

(2) **Equipment and protection systems intended for use in potentially explosive atmospheres  
Directive 94/9/EC**

(1) **EC-TYPE EXAMINATION CERTIFICATE**

(3) Number of the EC type examination certificate: **INERIS 01ATEX0001X**

(4) Protection apparatus or system:

**3-PHASE ASYNCHRONOUS MOTOR TYPE FLSD...**

(FLSD may be supplemented by an option symbol and the type by the shaft height an indication of the symbol  
for the distance between the centre lines of the motor mounting holes and/or for the number of poles)

(5) Manufacturer: **LEROY SOMER**

(6) Address: **F- 90500 BEAUCOURT or F- 16015 ANGOULEME**

(7) This protection system or equipment and any other acceptable alternative of this one are described in the appendix of this certificate and the descriptive documents quoted in this appendix.

(8) The INERIS, notified body and identified under number 0080, in accordance with article 9 of Council Directive 94/9/CE 23 th March 1994, certifies that this protection system or equipment fulfills the Essential of Health and Safety Requirements relating to the design and construction of equipments and protection systems intended for use in potentially explosive atmospheres, described in appendix II of the Directive.

The examinations and the tests are consigned in official report n° 15707/01.

(9) The respect of the Essential Health and Safety Requirements is ensured by:

- conformity with:

EN 50 014 of June 1997 + A1 and A2

EN 50 018 of August 1994

EN 50 019 of March 1994


EN 50 281-1-1 of September 1998

- specific solutions adopted by the manufacturer to meet the Essential Health and Safety Requirements described in the descriptive documents.

(10) Sign X, when it is placed following the Number of the EC type examination certificate, indicates that this equipment and protection system is subjected to the special conditions for safe use, mentioned in the annex of this certificate.

- (11) This EC type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.
- (12) The marking of the equipment or the protection system will have to contain:

 II 2 G EEx d IIB T5 or EEx d IIB T4 or EEx de IIB T5 or EEx de IIB T4

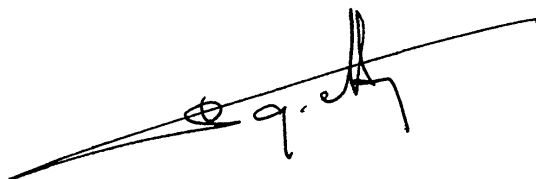
or  II 2 GD EEx d IIB T5 or EEx d IIB T4 or EEx de IIB T5 or EEx de IIB T4 IP66 T100°C or T125°C

Verneuil-en-Halatte, 2001 06 27

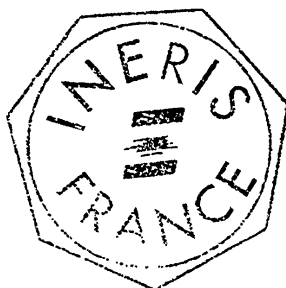


X.LEFEBVRE

Engineer at the Laboratory for Certification of  
ATEX equipment



Director of the Certifying Body,  
By delegation  
B. PIQUETTE  
Deputy manager of Certification



(13)

## ANNEX

(14)

EC TYPE EXAMINATION CERTIFICATE N° INERIS 01ATEX0001X

(15)

### DESCRIPTION OF THE EQUIPMENT OR THE PROTECTION SYSTEM

Three-phased induction motor with frame and bearings in cast iron or steel.

The basic shaft heights are:

80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280, 315, 355 mm.

A primary junction box in cast iron or steel is mounted on the housing and is not connected to the motor only for the motor with shaft height 80. The primary or auxiliary box can be protected either by flameproof enclosure, by increased safety, either by flameproof enclosure and increased safety. As a variation, between one and four auxiliary junction boxes, can be welded on the primary junction box in steel, or the connection can be made of a unterminated cable.

The motor may be designed with one or two speeds.

Temperature sensors may be incorporated in the stator windings and the bearings.

The motor may be supplied through a frequency converter an/or can operate at variable speed. In this case, it is fitted with temperature sensors located in the stator windings and in the front bearing. These sensors should be connected to a device that shuts off power to the motor so that the maximum indicated surface temperature is never reached.

Heating resistances may be located in the winding.

Those nuts and bolts whose deployment affects safety may be of stainless steel, type Z2 CND 17-12 or Z6 CND 17-11 (class 8.8 or 80).

The motor and the junction boxes can be realised by the manufacturer for use in an ambient temperature range of -25°C to 40°C or of -25°C to 60°C or of -40°C to 60°C.

The degree of protection of enclosures (motor and junction box(es)) is IP55 in the standard version, IP66 according in the variant to EN 60 034 part 5 EN 60 529 and EN 50 281-1-1.

The degree of mechanical protection of enclosures is IK08 in the standard version. The degree of mechanical protection of junction box(es) is IK10 in the variant of construction described by descriptive documents according to EN 50 102.

Electrical cables are inserted into the apparatus through screw-in cable penetrations of a type certified EEx d and/or EEx e, according to the CENELEC standards or through conduit entrie(s).

The motor can be fitted with the following Ex components:

- Feed-through type T. Certificate CERCHAR 82.9003 U
- Feed-through type 07-9304-.../... Certificate PTB 81.1020 U
- Feed-through type 07-930.-.../... Certificate PTB 88.B 1032 U
- Purge valve type VPX Certificate LCIE 83.0010 U
- Components in relation with cables entries type A,AD,B,R,E,U,M,BM,OB  
EC type examination certificate LCIE 98ATEX0001U

### SAFETY PARAMETERS

Motor:

- Supply voltage max : 1100 V above the shaft height 132
- Supply voltage max : 726 V until the shaft height 132
- Frequency : 50 or 60 Hz or  
other fixed values between,  
up to 200 Hz until the shaft height  $\leq$  132  
up to 100 Hz up to the shaft height 132  
Frequency variation : same range defined below
- Rating : - standard version, S1 service  
. from 0.18 kW to 400 kW under 50 Hz
- for special versions the different parameters can be adapted.

Heating resistances :  $U_{max} = 550$  V- $P_{max} = 200$  W .

Operating maximal thresholds of the temperature sensors:

- Maximum surface temperature = 125°C or class T4:
  - . winding sensor 150°C  $\pm$  5°C
  - . bearing sensor 120°C  $\pm$  5°C
- Maximum surface temperature = 95°C or class T5:
  - . winding sensor 110°C  $\pm$  5°C
  - . bearing sensor 90°C  $\pm$  5°C

Operating maximal thresholds of the auxiliary equipment that should shut down the motor when variation resistance sensors or thermocouples are used:

- for a maximum surface temperature = 125°C or class T4:  
150°C for the stator and 120°C for the bearings
- for a maximum surface temperature = 95°C or class T5:  
110°C for the stator and 90°C for the bearings

For using in ambient temperatures inferior to -20°C (-40°C maxi), the manufacturing is previewed by the manufacturer under his responsibility. Type test have been performed under ambient temperatures required by standards.

**MARKING**

Marking must be readable and indelible; it must comprise the following indications:

- **LEROY SOMER**  
F- 90500 BEAUCOURT or F- 16015 ANGOULEME
- FLSD... (1)
- INERIS 01ATEX0001 X
- (serial number, if any)
- (Year of construction)
- $\text{\textcircled{Ex}}$  II 2 G or  $\text{\textcircled{Ex}}$  II 2 GD
- EEx d IIB T4 or T5(\*) or EEx de IIB T4 ou T5 (\*)
- IP66 T 125°C or T 100°C (\*\*)
- T amb: -25°C to 40°C

or

- **LEROY SOMER**  
F- 90500 BEAUCOURT or F- 16015 ANGOULEME
- FLSD... (1)
- INERIS 01ATEX0001 X
- (serial number, if any)
- (Year of construction)
- $\text{\textcircled{Ex}}$  II 2 G or  $\text{\textcircled{Ex}}$  II 2 GD
- EEx d IIB T4 or T5(\*) or EEx de IIB T4 ou T5 (\*)
- IP66 T 125°C or T 100°C (\*\*)
- T amb: -25°C to 50°C

or

- **LEROY SOMER**  
F- 90500 BEAUCOURT or F- 16015 ANGOULEME
- FLSD... (1)
- INERIS 01ATEX0001 X
- (serial number, if any)
- (Year of construction)
- $\text{\textcircled{Ex}}$  II 2 G or  $\text{\textcircled{Ex}}$  II 2 GD
- EEx d IIB T4 or T5(\*) or EEx de IIB T4 ou T5 (\*)
- IP66 T 125°C or T 100°C (\*\*)
- T amb: -25°C to 60°C
- T cable : (\*)

or

- **LEROY SOMER**

F- 90500 BEAUCOURT or F- 16015 ANGOULEME

- FLSD... (1)
- INERIS 01ATEX0001 X
- (serial number, if any)
- (Year of construction)
- $\text{Ex}$  II 2 G or  $\text{Ex}$  II 2 GD
- **EEx d IIB T4 or T5(\*) or EEx de IIB T4 ou T5 (\*)**
- IP66 T 125°C or T 100°C (\*\*)
- T amb: -40°C to 60°C
- T cable : (\*)

(1) FLSD may be supplemented by an option symbol and the type by the shaft height an indication of the symbol for the distance between the motor mounting holes and/or of the number for poles

(\*) see temperature class table

- In the case of motor fitted with a junction box « e » :
  - on the motor, the type of protection « d »
  - on the junction box, the type of protection « e »  
Rated current and voltage
- In the case of motor fitted with a junction box « de » :
  - on the motor, the type of protection « d »
  - on the junction box, the type of protection « d » and « e »  
Rated current and voltage

and, in each of the above cases, on each junction box lid, the following:

DO NOT OPEN WHEN ENERGIZED

DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT

(\*\*) Obligatory mention for use in the presence of combustible dust.

The whole of marking can be carried out in the language of the country of use.

The protection apparatus or system must also carry the marking normally envisaged by the standards of construction which relate to it.

**ROUTINE EXAMINATIONS AND TESTS**

Each example of the equipment hardware defined above must have successfully passed before delivery an overpressure test in accordance with section 16.1 of standard EN 50 018, of a period comprised between 10 and 60 secondes under:

- 12 bar performed for motor of shaft height 250, 14 bar for his flameproof junction box and 7.7 bar for auxiliary junction box

- 11.1 bar performed for motor of shaft height 280, 10.5 bar for his flameproof junction box and 7.7 bar for auxiliary junction box
- 20.6 bar performed for motor of shaft height 315, 20.6 bar for his flameproof junction box and 7.7 bar for auxiliary junction box
- 18 bar performed for motor of shaft height 355, 18 bar for his flameproof junction box and 7.7 bar for auxiliary junction box

The motors of shaft height 80 to 225 fitted with their flameproof junction box are exempted of routine test according 16.2 of standard EN 50 018. These having successfully undergone a static overpressure test corresponding to 4 times the reference pressure.

Each example of the junction box protected by « e » or « de » defined above must have successfully passed before delivery a dielectric strength test carried out as specified in 7.1 in accordance with 6 of the EN 50 019 standard on the connection elements.

#### **(16) DESCRIPTIVE DOCUMENTS**

The report is composed of the documents quoted hereafter, constituting the descriptive file of the apparatus, object of this certificate.

- Descriptive notice ref.FB "ATEX d" 30/01 (15 pages) signed on 2001.05.02
- Basic elements instructions (1 page) signed on 2001.05.02
- Temperature class table No. 17-160-369 signed on 2001.05.02
- Drawings folios No. 17-160-333 to 17-160-368 signed on 2001.05.02

#### **(17) SPECIAL CONDITIONS FOR SAFE USE**

When the motor is supplied through a frequency converter and /or used in an air flow, it must be fitted with thermal sensors in the windings, on the front bearing (shaft height  $\geq$  160) and eventually on the rear bearing.

When the motor is fitted with a forced ventilation, a device has to oppose to running of the main motor in absence of ventilation.

In order to ensure that the maximum surface temperature is not exceeded, the thermal sensors fitted to the motor should be connected to a device that switches off power to the motor when the operating thresholds defined in (15) are reached. Also the heating resistances may be powered only when the motor is disconnected from the power supply and cold ; their using is recommended for ambient temperature above to  $-20^{\circ}\text{C}$ .

When the motor is equipped with one or many auxiliary connecting boxes, it can only support a low risk of mechanical danger and the user would have to ensure a complementary protection in case of high risk.

The yield stress of the fastener elements of the flameproof casing must be at least equal to  $780\text{N/mm}^2$ .

The cable entries shall be compatible with the type of protection used for the connecting part. In the variant with unterminated cable(s), the connection to the motor must be made whether in a non-explosive atmosphere or protected by a standard type of protection.

These special conditions are defined in the instructions for the motor.

**(18) ESSENTIAL REQUIREMENTS OF SAFETY AND HEALTH**

The respect of the Essential Health and Safety Requirements is ensured by:

- conformity to the European standards EN 50 014, EN 50 018, EN 50 019 and EN 50 281-1-1
- the whole of the provisions adopted by the manufacturer and described in the descriptive documents.



## ADDITION

- (3) **INERIS 01ATEX0001 X/01**
- (4) **3-PHASE ASYNCHRONOUS MOTOR TYPE FLSD...**
- (5) **Made by LEROY SOMER**

(15) - PURPOSE OF THE ADDITION

Update of the descriptive documents allowing:

- Modification of the type: the type FLSD can become FLSDE when the engine is provided with a terminal box protected by increased safety.
- Modification of the range of ambient temperature:  $-20^{\circ}\text{C}$  to  $40^{\circ}\text{C}$  in standard use,  $-20^{\circ}\text{C}$  to  $20^{\circ}\text{C}$  in alternative of execution.
- Mechanical Modification.
- Temperature Class T6 according to specific construction.
- Alternative of execution for group IIC for the range height from axis 80 to 132.
- Alternative of execution for group I category M2.

PARAMETERS RELATING TO THE SAFETY

The parameters relating to safety indicated in the basic certificate are unchanged:

Operating maximal thresholds of the temperature sensors:

- Maximum surface temperature =  $85^{\circ}\text{C}$  or class T6 :
  - . winding sensor  $100^{\circ}\text{C} \pm 5^{\circ}\text{C}$
  - . bearing sensor  $70^{\circ}\text{C} \pm 5^{\circ}\text{C}$



Operating maximal thresholds of the auxiliary equipment that should shut down the motor when variation resistance sensors or thermocouples are used:

- for a maximum surface temperature =  $85^{\circ}\text{C}$  or class T6:
  - 100°C for the stator and 70°C for the bearings

The thresholds defined in the basic certificate for the temperature class T4 apply for the application group I.

### MARKING


The code marking envisaged in the basic certificate is supplemented by the following code:

- LEROY SOMER
- F- 16015 ANGOULEME or F- 90500 BEAUCOURT
- FLSD...or FLSDE... (1)
- INERIS 01ATEX0001 X
- (Serial number)
- (Year of construction)
-  II 2 G or  II 2 GD
- EEx d or de IIB T4 or T5 or T6(\*) or EEx d or de IIC T4 or T5 or T6(\*)
- IP66 T 125°C or T 100°C or T85°C(\*\*)
- T amb: (\*\*\*)

(1) FLSD or FLSDE may be supplemented by an option symbol and the type by the shaft height an indication of the symbol for the distance between the motor mounting holes and/or of the number for poles

- (\*) See temperature class table
- (\*\*) Obligatory mention for use in the presence of combustible dust.
- (\*\*\*) The indication of the range of ambient temperature when it is different from -20°C to 40°C.

In the specific case of group I, the marking becomes :

-  I M2
- EEx d or de I

### ROUTINE EXAMINATIONS AND TESTS

The examinations and individual tests envisaged in the basic certificate are supplemented as follow:

In the case of box with steel welded mechanic, each example of the equipment hardware defined above must have successfully passed before delivery an overpressure test in accordance with section 16.1 of standard EN 50 018, of a period comprised between 10 and 60 secondes under:

- 8,5 bar for the boxes of the engines height from 80 to 132,
- 9,9 bar for the engines height of axe from 160 to 225,
- 14 bars for the height of axe 250,
- 10,5 bars for the height of axe 280,
- 20 bars for the height of axe 315S,
- 20,6 bars for the height of axe from 315M/L,
- 18 bars for the height of axe from 355,
- 7,7 bar for the auxiliary box.

**(16) - DESCRIPTIVE DOCUMENTS**

The documents referred to below, constitute the file describing the modifications of the apparatus and forming the subject of the present addition.

- Descriptive note of complement n°1 of 2003.03.03
- Temperature class table n°17-160369A signed on 2003.03.20
- Plans folios 17-160337A ; 17-160338A ; n°17-160339A ; n°17-160341A ; 17-160342A ; 17-160350A ; 17-160365A ; 17-160366A folios 2A, 2IIC, 4A et 6A ; 17-160393 et 17-160394 signed on 2003.03.20.

**(17) - SPECIAL CONDITIONS FOR SAFE USE**

The special conditions are modified as follow:

When the motor is supplied through a frequency converter and/or used in an air flow, it must be fitted with thermal sensors in the windings, on the front bearing (shaft height  $\geq 160$ ) and eventually on the rear.

When the motor is fitted with a forced ventilation, a device has to oppose to running of the main motor in absence of ventilation.

In order to ensure that the maximum surface temperature is not exceeded, the thermal sensors fitted to the motor should be connected to a device that switches off power to the motor when the operating thresholds defined in (15) are reached. Also the heating resistances may be powered only when the motor is disconnected from the power supply and cold ; their using is recommended for ambient temperature above to  $-20^{\circ}\text{C}$ .

When the motor is equipped with one or many auxiliary connecting boxes, it can only support a low risk of mechanical danger and the user would have to ensure a complementary protection in case of high risk.

The yield stress of the fastener elements of the flameproof casing must be at least equal to 780N/mm<sup>2</sup>.

The cable entries shall be compatible with the type of protection used for the connecting part. In the variant with unterminated cable(s), the connection to the motor must be made whether in a non-explosive atmosphere or protected by a standard type of protection.


These special conditions are defined in the instructions for the motor.

(18) - ESSENTIAL REQUIREMENTS OF SAFETY AND HEALTH

The respect of the Essential Health and Safety Requirements is ensured by:

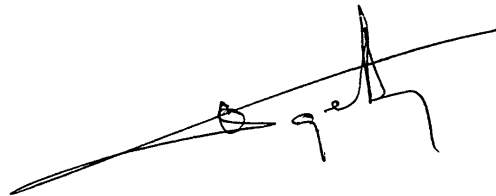
- conformity to the European standards EN 50 014, EN 50 018, EN 50 019 and EN 50 281-1-1
- the whole of the provisions adopted by the manufacturer and described in the descriptive documents.

Verneuil-en-Halatte, 2003 05 22



X. LEFEBVRE

Engineer at the Laboratory of Certification of ATEX  
Equipment



Director of the Certifying Body,  
By delegation  
B. PIQUETTE  
Deputy manager of Certification

