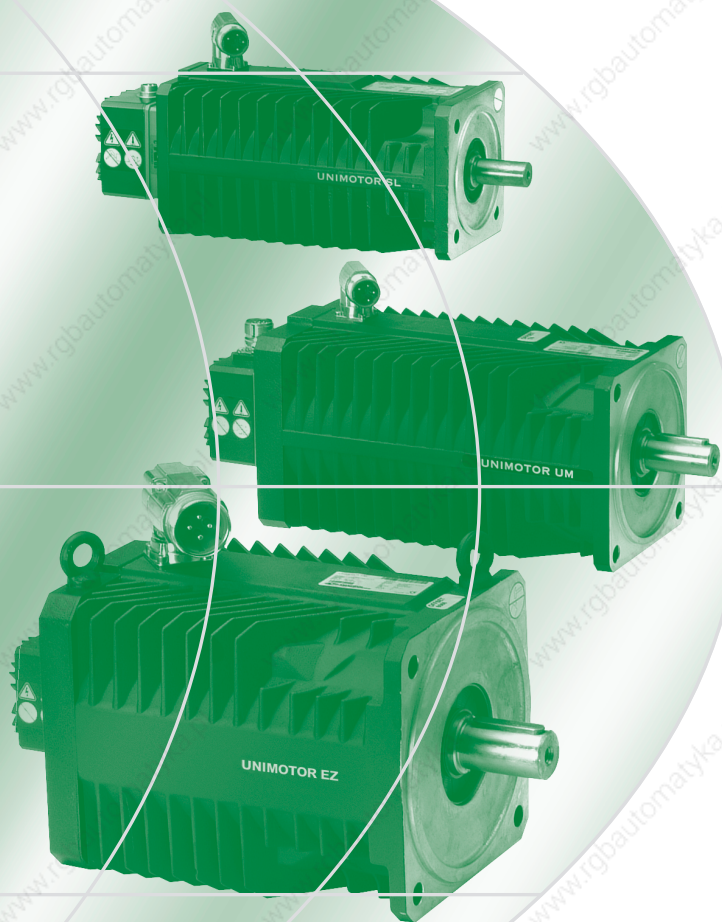




**CONTROL  
TECHNIQUES**

[www.ctdynamics.com](http://www.ctdynamics.com)



## Unimotor EZ<sup>®</sup> Brochure

Control Techniques Dynamics  
Brushless AC Servo Motors



## Introducing the 75-190EZ motor

Unimotor EZ is a range of brushless AC servo motors which support a winding to suit 220V nominal AC drives. The range is available in five frame sizes 75:95:115:142 and 190mm. The unique “finned” motor housing is a high-strength aluminium alloy casting that improves heat dissipation by conduction, radiation and convection. The single piece integral construction permits accurate bearing to housing alignment and maintains air gap concentricity. This arrangement optimises torque output and reduces cogging torque. The design also conforms to the sealing standard (IP65S) when mounted and connected.

## Standard Features

- \* Modular rotor design.
- \* Rotor assembly balanced to ISO1940 ( BS 6861 ) G 6.3.
- \* Class H winding insulation.
- \* High thermal dissipation due to “finned” design.
- \* Thermal overload protection.
- \* Incremental Encoder for high precision feedback.
- \* PTC thermistors for thermal monitoring and overload protection.
- \* IP65S standard (with mating connector) sealed against water spray and dust.
- \* Connectors for Power and signal.
- \* Low inertia is standard for fast acceleration.
- \* UL and CSA recognised insulation system.
- \* IEC mounting flange.
- \* Shaft key as standard

## Optional Features

- \* Hybrid box available.
- \* Parking brake.
- \* High inertia.
- \* Plain shaft (non keyed)
- \* Resolver feedback for rugged applications.
- \* Sin/Cos encoder for high resolution and accuracy (Single and multi-turn).
- \* UL recognised motors

## Optional Products



- \* Cable assemblies for power and signal



- \* Gear box options, high precision low backlash, general purpose and right angle gearboxes available in various ratios.

\* Where volumes have justified it, CTD have designed a number of custom specific motors, please contact CTD for details.

## Motor Specification

### Physical

Insulation class	Class H (180° C) BS EN 60034-1 UL number E214439
Dimensional accuracy	IEC60072-1 Class N
Degree of balance	Rotor is balanced to ISO 1940 (BS6861) G 6.3 (half key convention to ISO 8821)
Output Shaft	Output key is standard (to IEC 60072-1) Plain shaft is optional
Temperature monitoring	PTC thermistor, 165° C switch temperature
Connections	Connector or Hybrid box for power and brake; connector for feedback devices and thermistor

### Environmental

Ingress Protection	IP65S with mating connector and cable
Operating Temperature	Up to 40° C ambient
Storage Temperature	-20° C to 70° C
Temperature rise	125° C over ambient of 40° C Max 100° C over ambient of 40° C Typical
Relative Humidity	90% Non condensing

## Brake Specification

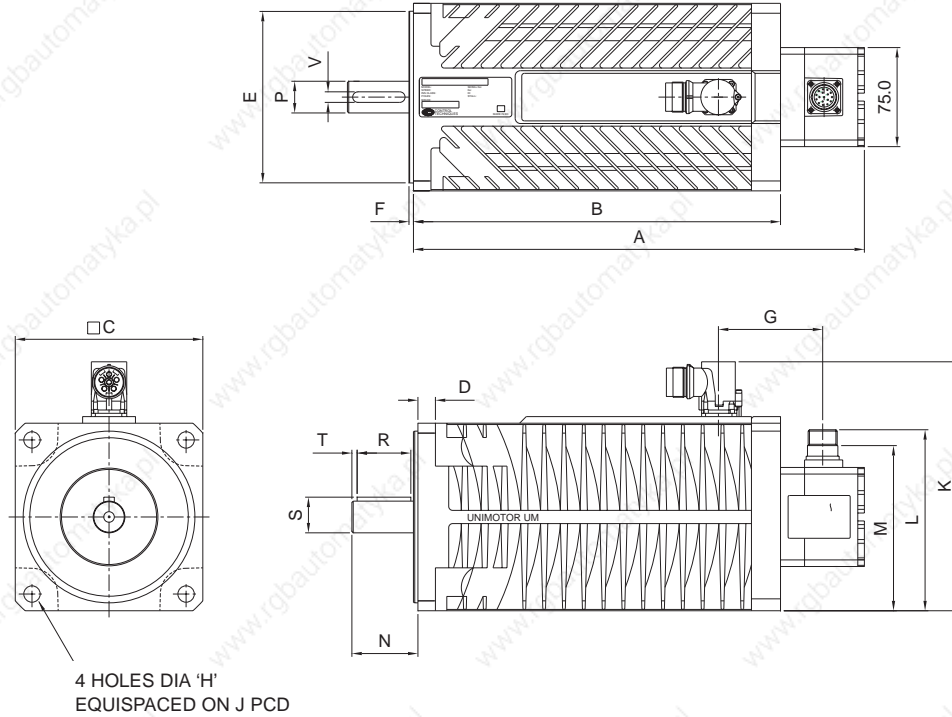
Motor Frame	Supply Volts	Input Power	Static Torque	Release Time	Moment of Inertia	Backlash
Size	V d.c.	Watts	Nm	ms nom	kgcm <sup>2</sup> *	Degrees
75	24	6.3	2	22	0.03	0.75
95	24	16	6	30	0.29	0.75
115	24	16	12	40	0.49	0.75
142	24	23	20	85	1.28	0.6
190(A/B)	24	25	40	95	1.28	0.6
190(C/D)	24	25	60	120	2.50	0.6

\*Note 1 kgcm<sup>2</sup> = 1x10<sup>-4</sup>kgm<sup>2</sup>

- The brakes are intended for parking duty and engage on power de-energisation.
- Refer to drive centre 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.

## Dimensions (mm) Frame size 75-142

Note: Dimension A,B,M,L and K are shown at the maximum.



## Dimensions – Frame Sizes 75-142

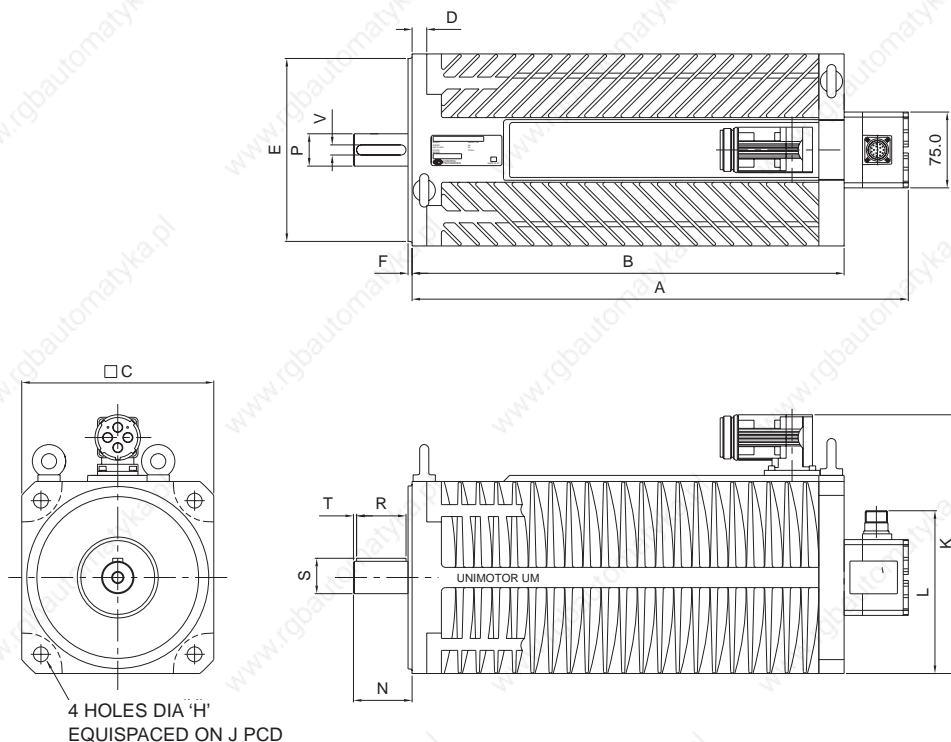
FRAME SIZE	75					95					115					142				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
A Length Overall (Unbraked)	211	241	271	301		222	252	282	312	342	242	272	302	332	362	225	255	285	315	345
A Length Overall (Braked)	241	271	301	331		252	282	312	342	372	272	302	332	362	392	285	315	345	375	405
B Body Length (Unbraked)	146	176	206	236		157	187	217	247	277	177	207	237	267	297	160	190	220	250	280
B Body Length (Braked)	176	206	236	266		187	217	247	277	307	207	237	267	297	327	220	250	280	310	340
C Flange Square		75.0					95.0					115.0					142.0			
D Flange Thickness		7.0					9.0					11.0					12.3			
E Register Diameter		60.0 (J6)					80.0 (J6)					95.0 (J6)					130.0 (J6)			
F Register Length		2.4					2.9					2.9					3.4			
G Power to Connect C/L		61.0					62.5					66.0					80.0			
H Fixing Holes Diameter		5.8 (H14)					7.0 (H14)					10.0 (H14)					12.0 (H14)			
J Fixing Hole p.c.d.		75.0					100.0					115.0					165.0			
K Overall Height		126.0					146.0					166.0					193.0			
L Signal Connector Height (UM)		107.0					117.0					127.0					140.0			
M Signal Connector Height (SL)		88.0					98.0					108.0					121.0			
N Shaft Length (front)	23.0	30.0	30.0	30.0		30.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
P Shaft Diameter (front)	11.0	14.0	14.0	14.0		14.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0

### Shaft Key Dimensions (option A)

R Key Length	14.0	22.0	22.0	22.0		22.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
S Key Height	12.4	15.9	15.9	15.9		15.9	21.4	21.4	21.4	21.4	21.4	21.4	21.4	26.9	26.9	26.9	26.9	26.9	26.9	26.9
T Key to Shaft End	3.5	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
V Key Width	4.0	5.0	5.0	5.0		5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0

## Dimensions (mm) Frame size 190

Note: Dimension A,B,M,L and K are shown at the maximum.



## Dimensions (mm) Frame size 190

### FRAME SIZE

190

Dimension / Length suffix	A	B	C	D
A Length Overall (Unbraked)	273	327	381	435
A Length Overall (Braked)	327	381	435	489
B Body Length (Unbraked)	210	264	318	372
B Body Length (Braked)	264	318	372	425
C Flange Square		190.0		
D Flange Thickness		14.5		
E Register Diameter		180.0 (J6)		
F Register Length		4.0		
G Power to Connect C/L		0		
H Fixing Holes Diameter		14.5 (H14)		
J Fixing Hole p.c.d.		215.0		
K Overall Height		260.0		
L Signal Connector Height (UM)		161.1		
N Shaft Length (front)	58.0	58.0	58.0	58.0
P Shaft Diameter (front)	32.0(K6)	32.0(K6)	32.0(k6)	32.0(K6)

### Shaft Output Key Dimensions (Option A)

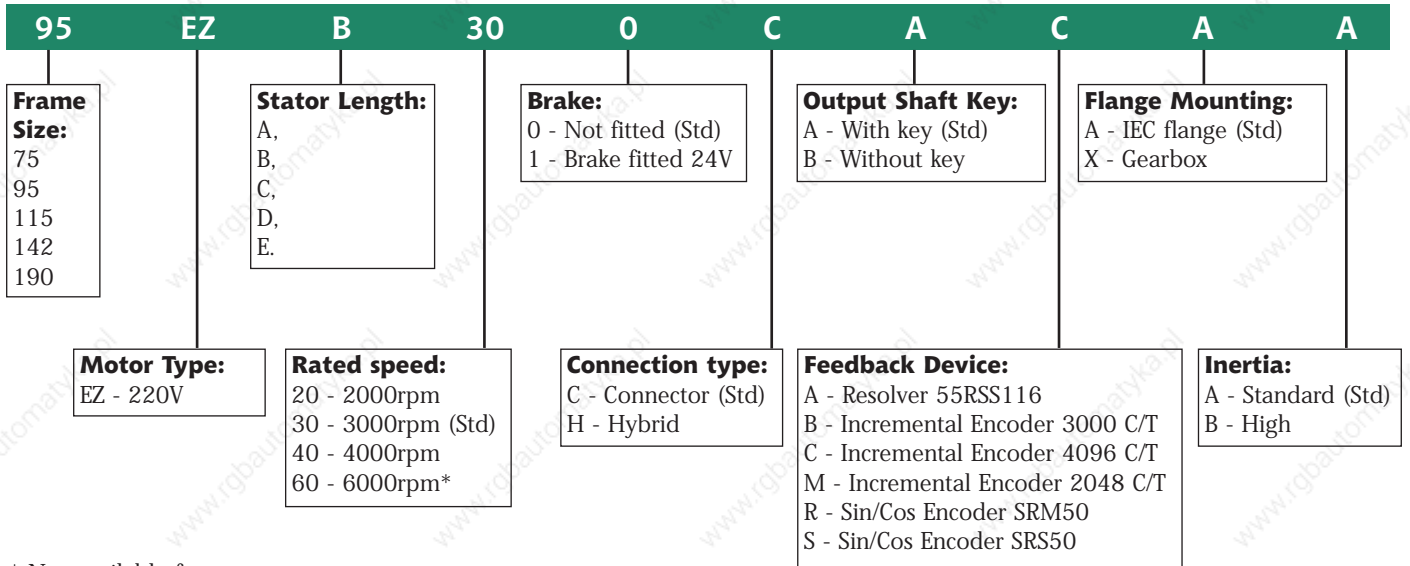
R Key Length	49.0
S Key Height	35.0
T Key to Shaft End	3.1
V Key Width	10.0



## Ordering Information

Use the information below in the illustration to create an order code for a EZ motor. The details in the band are an example of an order reference. (std) = Standard selection.

### ORDER REFERENCE EXAMPLE



\* Not available for some motors

## Connection details

### Power Plugs

	75-142 with brake	75-142 without brake
Pin	Function	Function
1	Phase U	Phase U
2	Phase V	Phase V
3	Earth	Earth
4	Phase W	Phase W
5	Brake	N/C
6	Brake	N/C
Shell	Screen	Screen
	190 with brake	190 without brake
Pin	Function	Function
U	Phase U	Phase U
V	Phase V	Phase V
Ⓧ	Earth	Earth
W	Phase W	Phase W
+	Brake	N/C
-	Brake	N/C
Shell	Screen	Screen

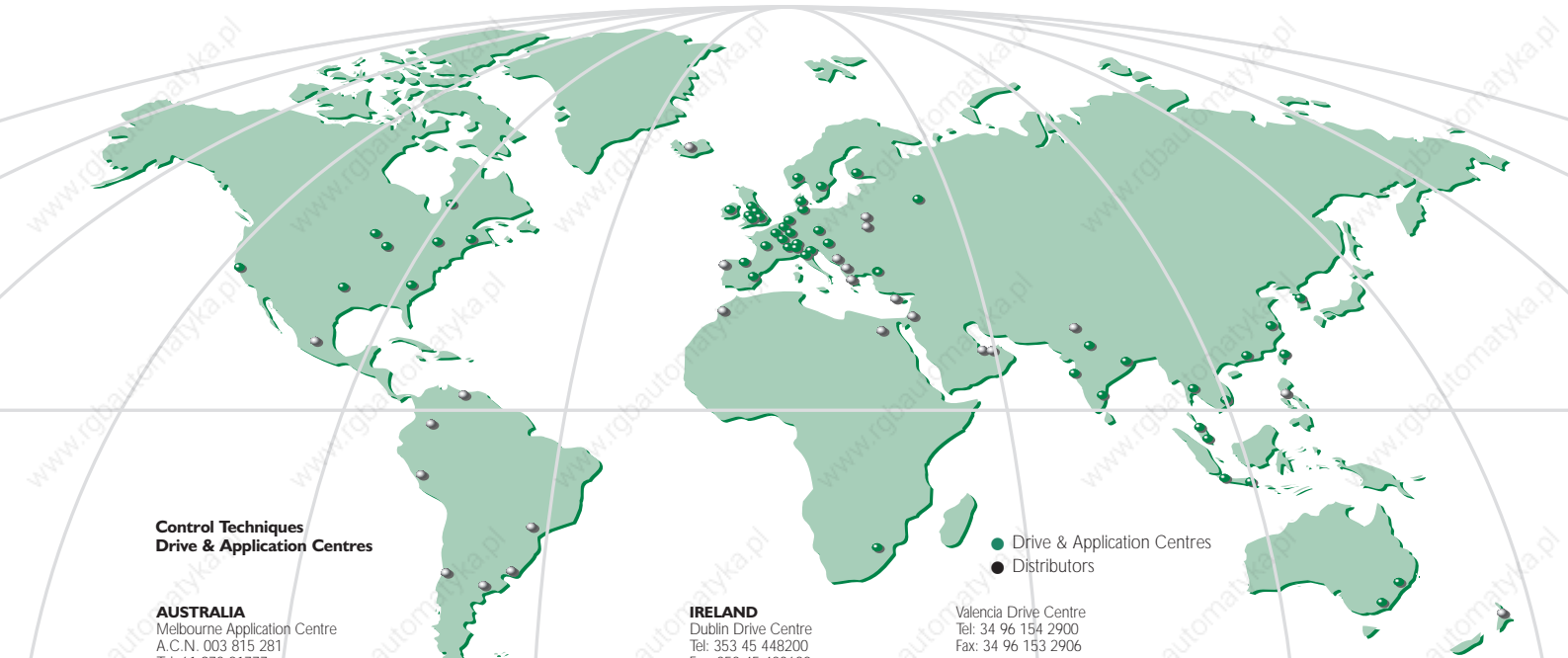
### Signal Plugs

	Encoder	Resolver	Sincos
Pin	Function	Function	Function
1	Thermistor 0V	Excitation high	REF Cos
2	Thermistor Signal	Excitation low	+ Daten
3	Screen	Cos high	-Daten
4	S1	Cos low	+ Cos
5	S1 Inverse	Sin high	+ Sin
6	S2	Sin low	REF Sin
7	S2 Inverse	Thermistor	Thermistor
8	S3	Thermistor	Thermistor
9	S3 Inverse		Screen
10	Channel A		0 Volts
11	Index		-
12	Index Inverse		+ Volts
13	Channel A Inverse		
14	Channel B		
15	Channel B Inverse		
16	+ 5V		
17	0 Volts		
body	Screen	Screen	

EZ servo motor technical specifications		For 3 Phase VPWM Drives 200 - 240Vrms												v.20M, last updated: 21/5/03													
		75			95			115			142			190													
All Speeds		A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D		
Stall torque: rated torque and power relate to maximum continuous operation in a 40°C ambient Δt= 100 degC		All data subject to +/-10% tolerance																									
Unimotors with Encoder Feedback																											
Maximum Cogging (Nm)		0.02	0.03	0.04	0.05	0.03	0.06	0.08	0.10	0.10	0.13	0.06	0.10	0.14	0.18	0.21	0.09	0.16	0.23	0.30	0.35	0.30	0.54	0.72	0.99		
Winding Thermal Time Const (sec)		81	74	94	100	172	168	183	221	228	175	185	198	217	241	213	217	275	301	365	240	242	319	632	48.0		
Standard Inertia (kgcm <sup>2</sup> )		3.0	3.7	4.4	5.1	5.0	6.1	7.2	8.3	9.5	6.5	8.2	9.9	11.6	13.2	10.9	13.2	15.5	17.8	20.5	26.0	33.0	40.0	48.0	235		
High Inertia (kgcm <sup>2</sup> )		1.2	1.6	2.1	2.5	3.5	4.5	5.6	6.7	7.8	9.7	12.0	14.3	16.6	18.8	21.6	28.0	34.3	40.7	47.0	65.4	93.5	141	188	219		
Peak Torque nominal (Nm)		3.6	6.6	9.3	11.7	6.9	12.9	17.7	22.5	27.0	10.5	19.8	28.2	37.2	45.9	32.4	45.9	59.4	70.2	83.4	123	176	235	295	73.2		
Continuous Stall Torque (Nm)		1.2	2.2	3.1	3.9	2.3	4.3	5.9	7.5	9.0	3.5	6.6	9.4	12.4	15.3	6.3	10.8	15.3	19.8	23.4	21.8	41.1	58.7	73.2	50.4		
Rated Torque (Nm)		1.1	2.1	3.0	3.8	2.2	4.0	5.5	6.9	8.2	3.2	6.1	8.7	10.8	14.0	5.9	10.3	14.6	18.4	21.3	20.0	36.9	50.4	63.2	42.1		
Rated Power (kW)		0.23	0.44	0.63	0.80	0.46	0.84	1.15	1.45	1.72	0.67	1.28	1.82	2.28	2.93	1.24	2.16	3.06	3.85	4.46	4.19	7.73	10.6	13.5	9.6		
R (ph-ph) (Ohms)		45.8	15.3	8.52	5.72	19.4	6.24	3.16	2.31	1.71	9.09	2.83	1.51	0.99	0.82	4.28	1.33	0.76	0.45	0.32	0.50	0.15	0.10	0.08	0.06		
L (ph-ph) (mH)		98.8	43.4	27.9	20.2	59.2	25.8	16.0	12.6	10.1	47.3	20.6	13.1	9.54	7.86	33.7	15.1	10.3	6.96	5.58	7.98	3.32	2.73	2.19	1.59		
Rated Speed 2000 rpm		Kt (Nm/A) 1.40 Ke (V/krpm) 85.5																									
Rated Torque (Nm)		1.1	2.1	3.0	3.8	2.2	4.0	5.5	6.9	8.2	3.2	6.1	8.7	10.8	14.0	5.9	10.3	14.6	18.4	21.3	20.0	36.9	50.4	63.2	42.1		
Continuous Stall Current (A)		0.9	1.6	2.3	2.8	1.7	3.1	4.3	5.4	6.5	2.6	4.8	6.8	8.9	11.0	4.6	7.8	11.0	14.2	16.8	15.7	29.5	42.1	50.4	36.9		
Rated Power (kW)		0.35	0.63	0.88	1.10	0.63	1.23	1.70	2.14	2.54	0.94	1.73	2.54	3.27	3.96	1.70	2.83	3.83	4.96	5.83	6.03	10.4	14.2	17.8	13.5		
R (ph-ph) (Ohms)		18.9	6.26	3.50	2.38	8.03	2.68	1.57	1.03	0.77	4.01	1.30	0.73	0.47	0.37	1.90	0.59	0.31	0.20	0.20	0.25	0.08	0.05	0.04	0.03		
L (ph-ph) (mH)		42.5	18.4	11.9	8.82	25.6	12.0	7.91	5.60	4.65	20.1	9.16	6.07	4.26	3.49	15.0	6.85	4.20	1.94	1.94	3.98	1.87	1.59	1.29	0.96		
Rated Speed 3000 rpm		Kt (Nm/A) 0.93 Ke (V/krpm) 57.0																									
Rated Torque (Nm)		1.1	2.0	2.8	3.5	2.0	3.9	5.4	6.8	8.1	3.0	5.5	8.1	10.4	12.6	5.4	9.0	12.2	15.8	18.4	19.2	33.0	44.2	54.0	40.4		
Continuous Stall Current (A)		1.3	2.4	3.4	4.2	2.5	4.7	6.4	8.1	9.7	3.8	7.1	10.2	13.4	16.5	6.8	11.7	16.5	21.3	25.3	23.5	44.2	60.4	73.2	54.0		
Rated Power (kW)		0.42	0.71	0.96	1.21	0.75	1.26	1.68	2.05	2.39	1.05	1.97	2.64	3.14	3.76	1.51	2.93	3.96	4.96	5.83	6.03	10.4	14.2	17.8	13.5		
R (ph-ph) (Ohms)		10.2	3.39	1.92	1.48	5.15	1.64	0.92	0.62	0.43	2.62	0.82	0.44	0.29	0.20	1.20	0.36	0.20	0.13	0.10	0.25	0.08	0.05	0.04	0.03		
L (ph-ph) (mH)		24.6	10.8	7.14	5.42	15.5	6.77	4.61	3.46	2.54	12.6	5.48	3.57	2.53	1.94	9.45	4.08	2.53	1.94	1.94	3.98	1.87	1.59	1.29	0.96		
Rated Speed 4000 rpm		Kt (Nm/A) 0.72 Ke (V/krpm) 44.0																									
Rated Torque (Nm)		1.0	1.7	2.3	2.9	1.8	3.0	4.0	4.9	5.7	2.5	4.7	6.3	7.5	9.0	3.6	7.0	9.0	11.0	12.6	19.2	33.0	44.2	54.0	40.4		
Continuous Stall Current (A)		1.7	3.1	4.4	5.5	3.3	6.0	8.3	10.5	12.6	4.9	9.2	13.1	17.3	21.3	8.8	15.1	21.3	27.0	31.5	23.5	44.2	60.4	73.2	54.0		
Rated Power (kW)		0.42	0.71	0.96	1.21	0.75	1.26	1.68	2.05	2.39	1.05	1.97	2.64	3.14	3.76	1.51	2.93	3.96	4.96	5.83	6.03	10.4	14.2	17.8	13.5		
R (ph-ph) (Ohms)		10.2	3.39	1.92	1.48	5.15	1.64	0.92	0.62	0.43	2.62	0.82	0.44	0.29	0.20	1.20	0.36	0.20	0.13	0.10	0.25	0.08	0.05	0.04	0.03		
L (ph-ph) (mH)		24.6	10.8	7.14	5.42	15.5	6.77	4.61	3.46	2.54	12.6	5.48	3.57	2.53	1.94	9.45	4.08	2.53	1.94	1.94	3.98	1.87	1.59	1.29	0.96		
Rated Speed 6000 rpm		Kt (Nm/A) 0.47 Ke (V/krpm) 28.5																									
Rated Torque (Nm)		0.9	1.6	2.1	2.6	1.3	2.1	2.8	3.3	3.9	2.2	4.0	5.4	6.3	7.5	2.9	4.0	5.4	6.3	7.5	19.2	33.0	44.2	54.0	40.4		
Continuous Stall Current (A)		2.6	4.8	6.7	8.4	5.0	9.3	12.7	16.2	19.7	7.6	14.2	19.7	25.3	31.5	13.6	21.3	28.2	35.1	42.1	23.5	44.2	60.4	73.2	54.0		
Rated Power (kW)		0.57	1.01	1.32	1.63	0.82	1.32	1.76	2.07	2.39	1.38	2.51	3.41	4.14	4.96	1.82	2.93	3.96	4.96	5.83	6.03	10.4	14.2	17.8	13.5		
R (ph-ph) (Ohms)		4.49	1.49	0.95	0.65	2.01	0.67	0.35	0.26	0.18	0.96	0.30	0.16	0.10	0.07	0.49	0.16	0.09	0.06	0.04	0.25	0.08	0.05	0.04	0.03		
L (ph-ph) (mH)		10.7	4.73	3.10	2.33	6.41	3.01	1.77	1.40	1.04	4.80	2.09	1.36	0.96	0.73	3.96	1.64	1.04	0.73	0.54	3.98	1.87	1.59	1.29	0.96		

N/A Not available  
 ▲ Consult factory  
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 CT Dynamics Limited have an ongoing process of development and reserve the right to change the specification without notice.

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Telifford Drive Centre  
Tel: 44 1952 213700  
Fax: 44 1952 213701  
After Hours: 44 1952 213700

Charlotte Application Centre  
Tel: 1 704 393 3366  
Fax: 1 704 393 0900  
After Hours: 1 800 893 2321

Chicago Application Centre  
Tel: 1 630 752 5249  
Fax: 1 630 752 4156  
After Hours: 1 800 893 2321

Cleveland Drive Centre  
Tel: 1 440 717 0123  
Fax: 1 440 717 0133  
After Hours: 1 800 893 2321

Minneapolis Drive Centre  
Tel: 1 952 995 8000  
Fax: 1 952 995 8020  
After Hours: 1 800 893 2321

Providence Drive Centre  
Tel: 1 401 333 3331  
Fax: 1 401 333 6330  
After Hours: 1 800 893 2321

Ho Chi Minh Application Centre  
Tel: 84 8 842 5157  
/84 8 849 1980  
Fax: 84 8 8425157

Lausanne Application Centre  
Tel: 41 21 637 7070  
Fax: 41 21 637 7071

Zurich Drive Centre  
Tel: 41 56 201 4242  
Fax: 41 56 201 4243  
After Hours: 41 79 357 8683

Taipei Application Centre  
Tel: 886 22325 9555  
Fax: 886 22705 9131

Stockholm Application Centre  
Tel: 46 8 554 24100  
Fax: 46 8 554 24120

Valencia Drive Centre  
Tel: 34 96 154 2900  
Fax: 34 96 153 2906

Melbourne Application Centre  
A.C.N. 003 815 281  
Tel: 61 973 81777  
Fax: 61 9729 3200  
After Hours: 61 2 9963 5271

Sydney Drive Centre  
A.C.N. 003 815 281  
Tel: 61 2 9838 7222  
Fax: 61 2 9838 7764  
After Hours: 61 2 9963 5271

Linz Drive Centre  
Tel: 43 7229 789480  
Fax: 43 7229 7894810  
After Hours: 43 7215 3502

Brussels Drive Centre  
Tel: 32 2725 2721  
Fax: 32 2725 4940

Toronto Drive Centre  
Tel: 1 905 475 4699  
Fax: 1 905 475 4694

Shanghai Drive Centre  
Tel: 86 21 5426 0668  
Fax: 86 21 5426 0669  
Beijing Application Centre  
Tel: 86 10 6592 5321 ext. 20  
Fax: 86 10 6500 3094

Brno Drive Centre  
Tel: 420 541 192111  
Fax: 420 541 192115  
After Hours: 420 541 192119

Copenhagen Drive Centre  
Tel: 45 4369 6100  
Fax: 45 4369 6101  
After Hours: 45 4369 6100

Helsinki Drive Centre  
Tel: 358 985 2661  
Fax: 358 985 26823  
After Hours: 358 500 423271

Leroy Somer  
Angoulême Drive Centre  
Tel: 33 5 4564 5454  
Fax: 33 5 4564 5400

Control Techniques GmbH  
Meysstraße 20  
D-53773 Hennef  
Tel: 02242 877-0  
Fax: 02242 877 277  
After Hours: 0171 49 64 777

Control Techniques GmbH  
Rodensteijnstr. 19  
D-64625 Bensheim  
Tel: 06251 17 70-0  
Fax: 06251 17 70-98  
After Hours: 0171 49 64 777

Control Techniques GmbH  
Röhrsdorfer Allee 14  
D-09247 Chemnitz  
Tel: 03722 5203-0  
Fax: 03722 5203-30  
After Hours: 0171 49 64 777

Rotterdam Drive Centre  
Tel: 31 1844 20555  
Fax: 31 1844 20721  
After Hours: 31 1844 20555

Mumbai Application Centre  
Tel: 91 20 613 1954  
Fax: 91 20 612 3771

Kolkata Application Centre  
Tel: 91 33 357 5302/357 5306  
Fax: 91 33 357 3435  
After Hours: 91 33 358 3622

Chennai Drive Centre  
Tel: 91 44 496 1123/  
496 1130/496 1083  
Fax: 91 44 496 1602  
After Hours: 91 44 496 1083

Dublin Drive Centre  
Tel: 353 45 448200  
Fax: 353 45 433622

Milan Drive Centre  
Tel: 39 02575 751  
Fax: 39 02575 12858  
After Hours: 39 02575 751

Vicenza Drive Centre  
Tel: 39 0444 396200  
Fax: 39 0444 341317

Seoul Application Centre  
Tel: 82 2 557 7374  
Fax: 82 2 557 7301  
After Hours: 82 2 557 7374

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After Hours: 420 541 192119

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After Hours: 91 33 358 3622

Chennai Drive Centre  
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496 1130/496 1083  
Fax: 91 44 496 1602  
After Hours: 91 44 496 1083

Dublin Drive Centre  
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Fax: 353 45 433622

Milan Drive Centre  
Tel: 39 02575 751  
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After Hours: 39 02575 751

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