



# HDT 09N

# Data sheet

## Electrical data

Value	unit	Ma winding	Ja winding
Number of poles		10	10
Number of pole pairs		5	5
Inductance/Phase	mH	3.6	0.40
Resistance/Phase	Ohm	0.52	0.06
Resistance/Phase-phase	Ohm	1.04	0.12
Back EMF/Phase-Phase RMS	Vs/rad	0.49	0.16
Back EMF @ 1000 rpm	V	52	17
Torque constant (RMS)	Nm/A	0.85	0.28
Max rail voltage	V	750	750

For higher torques, see next page. The torque constant is defined as the back EMF; friction losses are ignored. Data are based on a small sample and not definitive.

## Mechanical data (resolver feedback)

Value	unit	HDT09N
		no brake
J	kgcm <sup>2</sup>	2.15
Mass	kg	3.5

## Insulation class

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

## Protection class

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

## Thermistor

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

## Holding brake

No brake is available for HDT motors at this time.

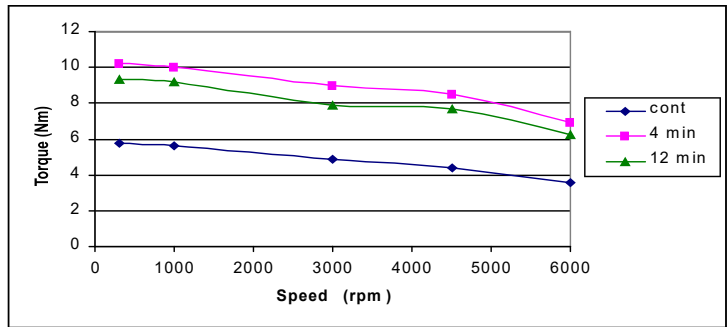
## Motor name structure

Type	Flange size	Stator length	Winding	Feedback	Power connector	Brake	Shaft key	Options
HDT	09	N	- Ma	- A	- A	- A	- A	- AAA

<b>Type</b>	HDT = 10 pole shaft motor, HDD/ICM = 20 pole motors
<b>Flange size</b>	Approximate in cm. 09 = 92 mm.
<b>Stator length</b>	E (shortest), J, N, Q (longest).
<b>Winding</b>	Ma suitable for 6000 rpm at rail voltage 560V Ja suitable for 6000 rpm at 180V
<b>Feedback</b>	See the feedback list on <a href="http://www.hdd.se">www.hdd.se</a>
<b>Power connector</b>	Many different pinouts available; see <a href="http://www.hdd.se">www.hdd.se</a>
<b>Brake</b>	A = no brake, D = holding brake. Data see above.
<b>Shaft key</b>	A = shaft with keyway (standard), B = shaft without keyway.
<b>Options</b>	AAA = standard. For other options please contact HDD.

**Torque** at 90°C max temp rise, in Nm

Speed	100%	25%, 4min	25%, 12min
300	5.75	10.2	9.3
1000	5.6	10.0	9.2
3000	4.9	9.0	7.9
4500	4.4	8.5	7.7
6000	3.6	6.9	6.25



**Current** at 90°C max temp rise, in Ampere rms

Speed	Ma winding			Ja winding		
	100%	25%, 4min	25%, 12min	100%	25% 4min	25%, 12min
300	7.4	13.5	11.9	22.2	40.5	35.7
1000	7.2	13	11.8	21.6	39.0	35.4
3000	6.5	12.5	10.8	19.5	37.5	32.4
4500	6.1	11.6	10.4	18.3	34.8	31.2
6000	5.25	11.0	10.0	15.8	33.0	30.0

Data were measured on an HDT 09N-Ma series motor mounted on a vertical 260 x 200 x 12 mm aluminum plate in free air, with a maximal winding temperature rise of 90°C and driven by a commercially available inverter.

Data are given for continuous operation and two drive cycles: 1 min on and 3 min off, and 3 min on and 9 min off, respectively. Data for other windings were calculated.

**Important note on peak torque and currents**

HDT 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.

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

Maximal axial load (push): 350 N at 500 rpm, 100 N at 3000 rpm, 35 N at 6000 rpm. Maximal axial load (pull): 50 N at all speeds. Maximal radial load at zero axial load is given by the curves below.

For special cases please contact HDD for calculations.

