



HAVELLS

Smoke Extraction



Firex
SERIES
MOTOR

Catalogue 2022 **IE3** **IE2**

Overview

Havells is leading manufacturer of Induction Motors. Havells motors are extensively used in various industries and applications.

Havells "Firex series" smoke extraction motors designed to work in high temperature environment, these motors are obtained through a strict quality control system and complying with international standards specific to the product, which makes motor more reliable for smoke extraction application.

Havells offers you a complete range of Smoke Extraction motors ranging classes F250, F300 and F400, single-speed or two-speed; following are the technical specifications of our standard smoke motors:

F 250 corresponds to 250°C for 120 min

F 300 corresponds to 300°C for 60 min

F 300 corresponds to 300°C for 120 min

F 400 corresponds to 400°C for 60 min

F 400 corresponds to 400°C for 120 min

Technical Specification Standards & Regulation

In addition to relevant standards & regulations, EN 12101-3 applies for non-portable fire-fighting systems, Systems for controlling smoke & heat flows, specification for smoke & heat extraction units.

Smoke Motor Specifications

Rated Power	0.37 kW to 200 kW
IEC Frame	71 To 315
Cooling Type	TEFC & TEAO
Service Factor	1.0 STD & 1.15 Single speed AOM
Frequency	50/60 Hz $\pm$ 5% Variation
Voltage (at 50/60Hz)	220/380, 230/400, 240/415 (below 2.2kW) 380/660, 400-415/690 (2.2kW and Above)
Insulation	H - Smoke
Flying leads	Teflon 1mtr long in class H upto 160 Frame & 1.5mtr 180 Frame Onwards along with Separate T.Box assembly
Duty	S1 / S2 (only one duty at Time)
Single Speed Pole	2, 4, 6 & 8
Multi Speed Pole	2/4, 4/8, 2/6, 2/8, 4/6, 6/8
Protection	IP55 (On request IP56/IP65/IP66)
Mounting	B3, B5, B14, B35 & (B30 - Frame 80, 90, 100, 160, 180)
Paint	Smoke Grey (Other RAL on request)
Re-greasing Facilities	200 Frame and above (160/180 Frame on request)
Shaft material	EN8 (EN24 & SS410 on request)
Bearing Make	SKF/FAG
Grease	Molygraph (Grade as per Temperature)

Testing & Test Certificates

Havells smoke extraction motors are tested as per BS12101-3:2015 Norms and Havells range of motors tested for F400 for 120 minutes of operation in Applus lab.

Also, our motors have been tested and approved by TUV NORD, India Certification No. 8118853927 / 2021 / CM-HAVELLS - 01 Date: - 09.03.2021 and No: 10225819/

HAVELLS/2020/8118146699/20200629-01R Date: -22.07.2020

Applications

Havells smoke extraction motors are used for running smoke extractor fan, these smoke extraction systems are installed in large buildings, shopping malls, factories, warehouses, enclosed parking lots and tunnels.

In other words, they are used where a large concentration of people in commercial and industrial facilities are present.

Additional advantages include reduction of damage and preventing financial & life loss by extracting smoke, reduction of roof temperatures and delay in fire spreading.



Benefits

The Smoke-Extraction Motors operate as so-called “Dual-Function Motors”:

- Normal operation (no instance of fire): Incoming/Outgoing air flow
- Fault operation (in case of fire):
 - Removal of smoke from escape & access routes
 - Supporting firefighting by creating a smoke-free zone
 - Protecting devices & equipment
 - Reducing the heat stress of components during a fire
 - Reducing secondary damage due to thermal bi-products & hot gases
- The declared nameplate performance unchanged at elevated temperatures. This helps to design the smoke extraction systems in compact size.
- Radial-Flow & Axial-Flow fan drive are possible.
- Self-ventilated motors with a metal fan impeller can be used as radial-flow fan drives.
- Forced Air Cooled Motors can be used as axial-flow fan drives taking into account the required volumetric flow of motor cooling. In this case the driven fan performs the ventilation.

Section - I

Performance data for
Standard 415 V 50 Hz
IE3 / IE2 Motors



Performance Chart

IE3

Three-Phase Squirrel Cage Induction Motor	
Voltage	415±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

3000 RPM (2 Pole)

Sr.No	Frame Size	Output		Speed r/min	Efficiency			Power Factor (cosφ)			Rated Full load Current A	Direct-ON-Line Starter			Moment of inertia GD2 (Kgm ²)	Weight Kg (Approx.)
		kW	HP		100%	75%	50%	100%	75%	50%		Starting Current (%)	Starting Torque (%)	Pull-Out Torque (%)		
1	71Z	0.37	0.5	2830	73.8	73.8	72.6	0.78	0.73	0.66	0.9	550	210	240	0.002	7.8
2	71Z	0.55	0.75	2830	77.8	77.8	76.7	0.8	0.75	0.68	1.2	550	200	240	0.003	8.1
3	80Z	0.75	1	2840	80.7	80.7	79.6	0.82	0.78	0.72	1.6	650	220	240	0.004	15.3
4	80Z	1.1	1.5	2850	82.7	82.7	81.7	0.82	0.78	0.72	2.3	650	230	260	0.005	15.7
5	90S	1.5	2	2860	84.2	84.2	83.1	0.85	0.81	0.75	2.9	700	220	250	0.012	21.3
6	90L	2.2	3	2860	85.9	85.9	84.8	0.88	0.84	0.78	4	750	220	250	0.012	22.3
7	100L	3.7	5	2920	87.8	87.8	86.8	0.86	0.83	0.77	6.8	750	220	250	0.018	31
8	132S	5.5	7.5	2900	89.2	89.2	88.3	0.89	0.86	0.81	9.6	750	220	250	0.068	57
9	132S	7.5	10	2900	90.1	90.1	89.2	0.9	0.87	0.82	12.9	750	230	250	0.071	64
10	160M	11	15	2930	91.2	91.2	90.3	0.88	0.85	0.8	19.1	750	220	250	0.246	113
11	160M	15	20	2930	91.9	91.9	91	0.89	0.86	0.81	25.5	750	220	250	0.284	133
12	160L	18.5	25	2930	92.4	92.4	91.5	0.9	0.87	0.82	31	750	220	240	0.359	136
13	180M	22	30	2935	92.7	92.7	91.8	0.9	0.87	0.82	36.7	750	220	250	0.414	172
14	200L	30	40	2950	93.3	93.3	92.4	0.9	0.87	0.82	49.7	750	200	245	0.775	241
15	200L	37	50	2950	93.7	93.7	92.8	0.88	0.85	0.8	62.4	750	220	250	0.99	246
16	225M	45	60	2950	94	94	93.1	0.9	0.88	0.84	74	750	220	250	1.78	319
17	250M	55	75	2950	94.3	94.3	93.4	0.9	0.88	0.84	90.2	750	200	240	2.145	407
18	280S	75	100	2975	94.7	94.7	93.8	0.92	0.9	0.86	119.8	750	210	250	4.635	640
19	280M	90	120	2975	95	95	94.1	0.91	0.89	0.85	144.8	750	220	250	5.319	644

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Performance Chart

IE3

Three-Phase Squirrel Cage Induction Motor	
Voltage	415±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

1500 RPM (4 Pole)

Sr.No	Frame Size	Output		Speed r/min	Efficiency			Power Factor (cosφ)			Rated Full load Current A	Direct-ON-Line Starter			Moment of inertia GD2 (Kgm ²)	Weight Kg (Approx.)
		kW	HP		100%	75%	50%	100%	75%	50%		Starting Current (%)	Starting Torque (%)	Pull-Out Torque (%)		
1	71Z	0.37	0.5	1385	77.3	77.3	74.3	0.73	0.67	0.58	0.91	650	200	240	0.004	7.8
2	80Z	0.55	0.75	1400	80.8	80.8	79.9	0.75	0.69	0.6	1.3	600	220	240	0.010	14.3
3	80Z	0.75	1	1420	82.5	82.5	81.5	0.74	0.69	0.61	1.7	650	220	260	0.011	15.8
4	90S	1.1	1.5	1430	84.1	84.1	83.1	0.79	0.74	0.67	2.3	650	220	250	0.022	23.3
5	90L	1.5	2	1430	85.3	85.3	84.4	0.83	0.79	0.71	2.9	650	210	250	0.025	25.3
6	100L	2.2	3	1455	86.7	86.7	85.8	0.78	0.74	0.66	4.5	700	210	240	0.046	32
7	112M	3.7	5	1450	88.4	88.4	87.5	0.82	0.78	0.71	7.1	700	220	250	0.061	41
8	132S	5.5	7.5	1450	89.6	89.6	88.7	0.81	0.77	0.7	10.5	700	230	260	0.148	63
9	132M	7.5	10	1450	90.4	90.4	89.5	0.82	0.78	0.71	14.1	700	220	250	0.163	76
10	160M	11	15	1460	91.4	91.4	90.5	0.85	0.81	0.74	19.7	720	210	260	0.456	115
11	160L	15	20	1465	92.1	92.1	91.2	0.85	0.81	0.74	26.7	720	210	250	0.501	137
12	180M	18.5	25	1465	92.6	92.6	91.7	0.83	0.79	0.72	33.5	650	215	250	0.680	167
13	180L	22	30	1465	93	93	92.1	0.85	0.81	0.75	38.7	700	200	250	0.742	170
14	200L	30	40	1465	93.6	93.6	92.7	0.83	0.8	0.73	53.7	700	210	250	1.600	252
15	225S	37	50	1475	93.9	93.9	93	0.85	0.82	0.75	64.5	700	220	260	1.840	286
16	225M	45	60	1475	94.2	94.2	93.3	0.86	0.83	0.77	77.3	700	220	250	2.112	323
17	250M	55	75	1475	94.6	94.6	93.9	0.86	0.83	0.77	94.1	700	240	265	3.850	426
18	280S	75	100	1485	95	95	94.1	0.87	0.84	0.78	126	750	220	250	4.928	634
19	280M	90	120	1485	95.2	95.2	94.3	0.88	0.85	0.8	149.5	750	220	250	6.424	652

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Performance Chart

IE3

Three-Phase Squirrel Cage Induction Motor	
Voltage	415±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

1000 RPM (6 Pole)

Sr.No	Frame Size	Output		Speed r/min	Efficiency			Power Factor (cosφ)			Rated Full load Current A	Direct-ON-Line Starter			Moment of inertia GD2 (Kgm ²)	Weight Kg (Approx.)
		kW	HP		100%	75%	50%	100%	75%	50%		Starting Current (%)	Starting Torque (%)	Pull-Out Torque (%)		
1	80Z	0.37	0.5	920	73.5	73.3	72.3	0.7	0.64	0.54	1	400	170	210	0.010	13.3
2	80Z	0.55	0.75	920	77.2	77	76	0.71	0.66	0.57	1.4	450	180	220	0.011	17.3
3	90S	0.75	1	920	78.9	78.9	78	0.72	0.67	0.59	1.8	650	180	220	0.023	22.3
4	90L	1.1	1.5	915	81	81	80.1	0.75	0.7	0.62	2.5	650	180	220	0.025	25.3
5	100L	1.5	2	935	82.5	82.5	81.7	0.75	0.7	0.62	3.4	650	190	210	0.052	30
6	112M	2.2	3	950	84.3	84.3	83.4	0.75	0.7	0.63	4.8	600	210	240	0.075	47
7	132S	3.7	5	960	86.5	86.5	85.6	0.74	0.7	0.62	8	650	200	240	0.220	65
8	132M	5.5	7.5	975	88	88	87.1	0.75	0.71	0.63	11.6	600	200	240	0.242	76
9	160M	7.5	10	975	89.1	89.1	88.2	0.8	0.76	0.68	14.6	700	200	240	0.450	129
10	160L	11	15	965	90.3	90.3	89.4	0.79	0.75	0.68	21.5	700	200	280	0.472	132
11	180L	15	20	975	91.2	91.2	90.3	0.82	0.78	0.71	28	720	200	250	0.990	168
12	200L	18.5	25	975	91.7	91.7	90.8	0.8	0.76	0.69	35	700	200	230	2.050	220
13	200L	22	30	980	92.2	92.2	91.3	0.83	0.79	0.72	40	750	200	230	2.260	221
14	225M	30	40	980	92.9	92.9	92	0.83	0.79	0.72	54.1	750	200	250	3.520	328
15	250M	37	50	980	93.3	93.3	92.6	0.83	0.8	0.73	67	750	200	240	5.750	405
16	280S	45	60	985	93.7	93.7	92.8	0.85	0.82	0.75	78.6	750	200	240	8.100	682
17	280M	55	75	985	94.1	94.1	93.2	0.84	0.81	0.74	96.8	750	200	240	8.510	724

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Performance Chart



Three-Phase Squirrel Cage Induction Motor	
Voltage	415±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

3000 RPM (2 Pole)

Sr.No	Frame Size	Output		Speed r/min	Efficiency			Power Factor (cosφ)			Rated Full load Current A	Direct-ON-Line Starter			Moment of inertia GD2 (Kgm ²)	Weight Kg (Approx.)
		kW	HP		100%	75%	50%	100%	75%	50%		Starting Current (%)	Starting Torque (%)	Pull-Out Torque (%)		
1	71Z	0.37	0.5	2800	69.5	69.5	68.4	0.78	0.73	0.65	0.94	500	220	245	0.002	6.8
2	71Z	0.55	0.75	2800	74.1	74.1	73.1	0.79	0.74	0.66	1.3	500	210	240	0.002	7
3	80Z	0.75	1	2830	77.4	77.4	74.5	0.8	0.76	0.69	1.7	600	240	270	0.004	14.3
4	80Z	1.1	1.5	2840	79.6	79.6	78.2	0.8	0.76	0.69	2.4	600	250	280	0.004	14.7
5	90S	1.5	2	2850	81.3	81.3	80.1	0.85	0.81	0.74	3	650	230	250	0.010	20.3
6	90L	2.2	3	2840	83.2	83.2	82.1	0.88	0.84	0.77	4.2	700	220	250	0.012	21.3
7	100L	3.7	5	2920	85.5	85.5	84.8	0.86	0.83	0.76	7	700	240	270	0.013	30
8	132S	5.5	7.5	2890	87	87	86.1	0.89	0.86	0.8	9.9	700	240	270	0.056	56
9	132S	7.5	10	2890	88.1	88.1	86.9	0.9	0.87	0.81	13.2	700	250	290	0.068	63
10	160M	11	15	2920	89.4	89.4	88.5	0.88	0.85	0.79	19.5	700	230	260	0.226	111
11	160M	15	20	2920	90.3	90.3	89.4	0.89	0.86	0.8	26	700	230	250	0.256	132
12	160L	18.5	25	2920	90.9	90.9	90	0.89	0.86	0.81	31.8	750	225	245	0.284	135
13	180M	22	30	2930	91.3	91.3	90.4	0.9	0.87	0.82	37.2	700	220	250	0.298	168
14	200L	30	40	2945	92	92	91.1	0.9	0.87	0.82	50.4	700	210	255	0.700	228
15	200L	37	50	2945	92.5	92.5	91.6	0.88	0.85	0.8	63.2	700	220	260	0.900	243
16	225M	45	60	2945	92.9	92.9	92	0.9	0.88	0.83	75	700	225	250	1.300	313
17	250M	55	75	2945	93.2	93.2	92.3	0.9	0.88	0.83	91.2	700	220	260	1.950	415
18	280S	75	100	2970	93.8	93.8	92.9	0.92	0.9	0.85	121	700	210	250	4.560	588
19	280M	90	120	2970	94.1	94.1	93.2	0.91	0.89	0.84	146.2	700	230	275	5.100	610

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Performance Chart

IE2

Three-Phase Squirrel Cage Induction Motor	
Voltage	415±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

1500 RPM (4 Pole)

Sr.No	Frame Size	Output		Speed r/min	Efficiency			Power Factor (cosφ)			Rated Full load Current A	Direct-ON-Line Starter			Moment of inertia GD2 (Kgm ²)	Weight Kg (Approx.)
		kW	HP		100%	75%	50%	100%	75%	50%		Starting Current (%)	Starting Torque (%)	Pull-Out Torque (%)		
1	71Z	0.37	0.5	1380	72.7	72.7	71.5	0.71	0.65	0.55	1	500	220	250	0.003	7.3
2	80Z	0.55	0.75	1400	77.1	77.1	73.9	0.73	0.67	0.57	1.4	500	260	280	0.008	13.3
3	80Z	0.75	1	1410	79.6	79.6	76.4	0.75	0.7	0.61	1.7	500	240	280	0.010	15.3
4	90S	1.1	1.5	1420	81.4	81.4	80.5	0.79	0.74	0.66	2.4	600	240	270	0.019	20.3
5	90L	1.5	2	1420	82.8	82.8	81.2	0.83	0.78	0.7	3	600	250	280	0.022	23.3
6	100L	2.2	3	1450	84.3	84.3	82.8	0.78	0.73	0.66	4.7	600	240	270	0.035	31
7	112M	3.7	5	1450	86.3	86.3	85.4	0.81	0.76	0.69	7.4	650	240	290	0.052	40
8	132S	5.5	7.5	1450	87.7	87.7	86.8	0.8	0.76	0.68	10.9	650	250	280	0.135	61
9	132M	7.5	10	1450	88.7	88.7	87.2	0.82	0.78	0.7	14.3	650	240	275	0.148	68
10	160M	11	15	1460	89.8	89.8	89	0.85	0.8	0.73	20	650	220	260	0.420	113
11	160L	15	20	1460	90.6	90.6	89.8	0.84	0.78	0.71	27.4	650	230	270	0.456	135
12	180M	18.5	25	1460	91.2	91.2	90.3	0.82	0.8	0.73	34.4	650	230	250	0.600	152
13	180L	22	30	1465	91.6	91.6	90.7	0.84	0.79	0.72	39.8	650	230	280	0.680	168
14	200L	30	40	1460	92.3	92.3	91.4	0.83	0.81	0.74	54.5	650	220	250	1.450	234
15	225S	37	50	1475	92.7	92.7	91.8	0.85	0.83	0.76	65.3	650	225	260	1.650	283
16	225M	45	60	1475	93.1	93.1	92.2	0.86	0.83	0.76	78.2	650	220	250	1.840	317
17	250M	55	75	1470	93.5	93.5	92.9	0.86	0.84	0.77	95.2	650	230	250	3.500	424
18	280S	75	100	1480	94	94	93.1	0.87	0.84	0.78	128	700	230	260	4.480	609
19	280M	90	120	1485	94.2	94.2	93.3	0.87	0.86	0.8	153	700	230	260	5.840	632

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Performance Chart

IE2

Three-Phase Squirrel Cage Induction Motor	
Voltage	415±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

1000 RPM (6 Pole)

Sr.No	Frame Size	Output		Speed r/min	Efficiency			Power Factor (cosφ)			Rated Full load Current A	Direct-ON-Line Starter			Moment of inertia GD2 (Kgm2)	Weight Kg (Approx.)
		kW	HP		100%	75%	50%	100%	75%	50%		Starting Current (%)	Starting Torque (%)	Pull-Out Torque (%)		
1	80Z	0.37	0.5	910	67.6	67.4	65.2	0.7	0.63	0.54	1.1	378	180	210	0.008	12.3
2	80Z	0.55	0.75	910	73.1	72.9	70	0.71	0.65	0.57	1.5	400	180	220	0.010	14.3
3	90S	0.75	1	910	75.9	75.9	74.7	0.66	0.6	0.52	2.31	600	220	230	0.018	21.3
4	90L	1.1	1.5	910	78.1	78.1	76.9	0.71	0.66	0.58	2.8	600	200	220	0.023	21.3
5	100L	1.5	2	930	79.8	79.8	77.8	0.72	0.67	0.59	3.6	600	190	220	0.045	29.2
6	112M	2.2	3	940	81.8	81.8	79.6	0.72	0.67	0.59	5.2	600	230	260	0.057	38
7	132S	3.7	5	950	84.3	84.3	82.8	0.72	0.67	0.6	8.5	600	220	250	0.216	64
8	132M	5.5	7.5	970	86	86	85.1	0.73	0.68	0.61	12.2	600	230	260	0.220	65
9	160M	7.5	10	970	87.2	87.2	86.3	0.77	0.72	0.65	15.5	650	220	250	0.354	104
10	160L	11	15	960	88.7	88.7	87.8	0.77	0.73	0.65	22.4	650	245	300	0.450	131
11	180L	15	20	970	89.7	89.7	89	0.8	0.76	0.68	29.1	670	240	280	0.820	149
12	200L	18.5	25	970	90.4	90.4	89.2	0.78	0.73	0.66	36.5	650	230	260	1.790	218
13	200L	22	30	975	90.9	90.9	89.5	0.79	0.75	0.68	42.6	680	210	230	1.880	220
14	225M	30	40	975	91.7	91.7	90.8	0.82	0.78	0.71	55.5	700	220	250	3.220	327
15	250M	37	50	975	92.2	92.2	91.2	0.82	0.78	0.72	68.1	700	230	260	5.200	363
16	280S	45	60	980	92.7	92.7	91.3	0.85	0.81	0.75	79.5	700	210	250	7.500	559
17	280M	55	75	980	93.1	93.1	91.5	0.84	0.8	0.74	97.8	700	220	250	8.700	494

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Section - II

Performance Data for
different Voltages
(i.e. 380 V / 400 V)
IE3 / IE2 Motors



Three-Phase Squirrel Cage Induction Motor	
Voltage	380 / 400 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

3000 RPM (2 Pole)

Rating of Motor				380 V								400 V							
Sr. No	Frame Size	Output		Full load Speed r/min	Efficiency			Power Factor (cosφ)			Rated Current A	Full load Speed rpm	Efficiency			Power Factor (cosφ)			Rated Current A
		kW	HP		100%	75%	50%	100%	75%	50%			100%	75%	50%	100%	75%	50%	
1	71Z	0.37	0.50	2830	71.62	71.26	70.90	0.81	0.76	0.69	0.96	2822	72.49	72.12	71.76	0.81	0.75	0.68	0.92
2	71Z	0.55	0.75	2830	75.86	75.48	75.11	0.86	0.80	0.73	1.28	2822	76.64	76.25	75.87	0.85	0.91	0.72	1.22
3	80Z	0.75	1.00	2840	78.97	78.57	78.18	0.84	0.80	0.74	1.71	2831	79.66	79.26	78.86	0.84	0.86	0.73	1.63
4	80Z	1.10	1.50	2850	81.12	80.71	80.31	0.84	0.80	0.73	2.46	2841	81.75	81.34	80.94	0.83	0.85	0.73	2.34
5	90S	1.50	2.00	2860	82.74	82.33	81.92	0.89	0.85	0.78	3.10	2851	83.32	82.91	82.49	0.88	0.92	0.78	2.95
6	90L	2.20	3.00	2860	84.59	84.16	83.74	0.92	0.88	0.82	4.28	2851	85.11	84.69	84.26	0.92	0.96	0.81	4.07
7	100L	3.70	5.00	2920	86.66	86.23	85.79	0.89	0.86	0.80	7.28	2911	87.11	86.68	86.25	0.89	0.92	0.79	6.91
8	132S	5.50	7.50	2900	88.19	87.75	87.31	0.92	0.89	0.84	10.27	2891	88.59	88.15	87.71	0.92	0.95	0.84	9.76
9	132S	7.50	10.0	2900	89.18	88.73	88.29	0.93	0.89	0.84	13.81	2891	89.55	89.10	88.65	0.92	0.95	0.84	13.12
10	160M	11.0	15.0	2930	90.39	89.94	89.49	0.90	0.87	0.82	20.44	2921	90.71	90.26	89.81	0.90	0.93	0.82	19.42
11	160M	15.0	20.0	2930	91.16	90.71	90.25	0.92	0.89	0.83	27.29	2921	91.46	91.00	90.54	0.91	0.94	0.83	25.93
12	160L	18.5	25.0	2930	91.71	91.26	90.80	0.92	0.89	0.84	33.18	2921	91.99	91.53	91.07	0.92	0.95	0.84	31.52
13	180M	22.0	30.0	2935	92.05	91.59	91.13	0.92	0.89	0.84	39.28	2926	92.31	91.84	91.38	0.92	0.95	0.84	37.31
14	200L	30.0	40.0	2950	92.71	92.25	91.79	0.92	0.89	0.84	53.19	2941	92.94	92.48	92.02	0.92	0.95	0.84	50.53
15	200L	37.0	50.0	2950	93.15	92.69	92.22	0.90	0.87	0.82	66.78	2941	93.37	92.90	92.44	0.90	0.93	0.82	63.45
16	225M	45.0	60.0	2950	93.49	93.02	92.55	0.92	0.90	0.86	79.20	2941	93.69	93.22	92.75	0.92	0.95	0.86	75.24
17	250M	55.0	75.0	2950	93.82	93.35	92.88	0.92	0.90	0.86	96.54	2941	94.01	93.54	93.07	0.92	0.94	0.86	91.71
18	280S	75.0	100	2975	94.26	93.79	93.32	0.94	0.92	0.88	128.22	2966	94.44	93.96	93.49	0.94	0.96	0.88	121.81
19	280M	90.0	120	2975	94.60	94.12	93.65	0.93	0.91	0.87	154.97	2966	94.76	94.28	93.81	0.93	0.95	0.87	147.23

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Performance Chart

IE3

Three-Phase Squirrel Cage Induction Motor	
Voltage	380 / 400 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

1500 RPM (4 Pole)

Rating of Motor				380 V								400 V							
Sr. No	Frame Size	Output		Full load Speed r/min	Efficiency			Power Factor (cosφ)			Rated Current A	Full load Speed rpm	Efficiency			Power Factor (cosφ)			Rated Current A
		kW	HP		100%	75%	50%	100%	75%	50%			100%	75%	50%	100%	75%	50%	
1	71Z	0.37	0.50	1385	75.33	74.95	74.58	0.77	0.70	0.61	0.97	1381	76.12	75.73	75.36	0.76	0.70	0.60	0.93
2	80Z	0.55	0.75	1400	79.07	78.68	78.28	0.76	0.70	0.61	1.39	1396	79.76	79.36	78.97	0.75	0.76	0.60	1.32
3	80Z	0.75	1.00	1420	80.90	80.50	80.10	0.77	0.72	0.64	1.82	1416	81.54	81.13	80.73	0.77	0.80	0.63	1.73
4	90S	1.10	1.50	1430	82.63	82.22	81.81	0.82	0.77	0.70	2.46	1426	83.22	82.80	82.39	0.82	0.85	0.69	2.34
5	90L	1.50	2.00	1430	83.93	83.51	83.10	0.87	0.83	0.75	3.10	1426	84.48	84.06	83.64	0.87	0.92	0.74	2.95
6	100L	2.20	3.00	1455	85.46	85.03	84.61	0.81	0.77	0.69	4.82	1451	85.95	85.53	85.10	0.81	0.84	0.68	4.58
7	112M	3.70	5.00	1450	87.31	86.88	86.44	0.85	0.81	0.73	7.60	1446	87.75	87.31	86.87	0.84	0.87	0.73	7.22
8	132S	5.50	7.50	1450	88.63	88.19	87.75	0.84	0.80	0.73	11.24	1446	89.02	88.57	88.13	0.84	0.87	0.72	10.68
9	132M	7.50	10.0	1450	89.51	89.06	88.62	0.84	0.80	0.73	15.09	1446	89.86	89.42	88.97	0.84	0.86	0.73	14.34
10	160M	11.0	15.0	1460	90.61	90.16	89.71	0.87	0.83	0.76	21.08	1456	90.92	90.47	90.02	0.87	0.90	0.76	20.03
11	160L	15.0	20.0	1465	91.38	90.93	90.47	0.87	0.83	0.76	28.58	1461	91.67	91.21	90.75	0.87	0.89	0.76	27.15
12	180M	18.5	25.0	1465	91.94	91.48	91.02	0.85	0.81	0.74	35.85	1461	92.20	91.74	91.28	0.85	0.87	0.74	34.06
13	180L	22.0	30.0	1465	92.38	91.92	91.46	0.87	0.83	0.77	41.42	1461	92.62	92.16	91.70	0.87	0.90	0.77	39.35
14	200L	30.0	40.0	1465	93.04	92.58	92.11	0.85	0.82	0.75	57.47	1461	93.26	92.80	92.33	0.85	0.87	0.75	54.60
15	225S	37.0	50.0	1475	93.37	92.91	92.44	0.87	0.84	0.77	69.03	1471	93.58	93.11	92.65	0.87	0.89	0.77	65.58
16	225M	45.0	60.0	1475	93.71	93.24	92.77	0.88	0.85	0.79	82.73	1471	93.90	93.43	92.97	0.88	0.90	0.79	78.59
17	250M	55.0	75.0	1475	94.15	93.68	93.21	0.88	0.85	0.79	100.71	1471	94.33	93.86	93.39	0.88	0.90	0.79	95.68
18	280S	75.0	100	1485	94.60	94.12	93.65	0.89	0.86	0.80	134.85	1481	94.76	94.28	93.81	0.89	0.92	0.80	128.11
19	280M	90.0	120	1485	94.82	94.35	93.87	0.90	0.87	0.82	160.00	1481	94.97	94.49	94.02	0.90	0.92	0.82	152.00

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Three-Phase Squirrel Cage Induction Motor	
Voltage	380 / 400 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

1000 RPM (6 Pole)

Rating of Motor				380 V								400 V							
Sr. No	Frame Size	Output		Full load Speed r/min	Efficiency			Power Factor (cosφ)			Rated Current A	Full load Speed rpm	Efficiency			Power Factor (cosφ)			Rated Current A
		kW	HP		100%	75%	50%	100%	75%	50%			100%	75%	50%	100%	75%	50%	
1	80Z	0.37	0.50	920	71.30	70.94	70.59	0.74	0.67	0.57	1.07	917	72.18	71.81	71.46	0.73	0.67	0.56	1.02
2	80Z	0.55	0.75	920	75.22	74.85	74.47	0.74	0.69	0.60	1.50	917	76.01	75.63	75.25	0.73	0.77	0.59	1.42
3	90S	0.75	1.00	920	77.04	76.65	76.27	0.77	0.71	0.63	1.93	917	77.78	77.39	77.01	0.76	0.81	0.62	1.83
4	90L	1.10	1.50	915	79.29	78.89	78.50	0.79	0.74	0.65	2.68	912	79.97	79.57	79.17	0.78	0.82	0.65	2.54
5	100L	1.50	2.00	935	80.90	80.50	80.10	0.77	0.72	0.64	3.64	932	81.54	81.13	80.73	0.77	0.79	0.63	3.46
6	112M	2.20	3.00	950	82.85	82.44	82.02	0.79	0.73	0.66	5.14	947	83.43	83.01	82.60	0.78	0.82	0.66	4.88
7	132S	3.70	5.00	960	85.24	84.81	84.39	0.77	0.73	0.65	8.56	957	85.74	85.32	84.89	0.77	0.80	0.64	8.13
8	132M	5.50	7.50	975	86.88	86.44	86.01	0.77	0.73	0.65	12.42	972	87.33	86.89	86.46	0.77	0.80	0.65	11.79
9	160M	7.50	10.0	975	88.08	87.64	87.20	0.83	0.79	0.70	15.63	972	88.49	88.05	87.61	0.82	0.85	0.70	14.84
10	160L	11.0	15.0	965	89.40	88.95	88.51	0.81	0.77	0.70	23.01	962	89.76	89.31	88.86	0.81	0.83	0.70	21.86
11	180L	15.0	20.0	975	90.39	89.94	89.49	0.84	0.80	0.73	29.97	972	90.71	90.26	89.81	0.84	0.86	0.73	28.47
12	200L	18.5	25.0	975	90.94	90.49	90.03	0.83	0.78	0.71	37.46	972	91.24	90.79	90.33	0.82	0.85	0.71	35.59
13	200L	22.0	30.0	980	91.49	91.04	90.58	0.85	0.81	0.74	42.81	977	91.77	91.32	90.86	0.85	0.87	0.74	40.67
14	225M	30.0	40.0	980	92.27	91.81	91.35	0.85	0.81	0.74	57.90	977	92.52	92.06	91.60	0.85	0.87	0.74	55.01
15	250M	37.0	50.0	980	92.71	92.25	91.79	0.85	0.82	0.74	71.71	977	92.94	92.48	92.02	0.84	0.86	0.74	68.12
16	280S	45.0	60.0	985	93.15	92.69	92.22	0.87	0.84	0.77	84.12	982	93.37	92.90	92.44	0.87	0.89	0.77	79.92
17	280M	55.0	75.0	985	93.60	93.13	92.66	0.86	0.83	0.76	103.60	982	93.80	93.33	92.86	0.86	0.88	0.76	98.42
18	280S	75.0	100	1485	94.60	94.12	93.65	0.89	0.86	0.80	134.85	1481	94.76	94.28	93.81	0.89	0.92	0.80	128.11
19	280M	90.0	120	1485	94.82	94.35	93.87	0.90	0.87	0.82	160.00	1481	94.97	94.49	94.02	0.90	0.92	0.82	152.00

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Performance Chart

IE2

Three-Phase Squirrel Cage Induction Motor	
Voltage	380 / 400 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

3000 RPM (2 Pole)

Rating of Motor				380 V								400 V							
Sr. No	Frame Size	Output		Full load Speed r/min	Efficiency			Power Factor (cosφ)			Rated Current A	Full load Speed rpm	Efficiency			Power Factor (cosφ)			Rated Current A
		kW	HP		100%	75%	50%	100%	75%	50%			100%	75%	50%	100%	75%	50%	
1	71Z	0.37	0.50	2800	67.10	66.76	66.43	0.83	0.78	0.69	1.01	2792	68.05	67.71	67.37	0.82	0.77	0.68	0.96
2	71Z	0.55	0.75	2800	71.93	71.57	71.22	0.83	0.78	0.70	1.39	2792	72.80	72.43	72.07	0.83	0.87	0.69	1.32
3	80Z	0.75	1.00	2830	75.44	75.06	74.68	0.83	0.79	0.72	1.82	2822	76.22	75.84	75.46	0.82	0.85	0.71	1.73
4	80Z	1.10	1.50	2840	77.79	77.40	77.01	0.84	0.79	0.72	2.57	2831	78.51	78.12	77.73	0.83	0.87	0.71	2.44
5	90S	1.50	2.00	2850	79.61	79.21	78.82	0.89	0.85	0.78	3.21	2841	80.29	79.88	79.49	0.88	0.93	0.77	3.05
6	90L	2.20	3.00	2840	81.66	81.25	80.84	0.91	0.87	0.80	4.50	2831	82.28	81.86	81.45	0.90	0.94	0.79	4.27
7	100L	3.70	5.00	2920	84.15	83.73	83.31	0.89	0.86	0.79	7.49	2911	84.69	84.27	83.85	0.89	0.92	0.78	7.12
8	132S	5.50	7.50	2890	85.79	85.36	84.93	0.92	0.89	0.83	10.60	2881	86.27	85.84	85.41	0.91	0.94	0.82	10.07
9	132S	7.50	10.0	2890	86.99	86.55	86.12	0.93	0.90	0.83	14.13	2881	87.43	86.99	86.56	0.92	0.95	0.83	13.42
10	160M	11.0	15.0	2920	88.41	87.97	87.53	0.91	0.87	0.81	20.87	2911	88.81	88.36	87.92	0.90	0.93	0.81	19.83
11	160M	15.0	20.0	2920	89.40	88.95	88.51	0.92	0.89	0.82	27.83	2911	89.76	89.31	88.86	0.91	0.94	0.82	26.44
12	160L	18.5	25.0	2920	90.06	89.61	89.16	0.92	0.89	0.83	34.03	2911	90.39	89.94	89.49	0.91	0.94	0.83	32.33
13	180M	22.0	30.0	2930	90.50	90.05	89.60	0.93	0.90	0.85	39.81	2921	90.82	90.36	89.91	0.92	0.95	0.84	37.82
14	200L	30.0	40.0	2945	91.27	90.82	90.36	0.93	0.89	0.84	53.94	2936	91.56	91.10	90.65	0.92	0.95	0.84	51.24
15	200L	37.0	50.0	2945	91.82	91.37	90.91	0.91	0.87	0.82	67.64	2936	92.09	91.63	91.17	0.90	0.93	0.82	64.26
16	225M	45.0	60.0	2945	92.27	91.81	91.35	0.92	0.90	0.85	80.27	2936	92.52	92.06	91.60	0.92	0.94	0.85	76.26
17	250M	55.0	75.0	2945	92.60	92.14	91.68	0.92	0.90	0.85	97.61	2936	92.84	92.37	91.91	0.92	0.95	0.85	92.73
18	280S	75	100	2970	93.26	92.80	92.33	0.94	0.92	0.87	129.50	2961	93.48	93.01	92.54	0.94	0.97	0.87	123.03
19	280M	90	120	2970	93.60	93.13	92.66	0.93	0.91	0.86	156.47	2961	93.80	93.33	92.86	0.93	0.96	0.86	148.65

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Three-Phase Squirrel Cage Induction Motor	
Voltage	380 / 400 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

1500 RPM (4 Pole)

Rating of Motor				380 V								400 V							
Sr. No	Frame Size	Output		Full load Speed r/min	Efficiency			Power Factor (cosφ)			Rated Current A	Full load Speed rpm	Efficiency			Power Factor (cosφ)			Rated Current A
		kW	HP		100%	75%	50%	100%	75%	50%			100%	75%	50%	100%	75%	50%	
1	71Z	0.37	0.50	1380	70.46	70.10	69.75	0.75	0.68	0.58	1.07	1376	71.35	70.99	70.64	0.74	0.67	0.57	1.02
2	80Z	0.55	0.75	1400	75.12	74.74	74.37	0.74	0.68	0.58	1.50	1396	75.91	75.53	75.15	0.73	0.75	0.57	1.42
3	80Z	0.75	1.00	1410	77.79	77.40	77.01	0.81	0.75	0.65	1.82	1406	78.51	78.12	77.73	0.80	0.86	0.65	1.73
4	90S	1.10	1.50	1420	79.72	79.32	78.92	0.82	0.76	0.68	2.57	1416	80.39	79.99	79.59	0.81	0.84	0.68	2.44
5	90L	1.50	2.00	1420	81.23	80.82	80.42	0.87	0.82	0.74	3.21	1416	81.86	81.45	81.04	0.87	0.91	0.73	3.05
6	100L	2.20	3.00	1450	82.85	82.44	82.02	0.80	0.75	0.68	5.03	1446	83.43	83.01	82.60	0.80	0.82	0.67	4.78
7	112M	3.70	5.00	1450	85.02	84.60	84.17	0.83	0.78	0.71	7.92	1446	85.53	85.11	84.68	0.83	0.86	0.71	7.52
8	132S	5.50	7.50	1450	86.55	86.12	85.69	0.83	0.79	0.70	11.67	1446	87.01	86.57	86.14	0.82	0.85	0.70	11.08
9	132M	7.50	10.0	1450	87.64	87.20	86.77	0.85	0.81	0.73	15.30	1446	88.07	87.63	87.19	0.85	0.88	0.72	14.54
10	160M	11.0	15.0	1460	88.85	88.41	87.96	0.88	0.83	0.75	21.41	1456	89.23	88.78	88.34	0.88	0.90	0.75	20.34
11	160L	15.0	20.0	1460	89.73	89.28	88.83	0.87	0.80	0.73	29.33	1456	90.08	89.63	89.18	0.86	0.89	0.73	27.86
12	180M	18.5	25.0	1460	90.39	89.94	89.49	0.84	0.82	0.75	36.82	1456	90.71	90.26	89.81	0.84	0.87	0.75	34.98
13	180L	22.0	30.0	1465	90.83	90.38	89.92	0.86	0.81	0.74	42.60	1461	91.14	90.68	90.23	0.86	0.89	0.74	40.47
14	200L	30.0	40.0	1460	91.60	91.15	90.69	0.85	0.83	0.76	58.33	1456	91.88	91.42	90.96	0.85	0.87	0.76	55.41
15	225S	37.0	50.0	1475	92.05	91.59	91.13	0.87	0.85	0.78	69.89	1471	92.31	91.84	91.38	0.87	0.90	0.78	66.39
16	225M	45.0	60.0	1475	92.49	92.03	91.57	0.88	0.85	0.78	83.69	1471	92.73	92.27	91.81	0.88	0.90	0.78	79.51
17	250M	55.0	75.0	1470	92.93	92.47	92.00	0.88	0.86	0.79	101.89	1466	93.16	92.69	92.23	0.88	0.90	0.79	96.79
18	280S	75.0	100	1480	93.49	93.02	92.55	0.89	0.86	0.80	136.99	1476	93.69	93.22	92.75	0.89	0.91	0.80	130.14
19	280M	90.0	120	1485	93.71	93.24	92.77	0.89	0.88	0.82	163.75	1481	93.90	93.43	92.97	0.89	0.91	0.82	155.56

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Performance Chart

IE2

Three-Phase Squirrel Cage Induction Motor	
Voltage	380 / 400 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418) / TEFC (IC411)

1000 RPM (6 Pole)

Rating of Motor				380 V								400 V							
Sr. No	Frame Size	Output		Full load Speed r/min	Efficiency			Power Factor (cosφ)			Rated Current A	Full load Speed rpm	Efficiency			Power Factor (cosφ)			Rated Current A
		kW	HP		100%	75%	50%	100%	75%	50%			100%	75%	50%	100%	75%	50%	
1	80Z	0.37	0.50	910	65.11	64.79	64.46	0.73	0.66	0.57	1.18	907	66.10	65.77	65.44	0.72	0.65	0.56	1.12
2	80Z	0.55	0.75	910	70.88	70.52	70.17	0.73	0.67	0.59	1.61	907	71.76	71.40	71.05	0.73	0.75	0.58	1.53
3	90S	0.75	1.00	910	73.84	73.47	73.10	0.62	0.57	0.49	2.47	907	74.66	74.29	73.92	0.62	0.58	0.49	2.35
4	90L	1.10	1.50	910	76.18	75.80	75.42	0.73	0.68	0.60	3.00	907	76.95	76.56	76.18	0.72	0.75	0.59	2.85
5	100L	1.50	2.00	930	78.00	77.61	77.22	0.76	0.71	0.62	3.85	927	78.72	78.33	77.93	0.75	0.79	0.62	3.66
6	112M	2.20	3.00	940	80.15	79.75	79.35	0.75	0.70	0.61	5.57	937	80.81	80.41	80.00	0.74	0.77	0.61	5.29
7	132S	3.70	5.00	950	82.85	82.44	82.02	0.75	0.69	0.62	9.10	947	83.43	83.01	82.60	0.74	0.77	0.62	8.64
8	132M	5.50	7.50	970	84.70	84.27	83.85	0.76	0.70	0.63	13.06	967	85.22	84.79	84.37	0.75	0.78	0.63	12.40
9	160M	7.50	10.0	970	86.00	85.57	85.15	0.80	0.75	0.67	16.59	967	86.48	86.05	85.62	0.79	0.82	0.67	15.76
10	160L	11.0	15.0	960	87.64	87.20	86.77	0.80	0.75	0.67	23.97	957	88.07	87.63	87.19	0.79	0.82	0.67	22.78
11	180L	15.0	20.0	970	88.74	88.30	87.85	0.82	0.78	0.70	31.14	967	89.12	88.68	88.23	0.82	0.85	0.70	29.59
12	200L	18.5	25.0	970	89.51	89.06	88.62	0.80	0.75	0.68	39.06	967	89.86	89.42	88.97	0.80	0.83	0.68	37.11
13	200L	22.0	30.0	975	90.06	89.61	89.16	0.81	0.77	0.70	45.59	972	90.39	89.94	89.49	0.81	0.84	0.70	43.31
14	225M	30.0	40.0	975	90.94	90.49	90.03	0.84	0.80	0.73	59.40	972	91.24	90.79	90.33	0.84	0.87	0.73	56.43
15	250M	37.0	50.0	975	91.49	91.04	90.58	0.84	0.80	0.74	72.88	972	91.77	91.32	90.86	0.84	0.86	0.74	69.24
16	280S	45.0	60.0	980	92.05	91.59	91.13	0.87	0.83	0.77	85.09	977	92.31	91.84	91.38	0.87	0.89	0.77	80.83
17	280M	55.0	75.0	980	92.49	92.03	91.57	0.86	0.82	0.76	104.67	977	92.73	92.27	91.81	0.86	0.88	0.76	99.44

Note: All performance figures are in accordance with IEC 60034-2018, subject to tolerance

Section- III

Performance data for AOM
with Service Factor - 1.15

415 V / 400 V / 380 V

IE3 / IE2 Motors



Performance Chart

IE3

Three-Phase Squirrel Cage Induction Motor	
Voltage	415 / 400 / 380 $\pm$ 10%
Frequency	50 $\pm$ 5%
Ambient	40 °C (Smoke F250, F300 & F400)
Service Factor AOM	1.15
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEA0 (IC418)

3000 RPM (2 Pole)

Rating of Motor				Service Factor 1.15 @415 V								Service Factor 1.15 @380V			Service Factor 1.15 @400V		
Sr. No	Frame Size	Output		Full load Speed	Efficiency			Power Factor (cosφ)			Full Load Current	Efficiency	P.F	Full Load Current	Eff	P.F	Full Load Current
		kW	HP		rpm	100%	75%	50%	100%	75%							
1	71Z	0.37	0.50	2822	72.2	71.8	71.5	0.79	0.74	0.67	1.04	69.6	0.84	1.11	70.7	0.83	1.05
2	71Z	0.55	0.75	2822	76.4	76.0	75.6	0.83	0.78	0.71	1.38	74.1	0.88	1.48	75.0	0.87	1.40
3	80Z	0.75	1.00	2831	79.4	79.0	78.6	0.82	0.78	0.72	1.84	77.4	0.86	1.97	78.2	0.85	1.87
4	80Z	1.10	1.50	2841	81.6	81.2	80.8	0.82	0.78	0.72	2.65	79.7	0.85	2.83	80.5	0.84	2.69
5	90S	1.50	2.00	2851	83.2	82.7	82.3	0.87	0.82	0.76	3.34	81.4	0.90	3.57	82.1	0.89	3.39
6	90L	2.20	3.00	2851	85.0	84.6	84.1	0.90	0.86	0.80	4.60	83.4	0.94	4.92	84.0	0.93	4.68
7	100L	3.70	5.00	2911	87.0	86.6	86.1	0.87	0.84	0.78	7.82	85.6	0.90	8.37	86.2	0.90	7.95
8	132S	5.50	7.50	2891	88.5	88.1	87.6	0.90	0.87	0.82	11.04	87.3	0.93	11.82	87.8	0.93	11.22
9	132S	7.50	10.00	2891	89.5	89.0	88.6	0.90	0.87	0.82	14.84	88.4	0.93	15.88	88.8	0.93	15.08
10	160M	11.00	15.00	2921	90.7	90.2	89.8	0.88	0.85	0.80	21.97	89.7	0.91	23.51	90.1	0.91	22.33
11	160M	15.00	20.00	2921	91.4	91.0	90.5	0.89	0.86	0.81	29.33	90.5	0.92	31.39	90.9	0.92	29.82
12	160L	18.50	25.00	2921	92.0	91.5	91.1	0.90	0.87	0.82	35.65	91.1	0.93	38.15	91.5	0.93	36.25
13	180M	22.00	30.00	2926	92.3	91.8	91.4	0.90	0.87	0.82	42.21	91.5	0.93	45.17	91.8	0.93	42.91
14	200L	30.00	40.00	2941	93.0	92.5	92.0	0.90	0.87	0.82	57.16	92.2	0.93	61.17	92.5	0.93	58.11
15	200L	37.00	50.00	2941	93.4	92.9	92.5	0.88	0.85	0.80	71.76	92.7	0.91	76.80	93.0	0.91	72.96
16	225M	45.00	60.00	2941	93.7	93.3	92.8	0.90	0.88	0.84	85.10	93.1	0.93	91.08	93.3	0.92	86.53
17	250M	55.00	75.00	2941	94.0	93.6	93.1	0.90	0.88	0.84	103.73	93.4	0.93	111.02	93.7	0.92	105.47
18	280S	75.00	100.00	2966	94.5	94.0	93.5	0.92	0.90	0.86	137.77	93.9	0.95	147.45	94.2	0.94	140.08
19	280M	90.00	120.00	2966	94.8	94.3	93.9	0.91	0.89	0.85	166.52	94.3	0.94	178.22	94.5	0.93	169.31

Given service factor is applicable for air over motor applications.

Three-Phase Squirrel Cage Induction Motor	
Voltage	415 / 400 / 380 $\pm$ 10%
Frequency	50 $\pm$ 5%
Ambient	40 °C (Smoke F250, F300 & F400)
Service Factor AOM	1.15
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418)

1500 RPM (4 Pole)

Rating of Motor				Service Factor 1.15 @415 V								Service Factor 1.15 @380V			Service Factor 1.15 @400V		
Sr. No	Frame Size	Output		Full load Speed rpm	Efficiency			Power Factor (cos ϕ)			Full Load Current A	Efficiency	P.F	Full Load Current	Eff	P.F	Full Load Current
		kW	HP		100%	75%	50%	100%	75%	50%		100%	75%	50%	100%	75%	50%
1	71Z	0.37	0.50	1381	75.8	75.5	75.1	0.75	0.68	0.59	1.05	73.5	0.79	1.12	74.5	0.78	1.06
2	80Z	0.55	0.75	1396	79.5	79.1	78.8	0.74	0.68	0.59	1.50	77.5	0.77	1.60	78.3	0.77	1.52
3	80Z	0.75	1.00	1416	81.4	80.9	80.5	0.75	0.70	0.62	1.96	79.4	0.79	2.09	80.2	0.78	1.99
4	90S	1.10	1.50	1426	83.1	82.6	82.2	0.80	0.75	0.68	2.65	81.3	0.84	2.83	82.0	0.83	2.69
5	90L	1.50	2.00	1426	84.3	83.9	83.5	0.85	0.81	0.73	3.34	82.7	0.89	3.57	83.4	0.88	3.39
6	100L	2.20	3.00	1451	85.8	85.4	85.0	0.79	0.75	0.67	5.18	84.3	0.82	5.54	85.0	0.82	5.26
7	112M	3.70	5.00	1446	87.7	87.2	86.8	0.83	0.79	0.72	8.17	86.3	0.86	8.74	86.9	0.85	8.30
8	132S	5.50	7.50	1446	89.0	88.5	88.1	0.82	0.78	0.71	12.08	87.8	0.85	12.92	88.3	0.84	12.28
9	132M	7.50	10.0	1446	89.8	89.4	88.9	0.82	0.78	0.71	16.22	88.7	0.85	17.35	89.2	0.85	16.49
10	160M	11.0	15.0	1456	90.9	90.4	90.0	0.85	0.81	0.74	22.66	89.9	0.88	24.25	90.3	0.88	23.03
11	160L	15.0	20.0	1461	91.7	91.2	90.7	0.85	0.81	0.74	30.71	90.8	0.88	32.86	91.1	0.88	31.22
12	180M	18.5	25.0	1461	92.2	91.7	91.3	0.83	0.79	0.72	38.53	91.4	0.86	41.23	91.7	0.85	39.17
13	180L	22.0	30.0	1461	92.6	92.2	91.7	0.85	0.81	0.75	44.51	91.9	0.88	47.63	92.2	0.88	45.25
14	200L	30.0	40.0	1461	93.3	92.8	92.4	0.83	0.80	0.73	61.76	92.6	0.86	66.09	92.9	0.85	62.79
15	225S	37.0	50.0	1471	93.6	93.1	92.7	0.85	0.82	0.75	74.18	93.0	0.88	79.39	93.2	0.87	75.42
16	225M	45.0	60.0	1471	93.9	93.5	93.0	0.86	0.83	0.77	88.90	93.3	0.89	95.14	93.6	0.88	90.38
17	250M	55.0	75.0	1471	94.4	93.9	93.4	0.86	0.83	0.77	108.22	93.8	0.88	115.82	94.0	0.88	110.03
18	280S	75.0	100	1481	94.8	94.3	93.9	0.87	0.84	0.78	144.90	94.3	0.90	155.08	94.5	0.89	147.33
19	280M	90.0	120	1481	95.0	94.6	94.1	0.88	0.85	0.80	171.93	94.5	0.90	184.00	94.7	0.90	174.80

Given service factor is applicable for air over motor applications.

Performance Chart

IE3

Three-Phase Squirrel Cage Induction Motor	
Voltage	415 / 400 / 380 $\pm 10\%$
Frequency	50 $\pm 5\%$
Ambient	40 °C (Smoke F250, F300 & F400)
Service Factor AOM	1.15
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEA0 (IC418)

1000 RPM (6 Pole)

Rating of Motor				Service Factor 1.15 @415 V								Service Factor 1.15 @380V			Service Factor 1.15 @400V		
Sr. No	Frame Size	Output		Full load Speed rpm	Efficiency			Power Factor (cos ϕ)			Full Load Current A	Efficiency	P.F	Full Load Current	Eff	P.F	Full Load Current
		kW	HP		100%	75%	50%	100%	75%	50%		100%	75%	50%	100%	75%	50%
1	80Z	0.37	0.50	917	71.9	71.5	71.1	0.72	0.65	0.55	1.15	69.3	0.76	1.23	70.3	0.75	1.17
2	80Z	0.55	0.75	917	75.7	75.4	75.0	0.72	0.67	0.58	1.61	73.4	0.76	1.72	74.4	0.75	1.64
3	90S	0.75	1.00	917	77.5	77.1	76.8	0.75	0.70	0.61	2.07	75.3	0.79	2.22	76.2	0.78	2.10
4	90L	1.10	1.50	912	79.8	79.4	79.0	0.77	0.72	0.63	2.88	77.7	0.80	3.08	78.6	0.80	2.92
5	100L	1.50	2.00	932	81.4	80.9	80.5	0.75	0.70	0.62	3.91	79.4	0.79	4.18	80.2	0.78	3.98
6	112M	2.20	3.00	947	83.3	82.9	82.4	0.77	0.71	0.64	5.52	81.5	0.80	5.91	82.2	0.79	5.61
7	132S	3.70	5.00	957	85.6	85.2	84.8	0.75	0.71	0.63	9.20	84.1	0.78	9.85	84.7	0.77	9.35
8	132M	5.50	7.50	972	87.2	86.8	86.4	0.76	0.72	0.64	13.34	85.9	0.78	14.28	86.4	0.78	13.56
9	160M	7.50	10.0	972	88.4	88.0	87.5	0.81	0.77	0.69	16.79	87.2	0.84	17.97	87.7	0.83	17.07
10	160L	11.0	15.0	962	89.7	89.3	88.8	0.79	0.75	0.68	24.73	88.6	0.82	26.46	89.1	0.82	25.14
11	180L	15.0	20.0	972	90.7	90.2	89.8	0.82	0.78	0.71	32.20	89.7	0.85	34.46	90.1	0.84	32.74
12	200L	18.5	25.0	972	91.2	90.8	90.3	0.81	0.77	0.70	40.25	90.3	0.83	43.08	90.7	0.83	40.92
13	200L	22.0	30.0	977	91.8	91.3	90.8	0.83	0.79	0.72	46.00	90.9	0.86	49.23	91.3	0.86	46.77
14	225M	30.0	40.0	977	92.5	92.1	91.6	0.83	0.79	0.72	62.22	91.7	0.86	66.59	92.1	0.86	63.26
15	250M	37.0	50.0	977	93.0	92.5	92.0	0.83	0.80	0.73	77.05	92.2	0.85	82.46	92.5	0.85	78.34
16	280S	45.0	60.0	982	93.4	92.9	92.5	0.85	0.82	0.75	90.39	92.7	0.88	96.74	93.0	0.87	91.90
17	280M	55.0	75.0	982	93.8	93.4	92.9	0.84	0.81	0.74	111.32	93.2	0.87	119.14	93.5	0.86	113.18

Given service factor is applicable for air over motor applications.

Performance Chart



Three-Phase Squirrel Cage Induction Motor	
Voltage	415 / 400 / 380 $\pm$ 10%
Frequency	50 $\pm$ 5%
Ambient	40 °C (Smoke F250, F300 & F400)
Service Factor AOM	1.15
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418)

3000 RPM (2 Pole)

Rating of Motor				Service Factor 1.15 @415 V								Service Factor 1.15 @380V			Service Factor 1.15 @400V		
Sr. No	Frame Size	Output		Full load Speed rpm	Efficiency			Power Factor (cos ϕ)			Full Load Current A	Efficiency	P.F	Full Load Current	Eff	P.F	Full Load Current
		kW	HP		100%	75%	50%	100%	75%	50%		100%	75%	50%	100%	75%	50%
1	71Z	0.37	0.50	2792	67.7	67.4	67.0	0.81	0.76	0.67	1.08	64.9	0.86	1.16	66.0	0.85	1.10
2	71Z	0.55	0.75	2792	72.5	72.1	71.8	0.81	0.76	0.68	1.50	70.0	0.86	1.60	71.0	0.85	1.52
3	80Z	0.75	1.00	2822	76.0	75.6	75.2	0.81	0.77	0.70	1.96	73.6	0.85	2.09	74.6	0.84	1.99
4	80Z	1.10	1.50	2831	78.3	77.9	77.5	0.81	0.77	0.70	2.76	76.1	0.85	2.95	77.0	0.84	2.81
5	90S	1.50	2.00	2841	80.1	79.7	79.3	0.87	0.83	0.76	3.45	78.1	0.91	3.69	78.9	0.90	3.51
6	90L	2.20	3.00	2831	82.1	81.7	81.3	0.89	0.85	0.78	4.83	80.3	0.93	5.17	81.0	0.92	4.91
7	100L	3.70	5.00	2911	84.6	84.1	83.7	0.87	0.84	0.77	8.05	82.9	0.90	8.62	83.6	0.90	8.18
8	132S	5.50	7.50	2881	86.2	85.7	85.3	0.90	0.87	0.81	11.39	84.7	0.93	12.18	85.3	0.92	11.58
9	132S	7.50	10.0	2881	87.3	86.9	86.5	0.91	0.87	0.81	15.18	86.0	0.94	16.25	86.5	0.93	15.43
10	160M	11.0	15.0	2911	88.7	88.3	87.9	0.88	0.85	0.79	22.43	87.5	0.91	24.00	88.0	0.91	22.80
11	160M	15.0	20.0	2911	89.7	89.3	88.8	0.89	0.86	0.80	29.90	88.6	0.92	32.00	89.1	0.92	30.40
12	160L	18.5	25.0	2911	90.4	89.9	89.5	0.90	0.87	0.82	36.57	89.3	0.92	39.14	89.8	0.92	37.18
13	180M	22.0	30.0	2921	90.8	90.3	89.9	0.91	0.88	0.83	42.78	89.8	0.93	45.79	90.2	0.93	43.50
14	200L	30.0	40.0	2936	91.5	91.1	90.6	0.90	0.87	0.82	57.96	90.7	0.93	62.03	91.0	0.93	58.93
15	200L	37.0	50.0	2936	92.1	91.6	91.2	0.88	0.85	0.80	72.68	91.3	0.91	77.79	91.6	0.91	73.90
16	225M	45.0	60.0	2936	92.5	92.1	91.6	0.90	0.88	0.83	86.25	91.7	0.93	92.31	92.1	0.93	87.69
17	250M	55.0	75.0	2936	92.8	92.4	91.9	0.90	0.88	0.83	104.88	92.1	0.93	112.25	92.4	0.93	106.64
18	280S	75.0	100	2961	93.5	93.0	92.6	0.92	0.90	0.85	139.15	92.8	0.95	148.93	93.1	0.95	141.48
19	280M	90.0	120	2961	93.8	93.4	92.9	0.91	0.89	0.84	168.13	93.2	0.94	179.94	93.5	0.94	170.95

Given service factor is applicable for air over motor applications.

Performance Chart

IE2

Three-Phase Squirrel Cage Induction Motor	
Voltage	415 / 400 / 380 $\pm$ 10%
Frequency	50 $\pm$ 5%
Ambient	40 °C (Smoke F250, F300 & F400)
Service Factor AOM	1.15
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418)

1500 RPM (4 Pole)

Rating of Motor				Service Factor 1.15 @415 V								Service Factor 1.15 @380V			Service Factor 1.15 @400V		
Sr. No	Frame Size	Output		Full load Speed rpm	Efficiency			Power Factor (cos ϕ)			Full Load Current A	Efficiency	P.F	Full Load Current	Eff	P.F	Full Load Current
		kW	HP		100%	75%	50%	100%	75%	50%		100%	75%	50%	100%	75%	50%
1	71Z	0.37	0.50	1376	71.0	70.7	70.3	0.72	0.66	0.56	1.15	68.4	0.77	1.23	69.5	0.76	1.17
2	80Z	0.55	0.75	1396	75.6	75.3	74.9	0.72	0.66	0.56	1.61	73.3	0.76	1.72	74.3	0.75	1.64
3	80Z	0.75	1.00	1406	78.3	77.9	77.5	0.78	0.73	0.64	1.96	76.1	0.82	2.09	77.0	0.81	1.99
4	90S	1.10	1.50	1416	80.2	79.8	79.4	0.80	0.74	0.66	2.76	78.2	0.83	2.95	79.0	0.82	2.81
5	90L	1.50	2.00	1416	81.7	81.3	80.9	0.85	0.80	0.72	3.45	79.8	0.89	3.69	80.6	0.88	3.51
6	100L	2.20	3.00	1446	83.3	82.9	82.4	0.78	0.73	0.66	5.41	81.5	0.81	5.78	82.2	0.81	5.50
7	112M	3.70	5.00	1446	85.4	85.0	84.6	0.81	0.76	0.69	8.51	83.9	0.85	9.11	84.5	0.84	8.65
8	132S	5.50	7.50	1446	86.9	86.5	86.0	0.81	0.77	0.69	12.54	85.5	0.84	13.42	86.1	0.83	12.74
9	132M	7.50	10.0	1446	88.0	87.5	87.1	0.83	0.79	0.71	16.45	86.7	0.86	17.60	87.2	0.85	16.72
10	160M	11.0	15.0	1456	89.2	88.7	88.3	0.86	0.81	0.74	23.00	88.0	0.89	24.62	88.5	0.88	23.39
11	160L	15.0	20.0	1456	90.0	89.6	89.1	0.85	0.79	0.71	31.51	89.0	0.87	33.72	89.4	0.87	32.04
12	180M	18.5	25.0	1456	90.7	90.2	89.8	0.83	0.80	0.73	39.56	89.7	0.85	42.34	90.1	0.85	40.22
13	180L	22.0	30.0	1461	91.1	90.7	90.2	0.84	0.79	0.72	45.77	90.2	0.87	48.99	90.6	0.87	46.54
14	200L	30.0	40.0	1456	91.9	91.4	91.0	0.83	0.81	0.74	62.68	91.0	0.86	67.08	91.4	0.86	63.72
15	225S	37.0	50.0	1471	92.3	91.8	91.4	0.85	0.83	0.76	75.10	91.5	0.88	80.37	91.8	0.88	76.35
16	225M	45.0	60.0	1471	92.7	92.3	91.8	0.86	0.83	0.76	89.93	92.0	0.89	96.25	92.3	0.89	91.44
17	250M	55.0	75.0	1466	93.2	92.7	92.2	0.86	0.84	0.77	109.48	92.5	0.89	117.17	92.8	0.88	111.31
18	280S	75.0	100	1476	93.7	93.3	92.8	0.87	0.84	0.78	147.20	93.1	0.89	157.54	93.3	0.89	149.67
19	280M	90.0	120	1481	93.9	93.5	93.0	0.87	0.86	0.80	175.95	93.3	0.89	188.31	93.6	0.89	178.90

Given service factor is applicable for air over motor applications.

Three-Phase Squirrel Cage Induction Motor	
Voltage	415 / 400 / 380 $\pm$ 10%
Frequency	50 $\pm$ 5%
Ambient	40 °C (Smoke F250, F300 & F400)
Service Factor AOM	1.15
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEAO (IC418)

1000 RPM (6 Pole)

Rating of Motor				Service Factor 1.15 @415 V								Service Factor 1.15 @380V			Service Factor 1.15 @400V		
Sr. No	Frame Size	Output		Full load Speed rpm	Efficiency			Power Factor (cos ϕ)			Full Load Current A	Efficiency	P.F	Full Load Current	Eff	P.F	Full Load Current
		kW	HP		100%	75%	50%	100%	75%	50%		100%	75%	50%	100%	75%	50%
1	80Z	0.37	0.50	907	65.7	65.4	65.1	0.71	0.64	0.55	1.27	62.9	0.76	1.35	64.0	0.75	1.29
2	80Z	0.55	0.75	907	71.4	71.1	70.7	0.71	0.65	0.57	1.73	68.9	0.76	1.85	69.9	0.74	1.75
3	90S	0.75	1.00	907	74.4	74.0	73.6	0.61	0.55	0.48	2.66	72.0	0.64	2.84	72.9	0.63	2.70
4	90L	1.10	1.50	907	76.7	76.3	75.9	0.71	0.66	0.58	3.22	74.4	0.75	3.45	75.4	0.74	3.27
5	100L	1.50	2.00	927	78.5	78.1	77.7	0.74	0.69	0.61	4.14	76.4	0.77	4.43	77.2	0.77	4.21
6	112M	2.20	3.00	937	80.6	80.2	79.8	0.73	0.68	0.60	5.98	78.6	0.76	6.40	79.4	0.76	6.08
7	132S	3.70	5.00	947	83.3	82.9	82.4	0.73	0.68	0.61	9.78	81.5	0.76	10.46	82.2	0.75	9.94
8	132M	5.50	7.50	967	85.1	84.7	84.2	0.74	0.69	0.62	14.03	83.5	0.77	15.02	84.2	0.76	14.27
9	160M	7.50	10.0	967	86.4	85.9	85.5	0.78	0.73	0.66	17.83	84.9	0.81	19.08	85.5	0.80	18.12
10	160L	11.0	15.0	957	88.0	87.5	87.1	0.78	0.74	0.66	25.76	86.7	0.80	27.57	87.2	0.80	26.19
11	180L	15.0	20.0	967	89.1	88.6	88.2	0.81	0.76	0.68	33.47	87.9	0.83	35.82	88.4	0.83	34.03
12	200L	18.5	25.0	967	89.8	89.4	88.9	0.79	0.73	0.66	41.98	88.7	0.81	44.92	89.2	0.81	42.68
13	200L	22.0	30.0	972	90.4	89.9	89.5	0.80	0.75	0.68	48.99	89.3	0.82	52.43	89.8	0.82	49.81
14	225M	30.0	40.0	972	91.2	90.8	90.3	0.82	0.78	0.71	63.83	90.3	0.85	68.31	90.7	0.85	64.89
15	250M	37.0	50.0	972	91.8	91.3	90.8	0.82	0.78	0.72	78.32	90.9	0.85	83.82	91.3	0.85	79.63
16	280S	45.0	60.0	977	92.3	91.8	91.4	0.85	0.81	0.75	91.43	91.5	0.88	97.85	91.8	0.88	92.96
17	280M	55.0	75.0	977	92.7	92.3	91.8	0.84	0.80	0.74	112.47	92.0	0.87	120.37	92.3	0.86	114.35

Given service factor is applicable for air over motor applications.

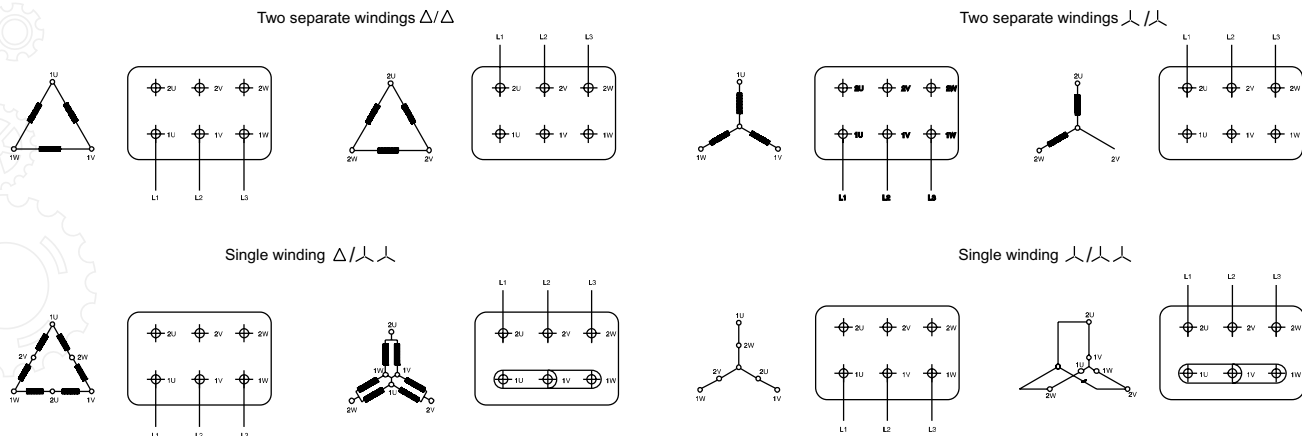
Section- IV

Performance data for
Dual Speed Motors at
Voltages 415 V



Havells Pole-changing Dual Speed motor are designed for single voltage and direct-on-line starting (special design for Y-Δ-connection on request). When the ratio between the two speeds is from 1 to 2, the standard motors have one single winding (Dahlander connection). For the other speeds, the motors have two separate windings.

Motor Connection Types:



Bearing Size & Cable Entry

Rating		Bearing Details		Cable Entry Size for Terminal Box		Space Heater*	RT	BTD
Frame	Pole	B-DE	B-NDE	Entry Size	Min. Cable Size			
63	2-8	6202-Z C3	6202-Z C3	M16 & M20	4Cx4mm2	240V-1Ph-25W	OK**	N/A
71	2-8	6203-2 C3	6203-2 C3	M16 & M20	4Cx4mm2	240V-1Ph-25W	OK**	
80	2-8	6204-Z C3	6204-Z C3	M25 & M20	4Cx4mm2	240V-1Ph-25W	OK**	
90	2-8	6205-Z C3	6205-Z C3	M25 & M20	4Cx10mm2	240V-1Ph-25W	OK**	
100	2-8	6206-Z C3	6206-Z C3	M25 & M20	4Cx10mm2	240V-1Ph-25W	OK**	
112	2-8	6206-Z C3	6206-Z C3	M25 & M20	4Cx10mm2	240V-1Ph-25W	OK**	
132	2-8	6208-Z C3	6208-Z C3	2xM32	4Cx10mm2	240V-1Ph-25W	OK**	OK**
160	2-8	6309-Z C3	6309-Z C3	2XM40	"3Cx50mm2 or 2x3Cx35mm2"	240V-1Ph-25W	OK**	OK**
160*	2-8	6309 C3	6309 C3	2XM40	"3Cx50mm2 or 2x3Cx35mm2"	240V-1Ph-25W	OK**	OK**
180	2-8	6310 C3	6310 C3	2XM40	"3Cx50mm2 or 2x3Cx35mm2"	240V-1Ph-40W	OK**	OK**
200	2-8	6312 C3	6312 C3	2xM50	"3Cx50mm2 or 2x3Cx35mm2"	240V-1Ph-40W	OK**	OK**
225	2-8	6313 C3	6313 C3	2xM50	"3Cx120mm2 or 2x3Cx95mm2"	240V-1Ph-40W	OK**	OK**
250	2-8	6314 C3	6314 C3	2xM63	"3Cx120mm2 or 2x3Cx95mm2"	240V-1Ph-60W	OK**	OK**
280	2	6316 C3	6316 C3	2xM63	"3Cx120mm2 or 2x3Cx95mm2"	240V-1Ph-60W	OK**	OK**
	4-8	6318 C3	6318 C3	2xM63	"3Cx120mm2 or 2x3Cx95mm2"	240V-1Ph-60W	OK**	OK**
315	2	6316 C3	6316 C3	2xM63	"3Cx400mm2 or x3Cx300mm2"	240V-1Ph-100W	OK**	OK**
	4-10	NU319 C3	6319 C3	2xM63	"3Cx400mm2 or x3Cx300mm2"	240V-1Ph-100W	OK**	OK**
355	2	6319 C3	6319 C3	2xM63	"3Cx400mm2 or x3Cx300mm2"	240V-1Ph-100W	OK**	OK**
	4-10	NU322 C3	6322 C3	2xM63	"3Cx400mm2 or x3Cx300mm2"	240V-1Ph-100W	OK**	OK**

** On Request or according to Application/Temp.

** Motor with RTD and BTD as on request."

Performance Chart



Three-Phase Squirrel Cage Induction Motor (Dual Speed)	
Voltage	415 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEFC (IC411) / TEAO (IC418)

4/2 Pole Dahlander Connection Δ/YY

S.No	Frame Size	Output		Pole	Speed Rpm	Efficiency at 100%	Power Factor (Cosφ)	Rated Current (Amps)	Direct-On-Line starting		Moment of Inertia GD2 (Kgm2)	Approx Weight Kg (Approx.)
		kW	HP						Starting Current (%)	Breakaway Torque (%)		
1	MHEE63ZAA	0.2/0.3	0.27/0.40	4/2	1345/2700	56/65	0.65/0.81	0.76/0.79	2.4/3.2	2.1/2.1	0.0040	4.6
2	MHEE71ZAA	0.3/0.45	0.40/0.65	4/2	1374/2830	61/66	0.78/0.73	0.87/1.29	3.3/3.0	2.3/2.1	0.0076	6.3
3	MHEE80ZAA	0.45/0.6	0.65/0.80	4/2	1390/2760	64/68.8	0.75/0.8	1.3/1.51	3.8/4.0	2.3/2.2	0.0158	8.3
4	MHEE80ZBA	0.55/0.75	0.75/1.0	4/2	1435/2850	70/71.2	0.67/0.77	1.63/1.9	4.5/5.0	2.6/2.8	0.0200	11.5
5	MHEE80ZCA	0.8/1.1	1.1/1.5	4/2	1425/2830	76.1/77.2	0.7/0.79	2.08/2.5	4.5/4.9	2.5/2.7	0.0241	14.7
6	MHEE90LAA	1.2/1.55	1.6/2.1	4/2	1435/2850	77.4/78.3	0.71/0.79	3.03/3.48	4.7/5.1	2.6/2.7	0.0310	15.6
7	MHEE90LBA	1.6/2	2.15/2.7	4/2	1390/2810	73.5/75.5	0.78/0.86	3.88/4.28	4.1/5.5	2.7/2.6	0.0373	17.1
8	MHEE100LAA	1.8/2.5	2.5/3.35	4/2	1420/2865	78.5/77.4	0.76/0.84	4.19/5.34	5.2/5.5	2.2/2.2	0.0460	21.4
9	MHEE100LBA	2.2/3	3.0/4.0	4/2	1410/2830	74.6/71.4	0.72/0.82	5.69/7.12	4.2/4.3	1.8/2.0	0.0460	22.5
10	MHEE100LCA	2.6/3.3	3.5/4.4	4/2	1430/2890	82.6/78.6	0.78/0.76	5.61/7.68	4.7/5.5	1.9/2.2	0.0558	23.2
11	MHEE112MAA	3.3/4.4	4.4/5.9	4/2	1410/2800	77.4/75.4	0.82/0.85	7.23/9.55	4.5/5.1	2.1/2.4	0.1330	36.1
12	MHEE132SZA	4.4/5.5	6.0/7.5	4/2	1450/2925	83/84.6	0.7/0.87	10.53/10.39	4.4/7.2	2.2/2.7	0.1383	42.6
13	MHEE132MZA	6.6/8.1	9.0/11.0	4/2	1460/2920	85.4/84.5	0.76/0.9	14.14/14.81	5.5/7.5	2.6/2.9	0.1713	51.4
14	MHEE160MZA	8.8/11	12.0/15.0	4/2	1460/2940	87.1/87.5	0.79/0.91	17.79/19.21	5.5/7.5	2.0/1.9	0.5175	94.0
15	MHEE160LZA	12.5/15	17.0/20.4	4/2	1470/2955	89.4/90	0.74/0.9	26.28/25.76	4.8/7.4	2.1/2.3	0.6400	108.7

8/4 Pole Dahlander Connection Δ/YY

1	MHEE71ZAA	0.09/0.15	0.12/0.20	8/4	610/1310	40/56	0.61/0.75	0.51/0.49	2.5/3.2	1.6/1.6	0.0071	6.3
2	MHEE80ZAA	0.18/0.37	0.25/0.50	8/4	700/1370	43.2/58.7	0.63/0.83	0.92/1.05	2.6/3.4	1.8/1.6	0.0197	7.9
3	MHEE80ZBA	0.26/0.51	0.35/0.68	8/4	700/1360	44.1/61.2	0.6/0.88	1.36/1.31	2.5/3.6	2.0/1.6	0.0247	9.2
4	MHEE90SAA	0.37/0.75	0.50/1.0	8/4	690/1385	52.2/67.1	0.58/0.82	1.7/1.89	2.8/3.9	1.9/1.8	0.0318	13.5
5	MHEE90LBA	0.5/1	0.67/1.34	8/4	690/1410	52.2/72.5	0.58/0.8	2.29/2.39	3.3/4.0	2.3/1.9	0.0478	15.7
6	MHEE100LAA	0.7/1.4	0.94/1.9	8/4	700/1440	57.2/78.5	0.5/0.78	3.4/3.18	2.8/4.3	2.1/1.9	0.0558	21.9
7	MHEE100LBA	0.9/1.8	1.2/2.5	8/4	690/1415	62/76	0.56/0.87	3.6/3.78	2.5/4.5	1.9/1.8	0.0600	23.7
8	MHEE112MAA	1/1.8	1.34/2.5	8/4	710/1445	66.1/78.5	0.61/0.82	3.45/3.89	3.9/6.3	2.2/2.1	0.1418	31.7
9	MHEE112MBA	1.3/2.6	1.75/3.0	8/4	705/1420	70/76.3	0.65/0.88	3.97/5.38	3.2/4.8	2.1/2.0	0.1670	34.2
10	MHEE132SZA	2.1/3.7	2.9/5.0	8/4	710/1440	70.2/76.1	0.66/0.84	6.3/8.05	4.0/5.2	1.9/1.7	0.2950	42.5
11	MHEE132MZA	2.6/4.8	3.5/6.5	8/4	715/1450	71.6/78.8	0.6/0.8	8.42/10.59	4.3/5.5	2.3/1.8	0.3775	55.5
12	MHEE160MYA	4/6.3	5.5/8.6	8/4	710/1410	80/81	0.64/0.88	10.86/12.29	4.6/6.5	1.8/1.7	0.8125	88.5
13	MHEE160LYA	4.8/7.5	6.5/10.0	8/4	730/1470	80/85	0.65/0.85	12.84/14.44	4.5/6.5	1.8/1.6	1.0575	106.5
14	MHEE160LZA	5.9/10.3	8.0/14.0	8/4	725/1450	81/87	0.66/0.88	15.35/18.71	5.0/6.0	1.9/1.6	1.2750	110.5

Note: All performance figures are in accordance to Havells Design and subject to change prior confirmation

Performance Chart



Three-Phase Squirrel Cage Induction Motor (Dual Speed)	
Voltage	415 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEFC (IC411) / TEAO (IC418)

4/6 Pole Separate Windings

S.No	Frame Size	Output		Pole	Speed	Efficiency at 100%	Power Factor (Cosφ)	Rated Current (Amps)	Direct-On-Linestarting		Moment of Inertia GD2 (Kgm2)	Approx Weight
		kW	HP		Rpm				Starting Current (%)	Breakaway Torque (%)		Kg (Approx.)
1	MHEE71ZAA	0.22/0.15	0.30/0.20	4/6	1430/900	61/44	0.7/0.64	0.71/0.74	1.9/3.4	1.5/1.8	0.0073	6.2
2	MHEE80ZAA	0.37/0.26	0.50/0.35	4/6	1385/905	61.4/48.1	0.82/0.8	1.02/0.94	3.7/2.6	1.7/1.3	0.0197	8.3
3	MHEE80ZBA	0.55/0.37	0.75/0.50	4/6	1380/900	60.5/51.1	0.64/0.82	1.97/1.22	3.7/2.7	1.6/1.2	0.0247	10.0
4	MHEE90SAA	0.75/0.5	1.0/0.67	4/6	1400/930	63/64	0.81/0.61	2.04/1.78	3.0/3.5	1.4/1.8	0.0410	13.4
5	MHEE90LBA	1/0.65	1.34/0.87	4/6	1380/920	68.8/67.1	0.81/0.62	2.49/2.17	2.9/3.4	1.1/1.6	0.0478	16.4
6	MHEE100LAA	1.2/0.8	1.6/1.07	4/6	1460/940	76/67.9	0.66/0.7	3.32/2.34	4.7/3.0	2.1/1.5	0.0460	24.4
7	MHEE100LBA	1.6/1	2.15/1.34	4/6	1445/935	77.6/69.5	0.73/0.63	3.92/3.17	5.8/3.0	2.8/1.7	0.0558	33.2
8	MHEE112MAA	1.8/1.3	2.5/1.75	4/6	1445/950	74.6/69.5	0.85/0.78	3.94/3.33	5.9/3.8	1.9/1.3	0.1418	33.3
9	MHEE112MBA	2.6/1.85	3.5/2.5	4/6	1445/950	73.8/71.6	0.86/0.73	5.69/4.92	6.1/4.4	2.0/1.7	0.1753	37.0
10	MHEE132SZA	3.1/2.2	4.2/3.0	4/6	1440/965	80/78	0.8/0.74	6.73/5.3	5.8/5.6	2.1/2.0	0.2240	41.9
11	MHEE132MZA	4/2.6	5.5/3.5	4/6	1470/975	81/79.3	0.83/0.74	8.27/6.16	7.7/5.2	2.0/1.9	0.2925	51.0
12	MHEE160MYA	5.5/3.7	7.5/5.0	4/6	1480/970	84/81.4	0.79/0.73	11.53/8.66	7.5/4.5	2.5/1.6	0.8125	88.5
13	MHEE160MZA	7.5/4.8	10.2/6.5	4/6	1465/960	85/82.6	0.83/0.75	14.79/10.77	7.4/4.6	2.4/1.6	0.8125	88.5
14	MHEE160LZA	11/6.6	15.0/9.0	4/6	1470/960	86/83.8	0.86/0.75	20.69/14.6	7.2/5.0	2.3/1.8	1.0575	106.5

6/8 Pole Separate Windings

1	MHEE80ZAA	0.37/0.18	0.50/0.25	6/8	915/700	51.1/44.2	0.81/0.65	1.24/0.87	2.8/2.5	1.4/1.7	0.0247	9.5
2	MHEE90LAA	0.55/0.3	0.75/0.40	6/8	950/710	65.2/45.1	0.62/0.52	1.89/1.77	3.9/2.6	2.5/1.9	0.0478	16.2
3	MHEE100LAA	0.75/0.45	1.0/0.60	6/8	960/720	72.6/61.8	0.67/0.54	2.14/1.87	4.1/2.9	1.9/1.9	0.0673	23.4
4	MHEE112MAA	0.95/0.65	1.3/0.90	6/8	965/715	65.2/62.1	0.78/0.7	2.59/2.08	4.5/3.8	1.4/1.7	0.1418	32.0
5	MHEE112MBA	1.5/0.75	2.0/1.0	6/8	970/720	75.3/64.6	0.66/0.6	4.19/2.69	4.6/3.8	2.2/2.1	0.1870	36.2
6	MHEE132SZA	2.2/1.2	3.0/1.6	6/8	970/730	73.5/66	0.69/0.6	6.03/4.21	4.5/3.7	1.6/1.7	0.2950	42.5
7	MHEE132MZA	3/1.7	4.1/2.3	6/8	980/730	78.2/72.5	0.72/0.64	7.41/5.09	5.4/4.3	1.7/1.7	0.3775	55.5
8	MHEE160MYA	4.8/2.6	6.5/3.5	6/8	970/730	83/74	0.8/0.7	10.05/6.98	4.8/3.6	1.9/1.8	1.1270	88.0
9	MHEE160MZA	5.9/3.3	8.0/4.5	6/8	970/730	83.2/73	0.76/0.6	12.98/10.48	6.5/5.0	2.2/2.1	1.5025	97.5

Note: All performance figures are in accordance to Havells Design and subject to change prior confirmation

Performance Chart



Three-Phase Squirrel Cage Induction Motor (Dual Speed)	
Voltage	415 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEFC (IC411) / TEAO (IC418)

4/2 Pole Dahlander Connection Y/YY

S.No	Frame Size	Output		Pole	Speed	Efficiency at 100%	Power Factor (Cosφ)	Rated Current (Amps)	Direct-On-Linestarting		Moment of Inertia GD2 (Kgm2)	Approx Weight
		kW	HP		Rpm				Starting Current (%)	Breakaway Torque (%)		Kg (Approx.)
1	MHEE63ZAA	0.07/0.33	0.095/0.45	4/2	1350/2700	55/60	0.7/0.8	0.25/0.95	2.5/2.6	1.8/1.6	0.0037	5.0
2	MHEE71ZAA	0.08/0.37	0.11/0.5	4/2	1350/2870	60/64	0.65/0.68	0.28/1.18	3.2/4.3	2.0/2.8	0.0082	7.9
3	MHEE71ZBA	0.12/0.55	0.16/0.75	4/2	1430/2835	70/68	0.65/0.72	0.36/1.56	4.1/4.0	3/2.8	0.0108	10.0
4	MHEE80ZAA	0.15/0.75	0.2/1.0	4/2	1400/2710	70/68	0.68/0.8	0.43/1.91	2.6/4.6	2.8/2.9	0.0158	8.3
5	MHEE80ZBA	0.22/1.1	0.3/1.5	4/2	1420/2820	70/73	0.75/0.84	0.58/2.49	4.6/4.7	2.7/2.9	0.0200	11.5
6	MHEE90LAA	0.3/1.5	0.4/2.0	4/2	1400/2830	69/70	0.7/0.84	0.86/3.54	4.7/5.0	2.7/3.0	0.0313	15.6
7	MHEE90LBA	0.44/2.2	0.6/3.0	4/2	1430/2830	74/72	0.76/0.89	1.08/4.77	4.5/5.2	2.6/2.8	0.0373	17.1
8	MHEE100LAA	0.5/2.5	0.67/3.3	4/2	1430/2840	72/73	0.77/0.88	1.25/5.41	4.6/5.0	2.2/2.3	0.0460	21.4
9	MHEE100LBA	0.6/3	0.8/4.0	4/2	1440/2850	78/77	0.79/0.87	1.35/6.23	4.5/4.5	2.2/2.1	0.0558	23.2
10	MHEE112MAA	0.75/3.7	1.0/5.0	4/2	1440/2850	74/72	0.8/0.9	1.76/7.94	4.5/5.1	2.0/2.4	0.1330	36.1
11	MHEE112MBA	0.9/4.5	1.2/6.1	4/2	1440/2850	75/73	0.82/0.9	2.03/9.52	4.5/5.5	2.0/2.3	0.1475	40.0
12	MHEE132SAA	1.1/5.5	1.5/7.5	4/2	1440/2880	81.5/84.8	0.78/0.9	2.4/10.02	5.0/6.0	2.1/2.8	0.1383	42.6
13	MHEE132SBA	1.5/7.1	2/9.5	4/2	1440/2900	82/86	0.78/0.92	3.26/12.48	5.3/6.5	2.2/2.9	0.1383	42.6
14	MHEE132MCA	1.9/8	2.6/10.9	4/2	1450/2930	83.7/88	0.82/0.87	3.85/14.53	5.5/7.0	2.2/3.0	0.1713	51.4
15	MHEE160MAA	2.8/11	3.8/15.0	4/2	1440/2940	82.5/88.2	0.78/0.9	6.05/19.27	5.0/7.5	2.0/2.1	0.5175	94
16	MHEE160MBA	3.3/13.5	4.5/18.3	4/2	1440/2920	83/88.5	0.8/0.92	6.91/23.06	5.5/7.5	2.0/2.2	0.5175	94
17	MHEE160LCA	4.4/18.5	6.0/25.1	4/2	1450/2940	85.5/89.5	0.83/0.92	8.62/31.25	5.5/7.5	2.0/2.2	0.6400	108.7

8/4 pole Dahlander Connection Y/YY

1	MHEE71ZAA	0.08/0.37	0.11/0.5	8/4	660/1370	26/57	0.63/0.72	0.67/1.25	2.8/3.4	1.9/1.7	0.0124	6.8
2	MHEE80ZAA	0.12/0.55	0.16/0.75	8/4	685/1420	50/69	0.6/0.74	0.55/1.49	1.9/3.3	1.4/1.5	0.0247	9.2
3	MHEE80ZBA	0.18/0.75	0.25/1.0	8/4	660/1380	53/67	0.73/0.81	0.64/1.92	2.0/3.5	1.6/1.7	0.0241	10.6
4	MHEE90LAA	0.18/1.1	0.25/1.5	8/4	680/1400	60/70	0.65/0.82	0.64/2.66	2.8/4.0	1.5/2.0	0.0298	15.7
5	MHEE90LCA	0.4/1.6	0.54/2.15	8/4	675/1400	61.5/75	0.64/0.79	1.41/3.75	3.1/5.0	1.6/2.2	0.0370	19.6
6	MHEE100LAA	0.45/2.2	0.60/3.0	8/4	680/1420	63.1/75.3	0.6/0.8	1.65/5.08	2.7/4.7	1.7/2.0	0.0558	21.9
7	MHEE100LBA	0.6/2.6	0.80/3.5	8/4	680/1435	64/76.2	0.63/0.75	2.07/6.32	2.7/4.8	1.7/2.2	0.0600	23.7
8	MHEE112MAA	0.7/3.3	0.94/4.5	8/4	690/1420	62/78	0.7/0.8	2.24/7.35	3.4/6.5	1.8/2.4	0.1670	34.2
9	MHEE112MCA	1/4	1.34/5.5	8/4	720/1420	60/77	0.7/0.82	3.31/8.81	3.5/5.0	2.3/1.9	0.1950	40.0
10	MHEE132SAA	1.1/4.5	1.5/6.1	8/4	725/1450	77/85.5	0.58/0.82	3.42/8.92	3.5/5.4	2.2/2.7	0.2240	41.9
11	MHEE132MBA	1.4/5.5	1.9/7.5	8/4	720/1440	78/86	0.62/0.82	4.02/10.85	3.6/5.5	2.0/2.5	0.2925	51.0
12	MHEE132MCA	1.8/7.5	2.4/10.2	8/4	720/1450	78.2/86.5	0.64/0.86	5/14.02	4.6/6.0	2.0/2.5	0.3725	65.0
13	MHEE160MZA	2.2/10	3.0/13.0	8/4	720/1450	80/88	0.61/0.83	6.27/19.04	3.5/6.0	1.8/1.7	0.8125	88.5
14	MHEE160LZA	3.2/15.01	4.3/20.01	8/4	720/1450	81/90	0.61/0.88	9.01/26.36	3.5/6.5	1.7/1.8	1.0575	106.5

Note: All performance figures are in accordance to Havells Design and subject to change prior confirmation

Performance Chart



Three-Phase Squirrel Cage Induction Motor (Dual Speed)	
Voltage	415 ±10%
Frequency	50±5%
Ambient	50 °C (Smoke F250, F300 & F400)
Duty	S1 - S2
Class of Insulation	H - Smoke
Type of enclosure	TEFC (IC411) / TEAO (IC418)

4/6 Poles Separate Windings

S.No	Frame Size	Output		Pole	Speed	Efficiency at 100%	Power Factor (Cosφ)	Rated Current (Amps)	Direct-On-Linestarting		Moment of Inertia GD2 (Kgm2)	Approx Weight
		kW	HP		Rpm				Starting Current (%)	Breakaway Torque (%)		Kg (Approx.)
1	MHEE71ZAA	0.25/0.08	0.33/0.11	4/6	1370/900	60/40	0.8/0.7	0.72/0.39	3.0/2.5	1.6/1.6	0.0115	6.7
2	MHEE71ZBA	0.37/0.13	0.50/0.18	4/6	1360/880	62/44	0.8/0.7	1.03/0.58	3.2/2.6	1.6/1.6	0.0124	7.2
3	MHEE80ZAA	0.55/0.18	0.75/0.25	4/6	1380/920	60/42	0.83/0.82	1.53/0.72	3.5/2.4	1.6/1.0	0.0197	8.3
4	MHEE80ZBA	0.75/0.25	1.0/0.33	4/6	1400/940	70/60	0.82/0.72	1.81/0.8	4.2/2.6	1.6/1.3	0.0405	14
5	MHEE90SAA	0.75/0.24	1.0/0.32	4/6	1400/950	70/60	0.82/0.72	1.81/0.77	4.2/2.6	1.6/1.3	0.0405	14
6	MHEE90LBA	1.1/0.37	1.5/0.50	4/6	1400/930	70/60	0.81/0.74	2.69/1.15	4.3/2.7	1.6/1.2	0.0478	16.4
7	MHEE90LCA	1.5/0.5	2.0/0.67	4/6	1420/950	73/64	0.8/0.7	3.57/1.55	4.8/2.6	1.5/1.3	0.0598	20.5
8	MHEE100LAA	1.85/0.6	2.5/0.75	4/6	1400/920	74/64	0.8/0.73	4.34/1.78	4.8/3.1	1.8/1.5	0.0673	23.4
9	MHEE100LBA	2.2/0.75	3.0/1.0	4/6	1420/950	76/66	0.79/0.75	5.09/2.1	5.0/3.5	1.7/1.3	0.0925	22.6
10	MHEE112MAA	3/1	4.0/1.34	4/6	1440/970	80/73	0.81/0.65	6.44/2.93	5.8/4.6	2.5/2.1	0.1330	30.4
11	MHEE132SAA	3.8/1.3	5.2/1.8	4/6	1460/970	85/75	0.8/0.72	7.77/3.34	6.5/4.0	2.2/1.7	0.2240	41.9
12	MHEE132MBA	4.4/1.5	6.0/2.0	4/6	1460/970	86/78.2	0.85/0.73	8.37/3.65	6.5/4.4	2.2/1.7	0.2925	51.0
13	MHEE132MCA	5.5/1.8	7.5/2.4	4/6	1460/970	86.8/80	0.84/0.74	10.49/4.23	7.0/4.7	2.6/1.8	0.3725	65.0
14	MHEE132MDA	6.3/2.21)	8.6/3.01)	4/6	1460/970	86.8/81	0.84/0.73	12.02/5.19	7.2/4.8	2.6/1.9	0.3725	66.0
15	MHEE160MAA	7.5/2.5	10.0/3.4	4/6	1470/975	87.5/83	0.83/0.75	14.36/5.58	8.3/4.5	2.5/1.9	0.8125	88.5
16	MHEE160LBA	11/3.7	15.0/5.0	4/6	1470/970	88/84.2	0.81/0.73	21.46/8.37	8.0/4.8	2.4/1.8	1.0575	106.5
17	MHEE160LCA	13/4.01)	17.7/5.41)	4/6	1460/970	88/84.5	0.81/0.72	25.37/9.16	8.0/4.8	2.4/1.9	1.0575	106.5

6/8 Pole Separate Windings

1	MHEE80ZAA	0.25/0.11	0.33/0.15	6/8	930/720	53/49	0.79/0.62	0.83/0.5	2.9/3.0	1.6/1.8	0.0197	7.9
2	MHEE80ZBA	0.37/0.15	0.50/0.25	6/8	920/715	52/47	0.81/0.63	1.22/0.7	2.8/2.8	1.4/1.9	0.0247	9.5
3	MHEE90LAA	0.55/0.22	0.75/0.30	6/8	960/740	65/47	0.62/0.51	1.89/1.27	3.9/2.9	2.5/2.1	0.0478	16.2
4	MHEE90LBA	0.75/0.3	1.0/0.40	6/8	940/720	64/45.5	0.67/0.52	2.43/1.76	3.4/2.6	2.2/1.9	0.0478	16.2
5	MHEE100LAA	1.1/0.45	1.5/0.60	6/8	950/710	70.6/58	0.71/0.67	3.05/1.61	4.3/2.8	2.0/1.3	0.0943	22.0
6	MHEE112MAA	1.5/0.6	2.0/0.80	6/8	970/720	75.8/65	0.65/0.6	4.23/2.14	5.5/3.4	2.8/2.1	0.1870	39.0
7	MHEE132SZA	2.2/0.9	3.0/1.2	6/8	970/715	78/69	0.67/0.55	5.85/3.29	4.8/4.0	1.6/1.6	0.2950	42.5
8	MHEE132MYA	3/1.2	4.0/1.6	6/8	960/715	80/72	0.7/0.55	7.45/4.21	4.8/4.1	1.6/1.6	0.3775	55.5
9	MHEE132MZA	4/1.6	5.5/2.2	6/8	960/715	81/74	0.78/0.6	8.8/5.01	5.3/4.4	1.7/1.7	0.4450	64.1
10	MHEE160MYA	5.5/2.2	7.5/3.0	6/8	970/730	83/76	0.77/0.6	11.97/6.71	5.7/5.6	1.6/1.9	1.1270	88.0
11	MHEE160MZA	7/3	9.5/4.1	6/8	970/730	84/77	0.8/0.65	14.49/8.33	6.0/5.8	1.7/2.2	1.5025	97.5

Note: All performance figures are in accordance to Havells Design and subject to change prior confirmation

Air Velocity For TEAO Fan Motor

IEC Rating Speed (m/s)

Frame Size	3000 rpm	3600 rpm	1500 rpm	1800 rpm	1000 rpm	1200 rpm	750 rpm	900 rpm
63	8.1	9.7	4.1	4.9	2.6	3.1	2.0	2.4
71	10.6	12.8	5.3	6.3	3.6	4.3	2.6	3.1
80	9.0	10.8	4.7	5.6	3.1	3.8	2.3	2.8
90	10.3	12.3	5.1	6.1	3.8	4.5	2.7	3.2
100	16.0	19.2	8.0	9.7	5.4	6.5	4.0	4.8
112	14.3	17.1	9.4	11.2	6.2	7.4	4.7	5.6
132	17.1	20.5	10.1	12.1	6.9	8.3	5.2	6.2
160	12	14	9	10	6	7	4	5
180	11	13	10	12	7	8	5	6
200	13	16	12	14	8	9	6	7
225	25	31	16	19	14	17	10	12
250	25	30	16	19	14	17	10	12
280	18	21	16	19	15	18	11	14
315S/M	20	23	16	19	17	20	12	15
315M/L	20	23	21	26	17	20	12	15
355S/M/L	21	25	21	26	20	24	15	18

AOM Speed (m/s)

Frame Size	3000 rpm	3600 rpm	1500 rpm	1800 rpm	1000 rpm	1200 rpm	750 rpm	900 rpm
63	12.1	14.6	6.1	7.3	4.0	4.8	3.0	3.6
71	15.9	19.1	7.9	9.6	5.4	6.5	4.0	4.8
80	13.5	16.1	7.0	8.4	4.8	5.7	3.5	4.3
90	15.5	18.6	7.6	9.2	5.7	6.8	4.2	5.0
100	24.1	28.9	12.1	14.6	8.1	9.8	8.1	9.7
112	21.4	25.7	14.0	16.9	9.3	11.2	9.1	10.9
132	25.7	30.8	15.2	18.2	10.4	12.4	10.3	12.4
160	17	21	13	15	9	10	6	8
180	20	25	16	20	10	12	8	9
200	24	28	17	21	12	14	9	10
225	31	37	24	28	21	25	16	19
250	31	37	24	29	21	25	16	19
280	27	32	24	29	23	28	17	21
315S/M	29	35	23	28	25	30	19	22
315M/L	29	35	32	38	25	30	19	22
355S/M/L	31	38	32	38	30	36	22	27

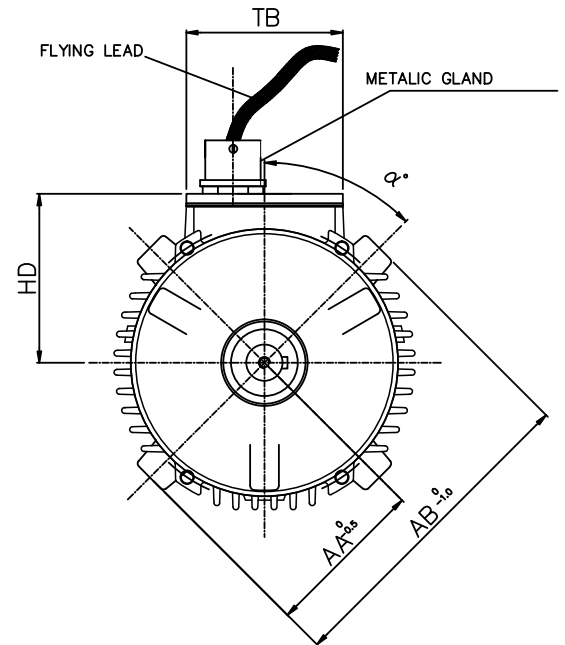
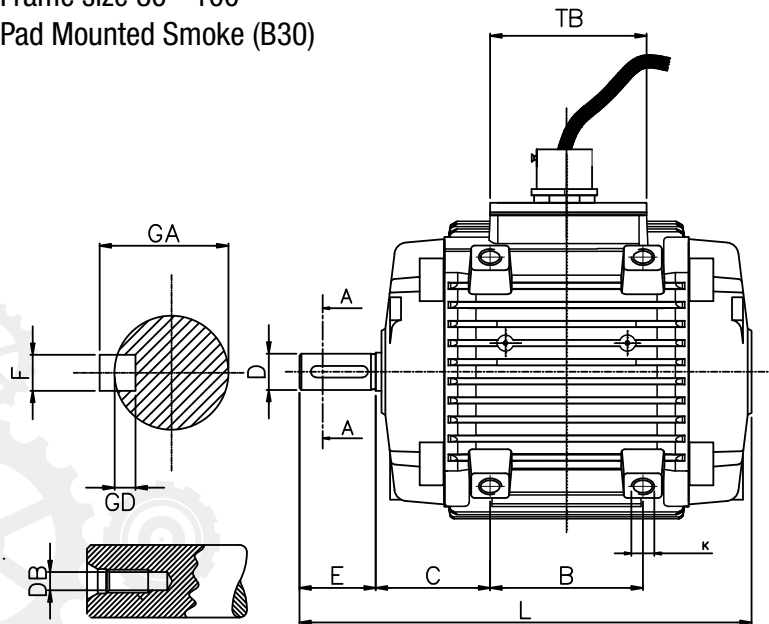
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Paint Specifications

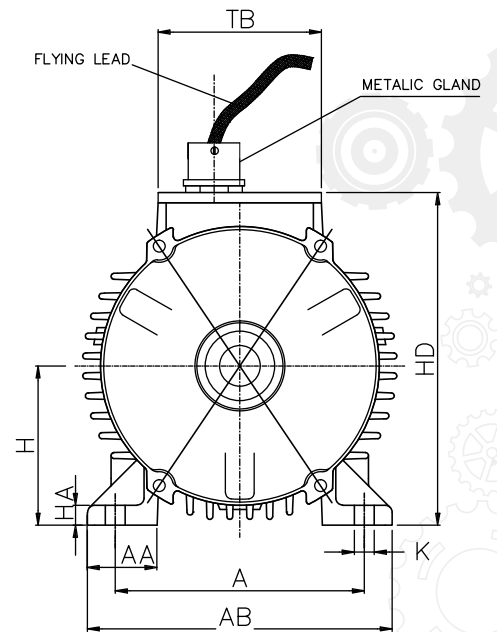
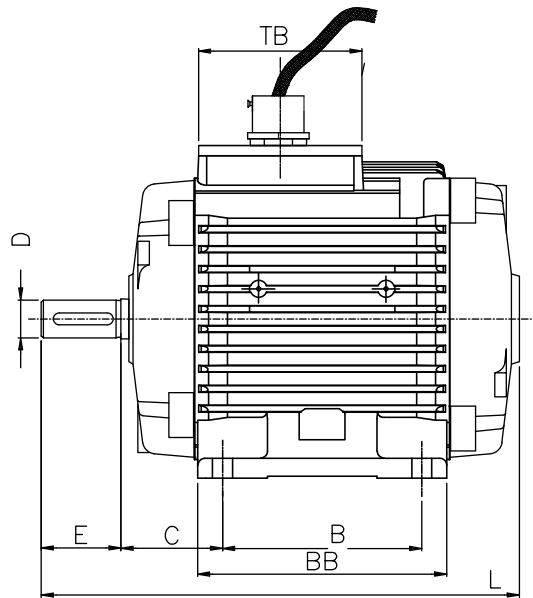
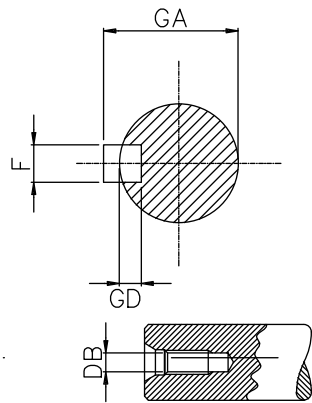
Standard	Usage	Type	Primer				Paint - Top Coat				
			Type	Pack	Shade	DFT (micron)	Pack	RAL Shade	DFT (micron)	Salt Spray Life (hrs)	UV Resistance
NA	Sheltered industrial environments;	Alkid Quick Dry	Red Oxide Zinc	Single	Grey	20-25	Single	Havells Grey (Closest 7035)	25-30	96	No
NA	Non sheltered marine environment, resistance to acid ,alkalis & Solvent Spill.	Epoxy Matt Light	Red Oxide Zinc	Single	Grey	20-25	Single	Grey 631	25-30	150	No
NA	Painting of equipment, structures in general subject to moderate and high aggressive level such as: pulp and paper plants, steel and iron and chemical industries	Poly Urethane	Epoxy	Two	Grey	35-40	Two	Havells Grey (Closest 7035)	35-40	500	Yes
ISO 12944-5	Extreme Moist Environment , Marine , off shore .	C5 M	Epoxy high build zinc rich	Single	Grey	40-50	Single	-	-	-	-
			Epoxy HB MIO coating	-	-	-	Single	7032	80-100	720	Yes
			Epoxy HB top Coat	-	-	-	Single	7032	60-70	720	Yes

GA Drawing

Frame size 80 - 100 Pad Mounted Smoke (B30)



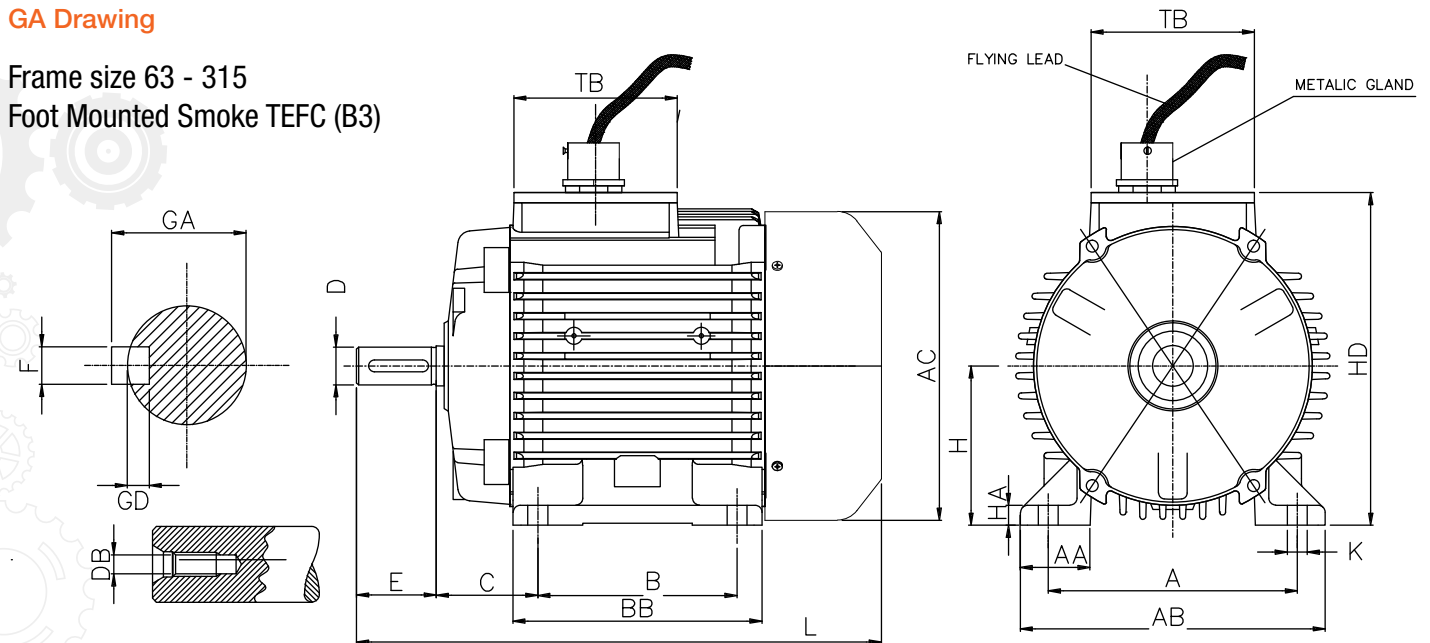
Frame	NO OF POLES	C	B	K	α	HD	AB	AA	D	E	F	GD	GA	DB	L	TB
80	2-8	60	80	M12x1.75x14	45°	90	170	85	19 j6	40	6	6	21.5	M6	240	82x82
90L	2-8	73.5	90	M12x1.75x14	45°	98	190	95	24 j6	50	8	7	27	M8	290/306	82x82
100L	2-8	83	100	M12x1.75x14	45°	108	210	105	28 j6	60	8	7	31	M10	326	82x82



Frame	Poles	H	B	A	C	K	AB	BB	HD	HA	AA	D	E	F	GD	GA	DB	L	TB
63	2-4	63	80	100	40	7	119	100	125	8	30	11	23	4	4	12.5	M4	181	65X65
71	2-8	71	90	112	45	8	135	110	147	8	31	14	30	5	5	16	M5	207	65X65
80	2-8	80	100	125	50	10	153	125	167	9	35	19	40	6	6	21.5	M6	240	82X82
90S	2-8	90	100	140	56	10	170	150	188	12	36	24	50	8	7	27	M8	290 / 306	82X82
90L	2-8	90	125	140	56	10	170	150	188	12	36	24	50	8	7	27	M8	290 / 306	82X82
100L	2-8	100	140	160	63	12	192	166	203	12	40	28	60	8	7	31	M10	326	82X82
112M	2-8	112	140	190	70	12	220	175	231	15	48	28	60	8	7	31	M10	340	82X82
132S	2-8	132	140	216	89	12	256	218	266	15	59	38	80	10	8	41	M12	390 / 410	105X105
132M	2-8	132	178	216	89	15	256	218	266	15	59	38	80	10	8	41	M12	430 / 450	105X105
160M	2-8	160	210	254	108	15	308	260	328	20	65	42	110	12	8	45	M16	510	136X136
160L	2-8	160	254	254	108	15	308	300	328	20	65	42	110	12	8	45	M16	560	136X136
180M	2-8	180	241	279	121	14	330	316	363	22	66	48	110	14	9	51.5	M16	620	147X147
180L	2-8	180	279	279	121	14	330	316	363	22	66	48	110	14	9	51.5	M16	620	147X147
200L	2-8	200	305	318	133	18	380	360	396	25	79	55	110	16	10	59	M20	675	160X160
225S	2	225	286	356	149	18.5	420	375	450	28	90	55	110	16	10	59	M20	736	160X160
	4,6,8	225	286	356	149	18.5	420	375	450	28	90	60	140	18	11	64	M20	766	160X160
225M	2	225	311	356	149	18.5	420	375	450	28	90	55	110	16	10	59	M20	736	160X160
	4,6,8	225	311	356	149	18.5	420	375	450	28	90	60	140	18	11	64	M20	766	160X160
250M	2	250	349	406	168	24	500	425	500	40	135	60	140	18	11	64	M20	820	190X190
	4,6,8	250	349	406	168	24	500	425	500	40	135	65	140	18	11	69	M20	820	190X190
280S	2	280	368	457	190	24	545	500	556	38	90	65	140	18	11	69	M20	920	190X190
	4,6,8	280	368	457	190	24	545	500	556	38	90	75	140	20	12	79.5	M20	920	190X190
280M	2	280	419	457	190	24	545	500	556	38	90	65	140	18	11	69	M20	920	190X190
	4,6,8	280	419	457	190	24	545	500	556	38	90	75	140	20	12	79.5	M20	920	190X190
315S	2	315	406	508	216	28	630	533	665	45	110	65	140	18	11	69	M20	1014	240X240
	4,6,8,10	315	406	508	216	28	630	533	665	45	110	80	170	22	14	85	M20	1044	240X240
315M	2	315	457	508	216	28	630	533	665	45	110 / 115	65	140	18	11	69	M20	1014 / 1044	240X240
	4,6,8,10	315	457	508	216	28	630	533	665	45	110 / 115	80	170	22	14	85	M20	1014 / 1044	240X240
315L	2	315	508	508	216	28	630	584	665	45	115	65	140	18	11	69	M20	1100	240X240
	4,6,8,10	315	508	508	216	28	630	584	665	45	115	80	170	22	14	85	M20	1125	240X240

GA Drawing

Frame size 63 - 315 Foot Mounted Smoke TEFC (B3)



FRAME	POLES	H	B	A	C	K	AB	BB	HD	HA	AA	AC	D	E	F	GD	GA	DB	L	TB
63	2-4	63	80	100	40	7	119	100	125	8	30	124	11	23	4	4	12.5	M4	211	65X65
71	2-8	71	90	112	45	8	135	110	147	8	31	140	14	30	5	5	16	M5	246	65X65
80	2-8	80	100	125	50	10	153	125	167	9	35	157	19	40	6	6	21.5	M6	270	82X82
90S	2-8	90	100	140	56	10	170	150	188	12	36	197	24	50	8	7	27	M8	318/340	82X82
90L	2-8	90	125	140	56	10	170	150	188	12	36	197	24	50	8	7	27	M8	318/340	82X82
100L	2-8	100	140	160	63	12	192	166	203	12	40	192	28	60	8	7	31	M10	370	82X82
112M	2-8	112	140	190	70	12	220	175	231	15	48	222	28	60	8	7	31	M10	387	82X82
132S	2-8	132	140	216	89	12	256	218	266	15	59	248	38	80	10	8	41	M12	443/464	105X105
132M	2-8	132	178	216	89	15	256	218	266	15	59	248	38	80	10	8	41	M12	483/505	105X105
160M	2-8	160	210	254	108	15	308	260	328	20	65	316	42	110	12	8	45	M16	590	136X136
160L	2-8	160	254	254	108	15	308	300	328	20	65	316	42	110	12	8	45	M16	630	136X136
180M	2-8	180	241	279	121	14	330	316	363	22	66	355	48	110	14	9	51.5	M16	715	147X147
180L	2-8	180	279	279	121	14	330	316	363	22	66	355	48	110	14	9	51.5	M16	715	147X147
200L	2-8	200	305	318	133	18	380	360	396	25	79	379	55	110	16	10	59	M20	800	160X160
225S	2	225	286	356	149	18.5	420	375	450	28	90	445	55	110	16	10	59	M20	880	160X160
	4,6,8	225	286	356	149	18.5	420	375	450	28	90	445	60	140	18	11	64	M20	910	160X160
225M	2	225	311	356	149	18.5	420	375	450	28	90	445	55	110	16	10	59	M20	880	160X160
	4,6,8	225	311	356	149	18.5	420	375	450	28	90	445	60	140	18	11	64	M20	910	160X160
250M	2	250	349	406	168	24	500	425	500	40	135	494	60	140	18	11	64	M20	970	190X190
	4,6,8	250	349	406	168	24	500	425	500	40	135	494	65	140	18	11	69	M20	970	190X190
280S	2	280	368	457	190	24	545	500	556	38	90	520	65	140	18	11	69	M20	1050	190X190
	4,6,8	280	368	457	190	24	545	500	556	38	90	520	75	140	20	12	79.5	M20	1050	190X190
280M	2	280	419	457	190	24	545	500	556	38	90	520	65	140	18	11	69	M20	1050	190X190
	4,6,8	280	419	457	190	24	545	500	556	38	90	520	75	140	20	12	79.5	M20	1050	190X190
315S	2	315	406	508	216	28	630	533	665	45	110	640	65	140	18	11	69	M20	1146	240X240
	4,6,8,10	315	406	508	216	28	630	533	665	45	110	640	80	170	22	14	85	M20	1176	240X240
315M	2	315	457	508	216	28	630	533	665	45	110/115	640	65	140	18	11	69	M20	1014/1100	240X240
	4,6,8,10	315	457	508	216	28	630	533	665	45	110/115	640	80	170	22	14	85	M20	1044/1125	240X240
315L	2	315	508	508	216	28	630	584	665	45	115	640	65	140	18	11	69	M20	1226	240X240
	4,6,8,10	315	508	508	216	28	630	584	665	45	115	640	80	170	22	14	85	M20	1256	240X240

Notes



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