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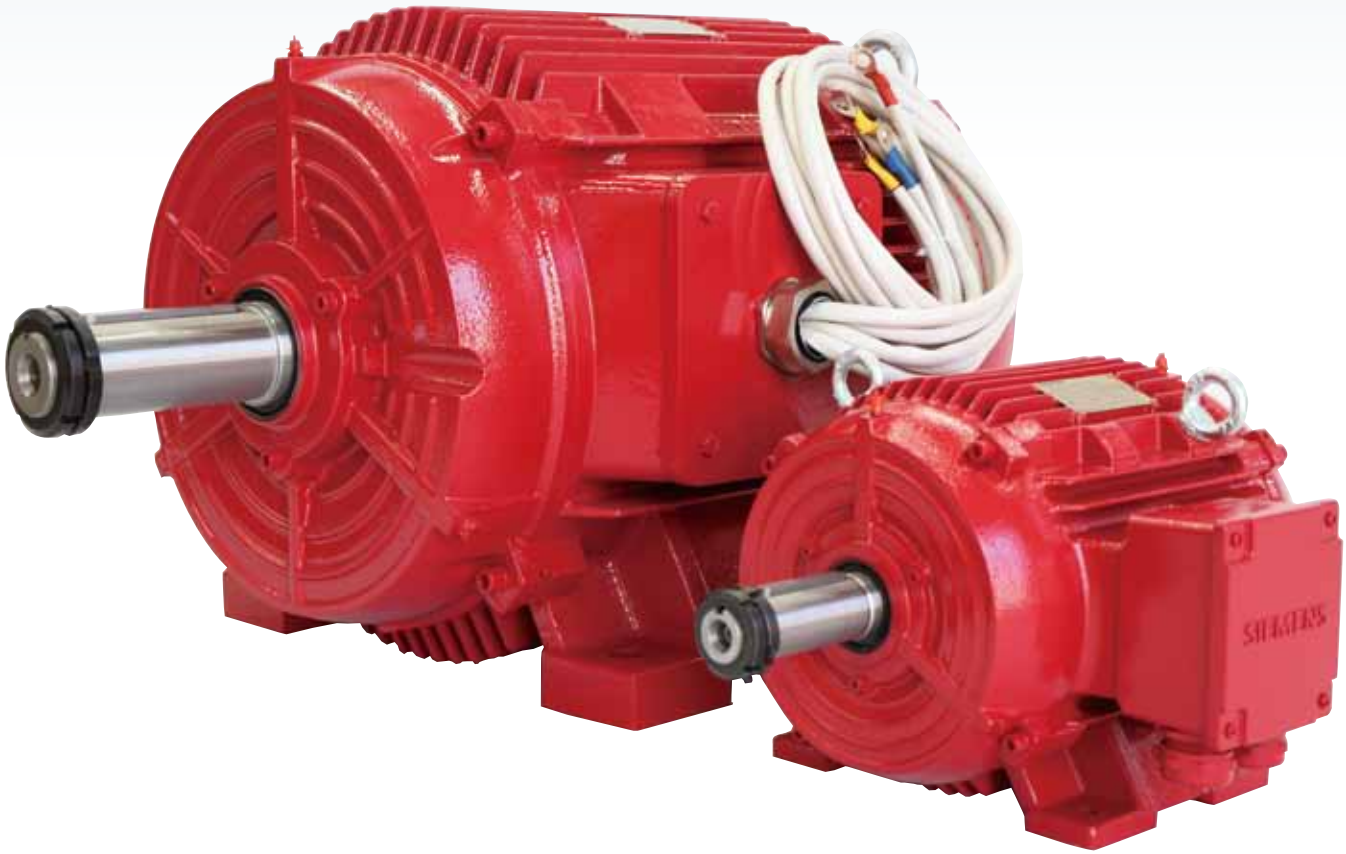

西门子低压排烟电机

Siemens Low-Voltage Smoke Extraction Motors

产品样本 • 01.2017

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总体介绍

西门子 1LE0 系列排烟电机是铸铁全封闭表面冷却式三相异步电动机，其防护等级为 IP55，1LE0 系列排烟电动机设计生产符合 ISO、IEC、GB 等相关标准的要求。采用 1LE0 系列排烟电机，最高可达国家二级能效标准（IE3）。在发生火灾时，电动机可以在 280°C 高温下，运行两个小时。

1LE0 系列排烟电机适用于连续工作制（S1）、恒转速或一定速度范围内的变频调速应用。
西门子 1LE0 系列排烟电机，可广泛应用于购物中心、封闭停车场、地铁、隧道和大型高层建筑等对消防安全要求较高的建筑内。一旦火灾发生，环境温度及烟雾等有害气体浓度将不断攀升，在高温状态下及时、高效、持续地排出浓烟和高温有害气体，将为减少生命财产损失和消防灭火赢得宝贵时间。

西门子 1LE0 系列排烟电机技术特性

- 机座材料：灰铸铁；
- 标准颜色：消防红；
- 额定功率：0.55kW~315kW (50Hz)
- 0.75kW 及以上的 2、4、6 极电动机最高可达到 GB18613-2012 标准能效等级 2 级，且 能满足 IEC 60034-30 标准中的 IE3 效率等级（50Hz）；
- 优化的紧凑型结构；
- 标准安装结构类型（符合 IEC 60034-7 标准规定）：IM B3、IM B5、IM B35 等；
- 所有的电动机设计防护等级为 IP55（IEC 60034-5）；
- FS[1] 132-355 标配再润滑装置；
- 出线口安装板标准位置处于机座右侧，装端式接头；

[1] FS，机座的英文（Frame Size）缩写。

Overview

Siemens 1LE0 Series Low-Voltage Smoke Extraction of 3 phase asynchronous motors with cast iron housing is self surface cooling with IP55 environmental protection, and applicable for Smoke Extraction use. These motors are designed and manufactured in accordance with ISO, IEC standards, GB standards. 1LE0 series smoke extraction motors is up to the second national energy efficiency standards (IE3). In fire emergency, the motor can run 2 hours under the temperature of 280°C.

The 1LE0 series motor is designed for constant or adjustable speed with continuous duty operation (S1) over a speed range.

Siemens 1LE0 series smoke extraction motors can be used widely in shopping malls、closed parking areas、metros、tunnels and high buildings, which has high requirement of fire-fighting and ventilation systems of constructions. Once a fire, the temperature climb up quickly. A timely, high efficient and continuous extraction of strong smoke and high-temperature poisonous gas is crucial for firefighting and rescue.

Features of Siemens 1LE0 series smoke extraction motor

- Frame material: grey cast iron.
- Standard color: fire emergency red.
- Rated power output: 0.55kW~315kW at 50Hz.
- Available in 2, 4, 6 pole motor (0.75kW and up) is up to efficiency grade 2. according to GB18613-2012 and efficiency class IE3（50Hz) according to IEC 60034-30.
- Optimized compact style construction.
- Standard mounting construction according to IEC 60034-7: IM B3, IM B5, IM B35 and etc.
- All motors are designed to IP55 degree of protection (IEC 60034-5) .
- Re-greasing devices for FS[1] 132-355 as standard.
- Outlet of the cable is on the right side from the DE.

[1] FS，Frame Size

铭牌信息 Nameplate

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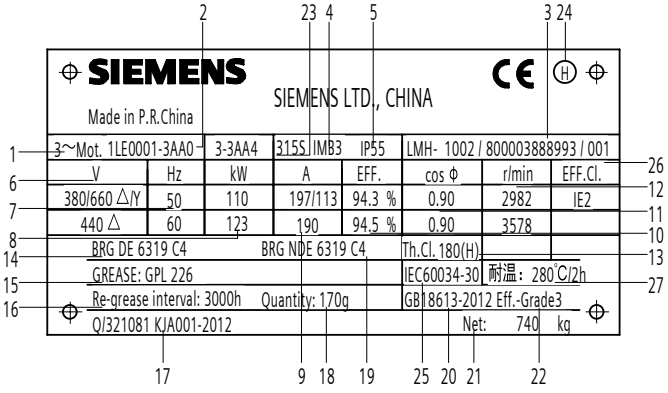
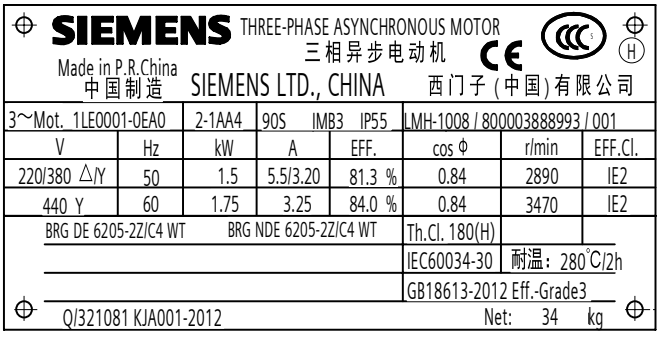




1	三相异步电动机	Three-phase low-voltage motor
2	订货号	Order No.
3	产品序列号	Series number
4	安装结构形式	Type of construction
5	防护等级	Degree of protection
6	额定电压	Rated voltage and Winding connections
7	频率	Frequency [Hz]
8	额定功率	Rated output [kW]
9	额定电流	Rated current [A]
10	效率	Efficiency
11	功率因数	Power factor [cosφ]
12	额定转速	Rated speed
13	热分级	Thermal class
14	驱动端轴承	Bearing at the drive end
15	润滑脂类型	Grease type
16	再润滑周期	Re-grease interval
17	执行标准	Standards
18	再加润滑脂的重量	Quantity
19	非驱动端轴承	Bearing at the non-drive end
20	中国国家标准	GB standard
21	净重	Net weight
22	中国能效等级	GB efficiency grade
23	机座号	Frame size
24	平衡方式	Balance method
25	IEC 标准	IEC standard
26	IEC 能效等级	IEC efficiency class
27	耐温	Temperature

安装结构型式 Construction and mounting type

结构型式 Construction type	机座带底脚，端盖无法兰 With feet and without flange on the end-shield (DE)	机座不带底脚，端盖有法兰 Without feet and with flange on the end-shield (DE)	机座带底脚，端盖有法兰 With feet and with flange on the end-shield (DE)
安装型式 Mounting type	**IM B3 FS 80 ~ 355**	**IM B5 FS 80 ~ 315**	**IM B35 FS 80 ~ 355**
示意图 Diagram			
电动机订货号第 14 位号上对应的字母 Letter, position 14th of Motor code	**A**	**F**	**J**

轴承系统

1LE0 系列排烟电机标准配置深沟球轴承，这些轴承是密封的或可再润滑型的。

Bearing system

1LE0 smoke extraction motors are supplied with ball bearing as standard. as standard. These bearings are either of the sealed or regreasable type.

轴承选配

Bearing Assignment

1LE0 排烟电机轴承标准配置 Standard Bearing of 1LE0 Smoke Extraction Motor			
基座号 Frame size	极数 Pole No.	驱动端 DE	非驱动端 NDE
80	2,4,6	6204 2Z C4 WT	6204 2Z C4 WT
90	2,4,6	6205 2Z C4 WT	6205 2Z C4 WT
100	2,4,6	6206 2Z C4 WT	6206 2Z C4 WT
112	2,4,6	6206 2Z C4 WT	6206 2Z C4 WT
132	2,4,6	6208 C4	6208 C4
160	2,4,6	6209 C4	6209 C4
180	2,4,6	6210 C4	6210 C4
200	2,4,6	6212 C4	6212 C4
225	2,4,6	6213 C4	6213 C4
250	2,4,6	6215 C4	6215 C4
280	2,4,6	6317 C4	6317 C4
315	2,4,6	6319 C4	6319 C4
355	2	6319 C4	6319 C4
355	4,6	6322 C4	6322 C4

注：
DE　驱动端
NDE　非驱动端

Note:
DE　Driven end
NDE　Non driven end

噪声

噪声值

噪声值根据 DIN EN ISO 1680 标准在噪音室测得。表面声压级噪声 L_{pfa} 计算表示单位为 dB（A）。声压级噪声的空间平均值是在其测量面上测得的。测量面是距离电动机表面一立方米的地方。声功率级噪声用 L_{WA} 来表示，单位为 dB（A）。下面给出噪声值仅适用于机壳表面冷却（冷却方式：IC410）电动机在 50 Hz 电源供电空载运行时的情况，容差为 +3 dB。当在 60 Hz 电源下空载运行时，偏差值大约为 +4 dB。

Noise levels

Noise levels for mains-fed operation

The noise levels are measured in accordance with DIN EN ISO 1680 in a dead room. It is specified as the A-valued measuring-surface sound pressure level L_{pfa} in dB (A). This is the spatial mean value of the sound pressure levels measured on the measuring surface. The measuring surface is a cube 1 m away from the motor surface. The sound power level is also specified as L_{WA} in dB (A). The following specified values are only valid for self surface cooling(cooling method:IC410) motor with no load at 50 Hz with no load, and the tolerance is +3 dB. While motor operating 60 Hz with no load, the values are approximately +4 dB (A) higher.

功率 Output（kW）	同步转速 synchronous speed（r/min） L_{pfa} / L_{WA} （dB（A）） 3000（2 极 poles）	1500（4 极 poles）	1000（6 极 poles）
0.55	–	45 / 57	44 / 56
0.75	53 / 65	45 / 57	48 / 60
1.1	53 / 65	47 / 59	48 / 60
1.5	60 / 72	47 / 59	52 / 64
2.2	60 / 72	55 / 67	54 / 66
3	62 / 74	55 / 67	56 / 69
4	63 / 75	55 / 67	56 / 69
5.5	66 / 79	57 / 70	56 / 69
7.5	66 / 79	57 / 70	60 / 73
11	67 / 80	60 / 73	60 / 73
15	67 / 80	60 / 73	61 / 74
18.5	67 / 80	61/ 74	65 / 78
22	69 / 82	61/ 74	65 / 78
30	71 / 84	63 / 76	65 / 79
37	71 / 84	63 / 77	65 / 79
45	74 / 88	63 / 77	65 / 79
55	74 / 88	64 / 78	65 / 79
75	74 / 88	66 / 80	66 / 80
90	76 / 90	66 / 80	66 / 80
110	78 / 92	69 / 83	68 / 82
132	78 / 92	69 / 83	68 / 83
160	81 / 95	69 / 83	72 / 87
185	81 / 95	74 / 88	75 / 90
200	81 / 95	74 / 88	75 / 90
220	86 / 101	82 / 97	75 / 90
250	86 / 101	82 / 97	75 / 90
280	88 / 103	85 / 100	–
315	88 / 103	85 / 100	–

L_{pfa} – 声压级

L_{WA} – 声功率级

L_{pfa} – sound pressure level

L_{WA} – sound power level

电气特性

额定输出

1LE0 排烟电机的额定功率是指电动机在连续运行的情况下 S1（IEC 60034-1），此时周围环境温度为 -20 °C ~ 40 °C，海拔高度不超过 1000 m。

电压、频率

IEC 60034-1 将电压和频率的偏差分为 A 类 (电压偏差 ±5 %，频率偏差 ±2 %) 和 B 类 (电压偏差 ±10 %，频率偏差 +3 % / -5 %) 。电动机均能够在 A 类和 B 类提供额定转矩。在 A 类中，温度比正常运行下温度大约提升 10 K。

Electrical design

Rated Output

1LE0 smoke extraction motors rated output powers means that the motor runs under continuous duty S1 (IEC 60034 - 1) operation when operated at ambient temperature from -20 °C to 40 °C and at altitudes of up to 1000 m over sea.

Voltage and Frequency

IEC 60034-1 differentiates between Category A (combination of voltage deviation ±5 % and frequency deviation ±2 %) and Category B (combination of voltage deviation ±10 % and frequency deviation +3 % / -5 %) for voltage and frequency fluctuations. The motors can supply their rated torque in both Category A and B. In Category A, the temperature rise is approximately 10 K higher than during normal operation.

标准 Standard 60034 - 1	类别 Category A	类别 Category B
电压偏差 Voltage deviation	±5 %	±10 %
频率偏差 Frequency deviation	±2 %	+3 % / -5 %
根据标准，不推荐电动机在 B 类情况下长时间运行 According to the standard, longer operation is not recommended for Category B.		

电气数据公差

- 效率 η
  P_{rated} ≤ 150 kW: - 0.15 x (1 – η)
  P_{rated} > 150 kW: - 0.10 x (1 – η)
  效率 η 为小于 1 的值
- 功率因数：(1 – cos φ) / 6
  最小绝对值：0.02
  最大绝对值：0.07
- 转差率：±20 %（电动机的偏差 < 1 kW ± 30 % 时是允许的）
- 堵转电流：+20 %
- 堵转转矩：-15 % ~ +25 %
- 最大转矩：-10 %
- 转动惯量：±10 %

Tolerance for electrical data

- Efficiency η at
  P_{rated} ≤ 150 kW: - 0.15 x (1 – η)
  P_{rated} > 150 kW: - 0.10 x (1 – η)
  With η being a decimal number
- Power factor - (1 – cos φ) / 6
  Minimum absolute value: 0.02
  Maximum absolute value: 0.07
- Slip ±20 % (for motors < 1 kW ±30 % is admissible)
- Locked-rotor current +20 %
- Locked-rotor torque -15 % to +25 %
- Breakdown torque -10 %
- Moment of inertia ±10 %

过载倍数

根据 IEC60034 标准要求，1LE0 系列电动机能够在额定电压和频率下承受 1.5 倍的额定电流达 2 分钟。

Overload times

According to IEC60034,1LE0 smoke extraction motors series motors are designed to withstand overload capacity of 1.5 times rated current for 2 minutes at rated voltage and frequency.

绝缘系统

1LE0 排烟电机绝缘系统具有可靠性、耐用性好和寿命长、耐冲击能力强的特点。

1LE0 排烟电机标准设计温度等级为 180（H）。当 1LE0 电动机直接供电，且输出额定功率时，其绝缘系统按 155（F）温度等级使用。

Insulation system

The insulation system of 1LE0 smoke extraction motors results in high reliability, a long service life and high resistance to stress, for example, during starting or under overload conditions.

1LE0 smoke extraction motors are designed for temperature class 180（H). At rated output with line-fed operation, the motors can be used in temperature class 155(F).

变频应用

西门子低压排烟电机适于变转速和恒转速两种应用。

当变频器驱动电动机时，电磁干扰的程度大小取决于变频器的类型（种类，IGBT 数量，干扰控制措施及制造商）、布线、距离以及应用需求。在设计和应用阶段必须参考变频器制造商关于电磁兼容性的安装指导。

当 1LE0 排烟电机变频应用（变频器供电），且输出额定功率时，电动机的使用温度等级为 180（H）。为了避免杂散电流对电动机轴承的损坏，推荐 FS250 ~ 355 电动机使用绝缘轴承。请向西门子咨询关于绝缘轴承的详细信息。

变频器驱动运行

1LE0 排烟电机的标准绝缘系统设计要求，能够保证其在变频器供电电压不超过 460 V 时正常运行。

1LE0 排烟电机带有特定的负载时能够使用变频器驱动，其特定的负载扭矩如以下图表所示：

在电动机运行速度超过额定转速时，噪声和振动值将增加，并且轴承的寿命将缩短。需要注意再润滑周期和润滑脂的寿命。

Converter fed application

Siemens LV smoke extraction motors are suitable for variable speed and consistent speed operation.

In application where the motor is driven by a converter, the degree of electrical interference depends on the type of converter used (type, number of IGBTs, interference suppression measures, and manufacturer), cabling, distance and application requirements. The installation guidelines of the converter manufacturer with regards to electromagnetic compatibility must be considered at all times during the design and implementation phases.

At rated output with converter fed operation, the motors will be used in temperature class 180（H）. To prevent damage as a result of bearing currents, insulated bearings are recommended to be assembled for frame size 250 and above. Please inquire Siemens about the detailed information of insulated bearing.

Converter-fed operation

The standard insulation of the 1LE0 smoke extraction motors is designed such that operation is possible on the converter at mains voltage up to 460 V.

1LE0 smoke extraction motors are capable for converter-fed operation with certain characteristics load, of which the load torque characteristics is referred in the following diagram:

At operating speeds above rated speed the noise and vibration levels increase and the bearing life time reduce. Attention should be paid to the re-greasing intervals and the grease service life.

电压承受值

绕组绝缘的电介质应力决定于：

- 电压峰值，上升时间以及变频器产生的脉冲频率；
- 变频器与电动机连接电缆的特性和长度；
- 绕组结构和其他系统参数，尤其是绝缘系统中不同绕组的对地电压（代表了绝缘系统的电介质应力）。

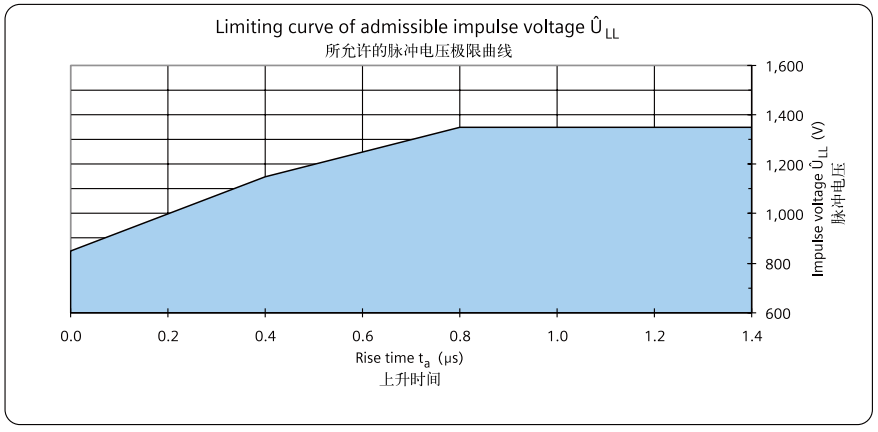
图表所示为 1LE0 排烟电机标准绝缘能承受电压的峰值和上升时间：

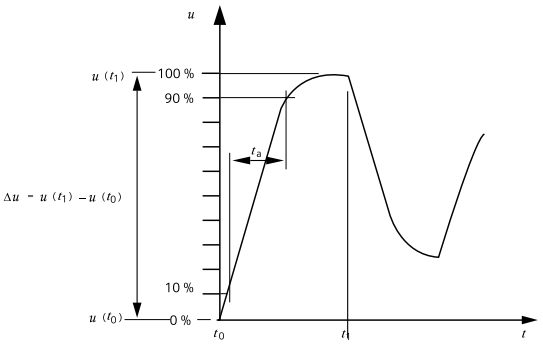
Voltage withstand levels

The dielectric stress of the winding insulation is determined by:

- the peak voltage, rise time and frequency of the impulses produced by the converter.
- the characteristics and the length of the connection leads between the converter and motor.
- the winding construction and other system parameters, especially the voltages between the different parts of the winding and the ground represent dielectric stress at the insulation system.

The standard insulation of the 1LE0 smoke extraction motors are designed to withstand voltage peak and rise time which is showed in the diagram:





数值参照 IEC 60034-17，GB/T 20161-2008 标准。

The values refer to standard IEC 60034-17 and GB/T 20161-2008.