IP66
GSW GEAR BOX MOTOR SERIES

Three Phase Aluminium Gear Box Motors

Australian Version | October 2013

www.ceg.co

CEG
ELECTRIC MOTORS AND PUMPS

CONTENTS

GSW GEAR BOX SERIES

THREE PHASE ALUMINIUM MOTORS

CEG is an Australasian leader of electric motors and water pumps for the industrial and domestic market.

GSW GEAR BOX SERIES

The GSW catalogue details the complete range and specifications of this series. The GSW Series motors are aluminium, three phase, squirrel cage, totally enclosed fan cooled (TEFC), with outputs from 0.12kW to 11kW. These include 2 speed and single speed 2, 4, 6 and 8 pole design, with an innovative multi IEC flange arrange and reduced shaft for pinion placement for one of the most common gear boxes in the country.

CEG has designed and engineered this series to out perform the original equiptment manufacturer. CEG features include IP66, and high efficiency.

EFFICIENCY

The GSW Series, exceed the requirements for the listed MEPS AS/NZ 1359.5-2004 minimum efficiency levels under test method B.

QUALITY ASSURANCE

Stringent quality procedures are observed from initial design to the finished product, in accordance with the ISO9001 documented quality systems. This is a further assurance that only the highest possible standards of quality are accepted right through to final packaging.

BENEFITS INCLUDE

- Energy efficient providing low running costs
- Light weight aluminium construction
- High reliability for long life
- Low noise levels
- Multi voltage at 50Hz - 400/415 ± 6%
  - ≤ 3kW 220 - 240/380 - 415
  - ≥ 4kW 380 - 415/660 - 720
- Multi voltage at 60Hz
  - ≤ 3kW 264 - 288/440 - 480
  - ≥ 4kW 440 - 480/760 - 830
- Dual frequency 50Hz and 60Hz
- High torque with smooth acceleration and low current
- High IP66 protection
- Class F insulation with Class B temperature rise
- Ambient 40°C temperature rise 80°C
- 2-year warranty

MATERIALS AND CONSTRUCTION

SHAFTS

GSW Series motor shafts are made of C43 steel. They are supplied with a machined section for placement of pinion, along with a circlip grove for retention of the pinion.

ROTOR

Rotor core laminations are constructed from high quality magnetic steel. Rotor cages are of the squirrel cage type, and are manufactured from pressurised die cast aluminium as a single piece. This manufacturing process achieves both high starting torque with smooth acceleration and low current. Once assembled the rotor is dynamically balanced to achieve smooth operation.

BALANCING

Each die cast aluminium rotor assembly, (made up of the shaft and rotor core) is dynamically balanced to a high commercial level.

STATOR CASING

Stator enclosures are manufactured from high density aluminium. They are designed and manufactured as one piece, complete with integrated ribs.

This manufacturing process ensures the stator casing remains rigid under the most extreme starting and running loads.

The integrated design of longitude ribs ensures the maximum effective dissipation of heat improving motor life.

This manufacturing process ensures the stator casing remains rigid under the most extreme starting and running loads.
The integrated design of longitude ribs ensures the maximum effective dissipation of heat improving motor life.

END-SHIELDS AND FLANGES

Motor end-shields are made from high density diecast aluminium alloy.

They are designed and manufactured as a single piece, ensuring they remain ridged under the most extreme starting and running loads. End-shields are machined to close tolerances providing perfect alignment and fit. Improved thermal dissipation guarantees long bearing life.

EARTHING

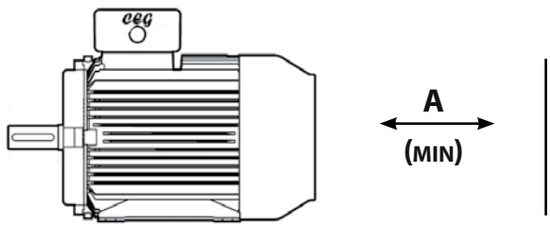
All terminal boxes include an internal earth stud.
Additional external earthing pads are provided on the stator for all frame sizes.

COOLING

The GSW Gear Box Series of motors are all totally enclosed fan-cooled (TEFC) over the external longitude ribs. (Special TEOAM motors available on request)

All frame sizes have polypropylene cooling fans. These cooling fans are suitable for both directions of rotation. Cooling air is drawn in through the fan cowl and blown the length of the motor.

FRAME SIZE:	DIMENSIONS (A):
63M - 100M	15mm
100M - 132M	30mm
160M	40mm



For further information on cooling when running below standard synchronises speed on variable speed drive (VSD) contact your CEG agent for an air velocity table as extra external cooling may be required.

When installing the motor it is important to ensure airflow into the motor cowl is not restricted. The table above provides dimensions that should be used as a guide for minimum distance requirements when mounting as a precaution to not impede airflow.

BEARINGS

All GSW motors are equipped with high quality deep groove ball (C3) bearings with double shielded bearings (ZZ) .

GSW Series motor bearings are specifically designed for use in electric motors. The bearings all come pre-lubricated with a lithium based grease and are maintenance free for life, which under normal operating conditions will provide maximum reliability.

Bearing grease is suitable for operation temperatures ranging from –20ºC to 120ºC. For operation outside these temperatures please contact your local CEG agent for advice.

Bearing housings are fine bored to precision dimension by boring machines. The shaft has excellent surface finish (closely ground). This ensures close tolerances and a high degree of concentricity leading to correct bearing fits for extended bearing life.

The minimum life of bearings for a standard motor is: 20,000hrs for 2 pole motors and 40,000hrs for 4, 6 and 8 pole motors. These are based on operation under conditions of maximum permissible radial thrust, axial thrust, and minimum diameter and maximum face width of pulley. These values are calculated for horizontal mounting only.

WINDINGS

Windings consist of high grade electrolytic copper wire insulated with high temperature polyester varnished wire. These are inserted into the slot liners, which are double cuffed at the slot mouth providing strength to the insulation.

Windings are fitted with insulating phase barriers and bound with a class F tape to provide additional protection against motor failure caused through insulation breakdown from electrical and/or mechanical stresses.

All stators are vacuum impregnated with a thermo setting epoxy resin (class F).

TERMINAL BOX

All terminal boxes in the GSW Gear Box Series are constructed from aluminium with generous dimensions and added attention has been paid to prevent the ingress of water - IP66.

Terminal boxes on all motors can easily be converted from top (standard to right-hand and left-hand side, and are rotatable 360º in increments of 90º. This feature has been incorporated in order to facilitate cable entry from any direction. All terminal boxes include an internal earth stud.

One-piece gaskets are fitted between all mounting surfaces to ensure IP66 protection is maintained. Cable glands are supplied in all cable entries.

FINISH

All cast aluminium components are protected with a zinc chromate primer to prevent oxidisation. The finishing coat of standard Global motors is a grey colour in a synthetic enamel paint, which is adequate for normal operational conditions.

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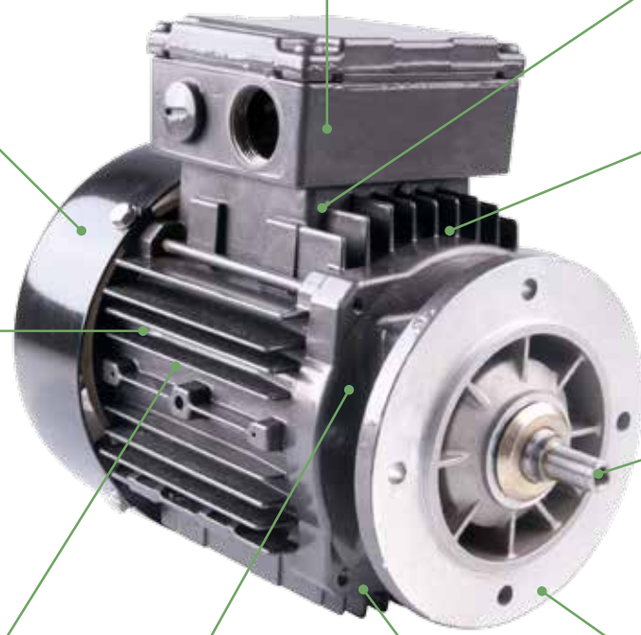
TERMINAL BOX
Generously sized to make electrical connections easier. Terminal boxes on all motors are rotatable 360° in increments of 90°. This feature has been incorporated in order to facilitate cable entry from any direction. IP66.

COOLING FAN
All GSW Gear Box Series have a polypropylene cooling fan fitted. The whole cooling system is design to obtain maximum dissipation of heat, using specific fans for each speed, thus reducing the noise level and increasing motor efficiency.

LAMINATIONS
The lamination core consists of thermo chemically coated low loss magnetic steel achieving the utmost efficiency with low operating temperatures.



WINDINGS
Stator windings consist of high grade enamelled electrolytic copper wire, with Class F insulation between coils & slots. All stators are varnished with a thermo setting epoxy resin.

CASING
Made of a single piece of high density aluminium, giving rigidity under the most extreme starting loads. This integrated design of longitude ribs ensures the maximum effective dissipation of heat improving motor life.

SHAFT
Made of high grade C43 steel and supplied complete with key. Gamma seal as standard.

ROTOR
Made from low loss magnetic steel lamination, the rotor is squirrel cage die-cast aluminium design. This particular design allows maximum starting torque to be obtained.

END-SHIELDS
Motor end-shields frame are made of die-cast aluminium alloy frames. The special webbed designed end-shields transmit the load to the casting in a uniform way improving the thermal dissipation of heat thereby guaranteeing bearing life and high efficiency. In the assembly process stringent attention is paid to the application process of the IP procedure, this ensures every motor leaving the factory has a high IP66 rating.

EXTERIOR FINISH
All aluminium components are protected with a zinc chromate primer to prevent oxidisation. The finishing coat of the GSW Series is a grey synthetic enamel paint, which is adequate for normal operational conditions.

BEARINGS
Are high quality oversized deep groove ball bearings with double shielded bearings that are lubricated for life. These are able to withstand strong radial and axial loads.

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1500 R/MIN (4 POLE) - FRAME SIZES 63 - 160M

kW	MOTOR FRAME	PINION SIZE	SPEED (R/MIN)	400V / 50Hz							380V 50Hz	415V 50Hz	J=1/4GD² (kg.m²)	(Kg)	440V 60HZ	
				(%)	COS Φ	IN (A)	IL/IN	TN (NM)	TL/TN	TB/TN	IN (A)	IN (A)			kW	IN (A)
0.12	63	10	1330	62.0	0.69	0.30	3.4	0.65	2.7	2.7	0.32	0.29	0.0001	3.6	0.1	0.38
0.18	63	10	1360	62.0	0.73	0.59	4.4	1.26	2.1	2.2	0.62	0.57	0.0003	4.7	0.2	0.61
0.25	71	10	1370	67.3	0.74	0.76	5.2	1.74	2.1	2.2	0.80	0.73	0.0008	6.0	0.28	0.79
0.37	71	10	1375	72.2	0.69	1.09	4.5	2.6	3.3	2.7	1.15	1.05	0.001	6.3	0.41	1.12
0.55	80	10	1380	71	0.74	1.48	4.8	3.8	2.5	2.6	1.57	1.43	0.0012	7.3	0.61	1.57
0.55	80	14	1390	72.1	0.75	1.45	4.8	3.8	2.5	2.6	1.53	1.4	0.0018	10	0.61	1.57
0.72	80	14	1405	75.7	0.76	1.90	5.0	5.1	2.4	2.5	2.0	1.8	0.0021	11	0.8	2.05
1.1	90S	12	1415	83.8	0.74	2.6	6.1	7.4	2.8	30	2.59	2.37	0.0022	12.5	1.21	2.59
1.1	90S	14	1425	84.0	0.74	2.6	6.2	7.4	2.9	3.0	2.6	2.5	0.0026	17	1.21	2.59
1.5	90L	14	1430	86.2	0.75	3.4	7.0	10.0	3.1	3.4	3.4	3.3	0.0029	18	1.65	3.39
2.2	100S	16	1455	86.5	0.78	4.7	8.3	14.4	3.1	3.5	4.8	4.7	0.0058	24	2.42	4.77
3	100L	16	1455	87.4	0.79	6.2	8.0	19.7	2.7	3.0	6.5	6.0	0.0071	29	3.3	6.35
4	112M	18	1455	88.9	0.79	8.2	7.3	26.3	2.6	3.1	8.4	8.1	0.011	31	4.4	8.37
5.5	132S	22	1460	90.2	0.83	10.6	7.1	36.0	2.0	2.7	11.0	10.4	0.023	53	6.05	11.3
7.5	132M	22	1455	90.5	0.84	14.3	7.4	49.2	2.3	2.8	14.9	14.0	0.032	63	8.25	15
9.2	132ML	22	1460	91.0	0.84	21	7.3	71.5	2.1	3.2	21.8	20.0	0.05	58	12.1	21.8
11	160M	42	1470	91.0	0.84	20.7	7.4	71.5	2.1	3.2	21.3	20.6	0.079	80	12.1	21.8

(%)	Efficiency full load
COS Φ	Power factor
IN (A)	Current full load
IL/IN	Current locked rotor
TN (NM)	Torque full load
TL/TN	Torque locked rotor
TB/TN	Torque break down
J=1/4GD²	Moment of inertia
(kg)	Weight of foot mount motor

MEPS 2 COMPLIANT

Every care has been taken to ensure the accuracy of the information contained in this publication, but due to continuous development and improvement the right is reserved to supply products which may differ slightly from those illustrated and described in this publication.

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1000 R/MIN (6 POLE) - FRAME SIZES 63 - 160M

kW	MOTOR FRAME	PINION SIZE	SPEED (R/MIN)	400V / 50Hz							380V 50Hz	415V 50Hz	$J=^{1/4}GD^2$ (kg.m²)	(Kg)	440V 60HZ	
				(%)	COS Φ	I_N (A)	I_L/I_N	T_N (Nm)	T_L/T_N	T_B/T_N	I_N (A)	I_N (A)			kW	I_N (A)
0.09	63	10	900	60.0	0.68	0.91	4.0	2.65	1.9	2.0	0.96	2.65	0.0009	6.3	0.28	0.93
0.12	63	10	915	67.5	0.70	1.12	3.4	3.9	1.8	2.1	1.18	3.9	0.0016	10	0.41	1.27
0.18	71	10	925	68.6	0.66	1.66	3.3	5.7	1.4	2.1	1.75	5.7	0.0019	11	0.61	1.74
0.25	71	10	900	60.0	0.68	0.91	4.0	2.65	1.9	2.0	0.96	0.87	0.0009	6.3	0.28	0.93
0.37	80	14	915	67.5	0.70	1.12	3.4	3.9	1.8	2.1	1.18	1.19	0.0016	10	0.41	1.27
0.55	80	14	925	68.6	0.72	1.66	3.3	5.7	1.4	2.1	1.75	1.63	0.0019	11	0.61	1.74
0.72	90S	14	935	74.4	0.72	2.0	4.6	7.7	2.4	2.6	2.1	2.2	0.0029	13	0.8	2.24
1.1	90L	14	950	79.9	0.71	2.8	6.2	11.1	2.3	2.7	2.8	2.6	0.0041	18	1.21	2.80
1.5	100M	16	955	81.9	0.74	3.6	6.0	15.0	2.4	2.9	3.7	3.6	0.0079	26	1.65	3.64
2.2	112M	18	960	84.9	0.72	5.2	5.7	21.9	2.1	2.6	5.3	5.2	0.0158	32	2.42	5.15
3	132S	22	965	86.3	0.76	6.6	5.9	29.7	1.8	2.2	6.8	6.5	0.035	50	3.3	6.91
4	132M	22	965	87.2	0.76	8.8	6.4	39.6	2.0	2.7	9.0	8.8	0.041	51	4.4	9.05
5.5	132ML	22	965	87.9	0.77	11.8	6.6	54.4	2.0	2.7	12.2	11.7	0.051	62	6.05	12.15
7.5	160M	28	975	89.2	0.79	15.4	6.4	73.5	2.1	2.9	15.7	15.3	0.098	86	8.25	16.27

(%)	Efficiency full load
COS Φ	Power factor
I_N (A)	Current full load
I_L/I_N	Current locked rotor
T_N (Nm)	Torque full load
T_L/T_N	Torque locked rotor
T_B/T_N	Torque break down
$J=^{1/4}GD^2$	Moment of inertia
(kg)	Weight of foot mount motor

MEPS 2 COMPLIANT

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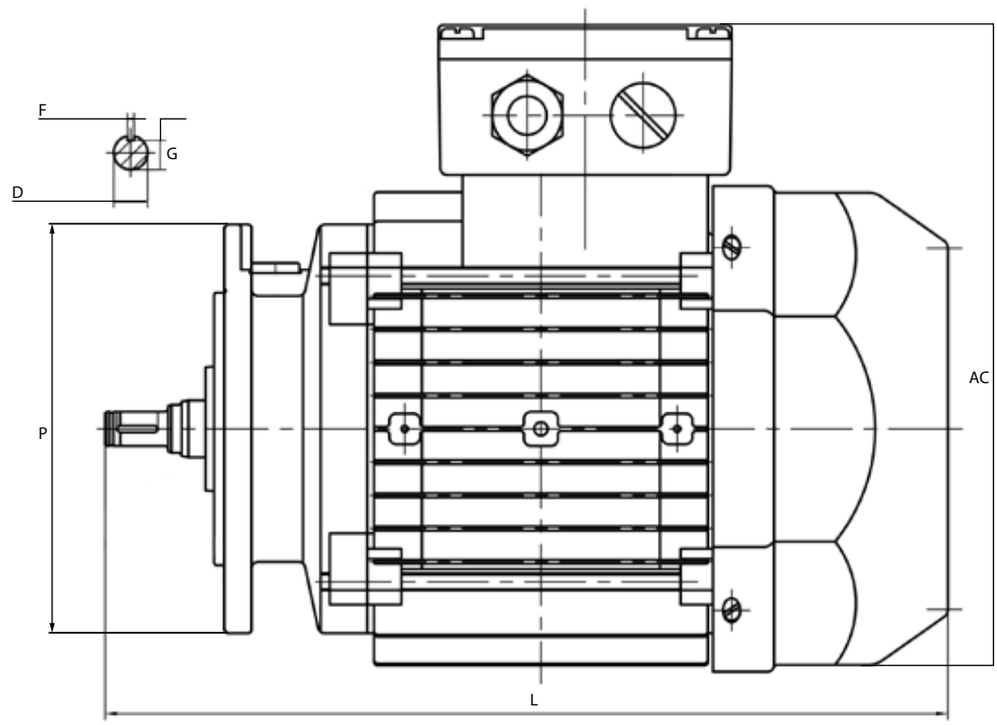
FLANGE P DIMENSION MM (OUTSIDE DIAMETER OF FLANGE)

GSW GEAR BOX GENERAL DIMENSIONS									
MOTOR FRAME	120	160	200	250	300	350	400	450	550
63	✓	✓	✓	×	×	×	×	×	×
71	✓	✓	✓	×	×	×	×	×	×
80	✓	✓	✓	✓	✓	×	×	×	×
90	✓	✓	✓	✓	✓	×	×	×	×
100	✓	✓	✓	✓	✓	✓	×	×	×
112	×	✓	✓	✓	✓	✓	×	×	×
132S	×	✓	✓	✓	✓	✓	✓	×	×
132M	×	✓	✓	✓	✓	✓	✓	✓	×
132ML	×	✓	✓	✓	✓	✓	✓	✓	×
160M	×	×	✓	✓	✓	✓	✓	✓	✓



GSW FLANGE MOUNT 1500 R/MIN (4 POLE)

GSW GEAR BOX GENERAL DIMENSIONS						
KW	MOTOR FRAME	AC	D	F	G	L
0.12	63	171	10	2	8.9	236.5
0.18	63	171	10	2	8.9	236.5
0.25	71	190	10	2	8.9	248.0
0.37	71	190	10	2	8.9	248.0
0.55	80	190	10	2	8.9	296
0.55	80	190	14	3	12.0	296
0.72	80	190	14	3	12.0	296
1.1	90S	249	12	3	10.0	350
1.1	90S	249	14	3	12.0	350
1.5	90L	249	14	3	12.0	350
2.2	100S	249	16	4	13.4	352
3.0	100L	249	16	4	13.4	390
4.0	112M	272	18	4	15.4	388
5.5	132S	272	22	5	18.4	436
7.5	132M	350	22	5	18.4	461
9.2	132ML	350	22	5	18.4	526
11	160M	350	28	6	23.9	526

GSW FLANGE MOUNT 1000 R/MIN (6 POLE)

GSW GEAR BOX GENERAL DIMENSIONS						
KW	MOTOR FRAME	AC	D	F	G	L
0.09	63	171	10	2	8.9	236.5
0.12	63	171	10	2	8.9	236.5
0.18	71	190	10	2	8.9	248.0
0.25	71	190	10	2	8.9	248.0
0.37	80	190	14	3	12.0	296
0.55	80	190	14	3	12.0	296
0.72	90S	249	14	3	12.0	350
1.1	90L	249	14	3	12.0	350
1.5	100M	249	16	4	13.4	352
2.2	112M	272	18	4	15.4	388
3.0	132S	272	22	5	18.4	436
4.0	132M	350	22	5	18.4	461
5.5	132ML	350	22	5	18.4	526
7.5	160M	350	28	6	23.9	526

OTHER AVAILABLE PRODUCTS

CEG GLOBAL GREEN THREE PHASE SERIES

The Global Green Series is our premium efficiency three phase aluminium range. The Global Green Series receives ISO 9001 quality standards, observed from their first class design to the finished product. All Global Green products are MEPS compliant to AS/NZS 1359.5-2004.

- *2850RPM, 1425RPM, 960RPM, 720RPM*
- *Multi speed available*
- *IP 55 (IP56, IP66 available on request)*
- *Multi voltage design*
- *Available from 0.09kW up to 37kW*
- *Frame size 56F - 200F*
- *Available in B3, B5, B14A/B mounting*
- *50/60 Hz*

CEG GLOBAL GREEN BRAKE SERIES

The Global Green Brake Series is our premium efficiency three phase aluminium DC brake motor. The brake feature on this series makes them especially suitable for situations where safety is paramount, all brake motors include a hand release for maintenance.

- *2850RPM, 1425RPM, 960RPM, 720RPM*
- *DC brake unit*
- *IP 55 (IP56, IP66 available on request)*
- *Available from 0.18kW up to 30kW*
- *Frame size 63F - 200F*
- *Available in B3, B5, B14A/B mounting*

LAFERT SINGLE PHASE SERIES

The LFP and LFC Series is our premium single phase range. The aluminium construction makes this series particularly adaptable in all environments. These Italian made motors are in the industry leader in durability and reliability.

- *2850RPM, 1425RPM, 960RPM, 720RPM*
- *Class F insulation (Class H available on request)*
- *IP 55 (IP56, IP66 available on request)*
- *LFP available from 0.09kW up to 2.2kW (PSC)*
- *LFC available from 0.18kW up to 3.7kW (CSCR)*
- *Available in B3, B5, B14A/B,V1 reducing mounting*

CEG CSCR SERIES

The CSCR Series or Capacitor Start Capacitor Run (CSCR) is constructed from aluminium, incorporating the latest multi mount design. Equipped with an additional starting capacitor for high starting torque design application.

- *2850RPM, 1425RPM, 960RPM*
- *Class F insulation*
- *IP 55 rating*
- *Available 0.25kW up to 4.0kW (63F - 100F)*
- *Complete with manual reset overload (below 3.0kW)*
- *Available in B3, B5, B14A mounting*

ITALVIBRAS MVSI SERIES

The MVSI Series is available in both single, three phase and also DC. This range represents the current state-of-art research and design, allowing them to suit the most varied industrial applications.

- *2850RPM, 1425RPM, 960RPM, 720RPM*
- *Available from 85W to 24kW*
- *IP 66 rating, Class F insulation*
- *Wide range of forces 4kg - 22,000kg*
- *Available in stainless steel 316L*
- *Available in hazardous location, IEC Ex Certificate*

CEG SST SERIES

The Stainless Steel wash down series are available in single and three phase. Designed for food processing, pharmaceutical and other environments requiring extreme cleanliness and frequent washdowns.

- *2850RPM, 1425RPM, 960RPM*
- *Frame size 63F - 132F*
- *IP 69K rating*
- *Available 0.18kW up to 7.5W*
- *Available with encapsulated windings*
- *Available in B3, B5, B14A/B, SEW mounting*

CEG EXD SERIES

EXD range of Exd flameproof motors are certified for use in hazardous locations. These motors are designed to contain any sparks within the motor without igniting external vapours. They incorporate features such as a robust cast iron construction and special terminal box to meet the stringent certification requirements.

- *IP 55*
- *Thermistors standard in three phase versions*
- *IEC Ex certificate*
- *Exd IIC T4/IIB T4*
- *B5 and B14A flanges available*
- *Frame size 63F - 500F*

CEG INP INDUSTRIAL PERFORMANCE SERIES

The INP Series is our industrial performance range. The cast iron construction makes this series particularly durable in all environments. INP Series are MEPS compliant to AS/NZS 1359.5-2004.

- *2850RPM, 1425RPM, 960RPM, 720RPM, 580RPM*
- *Class F insulation (Class H available on request)*
- *IP66 rating*
- *Available from 0.18kW to 1450kW*
- *Frame sizes 63F - 500F*
- *Available in B3, B3/5, B14A/B VI mounting*

CEG

ELECTRIC MOTORS AND PUMPS

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