

CESI

CERTIFICATE



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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 007X /01

[4] **Product:** Three-phase asynchronous motors series 7AT 90-100-112-132-160- 180-200-225-250-280-315

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

[6] **Address:** Over Hadstenevej 42; DK 8370 Hadsten - Denmark

[7] This supplementary certificate extends EC-Type Examination Certificate CESI 13 ATEX 007X 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.
The examination and test results are recorded in confidential report n. EX-B7006895

[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:

I M2 Ex db I Mb or I M2 Ex db eb I Mb
 II 2G Ex db IIB T3 Gb ; or II 2G Ex db eb IIB T3 Gb
II 2G Ex db IIC T3, T4, T5 Gb ; or II 2G Ex db eb IIC T3, T4, T5 Gb
II 2D Ex tb IIIC T130°C, T160°C Db

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Date 31/03/2017 - Translation issued the 31/03/2017

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Testing & Certification Division
Business Area Certification

Il Responsabile

(Roberto Piccin)

[13]

Schedule

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 0007X/01**

[15] **Description of the variation**

- New terminal blocks KM5, KM8, KM12,
- New multicore bushings type RSM with separate certification,
- New motor frame sizes 7AT 90 – 100 – 112
- Constructive variations on motor size 132
- New terminal box in protection "Ex db" for motors 7AT 132; 7AT 160-180; 7AT 200-225 and 7AT 250-280
- 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 7AT with Ambient Temperature +40°C,
- Assessment for temperature class T6 for motor types 7AT 132M-4 (4.8 kW) and 7AT 132SA-2 (3.4 kW)
- 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 7AT 90-100-112-132-160-180-200-225-250-280-315 are manufactured by different constructive typologies; they can be supplied by mains or by 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 such as heaters, thermal detectors, brake and encoder.

The motors series 7AT 90 ÷ 315 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 eb" terminal boxes (connected by piece fitting or by cable glands and cable).

The three-phase asynchronous motors series 7AT 90-100-112-132-160-180-200-225-250-280-315, can be manufactured with efficiency class IE1, IE2 and IE3 according to EN 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 7AT are suitable for temperature classes T5 and ambient temperature $T_a + 40^\circ\text{C}$.

The three-phase asynchronous motors series 7AT 90 ÷ 315 can have the following markings:

Motors in temperature class T3 and T4

-  **II 2G Ex db IIC T3, T4 Gb** Ambient Temperature : - 20°C / + 40°C /+ 50°C /+ 60°C
-  **II 2G Ex db eb IIC T3, T4 Gb**
-  **II 2D Ex tb IIC T160°C, T130°C**
-  **I M2 Ex db I Mb**
-  **I M2 Ex db eb I Mb**

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[13]

Schedule

[14] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 0007X/01

Motors in temperature class T3

- | | | |
|---|----------------------------------|---|
|  | II 2G Ex db IIB T3 Gb | <u>Ambient Temperature: - 20°C / + 80°C</u> |
|  | II 2G Ex db eb IIB T3 Gb | |
|  | II 2D Ex tb IIC T160°C Db | |

Motors in temperature class T5

- | | | |
|---|---------------------------------|--|
|  | II 2G Ex db IIC T5 Gb | <u>Ambient Temperature: - 20°C / +40°C</u> |
|  | II 2G Ex db eb IIC T5 Gb | |

Only for Motor types: 180 M-4 (max. Power 15.0 kW); 200 L-4 (max. Power 22.0 kW);

- | | | |
|---|---------------------------------|--|
|  | II 2G Ex db IIC T5 Gb | <u>Ambient Temperature: - 20°C / +45°C</u> |
|  | II 2G Ex db eb IIC T5 Gb | |

Only for Motor type 132M-4 (max. Power 5.0 kW);

- | | | |
|---|---------------------------------|--|
|  | II 2G Ex db IIC T5 Gb | <u>Ambient Temperature: - 20°C / +50°C</u> |
|  | II 2G Ex db eb IIC T5 Gb | |

Motors in temperature class T6

Only for Motor types: 132SA-2 (max. Power 3.4 kW);

- | | | |
|---|---------------------------------|--|
|  | II 2G Ex db IIC T6 Gb | <u>Ambient Temperature: - 20°C / +40°C</u> |
|  | II 2G Ex db eb IIC T6 Gb | |

Only for Motor type: 132MA-4 (max. Power 4.8 kW)

- | | | |
|---|---------------------------------|--|
|  | II 2G Ex db IIC T6 Gb | <u>Ambient Temperature: - 20°C / +45°C</u> |
| | II 2G Ex db eb IIC T6 Gb | |

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[13]

Schedule

[14] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 0007X/01

Description of the equipment (follows)

The motors of series 7AT.., are identified by a code with the following meaning:

A B C D E F G H I J K

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

B = Motor series: 7- motors with cast iron 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 (90-100-112-132-160-180-200-225-250-280-315)

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

G = Power designation, power 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

R1- Ex db eb I - motor "db" and terminal box "eb" group I

R2 = Ex db I - motor "db" group I 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

V = motor with forced ventilation unit and certified driving motor

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

Max. Surface Temperature for dust : T160°C ; T130°C

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[13]

Schedule

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 0007X/01**

Electrical characteristics of motors in temperature classes T4/T3

Motors supplied by mains

- Maximum rated voltage: 750 V
- Maximum rated power (S1): 225 kW
- Maximum rated current: 335 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
- Degree of protection: IP54 or IP 55 or IP 56 or IP 65 or IP 66

- 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))

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 and 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. and motors for group I M2 (mining).

The resetting of the supply shall not be automatic.

Main electrical characteristics of motors series 7AT., with Temperature class T5

Motor	Sample of standard motors				Motors for Ta > + 40°C							
	160M-4		180 L-4		180 M-4		200 L-4		132M-4			
Rated Voltage (V)	400	690	400	440	400	575	690	480	690	400	440	
Rated Power -S1 (kW)	11.0	11.0	16.0	18.0	15.0	13.3	15.0	22.0	22.0	5.0	5.5	
Rated frequency (Hz)	50	60	50	60	60	50	60	50	50	50	60	
Rated current (A)	21.7	12.5	31.3	29.0	29.8	17.2	17.2	63.0	23.0	10.0	10.0	
Number of poles	4	4	4	4	4	4	4	4	4	4	4	
Connection	delta	star	delta	delta	delta	star	star	delta	delta	delta	delta	
Temperature Class	T5	T5	T5	T5	T5	T5	T5	T5	T5	T5	T5	
Ambient Temp.(°C)	-20 ÷ + 40				-20 ÷ + 45						20 ÷ + 50 -	
Degree of protection	IP 54 o IP 55 o IP 56 o IP 65 o IP 66											

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[13]

Schedule

[14] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 0007X/01

Main electrical characteristics of motors series 7AT..., with Temperature class T6

<i>Motor</i>	<i>132 SA-2</i>		<i>132 MA-4</i>
Rated Voltage (V)	400	440	440
Rated Power -S1 (kW)	3.0	3.4	4.8
Rated frequency (Hz)	50	60	60
Rated current (A)	6.5	6.7	8.4
Number of poles	2	2	4
Connection	delta	delta	delta
Temperature Class	T6	T6	T6
Ambient Temperature (C°)	-20 ÷ + 40		-20 ÷ + 45
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.

Motors with forced ventilation unit (only for motors 132 ÷ 315)

These equipment are provided with a motor-driven blower mounted on the primary motor. The motor used for forced ventilation shall be suitable for group, type of protection and ambient temperature range foreseen from the primary 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.

Warning label

For motors size 315LB, motors without terminal box and motors with ambient temperature +60°C:

“Supply cables of motors shall be suitable at least for an operating temperature of 92°C”

For motor supply by inverter:

“Winding protected with PTC thermistors”

In case of use of anticondensate heaters:

“Warning – energised resistors”

[13]

Schedule

[14] SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 0007X/01

[16] Report n. EX- B7006895

Routine tests

"Ex db" motor enclosures

On the motor enclosure 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 sizes 90, 112, 180 and 200: 14.5 bar
- Motor enclosure size 100: 13.5 bar
- Motor enclosure size 132MX: 13.0 bar
- Motor enclosure sizes 132 and 160: 11.7 bar
- Motor enclosure size 225 : 17.6 bar
- Motor enclosure size 250 : 24.3 bar
- Motor enclosure size 280: 28.2 bar
- Motor enclosure size 315: 23.5 bar
- Motor enclosure size 315LB: 27.8 bar

Terminal boxes:

"Ex db" terminal boxes:

On the terminal boxes with type of protection "Ex db" (drw. TR-122016/9B2), the manufacturer shall carry out the overpressure routine tests according to paragraph 15.2.3.2 of IEC 60079-1 standard, at the following pressure values:

- Terminal box for motor sizes 90 ÷ 112 : 12.6 bar

On the terminal boxes, with type of protection "Ex db", (dwg. TR-122016/7B1) the manufacturer shall carry out the overpressure routine tests according to paragraph 15.2.3.2 of IEC 60079-1 standard, at the following pressure values:

- Terminal box for motor size 132 ÷ 280 : 13.2 bar
- Terminal box for motor size 315 : 15.5 bar

280, On the terminal boxes, with type of protection "Ex db", (dwg. TR-122016/7B4) for motors sizes 200, 225, 250 and the manufacturer shall carry out the overpressure routine tests according to paragraph 15.2.3.2 of IEC 60079-1 standard, at the following pressure values:

- Terminal box for motor size 200 ÷ 225 : 12.8 bar
- Terminal box for motor size 250 ÷ 280 : 13.7 bar

The terminal boxes with type of protection "Ex db" (drw. TR-122016/7B4) for motors sizes 132, 160 e 180 are exempted from overpressure test since they passed, with positive result, the test at to 4 times the reference pressure:

- 35.3 bar (8.8 x 4) terminal box for motors 132
- 33.2 bar (8.3 x 4) terminal box for motors 160, 180:

"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).

[13]

Schedule

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 0007X/01**

[17] **Special conditions for safe use**

- Supply cables of motors size 315LB, motors without terminal box and motors for the ambient temperature +60°C shall be suitable for an operating temperature equal or greater than 92°C;
- The motors for ambient temperature +80°C the 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 strength equal or higher than:
 - 800 N/mm² for motors size 90, 100, 112, 132, 160, 180, 280 and 315;
 - 1200 N/mm² for motors size 200, 225 and 250.
- 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**

Compliance with the Essential Health and Safety Requirements is not affected by this variation.
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”

[19] **Descriptive documents (prot. EX-B7006926)**

- Technical Note Nr. SH-A524200 HOYER Annex 1 (26 sh.)	Ed. 2	dated	10/01/2017
- Name plate drawing n 122016/6C4 (2 sh)	Rev. A	dated	25/11/2016
- Drawing n. 122016/6A	Rev. C	dated	30/09/2016
- Drawing n. 122016/4A	Rev. A	dated	20/01/2014
- Drawing n. 122016/9A		dated	30/09/2016
- Data list n. 122016/9B (2 sh)	Rev. B	dated	30/09/2016
- Drawing n. A52420/A		dated	20/01/2014
- Drawing n. A52420/B (2 sh)	Rev. B	dated	16/06/2014
- Drawing n. 122016/4B (2 sh)	Rev. C	dated	11/09/2014
- Drawing n. A69192-5	Rev. B	dated	30/09/2016
- Drawing n. A69192-6	Rev.C	dated	30/09/2016
- Drawing n. 122016/9B3		dated	30/09/2016
- Drawing n. TR-122016/9B2 (2 sh.)		dated	30/09/2016
- Drawing n. TR-122016/9B1 (2 sh.)		dated	30/09/2016
- Drawing n. TR-122016/7B1	Rev. D	dated	25/11/2016
- Drawing n. TR-122016/7B2	Rev. D	dated	25/11/2016
- Drawing n. TR-122016/7B3	Rev. A	dated	25/11/2016
- Drawing n. TR-122016/7B4	Rev. A	dated	25/11/2016
- Drawing n. TR-122016/7B5	Rev. D	dated	25/11/2016
- Drawing n. 122016/7B6 (4 sh)	Rev. B	dated	12/03/2015

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[13]

Schedule

[14] **SUPPLEMENTARY EU-TYPE EXAMINATION CERTIFICATE n. CESI 13 ATEX 0007X/01**

Descriptive documents (follows)

- Drawing n. 122016/9D1			dated 30/09/2016
- Drawing n. 122016/9D2			dated 30/09/2016
- Drawing n. 122016/7C1			dated 20/01/2014
- Drawing n. 122016/7C2			dated 16/06/2014
- Drawing n. 122016/7C4	Rev. A		dated 20/01/2014
- Drawing n. 122016/7C3		Rev. A	dated 19/12/2014
- Drawing n. 122016/7B7		Rev. A	dated 16/06/2014
- Drawing n. 122016/7B8			dated 10/04/2014
- Fac-simile EU Declaration of Conformity OB 7.3.7.13/ED/9			dated 25/11/2016
- Fac-simile EU Declaration of Conformity OB 7.3.7.13/B			dated 25/11/2016
- SVEND HOYER Operation and maintenance Instructions n. 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	2017/03/31	<ul style="list-style-type: none"> - New terminal blocks KM5, KM8, KM12, - New multicore bushings type RSM with separate certification, - New frame sizes 7AT 90 – 100 – 112 - Constructive variations on motor size 132 - New terminal box in protection "Ex db" for motors 7AT 132; 7AT 160-180; 7AT 200-225 and 7AT 250-280 - 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 7AT with Ta +40°C, - Assessment for temperature class T6 for motor types 7AT 132M-4 (4.8 kW) and 7AT 132SA-2 (3.4 kW) - 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.
00	2013/05/22	First issue of certificate CESI 13 ATEX 007X

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