

ATEX Additional Instructions

For Macerators in a potentially explosive atmosphere

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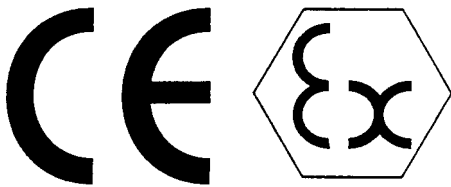
Macerators Series AM

Order no.:

ID-no.of the macerator:

Machine no.:

Macerator type:



Notice:

These additional instructions supplement the respective maintenance and operating instructions of the corresponding macerator series.

You will find the operating data, dimensions and other additional information in the order-specific part of the documentation.

Keep the additional instructions close to the macerator!

Contents

1. For your safety
2. Which explosion protection does your macerator have?
3. You have to monitor / control these parameters.
4. Installation and start-up
5. What you need to observe when operating your macerator

1 For your safety

This macerator corresponds to the current state of technology and the approved safety-related regulations. Nevertheless there might be a risk of injury to life and limb of the operator or third parties and impairments of the macerator respectively.

In order to guarantee the best possible and safe operation of the macerator, only qualified workers may perform maintenance or repair work.

Only authorized electrical technicians working in accordance with the country-specific electrical engineering standards and directives may perform work on the electrical equipment.

1.1 Intended use

This macerator crushes solids contained in liquids in accordance with the technical data sheet.

1.2 Improper use

This macerator is not suited for handling liquids which:

- chemically attack the materials of the macerator,
- are electrostatically charged with a conductivity $< 10^{-8}$ S/m (for details refer to BGR 132).

ALLWEILER AG will assume no liability for damages or interruptions of operation, resulting from non-compliance with these additional instructions or the operating instructions.

1.3 Special equipment directives

As a non-electrical production facility the macerator fulfills the requirements on equipment of the equipment group II, category 2 and 3 respectively in accordance with the directive 94/9/EG.

-The directive 94/9/EG has to be fulfilled for:

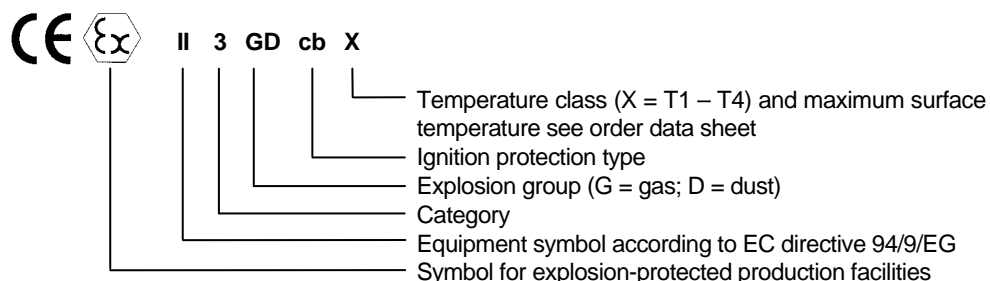
- Motors and couplings provided on site according to the required category and temperature class in the respective zone.
- Monitoring devices if they are installed in an explosion-proof zone.

In accordance with the directive 99/92/EG the plant operator is responsible for the fulfillment of directives.

2 Which explosion protection does your macerator have?

The designation of your macerator indicates which explosion environment the macerator may be operated in.

2.1 Explosion protection specification

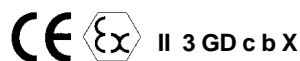


Category	Explosion protection
2	<ul style="list-style-type: none"> The unit guarantees a high level of safety. A disruption that normally has to be considered must not become an ignition hazard. An explosive atmosphere must be expected in the environment from time to time.
3	<ul style="list-style-type: none"> The unit guarantees a normal level of safety. In normal operation intolerably high surface temperatures must not become an ignition hazard. In the environment an explosive atmosphere is only to be expected rarely or for short periods of time.

Table 1: Explosion protection

2.2 Explosions protection according to device group II, category 3

If the type plate of your macerator shows the following details:

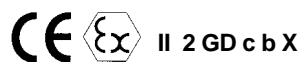


the following is applicable:

- additional monitoring facilities are required (see chapter 3, you have to monitor / control these parameters).
- The macerator is suited for operation in areas where an explosive atmosphere is to be expected occasionally or for a short period of time.
- Ignition protection type c = constructive safety.
- ignition protection type b = monitoring of ignition sources.

2.3 Explosion protection according to device group II, category 2

If the type plate on your macerator shows the following details:



the following is applicable:

- additional monitoring facilities are required (see chapter 3, you have to monitor / control these parameters).
- the macerator is suited for operation in areas where an explosive atmosphere is to be expected occasionally.
- Ignition protection type c = constructive safety;
- Ignition protection type b = monitoring of ignition sources.

2.4 Classification of the macerators in temperature classes

In accordance with EN 13463-1 the macerators are classified in temperature classes depending on the temperature of the pumped liquid. Table 2 "Temperature classes" shows the maximum admissible temperature of the pumped liquid.

All temperature specifications refer to a maximum ambient temperature of 40 °C.


Series	Hazard classification	Maximum temperature of the liquid			
		T4 (135°)	T3 (200°)	T2 (300°)	T1 (450°)
		 WARNING The indicated temperatures may only be regarded as a product / performance overview! Refer to the order data sheet regarding the exact maximum temperature applicable for the macerator.			
AM	II 3 G c b	40 °C	80 °C	80 °C	80 °C
AM	II 2 G c b				

Table 2: Temperature classes

2.5 Maximum surface temperature

The maximum surface temperature is indicated in the order data sheet.

3 You have to monitor / control these parameters

3.1 You have to monitor / control these parameters in category 3

Sparks which are generated mechanically by friction, impact, and abrasion occurrences in the area of the cutting tools are considered as possible ignition sources. Before starting the macerator and during operation the macerator housing has to be completely filled with liquid.

The filling level of the macerator housing has to be monitored.

Install a flow rate and / or tank level measuring.

Set the flow rate and / or the tank level in accordance with the parameters of the macerator and the tank level required for the operation.

3.2 You have to monitor / control these parameters in category 2

Sparks which are generated mechanically by friction, impact, and abrasion occurrences in the area of the cutting tools are considered as possible ignition sources. Before starting the macerator and during operation the macerator housing has to be completely filled with liquid.

The filling level of the macerator housing has to be monitored.

Install a flow rate and / or tank level measuring.

Set the flow rate and / or the tank level in accordance with the parameters of the macerator and the tank level required for the operation.

The self-heating of the mechanical seal is considered as a possible ignition source.

The mechanical seal has to be charged with flushing liquid.

Observe the monitoring requirements.

Install a flow rate monitoring in the line of the flushing liquid.

These requirements must be fulfilled by a flow rate monitoring:

Maximum response time: 2 s.

4 Installation and start-up



Danger of explosion due to excessive heat!

Danger of severe injuries or death.

⇒ Localize and eliminate excess temperature on the macerator.

- Install the macerator according to the operating instructions, chapter 5. Observe the indications referring to the installation site and the protective devices especially the maximum temperature of the pumped liquid (see order data sheet).
- Before starting operation of the macerator exhaust the air from the liquid cycle.
- The admissible maximum temperature of the flushing or quench liquid of the mechanical seal is 60°C.
- The flow rate of the sealing liquid of the mechanical seal has to be set in a way that the discharge temperature does not exceed 60°C. the temperature difference between suction and discharge may be 10 K at most.
- Integrate the macerator (aggregate) in the potential equalization according to EN 60079-14 at the operating site.
- Start the macerator up according to the operating instructions, chapter 6.

4.1 Coupling

- Use Loctite (medium consistency) to additionally secure the set screws for the center attachment of the coupling halves against self-loosening.

5 During the operation of the macerator you have to observe the following:



Danger of explosion!

Danger of severe injuries or death.

⇒ In case of irregularities or failures stop the aggregate immediately!

Localize and respectively determine the cause of failure.

⇒ Do not restart the unit before having eliminated the cause of the defect.

For applications in a potentially explosive dust atmosphere:

- ⇒ Clean the macerator in regular intervals in order to avoid dust deposits with a thickness exceeding 5 mm.
- ⇒ A regular cleaning of the slot between the counter-ring of the mechanical seal (208) and the shaft (113) is required if an extended examination of the operator reveals a risk of ignition.

5.1 The following operating methods must be avoided:

- Explosive atmosphere in the macerator housing
- dry running of the mechanical seal
- overload operation
- operation with closed suction valve
- operation with closed pressure valve

5.2 Maintenance intervals



WARNING

Danger of explosion due to excessive heat!

Danger of severe injuries or death.

The decomposition processes of lubricants caused by aging lead to damages to bearings and inadmissibly high surface temperatures.

⇒ Keep the specified maintenance intervals.

Notice:

⇒ The maintenance intervals get shorter when the aggregate is operated under more difficult conditions such as vibrations, aggressive gases, humidity etc.

⇒ After maintenance assemble the macerator as described in the operating instructions under chapter 7.2.2.

1. Check regularly:

- The macerator for changed operating noise during operation
- the motor according to the operating instructions of the motor manufacturer,
- the surface temperature of the macerator and the motor,
- the complete aggregate for vibrations,
- the coupling according to the operating instructions of the manufacturer of the coupling,
- the bearing for functional capability,
- each monitoring device for functional capability.

2. Device group II, category 2

- Replace the roller bearings after 30,000 operating hours at the latest.

Subject to technical changes



A Colfax Business Unit

ALLWEILER AG
Postfach 200123 • 46223 Bottrop
Kirchhellener Ring 77-79 • 46244 Bottrop
Germany
Tel. +49 (0)2045 966-60
Fax. + 49 (0)2045 966-679
E-Mail: service-ge@allweiler.de
Internet: <http://www.allweiler.com>