General User Guide

for the

O E N O C A T

CAT-FK-36/350
CAT-FL-36/557

Figure 1: OENOCAT CAT-FL-36/557

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1 Preliminary Remarks

Manufacturer and origin of ANSEROS devices is:

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The warranty period is 12 months. Damages incurred due to improper operation by untrained personnel or due to commissioning by unauthorized persons are excluded from warranty. ANSEROS analyzers and peripherals are easy in operation and maintenance. Putting into operation and instruction of personnel are carried out by ANSEROS.

When making a claim under warranty, indicate the instrument number (see nameplate). The commercial invoice is the warranty certificate. In case the warranty period starts with the date of commissioning, the customer has to deliver a signed documentation of the startup / acceptance to ANSEROS.

The method and the apparatus Oenocat as well as the brand OENOCAT are protected by patents: DE 102012108042.9, R 302013026530.0/40. The word and design mark ANSEROS is protected worldwide.

ANSEROS reserves the right to carry out technical changes concerning design details and performance data as well as changes in appearance due to continuous further development.

⚠ **Warning:**	Tampering or unauthorized readjustment or replacement of components can significantly impair the electrical and chemical safety of this product. Use only manufacturer-documented methods and spare parts for repair.

2 Mode of Operation, Functional Principle

According to a decision of the European Parliament and the EU Council of 2012, from September 2013 onwards the treatment of wooden barrels, stainless steel tanks, bottles, hoses, filters and small parts with sulfurous acid (sulfurous water, sulfurous burning off of wooden barrels) for preservation in the winemaking process will be prohibited.

The device Anseros OENOCAT replaces the existing sulfur treatment. Inside barrels and other receptacles, the OENOCAT produces so-called negative ions which have an absolutely germ-killing effect and preserve the barrel. The excited gas also infiltrates the pores and gaps between the staves. Odor-active substances are oxidized (Patent DE 10 2012 108 042.9).

When using the OENOCAT device, the barrel is closed by a stopper and thus secure. According to the Low Voltage Directive, OENOCAT operates at 12 volts DC.

The effect of the OENOCAT device has been analysed by DLR Rheinpfalz (Neustadt / Wstr., Germany; test suspensions: saccharomyces cerevisiae, brettanomyces bruxellensis) and confirmed by various other institutions (Figures 2 and 3). Further reading: article: „Der Luftsterilisator OENOCAT-30: Eine Alternative bei der Holzfasskonservierung?“ (“The Air sterilizer OENOCAT-30: An alternative in wooden barrel preservation?”) In: *Das Deutsche Weinmagazin* (The German Wine Magazine), No. 20 / 06.12.2012, p. 34-36.

Image courtesy of SLVA Weinberg

Figure 2: Barrel, untreated (before)

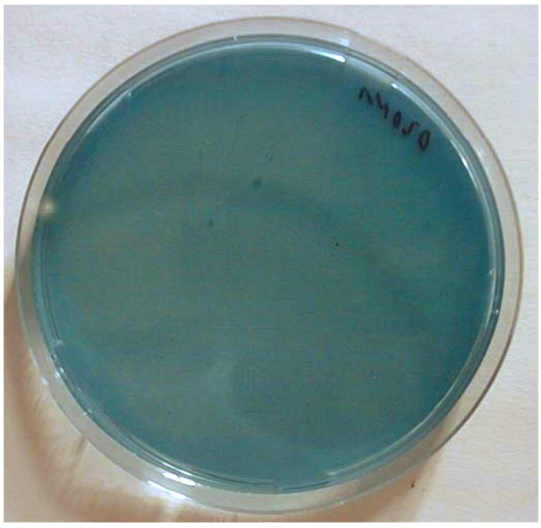

Image courtesy of SLVA Weinberg

Figure 3: Barrel, treated (after)

Ozone is generated by high voltage discharges (Figure 4). Short high voltage discharges produce very high electrical field strengths which on their behalf cause corona discharges.

Normal ambient air contains about 20% oxygen (O_2). The oxygen (O_2) is converted to ozone (O_3).

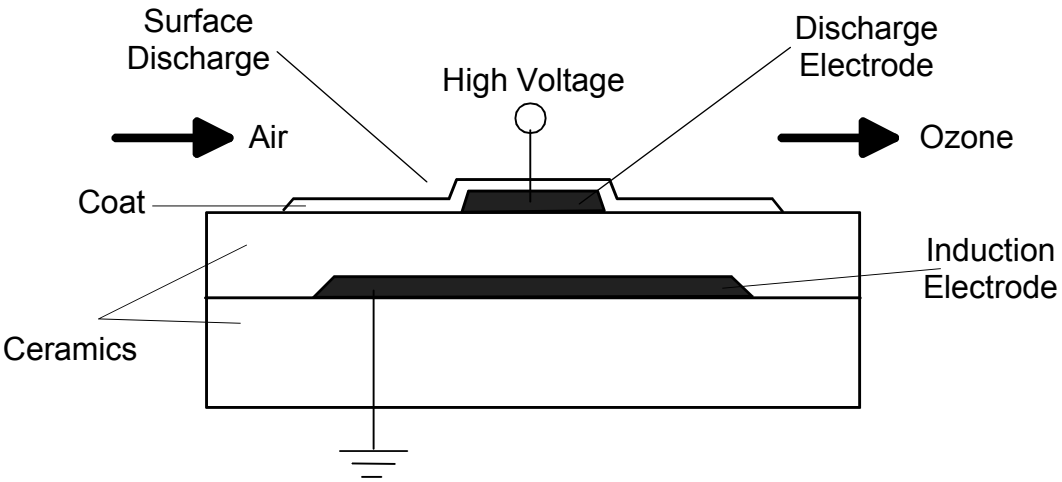

Figure 4: Principle of ozone generation

Ozone can qualitatively be measured in barrels (Figure 6) with paper strips (Cat. No. 77006).When openly used in a cellar room (Figure 10) test strips (No. 77019) can be used. Further possibilities for measuring ozone are indicated in the Anseros journal HORIZON, Vol.6, No. 2.

3 System Overview

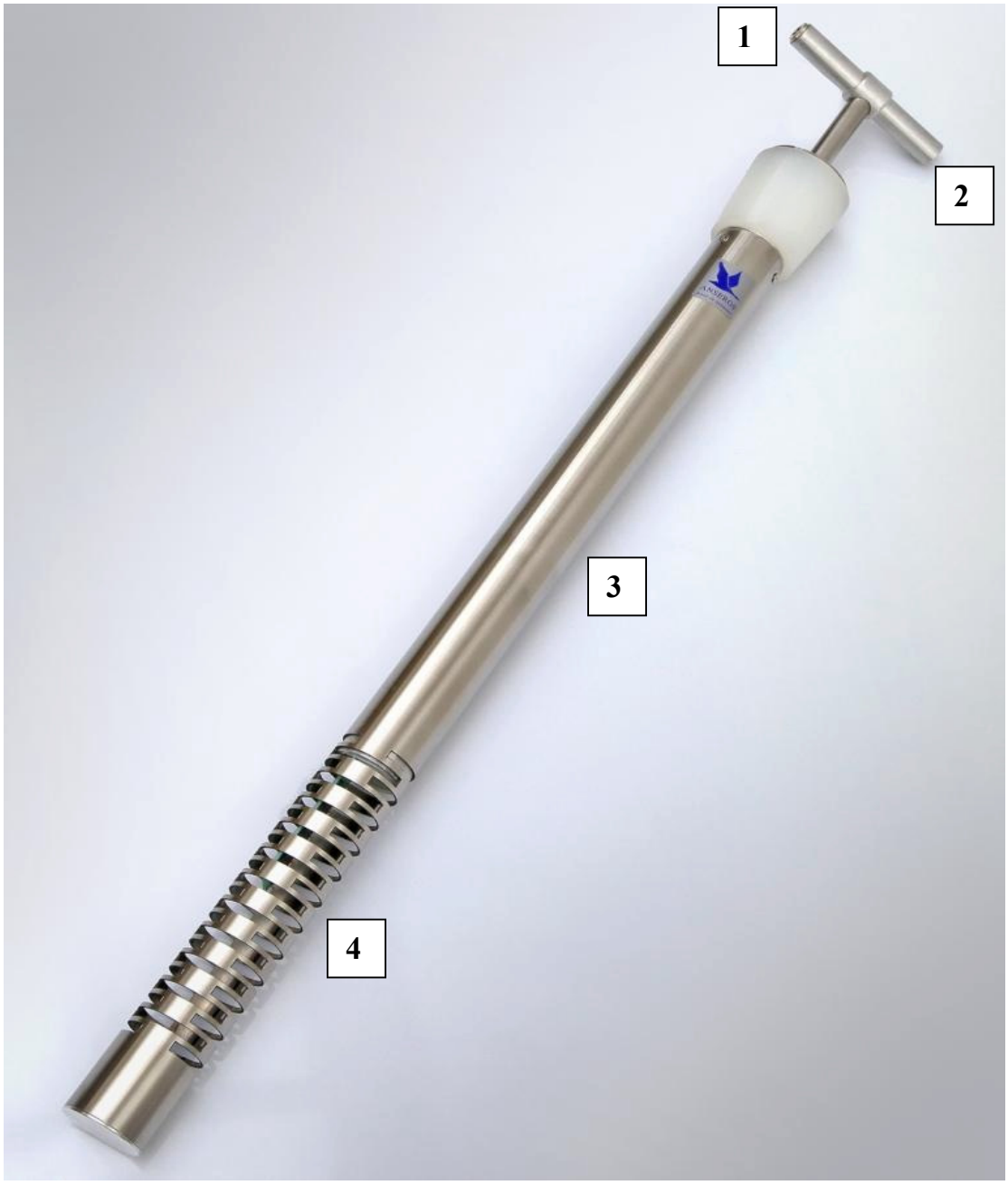

Figure 5: Design and features

1. LED lamp (green)
2. Power supply socket, 12 V
3. Tube, heated
4. Convection area

4 Basic Recommendations for Use

Figure 6: Application through the bunghole

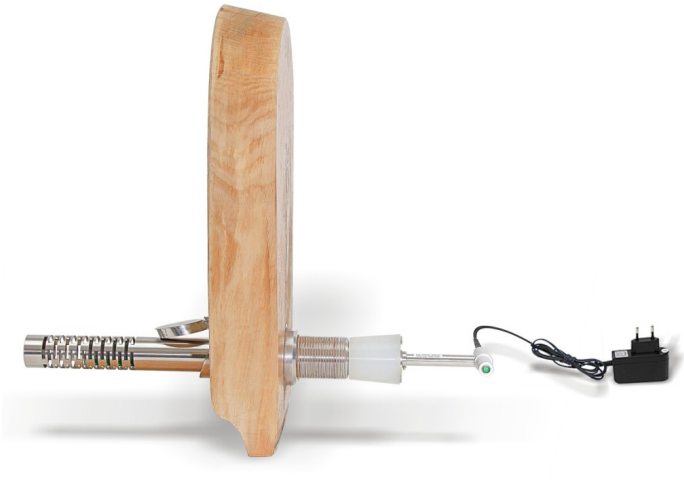

Figure 7: Application through mortise flap

Figures 6 and 7 show the typical applications of Oenocat devices in a barrique barrel: insertion in the bunghole or in the mortise. The mains adapter delivered with the device is connected to an AC outlet 100-240 V / 50-60 Hz.
As soon as the 12 V plug is plugged into the socket on the handle, the green on the handle LED lights up. The device is now in operation, producing ozone in the barrel.

Figure 8: Mains adapter 59558, 100-240 V, 50-60 Hz

The barrel may be damp inside, but it must be free of liquid water. Oenocat devices must not be immersed in liquid water in any case, otherwise, they will be destroyed. Personnell, however, is not at risk even in this case since the device operates at low voltage (the high voltage inside the unit is harmless as long as the housing is closed).

The treatment times are shown in Table 1, they represent a recommendation.

Recommended duration of use of the Oenocat device depending on the age of the barrel and on the estimated degree of contamination					
	Degree of contamination				
	A	B	C	D	E
Age of the barrel	Recommended duration of use in hours				
New	2				
1 year	4	8	-		
2 years	8	12	16	20	24
3 years	12	16	20	24	-
4 years	16	20	24	-	-
5 years +x	20	24	-	-	-
Degree of contamination: A: very low → sensorily and analytically unnoticeable B: low → sensorily and analytically uncritical C: moderate → sensorily and analytically noticeable D: high → sensorily and analytically critical E: very high → sensorily and analytically highly polluted				**Barrel volume:** 225 … 300 liters	

Table 1: Recommendations for the duration of use

If the barrel is not filled immediately but stored until refilling for weeks or even months, the Oenocat device may remain in the barrel. With a timer (No. 78671), the Oenocat can also be operated intermittently.

The rod of Oenocat is lukewarm. This is to generate convection in the interior of the barrel and thus to distribute the ozone gas from the bottom upwards. The rod length of the Oenocat CAT-FL-36/557 is 557 mm, the rod length of the Oenocat CAT-FK-36/350 is 350 mm (special versions with longer rods are available). In case of a high barrel, the insertion through the mortise panel (Figure 7) is recommend to obtain a good convection.

In case of a barrel volume > 500 liters, longer treatment times must be considered or two Oenocat devices must be used, both through the bunghole and through the mortise. Otherwise there is a risk that the barrel floor area is not supplied with ozone, resulting in incomplete sterilization or no sterilization at all in this area.

5 Handling and Operation

5.1 Safety requirements before commissioning

⚠ Observe the safety instructions in Chapter 7 of this manual!
Ozone must not be inhaled!

5.1.1 Electrical Safety

The electrical installation required for connecting the mains adapter (100-240 V / 50-60 Hz) has to be carried out by a qualified electrical installer.

Cable duct guidings along the ceiling are recommendable with sockets hanging down close to the application place, especially in cellars with high humidity or moisture on the ground. The mains adapter must be used in dry areas only. The OENOCAT must be used with the original mains adapter only.

5.1.2 Safety in dealing with ozone openly applied in a cellar room

In case of an open application of Oenocat outside of casks for the sterilization of cellar rooms (Figure 10), it must be additionally ensured that the power supply can be switched on and off from outside the cellar room.

Under no circumstances people shall be allowed enter the ozonized cellar room during or immediately after the open application of Oenocat – risk of poisoning by ozone. Therefore it must be guaranteed that the Oenocat can be switched on, operated and switched off from outside the locked ozonized cellar room. This is especially important for smaller cellar rooms. From a room size of 250m³ upwards, the ozone concentration remains significantly below the MAC value (Maximum Allowable Concentration) even without additional ventilation when using a single OENOCAT.

It is recommended to use a timer (No. 78671, Figure 9), e.g. for operation at night with absent personnel. The timer must be installed outside the ozonized cellar room.

Figure 9: Timer 78671

5.2 Application inside of barrels: switching on and off

5.2.1 Switching on

Stick Oenocat into the barrel and establish electricity connection (12 V DC / 100-230 V AC, 50-60 Hz). The green LED on the handle lights up (Figures. 7 and 8). Ozone operation is running. After about an hour, the maximum ozone concentration of 200 mg O_3/m^3 in a barrique barrel (225 liters) is reached.

5.2.2 Switching off

Unplug the mains adapter from the electrical outlet and / or disconnect the 12 V plug from the handle. The green LED on the handle turns off. The ozone inside the barrel breaks up into oxygen within 10 minutes. The Oenocat can be drawn out of the barrel.

5.3 Open application in a cellar room outside of barrels: switching on and off

5.3.1 Switching on

Make sure that the power supply provided for the Oenocat is permanently switched off from outside the cellar room by means of a switch or (especially when operated with timer) by pulling a power plug.

Position Oenocat in the cellar room (wall mount recommended). Connect mains adapter with Oenocat and with turned-off power supply. Leave cellar room and lock cellar room door. Turn on power supply. Ozone operation is running.

⚠ Lock the ozone-containing room and secure it against accidental entering!

5.3.2 Switching off

⚠ Do not enter the ozone-containing room. Do not switch off directly at the device!

Stay outside of the locked cellar room and permanently switch off the Oenocat's power supply from there by means of a power switch or (especially in case of timer operation) by pulling a power plug. Wait before unlocking and entering the cellar room until the ozone inside has decomposed to oxygen.

The ozone-containing room may not be entered immediately after turning off the ozone generation by the OENOCAT! To avoid health risks (see also safety regulations in chapter 7), the remaining ozone must have decomposed by itself to the MAC value (Maximum Allowable Concentration, 0.1 ppm or 0.2 mg/m³).

The time required depends on the ozone concentration in the room. Moisture, the presence of ozone-consuming materials, the room size and the duration of the ozone production affect the waiting time that must strictly be adhered to before the ozonized room may be entered again.

The time can be reduced by appropriate ventilation. From a room size of 250m³ upwards, the ozone amount is well below the MAC value (Maximum Allowable Concentration) even without additional ventilation when using a single OENOCAT.

If the same room is frequently subjected to ozone, this waiting period can once be determined precisely by controlling the MAC value (0.1 ppm or 0.2 mg/m³) using an ozone meter.

For determining the necessary waiting time in case of alternating rooms, please contact ANSEROS!

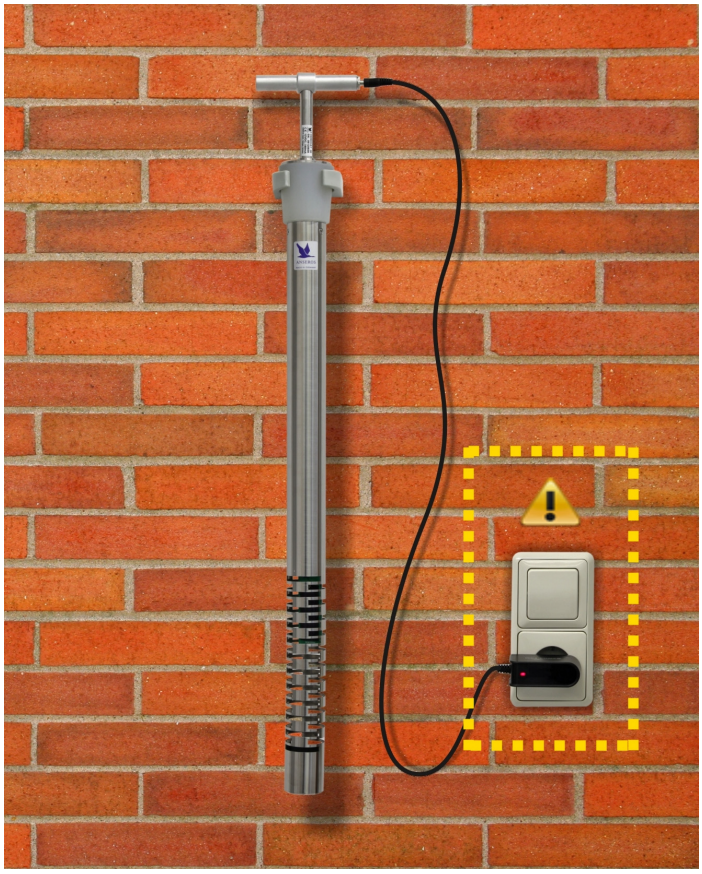

Figure 10: OENOCAT as cellar sterilizer: electricity connection must be interruptible from outside the ozonized room (chapters 5.1.2 and 5.3)

6 Service and Maintenance

⚠ Before servicing, opening or removal of the housing, turn off the unit and pull the power plug!

⚠ It is forbidden to bypass safety devices or to make changes to them in any way!

According to the rules ZH 1/474 of the German professional associations (Berufsgenossenschaften) ozone generators must be checked regularly.

⚠ Maintenance must be carried out by ANSEROS personnel only or by specially trained staff following ANSEROS instructions. The device may only be opened by qualified personnel. The power supply must be cut off. Caution: High voltage inside the unit!

6.1 Maintenance

Unplug the device and make it tension-free. Disassemble the device as shown in Figure 11 and 12. The glass tube in the ozone part (caution: fragile, as marked on Figure 12) can be washed with soap solution in case of waxy surface coatings, or, in case of salt-like crusts, with a bit of sour water. The use of solvents such as turpentine or alcohol is prohibited – possible danger of fire (see Chapter 7).

6.2 Replacement of the Ozone Part

If the green LED does not light up after switching on, the discharge current has been interrupted. The ozone part (Art. No. 78767) can be reordered and replaced by opening the screwing.

Figure 11: OENOCAT, broken down into its component parts

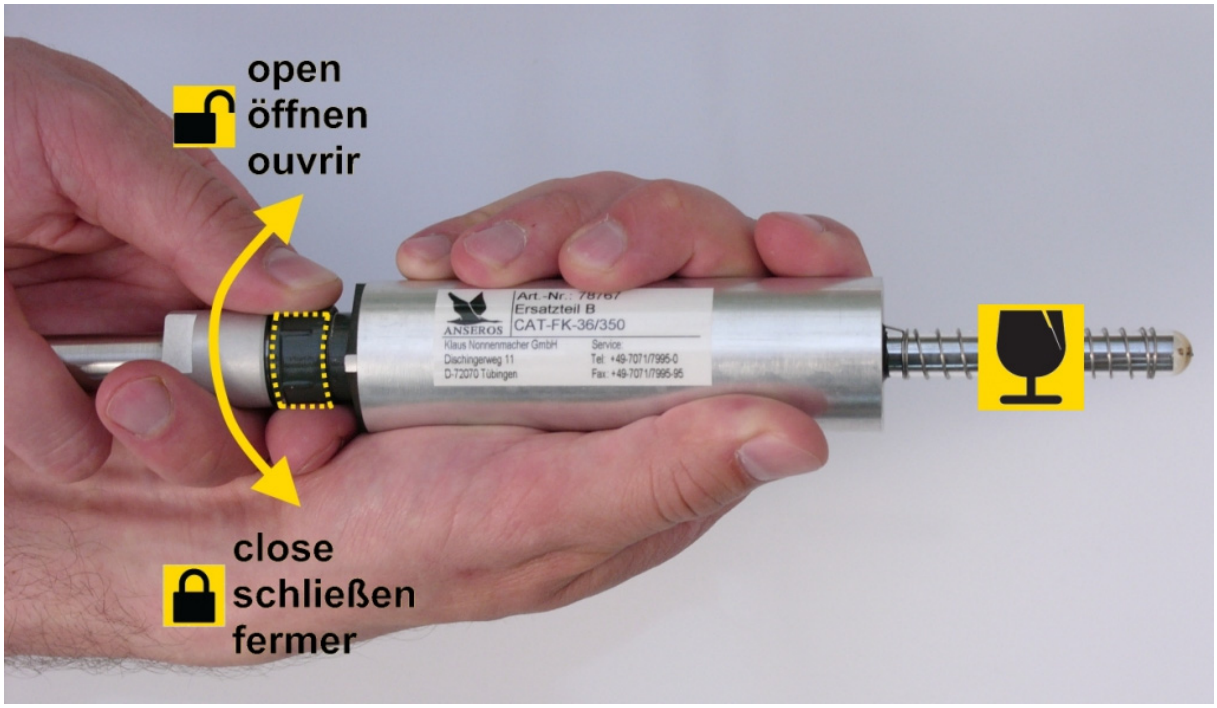

Figure 12: Ozone part, separable from the upper part of the device by coupling nut (marked in yellow)

Figure 13: Connection between the upper part and the ozone part: fitting nose must match (see arrows)

7 Safety regulations for the operation of ozone generators in enclosed spaces

7.1 Safety Information

7.1.1 Ozone

The guidelines of the German professional associations ("Berufsgenossenschaften", ZH 1/474) have to be observed. Ozone is a highly toxic oxidiser. It has been shown to be very dangerous and harmful to humans and animals. Precautions have to be taken to avoid exposure to this gas.

⚠ **Ozone must not be inhaled!**

It causes a reduction in lung function that often lasts for several days!

In 1993, the ozone safety limits were set to 0.12 ppm in the USA. This corresponds to 240 µg/m³. In Germany, the meteorological limits are set to 120 µg/m³. The MAC value (Maximum Allowed Concentration) is currently 0.1 ppm which corresponds to 0.2 mg O_3/m³.

⚠ **High ozone concentrations are explosive; danger of fire!**

Precautions to be taken:

- Gas masks with ozone filters must be provided, covering mouth and nose
- Fresh air supply and / or air exhaust

Even after only a short exposure to ozone, the human sense of smell is temporarily lost!

Seek immediate medical attention in case of:

- Eye irritation
- Dizziness or severe coughing
- Shortness of breath or pain in deep breathing

7.1.2 Risk of Electric Shock

- Ozone generators include high voltage elements. Before opening the housing, the power plug must be removed, otherwise there is a risk of death!
- The device must not get into contact with water.
- In case of visible damage to the device, it must not be put into operation anymore.
- The device may only be used as intended.

7.1.3 Danger of Fire and Explosion, Danger of Chemical Burns

Only use ozone-resistant materials such as PFA, PTFE or stainless steel.

- Silicone hoses can burn at high ozone concentration.
- PTFE tubes may emit hydrogen fluoride (HF) which corrodes quartz glass.
- Activated carbon filters explode after short exposure.
- All parts that get into contact with ozone or oxygen have to be kept absolutely free of oil and grease.
- The device must not be operated in the vicinity of flammable or explosive substances. Combustible gas mixtures will be ignited by the electric discharge in the device.

8 Troubleshooting

⚠ **Check the electrical functionality of the Oenocat exclusively when used in a closed barrel. Only this way, the danger of poisoning by ozone can be avoided.**

If your OENOCAT is not functioning, proceed as follows:

Make sure that the mains adapter is connected to the Oenocat and to the power supply.

If the green LED of the Oenocat does not light despite functional power supply, ozone may still be produced (in case of failure of the LED). **Therefore unplug the mains adapter from the electrical outlet and / or disconnect the 12 V plug from the handle before pulling the Oenocat out of the barrel.** Contact ANSEROS to determine the cause of the defect. Possible sources of malfunctioning in this case:

- Failure of the power supply (cat. no. 59558)
- Failure of the ozone part (cat. no. 78767, exchange according to Chapter 6, “Service and Maintenance”)
- Failure of the LED (send the device to ANSEROS)

⚠ **Maintenance must be carried out by ANSEROS personnel only or by specially trained staff following ANSEROS instructions. The device may only be opened by qualified personnel. The power supply must be cut off. Caution: High voltage inside the unit!**

9 Appendix

9.1 Scope of Delivery

OENOCAT in stainless steel housing	1
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Mains adapter (cat. no. 59558)	1

9.2 Technical Data

Power supply	100-240 V AC / 50-60 Hz
Room temperature	<35° C
Atmosphere	normale Raumluft
Maximum amount of ozone generated	250 mg O_3/h m³
Diameter	36 mm
Rod length, device type CAT-FK-36/350	350 mm
Rod length, device type CAT-FL-36/557	557 mm
Weight, device type CAT-FK-36/350 (without power supply)	750 g
Weight, device type CAT-FL-36/557 (without power supply)	1000 g

9.3 Contamination in Wooden Barrels

9.3.1 Bacteria

- Vinegar bacteria – *Acetobacter*
- Lactic acid bacteria – *Lactobacillus*
- *Pediococcus damnosus* (often referred to as *Pediococcus cerevisiae)*

9.3.2 Yeasts

- *Saccharomyces cerevisiae*
- *Saccharomyces bayanus*
- *Saccharomyces ellipsoides*
- *Saccharomyces uvarum*
- *Pichia klyveri*
- *Metschnikowia pulcherrima*
- *Brettanomyces bruxellensis* (spontaneous fermentation ~ *lambic*)

- *Brettanomyces lambicus* (spontaneous fermentation ~ *lambic*)
- *Torulaspora delbrueckii* (top-fermenting yeast)

9.3.3 Apiculatus Yeasts

Genera:

- *Kloeckera*
- *Hanseniospora*
- *Hansenula*
- *Candida*

Contact:

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