



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

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

Certificate No.: **IECEx CES 14.0009X** Page 1 of 4 Certificate history:
Status: **Current** Issue No: 4 Issue 3 (2020-07-31)
Date of Issue: 2021-11-29 Issue 2 (2017-04-04)
Issue 1 (2016-07-29)
Issue 0 (2014-09-30)
Applicant: **KONCAR - MES d.d.**
(KONCAR – MALI ELEKTRICNI STROJEVI d.d.)
Fallerovo setaliste 22
HR-10002 Zagreb
Croatia
Equipment: **Three-phase asynchronous motors series 7AT 71-80-90-100-112-132-160-180-200-225-250-280-315**
Optional accessory:
Type of Protection: **Flameproof enclosures 'd'; Increased safety 'e'; Dust ignition protection 't'**
Marking: **Ex db I Mb or Ex db eb IMb**
Ex db IIC T3,T4,T5,T6 Gb or Ex db eb IIC T3,T4,T5,T6 Gb
Ex tb IIIC T160°C, T130°C, T100°C Db _
and
Ex db IIB T3 Gb or Ex db eb IIB T3 Gb
Ex tb IIIC T160°C Db

Approved for issue on behalf of the IECEx
Certification Body:

Mirko Balaz

Position:

Head of IECEx CB

Signature:
(for printed version)

Date:

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Certificate issued by:

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

CESI



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Certificate No.: **IECEX CES 14.0009X**

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Date of issue: 2021-11-29

Issue No: 4

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

Additional
manufacturing
locations:

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 equipment 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 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-1:2014-06](#) Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

[IEC 60079-31:2013](#) Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

[IEC 60079-7:2017](#) Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

This Certificate **does not** indicate compliance with 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 Reports:

[IT/CES/ExTR14.0011/00](#)
[IT/CES/ExTR14.0011/03](#)

[IT/CES/ExTR14.0011/01](#)
[IT/CES/ExTR14.0011/04](#)

[IT/CES/ExTR14.0011/02](#)

Quality Assessment Report:

[IT/CES/QAR10.0010/11](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

Three-phase asynchronous motors series 7AT 71-80-90-100-112-132-160-180-200-225-250-280-315 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 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.

Only for group II and III, the motors series 7AT 71 ÷ 315 can be assembled with two "Ex d" 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).

For all motors of group I, aluminium alloy, as material, is excluded.

The motors can be equipped with auxiliary devices such as heaters, thermal detectors, brake and encoder.

The three-phase asynchronous motors series 7AT 71-80-90-100-112-132-160-180-200-225-250-280-315, can be manufactured with efficiency class IE1, IE2 and IE3 according to EN 60034-30 standard.

See annex for further description.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- 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 71, 80, 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 IEC 60079-0 standard according to the installation rules in force in the site of
- The motor for group I (Mb) type 7AT size 71, 80, 90, 100, 112 was tested for low risk of mechanical danger and it shall be additionally protected against impact.
- The flamepaths are specified in the manufacturer drawings. For information regarding the dimensions of the flameproof joints the manufacturer shall be contacted.
- For motors painted with non-conductive dry film having thickness > 0.2 mm, the following label shall be applied: "Warning – potential electrostatic charging hazard. Clean with damp cloth"



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Variations indicated below, refer to issue 4 of CoC IECEX CES 14.0009X:

Variation 4.1 - New motor sizes IEC 71, 80, 90S/L (shorter version than previous size 90, now called 90LX).

Variation 4.2 - New terminal box 7AT 71÷112 (Ex eb).

Variation 4.3 - Assessment for temperature class T6 for complete motor range 7AT 71÷315 (design T6; Practice 3 + Appendix 7 + Appendix 8).

Variation 4.4 - Motors for mining application (Ex db I Mb; Ex db eb I Mb).

Variation 4.5 - Corrosion protection system for motors in group IIC.

Variation 4.6 - The motors series 7AT, originally assessed in compliance with IEC 60079-7 Ed. 5th 2015 has been reassessed on the basis of the new standard IEC 60079-7 Ed. 5.1th: 2017.

Annex:

[Koncar-MES IECEX CES14_0009X ANNEX Issue 4 - 7AT 71-315.pdf](#)



Prot: C1016415

Annex to certificate:
Applicant:

IECEX CES 14.0009X Issue No.4 of 2021-11-29
KONCAR - MES d.d. (KONCAR – MALI ELEKTRICNI STROJEVI d.d.)
Fallerovo setaliste 22, HR – 10002 Zagreb, Croatia
Three-phase asynchronous motors series
7AT 71-80-90-100-112-132-160-180-200-225-250-280-315

Electrical Apparatus:

Description of equipment

The three-phase asynchronous motors series 7AT 71-80-90-100-112-132-160-180-200-225-250-280-315 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 can be 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.

Only for group II and III, the motors series 7AT 71 ÷ 315 can be assembled with two “Ex d” 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).

For all motors of group I, aluminium alloy, as material, is excluded.

The motors can be equipped with auxiliary devices such as heaters, thermal detectors, brake and encoder.

The three-phase asynchronous motors series 7AT 71-80-90-100-112-132-160-180-200-225-250-280-315, 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 motors series 7AT 71÷315, for gas group IIC, can be protected from corrosion with a top layer of conductive paint or alternatively with a layer of non-conductive dry film having thickness > 0.2 mm, in this last case, the following label shall be applied: “Warning – potential electrostatic charging hazard. Clean with damp cloth”.

Marking:

Depending on of type of protection, the motor series 7AT 71 ÷ 315, for **group I** can be marked as follows:

Ex db I Mb
Ex db eb IMb

Depending on of type of protection and ambient temperature, the motor series 7AT 71 ÷ 315, for **groups II, and III** can be marked as follows:

Ex db IIC T3, T4, T5, T6 Gb Ambient Temperature: - 20°C / +40°C
Ex db eb IIC T3, T4, T5, T6 Gb
Ex tb IIIC T160°C, T130°C, T100°C Db

Ex db IIC T3, T4 Gb Ambient Temperature: - 20°C / +40°C / + 50°C / +60°C
Ex db eb IIC T3, T4 Gb
Ex tb IIIC T160°C, T130°C Db

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

Temperature Class T5 and Ambient Temperature +45°C

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

Ex db IIC T5 Gb
Ex db eb IIC T5 Gb

Temperature Class T5 and Ambient Temperature +50°C

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

Ex db IIC T5 Gb
Ex db eb IIC T5 Gb



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Annex to certificate:

Applicant:

Electrical Apparatus:

IECEX CES 14.0009X Issue No.4 of 2021-11-29

KONCAR - MES d.d. (KONCAR – MALI ELEKTRICNI STROJEVI d.d.)

Fallerovo setaliste 22, HR – 10002 Zagreb, Croatia

Three-phase asynchronous motors series

7AT 71-80-90-100-112-132-160-180-200-225-250-280-315

Marking (follows):

Temperature Class T6 and Ambient Temperature +45°C

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

Ex db IIC T6 Gb

Ex db eb IIC T6 Gb

Model 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: 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 (71-80-90-100-112-132-160-180-200-225-250-280-315)

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); (4/2....., 8/4/2; 6/4/2; ...)

I = Type of protection

D = motor in type of protection "explosion-proof enclosure-d" and terminal box in type of protection "explosion-proof enclosure-d", design Ex db IIC (IIB)

E = motor in type of protection "explosion-proof enclosure-d" and terminal box in type of protection "increased safety-e", design Ex db eb IIC (IIB)

K = motor in type of protection "explosion-proof enclosure-d" equipped with frame lid on which the certified cable bushing or cable gland in type of protection "explosion-proof enclosure-d" is mounted, design Ex db IIC (IIB)

R1- motor in Ex protection "db" and terminal box in Ex protection "eb" with certified cable plugs (design Ex db eb I)

R2- motor in Ex protection "db" and terminal box in Ex protection "db" with certified cable plugs, or with direct cable entry (barrier cable glands) – (design Ex db I)

P = Ex tb IIC - motor in type of protection "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 (Gas); T3; T4; T5; T6

Max Surface temperature (Dust): T160°C; T130°C; T100°C



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Fallerovo setaliste 22, HR – 10002 Zagreb, Croatia
Three-phase asynchronous motors series
7AT 71-80-90-100-112-132-160-180-200-225-250-280-315**

Electrical Apparatus:

Electrical characteristics

Main electrical characteristics of motors series 7AT..., with Temperature classes T3 and T4

Supply by mains

Maximum voltage:	750	V
Maximum rated power (S1 duty)	225	kW
Maximum rated current:	335	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:	IP54 or IP 55 or IP 56 or IP 65 or IP 66 IP67 (for “Ex db” motors only)	
Ambient temperature:	-20 ÷ +40 °C (standard motors) -20 ÷ +50 °C (motors provided with permanently connected cables) -20 ÷ +60°C (on demand) -20 ÷ +80 °C (only for group IIB motors, with power derating for reducing the winding rise-temperature within the limits of the insulation class B (120 °C))	

The anticondensation heaters installed inside the motor can have a maximum power of 130 W

The equipment, in Ex db execution only, has been separately tested against the requirements of IEC 60034-5 and IEC 60529 and it meets IP67.

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) or thermal switches (TP); 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 operation of the thermal detector shall guarantee the disconnection of the supply; the resetting of the supply shall not be automatic.



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Fallerovo setaliste 22, HR – 10002 Zagreb, Croatia
Three-phase asynchronous motors series
7AT 71-80-90-100-112-132-160-180-200-225-250-280-315

Electrical Apparatus:

Electrical characteristics (follows)

Main electrical characteristics of motors series 7AT..., with Temperature class T5 and Ta > + 40°C

Motor	180 M-4			200 L-4		132M-4	
	Rated Voltage (V)	400	575	690	480	690	400
Rated Power -S1 (kW)	15.0	13.3	15.0	22.0	22.0	5.0	5.5
Rated frequency (Hz)	60	50	60	50	50	50	60
Rated current (A)	29.8	17.2	17.2	63.0	23.0	10.0	10.0
Number of poles	4	4	4	4	4	4	4
Connection	delta	star	star	delta	delta	delta	delta
Temperature Class	T5	T5	T5	T5	T5	T5	T5
Ambient Temp.(°C)	-20 ÷ + 45°C					20 ÷ + 50°C	
Degree of protection	IP 54 or IP 55 or IP 56 or IP 65 or IP 66 or IP67 (for Ex db" only)						

Main electrical characteristics of motors series 7AT..., with Temperature class T6 and Ta > + 40°C

Motor	132 MA-4
Rated Voltage (V)	440
Rated Power -S1 (kW)	4.8
Rated frequency (Hz)	60
Rated current (A)	8.4
Number of poles	4
Connection	delta
Temperature Class	T6
Ambient Temperature (C°)	-20 ÷ + 45°C
Degree of protection	IP 54 or IP 55 or IP 56 or IP65 or IP66 or IP67 (for Ex db" only)

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 (brake and encoder not available for Ta + 80°C).

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

These machines 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. The operation of the primary motor shall be interlocked to the correct operation of the forced ventilation.



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Fallerovo setaliste 22, HR – 10002 Zagreb, Croatia

Three-phase asynchronous motors series

7AT 71-80-90-100-112-132-160-180-200-225-250-280-315

Warning label

“Warning - Do not open when energized”.

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 or TP thermal switches”

In case of use of anticondensation heaters:

“Warning – energised resistors”.

In case of paint with nonconductive dry film thickness > 0.2 mm

“Warning – potential electrostatic charging hazard. Clean with damp cloth”

Installation conditions

The accessories used for cable entries and for closing unused openings shall be certified according to the following's 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”
- IEC 60079-0 and IEC 60079-31 for motors and terminal box with type of protection “Ex tb”

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