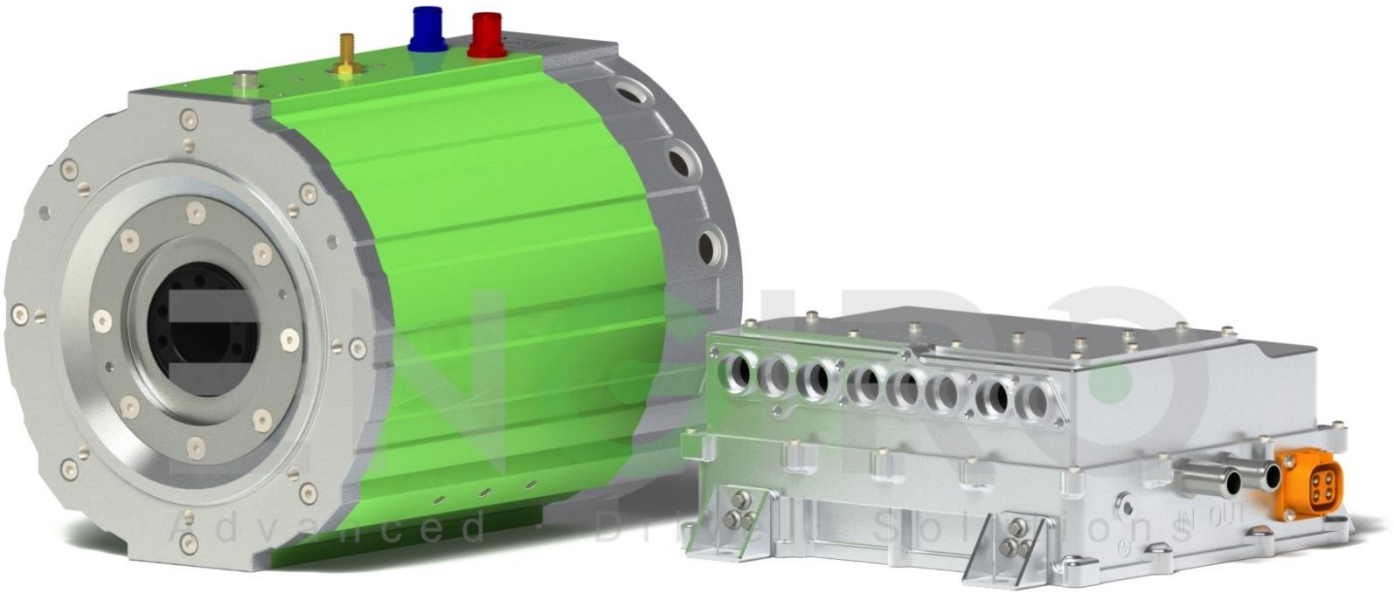
260W-13202-SFR
400V Traction Set

127 kW drive set for traction applications

Art.-No.: 1667



KEY FEATURES

- 400V 6-phase motor controller
- Water-cooled
- High peak power for traction applications
- Full torque at zero speed
- EN ISO/IEC 17020:2012 (R85) already available upon request

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Table of Content

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.

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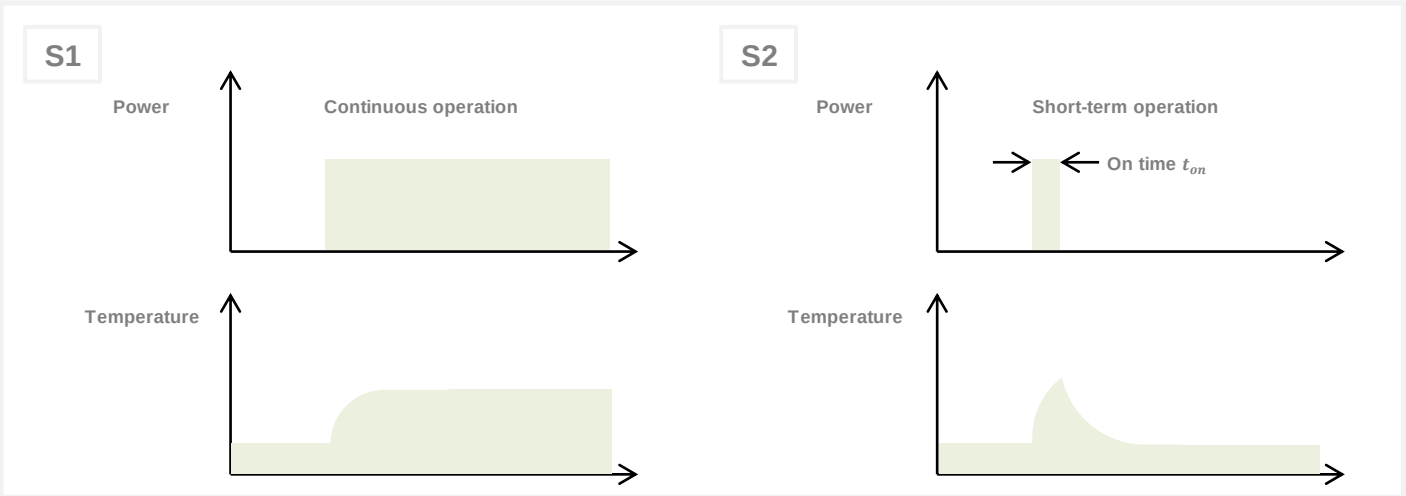
Operating Range

Characteristic Operating Points[1] (cooling as specified on next page)		S1	S2	S2	
Feasible operation time	t_{on}	Continuous	180 sec	30 sec	
Torque	T	335	514	670	Nm
Power	P	149	191	227	kW
Recuperation power	P_{recu}	137	213	261	kW
Phase rms-current (AC)	I_{rms}	204	300	439	A
Battery current (DC)	I_{DC}	416	533	665	A
Battery voltage (DC)	U_{DC}	400	400	400	V
Speed	n	4250	3567	3243	rpm
Electric frequency	f_{el}	354	297	270	Hz
Set Efficiency	η_{tot}	91	90	87	%

Maximum Operating Range		Min.	Nom.	Max.	
Torque	T_{max}	-	335	670	Nm
Power	P_{max}	-	149	227	kW
Recuperation power	$P_{max,Recu}$	-	137	261	kW
Phase rms-current	$I_{rms,max}$	-	204[2]	439[2,3]	A
Battery current (DC)	$I_{DC,max}$	-	416[2]	665[2,3]	A
Battery voltage (DC)	U_{max}	190[4]	400	450[4]	V
Speed	n_{max}	-	4250	5000	rpm
Electric frequency	f_{el}	-	354	417	Hz
Power density	$p_{gravimetric}$			1.98	kW/kg



1) Defined Range only valid for a power factor of 1 at DC input
2) The cables must not exceed a temperature of 140 °C at any time. Temperature and service life depend on the installation condition.
3) Peak rating for max. 60 seconds on time
4) Derating @ <280V and >420V

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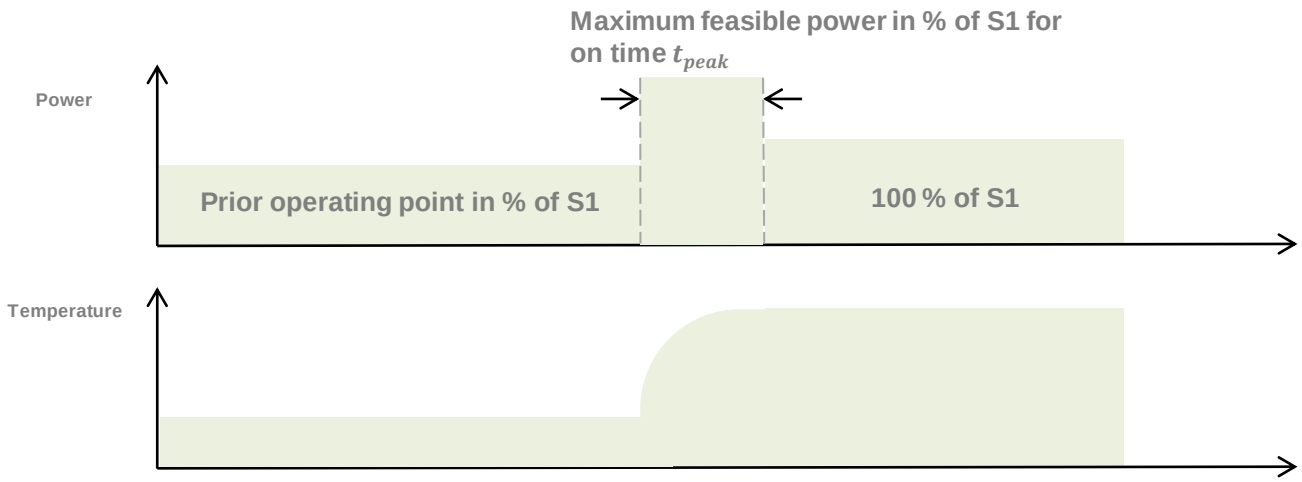
Operating Range

S9 Operating Points Maximum Feasible Power in % of S1						
U_{nom} = 400V		Prior operating point in % of S1				
		0 %	25 %	50 %	75 %	100 %
On time t_{peak}	30 s	167 %	167 %	167 %	163 %	100 %
	60s	163 %	150 %	´148 %	130 %	100 %
	180s	140 %	130 %	126 %	115 %	100 %

S9 Overload capability for subsequent continuous operation depending on preceding operation



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Additional Data

Additional Data					
		Motor	Inverter		
Weight (w/o cables)		106	15	kg	
Rotor moment of inertia		0.095	-	kg*m²	
Allowed range of ambient temperature		-20 … +85	-40 … +90	°C	
Cooling	Advised medium (OAT Coolants)	water/glycol - 50/50 ▪ TL 774-D/F ▪ VIN 878389 ▪ MAN 324 SNF ▪ MTL 5048			
	Flow rate	> 15	8-16[1)]	l/min	
	Inlet temperature	≤ 60[2)]	≤ 85[3)]	°C	
	Pressure drop	≤ 0.5	nom. 0.15	bar	
	Maximum pressure	2	2.5	bar	
	Cooling channel volume	1.64	0.13	l	
DC link capacitance		-	1000	µF	
Temperature monitoring		1 x KTY84-130[4)]	Internal		
Rotation direction		freely controllable via CAN-Bus			
Ports					
Power terminals		2-Phase HVDC, 2x 3-Phase HVAC			
Signal connectors		AMPSEAL, 35-Pin			
Cooling connectors		inner Ø 15 mm outer Ø 19 mm	inner Ø 15 mm outer Ø 20 mm		
Control and Communication					
Type		Slave			
		Speed/Torque Control freely controllable via interface			
CAN Bus	Symbol/Baud rate	250/500 kbaud/s[5)]			
	Technology	CAN 2.0, J1939 like			
Torque Ramp		Safety limits can be set in inverter by ENGIRO.			
Speed Ramp		Safety limits can be set in inverter by ENGIRO.			

1) Derating for 8-12 l/min
2) Derating for $T_{coolant}$ > 45°C
3) Derating for $T_{coolant}$ > 65°C
4) per 3-phase system
5) Upon request

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Certifications

Certifications		
	Motor	**Inverter**
Type approval	CE, EN 60034	-
Environmental	ISO 9227	-
Protection grade	ISO 20653 IP6K9K[2)]	ISO 20653 IP67
Vibrations	Prepared for ISO 16750-3	ISO 16750-3
EMC	-	CISPR25, ECE R10
Functional safety	-	Designed for ISO 26262 up to ASIL-C
Automotive	EN ISO/IEC 17020:2012 (R85)[1,2)]	

1) Available upon request and applies only to combination of motor and inverter.
2) Certificate already available for nominal power of 115 kW.
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. / Only applies to SFR Variant /

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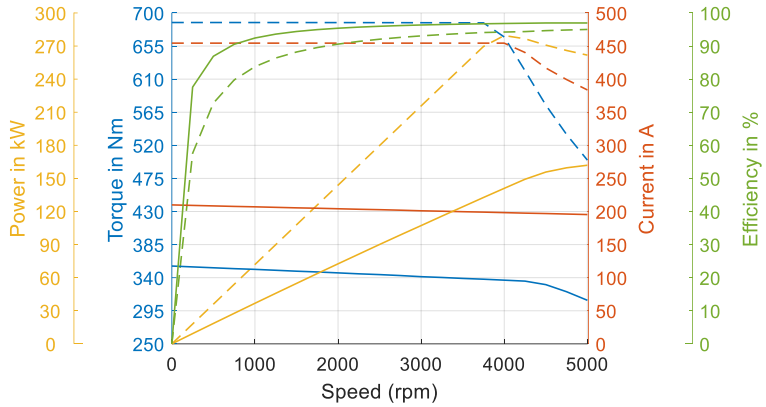
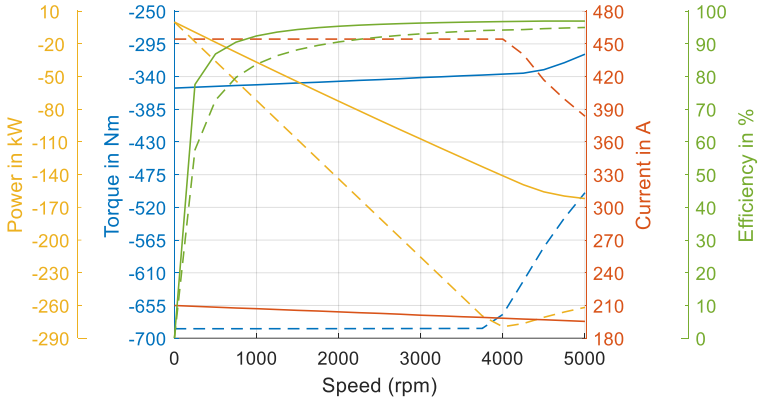
Performance Plots

400V

Simulated Motor Characteristics
solid lines: continuous
dashed lines: maximum

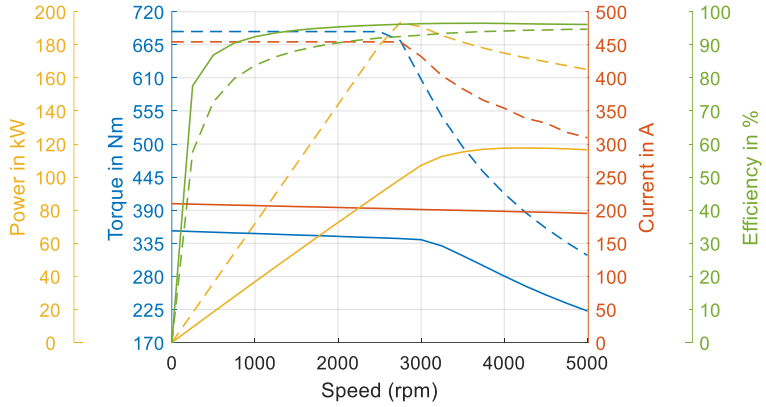


Simulated Generator Characteristics
solid lines: continuous
dashed lines: maximum

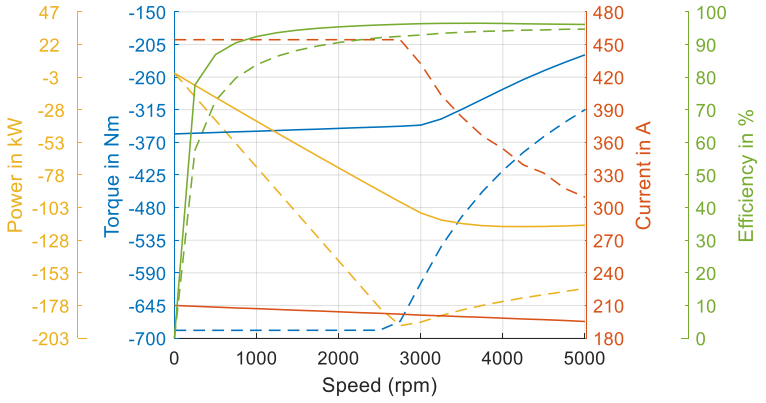


280V

Simulated Motor Characteristics
solid lines: continuous
dashed lines: maximum



Simulated Generator Characteristics
solid lines: continuous
dashed lines: maximum



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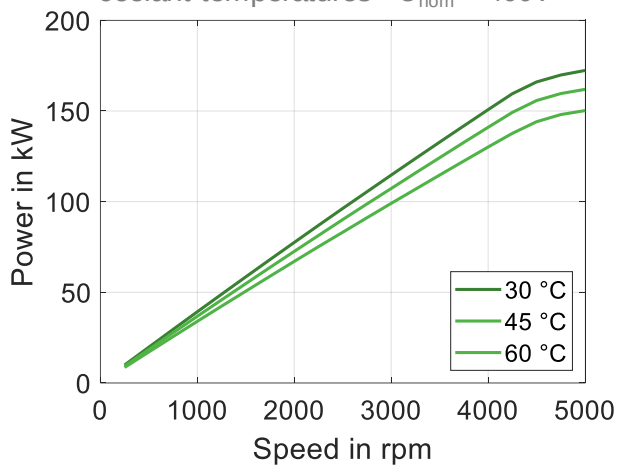
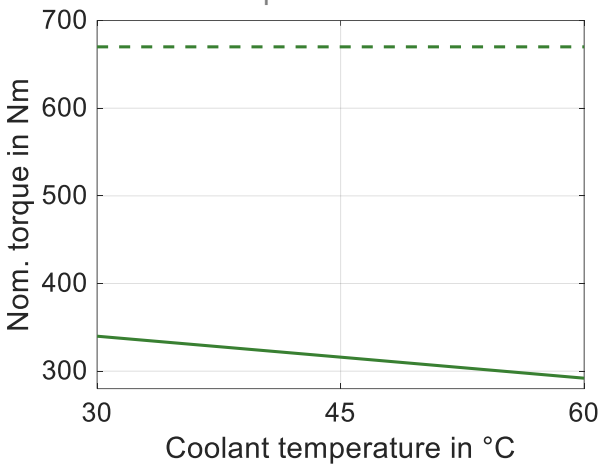
Additional Characteristics

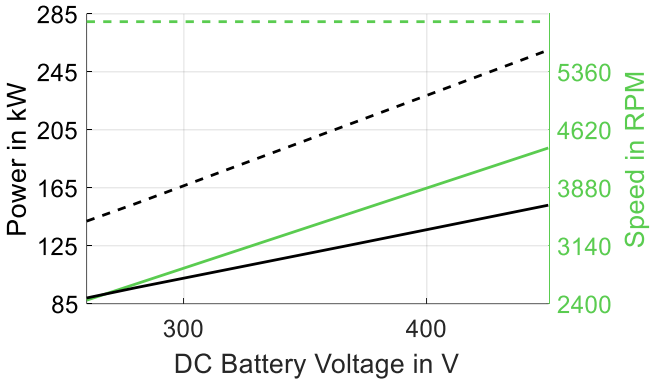
Simulated nominal power at different coolant temperatures - U_{nom} = 400V



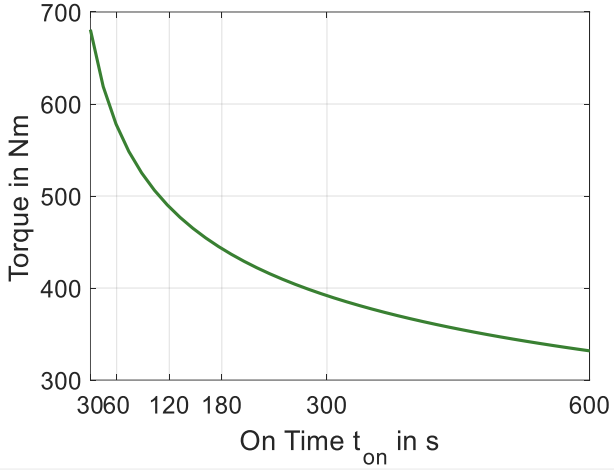
Available torque at different coolant temperatures[1)]



Simulated power and speed over battery voltage[1)]

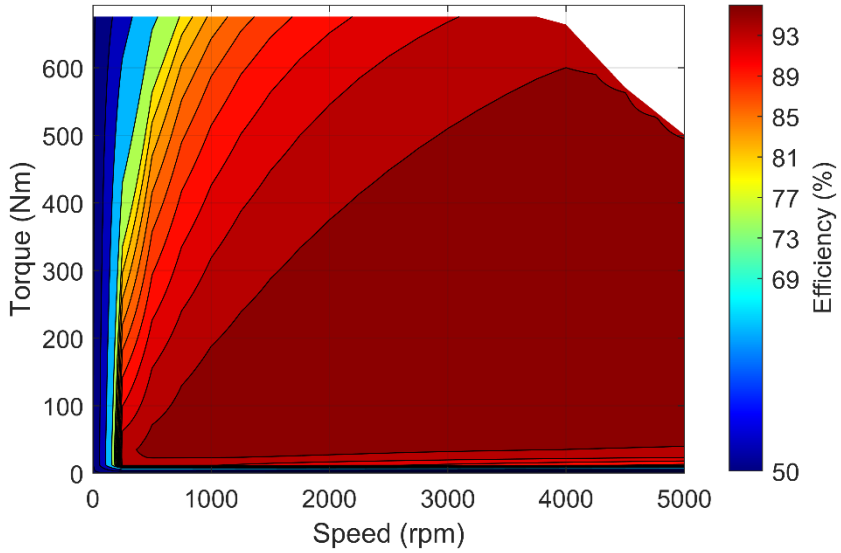


Torque over feasible maximum on time, S2 operation cycles - 45°C coolant temperature



400V

Simulated motor efficiency characteristics



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

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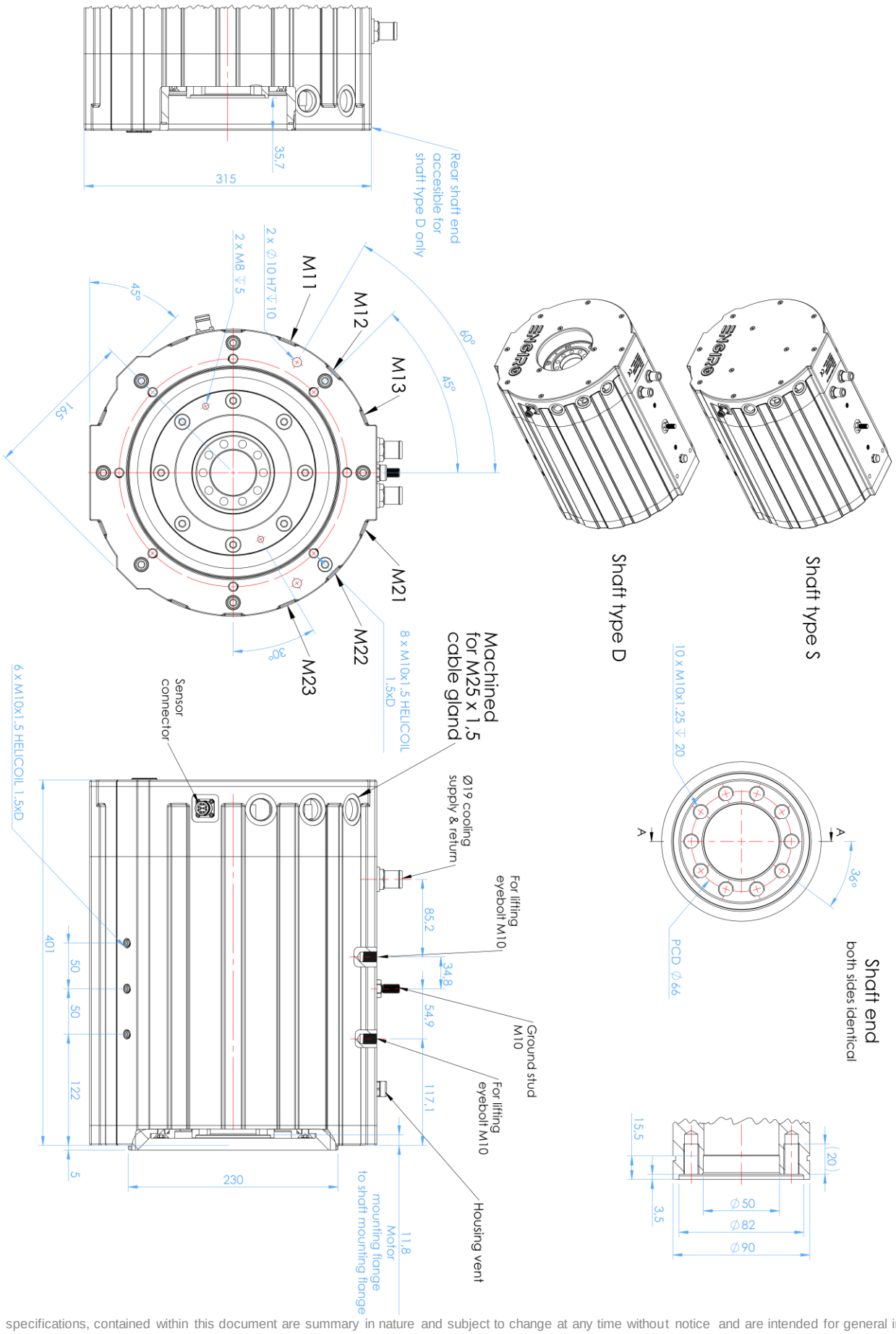
Technical Drawings



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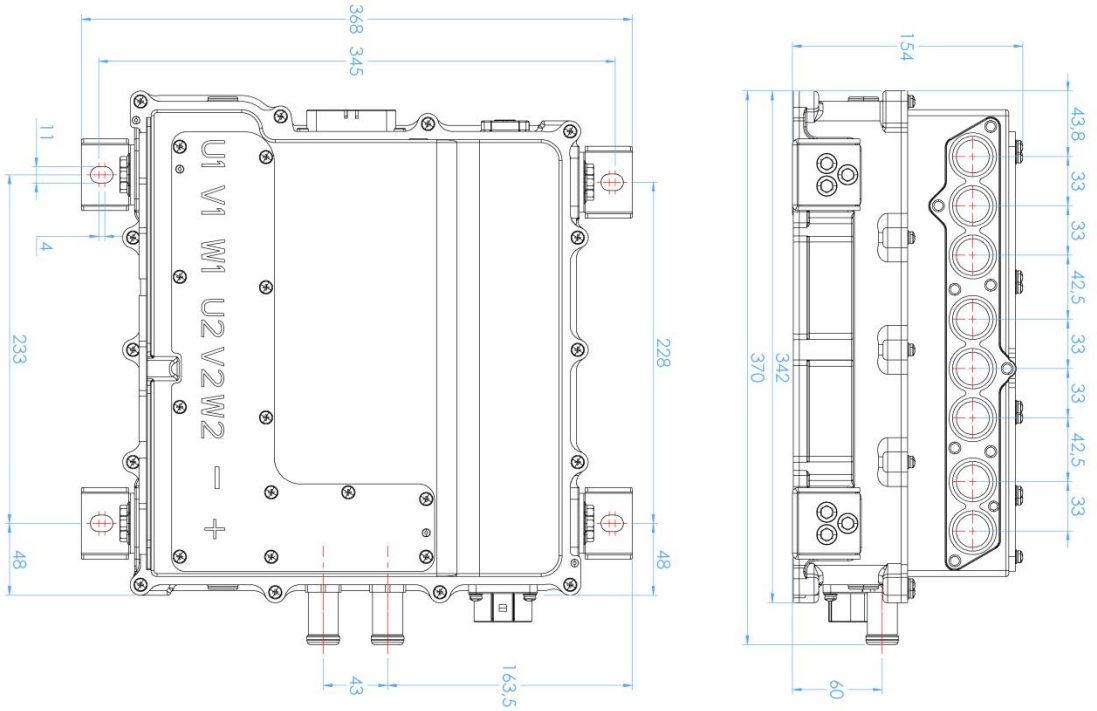
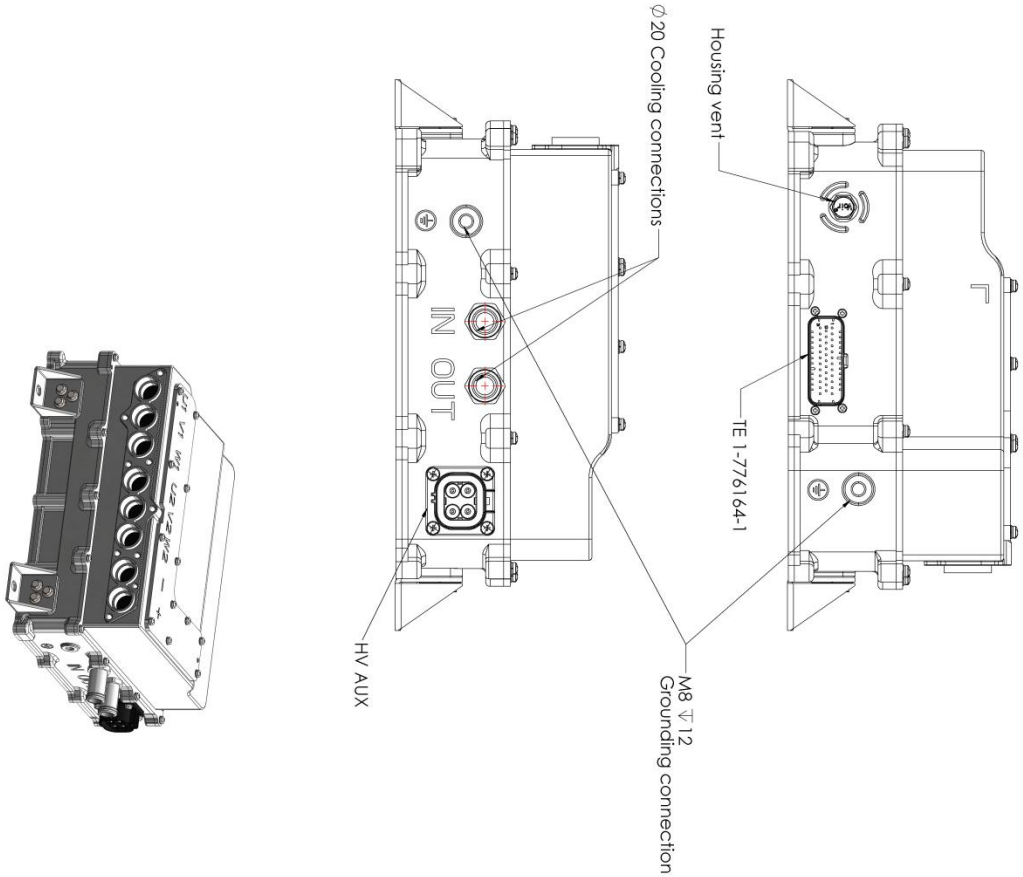
Technical Drawings





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Delivery Content

260W-13202-SFR 400V Set						
Item description				Article number		
Available Motor Variants	A: flange	B: shaft	C: position sensor	Component	Set	
	S: single side accessible	F: hollow shaft with two screw flanges	R: resolver	260W_13202_SFR	1667	
	Further flange and shaft types can be found in the user manual and are available upon request					
ENGIRO 400V 2x3-phase/6-phase motor controller 480/900 A with 2x400V auxilliary contact				1322	1x	included in set
Cables	Amphenol DC port 2 x 70mm² Leoni cables with connector; length: 10 m			1368	1x	
	Amphenol AC port 3 x 50mm² Leoni cables with connector; length: 0,85 m ABC			1365	1x	
	Amphenol AC port 3 x 50mm² Leoni cables with connector; length: 0,85 m UVW			1374	1x	
	Resolver + Temp. data cable for ENGIRO 260W, 6-phase motor controller; length: 2m			1418	1x	
Cable glands M25 shielded Pflitsch blueglobe IP 6k9k				1378	6x	
Cable lugs DIN 46234 35-8				1332	6x	

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