

NPX Couplings

NPX Coupling selection procedure

Based on Power and Speed

- 1] **Service Factor**
From Table 1 on page 301, select the service factor that is appropriate for the application
- 2] **Design Power**
Multiply the absorbed power, kW, of the driven machine by the service factor, from step 1) to obtain the design power.
If the absorbed power is not known, use the prime mover power.
- 3] **NPX coupling size selection**
Refer to Table 2 on page 301.

Read down the left hand vertical column to the required speed.
Interpolate if the exact speed is not listed
Read horizontally across on the speed line until a power equal to or in excess of the design power, from step 2), is reached.
Read vertically to the top of the column to obtain the correct size of NPX coupling.
- 4] **Bore dimensions**
From the dimension Tables on pages 303 and 304, check that the selected coupling will fit the shafts.



Based on IEC Electric Motors (page 302)

- 1] Note the frame size of the motor, power, speed (or number of poles)
- 2] Read across to the column headed by the motor speed (or number of poles)
- 3] The next column to the motor power gives the size of NPX coupling required
Pilot bore flange sizes are in normal type face. Taper bore flanges are in *italics*

NPX coupling selection example

Select a Challenge NPX coupling to couple a 15.0 kW, 1460 rev/min motor to a pulveriser which absorbs 13.2 kW.

Both shaft diameters are 42 mm and Taper bush flanges are required for both shafts.

- 1] **Service factor**
from Table 1 on page 301, the service factor for this application is 1.75
- 2] **Design power**
using the absorbed power of the pulveriser, the design power is $13.2 \times 1.75 = 23.1$ kW
- 3] **NPX coupling size selection**
Refer to Table 2 on page 301
By reading down and interpolating for the required speed of 1460 rev/min, it is seen that an NPX size 110 will transmit 24.5 kW which is in excess of the 23.1 kW required from step 2)
- 4] **Bore dimensions**
from the dimension Table on page 304, the flanges on an NPX 110 take a 1610 taper bush which are available with bores to suit the shaft requirements of the application

NPX Coupling Selection

Table 1, Service Factors

Special cases For applications where shock, vibration and torque fluctuations occur – consult Challenge	Type of prime mover		
	Electric motors and other smooth running devices	Internal combustion engines with 4 or more cylinders	Internal combustion engines with less than 4 cylinders
Type of driven machine			
Uniform load Light duty agitators, belt conveyors for sand etc., fans upto 7.5 kW, centrifugal compressors and pumps, generators	1.00	1.25	1.50
Moderate load Variable density agitators, belt conveyors (non-uniform loads), fans over 7.5 kW, other rotary compressors and pumps, machine tools, printing machinery, laundry machinery, rotary screens, rotary woodworking machinery	1.25	1.50	2.00
Heavy load Reciprocating compressors and pumps, positive displacement blowers, heavy duty conveyors such as screw, bucket etc., hammer mills, pulverisers, presses, shears, punches, rubber machinery, crushers, metal mills	1.75	2.00	2.50

The above Service Factors are based on 24 hours/day duty

Table 2, Power Ratings (kW)

Rotational speed in rev/min	58	68	80	95	110	125	140	160	180	200	225	250
100	0.20	0.36	0.63	1.05	1.68	2.51	3.77	5.86	9.22	14.0	20.9	29.3
150	0.30	0.54	0.95	1.58	2.52	3.77	5.66	8.79	13.8	21.0	31.4	44.0
200	0.40	0.72	1.26	2.10	3.36	5.02	7.54	11.7	18.4	28.0	41.8	58.6
300	0.60	1.08	1.89	3.15	5.04	7.53	11.3	17.6	27.7	42.0	62.7	87.9
400	0.80	1.44	2.52	4.20	6.72	10.0	15.1	23.4	36.9	56.0	83.6	117
500	1.00	1.80	3.15	5.25	8.40	12.6	18.9	29.3	46.1	70.2	105	147
600	1.20	2.16	3.78	6.30	10.1	15.1	22.6	35.2	55.3	84.0	125	176
700	1.40	2.52	4.41	7.35	11.8	17.6	26.4	41.0	64.5	98.2	147	205
720	1.44	2.59	4.54	7.56	12.1	18.1	27.1	42.2	66.4	101	151	211
800	1.60	2.88	5.04	8.40	13.4	20.1	30.2	46.9	73.8	112	168	235
900	1.80	3.24	5.67	9.45	15.1	22.6	33.9	52.7	83.0	126	188	264
960	1.92	3.46	6.05	10.1	16.1	24.1	36.2	56.3	88.5	135	201	281
1000	2.00	3.60	6.30	10.5	16.8	25.1	37.7	58.6	92.2	140	209	293
1200	2.40	4.32	7.56	12.6	20.2	30.1	45.2	70.3	111	168	251	352
1400	2.80	5.04	8.82	14.7	23.5	35.1	52.8	82.0	129	196	293	410
1440	2.88	5.18	9.07	15.1	24.2	36.1	54.3	84.4	133	202	302	422
1500	3.00	5.40	9.45	15.8	25.2	37.7	56.6	87.9	138	210	314	440
1800	3.60	6.48	11.3	18.9	30.2	45.2	67.9	105	166	253	377	528
2000	4.00	7.20	12.6	21.0	33.6	50.2	75.4	117	184	281	419	586
2500	5.00	9.00	15.8	26.3	42.0	62.8	94.3	147	231	351	524	733
2880	5.76	10.4	18.1	30.2	48.4	72.3	109	169	266	404	603	-
3000	6.00	10.8	18.9	31.5	50.4	75.3	113	176	277	421	628	-
3500	7.00	12.6	22.1	36.8	58.8	87.9	132	205	323	-	-	-
4000	8.00	14.4	25.2	42.0	67.2	100	151	234	-	-	-	-
4500	9.00	16.2	28.4	47.3	75.6	113	170	-	-	-	-	-
5000	10.0	18.0	31.5	52.5	84.0	126	-	-	-	-	-	-

All power ratings are constant torque
Interpolate for speeds not listed

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NPX Coupling Selection

IEC motor selection Table (50Hz)

Frame size, shaft diameter and length			Motor power (kW) 2-pole 3000 rev/min	NPX size *	Motor power (kW) 4-pole 1500 rev/min	NPX size *	Motor power (kW) 6-pole 1000 rev/min	NPX size *	Motor power (kW) 8-pole 750 rev/min	NPX size *
	2 pole	4, 6, 8 pole								
80	19 x 40		0.75	58 / 80	0.55	58 / 80	0.37	58 / 80	0.18	
			1.1	58 / 80	0.75	58 / 80	0.55	58 / 80	0.25	
90S	24 x 50		1.5	68 / 80	1.1	68 / 80	0.75	68 / 80	0.37	
90L			2.2	68 / 80	1.5	68 / 80	1.1	68 / 80	0.55	
100L	28 x 60		3.0	80 / 80	2.2	80 / 80	1.5	80 / 80	0.75	80 / 80
					3.0				1.1	80 / 80
112M	38 x 80		4.0	80 / 80	4.0	80 / 80	2.2	80 / 80	1.5	80 / 80
132S			5.5	95 / 110	5.5	95 / 110	3.0	95 / 110	2.2	95 / 110
132M			7.5	95 / 110		95 / 110				
					7.5			4.0	95 / 110	3.0
160M	42 x 110		11	95 / 110	11	95 / 110	7.5	95 / 110	4.0	95 / 110
					15	95 / 110				5.5
160L	48 x 110		18.5	95 / 110	15	110 / 110	11	110 / 110	7.5	110 / 110
180M			22	110 / 125	18.5	110 / 125				
180L					22	125 / 125	15	125 / 125	11	125 / 125
					30	125 / 160	30	125 / 160	18.5	125 / 160
200L	55 x 110		37	125 / 160			22	140 / 160		
							37	140 / 160		
225S	55 x 110	60 x 140		125 / 160	45	140 / 160	30	140 / 160	22	140 / 160
225M			45	125 / 160	45	140 / 160	30	140 / 160	22	140 / 160
250M	60 x 140	65 x 140	55	140 / 160	55	160 / 160	37	160 / 160	30	160 / 160
280S	75 x 140		75	160 / 160	75	<i>200</i>	45	<i>200</i>	37	<i>250</i>
280M			90	160 / 160	90	<i>200</i>	55	<i>200</i>	45	<i>250</i>
315S	80 x 170		110	160 / 160	110	<i>250</i>	75	<i>250</i>	55	<i>250</i>
315M	65 x 140		132	160 / 160	132		90	<i>250</i>	75	<i>250</i>
					160	160 / 160	160		110	<i>250</i>
315L			200		200		132	<i>250</i>	110	<i>250</i>
							160	<i>250</i>	132	<i>250</i>
315	85 x 170		250		250	<i>250</i>	200			

The above selection procedure is based on the following parameters:-

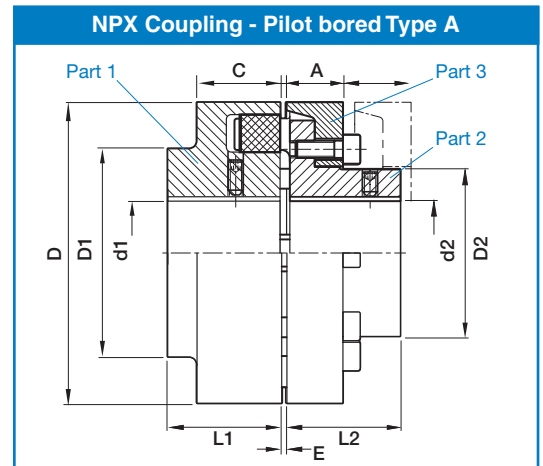
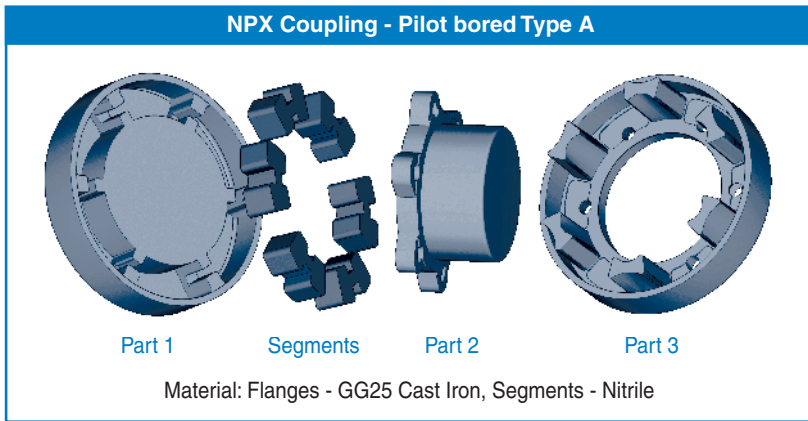
- Service factor of 1.25
- No more than 25 starts per hour

If the parameters differ from the above, the selection should be based on power and speed

* Pilot bore flanges are in **bold normal** type face

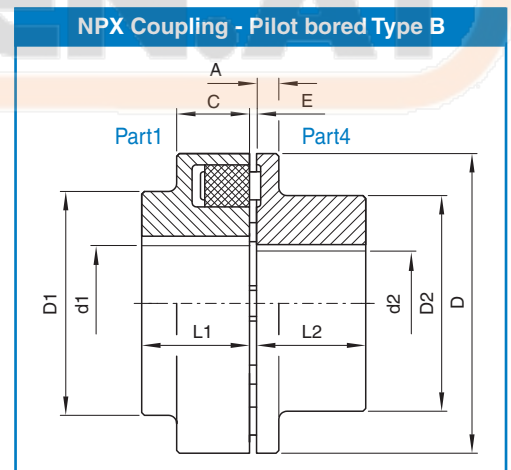
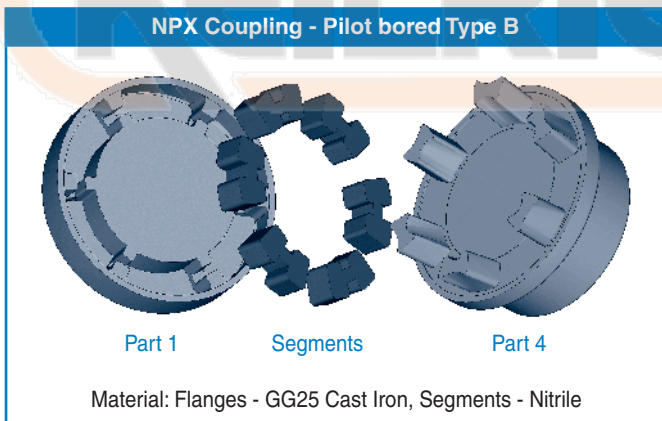
* Taper bore flanges are in *light italic* type face

NPX Couplings



Pilot bored Type A

Size	Power at 100 rev/min kW	Torque		Max Speed rev/min	Minimum bore		Maximum bore		D parts 1 and 3	L1 part 1	L2 part 2	D1 part 1	D2 part 2	A part 3	C part 1	E	Weight of flange kg		
		Rated Nm	Max Nm		d1 part 1	d2 part 2	d1 part 1	d2 part 2									flange part 1	flange part 2	flange part 3
110	1.68	160	480	5000	17	12	48	38	111	40	40	86	62	20.0	34	2 - 4	1.95	1.38	1.97
125	2.51	240	720	5000	18	15	55	45	126	50	50	100	75	23.5	36	2 - 4	3.05	2.42	1.97
140	3.77	360	1080	4900	20	17	60	50	141	55	55	100	82	28.0	34	2 - 4	3.65	3.04	2.50
160	5.86	560	1680	4250	25	20	65	58	161	60	60	108	95	28.0	40	2 - 6	5.05	4.19	3.49
180	9.22	880	2640	3800	25	20	75	65	180	70	70	125	108	30.0	42	2 - 6	7.80	5.94	4.41
200	14.03	1340	4020	3400	30	25	85	75	200	80	80	140	122	32.5	47	2 - 6	11.0	8.61	6.02
225	20.94	2000	6000	3000	35	30	90	85	225	90	90	150	138	38.0	52	2 - 6	15.0	12.06	8.93
250	29.32	2800	8400	2750	45	45	100	95	250	100	100	165	155	42.0	60	3 - 8	19.5	17.41	11.70



Pilot bored Type B

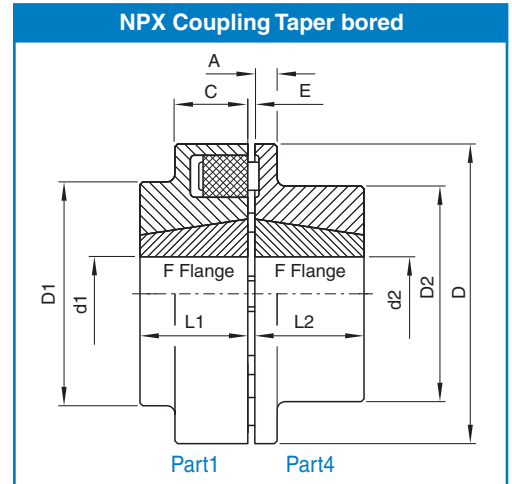
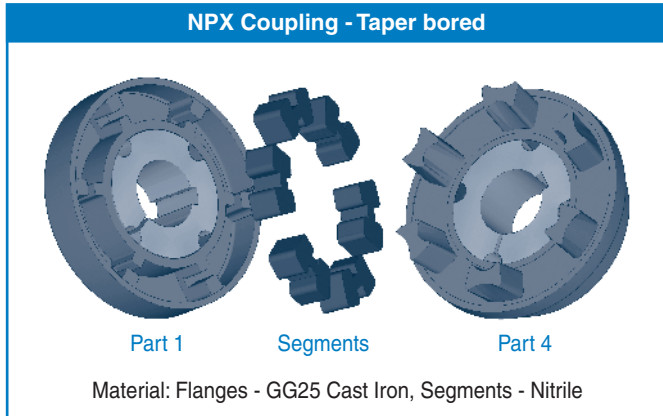
Size	Power at 100 rev/min kW	Torque		Max Speed rev/min	Minimum bore		Maximum bore		D parts 1 and 4	L1 part 1	L2 part 4	D1 part 1	A part 4	C part 1	E	Weight of flange kg	
		Rated Nm	Max Nm		d1 part 1	d2 part 4	d1 part 1	d2 part 4								part 1	part 4
58	0.20	19	57	5000	-	-	19	19	59	20	20	-	8	20	2 - 4	0.24	0.28
68	0.36	34	102	5000	-	-	24	24	69	20	20	-	8	20	2 - 4	0.32	0.45
80	0.63	60	180	5000	12	12	30	30	81	30	30	-	10	30	2 - 4	0.75	0.94
95	1.05	100	300	5000	12	12	42	42	96	35	36	76	13	30	2 - 4	1.30	1.55
110	1.68	160	480	5000	17	17	48	48	111	40	40	86	14	34	2 - 4	1.95	2.25
125	2.51	240	720	5000	18	18	55	55	126	50	50	100	18	36	2 - 4	3.05	3.60
140	3.77	360	1080	4900	20	20	60	60	141	55	55	100	20	34	2 - 4	3.65	4.50
160	5.86	560	1680	4250	25	25	65	65	161	60	60	108	20	40	2 - 6	5.05	5.95
180	9.22	880	2640	3800	25	25	75	75	180	70	70	125	20	42	2 - 6	7.80	8.50
200	14.03	1340	4020	3400	30	30	85	85	200	80	80	140	24	47	2 - 6	11.0	12.4
225	20.94	2000	6000	3000	35	35	90	90	225	90	90	150	18	52	2 - 6	15.0	15.5
250	29.32	2800	8400	2750	45	45	100	100	250	100	100	165	18	60	3 - 8	19.5	19.5

Weight and inertia figures are for a mid range bore.

Temperature range -30°C to 75°C

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NPX Couplings



Taper bored

Size	Power at 100 rev/min kW	Torque		Max speed rev/min	Bush for F flange	Max bore d1/d2 parts 1 and 4	D parts 1 and 4	L1 part 1	L2 part 4	D1 part 1	D2 part 4	A part 4	C part 1	E	Weight of flange kg	
		rated Nm	max Nm												flange part 1	flange part 4
80	0.63	60	180	5000	1108	28	80	22.5	22.5	0	0	22.5	22.5	2 - 4	0.75	0.94
95	1.05	100	300	5000	1210	32	95	26.5	26.5	0	76	13.0	26.5	2 - 4	1.30	1.55
110	1.68	160	480	5000	1615	42	110	38.5	38.5	86	86	14.0	34.0	2 - 4	1.95	2.25
125	2.51	240	720	5000	2012	50	125	32.5	32.5	0	100	18.0	32.5	2 - 4	3.05	3.60
140	3.77	360	1080	4900	2012	50	140	32.5	32.5	0	100	20.0	32.5	2 - 4	3.65	4.50
160	5.86	560	1680	4250	2517	65	160	46.0	46.0	108	108	20.0	40.0	2 - 6	5.05	5.95
180	9.22	880	2640	3800	2517	65	180	46.0	46.0	125	125	20.0	42.0	2 - 6	7.80	8.50
200	14.03	1340	4020	3400	3020	75	200	52.0	52.0	140	140	24.0	47.0	2 - 6	11.0	12.4
225	20.94	2000	6000	3000	3020	75	225	52.0	52.0	150	150	18.0	52.0	2 - 6	15.0	15.5
250	29.32	2800	8400	2750	3535	90	250	90.0	90.0	165	165	18.0	60.0	3 - 8	19.5	19.5

Weight and inertia figures are for a mid range bore.

Temperature range -30°C to 75°C