

0403

EXAMPLE APPLICATION DETAILS

Absorbed power of driven machine = 0.95 HP
 Output speed of gearbox or Input speed of machine = 54 rev/min
 Application = Uniformly loaded belt conveyor
 Duration of service (hours per day) = 24hrs
 Mounting position = 1
 Ambient temperature = 70°F (20°C)
 Running time (%) = 100%

1 DETERMINE MECHANICAL SERVICE FACTOR (Fm)

Refer to Load Classification by Application, table 3, page 4
 Application = Uniformly loaded belt conveyor

Conveyors-uniformly loaded or fed		U = Uniform load
apron	U	
assembly	U	
belt	U	
bucket	U	
chain	U	

Refer to mechanical service factor (Fm), table 1, page 3
 Duration of service (hours per day) = 24hrs

Prime mover	Duration of service-hrs per day	Load classification-drive	
		Uniform	Moderate
Electric motor, steam turbine or hydraulic motor	Under 3	0.80	1.00
	3 to 10	1.00	1.25
	Over 10	1.25	1.50

Therefore mechanical service factor (Fm) = 1.25

If the unit is subject to frequent start/stops Fm must be multiplied by factor Fs (see table 2 page 3)

2 DETERMINE REQUIRED OUTPUT TORQUE AT GEARBOX OUTPUTSHAFT

$$\text{Absorbed output torque} = \frac{\text{Absorbed power} \times 63025}{\text{Gearbox output speed}}$$

$$\frac{0.95 \times 63025}{54} = 1109 \text{ lb.in}$$

3 SELECT GEARMOTOR

Refer to selection table one motor size larger than absorbed power.
 Absorbed power = 0.95 HP, therefore refer to 1.0 HP selection table, page 42
 Always select from 4 POLE selection table in the first instance as this offers a more economical solution.
 Required output speed of gearbox = 54 rev/min

1.0 HP	N2 R/MIN	i	lb in	Fm	lbf	UNIT DESIGNATION	lb	Motor Frame Size
	Output Speed	Ratio	Output Torque	Service Factor	Overhung Load			
4 POLE	188	9.09	324	3.71	899	M 0 2 2 2 9 . 0 _ M _ _ _ 1 . 0 B - -	49.6	80A
	138	12.37	441	2.89	899	1 2 .		
	122	14.05	500	2.6	899	1 4 .		
	107	15.97	567	2.4	899	1 6 .		
	97	17.58	626	2.19	899	1 8 .		
	85	20.23	719	1.97	882	2 0 .		
	78	21.99	782	1.81	868	2 2 .		
	65	26.4	938	1.51	899	2 8 .		
	54	31.68	1123	1.26	859	3 2 .		
	48	35.69	1263	1.12	899	3 6 .		

4 CHECK OUTPUT TORQUE

Output torque (M2) of selected unit must be equal or more than required output torque at gearbox outputshaft.
 Required output torque at gearbox outputshaft = 1109 lb.in

1.0 HP	N2 R/MIN	i	lb in	Fm	lbf	UNIT DESIGNATION	lb	Motor Frame Size
	Output Speed	Ratio	Output Torque	Service Factor	Overhung Load			
4 POLE	188	9.09	324	3.71	899	M 0 2 2 2 9 . 0 _ M _ _ _ 1 . 0 B - -	49.6	80A
	138	12.37	441	2.89	899	1 2 .		
	122	14.05	500	2.6	899	1 4 .		
	107	15.97	567	2.4	899	1 6 .		
	97	17.58	626	2.19	899	1 8 .		
	85	20.23	719	1.97	882	2 0 .		
	78	21.99	782	1.81	868	2 2 .		
	65	26.4	938	1.51	899	2 8 .		
	54	31.68	1123	1.26	859	3 2 .		
	48	35.69	1263	1.12	899	3 6 .		

Selected unit's output torque (M2) = 1123 lb.in, therefore unit is acceptable

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5 CHECK SERVICE FACTOR

Service factor (Fm) of selected unit must be equal or more than required service factor.

Required service factor of gearbox = 1.25

1.0 HP	N2 R/MIN	i	lb in	Fm	lbf	UNIT DESIGNATION	lb	
	Output Speed	Ratio	Output Torque	Service Factor	Overhung Load	Column Entry <input type="text" value="1"/> Through <input type="text" value="20"/> Spaces to be filled when entering order	Weight of Base Mount Unit	Motor Frame Size
4 POLE	188	9.09	324	3.71	899	M 0 2 2 2 9 . 0 _ M _ _ _ 1 . 0 B _ _	49.6	80A
	138	12.37	441	2.89	899	1 2 .		
	122	14.05	500	2.6	899	1 4 .		
	107	15.97	567	2.4	899	1 6 .		
	97	17.58	626	2.19	899	1 8 .		
	85	20.23	719	1.97	882	2 0 .		
	78	21.99	782	1.81	868	2 2 .		
	65	26.4	938	1.51	899	2 8 .		
	54	31.68	1123	1.26	859	3 2 .		
	48	35.69	1263	1.12	899	3 6 .		

Selected unit's service factor (Fm) = 1.26, therefore unit is acceptable.

Alternatively a M03 unit could be selected which has a greater service factor

1.0 HP	N2 R/MIN	i	lb in	Fm	lbf	UNIT DESIGNATION	lb	
	Output Speed	Ratio	Output Torque	Service Factor	Overhung Load	Column Entry <input type="text" value="1"/> Through <input type="text" value="20"/> Spaces to be filled when entering order	Weight of Base Mount Unit	Motor Frame Size
4 POLE	153	11.15	398	3.78	899	M 0 3 2 2 1 1 . _ M _ _ _ 1 . 0 B _ _	49.6	80A
	138	12.37	441	3.53	899	1 2 .		
	122	14.05	499	3.24	899	1 4 .		
	107	15.97	569	3.02	799	1 6 .		
	97	17.58	626	2.78	779	1 8 .		
	85	20.23	720	2.53	745	2 0 .		
	78	21.99	783	2.36	859	2 2 .		
	65	26.4	940	1.97	810	2 8 .		
	54	31.68	1119	1.65	696	3 2 .		
	48	35.69	1258	1.47	766	3 6 .		

Selected unit's service factor (Fm) = 1.65, therefore unit is acceptable.

6 CHECK OVERHUNG LOADS

If sprocket, gear, etc is mounted on the outputshaft then refer to Overhung Loads Procedure, page 83, and compare with allowable overhung load (lbf) of selected unit

Allowable overhung load (lbf) must be equal or more than calculated overhung load (P)

1.0 HP	N2 R/MIN	i	lb in	Fm	lbf	UNIT DESIGNATION	lb	
	Output Speed	Ratio	Output Torque	Service Factor	Overhung Load	Column Entry <input type="text" value="1"/> Through <input type="text" value="20"/> Spaces to be filled when entering order	Weight of Base Mount Unit	Motor Frame Size
4 POLE	188	9.09	324	3.71	899	M 0 2 2 2 9 . 0 _ M _ _ _ 1 . 0 B _ _	49.6	80A
	138	12.37	441	2.89	899	1 2 .		
	122	14.05	500	2.6	899	1 4 .		
	107	15.97	567	2.4	899	1 6 .		
	97	17.58	626	2.19	899	1 8 .		
	85	20.23	719	1.97	882	2 0 .		
	78	21.99	782	1.81	868	2 2 .		
	65	26.4	938	1.51	899	2 8 .		
	54	31.68	1123	1.26	859	3 2 .		
	48	35.69	1263	1.12	899	3 6 .		

NOTE: If any of the following conditions occur then consult Textron Power Transmission Application Engineers:-

- a) Mass acceleration factor > 10
- b) Ambient temperature is above 104°F (40°C)