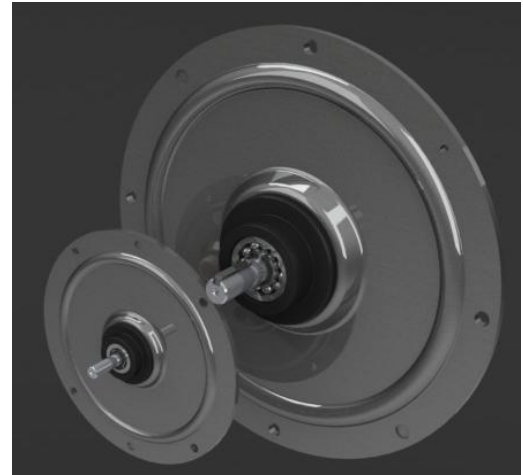# *GP* Series

Peak Torque	**100 to 1700Ncm**
Cont. Torque	**10 to 170 Ncm**
Power	**38 to 533 Watts**
Speed	**1 to 6000rpm**

The Printed Motor Works *GP* series is a totally enclosed DC motor in an ultra slim pancake profile. Incorporating flat armature technology, these pancake motors can provide a cost effective servo capability and are ideal for general purpose applications. Two variants of magnet are available for 9cm, 12cm, and 16cm armature diameters: standard ferrite (*GP*M) and high-power neodymium magnets (*GP*N). There are also two variants of armature winding for each size: a parallel low resistance (LR) winding which offers more speed, and a standard series winding which offers more torque.

Motor	Power	Torque	Speed	Voltage	Current	Cont. Stall Current	Diameter	Depth	Depth + Encoder
	P	T	N	V	I	IS	A	B	C
	Watt	Ncm	RPM	Volt	Amp	Amp	mm	mm	mm
*GP*M9LR	39	10	3705	9.0	11.7	6.6	120	26.0	44.0
*GP*M9	41	13	3000	14.5	6.9	4.5	120	26.0	44.0
*GP*N9LR	75	25	2887	12.0	11.4	6.5	120	26.0	44.0
*GP*N9	94	30	3000	22.5	6.9	4.5	120	26.0	44.0
*GP*M12LR	64	20	3050	12.0	10.8	6.5	152	30.0	46.0
*GP*M12	110	35	3000	23.5	7.6	5.0	152	30.0	46.0
*GP*N12LR	190	48	3810	24.0	11.0	7.0	152	30.0	46.0
*GP*N12	200	64	3000	37.5	7.3	5.0	153	30.0	46.0
*GP*M16LR	221	73	2905	24.0	13.4	8.0	215	35.6	51.6
*GP*M16	300	96	3000	43.3	9.3	6.0	215	35.6	51.6
*GP*N16LR	324	100	3102	36.0	11.7	8.0	215	35.6	51.6
*GP*N16	553	170	3000	75.8	8.4	5.7	215	35.6	51.6

Specific benefits
- Low profile
- Zero cogging
- Rapid acceleration
- Low inertia
- High Instantaneous torque
- High peak torque
- No torque drop-off at speed
- Ultra slow creep capability
- Wide speed range
- Low inductance
- Long brush life
- Controllable with servo amplifiers
- Design options include custom shaft, encoders, gearboxes and pulleys
- Available as an open motor for full application integration

ØA   B   C
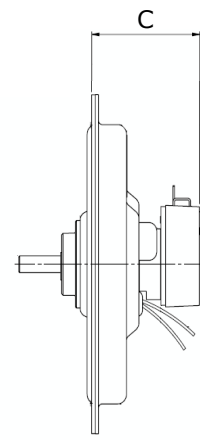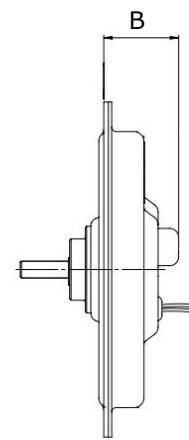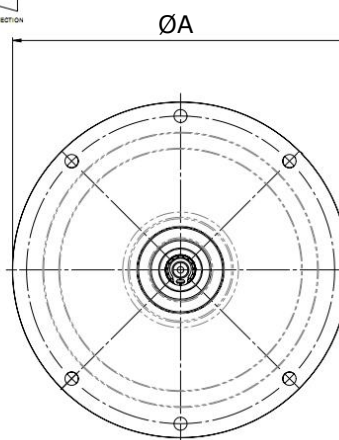
Standard Motor   Encoder Option

Printed Motor Works

GP Series

Applications:

Servo mechanisms, motion control, industrial robots, CNC machining, printing machinery, centrifuge, logistics solutions, medical mobility, medical scanners, flight simulators, marine autopilots and high ambient temperature ventilation.

Markets:

Industrial automation, automotive, medical, life sciences, aerospace & defence, printing, logistics, instrumentation, test and measurement, oil & gas and offshore marine.

Design Modifications

- Encoders
- Timing pulleys
- Long leads
- Tri-rated cable
- Open/kit option

- Customised shafts
- EMC suppression
- Connectors
- Rated for operation in 150°C ambient
- Mounting customisation

Standard Encoder Option:

Motor	Counts per Rev. CPR	Channels	Type	Supply Voltage V
*GP*M9	500	A + B + Index	Optical	+ 5
*GP*N9	500	A + B + Index	Optical	+ 5
*GP*M12	500	A + B + Index	Optical	+ 5
*GP*N12	500	A + B + Index	Optical	+ 5
*GP*M16	500	A + B + Index	Optical	+ 5
*GP*N16	500	A + B + Index	Optical	+ 5

Note: Standard Option also applies to LR versions. Other resolutions and differential/line driver output versions available on request.

Suggested Drives:

PWM24/10
PWM24/25   *Basic motor speed control*
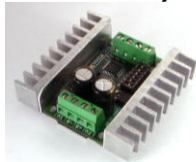
6-30Vdc for basic Speed control applications. 10Amp and 25Amp with single and twin axis control.
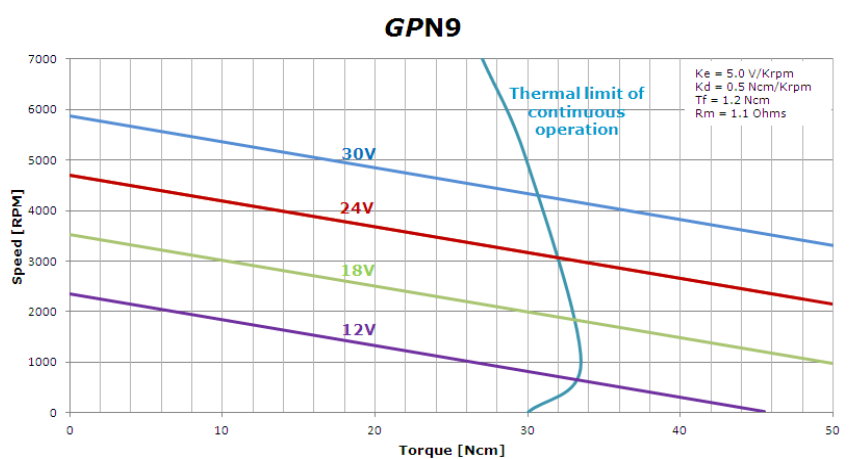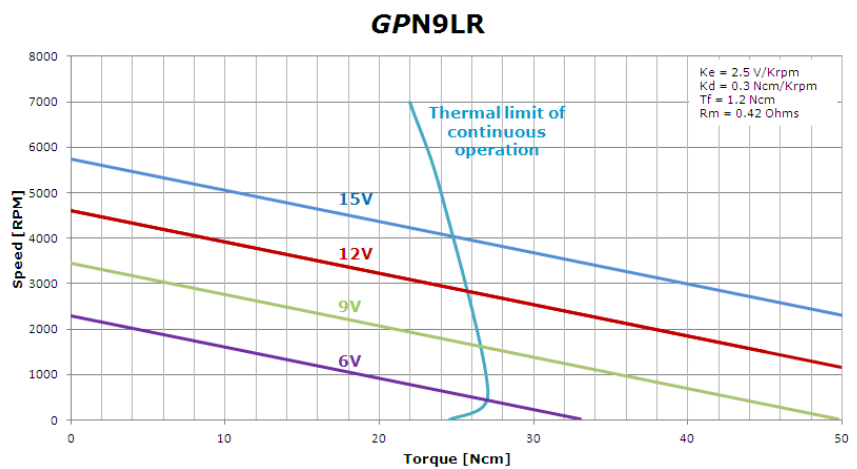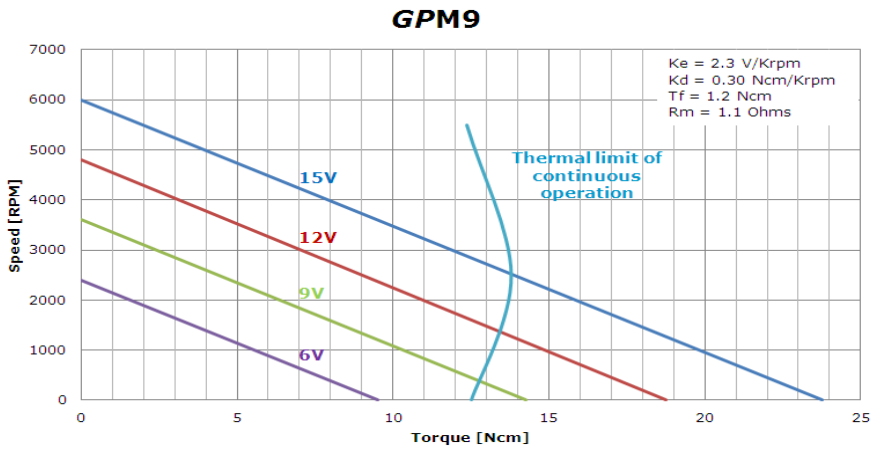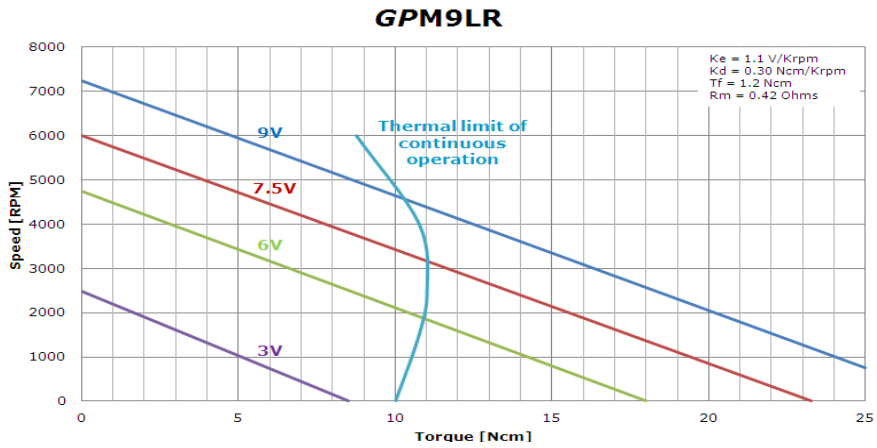
JUNUS   *General speed control applications*

20-180Vdc for Velocity and Torque control with 6 digital I/O. 5Amp - 30Amp variants, RS232 communication.

ACCELNET   *General servo applications*

20-180Vdc for Velocity, Torque and Position control with 11 digital I/O and Encoder feedback. 5Amp - 36Amp variants, RS232 & macro communication.

GP Series

*GP*M9LR

Ke = 1.1 V/Krpm
Kd = 0.30 Ncm/Krpm
Tf = 1.2 Ncm
Rm = 0.42 Ohms

*GP*M9

Ke = 2.3 V/Krpm
Kd = 0.30 Ncm/Krpm
Tf = 1.2 Ncm
Rm = 1.1 Ohms

*GP*N9LR

Ke = 2.5 V/Krpm
Kd = 0.3 Ncm/Krpm
Tf = 1.2 Ncm
Rm = 0.42 Ohms

*GP*N9

Ke = 5.0 V/Krpm
Kd = 0.5 Ncm/Krpm
Tf = 1.2 Ncm
Rm = 1.1 Ohms

NOTE: The above voltages are examples, not a predefined maximum or minimum.
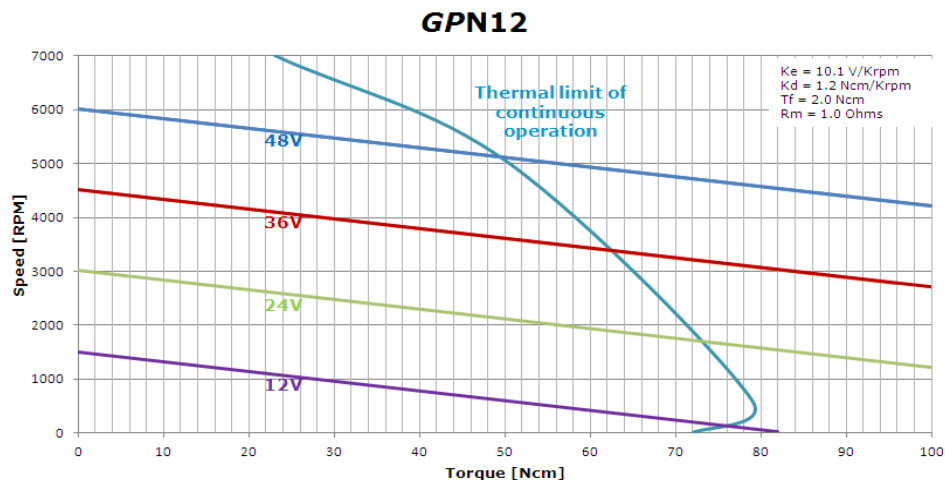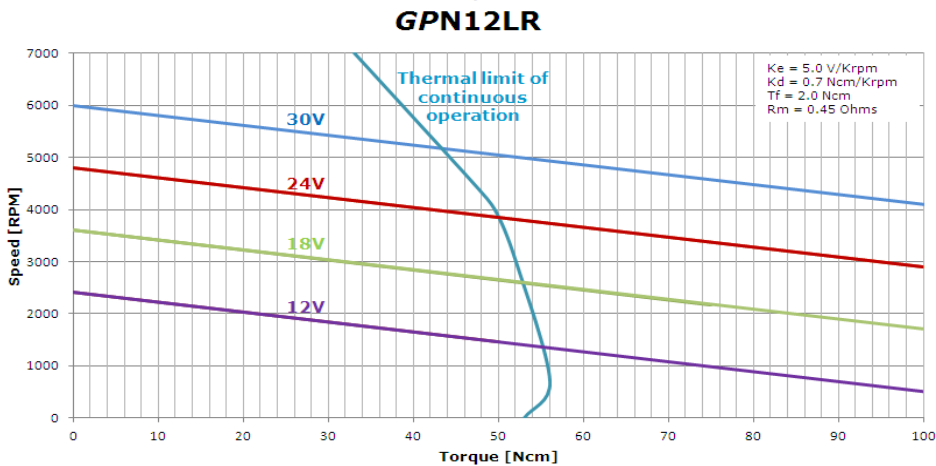Due to ongoing product improvements data is subject to change without notice.
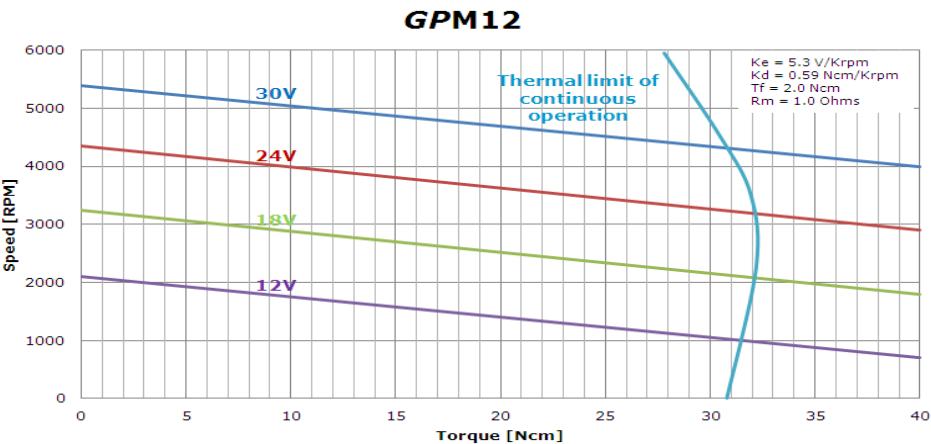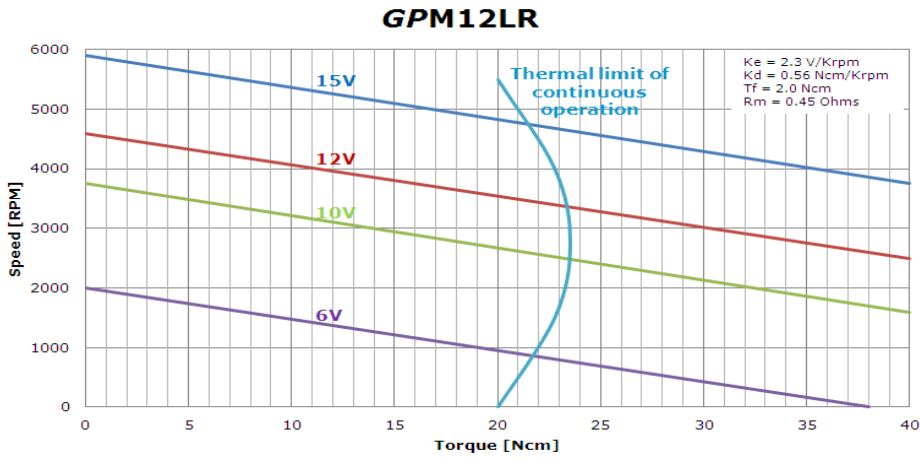
GP Series

*GP*M12LR

Speed [RPM] vs Torque [Ncm]

15V, 12V, 10V, 6V

Thermal limit of continuous operation

Ke = 2.3 V/Krpm
Kd = 0.56 Ncm/Krpm
Tf = 2.0 Ncm
Rm = 0.45 Ohms

*GP*M12

Speed [RPM] vs Torque [Ncm]

30V, 24V, 18V, 12V

Thermal limit of continuous operation

Ke = 5.3 V/Krpm
Kd = 0.59 Ncm/Krpm
Tf = 2.0 Ncm
Rm = 1.0 Ohms

*GP*N12LR

Speed [RPM] vs Torque [Ncm]

30V, 24V, 18V, 12V

Thermal limit of continuous operation

Ke = 5.0 V/Krpm
Kd = 0.7 Ncm/Krpm
Tf = 2.0 Ncm
Rm = 0.45 Ohms

*GP*N12

Speed [RPM] vs Torque [Ncm]

48V, 36V, 24V, 12V

Thermal limit of continuous operation

Ke = 10.1 V/Krpm
Kd = 1.2 Ncm/Krpm
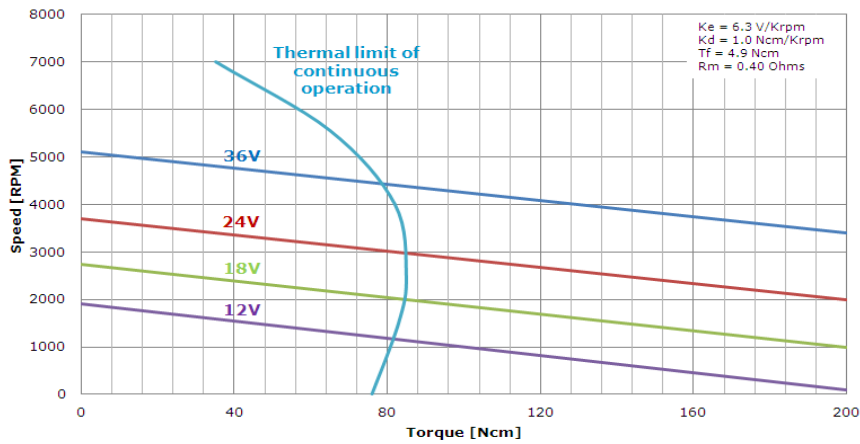Tf = 2.0 Ncm
Rm = 1.0 Ohms
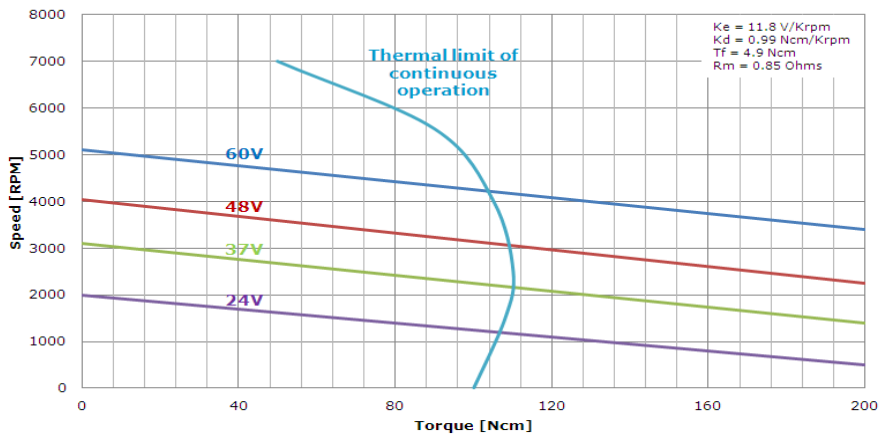
NOTE: The above voltages are examples, not a predefined maximum or minimum.
Due to ongoing product improvements data is subject to change without notice.

GP Series

*GP*M16LR

Ke = 6.3 V/Krpm
Kd = 1.0 Ncm/Krpm
Tf = 4.9 Ncm
Rm = 0.40 Ohms

*GP*M16

Ke = 11.8 V/Krpm
Kd = 0.99 Ncm/Krpm
Tf = 4.9 Ncm
Rm = 0.85 Ohms

*GP*N16LR

Ke = 10 V/Krpm
Kd = 2.5 Ncm/Krpm
Tf = 4.9 Ncm
Rm = 0.425 Ohms

*GP*N16

Ke = 22.9 V/Krpm
Kd = 2.5 Ncm/Krpm
Tf = 4.9 Ncm
Rm = 0.85 Ohms

NOTE: The above voltages are examples, not a predefined maximum or minimum.
Due to ongoing product improvements data is subject to change without notice.

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Printed Motor Works Limited
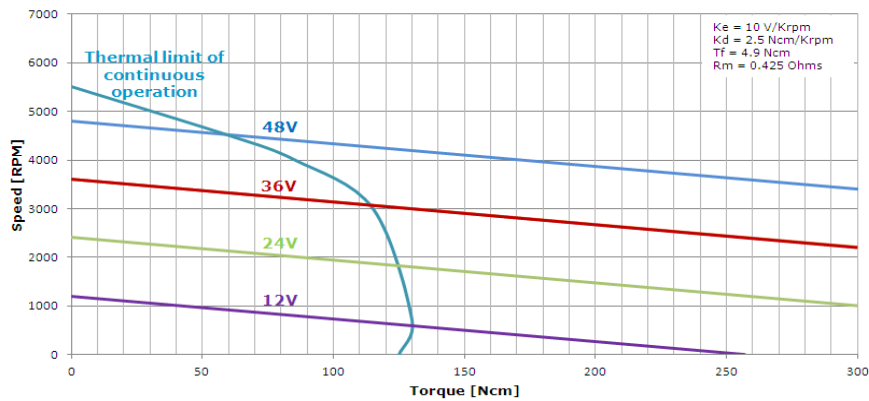Newman Lane, Alton
Hampshire GU34 2QW, UK

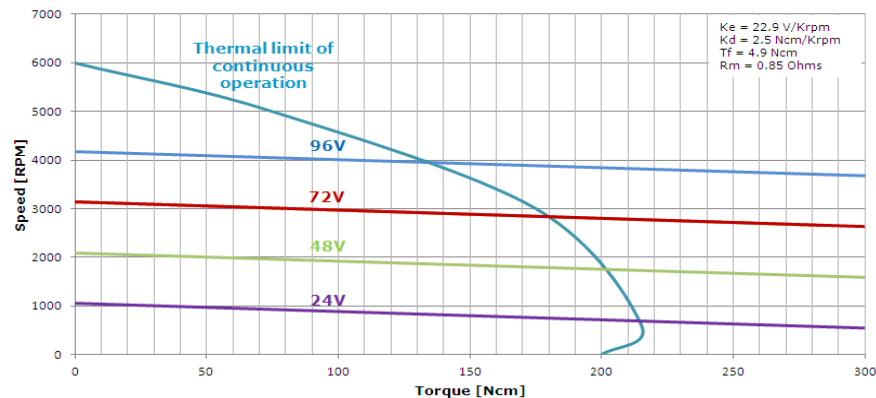Printed Motor Works