



M4-295X DC Servomotors

Direct Replacement of SEM MT30* 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

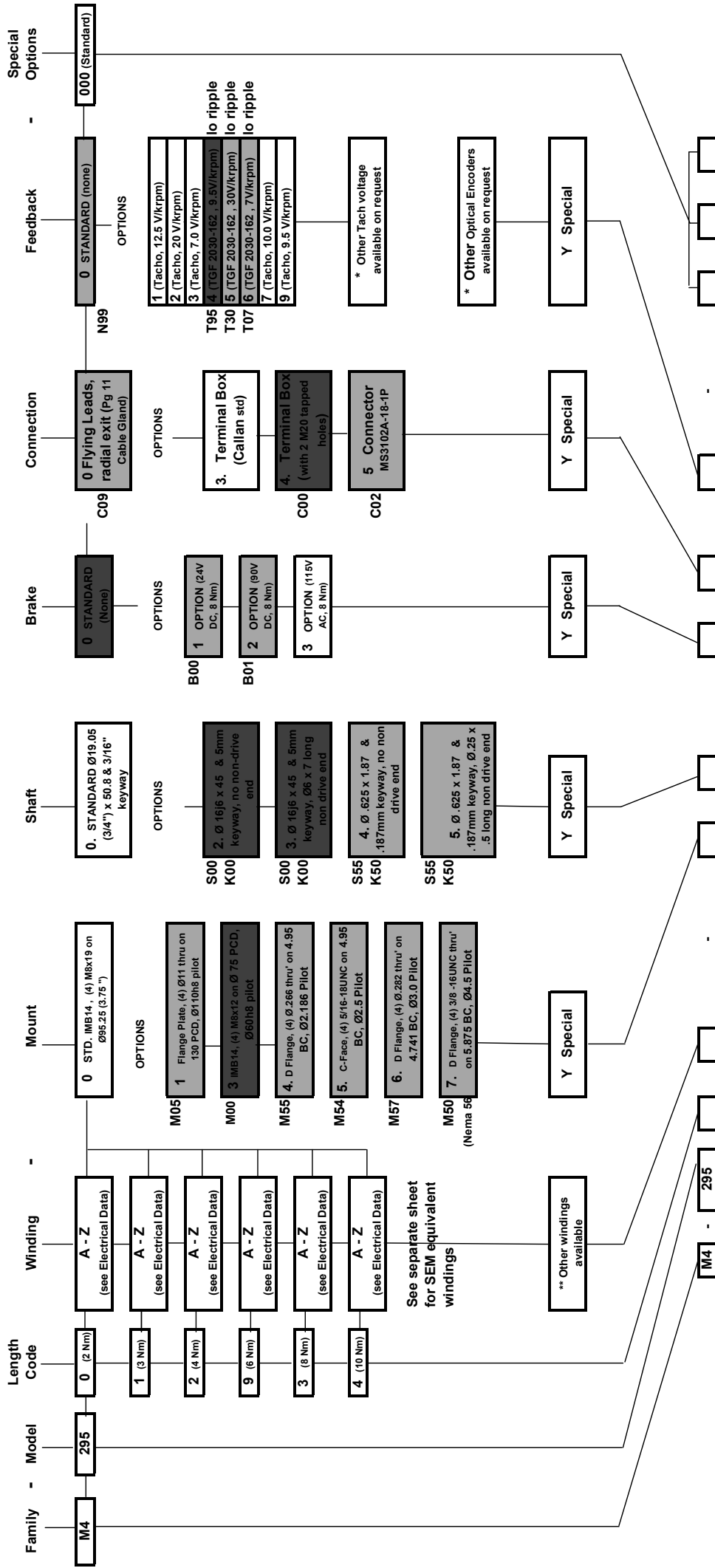
* MT is a tradename of SEM Ltd, UK, brush DC servomotors





SEM	Callan Technology
MT30E4-52	M4-2950 M
MT30E4-32	M4-2950 Q
MT30E4-25	M4-2950 S
MT30E4-20	M4-2950 A
MT30F4-52	M4-2950 M
MT30F4-45	M4-2950 F (updated 11/9/11)
MT30F4-39	M4-2950 U
MT30F4-25	M4-2950 S
MT30H4-65	M4-2951 L
MT30H4-44	M4-2951 I
MT30H4-33	M4-2951 C
MT30H4-22	M4-2951 E
MT30M4-59	M4-2951 K
MT30M4-48	M4-2951 J
MT30M4-38	M4-2951 H
MT30M4-24	M4-2951 G
MT30R4-58	M4-2952 I
MT30R4-46	M4-2952 B (updated 3/12/12)
MT30R4-37	M4-2952 A
MT30R4-25	M4-2952 F
MT30U4-57	M4-2959 E
MT30U4-48	M4-2959 F
MT30U4-36	M4-2959 A
MT30U4-26	M4-2959 G
MT30Z4-85	M4-2959 H
MT30Z4-61	M4-2959 B
MT30Z4-37	M4-2959 A

M4-295X Code Table (Replacements for SEM MT30)

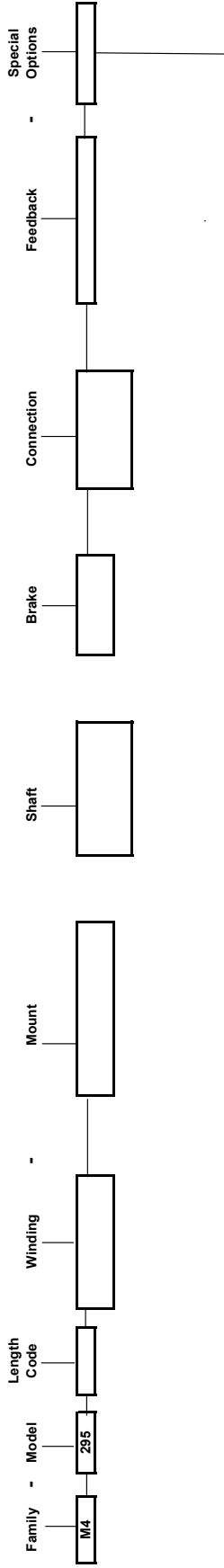


█ = SEM Standard for MT30
 █ = SEM Standard Option for MT30

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

Example : M4 - 295 3 A - 0 0 0 1 1 - 0 0 0 0

M4-295X Code Table (Replacements for SEM MT30)



Factory Assigned "Dash I

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

- 000 Standard motor as specified by order code, no thermostat, no rear shaft ext (plain endcover)
- 124 Motor as specified by order code, no thermostat, rear shaft ext provided Ø6mm (motor rear compatible with SEM MT30)
- 140 Motor as specified by order code, with thermostat, no rear shaft ext (plain endcover)
- 142 Motor as specified by order code, with thermostat, rear shaft ext provided Ø6mm (motor rear compatible with SEM MT30)

Accessories (must be specified and ordered separately)

- M75701-567 Encoder Adapter (BEC 260 or 755) Suitable for motors -124 or -142 (replaces SEM A04)
- M35701-100 Encoder Cover (BEC 260 or 755) Suitable for motors -124 or -142 Adapts to item M75701-567 above (replaces SEM G01/G02)

Motor	M4-2950				M4-2950			
	Winding				S			
	replaces :-				A			
Power, P (W) (Brush cont. Limit)	(MT30E4-52)	(MTE4-32)	(MT30E4-25)	(MT30E4-20)	(MT30F4-52)	(MT30F4-45)	(MT30F4-39)	(MT30F4-25)
Max Speed, Nmax (rpm)	0.5	0.7	0.75	0.75	0.5	0.5	0.52	0.75
Cont. Torque Mo (Nm)	2,700	4,000	4,000	4,000	2,700	3,000	3,600	4,000
Current @ Cont. Torque, Io (A)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Peak Torque, Mmax (Nm)	4.3	6.9	9.2	11.7	4.3	4.8	5.7	9.2
Current @ Peak Torque, Ip (A)	13	17.2	15.5	12.9	13	14.7	16.5	15.5
Max Terminal Voltage, VT (V)	32	79	90	90	32	42	60	90
Back EMF Const, Ke (V/krpm)	140	130	100	80	140	140	140	100
Torque Const., KT (Nm/A)	51	31	23.8	18.2	51	45.5	38.2	23.8
DC Resistance, R (Ω)	0.482	0.293	0.225	0.172	0.482	0.43	0.361	0.225
Inductance, L (mH)	2.9	1.1	0.55	0.32	2.9	2.2	1.55	0.55
Weight, M (kg)	7.2	2.7	1.55	0.92	7.2	5.7	4	1.55
Inertia, JM (kgm ²)			7.5				7.5	
Static Friction, TF (Nm)			9.4x10 ⁻⁴				9.4x10 ⁻⁴	
Viscous Damping, F1 (Nm/krpm)			0.145				0.145	
			0.03				0.03	

Tachogenerator Option

Tachogenerator Model	TGF 2030
Voltage, Kg (V/krpm)	7.0 / 9.5 / 19.0/30.0
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)	16	16	16
Brake Static Torque (Nm)	12	12	12
Weight (brake + housing) Kg	2.5	2.5	2.5

Motor	M4-2951					M4-2951				
	L (MT30H4-65)	I (MT30H4-44)	C (MT30H4-33)	E (MT30H4-22)		K (MT30M4-59)	J (MT30M4-48)	H (MT30M4-38)	G (MT30M4-24)	
Winding replaces :-	0.6	0.65	0.8	0.82		0.6	0.65	0.7	0.8	
Power, P (W) (Brush cont. Limit)	2,100	3,100	4,000	4,000		2,400	3,000	3,700	4,000	
Max Speed, Nmax (rpm)	2.9	2.9	2.9	2.9		2.9	2.9	2.9	2.9	
Cont. Torque Mo (Nm)	4.9	7.4	10	14.6		5.6	6.8	8.3	12.7	
Current @ Cont. Torque, Io (A)	18.5	26	22	16.1		21.8	24.2	25	18	
Peak Torque, Mmax (Nm)	35	84	90	90		49	70	90	90	
Current @ Peak Torque, Ip (A)	140	140	130	90		140	140	140	100	
Max Terminal Voltage, VT (V)	65.5	43.7	32.6	21.8		57.4	46.5	38.2	24.6	
Back EMF Const, Ke (V/krpm)	0.62	0.413	0.308	0.206		0.543	0.44	0.361	0.233	
Torque Const., KT (Nm/A)	2.65	1.1	0.6	0.27		1.88	1.32	0.85	0.37	
DC Resistance, R (Ω)	8	3.55	2	0.89		6.1	4	2.7	1.1	
Inductance, L (mH)										
Weight, M (kg)			8.75					8.75		
Inertia, JM (kgm ²)			11.7x10 ⁻⁴					11.7x10 ⁻⁴		
Static Friction, TF (Nm)			0.222					0.222		
Viscous Damping, F1 (Nm/krpm)			0.052					0.052		

Tachogenerator Option

Tachogenerator Model	TGF 2030
Voltage, Kg (V/krpm)	7.0 / 9.5 / 19.0/30.0
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)	16	16	16
Brake Static Torque (Nm)	12	12	12
Weight (brake + housing) Kg	2.5	2.5	2.5

Motor		M4-2952			
Winding		I	B	A	F
replaces :-		(MT30R4-58)	(MT30R4-46)	(MT30R4-37)	(MT30R4-25)
Power, P (W) (Brush cont. Limit)		0.8	0.9	0.9	1.0
Max Speed, Nmax (rpm)		2,400	3,000	3,700	3,800
Cont. Torque Mo (Nm)		4.1	4.1	4.1	4.1
Current @ Cont. Torque, Io (A)		7.4	9.5	11.8	17
Peak Torque, Mmax (Nm)		32.5	30	27.1	20.3
Current @ Peak Torque, Ip (A)		73	90	90	90
Max Terminal Voltage, VT (V)		140	140	140	100
Back EMF Const, Ke (V/krpm)		60	45.4	37.8	26.4
Torque Const., KT (Nm/A)		0.567	0.434	0.357	0.25
DC Resistance, R (Ω)		1.26	0.68	0.452	0.25
Inductance, L (mH)		4.2	2.5	1.6	0.78
Weight, M (kg)		10			
Inertia, JM (kgm ²)		14x10 ⁻⁴			
Static Friction, TF (Nm)		0.3			
Viscous Damping, F1 (Nm/krpm)		0.075			

Tachogenerator Option

Tachogenerator Model	TGF 2030
Voltage, KG (V/krpm)	7.0 / 9.5 / 19.0/30.0
Ripple (pk-pk/avg)	2%

Encoder Option- Flexmount Encoder with internal bearing

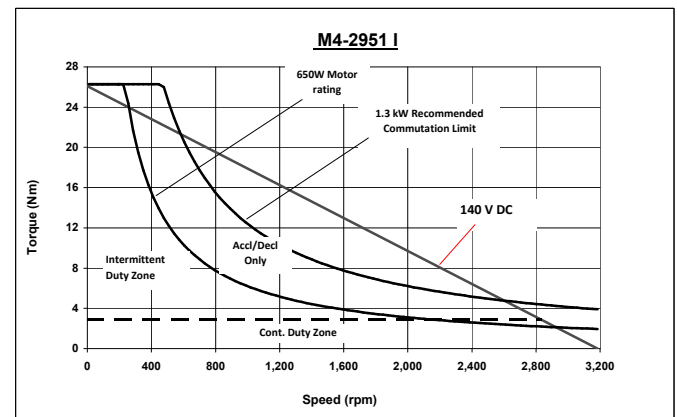
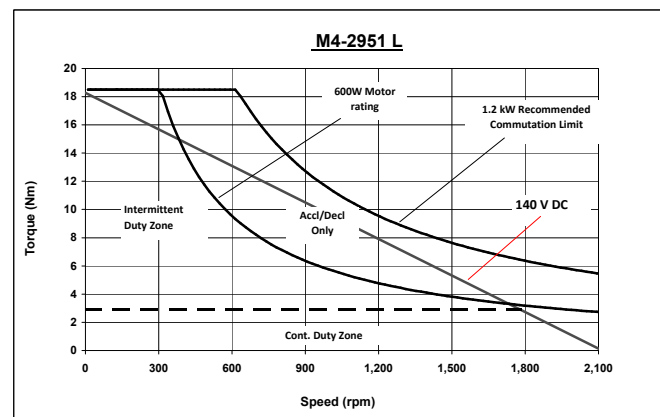
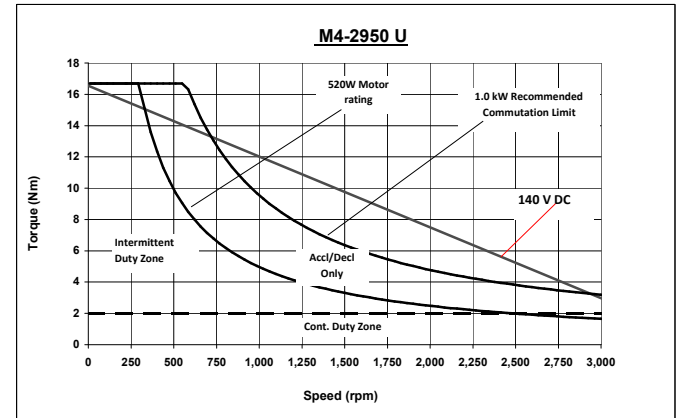
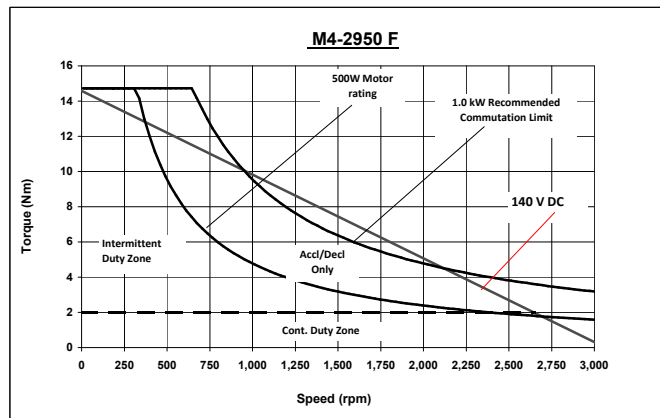
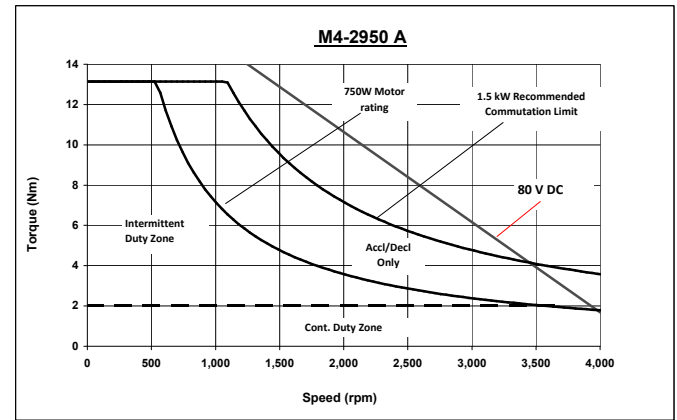
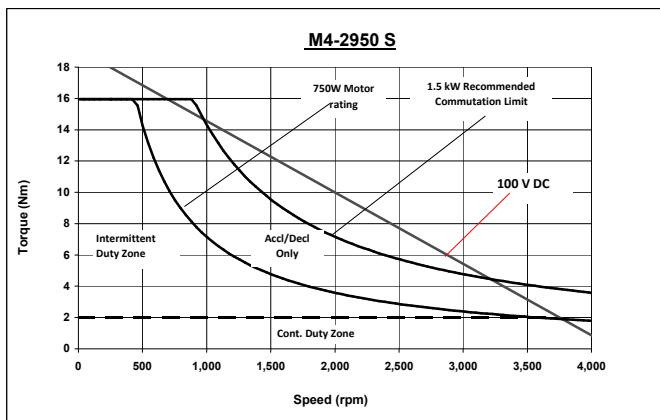
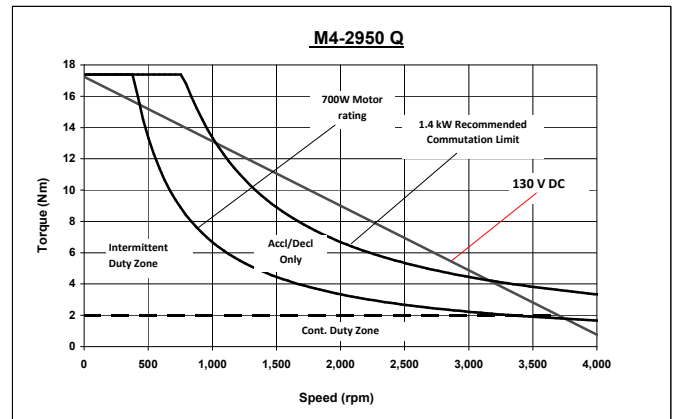
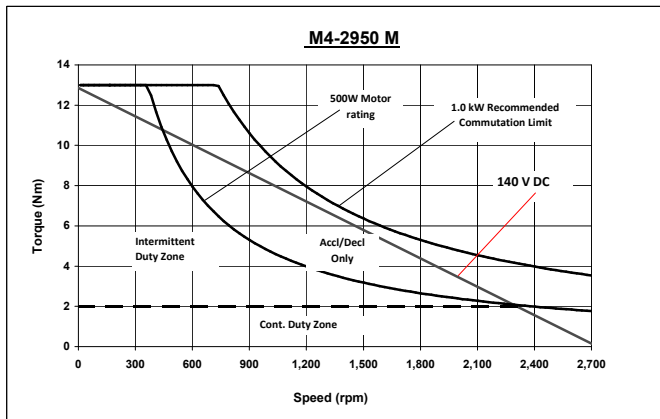
Encoder Type	Incremental (A quad B with index Z & complements)
Power Supply	5V DC ±5%, 200mA max
Output	Line Driver, 20mA max source/sink
Resolution (ppr)	1024 / 2048 / 4096
Frequency Response	120 kHz max

Brake Option

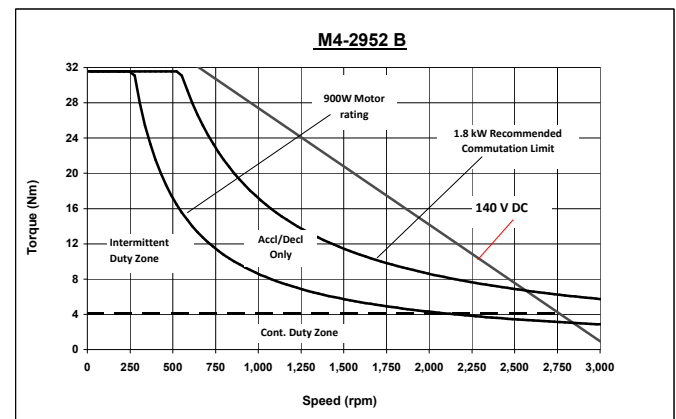
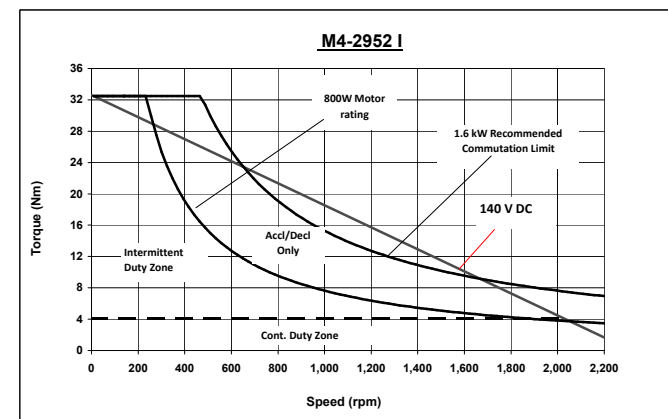
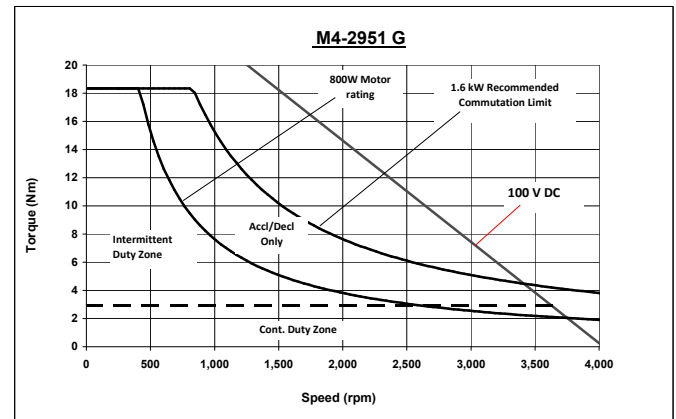
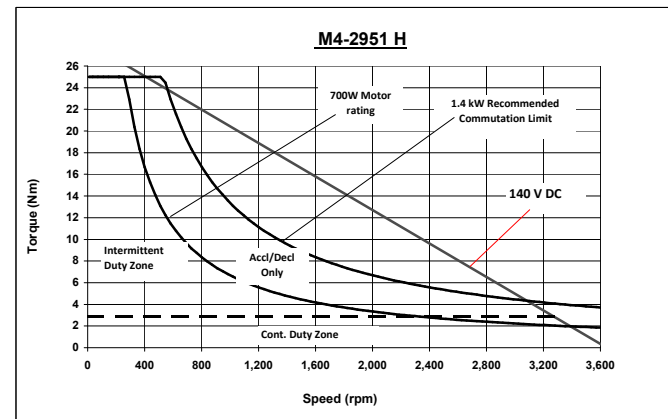
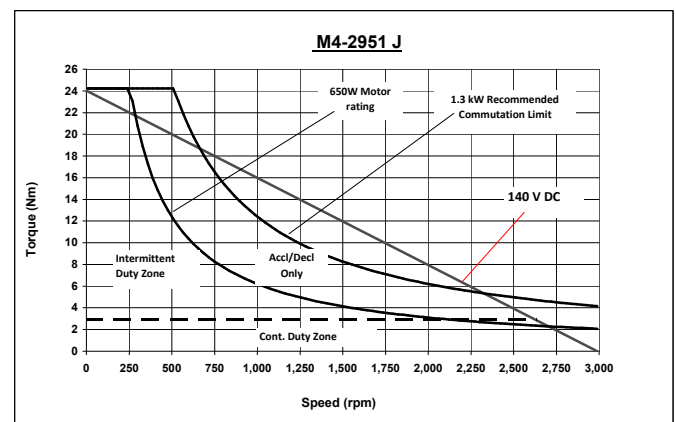
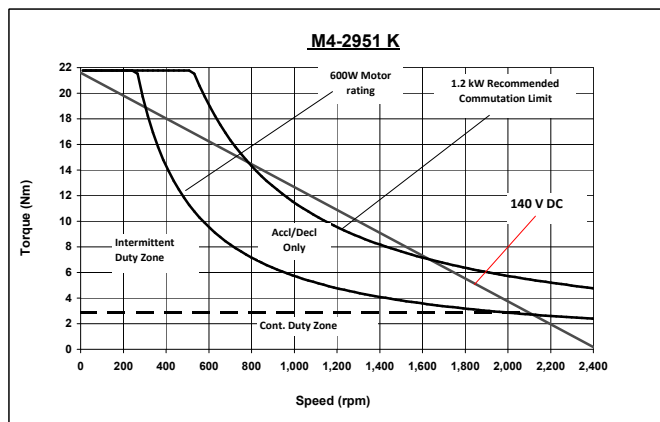
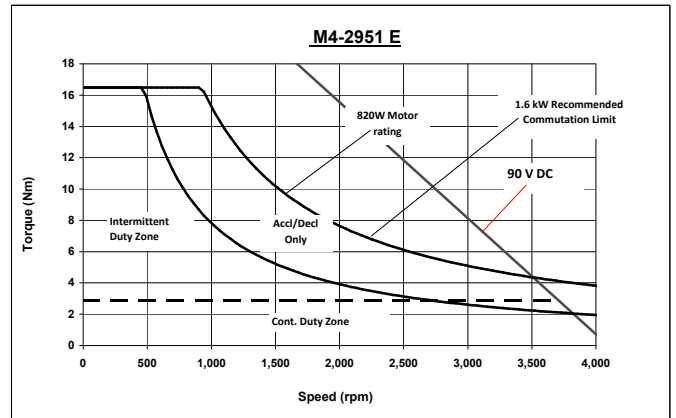
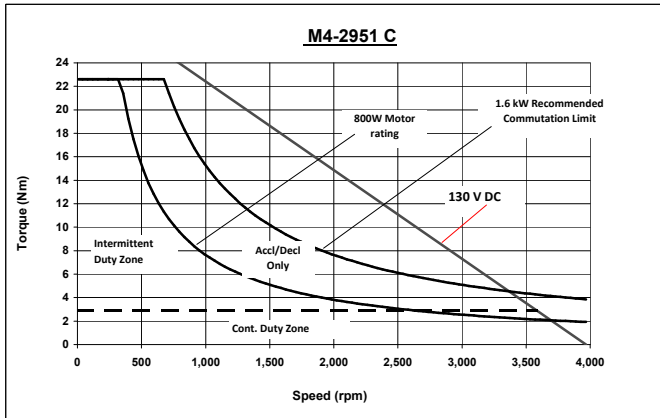
Brake Voltage	24 (DC)	90 (DC)	115 (AC)
Power (Watts)	16	16	16
Brake Static Torque (Nm)	12	12	12
Weight (brake + housing) Kg	2.5	2.5	2.5

Motor	M4-2959				M4-2959			
	E (MT30U4-57)	F (MT30U4-48)	A (MT30U4-36)	G (MT30U4-26)	H (MT30Z4-85)	B (MT30Z4-61)	A (MT30Z4-37)	
Power, P (W) (Brush cont. Limit)	1.0	1.1	1.2	1.2	0.9	1.0	1.2	
Max Speed, Nmax (rpm)	2,500	3,000	3,700	3,700	1,600	2,300	3,700	
Cont. Torque Mo (Nm)	6.0	5.9	5.9	5.8	6.0	6.0	5.9	
Current @ Cont. Torque, Io (A)	11.6	14.4	16	23	7.5	11	16	
Peak Torque, Mmax (Nm)	40	32.5	29.6	22	39.3	42	29.6	
Current @ Peak Torque, Ip (A)	90	90	90	90	56	90	90	
Max Terminal Voltage, VT (V)	140	140	140	100	140	140	140	
Back EMF Const, Ke (V/krpm)	56	44.4	38.8	27.7	88.8	61	38.8	
Torque Const., KT (Nm/A)	0.53	0.42	0.37	0.262	0.84	0.58	0.37	
DC Resistance, R (Ω)	0.64	0.4	0.32	0.16	1.65	0.8	0.32	
Inductance, L (mH)	2.4	1.54	1.2	0.6	6.1	2.9	1.2	
Weight, M (kg)	12.5				12.5			
Inertia, JM (kgm ²)	20.7x10 ⁻⁴				20.7x10 ⁻⁴			
Static Friction, TF (Nm)	0.365				0.365			
Viscous Damping, F1 (Nm/krpm)	0.113				0.113			
Tachogenerator Option								
Tachogenerator Model	TGF 2030							
Voltage, Kg (V/krpm)	7.0 / 9.5 / 19.0/30.0							
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)	16	16	16					
Brake Static Torque (Nm)	12	12	12					
Weight (brake + housing) Kg	2.5	2.5	2.5					

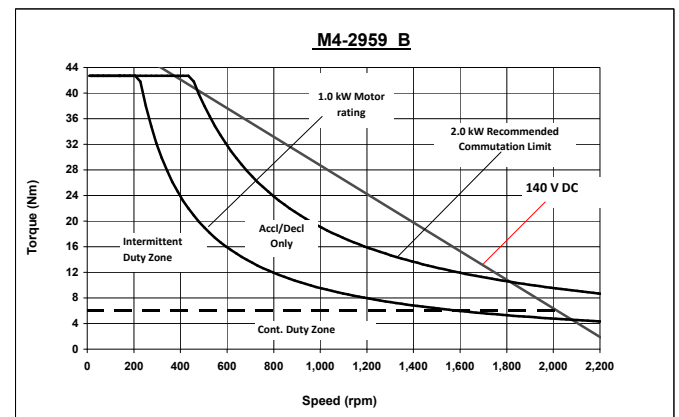
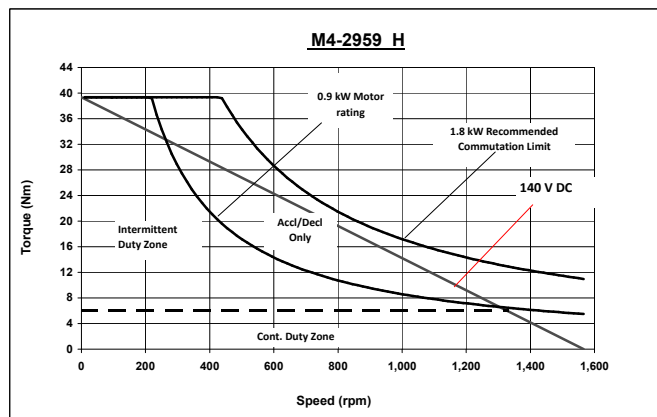
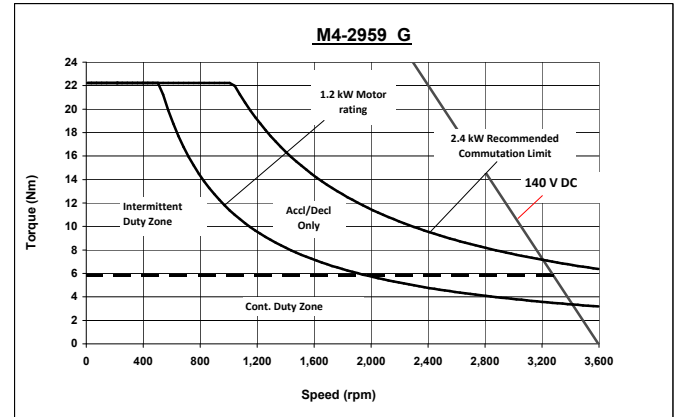
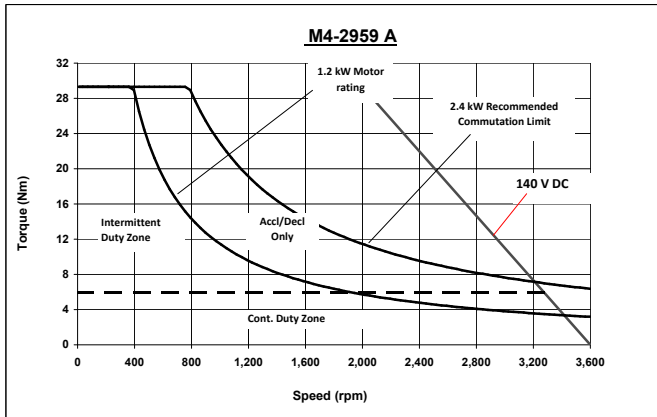
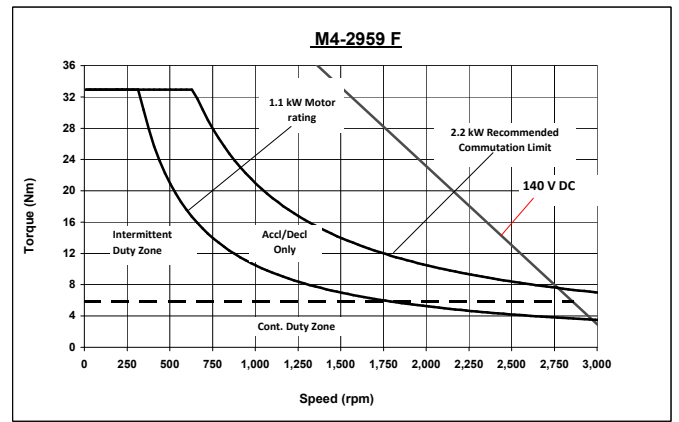
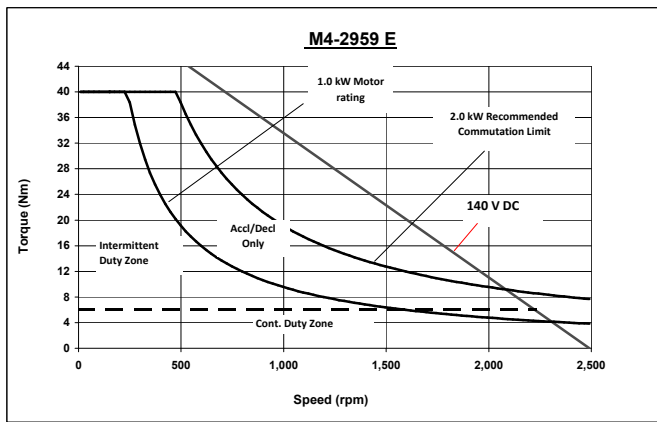
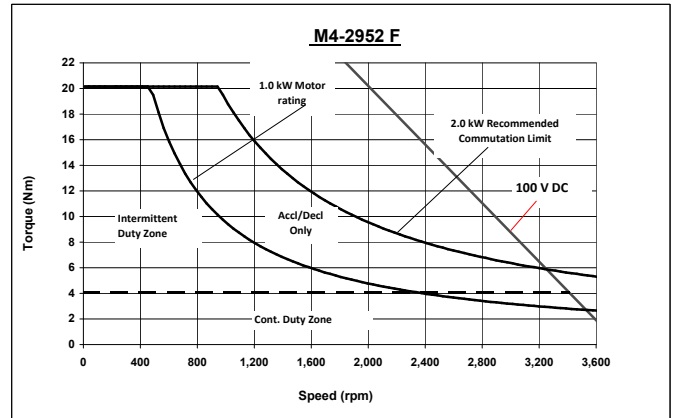
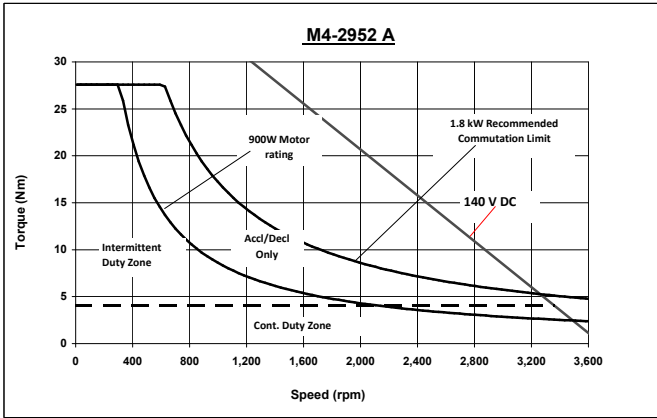
Performance Curves

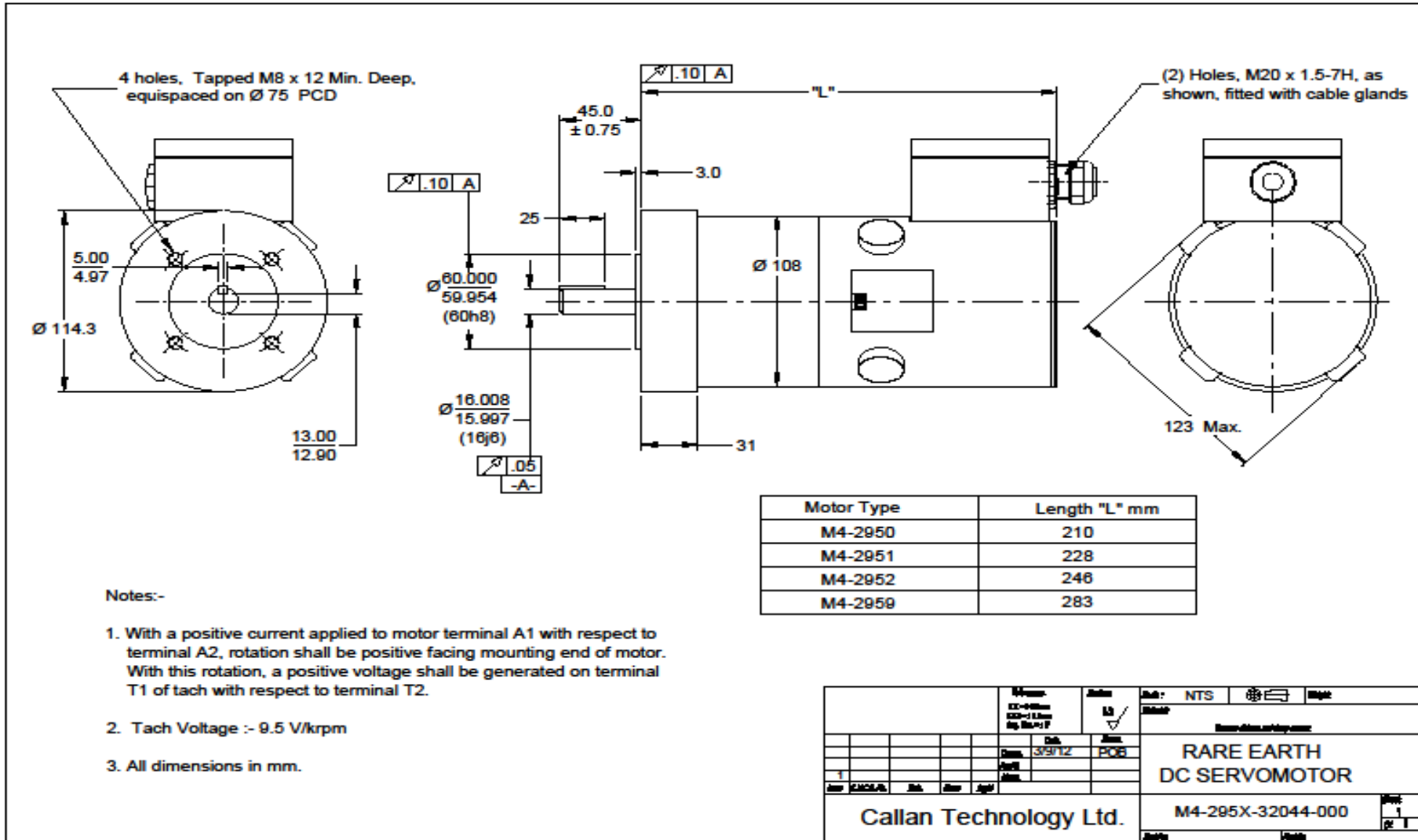


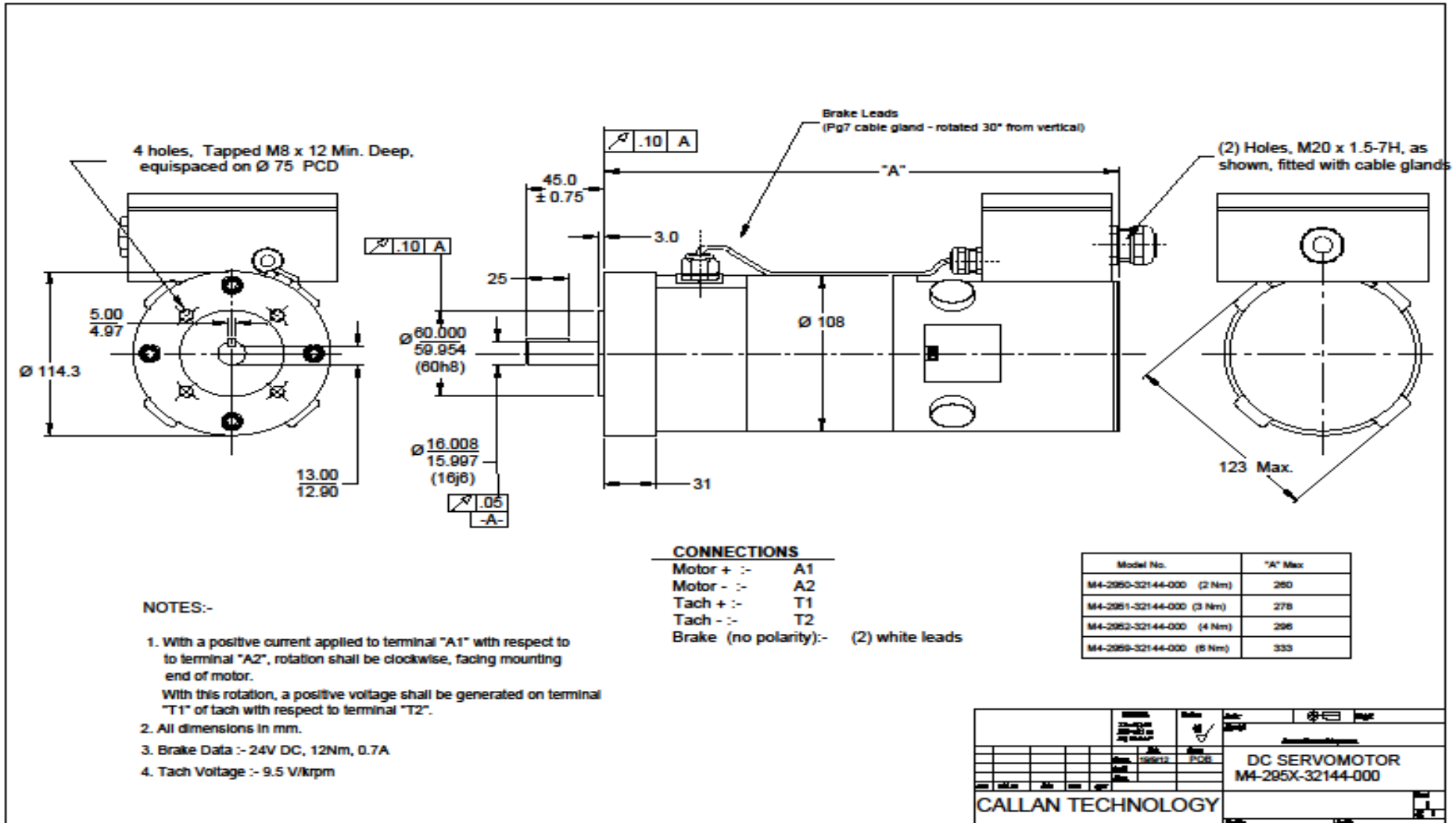
Performance Curves

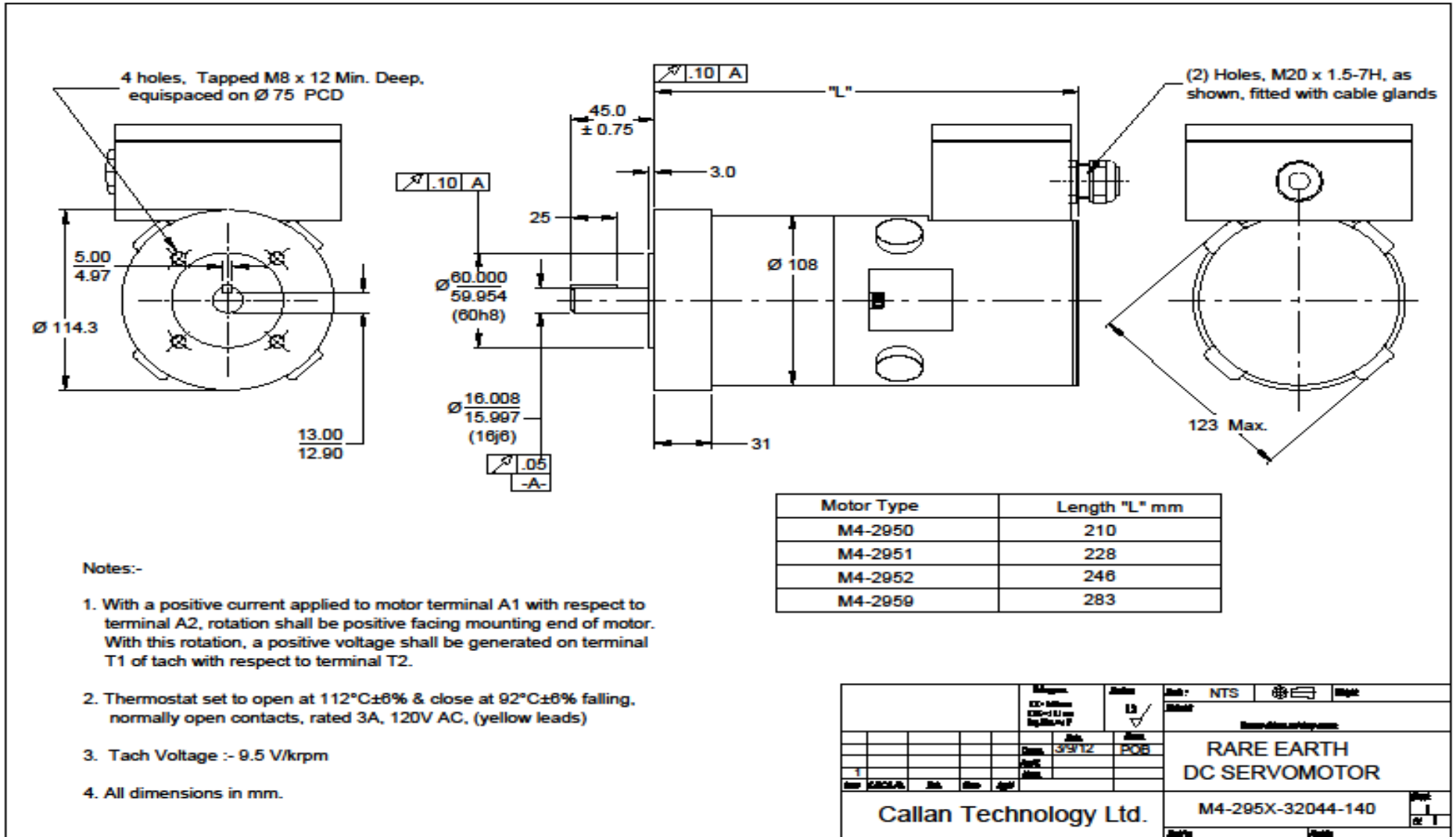


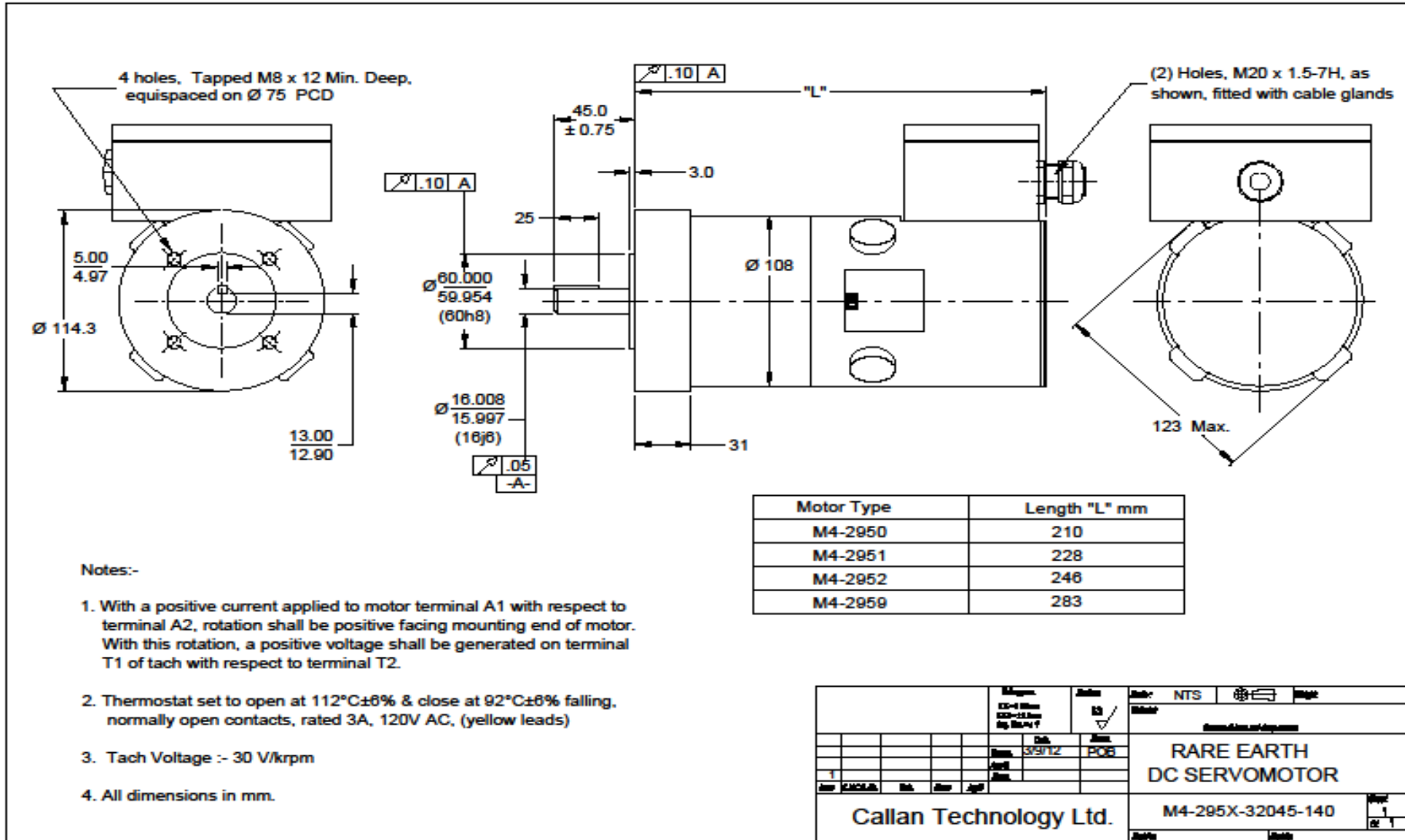
Performance Curves

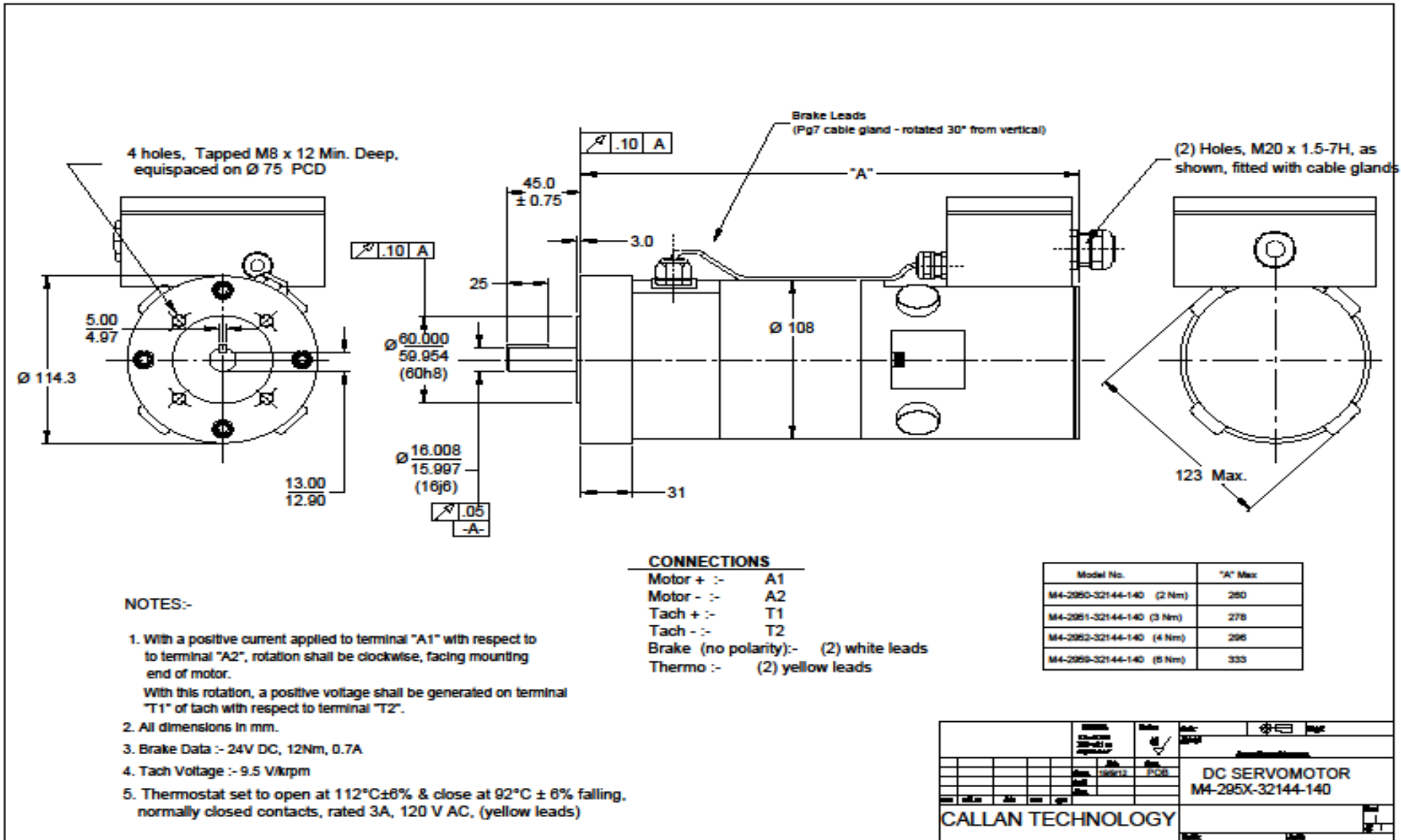


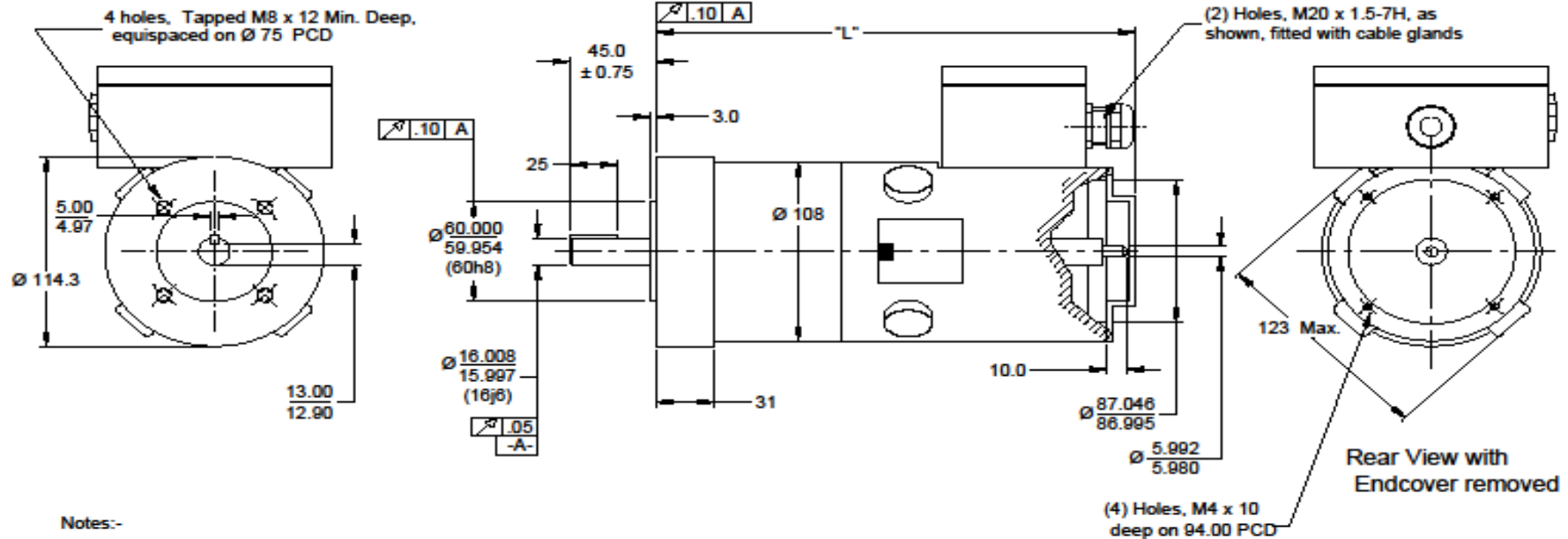












1. With a positive current applied to motor terminal A1 with respect to terminal A2, rotation shall be positive facing mounting end of motor. With this rotation, a positive voltage shall be generated on terminal T1 of tach with respect to terminal T2.
2. Thermostat set to open at $112^{\circ}\text{C} \pm 6\%$ & close at $92^{\circ}\text{C} \pm 6\%$ falling, normally open contacts, rated 3A, 120V AC, (yellow leads)
3. Tach Voltage :- 9.5 V/krpm
4. Rear shaft extension provided with (2) flats at 90°
5. All dimensions in mm.

Motor Type	Length "L" mm
M4-2950	230
M4-2951	248
M4-2952	266
M4-2959	303

20-Minute 200-400 rpm App. 100-150		NTS	1/11/12	FCB	1
RARE EARTH DC SERVOMOTOR					1
Callan Technology Ltd.					M4-295X-32044-142
1					1