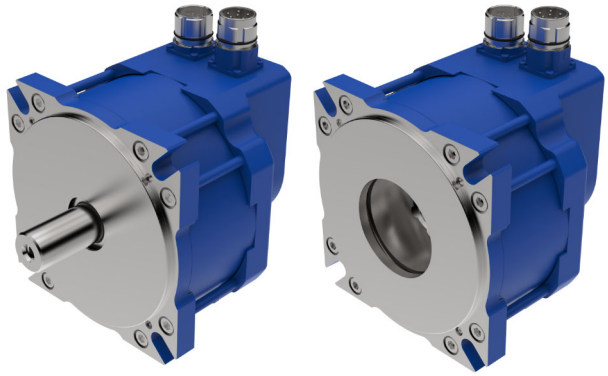
Swedish Innovative Servo Motion Engineering Since 1994



HDD/ICM 14J - Data sheet

Electric data

Value	Unit	Winding	
		Pa (400VAC)	Ma (230VAC)
Number of poles		20	20
Number of pole pairs		10	10
Inductance/Phase	mH	4.4	1.1
Resistance/Phase	Ohm	0.77	0.19
Resistance/Phase-Phase	Ohm	1.5	0.38
Back EMF/Phase-Phase RMS	Vs/rad	0.90	0.45
Back EMF @ 1000 rpm	V	94	47
Torque constant (RMS)	Nm/A	1.56	0.78
Max rail voltage	V	750	750
Recommended peak current	A	15	30
Torque at recommended peak current	Nm	22.5	22.5

For higher torques, see next page.

Mechanical data (resolver feedback)

Value	Unit	HDD 14J / ICM 14J	
		no brake	brake
J	kgcm2	13.3	13.7
Mass	kg	6.0 / 5.7	6.5 / 6.2

Holding brake

Value	Unit	
Torque	Nm	9
J	kgcm2	0.4
Voltage	V DC	24
Power	W	12

Thermistors

Overheat protection consists of triple PTC thermistors. One on each phase.	
R @ 25 C	100 to 350 Ohm
R @ 145 C	< 1650 Ohm
R @ 155 C	> 4 kOhm

Protection class

HDD motors comply with the requirements for IP 65. IP-67 is available on request.

Insulation class

The insulation system complies with the requirements of EEC LV Directive 73/23/EEC and 93/68/EEC. Test report E9911111E01.

Motor name structure

Type	Flange size	Stator length	Winding	Feedback	Power connector	Brake	Shaft key	Options
HDD	14	J	-Pa	-A	-A	-A	-A	-AAA

Type HDD = shaft motor, ICM = internal coupling motor.

Flange size Approximate in cm. 14 = 140 mm.

Stator length HDD: J(shortest), N, Q, R (longest), ICM: J (shortest), N (longest).

Winding Suitable rail voltage at 3000 rpm.

Pa	560V
Ma	320V

Feedback See the feedback list on www.hddservo.com/product-options/

Power connector Many different pinouts available; see www.hddservo.com/product-options/

Brake A = no brake, D = holding brake. Data see above.

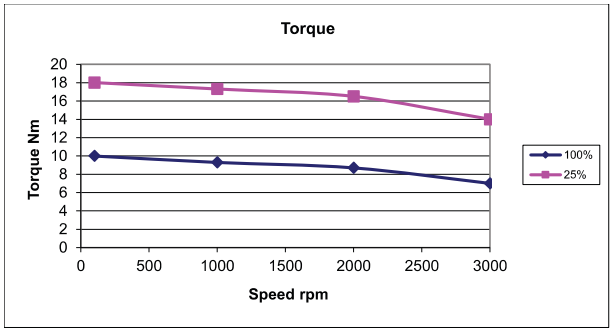
Shaft key A = shaft with key, B = shaft without key.

Options AAA = standard. For other options please contact HDD.

Torque

Torque in Nm at 90ºC temp rise (median temp rise, i.e. average between min and max temp for 25% cycle).

Duty cycle	100%	25%
100rpm	10.0	18.0
1000rpm	9.3	17.3
2000rpm	8.7	16.5
3000rpm	7.0	14.0



Current

Current at 90ºC temp rise, in Ampere rms.

Winding	Pa	Ma	Pa	Ma
Duty cycle	100%		25%	
100rpm	7.0	14.0	13.0	26.0
1000rpm	6.6	13.2	12.7	25.4
2000rpm	6.0	12.0	12.3	24.6
3000rpm	5.3	10.6	10.6	21.2

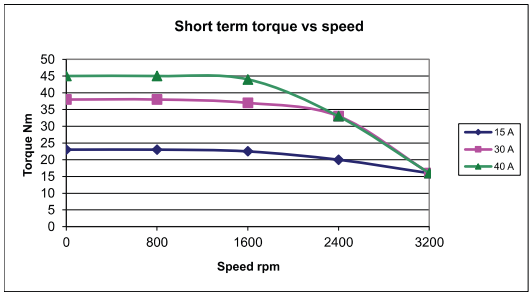
Data were measured on an HDD14J-Pa series motor mounted on a vertical 450 x 375 x 30 mm steel plate in free air, with a winding temperature rise of 90ºC and driven by a commercially available inverter.

Important note on peak torque and currents

The HDD/ICM motors are capable of high peak torques. At very high peak torques the permitted pulse time is very limited as a high current in a very small motor causes rapid temperature rise in the copper winding. The protection thermistor will not react fast enough to protect the winding during high pulse loads. A 40A rms current to a HDD14J-Pa will give some 45 Nm, but the copper winding temperature will increase with some 40ºC per second. This is not a problem for short pulses of < 0.5 seconds as long as the rms value of the current is kept below some 7 A. The short term torque graph below represents acceleration ramps at various commanded currents; the actual currents may be lower if the driver has not been able to compensate for the high acceleration.

Torque at various commanded currents

HDD 14J-Pa at 560V rail voltage



Maximum load on shaft at life expectancy 20,000 h (shaft motors only)

Maximal axial load (push): 1000 N at 500 rpm, 300 at 3000 rpm.
Maximal axial load (pull): 100 N at all speeds.
Maximal radial load is given by the curves below.

