

## P400 R Series E-Motors

YASA motors and generators are the smallest and lightest in their class. Based on YASA's unique Yokeless and Segmented Armature topology, the motors use less materials more efficiently to provide higher torque and power densities than any comparable motor or generator.

The P400 R Series are 3<sup>rd</sup> generation YASA e-machines and feature enhanced durability and NVH characteristics to simplify integration into prototype and limited run vehicle production.

### YASA P400 R SERIES.

Peak torque @450 A <sub>RMS</sub> <sup>2</sup>	370 Nm
Continuous Torque <sup>1</sup>	Up to 200 Nm
Peak Power @700 V <sub>DC</sub> <sup>2</sup>	160 kW
Continuous Power <sup>1</sup>	20 kW to 100 kW
Speed	0 – 8000 rpm
Peak Efficiency <sup>3</sup>	96%
Dry Mass <sup>4</sup>	from 24 kg

- Best-in-class torque and power density. Peak power density<sup>2,4</sup> > 6.7 kW/kg
- Dimensions from just 305mm (D) x 80.4mm (L)
- Through-shaft mounting and stacking capability

Applications where the YASA P400 Series excel include:

- Traction motors for on, off-road, rail and marine transport. Hybrid and full electric.
- Generators. Especially where size and weight are important in mobile and variable speed generation.
- P2 Hybrid. Generate, power boost and start from a small axial length. Ideal for transverse layout.
- Hydraulic replacement. Compact and efficient alternatives for hydraulic motors and starters.



AUTOMOTIVE



OFF ROAD



MARINE



INDUSTRIAL



AEROSPACE



MOTORSPORT

The flexible, modular design of the P400 R Series offers a range of torque and power combinations that can be tailored to optimise performance in specific applications. For volume manufactures, YASA custom motor designs achieve significantly higher power density at competitive cost.

Please call +44 (0) 1865 952 100 or email [sales@yasa.com](mailto:sales@yasa.com) to discuss your requirements.

1. Maximum continuous ratings are based on extrapolated test data for a YASA P400 HC motor with integrated rotor cooling, 30°C ambient temp, 20 ltrs/min coolant flow and coolant inlet temp <65°C.

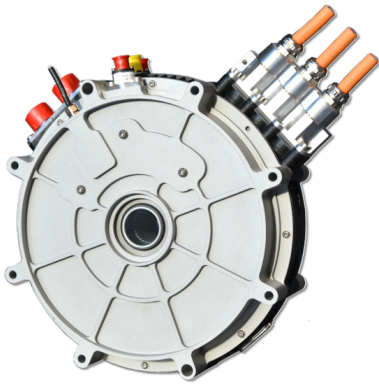
2. Peak torque & power ratings are given at 60°C rotor and 60°C coolant inlet temperature and 450 A<sub>RMS</sub>.

3. Peak efficiency measured at the optimal operating area of the YASA P400 Series and does not include controller efficiency.

4. Mass for flange mounted cartridge version with a single cover incorporating a standard rotary position sensor.

5. Mass is 27.5kg for the P400 RS model and 28.2kg for the P400 RHC model with integrated rotor fan cooling. Mass includes covers and position and temperature sensors but excludes phase cable and connector.

All data subject to change without notice.



The P400 RS is the versatile backbone of the P400 R Series and offers exceptional peak performance in a lightweight sealed package. The RS model is the first choice for simplified integration into automotive, off-road and marine traction and hybridisation programs.

### Mechanical

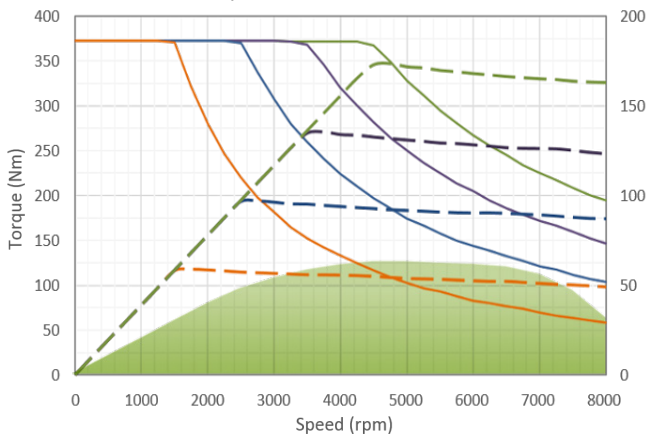
Casing Diameter	305 mm
Mounting 8x Ø8.3	294 mm PCD
Axial length	106.7 mm
Dry Mass	28.2 kg
Stator Cooling	Oil

### Electrical

Peak Torque @450 A	up to 370 Nm
Continuous Torque	up to 200 Nm
Peak Power @700V	160 kW
Continuous Power	up to 60 kW
Maximum Speed	8000 rpm

### Example Electrical Performance with 800V controller @450A<sub>RMS</sub> P400 RS

#### Power and Torque

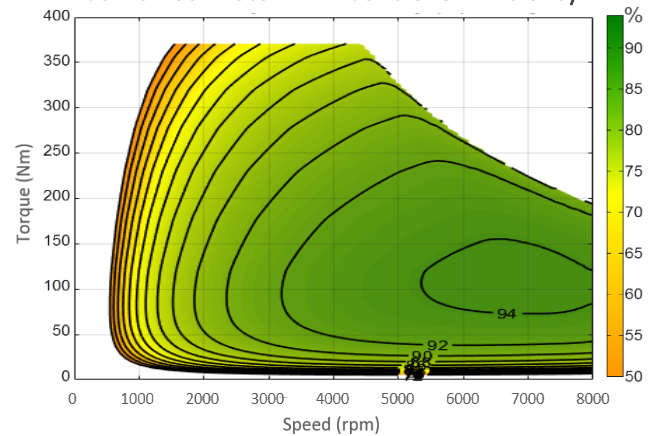


Peak (30 sec)	
Torque	Power
<span style="color: green;">—</span> 700V	<span style="color: green;">- - -</span>
<span style="color: purple;">—</span> 550V	<span style="color: purple;">- - -</span>
<span style="color: blue;">—</span> 400V	<span style="color: blue;">- - -</span>
<span style="color: orange;">—</span> 250V	<span style="color: orange;">- - -</span>

Continuous Power P400 S
<span style="background-color: #90EE90; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 24/7 Continuous

(Preliminary data)

#### Combined Motor AND Controller Efficiency

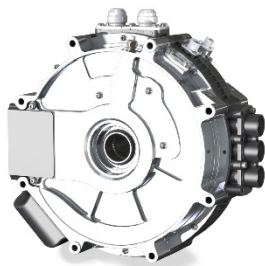


The specified P400 S performance is based on dynamometer test data. The performance available in your application may be different and will depend on drive cycle and installation details. Please contact us for detailed information.

Peak data at 60°C rotor, 60°C coolant inlet @20 ltrs/min and 60°C ambient  
 Continuous ratings at coolant inlet <50°C @20 ltrs/min, <30°C ambient.

## P400 RHC and P400 C

### P400 RHC High Continuous Output



- Up to **100kW continuous 24/7**
- Integrated rotor air cooling via air duct.
- Traction and power generation solution for enclosed engine bay environments.

### P400 C Cartridge



- **Axial length 80.4 mm**
- Cartridge model for project integration
- Flexible package for the optimum performance in your application.

### Performance in your application

The YASA P400 R Series motors are available in a range of torque and speed combinations and with a variety of mechanical and cooling options.

Please **contact us** to discuss your application requirements. We can then supply detailed information on the YASA products and options that may be suitable for you.