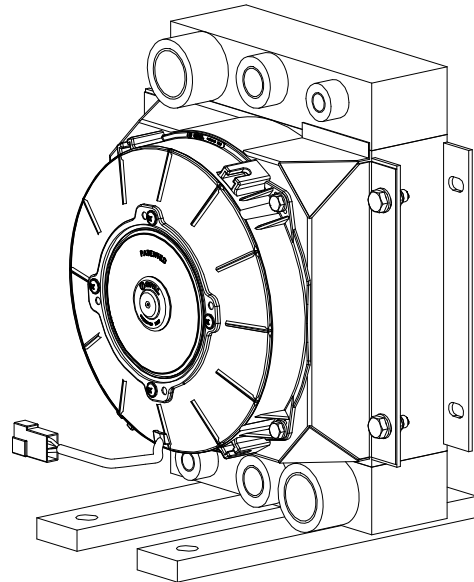




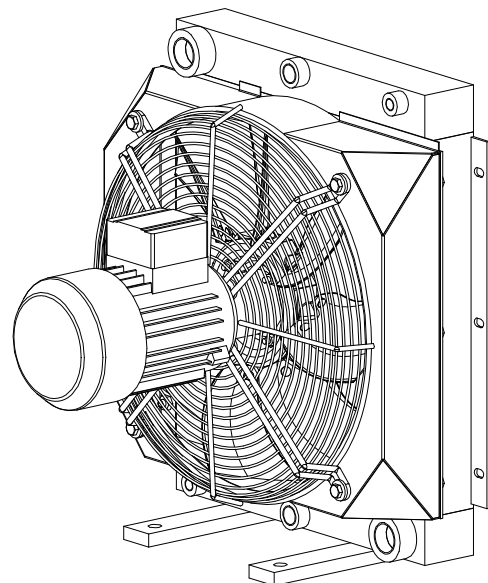
Oil/air cooler

type
OAC

according to directive 94/9/EG
(ATEX 95)



Oil/air cooler; example: OAC 100



Oil/air cooler; example: OAC 200 to OAC 1000



The oil/air cooler is a high-power cooler. It has compact dimensions and was developed for cooling hydraulic oil, gear lubricant oil, lubricating oil and water-glycol.

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3 Enclosure A

Hints and Instructions Regarding the Use in Hazardous Areas

- 3.1 Use in  Hazardous Areas According to the Regulations
- 3.2  Marking for the Hazardous Area
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1 Hints

1.1 General Hints

Please read through these mounting instructions carefully before you assemble the oil/air cooler.
Please pay special attention to the safety instructions!



The oil/air cooler is suitable and approved for the use in hazardous areas.
When using in hazardous areas please observe the special hints and instructions regarding safety in enclosure A.

The mounting instructions are part of your product. Please keep them carefully and close to the oil/air cooler.
The copyright for these mounting instructions remains with **KTR Kupplungstechnik GmbH**.

1.2 Safety and Advice Hints



DANGER!

Danger of injury to persons.



CAUTION!

Damages on the machine possible.



ATTENTION!

Pointing to important items.



PRECAUTION!

Hints concerning explosion protection.

1.3 General Hints to Danger



DANGER!

With assembly and disassembly of the oil/air cooler it has to be made sure that the entire drive train is protected against unintentional engagement. You can be seriously hurt by rotating parts. Please make absolutely sure to read through and observe the following safety instructions.

- All operations on and with the oil/air cooler have to be performed taking into account "safety first".
- Please make sure to disengage the power pack before you perform your work on the oil/air cooler.
- Protect the power pack against unintentional engagement, e. g. by providing hints at the place of engagement or removing the fuse for current supply.
- Do not touch the operation area of the machine as long as it is in operation.
- Please protect the rotating drive parts against unintentional touch. Please provide for the necessary protection devices and caps.

1.4 Proper Use

You may only assemble and disassemble the oil/air cooler if you

- have carefully read through the mounting instructions and understood them
- had technical training
- are authorized to do so by your company

The oil/air cooler may only be used in accordance with the technical data (see hydraulic components catalogue).
Unauthorized modifications on the oil/air cooler design are not admissible. We do not take any warranty for resulting damages. To further develop the product we reserve the right for technical modifications.

The **oil/air cooler** described in here corresponds to the technical status at the time of printing of these mounting instructions.

Please note protection mark ISO 16016.	Drawn:	16.04.12 Pz/Wb	Replaced for:	KTR-N valid from 15.01.10
	Verified:	24.04.12 Pz	Replaced by:	



2 Assembly

The oil/air cooler is generally supplied ready for assembly.

2.1 Components of oil/air cooler

Component	Quantity	Designation
1	1	Oil/air cooler

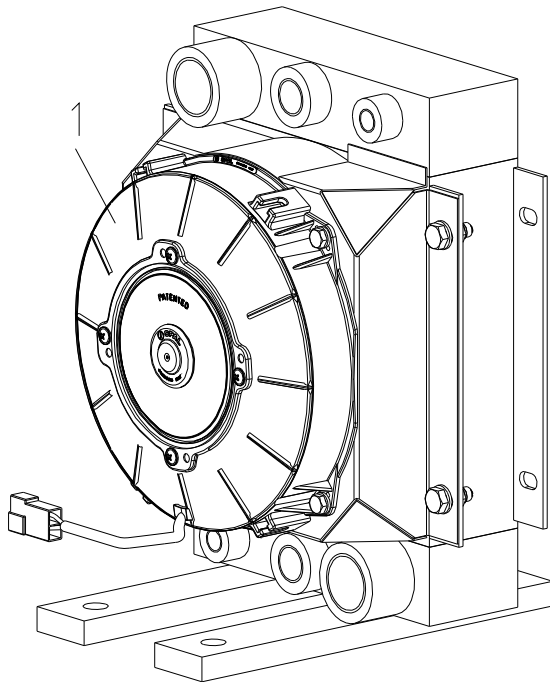


Illustration 1: oil/air cooler; example: OAC 100

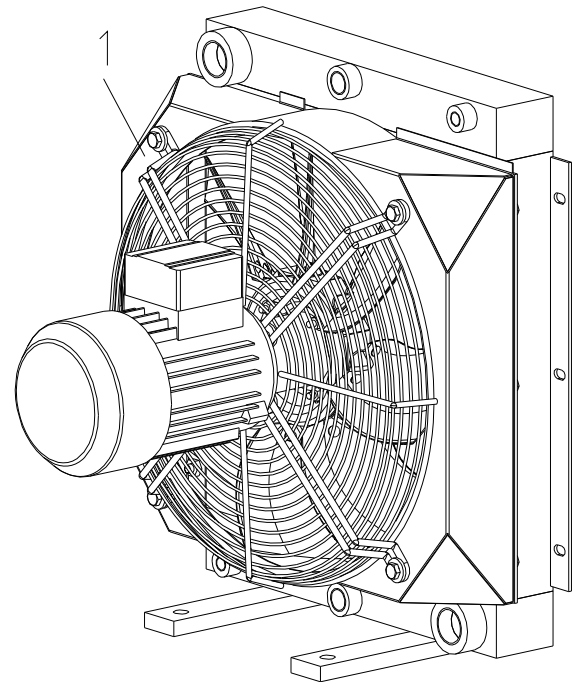


Illustration 2: oil/air cooler; example: OAC 200 to OAC 1000

2.2 Place of arrangement

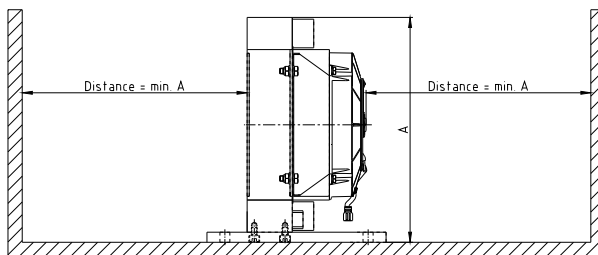


Illustration 3: oil/air cooler; example: OAC 100

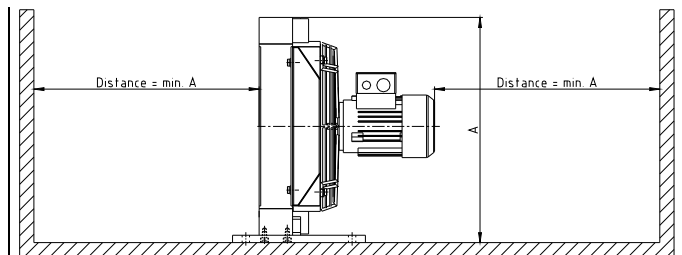


Illustration 4: oil/air cooler; example: OAC 200 to OAC 1000

In order to achieve the optimum cooling power the distance to the neighbouring wall should not fall below the height of the cooling element (dimension A), since otherwise a proper air supply is not assured (see illustration 3 and 4).



CAUTION!

Backstreaming of hot circulating air and the assembly of the cooling grid in front of sources of heat should be avoided.



ATTENTION!

An unfavourable place of arrangement may increase the noise level by sound reflection.



2 Assembly

2.3 Installation of oil/air cooler

The oil/air cooler may be installed in various positions, while the vertical position should be preferred. Sufficient fastening has to be ensured.



ATTENTION!

Some engines have covered holes which serve for draining condensation water that might occur.

To connect the oil/air cooler please use suitable hydraulic tubes. These are connected on the entrance and exit side of the cooling element (see illustration 5 and 6).

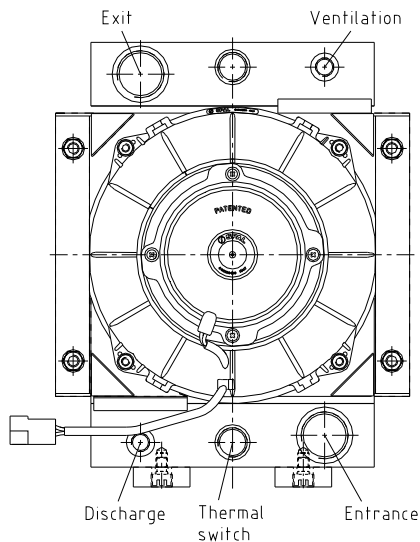


Illustration 5: oil/air cooler; example: OAC 100

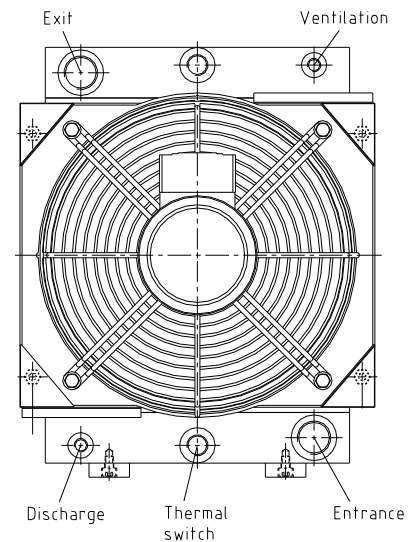


Illustration 6: oil/air cooler; example: OAC 200 to OAC 1000



ATTENTION!

Please make sure that the connections and tubes are adapted to pressure, flow rate, temperature and fluid of the oil/air cooler.

2.4 Thermal switch

A thermal switch to control the fan can be screwed directly into the cooler or tank (see illustration 5 and 6).

2.5 Operating pressure and temperature

The maximum operating pressure must not exceed the load of 26 bar (for OAC 900 and OAC 10 bar only) during the operation.



CAUTION!

With dynamic load pressure peaks exceeding 26 bar (OAC 900 and OAC 1000 10 bar only) have to be avoided.

The maximum permissible temperature of the medium to be cooled must not exceed 150 °C.



ATTENTION!

The ambient temperature of the medium to be cooled should not be modified suddenly. Please take into account boiling point and freezing point!

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	Verified:	24.04.12 Pz	Replaced by:	



2 Assembly

2.6 Electric connection

Before connecting the motor to the mains supply, the details shown on the rating plate (see illustration 8) of the motor have to be compared to the voltage and frequency of the power grid.



PRECAUTION!
For the application in explosive areas only approved electric motors may be used.

The direction of rotation of the fan and the air flow have to correspond to the arrows shown on the oil/air cooler (see illustration 7).



ATTENTION!
The connection of electric motors to the electric supply may only be performed by trained specialists. Please note the latest regulations and safety provisions for electricity!



CAUTION!
Incorrect connections, defective cables, etc. may energize the components connected or cause the electric motor to turn in the wrong direction, respectively.



ATTENTION!
Please note the operating instructions of the electric motor you use!

When using a thermal switch please note our mounting instructions KTR-N 41026 in addition.



ATTENTION!
It is recommended to use an overload protection on the electric motor.

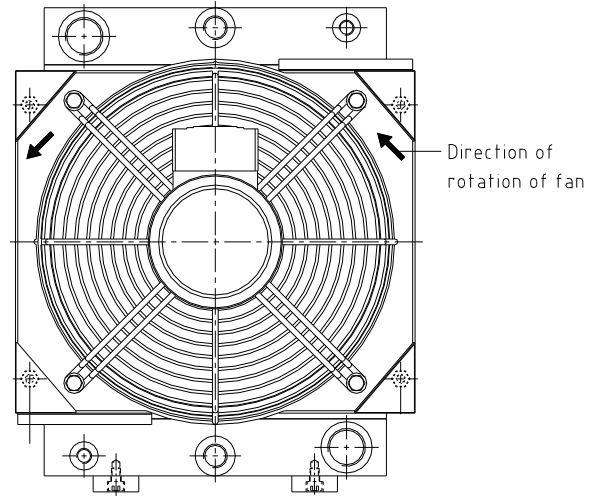


Illustration 7: direction of rotation of fan

2.7 Cooling medium

The oil/air cooler is suitable for the use of mineral oil and water-glycol (other media on request).



PRECAUTION!
For the application in explosive areas the oil/air cooler may be used for cooling mineral oil and water-glycol only. Any other kind of use of the OAC is not permissible.

2.8 Start-up

Please check if the oil/air cooler is connected and fastened properly.

Please note the following procedure:

- Flush the oil/air cooler with the same fluid/medium as the other systems.
- Filter the fluid/medium after the flow.

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	Verified: 24.04.12 Pz	Replaced by:



2 Assembly

2.8 Start-up

Continuation:

- The oil/air cooler and the protective grid have to be free from damages.
- The fan must be able to rotate unimpededly.
- Hydraulic connections need to be tightened.
- The internal side of the fan housing has to be free from any objects.



DANGER!

Components which are thrown away may cause injuries to persons or damage other elements.

2.9 Maintenance and Service

Preventive maintenance measures should be performed by the user in regular intervals.

The following items have to be investigated:

- Unusual noise or vibrations must not be produced.



CAUTION!

In case of vibrations please check the screwing of the motor.

If the failure is not repaired in this way, please consult with KTR Kupplungstechnik GmbH.

- Proper fastening of the oil/air cooler has to be ensured.
- Dirt on the oil/air cooler reduces the cooling power; i. e. make sure to clean your cooler (see item *cleaning*).
- Please inspect the oil/air cooler for any damages, defective components have to be replaced.
- Inspect the cooling grid for leakages on the oil/air cooler and the screwings of pipes.



CAUTION!

Leakages need to be removed immediately.

Leakage oil has to be removed properly, since oil residues may vaporize on heated components and ignite.



- Please inspect the distances between the fan and the protective grid (see chapter 3.3).
- Please inspect the individual components of the machine for electroconductive connections.
- The motor temperature has to be inspected while the machine is in operation.



ATTENTION!

It must not exceed the temperature class mentioned in the type label (see illustration 8).

- The bearings of the motors are subject to permanent lubrication.



ATTENTION!

Re-lubrication is not possible. Please note the service life of the motor bearing as per the data sheet of the motor manufacturer.

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2 Assembly

2.10 Cleaning



DANGER!

Before cleaning please make sure that the oil/air cooler has cooled down. Touching the hot components causes burns.



CAUTION!

For cleaning operations, e. g. with water, make sure to disengage the cooler from the current supply. Please note the protective system.

Side of air laminas

The air laminas may be cleaned by means of compressed air. In case of heavy dirt cleaning has to be performed by means of a pressure washer and a degreasing agent. The jet should be kept carefully and in parallel with the air lamina.

Oil side of the cooling element

The oil side of the cooling element is cleaned by means of flushing with a degreasing agent. Afterwards flush with the fluid/medium which is used later, too.

2.11 Spares Inventory, Customer Service Addresses

A basic requirement to guarantee the operational readiness of the oil/air cooler is a stock of the most important spare parts on site.

Contact addresses of the KTR partners for spare parts and orders can be obtained from the KTR homepage under www.ktr.com.

2.12 Diagrams – Pressure loss and power

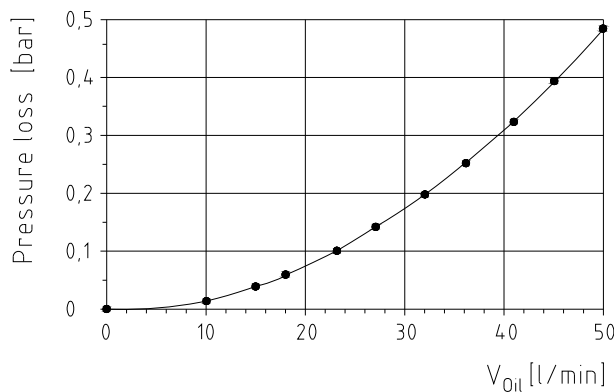


diagram 1: OAC 100 – pressure loss 30 cSt

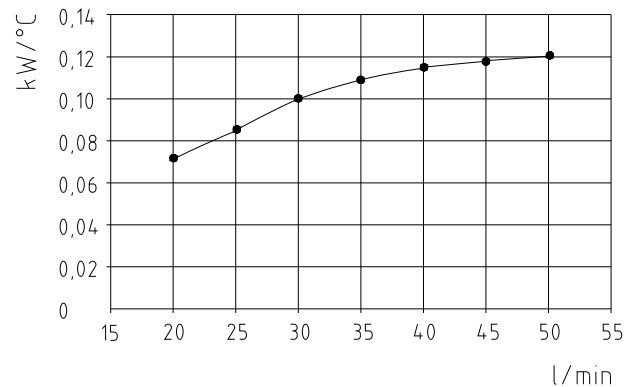


diagram 2: OAC 100 – power

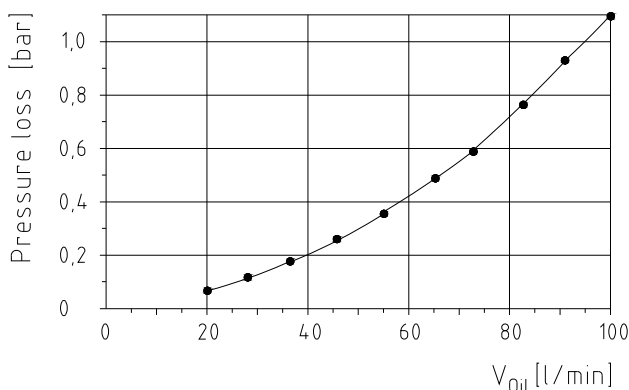


diagram 3: OAC 200 – pressure loss 30 cSt

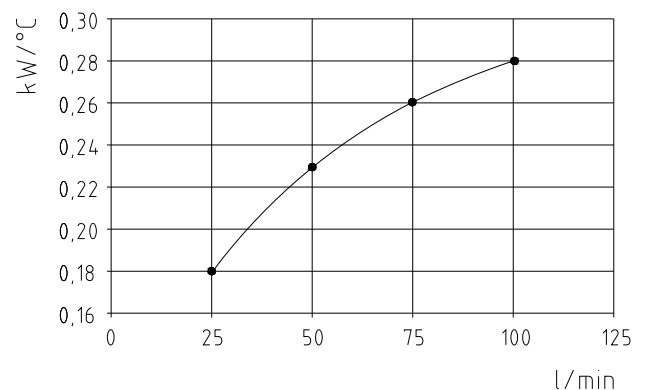


diagram 4: OAC 200 – power



2 Assembly

2.12 Diagrams – Pressure loss and power

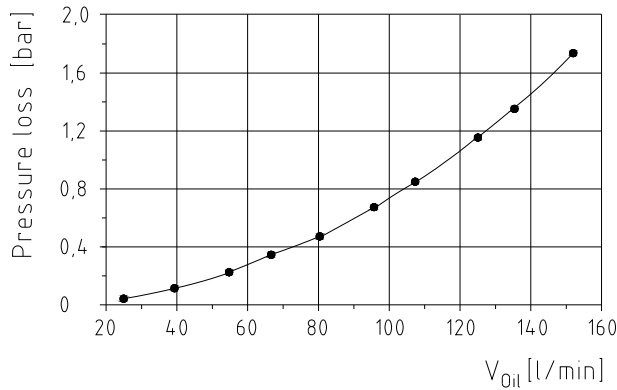


diagram 5: OAC 300 – pressure loss 30 cSt

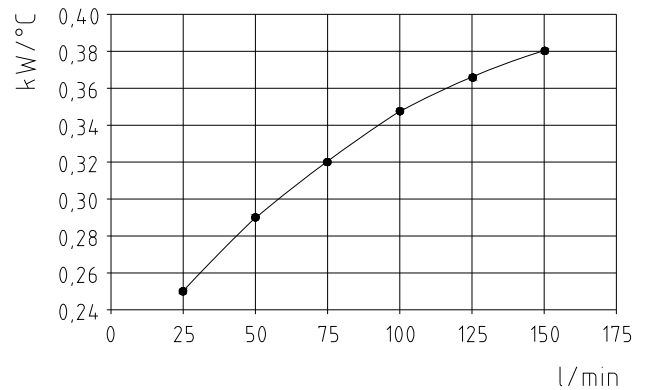


diagram 6: OAC 300 – power

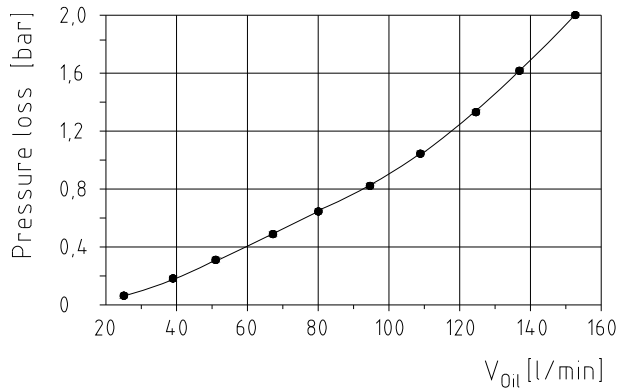


diagram 7: OAC 400 – pressure loss 30 cSt

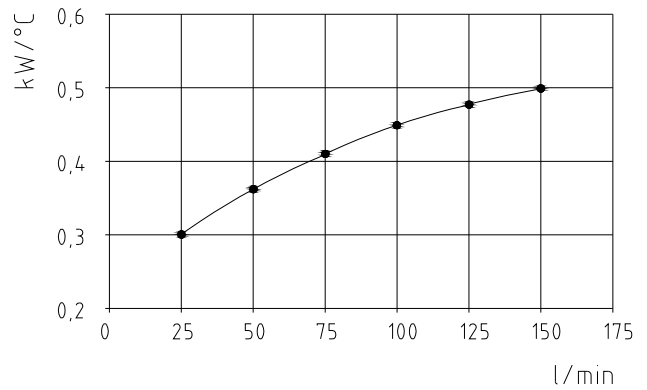


diagram 8: OAC 400 – power

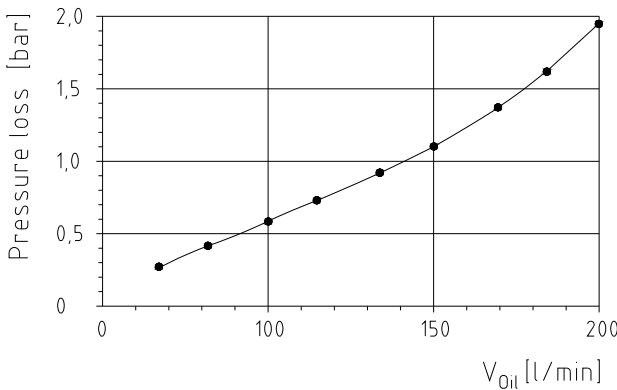


diagram 9: OAC 500 – pressure loss 30 cSt

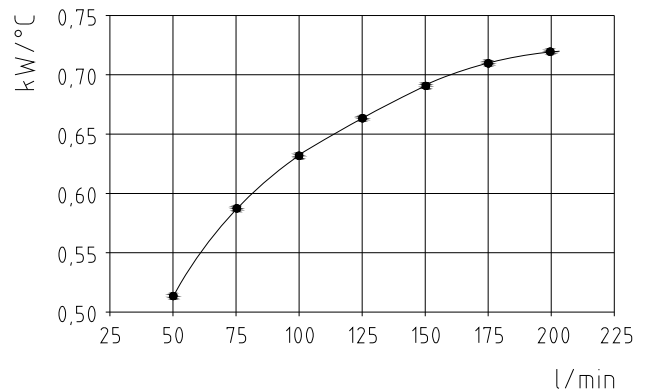


diagram 10: OAC 500 – power

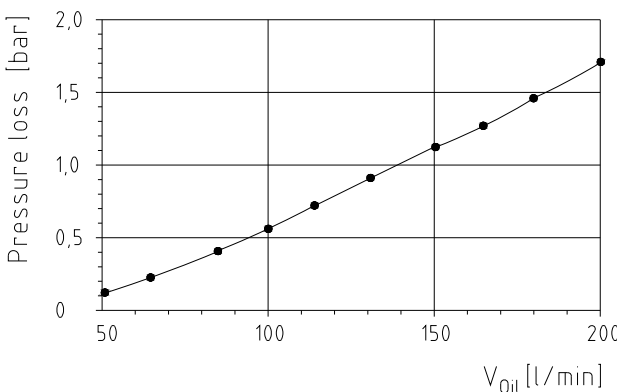


diagram 11: OAC 600 – pressure loss 30 cSt

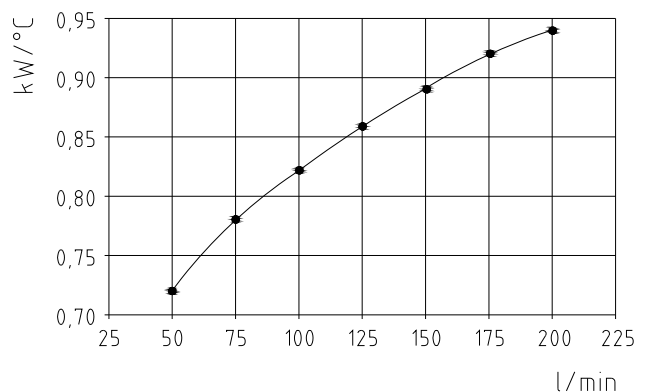


diagram 12: OAC 600 – power



2 Assembly

2.12 Diagrams – Pressure loss and power

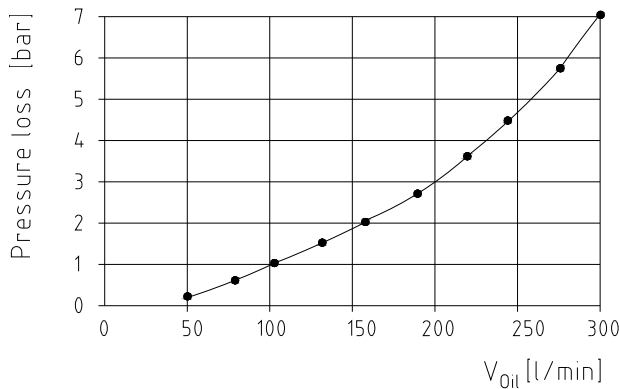


diagram 13: OAC 700 – pressure loss 30 cSt

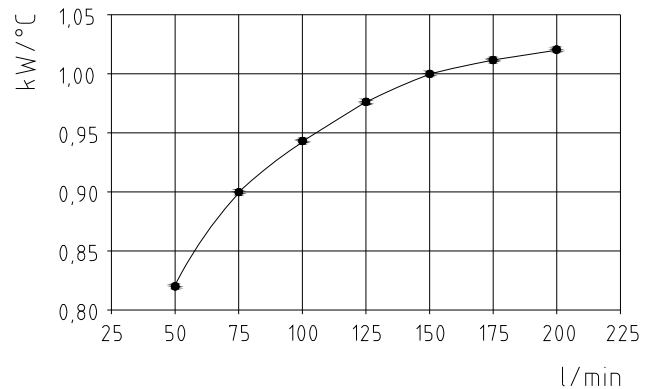


diagram 14: OAC 700 – power

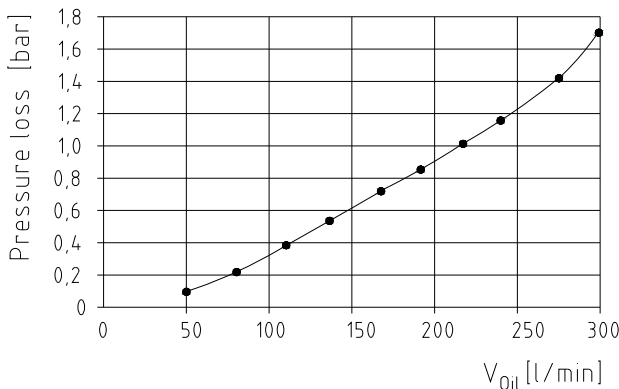


diagram 15: OAC 800 – pressure loss 30 cSt

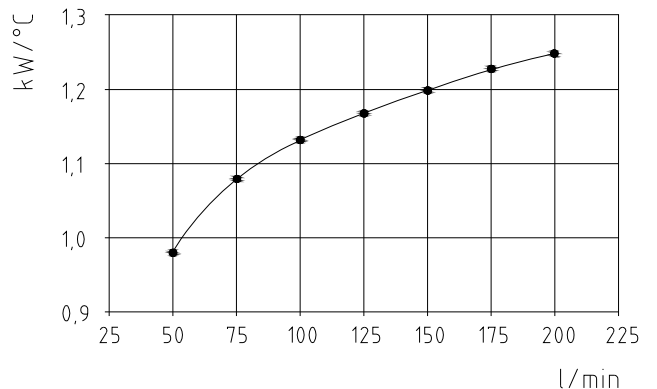


diagram 16: OAC 800 – power

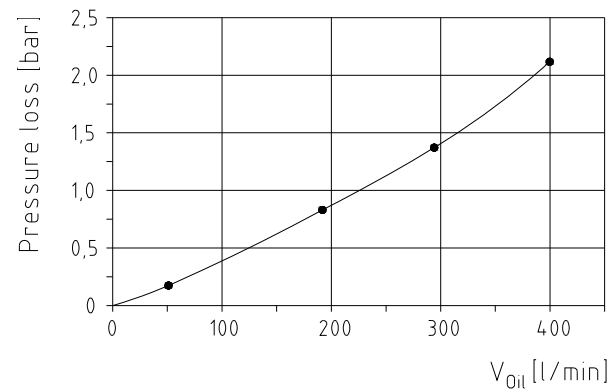


diagram 17: OAC 900 – pressure loss 30 cSt

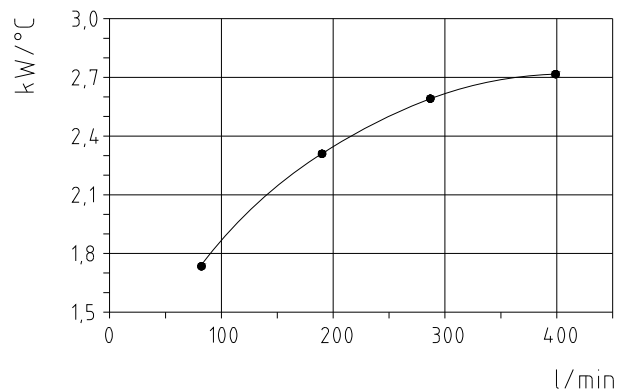


diagram 18: OAC 900 – power

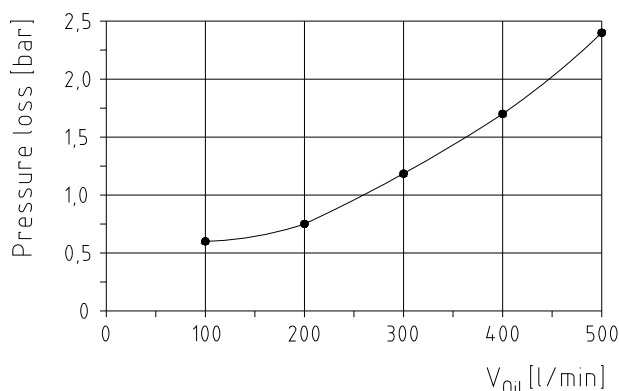


diagram 19: OAC 1000 – pressure loss 30 cSt

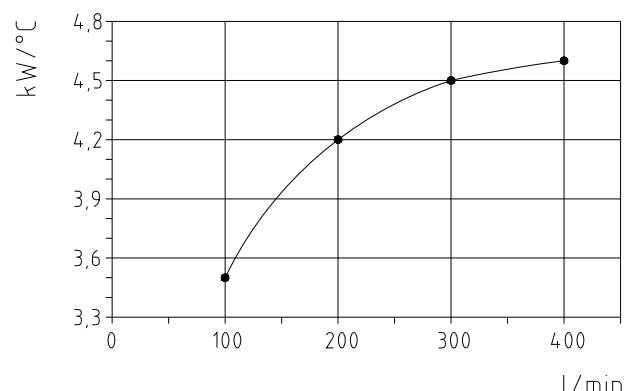


diagram 20: OAC 1000 – power



3 Enclosure A

Hints and Instructions Regarding the Use in Hazardous Areas

Sizes: OAC 100 to OAC 900

3.1 Use in Hazardous Areas According to the Regulations

Conditions of operation in hazardous locations

Oil/air coolers are suitable for the use according to EC standard 94/9/EC.

Industry (with the exception of mining)

- device class II of category 2 and 3 (*oil/air cooler is not approved for device class 1*)
- media class G (*gases, fogs, steams*), zone 1 and 2 (*oil/air cooler is not approved for zone 0*)
- media class D (*dusts*), zone 22 (*oil/air cooler are not approved for zone 20 and 21*)
- explosion class IIB+H₂ (*explosion class IIA and I (IIA1) is included*)

Temperature class (for machines of category 2G):

Temperature class	Ignition temperature(Tz)	max. perm. media temperature
T1	> 450 °C	360 °C
T2	300 °C < Tz ≤ 450 °C	240 °C
T3	200 °C < Tz ≤ 300 °C	160 °C
T4	135 °C < Tz ≤ 200 °C	108 °C
T5	100 °C < Tz ≤ 135 °C	80 °C
T6	85 °C < Tz ≤ 100 °C	68 °C

Explanation:

The permissible ambient temperatures T_a for the use of the oil/air coolers are stipulated from -20 °C to + 40 °C.
The media temperature may be significantly higher than the ambient temperature depending on the operation. The component being part of the lowest temperature class is decisive for the application.


Temperature class (for machines of category 3D)

The media temperature must not exceed a maximum of 2/3 of the minimum ignition temperature in °C of the cloud of dust concerned (also in case of breakdowns) or must fall below the minimum ignition temperature of a dust layer (smoldering temperature) by 75 K.

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	Verified: 24.04.12 Pz	Replaced by:



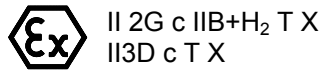
3 Enclosure A

Hints and Instructions Regarding the Use in  Hazardous Areas

3.2 Marking for the Hazardous Area

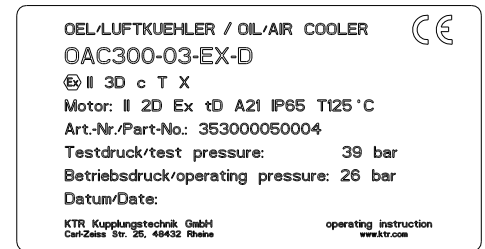
The oil/air coolers of series OAC for the use in explosive areas are marked as follows:

Short labelling:



The labelling with Explosion Group IIC includes the Explosion Groups IIA and I (IIA1).

Illustration 8:
example - rating plate



3.3 Start-up for the use in explosive areas



CAUTION!

The oil/air cooler may only be used in the areas marked in the type label of the oil/air cooler and motor. The element with the lowest class has to be considered to be decisive here. The decision about classifying the place of application is subject to the user.



ATTENTION!

The start-up of the cooler is only permissible by trained specialists.

- Please make sure that the supply and delivery pipes are properly connected.
- After start-up the connections and the cooling element have to be inspected for leak tightness.
- The electric motor or oil motor, respectively, has to be connected in a way that the torsional direction marked on the oil/air cooler is adhered to as described in *electric connection*.
- The cooler needs to be earthed in the position marked (equipotential bonding of cooler).
- Inspect the oil motor for leakages.



CAUTION!

Leakages need to be removed immediately. Leakage oil has to be removed properly, since oil residues may vaporize on heated components and ignite.

- When the motor is started, vibrations and unusual noise (shushing noise, squeaking, etc.) must not arise.




CAUTION!

In case of vibrations please inspect the screwing of the motor. If the damage is not repaired in this way, please consult with KTR Kupplungstechnik GmbH.

Please note protection mark ISO 16016.	Drawn:	16.04.12 Pz/Wb	Replaced for:	KTR-N valid from 15.01.10
	Verified:	24.04.12 Pz	Replaced by:	



3 Enclosure A

Hints and Instructions Regarding the Use in  Hazardous Areas

3.3 Start-up for the use in explosive areas

Continued:

- The oil/air cooler may only be mounted vertically and has to be screwed to the basement via all fastening holes.
- It needs to be made sure that the distance of suction and the blowing distances (distance A, see place of assembly) marked are adhered to.
- The cooler grid must not be sealed by foreign particles.
- Please inspect the distances between the fan and the protective grid.



ATTENTION!

The minimum clearance between rotating components and non-mobile components is at least 1% of the relevant contact diameter. The distance is 2 mm for OAC 100 (Ø190 mm), thus 6,3 mm for OAC 800 (Ø630 mm). This distance may be reduced to 10% of the shaft diameter with a minimum of 2 mm and a maximum of 13 mm. The result is that for all fans with a shaft diameter up to 200 mm the minimum gap is considered to be sufficient.

- With the test run please make sure that the permissible motor temperature is not exceeded. The temperature classes of cooler and motor mentioned in the type label have to be adhered to obligatorily (see chapter 3.1).

3.4 Assembly – Disassembly

The assembly of the cooler is performed by KTR Kupplungstechnik GmbH.
The oil/air cooler is supplied ready for operation.

A disassembly of the cooler is only permissible after prior written agreement by KTR Kupplungstechnik GmbH.

3.5 Permissible accessories for the use in explosive areas

Only those accessories (example: thermal switches, etc.) which are certified in accordance with ATEX and which correspond to the temperature class may be mounted to the oil/air cooler or their respective motors.



PRECAUTION!

Any modifications in design on the oil/air coolers which are projected for the use in explosive areas are not permissible.



CAUTION!

The buyer has the sole responsibility for any machining performed subsequently. KTR does not take any warranty.

Please note protection mark ISO 16016.	Drawn: 16.04.12 Pz/Wb	Replaced for: KTR-N valid from 15.01.10
	Verified: 24.04.12 Pz	Replaced by:



3 Enclosure A

Hints and Instructions Regarding the Use in  Hazardous Areas

3.6 EC Certificate of Conformity

EC Certificate of Conformity

corresponding to EC Standard 94/9/EC dated 23 March 1994
and to the legal regulations

The manufacturer - KTR Kupplungstechnik GmbH, D-48432 Rheine - states that the

Oil/air cooler - OAC

described in these mounting instructions and **explosion-proof** designed correspond to Article 1 (3) b) of Standard 94/9/EC and comply with the general Safety and Health Requirements according to enclosure II of Standard 94/9/EC.

According to article 8 (1) of Standard 94/9/EC the technical documentation is deposited with the:

IBExU
Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7

09599 Freiberg

The manufacturer - KTR Kupplungstechnik GmbH, D-48432 Rheine – states that the

Oil/air cooler - OAC

described in these operating instructions are in accordance with the following standards:

2006/42/EC	Machinery Directive (MRL)
97/23/EC	Pressure Equipment Directive (DGRL)
DIN EN ISO 12100	Safety of machinery

Rheine, 16.04.12
Date


i. V. _____
Reinhard Wibbeling
Engineering Manager


i. V. _____
Christoph Bettmer
Product Manager