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CL40 Series Coreless DC Motors

Allied Motion's **CL40 series of 40 mm dia., 7 and 12 W coreless DC motors** provides maximized performance through the use of high performance permanent magnets, a uniquely wound and formed coreless rotor, and a precious-metal commutation system. CL motors are efficient, having zero iron loss, and being coreless, they have no preferred rotor position (cog-free), minimal torque ripple, and low rotor inertia.

CL40 series motors are ideal for ticket and money dispensers, medical devices, small pumps and fan applications.

Features & Benefits

- Coreless rotor design for smooth, cog-free operation
- High-strength magnets for maximized performance
- Coreless design means no iron loss and higher efficiency compared to iron-core motors
- Precious metal commutation system for low starting voltage (7 W models)
- Low inertia rotor for rapid response

Options

- Spur or planetary gearhead with ratios up to 900:1
- Incremental or absolute encoder
- Integrated tachometer
- Ball bearings
- Custom winding for alternate voltages
- Custom lead and connector configurations
- Alternate shaft configurations



- High performance 40 mm DC coreless motors
- Power ratings of 7 and 12 W, and voltage ratings from 6 to 30 VDC
- Optimized performance from coreless winding and high strength magnets

Specifications

Dimensions

Performance

Gearboxes

Documents

CL 40 7-Watt Models

Model	9904 120 +	16701	16702	16703	16704	16705	16706	16707
Bearing System		Sleeve						
Commutation System		Precious metal						
Max. Radial Shaft Load (10 mm (0.39") from front mount)	N (oz)	5 (18)						
Max. Axial Shaft Load	N (oz)	0.5 (1.8)						
Ambient Temp.-Operating	°C	-10 to 60						
Ambient Temp.-Storage	°C	-40 to 70						
Mass (Weight)	g (oz)	200 (7.05)						
Nominal Voltage	VDC	6	9	12	15	18	24	30
Nominal Torque	mNm (oz-in)	22 (3.12)						
Nominal Speed	RPM	2650	3010	2700	2920	3050	2980	2930
Nominal Current	mA	1520	1090	760	635	540	400	320
No-Load Speed	RPM	3780	4050	3780	3940	4050	3980	3940
No-Load Current	mA	60	44	30	25	22	16	13
BEMF at 3000 RPM	V	4.71	6.59	9.42	11.3	13.2	17.9	22.6
Torque Constant	mNm/A (oz-in/A)	15 (2.12)	21 (2.97)	30 (4.25)	36 (5.1)	42 (5.95)	57 (8.07)	72 (10.2)
Terminal Resistance	Ohm	1.2	2.2	4.6	6.3	8.4	15.6	25.1
Starting Torque at Nom. Voltage	mNm (oz-in)	74 (10.5)	86 (12.2)	77 (10.9)	85 (12)	89 (12.6)	87 (12.3)	85 (12)
Starting Current at Nom. Voltage	A	5	4.1	2.6	2.4	2.1	1.5	1.2
Rotor Inductance	mH	0.15	0.29	0.59	0.85	1.16	2.14	3.41
Rotor Inertia	kgm ² (oz-in-s ²)	4.0E-6 (5.67E-4)						
Mech. Time Constant	ms	20						
Thermal Resistance Winding-Housing	°C/W	5.5						
Thermal Resistance Housing-Ambient	°C/W	13						
Compatible Gearboxes (option)		P32A, P32B, S37A, S38A, S52B, S70C						

CL 40 12-Watt Models

Model	9904 120+	15601	15602	15603	15604	15605
Bearing System		Front Sleeve, Back Ball				
Commutation System		Graphite / Copper				
Max. Radial Shaft Load (10 mm (0.39") from front mount)	N (oz)	5 (18)				
Max. Axial Shaft Load	N (oz)	0.5 (1.8)				
Ambient Temp.-Operating	°C	-10 to 60				
Ambient Temp.-Storage	°C	-40 to 70				
Mass (Weight)	g (oz)	200 g (7.05)				
Nominal Voltage	V	12	15	18	24	30
Noimnal Torque	mNm (oz-in)	26 (3.68)				
Nominal Speed	RPM	4140	4090	4150	4170	4100
Nominal Current	mA	1250	980	830	630	490
No-Load Speed	RPM	5280	5180	5220	5280	5180
No-Load Current	mA	49	38	32	25	19
BEMF at 3000 RPM	V	6.76	8.62	10.3	13.5	17.2
Torque Constant	mNm/A (oz-in/A)	21.5 (3.05)	27.4 (3.88)	32.6 (4.62)	43 (6.09)	54.9 (7.78)
Terminal Resistance	Ohm	2.1	3.3	4.6	8.3	13.1
Starting Torque at Nom. Voltage	mNm (oz-in)	121 (17.1)	123 (17.4)	126 (17.8)	123 (17.4)	125 (17.7)
Starting Current at Nom. Voltage	A	5.6	4.5	3.9	2.9	2.3
Rotor Inductance	mH	0.31	0.5	0.71	1.23	2.01
Rotor Inertia	kgm ² (oz-in-s ²)	4.0E-6 (5.67E-4)				
Mech. Time Constant	ms	18				
Thermal Resistance Winding-Housing	°C/W	5.5				
Thermal Resistance Housing-Ambient	°C/W	10.5				
Compatible Gearboxes (option)		P32A, P32B, S37A, S38A, S52B, S70C				