IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx CES 10.0019X

Issue No: 3

Certificate history:
Issue No. 3 (2017-03-30)
Issue No. 2 (2016-07-29)
Issue No. 1 (2014-09-30)
Issue No. 0 (2010-12-01)

Status: **Current**

Date of Issue: **2017-03-30**

Applicant: **KONCAR - MES d.d.**
(KONCAR–MALI ELEKTRICNI STROJEVI d.d.)
Fallerovo setaliste 22
HR – 10002 Zagreb
Croatia

Equipment: **Three-phase asynchronous motors series 5AT 71- 80-90-100-112**

Optional accessory:

Type of Protection: **Flameproof enclosures 'd'; increased safety "e"**

Marking:

Ex db IIC T3,T4,T5 Gb *or*

Ex db eb IIC T3,T4,T5 Gb

Approved for issue on behalf of the IECEx Certification Body: Mirko Balaz

Position: Head of IECEx CB

Signature:
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

CESI
Centro Elettrotecnico
Sperimentale Italiano S.p.A.
Via Rubattino 54
20134 Milano
Italy

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Manufacturer:	**KONCAR - MES d.d.** (KONCAR–MALI ELEKTRICNI STROJEVI d.d.) Fallerovo setaliste 22 HR – 10002 Zagreb **Croatia**	

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-7 : 2015 Edition:5.0	Explosive atmospheres – Part 7: Equipment protection by increased safety "e"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

IT/CES/ExTR09.0007/00 IT/CES/ExTR09.0007/01 IT/CES/ExTR09.0007/02
IT/CES/ExTR09.0007/03 IT/CES/ExTR09.0007/04

Quality Assessment Report:

IT/CES/QAR10.0010/06

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

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 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 (heaters, thermal detectors) and with separate brake and/or encoder.

The Three-phase asynchronous motors series 5AT 71-80-90-100-112, can be manufactured with efficiency class IE1, IE2 and IE3 according to IEC 60034-30 standard.

See annex for further description.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- Supply cables of motors for the ambient temperature +60°C shall be suitable for an operating temperature equal or greater than 85°C.
- Screws used for fastening the parts of motor enclosure, shields and terminal box shall have a yield stress higher than 800N/mm2.
- 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 IEC 60079-0 standard according to 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 flameproof joints the manufacturer shall be contacted.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Variation 3

Variation 3.1 - New design of motors with efficiency class IE2 and IE3.

Variation 3.2 - New additional code for motors with efficiency class IE2 and IE3.

Variation 3.3 - Reassessment for temperature class T5 (standard motors).

Variation 3.4 - Reassessment for temperature class T6 for motors frame sizes: 80 A-2; 90 L-2.

Variation 3.5 - Upgrading the name-plate.

Variation 3.6 - The motors series 5AT 71÷ 112, originally assessed in compliance with IEC 60079-7 Ed. 4th 2006 has been reassessed on the basis of the new standard IEC 60079-7 Ed. 5th: 2015.

Annex:

IECExCES10.0019X ANNEX Issue 3-KONCAR motors 5AT 71-112.pdf

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Prot: B7010943

Annex to certificate: **IECEx CES 10.0019X Issue No.3 of 2017-03-30**
Applicant: **KONCAR - MES d.d.**
(KONCAR – MALI ELEKTRICNI STROJEVI d.d.**)**
Fallerovo setaliste 22, HR – 10002 Zagreb, Croatia
Electrical Apparatus: **Three-phase asynchronous motors series 5AT 71-80-90-100-112**

Description of 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 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 (heaters, thermal detectors) and with separate brake and/or encoder.
The Three-phase asynchronous motors series 5AT 71-80-90-100-112, can be manufactured with efficiency class IE1, IE2 and IE3 according to IEC 60034-30 standard.
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 Ta = +40°C
The standard motors series 5AT are assessed for temperature classes T5 and ambient temperature Ta + 40°C.

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, 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

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)

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Fallerovo setaliste 22, HR – 10002 Zagreb, Croatia
Electrical Apparatus: **Three-phase asynchronous motors series 5AT 71-80-90-100-112**

Electrical characteristics

Main electrical characteristics of motors series 5AT.., with Temperature classes T3 and T4

Supply by mains

Maximum voltage:	750	V
Maximum rated power (S1 duty)	4,5	kW
Maximum rated current:	8,7	A
Rated frequency:	50 / 60	Hz
Rated speed:	750 ÷ 3600	rpm
Insulation class:	F-H	(with Δt B)
Duty:	S1 ÷ S10	
Number of poles:	2 ÷ 8	
Degree of protection	IP 55	
	IP54 or IP 56 or IP 65 or IP 66 (optional)	
Ambient temperature:	-20°C ÷ +40 °C (standard motors)	
	-20°C ÷ +50 °C (motors provided with permanently connected cables)	
	-20°C ÷ +60°C (on demand)	

The anticondensate heaters installed inside the motor can have a maximum power of 80 W.

Motors supplied by inverter

Maximum voltage:	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; they 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.

Main electrical characteristics of motors series 5AT.., with Temperature class T5

	Sample of standard motors				*Motors for Ta > + 40°C*					
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									

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Fallerovo setaliste 22, HR – 10002 Zagreb, Croatia
Electrical Apparatus: **Three-phase asynchronous motors series 5AT 71-80-90-100-112**

Electrical characteristics *(follows)*

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				

Depending on of type of protection and ambient temperature, the motor series 5AT 71 ÷ 112 can be marked as follows:

Motors in temperature class T3 and T4

Ex db IIC T3, T4 Gb Ambient Temperature: - 20°C / +40°C/ +50°C / +60°C
Ex db eb IIC T3, T4 Gb

Motors in temperature class T5

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

Only for Motor types 90 L-2 (max. Power 1.7 kW);

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

Only for Motor types 100 LA-4 (max. Power 1.7 kW);

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

Only for Motor types 90 S-2 (max. Power 1.2 kW);

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

Motors in temperature class T6

Only for Motor types: 80 A-2 (max. Power 0.4 kW)
90 L-2 (max. Power 1.1 kW);

Ex db IIC T6 Gb Ambient Temperature: - 20°C / +40°C
Ex db eb IIC T6 Gb

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Electrical Apparatus: **Three-phase asynchronous motors series 5AT 71-80-90-100-112**

Motors with brake and/or encoder

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

Warning label

For motor supply by inverter: “Winding protected with PTC thermistors”
In case of use of anticondensate heaters: “Warning – energized resistors”.

Installation conditions

The accessories used for cable entries and for closing unused openings shall be certified according to the followings standards:
- IEC 60079-0 and IEC 60079-1 for motors and terminal box with type of protection “Ex db”
- IEC 60079-0 and IEC 60079-7 for terminal box with type of protection “Ex eb”

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