

MONARCH CAST IRON MOTORS

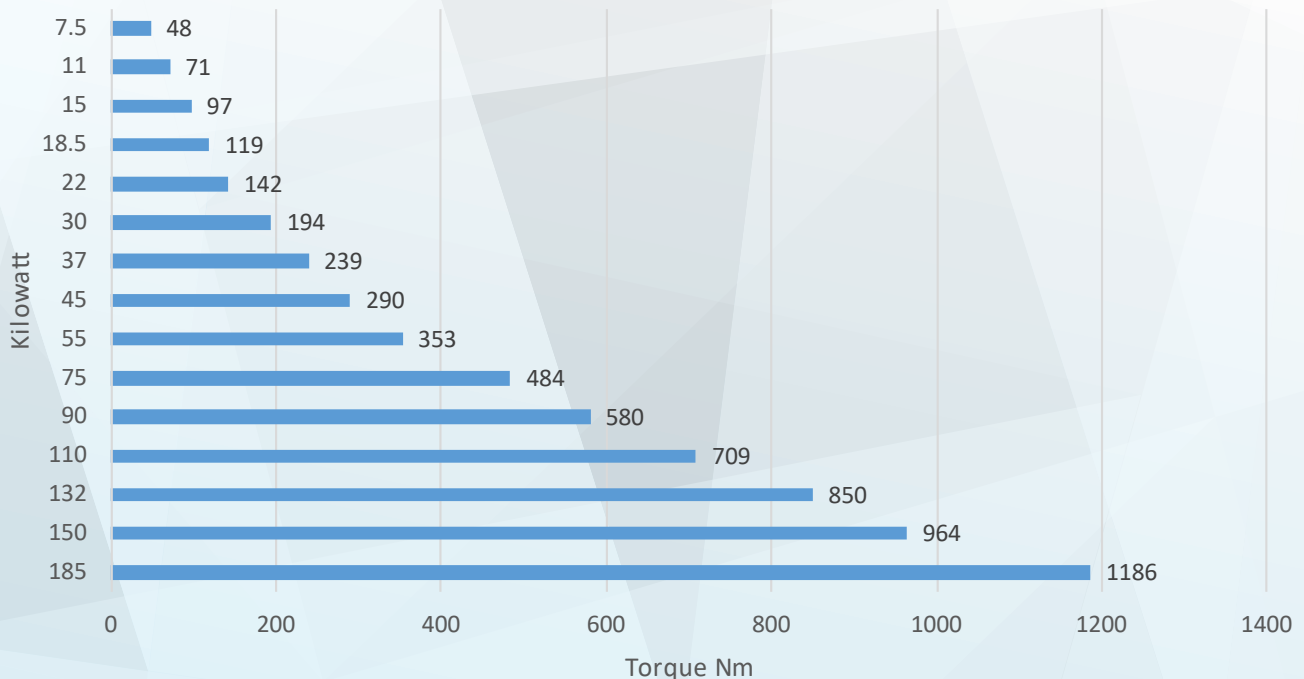
MONARCH GX - Three Phase Induction Motors are a range of high quality, Totally Enclosed Fan Cooled (TEFC), Squirrel Cage Induction motors, designed, manufactured and tested to the latest International and Australian Standards.

FEATURES

- Metric frame motor to AS1359,
- 0.55kW to 500kW
- Totally Enclosed Fan Cooled (IC411)
- Meets AS1359.5 Minimum Efficiency
- Performance Standard, table B2
- 380~415 Volts 3 Phase 50 Hz (other supplies on request)
- Class F insulation with a Class B temperature rise
- Continuous rated, duty type S1
- Cast Iron construction with top mounted terminal box
- IP55 protection rating



Full Load Output Torque



MONARCH GX - Three Phase Induction Motors are a range of high quality, Totally Enclosed Fan Cooled (TEFC), Squirrel Cage Induction motors, designed, manufactured and tested to the latest International and Australian Standards.

There are two main motor types -

Types	Enclosure	Insulation Class	Shaft seals
Standard	IP55	F	"V" ring
Severe Duty	IP66	H	Steffa

Standards

- Designed and Manufactured to IEC34, IEC72, AS1359 with Quality Assurance to ISO9001.
- Frame sizes are generally to CENELEC HD231 and AS1359 as detailed in "Performance Data" on page 3.

MEPS (Minimum Efficiency Performance Standard)

- All motors meet or exceed the requirements of Australian Standard AS1359.5-2004 Minimum Energy Performance Standards – Table B2.

Electric Supply

- Motors are designed for 380 – 415 Volt 3 phase 50 Hz and are also suitable for 440 – 480 Volt 60 Hz supply systems.
- Motors 3 kW and below are 380 - 415 Volt 50 Hz STAR connected and may also be reconnected to 240 Volt 3 phase 50 Hz DELTA configuration for use with single phase inverters.
- Motors 4 kW and larger are 380 – 415 Volt 50 Hz DELTA connected.

Cooling System

- Cooling is TEFC IC411 to AS1359.106.
- Fan cover is heavy gauge pressed steel.
- Cooling fan is polypropylene up to frame size D280 and is metal on frames D315 and larger.

Mounting

Motors are available in the following mountings

- Foot mounted IM1001 (B3)
- Foot and Flange mounted IM2001 (B35)
- Flange mounted IM3001 (B5)
- Foot and C Face mounted IM2101 (B34)
- C Face mounted IM3601 (B14)

Above IM nominations are those for horizontal mounting with other mounting orientations (ie. vertical etc.) available on request.

Duty Rating

- All motors are continuously maximum rated type S1.

Ambient

- Motors are designed to operate in ambient conditions of -20°C to +40°C as standard. Operation in adverse ambient conditions should be referred to TECO.

Altitude

- Designed for operation at an altitude not exceeding 1000 metres above sea level (refer to TECO sales offices for higher altitudes).

Performance

- Motors are designed to meet the performance requirements of Design N as per AS1359.41.

Motor Construction

- Cast Iron frame with integrally cast feet and cast iron end shields.
- Castings are machined to close tolerances for accurate alignment and minimum vibration.

Stator and Windings

- High grade insulated cold rolled electro magnetic steel laminations.
- Windings are designed with a temperature rise of class B for long motor life and thermal reserve for abnormal conditions.
- Windings are random wound double enamelled copper wire, impregnated with a solventless resin and are tropic proof rated as standard.

Winding Protection

- Frame sizes D160 and larger are fitted with PTC thermistor protection (P140) within the windings (one per phase) with the leads terminated in the main terminal box.

Rotor Construction

- High grade insulated cold rolled electro magnetic steel laminations.
- Rotor cage is pressure die cast high conductivity aluminium with waffer blades and balance supports integrally cast onto the rotor endrings.
- The rotor is pressed and keyed on to the high tensile steel shaft.

Bearing and Lubrication System

- Motors up to and including frame sizes D225 and all 2 pole motors have a Ball / Ball bearing combination.
- Four pole and slower speeds in motor frame sizes D250 and larger have a Roller / Ball bearing combination for heavy-duty belt drive applications.
- Motor frame sizes D80 to D160 have greased for life sealed bearings.
- Motor frame sizes D180 and larger have a Grease Relief system that enables motor to be re-greased during operation.

Balance

- All rotors are dynamically balanced with a half key to Class N, according to AS1359.50.

Terminal Box

- Terminal box is top mounted on motor frame with all metal to metal joints provided with neoprene gaskets.
- Base – Lid surfaces are machined and fitted with one-piece neoprene gasket providing terminal boxes with an IP66 rating.
- Terminal box can be rotated in 90° steps through 360° for alternate cable entry orientations.

Rating Plate

- A stainless steel rating plate containing all details as specified in AS1359.4 including bearing sizes is fitted to all motors.

Finish

- All castings are mechanically cleaned and de-greased.
- Cast Iron components are primed internally and externally with an epoxy oxide red primer.
- Two finish coats of matt acrylic resin are applied providing a high corrosion protected surface. Finish colour TEAL T63 (standard), Blue Jade T2 (Severe Duty), colours are to AS2700.

Inverter Duty

- Motors are suitable for Inverter duty, subject to torque and speed limitations and correct installation of motor and drive.

Two Speed Motors

- Available ex stock are a variety of two-speed motors for variable torque applications (Centrifugal pump / Fan).

Pole configurations

Poles	2 / 4	4 / 8	4 / 6	6 / 8
Winding	Tapped	Tapped	Dual	Dual

- Output powers, performance and frame sizes on request.

Testing

- In addition to a full program of tests during manufacture each motor is subjected to routine tests to AS1359 prior to despatch.

Options

Some available options as follows:

- IP56, IP65 & IP66 enclosure
- Smoke Spill to AS1668.1:1998, 300°C for 0.5 hours (Class H) or 200°C for 2 hours (Class F).
- Anti-condensation heaters
- Thermistor protection (on motor frames <D160)
- Resistance temperature detectors (RTD's)
- Auxiliary terminal boxes for Thermistor / heater terminations
- Multi-speed motors, 2 speed motors are ex stock
- Airstream rated IC418
- Brake Motors
- Special paint systems / colours
- Stainless steel fasteners
- Double / non standard shaft extensions
- Insulated bearing
- Shaft earth brush
- Encoder / Tacho, Force ventilation
- Others on request

Performance Data 50 Hz

Rated Output kW	Frame Size	Speed RPM	Efficiency %			Power Factor Cos p.u.			Current		Torque			Noise Level dB(A) no load 1metre	Moment of Inertia WR ² in kgm ²	Approx. net weight IM1001 kg
			1/1	3/4	1/2	1/1	3/4	1/2	Nameplate Full Load @ 415Volt Amps I _N	Starting I _{st} I _N	Full load I _N Nm	Starting I _{st} T _N	Break-down I _b T _N			

2 pole

0.75	80	2845	80.5%	81.5%	79.4%	0.83	0.75	0.62	1.56	6.8	2.51	2.20	2.30	59	0.0010	18
1.1	80	2840	82.2%	84.8%	83.4%	0.83	0.76	0.64	2.25	7.2	3.68	2.20	2.30	59	0.0013	20
1.5	90S	2840	84.1%	85.2%	83.5%	0.85	0.79	0.69	2.92	7.5	4.96	2.20	2.30	64	0.0020	25
2.2	90L	2825	85.6%	86.8%	86.0%	0.85	0.81	0.71	4.20	7.6	7.28	2.20	2.30	64	0.0026	29
3	100L	2880	86.7%	88.2%	88.0%	0.87	0.86	0.78	5.53	8.1	9.96	2.20	2.30	68	0.0042	39
4	112M	2880	87.6%	87.4%	86.7%	0.88	0.85	0.76	7.22	8.3	13.1	2.20	2.30	69	0.0058	39
5.5	132S	2915	88.5%	89.8%	89.0%	0.88	0.85	0.77	9.8	8.3	18.0	2.20	2.30	72	0.0128	60
7.5	132S	2915	89.5%	90.1%	89.2%	0.88	0.86	0.80	13.2	7.7	24.6	2.20	2.30	72	0.0151	75
11	160M	2940	90.6%	90.9%	90.3%	0.89	0.88	0.83	19.0	7.5	35.7	2.20	2.30	78	0.0489	120
15	160M	2935	91.3%	91.6%	90.9%	0.89	0.88	0.84	25.6	7.5	48.8	2.20	2.30	78	0.0559	128
18.5	160L	2940	91.8%	91.6%	91.0%	0.89	0.89	0.84	31.5	7.5	60.1	2.20	2.30	78	0.0648	142
22	180M	2950	92.2%	92.0%	91.0%	0.90	0.89	0.84	36.9	7.5	71.6	2.20	2.30	81	0.0808	176
30	200L	2955	92.9%	92.6%	91.8%	0.90	0.90	0.86	49.9	7.5	96.9	2.00	2.30	84	0.163	250
37	200L	2955	93.3%	93.0%	92.3%	0.90	0.89	0.85	61.3	7.5	120	2.00	2.30	84	0.172	258
45	225M	2970	93.7%	93.8%	93.2%	0.90	0.89	0.86	74.2	7.5	145	2.00	2.30	84	0.302	336
55	250M	2970	94.0%	94.1%	93.7%	0.90	0.90	0.86	90.4	7.5	177	2.00	2.30	85	0.420	434
75	280S	2975	94.6%	94.4%	92.6%	0.90	0.89	0.84	122	7.5	241	2.00	2.30	86	0.986	616
90	280M	2975	94.8%	94.5%	92.8%	0.91	0.90	0.88	146	7.5	289	2.00	2.30	86	1.04	660
110	280M*	2980	95.1%	95.4%	94.9%	0.92	0.91	0.90	174	7.1	353	1.80	2.20	86	1.30	755
110	315S	2976	95.1%	94.8%	93.1%	0.92	0.91	0.89	175	7.1	353	1.80	2.20	88	1.33	980
132	315M	2978	95.4%	95.2%	94.1%	0.91	0.89	0.84	211	7.1	423	1.80	2.20	88	1.50	1080
160	315L	2978	95.5%	95.2%	94.3%	0.90	0.89	0.84	259	7.1	513	1.80	2.20	91	1.67	1160

4 pole

0.55	80	1395	80.7%	80.8%	78.2%	0.75	0.65	0.53	1.26	6.5	3.67	2.20	2.20	50	0.0016	20
0.75	80	1400	82.2%	82.2%	79.3%	0.75	0.66	0.53	1.70	6.6	5.00	2.20	2.20	50	0.0020	21
1.1	90S	1390	83.8%	83.8%	81.9%	0.77	0.67	0.55	2.37	6.8	7.31	2.30	2.30	53	0.0030	26
1.5	90L	1390	85.0%	85.4%	83.5%	0.77	0.68	0.55	3.19	7.0	9.96	2.30	2.30	53	0.0038	31
2.2	100L	1425	86.4%	86.1%	84.3%	0.81	0.73	0.61	4.38	7.4	14.5	2.30	2.30	56	0.0077	40
3	100L	1430	87.4%	87.0%	84.5%	0.81	0.71	0.59	5.90	7.4	19.8	2.30	2.30	56	0.0093	44
4	112M	1440	88.3%	88.0%	86.0%	0.82	0.72	0.59	7.68	7.5	26.3	2.30	2.30	57	0.0128	58
5.5	132S	1450	89.2%	89.4%	88.2%	0.83	0.77	0.68	10.3	7.8	36.1	2.30	2.30	63	0.0285	70
7.5	132M	1450	90.1%	90.4%	89.4%	0.84	0.78	0.68	13.8	7.4	49.2	2.30	2.30	63	0.0366	90
10	132M	1460	90.1%	91.1%	90.9%	0.84	0.77	0.66	18.4	7.4	60.3	2.30	2.30	67	0.0394	94
11	160M	1465	91.0%	91.7%	91.2%	0.85	0.80	0.71	19.8	7.0	71.8	2.20	2.30	67	0.0771	122
15	160L	1460	91.8%	92.1%	91.8%	0.85	0.80	0.72	26.7	7.0	97.6	2.20	2.30	67	0.101	146
18.5	180M	1470	92.2%	92.0%	91.6%	0.86	0.85	0.77	32.5	7.5	120	2.20	2.30	68	0.152	179
22	180L	1470	92.6%	92.6%	91.8%	0.86	0.85	0.77	38.5	7.8	143	2.20	2.30	68	0.187	206
30	200L	1475	93.2%	93.5%	93.0%	0.86	0.84	0.78	52.1	7.2	195	2.20	2.30	71	0.285	255
37	225S	1480	93.6%	93.8%	93.2%	0.87	0.84	0.79	63.2	7.4	239	2.00	2.30	73	0.473	305
45	225M	1480	93.9%	93.9%	93.6%	0.87	0.85	0.80	76.6	7.4	290	2.20	2.30	73	0.554	342
55	250M	1480	94.2%	94.2%	93.5%	0.87	0.87	0.81	93.4	7.4	356	2.00	2.20	75	0.751	428
75	250M*	1485	94.7%	94.5%	93.4%	0.88	0.88	0.83	125	7.4	483	2.20	2.30	78	0.824	515
75	280S	1485	94.7%	95.2%	94.4%	0.87	0.84	0.76	127	7.2	482	2.20	2.30	78	1.92	657
90	280M	1485	95.0%	95.2%	94.4%	0.87	0.84	0.77	151	7.2	579	2.20	2.30	78	2.32	748
110	280M*	1486	95.3%	95.3%	94.6%	0.88	0.86	0.79	182	7.2	708	2.20	2.30	85	2.47	780
110	315S	1484	95.3%	95.2%	94.3%	0.89	0.89	0.84	180	6.9	706	2.10	2.20	85	2.34	1000
132	315M	1484	95.5%	95.5%	94.7%	0.89	0.88	0.84	216	6.9	847	2.10	2.20	85	2.58	1100
160	315L	1483	95.7%	95.9%	95.1%	0.90	0.88	0.80	259	6.9	1028	2.10	2.20	89	2.96	1160
200	315L	1487	95.5%	95.6%	95.0%	0.89	0.88	0.84	328	6.9	1785	2.00	2.20	89	3.46	1270
250	355M	1490	95.8%	95.9%	95.2%	0.90	0.88	0.80	404	6.9	1603	2.10	2.20	93	6.60	1830

Notes:

- 1) Output at 415V is also suitable for 380 Volt and 400 Volt operation. For 380 Volt I_N x 1.092. For 400 Volt I_N x 1.375.
- 2) Performance data is subject to AS1359.101 tolerances.
- 3) Noise level is the typical Mean Sound Pressure Level on no load at one metre an is subject to tolerance.
- 4) Frame sizes to AS1359.3001997 Western European allocations from CENELEC HD 231 apart from motors with suffix of* on frame size.
- 5) Suffix of * have frame sizes to AS1359.30-1997 Australia / British allocations.
- 6) Performance data for larger size motors on application.

Monarch Cast Iron Motors



Performance Data 50 Hz

Rated Output kW	Frame Size	Speed RPM	Efficiency %			Power Factor Cos p.u.			Current			Torque			Noise Level dB(A) no load 1metre	Moment of Inertia WR ² in kgm ²	Approx. net weight IM1001 kg
			1/1	3/4	1/2	1/1	3/4	1/2	Nameplate Full Load @ 415Volt Amps I _N	Starting I _{st} I _N	Full load I _N Nm	Starting I _{st} T _N	Break-down I _b T _N				
6 pole																	
0.55	80	885	65.0%	68.5%	65.7%	0.71	0.61	0.47	1.66	4.7	5.91	1.90	2.10	46	0.0026	21	
0.75	90S	920	77.7%	78.8%	75.7%	0.72	0.59	0.47	1.87	5.9	7.56	2.00	2.10	49	0.0038	23	
1.1	90L	920	79.9%	82.0%	79.2%	0.73	0.63	0.51	2.62	5.9	11.1	2.00	2.10	49	0.0053	31	
1.5	100L	945	81.5%	81.3%	78.7%	0.75	0.62	0.50	3.41	6.0	15.0	2.00	2.10	53	0.0107	38	
2.2	112M	950	83.4%	84.3%	83.0%	0.76	0.67	0.56	4.83	6.5	22.0	2.00	2.10	57	0.0151	52	
3	132S	960	84.9%	86.0%	83.9%	0.76	0.67	0.55	6.47	6.8	29.6	2.10	2.10	61	0.0318	67	
4	132M	965	86.1%	88.3%	87.7%	0.76	0.69	0.56	8.50	6.9	39.4	2.10	2.10	61	0.0394	78	
5.5	132M	965	87.4%	87.7%	86.2%	0.77	0.66	0.55	11.4	7.1	54.2	2.10	2.10	61	0.0494	87	
7.5	160M	965	88.5%	89.9%	89.5%	0.78	0.74	0.64	15.1	6.7	74.1	2.10	2.10	65	0.0964	118	
11	160L	965	89.8%	90.5%	89.9%	0.79	0.71	0.60	21.6	6.9	108	2.00	2.10	65	0.127	140	
15	180L	975	90.7%	90.4%	88.8%	0.81	0.79	0.70	28.4	7.2	146	2.00	2.10	65	0.201	185	
18.5	200L	980	91.3%	91.1%	90.6%	0.81	0.78	0.72	34.8	7.2	180	2.10	2.10	68	0.325	242	
22	200L	980	91.8%	91.9%	91.3%	0.83	0.80	0.74	40.2	7.5	214	2.10	2.10	68	0.371	258	
30	225M	985	92.5%	92.9%	92.2%	0.84	0.81	0.73	53.7	7.1	291	2.10	2.10	68	0.533	303	
37	250M	990	93.0%	92.7%	91.8%	0.85	0.83	0.75	65.2	7.0	358	2.10	2.10	70	0.877	395	
45	280S	990	93.5%	93.7%	92.6%	0.86	0.83	0.75	78.1	7.0	434	2.10	2.00	72	1.85	567	
55	280M	990	93.9%	94.4%	93.5%	0.87	0.84	0.80	94.1	7.0	531	2.10	2.00	72	2.12	625	
75	315S	989	94.4%	94.1%	93.3%	0.85	0.80	0.73	130	7.0	729	2.00	2.00	77	2.61	990	
90	315M	988	94.8%	94.8%	94.5%	0.86	0.83	0.76	153	7.0	872	2.00	2.00	77	3.04	1080	
110	315L	989	95.1%	95.1%	94.4%	0.86	0.83	0.76	187	6.7	1062	2.00	2.00	77	3.71	1150	
132	315L	988	95.4%	95.8%	95.0%	0.87	0.85	0.79	222	6.7	1275	2.00	2.00	77	4.24	1210	
160	355M	991	95.6%	95.7%	95.4%	0.87	0.86	0.80	269	6.7	1544	1.90	2.00	84	7.44	1650	

8 pole

0.55	90L	700	73.5%	74.4%	71.3%	0.61	0.51	0.39	1.71	4.0	7.50	1.80	2.00	48	0.0053	31
0.75	100L	700	73.5%	75.7%	72.8%	0.67	0.58	0.44	2.12	4.0	10.2	1.80	2.00	51	0.0078	33
1.1	100L	700	76.3%	79.1%	76.9%	0.69	0.59	0.45	2.91	5.0	15.0	1.80	2.00	51	0.0107	38
1.5	112M	705	78.4%	80.8%	79.4%	0.69	0.61	0.47	3.86	5.0	20.5	1.80	2.00	53	0.0162	52
2.2	132S	710	80.9%	82.9%	81.8%	0.71	0.65	0.51	5.33	6.0	29.5	1.80	2.00	53	0.0331	67
3	132M	710	82.7%	84.4%	83.1%	0.71	0.62	0.49	7.10	5.5	40.0	2.00	2.00	56	0.0440	80
4	160M	715	84.2%	88.0%	87.5%	0.73	0.69	0.60	9.05	6.0	54.6	1.90	2.10	60	0.0771	105
5.5	160M	715	85.8%	88.4%	87.8%	0.74	0.70	0.58	12.0	6.0	73.3	2.00	2.00	60	0.0989	113
7.5	160L	715	87.2%	88.6%	87.9%	0.75	0.71	0.59	16.0	6.0	99.9	2.00	2.00	60	0.131	139
11	180L	730	88.8%	89.0%	88.6%	0.76	0.72	0.62	22.7	6.6	144	2.00	2.00	62	0.214	184
15	200L	730	90.0%	90.3%	89.5%	0.76	0.74	0.63	30.5	6.6	197	2.00	2.00	65	0.401	260
18.5	225S	735	90.7%	90.7%	89.8%	0.76	0.69	0.57	37.3	6.6	241	1.90	2.00	65	0.529	275
22	225M	735	91.2%	91.6%	90.7%	0.78	0.72	0.61	43.0	6.6	287	1.90	2.00	65	0.626	309
30	250M	740	92.1%	91.8%	90.7%	0.79	0.71	0.60	57.4	6.6	388	1.90	2.00	67	0.914	401
37	280S	741	92.7%	92.6%	91.3%	0.78	0.74	0.64	71.2	6.6	477	1.90	2.00	68	1.85	567
45	280M	742	93.2%	93.6%	92.5%	0.79	0.76	0.66	84.5	6.6	499	1.90	2.00	68	2.22	651
55	315S	741	93.7%	93.6%	92.4%	0.78	0.73	0.62	105	6.6	710	1.80	2.00	74	2.97	1000
75	315M	741	94.4%	94.2%	93.3%	0.79	0.75	0.65	141	6.6	967	1.80	2.00	74	3.96	1100
90	315L	741	94.7%	94.6%	93.8%	0.81	0.77	0.68	164	6.6	1161	1.80	2.00	74	4.65	1160
110	315L	741	95.1%	94.8%	94.1%	0.81	0.79	0.72	199	6.6	1422	1.80	2.00	74	5.40	1230
132	355M	742	95.4%	95.5%	94.7%	0.82	0.78	0.67	235	6.4	1700	1.80	2.00	82	8.36	1700
160	355M	742	95.7%	95.6%	95.1%	0.82	0.793	0.72	283	6.4	2061	1.8	2	82	9.59	1750

Notes:

- Output at 415V is also suitable for 380 Volt and 400 Volt operation. For 380 Volt I_N x 1.092. For 400 Volt I_N x 1.375
- Performance data is subject to AS1359.101 tolerances.
- Noise level is the typical Mean Sound Pressure Level on no load at one metre and is subject to tolerance.
- Frame sizes to AS1359.3001997 Western European allocations from CENELEC HD 231 apart from motors with suffix of* on frame size.
- Suffix of * have frame sizes to AS1359.30-1997 Australia / British allocations.
- Performance data for larger size motors on application.



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