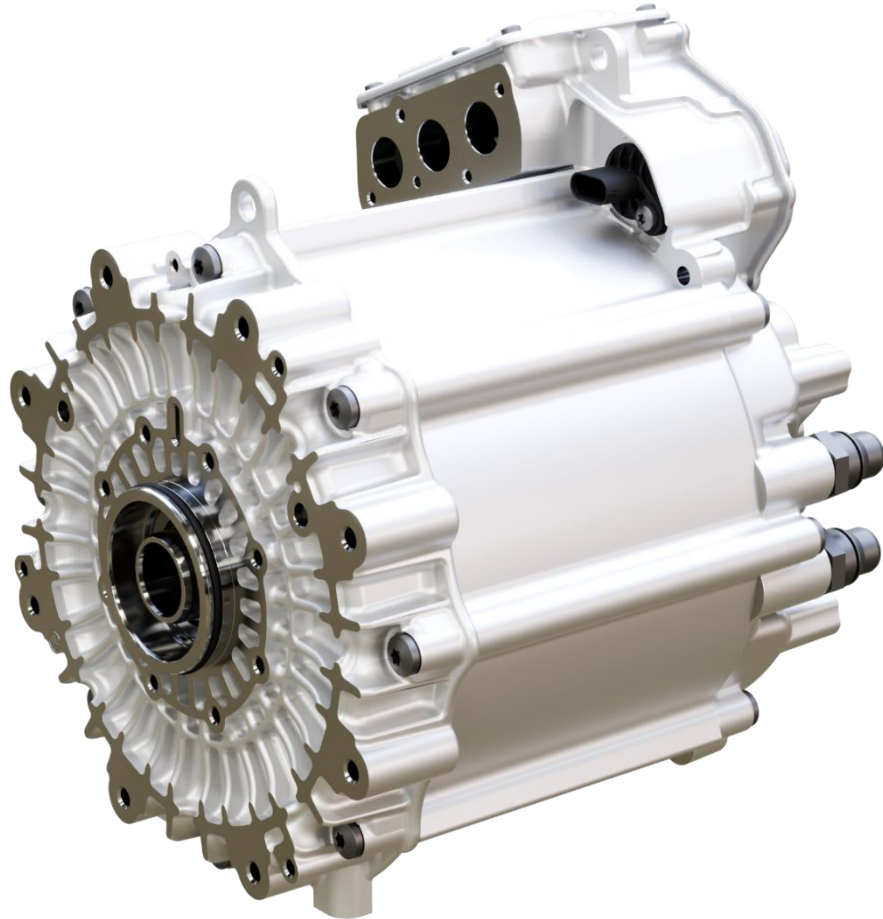


# EM220-154 800V

PSM with 156 kW continuous power



## Key Features

- permanent magnet synchronous machine
- hairpin technology
- water-cooled
- high power for motor applications

## General properties & Basic information

Machine type	Permanent magnet synchronous machine (PSM)
Stator winding technology	U-pin ("Hairpin")
Pole pair number	4
Preferred direction of rotation	Counter-clockwise (see page 4)
Max. operating speed	13,000 rpm
Operating ambient temperature	- 25°C ... 85°C
Max. altitude	4,400 m ASL
Protection classes	IP6K6K / IP6K7 / IP6K9K
Shock loads	up to 50g (6ms) (ISO 16750-3 Test 4.2.2 Shock II)
Vibrations	up to 50 m/s <sup>2</sup> sine-on-random & 68.7 m/s <sup>2</sup> RMS (ISO 16750-3 4.1.5 Test XIII)

## Dimension & Mechanical properties

Outside dimension (L x W x H)	330 mm x 308 mm x 373 mm
Total weight	~ 64 kg ( <i>without coolant</i> )
Moment of inertia	~ 50,565 kgmm <sup>2</sup> ( <i>incl. Rotor and shaft</i> )
Rotating mass	~ 19 kg
Balancing quality	G4.0 (ISO 21940-11:2003)

## Electrical properties

Nominal voltage	700 V <sub>AC</sub>
Maximal efficiency	97 %
Minimum inverter switching frequency	4 kHz

## Continuous / Nominal Performance (s1, 30 min @ coolant temp. 65 °C)\*

Power	156 kW
Torque	235 Nm
Current	248 A <sub>rms</sub>

\* data achieved with 450 A inverter @ 10 kHz switching frequency

## Peak Performance (s2, 20 s @ coolant temp. 65 °C)\*

Power	306 kW
Torque	460 Nm
Current	450 A <sub>rms</sub>

\* data achieved with 450 A inverter @ 10 kHz switching frequency

## Cooling

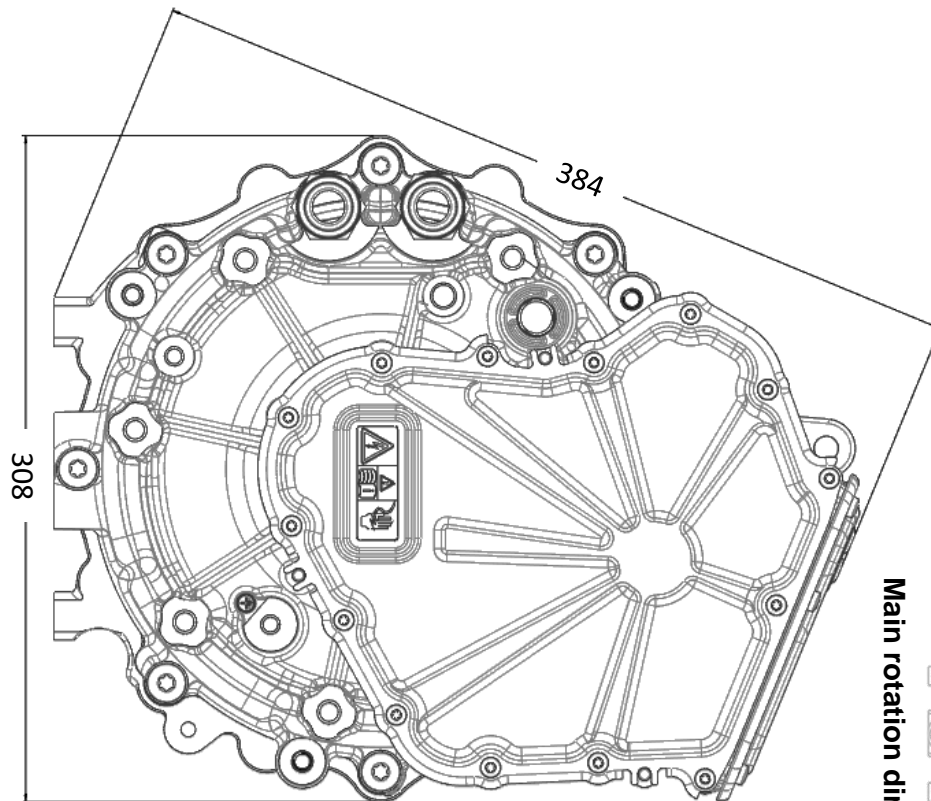
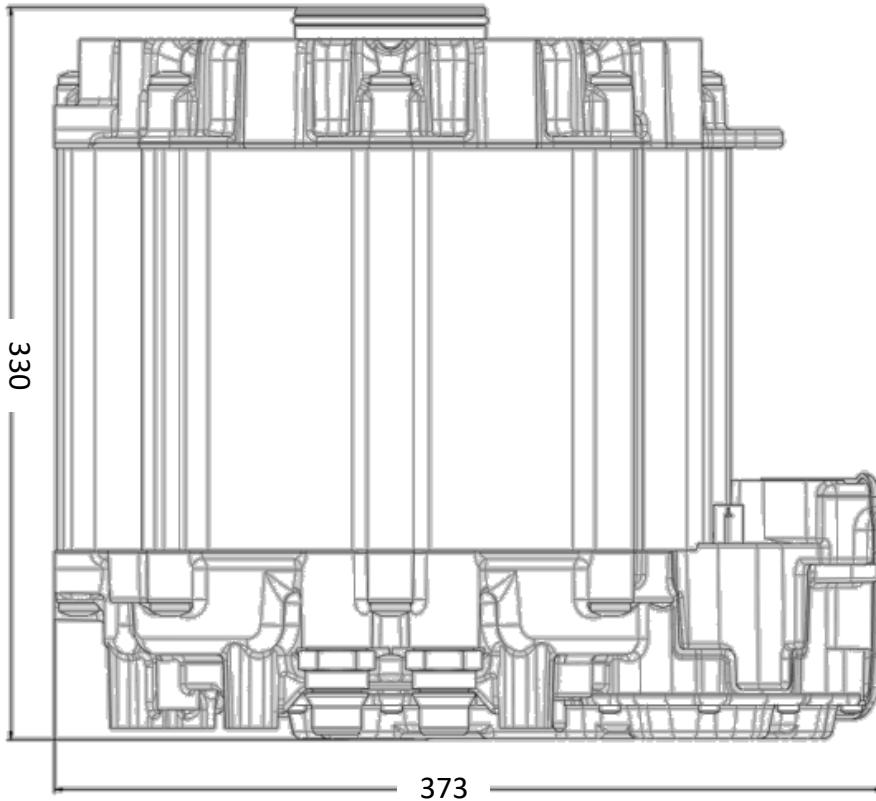
Cooling liquid/mixture	50% Water; 50% Glycol (Glysantin G40 BASF recommended)
Nominal cooling liquid flow	10 l/min @ 65°C
Pressure Loss	~ 130 mbar @ 10 l/min; 65°C
Max. cooling liquid temperature	75°C

## Connections & Interfaces

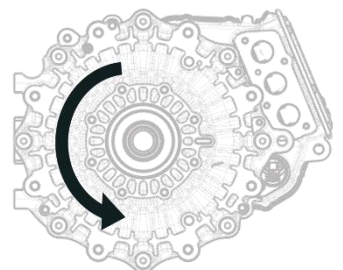
Coolant connection	Normaquick PS3 NW16 (inlet & outlet)
HV connector	3 x IPT-HD plug connection ( <i>TE Connectivity (2355146-2)</i> )
HV cable dimension	3 x 50/70/95 mm <sup>2</sup>
LV connector	10-pin connector socket ( <i>Hirschmann Automotive (806-360-521)</i> )
Standard flange D-side	8 x M10x30, bolt circle Ø275 mm 8 x M8x24, bolt circle Ø130 mm
Shaft Spline	DIN5480 N32x1.25x24x9H

Interfaces can be adapted or changed depending on the integration case. Performance data may vary depending on the inverter and cooling system chosen.

Please contact our sales for further information.

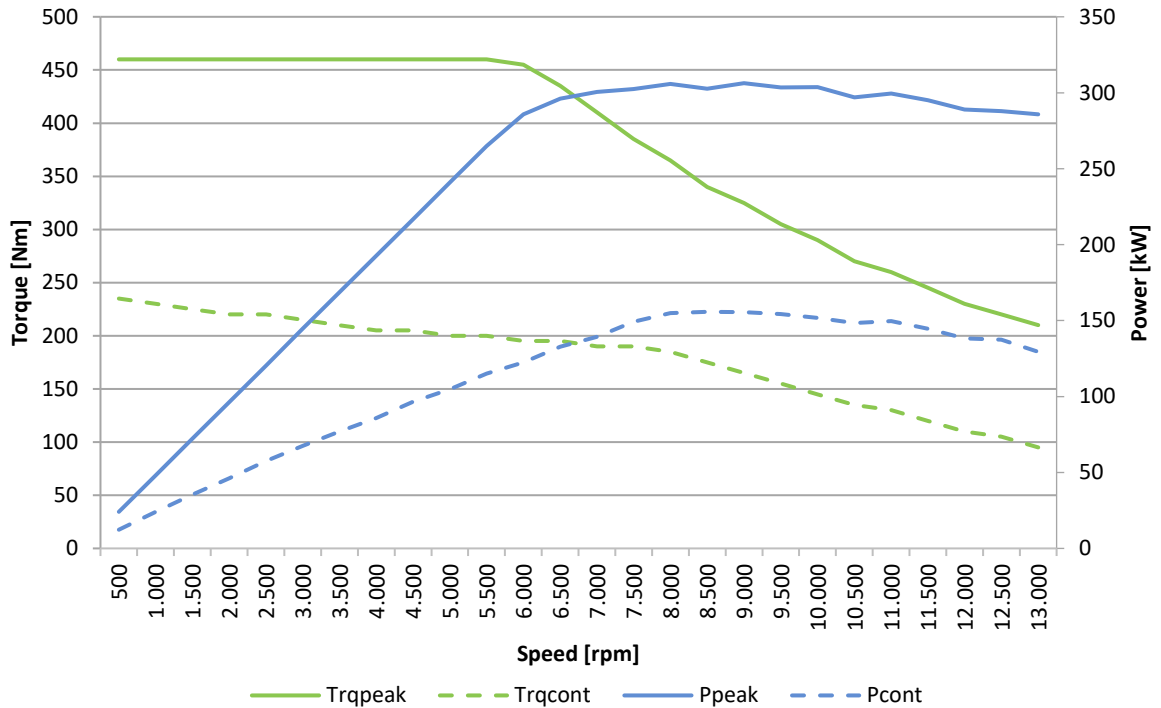


Main rotation direction



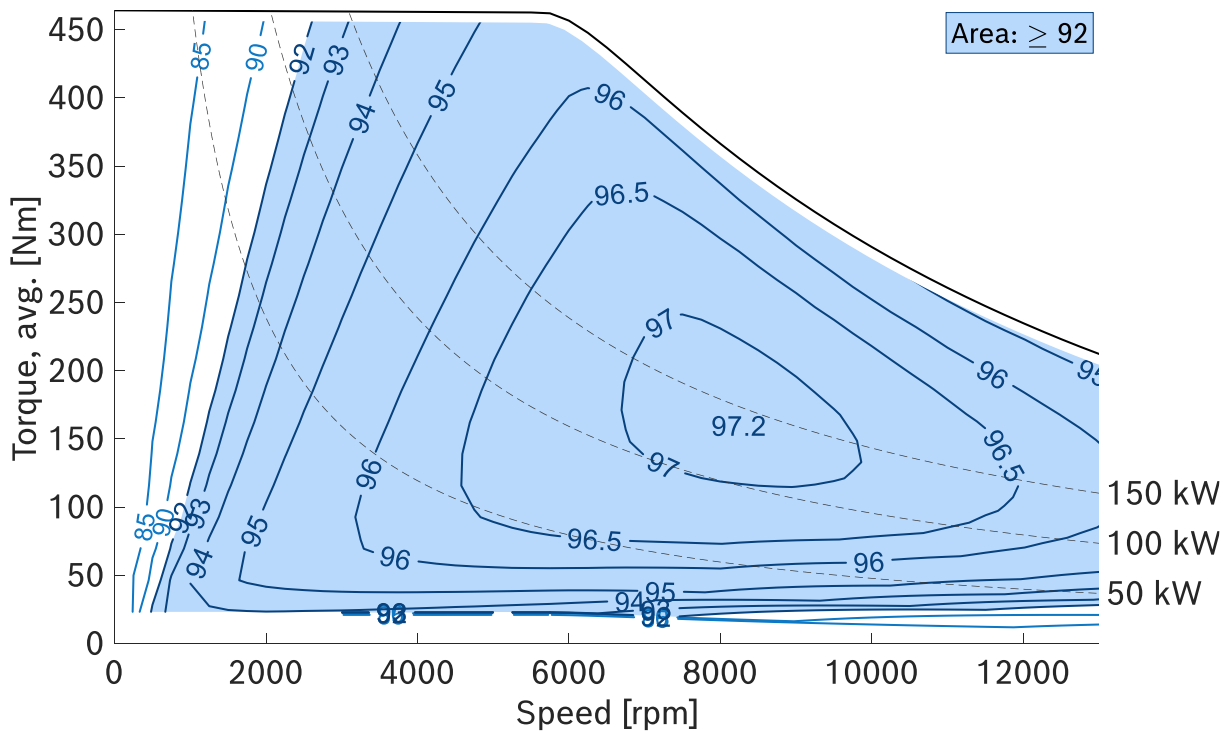
## Simulated Characteristic Motor Parameters

EM only;  $U_{nom} = 700\text{ V}$ ;  $I = 450\text{ A}_{rms}$   
 continuous lines: S1 30 min; peak lines: 20 s



## Simulated Efficiency of Motor

EM only;  $U_{nom} = 700\text{ V}$ ;  $I = 450\text{ A}_{rms}$



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