

Portescap

Ultra EC™ motors



NEW Speeding away from the pack Portescap's new high speed low temp brushless motor

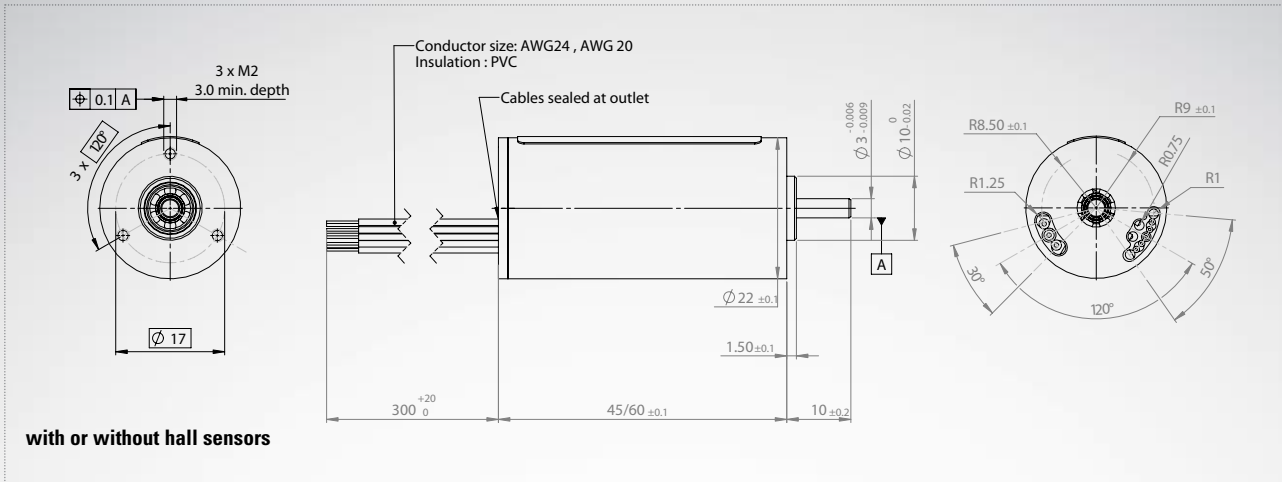
Portescap introduces the new 22ECS brushless motor designed specifically for high speed applications. The 22ECS has been optimized to be one of the most advanced and highest performing brushless slotless motors in its class. The 22ECS offers exceptional efficiency and runs up to 30% cooler than similar motors at speeds greater than 50K RPM.

The 22ECS is constructed with a new enhanced high efficiency magnetic circuit that drastically reduces both iron and recirculation losses to offer very low operating temperatures at high speeds. The new patent pending motor coil also achieves higher available torque and mechanical power than similar high speed motors in the market. The result is that the new 22ECS stays much cooler, thus enhancing the life and reliability of the motor, as well as offering greater power density than equivalent models.

The motor's compact size, high power and efficiency allows for applications to be smaller and more mobile, and proves to be an excellent choice for battery operated devices.

Attributes	Features	Benefits
Compact	Ø22mm	Available in different lengths
Powerful	Up to 180 W mechanical power at 50'000 rpm	Drill, ventilation and tool end uses
Efficient	Optimized to achieve up to 91% efficiency	Optimal for battery powered or low temp applications
Reactive	Shorter mechanical time constant	Rapid acceleration during operating speed changes
Fast	Optimized coil and bearing assembly	Able to achieve output speeds up to 73,000 rpm
Cool	Optimized patent-pending coil design	Runs 30% cooler than similar motors to extend device life
Smart	Built-in thermal sensor	Capable of providing precise thermal management





Designation	Electrical Data - Winding Type**	22ECS45 **		22ECS60 **			
		24	18	21	17		
1	Nominal voltage	V	24	24	24	24	±0,1
2	Optimization direction (standard)	-	CCW	CCW	CCW	CCW	typical
3	No-load speed	rpm	51600	68500	35000	43000	±10%
4	Typical no-load current	mA	240	300	190	270	±50%
5	Max. continuous mechanical power (@ 25°C)	W	120	120	180	180	typical
6	Max. continuous current	A	6.4	8.2	7.1	8.7	typical
7	Max. continuous torque	mNm (oz-in)	26.7 (3.78)	26.8 (3.80)	45.9 (6.50)	44.5 (6.30)	typical
8	Back-EMF constant	V/1000 rpm	0.44	0.34	0.68	0.53	±10%
9	Torque constant	mNm/A (oz-in/A)	4.2 (0.59)	3.3 (0.47)	6.5 (0.92)	5.1 (0.72)	±10%
10	Motor regulation R/k ²	10 ³ /Nms	8.5	8.5	3.6	3.8	typical
11	Motor regulation k/R ^{1/2}	mNm/W ^{1/2} (oz-in/W ^{1/2})	10.8 (1.53)	10.8 (1.53)	16.7 (2.36)	16.1 (2.28)	typical
12	Internal resistance - phase to phase	Ω	0.15	0.09	0.15	0.10	±8%
13	Line to Line resistance at connectors	Ω	0.17	0.10	0.17	0.12	typical
14	Inductance - phase to phase	mH	0.02	0.015	0.012	0.009	typical
15	Mechanical time constant	ms	1.9	1.9	1.3	1.3	typical
16	Electrical time constant	ms	0.13	0.17	0.08	0.09	typical

General Data							
17	Thermal resistance coil-housing	°C/W	1.3	1.3	1.1	1.1	typical
18	Thermal resistance housing-ambient	°C/W	10.4	10.4	8.3	8.3	typical
19	Thermal time constant	s	660	660	950	950	typical
20	Mass	g (oz)	110 (3.88)	110 (3.88)	150 (5.29)	150 (5.29)	typical
21	Rotor inertia	kg.m ² ·10 ⁻⁷ (oz.in.sec ²)	2.3 (3.3·10 ⁻⁵)	2.3 (3.3·10 ⁻⁵)	3.5 (5·10 ⁻⁵)	3.5 (5·10 ⁻⁵)	typical

General Data		All	
22	Max. motor speed	rpm	73,000 max
23	Ambient working temperature range	°C	-30 / +100 -
24	Ambient storage temperature range	°C	-40 / +100 -
25	Ball bearings preload	N	5.5 typical
26	Axial static force without shaft support	N	34 max
27	Max. winding temperature	°C	125 max
28	Typical housing material	Stainless steel / aluminium rear flange	
29	Hall sensor electrical phasing	°	120 typical

*RoHS Compliant

