

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

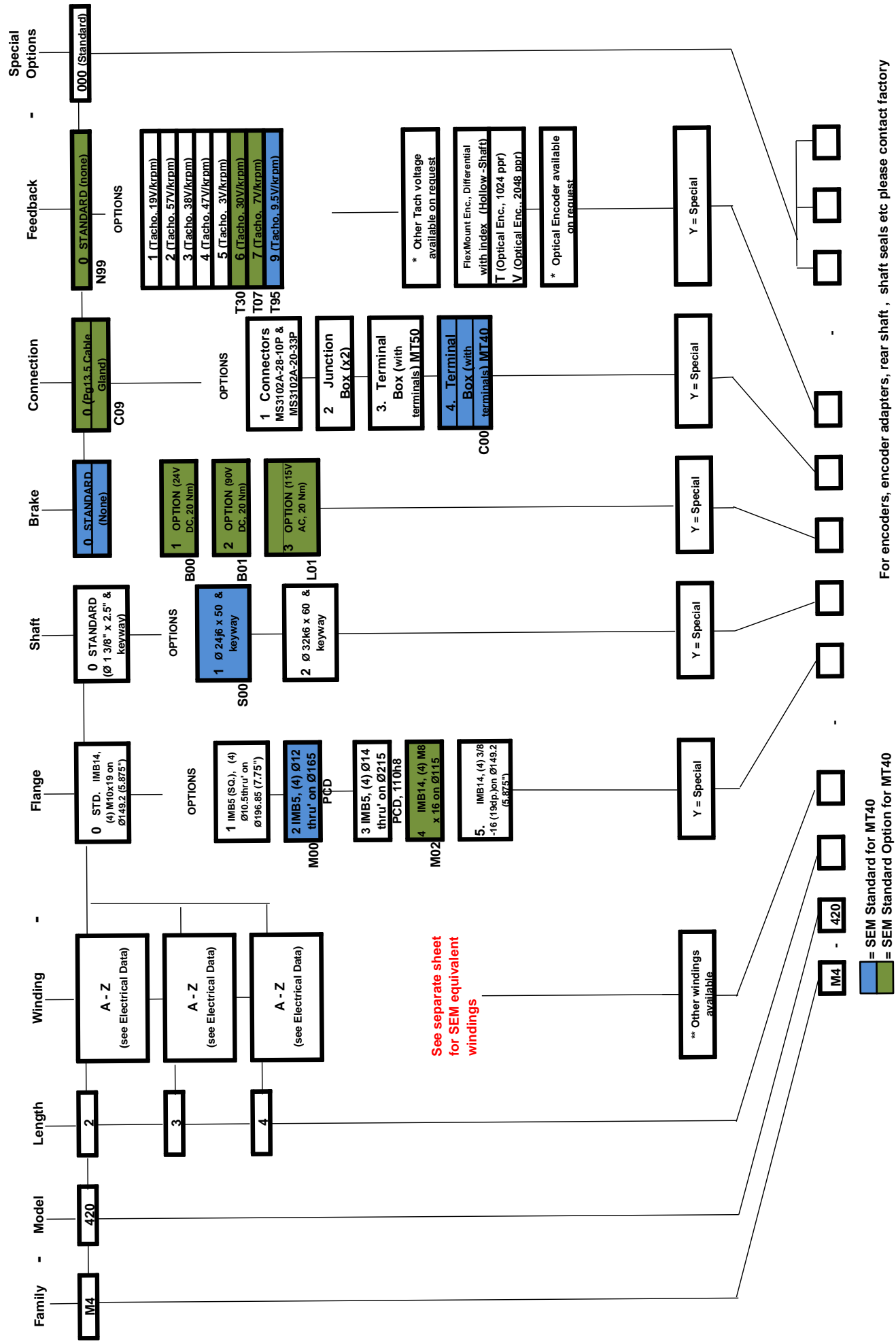


M4-420X motor replacements

for SEM MT40 servomotors

Original Part Number	Our Replacement
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

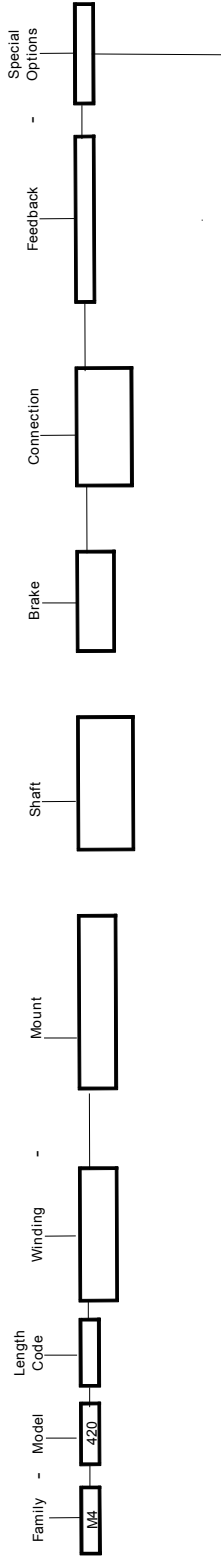
M4-420X Code Table (Replacements for SEM MT40)



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)



Factory Assigned "Dash No."

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 **NOI** 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 Winding replaces :-	M4-4202			M4-4203			M4-4204		
	G	F	A	F	E	B	F	B	C
Power, P (kW) (Brush cont. Limit)	(MT40P4-76)	(MT40P4-61)	(MT40P4-38)	(MT40W4-90)	(MT40W4-68)	(MT40W4-46)	(MT40ZD4-90)	(MT40ZD4-60)	(MT40ZD4-45)
Max Speed, Nmax (rpm)	1.2	1.2	1.2	1.2	1.3	1.7	1.2	1.79	1.86
Cont. Torque Mo (Nm)	2.400	3.000	4.000	2.000	2.600	4.000	2.000	3.000	4.000
Current @ Cont. Torque, Io (A)	7.3	7.3	7.0	10.8	10.6	10.1	10.8	14.2	13.6
Peak Torque, Mmax (Nm)	11.3	14	21.5	13.8	18.2	25.7	13.8	26.3	33.3
Current @ Peak Torque, Ip (A)	35	35	35	52	52	44.7	52	60	46
Max Terminal Voltage, Vt (V)	60	75	120	75	100	120	75	120	120
Back EMF Const. Ke (V/krpm)	180	180	150	180	180	180	180	180	180
Torque Const., Kt (Nm/A)	72.4	57.9	36.2	86	63.9	42.6	86	56.8	42.6
DC Resistance, R ()	0.685	0.548	0.342	0.813	0.604	0.403	0.813	0.537	0.403
Inductance, L (mH)	0.8	0.51	0.2	0.64	0.35	0.154	0.64	0.181	0.107
Weight, M (kg)	2.8	1.8	0.7	2.6	1.5	0.66	2.6	0.88	0.49
Inertia, Jm (kgm ²)		21				23			26
Static Friction, Tf (Nm)		61x10 ⁻⁴				85x10 ⁻⁴			110x10 ⁻⁴
Viscous Damping, F1 (Nm/krpm)		0.36				0.41			0.47
		0.09				0.11			0.14
Tachogenerator Option									
Tachogenerator Model									
Voltage, Kg (V/krpm)									
Ripple (pk-pk/avg)									
Encoder Option- Flexmount Encoder with internal bearing									
Encoder Type									
Power Supply									
Output									
Resolution (ppr)									
Frequency Response									
Brake Option									
Brake Voltage									
Power (Watts)									
Brake Static Torque (Nm)									
Weight (brake + housing) Kg									

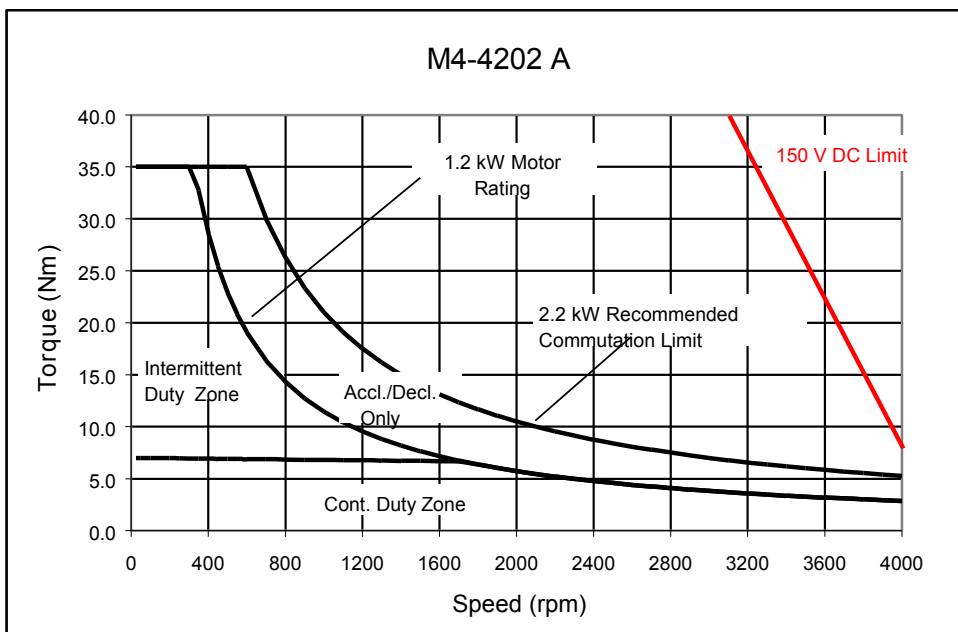
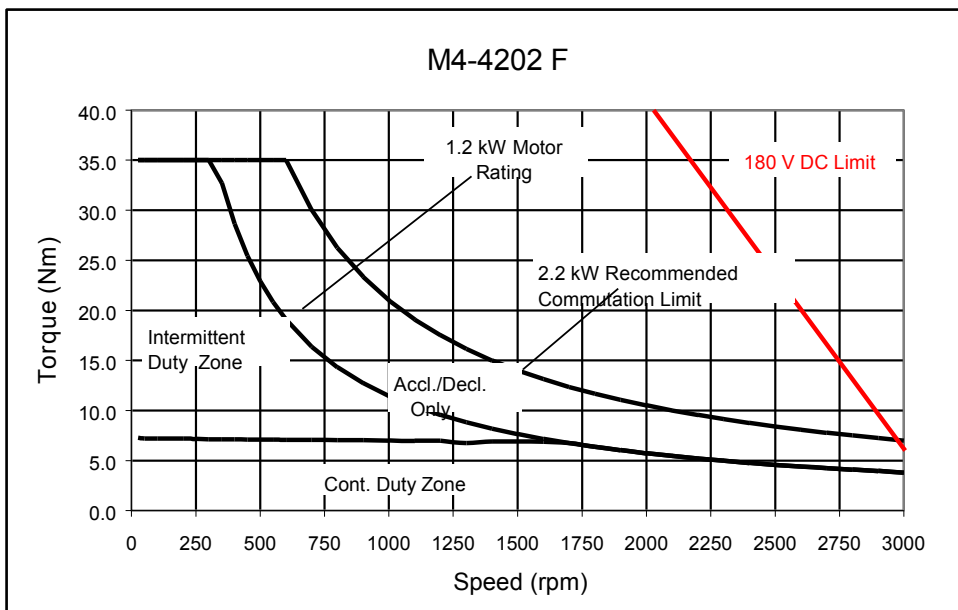
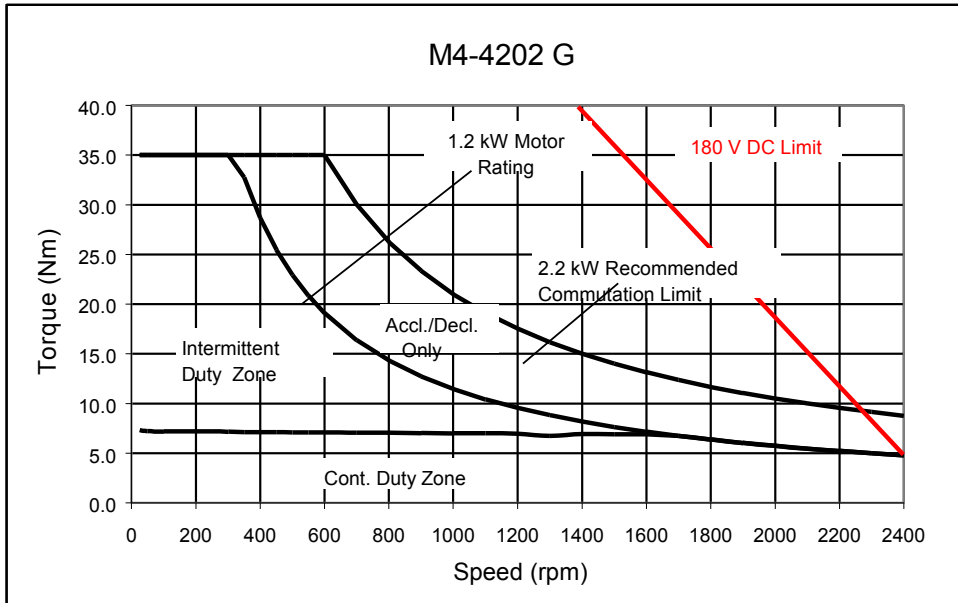
Incremental (A quad B with index Z & complements)
5V DC +5%, 200mA max
Line Driver, 20mA max source/sink
1024 / 2048 / 4096
120 kHz max

24 (DC)
28
20
13

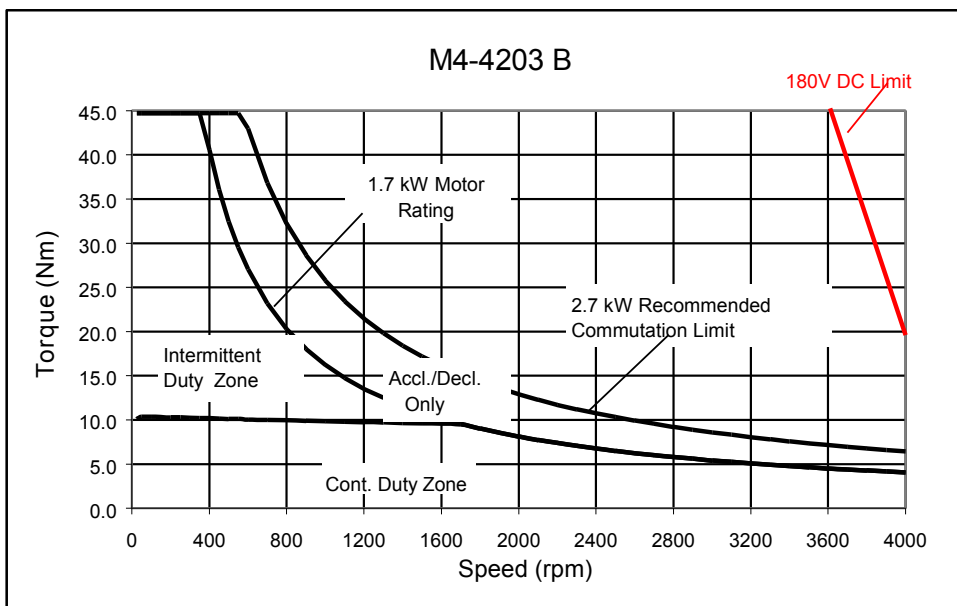
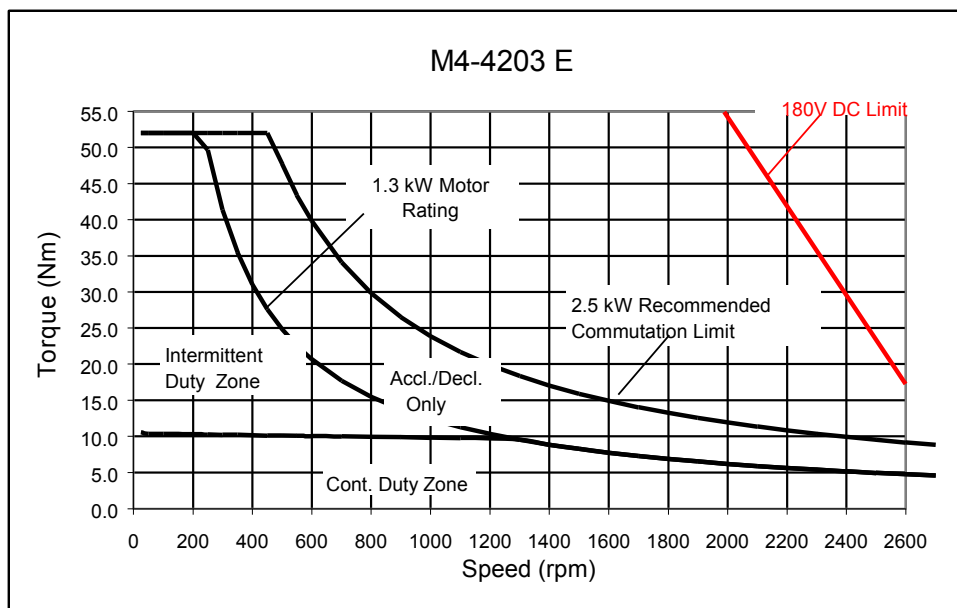
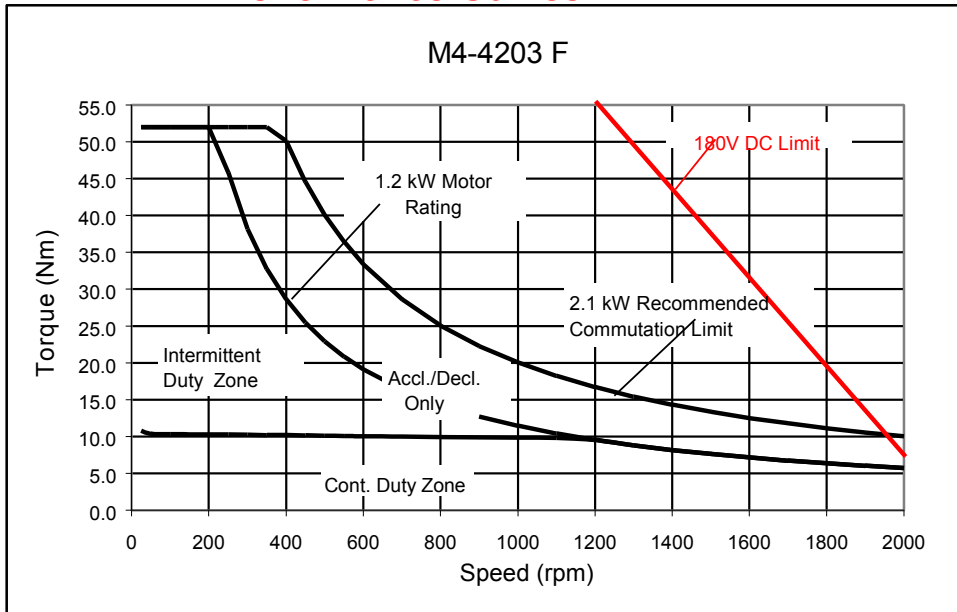
90 (DC)
28
20
13

115 (AC)
28
20
13

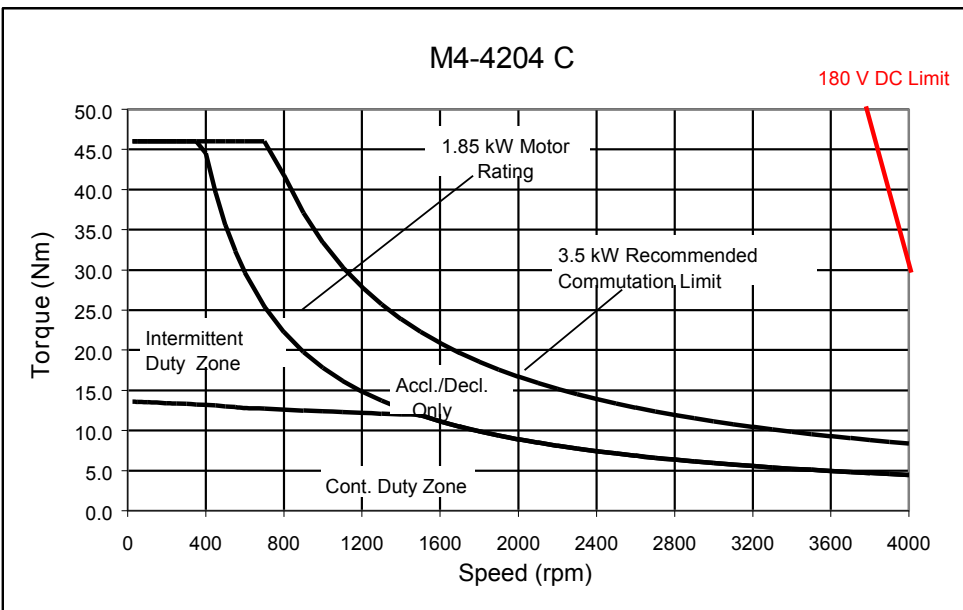
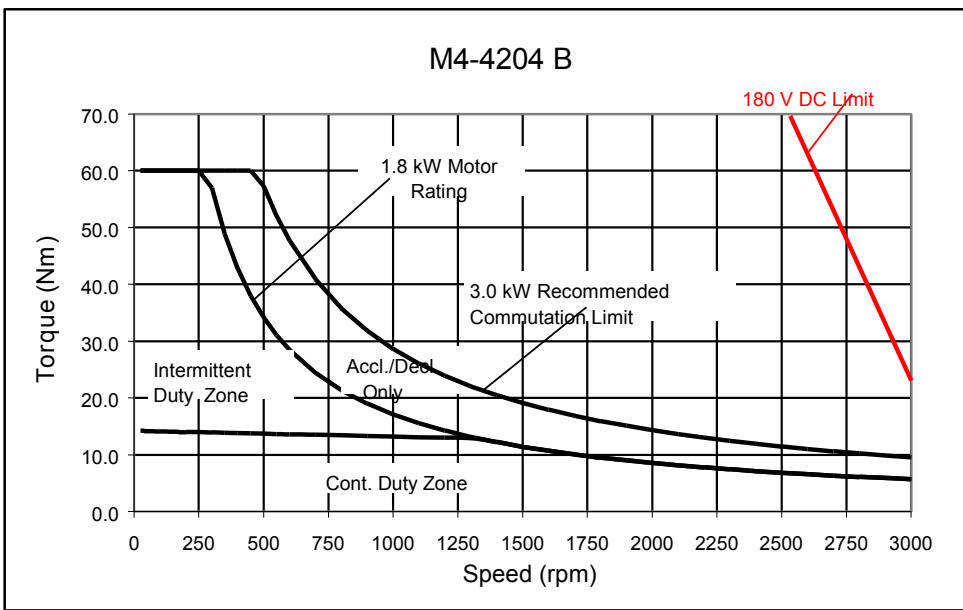
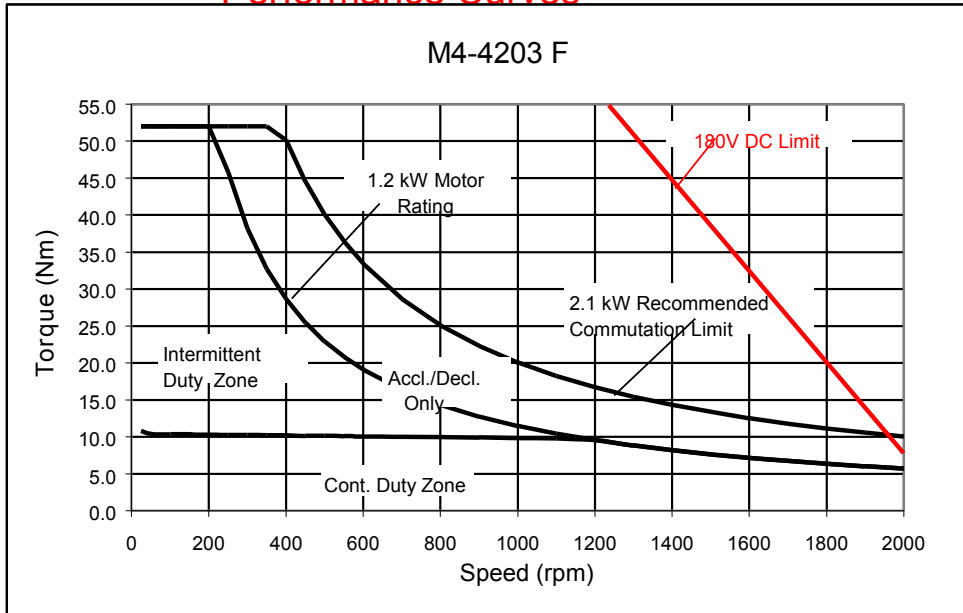
Performance Curves



Performance Curves

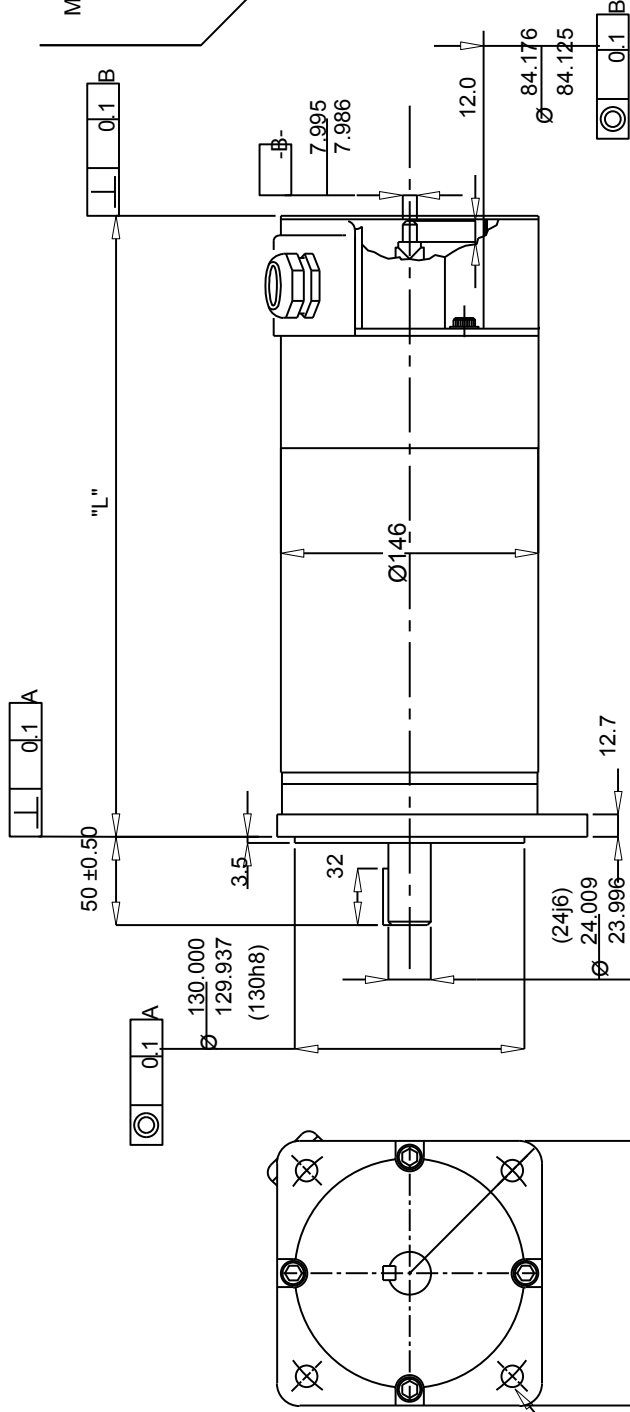


Performance Curves



Tach Leads - 450 Length
(Pg 7 Cable Gland)

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



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

(3) Holes - M4 Tap
equispaced as shown
on 93.65 P.C.D.
(EndCover Mounting Holes)

Key & Keyway Detail

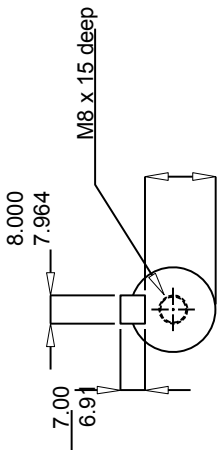
Notes:-

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.

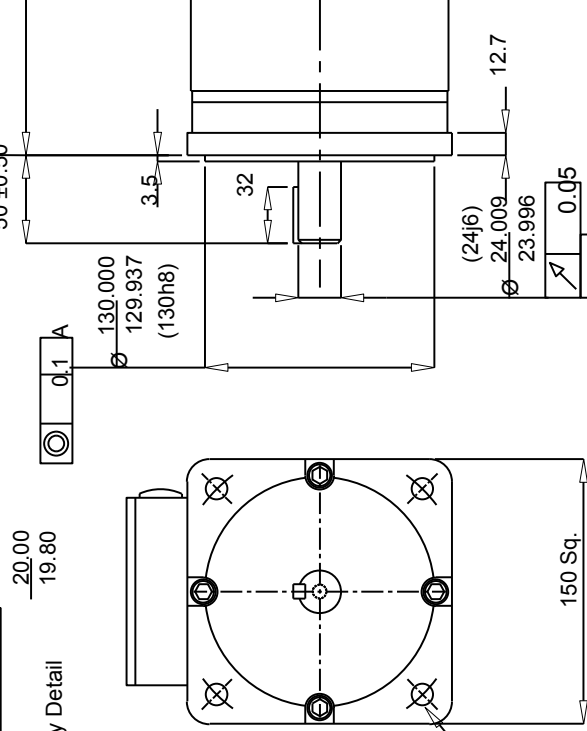
Tolerances:
X.X ± 0.3
X.XX ± 0.1
Ang. Dim. = ± 1°

Issue	ECO. No.	Date	Name	App'd	Norm
			Drawn	21/5/08	POB
			App'd		
			Name		
			Date		

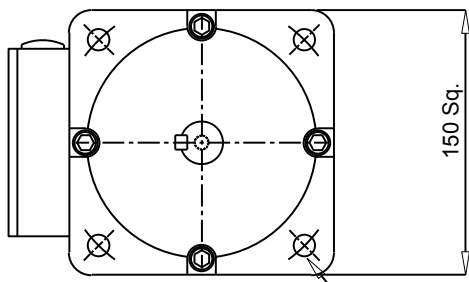
Scale: NTS	Weight:
Material: SEE NOTES	Remove all burrs and sharp corners
Rare Earth Servomotor with Tach M4-420X-21001-000	
M4-420X-21001-000	
Sheet 1	of 1



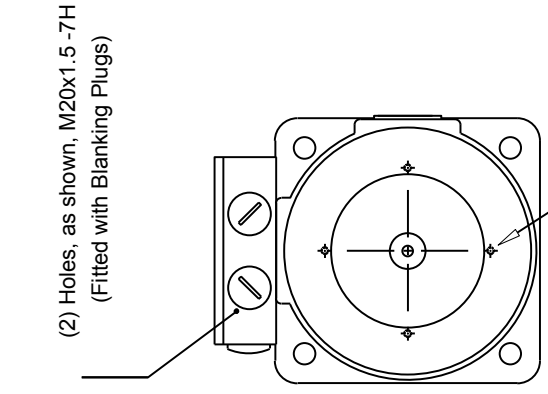
Key & Keyway Detail



"L"

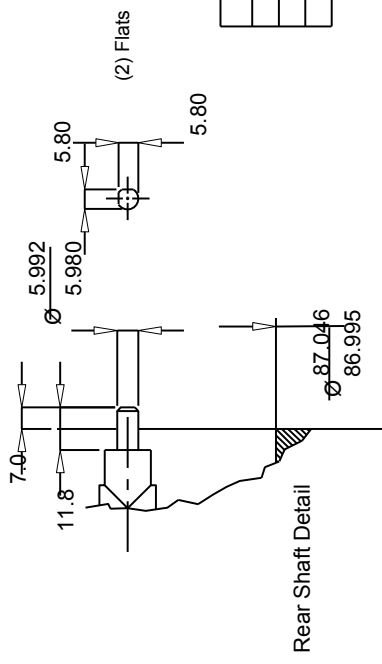


(4) Holes, Ø 12 thru' equispaced as shown on Ø 165 PCD



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

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



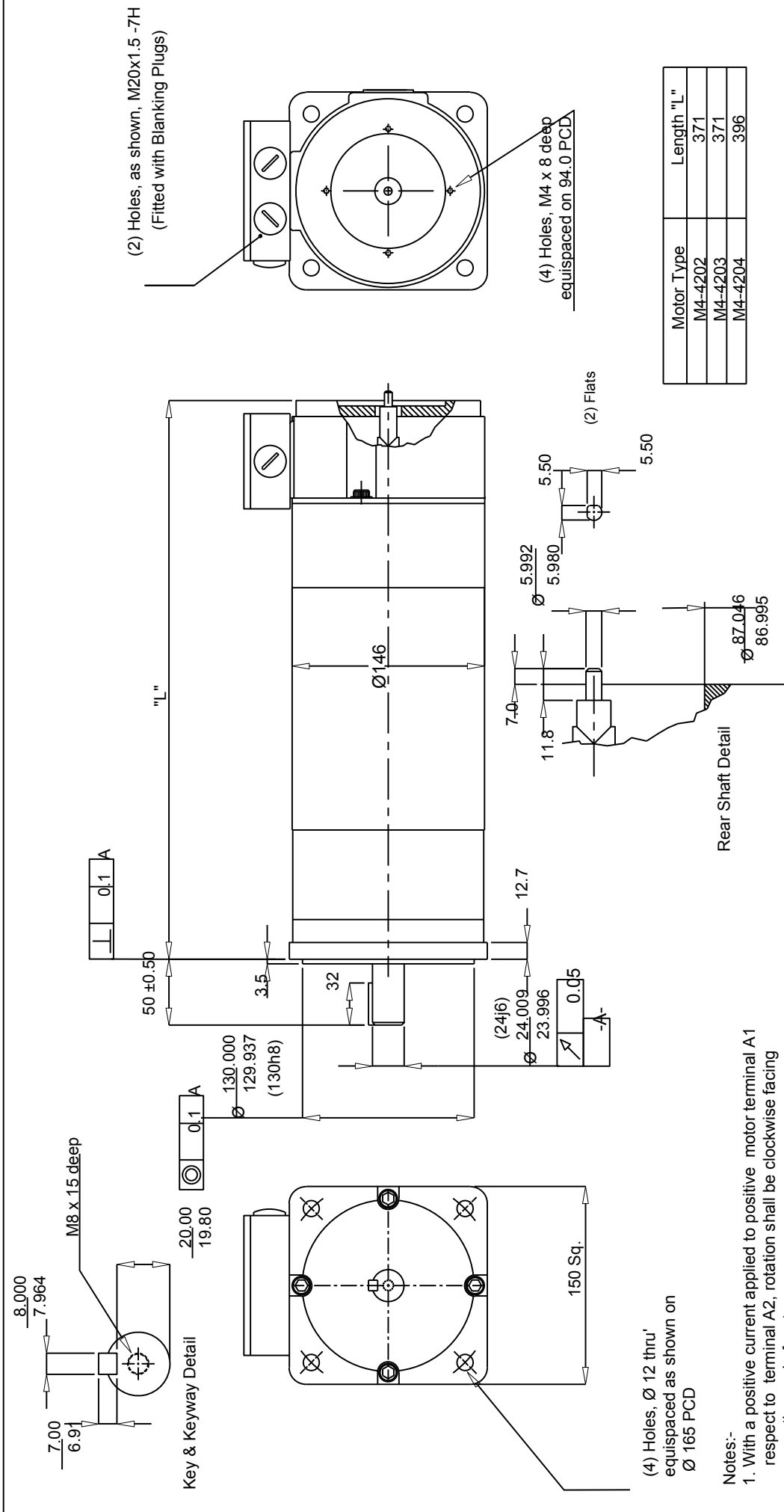
Rear Shaft Detail

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

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)
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.

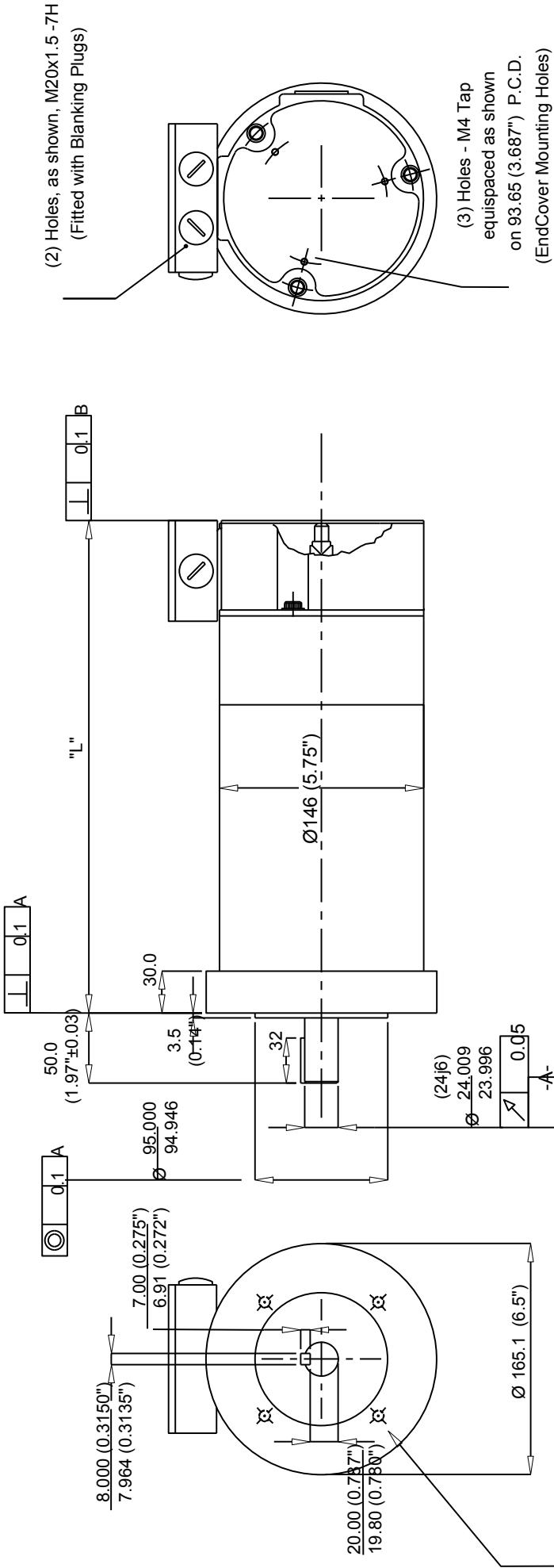
Scale :		NTS		Weight :	
Material :				SEE NOTES	
Tolerances:				Remove all burrs and sharp corners.	
X.X = ± 0.3		Name			
X.XX = ± 0.1		Date			
Ang. Dim. = ± 1°		Drawn	9/9/13		
		App'd			
		Issue	ECO.	No.	Date
				Name	App'd
				Name	App'd
Rare Earth Servomotor with Tach					
M4-420X-21049-410					
M4-420X-21049-410					
Sheet 1 of 1					



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

Scale: NTS	Weight:												
Material: SEE NOTES	Remove all burrs and sharp corners												
Rare Earth Servomotor with Tach													
M4-420X-21149-410													
<table border="1"> <thead> <tr> <th>Issue</th> <th>ECO. No.</th> <th>Date</th> <th>Name</th> <th>App'd</th> <th>Norm</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>Drawn 20/2/13</td> <td>POB</td> <td></td> </tr> </tbody> </table>		Issue	ECO. No.	Date	Name	App'd	Norm	1			Drawn 20/2/13	POB	
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1			Drawn 20/2/13	POB									
<table border="1"> <thead> <tr> <th>Tolerances:</th> <th>Date</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>X.X = ± 0.3</td> <td></td> <td></td> </tr> <tr> <td>X.XX = ± 0.1</td> <td></td> <td></td> </tr> <tr> <td>Ang. Dim. = ± 1°</td> <td></td> <td></td> </tr> </tbody> </table>		Tolerances:	Date	Name	X.X = ± 0.3			X.XX = ± 0.1			Ang. Dim. = ± 1°		
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X.X = ± 0.3													
X.XX = ± 0.1													
Ang. Dim. = ± 1°													
M4-420X-21149-410													
Sheet 1 of 1													

- 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
 - Brake Data :- 24 V, 20 Nm, 1.1 A (2 white leads)
(Brake has no polarity)
 - All dimensions in mm.



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

(3) Holes - M4 Tap
equispaced as shown
on 93.65 (3.687") P.C.D.
(EndCover Mounting Holes)

Model	Length "L" Max	Model	Length "L" Max
M4-4203	297 (11.68")	M4-4207	398 (15.68")
M4-4204	322 (12.68")	M4-4208	424 (16.68")
M4-4205	347 (13.68")	M4-4209	449 (17.68")
M4-4206	373 (14.68")		

- 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 T2.
 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	
Tolerances. X.XX = ± 0.015 X.XXX = ± 0.005 Ang. Dim. = ± 1°		Name Date Drawn 1/10/12 POB	
Issue ECO_No. Date Name App'd Norm		Rare Earth Motor M4-420X-41049-000	
M4-420X-41049-000		Sheet 1 of 1	