

XR32-13 In-Wheel Motor

Peak Torque	577/400 Nm
Rated Continuous Torque	300 / 250 Nm
Rated Speed	150 / 187 RPM
Speed range	0-2000 RPM

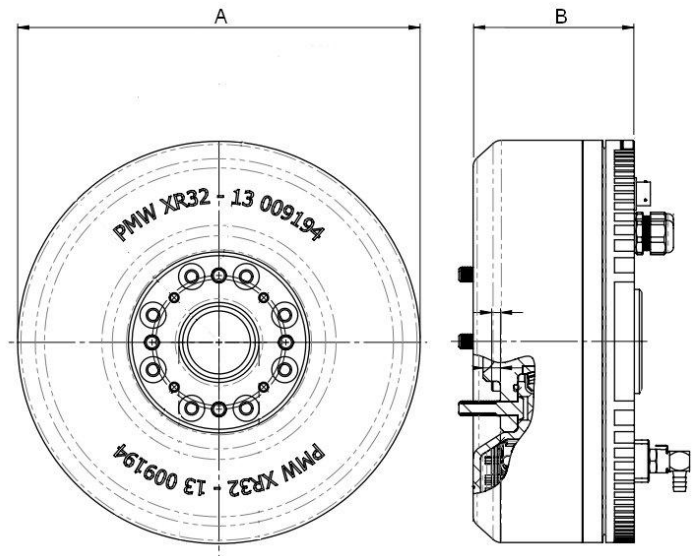


The Printed Motor Works XR32 Series is a compact and very powerful 3-phase permanent magnet brushless DC motor. The XR32 range is designed to fit inside the wheel rim, but can be used in-board with half shaft connection to the wheels. It utilizes the most powerful grade NdFeB magnets and delivers unparalleled performance relative to its size of and weight of just 32kg. The XR32 range is available with convection air cooling or with an advanced water cooling jacket in the stator winding wall. The XR32 range is a high-end motor designed and built to meet each customer's specification.

Symbol	Peak Torque Tp	Rated Torque T	Rated Speed N	Voltage V	Peak Current I _{rms}	Dia. A	Depth B	Mass M
Unit	Nm	Nm	RPM	Volt	Amp	mm	mm	Kg
XR32-13 Air cooled	400	250	150	100	376	324.5	130	32.35
XR32-13 Water cooled	577	300	187	100	550	324.5	130	32.15

Specific benefits

- Market leading power density
- Brushless hub motor with pancake profile
- High peak torque
- Water and dust protection
- High efficiency on load
- Compatible off-the-shelf drives available
- Custom mechanical design service
- Custom windings available for special voltage/speed profiles



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Applications

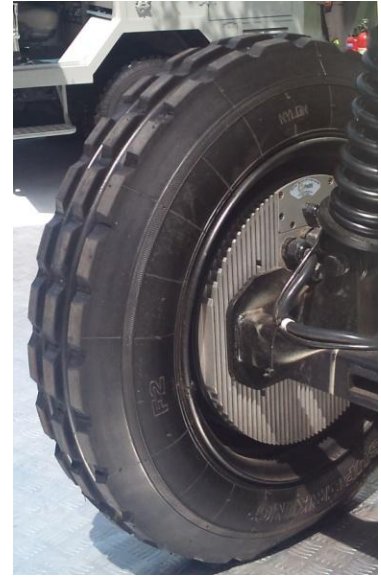
Industrial and marine winch systems, bomb disposal robots, military electric vehicles, commercial electric vehicles, elevators, direct drive radar, direct drive railway vehicles.

Markets

Commercial vehicles, industrial automation, aerospace & defence, oil & gas, railways.

Design Modifications

- Customised speed
- Customised voltage
- Customised chassis
- Customised diameters
- Customised torque
- Customised feedback
- Customised wheel interface
- Customised depths



Standard Feedback Options

Motor	Hall Sensors	Separation °elec	Type	Supply Voltage V
XR32-13	x3 Digital	60	Latch	5-24

Suggested Controllers



Gen 4 Size 6 Controller

- Advanced flux vector control from digital halls
- Up to 116VDC supply voltage
- Up to 550Arms peak output current
- Autocheck system diagnostic
- Integrated logic circuit
- Hardware & software failsafe watchdog operation
- Induction motor control
- Integrated fuse holder
- IP66 protection



Gen 4 Size 8 Controller

- Advanced flux vector control from digital halls
- Up to 400V DC supply voltage
- Up to 100kW peak power output
- Up to 60kW continuous power output
- Integrated logic circuit
- Includes an additional dedicated safety supervisory processor
- 12V or 24V nominal supply
- Designed for ISO26262 ASIL C compliance
- Safety interlock pulsed enable signal



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Performance Specifications	Symbol	Units	XR32-13 Air Cooled	XR32-13 Water Cooled
Peak Torque	T_P	Nm (lb-ft)	400 (295.0)	577 (425.57)
Rated Continuous Torque @ 50°C	T_{25}	Nm (lb-ft)	250 (184.39)	300 (221.27)
Rated Speed	N	RPM	150	187
Rated Output Power	P	kW	3.93	5.87
Maximum Recommended Speed	N _{max}	RPM	2000	2000
Electrical Specifications				
Rated Terminal Voltage	E	Volts	100	100
Rated Continuous Current	I	Amps(RMS)	213	322
Peak Current	I _p	Amps (RMS)	377	550
Motor Constants				
Line-Line Resistance	R _{L-L}	Ohms	0.16	0.16
Back EMF Constant	K _E	V/kRPM	110	110
Torque Constant	K _T	Nm/Amp(lb-ft/Amp)	1.05 (0.77)	1.05(0.77)
Armature Inductance (Line-Line)	L	mH	11	11
Mechanical Specifications				
Moment of Inertia	J _m	Kgm ² (lb-ft ²)	0.10606(2.5168)	0.10606(2.5168)
Weight	W	kg (Ibs)	32.35(71.32)	32.15(70.88)
Diameter	D	mm (in)	324.5 (12.77)	324.5 (12.77)
Length	LG	mm (in)	130 (5.12)	130 (5.12)
Permitted Radial Load	{ 50% Safety Factor	Kg (Ibs)	1500(3306.93)	1500(3306.93)
Permitted Axial Load		Kg (Ibs)	1200(2645.55)	1200(2645.55)
Cooling Specifications				
Water Flow		Litres/min	-	7
Water Pressure		Bar		1.4
Air Speed @ 150 RPM		m/s	2.75	2.75



Printed Motor Works

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Torque and current versus speed and torque versus current for XR32-13 Water Cooled

