

BREITLÄNDER
Part of LGC Standards

Manual

SWING MILL HK40

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Technical improvements, modification and errors reserved

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1. Unpacking

Check for any outside damage of packing, have report on such observations signed by carrier (driver), required for any claims against transport company. Inspect machine and accessory promptly after receipt for completeness and any hidden damages.

Note!

Corundum, zirconia and tungsten carbide materials are extremely brittle and prone to fracture. These vessels have to be handled very carefully and will be damaged when dropped. Never operate vessels without grinding material.

Manufacturer's warranty does not cover any fracture or chipping. These products have to be examined promptly for any damage (possibly from transport) on receipt.

2. Removal of transport locks

The machine has 2 transport locks which must be removed before operation:

- a) locking screw beneath bottom of machine
- b) locking bar on rear side of machine

After removal of transport locks the rear side panel of machine must be reattached.

3. Design of mill HK40

This swing mill is designed for quick milling and simultaneous homogenization of various kinds of materials, especially for preparation of laboratory samples.

The compact design allows the machine to be placed on the lab desk. Special care was applied for a well balanced mechanism.

Safe operation has been technically ensured. The mechanism of the desk top mill is fully covered, the electric control keys are situated on the front panel allowing instant stop at any time of operation. The grinding vessels are fixed in one position, an unlocked grinding vessel will not allow the hatch to be closed and thus block the start. During operation an electromagnetic lock keeps the operation area closed. In case of irregular locking unplug machine from mains, take out plastic stopper on top of hatch and insert special key supplied for manual opening of hatch.

The grinding vessel can easily be removed for charging, discharging, cleaning or exchange with another vessel.

The grinding conditions can be set reproducibly by fractions of a second up to 100 minutes.

4. Filling of grinding vessel

Put the material to be milled **between stone and inner wall**, do not put any grinding material on top of stone. This will prevent proper closure of cover and free movement of stone. Close the vessel properly **ensuring the O-ring to be inserted correctly**. The vessel cover must be fitting into the vessel without pressure. Make sure that the tray holding the vessel is clean so that the vessel fits into the locking recess. Ensure that the plastic compression ring is in the tray. Fix the grinding vessel into correct position on the tray by the pressing screw. Wait until the grinding vessel is in a non-swinging state. Close the hatch, set the milling time and start the operation.

Note!

Never operate the mill without the grinding vessel, only HK40 original grinding vessels can be used. Never operate non-steel vessels without a grinding media.

Attention!

Start the machine only when the grinding vessel is no longer swinging – otherwise the machine will get out of balance and damage will be caused.

Any broken part in a machine with moving mechanism requires immediate stop of operation in order to prevent further damage and accident. Do not to operate a machine with unregular noise or broken parts unless the cause has been identified, properly removed and the machine been set into operating order.

5. Setting of milling time

4 red digits show operating time: minutes and seconds in 2 digits each. Maximum setting of operating time is 99 minutes and 59 seconds. Each time digit can be set separately. After entering any new operating time the new time set will be shown in the display when the machine is started and will remain valid until a new time is set. Changing of time setting during operation will become operative always for next working cycle.

6. Grinding Vessels

There are various grinding vessels manufactured from steel, corundum, zirconia, plastic and tungsten carbide available, see more detailed description in this manual. We recommend a steel vessel for many general purpose applications because of high durability; depending on applications a corundum 99.6% vessel is very often used as universal one, too. Please take care with any ceramic vessels – such material is brittle and prone to crack or fracture if handled roughly.

7. Properties of various grinding vessels available for HK40

BR HKMG3 Hardened Steel

Universal grinding vessel for general purpose applications with high durability from internally hardened steel, abrasion resistance moderate compared to corundum, hardness MOHS 5.5-6, Vickers HV 800, matrix element is Fe, minor elements Cr, Si, Mn, C, W and V.

BR HKMG4 Nitrided Steel

The surface hardness (0.1mm depth) of this steel vessel is considerably higher than the regular hardened steel one. This vessel is thus suitable for harder material with very good durability and toughness for routine work. Hardness MOHS 6, Vickers HV 1150, Matrix and minor elements as above.

BR HKMG5 Tungsten Carbide

Tungsten carbide is much harder and of higher specific weight than steel. This type of grinding vessel is widely used in laboratories because it allows fast and most effective grinding of very hard samples. Hardness is MOHS 8.5, Vickers HV 1500, Matrix W, C and Co, minor elements Ta, Ti and Nb.

Ceramic vessels

The hardness and resistance to abrasion and corrosion is very high, however these ceramic materials are very fragile and should be handled carefully.

BR HKMG1 Corundum 99.6%, bio-inert

This material has very high resistance to abrasion and these vessels are chosen when steel or tungsten carbide vessels are not applicable due to unwanted metal element contamination. Hardness is very high MOHS 9, Vickers HV 1650, matrix element is Al with traces of Si, Ca, Mg, Na and Fe.

BR HKMG2 Corundum 99.9%, bio-inert

This very high pure material shows lowest trace elements and provides the ultimate hardness of grinding vessels. It is used in applications with requirements for least contamination. Hardness MOHS 9+, Vickers HV 1850.

BR HKMG6 Zirconia 99.9%

This high pure material is of special interest to the analyst, as there is very low contamination from elements normally not of interest like Zr and traces of Hf, Y and Mg. The higher specific weight increases the grinding speed over corundum. Hardness MOHS 8.5, Vickers HV 1350.

8. Maintenance

The machine does not require any special maintenance. Any dust or grinding material should be cleaned by brush and vacuum cleaner. Make sure that the arresting mechanism, especially the movable piston of the press dish is clean from milling dust. The motor bearings have a durable filling.

9. Some practical hints for operation

The grinding vessel should not be overfilled, overfilled grinding vessels will not allow the stone to move freely and thus not effect grinding. The material of the grinding vessel must be harder than the material to be grinded and its presence as wear off material in the sample should not interfere with the analysis. Thus the grinding vessel has to be properly chosen in respect to unavoidable wear off from grinding process and proposed analysis of the sample. With harder materials start with smaller quantities of about 10ml.

The grinding noise is low at the beginning and will become louder when the material becomes finer. Experienced operators are able to conclude from the specific grinding tone the level of material fineness.

Overgrinding will not only increase unavoidable contamination from grinding vessel material, but will at the same time increase conglomeration of material on the walls and material warm up, which can be reduced by use of grinding additives.

Relatively soft materials may impose problems for fine grinding, tending to stick onto the walls and to the stone – this may be overcome by shortening the grinding time or by addition of various grinding additives. Most common are tablets of polymeric substances of light element composition. Some of these agents furthermore have special properties to facilitate pelletizing. Individual testing to find optimum conditions is required. We recommend a special grinding and pelletizing agent in form of 0.25g tablets, which has shown overall good properties in practical use; addition of one tablet only may, depending on grinding material, significantly enhance the grinding properties. The art.-no. is BR SPECTAB20, testing quantities are available on request.

Practical cleaning of the grinding vessel is made by grinding of silicate sand.

10. Trouble shooting and possible causes

The mill does not react after pressing the green starting button:

- Electric current supply interrupted
- The hatch of the machine is not closed
- The fuse is blown (open back panel, fuse socket in timer box)
- The starting capacitor is broken

Fuse blows immediately after machine is switched on:

- Motor connection cable broken
- Defective motor brake
- Motor blockage due to released part
- Defective motor

The mill is too noisy:

- Some mechanical part was released – stop operation immediately
- The machine has been started before the vessel was in stationary state

11. Related products for sample preparation offered

- autofluxer® automatic fusion machines with 2 and 4 stations
- fluxes for bead preparation: di-lithiumtetraborate and metaborate mixes
- hydraulic presses, manual + electrohydraulic
- die sets for pelletizing
- pellet cups in aluminium or plastic
- grinding and pelletizing agents
- reference materials
- glass monitor standards for XRF

Appendix

Technical Data

Machine

Dimensions	345 x 295 x 540 mm
Mass	~ 40 kg
Motor	230V/50Hz or 115V/60Hz, 200 W
Timer	max. 10 min. variable
Interruption of processing - any time	Stop push button

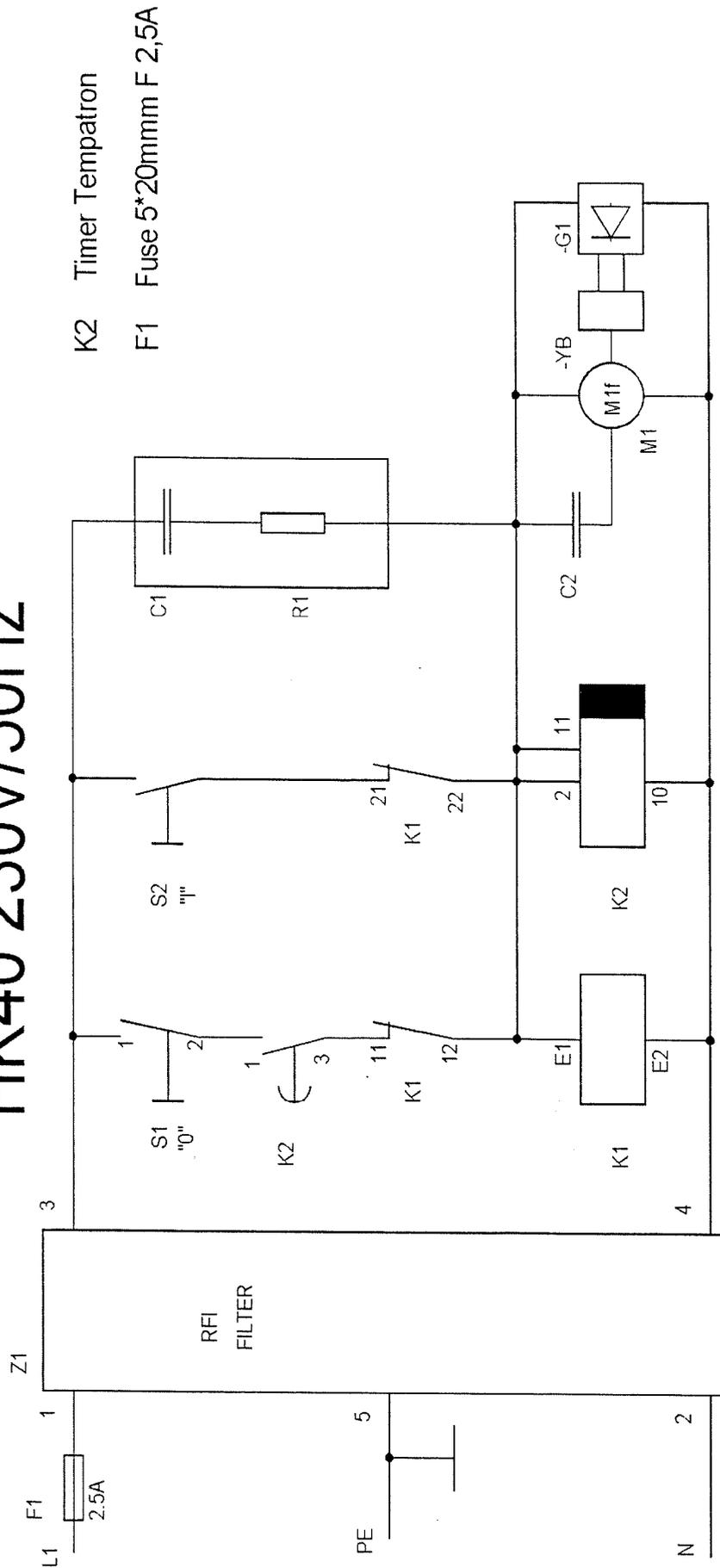
Grinding vessels

Dimensions of vessel	Ø 109mm, height 55.5mm
Volume	100 ml
Effective filling volume	max. 30 ml

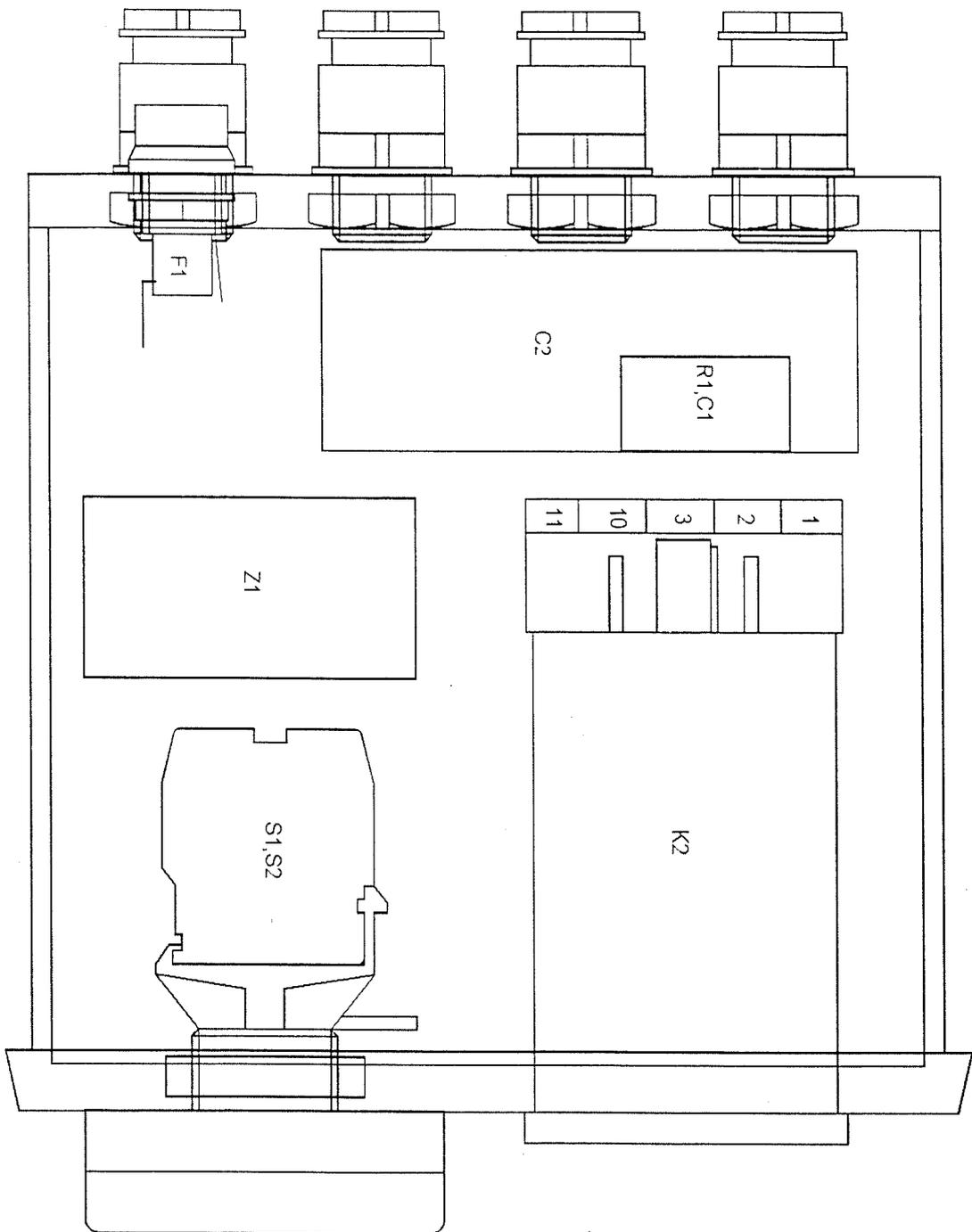
Material – Application

Minerals, cement, clinker, rocks, soils, slag, refractory, ores etc.
Starting particle size approx. 5mm

HK40 230V/50HZ



Compounds in Switch Board Box



Warranty for sample preparation machines and equipment series HK

Parts and equipment manufactured by the producer are warranted from defect in material and workmanship for a period of six months from the date of purchase. Other parts or equipment are covered to the extend of warranty provided by the original manufacturer.

The producer makes no other warranty with respect to merchantability, fitness for purpose, or otherwise. Consumables and items of similar nature are not covered by this warranty.

The producer's sole obligation under this warranty shall be to repair or replace any part or parts which, to our satisfaction, prove to be defective upon return prepaid to the producer. This obligation does not include labour to install replacement parts, nor does it cover any failure due to accident, abuse, neglect, or use in disregard of instructions furnished by the producer. In no event shall damages for defective goods exceed the purchase price of the goods, and the producer shall not be liable for incidental or consequential damages whatsoever.

All claims in regard to the parts or equipment must be made in writing within 10 days after the purchaser learns of the facts upon which the claim is based. Written authorization must be obtained from the producer prior to returning any part or parts. This warranty is voided by failure to comply with these notice requirements.

The warranty on the machine remains valid only when genuine replacement parts are employed.

This machine should be operated only by technically qualified staff who have fully read and understood these instructions. The operator should follow all of the warnings and cautions set forth in this manual and should follow the applicable safety procedures.

Any repairs should only be done by the manufacturer or by its appointed and trained representatives.



EC - DECLARATION OF CONFORMITY

according to the EC - guide line for machines No. 2006/42EEC, appendix II A

We the undersigned

Ing. Hajek & Koucky Comp.
Apparatus technique
Dvorakova 299
TURNOV, Czech Republic

declare that the machine mentioned below corresponds, in its conception and art of the construction and in the make applied by us, to the basic safety and sanitary requirements of the EC guide line. In case an alteration was made we did not approve, this declaration becomes null and void.

Designation of the machine	Laboratory Mill
Type of the machine	HK 40
EC Guidelines according to	Machine Directives 2006/42/EEC Low Voltage Directive 2006/95/EEC EMC-Directives 2004/108/EEC
Applied Standards	EN 294 EN 418 ISO 3744 EN 60 204-1 EN 50082-2 EN 50011 IEC 555-2,3 and thereafter EN ISO 12100/2003 and EN ISO 13857/2008

The specific technical documentation in accordance with Appendix VII B has been written and is available in its entirety.

The person authorised for compiling the specific technical documentation is: Ing. Václav Hájek address see above. The specific documentation will be transmitted to the official authorities on justified request

Specifikation : Test records VTU Vyskov, EMC-Army-Test-Station VTÚPV (E.T.C)
EC declaration of conformity Siemens Elektromotory s.r.o Mohelnice

All industrial property rights remain with the above-mentioned manufacturer.

Date and signatures
of the manufacturer

Turnov 2..1.2010

Ing. Václav Hájek

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