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EU Declaration of conformity

We declare under our sole responsibility that this product corresponds to the directives 2014/35/EU, 2006/42/EC, 2014/30/EU and 2011/65 EU and conforms with the following standards or normative documents: EN 61010-1, EN 61010-2-051, EN ISO 12100, EN 61326-1 and EN 60529.

A copy of the complete EU Declaration of conformity can be requested at sales@ika.com.

Safety instructions

- **Read the operating instructions in full before starting up and follow the safety instructions.**
- Follow the safety instructions, guidelines, occupational health and safety and accident prevention regulations.
- Keep the operating instructions in a place where they can be accessed by everyone.
- Ensure that only trained staff work with the appliance.
- The device must only be used in a technically perfect condition.
- The **M 20** device may not be used in areas subject to explosion hazards.
- Protective glasses must be worn when performing experimental cuts. In addition, suitable protective gloves must be worn when adding coolants.
- Experiments involving grinding must be performed behind a protective wall (Plexiglas®-wall, exhaust hood or the like) in order to prevent injury caused by the sudden occurrence of excess pressure (possible bursting of the cover).
- Please comply with all of the relevant safety regulations.

Intended use

IKA universal grinder **M 20** is suitable for carrying out low-loss grinding of hard and brittle substances as of grain size 6 - 7 mm. The grinders operate without creating dust or lost. Beaters, blades and grinding are replaceable. The useful volume of the grinding chamber is 250 ml for the **M 20** grinder.

Hard and brittle ground material is crushed by means of beaters or blades rotating at high speed.

Oil substances or those that are given to smearing and which are not capable of being ground at room temperature have to be cooled for grinding (e.g. embrittled with liquid nitrogen).

Unpacking

Unpack:

- Please unpack the device carefully.
- Any damage should be notified immediately to the shipping agent (post office, railway network or logistics company).

Delivery scope:

- **M 20 grinder**
- **M 21** stainless steel beater
- Set of tools
- Operating instructions
- A warranty card.

Commissioning

Check whether the voltage specified on the type plate matches the mains voltage available. The power socket used must be earthed (protective earth conductor contact). If these conditions are met, the device is ready to operate after plugging in the mains plug. If these procedures are not followed, safe operation cannot be guaranteed and/or the equipment may be damaged.

Observe the ambient conditions (temperature, humidity, etc.) listed under Technical Data.

NOTE: The grinder is designed for short term operation.

Maximum operating time - 7 minutes.

After that, the grinder must cool off for approximately 10 minutes.

This condition does not apply if the grinders is connected to a cooling unit.



Motor circuit breaker

The grinder is protected against overload by means of an overcurrent protective device. In the event of overload the overcurrent protective device interrupts the current supply. Restarting is carried out by pressing-in the black button at the rear of the grinder. The motor is switched on via push-button at the front.

Description

The device consists of three basic units (drive unit, middle part and cover) which are connected to each other by means of quick-release locks. When assembling the three units make certain that the hose coupling for cooling the middle part is located at the rear of the device. When putting on the cover make certain that the safety pin in the middle part is pushed down by the pressure pin on the cover. Otherwise, a tight and reliable connection is not ensured and the grinder will not start.

The device is started by pressing the push-button at the front.

Grinding

Fineness is mainly dependent on how long the grinding operation is performed.

If materials are to be ground that are smaller than a certain grain size then it should be sieved and the residue in the sieve is put back into the grinder. For sharp-edged material which is thus very abrasive, it is recommended that the entire quantity is left in the grinder in order to additionally exploit the properties of the material.

Grinding while cooling

Plastic, soft or smeary materials have to be cooled if they are to be ground.

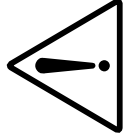
There are two hose couplings located at the rear of the grinder in order to connect the cooling brine. Cooling with tap water is usually sufficient for substances which become hot as a result of the grinding operation and are thus given to smearing or those that produce oil.

The grinding chamber may only be filled halfway especially when drugs containing oils and similar materials are ground.

If more refrigeration is required then the ground matter should be cooled prior to being put into the grinding chamber.

The following procedure shall apply if liquid nitrogen is used in order to embrittle the material to be ground:

Safety information:



Suitable protective gloves must be worn when filling and transferring liquid nitrogen!
Protective glasses must be worn!

- The sample to be ground is put into a suitable vessel (e.g. evaporating dish) and covered with enough liquid nitrogen until it is completely covered.
When using liquid nitrogen make certain that the sample is not capable of reacting with oxygen.
- Cool grinding chamber using liquid nitrogen.
- Put the deep-cooled sample into the grinder and grind approximately 15 seconds.
- Then open the grinder and add liquid nitrogen for only as long as it takes for the sample to become deep-cooled again (embrittled).

Safety information:

Make certain that the liquid nitrogen has evaporated before beginning the grinding operation.

NOTE: Danger of overpressure!



- Repeat the grinding operation for approximately 15 seconds.
- Repeat the sequence of cooling and grinding until desired fineness has been achieved.
- If the required fineness has not been achieved after 5 minutes, then a further reduction in grain size is unlikely.
The respective grinding chambers are sealed by means of labyrinth sealings. Though they are dust-proof, they are not leak-proof. This should be taken into account for substances where liquids may escape.

Replacing the grinding tools

The grinding tool is fixed by means of the retaining tube and the cap nut is unscrewed by using the SW 10 spanner. The grinding tool, which rests on a double-edge track, may then be pulled out.

Maintenance and cleaning

The device is maintenance-free. It is only subject to the natural wear and tear of components and their statistical failure rate.

Cleaning:



For cleaning disconnect the mains plug.

Only use cleansing agents which have been recommended by **IKA**:
Water (containing surfactant) and isopropyl alcohol.

- Wear protective gloves during cleaning the instruments.
- Electrical instruments may not be placed in the cleansing agent for the purpose of cleaning.

- Do not allow moisture to get into the instrument when cleaning.
- Before using another than the recommended method for cleaning or decontamination, the user must ascertain with **IKA** that this method does not destroy the instrument.

Spare parts order:

When ordering spare parts, please give:

- machine type
- manufacturing number, see type plate
- item and designation of the spare part, see www.ika.com, spare parts diagram and spare parts list.

Repair:

In case of repair the device has to be cleaned and free from any materials which may constitute a health hazard.

For repair, please request the “**Decontamination Certificate**” form **IKA** or use the download printout of it from **IKA** website: www.ika.com.

If you require servicing, return the appliance in its original packaging. Storage packaging is not sufficient. Please also use suitable transport packaging.

Accessories

- M 20.1** spar grinding chamber with cover
- M 21** spare beater, stainless steel
- M 22** beater, stainless steel
- M 23** star-shape blade, stainless steel

Warranty

In accordance with **IKA** warranty conditions, the warranty period is 24 months. For claims under the warranty please contact your local dealer. You may also send the machine direct to our works, enclosing the delivery invoice and giving reasons for the claim. You will be liable for freight costs.

The warranty does not cover wearing parts, nor does it apply to faults resulting from improper use or insufficient care and maintenance contrary to the instructions in this operating manual.

Technical data

Design voltage	VAC	230 ± 10% 115 ± 10% 100 ± 10%
Frequency	Hz	50 / 60
Permissible ambient temperature	°C	+5 ... +40
Permissible relative humidity	%	80
IP code according to EN 60529		IP 21
Rated speed	rpm	20000
Motor		universal motor
Maximum motor input	W	550
Grinding chamber useful volume	ml	250
Permissible operating time (without cooling)	min	7
Interference suppression		as in VDE 0871
Dimensions	mm	170 x 170 x 350
Weight	kg	6.6

Subject to technical changes!