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

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CALLAN TECHNOLOGY

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

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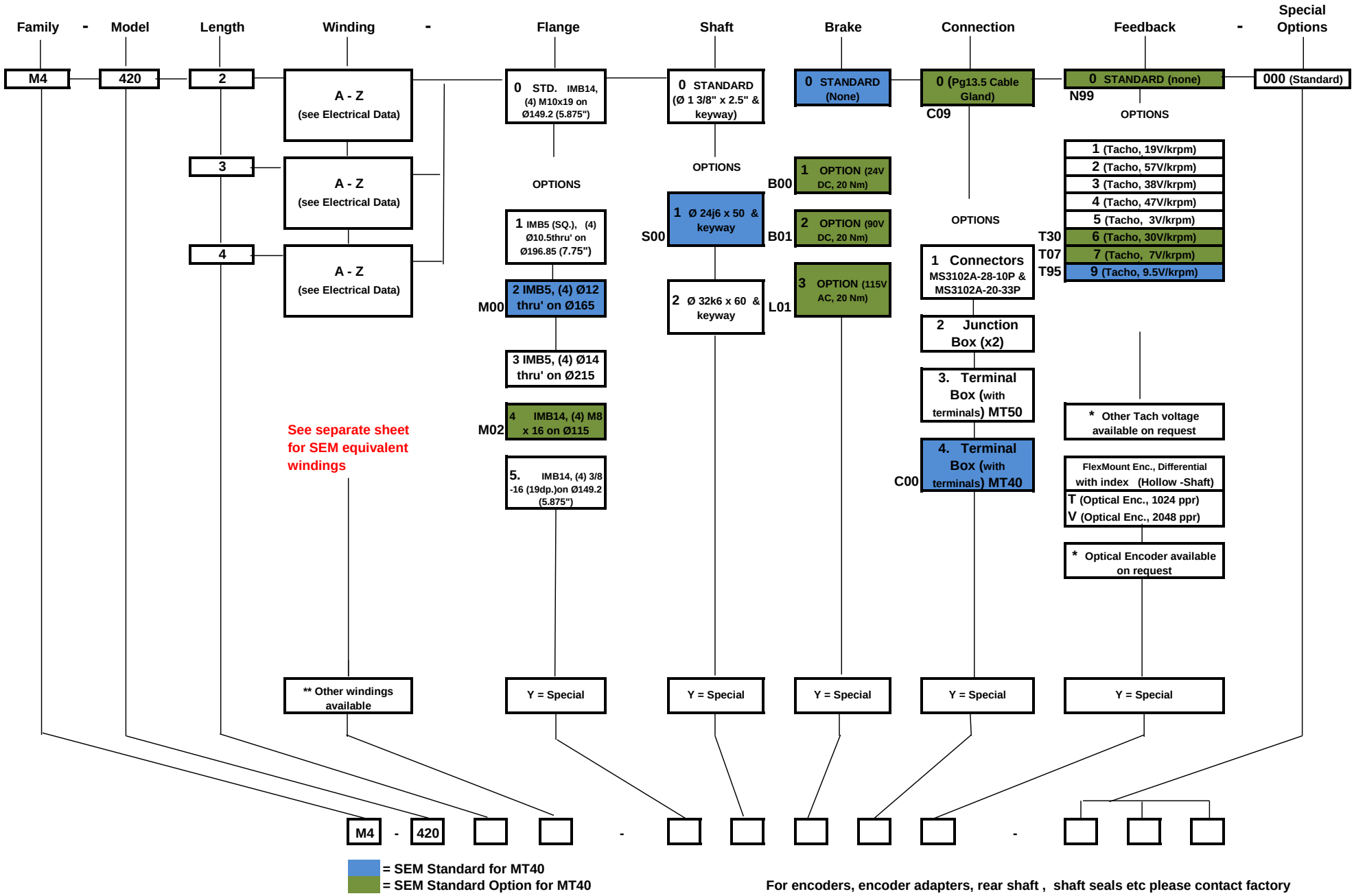
M4-420X Code Table (Replacements for SEM MT40)

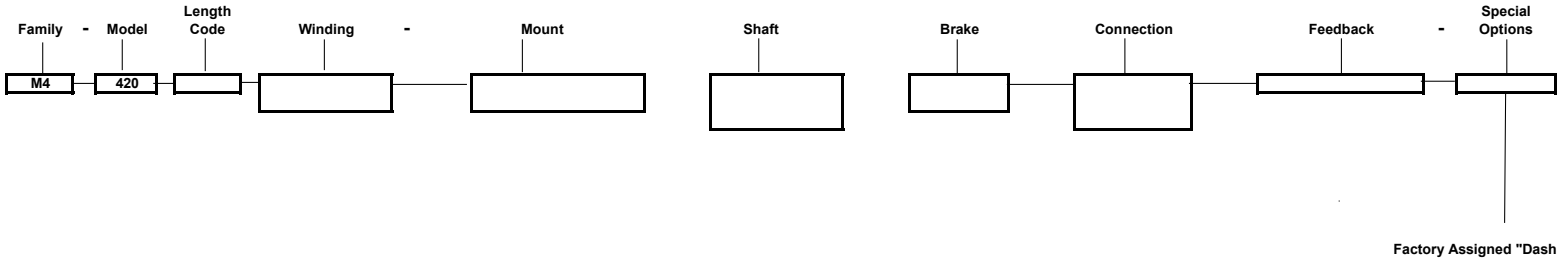


= SEM Standard for MT40
= SEM Standard Option for MT40

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**

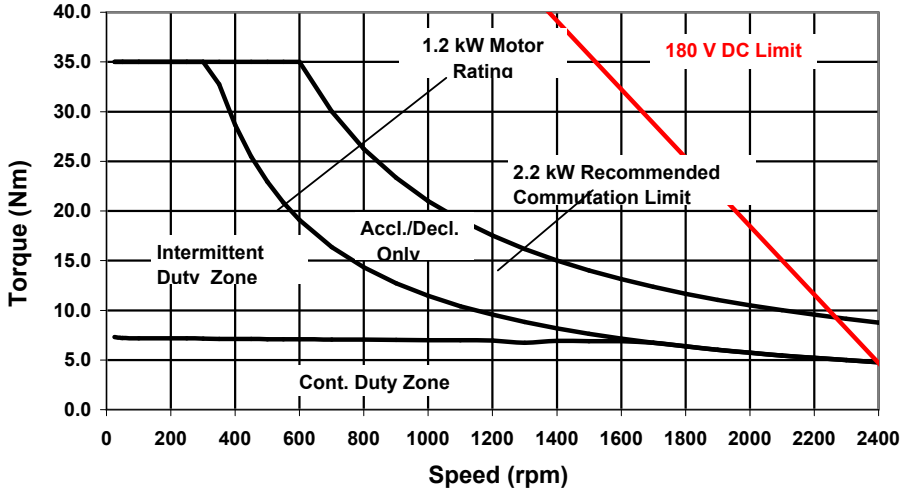
-410 **Standard motor as specified by order code, with thermostat, with rear shaft ext., rear pilot & mounting holes compatible to MT40**

Accessories (must be specified and ordered separately)

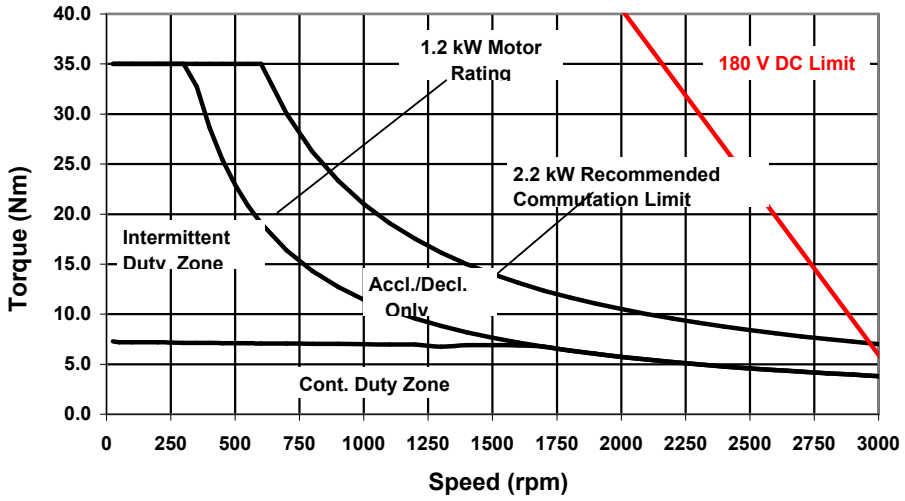
Motor		M4-4202				M4-4203					M4-4204	
Winding		G	F	A		F	E	B	F		B	C
replaces :-		(MT40P4-76)	(MT40P4-61)	(MT40P4-38)		(MT40W4-90)	(MT40W4-68)	(MT40W4-45)	(MT40ZD4-90)		(MT40ZD4-60)	(MT40ZD4-45)
Power, P (kW) (Brush cont. Limit)		1.2	1.2	1.2		1.2	1.3	1.7	1.2		1.79	1.86
Max Speed, Nmax (rpm)		2,400	3,000	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, V_T (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., K_T (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, J_M (kgm^2)		$61x10^{-4}$				$85x10^{-4}$					$110x10^{-4}$	
Static Friction, T_F (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, K_G (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

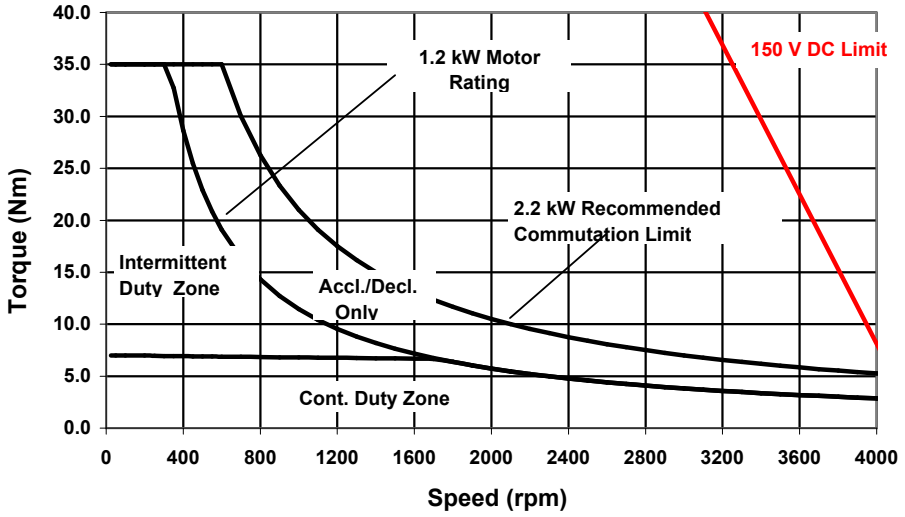
M4-4202 G



M4-4202 F

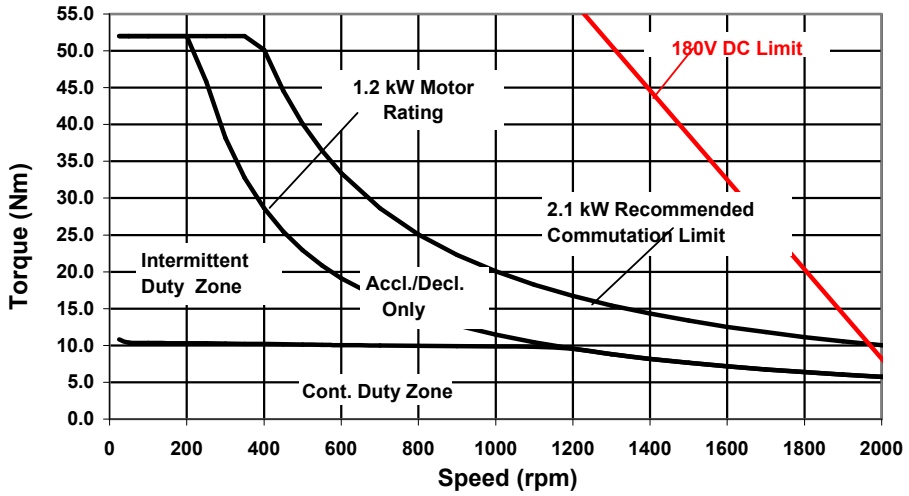


M4-4202 A

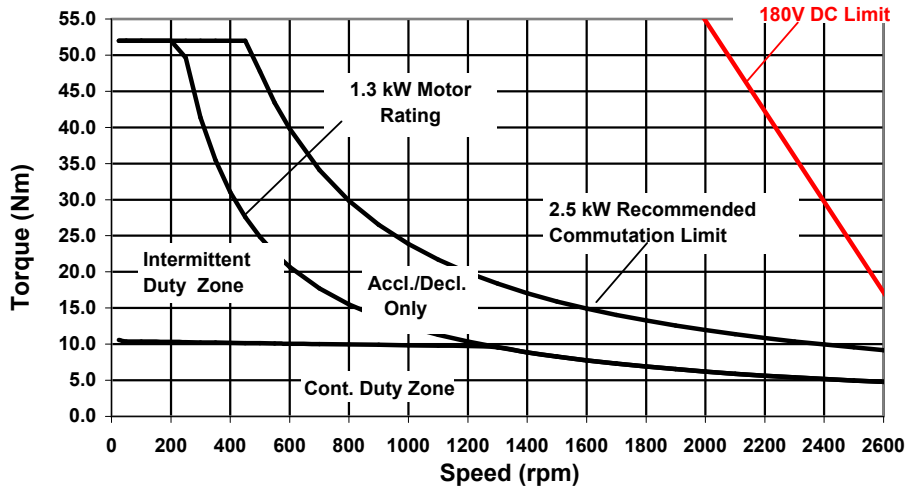


Performance Curves

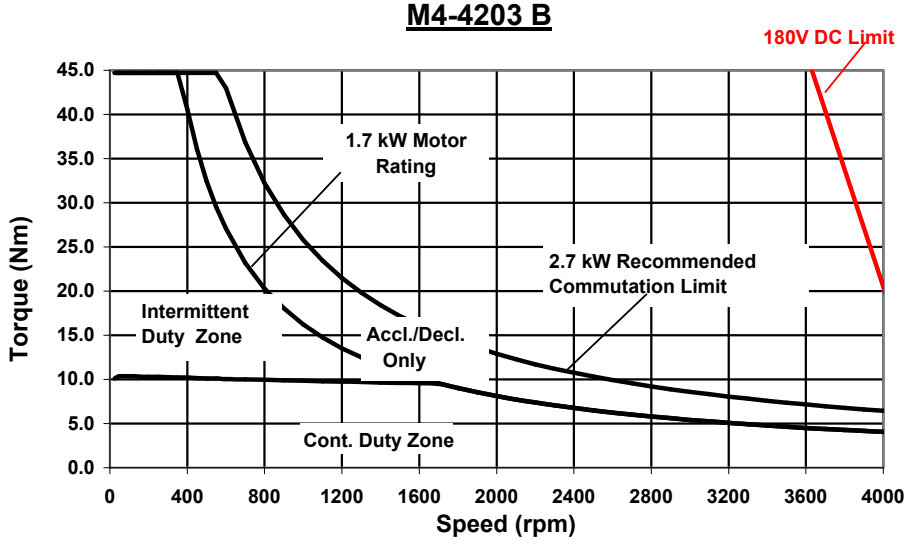
M4-4203 F



M4-4203 E

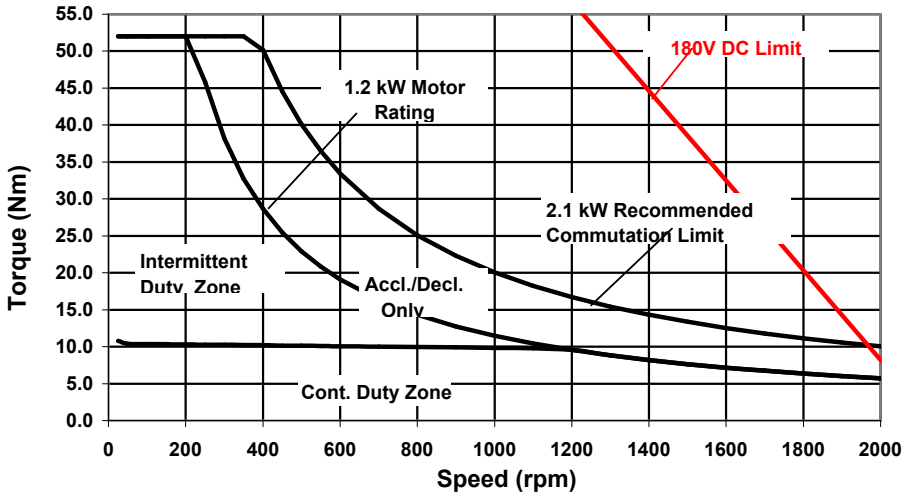


M4-4203 B

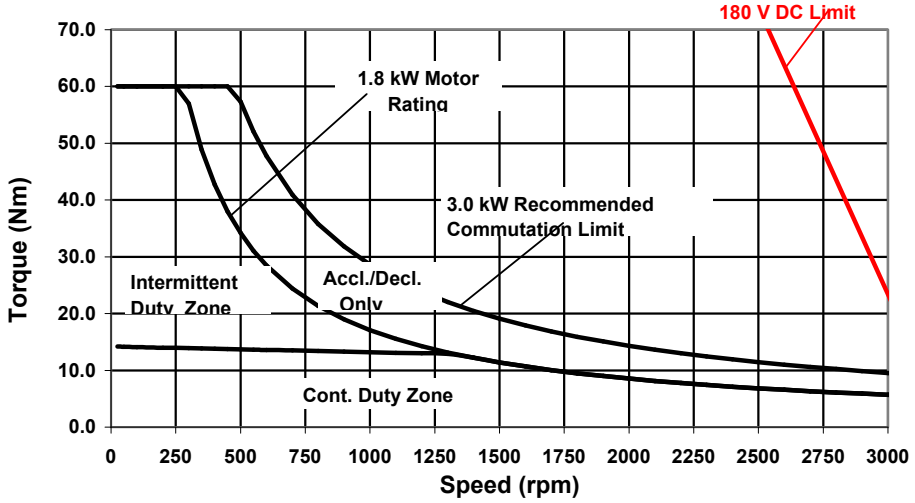


Performance Curves

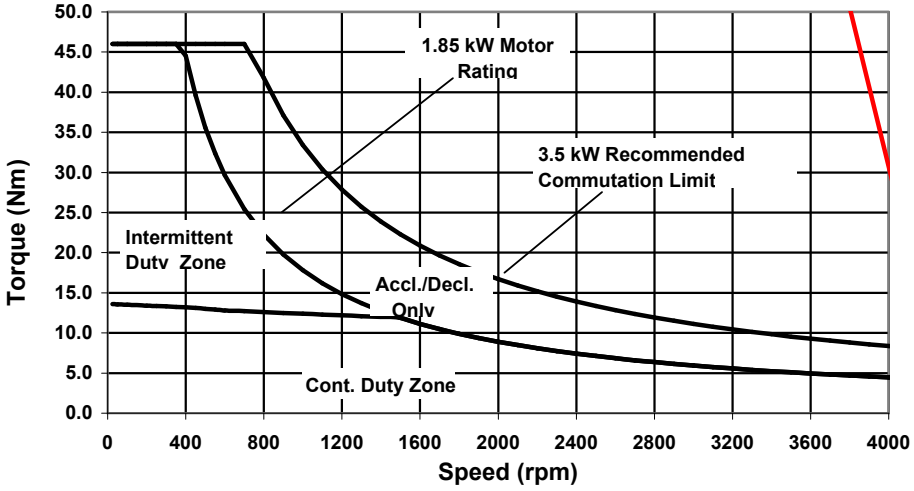
M4-4203 F

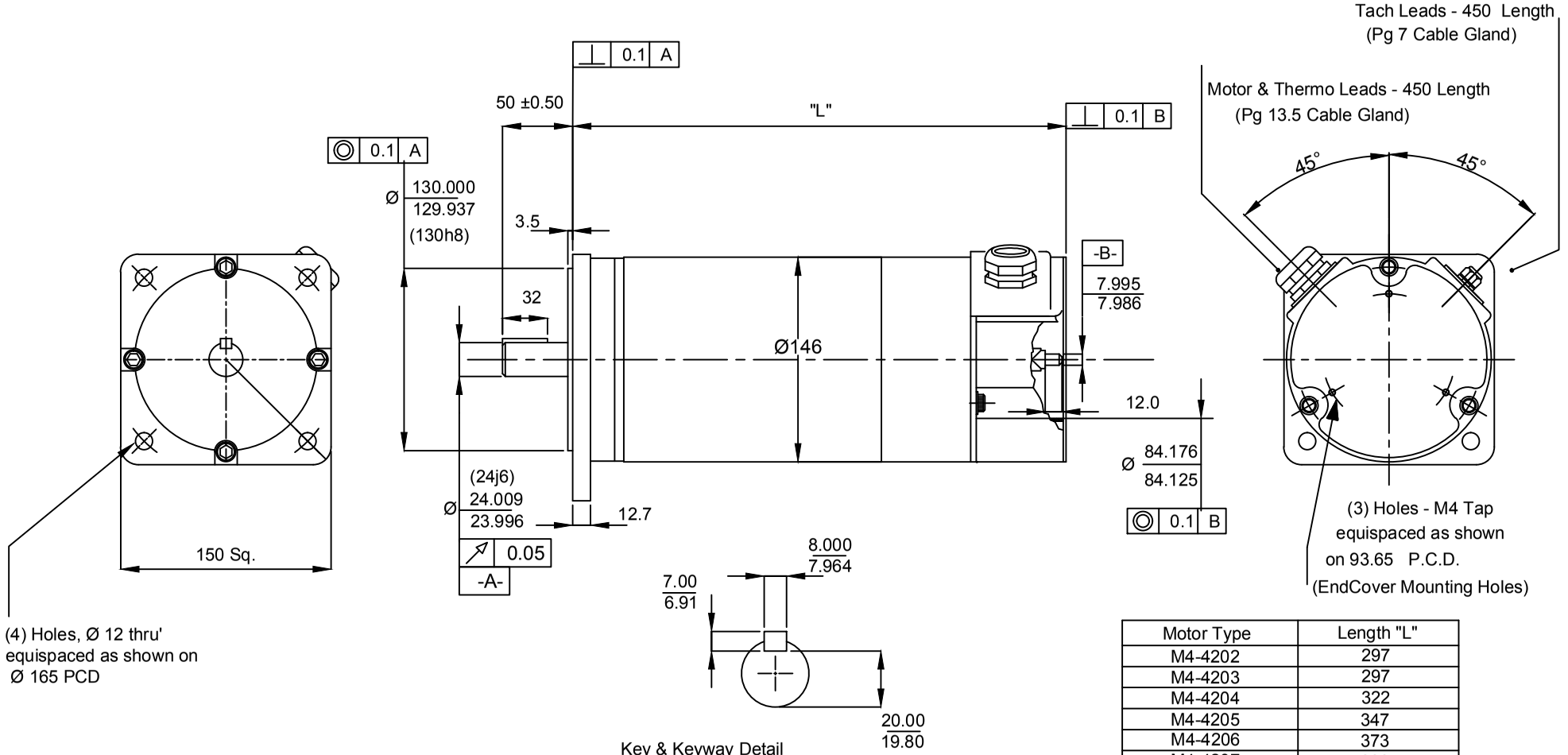


M4-4204 B



M4-4204 C





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

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.

Issue	ECO. No.	Date	Name	App'd

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

	Date	Name
Drawn	21/5/08	POB
App'd		
Norm		

Scale : NTS

Weight :

Material : SEE NOTES

Remove all burrs and sharp corners

Rare Earth Servomotor with Tach
M4-420X-21001-000

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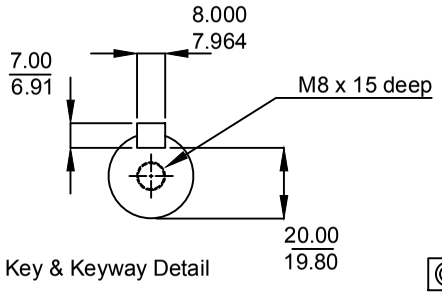
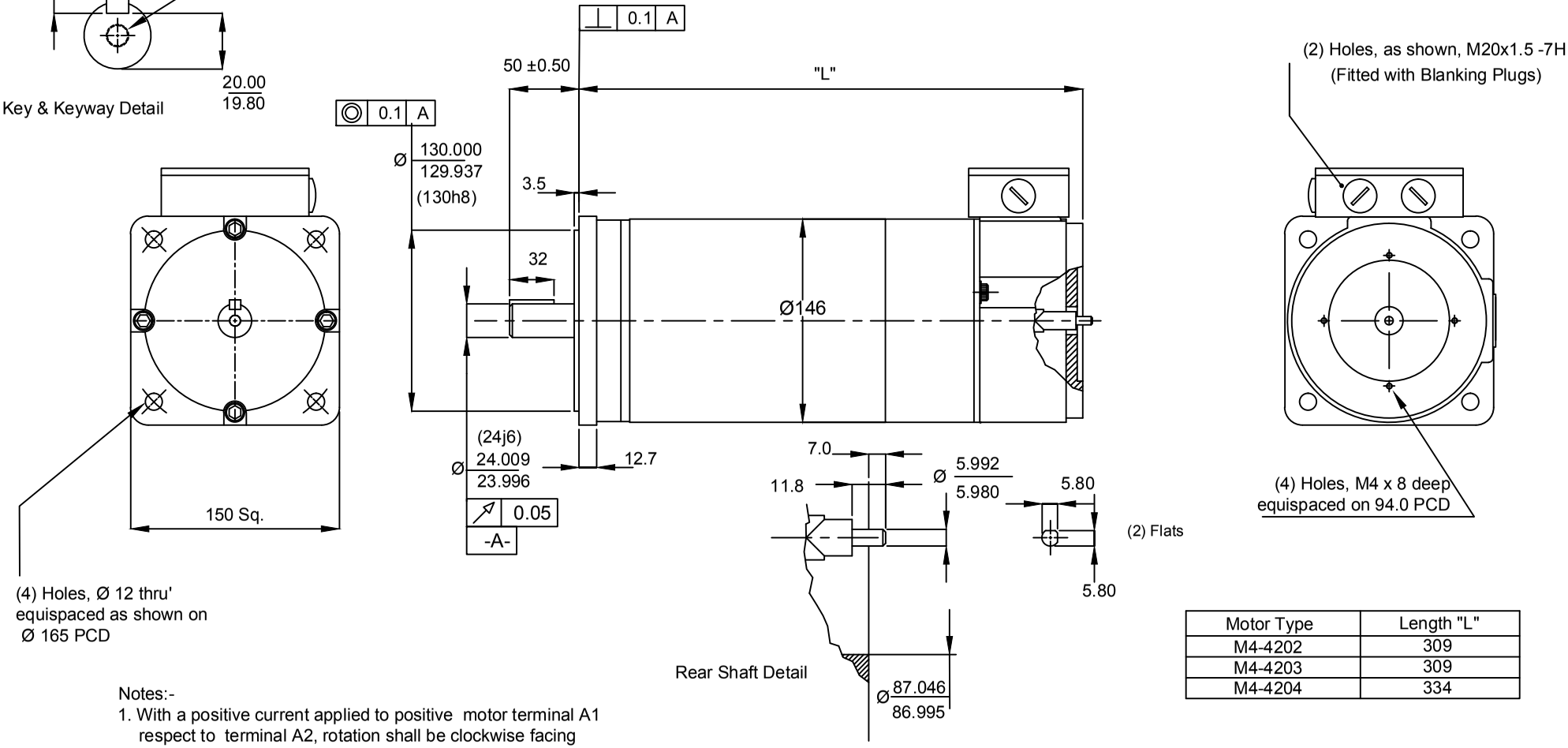
M4-420X-21001-000

Sheet 1 of 1



Key & Keyway 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 T1of 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.

Issue	ECO. No.	Date	Name	App'd
1				

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

	Date	Name
Drawn	9/9/13	POB
App'd		
Norm		

Scale : NTS

Weight :

Material : SEE NOTES

Remove all burrs and sharp corners

Rare Earth Servomotor with Tach
M4-420X-21049-410

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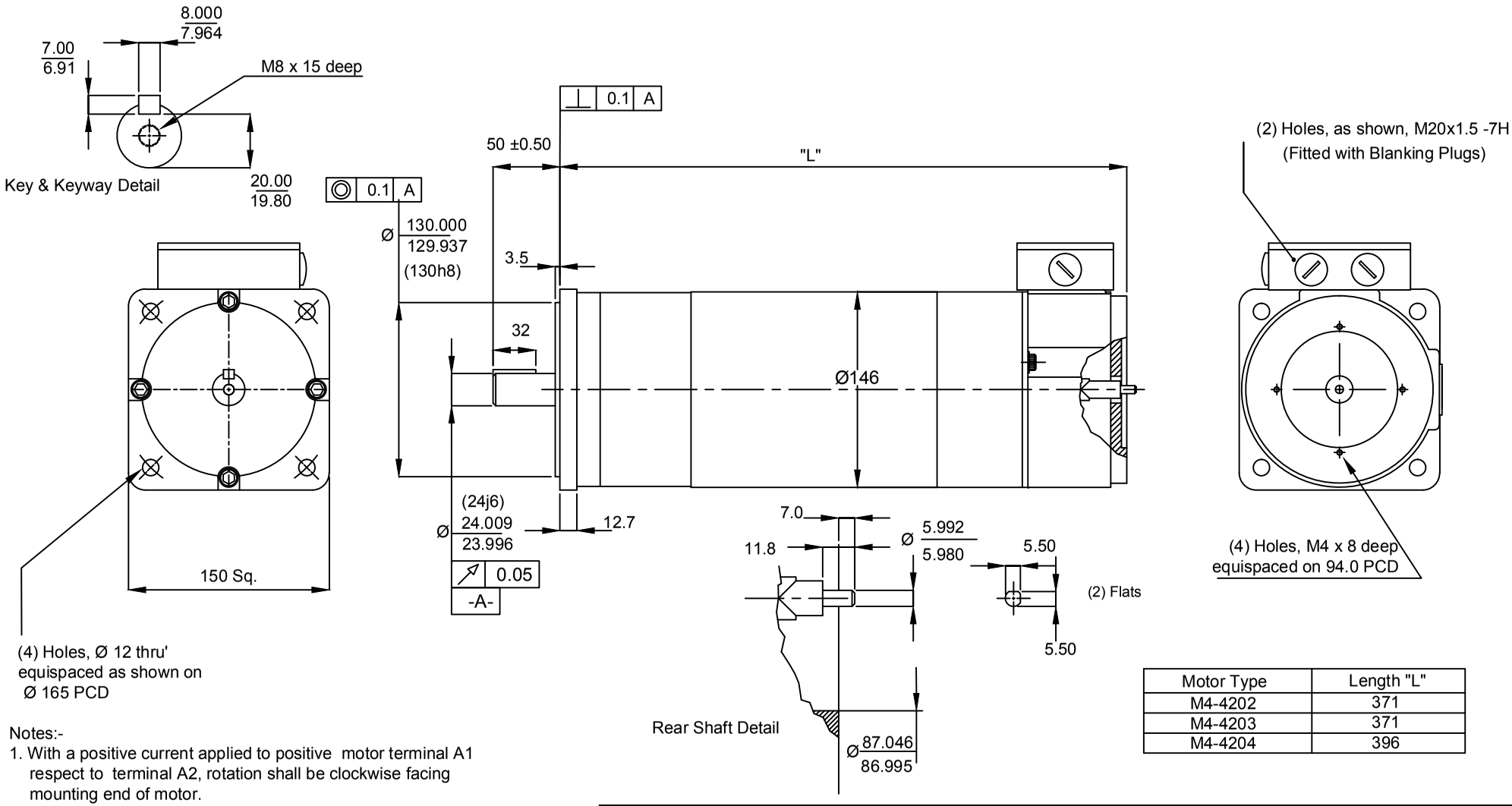
M4-420X-21049-410

Sheet 1 of 1



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)

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

5. All dimensions in mm.

Issue	ECO. No.	Date	Name	App'd
1				

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

	Date	Name
Drawn	20/2/13	POB
App'd		
Norm		

Scale : NTS

Weight :

Material : SEE NOTES

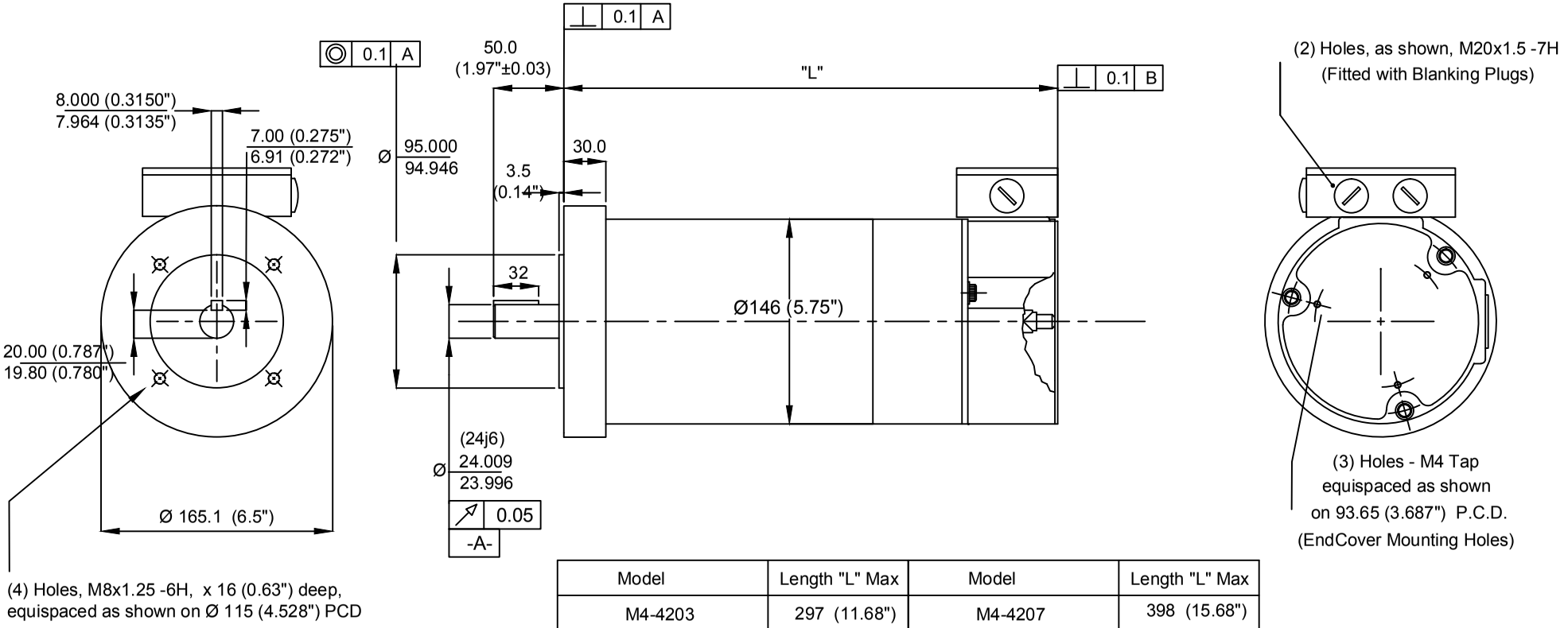
Remove all burrs and sharp corners

Rare Earth Servomotor with Tach
M4-420X-21149-410

Callan Technology Ltd.

M4-420X-21149-410

Sheet 1 of 1



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.

Issue	ECO. No.	Date	Name	App'd

Tolerances.
X.XX = ± 0.015
X.XXX= ± 0.005
Ang. Dim. = ± 1°

	Date	Name
Drawn	1/10/12	POB
App'd		
Norm		

Scale : NTS

Weight :

Material : SEE NOTES

Remove all burrs and sharp corners

Rare Earth Motor

M4-420X-41049-000

Callan Technology Ltd.

M4-420X-41049-000

Sheet 1 of 1