

Section 8:

Electric Motors

The Fenner FM Series electric motors conform to the latest European electric motor efficiency standards. The range is available from G3 to 71 frame in Aluminium, IE2 and Cast Iron, from 80 to 315L frame in IE3 premium efficiency.



- Cast Iron Range IE3 premium efficiency and ECA complaint
- IE3 range 80 - 315D frame with detachable feet
- 2, 4 and 6 pole
- Foot, flange and face mounted options available from stock

Electric Motors: Design Data Required

Power required (kW or HP)
Motor speed required (rpm or No. of Poles)
Mains voltage supply (volts/phases/frequency)
Mounting type (foot, flange, face etc.)
Enclosure (IP rating)
Existing/required frame size
Method of starting (Star, Delta, DOL, inverter etc.)
Construction (aluminium/cast iron)
Special features required

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FM-3 Premium Efficiency Motors

Energy efficient IE3 electric motors

- > Available in 2, 4 and 6 pole
- > 0.75kW to 315kW
- > IP55 protection
- > 160 to 315 frame all multi mount design
- > All motors fitted with thermistors terminated in the terminal box
- > Drive end bearings fixed

Fenner[®]

THE MARK OF ENGINEERING EXCELLENCE

Motor Selection

SELECTION PROCEDURE

The output powers published overleaf are based upon continuous maximum rating conditions. Therefore design factors for above average running periods do not normally affect the selection. These ratings assume a normal operating condition at an ambient temperature not exceeding 40°C at an altitude below 1000 metres. Correction factors for other conditions are given below.

Permitted Frequency of Starts

When a motor is stopped and restarted too frequently, overheating will occur. Specific results depend upon the relative inertia of the motor and of the driven machine so it is not possible to publish meaningful figures. If in doubt contact your local Fenner authorised distributor.

Noise and Vibration

The FM:P range of motors comply with international recommendations relating to maximum permitted noise levels. All rotors are dynamically balanced, with a key fitted, in order to ensure that vibration levels do not exceed class N, ISO 2373.

Derating Table for Different Ambient Temperatures and Altitudes

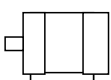
Ambient Temp °C	Power available as % of published figure at following altitude (metres)					
	Below					
	500	1000	1500	2000	2500	3000
20	100	100	100	100	100	97.0
25	100	100	100	100	99.0	95.4
30	100	100	100	98.7	95.6	91.9
35	100	100	100	96.8	93.7	90.1
40	100	100	97	94.0	91.0	87.5
45	94.0	94.0	91.2	88.4	85.5	82.3
50	91.0	91.0	88.3	85.5	82.8	79.6
55	88.0	88.0	85.4	82.7	80.1	77.0
60	84.0	84.0	81.5	79.0	76.4	73.5

Motor bearings are charged with grease suited for ambient temperatures in the range -30°C to 55°C.

Mounting Arrangements

Normal Mounting Arrangement

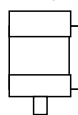
IM 1001



Foot Mounted (B3)

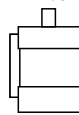
Alternative Mounting Arrangement

IM 1011



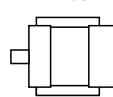
(V5)

IM 1031



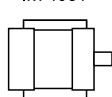
(V6)

IM 1051



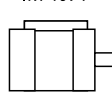
(B6)

IM 1061



(B7)

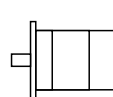
IM 1071



(B8)

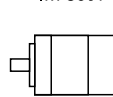
Normal Mounting Arrangement

IM 3001



Flange Mounted (B5)

IM 3601



Face Mounted (B14)

Alternative Mounting Arrangement

IM 3011



(V1)

IM 3031



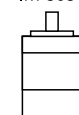
(V3)

IM 3611



(V18)

IM 3631



(V19)

Motor Mounting Arrangements
To IEC 34-7 code 1 and code 11 shown

Starting Torque and Nominal Torque

T_S : The starting torque is the mechanical torque developed by the motor with the rotor locked.

T_N : The nominal torque is the mechanical torque that the motor is developing when it is giving its nominal power and speed.

The value T_S/T_N given in the table is a multiple of Nominal torque

Current and Nominal Current

I_N : The nominal current is the current that the motor is developing at nominal power and nominal voltage.

I_S : The starting current is the current that the motor is developing when the rotor is locked.

Bearing Life

Bearing life depends on factors such as bearing load, rotation, speed, and operating temperature of the bearing. Standard electric motors are fitted with bearings of sufficient capacity for normal overhung or axial loads. If bearing capacity is in doubt consult your supplier with full application details.

Mounting Positions

Although motors are normally stocked in either the B3 or B5 assembly format, it is in most cases possible to mount them in any of the alternative mounting arrangements shown in the motor mounting arrangements table without further modification, but it is essential that the actual mounting is specified at the time of order.

Fenner Premium Efficiency Motors Specification

- **Class F Insulation**
Class F insulation with class B temperature rise.
- **IC 411 Cooling**
Surface cooled to IC 411 according to IEC 34-6.
- **IP55 Protection**
Achieves an IP55 classification according to IEC34-5.
- **Motor Frame**
Manufactured in high grade cast iron from 80 to 315 frame sizes.
- **Stator**
Constructed from high grade electrical steel laminations.
- **Rotor**
Dynamically balanced squirrel cage rotor is made from cast aluminium shrunk onto the shaft.
- **Bearings and Seals**
63 series bearings as standard from 112 frame giving better radial load ratings on belt drive applications. Spring lip seals are standard on both drive end & none drive end. B5 and B14 flanges are fitted with lip seals for use on wet gearboxes.
- **Warranty and Support**
The comprehensive 12 month warranty is complemented by full technical support from your local authorised distributor.

Ordering Instructions

All Fenner electric motors are identified by a product code number. This consists of an eight digit code depending on the motor type, frame size, mounting, speed and power.

These codes should be included on all enquiries, correspondence and orders.

FIRST THREE DIGITS:

Motor material and efficiency

Code	Range	Material
156	IE2	Aluminium
157	IE2	Cast Iron
158	IE3	Aluminium
159	IE3	Cast Iron

FOURTH DIGIT:

Frame size

Code	Frame
A	56
B	63
C	71
D	80
E	90
F	100
G	112
H	132
J	160
K	180
L	200
M	225
N	250
P	280
R	315
S	355
T	400
U	450
V	500
W	560

FIFTH DIGIT:

Mounting type

Code	Mounting	Description
1	B3	Foot mounted
2	B5	Flange Mounted
3	B35	Foot & Flange Mounted
4	B14	Face Mounted
5	B34	Foot & Face Mounted
6	B14B	DIN Standard Face Mounted
7	B34B	Foot & DIN standard Face Mounted

SIXTH DIGIT:

Nominal output speed

Code	Poles	Nominal Speed
2	2	3000
4	4	1500
6	6	1000
8	8	750
1	10	600
3	12	500

SEVENTH & EIGHTH DIGITS:

Rated output power

Code	kW	Code	kW
01	0.06	32	75
02	0.09	33	90
03	0.12	34	110
04	0.18	35	132
05	0.25	36	150
06	0.37	37	160
07	0.55	38	180
08	0.75	39	185
09	1.1	40	200
10	1.3	41	225
11	1.4	42	250
12	1.5	43	280
13	1.8	44	315
14	2.0	45	355
15	2.2	46	400
16	3.0	47	450
17	3.7	48	500
18	3.8	49	560
19	4.0	50	630
20	5.5	51	710
21	7.2	52	750
22	7.5	53	800
23	9.0	54	815
24	11.0	55	850
25	15.0	56	900
26	18.5	57	1000
27	22.0	58	1120
28	30.0	59	1200
29	37.0	60	1250
30	45.0	61	1400
31	55.0	-	-

NINTH DIGIT:

Options Code

Code	Description
A	Anti-condensation heaters
C	Rain canopy for V1 motor
N	Failsafe brake and hand release
Z	Force vent motor
Q	Special motor

Performance Data - FM:2 Aluminium & FM:3 Cast Iron 2 Pole

FM:2 Series - 2 Pole - 3000 rpm

230/400V - 50Hz - up to 0.55kW

Frame Size	Product Code	Rated Output Power PN kW	Full Load Speed Rev/Min	Current		Efficiency %			Power Factor Cos φ			Torque			Moment of Inertia J=GD ² /4 (kg-m ²)	Weight B3 Version kg
				Full Load T _N A	Starting Current T _s A	100% Full Load	75% Full Load	50% Full Load	100% Full Load	75% Full Load	50% Full Load	Nominal Torque T _N Nm	Starting Torque T _s /T _N Nm	Breakdown Torque T _b /T _N Nm		
63M	156B*204	0.18	2775	0.49	4.41	67.4	67.4	60.4	0.79	0.69	0.55	0.62	1.9	2.00	0.00017	5
63M	156B*205	0.25	2785	0.65	4.50	69.9	70.0	66.7	0.79	0.70	0.56	0.86	1.95	2.05	0.00021	6
71M	156C*206	0.37	2790	0.93	4.86	71.0	71.0	66.7	0.81	0.71	0.55	1.27	1.9	2.20	0.00017	8
71M	156C*207	0.55	2780	1.27	5.32	75.5	76.2	73.3	0.83	0.75	0.59	1.89	1.9	2.20	0.00033	9

Replace * in part number with desired mounting configuration (1=B3 / 2 = B5 / 3 = B35 / 4 = B14 / 5 =B34

FM:3 Series - 2 Pole - 3000 rpm

230/400V - 50Hz - up to 200kW

Frame Size	Product Code	Rated Output Power PN kW	Full Load Speed Rev/Min	Current		Efficiency %			Power Factor Cos φ			Torque			Moment of Inertia J=GD ² /4 (kg-m ²)	Weight B3 Version kg
				Full Load T _N A	Starting Current T _s A	100% Full Load	75% Full Load	50% Full Load	100% Full Load	75% Full Load	50% Full Load	Nominal Torque T _N Nm	Starting Torque T _s /T _N Nm	Breakdown Torque T _b /T _N Nm		
80M	159D*208	0.75	2875	1.59	12	80.7	78.3	75.1	0.84	0.78	0.67	2.49	2.80	3.35	0.00150	25
80M	159D*209	1.1	2870	2.26	18	82.7	83.0	81.3	0.85	0.79	0.67	3.66	3.00	3.50	0.00175	26
90S	159E*212	1.5	2850	2.84	22	84.2	85.4	85.8	0.91	0.87	0.78	5.02	2.20	2.80	0.00300	32
90L	159E*215	2.2	2860	4.13	35	85.9	86.7	86.8	0.90	0.85	0.76	7.33	2.45	3.15	0.00350	36
100L	159F*216	3.0	2855	5.52	48	87.1	88.3	88.4	0.90	0.87	0.79	5.70	3.25	3.55	0.00630	46
112M	159G*219	4.0	2875	7.2	69	88.1	89.0	88.9	0.91	0.88	0.80	13.3	2.70	3.60	0.01150	56
132S	159H*220	5.5	2930	10.1	80	89.2	89.8	89.5	0.89	0.86	0.80	17.9	2.05	3.40	0.01880	82
132S	159H*222	7.5	2920	13.8	100	90.1	90.9	90.8	0.87	0.85	0.78	24.5	1.95	3.15	0.02000	88
160M	159J*224	11.0	2935	19.3	150	91.5	92.5	92.5	0.90	0.89	0.84	35.7	2.30	2.85	0.04600	138
160M	159J*225	15.0	2935	26.5	230	91.9	92.0	92.0	0.89	0.86	0.78	48.8	2.75	3.30	0.05000	150
160L	159J*226	18.5	2930	32.1	260	92.4	93.0	93.0	0.90	0.90	0.84	60.3	2.45	2.95	0.05900	163
180M	159K*227	22.0	2940	39.2	300	93.0	93.0	93.0	0.87	0.85	0.77	71.6	2.25	2.75	0.07100	208
200L	159L*228	30.0	2950	51.6	400	93.3	93.5	92.5	0.90	0.90	0.87	97.1	2.00	2.70	0.15000	293
200L	159L*229	37.0	2955	62.4	510	94.0	95.0	94.5	0.91	0.91	0.87	119	1.95	2.80	0.18500	325
225M	159M*230	45.0	2960	75.9	615	94.0	94.0	93.5	0.91	0.91	0.88	146	1.50	2.90	0.29500	410
250M	159N*231	55.0	2970	91.3	735	95.0	95.0	95.0	0.92	0.90	0.87	177	1.50	3.15	0.38500	501
280S	159P*232	75.0	2965	125.6	910	94.7	94.5	93.0	0.91	0.90	0.86	242	1.50	2.40	0.60000	663
280M	159P*233	90.0	2970	151.1	1100	95.0	95.0	94.6	0.91	0.89	0.83	289	1.50	2.40	0.70000	767
315S	159R*234	110	2970	184.3	1335	95.2	95.0	94.3	0.91	0.89	0.85	354	1.50	2.40	1.20000	975
315M	159R*235	132	2970	219.5	1500	95.4	95.2	94.8	0.91	0.91	0.88	424	1.30	2.30	1.30000	1144
315M	159R*237	160	2975	262.6	1890	95.6	95.5	94.8	0.92	0.91	0.88	513	1.30	2.40	1.30000	1274
315L	159R*240	200	2975	327.5	2320	95.8	95.8	95.5	0.92	0.92	0.90	643	1.30	2.40	1.70000	1495

Replace * in part number with desired mounting configuration (1=B3 / 2 = B5 / 3 = B35 / 4 = B14 / 5 =B34

Performance Data - FM:2 Aluminium & FM:3 Cast Iron 4 Pole

FM:2 Series -4 Pole - 1500 rpm

230/400V - 50Hz - up to 0.55kW

Frame Size	Product Code	Rated Output Power PN kW	Full Load Speed Rev/Min	Current		Efficiency %			Power Factor Cos ϕ			Torque			Moment of Inertia $J=GD^2/4$ (kg-m ²)	Weight B3 Version kg
				Full Load T_N A	Starting Current T_s A	100% Full Load	75% Full Load	50% Full Load	100% Full Load	75% Full Load	50% Full Load	Nominal Torque T_N Nm	Starting Torque T_s/T_N Nm	Breakdown Torque T_b/T_N Nm		
63M	156B*404	0.18	1375	0.54	2.1	65.0	63.8	58.2	0.75	0.64	0.50	1.25	2.00	2.00	0.00043	6
71M	156C*405	0.25	1380	0.67	2.8	69.5	70.1	66.2	0.77	0.67	0.52	1.73	2.00	2.00	0.00067	8
71M	156C*406	0.37	1385	1.02	4.3	69.5	69.9	66.3	0.75	0.65	0.50	2.55	2.05	2.05	0.00080	9
80M	156D*407	0.55	1435	1.34	8.8	78.1	78.1	75.2	0.76	0.69	0.56	3.66	2.55	2.80	0.00260	13

Replace * in part number with desired mounting configuration (1=B3 / 2 = B5 / 3 = B35 / 4 = B14 / 5 =B34

FM:3 Series - 4 Pole - 1500 rpm

230/400V - 50Hz - up to 200kW

Frame Size	Product Code	Rated Output Power PN kW	Full Load Speed Rev/Min	Current		Efficiency %			Power Factor Cos ϕ			Torque			Moment of Inertia $J=GD^2/4$ (kg-m ²)	Weight B3 Version kg
				Full Load T_N A	Starting Current T_s A	100% Full Load	75% Full Load	50% Full Load	100% Full Load	75% Full Load	50% Full Load	Nominal Torque T_N Nm	Starting Torque T_s/T_N Nm	Breakdown Torque T_b/T_N Nm		
80M	159D*408	0.75	1410	1.79	6.15	82.5	81.8	79.7	0.69	0.59	0.50	5.07	3.15	3.35	0.00325	27
90S	159E*409	1.1	1430	2.37	7.40	84.1	84.4	83.2	0.74	0.64	0.58	7.33	2.55	2.90	0.00425	33
90L	159E*412	1.5	1435	3.38	7.70	85.3	84.1	82.2	0.80	0.72	0.52	9.97	3.00	3.35	0.0055	39
100L	159F*415	2.2	1450	4.52	7.30	86.7	87.3	86.9	0.75	0.66	0.61	14.50	2.00	2.70	0.0110	46
100L	159F*416	3.0	1455	6.33	7.75	87.7	87.7	86.2	0.81	0.74	0.58	19.70	2.50	3.35	0.0130	53
112M	159G*419	4.0	1445	7.95	7.15	88.6	88.4	87.9	0.78	0.71	0.66	26.40	2.45	2.80	0.0210	66
132S	159H*420	5.5	1455	10.4	7.40	89.6	90.4	90.3	0.82	0.77	0.70	36.10	2.45	3.00	0.0330	88
132M	159H*422	7.5	1460	14.2	7.75	90.4	90.8	90.4	0.85	0.81	0.69	49.10	2.70	3.30	0.0430	108
160M	159J*424	11.0	1460	20.7	7.75	91.4	92.0	91.5	0.85	0.80	0.70	71.70	2.30	2.70	0.0920	138
160L	159J*425	15.0	1460	27.8	8.10	92.1	92.5	92.5	0.84	0.80	0.71	97.40	2.50	2.85	0.1150	150
180M	159K*426	18.5	1475	35.4	7.65	92.6	94.0	93.0	0.85	0.81	0.70	120.0	2.15	2.55	0.1750	215
180L	159K*427	22.0	1475	42.2	7.45	93.0	93.5	93.0	0.82	0.77	0.71	142.0	1.90	2.45	0.1980	221
200L	159L*428	30.0	1470	53.5	8.35	94.1	95.0	95.0	0.81	0.77	0.77	195.0	2.50	2.80	0.3630	312
225S	159M*429	37.0	1480	66.4	7.60	94.1	95.0	94.5	0.86	0.85	0.73	237.0	2.10	3.00	0.4700	371
225M	159M*430	45.0	1480	81.3	7.40	94.5	95.0	94.5	0.86	0.82	0.70	290.0	2.10	2.90	0.5000	416
250M	159N*431	55.0	1485	95.5	7.85	95.0	95.0	94.5	0.85	0.80	0.77	354.0	2.10	2.65	0.9800	546
280S	159P*432	75.0	1480	128	7.10	95.0	95.0	94.2	0.88	0.85	0.82	483.0	1.60	2.50	1.6000	741
280M	159P*433	90.0	1480	154.2	7.15	95.2	95.0	94.5	0.89	0.87	0.81	580.0	1.80	2.50	1.8000	871
315S	159R*434	110	1480	188.1	7.25	95.4	95.2	94.8	0.89	0.87	0.81	710.0	1.60	2.50	2.9000	988
315M	159R*435	132	1480	225.2	6.65	95.6	95.5	94.8	0.89	0.88	0.85	852.0	1.50	2.30	3.1000	1248
315M	159R*437	160	1482	267.9	6.90	95.8	95.8	95.0	0.90	0.89	0.84	1030.0	1.25	2.30	3.0000	1287
315L	159R*440	200	1482	334.1	6.80	96.0	95.8	95.3	0.90	0.90	0.85	1290.0	1.30	2.20	3.8000	1547

Replace * in part number with desired mounting configuration (1=B3 / 2 = B5 / 3 = B35 / 4 = B14 / 5 =B34

Performance Data - FM:2 Aluminium & FM:3 Cast Iron 6 Pole

FM:2 Series - 6 Pole - 1000 rpm

230/400V - 50Hz - up to 0.55kW

Frame Size	Product Code	Rated Output Power PN kW	Full Load Speed Rev/Min	Current		Efficiency %			Power Factor Cos φ			Torque			Moment of Inertia J=GD ² /4 (kg-m ²)	Weight B3 Version kg
				Full Load T _N A	Starting Current T _s A	100% Full Load	75% Full Load	50% Full Load	100% Full Load	75% Full Load	50% Full Load	Nominal Torque T _N Nm	Starting Torque T _s /T _N Nm	Breakdown Torque T _b /T _N Nm		
71M	156C*604	0.18	935	0.63	2.3	62.5	60.0	52.4	0.66	0.56	0.45	1.84	1.80	2.05	0.00141	9
71M	156C*605	0.25	935	0.85	3.1	65.0	63.0	55.5	0.67	0.56	0.44	2.56	2.00	2.20	0.00167	10
80M	156D*606	0.37	920	1.24	4.5	65.5	64.5	59.0	0.66	0.57	0.46	3.84	1.75	2.00	0.00164	12
80M	156D*607	0.55	920	1.64	6.7	74.0	74.6	72.2	0.66	0.57	0.46	5.71	1.85	2.10	0.00315	13

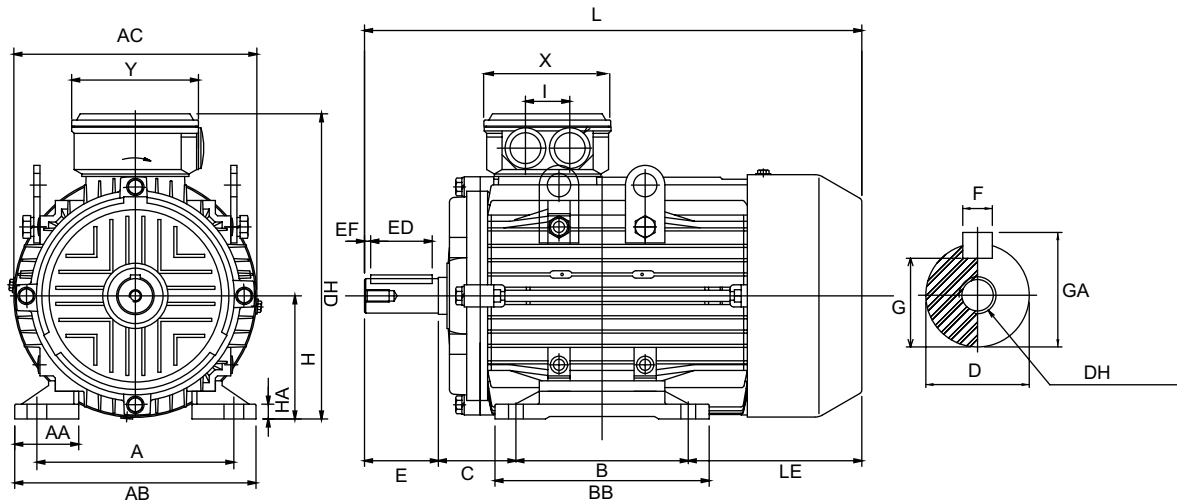
Replace * in part number with desired mounting configuration (1=B3 / 2 = B5 / 3 = B35 / 4 = B14 / 5 =B34

FM:3 Series - 6 Pole - 1000 rpm

230/400V - 50Hz - up to 200kW

Frame Size	Product Code	Rated Output Power PN kW	Full Load Speed Rev/Min	Current		Efficiency %			Power Factor Cos φ			Torque			Moment of Inertia J=GD ² /4 (kg-m ²)	Weight B3 Version kg
				Full Load T _N A	Starting Current T _s A	100% Full Load	75% Full Load	50% Full Load	100% Full Load	75% Full Load	50% Full Load	Nominal Torque T _N Nm	Starting Torque T _s /T _N Nm	Breakdown Torque T _b /T _N Nm		
90S	159E*608	0.75	935	1.93	9	78.9	80.6	79.4	0.71	0.63	0.49	7.65	2.05	2.25	0.0055	33
90L	159E*609	1.1	930	2.72	13	81.0	81.2	80.5	0.72	0.64	0.50	11.3	2.00	2.15	0.0065	36
100L	159F*612	1.5	950	3.62	18	82.5	82.9	81.5	0.73	0.65	0.52	15.1	2.00	2.25	0.0140	52
112M	159G*615	2.2	960	5.62	29	84.3	84.3	82.2	0.67	0.59	0.47	21.9	1.75	2.50	0.0210	59
132S	159H*616	3.0	970	6.36	41	85.6	86.1	85.1	0.80	0.73	0.60	29.5	1.75	3.00	0.0380	85
132M	159H*619	4.0	970	8.37	57	86.8	87.2	86.3	0.80	0.73	0.60	39.5	1.80	3.10	0.0510	96
132M	159H*620	5.5	970	12.3	88	88.0	88.0	86.2	0.74	0.66	0.52	54.1	2.10	3.45	0.0540	101
160M	159J*622	7.5	970	15.2	110	90.0	91.0	90.0	0.79	0.73	0.61	73.7	2.35	2.80	0.1200	153
160L	159J*624	11.0	970	22.5	170	90.3	91.0	90.5	0.78	0.72	0.61	109	2.95	2.85	0.1570	176
180L	159K*625	15.0	970	29	200	91.2	92.0	92.0	0.82	0.78	0.68	148	2.15	2.30	0.3350	234
200L	159L*626	18.5	975	36.1	260	92.0	93.0	93.0	0.81	0.76	0.67	181	2.20	2.40	0.4600	280
200L	159L*627	22.0	975	42.3	305	92.2	93.0	93.5	0.82	0.77	0.68	215	2.10	2.40	0.5200	299
225M	159M*628	30.0	980	55.8	335	93.0	94.0	94.0	0.84	0.80	0.77	292	2.00	2.15	0.7600	423
250M	159N*629	37.0	980	67.3	490	93.3	94.0	94.0	0.85	0.82	0.75	360	2.30	2.50	1.0500	527
280S	159P*630	45.0	980	81.6	530	93.7	93.7	93.0	0.85	0.82	0.74	439	1.40	2.30	1.9000	663
280M	159P*631	55.0	980	99.3	640	94.1	94.0	93.5	0.85	0.82	0.74	536	1.50	2.40	2.4000	728
315S	159R*632	75.0	985	135.4	900	94.6	94.5	93.7	0.85	0.82	0.73	727	1.60	2.40	3.7000	975
315M	159R*633	90.0	985	161	1030	94.9	94.9	94.2	0.85	0.83	0.75	872	1.60	2.30	4.2000	1157
315M	159R*634	110	985	198.8	1380	95.1	95.0	94.5	0.84	0.80	0.71	1065	1.70	2.50	5.1000	1287
315L	159R*635	132	985	229.6	1500	95.4	95.4	95.0	0.87	0.86	0.79	1280	1.30	2.30	5.3000	1443
315L	159R*637	160	985	277.7	1860	95.6	95.6	95.0	0.87	0.85	0.78	1550	1.30	2.30	5.8000	1508
315D	159R*640	200	985	342.4	2450	95.8	95.8	95.4	0.88	0.87	0.80	1938	1.50	2.40	10.9000	2797

Aluminium Series Dimensions: B3 Mounting



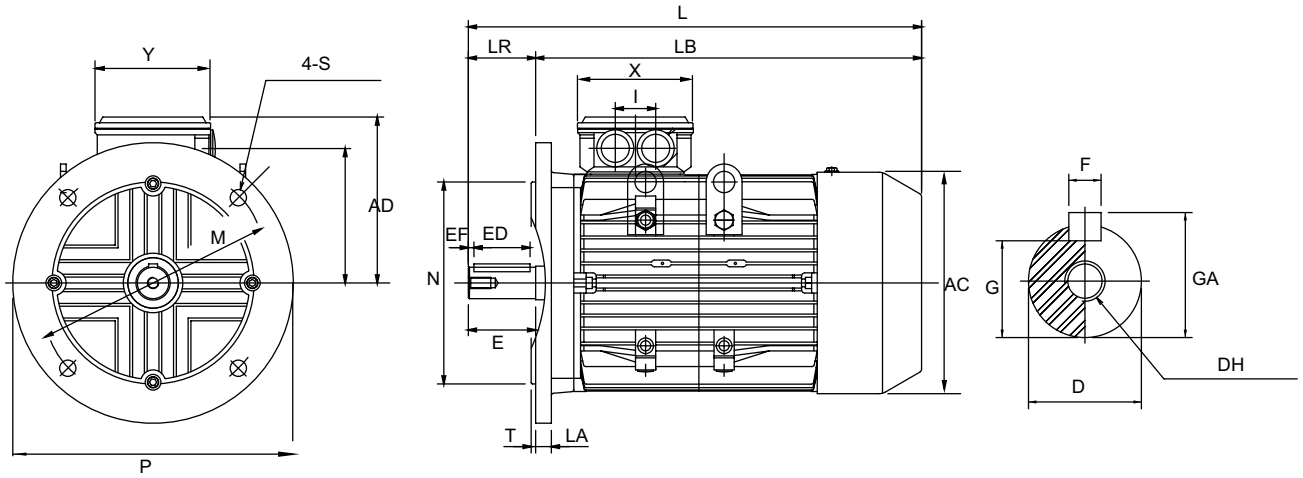
Type/ Frame Size	No of Poles	A	AA	AB	AC	B	BB	C	D	DH	E	ED	EF	F	G	GA	H	HA	HD	I	L	LE	X	Y
63M	2-4	100	35.5	125	120	80	105	40	11	M4 X 8	23	16	4	4	8.5	12.5	63	9	171	28	220.5	77.5	91	91
71M	2-4	112	36.5	136	136	90	116	45	14	M5 X 10	30	22	4	5	11	16	71	9	187	28	245	80	91	91
80M	2-8	125	42.5	158	159	100	126	50	19	M6 X 12	40	32	4	6	15.5	21.5	80	9	208	28	314	124	91	91
90S	2-8	140	49	175	176	100	133	56	24	M8 X 16	50	40	5	8	20	27	90	11	228	38	343	137	103	103
90L	2-8	140	49	175	176	125	155	56	24	M8 X 16	50	40	5	8	20	27	90	11	228	38	368	137	103	103

Dimensions in mm

For weights refer to selection tables on pages 159-161

Type	Cable Entry
63M	2 x M 16 X 1.5
71M	2 x M 16 X 1.5
80M	2 x M 16 X 1.5
90S	2 X M25 X 1.5
90L	2 X M25 X 1.5

Aluminium Series Mounting: B5 Mounting

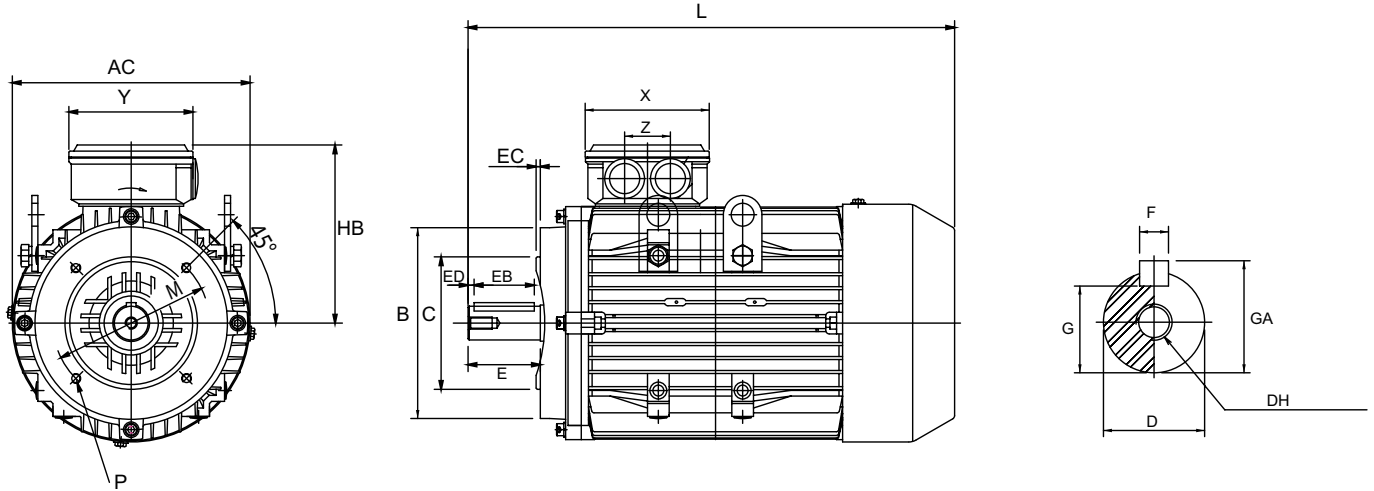


Type/ Frame Size	No of Poles	AC	AD	D	DH	E	ED	EF	F	G	GA	I	L	LA	LB	LR	M	N	P	S	T	X	Y
63M	2-4	120	108	11	M4 X 8	23	16	4	4	8.5	12.5	28	220.5	9	197.5	23	115	95	140	10	3	91	91
71M	2-6	136	116	14	M5 X 10	30	22	4	5	11	16	28	245	10	215	30	130	110	160	10	3.5	91	91
80M	2-6	159	129	19	M6 X 12	40	32	4	6	15.5	21.5	28	314	10	274	40	165	130	200	10	3.5	91	91
90S	2-6	176	139	24	M8 X 16	50	40	5	8	20	27	38	343	11	293	50	165	130	200	12	3.5	103	103
90L	2-6	176	139	24	M8 X 16	50	40	5	8	20	27	38	368	11	318	50	165	130	200	12	3.5	103	103

Dimensions in mm
For weights refer to selection tables on pages 159-161

Type	Cable Entry
63M	2 x M16 x 1.5
71M	2 x M16 x 1.5
80M	2 x M16 x 1.5
90S	2 x M25 x 1.5
90L	2 x M25 x 1.5

Aluminium & Cast Iron Series Dimensions: B14 Mounting



Aluminium Series Dimensions: B14 Mounting

Type/ Frame Size	No of Poles	AC	B	C	D	DH	E	EB	EC	ED	F	G	GA	HB	L	M	P	X	Y	Z	Cable Entry
63M	2-4	119.6	94.5	60j6	11j6	M4 x 16	23	16	3.0	4	4	8.5	12.5	108	221	75	4 x M5 x 9	91	91	28	2 x M16 x 1.5
71M	2-4	135.6	108.5	70j6	14j6	M5 x 16	30	22	3.5	4	5	11.0	16.0	116	245	85	4 x M6 x 9	91	91	28	2 x M16 x 1.5
80M	2-4	158.4	126.0	80j6	19j6	M6 x 16	40	32	3.5	4	6	15.5	21.5	129	314	100	4 x M6 x 9	91	91	28	2 x M16 x 1.5
90S	2-6	175.4	137.0	95j6	24j6	M8 x 19	50	40	3.5	5	8	20.0	27.0	139	343	115	4 x M8 x 9	103	103	38	2 x M25 x 1.5
90L	2-6	175.4	137.0	95j6	24j6	M8 x 19	50	40	3.5	5	8	20.0	27.0	139	368	115	4 x M8 x 9	103	103	38	2 x M25 x 1.5

Dimensions in mm

For weights refer to selection tables on pages 159-161

Cast Iron Series Dimensions: B14 Mounting

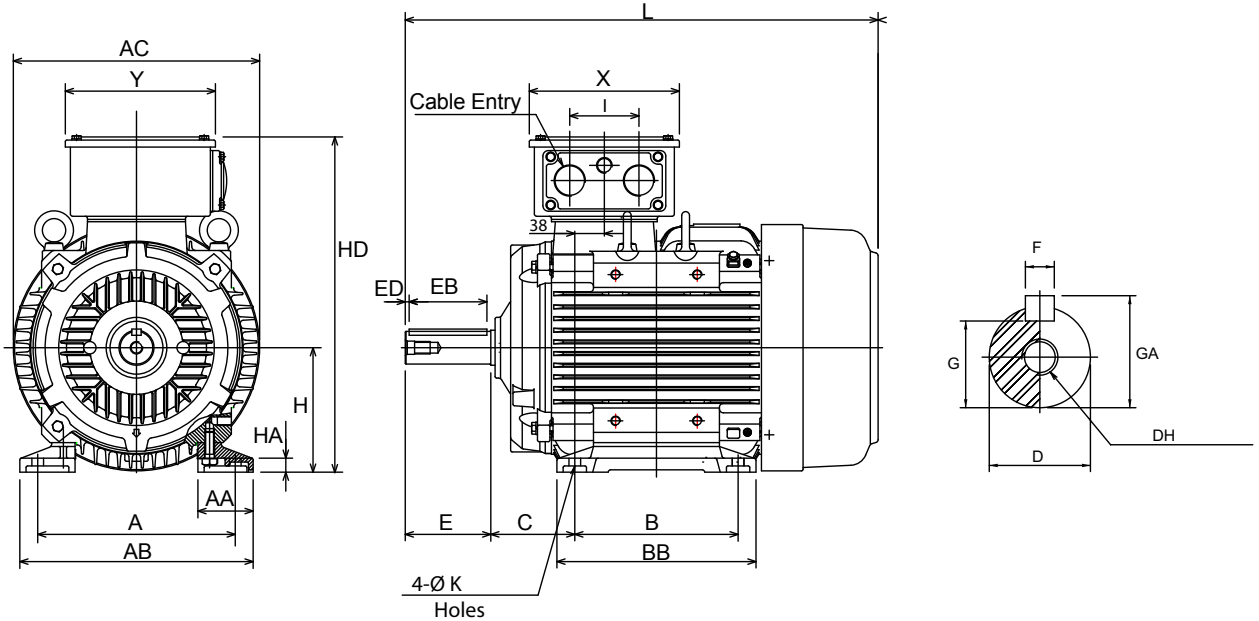
Type/ Frame Size	No of Poles	AC	B	C	D	DH	E	EB	EC	ED	F	G	GA	HB	L	M	P	X	Y	Z	Cable Entry
80M	2-4	156	120	80j6	19j6	M6 x 16	40	32	3.0	4.0	6	15.5	21.5	161.0	293.0	100	4 x M6 x 10	115	115	40	2 x M25 x 1.5
90S	2-6	176	140	95j6	24j6	M8 x 19	50	40	3.0	5.0	8	20.0	27.0	171.0	344.5	115	4 x M8 x 12	115	115	40	2 x M25 x 1.5
90L	2-6	176	140	95j6	24j6	M8 x 19	50	40	3.0	5.0	8	20.0	27.0	171.0	369.5	115	4 x M8 x 12	115	115	40	2 x M25 x 1.5
100L	2-6	196	160	110j6	28j6	M10 x 22	60	50	3.5	5.0	8	24.0	31.0	191.0	392.0	130	4 x M8 x 12	125	137	46	2 x M32 x 1.5
112M	2-6	218	160	110j6	28j6	M10 x 22	60	50	3.5	5.0	8	24.0	31.0	198.5	412.5	130	4 x M8 x 16	125	137	46	2 x M32 x 1.5
132S	2-6	258	200	130j6	38k6	M12 x 28	80	70	3.5	5.0	10	33.0	41.0	216.0	466.0	165	4 x M10 x 15	125	137	46	2 x M32 x 1.5
132M	4-6	258	200	130j6	38k6	M12 x 28	80	70	3.5	5.0	10	33.0	41.0	216.0	412.5	165	4 x M10 x 15	125	137	46	2 x M32 x 1.5

Dimensions in mm

For weights refer to selection tables on pages 159-161

Type	Cable Entry
63M	2 X M16 X1.5
71M	2 X M16 X1.5
80M	2 X M16 X1.5
90S	2 X M25 X 1.5
90L	2 X M25 X 1.5

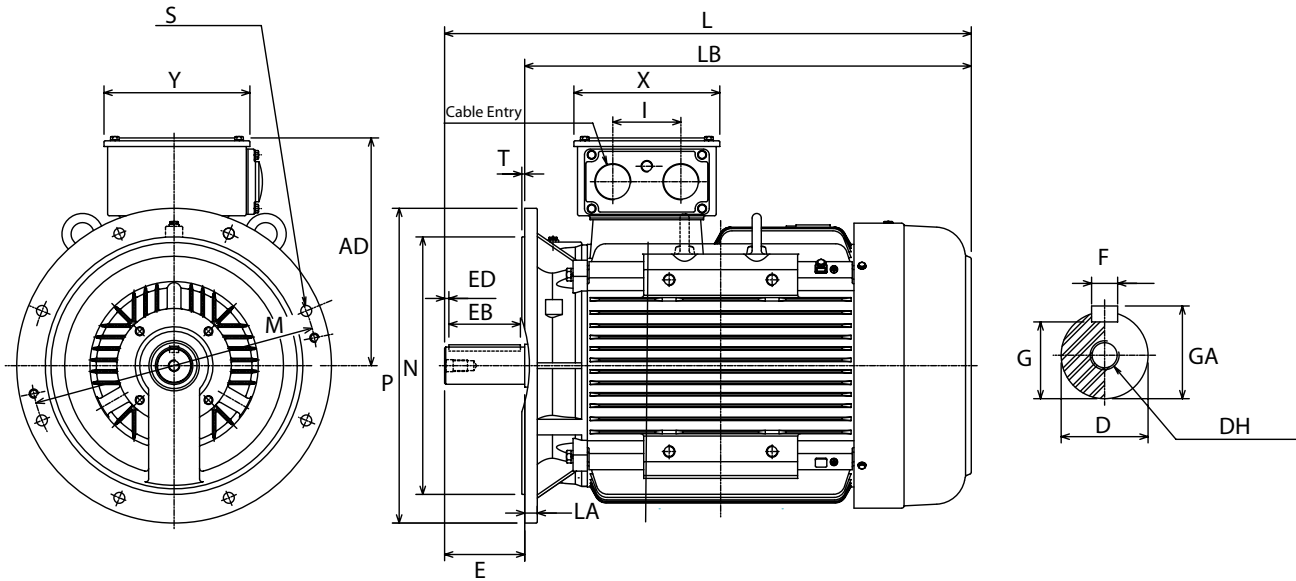
Cast Iron Series Dimensions: B3 Mounting



Type/ Frame Size	No of Poles	A	AA	AB	AC	B	BB	C	D	DH	E	EB	ED	F	G	GA	H	HA	HD	I	K	L	X	Y	Cable Entry
80M	2-4	125	35.0	161	156	100	130	50	19j6	M6	40	32	4.0	6	15.5	21.5	80	10	241.0	40	10.0	293.0	115	115	2 x M25 x 1.5
90S	2-6	140	40.0	180	176	100	125	56	24j6	M8	50	40	5.0	8	20.0	27.0	90	10	261.0	40	10.0	344.5	115	115	2 x M25 x 1.5
90L	2-6	140	40.0	180	176	125	125	56	24j6	M8	50	40	5.0	8	20.0	27.0	90	10	261.0	40	10.0	369.5	115	115	2 x M25 x 1.5
100L	2-6	160	40.0	200	196	140	176	63	28j6	M10	60	50	5.0	8	24.0	31.0	100	12	291.0	46	12.0	392.0	125	137	2 x M32 x 1.5
112M	2-6	190	50.0	235	218	140	176	70	28j6	M10	60	50	5.0	8	24.0	31.0	112	13	310.5	46	12.0	412.5	125	137	2 x M32 x 1.5
132S	2-6	216	63.5	259	258	140	184	89	38k6	M12	80	70	5.0	10	33.0	41.0	132	16	348.0	46	12.0	466.0	125	137	2 x M32 x 1.5
132M	4-6	216	63.5	259	258	178	222	89	38k6	M12	80	70	5.0	10	33.0	41.0	132	16	348.0	46	12.0	412.5	125	137	2 x M32 x 1.5
160M	2-6	254	71.0	300	317	210	256	108	42k6	M16	110	100	5.0	12	37.0	45.0	160	18	431.0	89	14.5	608.0	193	193	2 x M40 x 1.5
160L	2-6	254	71.0	300	317	254	300	108	42k6	M16	110	100	5.0	12	37.0	45.0	160	18	431.0	89	14.5	652.0	193	193	2 x M40 x 1.5
180M	2-4	279	72.0	330	354	241	292	121	48k6	M16	110	100	5.0	14	42.5	51.5	180	20	477.0	89	14.5	672.0	193	193	2 x M40 x 1.5
180L	4-6	279	72.0	330	354	279	330	121	48k6	M16	110	100	5.0	14	42.5	51.5	180	20	477.0	89	14.5	710.0	193	193	2 x M40 x 1.5
200L	2-6	318	88.0	378	398	305	365	133	55m6	M20	110	100	5.0	16	49.0	59.0	200	24	530.0	106	18.5	770.0	231	231	2 x M50 x 1.5
225S	4	356	94.0	416	449	286	350	149	60m6	M20	140	125	7.5	18	53.0	64.0	225	28	581.0	106	18.5	816.0	231	231	2 x M50 x 1.5
225M	2	356	94.0	416	449	311	375	149	55m6	M20	110	100	5.0	16	49.0	59.0	225	28	581.0	106	18.5	811.0	231	231	2 x M50 x 1.5
225M	4-6	356	94.0	416	449	311	375	149	60m6	M20	140	125	7.5	18	53.0	64.0	225	28	581.0	106	18.5	841.0	231	231	2 x M50 x 1.5
250M	2	406	112	480	498	349	425	168	60m6	M20	140	125	7.5	18	53.0	64.0	250	30	648.0	119	24.0	921.0	255	255	2 x M63 x 1.5
250M	4-6	406	112	480	498	349	425	168	65m6	M20	140	125	7.5	18	53.0	69.0	250	30	648.0	119	24.0	921.0	255	255	2 x M63 x 1.5
280S	2	457	110	560	550	368	495	190	65m6	M20	140	125	7.5	18	58.0	69.0	280	32	726.0	119	24.0	1087.5	255	255	2 x M63 x 1.5
280S	4-6	457	110	560	550	368	495	190	75m6	M20	140	125	7.5	20	67.5	79.5	280	32	726.0	119	24.0	1087.5	255	255	2 x M63 x 1.5
280M	2	457	110	560	550	419	495	190	65m6	M20	140	125	7.5	18	58.0	69.0	280	32	726.0	119	24.0	1087.5	255	255	2 x M63 x 1.5
280M	4-6	457	110	560	550	419	495	190	75m6	M20	140	125	7.5	20	67.5	79.5	280	32	726.0	119	24.0	1087.5	255	255	2 x M63 x 1.5
315S	2	508	115	615	620	406	540	216	65m6	M20	140	125	7.5	18	58.0	69	315	35	842.0	140	28	1266	322	336	2 x M63 x 1.5
315S	4-6	508	115	615	620	406	540	216	80m6	M20	170	160	5.0	22	71.0	85	315	35	842.0	140	28	1296	322	336	2 x M63 x 1.5
315M	2	508	115	628	620	457	540	216	65m6	M20	140	125	7.5	18	58.0	69	315	35	842.0	140	28	1266	322	336	2 x M63 x 1.5
315M	4-6	508	115	628	620	457	540	216	80m6	M20	170	160	5.0	22	71.0	85	315	35	842.0	140	28	1296	322	336	2 x M63 x 1.5
315L	2	508	150	650	620	508	730	216	65m6	M20	140	125	7.5	18	58.0	69	315	45	842.0	140	28	1366	322	336	2 x M63 x 1.5
315L	4-6	508	150	650	620	508	730	216	80m6	M20	170	160	5.0	22	71.0	85	315	45	842.0	140	28	1396	322	336	2 x M63 x 1.5
315D	4-6	508	150	650	682	900	1080	216	85m6	M20	170	160	5.0	22	76.0	90	315	45	905.0	180	28	1704	372	412	2 x M63 x 1.5

Dimensions in mm, For weights refer to selection tables on pages 159-161

Cast Iron Series Dimensions: B5 Mounting



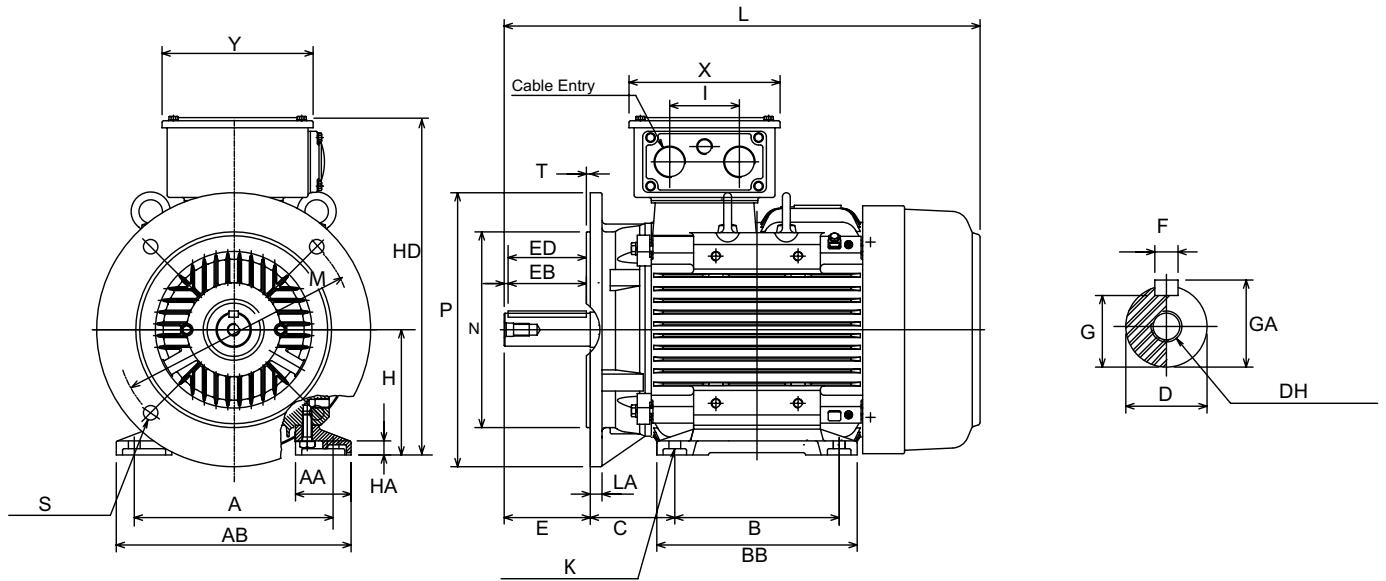
Type/ Frame Size	No of Poles	AC	AD	D	DH	E	EB	ED	F	G	GA	I	L	LA	LB	M	N	P	S	T	X	Y	Cable Entry
80M	2-6	156	161	19j6	M6	40	32	4.0	6	15.5	21.5	40	293.0	12	253.0	165	130	200	4 x Ø12.0	3.5	115	115	2 x M25 x 1.5
90S	2-6	176	171	24j6	M8	50	40	5.0	8	20.0	27.0	40	344.5	12	253.0	165	130	200	4 x Ø12.0	3.5	115	115	2 x M25 x 1.5
90L	2-6	176	171	24j6	M8	50	40	5.0	8	20.0	27.0	40	369.5	12	253.0	165	130	200	4 x Ø12.0	3.5	115	115	2 x M25 x 1.5
100L	2-6	196	191	28j6	M10	60	50	5.0	8	24.0	31.0	50	392.0	16	253.0	215	180	250	4 x Ø14.5	4	125	137	2 x M32 x 1.5
112M	2-6	218	198.5	28j6	M10	60	50	5.0	8	24.0	31.0	50	412.5	15	253.0	215	180	250	4 x Ø14.5	4	125	137	2 x M32 x 1.5
132S	2-6	258	216	38j6	M12	80	70	5.0	10	33.0	41.0	50	466.0	16	253.0	265	230	300	4 x Ø14.5	4	125	137	2 x M32 x 1.5
132M	4-6	258	216	38j6	M12	80	70	5.0	10	33.0	41.0	50	504.0	16	253.0	265	230	300	4 x Ø14.5	4	125	137	2 x M32 x 1.5
160M	2-6	317	271	42k6	M16	110	100	5.0	12	37.0	45.0	89	608.0	15	498.0	300	250	350	8 x Ø18.5	5	193	193	2 x M40 x 1.5
160L	2-6	317	271	42k6	M16	110	100	5.0	12	37.0	45.0	89	652.0	15	542.0	300	250	350	8 x Ø18.5	5	193	193	2 x M40 x 1.5
180M	2-4	354	297	48k6	M16	110	100	5.0	14	42.5	51.5	89	672.0	15	562.0	300	250	350	4 x Ø18.5	5	193	193	2 x M40 x 1.5
180L	4-6	354	297	48k6	M16	110	100	5.0	14	42.5	51.5	89	710.0	15	600.0	300	250	350	4 x Ø18.5	5	193	193	2 x M40 x 1.5
200L	2-6	398	330	55m6	M20	110	100	5.0	16	49.0	59.0	106	770.0	17	660.0	350	300	400	4 x Ø18.5	5	231	231	2 x M50 x 1.5
225S	4	449	356	60m6	M20	140	125	7.5	18	53.0	64.0	106	816.0	20	676.0	400	350	450	8 x Ø18.5	5	231	231	2 x M50 x 1.5
225M	2	449	356	55m6	M20	110	100	5.0	16	49.0	59.0	106	811.0	20	701.0	400	350	450	8 x Ø18.5	5	231	231	2 x M50 x 1.5
225M	4-6	449	356	60m6	M20	140	125	7.5	18	53.0	64.0	106	841.0	20	701.0	400	350	450	8 x Ø18.5	5	231	231	2 x M50 x 1.5
250M	2	498	398	60m6	M20	140	125	7.5	18	53.0	64.0	119	921.0	22	781.0	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
250M	4-6	498	398	65m6	M20	140	125	7.5	18	53.0	69.0	119	921.0	22	781.0	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
280S	2	550	446	65m6	M20	140	125	7.5	18	58.0	69.0	119	1087.5	22	947.5	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
280S	4-6	550	446	75m6	M20	140	125	7.5	20	67.5	79.5	119	1087.5	22	947.5	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
280M	2	550	446	65m6	M20	140	125	7.5	18	58.0	69.0	119	1087.5	22	947.5	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
280M	4-6	550	446	75m6	M20	140	125	7.5	20	67.5	79.5	119	1087.5	22	947.5	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
315S	2	660	527	65m6	M20	140	125	7.5	18	58.0	69	140	1266	25	1126.0	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5
315S	4-6	660	527	80m6	M20	170	160	5.0	22	71.0	85	140	1296	25	1126.0	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5
315M	2	660	527	65m6	M20	140	125	7.5	18	58.0	69	140	1266	25	1126.0	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5
315M	4-6	660	527	80m6	M20	170	160	5.0	22	71.0	85	140	1296	25	1126.0	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5

Dimensions in mm

For weights refer to selection tables on pages 159-161

Dimension AC is the diameter of motor body case, see page 165.

Cast Iron Series Dimensions: B35 Mounting



Type/ Frame Size	No of Poles	A	AA	AB	AC	B	BB	C	D	DH	E	EB	ED	F	G	GA	H	HA	HD	I	K	L	LA	M	N	P	S	T	X	Y	Cable Entry
80M	2-4	125	35.0	161	156	100	130	50	19j6	M6	40	32	4.0	6	15.5	21.5	80	10	241.0	40	10.0	293.0	12	165	130	200	4 x Ø12.0	3.5	115	115	2 x M25 x 1.5
90S	2-6	140	40.0	180	176	100	125	56	24j6	M8	50	40	5.0	8	20.0	27.0	90	10	261.0	40	10.0	344.5	12	165	130	200	4 x Ø12.0	3.5	115	115	2 x M25 x 1.5
90L	2-6	140	40.0	180	176	125	125	56	24j6	M8	50	40	5.0	8	20.0	27.0	90	10	261.0	40	10.0	369.5	12	165	130	200	4 x Ø12.0	3.5	115	115	2 x M25 x 1.5
100L	2-6	160	40.0	200	196	140	176	63	28j6	M10	60	50	5.0	8	24.0	31.0	100	12	291.0	46	12.0	392.0	16	215	180	250	4 x Ø14.5	4	125	137	2 x M32 x 1.5
112M	2-6	190	50.0	235	218	140	176	70	28j6	M10	60	50	5.0	8	24.0	31.0	112	13	310.5	46	12.0	412.5	15	215	180	250	4 x Ø14.5	4	125	137	2 x M32 x 1.5
132S	2-6	216	63.5	259	258	140	184	89	38k6	M12	80	70	5.0	10	33.0	41.0	132	16	348.0	46	12.0	466.0	16	265	230	300	4 x Ø14.5	4	125	137	2 x M32 x 1.5
132M	4-6	216	63.5	259	258	178	222	89	38k6	M12	80	70	5.0	10	33.0	41.0	132	16	348.0	46	12.0	412.5	16	265	230	300	4 x Ø14.5	4	125	137	2 x M32 x 1.5
160M	2-6	254	71.0	300	317	210	256	108	42k6	M16	110	100	5.0	12	37.0	45.0	160	18	431.0	89	14.5	608.0	15	300	250	350	8 x Ø18.5	5	193	193	2 x M40 x 1.5
160L	2-6	254	71.0	300	317	254	300	108	42k6	M16	110	100	5.0	12	37.0	45.0	160	18	431.0	89	14.5	652.0	15	300	250	350	8 x Ø18.5	5	193	193	2 x M40 x 1.5
180M	2-4	279	72.0	330	354	241	292	121	48k6	M16	110	100	5.0	14	42.5	51.5	180	20	477.0	89	14.5	672.0	15	300	250	350	4 x Ø18.5	5	193	193	2 x M40 x 1.5
180L	4-6	279	72.0	330	354	279	330	121	48k6	M16	110	100	5.0	14	42.5	51.5	180	20	477.0	89	14.5	710.0	15	300	250	350	4 x Ø18.5	5	193	193	2 x M40 x 1.5
200L	2-6	318	88.0	378	398	305	365	133	55m6	M20	110	100	5.0	16	49.0	59.0	200	24	530.0	106	18.5	770.0	17	350	300	400	4 x Ø18.5	5	231	231	2 x M50 x 1.5
225S	4	356	94.0	416	449	286	350	149	60m6	M20	140	125	7.5	18	53.0	64.0	225	28	581.0	106	18.5	816.0	20	400	350	450	8 x Ø18.5	5	231	231	2 x M50 x 1.5
225M	2	356	94.0	416	449	311	375	149	55m6	M20	110	100	5.0	16	49.0	59.0	225	28	581.0	106	18.5	811.0	20	400	350	450	8 x Ø18.5	5	231	231	2 x M50 x 1.5
225M	4-6	356	94.0	416	449	311	375	149	60m6	M20	140	125	7.5	18	53.0	64.0	225	28	581.0	106	18.5	841.0	20	400	350	450	8 x Ø18.5	5	231	231	2 x M50 x 1.5
250M	2	406	112	480	498	349	425	168	60m6	M20	140	125	7.5	18	53.0	64.0	250	30	648.0	119	24.0	921.0	22	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
250M	4-6	406	112	480	498	349	425	168	65m6	M20	140	125	7.5	18	53.0	69.0	250	30	648.0	119	24.0	921.0	22	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
280S	2	457	110	560	550	368	495	190	65m6	M20	140	125	7.5	18	58.0	69.0	280	32	726.0	119	24.0	1087.5	22	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
280S	4-6	457	110	560	550	368	495	190	75m6	M20	140	125	7.5	20	67.5	79.5	280	32	726.0	119	24.0	1087.5	22	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
280M	2	457	110	560	550	419	495	190	65m6	M20	140	125	7.5	18	58.0	69.0	280	32	726.0	119	24.0	1087.5	22	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
280M	4-6	457	110	560	550	419	495	190	75m6	M20	140	125	7.5	20	67.5	79.5	280	32	726.0	119	24.0	1087.5	22	500	450	550	8 x Ø18.5	5	255	255	2 x M63 x 1.5
315S	2	508	115	615	620	406	540	216	65m6	M20	140	125	7.5	18	58.0	69	315	35	842.0	140	28	1266	25	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5
315S	4-6	508	115	615	620	406	540	216	80m6	M20	170	160	5.0	22	71.0	85	315	35	842.0	140	28	1296	25	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5
315M	2	508	115	628	620	457	540	216	65m6	M20	140	125	7.5	18	58.0	69	315	35	842.0	140	28	1266	25	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5
315M	4-6	508	115	628	620	457	540	216	80m6	M20	170	160	5.0	22	71.0	85	315	35	842.0	140	28	1296	25	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5
315L	2	508	150	650	620	508	730	216	65m6	M20	140	125	7.5	18	58.0	69	315	45	842.0	140	28	1366	25	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5
315L	4-6	508	150	650	620	508	730	216	80m6	M20	170	160	5.0	22	71.0	85	315	45	842.0	140	28	1396	25	600	550	660	8 x Ø24.0	6	322	336	2 x M63 x 1.5
315D	4-6	508	150	650	682	900	1080	216	85m6	M20	170	160	5.0	22	76.0	90	315	45	905.0	180	28	1704	30	600	550	660	8 x Ø24.0	6	372	412	2 x M63 x 1.5

Dimensions in mm

Dimension AC is the diameter of motor body case, see page 165.

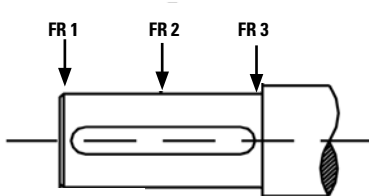
For weights refer to selection tables on pages 159-161

Permissible Radial Shaft Loads

Operation of an electric motor with sprocket, gear or 'V' pulley (or caused by influences of the driven machine) will result in radial forces on the shaft end and bearings.

In any event the pulley, sprocket etc should be positioned as close as possible to the motor case in order to reduce bearing loads and shaft stresses, and to prolong life.

The permissible radial force depends on the point of application of the external force see diagram below.



(1) Calculation on basis of Torque:

$$\text{Overhung load (N)} = \frac{T \times 1000 \times k}{r}$$

(2) Calculation on basis of Power:

$$\text{Overhung load (N)} = \frac{kW \times 9550 \times 1000 \times K}{n \times r}$$

Where:

- T = Absorbed Torque at shaft in Nm
- kW = Absorbed power at shaft in kW
- r = pitch radius of sprocket, gear or 'V' pulley in mm
- n = Rev/min of shaft
- K = Application factor - 1.35 for sprocket, 1.25 for gear or timing pulley and 1.75 for 'V' pulley.

If the desired bearing life is known the minimum pulley diameter can be calculated using the following formula:

$$D = \frac{1.9 \times 10^7 \times K \times P}{n \times FR}$$

Where:

- D = diameter of the pulley (mm)
- P = power of the motor (kW)
- n = motor rated speed (Rev/min)
- k = belt tension factor, k=2.0 - 2.5 for V-belts
- FR(x) = permissible radial force (N)

The following tables give the permissible radial forces in Newtons assuming zero axial force.**

In the case of higher radial force given in the standard ball bearing column a cylindrical selection must be made.

** If axial forces are expected as well as radial forces please consult your local Authorised Fenner Distributor.

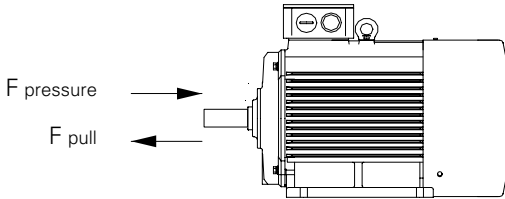
Permissible Radial Shaft Load FR (N)

Frame Size	No of Poles	Load FR For Standard Ball Bearings						Load FR For Cylinder Roller Bearings			
		Aluminium Motors			Cast Iron Motors			Cast Iron Motors			
		Max	Max	Max	Max	Max	Max	Max	Max	Max	Min
		FR1	FR2	FR3	FR1	FR2	FR3	FR1	FR2	FR3	FR3 min
63	2	324	350	377	-	-	-	-	-	-	-
	4	408	441	474	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
71	2	344	376	409	-	-	-	-	-	-	-
	4	440	481	523	-	-	-	-	-	-	-
	6	490	536	583	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
80	2	558	620	682	558	620	682	-	-	-	-
	4	699	777	855	699	777	855	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
90	2	583	659	736	583	659	736	-	-	-	-
	4	741	838	936	741	838	936	-	-	-	-
	6	849	961	1073	849	961	1073	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
100	2	830	932	1034	830	932	1034	-	-	-	-
	4	1039	1168	1296	1039	1168	1296	-	-	-	-
	6	1186	1333	1479	1186	1333	1479	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
112	2	1157	1293	1429	1157	1293	1429	-	-	-	-
	4	1465	1637	1809	1465	1637	1809	-	-	-	-
	6	1699	1898	2098	1699	1898	2098	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
132	2	1734	1970	2207	1734	1970	2207	-	-	-	-
	4	2185	2428	2780	2185	2428	2780	-	-	-	-
	6	2530	2834	3139	2530	2834	3139	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
160	2	2198	2507	2816	2198	2507	2816	-	-	-	-
	4	2740	3125	3511	2740	3125	3511	-	-	-	-
	6	3143	3541	3938	3143	3541	3938	-	-	-	-
	8	-	-	-	-	-	-	-	-	-	-
180	2	-	-	-	3141	3529	3917	6669	7407	8327	919
	4	-	-	-	3835	4316	4796	8027	8920	10036	804
	6	-	-	-	4398	4902	5405	9186	10135	11302	766
	8	-	-	-	-	-	-	-	-	-	-
200	2	-	-	-	3434	3793	4152	7350	8119	8888	1108
	4	-	-	-	4368	4825	5282	9075	10024	10973	960
	6	-	-	-	4965	5485	6004	10203	11271	12338	911
	8	-	-	-	-	-	-	-	-	-	-
225	2	-	-	-	4010	4401	4792	8233	9036	9839	1316
	4	-	-	-	4731	5346	5962	9503	10739	11976	1131
	6	-	-	-	5436	6112	6788	10817	12161	13506	1069
	8	-	-	-	-	-	-	-	-	-	-
250	2	-	-	-	4902	5441	5981	11585	12860	141135	1807
	4	-	-	-	6026	6685	7343	14149	15695	17240	1525
	6	-	-	-	7130	7909	8688	16194	17963	19732	1431
	8	-	-	-	-	-	-	-	-	-	-
280	2	-	-	-	5231	5685	6224	11638	12656	13856	2092
	4	-	-	-	7482	8255	9210	17635	19451	21692	2241
	6	-	-	-	8353	9210	10275	19671	21705	24216	2082
	8	-	-	-	-	-	-	-	-	-	-
315L	2	-	-	-	5208	5514	5871	12114	12827	13642	2094
	4	-	-	-	8895	9786	10894	22106	24348	27100	2910
	6	-	-	-	-	-	-	24996	27531	30640	2679
	8	-	-	-	-	-	-	-	-	-	-

For frame size 315D consult your local Authorised Distributor

Permissible Axial Loads

Motor IM B3



Permissible Axial Loads for Horizontal Fenner Motors

The following table gives the permissible axial forces in Newtons, assuming zero radial force**. In this case the motor should be ordered with standard ball bearings.

If the axial force is greater than that given in the table, an angular contact bearing should be ordered. The values are based on normal conditions at 50 Hz and calculated at 20.000 working hours for two pole motors and 40.000 hours for 4, 6 and 8 pole motors. At 60Hz the values must be reduced by 10%.

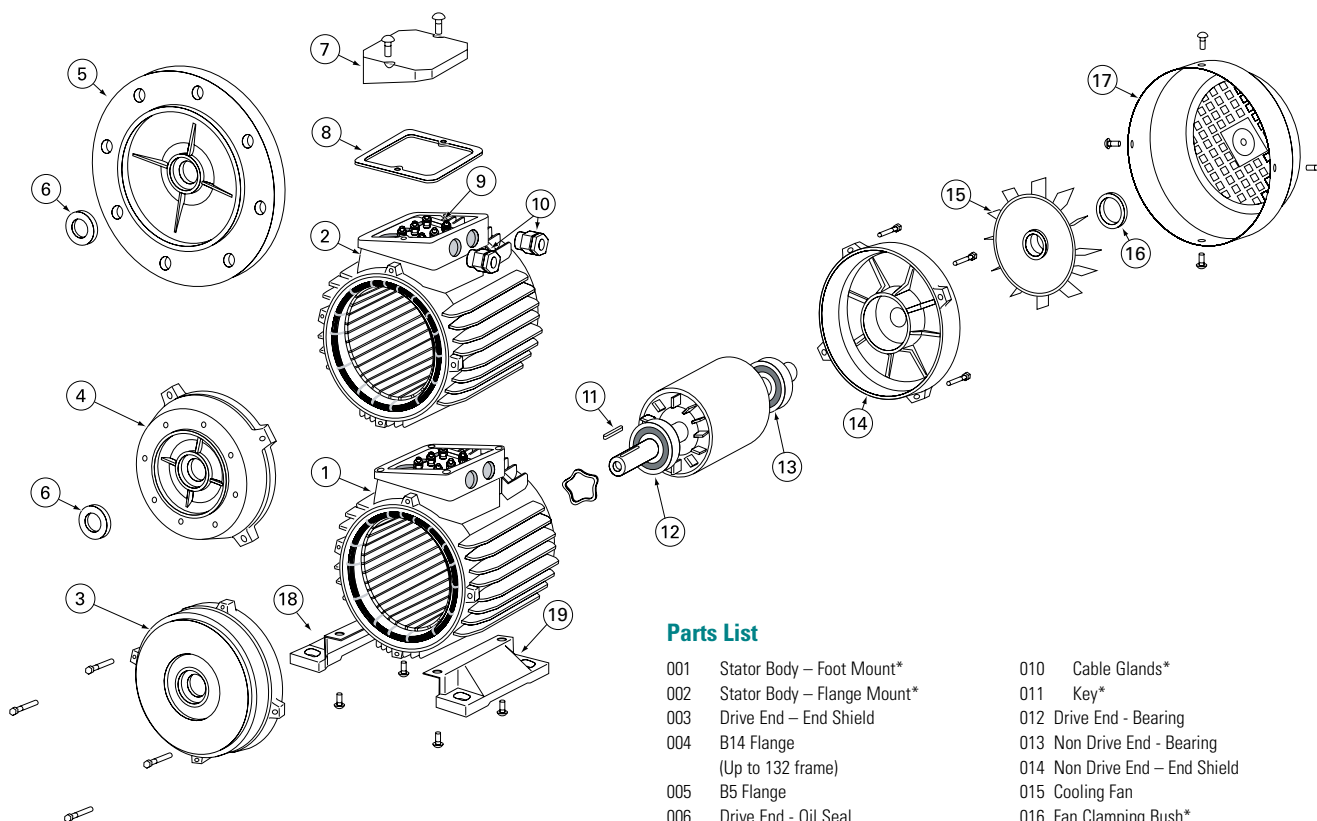
F pressure is calculated for a fixed bearing at the DE.

** If FR and FA both apply contact your local Fenner Authorised Distributor.

Maximum Permissible Axial Bearing Load for Horizontal Mounting

Frame Size	Maximum Axial Bearing Load FR (N)					
	2 Pole		4 Pole		6 Pole	
	F Pressure	F Pull	F Pressure	F Pull	F Pressure	F Pull
63	-	-	-	-	-	-
71	-	-	-	-	-	-
80	490	490	617	617	-	-
90	470	470	676	676	774	774
100	657	657	931	931	1068	1068
112	911	911	1294	1294	1490	1490
132	1401	1401	1960	1960	2254	2254
160	1793	1793	2528	2528	2881	2881
180	2470	2470	3440	3440	3920	3920
200	2734	2734	3459	3459	4449	4449
225	3165	3165	3920	3920	5018	5018
250	3900	3900	4753	4753	6233	6233
280	4106	4106	6085	6085	6860	6860
315 S/M	3775	3775	6694	6694	7577	7577
315 L	3645	3645	6713	6713	7693	7693

Replacement Parts



Parts List

001	Stator Body – Foot Mount*	010	Cable Glands*
002	Stator Body – Flange Mount*	011	Key*
003	Drive End – End Shield	012	Drive End - Bearing
004	B14 Flange (Up to 132 frame)	013	Non Drive End - Bearing
005	B5 Flange	014	Non Drive End – End Shield
006	Drive End - Oil Seal	015	Cooling Fan
007	Terminal Box Lid	016	Fan Clamping Bush*
008	Terminal Box Gasket	017	Fan Cover
009	Terminal Block	018	Left Foot*
		019	Right Foot*

* For all aluminium multi mount motors

Replacement parts are stocked for motors up to 200 frame

To Order Spare Parts for the FM Range:

FIRST THREE DIGITS:

Motor material and efficiency

Code	Range	Material
156	IE2	Aluminium
157	IE2	Cast Iron
158	IE3	Aluminium
159	IE3	Cast Iron

FOURTH DIGIT:

Frame size

Code	Frame
A	56
B	63
C	71
D	80
E	90
F	100
G	112
H	132
J	160
K	180
L	200
M	225
N	250
P	280
R	315
S	355
T	400
U	450
V	500
W	560

FIFTH DIGIT:

When ordering spare parts always use 9 as the fifth digit.

SIXTH, SEVENTH & EIGHTH DIGIT:

Please select relevant item number from the spare parts list above.

Replacement Parts & Electrical Connections

Bearings

As a standard both Drive End (DE) bearing and Non Drive End (NDE) bearing are ball bearings, suitable for horizontal and vertical mounting of the motor (except for frame size 315, 2-pole; where a special bearing is provided for vertical operation).

As an option reinforced bearing types can be provided according to customers load specifications.

The DE bearing is fixed; it absorbs axial and radial forces transmitted from the driven machine. The floating bearing is installed at the NDE to allow thermal expansion of the shaft and to absorb radial forces.

The bearings are preloaded in axial direction by an undular washer at the NDE.

Motors up to frame size 160 are equipped with double shielded bearings (suffix "zz" on bearing type). These bearing types are lubricated for life. They are maintenance free and cannot be regreased.

Motors from frame size 180 up to 315 are equipped with grease nipples both at DE and NDE for manual regreasing. These bearings are already greased during manufacture.

Standard Bearings Used in Aluminium Motors

Frame Size	No of Poles	Drive End	Non Drive End
63	2-4	6201 ZZC3	6201 ZZC3
71	2-6	6202 ZZC3	6202 ZZC3
80	2-8	6204 ZZC3	6204 ZZC3
90	2-8	6205 ZZC3	6205 ZZC3
100	2-8	6206 ZZC3	6305 ZZC3
112	2-8	6306 ZZC3	6306 ZZC3
132	2-8	6308 ZZC3	6308 ZZC3
160	2-8	6309 ZZC3	6309 ZZC3

Standard Bearings Used in Cast Iron Motors Frame Size Up To 160

Frame Size	No of Poles	Drive End	Non Drive End
80	2-8	6204 ZZC3	6204 ZZC3
90	2-8	6205 ZZC3	6205 ZZC3
100	2-8	6206 ZZC3	6305 ZZC3
112	2-8	6306 ZZC3	6306 ZZC3
132	2-8	6308 ZZC3	6306 ZZC3
160	2-8	6309 ZZC3	6307 ZZC3

Bearings Used in Cast Iron Motors Frame Size 180 Up To 315

Frame Size	No of Poles	Drive End			Non Drive End
		Regreaseable			
		Standard	Standard V Mounting	Reinforced	Standard
180	2-8	6311 C3	6311 C3	NU311	6310 C3
200	2-8	6312 C3	6312 C3	NU312	6212 C3
225	2	6312 C3	6312 C3	NU312	6212 C3
	4-8	6313 C3	6313 C3	NU313	6213 C3
250	2	6313 C3	6313 C3	NU313	6313 C3
	4-8	6315 C3	6315 C3	NU315	6313 C3
280	2	6316 C3	6316 C3	NU316	6314 C3
	4-8	6318 C3	6318 C3	NU318	6316 C3
315	2	6316 C3	7316 C3	NU316	6314 C3
	4-8	6320 C3	6320 C3	NU320	6316 C3
315D	2	6316 C3	7316 C3	NU316	6316 C3
	4-8	6322 C3	6322 C3	NU322	6322 C3

Electrical Connections

Connection cables and earthing requirements should conform to IEE regulations.

It is recommended that a suitable overload is fitted to protect the motor windings. Line fuses only protect the cables from short circuit not the motor.

Ensure that all terminals are tight and that the correct terminal arrangements are observed.

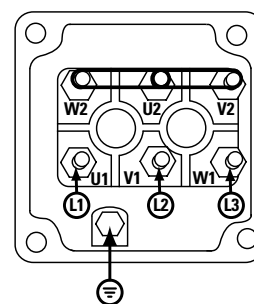
All motors are capable of running with two voltages.

Smaller motors are suitable for a 230/400V supply and larger motors are suitable for a 400/690V supply.

It is only possible to use a 400V Star/Delta starter on motors that are wound 400/690V - for this type of start, links must be removed.

Terminal Marking and Direction of Rotation

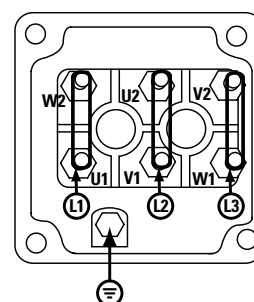
In accordance with the current standard, if the supply is connected to the motor's stator terminals, which are marked U1, V1 and W1 and the phase sequence of supply is 1, 2 & 3, then the direction of rotation will be clockwise when viewed from the drive-end.



STAR CONNECTION

This is the higher of the two voltages shown on the plate.

400V on a 230 / 400V motor
690V on a 400 / 690V motor



DELTA CONNECTION

This is the lower of the two voltages shown on the plate.

230V on a 230 / 400V motor
400V on a 400 / 690V motor

Slide Bases and Slide Rails

MOTOR SLIDE BASES

Fenner motor slide bases cover the full range of motors up to frame size 280.

Slide Bases are available in two versions:

- The MPB is a heavy duty single plate base available for motors from 90 to 280 frame.
- The MB is a lightweight and easy to mount dual-plate base available for motors from 56 to 132 frame.

Compare the features and benefits of Fenner bases with your current method!

Both ranges are specifically designed for extreme drive loads and are manufactured without welding in heavy gauge pre-slotted galvanised steel for maximum resistance to corrosion.

For Offshore and special process applications all bases can be supplied to special order coated or manufactured in Stainless Steel.

Unlike slide rails the development of the Motor Slide Base has been market led. A new

technology offering the manufacturer reductions in design errors, time savings in production and thus cost savings over the whole manufacturing process.

Maintenance and production engineers now have the ability to maintain absolute belt alignment throughout the drive tensioning process meaning fast in situ belt tensioning without the removal of guards and thus no plant down time.

Features

- Large range accommodating motor frames from 56 - 280
- Fully adjustable operation
- Compact design
- Robust and plated screw adjustment
- Pre slotting for precision adjustment
- No welding points
- Availability in Galvanised or Stainless Steel
- Usage for friction drives, pumps, chain drives
- Usage with all types and makes of motors

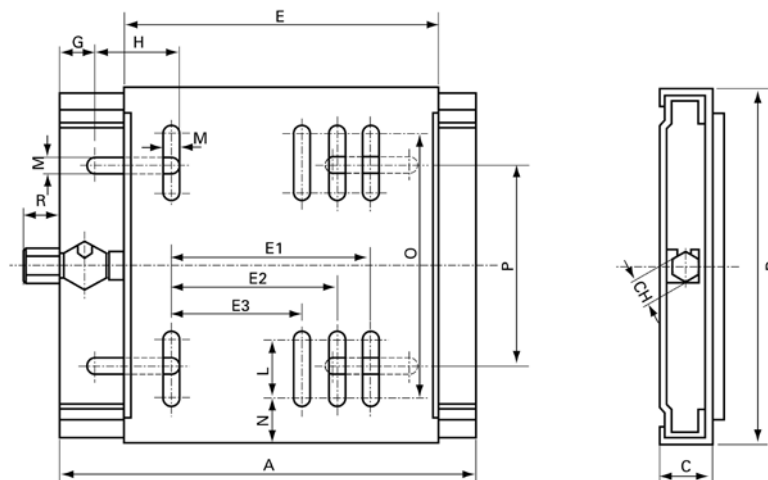
Benefits: Original Equipment

- Competitive Price
- Reduces design errors
- Reduces design time
- Reduces fitting time
- Reduces positioning time
- No drilling required to fit
- Accurate and positive alignment every time
- Ex-stock deliveries Nation-wide

Benefits: Maintenance

- No plant down-time
- Institute drive adjustment
- Drive tensioning without removal of guards
- Corrosion resistant finish
- Rapid adjustment feature (optional)
- Totally maintenance free

Mono Plate Base (MPB)

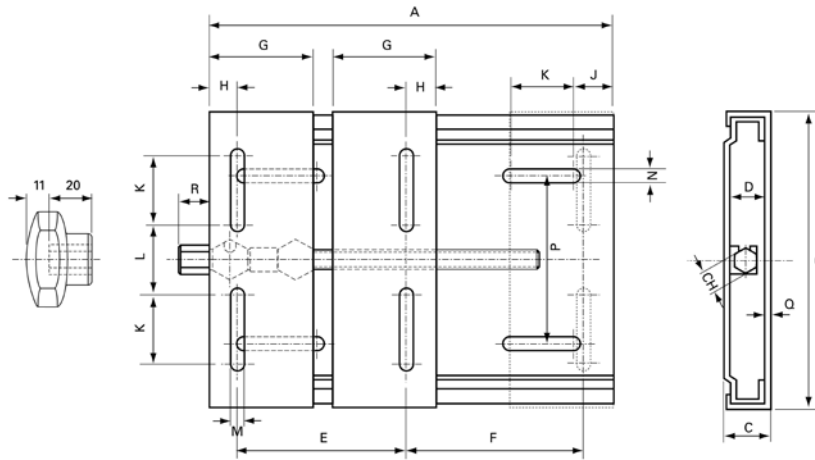


Dimensions

Product	Type	Motor	A	B	C	CH	E	E3	E2	E1	G	H	L	M	N	O	P	R	Weight
047A9012	MPB 90/112	90-100-112	307	213	33	19	255	140	160	190	28	50	50.0	10.5	25.5	162	108	30	4.1
047D1682	MPB 160/180-2	160-180	430	370	40	22	380		254	279	30	62	62.0	12.5	41.5	287	248	30	12.0
047P1618	MPB 160/180	160-180	490	370	40	22	380		254	279	30	62	62.0	12.5	41.5	287	248	30	12.7
047E2022	MPB 200/225	200-225	585	450	50	22	468		318	356	30	60	52.0	17.0	49.0	352	300	30	23.7
047F0250	MPB 250*	250	600	470	65	22	515			406	30	60	70.0	22.0	50.5	369	320	30	28.1
047G0280	MPB 280*	280	735	570	65	22	585			457	30	70	70.0	22.0	55.0	460	420	30	38.2

Slide Bases and Slide Rails

Twin Plate Base (MB)



Dimensions

Product	Type	Motor	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	Weight
047K6380	MB 63/80	63 - 80	210	195	33	27	100	70	70	20	25	50.0	43	10.5	10.5	19	98	3	30	2.3
047L6310	MB 63/100	63 - 100	270	195	33	27	100	130	70	20	25	50.0	43	10.5	10.5	19	98	3	30	2.7
047M9012	MB 90/112	90 - 112	307	213	33	27	100	165	70	20	29	50.0	62	10.5	10.5	19	108	3	30	3.4
047M9032	MB 90/132	90 - 132	430	290	40	32	140	240	95	27	29	62.5	90	13.0	13.0	22	165	4	30	7.4
047N9322	MB 90/132-2	90 - 132	340	290	40	32	140	150	95	27	29	62.5	90	13.0	13.0	22	165	4	30	6.3

SITE ADJUSTMENT KNOB – for types 63/80 + 63/100 with 19mm hexagon - for types 90/132 with 22mm hexagon.

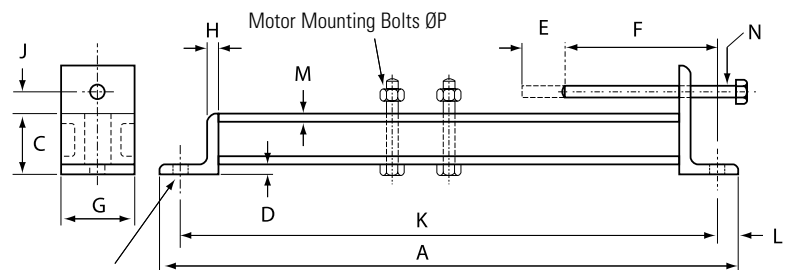
Table of Adjustments – Motor Sizes

Type	Adjustments	63 M	71 M	80 M	90 S	90 L	100 L	112 M	132 S	132 M	Additional adjustments with slots
MB 63/80	E	100	112	125							F+50
	F	70	58	45							
MB 63/100	E	100	112	125	140	140	160				
	F	130	118	105	90	90	70				
MB90/112	E				140	140	160	190			
	F				127	127	107	77			
MB 90/132	E				140	140	160	190	216	216	
	F				240	240	220	190	164	164	
MB 90/132-2	E				140	140	160	190	216	216	F+62.5
	F				240	240	220	190	164	164	

Dimensions, form and technical data are not binding.

FENNER SLIDE RAILS

Are made from fabricated steel to provide a simple and accurate method of mounting electric motors to machine bed plates. Each product code refers to one complete set for one motor and includes slide rails, tensioning bolts and motor mounting bolts.



Mounting holes 2 x ØB

Dimensions

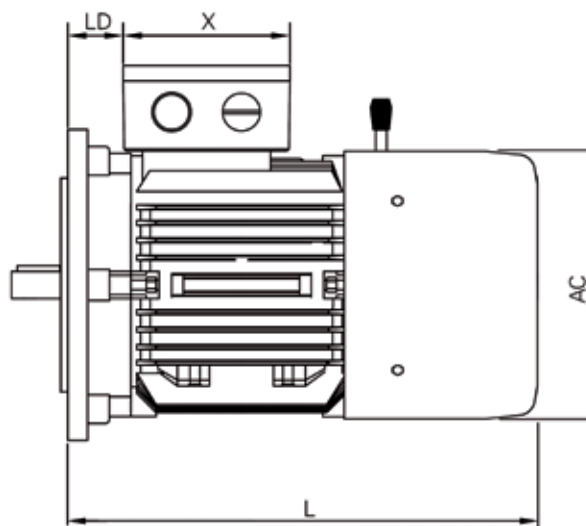
Product Code	Frame Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P
076K0000	63-90	355	10	30	10	95	45	35	8	6	325	20	2.00	M10	4xM8x40
076L0000	100-132	470	12	44	12	160	50	50	10	6	430	20	3.00	M10	4xM10x65
076M0000	160-180	615	15	64	14	190	60	65	12	10	565	25	3.15	M12	4xM12x90
076N0000	200-225	785	19	82	30	230	70	80	20	12	725	35	4.00	M16	4xM16x110
076P0000	250-280	945	24	82	20	300	58	110	20	16	885	30	3.15	M20	6xM20x130
076R0000	315-355	1215	28	100	25	375	70	110	24	20	1115	50	5.00	M24	6xM24x150

Accessories - Brake Motors

Brake Motors (M/N)

Fenner Brake motors are available with (N) or without (M) Hand release lever and are standard failsafe brakes rectified in the terminal box from the supply to the motor terminals. When a supply voltage is sent to the motor, the rectifier is energised releasing the brake and allowing the motor to run. When the voltage is removed, the brake coil is de-energised and the spring applies the brake to stop the motor.

DIMENSIONS



2 POLE

kW	Speed	Frame	400V Amps	Brake Torque Nm	AC	L	LD	X	Cut-in	Cut-out	J _{BRAKE}	dB (A)	kg
0.37	2730	71M	0.97	12	145	307	27	94	30ms	15ms	0.00014	50	8.5
0.55	2760	71M	1.42	12	145	307	27	94	30ms	15ms	0.00014	50	9.5
0.75	2770	80M	1.77	16	165	353	27	105	30ms	15ms	0.00021	52	13
1.1	2770	80M	2.51	16	165	353	27	105	30ms	15ms	0.00021	52	13
1.5	2840	90S	3.28	20	185	367	30	105	40ms	15ms	0.00039	56	15
2.2	2840	90L	4.61	20	185	392	30	105	40ms	15ms	0.00039	56	20
3	2840	100L	6.03	40	205	474	26	112	45ms	20ms	0.00104	59	27
4	2880	112M	7.88	60	230	483	32	112	85ms	25ms	0.00135	61	35
5.5	2900	132S	10.53	90	270	553	38	112	95ms	50ms	0.00219	64	46
7.5	2920	132S	14.14	90	270	553	38	112	95ms	50ms	0.00219	64	56
11	2940	160M	19.96	180	320	705	64	143	95ms	50ms	0.00438	68	91
15	2940	160M	26.61	180	320	705	64	143	95ms	50ms	0.00438	68	109

4 POLE

kW	Speed	Frame	400V Amps	Brake Torque Nm	AC	L	LD	X	Cut-in	Cut-out	J _{BRAKE}	dB (A)	kg
0.25	1360	71M	0.84	12	145	307	27	94	30ms	15ms	0.00014	50	6.5
0.37	1370	71M	1.1	12	145	307	27	94	30ms	15ms	0.00014	50	8.3
0.55	1370	80M	1.58	16	165	353	27	105	30ms	15ms	0.00021	52	9.6
0.75	1380	80M	1.93	16	165	353	27	105	30ms	15ms	0.00021	52	13
1.1	1400	90S	2.84	20	185	367	30	105	40ms	15ms	0.00039	56	18
1.5	1400	90L	3.45	20	185	392	30	105	40ms	15ms	0.00039	56	18
2.2	1420	100L	4.84	40	205	474	26	112	45ms	20ms	0.00104	59	26
3	1420	100L	6.47	40	205	474	26	112	45ms	20ms	0.00104	59	30
4	1430	112M	8.26	60	230	483	32	112	85ms	25ms	0.00135	61	35
5.5	1460	132S	11.03	90	270	553	38	112	95ms	50ms	0.00219	64	55
7.5	1460	132M	14.64	90	270	564	38	112	95ms	50ms	0.00219	64	65
11	1460	160M	20.64	180	320	705	64	143	95ms	50ms	0.00438	68	94
15	1460	160L	28.15	200	320	705	64	143	100ms	60ms	0.00408	68	109

Accessories - Force Vent Motors

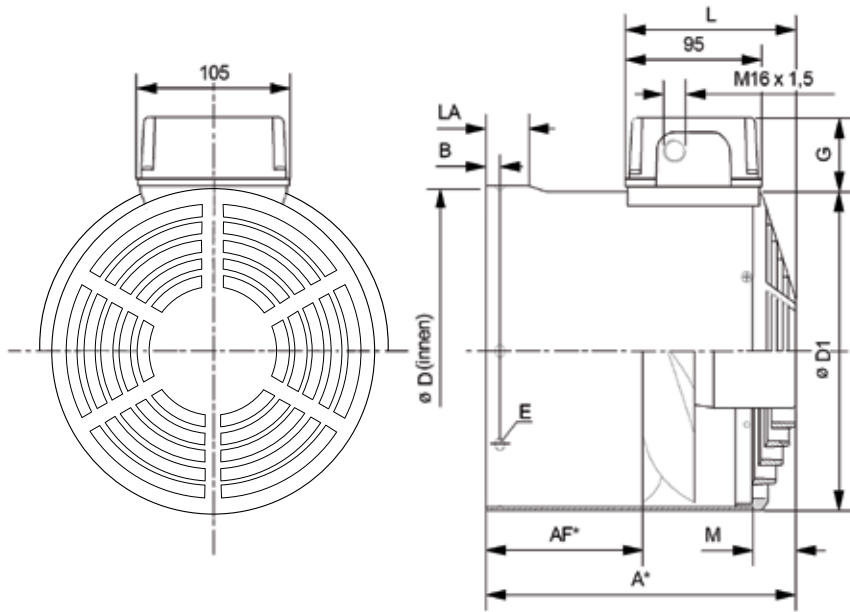
Force Vent Motors (Z)

Fenner motors are available with fixed speed cooling systems for applications that require speed control via an inverter below 25Hz operation.

The "Z" series force-vent units are pre-wired for a 230V 1 phase supply but the capacitor can easily be removed to operate on a 230/400V 3 phase 50Hz supply.

These blowers are enclosed to IP66 and come with a separate terminal box for electrical connections to be made.

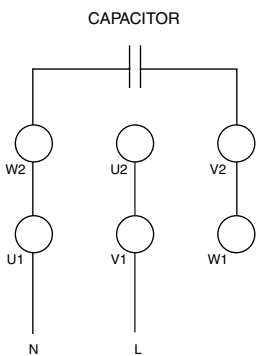
DIMENSIONS



SIZE	IEC	Fan Ø	m3/hr	db (A)	kg	A	AF	B	D	D1	E	G	L	LA	M	A	W	A ^{230V}	A ^{400V}	W
860Z0071	71	132	60	51	2.95	170	75	10	138	139	5.5 x 7	53	107	25	20	0.12	41	0.1	0.06	33
860Z0080	80	150	88	55	3.1	170	75	15	154	157	5.5 x 7	53	107	-	20	0.13	44	0.1	0.06	34.0
860Z0090	90	169	169	58	3.4	180	75	10	174	177	5.5 x 7	53	117	-	30	0.27	87	0.28	0.16	90
860Z0100	100	187	208	59	3.65	190	85	15	194	195	5.5 x 7	53	117	25	30	0.29	94	0.28	0.16	93
860Z0112	112	210	295	61	3.95	195	90	21	218	219	5.5 x 7	53	117	40	30	0.31	107	0.28	0.16	94
860Z0132	132	250	450	69	4.15	240	113	22	258	258	5.5 x 7	54	127	45	40	0.59	185	0.45	0.24	148
860Z0160	160	300	780	74	5.2	300	148	20	312	311	5.5 x 7	54	127	50	40	0.93	225	0.85	0.51	280

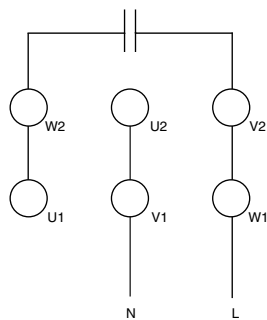
ELECTRICAL CONNECTION

230V 1 Phase 50Hz



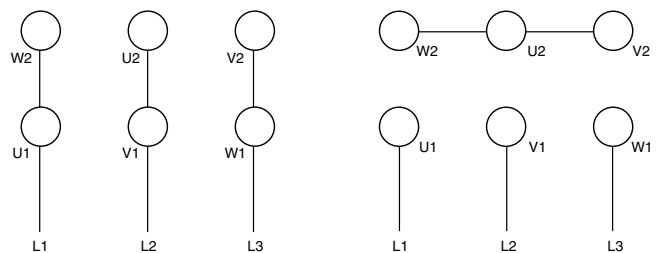
CLOCKWISE ROTATION

CAPACITOR



ANTI-CLOCKWISE ROTATION

230/400V 3 Phase 50Hz



230V 3 Phase 50Hz DELTA

400V 3 Phase 50Hz STAR

Accessories - Clutch/Brake Motors

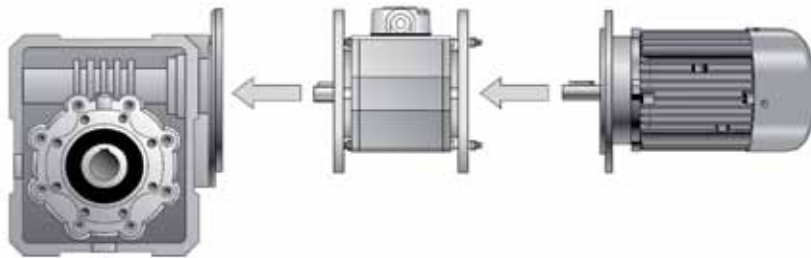
Clutch/Brake Units (L)

Fenner Clutch/Brake units (Series L) are designed to fit between motor and gearbox using a standard B5 IEC flange. The range is available for 63-112 frames and are sealed to IP55 and controlled by 24V DC signal.

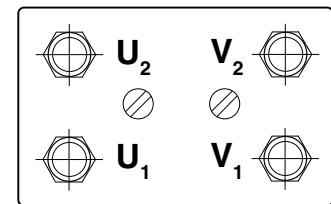
DIMENSIONS

DATA	Symbol	Units	860L07 _	860L09 _	860L11 _	860L14 _
Nominal Torque	M	Nm	7.5	15	30	75
Input Electric Power	P	W	12	17	22	35
Rated Voltage	Vn	Vdc	24	24	24	24
Rated Current	In	A	0.5	0.7	0.92	1.46
Moment of Inertia	J	kgm ²	0.14 • 10 ⁻³	0.56 • 10 ⁻³	1.25 • 10 ⁻³	4.15 • 10 ⁻³
Permissible friction work per operation	Wm	KJ	7	10	33	55
Permissible friction work per hour	Wh	KJ/h	260	300	330	360
Total friction work (operational life)	Wt	MJ	280	500	730	1220
Switch-on-time (clutch or brake)	t1	ms	20	30	45	60
Switch-off-time (clutch or brake)	t2	ms	30	60	75	100
Air Gap	s	mm	0.3	0.35	0.35	0.35
Weight	m	kg	4.6	6.9	10.3	16.5

ASSEMBLY DIAGRAM

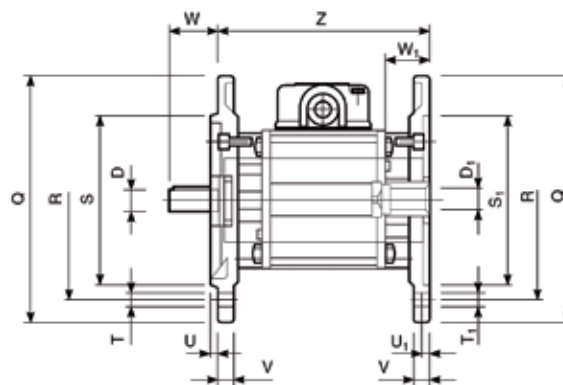


ELECTRICAL CONNECTION



U₁ Shared V₁ Not Used
 U₂ Brake V₂ Clutch

DIMENSIONS



SIZE	IEC	Size	Nm	W	Amps	D	D1	Q	R	S	S1	T	T1	U	U1	V	W	W1	Z	kg ~
860L0763	63	07	7.5	12	0.5	11 h6	11 G7	140	115	95 h8	95 H8	9	M8	3	3.5	10	23	24	137	4.6
60L0971	71	09	15	17	0.7	14 h6	14 G7	160	130	110 h8	110 H8	9	M8	3.5	4	10	30	31	160	6.9
60L1180	80	11	30	22	0.92	19 h6	19 G7	200	165	130 h8	130 H8	11	M10	3.5	4	12	40	41	190	10.3
860L1190	90	11	30	22	0.92	24 h6	24 G7	200	165	130 h8	130 H8	11	M10	3.5	4	12	50	51	190	10.3
860L1410	100	14	75	35	1.46	28 h6	28 G7	250	215	180 h8	180 H8	14	M12	4	4.5	14	60	61	224	16.5
860L1411	112	14	75	35	1.46	28 h6	28 G7	250	215	180 h8	180 H8	14	M12	4	4.5	14	60	61	224	16.5

- Weight given excludes motor - for additional motor dimensions and motor weight refer to page XXX

Accessories - Disc Variators

Fenner Disc Variators (X)

Fenner Disc Variators use a friction system to vary drive transmission speed. To correctly select a variator, you need to know the required torque and refer to the selection tables below.

Care must be taken to ensure that the number of starts does not exceed 10 per minute. You should apply an appropriate service factor to the variator selection to ensure that there is sufficient torque for the application.

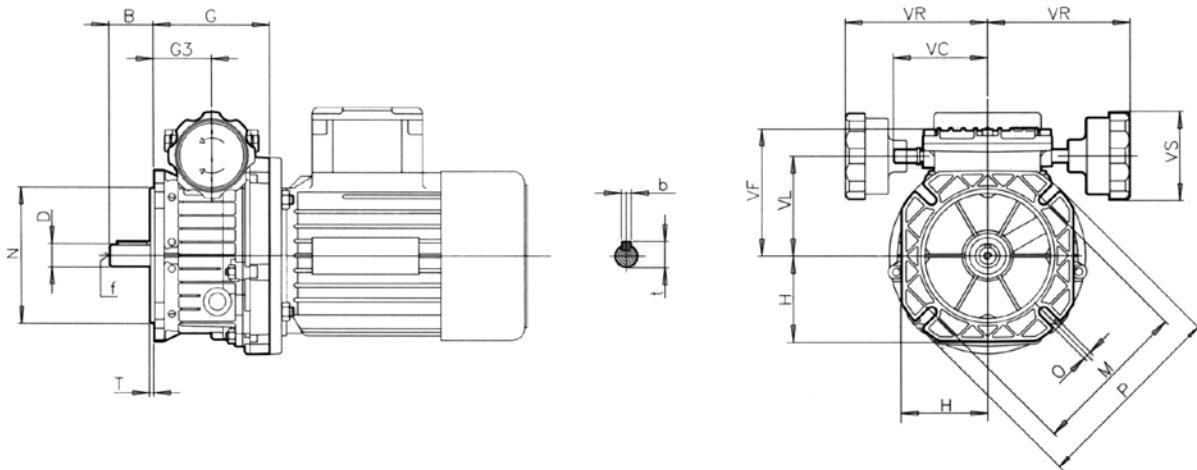
The Fenner variator range offers an IEC B5 flange on both input and output to enable fitting between gearhead and standard motor. The range is available in 63-90 frame in Aluminium design and from 100-132 frame in a Cast Iron housing.

Speed range is available as 5:1 or 6:1 depending on the size of the unit - refer to selection tables below.

The range offers silent, vibration-free running while maintaining a relatively high efficiency.

Motor Size	2P	Speed Range	Output Torque	4P	Speed Range	Output Torque
0.18kW	-	-	-	860X0201	880 - 170rpm	1.6 - 3.3Nm
0.25kW	860X0203	1760 - 340rpm	1.1 - 2.7Nm	860X0506	1000 - 170rpm	2.0 - 6.0Nm
0.37kW	860X0509	2000 - 340rpm	1.7 - 4.0Nm	860X0508	1000 - 170rpm	3.0 - 6.0Nm
0.55kW	860X0510	2000 - 340rpm	2.2 - 6.0Nm	860X1016	1000 - 170rpm	4.4 - 12.0Nm
0.75kW	860X1019	2000 - 340rpm	3.2 - 6.0Nm	860X1018	1000 - 170rpm	6.0 - 12.0Nm
1.1kW	860X1020	2000 - 340rpm	4.4 - 12.0Nm	860X2024	1000 - 190rpm	9.0 - 24.0Nm
1.5kW	860X2026	2000 - 380rpm	6.0 - 24.0Nm	860X2028	1000 - 190rpm	12.0 - 24.0Nm
2.2kW	860X2029	2000 - 380rpm	9.0 - 24.0Nm	860X3036	1000 - 190rpm	18.0 - 48.0Nm
3.0kW	-	-	-	860X3038	1000 - 190rpm	24.0 - 48.0Nm
4.0kW	-	-	-	860X5046	1000 - 190rpm	32.0 - 64.0Nm
5.5kW	-	-	-	860X9054	1000 - 190rpm	44.0 - 144.0Nm
7.5kW	-	-	-	860X9056	1000 - 190rpm	60.0 - 144.0Nm

DIMENSIONS



SIZE	IEC	b	B	D	f	G	G3	H	M	N	O	P	t	T	VC	VF	VL	VR	VS	kg ~
860X02 __	63	4	23	11 j6	-	82.5	40	62.5	115	95 f8	9	140	12.5	3	79.5	91.5	69	116.5	71	2.3
860X05 __	71	5	30	14 j6	M6	104.0	47	70	130	110 f8	9	160	16.0	3.5	79.5	104.5	82	116.5	71	4.0
860X10 __	80	6	40	19 j6	M6	131.5	57	90	165	130 f8	11	200	21.5	3.5	89.5	127.0	103	126.5	71	6.7
860X20 __	90	8	60	28 j6	M10	173.0	105.5	108	215	180 f8	14	250	27.0	4	97	152.0	108	117.0	90	-
860X30 __	100	8	80	38 j6	M12	207.5	123.5	134	265	230 f8	14	300	31.0	5	135	186.5	134	155.0	120	-
860X50 __	112	8	80	38 j6	M12	207.5	123.5	134	265	230 f8	14	300	31.0	5	135	186.5	134	155.0	120	-
860X90 __	132	10	80	42 k6	M12	266.0	164.5	165	300	250 f8	18	350	41.0	5	161	233.5	165	183.0	120	-

~ Weight given excludes motor - for additional motor dimensions and motor weight refer to pages 165-168

Lubrication

Lubrication

The Fenner range of variators are pre-filled for use in a horizontal mounting position. Should the mounting position be different it is important to top up the lubricant according to the table below.

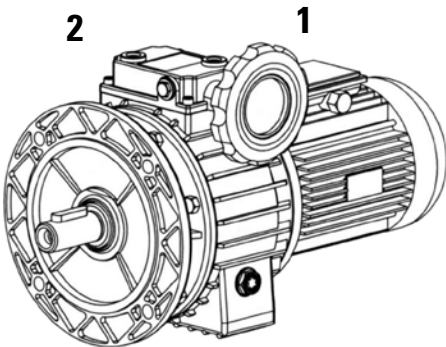
Sizes X02 / X05 and X10 are maintenance free but larger units require routine maintenance - for details of oil changes and lubricant type please refer to installation and maintenance instructions supplied with unit.

Size	B3/B5	B6/B7	B8	V1	V5	V3	V6
860X02 __	0.11	0.11	0.29	0.29	0.29	0.29	0.29
860X05 __	0.15	0.15	0.46	0.46	0.46	0.46	0.46
860X10 __	0.38	0.38	0.86	0.86	0.86	0.86	0.86
860X20 __	0.80	0.80	0.80	1.72	1.72	1.09	1.09
860X30 __	1.55	1.55	1.55	2.75	2.75	2.29	2.29
860X50 __	1.55	1.55	1.55	2.75	2.75	2.29	2.29

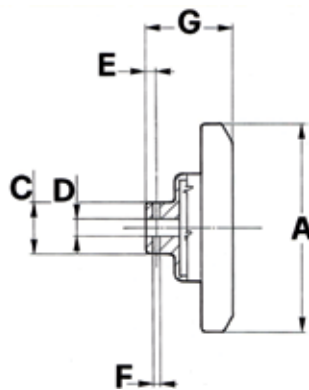
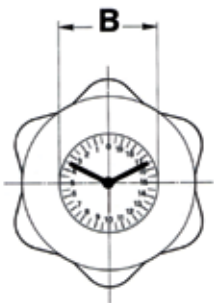
Control Options

The standard Control wheel can be positioned on either side of the variator. The standard position is on the LEFT Hand side as viewed from the motor side of the unit when control shaft is at the top.

An alternative Gravitational Indicator is also available which indicates the operational speed. The position of the handwheel is necessary to ensure supply of the correct component - see below for details.



Size	POSITION 1	POSITION 2
860X02 __	860X0001	860X0004
860X05 __	860X0001	860X0004
860X10 __	860X0001	860X0004
860X20 __	860X0002	860X0005
860X30 __	860X0003	860X0006
860X50 __	860X0003	860X0006
860X90 __	860X0003	860X0006



SIZE	A	B	C	D	E	F	G
860X0001	71	55	26	10	5	4	34
860X0002	90	57	22	10	6	4	47
860X0003	120	57	30	12	6	5	50
860X0004	71	55	26	10	5	4	34
860X0005	90	57	22	10	6	4	47
860X0006	120	57	30	12	6	5	50