AC motors

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Low voltage AC motors Sizes and ratings



86 Drives and controls, motors and mechanical power transmission catalogue

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com



AC motors European Minimum Energy Performance Standards (EU MEPS)



2007

Standard on efficiency measurement methods

Introduces new rules concerning the testing methods to be used for determining losses and efficiency.

The resulting efficiency values differ from those obtained under the previous IEC testing standard IEC 60034-2: 1996

ABB calculates efficiency values according to the indirect method, with additional losses determined from measurement. This is the preferred low uncertainty method outlined in the standard.

0.75 1.5

Output kW

60



AC motors EU 4/2014 - main changes and exclusions

Original Regulation EC 640/2009

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EU MEPS covers 2-, 4- and 6-pole single speed, threephase induction motors in a power range of 0.75 kW -375 kW rated up to 1000 V. It covers all duty types as long as the motors are capable of continuous duty operation.

Amending Regulation EU 4/2014

The amending regulation came into force in mid-2014 and was intended to close loopholes in the original regulation. The amendment was issued after it became clear that certain manufacturers were intentionally contravening the spirit of EU MEPS.

The amendment did not change the scope of EU MEPS, but instead clarified the original spirit of Regulation EC 640. The main changes are shown below.

The original Regulation excluded the following motors from the scope of EU MEPS:		
motors designed to operate wholly immersed in a liquid	change	specified to operate
motors completely integrated into a product where the motor's energy performance cannot be tested independently from the product		no change
motors specifically designed to operate continuously:	change	specified to operate exclusively
at altitudes exceeding 1000 meters ASL	change	4000 m
outside the ambient air temperature range of -15°C +40°C	change	-30°C +60°C
where ambient air temperatures are less than – 15 °C for any motor or less than 0 °C for a motor with air cooling	change	water cooling
in maximum operating temperatures above 400°C	D I	no change
where the water coolant temperature at the inlet to a product is less than 5°C or exceeds 25°C	change	0°C 32°C
in potentially explosive atmospheres as defined in Directive 94/9/EC		no change
brake motors		no change
Requirements for markings on motor rating plates:		
manufacturers must mark efficiency at 100%, 75% and 50% of rated load	change	In the case of small motors (ie, where the rating plate is small) only the effciency for 100% rated load to be shown

Low voltage AC motors Process performance motors

What is a process performance motor? Process performance motors are the flagship of ABB's standard low voltage motors. This range provides the most comprehensive, versatile set of motors for the process industries and heavy-duty applications which are dependent on continuous reliability, lowest possible environmental impact and life cycle costs. Their superior ability to perform reliably and efficiently, continuously and even under the most challenging circumstances, ensures that they power their way through the toughest tasks and conditions.



Where can it be used?

- End-users in continuous process industries
- Project OEMs
- Demanding industries:
 - pulp and paper
 - metals
 - minerals and mining

Highlights

- All variant codes possible for process industry
- Application knowledge and engineering
- With three years warranty and option to extend to five years
- IE3 and IE4

Low voltage AC motors Process performance cast iron motors 80-355, 2, 4 & 6 poles

TEFC low voltage motors, cast iron, IP55, IC 411, single-speed. 400 V 3-phase 50 Hz See product catalogues or www.abb.com/motors&generators for more information on products.

Output

0.25

0.37

0.55

0.75

1.1

1.5

2.2

3

4

5.5

7.5

11

15

22

30

37

45

55

75

90

110

132

18.5

kW

Torque

1.69

2.5

3.6

4.9

7.3

9.9

14.5

19.8

26.3

36

49

71

97

119

142

193

238

290

354

482

578

704

846

Nm

1500 r/min = 4 poles

Current

0.6

0.9

1.2

1.7

2.4

3.3

4.5

6.1

8.9

11.9

15.7

20.4

27.8

34.9

41.5

54.6

65.4

80.2

97.8

134

161

194

234

Eff*

73.5

77.3

80.8

82.5

84.1

85.3

86.7

87.7

88.6

89.6

90.4

92.2

92.6

93.3

93.3

94.4

94.9

95.2

95.4

95.9

96.2

96.3

96

Frame size

M3BP 71MD 4

M3BP 71MLE 4

M3BP 80MLC 4

M3BP 80MLE 4

M3BP 90LA 4

M3BP 90LB 4

M3BP 100LA 4

M3BP 100MLB 4

M3BP 112ME 4

M3BP 132SMB 4

M3BP 132SME 4

M3BP 160MLA 4

M3BP 160MLB 4

M3BP 180MLA 4

M3BP 180MLB 4

M3BP 200MLA 4

M3BP 225SMA 4

M3BP 225SMB 4

M3BP 250SMA 4

M3BP 280SMB 4

M3BP 280SMC 4

M3BP 315SMC 4

M3BP 315SMD 4

Output kW	Torque Nm	Current I	Eff*	Frame size	Foot price	Flange price
3000 r/m	in = 2 poles	8		•		
0.37	1.29	0.94	73.8	M3BP 71MC 2	£260	£306
0.55	1.91	1.25	77.8	M3BP 71ME 2	£292	£338
0.75	2.5	1.6	80.7	M3BP 80MC 2	£402	£446
1.1	3.7	2.3	82.7	M3BP 80ME 2	£422	£465
1.5	4.9	2.9	84.2	M3BP 90SLA 2	£444	£491
2.2	7.2	4.2	85.9	M3BP 90LA 2	£552	£597
3	9.9	5.4	87.1	M3BP 100MLA 2	£649	£721
4	13.3	6.9	88.1	M3BP 112ME 2	£834	£936
5.5	18.1	9.8	89.2	M3BP 132SMC 2	£1,010	£1,094
7.5	24.6	13.3	90.1	M3BP 132SME 2	£1,218	£1,329
11	36	18.7	92.1	M3BP 160MLA 2	£1,349	£1,486
15	49	25.4	92.5	M3BP 160MLB 2	£1,603	£1,748
18.5	60	30.8	93.1	M3BP 160MLC 2	£1,957	£2,085
22	71	37.4	93.2	M3BP 180MLA 2	£2,363	£2,472
30	97	51	94.2	M3BP 200MLA 2	£3,033	£3,160
37	119	61.9	94.7	M3BP 200MLB 2	£4,416	£4,597
45	145	76.8	94.9	M3BP 225SMA 2	£5,590	£5,787
55	177	93.6	95.2	M3BP 250SMA 2	£6,630	£6,849
75	240	129	95.5	M3BP 280SMB 2	£8,395	£8,876
90	288	153	95.7	M3BP 280SMC 2	£9,557	£9,847
110	352	189	95.9	M3BP 315SMB 2	£12,589	£13,002
132	422	226	96.1	M3BP 315SMC 2	£13,917	£14,344
160	512	268	96.2	M3BP 315MLA 2	£15,905	£16,336
200	640	334	96.4	M3BP 315MLB 2	£22,142	£24,296
200	640	336	96.4	M3BP 355SMA 2	£22,142	£24,296
250	801	413	96.4	M3BP 315LKB 2	£28,018	£29,390
250	800	415	96.4	M3BP 355SMB 2	£28,018	£29,390
315	1008	533	96.4	M3BP 355SMC 2	£35,266	£36,639
355	1137	595	96.4	M3BP 355MLA 2	£39,775	£41,146

Output kW	Torque Nm	Current I	Eff*	Frame size	Foot price	Flange price
1000 r/m	nin = 6 poles	3				
0.18	1.94	0.57	63.9	M3BP 71ME 6	£271	£318
0.25	2.5	0.82	68.6	M3BP 80MB 6	£331	£386
0.37	3.8	1.06	73.5	M3BP 80MC 6	£381	£427
0.55	5.6	1.52	77.2	M3BP 80ME 6	£385	£428
0.75	7.6	1.8	78.9	M3BP 90SLD 6	£425	£466
1.1	11.1	2.6	81	M3BP 90LF 6	£509	£554
1.5	14.9	3.8	82.5	M3BP 100MLB 6	£632	£699
2.2	21.6	4.5	84.3	M3BP 112MJ 6	£779	£849
3	29.1	6.9	85.6	M3BP 132SMB 6	£1,010	£1,087
4	39	10.7	86.8	M3BP 132SMF 6	£1,145	£1,215
5.5	54	12.3	88	M3BP 132SMJ 6	£1,237	£1,313
7.5	73	15.2	90.8	M3BP 160MLA 6	£1,332	£1,464
11	107	23.5	91.2	M3BP 160MLB 6	£1,940	£2,079
15	146	30.4	92.2	M3BP 180MLA 6	£2,363	£2,528
18.5	178	37.3	92.8	M3BP 200MLA 6	£2,795	£2.981

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Output	Torque	Current	Eff*	Frame size	Foot	Flange
kW	Nm	I			price	price
1000 r/r	nin = 6 pol	es	•			
22	212	43	93.3	M3BP 200MLB 6	£3,106	£3,309
30	290	56.8	94.1	M3BP 225SMA 6	£4,834	£5,066
37	357	68	94.4	M3BP 250SMA 6	£5,610	£5,863
45	433	80.9	94.7	M3BP 280SMB 6	£8,145	£8,412
55	531	99.4	95	M3BP 280SMC 6	£8,863	£9,149
75	720	138	95.3	M3BP 315SMC 6	£10,903	£11,354
90	865	170	95.5	M3BP 315SMD 6	£12,820	£13,502
110	1057	202	95.7	M3BP 315MLB 6	£15,583	£16,264
132	1269	243	95.9	M3BP 315LKA 6	£19,186	£20,440
160	1537	293	96.1	M3BP 315LKC 6	£21,873	£23,129
160	1536	294	96.1	M3BP 355SMB 6	£21,873	£23,129
200	1919	367	96.2	M3BP 355SMC 6	£27,249	£28,503
250	2399	456	96.4	M3BP 355MLB 6	£33,703	£34,958
315	3026	576	96.5	M3BP 355LKA 6	£40,514	£41,768
355	3407	668	96.5	M3BP 355LKB 6	£48.223	£49.477

* Efficiency full load 100%

160 1025 278 96.5 M3BP 315MLB 4 £14,632 £15,062 200 1282 344 96.6 M3BP 315LKB 4 £20.798 £21.336 200 1281 345 96.6 M3BP 355SMA 4 £20,798 £21,336 250 1602 430 96.6 M3BP 315LKC 4 £24,561 £25,279 250 433 M3BP 355SMB 4 1601 96.6 £24,561 £25,279 315 2019 554 96.6 M3BP 355SMC 4 £32,627 £33,703 96.6 £35.852 355 227/ 616 MORP OSSMI & A £31 780

IF3

Flange

price

£299

£331

£425

£430

£465

£554

£649

£735

£878

£1,110

£1,350

£1,473

£1,833

£2,105

£2,453

£3,235

£4,308

£5,030

£6,006

£7,587

£9,040

£11,067

£12,948

Foot

price

£252

£283

£378

£386

£422

£509

£577

£656

£815

£1,037

£1,277

£1,339

£1,667

£1,978

£2,363

£3,070

£4,091

£4,794

£5,734

£7,157

£8,591

£10,600

£12,519

Low voltage AC motors Process performance aluminium motors 80-250, 2, 4 & 6 poles

TEFC low voltage motors, aluminium, IP55, IC 411, single-speed. 400 V 3-phase 50 Hz See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW	Torque Nm	Current I	Eff*	Frame size	Foot price	Flange price
3000 r/mi	n = 2 poles					
0.75	2.5	1.7	80.7	M3AA 80B 2	£241	£278
1.1	3.7	2.4	82.7	M3AA 80C 2	£266	£296
1.5	4.9	3	84.4	M3AA 90L 2	£311	£351
2.2	7.2	4.7	85.9	M3AA 90LB 2	£394	£433
3	9.9	5.4	87.5	M3AA 100LB 2	£467	£513
4	13.3	7.2	88.5	M3AA 112MB 2	£555	£613
5.5	18	9.9	89.2	M3AA 132SB 2	£723	£796
7.5	24.7	13	90.5	M3AA 132SC 2	£900	£970
11	36	18.7	92.1	M3AA 160MLA 2	£1,333	£1,446
15	49	25.4	92.5	M3AA 160MLB 2	£1,732	£1,860
18.5	60	30.8	93.1	M3AA 160MLC 2	£2,078	£2,205
22	71	37.4	93.2	M3AA 180MLA 2	£2,370	£2,533
30	97	51	94.2	M3AA 200MLA 2	£2,990	£3,170
37	119	61.9	93.7	M3AA 200MLB 2	£3,900	£4,118
45	145	76.8	94.9	M3AA 225SMA 2	£5,611	£5,852
55	177	93.6	95.2	M3AA 250SMA 2	£6,564	£6,827
75	241	127	94.7	M3AA 280SMA 2	£8,103	£8,313
90	289	149	95	M3AA 280SMB 2	£9,493	£9,743

Output	Torque	Current	Eff*	Frame size	Foot	Flange
kW	Nm	I			price	price
1500 r/mi	n = 4 poles					
0.75	5	1.9	82.5	M3AA 80ME 4	£250	£281
1.1	7.3	2.5	84.1	M3AA 90LB 4	£287	£324
1.5	9.9	3.3	85.3	M3AA 90LD 4	£339	£385
2.2	14.4	4.6	86.7	M3AA 100LC 4	£412	£458
3	19.8	5.9	87.9	M3AA 100LD 4	£491	£546
4	26.3	8.6	88.6	M3AA 112MB 4	£583	£638
5.5	36	11	89.6	M3AA 132M 4	£744	£815
7.5	49	15.6	90.6	M3AA 132MA 4	£943	£1,028
11	71	20.4	92.2	M3AA 160MLA 4	£1,360	£1,473
15	97	27.8	92.6	M3AA 160MLB 4	£1,765	£1,876
18.5	119	34.9	93.3	M3AA 180MLA 4	£2,005	£2,168
22	142	41.5	93.3	M3AA 180MLB 4	£2,407	£2,570
30	193	54.6	94.4	M3AA 200MLA 4	£3,098	£3,317
37	238	65.4	94.9	M3AA 225SMA 4	£3,941	£4,218
45	290	80.2	95.2	M3AA 225SMB 4	£4,796	£5,075
55	354	97.8	95.4	M3AA 250SMA 4	£5,730	£5,968
75	483	138	95	M3AA 280SMA 4	£7,347	£7,599

IE3

Output kW	Torque Nm	Current I	Eff*	Frame size	Foot price	Flange price
1000 r/m	in = 6 poles			·		
0.75	7.7	2.1	78.9	M3AA 90LB 6	£315	£345
1.1	11.3	2.7	81	M3AA 90LD 6	£388	£412
1.5	14.9	3.6	84.7	M3AA 100LC 6	£443	£485
2.2	22	5.9	84.3	M3AA 112MB 6	£555	£592
3	29.5	7.4	85.6	M3AA 132S 6	£693	£741
4	40	8.9	86.8	M3AA 132MA 6	£860	£903
5.5	54	13.3	88.5	M3AA 132MC 6	£1,065	£1,095
7.5	73	15.2	90.8	M3AA 160MLA 6	£1,446	£1,559
11	107	23.5	91.2	M3AA 160MLB 6	£1,969	£2,078
15	145	30.4	92.2	M3AA 180MLA 6	£2,461	£2,625
18.5	178	37.3	92.8	M3AA 200MLA 6	£2,953	£3,171
22	212	43	93.3	M3AA 200MLB 6	£3,482	£3,700
30	290	56.8	94.1	M3AA 225SMA 6	£4,877	£5,115
37	357	68	94.4	M3AA 250SMA 6	£5,796	£6,087
45	434	85.5	93.7	M3AA 280SMA 6	£6,791	£7,040
55	531	105	94.1	M3AA 280SMB 6	£8,306	£8.765

* Efficiency full load 100%



Low voltage AC motors General performance motors

What is a general performance motor? These motors combine convenience and easy handling seamlessly with ABB's engineering expertise, while at the same time providing standard variants and modifications. The motors can be tailored according to the specific needs of OEMs. The high modularity enables adding a wide variety of elements to the robust frame, thus making the overall solution to fit the specific situation and customer need perfectly. As the user only pays for the enhancements needed and used, the motors are free from all unnecessary elements.



Where can it be used?

- End-users in various industries
- Tailored serial project OEM
- Pumps
- Fans
- Compressors

Low voltage AC motors General performance cast iron motors 132-355, 2, 4 & 6 poles

TEFC low voltage motors, cast iron, IP55, IC 411, single-speed. 400 V 3-phase 50 Hz See product catalogues or www.abb.com/motors&generators for more information on products.

Output kW	Torque Nm	Current I	Eff*	Frame size	Foot price	Flange price
3000 r/m	in = 2 poles		<u>`</u>			
0.37	1.25	0.87	76.5	M2BAX 71MC 2	£173	£189
0.55	1.87	1.27	78.4	M2BAX 71MB 2	£178	£199
0.75	2.5	1.68	80.7	M2BAX 80MC 2	£235	£256
1.1	3.7	2.3	82.7	M2BAX 80MD 2	£297	£341
1.5	4.9	3.1	84.2	M2BAX 90SB 2	£352	£398
2.2	7.2	4.6	85.9	M2BAX 90SLA 2	£436	£481
3	9.8	5.5	87.1	M2BAX 100LKA 2	£531	£589
4	13.2	7.3	88.1	M2BAX 112MB 2	£627	£688
5.5	17.9	10.8	89.2	M2BAX 132SMA 2	£822	£900
7.5	24.7	13.2	90.1	M2BAX 132SME 2	£1,042	£1,124
11	36	19.1	91.2	M2BAX 160MLA 2	£1,088	£1,190
15	49	26.8	91.9	M2BAX 160MLB 2	£1,385	£1,484
18.5	60	32.1	92.4	M2BAX 160MLC 2	£1,646	£1,745
22	71	38.1	92.7	M2BAX 180MLA 2	£1,940	£2,093
30	97	52.8	93.3	M2BAX 200MLA 2	£2,621	£2,824
37	119	64.1	93.7	M2BAX 200MLB 2	£3,232	£3,435
45	145	79.5	94	M2BAX 225SMA 2	£3,751	£3,985
55	177	94.2	94.3	M2BAX 250SMA 2	£4,543	£4,807
75	241	130	94.7	M2BAX 280SMB 2	£6,807	£7,174
90	289	155	95	M2BAX 280SMC 2	£8,186	£8,554
110	352	192	95.2	M2BAX 315SMB 2	£9,970	£10,595
132	423	230	95.4	M2BAX 315SMC 2	£12,048	£12,674
160	512	278	95.6	M2BAX 315SMD 2	£14,954	£15,579
200	640	343	95.8	M2BAX 315MLA 2	£18,762	£19,387
250	800	423	95.8	M2BAX 355SMA 2	£23,765	£24,868
315	1009	533	95.8	M2BAX 355SMB 2	£29,870	£31,003
355	1136	608	95.8	M2BAX 355SMC 2	£33,475	£34,608

Output	Torque	Current	Eff*	Frame size	Foot	Flange
KVV	NIII				price	price
1500 r/m	lin = 4 pole	S				0.101
0.25	1.66	0.76	/3.5	M2BAX /1MB 4	£160	£181
0.37	2.5	1.05	77.3	M2BAX 71MLA 4	£170	£203
0.55	3.6	1.33	80.8	M2BAX 80MC 4	£203	£235
0.75	5	1.87	82.5	M2BAX 80MLA 4	£290	£319
1.1	7.3	2.6	84.1	M2BAX 90SB 4	£364	£402
1.5	10	3.5	85.3	M2BAX 90SLA 4	£436	£474
2.2	14.5	4.7	86.7	M2BAX 100LB 4	£495	£551
3	19.8	6.3	87.7	M2BAX 100LKA 4	£555	£611
4	26.5	8	88.6	M2BAX 112MLA 4	£662	£723
5.5	36	11.5	89.6	M2BAX 132SMA 4	£847	£924
7.5	49	15.4	90.4	M2BAX 132SME 4	£1,087	£1,168
11	71	21.2	91.4	M2BAX 160MLA 4	£1,125	£1,224
15	97	28.7	92.1	M2BAX 160MLB 4	£1,433	£1,533
18.5	119	34.8	92.6	M2BAX 180MLA 4	£1,631	£1,785
22	142	41.7	93	M2BAX 180MLB 4	£1,940	£2,093
30	193	55.1	93.6	M2BAX 200MLA 4	£2,525	£2,726
37	238	68.6	93.9	M2BAX 225SMA 4	£3,085	£3,318
45	290	82.1	94.2	M2BAX 225SMB 4	£3,751	£3,985
55	354	100	94.6	M2BAX 250SMA 4	£4,543	£4,807
75	482	133	95	M2BAX 280SMB 4	£6,585	£6,953
90	579	159	95.2	M2BAX 280SMC 4	£7,689	£8,076
110	705	196	95.4	M2BAX 315SMB 4	£9,547	£10,172
132	847	232	95.6	M2BAX 315SMC 4	£11,515	£12,140
160	1027	284	95.8	M2BAX 315SMD 4	£13,924	£14,549
200	1284	350	96	M2BAX 315MLB 4	£17,676	£18,302
250	1601	437	96	M2BAX 355SMA 4	£22,054	£23,139
315	2017	550	96	M2BAX 355SMB 4	£28,325	£29,458
355	2275	621	96	M2BAX 355SMC 4	£31,930	£33,063

Output kW	Torque Nm	Current I	Eff*	Frame size	Foot price	Flange price
1000 r/m	in = 6 poles			•		
0.18	1.85	0.59	63.9	M2BAX 71MB 6	£184	£209
0.25	2.6	0.78	68.6	M2BAX 71MLA 6	£211	£237
0.37	3.8	1.1	73.5	M2BAX 80MC 6	£232	£262
0.55	5.6	1.51	77.2	M2BAX 80MLA 6	£259	£294
0.75	7.5	2.3	78.9	M2BAX 90SLA 6	£272	£306
1.1	11	3.2	81	M2BAX 90LB 6	£320	£359
1.5	15	4	82.5	M2BAX 100LKA 6	£401	£446
2.2	22	5.8	84.3	M2BAX 112MLA 6	£540	£589
3	29.6	7.4	85.6	M2BAX 132SMA 6	£709	£758
4	39	10.2	86.8	M2BAX 132SMB 6	£771	£841
5.5	54	13.5	88	M2BAX 132MLA 6	£1,026	£1,067
7.5	73	15.8	89.1	M2BAX 160MLA 6	£1,162	£1,263
11	108	22.6	90.3	M2BAX 160MLB 6	£1,559	£1,658
15	146	30.1	91.2	M2BAX 180MLA 6	£2,009	£2,161
18.5	179	35.5	91.7	M2BAX 200MLA 6	£2,455	£2,657
22	212	42.5	92.2	M2BAX 200MLB 6	£2,919	£3,121
30	291	55.5	92.9	M2BAX 225SMA 6	£3,847	£4,081
37	357	71.5	93.3	M2BAX 250SMA 6	£4,584	£4,849
45	434	82.6	93.7	M2BAX 280SMB 6	£6,016	£6,402
55	529	98.1	94.1	M2BAX 280SMC 6	£7,358	£7,725
75	721	136	94.6	M2BAX 315SMB 6	£9,860	£10,485
90	865	163	94.9	M2BAX 315SMC 6	£11,845	£12,472
110	1058	201	95.1	M2BAX 315SMD 6	£14,403	£15,028
132	1268	244	95.4	M2BAX 315MLB 6	£17,198	£17,824
160	1540	294	95.6	M2BAX 355SMA 6	£21,263	£22,367
200	1925	368	95.8	M2BAX 355SMB 6	£26,780	£27,913
250	2404	465	95.8	M2BAX 355SMC 6	£32,960	£34,093

* Efficiency full load 100%

IE3

Low voltage AC motors Explosive atmospheres

There are systems in place worldwide to classify explosive atmospheres by zones, according to the risk posed by explosive gas ('G") or dust ("D").



Zone 2 ("G") / 22 ("D") **Abnormal condition** Presence of explosive atmosphere only by accident, but not during normal duty Equipment protection level "c" required

> Zone 1 ("G") / 21 ("D") Occasionally Incidental presence of explosive atmosphere during normal duty Equipment protection level "b" required

> > Zone 0 ("G") / 20 ("D") Continously Permanent presence of explosive atmosphere Equipment protection level "a" required

Ex d(e) II... 🐼 Gb Ex e II... 🐼 Gb Ex p II... 🐼 Gb Ex t III... 🐼 Db

> Ex nA II... 🚱 Gc Ex t III... 🚱 Dc

Classification of explosive atmospheres according to CENELEC and IEC

The following standards define areas according to the presence of gas or dust in the atmosphere:

IEC/EN 60079-10-1 Gas IEC/EN 60079-10-2 Dust

Standard IEC 60079-0 EN 60079-0			Installation Zone acc. to IEC 60079-10-x EN 60079-10-x	Atex Directive 94/9/EC		Main motor Protection Types
Group	EPL	Protection level	Zones	Equipment group	Equipment category	
	Ма	very high	NA		M1	NA
(Mines)	Mb	high		(Mines)	M2	
1	Ga	very high	0		1G	NA
(Gas)	Gb	high	1	(Surface)	2G	Ex d/Ex de, Ex p, Ex e
	Gc	enhanced	2		3G	Ex nA
	Da	very high	20		1D	NA
(Dust)	Db	high	21		2D	Ex tb IP 65
	Dc	enhanced	22		3D	Ex tc, IP 65/IP 55

Low voltage AC motors Explosive atmospheres

To ensure equipment can be safely used in potentially explosive atmospheres, the explosive atmospheres where the equipment is installed must be known. The temperature class of equipment must be compared with the spontaneous ignition the equipment of the gas mixtures concerned, and in specific cases the gas group must be known (e.g.flame proof protection).

Gas classification

Temperature class	Ignition temp. of gas/ vapour °C	Max. permitted temp. of equipment °C	Gas examples
T1	>450	450	Hydrogen
T2	>300 <450	300	Ethanol
T3	>200 <300	200	Hydrogen sulfide
T4	>135 <200	135	Diethyl ether
T5	>100 <135	100	-
T6	>85 <100	85	Carbon disulfide

Gas subdivision

IA	- 120 gases and vapours, e.g. butane/petroleum/propane
IB	- 30 gases and vapours, e.g. ethylene/dimethyl ether/coke oven gas
IC	three gases: hydrogen H2/acetylene C2H2 carbon disulfide CS2

Marking of equipment protection for gas according to ATEX



Marking of equipment protection for gas according to IEC



Low voltage AC motors Flameproof motors 80-400, 2 & 4 poles Exd/e^{*} IIB T4



TEFC low voltage motors, cast iron, IP55, IC 411, single-speed. 400 V 3-phase 50 Hz See product catalogues or www.abb.com/motors&generators for more information on products.

3000 r/min = 2 poles 1500 r/min = 4 poles 143 76.6 M3JP/KP 80MA.4 C775 C771 1.3 7.2 2.2 1.69 60.1 M3JP/KP 80MA.2 C771 C820 0.55 3.7 1.43 76.6 M3JP/KP 80MA.4 C773 C771 C808 1.5 5 3 82 M3JP/KP 90SLA 2 C808 C868 0.75 5.1 1.81 60.2 M3JP/KP 90SLA 4 C784 C868 C936 2.2 7.3 4.3 83.7 M3JP/KP 100LA 2 C1.121 C1.197 2.2 14.6 4.4 46.5 M3JP/KP 100LA 4 C940 C1.107 4 13.2 7.5 86 M3JP/KP 132SMD 2 C1.069 C1.701 4 88.2 M3JP/KP 132SMD 4 C1.730 C1.433 7.5 24.6 13.5 89.2 M3JP/KP 132SMD 2 C2.060 C2.577 HO 7.5 49 16 89.2 M3JP/KP 100MLA 2 C2.385 C2.555 9.2 H3.148 M3JP/KP 132SMD 4	
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45 146 78.8 93.3 M3JP/KP 200MLE 2 £8,585 £8,964 HO 37 240 69.7 93 M3JP/KP 200MLC 4 £5,901 £6,107 45 145 79.4 93.8 M3JP/KP 225SMB 2 £9,112 £9,451 37 239 67.1 93.6 M3JP/KP 225SMB 4 £6,362 £6,600 55 177 96. 93.9 M3JP/KP 225SMC 2 £11,254 £11,679 HO 45 291 80.8 93.8 M3JP/KP 225SMC 4 £7,716 £7,770 55 177 94.6 94.3 M3JP/KP 250SMA 2 £11,679 HO 45 291 80.8 93.8 M3JP/KP 225SMD 4 £8,704 £9,128 67 216 120 93.9 M3JP/KP 250SMB 2 £12,730 £13,514 HO 55 355 100 94.3 M3JP/KP 250SMA 4 £9,216 £9,626 75 241 131 94.3 M3JP/KP 260SMA 2 £14,000 £14,416 75 485 134 93.8 M3JP/KP 250SMB 4 £11,873 £11,899 90 280	
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	•••••
250 800 423 95.7 M3JP/KP 355SMA 2 £44.450 £45.671 200 1285 351 95.6 M3JP/KP 315MLA 4 £33.818 £34.326	•••••
315 1009 534 95.7 M3 P/KP 355SMB 2 554.214 555.258 250 1604 443 95.9 M3 P/KP 355SMA 4 542.314 543.503	•••••
355 1136 608 95.7 M3JP/KP 355SMC 2 558.049 559.267 315 2021 551 95.9 M3JP/KP 355SMB 4 553.358 554.547	•••••
400 1281 677 96.9 M3JP/KP 355MLA 2 £64.496 £65.717 355 2280 614 95.9 M3JP/KP 3555MC 4 £60.154 £61.343	•••••
450 1441 743 97.1 M3/P/KP 355MLB 2 572.167 573.388 400 2565 705 96.3 M3/P/KP 355MLA 4 567.630 569.161	•••••
500 1601 832 96.9 M3.IP/KP 355I KA 2 184 019 185 240 450 2884 781 96.7 M3.IP/KP 355MI B 4 175 205 176 575	•••••
560 1790 934 97.2 M3.IP/KP 400 A 2 193 966 195 699 500 3004 865 97 M3.IP/KP 356K A 1 198 235 184 606	•••••
560 1790 934 97.2 M3.IP/KP 400 KA 2 593.956 595.699 560 3586 982 96.8 M3.IP/KP.400 A 504.791 596.551	•••••
630 2014 11044 97.4 M3.IP/KP.4001 82 \$102.844 \$104.587 550 3556 982 36.8 M3.IP/KP.4001 44 504.791 C06.551	•••••
630 2014 11044 97.4 M3.IP/KP.4001 K2 1102 844 1104 587 630 4035 1084 07 M32 IP/KP.4001 R4 1106 711 1110 619	•••••
710 2270 1175 97.5 M3.PKP 400 C 2 117.5745 117.488 630 4035 1084 67 M30 PKP 4010 4 100 711 2110.619	•••••
710 2270 1175 97.5 M3.IP/KP.4001KC.2 \$115.745 \$117.488 710 4647 1235 07.1 M3.IP/KP.4001C.4 \$110.090 \$115.049	•••••
The left internet left internet left internet in	•••••

^{*}JP Exd ^{*}KP Exde

HO = High-output design [†] Efficiency full load 100%

Low voltage AC motors Flameproof motors, 80-450, 6 & 8⁺ poles Exd/e^{*} IIB T4

ATEX Certified

IE2

TEFC low voltage motors, cast iron, IP55, IC 411, single-speed. 400 V 3-phase 50 Hz See product catalogues or **www.abb.com/motors&generators** for more information on products.

Output kW	Torque Nm	Current	Eff [†]	Frame size	Foot	Flange		Output kW	Torque Nm	Current	Eff†	Frame size	Foot	Flange	
1000 r/s	nin = 6 nc														
0.37	3 7	1 20	71.6		£78/	6853		0.18	2 A	1 07	57 7		£785	6853	
0.55	5.6	1.25	70.3	M3 IP/KP 80MR 6	£820	£887		0.10	34	1 15	61.4	M3.IP/KP 80MB 8	£827	£891	
0.33	7.6	21	70.0		£855	£007		0.20	5.1	1.31	65.5	M3.IP/KP 90SLA 8	£847	£919	
1 1	11 3	2.1	78.5	M3 IP/KP 90SI C 6	£868	£010		0.55	7.6	1 01	68.7	M3.IP/KP 90.SI C 8	£031	£1 005	
1.5	15.1	3.7	81.6	M3.IP/KP 100LA 6	£000 £940	£1 017		0.00	9.0 9.0	2.6	76.5	M3.IP/KP 100L4 8	£1 021	£1,000	
2.2	22.1	55	82.5	M3 IP/KP 112MB 6	£1 307	£1,017		1 1	14.6	3.7	75.3	M3.IP/KP 100LR 8	£1,021	£1,000	
2 <u>2</u> 2	20.8	60	8/	M3 IP/KP 132SMB 6	£1,007	£1,400		1.5	20.1	5.3	75.3	M3.IP/KP 112MC 8	£1,002	£1,400	
4	30	- 0.5 - 0	85.7	M3.IP/KP 132SMC 6	£1,750	£1,000		2.2	20.1	6.1	80.3	M3.IP/KP 132SMC 8	£1,400	£1,400 £1,976	
5 5	54	12.6	87.5	M3.IP/KP 132SMD 6	£1,000	£2,062		3	40	77	79.9	M3.IP/KP 132SMD 8	£2 112	£2 177	
7 5	74	15.9	87.6	M3.IP/KP 160MLA 6	£2,041	£2,520		4	53	9.8	83.3	M3.IP/KP 160MLA 8	£2 282	£2 488	
11	108	21.9	90.1	M3.IP/KP 160MLB 6	£3 164	£3 267		5.5	73	12.9	86.8	M3.IP/KP 160MLB 8	£2,202	£2,100	<u>.</u>
11	100	21.0	00.1	M2 ID/KD 160MLC 6	02 700	00 075	ЦО	7.5	100	18.8	82	M3.IP/KP 160MLC 8	£3 284	£3 402	
14	100	00.1	09.2	M2 ID/KP 100MI D 6	£3,790	£3,070	ΠU	11	145	25	88.3	M3.IP/KP 180MLB 8	£4 272	£4 407	
10 5	147	29.2	90.5	M2 ID/KP 100MLC 6	£4,219 04.767	£4,000	ЦО	15	105	30 1	80.0		£ 1,ET E	£5,682	
10.0	102	25.0	90.1	M2 ID/KP 200MLA 6	£4,707	£4,910	ПО	18.5	0/1	27.2	80.0	M3 ID/KD 200MLR 8	C6 201	£5,002 £6,407	НΟ
10.0	100	101.9	90.5	MO ID/KE 2001VILA 0	LU,UUZ	LU,201		10.5	0/1	10	09.2	M2 ID/KD 2258MA 9	CG 540	CG 767	110
22	214	42.1	91.0	M2 IP/KP 200MLC 6	£3,393	£0,700	ЦО	10.0	241	40	90 6	MOJE/KE 2200WA 0	£0,040	£0,707	
20	291	50.0	90.0	MO ID/KE 2001VILO 0	£7,007	£1,242	по	22	201	61.0	90.0	M2 ID/KP 2255WD 0	£7,004	£1,991 CO 410	ЦО
30	291	01.0	92.2	NO ID/KP 2200IVID 0	£1,490	£1,110	ЦО	20	200	: 01.2 : 60.6	90.7	M2 ID/KP 2200WO 0	£9,199 CO 775	£9,410 010.051	ПО
07	057	71 1	91.0	MO ID/KP 2200IVIC 0	L0,000	£0,770	ΠU	07	. 390	200.0	91.0	MO ID/KE 2000WA 0	L9,110	£10,201	ЦО
01 1E	100	00.1	92.2	MO ID/KP 2000MA 0	£9,020	29,070	ЦО	07 07	479	: 70.0	92.2	M2 ID/KP 2000IVID 0	£11,001	£11,323	ΠU
40	400	: 00.1	90.1	M2 ID/KP 2000MA 6	£10,097	£11,101	ПО	15	580	00.1	02.1	M3 ID/KD 280SMR 8	£16,906	£12,000	
40	404 E01	101	90.4		C16 701	£12,047		4J 55	700	107	02.1		C17 505	C17 0/0	ЦО
75	2001	101	93.0	M2 ID/KP 2000IVID 0	£10,791	£17,007	ЦО	55	709	107	90.4	M2 ID/KP 2150MA 0	£17,000	£17,040 010,715	ПО
75	700	107	94.2	M2 ID/KP 2159MA 6	£10,900	£17,007	по	75	066	1/12	92.4	M3 ID/KD 315SMA 0	£19,200	£19,710 £27,810	
10	066	140	94.4	M2 ID/KP 2150MP 6	£19,200	£19,710		00	1160	140	033	M3 ID/KD 315SMC 8	C28 0/2	£24,010	
110	1060	201	94.0	M3 ID/KD 315SMD 0	£20,200	£23,792		110	1/10	205	03.6	M3 ID/KD 3150WO 0	£20,042	£20,721	
122	1000	201	05.3	M3 ID/KD 3150110 0	£20,002	C21 //2		132	160/	205	03.0	M3 IP/KP 355SMA 8	£38.066	£30,007	
160	1520	: 241	05.0	M2 ID/KD 2550MA 6	007 007	020 576	÷	160	2054	200	017	M3 ID/KD 355SMR 8	C15 711	£46.001	
200	1003	284	05.7	M3 ID/KD 355SMR 6	£47.240	£18 000		200	2004	386	01 5	M3 IP/KP 355SMC 8	£57 265	£58 287	
250	2/0/	160	95.7	M3 IP/KP 355SMC 6	£58 70/	£50,816		250	3213	477	94.5	M3.IP/KP 355MI B 8	£78.337	£79,207	
215	2404	570	05.7	M3 ID/KD 355MI B 6	\$74,000	£33,010		215	10/13	588	06.1		£00,007	£03.628	
355	3/17	661	05.7	M3 ID/KD 355I KA 6	CR6 367	C87 738		315	1040	588	96.1		£00,200	£03,628	<u>.</u>
400	3917	222	90.7	M3 ID/KD 4001 A 6	CO3 708	£07,700		355	4040	612	06.2	M3 ID/KD 400LIKK 0	£101 78/	£105 521	
400	38/7	730	06.2		CO3 708	£07 707		355	4562	6/2	90.2	M3 IP/KP 400LD 0	£101,704	£105,521	
400	1303	916	06.6	M3 ID/KD 400LINA 0	£30,730	£37,707		400	513/	737	96	M3 IP/KP 400L(C 8	£105,704	£100,021	
450	4020	010	06.6		0105 501	C110,100		400	5134	797	06		£105,477	£100,012	
500	4020	805	90.0		£100,021	£122 324		430	5510	789	95 9	M3.IP/KP 450L A 8	£114 351	£116.616	
500	1808	805	06.6		£117 342	C100 204		470	6032	862	96	M3 IP/KP 450LP 0	£12/ Q22	£127 2/Q	
560	5385	000	06.0		C104 444	£122,024	<u>.</u>	530	6703	: 002	06 1	M3 IP/KP 450LD 0	£129,002	£1/1 360	
560	5385	970	90.9 06.0		£124,444	£129,020	<u>.</u>	600	7600	112/	06.3	M3 IP/KP 450L0 0	£153,104	£155 663	
610	5860	1008	90.9	M3 IP/KP /501 & 6	£126 552	£128,020		000	1030	: 1124	. 00.0	10001/11 400LD 0	2100,000	2100,000	:

⁻ JP Exd ⁻ KP Exde

HO = High-output design

⁺ Efficiency full load 100%

⁺ IE2 not applicable to 8 pole

Low voltage AC motors Optional extras for low voltage AC motors

Please note, ABB general performance motors have limited optional extras (see extras marked with*). Select motor from the ABB process performance range when additional extras are required.

R = On request

- S = Standard
- N = Not available

Option description	Modification code	Motor types	80	90	100	112	132	160	180	200	225	250	280	315	355
			£	£	£	£	£	3	£	£	£	£	£	£	£
Auxilliary terminal box for accessories	418	•	Ν	N	Ν	Ν	Ν	364	364	364	364	364	364	364	364
	418		364	364	364	364	364	364	364	364	364	364	364	364	364
British Standard sliderails*		٠	80	80	115	115	115	157	157	289	289	484	484	890	889
	7		80	80	115	115	115	157	157	289	289	484	484	890	889
Degree of Protection IP56*	403	•	246	246	246	307	307	351	351	351	351	351	351	385	406
	403		246	246	246	307	351	351	351	351	351	351	351	385	406
Degree of Protection IP65	158	•	246	246	246	312	312	398	398	398	398	398	350	385	406
	158		246	246	246	312	312	398	398	398	398	398	350	385	406
External earth bolt*	67	•	70	70	70	70	70	122	122	122	122	122	119	119	119
	67		70	70	70	70	70	122	122	122	122	122	119	119	119
Foot and face mounting*	8	•	130	130	130	169	169	Ν	Ν	Ν	Ν	Ν	Ν	Ν	N
	8		94	94	94	136	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν
Foot and flange mounting*	9	•	130	130	130	169	169	322	322	427	427	467	402	696	1215
	9		94	94	94	136	136	285	285	380	380	414	402	696	1215
Frequency converter rating plate.	163	•	72	72	72	72	72	72	72	72	72	72	72	72	71
Rating data according to quotation	163		72	72	72	72	72	72	72	72	72	72	72	72	71
Heating element specify 120 V or	450/451	•	234	234	234	261	261	315	349	388	444	533	474	474	530
240 V*	450/451		234	234	234	261	261	315	349	388	444	533	474	474	530
Insulated bearing at NDE. Frame 280	701	•	R	R	R	R	R	R	R	R	R	R	1127	1127	1560
and above on variable-speed drives.*	701		R	R	R	R	R	R	R	R	R	R	1127	1127	1560
Metal fan	68	•	150	150	150	210	210	303	303	326	342	342	550	589	626
	68		145	145	145	208	208	269	269	287	303	303	550	589	626
Metal fan cover	53	•	100	100	100	139	137	S	S	S	S	S	S	S	S
	53		S	S	S	S	S	S	S	S	S	S	S	S	S
Paint colour to standard RAL specify	114	٠	215	215	215	210	210	257	257	257	257	257	250	250	249
RAL no.*	114		215	215	215	210	210	257	257	257	257	257	250	250	249
PT100 resistance element one per	445	•	Ν	Ν	Ν	634	634	623	623	922	922	922	869	869	868
phase	445		R	R	R	634	634	623	623	922	922	922	869	869	868
PTC thermistors, three in series, 150°C	436	•	131	131	131	169	169	246	246	246	246	246	212	212	212
others on request*	436		131	131	131	169	169	246	246	246	246	246	212	212	212

Low voltage AC motors Optional extras for low voltage AC motors

Please note, ABB general performance motors have limited optional extras (see extras marked with*). Select motor from ABB process performance range when additional extras are required.

R = On	request
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- S = Standard
- N = Not available

Option description	Modification code	Motor types	80	90	100	112	132	160	180	200	225	250	280	315	355
			£	£	£	£	£	£	£	£	£	£	£	£	£
Rain canopy for VI mounting*	5	٠	111	111	111	127	127	145	167	175	235	290	349	412	614
	5		111	111	111	127	127	145	167	175	235	290	349	412	614
Restamping voltage, frequency and	2	•	51	51	51	51	51	51	51	51	51	51	51	51	51
output, continuous duty*	2		51	51	51	51	51	51	51	51	51	51	51	51	51
Roller bearing at DE (not available on	37	•	Ν	Ν	Ν	Ν	Ν	257	295	335	386	427	367	367	536
IIC motors)*	37		Ν	Ν	Ν	Ν	Ν	257	295	335	386	427	367	367	536
Separate (fixed speed) motor cooling	183	•	382	382	382	927	927	1151	1311	1837	2160	2519	Ν	Ν	Ν
fan	158		R	R	1010	1213	1513	1622	1622	1622	1908	2226	2409	3030	3289
SPM nipples	43	•	Ν	Ν	Ν	155	155	261	293	327	337	337	329	329	329
	43		Ν	Ν	Ν	Ν	Ν	261	293	327	337	337	329	329	S
Test - routine*	148	•	208	208	208	236	236	236	236	236	236	236	236	236	235
	148		208	208	208	236	236	236	236	236	236	236	236	236	235
Test - Type test report from test of an	145	٠	88	88	88	88	88	88	88	125	125	125	176	176	176
identical motor (where available)*	145		88	88	88	88	88	88	88	125	125	125	176	176	176

Alloy Cast Iron

Low voltage AC motors NEMA motors

General purpose industrial motors

Three-phase, totally enclosed, foot mounted

– 1/8 – 400 HP

- NEMA 42 - 449T



Severe duty motors

Three-phase, totally enclosed, foot mounted - 1 - 400 HP - NEMA 143T - 449T



Applications

Pumps, compressors, fans, conveyors, machine tools and other general purpose three-phase applications.

Features

Suitable for mounting in any position. Ball bearings, heavygauge steel and cast-iron frames, and gasketed conduit boxes. Class F insulation, 1.15 service factor, low-loss electrical grade lamination steel. EM Super-E[®] motors have NEMA Premium[®] efficiency and three years warranty. Motors with TR suffix have roller bearings for heavy belted loads.

Applications

Petrochemical plants, mines, foundries, pulp and paper plants, waste management facilities, chemical plants, tropical climates and other processing industry applications requiring protection against corrosion caused by severe environmental operating conditions.

Features

ECP motors are XEX designs. 1.15 service factor, corrosion resistant epoxy finish, regreasable ball or roller bearings, oversized rotatable cast iron conduit box, cast iron frames, V-ring shaft seal, moisture resistant copper windings. Class F insulation, stainless steel nameplate and corrosion resistant hardware. ECP/XEX Super-E[®] motors have NEMA Premium[®] efficiency and three years warranty. Positive lubrication system (PLS) on 360 frames and larger.

Explosion-proof motors Single and three-phase, foot mounted - 1/4 - 300 HP

- NEMA 48 - 449T



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Applications

Ideal for use where hazardous fumes or dust may be present.

Features

UL and CSA approved for Division 1, Class I, Group D; Class I, Group D, Class II Group F & G; Class I, Group C & D, Class II, Group F & G. Corrosion resistant epoxy finish. Shipped with UL. and CSA approved cast conduit box assembled to each motor. 1.00 service factor. EM Super-E[®] explosion proof motors have NEMA Premium[®] efficiency and three years warranty.

Low voltage AC motors Central motor stock, Mod Express[®] line, Menden, Germany

ABB's European logistics centre in Menden, Germany offers customers on-time and just-in-time delivery on a wide range of ABB products.

The 23,000 square metre facility has 45,000 automated parts bins and stocks over 2.5 million ABB items including parts and accessories.

NEMA motors are in stock at the facility and include:

- NEMA general purpose
- ECP XEX severe duty
- IEEE841 totally enclosed severe duty and speciality motors.

NEMA general purpose TEFC motors are basic protection motors used on pump and fan applications and have a protection similar to the European IP44 rating.

The NEMA ECP XEX severe duty TEFC motors are suited to tougher industrial operating environments and are protected similar to IP54.

The IEEE841 specification, totally enclosed severe duty motors are protected similar to IP56.

Among those motors stocked in Menden are 2-pole and 4-pole variants, with various mounting styles available including foot mounted, C-face mounted and C-face footless options. The speciality motors include a selection of Baldor permanent magnet DC motors.

NEMA motors are now available within 48 hours from ABB's central European stockholding in Germany.

NEMA general purpose motors

1/3 through 250 HP, 0.25 kW to 187 kW
NEMA general purpose motors
1/3 through 250 HP, 0.25 kW to 187 kW

IEEE841 standard severe duty motors

– 1 through 250 HP, 0.75 kW to 187 kW





Modifications to NEMA motors, certified to CSA standards, can be carried out by ABB at its European logistics centre in Germany for distribution across Europe.

The motor build centre, called the Mod Express[®] line, carries out modifications to NEMA general purpose, severe duty and IEEE 841 severe duty motors held in stock. General purpose and IEEE severe duty motors are available with foot mount, C-face foot and C-face footless options and severe duty motors stocked with foot mounted options.

ABB's European logistics centre in Germany is fully equipped with a secure storage facility, access to fast-track air freight dispatch and has an export packaging option through the Mod Express[®] line, giving an all-in-one facility for immediate NEMA motor dispatch.

A dedicated exports team ensure that all the correct paperwork is supplied with the motor to allow on-time delivery worldwide without Customs delays.

ABB is the only supplier able to deliver a customised NEMA motor from local stock with full accreditation to CSA anywhere in the world.

The modifications available for these motors include:

- Installation of thermistors
- Thermal protection sensors
- Bearing upgrades
- Conduit box modifications
- Tropicalisation
- Customised paint finishes
- Nameplate modification

AC motors High voltage Overview

Engineered rib-cooled motor NXR

- 100 kW to 1,800 kW
- 315 to 500 frame size
- New platform for HV rib-cooled motors
- High efficiency levels, low noise levels
- Fixed-speed, variable-speed and safe area use



Engineered rib-cooled motor HXR

- 100 kW to 2,250 kW
- 355 to 560 frame size
- High efficiency levels, low noise levels
- Fixed-speed, variable-speed and hazardous area use



AC motors High voltage Overview

