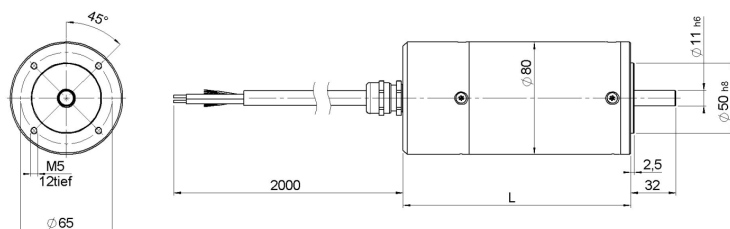




## HSM71

### Brushless DC motors

Up to 800W output power can be combined with various gears and holding brakes  
Hall sensor as feedback system



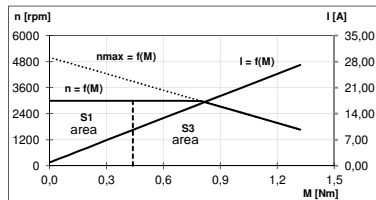
Type	Dimension L
HSM7115	133
HSM7130	148
HSM7145	163
HSM7160	178

Power cable		Signal cable	
Description	Wire colour	Description	Wire colour
motor phase A	black with number print 1	Hall sensor 1	green
motor phase B	black with number print 2	Hall sensor 2	yellow
motor phase C	black with number print 3	Hall sensor 3	orange
		Hall sensor supply	red
		Hall sensor ground	black
		temperature sensor PT1000 + (max. 24 V <sub>DC</sub> )	violet
		temperature sensor PT1000 - (GND)	blue
		voltage drop over PT1000 (connection to analog input)	brown

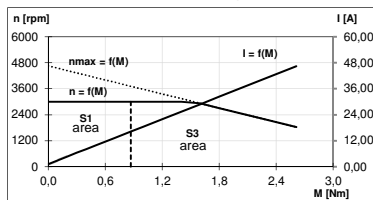
### Operation characteristics:

Measured at 24V<sub>DC</sub> with block-shaped current supply

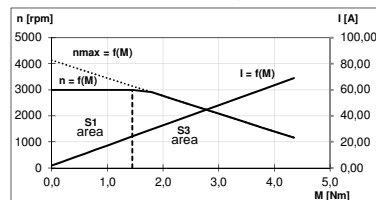
HSM7115-24, 24V, 3000rpm



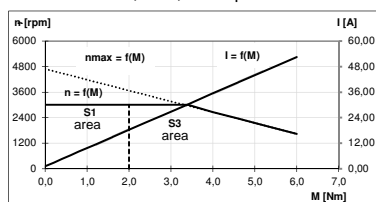
HSM7130-24, 24V, 3000rpm



HSM7145-24, 24V, 3000rpm



HSM7160-48, 48V, 3000rpm



### Description:

The motors of the HSM series are brushless permanent magnet DC motors. These motor systems commutate on the basis of suitable drive controllers (hence the term EC motor). The stator is a 3-phase toothed coil winding, the rotor consists of 12 high-quality neodymium-iron-bore magnets. The specially developed Hall sensor board serves as a very cost-efficient and reliable feedback system. The HSM drives can be expanded modularly with different gearboxes, holding brakes and encoder systems.

### Characteristics:

- high power density
- cost efficiency
- high efficiency
- low inertia rotor
- good controllability
- compact design
- all windings also available as standard in 48V<sub>DC</sub>
- can be combined with planetary gearboxes, worm gearboxes and planetary angle gearboxes
- IP protection classes above 54 available as an option
- optional connectors available
- winding optimization also for other speeds
- connecting cable available in different lengths and with or without shield
- connecting cable assembled to the suitable EDC drive controllers

Type		HSM7115-24	HSM7115-48	HSM7115	HSM7115	HSM7130-24	HSM7130-48	HSM7130	HSM7130	
series										
nominal speed	rpm	3000	3000	4000	4000	3000	3000	4000	4000	
nominal voltage	V	24	48	24	48	24	48	24	48	
nominal current <sup>2)5)</sup>	$A_{rms}$	9,6	4,7	11,5	5,8	16,3	8,4	22	11,6	
nominal power <sup>1)</sup>	W	140	140	180	180	270	270	360	360	
operation acc. to VDE0530		S1		S1		S1		S1		
protection acc. to VDE0530		IP54		IP54		IP54		IP54		
connection		sheathed cable		sheathed cable		sheathed cable		sheathed cable		
rotating direction		reversible		reversible		reversible		reversible		
design		IM B14		IM B14		IM B14		IM B14		
<b>Mechanical data:</b>										
mass moment of inertia	kgm <sup>2</sup>	0,0752*10 <sup>-3</sup>		0,0752*10 <sup>-3</sup>		0,1463*10 <sup>-3</sup>		0,1463*10 <sup>-3</sup>		
nominal torque <sup>1)</sup>	Nm	0,44	0,44	0,43	0,43	0,87	0,87	0,85	0,85	
peak torque	Nm	1,32	1,32	1,29	1,29	2,6	2,6	2,55	2,55	
speed constant	V <sup>-1</sup> *rpm	208	101	260	130	195	97	259	130	
characteristic slope $\Delta n/\Delta M$	rpm/Nm	2519	2482	3023	3030	1137	1134	1363	1412	
mechanical time constant	ms	4,4	4,2	4,2	4,1	4,08	2,62	3,34	3	
friction torque	Nm	0,045		0,045		0,035		0,07		
rotor weight	kg	0,37	0,37	0,37	0,37	0,59	0,59	0,59	0,59	
motor weight	kg	2,05	2,05	2,05	2,05	2,5	2,5	2,5	2,5	
motor weight incl. parking brake	kg	3,05	3,05	3,05	3,05	3,5	3,5	3,5	3,5	
$F_R$ (permissible radial shaft load) <sup>3)</sup>	N	230		230		230		230		
$F_A$ (permissible axial shaft load)	N	90		90		90		90		
<b>Electrical data:</b>										
phase number		3		3		3		3		
pol number		12		12		12		12		
terminal resistance <sup>4)</sup>	$\Omega$	0,156	0,642	0,1	0,39	0,085	0,27	0,043	0,143	
inductance <sup>4)</sup>	mH	0,085	0,469	0,07	0,28	0,096	0,34	0,053	0,122	
voltage constant	V/1000*rpm	4,8	9,93	3,84	7,69	5,15	10,31	3,87	7,69	
torque constant	Nm/A	0,0504	0,105	0,0414	0,0829	0,0541	0,1228	0,0434	0,0832	
max. peak current <sup>2)5)</sup>	$A_{rms}$	27	13	32,3	16,1	46	24,4	60	32	
electric time constant	ms	0,54	0,73	0,7	0,72	1,17	1,26	1,23	0,85	
<b>Thermal data:</b>										
max. ambient temperature	°C	20		20		20		20		
insulation class acc. To VDE0530		F		F		F		F		
thermal time constant	min	follows		follows		60	follows	follows	follows	
temperature-rise without cooling	K/W	follows		follows		0,89	follows	follows	follows	
<b>Connection:</b>										
cable gland	M20x1,5	Power cable 2m. Available in different lengths, can be assembled with EDC drive controller crimp contacts and plugs on request.								
cable gland	M16x1,5	Sensor cable 2m. Available in different lengths, can be assembled with EDC drive controller crimp contacts and plugs on request.								
<b>Parking brake: B17</b>										
nominal voltage	V	24				24				
nominal current	A	0,63				0,63				
static break torque (motor shaft)	Nm	2				2				
max. number of operations per hour		2000				2000				

Tolerances acc. to VDE 0530 ± 10%.

<sup>1)</sup> Values apply when mounting on aluminium contact surfaces (A=0,15m2, d=10mm).

<sup>2)</sup> RMS value of the current

<sup>3)</sup> Centre of the shaft.

<sup>4)</sup> Measured between two phases.

<sup>5)</sup> The current that actually flows in the motor system, not to be confused with the current that is displayed on the power supply unit.

The values are valid for use in the temperature range 0-20°C and must not be exceeded, even briefly, to avoid the risk of magnet weakening.

Type		HSM7145-24	HSM7145-48	HSM7145	HSM7145	HSM7160-48	HSM7160
series							
nominal speed	rpm	3000	3000	4000	4000	3000	4000
nominal voltage	V	24	48	24	48	48	48
nominal current <sup>(2)5)</sup>	$A_{rms}$	25,3	14,5	37	18,2	18,3	23,8
nominal power <sup>1)</sup>	W	460	460	595	595	630	800
operation acc. to VDE0530		S1		S1		S1	S1
protection acc. to VDE0530		IP54		IP54		IP54	IP54
connection		sheathed cable		sheathed cable		sheathed cable	sheathed cable
rotating direction		reversible		reversible		reversible	reversible
design		IM B14		IM B14		IM B14	IM B14
<b>Mechanical data:</b>							
mass moment of inertia	kgm <sup>2</sup>	0,2174*10 <sup>-3</sup>		0,2174*10 <sup>-3</sup>		0,2885*10 <sup>-3</sup>	0,2885*10 <sup>-3</sup>
nominal torque <sup>1)</sup>	Nm	1,45	1,45	1,42	1,42	2	1,9
peak torque	Nm	4,35	4,35	4,26	4,26	6	5,7
speed constant	V <sup>-1</sup> *rpm	172	102	247	130	98	130
characteristic slope $\Delta n/\Delta M$	rpm/Nm	684	655	797	909	508	675
mechanical time constant	ms	2,6	2,95	4,4	2,5	follows	follows
friction torque	Nm	0,12		0,12		0,14	0,14
rotor weight	kg	0,82	0,82	0,82	0,82	1,05	1,05
motor weight	kg	2,95	2,95	2,95	2,95	3,4	3,4
motor weight incl. parking brake	kg	3,95	3,95	3,95	3,95	4,4	4,4
$F_R$ (permissible radial shaft load) <sup>3)</sup>	N	230		230		230	230
$F_A$ (permissible axial shaft load)	N	90		90		90	90
<b>Electrical data:</b>							
phase number		3		3		3	3
pol number		12		12		12	12
terminal resistance <sup>4)</sup>	$\Omega$	0,045	0,16	0,036	0,081	0,097	0,062
inductance <sup>4)</sup>	mH	0,06	0,187	0,02	0,08	0,1	0,074
voltage constant	V/1000*rpm	5,8	9,81	4,05	7,68	10,23	7,68
torque constant	Nm/A	0,0648	0,1085	0,0425	0,085	0,1169	0,0857
max. peak current <sup>(2)5)</sup>	$A_{rms}$	69	41	100	51,5	52	68
electric time constant	ms	1,33	1,17	0,56	0,99	1,03	1,2
<b>Thermal data:</b>							
max. ambient temperature	°C	20		20		20	20
insulation class acc. to VDE0530		F		F		F	F
thermal time constant	min	follows	follows	follows	follows	follows	follows
temperature-rise without cooling	K/W	follows	follows	follows	follows	follows	follows
<b>Connection:</b>							
cable gland	M20x1,5	Power cable 2m. Available in different lengths, can be assembled with EDC drive controller crimp contacts and plugs on request.					
cable gland	M16x1,5	Sensor cable 2m. Available in different lengths, can be assembled with EDC drive controller crimp contacts and plugs on request.					
<b>Parking brake: B17</b>							
nominal voltage	V	24				24	
nominal current	A	0,63				0,63	
static break torque ( motor shaft)	Nm	2				2	
max. number of operations per hour		2000				2000	

Tolerances acc. to VDE 0530 ± 10%.

<sup>1)</sup> Values apply when mounting on aluminium contact surfaces (A=0,15m2, d=10mm).

<sup>2)</sup> RMS value of the current.

<sup>3)</sup> Centre of the shaft.

<sup>4)</sup> Measured between two phases.

<sup>5)</sup> The current that actually in the motor system, not to be confused with the current that is displayed on the power supply unit.

The values are valid for use in the temperature range 0-20°C and must not be exceeded, even briefly, to avoid the risk of magnet weakening.