

IE1 & IE2



THREE-PHASE INDUCTION MOTORS

- of general use
- for hoisting units drive



Products Catalogue




Achilles JQS
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 Joint Qualification System
 for suppliers to the Oil Industry in Norway and Denmark
Certificate of Qualification
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 The qualification concerns the product and service
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TOTALLY ENCLOSED FAN COOLED INDUCTION MOTORS OF GENERAL USE TYPE ASU

The enclosed induction motor of general use range is meant for industrial application such as driving of machine tools, pumps, fans, compressors a.s.o

The motors are intended to operate under the following environmental conditions:

- Temperature: - 33⁰ C.....+ 40⁰ C
- Relative humidity: max. 80% at 20⁰ C
- Maximum altitude of installation: 1000 m (3000 feet) (above sea level).

The motors are manufactured in accordance with the requirements of the following standards:

- EN 60034-1:2005 – Rotating electrical machines. Part 1: Rating and performance.
- SR 1893:2008 – Rotating electrical machines. Rules and methods for quality control.
- STAS 1893/3 - 87 - Rotating electrical machines. Marking, packing, supply, documents, guarantees.
- EN 60034-6:1994 - Rotating electrical machines -- Part 6: Methods of cooling (IC Code).
- EN 60034-7:1996 - Rotating electrical machines. Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM Code).
- EN 60034-9:2006 - Rotating electrical machines -- Part 9: Noise limits.
- EN 60034-14:2004/A1:2008 - Rotating electrical machines -- Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity.
- CEI 60034-17:2003 - Rotating electrical machines - Part 17: Cage induction motors when fed from converters. Application guide
- EN 60529:1995/A1:2003 – Degrees of protection provided by enclosures (IP code).
- CEI 60072-1:1994 - Dimensions and output series for rotating electrical machines. Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080.

The motors are manufactured using class F insulating materials. On request, class H also available.

Terminal box could be equipped with 1 or 2 cable glands.

The presser size and the supply cable maximum diameter allowed by the cable entry are given in the table 1.

Table 1

Motor type	Frame size	Presser size	Supply cable max diameter
ASU	63, 71, 80, 90, 100, 112	1 x M25	12.5
	132	2 x M32	21
	160, 180	2 x M40	26.5
	200, 225, 250	2 x M50	35
	280, 315, 355	2 x M63	44
Optionally	All frame sizes	1 x M16	11

To connect the supply cable, the motors are equipped with a terminal plate having 6 terminals. The terminal box is normally positioned on the top of the motor. The motors have earthing screws on the frame and inside the terminal box. The motors are provided with rolling-contact bearings. The 280-315 frame size motors are equipped with lubricating system permitting the rolling bearing lubrication while the motors are operating. The bearings are not dimensioned to stand axial forces outside the motors. The bearing types are shown in the table 2.



Table 2

Frame size	Drive end		Non-drive end	
	2p=2	2p=4,6,8	2p=2	2p=4,6,8
63	6202 2Z		6202 2Z	
71	6203 2Z		6203 2Z	
80	6304 2Z		6304 2Z	
90	6305 2Z		6305 2Z	
100	6306 2Z		6306 2Z	
112	6307 2Z		6307 2Z	
132	6308 2Z		6308 2Z	
160	6310 2Z		6310 2Z	
180	6311 2Z		6311 2Z	
200	6313 2Z		6313 2Z	
225	6314 2Z		6314 2Z	
250	6314 2Z		6314 2Z	
280	6316		6316	
315 SM	6317		6317	
315 ML	6316	6319	6316	6319
355	6319	6322	6319	6322

Table 3

Frequency [Hz]	Noise level dB(A)
≤50	≤5
60	6
70	10
80	13
85	15

The producer may use other bearing types as well. The most commonly used mounting arrangements are IM1001, 1011, 2001, 3001, 3011 according to EN 60034-7:1993 (IEC 34-7; DIN IEC 34-7 part.7). Excepting the IM1011 and IM3011 mounting arrangements, the motors having two free shaft ends are also available upon request. The protection degree of the motors is IP 55, according to EN 60034-5:2001 (IEC 34-5; DIN VDE 0530-part.5). The cooling system of the motors is IC 411 according to EN 60034-6:1993. Cooling fluid is environment air. Motor cooling is done by a fan mounted on the motor shaft. The rated duty of the motors is the continuous duty S1, according to EN 60034-1:2004 (IEC 34-1; DIN VDE 0530 - part.1).

The nominal parameters shown in the tables refer to a service factor SF=1.

Motors have to be supplied with 3 phase voltage according to norms EN 60034-1:2004. Motors in frame size 63-90 can be supplied with max. voltage of 500V and motors in frame sizes 100- 315 can be supplied with max voltage of 690V. Rated frequency is 50 Hz. The usual voltages are: 220 V, 230 V, 380 V, 400 V, 415 V, 440 V, 460 V, 480 V, 500 V, 660 V and 690 V. The allowed voltage fluctuation is ±10% of rated voltage. On request, the motors could be manufactured for frequency of 60Hz.

The motors can also be fed from PWM frequency converters (VACON or similar) according to the torque/speed characteristic $M=f(\text{Hz})$ given in Fig. 1. In case of motors supplied from frequency converters - puls width modulation control, vibration levels are according to EN 60034-14:2004/A1:2007, nevertheless vibration level may increase for loaded motors in certain frequency ranges according to IEC TS 60034-25:2007.

Maximum noise levels of motors are according to EN 60034-9 :2005/A1:2007.

The noise level of self ventilated motors supplied from frequency converters increases when motors speed increases.

The expected average values of noise increase compared with noise levels indicated in EN 60034-9:2005 are mentioned in table 3.

The magnetic noise of the motors supplied from frequency converters can be kept inside allowed range by means of frequency converter controller.

On request, the motors can be equipped with the following optional devices:

- PTC thermistors in stator winding
- PT 100 (thermoreistance) in stator winding or bearings
- heating resistance

The above, as well as after optional devices have to be agreed with the manufacturer.

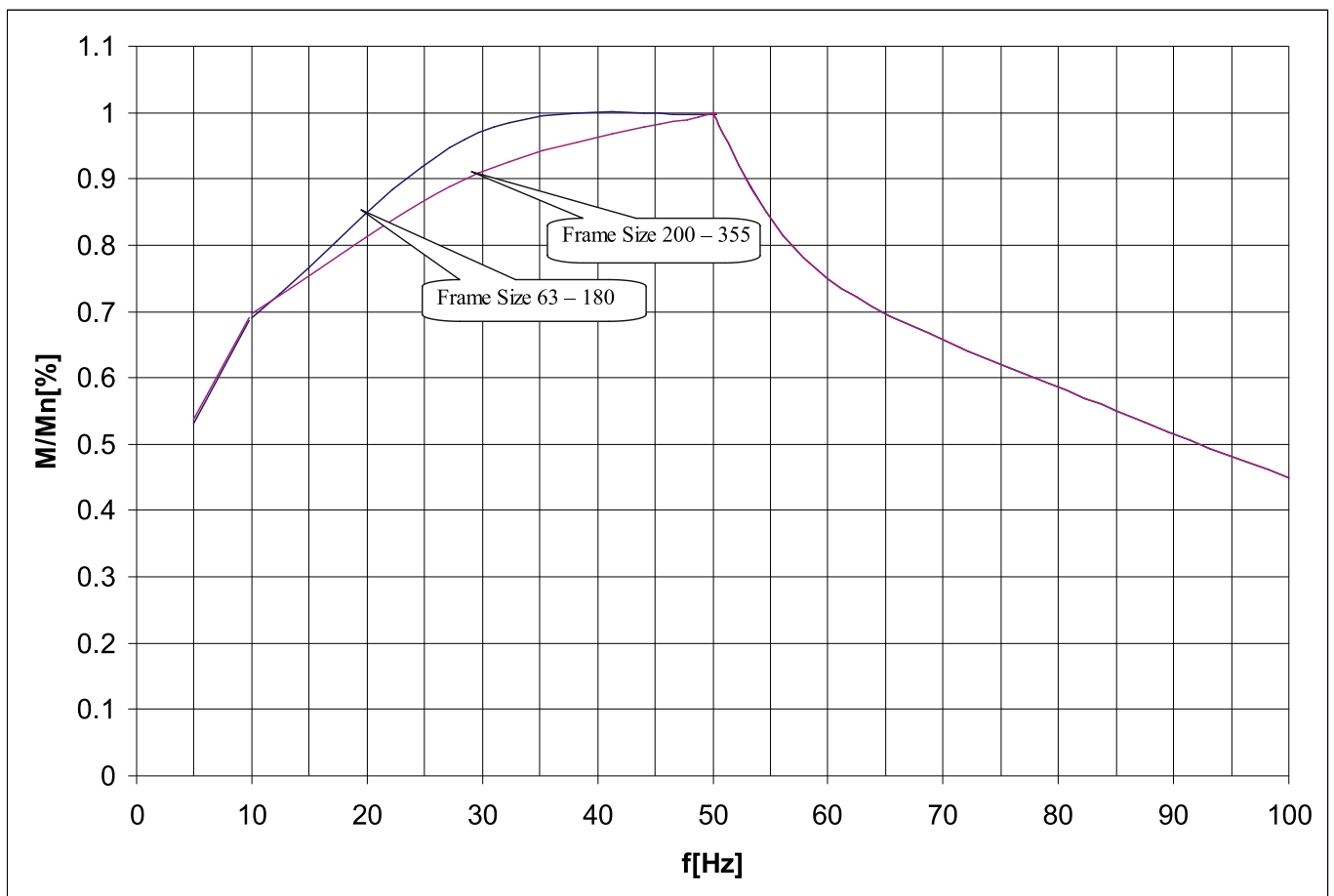
The technical parameter tolerances are in keeping with EN 60034-1:2004 and are shown in table 4.



Table 4

No	Parameter name	Tolerances
1	Efficiency - power lower than or equal to 50kW - power higher than 50kW	- 15% din (1- η)
		- 10% din (1- η)
2	Power factor ($\cos \varphi$)	1/6 of (1- $\cos \varphi$), min 0,02 and max 0,07
3	Slip (at full load and operating temperature)	+ / - 20% of the slip guaranteed value
4	Initial starting current	+ 20% of the guaranteed starting current (without lower limit)
5	Initial starting torque	- 15% + 25% of the guaranteed value
		(+ 25% only on express demand)
6	Maximum torque	- 10% of the torque guaranteed value, with the specification that after applying this tolerance, the torque should remain equal or higher than 1.6 or 1.5 times the nominal torque

Annex 1 - Torque/speed characteristic of the motors fed from PWM frequency converters





IE1 - EFFICIENCY

Standard asynchronous motors - TECHNICAL PARAMETERS

Motor type	Rated power [kW]	Rated speed [rpm]	Current (400V) [A]	η %	$\cos \varphi$	I_p I_n	M_p M_n	$\frac{M_{max}}{M_n}$	Weight [kg]
2 poles									
ASU 63a-2	0,18	2640	0,59	58,5	0,75	4,5	2,8	3,1	9,1
ASU 63b-2	0,25	2650	0,73	66,1	0,75	4,5	3,5	3,1	10,0
ASU 71a-2	0,37	2650	0,99	66,5	0,81	4,5	2,4	2,4	12,6
ASU 71b-2	0,55	2660	1,41	68,0	0,83	4,5	2,4	2,4	14,1
ASU 80a-2	0,75	2675	1,81	73,0	0,82	4,5	2,7	2,7	17,8
ASU 80b-2	1,1	2680	2,51	76,3	0,83	4,8	2,7	2,7	19,8
ASU 90S-2	1,5	2680	3,28	78,5	0,84	5,0	2,4	2,5	26,0
ASU 90L-2	2,2	2700	4,64	81,5	0,84	5,0	2,4	2,8	28,8
ASU 100LW-2	3	2825	6,14	83,0	0,85	5,0	3,0	2,9	38,0
ASU 112M-2	4	2850	8,06	84,3	0,85	6,0	3,1	3,1	49,0
ASU 132Sa-2	5,5	2860	10,8	85,9	0,86	6,5	3,1	2,6	75,0
ASU 132Sb-2	7,5	2860	14,6	87,1	0,85	6,5	3,1	2,5	80,0
ASU 160Ma-2	11	2900	21,1	88,6	0,85	6,3	2,4	2,4	105
ASU 160Mb-2	15	2900	28,1	89,5	0,86	6,3	2,4	2,4	120
ASU 160L-2	18,5	2910	34,2	90,3	0,86	6,5	2,4	2,5	135
ASU 180M-2	22	2920	40,2	90,8	0,87	6,5	2,5	2,8	175
ASU 200La-2	30	2930	54,4	91,5	0,87	7,0	2,5	2,7	235
ASU 200Lb-2	37	2930	67,1	92,5	0,86	7,0	2,7	2,9	265
ASU 225M-2	45	2940	80,5	92,8	0,87	7,0	2,2	2,5	330
ASU 250M-2	55	2940	97,9	93,2	0,87	7,8	2,2	2,45	430
ASU 280S-2	75	2945	134	94,0	0,86	7,1	2,3	3,0	520
ASU 280M-2	90	2960	155	94,0	0,89	7,8	2,4	2,4	600
ASU 315S-2	110	2965	187	94,5	0,90	7,7	2,3	2,6	710
ASU 315M-2	132	2970	219	94,5	0,92	7,9	2,1	2,8	810
ASU 315MX-2	160	2970	268	94,9	0,91	7,5	2,3	2,4	1130
ASU 315LY-2	200	2975	334	95,1	0,91	7,8	2,3	2,4	1250
ASU 355Ma-2	250	2975	431	95,1	0,88	6,3	2,2	2,8	1300
ASU 355Mb-2	280	2975	483	95,1	0,88	6,0	2,0	2,5	1380
ASU 355L-2	315	2975	542	95,3	0,88	6,3	2,3	2,9	1510
4 poles									
ASU 63a-4	0,12	1320	0,43	58,1	0,69	3,5	2,4	2,4	10,0
ASU 63b-4	0,18	1320	0,62	60,2	0,70	3,5	3,1	3,1	11,2
ASU 71a-4	0,25	1330	0,77	66,8	0,70	3,5	2,4	2,7	14,1
ASU 71b-4	0,37	1330	1,04	71,6	0,72	3,5	2,5	2,5	15,1
ASU 80a-4	0,55	1350	1,51	72,1	0,73	4,0	2,7	2,7	18,8
ASU 80b-4	0,75	1380	1,99	74,6	0,73	4,5	2,7	3,0	19,8
ASU 90S-4	1,1	1390	2,70	76,4	0,77	4,5	2,8	2,6	25,8



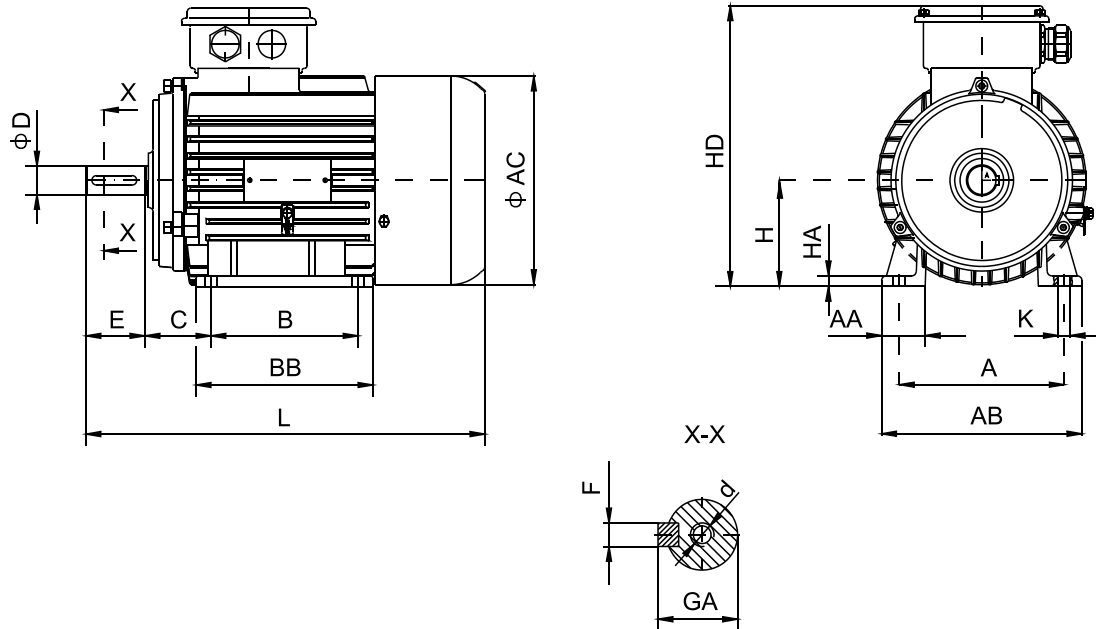
Motor type	Rated power [kW]	Rated speed [rpm]	Current (400V) [A]	η %	$\text{Cos } \varphi$	I_p / I_n	M_p / M_n	M_{max} / M_n	Weight [kg]
ASU 90L-4	1,5	1380	3,59	78,3	0,77	5,0	3,0	2,5	28,8
ASU 100LW-4	2,2	1420	5,02	81,1	0,78	5,0	2,5	2,6	38,0
ASU 100LX-4	3	1410	6,69	83,0	0,78	5,5	2,5	2,6	41,0
ASU 112M-4	4	1420	8,49	85,0	0,80	5,5	2,4	2,8	51,0
ASU 132S-4	5,5	1445	11,0	87,0	0,83	6,0	2,4	2,7	80,0
ASU 132M-4	7,5	1455	15,3	87,1	0,81	6,0	2,4	2,6	100
ASU 160M-4	11	1440	20,3	89,0	0,88	6,5	2,2	2,4	115
ASU 160L-4	15	1440	27,4	90,0	0,88	6,5	2,3	2,4	135
ASU 180M-4	18,5	1450	33,2	90,5	0,89	7,0	2,0	2,4	170
ASU 180L-4	22	1460	39,2	91,0	0,89	7,0	2,0	2,4	180
ASU 200L-4	30	1460	53,2	91,5	0,89	7,0	2,0	2,6	240
ASU 225S-4	37	1470	66,3	92,6	0,87	6,5	2,0	2,6	300
ASU 225M-4	45	1470	79,4	93,0	0,88	6,5	2,2	2,4	325
ASU 250M-4	55	1460	96,0	94,0	0,88	7,5	2,4	2,6	430
ASU 280S-4	75	1460	134	94,0	0,86	7,3	2,4	3,0	467
ASU 280M-4	90	1470	158	94,5	0,87	7,6	2,1	2,2	610
ASU 315S-4	110	1470	188	95,0	0,89	7,2	2,1	3,0	720
ASU 315M-4	132	1470	225	95,0	0,89	7,4	2,0	3,0	820
ASU 315MX-4	160	1480	276	95,0	0,88	6,8	2,1	2,2	1150
ASU 315LZ-4	200	1480	345	95,2	0,88	6,7	2,1	2,2	1315
ASU 355Ma-4	250	1485	430	95,3	0,88	6,5	2,3	2,3	1530
ASU 355Mb-4	280	1485	476	95,5	0,89	6,3	2,4	2,4	1630
ASU 355L-4	315	1485	535	95,5	0,89	6,6	2,5	2,5	1850
6 poles									
ASU 71a-6	0,18	900	0,58	61,0	0,74	3,0	2,1	2,4	14
ASU 71b-6	0,25	900	0,74	65,0	0,75	3,6	2,2	2,6	15
ASU 80a-6	0,37	900	1,16	62,0	0,74	3,0	2,0	2,3	18,8
ASU 80b-6	0,55	910	1,68	67,5	0,70	3,5	1,9	2,5	19,8
ASU 90S-6	0,75	920	2,03	70,1	0,76	3,5	1,9	2,7	25,8
ASU 90L-6	1,1	920	2,82	74,0	0,76	4,5	1,9	2,6	28,8
ASU 100LX-6	1,5	955	3,73	75,3	0,77	4,5	2,0	2,2	41
ASU 112M-6	2,2	960	5,22	79,0	0,77	5,5	2,0	2,3	50
ASU 132S-6	3	955	6,94	81,0	0,77	6,0	2,1	2,8	80
ASU 132Ma-6	4	955	8,70	84,0	0,79	6,0	2,1	2,4	90
ASU 132Mb-6	5,5	955	11,1	86,5	0,83	6,0	2,1	2,5	100
ASU 160M-6	7,5	960	14,8	88,3	0,83	6,0	2,0	2,1	115
ASU 160L-6	11	960	22,4	88,7	0,80	6,0	2,0	2,1	135
ASU 180L-6	15	960	29,0	89,0	0,84	6,0	2,0	2,5	180
ASU 200La-6	18,5	970	34,0	90,5	0,87	6,1	2,0	2,5	225
ASU 200Lb-6	22	970	40,1	90,0	0,88	7,0	2,1	2,4	278
ASU 225M-6	30	970	53,8	91,5	0,88	6,5	2,0	2,1	325
ASU 250M-6	37	975	69,2	93,0	0,83	7,8	2,4	2,7	430



Motor type	Rated power [kW]	Rated speed [rpm]	Current (400V) [A]	η %	$\text{Cos } \varphi$	$\frac{I_p}{I_n}$	$\frac{M_p}{M_n}$	$\frac{M_{\text{max}}}{M_n}$	Weight [kg]
ASU 280S-6	45	975	81,3	94,0	0,85	7,1	2,2	2,0	530
ASU 280M-6	55	980	101	94,0	0,84	6,7	2,0	2,1	610
ASU 315S-6	75	980	134	94,0	0,86	6,3	2,0	2,5	690
ASU 315M-6	90	980	154	94,5	0,89	7,7	2,2	2,4	720
ASU 315MX-6	110	985	198	94,5	0,85	6,7	2,0	2,2	1090
ASU 315LX-6	132	985	240	94,5	0,84	6,1	2,2	2,2	1110
ASU 315LY-6	160	985	284	94,5	0,86	6,1	2,2	2,2	1210
ASU 355M-6	200	987	341	95,1	0,89	6,0	2,1	2,1	1530
ASU 355L-6	250	989	430	95,3	0,88	7,0	2,5	2,5	1600
8 poles									
ASU 71-8	0,09	630	0,45	50,0	0,58	2,9	2,6	3,2	15
ASU 80a-8	0,18	660	0,87	50,0	0,60	2,9	2,7	3,3	18,8
ASU 80b-8	0,25	670	1,12	52,0	0,62	3,0	2,7	2,7	19,8
ASU 90S-8	0,37	680	1,54	55,0	0,63	3,1	2,7	3,1	25,8
ASU 90L-8	0,55	690	2,04	60,0	0,65	3,0	2,7	2,7	28,8
ASU 100LW-8	0,75	700	2,45	64,0	0,69	3,3	3,0	2,3	36
ASU 100LX-8	1,1	705	3,36	70,5	0,67	4,1	2,0	2,3	41
ASU 112M-8	1,5	705	4,18	73,0	0,71	4,1	2,0	2,0	51
ASU 132S-8	2,2	710	6,22	78,5	0,65	5,0	1,8	2,0	80
ASU 132M-8	3	712	7,23	82,0	0,73	5,0	1,8	2,2	100
ASU 160Ma-8	4	720	10,2	82,2	0,69	5,0	1,9	2,0	105
ASU 160Mb-8	5,5	720	13,4	84,5	0,70	5,2	1,9	2,2	115
ASU 160L-8	7,5	720	18,2	85,1	0,70	5,0	2,0	2,1	135
ASU 180L-8	11	720	25,6	86,5	0,71	6,0	2,1	2,1	190
ASU 200L-8	15	720	31,2	89,0	0,78	6,0	1,8	2,5	278
ASU 225S-8	18,5	730	41,2	90,0	0,72	6,0	2,3	2,2	300
ASU 225M-8	22	730	49,0	91,3	0,71	6,0	2,3	2,2	325
ASU 250M-8	30	730	58,8	92,0	0,80	6,0	2,2	2,3	430
ASU 280S-8	37	735	71,8	93,0	0,80	6,0	1,8	1,9	530
ASU 280M-8	45	735	87,3	93,0	0,80	6,2	1,8	2,5	610
ASU 315S-8	55	735	106	93,0	0,81	6,0	1,8	2,2	690
ASU 315M-8	75	735	146	93,0	0,80	6,3	1,9	2,5	720
ASU 315MX-8	90	735	175	94,0	0,79	5,9	1,8	2,0	1110
ASU 315LY-8	110	735	214	94,0	0,79	5,9	1,8	2,0	1200
ASU 315LZ-8	132	735	260	94,0	0,78	5,5	1,8	2,0	1315
ASU 355M-8	160	739	293	95,0	0,83	6,0	2,0	2,0	1550
ASU 355L-8	200	739	366	95,1	0,83	5,5	2,0	2,0	1630



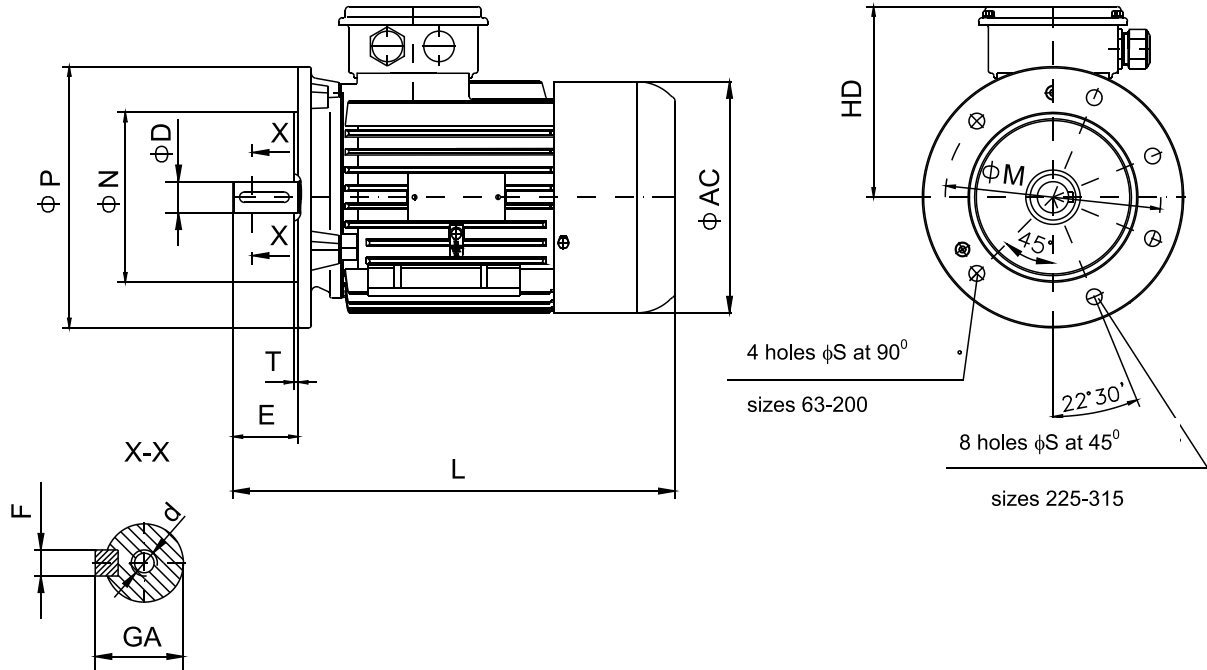
ASU - IM 1001 (IMB3) series induction motors



Frame size	A	B	C	H	K	D		E	F h9	GA	D	AA	AB	BB	HA	AC	HD	L
						Nom.	Tol.											
63	100	80	40	63	7	11	j6	23	4	12.5	M4	31	131	104	9	125	162	258
71	112	90	45	71	7	14	j6	30	5	16	M5	37	141	125	9	140	182	295
80	125	100	50	80	10	19	j6	40	6	21.5	M6	35	155	125	9	158	216	287
90S	140	100	56	90	10	24	j6	50	8	27	M8	37	170	150	9	177	238	339
90L	140	125	56	90	10	24	j6	50	8	27	M8	37	170	150	9	177	238	339
100LW	160	140	63	100	12	28	j6	60	8	31	M10	47	200	176	10	199	257	387
100LX	160	140	63	100	12	28	j6	60	8	31	M10	47	200	176	10	199	257	387
112M	190	140	70	112	12	28	j6	60	8	31	M10	55	224	176	12	221	284	406
132S	216	140	89	132	12	38	k6	80	10	41	M12	68	264	220	14	263	333	496
132M	216	178	89	132	12	38	k6	80	10	41	M12	68	264	220	14	263	333	496



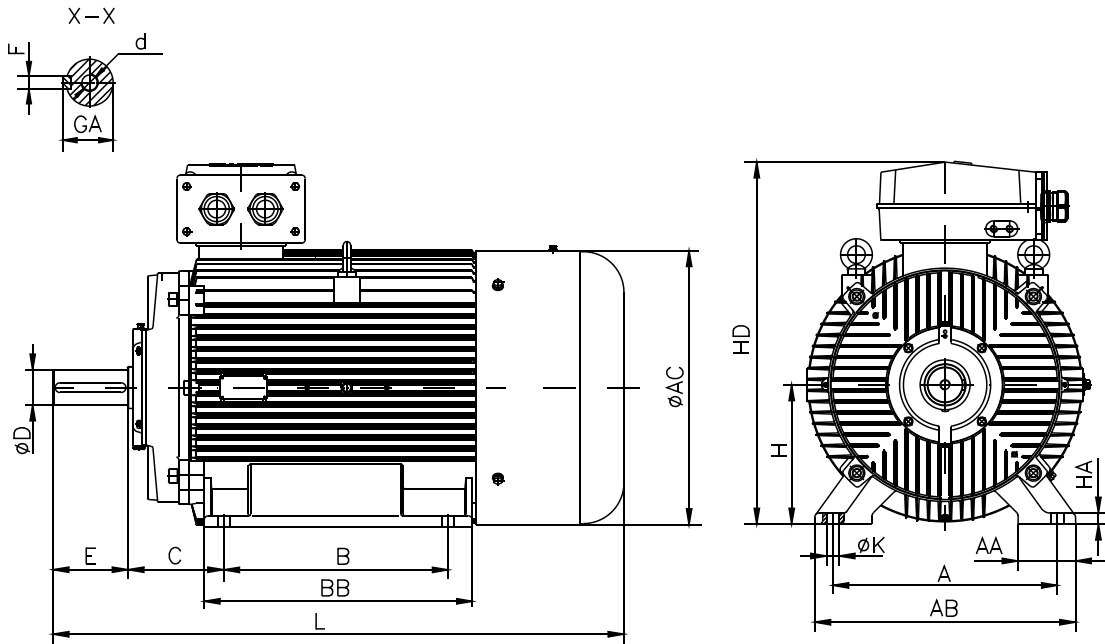
ASU - IM 3001 (IMB5) series induction motors



Frame size	M	N	P	S	T	D		E	F h9	GA	d	AC	HD	L
						Nom.	Tol.							
63	115	95	140	10	3	11	j6	23	4	12.5	M4	125	99	258
71	130	110	160	10	3.5	14	j6	30	5	16	M5	140	111	295
80	165	130	200	12	3.5	19	j6	40	6	21.5	M6	158	136	287
90S	165	130	200	12	3.5	24	j6	50	8	27	M8	177	148	339
90L	165	130	200	12	3.5	24	j6	50	8	27	M8	177	148	339
100LW	215	180	250	14.5	4	28	j6	60	8	31	M10	199	157	387
100LX	215	180	250	14.5	4	28	j6	60	8	31	M10	199	157	387
112M	215	180	250	14.5	4	28	j6	60	8	31	M10	221	172	406
132S	265	230	300	14.5	4	38	k6	80	10	41	M12	263	201	496
132M	265	230	300	14.5	4	38	k6	80	10	41	M12	263	201	496



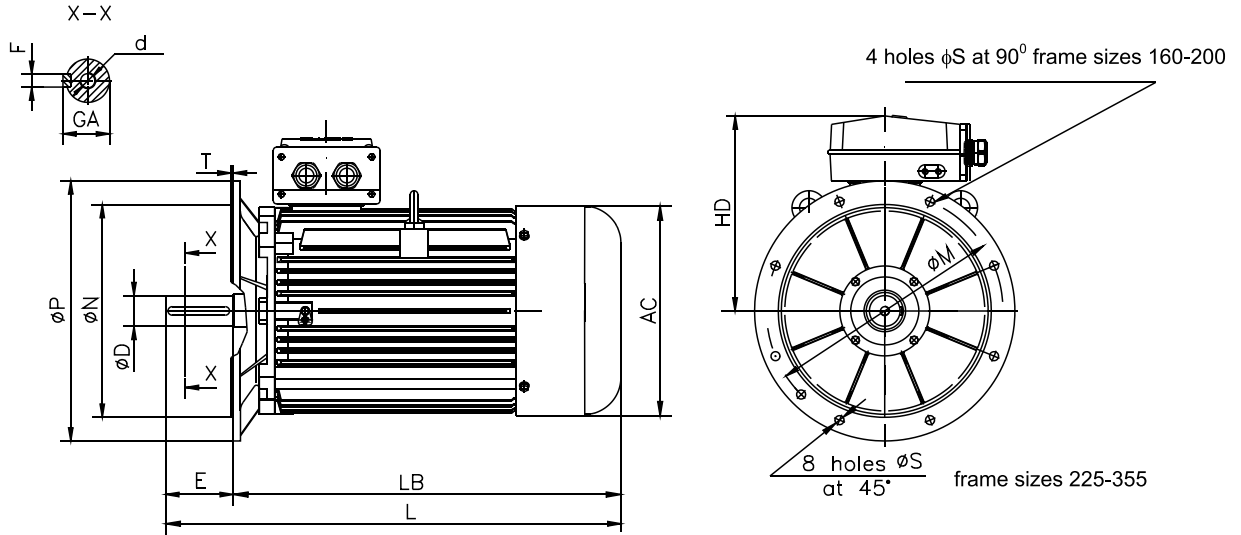
ASU - IM 1001 (IMB3) series induction motors



Frame size	A	B	C	H	K	D			E		F h9		GA		d		AA	AB	BB	HA	AC	HD	L					
						nom.		tol.	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2							2p=2	2p>2	2p=2	2p>2	2p=2	2p>2
						2p=2	2p>2																					
160M	254	210	108	160	14.5	42	k6	110	12	45	M16		310	298	14	315	404	630										
160L	254	254	108	160	14.5	42	k6	110	12	45	M16	84	310	298	14	315	404	630										
180M	279	241	121	180	14.5	48	k6	110	14	51,5	M16	72	350	295	18	355	438	668										
180L	279	279	121	180	14.5	48	k6	110	14	51,5	M16	72	350	335	18	355	438	708										
200L	318	305	133	200	18,5	55	m6	110	16	59	M20	70	380	367	17	395	507	780										
225S	356	286	149	225	18,5	-	60	m6	-	140	-	18	-	64	M20	80	425	358	22	445	552	-	840					
225M	356	311	149	225	18,5	55	60	m6	110	140	16	18	59	64	M20	80	425	383	22	445	552	835	865					
250M	406	349	168	250	24	60	65	m6	140	140	18	18	64	69	M20	95	490	440	20	445	660	925	925					
280S	457	368	190	280	24	65	75	m6	140	140	18	20	69	79,5	M20	125	540	523	20	494	677,5	986						
280M	457	419	190	280	24	65	75	m6	140	140	18	20	69	79,5	M20	125	540	523	20	494	677,5	986						
315S	508	406	216	315	28	65	80	m6	140	170	18	22	69	85	M20	130	590	580	25	554	819	1109	1139					
315M	508	457	216	315	28	65	80	m6	140	170	18	22	69	85	M20	130	590	580	25	554	819	1109	1139					
315MX/LX	508	457	216	315	28	65	80	m6	140	170	18	22	69	85	M20	130	590	607	25	623	819	1232	1292					
315LY/LZ	508	508	216	315	28	65	80	m6	140	170	18	22	69	85	M20	130	590	607	25	623	819	1232	1292					
355Ma	610	560	254	355	28	70	100	m6	140	210	20	28	74,5	106	M20	M24	110	714	695	32	698	920	1370	1480				
355Mb	610	560	254	355	28	70	100	m6	140	210	20	28	74,5	106	M20	M24	110	714	695	32	698	920	1370	1480				
355L	610	630	254	355	28	70	100	m6	140	210	20	28	74,5	106	M20	M24	110	714	765	32	698	920	1450	1560				



ASU - IM 3001 (IMB5) series induction motors



Frame size	M	Nj6	P	S	T	D			E		F h9		GA		d		AC	HD	LB		L			
						nom.		tol.	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2			2p=2	2p>2	2p=2	2p>2	2p=2	2p>2
						2p=2	2p>2																	
160M	300	250	350	18.5	5	42	k6		110		12		45		M16		315	244	520		630			
160L	300	250	350	18.5	5	42	k6		110		12		45		M16		315	244	520		630			
180M	300	250	350	18.5	5	48	k6		110		14		51,5		M16		355	258	558		668			
180L	300	250	350	18.5	5	48	k6		110		14		51,5		M16		355	258	598		708			
200L	350	300	400	18.5	5	55	m6		110		16		59		M20		395	307	670		780			
225S	400	350	450	18.5	5	-	60	m6	-	140	-	18	-	64	M20		445	327	-	700	-	840		
225M	400	350	450	18.5	5	55	60	m6	110	140	16	18	59	64	M20		445	327	725	725	835	865		
250M	500	450	550	18.5	5	60	65	m6	140	140	18	18	64	69	M20		445	397	785	785	925	925		
280S	500	450	550	18.5	5	65	75	m6	140	140	18	20	69	79,5	M20		494	397,5	846		986			
280M	500	450	550	18.5	5	65	75	m6	140	140	18	20	69	79,5	M20		494	397,5	846		986			
315S	600	550	660	24	6	65	80	m6	140	170	18	22	69	85	M20		554	504	969	969	1109	1139		
315M	600	550	660	24	6	65	80	m6	140	170	18	22	69	85	M20		554	504	969	969	1109	1139		
315MX/LX	600	550	660	24	6	65	80	m6	140	170	18	22	69	85	M20		623	504	1092	1122	1232	1292		
315LY/LZ	600	550	660	24	6	65	80	m6	140	170	18	22	69	85	M20		623	504	1092	1122	1232	1292		
355Ma	740	680	800	24	6	70	100	m6	140	210	20	28	74,5	106	M20	M24	698	565	1230	1270	1370	1480		
355Mb	740	680	800	24	6	70	100	m6	140	210	20	28	74,5	106	M20	M24	698	565	1230	1270	1370	1480		
355L	740	680	800	24	6	70	100	m6	140	210	20	28	74,5	106	M20	M24	698	565	1310	1350	1450	1560		



IE2 – HIGH EFFICIENCY

Motor type	Rated power (kW)	Rated speed (rot/min)	Current (400 V) (A)	η %			Cos ϕ	I_p I_n	M_p M_n	M_{max} M_n	Weight (kg)
				100%	75%	50%					
2 poles											
E2-ASU 80a-2	0,75	2865	1,59	80,3	79,5	76,1	0,85	6,3	4,1	4,3	19
E2-ASU 80b-2	1,1	2850	2,19	80,5	79,7	76,3	0,90	5,6	2,3	2,5	24
E2-ASU 90Sa-2	1,5	2850	2,95	81,6	82,1	78,5	0,89	5,2	3,3	3,4	27
E2-ASU 90L-2	2,2	2820	4,14	83,3	83,8	80,2	0,92	5,7	2,3	2,7	30
E2-ASU 100La-2	3	2830	5,6	85,2	86,5	83,2	0,92	6,1	3,2	3,5	40
E2-ASU 112Ma-2	4	2885	7,4	86,7	86,4	84,4	0,91	7,7	2,7	2,7	52
E2-ASU 132Sa-2	5,5	2930	10,1	88,6	88,3	86,0	0,85	7,7	3,6	3,9	90
E2-ASU 132Sb-2	7,5	2920	14,1	88,1	87,8	85,5	0,88	7,1	3,3	3,8	95
E2-ASU 160Ma-2	11	2925	19,6	91,0	90,6	89,8	0,90	7,0	2,3	2,4	135
E2-ASU 160Mb-2	15	2925	26,6	92,2	91,8	91,0	0,90	7,0	2,2	2,4	155
E2-ASU 160L-2	18,5	2925	32,1	92,4	92,0	91,2	0,91	7,0	2,3	2,5	175
E2-ASU 180M-2	22	2945	38,1	91,5	91,4	89,8	0,92	7,5	1,9	2,1	200
E2-ASU 200La-2	30	2930	52,3	92,3	92,1	90,8	0,90	6,4	2,5	2,5	291
E2-ASU 200Lb-2	37	2945	64,2	92,6	92,4	91,1	0,90	7,3	2,9	2,9	294
E2-ASU 225M-2	45	2955	75,3	93,5	93,7	92,9	0,91	7,7	3,0	3,6	389
E2-ASU 250M-2	55	2943	92	93,4	93,6	92,8	0,92	7,8	2,7	3,5	475
E2-ASU 280S-2	75	2950	130	94,2	94,2	93,5	0,89	6,1	1,8	1,8	550
E2-ASU 280M-2	90	2960	155	94,3	94,0	92,8	0,89	6,8	2,6	2,6	650
E2-ASU 315S-2	110	2964	183	95,1	95,1	94,3	0,93	7,5	2,2	2,7	760
E2-ASU 315M-2	132	2965	214	95,5	95,3	94,6	0,93	7,6	2,5	2,5	860
E2-ASU 315MX-2	160	2975	264	95,3	94,9	93,2	0,92	7,0	1,9	1,9	1080
E2-ASU 315LY-2	200	2980	329	95,5	95,1	93,4	0,92	7,0	2,1	2,1	1150
E2-ASU 355M-2	250	2980	431	95,1	94,9	93,5	0,88	6,3	2,2	2,8	1300
E2-ASU 355La-2	280	2980	483	95,1	94,8	93,4	0,88	6,0	2,0	2,5	1380
E2-ASU 355Lb-2	315	2980	542	95,2	94,8	93,2	0,88	6,3	2,3	2,9	1510



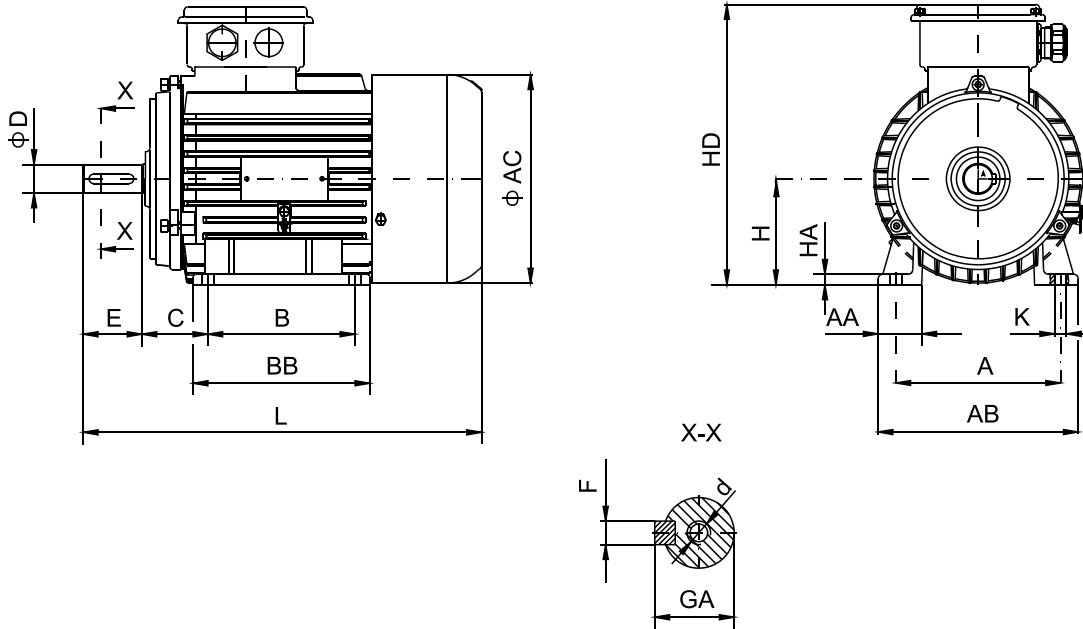
Motor type	Rated power (kW)	Rated speed (rot/min)	Current (400 V) (A)	η %			Cos ϕ	$\frac{I_p}{I_n}$	$\frac{M_p}{M_n}$	$\frac{M_{max}}{M_n}$	Weight (kg)
				100%	75%	50%					
4 poles											
E2-ASU 80b-4	0,75	1425	1,78	79,8	78,5	75,8	0,77	5,6	2,5	2,5	20
E2-ASU 90Sb-4	1,1	1415	2,68	82,5	82,1	80,1	0,85	6,3	2,6	2,6	28
E2-ASU 90L-4	1,5	1420	3,33	82,8	82,4	80,4	0,78	6,2	2,9	2,9	33
E2-ASU 100La-4	2,2	1442	4,87	85,1	85,7	82,5	0,77	5,1	2,3	2,4	40
E2-ASU 100Lb-4	3	1437	6,64	85,7	86,0	83,7	0,76	5,6	2,7	3,2	49
E2-ASU 112Mb-4	4	1430	7,69	86,8	87,7	87,0	0,86	5,9	2,3	2,5	53
E2-ASU 132Sb-4	5,5	1464	9,9	88,9	88,5	87,9	0,86	6,5	2,2	2,4	87
E2-ASU 132M-4	7,5	1455	14,5	90,0	89,6	89,0	0,83	7,3	2,4	2,9	101
E2-ASU 160M-4	11	1461	19,2	90,9	90,2	87,7	0,91	7,9	2,1	2,7	150
E2-ASU 160L-4	15	1452	26,2	90,9	90,1	87,8	0,91	7,3	2,0	2,8	165
E2-ASU 180M-4	18,5	1471	33,3	92,6	92,5	91,5	0,87	7,7	2,3	2,8	195
E2-ASU 180L-4	22	1470	39,1	92,3	92,2	90,5	0,88	7,8	2,3	2,8	218
E2-ASU 200La-4	30	1479	54,6	92,7	92,3	90,8	0,86	7,8	2,3	2,5	298
E2-ASU 225S-4	37	1473	64,0	92,6	84,4	74,4	0,90	7,1	2,0	2,5	322
E2-ASU 225M-4	45	1475	79,7	93,7	93,6	92,7	0,87	7,8	2,3	2,3	392
E2-ASU 250M-4	55	1475	94	94,3	94,4	93,8	0,89	7,9	2,1	2,1	481
E2-ASU 280S-4	75	1480	128	94,9	94,7	94,1	0,88	7,9	2,8	3,2	601
E2-ASU 280M-4	90	1480	154	94,9	94,8	94,1	0,89	7,2	2,4	3,0	650
E2-ASU 315S-4	110	1476	181	94,7	94,5	93,5	0,91	7,3	2,0	2,3	802
E2-ASU 315M-4	132	1474	230	95,0	95,6	95,1	0,87	7,5	2,1	2,2	880
E2-ASU 315MX-4	160	1478	251	95,0	94,8	93,8	0,87	7,2	2,3	2,6	1110
E2-ASU 315LZ-4	200	1481	344	95,3	95,2	94,2	0,88	6,8	2,9	2,9	1200
E2-ASU 355M-4	250	1485	430	95,3	94,9	93,9	0,88	6,5	2,3	2,3	1530
E2-ASU 355La-4	280	1485	476	95,5	95,0	94,2	0,89	6,3	2,4	2,4	1630
E2-ASU 355Lb-4	315	1485	535	95,5	95,1	94,5	0,89	6,6	2,5	2,5	1850



Motor type	Rated power (kW)	Rated speed (rot/min)	Current (400 V) (A)	η %			Cos ϕ	$\frac{I_p}{I_n}$	$\frac{M_p}{M_n}$	$\frac{M_{max}}{M_n}$	Weight (kg)
				100%	75%	50%					
6 poles											
E2-ASU 90Sb-6	0,75	948	1,89	76,2	74,7	70,3	0,75	4,6	2,1	2,3	27
E2-ASU 90L-6	1,1	950	2,76	78,1	76,6	73,2	0,74	5,1	2,4	2,9	38
E2-ASU 100Lb-6	1,5	965	3,68	80,4	79,0	74,8	0,73	5,7	2,2	2,2	45
E2-ASU 112Mb-6	2,2	955	4,71	82,9	82,7	79,5	0,81	5,8	2,1	2,1	54
E2-ASU 132Sa-6	3	962	6,69	84,8	79,9	77,4	0,77	6,5	2,2	2,9	86
E2-ASU 132Ma-6	4	962	8,84	84,6	84,4	80,4	0,74	6,6	2,3	2,6	92
E2-ASU 132Mb-6	5,5	955	10,8	87,0	86,4	84,4	0,82	6,5	2,4	2,6	102
E2-ASU 160M-6	7,5	964	14,8	87,2	87,8	86,7	0,85	5,8	2,0	2,9	125
E2-ASU 160L-6	11	965	21,4	88,9	90,1	90,0	0,84	5,6	1,9	1,9	144
E2-ASU 180L-6	15	975	27,6	91,5	91,4	89,9	0,86	7,8	2,2	2,8	205
E2-ASU 200La-6	18,5	977	34,2	90,5	90,5	89,5	0,87	7,7	2,3	3,3	257
E2-ASU 200Lb-6	22	979	38,9	91,7	91,5	90,8	0,89	7,8	2,1	2,8	293
E2-ASU 225M-6	30	982	54,2	93,2	93,5	92,6	0,86	7,4	2,2	2,6	324
E2-ASU 250M-6	37	980	65,1	92,5	92,4	92,2	0,89	7,6	2,4	3,1	403
E2-ASU 280S-6	45	980	78,9	93,1	93,2	92,3	0,89	7,4	2,0	2,8	550
E2-ASU 280M-6	55	980	100	94,5	94,7	94,2	0,84	7,9	2,8	3,2	610
E2-ASU 315S-6	75	982	133	94,4	94,5	93,9	0,86	7,5	2,2	2,2	792
E2-ASU 315M-6	90	981	156	94,4	94,7	94,4	0,89	6,7	1,9	2,1	892
E2-ASU 315MX-6	110	988	196	94,3	94,2	93,2	0,87	6,5	2,5	2,5	1080
E2-ASU 315LY-6	132	985	234	94,6	94,9	94,7	0,86	5,4	2,2	2,2	1157
E2-ASU 315LZ-6	160	985	282	94,8	95,1	94,9	0,86	5,4	2,0	2,0	1234
E2-ASU 355M-6	200	987	341	95,1	94,8	94	0,89	6,0	2,1	2,1	1530
E2-ASU 355L-6	250	989	430	95,3	95	94,3	0,88	7,0	2,5	2,5	1600



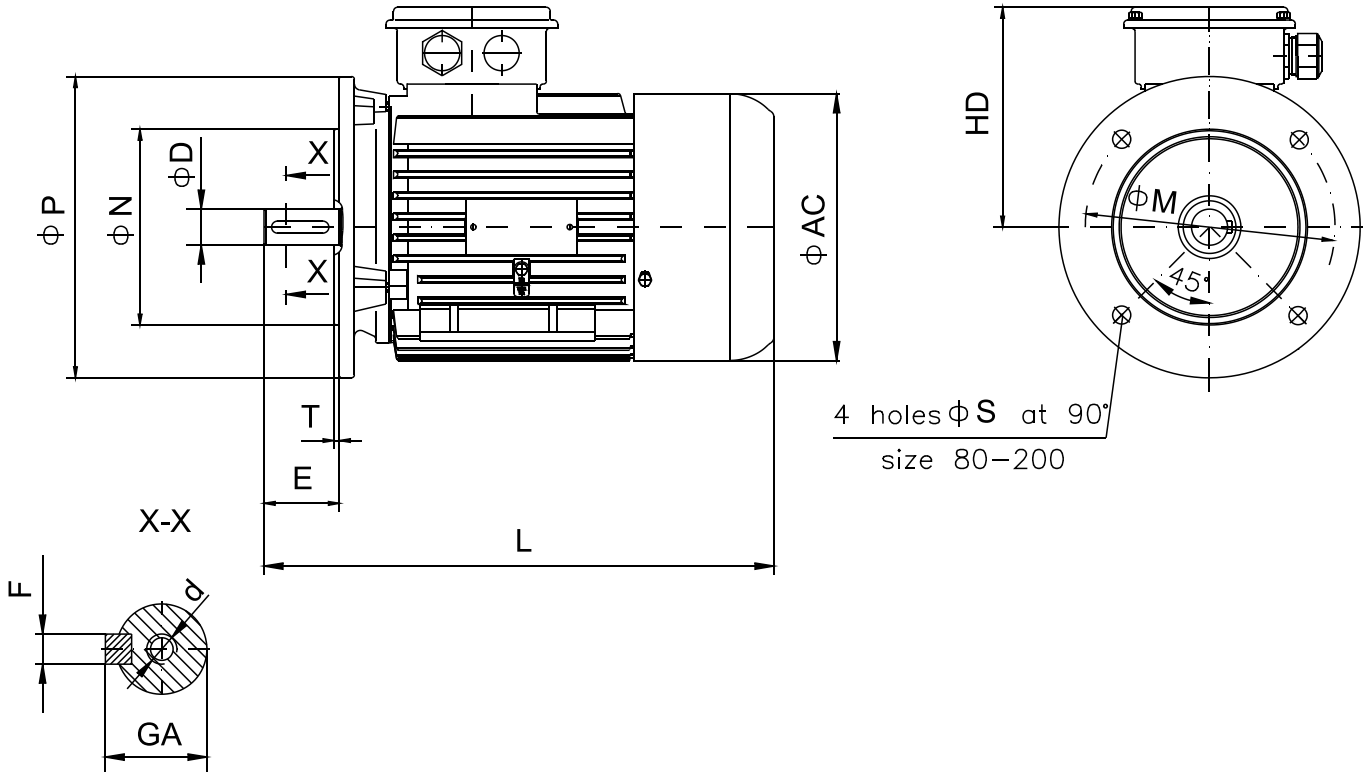
E2-ASU - IM 1001 (IMB3) series induction motors



Frame size Baugröße Hauteur d'axe	A	B	C	H	K	D		E		F h9		GA		d	AA	AB	BB	HA	AC	HD	L			
						nom.	tol.	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2								2p=2	2p>2	2p=2	2p>2
80	125	100	50	80	10	19	j6	40	6	21,5	M6	35	155	125	9	158	216		310					
90Sa	140	100	56	90	10	24	j6	50	8	27	M8	37	170	150	9	177	238		339					
90Sb	140	100	56	90	10	24	j6	50	8	27	M8	37	170	150	9	177	238		411					
90L	140	125	56	90	10	24	j6	50	8	27	M8	37	170	150	9	177	238		411					
100L	160	140	63	100	12	28	j6	60	8	31	M10	47	200	176	10	199	257		410					
112M	190	140	70	112	12	28	j6	60	8	31	M10	55	224	176	12	222	284		406					
132S	216	140	89	132	12	38	k6	80	10	41	M12	68	264	220	14	263	333		565					
132M	216	178	89	132	12	38	k6	80	10	41	M12	68	264	220	14	263	333		565					
160M	254	210	108	160	14.5	42	k6	110	12	45	M16	84	310	298	14	315	404		630					
160L	254	254	108	160	14.5	42	k6	110	12	45	M16	84	310	298	14	315	404		630					



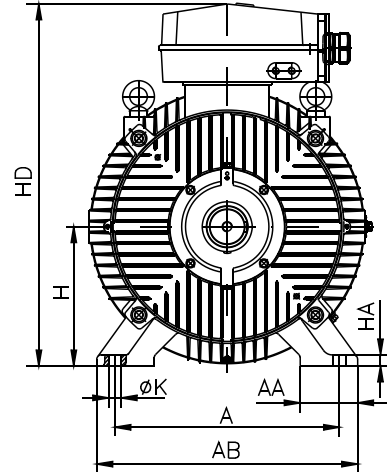
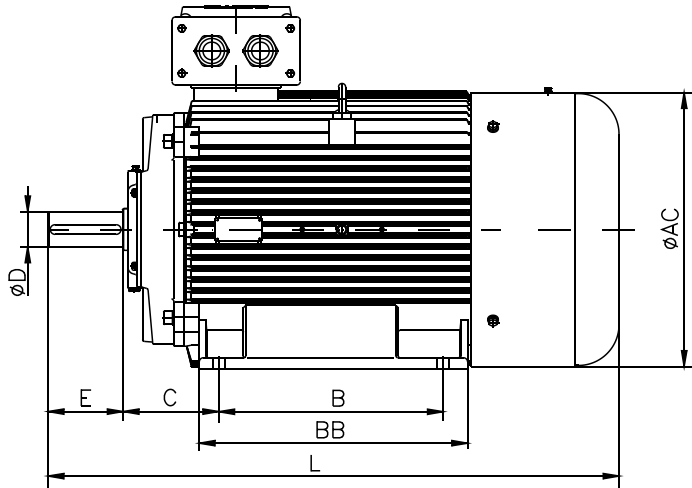
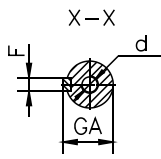
E2-ASU - IM 3001 (IMB5) series induction motors



Frame size Baugröße Hauteur d'axe	M	N j6	P	S	T	D		E		F h9		GA		d	AC	HD	L
						nom.	tol.	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2				
80	165	130	200	12	3,5	19	j6	40	6	21,5	M6	158	136	310			
90Sa	165	130	200	12	3,5	24	j6	50	8	27	M8	177	148	339			
90Sb	165	130	200	12	3,5	24	j6	50	8	27	M8	177	148	411			
100L	215	180	250	14,5	4	28	j6	60	8	31	M10	199	157	410			
112M	215	180	250	14,5	4	28	j6	60	8	31	M10	222	172	406			
132S	265	230	300	14,5	4	38	k6	80	10	41	M12	263	201	565			
132M	265	230	300	14,5	4	38	k6	80	10	41	M12	263	201	565			
160M	300	250	350	18,5	5	42	k6	110	12	45	M16	315	244	630			
160L	300	250	350	18,5	5	42	k6	110	12	45	M16	315	244	630			
180M	300	250	350	18,5	5	48	k6	110	14	51,5	M16	357	318	730			
180L	300	250	350	18,5	5	48	k6	110	14	51,5	M16	357	318	730			
200La	350	300	400	18,5	5	55	m6	110	16	59	M20	396	381	895			
200Lb	350	300	400	18,5	5	55	m6	110	16	59	M20	396	381	945			



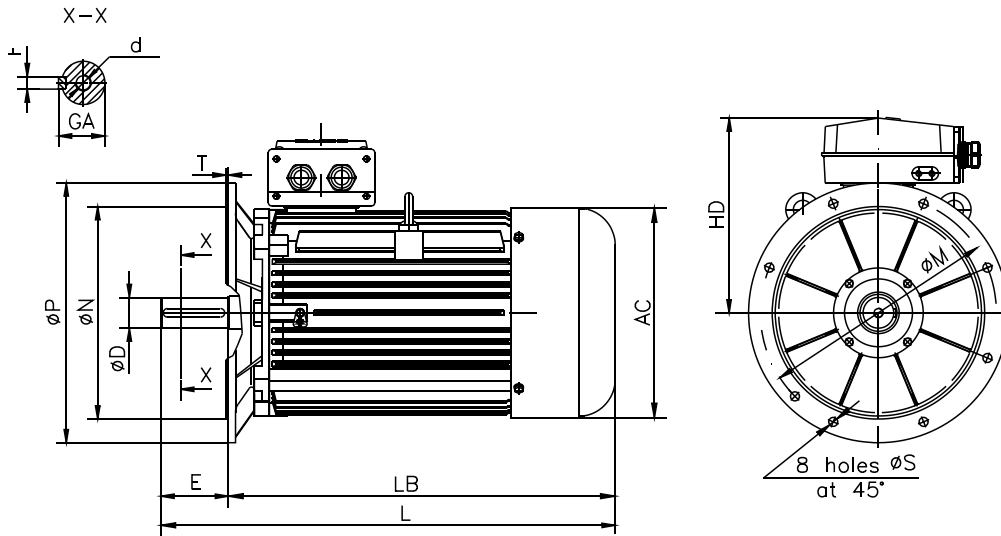
E2-ASU - IM 1001 (IMB3) series induction motors



Frame size Baugröße Hauteur d'axe	A	B	C	H	K	D			E		F h9		GA		d		AA	AB	BB	HA	AC	HD	L				
						nom.	tol.	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2	2p=2							2p>2	2p=2	2p>2	2p=2	2p>2
						2p=2	2p>2																				
180M	279	241	121	180	14.5	48	k6	110	14	51,5	M16	80	360	340	25	357	498	730									
180L	279	279	121	180	14.5	48	k6	110	14	51,5	M16	80	360	340	25	357	498	730									
200La	318	305	133	200	18.5	55	m6	110	16	59	M20	82	400	380	25	396	581	895									
200Lb																		945									
225S	356	286	149	225	18.5	-	60	m6	-	140	-	18	-	64	M20	100	440	430	20	446	636	-	1006				
225M	356	311	149	225	18.5	55	60	m6	110	140	16	18	59	64	M20	100	440	430	20	446	636	976	1006				
250M	406	349	168	250	24	60	65	m6	140	140	18	18	64	69	M20	120	500	480	20	446	660	1056	1056				
280S	457	368	190	280	24	65	75	m6	140	140	18	20	69	79,5	M20	125	540	523	20	494	678	1067					
280M	457	419	190	280	24	65	75	m6	140	140	18	20	69	79,5	M20	125	540	523	20	494	678	1067					
315S	508	406	216	315	28	65	80	m6	140	170	18	22	69	85	M20	130	590	580	25	554	819	1161	1191				
315M	508	457	216	315	28	65	80	m6	140	170	18	22	69	85	M20	130	590	580	25	554	819	1161	1191				
315MX	508	457	216	315	28	65	80	m6	140	170	18	22	69	85	M20	130	590	607	25	623	819	1310	1370				
315LY	508	508	216	315	28	65	80	m6	140	170	18	22	69	85	M20	130	590	607	25	623	819	1310	1370				
315LZ	508	508	216	315	28	65	80	m6	140	170	18	22	69	85	M20	130	590	607	25	623	819	1310	1370				
355M	610	560	254	355	28	70	100	m6	140	210	20	28	74.5	106	M20	M24	110	714	695	32	698	920	1496	1565			
355La	610	630	254	355	28	70	100	m6	140	210	20	28	74.5	106	M20	M24	110	714	765	32	698	920	1576	1645			
355Lb	610	630	254	355	28	70	100	m6	140	210	20	28	74.5	106	M20	M24	110	714	765	32	698	920	1576	1645			



E2-ASU - IM 3001 (IMB5) series induction motors



Frame size Baugröße Hauteur d'axe	M	Nj6	P	S	T	D			E		F h9		GA		d		AC	HD	LB		L	
						nom.		tol.	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2	2p=2	2p>2			2p=2	2p>2	2p=2	2p>2
						2p=2	2p>2															
225S	400	350	450	18.5	5	-	60	m6	-	140	-	18	-	64	M20	446	411	-	866	-	1006	
225M	400	350	450	18.5	5	55	60	m6	110	140	16	18	59	64	M20	446	411	866	866	976	1006	
250M	500	450	550	18.5	5	60	65	m6	140	140	18	18	64	69	M20	446	435	916	916	1056	1056	
280S	500	450	550	18.5	5	65	75	m6	140	140	18	20	69	79.5	M20	494	398	927		1067		
280M	500	450	550	18.5	5	65	75	m6	140	140	18	20	69	79.5	M20	494	398	927		1067		
315S	600	550	660	24	6	65	80	m6	140	170	18	22	69	85	M20	554	504	1021	1021	1161	1191	
315M	600	550	660	24	6	65	80	m6	140	170	18	22	69	85	M20	554	504	1021	1021	1161	1191	
315MX	600	550	660	24	6	65	80	m6	140	170	18	22	69	85	M20	623	504	1170	1200	1310	1370	
315LY	600	550	660	24	6	65	80	m6	140	170	18	22	69	85	M20	623	504	1170	1200	1310	1370	
315LZ	600	550	660	24	6	65	80	m6	140	170	18	22	69	85	M20	623	504	1170	1200	1310	1370	
355M	740	680	800	24	6	70	100	m6	140	210	20	28	74.5	106	M20	M24	698	565	1356	1355	1496	1565
355La	740	680	800	24	6	70	100	m6	140	210	20	28	74.5	106	M20	M24	698	565	1436	1435	1576	1645
355Lb	740	680	800	24	6	70	100	m6	140	210	20	28	74.5	106	M20	M24	698	565	1436	1435	1576	1645



THREE-PHASE SQUIRREL-CAGE INDUCTION MOTORS FOR HOISTING UNITS DRIVE ASF M TYPE

The ASF M range of three-phase squirrel-cage induction motors with electromagnetic brakes are intended for hoisting unit drive. The motors are not designed to operate in potential explosive or chemically aggressive environments.

The ASF M motors are manufactured in the following construction types: IMB 3, IMB 35, IMB 5, IMV 1, IMV 5.

The normal degree of protection is IP 54 for the motor and IP 20 for the fan input. The motor insulation class is F. The ASF M motor standard rated duty is S4 i.e. 120 switches/hour, DA 40%, inertia factor FI 2.

The brake is an independent, motor fastened subassembly, the whole assembly being an integrated construction.

The brake is electromagnetic, friction type.

ASF M motors are equipped with DC brakes. The brakes can be supplied from motor winding or from an external voltage source (see table 4). Brakes (24V DC) type FEA are supplied by the rectified voltage taken from motor winding (see figure 1).

The brake coil ends are connected into the motor terminal box.

Figure 1 - Supply diagram of FEA brake

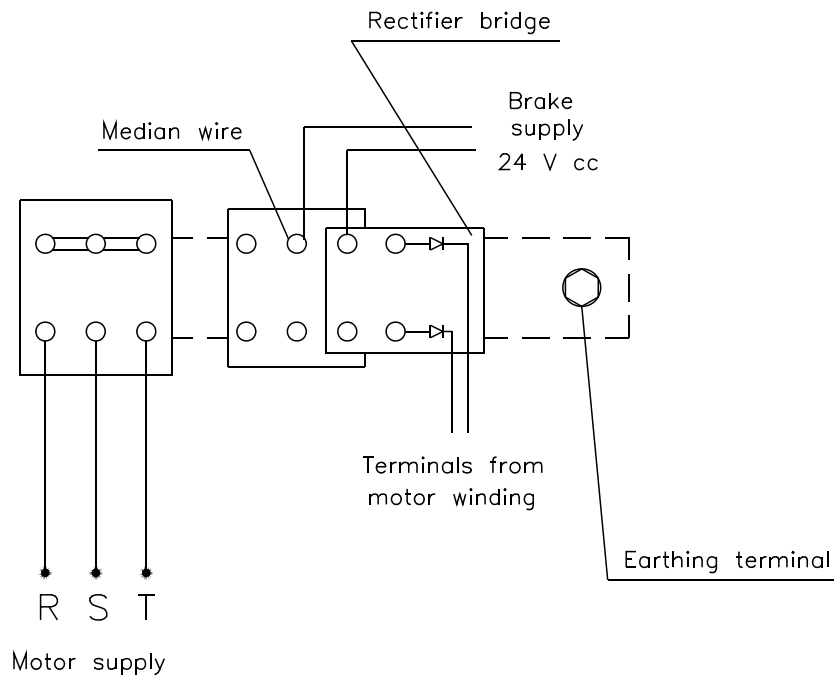


Table 4

Frame size	Brake		Supply		
	Brake type	Braking torque (Nm)	Voltage (V)	Supply options	
				Motor voltage	External source
80	FEA 1.6	16	24cc	motor winding socket via rectifier	Yes
90	FEA 2.5	25	24cc	motor winding socket via rectifier	Yes
100	FEA 4	40	24cc	motor winding socket via rectifier	Yes
112	FEA 5	50	24cc	motor winding socket via rectifier	Yes
132	FEA 10	100	24cc	motor winding socket via rectifier	Yes
160	FEA 20	200	24cc	motor winding socket via rectifier	Yes



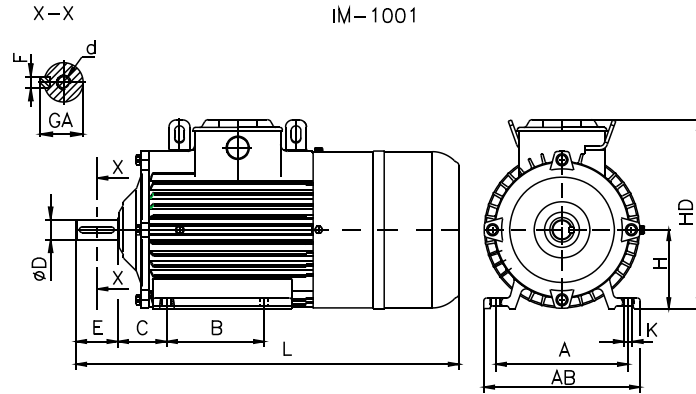
Three-phase squirrel cage and induction motors with brake for hoisting units drive type ASFM – TECHNICAL PARAMETERS

Motor type	Rated power (kW)	n rpm	cosφ	$\frac{M_p}{M_n}$	$\frac{I_p}{I_n}$	η %	J (kgm ²)	MF (Nm)	Weight [kg]
4 poli -4 poles									
ASFM 80 a-4	0.63	1350	0.70	2.5	6	60	0.00712	16	23
ASFM 80 b-4	0.8	1350	0.71			63	0.00807	16	24
ASFM 80 c-4	1	1350	0.72			66	0.00892	16	25
ASFM 90 La-4	1.25	1350	0.73			69	0.0141	25	33
ASFM 90 Lb-4	1.6	1350	0.74			72	0.0162	25	34
ASFM 100 La-4	2	1400	0.75			74	0.0308	40	46
ASFM 100 Lb-4	2.5	1400	0.76			76	0.0402	40	48
ASFM 112 Ma-4	3.2	1410	0.77			78	0.0513	50	62
ASFM 112 Mb-4	4	1410	0.78			80	0.601	50	86
ASFM 132 Sa-4	5	1420	0.79			82	0.104	100	85
ASFM 132 Sb-4	6.3	1420	0.80			83	0.127	100	90
ASFM 132 M-4	8	1420	0.81			84	0.158	100	96
ASFM 160 M-4	10	1430	0.82			85	0.32	200	175
ASFM 160 M-4	16	1440	0.82			85	0.47	200	190
6 poli – 6 poles									
ASFM 80 a-6	0.4	850	0.64	2.0	6	53	0.0137	16	23
ASFM 80 b-6	0.5	850	0.65			56	0.0145	16	24
ASFM 80 c-6	0.63	850	0.66			59	0.0171	16	25
ASFM 90 La-6	0.8	905	0.67			62	0.0245	25	33
ASFM 90 Lb-6	1	905	0.68			65	0.0271	25	34
ASFM 100 La-6	1.25	920	0.69			68	0.0426	40	46
ASFM 100 Lb-6	1.6	920	0.70			71	0.0495	40	48
ASFM 112 Ma-6	2	920	0.71			73	0.0623	50	60
ASFM 112 Mb-6	2.5	920	0.72			75	0.0714	50	64
ASFM 132 Sa-6	3.2	930	0.73			77	0.1276	100	62
ASFM 132 Sb-6	4	930	0.74			79	0.1691	100	90
ASFM 132 M-6	5	930	0.75			81	0.1985	100	96
ASFM 160 M-6	8	940	0.76			82	0.495	200	175
ASFM 160M-6	10	940	0.78			82	0.495	200	175
8 poli -8 poles									
ASFM 80 a-8	0.32	650	0.60	2.0	6	49	0.0137	16	23
ASFM 80 b-8	0.4	650	0.61			52	0.0145	16	24
ASFM 80 c-8	0.5	650	0.62			55	0.0171	16	25
ASFM 90 La-8	0.63	650	0.63			58	0.0245	25	33
ASFM 90 Lb-8	0.8	650	0.64			61	0.0271	25	34
ASFM 100 La-8	1	650	0.65			64	0.0426	40	45
ASFM 100 Lb-8	1.25	650	0.66			67	0.0495	40	47
ASFM 112 Ma-8	1.6	660	0.67			70	0.0623	50	60
ASFM 112 Mb-8	2	660	0.68			72	0.0714	50	63
ASFM 132 Sa-8	2.5	690	0.69			74	0.1276	100	89
ASFM 132 Sb-8	3.2	690	0.70			76	0.1691	100	90
ASFM 132 M-8	4	690	0.71			78	0.1985	100	96
ASFM 160 M-8	8	700	0.72			79	0.495	200	175



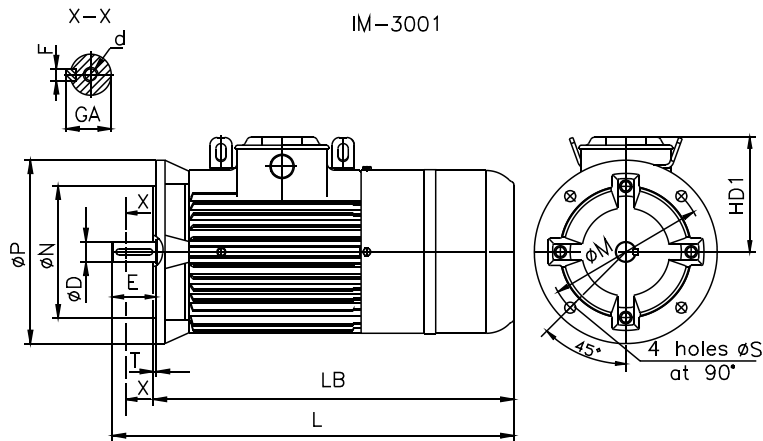
ASFM – series induction motors

IM 1001 (IMB3)



Frame size	Foot mounting					Shaft extension						GA	d	AB	HD +2	L
	A	B	C	H		K	D		E	F						
				Nom	Tol		Nom	Tol		Nom	Tol					
ASFM 80	125	100	50	80	0,5	10	19	j6	40	6	h9	21,5	M6	160	205	396
ASFM 90L	140	125	56	90		10	24		50	8		27	M8	180	222	452
ASFM 100L	160	140	63	100		12	28		60	8		31	M8	200	248	468
ASFM 112M	190	140	70	112		12	28	60	8	31		M8	224	269	549	
ASFM 132S	216	140	89	132		12	38	80	10	41		M10	264	345	598	
ASFM 132M	216	178	89	132		12	38	80	10	41		M10	264	345	645	
ASFM 160M	254	210	108	160		14,5	42	110	12	45		M12	320	399	810	

IM 3001 (IMB5)



Frame size	Flange mounting					Shaft extension						HD1 +2	LB	L	
	M	Nj6	P	S	T	D		E	F		GA				d
						Nom	Tol		Nom	Tol					
ASFM 80	165	130	200	12	3,5	19	j6	40	6	h9	21,5	M6	125	356	396
ASFM 90L	165	130	200	12	3,5	24		50	8		27	M8	132	402	452
ASFM 100L	215	180	250	14,5	4	28		60	8		31	M8	148	408	468
ASFM 112M	215	180	250	14,5	4	28	60	8	31		M8	157	489	549	
ASFM 132S	265	230	300	14,5	4	38	80	10	41		M10	213	518	598	
ASFM 132M	265	230	300	14,5	4	38	80	10	41		M10	213	565	645	
ASFM 160M	300	250	350	18,5	5	42	110	12	45		M12	239	700	810	



AIM SERIES OF THREE – PHASE WOUND ROTOR INDUCTION MOTORS FOR HOISTING UNITS DRIVE
AIFM SERIES OF THREE-PHASE WOUND ROTOR ELECTROMAGNETIC BRAKE INDUCTION MOTORS
FOR HOISTING UNITS DRIVE

The AIM series of three-phase induction motors with wound rotor and brushes in permanent contact with the rings and AIFM series, derived from the first one, equipped with an electromagnetic brake are meant for hoisting units drive.

The motors comply with the requirements of the following standards and norms:

- EN 60034-1:2004 – Rotating electrical machines. Part 1: Rating and performance.
- SR 1893:2008 - Rotating electrical machines. Rules and methods for quality control.
- STAS 1893/3-87 - Rotating electrical machines. Marking, packing, supply, documents, guarantees.
- EN 60034-6:1993 - Rotating electrical machines -- Part 6: Methods of cooling (IC Code).
- EN 60034-7:1996/A1:2001 - Rotating electrical machines. Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM Code).
- EN 60034-9:2005 - Rotating electrical machines -- Part 9: Noise limits.
- EN 60034-14:2004/A1:2007 - Rotating electrical machines -- Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher - Measurement, evaluation and limits of vibration severity.
- EN 60529:1995/A1:2003 - Degrees of protection provided by enclosures (IP code).
- CEI 60072-1:1994 - Dimensions and output series for rotating electrical machines. Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080.
- STAS 6968/1-87 - Wound-rotor induction motors for hoisting and transport installations. Special technical requirements.
- STAS 6968/2-88 - Ring asynchronous motors for hoisting an transport installation. Correlation of output powers with mounting dimensions.

The motors are intended to operate under the following environmental conditions:

- Temperature - 33^o C..... + 40^o C
- Relative humidity: max. 80% at 20^o C
- Maximum altitude of installation: 1000 m (3000 feet) above sea level.

The motors are solid grey -cast iron mechanical construction; the housing is fitted with cooling fins and is blown by an outer fan placed at the non-drive end side, protected by a fan cover.

The motors are provided with rolling-contact bearings.

The bearing types, appropriate to each frame size motors are given in table 1.

Table 1

Frame size	Bearing symbol				Brush dimensions
	AIM		AIFM		
	Drive-end	Non drive-end	Drive-end	Non drive-end	
100	6306 P6 EL	6306 P6 EL	6306 P6 EL	6306 P6 EL	16 x 8
112	6307 2Z P63 EL	6307 2Z P63 EL	6307 2Z P63 EL	6307 2Z P63 EL	16 x 8
132	6308 2Z P63 EL	6308 2Z P63 EL	6308 2Z P63 EL	6308 2Z P63 EL	20 x 10
160	6310 2Z P63 EL	6310 2Z P63 EL	6310 2Z P63 EL	6310 2Z P63 EL	25 x 12.5
180	6311 2Z P63 EL	6311 2Z P63 EL	6311 2Z P63 EL	6311 2Z P63 EL	25 x 12.5
200	6312 P6	6312 P6	-	-	32 x 16
225	6313 P6	6313 P6	-	-	32 x 16
250	NU 315 P6	6315 P6	-	-	40 x 20
280	NU 317 P6	6317 P6	-	-	40 x 20

The bearings are not dimensioned to stand axial forces outside the motors. The stator and rotor common terminal box, located on top the motor, is provided with cable entries on both sides and normalized glands. The terminal box allows for the inspection of the slip rings and brushes. The brush dimensions are given in table 1.

A six-terminal plate allowing the stator winding star or delta connection is fitted inside the terminal box. AIFM motors have an additional terminal plate for brake supply. The rotor cables are connected to the terminals on the brush holder.

The housings are provided with earthing terminals.

The protection degree of the AIFM type motors is:

- IP 55 for frame sizes 100 -180

The protection degree of the AIM type motors is:

- IP 55 for frame sizes 112 -180, 250, 280
- IP 54 for the other frame sizes

The usual mounting arrangements, according to EN 60034-7 (IEC 34-7) are: IM1001, IM2001, IM3001, IM1011 and IM3011. The AIM series are also available in IM1002 mounting arrangement.

The stator and rotor windings are manufactured in class F of insulation. The motors are designed to be supplied from a three - phase mains with line voltage of 220V, 230V, 380V, 400 V at 50 Hz frequency. They may be as well manufactured as to meet other intermediate voltages and the 60 Hz frequency.



The supply source could be motor winding or a separate source. The brakes type FEA are supplied with rectified voltage from motor winding – see figure 2. The brake supply voltage is given in table 4.

A starting rheostat, inserted in the rotor circuit, setting up the starting time at 6-7 sec., enables the starting of the motors. The motors manufacturer does not supply the starting rheostat.

The AIM and AIFM motors are designed to operate under an intermittent periodic duty S3, characterized by six starts per hour and an operating factor of 40%.

Table 5 includes the technical parameters corresponding to other rated duties (S1, S2, S4).

The rated output refers to rated duty and the standard environmental conditions.

For environmental conditions different from the temperate climate standard values, the output varies as shown in tables 2a and 2b.

Table 2a

Height [m]	0-1000	1001-2000	2001-3000	3001-4000
Effective power [%P]	100	94	86	77

Table 2b

Ambient temperature [°C]	40	50	60
Effective power [%P]	100	90	80

According to EN 60034-1:2005 (IEC 34-1) the technical parameters are subject to the following tolerances table3.

Table 3

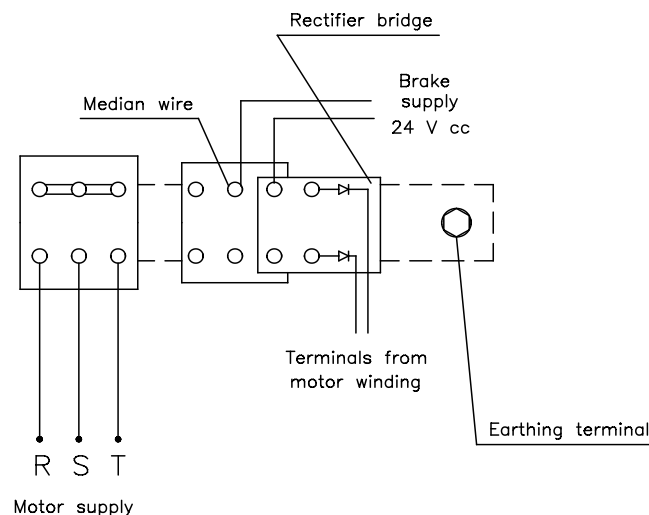
Parameter name	Tolerances
Efficiency - power lower than or equal to 50kW - power higher than 50kW	- 15% din (1 - η) - 10% din (1 - η)
Power factor (cos φ)	$\frac{1}{6}$ of (1 - cos φ), min 0,02 and max 0,07
Slip (at full load and operating temperature)	+/- 20% of the slip guaranteed value
Maximum torque	- 10% of the torque guaranteed value, with the specification that after applying this tolerance, the torque should remain equal or higher than 1,6 or 1,5 times the nominal torque
Moment of inertia	+ / - 10% of the guaranteed value

The vibration levels, in mm/s comply with EN 60034-14:2004/A1:2008. The maximum permissible values of the motors noise levels, expressed by the sound power are in accordance to EN 60034-9:2006 (IEC 34-9).

Table 4

Frame size	Brake		Voltage (V)	Supply	
	Brake type	Braking torque (Nm)		Supply options	
				Motor voltage	External source
100	FEA 5	50	24 cc	motor terminals via rectifier	Yes
112	FEA 5	50	24 cc	motor terminals via rectifier	Yes
132	FEA 10	100	24 cc	motor terminals via rectifier	Yes
160	FEA 20	200	24 cc	motor terminals via rectifier	Yes
180	FEA 30	200	24 cc	motor terminals via rectifier	Yes

Figure 2 - Supply diagram of FEA brake



Type	Name	Rated duty S3 – 6cont/h -DA = 40%				Mmax / M _n		GD ²		Weight		Mf	Equivalent services (kW)													
		P	n	cosφ	Efficiency	I ₁ (380V)	I ₂	U ₂	AIM	AIFM	AIM	AIFM	kg	AIM	AIFM	S1	S2	S3	S4 - FI = 2							
	Size	kW	rpm	%	AIM	AIFM	A	A	V	kgfm ²	kg	Nm	60	100	25	40	60	40	60							
Synchronous speed 1500 rot/min																										
AIM	AIFM	100La-4	2	1310	0.65	68	7	7	18	110	2.9	0.14	0.184	42	55	50	1.6	1.8	2.2	1.7	1.6	1.9	1.7	1.6	1.5	1.3
AIM	AIFM	100Lb-4	2.5	1340	0.68	69	8.1	8.1	20	115	2.7	0.16	0.2	46	59	50	2	2.2	2.7	2.1	2	2.4	2.1	2	1.9	1.6
AIM	AIFM	112Ma-4	3.2	1340	0.67	71.5	10	10	22	120	2.6	0.18	0.2	56	69	50	2.5	2.9	3.5	2.7	2.5	3	2.7	2.5	2.4	2.1
AIM	AIFM	112Mb-4	4	1350	0.7	77	11.3	11.3	24	130	3	0.2	0.22	61	74	50	3.2	3.6	4.4	3.4	3.2	3.8	3.4	3.2	3	2.6
AIM	AIFM	132S-4	5	1350	0.73	74	14	14	28	145	3.2	0.22	0.24	90	115	100	4	4.5	5.5	4.2	4	4.8	4.2	4	3.7	3.2
AIM	AIFM	132Ma-4	6.3	1390	0.73	76.5	17.2	17.2	30	160	2.8	0.25	0.27	100	135	100	5	5.6	6.9	5.4	5	6	5.4	5	4.7	4.1
AIM	AIFM	132Mb-4	8	1400	0.74	82.5	20	20	36	170	3.6	0.3	0.32	125	140	100	6.3	7.2	8.8	6.8	6.3	7.6	6.8	6.3	6	5.2
AIM	AIFM	160M-4	10	1400	0.78	83	23.5	23.5	36	180	3.8	0.55	0.6	170	200	200	7.5	8.7	11	8.5	7.5	9.5	8.5	7.5	7.5	6.5
AIM	AIFM	160L-4	15	1420	0.76	84	35.7	35.7	38	260	3.2	0.65	0.7	190	220	200	11	13	16.5	12.5	11	14	12.5	11	10.5	9.5
AIM	AIFM	180L-4	20	1420	0.82	86	43.1	43.1	48	270	3	1	1.15	215	245	300	15	18	22	17	15	19	17	15	14.5	13
AIM		200La-4	24	1420	0.87	89	47.2		67	230	3.2	1.6		350			18.5	22.5	28	21	18.5	23	21	18.5	18	16
AIM		200L-4	25	1440	0.88	89	48.5	48.5	72	230	3.2	1.6		367			18.5	22.5	28	21	18.5	23	21	18.5	18	16
AIM		200Lb-4	28	1420	0.87	89	55		80	275	3.0	1.75		367			22	27	33	25	22	27	25	22	21	19
AIM		225Ma-4	32	1440	0.88	89	62		77	275	2.8	2.5		375			22	29	37	27	22	30.4	26	22	23	20
AIM		225Mb-4	39	1440	0.87	90.5	76		78	330	2.9	3.2		388			30	37	45	34	30	37	33	30	28	25
AIM		250M-4U	48	1460	0.79	88	105		160	195	3	4.5		540			37	46	55	42	37	46	41	37	35	31
AIM		250M-4V	58	1460	0.73	88	137		162	235	4	5.5		582			45	56	67	51	45	56	50	45	42	38
AIM		280S-4	75	1470	0.88	92	141		160	280	2.5	9.7		700			55	67	85	62	55	67	60	52	50	45
AIM		280M-4	85	1470	0.9	92	158		170	300	2.6	11		760			64	75	95	70	64	75	70	60	56	50
Synchronous speed 1000 rpm																										
AIM	AIFM	100La-6	125	880	0.68	67	4.1	4.1	13	80	2.7	0.18	0.21	42	55	50	1	1.1	1.4	1.1	1	1.2	1.1	1	0.9	0.7
AIM	AIFM	100Lb-6	1.6	880	0.7	72	4.8	4.8	15	85	2.6	0.2	0.22	46	59	50	1.2	1.4	1.8	1.3	1.2	1.5	1.3	1.2	1.1	0.9
AIM	AIFM	112Ma-6	2	880	0.72	75	5.7	5.7	19	95	2.7	0.23	0.24	56	69	50	1.6	1.8	2.2	1.7	1.6	1.9	1.7	1.6	1.5	1.3
AIM	AIFM	112Mb-6	2.5	880	0.67	70.4	8	8	19	105	3.5	0.25	0.27	61	74	50	2	2.2	2.7	2.1	2	2.4	2.1	2	1.9	1.6
AIM	AIFM	132S-6	3.2	900	0.7	71	9.8	9.8	20	110	2.8	0.28	0.3	90	115	100	2.5	2.9	3.5	2.7	2.5	3	2.7	2.5	2.4	2.1
AIM	AIFM	132Ma-6	4	900	0.7	77	11.2	11.2	26	115	2.8	0.3	0.32	100	135	100	3.2	3.6	4.4	3.4	3.2	3.8	3.4	3.2	3	2.6
AIM	AIFM	132Mb-6	5	900	0.73	76	13.7	13.7	27	120	2.7	0.33	0.35	125	140	100	4	4.5	5.5	4.2	4	4.8	4.2	4	3.7	3.2
AIM	AIFM	160M-6	7.5	920	0.76	79	18	18	27	180	2.6	0.6	0.65	170	200	200	5.5	6.5	8	6	5.5	7	6	5.5	5.5	5
AIM	AIFM	160L-6	10	920	0.79	83	23.2	23.2	25	260	2.6	0.8	0.9	190	220	200	7.5	9	11.5	8.5	7.5	9.5	8.5	7.5	7	6.5
AIM	AIFM	180L-6	15	930	0.8	86	35.3	33	45	230	3	1.3	1.4	215	245	300	11	13	16.5	12.5	11	14	12.5	11	10.5	9.5
AIM		200L-6	20	950	0.83	86.4	42.6	42.6	51	255	3.8	1.7		356			15	18	23	17.5	15	19	17	15	14	13
AIM		225Ma-6	25	950	0.87	89.5	49		63	250	2.4	3.4		368			18.5	23	28	22	18.5	23	21	18.5	18	16
AIM		225Mb-6	30	950	0.87	89	59		68	290	2.7	3.7		380			22	27	34	26	22	28	25	22	21	19
AIM		250M-6U	37	970	0.82	88	78		175	140	3.9	5.1		545			27	34	42	32	27	34	30	27	26	23
AIM		250M-6V	45	970	0.78	85	103		168	175	3.2	7		595			34	43	52	39	34	43	38	34	32	29
AIM		280S-6	60	970	0.77	89	133		206	190	2.8	11		700			45	57	70	52	45	57	50	45	43	38
AIM		280M-6	75	970	0.81	89.4	158		210	235	2.8	14		760			55	70	85	64	55	70	62	55	52	47

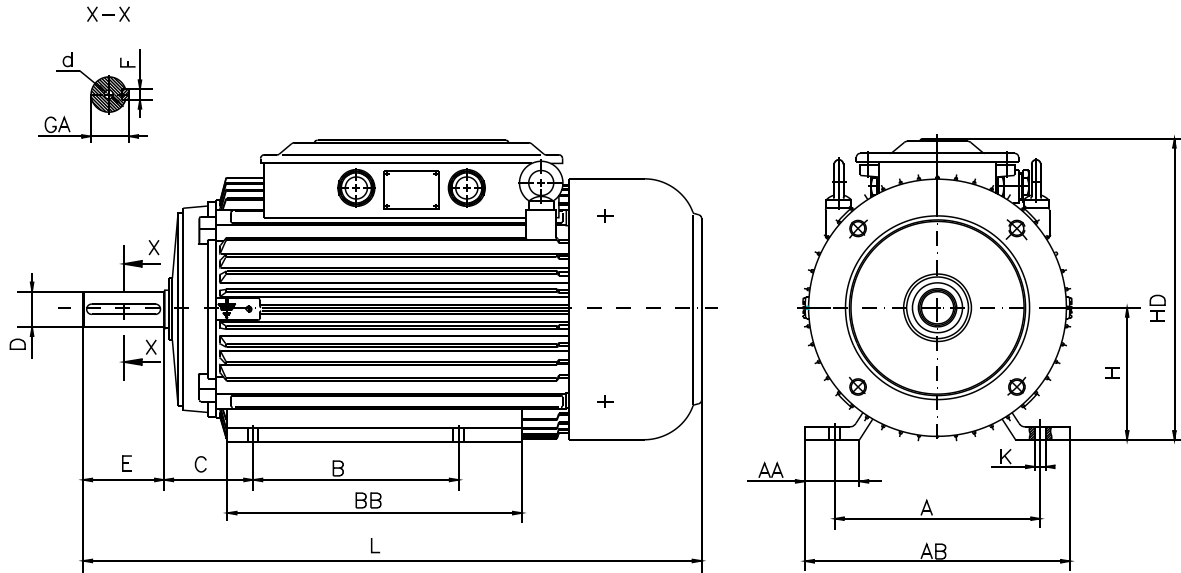
Name		Rated duty S3 – 6con/h - DA = 40%										Equivalent services (kW)															
Type	Size	P kW	n rpm	cos φ	Efficiency			I ₁ (380V)			U ₂	Mmax / Mn	GD ²		Weight		Mf	S1	S2	S3	S4 - FI = 2						
					AIM	AIFM	AIM	AIFM	AIM	AIFM			kg	kgm ²	kg	Nm					con/h						
																					25	60	100	25	40	60	40
Synchronous speed 750 rpm																											
8 poles																											
AIM	AIFM	132S-8	2.5	660	0.65	68	68	8.6	8.6	18	100	2.8	0.28	0.3	90	115	100	1.6	2.2	2.8	2.2	1.6	2.3	2.1	1.6	1.6	1.5
AIM	AIFM	132Ma-8	3.2	665	0.63	72	72	10.7	10.7	21	115	2.6	0.3	0.32	100	135	100	2.2	2.9	3.6	2.8	2.2	3	2.7	2.2	2.2	2.1
AIM	AIFM	132Mb-8	4	670	0.65	73	73	12.8	12.8	26	135	3.1	0.33	0.35	125	140	100	3	3.6	4.5	3.5	3	3.7	3.4	3	2.8	2.6
AIM	AIFM	160M-8	5.5	700	0.68	82	82	15	15	26	160	2.35	0.6	0.65	170	200	200	4	5	6.3	4.7	4	5.1	4.5	4	3.9	3.6
AIM	AIFM	160L-8	7.5	700	0.69	81	81	20.4	20.4	28	195	2.35	0.8	0.9	190	220	200	5.5	6.7	8.6	6.4	5.5	7	6.1	5.5	5.3	4.9
AIM	AIFM	180L-8	10	700	0.64	83	83	28.6	28.6	31	210	2.25	1.3	1.4	215	245	300	7.5	9	11.5	8.5	7.5	9.5	8.5	7.5	7	6.5
AIM		200L-8	15	710	0.67	83		41	41	39	250	2.26	1.6	2	348			11	13.5	16.5	12.5	11	14	12	11	10.5	9.5
AIM		225Ma-8	20	710	0.75	88		46		59	220	2.5	3.8		355			15	18.5	23	17.5	15	18.5	16.5	15	14.5	13
AIM		225Mb-8	25	710	0.7	87		62.4		61	270	2.58	4.4		368			18.5	23	28	22	18.5	23	20	18.5	17.5	16
AIM		250M-8	30	720	0.81	84		67		132	150	3.2	6.4		540			22	27	34	26	22	28	24	22	21	19
AIM		250M-8	37	720	0.75	85		88.3		129	190	3	7.5		590			27	33	42	32	27	34	30	27	26	24
AIM		280S-8	50	720	0.8	90		106		163	200	3.1	11.5		710			37	46	57	44	37	47	41	37	35	32
AIM		280M-8	63	720	0.77	87		143		166	250	3.1	14		780			47	59	73	55	47	60	52	47	45	41
Synchronous speed 600 rpm																											
10 poles																											
AIM		200L-10	11.5	570	0.56	83		37.6		50	150	2.5	1.6		348			7.5	11	12.5	10	7.5	11	10	8.5	7.5	6
AIM		250M-10	23	570	0.56	83.8		74.5		121	125	3.3	5.8		486			16.5	20.5	26	20	16.5	21	18.5	16.5	16	14
AIM		250M-10	28	570	0.63	86		79		124	150	2.8	7.5		611			20	25	32	24	20	25	22	20	19	17
AIM		280S-10	37	570	0.68	87.5		94.6		153	160	2.8	11.5		720			27	34	42	32	27	34	30	27	26	23
AIM		280M-10	48	570	0.66	85.7		129		162	195	2.3	14		780			35	44	55	42	35	45	40	35	34	30

INDUCTION MOTORS CATALOGUE



SLIP RING THREE-PHASE INDUCTION MOTORS FOR HOISTING UNITS DRIVE TYPE AIM, AIFM

IM 1001

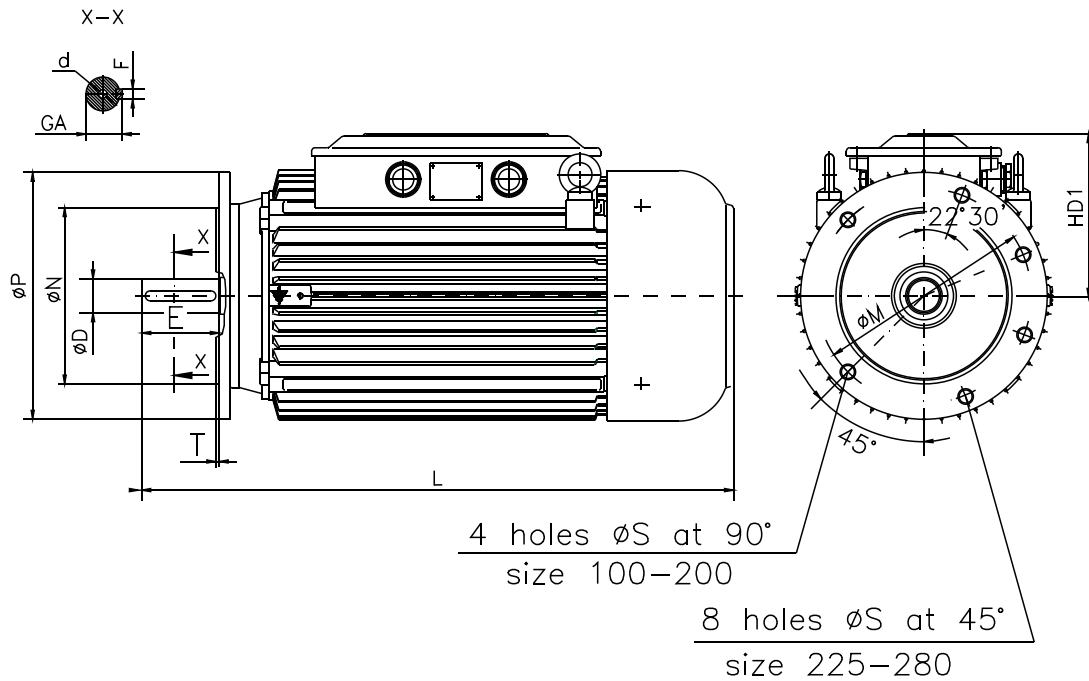


Frame size	A	B	C	H	K	D	E	F	GA	d	AA	AB	BB	HD	L	
															AIM	AIFM
100L	160	140	63	100	12	28	60	8	31	M10	36	200	280	245	485	620
112M	190	140	70	112	12	28	60	8	31	M10	40	224	290	267	535	655
132S	216	140	89	132	12	38	80	10	41	M12	59	264	285	312	596	725
132M	216	178	89	132	12	38	80	10	41	M12	59	264	330	312	634	763
160M	254	210	108	160	14.5	42	110	12	45	M16	70	320	400	378	776	925
160L	254	254	108	160	14.5	42	110	12	45	M16	70	320	400	378	776	925
180L	279	279	121	180	14.5	48	110	14	51.5	M16	73	360	400	412	840	970
200L	318	305	133	200	18.5	55	110	16	59	M20	83	400	450	460	905	-
225M	356	311	149	225	18.5	60	140	18	64	M20	92	450	500	510	1015	-
250M	406	349	168	250	24	70	140	20	74.5	M20	140	500	570	571	1201	-
280S	457	368	190	280	24	80	170	22	85	M20	140	560	658	625	1315	-
280M	457	419	190	280	24	80	170	22	85	M20	140	560	658	625	1315	-



SLIP RING THREE-PHASE INDUCTION MOTORS FOR HOISTING UNITS DRIVE TYPE AIM, AIFM

IM 3001



Frame size	M	N	P	S	T	D	E	F	GA	d	HD1	L	
												AIM	AIFM
100L	215	180	250	14.5	4	28	60	8	31	M10	145	485	620
112M	215	180	250	14.5	4	28	60	8	31	M10	155	535	655
132S	265	230	300	14.5	4	38	80	10	41	M12	180	596	725
132M	265	230	300	14.5	4	38	80	10	41	M12	180	634	763
160M	300	250	350	18.5	5	42	110	12	45	M16	218	776	925
160L	300	250	350	18.5	5	42	110	12	45	M16	218	776	925
180L	300	250	350	18.5	5	48	110	14	51.5	M16	232	840	970
200L	350	300	400	18.5	5	55	110	16	59	M20	260	905	-
225M	400	350	450	18.5	5	60	140	18	64	M20	285	1015	-
250M	500	450	550	18.5	5	70	140	20	74.5	M20	321	1201	-
280S	500	450	550	18.5	5	80	170	22	85	M20	345	1315	-
280M	500	450	550	18.5	5	80	170	22	85	M20	345	1315	-

We reserve the right to implement modifications without notice.



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