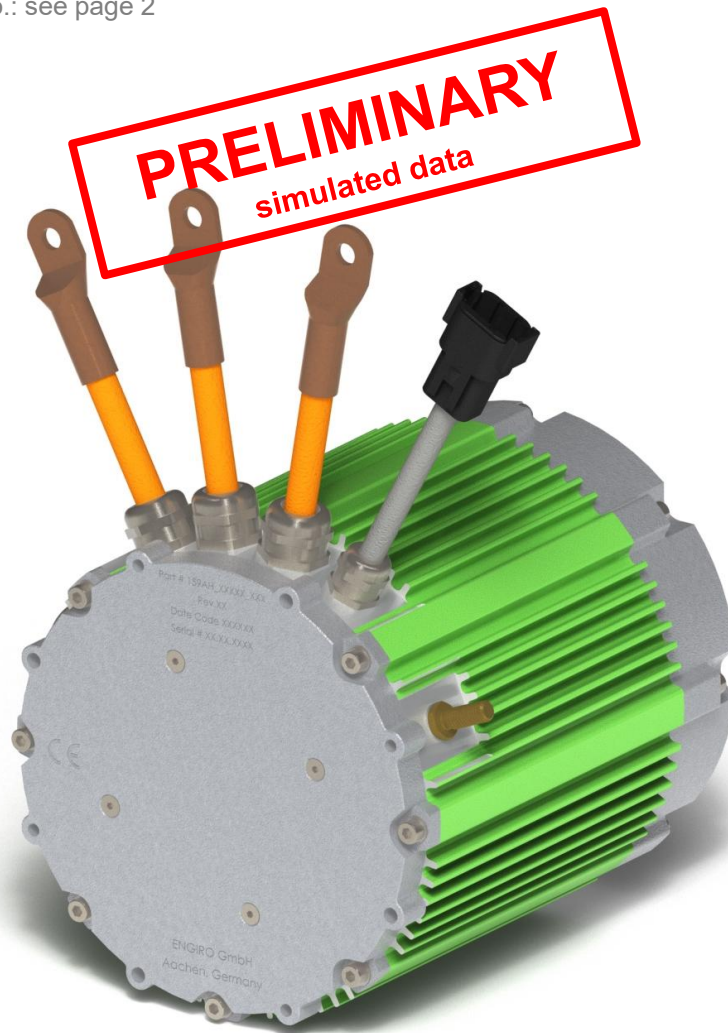


159AH-06012-ABC

air-cooled motor / generator with 11 kW continuous power

This datasheet refers to art.no.: see page 2



KEY FEATURES

- permanent magnet synchronous machine
- air-cooled
- high peak power for motor applications
- convincing cost-benefit ratio
- recommended voltage range from 48 V to 200 V
- delivery with controller possible

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Additional Data	4
Available Type Variants	5
Technical Drawings	6
Performance Plots	8

Note:

On September 1st, 2024, we transferred our ERP systems to SAP. Due to this change, we are altering our **current part numbers**. To see how our article numbers and motor naming scheme has changed, please consider the conversion table below:

Please note the separate declaration for B-side interfaces S01 (closed) and B01/02 (Integrated brake).

Article Number Conversion					
Part.no.	Old part.no.	Flange	Shaft	Position sensor	B-side Interface
4752394	159AH_06012_SPE	S1	P1	E	S01
4663844	159AH_06012_SHE	S1	H1	E	S01
4775692	159AH_06012_EDE	E1	D1	E	S01
4782844	159AH_06012_EDRB3	E1	D1	R	B02
4820607	159AH_06012_EDRB3X1	E1	D1	R	B01
4843463	159AH_06012_BCR	B1	C1	R	S01
4843464	159AH_06012_BCRB3	B1	C1	R	B02

To be noted:

The information in this technical data sheet is based on our current knowledge and experience. Due to the wide range of possible influences during application, they do not exempt the processor and user from carrying out their own tests and trials. Although the suitability for a specific application can be estimated from our information, a legally binding assurance is by no means possible. Depending on the individual case, we recommend consultation with us. Any industrial property rights and applicable laws must be observed by the recipient of our products on his own responsibility.

Characteristic Operating Points¹⁾

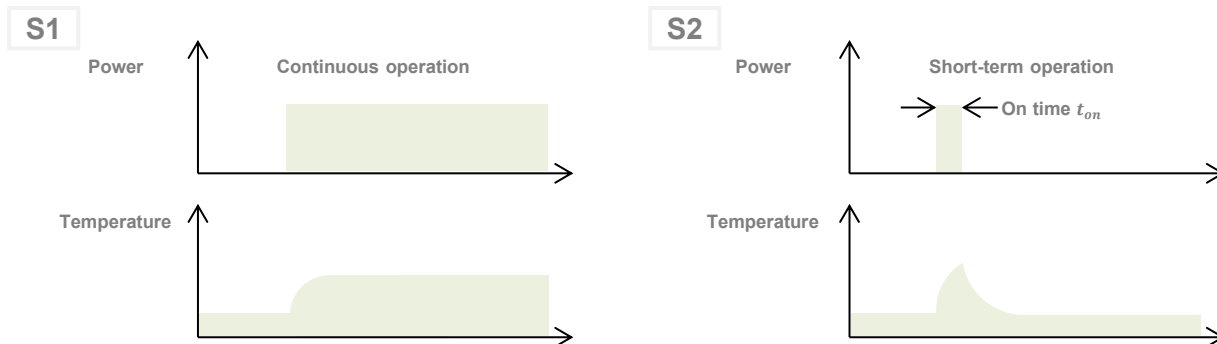
		S1	S2	S2	
Feasible operation time	t_{on}	continuous	15 min	30 sec	
Torque ²⁾	T	25	25	65	Nm
Power ²⁾	P	11	11	23	kW
Speed	n	4200	4200	3350	rpm
Phase RMS-current (AC) ³⁾	I_{rms}	248	248	823	A
Battery current (DC) ³⁾	I_{DC}	259	259	656	A
Battery voltage (DC)	U_{DC}	48	48	48	V
Electric frequency	f_{el}	350	350	279	Hz
Efficiency	η_{tot}	93	93	76	%
Power factor	$\cos(\varphi)$	0.94	0.94	0.73	

Cooling

Cooling medium	air	
Air flow rate	6	m/s
Cooling air temperature	20	°C
Cooling definition	1 (see image 1.1 in chapter "Additional Data")	

Maximum Operating Range

Torque ^{2) 4)}	T_{max}	76 @ 0 rpm	Nm
Power ^{2) 4)}	P_{max}	23 @ 3350 rpm	kW
Speed ⁵⁾	n_{max}	8000	rpm
Phase RMS-current (AC) ^{3) 4)}	$I_{rms,max}$	823	A
Battery current (DC) ^{3) 4)}	I_{max}	656	A
Battery voltage (DC)	U_{max}	200	V
Electric frequency	f_{el}	666	Hz



- 1) Temperature limitations according to the chapter "Additional Data"
- 2) Torque rating is dependent on rotor temperature
- 3) The cables must not exceed a temperature of 140 °C at any time. Temperature and service life depend on the installation condition.
- 4) Peak rating for max. 30 sec on time
- 5) Higher speeds available upon request. A detailed discussion of the functional safety concept of the vehicle is required.

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Electrical Data					
Number of phases	3				
Number of pole pairs	5				
Maximum stationary short circuit current ¹⁾	457 A (RMS) @ 20 °C, ≥ 2000 rpm				
Maximal efficiency	93				%
T/I constant (I<I _{nom})	0.104				Nm/A _{rms}
U/n constant (AC) at temperature 20 °C	rms:	6.88	peak:	9.98	V/(1000rpm)
Ke constant (AC) at temperature 20 °C	rms:	0.07	peak:	0.1	V/(rad*s ⁻¹)
Additional Data					
Rotor moment of inertia	0.0052				kg*m²
Allowed range of ambient temperature	Motor: -20 ... +85 Motor with brake BFK470-10: -20 ... +50 Motor with brake BFK470-12: -20 ... +40				°C
Maximal motor temperature	140				°C
Maximal surface temperature	100				°C
Maximum operating altitude	4000				m N.N.
Temperature monitoring	KTY 84-130				
Connectors					
Power terminals	3 x 50 mm² cables with M8 cable lugs				
Length power cables	500 mm				
Signal connectors	Deutsch DTM04-08PA				
Length signal cable	500 mm				
Certifications					
	Motor		Motor with brake		
Type approval	CE, EN 60034		CE, EN 60034		
Salt spray test	ISO 9227		Motor: ISO 9227 Brake: not available		
Protection grade ¹⁾	ISO 20653 IP6K9K		Motor: ISO 20653 IP6K9K Break: DIN EN 60529 IP66		
Vibrations	ISO 16750-3		ISO 16750-3		
Customs tariff number	8501 5230				

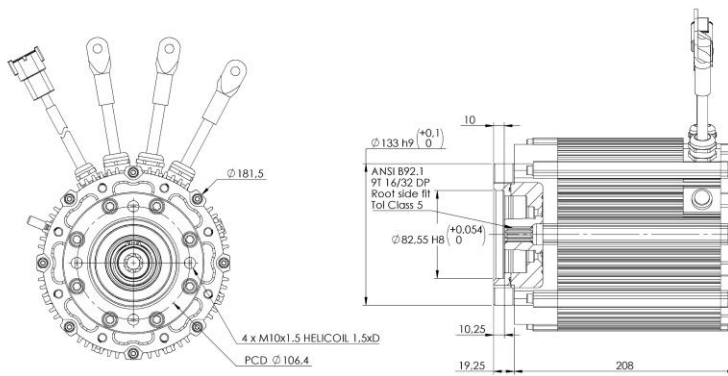
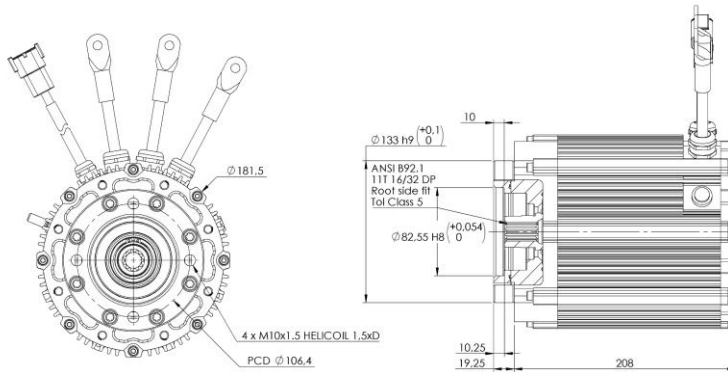
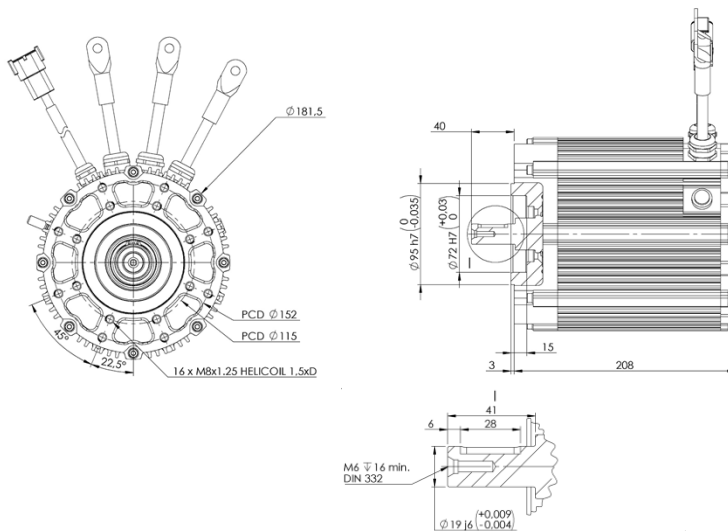
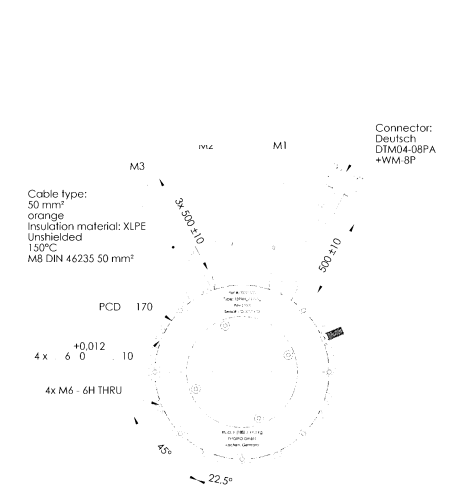
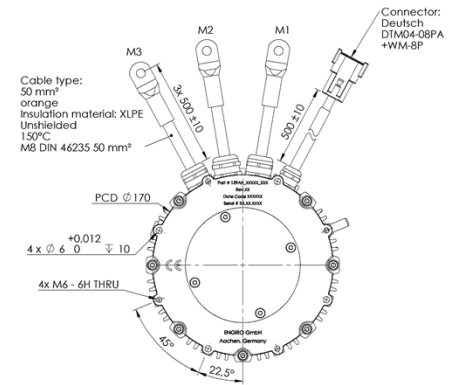
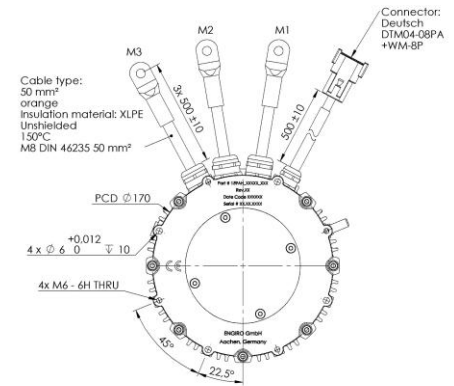
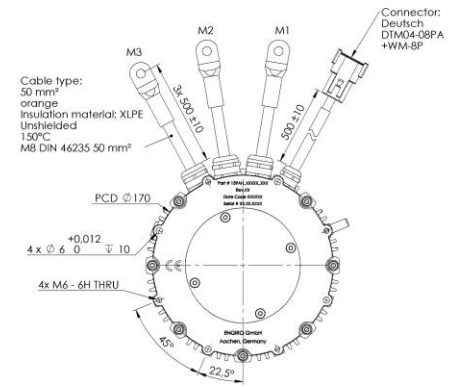
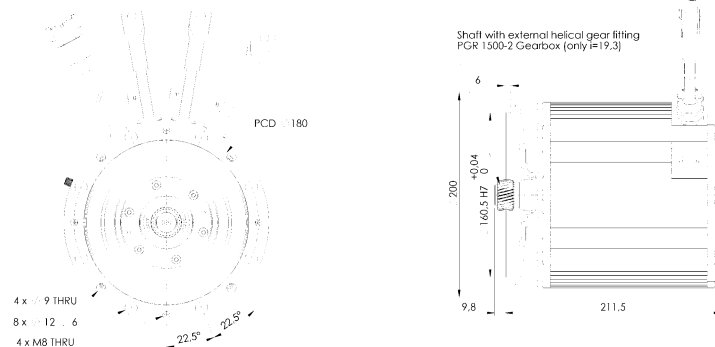
1) Simulated

2) Applies for cooling conditions: 6 m/s; 20 °C. For other cooling conditions contact ENGIRO

3) Please note that the IP6K9K rating is only valid if the machine is installed with suitable cable glands and an appropriate sealed interface at the drive side of the motor (flange and/or shaft). Please contact ENGIRO for further questions.

Available Type Variants				
Flange	Shaft	Pos. sensor	B-side interface	Weight (kg)
S1 SAE J744 82-2 (A) flange, Ø82,55 mm hydraulic pump	H1 Shaft with internal spline, ANSI B92.1 9T 16/32 DP 30° flat root side fit, Tol. Class 5	E Encoder	S01 Closed B-side	≈ 16 kg
	P1 Shaft with internal spline, ANSI B92.1 11T 16/32 DP 30° flat root side fit, Tol. Class 5			
E1 IEC B14 flange (Ø95 mm centering, Ø115 mm PCD 8 x M8)	D1 Cylindrical shaft with keyway, Ø19 mm	E Encoder	S01 Closed B-side	≈ 16 kg
		R Resolver	B01 1) Integrated brake with manual release BFK 470-12 HFC 68 Nm, 48 VDC, IP66 certified	≈ 22 kg
			B02 1) Integrated brake BFK 470-10 HFC 42 Nm, 48 VDC, IP66 certified	≈ 20 kg
B1 Flange for Allweier PGR 1500 gearbox including shaft seal	C1 Shaft with external helical gear fitting PGR 1500-2 Gearbox (only for i = 19,3)	R Resolver	S01 Closed B-side	≈ 16 kg
			B02 1) Integrated brake BFK 470-10 HFC 42 Nm, 48 VDC, IP66 certified	≈ 20 kg

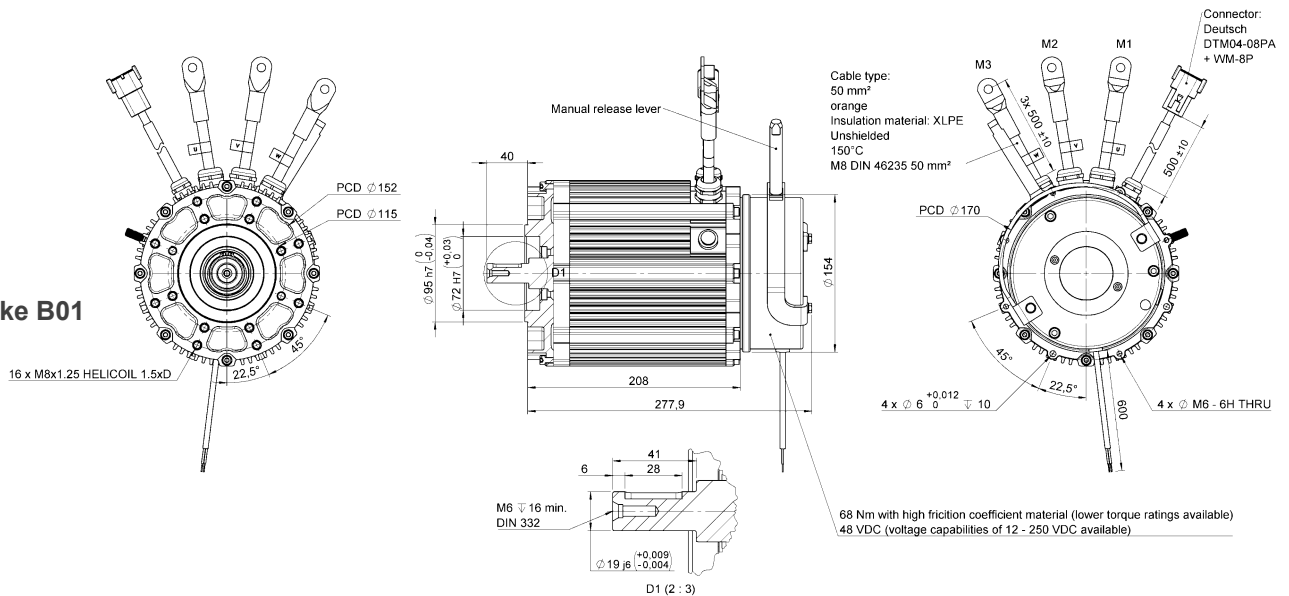
1) Other torque and voltage ranges are available on request. For more information about brake specifications and guidelines please consider the brake manufacturers manual (<https://www.kendrion.com/en/>)

Flange S1
Shaft H1Flange S1
Shaft P1Flange E1
Shaft D1Flange B1
Shaft C1

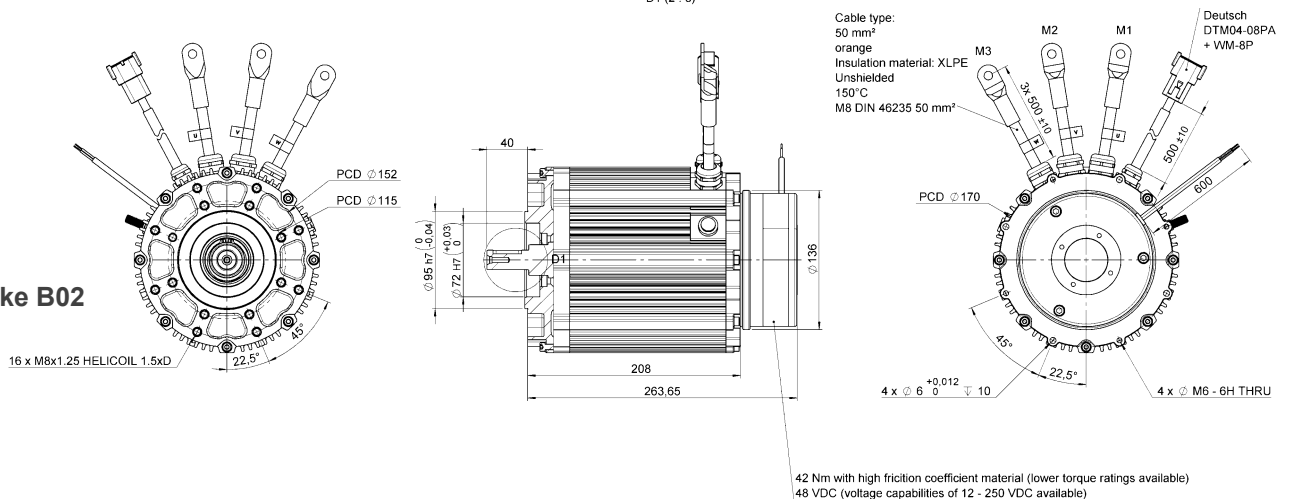
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Options for integrated Brake 1)

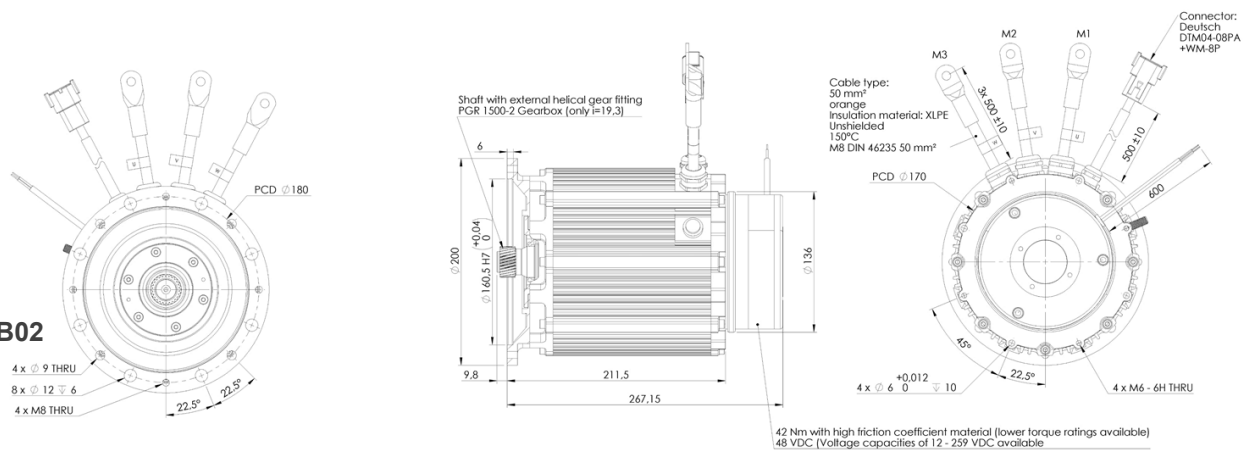
**Flange E1
Shaft D1
Integrated Brake B01**



**Flange E1
Shaft D1
Integrated Brake B02**



**Flange B1
Shaft C1
Integrated Brake B02**

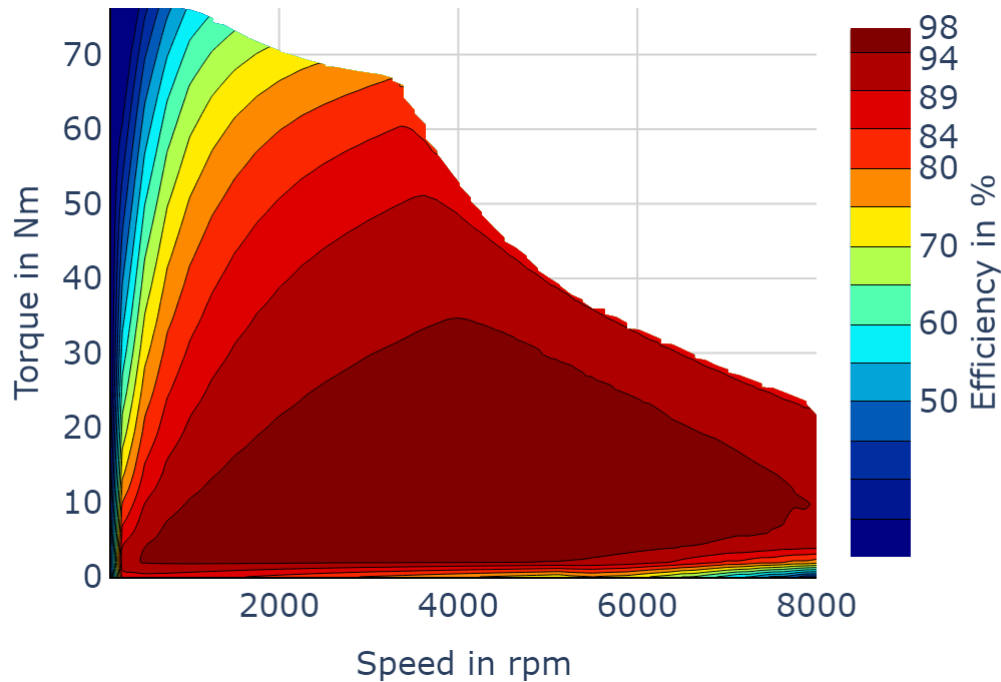


1) Other torque and voltage ranges are available on request. For more information about brake specifications and guidelines please consider the brake manufacturers manual (<https://www.kendrion.com/en/>)

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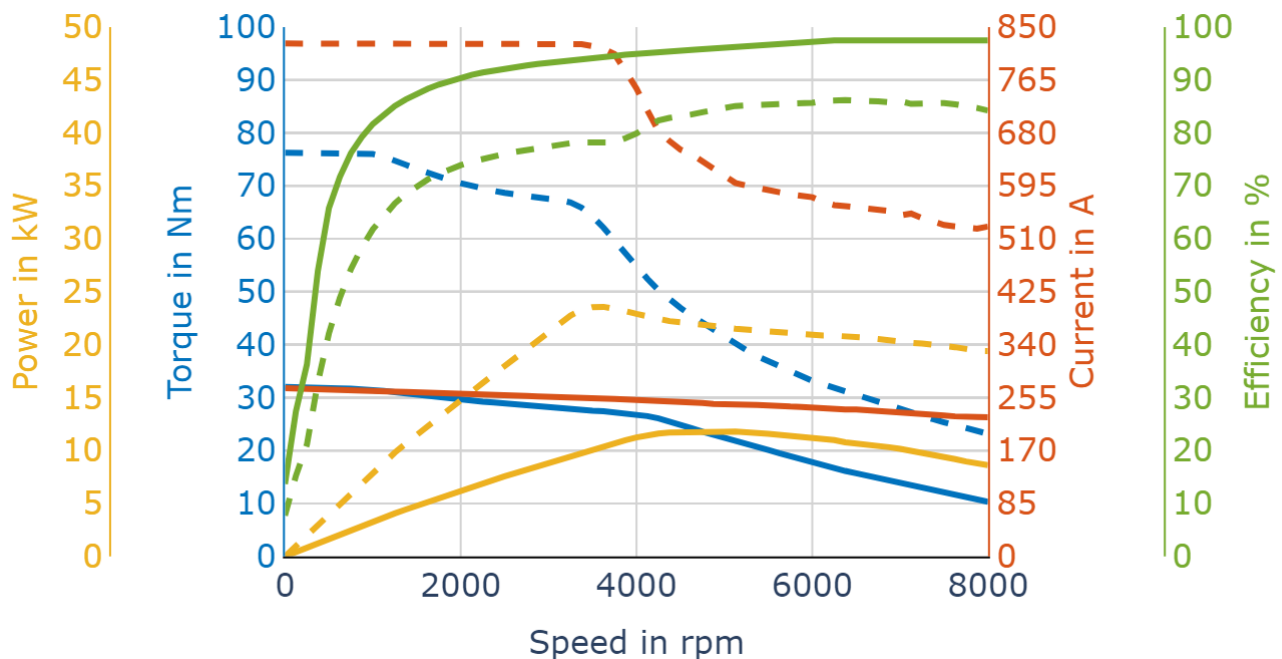
48 V

Simulated Efficiency of Motor Application

(electric machine only; $U_{\text{nom}} = 48 \text{ V}$)

48 V

Simulated Characteristic Motor Parameters

solid lines: S1 continuous; dashed lines: S2 (30 sec) maximum
(cooling as specified in chapter "Additional Data")

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