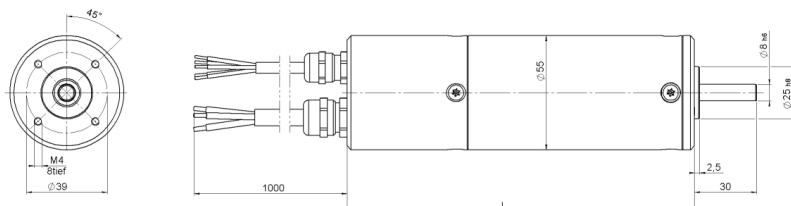




HSM46

Brushless DC motors

Up to 220W output power can be combined with various gears and holding brakes
Hall sensors as feedback system



Type	Dimension L
HSM4615	138
HSM4630	153
HSM4645	168

Power cable

Description	Wire colour
motor phase A	black with number print 1
motor phase B	black with number print 2
motor phase C	black with number print 3

Signal cable

Description	Wire colour
Hall sensor 1	green
Hall sensor 2	yellow
Hall sensor 3	orange
Hall sensor supply	red
Hall sensor ground	black
temperature sensor PT1000 + (max. 24 V _{DC})	violet
temperature sensor PT1000 - (GND)	blue
voltage drop over PT1000 (connection to analog input)	brown

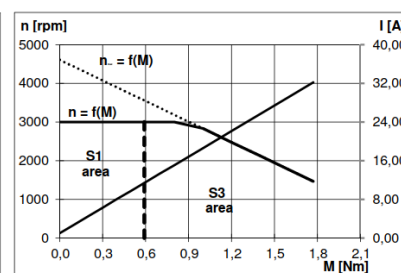
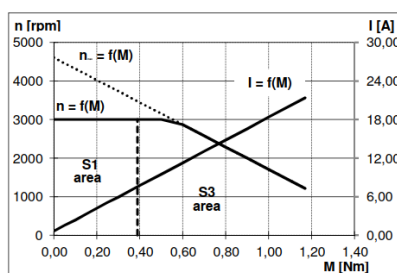
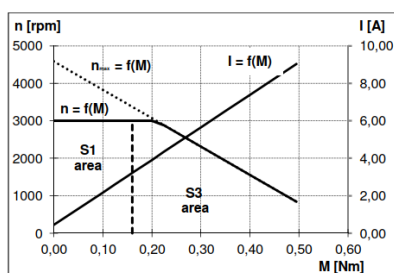
Operation characteristics:

Measured at 24V_{DC} with block-shaped current supply

HSM4615-24, 24V, 3000rpm

HSM4630-24, 24V, 3000rpm

HSM4645-24, 24V, 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 6 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_{DC}
- 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		HSM4615-24	HSM4615	HSM4630-24	HSM4630-48	HSM4630	HSM4630	HSM4645-24	HSM4645-48	HSM4645	HSM4645	
series												
nominal speed	rpm	3000	4000	3000	3000	4000	4000	3000	3000	4000	4000	
nominal voltage	V	24	24	24	48	24	48	24	48	24	48	
nominal current ²⁾⁵⁾	A _{rms}	3,3	4,7	7,5	3,7	9,3	4,7	10,3	4,6	14,6	6,6	
nominal power ¹⁾	W	52	65	125	125	140	140	175	190	220	220	
operation acc. to VDE0530		S1	S1	S1	S1	S1	S1	S1	S1	S1	S1	
protection acc. to VDE0530		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	
connection		sheathed cable	sheathed cable	sheathed cable	sheathed cable	sheathed cable	sheathed cable	sheathed cable	sheathed cable	sheathed cable	sheathed cable	
rotating direction		reversible	reversible	reversible	reversible	reversible	reversible	reversible	reversible	reversible	reversible	
design		IM B14	IM B14	IM B14	IM B14	IM B14	IM B14	IM B14	IM B14	IM B14	IM B14	
Mechanical data:												
mass moment of inertia	kgm ²	0,0025*10 ⁻³	0,0025*10 ⁻³	0,0044*10 ⁻³		0,0044*10 ⁻³		0,0063*10 ⁻³		0,0063*10 ⁻³		
nominal torque ¹⁾	Nm	0,165	0,155	0,39	0,39	0,34	0,34	0,56	0,59	0,52	0,52	
peak torque	Nm	0,48	0,465	1,17	1,17	1,02	1,02	1,70	1,77	1,56	1,56	
speed constant	V ⁻¹ *rpm	191	267	192	92,6	267	133	192	88,2	257	122	
characteristic slope Δn/ΔM	rpm/Nm	7584	10201	2898	2355	3694	3312	1776	1639	2345	2048	
mechanical time constant	ms	0,71	1,05	0,74	0,33	0,51	0,39	0,5	0,3	0,42	0,31	
friction torque	Nm	0,025	0,025	0,035		0,035		0,055		0,055		
rotor weight	kg	0,095	0,095	0,131	0,131	0,131	0,131	0,168	0,168	0,168	0,168	
motor weight	kg	1,23	1,23	1,4	1,4	1,4	1,4	1,57	1,57	1,57	1,57	
motor weight incl. parking brake	kg	1,88	1,88	2,05	2,05	2,05	2,05	2,22	2,22	2,22	2,22	
F _R (permissible radial shaft load) ³⁾	N	100	100	100		100		100		100		
F _A (permissible axial shaft load)	N	40	40	40		40		40		40		
Electrical data:												
phase number		3	3	3		3		3		3		
pole number		6	6	6		6		6		6		
terminal resistance ⁴⁾	Ω	0,95	0,63	0,348	0,97	0,19	0,58	0,29	0,89	0,104	0,39	
inductance ⁴⁾	mH	0,91	0,89	0,46	0,84	0,234	0,471	0,23	1,38	0,176	0,37	
voltage constant	V/1000*rpm	5,23	3,75	5,21	10,8	3,75	7,5	5,21	11,33	3,9	8,23	
torque constant	Nm/A	0,0575	0,0387	0,0564	0,114	0,0403	0,0807	0,0568	0,138	0,0394	0,0883	
max. peak current ²⁾⁵⁾	A _{rms}	8,8	12,7	21	10,6	26	13,1	32	13,3	41	18,3	
electric time constant	ms	1,11	1,41	1,32	1,16	1,23	0,81	1,13	1,55	1,7	0,95	
Thermal data:												
max. ambient temperature	°C	20	20	20		20		20		20		
insulation class acc. to VDE0530	F		F	F		F		F		F		
thermal time constant	min	follows	follows	11	follows	follows	follows	40	follows	follows	follows	
temperature-rise without cooling	K/W	follows	follows	1,16	follows	follows	follows	1,47	follows	follows	follows	
Connection:												
cable gland	M16x1,5	Power cable 2m. Available in different lengths, can be assembled with EDC drive controller crimp contacts and plugs on request.										
cable gland	M12x1,5	Sensor cable 2m. Available in different lengths, can be assembled with EDC drive controller crimp contacts and plugs on request.										
Parking brake: B19												
nominal voltage	V					24						24
nominal current	A					0,52						0,52
static break torque (motor shaft)	Nm					1						1
max. number of operations per hour						2000						2000

Tolerances acc. to VDE 0530 ± 10%.

¹⁾ Values apply when mounting on aluminum contact surfaces (A=0,15m2, d=10mm).

²⁾ RMS value of the current.

³⁾ Centre of the shaft.

⁴⁾ Measured between two phases.

⁵⁾ 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.