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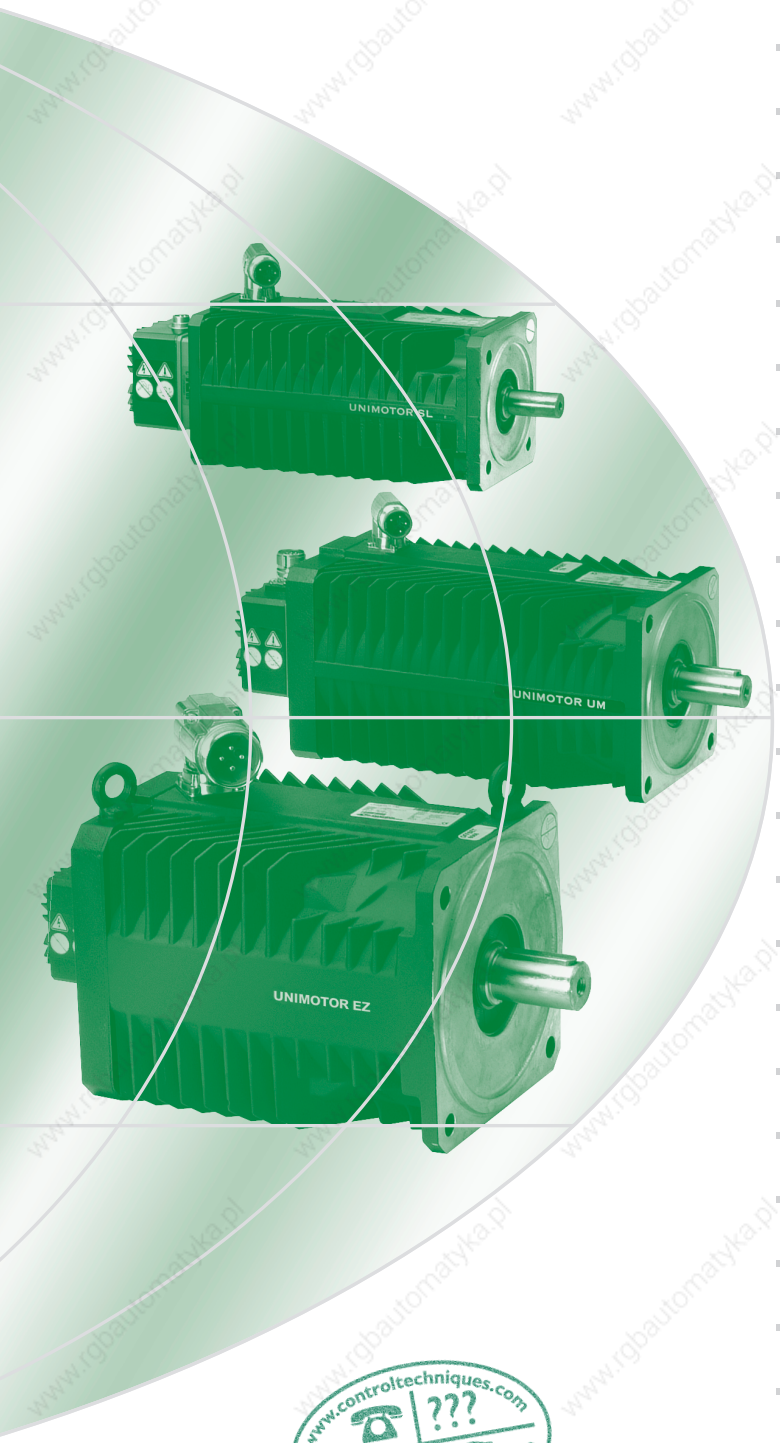

Unimotor EZ Brochure

Control Techniques Dynamics
Brushless AC Servo Motors

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75-190EZ Motor Brochure

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

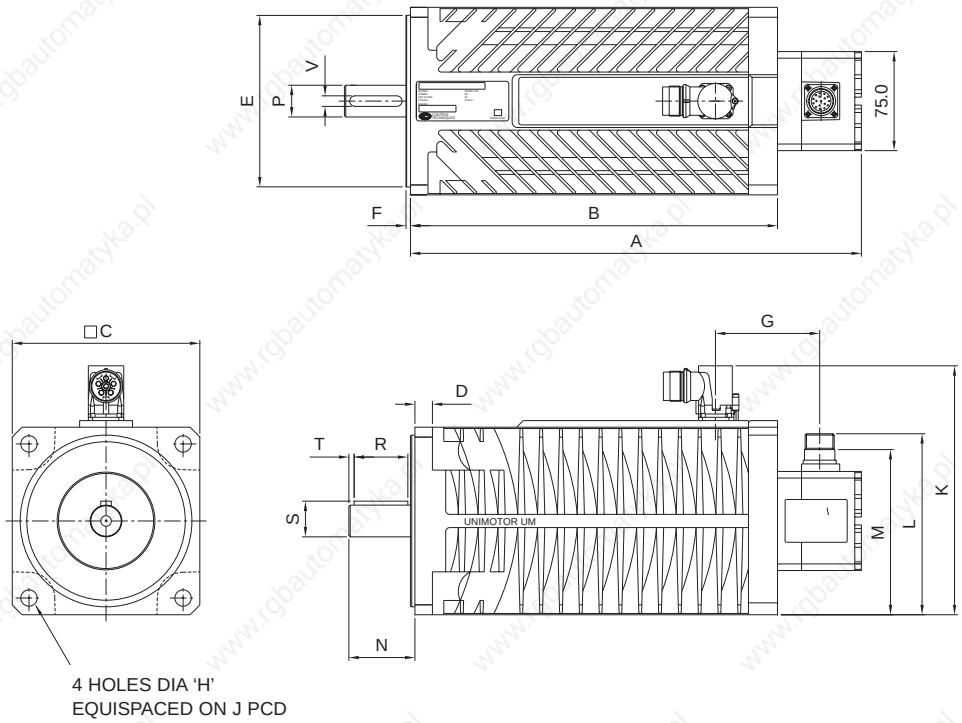
Motor Frame Size	Supply Volts V d.c.	Input Power Watts	Static Torque Nm	Release Time ms nom	Moment of Inertia kgcm^2 *	Backlash Degrees
75	24	6.3	2	22	0.03	0.75
95	24	16	6	30	0.29	0.75
115	24	16	12	40	0.49	0.75
142	24	23	20	85	1.28	0.6
190(A/B)	24	25	40	95	1.28	0.6
190(C/D)	24	25	60	120	2.50	0.6

*Note 1 kgcm^2 = 1x10^{-4}kgm^2

- 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.

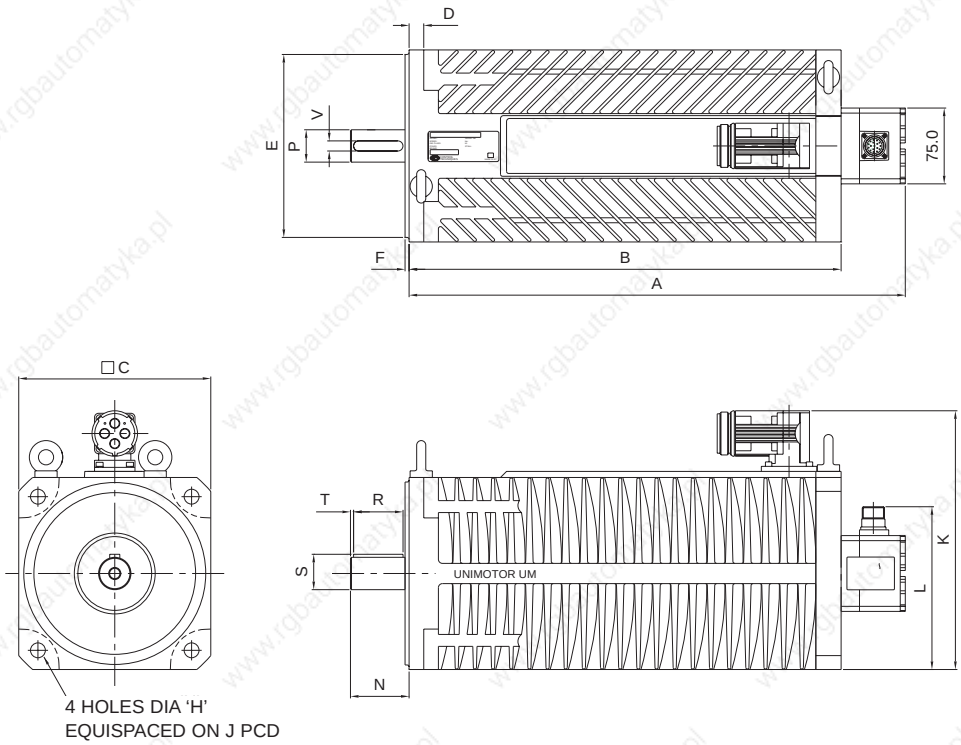


Dimensions – Frame Sizes 75-142

FRAME SIZE		75				95					115					142				
Dimension / Length suffix		A	B	C	D	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 sufix		**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

95	EZ	B	30	0	C	A	C	A	A

Frame Size:
75
95
115
142
190

Motor Type:
EZ - 220V

Stator Length:
A,
B,
C,
D,
E.

Rated speed:
20 - 2000rpm
30 - 3000rpm (Std)
40 - 4000rpm
60 - 6000rpm*

Brake:
0 - Not fitted (Std)
1 - Brake fitted 24V

Connection type:
C - Connector (Std)
H - Hybrid

Output Shaft Key:
A - With key (Std)
B - Without key

Feedback Device:
A - Resolver 55RSS116
B - Incremental Encoder 3000 C/T
C - Incremental Encoder 4096 C/T
M - Incremental Encoder 2048 C/T
R - Sin/Cos Encoder SRM50
S - Sin/Cos Encoder SRS50

Flange Mounting:
A - IEC flange (Std)
X - Gearbox

Inertia:
A - Standard (Std)
B - High

* 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

Unimotors with Encoder Feedback
Δt= 100 degC

Stall torque; rated torque and power relate to maximum continuous operation in a 40°C ambient

All data subject to +/-10% tolerance

Motor Frame Size (mm)		75				95					115					142					190			
All Speeds	**Frame Length**	A	B	C	D	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D
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
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	18.9	32.4	45.9	59.4	70.2	65.4	123	176	219
High Inertia (kgcm^2)		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	93.5	141	188	235
Standard Inertia (kgcm^2)		0.6	1.0	1.5	1.9	1.4	2.5	3.6	4.7	5.8	3.2	5.5	7.8	10.0	12.3	7.8	14.1	20.5	26.8	33.1	50.0	97.0	144	191
Weight (kg)		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
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
Maximum Cogging (Nm)		0.02	0.03	0.04	0.05	0.03	0.06	0.08	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
											Kt (Nm/A) 1.40													
Rated Speed 2000 rpm											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	▲
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	
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	2.26	2.93	1.24	2.16	3.06	3.85	4.46	4.19	7.73	10.6	
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	
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	
											Kt (Nm/A) 0.93													
Rated Speed 3000 rpm											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	N/A	19.2	33.0	▲	N/A
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		23.5	44.2		
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		6.03	10.4		
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		0.25	0.08		
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		3.98	1.87		
											Kt (Nm/A) 0.72													
Rated Speed 4000 rpm											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	▲	3.6	7.0	▲	N/A	N/A				
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		8.8	15.1							
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		1.51	2.93							
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		1.20	0.36							
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		9.45	4.08							
											Kt (Nm/A) 0.47													
Rated Speed 6000 rpm											Ke (V/krpm) 28.5													
Rated Torque (Nm)		0.9	1.6	2.1	2.6	1.3	2.1	2.8	3.3	▲	2.2	4.0	▲	N/A	N/A	2.9	▲	N/A	N/A	N/A				
Continuous Stall Current (A)		2.6	4.8	6.7	8.4	5.0	9.3	12.7	16.2		7.6	14.2				13.6								
Rated Power (kW)		0.57	1.01	1.32	1.63	0.82	1.32	1.76	2.07		1.38	2.51				1.82								
R (ph-ph) (Ohms)		4.49	1.49	0.95	0.65	2.01	0.67	0.35	0.26		0.96	0.30				0.49								
L (ph-ph) (mH)		10.7	4.73	3.10	2.33	6.41	3.01	1.77	1.40		4.80	2.09				3.96								

N/A Not available

▲ Consult factory

The information contained in this specification is for guidance only and does not form part of any contract.
CT Dynamics Limited have an ongoing process of development and reserve the right to change the specification without notice.

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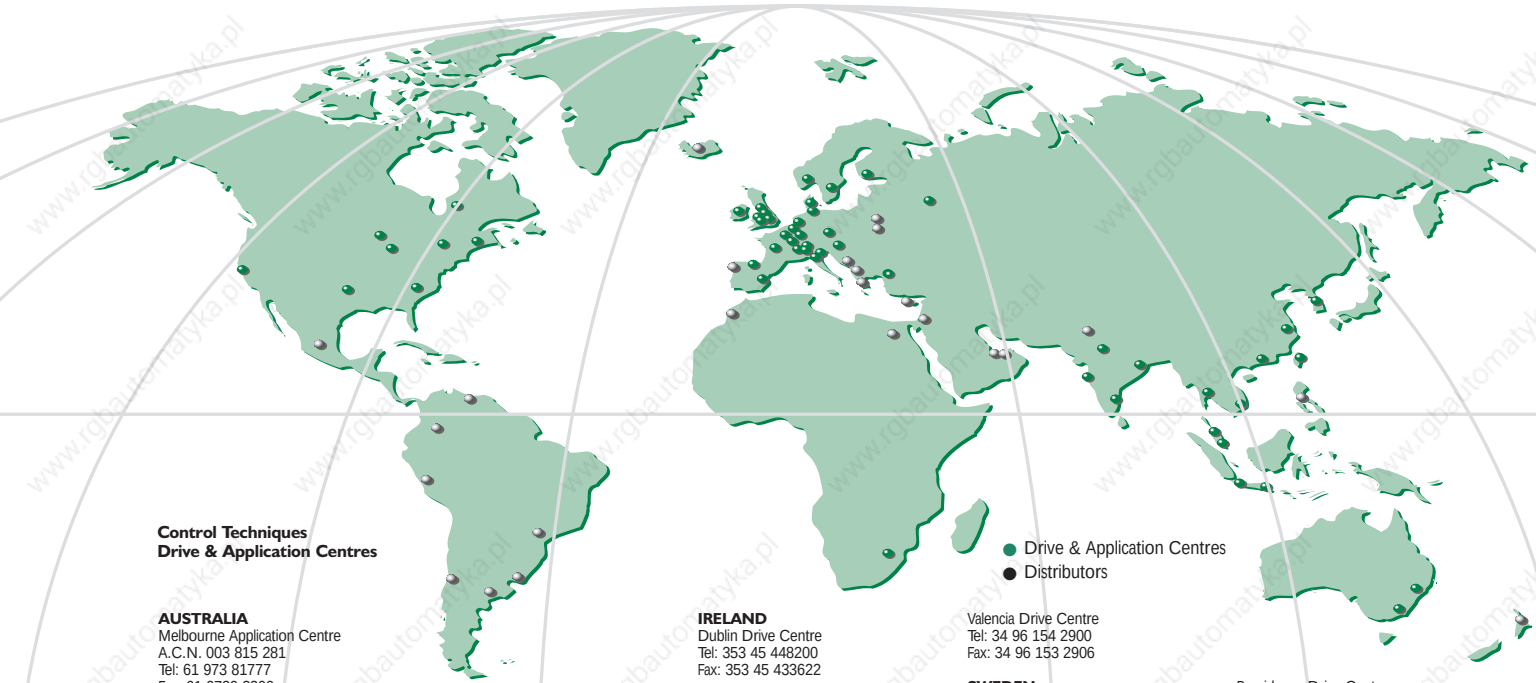
Driving the world…



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Cleveland Drive Centre
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After Hours: 1 800 893 2321

Minneapolis Drive Centre
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