

TORQUE DENSITY



**Applimotion**  
*Motors & Actuators*

PRODUCT DATA SHEET

# Omni+ Series Motors

Pre-Engineered, High Torque  
Density, Low Cogging Direct  
Drive Motors

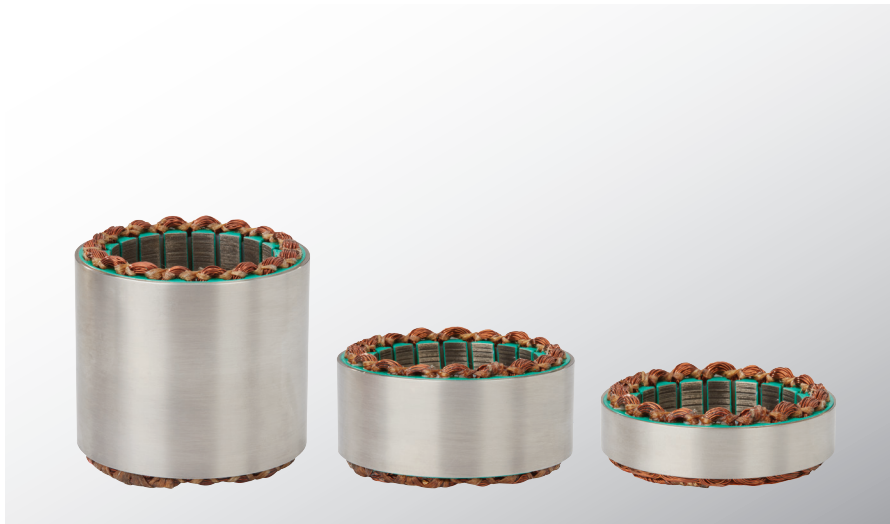
The Omni+ Series delivers minimal cogging  
and high torque density, resulting in smooth  
motion, lower power dissipation, and  
decreased temperature rise.

› [CELERAMOTION.COM](http://CELERAMOTION.COM)



# Omni+ Series Motors

Pre-Engineered, High Torque Density, Low Cogging Direct Drive Motors



## Efficient and Powerful.

Pre-engineered for optimal system integration, the Omni+ Series is offered in a range of axial lengths and winding options. Large rotor ID to stator OD ratios provide thin cross-section form factors, allowing design flexibility as well as convenience for routing cables, optics, and other system elements. Standard diameters and stack lengths pair easily with strain wave gears, and motor windings pair with drive current ratings - making all models compatible with a wide range of motor drives. Frameless motor kits fit simply into geared robotic joints, direct drive rotary stages, or actuator applications for efficient utilization of space.

The Omni+ Series motors are designed to provide high torque density and ultra-low cogging in a thermally efficient package. Frameless motor kit technology provides high speeds and accelerations, with superior mechanical stiffness, reducing settling times and increasing system performance and throughput.

### Features and Benefits

- High pole count, electromagnetic design delivers elite torque density and compact form factor
- Large ID to OD ratio for convenient routing of cables, optics, and other system elements
- Size compatibility with common strain wave gears and a wide range of motor drives enables easy integration
- Low cogging for accurate and smooth motion
- Custom windings and form factors available to meet application requirements

Specifications	Units	60 mm Model	70 mm Model
Continuous Torque:	Nm	0.456 to 1.610	0.742 to 2.290
Max Torque:	Nm	0.915 to 5.290	1.570 to 7.140
Diameter:	mm	60 (Stator OD)	70 (Stator OD)
Through Hole:	mm	31 (Rotor ID)	38 (Rotor ID)

Contact Celera Motion for torque-speed specifications. Specifications subject to change.

RoHS  
CE



**Applimotion**  
Motors & Actuators

3900 Atherton Road, Suite 110 | Rocklin, CA 95765 USA  
Tel: 781.266.5200 | [innovation@celeramotion.com](mailto:innovation@celeramotion.com) | [celeramotion.com](http://celeramotion.com)

2

# Omni+ Series Motors

Pre-Engineered, Higher Torque Density, Low Cogging Direct Drive Motors

## Omni+ Higher Torque Density Motors

SIZE	OP-060					
MODEL NUMBER	OPH-060-013-X OPN-060-013-X		OPH-060-025-X OPN-060-025-X		OPH-060-050-X OPN-060-050-X	

### PERFORMANCE SPECIFICATIONS

Winding Option	X	A	B	C	D	A	B	C	A	B	C
Continuous Torque*	Nm	0.524	0.569	0.584	0.456**	0.876	0.961	0.925	1.58	1.61	1.55
Max Torque	Nm	1.30	1.28	1.26	0.915**	2.44	2.67	2.39	5.25	5.29	4.77

### ELECTRICAL SPECIFICATIONS

Design Voltage	$V_{DC}$	24	48	48	48	48	48	48	48	48	48
Continuous Current*	$A_{DC}$	16.90	9.32	7.69	2.59	15.10	10.80	5.82	15.60	10.10	4.88
Max Current*	$A_{DC}$	42.00	21.00	16.60	5.20	42.00	30.00	15.00	52.00	33.30	15.00
Resistance <sub>phase-phase</sub>	Ohm	0.117	0.383	0.564	3.330	0.173	0.336	1.160	0.190	0.454	1.930
Inductance <sub>phase-phase</sub>	mH	0.06	0.23	0.35	1.90	0.10	0.20	0.83	0.14	0.42	1.70
$K_e$ <sub>phase-phase</sub> (unloaded 25° C)	$V_{peak}/krpm$	3.60	7.00	8.72	20.30	6.69	10.30	18.20	11.60	18.50	37.00
$K_{t_{TRAP}}$ (unloaded 25° C)	$Nm/A_{DC}$	0.034	0.067	0.083	0.194	0.064	0.098	0.174	0.110	0.177	0.353
$K_{t_{TRAP}}$ (loaded, hot)	$Nm/A_{DC}$	0.031	0.061	0.076	0.176	0.058	0.089	0.159	0.101	0.159	0.318
$K_{t_{SINE}}$ (unloaded 25° C)	$Nm/A_{peak}$	0.029	0.058	0.072	0.168	0.055	0.085	0.151	0.095	0.153	0.306
$K_{t_{SINE}}$ (loaded, hot)	$Nm/A_{peak}$	0.027	0.053	0.066	0.152	0.050	0.077	0.138	0.087	0.138	0.275
$K_m$ (25° C)	$Nm/\sqrt{W}$	0.099	0.108	0.111	0.106	0.154	0.169	0.162	0.252	0.263	0.254
$K_m$ (hot)	$Nm/\sqrt{W}$	0.082	0.088	0.091	0.087	0.126	0.138	0.132	0.207	0.214	0.207

### THERMAL SPECIFICATIONS

Thermal Resistance***	°C/W	2.60		2.20		1.88	
Aluminum Housing Wall Thickness	mm	10.6		10.6		10.6	
Aluminum Housing Axial Length	mm	53.0		66.0		90.0	

### MECHANICAL SPECIFICATIONS

Weight - Total****	kg	0.19		0.34		0.65	
Stator Weight	kg	0.12		0.22		0.43	
Rotor Weight	kg	0.07		0.12		0.22	
Pole Count	#	14		14		14	
Rotor Inertia	$kg\cdot m^2$	2.21 E-05		3.84 E-05		7.11 E-05	
Cogging Torque	$Nm_{peak-peak}$	5.41 E-03		8.15 E-03		1.33 E-02	
% Cogging Torque (verses Continuous Torque)	%	0.98		0.93		0.84	

Customers should adjust their system parameters to match the intended design voltage for each winding option. Customers should adjust their system parameters to match the intended design voltage for each winding option, otherwise excessive speed resulting in rotor damage may occur. All data assumes 25° C ambient. \*Continuous stall current for 130° C rise above 25° C ambient to reach 155° C max winding temperature. \*\*Derated torque performance due to current limited winding option. \*\*\*Assumes motor is installed in a cylindrical aluminum housing with average wall thickness and length specified in table above. \*\*\*\*Weights are estimated. Hall option adds 0.015 kg to stator weight. Contact Celera Motion for torque-speed specifications. Specifications subject to change.

# Omni+ Series Motors

Pre-Engineered, Higher Torque Density, Low Cogging Direct Drive Motors

## Omni+ Higher Torque Density Motors

SIZE	OP-070					
MODEL NUMBER	OPH-070-013-X OPN-070-013-X		OPH-070-025-X OPN-070-025-X		OPH-070-050-X OPN-070-050-X	

### PERFORMANCE SPECIFICATIONS

Winding Option	X	A	B	C	D	A	B	C	A	B	C
Continuous Torque*	Nm	0.742	0.828	0.812	0.819	1.310	1.390	1.400	2.130	2.260	2.290
Max Torque	Nm	1.830	1.980	1.810	1.570**	3.580	3.700	3.590	6.600	7.140	6.820

### ELECTRICAL SPECIFICATIONS

Design Voltage	$V_{DC}$	24	48	48	48	48	48	48	48	48	48
Continuous Current*	$A_{DC}$	20.6	13.8	7.52	2.49	17.20	11.10	6.48	16.80	13.30	5.57
Max Current*	$A_{DC}$	52.00	33.00	16.80	4.98	47.20	29.60	16.60	52.00	42.00	16.60
Resistance <sub>phase-phase</sub>	Ohm	0.099	0.219	0.740	6.740	0.163	0.389	1.150	0.205	0.327	1.870
Inductance <sub>phase-phase</sub>	mH	0.04	0.13	0.43	4.30	0.11	0.29	0.85	0.14	0.28	1.70
$K_{e_{phase-phase}}$ (unloaded 25° C) $V_{peak}/krpm$		4.04	6.91	12.50	39.50	8.73	14.40	25.10	14.70	19.60	47.80
$K_{t_{TRAP}}$ (unloaded 25° C)	$Nm/A_{DC}$	0.039	0.066	0.119	0.377	0.083	0.137	0.240	0.140	0.187	0.456
$K_{t_{TRAP}}$ (loaded, hot)	$Nm/A_{DC}$	0.036	0.060	0.108	0.329	0.076	0.125	0.216	0.127	0.170	0.411
$K_{t_{SINE}}$ (unloaded 25° C)	$Nm/A_{peak}$	0.034	0.057	0.103	0.326	0.072	0.119	0.208	0.121	0.162	0.395
$K_{t_{SINE}}$ (loaded, hot)	$Nm/A_{peak}$	0.031	0.052	0.094	0.285	0.066	0.108	0.187	0.110	0.147	0.356
$K_m$ (25° C)	$Nm/\sqrt{W}$	0.124	0.141	0.138	0.145	0.206	0.220	0.224	0.309	0.327	0.333
$K_m$ (hot)	$Nm/\sqrt{W}$	0.100	0.115	0.113	0.119	0.169	0.180	0.183	0.253	0.267	0.272

### THERMAL SPECIFICATIONS

Thermal Resistance***	°C/W	2.07		1.80		1.49	
Aluminum Housing Wall Thickness	mm	10.6		10.6		10.6	
Aluminum Housing Axial Length	mm	53.0		66.0		90.0	

### MECHANICAL SPECIFICATIONS

Weight - Total****	kg	0.287		0.492		0.903	
Stator Weight	kg	0.199		0.338		0.619	
Rotor Weight	kg	0.088		0.154		0.284	
Pole Count	#	14		14		14	
Rotor Inertia	kg-m <sup>2</sup>	4.36 E-05		7.59 E-05		1.41 E-04	
Cogging Torque	$Nm_{peak-peak}$	8.16 E-03		1.11 E-02		1.70 E-02	
% Cogging Torque (verses Continuous Torque)	%	1.1		0.85		0.80	

Customers should adjust their system parameters to match the intended design voltage for each winding option. Customers should adjust their system parameters to match the intended design voltage for each winding option, otherwise excessive speed resulting in rotor damage may occur. All data assumes 25° C ambient. \*Continuous stall current for 130° C rise above 25° C ambient to reach 155° C max winding temperature. \*\*Derated torque performance due to current limited winding option. \*\*\*Assumes motor is installed in a cylindrical aluminum housing with average wall thickness and length specified in table above. \*\*\*\*Weights are estimated. Hall option adds 0.015 kg to stator weight. Contact Celera Motion for torque-speed specifications. Specifications subject to change.



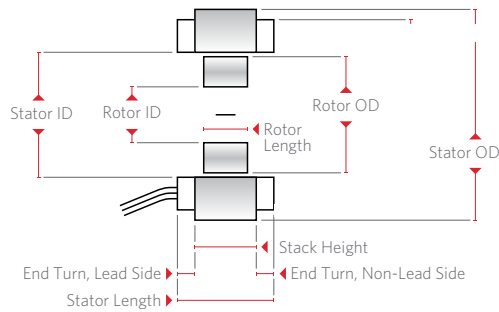
**Applimotion**  
Motors & Actuators

3900 Atherton Road, Suite 110 | Rocklin, CA 95765 USA  
Tel: 781.266.5200 | [innovation@celeramotion.com](mailto:innovation@celeramotion.com) | [celeramotion.com](http://celeramotion.com)

# Omni+ Series Motors

Pre-Engineered, Higher Torque Density, Low Cogging Direct Drive Motors

## Dimensional Interface



SIZE	OP-060		
MODEL NUMBER	OPH-060-013-X OPN-060-013-X	OPH-060-025-X OPN-060-025-X	OPH-060-050-X OPN-060-050-X

### DIMENSIONS

Stator OD	mm	60.0	60.0	60.0
Stator ID	mm	41.7	41.7	41.7
Rotor OD	mm	40.6	40.6	40.6
Rotor ID	mm	31.0	31.0	31.0
Stator Length, No Halls (N)	mm	21.89	34.39	59.39
Stator Length, Halls (H)	mm	26.45	38.95	63.95
End Turn, Lead Side (N)	mm	4.56	4.56	4.56
End Turn, Lead Side (H)	mm	9.12	9.12	9.12
Stack Height	mm	12.5	25.0	50.0
End Turn, Non-Lead Side	mm	4.83	4.83	4.83
Rotor Length	mm	17.5	30.0	55.0

SIZE	OP-070		
MODEL NUMBER	OPH-070-013-X OPN-070-013-X	OPH-070-025-X OPN-070-025-X	OPH-070-050-X OPN-070-050-X

### DIMENSIONS

Stator OD	mm	70.0	70.0	70.0
Stator ID	mm	49.8	49.8	49.8
Rotor OD	mm	49.1	49.1	49.1
Rotor ID	mm	38.0	38.0	38.0
Stator Length, No Halls (N)	mm	21.01	33.51	58.51
Stator Length, Halls (H)	mm	25.08	37.58	62.58
End Turn, Lead Side (N)	mm	4.06	4.06	4.06
End Turn, Lead Side (H)	mm	8.13	8.13	8.13
Stack Height	mm	12.5	25.0	50.0
End Turn, Non-Lead Side	mm	4.45	4.45	4.45
Rotor Length	mm	17.5	30.0	55.0



**Applimotion**  
Motors & Actuators

3900 Atherton Road, Suite 110 | Rocklin, CA 95765 USA  
Tel: 781.266.5200 | [innovation@celeramotion.com](mailto:innovation@celeramotion.com) | [celeramotion.com](http://celeramotion.com)

# Omni+ Series Motors

Pre-Engineered, Higher Torque Density, Low Cogging Direct Drive Motors

## How to Order

Motor Part Number

OPH-060-025-A-000 (example)

