

# CD16 Serials



## DC Coreless Motor

### Maximum Sleeve Bearing Loads

Axial (Dynamic)	≤0.8N
Radial (4mm From Jamming Ring)	≤1.4N
Press-Fit Force (Static)	≤15N
Axial Play (Measured Under Less Than 4N Axial Force)	0.05 - 0.15mm
Maximum Radial Play	0.02mm

Maximum Allowable Screw Depth into flange 2.5mm

Table 1

		Motor data (at 25°C)								
		CD16-0104-1	CD16-0104-2	CD16-0104-3	CD16-0108	CD16-0105	CD16-0104-3	CD16-0108	CD16-0105	
Assigned power rating	W	0.8	0.8	0.8	0.7	1.0	1.3	1.3	1.0	
Nominal voltage	V	4.5	6	9	12	3	6	9	12	
Terminal resistance ±10%	Ω	4.26	8	17.2	39.4	1.03	5.05	10.3	26.0	
No load speed ±10%	rpm	8800	8590	8480	8280	10900	10100	10600	10400	
No load current	mA	21.6	12.8	8.4	5.7	60.0	13	13.5	8.70	
Speed constant	rpm/V	1956	1432	942	690	3633	1683	1178	867	
Torque constant	mN.m/A	4.79	6.56	9.98	13.59	2.58	5.61	7.99	10.82	
Starting current	mA	1056	750	523	304	2913	1188	874	462	
Stall torque	mN.m	5.06	4.92	5.22	4.13	7.50	6.67	6.98	4.99	
Max. efficiency	%	73	76	76	74	73	80	77	74	
Limits for continuous operating range	Current	mA	240	187	120	76	394	297	190	115
	Torque	mN.m	1.15	1.23	1.2	1.03	1.01	1.67	1.52	1.24
	Speed	rpm	6801	6448	6535	6212	9426	7575	8295	7809
	Output power	W	0.818	0.828	0.819	0.671	1.00	1.32	1.32	1.02
Max. permissible winding temperature	°C	+85	+85	+85	+85	+85	+85	+85	+85	
Ambient temperature range	°C	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	
Weight	g	19.7	19	19	19	19	19	19	19	

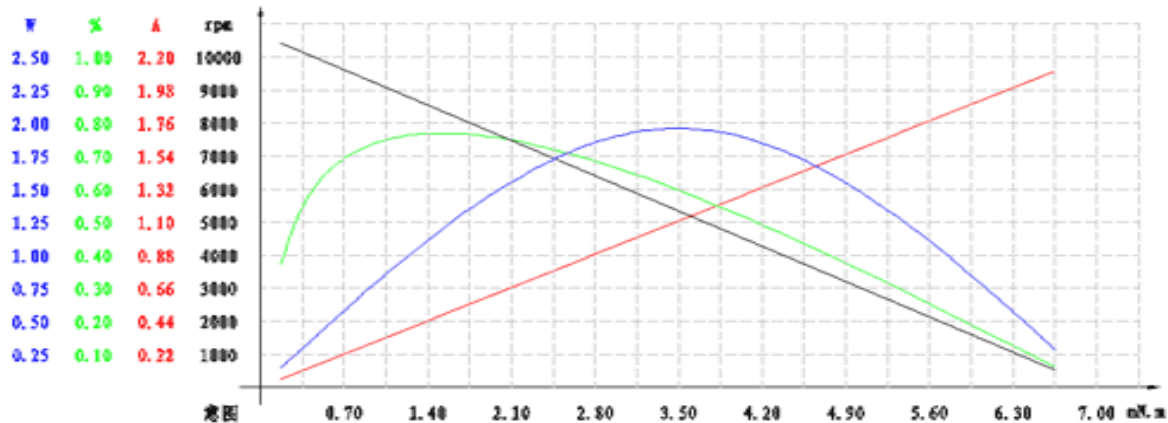
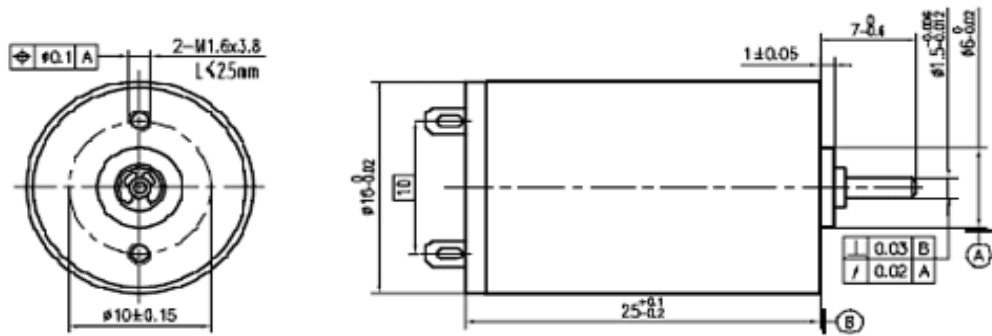
Table 2

		Motor data (at 25°C)							
		CD16-0112	CD16-0206	CD16-0103	CD16-0208				
Assigned power rating	W	1.4	1.4	1.7	1.4				
Nominal voltage	V	3.0	6.0	9.0	12				
Terminal resistance ±10%	Ω	0.932	4.44	8.73	18.4				
No load speed ±10%	rpm	10200	10300	10600	10200				
No load current	mA	45.0	20.2	15.2	8.1				
Speed constant	rpm/V	3400	1717	1178	850				
Torque constant	mN.m/A	2.77	5.48	7.99	11.1				
Starting current	mA	3219	1351	1031	652				
Stall torque	mN.m	8.92	7.41	8.24	7.24				
Max. efficiency	%	78	77	77	79				
Limits for continuous operating range	Current	mA	580	310	257	163			
	Torque	mN.m	1.61	1.7	2.05	1.81			
	Speed	rpm	8362	7937	7958	7651			
	Output power	W	1.41	1.41	1.71	1.45			
Max. permissible winding temperature	°C	+85	+85	+85	+85				
Ambient temperature range	°C	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65				
Weight	g	22.9	22	22	22				

Table 3

Motor data (at 25°C)									
Assigned power rating	W	1.5	1.8	1.9	1.9	1.5	2.5	1.8	
Nominal voltage	V	3.0	4.5	6.0	9	12	18	24	
Terminal resistance ±10%	Ω	0.658	1.21	2.45	6.1	13.4	20.2	50.5	
No load speed ±10%	rpm	8400	8450	8700	8580	8570	8530	8640	
No load current	mA	70.0	28	36.7	22.8	13.4	212.1	8.90	
Speed constant	rpm/V	2800	1878	1450	953	714	474	360	
Torque constant	mN.m/A	3.36	5.05	6.49	9.87	13.18	19.89	26.04	
Starting current	mA	4559	3719	2449	1475	896	891	475	
Stall torque	mN.m	15.32	18.78	15.89	14.56	11.80	17.72	12.38	
Max. efficiency	%	77	83	77	77	77	78	75	
Limits for continuous operating range	Current	mA	582	460	381	260	155	178	95
	Torque	mN.m	1.96	2.32	2.47	2.57	2.04	3.54	2.47
	Speed	rpm	7328	7405	7346	7068	7087	6826	6913
	Output power	W	1.50	1.8	1.9	1.9	1.52	2.53	1.79
Max. permissible winding temperature	°C	+85	+85	+85	+85	+85	+85	+85	
Ambient temperature range	°C	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	
Weight	g	36.1	35	35	34.4	34.9	34.9	34.9	

**Representative drawings and performance Curve for models in tabel 1**



**Note**

1. Motor data tested at ambient temperature 25°C. Data varies when the temperature changes.
2. Motor service life different from operating conditions. In common condition, service life is achievable between approx. 1000 to 3000 hours.



# CD20 Serials



## DC Coreless Motor

### General Specification

#### Maximum Sleeve Bearing Loads

Axial (Dynamic)	≤1.0N
Radial (4mm From Jamming Ring)	≤2.7N
Press-Fit Force (Static)	≤80N
Axial Play (Measured Under Less Than 4N Axial Force)	0.05 - 0.15mm
Maximum Radial Play	0.02mm
Maximum Allowable Screw Depth into flange 2.5mm	

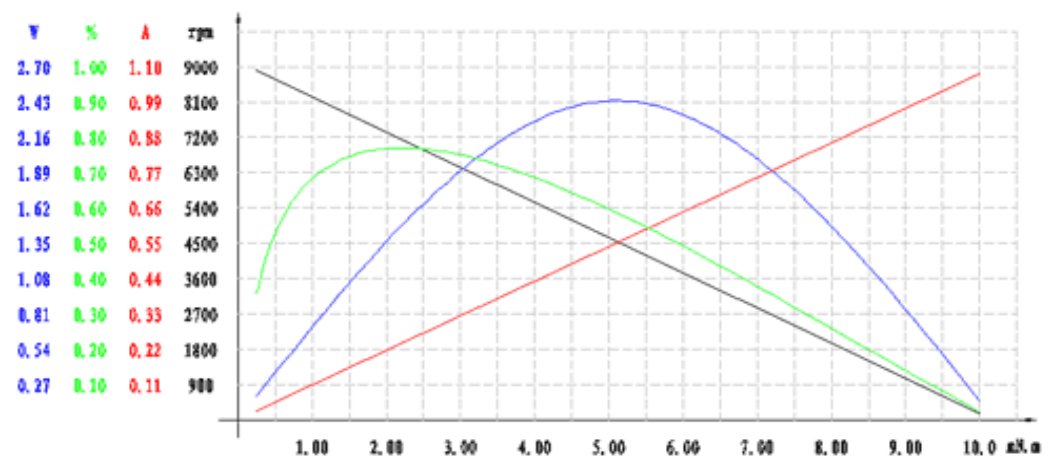
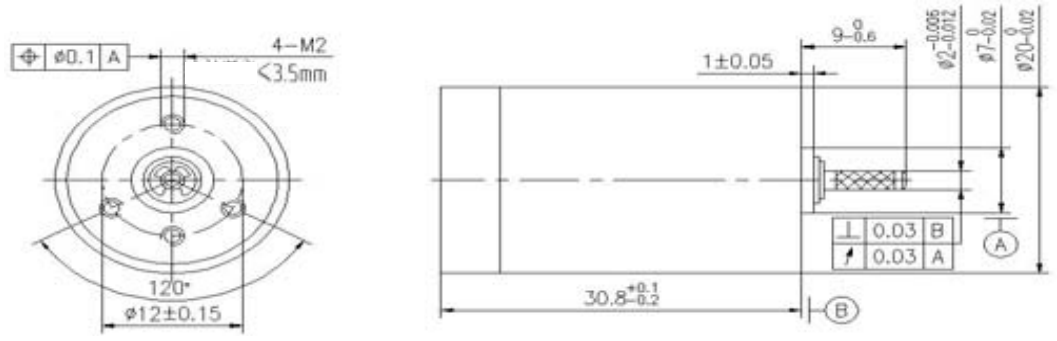
Table 1

		Motor data (at 25°C)					
		CD20-0203	CD20-0206	CD20-0209			
Assigned power rating	W	1.6	1.6	1.6			
Nominal voltage	V	3.0	6.0	9.0			
Terminal resistance ±10%	Ω	0.655	3.91	8.09			
No load speed ±10%	rpm	8500	8200	8170			
No load current	mA	60.2	19	19.5			
Speed constant	rpm/V	2833	1367	908			
Torque constant	mN.m/A	3.33	6.9	10.34			
Starting current	mA	4580	1535	1112			
Stall torque	mN.m	15.24	10.59	11.5			
Max. efficiency	%	78	79	75			
Limits for continuous operating range	Current	mA	628	352	228		
	Torque	mN.m	2.09	2.43	2.36		
	Speed	rpm	7335	6319	6496		
	Output power	W	1.76	0.84	2.54		
Max. permissible winding temperature	°C	+85	+85	+85			
Ambient temperature range	°C	-20 -- +65	-20 -- +65	-20 -- +65			
Weight	g	39	39.5	39			

Table 2

		Motor data (at 25°C)					
		CD20-0309					
Assigned power rating	W	3.2					
Nominal voltage	V	9.0					
Terminal resistance ±10%	Ω	2.2					
No load speed ±10%	rpm	8130					
No load current	mA	23.2					
Speed constant	rpm/V	903					
Torque constant	mN.m/A	10.52					
Starting current	mA	4091					
Stall torque	mN.m	43.02					
Max. efficiency	%	86					
Limits for continuous operating range	Current	mA	396				
	Torque	mN.m	4.16				
	Speed	rpm	7343				
	Output power	W	3.20				
Max. permissible winding temperature	°C	+85					
Ambient temperature range	°C	-20 -- +65					
Weight	g	61.1					

**Representative drawings and performance Curve for models in table 1**



**Note**

1. Motor data tested at ambient temperature 25°C. Data varies when the temperature changes.
2. Motor service life different from operating conditions. In common condition, service life is achievable between appros. 1000 to 3000 hours.
3. Electrical connection: 2 wire pigtail approx. 150 mm long.



## DC Coreless Motor

### Maximum Sleeve Bearing Loads

Axial (Dynamic)	≤1.0N
Radial (4mm From Jamming Ring)	≤2.7N
Press-Fit Force (Static)	≤80N
Axial Play (Measured Under Less Than 4N Axial Force)	0.05 - 0.15mm
Maximum Radial Play	0.02mm
Maximum Allowable Screw Depth into flange 2.5mm	

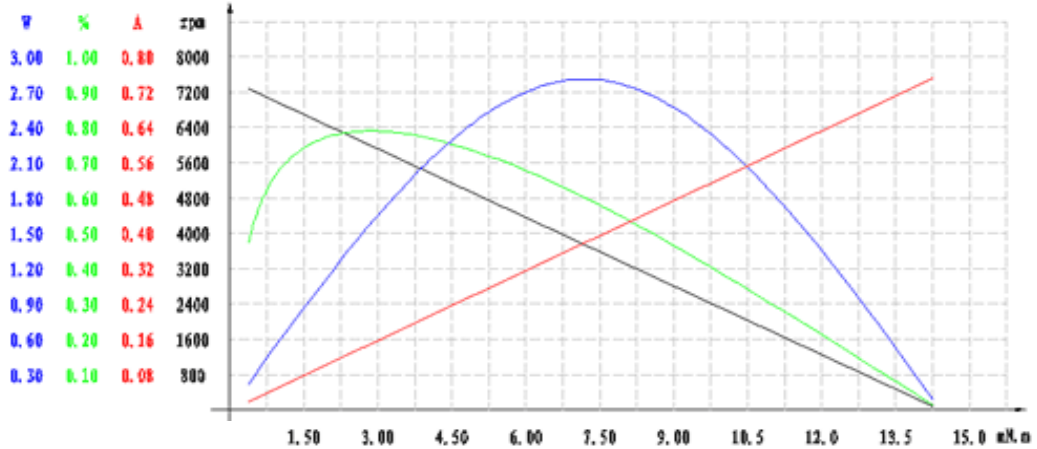
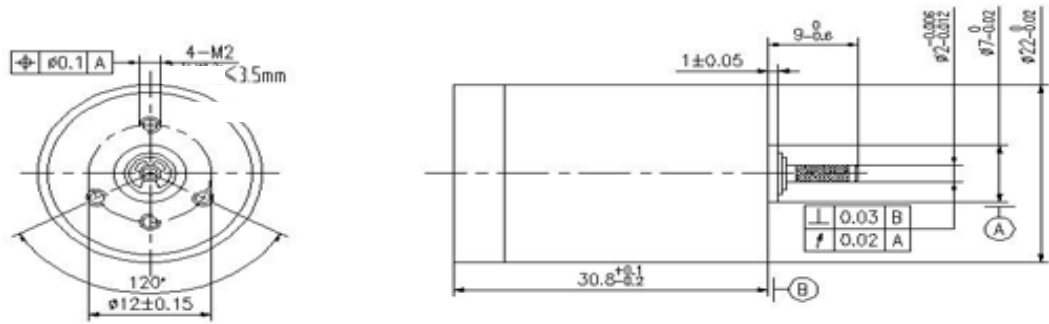
Table 1

		Motor data (at 25°C)					
		CD22-0203	CD22-0206	CD22-0309	CD22-0312	CD22-04-15	CD22-0318
Assigned power rating	W	2.0	2.0	2.8	3.4	3.6	2.6
Nominal voltage	V	3	6	9	12	15	18
Terminal resistance ±10%	Ω	0.381	1.87	4.6	6.78	9.84	19.9
No load speed ±10%	rpm	8500	8330	8200	8160	8400	8170
No load current	mA	75.0	24	15.3	14.1	12.1	9.10
Speed constant	rpm/V	2833	13898	911	680	560	454
Torque constant	mN.m/A	3.34	6.83	10.4	13.94	16.93	20.84
Starting current	mA	7874	3209	1957	1770	1524	905
Stall torque	mN.m	26.30	21.92	20.36	24.67	25.80	18.85
Max. efficiency	%	81	83	83	83	83	81
Limits for continuous operating range	Current	mA	742	381	391	354	181
	Torque	mN.m	2.48	2.6	4.07	4.93	3.77
	Speed	rpm	7699	7341	6561	6528	6535
	Output power	W	2.00	2	2.79	3.37	2.58
Max. permissible winding temperature	°C	+85	+85	+85	+85	+85	+85
Ambient temperature range	°C	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65
Weight	g	48	48	48	48	48	48

Table 2

		Motor data (at 25°C)					
		CD22-0409	CD22-0412	CD22-0618	CD22-0624		
Assigned power rating	W	4.0	4.0	6.0	6.0		
Nominal voltage	V	9.0	12.0	18.0	24		
Terminal resistance ±10%	Ω	1.33	2.2	6.25	9.05		
No load speed ±10%	rpm	8240	8240	8120	8180		
No load current	mA	38.2	22.7	12.5	13.3		
Speed constant	rpm/V	916	687	451	341		
Torque constant	mN.m/A	10.38	13.86	21.09	27.89		
Starting current	mA	6767	5455	2880	2652		
Stall torque	mN.m	70.22	75.58	60.73	73.97		
Max. efficiency	%	86	88	87	86		
Limits for continuous operating range	Current	mA	481	358	387	394	
	Torque	mN.m	4.99	4.96	8.16	10.99	
	Speed	rpm	7654	7699	7029	6965	
	Output power	W	4.00	4.00	6.00	8.01	
Max. permissible winding temperature	°C	+85	+85	+85	+85		
Ambient temperature range	°C	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65		
Weight	g	70	70	70	70		

**Representative drawings and performance Curve for models in table 1**



**Note**

1. Motor data tested at ambient temperature 25°C. Data varies when the temperature changes.
2. Motor service life different from operating conditions. In common condition, service life is achievable between appros. 1000 to 3000 hours.



## DC Coreless Motor

### Maximum Sleeve Bearing Loads

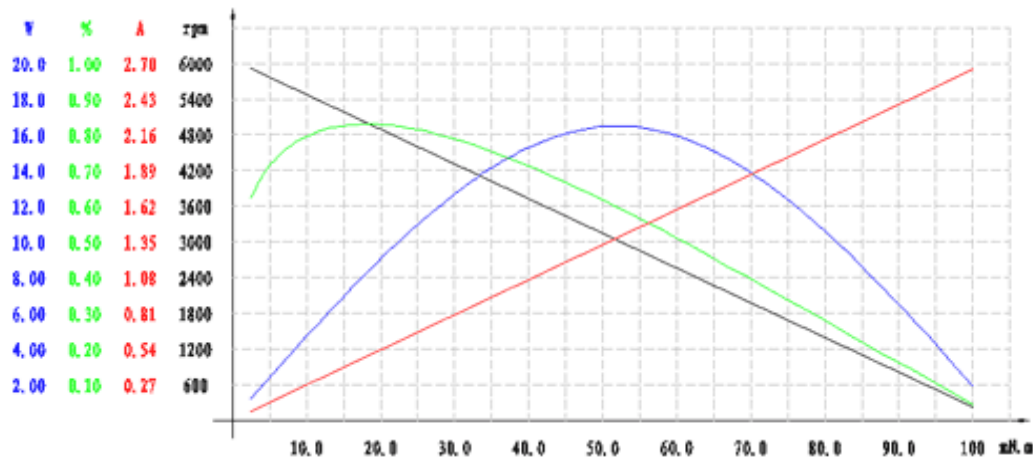
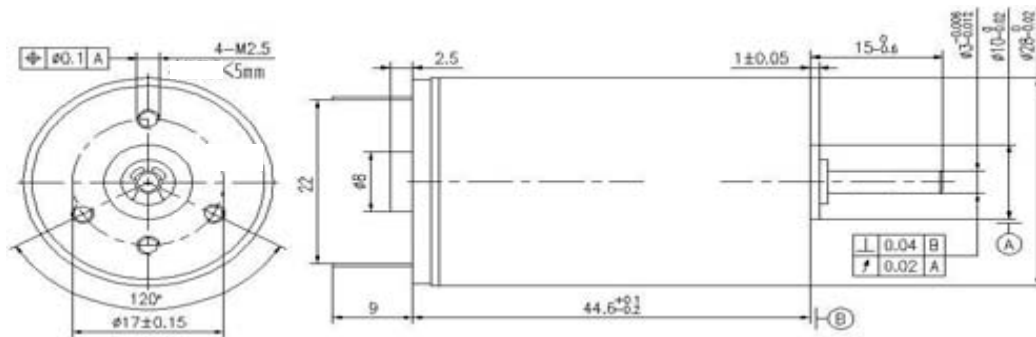
Axial (Dynamic)	≤1.7N
Radial (4mm From Jamming Ring)	≤5.5N
Press-Fit Force (Static)	≤80N
Axial Play (Measured Under Less Than 4N Axial Force)	0.05 - 0.15mm
Maximum Radial Play	0.02mm

Maximum Allowable Screw Depth into flange 2.5mm

### Motor data (at 25°C)

		CD28-0612	CD28-0918	CD28-1124	CD28-1136
Assigned power rating	W	6.0	8.5	11.0	11.0
Nominal voltage	V	12	18	24	36
Terminal resistance ±10%	Ω	1.67	4.32	6.68	15.3
No load speed ±10%	rpm	6020	6040	6040	5870
No load current	mA	40.0	20	17.1	11.3
Speed constant	rpm/V	502	336	252	163
Torque constant	mN.m/A	18.94	28.34	37.78	58.31
Starting current	mA	7186	4167	3593	2353
Stall torque	mN.m	136.09	118.07	135.75	137.21
Max. efficiency	%	86	87	87	87
Limits for continuous operating range	Current	mA	544	547	543
	Torque	mN.m	10.30	15.5	20.52
	Speed	rpm	5564	5247	5127
	Output power	W	6000	8512	11010
Max. permissible winding temperature	°C	+85	+85	+85	+85
Ambient temperature range	°C	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65
Weight	g	122.6	122	122	122

### Drawings and performance Curve



### Note

- Motor data tested at ambient temperature 25°C. Data varies when the temperature changes.
- Motor service life different from operating conditions. In common condition, service life is achievable between approx. 1000 to 3000 hours.

## DC Coreless Motor

### General Specification

#### Maximum Sleeve Bearing Loads

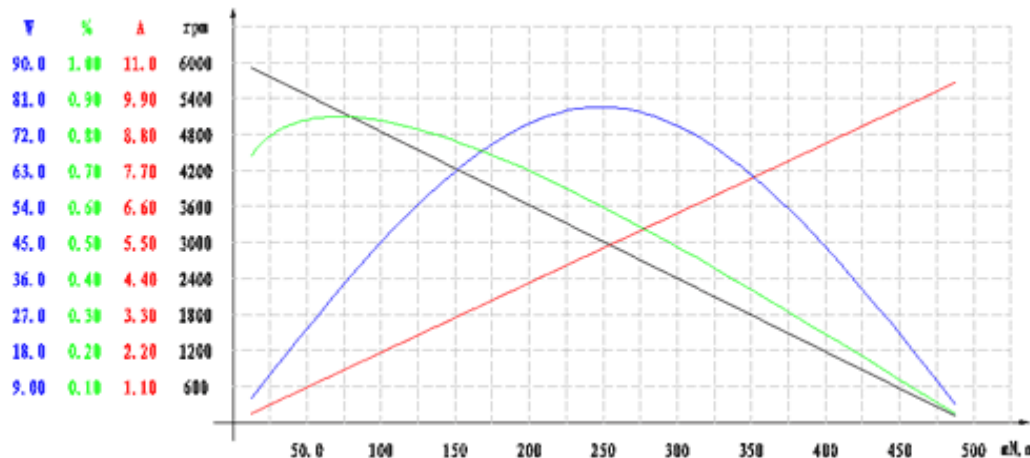
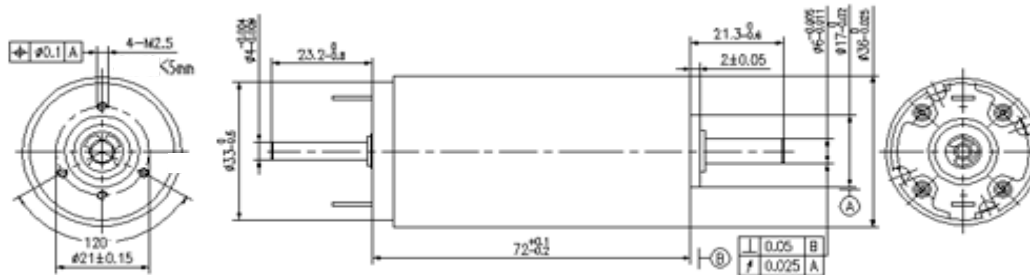
Axial (Dynamic)	≤2.4N
Radial (4mm From Jamming Ring)	≤28N
Press-Fit Force (Static)	≤110N
Axial Play (Measured Under Less Than 4N Axial Force)	0.05 - 0.15mm
Maximum Radial Play	0.025mm

Maximum Allowable Screw Depth into flange 2.5mm

### Motor data (at 25°C)

		CD36-4112	CD36-4215	CD36-4524	CD36-4530	CD36-4236	
Assigned power rating	W	41	42	45	45	42	
Nominal voltage	V	12	15	24	30	36	
Terminal resistance ±10%	Ω	0.561	0.692	1.4	2	2.90	
No load speed ±10%	rpm	6010	6260	6130	6090	6220	
No load current	mA	248	190	56.5	53.9	49.6	
Speed constant	rpm/V	501	417	255	203	173	
Torque constant	mN.m/A	18.86	22.69	37.28	46.9	55.08	
Starting current	mA	21390	21676	17143	15000	12414	
Stall torque	mN.m	403.32	491.89	639.13	703.43	683.71	
Max. efficiency	%	80	82	89	88	88	
Limits for continuous operating range	Current	mA	4270	3364	2135	1682	1324
	Torque	mN.m	80.51	76.34	79.6	78.88	72.92
	Speed	rpm	4810	5288	5367	5407	5557
	Output power	W	40536	42255	44711	44641	42410
Max. permissible winding temperature	°C	+85	+85	+85	+85	+85	
Ambient temperature range	°C	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	-20 -- +65	
Weight	g	338	340	340	340	340	

### Representative drawings and performance Curve



### Note

1. Motor data tested at ambient temperature 25°C. Data varies when the temperature changes.
2. Motor service life different from operating conditions. In common condition, service life is achievable between approx. 1000 to 3000 hours.
3. Excessive bending of motor terminals may result in breakage when more than 3 times.