



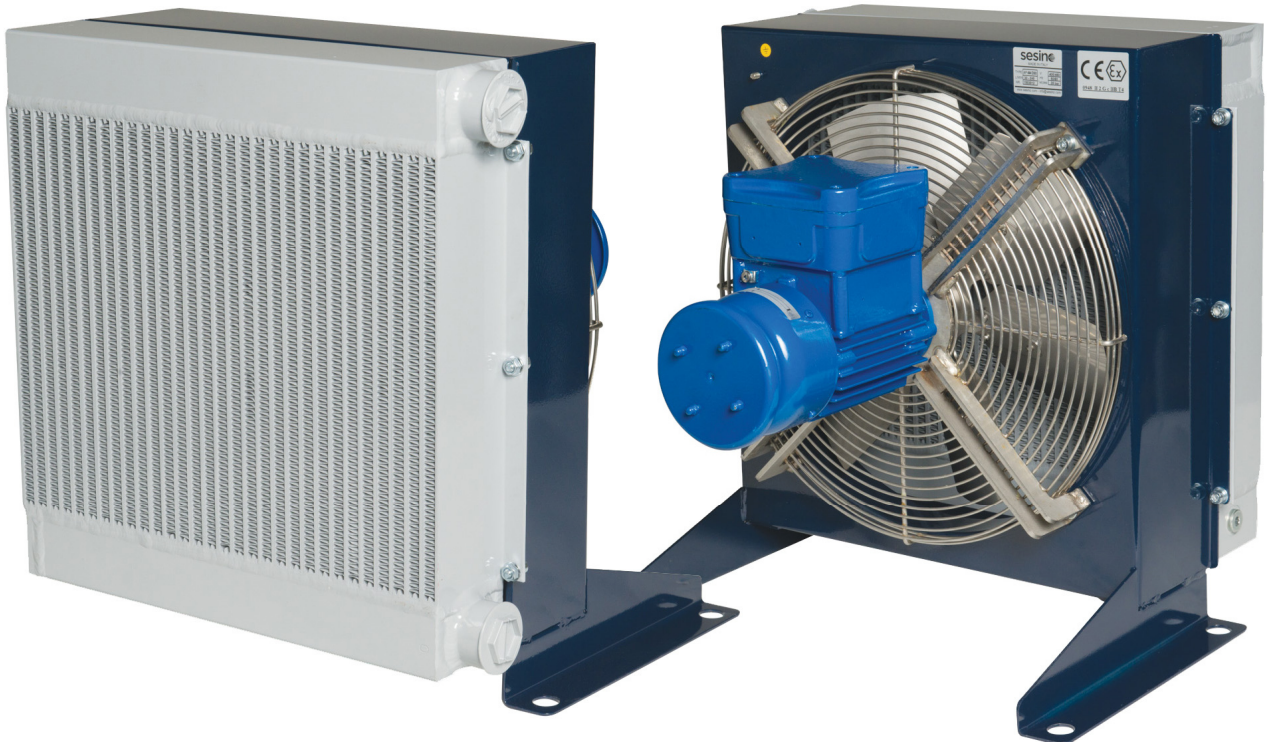
HEAT EXCHANGING EXCELLENCE SINCE 1919

# USE AND MAINTENANCE MANUAL

## Air-oil series AP EMX Heat exchanger

### AC fan motor – ATEX

300 EMX – 300/2 EMX – 430 EMX – 430/2 EMX – 494 EMX – 580 EMX – 680  
EMX – 730 EMX – 830 EMX – 2/680 EMX – 2/730 EMX – 2/830 EMX – 3/830 EMX

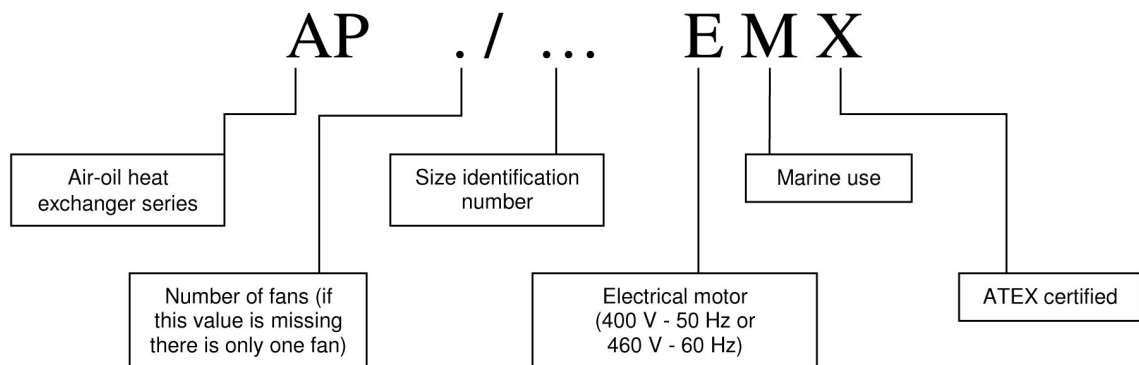


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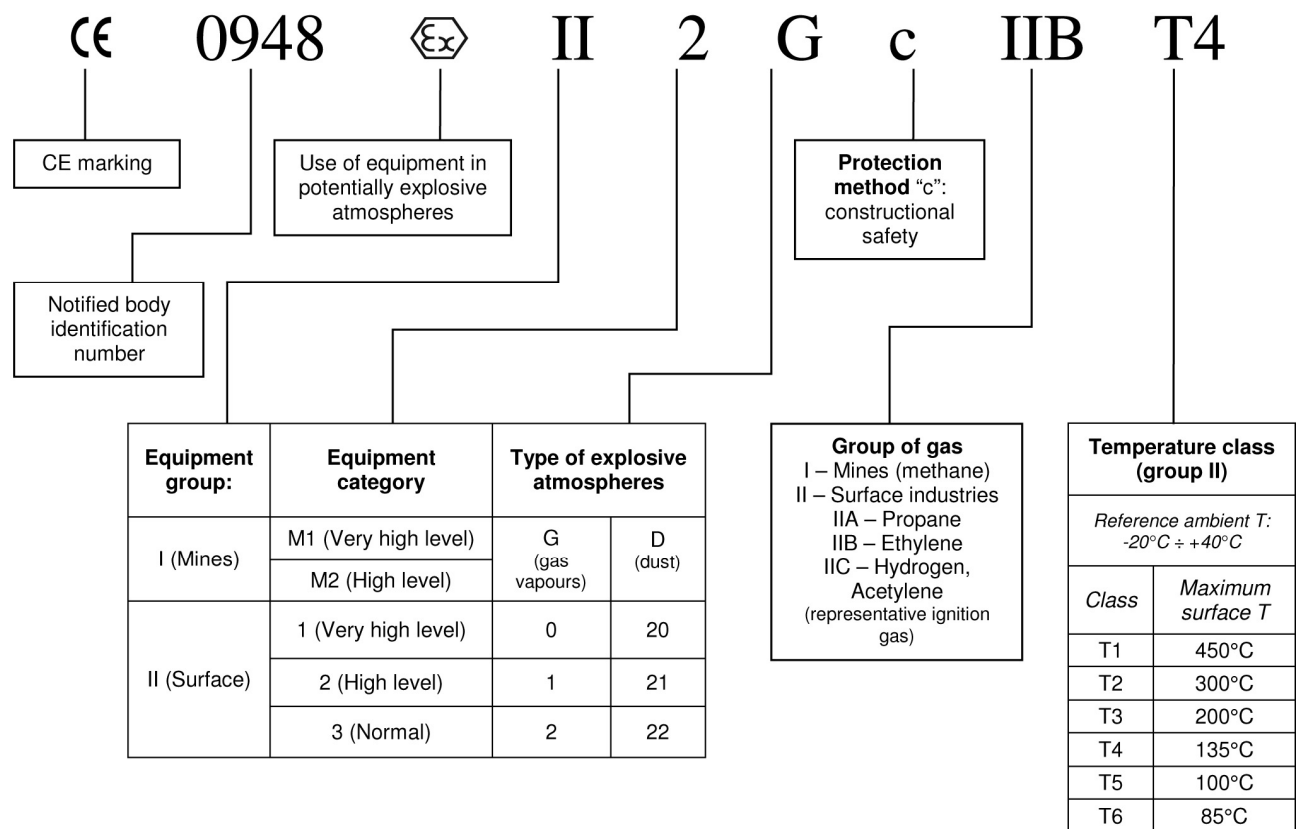
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## 1. INTRODUCTION

The air-oil heat exchangers AP EMX series are designed and constructed for the oil cooling (or other fluid, compatible with used materials, see paragraph 5), obtained by conveying air via fan through a radiator.



These heat exchangers are suitable for working in potentially explosive atmospheres in conformity with 94/9/CE directive (ATEX), group II category 2. They are also suitable for working in marine environment.



The customer has the responsibility to perform the installation and servicing with qualified personnel, by implementing all the security procedures necessary and required by the

laws, rules and regulations in force in the country where the equipment is commissioned. The information required for proper use of the heat exchangers described in this manual, are completed by the information in the user manual and maintenance of the fan. AP EMX series exchangers are machines for use in areas classified with the presence of gas / vapours (zone 1), designed and built in accordance with ATEX Directive 94/9/CE, group IIB, category 2G, class T4 (see marking on page 4) according to European standards EN 1127-1, EN 13463-1, EN 13463-5 and EN 14986. On request they can be supplied for use in areas classified with the presence of dust (2D T135°C).

This manual should be considered an integral part of the heat exchanger and should be kept with it.

Keep this manual intact and available for the whole product life.

Carefully read the manual before installation of the heat exchanger.

The manual contains important information about safety.

## **2. WARNINGS**



- a) Before carrying out any kind of maintenance or cleaning operation, disconnect the electricity supply of the equipment.



- b) The heat exchanger has to be used only for that which it was designed. Any other use may cause damage to property and people, and therefore the manufacturer declines all responsibility for accidents arising from its misuse.



- c) Before connecting, the electricity supplies please check that:
- the electrical system is in conformity with the current legislation;
  - the voltage and the frequency correspond to what shown over the equipment's label;
  - the circuit has the earthing system.



- d) After having installed the exchanger please run a trial in order to test the proper installation and functioning.  
In case of negative results disconnect the heat exchanger from the current and contact the present writer for the appropriate assistance operations.  
**DO NOT TRY TO REPAIR THE EQUIPMENT WITHOUT THE PREVIOUS ASSISTANCE OF THE PRODUCER.**



- e) Do not touch the heat exchanger while functioning. During the cooling process, some of the external surfaces could be very warm.



- f) Do not remove the nameplate of the heat exchanger. It reports the product specifications and contractual references that allow the traceability of the same. It is considered an integral part of the heat exchanger and should remain clearly visible on it.

### **3. ASSEMBLY AND INSTALLATION**

Air-oil heat exchangers are generally installed in the return circuit.

It is also possible to realize a separate circuit with an autonomous pump and this is advisable when the oil flows at the drainpipe are very changeable. In this way, it is possible to obtain a better heating performance.

The oil joints must be connected so that the inlet tube is positioned lower than the exit tube. Moreover, the tubes themselves do not have to show reductions compared with the connections of the cooling element.

In order to warrant the right heating performance please pay attention to the positioning of the heat exchanger, observing the minimum distance from obstacles on both the front and backside of the cooling element.

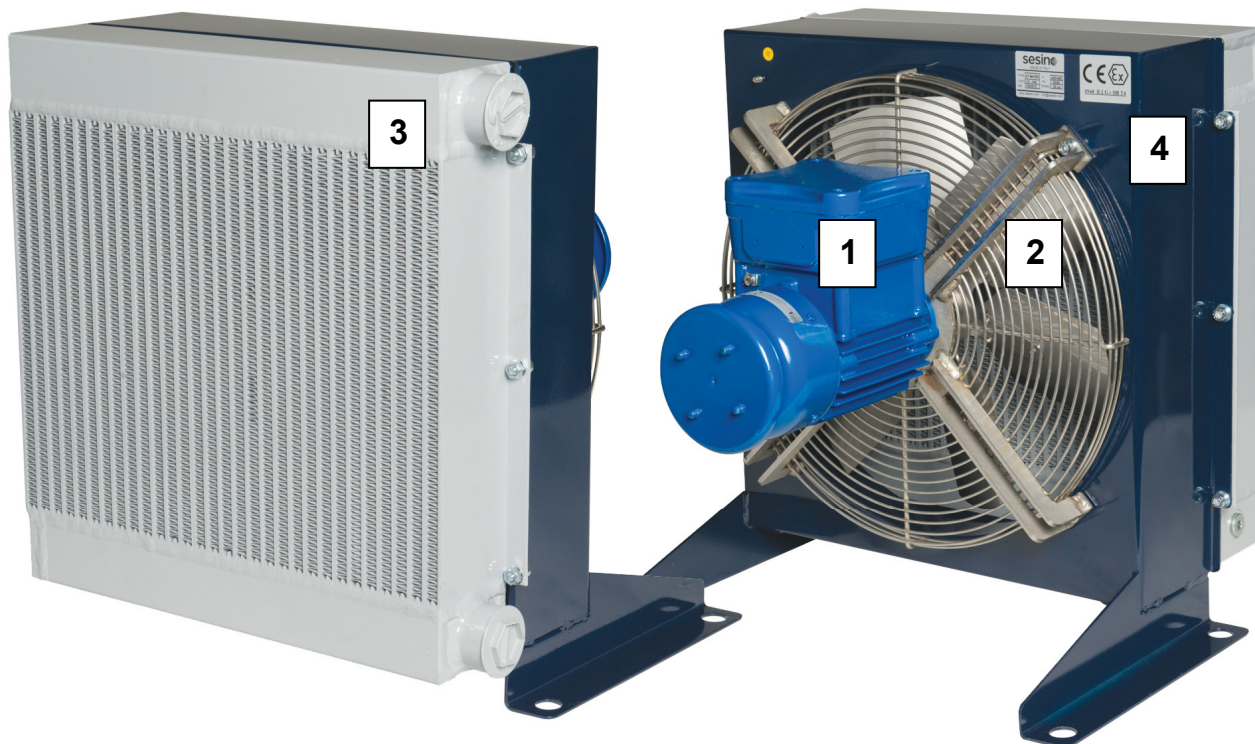
Normally this distance do not have to be less than the half of the electric fan diameter.

Make sure that the heat exchanger is installed on bearings suitable for its weight.

Also shall observe the additional warnings reported in paragraph 11.



#### **4. AIR-OIL HEAT EXCHANGER SCHEME**



1. ELECTRIC MOTOR
2. IMPELLER
3. RADIATOR CORE
4. FRAME

## 5. CARATTERISTICHE TECNICHE DI UTILIZZAZIONE

- Hot fluid inlet max. temperature: 100°C
- Max. ambient temperature: -20÷40°C
- Operating fluids: Mineral oil  
Synthetic oil  
Emulsified water  
Water-ethylene glycol
- Maximum allowable operating pressure: 20 bar

**N.B.:** contattare il nostro ufficio tecnico in caso di applicazioni speciali.

In hydraulic circuits, it can occur some pressure peaks that could near or exceed the maximum admissible heat exchanger's pressure. In any case, the particular conformation of the cooling element allows us to obtain remarkable heating performances and high-pressure resistance.

**Warning:** These pulsations move inside the oil at the sound velocity, therefore they cannot be gauged with standard manometers, but only with a proper electronic instrumentation.

The maximum static pressure allowed by Sesino heat exchangers is 20 bar and the test pressure is 35 bar.

It is always advisable to install parallel to the heat exchanger a by-pass valve in order to avoid extreme backpressures, most of all during the start process of the machine with cool oil.

The electrical system must be realized by the installer in conformity with the regulations in force.

Also shall observe the additional warnings reported in paragraph 11.

## 6. CHECK AFTER INSTALLATION

Once having installed the heat exchanger it is better to do a general check on it. Therefore, it is advisable to bring the system in pressure to test possible oil leaks from the connectors or from the sealing surfaces. Check also the correct electric fan rotation, observing its rotation direction in relation to the instructions of the heat exchanger's label.

## 7. PERIODIC MAINTENANCE

The maintenance of the fan must be carried out by expert and appropriately trained personnel. ***Before carrying out any kind of maintenance or cleaning operation, disconnect the electricity supply of the equipment and wait until moving parts have stopped. Do not perform any maintenance in potentially explosive atmospheres.***

### 7.1. Oil side cleaning

For this kind of cleaning, the heat exchanger must be disconnected from the operating machine on which it is installed.

Once on the floor, in order to remove the dirt from inside the heat exchanger, it is necessary to pass around it a detergent that is compatible with aluminum. Circulate the cleaner from 10 to 30 minutes in the direction opposite to the usual working one.

After this process, the detergent liquid remains inside the exchanger so you have to discharge it through the circulation of warm water.

Before connecting the exchanger to the circuit, make sure that all the dirt and detergent leftovers had been removed.

While carrying this process Costante Sesino S.p.A urges you to respect the anti-pollution regulation and to use the proper services for the exhaust oils disposal.

### 7.2. Air side cleaning

In order to ensure a long lasting functionality of the thermal efficiency of the equipment, it is necessary the radiator core to be free from hindrances that could limit the active surface of heat exchange.

In order to respect this prescription it is enough to blow with compressed air on the exchanger surface, in parallel with the radiator core.

**Warning:** during this process be careful not to exceed the air pressure over 6-8 bar.

In case of dusty or humid environments or places, it could be necessary to use detergent products before blowing on the surface, in order to remove dirt deposits from the heat exchanger.



**Warning:** the use of detergents that are not compatible with the heat exchanger surface could cause damages to things and people as well as compromise the proper use of the exchanger.

## 8. TAMPERING

Any operation aimed to modify the heat exchanger, executed without prior authorization from the Costante Sesino S.p.A. will automatically result in the decline of the warranty provisions.

## 9. STORAGE

The heat exchanger has to be stored in a moisture free environment (<60%) and at a temperature (from 5°C to 30°C) such as to prevent condensation and oxidation to its internal parts.

## 10. DISPOSAL

The Costante Sesino S.p.A. heat exchangers are manufactured with fully recyclable materials.

Therefore, they are disposable without any harm to the environment according to the rules and regulations in the area of use.

## 11. ADDITIONAL WARNINGS

The additional instructions, which are given below, derive from residual risks of the risk analysis carried out by Costante Sesino S.p.A. and from warnings of the use and maintenance manual of the fan that have not been resolved and managed because the installer and/or end user are responsible for their resolution. Therefore, they are additional guidelines that must be followed for correct and safe operation of the heat exchanger according to ATEX directive.



- a) Proper grounding of the heat exchanger must be performed by the installer. Costante Sesino S.p.A. assured electrical continuity and minimization of the formation of electrostatic charges and parasitic currents between the various parts of the exchanger, but everything to be effective requires the electrical continuity with the ground by a conductor wire, in order to ensure that the electrical resistance between the earth and the heat exchanger is less than 1 MΩ.

A screw on the frame, marked with the grounding symbol, was already set up as shown in the following picture:



After having realised the connection, check the compliance of the intervention by measuring with a voltmeter/multimeter the actual value of the earth-heat exchanger resistance (which must be less than the value shown above) before attempting to operate the equipment.



- b) The heat exchanger installation on appropriate supports must ensure not only the electric continuity with the ground, but also the maximum damping of vibrations which may affect to or even damage, in the long run, the rotor and the motor.



- c) The oil maximum temperature in the heat exchanger is 100°C, as indicated in paragraph 5. In case there is no guarantee that the oil can be kept below this limit temperature, it is necessary to install a fail-safe temperature monitoring system to interrupt the power supply (shutdown of the heat exchanger) if you were to register an abnormal overshoot of thermal threshold.  
The effectiveness of this system must be tested at the first start.



- d) Do not use oils with an ignition temperature (flash point) lower than  $T_4 + 50\text{ K}$ , or less than 185°C. In fact, in the case of radiator rupture with consequent oil leakage, this measure prevents, with reasonable margin, the possibility of combustion if oil comes in contact with any hot surface of the heat exchanger (the temperature of which is certainly below 135°C as labelled  $T_4$ ), therefore avoiding the explosive atmosphere ignition.