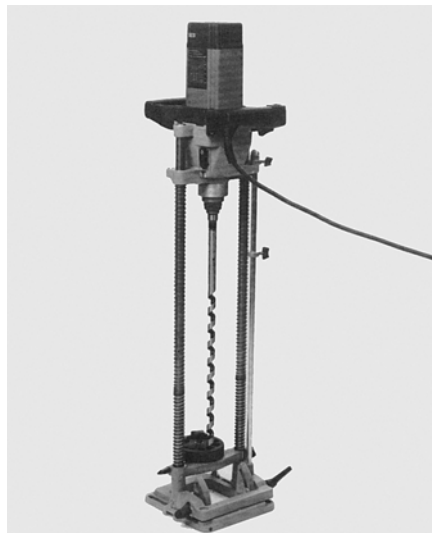




- (D) **Zimmerei-Bohrmaschine ZB 400 / 600 E**
Originalbetriebsanleitung
- (GB) **Carpentry Drilling Machine ZB 400 / 600 E**
Original operating instructions
- (F) **Perceuse pour charpente ZB 400 / 600 E**
Traduction de la notice d'emploi originale
- (I) **Trapano per carpenteria ZB 400 / 600 E**
Istruzioni per l'uso originali
- (NL) **Timmermans-Boormachine ZB 400 / 600 E**
Originele gebruiksaanwijzing
- (E) **Taladradora de carpintero ZB 400 / 600 E**
Manual de instrucciones original

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(+ 070911)



MAF00894

ACHTUNG !

Diese Betriebsanleitung enthält Hinweise, die für das sichere Arbeiten mit dieser Maschine wichtig sind. Lesen Sie deshalb unbedingt diese Betriebsanleitung sorgfältig durch!

WARNING !

These operating instructions contain important notes on safe working practices with this machine. It is therefore essential that you read these operating instructions carefully!

AVERTISSEMENT !

Cette notice d'emploi contient des indications importantes pour la sécurité du travail avec cette machine. Veuillez la lire attentivement !

ATTENZIONE !

Le presenti istruzioni per l'uso contengono avvertenze importanti per lavorare con sicurezza con questa macchina. Per questo motivo leggete assolutamente le presenti istruzioni per l'uso con la dovuta accuratezza!

ATTENTIE !

Deze gebruiksaanwijzing omvat instructies die voor het veilige werken met deze machine belangrijk zijn. Leest u vandaar in ieder geval deze gebruiksaanwijzing zorgvuldig door!

¡ATENCIÓN!

Lea atentamente este manual de instrucciones, que contiene la información necesaria para garantizar la seguridad en el trabajo con esta máquina.

You will find the following warnings and symbols in these operating instructions:



This symbol indicates where you will find notes for your safety. If disregarded, this may result in very serious injuries.



This symbol indicates a potentially hazardous situation. If it is disregarded, the product or objects in its vicinity may be damaged.



This symbol indicates tips for the user and other useful information.

1 Product information




for machines with Art.-Nr. 922 901, 922 905 or 922 920 (ZB 400 E)
923 301 or 923 320 (ZB 600 E)

1.1 Manufacturer's data

MAFELL AG
P. O. Box 1180, D-78720 Oberndorf/Neckar
Phone +49 7423 812-0, Fax +49 7423 812-218

1.2 Machine identification

All data required for identification of the machine are stated on the rating plate which is attached to the motor casing.

- ▶  Protection class II
- ▶  CE-mark to declare conformity with the essential health and safety requirements according to Annex I of the Machinery Directive
- ▶  Only for EU countries
Do not dispose of electric tools together with household waste material!
In observance of European Directive 2002/96/EC on waste electrical and electronic equipment and its implementation in accordance with national law, electric tools that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

1.3 Technical data

- | | | |
|---|------------|---------------------------------|
| ▶ Drilling depth with focussing device | (ZB 400 E | 350 mm (13 25/32 in.) |
| | (ZB 600 E | 475 mm (18 45/64 in.) |
| ▶ Drilling depth without focussing device | (ZB 400 E | 380 mm (14 31/32 in.) |
| | (ZB 600 E | 505 mm (19 7/8 in.) |
| ▶ Tilttable up to | | 45° |
| ▶ Drill bit diameter | (ZB 400 E | 10 – 30 mm (25/64 – 1 3/16 in.) |
| | (ZB 600 E | 12 – 30 mm (15/32 – 1 3/16 in.) |
| ▶ Drill bit length | (ZB 400 E | 650 mm (25 19/32 in.) |
| | (ZB 600 E | 820 mm (32 9/32 in.) |
| ▶ Clamping collar | | 63 mm (2 31/64 in.) |

- 】 Drilling speed – no load 340 – 1450 rpm
- 】 Two-stage mechanical gear
- 】 Electronic speed control stabilized under load
- 】 Clockwise / counterclockwise rotation
- 】 Weight without mains cable - with mount
 - ⦿ ZB 400 E 9,4 kg (20.7 lbs)
 - ⦿ ZB 600 E 9,4 kg (20.7 lbs)

- Universal motor, radio and TV interference suppressed 230 V~, 50 Hz
- 】 Power input (continuous operation) 1200 W
- 】 Power output 760 W

1.4 Noise emission

Noise emission values determined according to EN 60745-1 and 60745-2-1:

	Sound power level	Workplace-related emission value
No load	100 dB (A)	89 dB (A)
Operation	101 dB (A)	90 dB (A)

The noise measurement was recorded using the drill bit included in the standard equipment.

The stated values do not take any series variance into account and are not suitable for determining the immission sound power level, since this varies depending on the operating time, the machining operation concerned and environmental factors. The immission sound power level can consequently be determined only in the individual instance on the premises of the machine user.

1.5 Vibration

The typical hand-arm vibration is less than 2.5 m/s².

1.6 Delivery specification

Carpentry drilling machine ZB 400 E or ZB 600 E complete with:

- 1 drill mount cpl.
- 1 focussing device
- 1 wood drill bit Ø 18 mm (45/64 in.)
- 1 adaptor MK2, Art.-No. 039 139
- 1 operating manual
- 1 folder «Safety instructions»

1.7 Use according to intended purpose

The MAFELL carpentry drilling machine ZB 400 E / 600 E is intended exclusively for drilling of solid timber, using wood drill bits.

The length of the wood drill bits must be 650 mm (25 19/32 in.) for the ZB 400 E and 820 mm (32 9/32 in.) for the ZB 600 E. A drill bit diameter of 10 to 30 mm (25/64 to 1 3/16 in.) is recommended.

In conjunction with the special drill mount 039 160 (optional accessory) the carpentry drilling machine ZB 400 E / 600 E is intended for countersinking with ring-groove drilling tools and head countersinks, which are offered by MAFELL as optional accessories.

Any other use beyond this scope is considered as failing to comply with the intended purpose. The manufacturer is not liable for any damage caused as a result of this; the risk is borne solely by the user.

The machine is not suitable for operation in the rain outdoors or in areas subject to explosion hazards.

Use according to intended purpose also includes compliance with the operating, maintenance and repair conditions specified by MAFELL, and adherence to the safety instructions contained in the operating manual.

The carpentry drilling machine ZB 400 E / 600 E may only be used, set up and serviced by persons over 18 years of age who are familiar with the machine and have been instructed as to the dangers involved. Repair work must be carried out by authorized MAFELL dealers or a MAFELL customer service station.

The safety regulations applicable in the country of use, as well as all other generally accepted rules on safety and occupational medicine, must be observed.

Unauthorized modifications to the machine preclude the liability of the manufacturer for any resultant damage.

1.8 Residual risks



Residual risks may also arise owing to the design of the machine relating to its intended purpose even if the machine is used properly and in compliance with all relevant safety regulations; e.g.:

- › Touching the drill bit or the drill bit mounting when drilling.
- › Breakage of the drill bit.
- › Touching live parts with the housing open and the mains plug not removed.
- › Hearing can be impaired when working for long periods without ear protectors.
- › Emission of wood dust: a health hazard when working for long periods without dust extraction.

2 Safety instructions



Woodworking machines can be dangerous when in use. You should therefore always follow the safety instructions set out in this chapter, as well as the safety regulations applicable in the country of use!

General instructions:

- › Never work without the protective equipment prescribed for the relevant operation and do not make any modifications to the machine that could undermine safety.
- › Children and young persons must not operate this machine. This rule does not apply to young persons receiving training and being supervised by an expert.
- › Prior to all work, make sure that the safety and operating equipment is securely attached, undamaged and in good working condition.
- › Always be aware of environmental influences. Do not allow the machine to be exposed to the rain and do not use the machine in a damp or wet environment, or in the vicinity of inflammable liquids or gases.
- › When operating the machine outdoors, use of an earth-leakage circuit-breaker is recommended.
- › Do not carry the machine by the cable and do not remove the mains plug from the socket by pulling on the cable.
- › Protect the cable against oil and high temperatures and do not pull it over any sharp edges.
- › Damaged cables or plugs must be renewed immediately.
- › Avoid sharp bends in the cable. Especially when transporting and storing the machine, do not wind the cable around the machine.
- › Only use wood drill bits with the technical data stated in this manual.
- › Do not use:
 - (damaged tools
 - (blunt tools
- › Store the machine in the dry under lock and key and out of reach of children.

Instructions on the use of personal safety equipment:

- › Always wear close-fitting industrial clothing and remove rings, bracelets and watches.
- › The sound pressure level at the workplace exceeds 85 dB (A). Users should therefore wear ear protectors.

Instructions on operation:

- ▶ Provide an uncluttered, anti-slip location with adequate illumination.
- ▶ Before tool changes, making adjustments and eliminating malfunctions pull out the mains plug.
- ▶ Never work with pieces which are too big or too small for the machine's capacity.
- ▶ Thin, long drill bits (> 300 mm / 12 in.) at high speed should be used only with the focussing device.
- ▶ Machine must be switched off before being connected to the mains.
- ▶ Before switching on, make sure that the drill bit is tightly secured and that the Allen key has been removed.
- ▶ Whenever possible, secure the workpiece against slipping and tipping over (e. g. with screw clamps).
- ▶ Do not begin drilling until the drill has reached full speed.
- ▶ Examine the workpiece for foreign objects. Never attempt to drill into nails or other metal objects.
- ▶ Keep your hands away from the underside of the workpiece when drilling (risk of injury!).
- ▶ When drilling, always lead the cable away from the machine to the rear.
- ▶ Match the feed rate to the thickness of the workpiece when drilling. Excessive feedrates overload the motor, lead to poorly executed holes and blunt the drill bit prematurely.
- ▶ Do not remove the machine from the workpiece until the drill bit is stationary.
- ▶ Always keep your hands well away from the drill bit and the drill bit mounting while the machine is running.
- ▶ The drilling machine must be operated only outdoors or on well ventilated premises as an effective chip and dust extraction is not possible.

Instructions on service and maintenance:

- ▶ Regular cleaning of the machine, especially of the drill bit mounting, is an important safety factor. Before beginning this task, pull out the mains plug.
- ▶ Only original MAFELL spare parts and accessories must be used. Otherwise the manufacturer does not offer any warranty and does not accept any liability.

3 Setting up / Adjusting

3.1 Mains connection



Machine must be switched off before being connected to the mains.

The carpentry drilling machine has Class II protective insulation (double-insulated).

Before starting up, make sure that the mains voltage matches the voltage stated on the rating plate.

3.2 Mounting and exchanging drill bits



Always pull out the mains plug before changing tools.

- Lift sleeve 7 (Fig. 1) until the ring groove 8 around the arbor becomes visible. Insert the drill bit into the arbor as far as it will go, the flat end of the drill bit should be in line with the two small grooves 9 cut into the end of the arbor. Release the sleeve.
- When using the focussing device the star knob 15 (Fig. 2) should be loosened so that the focussing disk 16 can be tilted. Insert the drill bit through the hole of the correct size, return the focussing disk to its normal position, insert the drill bit into the arbor as described above and tighten the star knob. Counter bore heads with \varnothing of 80 and \varnothing 100 mm (3 5/32 or 3 15/16 in.) should be used only in conjunction with the standard drill mount. For this purpose the upper (long) springs should be removed. Ringgroove drilling tools should be used only in conjunction with the special drill mount with stop plate, available as optional accessory.
- To exchange the drill bit hold it with one hand, lift sleeve 7 (Fig. 1) until the ring groove around the arbor becomes visible. Remove the drill bit and release the sleeve. Before inserting a new drill bit make sure that the shaft of the drill bit and the receiving, toolholding surface of the arbor are clean.

4 Operation



Do not switch on the machine if the drill bit is touching the workpiece.

4.1 Switching on and off

Temporary operation

- Switching on: Press switch 1 (Fig. 3).
- Switching off: Release switch.

Continuous operation

- Switching on: Press switch 1 first and then press locking button 2. The motor runs without keeping the switch pressed.
- Switching off: Press switch 1 until locking button 2 trips, then release the switch.

4.2 Adjusting drilling speed

This drilling machine has a gear box and an electronic speed control. The drilling speed can be adjusted continuously between 340 and 1450 rpm. The built-in electronics ensure a jerk-free acceleration when switching on and control the speed according to the value set.

The drilling speed required should be selected by referring to the diagramme 3 (Fig. 3) (see Fig. 4) and is set by means of the gear shift lever 4 (Fig. 3) and the setting wheel 5.



Gear should be shifted only when the motor has been switched off and the machine is running out or has stopped (see Fig. 5)! When the machine has been switched on the direction of rotation of the drill bit should be checked. If necessary, the direction of rotation can be changed by means of the reversing switch 6 (Fig. 3). Before actuating the reversing switch the motor should be switched off (the reversing switch is mechanically blocked).

4.3 Operating instructions

- Bolt 10 (Fig. 6) should be pushed down as far as possible.
- Place the machine in its correct position so that the drill bit will be exactly above the centre marking of the hole to be drilled. Turn the machine until the bolt touches the timber so that it can act as a stop for torsional force. When the machine has been switched on it should be pushed down with light pressure until the threaded tip of the drill bit has «taken» in the work. Now, the drill will advance automatically. If the drill bit should get stuck, the direction of rotation should be reversed. Before the reverse switch is actuated, the machine must be switched off.

To drill a blind pocket hole it is possible to set the drilling depth by means of the depth stop ring 11 (Fig. 3). To drill holes at an angle loosen clamping lever 12, tilt the machine until the angle desired is indicated on scale 13, tighten clamping lever again. When using short drill bits the maximum return stroke can be adapted by means of the depth stop ring 14.

To drill holes in the middle of a beam both bolts in the base plate of the drill mount should be pushed down and the machine should be turned until these bolts touch the beam on either side - max. width of a beam 22.5 cm (8 7/8 in.) (see Fig. 6 and Fig. 7).

For special work it may be necessary to use the stop plate which is available as optional accessory (Ref. No. 039 156).

4.4 Optional tools

The drilling machine can be used with ring-groove drilling tools and head countersinks. Special leaflets on request!

5 Service and maintenance



Pull out the mains plug before starting on any maintenance work!



MAFELL machines are designed to be low in maintenance. The ball bearings used are greased for life. After a prolonged period of operation, users are recommended to have the machine checked by an authorized MAFELL customer service shop.

5.1 Machine

The machine must be cleaned of dust deposits at regular intervals. When doing so, clean the air vents on the motor using a vacuum cleaner.

5.2 Tools

The drill bits used on the machine must be freed from resin regularly, as clean tools improve the drilling quality.

For cleaning only acid-free but no highly alkaline cleaning agents may be used.

This can be done by soaking the drill bits for 24 hours in paraffin or commercially available resin remover.

5.3 Storage

If the machine is out of service for a lengthy period of time, it should be thoroughly cleaned (see chapter 5.1). Spray bright metal panels with a rustproofing agent.

Store the machine only in dry rooms, where it is protected against weathering.

6 Troubleshooting



The determination of the causes of existing defects and their elimination always require increased attention and caution. Pull out the mains plug beforehand!

Some of the most frequent defects and their causes are listed in the following chart. In case of other defects, contact your dealer or the MAFELL customer service.

Defect	Cause	Elimination
Machine cannot be switched on	No mains voltage	Check power supply
	Carbon brushes worn	Take the machine to a MAFELL customer service shop
Machine stops while drilling is in progress	Mains failure	Check mains back-up fuse
Drill bit jams	Blunt bit	Replace the drill bit or sharpen it

7 Optional accessories

- | | |
|------------------------------|------------------|
| › Stop plate, cpl. | Ref. No. 039 156 |
| › Special drill mount | Ref. No. 039 160 |
| › Supplementary handle, cpl. | Ref. No. 039 203 |
| › Ejector drift 1 DIN 317 | Ref. No. 093 001 |

8 Exploded drawing and spare parts list

The corresponding information in respect of spare parts can be found on our homepage: www.mafell.com