AUM Series (Patented)

Ironless Brushless Linear Motor

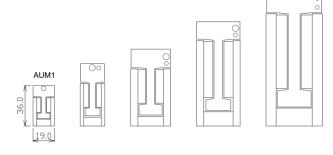


- Ironless technology
- Zero cogging force
- Patented technology
- Ironless linear motors with the highest motor constant and shortest coils lengths
- Large continuous force and peak force



AUM1 Specifications

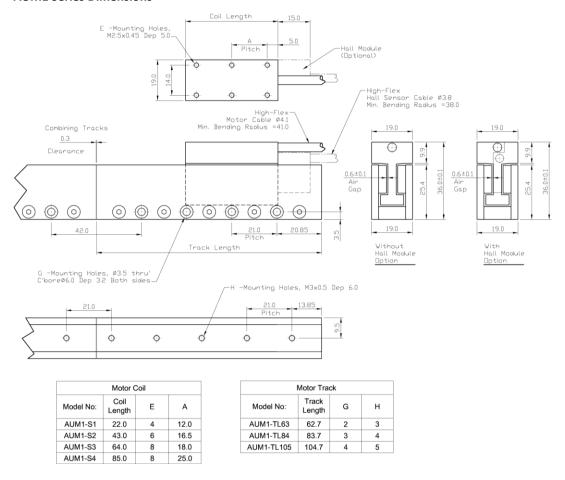
- Maximum continuous force of 11.9 N
- Maximum peak force of 47.6 N



Specifications		AUM1-S1	AUM1-S2	AUM1-S3	AUM1-S4	AUM1-S5
Performance Parameters	Unit	Series	Series	Series	Series	Series
Continuous Force, coil @100°C	N	3.0	6.0	8.9	11.9	14.9
Peak Force	N	11.9	23.8	35.7	47.6	59.5
Motor Constant	N/Sqrt(W)	1.67	2.42	2.98	3.46	3.87
Continuous Power	W	3.2	6.1	9.0	11.8	14.7
Peak Power	W	50.9	97.1	143.3	189.6	235.8
Electrical Cycle	mm	21	21	21	21	21
Max Coil Temperature	°C	125	125	125	125	125
Thermal Dissipation Constant	W/°C	0.04	0.08	0.12	0.16	0.20
Continuous current	Arms	1.7	1.7	1.7	1.7	1.7
Peak current	Arms	6.8	6.8	6.8	6.8	6.8
Max bus Voltage	Vdc	60.0	60.0	60.0	60.0	60.0
Force Constant	N/Arms	1.75	3.50	5.25	7.00	8.75
Back EMF Constant	Vpeak/(m/s)	1.4	2.9	4.3	5.7	7.1
Inductance	mH	0.11	0.22	0.31	0.41	0.51
Terminal Resistance @25°C	ohms	1.10	2.10	3.10	4.10	5.10
Electrical Time Constant	ms	0.10	0.10	0.10	0.10	0.10
Mechanical Parameters						
Coil Mass	g	25.0	50.0	75.0	100.0	125.0
Coil Length	mm	22	43	64	85	106
Track Mass (per 63 mm)	g		14	19		149
Magnetic Attraction	N		()		0



AUM1 Series Dimensions



Part Numbering

Motor Coil

Model	Connection	Size	Hall Options	Cable Length (m)	Ferrite Bead Options
AUM1	S = Series	S1-S4	Blank ¹ H9D ² NH ³	0.3 (300mm) 1.0 (1000mm)	Blank ⁴ FB ⁵

Example: AUM1-S-S2-0.3; AUM1-S-NH-0.3; AUM1-S-S2-H9D-0.3; AUM1-S-S2-H9D-0.3-FB

Motor Track

Model	Track Length
AUM1	TL63/ TL84/ TL105

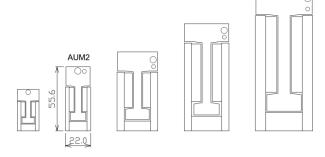
Example: AUM1-TL63

- 1 Blank = comes with hall module & hall cable terminated in flying leads. (standard)
- 2 H9D = comes with hall module & hall cable terminated with 9-Pins D-Sub connector.
- 3 NH = comes without hall module.
- 4 Blank = motor cable terminated in flying leads. (standard)
- 5 FB = motor cable terminated with ferrite beads.



AUM2 Specifications

- Maximum continuous force of 70 N
- Maximum peak force of 352 N

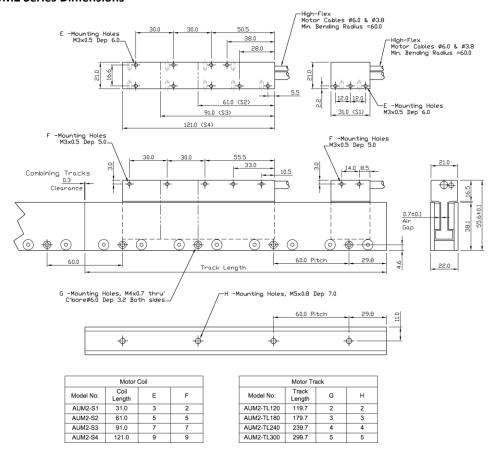


Specifications		AUM2-S1	AUN	12-S2	AUN	12-S3	AUN	12-S4	AUN	12-58
Performance Parameters	Unit	Series	Series	Parallel	Series	Parallel	Series	Parallel	Series	Parallel
Continuous Force, coil @100°C	N	8.8	17.6 26.4		35.2		70.4			
Peak Force	N	44.0	88	8.0	13	2.0	17	6.0	352.0	
Motor Constant	N/Sqrt(W)	3.05	4.	31	5.	28	6.	10	8.0	63
Continuous Power	W	8.3	16	5.6	25	5.0	33	3.3	66	5.6
Peak Power	W	208	4	16	63	24	83	32	1,6	664
Electrical Cycle	mm	30	3	30	3	0	3	0	3	0
Max Coil Temperature	°C	125	1	25	1.	25	12	25	12	25
Thermal Dissipation Constant	W/°C	0.11	0.	.22	0.	33	0.44 0.89		89	
Continuous current	Arms	1.6	1.6	3.2	1.6	3.2	1.6	3.2	1.6	3.2
Peak current	Arms	8.0	8.0	16.0	8.0	16.0	8.0	16.0	8.0	16.0
Max bus Voltage	Vdc	330.0	330.0	330.0	330.0	330.0	330	330		
Force Constant	N/Arms	5.5	11.0	5.5	16.5	8.3	22.0	11.0	44.0	22.0
Back EMF Constant	Vpeak/(m/s)	4.5	9.0	4.5	13.5	6.7	18.0	9.0	35.9	18.0
Inductance	mH	0.75	1.50	0.38	2.25	0.56	3.00	0.75	6.00	1.50
Terminal Resistance @25°C	ohms	3.25	6.50	1.63	9.75	2.44	13.00	3.25	26.00	6.50
Electrical Time Constant	ms	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Mechanical Parameters										
Coil Mass	kg	0.059	0.1	0.118 0.177 0.236		236	0.4	72		
Coil Length	mm	31	ϵ	51	9	1	12	21	24	11
Track Mass (per 120 mm)	kg				0.468				0.4	68
Magnetic Attraction	N				0				()

 $Continuous \ current \ is \ measured \ with \ coil \ mounted \ to \ an \ aluminum \ plate \ with \ same \ length \ as \ coil, \ 2X \ width, \ and \ thickness \ 12 \ mm$



AUM2 Series Dimensions



Part Numbering

Motor Coil

Model	Connection	Size	Thermal Sensor	Hall Options	Cable Length (m)	Ferrite Bead Options
AUM2	S = Series P = Parallel ¹	S1-S4, S8	K = PT100 (RTD) ²	Blank ³ H9D ⁴	3.0	Blank ⁵ NFB ⁶

Example: AUM2-S-S2-K-3.0; AUM2-S-S2-K-3.0-NFB; AUM2-S-S2-K-H9D-3.0; AUM2-S-S2-K-H9D-3.0-NFB

Motor Track

Model	Track Length
AUM2	TL120/ TL180/ TL240/ TL300

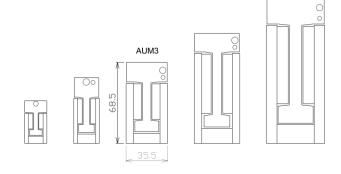
Example: AUM2-TL120

- 1 Parallel connection is not applicable to S1 motor coil.
- 2 K = PT100 (RTD) is standard for AUM2, Thermostat is not available.
- 3 Blank = comes with built-in hall sensor & hall cable terminated in flying leads. (standard)
- 4 H9D = comes with built-in hall sensor & hall cable terminated with 9-Pins D-Sub connector.
- 5 Blank = motor cable terminated with ferrite bead. (standard)
- 6 NFB = motor cable terminated in flying leads.



AUM3 Specifications

- Maximum continuous force of 220 N
- Maximum peak force of 867 N

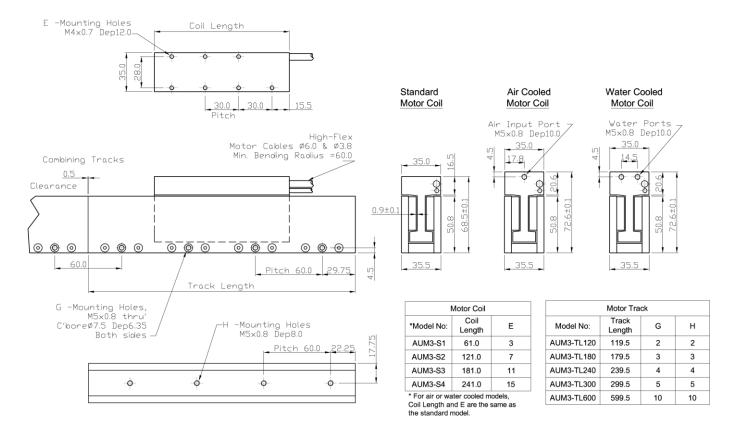


Specifications		AUM3-S1	AUI	VI3-S2	AUN	VI3-S3	AUN	//3-S4	AUN	13-S6
Performance Parameters	Unit	Series	Series	Parallel	Series	Parallel	Series	Parallel	Series	Parallel
Continuous Force, coil @100°C	N	28		57 85		113		170		
Continuous Force, AC, coil @100°C	N	34		68	1	.02	1	36	2	03
Continuous Force, WC, coil @100°C	N	37		73	1	.10	1	47	2	20
Peak Force	N	144	2	289	4	133	5	78	8	67
Motor Constant	N/Sqrt(W)	7.2	1	0.2	1	2.5	1	4.5	1	7.7
Continuous Power	W	15.2	3	0.5	4	5.7	6	0.9	9:	1.4
Peak Power	W	398	7	796	1,	193	1,	591	2,	387
Electrical Cycle	mm	60		60	(60	6	50	6	50
Max Coil Temperature	°C	125	1	125	1	.25	1	25	1	25
Thermal Dissipation Constant	W/°C	0.20	0	0.41 0.61 0.81		1.22				
Continuous current	Arms	1.8	1.8	3.6	1.8	3.6	1.8	3.6	1.8	3.6
Continuous current, AC	Arms	2.2	2.2	4.3	2.2	4.3	2.2	4.3	2.2	4.3
Continuous current, WC	Arms	2.3	2.3	4.7	2.3	4.7	2.3	4.7	2.3	4.7
Peak current	Arms	9.2	9.2	18.4	9.2	18.4	9.2	18.4	9.2	18.4
Max bus Voltage	Vdc	330.0	330.0	330.0	330.0	330.0	330.0	330.0	330.0	330.0
Force Constant	N/Arms	15.7	31.4	15.7	47.1	23.6	62.8	31.4	94.2	47.1
Back EMF Constant	Vpeak/(m/s)	12.8	25.6	12.8	38.5	19.2	51.3	25.6	76.9	38.5
Inductance	mH	3.13	6.26	1.57	9.39	2.35	12.52	3.13	18.78	4.70
Terminal Resistance @25°C	ohms	4.70	9.40	2.35	14.10	3.53	18.80	4.70	28.20	7.05
Electrical Time Constant	ms	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Mechanical Parameters										
Coil Mass	kg	0.22	0	.45	0	.68	0.	.91	1.	37
Coil Length	mm	61	1	121	1	.81	2	41	3	61
Track Mass (per 120 mm)	kg					1.00				
Magnetic Attraction	N					0				

AC- Air Cool, WC-Water Cool



AUM3 Series Dimensions



Part Numbering

Motor Coil

Model	Cooling Options	Connection	Size	Thermal Sensor	Hall Options	Cable Length (m)	Ferrite Bead Options
AUM3	Blank = Natural Convection A = Air Cooled W = Water Cooled	S = Series P = Parallel ¹	S1-S4, S6	J = Thermostat (standard) K = PT100 (RTD)	Blank ² H9D ³	3.0	Blank ⁴ NFB ⁵

Example: AUM3-S-S2-J-3.0; AUM3-S-S2-J-3.0-NFB; AUM3-S-S2-J-H9D-3.0; AUM3-S-S2-J-H9D-3.0-NFB

Motor Track

Model	Track Length
AUM3	TL120/ TL180/ TL240/ TL300/ TL600

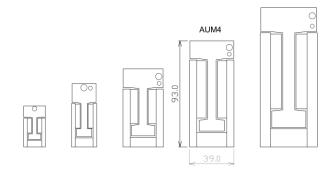
Example: AUM3-TL600

- 1 Parallel connection is not applicable to S1 motor coil.
- 2 Blank = comes with built-in hall sensor & hall cable terminated in flying leads. (standard)
- 3 H9D = comes with built-in hall sensor & hall cable terminated with 9-Pins D-Sub connector.
- 4 Blank = motor cable terminated with ferrite bead. (standard)
- 5 NFB = motor cable terminated in flying leads.



AUM4 Specifications

- Maximum continuous force of 614 N
- Maximum peak force of 2496 N



Specifications		AUM4-S1	AUN	14-S2	AUN	14-S3	AUN	14-S4
Performance Parameters	Unit	Series	Series	Parallel	Series	Parallel	Series	Parallel
Continuous Force, coil @100°C	N	55	1	10	166		221	
Continuous Force, AC, coil @100°C	N	66	1	32	1	99	265	
Continuous Force, WC, coil @100°C	N	77	1	54	2	30	3	07
Peak Force	N	312	6	24	9	36	1,2	248
Motor Constant	N/Sqrt(W)	11.2	15	5.8	19	9.4	22	2.4
Continuous Power	W	24.3	48	3.7	73	3.0	97	7.3
Peak Power	W	777	1,	555	2,3	332	3,:	110
Electrical Cycle	mm	60	ϵ	60	6	60	6	60
Max Coil Temperature	°C	125	1	25	1	25	1	25
Thermal Dissipation Constant	W/°C	0.32	0.	65	0.	97	1.30	
Continuous current	Arms	2.3	2.3	4.6	2.3	4.6	2.3	4.6
Continuous current, AC	Arms	2.8	2.8	5.5	2.8	5.5	2.8	5.5
Continuous current, WC	Arms	3.2	3.2	6.4	3.2	6.4	3.2	6.4
Peak current	Arms	13.0	13.0	26.0	13.0	26.0	13.0	26.0
Max bus Voltage	Vdc	330.0	330.0	330.0	330.0	330.0	330.0	330.0
Force Constant	N/Arms	24.0	48.0	24.0	72.0	36.0	96.0	48.0
Back EMF Constant	Vpeak/(m/s)	19.6	39.2	19.6	58.8	29.4	78.4	39.2
Inductance	mH	3.50	7.00	1.75	10.50	2.63	14.00	3.50
Terminal Resistance @25°C	ohms	4.60	9.20	2.30	13.80	3.45	18.40	4.60
Electrical Time Constant	ms	0.76	0.76	0.76	0.76	0.76	0.76	0.76
Mechanical Parameters								
Coil Mass	kg	0.28	0.	56	0.	89	1.	19
Coil Length	mm	61	1	21	1	81	2	41
Track Mass (per 120 mm)	kg				1	.77		
Magnetic Attraction	N					0		

AC- Air Cool, WC-Water Cool

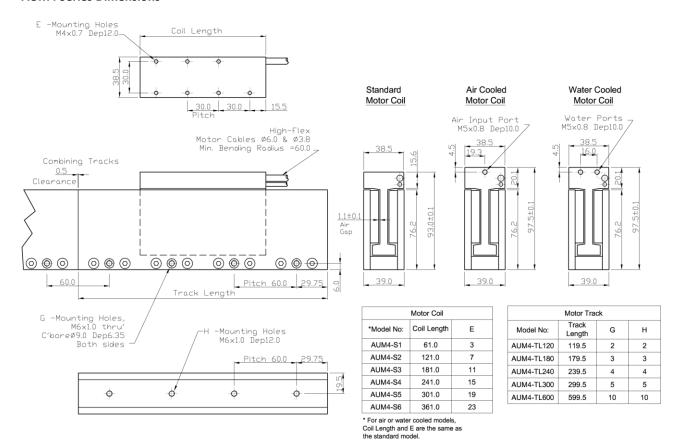


Specifications		AUM4-S5	AUM4-S6	AUM4-S8
Performance Parameters	Unit	Parallel	Parallel	Parallel
Continuous Force, coil @100°C	N	276	331	442
Continuous Force, AC, coil @100°C	N	331	397	530
Continuous Force, WC, coil @100°C	N	384	461	614
Peak Force	N	1,560	1,872	2,496
Motor Constant	N/Sqrt(W)	25.0	27.4	31.65
Continuous Power	W	121.7	146.0	194.7
Peak Power	W	3,887	4,664	6219.2
Electrical Cycle	mm	60	60	60
Max Coil Temperature	°C	125	125	125
Thermal Dissipation Constant	W/°C	1.62	1.95	2.60
Continuous current	Arms	4.6	4.6	4.6
Continuous current, AC	Arms	5.5	5.5	5.5
Continuous current, WC	Arms	6.4	6.4	6.4
Peak current	Arms	26.0	26.0	26.0
Max bus Voltage	Vdc	330.0	330.0	330.0
Force Constant	N/Arms	60.0	72.0	96.0
Back EMF Constant	Vpeak/(m/s)	49.0	58.8	78.4
Inductance	mH	4.38	5.25	7.00
Terminal Resistance @25°C	ohms	5.75	6.90	9.20
Electrical Time Constant	ms	0.76	0.76	0.76
Mechanical Parameters				
Coil Mass	kg	1.49	1.78	2.37
Coil Length	mm	301	361	481
Track Mass (per 120 mm)	kg		1.77	7
Magnetic Attraction	N		0	

AC- Air Cool, WC-Water Cool



AUM4 Series Dimensions



Part Numbering

Motor Coil

Model	Cooling Options	Connection	Size	Thermal Sensor	Hall Options	Cable Length (m)	Ferrite Bead Options
	Blank = Natural Convection	S = Series	S1-S6.	J = Thermostat	Blank ²		Blank⁴
AUM4	A = Air Cooled	P = Parallel ¹	S8	(standard)	H9D ³	3.0	NFB ⁵
	W = Water Cooled	P – Parallei	30	K = PT100 (RTD)	пэр		INFD

Example: AUM4-P-S4-J-3.0; AUM4-A-P-S4-J-3.0; AUM4-S-S2-J-3.0-NFB; AUM4-S-S2-J-H9D-3.0

Motor Track

Model	Track Length			
AUM4	TL120/ TL180/ TL240/ TL300/ TL600			

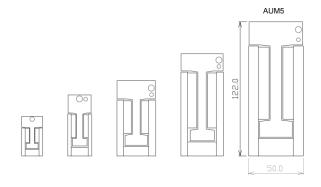
Example: AUM4-TL600

- ${\bf 1} \quad \hbox{Parallel connection is not applicable to 1 motor coil.}$
- 2 Blank = comes with built-in hall sensor & hall cable terminated in flying leads. (standard)
- 3 H9D = comes with built-in hall sensor & hall cable terminated with 9-Pins D-Sub connector.
- 4 Blank = motor cable terminated with ferrite bead. (standard)
- 5 NFB = motor cable terminated in flying leads.



AUM 5 Specifications

- Maximum continuous force of 1150 N
- Maximum peak force of 6367 N



Specifications	AUM5-S1		AUI	AUM5-S2		AUM5-S3	
Performance Parameters	Unit	Series	Series Parallel		Series	Series Parallel	
Continuous Force, coil @100°C	N	98	1	.97	295		
Continuous Force, AC, coil @100°C	N	118	2	36	354		
Continuous Force, WC, coil @100°C	N	128	255 383		83		
Peak Force	N	707	1,415 2,122		122		
Motor Constant	N/Sqrt(W)	19.2	2	7.1	33.2		
Continuous Power	W	26.3	5	2.5	78.8		
Peak Power	W	1,361	2,722		4,0	082	
Electrical Cycle	mm	84.0	8	4.0	84	4.0	
Max Coil Temperature	°C	125	125		125		
Thermal Dissipation Constant	W/°C	0.35	0.70		1.05		
Thermal time constant	min	35.4	35.4		35.4		
Continuous current	Arms	2.5	2.5	5.0	2.5	5.0	
Continuous current, AC	Arms	3.0	3.0	6.0	3.0	6.0	
Continuous current, WC	Arms	3.3	3.3	6.5	3.3	6.5	
Peak current	Arms	18.0	18.0	36.0	18.0	36.0	
Max bus Voltage	Vdc	330.0	330.0	330.0	330.0	330.0	
Force Constant	N/Arms	39.3	78.6	39.3	117.9	59.0	
Back EMF Constant	Vpeak/(m/s)	32.1	64.2	32.1	96.3	48.1	
Inductance	mH	6.50	13.00	3.25	19.50	4.88	
Terminal Resistance @25°C	ohms	4.20	8.40	2.10	12.60	3.15	
Electrical Time Constant	ms	1.55	1.55	1.55	1.55	1.55	
Mechanical Parameters							
Coil Mass	kg	0.73	1.45 2.16		.16		
Coil Length	mm	85.0	169.0 253.0			3.0	
Track Mass (per 168 mm)	kg	4.26					
Magnetic Attraction	N	0					

AC- Air Cool, WC-Water Cool

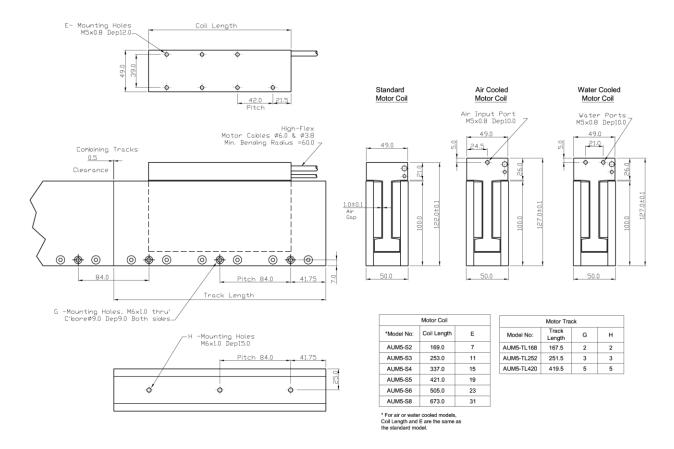


Specifications		AUM5-S4	AUM5-S5	AUM5-S6	AUM5-S8	AUM5-S9
Performance Parameters	Unit	Parallel	Parallel	Parallel	Parallel	Parallel
Continuous Force, coil @100°C	N	393	491	590	786	884
Continuous Force, AC, coil @100°C	N	472	590	707	943	1,061
Continuous Force, WC, coil @100°C	N	511	639	766	1,022	1,150
Peak Force	N	2,830	3,537	4,244	5,659	6,367
Motor Constant	N/Sqrt(W)	38.4	42.9	47.0	54.2	57.5
Continuous Power	W	105.0	131.3	157.5	210.0	236
Peak Power	W	5,443	6,804	8,165	10,886	12,247
Electrical Cycle	mm	84.0	84.0	84.0	84.0	84
Max Coil Temperature	°C	125	125	125	125	125
Thermal Dissipation Constant	W/°C	1.40	1.75	2.10	2.80	3.15
Thermal time constant	min	35.4	35.4	35.4	35.4	3.5.4
Continuous current	Arms	5.0	5.0	5.0	5.0	7.5
Continuous current, AC	Arms	6.0	6.0	6.0	6.0	9.0
Continuous current, WC	Arms	6.5	6.5	6.5	6.5	9.8
Peak current	Arms	36.0	36.0	36.0	36.0	54.0
Max bus Voltage	Vdc	330.0	330.0	330.0	330.0	330.0
Force Constant	N/Arms	78.6	98.3	117.9	157.2	117.9
Back EMF Constant	Vpeak/(m/s)	64.2	80.2	96.3	128.4	96.3
Inductance	mH	6.50	8.13	9.75	13.00	6.50
Terminal Resistance @25°C	ohms	4.20	5.25	6.30	8.40	4.20
Electrical Time Constant	ms	1.55	1.55	1.55	1.55	1.55
Mechanical Parameters						
Coil Mass	kg	2.88	3.60	4.32	5.76	6.48
Coil Length	mm	337.0	421.0	505.0	673.0	757.0
Track Mass (per 168 mm)	kg		•	4.26		
Magnetic Attraction	N			0		

AC- Air Cool, WC-Water Cool



AUM5 Series Dimensions



Part Numbering

Motor Coil

Model	Cooling Options	Connection	Size	Thermal Sensor	Hall Options	Cable Length (m)	Ferrite Bead Options
AUM5	Blank = Natural Convection A = Air Cooled W = Water Cooled	S = Series P = Parallel ¹	S1-S6, S8-S9	J = Thermostat (standard) K = PT100 (RTD)	Blank ² H9D ³	3.0	Blank ⁴ NFB ⁵

 $\textbf{Example:} \quad \textbf{AUM5-P-S4-J-3.0 ; AUM5-A-P-S4-J-3.0 ; AUM5-S-S2-J-3.0-NFB ; AUM5-S-S2-J-H9D-3.0-NFB} \\$

Motor Track

Model	Track Length			
AUM5	TL168/ TL252/ TL420			

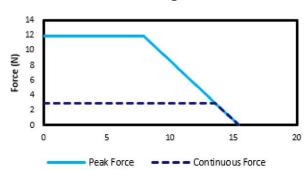
Example: AUM5-TL420

- 1 Parallel connection is not applicable to S1 motor coil.
- 2 Blank = comes with built-in hall sensor & hall cable terminated in flying leads. (standard)
- 3 H9D = comes with built-in hall sensor & hall cable terminated with 9-Pins D-Sub connector.
- 4 Blank = motor cable terminated with ferrite bead. (standard)
- 5 NFB = motor cable terminated in flying leads.

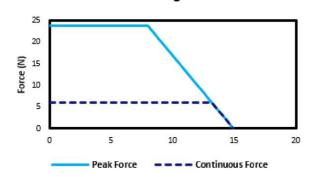


Force-Speed Curve

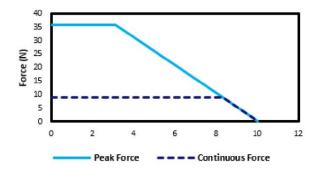
Force Speed Curve - AUM1-S1 DC Bus voltage:24V



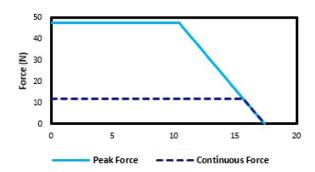
Force Speed Curve - AUM1-S2 DC Bus voltage:48V



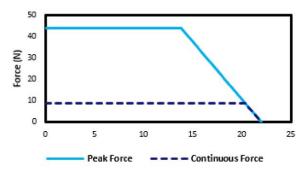
Force Speed Curve - AUM1-S3 DC Bus voltage:48V



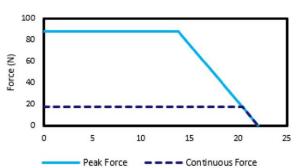
Force Speed Curve - AUM1-S4 DC Bus voltage:110V



Force Speed Curve - AUM2-S1 DC Bus voltage:110V

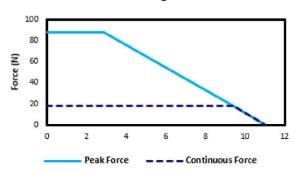


Force Speed Curve - AUM2-S2-P DC Bus voltage:110V

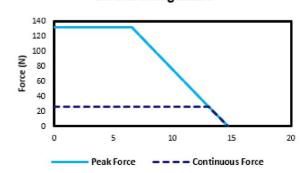




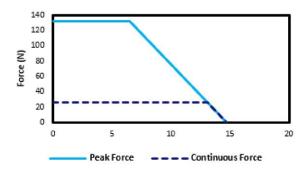
Force Speed Curve - AUM2-S2-S DC Bus voltage:110V



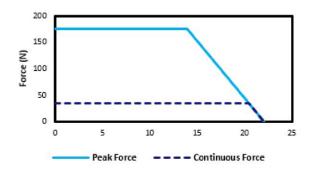
Force Speed Curve - AUM2-S3-P DC Bus voltage:110V



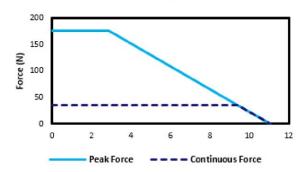
Force Speed Curve - AUM2-S3-S DC Bus voltage:220V



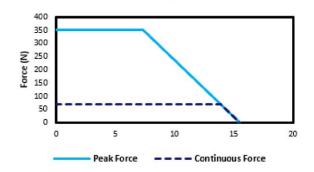
Force Speed Curve - AUM2-S4-P DC Bus voltage:220V



Force Speed Curve - AUM2-S4-S DC Bus voltage:220V

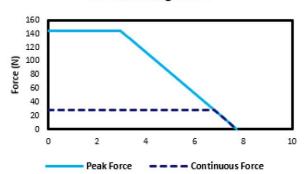


Force Speed Curve - AUM2-S8-P DC Bus voltage:310V

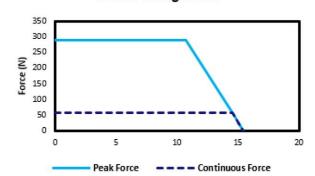




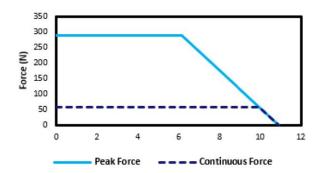
Force Speed Curve - AUM3-S1 DC Bus voltage:110V



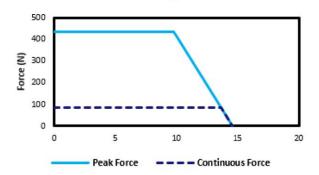
Force Speed Curve - AUM3-S2-P DC Bus voltage:220V



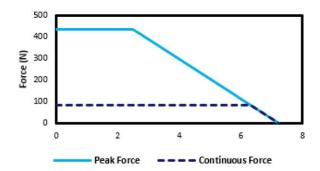
Force Speed Curve - AUM3-S2-S DC Bus voltage:310V



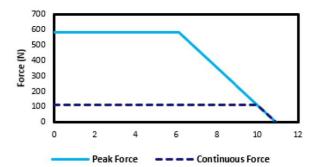
Force Speed Curve - AUM3-S3-P DC Bus voltage:310V



Force Speed Curve - AUM3-S3-S DC Bus voltage:310V

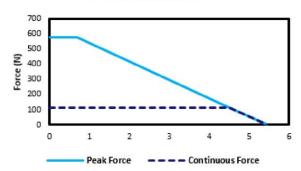


Force Speed Curve - AUM3-S4-P DC Bus voltage:310V

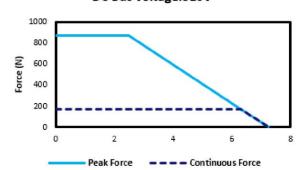




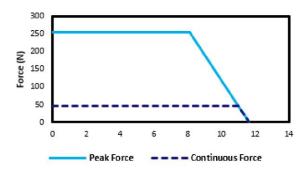
Force Speed Curve - AUM3-S4-S DC Bus voltage:310V



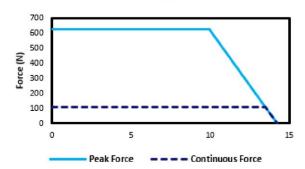
Force Speed Curve - AUM3-S6-P DC Bus voltage:310V



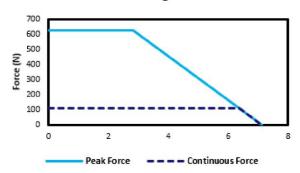
Force Speed Curve - AUM4-S1 DC Bus voltage:310V



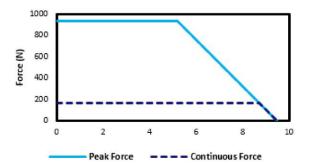
Force Speed Curve - AUM4-S2-P DC Bus voltage:310V



Force Speed Curve - AUM4-S2-S DC Bus voltage:310V

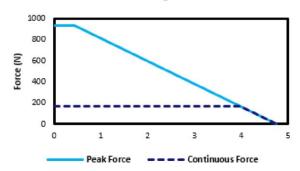


Force Speed Curve - AUM4-S3-P DC Bus voltage:310V





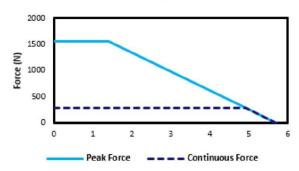
Force Speed Curve - AUM4-S3-S DC Bus voltage:310V



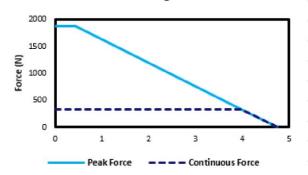
Force Speed Curve - AUM4-S4-P DC Bus voltage:310V



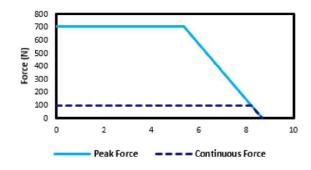
Force Speed Curve - AUM4-S5-P DC Bus voltage:310V



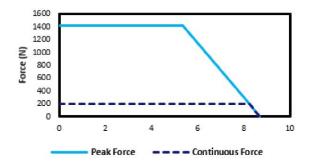
Force Speed Curve - AUM4-S6-P DC Bus voltage:310V



Force Speed Curve - AUM5-S1 DC Bus voltage:310V

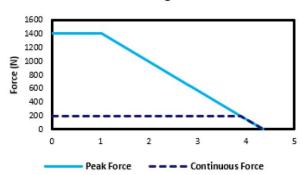


Force Speed Curve - AUM5-S2-P DC Bus voltage:310V

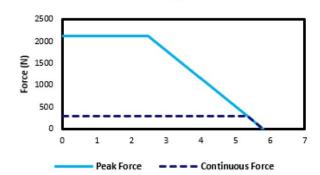




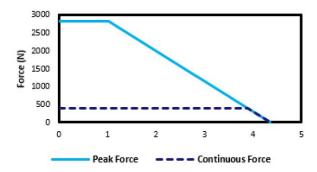
Force Speed Curve - AUM5-S2-S DC Bus voltage:310V



Force Speed Curve - AUM5-S3-P DC Bus voltage:310V



Force Speed Curve - AUM5-S4-P DC Bus voltage:310V



Force Speed Curve - AUM5-S5-P DC Bus voltage:330V

