

# PTflex<sup>®</sup> Couplings

PTflex couplings provide all the desirable features of an ideal flexible coupling, including Taper Lock fixing. The PTflex coupling is a "torsionally elastic" coupling offering versatility to designers and engineers with a choice of flange combinations to suit most applications.

The flanges are available in either F or H Taper Lock fitting or pilot bored, which can be bored to the required size. With the addition of a spacer the coupling can be used to accommodate standard distances between shaft ends and thereby facilitate pump maintenance.

PTflex couplings can accommodate simultaneous maximum misalignment in all planes without imposing undue loads on adjacent bearings and the excellent shock-absorbing properties of the flexible tyre reduce vibration and torsional oscillations.

PTflex tyres are available in natural rubber compounds for use in ambient temperatures between  $-50^{\circ}\text{C}$  and  $+50^{\circ}\text{C}$ .

## SELECTION

### (a) Service Factor

Determine the required Service Factor from table below.

### (b) Design Power

Multiply the normal running power by the service factor. This gives the design power which is used as a basis for selecting the coupling.

### (c) Coupling Size

Refer to Power Ratings table (page 125) and from the appropriate speed read across until a power greater than that required in step (b) is found.

The size of PTflex coupling required is given at the head of that column.

### (d) Bore Size

Check from Dimensions table (page 126) that chosen flanges can accommodate required bores.

## EXAMPLE

A PTflex coupling is required to transmit 45kW from an A.C. electric motor which runs at 1440 rev/min to a rotary screen for 12 hours per day. The motor shaft is 60mm diameter and the screen shaft is 55mm diameter. Taper Lock is required.

### (a) Service Factor

The appropriate service factor is 1,4.

### (b) Design Power

Design power =  $45 \times 1,4 = 63\text{kW}$ .

### (c) Coupling Size

By reading across from 1440 rev/min in the power ratings table the first power figure to exceed the required 63kW in step (b) is 75,4kW. The size of coupling is F90 PTflex.

### (d) Bore Size

By referring to the dimensions table it can be seen that both shaft diameters fall within the bore range available.

## SERVICE FACTORS

SPECIAL CASES For applications where substantial shock, vibration and torque fluctuations occur, and for reciprocating machines (e.g. internal combustion engines, piston pumps and compressors) refer to PTI with full machine details for analysis.	Type of Driving Unit					
	Electric Motors Steam Turbines			Internal Combustion Engines† Steam Engines Water Turbines		
	Hours per day duty			Hours per day duty		
Type of Driven Machine	10 and under	over 10 to 16 incl.	over 16	10 and under	over 10 to 16 incl.	over 16
<b>CLASS 1</b> Agitators, Brewing machinery, Centrifugal compressors and pumps. Belt conveyors, Dynamometers, Lineshafts, Fans up to 7,5kW. Blowers and exhausters (except positive displacement), Generators.	0,8	0,9	1,0	1,3	1,4	1,5
<b>CLASS 2*</b> Clay working machinery, General machine tools, paper mill beaters and winders, Rotary pumps, Rubber extruders, Rotary screens, Textile machinery, Marine propellers and Fans over 7,5kw.	1,3	1,4	1,5	1,8	1,9	2,0
<b>CLASS 3*</b> Bucket elevators, Cooling tower fans, Piston compressors and pumps, Foundry machinery, Metal presses, Paper mill calenders, Hammer mills, Presses and pulp grinders, Rubber calenders, Pulverisers and Positive displacement blowers.	1,8	1,9	2,0	2,3	2,4	2,5
<b>CLASS 4*</b> Reciprocating conveyors, Gyrotory crushers, Mills (ball, pebble and rod), Rubber machinery (Banbury mixers and mills) and Vibratory screens.	2,3	2,4	2,5	2,8	2,9	3,0

\* It is recommended that keys (with top clearance if in Taper Lock bushes) are fitted on application where load fluctuation is expected.

† Couplings for use with internal combustion engines may require special consideration, refer to pages 128 and 129.

# PTflex <sup>®</sup> Couplings – Power Ratings

## POWER RATINGS (kW)

Speed rev/min	Coupling Size														
	F40	F50	F60	F70	F80	F90	F100	F110	F120	F140	F160	F180	F200	F220	F250
100	0,25	0,69	1,33	2,62	3,93	5,24	7,07	9,16	13,9	24,3	39,5	65,7	97,6	121	154
200	0,50	1,38	2,66	5,24	7,85	10,5	14,1	18,3	27,9	48,7	79,0	131	195	243	307
300	0,75	2,07	3,99	7,85	11,8	15,7	21,2	27,5	41,8	73,0	118	197	293	364	461
400	1,01	2,76	5,32	10,5	15,7	20,9	28,3	36,6	55,7	97,4	158	263	391	486	615
500	1,26	3,46	6,65	13,1	19,6	26,2	35,3	45,8	69,6	122	197	328	488	607	768
600	1,51	4,15	7,98	15,7	23,6	31,4	42,4	55,0	83,6	146	237	394	586	729	922
700	1,76	4,84	9,31	18,3	27,5	36,6	49,5	64,1	97,5	170	276	460	684	850	1076
<b>720</b>	<b>1,81</b>	<b>4,98</b>	<b>9,57</b>	<b>18,8</b>	<b>28,3</b>	<b>37,7</b>	<b>50,9</b>	<b>66,0</b>	<b>100</b>	<b>175</b>	<b>284</b>	<b>473</b>	<b>703</b>	<b>875</b>	<b>1106</b>
800	2,01	5,53	10,6	20,9	31,4	41,9	56,5	73,3	111	195	316	525	781	972	1229
900	2,26	6,22	12,0	23,6	35,3	47,1	63,6	82,5	125	219	355	591	879	1093	1383
<b>960</b>	<b>2,41</b>	<b>6,63</b>	<b>12,8</b>	<b>25,1</b>	<b>37,7</b>	<b>50,3</b>	<b>67,9</b>	<b>88,0</b>	<b>134</b>	<b>234</b>	<b>379</b>	<b>630</b>	<b>937</b>	<b>1166</b>	<b>1475</b>
1000	2,51	6,91	13,3	26,2	39,3	52,4	70,7	91,6	139	243	395	657	976	1215	1537
1200	3,02	8,29	16,0	31,4	47,1	62,8	84,8	110	167	292	474	788	1172		
1400	3,52	9,68	18,6	36,6	55,0	73,3	99,0	128	195	341	553	919			
<b>1440</b>	<b>3,62</b>	<b>9,95</b>	<b>19,1</b>	<b>37,7</b>	<b>56,5</b>	<b>75,4</b>	<b>102</b>	<b>132</b>	<b>201</b>	<b>351</b>	<b>568</b>	<b>945</b>			
1600	4,02	11,1	21,3	41,9	62,8	83,8	113	147	223	390	632				
1800	4,52	12,4	23,9	47,1	70,7	94,2	127	165	251	438					
2000	5,03	13,8	26,6	52,4	78,5	105,5	141	183	279						
2200	5,53	15,2	29,3	57,6	86,4	115	155	202							
2400	6,03	16,6	31,9	62,8	94,2	126	170								
2600	6,53	18,0	34,6	68,1	102	136	184								
2800	7,04	19,4	37,2	73,3	110	147									
<b>2880</b>	<b>7,24</b>	<b>19,9</b>	<b>38,3</b>	<b>75,4</b>	<b>113</b>	<b>151</b>									
3000	7,54	20,7	39,9	78,5	118	157									
3600	9,05	24,9	47,9	94,2											

The figures in heavier type are for standard motor speeds. All these power ratings are calculated at constant torque. For speeds below 100 rev/min and intermediate speeds use nominal torque ratings.

## PHYSICAL CHARACTERISTICS – FLEXIBLE TYRES

Characteristics	Coupling Size														
	F40	F50	F60	F70	F80	F90	F100	F110	F120	F140	F160	F180	F200	F220	F250
Maximum speed rev/min	4500	4500	4000	3600	3100	3000	2600	2300	2050	1800	1600	1500	1300	1100	1000
Nominal Torque Nm T <sub>KN</sub>	24	66	127	250	375	500	675	875	1330	2325	3770	6270	9325	11600	14675
Maximum Torque Nm T <sub>K MAX</sub>	64	160	318	487	759	1096	1517	2137	3547	5642	9339	16455	23508	33125	42740
Torsional Stiffness Nm/°	5	13	26	41	63	91	126	178	296	470	778	1371	1959	2760	3562
Max, parallel misalignment mm	1,1	1,3	1,6	1,9	2,1	2,4	2,6	2,9	3,2	3,7	4,2	4,8	5,3	5,8	6,6
Maximum end float mm ±	1,3	1,7	2,0	2,3	2,6	3,0	3,3	3,7	4,0	4,6	5,3	6,0	6,6	7,3	8,2
Approximate mass, kg	0,1	0,3	0,5	0,7	1,0	1,1	1,1	1,4	2,3	2,6	3,4	7,7	8,0	10	15
Alternating Torque ± Nm @ 10Hz T <sub>KW</sub>	11	26	53	81	127	183	252	356	591	940	1556	2742	3918	5521	7124
Resonance Factor V <sub>R</sub>	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Damping Coefficient Ψ	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9

Maximum torque figures should be regarded as short duration overload ratings for use in such circumstances as direct-on-line starting.

**All flexible tyres have an angular misalignment capacity up to 4°.**

### FLEXIBLE TYRE CODE NUMBERS

Unless otherwise specified PTflex flexible tyres will be supplied in a natural rubber compound which is suitable for operation in temperatures -50°C to +50°C.

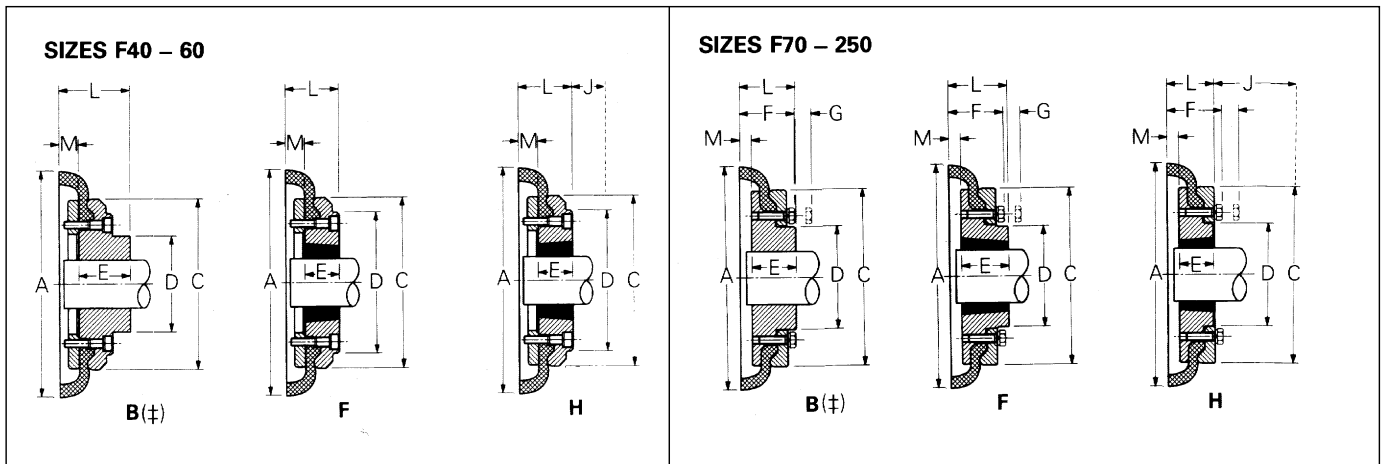
Size	Natural
F40	033A0048
F50	033B0048
F60	033C0048
F70	033D0048
F80	033E0048
F90	033F0048
F100	033G0048
F110	033H0048
F120	033J0048
F140	033K0048
F160	033L0048
F180	033Q0048
F200	033M0048
F220	033N0048
F250	033P0048

Coupling Size	M Dimension (mm)	Gap Between Tyre Ends (mm)	Clamping Screw Torque (Nm)	Screw Size
F40*	22	2	15	M6
F50*	25	2	15	M6
F60*	33	2	15	M6
F70	23	3	24	M8
F80	25	3	24	M8
F90	27	3	40	M10
F100	27	3	40	M10
F110	25	3	40	M10
F120	29	3	50	M12
F140	32	5	55	M12
F160	30	5	80	M16
F180	46	6	105	M16
F200	48	6	120	M16
F220	55	6	165	M20
F250	59	6	165	M20

\*Hexagonal socket caphead clamping screws on these sizes.

# PTflex Couplings – Dimensions

## FLANGES



## DIMENSIONS OF FLANGES TYPES B, F & H

Catalogue # Code	Size	Type	Bush No. #	Max Bore		Types F & H			Type B		Screw over Key	A	C	D	F	G§	M¶	Mass* (kg)	Inertia* (kgm²)
				Metric	Inch	L	E	J†	L	E									
F40	F40	B	–	32	–	–	–	29	33	22	M5	104	82	–	–	–	11	0,8	0,00074
		F	1008	25	1"	33	22	29	–	–	–	104	82	–	–	–	11	0,8	0,00074
		H	1008	25	1"	33	22	29	–	–	–	104	82	–	–	–	11	0,8	0,00074
F50	F50	B	–	38	–	–	–	38	45	32	M5	133	100	79	–	–	12,5	1,2	0,00115
		F	1210	32	1 1/4"	38	25	38	–	–	–	133	100	79	–	–	12,5	1,2	0,00115
		H	1210	32	1 1/4"	38	25	38	–	–	–	133	100	79	–	–	12,5	1,2	0,00115
F60	F60	B	–	45	–	–	–	38	55	38	M6	165	125	70	–	–	16,5	2,0	0,0052
		F	1610	42	1 1/2"	42	25	38	–	–	–	165	125	103	–	–	16,5	2,0	0,0052
		H	1610	42	1 1/2"	42	25	38	–	–	–	165	125	103	–	–	16,5	2,0	0,0052
F70	F70	B	–	50	–	–	–	–	47	35	M10	187	144	80	50	13	11,5	3,1	0,009
		F	2012	50	2"	44	32	42	–	–	–	187	144	80	50	13	11,5	3,1	0,009
		H	1610	42	1 1/2"	42	25	38	–	–	–	187	144	80	50	13	11,5	3,0	0,009
F80	F80	B	–	60	–	–	–	–	55	42	M10	211	167	98	54	16	12,5	4,9	0,018
		F	2517	60	2 1/2"	58	45	48	–	–	–	211	167	97	54	16	12,5	4,9	0,018
		H	2012	50	2"	45	32	42	–	–	–	211	167	98	54	16	12,5	4,6	0,017
F90	F90	B	–	70	–	–	–	–	63,5	49	M12	235	188	112	60	16	13,5	7,1	0,032
		F	2517	60	2 1/2"	59,5	45	48	–	–	–	235	188	108	60	16	13,5	7,0	0,031
		H	2517	60	2 1/2"	59,5	45	48	–	–	–	235	188	108	60	16	13,5	7,0	0,031
F100	F100	B	–	80	–	–	–	–	70,5	56	M12	254	216	125	62	16	13,5	9,9	0,055
		F	3020	75	3"	65,5	51	55	–	–	–	254	216	120	62	16	13,5	9,9	0,055
		H	2517	60	2 1/2"	59,5	45	48	–	–	–	254	216	113	62	16	13,5	9,4	0,054
F110	F110	B	–	90	–	–	–	–	75,5	63	M12	279	233	128	62	16	12,5	12,5	0,081
		F	3020	75	3"	63,5	51	55	–	–	–	279	233	134	62	16	12,5	11,7	0,078
		H	3020	75	3"	63,5	51	55	–	–	–	279	233	134	62	16	12,5	11,7	0,078
F120	F120	B	–	100	–	–	–	–	84,5	70	M16	314	264	143	67	16	14,5	16,9	0,137
		F	3525	100	4"	79,5	65	67	–	–	–	314	264	140	67	16	14,5	16,5	0,137
		H	3020	75	3"	65,5	51	55	–	–	–	314	264	140	67	16	14,5	15,9	0,130
F140	F140	B	–	130	–	–	–	–	110,5	94	M20	359	311	178	73	17	16	22,2	0,254
		F	3525	100	4"	81,5	65	67	–	–	–	359	311	178	73	17	16	22,3	0,255
		H	3525	100	4"	81,5	65	67	–	–	–	359	311	178	73	17	16	22,3	0,255
F160	F160	B	–	140	–	–	–	–	117	102	M20	402	345	187	78	19	15	35,8	0,469
		F	4030	115	4 1/2"	92	77	80	–	–	–	402	345	197	78	19	15	32,5	0,380
		H	4030	115	4 1/2"	92	77	80	–	–	–	402	345	197	78	19	15	32,5	0,380
F180	F180	B	–	150	–	–	–	–	137	114	M20	470	398	200	94	19	23	49,1	0,871
		F	4535	125	5"	112	89	89	–	–	–	470	398	205	94	19	23	42,2	0,847
		H	4535	125	5"	112	89	89	–	–	–	470	398	205	94	19	23	42,2	0,847
F200	F200	B	–	150	–	–	–	–	138	114	M20	508	429	200	103	19	24	58,2	1,301
		F	4535	125	5"	113	89	89	–	–	–	508	429	205	103	19	24	53,6	1,281
		H	4535	125	5"	113	89	89	–	–	–	508	429	205	103	19	24	53,6	1,281
F220	F220	B	–	160	–	–	–	–	154,5	127	M20	562	474	218	118	20	27,5	79,6	2,142
		F	5040	125	5"	129,5	102	92	–	–	–	562	474	223	118	20	27,5	72,0	2,104
		H	5040	125	5"	129,5	102	92	–	–	–	562	474	223	118	20	27,5	72,0	2,104
F250	B	–	190	–	–	–	–	161,5	132	M20	628	532	254	125	25	29,5	104,0	3,505	

Dimensions in millimetres unless otherwise stated.

§ G is the amount by which clamping screws need to be withdrawn to release tyre.

† J is the wrench clearance to allow for tightening/loosening the bush on the shaft and the clamp ring screws on sizes F40, F50 and F60. The use of a shortened wrench will allow this dimension to be reduced.

¶ M is half the distance between flanges. Shaft ends, although normally located twice M apart, can project beyond the flanges as shown. In this event allow sufficient space between shaft ends for end float and misalignment.

\* Mass and inertia figures are for single flange with mid range bore and include clamping ring, screws and washers and half tyre.

‡ For pilot bore 'B' flange code as listed.

Flanges are also available finish bored with keyway if required.

Bore must be specified on order.

# Note: On sizes F70, 80, 100 and 120 the 'F' direction bush is larger than that in the 'H' direction.

# PTflex Spacer Couplings

Comprising a tyre coupling (size F40–F140) complete with a spacer flange designed for use on applications where it is an advantage to be able to move either shaft axially without disturbing the driving or driven machine (e.g. centrifugal pump rotors), PTflex spacer couplings are primarily designed for standard distance between shaft end dimensions 100, 140 and 180mm.

## SELECTION

1. Select a suitable size of Fenaflex coupling using the method shown on table. Read down the first column in table below and locate the size of coupling selected.
2. Read across until the required distance between shaft ends can be accommodated.
3. Note the required spacer coupling

designation at head of column.

4. Check from the Spacer Coupling Dimensions table below that the selected spacer/coupling combination can accommodate the machine shaft size.

## Note

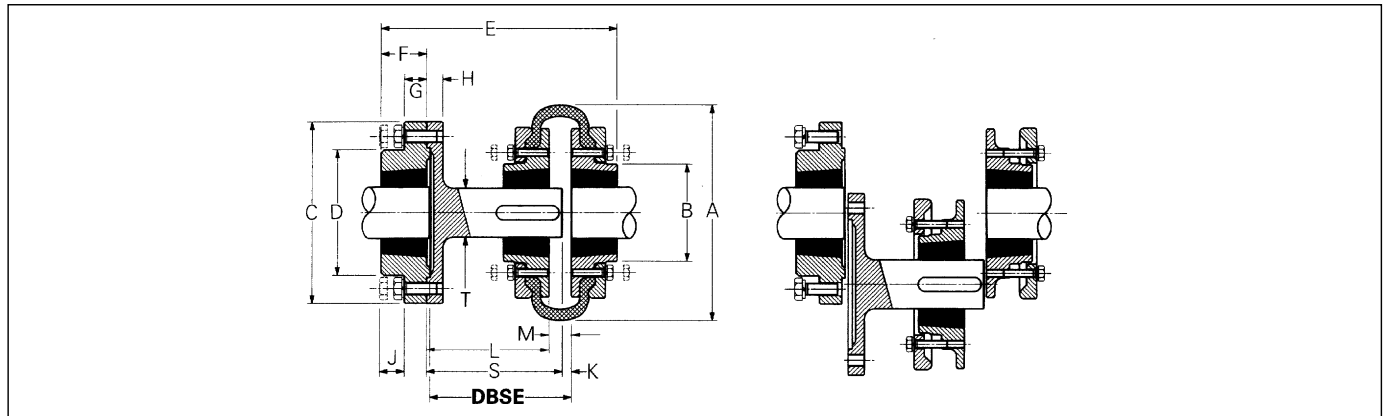
Typical order consists of

3 x Taper Lock bushes  
2 x PTflex flanges 1 x Fenaflex tyre

## DISTANCE BETWEEN SHAFT ENDS

Size	Distance between Shaft Ends (mm)																			
	SM12		SM16				SM25						SM30				SM35			
	80 (100)		100		140		100		140		180		140		180		140		180	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
<b>F40</b>	80	100	100	113	140	150														
<b>F50</b>			100	116	140	156														
<b>F60</b>			100	124	140	164														
<b>F70</b>							100	114	140	154	180	194								
<b>F80</b>							100	117	140	157	180	197								
<b>F90</b>									140	158	180	198								
<b>F100</b>													140	158	180	198				
<b>F110</b>													140	156	180	196				
<b>F120</b>																	140	160	180	200
<b>F140</b>																	140	163	180	203

Note: Alternative distances between shaft ends may be accommodated. Consult PTI.



## SPACER COUPLING DIMENSIONS

Spacer	Nom DBSE	PTflex	Spacer Code	Spacer Bush Size	Max. Bore		Fenaflex Bush Size	Max. Bore		A	B	C	D	E	F	G	H	J	K	L	M	S	T
					mm	Inch		mm	Inch														
<b>SM12</b>	<b>80</b>	<b>F40</b>	033S1200	1210	32	1 1/4"	1008	25	1"	104	82	118	83	134	25	14	15	14	6	65	22	77	25
<b>SM12</b>	<b>100</b>	<b>F40</b>	033S1200	1210	32	1 1/4"	1008	25	1"	104	82	118	83	140	25	14	15	14	22	77	22	77	25
<b>SM16</b>	<b>100</b>	<b>F40*</b>	033T1600	1610	42	1 5/8"	1008	25	1"	104	82	127	80	157	25	18	15	14	9	88	22	94	32
<b>SM16</b>	<b>140</b>	<b>F40*</b>	033V1600	1610	42	1 5/8"	1008	25	1"	104	82	127	80	187	25	18	15	14	9	128	22	134	32
<b>SM16</b>	<b>100</b>	<b>F50</b>	033T1600	1610	42	1 5/8"	1210	32	1 1/4"	133	79	127	80	160	25	18	15	14	9	85	25	94	32
<b>SM16</b>	<b>140</b>	<b>F50</b>	033V1600	1610	42	1 5/8"	1210	32	1 1/4"	133	79	127	80	200	25	18	15	14	9	125	25	134	32
<b>SM16</b>	<b>100</b>	<b>F60</b>	033T1600	1610	42	1 5/8"	1610	42	1 5/8"	165	70	127	80	161	25	18	15	14	9	78	33	94	32
<b>SM16</b>	<b>140</b>	<b>F60</b>	033V1600	1610	42	1 5/8"	1610	42	1 5/8"	165	70	127	80	201	25	18	15	14	9	118	33	134	32
<b>SM25</b>	<b>100</b>	<b>F70†</b>	033T2500	2517	60	2 1/2"	2012	50	2"	187	80	178	123	180	45	22	16	14	9	80	23	94	48
<b>SM25</b>	<b>140</b>	<b>F70†</b>	033V2500	2517	60	2 1/2"	2012	50	2"	187	80	178	123	220	45	22	16	14	9	120	23	134	48
<b>SM25</b>	<b>180</b>	<b>F70†</b>	033W2500	2517	60	2 1/2"	2012	50	2"	187	80	178	123	260	45	22	16	14	9	160	23	174	48
<b>SM25</b>	<b>100</b>	<b>F80</b>	033T2500	2517	60	2 1/2"	2517	60	2 1/2"	211	95	178	123	193	45	22	16	14	9	78	25	94	48
<b>SM25</b>	<b>140</b>	<b>F80</b>	033V2500	2517	60	2 1/2"	2517	60	2 1/2"	211	95	178	123	233	45	22	16	14	9	118	25	134	48
<b>SM25</b>	<b>180</b>	<b>F80</b>	033W2500	2517	60	2 1/2"	2517	60	2 1/2"	211	95	178	123	273	45	22	16	14	9	158	25	174	48
<b>SM25</b>	<b>140</b>	<b>F90</b>	033V2500	2517	60	2 1/2"	2517	60	2 1/2"	235	108	178	123	233	45	22	16	14	9	116	27	134	48
<b>SM25</b>	<b>180</b>	<b>F90</b>	033W2500	2517	60	2 1/2"	2517	60	2 1/2"	235	108	178	123	273	45	22	16	14	9	156	27	174	48
<b>SM30</b>	<b>140</b>	<b>F100</b>	033V3000	3020	75	3"	3020	75	3"	254	120	216	146	245	51	29	20	17	9	116	27	134	60
<b>SM30</b>	<b>180</b>	<b>F100</b>	033V3000	3020	75	3"	3020	75	3"	254	120	216	146	285	51	29	20	17	9	156	27	174	60
<b>SM30</b>	<b>140</b>	<b>F110</b>	033V3000	3020	75	3"	3020	75	3"	279	134	216	146	245	51	29	20	17	9	118	25	134	60
<b>SM30</b>	<b>180</b>	<b>F110</b>	033W3000	3020	75	3"	3020	75	3"	279	134	216	146	285	51	29	20	17	9	158	25	174	60
<b>SM35</b>	<b>140</b>	<b>F120†</b>	033V3500	3525	100	4"	3525	100	4"	314	140	248	178	272	63	34	20	17	9	114	29	134	80
<b>SM35</b>	<b>180</b>	<b>F120†</b>	033V3500	3525	100	4"	3525	100	4"	314	140	248	178	312	63	34	20	17	9	154	29	174	80
<b>SM35</b>	<b>140</b>	<b>F140</b>	033V3500	3525	100	4"	3525	100	4"	359	178	248	178	271	63	34	20	17	9	111	32	134	80
<b>SM35</b>	<b>180</b>	<b>F140</b>	033W3500	3525	100	4"	3525	100	4"	359	178	248	178	312	63	34	20	17	9	151	32	174	80

Note: Larger sizes of spacer coupling can be manufactured to order. Consult PTI.

\* F40 'B' Flange must be used to fit spacer shaft.

† 'F' Flange must be used to fit spacer shaft.