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Schema di certificazione

CESI-ATEX

[1] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE**

[2] **Equipment or Protective System intended for use
in potentially explosive atmospheres
Directive 2014/34/EU**

[3] Supplementary EU-Type Examination Certificate number:

CESI 13 ATEX 008 X /01

[4] **Product:** Three-phase asynchronous motors series 5AT 71 - 80 - 90 - 100 - 112

[5] **Manufacturer:** Svend Hoyer A/S

[6] **Address:** Over Hadstenvej 42; DK 8370 Hadsten – Denmark

[7] This supplementary certificate extends EC-Type Examination Certificate CESI 13 ATEX 008X to apply to products designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to..

[8] CESI, notified body n. 0722 in accordance with Article 17 of the Directive 2014/34/EU of the Parliament and Council of 26 February 2014, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.4

The examination and test results are recorded in confidential report n. EX- B7006372

[9] In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016

[10] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

[11] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 2014/34/EU. 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 protective system shall include the following:

II 2G Ex db IIB T3 Gb ; or **II 2G Ex db eb IIB T3 Gb**
II 2G Ex db IIC T5, T4, T3 Gb ; or **II 2G Ex db eb IIC T5, T4, T3 Gb**
II 2D Ex tb IIC T130°C, T160°C Db

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Date 23/03/2017 - Translation issued the 23/03/2017

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CESI S.p.A.

Testing & Certification Division
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Responsabile

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PRD N. 018B
Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC
Signatory of EA, IAF and ILAC Mutual Recognition Agreements



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Schedule

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 008X/01**

[15] **Description of the variation**

- New terminal blocks KM5,
- New multicore bushings type RSM. with separate certification,
- Motors assembled with two terminal boxes ("Ex db" or "Ex eb"),
- New design of motors with efficiency class IE2 and IE3,
- New additional code for motors with efficiency class IE2 and IE3,
- Assessment for temperature class T5 for motors series 5AT with Ambient Temperature +40°C,
- New electrical characteristics for motor types 5AT 90L-2
- Assessment for temperature class T6 for motor type 5AT 80A-2
- New type of protection "Ex tb"
- Upgrading the name-plate
- Updating to the new reference standard editions: EN 60079-1: 2014 and EN 60079-7: 2015.

Description of the equipment

The three-phase asynchronous motors series 5AT 71-80-90-100-112 are manufactured by different constructive typologies; they can be supplied by mains or inverter, with simple or double polarity, self-ventilated or with forced ventilation.

The motors are manufactured with two separate compartments: motor (Ex-db) and terminal box (Ex-db or Ex-eb) for supply and auxiliary circuits connection or can be provided with permanently connected cable.

The motors can be equipped with auxiliary devices (heaters, thermal detectors) and with separate brake and/or encoder. The cable entry devices used on the enclosure shall be suitably ATEX certified.

The motors series 5AT 71 ÷ 112 can be assembled with two "Ex db" terminal boxes (connected by sealing bushing 3 piece fitting or by barrier cable glands and cable) or with two "Ex e" terminal boxes (connected by piece fitting or by cable glands and cable).

The three-phase asynchronous motors series 5AT, can be manufactured with efficiency class IE2 and IE3 according to IEC 60034-30 standard.

The motors with efficiency level IE2 and IE3, differ from standard motors IE1 for better quality of laminations, higher length of stator/rotor package and higher filling factor of copper.




The motors with efficiency class IE2 and IE3 are identified by proper code and the level of the efficiency class is stated on name plate.

The motors, for temperature class T3/T4, are produced with insulation system in class F and are designed with temperature limit of the insulation class B (120°C) at ambient temperature $T_a = +40^\circ\text{C}$

The standard motors series 5AT are assessed for temperature classes T5 and ambient temperature $T_a + 40^\circ\text{C}$
Only the motors type: 80 A-2; 90 L-2, are suitable for temperature class T6.

Depending on of protection mode and ambient temperature, the motor series 5AT ...shall be marked as follows:

Motors in temperature class T3 and T4

- | | | |
|---|--|--|
|  | II 2G Ex db IIC T4, T3 Gb | <u>Ambient Temperature: - 20°C / +40°C / +50°C / +60°C</u> |
|  | II 2G Ex db eb IIC T4, T3 Gb | |
|  | II 2D Ex tb IIC T130°C, T160°C Db | |

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Motors in temperature class T3

- ⊕ II 2G Ex db IIB T3 Gb Ambient Temperature: - 20°C / +80°C
- ⊕ II 2G Ex db eb IIB T3 Gb
- ⊕ II 2D Ex tb IIIC T160°C Db

Motors in temperature class T5

- ⊕ II 2G Ex db IIC T5 Gb Ambient Temperature: - 20°C / +40°C
- ⊕ II 2G Ex db eb IIC T5 Gb

Only for motor type 90 L-2 (max. Power 1.7 kW)

- ⊕ II 2G Ex db IIC T5 Gb Ambient Temperature: - 20°C / +45°C
- ⊕ II 2G Ex db eb IIC T5 Gb

Only for motor type 100 LA-4 (max. Power 1.7 kW)

- ⊕ II 2G Ex db IIC T5 Gb Ambient Temperature: - 20°C / +50°C
- ⊕ II 2G Ex db eb IIC T5 Gb

Only for motor type 90 S-2 (max. Power 1.2 kW)

- ⊕ II 2G Ex db IIC T5 Gb Ambient Temperature: - 20°C / +60°C
- ⊕ II 2G Ex db eb IIC T5 Gb

Motors in temperature class T6.

Only for motor types: 80 A-2 (max. Power 0.40 kW); 90 L-2 (max Power 1.1 kW);

- ⊕ II 2G Ex db IIC T5 Gb Ambient Temperature: - 20°C / +40°C
- ⊕ II 2G Ex db eb IIC T5 Gb

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Description of the equipment (follows)

Equipment identification

The various motors types are identified by a code as follows:

A B C D E F G H I J K

A = Efficiency class: Blank = IE1; E = IE2; H = IE3

B = Motor series: 5- motors with aluminium die cast frame

C = Type of motor:

AT = basic design of single-speed motor

ATP = multi-speed motor with constant torque at all speed

ATPV = multi-speed fan rated motor

ABT = single-speed marine motor

ABTP = multi-speed marine motor with constant torque at all speed

ABTPV = multi-speed fan rated marine motor

D = Additional code (single or in combination)

A = motor with special mounting dimension

E = motor with special electric design

K = motor with electromagnetic brake

E = Motor frame size (71-80-90-100-112)

F = Frame length: S = Short, M = Medium, L = Long and X for longer frame (SX, MX, LX)

G = Power designation according to stator and rotor length: A,B,C,.. or

RA, RB, ...; (R= for reduced power in bigger frame)

H = Number of poles : (2 ÷ 8); (12/6...., 8/4/2; 6/4/2; ...)

I = Type of protection and means of external connection

D = Ex db IIC (B) - motor and terminal box "db"

E = Ex db eb IIC (B) - motor "db" and terminal box "eb"

K = Ex db IIC (B) - motor "db" with permanently connected cables

P = Ex tb IIIC- motor with dust protection mode "tb"

J = Code of additionally mounted equipment (single or in combination)

A = motor with space heaters

G = motor with encoder

T = motor with thermal protection

K = Temperature Class for gas: T3; T4; T5; T6* (* Not for all motors)

Max.Surface Temp. For dust : T160°C; T130°C

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[14] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 008X/01

Description of the equipment (follows)

Electrical characteristics of motors in temperature class T3/T4

Motors supplied by mains

- Maximum rated voltage: 750 V
- Maximum rated power: 4.5 kW
- Maximum rated current: 8.7 A
- Rated frequency: 50/60 Hz
- Rated speed: 750 ÷ 3600 rpm
- Number of poles: 2 ÷ 8
- Insulation class: F – H (with limit Δt B)
- Duty: S1 – S10
- Ambient temperature:
 - 20 ÷ + 40 °C (standard motors)
 - 20 ÷ + 50 °C (motors provided with permanently connected cables)
 - 20 ÷ + 60 °C (on request)
 - 20 ÷ + 80 °C (group IIB motors, with power derating for reducing the winding rise-temperature within the limits of the insulation class B (120 °C))
- Degree of protection: IP54 or IP 55 or IP 56 or IP 65 or IP 66 (for motors Cat. 2G)
IP66 (for motors Cat. 2D)

Motors supplied by inverter

- rated voltage maximum: 750 V
- peak voltage maximum: 1060 V
- frequency range:
 - 5 ÷ 87 Hz (motors 2p=2)
 - 5 ÷ 100 Hz (motors 2p=4, 6, 8)

The three-phase asynchronous motors supplied by inverter are provided with a suitable label reporting electrical operating characteristics. The motors supplied by inverter shall be provided, inside the stator winding, with thermal detectors (PTC);

These thermal detectors shall be connected to suitable protection devices of the supply system.

The operation of the thermal detector shall guarantee the disconnection of the supply at:

- 150 °C maximum for motors with temperature class T3.
- 130 °C maximum for motors with temperature class T4.

The resetting of the supply shall not be automatic.

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[14] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 008X/01

Description of the equipment (follows)

Electrical characteristics of motors series 5AT... with Temperature class T5

Motor	71 A-2	71 C-8		80 B-2	90 L-2		100 LA-4		90 S-2	
Rated Voltage (V)	400	400	480	400	400	440	400	440	400	440
Rated Power -S1 (kW)	0.4	0.12	0.14	1.2	1.5	1.7	1.5	1.7	1.1	1.2
Rated frequency (Hz)	60	50	60	60	50	60	50	60	50	60
Rated current (A)	0.75	0.55	0.55	1.6	3.1	3.2	3.5	3.3	2.3	2.3
Number of poles	2	8	8	2	2	2	4	4	2	2
Connection	star	star	star	star	star	star	star	star	star	star
Temperature Class	T5	T5	T5	T5	T5	T5	T5	T5	T5	T5
Ambient Temperature (°C)	-20 ÷ + 40			-20 ÷ + 45		-20 ÷ + 50		-20 ÷ + 60		
Degree of protection	IP 54 o IP 55 o IP 56 o IP 65 o IP 66									

Electrical characteristics of motors series 5AT... with Temperature class T6

Motor	80 A-2		90 L-2		
Rated Voltage (V)	400	440	400	380	230
Rated Power -S1 (kW)	0.37	0.4	1.1	1.1	1.1
Rated frequency (Hz)	50	60	50	50	50
Rated current (A)	0.91	0.86	2.3 A	2.4	4
Number of poles	2	2	2	2	2
Connection	star	star	star	star	delta
Temperature Class	T6	T6	T6	T6	T6
Ambient Temperature (C°)	-20 °C ÷ + 40 °C				
Degree of protection	IP 54 o IP 55 o IP 56 o IP 65 o IP 66				

Motors with brake and/or encoder

Brake and/or encoder, coupled to the motor, shall be suitable for group, category, type of protection and ambient temperature range foreseen from the motor.

Cable entries

The accessories used for cable entries, for unused holes and for connecting the separated terminal boxes shall be subject of separate certification according to the following standards:

Motors of Category 2G: EN 60079-0 and EN 60079-1 for terminal box “Ex db”
EN 60079-0 and EN 60079-7 for terminal box “Ex eb”

Motors of category 2D: EN 60079-0; EN 60079-1 and EN 60079-31 for terminal box “Ex db” and “Ex tb”
EN 60079-0; EN 60079-7 and EN 60079-31 for terminal box “Ex eb” and “Ex tb”

In all cases, the minimum degree of protection IP54, for motors of category 2G, and the minimum degree of protection IP 66, for motors of category 2D, shall be guaranteed according to EN 60034-5 and EN 60529 standards.

If cylindrical threads are used the coupling between the cable gland and terminal box shall be provided with block to prevent loosening.

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[14] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 008X/01

Warning label

For motor supply by inverter:

“Winding protected with PTC thermistors”

In case of use of anticondensate heaters:

“Warning – energized resistors”.

[16] Report n. EX- B7006372

Routine tests

“Ex db” motor enclosures

The manufacturer shall carry out the overpressure routine tests according to paragraph 15.2.3.2 of EN 60079-1 standard, at the following pressure values:

▪ Motor enclosure size 71 :	16.1 bar
▪ Motor enclosure size 80 :	12.6 bar
▪ Motor enclosure size 90:	15.5 bar
▪ Motor enclosure size 100:	11.3 bar
▪ Motor enclosure size 112:	12.8 bar

Terminal boxes:

“Ex db” terminal boxes:

- On the terminal boxes dwg. A69192/2C1, the manufacturer shall carry out the overpressure routine tests according to paragraph 15.2.3.2 of EN 60079-1 standard, at the pressure value of 12.6 bar
- The other terminal boxes for motors 71-80-90 (drw. A69192-41) and for motors 100.112 (drw. A69192-42) are exempted from overpressure test since they have been submitted, with positive result, to an overpressure test at 30 bar, corresponding to 4 times the reference pressure.

“Ex eb” terminal boxes:

The routine dielectric test, on “Ex eb” terminal box, shall be performed at $2U + 1000V$ with a minimum value of 1500V ($U =$ rated voltage of the motor).

[17] Special conditions for safe use

- Supply cables of motors for the ambient temperature + 60°C shall be suitable for an operating temperature equal or greater than 85°C; for ambient temperature +80°C supply cable shall be suitable for an operating temperature equal or greater than 105°C.
- Screws used for fastening the parts of motor enclosure, shields and terminal box shall have a yield stress higher than 800 Nmm².
- The motor provided with the cables permanently connected, shall have these cables protected against the risk of damage due to mechanical stresses. The free end connections shall be made according to one of the types of protection indicated in the EN 60079-0. Standard in compliance with the installation rules in force in the site of installation.
- The flamepaths are specified in the manufacturer drawings. For information regarding the dimensions of the the manufacturer shall be contacted.

[18] Essential Health and Safety Requirements

The Essential Health and Safety Requirements are covered by compliance to the following standards:

EN 60079-0: 2012 +A11: 2013 -	Electrical apparatus for explosive gas atmospheres: General requirements
EN 60079-1: 2014-	Explosive atmospheres: Flameproof enclosures “d”
EN 60079-7: 2015-	Explosive atmospheres: increased safety “e”
EN 60079-31: 2014-	Explosive atmospheres: dust ignition protection by enclosure “t”

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[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 008X/01**

[19] **Descriptive documents (prot. EX- B7006388)**

- Technical Note Nr. SH-A69192 HOYER Annex 1 (22 sh)	Ed. 2		dated	10/01/2017
- Drawing of nameplate n 122016/6C4 (2 sh)	Rev. A		dated	25/11/2016
- Drawing n. A49192/6A	Rev. C		dated	30/09/2016
- Drawing n. A69192	Rev. A		dated	03/03/2014
- Data list n. A69192-S1	Rev. B		dated	30/05/2014
- Data list n. A69192-S2	Rev. B		dated	30/05/2014
- Drawing n. TR-A69192-2	Rev. C		dated	25/11/2016
- Drawing n. TR-A69192/2C1 (2 sh)	Rev. D		dated	25/11/2016
- Drawing n. 122016/7B6 (sheet 1/4)	Rev. B		dated	12/03/2015
- Drawing n. 122016/7B6 (sheet 3/4)	Rev. B		dated	12/03/2015
- Drawing n. 122016/7B6 sheet 4/4)	Rev. B		dated	12/03/2015
- Drawing n. A69192-5	Rev. B		dated	30/09/2016
- Drawing n. A69192-6	Rev. C		dated	30/09/2016
- Drawing n. A69192-31	Rev. C		dated	30/09/2016
- Drawing n. A69192-32	Rev. C		dated	30/09/2016
- Drawing n. 122016/5N	Rev. A		dated	28/05/2014
- Drawing n. 122016/5L	Rev. B		dated	28/05/2014
- Drawing n. 122016/5I	Rev. B		dated	30/05/2014
- Drawing n. A69192/2C4			dated	30/05/2014
- Drawing n. A69192/2C3	Rev. A		dated	25/11/2016
- Fac-simile Declaration of Conformity Ex OB 7.3.7.13 ED9			dated	25/11/2016
- Fac-simile Declaration of Conformity Ex OB 7.3.7.13/A-5AT HOYER			dated	25/11/2016
- Operation and maintenance Instructions 122016 (12 sh)			dated	---/11/2016

One copy of all documents is kept in CESI files.

Certificate history

Issue n.	Issue Date	Summary description of variation
01	2017/03/23	<ul style="list-style-type: none"> - New terminal blocks M5, - New multicore bushings type RSM. with separate certification, - Motors assembled with two terminal boxes ("Ex db" or "Ex eb"), - New design of motors with efficiency class IE2 and IE3, - New additional code for motors with efficiency class IE2 and IE3, - Assessment for temperature class T5 for motors type series 5AT with Ta +40°C, - New electrical characteristics for motor types 5AT 90L-2, - Assessment for temperature class T6 for motor type 80A-2, - New type of protection"tb", - Upgrading the name-plate, - Updating to the new reference standard edition: IEC 60079-7: 2015.
00	2013/05/22	First issue of certificate CESI 03 ATEX 008X

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