

SLOTLESS



**Applimotion**  
*Motors & Actuators*

PRODUCT DATA SHEET

# Agility™ Series Motors

Zero Cogging Direct Drive  
Motors for Exceptionally  
Smooth Motion

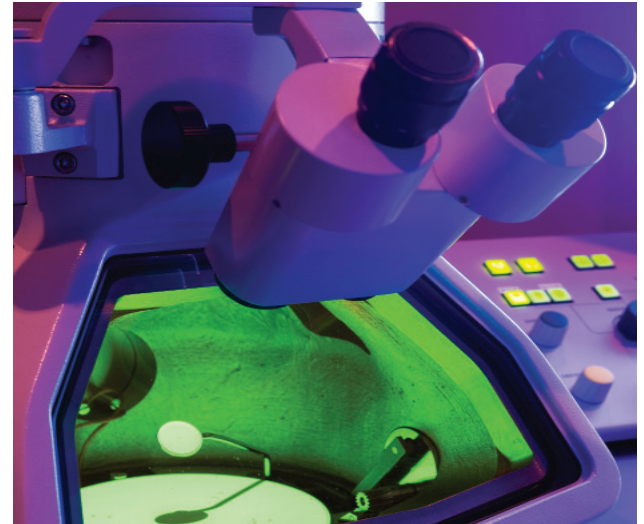
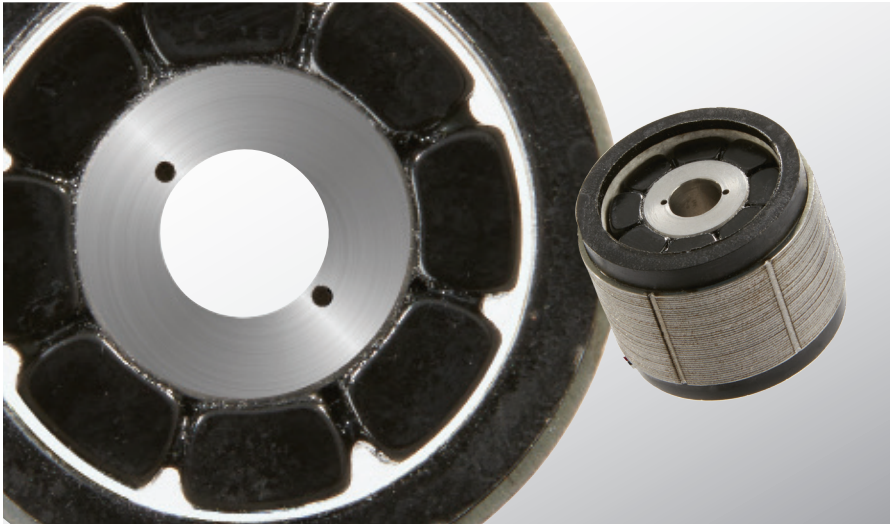
Designed with ZeroCog™ slotless motor technology from Applimotion, the Agility Series enables OEMs to achieve extremely smooth and highly accurate motion profiles using flexible and easy-to-integrate motor components.

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# Agility™ Series Motors

Zero Cogging Direct Drive Motors for Exceptionally Smooth Motion



## Smooth and Accurate.

Ideally suited for scanning, pointing, measuring and cutting applications that require extremely smooth velocity control and highly accurate positioning, the Agility Series delivers best-in-class torque ripple and zero cogging.

Engineered with ZeroCog™ slotless motor technology from Applimotion, the effects of cogging torque, magnetic forces, flux harmonics and phase balance and alignment are minimized to counteract the causes of torque ripple. Agility magnetic designs and construction techniques can achieve less than 2% torque ripple.

The Agility Series is offered in a wide range of low-profile form factors with a large through hole for convenient routing of cables, optics, sensing technologies and other system elements.

Frameless direct drive kit construction, high torque density and low mass enables Agility to be tightly integrated into compact, lightweight precision assemblies.

All models are compatible with a wide range of controllers and drives. Windings and form factors can be customized to meet application requirements.

### Benefits

- Zero cogging and low torque ripple for extremely smooth velocity control and low vibration
- Slotless magnetic design and direct drive technology enable highly accurate position control
- High torque density in low-profile form factors enables small footprint
- Large through hole for convenient routing of cables, optics, sensing technologies and other system elements
- High mechanical stiffness and low rotor inertia for efficient control of highly dynamic axes
- Easy integration into system design
- Compatible with wide range of drives and controllers
- Custom windings and form factors available to meet application requirements

Specifications	Units	UTS-19	UTS-53	UTS-89	UTS-114	UTS-222
Continuous Torque:	Nm	0.04	0.13	0.54	3.12	9.06
Peak Torque:	Nm	0.12	0.39	1.64	9.36	27.20
Diameter (Stator OD):	mm	18.97	52.83	88.90	114.30	222.25
Through Hole (Rotor ID):	mm	5.00	29.21	50.80	73.66	190.50
Stator Length:	mm	29.97	19.94	25.02	42.92	62.27
Pole Count:	#	6	12	12	16	64

Product groups listed and corresponding data are provided as a reference. Actual motor attributes are model and configuration specific. Standard and custom models are available within each group. Peak torque output is based on a 3:1 peak to continuous current ratio, and is based on limited duty cycle. Contact Celera Motion for torque-speed specifications. Specifications subject to change.



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Motors & Actuators

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# Agility™ Series Motors

Zero Cogging Direct Drive Motors for Exceptionally Smooth Motion

## Agility Slotless Motors

SIZE	UTS-19	UTS-29	UTS-41	
MODEL NUMBER	UTS-19-A-30-A-N-000	UTS-29-A-21-A-N-000	UTS-41-A-20-A-H-000	UTS-41-A-20-A-N-000

### PERFORMANCE SPECIFICATIONS

		UTS-19	UTS-29	UTS-41	UTS-41
Continuous Torque*	Nm	0.04	0.07	0.07	0.07
	oz-in	5.8	11	10	10
Peak Torque	Nm	0.12	0.22	0.21	0.21
	oz-in	17.4	32	30	30

### ELECTRICAL SPECIFICATIONS

		UTS-19	UTS-29	UTS-41	UTS-41
Continuous Current*	$A_{DC}$	1.30	0.89	1.70	1.70
Resistance <sub>phase-phase</sub>	Ohm	6.60	18.95	4.25	4.25
Inductance <sub>phase-phase</sub>	mH	0.18	0.87	0.20	0.20
$K_{e_{phase-phase}}$	$V_{peak}/krpm$	3.3	8.8	4.3	4.3
$K_{t_{TRAP}}$	$Nm/A_{DC}$	0.032	0.084	0.041	0.041
$K_{t_{SINE}}$	$Nm/A_{peak}$	0.027	0.072	0.036	0.036
$K_m$	$Nm/\sqrt{W}$	0.012	0.019	0.020	0.020

### THERMAL SPECIFICATIONS

		UTS-19	UTS-29	UTS-41	UTS-41
Thermal Resistance	$^{\circ}C/W$	8.0	6.0	5.5	5.5

### MECHANICAL SPECIFICATIONS

		UTS-19	UTS-29	UTS-41	UTS-41
Stator OD	mm	18.97	29.21	40.64	40.64
Stator ID	mm	14.48	22.35	31.92	31.92
Rotor OD	mm	13.84	21.34	30.65	30.65
Rotor ID	mm	5.00	6.35	16.26	16.26
Stator Length	mm	29.97	22.23	21.08	19.81
End Turn, Lead Side	mm	5.08	3.81	6.73	5.46
Stack Height	mm	20.32	15.24	10.16	10.16
End Turn, Non-Lead Side	mm	4.57	3.18	4.19	4.19
Rotor Length	mm	22.25	17.32	12.19	12.19
Weight - Total**	kg	0.038	0.068	0.084	0.084
Stator Weight	kg	0.014	0.022	0.031	0.031
Rotor Weight	kg	0.024	0.046	0.053	0.053
Pole Count	#	6	8	8	8
Rotor Inertia	lb-in-sec <sup>2</sup>	5.52E-06	2.45E-05	6.83E-05	6.83E-05
	kg-m <sup>2</sup>	6.24E-07	2.77E-06	7.72E-06	7.72E-06
Halls		No	No	Yes	No

All data measured at 40° C ambient. \*At continuous current, assuming a 90° C temperature rise. \*\*Weights are estimated as motor leads can become significant to total weight. Contact Celera Motion for torque-speed specifications. Specifications subject to change.

# Agility™ Series Motors

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## Agility Slotless Motors

SIZE	UTS-53		UTS-89
MODEL NUMBER	UTS-53-A-20-A-H-000	UTS-53-A-20-A-N-000	UTS-89-A-25-C-N-000

### PERFORMANCE SPECIFICATIONS

Continuous Torque*	Nm	0.13	0.13	0.54
	oz-in	18.5	18.5	77
Peak Torque	Nm	0.39	0.39	1.64
	oz-in	55.5	55.5	232

### ELECTRICAL SPECIFICATIONS

Continuous Current*	$A_{DC}$	3.37	3.37	2.3
Resistance <sub>phase-phase</sub>	Ohm	2.70	2.70	4.00
Inductance <sub>phase-phase</sub>	mH	0.12	0.12	0.54
$K_{e_{phase-phase}}$	$V_{peak}/krpm$	4.1	4.1	27.0
$K_{t_{TRAP}}$	$Nm/A_{DC}$	0.039	0.039	0.258
$K_{t_{SINE}}$	$Nm/A_{peak}$	0.034	0.034	0.223
$K_m$	$Nm/\sqrt{W}$	0.024	0.024	0.129

### THERMAL SPECIFICATIONS

Thermal Resistance	°C/W	3.0	3.0	3.0
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### MECHANICAL SPECIFICATIONS

Stator OD	mm	52.83	52.83	88.90
Stator ID	mm	42.67	42.67	75.69
Rotor OD	mm	41.91	41.91	74.17
Rotor ID	mm	29.21	29.21	50.80
Stator Length	mm	29.19	19.94	25.02
End Turn, Lead Side	mm	13.34	4.09	5.46
Stack Height	mm	12.80	12.80	15.24
End Turn, Non-Lead Side	mm	3.05	3.05	4.32
Rotor Length	mm	16.26	16.26	19.18
Weight - Total**	kg	0.158	0.158	0.525
Stator Weight	kg	0.064	0.064	0.217
Rotor Weight	kg	0.094	0.094	0.308
Pole Count	#	12	12	12
Rotor Inertia	lb-in-sec <sup>2</sup>	2.64E-04	2.64E-04	3.12E-03
	kg-m <sup>2</sup>	2.98E-05	2.98E-05	3.52E-04
Halls		Yes	No	No

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# Agility™ Series Motors

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## Agility Slotless Motors

SIZE	UTS-114	UTS-222
MODEL NUMBER	UTS-114-A-43-A-N-000	UTS-222-A-62-A-N-000

### PERFORMANCE SPECIFICATIONS

Continuous Torque*	Nm	3.12	9.06
	oz-in	441.9	1284.1
Peak Torque	Nm	9.36	27.20
	oz-in	1326.0	3852.3

### ELECTRICAL SPECIFICATIONS

Continuous Current*	$A_{DC}$	5.1	4.5
Resistance <sub>phase-phase</sub>	Ohm	2.30	4.40
Inductance <sub>phase-phase</sub>	mH	0.80	0.75
$K_{e_{phase-phase}}$	$V_{peak}/krpm$	64	210
$K_{t_{TRAP}}$	$Nm/A_{DC}$	0.611	2.005
$K_{t_{SINE}}$	$Nm/A_{peak}$	0.529	1.736
$K_m$	$Nm/\sqrt{W}$	0.403	0.956

### THERMAL SPECIFICATIONS

Thermal Resistance	$^{\circ}C/W$	1.5	1.0
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### MECHANICAL SPECIFICATIONS

Stator OD	mm	114.30	222.25
Stator ID	mm	96.77	208.66
Rotor OD	mm	95.25	207.01
Rotor ID	mm	73.66	190.50
Stator Length	mm	42.92	62.27
End Turn, Lead Side	mm	9.90	6.05
Stack Height	mm	25.40	50.17
End Turn, Non-Lead Side	mm	7.62	6.05
Rotor Length	mm	32.77	57.79
Weight - Total**	kg	1.210	3.420
Stator Weight	kg	0.442	1.315
Rotor Weight	kg	0.768	2.105
Pole Count	#	16	64
Rotor Inertia	lb-in-sec <sup>2</sup>	1.19E-02	2.07E-01
	kg-m <sup>2</sup>	1.34E-03	2.33E-02
Halls		No	No

All data measured at 40° C ambient. \*At continuous current, assuming a 90° C temperature rise. \*\*Weights are estimated as motor leads can become significant to total weight. Contact Celera Motion for torque-speed specifications. Specifications subject to change.

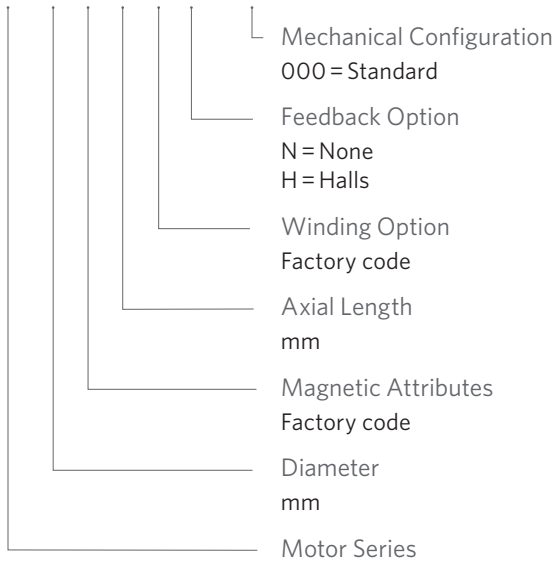
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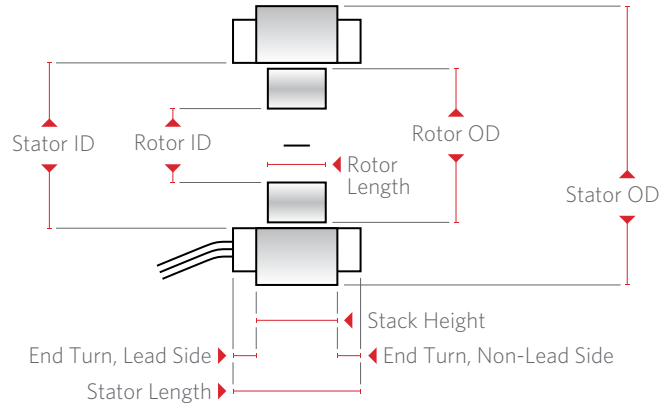
## How to Order

Motor

UTS-19-A-30-A-N-000 (example)



Dimensional Interface



### Notes

1. Ring magnets are limited to 5000 rpm, contact factory for higher speed magnet material.
2. Mechanical speed limits are imposed on all motors, contact factory for special options for higher speeds.
3. Kt value is calculated from the Ke value and is a static value. Amplifier design will impact actual running torque, contact factory.
4. Peak torque output is based on a 3:1 peak to continuous current ratio in the amplifier, and is limited to 10% duty cycle.



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