SANGALLI SERVOMOTORI

ECOPM

IE4 High Efficiency Motors

Motor Curves

ENG v.10-2021

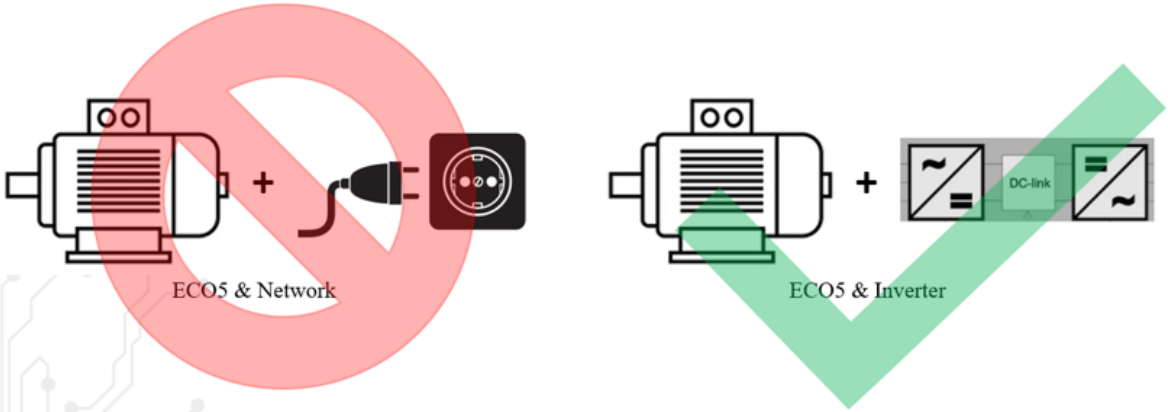
AC BRUSHLESS SERVOMOTORS - DSM5 Series

ECOPM Synchronous Motors the High efficiency makes them compatible with current and future Energy saving regulations. Their efficiency classification exceeds the standard defined by 60034-30-2 regulation as IE4 premium.

PRINCIPLE CHARACTERISTICS:

- Rare earth magnets for high temperature
- **8 poles** construction, Sinusoidal Bemf
- Integrated Thermal Protection with PTC
- Sensorless, standard version selfventilated
- Standard IEC housing, B3 B5 and B14 shape
- Compact design, reduced weight
- High efficiency, low losses
- Silent, high protection degree

ECOPM motors can only be fed by inverter



***IMPORTANT*:** Our **ECOPM** ECO5 Synchronous Motors are not suitable to be directly connected to the supply mains. Their operation is expected only in combination with an inverter. The inverter chosen must be able to drive a PMSM motor without feedback (function sensorless PMSM). On the market there are some types of inverters able to perform this function very well. Not all inverters are suitable for this function. It's very important to carefully match the combination motor-inverter-load.
Our technical department is at your disposal for more detailed information.

CURVES DEFINTION:

The S1 and S3 curves are defined at the following operating conditions:

- Ambient Temperature 0÷40°C
- Altitude 1000m
- Max Temperature Rise 100K
- Mounted on test flange *(refer to table below)*
- Duty cycle according to IEC60034-1
- DcBus 560Vdc
- No Brake

Motor FRAME	DIMENSIONS (side x side x thickness) [mm]
56	254x254x8
71	457x457x15
90	457x457x15
112	457x457x15

DERATING RULES:

- Derating due to presence of encoder 6%
- Power derating 1%/K in a range of 40°C to 50°C up to 1000m above sea level, while for site altitudes of over 1000 m above sea level performance downgrade:
  - 6% at 2000 m above sea level
  - 17% at 3000 m above sea level
  - 30% at 4000 m above sea level
  - 55% at 5000 m above sea level

For additional details please refer to the User Manual
For custom curves please contact our team at info@sangalliservomotori.it

DEFINITIONS

Rated power P_n [kW]
The power that can be maintained indefinitely in continuos duty (S1) at the rated speed.

Rated speed N_n [rpm]
The speed that can be maintained indefinitely in continuos duty (S1) while the motor is delivering the rated torque.

Rated torque M_n [Nm]
The torque that can be maintained indefinitely in continuos duty (S1) at the rated speed.

Rated current I_n [A]
The rated current (value in rms) is the effective current which the motor absorbs at the operating point defined by the rated speed and the rated torque.

Standstill torque M_0 [Nm]
The standstill or standstill torque is delivered by the cold motor (20°C) at a speed of 0<n<100 rpm. It does not take into account any torque dissipation (due to iron, mechanical, saturation, wave deformity). With the same current, the stall torque decreases as the motor temperature increases. (see Motor heating characteristic curves for values with hot motor)

Standstill current I_0 [A]
Current (rms value) applicable to the motor at a number of revolutions 0 <n <100 rpm. By applying this current to the cold engine (20 ° C), M_0 is delivered, the increase in overtemperature leads to a decrease in the torque with the same current I_0.
(see Motor heating characteristic curves for values with hot motor)

Maximum mechanical revs N_{mec} [min^{-1}]
The maximum mechanical revs indicate the maximum operating speed that is permitted at mechanical level.

Rotor moment of inertia J_r [$kgcm^2$]
The inertia of the rotor without taking into consideration the version of the transducer without a brake. (Kg cm^2=kg*m^2 *10^{-4}).

Maximum torque Mpk [Nm]
Torque that is generated when the peak load is applied.
The maximum torque is only available for a short time.

Maximum revs N_{max} [min^{-1}]
These indicate the maximum speed that can be reached using a converter at a given supply voltage.
It is not possible to sustain S1 service at maximum revs.

Peak current (pulse current) I_{pk} [A]
The peak current (rms value is up to 5 times the rated standstill current. The peak current of the servo amplifier used must be lower than the peak value of the motor.

Voltage constant K_E [mVmin]
Effective line to line voltage value at a speed of 1000rpm. The Ke is defined when operating without load (circuit open and motor driven) at a temperature of 20°C. The progress of the line to line voltage in these conditions is in linear proportion to the mechanical speed.

Torque constant K_T [Nm/A]
The torque constant indicates the ratio between M_0 and I_0 and does not take into account any dissipation.

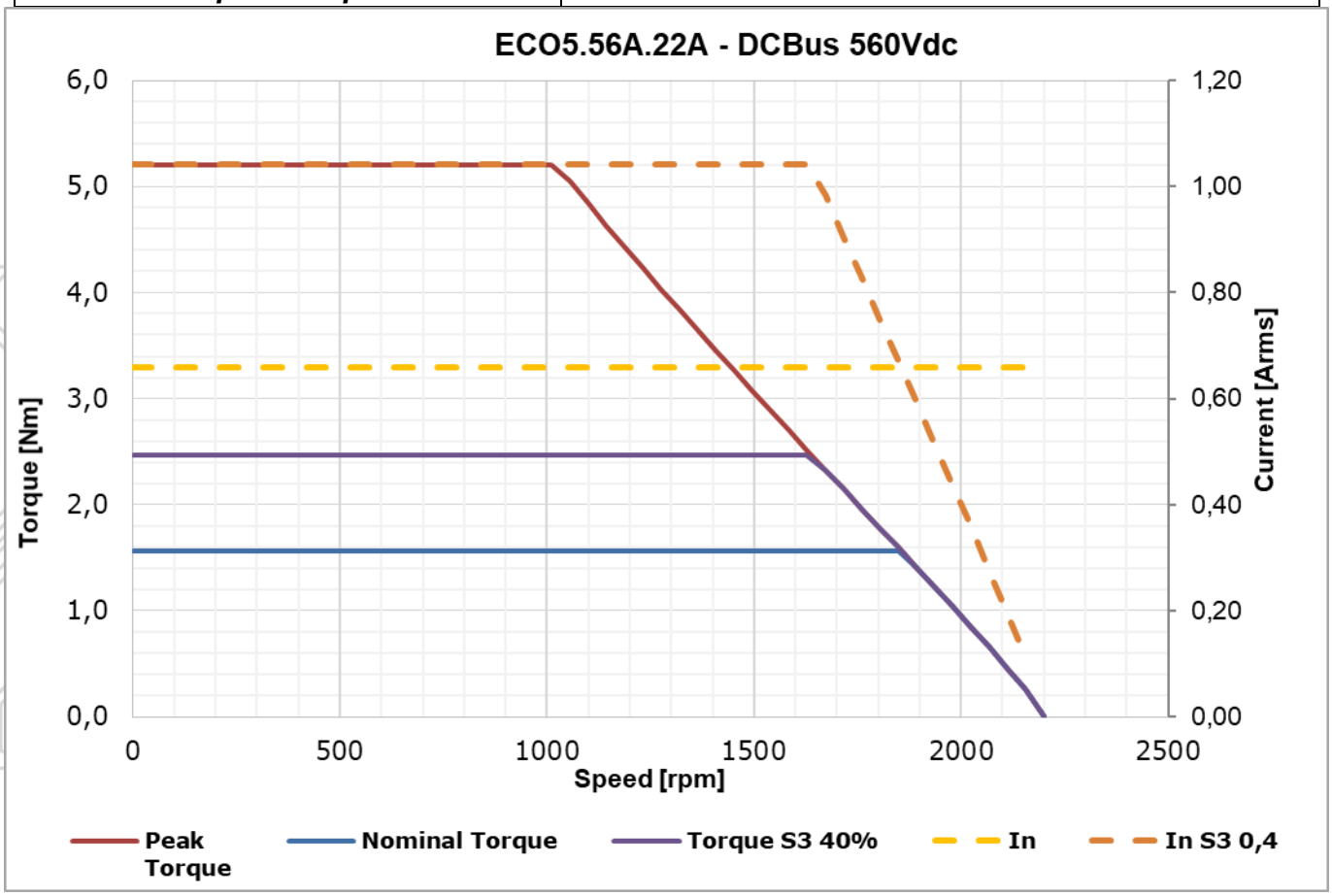
Resistance Ru-v [ohm]
Resistance between two phases at 20°C.

Inductance Lu-v [mH]
Inductance between two phases measured at 1KHz.

ECOPM Motor Series *(Click on motor Type to move to the related curve)*

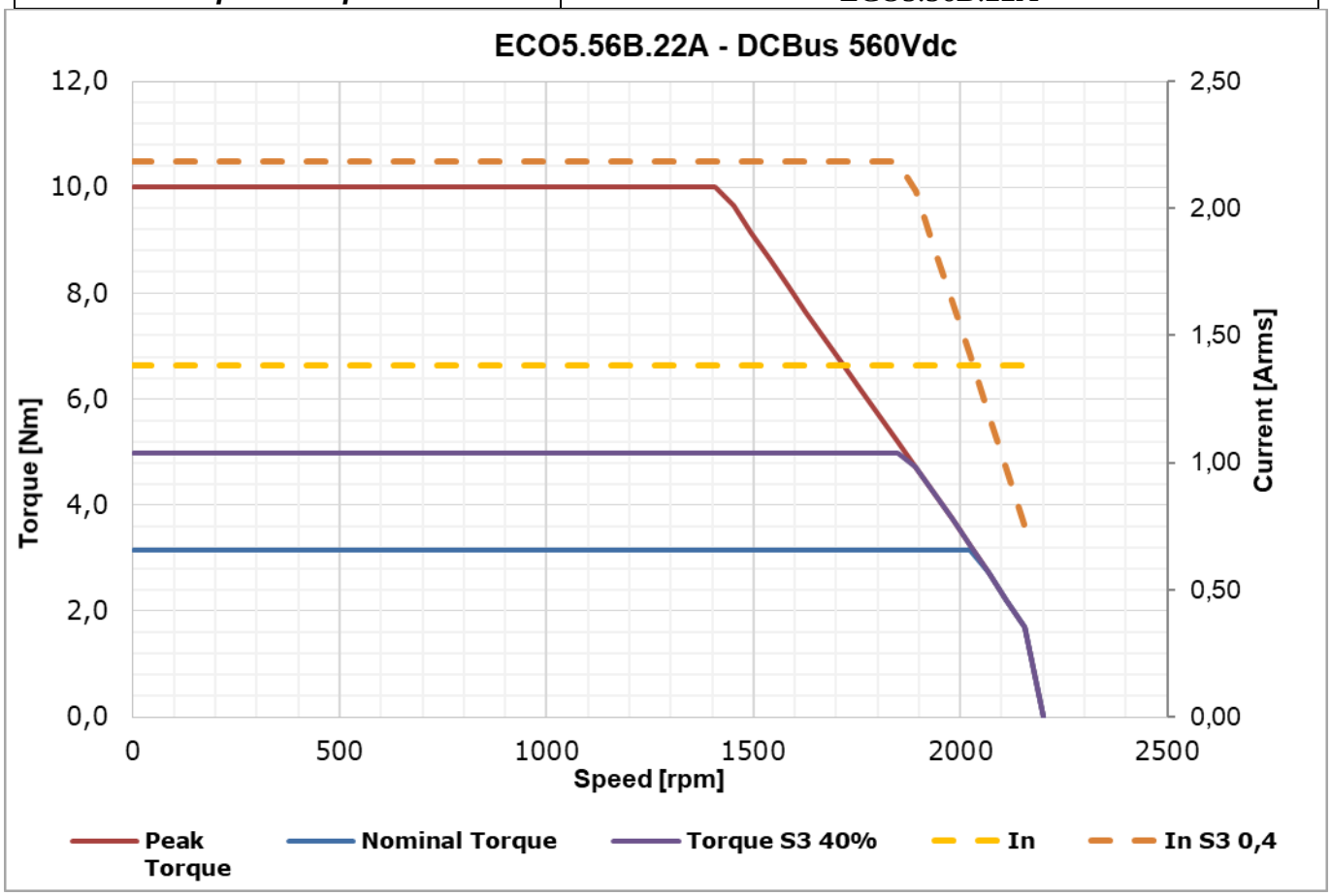
Type	P_n *[kW]*	N_n *[rpm]*	M_n *[Nm]*	I_n *[A]*	M_o *[Nm]*	I_o *[A]*	$N_{max\ mecc}$ *[rpm]*	R_{ff} *[ohm]*	L_{ff} *[mH]*	k_e *[V/krpm]*	k_t *[Nm/A]*	M_{pk} *[Nm]*	I_{pk} *[A]*	J_r *[kg cm²]*
ECO5.56A.22A	0,25	1500	1,6	0,66	2	0,66	7000	104,8	173,1	179	2,97	5,2	2,1	0,92
ECO5.56B.22A	0,5	1500	3,2	1,4	4	1,38	7000	34,2	72,7	173	2,87	10	4,1	1,72
ECO5.56A.26A	0,55	3000	1,8	1,1	2	1,12	7000	40,0	65,1	110	1,82	5,2	3,4	0,92
ECO5.56B.26A	1,1	3000	3,5	2,2	4	2,20	7000	13,9	29,3	110	1,82	10	6,5	1,72
ECO5.71A.22A	0,65	1500	4,1	1,5	5	1,53	6500	29,2	65,2	199	3,30	14	5,1	4,5
ECO5.71B.22A	1,3	1500	8,3	2,9	10	2,9	6500	10,33	43,2	206	3,41	26	9,1	8,5
ECO5.71A.26A	1,5	3000	4,8	2,9	5	2,9	6500	9,00	19,8	110	1,82	14	9,3	4,5
ECO5.71B.26A	3	3000	9,5	5,7	10	5,7	6500	2,98	12,3	110	1,82	26	17	8,5
ECO5.90A.22A	1,5	1500	9,7	3,6	13	3,6	6500	8,39	31,4	208	3,44	35	12	20
ECO5.90B.22A	3	1500	19,2	6,5	25	7,2	6500	2,87	14,2	212	3,51	64	22	43
ECO5.90A.26A	3,5	3000	11,1	7,3	13	7,3	6500	2,10	7,9	104	1,72	35	24	20
ECO5.90B.26A	7	3000	22,3	14,3	25	14,3	6500	0,73	3,6	106	1,75	64	43	43
ECO5.112A.22A	5	1500	31,7	9,2	34	9,2	5500	1,80	12,0	225	3,72	72	23	90
ECO5.112B.22A	10	1500	64	18,1	68	18,1	4500	0,70	5,8	228	3,77	130	41	170
ECO5.112A.26A	8	3000	25,5	16	34	18,4	5500	0,44	3,0	113	1,87	72	46	90
ECO5.112B.26A	16	3000	51	33	68	38,0	4500	0,16	1,3	108	1,79	130	87	170

Motor Torque vs. Speed Curve	ECO5.56A.22A



(Back to index)

Motor Torque vs. Speed Curve	ECO5.56B.22A



(Back to index)

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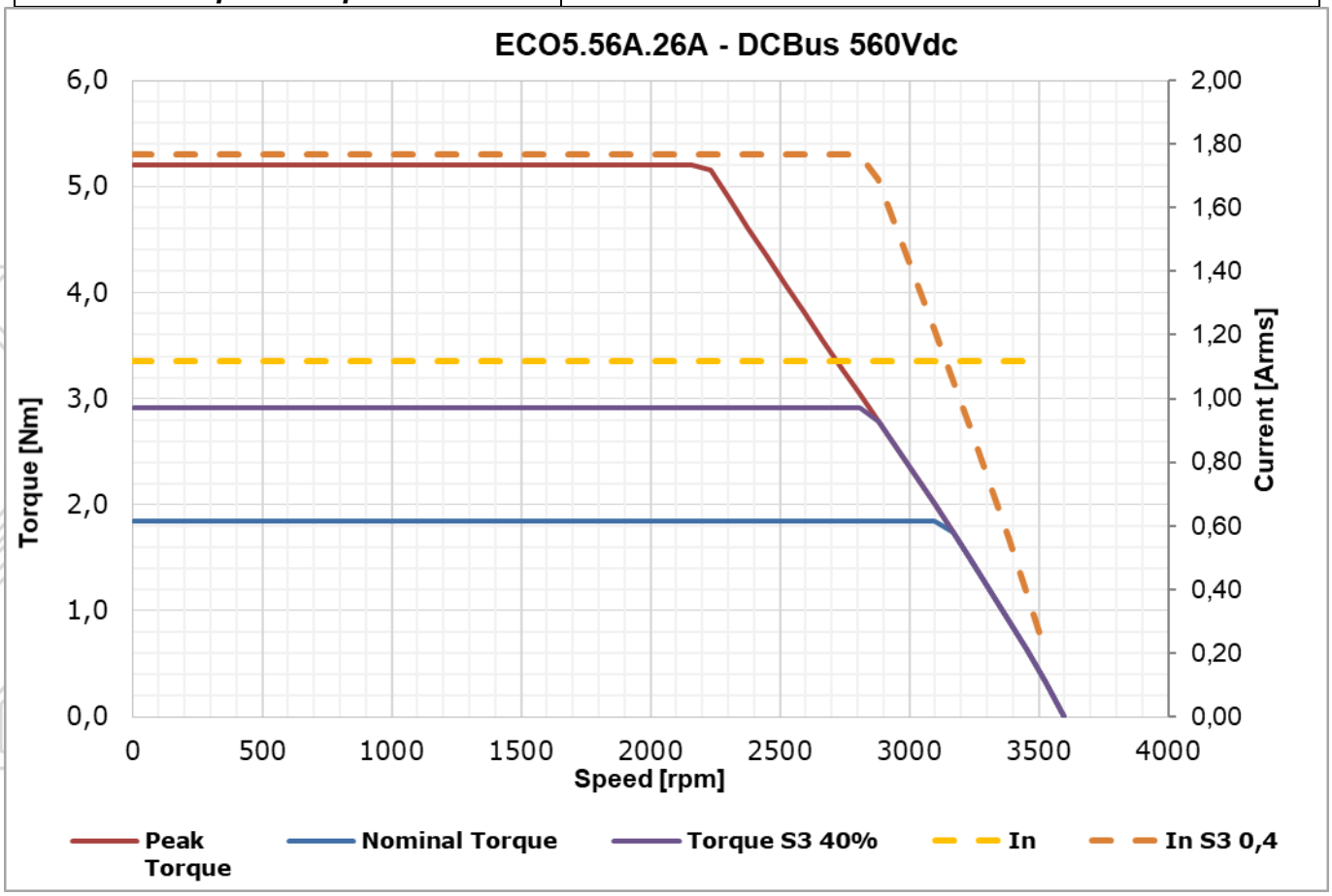

(Back to index)

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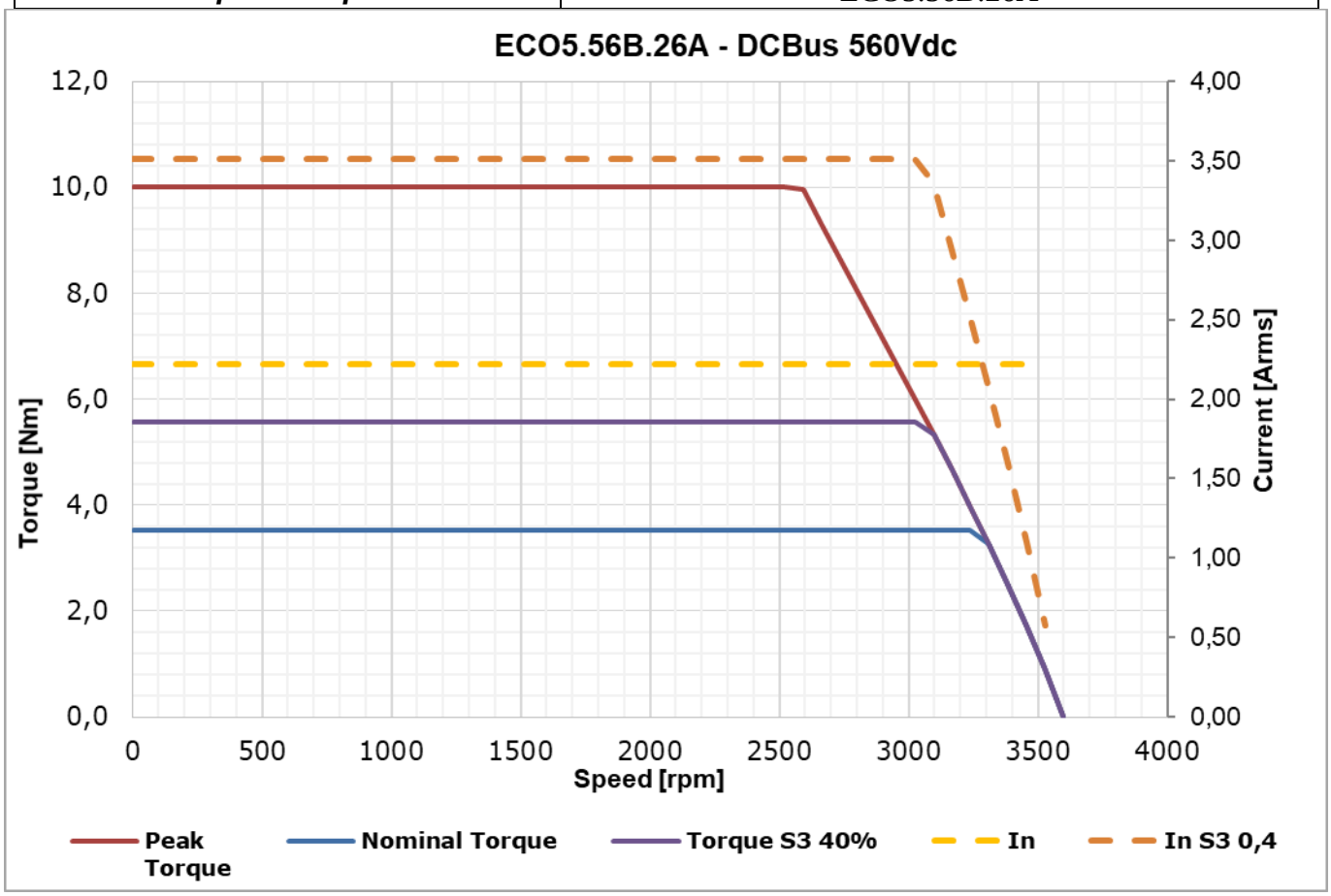
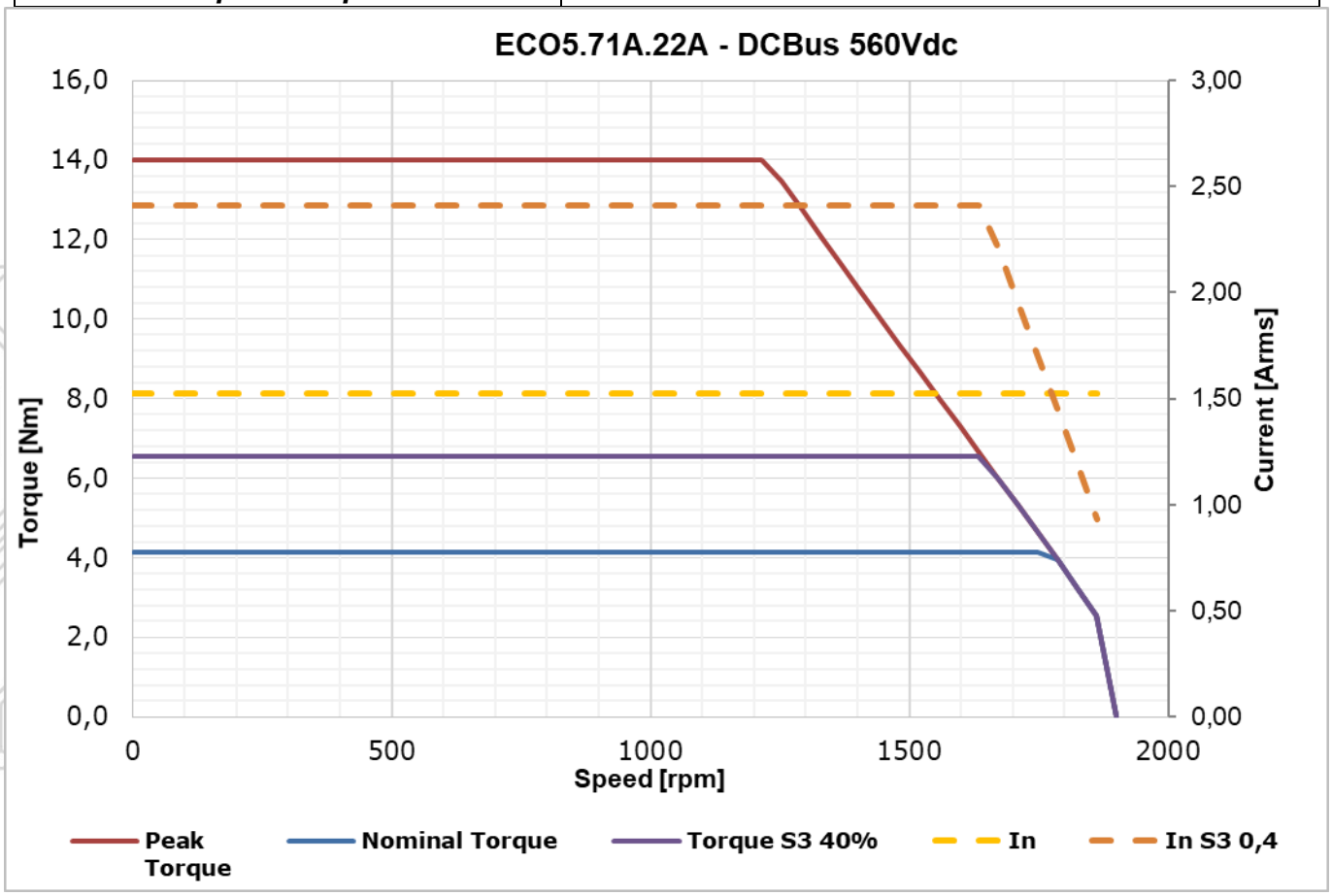


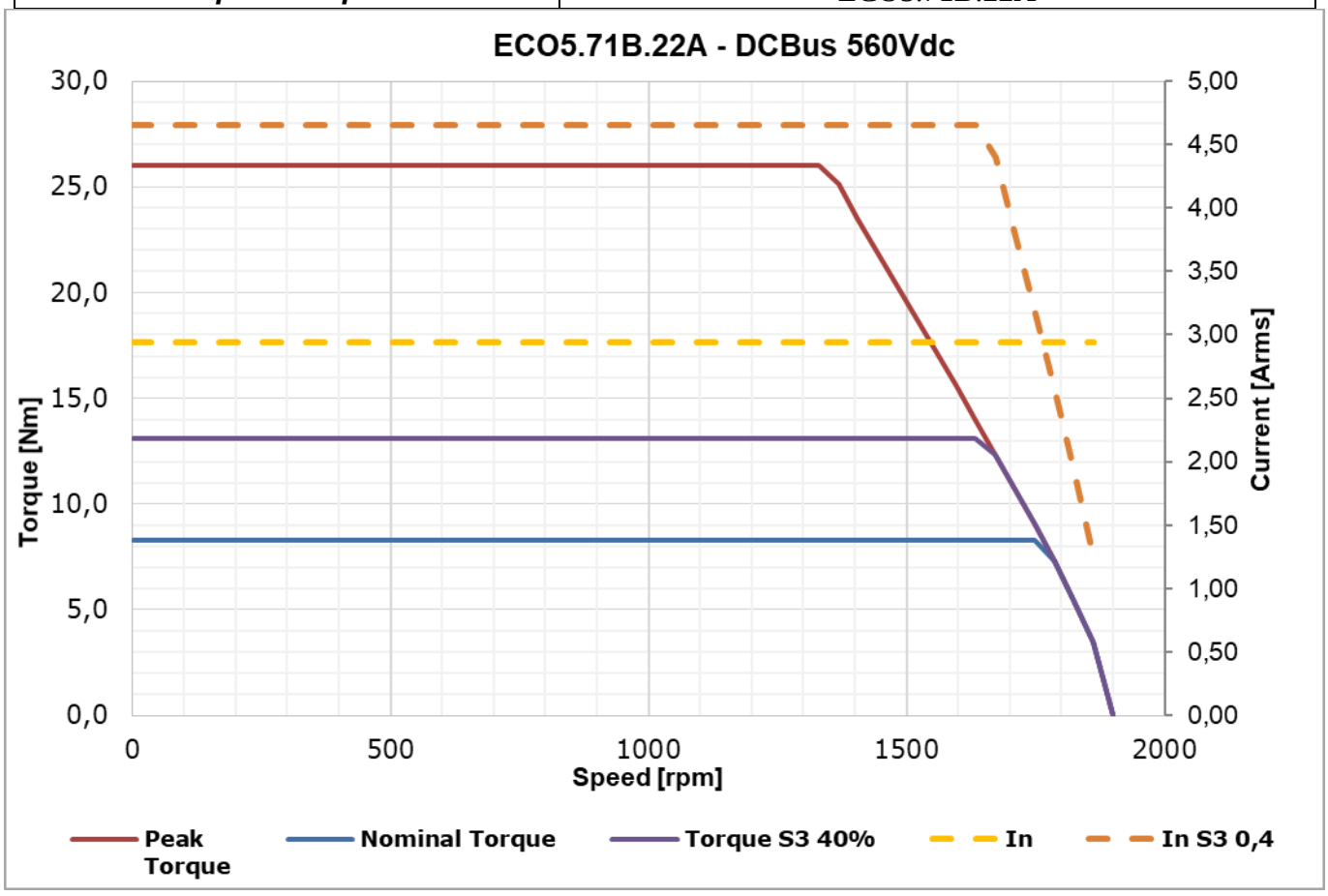
(Back to index)

Motor Torque vs. Speed Curve	ECO5.71A.22A



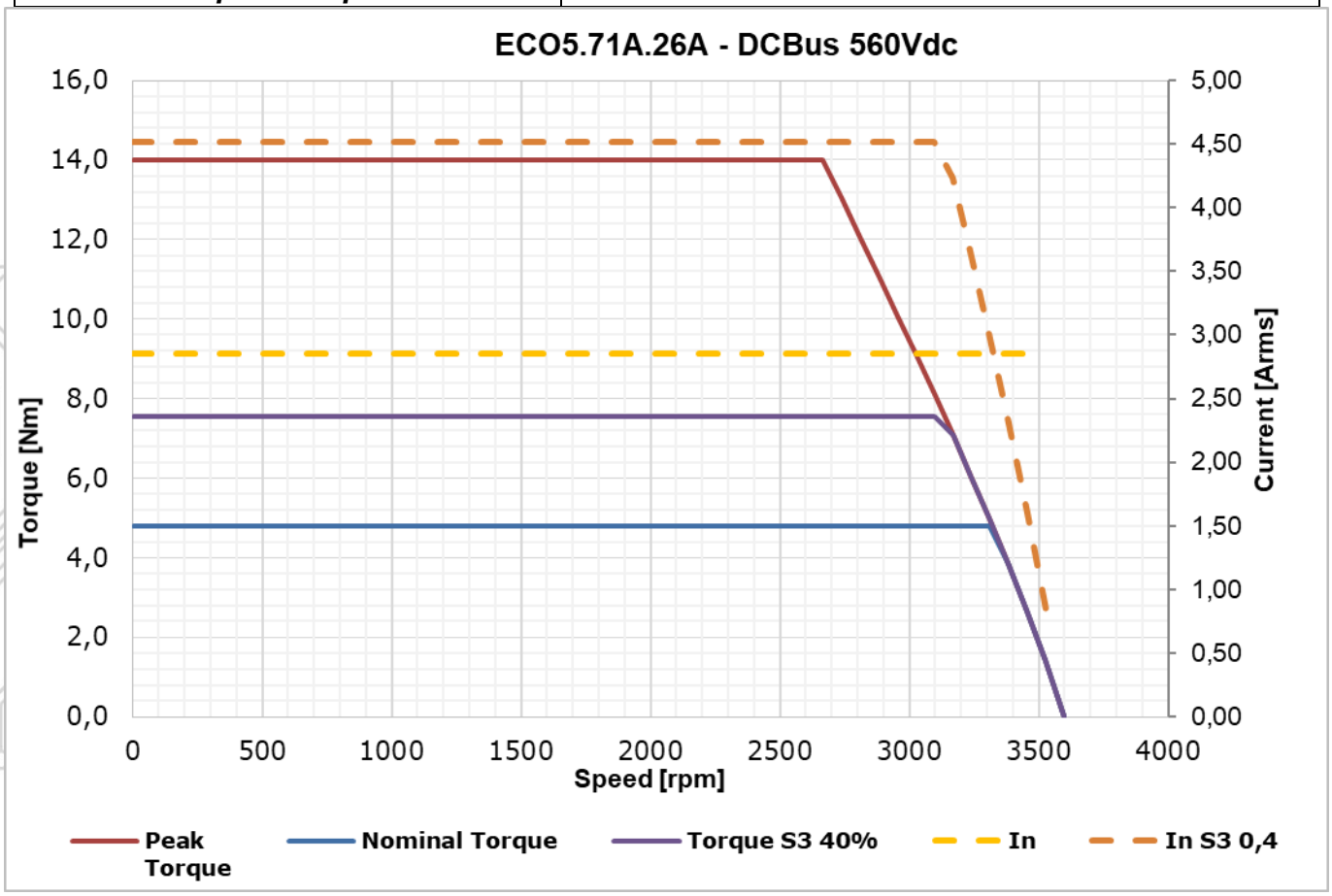
(Back to index)

Motor Torque vs. Speed Curve	ECO5.71B.22A



(Back to index)

Motor Torque vs. Speed Curve	ECO5.71A.26A



(Back to index)

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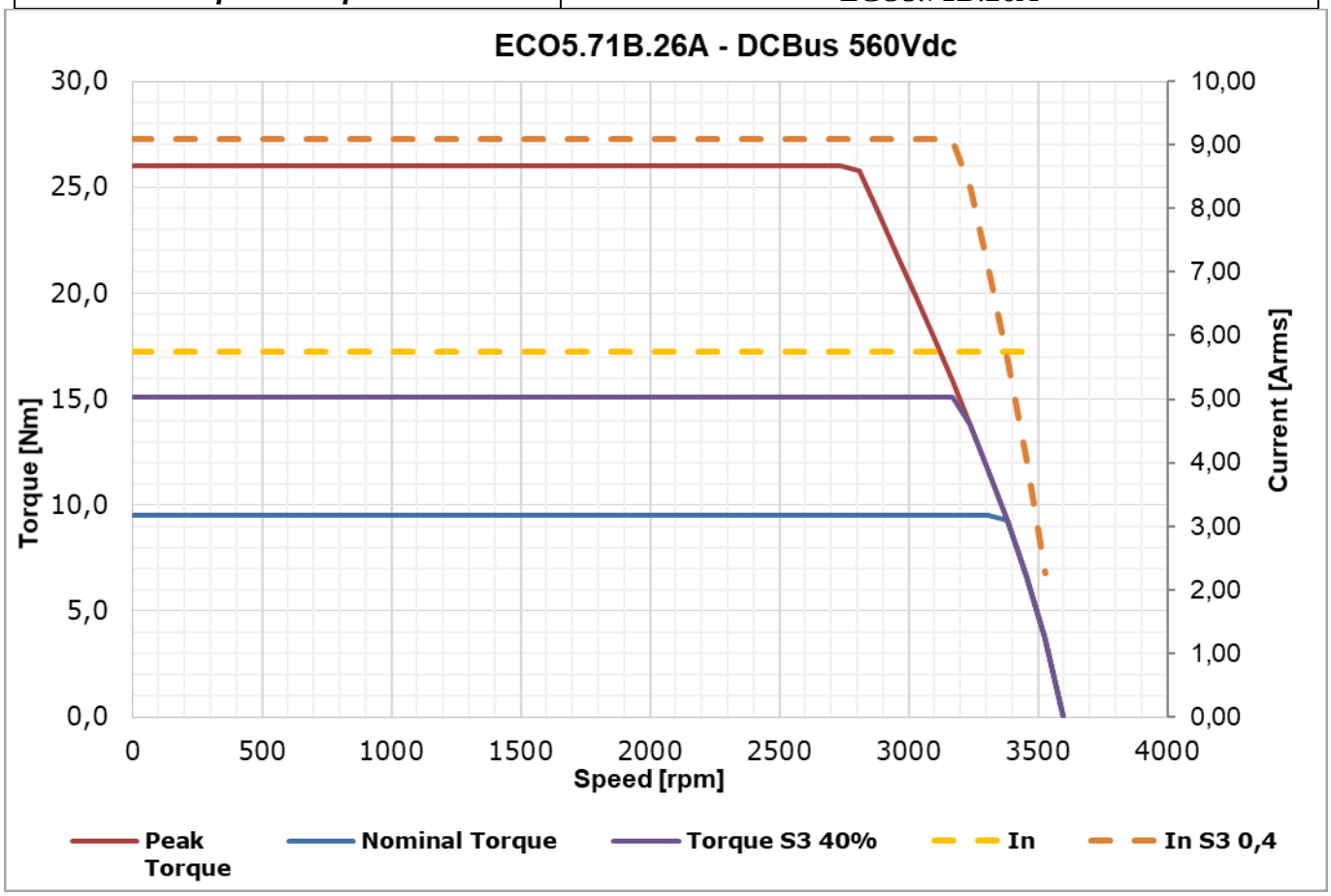
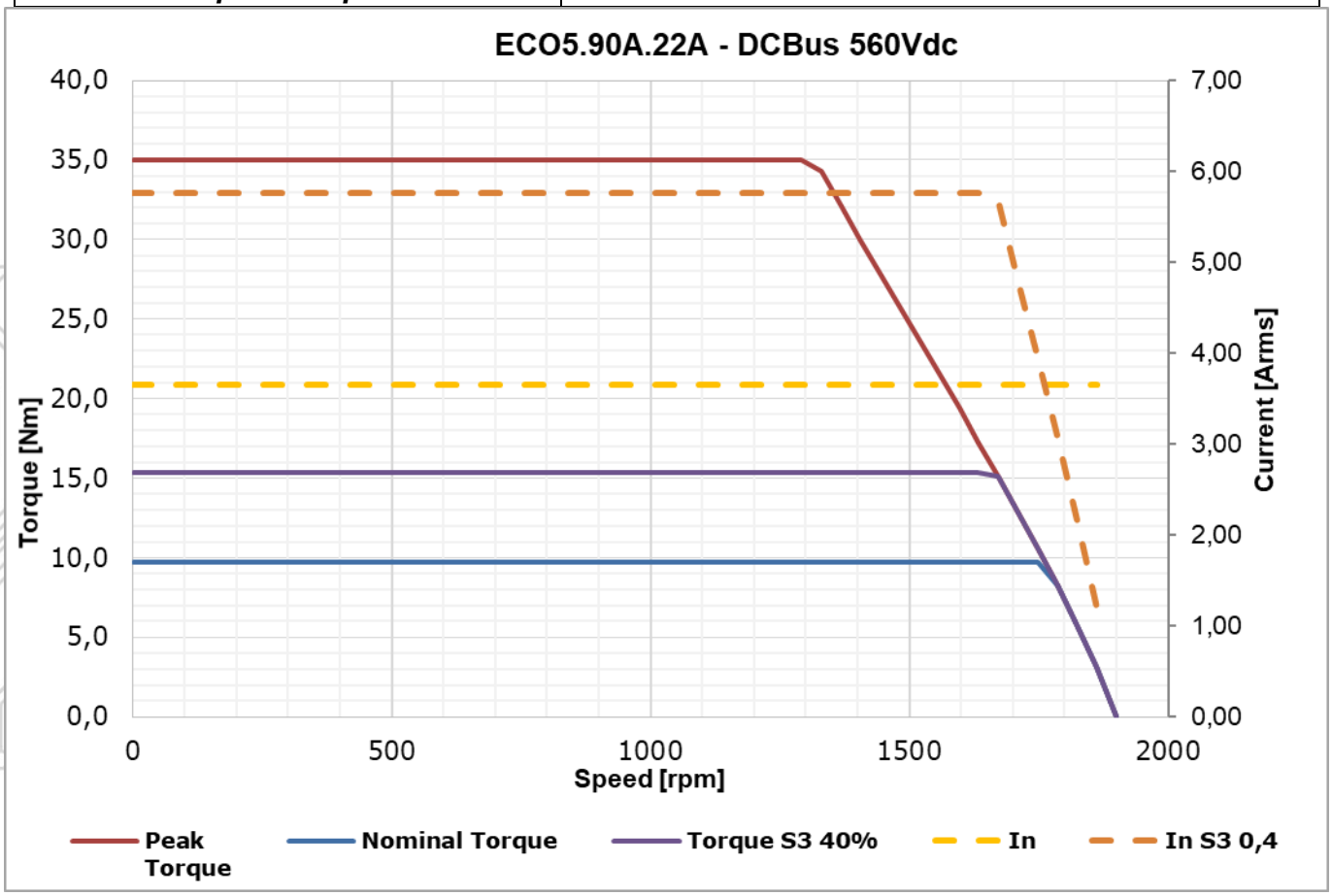


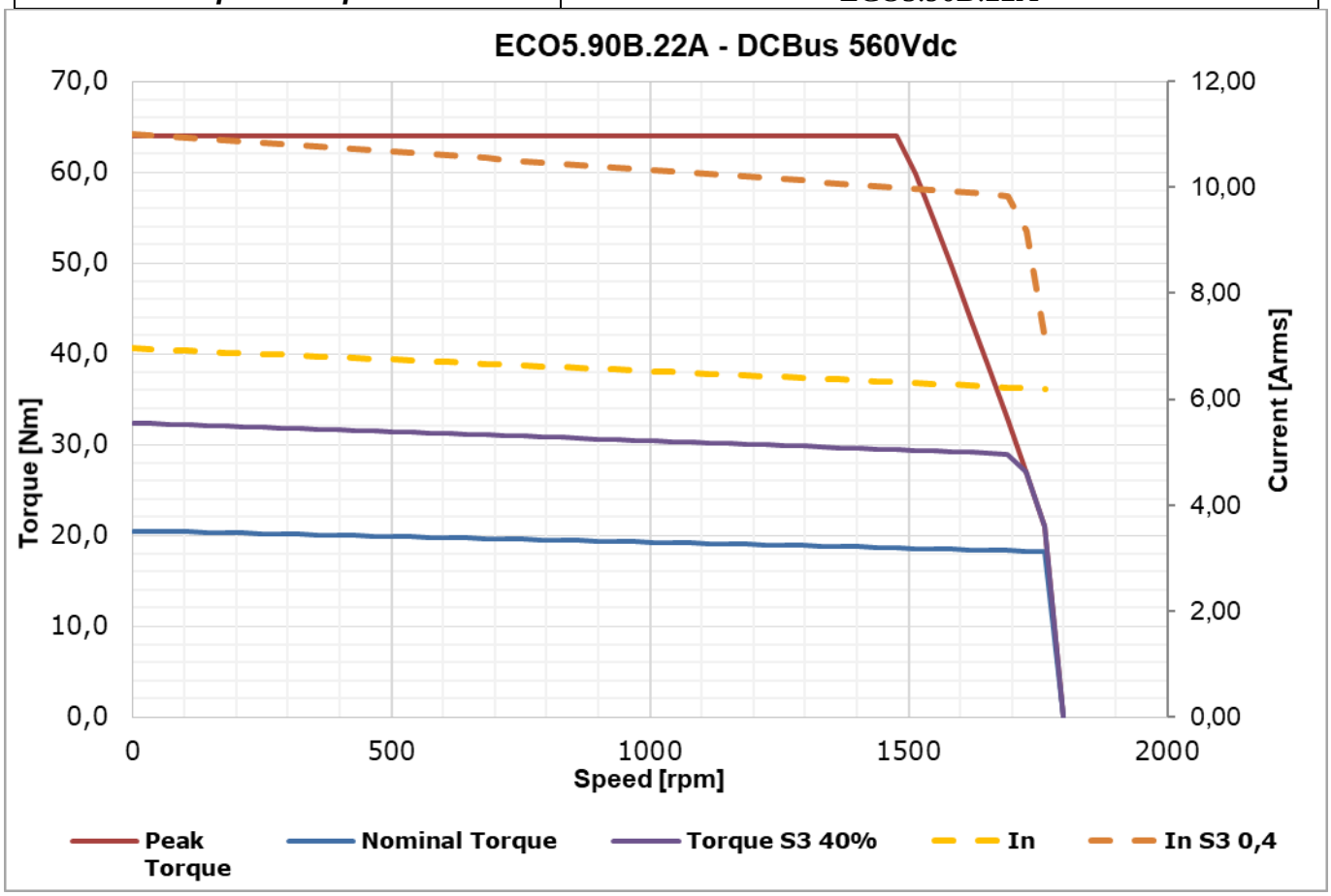
(Back to index)

Motor Torque vs. Speed Curve	ECO5.90A.22A



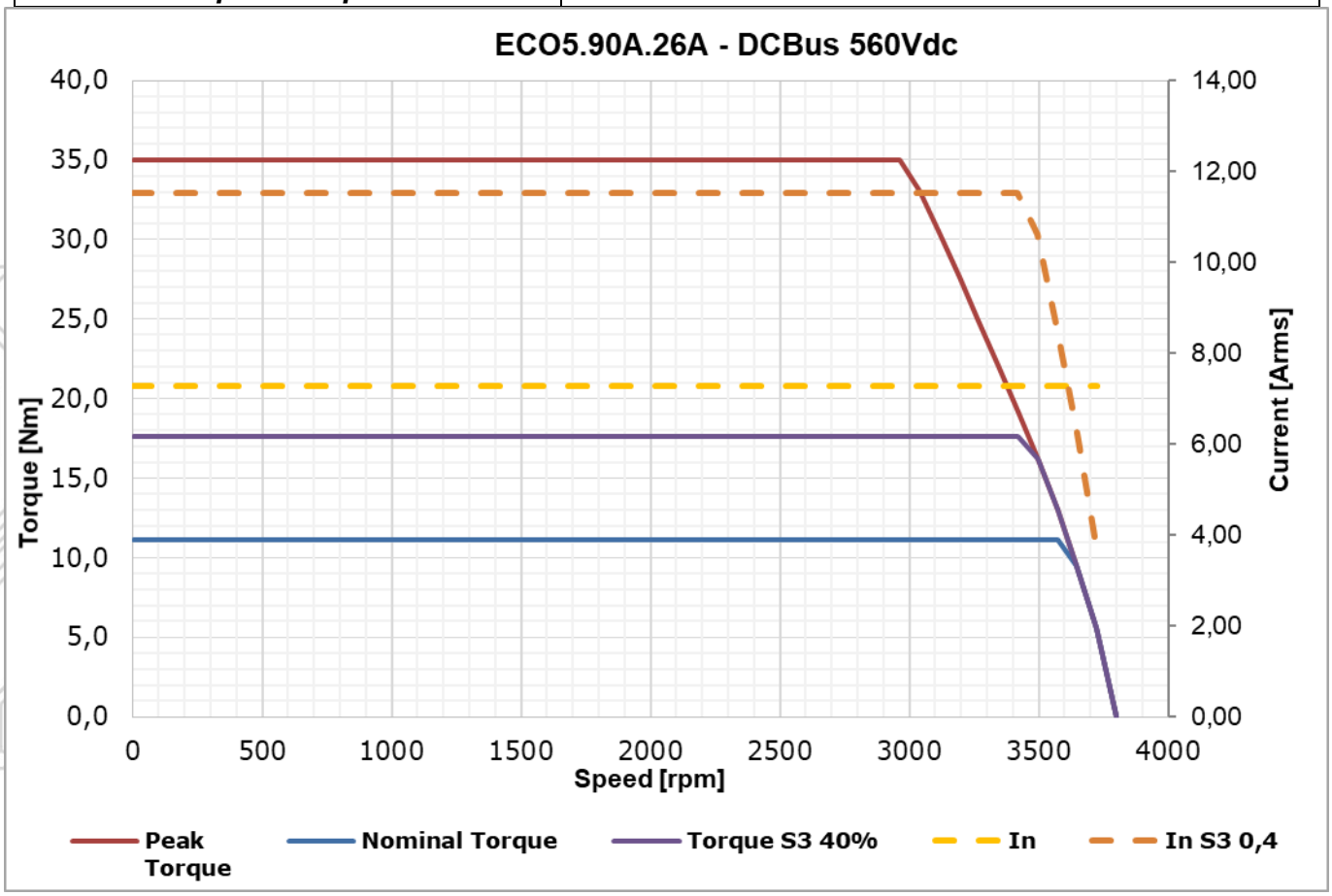
(Back to index)

Motor Torque vs. Speed Curve	ECO5.90B.22A



(Back to index)

Motor Torque vs. Speed Curve	ECO5.90A.26A



(Back to index)

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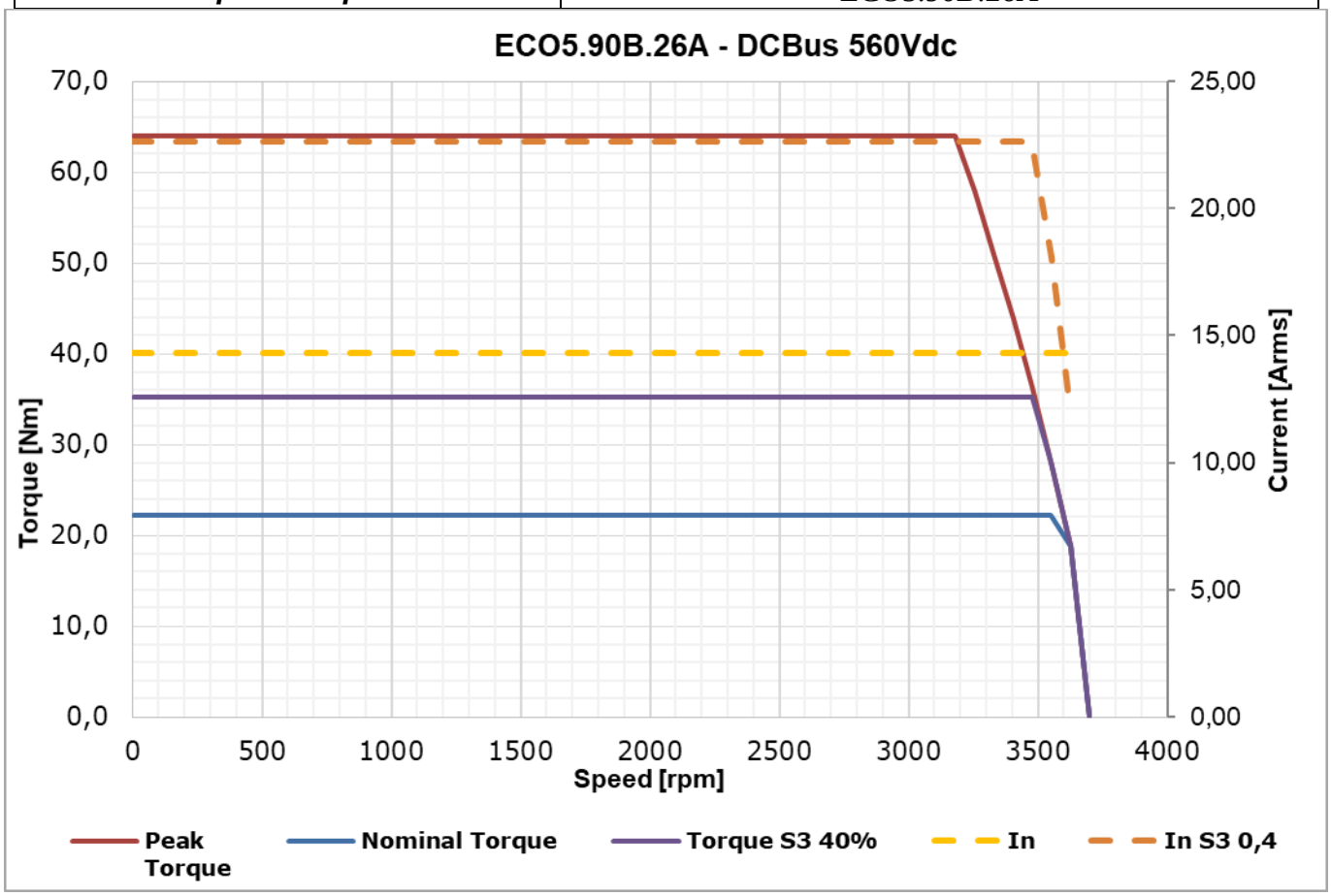
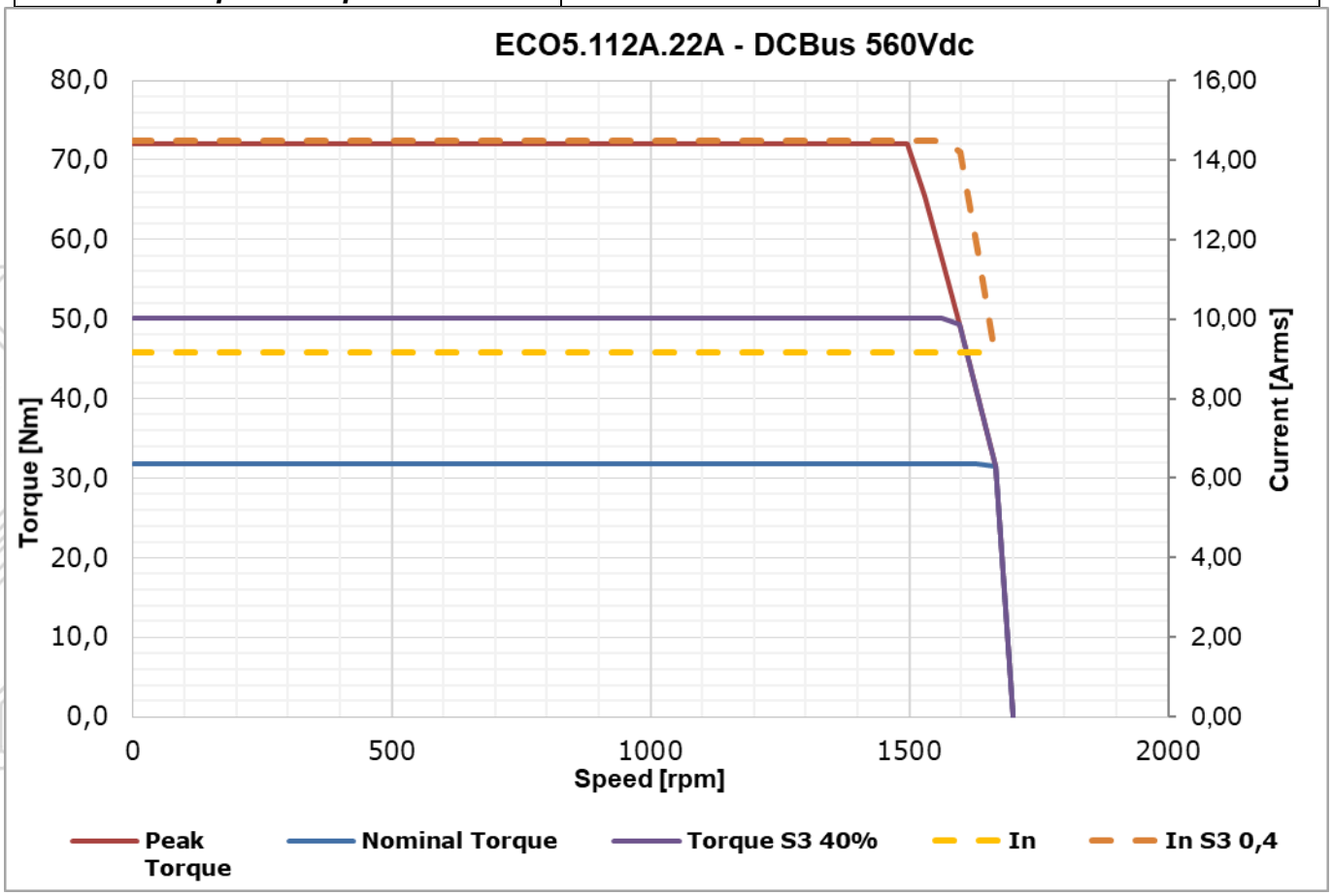


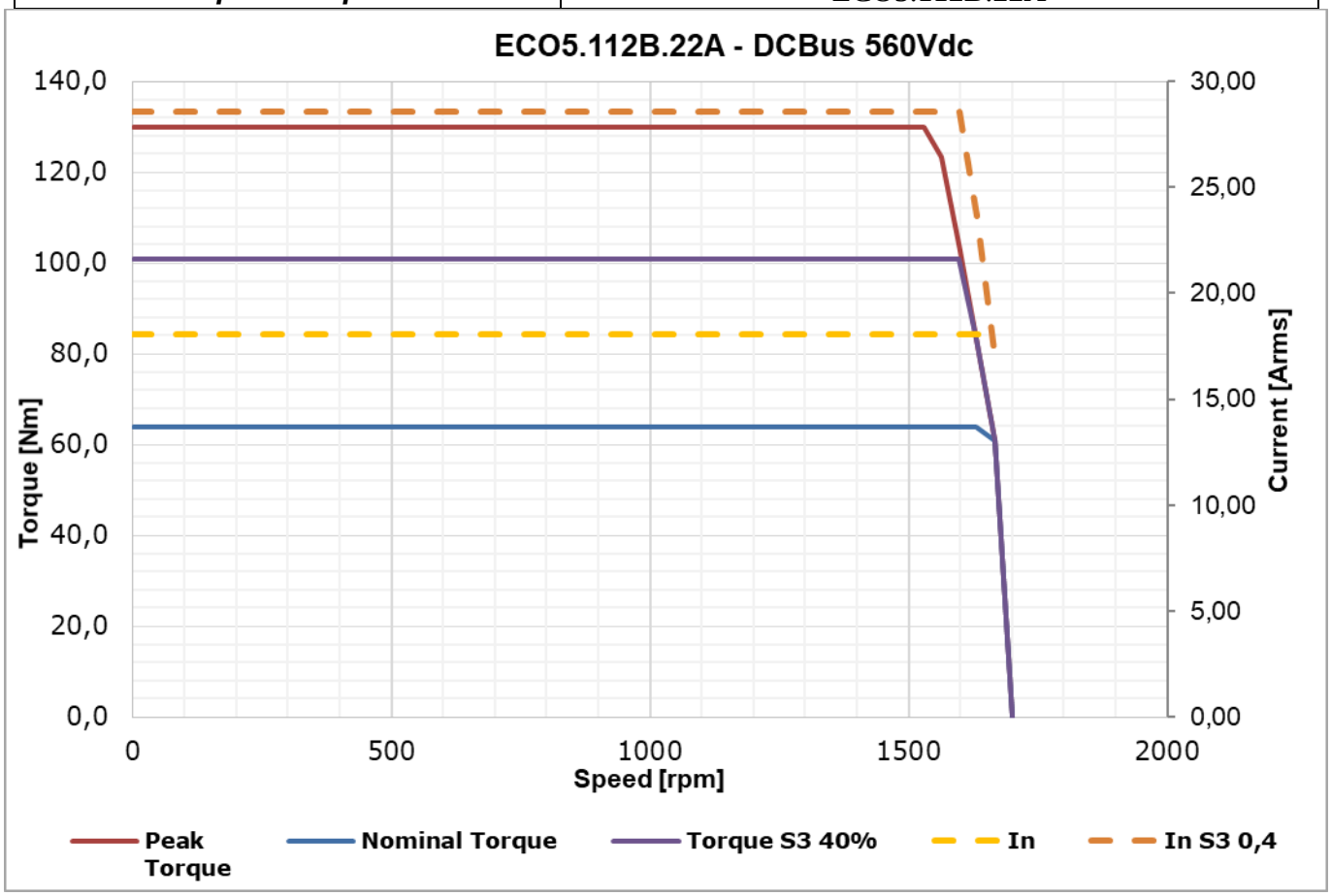
(Back to index)

Motor Torque vs. Speed Curve	ECO5.112A.22A



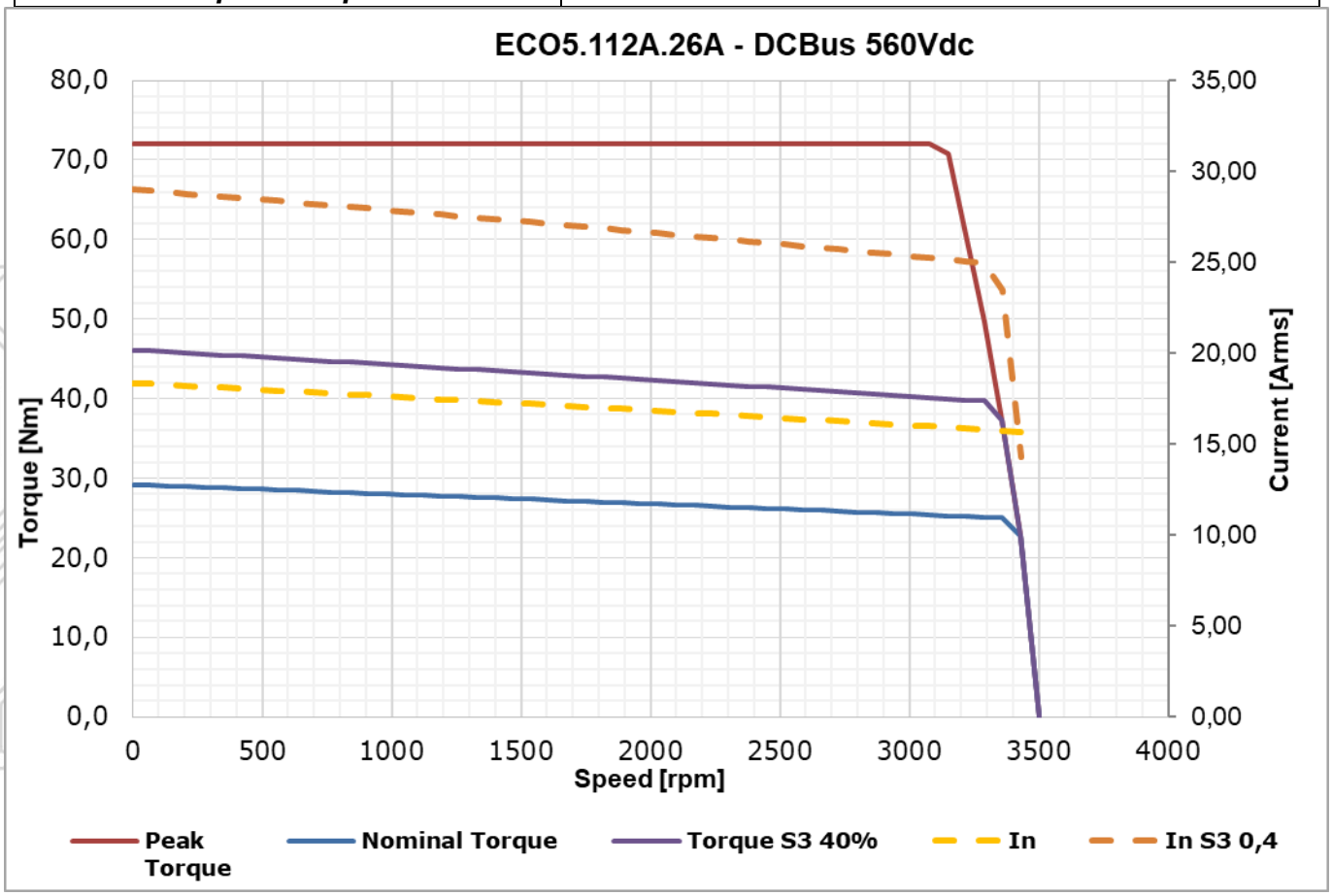
(Back to index)

Motor Torque vs. Speed Curve	ECO5.112B.22A



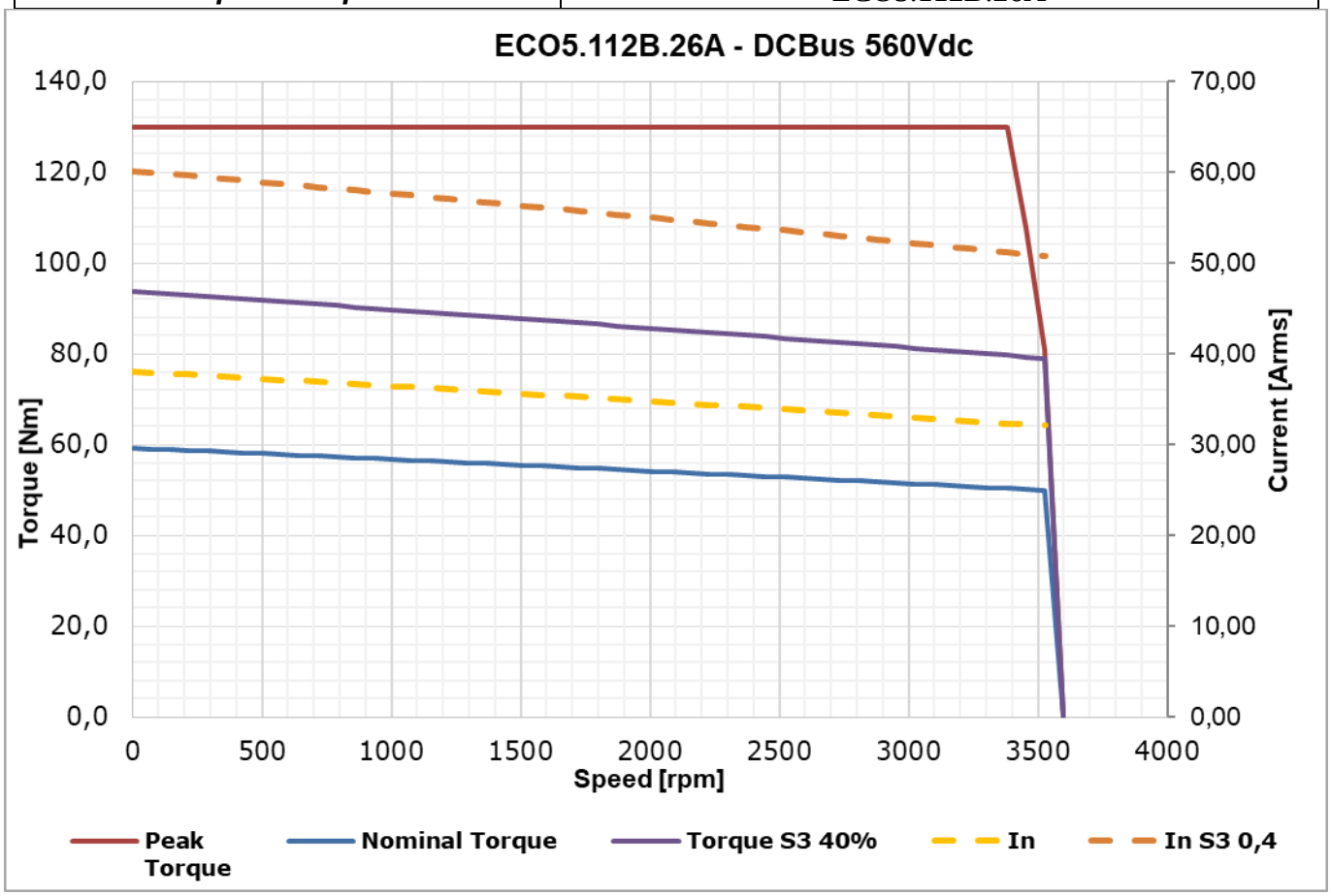
(Back to index)

Motor Torque vs. Speed Curve	ECO5.112A.26A



(Back to index)

Motor Torque vs. Speed Curve	ECO5.112B.26A



(Back to index)

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