



EMERSON[™]
Industrial Automation



Unimotor

Product Data
055 to 250 Frames
0.72 Nm to 136 Nm
(408 Nm Peak)




Introduction to Unimotor fm



Overview

Unimotor  is a high performance brushless AC servo motor range matched for use with Control Techniques drives. ‘’ stands for flexible motor, designed to accommodate a wide range of applications. The motors are available in seven frame sizes with various mounting arrangements and motor lengths.


Reliability and innovation

Unimotor  is designed using a proven development process that prioritises innovation and reliability. This process has resulted in Control Techniques’ market leading reputation for both performance and quality.

Matched motor and drive combinations


Control Techniques motors and drives are designed to function as an optimised system. Unimotor  is the perfect partner for Unidrive , Digitax ST and Epsilon EP drives.

Features


Unimotor  is suitable for a wide range of industrial applications, due to its extensive range of features

- Torque range: from 0.72 Nm to 136 Nm
- Standard and high energy parking brakes
- Numerous connector variants, e.g. vertical, 90° low profile, 90° rotatable and hybrid box on frame size 250
- Variety of flange possibilities (IEC/NEMA)
- Various shaft diameters; keyed or plain
- IP65 conformance; sealed against water spray and dust when mounted and connected
- Low inertia for high dynamic performance; high inertia option available
- World class performance
- Supported by rigorous testing for performance and reliability
- Optional high peak torque motors; up to 5 times stall torque
- Winding voltages of 400V and 220V
- Rated speeds include 1500 rpm, 2000 rpm, 3000 rpm, 4000 rpm, 6000 rpm and others available

Faster set-up, optimised performance




When a Control Techniques servo drive is connected to a Unimotor  fitted with a SinCos or Absolute encoder, it can recognise and communicate with the motor to obtain the “electronic nameplate” data. This motor data can then be used to automatically optimise the drive settings. This feature simplifies commissioning and maintenance, ensures consistent performance and saves time.

Accuracy and resolution to suit your application requirements

Choosing the right feedback device for your application is critical in getting optimum performance. Unimotor  has a range of feedback options that offer different levels of accuracy and resolution to suit most applications:

- Resolver: robust for extreme applications and conditions - low accuracy, medium resolution
- Incremental encoder: high accuracy, medium resolution
- Inductive absolute: medium accuracy, medium resolution
- Optical SinCos/Absolute: high accuracy, high resolution
- Single turn and multi-turn: Hiperface and EnDAT protocols supported


Ideal for retrofit

Unimotor  is an ideal retrofit choice with features to ensure it can integrate easily with your existing servo motor applications. Unimotor  has been designed so that existing Unimotor customers can easily migrate to the new platform. All connector interface types and mounting dimensions remain the same. If you are planning to retrofit your system, Unimotor  is the obvious choice.

Custom built motors

As part of our commitment to you, we can design special products to meet your application specific requirements.

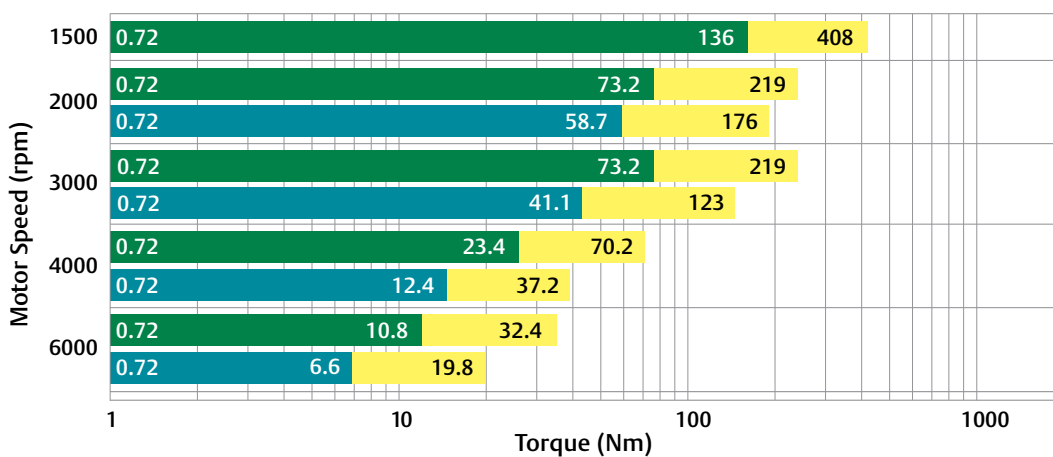
Wide range of accessories

Unimotor  has a wide range of accessories to meet all your system requirements:

- Feedback and power cables for static and dynamic applications
- Fan boxes
- Gearboxes
- Cable connectors



Torque performance ■ Peak ■ Stall at 220V nominal ■ Stall at 400V nominal




NB: The selection of drive-motor combinations should be based on duty/load profiles of the application

Conformance and standards



FM 30610

Ordering information

Use the information below in the illustration to create an order code for a Unimotor 

The details in the band are an example of an order reference (Std = Standard selection, Opt = Optional selection)

095	U	2	B	30	1	V
Frame size	Motor voltage	Peak torque selection	Stator length	Winding speed	Parking brake	Connection type
055	E = 220V	055 frame only	055 frame	055 frame only	055 frame only	055 frame only
075	U = 400V	2 = Standard peak torque	A	30 = 3000 rpm	0 = Not fitted (Std)	B = Power and Signal 90° rotatable (Std)
095	250 frame only	075-142 frame only	B	60 = 6000 rpm	1 = Parking brake fitted 24Vdc	C = Power 90° rotatable and Signal vertical
115	U = 400V	2 = Standard peak torque	C	075-190 frame only	X = Special	
142		P = High peak torque	075 frame	10 = 1000 rpm	075-190 frame only	V = Power and Signal vertical
190		190-250 frame only	A	20 = 2000 rpm	0 = Not fitted (Std)	X = Special
250		2 = Standard peak torque	B	25 = 2500 rpm	1 = Parking brake fitted 24Vdc	075-190 frame only
			C	30 = 3000 rpm	5 = High energy dissipation parking brake	A = Power and Signal 90° fixed
			D	40 = 4000 rpm	X = Special	B = Power and Signal 90° rotatable
			095-142 frame	45 = 4500 rpm	0 = Not fitted (Std)	C = Power 90° rotatable and Signal vertical
			A	50 = 5000 rpm	5 = High energy dissipation parking brake	V = Power and Signal vertical (Std)
			B	60 = 6000 rpm	X = Special	X = Special
			C	250 frame only	250 frame only	250 frame only
			D	10 = 1000 rpm		
			E	15 = 1500 rpm		
			190 frame	20* = 2000 rpm		
			A	25* = 2500 rpm		
			B			
			C			
			D			
			E			
			F			
			G			
			H			
			250 frame			
			D			
			E			
			F			

* D and E lengths, winding speed equal and above 2500rpm must use the Hybrid box. F lengths, winding speed equal and above 2000rpm must use the Hybrid box.

** Optional PCD's will have a different register diameter from the standard motors. Please consult Drive Centre or Distributors for details.

*** Available on 190 frame only

	A	CA	A	100		190		
	Output shaft	Feedback device	Inertia	PCD**		Shaft diameter		
A = Key (Std)		055 frame only	055 frame only	055 frame only				
B = Plain shaft	AR = Resolver		A = Standard	063	Std	09.0	Opt	
X = Special	CR = Incremental Encoder	4096 ppr	075-190 frame only	070	Opt	11.0	A-C	Std
	MR = Incremental Encoder (Std)	2048 ppr	A = Standard			14.0	Max	
	KR = Incremental Encoder	1024 ppr	B = High Inertia	075 frame only				
	EM = Inductive Absolute Multi-turn	EQI 1130	250 frame only	075	Std	11.0	A	Std
	FM = Inductive Absolute Single turn	ECI 1118	A = Standard	080	Opt	14.0	B-D	Std
	TL = Optical SinCos Multi-turn	SKM 36		085	Opt	19.0	Max	
	UL = Optical SinCos Single turn	SKS 36		095 frame only				
	XX = Special			100	Std	14.0	A	Std
		075-142 frame only		098	Opt	19.0	B-E	Std
	AE = Resolver			115	Opt	22.0	Max	
	CA = Incremental Encoder (Std)	4096 ppr		115 frame only				
	MA = Incremental Encoder	2048 ppr		115	Std	19.0	A-C	Std
	KA = Incremental Encoder	1024 ppr		130	Opt	24.0	D-E	Std
	EB = Optical Absolute Multi-turn	EQN 1325		145	Opt	32.0	Max	
	FB = Optical Absolute Single turn	ECN 1313		142 frame only				
	EC = Inductive Absolute Multi-turn	EQI 1331		165	Std	24.0	A-E	Std
	FC = Inductive Absolute Single turn	ECI 1319		149	Opt	32.0	Max	
	RA = Optical SinCos Multi-turn	SRM 50		190 frame only				
	SA = Optical SinCos Single turn	SRS 50		215	Std	32.0	A-H	Std
	XX = Special					42.0	Max	
		190-250 frame only		250 frame only				
	AE = Resolver (Std for 250)			300	Std	48.0	D-F	Std
	CA = Incremental Encoder (Std for 190)	4096 ppr						
	MA = Incremental Encoder***	2048 ppr						
	EB = Optical Absolute Multi-turn	EQN 1325						
	FB = Optical Absolute Single turn	ECN 1313						
	RA = Optical SinCos Multi-turn	SRM 50						
	SA = Optical SinCos Single turn	SRS 50						
	XX = Special							

Ratings

3 Phase VPWM drives 200-240Vrms

Δt= 100°C winding 40°C maximum ambient All data subject to +/-10% tolerance

Motor frame size (mm)	055E2			075E2				095E2				
	A	B	C	A	B	C	D	A	B	C	D	E
Continuous stall torque (Nm)	0.72	1.18	1.65	1.2	2.2	3.1	3.9	2.3	4.3	5.9	7.5	9.0
Standard (2) peak torque selection max (Nm)	2.88	4.72	6.60	3.6	6.6	9.3	11.7	6.9	12.9	17.7	22.5	27.0
High (P) peak torque selection max (Nm)	N/A	N/A	N/A	6	11	15.5	19.5	10.4	19.4	26.6	33.8	40.5
Standard inertia (kgcm ²)	0.12	0.23	0.34	0.7	1.2	1.6	2.0	1.8	2.9	4.0	5.1	6.2
High inertia (kgcm ²)				1.1	1.5	2.0	2.4	3.7	4.8	5.9	7.0	8.1
Winding thermal time const. (s)	34.0	38.0	42.0	81	74	94	100	172	168	183	221	228
Standard motor weight unbraked (kg)	1.20	1.50	1.80	3.60	4.40	5.20	6.00	5.10	6.30	7.50	8.70	9.90
Standard motor weight braked (kg)	1.60	1.90	2.20	4.10	4.90	5.70	6.50	5.70	6.90	8.70	9.30	10.50
Rated speed 2000 (rpm)	$\frac{K_t (Nm/A)}{K_e (V/krpm)} =$			$\frac{K_t (Nm/A) = 1.40}{K_e (V/krpm) = 85.50}$								
Rated torque (Nm)	C/D	C/D	C/D	1.1	2.1	3.0	3.8	2.2	4.0	5.5	6.9	8.2
Stall current (A)				0.9	1.6	2.3	2.8	1.7	3.1	4.3	5.4	6.5
Rated power (kW)				0.23	0.44	0.63	0.80	0.46	0.84	1.15	1.45	1.72
R (ph-ph) (Ω)				45.80	15.30	8.52	5.72	20.69	6.24	3.16	2.31	1.71
L (ph-ph) (mH)				74.10	34.71	21.50	16.16	72.40	22.50	13.73	10.79	8.70
Rated speed 3000 (rpm)	$\frac{K_t (Nm/A)}{K_e (V/krpm)} =$			$\frac{K_t (Nm/A) = 0.93}{K_e (V/krpm) = 57.00}$								
Rated torque (Nm)	0.74 45.00	0.87 52.50	0.91 55.00	1.1	2.0	2.8	3.5	2.0	3.9	5.4	6.8	8.1
Stall current (A)	0.97	1.36	1.81	1.3	2.4	3.4	4.2	2.5	4.7	6.4	8.1	9.7
Rated power (kW)	0.22	0.33	0.46	0.35	0.63	0.88	1.10	0.63	1.23	1.70	2.14	2.54
R (ph-ph) (Ω)	28.00	14.10	9.50	15.91	6.22	3.35	2.37	8.03	2.68	1.35	1.03	0.77
L (ph-ph) (mH)	50.00	32.00	23.00	30.33	14.74	9.54	7.08	22.04	8.70	6.10	4.48	3.99
Rated speed 4000 (rpm)	$\frac{K_t (Nm/A)}{K_e (V/krpm)} =$			$\frac{K_t (Nm/A) = 0.72}{K_e (V/krpm) = 44.00}$								
Rated torque (Nm)	C/D	C/D	C/D	1.0	1.7	2.3	2.9	1.8	3.0	4.0	4.9	5.7
Stall current (A)				1.7	3.1	4.4	5.5	3.2	6.0	8.2	10.5	12.5
Rated power (kW)				0.42	0.71	0.96	1.21	0.75	1.26	1.68	2.05	2.39
R (ph-ph) (Ω)				12.10	4.05	2.30	1.48	5.15	1.64	0.92	0.62	0.42
L (ph-ph) (mH)				19.60	8.88	5.85	4.20	13.00	7.28	3.80	2.75	2.18
Rated speed 6000 (rpm)	$\frac{K_t (Nm/A)}{K_e (V/krpm)} =$			$\frac{K_t (Nm/A) = 0.47}{K_e (V/krpm) = 28.50}$								
Rated torque (Nm)	0.45 27.00	0.43 26.00	0.48 29.00	0.9	1.6	2.1	2.6	1.3	2.1	2.8	C/D	C/D
Stall current (A)	1.61	2.74	3.44	2.6	4.7	6.6	8.3	4.9	9.2	12.6		
Rated power (kW)	0.43	0.57	0.75	0.57	1.01	1.32	1.63	0.82	1.32	1.76		
R (ph-ph) (Ω)	8.50	3.60	2.40	5.20	1.77	0.95	0.65	2.00	0.67	0.39		
L (ph-ph) (mH)	16.00	8.20	6.30	8.30	3.70	3.10	1.86	5.51	2.58	1.70		

C/D Consult Drive Centre/Distributor

N/A Not available

Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency

Control Techniques have an ongoing process of development and reserve the right to change the specification without notice

The information contained in this specification is for guidance only and does not form part of any contract

All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C

	115E2					142E2					190E2							
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	F	G	H
	3.5	6.6	9.4	12.4	15.3	5.7	10.8	15.3	19.8	23.4	C/D	21.8	C/D	41.1	C/D	58.7	C/D	73.2
	10.5	19.8	28.2	37.2	45.9	17.1	32.4	45.9	59.4	70.2		65.4		123.0		176.0		219.0
	14	26.4	37.6	49.6	61.2	22.8	43.2	61.2	79.2	93.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4.4	6.7	9.0	11.4	13.8	9.0	15.6	22.2	28.8	35.4		48.7		86.4		123.1		161.8
	9.5	11.8	14.1	16.6	18.9	23.3	29.9	36.5	43.1	49.7		93.9		131.6		168.3		207.0
	175	185	198	217	241	213	217	275	301	365		240		242		319		632
	7.80	9.70	11.60	13.50	15.40	10.00	13.30	16.10	18.90	21.70		25.30		33.90		42.50		51.30
	9.00	10.90	12.80	14.70	17.20	12.20	15.00	17.80	19.60	23.40		27.30		35.90		44.50		53.10
	3.2	6.1	8.7	10.8	14.0	5.3	10.3	14.6	18.4	21.3	C/D	20.0	C/D	36.9	C/D	50.4	C/D	C/D
	2.5	4.8	6.8	8.9	11.0	4.1	7.8	11.0	14.2	16.8		15.6		29.4		42.0		
	0.67	1.28	1.82	2.26	2.93	1.11	2.16	3.06	3.85	4.46		4.19		7.73		10.6		
	8.33	2.82	1.51	0.99	0.72	4.28	1.33	0.66	0.45	0.32		0.50		0.15		0.10		
	43.50	14.91	9.89	7.11	5.77	26.74	11.53	7.31	5.55	4.40		7.77		2.50		2.73		
	3.0	5.5	8.1	10.4	12.6	4.9	9.0	12.2	15.8	N/A	C/D	19.2	C/D	33.0	C/D	C/D	C/D	N/A
	3.8	7.1	10.2	13.4	16.5	6.2	11.7	16.5	21.3			23.5		44.2				
	0.94	1.73	2.54	3.27	3.96	1.54	2.83	3.83	4.96			6.03		10.4				
	3.70	1.30	0.73	0.47	0.37	1.90	0.59	0.31	0.22			0.17		0.06				
	15.94	7.23	4.82	3.37	3.49	11.87	5.12	3.35	3.32			2.62		1.26				
	2.5	4.7	6.3	7.5	C/D	3.6	7.0	C/D	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4.9	9.2	13.1	17.3		8.0	15.0											
	1.05	1.97	2.64	3.14		1.51	2.93											
	2.07	0.70	0.44	0.29		1.20	0.36											
	8.57	4.34	3.57	2.53		9.45	4.08											
	2.2	4.0	C/D	N/A	N/A	2.9	C/D	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	7.5	14.1				12.2												
	1.38	2.51				1.82												
	0.96	0.30				0.49												
	3.43	2.09				3.96												

Phase VPWM drives 380-480Vrms

$\Delta t = 100^{\circ}\text{C}$ winding 40°C maximum ambient All data subject to +/-10% tolerance

Motor frame size (mm)	055U2			075U2				095U2				
Frame length	A	B	C	A	B	C	D	A	B	C	D	E
Continuous stall torque (Nm)	0.72	1.18	1.65	1.2	2.2	3.1	3.9	2.3	4.3	5.9	7.5	9.0
Standard (2) peak torque selection max (Nm)	2.88	4.72	6.60	3.6	6.6	9.3	11.7	6.9	12.9	17.7	22.5	27.0
High (P) peak torque selection max (Nm)	N/A	N/A	N/A	6	11	15.5	19.5	10.4	19.4	26.6	33.8	40.5
Standard inertia (kgcm ²)	0.12	0.23	0.34	0.7	1.2	1.6	2.0	1.8	2.9	4.0	5.1	6.2
High inertia (kgcm ²)				1.1	1.5	2.0	2.4	3.7	4.8	5.9	7.0	8.1
Winding thermal time const. (s)	34.0	38.0	42.0	81	74	94	100	172	168	183	221	228
Standard motor weight unbraked (kg)	1.20	1.50	1.80	3.60	4.40	5.20	6.00	5.10	6.30	7.50	8.70	9.90
Standard motor weight braked (kg)	1.60	1.90	2.20	4.10	4.90	5.70	6.50	5.70	6.90	8.70	9.30	10.50
Rated speed 2000 (rpm) Kt (Nm/A) = Ke (V/krpm) =				Kt (Nm/A) = 2.40 Ke (V/krpm) = 147.00								
Rated torque (Nm)	C/D	C/D	C/D	1.1	2.1	3.0	3.8	2.2	4.0	5.5	6.9	8.2
Stall current (A)				0.5	1.0	1.3	1.7	1.0	1.8	2.5	3.2	3.8
Rated power (kW)				0.23	0.44	0.63	0.80	0.46	0.84	1.15	1.45	1.72
R (ph-ph) (Ω)				144.00	48.20	25.00	15.70	64.00	17.00	9.90	6.00	4.30
L (ph-ph) (mH)				214.00	99.20	59.20	44.70	202.00	54.50	36.50	25.60	18.90
Rated speed 3000 (rpm) Kt (Nm/A) = Ke (V/krpm) =	0.74 45.00	1.49 90.00	1.65 100.00	Kt (Nm/A) = 1.60 Ke (V/krpm) = 98.00								
Rated torque (Nm)	0.70	1.05	1.48	1.1	2.0	2.8	3.5	2.0	3.9	5.4	6.8	8.1
Stall current (A)	0.97	0.79	1.00	0.8	1.4	2.0	2.5	1.5	2.7	3.7	4.7	5.7
Rated power (kW)	0.22	0.33	0.46	0.35	0.63	0.88	1.10	0.63	1.23	1.70	2.14	2.54
R (ph-ph) (Ω)	28.00	45.00	31.00	60.80	20.10	10.50	7.50	24.50	6.80	4.00	2.74	2.00
L (ph-ph) (mH)	50.00	100.00	75.00	98.40	41.80	27.60	19.70	57.90	24.30	15.50	13.62	8.50
Rated speed 4000 (rpm) Kt (Nm/A) = Ke (V/krpm) =				Kt (Nm/A) = 1.20 Ke (V/krpm) = 73.50								
Rated torque (Nm)	C/D	C/D	C/D	1.0	1.7	2.3	2.9	1.8	3.0	4.0	4.9	5.7
Stall current (A)				1.0	1.9	2.6	3.3	2.0	3.6	5.0	6.3	7.5
Rated power (kW)				0.42	0.71	0.96	1.21	0.75	1.26	1.68	2.05	2.39
R (ph-ph) (Ω)				36.80	10.50	6.30	4.20	12.70	4.08	2.10	1.50	1.03
L (ph-ph) (mH)				54.90	24.80	14.90	10.80	31.50	13.60	8.50	6.30	4.80
Rated speed 6000 (rpm) Kt (Nm/A) = Ke (V/krpm) =	0.74 45.00	0.79 47.50	0.83 50.00	Kt (Nm/A) = 0.80 Ke (V/krpm) = 49.00								
Rated torque (Nm)	0.68	0.90	1.20	0.9	1.6	2.1	2.6	1.3	2.1	2.8	C/D	C/D
Stall current (A)	0.97	1.50	2.00	1.5	2.8	3.9	4.9	2.9	5.4	7.4		
Rated power (kW)	0.43	0.57	0.75	0.57	1.01	1.32	1.63	0.82	1.32	1.76		
R (ph-ph) (Ω)	28.00	10.70	7.80	15.00	5.00	2.66	1.90	5.45	1.82	1.05		
L (ph-ph) (mH)	50.00	25.00	20.00	24.00	10.60	6.80	4.80	14.10	6.00	3.80		

C/D Consult Drive Centre/Distributor

N/A Not available

Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency

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All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C

	115U2					142U2					190U2							
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	F	G	H
	3.5	6.6	9.4	12.4	15.3	5.7	10.8	15.3	19.8	23.4	9.6	21.8	31.1	41.1	50.6	58.7	66.0	73.2
	10.5	19.8	28.2	37.2	45.9	17.1	32.4	45.9	59.4	70.2	28.8	65.4	93.3	123.0	151.6	176.0	198.0	219.0
	14	26.4	37.6	49.6	61.2	22.8	43.2	61.2	79.2	93.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4.4	6.7	9.0	11.4	13.8	9.0	15.6	22.2	28.8	35.4	29.9	48.7	67.5	86.4	105.0	123.1	142.9	161.8
	9.5	11.8	14.1	16.6	18.9	23.3	29.9	36.5	43.1	49.7	75.1	93.9	112.7	131.6	150.2	168.3	188.1	207.0
	175	185	198	217	241	213	217	275	301	365	217	240	241	242	281	319	476	632
	7.80	9.70	11.60	13.50	15.40	10.00	13.30	16.10	18.90	21.70	21.00	25.30	29.60	33.90	38.20	42.50	46.80	51.30
	9.00	10.90	12.80	14.70	17.20	12.20	15.00	17.80	19.60	23.40	23.00	27.30	31.60	35.90	40.20	44.50	48.80	53.10
	3.2	6.1	8.7	10.8	14.0	5.3	10.3	14.6	18.4	21.3	9.3	20.0	28.4	36.9	43.8	50.4	53.0	54.7
	1.5	2.8	4.0	5.2	6.4	2.4	4.5	6.4	8.3	9.8	4.0	9.1	13.0	17.2	21.1	24.5	27.5	30.5
	0.67	1.28	1.82	2.26	2.93	1.11	2.16	3.06	3.85	4.46	1.90	4.19	5.90	7.73	9.20	10.6	11.1	11.5
	27.80	8.55	4.55	2.96	2.17	12.00	3.60	2.10	1.35	0.98	6.15	1.54	0.83	0.50	0.39	0.30	0.30	0.17
	108.00	40.50	25.70	21.90	17.36	83.00	35.90	18.70	13.60	10.70	52.90	23.55	15.00	8.81	8.68	7.16	6.73	4.63
	3.0	5.5	8.1	10.4	12.6	4.9	9.0	12.2	15.8	18.0	8.7	19.2	25.0	33.0	34.0	35.0	36.0	36.8
	2.2	4.2	5.9	7.8	9.6	3.6	6.8	9.6	12.4	14.7	6.0	13.7	19.4	25.7	31.6	36.7	41.3	45.8
	0.94	1.73	2.54	3.27	3.96	1.54	2.83	3.83	4.96	5.65	2.73	6.03	7.85	10.4	10.7	11.0	11.3	11.6
	12.60	3.86	2.02	1.40	1.08	5.30	1.72	0.94	0.61	0.42	2.73	0.70	0.41	0.22	0.17	0.11	0.13	0.09
	49.30	21.57	13.27	8.60	10.96	37.00	13.30	8.30	6.10	7.21	23.50	10.47	7.35	4.89	3.86	3.60	2.99	2.46
	2.5	4.7	6.3	7.5	8.7	3.6	7.0	8.9	10.7	12.2	7.0	17.5	21.5	29.0	N/A	N/A	N/A	N/A
	3.0	5.5	7.9	10.4	12.8	4.8	9.0	12.8	16.5	19.5	8.0	18.2	25.9	34.2				
	1.05	1.97	2.64	3.14	3.64	1.51	2.93	3.73	4.48	5.11	2.9	7.3	9.0	12.1				
	6.42	2.14	1.16	0.73	0.57	3.00	1.00	0.53	0.35	0.25	1.35	0.38	0.21	0.11				
	26.73	10.20	6.60	4.70	3.90	21.00	7.50	5.67	3.60	3.25	13.21	6.05	3.75	2.40				
	2.2	4.0	C/D	C/D	N/A	2.9	4.5	C/D	C/D	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	4.4	8.3				7.2	13.5											
	1.38	2.51				1.82	2.83											
	3.10	0.97				1.33	0.46											
	12.30	4.81				9.23	3.44											

Phase VPWM drives 380-480Vrms

$\Delta t = 100^{\circ}\text{C}$ winding 40°C maximum ambient All data subject to +/-10% tolerance

Motor frame size (mm)		250U2		
Frame length		D	E	F
Continuous stall torque (Nm)		92	116	136
Standard (2) peak torque selection max (Nm)		276.0	348.0	408.0
High (P) peak torque selection max (Nm)		N/A	N/A	N/A
Standard inertia (kgcm ²)		275	337	400
High inertia (kgcm ²)		408	502	597
Winding thermal time const. (s)		439	486	608
Standard motor weight unbraked (kg)		57.5	65.5	73.7
Standard motor weight braked (kg)		68.5	76.5	84.5
Speed 1000 (rpm)	$K_t \text{ (Nm/A)} =$ $K_e \text{ (V/krpm)} =$	$K_t \text{ (Nm/A)} = 5.4$ $K_e \text{ (V/krpm)} = 323$		
	Rated speed (rpm)	1000	1000	1000
	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) (Ω)	0.61	0.48	0.34
	L (ph-ph) (mH)	22.9	19.1	14.9
Speed 1500 (rpm)	$K_t \text{ (Nm/A)} =$ $K_e \text{ (V/krpm)} =$	$K_t \text{ (Nm/A)} = 3.6$ $K_e \text{ (V/krpm)} = 216$		
	Rated speed (rpm)	1500	1500	1500
	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) (Ω)	0.27	0.21	0.15
	L (ph-ph) (mH)	10	8.6	6.6
Speed 2000 (rpm)	$K_t \text{ (Nm/A)} =$ $K_e \text{ (V/krpm)} =$	$K_t \text{ (Nm/A)} = 2.7$ $K_e \text{ (V/krpm)} = 162$		
	Rated speed (rpm)	1500	1500	1500
	Rated torque (Nm)	65	73	81
	Stall current (A)	34.4	43.4	50.9
	Rated power (kW)	10.2	11.5	12.7
	R (ph-ph) (Ω)	0.15	0.1	0.08
	L (ph-ph) (mH)	5.7	4.2	3.7
Speed 2500 (rpm)	$K_t \text{ (Nm/A)} =$ $K_e \text{ (V/krpm)} =$	$K_t \text{ (Nm/A)} = 2.1$ $K_e \text{ (V/krpm)} = 129$		
	Rated speed (rpm)	1500	1500	1500
	Rated torque (Nm)	62	70	77
	Stall current (A)	43.0	54.2	63.6
	Rated power (kW)	9.7	11	12.1
	R (ph-ph) (Ω)	0.09	0.08	0.06
	L (ph-ph) (mH)	3.5	3.1	2.6

For the 250 motor frame size, resolver feedback is standard.

The Unimotor fm 250 servo motor has been designed to give greatest motor efficiency up to a rated, or rms, speed of 1500 rpm. The range does include the optional speeds of 2000rpm and 2500rpm. These windings will allow the end user to enter the intermittent speed zone as well as the intermittent torque zone on the 250 motor.

These higher speed windings are designed with optimum k_t values that allow increased speed without demanding very high currents

The Unimotor fm 250 is designed for S2 to S6 duties and as such the rms values play an important part in the motor selection for torque and speed.

C/D Consult Drive Centre/Distributor

N/A Not available

Stall torque, rated torque and power relate to maximum continuous operation tested in a 20°C ambient at 12kHz drive switching frequency

Control Techniques have an ongoing process of development and reserve the right to change the specification without notice

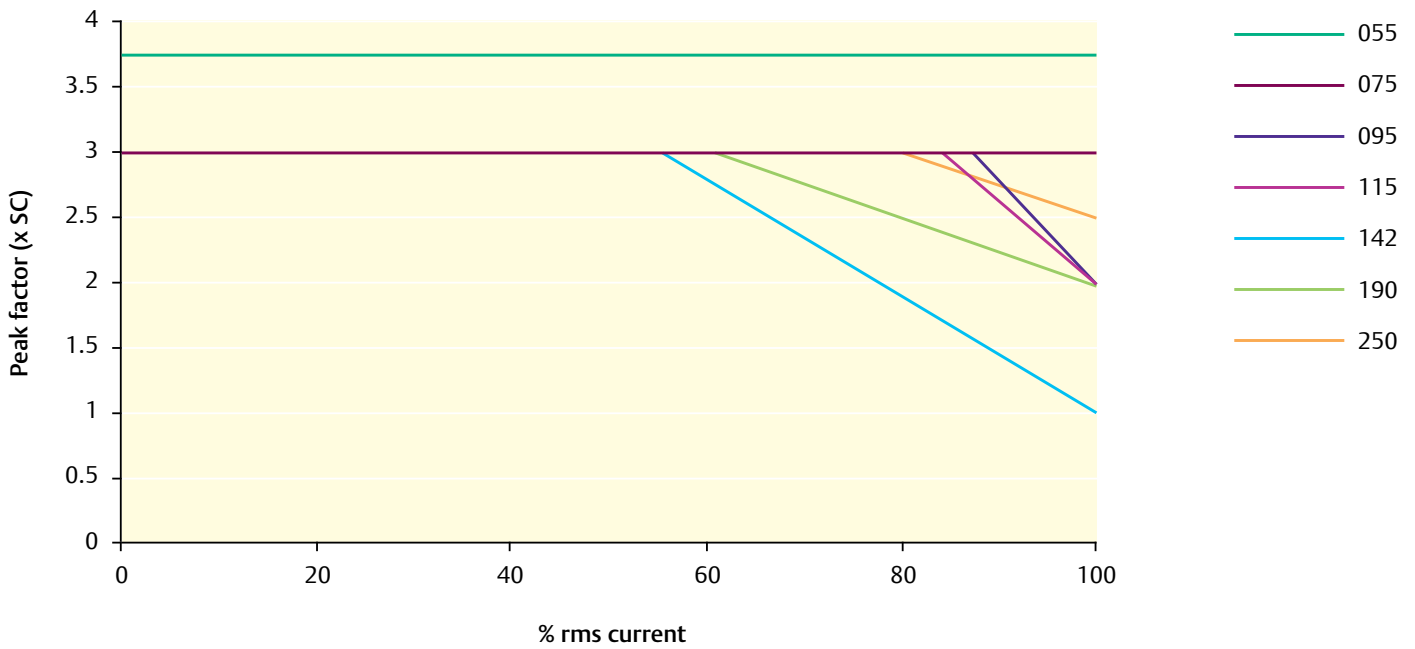
The information contained in this specification is for guidance only and does not form part of any contract

All other figures relate to a 20°C motor temperature. Maximum intermittent winding temperature is 140°C

Standard (2) peak torque

Peak torque defined for a maximum period of 250ms, RMS 3000 rpm, $\Delta_{max} = 100^{\circ}\text{C}$, 40°C ambient.

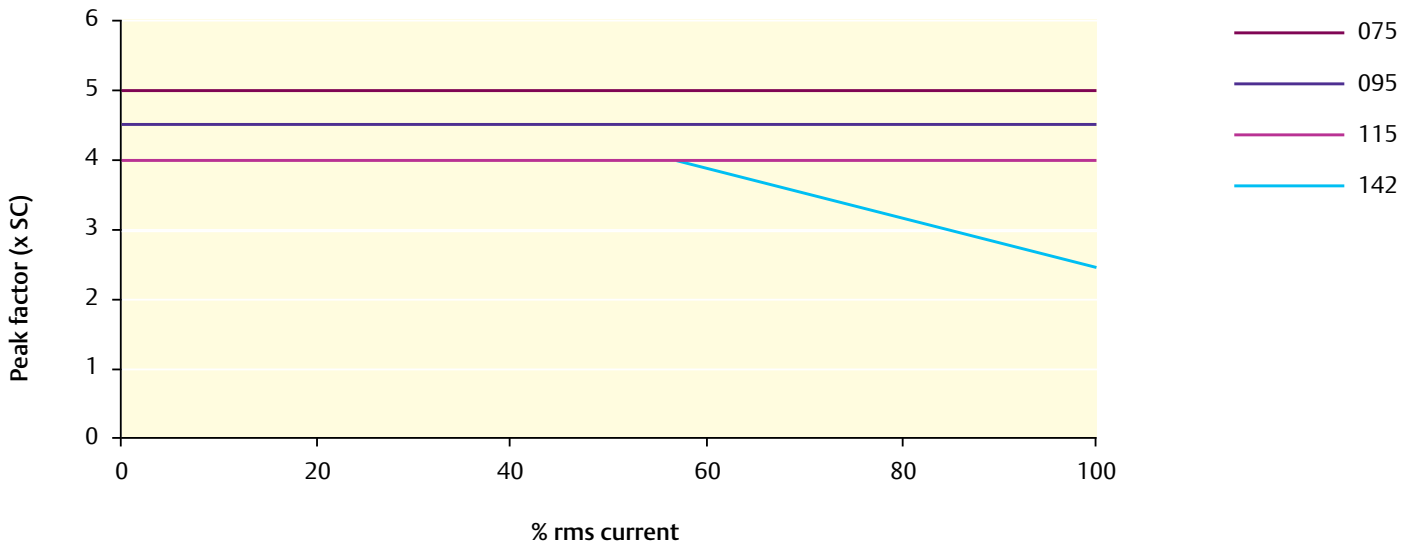
SC = stall current



High (P) peak torque

Peak torque defined for a maximum period of 250ms, RMS 3000 rpm, $\Delta_{max} = 100^{\circ}\text{C}$, 40°C ambient.

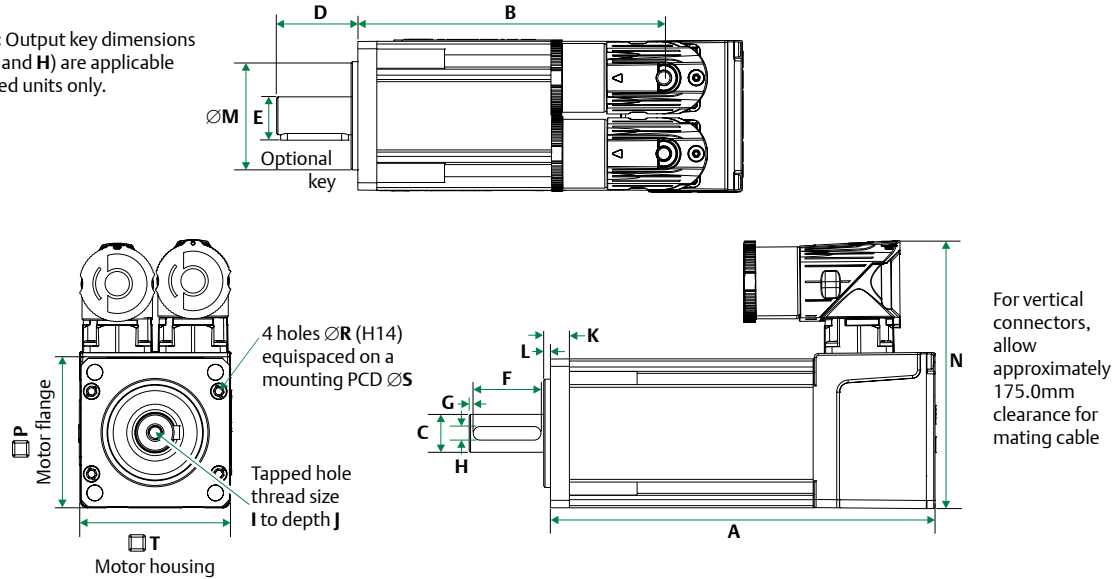
SC = stall current



Dimensions

Frame size 055

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



Standard motor dimension (mm) Note all dimensions shown are at nominal

	Unbraked length		Braked length		Flange thickness	Register length	Register diameter	Overall height	Flange square	Fixing hole diameter	Fixing hold PCD	Motor housing	Mounting bolts
	A	B	A	B									
055A	118.0	90.0	158.0	130.0	7.0	2.5	40.0	99.0	55.0	5.8	63.0	55.0	M5
055B	142.0	114.0	182.0	154.0									
055C	166.0	138.0	206.0	178.0									

Vertical connectors dimension (mm)

Note all dimensions shown are at nominal

	Unbraked length		Braked length		Power connector	Signal connector
	B1	B2	B1	B2		
055A	75.0	83.0	115.0	123.0	104.0	93.0
055B	99.0	107.0	139.0	147.0	104.0	93.0
055C	123.0	131.0	163.0	173.0	104.0	93.0

Output shaft dimensions (mm)

	Shaft diameter	Shaft length	Key height	Key length	Key to shaft end	Key width	Tapped hole thread size	Tapped hole depth
	C (j6)	D	E	F	G	H (h9)	I	J
9.0 Opt	9.0	20.0	10.2	15.0	1.0	3.0	M4	10.0
11.0 A-C Std	11.0	23.0	12.5	15.0	1.5	4.0	M4	10.0
14.0 Max	14.0	30.0	16.0	25.0	1.5	5.0	M5	12.5

Optional connector height (mm)

C type	96.00
V type	105.0

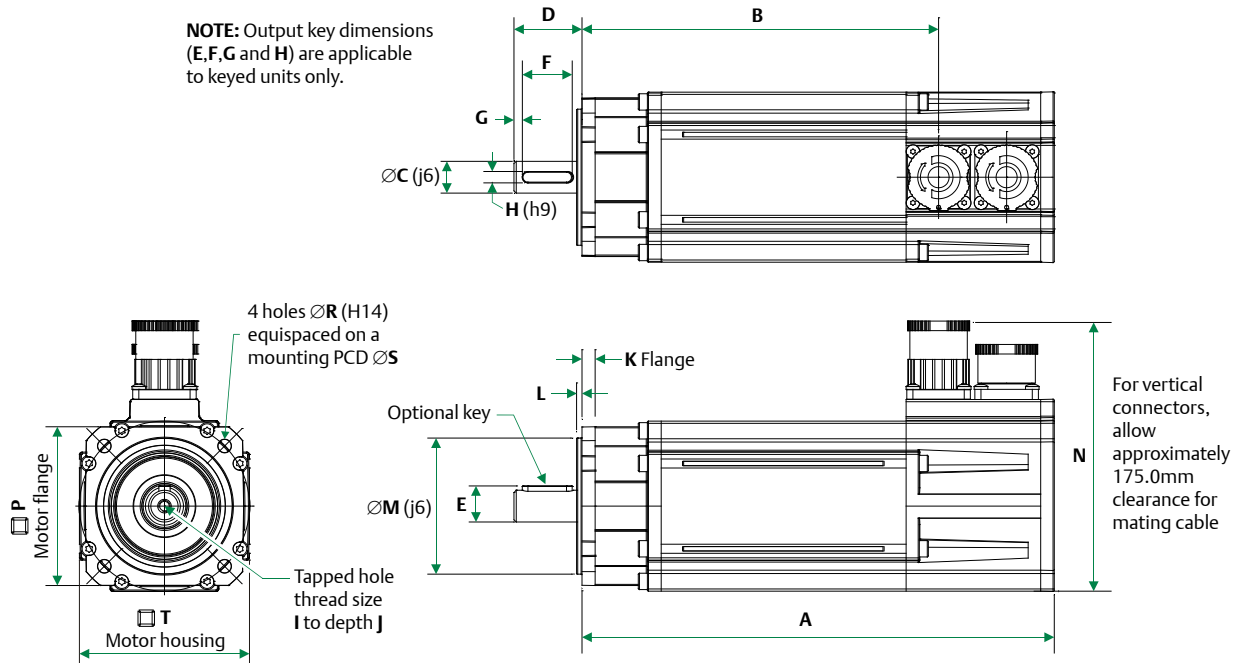
NOTE: Shaft options below the standard (Std) dimensions will require customer approval and may not be covered by warranty.

Optional flange dimensions (mm)

PCD code	Front end frame type	Flange thickness	Register length	Fixing hole diameter	Flange square	Fixing hole diameter	Fixing hold PCD	Mounting bolts
		K	L	M (j6)	P	R (H14)	S	
070	Flat	6	3	50	60	5.5	70	M5

Frame size 075

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



Standard motor dimension (mm) Note all dimensions shown are at nominal

	Unbraked length		Braked length		Flange thickness K (± 0.5)	Register length L (± 0.1)	Register diameter M (j6)	Overall height N (± 1.0)	Flange square P (± 0.1)	Fixing hole diameter R (H14)	Fixing hole PCD S (± 0.4)	Motor housing T (± 0.45)	Mounting bolts
	A (± 0.9)	B (± 1.0)	A (± 0.9)	B (± 1.0)									
075A	208.2	157.2	253.2	202.2	5.8	2.40	60.0	118.5	70.0	5.8	75.0	75.0	M5
075B	238.2	187.2	283.2	232.2									
075C	268.2	217.2	313.2	262.2									
075D	298.2	247.2	343.2	292.2									

Optional flat flange motor dimensions (mm)

	Unbraked length		Braked length	
	A (± 0.9)	B (± 1.0)	A (± 0.9)	B (± 1.0)
075A	192.6	141.6	237.6	186.6
075B	222.6	171.6	267.6	216.6
075C	252.6	201.6	297.6	246.6
075D	282.6	231.6	327.6	276.6

Optional flange dimensions (mm)

PCD code	Front end frame type	Flange square	Fixing hole PCD	Register diameter	Fixing hole diameter
		P (± 0.1)	S (± 0.4)	M (j6)	R (H14)
075	Extended	70.0	66.7 - 75.0	60.0	5.80
080	Extended	70.0	75.0 - 80.0	60.0	5.80
085	Flat	80.0	85.0	70.0	7.00

Output shaft dimensions (mm)

	Shaft diameter	Shaft length	Key height	Key length	Key to shaft end	Key width	Tapped hole thread size	Tapped hole depth
	C (j6)	D (± 0.45)	E (To IEC 72-1)	F (± 0.25)	G (± 1.1)	H (h9)	I	J (± 0.4)
11.0 A Std	11.0	23.0	12.5	14.0	3.6	4.0	M4x0.4	11.0
14.0 B-D Std	14.0	30.0	16.0	22.0	3.6	5.0	M5x0.8	13.5
19.0 Max	19.0	40.0	21.5	32.0	3.6	6.0	M6x1.0	17.0

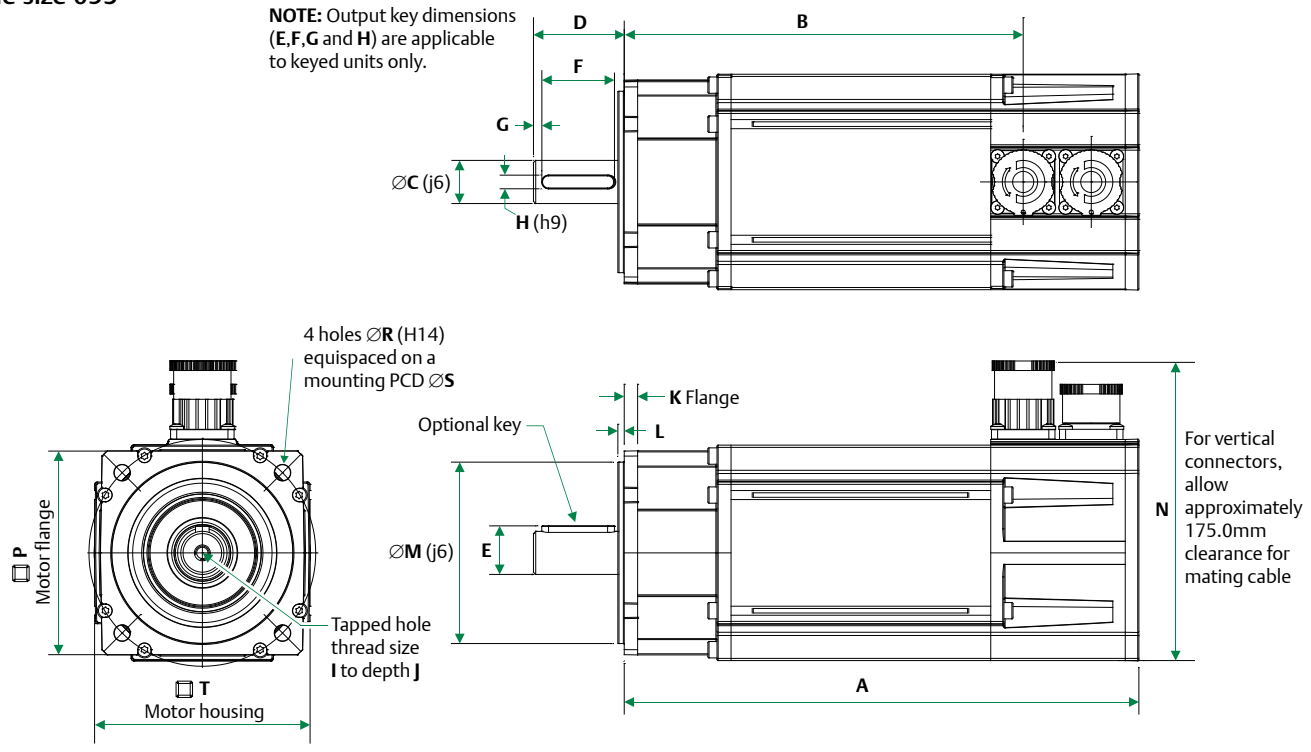
NOTE: Shaft options below the standard (Std) dimensions will require customer approval and may not be covered by warranty.

Optional connector height (mm)

Connection type	Overall height
	N (± 1.0)
A	118.5
B	126.0
C	126.0

Frame size 095

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



Standard motor dimension (mm) Note all dimensions shown are at nominal

	Unbraked length		Braked length		Flange thickness K (± 0.5)	Register length L (± 0.1)	Register diameter M (j6)	Overall height N (± 1.0)	Flange square P (± 0.1)	Fixing hole diameter R (H14)	Fixing hole PCD S (± 0.4)	Motor housing T (± 0.6)	Mounting bolts
	A (± 0.9)	B (± 1.0)	A (± 0.9)	B (± 1.0)									
095A	226.9	175.9	271.9	220.9	5.9	2.80	80.0	131.5	90.0	7.0	100.0	95.0	M6
095B	256.9	205.9	301.9	250.9									
095C	286.9	235.9	331.9	280.9									
095D	316.9	265.9	361.9	310.9									
095E	346.9	295.9	391.9	340.9									

Optional flat flange motor dimensions (mm)

	Unbraked length		Braked length	
	A (± 0.9)	B (± 1.0)	A (± 0.9)	B (± 1.0)
095A	201.8	150.8	246.8	195.8
095B	231.8	180.8	276.8	225.8
095C	261.8	210.8	306.8	255.8
095D	291.8	240.8	336.8	285.8
095E	321.8	270.8	366.8	315.8

Optional flange dimensions (mm)

PCD code	Front end frame type	Flange square	Fixing hole PCD	Register diameter	Flange thickness	Fixing hole diameter
		P (± 0.1)	S (± 0.4)	M (j6)	K (± 0.5)	R (H14)
098	Extended	90.0	98.43	73.0	6.8	7.0
115	Flat	105.0	115.0	95.0	6.8	10.0

Output shaft dimensions (mm)

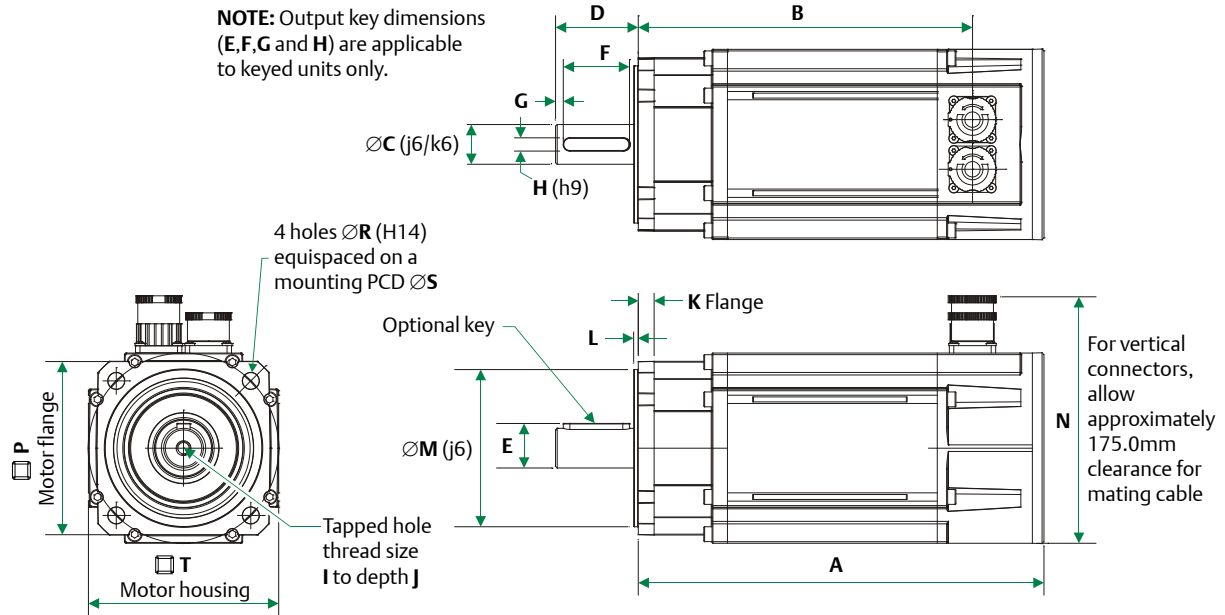
	Shaft diameter	Shaft length	Key height	Key length	Key to shaft end	Key width	Tapped hole thread size	Tapped hole depth
	C (j6)	D (± 0.45)	E (To IEC 72-1)	F (± 0.25)	G (± 1.1)	H (h9)	I	J (± 0.4)
14.0 A Std	14.0	30.0	16.0	22.0	3.6	5.0	M5 x 0.8	13.5
19.0 B-E Std	19.0	40.0	21.5	32.0	3.6	6.0	M6 x 1.0	17.0
22.0 Max	22.0	50.0	24.5	40.0	4.6	6.0	M8 x 1.25	20.0

Optional connector height (mm)

Connection type	Overall height
	N (± 1.0)
A	131.5
B	139.0
C	139.0

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

Frame size 115



Standard motor dimension (mm) Note all dimensions shown are at nominal

	Unbraked length		Braked length		Flange thickness K (± 0.5)	Register length L (± 0.1)	Register diameter M (j6)	Overall height N (± 1.0)	Flange square P (± 0.2)	Fixing hole diameter R (H14)	Fixing hole PCD S (± 0.4)	Motor housing T (± 0.6)	Mounting bolts
	A (± 0.9)	B (± 1.0)	A (± 0.9)	B (± 1.0)									
115A	245.2	202.	290.2	247.0	9.6	2.80	95.0	149.0	105.0	10.0	115.0	115.0	M8
115B	275.2	232.0	320.2	277.0									
115C	305.2	262.0	350.2	307.0									
115D	335.2	292.0	380.2	337.0									
115E	365.2	322.0	410.2	367.0									

Optional flat flange motor dimensions (mm)

	Unbraked length		Braked length	
	A (± 0.9)	B (± 1.0)	A (± 0.9)	B (± 1.0)
115A	214.4	171.2	259.4	216.2
115B	244.4	201.2	289.4	246.2
115C	274.4	231.2	319.4	276.2
115D	304.4	261.2	349.4	306.2
115E	334.4	291.2	379.4	336.2

Optional flange dimensions (mm)

PCD code	Front end frame type	Flange square	Fixing hole PCD	Register diameter	Fixing hole diameter
		P (± 0.2)	S (± 0.4)	M (j6)	R (H14)
130	Flat	130.0	130.0	110.0	10.0
145	Flat	130.0	130.0 – 145.0	110.0	10.0

Output shaft dimensions (mm)

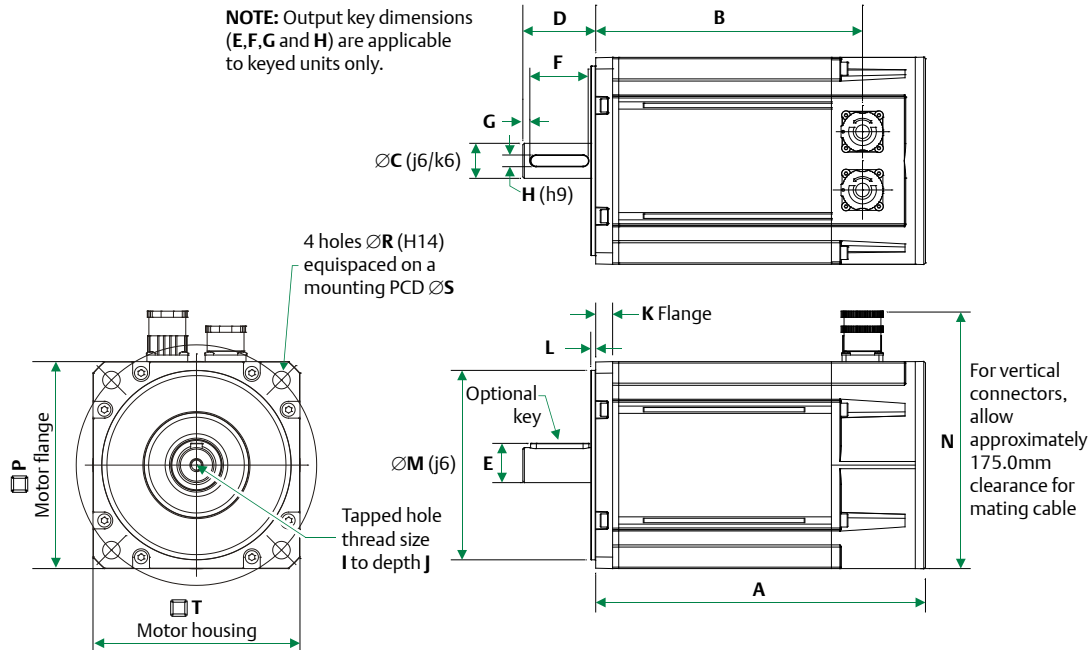
	Shaft diameter	Shaft length	Key height	Key length	Key to shaft end	Key width	Tapped hole thread size	Tapped hole depth
	C (j6)	D (± 0.45)	E (To IEC 72-1)	F (± 0.25)	G (± 1.1)	H (h9)	I	J (± 0.4)
19.0 A-C Std	19.0	40.0	21.5	32.0	3.6	6.0	M6 x 1.0	17.0
22.0 Opt	22.0	50.0	24.5	40.0	4.6	6.0	M8 x 1.25	20.0
24.0 D-E Std	24.0	50.0	27.0	40.0	4.6	8.0	M8 x 1.25	20.0
28.0 Opt	28.0	60.0	31.0	50.0	4.6	8.0	M10 x 1.5	23.0
32.0 Max	32.0 (K6)	80.0	35.0	70.0	4.6	10.0	M12 x 1.75	29.0

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

Optional connector height (mm)

Connection type	Overall height
	N (± 1.0)
A	149.0
B	156.5
C	156.5

Frame size 142



Standard motor dimension (mm) Note all dimensions shown are at nominal

	Unbraked length		Braked length		Flange thickness	Register length	Register diameter	Overall height vertical	Flange square	Fixing hole diameter	Fixing hole PCD	Motor housing	Mounting bolts
	A (± 0.9)	B (± 1.0)	A (± 0.9)	B (± 1.0)									
142A	226.2	183.0	271.2	228.0	11.6	3.4	130.0	176.0	142.0	12.0	165.0	142.0	M10
142B	256.2	213.0	301.2	258.0									
142C	286.2	243.0	331.2	288.0									
142D	316.2	273.0	361.2	318.0									
142E	346.2	303.0	391.2	348.0									

Optional motor flange dimensions (mm)

	Unbraked length		Braked length	
	A (± 0.9)	B (± 1.0)	A (± 0.9)	B (± 1.0)
142A	273.4	230.2	318.4	275.2
142B	303.4	260.2	348.4	305.2
142C	333.4	290.2	378.4	335.2
142D	363.4	320.2	408.4	365.2
142E	393.4	350.2	438.4	395.2

Optional flange dimensions (mm)

PCD code	Front end frame type	Flange square	Fixing hole PCD	Register diameter	Flange thickness	Fixing hole diameter
		P (± 0.2)	S (± 0.1)	M (j6)	K (± 0.5)	R (H14)
149	Extended	140.0	149.23	114.3	11.5	12.0

Output shaft dimensions (mm)

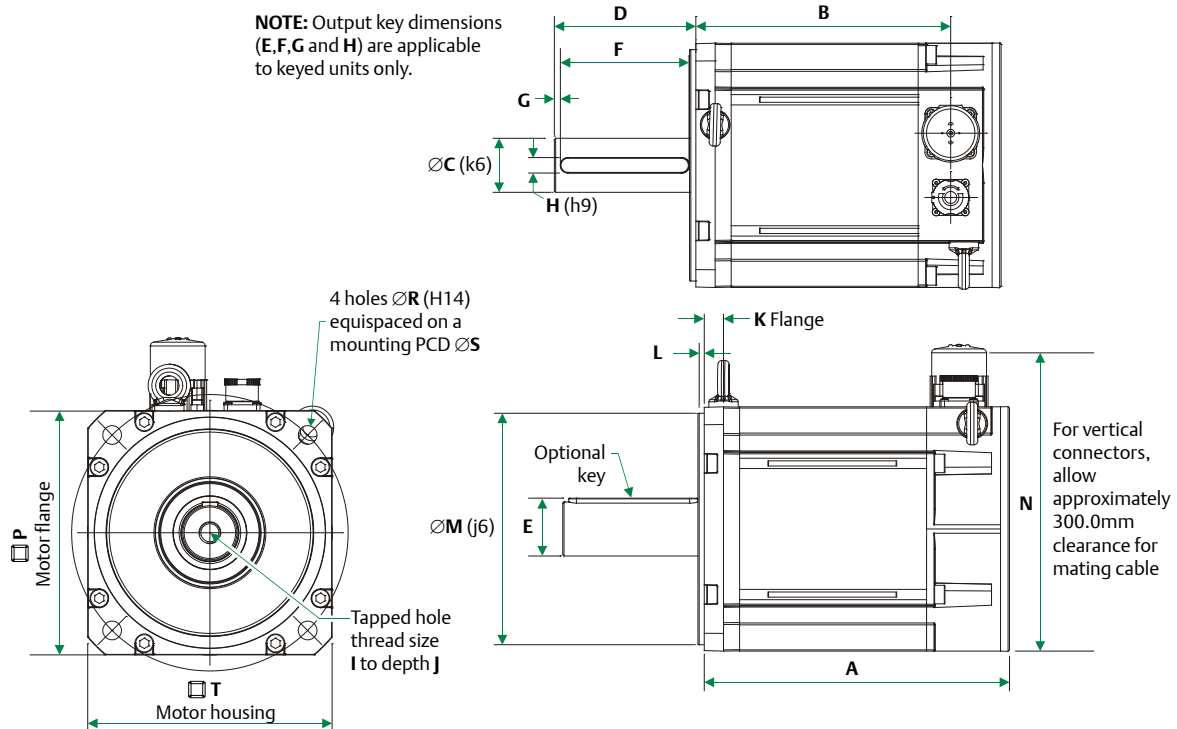
	Shaft diameter	Shaft length	Key height	Key length	Key to shaft end	Key width	Tapped hole thread size	Tapped hole depth
	C (j6)	D (± 0.45)	E (To IEC 72-1)	F (± 0.25)	G (± 1.1)	H (h9)	I	J (± 0.4)
22.0 Opt	22.0	50.0	24.5	40.0	4.6	6.0	M8 x 1.25	20.0
24.0 A-E Std	24.0	50.0	27.0	40.0	4.6	8.0	M8 x 1.25	20.0
28.0 Opt	28.0	60.0	31.0	50.0	4.6	8.0	M10 x 1.5	23.0
32.0 Max	32.0 (K6)	80.0	35.0	70.0	4.6	10.0	M12 x 1.75	29.0

Optional connector height (mm)

Connection type	Overall height
	N (± 1.0)
A	176.0
B	183.5
C	183.5

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

Frame size 190



Standard motor dimension (mm) Note all dimensions shown are at nominal

	Unbraked length		Braked length		Flange thickness K (± 0.5)	Register length L (± 0.1)	Register diameter M (j6)	Overall height N (± 1.0)	Flange square P (± 0.2)	Fixing hole diameter R (H14)	Fixing hole PCD S (± 0.4)	Motor housing T (± 1.5)	Mounting bolts
	A (± 0.9)	B (± 1.0)	A (± 0.9)	B (± 1.0)									
190A	237.4	198.2	318.2	279.0	15.0	3.90	180.0	232.0	190.0	14.5	215.0	190.0	M12
190B	264.3	225.1	345.2	306.0									
190C	291.3	252.1	372.1	332.9									
190D	318.2	279.0	399.1	359.9									
190E	345.2	306.0	426.0	386.8									
190F	372.1	332.9	453.0	413.8									
190G	399.1	359.9	479.9	440.7									
190H	426.0	386.8	506.9	467.7									

Optional connector height (mm)

Connection type	Overall height
	N (± 1.0)
A	245.0
B	252.5
C	252.5

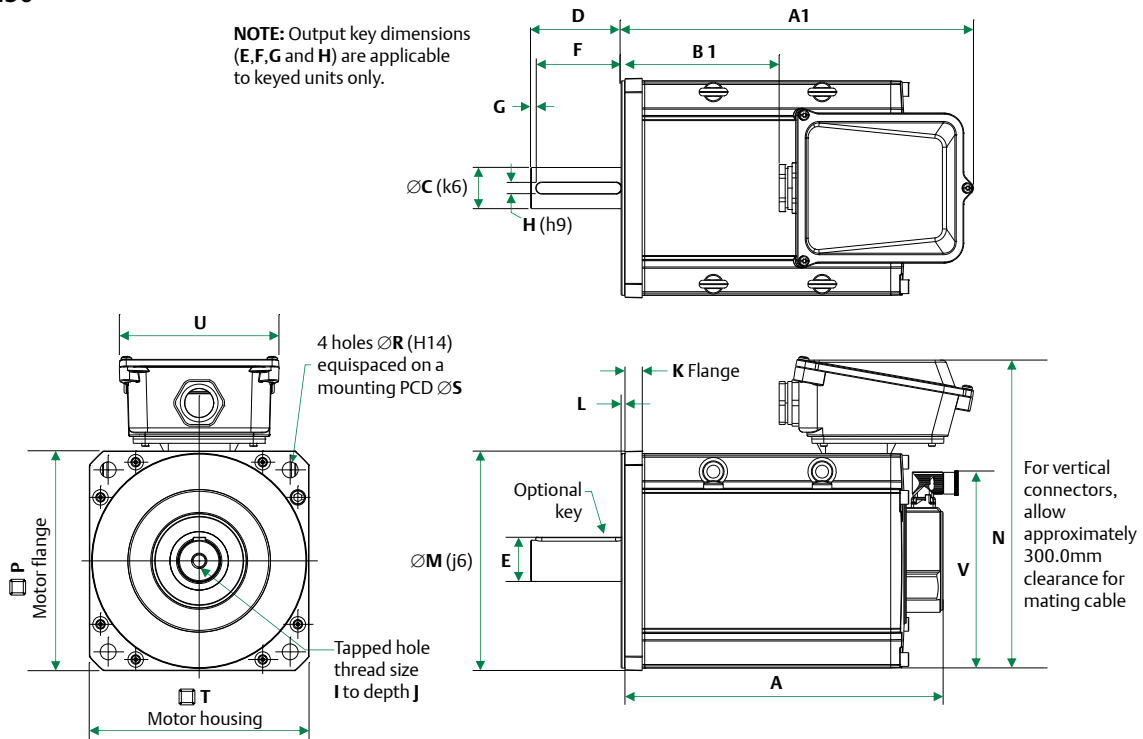
Output shaft dimensions (mm)

	Shaft diameter	Shaft length	Key height	Key length	Key to shaft end	Key width	Tapped hole thread size	Tapped hole depth
	C (j6)	D (± 0.45)	E (To IEC 72-1)	F (± 0.25)	G (± 1.1)	H (h9)	I	J (± 0.4)
28.0 Opt	28.0	60.0	31.0	50.0	4.6	8.0	M10 x 1.5	23.0
32.0 A-H Std	32.0 (k6)	80.0	35.0	70.0	4.6	10.0	M12 x 1.75	29.0
38.0 Opt	38.0 (k6)	80.0	41.0	70.0	4.6	10.0	M12 x 1.75	29.0
42.0 Max	42.0 (k6)	110.0	45.0	100.0	4.6	12.0	M16 x 2.0	37.0

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

Frame size 250

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



Standard motor dimension (mm) Note all dimensions shown are at nominal

	Motor Length			Flange thickness	Register length	Register diameter	Overall height	Flange square	Fixing hole diameter	Fixing hole PCD	Motor housing	Hybrid box width	Signal connector height	Mounting bolts
	A (± 1.3)	A1 (± 2.0)	B1 (± 1.3)											
	Unbraked motor			20.0	4.50	250.0	362.8	256.0	18.5	300.0	249.5	186.0	228.5	M16
250D	370.7	406.1	179.7											
250E	400.7	436.1	209.7											
250F	430.7	466.1	239.7											
	Braked motor													
250D	442.5	477.9	251.5											
250E	472.5	507.9	281.5											
250F	502.5	537.9	311.5											

Output shaft dimensions (mm)

	Shaft diameter	Shaft length	Key height	Key length	Key to shaft end	Key width	Tapped hole thread size	Tapped hole depth
	C (k6)	D (± 0.45)	E (To IEC 72-1)	F (± 0.25)	G (± 1.1)	H (h9)	I	J (± 0.4)
38.0 Opt	38.0	80.0	41.0	70.0	4.6	10.0	M12 x 1.75	29.0
42.0 Opt	42.0	110.0	45.0	100.0	6.0	12.0	M16 x 2.0	37.0
48.0 D-F Std	48.0	110.0	51.5	100.0	6.0	14.0	M16 x 2.0	37.0

Optional connector height (mm)

Connection type	Power overall height	Signal overall height
	N (± 1.0)	V (± 1.0)
V	291.5	221.0
C	312.5	221.0

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

Motor selection

Motor derating Any adverse operating conditions require that the motor performance be derated. These conditions include; ambient temperature above 40°C, motor mounting position, drive switching frequency or the drive being oversized for the motor.

Ambient temperatures The ambient temperature around the motor must be taken into account. For ambient temperatures above 40°C the torque must be derated using the following formula as a guideline. (Note: Only applies to 2000/3000rpm motors and assumes copper losses dominate)

$$\text{New derated torque} = \text{Specified torque} \times \sqrt{1 - ((\text{Ambient temperature} - 40^\circ\text{C}) / 100)}$$

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

Mounting arrangements The motor torque must 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. The motor is mounted with the connectors on the side or vertical. The motor is in a confined space with restricted air flow.

Drive switching frequency Most Unidrive SP and Digitax ST nominal current ratings are reduced for the higher switching frequencies. See the appropriate drive manual for details.

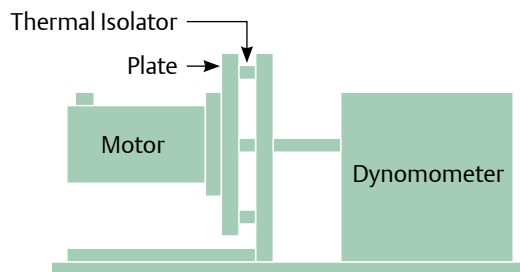
See the table below for the motor derate factors. These figures are for guidance only.

Note: Only applies to motors up to 3000rpm (rms) for frame sizes 055 to 190 and 1500rpm (rms) for frame size 250. Assumes copper losses dominate on all frame sizes.

Motor derate factors

Switching frequency	Motor type/frame									
	055	075	095	115		142		190		250
	A-C	A-D	A-E	A-C	D-E	A-C	D-F	A-B	C-H	D-F
3kHz	0.92	0.93	0.88	0.89	0.84	0.87	0.81	0.98	N/A	0.88
4kHz	0.93	0.94	0.91	0.91	0.87	0.91	0.86	0.99	0.55	0.90
6kHz	0.95	0.95	0.93	0.93	0.90	0.94	0.89	0.99	0.77	0.94
8kHz	0.96	0.98	0.97	0.97	0.95	0.97	0.96	1	0.90	0.98
12/16kHz	1	1	1	1	1	1	1	1	1	1

Thermal test conditions The performance data shown has been recorded under the following conditions: Ambient temperature 20°C, with the motor mounted on a thermally isolated aluminum plate as shown below.



Motor type/frame	Aluminium heatsink plate
055	110 x 110 x 27mm
075-095	250 x 250 x 15mm
115-142	350 x 350 x 20mm
190	500 x 500 x 20mm
250	500 x 500 x 20mm

Thermal protection Thermistor protection (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 in respect of a burnt out winding.

Environmental conditions Any liquids or gases that may come into contact with the motor must be checked to ensure compliance with the appropriate international standards.

Declaration of Conformity

Manufacturers Name: Control Techniques Dynamics Limited

Manufacturers' Address: South Way, Walworth Industrial Estate, Andover, Hampshire, SP105AB

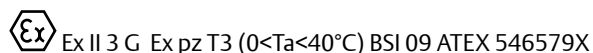
Declare under our sole responsibility that the Brushless Permanent Magnet Servo Motors described below comply with applicable Health and Safety Requirements of Annex I of the Low Voltage Directive 2006/95/EC and Annex II of the ATEX Directive 94/9/EC and the EMC Directive 2004/108/EC. Confidential technical documentation has been compiled according to the specific requirements of each directive:

Description of product: Brushless Permanent Magnet Servo Motors Types 480V U2, UM/SL, UD 220V E2, EZ, ED.

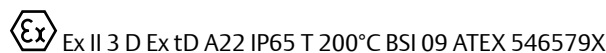
Standard rating: Frame Size 067 to 250, 480V AC, 11.6 kW maximum, Speed 0-6000 RPM, Thermal Classification: Delta 100°C.

ATEX rating: Unimotor UM and fm frame size 075 to 190, 480V AC, 11.6 kW maximum, Speed 0-3000 RPM, Thermal Classification: Delta 100°C.

Atex Gas



Atex Dust



The following standards have either been referred to or have been complied with in part or in full:

Reference	Title
EN 60034-1:2004	Rotating electrical machines – Part 1: Rating and performance
EN 60034-5:2001	Rotating electrical machines – Part 5: IP Code
EN 60034-6:1993	Rotating electrical machines – Part 6: IC Rating
EN 60034-7:1993	Rotating electrical machines – Part 7: IM Rating
EN 60034-8:2007	Rotating electrical machines – Part 8: Terminal markings and direction of rotation
EN 60034-14:2004	Rotating electrical machines – Part 14: Mechanical vibration
EN 60204-1:2006	Safety of machinery – Electrical equipment of machines Part 1: General requirements
EN 60079-0:2006	Electrical apparatus for explosive gas atmospheres – general requirements
EN 60079-2:2007	Electrical apparatus for explosive gas atmospheres – pressurised enclosures “p”
EN 61241-0:2006	Electrical apparatus for use in the presence of combustible dust – general requirements
EN 61241-1:2004	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures “tD”

Brake specification

Motor frame	Supply volts	Input power	Static torque		Release time	Moment of inertia	Backlash
			Standard brake (01)	High energy brake (05)			
Size	Vdc	Watts	Nm	Nm	ms nom	kgcm ² *	Degrees**
055	24	6.3	1.8	N/A	22	0.03	0.75
075	24	6.3	2	2.2	22	0.07	1.03
095	24	16	11	12.2	60	0.39	0.94
115	24	16	11	12.2	60	0.44	0.56
142	24	19.5	18	22	75	0.54	0.56
190 (A-D)	24	25	38	42	95	3.07	0.77
190 (E-H)	24	25	60	67	120	4.95	0.77
250	24	62	N/A	135	252	16.37	0.77


*Note 1 kgcm² = 1x10⁻⁴kgm² **Backlash figure will increase with time

- The brakes are intended for parking duty and are not for dynamic or safety use
- Refer to your Drive Centre or Distributor if your application requires dynamic braking in emergency conditions
- To provide protection to the brake control circuit it is recommended that a diode is connected across the output terminals of the solid state or relay contacts devices
- Larger torque brakes are available as an option. Please contact your Drive Centre or Distributor for details
- Figures are shown at 20°C brake temperature. Apply the derate factor of 0.7 to the standard brake torque figures if motor temperature is above 100°C. A derate factor of 0.9 applies to the high energy brake if motor temperature is above 100°C
- The brake will engage when power is removed

Feedback

Feedback device part number code	Feedback type	Encoder supply voltage ¹	Sincos cycles or incremental pulses per revolution	Resolution available to position loop ^{2&3}	Feedback Accuracy ¹
055 motors					
AR	Resolver	7V Excitation 5kHz	1	Medium 16384 (14 bit)	Low +/- 600"
KR	Incremental Encoder	5V	1024	4096 (12 bit)	Medium
MR			2048	8192 (13 bit)	+/- 150"
CR			4096	16384 (14 bit)	
EM (Multi-turn) FM (Single turn)	Inductive Absolute Encoder EnDat 2.1	5V	16	High 2.62x10 ⁵ (18 bits)	Medium +/- 480"
TL (Multi-turn) UL (Single turn)	SinCos Optical Encoder Hiperface	7 - 12V	128	High 4096 1.31x10 ⁵ (17 bit)	High +/- 52"
075-250 motors					
AE	Resolver	6 V rms Excitation 6kHz	1	Medium 16384 (14 bit)	Medium +/- 720"
CA	Incremental Encoder	5V	4096	16384 (14 bit)	High
MA			2048	8192 (13 bit)	+/- 60"
KA			1024	4096 (12 bit)	
EC (Multi-turn) FC (Single turn)	Inductive Absolute Encoder EnDat 2.1	7 - 10V	32	Medium Absolute position 524288 (19 bits)	Medium +/- 280"
RA (Multi-turn) SA (Single turn)	SinCos Optical Encoder Hiperface	7 - 12V	1024	Very high 1.04x10 ⁶ (20 bits)	High For SinCos Integral non-linearity +/- 45" For SinCos Differential non-linearity +/- 7" (Total accuracy +/- 52")
EB (Multi-turn) FB (Single turn)	Optical Absolute Encoder EnDat 2.2	3.6 - 14V	2048	Very High 2.08x10 ⁶ (21 bits)	Very High +/- 20" (Differential non linearity +/- 1% signal period)

Notes:

- 1) The output from the resolver is an analogue output. The resolution is determined by the analogue to digital converter used. The value shown is when the resolver is used in conjunction with the SM-Resolver.
- 2) The sin and cosine outputs from the SinCos optical encoders are analogue outputs. With Unidrive  and Digitax ST the resolutions quoted above are when the encoder type is set to either SC EnDat or SC Hiper depending on the encoder.
- 3) The information is supplied by the feedback device manufacturer and relates to it as a standalone device. The values may change when mounted into the motor and connected to a drive.

These values have not been verified by CT Dynamics.

Resolver

A passive wound device consisting of a stator and rotor elements excited from an external source, such as an SM-Resolver, the resolver produces two output signals that correspond to the sine and cosine angle of the motor shaft. This is a robust absolute device of low accuracy, capable of withstanding high temperature and high levels of vibration. Positional information is absolute within one turn - i.e. position is not lost when the drive is powered down.

Incremental Encoder

An electronic device using an optical disc. The position is determined by counting steps or pulses. Two sequences of pulses in quadrature are used so the direction sensing may be determined and 4 x (pulses per rev) may be used for resolution in the drive. A marker pulse occurs once per revolution and is used to zero the position count. The encoder also provides commutation signals, which are required to determine the absolute position during the motor phasing test. This device is available in 4096, 2048 and 1024 ppr version. Positional information is non absolute - i.e. position is lost when the drive is powered down.

SinCos/Absolute Encoders




Types available: **Optical** or **Inductive** - which can be single or multi-turn.

- 1) **Optical:** An electronic device using an optical disc. An absolute encoder with high resolution that employs a combination of absolute information, transmitted via a serial link, and sine/cosine signals with incremental techniques.
 - 2) **Inductive:** An electronic device using inductively coupled PCB's. An absolute encoder with medium resolution that employs a combination of absolute information, transmitted via a serial link, and sine/cosine signals with incremental techniques. This encoder can be operated with the drive using either sine/cosine or absolute (serial) values only. Positional information is absolute within 4096 turns - i.e. position is not lost when the drive is powered down.
- Multi-turn:** As previous but with extra gear wheels included so that the output is unique for each shaft position and the encoder has the additional ability to count complete turns of the motor shaft up to 4096 revolutions.

Electronic nameplating (075-250 motor only)

Available on both these types of encoders, and allows quick set-up times as the motor information is stored on board the encoder.



Cable information

PS	B	A		F	A	015
Cable type	Jacket	Phase & ground: conductor size		Connection details drive end	Connection details motor end	Cable length
PS = Power (Standard)	B = PUR	H** = 1.0mm ²	10A	C = 6 way power extension connector	A = 055 -115 power connector	Min = 001 (1m)
PB = Power (with brake)	C = OFS	G = 1.5mm ²	16A	F = Unidrive  (size 1-2) Ferrules	B = 142 -250 power connector	Max = 100 (100m)
		A = 2.5mm ²	22A	G = Unidrive  (size 3) Ring terminals	J = 250 hybrid ferrules	
		B = 4.0mm ²	30A	H = Digitax ST and SP0 Ferrules	X = Cut end	
		C* = 6.0mm ²	39A	J = Unidrive  (size 4) Ring terminals		
		D* = 10.0mm ²	53A	K = Epsilon EP Ferrules		
		E* = 16.0mm ²	70A	X = Cut end		

* Ring terminals for Drive studs only

** Only available in OFS

Cable type	PS for motor without brakes, PB for motors with brake.
Jacket	B is for the PUR sheath and is the Dynamic cable selection. C is for the OFS sheath and is the Static cable selection.
Conductor size	Select the conductor size according to the motors STALL CURRENT. Cables of 6mm ² and above will be fitted with ring terminals only. Ratings are for individual cables (not lashed together) in free air temperature up to 40°C - make allowances as appropriate.
Connection detail drive end	Select the correct drive end connection for the drive in use.
Connection detail motor end	Select the correct motor end connection for the motor in use.
Length	Numbers represent the required cable length in metres.

SI	B	A	A	A	015
Cable type	Jacket	Special options		Connection details motor end	Cable length*
SI = Incremental Encoder hyperboloid pins	B = PUR	A = Standard cable		A = Encoder 17 pin connector	Min = 001 (1m)
SR = Resolver	C** = OFS	E = Twisted screened SS cable		B = Resolver 12 pin connector	Max = 100 (100m)
SS = Sin/Cos Encoder		L = 8.5mm dia SI cable		C = Sin/Cos 12 pin connector (Hiperface)	
SE = Incremental Encoder split pins				E = 17 pin extension connector	
Connection details drive end				F = 90° Encoder 17 pin connector	
A = Digitax ST/Unidrive  /Epsilon EP Encoder 15 pin connector				G = 90° Resolver 12 pin connector	
B = Resolver / Sin/Cos Ferrules				H = 90° Sin/Cos 12 pin connector (Hiperface)	
F = Epsilon Encoder 26 pin connector				N = Sin/Cos 17 pin connector (EnDat)	
I = Extension connector male pins				O = 90° Sin/Cos 17 pin connector (EnDat)	
H = Digitax ST/Unidrive  Sin/Cos 15 pin connector				X = Cut end	
X = Cut end					

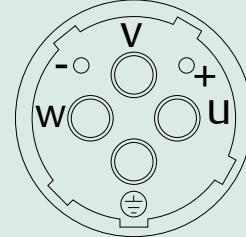
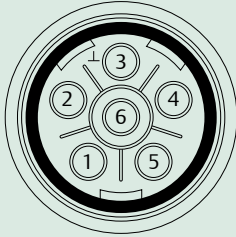
* Max cable length: 50m with the SIBA/SICA as standard, 100m only if +5V tolerance can be maintained. 10m with the SIBL. Heidenhain EC/FC 20m EB/FB 30m with the SSBA cable, EC/FC 20m EB/FB 100m with the SSBE cable.

** OFS only available on SI encoder cable

Cable type	Choose the cable type to match the feedback device.
Jacket	B is for the PUR sheath and is the Dynamic cable selection. C is for the OFS sheath and is the Static cable selection.
Special options	A is for standard cable. L is for the low cost 8.5mm incremental cable.
Connection detail drive end	Select the correct drive end connection for the drive in use.
Connection detail motor end	Select the correct motor end connection for the motor feedback device in use.
Length	Numbers represent the required cable length in metres.

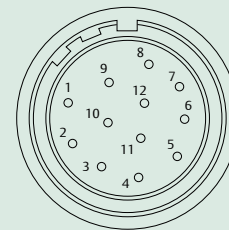
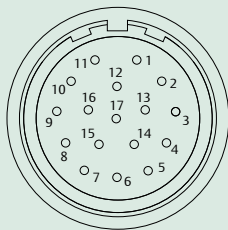
Motor connector details

Power plug



	055 -142 with brake	055 -142 without brake		190 -250 with brake	190 -250 without brake
Pin	Function	Function	Pin	Function	Function
1	Phase U (R)	Phase U (R)	U	Phase U (R)	Phase U (R)
2	Phase V (S)	Phase V (S)	V	Phase V (S)	Phase V (S)
3	Ground	Ground	⊖	Ground	Ground
4	Phase W (T)	Phase W (T)	W	Phase W (T)	Phase W (T)
5	Brake		+	Brake	
6	Brake		-	Brake	
Shell	Screen	Screen	Shell	Screen	Screen

Signal plug



	Incremental encoder (CR, MR, KR, CA, MA, KA, CR)	Heidenhain Absolute encoders (EM, FM, EC, FC, EB, FB)	Resolver (AR, AE)	SICK Sin/Cos encoders (TL, UL, RA, SA)
Pin	Function	Function	Function	Function
1	Thermistor	Thermistor	Excitation High	REF Cos
2	Thermistor	Thermistor	Excitation Low	+ Data
3		Screen (Optical encoder only)	Cos High	- Data
4	S1		Cos Low	+ Cos
5	S1 Inverse		Sin High	+Sin
6	S2		Sin Low	REF Sin
7	S2 Inverse		Thermistor	Thermistor
8	S3	+ Clock	Thermistor	Thermistor
9	S3 Inverse	- Clock		Screen
10	Channel A	+ Cos		0 Volts
11	Index	+ Data		-
12	Index Inverse	- Data		+ V
13	Channel A Inverse	- Cos		
14	Channel B	+ Sin		
15	Channel B Inverse	- Sin		
16	+ V	+ V		
17	0 Volts	0 Volts		
Body	Screen	Screen		Screen

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