

LSE - FLSE
3-phase TEFV induction motors
for increased safety
Technical catalogue

LSE - FLSE 3-phase TEFV induction motors for increased safety



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LSE - FLSE 3-phase TEFV induction motors for increased safety

General information



A1 - Quality assurance

A

Industrial concerns are having to cope with an ever more competitive environment. Productivity depends to a considerable degree on the right investment at the right time. LEROY-SOMER has the answer, building motors to precise standards of quality.

When carrying out quality checks on a machine's performance, the first step is to **measure the level of customer satisfaction**.

Careful study of this information tells us which points need looking at, improving and monitoring.

From the moment you place your order with our administrative staff until the motor is up and running (after design studies, launch and production activities) we keep you informed and involved.

Our own processes are constantly under review. All our staff are involved in both operational process analysis and continuous training programmes. These initiatives help them serve you better, and increased skills bring increased motivation.

At LEROY-SOMER, we think it vital for our customers to know the importance we attach to quality.

LEROY-SOMER has entrusted the certification of its expertise to various international organisations. Certification is granted by independent professional auditors, and recognises the high standards of the **company's quality assurance procedures**.

All activities resulting in the final version of the machine have therefore received official **ISO 9000** accreditation, **Edition 2000**. Products are also approved by official bodies who inspect their technical performance with regard to the various standards. This is a fundamental requirement for a company of international standing.

Our order tracking and manufacturing processes have been assessed for conformity by the notified body INERIS.



LSE - FLSE 3-phase TEFV induction motors for increased safety

General information



A2 - General standardization

LSE-FLSE(VIK) motors comply with all standards quoted in this catalogue

List of standards quoted in this document

Reference		Date	International standards
IEC 60034-1	EN 60034-1	1999	Electrical rotating machines: ratings and operating characteristics.
IEC 60034-5	EN 60034-5	2000	Electrical rotating machines: classification of degrees of protection provided by casings of rotating machines.
IEC 60034-6	EN 60034-6	1993	Electrical rotating machines (except traction): cooling methods.
IEC 60034-7	EN 60034-7	2000	Electrical rotating machines (except traction): symbols for mounting positions and assembly layouts.
IEC 60034-8		2001	Electrical rotating machines: terminal markings and direction of rotation.
IEC 60034-9	EN 60034-9	1997	Electrical rotating machines: noise limits.
IEC 60034-12	EN 60034-12	1999	Starting characteristics for single-speed 3-phase cage induction motors for supply voltages less than or equal to 660V.
IEC 60034-14	EN 60034-14	1996	Electrical rotating machines: mechanical vibrations of certain machines with a frame size above or equal to 56 mm. Measurement, evaluation and limits of vibrational intensity.
IEC 60038		1999	IEC standard voltages.
IEC 60072-1		1991	Dimensions and power series for electrical rotating machines: designation of casings between 56 and 400 and flanges between 55 and 1080.
IEC 60085		1984	Evaluation and thermal classification of electrical insulation.
IEC 60721-2-1		1987	Classification of natural environment conditions. Temperature and humidity.
IEC 60892		1987	Effects of an imbalance in the voltage system on the characteristics of three-phase squirrel-cage induction motors.
IEC 61000-2-10/11 and 2-2		1999	Electromagnetic compatibility (EMC): environment.
IEC guide 106		1989	Guidelines on the specification of environmental conditions for the determination of operating characteristics of equipment.
ISO 281		2000	Bearings - Basic dynamic loadings and nominal bearing life.
ISO 1680	EN 21680	1999	Acoustics - Test code for measuring airborne noise emitted by electrical rotating machines: a method for establishing an expert opinion for free field conditions over a reflective surface.
ISO 8821		1999	Mechanical vibration - Balancing. Conventions on shaft keys and related parts.
	EN 50102	1998	Degree of protection provided by the electrical housing against extreme mechanical impacts.
IEC 60079-0	EN 50014		Electrical equipment for explosive atmospheres: General regulations.
IEC 60079-7	EN 50019		Electrical equipment for explosive atmospheres: increased safety "e".
	EN 50281-1-1		Electrical apparatus for use in the presence of combustible dust.



LSE - FLSE 3-phase TEFV induction motors for increased safety

General information



A3 - Product approval and marking

A3.1 - APPROVAL

The LSE-FLSE increased safety motors presented in this catalogue conform to the national and/or international standards which govern the construction of this type of equipment.

EC type-examination certificates are drawn up by notified bodies, **in accordance with the European Community Council Directive 94/9/EC known as ATEX.**

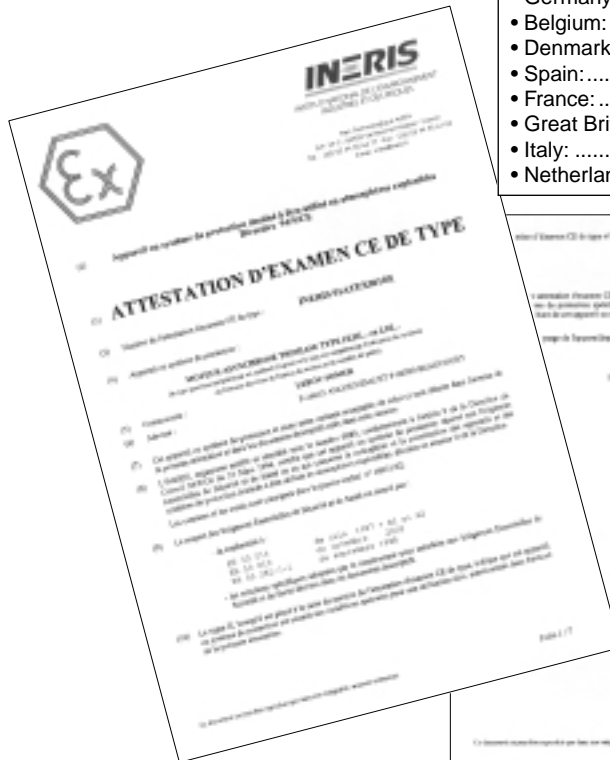
Approval is obtained when descriptive documents have been examined and validated, and tests performed. These include tests involving heating and explosion of the equipment.

EC-type examination certificates granted by the bodies listed opposite are recognized by all EC countries.

Approved equipment is authorized to carry the **CE** mark or the distinctive community mark **Ex**.

List of official accreditation laboratories

- Germany: **PTB - DMT/BVS**
- Belgium: **ISSEp**
- Denmark: **DEMKO**
- Spain: **LOM**
- France: **INERIS - L.C.I.E.**
- Great Britain: **EECS - SCS**
- Italy: **CESI**
- Netherlands: **KEMA**



A3.2 - MARKING

LEROIY SOMER
16015 ANGOULEME

Mot. 3 ~ LSE 132 SM
N° 034729 JA 002

CE
0080

IP 55 IK 08 cl.F 40°C S1 kg 39

V	Hz	min ⁻¹	kW	cos φ	A
Δ 230	50	1464	5.5	0.87	17.80
Y 400	-	1464	-	0.87	10.30

Ex II 2G EEx e II T3 INERIS 01ATEX 0010X

Increased safety "e" (EN50019)
LSE-FLSE nameplate : Marking complying with ATEX directive 94/9/CE
(in addition to IEC 60034-1)

(2) Identification no. of the notified body responsible for inspecting the production : 0080 = INERIS

VIK (in case of VIK accreditation)

(1) No. of CE type examination certificate body drawn up by a notified body

T°C temperature range if other than (-20 +40)

Ia/In-T_E EN 50019 §6.2.1

Ex II 2 G EEx e II T3 (T125°C)

For GD (Dust) Max. surface temperature acc. to EN 50281

- Temperature class (T3 or T4)
- None
- Equipment group (II)
- Protection type e
- Product which conforms to EN 50014 and at least protection type : e
- Gas or gas and dust (Gas, GasDust)
- Equipment category (2)
- Equipment group (II)
- Special symbol for protection against risk of explosion

Marking specific to methods of protection

ATEX markings specific to explosive atmospheres

Details for (1) Certificate no. and (2) Notified body no.

	LSE-FLSE 80 to 250	
	II 2G	
	(1)	(2)
LS Logo	INERIS 01ATEX0010 X	0080

LSE - FLSE 3-phase TEFV induction motors for increased safety

General information



A4 - Definition of atmospheres and zones

A4.1 - ATMOSPHERES AT RISK OF EXPLOSION

This includes all explosive and explosible conditions, the explosion character being permanent or potential.

Explosive atmospheres:

An explosive atmosphere is an atmosphere where a mixture of air and inflammable substances is to be found (in gas form, vapours, fog or mist) in such proportions that excessive temperature, arcs or sparks cause it to explode. **The danger is permanent.**

Explosible atmospheres:

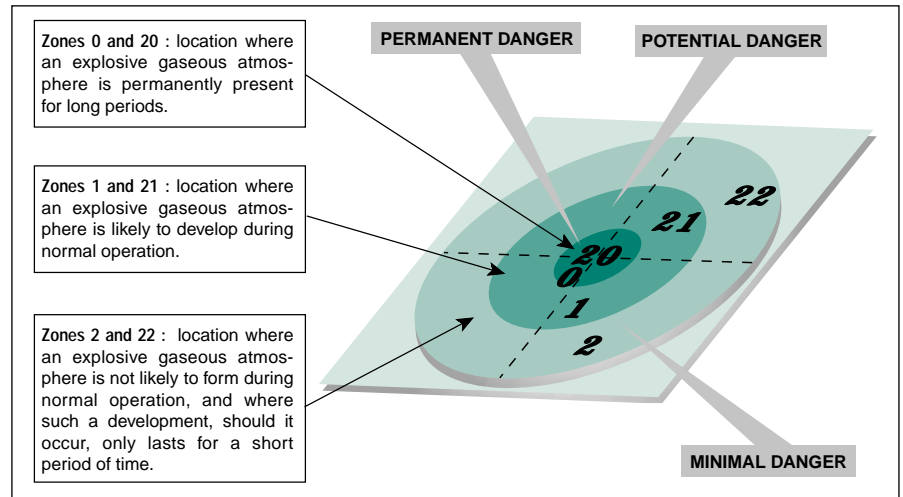
An explosible atmosphere is an atmosphere which may become explosive due to the particular local conditions. **The danger is potential.**

A4.2 - DEFINITION OF ZONES AT RISK OF EXPLOSION

The international standard EN 60079-10 defines the danger zones according to the risk of encountering an explosive atmosphere as shown in the diagram opposite:

LSE-FLSE motors can be used in zone 1 or 21

Note: Each country has similar and complementary publications giving instructions on the classification of dangerous locations.



Note: The zone is classified under the responsibility of the manager of the company where the equipment is installed.

A4.3 - TEMPERATURE CLASSES

A4.3.1 - Definition of temperature classes according to IEC 60079-0

The temperature class is based on the maximum temperature rise in the equipment and on the ambient operating temperature.

The maximum surface temperature of an electric device must always be lower than the ignition temperature of the mix of gases or vapour in which it will be used.

In order to be able to select various devices according to their surface temperature (internal and external), **six temperature classes** have been created.

Temperature class	T1	T2	T3	T4	T5	T6
Ignition temperature	> 450 °C	> 300 °C	> 200 °C	> 135 °C	> 100 °C	> 85 °C
Max. surface temperature permitted on the equipment	450 °C	300 °C	200 °C	135 °C	100 °C	85 °C

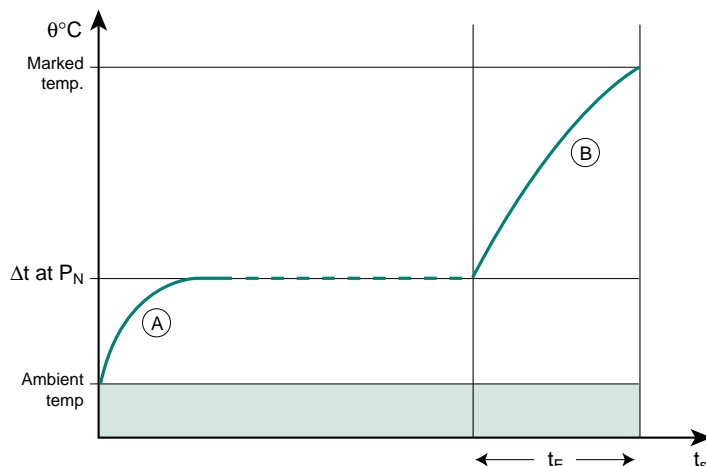
Note: For "GD", T_x^* and T_y^* applications, the lowest of the marked temperature tolerances is taken into account.

* T_x = temperature class in gas-filled atmospheres
 T_y = temperature class in dust-filled atmospheres

A4.3.2 - Definition of the marked temperature according to IEC 60079-7

- $\theta^\circ\text{C}$ = temperature
- Δt at P_N = temperature at rated power
- t_s = time
- t_E = locked rotor time
- (A) = temperature rise in normal duty
- (B) = temperature rise during locked rotor test

In the event of rotor failure and locking, an actuator should be able to disconnect the motor from the supply in a period $t < t_E$.



LSE - FLSE 3-phase TEFV induction motors for increased safety

General information



A5 - Definition of "Index of Protection" (IP/IK)

Indices of protection of electrical equipment enclosures

LSE-FLSE are IP 55 and IK 08 as standard

First number : Protection against solid objects			Second number: Protection against liquids			Mechanical protection		
IP	Tests	Definition	IP	Tests	Definition	IK	Tests	Definition
0		No protection	0		No protection	00		No protection
1	∅ 50 mm 	Protected against solid objects of over 50mm (eg : accidental hand contact)	1 		Protected against vertically dripping water (condensation)	01		Impact energy: 0.15 J
2	∅ 12 mm 	Protected against solid objects of over 12 mm (eg : finger)	2 		Protected against water dripping up to 15° from the vertical	02		Impact energy: 0.20 J
3	∅ 2.5 mm 	Protected against solid objects of over 2.5 mm (eg : tools, wire)	3 		Protected against rain falling at up to 60° from the vertical	03		Impact energy: 0.37 J
4	∅ 1 mm 	Protected against solid objects of over 1 mm (eg : small tools, thin wire)	4 		Protected against water splashes from all directions	04		Impact energy: 0.50 J
5		Protected against dust (no deposits of harmful material)	5 		Protected against jets of water from all directions	05		Impact energy: 0.70 J
6		Totally protected against any dust penetration	6 		Protected against jets of water comparable to heavy seas	06		Impact energy: 1 J
			7 		Protected against the effects of immersion of depths of between 0.15 and 1 m	07		Impact energy: 2 J
			8 		Protected against the effects of prolonged immersion at depth	08		Impact energy: 5 J
						09		Impact energy: 10 J
						10		Impact energy: 20 J

Example:

IP 55 machine

IP : Index of protection

- 5 : Machine protected against dust and accidental contact.
Test result: **no dust enters** in harmful quantities, no risk of direct contact with rotating parts. The test will last for 2 hours.
- 5 : Machine protected against jets of water from all directions from hoses at 3 m distance with a flow rate of 12.5 l/min at 0.3 bar.
The test will last for 3 minutes. Test result: **no damage from water** projected onto the machine.

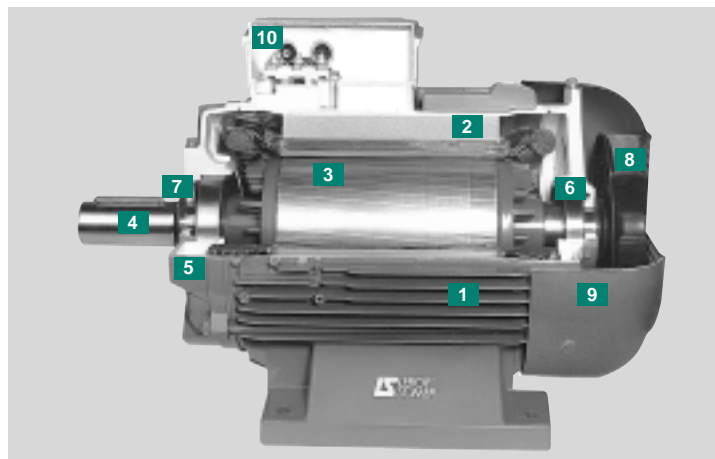
LSE - FLSE 3-phase TEFV induction motors for increased safety Construction



B1 - Components

B1.1 - DESCRIPTION OF LSE - FLSE 3-PHASE MOTORS

Component	Materials	Remarks
1 Finned housing	Aluminium alloy or cast iron	- with integral or screw-on feet, or without feet <ul style="list-style-type: none"> • 4 or 6 fixing holes for housings with feet • lifting rings - earth terminal
2 Stator	Insulated low-carbon magnetic steel laminations Insulated electroplated copper	- low carbon content guarantees long-term lamination pack stability - welded packs - semi-enclosed slots - class F insulation
3 Rotor	Insulated low-carbon magnetic steel laminations Aluminium	- inclined cage bars - rotor cage pressure die-cast in aluminium (or alloy for special applications) - shrink-fitted or keyed to shaft - rotor balanced dynamically, class N - 1/2 key
4 Shaft	Steel	- for frame size < 132 : <ul style="list-style-type: none"> • shaft end fitted with screw and washer • closed keyway - for frame size ≥ 132: <ul style="list-style-type: none"> • tapped hole • open keyway
5 End shields	Aluminium alloy Cast iron	- LSE series drive end and non drive end frame sizes 63 - 71 - LSE series non drive end frame sizes 80 - 90 - LSE series frame sizes 80 - 90 drive end (optional for 80 and 90 at non drive end) - LSE series frame size ≥ 100 • all FLSE series frame sizes
6 Bearings		- ball bearings - bearings preloaded at non drive end
7 Labyrinth seal Lipseals	Plastic or steel Synthetic rubber	- sealed with gaskets - labyrinth seals or deflector at drive end or non drive end
8 Fan	Composite material or aluminium alloy	- 2 directions of rotation: straight blades
9 Fan cover	Pressed steel	- fitted, on request, with a drip cover for operation in vertical position, shaft end facing down
10 Terminal box	Aluminium alloy or cast iron	- IP 55 or IP 65 for "GD" applications - can be turned, opposite the feet - fitted with a terminal block with 6 terminals certified EEx e safety - terminal box supplied fitted with certified EEx e safety cable anchor glands - 1 earth terminal in each terminal box



B1.2 - EXTERNAL FINISH

The standard paint colour for the LSE-FLSE range is:

RAL 2004

LSE - FLSE 3-phase TEFV induction motors for increased safety Construction



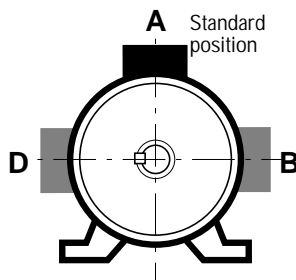
B2 - Mains connection

B2.1 - TERMINAL BOX AND CABLE GLAND POSITIONS

Placed as standard on the top of the motor, the terminal box has IP 55 (G) or IP 65 (GD) protection and is fitted with a cable gland (see table in B2.2).

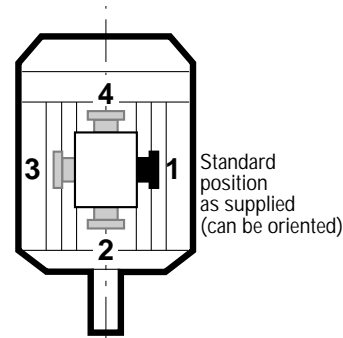
The standard position of the cable gland is on the right, seen from the drive end (position A1) but, owing to the symmetrical construction of the box, it can usually be placed in any of the 4 directions.

▼ Positions of the terminal box in relation to the drive end (motor in IM 1001 position)



Note: for FLSE motors, only position A is possible.

▼ Positions of the cable gland in relation to the drive end



Note: position 2 is not recommended for FF or FT flange mounted motors.

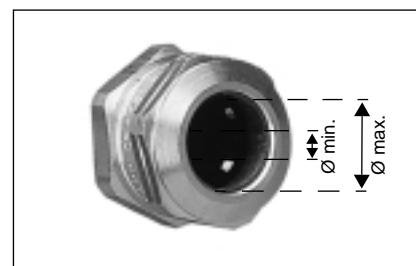
B2.2 - CABLE GLAND FOR RATED SUPPLY VOLTAGE OF 400V

Frame size	Single speed motor		Cable gland for accessories: PTO / PTF / etc
	D.O.L. starting	YΔ starting	
80	CMDEL ISO M20 x 1.5	-	CMDEL ISO M16 x 1.5
90	CMDEL ISO M20 x 1.5	-	CMDEL ISO M16 x 1.5
100	CMDEL ISO M20 x 1.5	2 x CMDEL ISO 20	CMDEL ISO M16 x 1.5
112 - 132 S	CMDEL ISO M20 x 1.5	2 x CMDEL ISO 20	CMDEL ISO M16 x 1.5
132 M	CMDEL ISO M25 x 1.5	2 x CMDEL ISO 25	CMDEL ISO M16 x 1.5
160 / 180 MR	2 x CMDEL ISO M25 x 1.5	2 x CMDEL ISO 25	CMDEL ISO M16 x 1.5
180	2 x CMDEL ISO M32 x 1.5	2 x CMDEL ISO 25	CMDEL ISO M16 x 1.5
200	2 x CMDEL ISO M32 x 1.5	2 x CMDEL ISO 25	CMDEL ISO M16 x 1.5
225	2 x CMDEL ISO M40 x 1.5	2 x CMDEL ISO 32	CMDEL ISO M16 x 1.5

CMDEL : cable anchor glands approved EEx e.
: cable gland made of brass.

Cable size and diameter of drill holes on brass cable gland mounting plates

Type of cable gland	Cable size	
	min. cable Ø (mm)	max. cable Ø (mm)
CMDEL ISO M16 x 1.5	6	11
CMDEL ISO M20 x 1.5	7.5	13
CMDEL ISO M25 x 1.5	12.5	18
CMDEL ISO M32 x 1.5	17.5	25
CMDEL ISO M40 x 1.5	24.5	33.5



For frame sizes 63, 71, 250 and 280: please consult Leroy-Somer.

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

	PAGES
2 poles - 3000 min ⁻¹ - EEx e II T3	12
2 poles - 3000 min ⁻¹ - EEx e II T3 VIK*	13
4 poles - 1500 min ⁻¹ - EEx e II T3	14
4 poles - 1500 min ⁻¹ - EEx e II T3 VIK*	15
6 poles - 1000 min ⁻¹ - EEx e II T3	16
6 poles - 1000 min ⁻¹ - EEx e II T3 VIK*	17
2 poles - 3000 min ⁻¹ - EEx e II T4	18
4 poles - 1500 min ⁻¹ - EEx e II T4	19
6 poles - 1000 min ⁻¹ - EEx e II T4	20

* VIK: extension of EN 50019 requirements to particular specifications intended for German manufacturing companies:

- ranges with special power ratings according to frame size (DIN 42673)
- increased duration t_E (≥ 7 sec)
- 2nd nameplate in the terminal box
- ISO M25 cable gland from frame size 80 mm upwards
- oil-resistant seals
- terminal blocks not split from frame size 160 mm upwards

Other polarities (1 or 2-speed): please consult Leroy-Somer.

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

2
poles
3000 min⁻¹

EEx e IIT3

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
LSE 63	380	0.25											
	400	0.25											
	415	0.25											
LSE 71	380	0.37											
	400	0.37											
	415	0.37											
LSE 71	380	0.55											
	400	0.55											
	415	0.55											
LSE 80 L	380	0.75	2860	2.5	1.7	0.86	79.2	6.8	2.7	2.8	8.3	0.0009	9.7
	400	0.75	2872	2.5	1.6	0.84	79.4	7.1	2.9	3	7.6	0.0009	9.7
	415	0.75	2890	2.5	1.6	0.81	79.5	7.4	3.1	3.2	7	0.0009	9.7
LSE 80 L	380	1.1	2860	3.75	2.4	0.89	78	7.1	2.9	2.8	12.6	0.0011	11.3
	400	1.1	2870	3.75	2.3	0.86	78.5	7.5	3.2	3.1	11.1	0.0011	11.3
	415	1.1	2885	3.75	2.3	0.84	78.7	7.9	3.4	3.3	10	0.0011	11.3
LSE 90 S	380	1.5	2845	5	3.1	0.90	82.3	7	2.8	2.8	11.6	0.0017	14
	400	1.5	2860	5	2.9	0.88	83.6	7.5	3.1	3.1	10.2	0.0017	14
	415	1.5	2880	5	2.9	0.87	83.5	8.2	3.5	3.5	8.5	0.0017	14
LSE 90 L	380	2.2	2869	7.5	4.4	0.89	85.5	6.2	2.1	2.7	11	0.0022	17.8
	400	2.2	2884	7.5	4.2	0.87	85.7	6.7	2.4	3.1	9.4	0.0022	17.8
	415	2.2	2895	7.5	4.1	0.87	85.8	7.5	2.6	3.3	7.5	0.0022	17.8
LSE 100 L	380	3	2871	10.1	5.9	0.90	85.8	5	2.1	2.1	9.7	0.0029	24
	400	3	2887	10.1	5.6	0.89	86.2	5.5	2.3	2.3	8	0.0029	24
	415	3	2903	10.1	5.6	0.87	86.3	5.9	2.5	2.5	7	0.0029	24
LSE 112 MU	380	4	2920	13.5	7.4	0.92	88.5	6.9	1.8	2.7	9.9	0.0088	39
	400	4	2928	13.5	7.1	0.92	88.6	7.5	2	3	8.4	0.0088	39
	415	4	2935	13.5	6.9	0.91	88.6	8.2	2.2	3.2	7	0.0088	39
LSE 132 SM	380	5.5	2916	18.6	10.2	0.92	89.4	5.9	1.5	2.4	10.4	0.016	49
	400	5.5	2926	18.6	9.7	0.91	89.8	6.5	1.7	2.6	8.6	0.016	49
	415	5.5	2933	18.6	9.4	0.90	89.9	7.2	1.8	2.8	7	0.016	49
LSE 132 SM	380	7.5	2921	25.4	13.6	0.92	90.2	6.25	1.6	2.4	10.3	0.018	54
	400	7.5	2929	25.4	13.1	0.92	90.4	6.9	1.7	2.6	8.5	0.018	54
	415	7.5	2936	25.4	12.6	0.91	90.6	7.6	1.9	2.9	7	0.018	54
LSE 160 MP	380	11	2927	36	19.8	0.93	90.2	6.4	1.5	2.4	10.1	0.023	72
	400	11	2935	36	19.1	0.92	90.5	7.1	1.7	2.6	8.2	0.023	72
	415	11	2941	36	18.5	0.91	90.6	7.7	1.8	2.8	7	0.023	72
LSE 160 L	380	15	2925	49	28	0.90	90.6	7.1	2.3	2.8	8.2	0.044	88
	400	15	2933	48.8	26.7	0.89	91	7.8	2.6	3.1	6.8	0.044	88
	415	15	2941	48.7	26	0.88	91.2	8.3	2.8	3.4	6	0.044	88
LSE 180 MT	380	18.5	2921	60.5	34	0.91	90.8	7.1	2.3	2.6	6.8	0.052	99
	400	18.5	2930	60.3	32.5	0.90	91.3	7.8	2.6	2.9	5.7	0.052	99
	415	18.5	2939	60.1	31.6	0.89	91.6	8.3	2.8	3.2	5	0.052	99
LSE 200 LT	380	22	2939	71.5	38.6	0.93	93.5	7.7	2.3	3	13.7	0.089	154
	400	22	2946	71.3	36.8	0.92	93.7	8.5	2.6	3.3	11.2	0.089	154
	415	22	2952	71.2	36	0.91	93.8	9	2.8	3.5	10	0.089	154
LSE 200 L	380	30	2951	97.1	53.1	0.92	93.3	7.1	2.4	2.8	12.3	0.12	180
	400	30	2956	96.9	50.9	0.91	93.5	7.8	2.7	3.1	10.2	0.12	180
	415	30	2961	96.8	49.5	0.90	93.7	8.3	2.9	3.4	9	0.12	180
LSE 225 MT	380	37	2942	120	65.6	0.92	93.2	7.1	2.4	2.8	6.8	0.14	200
	400	37	2951	120	62.7	0.91	93.6	7.8	2.7	3.1	5.7	0.14	200
	415	37	2957	120	60.9	0.90	93.9	8.3	3	3.4	5	0.14	200
LSE 250 MZ	380	45											
	400	45											
	415	45											
LSE 280 SC	380	55											
	400	55											
	415	55											

Please consult Leroy-Somer

Please consult Leroy-Somer

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

2
poles
3000 min⁻¹

EEx e IIT3 VIK

MAINS SUPPLY 380 / 400 / 420 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
LSE 90 S	380	1.5	2845	5	3.1	0.90	82.3	7	2.8	2.8	11.7	0.0017	14
	400	1.5	2865	5	3	0.87	82.8	7.5	3.1	3.1	10.4	0.0017	14
	420	1.5	2886	5	2.9	0.85	83.4	8.3	3.6	3.6	8.5	0.0017	14
LSE 90 L	380	1.85	2881	6.3	3.7	0.88	86.1	6.4	2.2	2.6	9.3	0.0022	17.8
	400	1.85	2890	6.3	3.6	0.86	86.2	6.5	2.4	3	9	0.0022	17.8
	420	1.85	2903	6.3	3.5	0.85	86.2	6.7	2.7	3.5	8.5	0.0022	17.8
LSE 100 L	380	2.5	2859	8.5	4.9	0.91	84.5	5.4	2.5	2.5	11.2	0.0026	22
	400	2.5	2865	8.5	4.8	0.89	84.7	5.8	2.7	2.7	9.7	0.0026	22
	420	2.5	2890	8.5	4.7	0.87	84.9	6.2	3.1	3.1	8.5	0.0026	22
LSE 112 MG	380	3.3	2915	11.2	6.5	0.95	82.1	8.9	2.9	3.8	11.4	0.0076	35
	400	3.3	2925	11.2	6.3	0.93	82.4	9.2	3.2	4.1	10.6	0.0076	35
	420	3.3	2935	11.2	6.0	0.91	82.7	10	3.5	4.6	9	0.0076	35
LSE 132 SM	380	4.6	2925	15.6	8.5	0.91	89.8	6.2	1.6	2.4	11.7	0.016	49
	400	4.6	2932	15.6	8.2	0.90	90	6.8	1.7	2.6	9.7	0.016	49
	420	4.6	2939	15.6	7.9	0.90	90.2	7.5	1.9	2.9	8	0.016	49
LSE 132 SM	380	5.5	2929	18.6	10.1	0.91	90.2	6.35	1.5	2.4	11.5	0.018	54
	400	5.5	2940	18.6	9.9	0.89	90	7.2	1.9	3	9	0.018	54
	420	5.5	2957	18.6	9.7	0.87	89.8	7.6	2.4	3.7	8	0.018	54
LSE 160 MP	380	7.5	2933	25.4	13.6	0.92	90.8	6.6	1.6	2.4	13.4	0.023	72
	400	7.5	2940	25.4	13	0.91	91	7.3	1.8	2.7	11	0.023	72
	420	7.5	2947	25.4	12.5	0.91	91.2	8.1	1.9	3	9	0.023	72
LSE 160 MP	380	10	2930	34	18.2	0.92	90.9	6.9	1.6	2.5	10.1	0.023	72
	400	10	2937	34	17.5	0.92	91	7.5	1.8	2.7	8.6	0.023	72
	420	10	2945	34	16.7	0.91	91.1	8.3	2	3.1	7	0.023	72
LSE 160 L	380	12.5	2944	40.5	23.3	0.89	91.4	8.5	2.7	3.4	13.8	0.044	88
	400	12.5	2950	40.5	22.4	0.88	91.6	9.3	3.1	3.8	11.6	0.044	88
	420	12.5	2957	40.4	21.8	0.86	91.7	10	3.4	4.2	10	0.044	88
LSE 180 MT	380	15	2943	48.7	27.6	0.90	91.7	8.4	2.9	3.3	13.9	0.052	99
	400	15	2950	48.6	26.5	0.89	91.9	9.3	3.2	3.6	11.6	0.052	99
	420	15	2956	48.5	25.8	0.87	92	10	3.6	4	10	0.052	99
LSE 200 LT	380	20	2949	64.8	34.9	0.93	93.6	8.3	2.5	3.3	14.5	0.089	154
	400	20	2954	64.7	33.5	0.92	93.7	9.2	2.8	3.6	11.8	0.089	154
	420	20	2959	64.5	32.2	0.91	93.7	10	3.2	4	10	0.089	154
LSE 200 L	380	24	2965	77.3	42.8	0.91	93.7	8.4	3	3.5	13.9	0.120	180
	400	24	2968	77.2	41	0.90	93.8	9.3	3.4	3.9	11.6	0.120	180
	420	24	2971	77.1	40	0.88	93.8	10	3.8	4.3	10	0.120	180
LSE 225 MT	380	28	2959	90.4	49.5	0.92	93.5	8.4	2.9	3.4	13.9	0.140	200
	400	28	2964	90.2	47.4	0.91	93.7	9.3	3.3	3.8	11.6	0.140	200
	420	28	2969	90.1	45.6	0.90	93.8	10	3.6	4.1	10	0.140	200
LSE 250 MZ	380	36											
	400	36											
	420	36											
LSE 280 SC	380	47											
	400	47											
	420	47											

Please consult Leroy-Somer

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

4 poles
1500 min⁻¹

EEx e IIT3

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
LSE 63	380	0.25											
	400	0.25											
	415	0.25											
LSE 71	380	0.37											
	400	0.37											
	415	0.37											
LSE 71	380	0.55											
	400	0.55											
	415	0.55											
LSE 80 L	380	0.75	1415	5	2	0.76	74	5.32	2	2.1	11.9	0.0024	10.9
	400	0.75	1430	5	2	0.72	74	5.6	2.2	2.3	10.7	0.0024	10.9
	415	0.75	1430	5	2	0.70	74	5.8	2.4	2.6	10	0.0024	10.9
LSE 90 S	380	1.1	1435	7.5	2.5	0.84	80.7	4.7	1.5	1.8	9.9	0.0032	13.5
	400	1.1	1443	7.5	2.4	0.83	81.5	5.2	1.6	2	8.1	0.0032	13.5
	415	1.1	1449	7.5	2.3	0.81	81.7	5.6	1.8	2.2	7	0.0032	13.5
LSE 90 L	380	1.5	1445	10	3.7	0.79	78	6.1	1.7	1.9	8	0.0037	15.2
	400	1.5	1450	10	3.7	0.75	78	6.4	1.7	2	7.2	0.0037	15.2
	415	1.5	1455	10	3.8	0.72	77	6.5	1.9	2.2	7	0.0037	15.2
LSE 100 L	380	2.2	1427	15	4.6	0.88	83.3	5.1	1.9	2	13.7	0.0055	22.5
	400	2.2	1444	15	4.5	0.85	83.5	5.8	2.1	2.2	10.6	0.0055	22.5
	415	2.2	1458	15	4.6	0.78	84.4	6.3	2.3	2.4	9	0.0055	22.5
LSE 100 LR	380	3	1412	20	6.4	0.86	81.9	5.1	2	2	9.4	0.0073	27.5
	400	3	1423	20	6.2	0.85	83	5.2	2	2.1	9	0.0073	27.5
	415	3	1433	20	5.9	0.84	83.8	5.9	2.2	2.3	7	0.0073	27.5
LSE 112 MU	380	4	1453	27.2	7.9	0.88	86.9	6	1.8	2	11.8	0.014	36.5
	400	4	1458	27.2	7.7	0.86	86.9	6.7	2	2.1	9.5	0.014	36.5
	415	4	1466	27.2	7.7	0.82	87.4	7.3	2.2	2.4	8	0.014	36.5
LSE 132 SM	380	5.5	1451	37.4	10.5	0.91	87.9	6	1.6	2.2	12.2	0.019	54.7
	400	5.5	1464	37.4	10.3	0.87	88.4	6.5	1.8	2.5	10.4	0.019	54.7
	415	5.5	1471	37.4	10.7	0.81	87.7	7	1.9	2.7	9	0.019	54.7
LSE 132 M	380	7.5	1455	50	15	0.88	86	7.9	1.7	2.4	7.6	0.023	59.9
	400	7.5	1457	50	14.8	0.85	86	8.4	1.9	2.6	6.8	0.023	59.9
	415	7.5	1460	50	14.6	0.83	86	8.9	2.1	2.8	6	0.023	59.9
LSE 160 MR	380	11	1465	74.7	22.1	0.84	89.2	7.6	2.2	2.9	8	0.035	78
	400	11	1468	74.7	22	0.82	89	8.1	2.4	3.1	7.1	0.035	78
	415	11	1472	74.7	21.7	0.80	88.8	8.8	2.6	3.4	6	0.035	78
LSE 160 L	380	15	1449	98.9	29.4	0.87	89.2	6.5	2.3	2.7	11.5	0.085	100
	400	15	1455	98.5	28	0.86	89.8	7.3	2.6	3.2	9.1	0.085	100
	415	15	1460	98.1	27.2	0.85	90.1	7.8	2.9	3.5	8	0.085	100
LSE 180 MR	380	18.5	1453	122	35.2	0.88	90.7	7.2	2.7	3	7.5	0.096	112
	400	18.5	1458	121	34	0.86	91.2	7.9	3	3.4	6.2	0.096	112
	415	18.5	1463	121	33.2	0.85	91.3	8.8	3.2	3.7	5	0.096	112
LSE 180 LU	380	22	1460	144	41.5	0.88	91.6	6.5	2.7	2.7	10.6	0.151	165
	400	22	1464	144	39.7	0.87	91.9	7.1	3	3	9	0.151	165
	415	22	1468	143	39.1	0.85	92.1	7.5	3.3	3.2	8	0.151	165
LSE 200 L	380	30	1468	195	57.2	0.86	92.7	6	2.5	2.4	13.6	0.240	205
	400	30	1472	195	54.8	0.85	93	6.6	2.7	2.6	11.2	0.240	205
	415	30	1475	194	53.3	0.84	93.2	7	3	2.9	10	0.240	205
LSE 225 SR	380	37	1467	241	70.4	0.86	92.9	6	2.7	2.6	13.6	0.290	235
	400	37	1471	240	68.2	0.84	93.2	6.6	3	2.9	11.2	0.290	235
	415	37	1474	240	66.5	0.83	93.3	7	3.2	3.1	10	0.290	235
LSE 250 ME	380	45											
	400	45											
	415	45											
LSE 280 SC	380	55											
	400	55											
	415	55											

Please consult Leroy-Somer

Please consult Leroy-Somer

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

4 poles
1500 min⁻¹

EEx e IIT3 VIK

MAINS SUPPLY 380 / 400 / 420 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
LSE 90 S	380	1	1444	6.8	2.3	0.83	81.6	5.2	1.7	2	11.7	0.0032	13.5
	400	1	1450	6.8	2.3	0.81	81.7	5.8	1.9	2.3	9.4	0.0032	13.5
	420	1	1456	6.8	2.2	0.78	81.9	6.3	2.1	2.5	8	0.0032	13.5
LSE 90 L	380	1.35	1444	9.2	3	0.83	83.5	6.3	1.9	2.2	10.5	0.0037	15.2
	400	1.35	1450	9.2	2.9	0.81	83.5	6.6	2.1	2.4	9.6	0.0037	15.2
	420	1.35	1456	9.2	2.9	0.78	83.5	6.8	2.4	2.7	9	0.0037	15.2
LSE 100 L	380	1.85	1445	12.6	4.1	0.81	83.9	6.3	2.3	2.4	14.2	0.0055	22.5
	400	1.85	1451	12.6	4	0.78	84	7	2.6	2.7	11.5	0.0055	22.5
	420	1.85	1457	12.6	4	0.76	84	7.5	2.9	3	10	0.0055	22.5
LSE 100 L	380	2.5	1428	16.9	5.8	0.82	80.5	5.4	2.5	2.5	13.2	0.0067	24.9
	400	2.5	1436	16.9	5.6	0.79	81.2	5.8	2.7	2.7	11.4	0.0067	24.9
	420	2.5	1444	16.9	5.5	0.77	81.7	6.2	3	3.1	10	0.0067	24.9
LSE 112 MU	380	3.6	1450	24.4	7.3	0.87	86.3	6.6	1.9	2.7	13.6	0.014	36.5
	400	3.6	1455	24.4	7.1	0.84	86.4	7.1	2	2.9	11.8	0.014	36.5
	420	3.6	1460	24.4	7	0.82	86.5	7.7	2.1	3	10	0.014	36.5
LSE 132 SM	380	5	1450	33.9	10	0.89	85.4	8	2.3	2.8	13.2	0.019	54.7
	400	5	1456	33.9	9.7	0.87	85.5	8.5	2.6	3.1	11.7	0.019	54.7
	420	5	1462	33.9	9.4	0.85	85.6	9.2	2.8	3.4	10	0.019	54.7
LSE 132 M	380	6.8	1445	46.2	13.5	0.90	84.8	7.3	2.8	2.6	12.2	0.023	59.9
	400	6.8	1457	46.2	13	0.88	84.9	7.9	3.1	2.8	10.4	0.023	59.9
	420	6.8	1460	46.2	12.6	0.87	85	8.5	3.4	3	9	0.023	59.9
LSE 160 MR	380	10	1465	67.9	20.4	0.84	88.6	9.3	2.9	3.7	9.2	0.035	78
	400	10	1469	67.9	20.5	0.81	88	9.5	3.2	4	8.9	0.035	78
	420	10	1473	67.9	20.7	0.76	87.2	10	3.6	4.5	8	0.035	78
LSE 160 L	380	13.5	1457	88.5	26.2	0.87	90	7.2	2.5	3	13.9	0.085	100
	400	13.5	1461	88.2	25.4	0.85	90.4	7.8	2.8	3.3	11.9	0.085	100
	420	13.5	1465	88	24.7	0.83	90.5	8.5	3.1	3.6	10	0.085	100
LSE 180 MR	380	15	1466	97.7	29.2	0.85	91.7	8.7	3.3	3.8	9.3	0.096	112
	400	15	1469	97.5	28.4	0.83	91.8	9.4	3.7	4.2	7.9	0.096	112
	420	15	1472	97.3	28.1	0.80	91.7	10	4	4.6	7	0.096	112
LSE 180 LU	380	17.5	1472	114	33.9	0.85	92.3	7.9	3.4	3.4	13.8	0.151	165
	400	17.5	1475	113	32.5	0.84	92.4	8.6	3.8	3.8	11.7	0.151	165
	420	17.5	1478	113	32.1	0.81	92.4	9.3	4.2	4.2	10	0.151	165
LSE 200 L	380	24	1478	155	46.4	0.84	93.5	7.4	3	3	13.5	0.240	205
	400	24	1481	155	44.6	0.83	93.6	8	3.4	3.3	11.5	0.240	205
	420	24	1483	155	44	0.81	93.6	8.6	3.8	3.7	10	0.240	205
LSE 225 SR	380	30	1477	194	58.7	0.83	93.6	7.3	3.3	3.2	13.2	0.290	235
	400	30	1479	194	57.1	0.81	93.6	7.9	3.7	3.6	11.3	0.290	235
	420	30	1481	194	55.8	0.79	93.6	8.4	4.1	4	10	0.290	235
LSE 225 MR	380	36	1468	234	69.2	0.85	93	6.2	2.7	2.7	13.9	0.290	235
	400	36	1471	234	66.3	0.84	93.3	6.8	3	3	11.5	0.290	235
	420	36	1474	233	64.6	0.82	93.4	7.3	3.3	3.3	10	0.290	235
LSE 250 ME	380	44											
	400	44											
	420	44											
LSE 280 SC	380	58											
	400	58											
	420	58											

Please consult Leroy-Somer

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

6
poles
1000 min⁻¹

EEx e IIT3

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
LSE 71	380	0.18											
	400	0.18											
	415	0.18											
LSE 71	380	0.25											
	400	0.25											
	415	0.25											
Please consult Leroy-Somer													
LSE 80 L	380	0.37	941	3.7	1.2	0.70	65.2	3.3	1.4	1.7	14	0.0032	9.7
	400	0.37	948	3.7	1.2	0.68	65.3	3.7	1.6	2	11.2	0.0032	9.7
	415	0.37	955	3.7	1.2	0.65	65.1	3.9	1.8	2.2	10	0.0032	9.7
LSE 80 L	380	0.55	950	5.5	1.8	0.68	69.9	4.1	1.9	2.2	10	0.0042	11
	400	0.55	955	5.5	1.8	0.64	68.6	4.5	2.1	2.4	8.4	0.0042	11
	415	0.55	959	5.5	1.9	0.60	66.3	4.6	2.4	2.7	8	0.0042	11
LSE 90 S	380	0.75	928	7.5	2.1	0.71	75.4	4.3	2.4	2.4	12	0.0039	13.5
	400	0.75	935	7.5	2.2	0.67	75	4.6	2.6	2.6	10.5	0.0039	13.5
	415	0.75	942	7.5	2.2	0.63	74.3	4.7	2.9	2.9	10	0.0039	13.5
LSE 90 L	380	1.1	907	11	3	0.76	74.7	3.9	2.1	2.1	11.5	0.0048	15.2
	400	1.1	918	11	3	0.72	75.2	4.1	2.2	2.2	10.4	0.0048	15.2
	415	1.1	926	11	3	0.68	74.8	4.4	2.5	2.5	9	0.0048	15.2
LSE 100 L	380	1.5	919	15	4.1	0.71	78	4.3	2.4	2.4	7.5	0.0069	19.7
	400	1.5	928	15	4.2	0.67	76.8	4.6	2.7	2.7	6.5	0.0069	19.7
	415	1.5	934	15	4.4	0.63	76.1	4.8	3	3	6	0.0069	19.7
LSE 112 MG	380	2.2	928	22	5.6	0.75	78.8	4.2	1.9	1.8	7.8	0.0152	33
	400	2.2	938	22	5.4	0.74	80.1	4.35	2	2	7.3	0.0152	33
	415	2.2	945	22	5.3	0.72	80.6	4.8	2.2	2.2	6	0.0152	33
LSE 132 SM	380	3	958	30	7.2	0.75	84.2	3.8	1.1	1.5	8.8	0.026	43.4
	400	3	963	30	7	0.74	84.6	4.3	1.2	1.6	6.9	0.026	43.4
	415	3	967	30	6.9	0.72	84.7	4.6	1.3	1.7	6	0.026	43.4
LSE 132 M	380	4	962	40	9.5	0.75	85.5	4.2	1.2	1.5	8.5	0.034	59.4
	400	4	966	40	9.1	0.74	85.9	4.6	1.3	1.6	7.1	0.034	59.4
	415	4	970	40	9	0.72	85.8	5	1.5	1.8	6	0.034	59.4
LSE 132 MU	380	5.5	958	55	12.8	0.76	86	4.2	1.3	1.5	8.8	0.043	66.5
	400	5.5	963	55	12.3	0.75	86.4	4.7	1.4	1.6	7.1	0.043	66.5
	415	5.5	968	55	12	0.73	86.5	5.1	1.6	1.8	6	0.043	66.5
LSE 160 M	380	7.5	960	74.6	16.4	0.81	85.6	4.6	1.5	2.1	13.3	0.084	81
	400	7.5	965	74.2	15.9	0.79	86	5	1.7	2.4	11.2	0.084	81
	415	7.5	968	74	15.9	0.76	86.2	5.3	1.8	2.6	10	0.084	81
LSE 160 L	380	11	957	110	24.1	0.81	85.7	4.8	1.6	2.2	8.5	0.126	105
	400	11	963	109	23.6	0.78	86.2	5.1	1.8	2.5	7.5	0.126	105
	415	11	966	109	23.3	0.76	86.4	5.4	1.9	2.7	6.7	0.126	105
LSE 180 L	380	15	959	149	31.6	0.83	86.9	5.1	1.9	2.1	8.5	0.191	135
	400	15	965	148	30.1	0.82	87.8	5.6	2.1	2.4	7.2	0.191	135
	415	15	969	148	29.2	0.81	88.3	6.1	2.3	2.6	6	0.191	135
LSE 200 LT	380	18.5	965	183	39.2	0.81	88.5	5.7	2.3	2.5	10.4	0.237	160
	400	18.5	969	182	38	0.79	89	6.2	2.5	2.8	8.8	0.237	160
	415	18.5	972	182	37.5	0.77	89.2	6.5	2.7	3	8	0.237	160
LSE 200 L	380	22	970	217	45.4	0.82	89.8	5.7	1.8	2.5	8	0.287	190
	400	22	974	216	44.1	0.80	90.1	6.2	2	2.7	6.8	0.287	190
	415	22	976	215	43.5	0.78	90.2	6.6	2.2	3	6	0.287	190
LSE 225 MR	380	30	973	295	63.6	0.79	90.7	6.2	2.4	2.7	6.4	0.380	235
	400	30	976	294	61.9	0.77	90.8	6.7	2.7	3	5.5	0.380	235
	415	30	978	293	62.2	0.74	90.8	7	3	3.3	5	0.380	235
LSE 250 ME	380	37											
	400	37											
	415	37											
LSE 280 SC	380	45											
	400	45											
	415	45											
LSE 280 MC	380	55											
	400	55											
	415	55											

Please consult Leroy-Somer

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

6
poles
1000 min⁻¹

EEx e IIT3 VIK

MAINS SUPPLY 380 / 400 / 420 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
LSE 90 S	380	0.65	931	6.5	1.8	0.72	75.6	4.6	2.3	2.4	10.2	0.0039	13.5
	400	0.65	937	6.5	1.8	0.68	75	4.7	2.6	2.7	9.8	0.0039	13.5
	420	0.65	945	6.5	1.9	0.63	74.6	4.9	2.9	3	9	0.0039	13.5
LSE 90 L	380	0.95	909	9.5	2.5	0.77	75.1	4	2.2	2.2	10.9	0.0048	15.2
	400	0.95	920	9.5	2.5	0.73	75.4	4.2	2.4	2.4	9.9	0.0048	15.2
	420	0.95	931	9.5	2.5	0.69	75.8	4.4	2.5	2.5	9	0.0048	15.2
LSE 100 L	380	1.3	920	13	3.5	0.73	77.1	4.2	2.3	2.3	7.7	0.0069	19.7
	400	1.3	930	13	3.5	0.68	76.9	4.3	2.6	2.6	7.3	0.0069	19.7
	420	1.3	938	13	3.6	0.64	76.7	4.4	2.9	2.9	7	0.0069	19.7
LSE 112 MG	380	1.9	929	19	4.9	0.75	78.7	3.5	1.6	1.6	13.7	0.0152	33
	400	1.9	937	19	4.7	0.73	79.7	4.2	1.9	1.9	9.5	0.0152	33
	420	1.9	948	19	4.5	0.71	80.7	4.9	2.2	2.2	7	0.0152	33
LSE 132 SM	380	2.6	959	26	6.2	0.75	84.5	3.7	1.1	1.4	11.3	0.026	43.4
	400	2.6	964	26	6	0.73	84.7	4	1.2	1.6	9.6	0.026	43.4
	420	2.6	969	26	5.8	0.72	85.1	4.7	1.3	1.7	7	0.026	43.4
LSE 132 M	380	3.5	962	35	8.3	0.75	85.3	4.1	1.2	1.5	10.4	0.034	59.4
	400	3.5	967	35	8	0.74	85.6	4.5	1.3	1.7	8.6	0.034	59.4
	420	3.5	971	35	7.8	0.72	85.8	5	1.4	1.8	7	0.034	59.4
LSE 132 MU	380	4.8	963	48	11.2	0.75	86.6	4.5	1.4	1.6	12	0.043	66.5
	400	4.8	967	48	10.8	0.74	86.8	5	1.5	1.7	9.7	0.043	66.5
	420	4.8	971	48	10.6	0.72	86.8	5.5	1.7	2	8	0.043	66.5
LSE 160 M	380	6.6	968	65.1	14.7	0.79	86.5	5.2	1.7	2.4	12.3	0.084	81
	400	6.6	972	64.8	14.5	0.76	86.6	5.5	1.9	2.7	11	0.084	81
	420	6.6	974	64.7	14.4	0.73	86.6	5.7	2.1	2.9	10.3	0.084	81
LSE 160 L	380	9.7	966	95.9	21.8	0.78	86.7	5.3	1.8	2.5	12.4	0.126	105
	400	9.7	970	95.5	21.5	0.75	86.9	5.7	2	2.8	10.7	0.126	105
	420	9.7	973	95.2	21	0.73	86.9	5.9	2.2	3	10	0.126	105
LSE 180 L	380	13.2	969	130	27.7	0.82	88.3	5.8	2.1	2.4	13.7	0.191	135
	400	13.2	972	130	26.8	0.80	88.9	6.3	2.4	2.7	11.6	0.191	135
	420	13.2	975	129	26.1	0.78	89.2	6.8	2.6	2.9	10	0.191	135
LSE 200 LT	380	16.5	971	162	35.6	0.79	89.2	6.3	2.6	2.9	10.2	0.237	160
	400	16.5	974	162	34.6	0.77	89.5	6.8	2.9	3.2	8.8	0.237	160
	420	16.5	977	161	33.8	0.75	89.6	7.1	3.1	3.4	8	0.237	160
LSE 200 L	380	20	976	196	41.5	0.81	90.5	6.3	2	2.7	12.7	0.287	190
	400	20	977	196	40.4	0.79	90.5	6.8	2.2	3	10.9	0.287	190
	420	20	980	195	40	0.76	90.5	7.1	2.4	3.2	10	0.287	190
LSE 225 MR	380	27	977	264	57.7	0.78	91	6.8	2.7	3	8.5	0.380	235
	400	27	979	263	57	0.75	91	7.2	3	3.3	7.6	0.380	235
	420	27	982	263	57.5	0.71	91	7.5	3.4	3.7	7	0.380	235
LSE 250 ME	380	33											
	400	33											
	420	33											
LSE 280 SC	380	40											
	400	40											
	420	40											
LSE 280 MC	380	46											
	400	46											
	420	46											

Please consult Leroy-Somer

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

2
poles
3000 min⁻¹

EEx e IIT4

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
LSE 63	380	0.25											
	400	0.25											
	415	0.25											
LSE 71	380	0.37											
	400	0.37											
	415	0.37											
LSE 71	380	0.55											
	400	0.55											
	415	0.55											
LSE 80 L	380	0.75	2868	2.5	1.6	0.86	83.2	5.9	2.2	2.5	8.5	0.0011	11.3
	400	0.75	2879	2.5	1.5	0.84	83.2	6.4	2.5	3	7.2	0.0011	11.3
	415	0.75	2894	2.5	1.5	0.83	82.9	7	2.7	3.3	6	0.0011	11.3
LSE 90 L	380	1.1	2845	3.7	2.2	0.91	83.1	5.2	1.9	2.4	10.8	0.0021	16
	400	1.1	2865	3.7	2.1	0.91	83.9	5.8	2.1	2.7	8.5	0.0021	16
	415	1.1	2880	3.7	2	0.90	84.2	6.4	2.3	2.9	7	0.0021	16
LSE 100 L	380	1.5	2850	5	3.1	0.89	83.8	5.3	1.9	2.4	10.5	0.0024	19
	400	1.5	2867	5	2.9	0.88	84.4	5.9	2.2	2.7	8.5	0.0024	19
	415	1.5	2882	5	2.8	0.88	84.9	6.5	2.4	3	7	0.0024	19
LSE 100 L	380	1.8	2848	6.3	3.5	0.92	86.1	5.1	1.9	2.3	9.2	0.0029	24
	400	1.8	2871	6.3	3.3	0.91	86.1	5.7	2.1	2.6	7.3	0.0029	24
	415	1.8	2882	6.3	3.2	0.91	86.3	6.3	2.4	2.9	6	0.0029	24
LSE 100 LG	380	2.2	2909	7.5	4.2	0.92	86.9	7.1	2.3	2.9	10	0.0076	35
	400	2.2	2919	7.5	4	0.91	87.2	7.8	2.5	3.2	8.3	0.0076	35
	415	2.2	2926	7.5	3.9	0.90	87.4	8.5	2.8	3.5	7	0.0076	35
LSE 112 MU	380	3	2914	10.1	5.5	0.95	86.5	7.7	2.5	3.1	9.8	0.0088	39
	400	3	2924	10.1	5.3	0.94	86.7	8.5	2.7	3.4	8	0.0088	39
	415	3	2930	10.1	5.2	0.93	86.9	9.1	3	3.7	7	0.0088	39
LSE 132 SM	380	4	2938	13.5	7.8	0.88	88.4	7.4	1.9	2.9	8.3	0.016	49
	400	4	2944	13.5	7.5	0.87	88.4	8.1	2.1	3.2	7	0.016	49
	415	4	2949	13.5	7.3	0.86	88.3	8.7	2.3	3.5	6	0.016	49
LSE 132 SM	380	5.5	2947	18.6	10	0.93	89.4	6.4	1.6	2.5	8.7	0.018	54
	400	5.5	2953	18.6	9.7	0.92	89.5	7	1.7	2.7	7.3	0.018	54
	415	5.5	2958	18.6	9.4	0.91	89.7	7.7	1.9	2.9	6	0.018	54
LSE 160 MP	380	7.5	2924	25.4	13.6	0.94	89.4	5.3	1.3	2	9	0.023	68
	400	7.5	2933	25.4	12.9	0.94	89.9	5.9	1.4	2.2	7.3	0.023	68
	415	7.5	2943	25.4	12.4	0.93	90.4	6.5	1.6	2.4	6	0.023	68
LSE 160 L	380	11	2938	35.8	20.2	0.91	90.9	7.7	2.4	3	7	0.044	88
	400	11	2945	35.7	19.3	0.90	91.3	8.5	2.8	3.4	5.8	0.044	88
	415	11	2952	35.6	18.8	0.89	91.5	9.1	3	3.7	5	0.044	88
LSE 180 MT	380	15	2936	48.8	27.4	0.91	91.5	7.8	2.6	2.9	7	0.052	99
	400	15	2943	48.7	26.2	0.90	91.8	8.6	2.9	3.2	5.8	0.052	99
	415	15	2950	48.6	25.5	0.89	91.9	9.2	3.1	3.5	5	0.052	99
LSE 200 LT	380	18.5	2954	59.8	32.6	0.92	93.6	8.6	2.7	3.5	6.8	0.089	154
	400	18.5	2959	59.7	31.4	0.91	93.6	9.4	3.1	3.9	5.7	0.089	154
	415	18.5	2963	59.6	30.6	0.90	93.6	10	3.3	4.2	5	0.089	154
LSE 200 L	380	22	2960	71	38.9	0.92	93.5	8.1	2.8	3.2	6.9	0.12	180
	400	22	2965	70.9	37.2	0.91	93.7	8.9	3.1	3.6	5.7	0.12	180
	415	22	2969	70.8	36.3	0.90	93.7	9.5	3.4	3.8	5	0.12	180
LSE 225 MT	380	30	2961	96.8	52.8	0.92	93.9	8.7	3	3.5	6.6	0.14	200
	400	30	2965	96.6	50.6	0.91	94	9.6	3.4	3.9	5.4	0.14	200
	415	30	2969	96.5	49.3	0.90	94.1	10	3.7	4.2	5	0.14	200
LSE 250 MZ	380	37											
	400	37											
	415	37											
LSE 280 SC	380	45											
	400	45											
	415	45											
LSE 280 MC	380	55											
	400	55											
	415	55											

Please consult Leroy-Somer

Please consult Leroy-Somer

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

4 poles
1500 min⁻¹

EEx e IIT4

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
LSE 63	380	0.25											
	400	0.25											
	415	0.25											
LSE 71	380	0.37											
	400	0.37											
	415	0.37											
Please consult Leroy-Somer													
LSE 80 L	380	0.55	1410	3.75	1.4	0.78	74	4.9	1.7	1.7	7.3	0.0024	10.9
	400	0.55	1425	3.75	1.4	0.76	75	5.1	1.9	2	6.7	0.0024	10.9
	415	0.55	1430	3.75	1.4	0.73	75	5.4	2.1	2.3	6	0.0024	10.9
LSE 90 S	380	0.75	1445	5	1.8	0.79	81	5.2	1.7	2.1	8	0.0032	13.5
	400	0.75	1451	5	1.7	0.77	81.4	5.6	1.9	2.4	6.9	0.0032	13.5
	415	0.75	1455	5	1.7	0.74	81.4	6	2.1	2.6	6	0.0032	13.5
LSE 90 L	380	1.1	1440	7.5	2.6	0.80	81.7	5	1.7	2.1	8.3	0.0037	15.2
	400	1.1	1447	7.5	2.5	0.78	82.1	5.5	1.8	2.3	6.9	0.0037	15.2
	415	1.1	1452	7.5	2.5	0.76	82.2	5.9	2	2.5	6	0.0037	15.2
LSE 100 L	380	1.5	1434	10	3.4	0.82	82.2	4.9	1.7	2	8.4	0.0064	25.5
	400	1.5	1442	10	3.3	0.80	82.8	5.4	1.8	2.2	6.9	0.0064	25.5
	415	1.5	1448	10	3.2	0.78	83.1	5.8	2	2.4	6	0.0064	25.5
LSE 100 L	380	1.8	1429	12	4	0.83	82.3	4.6	1.6	1.9	8.9	0.0073	27.5
	400	1.8	1437	12	3.9	0.81	83	5.1	1.7	2.1	7.2	0.0073	27.5
	415	1.8	1444	12	3.8	0.79	83.4	5.6	1.9	2.3	6	0.0073	27.5
LSE 100 LG	380	2.2	1461	15	4.5	0.85	86.9	6	1.7	2	8.6	0.0109	30.5
	400	2.2	1466	15	4.4	0.84	87.3	6.6	1.8	2.2	7.1	0.0109	30.5
	415	2.2	1469	15	4.3	0.82	87.4	7.2	2	2.4	6	0.0109	30.5
LSE 112 MU	380	3	1459	20	6.1	0.86	87.4	6.1	1.8	2	8.6	0.014	36.5
	400	3	1464	20	5.9	0.85	87.8	6.7	2	2.2	7.1	0.014	36.5
	415	3	1467	20	5.7	0.83	87.9	7.3	2.1	2.4	6	0.014	36.5
LSE 132 SM	380	4	1460	27.5	7.6	0.91	88	8	1.7	2.3	9.5	0.019	54.7
	400	4	1465	27.5	7.4	0.89	88	8.6	1.8	2.6	8.2	0.019	54.7
	415	4	1470	27.5	7.2	0.88	88	9.3	2	2.8	7	0.019	54.7
LSE 132 SM	380	5.5	1462	37.5	10.7	0.88	89	6.7	1.8	2.4	8.2	0.023	59.9
	400	5.5	1466	37.5	10.4	0.87	89.1	7.3	2	2.7	6.9	0.023	59.9
	415	5.5	1469	37.5	10.2	0.85	89	7.8	2.2	2.9	6	0.023	59.9
LSE 132 MU	380	7.5	1456	50	14.4	0.89	88.8	5.7	1.5	2.1	8.8	0.0306	65.5
	400	7.5	1461	50	13.8	0.88	89.2	6.3	1.6	2.3	7.2	0.0306	65.5
	415	7.5	1465	50	13.4	0.87	89.3	6.9	1.8	2.5	6	0.0306	65.5
LSE 160 L	380	11	1462	71.9	21.3	0.87	90.1	6.9	2.4	2.9	9.9	0.085	100
	400	11	1467	71.6	20.4	0.86	90.5	7.6	2.7	3.2	8.2	0.085	100
	415	11	1470	71.5	19.9	0.85	90.7	8.2	3	3.7	7	0.085	100
LSE 180 LU	380	15	1477	97.0	29.7	0.83	92.3	8.8	4	4	12.9	0.151	165
	400	15	1480	96.8	29	0.81	92.3	9.5	4.4	4.4	11	0.151	165
	415	15	1482	96.7	29	0.78	92.3	10	4.8	4.8	10	0.151	165
LSE 180 LU	380	18.5	1470	120	35.4	0.86	92.2	7.6	3.2	3.2	6.4	0.151	165
	400	18.5	1473	120	34.4	0.84	92.3	8.2	3.6	3.6	5.5	0.151	165
	415	18.5	1475	120	34	0.82	92.4	8.6	3.9	3.8	5	0.151	165
LSE 200 L	380	22	1480	142	43	0.83	93.5	8	3.4	3.3	11.4	0.240	205
	400	22	1482	142	41.9	0.81	93.6	8.7	3.7	3.6	9.6	0.240	205
	415	22	1484	142	41.4	0.79	93.5	9	4.1	3.9	9	0.240	205
LSE 225 SR	380	30	1477	194	58.7	0.83	93.6	7.3	3.3	3.2	9.3	0.290	235
	400	30	1479	194	57.1	0.81	93.6	7.9	3.7	3.6	7.9	0.290	235
	415	30	1481	194	56.4	0.79	93.6	8.4	4.1	3.9	7	0.290	235
LSE 250 ME	380	37											
	400	37											
	415	37											
LSE 280 SC	380	45											
	400	45											
	415	45											
LSE 280 MC	380	55											
	400	55											
	415	55											

Please consult Leroy-Somer

LSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C1 - Selection data: LSE aluminium motors

6
poles
1000 min⁻¹

EEx e IIT4

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
LSE 71	380	0.18											
	400	0.18											
	415	0.18											
Please consult Leroy-Somer													
LSE 80 L	380	0.25	947	2.5	0.9	0.67	66.2	3.5	1.5	1.8	11.8	0.0032	9.7
	400	0.25	953	2.5	0.9	0.64	66.3	3.8	1.7	2.1	10	0.0032	9.7
	415	0.25	958	2.5	0.9	0.62	65.9	4	1.9	2.3	9	0.0032	9.7
LSE 80 L	380	0.37	954	3.7	1.3	0.64	68.8	4.1	1.9	2.2	10	0.0042	11
	400	0.37	960	3.7	1.3	0.61	68.3	4.3	2.1	2.5	9.1	0.0042	11
	415	0.37	963	3.7	1.3	0.59	67.6	4.6	2.3	2.7	8	0.0042	11
LSE 90 S	380	0.55	940	5.5	1.6	0.68	76.5	4.8	2.7	2.7	10.6	0.0039	13.5
	400	0.55	947	5.5	1.6	0.65	76.2	5	3	3	9.7	0.0039	13.5
	415	0.55	952	5.5	1.7	0.61	75.5	5.2	3.3	3.3	9	0.0039	13.5
LSE 90 L	380	0.75	918	7.5	2	0.76	76.2	3.8	2	2	11.7	0.0048	15.2
	400	0.75	927	7.5	1.9	0.73	76.7	4.3	2.3	2.3	9.1	0.0048	15.2
	415	0.75	935	7.5	1.9	0.70	76.9	4.6	2.5	2.6	8	0.0048	15.2
LSE 100 L	380	1.1	900	11	2.8	0.78	76.3	3.7	2	2	8.1	0.0069	19.7
	400	1.1	913	11	2.7	0.76	77.6	3.9	2.1	2.1	7.3	0.0069	19.7
	415	1.1	923	11	2.7	0.73	78.3	4.3	2.4	2.4	6	0.0069	19.7
LSE 112 MG	380	1.5	934	15	3.9	0.74	79.3	3.8	1.7	1.7	9.6	0.0152	33
	400	1.5	943	15	3.8	0.72	80.2	4.4	1.9	1.9	7.1	0.0152	33
	415	1.5	949	15	3.7	0.70	80.7	4.8	2.2	2.2	6	0.0152	33
LSE 132 SM	380	2.2	963	22	5.4	0.73	84.7	4	1.1	1.5	9	0.026	43.4
	400	2.2	968	22	5.2	0.72	85.1	4.4	1.3	1.6	7.5	0.026	43.4
	415	2.2	971	22	5.1	0.71	85.1	4.9	1.4	1.8	6	0.026	43.4
LSE 132 M	380	3	964	30	7.2	0.74	85.9	4.2	1.2	1.5	8.9	0.034	59.4
	400	3	968	30	7	0.72	86.1	4.7	1.4	1.7	7.1	0.034	59.4
	415	3	972	30	6.8	0.71	86.2	5.1	1.5	1.8	6	0.034	59.4
LSE 132 MU	380	4	964	40	9.4	0.75	86.4	4.4	1.3	1.5	8.7	0.043	66.5
	400	4	968	40	9.2	0.73	86.6	4.9	1.5	1.7	7	0.043	66.5
	415	4	971	40	8.9	0.72	86.7	5.3	1.6	1.9	6	0.043	66.5
LSE 160 M	380	5.5	969	54.2	12	0.80	86.7	5.2	1.7	2.4	12.9	0.084	81
	400	5.5	973	54	11.9	0.77	86.9	5.6	1.9	2.7	11.1	0.084	81
	415	5.5	975	53.9	11.7	0.75	86.9	5.9	2.1	2.9	10	0.084	81
LSE 160 L	380	7.5	968	74	16.5	0.79	87.2	5.4	1.8	2.5	12.8	0.126	105
	400	7.5	972	73.7	16.1	0.77	87.4	5.8	2	2.8	10	0.126	105
	415	7.5	974	73.5	15.9	0.75	87.5	6.1	2.2	3	9	0.126	105
LSE 180 L	380	11	966	109	22.9	0.83	87.9	5.4	2	2.2	8.7	0.191	135
	400	11	970	108	21.9	0.82	88.6	5.9	2.2	2.4	7.3	0.191	135
	415	11	974	108	21.2	0.81	89	6.5	2.4	2.6	5	0.191	135
LSE 200 L	380	15	974	147	30.4	0.83	90.4	6.1	1.9	2.9	9.8	0.287	190
	400	15	977	147	29.5	0.81	90.7	6.6	2.1	2.9	8.3	0.287	190
	415	15	980	146	28.7	0.8	90.8	7.2	2.3	3.2	7	0.287	190
LSE 225 MR	380	18.5	981	180	39.3	0.78	91.7	7.4	3	3.3	13.2	0.380	235
	400	18.5	983	180	38.3	0.76	91.7	8	3.3	3.6	11.3	0.380	235
	415	18.5	985	179	38.5	0.73	91.6	8.5	3.7	4	10	0.380	235
LSE 225 MR	380	22	976	215	45.2	0.81	91.2	6.4	2.5	2.7	13.7	0.380	235
	400	22	979	215	43.9	0.79	91.5	7	2.8	3	11.5	0.380	235
	415	22	981	214	43.4	0.77	91.5	7.5	3.1	3.3	10	0.380	235
LSE 250 ME	380	30											
	400	30											
	415	30											
LSE 280 SC	380	37											
	400	37											
	415	37											
LSE 280 MC	380	45											
	400	45											
	415	45											

Please consult Leroy-Somer

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

	PAGES
2 poles - 3000 min ⁻¹ - EEx e II T3	22
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4 poles - 1500 min ⁻¹ - EEx e II T4	29
6 poles - 1000 min ⁻¹ - EEx e II T4	30

* VIK: extension of EN 50019 requirements to particular specifications intended for German manufacturing companies:

- ranges with special power ratings according to frame size (DIN 42673)
- increased duration t_E (≥ 7 sec)
- 2nd nameplate in the terminal box
- ISO M25 cable gland from frame size 80 mm upwards
- oil-resistant seals
- terminal blocks not split from frame size 160 mm upwards

Other polarities (1 or 2-speed): please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

2
poles
3000 min⁻¹

EEx e IIT3

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
FLSE 80 L	380	0.75	2860	2.5	1.7	0.86	79.2	6.8	2.7	2.8	8.3	0.0007	15
	400	0.75	2872	2.5	1.6	0.84	79.4	7.1	2.9	3	7.6	0.0007	15
	415	0.75	2890	2.5	1.6	0.81	79.5	7.4	3.1	3.2	7	0.0007	15
FLSE 80 L	380	1.1	2860	3.75	2.4	0.89	78	7.1	2.9	2.8	12.6	0.0009	18
	400	1.1	2870	3.75	2.3	0.86	78.5	7.5	3.2	3.1	11.1	0.0009	18
	415	1.1	2885	3.75	2.3	0.84	78.7	7.9	3.4	3.3	10	0.0009	18
FLSE 90 S	380	1.5	2845	5	3.1	0.90	82.3	7	2.8	2.8	11.6	0.00175	23.5
	400	1.5	2860	5	2.9	0.88	83.6	7.5	3.1	3.1	10.2	0.00175	23.5
	415	1.5	2880	5	2.9	0.87	83.5	8.2	3.5	3.5	8.5	0.00175	23.5
FLSE 90 L	380	2.2	2869	7.5	4.4	0.89	85.5	6.2	2.1	2.7	11	0.0023	27.7
	400	2.2	2884	7.5	4.2	0.87	85.7	6.7	2.4	3.1	9.4	0.0023	27.7
	415	2.2	2895	7.5	4.1	0.87	85.8	7.5	2.6	3.3	7.5	0.0023	27.7
FLSE 100 LK	380	3	2887	10.1	5.8	0.92	85.7	5.5	1.6	2.3	13.3	0.0069	42
	400	3	2900	10.1	5.5	0.91	86.2	6.1	1.8	2.5	10.8	0.0069	42
	415	3	2910	10.1	5.3	0.91	86.4	6.7	2	2.8	9	0.0069	42
FLSE 112 MU	380	4	2920	13.5	7.4	0.92	88.5	6.9	1.8	2.7	9.9	0.0099	54
	400	4	2928	13.5	7.1	0.92	88.6	7.5	2	3	8.4	0.0099	54
	415	4	2935	13.5	6.9	0.91	88.6	8.2	2.2	3.2	7	0.0099	54
FLSE 132 SM	380	5.5	2916	18.6	10.2	0.92	89.4	5.9	1.5	2.4	10.4	0.0263	71
	400	5.5	2926	18.6	9.7	0.91	89.8	6.5	1.7	2.6	8.6	0.0263	71
	415	5.5	2933	18.6	9.4	0.90	89.9	7.2	1.8	2.8	7	0.0263	71
FLSE 132 SM	380	7.5	2921	25.4	13.6	0.92	90.2	6.3	1.6	2.4	10.2	0.031	75
	400	7.5	2929	25.4	13.1	0.92	90.4	6.9	1.7	2.6	8.5	0.031	75
	415	7.5	2936	25.4	12.6	0.91	90.6	7.6	1.9	2.9	7	0.031	75

For higher power ratings, please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

2
poles
3000 min⁻¹

EEx e IIT3 VIK

MAINS SUPPLY 380 / 400 / 420 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
FLSE 80 L	380	1.1	2860	3.75	2.4	0.89	78	7.1	2.9	2.8	12.6	0.0009	19
	400	1.1	2875	3.75	2.4	0.85	78.2	7.5	3.2	3.1	11.4	0.0009	19
	420	1.1	2890	3.75	2.3	0.83	78.4	8	3.7	3.6	10	0.0009	19
FLSE 90 S	380	1.5	2845	5	3.1	0.90	82.3	7	2.8	2.8	12	0.00175	23.5
	400	1.5	2865	5	3	0.87	82.8	7.5	3.1	3.1	10.4	0.00175	23.5
	420	1.5	2886	5	2.9	0.85	83.4	8.3	3.6	3.6	8.5	0.00175	23.5
FLSE 90 L	380	1.85	2881	6.3	3.7	0.88	86.1	6.4	2.2	2.6	9.3	0.0023	27.7
	400	1.85	2890	6.3	3.6	0.86	86.2	6.5	2.4	3	9	0.0023	27.7
	420	1.85	2903	6.3	3.5	0.85	86.2	6.7	2.7	3.5	8.5	0.0023	27.7
FLSE 100 LK	380	2.5	2896	8.5	4.8	0.91	86.1	5.8	1.7	2.4	11.1	0.0069	42
	400	2.5	2905	8.5	4.6	0.90	86.5	6.2	1.9	2.7	9.7	0.0069	42
	420	2.5	2920	8.5	4.4	0.90	86.7	7.3	2.1	3	7	0.0069	42
FLSE 112 M	380	3.3	2915	11.2	6.5	0.95	82.1	8.9	2.9	3.8	11.4	0.0084	48
	400	3.3	2925	11.2	6.2	0.93	82.5	9.3	3.2	4.1	10.4	0.0084	48
	420	3.3	2935	11.2	6	0.91	82.7	10	3.5	4.6	9	0.0084	48
FLSE 132 SM	380	4.6	2925	15.6	8.5	0.91	89.8	6.2	1.6	2.4	11.7	0.0263	71
	400	4.6	2932	15.6	8.2	0.90	90	6.8	1.7	2.6	9.7	0.0263	71
	420	4.6	2939	15.6	7.9	0.90	90.2	7.5	1.9	2.9	8	0.0263	71
FLSE 132 SM	380	5.5	2929	18.6	10.1	0.91	90.2	6.35	1.5	2.4	13	0.031	75
	400	5.5	2940	18.6	9.9	0.89	90	7.2	1.9	3	10.1	0.031	75
	420	5.5	2957	18.6	9.7	0.87	89.8	8.1	2.4	3.7	8	0.031	75

For higher power ratings, please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

4 poles
1500 min⁻¹

EEx e IIT3

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
FLSE 80 L	380	0.75	1415	5	2	0.76	74	5.32	2	2.1	11.9	0.0024	17
	400	0.75	1430	5	2	0.72	74	5.6	2.2	2.3	10.7	0.0024	17
	415	0.75	1430	5	2	0.70	74	5.8	2.4	2.6	10	0.0024	17
FLSE 90 S	380	1.1	1435	7.5	2.5	0.84	80.7	4.7	1.5	1.8	10	0.0032	21
	400	1.1	1443	7.5	2.4	0.83	81.5	5.2	1.6	2	8.1	0.0032	21
	415	1.1	1449	7.5	2.3	0.81	81.7	5.6	1.8	2.2	7	0.0032	21
FLSE 90 L	380	1.5	1445	10	3.7	0.79	78	6.1	1.7	1.9	8	0.0037	23
	400	1.5	1450	10	3.7	0.75	78	6.4	1.7	2	7.2	0.0037	23
	415	1.5	1455	10	3.8	0.72	77	6.5	1.9	2.2	7	0.0037	23
FLSE 100 LK	380	2.2	1455	15	4.6	0.85	84.7	5.1	1.4	1.7	11.8	0.0077	41
	400	2.2	1460	15	4.4	0.84	85.2	5.7	1.5	1.9	9.5	0.0077	41
	415	2.2	1464	15	4.3	0.82	85.4	6.2	1.7	2.1	8	0.0077	41
FLSE 100 LK	380	3	1452	20	6.2	0.86	85.4	5.1	1.5	1.7	8.6	0.0107	43.6
	400	3	1457	20	5.9	0.85	86	5.7	1.6	1.9	6.9	0.0107	43.6
	415	3	1462	20	5.7	0.84	86.5	6.1	1.7	2.1	6	0.0107	43.6
FLSE 112 MU	380	4	1453	27.2	7.9	0.88	86.9	6	1.8	2	11.8	0.0137	51.5
	400	4	1458	27.2	7.7	0.86	86.9	6.7	2	2.1	9.5	0.0137	51.5
	415	4	1466	27.2	7.7	0.82	87.4	7.3	2.2	2.4	8	0.0137	51.5
FLSE 132 SM	380	5.5	1451	37.4	10.5	0.91	87.9	6	1.6	2.2	12.2	0.0154	65
	400	5.5	1464	37.4	10.3	0.87	88.4	6.5	1.8	2.5	10.5	0.0154	65
	415	5.5	1471	37.4	10.7	0.81	87.7	7	1.9	2.7	9	0.0154	65
FLSE 132 M	380	7.5	1455	50	15	0.88	86	7.9	1.7	2.4	7.6	0.0192	70
	400	7.5	1457	50	14.8	0.85	86	8.4	1.9	2.6	6.7	0.0192	70
	415	7.5	1460	50	14.6	0.83	86	8.9	2.1	2.8	6	0.0192	70

For higher power ratings, please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

4 poles
1500 min⁻¹

EEx e IIT3 VIK

MAINS SUPPLY 380 / 400 / 420 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
FLSE 90 S	380	1	1444	6.8	2.3	0.83	81.6	5.2	1.7	2	11.7	0.0032	21
	400	1	1450	6.8	2.2	0.81	81.8	5.9	1.9	2.3	9.1	0.0032	21
	420	1	1456	6.8	2.2	0.78	81.9	6.3	2.1	2.5	8	0.0032	21
FLSE 90 L	380	1.35	1444	9.2	3	0.83	83.5	6.3	1.9	2.2	10.5	0.0037	23
	400	1.35	1450	9.2	2.9	0.81	83.5	6.5	2.2	2.4	9.9	0.0037	23
	420	1.35	1456	9.2	2.9	0.78	83.5	6.8	2.4	2.7	9	0.0037	23
FLSE 100 LK	380	1.85	1460	12.6	3.9	0.84	85.3	5.6	1.5	1.9	8.8	0.0077	41
	400	1.85	1465	12.6	3.8	0.83	85.5	6.1	1.7	2.1	7.5	0.0077	41
	420	1.85	1470	12.6	3.7	0.81	85.8	6.8	1.8	2.3	6	0.0077	41
FLSE 100 LK	380	2.5	1464	16.9	5.2	0.84	86.7	6.3	1.7	2.1	11.9	0.0107	43.6
	400	2.5	1467	16.9	5.1	0.82	86.8	7	1.9	2.4	9.7	0.0107	43.6
	420	2.5	1471	16.9	4.9	0.80	86.8	7.7	2.2	2.6	8	0.0107	43.6
FLSE 112 MU	380	3.6	1450	24.4	7.3	0.87	86.3	6.6	1.9	2.7	13.6	0.0137	51.5
	400	3.6	1455	24.4	7.1	0.85	86.4	7.1	2	2.8	11.8	0.0137	51.5
	420	3.6	1460	24.4	7	0.82	86.5	7.7	2.1	3	10	0.0137	51.5
FLSE 132 SM	380	5	1450	33.9	10	0.89	85.4	8	2.3	2.8	13.2	0.0154	65
	400	5	1457	33.9	9.7	0.87	85.5	8.6	2.5	3.1	11.4	0.0154	65
	420	5	1462	33.9	9.4	0.85	85.6	9.2	2.8	3.4	10	0.0154	65
FLSE 132 M	380	6.8	1445	46.2	13.5	0.90	84.8	7.3	2.8	2.6	12.2	0.0192	70
	400	6.8	1455	46.2	13.1	0.88	84.9	7.8	3.1	2.8	10.7	0.0192	70
	420	6.8	1460	46.2	12.6	0.87	85	8.5	3.4	3	9	0.0192	70

For higher power ratings, please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

6
poles
1000 min⁻¹

EEx e IIT3

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
FLSE 80 L	380	0.37	941	3.7	1.2	0.70	65.2	3.3	1.4	1.7	14	0.0032	15
	400	0.37	948	3.7	1.2	0.68	65.3	3.7	1.6	2	11.1	0.0032	15
	415	0.37	955	3.7	1.2	0.65	65.1	3.9	1.8	2.2	10	0.0032	15
FLSE 80 L	380	0.55	950	5.5	1.8	0.68	69.9	4.1	1.9	2.2	10	0.0042	16
	400	0.55	955	5.5	1.8	0.64	68.6	4.5	2.1	2.4	8.4	0.0042	16
	415	0.55	959	5.5	1.9	0.60	66.3	4.6	2.4	2.7	8	0.0042	16
FLSE 90 S	380	0.75	928	7.5	2.1	0.71	75.4	4.3	2.4	2.4	11.9	0.0039	19
	400	0.75	935	7.5	2.2	0.67	75	4.6	2.6	2.6	10.5	0.0039	19
	415	0.75	942	7.5	2.2	0.63	74.3	4.7	2.9	2.9	10	0.0039	19
FLSE 90 L	380	1.1	907	11	3	0.76	74.7	3.9	2.1	2.1	11.5	0.0048	21
	400	1.1	918	11	3	0.72	75.2	4.1	2.2	2.2	10.4	0.0048	21
	415	1.1	926	11	3	0.68	74.8	4.4	2.5	2.5	9	0.0048	21
FLSE 100 LK	380	1.5	939	15	3.9	0.73	79.7	4.3	2	2	8.8	0.0136	41
	400	1.5	947	15	3.8	0.71	80.4	4.8	2.2	2.2	7	0.0136	41
	415	1.5	953	15	3.7	0.69	80.7	5.2	2.4	2.4	6	0.0136	41
FLSE 112 M	380	2.2	928	22	5.6	0.75	78.8	4.2	1.9	1.8	8	0.0152	45
	400	2.2	938	22	5.4	0.74	80.1	4.3	2	2	7.5	0.0152	45
	415	2.2	945	22	5.3	0.72	80.6	4.8	2.2	2.2	6	0.0152	45
FLSE 132 SM	380	3	958	30	7.2	0.75	84.2	3.8	1.1	1.5	8.8	0.026	72
	400	3	963	30	7	0.74	84.6	4.3	1.2	1.6	7	0.026	72
	415	3	967	30	6.9	0.72	84.7	4.6	1.3	1.7	6	0.026	72
FLSE 132 M	380	4	962	40	9.5	0.75	85.5	4.2	1.2	1.5	8.5	0.034	76
	400	4	966	40	9.1	0.74	85.9	4.6	1.3	1.6	7.1	0.034	76
	415	4	970	40	9	0.72	85.8	5	1.5	1.8	6	0.034	76
FLSE 132 MU	380	5.5	958	55	12.8	0.76	86	4.2	1.3	1.5	8.9	0.043	88
	400	5.5	963	55	12.3	0.75	86.4	4.7	1.4	1.6	7.1	0.043	88
	415	5.5	968	55	12	0.73	86.5	5.1	1.6	1.8	6	0.043	88

For higher power ratings, please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

6
poles
1000 min⁻¹

EEx e IIT3 VIK

MAINS SUPPLY 380 / 400 / 420 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
FLSE 90 S	380	0.65	931	6.5	1.8	0.72	75.6	4.6	2.3	2.4	10.2	0.0039	19
	400	0.65	938	6.5	1.8	0.68	75.1	4.8	2.6	2.7	9.4	0.0039	19
	420	0.65	945	6.5	1.9	0.63	74.6	4.9	2.9	3	9	0.0039	19
FLSE 90 L	380	0.95	909	9.5	2.5	0.77	75.1	4	2.2	2.2	10.9	0.0048	21
	400	0.95	917	9.5	2.5	0.73	75.4	4.2	2.3	2.3	9.9	0.0048	21
	420	0.95	931	9.5	2.5	0.69	75.8	4.4	2.5	2.5	9	0.0048	21
FLSE 100 LK	380	1.3	941	13	3.4	0.72	79.3	4.3	1.9	1.9	10.2	0.0136	41
	400	1.3	948	13	3.3	0.71	79.8	4.7	2.2	2.2	8.6	0.0136	41
	420	1.3	956	13	3.3	0.68	80.4	5.2	2.5	2.5	7	0.0136	41
FLSE 112 M	380	1.9	929	19	4.9	0.75	78.7	3.8	1.6	1.6	11.6	0.0152	45
	400	1.9	940	19	4.7	0.73	79.7	4.2	1.9	1.9	9.5	0.0152	45
	420	1.9	948	19	4.5	0.71	80.7	4.9	2.2	2.2	7	0.0152	45
FLSE 132 SM	380	2.6	959	26	6.2	0.75	84.5	3.7	1.1	1.4	11.3	0.026	72
	400	2.6	964	26	6	0.74	84.7	4.2	1.2	1.6	8.8	0.026	72
	420	2.6	969	26	5.8	0.72	85.1	4.7	1.3	1.7	7	0.026	72
FLSE 132 M	380	3.5	962	35	8.3	0.75	85.3	4.1	1.2	1.5	10.4	0.034	76
	400	3.5	967	35	8	0.74	85.5	4.5	1.3	1.7	8.6	0.034	76
	420	3.5	971	35	7.8	0.72	85.8	5	1.4	1.8	7	0.034	76
FLSE 132 MU	380	4.8	963	48	11.2	0.75	86.6	4.5	1.4	1.6	12	0.043	88
	400	4.8	967	48	10.8	0.74	86.8	5	1.5	1.7	9.7	0.043	88
	420	4.8	971	48	10.6	0.72	86.8	5.5	1.7	2	8	0.043	88

For higher power ratings, please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

2
poles
3000 min⁻¹

EEx e IIT4

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
FLSE 80 L	380	0.75	2868	2.5	1.6	0.86	83.2	5.9	2.2	2.5	8.5	0.0009	18
	400	0.75	2879	2.5	1.5	0.84	83.2	6.4	2.5	3	7.2	0.0009	18
	415	0.75	2894	2.5	1.5	0.83	82.9	7	2.7	3.3	6	0.0009	18
FLSE 90 L	380	1.1	2845	3.7	2.2	0.91	83.1	5.2	1.9	2.4	9.1	0.0021	25.5
	400	1.1	2865	3.7	2.1	0.91	83.9	5.8	2.1	2.7	7.3	0.0021	25.5
	415	1.1	2880	3.7	2	0.90	84.2	6.4	2.3	2.9	6	0.0021	25.5
FLSE 90 LU	380	1.5	2850	5	3.1	0.89	83.8	5.3	1.9	2.4	9	0.0024	28.3
	400	1.5	2867	5	2.9	0.88	84.4	5.9	2.2	2.7	7.3	0.0024	28.3
	415	1.5	2882	5	2.8	0.88	84.9	6.5	2.4	3	6	0.0024	28.3
FLSE 100 LK	380	2.2	2909	7.5	4.2	0.92	86.9	7.1	2.3	2.9	8.6	0.0069	42
	400	2.2	2919	7.5	4	0.91	87.2	7.8	2.5	3.2	7.1	0.0069	42
	415	2.2	2926	7.5	3.9	0.90	87.4	8.5	2.8	3.5	6	0.0069	42
FLSE 112 MU	380	3	2914	10.1	5.5	0.95	86.5	7.7	2.5	3.1	8.4	0.0099	54
	400	3	2924	10.1	5.3	0.94	86.7	8.5	2.7	3.4	6.9	0.0099	54
	415	3	2930	10.1	5.2	0.93	86.9	9.1	3	3.7	6	0.0099	54
FLSE 132 SM	380	4	2938	13.5	7.8	0.88	88.4	7.4	1.9	2.9	8.3	0.0263	71
	400	4	2944	13.5	7.5	0.87	88.4	8.1	2.1	3.2	7	0.0263	71
	415	4	2949	13.5	7.3	0.86	88.3	8.7	2.3	3.5	6	0.0263	71
FLSE 132 SM	380	5.5	2947	18.6	10	0.93	89.4	6.4	1.6	2.5	8.7	0.031	75
	400	5.5	2953	18.6	9.7	0.92	89.5	7	1.7	2.7	7.3	0.031	75
	415	5.5	2958	18.6	9.4	0.91	89.7	7.7	1.9	2.9	6	0.031	75
FLSE 132 MU	380	7.5	2924	25.4	13.6	0.94	89.4	5.3	1.3	2	9	0.038	81
	400	7.5	2933	25.4	12.9	0.94	89.9	5.9	1.4	2.2	7.3	0.038	81
	415	7.5	2943	25.4	12.4	0.93	90.4	6.5	1.6	2.4	6	0.038	81

For higher power ratings, please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

4
poles
1500 min⁻¹

EEx e IIT4

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
FLSE 80 L	380	0.55	1410	3.75	1.4	0.78	74	4.9	1.7	1.7	7.3	0.0024	17
	400	0.55	1425	3.75	1.4	0.76	75	5.1	1.9	2	6.7	0.0024	17
	415	0.55	1430	3.75	1.4	0.73	75	5.4	2.1	2.3	6	0.0024	17
FLSE 90 S	380	0.75	1445	5	1.8	0.79	81	5.2	1.7	2.1	8	0.0032	21
	400	0.75	1451	5	1.7	0.77	81.4	5.6	1.9	2.4	6.9	0.0032	21
	415	0.75	1455	5	1.7	0.74	81.4	6	2.1	2.6	6	0.0032	21
FLSE 90 L	380	1.1	1440	7.5	2.6	0.80	81.7	5	1.7	2.1	8.3	0.0037	23
	400	1.1	1447	7.5	2.5	0.78	82.1	5.5	1.8	2.3	6.9	0.0037	23
	415	1.1	1452	7.5	2.5	0.76	82.2	5.9	2	2.5	6	0.0037	23
FLSE 100 LK	380	1.5	1462	10	3.2	0.84	85.3	5.6	1.5	1.9	8.6	0.0077	41
	400	1.5	1466	10	3.1	0.82	85.5	6.1	1.6	2.1	7.2	0.0077	41
	415	1.5	1470	10	3	0.81	85.8	6.7	1.8	2.3	6	0.0077	41
FLSE 100 LK	380	2.2	1461	15	4.5	0.85	86.9	6	1.7	2	8.6	0.0107	43.6
	400	2.2	1466	15	4.4	0.84	87.3	6.6	1.8	2.2	7.1	0.0107	43.6
	415	2.2	1469	15	4.3	0.82	87.4	7.2	2	2.4	6	0.0107	43.6
FLSE 112 MU	380	3	1459	20	6.1	0.86	87.4	6.1	1.8	2	8.6	0.0137	51.5
	400	3	1464	20	5.9	0.85	87.8	6.7	2	2.2	7.1	0.0137	51.5
	415	3	1467	20	5.7	0.83	87.9	7.3	2.1	2.4	6	0.0137	51.5
FLSE 132 SM	380	4	1460	27.5	7.6	0.91	88	8	1.7	2.3	9.5	0.0154	65
	400	4	1465	27.5	7.4	0.89	88	8.6	1.8	2.6	8.2	0.0154	65
	415	4	1470	27.5	7.2	0.88	88	9.3	2	2.8	7	0.0154	65
FLSE 132 SM	380	5.5	1462	37.5	10.7	0.88	89	6.7	1.8	2.4	8.1	0.0192	70
	400	5.5	1466	37.5	10.4	0.87	89.1	7.3	2	2.7	6.9	0.0192	70
	415	5.5	1469	37.5	10.2	0.85	89	7.8	2.2	2.9	6	0.0192	70
FLSE 132 MU	380	7.5	1456	50	14.4	0.89	88.8	5.7	1.5	2.1	8.8	0.0256	82
	400	7.5	1461	50	13.8	0.88	89.2	6.3	1.6	2.3	7.2	0.0256	82
	415	7.5	1465	50	13.4	0.87	89.3	6.9	1.8	2.5	6	0.0256	82

For higher power ratings, please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety

Electrical characteristics



C2 - Selection data: FLSE cast iron motors

6
poles
1000 min⁻¹

EEx e IIT4

MAINS SUPPLY 380 / 400 / 415 V

50 Hz

Type	Rated voltage	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current / Rated current	Starting torque / Rated torque	Maximum torque / Rated torque	Locked rotor time	Moment of inertia	Weight
	U_N V	P_N kW	N_N min ⁻¹	M_N N.m	I_N A	$\cos \varphi$	η %	I_D/I_N	M_D/M_N	M_M/M_N	t_E s	J kg.m ²	IM B3 kg
FLSE 80 L	380	0.25	947	2.5	0.9	0.67	66.2	3.5	1.5	1.8	11.7	0.0032	15
	400	0.25	953	2.5	0.9	0.64	66.3	3.8	1.7	2.1	10	0.0032	15
	415	0.25	958	2.5	0.9	0.62	65.9	4	1.9	2.3	9	0.0032	15
FLSE 80 L	380	0.37	954	3.7	1.3	0.64	68.8	4.1	1.9	2.2	10	0.0042	16
	400	0.37	960	3.7	1.3	0.61	68.3	4.3	2.1	2.5	9	0.0042	16
	415	0.37	963	3.7	1.3	0.59	67.6	4.6	2.3	2.7	8	0.0042	16
FLSE 90 S	380	0.55	940	5.5	1.6	0.68	76.5	4.8	2.7	2.7	10.6	0.0039	19
	400	0.55	947	5.5	1.6	0.65	76.2	5	3	3	9.8	0.0039	19
	415	0.55	952	5.5	1.7	0.61	75.5	5.2	3.3	3.3	9	0.0039	19
FLSE 90 L	380	0.75	918	7.5	2	0.76	76.2	3.8	2	2	11.7	0.0048	21
	400	0.75	927	7.5	1.9	0.73	76.7	4.3	2.3	2.3	9.2	0.0048	21
	415	0.75	935	7.5	1.9	0.70	76.9	4.6	2.5	2.6	8	0.0048	21
FLSE 100 LK	380	1.1	941	11	2.9	0.72	79.3	4.2	1.9	1.9	8.5	0.0136	41
	400	1.1	948	11	2.8	0.70	80	4.6	2.1	2.1	7.1	0.0136	41
	415	1.1	954	11	2.8	0.68	80.5	5	2.4	2.4	6	0.0136	41
FLSE 112 M	380	1.5	934	15	3.9	0.74	79.3	3.8	1.7	1.7	9.6	0.0152	45
	400	1.5	943	15	3.8	0.72	80.2	4.4	1.9	1.9	7.1	0.0152	45
	415	1.5	949	15	3.7	0.70	80.7	4.8	2.2	2.2	6	0.0152	45
FLSE 132 SM	380	2.2	963	22	5.4	0.73	84.7	4	1.1	1.5	9	0.026	72
	400	2.2	968	22	5.2	0.72	85.1	4.4	1.3	1.6	7.5	0.026	72
	415	2.2	971	22	5.1	0.71	85.1	4.9	1.4	1.8	6	0.026	72
FLSE 132 M	380	3	964	30	7.2	0.74	85.9	4.2	1.2	1.5	8.8	0.034	76
	400	3	968	30	7	0.72	86.1	4.7	1.4	1.7	7.1	0.034	76
	415	3	972	30	6.8	0.71	86.2	5.1	1.5	1.8	6	0.034	76
FLSE 132 MU	380	4	964	40	9.4	0.75	86.4	4.4	1.3	1.5	8.7	0.043	88
	400	4	968	40	9.2	0.73	86.6	4.9	1.5	1.7	7	0.043	88
	415	4	971	40	8.9	0.72	86.7	5.3	1.6	1.9	6	0.043	88

For higher power ratings, please consult Leroy-Somer.

LSE 3-phase TEFV induction motors for increased safety Dimensions



D1 - Dimensions: LSE aluminium motors

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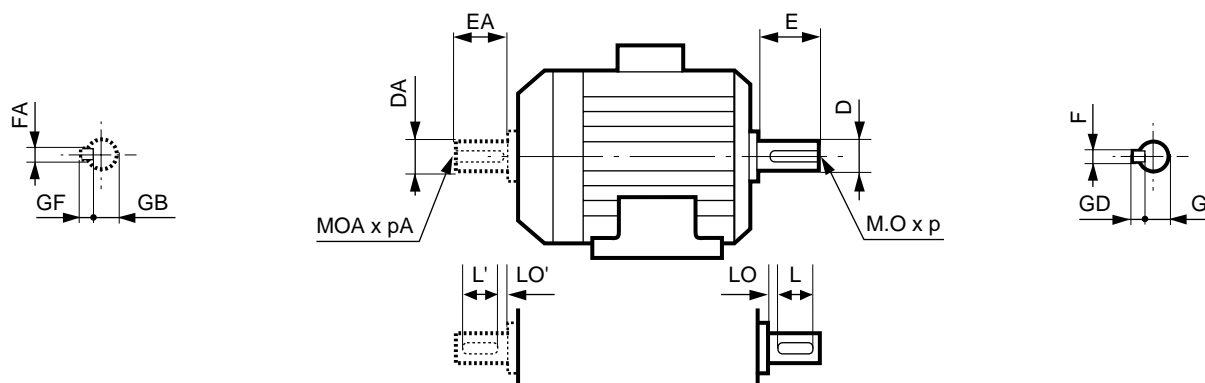
LSE 3-phase TEFV induction motors for increased safety Dimensions



D1 - Dimensions: LSE aluminium motors

Dimensions in millimetres

Dimensions of shaft extensions



Type	Main shaft extensions																		
	4, 6 and 8 poles										2 poles and 2/4 poles								
	F	GD	D	G	E	O	p	L	LO		F	GD	D	G	E	O	p	L	LO
LSE 80 L	6	6	19j6	15.5	40	6	16	30	6		6	6	19j6	15.5	40	6	16	30	6
LSE 90 S/L	8	7	24j6	20	50	8	19	40	6		8	7	24j6	20	50	8	19	40	6
LSE 100 L	8	7	28j6	24	60	10	22	50	6		8	7	28j6	24	60	10	22	50	6
LSE 112 MG/MU	8	7	28j6	24	60	10	22	50	6		8	7	28j6	24	60	10	22	50	6
LSE 132 S/M/SM	10	8	38k6	33	80	12	28	63	10		10	8	38k6	33	80	12	28	63	10
LSE 160 M/L/MP/LU/MR	12	8	42k6	37	110	16	36	100	6		12	8	42k6	37	110	16	36	100	6
LSE 180 MT/L/LU/MR	14	9	48k6	42.5	110	16	36	98	12		14	9	48k6	42.5	110	16	36	98	12
LSE 200 LT/L	16	10	55m6	49	110	20	42	97	13		16	10	55m6	49	110	20	42	97	13
LSE 225 ST/MR/SR/MT	18	11	60m6	53	140	20	42	126	14		16	10	55m6	49	110	20	42	97	13

Type	Secondary shaft extensions																		
	4, 6 and 8 poles										2 poles and 2/4 poles								
	FA	GF	DA	GB	EA	OA	pA	L'	LO'		FA	GF	DA	GB	EA	OA	pA	L'	LO'
LSE 80 L	5	5	14j6	11	30	5	15	25	3.5		5	5	14j6	11	30	5	15	25	3.5
LSE 90 S/L	6	6	19j6	15.5	40	6	16	30	6		6	6	19j6	15.5	40	6	16	30	6
LSE 100 L	8	7	24j6	20	50	8	19	40	6		8	7	24j6	20	50	8	19	40	6
LSE 112 MG/MU	8	7	24j6	20	50	8	19	40	6		8	7	24j6	20	50	8	19	40	6
LSE 132 S/M	8	7	28j6	24	60	10	22	50	6		8	7	28j6	24	60	10	22	50	6
LSE 160 MP/MR	10	8	38k6	33	80	12	28	63	10		10	8	38k6	33	80	12	28	63	10
LSE 160 M/L	12	8	42k6	37	110	16	36	100	6		12	8	42k6	37	110	16	36	100	6
LSE 180 MT/L/LU/MR	14	9	48k6	42.5	110	16	36	98	12		14	9	48k6	42.5	110	16	36	98	12
LSE 200 LT/L	16	10	55m6	49	110	20	42	97	13		16	10	55m6	49	110	20	42	97	13
LSE 225 ST/MR/SR/MT	18	11	60m6	53	140	20	42	126	14		16	10	55m6	49	110	20	42	97	13

For frame sizes 63, 71, 250 and 280: please consult Leroy-Somer.

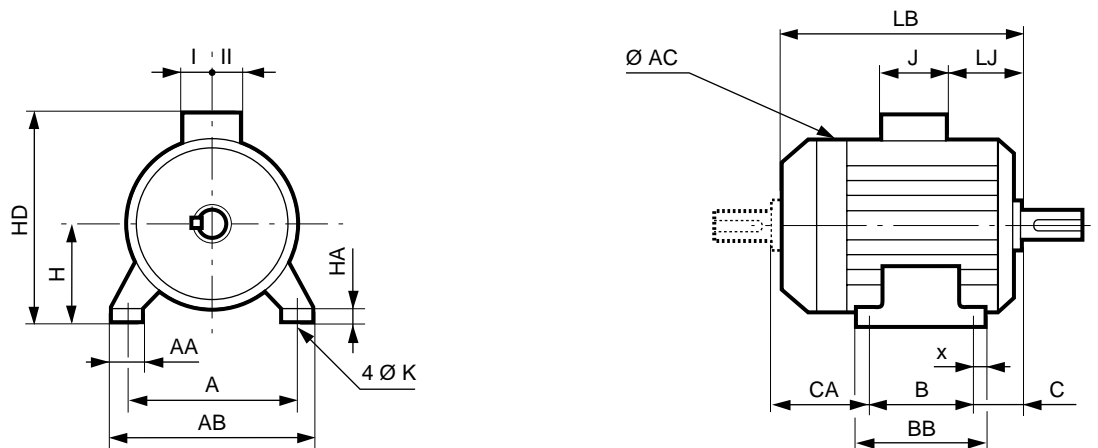
LSE 3-phase TEFV induction motors for increased safety Dimensions



D1 - Dimensions: LSE aluminium motors

Dimensions in millimetres

Foot mounting IM B3 (IM 1001)



Type	Main dimensions																	
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	CA
LSE 80 L	125	157	100	120	50	10	29	9	10	80	170	225	215	15	160	55	55	68
LSE 90 S	140	172	100	120	56	10	37	10	11	90	190	244	218	15	160	55	55	66
LSE 90 L	140	172	125	162	56	28	37	10	11	90	190	244	245	15	160	55	55	68
LSE 100 L	160	196	140	165	63	12	40	12	13	100	200	259	290	15	160	55	55	93
LSE 112 MG	190	220	140	165	70	12	52	12	14	112	235	280	315	24	160	55	55	110
LSE 112 MU	190	220	140	165	70	12	52	12	14	112	235	280	334	24	160	55	55	130
LSE 132 S	216	250	140	170	89	16	50	12	15	132	235	300	350	41	160	55	55	128
LSE 132 SM/M	216	250	178	208	89	16	59	12	18	132	280	319	387	25	160	55	55	126
LSE 132 MU	216	250	178	208	89	16	59	12	18	132	280	319	410	25	160	55	55	148
LSE 160 MP	254	294	210	294	108	20	64	14.5	25	160	315	357	468	55.5	160	55	55	154
LSE 160 M	254	294	210	294	108	20	60	14.5	25	160	310	408	495	45	205	100	95	182
LSE 160 MR	254	294	254	294	108	20	64	14.5	25	160	315	357	495	55.5	134	92	63	138
LSE 160 L	254	294	254	294	108	20	60	14.5	25	160	310	408	495	45	205	100	95	138
LSE 180 MT	279	324	241	316	121	20	79	14.5	28	180	310	453	495	39	217	103	145	138
LSE 180 MR	279	324	241	316	121	20	79	14.5	28	180	310	453	520	39	217	103	145	163
LSE 180 L	279	339	279	329	121	25	86	14.5	25	180	350	460	552	48	217	103	145	159
LSE 180 LU	279	339	279	329	121	25	86	14.5	25	180	350	460	593	48	217	103	145	199
LSE 200 LT	318	378	305	365	133	30	108	18.5	32	200	350	480	599	54	217	103	145	167
LSE 200 L	318	388	305	375	133	35	103	18.5	36	200	390	505	621	62	217	103	145	194
LSE 225 MT	356	431	311	386	149	50	127	18.5	36	225	390	525	628	68	217	103	145	178
LSE 225 SR	356	431	286	386	149	50	127	18.5	36	225	390	525	676	68	217	103	145	253
LSE 225 MR	356	431	311	386	149	50	127	18.5	36	225	390	525	676	68	217	103	145	228

For frame sizes 63, 71, 250 and 280: please consult Leroy-Somer.

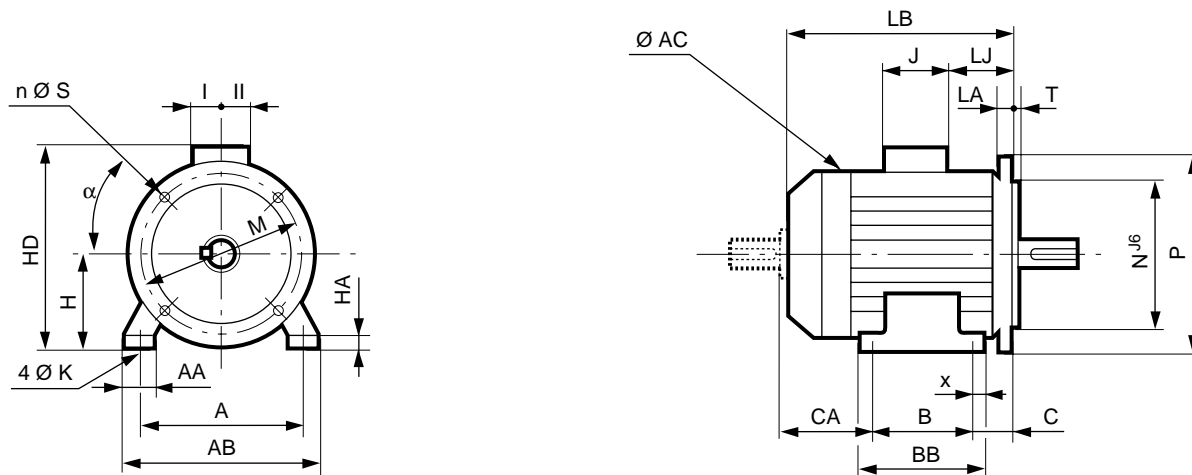
LSE 3-phase TEFV induction motors for increased safety Dimensions



D1 - Dimensions: LSE aluminium motors

Dimensions in millimetres

Foot and flange mounting IM B35 (IM 2001)



Type	Main dimensions																	
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	Sym.
LSE 80 L	125	157	100	120	50	10	29	9	10	80	170	225	215	15	160	55	55	FF 165
LSE 90 S	140	172	100	120	76	10	37	10	11	90	190	244	238	35	160	55	55	FF 165
LSE 90 L	140	172	125	162	76	8	37	10	11	90	190	244	265	35	160	55	55	FF 165
LSE 100 L	160	196	140	165	63	12	40	12	13	100	200	259	290	15	160	55	55	FF 215
LSE 112 MG	190	220	140	165	70	12	52	12	14	112	235	280	315	24	160	55	55	FF 215
LSE 112 MU	190	220	140	165	70	12	52	12	14	112	235	280	334	24	160	55	55	FF 215
LSE 132 S	216	250	140	170	89	16	50	12	15	132	235	300	350	41	160	55	55	FF 265
LSE 132 SM/M	216	250	178	208	89	16	59	12	18	132	280	319	387	25	160	55	55	FF 265
LSE 132 MU	216	250	178	208	89	16	59	12	18	132	280	319	410	25	160	55	55	FF 265
LSE 160 MP	254	294	210	294	108	20	64	14.5	25	160	315	357	468	55.5	160	55	55	FF 300
LSE 160 M	254	294	210	294	108	20	60	14.5	25	160	310	408	495	45	205	100	95	FF 300
LSE 160 MR	254	294	254	294	108	20	64	14.5	25	160	315	357	495	55.5	134	92	63	FF 300
LSE 160 L	254	294	254	294	108	20	60	14.5	25	160	310	408	495	45	205	100	95	FF 300
LSE 180 MT	279	324	241	316	121	20	79	14.5	28	180	310	453	495	39	217	103	145	FF 300
LSE 180 MR	279	324	241	316	121	20	79	14.5	28	180	310	453	520	39	217	103	145	FF 300
LSE 180 L	279	339	279	329	121	25	86	14.5	25	180	350	460	552	48	217	103	145	FF 300
LSE 180 LU	279	339	279	329	121	25	86	14.5	25	180	350	460	593	48	217	103	145	FF 300
LSE 200 LT	318	378	305	365	133	30	108	18.5	32	200	350	480	599	54	217	103	145	FF 350
LSE 200 L	318	388	305	375	133	35	103	18.5	36	200	390	500	621	62	217	103	145	FF 350
LSE 225 MT	356	431	311	386	149	50	127	18.5	36	225	390	525	628	68	217	103	145	FF 400
LSE 225 SR	356	431	286	386	149	50	127	18.5	36	225	390	525	676	68	217	103	145	FF 400
LSE 225 MR	356	431	311	386	149	50	127	18.5	36	225	390	525	676	68	217	103	145	FF 400

For frame sizes 63, 71, 250 and 280: please consult Leroy-Somer.

Dimension CA and shaft extensions are identical to those for foot mounted motors (page 32).

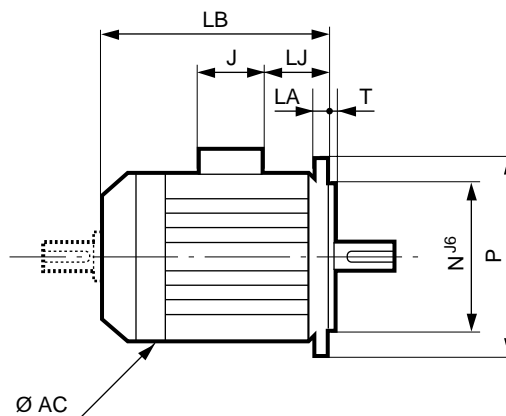
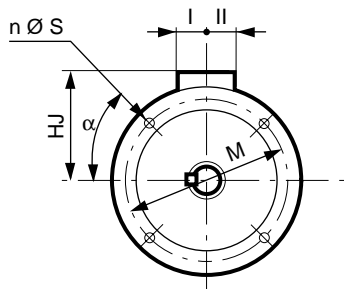
LSE 3-phase TEFV induction motors for increased safety Dimensions



D1 - Dimensions: LSE aluminium motors

Dimensions in millimetres

Flange mounting IM B5 (IM 3001)



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	14.5	12
FF 215	215	180	250	4	4	45	14.5	12
FF 215	215	180	250	4	4	45	14.5	12
FF 265	265	230	300	4	4	45	14.5	14
FF 265	265	230	300	4	4	45	14.5	14
FF 265	265	230	300	4	4	45	14.5	14
FF 300	300	250	350	5	4	45	18.5	14
FF 300	300	250	350	5	4	45	18.5	14
FF 300	300	250	350	5	4	45	18.5	14
FF 300	300	250	350	5	4	45	18.5	14
FF 300	300	250	350	5	4	45	18.5	14
FF 300	300	250	350	5	4	45	18.5	14
FF 300	300	250	350	5	4	45	18.5	14
FF 350	350	300	400	5	4	45	18.5	15
FF 350	350	300	400	5	4	45	18.5	15
FF 400	400	350	450	5	8	22.5	18.5	16
FF 400	400	350	450	5	8	22.5	18.5	16
FF 400	400	350	450	5	8	22.5	18.5	16

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
LSE 80 L	170	215	145	15	160	55	55
LSE 90 S	190	238	154	35	160	55	55
LSE 90 L	190	265	154	35	160	55	55
LSE 100 L	200	290	154	15	160	55	55
LSE 112 MG	235	315	168	24	160	55	55
LSE 112 MU	235	334	168	24	160	55	55
LSE 132 S	235	350	168	41	160	55	55
LSE 132 SM/M	280	387	187	25	160	55	55
LSE 132 MU	280	410	187	25	160	55	55
LSE 160 MP	315	468	197	55.5	160	55	55
LSE 160 M	316	495	248	45	205	100	95
LSE 160 MR	315	495	197	55.5	134	92	63
LSE 160 L	316	495	248	45	205	100	95
LSE 180 MT	316	495	273	39	217	103	145
LSE 180 MR	316	520	273	39	217	103	145
LSE 180 L	350	552	280	48	217	103	145
LSE 180 LU	350	593	280	48	217	103	145
LSE 200 LT	350	599	280	54	217	103	145
LSE 200 L	390	621	300	62	217	103	145
LSE 225 MT	390	628	300	68	217	103	145
LSE 225 SR	390	676	300	68	217	103	145
LSE 225 MR	390	676	300	68	217	103	145

For frame sizes 63, 71, 250 and 280: please consult Leroy-Somer.

Dimensions of shaft extensions identical to those for foot mounted motors (page 32).

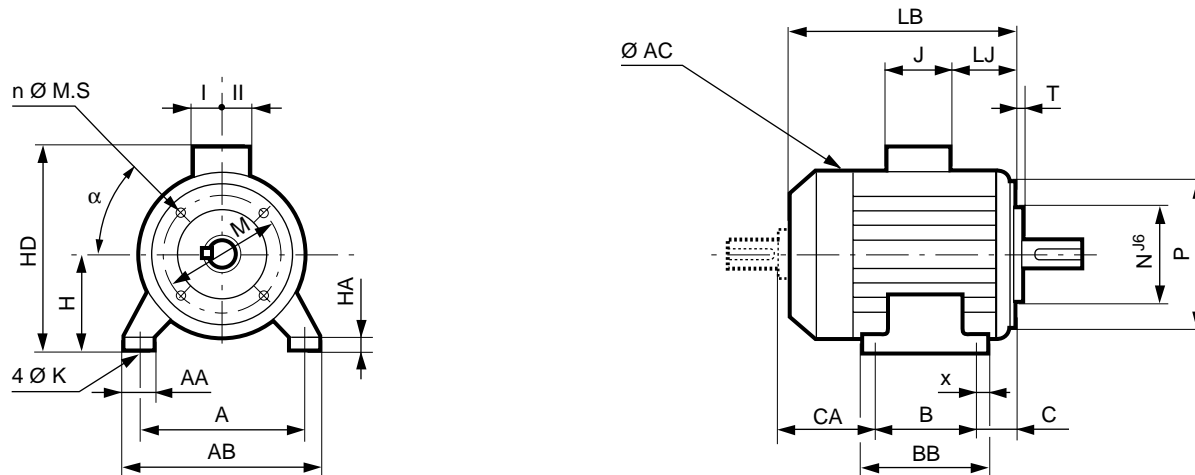
LSE 3-phase TEFV induction motors for increased safety Dimensions



D1 - Dimensions: LSE aluminium motors

Dimensions in millimetres

Foot and face mounting IM B34 (IM 2101)



Type	Main dimensions																	
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	Sym.
LSE 80 L	125	157	100	120	50	10	29	9	10	80	170	225	215	15	160	55	55	FT 100
LSE 90 S	140	172	100	120	56	10	37	10	11	90	190	244	218	15	160	55	55	FT 115
LSE 90 L	140	172	125	162	56	28	37	10	11	90	190	244	245	15	160	55	55	FT 115
LSE 100 L	160	196	140	165	63	12	40	12	13	100	200	259	290	15	160	55	55	FT 130
LSE 112 MG	190	220	140	165	70	12	52	12	14	112	235	280	315	24	160	55	55	FT 130
LSE 112 MU	190	220	140	165	70	12	52	12	14	112	235	280	334	24	160	55	55	FT 130
LSE 132 S	216	250	140	170	89	16	50	12	15	132	235	300	350	41	160	55	55	FT 215
LSE 132 SM/M	216	250	178	208	89	16	59	12	18	132	280	319	387	25	160	55	55	FT 215
LSE 132 MU	216	250	178	208	89	16	59	12	18	132	280	319	410	25	160	55	55	FT 215
LSE 160 MP	254	294	210	250	108	20	112	14	25	160	315	357	425	55.5	160	55	55	FT 215
LSE 160 MR	254	294	254	294	108	20	112	14	25	160	315	357	495	55.5	160	55	55	FT 215

For frame sizes 63, 71: please consult Leroy-Somer.

Dimension CA and shaft extensions are identical to those for foot mounted motors (page 32).

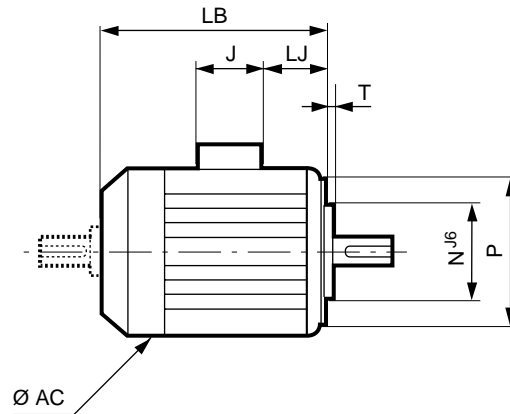
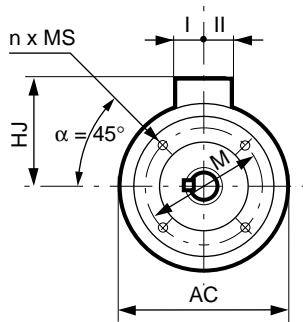
LSE 3-phase TEFV induction motors for increased safety Dimensions



D1 - Dimensions: LSE aluminium motors

Dimensions in millimetres

Face mounting IM B14 (IM 3601)



IEC symbol	Faceplate dimensions					
	M	N	P	T	n	MS
FT 100	100	80	120	3	4	M6
FT 115	115	95	140	3	4	M8
FT 115	115	95	140	3	4	M8
FT 130	130	110	160	3.5	4	M8
FT 130	130	110	160	3.5	4	M8
FT 130	130	110	160	3.5	4	M8
FT 215	215	180	250	4	4	M12
FT 215	215	180	250	4	4	M12
FT 215	215	180	250	4	4	M12
FT 215	215	180	250	4	4	M12
FT 215	215	180	250	4	4	M12

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
LSE 80 L	170	215	145	15	160	55	55
LSE 90 S	190	218	154	15	160	55	55
LSE 90 L	190	245	154	15	160	55	55
LSE 100 L	200	290	154	15	160	55	55
LSE 112 MG	235	315	168	24	160	55	55
LSE 112 MU	235	334	168	24	160	55	55
LSE 132 S	235	350	168	41	160	55	55
LSE 132 SM/M	280	387	187	25	160	55	55
LSE 132 MU	280	410	187	25	160	55	55
LSE 160 MP	315	425	197	55.5	160	55	55
LSE 160 MR	315	495	197	55.5	160	55	55

For frame sizes 63, 71: please consult Leroy-Somer.

Dimensions of shaft extensions identical to those for foot mounted motors (page 32).

LSE 3-phase TEFV induction motors for increased safety Dimensions



Optional features

Non-standard flanges

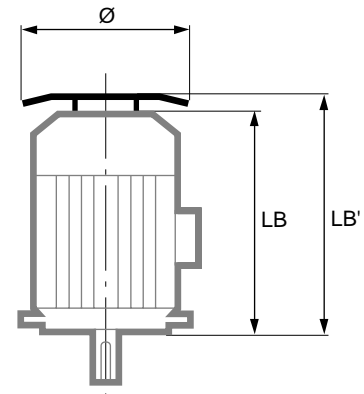
Motor type	Flange mounted (FF)									Face mounted (FT)							
	Flange type	FF 115	FF 130	FF 165	FF 215	FF 265	FF 300	FF 350	FF 400	FF 500	FT 85	FT 100	FT 115	FT 130	FT 165	FT 215	FT 265
LSE 80		○	○	●	*						*	●	*	*	*		
LSE 90		*	*	●	*							*	●	*	○		
LSE 90 (Foot)		○	○	○	○							*	●	*	○		
LSE 100		○	○	○	●								*	●	*	*	
LSE 112 MG/MU			○	○	●	*							*	●	*	*	
LSE 132 S				○	*	●							*	*	●	*	
LSE 132 SM/M/MU				○	○	●	○							*	●	*	
LSE 160 MP/L/MR/M					*	*	●	*							*	●	
LSE 180							●	*									
LSE 200							*	●	*								
LSE 225									●	*							

● Standard B3 ○ Adapted shaft * Adaptable without shaft modifications

Drip cover for operation in vertical position, shaft end facing down

Type	LB'	Ø
80	LB +20	145
90	LB +20	185
100	LB +20	185
112 MG/MU	LB +25	210
132 S	LB +25	210
132 SM/M	LB +30	240
160 MP/MR	LB +30	240
160 M/L	LB +36.5	265
180 MT/MR	LB +36.5	265
180 L/LU	LB +36.5	305
200 LT	LB +36.5	305
200 L	LB +36.5	350
225 MR/ST/SR	LB +36.5	350

Dimensions in millimetres



For frame sizes 63, 71, 250 and 280: please consult Leroy-Somer.

FLSE 3-phase TEFV induction motors for increased safety Dimensions



D2 - Dimensions: FLSE cast iron motors

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Foot and flange mounting IM B35 (IM 2001).....	42
Flange mounting IM B5 (IM 3001)	43
Foot and face mounting IM B34 (IM 2101)	44
Face mounting IM B14 (IM 3601)	45
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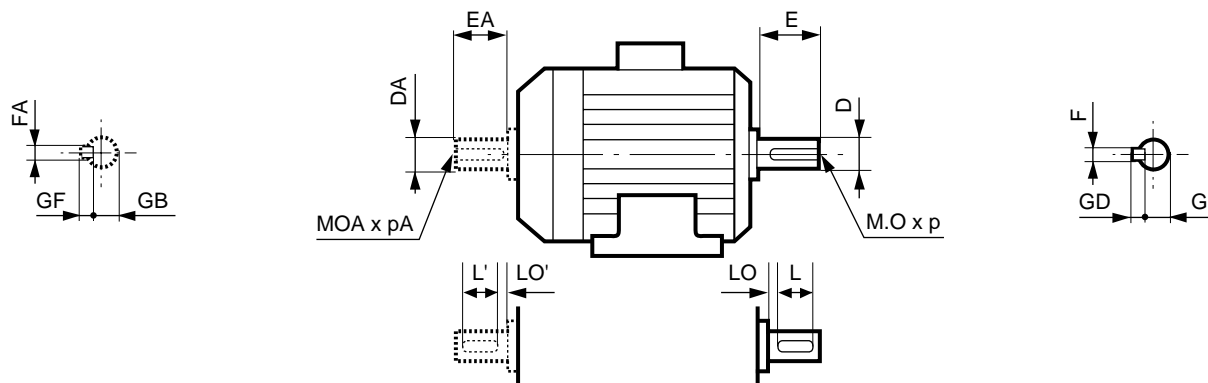
FLSE 3-phase TEFV induction motors for increased safety Dimensions



D2 - Dimensions: FLSE cast iron motors

Dimensions in millimetres

Dimensions of shaft extensions



Type	Main shaft extensions																	
	4, 6 and 8 poles									2 poles								
	F	GD	D	G	E	O	p	L	LO	F	GD	D	G	E	O	p	L	LO
FLSE 80 L	6	6	19j6	15.5	40	6	16	30	6	6	6	19j6	15.5	40	6	16	30	6
FLSE 90 S/L/LU	8	7	24j6	20	50	8	19	40	6	8	7	24j6	20	50	8	19	40	6
FLSE 100 L	8	7	28j6	24	60	10	22	50	6	8	7	28j6	24	60	10	22	50	6
FLSE 112 M/MU	8	7	28j6	24	60	10	22	50	6	8	7	28j6	24	60	10	22	50	6
FLSE 132 S/M/SM/MU	10	8	38k6	33	80	12	28	63	10	10	8	38k6	33	80	12	28	63	10

Type	Secondary shaft extensions																	
	4, 6 and 8 poles									2 poles								
	FA	GF	DA	GB	EA	OA	pA	L'	LO'	FA	GF	DA	GB	EA	OA	pA	L'	LO'
FLSE 80 L	5	5	14j6	11	30	5	15	25	3.5	5	5	14j6	11	30	5	15	25	3.5
FLSE 90 S/L/LU	6	6	19j6	15.5	40	6	16	30	6	6	6	19j6	15.5	40	6	16	30	6
FLSE 100 L	8	7	24j6	20	50	8	19	40	6	8	7	24j6	20	50	8	19	40	6
FLSE 112 M/MU	8	7	24j6	20	50	8	19	40	6	8	7	24j6	20	50	8	19	40	6
FLSE 132 S/M/SM/MU	8	7	28j6	24	60	10	22	50	6	8	7	28j6	24	60	10	22	50	6

For larger frame sizes, please consult Leroy-Somer.

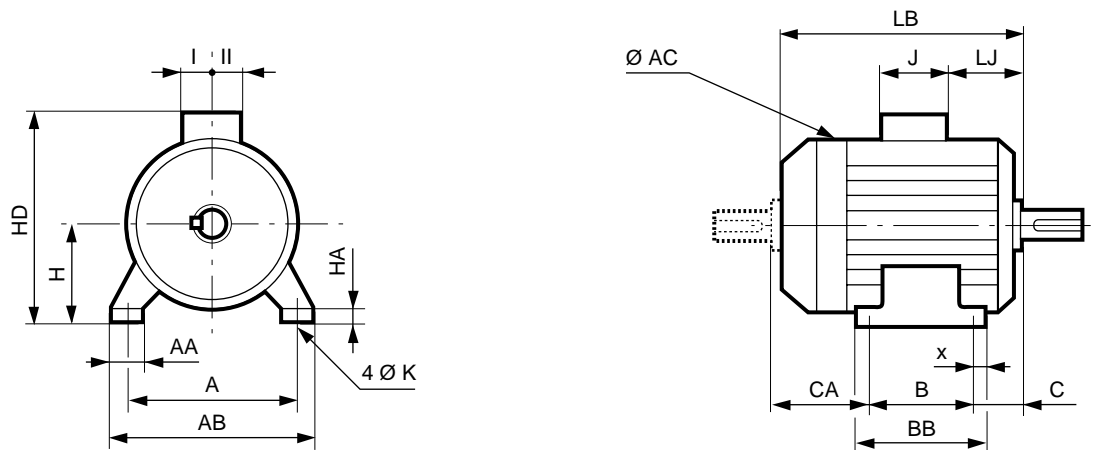
FLSE 3-phase TEFV induction motors for increased safety Dimensions



D2 - Dimensions: FLSE cast iron motors

Dimensions in millimetres

Foot mounting IM B3 (IM 1001)



Type	Main dimensions																	
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	CA
FLSE 80 L	125	157	100	130	50	20	32	9	10	80	160	230	214	27	126	63	63	68
FLSE 90 S	140	172	100	160	56	22	34	9	11	90	185	250	243	22	126	63	63	93
FLSE 90 L	140	172	125	160	56	22	34	9	11	90	185	250	243	22	126	63	63	68
FLSE 90 LU	140	172	125	160	56	22	34	9	11	90	185	250	263	22	126	63	63	88
FLSE 100 L	160	200	140	174	63	22	42	12	12	100	226	293	323	37	150	75	75	125
FLSE 112 M	190	230	140	174	70	22	45	12	12	112	226	305	323	37	150	75	75	119
FLSE 112 MU	190	230	140	174	70	22	45	12	12	112	226	305	342	37	150	75	75	138
FLSE 132 S	216	255	140	223	89	31	58	12	15	132	264	345	387	28	150	75	75	164
FLSE 132 M	216	255	178	223	89	31	58	12	15	132	264	345	387	28	150	75	75	126
FLSE 132 MU	216	255	178	223	89	31	58	12	15	132	264	345	410	28	150	75	75	149

For larger frame sizes, please consult Leroy-Somer.

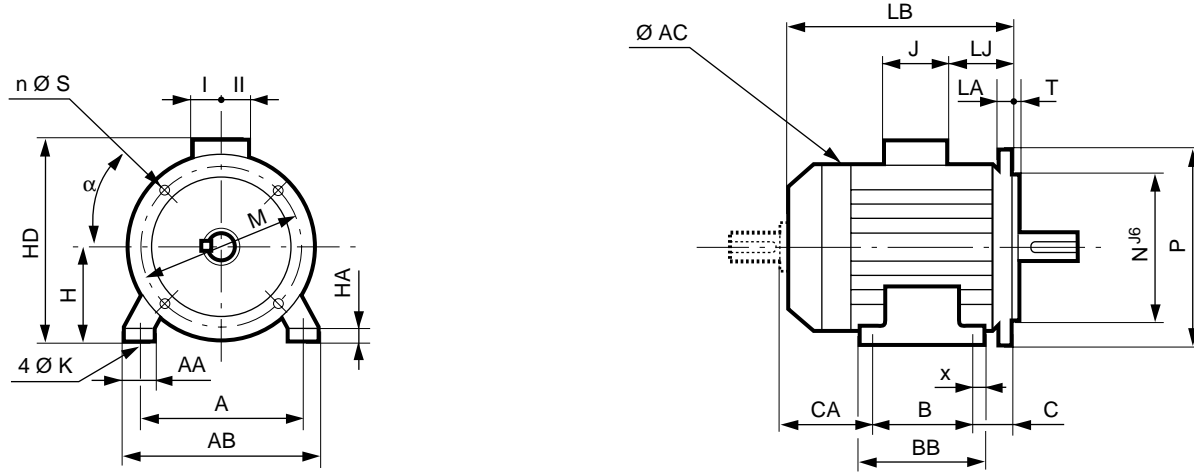
FLSE 3-phase TEFV induction motors for increased safety Dimensions



D2 - Dimensions: FLSE cast iron motors

Dimensions in millimetres

Foot and flange mounting IM B35 (IM 2001)



Type	Main dimensions																	
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	Sym.
FLSE 80 L	125	157	100	130	50	20	32	9	10	80	160	230	214	27	126	63	63	FF 165
FLSE 90 S	140	172	100	160	76	22	34	9	11	90	185	250	263	22	126	63	63	FF 165
FLSE 90 L	140	172	125	160	76	22	34	9	11	90	185	250	263	22	126	63	63	FF 165
FLSE 90 LU	140	172	125	160	76	22	34	9	11	90	185	250	283	22	126	63	63	FF 165
FLSE 100 L	160	200	140	174	63	22	42	12	12	100	226	293	323	37	150	75	75	FF 215
FLSE 112 M	190	230	140	174	70	22	45	12	12	112	226	305	323	37	150	75	75	FF 215
FLSE 112 MU	190	230	125	160	76	22	45	12	12	112	226	305	342	37	150	75	75	FF 215
FLSE 132 S	216	255	140	223	89	31	58	12	15	132	264	345	387	28	150	75	75	FF 265
FLSE 132 M	216	255	178	223	89	31	58	12	15	132	264	345	387	28	150	75	75	FF 265
FLSE 132 MU	216	255	178	223	89	31	58	12	15	132	264	345	410	28	150	75	75	FF 265

For larger frame sizes, please consult Leroy-Somer.

Dimension CA and shaft extensions are identical to those for foot mounted motors (page 40).

FLSE 3-phase TEFV induction motors for increased safety

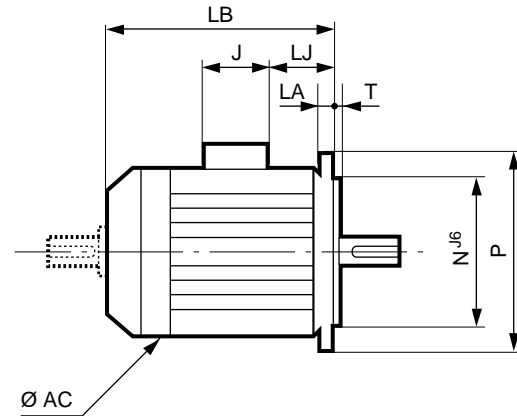
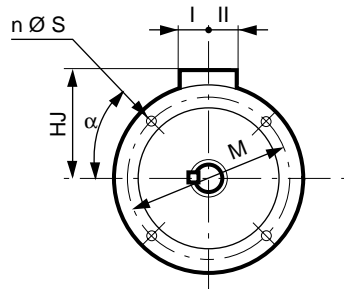
Dimensions



D2 - Dimensions: FLSE cast iron motors

Dimensions in millimetres

Flange mounting IM B5 (IM 3001)



IEC symbol	Flange dimensions						
	M	N	P	T	n	S	LA
FF 165	165	130	200	3.5	4	12	10
FF 165	165	130	200	3.5	4	12	10
FF 165	165	130	200	3.5	4	12	10
FF 165	165	130	200	3.5	4	12	10
FF 215	215	180	250	4	4	15	12
FF 215	215	180	250	4	4	15	12
FF 215	215	180	250	4	4	15	12
FF 265	265	230	300	4	4	15	14
FF 265	265	230	300	4	4	15	14
FF 265	265	230	300	4	4	15	14

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
FLSE 80 L	160	214	142	33	114	57	57
FLSE 90 S	185	263	153	48	114	57	57
FLSE 90 L	185	263	153	48	114	57	57
FLSE 90 LU	185	283	153	48	114	57	57
FLSE 100 L	226	323	176	55	114	57	57
FLSE 112 M	226	323	176	55	114	57	57
FLSE 112 MU	226	342	176	55	114	57	57
FLSE 132 S	264	387	195	46	114	57	57
FLSE 132 M	264	387	195	46	114	57	57
FLSE 132 MU	264	410	195	46	114	57	57

For larger frame sizes, please consult Leroy-Somer.

Dimensions of shaft extensions identical to those for foot mounted motors (page 40).

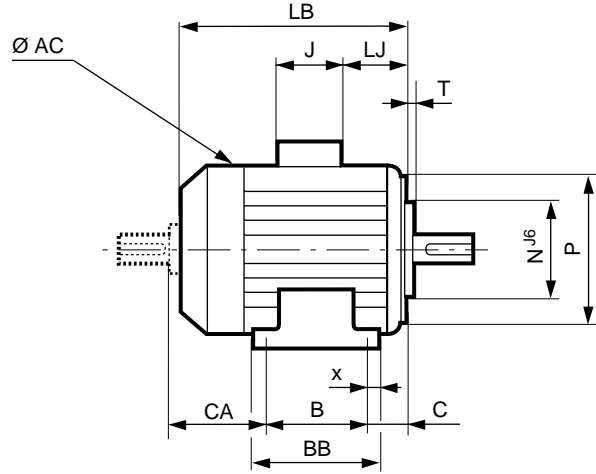
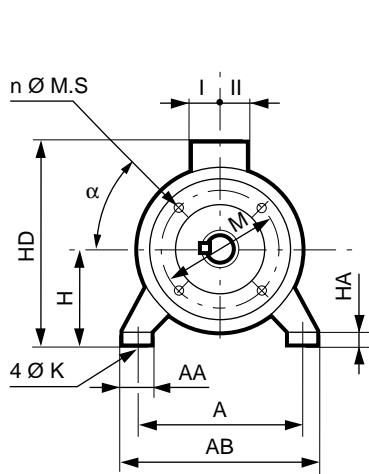
FLSE 3-phase TEFV induction motors for increased safety Dimensions



D2 - Dimensions: FLSE cast iron motors

Dimensions in millimetres

Foot and face mounting IM B34 (IM 2101)



Type	Main dimensions																	
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	Sym.
FLSE 80 L	125	157	100	130	50	20	32	9	10	80	160	230	214	27	126	63	63	FT 100
FLSE 90 S	140	172	100	160	56	22	34	9	11	90	185	250	243	22	126	63	63	FT 115
FLSE 90 L	140	172	125	160	56	22	34	9	11	90	185	250	243	22	126	63	63	FT 115
FLSE 90 LU	140	172	125	160	56	22	34	9	11	90	185	250	263	22	126	63	63	FT 115
FLSE 100 L	160	200	140	174	63	22	42	12	12	100	226	293	323	37	150	75	75	FT 130
FLSE 112 M	190	230	140	174	70	22	45	12	12	112	226	305	323	37	150	75	75	FT 130
FLSE 112 MU	190	230	140	174	70	22	45	12	12	112	226	305	342	37	150	75	75	FT 130
FLSE 132 S	216	255	140	223	89	31	58	12	15	132	264	345	387	28	150	75	75	FT 215
FLSE 132 M	216	255	178	223	89	31	58	12	15	132	264	345	387	28	150	75	75	FT 215
FLSE 132 MU	216	255	178	223	89	31	58	12	15	132	264	345	410	28	150	75	75	FT 215

Dimension CA and shaft extensions are identical to those for foot mounted motors (page 40).

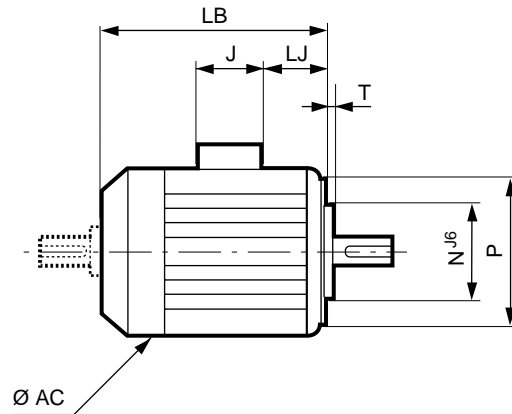
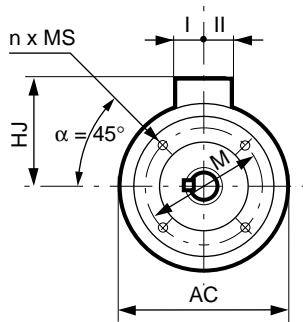
FLSE 3-phase TEFV induction motors for increased safety Dimensions



D2 - Dimensions: FLSE cast iron motors

Dimensions in millimetres

Face mounting IM B14 (IM 3601)



IEC symbol	Faceplate dimensions					
	M	N	P	T	n	MS
FT 100	100	80	120	3	4	M6
FT 115	115	95	140	3	4	M8
FT 115	115	95	140	3	4	M8
FT 115	115	95	140	3	4	M8
FT 130	130	110	160	3.5	4	M8
FT 130	130	110	160	3.5	4	M8
FT 130	130	110	160	3.5	4	M8
FT 215	215	180	250	4	4	M12
FT 215	215	180	250	4	4	M12
FT 215	215	180	250	4	4	M12

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
FLSE 80 L	160	214	150	27	126	63	63
FLSE 90 S	185	243	162	22	126	63	63
FLSE 90 L	185	243	162	22	126	63	63
FLSE 90 LU	185	263	162	22	126	63	63
FLSE 100 L	226	323	193	37	150	75	75
FLSE 112 M	226	323	193	37	150	75	75
FLSE 112 MU	226	342	193	37	150	75	75
FLSE 132 S	264	387	213	28	150	75	75
FLSE 132 M	264	387	213	28	150	75	75
FLSE 132 MU	264	410	213	28	150	75	75

Dimensions of shaft extensions identical to those for foot mounted motors (page 40).

FLSE 3-phase TEFV induction motors for increased safety Dimensions

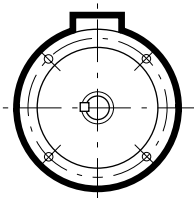


Optional features

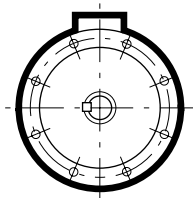
Non-standard flanges

Motor type	Flange mounted (FF)									Face mounted (FT)						
	FF 115	FF 130	FF 165	FF 215	FF 265	FF 300	FF 350	FF 400	FF 500	FT 85	FT 100	FT 115	FT 130	FT 165	FT 215	FT 265
FLSE 80 L	○	○	●	*						*	●	*	*	*		
FLSE 90	*	*	●	*							*	●	*	○		
FLSE 90 (Foot)	○	○	○	○							*	●	*	○		
FLSE 100 L	○	○	○	●								*	●	○	*	
FLSE 112 M/MU	○	○	○	●								*	●	○	*	
FLSE 112 MU		○	○	●	*							*	●	*	*	
FLSE 132 S/M/MU			○	○	●	○								*	●	*

● Standard ○ Adapted shaft * Adaptable without shaft modifications



NOTE: for flanges up to FF 350, the flange is drilled with 4 holes oriented at 45° in relation to the axis of the terminal box.



NOTE: from flange FF 400 upwards, the flange is drilled with 8 holes oriented at 22°30' in relation to the axes.

For larger frame sizes, please consult Leroy-Somer.

LSE - FLSE 3-phase TEFV induction motors for increased safety Maintenance / Installation



E1 - Identification

IDENTIFICATION PLATES AND LEGEND - FRAME SIZE 63 to 280

		Mot. 3 ~ LSE 112 MU			
F - 16015 ANGOULEME		N° 027010 LF040		0080	
IP55 IK08	cl.F	40°C	S1	kg 12	
V	Hz	min⁻¹	kW	cos φ	A
Δ 380	50	1453	4	0,88	7,9
Δ 400	-	1458	-	0,86	7,7
Δ 415	-	1466	-	0,82	7,7
ID/IN = 6,7 - t _E = 8 s					
II 2 G - EEx e II T3			INERIS 01ATEX0010X		

		MOT. 3 ~ LSE 160L-T			
F - 16015 ANGOULEME		N° 125089 MA 001		0080	
IP55 IK08		cl.F	40 °C	S1	
V	Hz	min⁻¹	kW	cos φ	A
Δ 380	50	1457	13,5	0,87	26,2
Δ 400	-	1461	-	0,85	25,4
Δ 420	-	1465	-	0,83	24,7
ID/IN = 7,8 - t _E = 10 s					
II 2 GD EEx e II T3 VIK			INERIS 01ATEX0010 X		
DE	6212 ZC3			g	
NDE	6210 ZC3			h	

▼ Definition of symbols used on nameplates



Legal mark of product conformity to the requirements of European Directives.

MOT 3 ~ : Three-phase A.C. motor

LSE : LSE series

112-160 : Frame size

MU - L : Frame size

Motor number

N° : Motor batch number

L - M * : Year of production

F - A ** : Month of production

040 - 001 : Serial number

kg : Weight

IP55 : Index of protection

IK08 : Shock resistance index

I cl. F : Insulation class F

40 °C : Maximum ambient temperature for operation

S1 : Duty

V : Supply voltage

Hz : Supply frequency

min⁻¹ : Revolutions per minute (rpm)

kW : Rated output power

cos φ : Power factor

A : Rated current

Δ : Connection symbol

ID/IN : Starting current

t_E : Locked rotor time

ATEX-specific markings

0080 : Identification number from INERIS (Notified Body)

: Special mark denoting protection against risk of explosion

II 2 G or II 2 GD : group and category of equipment

EEx : Symbol denoting switchgear designed for atmospheres potentially explosive

e : Protection type

II : Explosion group

T3 : Temperature class

VIK : Specific recommendations for the German market

INERIS : Notified Body

01ATEX0010X : EC type-examination certificate number

Bearings

DE : Drive end
Drive end bearing

NDE : Non drive end
Bearing at non drive end

* L = 2001

M = 2002

.....

**A = January

B = February

.....

LSE - FLSE 3-phase TEFV induction motors for increased safety Maintenance / Installation



E2 - Documentation - Manuals

LEROY-SOMER manufactures, in its ISO 9001 - Edition 2000 qualified production units, products certified by Notified Bodies: INERIS, LCIE, etc



EEEx e

LSE - FLSE

Cette notice doit être transmise à l'utilisateur final
This manual is to be given to the end-user

Moteurs asynchrones triphasés pour atmosphères explosibles gaz type EEx e
Recommandations spécifiques de mise en service et d'entretien
Three-phase induction motors for potentially explosive gas atmospheres type EEx e
Specific recommendations for commissioning and maintenance

Réf. 3606 - 4.33 / a - 7.02

EN

Three-phase induction motors for potentially explosive gas atmospheres type EEx e

Basic concepts of the instruction manual

This document complements installation and maintenance manual ref. 1889

This document complements installation and maintenance manual ref. 1889 and we can guarantee their surface temperature. They are designed for use in group II potentially explosive gas atmospheres - category 2 or dust-filled atmospheres in zone 21 (IP 65) or 22 (IP55) and have been CE marked in accordance with Directive ATEX 94/9-EC. The following instructions should be read in conjunction with standards NF C 15-100, NF EN 60079-17 (electrical apparatus designed for use in the presence of combustible dust), along with all regulations, requirements and good practice concerning the installation and use of equipment in potentially explosive atmospheres. LEROY-SOMER accepts no liability in the event of failure to comply with these rules and regulations.

Commissioning :
Ensure compatibility of the information on the motor nameplate with the actual explosive atmosphere, the operating zone, the ambient temperature, the marked temperature (T1 to T6), the mains voltage and frequency.
The maximum storage period is 3 years: after this time, replace the bearings and the seals on the spigots and shaft passages. Even in the event of prolonged storage or downtime, the interval between 2 greasing operations should never exceed 2 years. If one bearing needs to be replaced, the other bearing should also be replaced.
The choice of connection cable is determined by the current, the voltage, the temperature and the cable gland internal diameter.
A qualified operator should be responsible for connection, and should ensure that:
• the tag terminals are welded or crimped tightly on the terminal block
• the air distances are maintained (eg. >10 mm for U_s=400V)
• the cable is held tight in the cable gland
• IP55 protection is obtained by tightening the joints correctly (it should only be possible to undo them with a tool)
• IP55 protection is obtained by blocking with watertight plugs
• any unused entries are blocked with watertight plugs
• current regulations have been adhered to

If the rotor locks, a protective device should switch off the power supply in less time than the time indicated on the motor nameplate.
If space heaters are used, they should only be switched on when the motor is stopped and cold.
The motors, supplied by a frequency inverter and placed outside the danger zone, are fitted with a winding sensor, a DE shield sensor for frame sizes >160 mm and possibly an NDE shield sensor. These sensors should be connected to a device placed outside the danger zone which switches the motor off to ensure that the maximum surface temperature is never reached.
The drive supply voltage is 400 V ± 10% at 50 Hz. The frequency operating range should not exceed 25/50 Hz.
For motors equipped with a forced ventilation unit, this should have the same EEx e protection and should be commissioned at the same time as the motor (safety device to be incorporated in the cabinet).
If sensors (vibration sensors for example) are fitted, these should have IP 55 degree of protection minimum. They should be connected to the external circuit in a box which provides at least the same degree of protection, placed outside the danger zone.

During use :
Remove dust from the machine frequently, ensuring that the layer of dust never exceeds 5 mm and that the cover openings are not obstructed (risk of increased surface temperatures). Drain any condensation water every six months by opening the drain plugs at the bottom of the casing. Clean the drain holes and the plugs. Refit the plugs, replacing the seals to ensure IP55 protection.
The machine should always be cleaned at reduced pressure from the centre of the motor outwards to avoid introducing dust or particles under the seals.
Each time the motor is dismantled, clean all parts, replace the seals on the shaft passages, the shaft spigots and the terminal box cover with new seals of the same type. The seals on the shaft passages should be fitted using the same type of grease as on the bearings.

All repairs should be carried out by an APPROVED EXPERT REPAIRER.
Until 30/09/2003, motors introduced onto the market may be fitted with accessories and/or components certified in accordance with the CENELEC regulations relating to electrical equipment for use in group II potentially explosive atmospheres. Motors sold after this date will have to be fitted with accessories or components which have an EC type-examination certificate.

UNLESS WRITTEN AUTHORISATION HAS BEEN OBTAINED, THE MANUFACTURER CANNOT BE HELD RESPONSIBLE FOR ANY ACTION WHICH COULD AFFECT THE MOTOR'S SAFE OPERATION.

Under the responsibility of the notified body
INERIS

machines subject to the application of the Machinery Directive and/or assembled in accordance with the "Electrical Equipment for Machinery" and the 5.1989 modified by Directives 92-31 EEC dated 1992/36/EEC
machines in which they are incorporated have been checked against the applicable decrees, laws, orders, directives, application notes and/or controlled by electronic control or other means to ensure that the correct installation site. LEROY-SOMER accepts no liability for the correct installation of the motor.

cal director :

Q1T135 rev C dated 30/04/02

If lost, these documents will be supplied on request.

- Each motor is supplied with accompanying documents which must be handed to the END USER:
- the EC Declaration of Conformity and Incorporation
 - the Instruction Manual consisting of:
 - Recommendations for storing and installing induction motors.
 - Special manual for 3-phase induction motors for explosive gas-filled atmospheres (2G) or gas-filled dusty atmospheres (2GD).

Warning: unless the manufacturer's agreement has been obtained in writing, any intervention which might affect the motor protection type is the responsibility of the person carrying out the work.

Notes



I - APPLICATION AREA

Acceptance of our tenders or the placing of any order with us implies acceptance of the following conditions without exception or reservation. These conditions of sale shall prevail over all stipulations appearing on the customer's purchase order, his general conditions of purchase or any other document emanating from him and / or a third party.

A dispensation from these General Conditions of Sale applies to sales concerning foundry parts, which are subject to the European Foundries General Conditions of Sale, latest edition.

II - ORDERS

All orders, including those taken by our agents and representatives, by whatever mode of transmission, become valid only after we have accepted them in writing.

We reserve the right to modify the characteristics of our goods without prior warning. However, the customer reserves the possibility to specify technical specifications in the order. Unless such requirements have been notified in writing, the customer will not be able to refuse delivery of new modified goods.

Our company will not accept responsibility for an incorrect choice of goods if this incorrect choice results from incomplete and / or erroneous conditions of use, or conditions that have not been conveyed to the vendor by the customer.

Unless otherwise specified, our tenders and estimates are only valid for thirty days from the date of issue.

When the goods have to satisfy standards, particular regulations and / or be inspected by standards or control organisations, the price request must be accompanied by full specifications with which we must comply with. This is mentioned in the estimate. All test and inspection fees are the customer's responsibility.

III - PRICE

Our prices and price lists are shown exclusive of tax and may be revised without prior notice.

Our prices are either firm for the duration specified on the estimate, or subject to revision according to a formula accompanying the tender which, depending on the regulations, covers a change in the cost of raw materials, products, various services and salaries, an index of which is published in the B.O.C.C.R.F. ("Bulletin Officiel de la Concurrence, de la Consommation et de la Répression des Fraudes").

For any order of goods not found in our catalogue, requiring special manufacture, the invoice will include a minimum fixed sum of 600 FRF (six hundred French Francs) exclusive of tax, to cover start - up costs. Any tax due will be charged to the customer.

All related costs, such as customs clearance and special inspections, will be added on.

Customers should remember that the French Franc (or other currency) is being replaced by the Single European Currency (EURO) according to a European Community ruling. In accordance with the general principles of monetary law, references to the French Franc will then as of right be considered to refer to the Euro. This substitution will be enforced on the date and in accordance with the conditions defined by the European Community ruling.

IV - DELIVERY

Our export sales are governed by the INCOTERMS published by the International Chamber of Commerce ("I.C.C. INCOTERMS"), latest edition.

Goods are despatched in accordance with the conditions indicated on our order acknowledgement, sent out in response to any order for goods and / or services.

Unless otherwise specified, our prices refer to goods put at customer's disposal in our factories, and include standard packaging.

Unless otherwise specified, goods are always transported at the consignee's risk. Without exception, it is up to the purchaser to raise with the transporter, in the legal form and time limits, any claim concerning the condition or the number of packages received and also to send us at the same time a copy of this declaration. Failure to respect this procedure will relieve us of all responsibility.

In the case of CIF (Cost, Insurance & Freight) or CIP (Carriage & Insurance Paid to) sales, etc..., in the event of damage, our responsibility will only be engaged if any reservations and required declarations have been notified in the required time period, and will not in any case exceed the indemnity sum received from our insurers.

If the arrangements for despatch are modified, we reserve the right to invoice any additional costs arising from such changes. Packages cannot be returned.

Should the delivery of goods be delayed for a reason not attributable to the vendor, goods will be stored on the vendor's premises, at the own risk of the customer, at a charge for storage of 1% (one per cent) of the total order sum per week, beginning, without a grace period, on the day after the scheduled date of delivery indicated in the contract. After thirty days from this date, the vendor has the right to dispose of these goods as he wishes and arrange a new delivery date for the said goods with the customer. In all instances, all down payments received remain the property of the vendor as indemnity, without prejudice to other claims for damages that the vendor may wish to bring.

V - DELIVERY DATES

Delivery times are stated for information only, and do not include the month of August.

Delivery dates are counted from the issue date of the order acknowledgement from the vendor and are subject to compliance with the provisions indicated on the order acknowledgement, notably receipt of the down payment for the order, notification of the issuance of an irrevocable letter of credit conforming to all vendor requirements (especially as regards the amount, currency, validity, licence, etc.) and acceptance of the terms of payment with any guarantees which may be required, etc...

In no case does late delivery automatically entitle the customer to damages and / or penalties.

Unless otherwise specified, we reserve the right to make partial deliveries.

Delivery dates are automatically suspended without formal notice, and the vendor shall have no responsibility in cases of Force Majeure, or events beyond the control of the vendor or his suppliers such as delays, saturation, or unavailability of the planned transport methods, energy, raw materials etc., serious

accidents such as fires, explosions, strikes, lock out, or emergency measures taken by the Authorities occurring after the conclusion of the order and preventing its normal execution. Similarly, delivery dates are automatically suspended without formal notice in all cases of failure to perform or late payment by the customer.

VI - TESTS

All goods manufactured by the vendor are tested before leaving the factory in accordance with vendor's ISO 9001 certifications. Customers may attend these tests : they simply have to convey the wish to do so in writing when the order is placed.

Specific tests and acceptance tests requested by the customer, whether conducted on the customer's premises, in our factories, on-site, or by inspection organisations, must be noted on the order and are to be paid for by the customer.

Goods specially developed for a customer will have to be approved by the latter before any delivery of mass - produced goods, notified by signing and returning to us the Product Approval Schedule reference Q1. T. 034.

In the event of the customer's insistence on delivery without having signed this form beforehand, the goods will then still be considered as prototypes and the customer will assume sole responsibility for using it or supplying it to his own customers.

VII - TERMS OF PAYMENT

All our sales are considered as carried out and payable at the registered office of the vendor, without exception, whatever the method of payment, the place of conclusion of the sale and delivery.

When the customer is based in France, our invoices are payable on receipt in cash, by banker's draft, or by L.C.R. ("Lettre de Change - Relevé"), within thirty days from the end of the month following the invoice date, net and without discount.

When the customer is based outside France, our invoices are payable in cash against delivery of the dispatching documents or by irrevocable documentary credit confirmed by a first class French bank with all bank charges payable by the customer.

Payments must be made in the currency of the invoice.

In accordance with French Law N° 92.1442 dated December 31, 1992, non-payment of an invoice by its due date will give rise, after formal notice, to a penalty equal to one and a half times (1.5) the official rate of interest, and to late payment interest at the bank base rate plus five per cent. If the invoice carries V.A.T. (Value Added Tax), this is calculated on the amount, inclusive of tax, of the remaining sum due and comes into force from the due date.

Should steps have to be taken to recover the said amount, a surcharge of 15% (fifteen per cent) of the sum demanded will be payable.

Moreover, as a consequence of non - payment of an invoice or any term of payment, whatever the method of payment envisaged, the customer shall pay immediately for the whole of the outstanding amount owed to the vendor (including his subsidiaries, sister or parent companies, whether in France or overseas) for all deliveries or services, whatever their initial due date.

Notwithstanding any particular terms of payment arranged between the parties concerned, the vendor reserves the right to demand :

- payment in cash, before the goods leave the factory, for all orders in the process of manufacture, in the event of a problem with payment, or if the customer's financial situation justifies it,
- a down payment for the order.

Unless we are at fault, all down payments are non - returnable, without prejudice to our right to claim damages.

Any payment made in advance of the fixed payment date will lead to a discount of 0.2 % (zero point two per cent) per month of the amount concerned.

VIII - COMPENSATION CLAUSE

Unless prohibited by law, the vendor and the customer expressly agree between one another to compensate their respective debts arising from their commercial relationship, even if the conditions defined by law for legal compensation are not all satisfied.

In applying this clause, by vendor we mean any company in the LEROY SOMER group.

IX - TRANSFER OF RISKS - TRANSFERT OF TITLE

Transfer of risks occurs upon the handing over of the goods, according to the delivery conditions agreed at the time of ordering.

THE TRANSFER OF TITLE OF THE GOODS SOLD TO THE CUSTOMER OCCURS UPON PAYMENT OF THE WHOLE PRINCIPAL SUM AND INTEREST.

The provision of a document creating an obligation to pay (bank draft or similar) does not constitute payment.

So long as the price has not been paid in full, the customer is obliged to inform the vendor, within twenty - four hours, of the seizure, requisition or confiscation of goods to the benefit of a third party, and to take all safety measures to acquaint others with and respect our right of title in the event of intervention by creditors.

Failure to pay the amount due, whether total or partial, on the due date, for whatever reason and on whatever grounds, authorises the vendor to demand as of right and without formal notice, the return of the goods, wherever they may be, at the customer's expense and risk.

Return of the goods does not imply to cancellation of the sale. However, we reserve the option to apply the cancellation clause contained in these General Conditions of Sale.

X - CONFIDENTIALITY

The vendor and the customer undertake to maintain confidentiality of information of a technical, commercial or other nature, obtained during negotiations and / or the execution of any order.

XI - INDUSTRIAL AND INTELLECTUAL PROPERTY RIGHTS

The results, data, studies and information (whether patentable or not), or software developed by the vendor during execution of any order, and delivered to the customer, are the sole property of the vendor.

Apart from the instructions for use, servicing and maintenance, reports and documents of any type that we deliver to our customers remain our property and must be returned to us on

request, even when design fees have been charged for them, and they shall not be communicated to third parties or used without the prior written agreement of the vendor.

XII - CANCELLATION CLAUSE

We reserve the right to cancel immediately, as of right and without formal notice, the sale of our goods in case of non-payment of any part of the price by the due date, or in case of any breach in the contractual obligations of the customer. In this case, the goods will have to be returned to us immediately, at the customer's own risk and expense, subject to a penalty of 10% (ten per cent) of its value per week of delay. All payments already received shall remain our property as indemnity, without prejudice to our rights to claim damages.

XIII - WARRANTY

The vendor warrants the goods against any defect, arising from a default in material or in workmanship, for twelve months starting from the date on which they are made available, according to the conditions defined below.

The warranty for goods with special applications, or goods used 24 hours a day, is automatically reduced by half.

On the other hand, parts or accessories of other origin, which bear their own brand name, are included in our warranty only to the extent of the warranty conditions granted by the suppliers of these parts.

The vendor's warranty will only apply insofar as the goods have been stored, used and maintained in accordance with the vendor's instructions and documentation. It cannot be invoked when the default results from :

- failure to monitor, maintain or store the goods correctly,
- normal wear and tear of goods,
- intervention on or modification to the goods without the vendor's prior authorisation in writing,
- abnormal use, or use not conforming to the intended purpose,
- defective installation at the customer's and / or the final user's premises,
- non-communication, by the customer, of the intended purpose or the conditions of use of the goods,
- failure to use original manufacturer's spare parts,
- Force Majeure or any event beyond the control of the vendor,
- etc ...

In all cases, the warranty is limited to the replacement or the repair of parts or goods recognised as defective by our technical departments. If the repair is entrusted to a third party, it should only be carried out after acceptance by the vendor of the estimate for repair.

No goods should be returned without the vendor's prior authorisation in writing .

Goods to be repaired should be sent prepaid, to the address indicated by the vendor. If the goods have not been repaired under warranty, the cost of dispatching it back will be invoiced to the customer or to the end purchaser.

This warranty applies to our goods in accessible form and therefore does not cover the cost of dismantling and reinstallation of the said goods in the equipment in which they are integrated .

Repair, modification, or replacement of spare parts or goods during the warranty period will not extend the duration of the warranty.

The provisions of this article constitute the only obligation on the part of the vendor concerning the warranty for the goods supplied.

XIV - LIABILITY

The vendor will be liable for bodily injury caused by his goods or personnel.

The repair of property damages attributable to the vendor is expressly limited to a sum which may not exceed the amount of the goods found as defective.

It is expressly agreed that the vendor and the customer each waive any right to claim for indirect, consequential and / or punitive damages of any kind, such as loss of production, loss of profit, costs of withdrawal from the market or costs of recall, costs of dismantling and reinstallation of goods, loss of contracts, etc.

XV - SPARE PARTS AND ACCESSORIES

Spare parts and accessories are provided on request insofar as they are available. Related costs (carriage and any other costs) are always added to the invoice.

We reserve the right to demand a minimum quantity or invoice a minimum per order.

XVI - PARTIAL INVALIDITY

If any provision of these General Conditions of Sale is held to be unenforceable for any reason, it shall be adjusted rather than voided, if possible, in order to achieve the intent of the parties to the extent possible. In any event, all other provisions shall be deemed valid and enforceable to the full extent possible.

XVII -DISPUTES

THESE GENERAL CONDITIONS OF SALE ARE GOVERNED BY FRENCH LAW.

ANY DISPUTE RELATING TO OUR SALES, EVEN IN THE CASE OF MULTIPLE DEFENDANTS, SHALL BE, IN THE ABSENCE OF AMICABLE SETTLEMENT AND NOTWITHSTANDING ANY CLAUSE TO THE CONTRARY, SUBJECT TO THE JURISDICTION OF THE COURTS OF ANGOULEME (France).

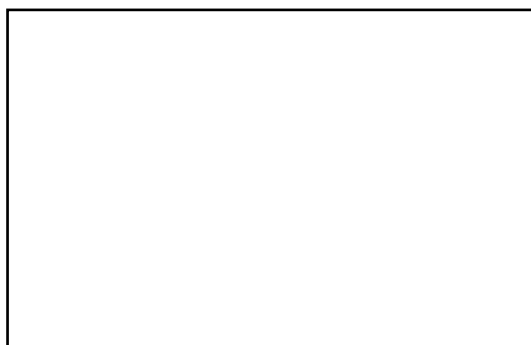


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