

FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

General information



Totally enclosed slip ring, wound rotor three-phase asynchronous motors.

Power from 7.5 to 300 kW for the frame sizes taking values from 160 to 355 mm.
Voltage: 230 V Δ / 400 V Y, 50 Hz (other voltages and frequencies on request).
Insulation class F, overheating B.
Standard version IP 55.

Performances

Thanks to the insertion of an appropriate rheostat in the rotor circuit, the slip ring, wound rotor motor offers the following possibilities:

- adapting the motor torque to that of the driven machine;
- tolerant of long starts;
- limits the starting current;
- sets the speed of rotation with the aid of a permanent slip rheostat (consult our technical department for this application).

Starting

The slip ring, wound rotor motor does not depend on the stator being connected in order

to start. A rheostat is used in order to start a motor.

Leroy-Somer recommends the liquid resistance rheostat known as the Polystart electrolytic starter.

This type of starter inserts a resistance into the rotor circuit, which gradually reduces until it disappears completely by a short-circuit at the end of the starting period.

The technical description «Transient operation - Starters».

Caution, the Polystart is not suitable for hoisting applications.

Use conditions

In the selection grids the following values are indicated:

- for a general use in service S3 (series FLSB);
- for a hoisting and handling S4/S5 (series FLSLB).



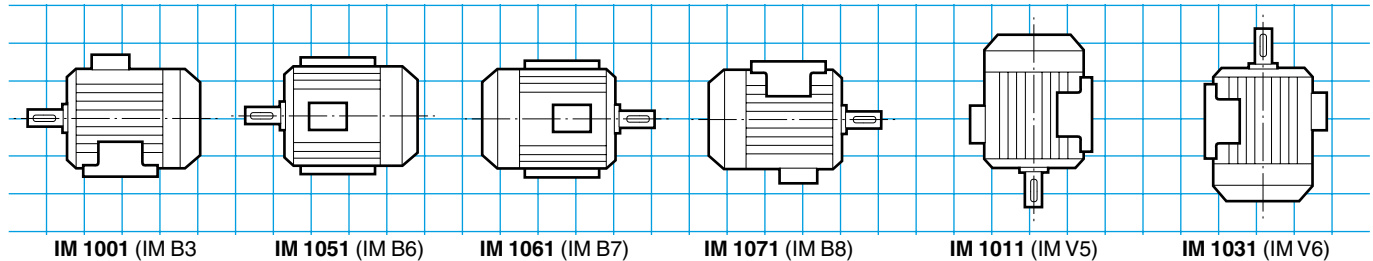
Description of the FLSB-FLSLB slip ring three-phase motors

Component	Materials	Remarks
Finned housing	Cast iron	- with cast foot, or without foot <ul style="list-style-type: none"> • 4, 6 or 8 mounting holes for the foot casing • lifting rings - earth terminal on foot or blade
Stator		- insulation system class F - impregnation under vacuum and pressure with polyester varnish
Wound rotor		- winding enamel covered wire, shrunk fibreglass on steel ring - dynamically balanced rotor, class A - 1/2 key
Shaft	Steel	- tapped centre hole - open key
Commutator	Bronze	- located in the opposite to the shaft end - 3 helically fluted bronze bushes for easy removal of carbon dust
Brushes	Selected according to the rotor and environmental characteristics	- inserted into double brush holders - access possible at the back part of the motor via an inspection door up to type 250, and via two inspection doors on larger motor sizes
End shields	Cast iron	- bearings fitted with drain holes for removing old grease
Bearings and lubrication		- regreasable bearings on the whole range
Labyrinth seals Lipseals	Steel or synthetic rubber	- front and rear lipseal for frame sizes from 160 to 200 included - front and rear decompression grooves from 225 to 250 - front and rear labyrinth seals for frame sizes \geq 280
Fan	Composite material up to 200 included, metal thereafter	- 2 directions of rotation: straight blades
Fan cover	Hardened pressed steel up to 250 inclusive, in cast iron thereafter	- on request, fitted with a drip cover for operation in vertical position, shaft facing down
Stator terminal box	Cast iron	- IP 55 - fitted with a 6 or 9 terminals board - from 160 to 355, closing plate fitted with brass cable glands - 1 earth terminal in all terminal boxes
Rotor terminal box	Cast iron from 280 only	Connection to slip ring provided: - for types 160: directly on a commutator bearing via a supplied cable gland (1 PG 21 brass) - for types 180 to 200: directly on a commutator bearing via a supplied cable gland (1 PG 29 brass) - for types 225 to 250: directly on the brush holders via a supplied cable gland (1 CM 30 L) - for types 280 to 355: in an additional terminal box located on the rear bearing housing

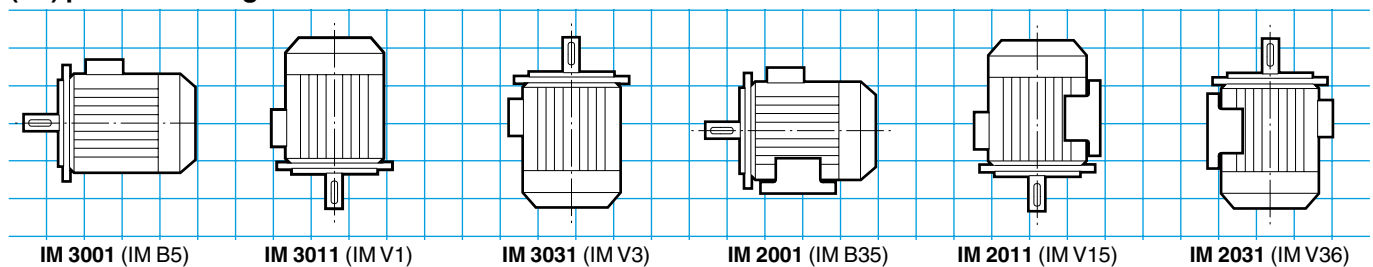
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Mounting positions

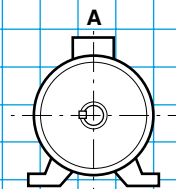
Foot mounted motors



(FF) plain hole flange mounted motors

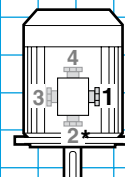


Terminal box position in relation to the motor shaft end



A : standard

Cable gland position in relation to the motor shaft end



1 : standard

* Position 2 not recommended and not feasible
on plain hole standard flange motor (FF)

Construction forms and possible positions according to the types

Code I	IM B3	IM B5	IM B6	IM B7	IM B8	IM B35	IM V1	IM V3	IM V5	IM V6	IM V15	IM V36
Code II	IM 1001	IM 3001	IM 1051	IM 1061	IM 1071	IM 2001	IM 3011	IM 3031	IM 1011	IM 1031	IM 2011	IM 2031
Frame size												
160	●	●	●	●	●	●	●	●	●	●	●	●
180	●	●	●	●	●	●	●	●	●	●	●	●
200	●	●	●	●	●	●	●	●	●	●	●	●
225	●	□	○	○	○	●	●	●	○	○	○	○
250	●	□	○	○	○	●	●	●	○	○	○	○
280	●	□	○	○	○	●	●	●	○	○	○	○
315	●	□	○	○	○	●	●	○	○	○	○	○
355	●	□	○	○	○	●	●	○	○	○	○	○

● : Possible positions

□ : Non possible positions

○ : Consult us, specifying the connection method and the possible radial and axial loads

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Adaptation possibilities

Leroy-Somer offers, in association with the FLSB-FLSLB slip ring motors, many options described above in the chapter relating to the transient system.

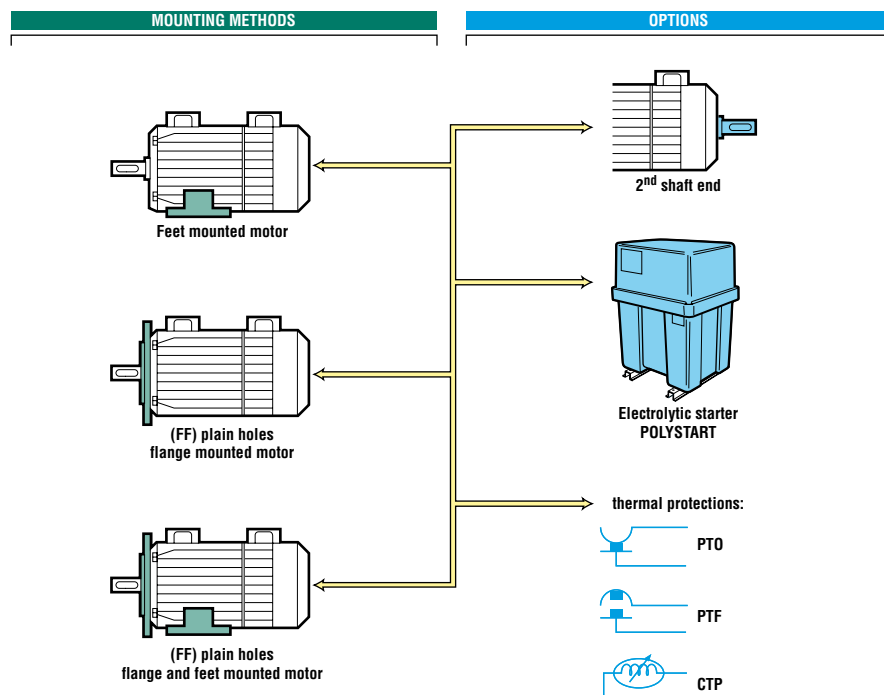
For other variants or all special adaptation, consult the technical specialists at Leroy-Somer.



The FLSB-FLSLB motors may be associated to the Polystart electrolytic starters.

The options:

- second shaft end
- thermal protections



Designation / Codification

4P 1500 min ⁻¹	FLSB	200	L	22 kW	IM 1001 (IM B3)	230 / 400 V	50 Hz	IP 55
Speed polarity	Motor type	IEC 60072 frame size	Housing designation and builder index	Rated power	IEC 60034-7 mounting position	Power supply voltage	Power supply frequency	IEC 60034-5 protection

Codification example:
Slip ring motor FLSB 1500 min⁻¹, 22 kW
IM 1001 (IM B3), 230/400 V

Designation	Code
4P FLSB 200 L 22 kW IM 1001 (IM B3) 230/400 V - 50 Hz	MA4 22 307

The table above is an example. It allows the creation of the designation for the required product. This designation corresponds to a product code. The product codes that are present in the selection grids can be used directly. They simplify the ordering process. The codification table is incorporated in the price list with the designations list.

FLSB slip ring totally enclosed three-phase asynchronous motors

Selection

General use U.G. - S3 duty - 6 starts/hour - Run factor 100 %
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

4
poles
1500 min⁻¹

Type	Rated power at 50 Hz P_N kW	Rated speed N_N min ⁻¹	Maxi. torque / Rated torque M_M/M_N	Current under 400 V		Rotor voltage U_R V	Efficiency η 100 %	Power factor $\cos \varphi$	Inertia moment Rotor J kg.m ²	Weight IM B3 kg
				Stator	Rotor					
				I_N A	I_R A					
FLSB 160 M	7.5	1447	3.8	18	24	190	85.5	0.70	0.07	130
FLSB 160 L	11	1445	4	23	26	260	88	0.78	0.0875	155
FLSB 180 M	13	1454	3.2	27	30	260	85	0.82	0.1625	208
FLSB 180 L	15	1450	3.2	29	30	305	89	0.84	0.1875	220
FLSB 200 L	18.5	1455	3.2	36	30	368	89	0.83	0.325	254
FLSB 200 L	22	1465	3.2	43	30	442	90	0.82	0.375	270
FLSB 225 M	30	1460	3.5	65	61	300	91	0.73	0.4575	313
FLSB 250 M	37	1485	3.5	73	64	345	91	0.80	0.675	403
FLSB 250 M	45	1464	3.5	92	70	390	94.3	0.75	0.75	437
FLSB 280 S	55	1468	4.4	109	82	410	91.2	0.80	1.4	850
FLSB 280 M	75	1475	3.7	140	91	500	90	0.86	1.675	900
FLSB 315 S	90	1470	3.4	171	106	516	91.6	0.83	2.275	1120
FLSB 315 M	110	1480	5	213	106	632	92.2	0.81	2.8	1220
FLSB 315 L	132	1480	5	241	110	726	93.1	0.85	3.2	1270
FLSB 355 L	160	1480	3.7	295	188	505	93.2	0.84	6.25	1550
FLSB 355 L	220	1478	4	375	201	630	93	0.91	7.875	1680
FLSB 355 L	250	1480	4	451	294	490	93	0.86	9.4	1830
FLSB 355 L	300	1480	4	518	314	560	95	0.88	9.4	1830

FLSB slip ring totally enclosed three-phase asynchronous motors

Selection

General use U.G. - S3 duty - 6 starts/hour - Run factor 100 %
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

4
poles
1500 min⁻¹

A

Type	Rated power at 50 Hz P_N kW	IM 1001 (IM B3)	
		Code	Qty
FLSB 160 M	7.5		-
FLSB 160 L	11		-
FLSB 180 M	13		-
FLSB 180 L	15		-
FLSB 200 L	18.5		-
FLSB 200 L	22	MA4 22 307	1
FLSB 225 M	30	MA4 30 307	1
FLSB 250 M	37	MA4 37 307	1
FLSB 250 M	45	MA4 45 307	1
FLSB 280 S	55	MA4 55 307	1
FLSB 280 M	75	MA4 75 307	1
FLSB 315 S	90	MA4 90 307	1
FLSB 315 M	110	MA4 10 420	1
FLSB 315 L	132	MA4 13 430	1
FLSB 355 L	160	MA4 16 440	1
FLSB 355 L	220	MA0 00 294	1
FLSB 355 L	250		-
FLSB 355 L	300		-

Selection example:

Speed:	1500 min ⁻¹ - 4 poles
Power:	75 kW
Mounting and position:	IM 1001 (IM B3)
Mains supply voltage:	230/400 V

Designation:

**4P FLSB 280 M 75 kW IM 1001 (IM B3)
400 V**

Code: MA4 75 307

FLSB slip ring totally enclosed three-phase asynchronous motors

Selection

General use U.G. - S3 duty - 6 starts/hour - Run factor 100 %
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

6
poles
1000 min⁻¹

Type	Rated power at 50 Hz P_N kW	Rated speed N_N min ⁻¹	Maxi. torque / Rated torque M_M/M_N	Current under 400 V		Rotor voltage U_R V	Efficiency η 100 %	Power factor $\cos \varphi$	Inertia moment Rotor J kg.m ²	Weight IM B3 kg
				Stator	Rotor					
				I_N A	I_R A					
FLSB 160 M	5.5	955	3.7	16	15.5	215	82.7	0.60	0.0875	130
FLSB 160 L	7.5	960	3.8	20	16	280	85	0.64	0.1125	155
FLSB 180 M	9	965	2.8	22	27	200	83.5	0.71	0.25	208
FLSB 180 L	11	966	2.8	26	28	235	85	0.72	0.2875	220
FLSB 200 L	13	955	2.8	33	33	240	85	0.67	0.375	254
FLSB 200 L	15	960	2.8	36	40	230	86	0.70	0.4375	270
FLSB 225 M	18.5	960	2.8	47	46	245	90	0.63	0.675	305
FLSB 225 M	22	965	3	56	49	270	90.2	0.63	0.75	313
FLSB 250 M	27	960	3.2	59	63	260	93	0.71	0.825	403
FLSB 250 M	34	978	3.2	76	71	290	93	0.69	0.95	437
FLSB 280 S	45	975	4.9	86	79	345	91	0.83	1.875	820
FLSB 280 M	55	980	5	105	77	435	92	0.82	2.325	890
FLSB 315 M	75	976	4	139	93	490	92.4	0.84	3.5	1120
FLSB 315 M	90	978	4	170	88	620	92	0.83	4.125	1220
FLSB 355 L	110	988	4.3	202	171	390	92.6	0.85	8.5	1550
FLSB 355 L	132	985	5.1	256	168	475	92	0.81	11.075	1660
FLSB 355 L	160	985	5	304	176	550	93.8	0.81	13.2	1750
FLSB 355 L	200	985	4	415	269	450	94	0.74	15.7	1830

FLSB slip ring totally enclosed three-phase asynchronous motors

Selection

General use U.G. - S3 duty - 6 starts/hour - Run factor 100 %
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

6
poles
1000 min⁻¹

A

Type	Rated power at 50 Hz	IM 1001 (IM B3)	
	P_N kW	Code	Qty
FLSB 160 M	5.5		-
FLSB 160 L	7.5		-
FLSB 180 M	9		-
FLSB 180 L	11		-
FLSB 200 L	13		-
FLSB 200 L	15		-
FLSB 225 M	18.5		-
FLSB 225 M	22		-
FLSB 250 M	27		-
FLSB 250 M	34		-
FLSB 280 S	45		-
FLSB 280 M	55		-
FLSB 315 M	75		-
FLSB 315 M	90		-
FLSB 355 L	110		-
FLSB 355 L	132		-
FLSB 355 L	160		-
FLSB 355 L	200		-

FLSB slip ring totally enclosed three-phase asynchronous motors

Selection

General use U.G. - S3 duty - 6 starts/hour - Run factor 100 %
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

8
poles
750 min⁻¹

Type	Rated power at 50 Hz P_N kW	Rated speed N_N min ⁻¹	Maxi. torque / Rated torque M_M/M_N	Current under 400 V		Rotor voltage U_R V	Efficiency η 100 %	Power factor $\cos \varphi$	Inertia moment Rotor J kg.m ²	Weight IM B3 kg	
				Stator							Rotor
				I_N A	I_R A						I_R A
FLSB 160 M	4	708	2.7	12	16.5	147	83	0.58	0.0875	130	
FLSB 160 L	5.5	708	2.7	17	17	194	82	0.57	0.1125	155	
FLSB 180 M	6.5	716	2.8	18	22	176	83.8	0.62	0.25	208	
FLSB 180 L	7.5	723	2.8	22	21.5	211	83.2	0.59	0.2875	220	
FLSB 200 L	9	728	2.8	23	23.5	232	83	0.68	0.4625	254	
FLSB 200 L	11	717	2.8	27	26	258	84	0.70	0.525	270	
FLSB 225 M	15	733	2.8	37	40	220	89.8	0.65	0.575	313	
FLSB 225 M	18.5	725	2.9	46	44	255	89.8	0.65	0.7	330	
FLSB 250 M	22	730	3.2	55	48.5	275	90.6	0.64	0.95	400	
FLSB 250 M	27	730	3.2	64	53	310	90.1	0.68	0.95	400	
FLSB 280 S	37	735	4.2	78	63	355	90	0.76	2.45	820	
FLSB 280 M	47	735	4.5	98	62	455	91	0.76	3	890	
FLSB 315 M	60	736	4	124	77	474	93	0.75	5.1	1120	
FLSB 315 M	75	738	4.3	147	77	589	93	0.79	6.25	1220	
FLSB 355 L	95	730	4.2	181	85	675	93.5	0.81	10.5	1550	
FLSB 355 L	120	732	3.8	244	161	440	92	0.77	12	1660	
FLSB 355 L	160	742	3.4	320	285	340	93.6	0.77	15	1970	

FLSB slip ring totally enclosed three-phase asynchronous motors

Selection

General use U.G. - S3 duty - 6 starts/hour - Run factor 100 %
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

8
poles
750 min⁻¹

A

Type	Rated power at 50 Hz	IM 1001 (IM B3)	
	P_N kW	Code	Qty
FLSB 160 M	4		-
FLSB 160 L	5.5		-
FLSB 180 M	6.5		-
FLSB 180 L	7.5		-
FLSB 200 L	9		-
FLSB 200 L	11		-
FLSB 225 M	15		-
FLSB 225 M	18.5		-
FLSB 250 M	22		-
FLSB 280 S	37		-
FLSB 280 M	47		-
FLSB 315 M	60		-
FLSB 315 M	75		-
FLSB 355 L	95		-
FLSB 355 L	120		-
FLSB 355 L	160		-

FLSB slip ring totally enclosed three-phase asynchronous motors

Selection

Hoisting and handling use - S4 or S5 duty
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

4
poles
1500 min⁻¹

Type	Run factor %	Class 150 (starts/h)			Class 300 (starts/h)			Class 600 (starts/h)			Rotor voltage U_R V	Inertia moment			Weight IM B3 kg
		Rated power at 50 Hz P_N kW	Current under 400 V		Rated power at 50 Hz P_N kW	Current under 400 V		Rated power at 50 Hz P_N kW	Current under 400 V			Rotor	Driven	Total	
			Stator I_N A	Rotor I_R A		Stator I_N A	Rotor I_R A		Stator I_N A	Rotor I_R A					
FLSLB 160 M	25	9.5	23	30	-	-	-	-	-	-	190	0.07	0.2425	0.3125	130
	40	8.5	20	27	7.5	18	24	-	-	-					
	60	7.5	18	24	6.5	18	21	6	17	19					
FLSLB 160 L	25	14	29	33	-	-	-	-	-	-	260	0.0875	0.35	0.4375	155
	40	12.5	26	29	10.5	24	24	-	-	-					
	60	11	23	26	9.5	23	22	7.5	18	17					
FLSLB 180 M	25	17	35	40	-	-	-	-	-	-	260	0.1625	0.3625	0.525	208
	40	15	31	35	12.5	30	29	-	-	-					
	60	13	27	30	11	26	26	8.5	21	20					
FLSLB 180 L	25	19	37	38	-	-	-	-	-	-	305	0.1875	0.4125	0.6	220
	40	17	33	34	14.5	33	29	-	-	-					
	60	15	29	30	13	29	26	10	23	20					
FLSLB 200 L	25	23	45	66	-	-	-	-	-	-	210	0.325	0.45	0.775	254
	40	21	41	61	18	41	52	-	-	-					
	60	18.5	36	53	16	36	46	12	27	35					
FLSLB 200 L	25	27	53	64	-	-	-	-	-	-	255	0.375	0.5	0.875	270
	40	25	49	59	21	48	50	-	-	-					
	60	22	43	52	19	43	45	14.5	33	34					
FLSLB 225 M	25	37	80	132	-	-	-	-	-	-	170	0.4575	0.7925	1.25	313
	40	33	71.5	118	28	71	100	-	-	-					
	60	30	65	107	25	63	89	19	48	68					
FLSLB 250 M	25	46	91	139	-	-	-	-	-	-	200	0.675	0.975	1.65	403
	40	41	81	124	35	81	106	-	-	-					
	60	37	73	112	31	71	94	24	55	73					
FLSLB 250 M	25	56	115	151	-	-	-	-	-	-	225	0.75	1.15	1.9	437
	40	50	102	135	42	100	113	-	-	-					
	60	45	92	121	38	91	102	29	69	78					
FLSLB 280 S	25	70	139	181	-	-	-	-	-	-	235	1.4	1.1	2.5	850
	40	60	119	155	54	125	139	-	-	-					
	60	55	109	142	48	111	124	39	90	101					
FLSLB 280 M	25	94	175	196	-	-	-	-	-	-	290	1.675	1.45	3.125	900
	40	85	159	178	74	138	155	-	-	-					
	60	75	140	157	68	148	142	51	111	107					
FLSLB 315 S	25	112	213	223	-	-	-	-	-	-	305	2.275	1.475	3.75	1120
	40	100	190	199	86	191	172	-	-	-					
	60	90	171	179	78	173	155	59	131	117					
FLSLB 315 M	25	137	265	231	-	-	-	-	-	-	360	2.8	1.7	4.5	1220
	40	122	236	205	103	233	173	-	-	-					
	60	110	213	185	94	212	158	70	158	118					
FLSLB 315 L	25	166	303	237	-	-	-	-	-	-	425	3.2	2.25	5.45	1270
	40	143	261	204	124	264	177	-	-	-					
	60	132	241	188	115	245	164	87	185	124					
FLSLB 355 L	25	202	372	242	-	-	-	-	-	-	505	6.25	0.45	6.7	1550
	40	174	321	209	150	323	180	-	-	-					
	60	160	295	192	139	299	167	105	226	126					
FLSLB 355 L	25	277	472	267	-	-	-	-	-	-	630	7.875	1.375	9.25	1680
	40	239	407	230	207	412	199	-	-	-					
	60	220	375	212	191	380	184	145	288	140					
FLSLB 355 L	25	-	-	-	-	-	-	-	-	-	490	9.4	1.45	10.85	1830
	40	270	487	334	-	-	-	-	-	-					
	60	250	451	309	216	455	267	-	-	-					
FLSLB 355 L	25	-	-	-	-	-	-	-	-	-	560	9.4	1.6	11	1830
	40	325	561	352	-	-	-	-	-	-					
	60	300	518	325	260	524	281	-	-	-					

FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

Selection

4
poles
1500 min⁻¹

Hoisting and handling use - S4 or S5 duty
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

A

Type	Run factor	Rated power at 50 Hz	IM 1001 (IM B3)	
	%	P_N kW	Code	Qty
FLSLB 160 M	25	9.5		-
	40	8.5		-
	60	7.5		-
FLSLB 160 L	25	14		-
	40	12.5		-
	60	11		-
FLSLB 180 M	25	17		-
	40	15		-
	60	13		-
FLSLB 180 L	25	19		-
	40	17		-
	60	15		-
FLSLB 200 L	25	23		-
	40	21		-
	60	18.5		-
FLSLB 200 L	25	27		-
	40	25		-
	60	22		-
FLSLB 225 M	25	37		-
	40	33		-
	60	30		-
FLSLB 250 M	25	46		-
	40	41		-
	60	37		-
FLSLB 250 M	25	56		-
	40	50		-
	60	45		-
FLSLB 280 S	25	70		-
	40	60		-
	60	55		-
FLSLB 280 M	25	94		-
	40	85		-
	60	75		-
FLSLB 315 S	25	112		-
	40	100		-
	60	90		-
FLSLB 315 M	25	137		-
	40	122		-
	60	110		-
FLSLB 315 L	25	166		-
	40	143		-
	60	132		-
FLSLB 355 L	25	202		-
	40	174		-
	60	160		-
FLSLB 355 L	25	277		-
	40	239		-
	60	220		-
FLSLB 355 L	25	-		-
	40	270		-
	60	250		-
FLSLB 355 L	25	-		-
	40	325		-
	60	300		-

FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

Selection

Hoisting and handling use - S4 or S5 duty
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

6
poles
1000 min⁻¹

Type	Run factor %	Class 150 (starts/h)			Class 300 (starts/h)			Class 600 (starts/h)			Rotor voltage U_R V	Inertia moment			Weight IM B3 kg
		Rated power at 50 Hz P_N kW	Current under 400 V		Rated power at 50 Hz P_N kW	Current under 400 V		Rated power at 50 Hz P_N kW	Current under 400 V			Rotor	Rotor	Total	
			Stator I_N A	Rotor I_R A		Stator I_N A	Rotor I_R A		Stator I_N A	Rotor I_R A					
FLSLB 160 M	25	7	20	20	-	-	-	-	-	-	215	0.0875	0.4625	0.55	130
	40	6	17	17	5.5	16	16	-	-	-					
	60	5.5	16	16	5	17	14	4	14	11					
FLSLB 160 L	25	9.5	25	21	-	-	-	-	-	-	280	0.1125	0.6375	0.75	155
	40	8.5	23	18	7	19	15	-	-	-					
	60	7.5	20	16	6.5	20	14	5.5	17	12					
FLSLB 180 M	25	11	27	33	-	-	-	-	-	-	200	0.25	0.65	0.9	208
	40	10	24	30	8.5	24	26	-	-	-					
	60	9	22	27	7.5	21	23	6.5	19	20					
FLSLB 180 L	25	14	33	36	-	-	-	-	-	-	235	0.2875	0.8125	1.1	220
	40	12.5	30	32	10.5	29	27	-	-	-					
	60	11	26	28	9.5	26	25	7.5	21	19					
FLSLB 200 L	25	17	43	44	-	-	-	-	-	-	235	0.375	0.925	1.3	254
	40	15	38	39	12	36	31	-	-	-					
	60	13	33	34	11	33	28	8.5	25	22					
FLSLB 200 L	25	19	46	50	-	-	-	-	-	-	230	0.4375	1.0875	1.525	270
	40	17	41	45	14	39	37	-	-	-					
	60	15	36	40	13	36	34	10	28	26					
FLSLB 225 M	25	23	58	57	-	-	-	-	-	-	245	0.675	1.3	1.975	305
	40	21	53	52	18	53	45	-	-	-					
	60	18.5	47	46	16	47	40	12.5	37	31					
FLSLB 225 M	25	28	71	63	-	-	-	-	-	-	270	0.75	1.5	2.25	313
	40	25	63	56	21	62	47	-	-	-					
	60	22	56	49	19	56	43	15	45	34					
FLSLB 250 M	25	34	74	137	-	-	-	-	-	-	150	0.825	2.075	2.9	403
	40	30	66	121	26	66	105	-	-	-					
	60	27	59	109	23	59	93	18	46	73					
FLSLB 250 M	25	43	96	153	-	-	-	-	-	-	170	0.95	2.55	3.5	437
	40	38	85	136	32	83	114	-	-	-					
	60	34	76	121	29	65	103	23	60	82					
FLSLB 280 S	25	57	109	173	-	-	-	-	-	-	200	1.875	2.75	4.625	820
	40	50	96	152	43	86	130	-	-	-					
	60	45	86	136	38	85	115	30	67	91					
FLSLB 280 M	25	70	134	170	-	-	-	-	-	-	250	2.325	3.175	5.5	890
	40	62	118	150	52	116	126	-	-	-					
	60	55	105	133	47	105	114	37	82	90					
FLSLB 315 M	25	95	176	206	-	-	-	-	-	-	280	3.5	4.325	7.825	1120
	40	84	156	182	72	156	156	-	-	-					
	60	75	139	162	64	138	139	50	108	108					
FLSLB 315 M	25	113	213	208	-	-	-	-	-	-	330	4.125	5.125	9.25	1220
	40	100	189	184	85	187	156	-	-	-					
	60	90	170	165	77	170	141	60	132	110					
FLSLB 355 L	25	138	253	215	-	-	-	-	-	-	390	8.5	3	11.5	1550
	40	122	224	190	105	225	164	-	-	-					
	60	110	202	171	94	201	146	72	154	112					
FLSLB 355 L	25	165	320	211	-	-	-	-	-	-	475	11.075	2.675	13.75	1660
	40	147	285	188	125	283	160	-	-	-					
	60	132	256	169	112	253	143	87	197	111					
FLSLB 355 L	25	200	380	219	-	-	-	-	-	-	555	13.2	2.9	16.1	1750
	40	178	338	195	155	344	169	-	-	-					
	60	160	304	175	140	310	153	106	235	116					
FLSLB 355 L	25	-	-	-	-	-	-	-	-	-	450	15.7	3.3	19	1830
	40	220	457	296	-	-	-	-	-	-					
	60	200	415	269	175	365	236	-	-	-					

FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

Selection

6
poles
1000 min⁻¹

Hoisting and handling use - S4 or S5 duty
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

A

Type	Run factor	Rated power at 50 Hz	IM 1001 (IM B3)	
	%	P_N kW	Code	Qty
FLSLB 160 M	25	7		-
	40	6		-
	60	5.5		-
FLSLB 160 L	25	9.5		-
	40	8.5		-
	60	7.5		-
FLSLB 180 M	25	11		-
	40	10		-
	60	9		-
FLSLB 180 L	25	14		-
	40	12.5		-
	60	11		-
FLSLB 200 L	25	17		-
	40	15		-
	60	13		-
FLSLB 200 L	25	19		-
	40	17		-
	60	15		-
FLSLB 225 M	25	23		-
	40	21		-
	60	18.5		-
FLSLB 225 M	25	28		-
	40	25		-
	60	22		-
FLSLB 250 M	25	34		-
	40	30		-
	60	27		-
FLSLB 250 M	25	43		-
	40	38		-
	60	34		-
FLSLB 250 M	25	57		-
	40	50		-
	60	45		-
FLSLB 280 M	25	70		-
	40	62		-
	60	55		-
FLSLB 315 M	25	95		-
	40	84		-
	60	75		-
FLSLB 315 M	25	113		-
	40	100		-
	60	90		-
FLSLB 355 L	25	138		-
	40	122		-
	60	110		-
FLSLB 355 L	25	165		-
	40	147		-
	60	132		-
FLSLB 355 L	25	200		-
	40	178		-
	60	160		-
FLSLB 355 L	25	-		-
	40	220		-
	60	200		-

FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

Selection

Hoisting and handling use - S4 or S5 duty
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

8
poles
750 min⁻¹

Type	Run factor %	Class 150 (starts/h)			Class 300 (starts/h)			Class 600 (starts/h)			Rotor voltage U_R V	Inertia moment			Weight IM B3 kg
		Rated power at 50 Hz P_N kW	Current under 400 V		Rated power at 50 Hz P_N kW	Current under 400 V		Rated power at 50 Hz P_N kW	Current under 400 V			Rotor	Driven	Total	
			Stator I_N A	Rotor I_R A		Stator I_N A	Rotor I_R A		Stator I_N A	Rotor I_R A					
FLSLB 160 M	25	5	15	21	-	-	-	-	-	-	145	0.0875	0.725	0.8125	130
	40	4.5	14	19	4	12	17	-	-	-					
	60	4	12	17	3.5	12	15	3	10.5	13					
FLSLB 160 L	25	7.5	23	23	-	-	-	-	-	-	195	0.1125	1.0125	1.125	155
	40	6.5	20	20	5.5	17	17	-	-	-					
	60	5.5	17	17	5	18	16	4	14	12					
FLSLB 180 M	25	8.5	24	29	-	-	-	-	-	-	175	0.25	1.075	1.325	208
	40	7.5	21	26	6.1	20	21	-	-	-					
	60	6.5	18	23	5.5	18	19	4.3	14	15					
FLSLB 180 L	25	9.5	28	27	-	-	-	-	-	-	210	0.2875	1.2625	1.55	220
	40	8.5	25	25	7	24	20	-	-	-					
	60	7.5	22	22	6.5	22	19	5	20	14					
FLSLB 200 L	25	12	31	32	-	-	-	-	-	-	230	0.4625	1.4125	1.875	254
	40	10	26	26	8.5	25	22	-	-	-					
	60	9	23	24	7.5	22	20	6.5	19	17					
FLSLB 200 L	25	14	34	33	-	-	-	-	-	-	260	0.525	1.8	2.325	270
	40	12	29	28	10.5	30	24	-	-	-					
	60	11	27	26	9.5	27	22	7.5	21	17					
FLSLB 225 M	25	18.5	46	51	-	-	-	-	-	-	220	0.575	2.625	3.2	313
	40	16.5	41	45	14.5	42	40	-	-	-					
	60	15	37	41	13	37	36	10	29	28					
FLSLB 225 M	25	23	57	55	-	-	-	-	-	-	255	0.7	3.15	3.85	330
	40	20	50	48	17.5	51	42	-	-	-					
	60	18.5	46	44	16	46	38	12.5	36	30					
FLSLB 250 M	25	28	66	106	-	-	-	-	-	-	160	0.95	3.65	4.6	400
	40	24	59	91	21	47	80	-	-	-					
	60	22	50	83	19	43	72	15	44	57					
FLSLB 250 M	25	34	79	115	-	-	-	-	-	-	180	1.125	4.5	5.625	435
	40	30	69	101	26	63	88	-	-	-					
	60	27	62	91	24	58	81	18	50	61					
FLSLB 280 S	25	47	104	139	-	-	-	-	-	-	205	2.45	5.05	7.5	820
	40	41	91	121	35	86	104	-	-	-					
	60	37	82	109	32	79	95	25	61	74					
FLSLB 280 M	25	60	124	137	-	-	-	-	-	-	265	3	6.5	9.5	890
	40	52	107	119	45	108	103	-	-	-					
	60	47	97	108	41	99	94	32	77	73					
FLSLB 315 M	25	75	155	165	-	-	-	-	-	-	275	5.1	7.15	12.25	1120
	40	66	136	145	57	137	126	-	-	-					
	60	60	124	132	52	125	115	40	96	88					
FLSLB 315 M	25	95	186	172	-	-	-	-	-	-	335	6.25	8.75	15	1220
	40	83	163	150	72	150	130	-	-	-					
	60	75	147	136	65	149	118	50	114	90					
FLSLB 355 L	25	120	229	187	-	-	-	-	-	-	390	10.5	9	19.5	1550
	40	105	200	163	90	200	140	-	-	-					
	60	95	181	148	82	182	127	65	144	101					
FLSLB 355 L	25	150	305	207	-	-	-	-	-	-	440	12	11.75	23.75	1660
	40	132	268	182	115	273	158	-	-	-					
	60	120	244	165	105	249	145	80	190	110					

FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

Selection

8
poles
750 min⁻¹

Hoisting and handling use - S4 or S5 duty
IP 55 - 50 Hz - Class F - 230 V Δ / 400 V Y

A

Type	Run factor	Rated power at 50 Hz	IM 1001 (IM B3)	
	%	P_N kW	Code	Qty
FLSLB 160 M	25	5		-
	40	4.5		-
	60	4		-
FLSLB 160 L	25	7.5		-
	40	6.5		-
	60	5.5		-
FLSLB 180 M	25	8.5		-
	40	7.5		-
	60	6.5		-
FLSLB 180 L	25	9.5		-
	40	8.5		-
	60	7.5		-
FLSLB 200 L	25	12		-
	40	10		-
	60	9		-
FLSLB 200 L	25	14		-
	40	12		-
	60	11		-
FLSLB 225 M	25	18.5		-
	40	16.5		-
	60	15		-
FLSLB 225 M	25	23		-
	40	20		-
	60	18.5		-
FLSLB 250 M	25	28		-
	40	24		-
	60	22		-
FLSLB 250 M	25	34		-
	40	30		-
	60	27		-
FLSLB 280 S	25	47		-
	40	41		-
	60	37		-
FLSLB 280 M	25	60		-
	40	52		-
	60	47		-
FLSLB 315 M	25	75		-
	40	66		-
	60	60		-
FLSLB 315 M	25	95		-
	40	83		-
	60	75		-
FLSLB 355 L	25	120		-
	40	105		-
	60	95		-
FLSLB 355 L	25	150		-
	40	132		-
	60	120		-

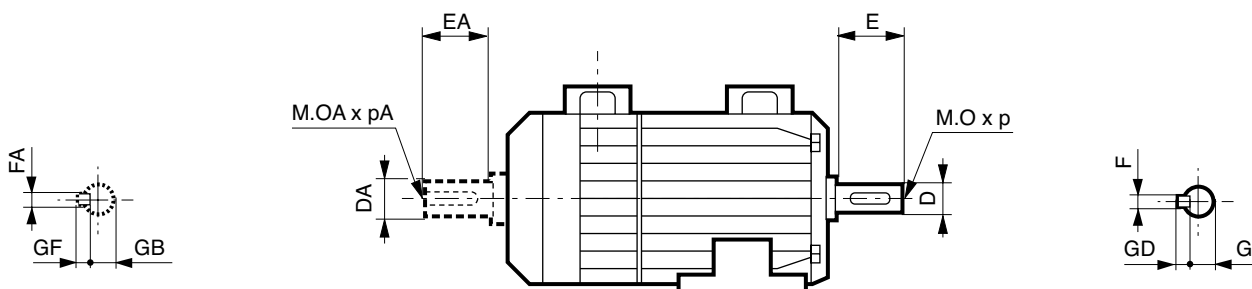
FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSB-FLSLB totally enclosed three-phase asynchronous motors - IP 55
Slip ring -wound rotor

Dimensions in millimetres

- shaft end



Type	Shaft ends						
	4 and more poles						
	F	GD	D	G	E	O	p
	FA	GF	DA	GB	EA	OA	pA
FLSB-FLSLB 160 M/L	12	8	42 k6	37	110 h13	16	40
FLSB-FLSLB 180 M/L	14	9	48 k6	42.5	110 h13	16	40
FLSB-FLSLB 200 L	16	10	55 m6	49	110 h13	20	42
FLSB-FLSLB 225 S/M	18	11	60 m6	53	140 h13	20	42
FLSB-FLSLB 250 M	18	11	65 m6	58	140 h13	20	42
FLSB-FLSLB 280 S/M	20	12	75 m6	67.5	140 h13	20	42
FLSB-FLSLB 315 S/M	22	14	80 m6	71	170 h13	20	42
FLSB-FLSLB 315 L	25	14	90 m6	81	170 h13	24	50
FLSB-FLSLB 355 L	28	16	100 m6	90	210 h13	24	50

IMPORTANT NOTE: in standard, the hoisting type motors (FLSLB) have a mechanical conception identical to the general use type motors. Conformity to the standard NF C 51-157.

Type	Shaft ends option						
	4 and more poles						
	F	GD	D	G	E	O	p
	FA	GF	DA	GB	EA	OA	pA
FLSLB 250 M	20	12	70 m6	62.5	140 h13	20	42
FLSLB 280 S/M	22	14	80 m6	71	140 h13	20	42
FLSLB 315 S/M	25	14	90 m6	81	170 h13	24	50

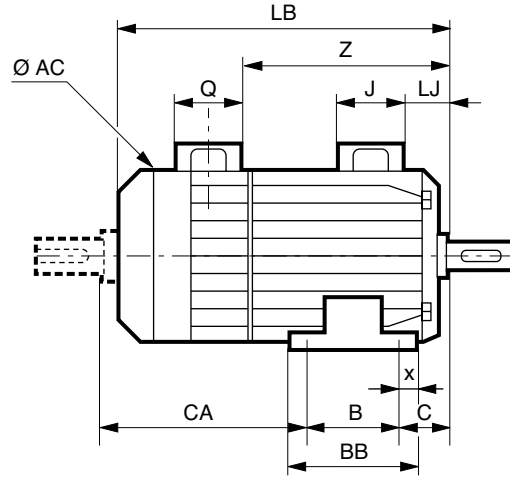
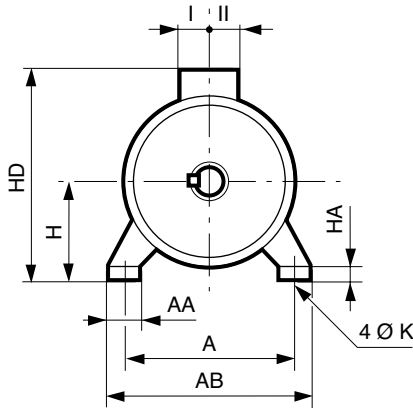
FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSB-FLSLB totally enclosed three-phase asynchronous motors - IP 55 Slip ring - wound rotor

Dimensions in millimetres

– foot mounted



Main dimensions

Type	A	AB	B	BB	C	x	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	Z	Q	CA
FLSB-FLSLB 160 M	254	328	210	248	108	20	79	14	24	160	316	418	613	111	148	79	90	-	-	301
FLSB-FLSLB 160 L	254	328	254	292	108	20	79	14	24	160	316	418	657	111	148	79	90	-	-	301
FLSB-FLSLB 180 M	279	331	241	319	121	20	60	14	20	180	352	472	693	74	222	115	155	-	-	336
FLSB-FLSLB 180 L	279	331	279	319	121	20	60	14	20	180	352	472	693	74	222	115	155	-	-	298
FLSB-FLSLB 200 L	318	370	305	355	133	25	66	18	20	200	392	509	746	77	222	115	155	-	-	312
FLSB-FLSLB 225 M	356	426	311	375	149	32	80	18	27	225	540	659	930	70	352	173	210	-	-	480
FLSB-FLSLB 250 M	406	476	349	413	168	32	80	22	27	250	540	681	1010	70	352	173	210	-	-	503
FLSB-FLSLB 280 S	457	537	368	499	190	40	80	22	40	280	556	730	1280	68	352	173	210	787	230	725
FLSB-FLSLB 280 M	457	537	419	499	190	40	80	22	40	280	556	730	1280	68	352	173	210	787	230	674
FLSB-FLSLB 315 S	508	600	406	598	216	45	100	27	40	315	624	833	1420	68	352	173	210	878	230	804
FLSB-FLSLB 315 M	508	600	457	598	216	45	100	27	40	315	624	835	1420	70	452	217	269	878	230	753
FLSB-FLSLB 315 L	508	600	508	598	216	45	100	27	40	315	624	835	1420	70	452	217	269	878	230	702
FLSB-FLSLB 355 L	610	710	630	710	254	40	110	27	35	355	700	910	1560	61	452	217	269	1093	230	678
FLSB-FLSLB 355 L'	610	710	630	710	254	40	110	27	35	355	700	910	1685	61	452	217	269	1218	230	803

1. 4 poles motors from 250 kW at catalogue rotor voltages and 6 and 8 poles from 160 kW at catalogue rotor voltages.

Tolerance on frame size: 0/-0.5 for motors 160 to 250

Tolerance on frame size: 0/-1 for motors 280 to 355

Tolerance on dimensions B - A: js14

Tolerance on dimension C: js16

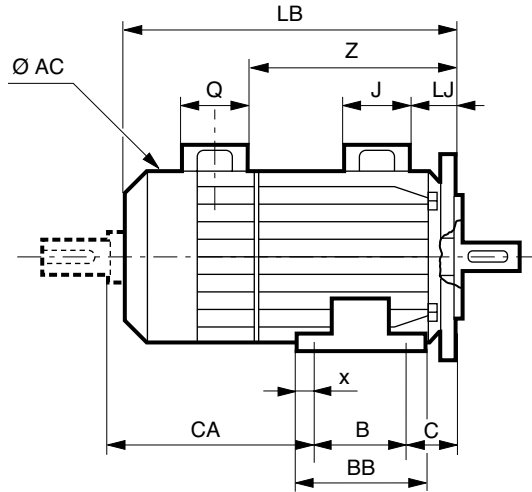
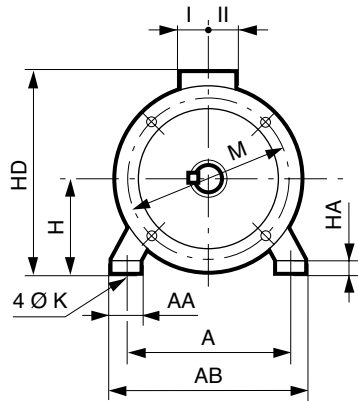
FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSB-FLSLB totally enclosed three-phase asynchronous motors - IP 55
Slip ring -wound rotor

Dimensions in millimetres

– (FF) foot and plain hole flange mounted



Type	Main dimensions																			IEC	
	A	AB	B	BB	C	x	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	Z	Q	CA	symb.
FLSB-FLSLB 160 M	254	328	210	248	108	20	79	14	24	160	316	418	613	111	148	79	90	-	-	301	FF 300
FLSB-FLSLB 160 L	254	328	254	292	108	20	79	14	24	160	316	418	657	111	148	79	90	-	-	301	FF 300
FLSB-FLSLB 180 M	279	331	241	319	121	20	60	14	20	180	352	472	693	74	222	115	155	-	-	336	FF 300
FLSB-FLSLB 180 L	279	331	279	319	121	20	60	14	20	180	352	472	693	74	222	115	155	-	-	298	FF 300
FLSB-FLSLB 200 L	318	370	305	355	133	25	66	18	20	200	392	509	746	77	222	115	155	-	-	312	FF 350
FLSB-FLSLB 225 M	356	426	311	375	149	32	80	18	27	225	540	659	930	70	352	173	210	-	-	480	FF 400
FLSB-FLSLB 250 M	406	476	349	413	168	32	80	22	27	250	540	681	1010	70	352	173	210	-	-	503	FF 500
FLSB-FLSLB 280 S	457	537	368	499	190	40	80	22	40	280	556	730	1280	68	352	173	210	787	230	725	FF 500
FLSB-FLSLB 280 M	457	537	419	499	190	40	80	22	40	280	556	730	1280	68	352	173	210	787	230	674	FF 500
FLSB-FLSLB 315 S	508	600	406	598	216	45	100	27	40	315	624	833	1420	68	352	173	210	878	230	804	FF 600
FLSB-FLSLB 315 M	508	600	457	598	216	45	100	27	40	315	624	835	1420	70	452	217	269	878	230	753	FF 600
FLSB-FLSLB 315 L	508	600	508	598	216	45	100	27	40	315	624	835	1420	70	452	217	269	878	230	702	FF 600
FLSB-FLSLB 355 L	610	710	630	710	254	40	110	27	35	355	700	910	1560	61	452	217	269	1093	230	678	FF 740
FLSB-FLSLB 355 L ¹	610	710	630	710	254	40	110	27	35	355	700	910	1685	61	452	217	269	1218	230	803	FF 740

1. 4 poles motors from 250 kW at catalogue rotor voltages and 6 and 8 poles from 160 kW at catalogue rotor voltages.

Tolerance on frame size: 0/-0.5 for motors 160 to 250

Tolerance on frame size: 0/-1 for motors 280 to 355

Tolerance on dimensions B - A: js14

Tolerance on dimension: js16

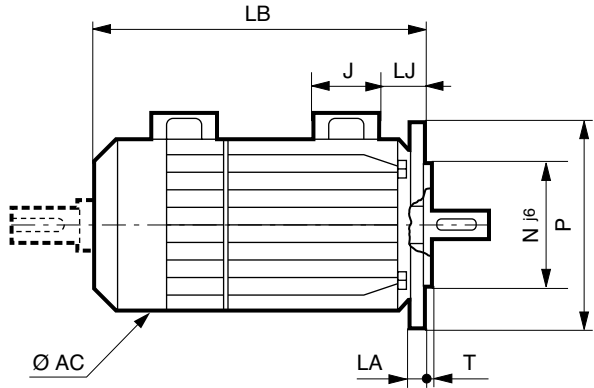
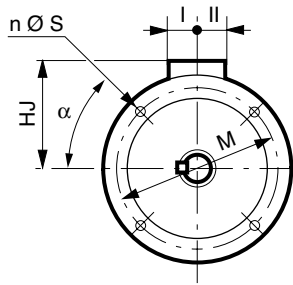
FLSB - FLSLB slip ring totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSB-FLSLB totally enclosed three-phase asynchronous motors - IP 55
Slip ring -wound rotor

Dimensions in millimetres

– (FF) plain hole flange mounted



IEC symbol	Cotes des brides							
	M	N	P	T	n	S	LA	α
FF 300	300	250	350	5	4	18	15	45°
FF 350	350	300	400	5	4	18	15	45°
FF 400	400	350	450	5	8	18	16	22°30'
FF 500	500	450	550	5	8	18	18	22°30'
FF 600	600	550	660	6	8	22	25	22°30'
FF 740	740	680	800	6	8	22	25	22°30'

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
FLSB-FLSLB 160 M	316	613	258	111	148	79	90
FLSB-FLSLB 160 L	316	657	258	111	148	79	90
FLSB-FLSLB 180 M	352	693	292	74	222	115	155
FLSB-FLSLB 180 L	352	693	292	74	222	115	155
FLSB-FLSLB 200 L	392	746	309	77	222	115	155
FLSB-FLSLB 225 M	540	930	434	70	352	173	210
FLSB-FLSLB 250 M	540	1010	431	70	352	173	210
FLSB-FLSLB 280 S	556	1280	450	68	352	173	210
FLSB-FLSLB 280 M	556	1280	450	68	352	173	210
FLSB-FLSLB 315 S	624	1420	518	68	352	173	210
FLSB-FLSLB 315 M	624	1420	520	70	452	217	269
FLSB-FLSLB 315 L	624	1420	520	70	452	217	269
FLSB-FLSLB 355 L	700	1560	555	61	452	217	269
FLSB-FLSLB 355 L'	700	1685	555	61	452	217	269

1. 4 poles motors from 250 kW at catalogue rotor voltages and 6 and 8 poles motors from 160 kW at catalogue rotor voltages.

Note: the mating surface of the flange is located on the same plane as the shoulder of the shaft:

Dimension R = 0 ± 1.1 for motor 160

Dimension R = 0 ± 1.25 for motors 180 to 250

Dimension R = 0 ± 1.45 for motors 280 to 355

The IM3001 (IM B5) mounting is not provided for the frame sizes from 225 M upwards.

Polystart LB electrolytic starters

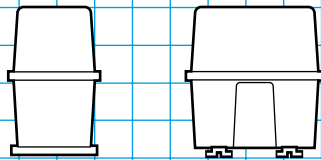
General information



The Polystart is a device allowing the starting of slip ring, wound rotor motors. The slip ring, wound rotor motor does not depend on the stator being connected in order to start. A rheostat is used in order to start a motor. Leroy-Somer recommends the liquid resistance rheostat known as the Polystart electrolytic starter.

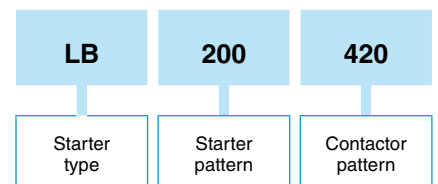
This type of starter inserts a resistance in the rotor circuit, the effect of which is gradually reduced until it disappears completely by a short-circuit at the end of the starting period.

Mounting position



The only possibility

Designation / Codification



The table above is an example. It allows the creation of the designation for the required product. This designation corresponds to a product code. The product codes that are present in the selection grids can be used directly. They simplify the ordering process.