

BBS SERIES II

IMPERIAL MOTORS, *B56 frame*
British Standard/Nema

Australian Version | June 2016



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CEG

ELECTRIC MOTORS AND PUMPS

BBS SERIES II

IMPERIAL MOTORS, B56 FRAME



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

INTRODUCTION

Our products are used in almost every industrial activity, including water treatment, building services, chemical / petrochemicals and general processing and manufacturing where they drive fans, pumps, compressors and conveyors, to name just a selection of the vast applications.

We have an extensive stock of motors throughout Australia and New Zealand, backed up by a network of distributors, ensuring excellent local support and service wherever needed.

BBS SERIES

The BBS Series catalogue details the complete range and specifications of the BBS Series. The BBS Series are imperial motors with a rolled steel casing available in single & three phase, Totally Enclosed Fan Cooled (TEFC) & Open Drip Proof (ODP).

Motors conform to:

- 1) BS 4999/5000 Pt1
- 2) Nema MG1-2009

These include single speed in either 2, 4 or 6 pole design.

They combine efficiency and excellent quality.

The B56 II Series motor range covers from 0.25kW right through to 2.2kW. They are widely used in a diverse range of industrial and rural applications from food and drink to water and sewerage, from heating and ventilation to refrigeration etc.

MOUNTING

All models are available with a choice of mountings options:

- Solid foot base (B3)
- Flange British Standard
- Flange NEMA
- Resilient base
- OEM Special

PROTECTION DEGREE

CEG BBS of motors are available in both Totally Enclosed Fan Cooled (TEFC) with IP55 protection & Open Drip Proof (ODP) IP23 as defined by IEC standards.



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 efficiency for low running costs
- Low noise levels
- Fully reversible
- Complete with heavy duty lead & plug
- DE bearing size increased to 6205 for better life and load capacity
- Up-rated insulation, now to class F
- Complete with manual reset overload
- Rolled heavy gauge steel case
- Voltage 230-240V or 400-415V
- High power factors
- High torque with smooth acceleration & low current
- Class F insulation with Class B temperature rise
- Now IP55 (TEFC) or IP23 (ODP)
- Continuous rated surface factor (S1)
- 2-year warranty



Various mounting arrangements are offered for the B56 2000 Series depending on the motor coupling. The following mounting arrangements are available:



FOOT MOUNT (B3)



**FLANGE MOUNT
(BRITISH STANDARD)**



AIR COMPRESSOR



**FLANGE MOUNT
(NEMA STANDARD)**

MECHANICAL INFORMATION

SHAFTS

CEG BBS series motor shafts are made of C43 steel and come supplied with a key. Customized dimensions are available on request.

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 high starting torque with smooth acceleration & 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 a single piece of rolled heavy gauge steel. They are designed and manufactured as a one piece body with a CNC weld on the underside, completed by attaching a pressed metal base. This manufacturing process ensures the stator casing remains ridged under the most extreme starting and running loads.

END-SHIELDS AND FLANGES

Motor end-shields are made of die-cast aluminium alloy with flanges constructed of high quality aluminium now as standard.

COOLING

The BBS series of motors are available in Totally Enclosed Fan Cooled, now IP55 (TEFC) & Open Drip Proof, now IP23 (ODP). All frame types have polypropylene cooling fans fitted. The TEFC has an external fan blowing over the outer case while the ODP has an internal fan blowing directly over the windings. These cooling fans are suitable for both directions of rotation.

TEFC

With TEFC motors cooling air is drawn in through the fan cowl and blown the length of the motor. The motor fan cowl provides protection for the fan and increases the effectiveness of the airflow in directing it over external body. When installing the motor it is important to ensure airflow into the motor cowl is not restricted.

ODP

With ODP motors cooling air is drawn in through the slots in the end-shield and blown out the slots in the body. When installing the motor it is important to ensure airflow into the motor is not restricted.



TERMINAL AND CAPACITOR BOX

All CEG single phase terminal boxes in the BBS range consist of one piece of high quality die cast aluminium (located on the top of the motor). The base is constructed from pressed steel. A neoprene gasket is fitted between the terminal box and motor frame to ensure IP55 protection is maintained.

ODP Compressor motors retain the one piece terminal box on top, whereas the remaining ODP motors have the terminal block located in the back-end shield. The standard position of the cable gland is facing 90° to the shaft on the right hand side.

OVERLOAD PROTECTION

Single phase motors are designed to run at 230/240V with three phase designed for 400/415V. They will provide their rated output when 50Hz rated frequency is applied by a voltage that may vary between 230/240V on single phase and 400/415V on three phase models. Outside this range could lead to overload tripping.

An external manual reset overload is fitted to all single phase BBS series motors, for three phase units customers are required to supply their own external overload protection.

The overload is mounted in the terminal box. A weather proof cover is fitted as standard to ensure the IP55 protection is maintained. It is connected in series with one of the main supply leads. All single phase motors are fitted with a 2m lead & plug.

WINDING CONFIGURATIONS

STATOR WINDINGS

Windings consist of high-grade electrolytic copper which has been used as it produces less heat and ensures efficient operation. This wire is then insulated with high temperature modified polyester enamel raising the thermal margin in hot spots (e.g. terminal box where there is disrupted air flow) and thereby extending the life of the windings.

All BBS series motors are wound with class F insulation slot liners for longer life.

All stators are varnished with a thermo setting epoxy resin (class F) to provide increased heat dissipation and to help withstand electrical and mechanical stresses. Then a further lace binding is applied to the winding for extra mechanical rigidity.

FINISH

All BBS motors are protected with zinc chromate primer to prevent oxidisation. The finishing coat of new BBS motors is an extra thick coating of black enamel, which is adequate for normal operational conditions. However special paint is also available for motors required to operate in acidic, alkaline, or any other corrosive atmosphere. Motor components are suitably treated to withstand corrosion due to such atmospheres and are then painted with an epoxy based paint of any shade requested.



All CEG BBS Series motors are equipped with high quality oversized deep groove ball bearings. These bearings are C3-ZZ rated.

The bearings all come pre-lubricated for life of the bearing with a lithium based grease.

The lithium grease supplied in the bearing has a temperatures range from -20°C - +140°C. For operation outside these temperatures please contact your local CEG agent for advice.

Bearing housings are fine bored to exacting dimensions coupled with 8 strengthening webs attached to the bearing housing. 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 expected life of bearings for a standard motor is: 20,000hrs for a 2 pole motor and 40,000hrs for a 4 or 6 pole motor. 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.

TABLE 1.10 - 3000 RPM

BEARING REFERENCES			
kW	MOUNTING POSITION	BEARINGS	
		DRIVE END	NON-DRIVE END
0.37	All	6205-ZZ	6205-ZZ
0.55	All	6205-ZZ	6205-ZZ
0.75	All	6205-ZZ	6205-ZZ
1.10	All	6205-ZZ	6205-ZZ
1.50	All	6205-ZZ	6205-ZZ
1.80	All	6205-ZZ	6205-ZZ
2.20	All	6205-ZZ	6205-ZZ

TABLE 1.20 - 1500 RPM

BEARING REFERENCES			
kW	POSITION	BEARINGS	
		DRIVE END	NON-DRIVE END
0.25	All	6205-ZZ	6205-ZZ
0.37	All	6205-ZZ	6205-ZZ
0.55	All	6205-ZZ	6205-ZZ
0.75	All	6205-ZZ	6205-ZZ
1.10	All	6205-ZZ	6205-ZZ
1.50	All	6205-ZZ	6205-ZZ

TABLE 1.30 - 1000 RPM

BEARING REFERENCES			
kW	POSITION	BEARINGS	
		DRIVE END	NON-DRIVE END
0.37	All	6205-ZZ	6205-ZZ
0.55	All	6205-ZZ	6205-ZZ
0.75	All	6205-ZZ	6205-ZZ

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.



SINGLE PHASE B56 - TOTALLY ENCLOSED FAN COOLED (TEFC) 3000RPM

3000 R/MIN	GENERAL			PERFORMANCE							
	KW	TYPE	FRAME SIZE	SPEED (R/MIN)	IN (A)	%	COS Ø	TN (Nm)	$\frac{TL}{TN}$	$\frac{IL}{IN}$	KG
	0.37	CSCR	B56	2905	2.51	65.75	0.98	1.22	5.81	8.42	10.8
	0.55	CSCR	B56	2905	3.34	73.35	0.99	1.82	4.01	8.45	11.8
	0.75	CSCR	B56	2880	4.60	73.62	0.96	2.47	2.97	6.49	13.6
	1.10	CSCR	B56	2890	6.29	79.91	0.97	3.69	4.15	7.69	17.3
	1.50	CSCR	B56	2875	8.16	80.67	0.99	4.95	3.20	6.54	20.0

SINGLE PHASE B56 - TOTALLY ENCLOSED FAN COOLED (TEFC) 1500RPM

1500 R/MIN	GENERAL			PERFORMANCE							
	KW	TYPE	FRAME SIZE	SPEED (R/MIN)	IN (A)	%	COS Ø	TN (Nm)	$\frac{TL}{TN}$	$\frac{IL}{IN}$	KG
	0.25	CSCR	B56	1450	1.95	56.65	0.99	1.64	4.49	8.65	10.1
	0.37	CSCR	B56	1450	2.82	61.83	0.93	2.43	3.88	7.96	10.3
	0.55	CSCR	B56	1445	3.98	69.32	0.88	3.69	3.61	7.80	13.3
	0.75	CSCR	B56	1455	4.73	71.72	0.96	4.89	3.52	8.05	17.3
	1.10	CSCR	B56	1450	6.02	79.79	0.99	7.35	3.12	7.74	20.0
	1.50	CSCR	B56	1445	7.78	83.78	0.99	9.87	2.87	6.31	21.4

SINGLE PHASE B56 - TOTALLY ENCLOSED FAN COOLED (TEFC) 1000RPM

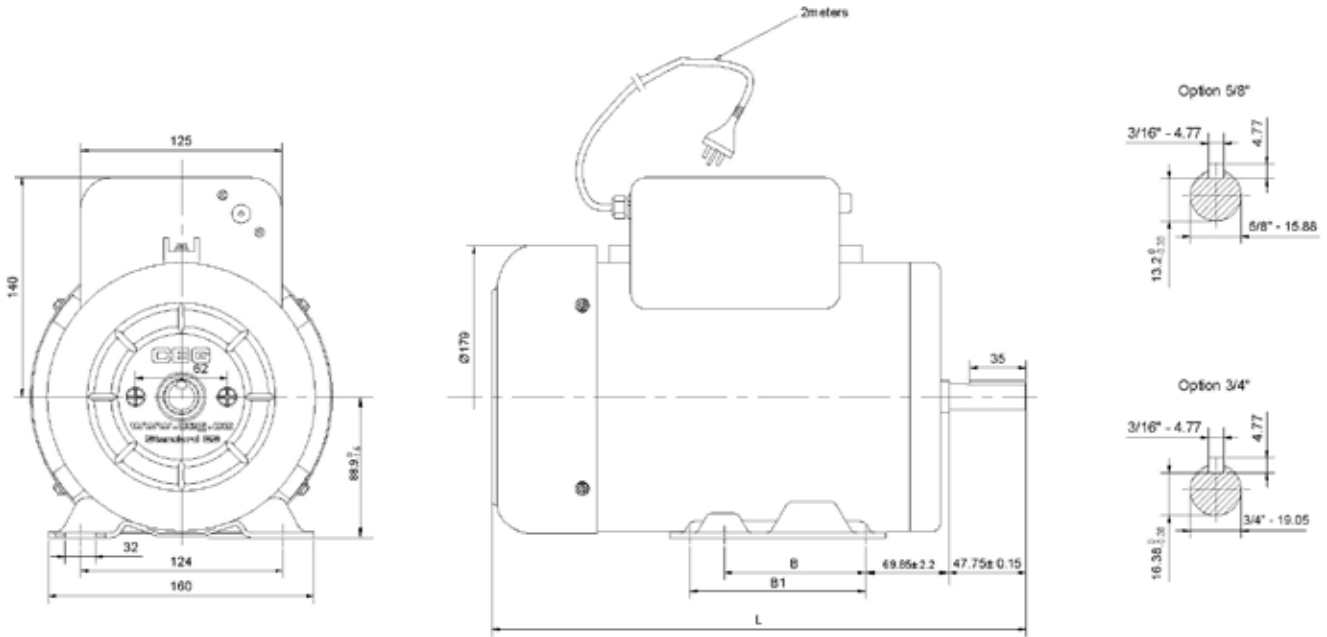
1000 R/MIN	GENERAL			PERFORMANCE							
	KW	TYPE	FRAME SIZE	SPEED (R/MIN)	IN (A)	%	COS Ø	TN (Nm)	$\frac{TL}{TN}$	$\frac{IL}{IN}$	KG
	0.37	CSCR	B56	960	2.21	76.01	0.97	3.71	6.44	3.52	12.4
	0.55	CSCR	B56	950	3.30	77.11	0.98	5.54	5.51	2.88	15.9
	0.75	CSCR	B56	950	4.26	77.72	0.99	7.53	4.92	2.59	20.2

IN (A) Current full load
 % Efficiency full load
 COS Ø Power factor
 TN (Nm) Torque full load

TL/TN Torque locked rotor
 IL/IN Current locked rotor
 KG Weight of foot mount motor



FOOT MOUNT - B56 TEFC - TOTALLY ENCLOSED FAN COOLED



3000RPM

BBS GENERAL DIMENSIONS				SHAFT OPTION	
kW	B	B1	L	5/8"	3/4"
0.37	76.2	-	316	YES	NO
0.55	76.2	-	316	YES	NO
0.75	76.2	-	316	YES	NO
1.10	76.2	127	331	YES	YES
1.50	76.2	127	331	YES	YES

1000RPM

BBS GENERAL DIMENSIONS				SHAFT OPTION	
kW	B	B1	L	5/8"	3/4"
0.37	76.2	-	316	YES	NO
0.55	76.2	-	316	YES	NO
0.75	76.2	-	316	YES	NO

Note: All dimensions in millimetres, unless otherwise stated

1500RPM

BBS GENERAL DIMENSIONS				SHAFT OPTION	
kW	B	B1	L	5/8"	3/4"
0.25	76.2	-	316	YES	NO
0.37	76.2	-	316	YES	NO
0.55	76.2	-	316	YES	NO
0.75	76.2	-	316	YES	NO
1.10	76.2	127	331	YES	YES
1.50	76.2	127	331	YES	YES



THREE PHASE B56 - TOTALLY ENCLOSED FAN COOLED (TEFC)

3000 R/MIN	GENERAL		PERFORMANCE								
	KW	FRAME SIZE	SPEED (R/MIN)	IN (A)	%	COS Ø	TN (Nm)	$\frac{TL}{TN}$	$\frac{IL}{IN}$	415V IN (A)	KG
	0.37	B56	2830	1.38	70	0.69	1.3	2.51	5.09	1.25	11.1
0.72	B56	2850	2.25	67	0.70	2.58	2.62	5.28	2.11	15.0	

1500 R/MIN	GENERAL		PERFORMANCE								
	KW	FRAME SIZE	SPEED (R/MIN)	IN (A)	%	COS Ø	TN (Nm)	$\frac{TL}{TN}$	$\frac{IL}{IN}$	415V IN (A)	KG
	0.37	B56	1420	1.39	70	0.64	2.44	2.63	4.96	1.26	11.1
	0.55	B56	1420	1.90	67	0.68	3.67	2.76	5.30	1.72	12.6
	0.72	B56	1420	2.27	77	0.71	4.95	2.33	5.19	2.13	15.0
1.1*	B56	1420	3.12	82	0.72	7.37	3.30	6.09	2.95	16.8	

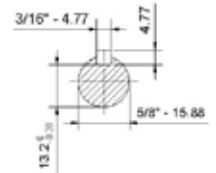
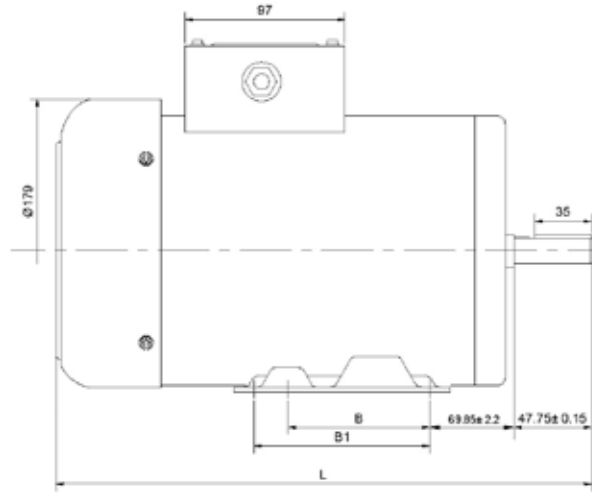
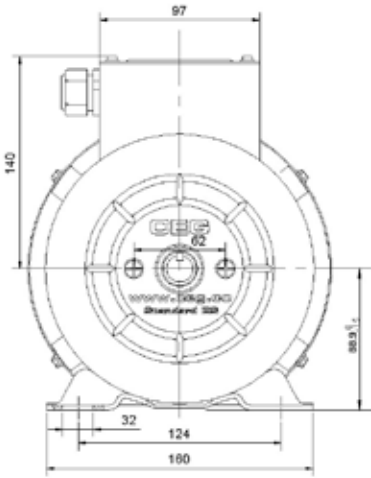
*S2 rated

1000 R/MIN	GENERAL		PERFORMANCE								
	KW	FRAME SIZE	SPEED (R/MIN)	IN (A)	%	COS Ø	TN (Nm)	$\frac{TL}{TN}$	$\frac{IL}{IN}$	415V IN (A)	KG
	0.37	B56	900	1.43	70	0.66	3.9	2.81	5.5	1.30	12.0
0.72	B56	900	2.31	77	0.70	7.96	3.24	5.11	2.28	16.1	

IN (A)	Current full load	TL/TN	Torque locked rotor
%	Efficiency full load	IL/IN	Current locked rotor
COS Ø	Power factor	KG	Weight of foot mount motor
TN (NM)	Torque full load		



FOOT MOUNT - B56 TEFC - TOTALLY ENCLOSED FAN COOLED



3000RPM

BBS GENERAL DIMENSIONS			
kW	B	B1	L
0.37	76.2	-	316
0.72	76.2	-	316

1000RPM

BBS GENERAL DIMENSIONS			
kW	B	B1	L
0.37	76.2	-	316
0.72	76.2	-	316

1500RPM

BBS GENERAL DIMENSIONS			
kW	B	B1	L
0.37	76.2	-	316
0.55	76.2	-	316
0.75	76.2	-	316
1.10	76.2	127	331

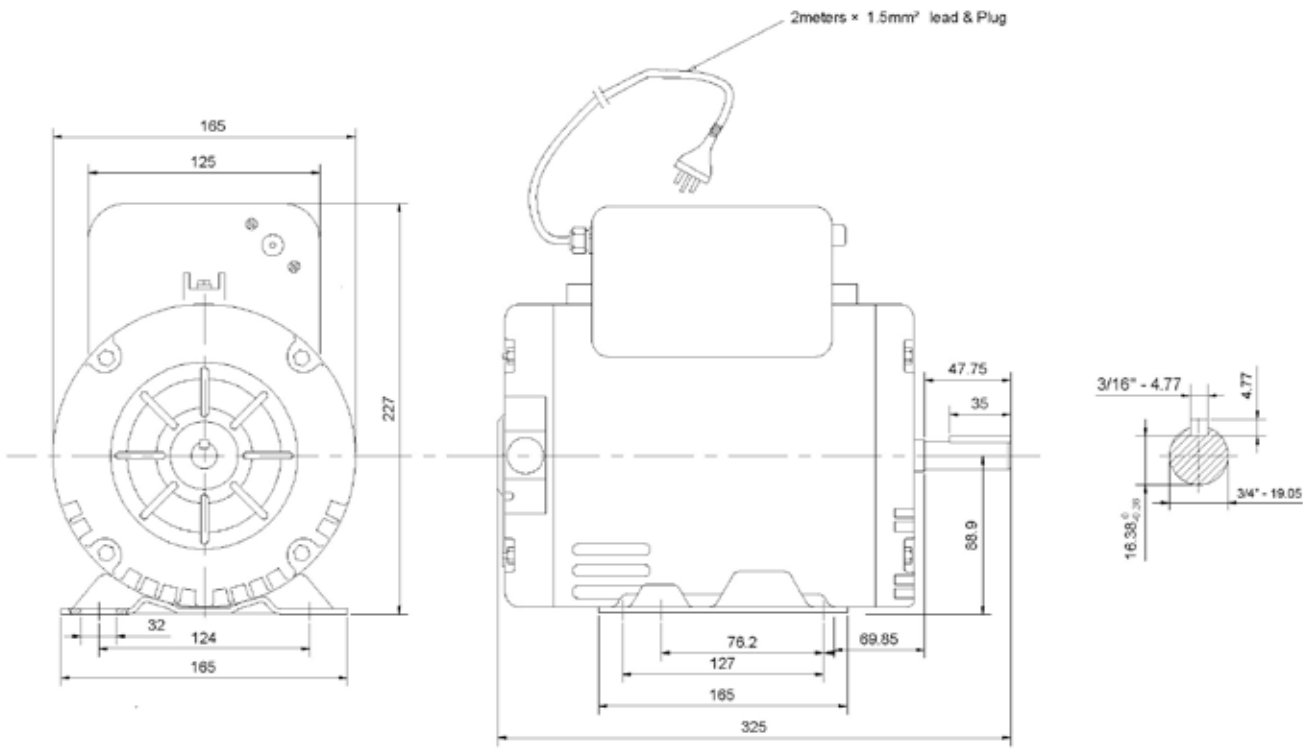
Note: All dimensions in millimetres, unless otherwise stated



SINGLE PHASE B56 - OPEN DRIP PROOF (ODP) COMPRESSOR RATED

3000 R/MIN	GENERAL			PERFORMANCE							
	KW	TYPE	FRAME SIZE	SPEED (R/MIN)	IN (A)	%	COS Ø	TN (Nm)	TL/TN	IL/IN	KG
	1.8	CSCR	B56	2840	9.64	83.78	0.99	6.2	2.14	6.38	21.3
	2.2	CSCR	B56	2850	11.31	85.68	0.99	7.45	2.29	5.83	22.2
	2.4	CSCR	B56	2850	12.34	84.71	0.99	7.94	2.49	7.06	25.4
2.6	CSCR	B56	2850	13.38	84.46	0.99	8.73	2.57	6.36	28.2	

FOOT MOUNT - B56 ODP - COMPRESSOR DUTY



IN (A) Current full load
 % Efficiency full load
 COS Ø Power factor
 TN (NM) Torque full load

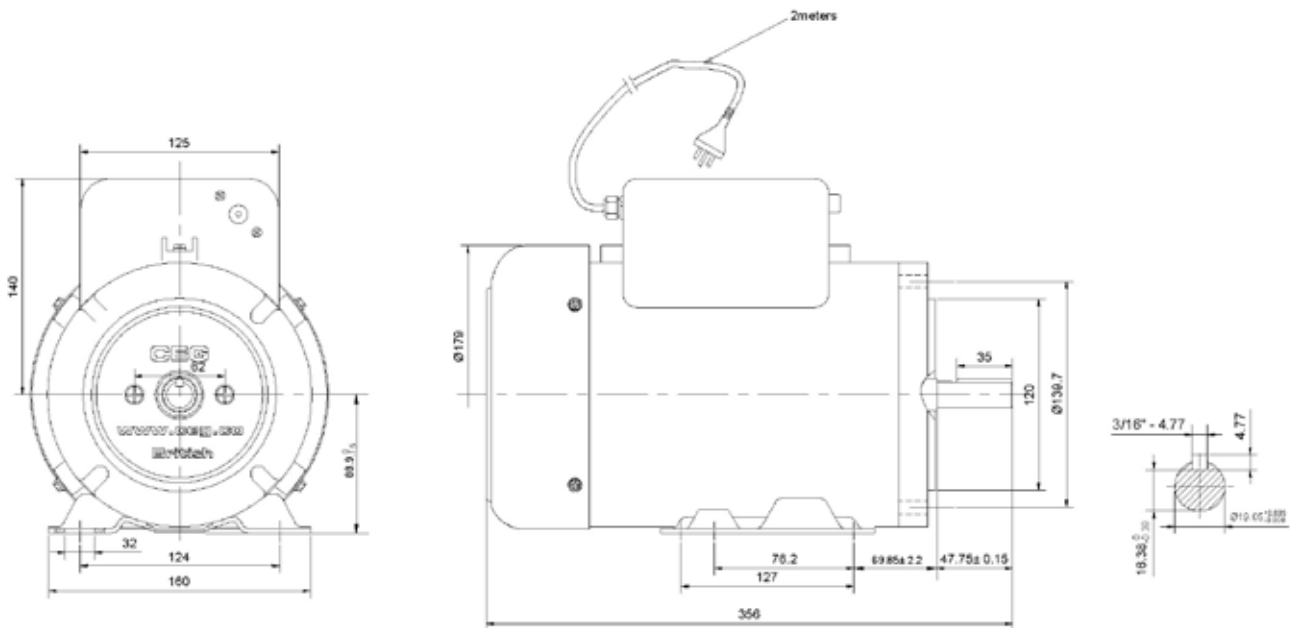
TL/TN Torque locked rotor
 IL/IN Current locked rotor
 KG Weight of foot mount motor



SINGLE PHASE B56 - TOTALLY ENCLOSED FAN COOLED (TEFC) WOOL PRESS

3000 R/MIN	GENERAL			PERFORMANCE							
	KW	TYPE	FRAME SIZE	SPEED (R/MIN)	IN (A)	%	COS Ø	TN (Nm)	TL/TN	IL/IN	KG
	2.2	CSCR	B56	2850	11.31	85.68	0.99	7.42	2.39	6.27	28.2

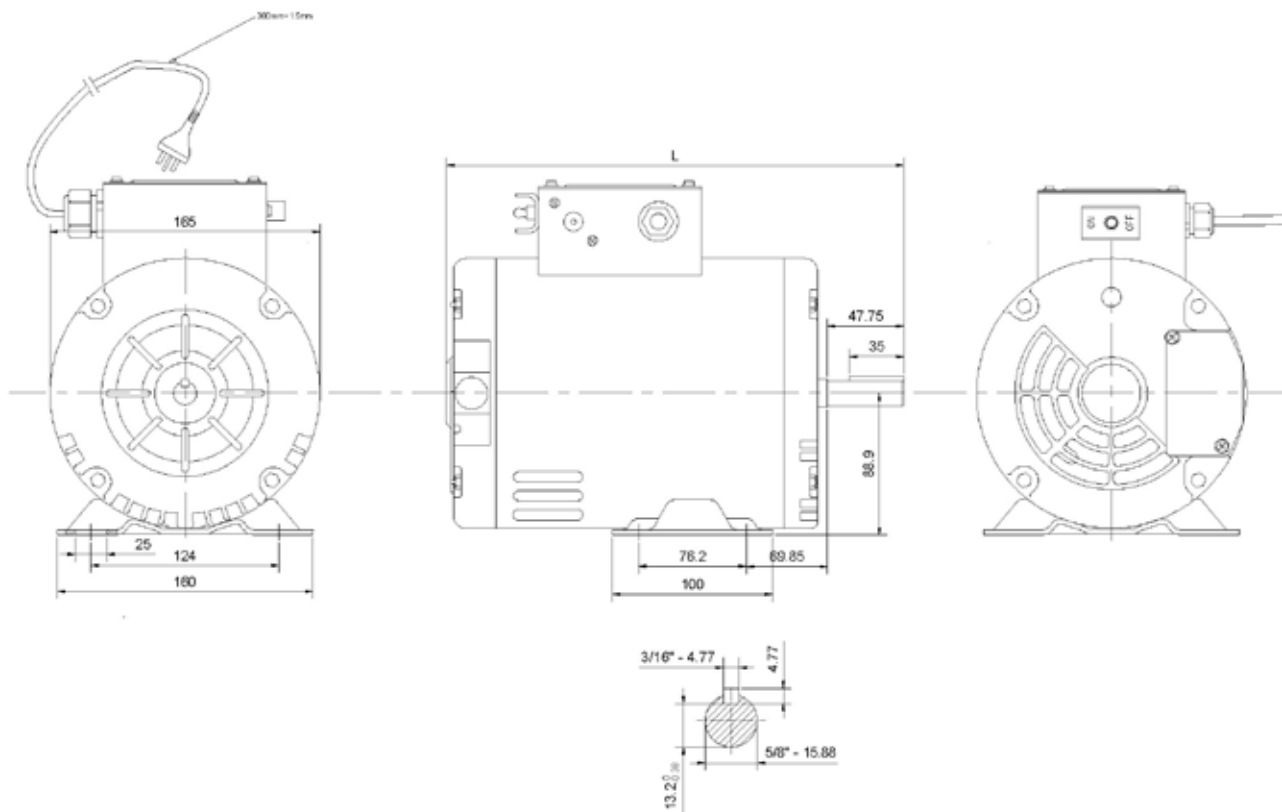
FOOT MOUNT - B56 TEFC - WOOL PRESS



IN (A) Current full load
 % Efficiency full load
 COS Ø Power factor
 TN (NM) Torque full load

TL/TN Torque locked rotor
 IL/IN Current locked rotor
 KG Weight of foot mount motor

SINGLE PHASE B56 - OPEN DRIP PROOF (ODP) 1500RPM - CEMENT MIXER MOTORS



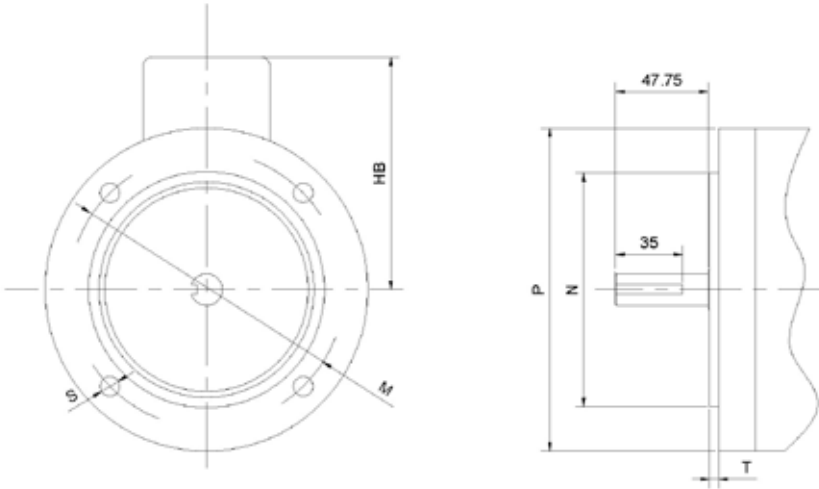
1500 R/MIN	GENERAL			PERFORMANCE								DIMENSION
	KW	TYPE	FRAME SIZE	SPEED (R/MIN)	IN (A)	%	COS Ø	TN (Nm)	$\frac{TL}{TN}$	$\frac{IL}{IN}$	KG	L
	0.55	SP	B56	1435	5.0	63	0.77	3.7	1.69	10.35	13.0	285
0.75	SP	B56	1450	7.1	68	0.67	4.9	2.43	12.08	17.2	305	

IN (A) Current full load
 % Efficiency full load
 COS Ø Power factor
 TN (NM) Torque full load

TL/TN Torque locked rotor
 IL/IN Current locked rotor
 KG Weight of foot mount motor

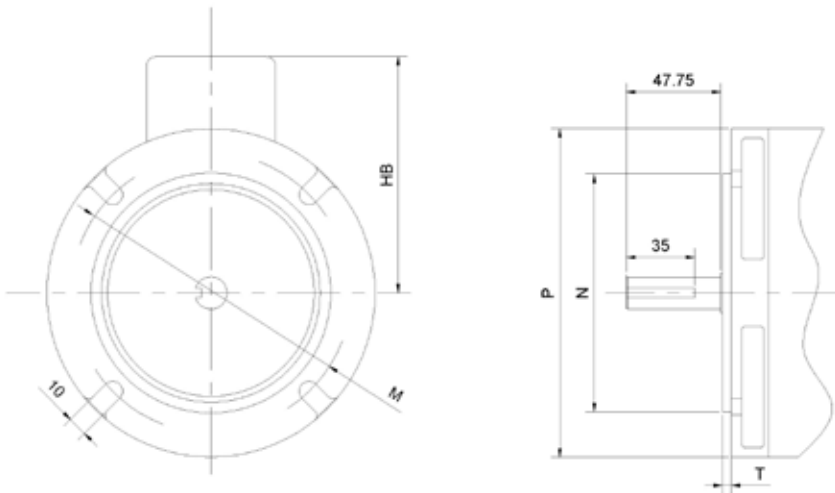


NEMA



BBS GENERAL DIMENSIONS						
HB 1Ø	HB 3Ø	M	N	P	S	T
140	140	149.2	114.30	165.1	3/8 UNC	3.0

BRITISH STANDARD



BBS GENERAL DIMENSIONS					
HB 1Ø	HB 3Ø	M	N	P	T
140	140	139.7	120.65	165.1	3.0

Note: All dimensions in millimetres, unless otherwise stated



TABLE 2.10 - BBS SERIES CAPACITOR AND OVERLOAD SIZING

3000 R/MIN	CAPACITOR			MANUAL RESET OVERLOAD SIZE
	kW	START CAP	RUN CAP 450V	AMP
	0.37	135 μ F/1250V	20 μ F	3.0
0.55	150 μ F/1250V	25 μ F	4.0	
0.75	135 μ F/1250V	20 μ F	5.0	
1.10	200 μ F/1250V	30 μ F	7.0	
1.80	200 μ F/1300V	35 μ F	12.0	
1.50	200 μ F/1250V	35 μ F	9.0	
2.20	200 μ F/1300V	40 μ F	13.0	
2.40	200 μ F/1300V	40 μ F	15.0	
2.60	200 μ F/1250V	50 μ F	16.0	

TABLE 2.20 - BBS SERIES CAPACITOR AND OVERLOAD SIZING

1500 R/MIN	CAPACITOR			MANUAL RESET OVERLOAD SIZE
	kW	START CAP	RUN CAP 450V	AMP
	0.25	135 μ F/250V	18 μ F	2.0
0.37	135 μ F/250V	20 μ F	3.0	
0.55	200 μ F/250V	20 μ F	4.0	
0.75	200 μ F/250V	25 μ F	5.0	
1.10	250 μ F/250V	35 μ F	7.0	
1.50	250 μ F/250V	40 μ F	9.0	

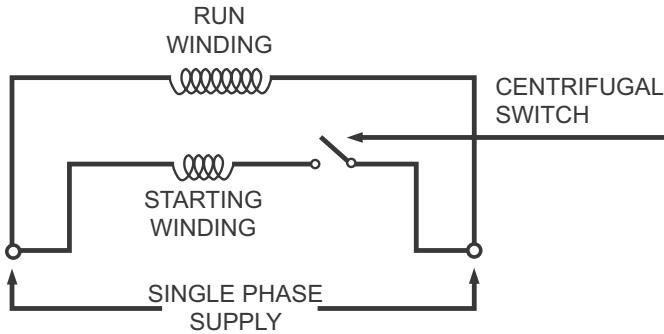
TABLE 2.30 - BBS SERIES CAPACITOR AND OVERLOAD SIZING

1000 R/MIN	CAPACITOR			MANUAL RESET OVERLOAD SIZE
	kW	START CAP 275V	RUN CAP 440V	AMP
	0.37	100 μ F/250V	20 μ F	3.0
0.55	100 μ F/250V	25 μ F	4.0	
0.75	100 μ F/250V	25 μ F	5.0	

WINDING CONFIGURATIONS

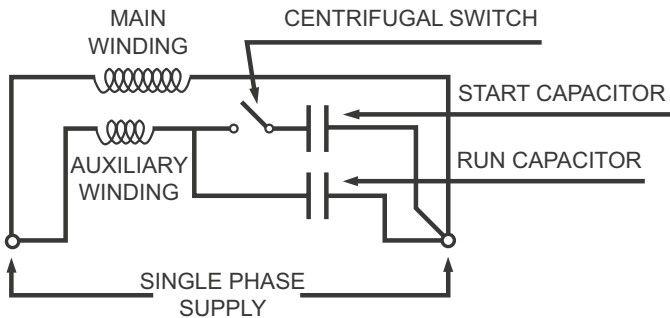
Split phase (SP)

Split phase motors are single phase. The starting winding has less turns and smaller wire size than the running winding. This gives a relatively low locked rotor torque and high locked rotor current. The starting winding is cut out by a centrifugal switch at the appropriate speed.



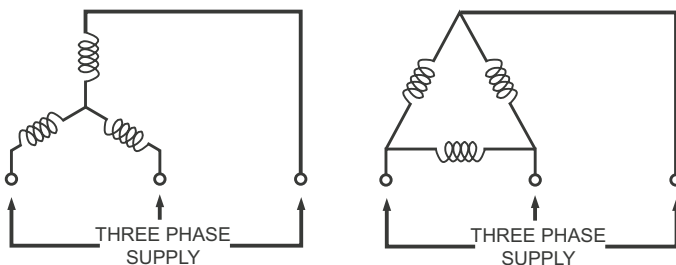
Capacitor start capacitor run (CSCR)

CSCR motors have two capacitors connected in series with the auxiliary winding. One capacitor of low value (run capacitor) is permanently connected. The second capacitor of high value is connected in parallel with the run capacitor during the start up period.



Three phase

Three phase motors have three balanced windings displaced by 120 electrical degrees producing a rotating field without switch or capacitor components. The windings produce relatively high locked rotor torques.



Star Diagram

Delta Diagram



AUSTRALIAN SALES NETWORK

Brisbane Branch

2, 711 Boundary Road, Coopers Plains, 4108, Queensland

Phone +61 (0) 7 3277 0377 Fax +61 (0) 7 3277 0477

Sydney Distributor

Blackburn Electric Wires Pty Ltd

55 Garema Circuit, Kingsgrove, 2208 NSW

Phone + 61(0) 2 9750 3133 Fax +61 (0) 2 9759 0245

NEW ZEALAND SALES NETWORK

Palmerston North Branch

76 - 86 Cuba Street, Palmerston North

Phone +64 (0) 6 357 8940 Fax +64 (0) 6 356 2093

Auckland Branch

Phone +64 (0) 9 309 8940 Fax +64 (0) 9 309 8941

Christchurch Branch

Phone +64 (0) 3 348 8940 Fax +64 (0) 3 348 8945

Invercargill Branch

Phone +64 (0) 3 218 8940 Fax +64 (0) 3 215 6392

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