



M4-420X DC Servomotors

Direct Replacement of SEM MT40* motors



- Identical motor shaft and mount dimensions (IEC & NEMA options)
- Matched motor windings
- Compatible torque/speed performance
- Matched connection options
- 24/90 V DC or 115V AC brake options
- Matched tachogenerator output
- Encoder options available
- Matched non drive end interface options
- Rare Earth magnets
- Rugged mechanical design

* MT is a tradename of SEM Ltd, UK, brush DC servomotors

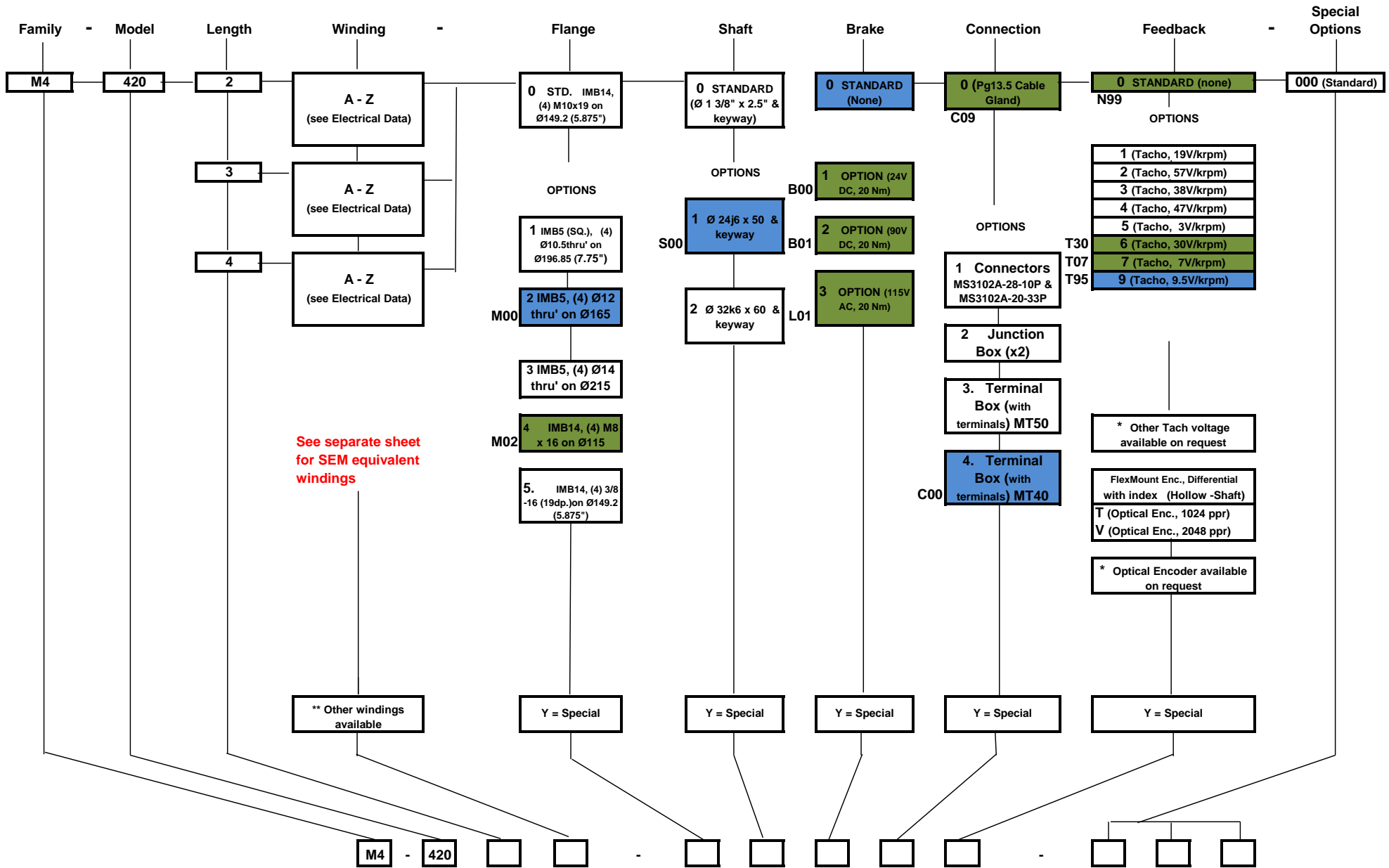




Callan Technology replacements
for SEM MT40 servomotors

SEM	Callan Technology
MT40P4-76	M4-4202 G
MT40P4-61	M4-4202 F
MT40P4-38	M4-4202 A
MT40W4-90	M4-4203 F
MT40W4-68	M4-4203 E
MT40W4-45	M4-4203 B
MT40ZD4-90	M4-4203 F
MT40ZD4-60	M4-4204 B
MT40ZD4-45	M4-4204 C

M4-420X Code Table (Replacements for SEM MT40)

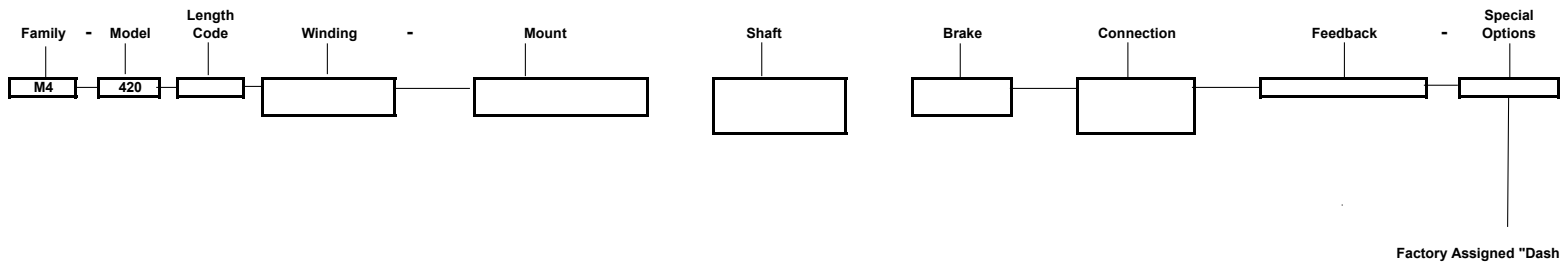


Blue box = SEM Standard for MT40
 Green box = SEM Standard Option for MT40

For encoders, encoder adapters, rear shaft , shaft seals etc please contact factory

Example : M4 - 420 3 A - 0 0 0 1 1 - 0 0 0

M4-420X Code Table (Replacements for SEM MT40)



Dash No. List (as of 5/12/12)

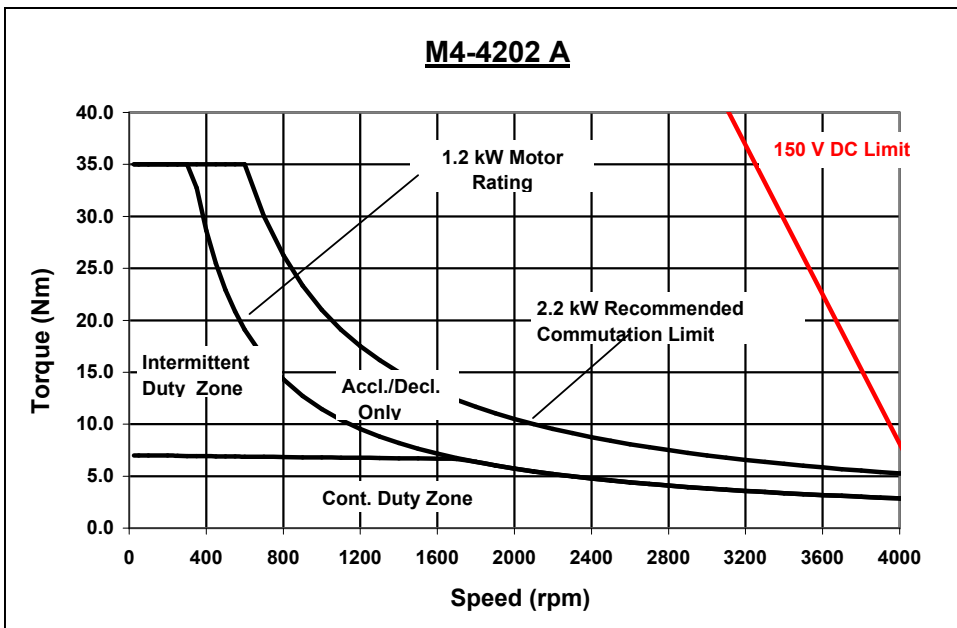
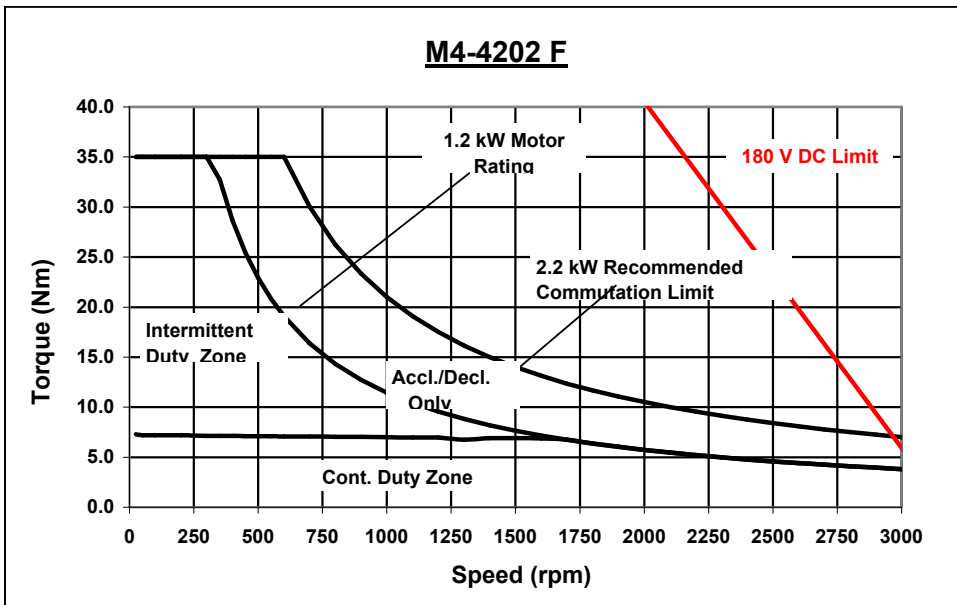
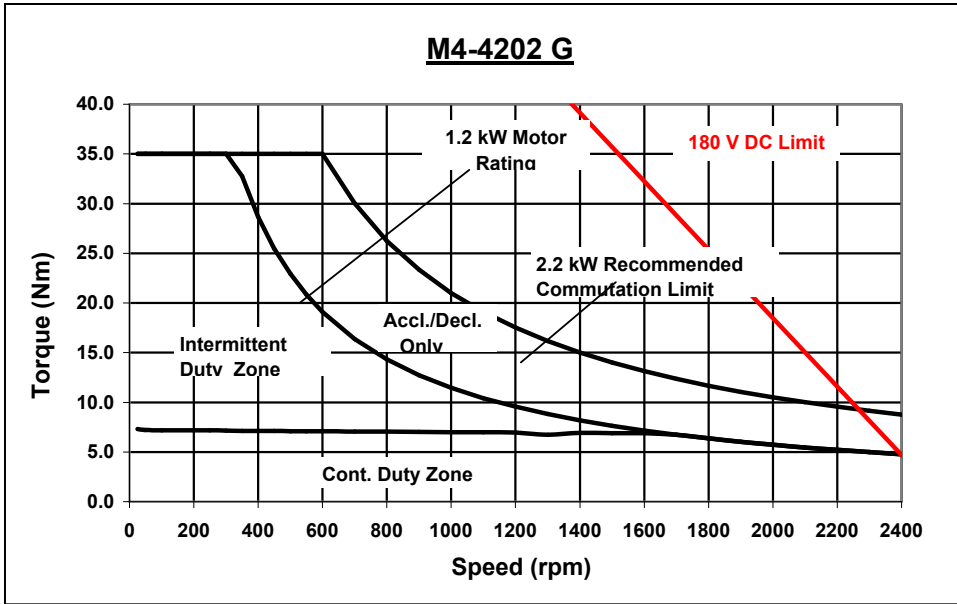
-000 Standard motor as specified by order code, with thermostat, with rear shaft ext., rear pilot & mounting holes **NOT** MT40 compatible

-410 Standard motor as specified by order code, with thermostat, with rear shaft ext., rear pilot & mounting holes **compatible to MT40**

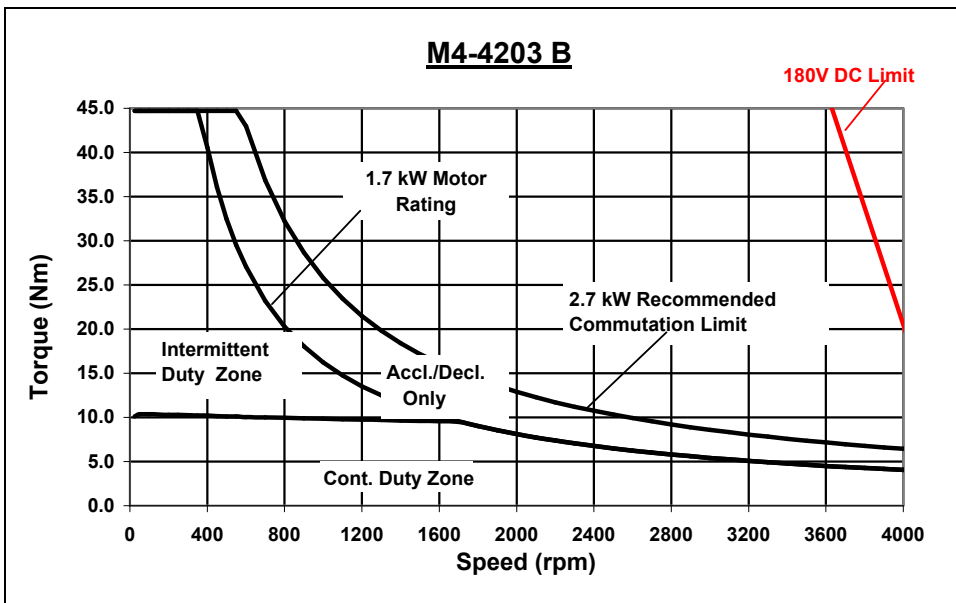
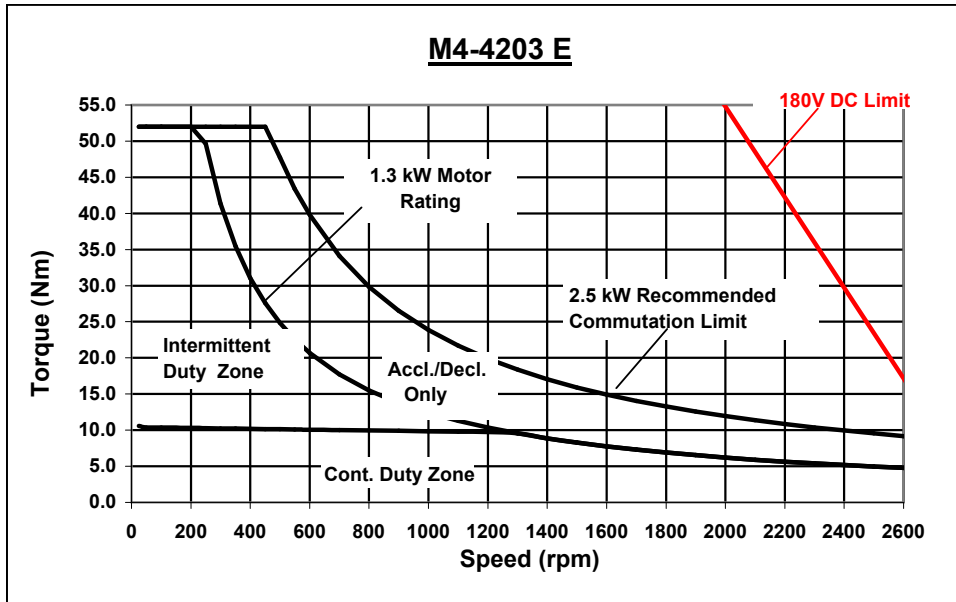
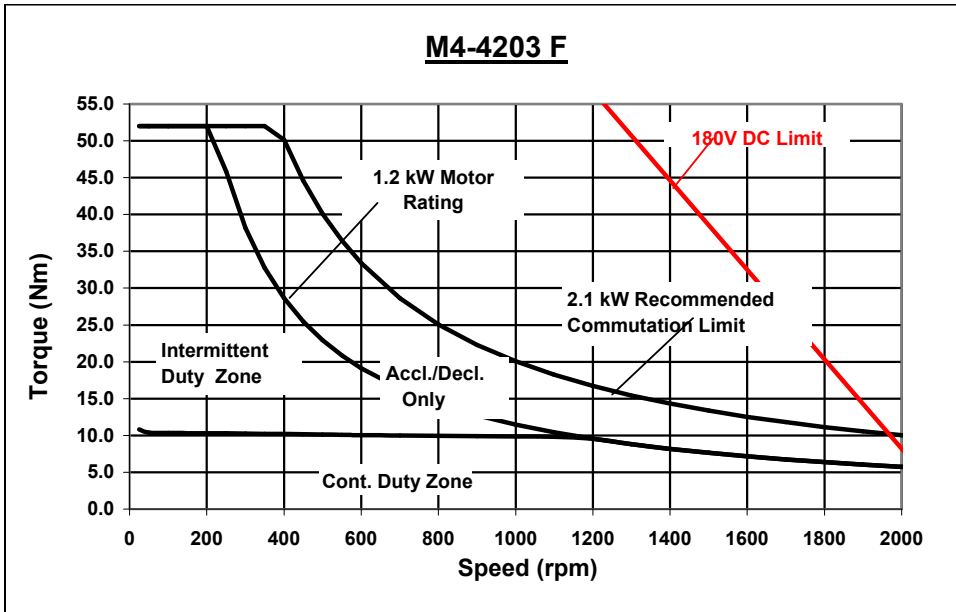
Accessories (must be specified and ordered separately)

Motor		M4-4202			M4-4203				M4-4204	
Winding		G	F	A	F	E	B	F	B	C
replaces :-		<i>(MT40P4-76)</i>	<i>(MT40P4-61)</i>	<i>(MT40P4-38)</i>	<i>(MT40W4-90)</i>	<i>(MT40W4-68)</i>	<i>(MT40W4-45)</i>	<i>(MT40ZD4-90)</i>	<i>(MT40ZD4-60)</i>	<i>(MT40ZD4-45)</i>
Power, P (kW) (Brush cont. Limit)		1.2	1.2	1.2	1.2	1.3	1.7	1.2	1.79	1.86
Max Speed, Nmax (rpm)		2,400	3,000	4,000	2,000	2,600	4,000	2,000	3,000	4,000
Cont. Torque Mo (Nm)		7.3	7.3	7.0	10.8	10.6	10.1	10.8	14.2	13.6
Current @ Cont. Torque, Io (A)		11.3	14	21.5	13.8	18.2	25.7	13.8	26.3	33.3
Peak Torque, Mmax (Nm)		35	35	35	52	52	44.7	52	60	46
Current @ Peak Torque, Ip (A)		60	75	120	75	100	120	75	120	120
Max Terminal Voltage, Vt (V)		180	180	150	180	180	180	180	180	180
Back EMF Const, Ke (V/krpm)		72.4	57.9	36.2	86	63.9	42.6	86	56.8	42.6
Torque Const., Kt (Nm/A)		0.685	0.548	0.342	0.813	0.604	0.403	0.813	0.537	0.403
DC Resistance, R (Ω)		0.8	0.51	0.2	0.64	0.35	0.154	0.64	0.181	0.107
Inductance, L (mH)		2.8	1.8	0.7	2.6	1.5	0.66	2.6	0.88	0.49
Weight, M (kg)		21			23				26	
Inertia, JM (kgm ²)		61x10 ⁻⁴			85x10 ⁻⁴				110x10 ⁻⁴	
Static Friction, Tf (Nm)		0.36			0.41				0.47	
Viscous Damping, F1 (Nm/krpm)		0.09			0.11				0.14	
Tachogenerator Option										
Tachogenerator Model		TGF 2030								
Voltage, KG (V/krpm)		7.0 / 9.5 / 19.5 / 30.0								
Ripple (pk-pk/avg)		2%								
Encoder Option- Flexmount Encoder with internal bearing										
Encoder Type		Incremental (A quad B with index Z & complements)								
Power Supply		5V DC ±5%, 200mA max								
Output		Line Driver, 20mA max source/sink								
Resolution (ppr)		1024 / 2048 / 4096								
Frequency Response		120 kHz max								
Brake Option										
Brake Voltage		24 (DC)			90 (DC)				115 (AC)	
Power (Watts)		28			28				28	
Brake Static Torque (Nm)		20			20				20	
Weight (brake + housing) Kg		13			13				13	

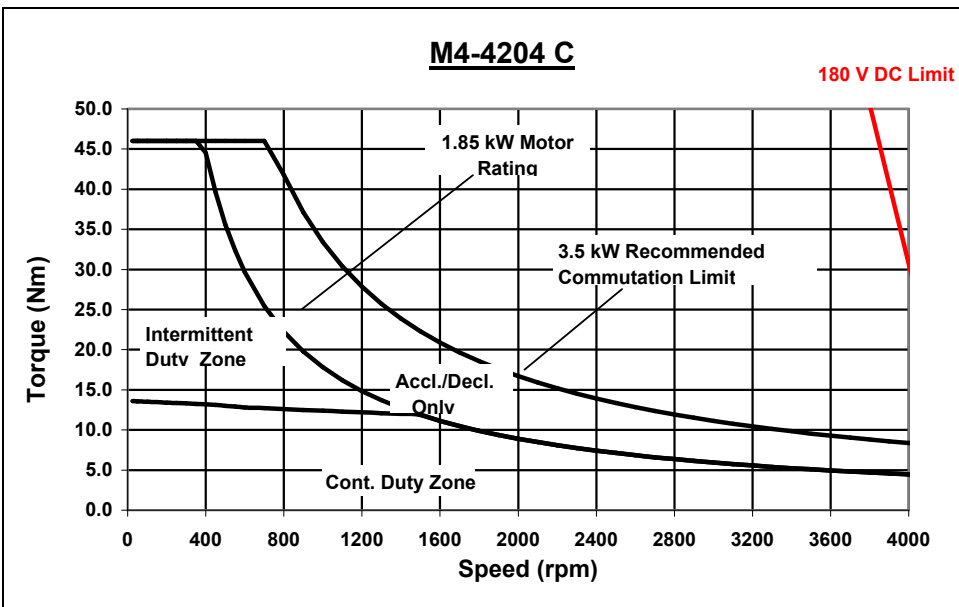
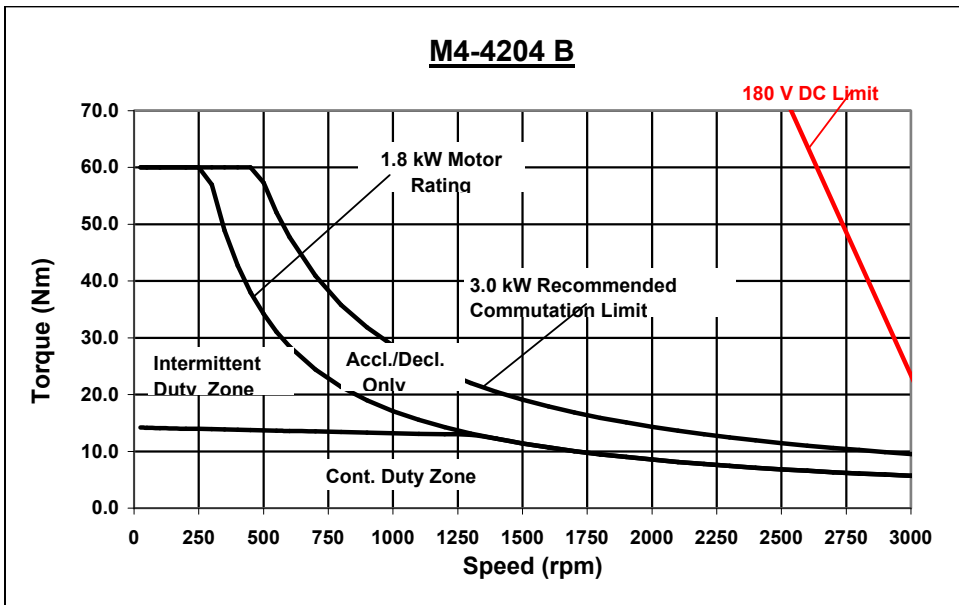
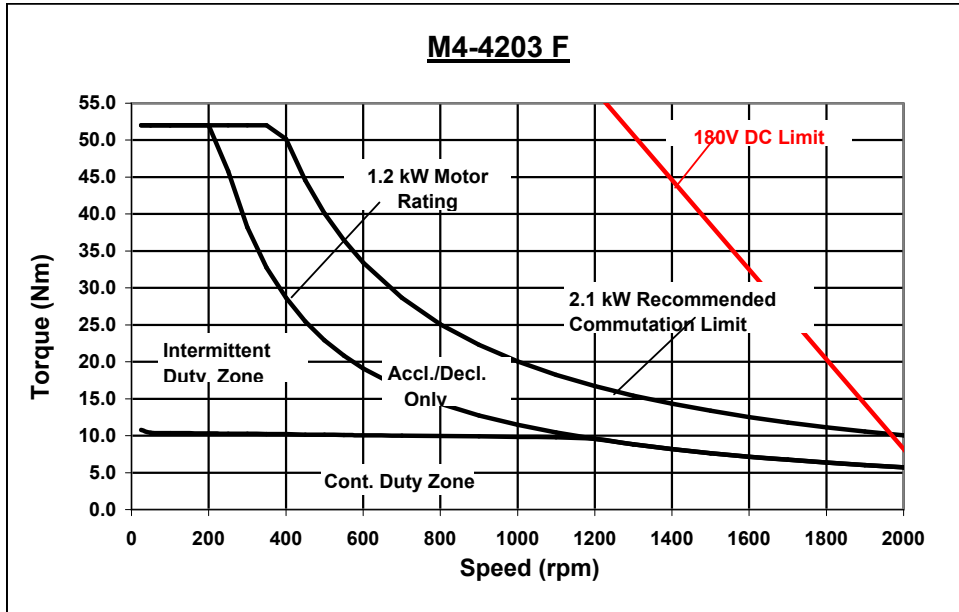
Performance Curves



Performance Curves

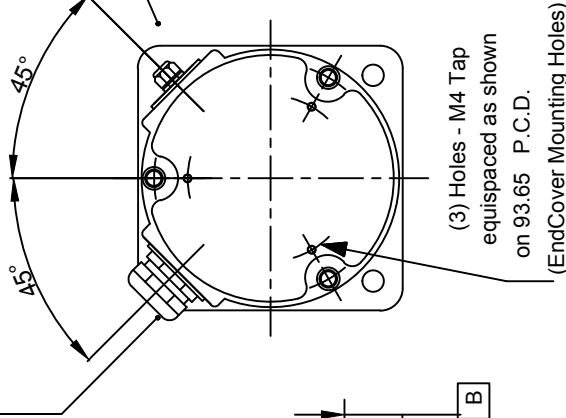


Performance Curves

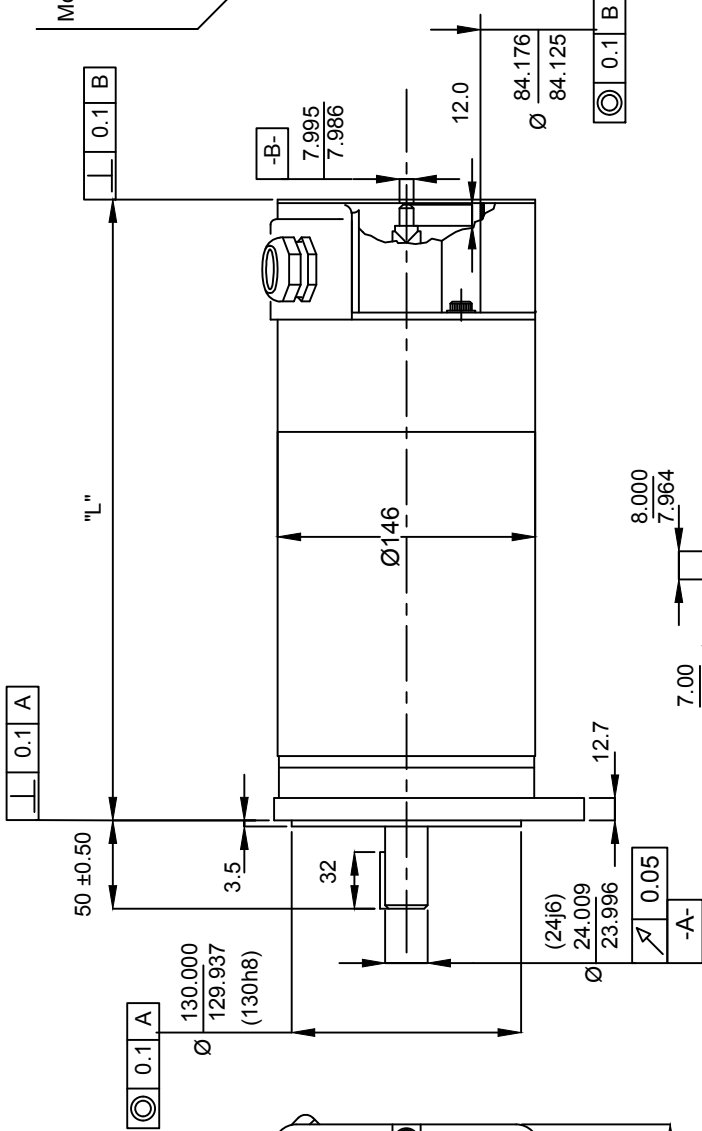


Tach Leads - 450 Length
(Pg 7 Cable Gland)

Motor & Thermo Leads - 450 Length
(Pg 13.5 Cable Gland)



Motor Type	Length "L"
M4-4202	297
M4-4203	297
M4-4204	322
M4-4205	347
M4-4206	373
M4-4207	398
M4-4208	424
M4-4209	449



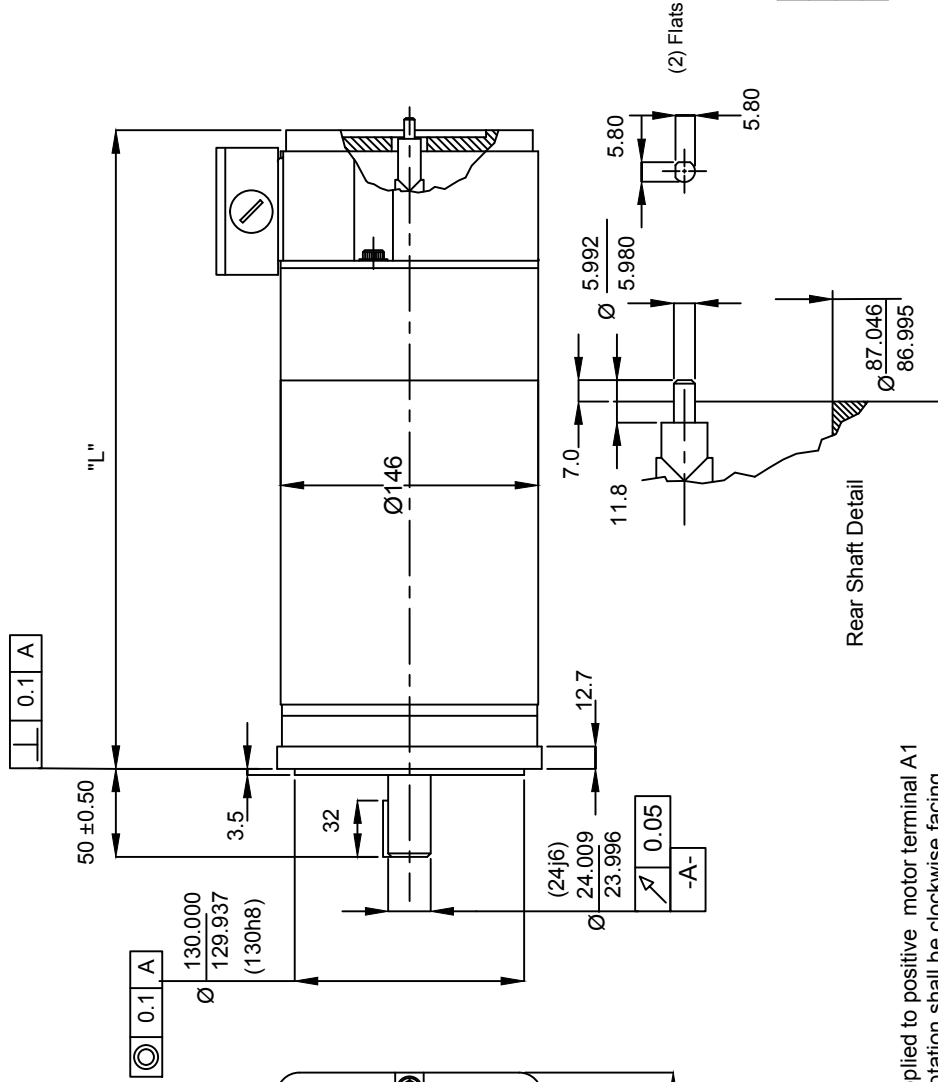
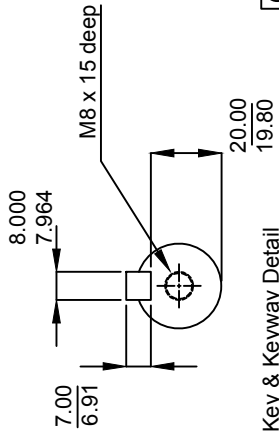
(4) Holes, Ø 12 thru' equispaced as shown on Ø 165 PCD

Key & Keyway Detail

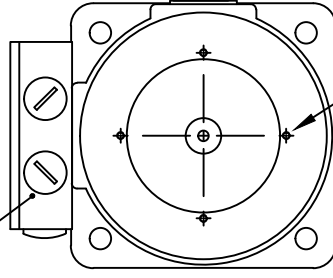
Notes:-

1. With a positive current applied to green lead (x3) with respect to orange lead (x3) of motor, rotation shall be clockwise facing mounting end of motor.
With this rotation a positive voltage shall be generated on black lead of tach with respect to white lead.
2. Motor can be mounted in any position
3. Thermostat set to open at 90°C ± 6°C & close at 70° ± 6°C falling.
N.C. contacts rated to 3.0 Amps, 250V. AC., (2) Yellow leads
4. All dimensions in mm.

Scale : NTS		Weight :	
Material : SEE NOTES		Remove all burrs and sharp corners	
Rare Earth Servomotor with Tach M4-420X-21001-000			
Tolerances. X.X = ± 0.3 X:XX = ± 0.1 Ang. Dim. = ± 1°		Issue	Name
		ECO. No.	Date
		App'd	Norm
		Drawn	21/5/08
		App'd	POB
		Date	
		Name	
Callan Technology Ltd.			
M4-420X-21001-000		Sheet	1
		of	1



(2) Holes, as shown, M20x1.5 -7H
(Fitted with Blanking Plugs)



(4) Holes, M4 x 8 deep
equispaced on 94.0 PCD

(4) Holes, Ø 12 thru'
equispaced as shown on
Ø 165 PCD

Motor Type	Length "L"
M4-4202	309
M4-4203	309
M4-4204	334

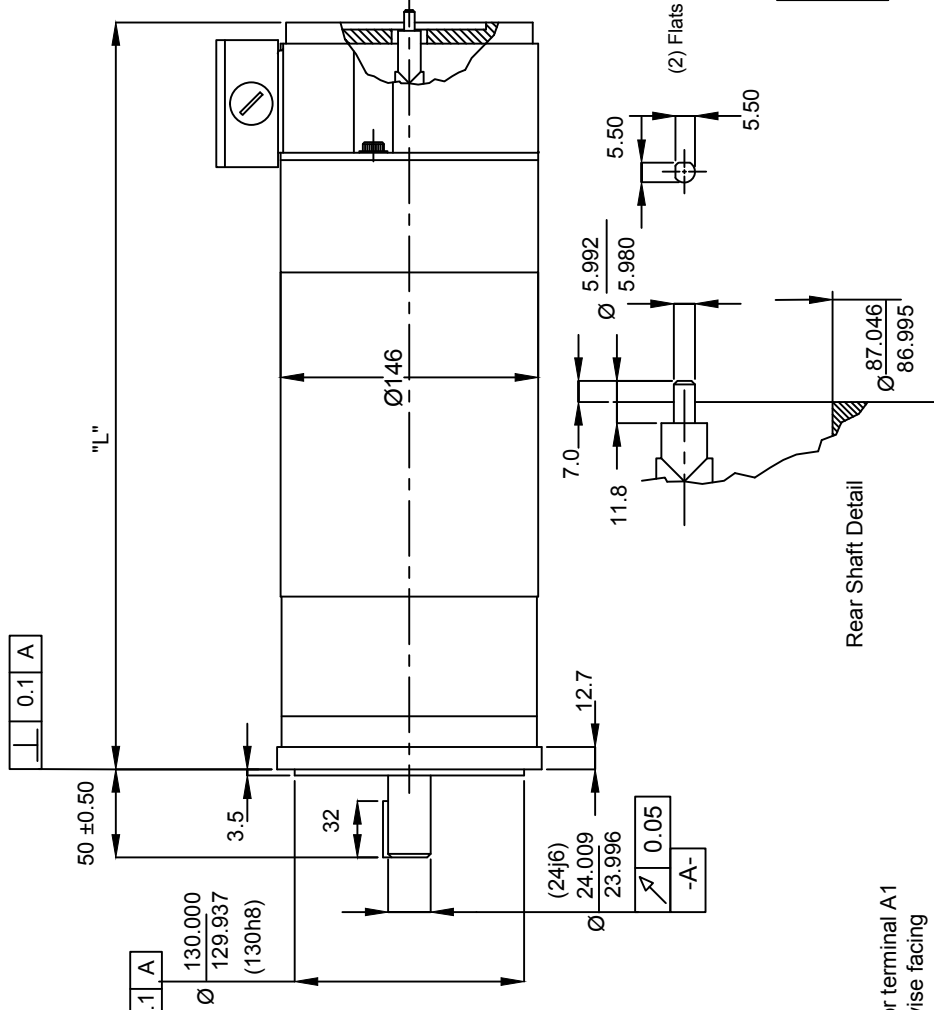
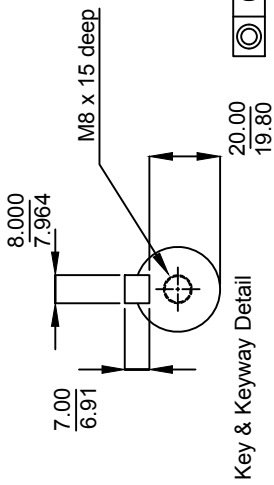
Rear Shaft Detail

Notes:-

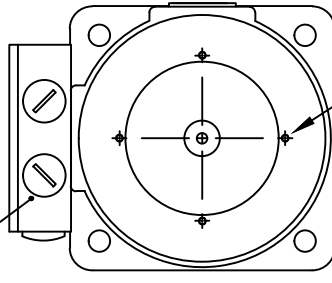
- With a positive current applied to positive motor terminal A1 respect to terminal A2, rotation shall be clockwise facing mounting end of motor.
With this rotation a positive voltage shall be generated on terminal T1 of tach with respect to terminal T2.
(Wiring diagram inside Terminal Box)
- Motor can be mounted in any position
- Thermostat set to open at 90°C ± 6°C & close at 70° ± 6°C falling.
N.C. contacts rated to 3.0 Amps, 250V. AC., (2) Yellow leads
- All dimensions in mm.

Scale :		NTS		Weight :	
Material :		SEE NOTES		Remove all burrs and sharp corners	
Tolerances.		X.X = ± 0.3		Name	
X.XX = ± 0.1		Ang. Dim. = ± 1°		Date	
				Drawn	
				g/g/r/13	
				App'd	
				Name	
				App'd	
				Norm	
				Issue	
				ECO. No.	
				Date	
				Name	
				App'd	
				Norm	
				1	
				POB	
				Rare Earth Servomotor with Tach	
				M4-420X-21049-410	
				M4-420X-21049-410	
				Sheet	
				1	
				of 1	

Callan Technology Ltd.



(2) Holes, as shown, M20x1.5 -7H
(Fitted with Blanking Plugs)



(4) Holes, M4 x 8 deep
equispaced on 94.0 PCD

(4) Holes, Ø 12 thru'
equispaced as shown on
Ø 165 PCD

Motor Type	Length "L"
M4-4202	371
M4-4203	371
M4-4204	396

Notes:-
1. With a positive current applied to positive motor terminal A1 respect to terminal A2, rotation shall be clockwise facing mounting end of motor.
With this rotation, a positive voltage shall be generated on terminal T1 of tach with respect to terminal T2.
(Wiring diagram inside Terminal Box)

- Motor can be mounted in any position
- Thermostat set to open at $90^{\circ}\text{C} \pm 6^{\circ}\text{C}$ & close at $70^{\circ} \pm 6^{\circ}\text{C}$ falling. N.C. contacts rated to 3.0 Amps, 250V. AC., (2) Yellow leads
- Brake Data :- 24 V, 20 Nm, 1.1 A (2 white leads) (Brake has no polarity)
- All dimensions in mm.

Scale :	NTS	Weight :
Material : SEE NOTES Remove all burrs and sharp corners		
Tolerances. X.X = ± 0.3 X.XX = ± 0.1 Ang. Dim. = $\pm 1^{\circ}$		
Issue	ECO. No.	Date
1		
App'd	Name	App'd
POB	Date	Name
20/2/13	20/2/13	POB
Rare Earth Servomotor with Tach M4-420X-21149-410		
Callan Technology Ltd.		
M4-420X-21149-410		
Sheet 1 of 1		

