

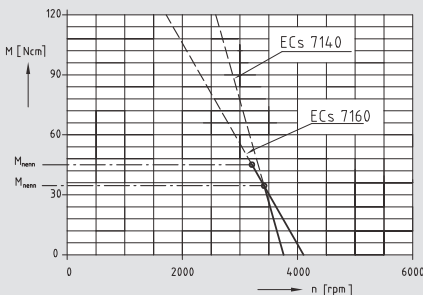
# Brushless DC motor

- Properties:**
- Connection: Operation on the external standard controller (block commutation)  
Rotor position sensing using 3 hall sensors.  
Connection using loose stranded conductors and a plug connector
  - Rotor: 4-pole neodymium magnet, slight detent torque  
due to continual angular magnetization (no grades)
  - Service life: 20,000 h, S1 duty
  - Insulation mat. class: B, optional F
  - System of protection: IP 00 (open design)
  - Special model: Design for short-time duty with high performance,  
additional voltages and speeds upon request
  - Options: Thermal protection, special shafts, custom design

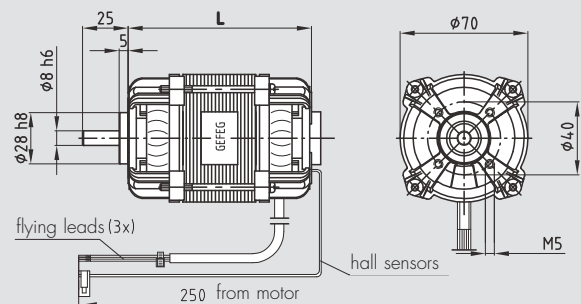


Type	Name			ECs 7140	ECs 7160
	Nominal voltage	U	Volt DC	24	24
<b>Rate</b>	Nominal power	$P_2$	W	109.9	157.0
	Nominal speed	$n_{nom}$	rpm	3000	3000
	Nominal torque	$T_{nom}$	Ncm	35	50
	Starting torque	$T_S$	Ncm	100	150
	Nominal current	$I_{nom}$	A	6.3	8.4
	Idling speed	$n_{idle}$	rpm	3550	3900
	No-load current	$I_0$	A	0.6	0.9
	<b>Characteristics</b>	Gradient speed torque curve	$1 / k$	mNm / rpm	0.59
Peak torque (short-term)		$T_A$	Ncm	211	350
Speed constant		$c_n$	rpm / V	122.29	133.96
Torque constant		$c_T$	Ncm / A	5.77	5.458
Nominal efficiency		$\eta$	%	0.73	0.78109
<b>Connection</b>	Terminal resistance	R	Ohm	0.7	0.2
	Phase – Phase				
<b>Dynamics</b>	Weight	m	kg	1.5	2.1
	Moment of inertia	J	gcm <sup>2</sup>	482	697
<b>Thermal</b>	Adm. ambient temperature	$T_a$	°C	-20 to +40	-20 to +40
	Max. adm. stator temperature	$T_{max}$	°C	+120	+120
<b>Coupling</b>	Shaft diameter	d	mm	8	8
	Max. axial force	$F_a$	N	20	20
	Max. radial force	$F_r$	N	220	220

### Dimensions - Characteristics



Type	L / mm
ECs 7140	100.5
ECs 7160	120.5



### System technology (tables next page)

<b>Recommended combinations</b>	Worm gear	GS 3
	Spur gear	upon request
	Planetary gear	PM 60
	Rotary encoder	upon request
	Brake	upon request
	Electronics	UCE 24

# Gear unit combinations

- All torques are calculated with a duty factor of 1!



Additional recommended combinations upon request

Type	Name Nominal voltage / DC voltage	ECs 7140		ECs 7160			
		n rpm	M Nm	n rpm	M Nm		
<b>GS 3 Worm gear 1-stage</b>							
	i=5	600	1.4	600	2.0		
	i=10	300	2.4	300	3.4		
	i=15	200	3.4	200	4.8		
	i=20	150	4.0	150	5.7		
	i=30	100	4.9	100	7.1		
	i=50	60	6.1	60	8.8		
	i=70	43	8.3	43	11.9*		
	i=100	30	9.8*	30	14.0*		

Additional reductions upon request. \* Max. load at the gear output.  
(Motor power must be limited if necessary)

Type	Name Nominal voltage / DC voltage	ECs 7140		ECs 7160			
		n rpm	M Nm	n rpm	M Nm		
<b>M 10 Spur gear 1-3 stages</b>							

Additional reduction ratios upon request.

Type	Name Nominal voltage / DC voltage	ECs 7140		ECs 7160			
		n rpm	M Nm	n rpm	M Nm		
<b>PM/P 60 Planetary gear 1-3 stage</b>							
	i=3.7	811	1.0	811	1.5		
	i=5.2	577	1.5	577	2.1		
	i=6.8	441	1.9	441	2.7		
	i=13.7	219	3.6	219	5.1		
	i=18.4	163	4.8	163	6.9		
	i=28.9	104	7.6	104	10.8		
	i=45.6	66	12.0	66	17.1		
	i=78.7	38	19.3	38	27.5		
	i=115	26	28.2	26	40.3		
i=169	18	41.4	18	59.2			

Additional reduction ratios upon request.