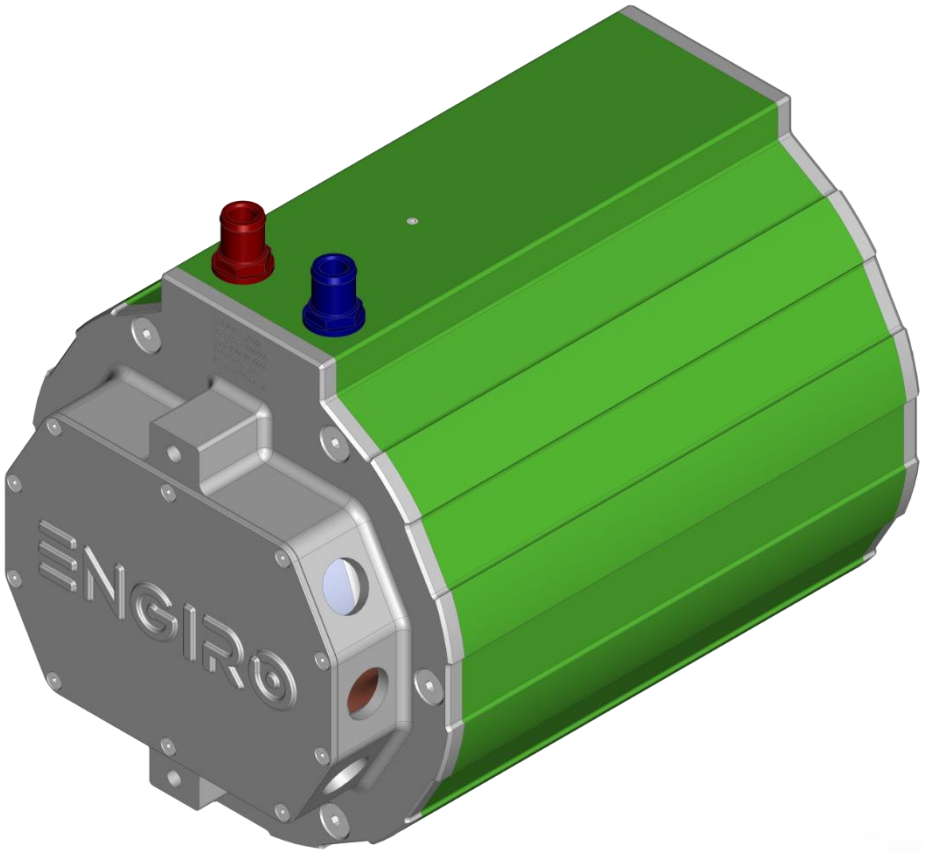
205W-16023-P-ABC

water-cooled motor / generator with 77 kW continuous power

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



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

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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**
4872453	205W_16023_SEF_P	S1	E1	F
4872455	205W_16023_SSF_P	S1	S1	F

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

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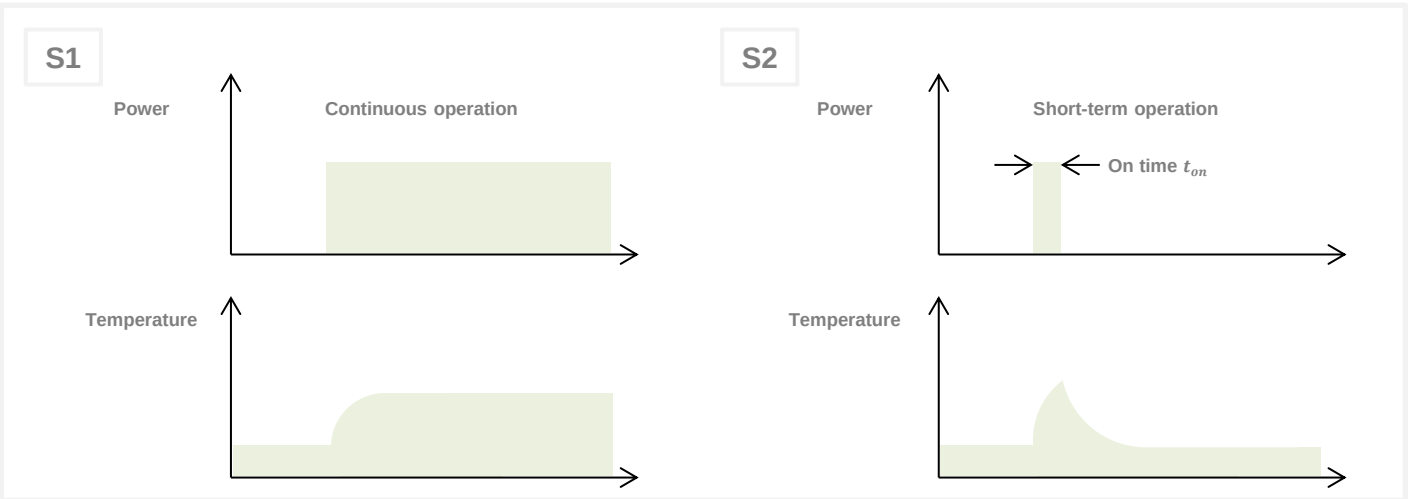
Characteristic Operating Points[1]					
		S1	S2	S2	
Feasible operation time	t_{on}	continuous	30 min	60 sec	
Torque [2]	T	85	85	252	Nm
Power [2]	P	77	77	194	kW
Speed	n	8680	8680	7370	rpm
Phase RMS-current (AC) [3]	I_{rms}	112	112	297	A
Battery current (DC) [3]	I_{DC}	107	107	263	A
Battery voltage (DC)	U_{DC}	800	800	800	V
Electric frequency	f_{el}	578	578	491	Hz
Efficiency	η_{tot}	91	91	92	%
Power factor	$cos(\varphi)$	0.91	0.91	0.94	
Cooling	specified in chapter „Additional Data“				

Maximum Operating Range			
Torque [2] [4]	T_{max}	252 @ 7370 rpm	Nm
Power [2] [4]	P_{max}	194 @ 7370 rpm	kW
Speed [5]	n_{max}	9000	rpm
Phase RMS-current (AC) [3] [4]	$I_{rms,max}$	297	A
Battery current (DC) [3] [4]	$I_{DC,max}$	263	A
Battery voltage (DC)	U_{max}	850	V
Electric frequency	f_{el}	600	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.

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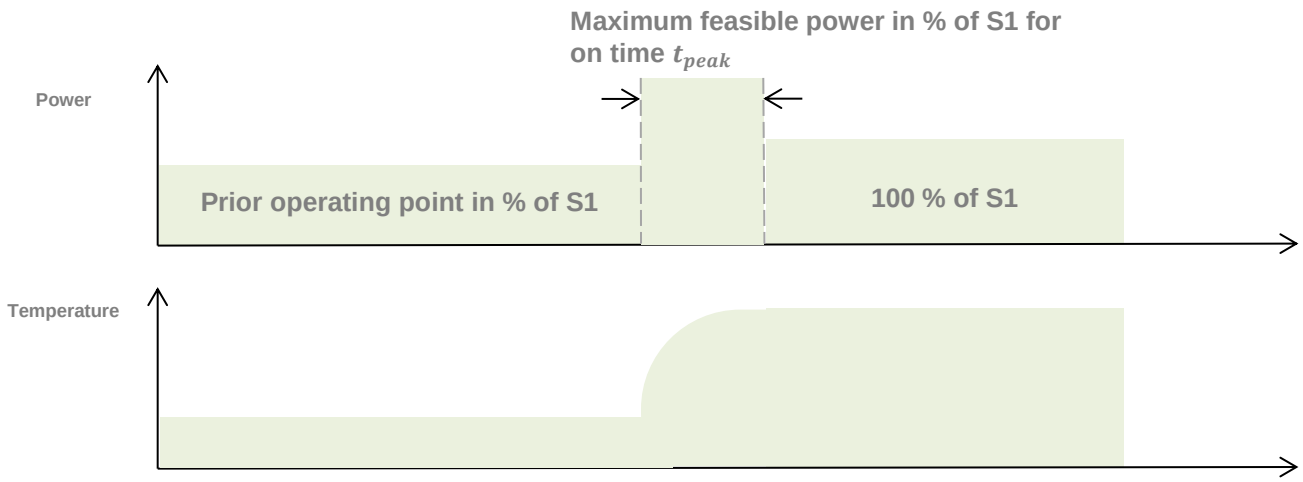
S9 Operating Points [1] Maximum Feasible Power in % of S1						
U_{nom} = 800 V		Prior operating point in % of S1				
		0 %	25 %	50 %	75 %	100 %
On time t_{peak}	30s	280 %	270 %	250 %	200 %	100 %
	180s	140 %	140 %	130 %	120 %	100 %
	420s	100 %	100 %	100 %	100 %	100 %

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

S9 Overload capability for subsequent continuous operation depending on preceding operation



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Additional Data

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Electrical Data						
Number of phases					3	
Number of pole pairs					4	
Maximum stationary short circuit current [1]					261 A (RMS) @ 20 °C @ ≥ 700 rpm	
Maximal efficiency					94	%
T/I constant (I<Inom)					0.759	Nm/A_{rms}
U/n constant (AC) at temperature 20 °C		rms:	55.98	peak:	91.6	V/(1000rpm)
Ke constant (AC) at temperature 20 °C		rms:	0.53	peak:	0.87	$V/(rad*s^{-1})$
Additional Data						
Rotor moment of inertia					0.0267	$kg*m^2$
Allowed range of ambient temperature [2]					-20 … +85	°C
Maximal motor temperature					140	°C
Temperature monitoring					KTY-84-130	
Cooling	Advised medium (OAT Coolants)	water/glycol - 50/50 ▪ TL 774-D/F ▪ VIN 878389 ▪ MAN 324 SNF ▪ MTL 5048				
	Flow rate				12	l/min
	Inlet temperature				45	°C
	Pressure drop				0.298	bar
	Maximum pressure				2	bar
	Cooling channel volume				1.03	l
Connectors						
Power terminals					Prepared for M8 cable lugs; 3x M25 cable glands (not included)	
Signal connectors					1x Hummel 10 Pin Connector, M16	
Cooling connectors					inner Ø 12 mm, outer Ø 19 mm	
Certifications						
Type approval					CE, EN 60034	
Salt mist					ISO 9227	
Protection grade					IP6K9K[3]	
Vibrations					Prepared for ISO 16750-3	
Customs tariff number					8501 5381	

1) Simulated
2) Linear derating from 70 °C to 0 A at 85 °C
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.

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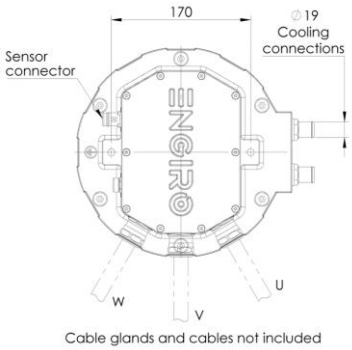
Available Type Variants

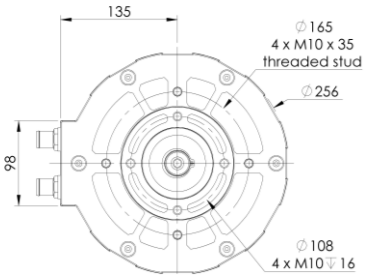
Shaft and Flange Combinations for 205W-16023-ABC		Flange (A)
		S1 (Standard)
Shaft (B)	**S1** (Cylindrical shaft with keyway Ø 28mm)	● (~56 kg)
	E1 (External splines, DIN 5480 W28)	● (~56 kg)
Position Sensor (C)		F: resolver gain 0.29 R: resolver gain 0.5 (Please note: The R resolver is a phase-out version with a 0.5 gain, which is replaced by the F resolver with a 0.29 gain)

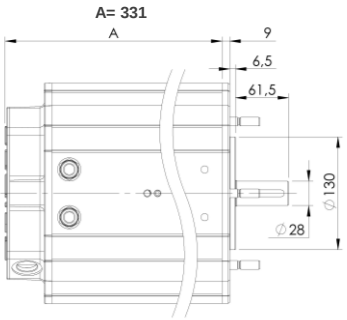
Other individual combinations are also possible on request.

Technical Drawings

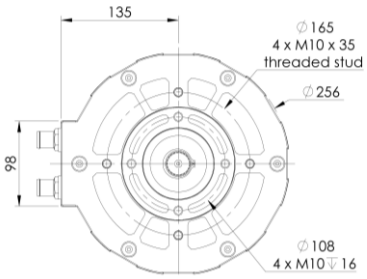


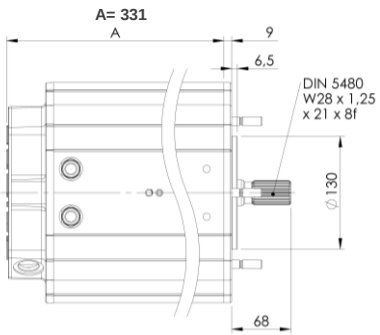
Flange S1
Shaft S1





Flange S1
Shaft E1





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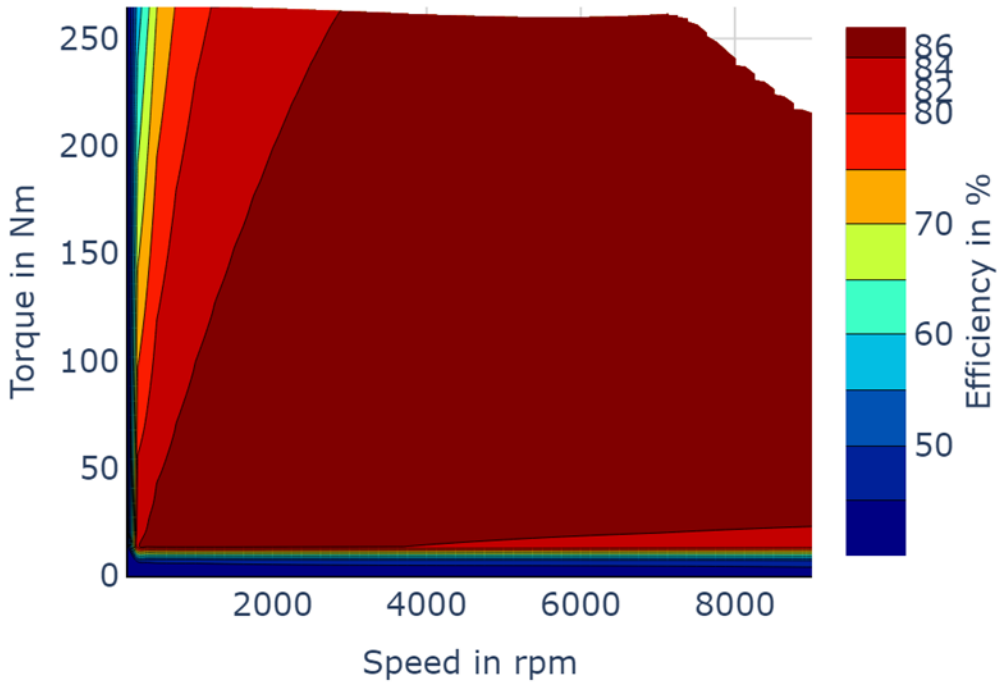
800 V

Simulated Efficiency of Motor Application

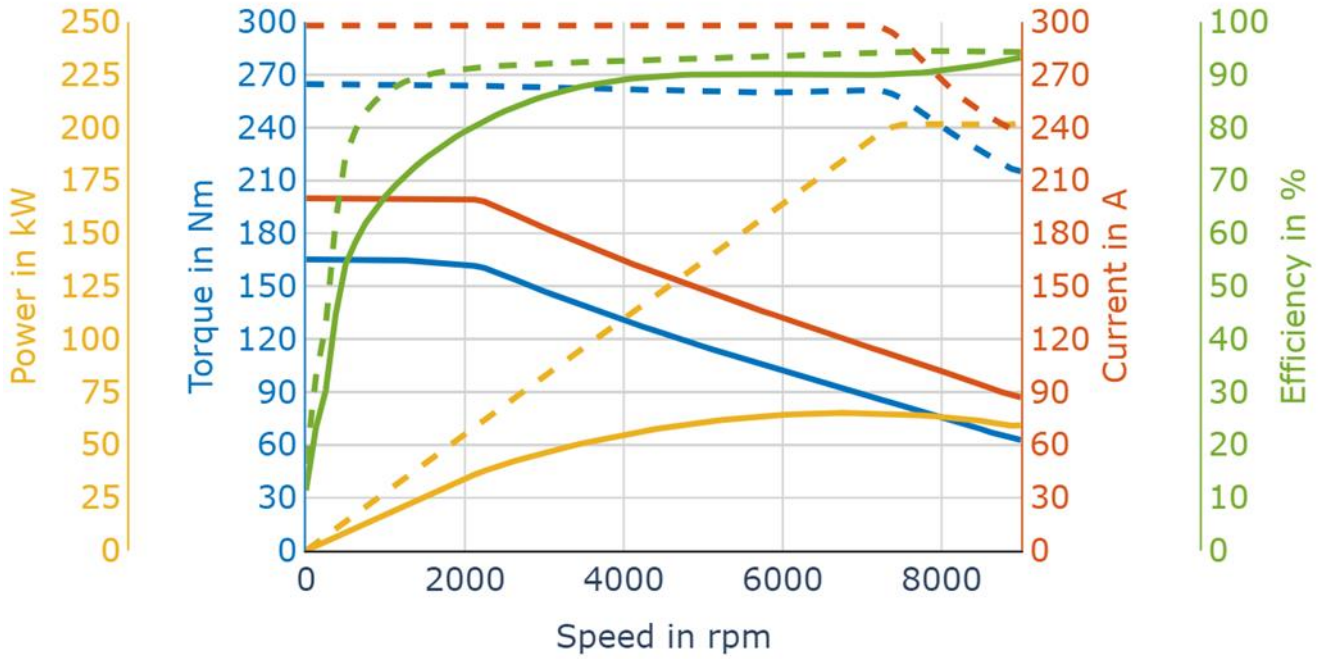
(electric machine only; U_{nom} = 800 V)



800 V

Simulated Characteristic Motor Parameters

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



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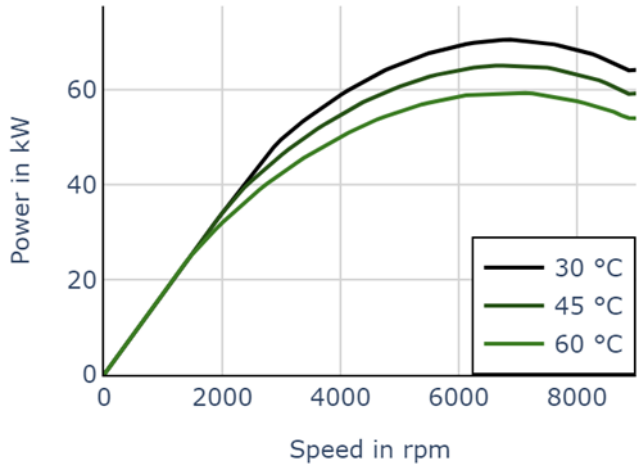
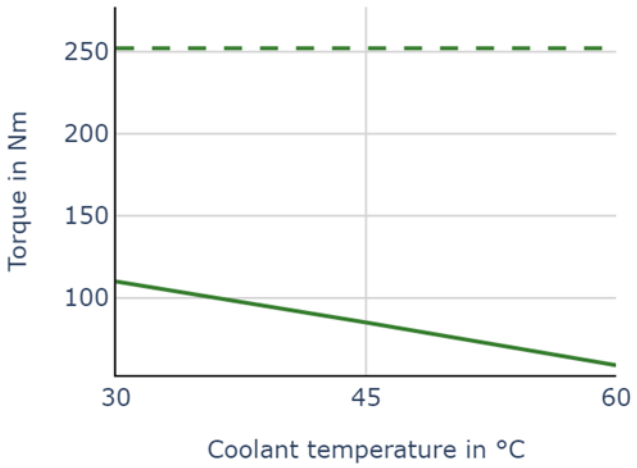
Additional Characteristics

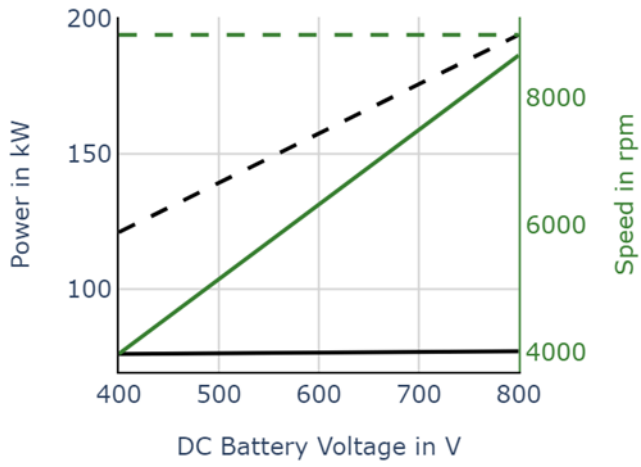
Simulated Nominal Power at Different Coolant Temperatures – U_{nom} = 800 V



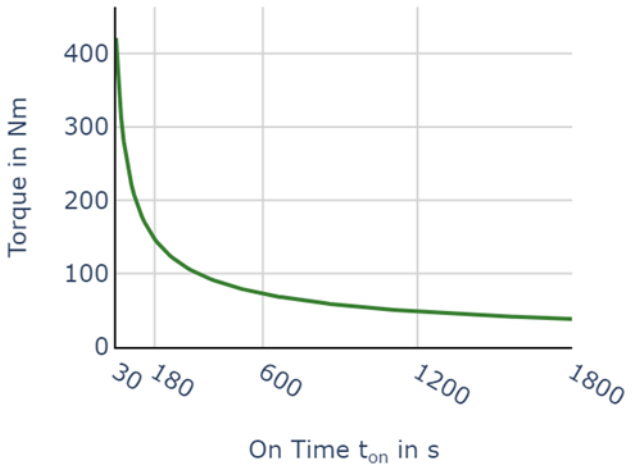
Available Torque at Different Coolant Temperatures [1)]



Power and 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;

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