



CESI S.p.A.
Via Rubattino 54
I-20134 Milano - Italy
Tel: +39 02 21251
Fax: +39 02 21255440
e-mail: info@cesi.it
www.cesi.it

Schema di certificazione

CESI-ATEX

[1] **TYPE EXAMINATION CERTIFICATE**

[2] **Category 3 Equipment intended for use
in potentially explosive atmospheres
Directive 2014/34/EU**

[3] Type Examination Certificate number:
CESI 19 ATEX 017 X

[4] Product: **Three-phase asynchronous motors
types 5AZN 63-160, 7AZN 90-315**

[5] Manufacturer: **KONČAR-MES d.d.
(KONČAR – MALI ELEKTRIČNI STROJEVI d.d.)**

[6] Address: **Fallerovo šetalište 22, HR-10000 Zagreb, Croatia**

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] CESI certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design of category 3 equipment intended for use in potentially explosive atmospheres given in Annex II to the European Union Directive 2014/34/EU of the European Parliament and Council of 26 February 2014.

The examination and test results are recorded in confidential report n. **EX-B9006390**.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 EN IEC 60079-7:2015/A1:2018 EN 60079-31:2014

except in respect of those requirements listed at item 18 of the Schedule.

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

[11] This TYPE EXAMINATION CERTIFICATE relates only to the design, examination and tests of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

[12] The marking of the product shall include the following:

**II 3G Ex ec IIC T4 ... T3 Gc
II 3D Ex tc IIIC T90°C ... T160°C Dc IP6x**

This certificate may only be reproduced in its entirety and without any change, schedule included.

Date 27/09/2019 - Translation issued the 27/09/2019

Prepared
Adrián Lucas Vagni

Verified
Mirko Balaž

Approved
Roberto Piccin

[13]

Schedule





[14] **TYPE EXAMINATION CERTIFICATE n. CESI 19 ATEX 017 X**

[15] **Description of product**

The three-phase asynchronous squirrel-cage electric motors series **5AZN 63-160, 7AZN 90-315** are manufactured in frame sizes IEC 63, 71, 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280 and 315, one speed and of various types of construction acc. to IEC 60034-7, with efficiency class IE1, IE2 and IE3 acc. to IEC 60034-30 standard. These motors can be supplied by sinusoidal voltage (direct net connection) or by regulation of rotational speed (static frequency converters), with simple or double polarity, they are self-ventilated, they can have terminal box for supply and auxiliary circuit connection or can be provided with permanently connected cable. They can be equipped with auxiliary devices such as anticondensation heaters, thermal detectors or encoder. The standard motors are produced with insulation system in class F and are designed with temperature limit of the insulation class B ($\Delta t=80K$ with Tamb up to 40°C). The motors for temperature class T3 can be designed with temperature limit of the insulation class F ($\Delta t=105K$ with Tamb up to 40°C) with insulation system in class F or H.

Marking:

The motor can be marked for gas atmospheres of Group IIC, IIB or IIA, or for dust atmospheres containing conductive dusts of Group IIIC, as follows:

 II 3G Ex ec IIC T4 or T3 Gc
 or
 II 3G Ex ec IIB T4 or T3 Gc
 or
 II 3G Ex ec IIA T4 or T3 Gc
 or
 II 3D Ex tc IIIC T90°C or T135°C or T160°C Dc IP6x

When use in gas atmospheres of Group IIC with total dry film thickness > 0,2mm, a **Warning label** regarding potential electrostatic charging hazards shall be applied.

Model identification:

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>	<u>H</u>	<u>I</u>	<u>J</u>	<u>K</u>
A	=	Efficiency class (if different than IE1): E – IE2 H – IE3								
B	=	Series designation: 5 – motors with aluminium die cast frame 7 – motors with welded construction or cast iron frame								
C	=	Type designation: AZN – basic design single-speed motor ABZN – single-speed marine motor AZNK – single-speed motor with built-on brake AZNP – multi-speed motor with constant torque characteristic AZNPV – multi-speed motor with variable torque characteristic								
D	=	Additional type designation (single letter or combination of letters): A – special mounting dimensions and/or special free shaft end dimensions E – special electric design (special voltage or power)								
E	=	IEC frame size: 63, 71, 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280, 315								
F	=	Frame length: S – short M – medium L – long X – longer frame (SX, MX, LX)								

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- G** = Power designation:
A, B, C – power according to stator and rotor length
R – reduced power in bigger frame (RA, RB, ...)
- H** = Number of poles:
2 ... 12
- I** = Type of explosion protection mark (additional mark for AZN motors for G-gas and D-dust):
P – motor in type of protection: Ex ec IIC / IIB / IIA and/or Ex tc IIIC
- J** = Additionally mounted or built-in equipment mark (single letter or combination of letters):
K – motor equipped with cable (without terminal box)
T – thermal protection
A – space heaters
V – forced ventilation
G – encoder
- K** = Temperature class mark or maximum temperature (single or combination):
for gases – **T3** or **T4**
for dusts – **T90°C ... T160°C**
for gases and dusts – **T4 ... T3 – T90°C ... T160°C**

Electrical characteristics

Supply by direct net connection:

Main electrical characteristics of motors series **5AZN 63-160, 7AZN 90-315**, supplied by direct net connection:

Maximum voltage	up to 750 V
Maximum current	up to 335 A
Rated voltage / frequency	400V / 50Hz or 440V / 60 Hz
Synchronous speed	750 to 3600 RPM
Number of poles	2 to 12
Duty type	S1
Temperature class	T4 (with Δt B) T3 (with Δt F)
Rated power at S1 duty	225 KW
Degree of protection for motors and for terminals boxes	IP55, IP56, IP65, IP66 – for gases IP65, IP66 – for dusts
Ambient temperature	standard motors: -20 ÷ +40°C on demand (class T4): -20 ÷ +50°C or -20 ÷ +60°C or -30 ÷ +50°C or -30 ÷ +60°C on demand (class T3): -20 ÷ +50°C or -20 ÷ +60°C or -20 ÷ +70°C or -30 ÷ +40°C or -30 ÷ +50°C or -30 ÷ +60°C or -30 ÷ +70°C

The anticondensation heaters installed inside the motor can have a maximum power as follows.

Recommended values are:

- One (1) heater 25W for frame sizes 60 – 90
- Two (2) heaters 25W for frame sizes 100 – 132
- Two (2) heaters 40W for frame sizes 160 – 250
- Four (4) heaters 40W for frame sizes 280 – 315

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Schedule

[14] **TYPE EXAMINATION CERTIFICATE n. CESI 19 ATEX 017 X**

Supply by frequency inverter:

Main electrical characteristics of motors series **5AZN 63-160, 7AZN 90-315**, supplied by frequency inverter:

Maximum voltage	750 V
Peak voltage maximum	1060 V
Power	0,12 ÷ 200 kW
Moment	0,4 ÷ 1286 Nm
Speed	150 ÷ 5200 rpm
Maximum current	335 A
Frequency range	5 ÷ 87 Hz (motors 2p=2) 5 ÷ 100 Hz (motors 2p=4, 6, 8)
Duty	S9
Cooling method	IC 411

The motors supplied by inverter are provided with a suitable label reporting electrical operating characteristics.

Frequency inverter settings:

Motors series **5AZN 63-160, 7AZN 90-315** may only be operated with converters that meet the following conditions (stated settings must be maintained during operation):

Minimum clock frequency	5 kHz
Motor current (short-term)	1,5 * I _N
Maximum overload period	60 s
Minimum frequency f _{min}	according motor nameplate data
Maximum frequency f _{max}	according motor nameplate data
Permissible period of operation below f _{min}	60 s

Maximum overload period and permissible period of operation below f_{min} are based on a 10-minute time interval.

The motors shall be provided, inside the stator winding, with thermal detectors (PTC or TP). Thermal detectors shall be connected to suitable protection devices of the supply system. The resetting of the supply shall not be automatic. The operation of the thermal detector shall guarantee the disconnection of the supply at:

- 150 °C maximum for motors with temperature class T3;
- 110 °C maximum for motors with temperature class T4.

Warning label

For motor supply by inverter: "Winding protected with PTC thermistors".

In case of use of anticondensation heaters: "Warning – energized resistors".

In case of Gas Group IIC and total dry film thickness > 0,2mm: "Warning – potential electrostatic charging hazard.

Clean with damp cloth".

[16] **Report n. EX-B9006390**

Routine tests

Each produced motor shall be tested in accordance to tables listed at item [19].

The manufacturer shall carry out the Dielectric strength test according to standard EN 60079-7 cl. 7.1 with test voltage applied (2Un+1000) V for a period at least 60 s or with 1,2 x (2Un+1000) V for a period of at least 100 ms.

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Schedule

[14] **TYPE EXAMINATION CERTIFICATE n. CESI 19 ATEX 017 X**

[17] **Special conditions for safe use (X)**

- For motors without terminal box and motors with ambient temperature 50 °C and 60 °C:
" Supply cables of motors shall be suitable at least for operating temperature ≥ 90 °C".
- For motors without terminal box and motors with ambient temperature 70 °C:
" Supply cables of motors shall be suitable at least for operating temperature ≥ 120 °C".
- 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 the types of protection indicated in EN 60079-0 standard according to the installation rules in force in the site of installation.
- For motors equipped with anti-condensation heaters, use of supplied thermal protection is mandatory.

[18] **Essential Health and Safety Requirements**

Covered by the standards listed at item [9].

[19] **Descriptive documents (prot. EX-B9006394)**

Title	Drawing No	Rev. level	Date
Technical Description Motor 5/7AZN 63-315 (19 pag.)	A52311 ANNEX 1	1	16.04.2019
Nameplates Drawing	A52311/K	A	22.02.2019
Encoder Mounting Schematic Overview	A52311/I	-	22.02.2019
Brake Mounting Schematic Overview Drawing	A52311-5	-	04.2019
Forced Ventilation Mounting Schematic Overview Drawing	A52311/F	-	22.02.2019
Thermal Protection Connection Drawing	A61903/E	-	30.05.2014
Operation & Maintenance Instructions For Iec Low Voltage Squirrel-Cage Induction Motors (18 pag.)	2752514	-	02.2019
Appendix 1: Technical data of IE2/IE3 motors (4 pag.)	-	-	14.02.2019
Appendix 2: Technical data of rotor and stator	-	-	13.09.2018
Appendix 3: Drive over frequency inverter	-	-	22.02.2019
Appendix 4: Certified components	-	-	14.02.2019
Appendix 5: Maximal surface temperatures for protection by enclosure "tc"	-	-	14.02.2019
Appendix 6: Thermal analysis for motors in explosion protection "ec" (5 pag.)	-	-	14.02.2019
Testing station work procedures (11 pag.)	PP2530 .09.05	8	06.07.2018
Warning labels	A52311/L	-	22.02.2019

One copy of all documents is kept in CESI files.