OILTECH
MEMBER OF THE OLAER GROUP

Installation and servicing instructions for LAC-X

Declaration of conformity

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Product: Air oil heat exchanger type Oiltech LAC-X

Oiltech AB declares under sole responsibility that the product above to which this declaration relates is in conformity with the ATEX directive 94/9/EC concerning equipment intended for use in potentially explosive atmospheres.
The product complies with the general Essential Health and Safety Requirements and the supplementary requirements for equipment in category 2 of equipment-group II in Annex II of the directive.

Compliance with the Essential Health and Safety Requirements in 94/9/EC has been assured by compliance with the following harmonized standards.

- Non-electrical equipment for potential explosive atmospheres - SS-EN 13463-1 and SS-EN 13463-5.
- Explosive atmospheres – Explosion prevention and protection - SS-EN 1127-1

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Preface

This document is a complementary document to the document “Installation and servicing instructions for LAC” with P/N 20009201 which also is included in the delivery.
This document deals with special instructions and information regarding the use of the product in potentially explosive atmospheres. Instructions in all documentation must be followed for safe use.

Intended use

Oiltech LAC-X air oil heat exchanger is intended for cooling of hydraulic fluids in industrial systems above ground with a potentially explosive atmosphere.

General information

The Oiltech LAC-X is defined and approved as non-electrical equipment, the electrical motors used by Oiltech on the LAC-X are all already evaluated by the supplier of the motor and complies with the relevant directives.
The non-electrical part i.e. every part except the electric motor, of the Oiltech LAC-X complies with the general Essential Health and Safety Requirements and the supplementary requirements for equipment in category 2 of equipment-group II in Annex II of the ATEX directive 94/9/EC. The non-electrical part of the Oiltech LAC-X is safe to use in potentially explosive atmospheres caused by gases, vapours or mists classified as zone 1 (and 2) and also in potentially explosive atmospheres caused by air/dust mixtures classified as zone 21 (and 22).
Oiltech LAC-X is equipped with an electrical motor, either by Oiltech at delivery or by the customer. The electric motor supplied by Oiltech is approved for explosive atmospheres according to the customer’s request.

Marking

The cooler is marked on the side of the fanhouse. The marking is part number, designation of the cooler, serial number and delivery date all according to “Installation and servicing instructions for LAC”. The cooler is also marked on the same place with marking as to in what explosive atmosphere the non-electrical part of the LAC-X can be used.

II: Group II, intended for use above ground.
2: Category 2 equipment.
G: Suitable for explosive atmospheres caused by gases, vapours or mists.
D: Suitable for explosive atmospheres caused by air/dust mixtures.
c: Ignition protected by constructional safety.
TX: Maximum surface temperature, see “Maximum surface temperature” for more information.
TFR 0001: Reference number of the Technical file.

The electrical motor is marked on its motor plate.

Examples of marking on the motor:

MARKING MOTORS FOR GASES	
CE	Mark of conformity to the applicable European directives
Ex	Community mark specifically indicating explosion protection
II 2 G	Motor suitable for above ground plants with the presence of category 2G gases or vapours
EEx d (EEx de)	Flameproof motor with flameproof terminal box Flameproof motor with increased safety terminal box
IIB (IIC)	Container appropriate for substances (gases) in group IIB or IIC
T3 (T4) (T5) (T6)	Motor temperature class (maximum surface temperature)
XYZW xx ATEX yyy	XYZW: laboratory that issued the CE certificate type xx: year in which the certificate was issued yyy: type certificate number
0000	Reference number of the notified body that executed the notification of the production system quality

	MARKING MOTORS FOR DUST
CE	Mark of conformity to the applicable European directives
Ex	Community mark specifically indicating explosion protection
II GD	Motor suitable for above ground plants with the presence of category 2GD dust
T 150 °C (T 135 °C) (T 100 °C) (T 85 °C)	Maximum motor surface temperature
IP 6x	Mechanical protection level of motor and terminal box
XYZW xx ATEX yyy	XYZW: laboratory that issued the CE type certificate xx: year the certificate was issued yyy: type certificate number
0000	Number of the accredited body that approved the quality of the production system

Note!
Make sure by reading the marking on the fanhouse and on the electric motor that the complete LAC-X, non-electrical part and electric motor, is suitable to the area classification and the characteristics of the flammable substance and type of explosive atmosphere present.

Maximum surface temperature

The surface temperature of the cooler i.e. the cooler matrix will be the same as the temperature of the fluid in the cooler matrix. In other words the temperature depends not on the cooler itself but on operating conditions.
The maximum permissible temperature for the fluid in the cooler matrix is 120°C.

Note!
Make sure that the temperature in the hydraulic system does not override the permissible temperature for the system. Oiltech recommends the use of a temperature sensor and control device in the system.

Explosive atmospheres caused by air/dust mixtures

The temperature of all surfaces that can come in contact with dust clouds shall not exceed 2/3 of the minimum ignition temperature in °C of the dust cloud.
The temperature of all surfaces on which dust can be deposited shall be lower by a safety margin of 75 K between the minimum ignition temperature of the dust layer and the surface temperature if the thickness of the dust layer is 5 mm or less. Larger safety margin is required if the layer thickness is greater than 5 mm.
Dust with lower Minimum Ignition Energy (MIE) than 3mJ may need a special examination.

Electric motor

Note!
The electric motor must be protected against overloads with automatic power supply disconnection by using a countdown protection device or by using a device to control directly the temperature by means of temperature sensors inserted in the windings.
Cable entries and connections must be made via cable or conductor entries in a conduit conforming to relevant standards.
For operation with an inverter, motors must be equipped with PTC or PT100 thermistors inserted in the winding to ensure compliance with the limits of the temperature class.
When power is supplied by a frequency converter, the installer bears responsibility for checks and any measures required to comply with immunity and emission limits as laid down by the standards.

Motors mounted by the customer
If the electric motor is mounted by the customer the motor must be mounted according to the instructions in “Installation and servicing instructions for LAC”. The outer earthing screw on the electric motor must be connected to the earthing plate on the side of the fanhouse to secure that the fan, fanhub, fanboss and motor has equal potential as the rest of the parts of the cooler.
Follow the motor suppliers instructions when installing and connecting the motor.

Note!
Make sure that the electric motor is correct in regards of motor power, rotation speed etc.

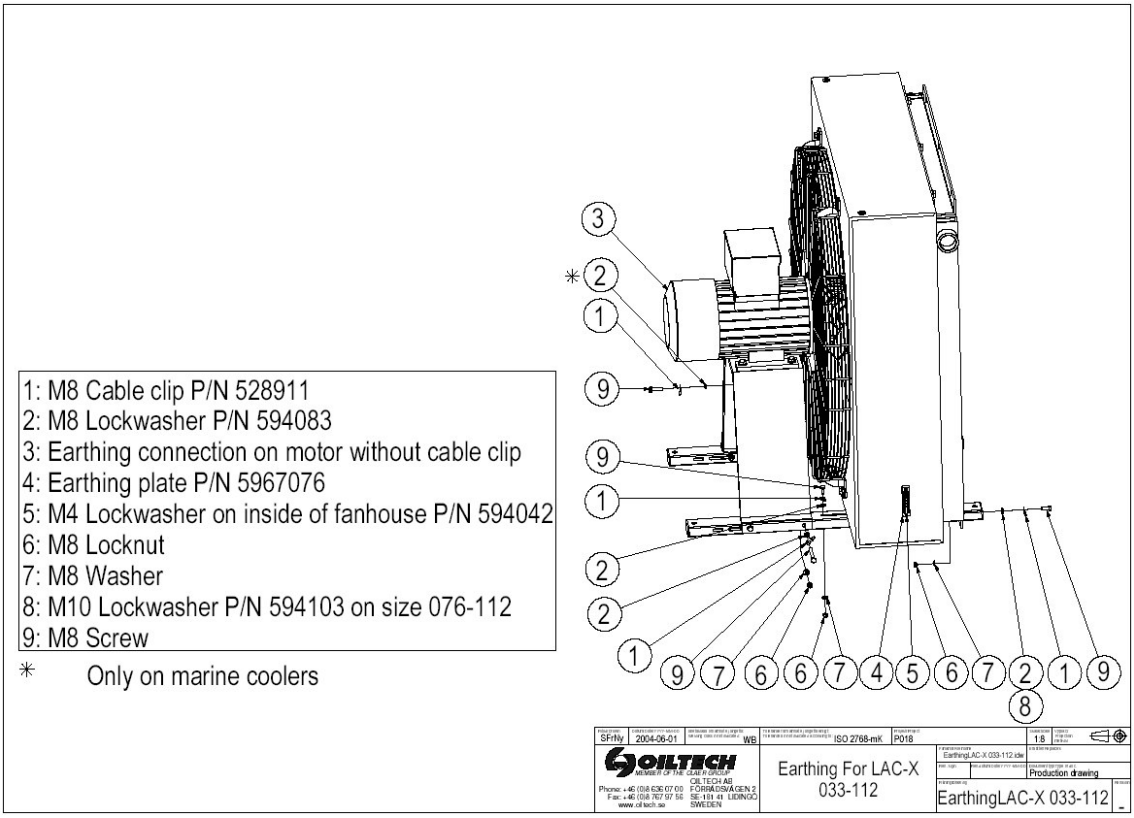
Ambient temperature

The maximum and minimum permissible ambient temperature depends mainly on the type of electrical motor used, normally this is – 20°C - + 40°C.
The maximum temperature may in extreme cases, such as temperatures above + 40°C and high rotational speed, also affect the maximum permissible rotational speed for the fan.

Note!
Oiltech recommends the use of a sensor device to monitor the ambient temperature.

Electrostatic discharge

The parts of the cooler are all connected together to an earthing plate with earthing wires to secure equal potential of the parts. The earthing plate is mounted on the back or on the side of the fanhouse.



Example of earthing connections.

Fan

The fan used on Oiltech LAC-X is made with fan blades made of an antistatic material.
Maximum permissible rotational speed depends on type of fan, size i.e. diameter of the fan, working temperature for the fan and fan power.
The working temperature for the fan depends on the ambient temperature and the temperature rise for the air by going through the cooler matrix.
By using motors with rotational speed i.e. number of poles according to the ordering key for Oiltech LAC there is no risk of exceeding the maximum permissible rotational speed for the fan in 50 Hz and 60 Hz applications, even at the most extreme conditions such as maximum permissible ambient temperature, maximum cooling capacity at maximum flow all at the same time.
Note that Oiltech for some coolers use different fans for 60 Hz applications than for 50 Hz applications.

Before start

Connect the earthing plate to a central earthing connection for the system to secure that the Oiltech LAC-X has the same electrical potential as the rest of the system.
Follow start up instructions in “Installation and servicing instructions for LAC”

Maintenance

Note!

All maintenance must be performed by for the purpose trained personnel, with equipment and tools suitable for use in the specific explosive atmosphere and in compliance with criteria of the relevant standards.

Do not open the connection box of the electric motor when an explosive atmosphere is present.

Scheduled maintenance

- Make sure that the earthing connections not are damaged and that they are properly electrically connected to the parts and to the earthing plate to secure equal potential of all parts. This is especially important in corrosive atmospheres.
- In potentially explosive atmospheres caused by air/dust mixtures scheduled cleaning of the cooler must be made so that the thickness of the dust layer always is less than 5 mm, see "Explosive atmospheres caused by air/dust mixtures".

Dismantling

Note how the earthing wires are connected and connections are placed before dismantling any part.

Follow the instructions in "Installation and servicing instructions for LAC" for the part that is to be dismantled.

Assembling

Follow the instructions in "Installation and servicing instructions for LAC" for the part that is to be assembled and mount the earthing wires and connections as they were prior to the dismantling. Make sure that all earthing connections are made properly to secure equal potential of all parts.

Cooler options

Oiltech LAC-X can be equipped with the following options:

- Two-pass cooler matrix
- By-pass valve type S
- By-pass valve type T
- Dustguard
- Stoneguard

Lifting eyebolts can be ordered as accessories for coolers in size 033-112.

This document may subject to changes.