

Unimotor fm 230 V / 460 V

Flexible Configuration AC Servo Motors

Unimotor fm is a high performance, brushless AC Servo motor range matched for use with Control Techniques' brand drives. "FM" stands for "Flexible Motor" and is designed to accommodate a wide range of applications. The motors are available in six frame sizes with various mounting arrangements and motor lengths. Emerson drives and motors are designed to function as an optimized system. Unimotor fm is the perfect partner for Unidrive M, Digitax ST and Epsilon EP servo drives.

Key Features

- Torque range: 12.4 to 1204 lb-in (1.4 to 136.0 Nm)
- Medium inertia design with high inertia option available
- Connector styles include vertical, low profile and 90° rotatable
- Variety of flange possibilities (IEC/NEMA)
- Holding brake option
- IP65 conformance
- Winding to suit 230 V and 460 V
- Speed options include 2000, 3000, 4000 and 6000 rpm
- Multiple feedback options:
 - Resolver: Robust for extreme applications and conditions — lower accuracy, medium resolution
 - Incremental encoder: High accuracy, medium resolution
 - Absolute: Medium accuracy, medium resolution, single-turn and multi-turns
 - SinCos/Absolute: High accuracy, high resolution, single-turn and multi-turn
 - HIPERFACE (SICK) and EnDat (Heidenhain) protocols supported

Approvals

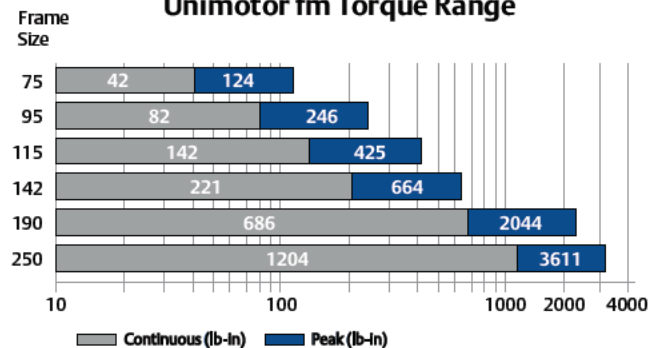


Unimotor

NOW WITH EVEN HIGHER PERFORMANCE!



Unimotor fm Torque Range



Electronic Nameplate Capability



When a Unidrive M, Unidrive SP or Digitax ST servo drive is connected to a SinCos or absolute encoder, it can recognize and communicate with the motor to obtain the "electronic nameplate" data. This motor data can then be used to automatically optimize the drive settings. This feature simplifies commissioning and maintenance, ensures consistent performance and saves time.

Unimotor fm Order Information

Use the information below to create an order code for a Unimotor fm (top row is an example).

095	U3	A	30	5	B	A	CA		A	100		190			
Frame size	Motor voltage	Stator length	Rated speed (rpm)	Brake	Connection type	Output shaft	Feedback device		Rotor Inertia + Thermister Type	Bolt Circle Diameter (BCD)		Shaft Diameter (ex. 110=11.0 mm)			
	075-190 Frames	075 Frame	075-190 Frames	075-250 Frames	075-142 Frames	075-250 Frames	075-142 Frames		075-250 Frames	075 Frame			Shaft Length (mm)	Frame Length	
075	E3 = 230 V	A	20 = 2000	0 = No Brake 5 = 24 Vdc Parking brake	B = Power and Signal 90° and rotatable size 1.0 C = Power 90° rotatable and signal vertical size 1.0 V = Power and Signal Vertical size 1.0 J = Power 90° and signal 90° and rotatable size 1.5 M = Power and Signal Vertical size 1.5 N = Power 90° rotatable and signal vertical size 1.5 H = Power hybrid box and signal vertical 250 Frame H = Power hybrid box and signal vertical (Std)	A = Keyway w/ Full Key installed B = No Keyway E* = Keyway w/ Half Key installed F* = Keyway w/ Half and Full Key included	AE = Resolver		A = Standard + PTC B = High + PTC C = Standard + KTY84-130 thermistor D = High + KTY84-130 thermistor	075	Std	075 Frame			
095	U3 = 460 V	B	30 = 3000				CA = Incremental Encoder (Std)					4096 ppr	080	Opt	110
115	250 Frame U3 = 460 V	C	40 = 4000				EB = Optical Absolute Multi-turn EnDat			EQN 1325	085	Opt	140	30	B-D
142		D	60 = 6000*				FB = Optical Absolute Single turn EnDat			ECN 1313	095 Frame		190	40	
190		095 -142 Frames 250 Frame	10 = 1000 15 = 1500 20 = 2000 25 = 2500				EC = Inductive Absolute Multi-turn EnDat			EQI 1331	100 Std		095 Frame		
250							FC = Inductive Absolute Single turn EnDat			ECI 1319	098	Opt	140	30	A
RA = Optical SinCos Multi-turn HIPERFACE							SRM 50	190		40			B-E		
SA = Optical SinCos Single turn HIPERFACE							SRS 50	115		Opt	240	50			
190-250 Frames							115 Frame								
AE = Resolver								115		Std	190	40	A-C		
CA = Incremental Encoder (Std)							4096 ppr				240	50	D, E		
EB = Optical Absolute Multi-turn EnDat							EQN 1325	142		Frame	240	50			
FB = Optical Absolute Single turn EnDat							ECN 1313				142 Frame				
RA = Optical SinCos Multi-turn HIPERFACE							SRM 50	149		Opt	240	50	A-E		
SA = Optical SinCos Single turn HIPERFACE							SRS 50				320	58	D, E		
Cable length restrictions apply. Refer to cable section for length requirements.								215		Std	190 Frame				
											320†	80†	A-H†		
								250		Frame	320	58	A-H		
											380	58			
			250 Frame												
			480	110	D-F										
		</													

Notes:

*Half key is used to balance shaft. It does not complete shaft radius

a 6000 rpm not available on all frames sizes

190 – Lifting eyelets will be fitted on all 190 motors. This is to enable easy handling of these motors that are often over 55 lbs in weight. If there is an issue with the lifting eyes causing an obstruction when mounting the mating cables then the lifting eyelets maybe removed once the motor is installed.

Hybrid Box Connection "H"– Due to the increased power ratings now available on the E3/U3 motors a hybrid box is now the standard power connection type on some 115 and 190 frames.

Power Connector Ratings - Due to the increased power ratings now available (E3/U3 motors), some power connector have changed. Refer to the Connector Size Reference Tables.

†Add (-SREL) to end of E3/ U3 order string for 80 mm length shafts on 190 mm frames.

Unimotor fm 75 mm Frame Ratings

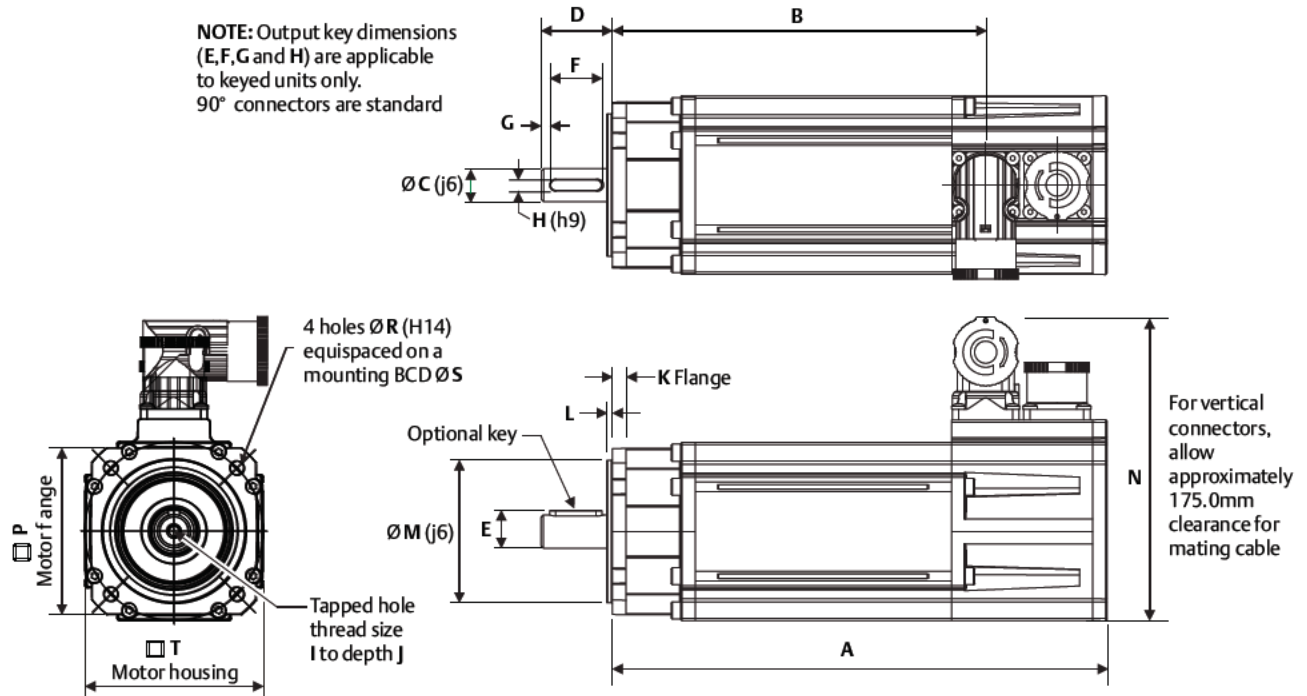
Motor Frame Size (mm)		075E3				075U3			
Voltage (Vrms)		230				460			
Frame Length		A	B	C	D	A	B	C	D
Continuous Stall Torque (lb-in)		12.4	23.9	32.7	41.6	12.4	23.9	32.7	41.6
Continuous Stall Torque (Nm)		1.4	2.7	3.7	4.7	1.4	2.7	3.7	4.7
Peak Torque (lb-in)		38	71	99	124	38	71	99	124
Peak Torque (Nm)		4.3	8	11.2	14	4.3	8	11.2	14
Standard Inertia (lb-in-sec ²)		0.00069	0.00108	0.00142	0.00180	0.00069	0.00108	0.00142	0.00180
Standard Inertia (kgm ²)		0.00008	0.00012	0.00016	0.00020	0.00008	0.00012	0.00016	0.00020
High Inertia (lb-in-sec ²)		0.00104	0.00142	0.00180	0.00218	0.00104	0.00142	0.00180	0.00218
High Inertia (kgm ²)		0.00012	0.00016	0.00020	0.00025	0.00012	0.00016	0.00020	0.00025
Winding Thermal Time Const. (s)		63	58	73	78	63	58	73	78
Motor Weight (lbs)		6.4	8.1	9.9	11.7	6.4	8.1	9.9	11.7
Motor Weight (kg)		2.9	3.7	4.5	5.3	2.9	3.7	4.5	5.3
Shaft Diameter (mm)		11	14	14	14	11	19	14	14
Shaft Length (mm)		23	30	30	30	23	30	30	30
2000 rpm	Kt (lb-in/A) =	12.4				21.24			
	Kt (Nm/A) =	1.4				2.4			
	Ke (V/k rpm) =	85.5				147			
Rated Torque (lb-in)		11.5	22.1	31.0	39.8	11.5	21.9	31.0	39.5
Rated Torque (Nm)		1.3	2.5	3.5	4.5	1.3	2.5	3.5	4.5
Stall Current (A)		1.0	1.9	2.7	3.3	0.6	1.1	1.6	1.9
Rated Power (kW)		0.72	0.52	0.73	0.93	0.27	0.52	0.73	0.93
R (ph-ph) (Ohms)		48.24	16.32	8.96	6.22	148.5	52.2	27.3	19.97
L (ph-ph) (mH)		87.47	39.77	24.68	19.15	258.7	117.28	74.2	56.97
3000 rpm	Kt (lb-in/A) =	8.23				14.16			
	Kt (Nm/A) =	0.93				1.6			
	Ke (V/k rpm) =	57.0				98.0			
Rated Torque (lb-in)		11.5	20.4	29.2	37.2	11.5	20.3	29.3	37.0
Rated Torque (Nm)		1.3	2.3	3.3	4.2	1.3	2.29	3.3	4.18
Stall Current (A)		1.55	2.85	4.9	5.02	0.90	1.66	2.33	2.92
Rated Power (kW)		0.41	0.72	1.04	1.31	0.41	0.72	1.04	1.31
R (ph-ph) (Ohms)		19.8	6.69	3.71	2.72	62.08	21.07	12.54	7.81
L (ph-ph) (mH)		37.2	16.8	10.69	8.27	114.6	52.65	34.18	23.89
4000 rpm	Kt (lb-in/A) =	6.2				10.62			
	Kt (Nm/A) =	0.7				1.2			
	Ke (V/k rpm) =	42.75				73.5			
Rated Torque (lb-in)		10.6	18.6	24.8	33.6	10.6	18.2	24.7	33.6
Rated Torque (Nm)		1.2	2.1	2.8	3.8	1.2	2.06	2.79	3.8
Stall Current (A)		2.06	3.79	5.31	6.67	1.20	2.21	3.10	3.89
Rated Power (kW)		0.5	0.86	1.17	1.59	0.50	0.86	1.17	1.59
R (ph-ph) (Ohms)		12.44	4.01	2.26	1.53	38.01	12.71	6.49	4.94
L (ph-ph) (mH)		23.35	9.62	6.32	4.63	68.39	30.46	18.28	13.97
6000 rpm	Kt (lb-in/A) =	4.16				7.08			
	Kt (Nm/A) =	0.47				0.8			
	Ke (V/k rpm) =	28.5				49.0			
Rated Torque (lb-in)		9.7	16.8	24.8	30.1	9.6	17.0	24.3	30.1
Rated Torque (Nm)		1.1	1.9	2.8	3.4	1.08	1.92	2.75	3.4
Stall Current (A)		3.06	5.64	7.91	9.94	1.80	3.31	4.65	5.84
Rated Power (kW)		0.68	1.21	1.73	2.14	0.68	1.21	1.73	2.14
R (ph-ph) (Ohms)		5.37	1.81	1.02	0.68	15.48	5.19	2.86	2.12
L (ph-ph) (mH)		9.8	4.42	2.88	2.06	28.66	12.77	8.01	6.33

NOTES:

- $\Delta t = 212^\circ\text{F}$ (100°C) winding 104°F (40°C) maximum ambient
- All data subject to $\pm 10\%$ tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 68°F (20°C) ambient at 12 kHz drive switching frequency
- Emerson has an ongoing process of development and reserves the right to change the specification without notice
- All other figures relate to a 68°F (20°C) motor temperature; maximum intermittent winding temperature is 284°F (140°C)

Unimotor fm 75 mm Frame Dimensions

NOTE: Output key dimensions (E,F,G and H) are applicable to keyed units only. 90° connectors are standard



Motor Dimensions*		Frame Length							
		A		B		C		D	
		(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)
Unbraked Length	A	8.20	208.2	9.38	238.2	10.56	268.2	11.74	298.2
	B	6.19	157.2	7.37	187.2	8.55	217.2	9.73	247.2
Braked Length	A	9.38	238.2	10.56	268.2	11.74	298.2	12.92	328.2
	B	7.37	187.2	8.55	217.2	9.73	247.2	10.91	277.2

*PCD 085 motor lengths differ from the above, refer to drawings for complete details

Connector Type		Connector Height	
		(in)	(mm)
"A"	N	4.7	118.5
"B" (std)		5.0	126.0
"C"		5.0	126.0
"V"		4.7	118.5

Dimensions for power connectors size 1.0

Flange Dimensions		BCD Code					
		Standard		Optional			
		075		080		085	
		(in)	(mm)	(in)	(mm)	(in)	(mm)
Flange Thickness	K	0.23	5.8	0.23	5.8	0.23	5.8
Pilot Thickness	L	0.09	2.4	0.09	2.4	0.09	2.4
Pilot Diameter (j6)	M	2.36	60.0	2.36	60.0	2.76	70.0
Flange Square	P	2.76	70.0	2.76	70.0	3.15	80.0
Mounting Hole Diameter (H14)	R	0.23	5.8	0.23	5.8	0.28	7.0
Mounting Hole BCD	S	2.6 to 3.0	66.7 to 75.0	3.0 to 3.2	75.0 to 80.0	3.4	85
Motor Housing	T	2.95	75	2.95	75	2.95	75
Mounting Bolts		M5				M6	

Shaft Dimensions		Shaft Diameter Code					
		11.0 mm Frame A		14.0 mm Frames B-D		19.0 mm Opt	
		(in)	(mm)	(in)	(mm)	(in)	(mm)
Shaft Diameter (j6)	C	0.43	11.0	0.55	14.0	0.75	19.0
Shaft Length	D ¹	0.91	23.0	1.18	30.0	1.57	40.0
Key Height	E ²	0.49	12.5	0.63	16.0	0.85	21.5
Key Length	F ²	0.55	14.0	0.98	25.0	1.26	32.0
Key-to-Shaft End	G ⁴	0.14	3.6	0.06	1.5	0.14	3.6
Key Width (H9)	H	0.16	4.0	0.20	5.0	0.24	6.0
Tapped Hole Thread Size	I	M4 x 0.7		M5 x 0.8		M6 x 1.0	
Tapped Hole Depth	J ⁵	0.43	11.0	0.53	13.5	0.67	17.0

¹±0.45 mm, ²To IEC 72-1, ³±0.25 mm, ⁴±1.1 mm, ⁵±0.4 mm

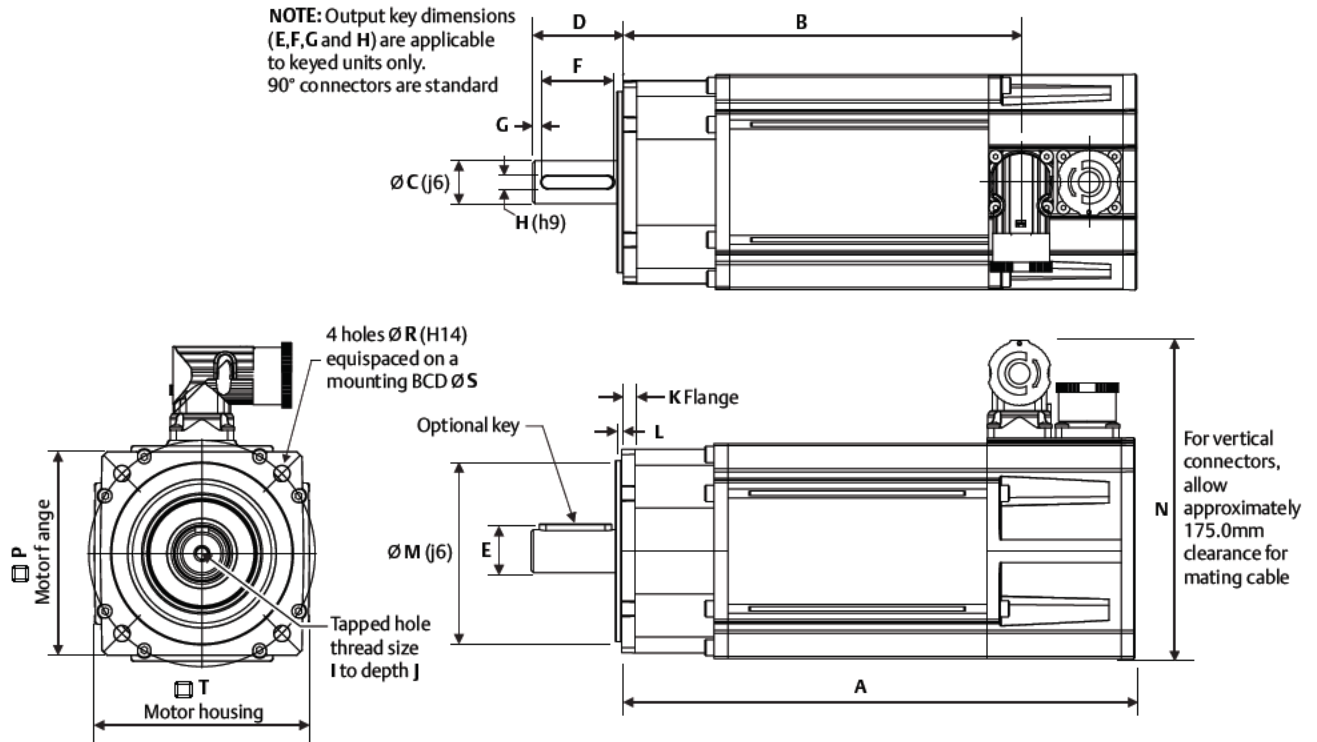
Unimotor fm 95 mm Frame Ratings

Motor Frame Size (mm)		095E3					095U3				
Voltage (Vrms)		230					460				
Frame Length		A	B	C	D	E	A	B	C	D	E
Continuous Stall Torque (lb-in)		22.1	39.8	55.8	69.9	82.3	21.7	39.8	55.8	69.9	81.9
Continuous Stall Torque (Nm)		2.5	4.5	6.3	7.9	9.3	2.5	4.5	6.3	7.9	9.3
Peak Torque (lb-in)		65	119	167	210	246	65	119	167	210	246
Peak Torque (Nm)		7.4	13.5	18.9	23.7	27.8	7.4	13.5	18.9	23.7	27.8
Standard Inertia (lb-in-sec ²)		0.00128	0.00230	0.00329	0.00427	0.00531	0.00128	0.00230	0.00329	0.00427	0.00531
Standard Inertia (kgm ²)		0.00015	0.00026	0.00037	0.00048	0.00060	0.00015	0.00026	0.00037	0.00048	0.00060
High Inertia Option (lb-in-sec ²)		0.00116	0.00398	0.00496	0.00593	0.00690	0.00116	0.00398	0.00496	0.00593	0.00690
High Inertia Option (kgm ²)		0.00013	0.00045	0.00056	0.00067	0.00078	0.00013	0.00045	0.00056	0.00067	0.00078
Winding Thermal Time Const. (s)		84	82	73	90	108	84	82	90	108	112
Motor Weight (lbs)		10.1	12.8	15.4	18	20.7	10.1	12.8	15.4	18	20.7
Motor Weight (kg)		4.6	5.8	7	8.2	9.4	4.6	5.8	7	8.2	9.4
Shaft Diameter (mm)		14	19	19	19	19	14	19	19	19	19
Shaft Length (mm)		30	40	40	40	40	30	40	40	40	40
2000 rpm	Kt (lb-in/A) =	12.4					21.2				
	Kt (Nm/A) =	1.4					2.4				
	Ke (V/k rpm) =	85.5					147.0				
Rated Torque (lb-in)		21.2	38.1	52.2	64.6	75.2	21.2	38.1	52.2	64.6	75.2
Rated Torque (Nm)		2.4	4.3	5.9	7.3	8.5	2.4	4.3	5.9	7.3	8.5
Stall Current (A)		1.8	3.2	4.5	5.6	6.6	1.0	1.9	2.6	3.3	3.9
Rated Power (kW)		0.51	0.9	1.23	1.53	1.77	0.51	0.9	1.23	1.53	1.77
R (ph-ph) (Ohms)		20.69	6.78	3.79	2.42	1.92	64.08	20.88	10.46	7.46	5.09
L (ph-ph) (mH)		57.78	26.1	16.36	11.83	9.75	173.4	78.16	47.02	35.44	27.18
3000 rpm	Kt (lb-in/A) =	8.23					14.2				
	Kt (Nm/A) =	0.93					1.60				
	Ke (V/k rpm) =	57.0					98.0				
Rated Torque (lb-in)		20.6	36.3	49.6	61.1	72.1	20.4	36.3	49.6	61.1	72.6
Rated Torque (Nm)		2.33	4.1	5.6	6.9	8.15	2.3	4.1	5.6	6.9	8.2
Stall Current (A)		2.63	4.84	6.77	8.49	9.95	1.5	2.8	3.9	4.9	5.8
Rated Power (kW)		0.73	1.29	1.76	2.17	2.56	0.73	1.29	1.76	2.17	2.56
R (ph-ph) (Ohms)		9.62	2.99	1.64	1.07	0.86	26.7	8.63	4.67	3.16	2.27
L (ph-ph) (mH)		26.29	11.47	7.15	5.16	4.35	76.65	33.71	21.09	15.95	12.06
4000 rpm	Kt (lb-in/A) =	6.2					10.6				
	Kt (Nm/A) =	0.7					1.2				
	Ke (V/k rpm) =	42.75					73.5				
Rated Torque (lb-in)		20.4	33.6	46.9	56.6	65.5	20.4	33.6	46.9	56.6	65.5
Rated Torque (Nm)		2.3	3.8	5.3	6.4	7.4	2.3	3.8	5.3	6.4	7.4
Stall Current (A)		3.5	6.43	9.0	11.29	13.21	2.0	3.8	5.3	6.6	7.7
Rated Power (kW)		0.94	1.59	2.2	2.68	3.1	0.94	1.59	2.2	2.68	3.1
R (ph-ph) (Ohms)		5.26	1.76	1.04	0.74	0.48	16.14	5.22	2.61	1.81	1.4
L (ph-ph) (mH)		14.94	6.67	4.52	3.53	2.44	44.25	19.54	11.75	8.86	7.25
6000 rpm	Kt (lb-in/A) =	4.2					7.1				
	Kt (Nm/A) =	0.47					0.8				
	Ke (V/k rpm) =	28.5					49.0				
Rated Torque (lb-in)		17.5	28.3	37.2			17.7	28.3	37.2		
Rated Torque (Nm)		1.98	3.2	4.2			2.0	3.2	4.2		
Stall Current (A)		5.21	9.57	13.4			3.1	5.6	7.9		
Rated Power (kW)		1.24	2.01	2.64			1.24	2.01	2.64		
R (ph-ph) (Ohms)		2.33	0.73	0.46			6.59	2.13	1.22		
L (ph-ph) (mH)		6.57	2.77	2.07			18.62	8.24	5.44		

NOTES:

- $\Delta t = 212^\circ\text{F}$ (100°C) winding 104°F (40°C) maximum ambient
- All data subject to $\pm 10\%$ tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 68°F (20°C) ambient at 12 kHz drive switching frequency
- Emerson has an ongoing process of development and reserves the right to change the specification without notice
- All other figures relate to a 68°F (20°C) motor temperature; maximum intermittent winding temperature is 284°F (140°C)

Unimotor fm 95 mm Frame Dimensions



Motor Dimensions		Frame Length							
		A		B		C		D	
		(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)
Unbraked Length	A	8.93	226.9	10.11	256.9	11.3	286.9	12.48	316.9
	B	6.93	175.9	8.11	205.9	9.29	235.9	10.47	265.9
Braked Length	A	10.11	256.9	11.3	286.9	12.48	316.9	13.66	346.9
	B	8.11	205.9	9.29	235.9	10.47	265.9	11.65	295.9

BCD 098 and 115 mm motor lengths differ from the above, refer to draw for motor details

Connector Type		Connector Height	
		(in)	(mm)
"A"	N	5.18	131.5
"B" (std)		5.47	139.0
"C"		5.47	139.0
"V"		5.18	131.5

Dimensions for power connectors size 1.0

Flange Dimensions		BCD Code					
		Standard		Optional			
		100		098		115	
		(in)	(mm)	(in)	(mm)	(in)	(mm)
Flange Thickness	K	0.23	5.9	0.268	6.8	0.268	6.8
Pilot Thickness	L	0.11	2.8	0.11	2.8	0.11	2.8
Pilot Diameter (J6)	M	3.15	80.0	2.87	73.0	3.74	95.0
Flange Square	P	3.54	90.0	3.54	90.0	4.13	105.0
Mounting Hole Dia. (H14)	R	0.28	7.0	0.28	7.0	0.29	10.0
Mounting Hole BCD	S	3.94	100.0	3.88	98.43	4.53	115.0
Motor Housing	T	3.74	95.0	3.74	95.0	3.74	95.0
Mounting Bolts		M6		M6		M8	

¹NEMA 34 flange option; shaft diameters differ from typical NEMA 34 flange

Shaft Dimensions		Shaft Diameter Code					
		14.0 mm Frame A		19.0 mm Frames B-E		22.0 mm Opt	
		(in)	(mm)	(in)	(mm)	(in)	(mm)
Shaft Diameter (J6)	C	0.55	14.0	0.75	19.0	0.866	22.0
Shaft Length	D ¹	1.18	30.0	1.57	40.0	1.97	50.0
Key Height	E ²	0.63	16.0	0.85	21.5	1.0	24.5
Key Length	F ²	0.98	25.0	1.26	32.0	1.63	40.0
Key-to-Shaft End	G ⁴	0.06	1.5	0.14	3.6	0.188	4.6
Key Width (H9)	H	0.20	5.0	0.24	6.0	0.245	6.0
Tapped Hole thread Size	I	M5 x 0.8		M6 x 1.0		M8 x 1.25	
Tapped Hole Depth	J ⁵	0.53	13.5	0.67	17.0	0.816	20.0

¹±0.45 mm, ²To IEC 72-1, ³±0.25 mm, ⁴±1.1 mm, ⁵±0.4 mm

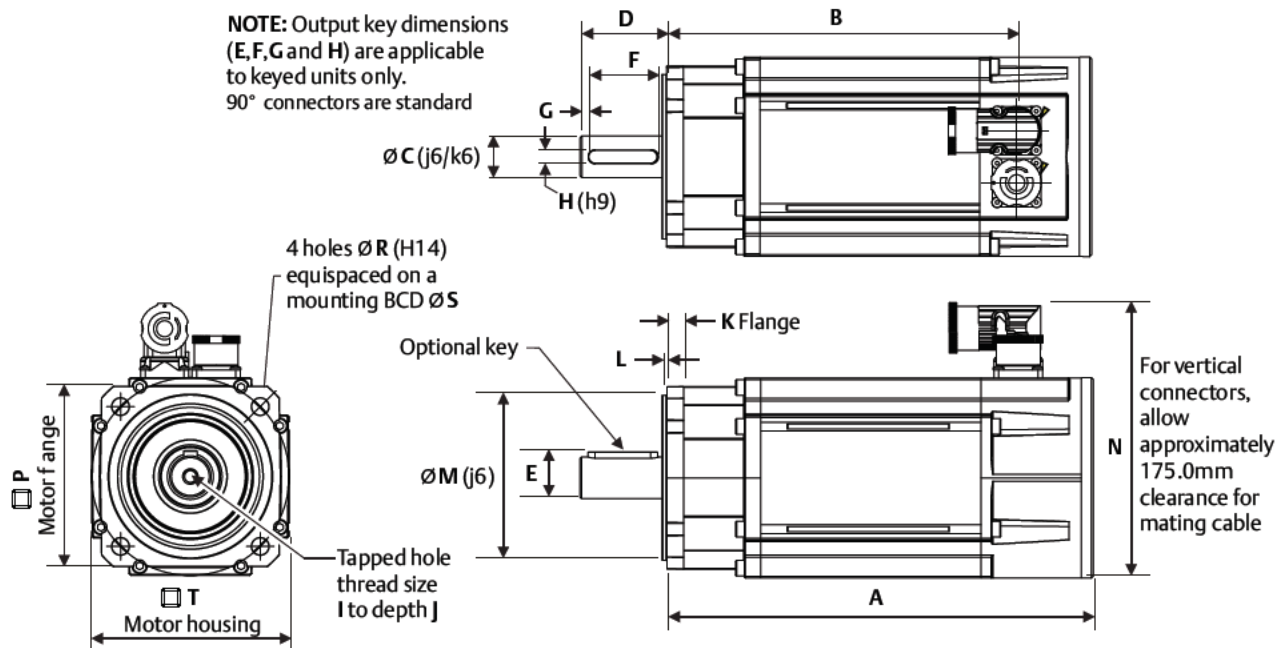
Unimotor fm 115 mm Frame Ratings

Motor Frame Size (mm)		115E3					115U3				
Voltage (Vrms)		230					460				
Frame Length		A	B	C	D*	E*	A	B	C	D	E
Continuous Stall Torque (lb-in)		35	65	96	121	142	35	65	96	121	142
Continuous Stall Torque (Nm)		3.9	7.4	10.8	13.7	16.0	3.9	7.4	10.8	13.7	16.0
Peak Torque (lb-in)		104	196	287	363	425	104	196	287	363	425
Peak Torque (Nm)		11.7	22.2	32.4	41	48	11.7	22.2	32.4	41	48
Standard Inertia (lb-in-sec ²)		0.00478	0.00682	0.00885	0.01106	0.0131	0.00478	0.00682	0.00885	0.01106	0.0131
Standard Inertia (kgm ²)		0.00054	0.00077	0.001	0.00125	0.00148	0.00054	0.00077	0.001	0.00125	0.00148
High Inertia Option (lb-in-sec ²)		0.00885	0.01089	0.01301	0.01513	0.01717	0.00885	0.01089	0.01301	0.01513	0.01717
High Inertia Option (kgm ²)		0.001	0.00123	0.00147	0.00171	0.00194	0.001	0.00123	0.00147	0.00171	0.00194
Winding Thermal Time Const. (s)		103	109	116	127	141	103	109	116	127	141
Motor Weight (lbs)		15.2	19.4	23.5	27.7	31.9	15.2	19.4	23.5	27.7	31.9
Motor Weight (kg)		6.9	8.8	10.7	12.6	14.5	6.9	8.8	10.7	12.6	14.5
Shaft Diameter (mm)		19	19	19	24	24	19	19	19	24	24
Shaft Length (mm)		40	40	40	50	50	40	40	40	50	50
2000 rpm	Kt (lb-in/A) =	12.4					21.2				
	Kt (Nm/A) =	1.4					2.4				
	Ke (V/k rpm) =	85.5					147.0				
Rated Torque (lb-in)		32.7	64.6	89.4	105.3	124.8	32.7	64.6	89.4	105.3	124.8
Rated Torque (Nm)		3.7	7.3	10.1	11.9	14.1	3.7	7.3	10.1	11.9	14.1
Stall Current (A)		2.8	5.3	7.7	9.8	11.4	1.6	3.1	4.5	5.7	6.7
Rated Power (kW)		0.77	1.53	2.12	2.49	2.95	0.77	1.53	2.12	2.49	2.95
R (ph-ph) (Ohms)		10.65	3.43	1.82	1.81	1.34	32.92	10.68	5.25	3.7	2.75
L (ph-ph) (mH)		55.83	19.43	12.31	9.5	7.68	139.43	59.51	35.9	27.63	21.87
3000 rpm	Kt (lb-in/A) =	8.23					14.2				
	Kt (Nm/A) =	0.93					1.6				
	Ke (V/k rpm) =	57.0					98.0				
Rated Torque (lb-in)		31.0	59.3	84.1	99.1	112.4*	31.0	59.3	84.1	99.1	112.4
Rated Torque (Nm)		3.5	6.7	9.5	11.2	12.7	3.5	6.7	9.5	11.2	12.7
Stall Current (A)		4.19	7.96	11.61	14.68	17.2	2.4	4.6	6.8	8.5	10.0
Rated Power (kW)		1.1	2.1	2.98	3.52	3.99	1.1	2.1	2.98	3.52	3.99
R (ph-ph) (Ohms)		4.91	1.52	0.81	0.57	0.43	14.74	4.37	2.3	1.53	1.23
L (ph-ph) (mH)		20.26	8.63	5.47	4.35	3.41	57.29	25.19	15.57	11.6	9.89
4000 rpm	Kt (lb-in/A) =	6.2					10.6				
	Kt (Nm/A) =	0.7					1.2				
	Ke (V/k rpm) =	42.75					73.5				
Rated Torque (lb-in)		26.6	51.3	66.4	73.5*	77.9*	26.6	51.3	66.4	73.5	77.9
Rated Torque (Nm)		3.0	5.8	7.5	8.3	8.8	3.0	5.8	7.5	8.3	8.8
Stall Current (A)		5.57	10.57	15.43	19.5	22.9	3.3	6.2	9.0	11.4	13.3
Rated Power (kW)		1.26	2.43	3.12	3.46	3.69	1.26	2.43	3.12	3.46	3.69
R (ph-ph) (Ohms)		3.05	0.93	0.49	0.3	0.27	8.49	2.61	1.31	0.84	0.66
L (ph-ph) (mH)		12.44	5.13	3.34	2.25	2.18	33.79	14.87	8.98	6.27	5.35
6000 rpm	Kt (lb-in/A) =	4.2					7.1				
	Kt (Nm/A) =	0.47					0.8				
	Ke (V/k rpm) =	28.5					49.0				
Rated Torque (lb-in)		23.9	44.3				23.9	44.3			
Rated Torque (Nm)		2.7	5.0				2.7	5.0			
Stall Current (A)		8.3	15.74				4.9	9.3			
Rated Power (kW)		1.7	3.14				1.7	3.14			
R (ph-ph) (Ohms)		1.5	0.41				3.48	1.09			
L (ph-ph) (mH)		6.08	2.34				14.31	6.3			

NOTES:

- * Ratings shown require connector option "H" terminal box.
- $\Delta t = 212\text{ }^{\circ}\text{F}$ (100 $^{\circ}\text{C}$) winding 104 $^{\circ}\text{F}$ (40 $^{\circ}\text{C}$) maximum ambient
- All data subject to $\pm 10\%$ tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 68 $^{\circ}\text{F}$ (20 $^{\circ}\text{C}$) ambient at 12 kHz drive switching frequency
- Emerson has an ongoing process of development and reserves the right to change the specification without notice
- All other figures relate to a 68 $^{\circ}\text{F}$ (20 $^{\circ}\text{C}$) motor temperature; maximum intermittent winding temperature is 284 $^{\circ}\text{F}$ (140 $^{\circ}\text{C}$)

Unimotor fm 115 mm Frame Dimensions



Motor Dimensions		Frame Length									
		A		B		C		D		E	
		(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)
Unbraked Length	A	9.71	246.6	10.89	276.6	12.07	306.6	13.25	336.6	14.43	366.6
	B	7.63	193.8	8.81	223.8	9.99	253.8	11.17	283.8	12.35	313.8
Braked Length	A	10.89	276.6	12.07	306.6	13.25	336.6	14.43	366.6	15.61	396.6
	B	8.81	223.8	9.99	253.8	11.17	283.8	12.35	313.8	13.54	343.8

BCD 130 motor lengths differ from the above, refer to draw for motor details

Connector Type	Connector Size	Connector Height	
		(in)	(mm)
"A"	N	1.0	5.87
"B" (std)		1.0	6.16
"C"		1.0	6.16
"V"		1.0	5.87
"J"		1.5	7.38
"M"		1.5	6.59

Flange Dimensions		BCD Code			
		Standard		Optional	
		115		130	
		(in)	(mm)	(in)	(mm)
Flange Thickness	K	0.39	10.1	0.52	13.2
Pilot Thickness	L	0.11	2.8	0.11	2.8
Pilot Diameter (j6)	M	3.74	95	4.33	110
Flange Square	P	4.13	105	5.12	130
Mounting Hole Dia. (H14)	R	0.39	10	0.39	10
Mounting Hole BCD	S	4.53	115	5.12	130
Motor Housing	T	4.53	115	4.53	115
Mounting Bolts		M8			

Shaft Dimensions		Shaft Diameter Code			
		19.0 mm Frame A-C		24.0 mm Frame D-E	
		(in)	(mm)	(in)	(mm)
Shaft Diameter (j6)	C	0.75	19.0	0.94	24.0
Shaft Length	D ¹	1.57	40.0	1.97	50.0
Key Height	E ²	0.85	21.5	1.06	27.0
Key Length	F ²	1.26	32.0	1.57	40.0
Key-to-Shaft End	G ⁴	0.14	3.6	0.18	4.6
Key Width (H9)	H	0.24	6.0	0.31	8.0
Tapped Hole thread Size	I	M6 x 1.0		M8 x 1.25	
Tapped Hole Depth	J ⁵	0.67	17.0	0.79	20.0

¹±0.45 mm, ²To IEC 72-1, ⁴±1.1 mm, ⁵±0.4 mm

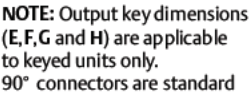
Unimotor fm 142 mm Frame Ratings

Motor Frame Size (mm)		142E3					142U3				
Voltage (Vrms)		230					460				
Frame Length		A	B	C*	D*	E*	A	B	C	D*	E*
Continuous Stall Torque (lb-in)		55.0	97.0	139.0	181.0	221.0	55.0	97.0	139.0	181.0	221.0
Continuous Stall Torque (Nm)		6.2	11.0	15.7	20.5	25.0	6.2	11.0	15.7	20.5	25.0
Peak Torque (lb-in)		165.0	292.0	417.0	544.0	664.0	165.0	292.0	417.0	544.0	664.0
Peak Torque (Nm)		18.6	33.0	47.1	61.5	75.0	18.6	33.0	47.1	61.5	75.0
Standard Inertia (lb-in-sec ²)		0.00903	0.01496	0.0208	0.02673	0.03266	0.00903	0.01496	0.0208	0.02673	0.03266
Standard Inertia (kgm ²)		0.00102	0.00169	0.00235	0.00302	0.00369	0.00102	0.00169	0.00235	0.00302	0.00369
High Inertia Option (lb-in-sec ²)		0.02053	0.02638	0.03231	0.03815	0.04408	0.02053	0.02638	0.03231	0.03815	0.04408
High Inertia Option (kgm ²)		0.00232	0.00298	0.00365	0.00431	0.00498	0.00232	0.00298	0.00365	0.00431	0.00498
Winding Thermal Time Const. (s)		145	148	188	206	249	145	148	188	206	249
Motor Weight (lbs)		18.3	25.1	31.9	38.7	45.5	18.3	25.1	31.9	38.7	45.5
Motor Weight (kg)		8.3	11.4	14.5	17.6	20.7	8.3	11.4	14.5	17.6	20.7
Shaft Diameter (mm)		24	24	24	24	24	24	24	24	24	24
Shaft Length (mm)		50	50	50	50	50	50	50	50	50	50
2000 rpm	Kt (lb-in/A) =	12.4					21.2				
	Kt (Nm/A) =	1.4					2.4				
	Ke (V/k rpm) =	85.5					147.0				
Rated Torque (lb-in)		52.2	92.0	130.1	163.7	190.3*	52.2	92.0	130.1	163.7	190.3
Rated Torque (Nm)		5.9	10.4	14.7	18.5	21.5	5.9	10.4	14.7	18.5	21.5
Stall Current (A)		4.4	7.9	11.2	14.6	17.9	2.6	4.6	6.5	8.5	10.4
Rated Power (kW)		1.23	2.18	3.08	3.87	4.49	1.23	2.18	3.08	3.87	4.49
R (ph-ph) (Ohms)		5.56	1.54	0.80	0.51	0.40	14.64	4.71	2.38	1.60	1.11
L (ph-ph) (mH)		35.43	14.25	8.99	6.35	5.25	98.76	42.15	26.32	19.46	15.08
3000 rpm	Kt (lb-in/A) =	8.23					14.2				
	Kt (Nm/A) =	0.93					1.6				
	Ke (V/k rpm) =	57.0					98.0				
Rated Torque (lb-in)		48.7	84.1	113.3	141.6*	161.1*	48.7	84.1	113.3	141.6	161.1
Rated Torque (Nm)		5.5	9.5	12.8	16.0	18.2	5.5	9.5	12.8	16.0	18.2
Stall Current (A)		6.67	11.83	16.88	22.04	26.88	3.9	6.9	9.8	12.8	15.6
Rated Power (kW)		1.73	2.98	4.02	5.03	5.70	1.73	2.98	4.02	5.03	5.7
R (ph-ph) (Ohms)		2.25	0.68	0.35	0.23	0.16	6.2	2.12	1.08	0.70	0.50
L (ph-ph) (mH)		14.68	6.33	3.89	3.66	2.23	42.97	19.11	12.06	8.91	6.7
4000 rpm	Kt (lb-in/A) =	6.2					10.6				
	Kt (Nm/A) =	0.7					1.2				
	Ke (V/k rpm) =	42.75					73.5				
Rated Torque (lb-in)		36.3	71.7	90.3*	108.0*	123.9*	36.3	71.7	90.3	108*	123.9*
Rated Torque (Nm)		4.1	8.1	10.2	12.2	14.0	4.1	8.1	10.2	12.2	14.0
Stall Current (A)		8.86	15.71	22.43	29.3	35.7	5.2	9.2	13.1	17.1	20.8
Rated Power (kW)		1.72	3.37	4.27	5.11	5.86	1.72	3.37	4.27	5.11	5.86
R (ph-ph) (Ohms)		1.29	0.38	0.23	0.13	0.09	3.64	1.18	0.61	0.41	0.29
L (ph-ph) (mH)		8.39	3.44	2.49	1.99	1.2	24.44	10.54	6.78	5.06	3.97
6000 rpm	Kt (lb-in/A) =						0.7				
	Kt (Nm/A) =						0.08				
	Ke (V/k rpm) =						49.0				
Rated Torque (lb-in)							28.3	46.0			
Rated Torque (Nm)							3.2	5.2			
Stall Current (A)							7.8	13.8			
Rated Power (kW)							2.01	3.27			
R (ph-ph) (Ohms)							1.63	0.53			
L (ph-ph) (mH)							11.08	4.78			

NOTES:

- * Ratings shown require connector option "J", "M", "N" size 1.5 power connector.
- Δt = 212 °F (100 °C) winding 104 °F (40 °C) maximum ambient
- All data subject to ±10% tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 68 °F (20 °C) ambient at 12 kHz drive switching frequency
- Emerson has an ongoing process of development and reserves the right to change the specification without notice
- All other figures relate to a 68 °F (20 °C) motor temperature; maximum intermittent winding temperature is 284 °F (140 °C)

UNIMOTOR FM



BCD 149 motor lengths differ from the above, refer to draw for motor details

Connector Type		Connector Size	Connector Height	
			(in)	(mm)
"A"	N	1.0	6.93	176.0
"B" (std)		1.0	7.22	183.5
"C"		1.0	7.22	183.5
"V"		1.0	6.93	176.0
"J"		1.5	8.05	204.5
"M"		1.5	7.26	184.5

Flange Dimensions		BCD Code			
		Standard		Optional	
		165		149†	
		(in)	(mm)	(in)	(mm)
Flange Thickness	K	0.55	14.0	0.45	11.5
Pilot Thickness	L	0.13	3.4	0.13	3.4
Pilot Diameter (J6)	M	5.12	130	4.5	114.3
Flange Square	P	5.59	142	5.51	140
Mounting Hole Dia. (H14)	R	0.47	12.0	0.47	12.0
Mounting Hole BCD	S	6.5	165	5.88	149.23
Motor Housing	T	5.59	142	5.59	142
Mounting Bolts		M10		M10	

[†]NEMA 56 flange option; shaft diameter 0.945 in (24 mm)

Shaft Dimensions		Shaft Diameter Code			
		24.0 mm Frame A-C		32.0 mm Frame D-E	
		(in)	(mm)	(in)	(mm)
Shaft Diameter (J6)	C	0.94	24.0	1.26	32.0
Shaft Length	D¹	1.97	50.0	2.28	58.0
Key Height	E²	1.06	27.0	1.38	35.0
Key Length	F³	1.57	40.0	1.97	50.0
Key-to-Shaft End	G⁴	0.18	4.6	0.18	4.6
Key Width (H9)	H	0.31	8.0	0.39	10.0
Tapped Hole thread Size	I	M8 x 1.25		M12 x 1.75	
Tapped Hole Depth	J⁵	0.79	20.0	1.14	29.0

¹±0.45 mm, ²To IEC 72-1, ³±0.25 mm, ⁴±1.1 mm, ⁵±0.4 mm

Unimotor fm 230 V 190 mm Frame Ratings

Motor Frame Size (mm)		190E3							
Voltage (Vrms)		230							
Frame Length		A	B	C*	D*	E*	F*	G*	H*
Continuous Stall Torque (lb-in)		100.0	199.1	296.5	393.9	477.9	557.6	628.4	681.5
Continuous Stall Torque (Nm)		11.3	22.5	33.5	44.5	54.0	63.0	71.0	77.0
Peak Torque (lb-in)		299.2	597.4	889.5	1181.6	1433.8	1672.8	1885.2	2044.5
Peak Torque (Nm)		33.8	67.5	100.5	133.5	162.0	189.0	213.0	231.0
Standard Inertia (lb-in-sec ²)		0.0277	0.04408	0.06045	0.07682	0.0932	0.10957	0.12595	0.14232
Standard Inertia (kgm ²)		0.00313	0.00498	0.00683	0.00868	0.01053	0.01238	0.01423	0.01608
High Inertia Option (lb-in-sec ²)		0.06178	0.07815	0.09453	0.11090	0.12727	0.14365	0.16002	0.1764
High Inertia Option (kgm ²)		0.00698	0.00883	0.01068	0.01253	0.01438	0.01623	0.01808	0.01993
Winding Thermal Time Const. (s)		194	214	215	216	251	285	425	564
Motor Weight (lbs)		31.68	42.24	52.8	63.36	73.92	84.48	95.04	105.6
Motor Weight (kg)		14.4	19.2	24	28.8	33.6	38.4	43.2	48
Shaft Diameter (mm)		32	32	32	32	32	32	32	32
Shaft Length† (mm)		58 or 80	58 or 80	58 or 80	58 or 80	58 or 80	58 or 80	58 or 80	58 or 80
2000 rpm	Kt (lb-in/A) =	12.39							
	Kt (Nm/A) =	1.4							
	Ke (V/k rpm) =	85.5							
	Rated Torque (lb-in)	95.6	182.3	260.2	335.4	392.1	447.0*	477.9*	495.6*
	Rated Torque (Nm)	10.8	20.6	29.4	37.9	44.3	50.5	54.0	56.0
	Stall Current (A)	8	16.1	23.9	31.8	38.6	45	50.7	55
	Rated Power (kW)	2.26	4.31	6.15	7.94	9.28	10.58	11.31	11.73
	R (ph-ph) (Ohms)	1.8	0.5	0.25	0.19	0.13	0.1	0.08	0.054
	L (ph-ph) (mH)	17.34	7.77	4.66	3.26	3.02	2.65	2.12	1.55
3000 rpm	Kt (lb-in/A) =	8.23							
	Kt (Nm/A) =	0.93							
	Ke (V/k rpm) =	57.0							
	Rated Torque (lb-in)	91.2	171.7	234.5	293.8*	302.7*	311.5*	320.4*	327.5*
	Rated Torque (Nm)	10.3	19.4	26.5	33.2	34.2	35.2	36.2	37.0
	Stall Current (A)	12.1	24.19	36.92	47.85	58.06	67.74	76.34	82.8
	Rated Power (kW)	3.24	6.09	8.33	10.43	10.74	11.06	11.37	11.62
	R (ph-ph) (Ohms)	0.83	0.256	132	0.09	0.07	0.05	0.05	0.03
	L (ph-ph) (mH)	7.94	3.87	2.46	1.81	1.55	1.17	1.36	0.86
4000 rpm	Kt (lb-in/A) =	6.20							
	Kt (Nm/A) =	0.7							
	Ke (V/k rpm) =	42.8							
	Rated Torque (lb-in)	72.6	161.1	203.6*	256.7*				
	Rated Torque (Nm)	8.2	18.2	23	29				
	Stall Current (A)	16.07	32.14	47.86	63.57				
	Rated Power (kW)	3.43	7.62	9.63	12.15				
	R (ph-ph) (Ohms)	0.46	0.14	0.07	0.06				
	L (ph-ph) (mH)	4.34	2.18	1.39	1.26				

NOTES:

- * Ratings shown require connector option "H"
- $\Delta t = 212^\circ\text{F}$ (100°C) winding 104°F (40°C) maximum ambient
- All data subject to $\pm 10\%$ tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 68°F (20°C) ambient at 12 kHz drive switching frequency
- Emerson has an ongoing process of development and reserves the right to change the specification without notice
- All other figures relate to a 68°F (20°C) motor temperature; maximum intermittent winding temperature is 284°F (140°C)

†Order Code Information for 230/460 V 190 mm Frame

The Unimotor E3/U3 190 frame models are now supplied with an 58 mm long output shaft. If replacing an existing Unimotor fm 190 E2/U2 model which has a standard 80 mm long output shaft add the suffix -SREM to the order code.

80mm long output shaft order code example:		shaft length	shaft diameter	notes
Unimotor fm E3/U3	190U3D300BACAA215320	58 mm	32 mm	New standard offering
Unimotor fm E2/U2 (replacement)	190U3D300JACAA215320-SREM	80 mm	32 mm	Previous standard offering

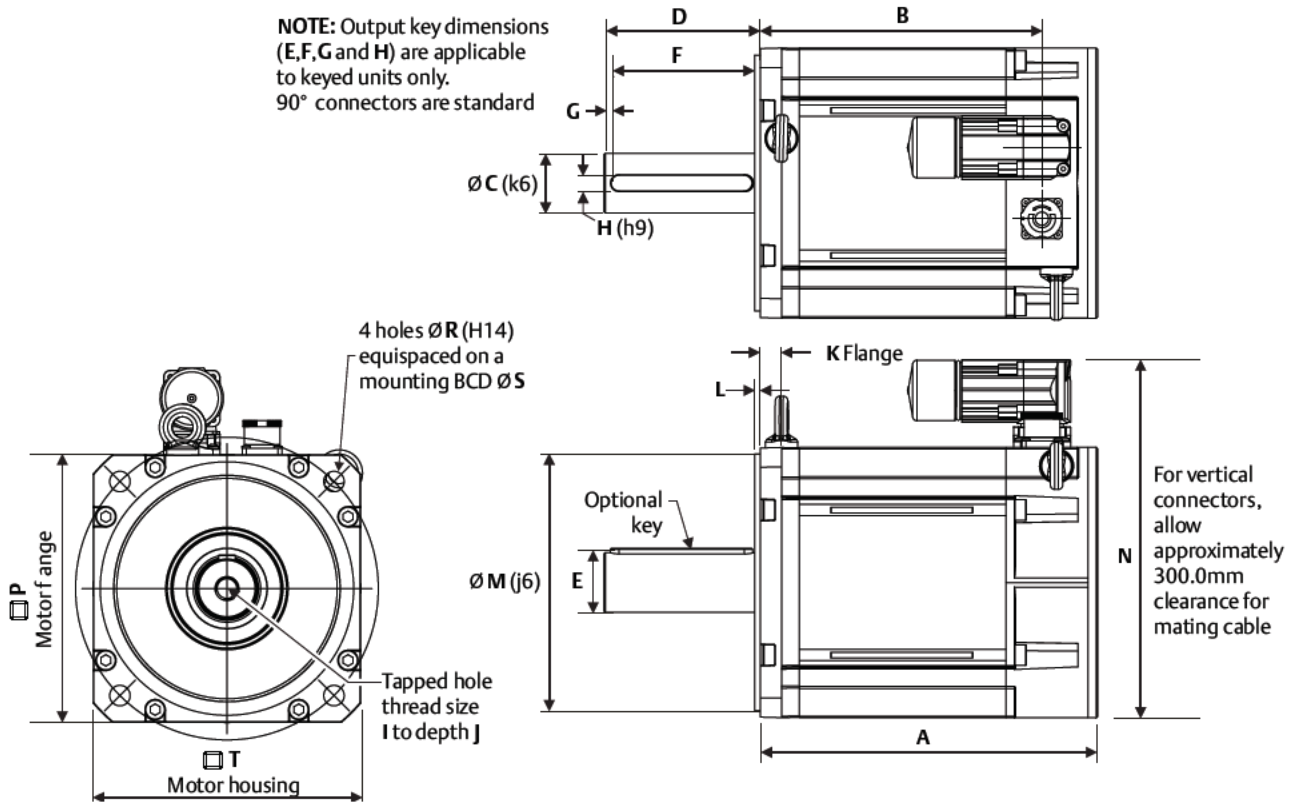
Unimotor fm 460 V 190 mm Frame Ratings

Motor Frame Size (mm)		190U3						
Voltage (Vrms)		460						
Frame Length		A	B	C	D	E	F	G* H*
Continuous Stall Torque (lb-in)		100	199.1	296.5	393.8	477.9	557.6	628.4 681.5
Continuous Stall Torque (Nm)		11.3	22.5	33.5	44.5	54	63	71 77
Peak Torque (lb-in)		299.1	597.4	889.4	1181.5	1433.7	1672.7	1885.1 2044.4
Peak Torque (Nm)		33.8	67.5	100.5	133.5	162	189	213 231
Standard Inertia (lb-in-sec ²)		0.0277	0.04408	0.06045	0.07682	0.0932	0.10957	0.12595 0.14232
Standard Inertia (kgm ²)		0.00313	0.00498	0.00683	0.00868	0.01053	0.01238	0.01423 0.01608
High Inertia Option (lb-in-sec ²)		0.06178	0.07815	0.09453	0.1109	0.12727	0.14365	0.16002 0.1764
High Inertia Option (kgm ²)		0.00698	0.00883	0.01068	0.01253	0.01438	0.01623	0.01808 0.01993
Winding Thermal Time Const. (s)		194	214	215	216	251	285	425 564
Motor Weight (lbs)		37.4	48	58.5	69.1	79.6	90.2	100.8 111.3
Motor Weight (kg)		17	21.8	26.6	31.4	36.2	41	45.8 50.6
Shaft Diameter (mm)		32	32	32	32	32	32	32 32
Shaft Length† (mm)		58 or 80	58 or 80	58 or 80	58 or 80	58 or 80	58 or 80	58 or 80 58 or 80
2000 rpm	Kt (lb-in/A) =	21.24						
	Kt (Nm/A) =	2.4						
	Ke (V/k rpm) =	147.0						
Rated Torque (lb-in)		95.6	182.3	260.2	335.4	392.1	446.9	477.9 495.6
Rated Torque (Nm)		10.8	20.6	29.4	37.9	44.3	50.5	54.0 56.0
Stall Current (A)		4.7	9.4	14.0	18.5	22.5	26.3	29.6 32.1
Rated Power (kW)		2.26	4.31	6.15	7.94	9.28	10.58	11.31 11.73
R (ph-ph) (Ohms)		6.15	1.54	0.83	0.5	0.37	0.28	0.26 0.23
L (ph-ph) (mH)		52.9	23.55	15.0	8.81	8.68	7.36	6.89 6.3
3000 rpm	Kt (lb-in/A) =	14.2						
	Kt (Nm/A) =	1.6						
	Ke (V/k rpm) =	98.0						
Rated Torque (lb-in)		91.2	171.7	234.5	293.8	302.7	311.5	320.4* 327.5*
Rated Torque (Nm)		10.3	19.4	26.5	33.2	34.2	35.2	36.2 37.0
Stall Current (A)		7.0	14.1	20.9	27.8	33.8	39.4	44.4 48.1
Rated Power (kW)		3.24	6.09	8.33	10.43	10.74	11.06	11.37 11.62
R (ph-ph) (Ohms)		2.73	0.7	0.41	0.22	0.17	0.14	0.15 0.08
L (ph-ph) (mH)		23.5	10.47	7.35	4.89	3.86	3.6	3.06 2.42
4000 rpm	Kt (lb-in/A) =	10.6						
	Kt (Nm/A) =	1.2						
	Ke (V/k rpm) =	73.5						
Rated Torque (lb-in)		72.6	161.1	203.6	256.7			
Rated Torque (Nm)		8.2	18.2	23.0	29.0			
Stall Current (A)		9.4	18.8	27.9	37.1			
Rated Power (kW)		3.43	7.62	9.63	12.15			
R (ph-ph) (Ohms)		1.35	0.38	0.21	0.14			
L (ph-ph) (mH)		13.56	6.05	3.86	2.45			

NOTES:

- * Ratings shown require connector option "H"
- $\Delta t = 212^{\circ}\text{F}$ (100°C) winding 104°F (40°C) maximum ambient
- All data subject to $\pm 10\%$ tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 68°F (20°C) ambient at 12 kHz drive switching frequency
- Emerson has an ongoing process of development and reserves the right to change the specification without notice
- All other figures relate to a 68°F (20°C) motor temperature; maximum intermittent winding temperature is 284°F (140°C)

Unimotor fm 230 V and 460 V 190 mm Frame Dimensions



Motor Dimensions		Frame Length															
		A		B		C		D		E		F		G		H	
Unbraked Length	A	7.85	199.4	9.03	229.4	10.21	259.4	11.39	289.4	12.57	319.4	13.76	349.4	14.94	379.4	16.12	409.4
	B	6.68	169.6	7.86	199.6	9.04	229.6	10.22	259.6	11.4	289.6	12.58	319.6	13.76	349.6	14.94	379.6
Braked Length	A	11.39	289.4	12.57	319.4	13.76	349.4	14.94	379.4	16.12	409.4	17.3	439.4	18.48	469.4	19.66	499.4
	B	10.22	259.6	11.4	289.6	12.58	319.6	13.76	349.6	14.94	379.6	16.13	409.6	17.31	439.6	18.49	469.6

Connector Type		Connector Size	Connector Height	
			(in)	(mm)
"A"	N	1.5	9.65	245.0
"J" (std)		1.5	9.94	252.5
"N"		1.5	9.94	252.5
"M"		1.5	9.13	232.0

Flange Dimensions		BCD Code	
		Standard	
		215	
Flange Thickness	K	(in)	(mm)
	L	0.73	18.5
Pilot Thickness	M	0.15	3.9
	N	7.09	180.0
Pilot Diameter (J6)	O	7.48	190.0
	P	7.48	190.0
Mounting Hole Diameter (H14)	R	.057	14.5
	S	8.46	215.0
Mounting Hole BCD	T	7.48	190.0
	U	M12	

Shaft Dimensions		Shaft Diameter Code					
		32.0 mm Frames A-H		32.0 mm Frame A-H Opt.		38.0 mm Opt.	
		(in)	(mm)	(in)	(mm)	(in)	(mm)
Shaft Diameter (J6)	C	1.26	32	1.26	32	1.5	38
	D ¹	2.28	58	3.15	80	2.28	58
Key Height	E ²	1.61	41	1.61	41	1.61	41
	F ³	2.76	70	2.76	70	2.76	70
Key-to-Shaft End	G ⁴	0.18	4.6	0.18	4.6	0.18	4.6
	H	0.39	10	0.39	10	0.39	10
Tapped Hole Thread Size	I	M12 x 1.75		M12 x 1.75		M12 x 1.75	
	J ⁵	1.14	29	1.14	29	1.14	29

¹±0.45 mm, ²To IEC 72-1, ³±0.25 mm, ⁴±1.1 mm, ⁵±0.4 mm

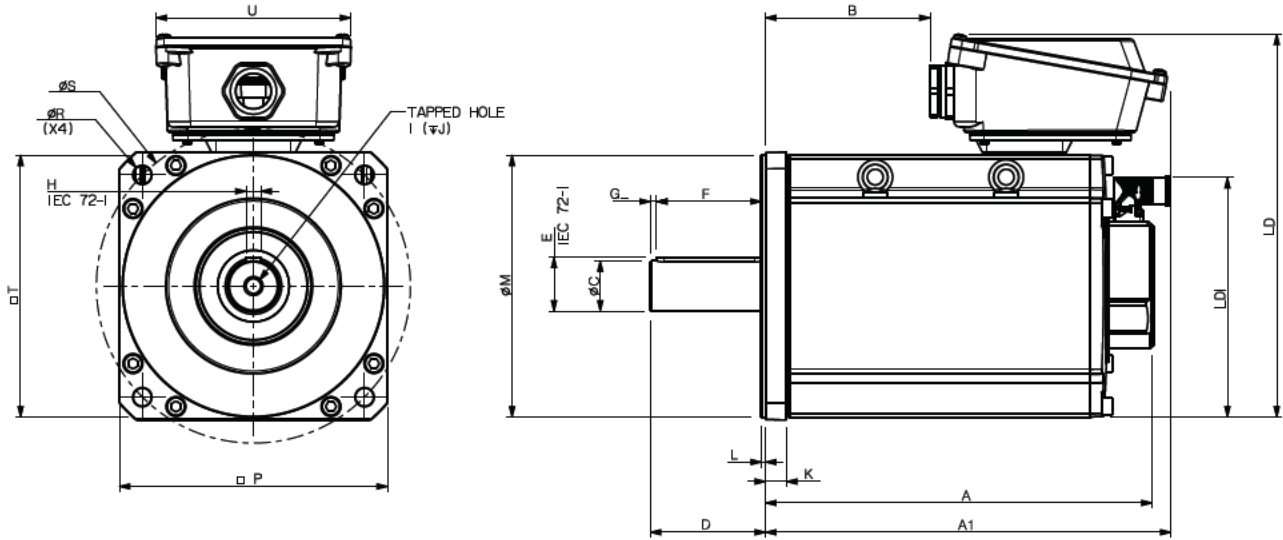
Unimotor fm 250 mm Frame Ratings

Motor Frame Size (mm)		250U3		
Voltage (Vrms)		460		
Frame Length		D	E	F
Continuous Stall Torque (lb-in)		814	1027	1204
Continuous Stall Torque (Nm)		92	116	136
Peak Torque (lb-in)		2443	3080	3611
Peak Torque (Nm)		276	348	408
Standard Inertia (lb-in-sec ²)		0.243	0.298	0.354
Standard Inertia (kgm ²)		0.028	0.034	0.04
High Inertia (lb-in-sec ²)		0.361	0.444	0.528
High Inertia (kgm ²)		0.041	0.050	0.060
Winding Thermal Time Const. (s)		439	486	608
Motor Weight (lbs)		126.5	144.1	162.1
Motor Weight (kg)		57.5	65.5	73.7
Shaft Diameter (mm)		48	48	48
Shaft Length (mm)		110	110	110
1000 rpm	Kt (lb-in/A) =	47.8		
	Kt (Nm/A) =	5.4		
	Ke (V/k rpm) =	323		
Rated Torque (lb-in)		664	814	938
Rated Torque (Nm)		75	92	106
Stall Current (A)		17.2	21.7	25.4
Rated Power (kW)		7.9	9.6	11.1
R (ph-ph) (Ohms)		0.61	0.48	0.34
L (ph-ph) (mH)		22.9	19.1	14.9
1500 rpm	Kt (lb-in/A) =	31.9		
	Kt (Nm/A) =	3.6		
	Ke (V/k rpm) =	216		
Rated Torque (lb-in)		593	673	743
Rated Torque (Nm)		67	76	84
Stall Current (A)		25.8	32.5	38.1
Rated Power (kW)		10.5	11.9	13.2
R (ph-ph) (Ohms)		0.27	0.21	0.15
L (ph-ph) (mH)		10.0	8.6	6.6
2000 rpm	Kt (lb-in/A) =	23.9		
	Kt (Nm/A) =	2.7		
	Ke (V/k rpm) =	162		
Rated Torque (lb-in)		593	655	717
Rated Torque (Nm)		67	74	81
Stall Current (A)		34.4	43.4	50.9
Rated Power (kW)		10.2	11.5	12.7
R (ph-ph) (Ohms)		0.15	0.10	0.08
L (ph-ph) (mH)		5.7	4.2	3.7
2500 rpm	Kt (lb-in/A) =	18.6		
	Kt (Nm/A) =	2.1		
	Ke (V/k rpm) =	129		
Rated Torque (lb-in)		549	620	681
Rated Torque (Nm)		62	70	77
Stall Current (A)		43	54.2	63.6
Rated Power (kW)		9.7	11	12.1
R (ph-ph) (Ohms)		0.09	0.08	0.06
L (ph-ph) (mH)		3.5	3.1	2.6

NOTES:

- $\Delta t = 212^{\circ}\text{F}$ (100°C) winding 104°F (40°C) maximum ambient
- All data subject to $\pm 10\%$ tolerance
- Stall torque, rated torque and power relate to maximum continuous operation tested in a 68°F (20°C) ambient at 12 kHz drive switching frequency
- Emerson has an ongoing process of development and reserves the right to change the specification without notice
- All other figures relate to a 68°F (20°C) motor temperature; maximum intermittent winding temperature is 284°F (140°C)

Unimotor fm 250 mm Frame Dimensions



Motor Dimensions		Frame Length					
		D		E		F	
		(in)	(mm)	(in)	(mm)	(in)	(mm)
Unbraked Length	A	14.59	370.7	15.78	400.7	16.96	430.7
	A1	24.8	630.1	25.9	660.1	27.2	690.1
	B	7.07	179.7	8.26	209.7	9.44	239.7
Braked Length	A	17.42	442.5	18.60	472.5	19.78	502.5
	A1	27.6	701.9	28.8	731.9	30.0	761.9
	B	9.90	251.5	11.08	281.5	12.26	311.5

Connector Type	Connector Height			
	LD		LD1	
	(in)	(mm)	(in)	(mm)
"V"	11.48	291.5	8.70	221
"C"	12.30	312.5	8.70	221
"B"	12.30	312.5	8.70	221
"H" (std)	14.3	363.5	8.70	221

Flange Dimensions		BCD Code	
		Standard	
		215	
		(in)	(mm)
Flange Thickness	K	0.79	20.0
Pilot Thickness	L	0.18	4.50
Pilot Diameter (J6)	M	9.84	250.0
Flange Square	P	10.08	256.0
Mounting Hole Diameter (H14)	R	0.73	18.5
Mounting Hole BCD	S	11.81	300.0
Motor Housing	T	9.82	249.5
Terminal Box Width	U	7.32	186.0
Mounting Bolts		M16	

Shaft Dimensions		Shaft Diameter Code					
		38.0 mm Opt.		42.0 mm Opt.		48.0 mm standard	
		(in)	(mm)	(in)	(mm)	(in)	(mm)
Shaft Diameter (J6)	C	1.50	38.0	1.65	42.0	1.89	48.0
Shaft Length	D ¹	3.15	80.0	4.33	110.0	4.33	110.0
Key Height	E ²	1.61	41.0	1.77	45.0	2.03	51.5
Key Length	F ²	2.76	70.0	3.94	100.0	3.94	100.0
Key-to-Shaft End	G ⁴	0.18	4.6	0.24	6.0	0.24	6.0
Key Width (H9)	H	0.39	10.0	0.47	12.0	0.55	14.0
Tapped Hole Thread Size	I	M12x1.75mm		M16x2.0mm		M16x2.0mm	
Tapped Hole Depth	J ⁵	1.46	37.0	1.46	37.0	1.14	29.0

¹±0.45 mm, ²To IEC 72-1, ³±0.25 mm, ⁴±1.1 mm, ⁵±0.4 mm

NOTE: Shaft options below the standard (Std) dimensions will require customer approval and may not be covered by warranty.

Unimotor fm E3/U3 Power Connector Size Reference Tables

Unimotor fm E3/U3 Power Connector size reference tables

Use the tables below to indentify the standard connection type provided for the different frame sizes.

This motor example has power connector order option J (size 1.5) and requires a motor power cable with a size 1.5 connector. **example: 142E3400JACAA165240**

230 V - 75 to 142 mm Frames

230V	075E3				095E3					115E3					142E3				
	A	B	C	D	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
2000 (rpm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5
3000 (rpm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	H	1.0	1.0	1.0	1.5	1.5
4000 (rpm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	H	H	1.0	1.0	1.5	1.5	1.5
6000 (rpm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0								

Power Connector code above B, C, V =Size 1.0 and J, M, N =Size 1.5, H =terminal box

460 V - 75 to 142 mm Frames

460V	75U3				95U3					115U3					142U3				
	A	B	C	D	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
2000 (rpm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3000 (rpm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4000 (rpm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.5
6000 (rpm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0			1.0	1.0				1.0	1.0			

Power Connector code above B, C, V =Size 1.0 and J, M, N =Size 1.5, H =terminal box

230 V - 190 mm Frames

230V	190E3							
	A	B	C	D	E	F	G	H
2000 (rpm)	1.5	1.5	1.5	1.5	1.5	1.5	H	H
3000 (rpm)	1.5	1.5	1.5	1.5	H	H	H	H
4000 (rpm)	1.5	1.5	H	H				

Power Connector code J, M, N =Size 1.5, H =terminal box

460 V - 190 mm Frames

460V	190U3							
	A	B	C	D	E	F	G	H
2000 (rpm)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
3000 (rpm)	1.5	1.5	1.5	1.5	1.5	1.5	H	H
4000 (rpm)	1.5	1.5	1.5	1.5				

Power Connector code J, M, N =Size 1.5, H =terminal box

Unimotor fm Motor Selection Considerations

Feedback

Feedback Device Order Code	Feedback Type	Encoder Supply Voltage	SinCos Cycles or Incremental Pulses per Revolution	Resolution Available to Position Loop	Feedback Accuracy
075-250 motors					
AE	Resolver ¹	6 Vrms	1	Medium	Medium
		Excitation 6 kHz		16384 (14 bit)	+/- 720 arc second
CA	Incremental Encoder	5 Vdc	4096	Medium	High
				16384 (14 bit)	+/- 60 arc second
EC (Multi-turn)	Inductive Absolute Encoder EnDat ²	5 Vdc	32	High	Medium
				Absolute position 524288 (19 bits)	+/- 280 arc second
FC (Single-turn)				Very high	High
RA (Multi-turn)	Optical SinCos Encoder HIPERFACE ²	7 - 12 Vdc	1024	1.04 x 10 ⁶	+/-52 arc second
SA (Single-turn)				(20 bits)	
EB (Multi-turn)	Optical Absolute Encoder EnDat ²	3.6 - 14 Vdc	2048	Very High	Very High
				2.08 x 10 ⁶	+/-20 arc second
FB (Single-turn)				(21 bits)	(Differential non linearity +/- 1% signal period)

NOTES:

¹Resolution value shown when used with the Unidrive M resolver input or SM-Resolver Option Module (Unidrive SP and Digitax ST)

²Resolution value shown when used with the Unidrive M, Unidrive SP or Digitax ST when the encoder type is set to either SC EnDat or SC Hiper, depending on the encoder. Multi-turn devices have 4096 (12 bit) resolution.

Motor Selection Considerations

Motor Selection

Motor Derating

Any adverse operating conditions require that the motor performance be derated. These conditions include ambient temperature above 104 °F (40 °C), motor mounting position, drive switching frequency or a drive oversized for the motor.

Ambient Temperatures

For ambient temperatures above 104 °F (40 °C), the torque must be derated using the following formula as a guideline (only applies to motors up to 3000 rpm and assumes copper losses dominate).

$$\text{New derated torque} = \text{Specified torque} \times \sqrt{1 - ([\text{ambient temperature}^* - 40] / 100)}$$

* Measured in °C

For example, with an ambient temperature of 169 °F (76 °C), the new derated torque will be 0.8 x specified torque.

Drive Switching Frequency

Most drive current ratings are reduced at higher switching frequencies. See individual drive manuals for details.

Most motor current ratings are reduced at lower switching frequencies. See the table below for motor derating factors (these figures are for guidance only).

Ingress Protection

IP65 conformance; sealed against water spray and dust when mounted and connected.

Unimotor fm Motor Derating Factors

Switching Frequency	Frame Length								
	075	095	115		142		190		250
	A-D	A-E	A-C	D-E	A-C	D-E	A-B	C-H	D-F
3 kHz	0.93	0.88	0.89	0.84	0.87	0.81	0.98	N/A	0.88
4 kHz	0.94	0.91	0.91	0.87	0.91	0.86	0.99	0.55	0.90
5/6 kHz	0.95	0.93	0.93	0.90	0.94	0.89	0.99	0.77	0.94
8 kHz	0.98	0.97	0.97	0.95	0.97	0.96	1	0.90	0.98
10/12/16 kHz	1	1	1	1	1	1	1	1	1

Unimotor fm Motor Holding Brake Specifications

Motor Frame Size	Power Supply	Input Power	Static Torque		Mechanical Release Time	Added Inertia		Added Weight		Degress
(mm)	(Vdc)	(W)	(lb-in)	(Nm)	(ms)	(lb-in-sec ²)	(kgcm ²)	(lb)	(kg)	(°)
75	24	6.3	19.5	2.2	22	0.00006	0.07	1.1	0.5	1.03
95	24	16	108	12.2	60	0.00035	0.39	1.3	0.6	0.94
115	24	23	177	20	120	0.00039	0.24	2.6	1.2	0.75
142	24	23	177	20	120	0.00048	0.3	3.7	1.7	0.75
190 (A-D)	24	25	221	42	95	0.00035	0.39	4.4	2.0	0.77
190 (E-H)	24	25	548	67	120	0.00035	0.39	4.4	2.0	0.77
250	24	62	1195	135	250	0.01452	16.4	24.2	11.0	0.5

NOTES:

- Figures shown in individual motor sections are at 68 °F (20 °C) ambient
- Apply a derate factor of 0.7 to standard brake torque figures if motor temperature is above 212 °F (100 °C)
- * Backlash will increase over time

Thermal Protection

Thermistor protection to 293 °F (145 °C) is built into the motor windings and gives an indication of serious overheating problems. **The installer must connect the thermistor to the drive. Failure to do so will invalidate the motor warranty if winding burns out.**

Environmental Conditions

Any liquids or gases that may come into contact with the motor must be confirmed to ensure compliance with the correct international standards.

Brake Operation

Do not apply the brake while the motor shaft is rotating. The brake can only take a limited number of emergency braking operations and must not be used for repeated dynamic braking.

Thermal Test Conditions

In general, motor torque should be derated if the motor mounting surface is heated from an external source such as a gearbox, the motor is connected to a poor thermal conductor, or the motor is mounted in a confined space with restricted air flow.

Thermal motor mounting arrangement test example:

