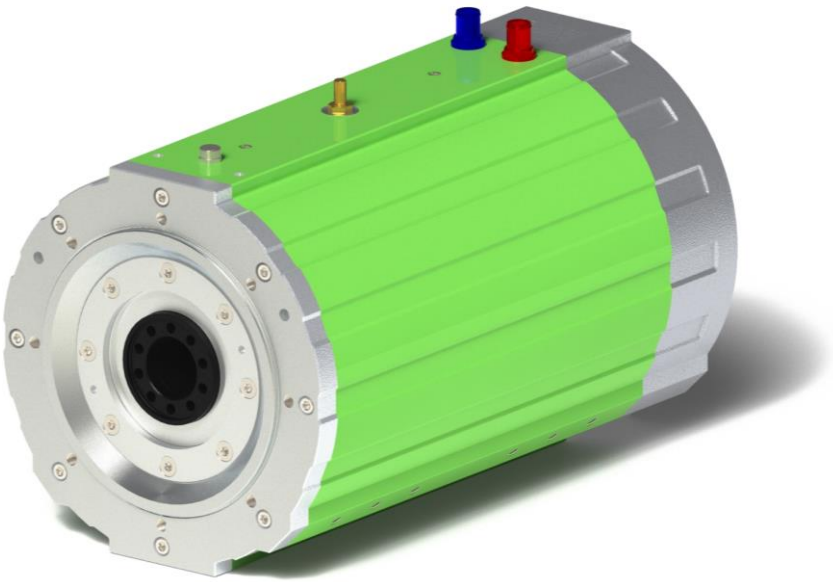
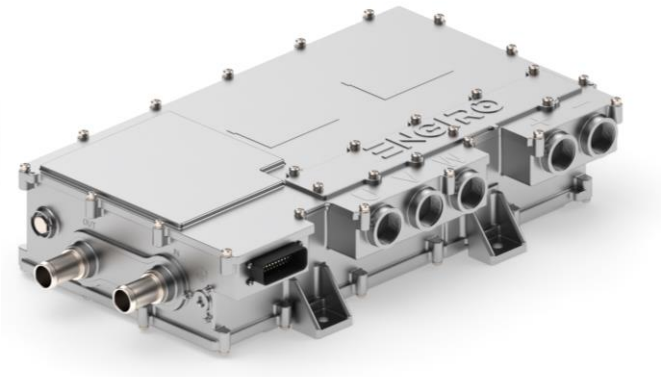
# 260W-20020-ABC

## water-cooled motor / generator with 165 kW continuous power

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





Part no.: 4843401
Article Name: EN1_800V_900A_W

## KEY FEATURES

- permanent magnet synchronous machine
- water-cooled
- high peak power for motor applications
- convincing cost-benefit ratio
- recommended voltage range from 350 V to 850 V
- delivery with controller possible



ENGIRO GmbH · Avantisallee 51 · 52072 Aachen · Germany
Tel. +49-241-99798-0 · E-Mail: engineering@engiro.de · www.engiro.de

# Table of Content



**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:

| Article Number Conversion | | | | | |
|---|---|---|---|---|---|
| **Part. No.** | **Old Part. No.** | **Flange** | **Shaft** | **Position Sensor** | **B-side interface** |
| 4807371 | 260W_20020_SFR | S1 | F1 | R | …S11 |

**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.**

Data, including specifications, contained within this document are summary in nature and subject to change at any time without notice and are intended for general information only. Call for latest revision. All brand names and product names referenced are trademarks, registered trademarks, or trade names of their respective holders.



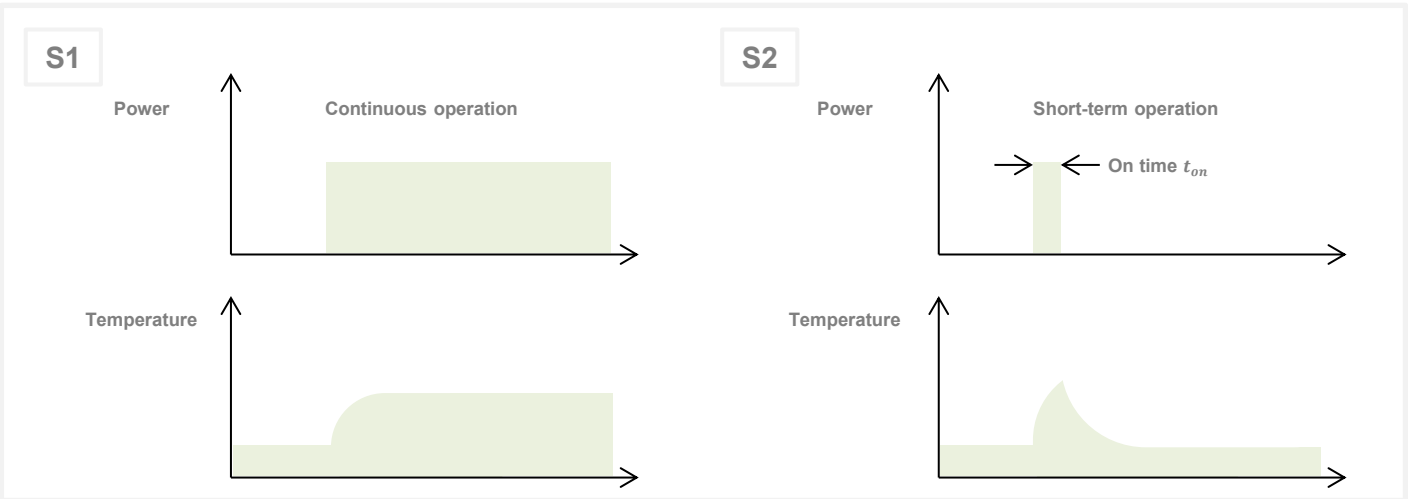
ENGIRO GmbH · Avantisallee 51 · 52072 Aachen · Germany
Tel. +49-241-99798-0 · E-Mail: engineering@engiro.de · www.engiro.de

# Operating Range

ENGIRO HYDAC INTERNATIONAL

| Characteristic Operating Points[1] | | | | | |
|---|---|---|---|---|---|
| | | S1 | S2 | S2 | |
| Feasible operation time | $t_{on}$ | continuous | 30 min | 60 sec | |
| Torque [2] | $T$ | 591 | 628 | 1097 | Nm |
| Power [2] | $P$ | 165 | 177 | 269 | kW |
| Speed | $n$ | 2680 | 2690 | 2340 | rpm |
| Phase RMS-current (AC) [3] | $I_{rms}$ | 219 | 231 | 491 | A |
| Battery current (DC) [3] | $I_{DC}$ | 227 | 236 | 399 | A |
| Battery voltage (DC) | $U_{DC}$ | 800 | 800 | 800 | V |
| Electric frequency | $f_{el}$ | 224 | 224 | 195 | Hz |
| Efficiency | $\eta_{tot}$ | 93 | 94 | 86 | % |
| Power factor | $cos(\varphi)$ | 0.94 | 0.95 | 0.87 | |
| Cooling | specified in chapter „Additional Data“ | | | | |

| Maximum Operating Range | | | |
|---|---|---|---|
| Torque [2] [4] | $T_{max}$ | 1097 @ 2340 rpm | Nm |
| Power [2] [4] | $P_{max}$ | 269 @ 2340 rpm | kW |
| Speed [5] | $n_{max}$ | 6000 | rpm |
| Phase RMS-current (AC) [3] [4] | $I_{rms,max}$ | 491 | A |
| Battery current (DC) [3] [4] | $I_{DC,max}$ | 399 | A |
| Battery voltage (DC) | $U_{max}$ | 850 | V |
| Electric frequency | $f_{el}$ | 500 | Hz |




1) Defined Range only valid for a power factor of 1 at DC input
2) Torque / Power 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. 60 sec on time
5) Higher speeds available upon request. A detailed discussion of the functional safety concept of the vehicle is required.

Data, including specifications, contained within this document are summary in nature and subject to change at any time without notice and are intended for general information only. Call for latest revision. All brand names and product names referenced are trademarks, registered trademarks, or trade names of their respective holders.



ENGIRO GmbH · Avantisallee 51 · 52072 Aachen · Germany
Tel. +49-241-99798-0 · E-Mail: engineering@engiro.de · www.engiro.de

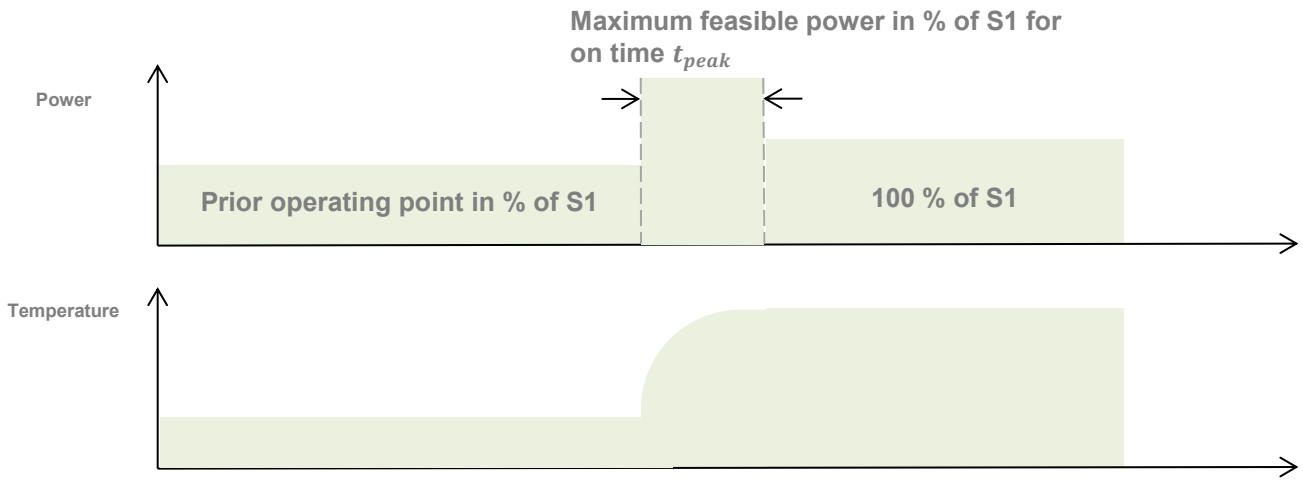
# Operating Range

| S9 Operating Points [1] Maximum Feasible Power in % of S1 | | | | | | |
|---|---|---|---|---|---|---|
| $U_{nom}$ = 800 V | | Prior operating point in % of S1 | | | | |
| | | 0 % | 25 % | 50 % | 75 % | 100 % |
| On time $t_{peak}$ | 30s | 160 % | 150 % | 140 % | 130 % | 100 % |
| | 180s | 120 % | 120 % | 110 % | 110 % | 100 % |
| | 420s | 100 % | 100 % | 100 % | 100 % | 100 % |

1) Cooling conditions as specified in chapter “Additional Data”

## S9

**Overload capability for subsequent continuous operation depending on preceding operation**




Data, including specifications, contained within this document are summary in nature and subject to change at any time without notice and are intended for general information only. Call for latest revision. All brand names and product names referenced are trademarks, registered trademarks, or trade names of their respective holders.



ENGIRO GmbH · Avantisallee 51 · 52072 Aachen · Germany
Tel. +49-241-99798-0 · E-Mail: engineering@engiro.de · www.engiro.de

# Additional Data

ENGIRO HYDAC INTERNATIONAL

| Electrical Data | | | | | | |
|---|---|---|---|---|---|---|
| Number of phases | | | | | 3 | |
| Number of pole pairs | | | | | 5 | |
| Maximum stationary short circuit current [1] | | | | | 262 A (RMS) @ 20 °C @ ≥ 400 rpm | |
| Maximal efficiency | | | | | 96 | % |
| T/I constant (I<Inom) | | | | | 2.697 | $Nm/A_{rms}$ |
| U/n constant (AC) at temperature 20 °C | | rms: | 171.41 | peak: | 253.76 | V/(1000rpm) |
| Ke constant (AC) at temperature 20 °C | | rms: | 1.64 | peak: | 2.42 | $V/(rad*s^{-1})$ |
| **Additional Data** | | | | | | |
| Rotor moment of inertia | | | | | 0.1327 | $kg*m^2$ |
| Allowed range of ambient temperature | | | | | -20 … +85 | °C |
| Maximal motor temperature [3] | | | | | operating point dependent | °C |
| Temperature monitoring | | | | | KTY 84-130 | |
| Cooling | Advised medium (OAT Coolants) | | | | water/glycol - 50/50<br>▪ TL 774-D/F<br>▪ VIN 878389<br>▪ MAN 324 SNF<br>▪ MTL 5048 | |
| | Flow rate | | | | 20 | l/min |
| | Inlet temperature | | | | 45 | °C |
| | Pressure drop | | | | 0.655 | bar |
| | Maximum pressure | | | | 2 | bar |
| | Cooling channel volume | | | | 1.16 | l |
| **Connectors** | | | | | | |
| Power terminals | | | | | 3 x M25 cable gland | |
| Signal connectors | | | | | M16, Hummel 10 Pin connector | |
| Cooling connectors | | | | | 2 x ¾" / 19 mm | |
| **Certifications** | | | | | | |
| Type approval | | | | | CE, EN 60034 | |
| Salt mist | | | | | Prepared for ISO 9227 | |
| Protection grade | | | | | ISO 20653 IP6K9K[2] | |
| Vibrations | | | | | Prepared for ISO 16750-3 | |
| Customs tariff number | | | | | 8501 5381 | |

1) Simulated
2) 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.
3) Please contact ENGIRO for the parametrization of third-party inverters

Data, including specifications, contained within this document are summary in nature and subject to change at any time without notice and are intended for general information only. Call for latest revision. All brand names and product names referenced are trademarks, registered trademarks, or trade names of their respective holders.



ENGIRO GmbH · Avantisallee 51 · 52072 Aachen · Germany
Tel. +49-241-99798-0 · E-Mail: engineering@engiro.de · www.engiro.de

# Technical Drawings

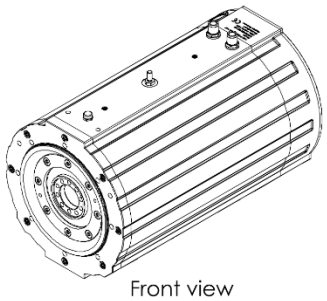
ENGIRO HYDAC INTERNATIONAL

## Available Type Variants

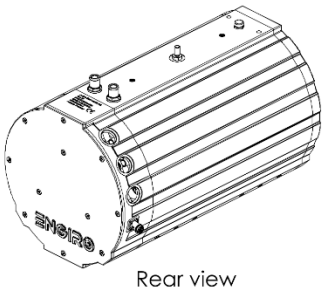
| Flange | Shaft | Pos. sensor | B-side interface | Weight (kg) |
|---|---|---|---|---|
| **S1**<br>Flange with mounting threads (Ø230 mm centering, Ø250 PCD 8 x M10) | **F1**<br>Hollow shaft with screw flange (Ø90 and Ø50 mm centering, Ø66 mm PCD 10 x M10) | **R**<br>Resolver | **S11**<br>Closed B-side | ≈ 119 kg |

Other individual combinations are also possible on request.

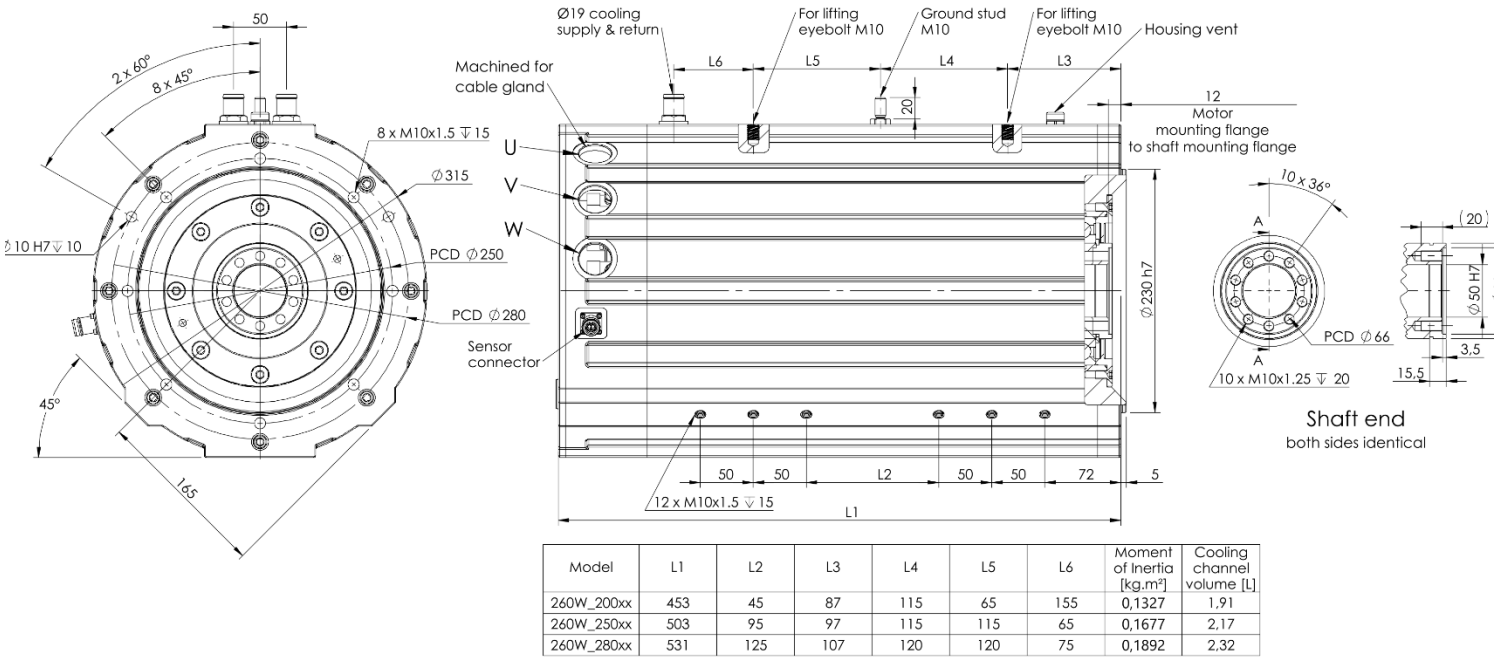
## Technical Drawings



Front view



Rear view
S Flange




| Model | L1 | L2 | L3 | L4 | L5 | L6 | Moment of Inertia [kg.m²] | Cooling channel volume [L] |
|---|---|---|---|---|---|---|---|---|
| 260W_200xx | 453 | 45 | 87 | 115 | 65 | 155 | 0,1327 | 1,91 |
| 260W_250xx | 503 | 95 | 97 | 115 | 115 | 65 | 0,1677 | 2,17 |
| 260W_280xx | 531 | 125 | 107 | 120 | 120 | 75 | 0,1892 | 2,32 |

1) Depending on the operating points and load conditions, measures may be required to increase the coefficient of friction in the flange connection. Please contact ENGIRO for further questions.

Data, including specifications, contained within this document are summary in nature and subject to change at any time without notice and are intended for general information only. Call for latest revision. All brand names and product names referenced are trademarks, registered trademarks, or trade names of their respective holders.



ENGIRO GmbH · Avantisallee 51 · 52072 Aachen · Germany
Tel. +49-241-99798-0 · E-Mail: engineering@engiro.de · www.engiro.de

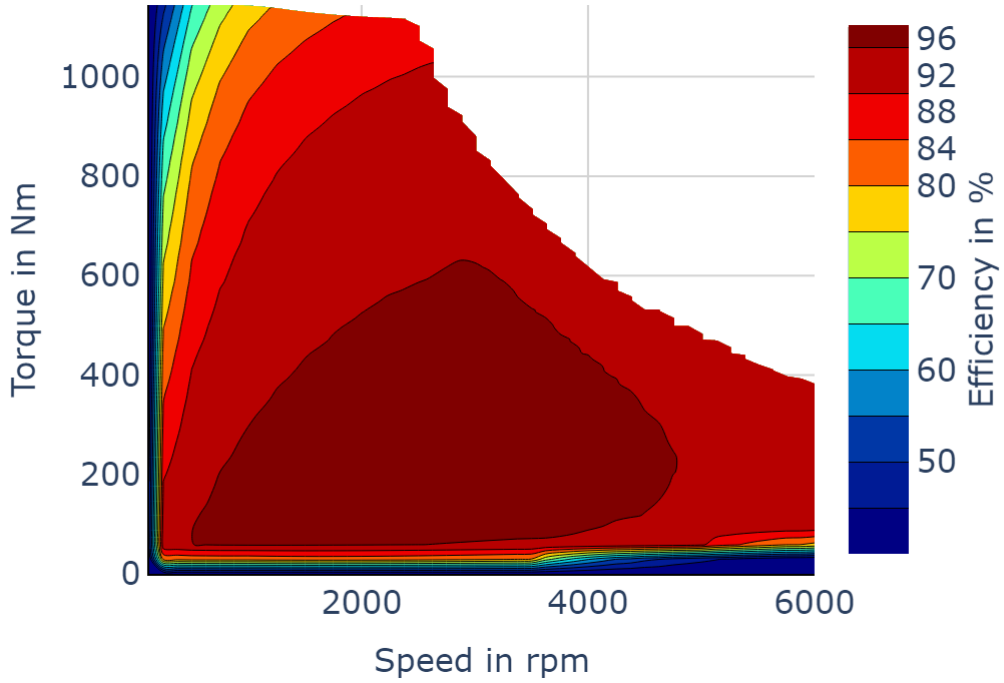
# Performance Plots

ENGIRO HYDAC INTERNATIONAL

## 800 V

### Simulated Efficiency of Motor Application

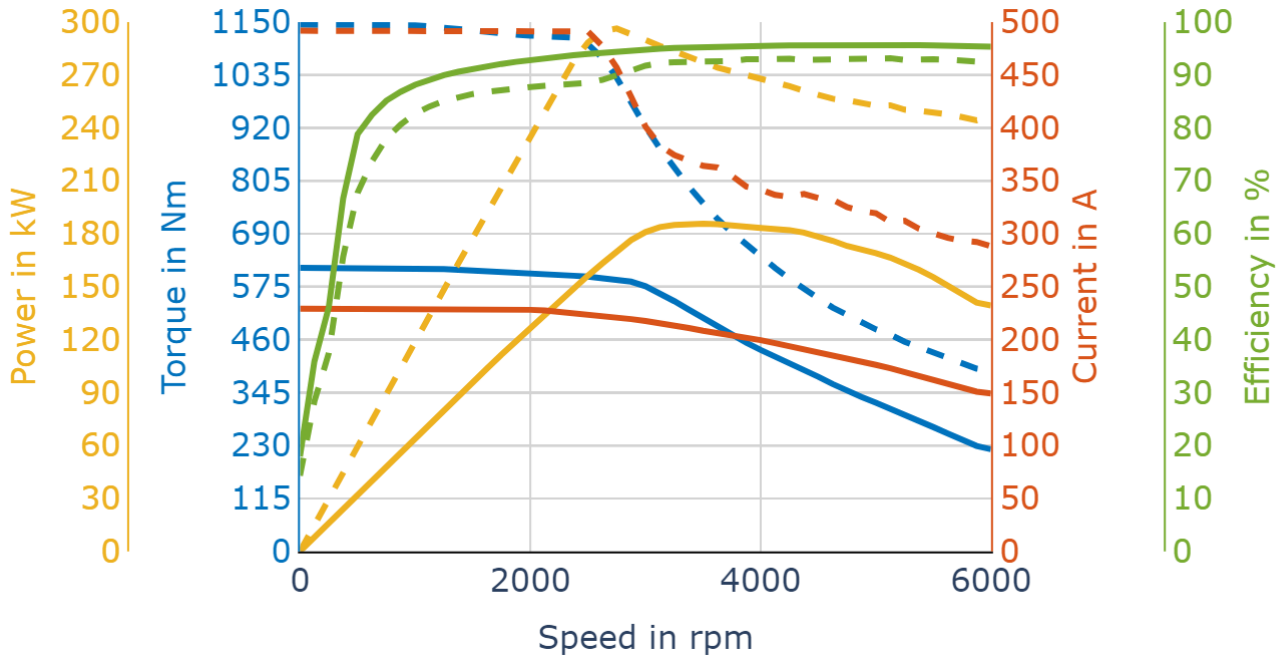
(electric machine only; $U_{nom}$ = 800 V)




## 800 V

### Simulated Characteristic Motor Parameters

solid lines: S1 continuous; dashed lines: S2 (60 sec) maximum
(cooling as specified in chapter “Additional Data”)




Data, including specifications, contained within this document are summary in nature and subject to change at any time without notice and are intended for general information only. Call for latest revision. All brand names and product names referenced are trademarks, registered trademarks, or trade names of their respective holders.

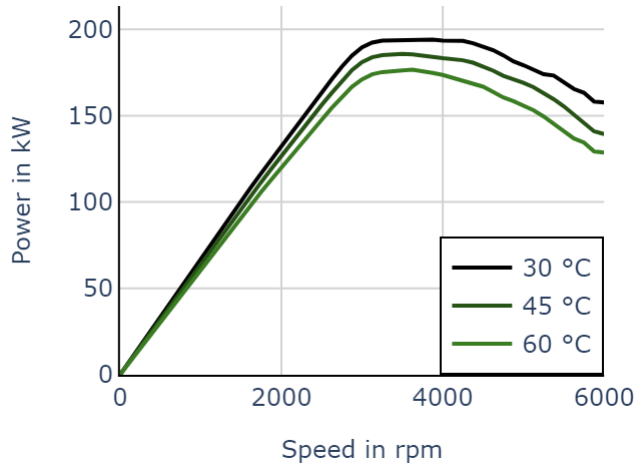


ENGIRO GmbH · Avantisallee 51 · 52072 Aachen · Germany
Tel. +49-241-99798-0 · E-Mail: engineering@engiro.de · www.engiro.de

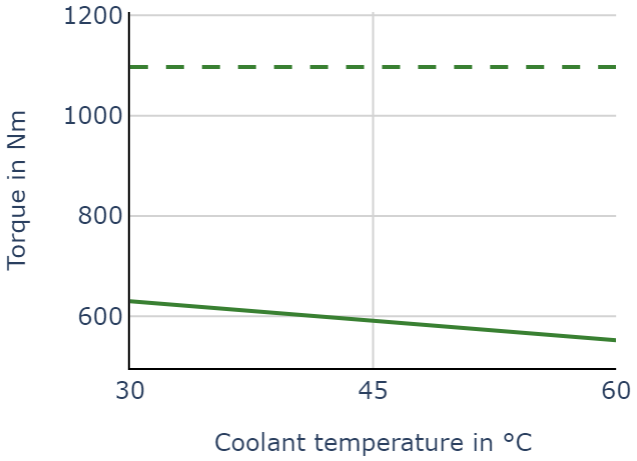
# Additional Characteristics



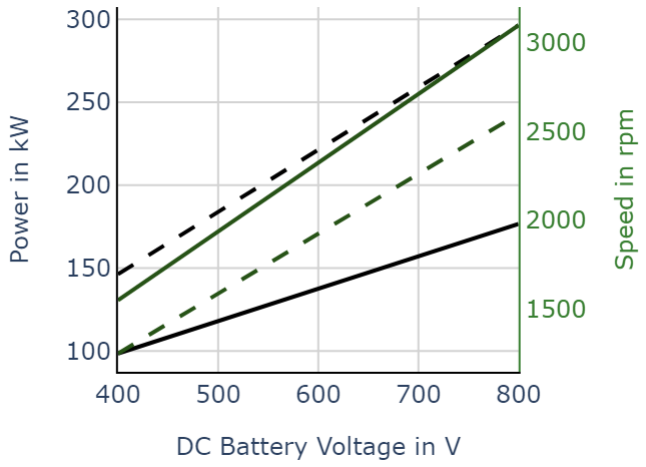
Simulated Nominal Power at Different Coolant Temperatures – $U_{nom}$ = 800 V



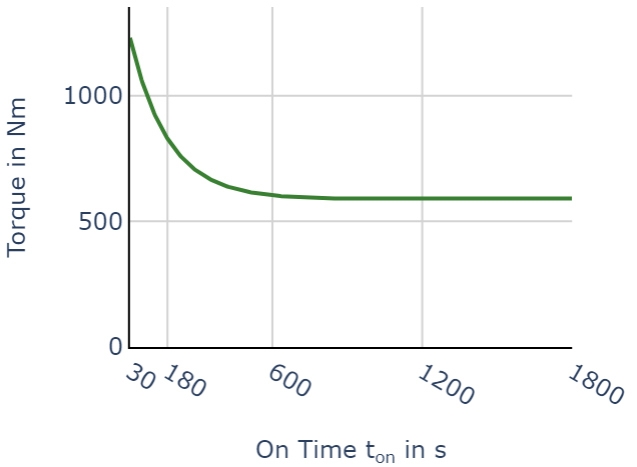

Available Torque at Different Coolant Temperatures [1)]




Simulated Power and Corner Speed over Battery Voltage[1)]
(45 °C Coolant Temperature)




Torque over Feasible Maximum On Time, S2 Operation Cycles
(45 °C Coolant Temperature)




1) solid lines: continuous; dashed lines: maximum;

Data, including specifications, contained within this document are summary in nature and subject to change at any time without notice and are intended for general information only. Call for latest revision. All brand names and product names referenced are trademarks, registered trademarks, or trade names of their respective holders.



ENGIRO GmbH · Avantisallee 51 · 52072 Aachen · Germany
Tel. +49-241-99798-0 · E-Mail: engineering@engiro.de · www.engiro.de