ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *SEM HDM105G10-90S* at our website: *Click HERE*

HDM

HIGH TORQUE DENSITY SERVOMOTORS



TECHNICAL DATA MANUAL
ISSUE NO. 5.5

Date: May 2012

SEM
controlled motor technology

SEM Limited
Faraday Way
Orpington, KENT
BR5 3QT
United Kingdom

Tel: +44 (0)1689 884 700
Fax: +44 (0)1689 884 884
Email: sales@sem.co.uk
Internet: www.sem.co.uk

CONTENTS

1 Introduction

2 General information
- Receiving and storage.
- Environmental protection.
- Mounting of motors.
- Thermal protection.
- Maintenance and servicing.
- Holding brake options
- E.U. Directives.

3 Mechanical tolerance

4 Connection details

5 Feedback device specification

6 Torque derating at high temperatures

8 HDM82 Technical Information

9 HDM105 Technical Information

10 HDM142 Technical Information

11 Useful Formulae

INTRODUCTION

SEM has continuously developed its range of servo products to best serve the latest industry requirements. The new HDM range of servomotors uses the long experience gained in the servomotor field to give cost effective performance.

The HDM range has been specifically designed to provide optimal performance whilst remaining compact and cost effective. The high torque to inertia ratio allows fast acceleration and deceleration and rapid dynamic response.

These motors are ideally suited for any high dynamic application where space constraints apply.

WHY BRUSHLESS?

The optimum performance of a brushless servomotor is achievable without danger of commutator “flashover”.

Speeds of up to 10000 rpm are possible.

SEM brushless servomotors are fitted with available with high flux density Neodymium Iron Boron magnets reducing rotor inertia and allowing higher peak torques for acceleration and deceleration.

As the winding is stationary, we have been able to position the thermal sensor here where it is most effective. By using this thermal sensor, the risk of overheating or demagnetising a brushless servomotor can be virtually eliminated.

The motors are virtually maintenance free.

GENERAL INFORMATION

RECEIVING AND STORAGE

On receipt the motors should be inspected. Any damage found should be reported immediately to SEM and the carrier.

ENVIRONMENTAL PROTECTION

All SEM brushless motors are protected to IP65 except at the shaft where the protection is IP64 with a shaft seal fitted.

Protection Class	Description
IP65	Totally protected against dust. Protected against low pressure jets of water from all directions with limited ingress permitted
IP64	Totally protected against dust. Protected against water sprayed from all directions with limited ingress permitted

MOUNTING OF MOTORS

Where a toothed belt is proposed, the motors should be flange mounted to an angle bracket or similar as close as possible to the line of action of the drive. The motor pulley should be positioned as close as possible to the mounting face and the pulley diameter chosen to maintain dynamic shaft loading within the limits indicated on the loading graphs. Particular attention must be given to the tension of the drive belts, with reference to the belt manufacturers instructions so that unnecessarily high shaft loads are avoided on installation. **If the belt tension is too high, the bearings may be damages and in extreme cases, the shaft may break.**

THERMAL PROTECTION

HDM servomotors are fitted with a Philips type KTY84-130 thermal sensor. The resistance of this sensor varies with temperature as indicated below.

Resistance change with temperature	
Temperature ºC	Resistance Ω
0	474 to 522
25	577 to 629
100	970 to 1030
150	1282 to 1385
160	1350 to 1463

The current in the sensor should be between 1mA and 3mA.

To protect the winding, the drive should shut down if the resistance exceeds 1400 Ohms.

GENERAL INFORMATION

MAINTENANCE AND SERVICING

BEARINGS

All HDM servomotors are fitted with double shielded, single row radial ball bearings. Under normal conditions, no maintenance is required.

Bearing Sepcification		
Frame	ISO Code for Drive End	ISO Code for Non-Drive End
HDM82	6002 2Z	6002 2Z
HDM105	6004 2Z	6003 2Z
HDM142	6205 2Z	6004 2Z

The bearings are selected to give a minimum of 30,000 hours life. Refer to the shaft loading graphs for further information.

MECHANICAL

It is recommended that a general inspection be made at regular intervals to check all bolts, nuts couplings etc to ensure that they are still tightened to the correct torque.

Fitting and Tightening Motor Drive End to Body Fasteners		
Frame	Screw Size	Torque
HDM82	M4	2.2
HDM105	M5	5.0
HDM42	M6	8.0

For information on the repair and rectification of brushless servomotors please contact SEM.

GENERAL INFORMATION

HOLDING BRAKES

HOLDING BRAKE OPTIONS

All brakes used on the HDM motors are constructed such that when in the power off state (brake engaged condition) the brake friction plate is forced into frictional contact with the rigidly fixed brake housing thus preventing the friction plate from rotating.

These are primarily a holding brake e.g. to hold a load under a no voltage condition. However, the brake can also be used in some applications for emergency stopping.

Connection should be such that when the motor is powered the brake is energized and the brake released. Under normal conditions, no maintenance is required other than ensuring that the hub and stationary plates are kept free from foreign matter.

Standard Ratings					
Frame	Type of Brake	Brake holding torque Nm	DC Voltage V	Nominal Power Consumed W	Standard Option
HDM82	Spring Applied	4.5Nm	24Vdc ± 10%	10.4W ± 7%	Yes
HDM105	Spring Applied	10Nm	24Vdc ± 10%	16W ± 7%	Yes
HDM142	Spring Applied	20Nm	24Vdc ± 10%	25W ± 7%	Yes

Other brake options available on request.

E.U. DIRECTIVES

There are three main directives that affect applications incorporating servomotors.

MACHINERY DIRECTIVE 2006/42/EC

This directive applies to complete machines and SEM HDM servomotors are therefore exempt.

LOW VOLTAGE DIRECTIVE 2006/95/EC

This applies to all electrical equipment for use with a DC voltage of 75V to 1500V and AC voltage from 50V to 1000V.

HDM brushless servomotors in the ranges, HRDM82, HDM105 and HDM142 conform to the EC directive.

A certificate of conformity is available from SEM sales on request

EMC DIRECTIVE (ELECTRO MAGNETIC COMPATIBILITY) 2004/108/EC

The directive applies to products or appliances with an intrinsic function for the end user in which:

a. They contain electrical / electronic systems liable to cause an electromagnetic disturbance.

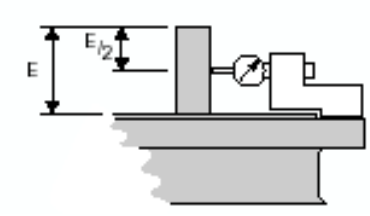
b. They contain electrical / electronic systems which may have their performance affected by an electromagnetic disturbance.

SEM can provide datasheets outlining the EMC characteristics of a standard AC brushless servomotor and giving advice on cable screening connectors and other related subjects.

SEM will be pleased to discuss any EMC related problems encountered by customers incorporating SEM AC servomotors into such products or appliances, which are governed by the EMC directive.

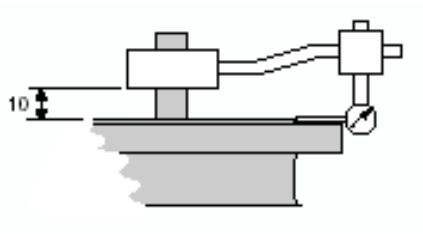
MECHANICAL TOLERANCE

SHAFT AND SPIGOT CHECKING CHART (BASED ON IEC72)

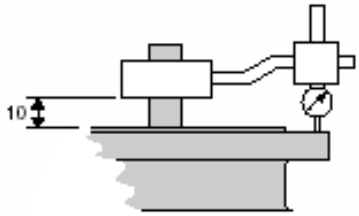


SHAFT EXTENSION RUN-OUT

SHAFT DIAMETER	NORMAL CLASS		PRECISION CLASS	
mm	mm	inch	mm	inch
>10 ≤18	.035	.00138	.018	.00071
>18 ≤30	.040	.00157	.021	.00082
>30 ≤50	.050	.00196	.025	.00098
>50 ≤80	.060	.00236	.030	.000181



CONCENTRICITY OF SPIGOT AND SHAFT



PERPENDICULARITY OF MOUNTING FACE TO SHAFT

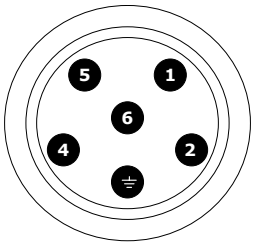
HDM MOTOR RANGE	SPIGOT DIAMETER	MAXIMUM PERMISSIBLE CHANGE IN INDICATOR READING			
		NORMAL CLASS		PRECISON CLASS	
	mm	mm	inch	mm	inch
82 105	80 95	.08	.00315	.04	.00157
142	130	.10	.00394	.05	.00197

CONNECTION DIAGRAM

HDM82 MOTORS FITTED WITH RESOLVER, M23 POWER AND M17 FEEDBACK CONNECTORS

SUPPLY CONNECTOR

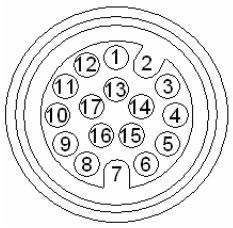
PIN	FUNCTION
1	MOTOR U
2	MOTOR V
4	BRAKE B+ (IF FITTED)
5	BRAKE B- (IF FITTED)
6	MOTOR W
⏚	EARTH



M23 CONNECTOR
6 PIN

FEEDBACK CONNECTOR

PIN	FUNCTION
1	STATOR 2ND PHASE S2
2	STATOR 2ND PHASES4
3	
4	
5	
6	
7	ROTOR R2
8	THERMAL SENSOR K1+ (IF FITTED)
9	THERMAL SENSOR K2- (IF FITTED)
10	ROTOR R1
11	STATOR 1ST PHASE S1
12	STATOR 1ST PHASE S3
13	
14	
15	
16	
17	



M17 CONNECTOR
17 PIN

Note that connectors are viewed from customer side

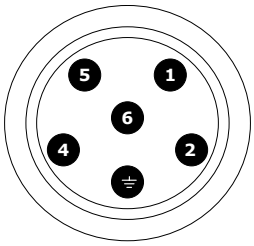
As SEM wiring diagram 323-1-51281

CONNECTION DIAGRAM

HDM82 MOTORS FITTED WITH RENCO R35I ENCODER, M23 POWER AND M17 CONNECTORS

SUPPLY CONNECTOR

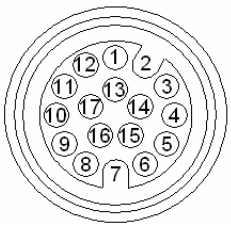
PIN	FUNCTION
1	MOTOR U
2	MOTOR V
4	BRAKE B+ (IF FITTED)
5	BRAKE B- (IF FITTED)
6	MOTOR W
⏚	EARTH



M23 CONNECTOR
6 PIN

FEEDBACK CONNECTOR

PIN	FUNCTION
1	B (ENC 2)
2	B- (NOT ENC 2)
3	Z (ENC 0)
4	W (POS SIG C)
5	U- (POS SIG NOT C)
6	U (POS SIG C)
7	GROUND (0V)
8	THERMAL SENSOR K1+ (IF FITTED)
9	THERMAL SENSOR K2 – (IF FITTED)
10	VCC (DC +5V)
11	A (ENC 1)
12	A- (NOT ENC 1)
13	Z- (NOT ENC 0)
14	W- (POS SIG NOT A)
15	V (POS SIG NOT B)
16	V- (POS SIG B)
17	



M17 CONNECTOR
17 PIN

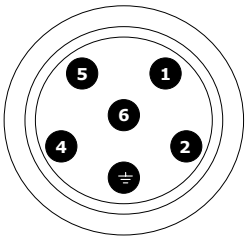
Note that connectors are viewed from customer side

CONNECTION DIAGRAM

HDM82, 105 AND 142 MOTORS FITTED WITH RESOLVER AND M23 CONNECTORS

SUPPLY CONNECTOR

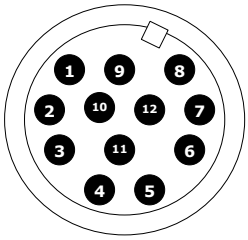
PIN	FUNCTION
1	MOTOR U
2	MOTOR V
4	BRAKE B+ (IF FITTED)
5	BRAKE B- (IF FITTED)
6	MOTOR W
⏚	EARTH



M23 CONNECTOR
6 PIN

FEEDBACK CONNECTOR

PIN	FUNCTION
1	STATOR 2ND PHASE S2
2	STATOR 2ND PHASES4
3	
4	
5	
6	
7	ROTOR R2
8	THERMAL SENSOR K1+ (IF FITTED)
9	THERMAL SENSOR K2- (IF FITTED)
10	ROTOR R1
11	STATOR 1ST PHASE S1
12	STATOR 1ST PHASE S3



M23 CONNECTOR
12 PIN (20º OFFSET)

Note that connectors are viewed from customer side

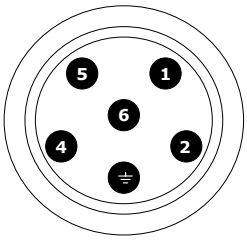
AS SEM WIRING DIAGRAM 323-1-48995

CONNECTION DIAGRAM

HDM82, 105 AND 142 MOTORS FITTED WITH RENCO R35I ENCODER AND M23 CONNECTORS

SUPPLY CONNECTOR

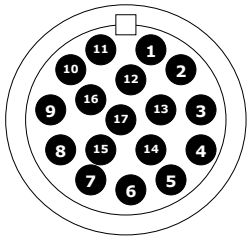
PIN	FUNCTION
1	MOTOR U
2	MOTOR V
4	BRAKE B+ (IF FITTED)
5	BRAKE B- (IF FITTED)
6	MOTOR W
⏚	EARTH



M23 CONNECTOR
6 PIN

FEEDBACK CONNECTOR

PIN	FUNCTION
1	B (ENC 2)
2	B- (NOT ENC 2)
3	Z (ENC 0)
4	W (POS SIG C)
5	U- (POS SIG NOT C)
6	U (POS SIG C)
7	GROUND (0V)
8	THERMAL SENSOR K1+ (IF FITTED)
9	THERMAL SENSOR K2 – (IF FITTED)
10	VCC (DC +5V)
11	A (ENC 1)
12	A- (NOT ENC 1)
13	Z- (NOT ENC 0)
14	W- (POS SIG NOT A)
15	V (POS SIG NOT B)
16	V- (POS SIG B)
17	



M23 CONNETOR
17 PIN

Note that connectors are viewed from customer side

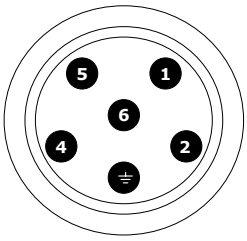
As SEM wiring diagram 323-1-51077

CONNECTION DIAGRAM

HDM82, 105 AND 142 MOTORS FITTED WITH HEIDENHAIN ERN1185/1387 ENCODER AND M23 CONNECTORS

SUPPLY CONNECTOR

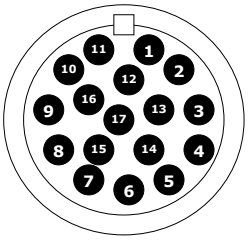
PIN	FUNCTION
1	MOTOR U
2	MOTOR V
4	BRAKE B+ (IF FITTED)
5	BRAKE B- (IF FITTED)
6	MOTOR W
⏚	EARTH



M23 CONNECTOR
6 PIN

FEEDBACK CONNECTOR

PIN	FUNCTION
1	A+ (0º SIGNAL)
2	A- (0º SIGNAL)
3	R+ (REF SIGNAL)
4	D- (COSINUS)
5	C+ (SINUS)
6	C- (COSINUS)
7	0V (UN)
8	THERMAL SENSOR K1+ (IF FITTED)
9	THERMAL SENSOR K2- (IF FITTED)
10	+5V (UP)
11	B+ (90º SIGNAL)
12	B- (90º SIGNAL)
13	R- (REF SIGNAL)
14	D+ (COSINUS)
15	0V (SENSOR UN)
16	+5V (SENSOR UP)
17	



M23 CONNECTOR
17 PIN

Note that connectors are viewed from customer side

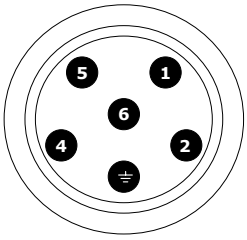
AS SEM WIRING DIAGRAM 323-1-48891

CONNECTION DIAGRAM

HDM82, 105 AND 142 MOTORS FITTED WITH HEIDENHAIN ENDAT ENCODER AND M23 CONNECTORS

SUPPLY CONNECTOR

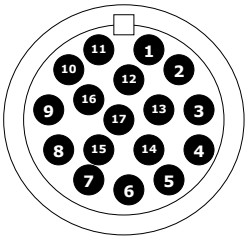
PIN	FUNCTION
1	MOTOR U
2	MOTOR V
4	BRAKE B+ (IF FITTED)
5	BRAKE B- (IF FITTED)
6	MOTOR W
⏚	EARTH



M23 CONNECTOR
6 PIN

FEEDBACK CONNECTOR

PIN	FUNCTION
1	A+ (0º SIGNAL)
2	A- (0º SIGNAL)
3	DATA +
4	
5	CLOCK +
6	
7	0V (UN)
8	THERMAL SENSOR K1+ (IF FITTED)
9	THERMAL SENSOR K2- (IF FITTED)
10	+5V (UP)
11	B+ (90º SIGNAL)
12	B- (90º SIGNAL)
13	DATA -
14	CLOCK -
15	0V (SENSOR UN)
16	+5V (SENSOR UP)
17	



M23 CONNECTOR
17 PIN

Note that connectors are viewed from customer side

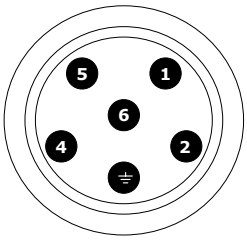
AS SEM WIRING DIAGRAM 323-1-49747

CONNECTION DIAGRAM

HDM82, 105 AND 142 MOTORS FITTED WITH STEGMANN SRS50/SRM50 ENCODER AND M23 CONNECTORS

SUPPLY CONNECTOR

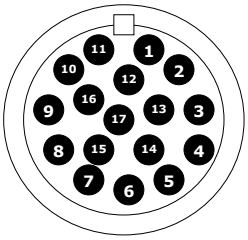
PIN	FUNCTION
1	MOTOR U
2	MOTOR V
4	BRAKE B+ (IF FITTED)
5	BRAKE B- (IF FITTED)
6	MOTOR W
⏚	EARTH



M23 CONNECTOR
6 PIN

FEEDBACK CONNECTOR

PIN	FUNCTION
1	SIN +
2	REFSIN
3	+485
4	
5	
6	
7	GROUND
8	THERMAL SENSOR K1+ (IF FITTED)
9	THERMAL SENSOR K2- (IF FITTED)
10	+V
11	COS +
12	REFCOS
13	-485
14	
15	
16	
17	



M23 CONNECTOR
17 PIN

Note that connectors are viewed from customer side

AS SEM WIRING DIAGRAM 323-1-49646

FEEDBACK DEVICE SPECIFICATION

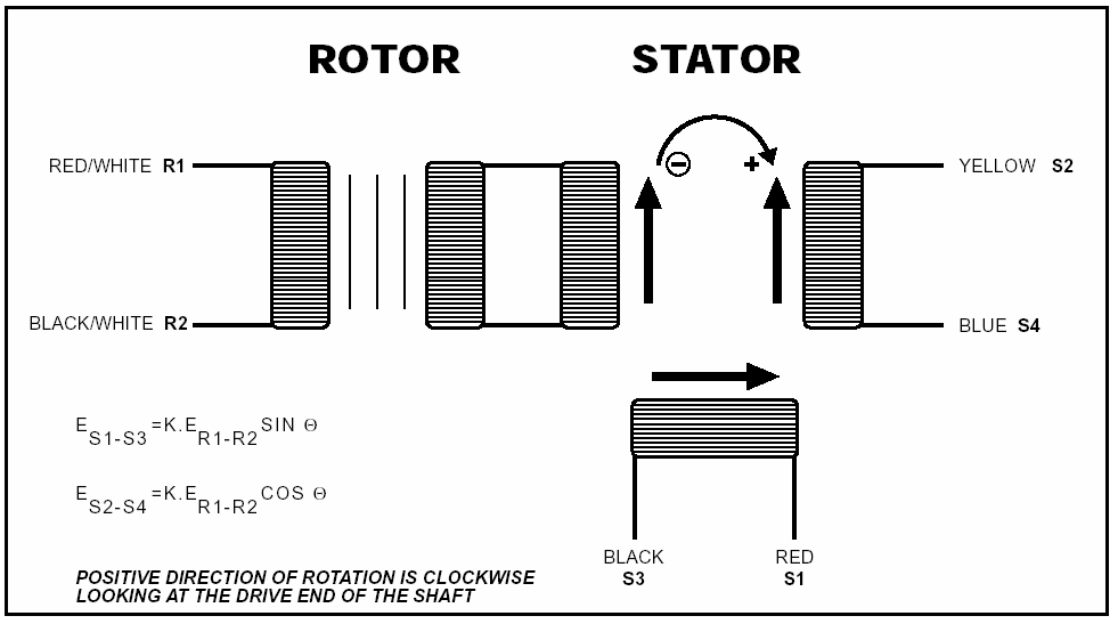
SPECIFICATION FOR RESOLVER SIZE 15

Fitted to SEM HDM motors

Configuration: 2 pole (1speed), brushless resolver.

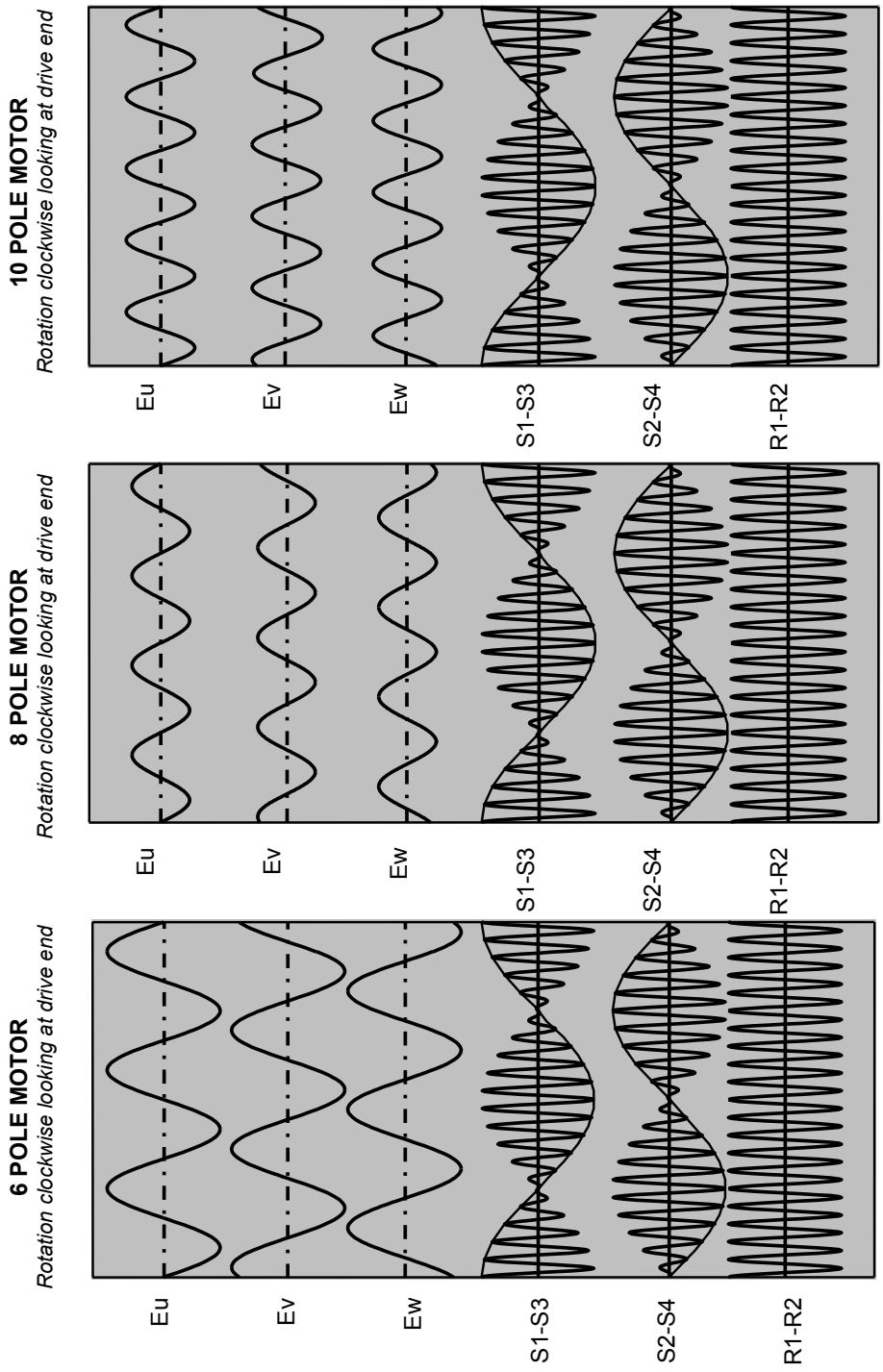
Input to single phase rotor.
Output from 2 phase stator
Connections and output equation: *see drawing*

DATA			
	Primary Side	R1-R2	
	Pole Pairs	1	
	Transformation Ratio	0.5 ± 0.05	
	Input Voltage	$7V_{rms}$	$7V_{rms}$
	Input Current	58mA	36mA
	Input Frequency	5 kHz	10kHz
	Phase Shift (± 3º)	8º	-6º
	Impedance		
	Zro	75 j 98 Ohm	110 j 159 Ohm
	Zso	180 j 230 Ohm	245 j 400 Ohm
	Zss	170 j 200 Ohm	216 j 370 Ohm
	DC resistances		
	Rotor	40 Ohm ± 10%	
	Stator	102 Ohm ± 10%	
	Null Voltage	30 mV max	
	Accuracy	± 10'	
	Approved resolver	LTN RE15-1-A84	



FEEDBACK DEVICE SPECIFICATION

SEM'S STANDARD RESOLVER SETTINGS



NOTES

1 Clockwise rotation means that the shaft rotates clockwise looking at the drive end of the shaft.
2 The EMFs (Eu, Ev, Ew) are phase EMFs
3 For + VE current into the motor; Iu, in phase with Eu will give a clockwise torque (motoring)

FEEDBACK DEVICE SPECIFICATION

SPECIFICATION FOR RENCO ENCODER TYPE R35i

Fitted to SEM HDM motors

Configuration: Square wave two channel quadrature with index and commutation signals

DATA **Electrical**

Resolutions available

Line Counts	2048, 4096, 8192

Input

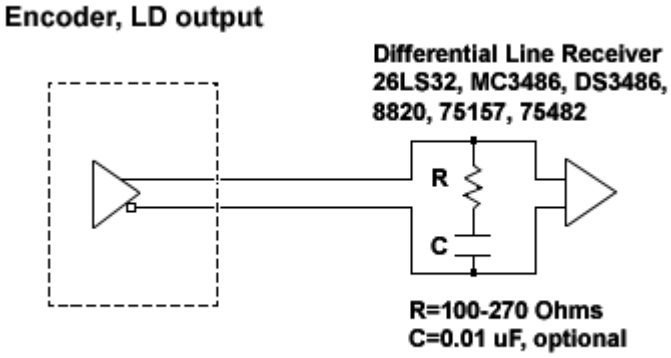
Supply voltage	5.0 VDC ± 10% Single Supply
Nominal power requirements	175mA

Output

Frequency Response	500KHz (1x)
Output Logic Levels	"1" 2.5 VDC Min "0" 0.5VDC Max

Output Format

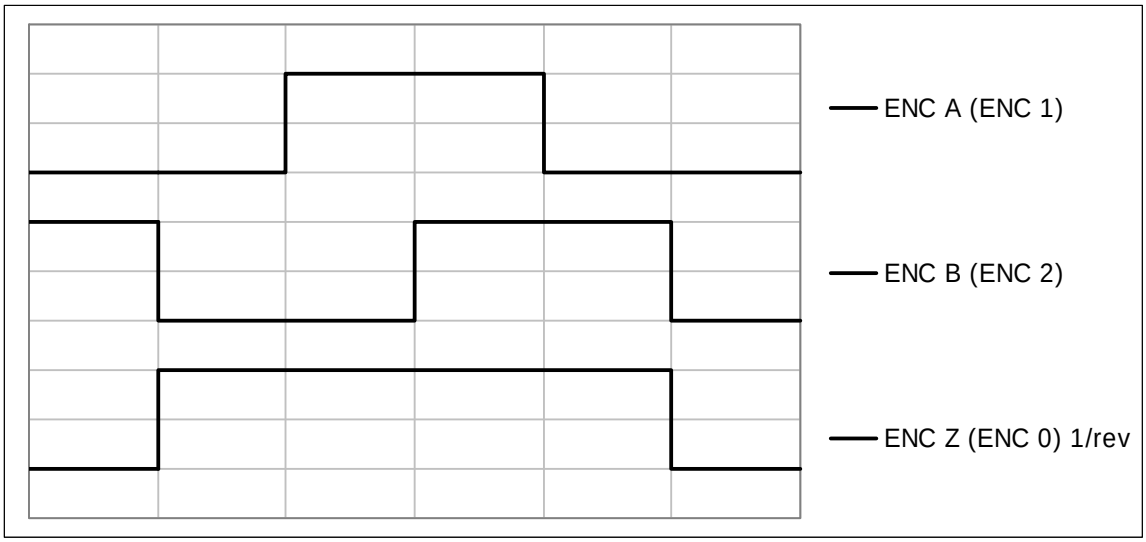
LD (Line driver)
TI 26C31IDBR typical output
26C32 typical line receiver suggested for user interface



FEEDBACK DEVICE SPECIFICATION

RENCO R35i TTL INCREMENTAL ENCODER–INCREMENTAL SIGNALS

Rotation clockwise looking at drive end



NOTES

NOT A leads NOT C and NOT C leads B.
NOT A lines up with motor line to line emf MOTOR U-V.
The ENC 0 signal occurs once per revolution.
For SEM's standard setting, the ENC 0 signal occurs at the falling edge of NOT C.
The width of the ENC 0 signal is 1 +/-0.5 incremental signal cycles.
Incremental signal ENC 1 leads ENC 2.

For SEM's standard setting (ENC 0 signal at the falling edge of NOT C), the correlation between SEM and encoder manufacturers' signal names is as follows

SEM	Renco R35i
NOT A	W-
NOT C	U-
B	V-
A	W
C	U
NOT B	V
ENC 1	A
ENC 2	B
ENC 0	Z
NOT ENC 1	A-
NOT ENC 2	B-
NOT ENC 0	Z-

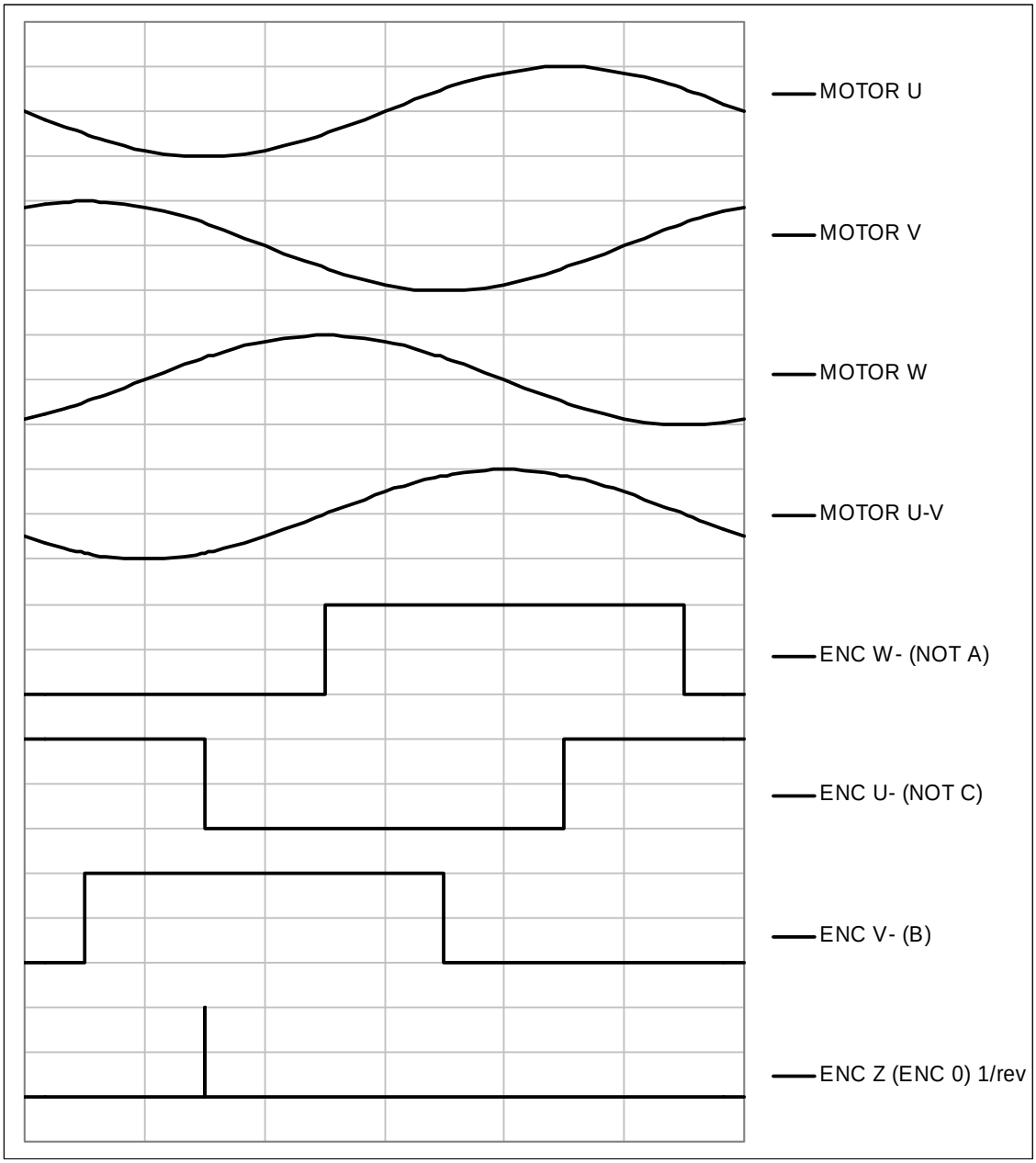
For other settings (alternative positions of ENC 0) the correlation between SEM and encoder manufacturers' signal names will be different

FEEDBACK DEVICE SPECIFICATION

RENCO R35i TTL INCREMENTAL ENCODER–COMMUTATION SIGNALS

(Note that some customers specify alternative settings)

Rotation clockwise looking at drive end



NOTES

1 Clockwise rotation means that the shaft rotates clockwise looking at the drive end of the shaft.
2 The EMFs (Eu, Ev, Ew) are phase EMFs
3 For + VE current into the motor; Iu, in phase with Eu will give a clockwise torque (motoring)

SEM TTL INCREMENTAL ENCODER SIGNAL SPEC

NOT A leads NOT C and NOT C leads B.
NOT A lines up with motor line to line emf MOTOR U-V.
The ENC 0 signal occurs once per revolution.
The width of the ENC 0 signal is 1 +/-0.5 incremental signal cycles.
Incremental signal ENC 1 leads ENC 2.

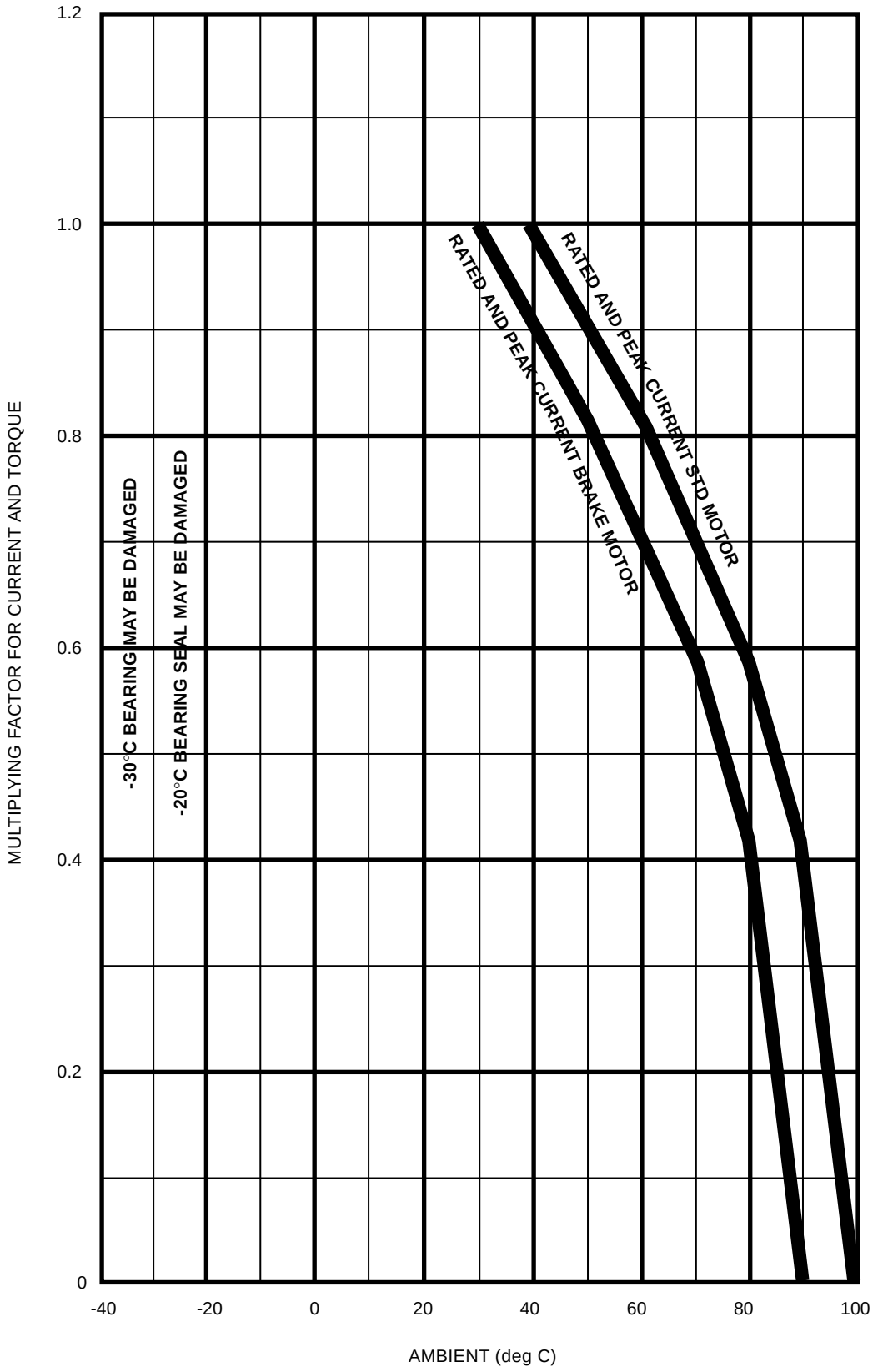
ADDITIONAL DETAILS FOR SEM'S STANDARD SETTING

The ENC 0 signal occurs at the falling edge of NOT C.
Renco R35i: U = SEM C; V = NOT B; W = A

DERATING OF SEM MOTORS WITH NdFeB MAGNETS

for unusual ambient temperatures

Note that the peak current must be reduced as well as the rated current



6

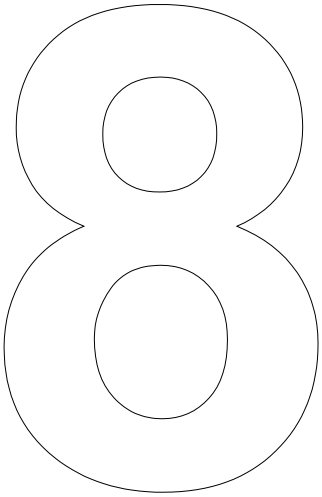
HDM82A8

HDM82C8

HDM82E8

HDM82J8

HDM82

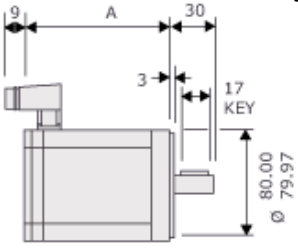


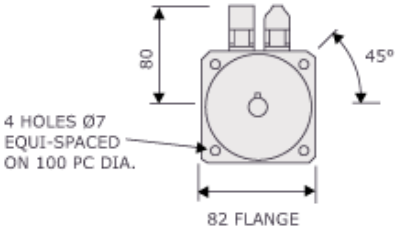
DATA TABLES · PERFORMANCE CURVES · SHAFT LOADING · MOTOR DRAWING · OPTIONAL FEATURES

8.1 HDM82A8

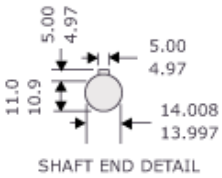
HDM COMPACT SERVOMOTORS

Outline Drawing.





Frame	Dimension 'A' without brake	with brake
HDM82A	82	122
HDM82C	100	140
HDM82E	118	158
HDM82J	154	194



Technical Data.

Parameter	Units	HDM82 A8-15S	HDM82 A8-30S	HDM82 A8-47S
Continuous Stall Torque [1]	**Nm**	**0.84**	**0.84**	**0.84**
Continuous Stall Current [1]	**A**	**4.8**	**2.4**	**1.5**
Rated Torque [1]	Nm	0.8	0.8	0.8
Rated Current [1]	A	4.7	2.3	1.5
Rated Speed	rpm	4500	4500	4500
Max. Speed (300V DC link)	rpm	8000	8000	6400
Max. Speed (560V DC link)[2]	rpm	-----	-----	8000
Peak Stall Torque	**Nm**	**2.2**	**2.2**	**2.2**
Peak Current	**A**	**22**	**11.2**	**7.1**
Resistance Line-Line[3]	Ω	1.13	4.5	11.2
Inductance Line-Line[4]	mH	2	8	20
Voltage Gradient No Load	V	15	30	47
Max. Motor EMF Line – Line	Volts	120	240	380
Torque Constant Kt[3,5]	Nm/A	0.17	0.35	0.54
Number of Poles		8	8	8
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	20	20	20
Thermal Resistance	°C/W	1.8	1.8	1.8
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	0.35	0.35	0.35
Static Friction Torque	Nm	0.04	0.04	0.04
Cogging Torque	Nm	0.028	0.028	0.028
Motor Weight	kg	1.7	1.7	1.7
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	0.74	0.74	0.74

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 255x255x6mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

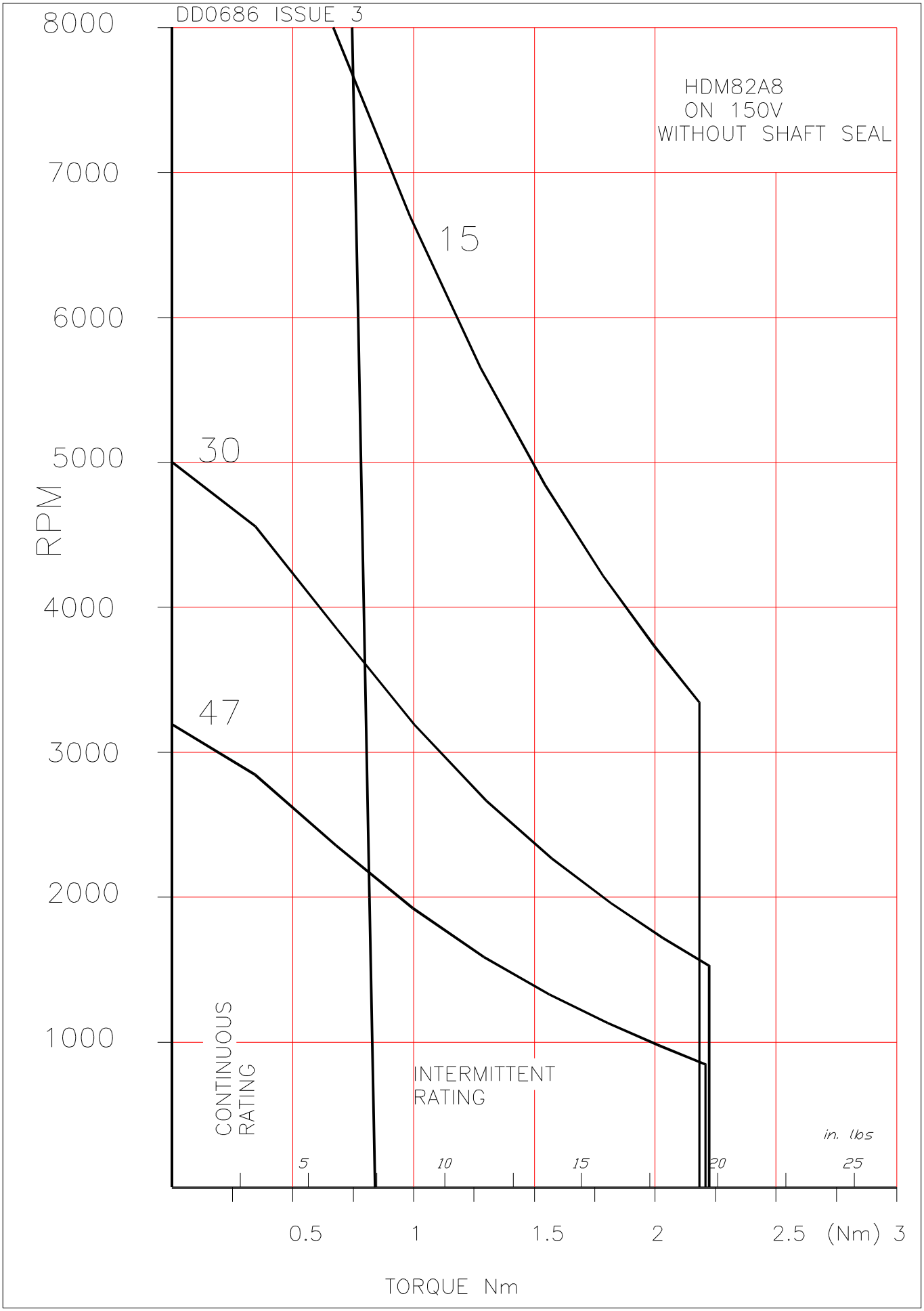
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

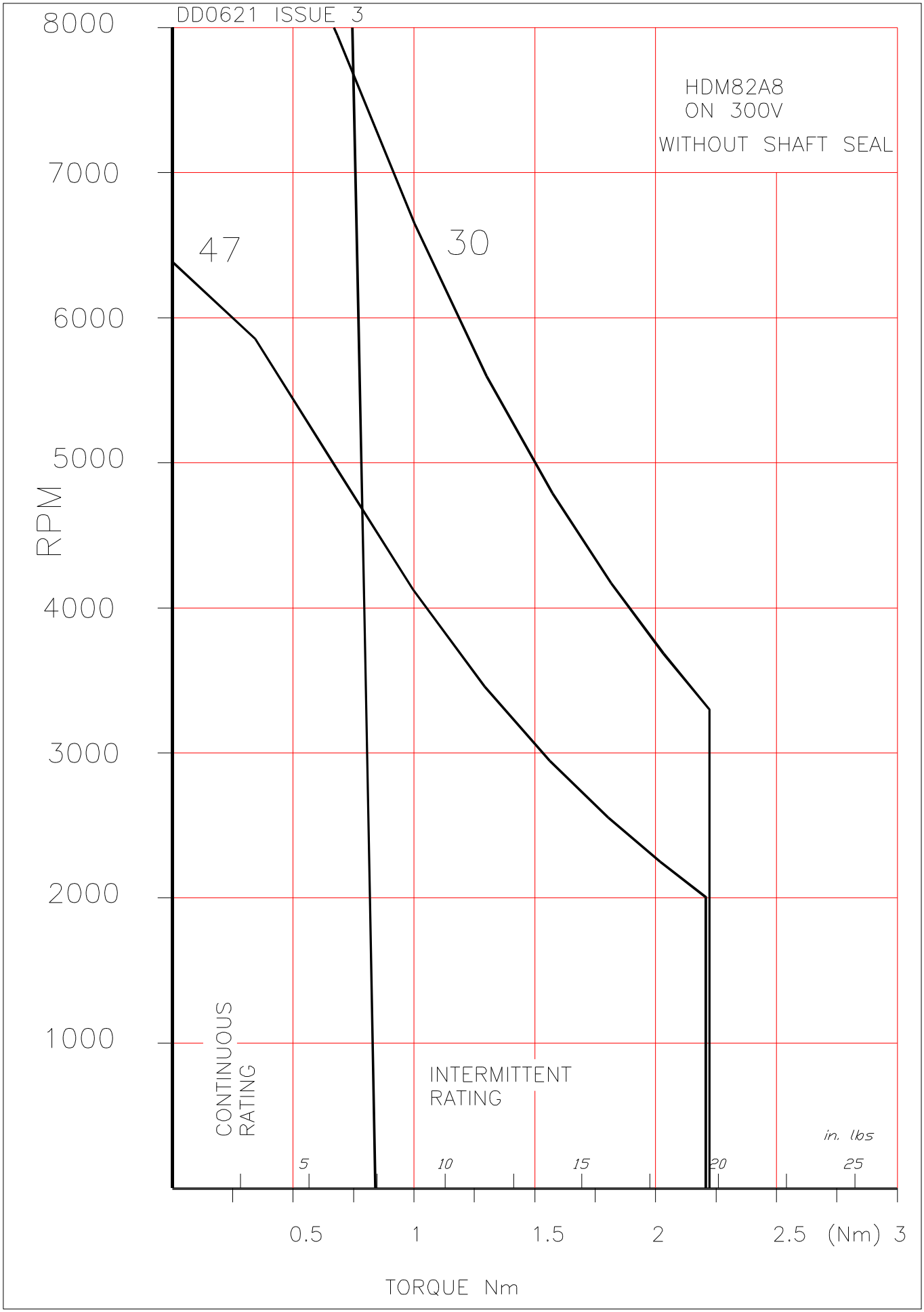
3 - At 25ºC.

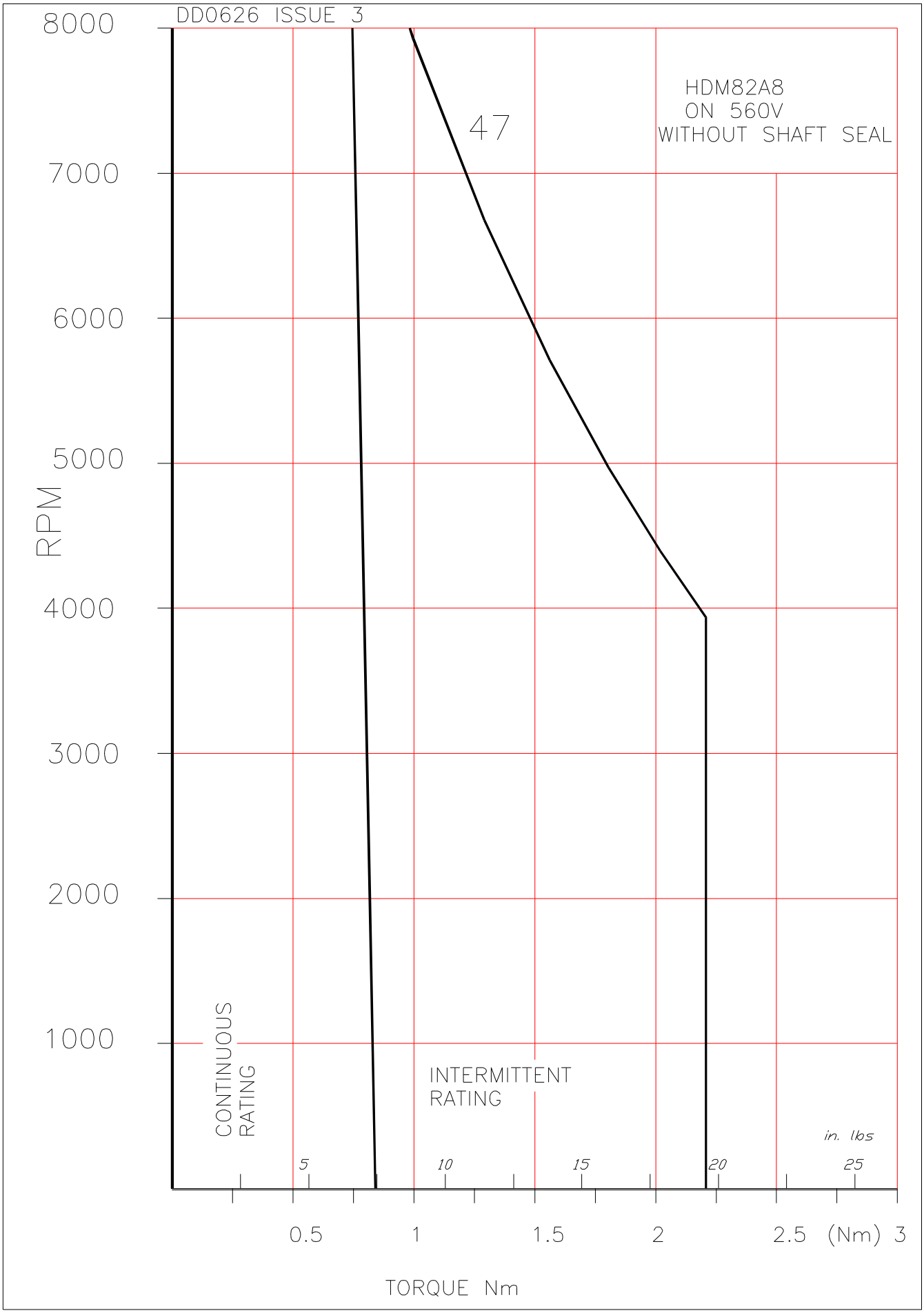
4 - Inductance values are based on nominal current.

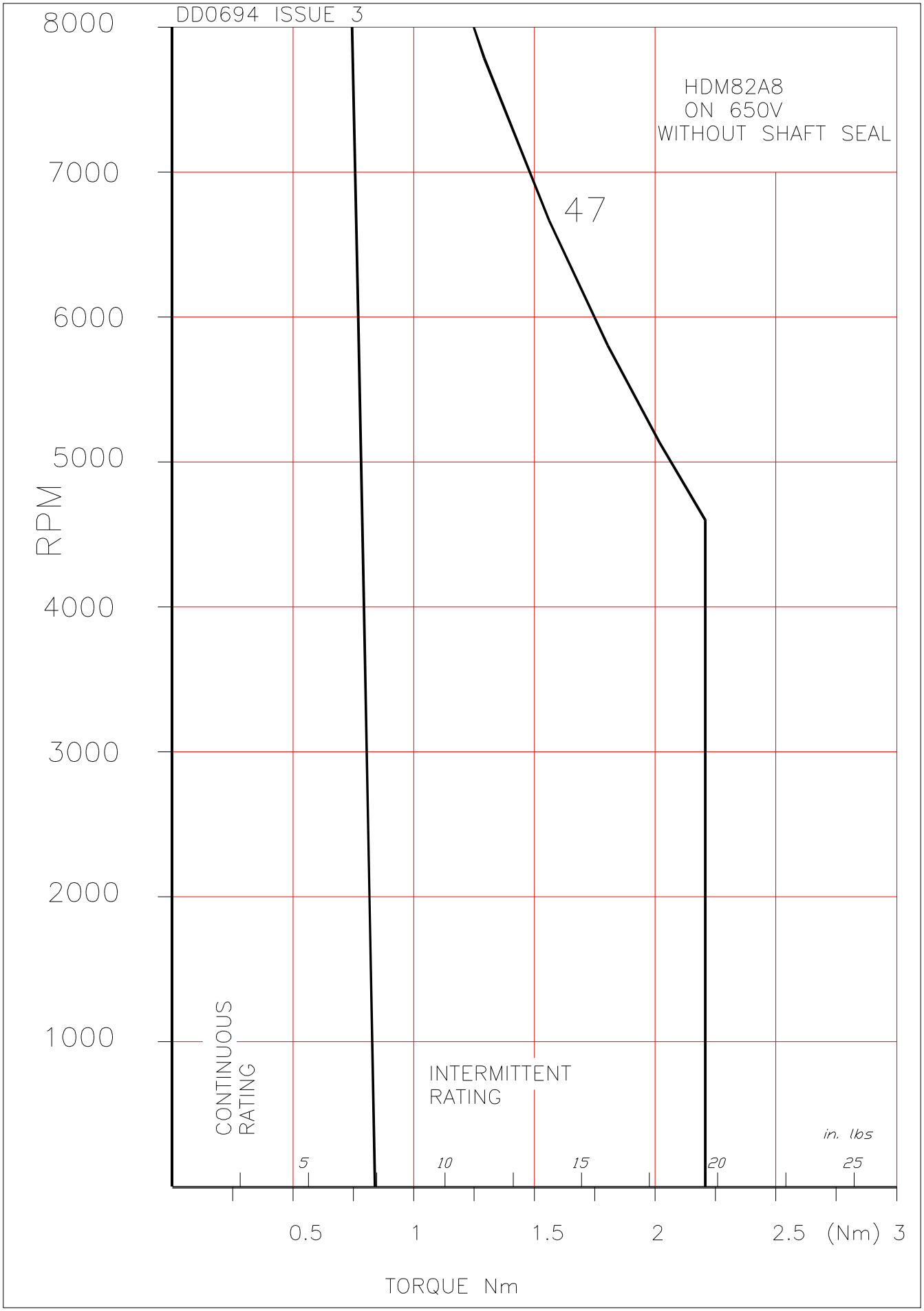
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0686 ISSUE 3
HDM82A8
ON 150V
WITHOUT SHAFT SEAL
8000
7000
6000
5000
4000
3000
2000
1000
RPM
15
30
47
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
5
10
15
20
25
0.5
1
1.5
2
2.5
(Nm) 3
TORQUE Nm

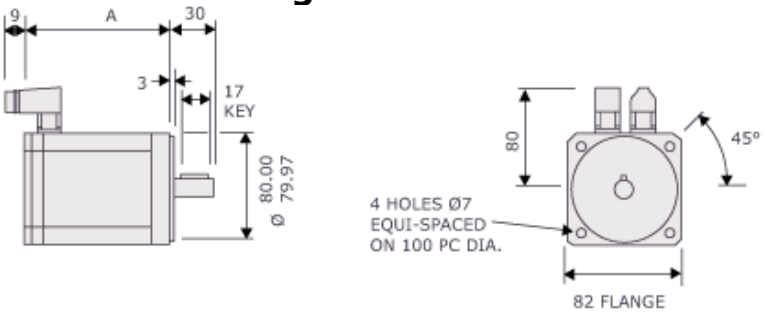

DD0621 ISSUE 3
HDM82A8
ON 300V
WITHOUT SHAFT SEAL
47
30
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
5
10
15
20
25
0.5
1
1.5
2
2.5
(Nm) 3
TORQUE Nm


DD0626 ISSUE 3
HDM82A8
ON 560V
WITHOUT SHAFT SEAL
47
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
5
10
15
20
25
0.5
1
1.5
2
2.5
(Nm) 3
TORQUE Nm

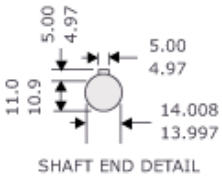

DD0694 ISSUE 3
HDM82A8
ON 650V
WITHOUT SHAFT SEAL
47
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
5
10
15
20
25
0.5
1
1.5
2
2.5
(Nm) 3
TORQUE Nm

8.2 HDM82C8

Outline Drawing.



Frame	Dimension 'A' without brake	with brake
HDM82A	82	122
HDM82C	100	140
HDM82E	118	158
HDM82J	154	194



Technical Data.

Parameter	Units	HDM82 C8-22S	HDM82 C8-28S	HDM82 C8-63S
Continuous Stall Torque [1]	**Nm**	**1.7**	**1.7**	**1.7**
Continuous Stall Current [1]	**A**	**6.6**	**5.2**	**2.3**
Rated Torque [1]	Nm	1.6	1.6	1.6
Rated Current [1]	A	6.2	4.8	2.1
Rated Speed	rpm	4500	4500	4500
Max. Speed (300V DC link)	rpm	8000	8000	4800
Max. Speed (560V DC link)[2]	rpm	-----	-----	8000
Peak Stall Torque	**Nm**	**4.6**	**4.6**	**4.6**
Peak Current	**A**	**32**	**25**	**11**
Resistance Line-Line[3]	Ω	0.83	1.37	7
Inductance Line-Line[4]	mH	1.8	3	15
Voltage Gradient No Load	V	22	28	63
Max. Motor EMF Line – Line	Volts	180	220	500
Torque Constant Kt[3,5]	Nm/A	0.26	0.33	0.75
Number of Poles		8	8	8
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	23	23	23
Thermal Resistance	°C/W	1.24	1.24	1.24
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	0.61	0.61	0.61
Static Friction Torque	Nm	0.04	0.04	0.04
Cogging Torque	Nm	0.05	0.05	0.05
Motor Weight	kg	2.3	2.3	2.3
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	1.55	1.55	1.55

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 255x255x6mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

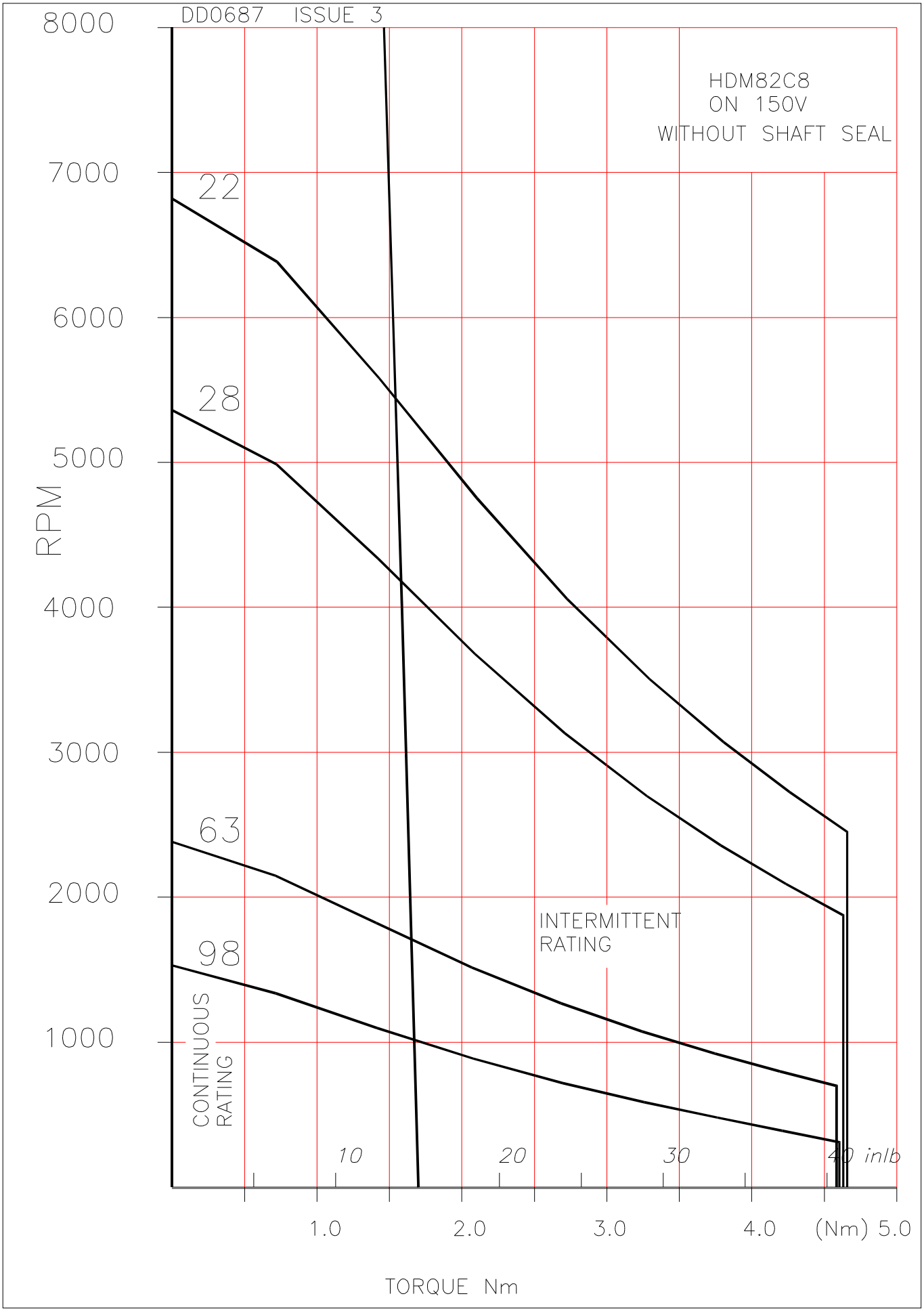
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

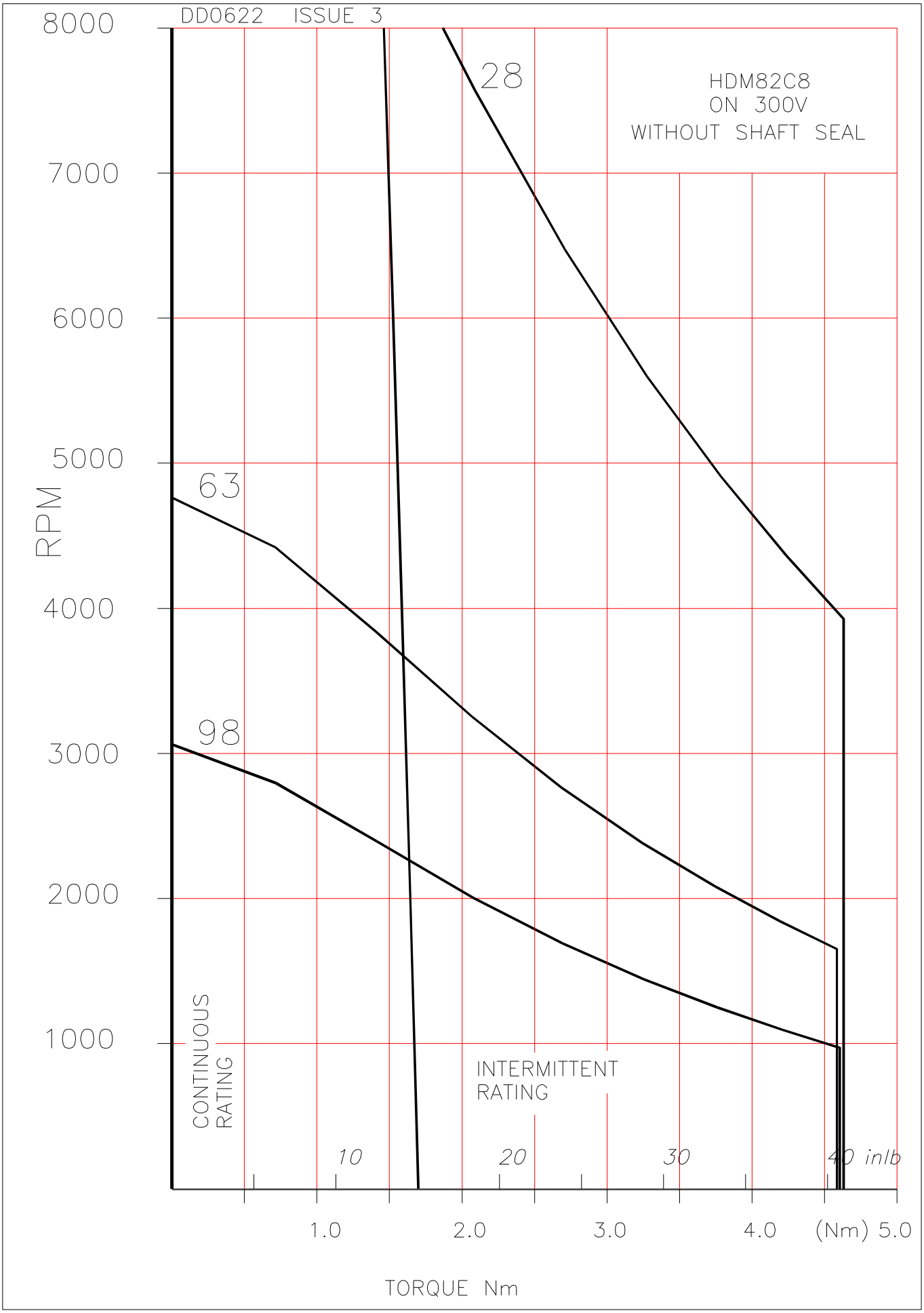
3 - At 25ºC.

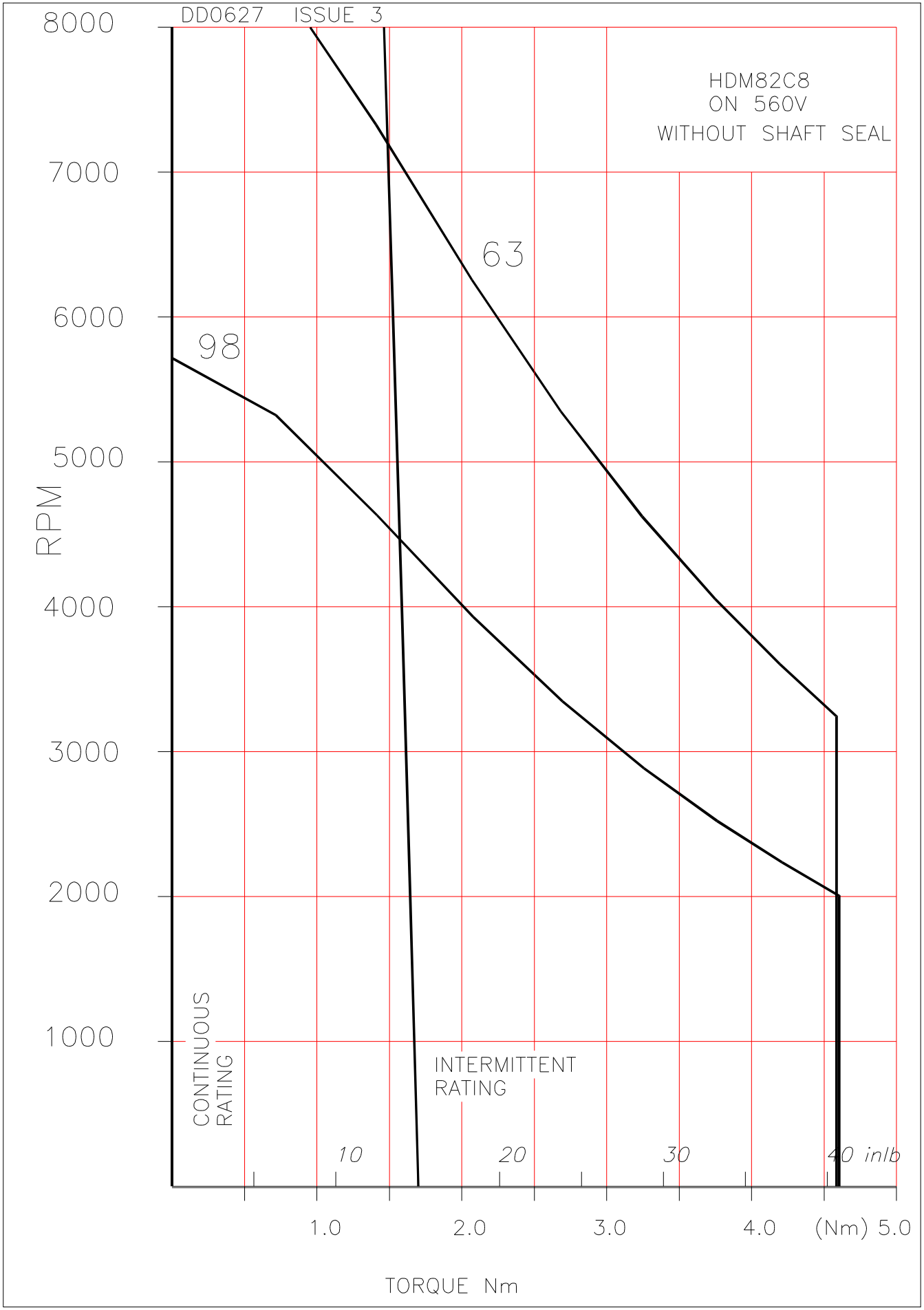
4 - Inductance values are based on nominal current.

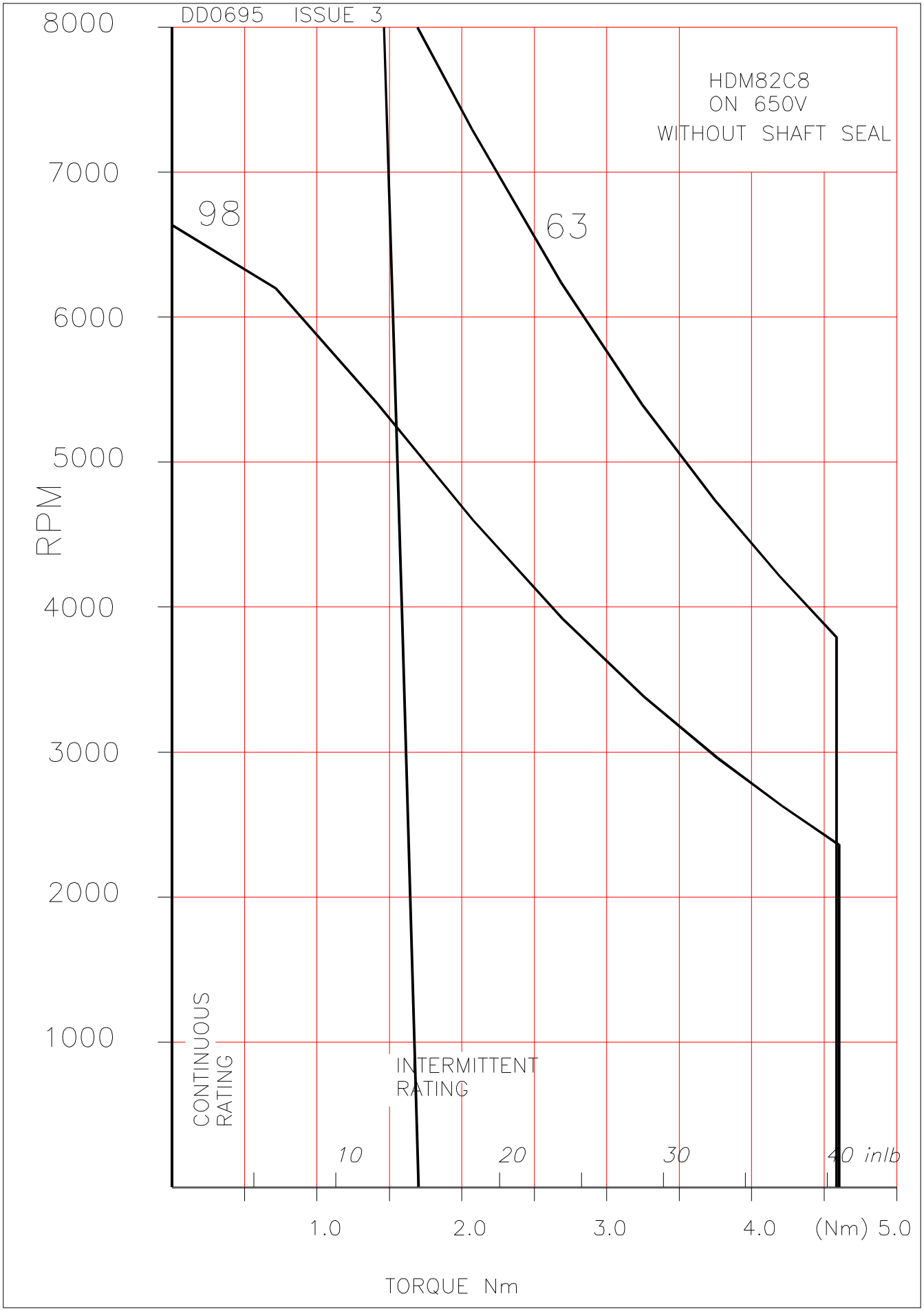
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0687 ISSUE 3
HDM82C8
ON 150V
WITHOUT SHAFT SEAL
8000
7000
6000
5000
4000
3000
2000
1000
RPM
22
28
63
98
INTERMITTENT
RATING
CONTINUOUS
RATING
10
20
30
40 inlb
1.0
2.0
3.0
4.0
(Nm) 5.0
TORQUE Nm

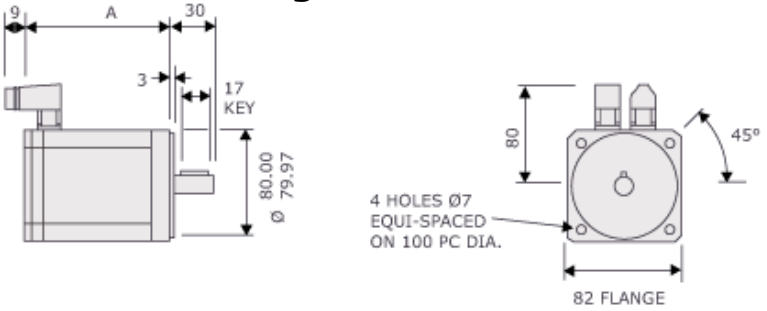

DD0622 ISSUE 3
8000
7000
6000
5000
4000
3000
2000
1000
RPM
28
63
98
HDM82C8
ON 300V
WITHOUT SHAFT SEAL
CONTINUOUS
RATING
INTERMITTENT
RATING
10
20
30
40 inlb
1.0
2.0
3.0
4.0
(Nm) 5.0
TORQUE Nm


DD0627 ISSUE 3
HDM82C8
ON 560V
WITHOUT SHAFT SEAL
63
98
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
10
20
30
40 inlb
1.0
2.0
3.0
4.0
(Nm) 5.0
TORQUE Nm

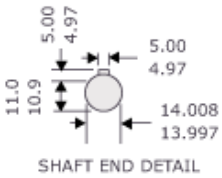

DD0695 ISSUE 3
HDM82C8
ON 650V
WITHOUT SHAFT SEAL
98
63
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
10
20
30
40 inlb
1.0
2.0
3.0
4.0
(Nm) 5.0
TORQUE Nm

8.3 HDM82E8

Outline Drawing.



Frame	Dimension 'A' without brake	with brake
HDM82A	82	122
HDM82C	100	140
HDM82E	118	158
HDM82J	154	194



Technical Data.

Parameter	Units	HDM82 E8-30S	HDM82 E8-38S	HDM82 E8-76S
Continuous Stall Torque [1]	**Nm**	**2.3**	**2.3**	**2.3**
Continuous Stall Current [1]	**A**	**6.6**	**5.2**	**2.6**
Rated Torque [1]	Nm	2.1	2.1	2.1
Rated Current [1]	A	6	4.7	2.3
Rated Speed	rpm	4500	4500	3000
Max. Speed (300V DC link)	rpm	8000	7800	3900
Max. Speed (560V DC link)[2]	rpm	-----	-----	7300
Peak Stall Torque	**Nm**	**6.9**	**6.9**	**6.9**
Peak Current	**A**	**35**	**28**	**14**
Resistance Line-Line[3]	Ω	0.91	1.5	5.8
Inductance Line-Line[4]	mH	2.2	3.4	13.5
Voltage Gradient No Load	V	30	38	76
Max. Motor EMF Line – Line	Volts	240	300	610
Torque Constant Kt[3,5]	Nm/A	0.35	0.45	0.9
Number of Poles		8	8	8
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	26	26	26
Thermal Resistance	°C/W	1.18	1.18	1.18
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	0.88	0.88	0.88
Static Friction Torque	Nm	0.04	0.04	0.04
Cogging Torque	Nm	0.075	0.075	0.075
Motor Weight	kg	2.9	2.9	2.9
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	2.2	2.2	2.2

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 255x255x6mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

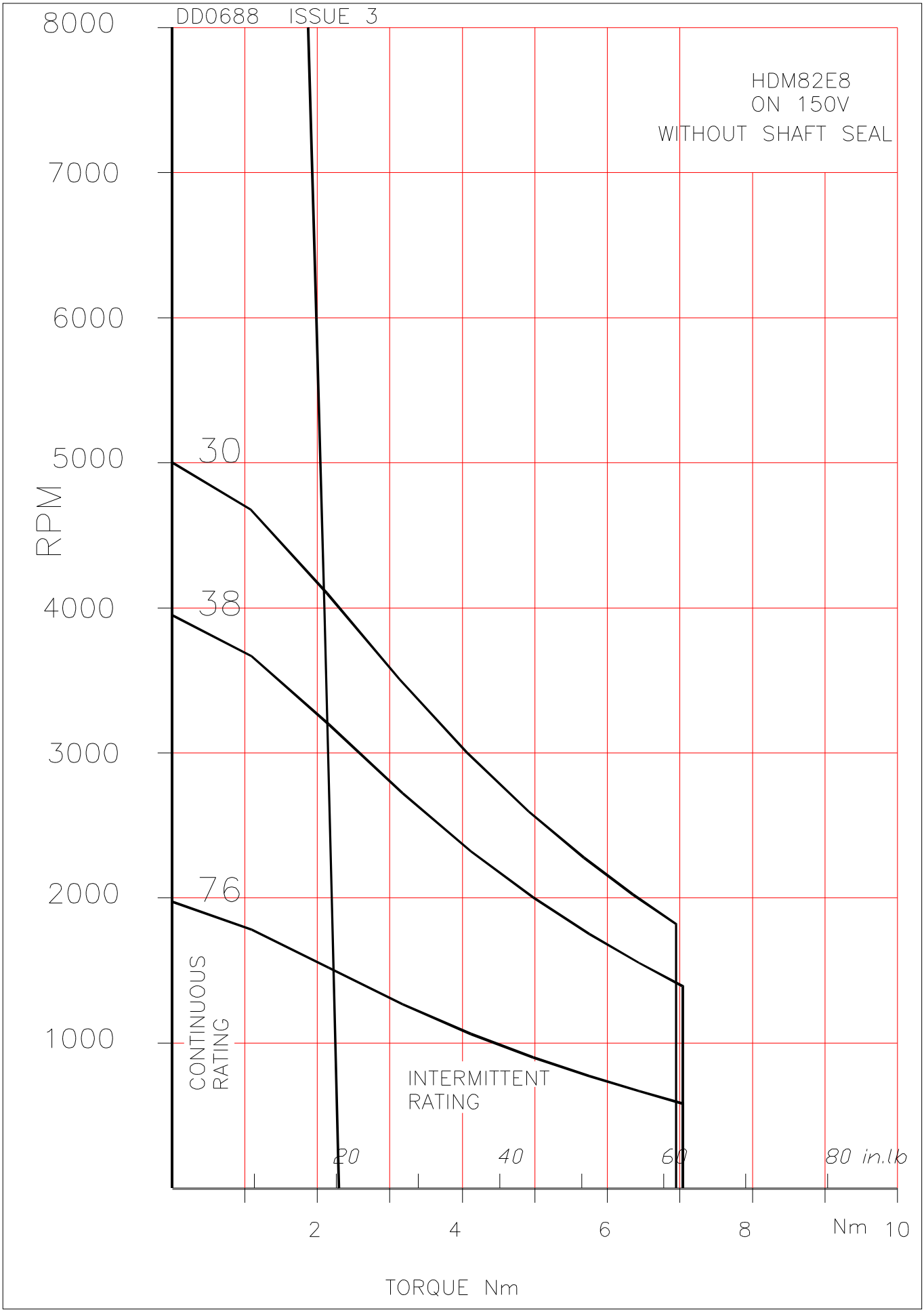
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

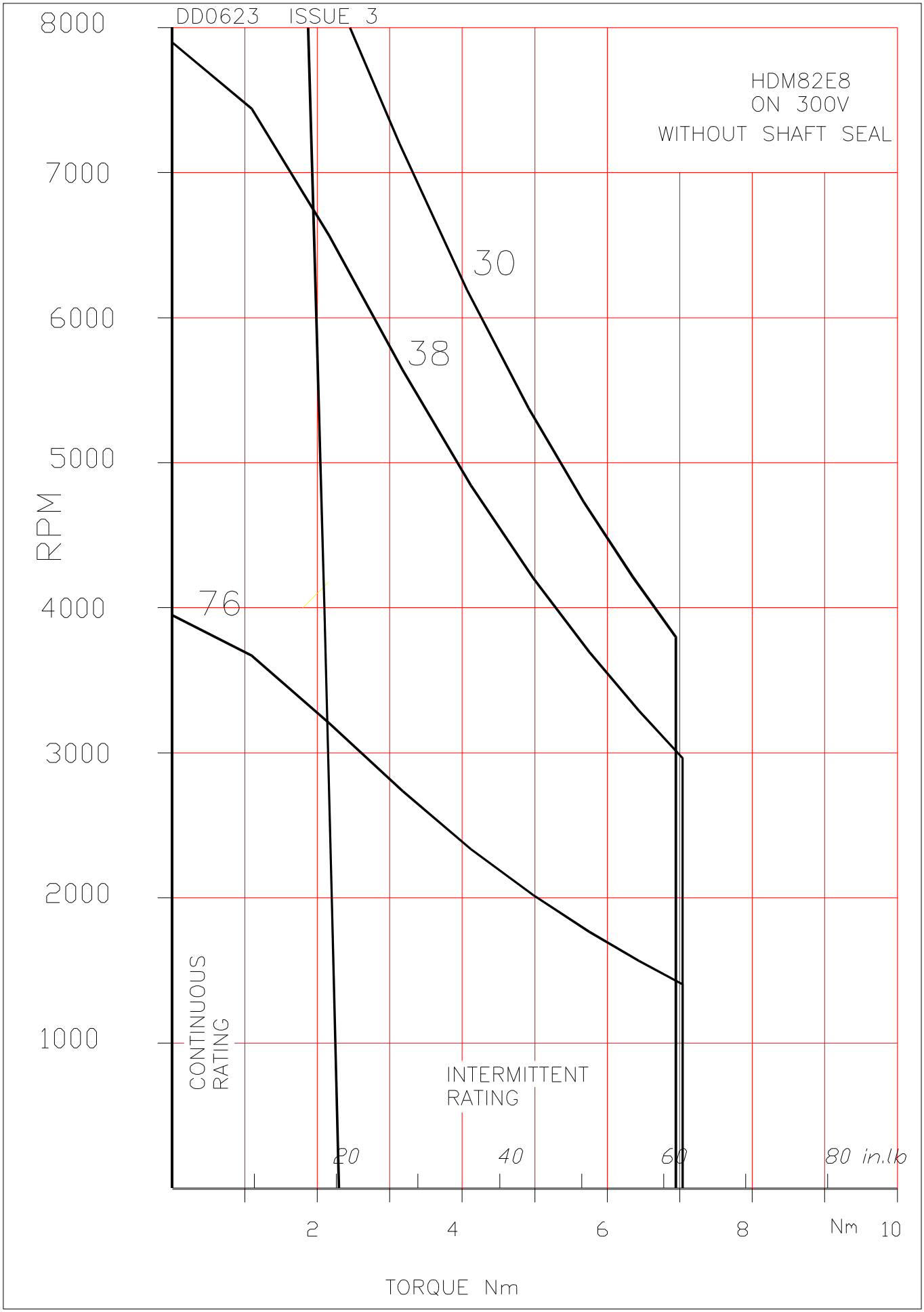
3 - At 25ºC.

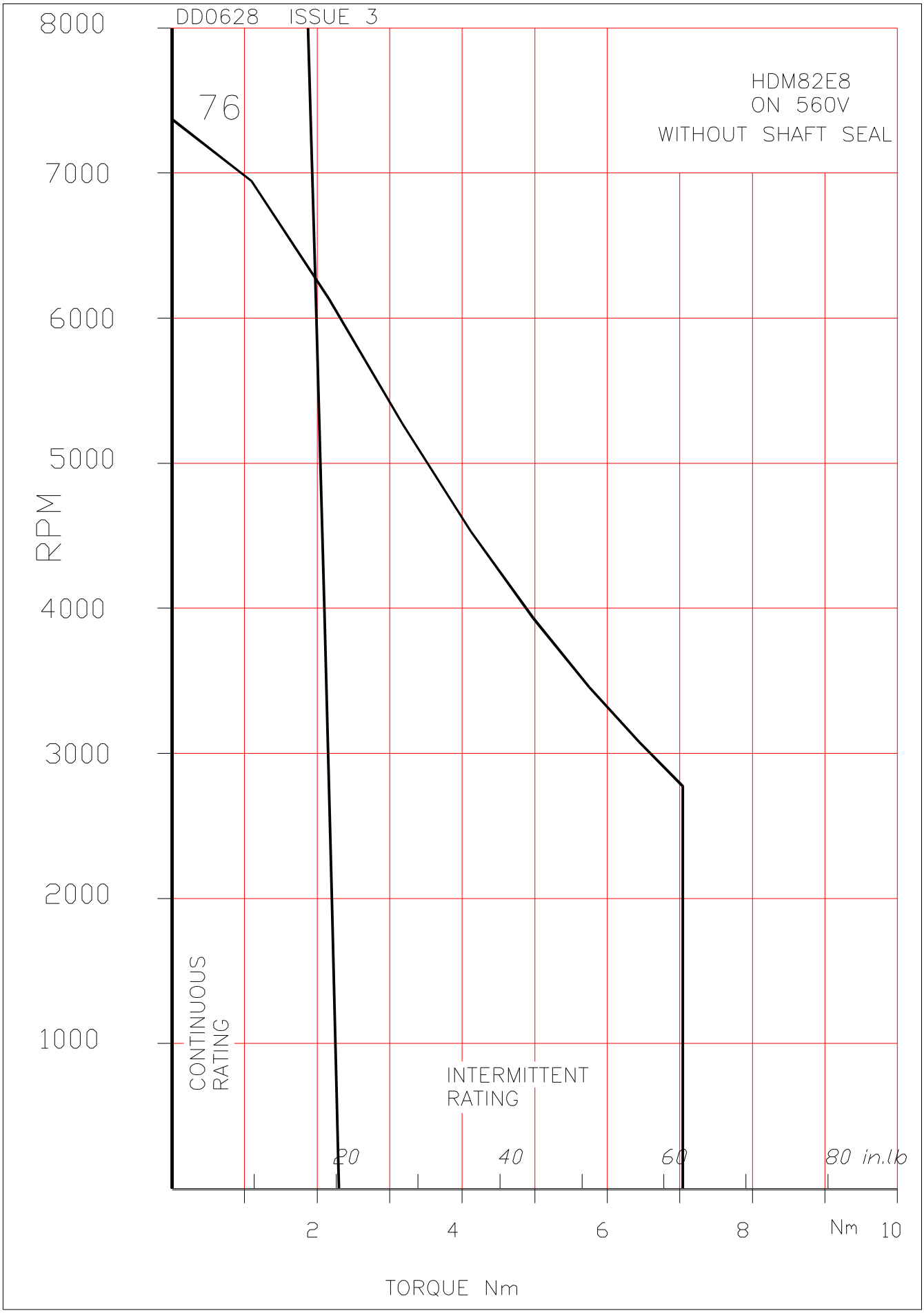
4 - Inductance values based on nominal current.

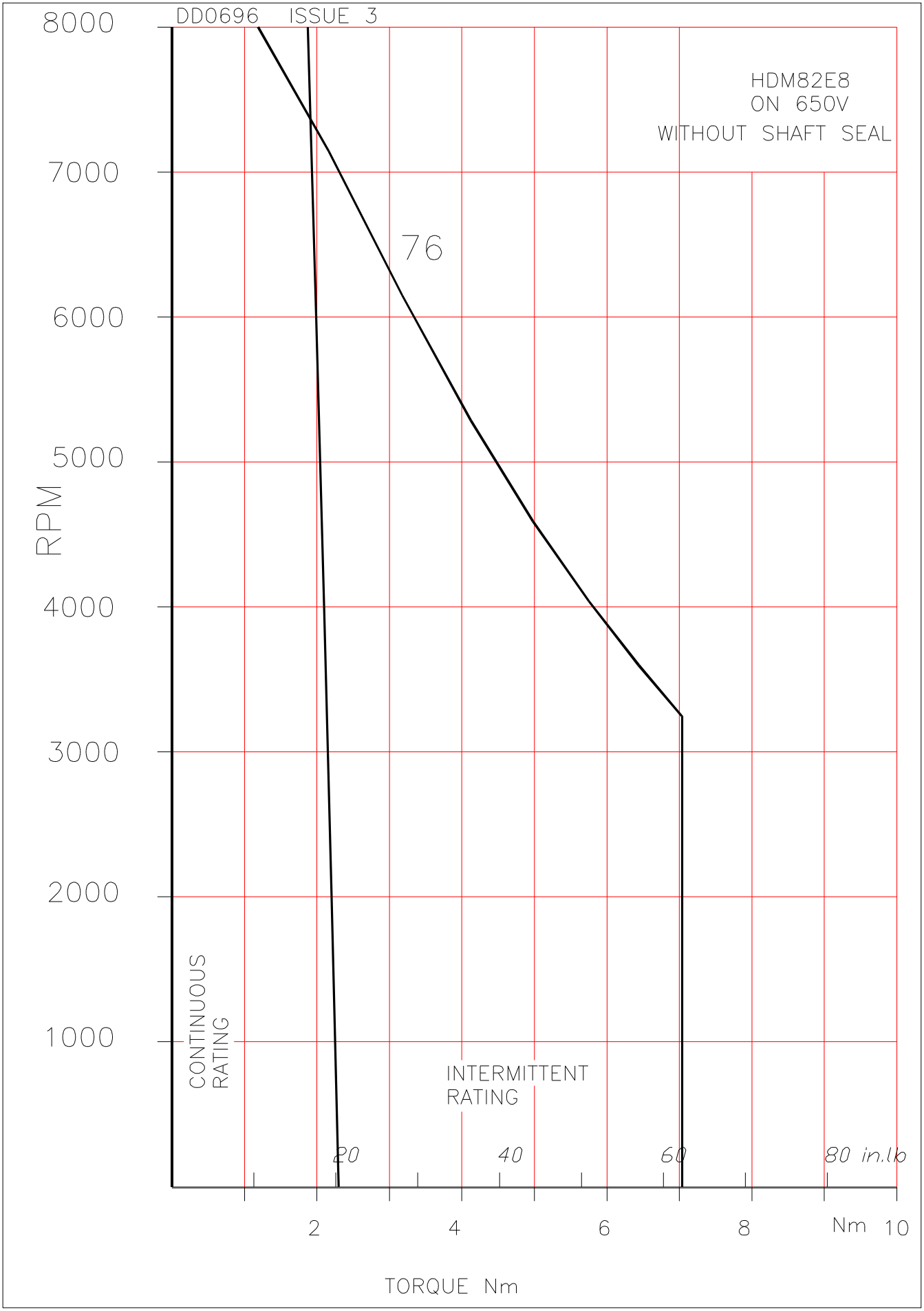
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0688 ISSUE 3
HDM82E8
ON 150V
WITHOUT SHAFT SEAL
8000
7000
6000
5000
4000
3000
2000
1000
RPM
30
38
76
CONTINUOUS
RATING
INTERMITTENT
RATING
20
40
60
80 in.lb
2
4
6
8
Nm 10
TORQUE Nm

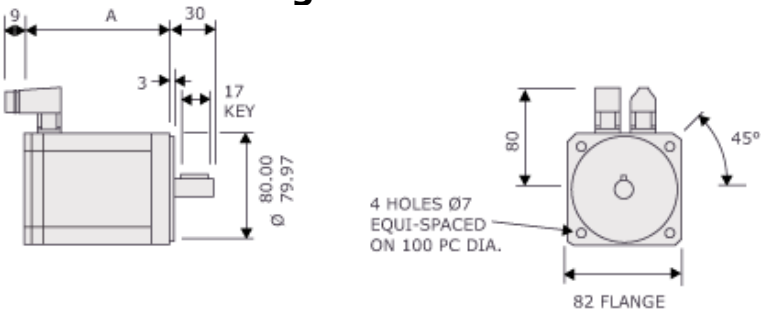

DD0623 ISSUE 3
HDM82E8
ON 300V
WITHOUT SHAFT SEAL
8000
7000
6000
5000
4000
3000
2000
1000
RPM
30
38
76
CONTINUOUS
RATING
INTERMITTENT
RATING
20
40
60
80 in.lb
2
4
6
8
Nm
10
TORQUE Nm


DD0628 ISSUE 3
HDM82E8
ON 560V
WITHOUT SHAFT SEAL
76
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
20
40
60
80 in.lb
2
4
6
8
Nm 10
TORQUE Nm

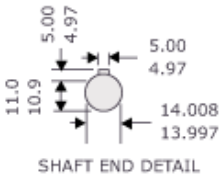

DD0696 ISSUE 3
HDM82E8
ON 650V
WITHOUT SHAFT SEAL
76
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
20
40
60
80 in.lb
2
4
6
8
Nm 10
TORQUE Nm

8.4 HDM82J8

Outline Drawing.



Frame	Dimension 'A' without brake	with brake
HDM82A	82	122
HDM82C	100	140
HDM82E	118	158
HDM82J	154	194



Technical Data.

Parameter	Units	HDM82 J8-40S	HDM82 J8-56S	HDM82 J8-116S
Continuous Stall Torque [1]	**Nm**	**3.5**	**3.5**	**3.5**
Continuous Stall Current [1]	**A**	**7.5**	**5.3**	**2.6**
Rated Torque [1]	Nm	2.6	2.6	2.6
Rated Current [1]	A	5.4	3.9	1.9
Rated Speed	rpm	4500	4500	4500
Max. Speed (300V DC link)	rpm	7300	5300	2600
Max. Speed (560V DC link)[2]	rpm	-----	8000	4800
Peak Stall Torque	**Nm**	**11.6**	**11.6**	**11.6**
Peak Current	**A**	**44**	**32**	**15**
Resistance Line-Line[3]	Ω	0.89	1.7	7.1
Inductance Line-Line[4]	mH	2.2	4.2	18.5
Voltage Gradient No Load	V	40	56	116
Max. Motor EMF Line – Line	Volts	320	450	700
Torque Constant Kt[3,5]	Nm/A	0.48	0.66	1.35
Number of Poles		8	8	8
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	30	30	30
Thermal Resistance	°C/W	0.95	0.95	0.95
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	1.4	1.4	1.4
Static Friction Torque	Nm	0.04	0.04	0.04
Cogging Torque	Nm	0.11	0.11	0.11
Motor Weight	kg	4	4	4
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	3.2	3.2	3.2

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 255x255x6mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

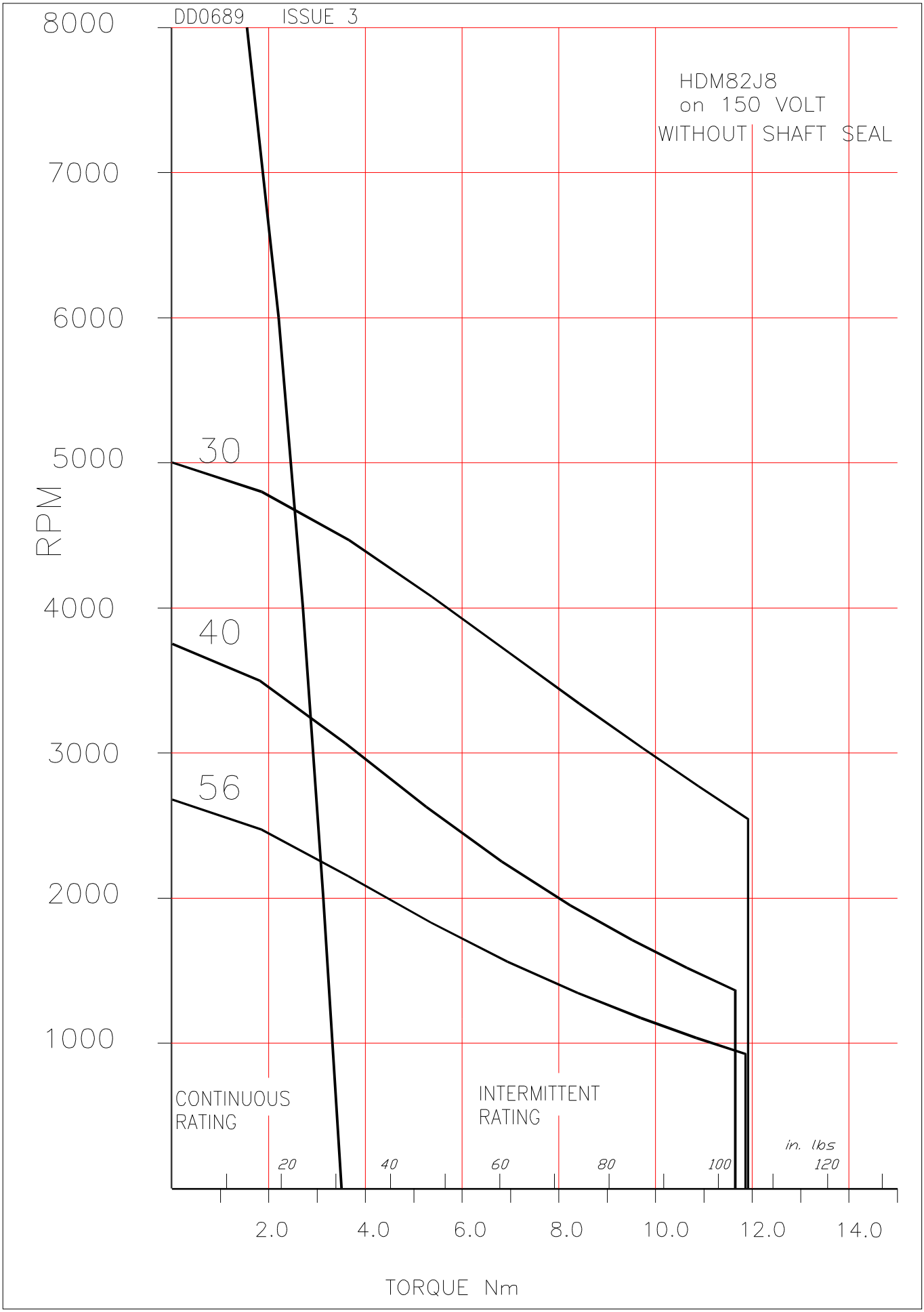
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

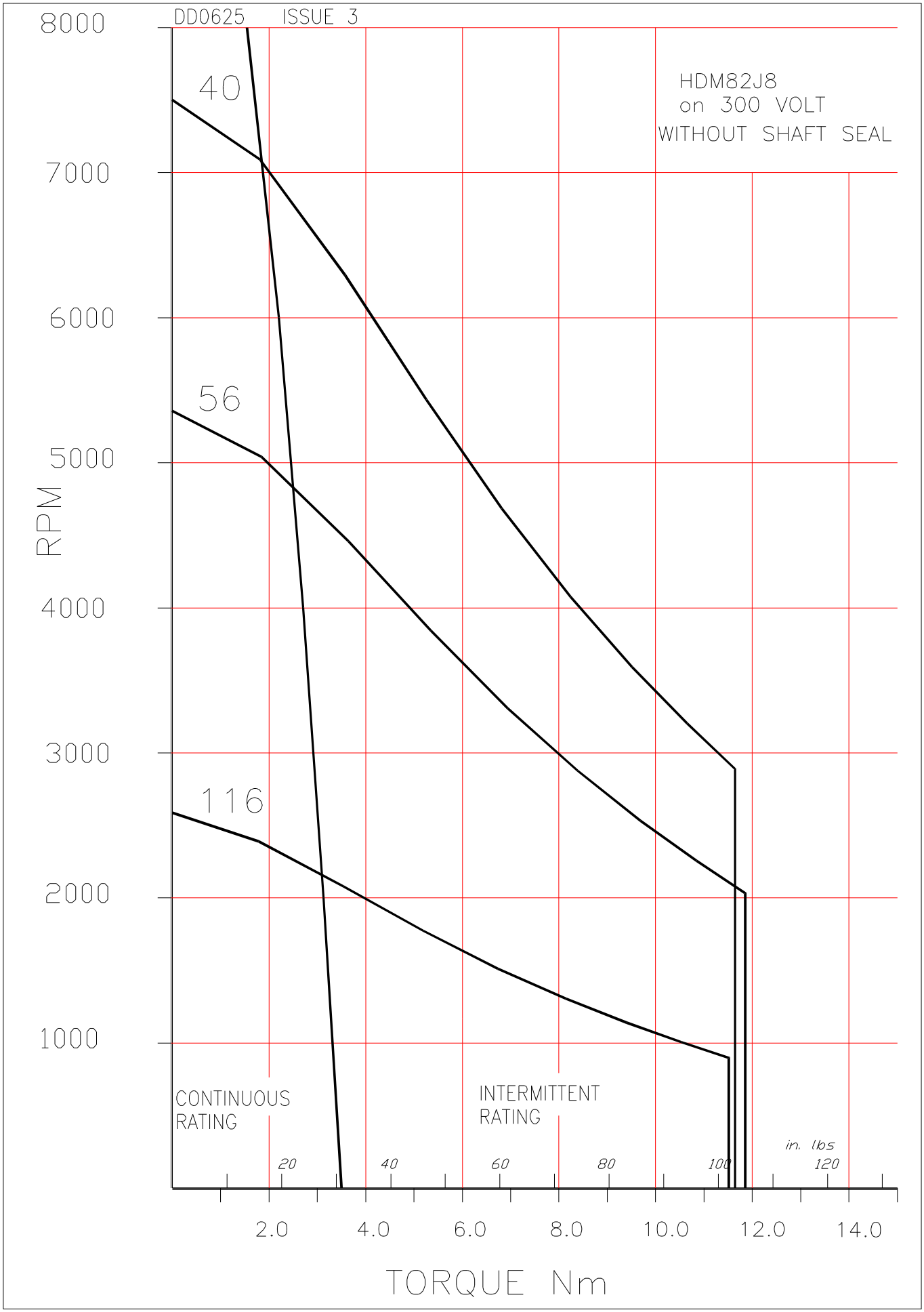
3 - At 25ºC.

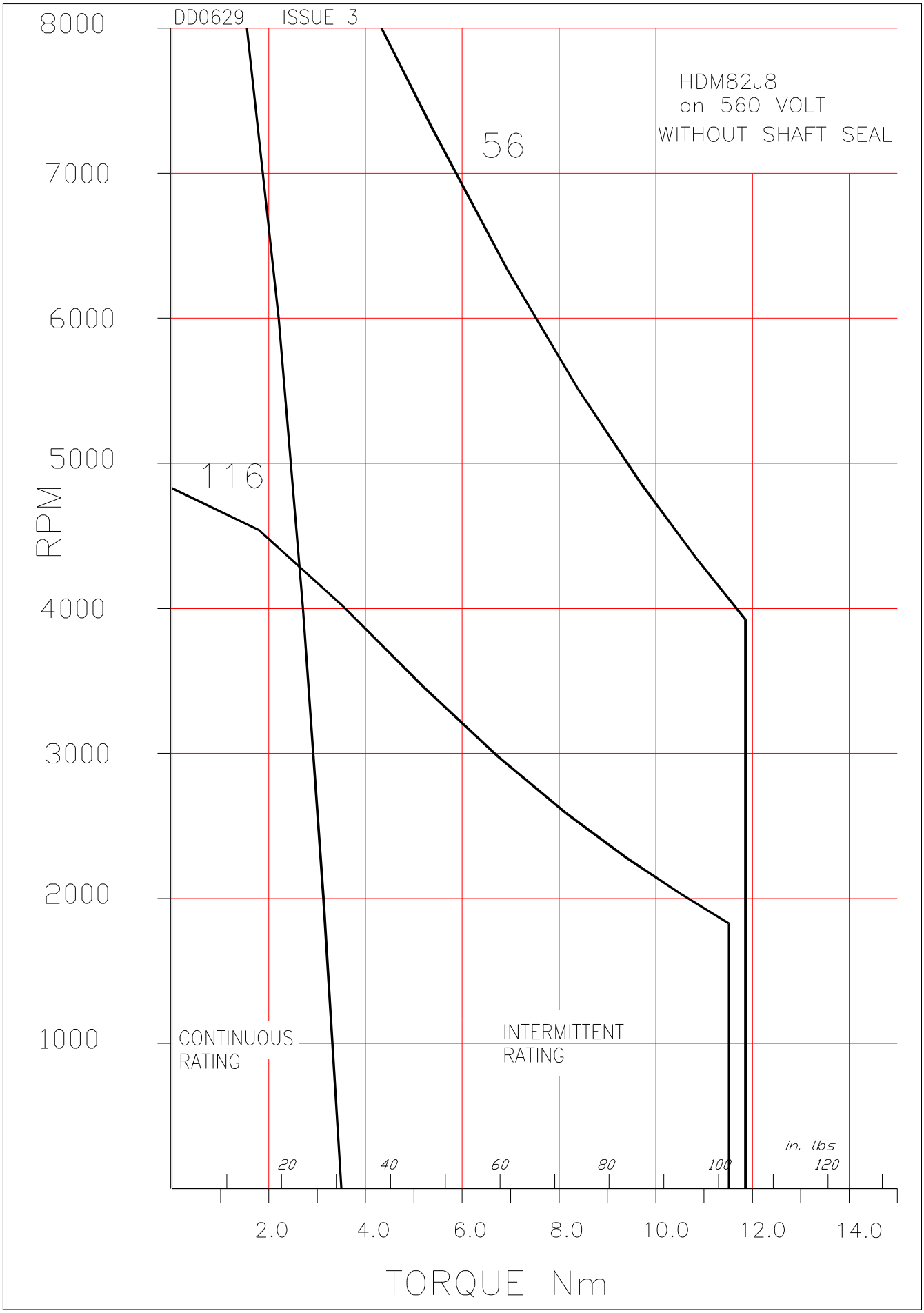
4 - Inductance values are based on nominal current.

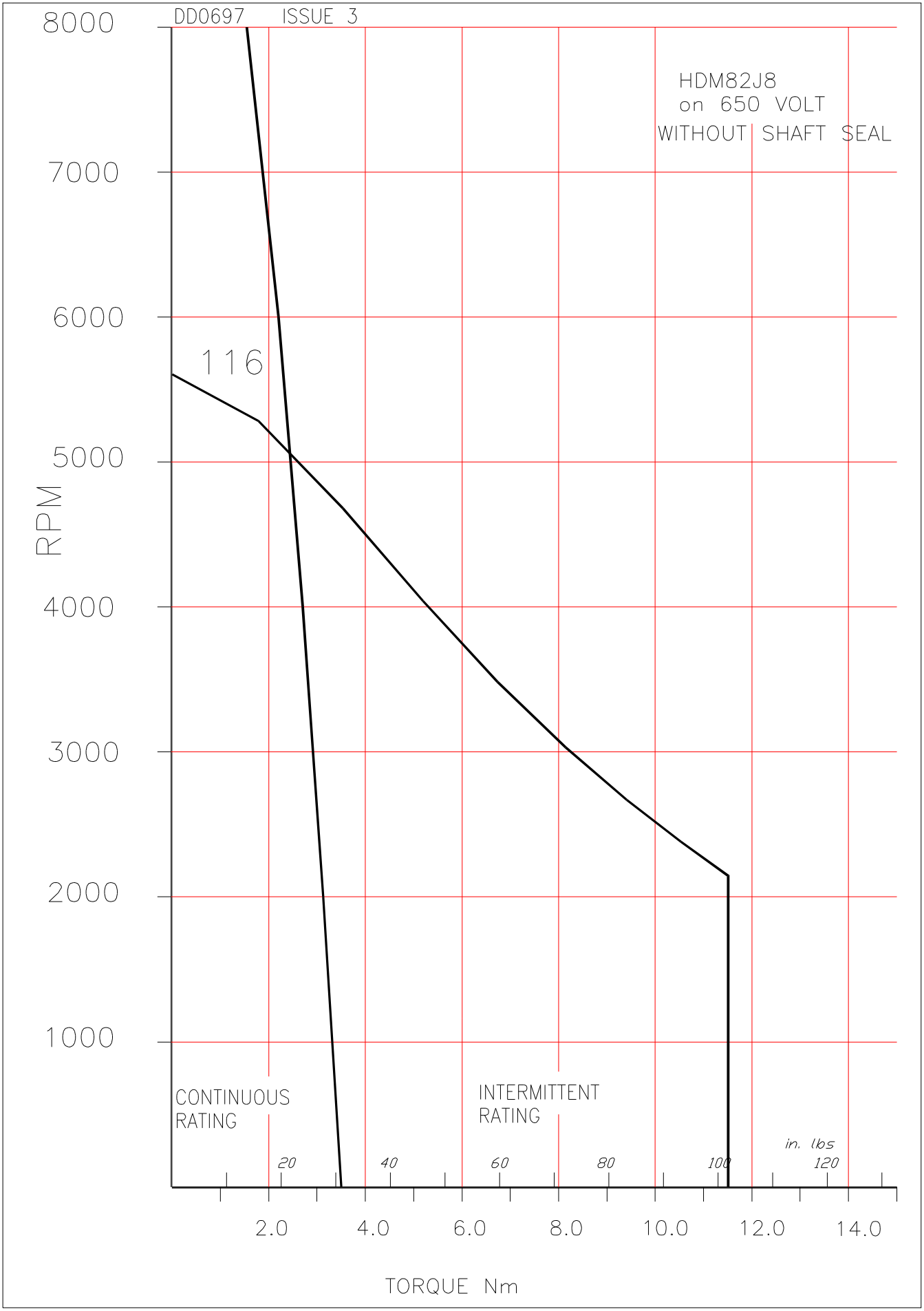
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0689 ISSUE 3
HDM82J8
on 150 VOLT
WITHOUT SHAFT SEAL
8000
7000
6000
5000
4000
3000
2000
1000
RPM
30
40
56
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
20
40
60
80
100
120
2.0
4.0
6.0
8.0
10.0
12.0
14.0
TORQUE Nm

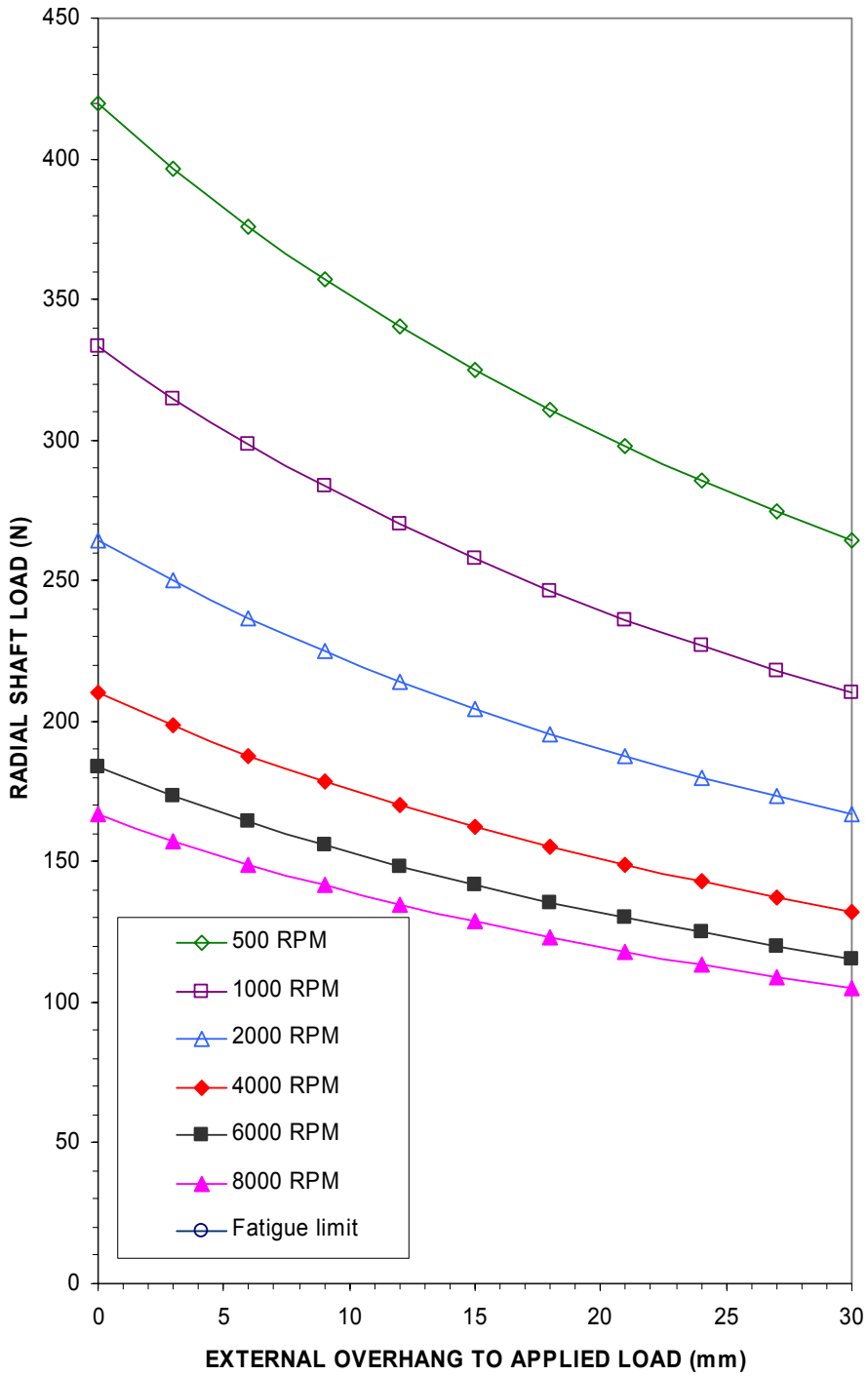

DD0625 ISSUE 3
HDM82J8
on 300 VOLT
WITHOUT SHAFT SEAL
40
56
116
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
20
40
60
80
100
120
in. lbs
2.0
4.0
6.0
8.0
10.0
12.0
14.0
TORQUE Nm


DD0629 ISSUE 3
HDM82J8
on 560 VOLT
WITHOUT SHAFT SEAL
56
116
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
20
40
60
80
100
120
in. lbs
2.0
4.0
6.0
8.0
10.0
12.0
14.0
TORQUE Nm


DD0697 ISSUE 3
HDM82J8
on 650 VOLT
WITHOUT SHAFT SEAL
116
8000
7000
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
20
40
60
80
100
120
2.0
4.0
6.0
8.0
10.0
12.0
14.0
TORQUE Nm

HDM82 PERMITTED RADIAL SHAFT LOADINGS

(Axial loading maybe considered separately - refer to next page)



Shaft Loading Information for SEM Standard Servomotors

General notes:-

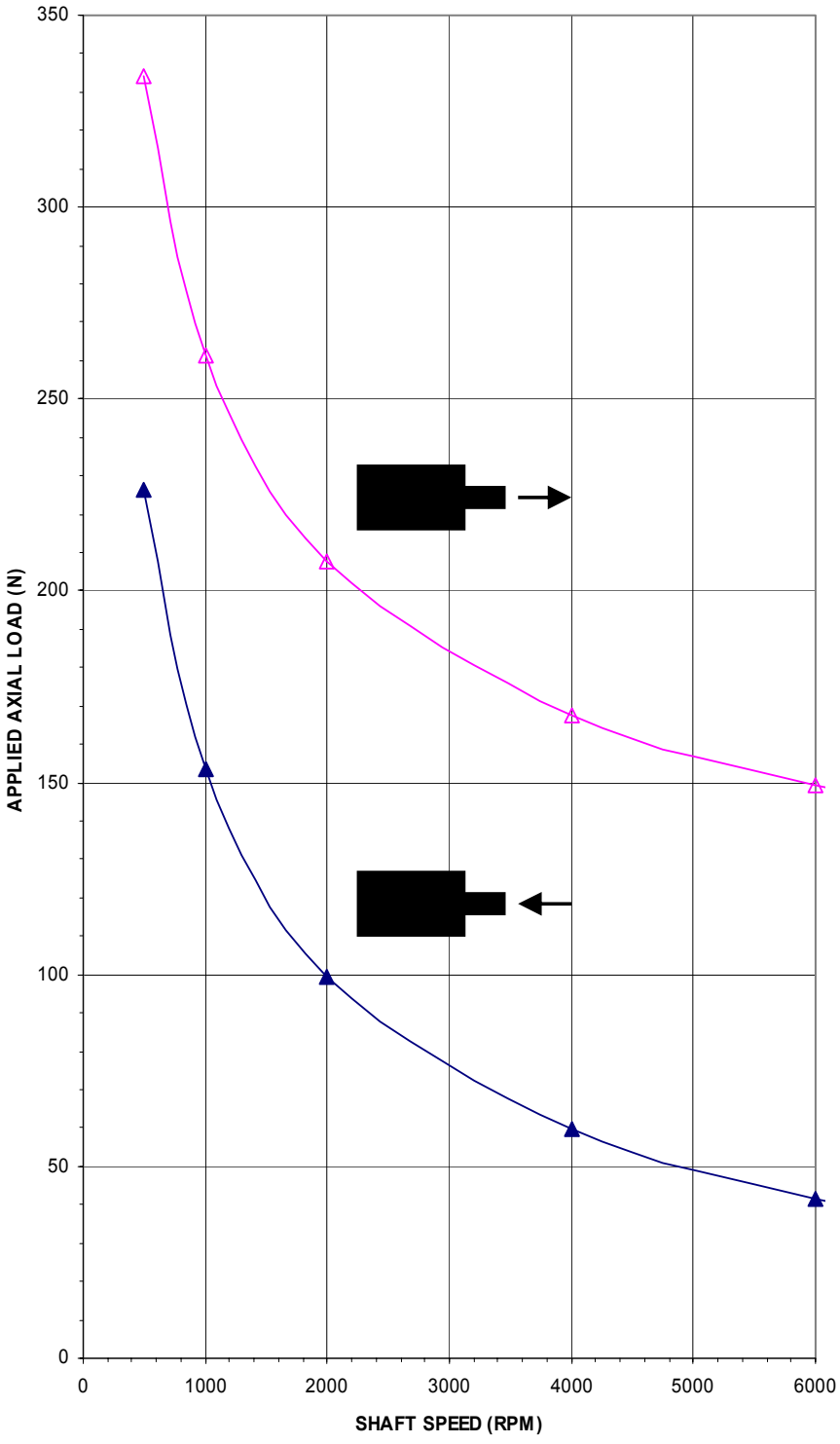
1 All loadings are based upon An L10 bearing life expectancy of 30,000 hours.

2 Separate graphs are usually supplied to indicate maximum axial loads which are applicable. However, for motors with locked drive end bearings, a graph is used to illustrate the maximum allowed radial shaft loadings together with a simplified calculation to provide a compensated figure for when radial and axial loadings are to be applied in combination.

3 It may occur, in certain circumstances, that loading outside the scope of the published information is deemed necessary. In these cases it is desirable that SEM Ltd should be consulted and all relevant information made available, in order that due consideration can be given to finding a satisfactory solution.

4 Should motors be required to operate under abnormal conditions, such as excessive vibration or shock, this should also be referred to SEM Ltd as noted above.

HDM82 PERMITTED AXIAL LOAD



Shaft Loading Information for SEM Standard Servomotors

General notes:-

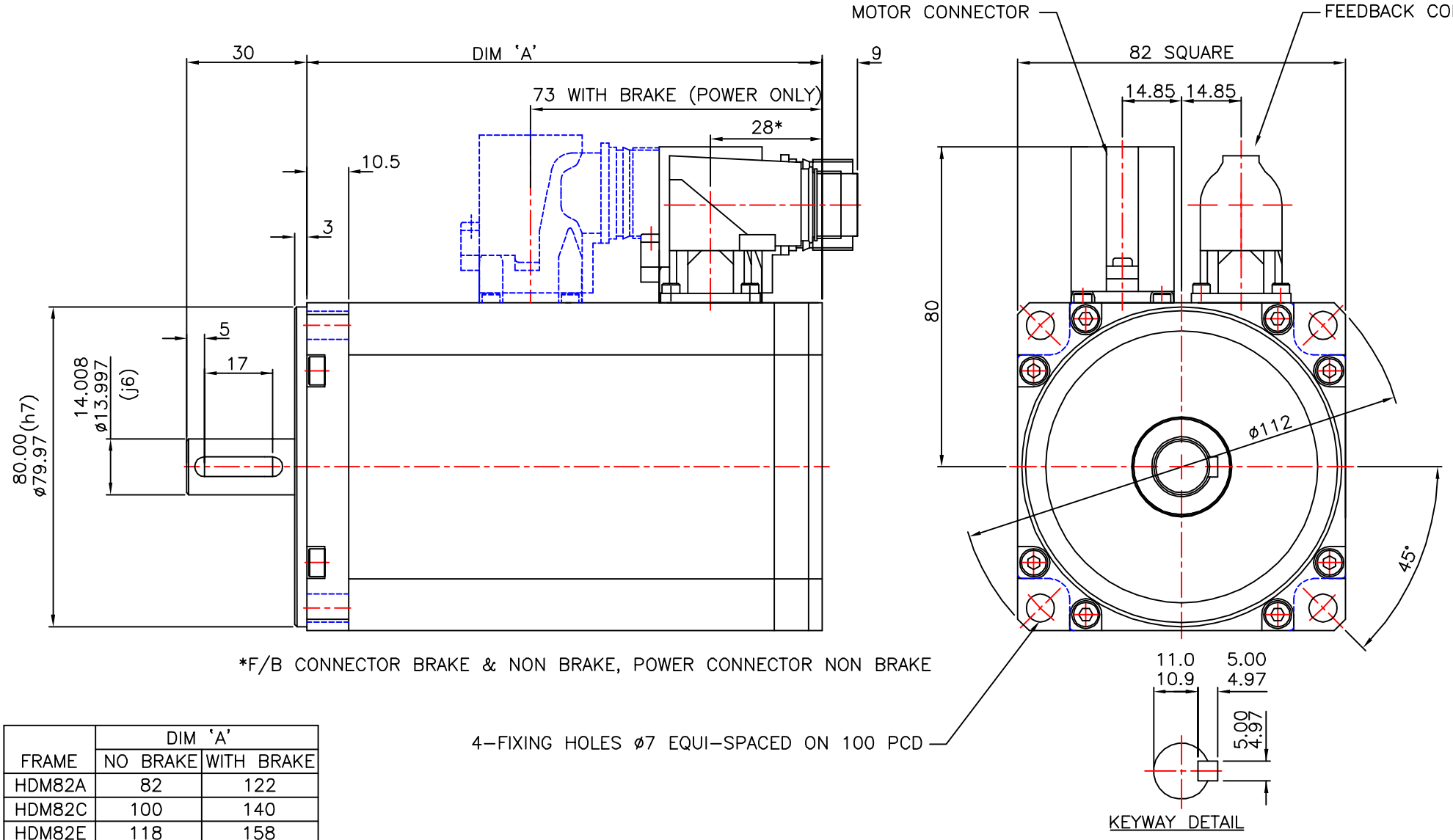
1 All loadings are based upon An L10 bearing life expectancy of 30,000 hours.

2 Separate graphs are usually supplied to indicate maximum axial loads which are applicable. However, for motors with locked drive end bearings, a graph is used to illustrate the maximum allowed radial shaft loadings together with a simplified calculation to provide a compensated figure for when radial and axial loadings are to be applied in combination.

3 It may occur, in certain circumstances, that loading outside the scope of the published information is deemed necessary. In these cases it is desirable that SEM Ltd should be consulted and all relevant information made available, in order that due consideration can be given to finding a satisfactory solution.

4 Should motors be required to operate under abnormal conditions, such as excessive vibration or shock, this should also be referred to SEM Ltd as noted above.

FIRST ANGLE PROJECTION



*F/B CONNECTOR BRAKE & NON BRAKE, POWER CONNECTOR NON BRAKE

4–FIXING HOLES ø7 EQUI–SPACED ON 100 PCD

FRAME	DIM 'A' NO BRAKE	DIM 'A' WITH BRAKE
HDM82A	82	122
HDM82C	100	140
HDM82E	118	158
HDM82J	154	194

FOR CONNECTORS FACING DE SEE 664–7–06548

2	12JUL06 MR3798 CONNECTORS CHANGED OVER
3	12MAR07 MR4005 F/B CONNECTOR ON BRAKE MOTOR MOVED

ALL DIMENSIONS IN MILLIMETRES
TOLERANCES UNLESS OTHERWISE STATED ANG: ±0.5° DIM: ±0.25mm

TITLE : HDM82 STD MET WITH M23 & M17 CONNS FACING NDE

MATERIAL	AS STATED	CODE	
SPEC		FORM	
FINISH		PATTERN No.	

DRAWING NO. 664–7–06498

SEM LONDON ENGLAND

SCALE	1:1
ISSUE No.	3
DR.	PFS
DATE	22MAY06
	A06498C1

HDM82 - OPTIONS (metric series)

Code	Description	Notes
WAVEFORM (WINDING)		
Y00-A*	Waveform	Sinusoidal waveform
FEEDBACK DEVICES		
F00-C*	Resolver (F00 setting)	2 Pole Resolver type 15-B with F00 setting
F66-A	No Feedback device fitted	
FITTED ENCODERS		
E28-C	Incremental Encoder	Renco R35i, 2048ppr
E30-C	Incremental Encoder	Renco R35i, 4098ppr
E31-D	Incremental Encoder	Renco R35i, 8192ppr
E15-C	Encoder	Heidenhain ERN1387 series, 2048ppr.
E22-B	Encoder, singleturn, Optical	Heidenhain ECN1313 series, 2048ppr with EnDat Interface.
E16-A	Encoder, multiturn, Optical	Heidenhain EQN1325 series, 2048ppr with EnDat Interface.
E33-A	Encoder, singleturn, Inductive	Heidhenhain ECI1319 series, 32ppr with EnDat Interface
E34-A	Encoder, multiturn, Inductive	Heidhenhain ECI1331 series, 32ppr with EnDat Interface
MECHANICAL INTERFACE		
M00-O*	Flange	82 x 82 mm square flange. Spigot Ø 80mm. Fixing 4 x Ø 7 mm holes on 100 mm PCD
R01-A	Close tolerance interface	Flange & shaft to IEC72-P (precision)
S00-H*	Shaft	Ø 14mm x 30mm long
K10-E*	Keyway	5 x 5 x 22 mm long, keyway with key enclosed type, also with half key supplied 5 x 2.5 x 22mm long
K99-A	No Keyway	Plain shaft
D01-F*	Shaft end threaded hole	M5 x 15mm deep
D99-A	No Shaft end threaded hole	
BRAKES		
B00-K	24Vdc Brake	4.5 Nm. Torque, Spring Applied
ELECTRICAL TERMINATIONS		
C00-Q*	Motor & feedback connector	Interconnectron size 1 power connector (6 pin) and M17 feedback receptacle (17 pin) facing NDE (resolver and R35i motors)
C48-A	Motor & feedback connector	Interconnectron size 1 power connector (6 pin) and size 1 feedback receptacle (17 pin) facing DE (Heidenhain encoder motors)
C70	Flying leads	Motor and feedback leads, C70-P 0.5m long, C70-Q 1m long, C70-R 1.5m long, C70-S 2.0m long.
C67-A	Motor plug	Interconnectron size 1 straight plug (6 pin) to suit option C00 & C48
C83-E	Feedback plug	M17 straight plug (17 pin) to suit option C00
C69-A	Feedback plug	Interconnectron straight plug (17 pin) to suit option C48
THERMAL PROTECTION		
P17-A*	KTY84-130 Thermal Sensor	
P18-A	No thermal overload	Thermal protection not fitted
ENCLOSURE PROTECTION		
W02-C*	IP64/65 enclosure	Nitrile shaft seal for IP64/65 protection (supplied loose)
W00-C	IP64/65 enclosure	Nitrile shaft seal for IP64/65 protection (factory fitted)
W01-E	IP64/65 enclosure	Viton shaft seal for IP64/65 protection (factory fitted)
W03-H	IP64/65 enclosure	Viton shaft seal for IP64/65 protection (supplied loose)
W99-A	No Shaft Seal Fitted	

***Standard feature**

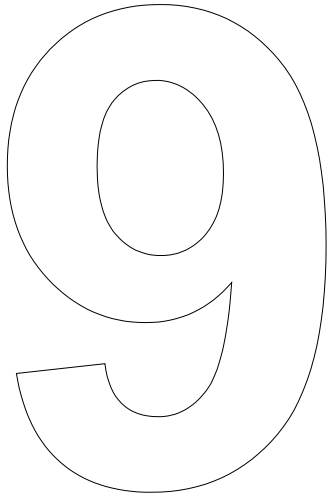
HDM105A10

HDM105C10

HDM105E10

HDM105G10

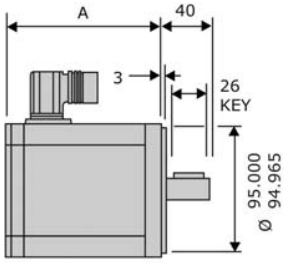
HDM105

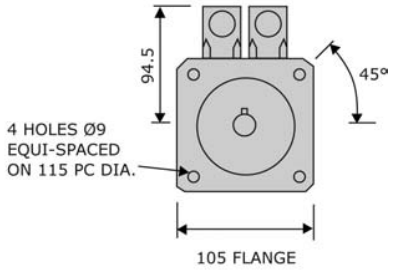


DATA TABLES · PERFORMANCE CURVES · SHAFT LOADING · MOTOR DRAWING · OPTIONAL FEATURES

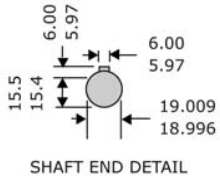
9.1 HDM105A10

Outline Drawing.





Frame	Dimension 'A' without brake	with brake
HDM105A	94	139
HDM105C	120	165
HDM105E	146	191
HDM105G	172	217



Technical Data.

Parameter	Units	HDM105 A10-31S	HDM105 A10-44S	HDM105 A10-89S
Continuous Stall Torque 1	**Nm**	**2.4**	**2.4**	**2.4**
Continuous Stall Current 1	**A**	**6.6**	**4.7**	**2.3**
Rated Torque [1]	Nm	2.2	2.2	2.2
Rated Current [1]	A	6.1	4.3	2.1
Rated Speed	rpm	3000	3000	3000
Max. Speed (300V DC link)	rpm	6000	6000	3300
Max. Speed (560V DC link)[2]	rpm	-----	-----	6000
Peak Stall Torque	**Nm**	**5.3**	**5.3**	**5.3**
Peak Current	**A**	**26**	**18**	**9**
Resistance Line-Line[3]	Ω	1.07	2.1	8.6
Inductance Line-Line[4]	mH	2.3	4.6	19
Voltage Gradient No Load	V	31	44	89
Max. Motor EMF Line – Line	Volts	190	260	530
Torque Constant Kt[3,5]	Nm/A	0.36	0.51	1.05
Number of Poles		10	10	10
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	30	30	30
Thermal Resistance	°C/W	1.05	1.05	1.05
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	1.4	1.4	1.4
Static Friction Torque	Nm	0.11	0.11	0.11
Cogging Torque	Nm	0.12	0.12	0.12
Motor Weight	kg	3	3	3
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	2.2	2.2	2.2

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 305x305x13mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

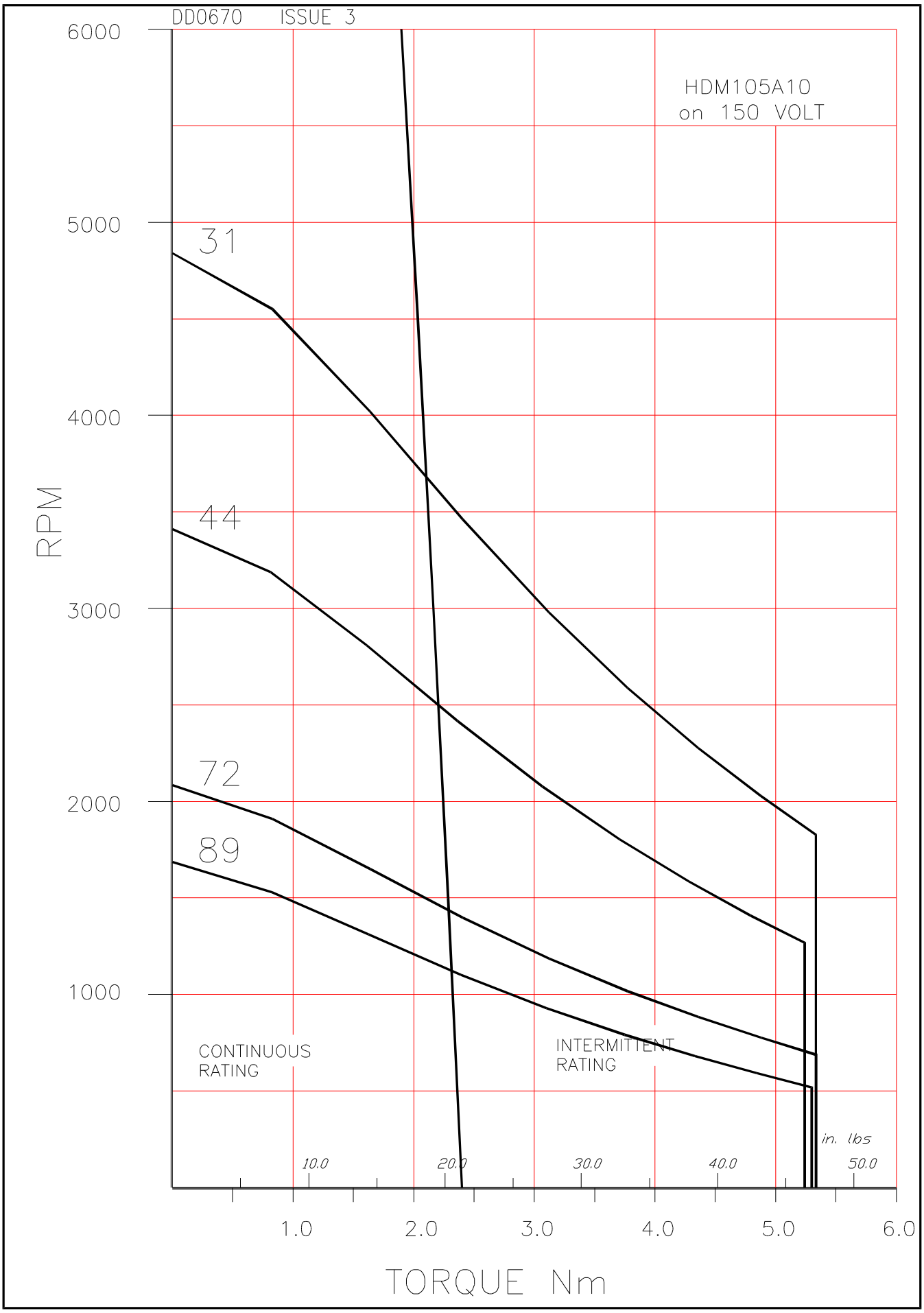
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

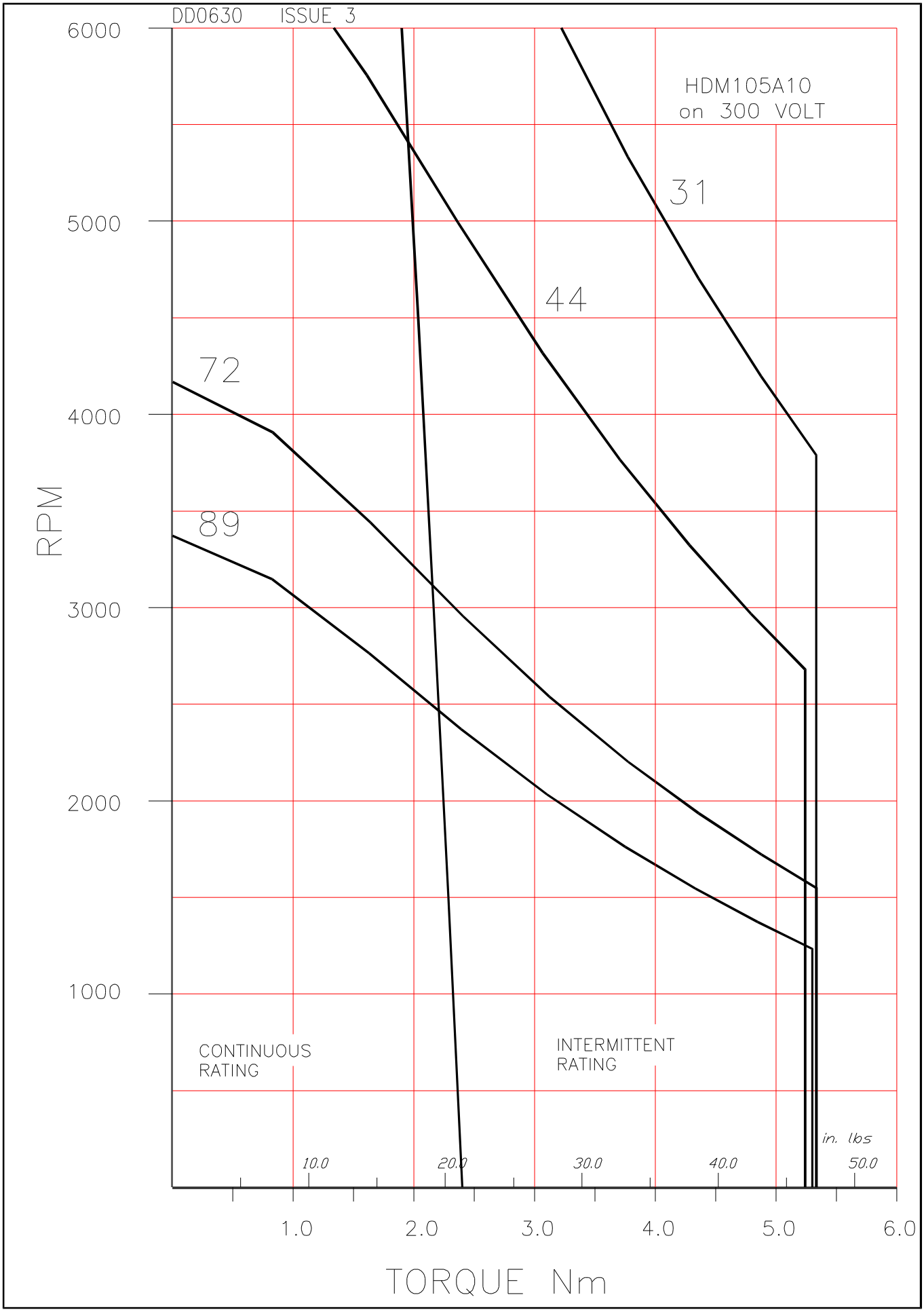
3 - At 25ºC.

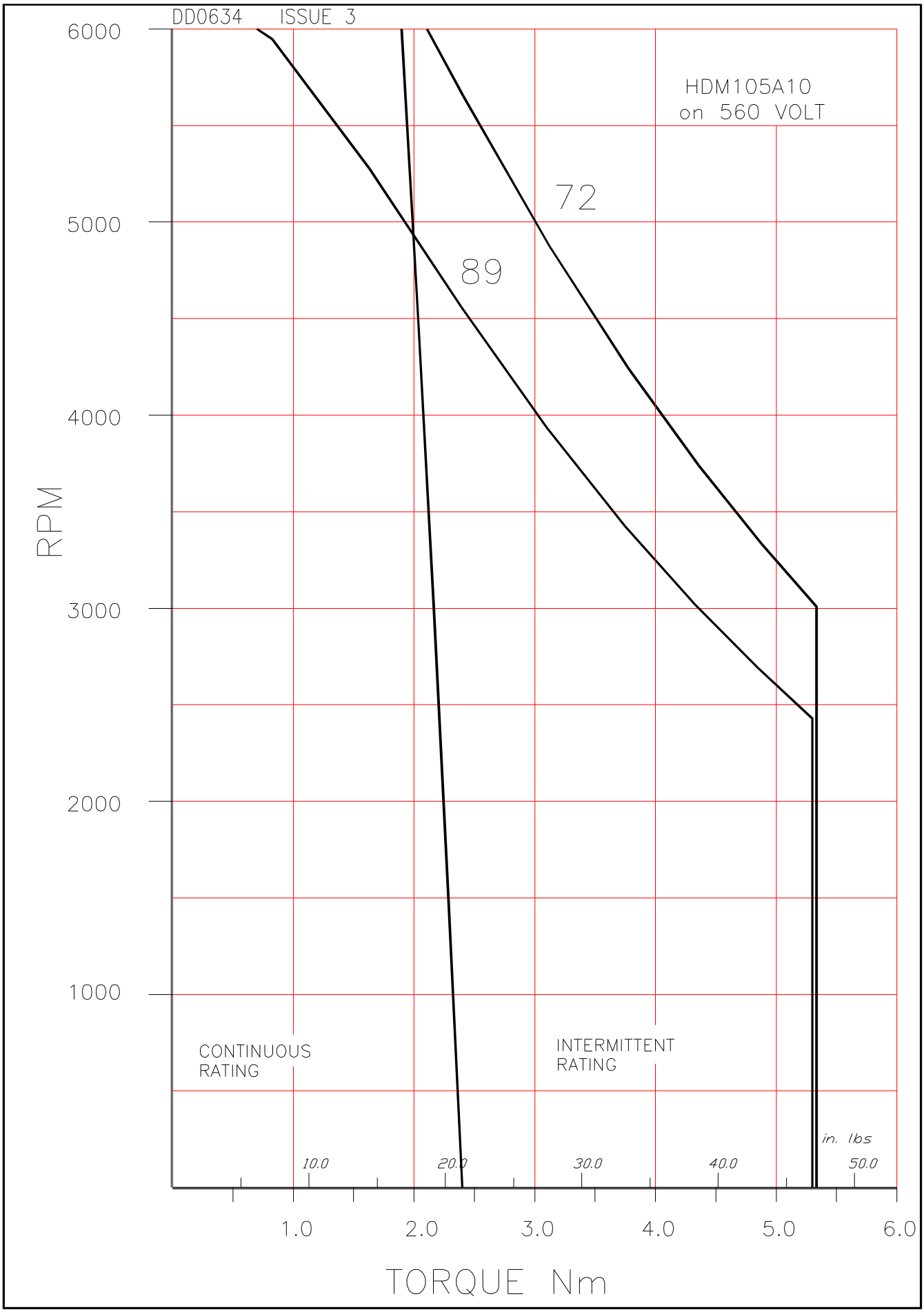
4 - Inductance values are based on nominal current.

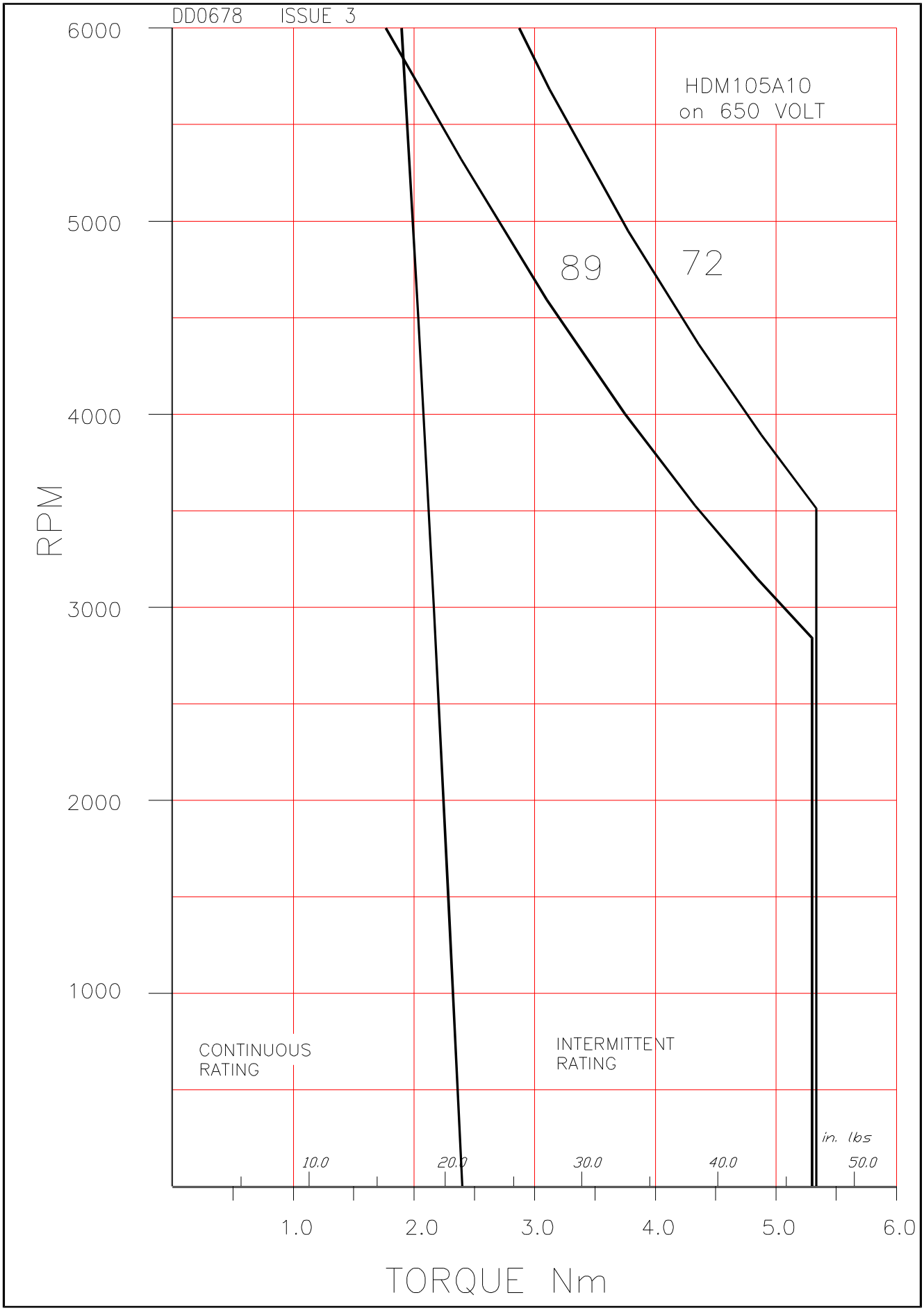
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0670 ISSUE 3
HDM105A10
on 150 VOLT
6000
5000
4000
3000
2000
1000
RPM
31
44
72
89
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
10.0
20.0
30.0
40.0
50.0
1.0
2.0
3.0
4.0
5.0
6.0
TORQUE Nm

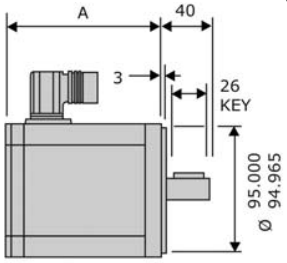

DD0630 ISSUE 3
HDM105A10
on 300 VOLT
31
44
72
89
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
10.0
20.0
30.0
40.0
50.0
1.0
2.0
3.0
4.0
5.0
6.0
TORQUE Nm

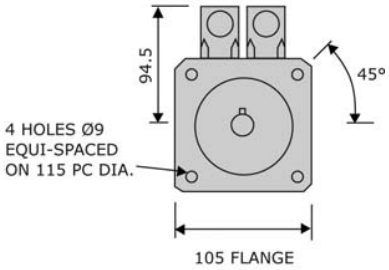

DD0634 ISSUE 3
HDM105A10
on 560 VOLT
72
89
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
10.0
20.0
30.0
40.0
50.0
1.0
2.0
3.0
4.0
5.0
6.0
TORQUE Nm


DD0678 ISSUE 3
HDM105A10
on 650 VOLT
89
72
RPM
6000
5000
4000
3000
2000
1000
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
10.0
20.0
30.0
40.0
50.0
1.0
2.0
3.0
4.0
5.0
6.0
TORQUE Nm

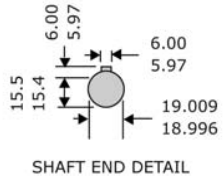
9.2 HDM105C10

Outline Drawing.





Frame	Dimension 'A' without brake	with brake
HDM105A	94	139
HDM105C	120	165
HDM105E	146	191
HDM105G	172	217



Technical Data.

Parameter	Units	HDM105 C10-39S	HDM105 C10-54S	HDM105 C10-77S
Continuous Stall Torque [1]	**Nm**	**4.6**	**4.6**	**4.6**
Continuous Stall Current [1]	**A**	**10.1**	**7.3**	**5.1**
Rated Torque [1]	Nm	4	4	4
Rated Current [1]	A	8.9	6.3	4.4
Rated Speed	rpm	3000	3000	3000
Max. Speed (300V DC link)	rpm	6000	5500	3800
Max. Speed (560V DC link)[2]	rpm	-----	-----	6000
Peak Stall Torque	**Nm**	**11**	**11**	**11**
Peak Current	**A**	**43**	**31**	**22**
Resistance Line-Line[3]	Ω	0.6	1.14	2.3
Inductance Line-Line[4]	mH	1.6	3.0	6.1
Voltage Gradient No Load	V	39	54	77
Max. Motor EMF Line – Line	Volts	230	320	460
Torque Constant Kt[3,5]	Nm/A	0.45	0.63	0.9
Number of Poles		10	10	10
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	35	35	35
Thermal Resistance	°C/W	0.8	0.8	0.8
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	2.3	2.3	2.3
Static Friction Torque	Nm	0.11	0.11	0.11
Cogging Torque	Nm	0.16	0.16	0.16
Motor Weight	kg	4.3	4.3	4.3
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	4.3	4.3	4.3

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 305x305x13mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

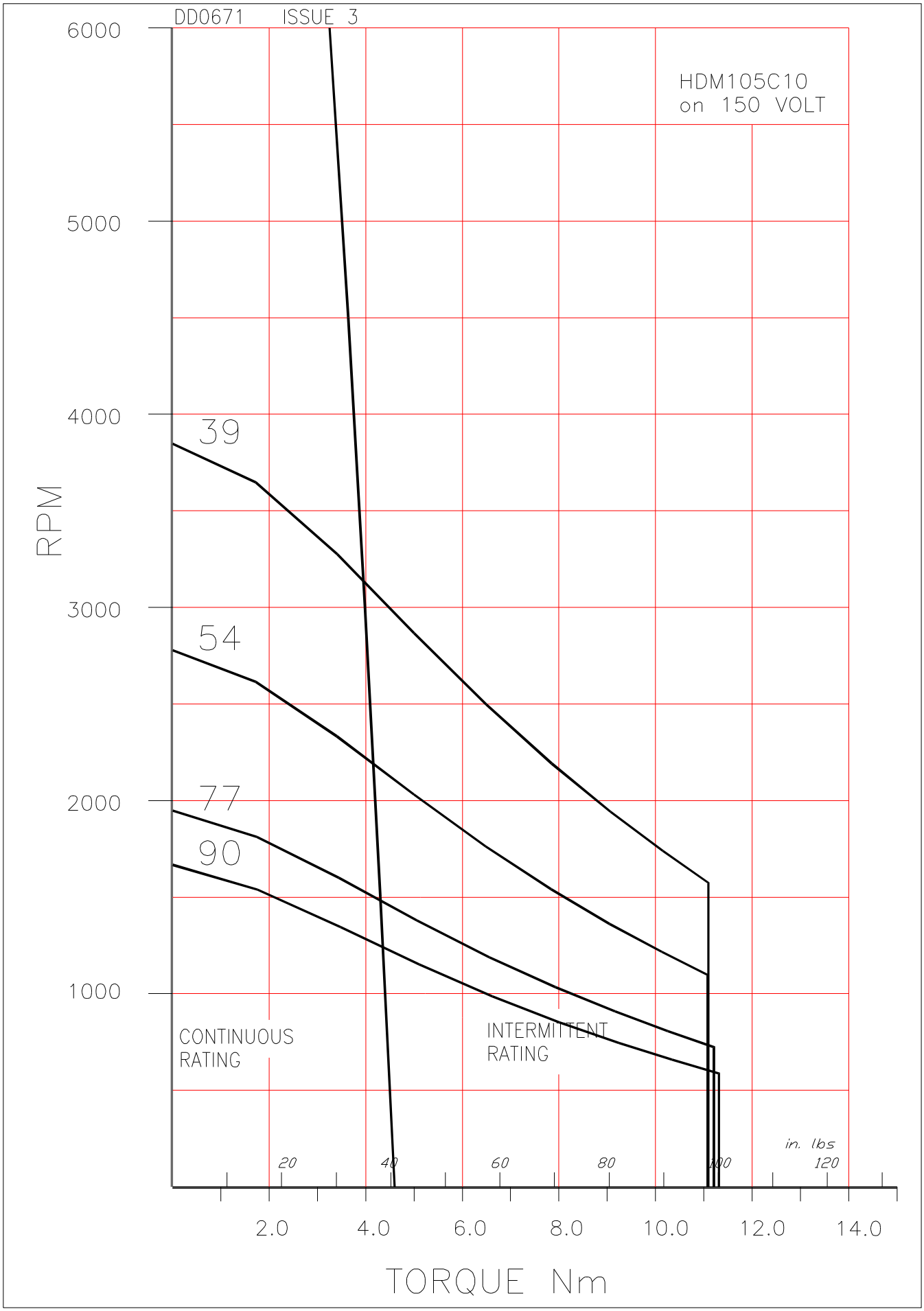
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

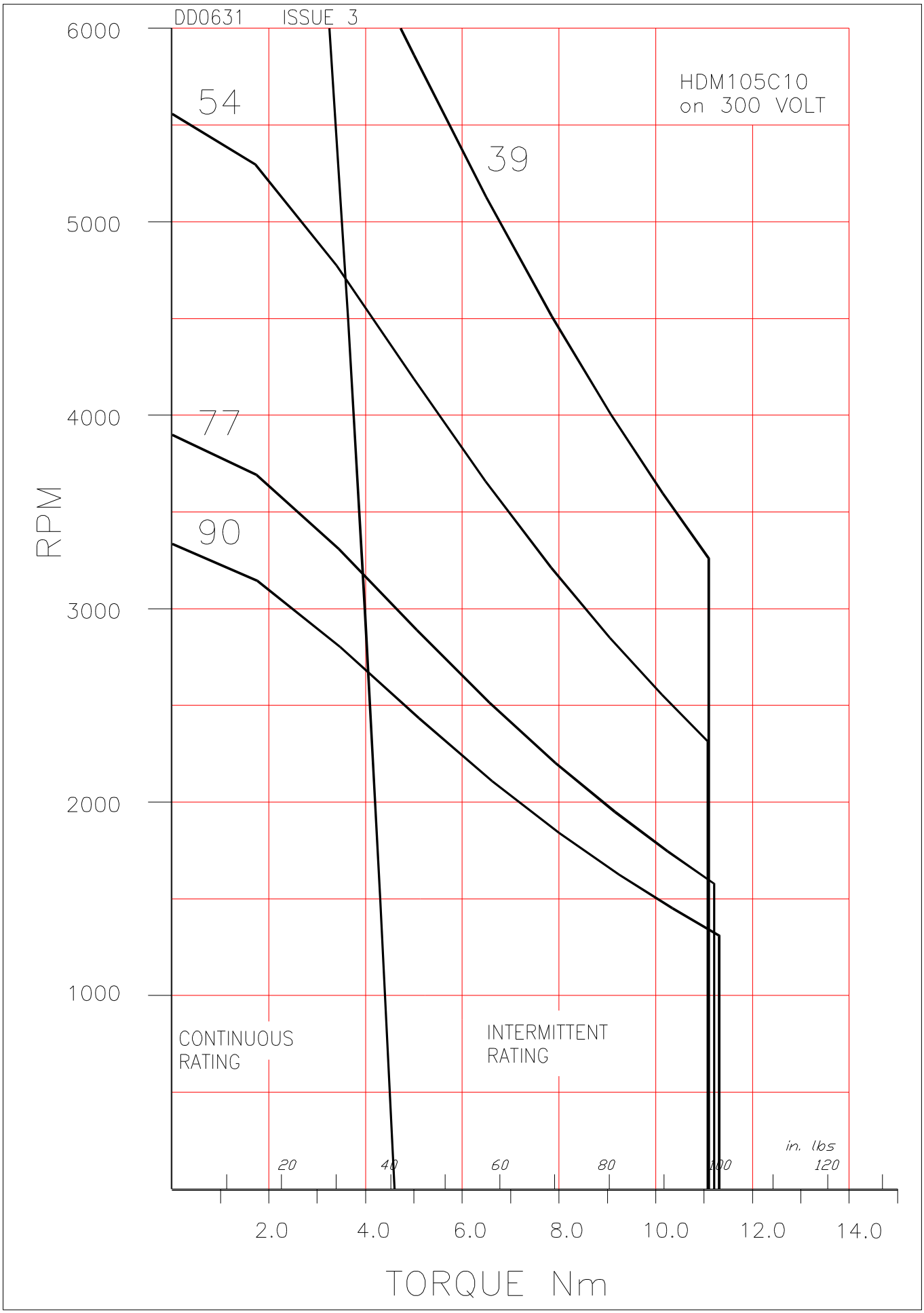
3 - At 25ºC.

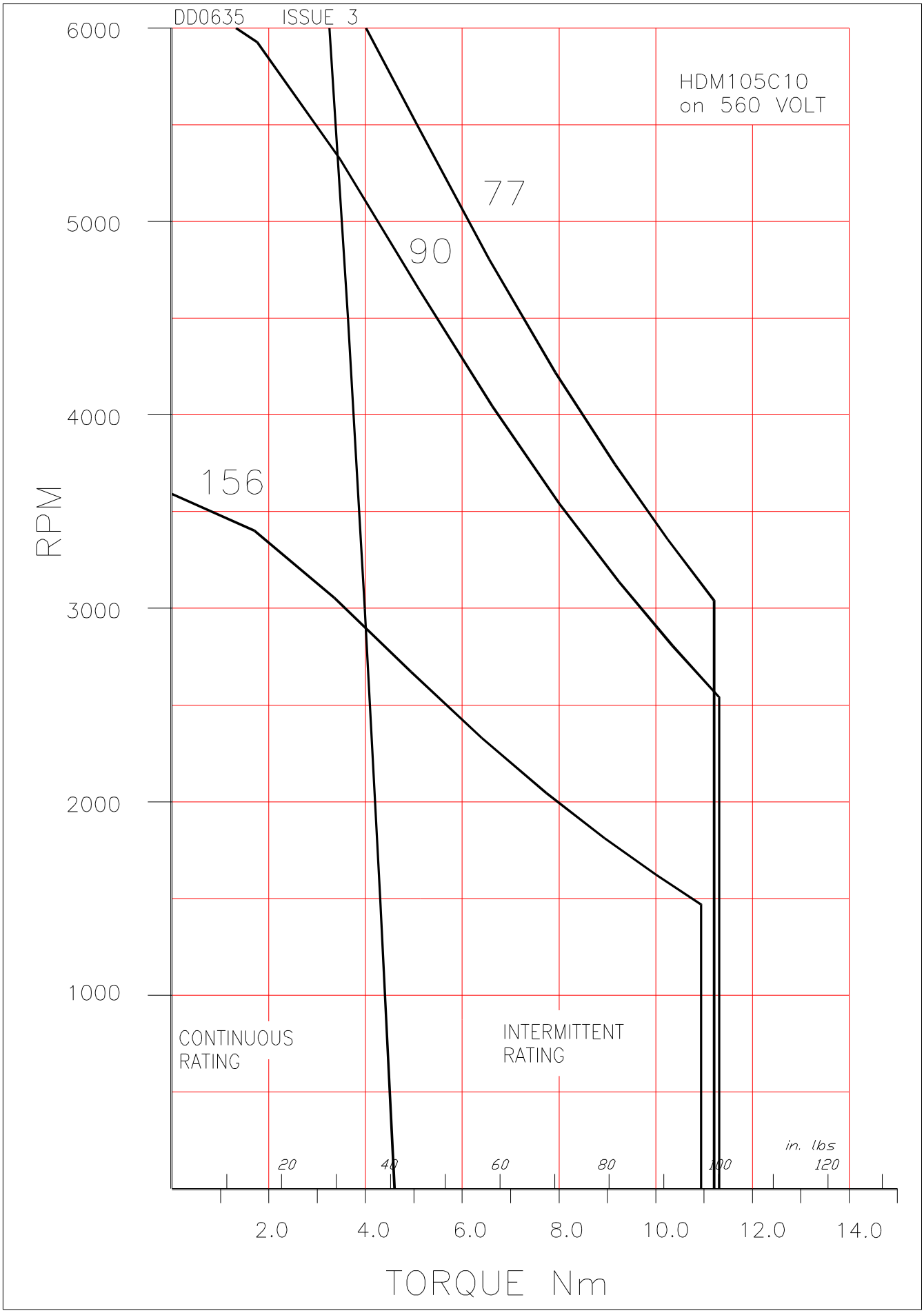
4 - Inductance values are based on nominal current.

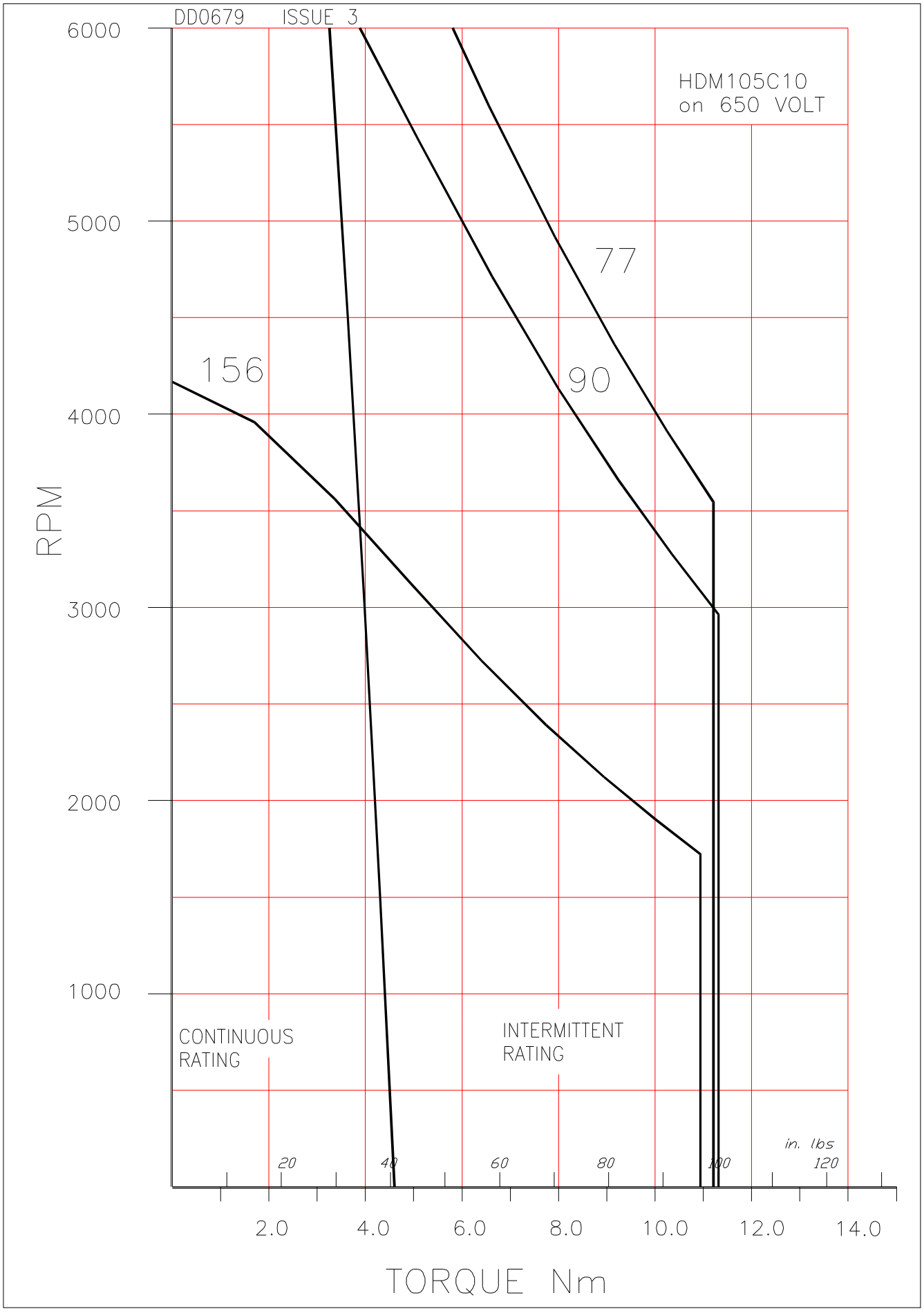
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0671 ISSUE 3
HDM105C10
on 150 VOLT
6000
5000
4000
3000
2000
1000
RPM
39
54
77
90
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
20
40
60
80
100
120
2.0
4.0
6.0
8.0
10.0
12.0
14.0
TORQUE Nm

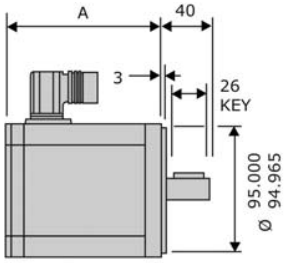

DD0631 ISSUE 3
HDM105C10
on 300 VOLT
54
39
77
90
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
20
40
60
80
100
120
in. lbs
2.0
4.0
6.0
8.0
10.0
12.0
14.0
TORQUE Nm

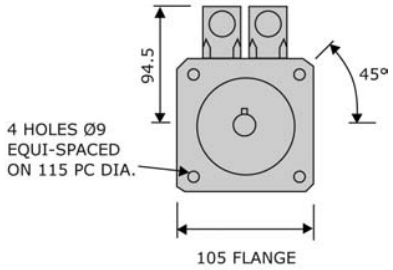

DD0635 ISSUE 3
HDM105C10
on 560 VOLT
77
90
156
RPM
6000
5000
4000
3000
2000
1000
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
20
40
60
80
100
120
2.0
4.0
6.0
8.0
10.0
12.0
14.0
TORQUE Nm


DD0679 ISSUE 3
HDM105C10
on 650 VOLT
6000
5000
4000
3000
2000
1000
RPM
156
90
77
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
20
40
60
80
100
120
2.0
4.0
6.0
8.0
10.0
12.0
14.0
TORQUE Nm

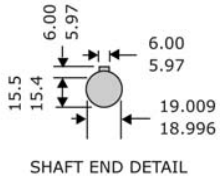
9.3 HDM105E10

Outline Drawing.





Frame	Dimension 'A' without brake	with brake
HDM105A	94	139
HDM105C	120	165
HDM105E	146	191
HDM105G	172	217



Technical Data.

Parameter	Units	HDM105E 10-51S	HDM105E 10-81S	HDM105 E10-104S
Continuous Stall Torque [1]	**Nm**	**6.3**	**6.3**	**6.3**
Continuous Stall Current [1]	**A**	**10.6**	**6.7**	**5.2**
Rated Torque [1]	Nm	5.2	5.2	5.2
Rated Current [1]	A	8.7	5.4	4.2
Rated Speed	rpm	3000	3000	3000
Max. Speed (300V DC link)	rpm	5800	3700	2800
Max. Speed (560V DC link)[2]	rpm	-----	6000	5300
Peak Stall Torque	**Nm**	**17**	**17**	**17**
Peak Current	**A**	**49**	**31**	**24**
Resistance Line-Line[3]	Ω	0.64	1.6	2.6
Inductance Line-Line[4]	mH	1.8	4.4	7.0
Voltage Gradient No Load	V	51	81	104
Max. Motor EMF Line – Line	Volts	310	490	620
Torque Constant Kt[3,5]	Nm/A	0.6	0.96	1.23
Number of Poles		10	10	10
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	39	39	39
Thermal Resistance	°C/W	0.7	0.7	0.7
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	3.2	3.2	3.2
Static Friction Torque	Nm	0.11	0.11	0.11
Cogging Torque	Nm	0.21	0.21	0.21
Motor Weight	kg	5.5	5.5	5.5
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	5.9	5.9	5.9

Notes

[1] - Motors are tested on an aluminium heatsink with dimensions 305x305x13mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

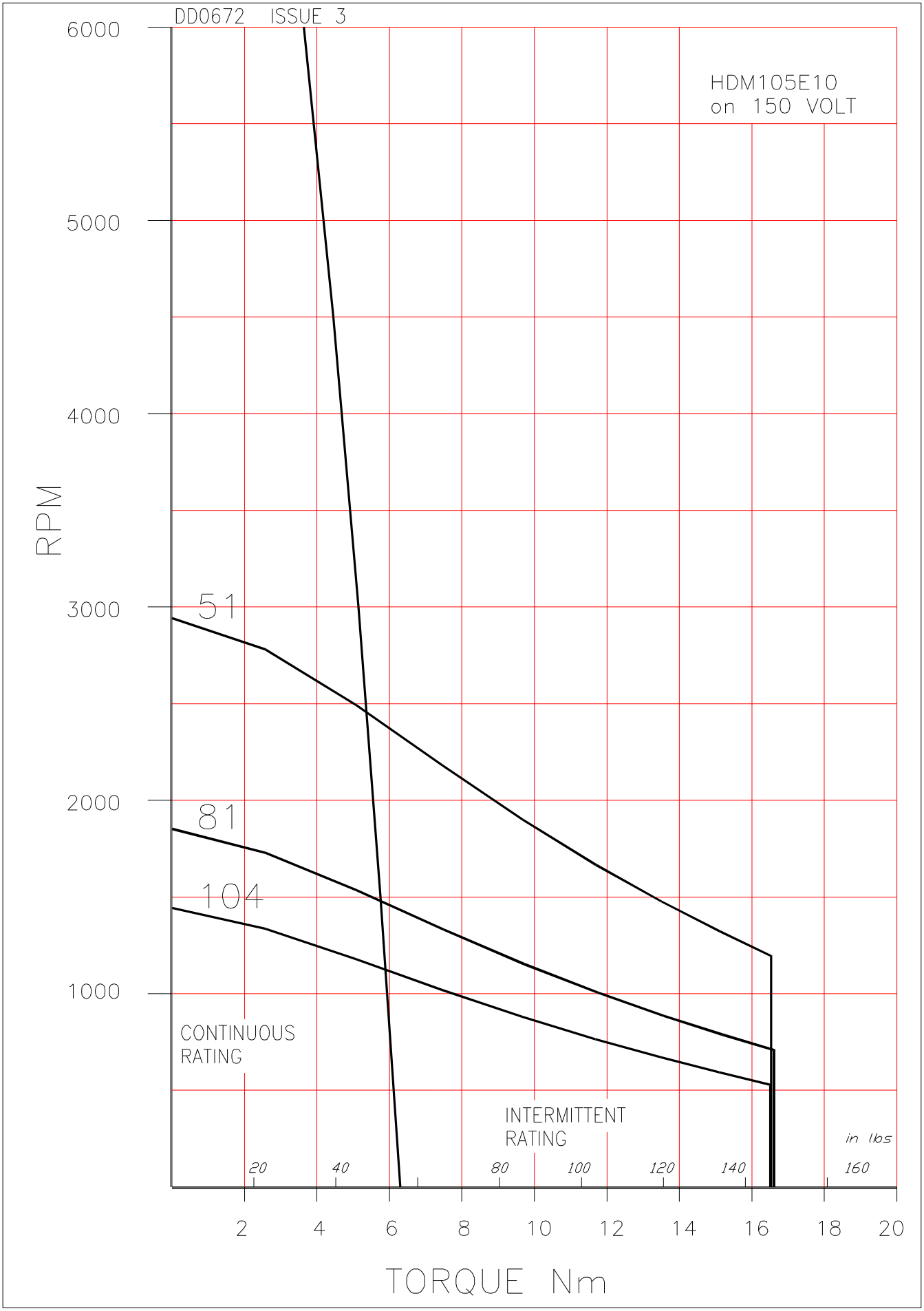
[2] - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

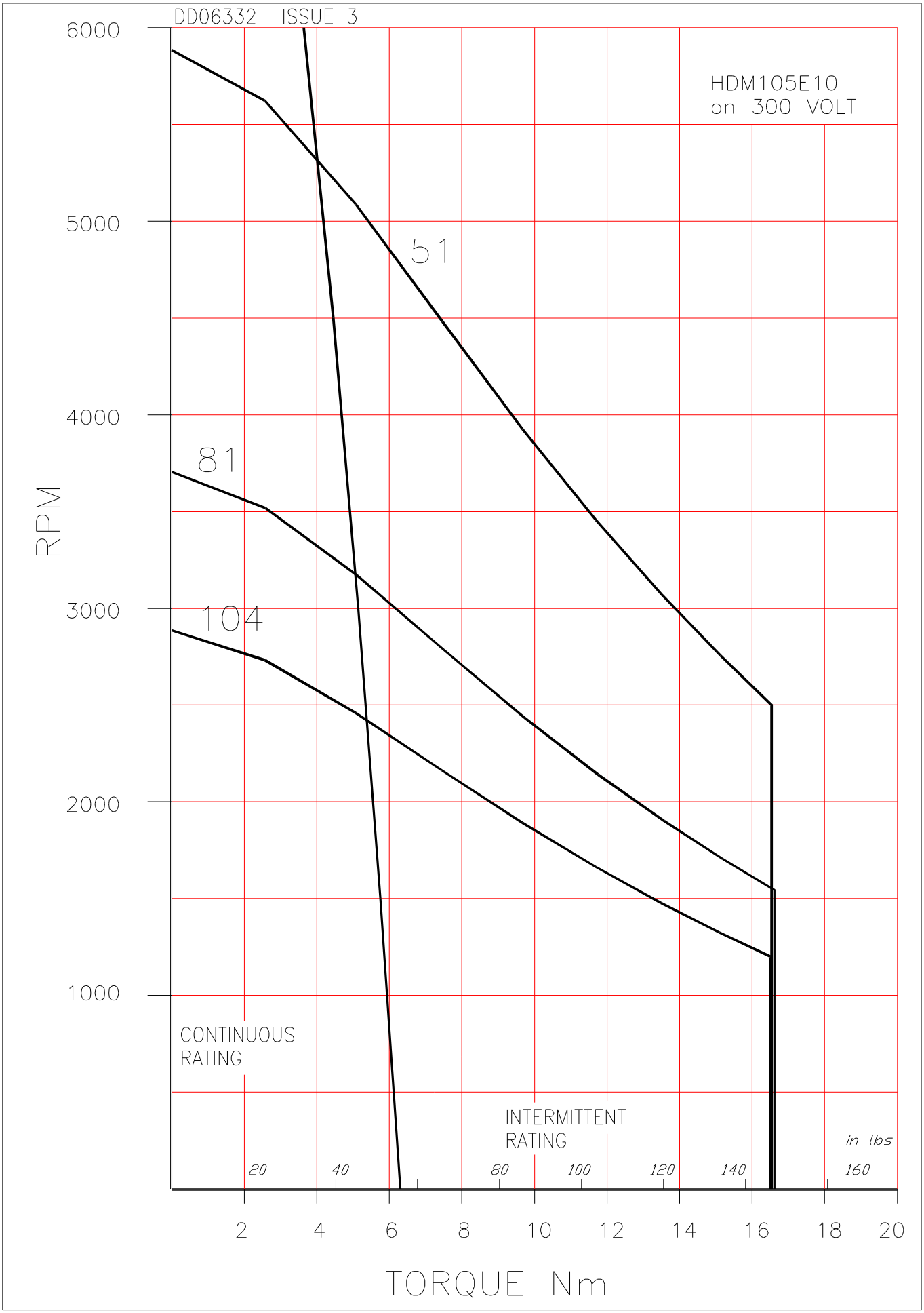
[3] - At 25ºC.

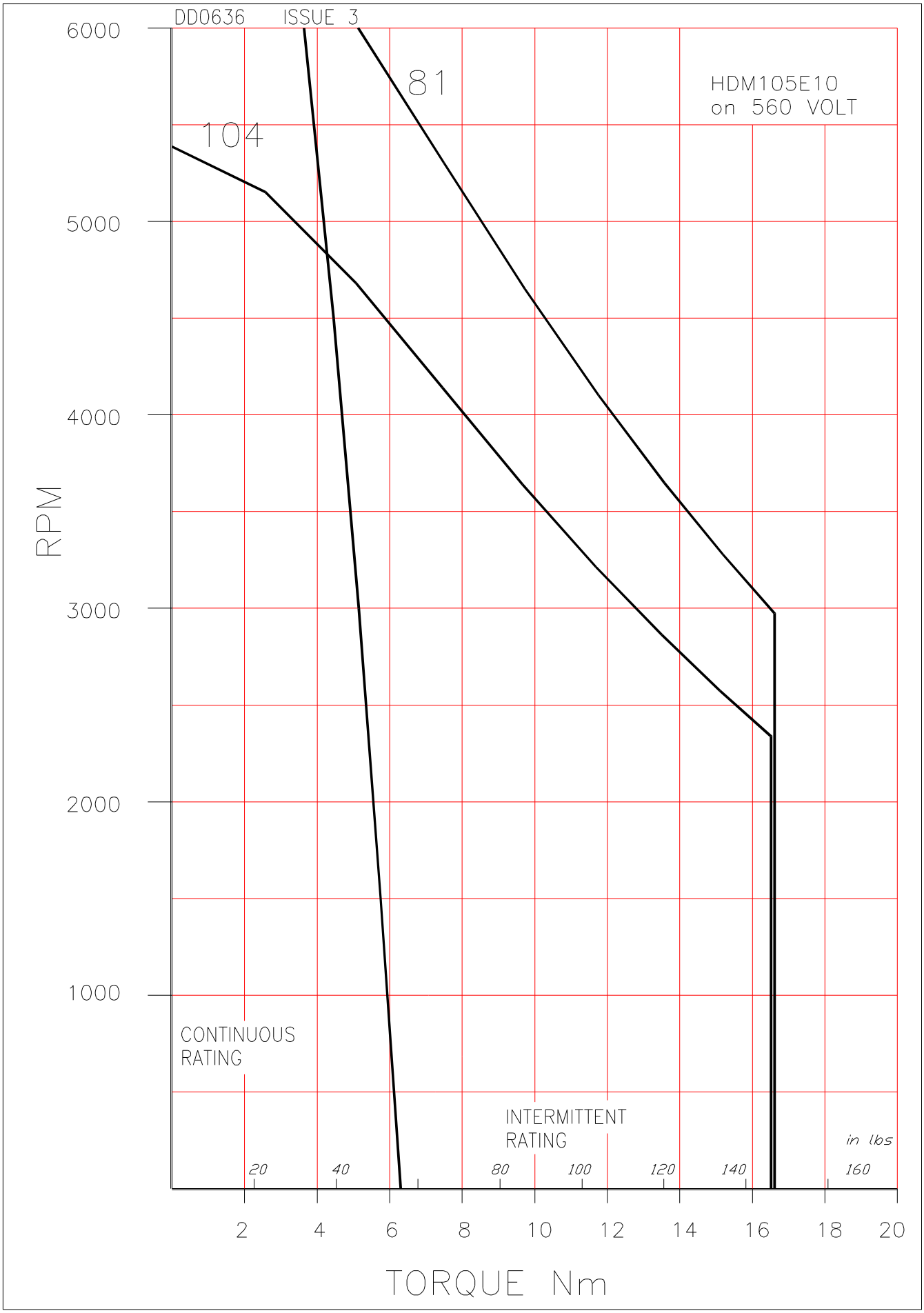
[4] - Inductance values are based on nominal current.

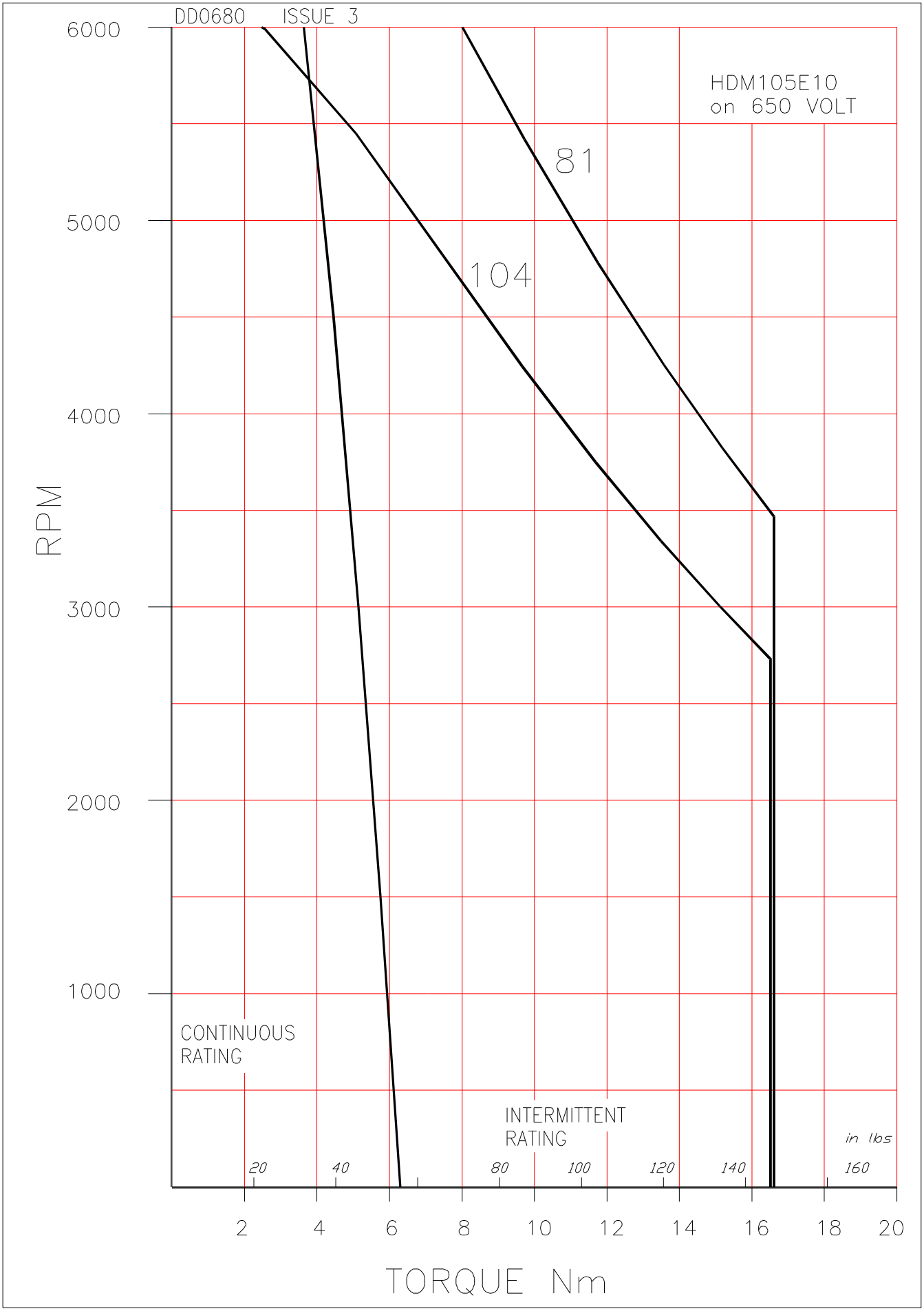
[5] - At rated values Torque = Kt x rms current.

[6] - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0672 ISSUE 3
HDM105E10
on 150 VOLT
6000
5000
4000
3000
2000
1000
RPM
51
81
104
CONTINUOUS
RATING
INTERMITTENT
RATING
in lbs
20
40
80
100
120
140
160
2
4
6
8
10
12
14
16
18
20
TORQUE Nm

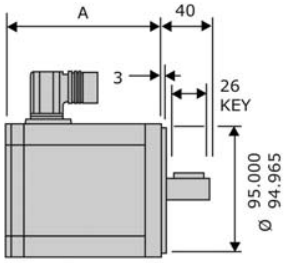

DD06332 ISSUE 3
HDM105E10
on 300 VOLT
6000
5000
4000
3000
2000
1000
RPM
51
81
104
CONTINUOUS
RATING
INTERMITTENT
RATING
in lbs
20
40
80
100
120
140
160
2
4
6
8
10
12
14
16
18
20
TORQUE Nm

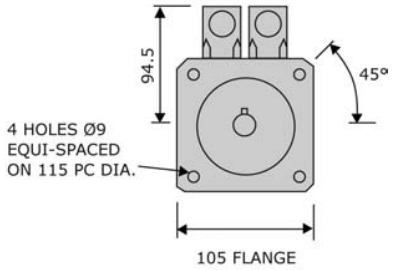

DD0636 ISSUE 3
HDM105E10
on 560 VOLT
81
104
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in lbs
20
40
80
100
120
140
160
2
4
6
8
10
12
14
16
18
20
TORQUE Nm


DD0680 ISSUE 3
HDM105E10
on 650 VOLT
81
104
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in lbs
20
40
80
100
120
140
160
2
4
6
8
10
12
14
16
18
20
TORQUE Nm

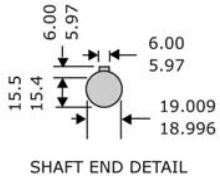
9.4 HDM105G10

Outline Drawing.





Frame	Dimension 'A' without brake	with brake
HDM105A	94	139
HDM105C	120	165
HDM105E	146	191
HDM105G	172	217



Technical Data.

Parameter	Units	HDM105 G10-69S	HDM105 G10-90S	HDM105 G10-120S
Continuous Stall Torque [1]	**Nm**	**7.9**	**7.9**	**7.9**
Continuous Stall Current [1]	**A**	**9.8**	**7.5**	**5.6**
Rated Torque [1]	Nm	5.7	5.7	5.7
Rated Current [1]	A	7	5.4	4
Rated Speed	rpm	3000	3000	3000
Max. Speed (300V DC link)	rpm	4300	3300	2500
Max. Speed (560V DC link)[2]	rpm	-----	6000	4600
Peak Stall Torque	**Nm**	**22**	**22**	**22**
Peak Current	**A**	**49**	**37**	**28**
Resistance Line-Line[3]	Ω	0.82	1.34	2.5
Inductance Line-Line[4]	mH	2.3	3.9	7.0
Voltage Gradient No Load	V	69	90	120
Max. Motor EMF Line – Line	Volts	410	540	700
Torque Constant Kt[3,5]	Nm/A	0.81	1.05	1.41
Number of Poles		10	10	10
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	40	40	40
Thermal Resistance	°C/W	0.58	0.58	0.58
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	4.1	4.1	4.1
Static Friction Torque	Nm	0.11	0.11	0.11
Cogging Torque	Nm	0.26	0.26	0.26
Motor Weight	kg	6.7	6.7	6.7
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	7.5	7.5	7.5

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 305x305x13mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

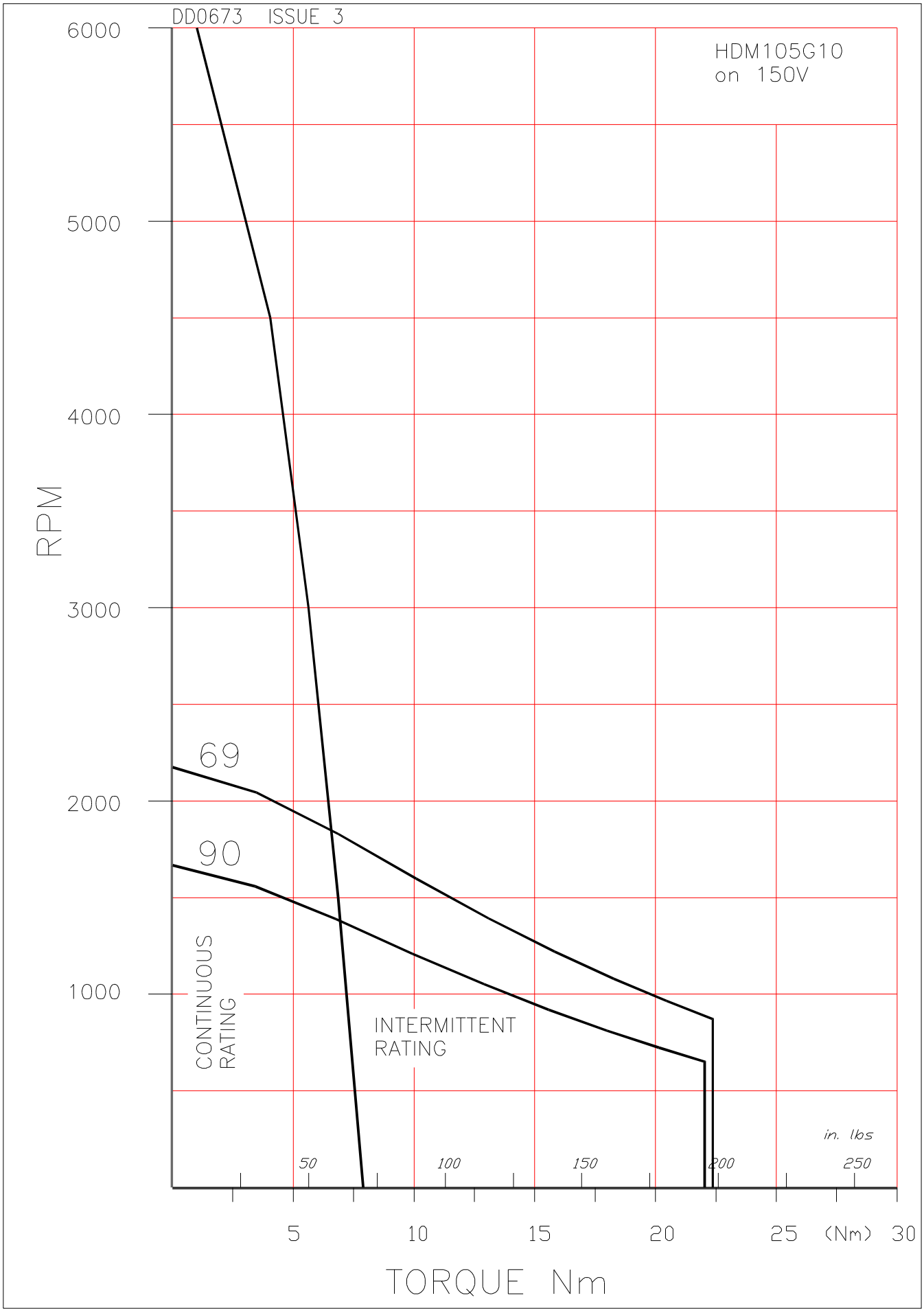
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

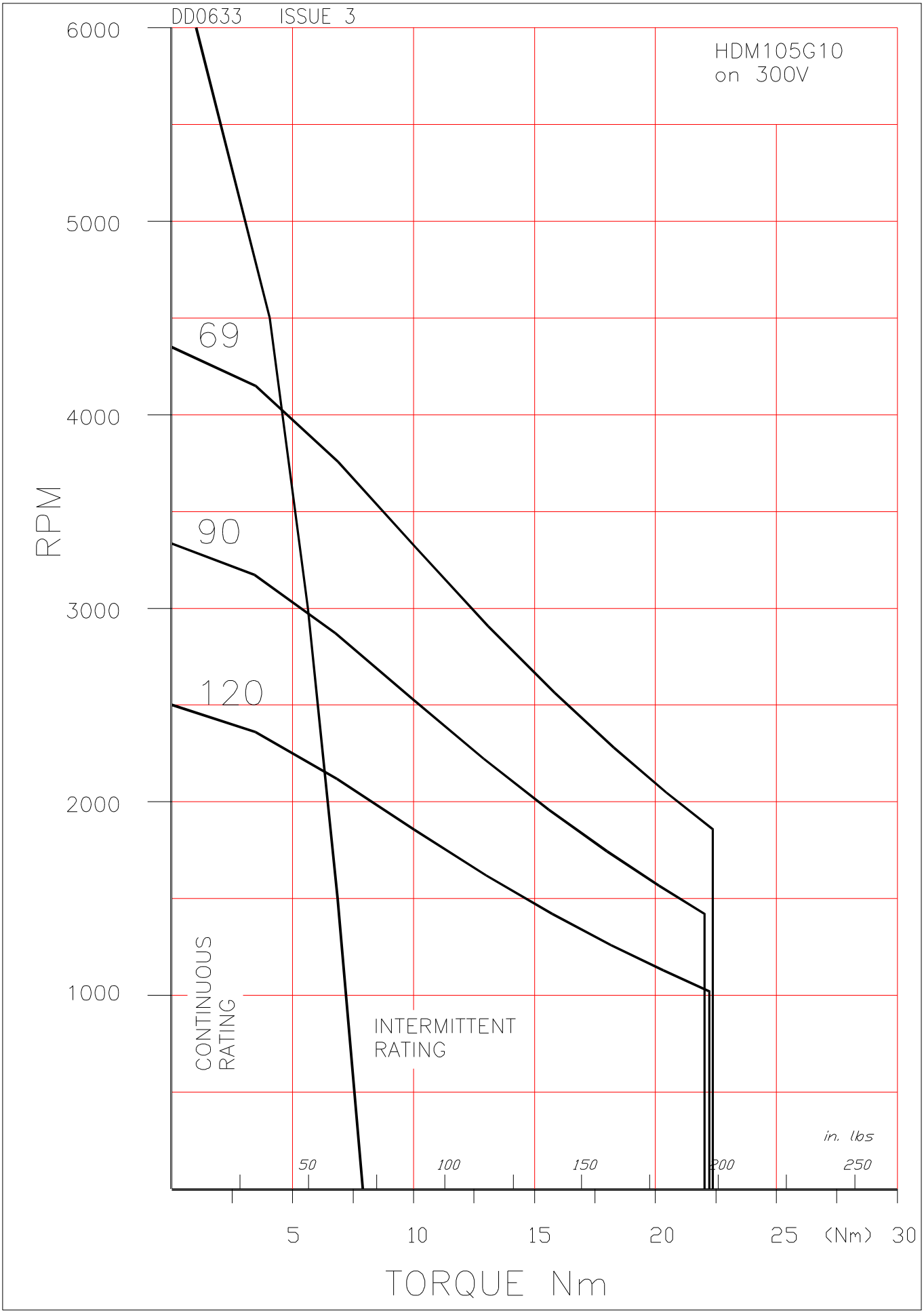
3 - At 25ºC.

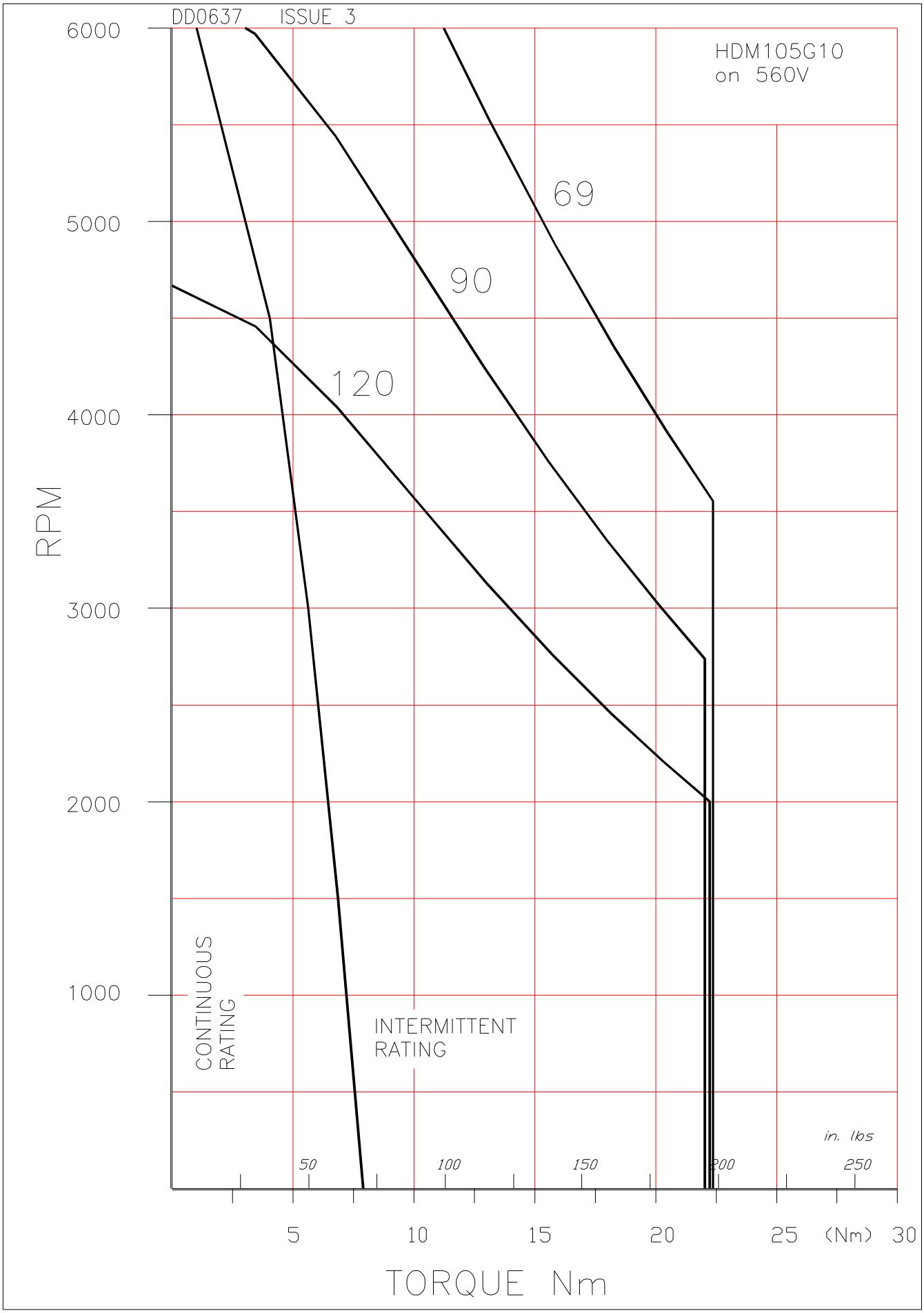
4 - Inductance values are based on nominal current.

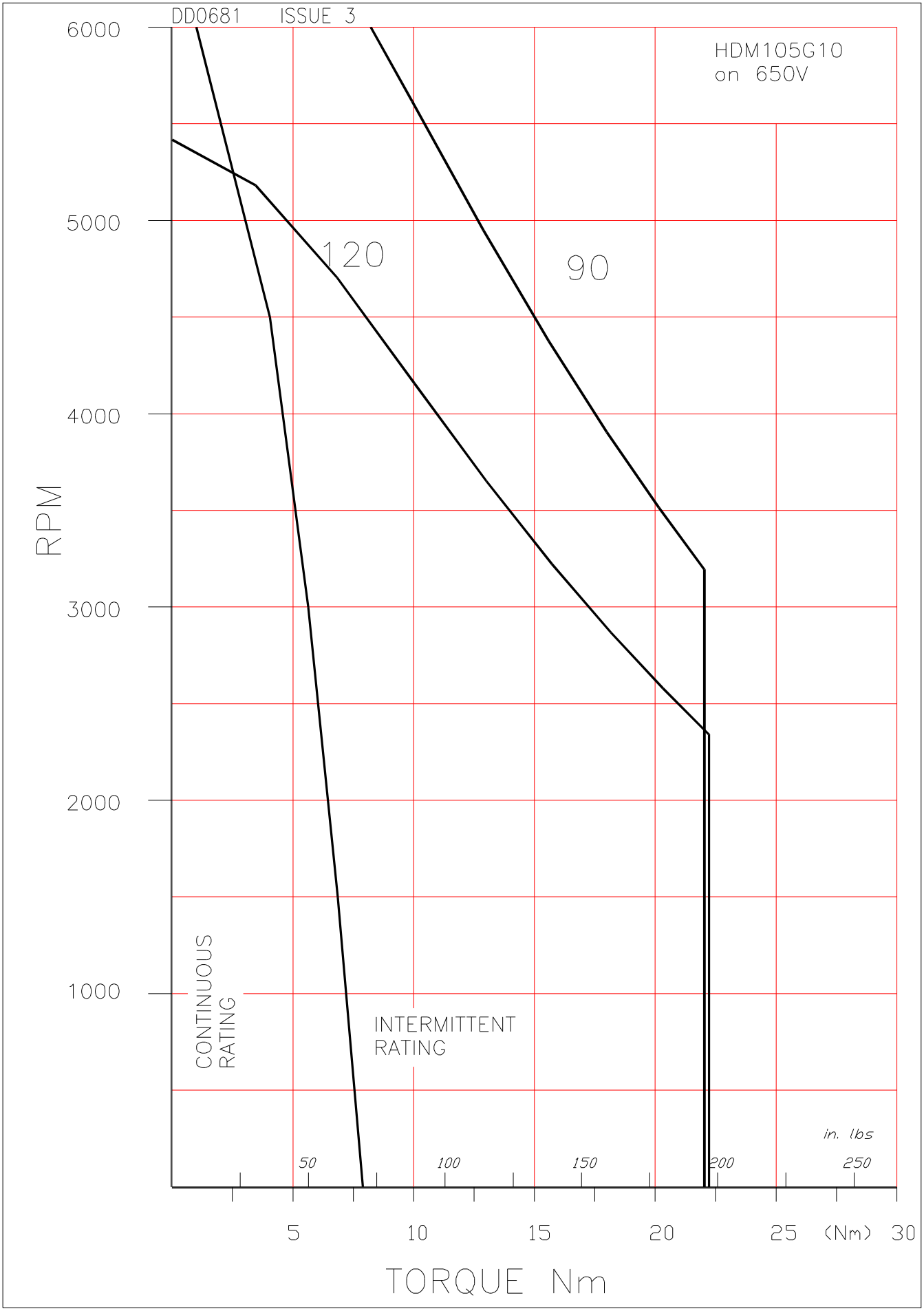
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0673 ISSUE 3
HDM105G10
on 150V
6000
5000
4000
3000
2000
1000
RPM
69
90
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
50
100
150
200
250
5
10
15
20
25
(Nm)
30
TORQUE Nm

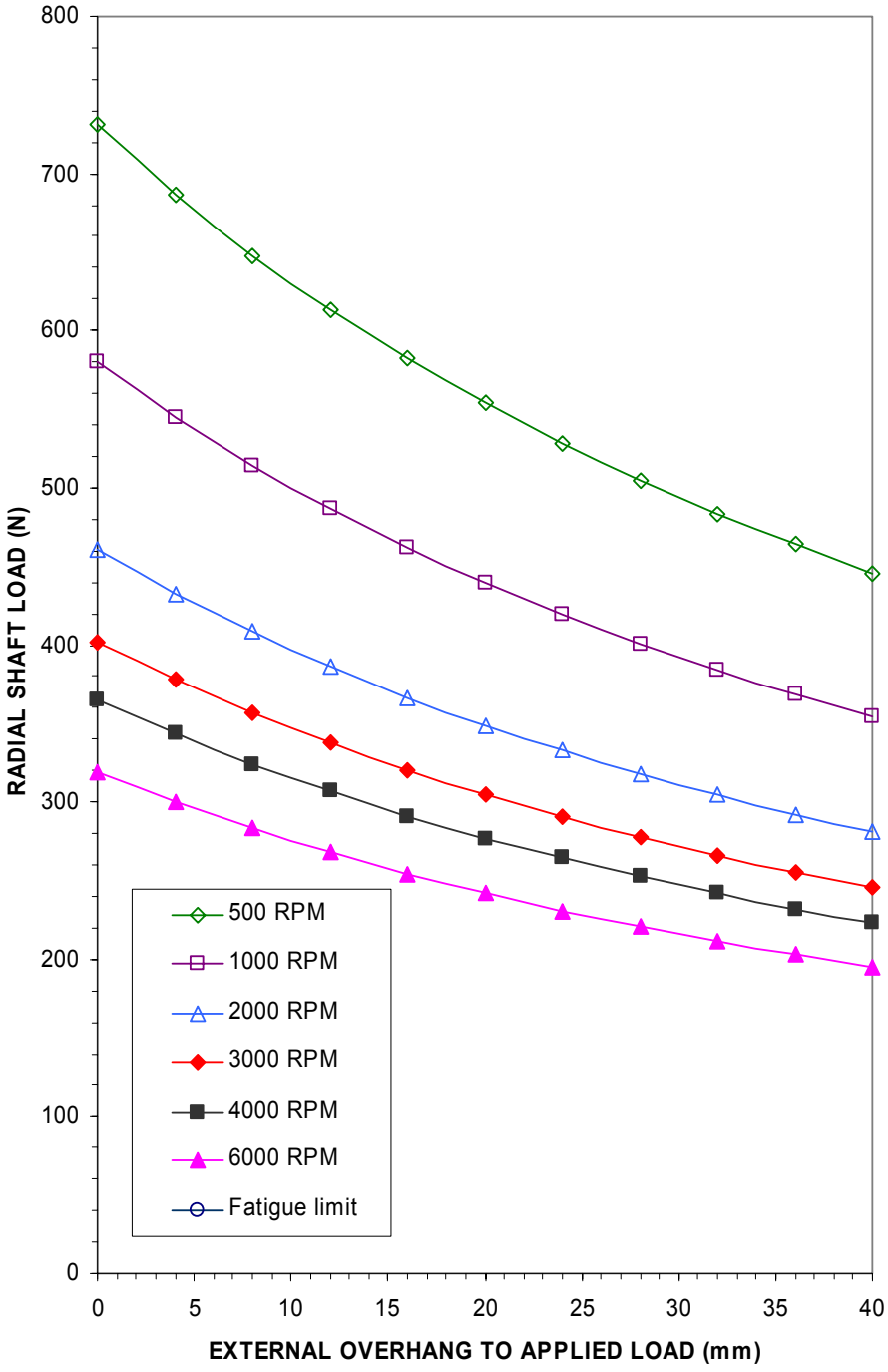

DD0633 ISSUE 3
HDM105G10
on 300V
6000
5000
4000
3000
2000
1000
RPM
69
90
120
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
50
100
150
200
250
5
10
15
20
25
(Nm)
30
TORQUE Nm


DD0637 ISSUE 3
HDM105G10
on 560V
69
90
120
6000
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
50
100
150
200
250
5
10
15
20
25
(Nm)
30
TORQUE Nm


DD0681 ISSUE 3
HDM105G10
on 650V
6000
5000
4000
3000
2000
1000
RPM
120
90
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
50
100
150
200
250
5
10
15
20
25
(Nm)
30
TORQUE Nm

HDM105 PERMITTED RADIAL SHAFT LOADINGS

(Axial loading maybe considered separately - refer to next page)



Shaft Loading Information for SEM Standard Servomotors

General notes:-

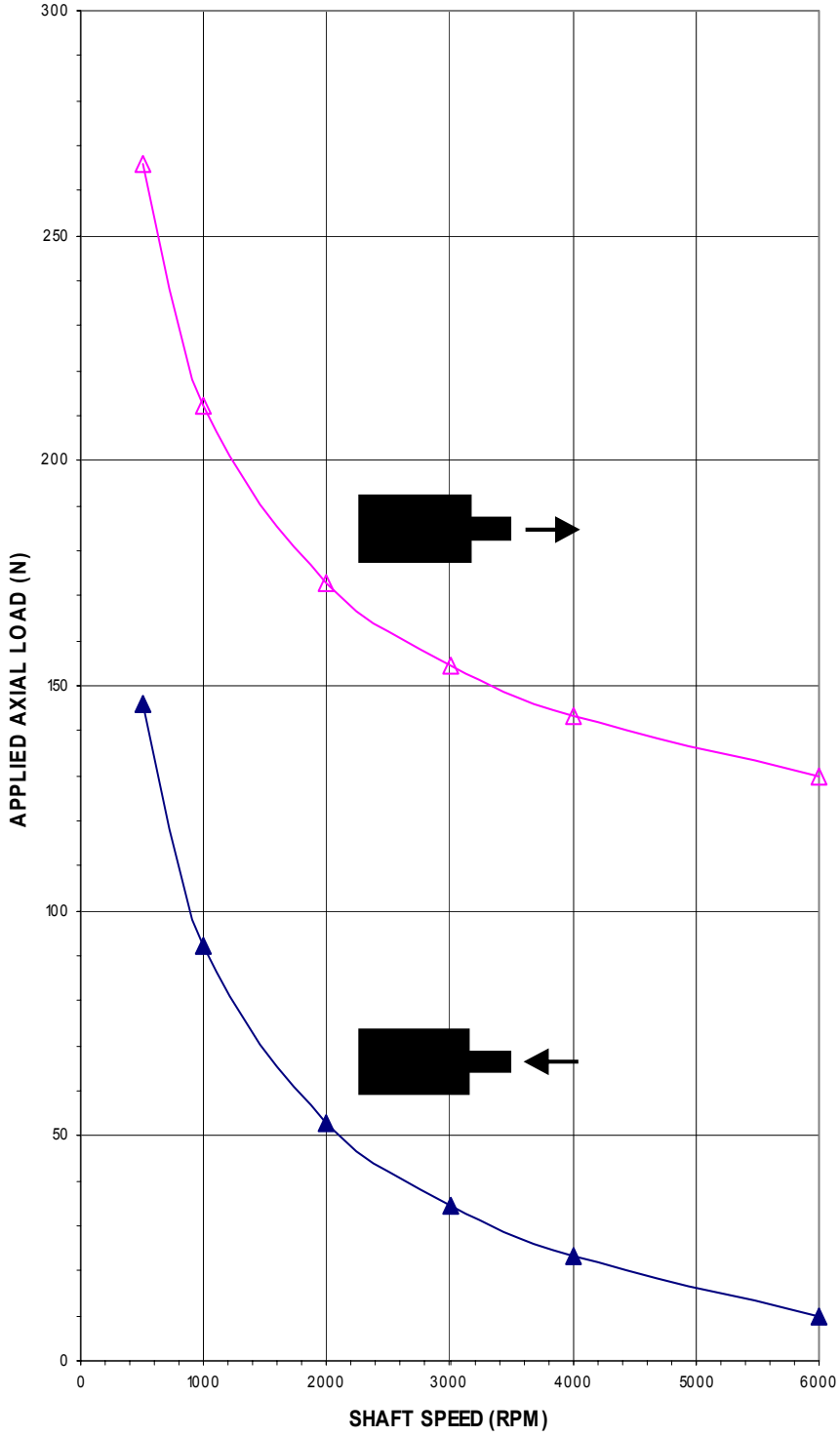
1 All loadings are based upon An L10 bearing life expectancy of 30,000 hours.

2 Separate graphs are usually supplied to indicate maximum axial loads which are applicable. However, for motors with locked drive end bearings, a graph is used to illustrate the maximum allowed radial shaft loadings together with a simplified calculation to provide a compensated figure for when radial and axial loadings are to be applied in combination.

3 It may occur, in certain circumstances, that loading outside the scope of the published information is deemed necessary. In these cases it is desirable that SEM Ltd should be consulted and all relevant information made available, in order that due consideration can be given to finding a satisfactory solution.

4 Should motors be required to operate under abnormal conditions, such as excessive vibration or shock, this should also be referred to SEM Ltd as noted above.

HDM105 PERMITTED AXIAL LOAD



Shaft Loading Information for SEM Standard Servomotors

General notes:-

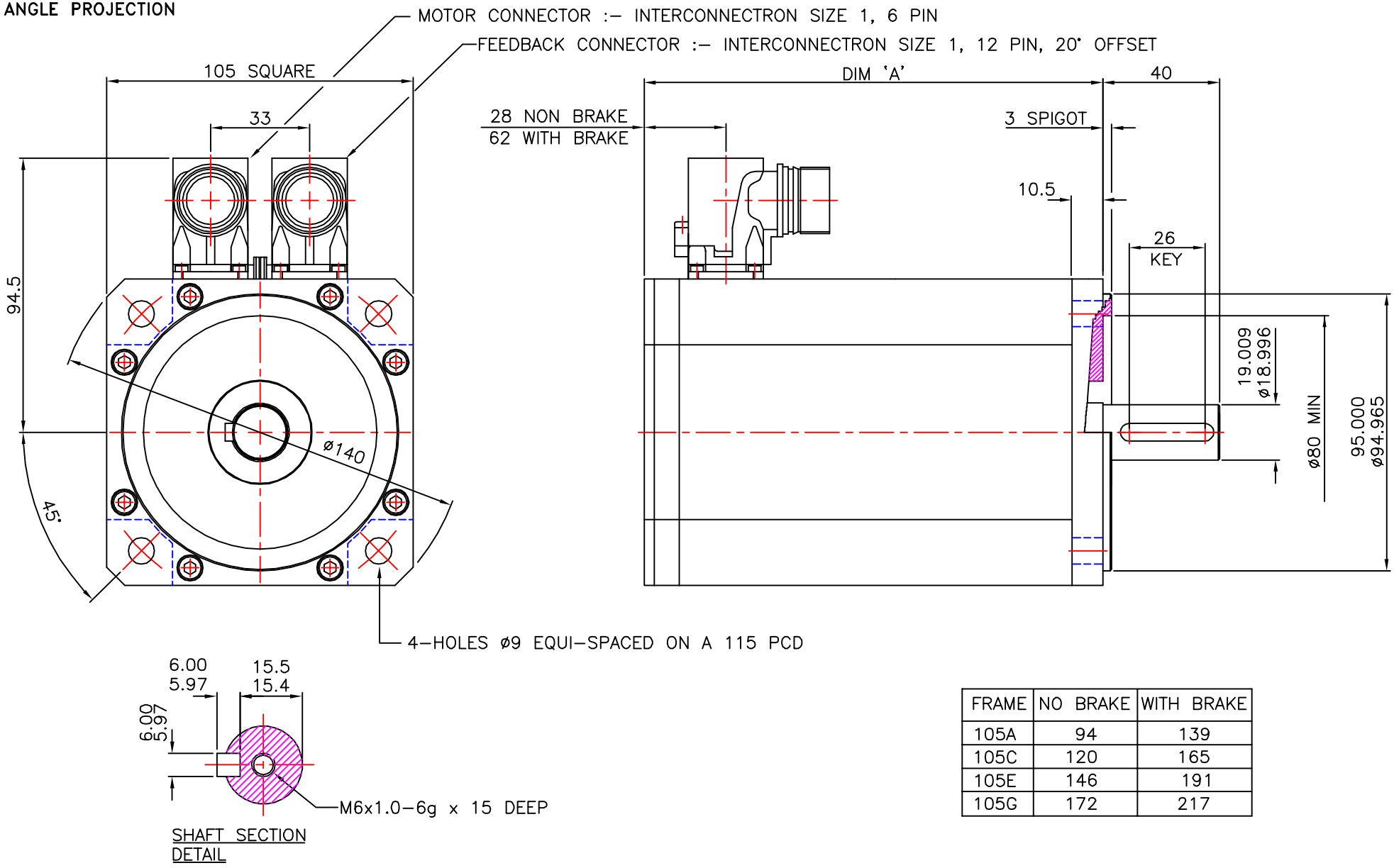
1 All loadings are based upon An L10 bearing life expectancy of 30,000 hours.

2 Separate graphs are usually supplied to indicate maximum axial loads which are applicable. However, for motors with locked drive end bearings, a graph is used to illustrate the maximum allowed radial shaft loadings together with a simplified calculation to provide a compensated figure for when radial and axial loadings are to be applied in combination.

3 It may occur, in certain circumstances, that loading outside the scope of the published information is deemed necessary. In these cases it is desirable that SEM Ltd should be consulted and all relevant information made available, in order that due consideration can be given to finding a satisfactory solution.

4 Should motors be required to operate under abnormal conditions, such as excessive vibration or shock, this should also be referred to SEM Ltd as noted above.

FIRST ANGLE PROJECTION



FRAME	NO BRAKE	WITH BRAKE
105A	94	139
105C	120	165
105E	146	191
105G	172	217

4	10AUG04 KEYWAY NOW ENCLOSED TO MR3176		
5	07SEP05 R35i & IEC72 RECESS ADDED MR3554		

TITLE : OUTLINE HDM105 STD METRIC – RESOLVER & R35i

MATERIAL		CODE	
SPEC		FORM	
FINISH		PATTERN No.	

ALL DIMENSIONS IN MILLIMETRES
TOLERANCES UNLESS OTHERWISE STATED ANG: ±0.5° DIM: ±0.25mm

DRAWING NO. 664–7–06349

SEM LONDON ENGLAND

SCALE	3:4
ISSUE No.	5
DR.	GFD
DATE	07MAY03
	A06349E1

HDM105 - OPTIONS (metric series)

Code	Description	Notes
WAVEFORM (WINDING)		
Y00-A*	Waveform	Sinusoidal waveform
FEEDBACK DEVICES		
F00-C*	Resolver (F00 setting)	2 Pole Resolver type 15-B with F00 setting
F66-A	No Feedback device fitted	
FITTED ENCODERS		
E28-A	Incremental Encoder	Renco R35i, 2048ppr
E30-A	Incremental Encoder	Renco R35i, 4098ppr
E31-A	Incremental Encoder	Renco R35i, 8192ppr
E15-C	Encoder	Heidenhain ERN1387 series, 2048ppr.
E22-B	Encoder, singleturn, Optical	Heidenhain ECN1313 series, 2048ppr with EnDat Interface.
E16-A	Encoder, multiturn, Optical	Heidenhain EQN1325 series, 2048ppr with EnDat Interface.
E33-A	Encoder, singleturn, Inductive	Heidhenhain ECI1319 series, 32ppr with EnDat Interface
E34-A	Encoder, multiturn, Inductive	Heidhenhain ECI1331 series, 32ppr with EnDat Interface
MECHANICAL INTERFACE		
M00-P*	Flange	105 x 105 mm square flange. Spigot Ø 95mm. Fixing 4 x Ø 9 mm holes on 115 mm PCD
R01-A	Close tolerance interface	Flange & shaft to IEC72-P (precision)
S00-I*	Shaft	Ø 19mm x 40mm long
K10-A*	Keyway	6 x 6 x 32 mm long, keyway with key enclosed type, also with half key supplied 6 x 3 x 32mm long
K99-A	No Keyway	Plain shaft
D01-G*	Shaft end threaded hole	M x 18mm deep
D99-A	No Shaft end threaded hole	
BRAKES		
B00-J	24Vdc Brake	10Nm. Torque, Spring Applied
ELECTRICAL TERMINATIONS		
C47-A*	Motor & feedback connector	Interconnectron size 1 power connector (6 pin) and size 1 feedback receptacle (12 pin) facing DE (resolver motors)
C48-A	Motor & feedback connector	Interconnectron size 1 power connector (6 pin) and size 1 feedback receptacle (17 pin) facing DE (encoder motors)
C67-A	Motor plug	Interconnectron straight plug (6 pin) to suit option C47 and C48
C68-A	Feedback plug	Interconnectron straight plug (12 pin) to suit option C47
C69-A	Feedback plug	Interconnectron straight plug (17 pin) to suit option C48
THERMAL PROTECTION		
P17-A*	KTY84-130 Thermal Sensor	
P18-A	No thermal overload	Thermal protection not fitted
ENCLOSURE PROTECTION		
W00-B*	IP64/65 enclosure	Nitrile shaft seal for IP64/65 protection (factory fitted)
W02-B	IP64/65 enclosure	Nitrile shaft seal for IP64/65 protection (supplied loose)
W01-I	IP64/65 enclosure	Viton shaft seal for IP64/65 protection (factory fitted)
W03-I	IP64/65 enclosure	Viton shaft seal for IP64/65 protection (supplied loose)
W99-A	No Shaft Seal Fitted	

***Standard feature**

HDM142A10

HDM142C10

HDM142E10

HDM142J10

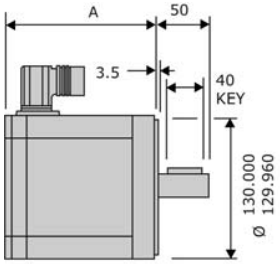
HDM142

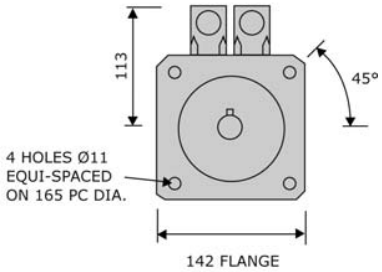
10

DATA TABLES · PERFORMANCE CURVES · SHAFT LOADING · MOTOR DRAWING · OPTIONAL FEATURES

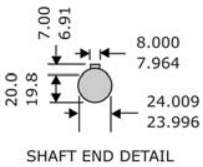
10.1 HDM142A10

Outline Drawing.





Frame	Dimension 'A' without brake	with brake
HDM142A	112	172
HDM142C	132	192
HDM142E	157	217
HDM142J	207	267



Technical Data.

Parameter	Units	HDM142 A10-54S	HDM142 A10-75S	HDM142 A10-107S
Continuous Stall Torque 1	**Nm**	**9.1**	**9.1**	**9.1**
Continuous Stall Current 1	**A**	**14**	**10.4**	**7.3**
Rated Torque [1]	Nm	8	8	8
Rated Current [1]	A	12.7	9.2	6.3
Rated Speed	rpm	3000	3000	3000
Max. Speed (300V DC link)	rpm	5000	4000	2800
Max. Speed (560V DC link)[2]	rpm	-----	5000	5000
Peak Stall Torque	**Nm**	**20**	**20**	**20**
Peak Current	**A**	**56**	**41**	**28**
Resistance Line-Line[3]	Ω	0.55	1.06	2.1
Inductance Line-Line[4]	mH	2.7	5.1	10.5
Voltage Gradient No Load	V	54	75	107
Max. Motor EMF Line – Line	Volts	270	380	540
Torque Constant Kt[3,5]	Nm/A	0.63	0.87	1.26
Number of Poles		10	10	10
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	30	30	30
Thermal Resistance	°C/W	0.42	0.42	0.42
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	6.6	6.6	6.6
Static Friction Torque	Nm	0.12	0.12	0.12
Cogging Torque	Nm	0.2	0.2	0.2
Motor Weight	kg	6.2	6.2	6.2
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	8.1	8.1	8.1

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 457x457x13mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

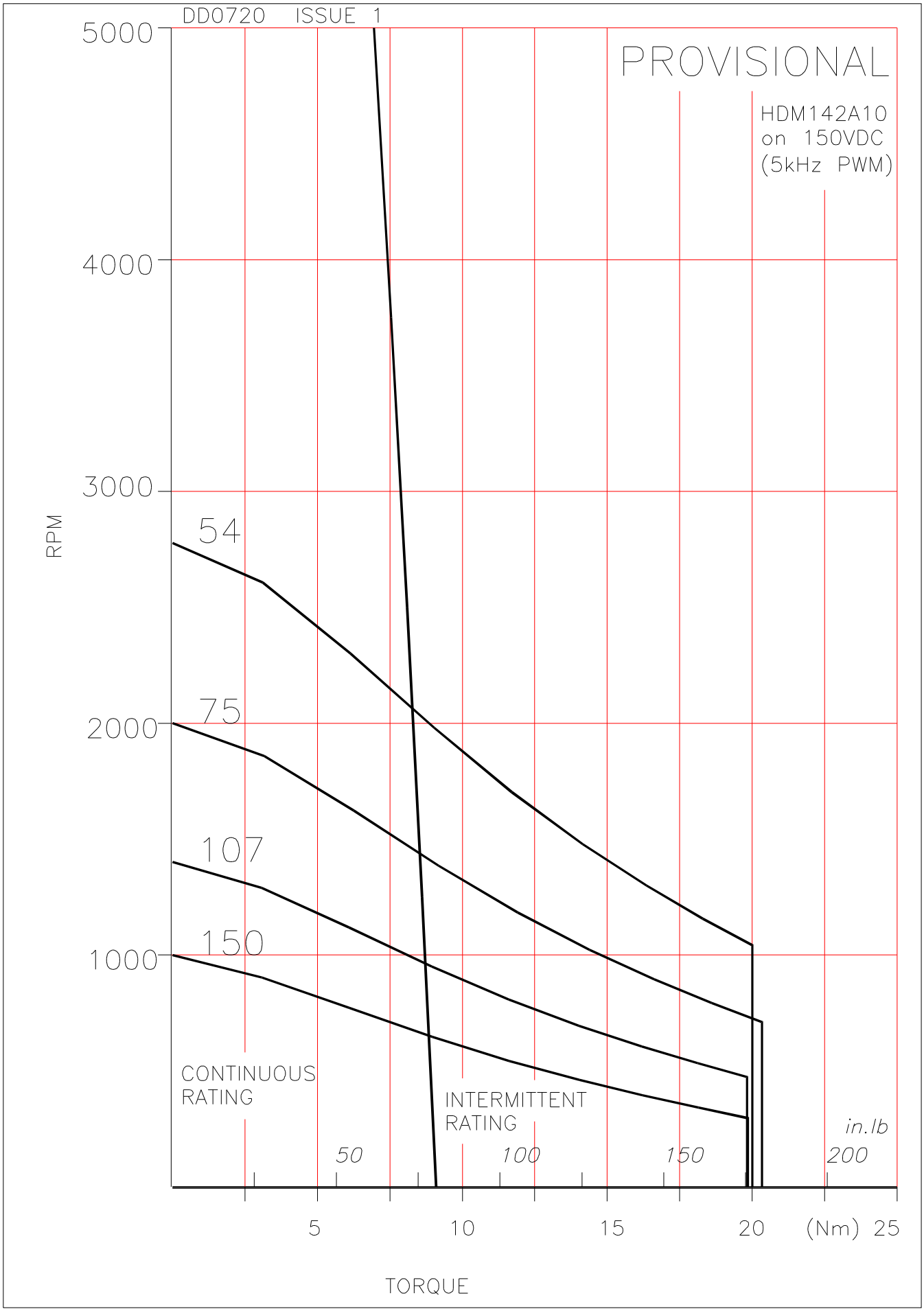
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

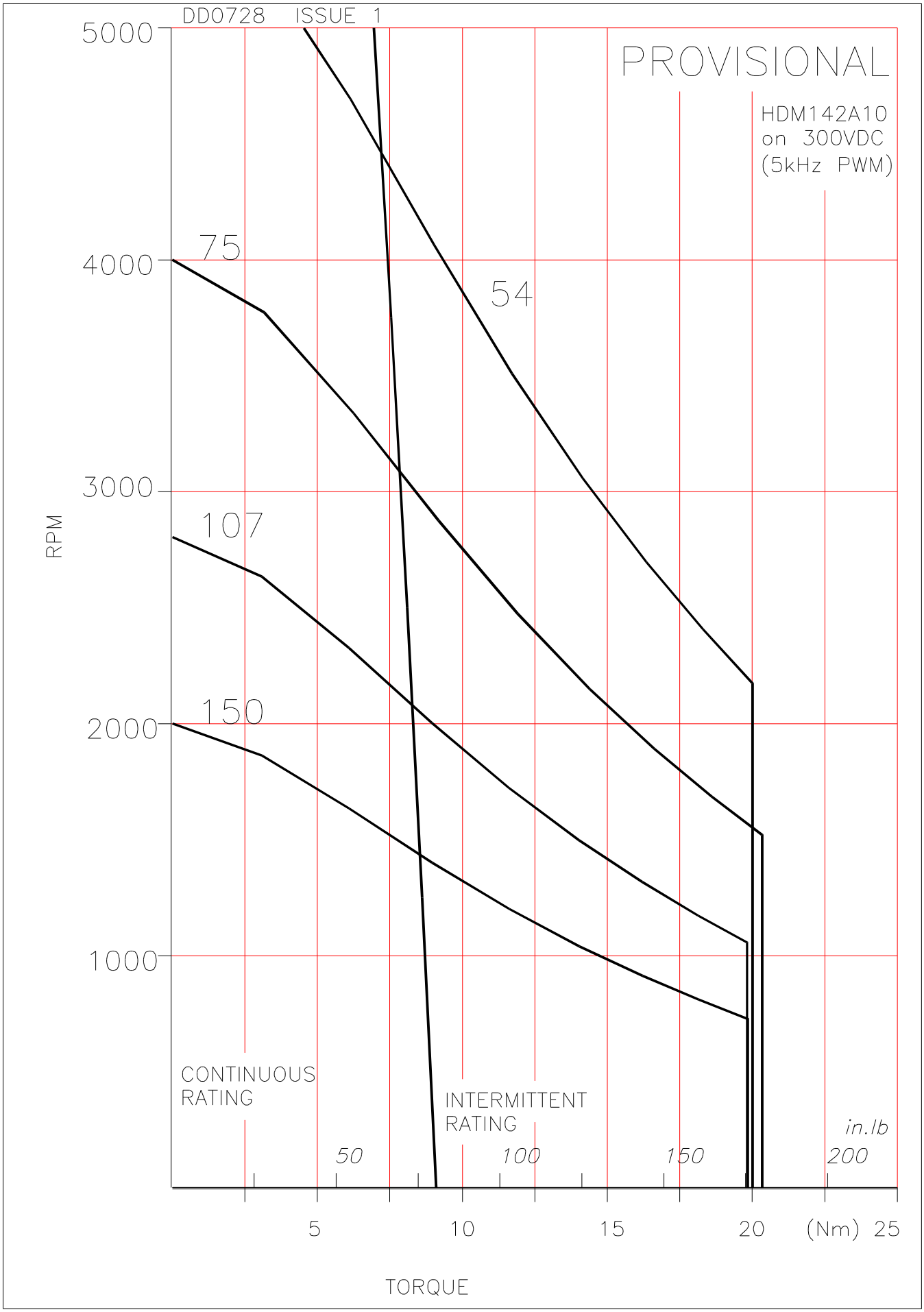
3 - At 25ºC.

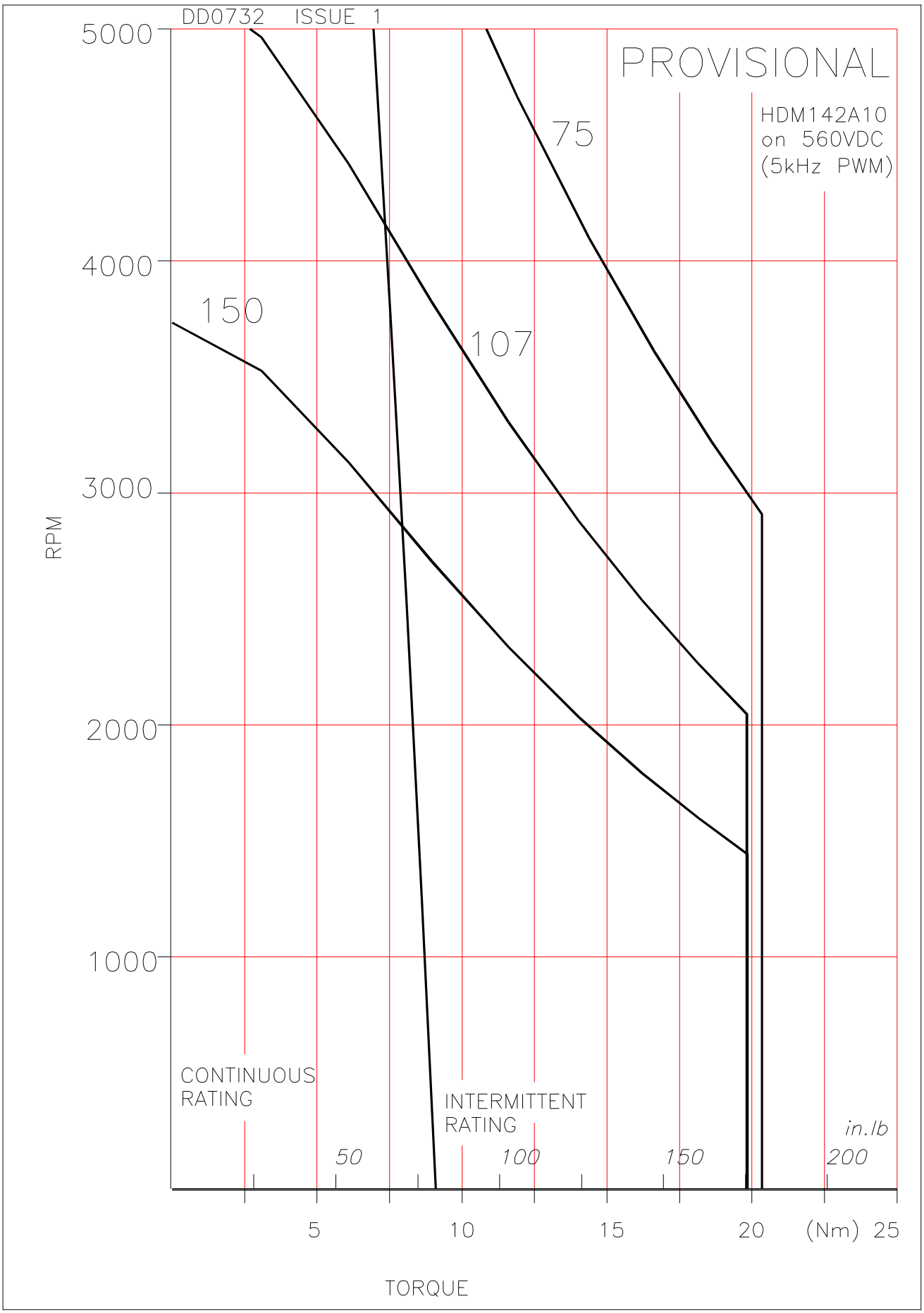
4 - Inductance values are based on nominal current.

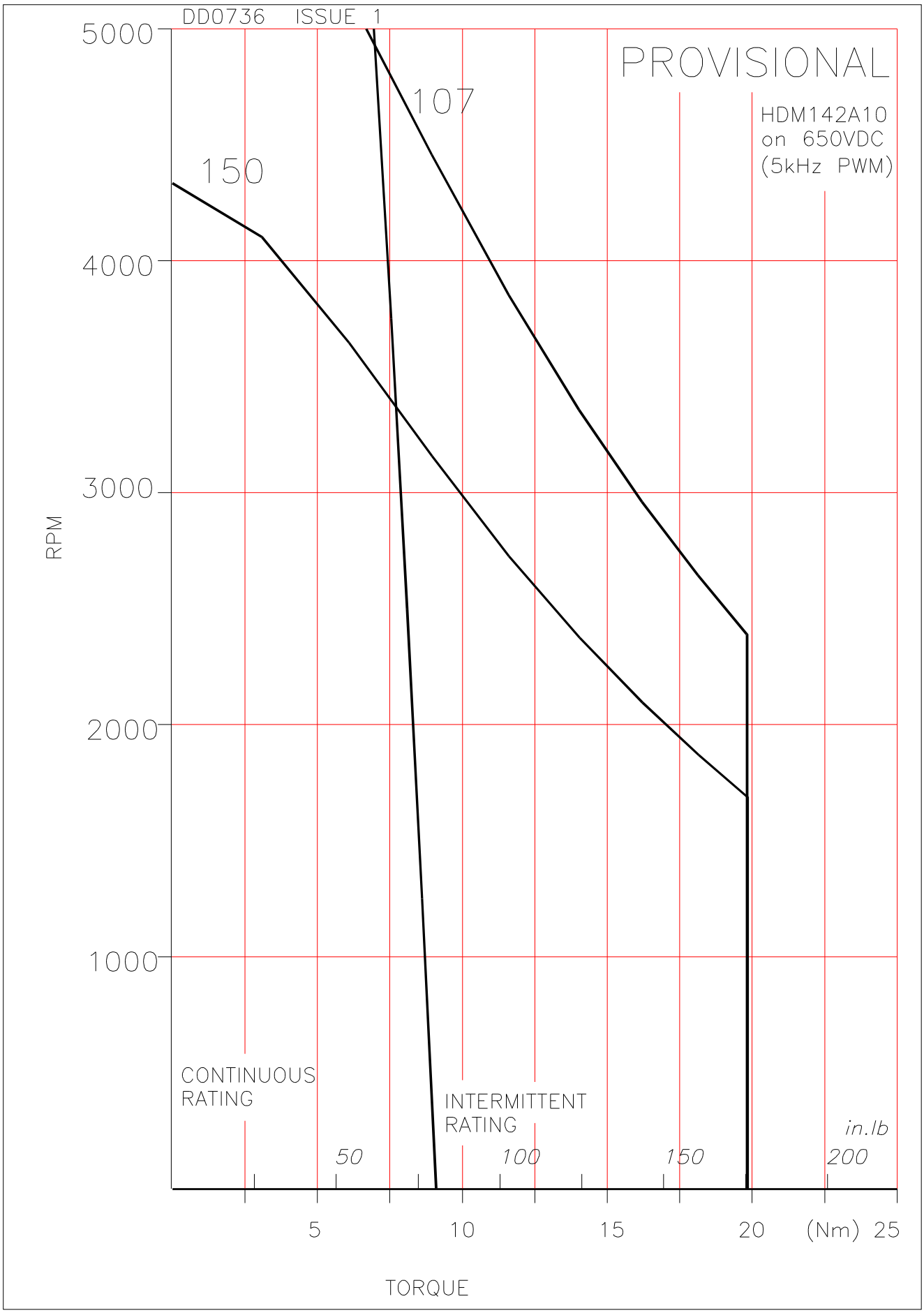
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0720 ISSUE 1
PROVISIONAL
HDM142A10
on 150VDC
(5kHz PWM)
5000
4000
3000
2000
1000
RPM
54
75
107
150
CONTINUOUS
RATING
INTERMITTENT
RATING
in.lb
50
100
150
200
5
10
15
20
(Nm) 25
TORQUE

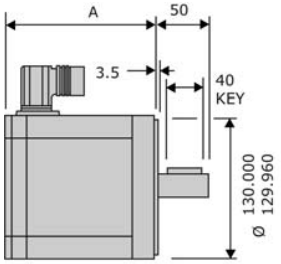

DD0728 ISSUE 1
PROVISIONAL
HDM142A10
on 300VDC
(5kHz PWM)
5000
4000
3000
2000
1000
RPM
75
54
107
150
CONTINUOUS
RATING
INTERMITTENT
RATING
in.lb
50
100
150
200
5
10
15
20
(Nm) 25
TORQUE

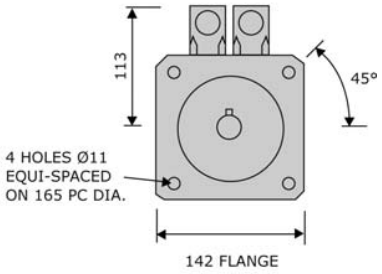

DD0732 ISSUE 1
PROVISIONAL
HDM142A10
on 560VDC
(5kHz PWM)
75
107
150
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in.lb
50
100
150
200
5
10
15
20
(Nm) 25
TORQUE


DD0736 ISSUE 1
PROVISIONAL
HDM142A10
on 650VDC
(5kHz PWM)
107
150
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in.lb
50
100
150
200
5
10
15
20
(Nm) 25
TORQUE

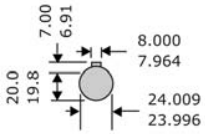
10.2 HDM142C10

Outline Drawing.





Frame	Dimension 'A' without brake	with brake
HDM142A	112	172
HDM142C	132	192
HDM142E	157	217
HDM142J	207	267



SHAFT END DETAIL

Technical Data.

Parameter	Units	HDM142 C10-76S	HDM142 C10-107S	HDM142 C10-152S
Continuous Stall Torque 1	**Nm**	**13**	**13**	**13**
Continuous Stall Current 1	**A**	**15**	**10.4**	**7.3**
Rated Torque [1]	Nm	11	11	11
Rated Current [1]	A	12.2	8.7	6.1
Rated Speed	rpm	3000	3000	3000
Max. Speed (300V DC link)	rpm	3900	2800	2000
Max. Speed (560V DC link)[2]	rpm	5000	5000	3700
Peak Stall Torque	**Nm**	**34**	**34**	**34**
Peak Current	**A**	**68**	**48**	**34**
Resistance Line-Line[3]	Ω	0.52	1.03	2
Inductance Line-Line[4]	mH	2.9	5.8	12
Voltage Gradient No Load	V	76	107	152
Max. Motor EMF Line – Line	Volts	380	540	700
Torque Constant Kt[3,5]	Nm/A	0.9	1.26	1.8
Number of Poles		10	10	10
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	35	35	35
Thermal Resistance	°C/W	0.43	0.43	0.43
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	10.7	10.7	10.7
Static Friction Torque	Nm	0.12	0.12	0.12
Cogging Torque	Nm	0.38	0.38	0.38
Motor Weight	kg	8.3	8.3	8.3
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	12.3	12.3	12.3

Notes

[1] - Motors are tested on an aluminium heatsink with dimensions 457x457x13mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

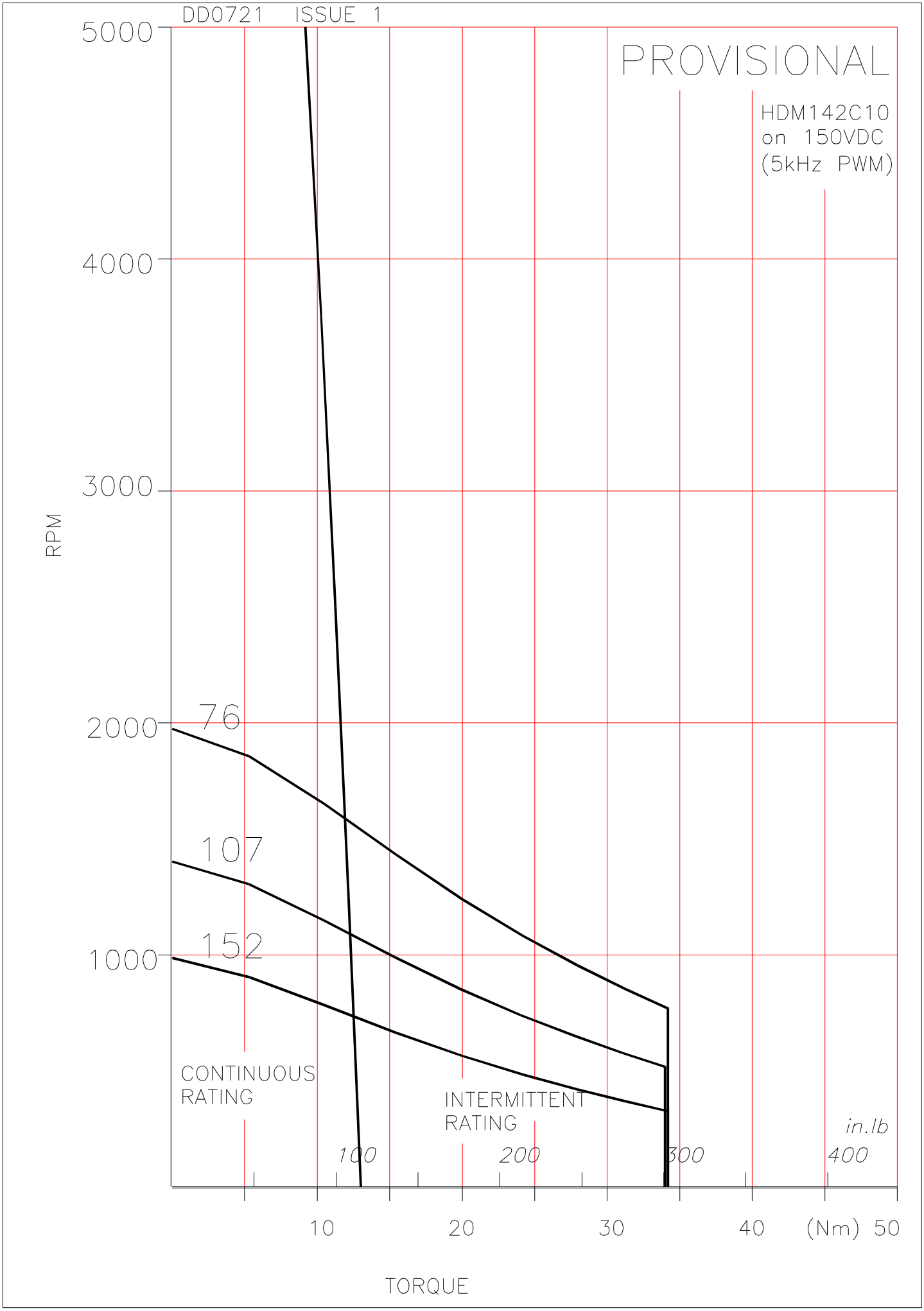
[2] - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

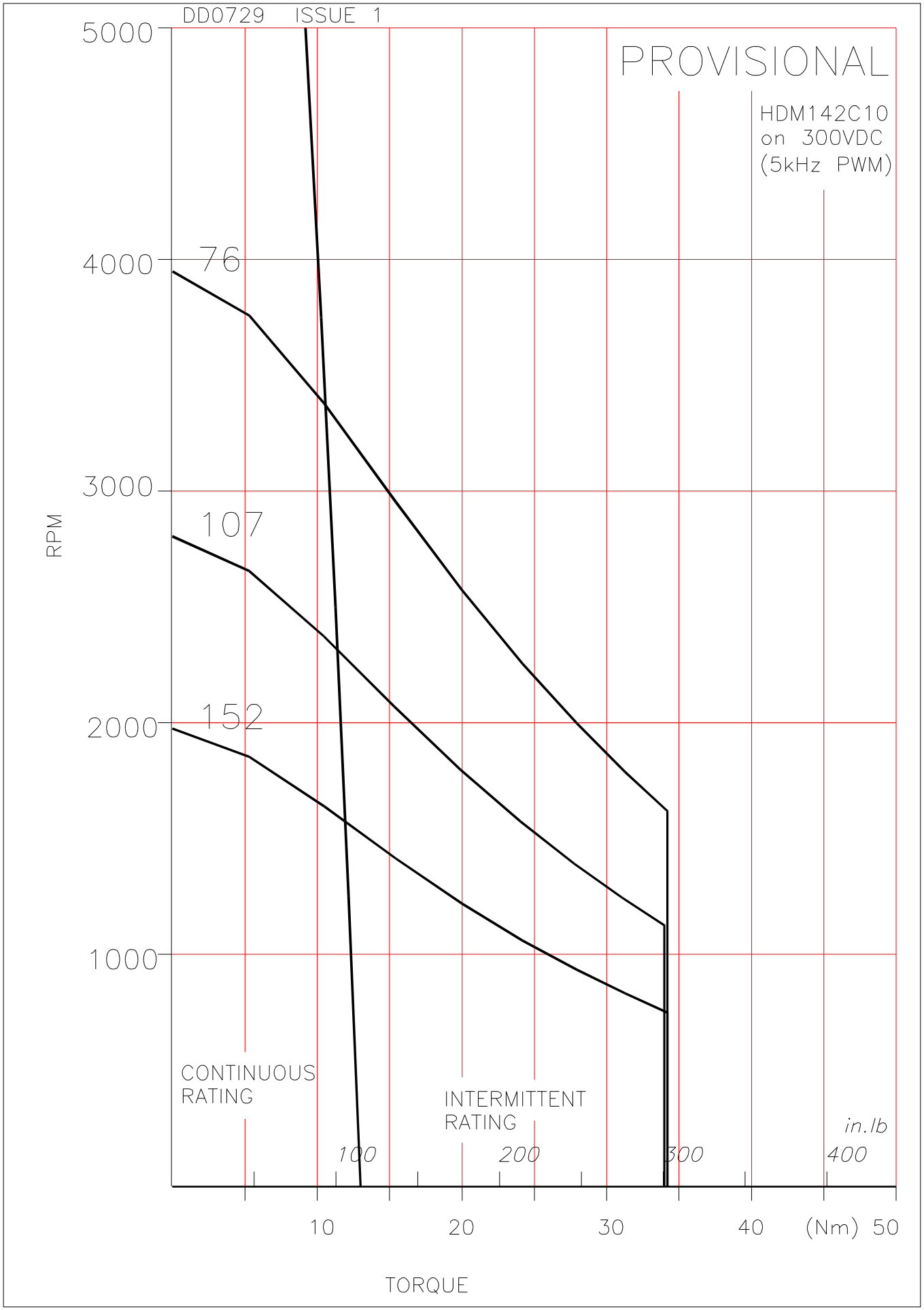
[3] - At 25ºC.

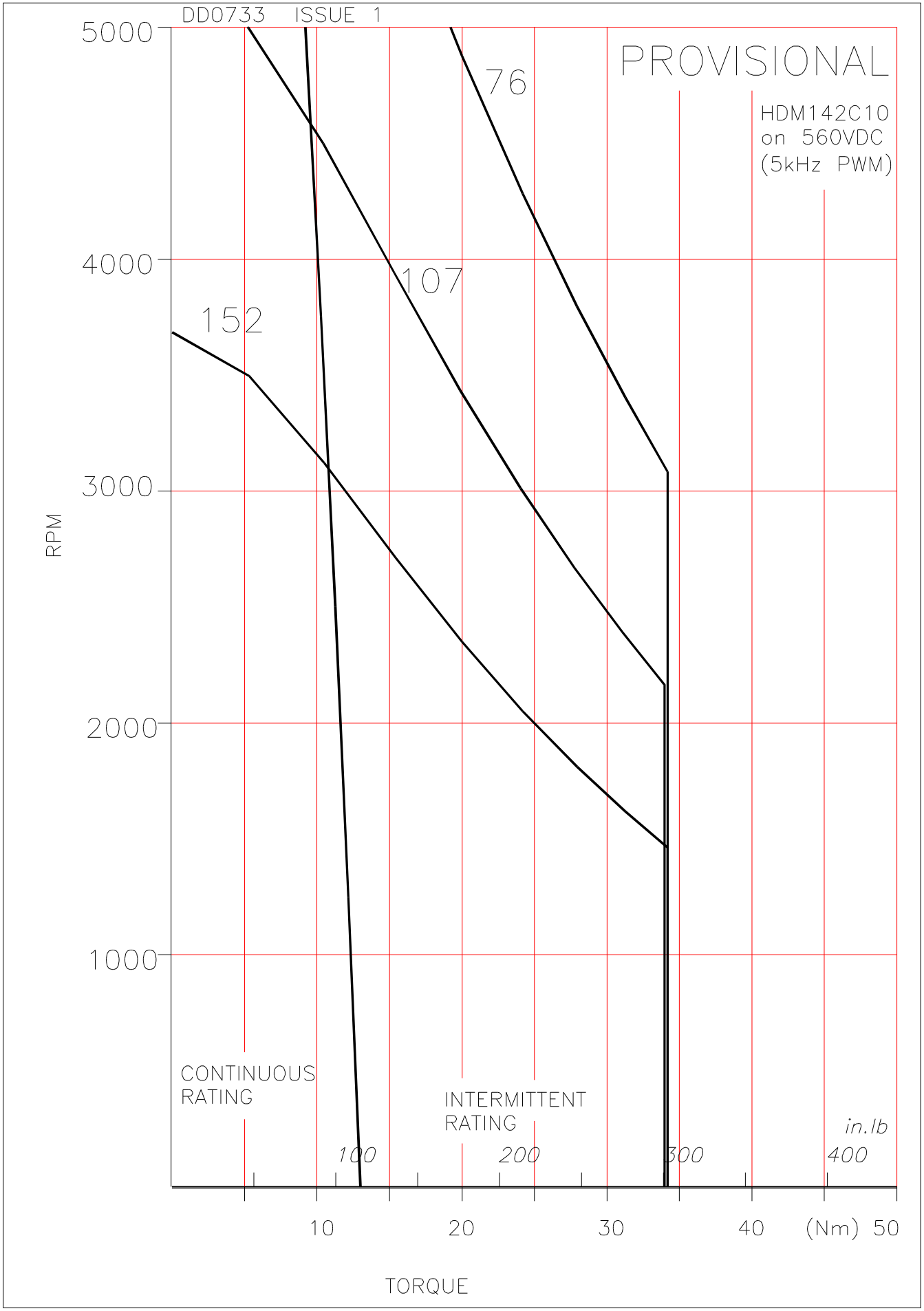
[4] - Inductance values are based on nominal current.

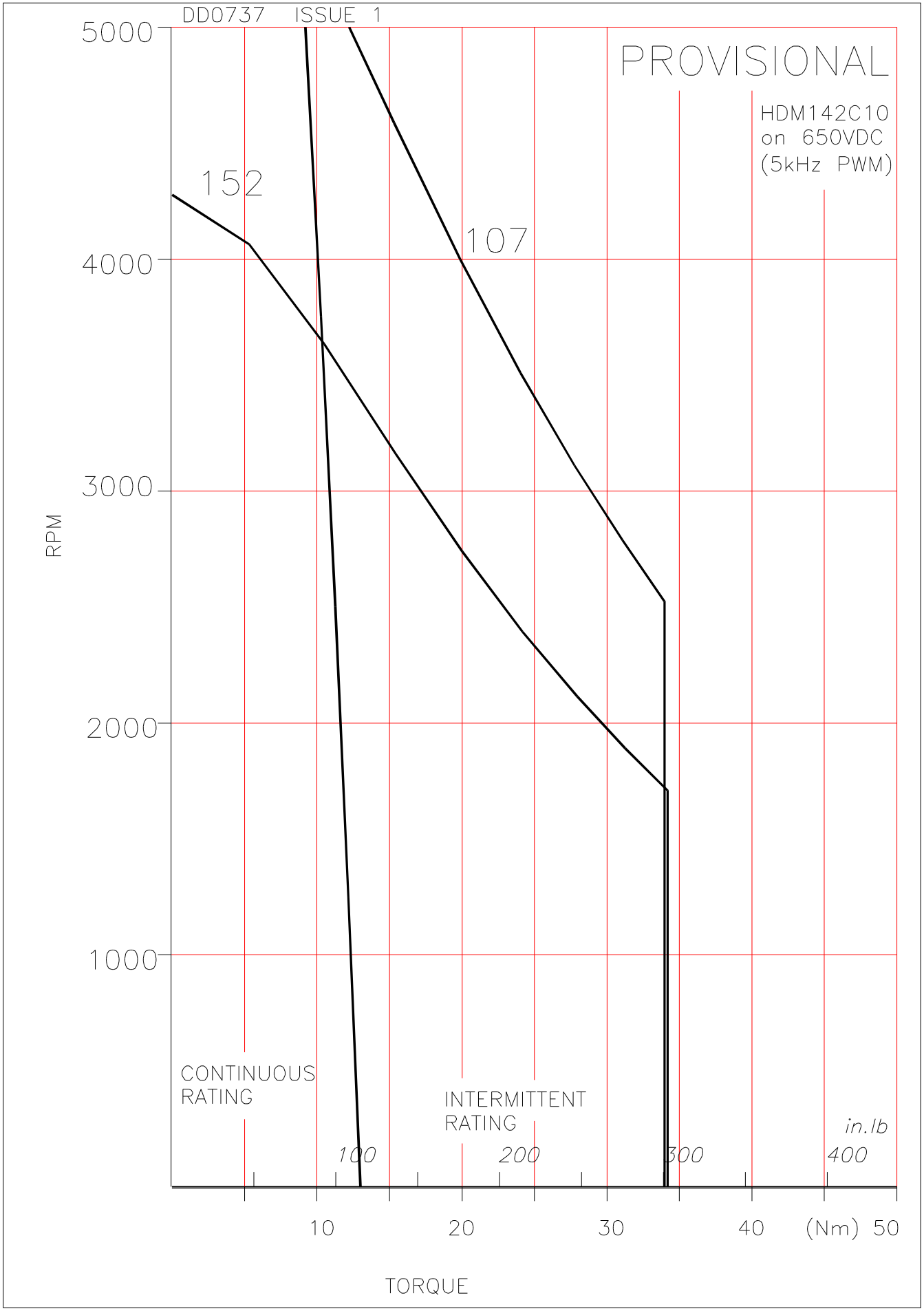
[5] - At rated values Torque = Kt x rms current.

[6] - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0721 ISSUE 1
PROVISIONAL
HDM142C10
on 150VDC
(5kHz PWM)
5000
4000
3000
2000
1000
RPM
76
107
152
CONTINUOUS
RATING
INTERMITTENT
RATING
in.lb
100
200
300
400
10
20
30
40
(Nm) 50
TORQUE

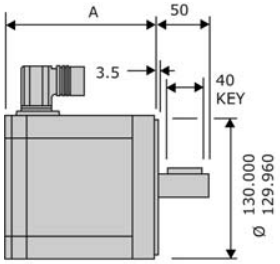

DD0729 ISSUE 1
PROVISIONAL
HDM142C10
on 300VDC
(5kHz PWM)
5000
4000
3000
2000
1000
RPM
76
107
152
CONTINUOUS
RATING
INTERMITTENT
RATING
in.lb
100
200
300
400
10
20
30
40
(Nm) 50
TORQUE

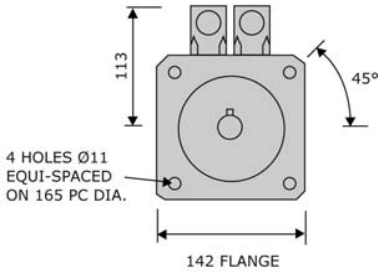

DD0733 ISSUE 1
PROVISIONAL
HDM142C10
on 560VDC
(5kHz PWM)
76
107
152
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in.lb
100
200
300
400
10
20
30
40
(Nm) 50
TORQUE


DD0737 ISSUE 1
PROVISIONAL
HDM142C10
on 650VDC
(5kHz PWM)
152
107
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in.lb
100
200
300
400
10
20
30
40
(Nm) 50
TORQUE

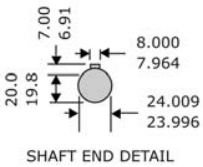
10.3 HDM142E10

Outline Drawing.





Frame	Dimension 'A' without brake	with brake
HDM142A	112	172
HDM142C	132	192
HDM142E	157	217
HDM142J	207	267



Technical Data.

Parameter	Units	HDM142E 10-92S	HDM142E 10-147S	HDM142E 10-204S
Continuous Stall Torque 1	**Nm**	**17**	**17**	**17**
Continuous Stall Current 1	**A**	**16**	**9.9**	**7.1**
Rated Torque [1]	Nm	14	14	14
Rated Current [1]	A	13	8.2	5.8
Rated Speed	rpm	3000	3000	2000
Max. Speed (300V DC link)	rpm	3300	2000	1500
Max. Speed (560V DC link)[2]	rpm	5000	3800	2700
Peak Stall Torque	**Nm**	**51**	**51**	**51**
Peak Current	**A**	**84**	**52**	**38**
Resistance Line-Line[3]	Ω	0.45	1.17	2.2
Inductance Line-Line[4]	mH	2.8	7	14
Voltage Gradient No Load	V	92	147	204
Max. Motor EMF Line – Line	Volts	460	700	700
Torque Constant Kt[3,5]	Nm/A	1.08	1.7	2.4
Number of Poles		10	10	10
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	40	40	40
Thermal Resistance	°C/W	0.42	0.42	0.42
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	16	16	16
Static Friction Torque	Nm	0.12	0.12	0.12
Cogging Torque	Nm	0.6	0.6	0.6
Motor Weight	kg	10.8	10.8	10.8
Motor Weight with brake fitted	kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	16	16	16

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 457x457x13mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

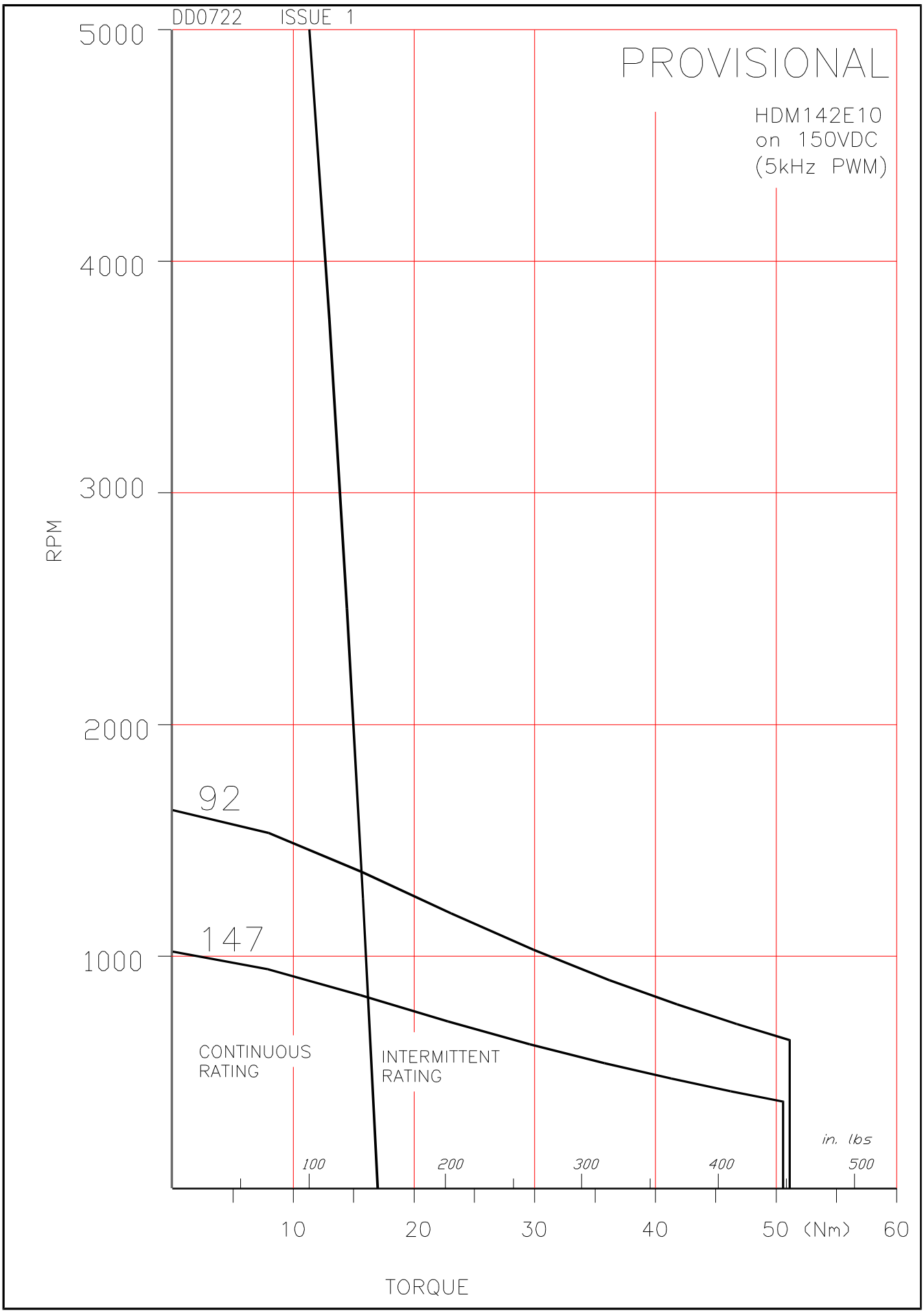
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

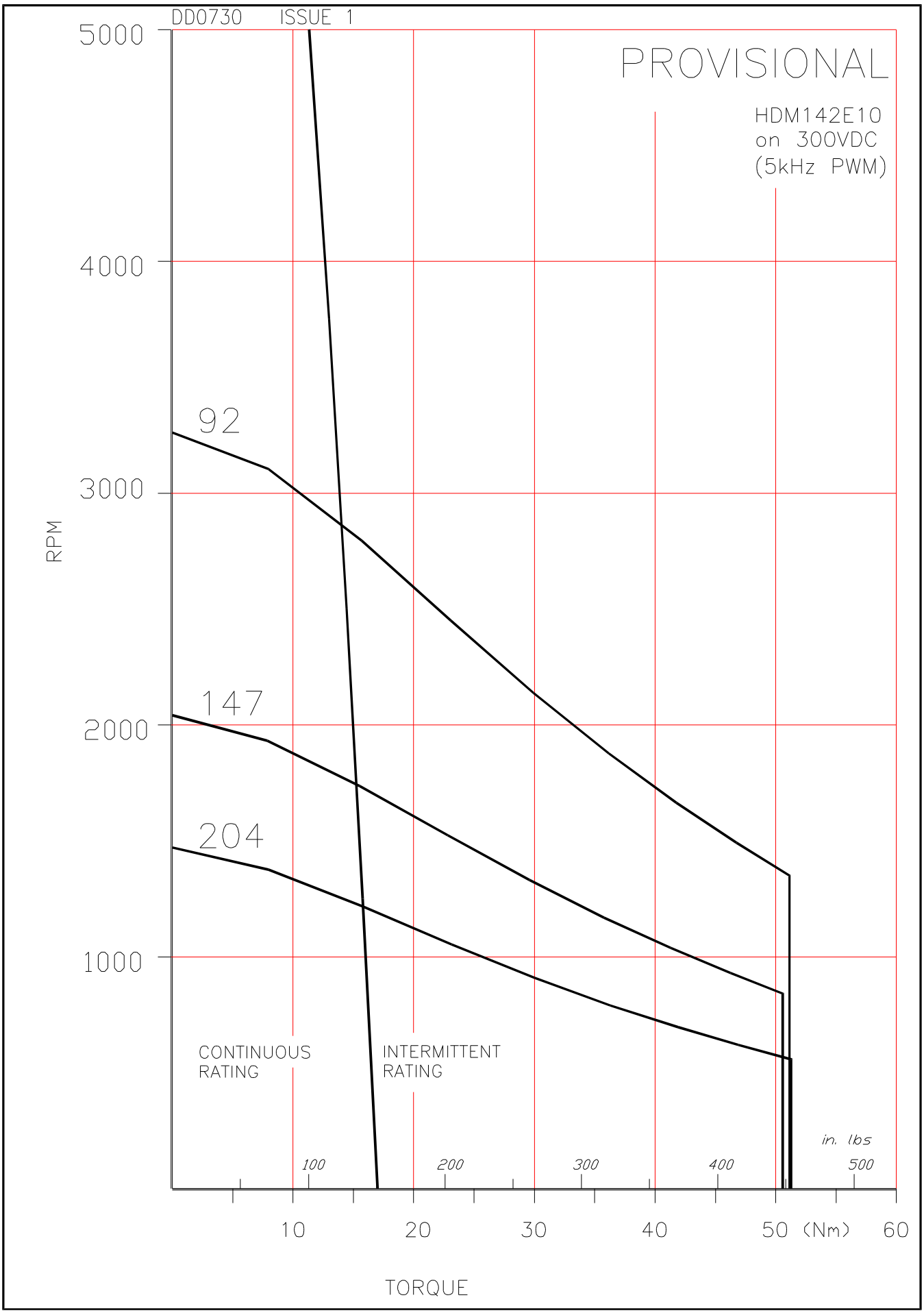
3 - At 25ºC.

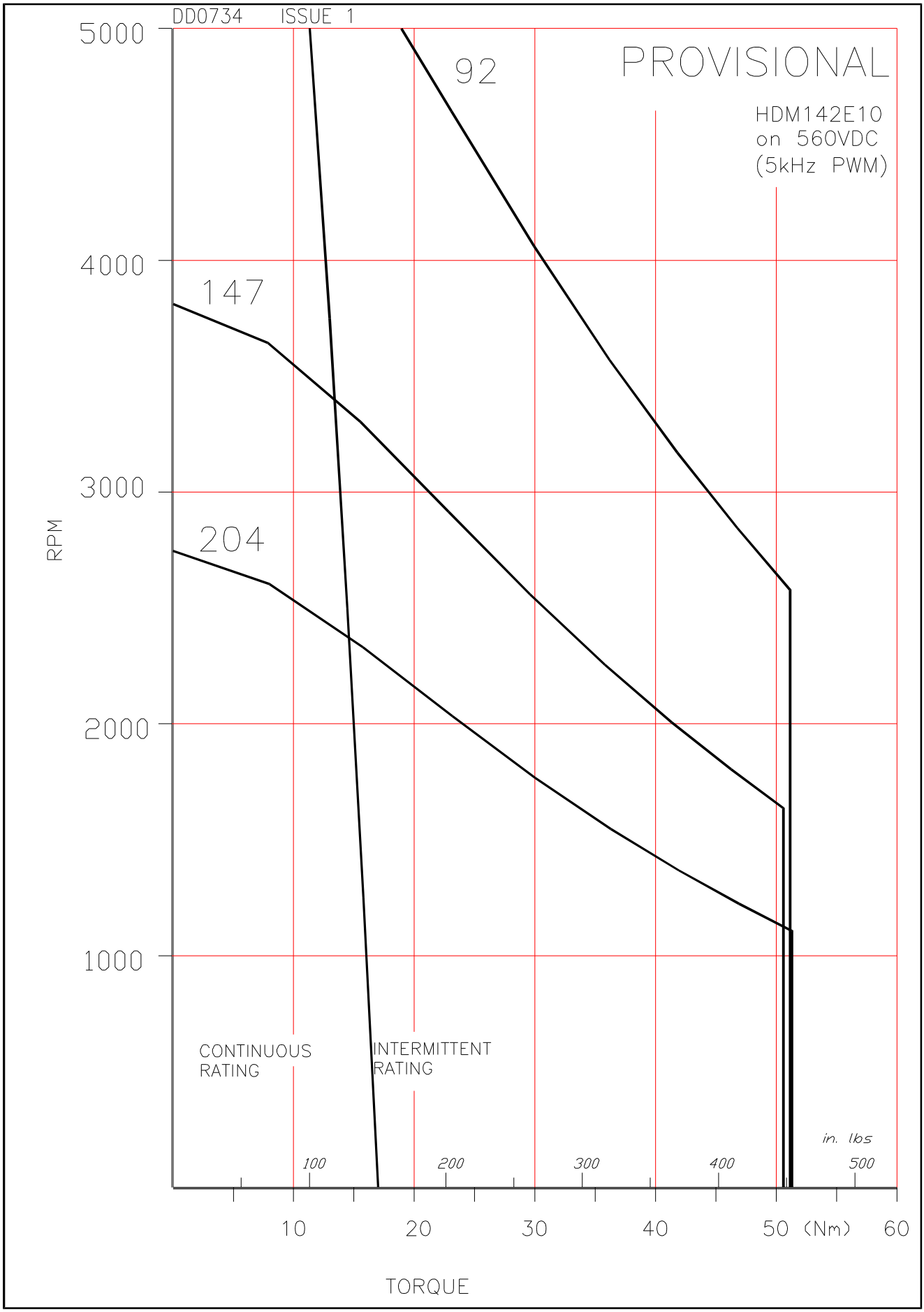
4 - Inductance values based on nominal current.

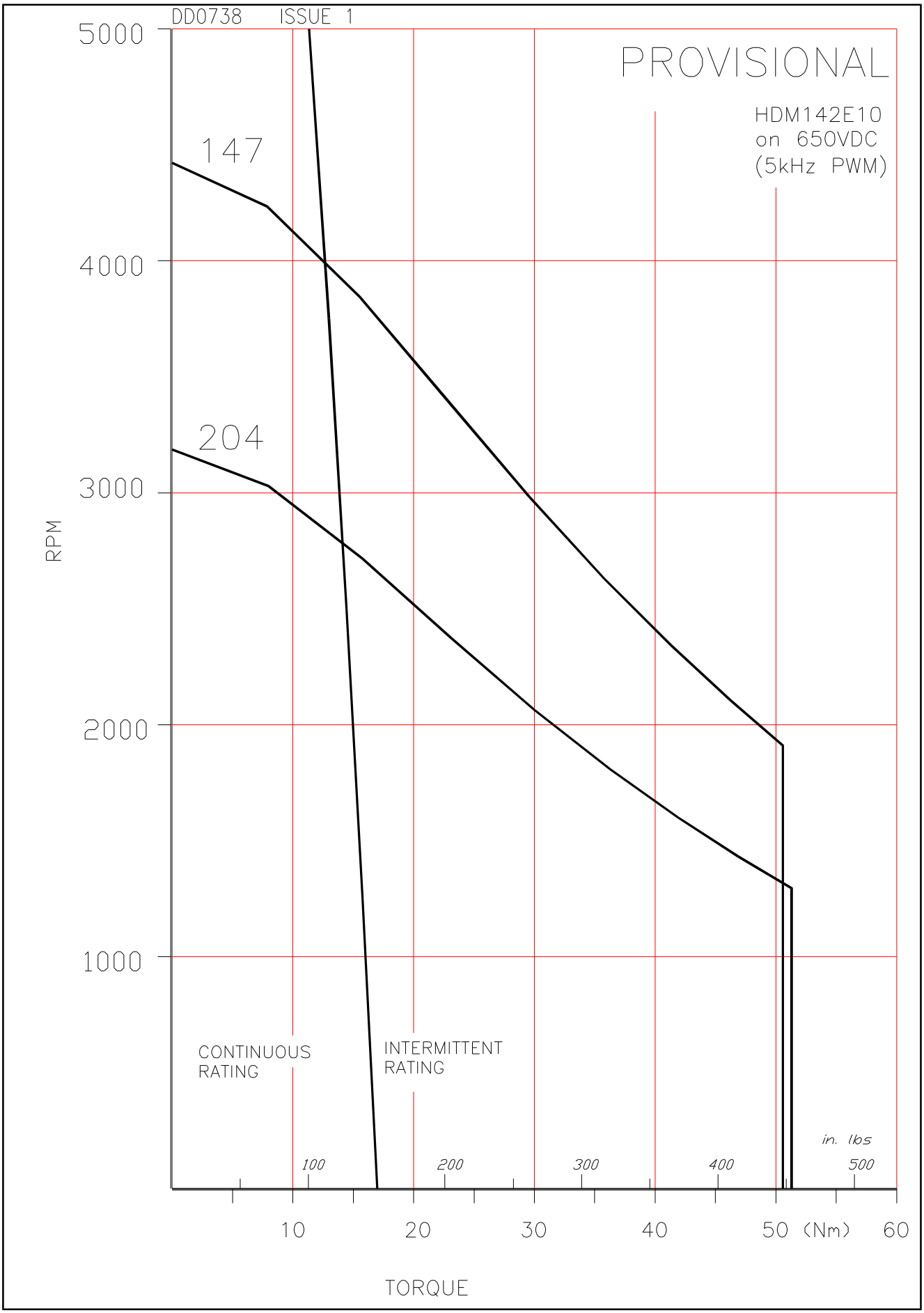
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0722 ISSUE 1
PROVISIONAL
HDM142E10
on 150VDC
(5kHz PWM)
5000
4000
3000
2000
1000
RPM
92
147
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
100
200
300
400
500
10
20
30
40
50 (Nm)
60
TORQUE

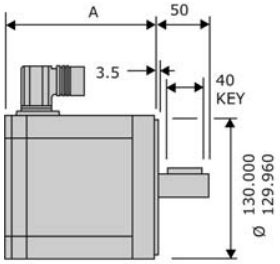

DD0730 ISSUE 1
PROVISIONAL
HDM142E10
on 300VDC
(5kHz PWM)
5000
4000
3000
2000
1000
RPM
92
147
204
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
100
200
300
400
500
10
20
30
40
50 (Nm)
60
TORQUE

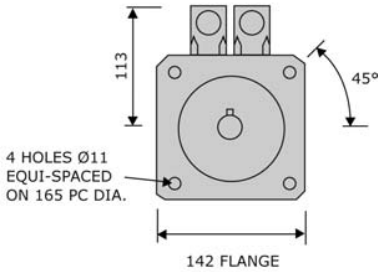

DD0734 ISSUE 1
PROVISIONAL
HDM142E10
on 560VDC
(5kHz PWM)
92
147
204
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
100
200
300
400
500
10
20
30
40
50 (Nm)
60
TORQUE


DD0738 ISSUE 1
PROVISIONAL
HDM142E10
on 650VDC
(5kHz PWM)
147
204
5000
4000
3000
2000
1000
RPM
CONTINUOUS
RATING
INTERMITTENT
RATING
in. lbs
100
200
300
400
500
10
20
30
40
50 (Nm)
60
TORQUE

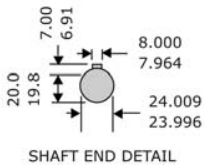
10.4 HDM142J10

Outline Drawing.





Frame	Dimension 'A' without brake	with brake
HDM142A	112	172
HDM142C	132	192
HDM142E	157	217
HDM142J	207	267



Technical Data.

Parameter	Units	HDM142J 10-137S	HDM142J 10-214S	HDM142J 10-309S
Continuous Stall Torque 1	**Nm**	**25**	**25**	**25**
Continuous Stall Current 1	**A**	**16**	**10**	**6.9**
Rated Torque [1]	Nm	17	20.2	23
Rated Current [1]	A	10.6	8.1	6.4
Rated Speed	Rpm	3000	2000	1000
Max. Speed (300V DC link)	Rpm	2200	1400	1000
Max. Speed (560V DC link)[2]	Rpm	4100	2600	1800
Peak Stall Torque	**Nm**	**85**	**85**	**85**
Peak Current	**A**	**94**	**60**	**42**
Resistance Line-Line[3]	Ω	0.56	1.36	2.8
Inductance Line-Line[4]	mH	3.6	9	18.5
Voltage Gradient No Load	V	137	214	309
Max. Motor EMF Line – Line	Volts	690	700	700
Torque Constant Kt[3,5]	Nm/A	1.6	2.5	3.6
Number of Poles		10	10	10
THERMAL				
Insulation Class		F	F	F
Max. Ambient Temperature	°C	40	40	40
Thermal Time Constant	minutes	50	50	50
Thermal Resistance	°C/W	0.35	0.35	0.35
MECHANICAL				
Rotor Polar Moment of Inertia	kgcm²	26	26	26
Static Friction Torque	Nm	0.12	0.12	0.12
Cogging Torque	Nm	1	1	1
Motor Weight	Kg	15.9	15.9	15.9
Motor Weight with brake fitted	Kg	TBA	TBA	TBA
Continuous Stall Torque (HR/HJ)[6]	Nm	24	24	24

Notes

1 - Motors are tested on an aluminium heatsink with dimensions 457x457x13mm and with a temperature rise ΔT of 100K on the windings. The maximum temperature of the windings is therefore 140°C.

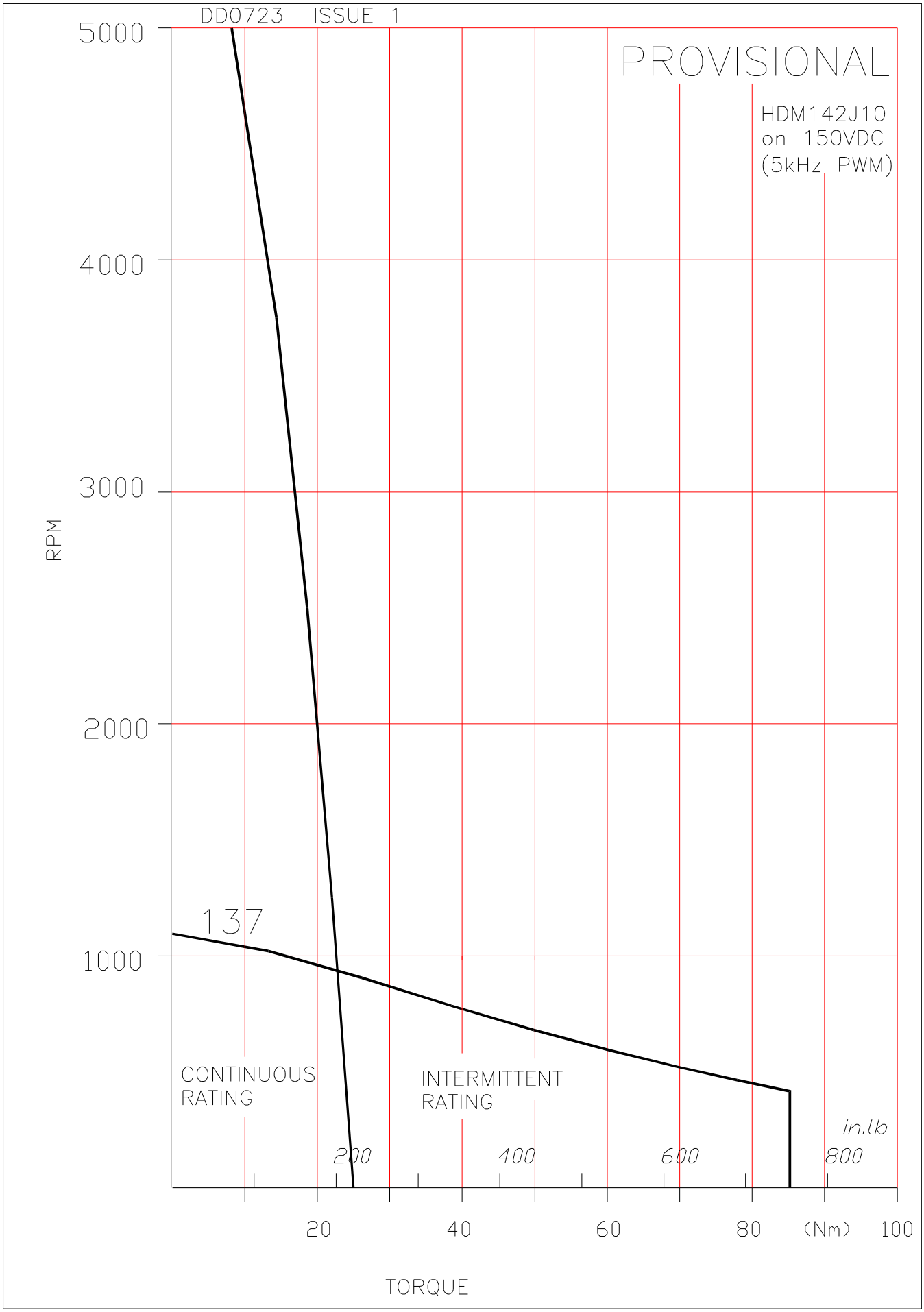
2 - Where no motor speed is specified, optimal performance may not be achieved on 560V DC link.

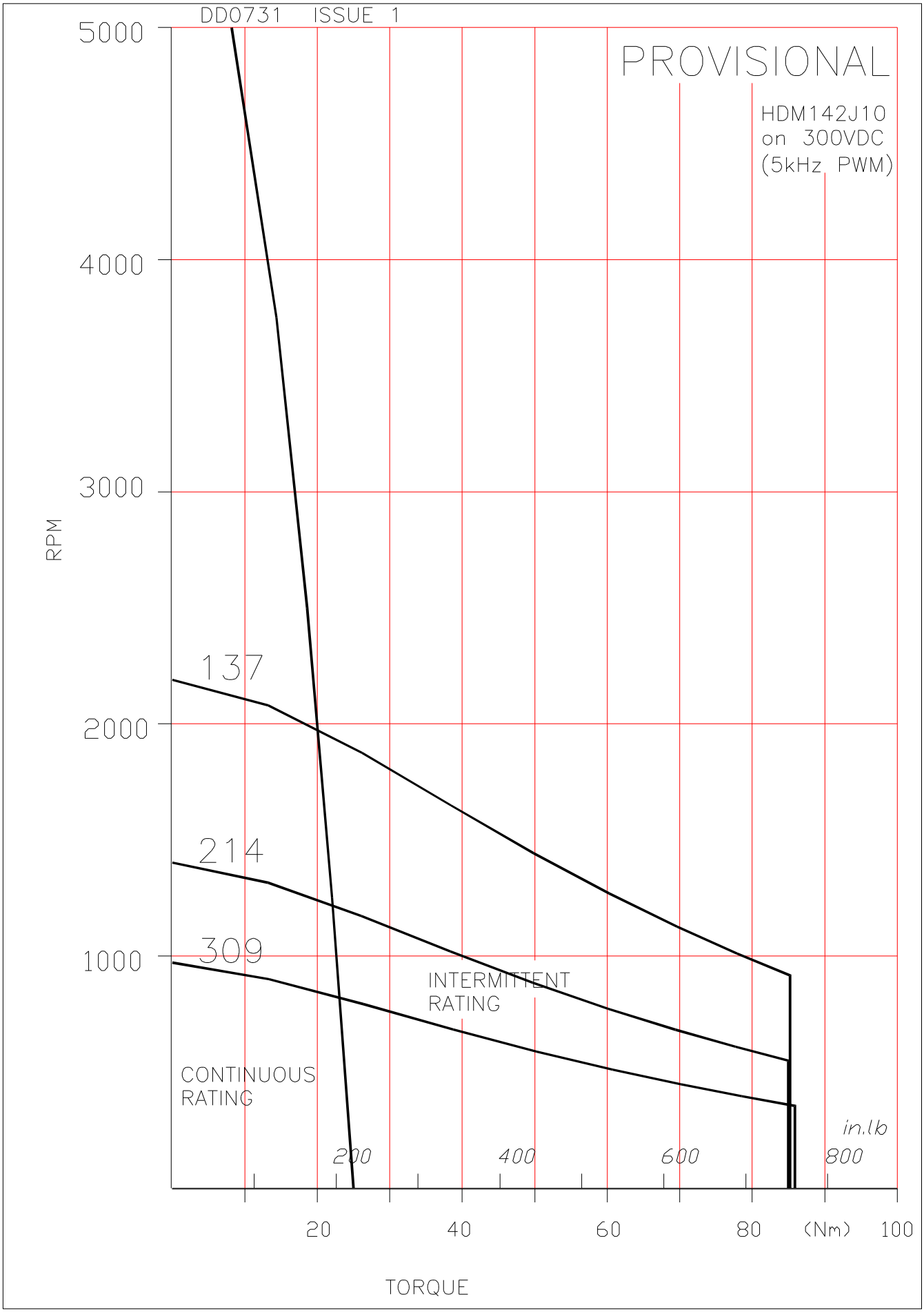
3 - At 25ºC.

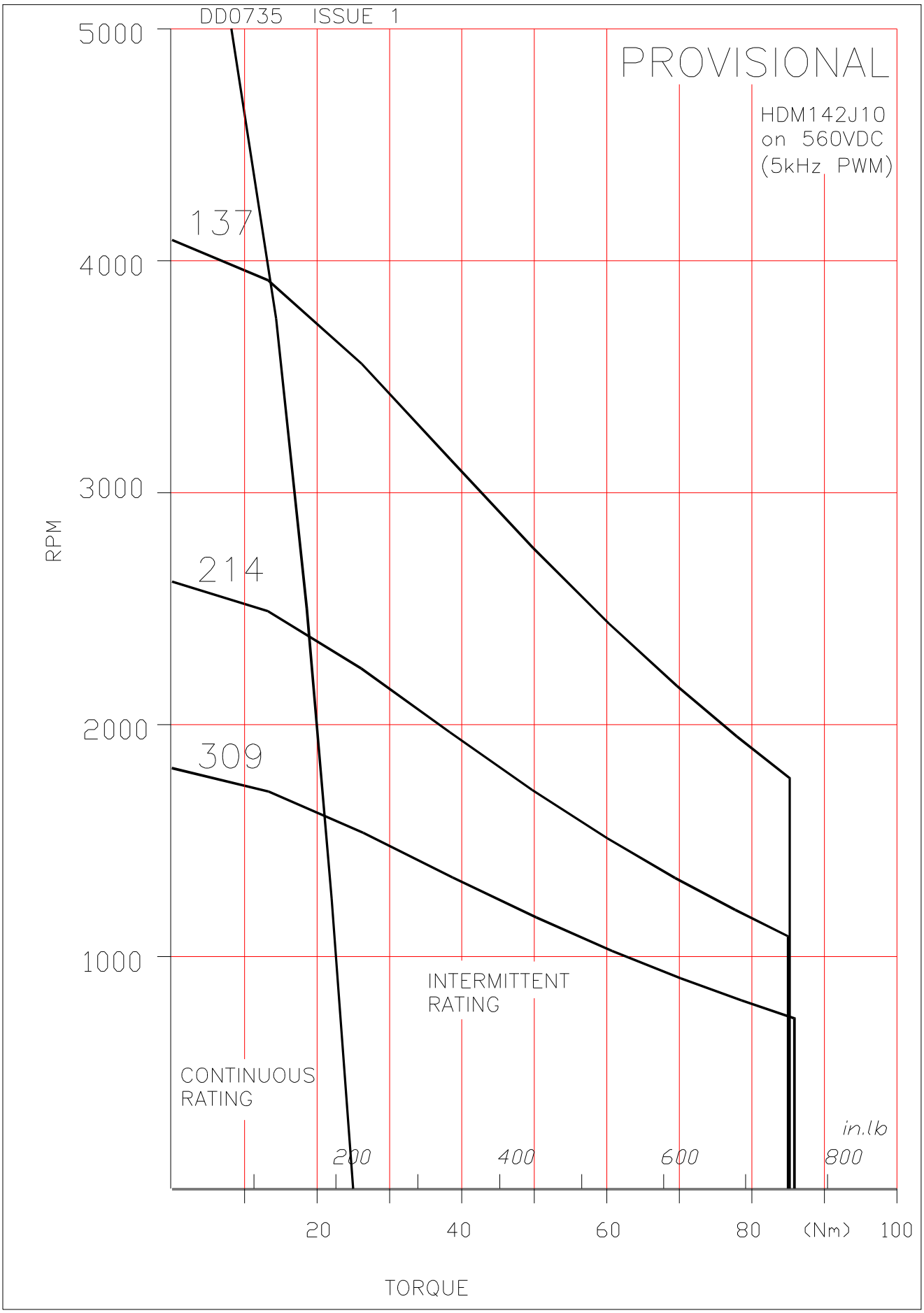
4 - Inductance values are based on nominal current.

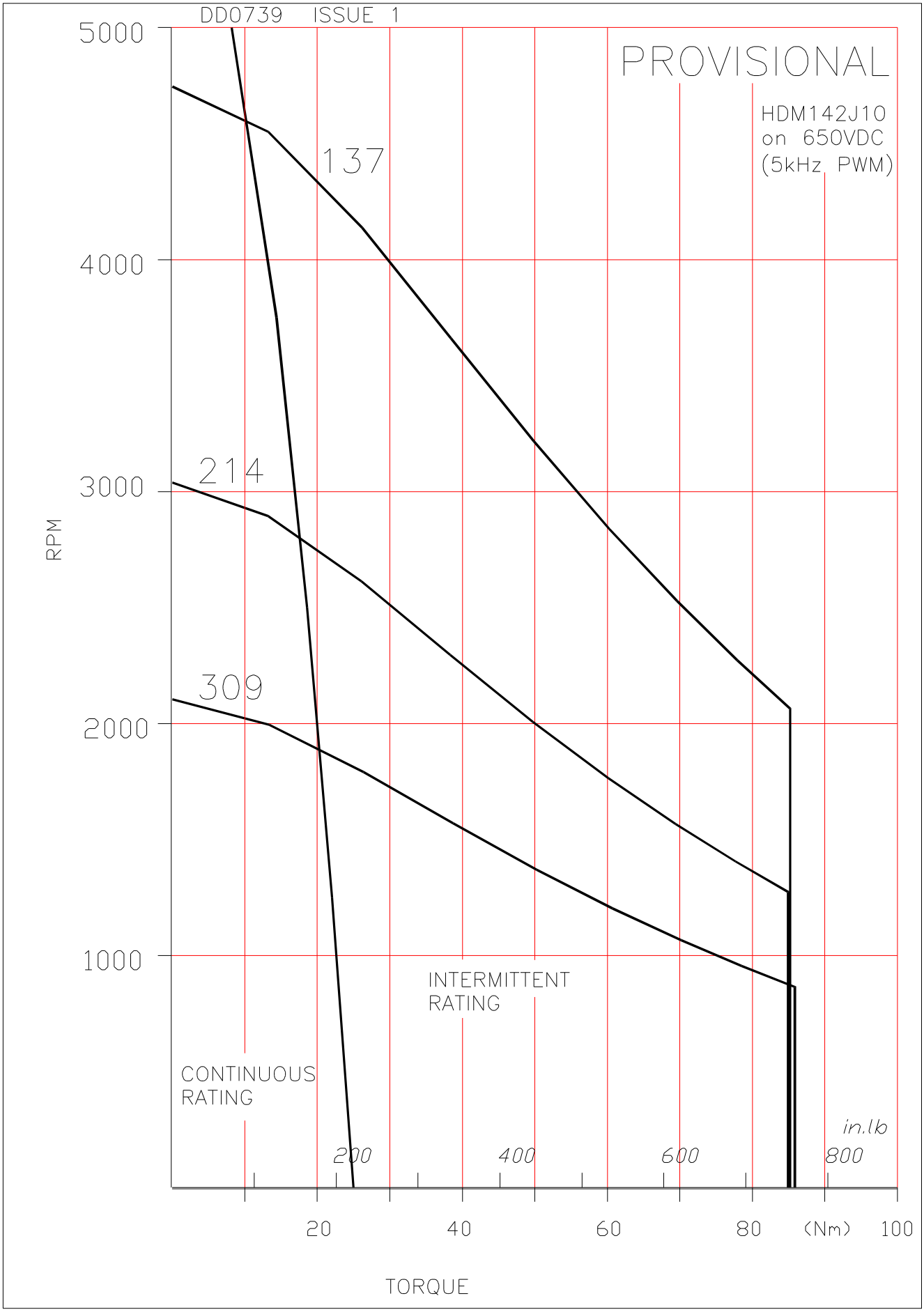
5 - At rated values Torque = Kt x rms current.

6 - Continuous Stall Torque (HR/HJ) is for use in comparisons with SEM's HR and HJ servomotors only.


DD0723 ISSUE 1
PROVISIONAL
HDM142J10
on 150VDC
(5kHz PWM)
5000
4000
3000
2000
1000
RPM
137
CONTINUOUS
RATING
INTERMITTENT
RATING
in.lb
200
400
600
800
20
40
60
80
(Nm)
100
TORQUE

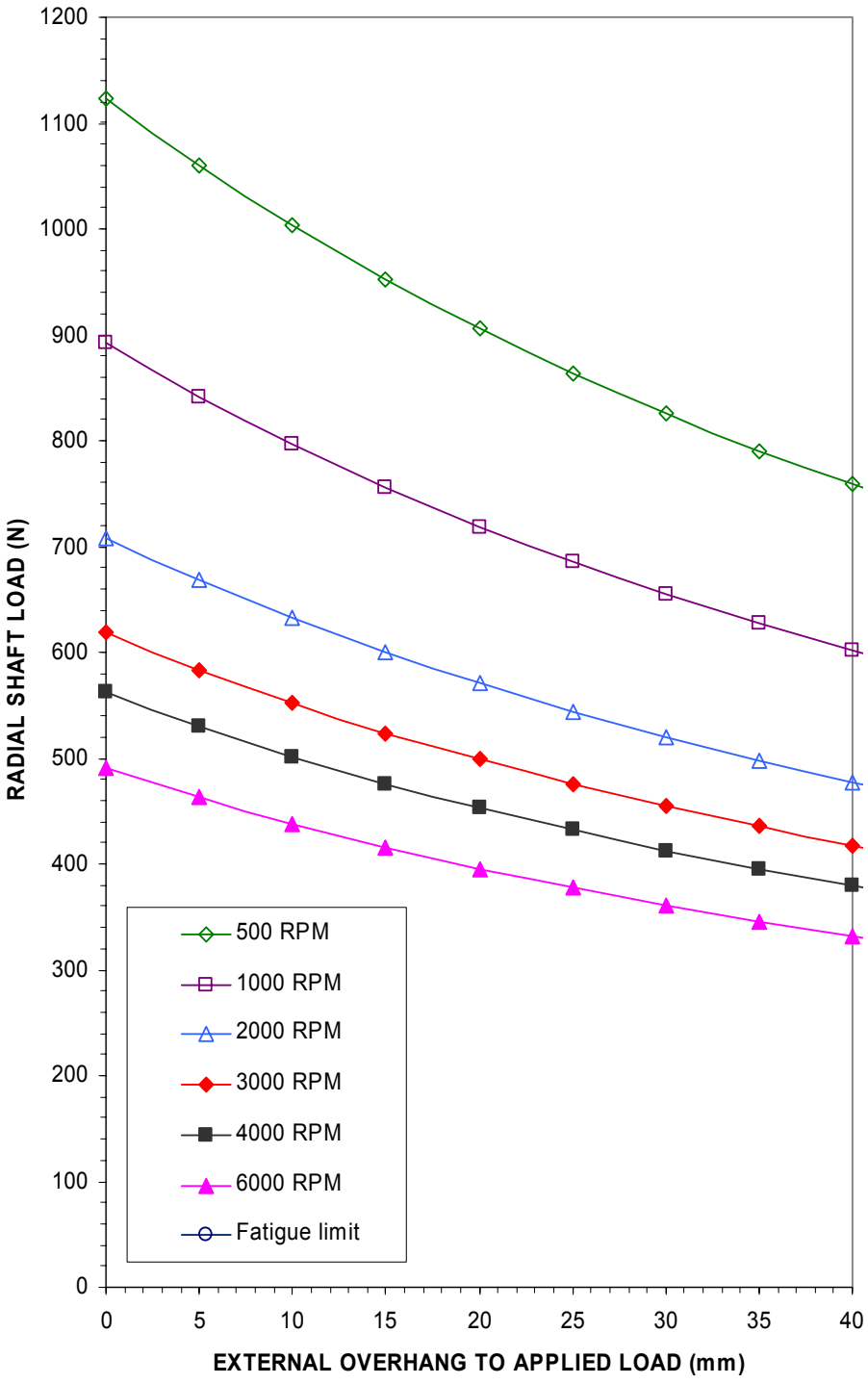

DD0731 ISSUE 1
PROVISIONAL
HDM142J10
on 300VDC
(5kHz PWM)
5000
4000
3000
2000
1000
RPM
137
214
309
INTERMITTENT
RATING
CONTINUOUS
RATING
in.lb
200
400
600
800
20
40
60
80
(Nm)
100
TORQUE


DD0735 ISSUE 1
PROVISIONAL
HDM142J10
on 560VDC
(5kHz PWM)
5000
4000
3000
2000
1000
RPM
137
214
309
INTERMITTENT
RATING
CONTINUOUS
RATING
in.lb
200
400
600
800
20
40
60
80
(Nm)
100
TORQUE


DD0739 ISSUE 1
PROVISIONAL
HDM142J10
on 650VDC
(5kHz PWM)
137
214
309
5000
4000
3000
2000
1000
RPM
INTERMITTENT
RATING
CONTINUOUS
RATING
in.lb
200
400
600
800
20
40
60
80
(Nm)
100
TORQUE

HDM142 PERMITTED RADIAL SHAFT LOADINGS

(Axial loading maybe considered separately - refer to next page)



Shaft Loading Information for SEM Standard Servomotors

General notes:-

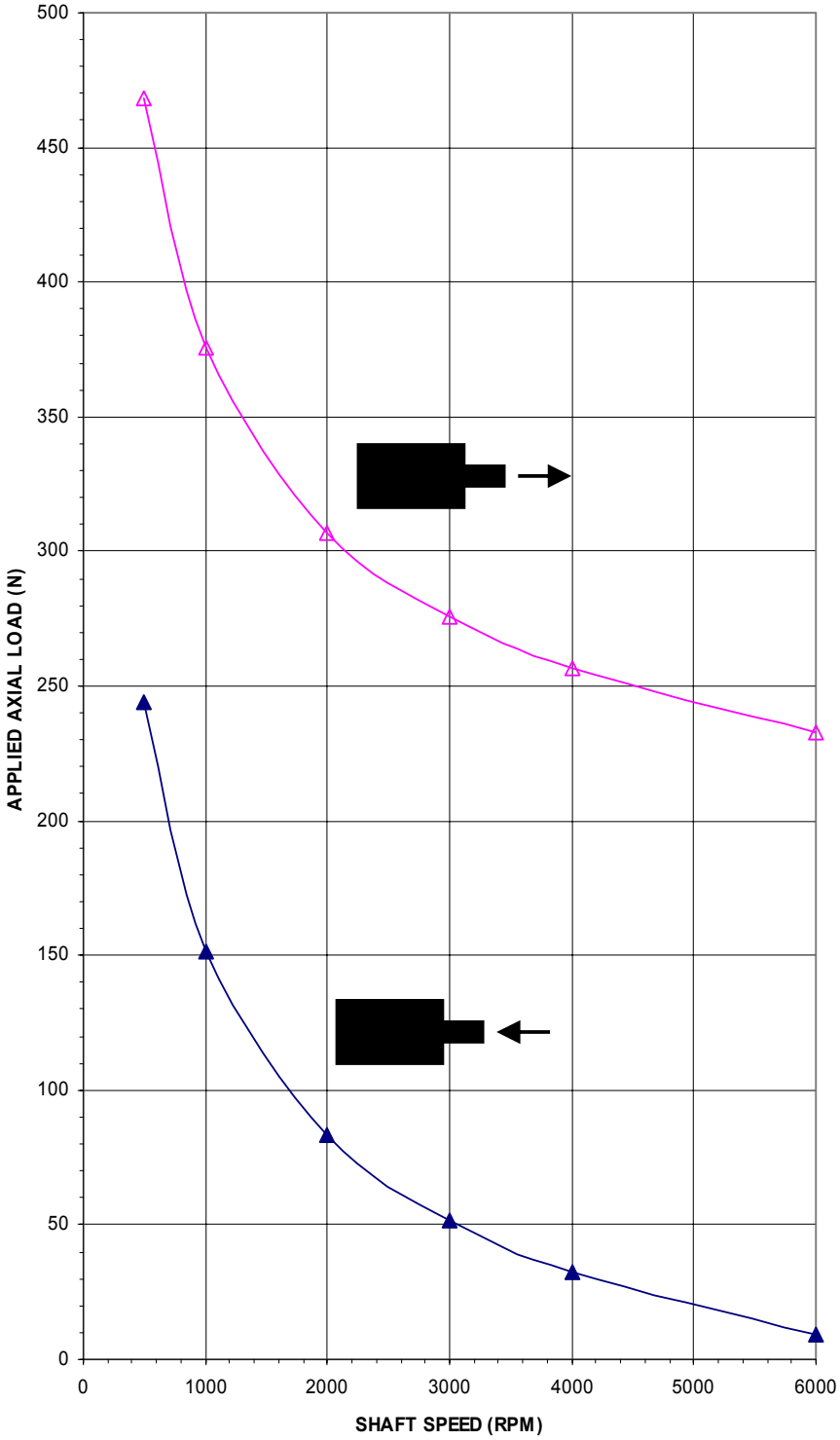
1 All loadings are based upon An L10 bearing life expectancy of 30,000 hours.

2 Separate graphs are usually supplied to indicate maximum axial loads which are applicable. However, for motors with locked drive end bearings, a graph is used to illustrate the maximum allowed radial shaft loadings together with a simplified calculation to provide a compensated figure for when radial and axial loadings are to be applied in combination.

3 It may occur, in certain circumstances, that loading outside the scope of the published information is deemed necessary. In these cases it is desirable that SEM Ltd should be consulted and all relevant information made available, in order that due consideration can be given to finding a satisfactory solution.

4 Should motors be required to operate under abnormal conditions, such as excessive vibration or shock, this should also be referred to SEM Ltd as noted above.

HDM142 PERMITTED AXIAL LOAD



Shaft Loading Information for SEM Standard Servomotors

General notes:-

1 All loadings are based upon An L10 bearing life expectancy of 30,000 hours.

2 Separate graphs are usually supplied to indicate maximum axial loads which are applicable. However, for motors with locked drive end bearings, a graph is used to illustrate the maximum allowed radial shaft loadings together with a simplified calculation to provide a compensated figure for when radial and axial loadings are to be applied in combination.

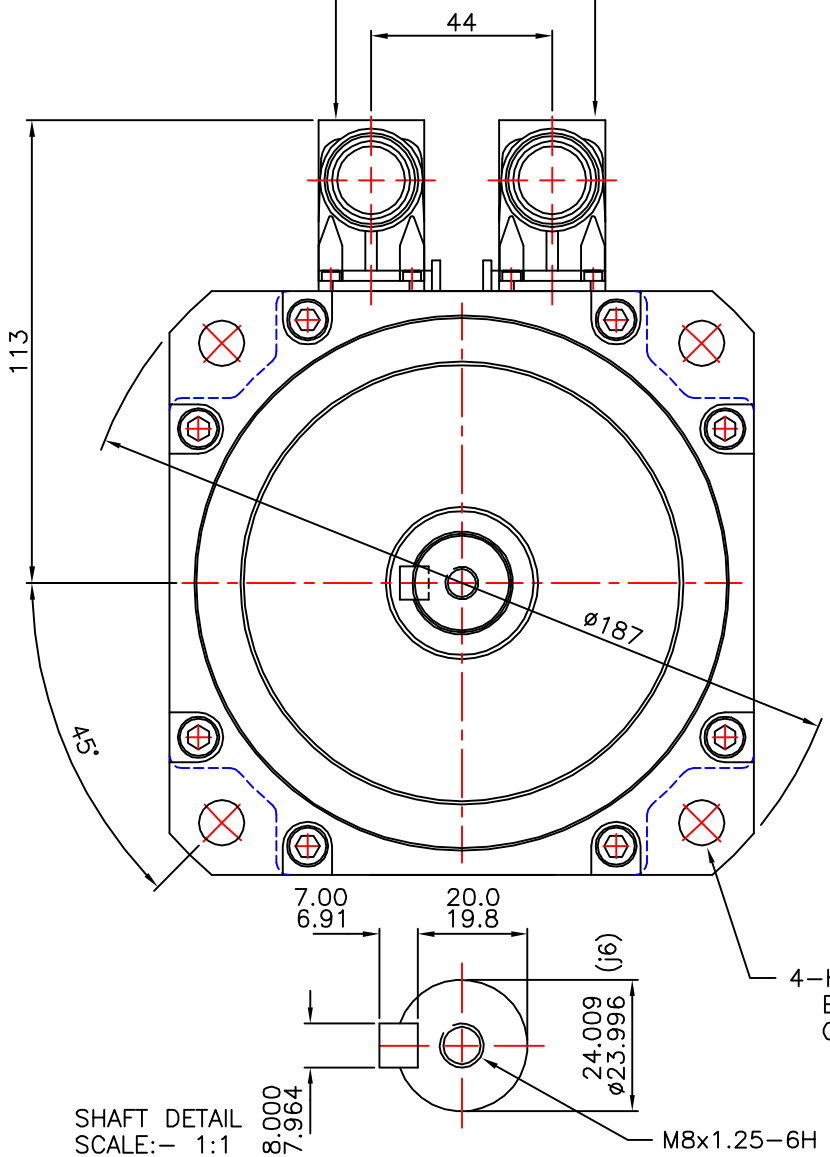
3 It may occur, in certain circumstances, that loading outside the scope of the published information is deemed necessary. In these cases it is desirable that SEM Ltd should be consulted and all relevant information made available, in order that due consideration can be given to finding a satisfactory solution.

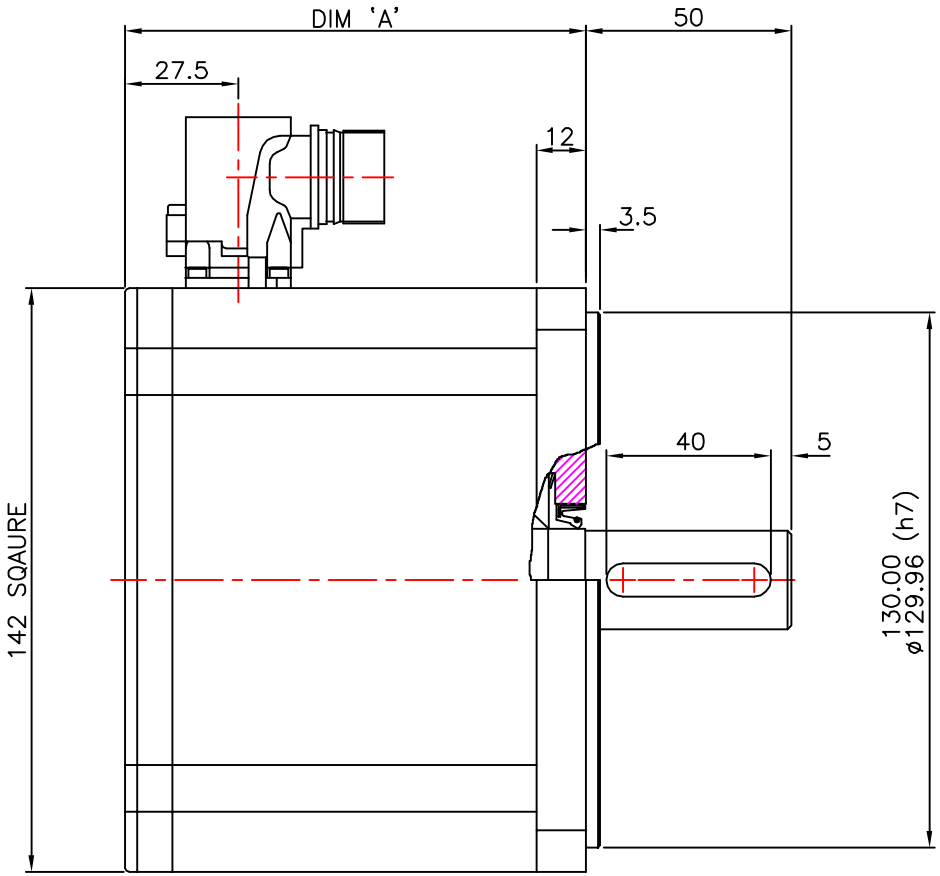
4 Should motors be required to operate under abnormal conditions, such as excessive vibration or shock, this should also be referred to SEM Ltd as noted above.

FIRST ANGLE PROJECTION

POWER CONNECTOR:–INTERCONNECTRON SIZE1, 6 PIN

FEEDBACK CONNECTOR:– RESOLVER–INTERCONNECTRON SIZE 1, 12 PIN, 20° OFFSET





FRAME	DIMENSION 'A'	
	WITHOUT BRAKE	WITH BRAKE
HDM142A	112	172
HDM142C	132	192
HDM142E	157	217
HDM142J	207	267

2	02FEB06 MR3674 UPDATED TO LATEST SPEC		
ALL DIMENSIONS IN MILLIMETRES TOLERANCES UNLESS ANG: ±0.5° OTHERWISE STATED DIM: ±0.25mm	TITLE: OUTLINE HDM142 STD METRIC – RESOLVER / R35i		
	MATERIAL	CODE	
	SPEC	FORM	
	FINISH	PATTERN No.	
	DRAWING NO. 664–7–06387		
	SEM LONDON ENGLAND		
	SCALE	3:4	
	ISSUE No.	2	
	DR.	SIH	
	DATE	02NOV04	
	A06387B1		

HDM142 - OPTIONS (metric series)

Code	Description	Notes
WAVEFORM (WINDING)		
Y00-A*	Waveform	Sinusoidal waveform
FEEDBACK DEVICES		
F00-C*	Resolver (F00 setting)	2 Pole Resolver type 15-B with F00 setting
F66-A	No Feedback device fitted	
FITTED ENCODERS		
E28-A	Incremental Encoder	Renco R35i, 2048ppr
E30-A	Incremental Encoder	Renco R35i, 4098ppr
E31-A	Incremental Encoder	Renco R35i, 8192ppr
E15-C	Encoder	Heidenhain ERN1387 series, 2048ppr.
E22-B	Encoder, singleturn, Optical	Heidenhain ECN1313 series, 2048ppr with EnDat Interface.
E16-A	Encoder, multiturn, Optical	Heidenhain EQN1325 series, 2048ppr with EnDat Interface.
E33-A	Encoder, singleturn, Inductive	Heidhenhain ECI1319 series, 32ppr with EnDat Interface
E34-A	Encoder, multiturn, Inductive	Heidhenhain ECI1331 series, 32ppr with EnDat Interface
MECHANICAL INTERFACE		
M00-R*	Flange	142 x 142 mm square flange. Spigot Ø 130mm. Fixing 4 x Ø 11 mm holes on 165 mm PCD
R01-A	Close tolerance interface	Flange & shaft to IEC72-P (precision)
S00-J*	Shaft	Ø 24mm x 50mm long
K10-B*	Keyway	8 x 7 x 40 mm long, keyway with key enclosed type, also with half key supplied 8 x 3.5 x 40 mm long
K99-A	No Keyway	Plain shaft
D01-H*	Shaft end threaded hole	M8 x 20mm deep
D99-B	No Shaft end threaded hole	
BRAKES		
B00-B	24Vdc Brake	18Nm. Torque, Spring Applied
ELECTRICAL TERMINATIONS		
C47-A*	Motor & feedback connector	Interconnectron size 1 power connector (6 pin) and size 1 feedback receptacle (12 pin) facing DE (resolver motors)
C48-A	Motor & feedback connector	Interconnectron size 1 power connector (6 pin) and size 1 feedback receptacle (17 pin) facing DE (encoder motors)
C67-A	Motor plug	Interconnectron straight plug (6 pin) to suit option C47 and C48
C68-A	Feedback plug	Interconnectron straight plug (12 pin) to suit option C47
C69-A	Feedback plug	Interconnectron straight plug (17 pin) to suit option C48
THERMAL PROTECTION		
P17-A*	KTY84-130 Thermal Sensor	
P18-A	No thermal overload	Thermal protection not fitted
ENCLOSURE PROTECTION		
W00-A*	IP64/65 enclosure	Nitrile shaft seal for IP64/65 protection (factory fitted)
W02-A	IP64/65 enclosure	Nitrile shaft seal for IP64/65 protection (supplied loose)
W01-J	IP64/65 enclosure	Viton shaft seal for IP64/65 protection (factory fitted)
W03-J	IP64/65 enclosure	Viton shaft seal for IP64/65 protection (supplied loose)
W99-A	No Shaft Seal Fitted	

***Standard feature**

USEFUL FORMULAE

All formulae given are for use in conjunction with the data published within this manual.

Mechanical Time Constant, $\tau_m = (J.R)/(2.Kt_{rms}^2)$

Electrical Time Constant, $\tau_e = (R/L)$

Power, $P = (M_n.\omega)/9.55$

Units

Mechanical time constant:	ms	τ_m
Electrical time constant:	ms	τ_e
Power:	W	P
Rotor polar moment of inertia:	kg cm^2	J
Resistance:	Ω	R
Torque constant:	Nm/A	Kt_{rms}
Inductance:	H	L
Torque (nominal):	Nm	M_n
Rotational speed:	rpm	ω

Conversion table

Length:	1” (inch)	= 25.4 mm	1m	= 3.281’ (feet)
Mass:	1oz (ounce)	= 0.0283 kg	1kg	= 2.205lb (pounds)
Force:	1oz	= 0.278 N	1N	= 0.225lb
Temperature:	1F	= $(9/5)T_{\circ C} + 32$	1°C	= $5/9\ (T_{\circ F} - 32)$
Torque:	1lb-in	= 0.113 Nm	1Nm	= 0.7376 lb-ft
Inertia:	1oz-in^2	= $1.83x10^{-5}$ kgm^2	1kgm^2	= 8.85 lb-in s^2
Power:	1HP	= 746 W	1kW	= 1.34 HP

In accordance with our policy of continual product improvement, SEM reserves the right to amend the specification of these products without prior notification.

Everything possible is done to ensure the accuracy of the technical information published herewith. However, mistakes do occur and data should be double-checked with SEM prior to its use in any decisive design stage.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP