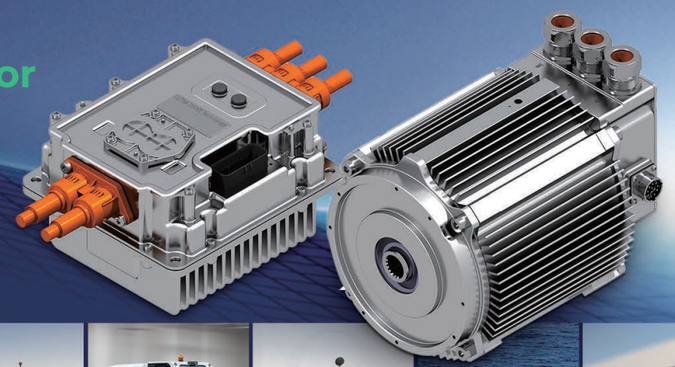
ROYPOW | ULTRA DRIVE

High-Power PMSM Motor & Controller Solution for eMobility

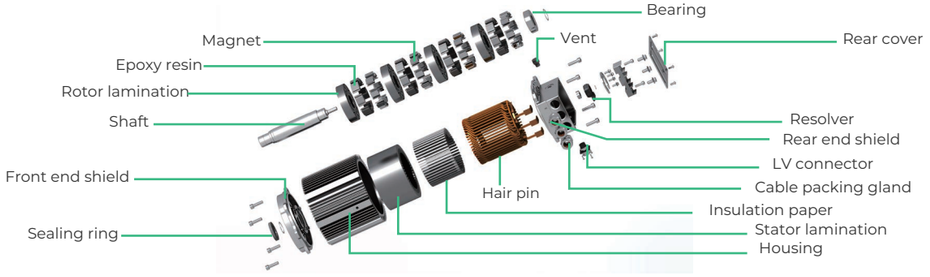
by ULTRADRIVE Technology™



Specification

FLA8025 PMSM Motor Family

Attribute	Unit	STD		PRO	MAX
		Para.			
Poles/Slots	-	8/48	8/48	8/48	8/48
Effective Size of Laminations	mm	Φ153xL64.5	Φ153xL64.5	Φ153xL86	Φ153xL107.5
Rated Speed	rpm	4800	4800	4800	4800
Max. Speed	rpm	10000	10000	10000	10000
Rated Voltage	Vdc	48	76.8/96	76.8/96	96/115
Peak Torque (30s)	Nm	91@20s	91@20s	110@30s	135@30s
Peak Power (30s)	kW	14.8@20s	25.8@20s @76.8V 33.3@20s @96V	25.5@30s @76.8V 32.8@30s @96V	32.7@30s @96V 39.9@30s @115V
Conts. Torque (60min&1000rpm)	Nm	30	30	37	45
Conts. Torque (2min&1800rpm)	Nm	80@ 20s	80@ 40s	80@ 2min	80@ 2min
Conts. Power (60min&4800rpm)	kW	6.5	12.3 @76.8V 14.9 @96V	11.8 @76.8V 14.5 @96V	14.1 @96V 16.4 @115V
Max. Efficiency	%	94	94.5	94.6	94.7
Torque Ripple (Peak-Peak)	%	3	3	3	3
Cogging Torque (Peak-Peak)	mNm	150	150	200	250
Proportion of high-efficiency area (efficiency>85%)	%	≥80%	≥80%	≥80%	≥80%
Peak Current of Phase/L-L (30s)	Arms	420	420	380	370
Peak DC Current (30s)	A	435	425	415	415
Conts. Current of Phase/L-L (60min)	Arms	170@6kW	160@12kW	160@12kW	100@12kW
Conts. DC Current (60min)	A	180@6kW	180@12kW	180@12kW	120@12kW
Conts. Current of Phase/L-L (2min)	Arms	420@20s	375@40s	280	220
Conts. DC Current (2min)	A	420@20s	250@40s	240	190
Cooling	-	Passive cooling	Passive cooling	Passive cooling	Passive cooling
IP Level	-	IP67	IP67	IP67	IP67
Insulation Grade	-	H	H	H	H
Vibration	-	Max.10g, refer to ISO16750-3	Max.10g, refer to ISO16750-3	Max.10g, refer to ISO16750-3	Max.10g, refer to ISO16750-3



Benefits & Features

Family Design for Wide Application
Scalable effective size of laminations to achieve different motor performance and compatible with rated 48/76.8/96/115V battery

Permanent Magnet Synchronous Motor
Advanced hair-pin winding increase slot fill factor of stator and power density 25%; PMSM technology increase overall efficiency 15-20% compared to asynchronous AC motor

High Output Performance
40 kW/115 Nm high output of motor, leading technologies in the design of motor and power module to improve electrical and thermal performance

Leading SVPWM Control Algorithm
FOC control algorithm combined with MTPA control technology provides higher control efficiency and accuracy, lower torque ripple of system

High Performance Infineon AURIX™ MCU
Faster and more stable Multi-core SW architecture, superior real-time performance, FPU operation for higher control accuracy, full vehicle functionalities benefit from tremendous Pin resources

User Preferences Mode
Supporting user to adjust the maximum speed limit, maximum acceleration rate and energy regenerative intensity

Battery Protection with CANBUS
Signals and functionalities interaction with battery by CANBUS, to ensure the safety use and extend the lifetime of battery over the whole life cycle

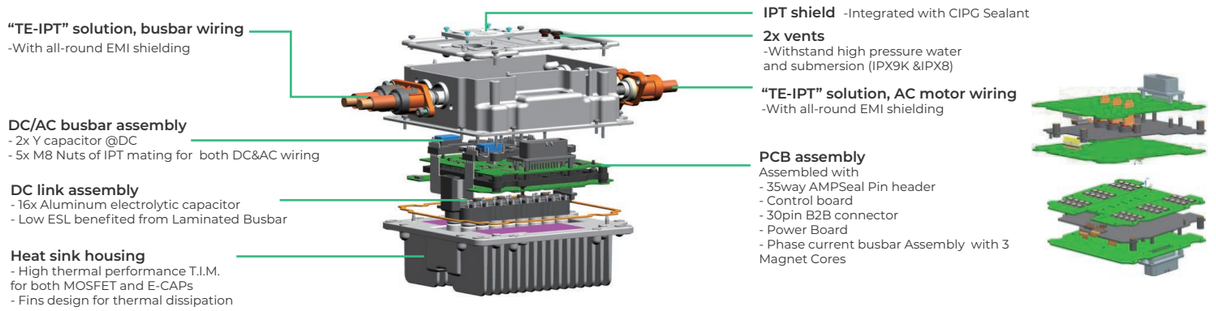
Comprehensive Diagnosis & Protection
Voltage and Current monitor & protection, Thermal monitor & derating, Load dump protection and etc.

Customized Mechanical & Electrical Interfaces
Simplified Plug and Play harness to easy installation and flexible CAN compatibility with RVC, CAN2.0B, J1939 and other protocols

All Automotive Grade
Rigorous and strictest design, testing and manufacturing standard to ensure high quality; All Chips Automobile AEC-Q Qualified

FLA8025 Controller

Attribute	Unit	Para.	Attribute	Unit	Para.
Operating Voltage	Vdc	40V~130	Communication	-	Customer Specific; eg. CAN2.0B 500kbps
Rated Voltage	Vdc	48V/76.8V/96V/115	Logic Voltage Supply	Vdc	9-16V, With Backup supply
Peak DC Current (30s)	A	500	Logic Operation Current	mA	≤500 mA
Peak Phase Current (30s)	Arms	500	Motor Postion Sensor	-	Resolver
Peak Power (30s)	kW	40	Functionality	-	Torque control/speed control/ Regen mode /Anti -rolling function
Conts. Power (60min)	kW	15	I/O Connector	-	35 Position; DI/AI/PWM/ HB/HSD+LSD/ 5V-OUT/ supported by MCU TC2xx or TC3xx
Max. Efficiency	%	98%	Dielectric Withstand	Vdc	1000 Vdc, 1min, leakage current<20mA
Voltage Accuracy	Vdc	±0.5	Discharge	-	Discharged to 60Vdc in 5mins
Current Accuracy	%	Max.{±5%, 2A}	Weight	kg	5
Motor Speed Accuracy	%	±5%	Diameter W x L x H	mm	248mm x 210mm x 148mm
Torque Accuracy	-	±1Nm@output torque <25Nm; ±5%, max. 2Nm@output torque>25Nm	Transmission Interface	-	Customer Specific
Electrical Frequency	Hz	800	Case Construction	-	Cast Aluminum Alloy
Motor Control	-	SVPWM	Vibration	rms	Max.10g, refer to ISO16750-3
Switch Frequency	kHz	10-20 (configurable)	IP Level	-	IP6K9K; IP67; IPXXB
Cooling	-	Passive air cooling	Safety	-	ISO6469; IEC60664
Operating Temperature	℃	-40~65℃; linear reduce max. current limit when internal temperature is between 65 ℃ and 85℃, complete cutoff occurs above 85℃and below -40℃	Design Life	-	8000h, Continuous operation w/o any fault
			EMC	-	CISPR25-2016 Class3; ISO7637 ClassIV; ISO11452 100V/m



sales@roypow.com, sales@ultradrivetech.com www.roypow.com