

FLSES

totally enclosed three-phase asynchronous motors

General information



Classe de rendement IE2

Totally enclosed three-phase power saving asynchronous motors, cast iron casing FLSES series, according to IEC EN 60034, 60038, 60072; power 1.1 to 355 kW, frame size 80 to 355 mm.
Single speed: 2 and 4 poles: 230/400 V or 400 V Δ , 50 Hz.

Protection

IP 55 standard version providing a good sealing against projected liquid and dust in an industrial environment.

The selections tables for motors in this catalogue allows for:

- Direct on line starting on the mains supplies 230 V or 400 V operating in:
 - delta connection (Δ) at 230 V,
 - star connection (Y) at 400 V.
- Star/delta starting (Y/ Δ) on mains supply 400 V with:
 - star connection (Y) during initial start,
 - delta connection (Δ) in 400 V duty.

Finish

Assembled with screws protected against corrosion.
RAL 6000 finishing paint (green).
Protection of the shaft end and of the flange against the atmospheric corrosion.
Individual anti-shock packaging.

Mains supply

- Standard according to IEC 60038:
 - 230/400 V +10% -10% at 50 Hz.
 - Standard construction allowing the following power supply:
 - 220/380 V +5% -5% at 50 Hz,
 - 230/400 V +10% -10% at 50 Hz,
 - 240/415 V +5% -5% at 50 Hz,
 - 265/460 V +5% -5% at 60 Hz.
 - Voltagess for the powers equal or greater than 3 kW:
 - 380 V Δ +5% -5% at 50 Hz,
 - 400 V Δ +10% -10% at 50 Hz,
 - 415 V Δ +5% -5% at 50 Hz,
 - 460 V Δ +5% -5% at 60 Hz.
- Construction suitable for Y/ Δ start.

Description of the FLSES cast iron three-phase motors

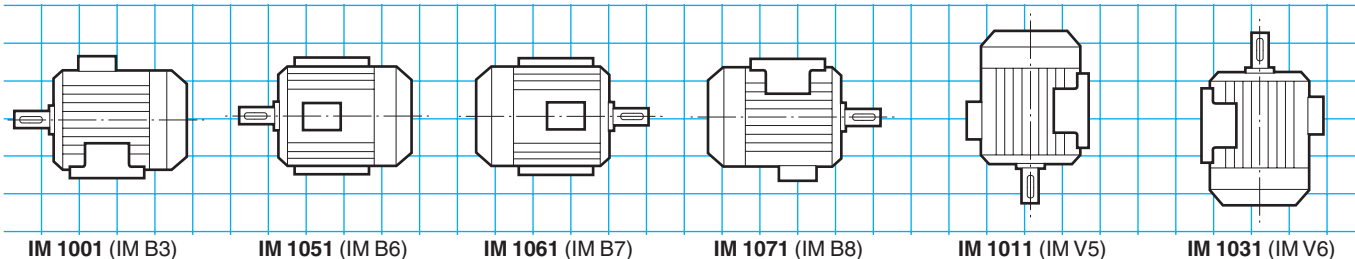
Component	Materials	Remarks
Finned housing	Cast iron	- with cast foot, or without foot <ul style="list-style-type: none"> • 4, 6 or 8 mounting holes for the foot casing • lifting rings for frame sizes ≥ 90 - earth terminal on foot or fin
Stator	Insulated low carbon magnetic steel laminations Enameled electrolytic copper	- the low carbon content guarantees the stability of the characteristics - assembled lamination pack - semi-enclosed slots - insulation system class F
Rotor	Insulated low carbon magnetic steel laminations Aluminium or copper	- inclined slots - squirrel cage pressure die cast in aluminium (or alloy for special applications) or mixed in copper - mounted on the shaft by heat shrinking, or keyed for mixed rotors - dynamically balanced rotor class A - 1/2 key
Shaft	Steel	- for frame size ≤ 132 : <ul style="list-style-type: none"> • shaft end fitted with screw and washer • closed keyway - for frame size ≥ 160 : <ul style="list-style-type: none"> • tapped centre hole • open key
End shields	Cast iron	
Bearings and lubrication		- ball bearings set C3 or C4 - ZZ types lubricated for life up to 132 - semi-protected or open types starting from 160, regreasable - preloaded rear bearings up to 315 S, preloaded front bearings from 315 M upwards
Labyrinth seals Lipseals	Technopolymer or steel, or cast iron or synthetic rubber	- front labyrinth seals for foot mounted motors with frame size ≤ 132 - front lipseal for flange and foot or flange mounted motors with frame sizes ≤ 132 - front and rear lipseal for frame sizes from 160 to 225 MT inclusive - decompression grooves for 225 M to 355 LD
Fan	Composite material up to 280 included, metal above and for frame size 250 to 280 - 4 poles	- 2 directions of rotation: straight blades
Fan cover	Steel sheet	- on request, fitted with a drip cover for operation in vertical position, shaft facing down
Terminal box	Cast iron body for all frame sizes Steel sheet metal cover from 80 to 132 frame size, cast iron thereafter	- IP 55 - fitted with a terminal block with 6 terminals up to 355 LD, 6 or 12 terminals thereafter - ISO plastic up to 132, terminal box fitted with cable gland - sizes 160 to 450, cable gland baseplate without drilled holes (optional horn or cable gland) - 1 earth terminal in each terminal box
Painting		- system IIa

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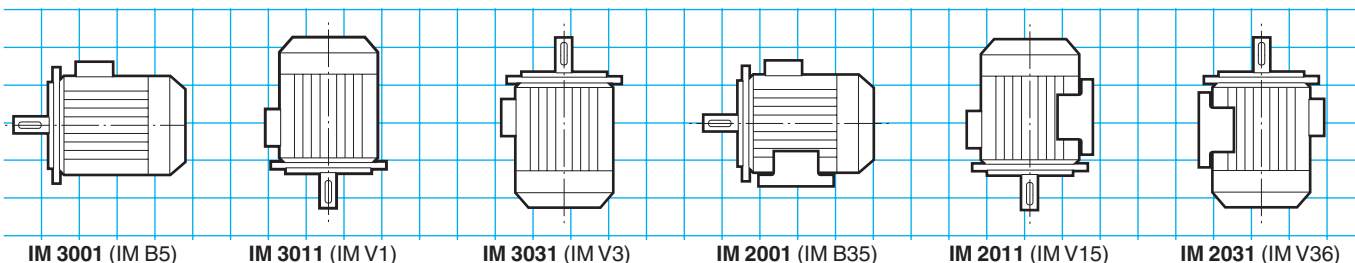
Mounting positions

Foot mounted motors



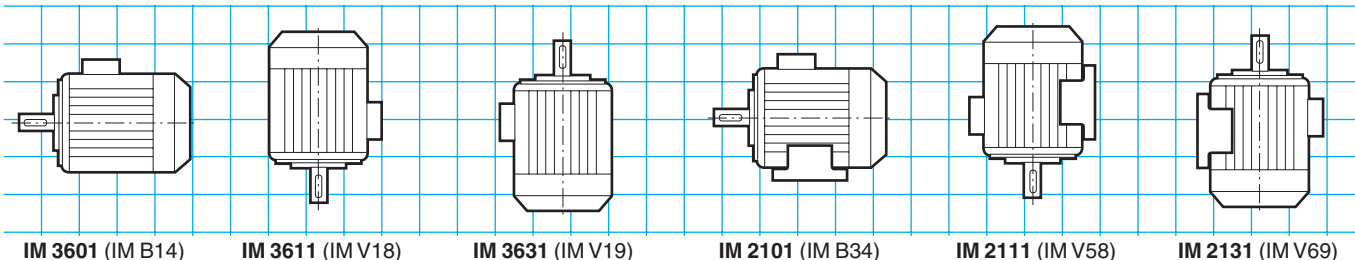
(FF) plain hole flange mounted motors

• Possible position IM 3001 (IM B5) up to 225 frame size inclusive

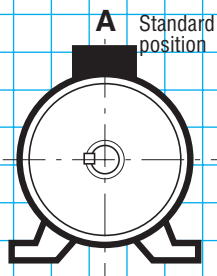


(FT) tapped hole flange mounted motors

• Possible positions up to 132 frame size inclusive

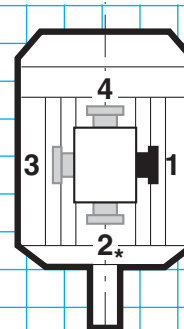


Terminal box position in relation to the motor shaft end



A : standard

Cable gland position in relation to the motor shaft end



1 : standard

* Position 2 not recommended and not feasible on standard flange mounted motor with plain holes (FF)

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Adaptation possibilities

Leroy-Somer offers, for use with the FLSES totally enclosed three-phase asynchronous motors, many options which meet the needs of highly diverse applications. They are described below and in the chapters relating to gearboxes and to speed variation. For other variants or any specific adaptation, consult the technical specialists Leroy-Somer.



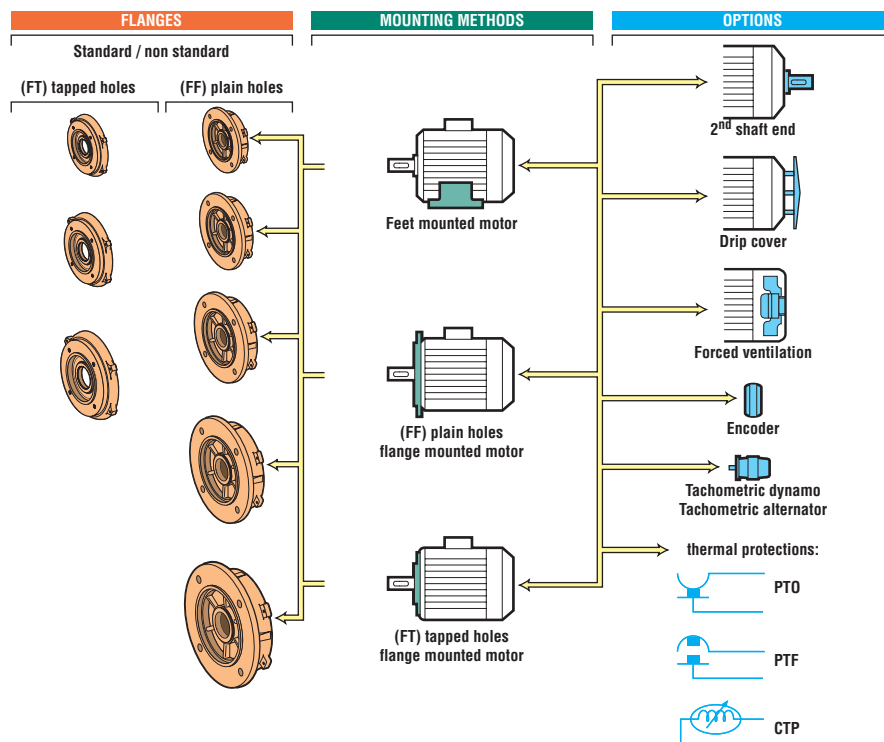
The FLSES three-phase motors may be associated to:

- gearboxes
- electronic variable speed drive (1)

The options:

- drip cover
- anti-blocking cover
- forced ventilation
- thermal protection
- brass cable glands
- cable glands of different dimensions
- switch
- cables output
- second shaft end
- non standard flanges
- anti-condensation heater
- aluminium fan

(1) Conforming to regulations for use indicated by the norm IEC 34-17.



Designation / Codification

4P 1500 min ⁻¹	FLSES	280	M	90 kW	IM 1001 (IM B3)	400 V Δ	50 Hz	IP 55
Speed polarity	Motor type	IEC 60072-1 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:

FLSES three-phase asynchronous motor, 1500 min⁻¹, 90 kW IM 1001 (IM B3), 400 V Δ

Designation	Code
4P FLSES 280 M 90 kW IM 1001 (IM B3) 400 V Δ	-

The table above is an example. It enables 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.

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Selection

IP 55 - 50 Hz - Class F - ΔT 80 K - 230 V Δ / 400 V Y - S1

2
poles
3000 min⁻¹

IE2

Type	Rated power	Rated speed	Rated torque	Rated current	Power factor			Efficiency* IEC 60034-2-1; 2007			Starting current/ Rated current	Starting torque/ Rated torque	Maximum torque/ Rated torque	Moment of inertia	Weight	Noise
	P _N	N _N	M _N	I _{N(400V)}	Cos Phi			η			I _d / I _n	M _d /M _n	M _m /M _n	J	IM B3	LP
	kW	min-1	Nm	A	4/4	3/4	2/4	4/4	3/4	2/4				kg.m2	kg	db(A)
FLSES 80 L	1.1	2877	3.7	2.3	0.85	0.78	0.63	81.7	82.2	80.6	7.7	3.5	2.8	0.0011	19	68
FLSES 90 SL	1.5	2881	5.0	3.0	0.86	0.8	0.67	83.3	83.5	81.5	8.2	3.6	3.6	0.0017	21	64
FLSES 90 L	2.2	2885	7.3	4.2	0.87	0.82	0.71	83.5	84.0	82.4	7.6	3.8	4.0	0.0023	26	64
FLSES 100 LK	3	2900	9.7	5.7	0.87	0.82	0.77	84.6	84.5	82.6	9.0	3.4	3.5	0.0069	42	66
FLSES 112 MG	4	2937	13.1	7.7	0.86	0.81	0.68	87.6	87.0	84.5	9.1	3.6	3.8	0.0107	52	69
FLSES 132 S	5.5	2935	18	10	0.87	0.82	0.76	87.7	88.0	86.6	8.0	3.1	3.6	0.0211	66	72
FLSES 132 M	7.5	2942	24.5	13.6	0.89	0.85	0.76	89.3	89.7	88.8	8.1	2.8	3.8	0.0236	70	72
FLSES 160 MA	11	2950	35	21	0.87	0.85	0.78	89.5	90.0	89.3	8.3	2.8	2.9	0.039	102	74
FLSES 160 MB	15	2944	48	27	0.90	0.88	0.81	90.3	90.5	90.3	8.3	2.7	2.7	0.046	114	74
FLSES 160 L	18.5	2938	61	33	0.90	0.88	0.83	90.9	90.7	90.1	8.5	3.2	3.3	0.06	133	74
FLSES 180 MR	22	2941	71	40	0.88	0.86	0.79	91.3	91.6	90.9	8.3	2.5	2.5	0.069	142	75
FLSES 200 LA	30	2956	96	52	0.89	0.87	0.82	92.8	93.0	92.9	8.2	2.8	3.7	0.14	245	76
FLSES 200 LB	37	2954	119	63	0.90	0.89	0.84	92.8	92.9	91.9	8.1	2.9	2.3	0.16	265	75
FLSES 225 MT	45	2950	145	77	0.90	0.89	0.85	92.9	93.2	92.5	7.8	2.7	2.2	0.19	290	76
FLSES 250 M	55	2966	177	94	0.89	0.87	0.81	94.0	94.0	93.2	8.0	2.5	2.3	0.44	405	77
FLSES 280 M	75	2965	242	131	0.88	0.86	0.80	93.8	93.4	92.2	7.7	2.5	3.0	0.55	560	77
FLSES 280 M	90	2961	290	159	0.87	0.85	0.81	94.1	93.7	90.2	7.5	2.4	2.9	0.55	560	77
FLSES 315 M	110	2974	353	191	0.88	0.86	0.81	94.3	94.2	93.5	7.9	2.4	2.9	1.71	1050	84
FLSES 315 M	132	2900	435	231	0.87	0.86	0.83	94.6	94.0	92.4	7.5	1.8	2.7	1.71	1050	84
FLSES 315 LB	160	2968	515	280	0.87	0.85	0.82	94.8	94.2	92.1	7.4	1.9	2.8	1.99	1150	84
FLSES 315 LB	200	2967	644	353	0.86	0.84	0.79	95.0	94.4	92.9	7.5	2.0	2.8	1.99	1150	84
FLSES 355 LA	250	2978	802	432	0.88	0.86	0.84	95.0	94.4	92.9	7.4	2.1	2.3	3.39	1400	84
FLSES 355 LC	275	2980	881	479	0.87	0.85	0.82	95.3	94.7	93.0	7.9	1.9	2.7	3.39	1500	84
FLSES 355 LC	315	2976	1011	542	0.88	0.86	0.82	95.3	94.7	93.0	7.3	1.8	2.5	3.39	1500	84
FLSES 355 LC	330	2980	1057	574	0.87	0.85	0.81	95.3	94.7	93.0	7.8	1.9	2.5	3.39	1915	84
FLSES 355 LD	355	2979	1138	610	0.88	0.86	0.82	95.5	94.8	93.2	7.9	1.9	2.4	4.03	1915	84

* This standard replaces the IEC 60034-2; 1996

FLSES

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Selection

IP 55 - 50 Hz - Class F - Δ T 80 K - 230 V Δ / 400 V Y - S1

2
poles
3000 min⁻¹

A

Type	Rated power at 50 Hz P_N kW	IM 1001 (IM B3)		IM 3001 (IM B5)		IM 2001 (IM B35)		IM 3601 (IM B14)	
		Code	Qty	Code	Qty	Code	Qty	Code	Qty
FLSES 80 L	1.1		-		-		-		-
FLSES 90 SL	1.5		-		-		-		-
FLSES 90 L	2.2		-		-		-		-
FLSES 100 LK	3		-		-		-		-
FLSES 112 MG	4		-		-		-		-
FLSES 132 S	5.5		-		-		-		-
FLSES 132 M	7.5		-		-		-		-
FLSES 160 MA	11		-		-		-		-
FLSES 160 MB	15		-		-		-		-
FLSES 160 L	18.5		-		-		-		-
FLSES 180 MR	22		-		-		-		-
FLSES 200 LA	30		-		-		-		-
FLSES 200 LB	37	MFES0037	1	MFES0038	1	MFES0039	1		-
FLSES 225 MT	45	MFES0040	1	MFES0041	1	MFES0042	1		-
FLSES 250 M	55	MFES0043	1	MFES0044	1	MFES0045	1		-
FLSES 280 M	75		-		-		-		-
FLSES 280 M	90		-		-		-		-
FLSES 315 M	110		-		-		-		-

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Selection

IP 55 - 50 Hz - Class F - Δ T 80 K - 230 V Δ / 400 V Y - S1

4
poles
1500 min⁻¹

IE2

Type	Rated power	Rated speed	Rated torque	Rated current	Power factor			Efficiency* IEC 60034-2-1; 2007			Starting current/ Rated current	Starting torque/ Rated torque	Maximum torque/ Rated torque	Moment of inertia	Weight	Noise
	P _N	N _N	M _N	I _{N(400V)}	Cos Phi			η			I _d / I _n	M _d /M _n	M _m /M _n	J	IM B3	LP
	kW	min-1	Nm	A	4/4	3/4	2/4	4/4	3/4	2/4				kg.m2	kg	db(A)
FLSES 90 L	1.1	1448	7.2	2.42	0.78	0.69	0.62	83.5	84.3	82.9	6.2	2.5	2.9	0.0043	24	50
FLSES 90 LU	1.5	1451	9.9	3.18	0.8	0.72	0.61	84.6	85.1	83.6	7.1	2.6	3.1	0.0051	27	50
FLSES 100 LK	2.2	1455	14.4	4.5	0.82	0.78	0.69	86.0	86.5	85.5	7.1	2.3	2.8	0.0096	37	52
FLSES 100 LK	3	1459	19.6	5.96	0.83	0.77	0.68	87.1	87.9	87.1	7.1	2.2	2.8	0.0134	43	52
FLSES 112 MU	4	1465	26.2	8.07	0.81	0.74	0.65	87.5	87.9	85.8	7.8	2.5	3.2	0.0168	53	52
FLSES 132 S	5.5	1453	36.1	10.2	0.87	0.82	0.77	89.0	89.3	88.3	7.2	2.2	2.9	0.029	71	59
FLSES 132 M	7.5	1458	49	14.1	0.85	0.8	0.76	89.5	90.1	90.4	8.0	2.6	3.3	0.036	80	59
FLSES 160 MB	11	1465	71.7	21	0.84	0.79	0.75	90.0	90.1	89.9	9.2	2.7	3.3	0.067	115	63
FLSES 160 LU	15	1465	97.8	28	0.84	0.79	0.75	90.6	90.8	90.5	9.2	2.7	3.3	0.092	130	63
FLSES 180 MR	18.5	1468	120	35	0.84	0.79	0.74	92.1	92.7	91.8	7.1	3.0	2.7	0.123	170	64
FLSES 180 LU	22	1465	143	42	0.82	0.78	0.69	92.1	92.8	92.1	7.3	3.0	2.7	0.146	200	64
FLSES 200 LB	30	1470	195	56	0.83	0.81	0.72	93.1	93.5	93.2	6.5	2.6	2.3	0.26	270	66
FLSES 225 ST	37	1476	239	69	0.82	0.76	0.64	93.2	93.7	93.2	7.2	3.2	3.3	0.28	290	66
FLSES 225 M	45	1483	290	78	0.87	0.83	0.74	93.7	94.3	93.6	7.1	2.6	2.9	0.7	388	68
FLSES 250 M	55	1479	355	102	0.82	0.80	0.71	93.5	93.9	93.4	6.6	2.4	2.0	0.7	395	68
FLSES 280 M	75	1483	483	137	0.84	0.79	0.68	94	93.9	92.1	7.5	2.6	2.7	1.015	565	70
FLSES 280 M	90	1478	581	164	0.84	0.79	0.68	94.2	93.7	93.1	7.1	2.6	2.8	1.015	565	70
FLSES 315 M	110	1482	709	202	0.83	0.80	0.71	94.5	94.2	93.4	7.3	2.5	2.6	2.9	1000	73
FLSES 315 M	132	1489	847	248	0.81	0.77	0.68	94.7	94	92.4	7.8	2.5	2.6	2.9	1000	73
FLSES 315 LA	160	1487	1027	300	0.81	0.75	0.67	94.9	94.8	94.1	7.6	2.0	2.4	3.4	1050	73
FLSES 315 LB*	200	1486	1285	379	0.80	0.74	0.66	95.1	94.9	94.2	7.6	2.0	2.3	3.4	1150	73
FLSES 355 LA	250	1490	1602	446	0.85	0.82	0.71	95.1	94.9	94.2	7.5	1.8	2.2	6.2	1550	82
FLSES 355 LC	300	1490	1923	535	0.85	0.82	0.71	95.3	95.1	94.3	7.2	1.7	1.8	6.5	1800	82
FLSES 355 LC*	315	1491	2017	596	0.80	0.73	0.60	95.3	95.1	94.3	7.9	2.0	2.2	6.5	1800	82
FLSES 355 LD	355	1491	2274	654	0.82	0.76	0.65	95.5	95.3	94.6	7.6	1.9	1.9	6.5	1800	82

* This standard replaces the IEC 60034-2; 1996

• Temperature rise class F

FLSES

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Selection

IP 55 - 50 Hz - Class F - Δ T 80 K - 230 V Δ / 400 V Y - S1

4
poles
1500 min⁻¹

A

Type	Rated power at 50 Hz P_N kW	IM 1001 (IM B3)		IM 3001 (IM B5)		IM 2001 (IM B35)		IM 3601 (IM B14)	
		Code	Qty	Code	Qty	Code	Qty	Code	Qty
FLSES 90 L	1.1		-		-		-		-
FLSES 90 LU	1.5		-		-		-		-
FLSES 100 LK	2.2		-		-		-		-
FLSES 100 LK	3		-		-		-		-
FLSES 112 MU	4		-		-		-		-
FLSES 132 S	5.5		-		-		-		-
FLSES 132 M	7.5		-		-		-		-
FLSES 160 MB	11		-		-		-		-
FLSES 160 LU	15		-		-		-		-
FLSES 180 MR	18.5		-		-		-		-
FLSES 180 LU	22		-		-		-		-
FLSES 200 LB	30		-		-		-		-
FLSES 225 ST	37	MFES0057	1	MFES0058	1	MFES0059	1		
FLSES 225 M	45	MFES0060	1	MFES0061	1	MFES0062	1		
FLSES 250 M	55	MFES0063	1	MFES0064	1	MFES0065	1		
FLSES 280 M	75		-		-		-		-
FLSES 280 M	90		-		-		-		-
FLSES 315 M	110		-		-		-		-
FLSES 315 M	132		-		-		-		-

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Selection

IP 55 - 50 Hz - Class F - Δ T 80 K - 400 V Δ - S1

2
poles
3000 min⁻¹

IE2

Type	Rated power	Rated speed	Rated torque	Rated current	Power factor			Efficiency* IEC 60034-2-1; 2007			Starting current/ Rated current	Starting torque/ Rated torque	Maximum torque/ Rated torque	Moment of inertia	Weight	Noise
	P _N	N _N	M _N	I _{N(400V)}	Cos Phi			η			I _d / I _n	M _d /M _n	M _m /M _n	J	IM B3	LP
	kW	min-1	Nm	A	4/4	3/4	2/4	4/4	3/4	2/4				kg.m2	kg	db(A)
FLSES 80 L	1.1	2877	3.7	2.3	0.85	0.78	0.63	81.7	82.2	80.6	7.7	3.5	2.8	0.0011	19	68
FLSES 90 SL	1.5	2881	5.0	3.0	0.86	0.8	0.67	83.3	83.5	81.5	8.2	3.6	3.6	0.0017	21	64
FLSES 90 L	2.2	2885	7.3	4.2	0.87	0.82	0.71	83.5	84.0	82.4	7.6	3.8	4.0	0.0023	26	64
FLSES 100 LK	3	2900	9.7	5.7	0.87	0.82	0.77	84.6	84.5	82.6	9.0	3.4	3.5	0.0069	42	66
FLSES 112 MG	4	2937	13.1	7.7	0.86	0.81	0.68	87.6	87.0	84.5	9.1	3.6	3.8	0.0107	52	69
FLSES 132 S	5.5	2935	18	10	0.87	0.82	0.76	87.7	88.0	86.6	8.0	3.1	3.6	0.0211	66	72
FLSES 132 M	7.5	2942	24.5	13.6	0.89	0.85	0.76	89.3	89.7	88.8	8.1	2.8	3.8	0.0236	70	72
FLSES 160 MA	11	2950	35	21	0.87	0.85	0.78	89.5	90.0	89.3	8.3	2.8	2.9	0.039	102	74
FLSES 160 MB	15	2944	48	27	0.90	0.88	0.81	90.3	90.5	90.3	8.3	2.7	2.7	0.046	114	74
FLSES 160 L	18.5	2938	61	33	0.90	0.88	0.83	90.9	90.7	90.1	8.5	3.2	3.3	0.06	133	74
FLSES 180 MR	22	2941	71	40	0.88	0.86	0.79	91.3	91.6	90.9	8.3	2.5	2.5	0.069	142	75
FLSES 200 LA	30	2956	96	52	0.89	0.87	0.82	92.8	93.0	92.9	8.2	2.8	3.7	0.14	245	76
FLSES 200 LB	37	2954	119	63	0.90	0.89	0.84	92.8	92.9	91.9	8.1	2.9	2.3	0.16	265	75
FLSES 225 MT	45	2950	145	77	0.90	0.89	0.85	92.9	93.2	92.5	7.8	2.7	2.2	0.19	290	76
FLSES 250 M	55	2966	177	94	0.89	0.87	0.81	94.0	94.0	93.2	8.0	2.5	2.3	0.44	405	77
FLSES 280 M	75	2965	242	131	0.88	0.86	0.80	93.8	93.4	92.2	7.7	2.5	3.0	0.55	560	77
FLSES 280 M	90	2961	290	159	0.87	0.85	0.81	94.1	93.7	90.2	7.5	2.4	2.9	0.55	560	77
FLSES 315 M	110	2974	353	191	0.88	0.86	0.81	94.3	94.2	93.5	7.9	2.4	2.9	1.71	1050	84
FLSES 315 M	132	2900	435	231	0.87	0.86	0.83	94.6	94.0	92.4	7.5	1.8	2.7	1.71	1050	84
FLSES 315 LB	160	2968	515	280	0.87	0.85	0.82	94.8	94.2	92.1	7.4	1.9	2.8	1.99	1150	84
FLSES 315 LB	200	2967	644	353	0.86	0.84	0.79	95.0	94.4	92.9	7.5	2.0	2.8	1.99	1150	84
FLSES 355 LA	250	2978	802	432	0.88	0.86	0.84	95.0	94.4	92.9	7.4	2.1	2.3	3.39	1400	84
FLSES 355 LC	275	2980	881	479	0.87	0.85	0.82	95.3	94.7	93.0	7.9	1.9	2.7	3.39	1500	84
FLSES 355 LC	315	2976	1011	542	0.88	0.86	0.82	95.3	94.7	93.0	7.3	1.8	2.5	3.39	1500	84
FLSES 355 LC	330	2980	1057	574	0.87	0.85	0.81	95.3	94.7	93.0	7.8	1.9	2.5	3.39	1915	84
FLSES 355 LD	355	2979	1138	610	0.88	0.86	0.82	95.5	94.8	93.2	7.9	1.9	2.4	4.03	1915	84

* This standard replaces the IEC 60034-2; 1996

FLSES

totally enclosed three-phase asynchronous motors

Selection

2
poles
3000 min⁻¹

IP 55 - 50 Hz - Class F - ΔT 80 K - 400 V Δ - S1

A

Type	Rated power at 50 Hz P_N kW	IM 1001 (IM B3)		IM 3001 (IM B5)		IM 2001 (IM B35)		IM 3601 (IM B14)	
		Code	Qty	Code	Qty	Code	Qty	Code	Qty
FLSES 80 L	1.1		-		-		-		-
FLSES 90 SL	1.5		-		-		-		-
FLSES 90 L	2.2		-		-		-		-
FLSES 100 LK	3		-		-		-		-
FLSES 112 MG	4		-		-		-		-
FLSES 132 S	5.5		-		-		-		-
FLSES 132 M	7.5		-		-		-		-
FLSES 160 MA	11		-		-		-		-
FLSES 160 MB	15		-		-		-		-
FLSES 160 L	18.5		-		-		-		-
FLSES 180 MR	22		-		-		-		-
FLSES 200 LA	30		-		-		-		-
FLSES 200 LB	37	MFES0046	1	MFES0047	1	MFES0048	1		
FLSES 225 MT	45	MFES0049	1	MFES0050	1	MFES0051	1		
FLSES 250 M	55	MFES0052	1	MFES0053	1	MFES0054	1		
FLSES 280 M	75	MFES0055	1		-		-		
FLSES 280 M	90	MFES0056	1		-		-		
FLSES 315 M	110		-		-		-		-
FLSES 315 M	132		-		-		-		-

FLSES

totally enclosed three-phase asynchronous motors

Selection

IP 55 - 50 Hz - Class F - ΔT 80 K - 400 V Δ - S1

4
poles
1500 min⁻¹

IE2

Type	Rated power	Rated speed	Rated torque	Rated current	Power factor			Efficiency* IEC 60034-2-1; 2007			Starting current/ Rated current	Starting torque/ Rated torque	Maximum torque/ Rated torque	Moment of inertia	Weight	Noise
	P _N	N _N	M _N	I _{N(400V)}	Cos Phi			η			I _d / I _n	M _d /M _n	M _m /M _n	J	IM B3	LP
	kW	min-1	Nm	A	4/4	3/4	2/4	4/4	3/4	2/4				kg.m2	kg	db(A)
FLSES 90 L	1.1	1448	7.2	2.42	0.78	0.69	0.62	83.5	84.3	82.9	6.2	2.5	2.9	0.0043	24	50
FLSES 90 LU	1.5	1451	9.9	3.18	0.8	0.72	0.61	84.6	85.1	83.6	7.1	2.6	3.1	0.0051	27	50
FLSES 100 LK	2.2	1455	14.4	4.5	0.82	0.78	0.69	86.0	86.5	85.5	7.1	2.3	2.8	0.0096	37	52
FLSES 100 LK	3	1459	19.6	5.96	0.83	0.77	0.68	87.1	87.9	87.1	7.1	2.2	2.8	0.0134	43	52
FLSES 112 MU	4	1465	26.2	8.07	0.81	0.74	0.65	87.5	87.9	85.8	7.8	2.5	3.2	0.0168	53	52
FLSES 132 S	5.5	1453	36.1	10.2	0.87	0.82	0.77	89.0	89.3	88.3	7.2	2.2	2.9	0.029	71	59
FLSES 132 M	7.5	1458	49	14.1	0.85	0.8	0.76	89.5	90.1	90.4	8.0	2.6	3.3	0.036	80	59
FLSES 160 MB	11	1465	71.7	21	0.84	0.79	0.75	90.0	90.1	89.9	9.2	2.7	3.3	0.067	115	63
FLSES 160 LU	15	1465	97.8	28	0.84	0.79	0.75	90.6	90.8	90.5	9.2	2.7	3.3	0.092	130	63
FLSES 180 MR	18.5	1468	120	35	0.84	0.79	0.74	92.1	92.7	91.8	7.1	3.0	2.7	0.123	170	64
FLSES 180 LU	22	1465	143	42	0.82	0.78	0.69	92.1	92.8	92.1	7.3	3.0	2.7	0.146	200	64
FLSES 200 LB	30	1470	195	56	0.83	0.81	0.72	93.1	93.5	93.2	6.5	2.6	2.3	0.26	270	66
FLSES 225 ST	37	1476	239	69	0.82	0.76	0.64	93.2	93.7	93.2	7.2	3.2	3.3	0.28	290	66
FLSES 225 M	45	1483	290	78	0.87	0.83	0.74	93.7	94.3	93.6	7.1	2.6	2.9	0.7	388	68
FLSES 250 M	55	1479	355	102	0.82	0.80	0.71	93.5	93.9	93.4	6.6	2.4	2.0	0.7	395	68
FLSES 280 M	75	1483	483	137	0.84	0.79	0.68	94	93.9	92.1	7.5	2.6	2.7	1.015	565	70
FLSES 280 M	90	1478	581	164	0.84	0.79	0.68	94.2	93.7	93.1	7.1	2.6	2.8	1.015	565	70
FLSES 315 M	110	1482	709	202	0.83	0.80	0.71	94.5	94.2	93.4	7.3	2.5	2.6	2.9	1000	73
FLSES 315 M	132	1489	847	248	0.81	0.77	0.68	94.7	94	92.4	7.8	2.5	2.6	2.9	1000	73
FLSES 315 LA	160	1487	1027	300	0.81	0.75	0.67	94.9	94.8	94.1	7.6	2.0	2.4	3.4	1050	73
FLSES 315 LB*	200	1486	1285	379	0.80	0.74	0.66	95.1	94.9	94.2	7.6	2.0	2.3	3.4	1150	73
FLSES 355 LA	250	1490	1602	446	0.85	0.82	0.71	95.1	94.9	94.2	7.5	1.8	2.2	6.2	1550	82
FLSES 355 LC	300	1490	1923	535	0.85	0.82	0.71	95.3	95.1	94.3	7.2	1.7	1.8	6.5	1800	82
FLSES 355 LC*	315	1491	2017	596	0.80	0.73	0.60	95.3	95.1	94.3	7.9	2.0	2.2	6.5	1800	82
FLSES 355 LD	355	1491	2274	654	0.82	0.76	0.65	95.5	95.3	94.6	7.6	1.9	1.9	6.5	1800	82

* This standard replaces the IEC 60034-2; 1996

• Temperature rise class F

FLSES

totally enclosed three-phase asynchronous motors

Selection

IP 55 - 50 Hz - Class F - Δ T 80 K - 400 V Δ - S1

4
poles
1500 min⁻¹

A

Type	Rated power at 50 Hz P_N kW	IM 1001 (IM B3)		IM 3001 (IM B5)		IM 2001 (IM B35)		IM 3601 (IM B14)	
		Code	Qty	Code	Qty	Code	Qty	Code	Qty
FLSES 100 LK	3		-		-		-		-
FLSES 112 MU	4		-		-		-		-
FLSES 132 M	5.5		-		-		-		-
FLSES 132 M	7.5		-		-		-		-
FLSES 160 M	11		-		-		-		-
FLSES 160 L	15		-		-		-		-
FLSES 180 MR	18.5		-		-		-		-
FLSES 180 L	22		-		-		-		-
FLSES 200 L	30		-		-		-		-
FLSES 225 ST	37	MFES0066	1	MFES0067	1	MFES0068	1		
FLSES 225 M	45	MFES0069	1	MFES0070	1	MFES0071	1		
FLSES 250 M	55	MFES0072	1	MFES0073	1	MFES0074	1		
FLSES 280 M	75		-		-		-		-
FLSES 280 M	90		-		-		-		-
FLSES 315 M	110		-		-		-		-
FLSES 315 M	132		-		-		-		-

FLSES

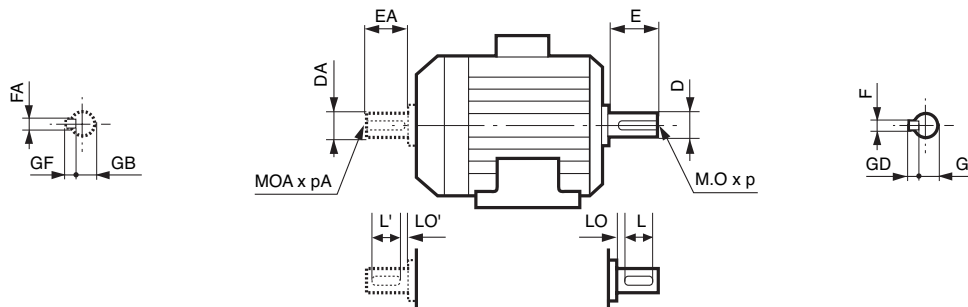
totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSES totally enclosed three-phase asynchronous motors - IP 55 Cage rotor

Dimensions in millimetres

- shaft end



Type	Main shaft end																	
	4 poles									2 poles								
	F	GD	D	G	E	O	p	L	LO	F	GD	D	G	E	O	p	L	LO
FLSES 80 L	6	6	19j6	15.5	40	6	16	30	6	6	6	19j6	15.5	40	6	16	30	6
FLSES 90 S/L	8	7	24j6	20	50	8	19	40	6	8	7	24j6	20	50	8	19	40	6
FLSES 100 L/LK	8	7	28j6	24	60	10	22	50	6	8	7	28j6	24	60	10	22	50	6
FLSES 112 M	8	7	28j6	24	60	10	22	50	6	8	7	28j6	24	60	10	22	50	6
FLSES 132 S/M/MU	10	8	38k6	33	80	12	28	63	10	10	8	38k6	33	80	12	28	63	10
FLSES 160 M/L	12	8	42k6	37	110	16	36	90	20	12	8	42k6	37	110	16	36	90	20
FLSES 180 MR/L	14	9	48k6	42.5	110	16	36	90	20	14	9	48k6	42.5	110	16	36	90	20
FLSES 200 L	16	10	55m6	49	110	20	42	90	20	16	10	55m6	49	110	20	42	90	20
FLSES 225 ST/MT/M	18	11	60m6	53	140	20	42	125	15	16	10	55m6	49	110	20	42	90	20
FLSES 250 M	18	11	65m6	58	140	20	42	125	15	18	11	60m6	53	140	20	42	125	15
FLSES 280 S/M	20	12	75m6	67.5	140	20	42	125	15	18	11	65m6	58	140	20	42	125	15
FLSES 315 ST/M	22	14	80m6	71	170	20	42	140	30	18	11	65m6	58	140	20	42	125	15
FLSES 315 L	25	14	90m6	81	170	24	50	140	30	20	12	70m6	62.5	140	20	42	125	15
FLSES 355 L	28	16	100m6	90	210	24	50	180	30	22	14	80m6	71	170	20	42	140	30

Type	Secondary shaft end																	
	4 poles									2 poles								
	FA	GF	DA	GB	EA	OA	pA	L'	LO'	FA	GF	DA	GB	EA	OA	pA	L'	LO'
FLSES 80 L	5	5	14j6	11	30	5	15	25	3.5	5	5	14j6	11	30	5	15	25	3.5
FLSES 90 S/L	6	6	19j6	15.5	40	6	16	30	6	6	6	19j6	15.5	40	6	16	30	6
FLSES 100 L/LK	8	7	24j6	20	50	8	19	40	6	8	7	24j6	20	50	8	19	40	6
FLSES 112 M	8	7	24j6	20	50	8	19	40	6	8	7	24j6	20	50	8	19	40	6
FLSES 132 S/M/MU	8	7	28k6	24	60	10	22	50	6	8	7	28j6	24	60	10	22	50	6
FLSES 160 M/L	12	8	42k6	37	110	16	36	90	20	12	8	42k6	37	110	16	36	90	20
FLSES 180 MR/L	14	9	48k6	42.5	110	16	36	90	20	14	9	48k6	42.5	110	16	36	90	20
FLSES 200 L	16	10	55m6	49	110	20	42	90	20	16	10	55m6	49	110	20	42	90	20
FLS 225 ST/MT/M	18	11	60m6	53	140	20	42	125	15	16	10	55m6	49	110	20	42	90	20
FLS 250 M	18	11	60m6	53	140	20	42	125	15	18	11	60m6	53	140	20	42	125	15
FLS 280 S/M	20	12	60m6	53	140	20	42	125	15	18	11	60m6	53	140	20	42	125	15
FLSES 315 ST/M	22	14	80m6	71	170	20	42	140	30	18	11	65m6	58	140	20	42	125	15
FLSES 315 L	25	14	90m6	81	170	24	50	140	30	20	12	70m6	62.5	140	20	42	125	15
FLSES 355 L	28	16	100m6	90	210	24	50	180	30	22	14	80m6	71	170	20	42	140	30

FLSES

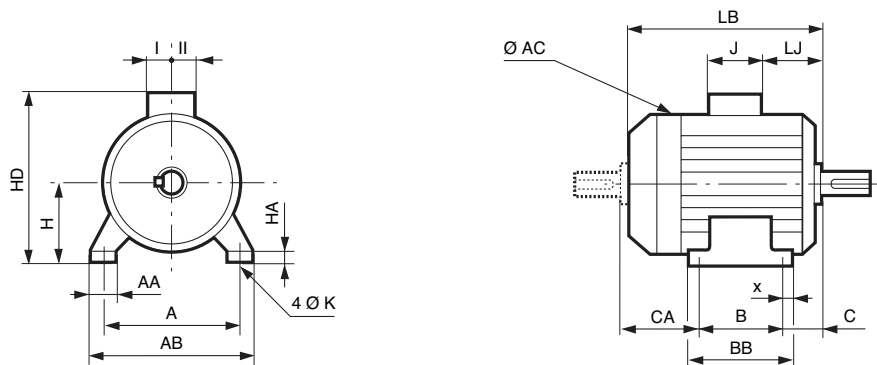
totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSES totally enclosed three-phase asynchronous motors - IP 55 Cage rotor

Dimensions in millimetres

- foot mounted



Type	Main dimensions																		
	A	AB	B	BB	C	x	AA	K	HA	H	AC	HD	LB	LB1*	LJ	J	I	II	CA
FLSES 80 L	125	157	100	130	50	20	32	9	11	80	170	231	216	178	7	136	68	68	83
FLSES 90 L	140	170	100	162	37	27	26	9	10	90	185	251	251	225	9	136	68	68	126
FLSES 90 S	140	170	125	162	52	27	26	9	10	90	185	251	251	225	9	136	68	68	110
FLSES 100 L	160	196	140	185	63	29	40	12	12	100	204	258	300	253	8	136	68	68	-
FLSES 100 LK	160	200	140	174	63	22	42	12	12	100	226	288	323	276	55	114	57	57	119
FLSES 112 M	190	230	140	185	70	32	48	12	12	112	231	294	309	265	18	136	68	68	-
FLSES 132 S	216	255	140	240	89	50	63	12	16	132	264	347	385	330	22	136	68	68	170
FLSES 132 M	216	255	178	240	89	50	63	12	16	132	264	347	385	330	22	136	68	68	170
FLSES 132 MU	216	255	178	240	89	50	63	12	16	132	264	347	412	351	22	136	68	68	170
FLSES 160 M	254	294	210	294	108	20	65	14	20	160	310	440	495	435	30	246	126	147	182
FLSES 160 L	254	294	254	294	108	20	65	14	20	160	310	440	495	435	30	246	126	147	138
FLSES 180 MR	279	324	241	295	121	25	80	14	25	180	310	460	515	450	30	246	126	147	158
FLSES 180 L	279	330	279	335	121	28	70	14	28	180	350	481	555	480	42	246	126	147	160
FLSES 200 L	318	374	305	361	133	28	80	18	44	200	394	530	681	595	51	246	126	147	248
FLS 225 ST	356	420	286	367	149	28	100	18	35	225	394	555	681	595	51	246	126	147	251
FLS 225 MT	356	420	311	367	149	28	100	18	35	225	394	555	681	595	51	246	126	147	226
FLS 225 M	356	426	311	375	149	32	80	18	27	225	540	656	780	630	70	352	173	210	326
FLS 250 M	406	476	349	413	168	32	80	22	27	250	540	681	780	630	70	352	173	210	269
FLS 280 S	457	527	368	432	190	32	80	22	27	280	540	711	860	710	70	352	173	210	302
FLS 280 M	457	527	419	483	190	32	80	22	27	280	540	711	960	810	70	352	173	210	357
FLSES 315 ST	508	598	406	547	216	45	90	27	45	315	556	761	1068	910	68	352	173	210	452
FLSES 315 M	508	600	457	598	216	45	100	27	45	315	624	835	1203	1030	70	452	217	269	536
FLSES 315 L	508	600	508	598	216	45	100	27	45	315	632	835	1203	1030	70	452	217	269	485
FLSES 355 LA/LB	610	710	630	710	254	40	110	27	35	355	700	910	1305	1118	61	452	217	269	427
FLSES 355 LC/LD	610	710	630	710	254	40	110	27	35	355	700	910	1430	1242	61	452	217	269	552

* LB1 : motor not ventilated

FLSES

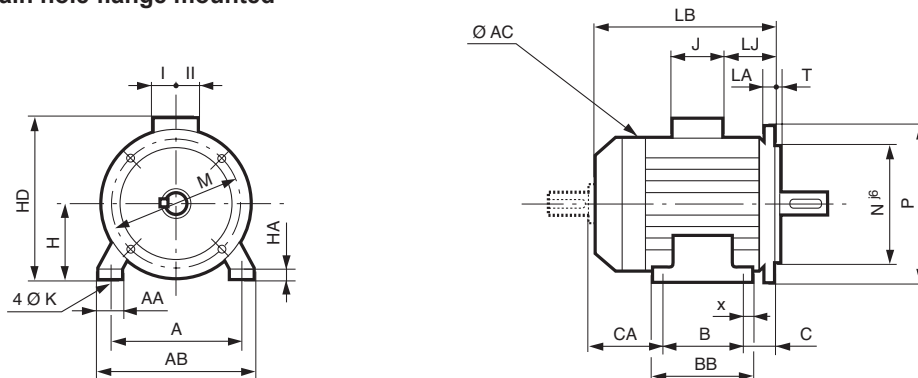
totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSES totally enclosed three-phase asynchronous motors - IP 55 Cage rotor

Dimensions in millimetres

- (FF) foot and plain hole flange mounted



Type	Main dimensions																			
	A	AB	B	BB	C	x	AA	K	HA	H	AC	HD	LB	LB1*	LJ	J	I	II	CA	Sym.
FLSES 80 L	125	157	100	130	50	20	32	9	11	80	170	231	216	178	7	136	68	68	83	FF 165
FLSES 90 S	140	170	100	162	37	27	26	9	10	90	185	251	251	225	9	136	68	68	126	FF 165
FLSES 90 L	140	170	125	162	52	27	26	9	10	90	185	251	251	225	9	136	68	68	110	FF 165
FLSES 100 L	160	196	140	185	63	29	40	12	12	100	204	258	300	253	8	136	68	68	-	FF 215
FLSES 100 LK	160	200	140	174	63	22	42	12	12	100	226	288	323	276	55	114	57	57	119	FF 215
FLSES 112 M	190	230	140	185	70	32	48	12	12	112	231	294	309	265	18	136	68	68	-	FF 215
FLSES 132 S	216	255	140	240	89	50	63	12	16	132	264	347	385	330	22	136	68	68	170	FF 265
FLSES 132 M	216	255	178	240	89	50	63	12	16	132	264	347	385	330	22	136	68	68	170	FF 265
FLSES 132 MU	216	255	178	240	89	50	63	12	16	132	264	347	412	351	22	136	68	68	170	FF 265
FLSES 160 M	254	294	210	294	108	20	65	14	20	160	310	440	495	435	30	246	126	147	182	FF 300
FLSES 160 L	254	294	254	294	108	20	65	14	20	160	310	440	495	435	30	246	126	147	138	FF 300
FLSES 180 MR	279	324	241	295	121	25	80	14	25	180	310	460	515	450	30	246	126	147	158	FF 300
FLSES 180 L	279	330	279	335	121	28	70	14	28	180	350	481	555	480	42	246	126	147	160	FF 300
FLSES 200 L	318	374	305	361	133	28	80	18	44	200	394	530	681	595	51	246	126	147	248	FF 350
FLSES 225 ST	356	420	286	367	149	28	100	18	35	225	394	555	681	595	51	246	126	147	251	FF 400
FLSES 225 MT	356	420	311	367	149	28	100	18	35	225	394	555	681	595	51	246	126	147	226	FF 400
FLSES 225 M	356	426	311	375	149	32	80	18	27	225	540	656	780	630	70	352	173	210	326	FF 400
FLSES 250 M	406	476	349	413	168	32	80	22	27	250	540	681	780	630	70	352	173	210	269	FF 500
FLSES 280 S	457	527	368	432	190	32	80	22	27	280	540	711	860	710	70	352	173	2010	302	FF 500
FLSES 280 M	457	527	419	483	190	32	80	22	27	280	540	711	960	810	70	352	173	210	357	FF 500
FLSES 315 ST	508	598	406	547	216	45	90	27	45	315	556	761	1068	910	68	352	173	210	452	FF 600
FLSES 315 M	508	600	457	598	216	45	100	27	45	315	624	835	1203	1030	70	452	217	269	536	FF 600
FLSES 315 L	508	600	508	598	216	45	100	27	45	315	632	835	1203	1030	70	452	217	269	485	FF 600
FLSES 355 LA/LB	610	710	630	710	254	40	110	27	35	355	700	910	1305	1118	61	452	217	269	427	FF 740
FLSES 355 LC/LD	610	710	630	710	254	40	110	27	35	355	700	910	1430	1242	61	452	217	269	552	FF 740

* LB1 : motor not ventilated

FLSES

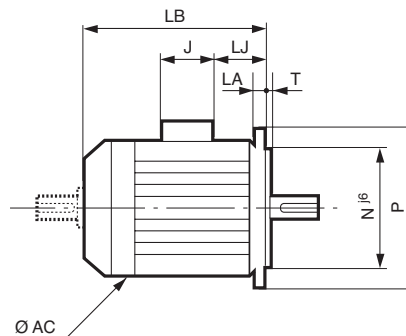
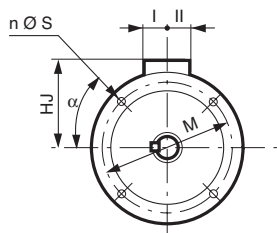
totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSES totally enclosed three-phase asynchronous motors - IP 55 Cage rotor

Dimensions in millimetres

- (FF) plain hole flange mounted



IEC symbol	Flange dimensions							
	M	N	P	T	n	α°	S	LA
FF 165	165	130	200	3.5	4	45	12	10
FF 165	165	130	200	3.5	4	45	12	10
FF 165	165	130	200	3.5	4	45	12	10
FF 215	215	180	250	4	4	45	15	11
FF 215	215	180	250	4	4	45	15	11
FF 215	215	180	250	4	4	45	15	11
FF 265	265	230	300	4	4	45	14.5	13
FF 265	265	230	300	4	4	45	14.5	13
FF 265	265	230	300	4	4	45	14.5	13
FF 300	300	250	350	5	4	45	18.5	13
FF 300	300	250	350	5	4	45	18.5	13
FF 300	300	250	350	5	4	45	18.5	13
FF 300	300	250	350	5	4	45	18.5	13
FF 350	350	300	400	5	4	45	19	15
FF 400	400	350	450	5	8	22.3	19	16
FF 400	400	350	450	5	8	22.3	19	16
FF 400	400	350	450	5	8	22.3	19	16
FF 500	500	450	550	5	8	22.3	18	18
FF 500	500	450	550	5	8	22.3	18	22
FF 500	500	450	550	5	8	22.3	18	22
FF 600	600	550	660	6	8	22.3	22	25
FF 600	600	550	660	6	8	22.3	22	25
FF 600	600	550	660	6	8	22.3	22	25
FF 740	740	680	800	6	8	22.3	22	25
FF 740	740	680	800	6	8	22.3	22	25

* LB1 : motor not ventilated

** LB1 : on request

The FF flange fixing form of motors in IM 3001 stop with the frame size 225.

Type	Main dimensions							
	AC	LB	LB1	HJ	LJ	J	I	II*
FLSES 80 L	170	216	178	152	7	136	68	68
FLSES 90 S	185	251	225	158	9	136	68	68
FLSES 90 L	185	251	225	158	9	136	68	68
FLSES 100 L	204	300	253	158	8	136	68	68
FLSES 100 LK	226	323	276	176	55	114	57	57
FLSES 112 M	231	309	265	182	18	136	68	68
FLSES 132 S	264	385	330	205	22	136	68	68
FLSES 132 M	264	385	330	205	22	136	68	68
FLSES 132 MU	264	412	351	205	22	136	68	68
FLSES 160 M	310	495	435	280	30	246	126	147
FLSES 160 L	310	495	435	280	30	246	126	147
FLSES 180 MR	310	515	450	280	30	246	126	147
FLSES 180 L	350	555	480	301	42	246	126	147
FLSES 200 L	394	681	595	330	51	246	126	147
FLSES 225 ST	394	681	595	330	51	246	126	147
FLSES 225 MT	394	681	595	330	51	246	126	147
FLSES 225 M	540	780	630	431	70	352	173	210
FLSES 250 M	540	780	630	431	70	352	173	210
FLSES 280 S	540	860	710	431	70	352	173	210
FLSES 280 M	540	960	810	431	70	352	173	210
FLSES 315 ST	556	1068	910	446	68	352	173	210
FLSES 315 M	624	1203	1030	520	70	452	217	269
FLSES 315 L	632	1203	1030	555	70	452	217	269
FLSES 355 LA/LB	700	1305	1118	555	61	452	217	269
FLSES 355 LC/LD	700	1430	1242	555	61	452	217	269

FLSES

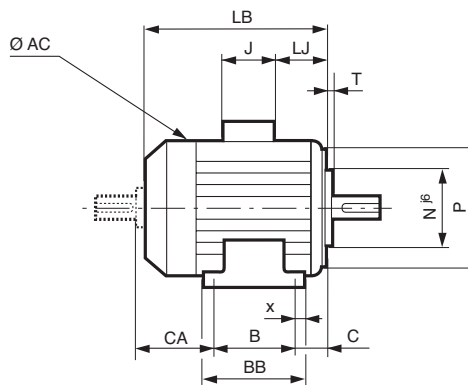
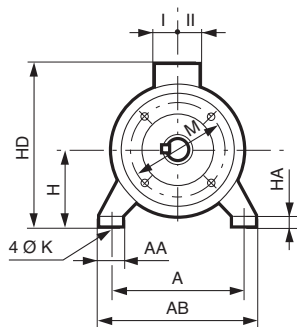
totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSES totally enclosed three-phase asynchronous motors - IP 55 Cage rotor

Dimensions in millimetres

– (FT) foot and tapped hole flange mounted



Main dimensions

Type	A	AB	B	BB	C	x	AA	K	HA	H	AC	HD	LB	LB1*	LJ	J	I	II	CA	Sym.
FLSES 80 L	125	157	100	130	50	20	32	9	11	80	170	231	216	178	7	136	68	68	83	FT 100
FLSES 90 S	140	170	100	162	37	27	26	9	10	90	185	251	251	225	9	136	68	68	126	FT 115
FLSES 90 L	140	170	125	162	52	27	26	9	10	90	185	251	251	225	9	136	68	68	110	FT 115
FLSES 100 L	160	196	140	185	63	29	40	12	12	100	204	258	300	253	8	136	68	68	-	FT 130
FLSES 100 LK	160	200	140	174	63	22	42	12	12	100	226	288	323	276	55	114	57	57	119	FT 130
FLSES 112 M	190	230	140	185	70	32	48	12	12	112	231	294	309	265	18	136	68	68	-	FT 130
FLSES 132 S	216	255	140	240	89	50	63	12	16	132	264	347	385	330	22	136	68	68	170	FT 215
FLSES 132 M	216	255	178	240	89	50	63	12	16	132	264	347	385	330	22	136	68	68	170	FT 215
FLSES 132 MU	216	255	178	240	89	50	63	12	16	132	264	347	412	351	22	136	68	68	170	FT 215

* LB1 : motor not ventilated

FLSES

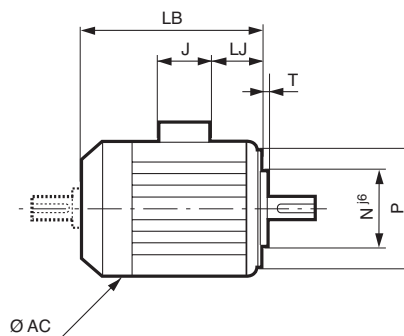
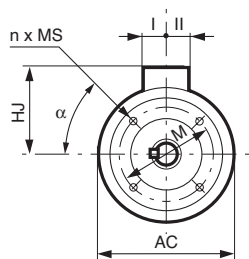
totally enclosed three-phase asynchronous motors

Dimensions

Dimensions of the FLSES totally enclosed three-phase asynchronous motors - IP 55 Cage rotor

Dimensions in millimetres

– (FT) tapped hole flange mounted



IEC symbol	Flange dimensions						
	M	N	P	T	n	α°	MS
FT 100	100	80	120	3	4	45	M6
FT 115	115	95	140	3	4	45	M8
FT 115	115	95	140	3	4	45	M8
FT 130	130	110	160	3.5	4	45	M8
FT 130	130	110	160	3.5	4	45	M8
FT 130	130	110	160	3.5	4	45	M8
FT 215	215	180	250	4	4	45	M8
FT 215	215	180	250	4	4	45	M8
FT 215	215	180	250	4	4	45	M9

* LB1 : motor not ventilated

Type	Main dimensions							
	AC	LB	LB1*	HJ	LJ	J	I	II*
FLSES 80 L	170	216	178	152	7	136	68	68
FLSES 90 S	185	251	225	158	9	136	68	68
FLSES 90 L	185	251	225	158	9	136	68	68
FLSES 100 L	204	300	253	158	8	136	68	68
FLSES 100 LK	226	323	276	159	55	114	57	57
FLSES 112 M	231	309	265	182	18	136	68	68
FLSES 132 S	264	385	330	205	22	136	68	68
FLSES 132 M	264	385	330	205	22	136	68	68
FLSES 132 MU	264	412	351	205	22	136	68	68

