

Powered Actuators

All actuators require an outside power source. Whether this power source be an electric motor, or hand wheel Duff-Norton has the required component.

Customers who choose to power their actuators via electronic motor may do so connecting the motor to the actuator via C-face adapter straight to the actuator's worm, via right angle gear reducer, or via remotely connecting the motor and actuator worm shaft with a coupling and connecting shaft.

Some customers also opt to manually power their actuators. In those cases hand wheels are usually the preferred drive component.



Reducer Driven

Duff-Norton provides customers with the most comprehensive and easily implemented motorized reducer assortment. For the first time customers can easily select the reducer model best suited for their application.

Features

- Available on 2 ton through 50 ton, machine screw or ball screw actuators
- Largest selection of gear reducer ratios available
- Easy mounting simplifies installation, eliminates drive alignment problems
- Field retrofit possible on existing non-motorized models
- Modular assembly allows many different arrangements. Most models can have parts repositioned in the field to solve clearance problems
- Properly sized motor and gear reducer mounted directly to side of actuator
- One motorized actuator can shaft drive one or more additional actuators
- Aluminum and finned housings yield better cooling properties
- Eliminates exposed shafts and couplings; no need to design and source shafts or couplings
- 1725 rpm, 230/460 volt, 3 phase TEFC motors standard. Other voltages and special motor features available

How to size a Motorized Gear Reducer:

First determine whether machine screw or ball screw actuators are to be used. Determine if it is a single actuator application, or multiple actuators, shaft driven from a common motorized reducer.

For a single actuator:

1. Determine actuator load.
2. Refer to the tables on pages 110 - 114. Select an actuator model with adequate nominal load rating. Ratings larger than actual load may be required due to column strength, life requirements, etc.
3. Select a reducer ratio to provide a suitable lifting speed.
4. Go along that line of the table to find a load capacity equal to or greater than applied load. Note the motor horsepower from the top of the column.

Note: Ratings in the shaded area of the chart exceed the safe load rating of a single actuator and are shown for designing multiple actuator systems. In no case should an actuator be used at a higher load or input horsepower than shown in the actuator specification charts on pages 31 and 67.



For multiple actuators, shaft driven from a single reducer:

1. Determine total system load and distribution of load between actuators.
2. Refer to the tables on pages 110 - 114. Select an actuator model with nominal load rating adequate for the most heavily loaded actuator in the system.
3. Select a reducer ratio to provide a suitable lifting speed.
4. Go along that line of the table to find a load capacity equal to or greater than total system load. Note the motor horsepower from the top of the column.

Performance Specifications - Machine Screw Actuators

Powered Actuators

Actuator Model	Actuator Ratio	Reducer Model	Reducer Ratio	Lifting Speed (in/min)	Lifting capacity (pounds)									
					Motor Horsepower(1725 rpm) / Frame Size									
					1 - 80L	1.5 - 90S	2 - 90L	3 - 100L	5 - 100L	7.5 -132S	10 -132M	15 - 160M	20 - 160L	
25 Ton MS	10.33:1	92672	4.85	22.2							24425			
			5.46	19.7							27540			
			5.92	18.2							20000	29830		
			6.78	15.9							22900	34260		
			7.73	13.9							26200	39160		
			8.71	12.4					12300	17900	29500	44090		
			9.78	11.0					13700	20200	33000	49500		
			11.02	9.8					15400	22600	37200	55720		
			12.64	8.5					17800	25800	42900	63920		
			14.08	7.7					19800	29000	47500	71100		
			16.08	6.7					22600	33000	54500			
			18.08	6.0					N.A.	37200	61400			
			20.37	5.3					N.A.	41600	68600			
			23.28	4.6					N.A.	48000	78800			
			26.55	4.1				27900	37000	54700				
			29.91	3.6				31800	42400	61400				
			34.17	3.2				35700	47600	70000				
			37.32	2.9			26500	39800	53000					
			42.04	2.6			30000	44900	59800					
			48.03	2.2			34400	50000	66700					
51.86	2.1			36500										
35 Ton MS	10.33:1	92772	4.81	22.4							22900			
			5.43	19.9							25860			
			6.11	17.6								29100		
			6.41	16.8							20300	30500		
			7.60	14.2							24100	36200		
			8.55	12.6							27160	40740		
			9.63	11.2							30600	45900		
			10.88	9.9				13800	20800	34700	52000			
			12.43	8.7				15800	23600	39400	59100			
			13.91	7.8				17600	26400	44000	66130			
			15.60	6.9				19800	29800	49600	74500			
			17.83	6.0				22750	34100	56900	85300			
			19.73	5.5				N.A.	37600	62700	94000			
			22.22	4.9				N.A.	42400	70700	106000			
			25.39	4.2				N.A.	48700	81000	121700			
			28.44	3.8					36180	54200	90400			
			32.04	3.4			30600	40800	61300	102200				
			36.61	2.9			35200	47000	70400	117400				
			40.77	2.6			26900	40400	53900					
			45.93	2.3			30650	46000	61300					
52.48	2.1			34450	51700	68900								
50 Ton MS	10.33:1	9042	8.83	12.2							42800	63400	84500	
			9.39	11.5							45400	67400	89900	
			10.21	10.6							49400	73300	97700	
			11.40	9.5								55300	82000	109000
			13.40	8.0							48800	65100	96300	128000
			15.66	6.9							56800	75800	112000	150000
			18.20	5.9							66300	88500	130000	173000
			20.32	5.3							74200	99000	145000	193000
			23.89	4.5							86400	115000	170000	227000
			27.91	3.9								101000	135000	200000
			31.70	3.4								114000	153000	
			34.39	3.1							84000	126000	168000	
			40.54	2.7								97700	146000	195000
			47.67	2.3								116000	175000	
			55.69	1.9						81300	135000	203000		

Charts show available ratios and motors for close coupled, IEC frame motors. Gear reducers with flange for NEMA C-face motor also available. Fitting of C-face motor will increase length of reducer-motor combination.

Actuator Model	Actuator Ratio	Reducer Model	Reducer Ratio	Lifting Speed (in/min)	Lifting Capacity (pounds) - See Notes Below												
					Motor Horsepower(1725rpm) / Frame Size												
					1/4 - 56C	1/3 - 56C	1/2 - 56C	3/4 - 56C	1 - 56C	1.5 - 140TC	2 - 140TC	3 - 180TC	5 - 180TC	7.5 - 180TC			
2 Ton BS	6:1	31	5	14.4	3490	4650	6970	10460	13950						Note:180TC flange !		
			7.5	9.6	5000	6680	10000	15000									
			10	7.2	6400	8500	12750	19000									
			15	4.8	8650	11500	17300										
			20	3.6	10800	14400	21600										
			25	2.9	11400	17000											
			30	2.4	11800	17700											
2 Ton BS High Lead	6:1	31	40	1.8	14200	21400											
			5	57.5	980	1300	1960	2940	3900								
			7.5	38.3	1400	1880	2800	4200	5600								
			10	28.8	1800	2400	3600	5390									
			15	19.2	2400	3200	4800										
			20	14.4	3000	4000	6000										
			25	10.8	3600	4800	7200										
3 Ton BS	6:1	31	30	2.4	11800	17700											
			5	23.7	2200	3100	4700	7000	9400								
			7.5	15.8	3380	4500	6750	10100	13500								
			10	11.9	4300	5700	8620	12900									
			15	7.9	5840	7700	11600										
			20	5.9	7300	9650	14600										
			25	4.7	8700	11500											
5 Ton BS	6:1	50	30	4.0	9000	12000											
			40	3.0	10900	14400											
			5	27.2	2280	3000	4550	6800	9100	13600	18200	27300*					
			7.5	18.2	3300	4400	6600	9900	13200	19800	26400						
			10	13.6	4300	5740	8600	12900	17200	25800	34500						
			15	9.1	5970	7950	11950	17900	23900	35800							
			20	6.8	7660	10200	15300	23000	30600								
5 Ton BS High Lead	6:1	50	25	5.5	9250	12300	18500	27700	37000								
			30	4.5	9970	13300	19900	29900	39900								
			40	3.4	12300	16400	24600	36900									
			5	57.4	1000	1330	2000	3000	4000	6000	8000	12000*					
			7.5	38.4	1450	1930	2900	4350	5800	8700	11600	17400*					
			10	28.7	1890	2520	3780	5670	7560	11300	15100						
			15	19.1	2550	3420	5130	7700	10300	15500	20600						
10 Ton BS	8:1	63	20	5.1	9560	12750	19100	28700	38200	57400	76500						
			25	4.1	11600	15400	23100	34700	46300	69500							
			30	3.4	12700	16900	25400	38000	50750	76000							
			40	2.6	15700	20950	31400	47100	62800								
			5	43.0	1180	1575	2370	3550	4730	7100	9470	14200	23600				
			7.5	28.7	1740	2300	3480	5220	6960	10400	13900	20800	34800				
			10	21.5	2260	2990	4530	6800	9060	13600	18100	27200					
20 Ton BS	8:1	75	5	21.6	2500	3400	5150	7700	10300	15500	20600	30900	51500	77300			
			7.5	14.4	3780	5040	7570	11300	15100	22700	30300	45400	75700	113000			
			10	10.8	4980	6650	9970	14900	19900	29900	39900	59800	99700				
			15	7.2	7050	9400	14100	21100	28200	42300	56400	84500	140900				
			20	5.4	9140	12100	18200	27400	36500	54800	73100	109600					
			25	4.3	11400	15100	22750	34100	45500	68200	91000						
			30	3.6	11700	15600	23400	35000	46700	70000	93400						
20 Ton BS High Lead	8:1	75	40	2.7	15400	20500	30800	46200	61600	92400	123000						
			5	43.1			2575	3850	5150	7750	10300	15450	25750	38650			
			7.5	28.7			2575	3850	5150	7750	10300	15450	25750	38650			

Performance Specifications - Ball Screw Actuators

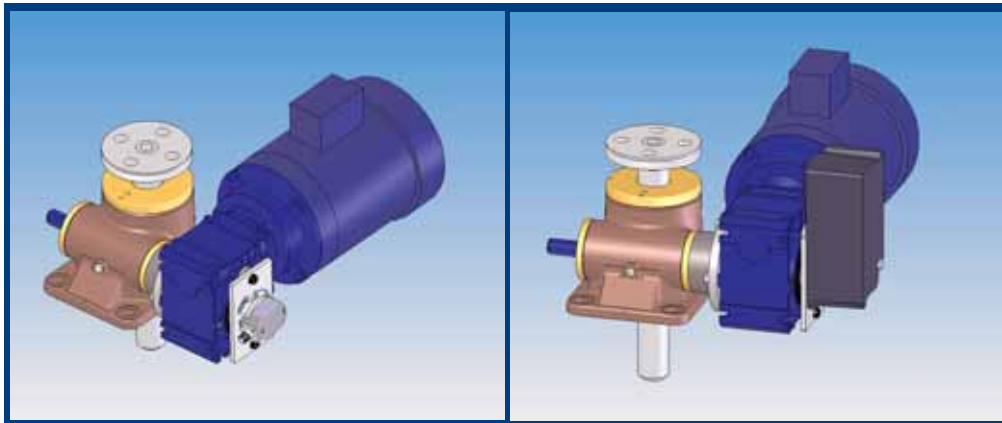
Powered Actuators

Actuator Model	Actuator Ratio	Reducer Model	Reducer Ratio	Lifting Speed (in/min)	Lifting capacity (pounds)										
					Motor Horsepower(1725 rpm) / Frame Size										
					.50 - 71L	.75 - 80S	1 - 80L	1.5 - 90S	2 - 90L	3 - 100L	5 - 100L	7.5 -132S			
25 Ton BS	10.33:1	92372	5.30	20.1						24600	35400	59000			
			5.97	17.9						27300	40200	66000			
			6.49	16.4							30000	43400	71800		
			7.32	14.6							33800	49300	81000		
			8.29	12.9							38000	55700	91700		
			9.47	11.3						32700	43400	63800	105000		
			10.84	9.8						37500	49900	72900	120000		
			11.39	9.4						39100	52500	76100	126000		
			13.01	8.2						44500	59500	87400			
			14.65	7.3					33800	50900	67500	114800			
			17.06	6.3					N.A.	59000	79400	128000			
			19.21	5.6					N.A.	66500	89000				
			21.95	4.9					N.A.	75600	100000				
			24.33	4.4			40800	56300	84100	112000					
			27.41	3.9			46100	63800	93800	125000					
			31.32	3.4			52000	71800	108000						
			33.80	3.2			37500	56300	77700						
			38.62	2.8			42300	64900	89000						
			43.52	2.5			47700	73400							
			49.73	2.1			54700	84000							
55.00	1.9			61700											
50 Ton BS Reverse Base Only	10.33:1	92672	4.85	33.4									60000		
			5.46	29.6										67600	
			5.92	27.3											73200
			6.78	23.9											56300
			7.73	20.9											84000
			8.71	18.6											96000
			9.78	16.5											108000
			11.02	14.7											121500
			12.64	12.8											136700
			14.08	11.5							30200	43800	72400	108000	
			16.08	10.1							33800	49500	81300	121500	
			18.08	9.0							37800	55500	91300	136700	
			20.37	7.9							43800	63500	105400	156900	
			23.28	7.0							48700	71200	116700	175000	
			26.55	6.1							55500	81300	134000		
			29.91	5.4							N.A.	91300	150000		
			34.17	4.7							N.A.	102000	168500		
			37.32	4.3							N.A.	118000	193500		
			42.04	3.8							68400	90900	134000		
			48.03	3.4							78000	104000	151000		
51.86	3.1							87700	117000	172000					
								97700	130000						
								73600	110000	147000					
								84500	122700	163700					
								89700							

Using Reducer-Horsepower Tables

- Listed actuator capacities consider reducer efficiencies and maximum power ratings.
- Capacities are based on available reducer output torque and apply to both single actuator and shaft-connected, multiple actuator configurations. Capacity is the total load for all actuators driven by the reducer.
- Shaded capacities exceed the single actuator load rating or horsepower rating. In no case should any actuator be loaded beyond its nominal load rating, or at input powers greater than shown in the actuator specification chart on page 67.**
- For multiple actuator configurations with total capacity greater than shown, contact Duff-Norton Application Engineering.

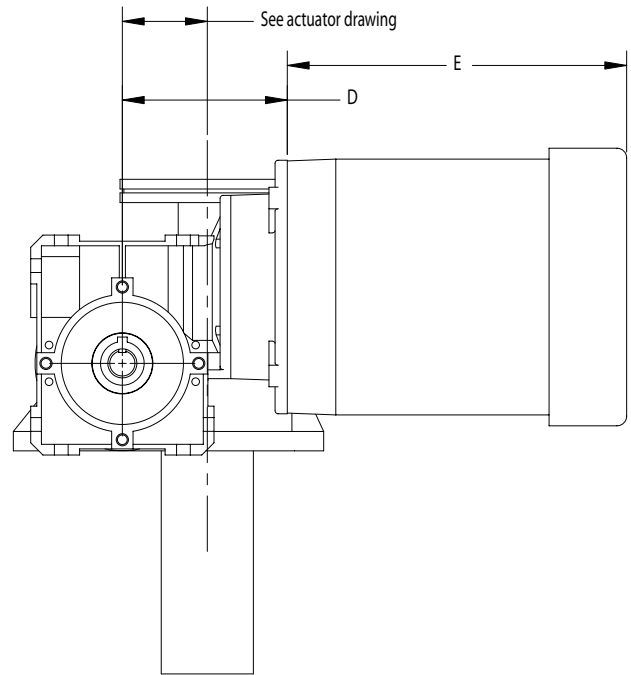
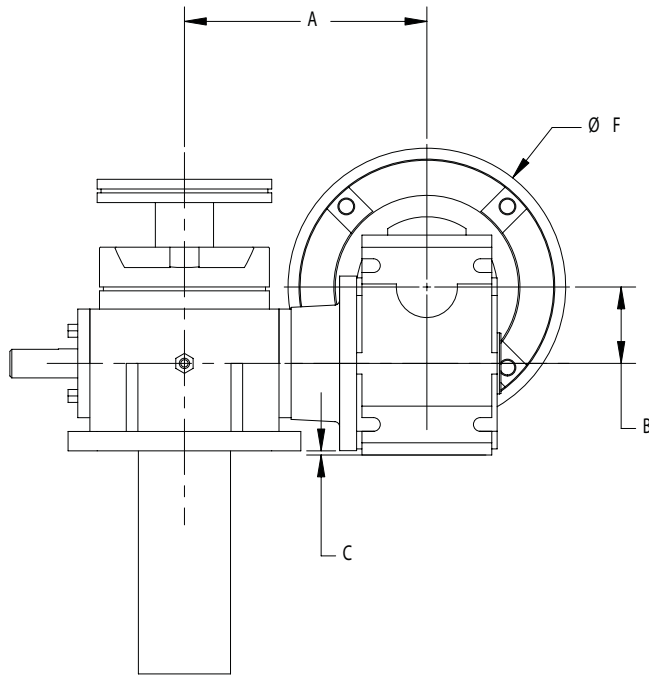
Actuator Model	Actuator Ratio	Reducer Model	Reducer Ratio	Lifting Speed (in/min)	Lifting Capacity (pounds) - See Notes Below											
					Motor Horsepower(1725rpm) / Frame Size											
					1/4 - 56C	1/3 - 56C	1/2 - 56C	3/4 - 56C	1 - 56C	1.5 - 140TC	2 - 140TC	3 - 180TC	5 - 180TC	7.5 - 210TC	10 - 210TC	
7511 (3500 lbs. Max.)	6:1	31	5	23	2363	3119	4725									
			7.5	16	3544	4678										
			10	12	4725	6237										
			15	8	7088											
			-	-												
7515 (12000 lbs. Max.)	8:1	63	5	20	8100	10692	16200									
			7.5	13	12150	16038										
			10	10	16200											
75151 (12000 lbs. Max. High Lead)	8:1	63	5	43	8100	10692	16200									
			7.5	28	12150	16038										
			10	21	16200											
			-	-												
			-	-												
7522 (27000 lbs. Max.)	10 2/3:1	75	5	16	18225	24057	36450									
			7.5	11	27338	36086										
			10	8	36450											
75151 (27000 lbs. Max. High Lead)	10 2/3:1	75	5	32	18225	24057	36450									
			7.5	21	27338	36086										
			10	16	36450											
			-	-												
			-	-												



Does your application require mounting the limit switch or encoder on the reducer so another component can mount to the actuator's other side? No problem! Call our customer service team for assistance.

Performance Specifications - Motorized Actuator Dimensions

Powered Actuators



Reduce Dimensions

Actuator Capacity (tons)	Reducer Model	Motor Frame	A (in)	B (in)	C (in)	D (in)
2	31	56C	6.75	1.22	.17 Above	4.14
3	40	56C	6.75	1.57	.22 Below	4.17
		140TC	6.75	1.57	.22 Below	4.64
5	50	56C	6.25	1.97	.11 Below	4.26
		140TC	6.25	1.97	.11 Below	4.73
10	63	56C	7.59	2.48	.59 Below	4.85
		140TC	7.59	2.48	.59 Below	5.32
		180TC	7.59	2.48	.59 Below	6.45
15	75	56-140TC	7.40	2.95	.40 Below	6.09
		180TC	7.40	2.95	.40 Below	6.96
20	75	56-140TC	7.68	2.95	.14 Below	6.09
		180TC	7.68	2.95	.14 Below	6.96
25	92672	80	7.40	2.68	.40 Above	7.08
		90-100	7.40	2.68	.40 Above	7.63
		132	7.40	2.68	.40 Above	7.95
35	92772	80	11.49	2.87	.92 Below	7.95
		90-100	11.49	2.87	.92 Below	8.50
		132	11.49	2.87	.92 Below	9.09
50	9042	100-160	11.64	1.42 Below	3.80 Below	9.72

Motor HP	Frame	Motor without Brake		Motor with Brake	
		E (in)	F (in)	E (in)	F (in)
0.25	56C	7.50	7.16	11.50	7.16
0.33	56C	7.50	7.16	11.50	7.16
0.50	56C	8.00	7.16	13.00	7.16
0.75	56C	8.75	7.16	13.00	7.16
1	56C	9.25	7.16	13.50	7.16
1.5	140TC	9.75	7.16	15.00	7.16
2	140TC	10.75	7.16	16.00	7.16
3	180TC	11.37	9.22	16.12	9.22
5	180TC	11.87	9.22	16.62	9.22
7.5	210TC	16.50	10.81	22.25	10.81
10	210TC	22.87	10.81	25.00	10.81
0.25	63L	7.56	5.12	9.76	5.12
0.33	71S	8.43	5.71	10.71	5.71
0.50	71L	8.43	5.71	10.71	5.71
0.75	80S	9.29	6.50	11.81	6.50
1	80L	9.29	6.50	11.81	6.50
1.5	90S	10.87	7.20	13.82	7.20
2	90L	10.87	7.20	13.82	7.20
3	100L	12.05	7.91	15.63	7.91
5	100L	12.05	7.91	15.63	7.91
7.5	132S	12.83	8.98	16.49	8.98
10	132M	16.41	10.47	20.59	10.47
15	160M	18.83	12.60	25.40	12.60
20	160L	18.83	12.60	25.40	12.60

NOTES:

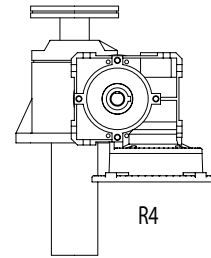
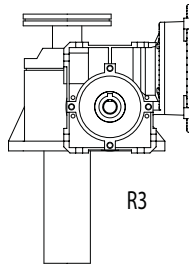
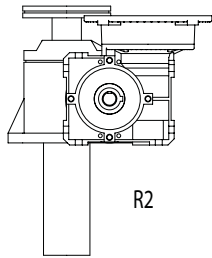
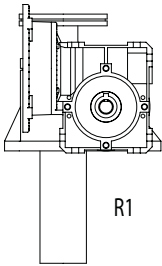
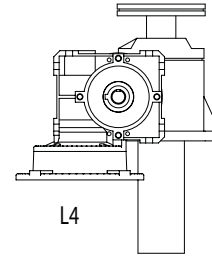
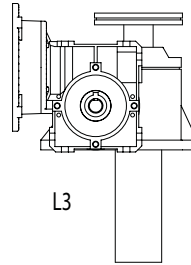
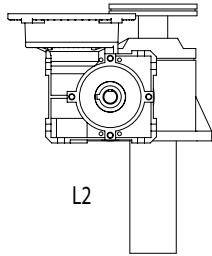
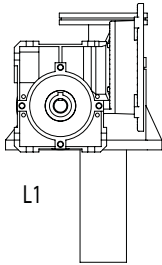
1. Motors in shaded portion of table are close-coupled, IEC frame, standard on 25 and 35 ton actuators with reducers.

NEMA C-face motors can be fitted to 25-50 ton units, with some increase in length. IEC frame motors can also be fitted to all other reducers, to reduce motor envelope size.

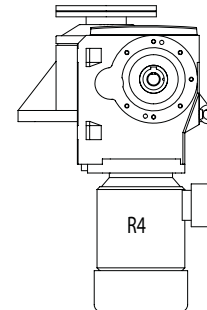
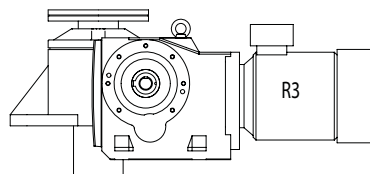
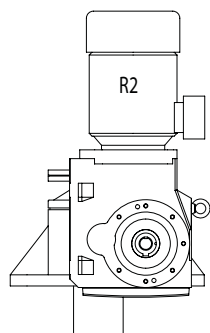
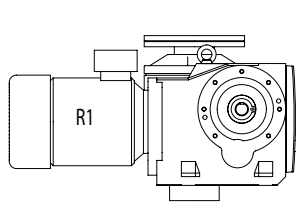
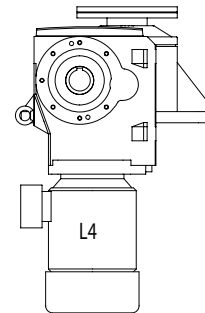
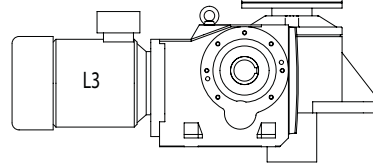
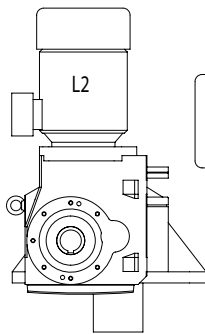
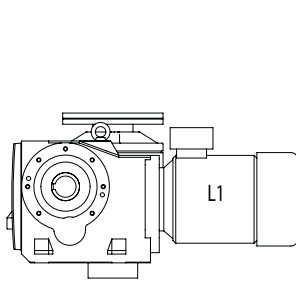
2. Dimensions for NEMA C-face motors are typical for 1725 rpm, 3-phase, TEFC motors. Dimensions may vary somewhat depending on manufacturer.

Powered Actuators

Reducer Positions 2-20 Tons



Reducer Positions 25-50 Tons



Duff-Norton can competitively supply motors for any application from suppliers such as Baldor, Nord, US Electric, Leeson, and more.

Features

Standard motors include:

- Brake and non-brake models
- Single and three phase models
- 230/460VAC
- 50/60Hz models
- 1/4 to 10 Horsepower ratings
- 1750RPM's
- Common NEMA frame sizes:
- 56, 143, and 182

Motors can be directly mounted to most Duff-Norton Actuators via C-face adapters, directly mounted via speed reducers, or remotely mounted via shafting and couplings. IEC, servo, hydraulic, air motors can also be supplied upon request.

