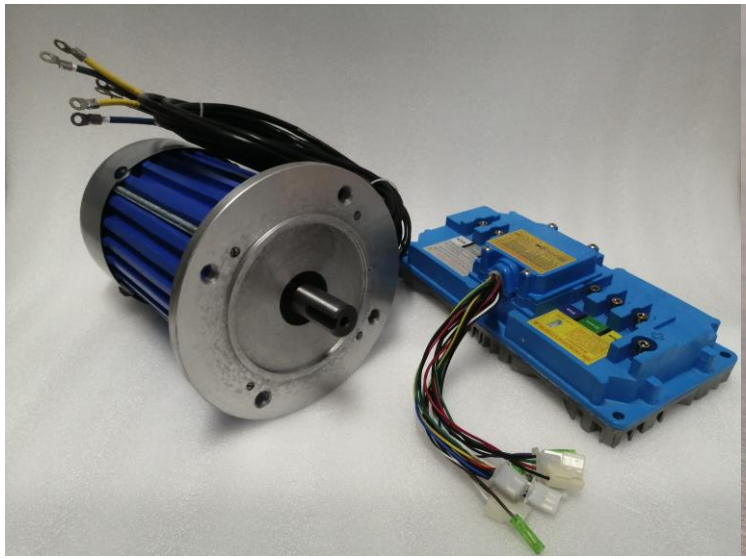
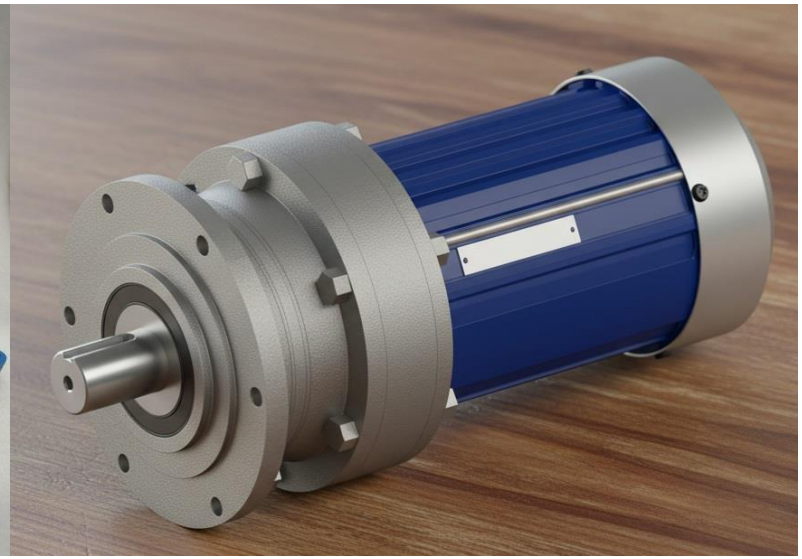
6 KW BLDC MOTOR SPECIFICATION





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TR120-6000W-3000RPM

Highlights

- ✓ 60/72VDC, 6000 Watts (Input), 3000 RPM Brushless DC Motor
- ✓ Available as standalone motor or with integrated cycloidal gear box of ratio 10, 15 or 25
- ✓ External Control
- ✓ Built in Hall Sensors with Hall Effect Angle of 120 degrees
- ✓ Insulation Class F
- ✓ Maximum operating temperature of 80^{o}C
- ✓ Optional with integrated spring activated 24V electro mechanical brake (other voltages also available on request)

Motor Specifications

Parameter	Value	
Rated Voltage*	60 VDC	72 VDC
Rated Current	100 A	83 A
Rated Power (Input)	6000 Watts	
Rated Power (Output)	5280 Watts	
Rated Speed (RPM)	3000 RPM	
Rated Torque (Nm)	16.8 Nm	
Peak Torque (Nm)	31 Nm*	
No Load Current (A)	8.5 A	
No Load RPM	4500 RPM	
Current Density (A/square mm)	6 A/square mm	
Variable Speed Range	0-4500 RPM	
Motor Mounting	Flange / Face only	
Frame Size	IEC 80B5 or 90B5 (See below)	
Motor Diameter	160 mm	
Motor Length (ML)	255 mm (With cooling fan)	
Shaft Diameter	19 / 24 mm diameter	
Shaft Length	50 mm or 40 mm	
Finish	Powder Coated	

*Note: Peak torque when the controller peak current is clamped at 150A

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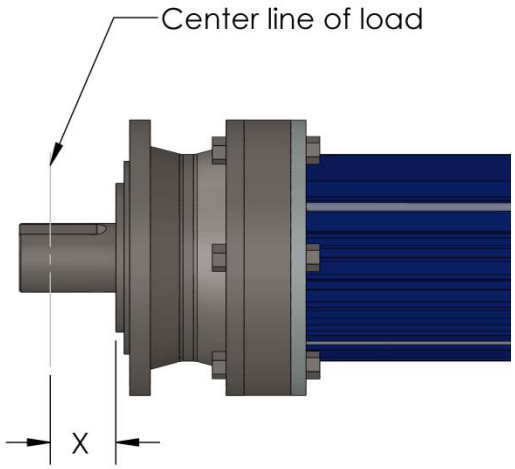
Recommended Gear Box Specifications

Parameter	Value
Type	Cycloidal Integrated
Reduction Ratio	15:1
Output Shaft	50 mm Diameter H6 x 70 mm length
Keyway	14 mm width x 9 mm depth x 56 mm length
Gear Box Torque Output	390 Nm
Gear Box Output Speed	200 RPM Maximum
Rated Input Power	9387 Watts
Allowable Overhung Load (Pro)	10898 Newtons
Allowable Axial Load (Pao)	3918.8 Newtons
Weight	~25 Kilograms
Mounting	Flange
Origin	Made in Coimbatore, India

Calculation of maximum allowable and actual Radial Load

1. Measure the distance X from the surface to the center line of the overhung load (OHL) and determine the Load Factor Lf from the table provided below



X (mm)	19	25	32	38	44.5	50	63.5
Lf	0.86	0.92	0.97	1.08	1.24	1.40	1.72

2. Determine the Connection Factor Cf and the Shock Factor Sf from the tables provided below

Connection Type	Cf
General Purpose Chain – Single Row	1.0
General Purpose Chain – Double Row	1.25
Machined Gear or Pinion	1.25
Synchronous Belt	1.5
V-Belt	1.5
Flat Belt	2.5

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Shock Type	Sf
No Shock	1.0
Moderate Shock	1.3
Heavy Shock	1.6

3. Calculate the OHL capacity by using the formula given below

OHL Capacity = Pro / (Cf * Lf * Sf)

Where
Pro = Allowable radial load (in Newtons) Cf = Coupling Factor Lf = Load Location Factor Sf = Safety Factor

4. Calculate the actual OHL / radial load by using the formula given below

Actual Radial Load Pr = TI / R

Where
TI = Torque on output shaft in Nm
R = Pitch circle radius of sprocket, gear, pulley, etc in meters

The actual OHL / radial load has to be lower than or equal to the OHL Capacity, if the actual OHL / radial load is higher than maximum permissible OHL then move the OHL closer to the surface and / or increase the pitch diameter of the connecting drive.

If the output shaft is also under axial load, then the actual axial load should be less than or equal to Pao / (Cf * Sf)

Actual Axial Load Pa <= Pao / (Cf * Sf)

Where
Pao = Allowable Axial Load (in Newtons) Cf = Coupling Factor Sf = Safety Factor

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External Brake – Specifications

Parameter	Value
Type	Spring Applied Electro Mechanical Brake
Make	Kendrion
Origin	Germany
Model No	BFK 458 10E 24 V
Power	30 W
Rated torques for holding brakes 1) @100 [min-1]	23 Nm
Maximum Speed	4000 RPM
Weight	2.5 Kilograms

Motor with integrated cycloidal gearbox and external electro mechanical brake

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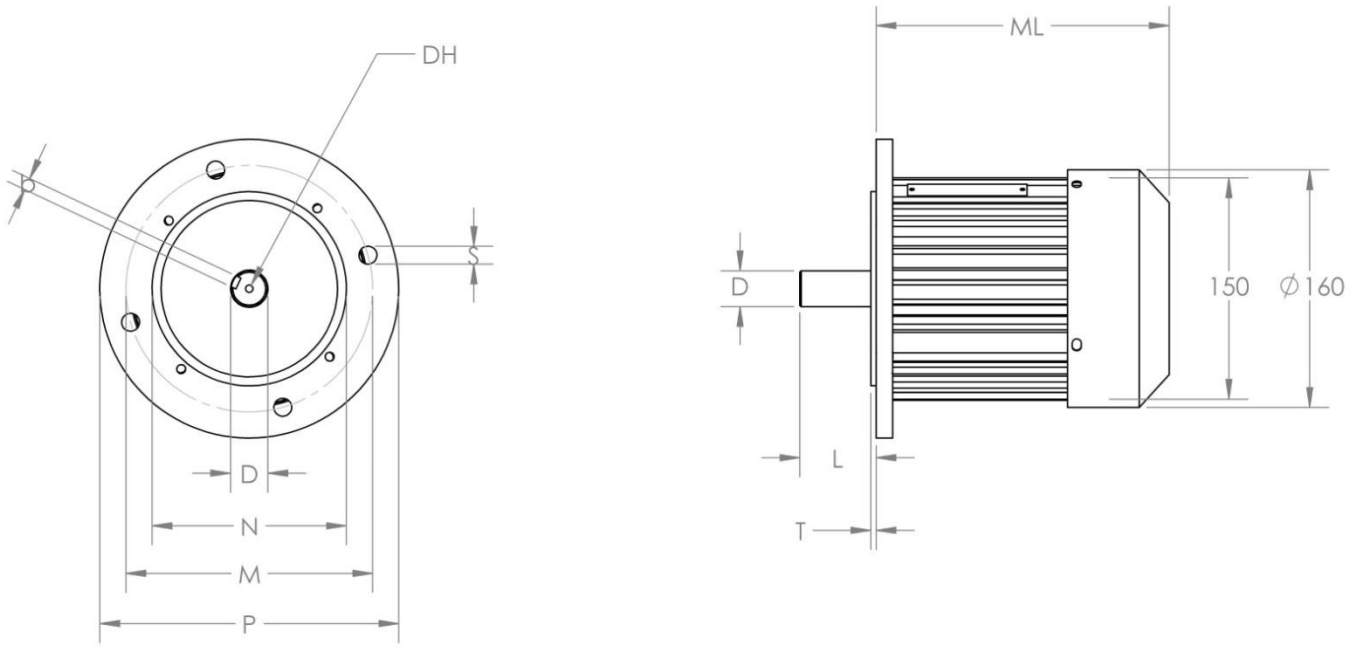
Dimensions – Motor (Without External Brake)

IR120 Series

Scale 1:4 Units: mm



IEC	D	b	L	DH	P	M	N	S	T
71B14	14	5	30	M5 x 12.5	165	85	70	M6 x 9	2.5
80B5	19	6	40	M6 x 16	200	165	130	11	3.5
80B14	19	6	40	M6 x 16	165	100	80	M6 x 9	3.0
90B5	24	8	50	M8 x 19	200	165	130	11	3.5

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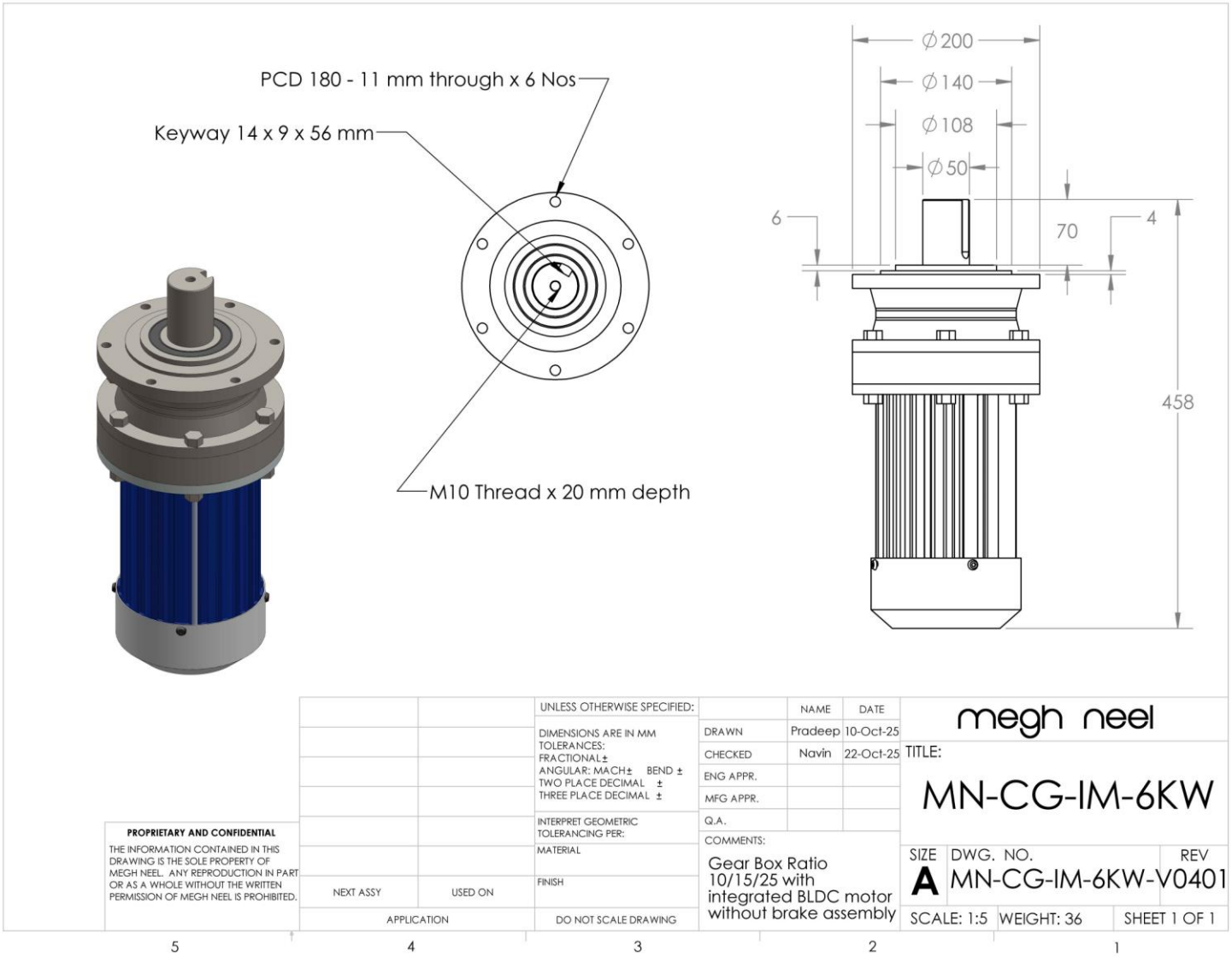
Dimensions – Motor with Integrated Cycloidal Gear Box



		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	megh neel
		DIMENSIONS ARE IN MM TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	Pradeep	10-Oct-25	
			CHECKED	Navin	22-Oct-25	TITLE: MN-CG-IM-6KW
			ENG APPR.			
			MFG APPR.			
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.			
		MATERIAL	COMMENTS: Gear Box Ratio 10/15/25 with integrated BLDC motor without brake assembly			SIZE A / DWG. NO. MN-CG-IM-6KW-V0401 / REV
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:5 WEIGHT: 36 SHEET 1 OF 1

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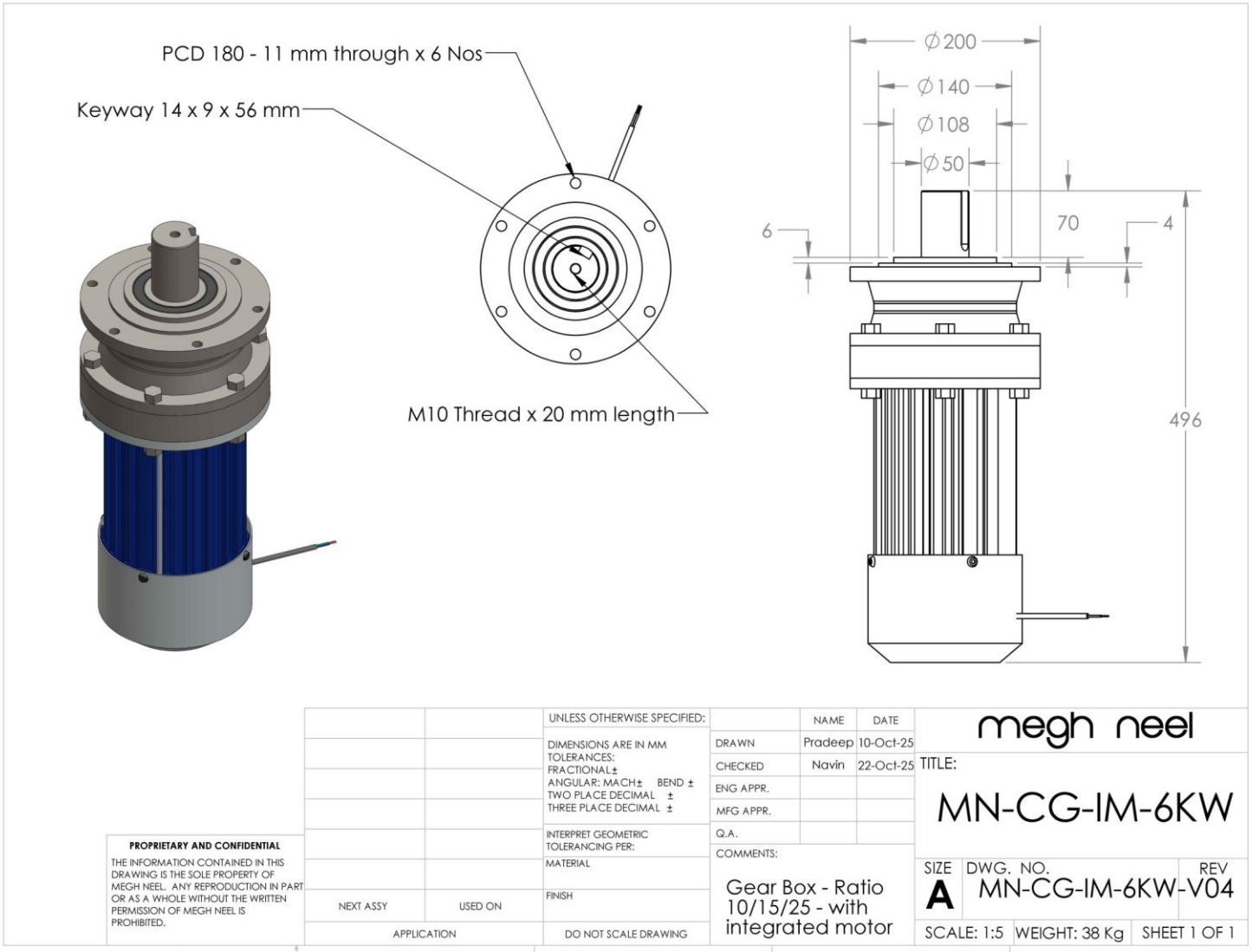
Dimensions – Motor with Integrated Cycloidal Gear Box & External Brake



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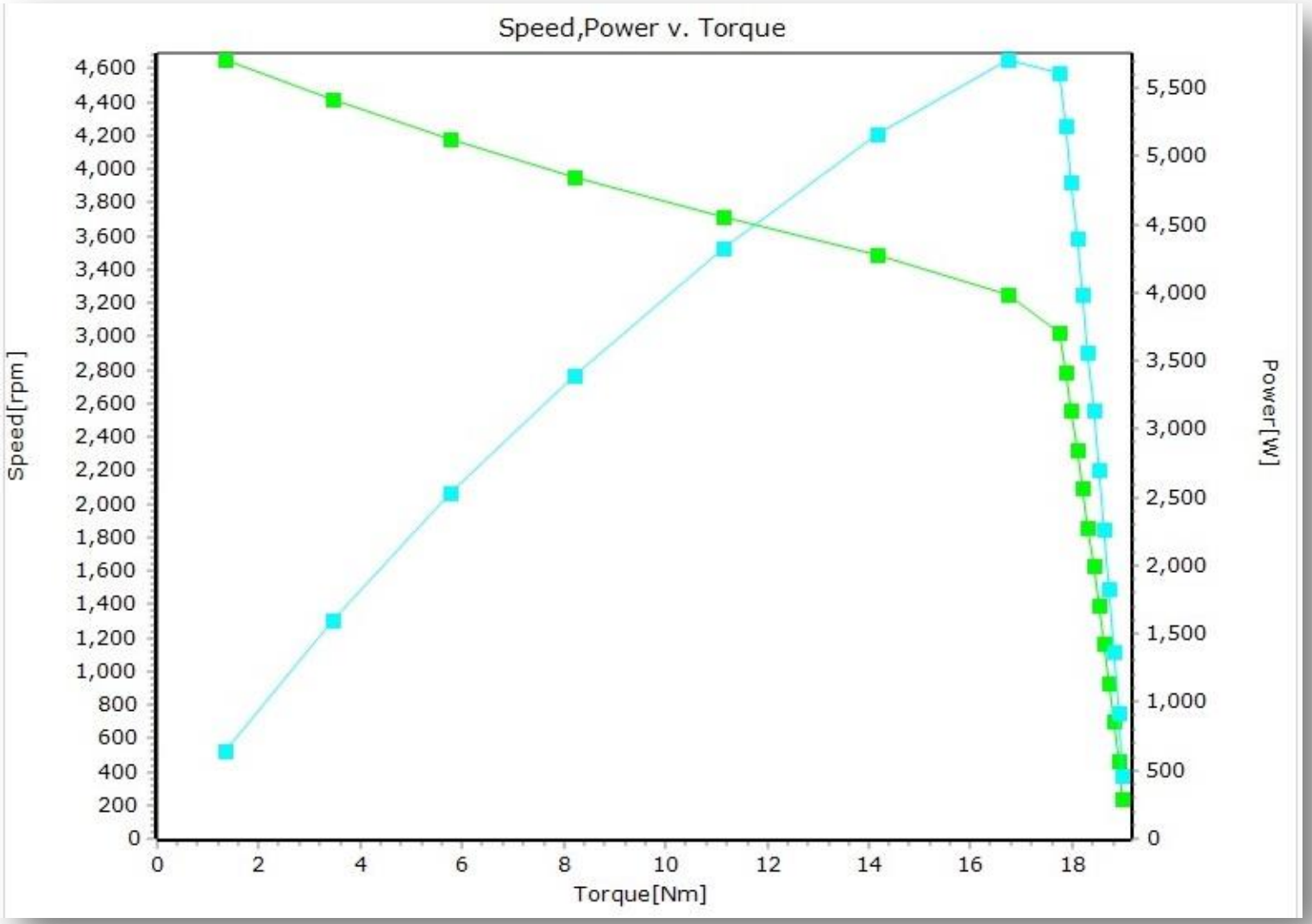
Motor Performance Characteristics



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Note: Test Results of the motor with RMS current clamped at 100A

BLDC Motor Controller Technical Specifications

Parameter	Value
Working Voltage	60VDC / 72VDC
Phase Angle	120^{o}
Motor Control Scheme	Sinusoidal Commutation
Phases	6
Peak Current	180 A
Max Output Power	10800 W
Cooling	Air Cooled
Brake	Low Level
IP Protection	IP65
Weight	~ 5 Kg
Protection Features	Overcurrent, Over temperature, Under voltage, Short-circuit

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