



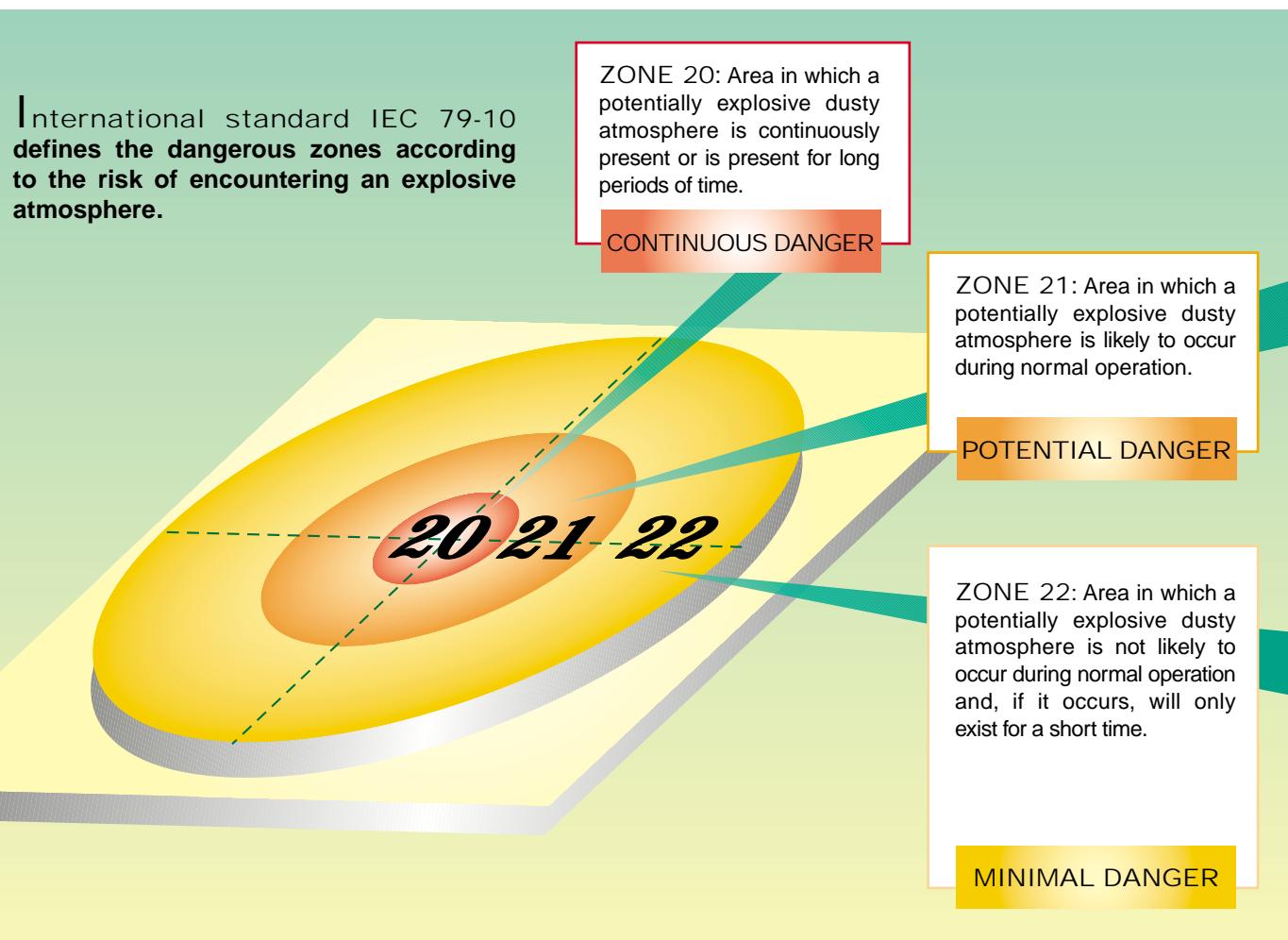
3215 en - 09.2003 / d



**LSPX-FLSPX**  
**3-phase induction motors**  
**POTENTIALLY EXPLOSIVE DUSTY ATMOSPHERES**  
Technical catalogue



From 1st July 2003, all motors marketed in the EC and designed to operate in zones where there is a high risk of explosion will have to be certified as conforming to the **European directive ATEX 94/9/EC (ATEX 95)**, entitled "Equipment and protective systems intended for use in explosive atmospheres". **All potentially explosive dusty atmospheres are affected by this directive:** food processing, sugar refineries, breweries, cement works, refineries, chemical and pharmaceutical industry, textile industry, etc.

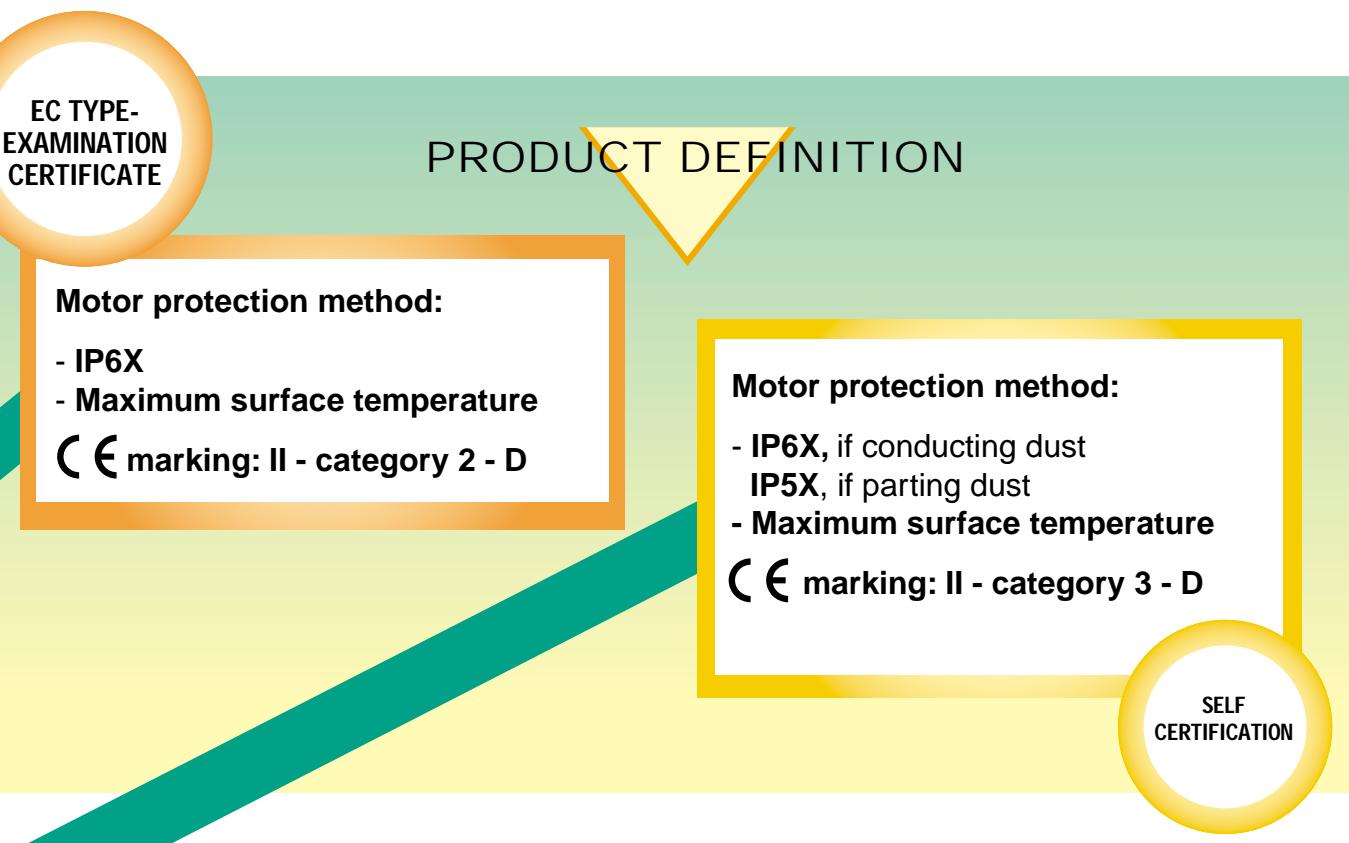


\* Directive transposed into national law in all countries of the European Community: Decree No. 96-1010 in France, No. 400/96 in Spain, SI 1996/192 in England, etc.

## THE ROLE OF A BUILDING USER

In establishments with electrical installations in categories which are likely to present a risk of explosion, **the user is required to:**

- **define the zones** in which **potentially explosive atmospheres** are likely to occur
- **select electrical equipment** suitable for use in the zones defined above
- **provide the appropriate installation, operating and servicing conditions** for this equipment



## EUROPEAN STANDARDS

- EN 1127.1: potentially explosive atmospheres: prevention of explosions and protection against explosions.
- EN 50281.1.1: Electrical apparatus for use in the presence of combustible dust: rules for construction and testing.
- EN 50281.1.2: Electrical apparatus for use in the presence of combustible dust: selection, installation and maintenance.
- EN 13463.1 to 8: Non-electrical equipment for use in potentially explosive atmospheres

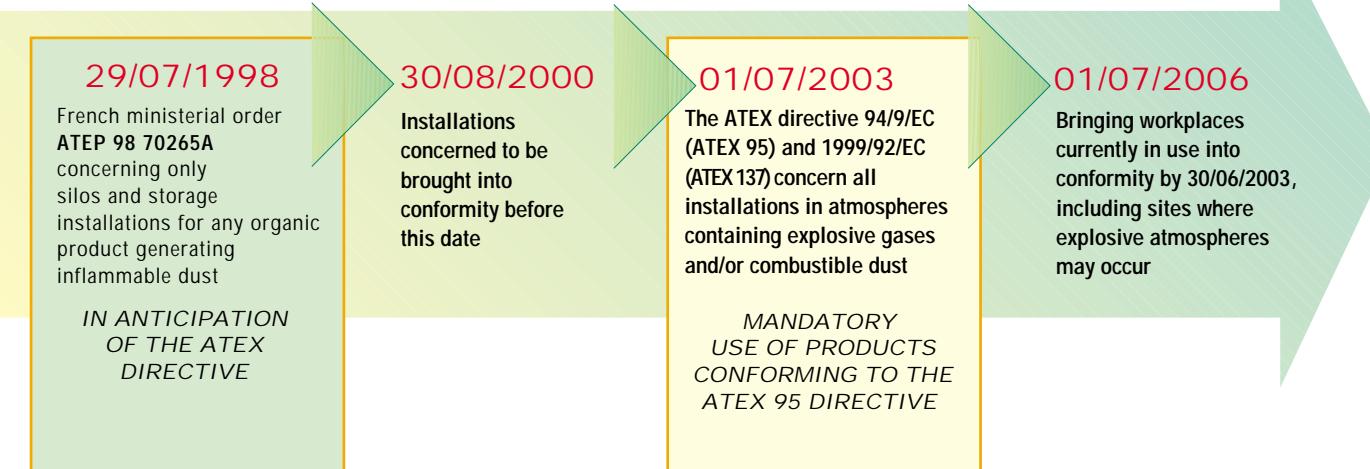
## MANUFACTURER'S OBLIGATIONS

With the objective of ensuring the **SAFETY** of **PERSONS** and **EQUIPMENT** in all **ZONES** presenting a **RISK OF EXPLOSION**, the manufacturer must:

- **Design and manufacture** products in accordance with safety requirements.
- **Mark products** in conformity with the directive.
- **Provide CE type certification** undertaken by the relevant notified body for category 2, or by the manufacturer for category 3.
- **Supply an instruction manual** with the product.

## Potentially explosive dusty atmospheres: LEROY-SOMER OPTIONS

### SIGNIFICANT DATES FOR CE MARKING - ATEX



## Potentially explosive dusty atmospheres: LEROY-SOMER OPTIONS



**CE MARKING:**  
Extract from the 94/9/EC directive

Each device should carry a legible and indelible label with the following information:

- The name and address of the manufacturer
- The mark (not necessary for components) followed by the number of the notified body involved in the production quality control phase, if applicable (category 2 zone 21)
- The batch or type designation
- The serial number
- The year of manufacture
- The special mark indicating protection against explosions followed by the symbol for the product group and category
- For group II, the letter G (concerning explosive atmospheres due to the presence of gas, vapour or spray) and/or:
- The letter D concerning explosive atmospheres due to the presence of dust
- Any other information vital for safe operation



Self-ignition temperature of dusts

	Wheat	Barley	Maize	Sunflower (seed)	Aluminium magnesium	Aluminium flakes	Alfalfa	Malt	Sugar
Minimum flash point of a cloud of dust (°C)	420	450	190	490	430	600	460	400	350
Minimum flash point of a 5 mm layer of dust(°C)	200	205	220	220	480	400	210	250	220
Max. surface temperature	125	130	145	145	286	325	135	175	145

Max. surface temperature  $\leq$  the lowest value of :

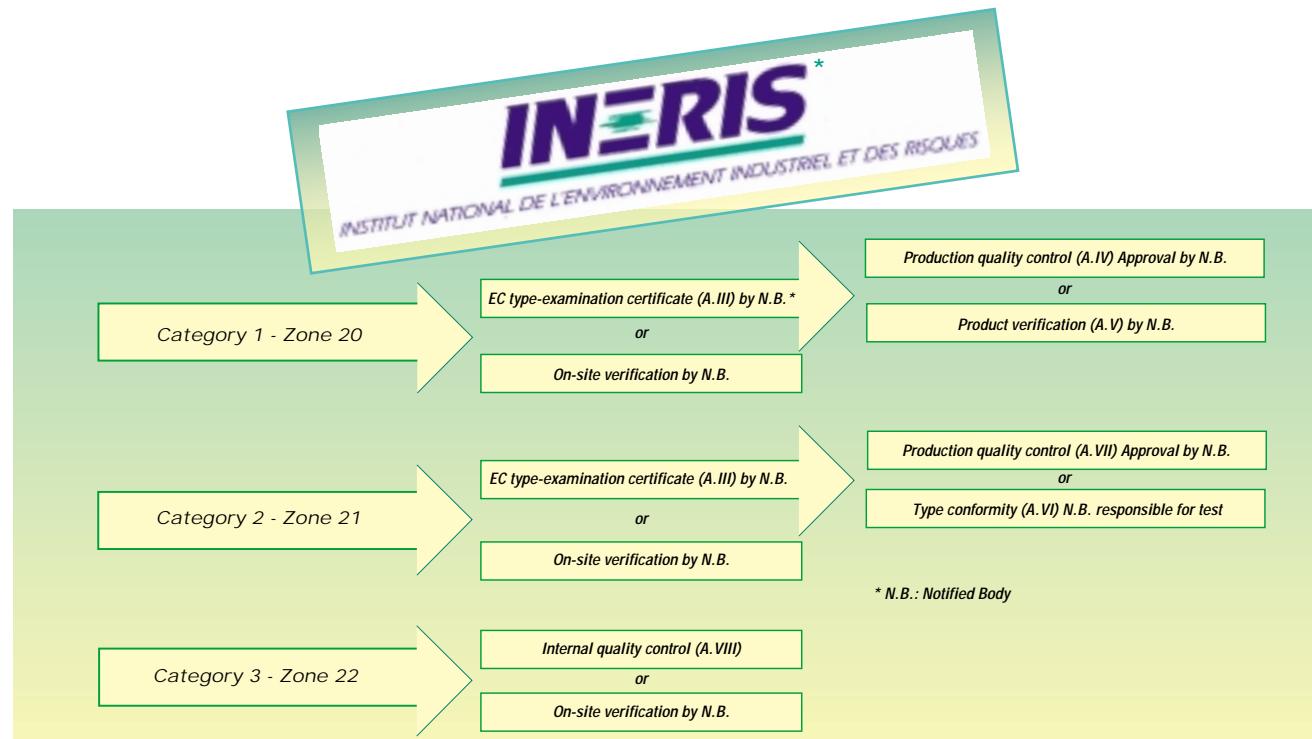
- (2/3 flash point temperature for a cloud)
- and (flash point temperature for a layer – 75 °C).

**Example for wheat:** 2/3 flash point for a cloud = 280 °C and flash point temperature for a layer – 75 °C = 125 °C.

Surface temperature of equipment used in the presence of wheat  $\leq$  125 °C.

### PRODUCT CERTIFICATION

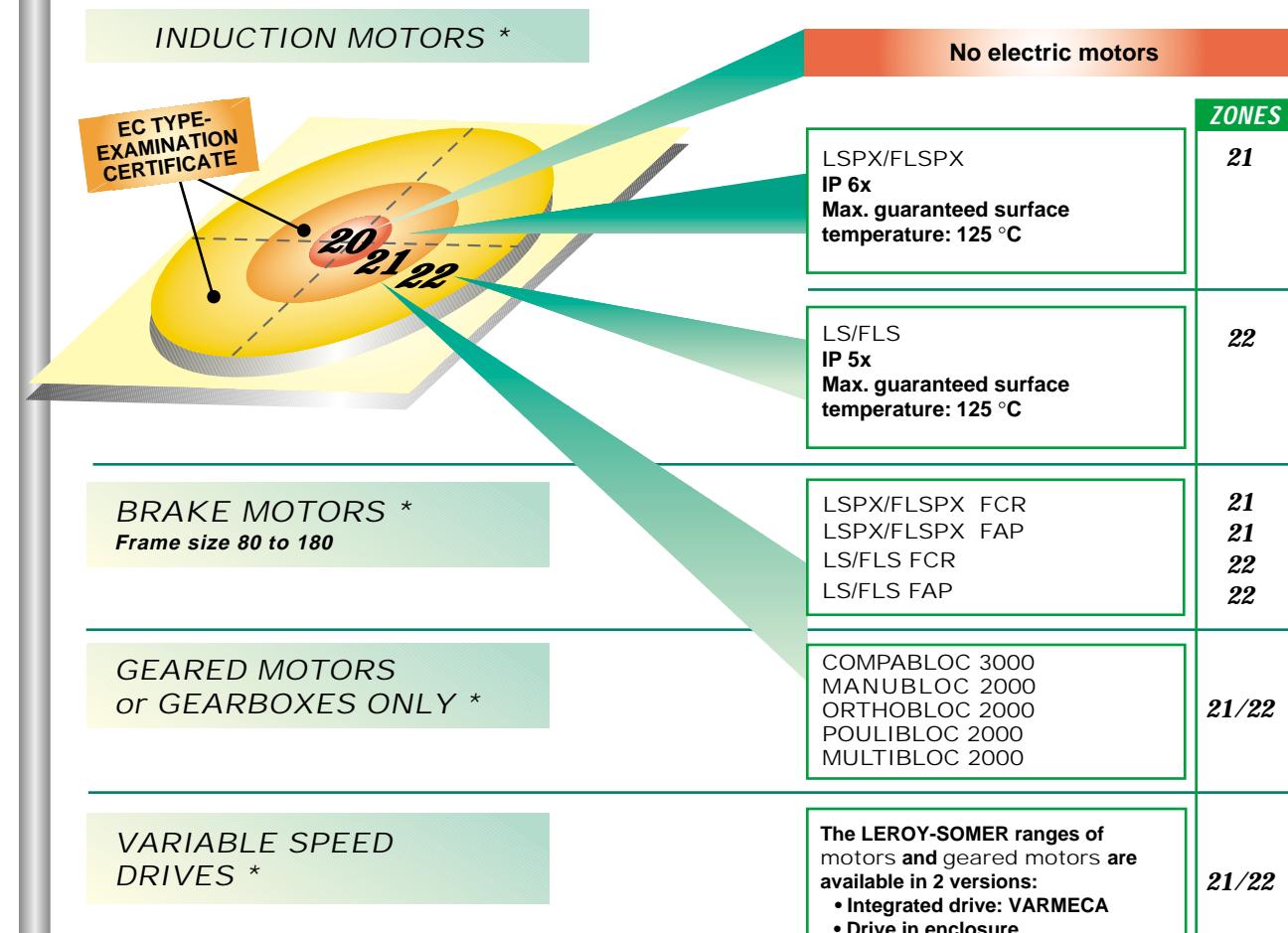
All LEROY-SOMER products which can be used in zone 21 or zone 22 are certified by **INERIS\***, a body notified by the European Commission.



All drive systems offered by LEROY-SOMER are certified by INERIS which endorses their conformity by providing EC TYPE-EXAMINATION CERTIFICATES under the ATEX Directive 94/9/EC.

**INERIS\***, control the risks, protect the environment

### THE GLOBAL LEROY-SOMER OFFER





# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

## Contents

	Pages
<b>A. General information</b>	
A1. Quality assurance . . . . .	7
A2. Definition of "Index of Protection" (IP) . . . . .	8
A3. Mountings and positions . . . . .	9
<b>Zone 21 - Category 2 motors</b>	
<b>B. LSPX - Aluminium range</b>	
B1. General . . . . .	11
B2. Selection . . . . .	12
– 2 poles . . . . .	12
– 4 poles . . . . .	13
– 6 poles . . . . .	14
– 8 poles . . . . .	15
B3. Dimensions . . . . .	16
– Shaft extensions . . . . .	16
– Foot mounted IM B3 (IM 1001) . . . . .	17
– Foot and flange mounted IM B35 (IM 2001) . . . . .	18
– Flange mounted IM B5 (IM 3001) . . . . .	19
– Foot and face mounted IM B34 (IM 2101) . . . . .	20
– Face mounted IM B14 (IM 3601) . . . . .	21
– Drip cover . . . . .	21
– Cable gland . . . . .	22
<b>C. FLSPX - Cast iron range</b>	
C1. General . . . . .	23
C2. Selection . . . . .	24
– 2 poles . . . . .	24
– 4 poles . . . . .	25
– 6 poles . . . . .	26
– 8 poles . . . . .	27
C3. Dimensions . . . . .	28
– Shaft extensions . . . . .	28
– Foot mounted IM B3 (IM 1001) . . . . .	29
– Foot and flange mounted IM B35 (IM 2001) . . . . .	30
– Flange mounted IM B5 (IM 3001) . . . . .	31
– Foot and face mounted IM B34 (IM 2101) . . . . .	32
– Face mounted IM B14 (IM 3601) . . . . .	33
– Drip cover . . . . .	33
– Cable gland . . . . .	34
<b>Zone 22 - Category 3 motors</b>	(Non-conductive dust)
<b>D. LS - LS aluminium range</b>	
D1. General . . . . .	35
D2. Selection . . . . .	36
– 2 poles . . . . .	36
– 4 poles . . . . .	37
– 6 poles . . . . .	38
– 8 poles . . . . .	39
D3. Dimensions . . . . .	40
– Shaft extensions . . . . .	40
– Foot mounted IM B3 (IM 1001) . . . . .	41
– Foot and flange mounted IM B35 (IM 2001) . . . . .	42
– Flange mounted IM B5 (IM 3001) . . . . .	43
– Foot and face mounted IM B34 (IM 2101) . . . . .	44
– Face mounted IM B14 (IM 3601) . . . . .	45
– Drip cover . . . . .	45
– Cable gland . . . . .	46
<b>E. FLS - FLS cast iron range</b>	
E1. General . . . . .	47
E2. Selection . . . . .	48
– 2 poles . . . . .	48
– 4 poles . . . . .	49
– 6 poles . . . . .	50
– 8 poles . . . . .	51
E3. Dimensions . . . . .	52
– Shaft extensions . . . . .	52
– Foot mounted IM B3 (IM 1001) . . . . .	53
– Foot and flange mounted IM B35 (IM 2001) . . . . .	54
– Flange mounted IM B5 (IM 3001) . . . . .	55
– Foot and face mounted IM B34 (IM 2101) . . . . .	56
– Face mounted IM B14 (IM 3601) . . . . .	57
– Drip cover . . . . .	57
– Cable gland . . . . .	58
<b>F. Options</b>	
F1. Variable speed operation . . . . .	59
F2. VARMECA motors . . . . .	59
F3. Brake motors . . . . .	59
<b>G. Adaptation with gearboxes</b>	60
<b>H. Identification</b>	61
<b>I. Documentation - Manuals</b>	62

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The descriptions cannot in any way be considered contractual.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### A - General information

## A1 - Quality assurance

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 accreditation according to **ISO 9000, Edition 2000**. Products are also approved by official bodies who check 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.



### ATTESTATION





# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### A - General information

#### A2 - Definition of "Index of Protection" (IP)

Indices of protection of electrical equipment enclosures

In accordance with IEC 34-5 - EN 60034-5 (IP)

- EN 50102 (IK)

- EN 50281

LSPX and FLSPX motors are standard configuration **IP 65 / IK 08**

LS and FLS motors are standard configuration **IP 55 / IK 08**

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		Protection against solid objects of over 50 mm (e.g. accidental hand contact)	1		Protected against vertically dripping water (condensation)	01		Impact energy : 0.15 J
2		Protected against solid objects of over 12 mm (e.g. finger)	2		Protected against water dripping up to 15° from the vertical	02		Impact energy : 0.20 J
3		Protected against solid objects of over 2.5 mm (e.g. tools, wire)	3		Protected against water dripping up to 60° from the vertical	03		Impact energy : 0.37 J
4		Protected against solid objects of over 1 mm (e.g. 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 dust	6		Protected against jets of water comparable to heavy seas	06		Impact energy : 1 J
			7		Protected against the effects of immersion to 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
			9			09		Impact energy : 10 J
			10			10		Impact energy : 20 J

Example:

IP 65 machine

IP : Index of protection

6 : Machine totally protected against any dust penetration.

*Test result: no dust enters in harmful quantities, no risk of direct contact with rotating parts. The test will last for 2 hours (test result: no talc enters which could affect the running of the motor).*

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).*



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### A - General information

## A3 - Mountings and positions

### Foot mounted motors

- See the options for mounting according to frame size.

<b>IM 1001 (IM B3)</b>	
- Horizontal shaft - Feet on floor	

<i>conforming to standard IEC 34-7</i>	
<b>IM 1071 (IM B8)</b>	

<b>IM 1051 (IM B6)</b>	
- Horizontal shaft - Wall mounted with feet on left when viewed from shaft end	

<b>IM 1061 (IM B7)</b>	
- Horizontal shaft - Wall mounted with feet on right when viewed from shaft end	

### (FF) flange mounted motors

- See the options for mounting according to frame size.

<b>IM 3001 (IM B5)</b>	
- Horizontal shaft	

<b>IM 2001 (IM B35)</b>	
- Horizontal shaft - Feet on floor	

<b>IM 3011 (IM V1)</b>	
- Vertical shaft facing down	

<b>IM 2011 (IM V15)</b>	
- Vertical shaft facing down - Feet on wall	

<b>IM 3031 (IM V3)</b>	
- Vertical shaft facing up	

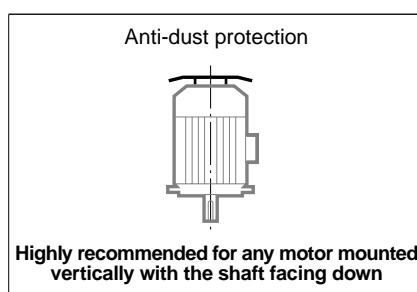
<b>IM 2031 (IM V36)</b>	
- Vertical shaft facing up - Feet on wall	

### (FT) face mounted motors

• frame sizes  $\leq$  132 mm.

<b>IM 3601 (IM B14)</b>	
- Horizontal shaft	

<b>IM 2101 (IM B34)</b>	
- Horizontal shaft - Feet on floor	



<b>IM 3611 (IM V18)</b>	
- Vertical shaft facing down	

<b>IM 2111 (IM V58)</b>	
- Vertical shaft facing down - Feet on wall	

<b>IM 3631 (IM V19)</b>	
- Vertical shaft facing up	

<b>IM 2131 (IM V69)</b>	
- Vertical shaft facing up - Feet on wall	

### Mounting options according to frame size

#### Some operating positions are prohibited for standard motors.

Select the possible configurations for machine installation from the table below.

If you encounter any difficulty, please consult Leroy-Somer.

Frame size	Mounting position											
	IM 1001	IM 1051	IM 1061	IM 1071	IM 1011	IM 1031	IM 3001	IM 3011	IM 3031	IM 2001	IM 2011	IM 2031
80 to 200	●	●	●	●	●	●	●	●	●	●	●	●
225 and 250	●	●	●	●	●	●	○	●	●	●	●	●
280 and 315	●	○	○	○	○	○	○	●	●	●	●	○
355 to 450	●	○	○	○	○	○	□	●	○	●	●	○

● : possible positions

□ : positions not available

○ : please consult Leroy-Somer specifying the coupling method and the axial and radial loads if applicable.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### A - General information

#### Notes

A



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

CATEGORY 2  
ZONE 21

## B1 - General



- **3-phase TEFV induction motors**, LSPX series, conforming to IEC 34, 72, EN 50281
- Single speed: power **0.09 to 90 kW\***, frame size 63 to 280 mm, 2, 4, 6, 8-pole; 230/400 V or 400 V  $\Delta$ , 50 Hz.
- Two-speed: (on request) power 0.09 to 37 kW\*, frame size 80 to 280 mm with 2/4, 4/6, 4/8, 6/8, 6/12 poles for general or centrifugal applications, PAM or Dahlander; 400 V Y or  $\Delta$ , 50 Hz.

- Protection **IP65**

#### - Motors for variable speed operation

- fitted with thermal probes on the windings (essential)
- on consultation (to be selected), see p. 60.

**Finish: aluminium housing**  
Assembled using protected fixing accessories.

Paint finish **RAL 1007 (yellow)**.  
Shaft end and flange protected against atmospheric corrosion.  
Individual anti-shock packaging.

#### A.C. supply

- Standard construction in accordance with IEC 38 ie:
  - 230/400 V + 10 % - 10 % at 50 Hz
  - 400 V  $\Delta$  + 10 % - 10 % at 50 Hz

\* Other power ratings: please consult Leroy-Somer

## Description of LSPX aluminium 3-phase motors



**II 2D T 125 °C**

Component	Materials	Remarks
Housing with cooling fins	Aluminium alloy	<ul style="list-style-type: none"> <li>- with integral or screw-on feet, or without feet</li> <li>- die-cast for frame size <math>\leq 180</math></li> <li>- gravity die-cast for frame size <math>\geq 200</math> <ul style="list-style-type: none"> <li>• 4 or 6 fixing holes for housings with feet</li> <li>• lifting rings for frame size <math>\geq 160</math>, optional for 132 and 112</li> </ul> </li> <li>- earth terminal (optional)</li> </ul>
Stator	Insulated low-carbon magnetic steel laminations Electroplated copper	<ul style="list-style-type: none"> <li>- low carbon content guarantees long-term lamination pack stability</li> <li>- welded packs</li> <li>- semi-enclosed slots</li> <li>- class F insulation</li> </ul>
Rotor	Insulated low-carbon magnetic steel laminations Aluminium (A5L)	<ul style="list-style-type: none"> <li>- inclined cage bars</li> <li>- rotor cage pressure die-cast in aluminium (or alloy for special applications)</li> <li>- shrink-fitted to shaft</li> <li>- rotor balanced dynamically, class N - 1/2 key</li> </ul>
Shaft	Steel	<ul style="list-style-type: none"> <li>- for frame size <math>\leq 132</math>:           <ul style="list-style-type: none"> <li>• shaft end fitted with screw and washer</li> <li>• captive drive key with rounded ends - for frame size <math>\geq 160</math>:               <ul style="list-style-type: none"> <li>• tapped hole</li> <li>• open keyway</li> </ul> </li> </ul> </li> </ul>
End shields	Aluminium alloy	- LS 63 - 71 drive end and non drive end
	Cast iron	- for frame size $\geq 80$
Bearings and lubrication		<ul style="list-style-type: none"> <li>- ball bearings</li> <li>- type ZZ "greased for life" up to and including frame size 200</li> <li>- semi-protected or open type for frame sizes 225 and 280</li> <li>- NDE bearings preloaded</li> </ul>
Lipseals	Synthetic rubber	<b>DE and NDE lipseal for IP 65 protection</b> of the shaft
Fan	Composite material or aluminium alloy	- 2 directions of rotation: straight blades
Fan cover	Pressed steel	- fitted, on request, with a drip cover for operation in vertical position, shaft end facing down
Terminal box	Aluminium alloy	<ul style="list-style-type: none"> <li>- <b>IP 65</b></li> <li>- can be turned in 4 directions, on opposite side from the feet for frame size <math>\geq 80</math></li> <li>- fitted with a <b>terminal block with 6 steel terminals and captive nuts</b></li> <li>- supplied with <b>cable anchor glands</b></li> <li>- 1 earth terminal in each terminal box</li> </ul>
Paint		<ul style="list-style-type: none"> <li>- system Ia</li> <li>- resistance to saline mist: 72 hours (according to NFX 41002)</li> </ul>



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

CATEGORY 2  
ZONE 21

## B2 - Selection

2  
poles  
3000 min<sup>-1</sup>

IP 65  
S1  
CI F insulation



II 2D T 125 °C

MAINS SUPPLY Δ 230 / Y 400 V or Δ 400 V      50 Hz												
Type	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current/ Rated current	Starting torque/ Rated torque	Max. torque/ Rated torque	Rated apparent power	Moment of inertia	Weight
	P <sub>N</sub> kW	N <sub>N</sub> min <sup>-1</sup>	C <sub>N</sub> N.m	I <sub>N (400V)</sub> A	100 %	100 %	I <sub>B</sub> /I <sub>N</sub>	M <sub>D</sub> /M <sub>N</sub>	M <sub>M</sub> /M <sub>N</sub>	kVA <sub>N</sub>	J kg.m <sup>2</sup>	IM B3 kg
LSPX 63 M	0.18	2790	0.6	0.52	0.75	67	5	3.4	3	0.36	0.00019	4.8
LSPX 63 M	0.25	2800	0.8	0.71	0.75	68	5.4	3.4	3.1	0.49	0.00025	6
LSPX 71 L	0.37	2800	1.3	0.98	0.80	68	5.2	3.2	3.8	0.68	0.00035	6.4
LSPX 71 L	0.55	2800	1.9	1.32	0.80	75	6	3.2	3.1	0.92	0.00045	7.3
LSPX 71 L	0.75	2780	2.5	1.70	0.85	75	6	3.4	3	1.18	0.00060	8.3
LSPX 80 L	0.75	2840	2.5	1.64	0.87	76	5.9	2.4	2.2	1.13	0.00070	8.2
LSPX 80 L	1.1	2837	3.7	2.4	0.84	78	5.8	2.7	2.4	1.7	0.00090	9.7
LSPX 80 L	1.5	2859	5	3.2	0.83	80.3	7	3.2	2.8	2.2	0.0011	11.3
LSPX 90 S	1.5	2870	5	3.4	0.81	79.6	8	3.9	4	2.3	0.0014	12
LSPX 90 L	1.8	2865	6	3.6	0.86	83.1	8	3.6	3.6	2.5	0.0017	14
LSPX 90 L	2.2	2862	7.4	4.3	0.88	83.6	7.7	3.7	3.3	3	0.0021	16
LSPX 100 L	3	2868	10	6.3	0.81	83.9	7.5	3.8	3.9	4.3	0.0022	20
LSPX 112 M	4	2877	13.5	7.9	0.85	86	7.8	2.9	2.9	5.5	0.0029	24.4
LSPX 112 MG	5.5	2916	18.1	10.5	0.88	86.6	9	3.1	3.5	7.2	0.0076	33
LSPX 132 S	5.5	2916	18.1	10.5	0.88	86.6	9	3.1	3.5	7.2	0.0076	34.4
LSPX 132 S	7.5	2905	24.5	14.7	0.85	86.5	8.7	3.4	3.6	10.2	0.0088	39
LSPX 132 M	9	2910	29.6	17.3	0.85	88.1	8.6	2.5	3.5	12	0.016	49
LSPX 132 M	11	2944	36	20.7	0.86	89.4	7.5	2.7	3.4	14.3	0.018	54
LSPX 160 MP	11	2944	36	20.7	0.86	89.4	7.5	2.7	3.4	14.3	0.019	62
LSPX 160 MP	15	2935	48.8	28.4	0.85	90	8.1	3	3.5	19.7	0.023	72
LSPX 160 L	18.5	2934	60.2	33.7	0.87	91	8	3	3.3	23.4	0.044	88
LSPX 180 MT	22	2938	71.5	39.9	0.87	91.5	8.1	3.1	3.1	27.6	0.052	99
LSPX 200 LT	30	2946	97.2	52.1	0.9	92.4	8.6	2.7	3.4	36.1	0.089	154
LSPX 200 L	37	2950	120	64.6	0.89	92.9	7.4	2.6	3	44.8	0.120	180
LSPX 225 MT	45	2950	146	77.4	0.9	93.3	7.5	2.8	3.1	53.6	0.140	200
LSPX 250 MZ	55	2956	178	95.2	0.89	93.7	8.3	3.1	3.4	66	0.173	235
LSPX 280 SC	75	2968	241	127	0.9	94.4	8.5	2.6	3.4	88.3	0.39	330
LSPX 280 MC	90	2968	290	152	0.9	94.7	8.4	2.6	3.3	105.6	0.47	375



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

CATEGORY 2  
ZONE 21

B2 - Selection

4  
poles  
1500 min<sup>-1</sup>

IP 65  
S1  
CI F insulation



II 2D T 125 °C

B

MAINS SUPPLY Δ 230 / Y 400 V or Δ 400 V

50 Hz

Type	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current/Rated current	Starting torque/Rated torque	Max. torque/Rated torque	Rated apparent power	Moment of inertia	Weight
	P <sub>N</sub> kW	N <sub>N</sub> min <sup>-1</sup>	C <sub>N</sub> N.m	I <sub>N (400V)</sub> A	100 %	100 %	I <sub>D</sub> /I <sub>N</sub>	M <sub>D</sub> /M <sub>N</sub>	M <sub>M</sub> /M <sub>N</sub>	kVA <sub>N</sub>	J kg.m <sup>2</sup>	IM B3 kg
LSPX 63 M	0.12	1380	0.8	0.44	0.70	56	3.2	2.5	2.4	0.31	0.00035	4.8
LSPX 63 M	0.18	1390	1.2	0.64	0.65	62	3.7	2.7	2.7	0.45	0.00048	5
LSPX 71 L	0.25	1425	1.7	0.80	0.65	69	4.6	2.7	2.9	0.56	0.00068	6.4
LSPX 71 L	0.37	1420	2.5	1.06	0.70	72	4.9	2.4	2.8	0.73	0.00085	7.3
LSPX 71 L	0.55	1400	3.8	1.62	0.70	70	4.8	2.3	2.5	1.12	0.0011	8.3
LSPX 80 L	0.55	1410	3.8	1.42	0.76	73.4	4.5	2	2.3	1	0.0013	8.2
LSPX 80 L	0.75	1400	5.1	2.01	0.77	70	4.5	2	2.2	1.4	0.0018	9.3
LSPX 80 L	0.9	1425	6	2.44	0.73	73	5.8	3	3	1.6	0.0024	10.9
LSPX 90 S	1.1	1429	7.4	2.5	0.84	76.8	4.8	1.6	2	1.7	0.0026	11.5
LSPX 90 L	1.5	1428	10	3.4	0.82	78.5	5.3	1.8	2.3	2.3	0.0032	13.5
LSPX 90 L	1.8	1438	12	4	0.82	80.1	6	2.1	3.2	2.7	0.0037	15.2
LSPX 100 L	2.2	1436	14.7	4.8	0.81	81	5.9	2.1	2.5	3.4	0.0043	20
LSPX 100 L	3	1437	20.1	6.5	0.81	82.6	6	2.5	2.8	4.5	0.0055	22.5
LSPX 112 M	4	1438	26.8	8.3	0.83	84.2	7.1	2.5	3	5.7	0.0067	24.9
LSPX 132 S	5.5	1447	36.7	11.1	0.83	85.7	6.3	2.4	2.8	7.7	0.014	36.5
LSPX 132 M	7.5	1451	49.4	15.2	0.82	87	7	2.4	2.9	10.5	0.019	54.7
LSPX 132 M	9	1455	59.3	18.1	0.82	87.7	6.9	2.2	3.1	12.5	0.023	59.9
LSPX 160 MP	11	1454	72.2	21	0.86	88.4	7.7	2.3	3.2	14.5	0.030	70
LSPX 160 LR	15	1453	98	28.8	0.84	89.4	7.5	2.9	3.6	20	0.036	86
LSPX 180 MT	18.5	1456	121	35.2	0.84	90.3	7.6	2.7	3.2	24.4	0.085	100
LSPX 180 LR	22	1456	144	41.7	0.84	90.7	7.9	3	3.3	28.9	0.096	112
LSPX 200 LT	30	1460	196	56.3	0.84	91.5	6.6	2.9	2.9	39	0.151	165
LSPX 225 ST	37	1468	241	68.7	0.84	92.5	6.3	2.7	2.6	47.6	0.24	205
LSPX 225 MR	45	1468	293	83.3	0.84	92.8	6.3	2.7	2.6	57.7	0.29	235
LSPX 250 ME	55	1478	355	101	0.84	93.6	7	2.7	2.8	70	0.63	320
LSPX 280 SC	75	1478	485	137	0.84	94.2	7.2	2.8	2.9	94.8	0.83	380
LSPX 280 MD	90	1478	581	164	0.84	94.4	7.6	3	3	113.5	1.03	450



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

CATEGORY 2  
ZONE 21

B2 - Selection

6  
poles  
 $1000 \text{ min}^{-1}$

IP 65  
S1  
CI F insulation



II 2D T 125 °C

Type	MAINS SUPPLY $\Delta 230 / Y 400 V$ or $\Delta 400 V$										50 Hz	
	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current/Rated current	Starting torque/Rated torque	Max. torque/Rated torque	Rated apparent power	Moment of inertia	Weight
	$P_N$ kW	$N_N$ $\text{min}^{-1}$	$C_N$ N.m	$I_N(400V)$ A	100 %	100 %	$I_D/I_N$	$M_D/M_N$	$M_M/M_N$	kVA <sub>N</sub>	J kg.m <sup>2</sup>	IM B3 kg
LSPX 63 M	0.09	860	0.9	0.46	0.80	35	2.1	1.8	1.8	0.32	0.0006	5.5
LSPX 71 L	0.12	920	1.3	0.64	0.55	49	2.9	2.5	2.6	0.45	0.0007	6.5
LSPX 71 L	0.18	895	1.8	0.81	0.62	52	2.7	1.9	2	0.56	0.0011	7.6
LSPX 71 L	0.25	840	2.6	1	0.70	50	2.5	1.7	1.7	0.71	0.0013	7.9
LSPX 80 L	0.25	955	2.5	0.85	0.67	63.1	3.9	1.6	1.8	0.59	0.0024	8.4
LSPX 80 L	0.37	950	3.7	1.1	0.72	66	4.3	1.7	2.2	0.76	0.0032	9.7
LSPX 80 L	0.55	950	5.5	1.8	0.64	68	4.9	2.1	2.6	1.2	0.0042	11
LSPX 90 S	0.75	930	7.7	2.1	0.77	68.5	4.2	2.4	2.6	1.4	0.0039	13.5
LSPX 90 L	1.1	915	11.5	3	0.76	70	4.7	2.4	2.5	2.1	0.0048	15.2
LSPX 100 L	1.5	905	15.8	4.2	0.74	69	4.5	2.5	2.7	2.9	0.0058	20
LSPX 112 M	2.2	905	23.2	5.8	0.76	72	5.6	2.8	2.7	4	0.0087	24.2
LSPX 132 S	3	957	30.3	6.8	0.78	81.1	6	2	2.6	4.7	0.018	38.3
LSPX 132 M	4	961	39.6	9.3	0.75	83.6	5.9	2.5	2.9	6.4	0.034	53.3
LSPX 132 M	5.5	960	54.2	13.3	0.71	84.1	5.5	2.5	2.8	9.2	0.039	59.4
LSPX 160 M	7.5	967	74.1	16.1	0.79	85.2	4.7	1.5	2.1	11.1	0.086	81
LSPX 160 L	11	967	109	23.3	0.79	86.3	4.6	1.6	2.1	16.1	0.116	105
LSPX 180 L	15	972	147	30.1	0.81	88.7	6.8	2.3	2.8	20.9	0.192	135
LSPX 200 LT	18.5	970	182	37	0.81	89	6.4	2.4	2.8	25.7	0.236	160
LSPX 200 L	22	972	216	43.6	0.81	89.9	6	2	2.7	30.2	0.295	190
LSPX 225 MR	30	968	296	59.5	0.81	89.9	6	2.2	2.5	41.2	0.39	235
LSPX 250 ME	37	978	361	71.1	0.81	92.7	6.2	2.3	2.5	49.3	0.85	305
LSPX 280 SC	45	978	439	86.5	0.81	92.7	6.2	2.3	2.5	59.9	0.99	340
LSPX 280 MC	55	978	537	106	0.81	92.6	6	2.4	2.5	73.3	1.19	385



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

CATEGORY 2  
ZONE 21

B2 - Selection

8  
poles  
 $750 \text{ min}^{-1}$

IP 65  
S1  
CI F insulation



II 2D T 125 °C

Type	MAINS SUPPLY $\Delta 230 / Y 400 V$ or $\Delta 400 V$										50 Hz	
	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current/Rated current	Starting torque/Rated torque	Max. torque/Rated torque	Rated apparent power	Moment of inertia	Weight
	$P_N$ kW	$N_N$ $\text{min}^{-1}$	$C_N$ N.m	$I_N(400V)$ A	100 %	100 %	$I_D/I_N$	$M_D/M_N$	$M_M/M_N$	kVA <sub>N</sub>	J kg.m <sup>2</sup>	IM B3 kg
LSPX 71 L	0.12	650	1.7	0.72	0.55	44	2.1	1.3	1.5	0.50	0.0013	8
LSPX 80 L	0.18	705	2.4	0.79	0.63	52	2.9	1.5	1.9	0.55	0.0031	9.7
LSPX 80 L	0.25	700	3.4	0.98	0.68	54	2.8	1.7	1.9	0.68	0.0041	11.3
LSPX 90 S	0.37	685	5.2	1.20	0.72	62	3.8	1.7	1.8	0.83	0.0038	13.5
LSPX 90 L	0.55	670	7.8	1.7	0.72	63.5	3.5	1.7	1.7	1.2	0.0047	15.2
LSPX 100 L	0.75	670	10.7	2.4	0.71	63.5	3.5	1.8	2.2	1.7	0.0047	18
LSPX 100 L	1.1	670	15.7	3.7	0.68	63	3.7	2	2.2	2.6	0.0068	21.8
LSPX 112 MG	1.5	710	20.2	4.7	0.64	72	3.8	2	2.1	3.3	0.015	24
LSPX 132 SM	2.2	713	30.2	6.1	0.68	77.1	4	1.7	2	4.2	0.025	45.6
LSPX 132 M	3	712	40.7	8	0.65	79.8	4.3	1.9	2.2	5.5	0.033	53.9
LSPX 160 M	4	718	53.2	11	0.63	83.3	3.9	1.7	2.3	7.6	0.068	84
LSPX 160 M	5.5	716	73.4	15.1	0.63	83.3	3.9	1.7	2.3	10.5	0.071	89
LSPX 160 L	7.5	714	100	20.6	0.63	83.4	3.9	1.9	2.3	14.3	0.09	101
LSPX 180 L	11	720	146	25.6	0.72	86	3.8	1.4	1.9	17.8	0.205	140
LSPX 200 L	15	725	198	32.9	0.75	87.7	4.4	1.6	2.1	22.8	0.27	185
LSPX 225 ST	18.5	725	244	42.4	0.72	87.5	4.2	1.6	2.1	29.4	0.33	210
LSPX 225 MR	22	725	290	51.9	0.7	87.4	4.4	1.9	2.3	36	0.4	240
LSPX 250 ME	30	730	392	60.3	0.79	90.9	5.8	1.9	2.7	41.8	0.99	330
LSPX 280 SC	37	730	484	74.3	0.79	91	5.6	1.8	2.6	51.5	1.19	370
LSPX 280 MD	45	728	590	91.4	0.78	91.1	5.4	1.8	2.6	63.3	1.39	430



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

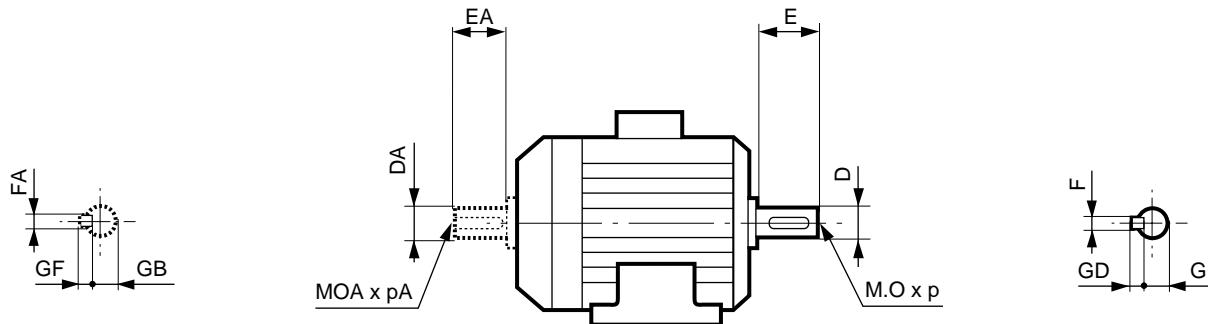
CATEGORY 2  
ZONE 21

## B3 - Dimensions

### Dimensions of LSPX 3-phase motors Cage rotor

Dimensions in millimetres

#### – Shaft extensions



Type	Main shaft extensions													
	4, 6 and 8 poles				2 poles and 2/4 poles									
Type	F	GD	D	G	E	O	p	F	GD	D	G	E	O	p
LSPX 63 M	4	4	11j6	8.5	23	4	10	4	4	11j6	8.5	23	4	10
LSPX 71 M	5	5	14j6	11	30	5	15	5	5	14j6	11	30	5	15
LSPX 80 L	6	6	19j6	15.5	40	6	16	6	6	19j6	15.5	40	6	16
LSPX 90 S/L	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
LSPX 100 L	8	7	28j6	24	60	10	22	8	7	28j6	24	60	10	22
LSPX 112 M/MG	8	7	28j6	24	60	10	22	8	7	28j6	24	60	10	22
LSPX 132 S/M	10	8	38k6	33	80	12	28	10	8	38k6	33	80	12	28
LSPX 160 M/L/MP/LR	12	8	42k6	37	110	16	36	12	8	42k6	37	110	16	36
LSPX 180 MT/LR/L	14	9	48k6	42.5	110	16	36	14	9	48k6	42.5	110	16	36
LSPX 200 LT/L	16	10	55m6	49	110	20	42	16	10	55m6	49	110	20	42
LSPX 225 ST/MR/SR	18	11	60m6	53	140	20	42	16	10	55m6	49	110	20	42
LSPX 250 MZ/ME	18	11	65m6	58	140	20	42	18	11	60m6	53	140	20	42
LSPX 280 SC/MC/MD	20	12	75m6	67.5	140	20	42	18	11	65m6	58	140	20	42

Type	Secondary shaft extensions													
	4, 6 and 8 poles				2 poles and 2/4 poles									
Type	FA	GF	DA	GB	EA	OA	pA	FA	GF	DA	GB	EA	OA	pA
LSPX 63 M	4	4	11j6	8.5	23	4	10	4	4	11j6	8.5	23	4	10
LSPX 71 M	5	5	14j6	11	30	5	15	5	5	14j6	11	30	5	15
LSPX 80 L	5	5	14j6	11	30	5	15	5	5	14j6	11	30	5	15
LSPX 90 S/L	6	6	19j6	15.5	40	6	16	6	6	19j6	15.5	40	6	16
LSPX 100 L	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
LSPX 112 M/MG	8	7	24j6	20	50	8	19	8	7	28j6	24	60	10	22
LSPX 132 S/M	8	7	28j6	24	60	10	22	8	7	38k6	33	80	12	28
LSPX 160 MP/LR	10	8	38k6	33	80	12	28	10	8	42k6	37	110	16	36
LSPX 160 M/L	12	8	42k6	37	110	16	36	12	8	48k6	42.5	110	16	36
LSPX 180 MT/LR/L	14	9	48k6	42.5	110	16	36	14	9	55m6	49	110	20	42
LSPX 200 LT/L	16	10	55m6	49	110	20	42	16	10	60m6	53	140	20	42
LSPX 225 ST/MR/SR	18	11	60m6	53	140	20	42	16	10	65m6	58	140	20	42
LSPX 250 MZ/ME	18	11	65m6	58	140	20	42	18	11	70m6	63	140	20	42
LSPX 280 SC/MC/MD	18	11	75m6	67.5	140	20	42	18	11	80m6	68	140	20	42



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

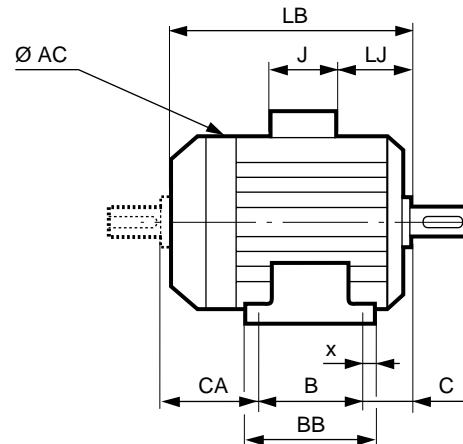
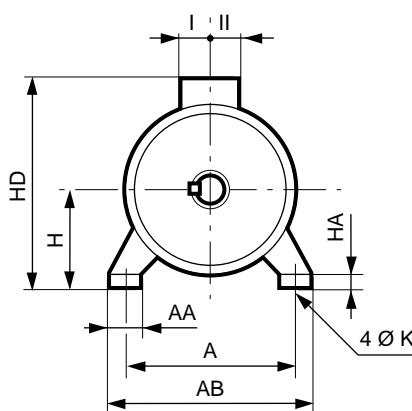
CATEGORY 2  
ZONE 21

## B3 - Dimensions

Dimensions of LSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot mounted 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
LSPX 63 M	100	115	80	96	40	7.5	24.5	7	8	63	124	160	172	21	78	39	39	55
LSPX 71 M	112	126	90	104	45	7.5	23	7	9	71	140	178	183	21	78	39	39	51
LSPX 80 L	125	157	100	120	50	10	29	9	10	80	170	208	215	25	89	52	52	68
LSPX 90 S	140	172	100	120	56	10	37	10	11	90	190	228	218	25	89	52	52	66
LSPX 90 L	140	172	125	162	56	28	37	10	11	90	190	228	245	25	89	52	52	68
LSPX 100 L	160	196	140	165	63	12	40	12	13	100	200	243	290	25	89	52	52	93
LSPX 112 M	190	220	140	165	70	12	45	12	14	112	200	255	290	25	89	52	52	86
LSPX 112 MG	190	220	140	165	70	12	52	12	14	112	235	264	315	34	89	52	52	110
LSPX 132 S	216	250	140	170	89	16	50	12	15	132	235	284	350	51	89	52	52	128
LSPX 132 SM/M	216	250	178	208	89	16	59	12	18	132	280	308	387	25	110	57	73	126
LSPX 160 MP	254	294	210	294	108	20	64	14.5	25	160	264	375	468	43	135	88	64	154
LSPX 160 M	254	294	210	294	108	20	60	14.5	25	160	310	395	495	44	134	92	63	182
LSPX 160 LR	254	294	254	294	108	20	64	14.5	25	160	264	375	495	43	135	88	64	138
LSPX 160 L	254	294	254	294	108	20	60	14.5	25	160	310	395	495	44	134	92	63	138
LSPX 180 MT	279	324	241	316	121	20	79	14.5	28	180	310	428	495	45	205	100	95	138
LSPX 180 LR	279	324	279	316	121	20	79	14.5	28	180	310	428	520	45	205	100	95	125
LSPX 180 L	279	339	279	329	121	25	86	14.5	25	180	350	435	552	54	205	100	95	159
LSPX 200 LT	318	378	305	365	133	30	108	18.5	32	200	350	455	599	60	205	100	95	167
LSPX 200 L	318	388	305	375	133	35	103	18.5	36	200	390	475	621	68	205	100	95	194
LSPX 225 ST	356	431	286	386	149	50	127	18.5	36	225	390	500	628	74	205	100	95	203
LSPX 225 SR	356	431	286	386	149	50	127	18.5	36	225	390	500	676	74	205	100	95	253
LSPX 225 MR	356	431	311	386	149	50	127	18.5	36	225	390	500	676	74	205	100	95	228
LSPX 250 MZ	406	470	349	449	168	70	150	24	47	250	390	550	676	68	217	103	145	172
LSPX 250 ME	406	470	349	420	168	35	90	24	36	250	479	654	810	68	292	148	180	293
LSPX 280 SC	457	520	368	478	190	35	90	24	35	280	479	684	810	68	292	148	180	252
LSPX 280 MC	457	520	419	478	190	35	90	24	35	280	479	684	810	68	292	148	180	201
LSPX 280 MD	457	520	419	478	190	35	90	24	35	280	479	684	870	68	292	148	180	261



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

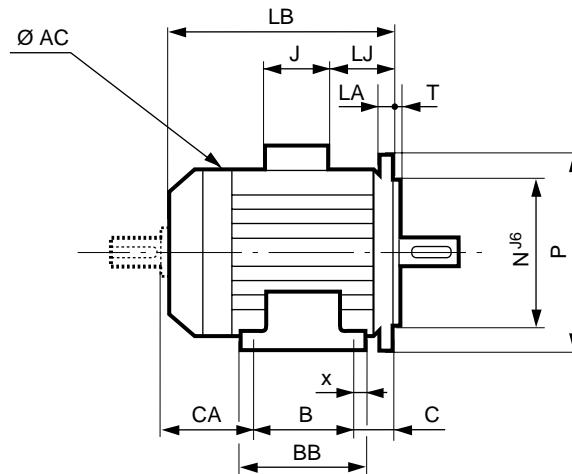
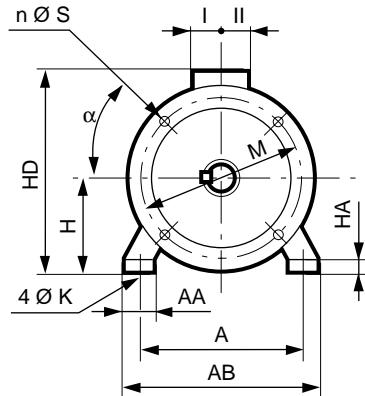
CATEGORY 2  
ZONE 21

## B3 - Dimensions

Dimensions of LSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot and flange mounted 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.
LSPX 63 M	100	115	80	96	40	7.5	24.5	7	8	63	124	160	172	21	78	39	39	FF 115
LSPX 71 M	112	126	90	104	45	7.5	23	7	9	71	140	178	183	21	78	39	39	FF 130
LSPX 80 L	125	157	100	120	50	10	29	9	10	80	170	208	215	25	89	52	52	FF 165
LSPX 90 S	140	172	100	120	76	10	37	10	11	90	190	228	218	45	89	52	52	FF 165
LSPX 90 L	140	172	125	162	56	8	37	10	11	90	190	228	245	45	89	52	52	FF 165
LSPX 100 L	160	196	140	165	63	12	40	12	13	100	200	243	290	25	89	52	52	FF 215
LSPX 112 M	190	220	140	165	70	12	45	12	14	112	200	255	290	25	89	52	52	FF 215
LSPX 112 MG	190	220	140	165	70	12	52	12	14	112	235	264	315	34	89	52	52	FF 215
LSPX 132 S	216	250	140	170	89	16	50	12	15	132	235	284	350	51	89	52	52	FF 265
LSPX 132 SM/M	216	250	178	208	89	16	59	12	18	132	280	308	387	25	110	57	73	FF 265
LSPX 160 MP	254	294	210	294	108	20	64	14.5	25	160	264	375	468	43	135	88	64	FF 300
LSPX 160 M	254	294	210	294	108	20	60	14.5	25	160	310	395	495	44	134	92	63	FF 300
LSPX 160 LR	254	294	254	294	108	20	64	14.5	25	160	264	375	495	43	135	88	64	FF 300
LSPX 160 L	254	294	254	294	108	20	60	14.5	25	160	310	395	495	44	134	92	63	FF 300
LSPX 180 MT	279	324	241	316	121	20	79	14.5	28	180	310	428	495	45	205	100	95	FF 300
LSPX 180 LR	279	324	279	316	121	20	79	14.5	28	180	310	428	520	45	205	100	95	FF 300
LSPX 180 L	279	339	279	329	121	25	86	14.5	25	180	350	435	552	54	205	100	95	FF 300
LSPX 200 LT	318	378	305	365	133	30	108	18.5	32	200	350	455	599	60	205	100	95	FF 350
LSPX 200 L	318	388	305	375	133	35	103	18.5	36	200	390	475	621	68	205	100	95	FF 350
LSPX 225 ST	356	431	286	386	149	50	127	18.5	36	225	390	500	628	74	205	100	95	FF 400
LSPX 225 SR	356	431	286	386	149	50	127	18.5	36	225	390	500	676	74	205	100	95	FF 400
LSPX 225 MR	356	431	311	386	149	50	127	18.5	36	225	390	500	676	74	205	100	95	FF 400
LSPX 250 MZ	406	470	349	449	168	70	150	24	47	250	390	550	676	68	217	103	145	FF 500
LSPX 250 ME	406	470	349	420	168	35	90	24	36	250	479	654	810	68	217	103	145	FF 500
LSPX 280 SC	457	520	368	478	190	35	90	24	35	280	479	684	810	68	292	148	180	FF 500
LSPX 280 MC	457	520	419	478	190	35	90	24	35	280	479	684	810	68	292	148	180	FF 500
LSPX 280 MD	457	520	419	478	190	35	90	24	35	280	479	684	870	68	292	148	180	FF 500

Dimensions of CA and shaft extensions: see pages 16 and 17.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

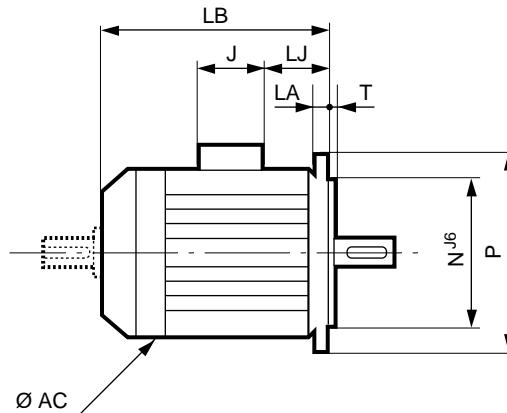
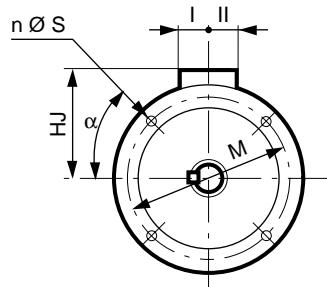
CATEGORY 2  
ZONE 21

## B3 - Dimensions

Dimensions of LSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Flange mounted IM B5 (IM 3001)



IEC symbol	Flange dimensions							
	M	N	P	T	n	α	S	LA
FF 115	115	95	140	3	4	45	10	10
FF 130	130	110	160	3.5	4	45	10	10
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 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
FF 500	500	450	550	5	8	22.5	18.5	18
FF 500	500	450	550	5	8	22.5	18.5	18
FF 500	500	450	550	5	8	22.5	18.5	18
FF 500	500	450	550	5	8	22.5	18.5	18

Dimensions of shaft extensions: see page 16.

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
LSPX 63 M	124	172	95	21	78	39	39
LSPX 71 M	140	183	102	21	78	39	39
LSPX 80 L	170	215	128	25	89	52	52
LSPX 90 S	190	238	138	45	89	52	52
LSPX 90 L	190	265	138	45	89	52	52
LSPX 100 L	200	290	143	25	89	52	52
LSPX 112 M	200	290	143	25	89	52	52
LSPX 112 MG	235	315	152	34	89	52	52
LSPX 132 S	235	350	152	51	89	52	52
LSPX 132 SM/M	280	387	176	25	110	57	73
LSPX 160 MP	264	468	215	43	135	88	64
LSPX 160 M	316	495	235	44	134	92	63
LSPX 160 LR	264	495	215	43	135	88	64
LSPX 160 L	316	495	235	44	134	92	63
LSPX 180 MT	316	495	248	45	205	100	95
LSPX 180 LR	316	520	248	45	205	100	95
LSPX 180 L	350	552	255	54	205	100	95
LSPX 200 LT	350	599	255	60	205	100	95
LSPX 200 L	390	621	275	68	205	100	95
LSPX 225 ST	390	628	275	74	205	100	95
LSPX 225 SR	390	676	275	74	205	100	95
LSPX 225 MR	390	676	275	74	205	100	95
LSPX 250 MZ	390	676	300	68	217	103	145
LSPX 250 ME	479	810	404	68	292	148	180
LSPX 280 SC	479	810	404	68	292	148	180
LSPX 280 MC	479	810	404	68	292	148	180
LSPX 280 MD	479	870	404	68	292	148	180



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

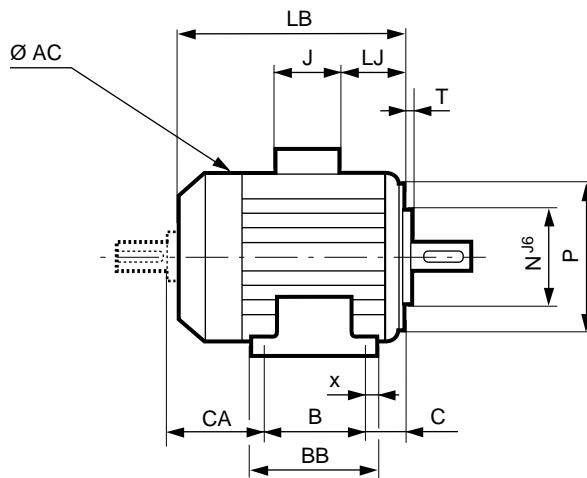
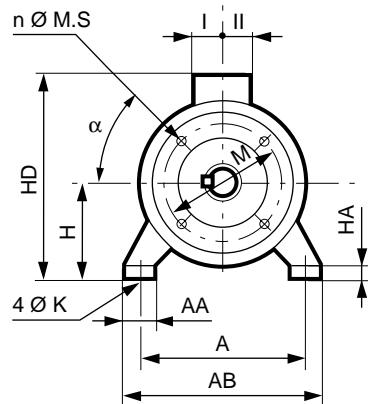
CATEGORY 2  
ZONE 21

## B3 - Dimensions

Dimensions of LSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot and face mounted 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.
LSPX 63 M	100	115	80	96	40	8	24.5	7	8	63	124	160	172	21	78	39	39	FT 75
LSPX 71 M	112	126	90	104	45	7	23	7	9	71	140	178	183	21	78	39	39	FT 85
LSPX 80 L	125	157	100	120	50	10	29	9	10	80	170	208	215	25	89	52	52	FT 100
LSPX 90 S	140	172	100	120	56	10	37	10	11	90	190	228	218	25	89	52	52	FT 115
LSPX 90 L	140	172	125	162	56	28	37	10	11	90	190	228	245	25	89	52	52	FT 115
LSPX 100 L	160	196	140	165	63	12	40	12	13	100	200	243	290	25	89	52	52	FT 130
LSPX 112 M	190	220	140	165	70	12	45	12	14	112	200	255	290	25	89	52	52	FT 130
LSPX 112 MG	190	220	140	165	70	12	52	12	14	112	235	264	315	34	89	52	52	FT 130
LSPX 132 S	216	250	140	170	89	16	50	12	15	132	235	284	350	51	89	52	52	FT 215
LSPX 132 SM/M	216	250	178	208	89	16	59	12	18	132	280	308	387	25	110	57	73	FT 215
LSPX 160 MP	254	294	210	250	108	20	112	14	25	160	310	375	425	43	135	88	64	FT 265
LSPX 160 LR	254	294	254	294	108	20	112	14	25	160	310	375	495	43	135	88	64	FT 265

Dimensions of CA and shaft extensions: see pages 16 and 17.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

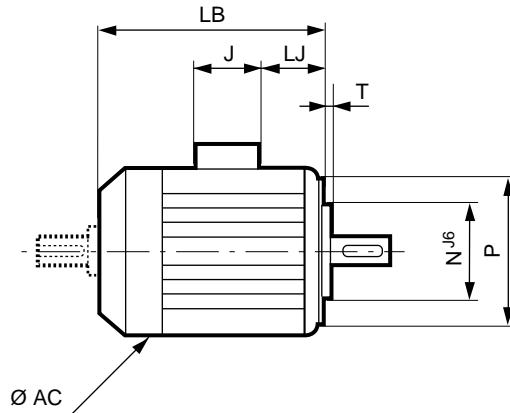
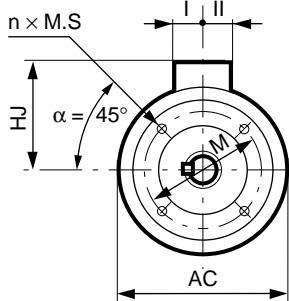
CATEGORY 2  
ZONE 21

## B3 - Dimensions

Dimensions of LSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Face mounted IM B14 (IM 3601)



IEC symbol	Flange dimensions					
	M	N	P	T	n	MS
FT 75	75	60	90	2.5	4	M5
FT 85	85	70	105	2.5	4	M6
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 265	265	230	300	4	4	M12
FT 265	265	230	300	4	4	M12

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
LSPX 63 M	124	172	95	21	78	39	39
LSPX 71 M	140	183	102	21	78	39	39
LSPX 80 L	170	215	128	25	89	52	52
LSPX 90 S	190	218	138	25	89	52	52
LSPX 90 L	190	245	138	25	89	52	52
LSPX 100 L	200	290	143	25	89	52	52
LSPX 112 M	200	290	143	25	89	52	52
LSPX 112 MG	235	315	152	34	89	52	52
LSPX 132 S	235	350	152	51	89	52	52
LSPX 132 SM/M	280	387	176	25	110	57	73
LSPX 160 MP	310	425	215	43	135	88	64
LSPX 160 LR	310	495	215	43	135	88	64

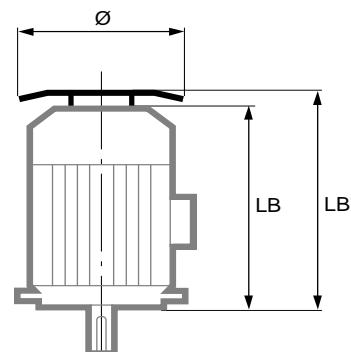
Dimensions of shaft extensions: see page 16.

## Drip covers

Dimensions in millimetres

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

Frame size	LB'	Ø
63	LB + 20	125
71	LB + 20	140
80	LB + 20	145
90, 100 and 112	LB + 20	185
112 MG and 132 S	LB + 25	210
132 SM/M and 160 M/LR	LB + 30	240
160 M/L and 180 MT/LR	LB + 36.5	265
180 L and 200 LT	LB + 36.5	305
200 L - 225 ST/MR and 250 MZ	LB + 36.5	350
250 ME - 280 SC/MC/MZ	LB + 55	420





# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LSPX

CATEGORY 2  
ZONE 21

## B3 - Dimensions

– Cable gland for rated supply voltage of 400 V

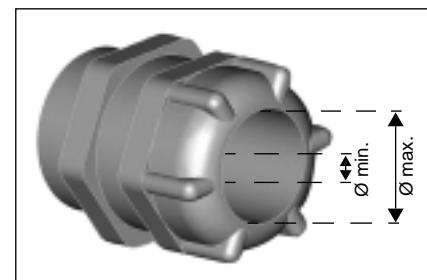
Frame size	Single-speed motor		Cable gland for PTO / PTF / ... accessories
	D.O.L. starting	UD starting	
63 / 71	CMDEL ISO M16 × 1.5	–	CMDEL ISO M16 × 1.5
80	CMDEL ISO M20 × 1.5	–	CMDEL ISO M16 × 1.5
90	CMDEL ISO M20 × 1.5	–	CMDEL ISO M16 × 1.5
100	CMDEL ISO M20 × 1.5	2 × CMDEL ISO 20	CMDEL ISO M16 × 1.5
112	CMDEL ISO M20 × 1.5	2 × CMDEL ISO 20	CMDEL ISO M16 × 1.5
132 S	CMDEL ISO M20 × 1.5	2 × CMDEL ISO 20	CMDEL ISO M16 × 1.5
132 M	CMDEL ISO M20 × 1.5	2 × CMDEL ISO 25	CMDEL ISO M16 × 1.5
160 / 180 MR	2 × CMDEL ISO M25 × 1.5	2 × CMDEL ISO 25	CMDEL ISO M16 × 1.5
180	2 × CMDEL ISO M32 × 1.5	2 × CMDEL ISO 30	CMDEL ISO M16 × 1.5
200	2 × CMDEL ISO M32 × 1.5	2 × CMDEL ISO 30	CMDEL ISO M16 × 1.5
225	2 × CMDEL ISO M40 × 1.5	2 × CMDEL ISO 40	CMDEL ISO M16 × 1.5
250	2 × CMDEL ISO M40 × 1.5	2 × CMDEL ISO 40	CMDEL ISO M16 × 1.5
280	2 × CMDEL ISO M50 × 1.5	2 × CMDEL ISO 50	CMDEL ISO M16 × 1.5

CMDEL : cable anchor gland.

: cable gland made of brass.

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

Type of cable gland	Tightening capacity		drill hole Ø	No thread
	min. cable Ø (mm)	max. cable Ø (mm)		
CMDEL ISO M16 · 1.5	6	11	16	1.5
CMDEL ISO M20 · 1.5	7.5	13	20	1.5
CMDEL ISO M25 · 1.5	12.5	18	25	1.5
CMDEL ISO M32 · 1.5	17.5	25	32	1.5
CMDEL ISO M40 · 1.5	24.5	33.5	40	1.5
CMDEL ISO M50 · 1.5	33	43	50	1.5





# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

CATEGORY 2  
ZONE 21

## C1 - General



– 3-phase TEFV induction motors, **FLSPX series with cast iron housing**, conforming to IEC 34, 72, EN 50281, power **0.18 to 400 kW**, frame size 80 to 355 mm.  
 • Single speed 2, 4, 6 and 8-pole: 230/400 V or 400 V  $\Delta$ , 50 Hz  
 • Two-speed: (on request) for general or centrifugal applications 2/4, 4/6, 4/8 and 6/8 poles 400 V Y or  $\Delta$ .

#### – Protection **IP65**

suitable for the harshest environments.

#### – Motors for variable speed operation

- fitted with thermal probes on the windings (essential)
- on consultation (to be selected), see p. 60.

For starting two-speed motors indirectly: please consult Leroy-Somer.

**Finish: cast iron housing**  
 Assembled using protected fixing accessories.  
 Paint finish **RAL 1007 (yellow)**.  
 Shaft end and flange protected against atmospheric corrosion.  
 Individual anti-shock packaging.

#### A.C. supply

- Standard construction in accordance with IEC 38 ie :
  - 230/400 V + 10 % – 10 % at 50 Hz
  - 400 V  $\Delta$  + 10 % – 10 % at 50 Hz

## Description of FLSPX cast iron 3-phase motors



**II 2D T 125 °C**

Component	Materials	Remarks
Housing with cooling fins	Cast iron	<ul style="list-style-type: none"> <li>- with integral feet, or without feet                     <ul style="list-style-type: none"> <li>• 4, 6 or 8 fixing holes for foot mounted housings</li> <li>• lifting rings for frame size <math>\geq 100</math></li> </ul> </li> <li>- earth terminal on foot or fin</li> </ul>
Stator	Insulated low-carbon magnetic steel laminations Insulated electroplated copper	<ul style="list-style-type: none"> <li>- low carbon content guarantees long-term lamination pack stability</li> <li>- welded packs</li> <li>- semi-enclosed slots</li> <li>- class F insulation</li> </ul>
Rotor	Insulated low-carbon magnetic steel laminations Aluminium (A5L) or copper	<ul style="list-style-type: none"> <li>- inclined cage bars</li> <li>- rotor cage pressure die-cast in aluminium (or alloy for special applications) or soldered in copper</li> <li>- shrink-fitted to shaft, or keyed for soldered rotors</li> <li>- rotor balanced dynamically, class N - 1/2 key</li> </ul>
Shaft	Steel	<ul style="list-style-type: none"> <li>- for frame size <math>\leq 132</math>:                     <ul style="list-style-type: none"> <li>• shaft end fitted with screw and washer</li> <li>• closed keyway</li> </ul> </li> <li>- for frame size <math>\geq 160</math>:                     <ul style="list-style-type: none"> <li>• tapped hole</li> <li>• open keyway</li> </ul> </li> </ul>
End shields	Cast iron	
Bearings and lubrication		<ul style="list-style-type: none"> <li>- ball bearings C3 play</li> <li>- type ZZ "greased for life" up to and including frame size 225</li> <li>- open bearings, regreasable, for frame size <math>\geq 200</math></li> <li>- NDE bearings preloaded up to 315 S, preloaded at DE from size 315 M upwards</li> </ul>
Fan	Composite material or aluminium alloy	- 2 directions of rotation: straight blades
Fan cover	Pressed steel	- fitted, on request, with a drip cover for operation in vertical position, shaft end facing down
Terminal box	Cast iron	<ul style="list-style-type: none"> <li>- <b>IP 65</b></li> <li>- can be turned, on the opposite side from the feet for frame size <math>\geq 160</math>, conforming to standards EN 50014 and EN 50019 (increased safety "e")</li> <li>- fitted with a <b>terminal block with 6 terminals and captive nuts</b> up to frame size <math>\leq 132</math></li> <li>- fitted with <b>isolators</b> above size 160</li> <li>- supplied with <b>cable anchor glands</b></li> <li>- 1 earth terminal in each terminal box</li> </ul>
Paint		<ul style="list-style-type: none"> <li>- system II</li> <li>- resistance to saline mist: 250 hours (according to NFX 41002)</li> </ul>



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

CATEGORY 2  
ZONE 21

## C2 - Selection

2  
poles  
3000 min<sup>-1</sup>

IP 65  
S1  
CI F insulation



II 2D T 125 °C

### MAINS SUPPLY Δ 230 / Y 400 V or Δ 400 V

50 Hz

Type	Power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	$I_d / I_n$	$C_d / C_n$	$C_m / C_n$	Apparent power	Moment of inertia	Weight
	kW	min <sup>-1</sup>	N.m	A	100%	100%				kVA	kg.m <sup>2</sup>	kg
FLSPX 80 L	0.75	2840	2.5	1.6	0.86	76.9	5.9	2.4	2.2	1.1	0.0007	15
FLSPX 80 L	1.1	2837	3.7	2.4	0.84	79.5	5.6	2.7	2.4	1.6	0.0009	18
FLSPX 90 S	1.5	2870	5	3.3	0.81	82	7.3	3	3.1	2.3	0.0014	21
FLSPX 90 L	2.2	2862	7.5	4.3	0.88	84.5	8.1	3.7	3.5	3	0.0021	26
FLSPX 100 LK	3	2925	10	5.5	0.91	86	8.4	2.4	3	3.8	0.0069	42
FLSPX 112 M	4	2940	13.6	7.5	0.89	86.5	8.7	2.9	3.3	5.2	0.0084	48
FLSPX 132 S	5.5	2940	18.7	10.6	0.86	87	7.6	2.3	2.9	7.4	0.0168	67
FLSPX 132 S	7.5	2950	25	14.1	0.87	88	8.9	2.6	3.4	9.8	0.0236	70
FLSPX 160 MA	11	2935	35.8	20	0.88	88.4	8.6	2.8	3.2	14.1	0.037	97
FLSPX 160 MB	15	2935	48.8	27	0.88	89.7	8.6	2.8	3.2	19	0.043	108
FLSPX 160 L	18.5	2940	60	33	0.90	90.8	8.4	2.7	3.1	22.6	0.057	126
FLSPX 180 MR	22	2940	71	39	0.89	91	8.5	2.8	3.1	27.2	0.065	135
FLSPX 200 LA	30	2950	97	51	0.91	92.4	7.7	2.4	2.8	35.7	0.13	245
FLSPX 200 LB	37	2959	120	63	0.9	93.5	8.3	3	3.4	44.4	0.16	265
FLSPX 225 MT	45	2958	145	78	0.89	93.8	8.3	2.8	3.2	54	0.19	290
FLSPX 250 M	55	2966	177	94	0.89	94.6	7.9	2.5	3.5	65	0.44	405
FLSPX 280 S	75	2965	241	127	0.90	94.6	8	2.7	3.8	88	0.47	505
FLSPX 280 M	90	2962	290	149	0.91	95.5	7.7	2.6	3.7	104	0.53	560
FLSPX 315 ST	110	2975	356	178	0.93	95.8	8.2	2.8	3.3	123	1.08	850
FLSPX 315 M	132	2962	427	221	0.90	96	7.5	1.8	2.7	153	1.71	1000
FLSPX 315 LA	160	2969	517	272	0.89	95.5	7.5	2	3	188	1.71	1050
FLSPX 315 LB	200	2967	647	342	0.88	96	7.7	2.3	3.4	237	1.99	1150
FLSPX 355 LA	250	2978	808	424	0.89	95.6	7.2	2.1	2.6	294	3.39	1400
FLSPX 355 LB	275	2980	881	464	0.89	96.2	8.4	2.3	2.9	322	3.39	1500
FLSPX 355 LB •	315	2976	1016	525	0.90	96.2	7.2	1.8	2.5	364	3.39	1500
FLSPX 355 LC	330	2980	1057	560	0.88	96.6	7.9	1.9	2.6	388	3.39	1915
FLSPX 355 LC	355	2979	1137	588	0.90	96.8	8.2	2.3	3.1	407	4.03	1915
FLSPX 355 LD •	400	2977	1284	673	0.89	96.4	7.8	2	2.7	466	4.03	1915

● Class F temperature rise

Δ 400 V mains supply only.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

### C2 - Selection

CATEGORY 2  
ZONE 21

4  
poles  
1500 min<sup>-1</sup>

IP 65  
S1  
CI F insulation



II 2D T 125 °C

C

#### MAINS SUPPLY Δ 230 / Y 400 V or Δ 400 V

50 Hz

Type	Power at 50 Hz kW	Rated speed min <sup>-1</sup>	Rated torque N.m	Rated current A	Power factor 100%	Efficiency 100%	$I_d / I_n$	$C_d / C_n$	$C_m / C_n$	Apparent power kVA	Moment of inertia kg.m <sup>2</sup>	Weight kg
FLSPX 80 L	0.55	1410	3.7	1.6	0.74	69.2	4.4	2.1	2.3	1.1	0.0013	15
FLSPX 80 L	0.75	1425	5	2	0.75	72.5	5.7	3	2.8	1.4	0.0024	17
FLSPX 90 S	1.1	1429	7.5	2.5	0.83	78	4.9	1.6	2	1.7	0.0026	19
FLSPX 90 L	1.5	1428	10	3.3	0.82	79.5	5.3	1.8	2.3	2.3	0.0032	21
FLSPX 90 L	1.8	1438	12.3	4	0.82	80.1	5.9	2.1	3.2	2.7	0.0037	23
FLSPX 100 LK	2.2	1457	15	4.6	0.83	83.8	6.3	1.9	2.4	3.2	0.0077	41
FLSPX 100 LK	3	1454	20	6.2	0.82	84.7	6.5	2.1	2.6	4.3	0.0094	44
FLSPX 112 M	4	1462	27.5	8.4	0.81	85.1	7.4	2.5	2.9	5.8	0.012	48
FLSPX 132 S	5.5	1467	37	10.9	0.84	87	8	2.7	3.7	7.7	0.0154	65
FLSPX 132 M	7.5	1450	50	14.3	0.87	87	7.3	1.9	2.9	10.5	0.0192	70
FLSPX 132 M	9	1449	61	16.8	0.88	87.7	7.6	2.8	2.9	11.6	0.023	75
FLSPX 160 M	11	1455	72.2	21	0.86	88.5	7.8	2.6	3.3	15	0.06	103
FLSPX 160 L	15	1455	98.5	28	0.86	89.5	7.8	2.6	3.3	20	0.079	120
FLSPX 180 MR	18.5	1465	120.5	35	0.86	90	7.8	2.6	3.3	24	0.095	135
FLSPX 180 L	22	1465	143	41	0.86	91.4	7.4	2.6	2.4	28	0.137	184
FLSPX 200 L	30	1471	195	56	0.85	91.9	6.5	2.5	2.3	39	0.24	260
FLSPX 225 ST	37	1476	240	70	0.82	93.6	7	2.6	2.4	49	0.28	290
FLSPX 225 M	45	1483	290	79	0.87	94.5	7	2.5	2.6	55	0.7	388
FLSPX 250 M	55	1479	355	101	0.84	94.5	6.5	2.4	2.5	70	0.7	395
FLSPX 280 S	75	1483	484	137	0.84	94.9	7.7	2.9	3	95	0.815	475
FLSPX 280 M	90	1478	581	162	0.85	95	7.6	3	3.1	112	1.015	565
FLSPX 315 ST	110	1482	710	203	0.83	94.8	7.3	2.9	2.7	141	1.83	850
FLSPX 315 M	132	1489	850	249	0.81	95	8	2.8	2.6	172	2.91	1000
FLSPX 315 LA	160	1486	1032	285	0.85	95.8	7.5	2.2	2.4	198	3.4	1050
FLSPX 315 LB •	200	1487	1291	369	0.82	96	8	2.2	2.3	255	3.4	1150
FLSPX 355 LA	250	1487	1611	427	0.88	96.5	7.4	1.7	2.3	296	6.2	1510
FLSPX 355 LB	300	1489	1930	520	0.87	96.3	6.5	1.6	1.6	360	6.2	1550
FLSPX 355 LC	315	1490	2019	557	0.85	96.5	7.4	2.2	2.2	386	6.5	1800
FLSPX 355 LC	355	1489	2279	619	0.86	96.8	6.6	1.9	1.9	429	6.5	1800
FLSPX 355 LD	400	1489	2564	689	0.87	96.8	7.4	2.1	2.1	477	7.4	1930

● Class F temperature rise

For power ratings above 400 kW, please consult Leroy-Somer.

Δ 400 V mains supply only.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

### C2 - Selection

CATEGORY 2  
ZONE 21

**6 poles**  
 $1000 \text{ min}^{-1}$

IP 65  
S1  
CI F insulation



II 2D T 125 °C

MAINS SUPPLY  $\Delta 230 / Y 400 \text{ V}$  or  $\Delta 400 \text{ V}$

50 Hz

Type	Power at 50 Hz kW	Rated speed $\text{min}^{-1}$	Rated torque N.m	Rated current A	Power factor 100%	Efficiency 100%	$I_d / I_n$	$C_d / C_n$	$C_m / C_n$	Apparent power kVA	Moment of inertia $\text{kg.m}^2$	Weight kg
FLSPX 80 L	0.25	950	2.5	0.8	0.74	60.3	3.6	2	1.9	0.6	0.0024	14
FLSPX 80 L	0.37	940	3.7	1.2	0.74	61	3.8	1.9	2.1	0.8	0.0032	15
FLSPX 80 L	0.55	955	5.5	1.8	0.67	65	4.4	2.5	2.6	1.3	0.0042	16
FLSPX 90 S	0.75	940	7.5	2.1	0.8	65.2	3.5	2	2.2	1.4	0.0039	21
FLSPX 90 L	1.1	940	11	2.7	0.81	73.5	4.8	1.8	2.2	1.8	0.0048	23
FLSPX 100 LK	1.5	955	15	3.5	0.78	78.3	6.3	2.2	2.8	2.5	0.0134	41
FLSPX 112 M	2.2	960	22	5.2	0.77	80	5.5	2.3	2.4	3.6	0.015	45
FLSPX 132 S	3	953	30	6.9	0.76	81.9	5.3	2.2	2.4	4.7	0.0376	71
FLSPX 132 M	4	970	40	9	0.78	82.1	6.7	2.8	2.7	6.2	0.0517	76
FLSPX 132 MU	5.5	970	54	12.2	0.79	82.1	7.1	3.2	2.7	8.5	0.0595	88
FLSPX 160 M	7.5	968	74	16	0.80	86	5	1.5	2.4	11	0.085	100
FLSPX 160 L	11	966	109	23	0.81	87	5	1.5	2.4	16	0.12	128
FLSPX 180 L	15	974	147	30	0.82	89.5	7.1	2.1	3.1	21	0.2	170
FLSPX 200 LA	18.5	975	181	36	0.83	90.7	7	2.2	3.3	25	0.29	240
FLSPX 200 LB	22	973	216	43	0.81	91.5	7	2.2	3.3	30	0.31	260
FLSPX 225 M	30	978	293	59	0.80	92	6	2	2.4	41	0.94	392
FLSPX 250 M	37	977	362	73	0.80	92.5	6.2	2.2	2.6	50	0.94	394
FLSPX 280 S	45	971	440	84	0.84	93	6	1.9	2.3	58	1.13	455
FLSPX 280 M	55	977	538	109	0.79	93	6.9	2.8	3.3	75	1.26	532
FLSPX 315 ST	75	987	731	133	0.86	94.8	6.5	2.3	2.1	92	1.8	850
FLSPX 315 M	90	987	875	161	0.85	95.6	6.7	1.7	1.5	111	2.6	1000
FLSPX 315 LA	110	983	1067	199	0.85	94.5	6	1.5	1.3	138	2.6	1050
FLSPX 315 LB	132	988	1280	241	0.83	95.9	7.4	2	1.8	167	3.5	1125
FLSPX 315 LB	150	986	1454	277	0.82	95.8	6.6	1.5	2.5	192	3.5	1125
FLSPX 355 LA	185	987	1783	346	0.81	95.8	7.5	2	3.3	240	5.4	1415
FLSPX 355 LB	220	988	2129	412	0.81	95.6	7.4	1.9	3.1	286	6.3	1535
FLSPX 355 LD	250	993	2406	459	0.82	95.8	7.8	2.1	2.3	317	8.6	1935
FLSPX 355 LD	300	992	2885	558	0.82	95.2	6.8	1.65	1.8	386	8.6	1935

For power ratings above 300 kW, please consult Leroy-Somer.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

CATEGORY 2  
ZONE 21

## C2 - Selection

8  
poles  
 $750 \text{ min}^{-1}$

IP 65  
S1  
CI F insulation



II 2D T 125 °C

C

### MAINS SUPPLY $\Delta 230 / Y 400 \text{ V}$ or $\Delta 400 \text{ V}$

50 Hz

Type	Power at 50 Hz kW	Rated speed $\text{min}^{-1}$	Rated torque N.m	Rated current A	Power factor 100%	Efficiency 100%	$I_d / I_n$	$C_d / C_n$	$C_m / C_n$	Apparent power kVA	Moment of inertia $\text{kg.m}^2$	Weight kg
FLSPX 80 L	0.18	710	2.5	0.8	0.64	52.3	3	1.6	1.6	0.5	0.0031	14
FLSPX 80 L	0.25	720	3.4	1.1	0.6	54.5	3.2	2	2.3	0.8	0.0041	16
FLSPX 90 S	0.37	685	5	1.2	0.71	64	3.5	1.7	1.7	0.9	0.0038	21
FLSPX 90 L	0.55	695	7.5	1.7	0.72	63	3.3	1.8	1.8	1.2	0.0047	23
FLSPX 100 LK	0.75	720	10	2.3	0.68	70.9	4.1	1.9	1.9	1.6	0.0085	41
FLSPX 100 LK	1.1	720	15	3.8	0.62	68	4.1	1.8	2.3	2.6	0.0117	43
FLSPX 112 M	1.5	725	20	4.8	0.63	72.5	4	2.1	2.2	3.3	0.015	45
FLSPX 132 S	2.2	715	30	7.2	0.6	74	3.2	1.4	1.8	5	0.0253	71
FLSPX 132 M	3	705	40	9.1	0.63	76	3.1	1.3	1.9	6.3	0.0334	81
FLSPX 160 MA	4	710	54	11.3	0.63	81.5	3.8	1.4	1.7	7.8	0.062	105
FLSPX 160 MB	5.5	710	74	15	0.65	82	3.8	1.4	1.7	10.4	0.071	111
FLSPX 160 L	7.5	715	100	20	0.65	83	3.8	1.5	1.8	14	0.086	128
FLSPX 180 L	11	724	147	27	0.7	85.1	3.9	1.4	1.7	19	0.21	175
FLSPX 200 L	15	729	196	34	0.72	88.1	5	1.8	2.6	24	0.32	265
FLSPX 225 ST	18.5	727	242	41	0.73	89	5	1.6	2.3	29	0.38	285
FLSPX 225 M	22	732	288	48	0.72	92.1	5.9	1.8	2.5	33	0.83	388
FLSPX 250 M	30	729	393	61	0.78	91.2	6.2	1.8	2.5	42	0.83	393
FLSPX 280 S	37	723	487	75	0.78	92	4.5	1.3	1.8	52	1.4	472
FLSPX 280 M	45	730	592	102	0.7	91.7	6	2.3	3.2	70	1.75	563
FLSPX 315 ST	55	738	715	102	0.83	94.2	7.4	2.1	3	71	2.7	850
FLSPX 315 M	75	743	972	147	0.78	94.8	7.4	2	2.2	102	3.1	1000
FLSPX 315 LA	90	742	1169	177	0.78	94.7	6.7	1.9	2.1	122	4.2	1030
FLSPX 315 LB	110	742	1420	222	0.76	94.8	7.2	2	2.2	153	5.1	1125
FLSPX 355 LA	132	741	1704	258	0.78	95.3	6.7	2	2.2	179	5.5	1415
FLSPX 355 LB	160	741	2065	312	0.78	95.3	6.9	2	2.2	216	6	1535
FLSPX 355 LD	200	741	2581	364	0.84	95	6.7	1.6	1.7	252	6.5	1935

For power ratings above 200 kW, please consult Leroy-Somer.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

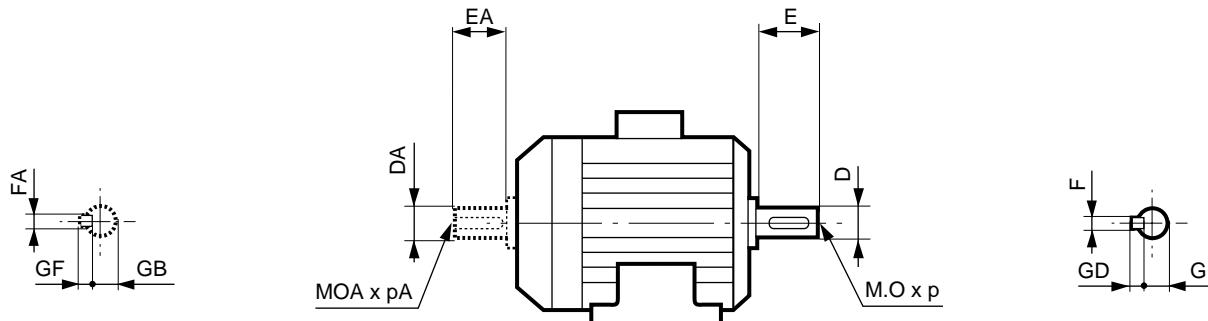
CATEGORY 2  
ZONE 21

## C3 - Dimensions

### Dimensions of FLSPX 3-phase motors Cage rotor

Dimensions in millimetres

#### – Shaft extensions



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

Type	Secondary shaft extensions													
	4, 6 and 8 poles				2 poles									
Type	FA	GF	DA	GB	EA	OA	pA	FA	GF	DA	GB	EA	OA	pA
FLSPX 80 L	5	5	14j6	11	30	5	15	5	5	14j6	11	30	5	15
FLSPX 90 S/L	6	6	19j6	15.5	40	6	16	6	6	19j6	15.5	40	6	16
FLSPX 100 LK	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
FLSPX 112 M	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
FLSPX 132 S/M/MMR	8	7	28j6	24	60	10	22	8	7	28j6	24	60	10	22
FLSPX 160 M/L	12	8	42k6	37	110	16	36	12	8	42k6	37	110	16	36
FLSPX 180 MR/L	14	9	48k6	42.5	110	16	36	14	9	48k6	42.5	110	16	36
FLSPX 200 L	16	10	55m6	49	110	20	42	16	10	55m6	49	110	20	42
FLSPX 225 ST/MT/M	18	11	60m6	53	140	20	42	16	10	55m6	49	110	20	42
FLSPX 250 M	18	11	65m6	58	140	20	42	18	11	60m6	53	140	20	42
FLSPX 280 S/M	20	12	75m6	67.5	140	20	42	18	11	65m6	58	140	20	42
FLSPX 315 ST	22	14	80m6	71	170	20	42	18	11	65m6	58	140	20	42
FLSPX 315 M	22	14	80m6	71	170	20	42	18	11	65m6	58	140	20	42
FLSPX 315 L	25	14	90m6	81	170	24	50	20	12	70m6	62.5	140	20	42
FLSPX 355 L/K	28	16	100m6	90	210	24	50	22	14	80m6	71	170	20	42



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

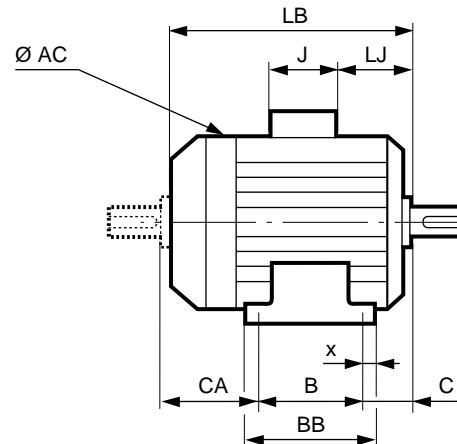
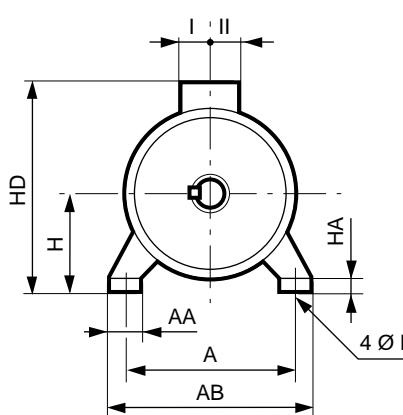
CATEGORY 2  
ZONE 21

## C3 - Dimensions

Dimensions of FLSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot mounted IM B3 (IM 1001)



C

Type	Main dimensions																	
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	CA
FLSPX 80 L	125	157	100	130	50	20	32	9	10	80	160	230	214	27	126	63	63	68
FLSPX 90 S	140	172	100	160	56	22	34	10	11	90	185	250	243	22	126	63	63	93
FLSPX 90 L	140	172	125	160	56	22	34	10	11	90	185	250	243	22	126	63	63	68
FLSPX 100 LK	160	200	140	174	63	22	42	12	12	100	226	293	323	37	150	75	75	125
FLSPX 112 M	190	230	140	174	70	22	45	12	12	112	226	305	323	37	150	75	75	119
FLSPX 112 MR	190	230	140	174	70	22	45	12	12	112	226	305	344	37	150	75	75	142
FLSPX 132 S	216	255	140	223	89	31	58	12	15	132	264	345	387	28	150	75	75	164
FLSPX 132 M	216	255	178	223	89	31	58	12	15	132	264	345	387	28	150	75	75	126
FLSPX 132 MR	216	255	178	223	89	31	58	12	15	132	264	345	410	28	150	75	75	149
FLSPX 160 M	254	294	210	294	108	20	65	14	24	160	310	440	495	50	220	128	128	182
FLSPX 160 L	254	294	254	294	108	20	65	14	24	160	310	440	495	50	220	128	128	138
FLSPX 180 MR	279	324	241	295	121	25	80	14	28	180	310	460	515	50	220	128	128	158
FLSPX 180 L	279	330	279	335	121	25	68	14	40	180	350	460	555	55	220	128	128	160
FLSPX 200 L	318	374	305	361	133	28	80	18	50	200	394	515	681	65	220	128	128	248
FLSPX 225 ST	356	420	286	367	149	28	100	18	35	225	394	540	681	65	220	128	128	251
FLSPX 225 MT	356	420	311	367	149	28	100	18	35	225	394	540	681	65	220	128	128	226
FLSPX 225 M	356	426	311	375	149	32	80	18	27	225	540	656	780	70	352	173	210	326
FLSPX 250 M	406	476	349	413	168	32	80	22	27	250	540	681	780	70	352	173	210	269
FLSPX 280 S	457	527	368	432	190	32	80	22	27	280	540	711	860	70	352	173	210	302
FLSPX 280 M	457	537	419	483	190	32	80	22	27	280	540	711	960	70	352	173	210	357
FLSPX 315 ST	508	598	406	547	216	45	90	27	45	315	556	755	1068	107	274	140	240	452
FLSPX 315 M	508	600	457	598	216	45	100	27	45	315	624	822	1203	119	354	180	330	536
FLSPX 315 L	508	600	508	598	216	45	100	27	45	315	624	822	1203	119	354	180	330	485
FLSPX 355 LA/LB	610	710	630	710	254	40	110	27	35	355	700	900	1305	110	354	180	330	427
FLSPX 355 LC/LD	610	710	630	710	254	40	110	27	35	355	700	900	1430	110	354	180	330	552



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

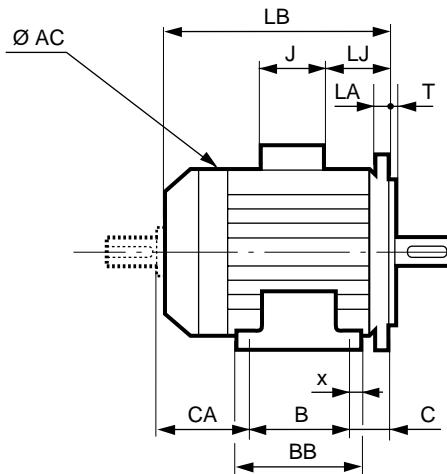
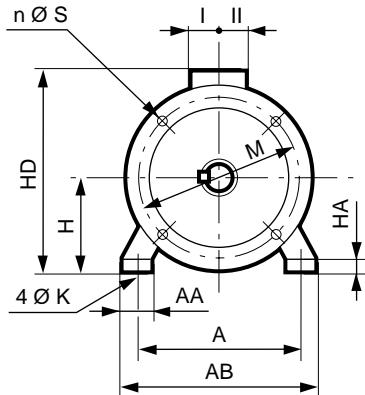
CATEGORY 2  
ZONE 21

## C3 - Dimensions

Dimensions of FLSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot and flange mounted 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.
FLSPX 80 L	125	157	100	130	50	20	32	9	10	80	160	230	214	27	126	63	63	FF 165
FLSPX 90 S	140	172	100	160	76	22	34	10	11	90	185	250	263	42	126	63	63	FF 165
FLSPX 90 L	140	172	125	160	76	22	34	10	11	90	185	250	263	42	126	63	63	FF 165
FLSPX 100 LK	160	200	140	174	63	22	42	12	12	100	226	293	323	37	150	75	75	FF 215
FLSPX 112 M	190	230	140	174	70	22	45	12	12	112	226	305	323	37	150	75	75	FF 215
FLSPX 112 MR	190	230	140	174	70	22	45	12	12	112	226	305	344	37	150	75	75	FF 215
FLSPX 132 S	216	255	140	223	89	31	58	12	15	132	264	345	387	28	150	75	75	FF 265
FLSPX 132 M	216	255	178	223	89	31	58	12	15	132	264	345	387	28	150	75	75	FF 265
FLSPX 132 MR	216	255	178	223	89	31	58	12	15	132	264	345	410	28	150	75	75	FF 265
FLSPX 160 M	254	294	210	294	108	20	65	14	24	160	310	440	495	50	220	128	128	FF 300
FLSPX 160 L	254	294	254	294	108	20	65	14	24	160	310	440	495	50	220	128	128	FF 300
FLSPX 180 MR	279	324	241	295	121	25	80	14	28	180	310	460	515	50	220	128	128	FF 300
FLSPX 180 L	279	330	279	335	121	25	68	14	40	180	350	460	555	55	220	128	128	FF 300
FLSPX 200 L	318	374	305	361	133	28	80	18	50	200	394	515	681	65	220	128	128	FF 350
FLSPX 225 ST	356	420	286	367	149	28	100	18	35	225	394	540	681	65	220	128	128	FF 400
FLSPX 225 MT	356	420	311	367	149	28	100	18	35	225	394	540	681	65	220	128	128	FF 400
FLSPX 225 M	356	426	311	375	149	32	80	18	27	225	540	656	780	70	352	173	210	FF 400
FLSPX 250 M	406	476	349	413	168	32	80	22	27	250	540	681	780	70	352	173	210	FF 500
FLSPX 280 S	457	527	368	432	190	32	80	22	27	280	540	711	860	70	352	173	210	FF 500
FLSPX 280 M	457	527	419	483	190	32	80	22	27	280	540	711	960	70	352	173	210	FF 500
FLSPX 315 ST	508	598	406	547	216	45	90	27	45	315	556	755	1068	107	274	140	240	FF 600
FLSPX 315 M	508	600	457	598	216	45	100	27	45	315	624	822	1203	119	354	180	330	FF 600
FLSPX 315 L	508	600	508	598	216	45	100	27	45	315	624	822	1203	119	354	180	330	FF 600
FLSPX 355 LA/LB	610	710	630	710	254	40	110	27	35	355	700	900	1305	110	354	180	330	FF 740
FLSPX 355 LC/LD	610	710	630	710	254	40	110	27	35	355	700	900	1430	110	354	180	330	FF 740

Dimensions of CA and shaft extensions: see pages 28 and 29.



# 3-phase TEFV induction motors Potentially explosive dusty atmospheres FLSPX

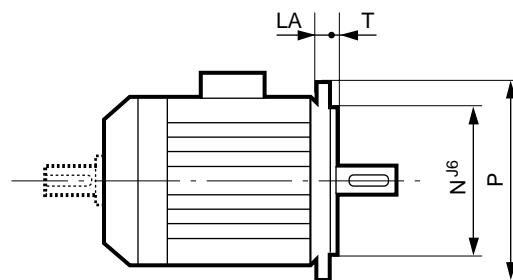
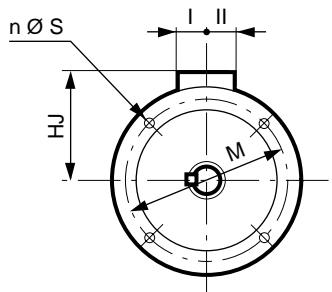
CATEGORY 2  
ZONE 21

## C3 - Dimensions

Dimensions of FLSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

– Flange mounted 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 215	215	180	250	4	4	15	12
FF 265	265	230	300	4	4	15	14
FF 300	300	250	350	5	4	18	15
FF 350	350	300	400	5	4	18	15
FF 400	400	350	450	5	8	18	16
FF 500	500	450	550	5	8	18	18*
FF 600	600	550	660	6	8	22	25
FF 740	740	680	800	6	8	22	25

Flange mounted motors FF, in position IM 3001 (IM B5), are only available up to frame size 225.

Dimensions of shaft extensions: see page 28.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

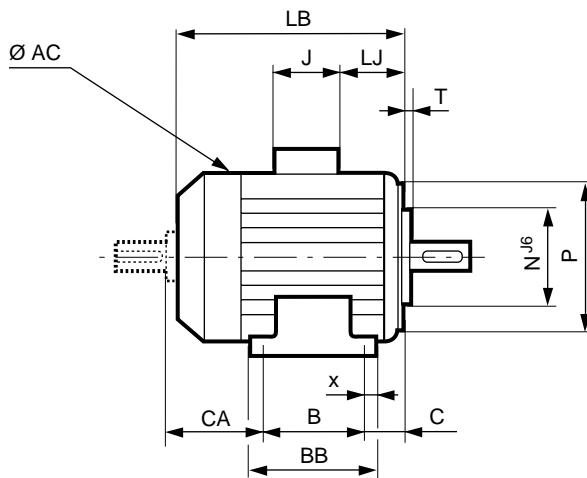
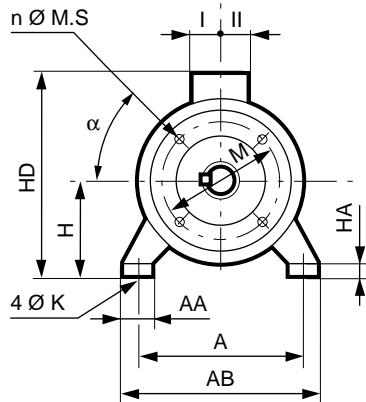
CATEGORY 2  
ZONE 21

## C3 - Dimensions

Dimensions of FLSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot and face mounted IM B34 (IM 2101)



Type	Main dimensions																
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	II	Sym.
FLSPX 80 L	125	157	100	130	50	20	32	9	10	80	160	230	214	27	126	63	63 FT 100
FLSPX 90 S	140	172	100	160	56	22	34	10	11	90	185	250	243	22	126	63	63 FT 115
FLSPX 90 L	140	172	125	160	56	22	34	10	11	90	185	250	243	22	126	63	63 FT 115
FLSPX 100 LK	160	200	140	174	63	22	42	12	12	100	226	293	323	37	150	75	75 FT 130
FLSPX 112 M	190	230	140	174	70	22	45	12	12	112	226	305	323	37	150	75	75 FT 130
FLSPX 112 MR	190	230	140	174	70	22	45	12	12	112	226	305	344	37	150	75	75 FT 130
FLSPX 132 S	216	255	140	223	89	31	58	12	15	132	264	345	387	28	150	75	75 FT 215
FLSPX 132 M	216	255	178	223	89	31	58	12	15	132	264	345	387	28	150	75	75 FT 215
FLSPX 132 MR	216	255	178	223	89	31	58	12	15	132	264	345	410	28	150	75	75 FT 215

Dimensions of CA and shaft extensions: see pages 28 and 29.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

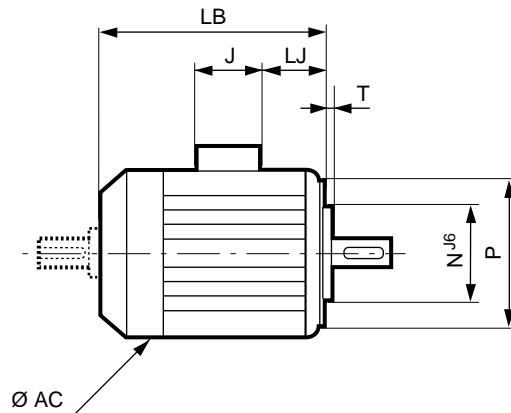
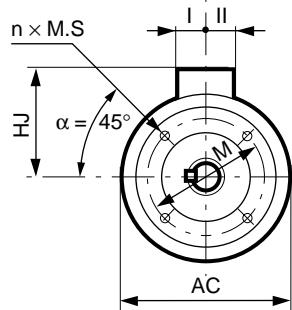
CATEGORY 2  
ZONE 21

## C3 - Dimensions

Dimensions of FLSPX 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Face mounted IM B14 (IM 3601)



Faceplate dimensions						
IEC symbol	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

Main dimensions							
Type	AC	LB	HJ	LJ	J	I	II
FLSPX 80 L	160	214	150	27	126	63	63
FLSPX 90 S	185	243	160	22	126	63	63
FLSPX 90 L	185	243	160	22	126	63	63
FLSPX 100 LK	226	323	193	37	150	75	75
FLSPX 112 M	226	323	193	37	150	75	75
FLSPX 112 MR	226	344	193	37	150	75	75
FLSPX 132 S	264	387	213	28	150	75	75
FLSPX 132 M	264	387	213	28	150	75	75
FLSPX 132 MR	264	410	213	28	150	75	75

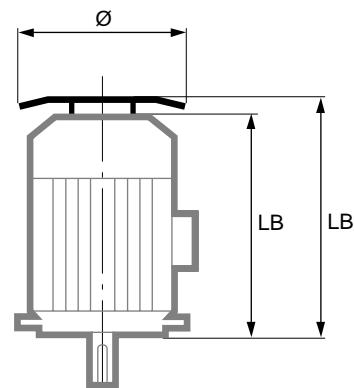
Dimensions of shaft extensions: see page 28.

## Drip covers

Dimensions in millimetres

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

Frame size	LB'	Ø
80	LB + 20	145
90 and 100	LB + 20	185
112 M	LB + 20	185
112 MR	LB + 25	210
132	LB + 30	240
160 and 180 MR	LB + 60	320
180 L	LB + 60	360
200 L	LB + 75	400
225 ST/MT	LB + 75	400
225 M and 250 M	LB + 130	420
280 and 315	LB + 130	420
355 L	LB + 135	500





# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLSPX

CATEGORY 2  
ZONE 21

## C3 - Dimensions

– Cable gland for rated supply voltage of 400 V

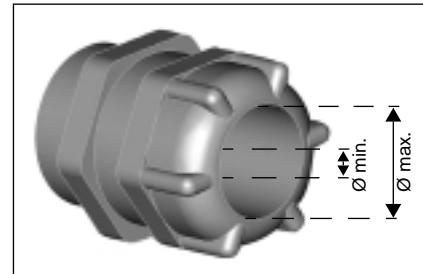
Frame size	Single-speed motor		Cable gland for PTO / PTF / ... accessories
	D.O.L. starting	UD starting	
80	CMDEL ISO M20 × 1.5	–	CMDEL ISO M16 × 1.5
90	CMDEL ISO M20 × 1.5	–	CMDEL ISO M16 × 1.5
100 LK	CMDEL ISO M20 × 1.5	2 × CMDEL ISO 20	CMDEL ISO M16 × 1.5
112	CMDEL ISO M20 × 1.5	2 × CMDEL ISO 20	CMDEL ISO M16 × 1.5
132	CMDEL ISO M20 × 1.5	2 × CMDEL ISO 20	CMDEL ISO M16 × 1.5
160 / 180 MR	2 × CMDEL ISO M25 × 1.5	2 × CMDEL ISO 25	CMDEL ISO M16 × 1.5
180	2 × CMDEL ISO M32 × 1.5	2 × CMDEL ISO 25	CMDEL ISO M16 × 1.5
200	2 × CMDEL ISO M32 × 1.5	2 × CMDEL ISO 30	CMDEL ISO M16 × 1.5
225	2 × CMDEL ISO M40 × 1.5	2 × CMDEL ISO 30	CMDEL ISO M16 × 1.5
250	2 × CMDEL ISO M40 × 1.5	2 × CMDEL ISO 40	CMDEL ISO M16 × 1.5
280 to 315	2 × CMDEL ISO M50 × 1.5	2 × CMDEL ISO 40	CMDEL ISO M16 × 1.5
355 LA to LD	1 × CMA 3" GC	2 × CMA 3" GC	CMDEL ISO M16 × 1.5

CMDEL : cable anchor gland.

: cable gland made of brass.

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

Type of cable gland	Tightening capacity		drill hole Ø	No thread
	min. cable Ø (mm)	max. cable Ø (mm)		
CMDEL ISO M16 · 1.5	6	11	16	1.5
CMDEL ISO M20 · 1.5	7.5	13	20	1.5
CMDEL ISO M25 · 1.5	12.5	18	25	1.5
CMDEL ISO M32 · 1.5	17.5	25	32	1.5
CMDEL ISO M40 · 1.5	24.5	33.5	40	1.5
CMDEL ISO M50 · 1.5	33	43	50	1.5
CMDEL ISO M63 · 1.5	42.5	55	63	1.5
CMA 3" GC	40	62	3"	2.30





# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

CATEGORY 3  
ZONE 22  
Non-conductive dust

## D1 - General



- **3-phase TEFV induction motors, LS series, conforming to IEC 34, 72, EN 50281**
- Single speed: power **0.09 to 160 kW**, frame size 56 to 315 mm, 2, 4, 6, 8-pole; 230/400 V or 400 V  $\Delta$ , 50 Hz.
- Two-speed: (on request) power 0.09 to 160 kW, frame size 80 to 315 mm with 2/4, 4/6, 4/8, 6/8, 6/12 poles for general or centrifugal applications, PAM or Dahlander; 400 V Y or  $\Delta$ , 50 Hz.

- Protection **IP55**

- **Motors for variable speed operation**
- fitted with thermal probes on the windings (essential)
- on consultation (to be selected), see p. 60.

**Finish: aluminium housing**  
Assembled using protected fixing accessories.  
RAL 6000 (green) paint finish.  
Shaft end and flange protected against atmospheric corrosion.  
Individual anti-shock packaging.

#### A.C. supply

- Standard construction in accordance with IEC 38 ie:
  - 230/400 V + 10 % - 10 % at 50 Hz
  - 400 V  $\Delta$  + 10 % - 10 % at 50 Hz

## Description of LS aluminium 3-phase motors dust option



**II 3D T 125 °C**

D

Component	Materials	Remarks
Housing with cooling fins	Aluminium alloy	<ul style="list-style-type: none"> <li>- with integral or screw-on feet, or without feet</li> <li>- die-cast for frame size <math>\leq 180</math></li> <li>- gravity die-cast for frame size <math>\geq 200</math> <ul style="list-style-type: none"> <li>• 4 or 6 fixing holes for housings with feet</li> <li>• lifting rings for frame size <math>\geq 160</math>, optional for 132 and 112</li> </ul> </li> <li>- earth terminal (optional)</li> </ul>
Stator	Insulated low-carbon magnetic steel laminations Electroplated copper	<ul style="list-style-type: none"> <li>- low carbon content guarantees long-term lamination pack stability</li> <li>- welded packs</li> <li>- semi-enclosed slots</li> <li>- class F insulation</li> </ul>
Rotor	Insulated low-carbon magnetic steel laminations Aluminium (A5L)	<ul style="list-style-type: none"> <li>- inclined cage bars</li> <li>- rotor cage pressure die-cast in aluminium (or alloy for special applications)</li> <li>- shrink-fitted to shaft</li> <li>- rotor balanced dynamically, class N - 1/2 key</li> </ul>
Shaft	Steel	<ul style="list-style-type: none"> <li>- for frame size <math>&lt; 132</math>:           <ul style="list-style-type: none"> <li>• shaft end fitted with screw and washer</li> <li>• captive drive key with rounded ends - for frame size <math>\geq 132</math>:               <ul style="list-style-type: none"> <li>• tapped hole</li> <li>• open keyway</li> </ul> </li> </ul> </li> </ul>
End shields	Aluminium alloy	<ul style="list-style-type: none"> <li>- LS 56 - 63 - 71 drive end and non drive end</li> <li>- LS 80 - 90 non drive end</li> </ul>
	Cast iron	<ul style="list-style-type: none"> <li>- LS 80 - 90 drive end (optional for LS 80 and 90 at non drive end)</li> <li>- LS 100 to 315 drive end and non drive end</li> </ul>
Bearings and lubrication		<ul style="list-style-type: none"> <li>- ball bearings</li> <li>- type ZZ "greased for life" up to and including frame size 180</li> <li>- semi-protected or open type for frame size 200</li> <li>- open type, regreasable from 225 upwards</li> <li>- NDE bearings preloaded</li> </ul>
Labyrinth seal Lipseals	Plastic or steel Synthetic rubber	<ul style="list-style-type: none"> <li>- lipseal or deflector at drive end for all flange mounted motors</li> <li>- lipseal, deflector or labyrinth seal for foot mounted motors</li> </ul>
Fan	Composite material or aluminium alloy	<ul style="list-style-type: none"> <li>- 2 directions of rotation: straight blades</li> <li>- 1 direction of rotation: angled blades (for frame size <math>\geq 315</math> with 2 poles)</li> </ul>
Fan cover	Composite material or pressed steel	<ul style="list-style-type: none"> <li>- fitted, on request, with a drip cover for operation in vertical position, shaft end facing down</li> </ul>
Terminal box	Composite material or aluminium alloy	<ul style="list-style-type: none"> <li>- <b>IP 55</b></li> <li>- can be turned, on the opposite side from the feet for frame size <math>\geq 80</math></li> <li>- fitted with a terminal block with 6 steel terminals as standard (brass as an option)</li> <li>- terminal box supplied <b>fitted with cable glands</b> (or without cable glands as an option)</li> </ul>
Paint		<ul style="list-style-type: none"> <li>- system Ia</li> <li>- resistance to saline mist: 72 hours (according to NFX 41002)</li> </ul>



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

### D2 - Selection

CATEGORY 3  
ZONE 22  
Non-conductive dust

2  
poles  
3000 min<sup>-1</sup>

IP 55  
S1  
CI F insulation



II 3D T 125 °C

Type	MAINS SUPPLY Δ 230 / Y 400 V or Δ 400 V											50 Hz	
	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current/Rated current	Starting torque/Rated torque	Max. torque/Rated torque	Rated apparent power	Moment of inertia		Weight
	P <sub>N</sub> kW	N <sub>N</sub> min <sup>-1</sup>	C <sub>N</sub> N.m	I <sub>N</sub> (400V) A	100%	100%	I <sub>D</sub> /I <sub>N</sub>	M <sub>D</sub> /M <sub>N</sub>	M <sub>M</sub> /M <sub>N</sub>	kVA <sub>N</sub>	J kg.m <sup>2</sup>	IM B3 kg	
LS 56 L	0.09	2860	0.3	0.44	0.55	54	4.9	5.5	5.6	0.30	0.00015	3.8	
LS 56 L	0.12	2820	0.4	0.50	0.60	58	4.6	4.1	4.2	0.34	0.00015	3.8	
LS 63 M	0.18	2790	0.6	0.52	0.75	67	5	3.4	3	0.36	0.00019	4.8	
LS 63 M	0.25	2800	0.8	0.71	0.75	68	5.4	3.4	3.1	0.49	0.00025	6	
LS 71 L	0.37	2800	1.3	0.98	0.80	68	5.2	3.2	3.8	0.68	0.00035	6.4	
LS 71 L	0.55	2800	1.9	1.32	0.80	75	6	3.2	3.1	0.92	0.00045	7.3	
LS 71 L	0.75	2780	2.5	1.70	0.85	75	6	3.4	3	1.18	0.00060	8.3	
LS 80 L	0.75	2840	2.5	1.64	0.87	76	5.9	2.4	2.2	1.13	0.00070	8.2	
LS 80 L	1.1	2837	3.7	2.4	0.84	78	5.8	2.7	2.4	1.7	0.00090	9.7	
LS 80 L	1.5	2859	5	3.2	0.83	80.3	7	3.2	2.8	2.2	0.0011	11.3	
LS 90 S	1.5	2870	5	3.4	0.81	79.6	8	3.9	4	2.3	0.0014	12	
LS 90 L	1.8	2865	6	3.6	0.86	83.1	8	3.6	3.6	2.5	0.0017	14	
LS 90 L	2.2	2862	7.4	4.3	0.88	83.6	7.7	3.7	3.3	3	0.0021	16	
LS 100 L	3	2868	10	6.3	0.81	83.9	7.5	3.8	3.9	4.3	0.0022	20	
LS 112 M	4	2877	13.5	7.9	0.85	86	7.8	2.9	2.9	5.5	0.0029	24.4	
LS 112 MG	5.5	2916	18.1	10.5	0.88	86.6	9	3.1	3.5	7.2	0.0076	33	
LS 132 S	5.5	2916	18.1	10.5	0.88	86.6	9	3.1	3.5	7.2	0.0076	34.4	
LS 132 S	7.5	2905	24.5	14.7	0.85	86.5	8.7	3.4	3.6	10.2	0.0088	39	
LS 132 M	9	2910	29.6	17.3	0.85	88.1	8.6	2.5	3.5	12	0.016	49	
LS 132 M	11	2944	36	20.7	0.86	89.4	7.5	2.7	3.4	14.3	0.018	54	
LS 160 MP	11	2944	36	20.7	0.86	89.4	7.5	2.7	3.4	14.3	0.019	62	
LS 160 MP	15	2935	48.8	28.4	0.85	90	8.1	3	3.5	19.7	0.023	72	
LS 160 L	18.5	2934	60.2	33.7	0.87	91	8	3	3.3	23.4	0.044	88	
LS 180 MT	22	2938	71.5	39.9	0.87	91.5	8.1	3.1	3.1	27.6	0.052	99	
LS 200 LT	30	2946	97.2	52.1	0.9	92.4	8.6	2.7	3.4	36.1	0.089	154	
LS 200 L	37	2950	120	64.6	0.89	92.9	7.4	2.6	3	44.8	0.120	180	
LS 225 MT	45	2950	146	77.4	0.9	93.3	7.5	2.8	3.1	53.6	0.140	200	
LS 250 MZ	55	2956	178	95.2	0.89	93.7	8.3	3.1	3.4	66	0.173	235	
LS 280 SC	75	2968	241	127	0.9	94.4	8.5	2.6	3.4	88.3	0.39	330	
LS 280 MC	90	2968	290	152	0.9	94.7	8.4	2.6	3.3	105.6	0.47	375	
LS 315 SP	110	2976	353	190	0.88	94.8	7.8	2.8	2.9	131.9	1.43	645	
LS 315 MP	132	2976	424	225	0.89	95	7.6	2.8	2.9	156.1	1.67	715	
LS 315 MR	160	2976	513	270	0.9	95.1	7.6	2.9	3.1	186.9	1.97	820	



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

### D2 - Selection

CATEGORY 3  
ZONE 22  
Non-conductive dust

4  
poles  
1500 min<sup>-1</sup>

IP 55  
S1  
CI F insulation



II 3D T 125 °C

MAINS SUPPLY Δ 230 / Y 400 V or Δ 400 V

50 Hz

Type	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current/Rated current	Starting torque/Rated torque	Max. torque/Rated torque	Rated apparent power	Moment of inertia	Weight
	P <sub>N</sub> kW	N <sub>N</sub> min <sup>-1</sup>	C <sub>N</sub> N.m	I <sub>N (400V)</sub> A	100%	100%	I <sub>D</sub> /I <sub>N</sub>	M <sub>D</sub> /M <sub>N</sub>	M <sub>M</sub> /M <sub>N</sub>	kVA <sub>N</sub>	J kg.m <sup>2</sup>	IM B3 kg
LS 56 L	0.09	1400	0.6	0.39	0.60	55	3.2	2.8	2.8	0.27	0.00025	4
LS 63 M	0.12	1380	0.8	0.44	0.70	56	3.2	2.5	2.4	0.31	0.00035	4.8
LS 63 M	0.18	1390	1.2	0.64	0.65	62	3.7	2.7	2.7	0.45	0.00048	5
LS 71 L	0.25	1425	1.7	0.80	0.65	69	4.6	2.7	2.9	0.56	0.00068	6.4
LS 71 L	0.37	1420	2.5	1.06	0.70	72	4.9	2.4	2.8	0.73	0.00085	7.3
LS 71 L	0.55	1400	3.8	1.62	0.70	70	4.8	2.3	2.5	1.12	0.0011	8.3
LS 80 L	0.55	1410	3.8	1.42	0.76	73.4	4.5	2	2.3	1	0.0013	8.2
LS 80 L	0.75	1400	5.1	2.01	0.77	70	4.5	2	2.2	1.4	0.0018	9.3
LS 80 L	0.9	1425	6	2.44	0.73	73	5.8	3	3	1.6	0.0024	10.9
LS 90 S	1.1	1429	7.4	2.5	0.84	76.8	4.8	1.6	2	1.7	0.0026	11.5
LS 90 L	1.5	1428	10	3.4	0.82	78.5	5.3	1.8	2.3	2.3	0.0032	13.5
LS 90 L	1.8	1438	12	4	0.82	80.1	6	2.1	3.2	2.7	0.0037	15.2
LS 100 L	2.2	1436	14.7	4.8	0.81	81	5.9	2.1	2.5	3.4	0.0043	20
LS 100 L	3	1437	20.1	6.5	0.81	82.6	6	2.5	2.8	4.5	0.0055	22.5
LS 112 M	4	1438	26.8	8.3	0.83	84.2	7.1	2.5	3	5.7	0.0067	24.9
LS 132 S	5.5	1447	36.7	11.1	0.83	85.7	6.3	2.4	2.8	7.7	0.014	36.5
LS 132 M	7.5	1451	49.4	15.2	0.82	87	7	2.4	2.9	10.5	0.019	54.7
LS 132 M	9	1455	59.3	18.1	0.82	87.7	6.9	2.2	3.1	12.5	0.023	59.9
LS 160 MP	11	1454	72.2	21	0.86	88.4	7.7	2.3	3.2	14.5	0.030	70
LS 160 LR	15	1453	98	28.8	0.84	89.4	7.5	2.9	3.6	20	0.036	86
LS 180 MT	18.5	1456	121	35.2	0.84	90.3	7.6	2.7	3.2	24.4	0.085	100
LS 180 LR	22	1456	144	41.7	0.84	90.7	7.9	3	3.3	28.9	0.096	112
LS 200 LT	30	1460	196	56.3	0.84	91.5	6.6	2.9	2.9	39	0.151	165
LS 225 ST	37	1468	241	68.7	0.84	92.5	6.3	2.7	2.6	47.6	0.24	205
LS 225 MR	45	1468	293	83.3	0.84	92.8	6.3	2.7	2.6	57.7	0.29	235
LS 250 ME	55	1478	355	101	0.84	93.6	7	2.7	2.8	70	0.63	320
LS 280 SC	75	1478	485	137	0.84	94.2	7.2	2.8	2.9	94.8	0.83	380
LS 280 MD	90	1478	581	164	0.84	94.4	7.6	3	3	113.5	1.03	450
LS 315 SP	110	1484	708	197	0.85	94.8	7	2.7	2.7	136.5	2.32	670
LS 315 MP	132	1484	849	236	0.85	95	7.6	2.9	3	163.5	2.79	750
LS 315 MR	160	1484	1030	286	0.85	95	7.7	2.9	3	198.1	3.27	845



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

### D2 - Selection

CATEGORY 3  
ZONE 22  
Non-conductive dust

**6 poles**  
 $1000 \text{ min}^{-1}$

**IP 55**  
**S1**  
**CI F insulation**



**II 3D T 125 °C**

Type	MAINS SUPPLY $\Delta$ 230 / Y 400 V or $\Delta$ 400 V										50 Hz	
	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current/Rated current	Starting torque/Rated torque	Max. torque/Rated torque	Rated apparent power	Moment of inertia	Weight
	$P_N$ kW	$N_N$ $\text{min}^{-1}$	$C_N$ N.m	$I_N$ (400V) A	100%	100%	$I_D/I_N$	$M_D/M_N$	$M_M/M_N$	kVA <sub>N</sub>	J kg.m <sup>2</sup>	IM B3 kg
LS 63 M	0.09	860	0.9	0.46	0.80	35	2.1	1.8	1.8	0.32	0.0006	5.5
LS 71 L	0.12	920	1.3	0.64	0.55	49	2.9	2.5	2.6	0.45	0.0007	6.5
LS 71 L	0.18	895	1.8	0.81	0.62	52	2.7	1.9	2	0.56	0.0011	7.6
LS 71 L	0.25	840	2.6	1	0.70	50	2.5	1.7	1.7	0.71	0.0013	7.9
LS 80 L	0.25	955	2.5	0.85	0.67	63.1	3.9	1.6	1.8	0.59	0.0024	8.4
LS 80 L	0.37	950	3.7	1.1	0.72	66	4.3	1.7	2.2	0.76	0.0032	9.7
LS 80 L	0.55	950	5.5	1.8	0.64	68	4.9	2.1	2.6	1.2	0.0042	11
LS 90 S	0.75	930	7.7	2.1	0.77	68.5	4.2	2.4	2.6	1.4	0.0039	13.5
LS 90 L	1.1	915	11.5	3	0.76	70	4.7	2.4	2.5	2.1	0.0048	15.2
LS 100 L	1.5	905	15.8	4.2	0.74	69	4.5	2.5	2.7	2.9	0.0058	20
LS 112 M	2.2	905	23.2	5.8	0.76	72	5.6	2.8	2.7	4	0.0087	24.2
LS 132 S	3	957	30.3	6.8	0.78	81.1	6	2	2.6	4.7	0.018	38.3
LS 132 M	4	961	39.6	9.3	0.75	83.6	5.9	2.5	2.9	6.4	0.034	53.3
LS 132 M	5.5	960	54.2	13.3	0.71	84.1	5.5	2.5	2.8	9.2	0.039	59.4
LS 160 M	7.5	967	74.1	16.1	0.79	85.2	4.7	1.5	2.1	11.1	0.086	81
LS 160 L	11	967	109	23.3	0.79	86.3	4.6	1.6	2.1	16.1	0.116	105
LS 180 L	15	972	147	30.1	0.81	88.7	6.8	2.3	2.8	20.9	0.192	135
LS 200 LT	18.5	970	182	37	0.81	89	6.4	2.4	2.8	25.7	0.236	160
LS 200 L	22	972	216	43.6	0.81	89.9	6	2	2.7	30.2	0.295	190
LS 225 MR	30	968	296	59.5	0.81	89.9	6	2.2	2.5	41.2	0.39	235
LS 250 ME	37	978	361	71.1	0.81	92.7	6.2	2.3	2.5	49.3	0.85	305
LS 280 SC	45	978	439	86.5	0.81	92.7	6.2	2.3	2.5	59.9	0.99	340
LS 280 MC	55	978	537	106	0.81	92.6	6	2.4	2.5	73.3	1.19	385
LS 315 SP	75	980	731	140	0.83	93.3	7.2	2.4	3	96.9	3.09	690
LS 315 MP	90	980	877	164	0.85	93.1	7.2	2.4	2.9	113.7	3.74	760
LS 315 MR	110	980	1072	200	0.85	93.5	7.2	2.4	2.9	138.4	4.36	850
LS 315 MR	132	986	1278	242	0.83	94.8	6.6	2.4	2.5	167.8	4.36	830



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

### D2 - Selection

CATEGORY 3  
ZONE 22  
Non-conductive dust

**8 poles**  
 $750 \text{ min}^{-1}$

**IP 55**  
**S1**  
**CI F insulation**



**II 3D T 125 °C**

Type	MAINS SUPPLY $\Delta 230 / Y 400 V$ or $\Delta 400 V$										50 Hz	
	Rated power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	Starting current/Rated current	Starting torque/Rated torque	Max. torque/Rated torque	Rated apparent power	Moment of inertia	Weight
	$P_N$ kW	$N_N$ $\text{min}^{-1}$	$C_N$ N.m	$I_N(400V)$ A	100%	100%	$I_D/I_N$	$M_D/M_N$	$M_M/M_N$	kVA <sub>N</sub>	J kg.m <sup>2</sup>	IM B3 kg
LS 71 L	0.12	650	1.7	0.72	0.55	44	2.1	1.3	1.5	0.50	0.0013	8
LS 80 L	0.18	705	2.4	0.79	0.63	52	2.9	1.5	1.9	0.55	0.0031	9.7
LS 80 L	0.25	700	3.4	0.98	0.68	54	2.8	1.7	1.9	0.68	0.0041	11.3
LS 90 S	0.37	685	5.2	1.20	0.72	62	3.8	1.7	1.8	0.83	0.0038	13.5
LS 90 L	0.55	670	7.8	1.7	0.72	63.5	3.5	1.7	1.7	1.2	0.0047	15.2
LS 100 L	0.75	670	10.7	2.4	0.71	63.5	3.5	1.8	2.2	1.7	0.0047	18
LS 100 L	1.1	670	15.7	3.7	0.68	63	3.7	2	2.2	2.6	0.0068	21.8
LS 112 MG	1.5	710	20.2	4.7	0.64	72	3.8	2	2.1	3.3	0.015	24
LS 132 SM	2.2	713	30.2	6.1	0.68	77.1	4	1.7	2	4.2	0.025	45.6
LS 132 M	3	712	40.7	8	0.65	79.8	4.3	1.9	2.2	5.5	0.033	53.9
LS 160 M	4	718	53.2	11	0.63	83.3	3.9	1.7	2.3	7.6	0.068	84
LS 160 M	5.5	716	73.4	15.1	0.63	83.3	3.9	1.7	2.3	10.5	0.071	89
LS 160 L	7.5	714	100	20.6	0.63	83.4	3.9	1.9	2.3	14.3	0.09	101
LS 180 L	11	720	146	25.6	0.72	86	3.8	1.4	1.9	17.8	0.205	140
LS 200 L	15	725	198	32.9	0.75	87.7	4.4	1.6	2.1	22.8	0.27	185
LS 225 ST	18.5	725	244	42.4	0.72	87.5	4.2	1.6	2.1	29.4	0.33	210
LS 225 MR	22	725	290	51.9	0.7	87.4	4.4	1.9	2.3	36	0.4	240
LS 250 ME	30	730	392	60.3	0.79	90.9	5.8	1.9	2.7	41.8	0.99	330
LS 280 SC	37	730	484	74.3	0.79	91	5.6	1.8	2.6	51.5	1.19	370
LS 280 MD	45	728	590	91.4	0.78	91.1	5.4	1.8	2.6	63.3	1.39	430
LS 315 SP	55	738	712	105	0.81	93.2	5.4	1.8	2.4	72.9	3.1	660
LS 315 MR	75	738	970	143	0.81	93.6	5.4	1.8	2.4	98.9	4.38	815

D



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

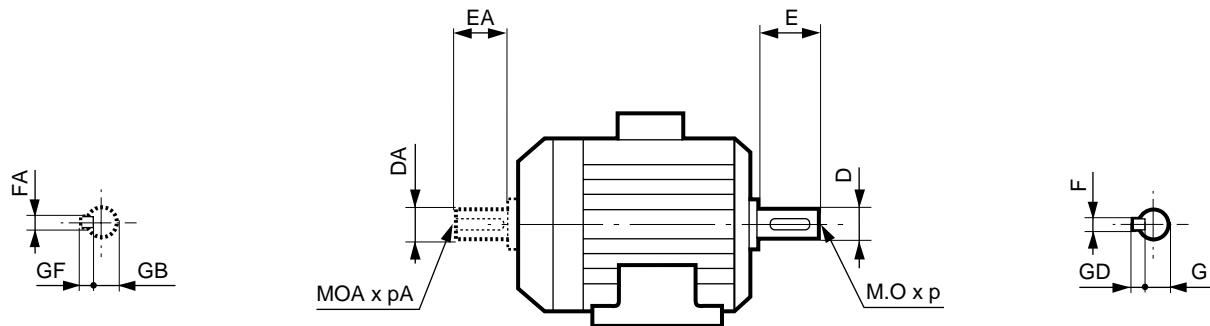
CATEGORY 3  
ZONE 22  
Non-conductive dust

## D3 - Dimensions

### Dimensions of LS 3-phase motors Cage rotor

Dimensions in millimetres

#### – Shaft extensions



Type	Main shaft extensions													
	4, 6 and 8 poles				2 poles									
Type	F	GD	D	G	E	O	p	F	GD	D	G	E	O	p
LS 56 M	3	3	9j6	7	20	4	10	3	3	9j6	7	20	4	10
LS 63 M	4	4	11j6	8.5	23	4	10	4	4	11j6	8.5	23	4	10
LS 71 M	5	5	14j6	11	30	5	15	5	5	14j6	11	30	5	15
LS 80 L	6	6	19j6	15.5	40	6	16	6	6	19j6	15.5	40	6	16
LS 90 S/L	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
LS 100 L	8	7	28j6	24	60	10	22	8	7	28j6	24	60	10	22
LS 112 M/MG	8	7	28j6	24	60	10	22	8	7	28j6	24	60	10	22
LS 132 S/M	10	8	38k6	33	80	12	28	10	8	38k6	33	80	12	28
LS 160 M/L/MP/LR	12	8	42k6	37	110	16	36	12	8	42k6	37	110	16	36
LS 180 MT/LR/L	14	9	48k6	42.5	110	16	36	14	9	48k6	42.5	110	16	36
LS 200 LT/L	16	10	55m6	49	110	20	42	16	10	55m6	49	110	20	42
LS 225 ST/MR/SR	18	11	60m6	53	140	20	42	16	10	55m6	49	110	20	42
LS 250 ME/MZ	18	11	65m6	58	140	20	42	18	11	60m6	53	140	20	42
LS 280 SC/MC/MD	20	12	75m6	67.5	140	20	42	18	11	65m6	58	140	20	42
LS 280 SK/MK	20	12	75m6	67.5	140	20	42	18	11	65m6	58	140	20	42
LS 315 SP/MP/MR	22	14	80m6	71	170	20	42	18	11	65m6	58	140	20	42

Type	Secondary shaft extensions													
	4, 6 and 8 poles				2 poles									
Type	FA	GF	DA	GB	EA	OA	pA	FA	GF	DA	GB	EA	OA	pA
LS 56 M	3	3	9j6	7	20	4	10	3	3	9j6	7	20	4	10
LS 63 M	4	4	11j6	8.5	23	4	10	4	4	11j6	8.5	23	4	10
LS 71 M	5	5	14j6	11	30	5	15	5	5	14j6	11	30	5	15
LS 80 L	5	5	14j6	11	30	5	15	5	5	14j6	11	30	5	15
LS 90 S/L	6	6	19j6	15.5	40	6	16	6	6	19j6	15.5	40	6	16
LS 100 L	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
LS 112 M/MG	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
LS 132 S/M	8	7	28j6	24	60	10	22	8	7	28j6	24	60	10	22
LS 160 MP/LR	10	8	38k6	33	80	12	28	10	8	38k6	33	80	12	28
LS 160 M/L	12	8	42k6	37	110	16	36	12	8	42k6	37	110	16	36
LS 180 MT/LR/L	14	9	48k6	42.5	110	16	36	14	9	48k6	42.5	110	16	36
LS 200 LT/L	16	10	55m6	49	110	20	42	16	10	55m6	49	110	20	42
LS 225 ST/MR/SR	18	11	60m6	53	140	20	42	16	10	55m6	49	110	20	42
LS 250 ME/MZ	18	11	65m6	58	140	20	42	18	11	60m6	53	140	20	42
LS 280 SC/MP/MD	18	11	65m6	58	140	20	42	18	11	65m6	58	140	20	42
LS 280 SK/MK	20	12	75m6	67.5	140	20	42	18	11	65m6	58	140	20	42
LS 315 SP/MP/MR	22	14	80m6	71	170	20	42	18	11	65m6	58	140	20	42



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

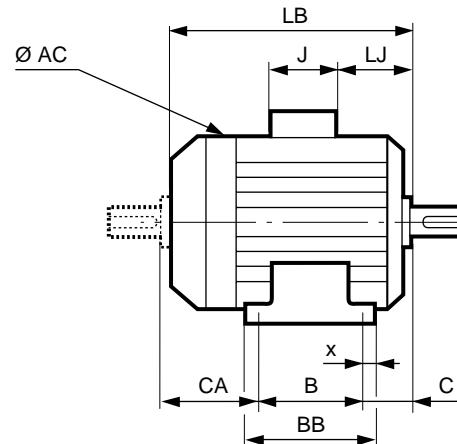
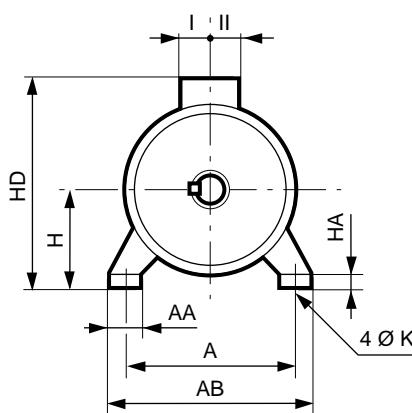
CATEGORY 3  
ZONE 22  
Non-conductive dust

## D3 - Dimensions

Dimensions of LS 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot mounted IM B3 (IM 1001)



D

Type	Main dimensions																	
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II	CA
LS 56 M	90	104	71	89	36	9.5	24	6	7	56	110	148	156	10	78	39	39	52
LS 63 M	100	115	80	96	40	7.5	24.5	7	8	63	124	160	172	21	78	39	39	55
LS 71 M	112	126	90	104	45	7.5	23	7	9	71	140	178	183	21	78	39	39	51
LS 80 L	125	157	100	120	50	10	29	9	10	80	170	203	215	26	86	43	43	68
LS 90 S	140	172	100	120	56	10	37	10	11	90	190	223	218	26	86	43	43	66
LS 90 L	140	172	125	162	56	28	37	10	11	90	190	223	245	26	86	43	43	68
LS 100 L	160	196	140	165	63	12	40	12	13	100	200	238	290	26	86	43	43	93
LS 112 M	190	220	140	165	70	12	45	12	14	112	200	250	290	26	86	43	43	86
LS 112 MG	190	220	140	165	70	12	52	12	14	112	235	260	315	36	86	43	43	110
LS 132 S	216	250	140	170	89	16	50	12	15	132	235	280	350	53	86	43	43	128
LS 132 SM/M	216	250	178	208	89	16	59	12	18	132	280	307	387	25	110	57	73	126
LS 160 MP	254	294	210	294	108	20	64	14.5	25	160	264	368	468	44	134	92	63	154
LS 160 M	254	294	210	294	108	20	60	14.5	25	160	310	395	495	44	134	92	63	182
LS 160 LR	254	294	254	294	108	20	64	14.5	25	160	264	368	495	44	134	92	63	138
LS 160 L	254	294	254	294	108	20	60	14.5	25	160	310	395	495	44	134	92	63	138
LS 180 MT	279	324	241	316	121	20	79	14.5	28	180	310	428	495	45	205	100	95	138
LS 180 LR	279	324	279	316	121	20	79	14.5	28	180	310	428	520	45	205	100	95	125
LS 180 L	279	339	279	329	121	25	86	14.5	25	180	350	435	552	54	205	100	95	159
LS 200 LT	318	378	305	365	133	30	108	18.5	32	200	350	455	599	60	205	100	95	167
LS 200 L	318	388	305	375	133	35	103	18.5	36	200	390	475	621	68	205	100	95	194
LS 225 ST	356	431	286	386	149	50	127	18.5	36	225	390	500	628	74	205	100	95	203
LS 225 SR	356	431	286	386	149	50	127	18.5	36	225	390	500	676	74	205	100	95	253
LS 225 MR	356	431	311	386	149	50	127	18.5	36	225	390	500	676	74	205	100	95	228
LS 250 MZ	406	470	349	449	168	70	150	24	47	250	390	550	676	68	217	103	145	172
LS 250 ME	406	470	349	420	168	35	90	24	36	250	471	654	810	68	292	148	180	293
LS 280 SC	457	520	368	478	190	35	90	24	35	280	479	684	810	68	292	148	180	252
LS 280 MC	457	520	419	478	190	35	90	24	35	280	479	684	810	68	292	148	180	201
LS 280 MD	457	520	419	478	190	35	90	24	35	280	479	684	870	68	292	148	180	261
LS 315 SP	508	594	406	537	216	40	114	28	70	315	586	780	947	125	292	148	180	341
LS 315 MP	508	594	457	537	216	40	114	28	70	315	586	780	947	125	292	148	180	290
LS 315 MR	508	594	457	537	216	40	114	28	70	315	586	780	1017	125	292	148	180	360



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

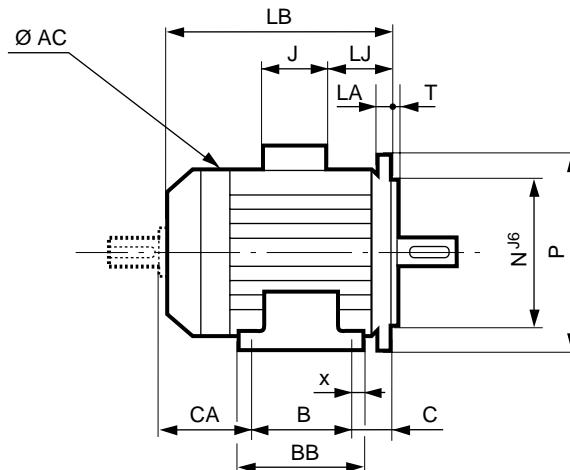
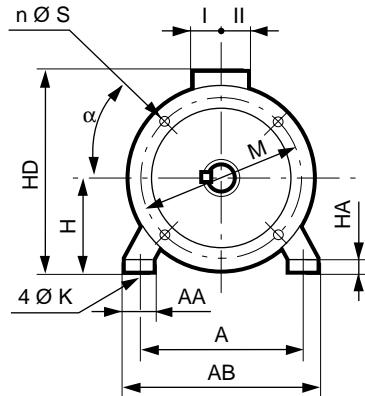
CATEGORY 3  
ZONE 22  
Non-conductive dust

## D3 - Dimensions

Dimensions of LS 3-phase motors  
Cage rotor

### – Foot and flange mounted IM B35 (IM 2001)

Dimensions in millimetres



Type	Main dimensions																
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II
LS 56 M	90	104	71	89	36	9.5	24	6	7	56	110	148	156	10	78	39	39 FF 100
LS 63 M	100	115	80	96	40	7.5	24.5	7	8	63	124	160	172	21	78	39	39 FF 115
LS 71 M	112	126	90	104	45	7.5	23	7	9	71	140	178	183	21	78	39	39 FF 130
LS 80 L	125	157	100	120	50	10	29	9	10	80	170	203	215	26	86	43	43 FF 165
LS 90 S	140	172	100	120	76	10	37	10	11	90	190	223	238	46	86	43	43 FF 165
LS 90 L	140	172	125	162	56	8	37	10	11	90	190	223	265	46	86	43	43 FF 165
LS 100 L	160	196	140	165	63	12	40	12	13	100	200	238	290	26	86	43	43 FF 215
LS 112 M	190	220	140	165	70	12	45	12	14	112	200	250	290	26	86	43	43 FF 215
LS 112 MG	190	220	140	165	70	12	52	12	14	112	235	260	315	36	86	43	43 FF 215
LS 132 S	216	250	140	170	89	16	50	12	15	132	235	280	350	53	86	43	43 FF 265
LS 132 SM/M	216	250	178	208	89	16	59	12	18	132	280	308	387	25	110	57	73 FF 265
LS 160 MP	254	294	210	294	108	20	64	14.5	25	160	264	375	468	43	135	88	64 FF 300
LS 160 M	254	294	210	294	108	20	60	14.5	25	160	310	395	495	44	134	92	63 FF 300
LS 160 LR	254	294	254	294	108	20	64	14.5	25	160	264	375	495	43	135	88	64 FF 300
LS 160 L	254	294	254	294	108	20	60	14.5	25	160	310	395	495	44	134	92	63 FF 300
LS 180 MT	279	324	241	316	121	20	79	14.5	28	180	310	428	495	45	205	100	95 FF 300
LS 180 LR	279	324	279	316	121	20	79	14.5	28	180	310	428	520	45	205	100	95 FF 300
LS 180 L	279	339	279	329	121	25	86	14.5	25	180	350	435	552	54	205	100	95 FF 300
LS 200 LT	318	378	305	365	133	30	108	18.5	32	200	350	455	599	60	205	100	95 FF 350
LS 200 L	318	388	305	375	133	35	103	18.5	36	200	390	475	621	68	205	100	95 FF 350
LS 225 ST	356	431	286	386	149	50	127	18.5	36	225	390	500	628	74	205	100	95 FF 400
LS 225 SR	356	431	286	386	149	50	127	18.5	36	225	390	500	676	74	205	100	95 FF 400
LS 225 MR	356	431	311	386	149	50	127	18.5	36	225	390	500	676	74	205	100	95 FF 400
LS 250 MZ	406	470	349	449	168	70	150	24	47	250	390	550	676	68	217	103	145 FF 500
LS 250 ME	406	470	349	420	168	35	90	24	36	250	479	654	810	68	292	148	180 FF 500
LS 280 SC	457	520	368	478	190	35	90	24	35	280	479	684	810	68	292	148	180 FF 500
LS 280 MC	457	520	419	478	190	35	90	24	35	280	479	684	810	68	292	148	180 FF 500
LS 280 MD	457	520	419	478	190	35	90	24	35	280	479	684	870	68	292	148	180 FF 500
LS 315 SP	508	594	406	537	216	40	114	28	70	315	586	780	947	125	292	148	180 FF 600
LS 315 MP	508	594	457	537	216	40	114	28	70	315	586	780	947	125	292	148	180 FF 600
LS 315 MR	508	594	457	537	216	40	114	28	70	315	586	780	1017	125	292	148	180 FF 600

Dimensions of CA and shaft extensions: see pages 40 and 41.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

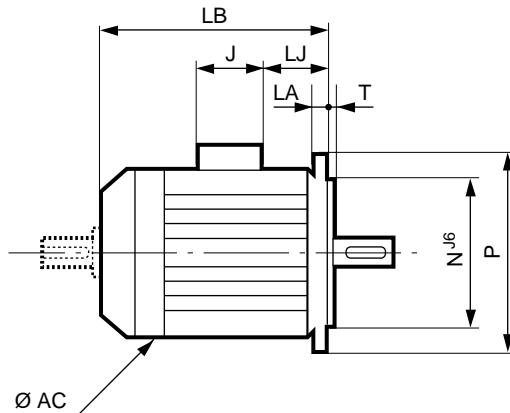
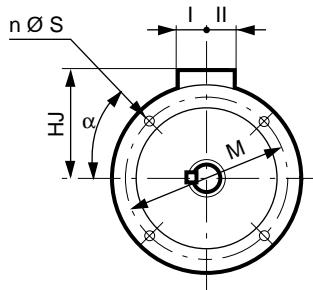
CATEGORY 3  
ZONE 22  
Non-conductive dust

## D3 - Dimensions

### Dimensions of LS 3-phase motors Cage rotor

Dimensions in millimetres

#### – Flange mounted IM B5 (IM 3001)



IEC symbol	Flange dimensions							
	M	N	P	T	n	α	S	LA
FF 100	100	80	120	2.5	4	45	7	5
FF 115	115	95	140	3	4	45	10	10
FF 130	130	110	160	3.5	4	45	10	10
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 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
FF 400	400	350	450	5	8	22.5	18.5	16
FF 500	500	450	550	5	8	22.5	18.5	18
FF 500	500	450	550	5	8	22.5	18.5	18
FF 500	500	450	550	5	8	22.5	18.5	18
FF 500	500	450	550	5	8	22.5	18.5	18
FF 500	500	450	550	5	8	22.5	18.5	18
FF 600	600	550	660	6	8	22.5	24	22
FF 600	600	550	660	6	8	22.5	24	22
FF 600	600	550	660	6	8	22.5	24	22

IM 3001 motors (IM B5) are only available up to frame size 225.

Dimensions of shaft extensions: see page 40.

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
LS 56 M	110	156	85	10	78	39	39
LS 63 M	124	172	95	21	78	39	39
LS 71 M	140	183	102	21	78	39	39
LS 80 L	170	215	123	26	86	43	43
LS 90 S	190	238	133	46	86	43	43
LS 90 L	190	265	133	46	86	43	43
LS 100 L	200	290	138	26	86	43	43
LS 112 M	200	290	138	26	86	43	43
LS 112 MG	235	315	148	36	86	43	43
LS 132 S	235	350	148	53	86	43	43
LS 132 SM/M	280	387	176	25	110	57	73
LS 160 MP	264	468	215	43	135	88	64
LS 160 M	316	495	235	44	134	92	63
LS 160 LR	264	495	215	43	135	88	64
LS 160 L	316	495	235	44	134	92	63
LS 180 MT	316	495	248	45	205	100	95
LS 180 LR	316	520	248	45	205	100	95
LS 180 L	350	552	255	54	205	100	95
LS 200 LT	350	599	255	60	205	100	95
LS 200 L	390	621	275	68	205	100	95
LS 225 ST	390	628	275	74	205	100	95
LS 225 SR	390	676	275	74	205	100	95
LS 225 MR	390	676	275	74	205	100	95
LS 250 MZ	390	676	300	68	217	103	145
LS 250 ME	479	810	404	68	292	148	180
LS 280 SC	479	810	404	68	292	148	180
LS 280 MC	479	810	404	68	292	148	180
LS 280 MD	479	870	404	68	292	148	180
LS 315 SP	586	947	465	125	292	148	180
LS 315 MP	586	947	465	125	292	148	180
LS 315 MR	586	1017	465	125	292	148	180



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

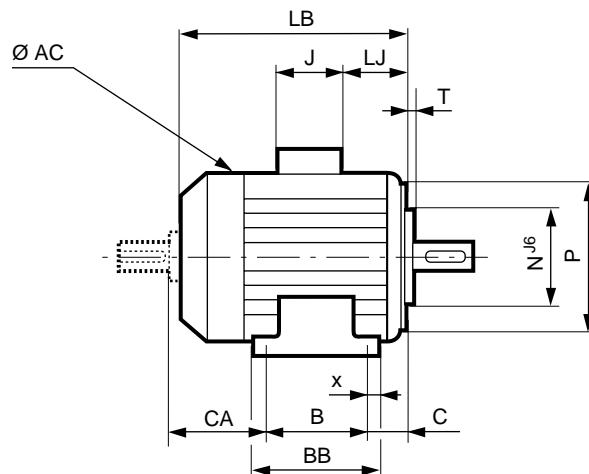
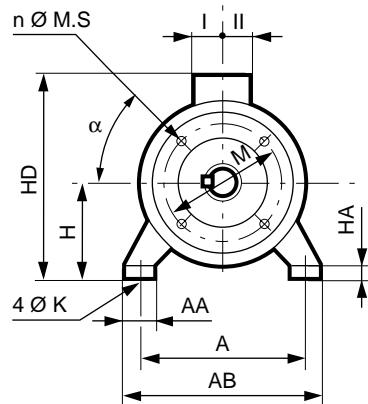
CATEGORY 3  
ZONE 22  
Non-conductive dust

## D3 - Dimensions

Dimensions of LS 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot and face mounted 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.
LS 56 M	90	104	71	89	36	9	24	6	7	56	110	148	156	10	78	39	39	FT 65
LS 63 M	100	115	80	96	40	8	24.5	7	8	63	124	160	172	21	78	39	39	FT 75
LS 71 M	112	126	90	104	45	7	23	7	9	71	140	178	183	21	78	39	39	FT 85
LS 80 L	125	157	100	120	50	10	29	9	10	80	170	203	215	26	86	43	43	FT 100
LS 90 S	140	172	100	120	56	10	37	10	11	90	190	223	218	26	86	43	43	FT 115
LS 90 L	140	172	125	162	56	28	37	10	11	90	190	223	245	26	86	43	43	FT 115
LS 100 L	160	196	140	165	63	12	40	12	13	100	200	238	290	26	86	43	43	FT 130
LS 112 M	190	220	140	165	70	12	45	12	14	112	200	250	290	26	86	43	43	FT 130
LS 112 MG	190	220	140	165	70	12	52	12	14	112	235	260	315	36	86	43	43	FT 130
LS 132 S	216	250	140	170	89	16	50	12	15	132	235	280	350	53	86	43	43	FT 215
LS 132 SM/M	216	250	178	208	89	16	59	12	18	132	280	308	387	25	110	57	73	FT 215
LS 160 MP	254	294	210	250	108	20	112	14	25	160	310	375	425	43	135	88	64	FT 215
LS 160 LR	254	294	254	294	108	20	112	14	25	160	310	375	495	43	135	88	64	FT 215

Dimensions of CA and shaft extensions: see pages 40 and 41.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

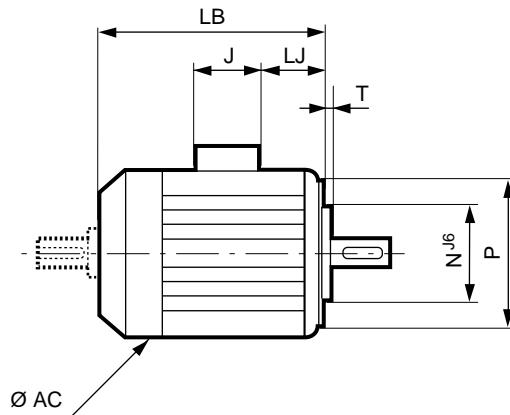
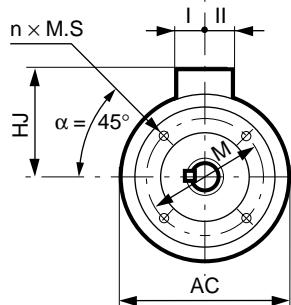
CATEGORY 3  
ZONE 22  
Non-conductive dust

## D3 - Dimensions

Dimensions of LS 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Face mounted IM B14 (IM 3601)



IEC symbol	Faceplate dimensions					
	M	N	P	T	n	MS
FT 65	65	50	80	2.5	4	M5
FT 75	75	60	90	2.5	4	M5
FT 85	85	70	105	2.5	4	M6
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

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
LS 56 M	110	156	85	10	78	39	39
LS 63 M	124	172	95	21	78	39	39
LS 71 M	140	183	102	21	78	39	39
LS 80 L	170	215	123	26	86	43	43
LS 90 S	190	218	133	26	86	43	43
LS 90 L	190	245	133	26	86	43	43
LS 100 L	200	290	138	26	86	43	43
LS 112 M	200	290	138	26	86	43	43
LS 112 MG	235	315	148	36	86	43	43
LS 132 S	235	350	148	53	86	43	43
LS 132 SM/M	280	387	176	25	110	57	73
LS 160 MP	310	425	215	43	135	88	64
LS 160 LR	310	495	215	43	135	88	64

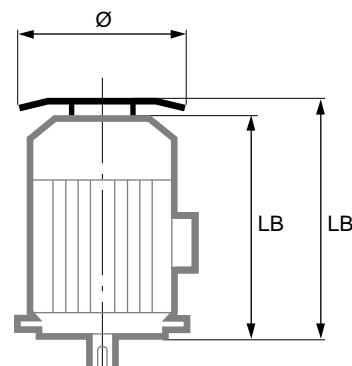
Dimensions of shaft extensions: see page 40.

## Drip covers

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

Frame size	LB'	Ø
56	LB + 20	114
63	LB + 20	125
71	LB + 20	140
80	LB + 20	145
90, 100 and 112	LB + 20	185
112 MG and 132 S	LB + 25	210
132 SM/M and 160 MP/LR	LB + 30	240
160 M/L and 180 MT/LR	LB + 36.5	265
180 L and 200 LT	LB + 36.5	305
200 L and 225 ST/MR	LB + 36.5	350
250 ME	LB + 55	420
280 SC/MC/MD	LB + 55	420
315	LB + 76.5	505

Dimensions in millimetres





# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### LS dust option

CATEGORY 3  
ZONE 22  
Non-conductive dust

## D3 - Dimensions

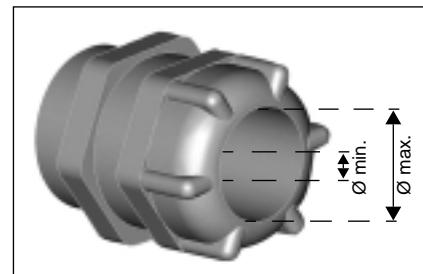
– Cable gland for rated supply voltage of 400 V

Frame size	Terminal box material	Single-speed motor		Two-speed motor		Cable gland for accessories: PTO / PTF / ...
		D.O.L. starting	Y $\Delta$ starting	2 windings	1 winding	
56	Plastic	ISO 16	-	2 x ISO 16	ISO 16	ISO 16
63	Plastic	ISO 16	-	2 x ISO 16	ISO 16	ISO 16
71	Plastic	ISO 16	-	2 x ISO 16	ISO 16	ISO 16
80	Plastic	ISO 20	-	2 x ISO 20	ISO 20	ISO 16
90	Plastic	ISO 20	-	2 x ISO 20	ISO 20	ISO 16
100	Plastic	ISO 20*	ISO 20*	2 x ISO 20*	ISO 20*	ISO 16
112 / 132 S	Plastic	ISO 20*	ISO 20*	2 x ISO 20*	ISO 20*	ISO 16
132 M	Aluminium alloy	ISO 25	ISO 25	2 x ISO 25	ISO 25*	ISO 16
160	Aluminium alloy	2 x ISO 25	2 x ISO 25	2 x ISO 25	2 x ISO 25	ISO 16
180	Aluminium alloy	2 - 4p 6 - 8p	2 x ISO 32 2 x ISO 25	2 x ISO 25	2 x ISO 32	2 x ISO 32
200	Aluminium alloy	2 x ISO 32	6 - 8p 2 - 4 - 6p	2 x ISO 32 2 x ISO 25	2 x ISO 40	2 x ISO 40
225	Aluminium alloy	2 - 4p 6 - 8p	2 x ISO 40 2 x ISO 32	2 x ISO 32	2 x ISO 40	2 x ISO 40
250	Aluminium alloy	2 - 4 - 6p 8p	2 x ISO 40 2 x ISO 32	2 x ISO 32	2 x ISO 50	2 x ISO 50
280	Aluminium alloy	2 - 4p 6 - 8p	2 x ISO 50 2 x ISO 40	2 - 4p 6 - 8p	2 x ISO 40 2 x ISO 32	2 x ISO 50
315 SP/MP	Aluminium alloy	2 - 4p 6 - 8p	2 x ISO 63 2 x ISO 50	2 - 4p 6 - 8p	2 x ISO 50 2 x ISO 40	2 x ISO 63
315 MR	Aluminium alloy	2 - 4p 6p	2 x ISO 63 2 x ISO 63	2 - 4p 6p	2 x ISO 63 2 x ISO 50	-

\* As an option, ISO 20 and ISO 25 cable glands may be replaced by ISO 25 and ISO 32 respectively (to comply with standard DIN 42925).

### Tightening capacity of cable glands

Type of cable gland	Tightening capacity	
	min. cable Ø (mm)	max. cable Ø (mm)
ISO 16	5	10
ISO 20	9.5	15
ISO 25	13	19
ISO 32	15	25
ISO 40	21	32
ISO 50	26	38
ISO 63	31	44



Standard cable gland material = plastic (brass on request).  
On request, the terminal boxes can be supplied with drill holes, without cable glands.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

**CATEGORY 3  
ZONE 22**  
Non-conductive dust

## E1 - General



– 3-phase TEFV induction motors, FLS series with cast iron housing, conforming to IEC 34, 72, EN 50281, power 0.18 to 750 kW, frame size 80 to 450 mm.

- Single speed 2, 4, 6 and 8-pole: 230/400 V or 400 V Δ, 50 Hz
- Two-speed: (on request) for general or centrifugal applications 2/4, 4/6 and 6/8 poles 400 V Y or Δ.

#### – Protection IP55

suitable for the harshest environments

#### – Motors for variable speed operation

- fitted with thermal probes (essential)
- on consultation (to be selected), see p. 60.

**Finish: cast iron housing**  
Assembled using protected fixing accessories.

Paint finish **RAL 6000 (green)**.  
Shaft end and flange protected against atmospheric corrosion.  
Individual anti-shock packaging.

#### A.C. supply

- Standard construction in accordance with IEC 38 ie:
  - 230/400 V + 10 % – 10 % at 50 Hz
  - 400 V Δ + 10 % – 10 % at 50 Hz

## Description of FLS cast iron 3-phase motors with dust option



**II 3D T 125 °C**

Component	Materials	Remarks
Housing with cooling fins	Cast iron	<ul style="list-style-type: none"> <li>- with integral feet, or without feet           <ul style="list-style-type: none"> <li>• 4, 6 or 8 fixing holes for foot mounted housings</li> <li>• lifting rings for frame size ≥ 100</li> </ul> </li> <li>- earth terminal on foot or fin</li> </ul>
Stator	Insulated low-carbon magnetic steel laminations Insulated electroplated copper	<ul style="list-style-type: none"> <li>- low carbon content guarantees long-term lamination pack stability</li> <li>- welded packs</li> <li>- semi-enclosed slots</li> <li>- class F insulation</li> </ul>
Rotor	Insulated low-carbon magnetic steel laminations Aluminium (A5L) or copper	<ul style="list-style-type: none"> <li>- inclined cage bars</li> <li>- rotor cage pressure die-cast in aluminium (or alloy for special applications) or soldered in copper</li> <li>- shrink-fitted to shaft, or keyed for soldered rotors</li> <li>- rotor balanced dynamically, class N - 1/2 key</li> </ul>
Shaft	Steel	<ul style="list-style-type: none"> <li>- for frame size ≤ 132:           <ul style="list-style-type: none"> <li>• shaft end fitted with screw and washer</li> <li>• captive drive key with rounded ends - for frame size ≥ 160:</li> <li>• tapped hole</li> <li>• open keyway</li> </ul> </li> </ul>
End shields	Cast iron	
Bearings and lubrication		<ul style="list-style-type: none"> <li>- ball bearings C3 play</li> <li>- type ZZ "greased for life" up to frame size 132</li> <li>- semi-protected or open type for frame size 160, regreasable</li> <li>- NDE bearings preloaded up to 315 S, preloaded at DE from size 315 M upwards</li> </ul>
Labyrinth seal Lipseals	Plastic, steel, or synthetic rubber	<ul style="list-style-type: none"> <li>- labyrinth seal at drive end for foot mounted motors, frame size ≤ 132</li> <li>- lipseal at drive end for foot and flange mounted or flange mounted motors, frame size ≤ 132</li> <li>- lipseal at non drive end for all motors ≤ 132</li> <li>- lipseal at drive end and non drive end for frame sizes 160 to 225 MT inclusive</li> <li>- labyrinth seal at drive end and non drive end for frame sizes ≥ 315</li> </ul>
Fan	Composite material or metal	- 2 directions of rotation: straight blades
Fan cover	Pressed steel	- fitted, on request, with a drip cover for operation in vertical position, shaft end facing down
Terminal box	Cast iron body for all frame sizes. Cover in pressed steel for frame sizes 80 to 132, cast iron for larger frame sizes.	<ul style="list-style-type: none"> <li>- <b>IP 55</b></li> <li>- fitted with a terminal block with 6 terminals up to 335 LD, 12 terminals thereafter</li> <li>- terminal box supplied <b>fitted with plastic cable glands</b> up to 225 MT</li> <li>- from 315 to 355 LD, terminal box supplied with drill holes, without cable glands</li> <li>- from 225 M to 280, and 355 LK to 450, terminal box strip and cable glands optional</li> <li>- 1 earth terminal in each terminal box</li> </ul>
Paint		<ul style="list-style-type: none"> <li>- system II</li> <li>- resistance to saline mist: 250 hours (according to NFX 41002)</li> </ul>



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

### E2 - Selection

CATEGORY 3  
ZONE 22  
Non-conductive dust

2  
poles  
3000 min<sup>-1</sup>

IP 55  
S1  
CI F insulation



II 3D T 125 °C

MAINS SUPPLY Δ 230 / Y 400 V or Δ 400 V

50 Hz

Type	Power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	$I_d / I_n$	$C_d / C_n$	$C_m / C_n$	Apparent power	Moment of inertia	Weight
	kW	min <sup>-1</sup>	N.m	A	100%	100%				kVA	kg.m <sup>2</sup>	kg
FLS 80 L	0.75	2840	2.5	1.6	0.86	76.9	5.9	2.4	2.2	1.1	0.0007	15
FLS 80 L	1.1	2837	3.7	2.4	0.84	79.5	5.6	2.7	2.4	1.6	0.0009	18
FLS 90 S	1.5	2870	5	3.3	0.81	82	7.3	3	3.1	2.3	0.0014	21
FLS 90 L	2.2	2862	7.5	4.3	0.88	84.5	8.1	3.7	3.5	3	0.0021	26
FLS 100 LK	3	2925	10	5.5	0.91	86	8.4	2.4	3	3.8	0.0069	42
FLS 112 M	4	2940	13.6	7.5	0.89	86.5	8.7	2.9	3.3	5.2	0.0084	48
FLS 132 S	5.5	2940	18.7	10.6	0.86	87	7.6	2.3	2.9	7.4	0.0168	67
FLS 132 S	7.5	2950	25	14.1	0.87	88	8.9	2.6	3.4	9.8	0.0236	70
FLS 160 MA	11	2935	35.8	20	0.88	88.4	8.6	2.8	3.2	14.1	0.037	97
FLS 160 MB	15	2935	48.8	27	0.88	89.7	8.6	2.8	3.2	19	0.043	108
FLS 160 L	18.5	2940	60	33	0.90	90.8	8.4	2.7	3.1	22.6	0.057	126
FLS 180 MR	22	2940	71	39	0.89	91	8.5	2.8	3.1	27.2	0.065	135
FLS 200 LA	30	2950	97	51	0.91	92.4	7.7	2.4	2.8	35.7	0.13	245
FLS 200 LB*	37	2959	120	63	0.9	93.5	8.3	3	3.4	44.4	0.16	265
FLS 225 MT*	45	2958	145	78	0.89	93.8	8.3	2.8	3.2	54	0.19	290
FLS 250 M*	55	2966	177	94	0.89	94.6	7.9	2.5	3.5	65	0.44	405
FLS 280 S*	75	2965	241	127	0.90	94.6	8	2.7	3.8	88	0.47	505
FLS 280 M*	90	2962	290	149	0.91	95.5	7.7	2.6	3.7	104	0.53	560
FLS 315 ST	110	2975	356	178	0.93	95.8	8.2	2.8	3.3	123	1.08	850
FLS 315 M	132	2962	427	221	0.90	96	7.5	1.8	2.7	153	1.71	1000
FLS 315 LA	160	2969	517	272	0.89	95.5	7.5	2	3	188	1.71	1050
FLS 315 LB	200	2967	647	342	0.88	96	7.7	2.3	3.4	237	1.99	1150
FLS 355 LA	250	2978	808	424	0.89	95.6	7.2	2.1	2.6	294	3.39	1400
FLS 355 LB	275	2980	881	464	0.89	96.2	8.4	2.3	2.9	322	3.39	1500
FLS 355 LB •	315	2976	1016	525	0.90	96.2	7.2	1.8	2.5	364	3.39	1500
FLS 355 LC	330	2980	1057	560	0.88	96.6	7.9	1.9	2.6	388	3.39	1915
FLS 355 LC	355	2979	1137	588	0.90	96.8	8.2	2.3	3.1	407	4.03	1915
FLS 355 LD •	400	2977	1284	673	0.89	96.4	7.8	2	2.7	466	4.03	1915

● Class F temperature rise

Δ 400 V mains supply only.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

CATEGORY 3  
ZONE 22  
Non-conductive dust

### E2 - Selection

4 poles  
1500 min<sup>-1</sup>

IP 55  
S1  
CI F insulation



II 3D T 125 °C

MAINS SUPPLY Δ 230 / Y 400 V or Δ 400 V

50 Hz

Type	Power at 50 Hz kW	Rated speed min <sup>-1</sup>	Rated torque N.m	Rated current A	Power factor 100%	Efficiency 100%	$I_d / I_n$	$C_d / C_n$	$C_m / C_n$	Apparent power kVA	Moment of inertia kg.m <sup>2</sup>	Weight kg
FLS 80 L	0.55	1410	3.7	1.6	0.74	69.2	4.4	2.1	2.3	1.1	0.0013	15
FLS 80 L	0.75	1425	5	2	0.75	72.5	5.7	3	2.8	1.4	0.0024	17
FLS 90 S	1.1	1429	7.5	2.5	0.83	78	4.9	1.6	2	1.7	0.0026	19
FLS 90 L	1.5	1428	10	3.3	0.82	79.5	5.3	1.8	2.3	2.3	0.0032	21
FLS 90 L	1.8	1438	12.3	4	0.82	80.1	5.9	2.1	3.2	2.7	0.0037	23
FLS 100 LK	2.2	1457	15	4.6	0.83	83.8	6.3	1.9	2.4	3.2	0.0077	41
FLS 100 LK	3	1454	20	6.2	0.82	84.7	6.5	2.1	2.6	4.3	0.0094	44
FLS 112 M	4	1462	27.5	8.4	0.81	85.1	7.4	2.5	2.9	5.8	0.012	48
FLS 132 S	5.5	1467	37	10.9	0.84	87	8	2.7	3.7	7.7	0.0154	65
FLS 132 M	7.5	1450	50	14.3	0.87	87	7.3	1.9	2.9	10.5	0.0192	70
FLS 132 M	9	1449	61	16.8	0.88	87.7	7.6	2.8	2.9	11.6	0.023	75
FLS 160 M	11	1455	72.2	21	0.86	88.5	7.8	2.6	3.3	15	0.06	103
FLS 160 L	15	1455	98.5	28	0.86	89.5	7.8	2.6	3.3	20	0.079	120
FLS 180 MR	18.5	1465	120.5	35	0.86	90	7.8	2.6	3.3	24	0.095	135
FLS 180 L	22	1465	143	41	0.86	91.4	7.4	2.6	2.4	28	0.137	184
FLS 200 L	30	1471	195	56	0.85	91.9	6.5	2.5	2.3	39	0.24	260
FLS 225 ST*	37	1476	240	70	0.82	93.6	7	2.6	2.4	49	0.28	290
FLS 225 M*	45	1483	290	79	0.87	94.5	7	2.5	2.6	55	0.7	388
FLS 250 M*	55	1479	355	101	0.84	94.5	6.5	2.4	2.5	70	0.7	395
FLS 280 S*	75	1483	484	137	0.84	94.9	7.7	2.9	3	95	0.815	475
FLS 280 M*	90	1478	581	162	0.85	95	7.6	3	3.1	112	1.015	565
FLS 315 ST	110	1482	710	203	0.83	94.8	7.3	2.9	2.7	141	1.83	850
FLS 315 M	132	1489	850	249	0.81	95	8	2.8	2.6	172	2.91	1000
FLS 315 LA	160	1486	1032	285	0.85	95.8	7.5	2.2	2.4	198	3.4	1050
FLS 315 LB •	200	1487	1291	369	0.82	96	8	2.2	2.3	255	3.4	1150
FLS 355 LA	250	1487	1611	427	0.88	96.5	7.4	1.7	2.3	296	6.2	1510
FLS 355 LB	300	1489	1930	520	0.87	96.3	6.5	1.6	1.6	360	6.2	1550
FLS 355 LC	315	1490	2019	557	0.85	96.5	7.4	2.2	2.2	386	6.5	1800
FLS 355 LC	355	1489	2279	619	0.86	96.8	6.6	1.9	1.9	429	6.5	1800
FLS 355 LD	400	1489	2564	689	0.87	96.8	7.4	2.1	2.1	477	7.4	1930
FLS 400 LB	400	1491	2559	691	0.87	96.6	8	2	2.6	478	11.7	2350
FLS 355 LKB	450	1490	2880	767	0.88	96.7	7.6	1.8	2.3	532	11.7	2320
FLS 400 LB	450	1490	2880	767	0.88	96.7	7.6	1.8	2.3	532	11.7	2350
FLS 355 LKB •	500	1490	3200	854	0.88	96.5	6.5	1.7	2.2	592	11.7	2320
FLS 400 LVB	500	1490	3200	864	0.87	96.5	6.5	1.7	2.2	599	11.7	2350
FLS 450 LA	500	1492	3200	864	0.87	96.5	8	1.6	2.2	599	21	3100
FLS 450 LVA	550	1491	3525	940	0.88	96.5	7.9	1.5	2.1	651	21	3100
FLS 450 LB	630	1493	4030	1089	0.87	96.5	8.2	1.5	2.1	754	24	3450
FLS 450 LVB •	675	1491	4326	1164	0.87	96.7	8	1.4	1.9	807	24	3450

● Class F temperature rise

Δ 400 V mains supply only.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

CATEGORY 3  
ZONE 22  
Non-conductive dust

### E2 - Selection

**6 poles**  
 $1000 \text{ min}^{-1}$

**IP 55**  
**S1**  
**CI F insulation**



**II 3D T 125 °C**

Type	MAINS SUPPLY $\Delta$ 230 / Y 400 V or $\Delta$ 400 V										50 Hz
	Power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	$I_d / I_n$	$C_d / C_n$	$C_m / C_n$	Apparent power	
kW	min <sup>-1</sup>	N.m	A	100%	100%				kVA	kg.m <sup>2</sup>	kg
FLS 80 L	0.25	950	2.5	0.8	0.74	60.3	3.6	2	1.9	0.6	0.0024
FLS 80 L	0.37	940	3.7	1.2	0.74	61	3.8	1.9	2.1	0.8	0.0032
FLS 80 L	0.55	955	5.5	1.8	0.67	65	4.4	2.5	2.6	1.3	0.0042
FLS 90 S	0.75	940	7.5	2.1	0.8	65.2	3.5	2	2.2	1.4	0.0039
FLS 90 L	1.1	940	11	2.7	0.81	73.5	4.8	1.8	2.2	1.8	0.0048
FLS 100 LK	1.5	955	15	3.5	0.78	78.3	6.3	2.2	2.8	2.5	0.0134
FLS 112 M	2.2	960	22	5.2	0.77	80	5.5	2.3	2.4	3.6	0.015
FLS 132 S	3	953	30	6.9	0.76	81.9	5.3	2.2	2.4	4.7	0.0376
FLS 132 M	4	970	40	9	0.78	82.1	6.7	2.8	2.7	6.2	0.0517
FLS 132 MU	5.5	970	54	12.2	0.79	82.1	7.1	3.2	2.7	8.5	0.0595
FLS 160 M	7.5	968	74	16	0.80	86	5	1.5	2.4	11	0.085
FLS 160 L	11	966	109	23	0.81	87	5	1.5	2.4	16	0.12
FLS 180 L	15	974	147	30	0.82	89.5	7.1	2.1	3.1	21	0.2
FLS 200 LA	18.5	975	181	36	0.83	90.7	7	2.2	3.3	25	0.29
FLS 200 LB	22	973	216	43	0.81	91.5	7	2.2	3.3	30	0.31
FLS 225 M	30	978	293	59	0.80	92	6	2	2.4	41	0.94
FLS 250 M	37	977	362	73	0.80	92.5	6.2	2.2	2.6	50	0.94
FLS 280 S	45	971	440	84	0.84	93	6	1.9	2.3	58	1.13
FLS 280 M	55	977	538	109	0.79	93	6.9	2.8	3.3	75	1.26
FLS 315 ST	75	987	731	133	0.86	94.8	6.5	2.3	2.1	92	1.8
FLS 315 M	90	987	875	161	0.85	95.6	6.7	1.7	1.5	111	2.6
FLS 315 LA	110	983	1067	199	0.85	94.5	6	1.5	1.3	138	2.6
FLS 315 LB	132	988	1280	241	0.83	95.9	7.4	2	1.8	167	3.5
FLS 315 LB	150	986	1454	277	0.82	95.8	6.6	1.5	2.5	192	3.5
FLS 355 LA	185	987	1783	346	0.81	95.8	7.5	2	3.3	240	5.4
FLS 355 LB	220	988	2129	412	0.81	95.6	7.4	1.9	3.1	286	6.3
FLS 355 LD	250	993	2406	459	0.82	95.8	7.8	2.1	2.3	317	8.6
FLS 355 LD	300	992	2885	558	0.82	95.2	6.8	1.65	1.8	386	8.6
FLS 355 LKB	350	994	3376	637	0.83	96	6.5	1.7	1.6	442	17
FLS 400 LB	350	994	3376	637	0.83	96	6.5	1.7	1.6	442	17
FLS 450 LA	400	996	3851	773	0.78	96.3	8	2	2.2	535	33
FLS 400 LKB	500	996	4809	952	0.79	96.5	8	2	2.2	659	35
FLS 450 LB	500	996	4809	952	0.79	96.5	8	2	2.2	659	35
FLS 450 LB	550	996	5273	1034	0.8	96.5	7.5	1.8	1.9	716	35

Δ 400 V mains supply only.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

CATEGORY 3  
ZONE 22  
Non-conductive dust

### E2 - Selection

8  
poles  
 $750 \text{ min}^{-1}$

IP 55  
S1  
CI F insulation



II 3D T 125 °C

MAINS SUPPLY  $\Delta 230 / Y 400 \text{ V}$  or  $\Delta 400 \text{ V}$

50 Hz

Type	Power at 50 Hz	Rated speed	Rated torque	Rated current	Power factor	Efficiency	$I_d / I_h$	$C_d / C_n$	$C_m / C_n$	Apparent power	Moment of inertia	Weight
	kW	min <sup>-1</sup>	N.m	A	100%	100%				kVA	kg.m <sup>2</sup>	kg
FLS 80 L	0.18	710	2.5	0.8	0.64	52.3	3	1.6	1.6	0.5	0.0031	14
FLS 80 L	0.25	720	3.4	1.1	0.6	54.5	3.2	2	2.3	0.8	0.0041	16
FLS 90 S	0.37	685	5	1.2	0.71	64	3.5	1.7	1.7	0.9	0.0038	21
FLS 90 L	0.55	695	7.5	1.7	0.72	63	3.3	1.8	1.8	1.2	0.0047	23
FLS 100 LK	0.75	720	10	2.3	0.68	70.9	4.1	1.9	1.9	1.6	0.0085	41
FLS 100 LK	1.1	720	15	3.8	0.62	68	4.1	1.8	2.3	2.6	0.0117	43
FLS 112 M	1.5	725	20	4.8	0.63	72.5	4	2.1	2.2	3.3	0.015	45
FLS 132 S	2.2	715	30	7.2	0.6	74	3.2	1.4	1.8	5	0.0253	71
FLS 132 M	3	705	40	9.1	0.63	76	3.1	1.3	1.9	6.3	0.0334	81
FLS 160 MA	4	710	54	11.3	0.63	81.5	3.8	1.4	1.7	7.8	0.062	105
FLS 160 MB	5.5	710	74	15	0.65	82	3.8	1.4	1.7	10.4	0.071	111
FLS 160 L	7.5	715	100	20	0.65	83	3.8	1.5	1.8	14	0.086	128
FLS 180 L	11	724	147	27	0.7	85.1	3.9	1.4	1.7	19	0.21	175
FLS 200 L	15	729	196	34	0.72	88.1	5	1.8	2.6	24	0.32	265
FLS 225 ST	18.5	727	242	41	0.73	89	5	1.6	2.3	29	0.38	285
FLS 225 M	22	732	288	48	0.72	92.1	5.9	1.8	2.5	33	0.83	388
FLS 250 M	30	729	393	61	0.78	91.2	6.2	1.8	2.5	42	0.83	393
FLS 280 S	37	723	487	75	0.78	92	4.5	1.3	1.8	52	1.4	472
FLS 280 M	45	730	592	102	0.7	91.7	6	2.3	3.2	70	1.75	563
FLS 315 ST	55	738	715	102	0.83	94.2	7.4	2.1	3	71	2.7	850
FLS 315 M	75	743	972	147	0.78	94.8	7.4	2	2.2	102	3.1	1000
FLS 315 LA	90	742	1169	177	0.78	94.7	6.7	1.9	2.1	122	4.2	1030
FLS 315 LB	110	742	1420	222	0.76	94.8	7.2	2	2.2	153	5.1	1125
FLS 355 LA	132	741	1704	258	0.78	95.3	6.7	2	2.2	179	5.5	1415
FLS 355 LB	160	741	2065	312	0.78	95.3	6.9	2	2.2	216	6	1535
FLS 355 LD	200	741	2581	364	0.84	95	6.7	1.6	1.7	252	6.5	1935
FLS 355 LKA	250	743	3235	464	0.82	95.3	6.8	1.6	2.2	322	18.5	2170
FLS 400 LA	250	743	3235	464	0.82	95.3	6.8	1.6	2.2	322	18.5	2200
FLS 355 LKB	300	741	3882	552	0.83	95	6	1.1	1.5	382	21.6	2370
FLS 400 LB	300	741	3882	552	0.83	95	6	1.1	1.5	382	21.6	2400
FLS 400 LKA	350	746	4500	652	0.81	96.2	6.2	1.7	1.4	452	40	3100
FLS 450 LA	350	746	4500	652	0.81	96.2	6.2	1.7	1.4	452	40	3150
FLS 400 LKB	400	746	5148	737	0.82	96.1	6.7	1.9	1.6	510	47	3420
FLS 450 LB	400	746	5148	737	0.82	96.1	6.7	1.9	1.6	510	47	3470

Δ 400 V mains supply only.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

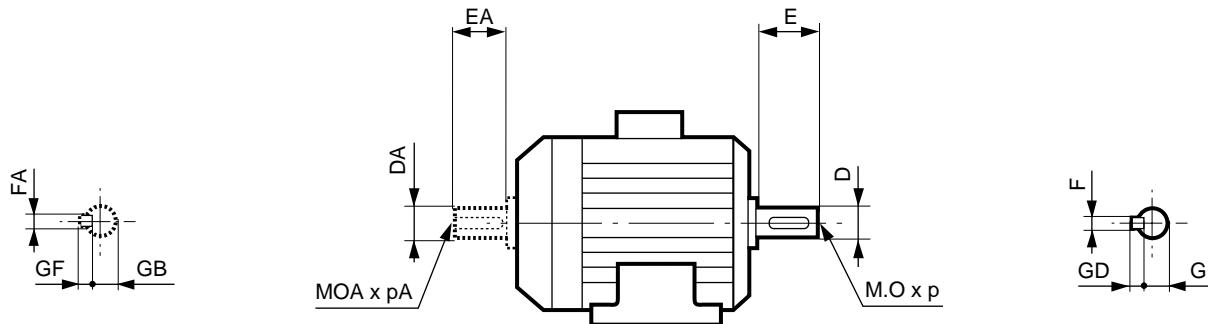
CATEGORY 3  
ZONE 22  
Non-conductive dust

## E3 - Dimensions

### Dimensions of FLS 3-phase motors Cage rotor

Dimensions in millimetres

#### – Shaft extensions



Type	Main shaft extensions							2 poles						
	F	GD	D	G	E	O	p	F	GD	D	G	E	O	p
FLS 80 L	6	6	19j6	15.5	40	6	16	6	6	19j6	15.5	40	6	16
FLS 90 S/L	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
FLS 100 LK	8	7	28j6	24	60	10	22	8	7	28j6	24	60	10	22
FLS 112 M	8	7	28j6	24	60	10	22	8	7	28j6	24	60	10	22
FLS 132 S/M/MR	10	8	38k6	33	80	12	28	10	8	38k6	33	80	12	28
FLS 160 M/L	12	8	42k6	37	110	16	36	12	8	42k6	37	110	16	36
FLS 180 MR/L	14	9	48k6	42.5	110	16	36	14	9	48k6	42.5	110	16	36
FLS 200 L	16	10	55m6	49	110	20	42	16	10	55m6	49	110	20	42
FLS 225 ST/MT/M	18	11	60m6	53	140	20	42	16	10	55m6	49	110	20	42
FLS 250 M	18	11	65m6	58	140	20	42	18	11	60m6	53	140	20	42
FLS 280 S/M	20	12	75m6	67.5	140	20	42	18	11	65m6	58	140	20	42
FLS 315 ST	22	14	80m6	71	170	20	42	18	11	65m6	58	140	20	42
FLS 315 M	22	14	80m6	71	170	20	42	18	11	65m6	58	140	20	42
FLS 315 L	25	14	90m6	81	170	24	50	20	12	70m6	62.5	140	20	42
FLS 355 L/LK	28	16	100m6	90	210	24	50	22	14	80m6	71	170	20	42
FLS 400 L/LK/LV	28	16	110m6	100	210	24	50	-	-	-	-	-	-	-
FLS 450 L/LV	32	18	120m6	109	210	24	50	-	-	-	-	-	-	-

Type	Secondary shaft extensions							2 poles						
	FA	GF	DA	GB	EA	OA	pA	FA	GF	DA	GB	EA	OA	pA
FLS 80 L	5	5	14j6	11	30	5	15	5	5	14j6	11	30	5	15
FLS 90 S/L	6	6	19j6	15.5	40	6	16	6	6	19j6	15.5	40	6	16
FLS 100 LK	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
FLS 112 M	8	7	24j6	20	50	8	19	8	7	24j6	20	50	8	19
FLS 132 S/M/MR	8	7	28j6	24	60	10	22	8	7	28j6	24	60	10	22
FLS 160 M/L	12	8	42k6	37	110	16	36	12	8	42k6	37	110	16	36
FLS 180 MR/L	14	9	48k6	42.5	110	16	36	14	9	48k6	42.5	110	16	36
FLS 200 L	16	10	55m6	49	110	20	42	16	10	55m6	49	110	20	42
FLS 225 ST/MT/M	18	11	60m6	53	140	20	42	16	10	55m6	49	110	20	42
FLS 250 M	18	11	65m6	58	140	20	42	18	11	60m6	53	140	20	42
FLS 280 S/M	20	12	70m6	53	140	20	42	18	11	60m6	58	140	20	42
FLS 315 ST	22	14	80m6	71	170	20	42	18	11	65m6	58	140	20	42
FLS 315 M	22	14	80m6	71	170	20	42	18	11	65m6	58	140	20	42
FLS 315 L	25	14	90m6	81	170	24	50	20	12	70m6	62.5	140	20	42
FLS 355 L/LK	28	16	100m6	90	210	24	50	22	14	80m6	71	170	20	42
FLS 400 L/LK/LV	28	16	110m6	100	210	24	50	-	-	-	-	-	-	-
FLS 450 L/LV	32	18	120m6	109	210	24	50	-	-	-	-	-	-	-



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

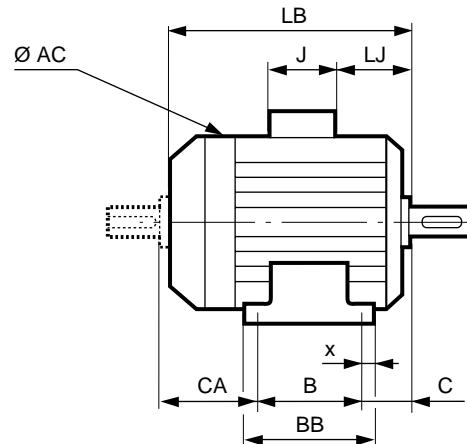
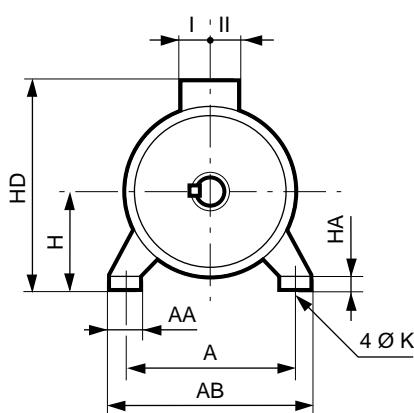
CATEGORY 3  
ZONE 22  
Non-conductive dust

## E3 - Dimensions

Dimensions of FLS 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot mounted 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
FLS 80 L	125	157	100	130	50	20	32	9	10	80	160	222	214	33	114	57	57	68
FLS 90 S	140	172	100	160	56	22	34	10	11	90	185	247	243	28	114	57	57	93
FLS 90 L	140	172	125	160	56	22	34	10	11	90	185	247	243	28	114	57	57	68
FLS 100 LK	160	200	140	174	63	22	42	12	12	100	226	276	323	55	114	57	57	125
FLS 112 M	190	230	140	174	70	22	45	12	12	112	226	288	323	55	114	57	57	119
FLS 112 MR	190	230	140	174	70	22	45	12	12	112	226	288	344	55	114	57	57	142
FLS 132 S	216	255	140	223	89	31	58	12	15	132	264	323	387	46	114	57	57	164
FLS 132 M	216	255	178	223	89	31	58	12	15	132	264	323	387	46	114	57	57	126
FLS 132 MR	216	255	178	223	89	31	58	12	15	132	264	323	410	46	114	57	57	149
FLS 160 M	254	294	210	294	108	20	65	14	24	160	310	385	495	50	160	80	80	182
FLS 160 L	254	294	254	294	108	20	65	14	24	160	310	385	495	50	160	80	80	138
FLS 180 MR	279	324	241	295	121	25	80	14	28	180	310	405	515	50	160	80	80	158
FLS 180 L	279	330	279	335	121	25	68	14	40	180	350	460	555	55	220	128	128	160
FLS 200 L	318	374	305	361	133	28	80	18	50	200	394	515	681	65	220	128	128	248
FLS 225 ST	356	420	286	367	149	28	100	18	35	225	394	540	681	65	220	128	128	251
FLS 225 MT	356	420	311	367	149	28	100	18	35	225	394	540	681	65	220	128	128	226
FLS 225 M	356	426	311	375	149	32	80	18	27	225	540	656	780	70	352	173	210	326
FLS 250 M	406	476	349	413	168	32	80	22	27	250	540	681	780	70	352	173	210	269
FLS 280 S	457	527	368	432	190	32	80	22	27	280	540	711	860	70	352	173	210	302
FLS 280 M	457	527	419	483	190	32	80	22	27	280	540	711	960	70	352	173	210	357
FLS 315 ST	508	598	406	547	216	45	90	27	45	315	556	755	1068	107	274	140	240	452
FLS 315 M	508	600	457	598	216	45	100	27	45	315	624	822	1203	119	354	180	330	536
FLS 315 L	508	600	508	598	216	45	100	27	45	315	624	822	1203	119	354	180	330	485
FLS 355 LA/LB	610	710	630	710	254	40	110	27	35	355	700	900	1305	110	354	180	330	427
FLS 355 LC/LD	610	710	630	710	254	40	110	27	35	355	700	900	1430	110	354	180	330	552
FLS 355 LK	610	750	630	815	254	40	128	27	45	355	787	1135	1687	70	625	205	355	813
FLS 400 L/LV	686	800	710	815	280	65	128	35	45	400	787	1180	1687	70	625	205	355	707
FLS 400 LKA/LKB	686	824	800	950	280	59	140	35	45	400	877	1230	1835	105	625	205	355	765
FLS 450 L/LV	750	890	800	950	315	94	140	35	45	450	877	1280	1835	105	625	205	355	730



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

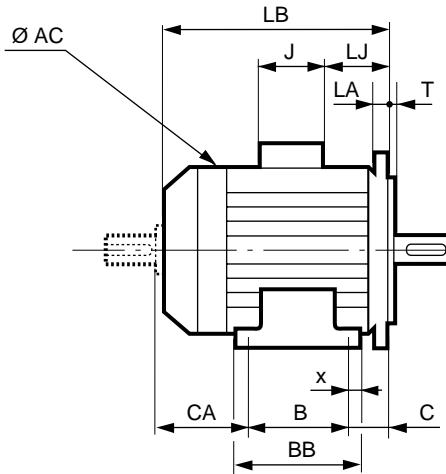
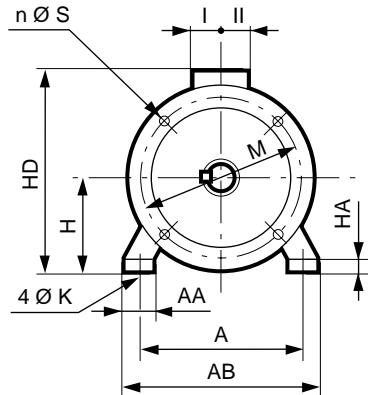
CATEGORY 3  
ZONE 22  
Non-conductive dust

## E3 - Dimensions

Dimensions of FLS 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot and flange mounted IM B35 (IM 2001)



Type	Main dimensions																
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	I	II
FLS 80 L	125	157	100	130	50	20	32	9	10	80	160	222	214	33	114	57	57 FF 165
FLS 90 S	140	172	100	160	76	22	34	10	11	90	185	247	263	48	114	57	57 FF 165
FLS 90 L	140	172	125	160	76	22	34	10	11	90	185	247	263	48	114	57	57 FF 165
FLS 100 LK	160	200	140	174	63	22	42	12	12	100	226	276	323	55	114	57	57 FF 215
FLS 112 M	190	230	140	174	70	22	45	12	12	112	226	288	323	55	114	57	57 FF 215
FLS 112 MR	190	230	140	174	70	22	45	12	12	112	226	288	344	55	114	57	57 FF 215
FLS 132 S	216	255	140	223	89	31	58	12	15	132	264	323	387	46	114	57	57 FF 265
FLS 132 M	216	255	178	223	89	31	58	12	15	132	264	323	387	46	114	57	57 FF 265
FLS 132 MR	216	255	178	223	89	31	58	12	15	132	264	323	410	46	114	57	57 FF 265
FLS 160 M	254	294	210	294	108	20	65	14	24	160	310	385	495	50	160	80	80 FF 300
FLS 160 L	254	294	254	294	108	20	65	14	24	160	310	385	495	50	160	80	80 FF 300
FLS 180 MR	279	324	241	295	121	25	80	14	28	180	310	405	515	50	160	80	80 FF 300
FLS 180 L	279	330	279	335	121	25	68	14	40	180	350	460	555	55	220	128	128 FF 300
FLS 200 L	318	374	305	361	133	28	80	18	50	200	394	515	681	65	220	128	128 FF 350
FLS 225 ST	356	420	286	367	149	28	100	18	35	225	394	540	681	65	220	128	128 FF 400
FLS 225 MT	356	420	311	367	149	28	100	18	35	225	394	540	681	65	220	128	128 FF 400
FLS 225 M	356	426	311	375	149	32	80	18	27	225	540	656	780	70	352	173	210 FF 400
FLS 250 M	406	476	349	413	168	32	80	22	27	250	540	681	780	70	352	173	210 FF 500
FLS 280 S	457	527	368	432	190	32	80	22	27	280	540	711	860	70	352	173	210 FF 500
FLS 280 M	457	527	419	483	190	32	80	22	27	280	540	711	960	70	352	173	210 FF 500
FLS 315 ST	508	598	406	547	216	45	90	27	45	315	556	755	1068	107	274	140	240 FF 600
FLS 315 M	508	600	457	598	216	45	100	27	45	315	624	822	1203	119	354	180	330 FF 600
FLS 315 L	508	600	508	598	216	45	100	27	45	315	624	822	1203	119	354	180	330 FF 600
FLS 355 LA/LB	610	710	630	710	254	40	110	27	35	355	700	900	1305	110	354	180	330 FF 740
FLS 355 LC/LD	610	710	630	710	254	40	110	27	35	355	700	900	1430	110	354	180	330 FF 740
FLS 355 LK	610	750	630	815	254	40	128	27	45	355	787	1135	1687	70	625	205	355 FF 740
FLS 400 L/LV	686	800	710	815	280	65	128	35	45	400	787	1180	1687	70	625	205	355 FF 940
FLS 400 LKA/LKB	686	824	800	950	280	59	140	35	45	400	877	1230	1835	105	625	205	355 FF 940
FLS 450 L/LV	750	890	800	950	315	94	140	35	45	450	877	1280	1835	105	625	205	355 FF 1080

Dimensions of CA and shaft extensions: see pages 52 and 53.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

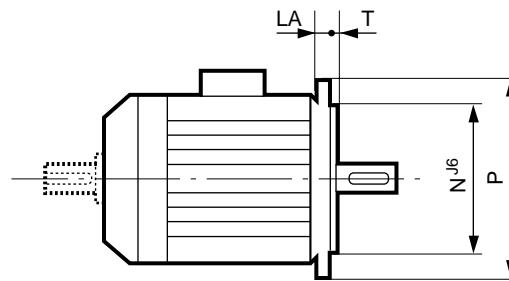
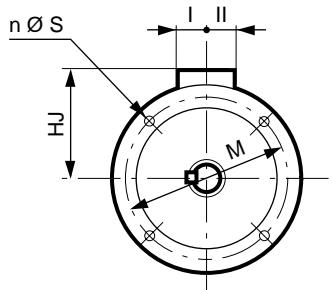
CATEGORY 3  
ZONE 22  
Non-conductive dust

## E3 - Dimensions

Dimensions of FLS 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Flange mounted 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 215	215	180	250	4	4	15	12
FF 215	215	180	250	4	4	15	12
FF 215	215	180	150	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
FF 300	300	250	350	5	4	18	15
FF 300	300	250	350	5	4	18	15
FF 300	300	250	350	5	4	18	15
FF 300	300	250	350	5	4	18	15
FF 350	350	300	400	5	4	18	15
FF 400	400	350	450	5	8	18	16
FF 400	400	350	450	5	8	18	16
FF 400	400	350	450	5	8	18	16
FF 500	500	450	550	5	8	18	18 <sup>1</sup>
FF 500	500	450	550	5	8	18	18 <sup>1</sup>
FF 500	500	450	550	5	8	18	18 <sup>1</sup>
FF 600	600	550	660	6	8	22	25
FF 600	600	550	660	6	8	22	25
FF 600	600	550	660	6	8	22	25
FF 740	740	680	800	6	8	22	25
FF 740	740	680	800	6	8	22	25
FF 740	740	680	800	6	8	22	25
FF 940	940	880	1000	6	8	28	28
FF 940	940	880	1000	6	8	28	30
FF 1080	1080	1000	1150	6	8	28	30

1. LA = 22 for frame sizes  $\geq 280$ .

FF flange mounted motors, in position IM 3001 (IM B5), are only available up to frame size 225.

Dimensions of shaft extensions: see page 52.

Type	Main dimensions						
	AC	LB	HJ	LJ	J	I	II
FLS 80 L	160	214	142	33	114	57	57
FLS 90 S	185	263	153	48	114	57	57
FLS 90 L	185	263	153	48	114	57	57
FLS 100 LK	226	323	176	55	114	57	57
FLS 112 M	226	323	176	55	114	57	57
FLS 112 MR	226	344	176	55	114	57	57
FLS 132 S	264	387	195	46	114	57	57
FLS 132 M	264	387	195	46	114	57	57
FLS 132 MR	264	410	195	46	114	57	57
FLS 160 M	310	495	225	50	160	80	80
FLS 160 L	310	495	225	50	160	80	80
FLS 180 MR	310	515	225	50	160	80	80
FLS 180 L	350	555	280	55	220	128	128
FLS 200 L	394	681	315	65	220	128	128
FLS 225 ST	394	681	315	65	220	128	128
FLS 225 MT	394	681	315	65	220	128	128
FLS 225 M	540	780	431	70	352	173	210
FLS 250 M	540	780	431	70	352	173	210
FLS 280 S	540	860	431	70	352	173	210
FLS 280 M	540	960	431	70	352	173	210
FLS 315 ST	556	1068	440	107	274	140	240
FLS 315 M	624	1203	507	119	354	180	330
FLS 315 L	624	1203	507	119	354	180	330
FLS 355 LA/LB	700	1305	545	110	354	180	330
FLS 355 LC/LD	700	1430	545	110	354	180	330
FLS 355 LK	787	1687	780	70	625	205	355
FLS 400 L/LV	787	1687	780	70	625	205	355
FLS 400 LKA/LKB	877	1835	830	105	625	205	355
FLS 450 L/LV	877	1835	830	105	625	205	355



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

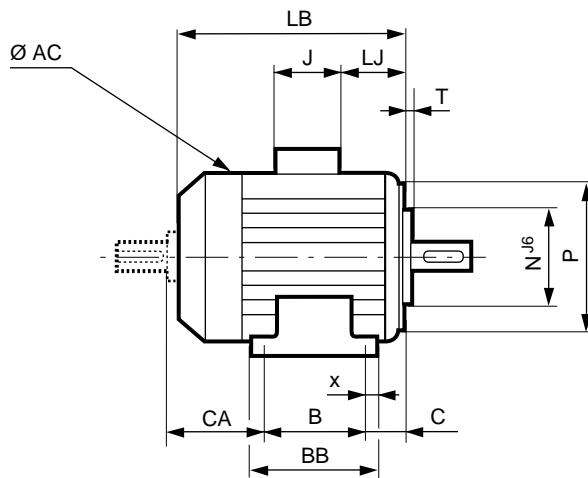
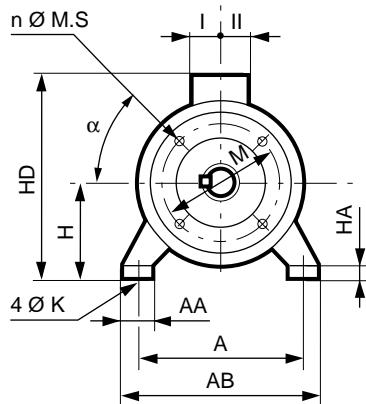
CATEGORY 3  
ZONE 22  
Non-conductive dust

## E3 - Dimensions

Dimensions of FLS 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Foot and face mounted IM B34 (IM 2101)



Type	Main dimensions																
	A	AB	B	BB	C	X	AA	K	HA	H	AC	HD	LB	LJ	J	II	Sym.
FLS 80 L	125	157	100	130	50	20	32	9	10	80	160	230	214	27	114	57	57 FT 100
FLS 90 S	140	172	100	160	56	22	34	10	11	90	185	250	243	42	114	57	57 FT 115
FLS 90 L	140	172	125	160	56	22	34	10	11	90	185	250	243	42	114	57	57 FT 115
FLS 100 LK	160	200	140	174	63	22	42	12	12	100	226	293	323	37	114	57	57 FT 130
FLS 112 M	190	230	140	174	70	22	45	12	12	112	226	305	323	37	114	57	57 FT 130
FLS 112 MR	190	230	140	174	70	22	45	12	12	112	226	305	344	37	114	57	57 FT 130
FLS 132 S	216	255	140	223	89	31	58	12	15	132	264	345	387	28	114	57	57 FT 215
FLS 132 M	216	255	178	223	89	31	58	12	15	132	264	345	387	28	114	57	57 FT 215
FLS 132 MR	216	255	178	223	89	31	58	12	15	132	264	345	410	28	114	57	57 FT 215

Dimensions of CA and shaft extensions: see pages 52 and 53.



# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

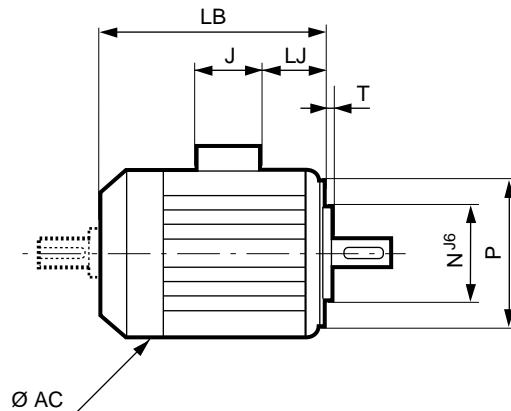
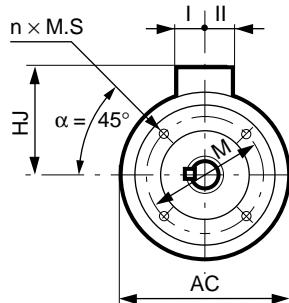
CATEGORY 3  
ZONE 22  
Non-conductive dust

## E3 - Dimensions

Dimensions of FLS 3-phase motors  
Cage rotor

Dimensions in millimetres

### – Face mounted IM B14 (IM 3601)



Faceplate dimensions						
IEC symbol	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

Main dimensions							
Type	AC	LB	HJ	LJ	J	I	II
FLS 80 L	160	214	142	33	114	57	57
FLS 90 S	185	243	153	28	114	57	57
FLS 90 L	185	243	153	28	114	57	57
FLS 100 LK	226	323	176	55	114	57	57
FLS 112 M	226	323	176	55	114	57	57
FLS 112 MR	226	344	176	55	114	57	57
FLS 132 S	264	387	195	46	114	57	57
FLS 132 M	264	387	195	46	114	57	57
FLS 132 MR	264	410	195	46	114	57	57

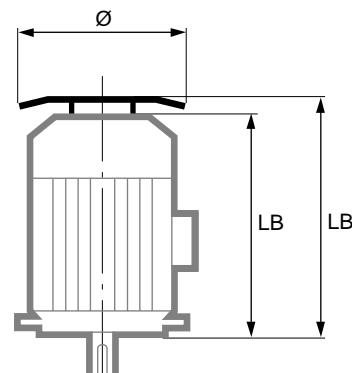
Dimensions of shaft extensions: see page 52.

## Drip covers

Dimensions in millimetres

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

Frame size	LB'	Ø
80	LB + 20	145
90 and 100	LB + 20	185
112 M	LB + 20	185
112 MR	LB + 25	210
132	LB + 30	240
160 and 180 MR	LB + 60	320
180 L	LB + 60	360
200 L	LB + 75	400
225 ST/MT	LB + 75	400
225 M and 250 M	LB + 130	420
280 and 315	LB + 130	420
355 L	LB + 135	500
355 LK/400/450	LB + 160	650





# 3-phase TEFV induction motors

## Potentially explosive dusty atmospheres

### FLS dust option

## E3 - Dimensions

CATEGORY 3  
ZONE 22  
Non-conductive dust

- Cable gland for rated supply voltage of 400 V

Frame size	Single-speed motor		Two-speed motor		Cable gland for accessories: PTO / PTF / ...
	D.O.L. starting	YΔ starting	2 windings	1 winding	
80	ISO 20	-	2 x ISO 20	ISO 20	ISO 16
90	ISO 20	-	2 x ISO 20	ISO 20	ISO 16
100 LK	ISO 20	ISO 20	2 x ISO 20	ISO 20	ISO 16
112 / 132 S	ISO 20	ISO 20	2 x ISO 20	ISO 20	ISO 16
132 M	ISO 25	ISO 25	2 x ISO 25	ISO 25	ISO 16
160 / 180 MR	1 x ISO 25	2 x ISO 25	2 x ISO 25	2 x ISO 25	ISO 16
180	1 x ISO 32	2 x ISO 32	2 x ISO 32	2 x ISO 32	ISO 16
200	1 x ISO 32	2 x ISO 32	2 x ISO 32	2 x ISO 32	ISO 16
225 ST/MT	1 x ISO 40	2 x ISO 40	2 x ISO 40	2 x ISO 40	ISO 16
225 M / 250 / 280	Motors supplied with an undrilled cable gland mounting plate, without nozzle or cable gland <sup>1</sup>				ISO 16
315 to 355 LD	Motors supplied with an undrilled cable gland mounting plate, without nozzle or cable gland <sup>1</sup>				ISO 16
355 LK to 450	Motors supplied with an undrilled cable gland mounting plate, without nozzle or cable gland <sup>1</sup>				ISO 16

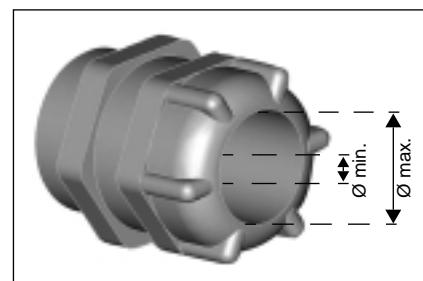
- standard cable gland material: polyamide 6/6 up to and including size 250.

- on request, special brass or stainless steel cable glands can be fitted.

1. For frame sizes 225 M to 450, the cable gland mounting plates are supplied without cable glands or drill holes. In order to receive them with drill holes and fitted with cable glands if required, you should specify the number of cables, their diameter and the type of cable gland required on your order.

### Tightening capacity of cable glands (NFC 68 311 and 312 standards)

Type of cable gland	Min. cable Ø - Max. cable Ø (mm)	
	Polyamide cable gland	Brass cable gland
ISO 16	6 - 10	5.5 - 9.5
ISO 20	10 - 15	8.5 - 13
ISO 25	13 - 19	12 - 17
ISO 32	17 - 25	15 - 22
ISO 40	24 - 32	19.5 - 28





# Geared motors Potentially explosive dusty atmospheres

## F - Options

### F1 - Variable speed operation

#### Essential thermal protection

- In the windings: up to frame size 160.
- In the windings and bearings: for frame size  $\geq 160$ .

#### Built-in indirect thermal protection

Type	Operating principle
Thermistor with positive temperature coefficient PTC	Variable non-linear resistance to indirect heating
Thermocouples $T$ ( $T < 150$ °C) – Constantan copper $T$ ( $T < 1000$ °C) – Nickel-copper copper	Peltier effect
Platinum resistance thermometer PT 100	Variable linear resistance to indirect heating

\* Frame sizes 132 and 160: please consult Leroy-Somer.

#### Forced ventilation

- With LSPX and FLSPX motors (zone 21) for frame sizes\*  $\geq 132$  M.
- Standard construction in zone 22.  
(Non-conductive dust)



#### Encoder

- Protection  $\geq$  IP6X and marked temperature.



### F2 - VARMECA MOTORS

**Zone 21:**  $71 \leq$  motors with frame size  $\leq 112$ .

**Zone 22:**  $71 \leq$  motors with frame size  $\leq 160$ .



F

### F3 - Brake motors\*

#### FAP brake

**Zone 21:**  $80 \leq$  motors with frame size  $\leq 180$ .

**Zone 22:**  $71 \leq$  motors with frame size  $\leq 200$ .



#### FCR brake

**Zone 21:**  $71 \leq$  motors with frame size  $\leq 112$ .

**Zone 22:**  $71 \leq$  motors with frame size  $\leq 132$ .



#### Auxiliary terminal boxes for frame size $\geq 160$

- Connection of probes or space heaters (on request) for FLS and FLSPX motors.

\* All these motors are also available in a VARMECA version.



# 3-phase induction motors Potentially explosive dusty atmospheres

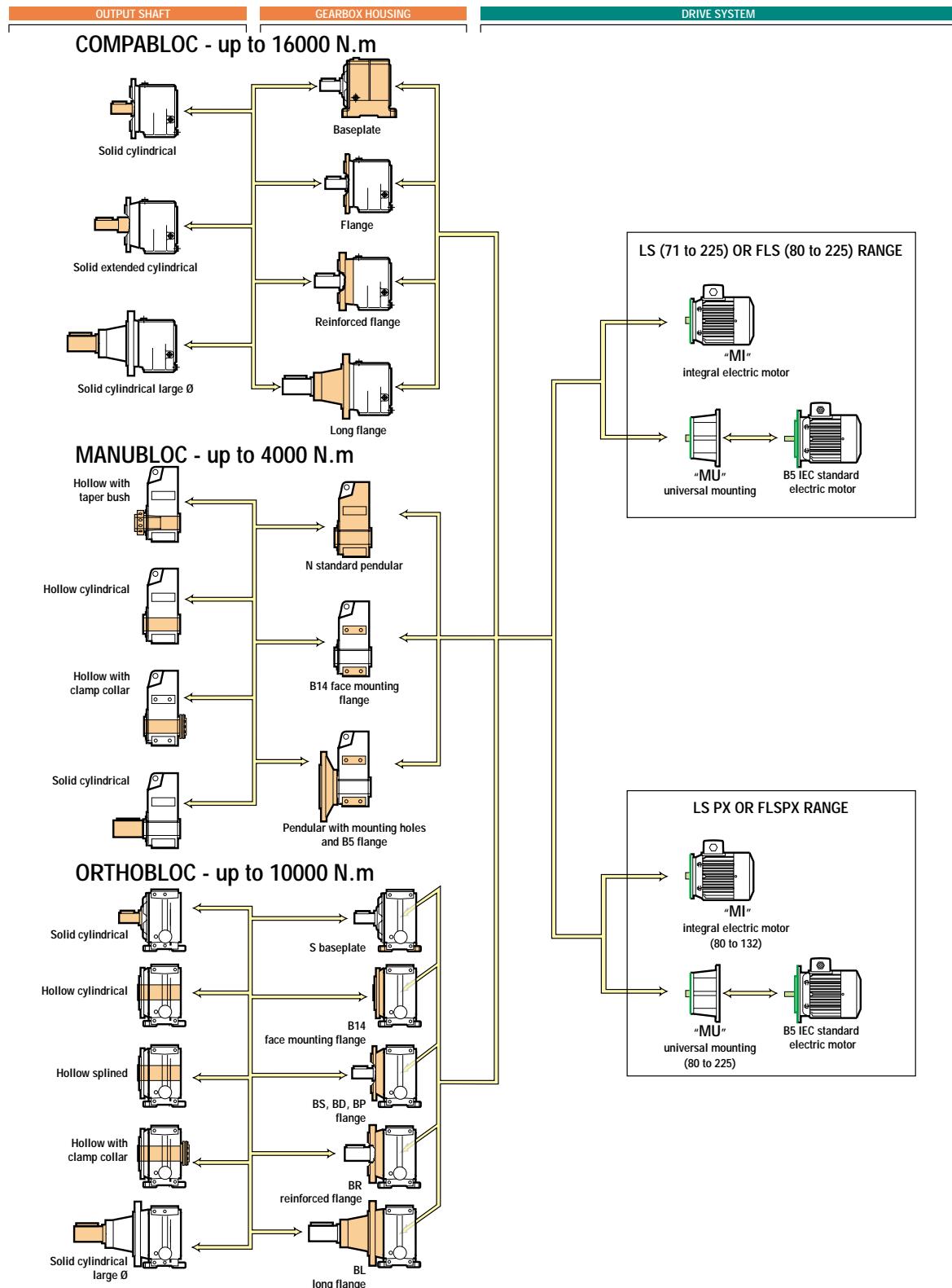
## G - Adaptation with gearboxes

ZONES 21 22

The Leroy-Somer ranges of geared motors and gearboxes are suitable for use in dusty atmospheres with motors with a customised finish (LS, FLS, LSPX, FLSPX, FAP and FCR brakes, etc).

The modularity of our gearboxes also means that they can be adapted for use in all configurations of machines to be driven.

This table is by no means exhaustive. For other types of operation or even gearboxes (worm and wheel, planetary), please consult Leroy-Somer's technical specialists who will be pleased to help.





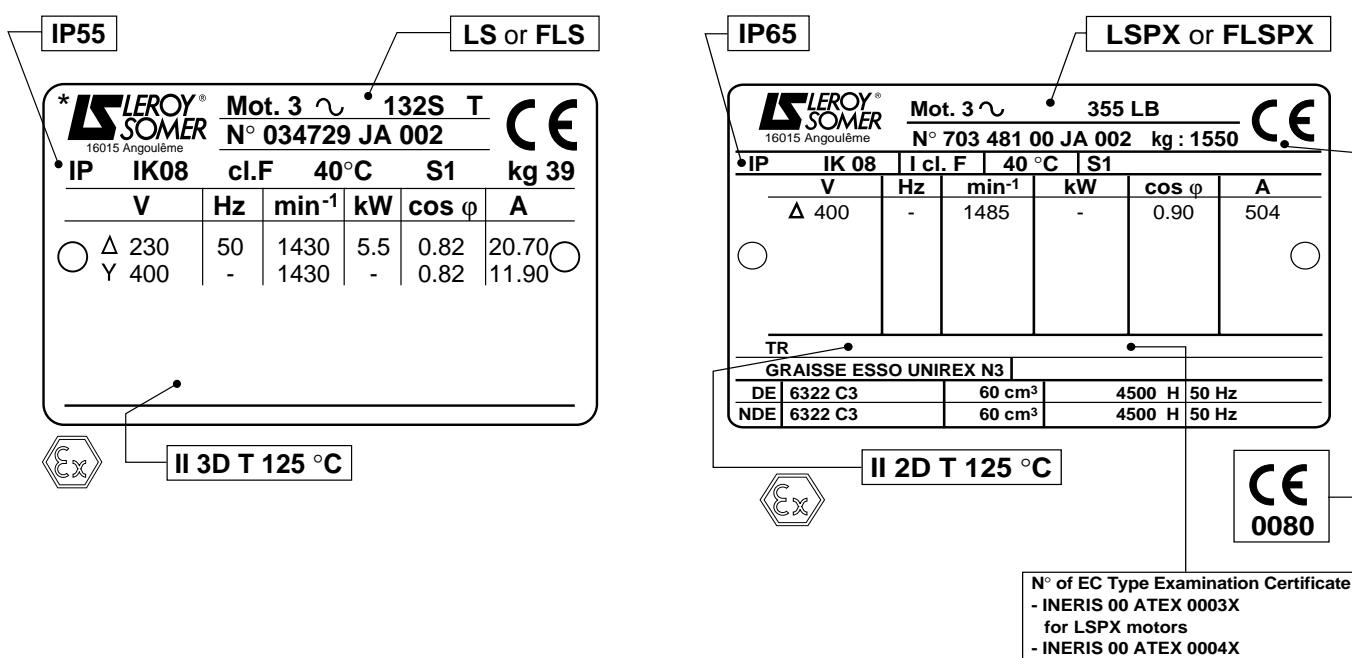
# 3-phase induction motors

## Potentially explosive dusty atmospheres

### Installation and Maintenance

## H - Identification

### Identification plates and legend



### ▼ Definition of symbols used on nameplates



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

#### ATEX special marking:

0080 : INERIS (Notified Body) identification number

: Special marking

II 2D : Group II, category 2, dust:

II 3D : Group II, category 3, dust

T max : Maximum surface temperature: 125 °C, for example

Ta : Ambient temperature: [- 25 °C; 40 °C], for example

Certificate No. : EC type-examination certificate number awarded by INERIS

Other : Additional marking relating to EC certification.

#### Motor

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

LS-FLS

LSPX-FLSPX : Series

132-355 : Frame size

S-LB : Housing symbol

T-TR : Impregnation index

N : Motor batch number

for motor types 80 to 355:

J\* : Year of production

A\*\* : Month of production

002 : Serial number

#### IP55-IK08

IP65-IK08 : Protection indices

(I) cl. F : Class F insulation

40 °C : Ambient operating temperature

S : Duty

% : Operating factor

...d/h : Number of cycles per hour

kg : Weight

V : Supply voltage

Hz : Supply frequency

min⁻¹ : Revolutions per minute (rpm)

kW : Rated output power

cos j : Power factor

A : Rated current

D : Delta connection

U : Star connection

#### Bearings

DE : Drive end bearing

NDE : Non drive end bearing

60 cm³ : Amount of grease at each greasing (in cm³)

4500 H : Regreasing interval (in hours) for θ amb indicated at a frequency of 50 Hz

UNIREX N3: Type of grease

\* J = 1999, K = 2000

\*\* A = January, B = February



# 3-phase induction motors

## Potentially explosive dusty atmospheres

### Installation and Maintenance

## I - Documentation - Manuals

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

**LSPX - FLSPX**

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

Moteurs asynchrones triphasés pour atmosphères explosives poussiéreuses Recommandations spécifiques de mise en service et d'entretien

3-phase induction motors for atmospheres containing explosive dust Specific recommendations for commissioning and maintenance

3385 - 07.2003 / b

CE

- Recommandations spécifiques de mise en service et d'entretien ..... 2
- Specific recommendations for commissioning and maintenance ..... 3
- Spezifische Empfehlungen für Inbetriebnahme und Wartung ..... 4
- Recomendaciones específicas de puesta en marcha y mantenimiento ..... 5
- Raccomandazioni specifiche di messa in servizio e di manutenzione ordinaria ..... 6
- Recomendações específicas de colocação em serviço e de manutenção ordinária ..... 7
- Raad voor de inbedrijfstelling en het onderhoud ..... 8
- Specifika rekommendationer för driftstart och för ordinärt underhåll ..... 9
- Særlige anbefalinger i forbindelse med driftsættele og vedligeholdelse ..... 10
- Käytönoton ja huollon erikoissuositukset ..... 11
- Igangsetting og vedlikeholds rutiner ..... 12
- ΕΙΔΙΚΕΣ ΟΔΗΓΙΕΣ ΓΙΑ ΤΗΝ ΘΕΣΗ ΣΕ ΛΕΙΤΟΥΡΓΙΑ ΚΑΙ ΤΗΝ ΣΥΝΤΗΡΗΣΗ ..... 13
- ..... 1

LEROY® SOMER

**LEROY® SOMER**

**EC DECLARATION OF CONFORMITY AND INCORPORATION (F)FLSPX (FAP) motor**

This document is a complement to the installation and maintenance manual ref. 1889 and the general manual ref. 3255.

Our motors have degree of protection IP 65/IK 08 minimum and we can guarantee their surface temperature. They are designed for use in group II atmospheres containing explosive dust - category 2 (zone 21) or category 3 (IP 55 - zone 22).

Before commissioning:

Ensure compatibility of the information on the motor nameplate with the actual explosive atmosphere, the operating zone and the ambient and surface temperatures.

Remove all dust from the machine.

Before commissioning, and then at least every 6 months, drain any condensation from inside the motor by opening the drain plugs at the bottom of the casing. Clean the drain holes and the plugs. Refit the plugs and replace the seals to ensure IP 65 protection.

The maximum storage period is 3 years. After this time, replace the bearings and the seals on the spigots and shaft passages.

Earthing is compulsory and must be performed in accordance with current regulations.

Connect the shield sensor, if supplied.

To maintain the motor's original IP65 degree of protection, it is essential to make a watertight seal between the rubber ring and the cable, by correctly tightening the cable gland so that it is not possible to unscrew it without a tool. Unscrewed cable entries and unused drain holes should be fitted with a threaded plug. When fitting cable glands or blocking holes, a seal of perbunan, or silicon or polyurethane mastic, should be inserted between the cable entries, the plugs, or the reducers and (and) the amplifiers and the support or the terminal box. For connections using screwed conduit entries, a minimum of 5 cylindrical threads or 3 tapered threads must be engaged. These threads must be rendered watertight by using either polyurethane or silicon mastic, or anti-vibration adhesive.

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.

Each time the motor is dismantled and at least once a year, replace the seals on the shaft passages, the shield spigots and the terminal box cover, with new seals of the same type after cleaning all parts. The seals on the shaft passages should be fitted with the same type of grease as on the bearings.

If space heaters are used, they should only be switched on when the motor is cold and at a standstill.

The motors, supplied by an independent frequency regulator, must be fitted with a winding probe, a probe for the front bearing for the HA > 160s, and possibly a probe for the rear bearing. In all cases, the probes must be connected to a device de-energizing the motor so that the maximum surface temperature indicated on the appliance is never reached.

The supply voltage must comply with that mentioned on the motor identification plate.

The VARMEECA integrated inverters are preset in compliance with selection guide ref. 3267. Any modification of the adjustments must be performed by authorized personnel.

When fitting sensor(s) (a vibration sensor for example), these should have IP 65 degree of protection minimum. They should be connected to the external circuit inside a box with at least IP 65 degree of protection or outside the danger zone (outside zones 20, 21 and 22).

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).

The machine should always be cleaned at reduced pressure from the centre of the motor towards the extremities to avoid introducing dust and particles under the seals.

Unless written authorisation has been obtained, the manufacturer cannot be held responsible for any action which could affect the motor's safe operation.

(for zone 21)  
(for zone 22) Conducting dust

EN 50281-1-1 &-2  
IEC 60034 - IEC 60072 - EN 60529  
73-23 EEC & 93-68 EEC  
94/9 /EC (decree 96-1010 dated 19-10-1996)  
ATEP 98 702-65 A dated 29-7-1998

for the LSPX series : INERIS 00ATEX0003 X  
for the FLSPX series : INERIS 00ATEX0004 X  
for the LSPX FAP series : INERIS 00ATEX0013 X  
for the FLSPX FAP series : INERIS 00ATEX0063

Under the responsibility of the notified body:  
**NERIS**

Machines subject to the application of the Machinery Directive and/or assembled in accordance with, 98/9 modified by Directives 92-31 EEC dated

Machines in which they are incorporated have  
regulations, laws, orders, directives, application  
at the installation site. LEROY-SOMER accepts no  
and/or controlled by electronic control or  
be responsible for ensuring that the  
installed are observed.

director :  
Q1T129 rev F dated 30/04/02

LEROY® SOMER

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.
  - Specific manual for 3-phase induction motors for explosive dusty atmospheres (2D and 3D).

**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.**

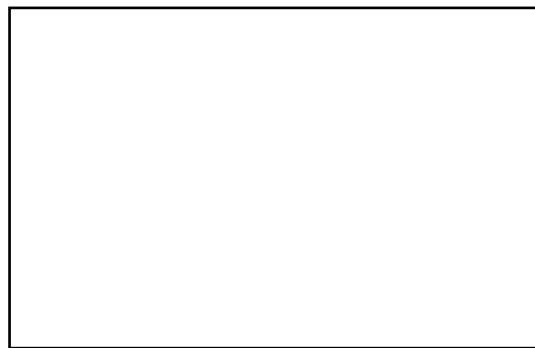


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