

# HILTI

## DD 160

Operating instructions

Mode d'emploi

Manual de instrucciones

Manual de instruções

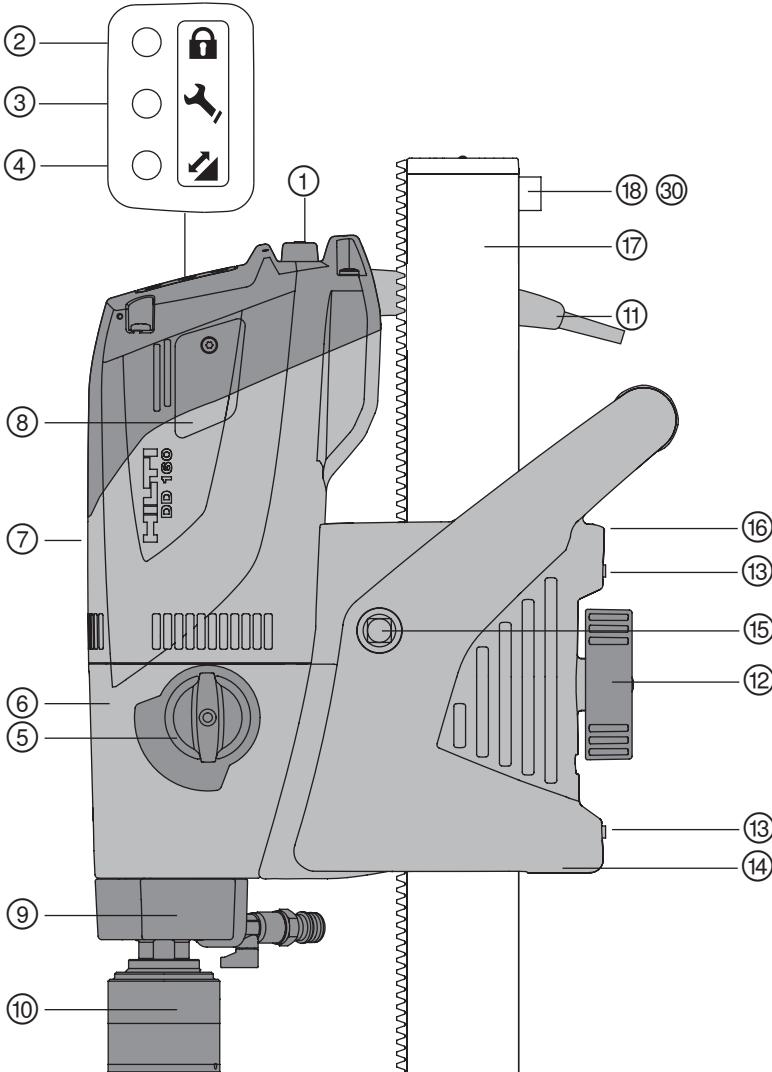
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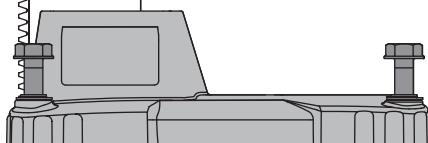
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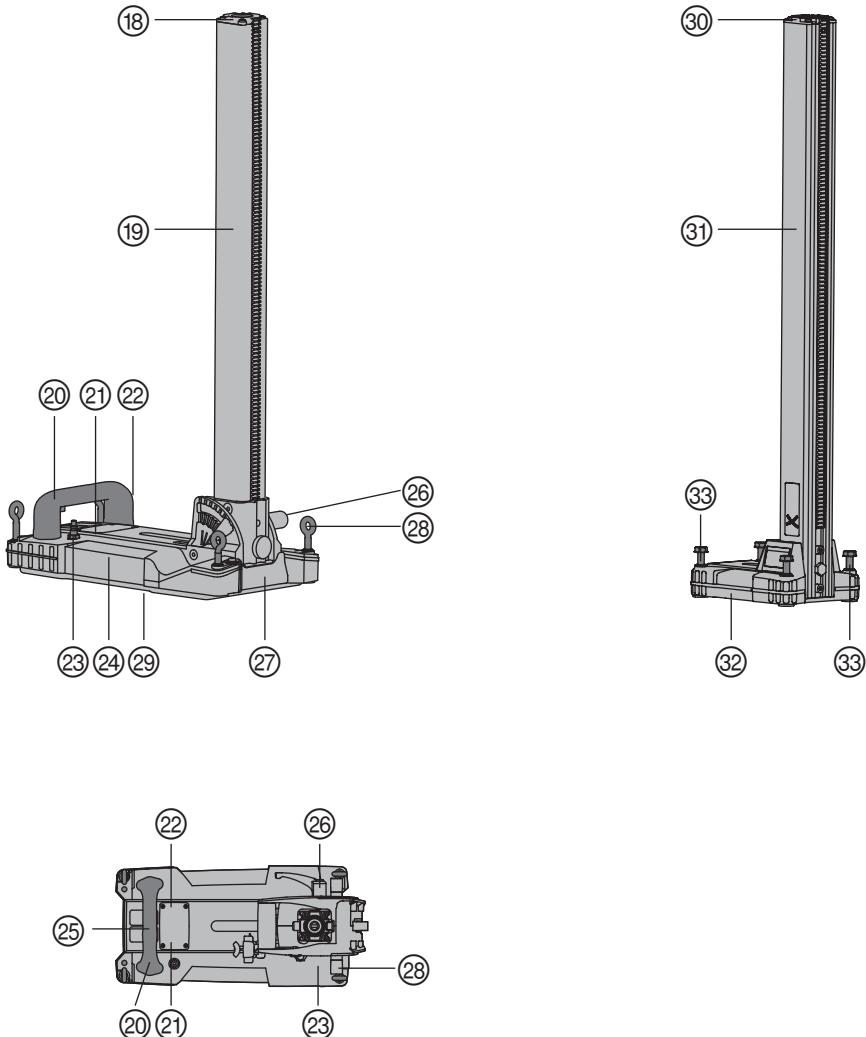
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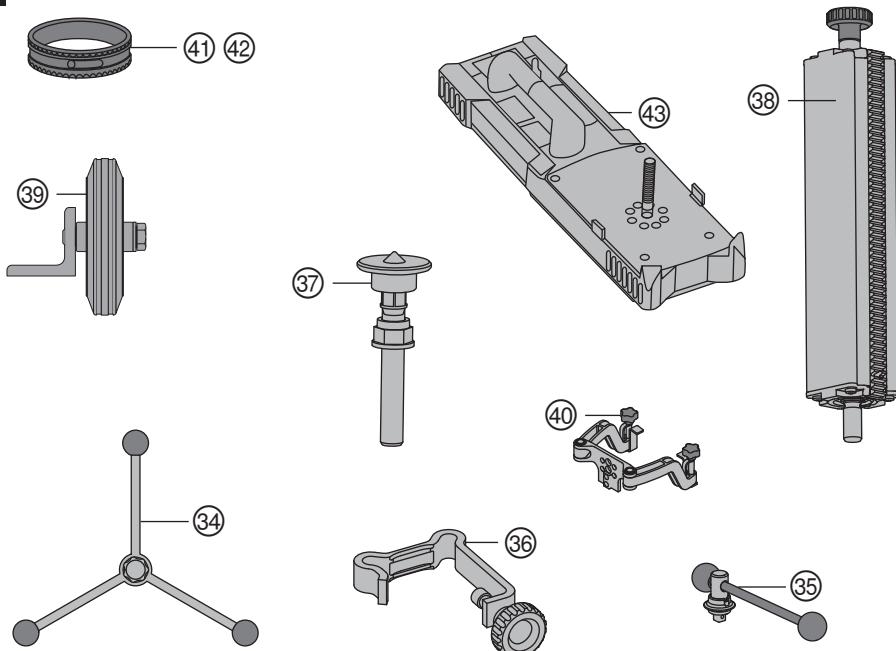
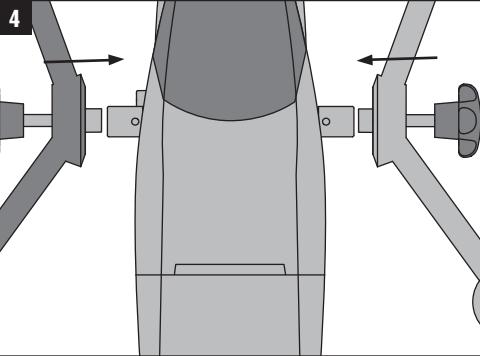
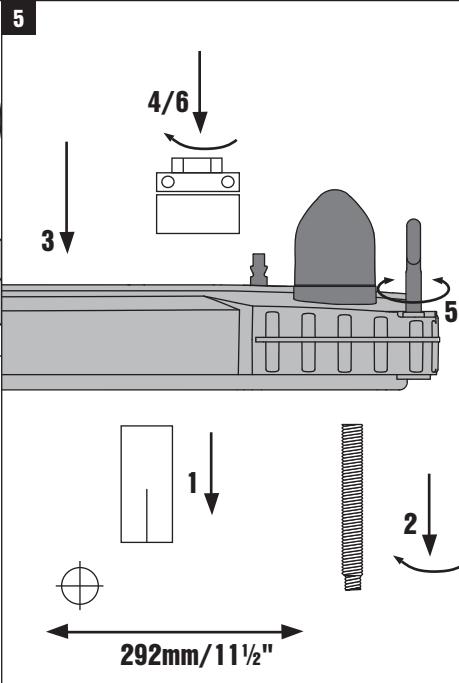


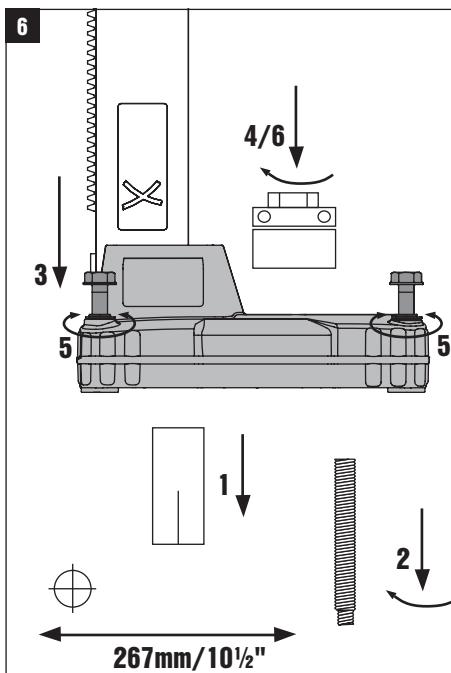
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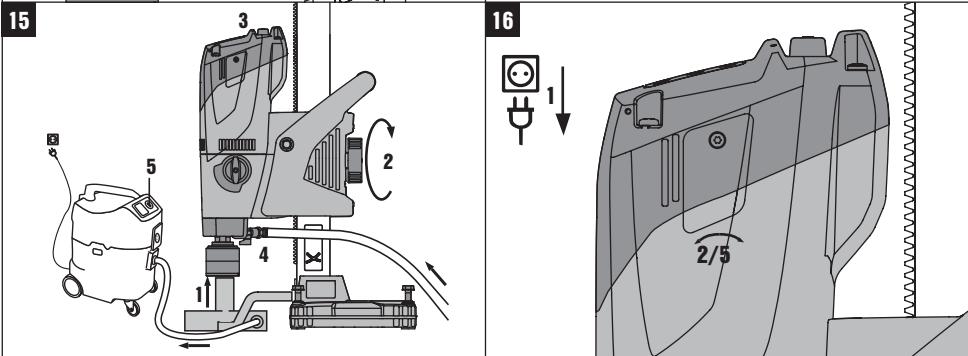
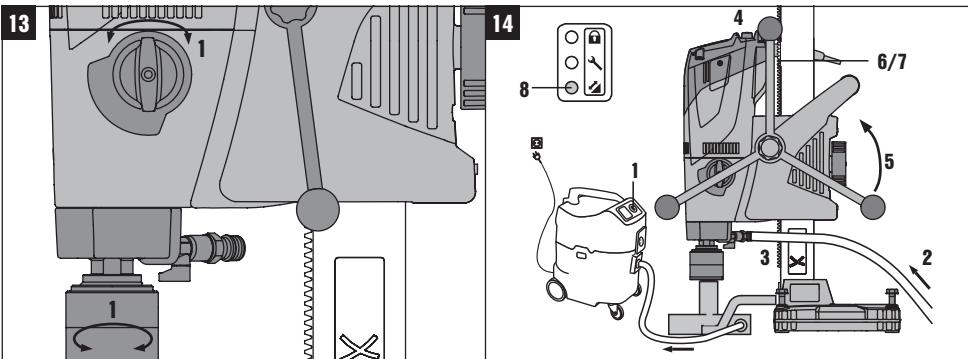
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# ORIGINAL OPERATING INSTRUCTIONS

## DD 160 diamond coring system

**It is essential that the operating instructions are read before the machine is operated for the first time.**

**Always keep these operating instructions together with the machine.**

**Ensure that the operating instructions are with the machine when it is given to other persons.**

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**1** These numbers refer to the corresponding illustrations. The illustrations can be found on the fold-out cover pages. Keep these pages open while studying the operating instructions.

In these operating instructions, the designation "the machine" always refers to the DD 160 diamond core drilling machine.

**Operating controls, parts and indicators (motor unit and drill stand) 1**

### DD 160 diamond core drilling machine

- ① On / off switch
- ② Theft protection indicator
- ③ Service indicator
- ④ Drilling performance indicator
- ⑤ Gear selector
- ⑥ Gearing section
- ⑦ Motor
- ⑧ Carbon brush cover
- ⑨ Water swivel
- ⑩ Chuck

- ⑪ Supply cord with GFCI
- ⑫ Carriage lock
- ⑬ Carriage play adjustment screws
- ⑭ Carriage
- ⑮ Hand wheel shaft
- ⑯ Supply cord holder
- ⑰ Drill stand
- ⑱ End stop screw
- ⑳ End stop screw

### Drill stand with combination base plate 2

- ⑯ End stop screw
- ⑯ Rail
- ⑯ Vacuum release valve
- ㉑ Pressure gauge
- ㉒ Leveling indicator
- ㉓ Vacuum hose connector
- ㉔ Combination base plate
- ㉕ Grip
- ㉖ Adjusting lever
- ㉗ Hole center indicator
- ㉘ Leveling screw
- ㉙ Vacuum seal

### Drill stand with anchor base plate 2

- ㉚ End stop screw
- ㉛ Rail
- ㉜ Anchor base plate, small
- ㉝ Leveling screw

### Various accessories 3

- ㉞ Star handle
- ㉟ Lever
- ㉞ Depth gauge
- ㉞ Jack screw
- ㉞ Rota-Rail (column swivel)
- ㉞ Wheel assembly
- ㉞ Vacuum base plate

### Water collection system 3

- ㉞ Holder
- ㉞ Water collector
- ㉞ Seal

# 1 General information

## 1.1 Safety notices and their meaning

### DANGER

Draws attention to imminent danger that will lead to serious bodily injury or fatality.

### WARNING

Draws attention to a potentially dangerous situation that could lead to serious personal injury or fatality.

### CAUTION

Draws attention to a potentially dangerous situation that could lead to slight personal injury or damage to the equipment or other property.

### NOTE

Draws attention to an instruction or other useful information.

## 1.2 Explanation of the pictograms and other information

### Prohibition signs



Transport by crane is not permissible.

### Warning signs



General warning



Warning: electricity



Warning: hot surface

### Obligation signs



Wear eye protection.



Wear a hard hat.



Wear ear protection.



Wear protective gloves.



Wear safety shoes.

### Symbols



Read the operating instructions before use.



Lock symbol



Equipped with theft protection system



Service indicator



Return waste material for recycling.



Amps



Volts



Alternating current



Hertz



Nominal speed under no load



Diameter



Millimeters



/min



RPM



Revolutions per minute

Revolutions per minute

Drilling performance indicator

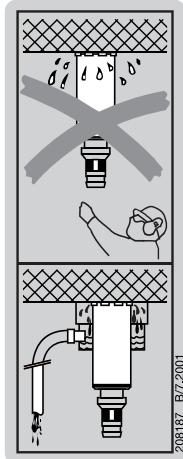
### On the drill stand and the vacuum base plate



Upper: An additional means of securing the drill stand must be employed when the machine is used for horizontal drilling with the vacuum securing method.

Lower: Use of the vacuum securing method for overhead drilling with the drill stand is not permissible.

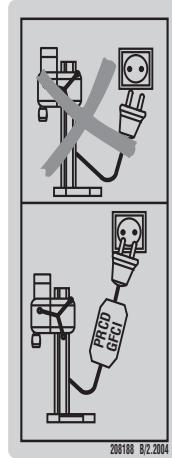
#### On the machine



200187 B/2/2001

Use of the water collection system in conjunction with a wet-type industrial vacuum cleaner is a mandatory requirement for working on ceilings.

#### On the machine



200188 B/2/2004

Operate the equipment only with a properly functioning GFCI.

#### Location of identification data on the machine

The type designation and serial number can be found on the type identification plate on the machine. Make a note of this data in your operating instructions and always refer to it when making an enquiry to your Hilti representative or service department.

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Type: \_\_\_\_\_

Generation: 02

Serial no.: \_\_\_\_\_

## 2 Description

### 2.1 Use of the product as directed

The DD 160 is an electrically-powered, rig-type diamond core drilling machine for drilling through-holes and blind holes in (reinforced) mineral materials using diamond core bits and the wet drilling technique (hand-held use is not permissible).

The machine must be adequately secured to the working surface with an anchor or vacuum base plate before use. To avoid injury, use only genuine Hilti core bits and DD 160 accessories.

Observe the safety rules and operating instructions for the accessories used.

Observe the information printed in the operating instructions concerning operation, care and maintenance.

Nationally applicable industrial safety regulations must be observed.

The machine, accessories and cutting tools may present hazards when handled incorrectly by untrained personnel or when used not as directed.

Use of the water collection system in conjunction with a wet-type industrial vacuum cleaner is a mandatory requirement for working overhead.

An additional means of securing the drill stand must be employed when the machine is secured with the vacuum base plate (accessory) for horizontal drilling.

Do not strike the base plate with a hammer or other heavy object when making adjustments to it.

Tampering with or modification of the machine, drill stand and accessories is strictly prohibited.

#### **WARNING**

**The machine may be operated only when connected to an adequately-rated electric supply equipped with an earth (ground) conductor.**

#### **WARNING**

**Drilling into materials hazardous to the health (e.g. asbestos) is not permissible.**

#### **DANGER**

**Use only the genuine Hilti accessories or ancillary equipment listed in the operating instructions.** Use of accessories or ancillary equipment not listed in the operating instructions may present a risk of personal injury.

### 2.2 Use of the machine with various items of equipment

Equipment	Core bit diameters	Drilling direction
Without water collection system and wet-type industrial vacuum cleaner	25...202 mm (1" to 8")	Not upwards
With water collection system	25...162 mm (1" to 6½")	Not upwards
With water collection system and wet-type industrial vacuum cleaner	25...162 mm (1" to 6½")	All directions

### 2.3 Gears and corresponding core bit diameters

Gear	Core bit diameters (mm)	Core bit diameters (inches)	No-load speed /min
1	152...202	6...8	420
2	72...142	2¾...5½	700
3	25...67	1...2½	1,570

## 2.4 Status indicator

LED indicators	State	Description / information
Theft protection indicator (2)	Blinking yellow light	The machine's theft protection system is active and must be unlocked with the TPS key.
Service indicator (3)	Red light and the machine starts	The carbon brushes are badly worn. After the lamp lights for the first time, the machine may continue to be used for several hours before the automatic cut-out is activated. Have the carbon brushes changed in good time so that the machine is always ready for use.
	Red light and the machine doesn't start	The carbon brushes must be changed.
	Blinking red light	Temporary fault, see Troubleshooting section.
Drilling performance display (4)	Orange light	Contact pressure too low
	Green light	Optimum contact pressure
	Red light	Contact pressure too high

## 2.5 TPS theft protection system (optional)

The machine may be optionally equipped with the TPS theft protection system. If equipped with this feature, the machine can be unlocked and made ready for operation only through use of the corresponding TPS key.

## 2.6 Items supplied as standard

- 1 Machine with hand wheel or lever
- 1 Operating instructions
- 1 Cardboard box

## 2.7 Using extension cords

Use only extension cords of a type approved for the application and with conductors of adequate gauge.

### Recommended minimum conductor gauge (cross section) and max. cable lengths

Conductor cross section	AWG12	AWG10
Mains voltage 120 V	75 ft	125 ft
Mains voltage 127 V	75 ft	125 ft

Do not use extension cords with 14 AWG or 16 AWG conductors. Use only extension cords equipped with an earth conductor.

## 2.8 Using a generator or transformer

This machine may be powered by a generator or transformer when the following conditions are fulfilled: The unit must provide a power output in watts of at least twice the value printed on the type identification plate on the machine. The operating voltage must remain within +5% and -15% of the rated voltage at all times, frequency must be in the 50 – 60 Hz range and never above 65 Hz, and the unit must be equipped with automatic voltage regulation and starting boost.

### NOTE

Switching other machines or appliances on and off can cause undervoltage and/or overvoltage peaks which could damage the machine. Never operate other machines from the generator/transformer at the same time.

### 3 Accessories

Designation	Short designation	Description
TPS theft protection system with company card, company remote and TPS-K key		Option
Water collection system		
Hand wheel (lever)		
Hand wheel (star handle)		
Core bit extension (BI+)		
Drill stand (with anchor base plate)		
Drill stand (with combination base plate and tilt mechanism)		
Vacuum base plate	DD-ST-120/160-VBP	
Depth gauge		
Jack screw		
Rota-Rail (column swivel)		

### 4 Technical data

Right of technical changes reserved.

#### NOTE

The machine is available in various voltage ratings. Please refer to the machine's type identification plate for details of its rated voltage and rated input power.

Rated voltage [V]	120	127
Rated current [A]	19.5	18.5
Mains frequency [Hz]	60	50/60

#### Other information about the machine

Rated speed under no load	420 /min (1st gear), 700 /min (2nd gear), 1570 /min (3rd gear)
Max. permissible water supply pressure	5 bar (72.52 psi)
Dimensions of the system with anchor base plate, (L x W x H)	400 mm (15.75") x 165 mm (6.5") x 945 mm (37.2")
Dimensions of the system with combination base plate, (L x W x H)	610 mm (24.02") x 250 mm (9.84") x 952 mm (37.48")
Weight of the system with anchor base plate	16.3 kg (35.93 lb)
Weight of the system with combination base plate	19.3 kg (42.55 lb)
Protection class	Protection class I (earthing)

## 5 Safety instructions

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### 5.1 General safety rules

- a) **Warning! Read and understand all instructions.** Failure to follow all instructions listed below may result in electric shock, fire and/or serious personal injury. **SAVE THESE INSTRUCTIONS.**

#### 5.1.1 Work area

- a) **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
- b) **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** Power tools create sparks which may ignite the dust or fumes.
- c) **Keep bystanders, children and visitors away while operating a power tool.** Distractions can cause you to lose control.

#### 5.1.2 Electrical safety

- a) **Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances.** Never remove the grounding prong or modify the plug in any way. **Do not use any adapter plugs.** Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. If the tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
- b) **Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is grounded.
- c) **Don't expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
- d) **Do not abuse the cord.** Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. **Replace damaged cords immediately.** Damaged cords increase the risk of electric shock.
- e) **When operating a power tool outside, use an outdoor extension cord marked "W-A" or "W".** These cords are rated for outdoor use and reduce the risk of electric shock.

#### 5.1.3 Personal safety

- a) **Stay alert, watch what you are doing and use common sense when operating a power tool.** Do not use tool while tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating power tools may result in serious personal injury.
- b) **Dress properly. Do not wear loose clothing or jewelry.** Contain long hair. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts.
- c) **Avoid accidental starting.** Be sure switch is off before plugging in. Carrying tools with your finger

on the switch or plugging in tools that have the switch on invites accidents.

- d) **Remove adjusting keys or switches before turning the tool on.** A wrench or a key that is left attached to a rotating part of the tool may result in personal injury.
- e) **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.
- f) **Use safety equipment. Always wear eye protection.** Dust mask, non-skid safety shoes, hard hat or hearing protection must be used for appropriate conditions.

#### 5.1.4 Tool use and care

- a) **Use clamps or other practical way to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.
- b) **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
- c) **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- d) **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce the risk of starting the tool accidentally.
- e) **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
- f) **Maintain tools with care. Keep cutting tools sharp and clean.** Properly maintained tools with sharp cutting edges are less likely to bind and are easier to control.
- g) **Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the tool's operation.** If damaged, have the tool serviced before using. Many accidents are caused by poorly maintained tools.
- h) **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool may become hazardous when used on another tool.

#### 5.1.5 Service

- a) **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury.
- b) **When servicing a tool, use only identical replacement parts.** Follow instructions in the Maintenance section of this manual. Use of unauthorized parts or failure to follow Maintenance Instructions may create a risk of electric shock or injury.

## 5.2 Proper organization of the work area



- a) **Approval must be obtained from the site engineer or architect prior to beginning drilling work.** Drilling work on buildings and other structures may influence the statics of the structure, especially when steel reinforcing bars or load-bearing components are cut through.
- b) **When drilling through walls, cover the area behind the wall, as material or the core may fall out on the other side of the wall.** When drilling through ceilings, secure (cover) the area below as drilled material or the core may drop out and fall down.
- c) **Place the mounting device on a solid, flat and level surface.** If the mounting device can slip or wobble, the machine cannot be guided smoothly and safely.
- d) **Check the nature of the surface.** Rough surfaces may reduce holding power. Coatings or composite materials may pull away from the surface while you are working.
- e) **Do not overload the mounting device and do not use it as a substitute for a ladder or platform.** Overloading the mounting device or standing on it may shift its center of gravity to a higher position, causing it to tip over.
- f) **Wear respiratory protection if the work causes dust.**
- g) **It is recommended that rubber gloves and non-skid shoes are worn when working outdoors.**
- h) **Keep the supply cord, extension cord, suction hose and vacuum hose away from rotating parts.**
- i) **Do not work from a ladder.**

### 5.2.1 General safety rules



- a) **Keep the grips dry, clean and free from oil and grease.**
- b) **Never leave the machine unattended.**
- c) **Children must be instructed not to play with the machine.**
- d) **The machine is not intended for use by children, by debilitated persons or those who have received no instruction or training.**
- e) **Never operate the machine without the supplied GFCI ground fault circuit interrupter (machines without GFCI: Never operate the machine without an isolating transformer). Test the GFCI each time before use.**
- f) **Check the machine and its accessories for any damage. Guards, safety devices and any slightly damaged parts must be checked carefully to ensure that they function faultlessly and as intended.**

**Check that moving parts function correctly without sticking and that no parts are damaged. All parts must be fitted correctly and fulfill all conditions necessary for correct operation of the machine. Damaged guards, safety devices and other parts must be repaired or replaced properly at an authorized service center unless otherwise indicated in the operating instructions.**

- g) **Avoid skin contact with drilling slurry.**
- h) **Wear a protective mask during work that generates dust, e.g. dry drilling. Connect a dust removal system. Drilling in materials hazardous to the health (e.g. asbestos) is not permissible.**
- i) **WARNING: Some dust created by grinding, sanding, cutting and drilling contains chemicals known to cause cancer, birth defects, infertility or other reproductive harm; or serious and permanent respiratory or other injury.** Some examples of these chemicals are: lead from lead-based paints, crystalline silica from bricks, concrete and other masonry products and natural stone, arsenic and chromium from chemically-treated lumber. Your risk from these exposures varies, depending on how often you do this type of work. **To reduce exposure to these chemicals, the operator and bystanders should work in a well-ventilated area, work with approved safety equipment, such as respiratory protection appropriate for the type of dust generated, and designed to filter out microscopic particles and direct dust away from the face and body. Avoid prolonged contact with dust. Wear protective clothing and wash exposed areas with soap and water.** Allowing dust to get into your mouth, nose, eyes, or to remain on your skin may promote absorption of harmful chemicals.

### 5.2.2 Mechanical



- a) **Follow the instructions concerning care and maintenance.**
- b) **Follow the instructions concerning lubrication and changing core bits.**
- c) **Check that the core bits used are compatible with the chuck system and that they are secured in the chuck correctly.**
- d) **Make sure that the machine is correctly and securely mounted on the drill stand.**
- e) **Do not touch rotating parts.**
- f) **Check that all the clamping screws are correctly tightened.**
- g) **As the end stop has a safety-relevant function, always check to ensure that the end stop screw is securely in place on the drill stand.**

### 5.2.3 Electrical



- a) Check the machine's supply cord at regular intervals and have it replaced by a qualified specialist if found to be damaged. Check extension cords at regular intervals and replace them if found to be damaged.
- b) Do not touch the supply cord or extension cord if it is damaged while working. Disconnect the supply cord plug from the power outlet.
- c) In case of an interruption in the electric supply: Switch the machine off and unplug the supply cord.
- d) Avoid using extension cords with multiple power outlets and the simultaneous use of several electric tools or machines connected to one extension cord.
- e) Never operate the machine when it is dirty or wet. Dust (especially dust from conductive materials) or dampness adhering to the surface of the machine may, under unfavorable conditions, lead to electric shock. Dirty or dusty machines should thus be checked at a Hilti service center at regular intervals, especially if used frequently for working on conductive materials.
- f) Before beginning work, check the working area (e.g. using a metal detector) to ensure that no concealed electric cables or gas and water pipes are present. External metal parts of the machine may

become live, for example, when an electric cable is damaged accidentally. This presents a serious risk of electric shock.

### 5.2.4 Thermal



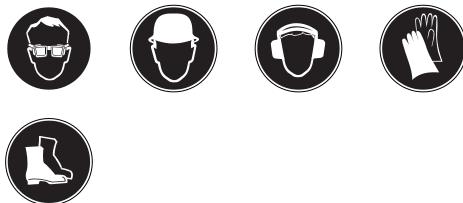
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Wear protective gloves when changing core bits. The core bit may become hot during use.

### 5.2.5 Requirements to be met by users

Improve the blood circulation in your fingers by relaxing your hands and exercising your fingers during breaks between working.

### 5.2.6 Personal protective equipment



The user and other persons in the vicinity must wear ANSI Z87.1-approved eye protection, a hard hat, ear protection, protective gloves and safety footwear while the machine is in use or during maintenance.

## 6 Before use



### CAUTION

The mains voltage must comply with the specification given on the type identification plate. Ensure that the power tool is disconnected from the electric supply.

### DANGER

When drilling through walls, cover the area behind the wall, as material or the core may fall out on the other side of the wall. When drilling through ceilings, secure (cover) the area below as drilled material or the core may drop out and fall down.

### DANGER

Check that the drill stand is securely fastened to the work surface.

### CAUTION

Do not break the connection to earth by using an adaptor plug.

### 6.1 Preparing for use

#### CAUTION

The machine and the diamond core bit are heavy. There is a risk of pinching parts of the body. Wear a hard hat, protective gloves and safety boots.

#### 6.1.1 Mounting the machine on the drill stand

#### NOTE

The motor section and the carriage form a unit. The machine can thus be removed from the drill stand together with the carriage.

1. Remove the end stop screw from the end of the rail.
2. Mount the machine on the drill stand by sliding the opening in the carriage over the end of the column.
3. Engage the carriage locking system with the channel and check that the channel is securely fastened.
4. Refit the end stop screw to the end of the rail.

## 6.1.2 Fitting the hand wheel 4

### NOTE

The hand wheel may be fitted on the left-hand or right-hand side of the carriage.

- Fit the hand wheel onto the shaft on the left-hand or right-hand side of the carriage.
- Secure the hand wheel.

## 6.1.3 Fastening the drill stand with an anchor 5 6

### WARNING

**Use an anchor suitable for the material on which you are working and observe the anchor manufacturer's instructions.**

### NOTE

Hilti M16 metal expansion anchors are usually suitable for fastening diamond core drilling equipment to uncracked concrete. Under certain conditions it may be necessary to use an alternative fastening method. Please contact Hilti Technical Service if you have any questions about secure fastening.

- If using the anchor base plate, set an anchor suitable for the applicable base material at a distance (ideally) of 267 mm (10 1/2") from the center of the hole to be drilled or, if using the combination base plate, at a distance of 292 mm (11 1/2") from the hole center.
- Screw the clamping spindle into the anchor.
- Place the drill stand base plate over the spindle and align it.
- Screw the clamping nut onto the spindle but do not tighten it.
- Level the base plate by turning the four leveling screws. Take care to ensure that the leveling screws make firm contact with the underlying surface.
- Use a suitable open-end wrench to tighten the clamping nut on the clamping spindle.
- Make sure that the drilling system is secured reliably.

## 6.1.4 Using the vacuum fastening method (drill stand with combination base plate) 7

### DANGER

A coated, laminated, rough or uneven surface may significantly reduce the effectiveness of the vacuum system. **Check whether the surface is suitable for use of the vacuum method to fasten the drill stand.**

### DANGER

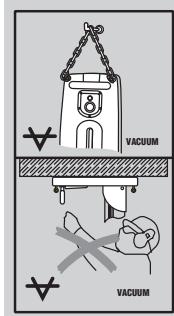
**Overhead drilling with the machine secured only by the vacuum base plate is not permissible.**

### CAUTION

**Make yourself familiar with information contained in the operating instructions for the vacuum pump and follow these instructions before using it.**

### WARNING

**Before beginning drilling and during operation it must be ensured that the pressure gauge indicator remains within the green area.**



### NOTE

To be carried out only when the drill stand is used with the anchor base plate and vacuum base plate: Screw the anchor base plate onto the vacuum base plate.

### NOTE

Make sure that the anchor base plate lies flat against the vacuum base plate and that the two plates are securely connected. Make sure that the core bit selected for use will not damage the vacuum base plate.

- Turn (retract) the 4 leveling screws until they project approx. 5 mm (0.2") beneath the combination base plate or, respectively, the vacuum base plate.
- Connect the vacuum pump to the vacuum connector on the combination base plate or vacuum base plate.
- Locate the center point of the hole to be drilled.
- Draw a line approximately 800 mm (31.5") in length from the center of the hole to be drilled towards where the drill stand is to be positioned.
- If using the combination base plate, make a mark on the line at a distance of 292 mm (11 1/2") from the center of the hole to be drilled.
- Switch on the vacuum pump and press the vacuum release valve.
- Bring the mark on the combination base plate or vacuum base plate into alignment with the line.
- Once the drill stand has been positioned correctly, release the vacuum release valve and press the base plate against the work surface.
- Level and steady the combination base plate or vacuum base plate by turning the 4 leveling screws.
- An additional means of securing the drilling system must be provided when drilling horizontally (e.g. a chain attached to an anchor, etc.).
- Make sure that the drilling system is secured reliably.

## 6.1.5 Fastening the drill stand with the jack screw

- Fit the jack screw at the top end of the rail.
- Position the drill stand on the work surface.
- Level the base plate by turning the four leveling screws.
- Secure the base plate by tightening the jack screw.
- Check to ensure that the machine is fastened securely.

## **6.1.6 Adjusting the drilling angle when using the drill stand with combination base plate** 8 9 10

(in 7.5° increments; adjustable to max. 45°)



### **CAUTION**

There is a risk of crushing the fingers in the pivot mechanism. **Wear protective gloves.**

1. At bottom right of the drill stand, release the adjusting lever until the slot nuts are disengaged.
2. Adjust the column to the desired angle.
3. Engage the slot nuts.
4. Tighten the adjusting lever until the slot nuts are fully engaged and the frame is again secured in position.
5. Bring the adjusting lever back into the vertical position by pushing it inwards and then moving it as necessary.

## **6.1.7 Fitting the water connection**

### **CAUTION**

Regularly check the hoses for damage and make sure that the maximum permissible water supply pressure of 5 bar is not exceeded.

### **CAUTION**

Make sure that the hose doesn't come into contact with rotating parts.

### **CAUTION**

Make sure that the hose is not pinched and damaged as the carriage advances.

### **CAUTION**

Check the water supply system to ensure there are no leaks.

### **NOTE**

To avoid damage to the components, use only fresh water containing no dirt particles.

### **NOTE**

An optional flow meter may also be fitted between the machine's water supply connector and the water supply hose.

1. Connect the water regulator to the machine.
2. Connect the water supply (hose coupling).

## **6.1.8 Fitting the water collection system (accessory)** 11

### **WARNING**

Use of the water collection system in conjunction with a wet-type industrial vacuum cleaner is a mandatory requirement for work on ceilings. The machine must be positioned at an angle of 90° to the ceiling. The

seal used must be of the correct size for the diamond core bit diameter.

### **NOTE**

Use of the water collection system allows water to be led away in controlled fashion, thus avoiding a mess or damage to the surrounding area. Best results are achieved with a wet-type industrial vacuum cleaner.

1. Release the screw at the front of the rail.
2. Push the water collector holder into position.
3. Fit the screw and tighten it.
4. Fit the water collector between the two movable arms of the water collector holder.
5. Press the water collector against the work surface by turning the two screws on the water collector holder.
6. Connect a wet-type industrial vacuum cleaner to the water collector or fit a length of hose through which the water can drain away.

## **6.1.9 Fitting the diamond core bit** 12



### **DANGER**

Do not use damaged core bits. Check the core bits for chipping, cracks, or heavy wear each time before use.

Do not use damaged tools. Fragments of the workpiece or a broken core bit may fly off and cause injury beyond the immediate area of operation.

### **DANGER**

To avoid injury, use only genuine Hilti core bits and DD 160 accessories. If using a machine with a BI+ chuck, only genuine Hilti core bits may be used with it.

### **CAUTION**

The core bit may become hot during use or during sharpening. There is a risk of burning your hands. **Wear protective gloves when changing the core bit.**

### **CAUTION**

Disconnect the supply cord plug from the power outlet.

### **NOTE**

If using an alternative type of chuck, lock the drive spindle with a suitable open-end wrench and use another suitable open-end wrench to tighten the core bit.

1. Engage the carriage locking system with the channel and check that the channel is securely fastened.
2. Open the chuck (BI+) by turning it in the direction of the open brackets symbol.

3. Push the diamond core bit into the chuck (BI+) from below, turning the core bit until the teeth in the chuck engage with the core bit.
4. Close the chuck (BI+) by turning it in the direction of the closed brackets symbol.
5. Check that the diamond core bit is securely mounted in the chuck by pulling on the core bit and attempting to move it from side to side.

#### **6.1.10 Selecting the speed**

##### **CAUTION**

**Do not change gear while the machine is running.  
Wait for the spindle to come to a halt.**

1. Set the switch to the correct position according to the core bit diameter used (see Section 2.3). When turning the switch, rotate the core bit by hand at the same time until the switch can be engaged in the recommended position.

#### **6.1.11 Removing the diamond core bit**



##### **CAUTION**

The core bit may become hot during use or during sharpening. There is a risk of burning your hands. **Wear protective gloves when changing the core bit.**

##### **CAUTION**

**Disconnect the supply cord plug from the power outlet.**

##### **NOTE**

If using an alternative type of chuck, grip and hold the drive spindle securely with a suitable open-end wrench and use another suitable open-end wrench to release the core bit.

1. Engage the carriage locking system with the channel and check that the channel is securely fastened.
2. Open the chuck (BI+) by turning it in the direction of the open brackets symbol.
3. Pull the sleeve on the chuck in the direction of the arrow towards the machine. This releases the core bit.
4. Remove the core bit.

## **7 Operation**



##### **WARNING**

**Make sure that the supply cord does not come into contact with rotating parts.**

##### **WARNING**

**Make sure that the supply cord is not pinched and damaged as the carriage advances.**

##### **CAUTION**

The machine and the drilling operation generate noise. **Wear ear protectors.** Excessive noise may damage the hearing.

##### **CAUTION**

Drilling may cause hazardous flying fragments. Flying fragments present a risk of injury to the eyes and body. **Wear eye protection and a hard hat.**

##### **CAUTION**

**Do not change gear while the machine is running.  
Wait until the drive spindle has stopped rotating.**

##### **CAUTION**

**Take care to avoid coming into contact with rotating parts when adjusting the water flow while the machine is running.**

##### **CAUTION**

**Releasing the tilt mechanism on the drill stand may cause the column to tilt suddenly.**

#### **7.1 TPS theft protection system (optional)**

##### **NOTE**

The machine may be equipped with the optional theft protection system. If the machine is equipped with this feature, it can be unlocked and made ready for operation only with the corresponding TPS key.

#### **7.1.1 Unlocking the machine**

1. Connect the supply cord to the electric supply and press the "I" or "Reset" button on the ground fault circuit interrupter. The yellow theft protection indicator LED blinks. The machine is now ready to receive the signal from the TPS key.

- Hold the TPS key or the TPS watch strap buckle against the lock symbol. The machine is unlocked as soon as the yellow theft protection indicator LED no longer lights.

**NOTE** If, for example, the electric supply is briefly interrupted due to a power failure or disconnected when moving to a different workplace, the machine remains ready for operation for approx. 20 minutes. In the event of a longer interruption, the TPS key must be used again to unlock the machine.

### 7.1.2 Activation of the theft protection system for the machine

#### NOTE

Further detailed information on activation and use of the theft protection system can be found in the operating instructions for the theft protection system.

### 7.2 Switching on and checking the ground fault circuit interrupter (GFCI)



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An isolating transformer must be used with machines not equipped with a GFCI.

- Plug the machine's supply cord into an earthed/grounded power outlet.
- Press the "Reset" button on the GFCI ground fault circuit interrupter.
- The drilling performance indicator lights orange.
- Press the "Test" button on the GFCI ground fault circuit interrupter.
- The indicator must go out.
- WARNING** If the indicator continues to light, further operation of the machine is not permissible. Have the machine repaired by trained personnel using genuine Hilti spare parts.
- Press the "Reset" button on the GFCI ground fault circuit interrupter.
- The indicator must light.

### 7.3 Drilling without use of the water collection system and industrial vacuum cleaner



#### WARNING

Water must not be allowed to run over the motor and cover.

#### WARNING

Water drainage is uncontrolled. **Overhead drilling is not permissible.**

- Slowly open the water flow regulator until the desired volume of water is flowing.
- Press the on/off switch on the machine (position "I"). The drilling performance indicator lights orange.
- Release the carriage locking mechanism.
- Turn the hand wheel until the diamond core bit is in contact with the work surface.
- Apply only light pressure until the diamond core bit has centered itself and then increase the pressure.
- Regulate the contact pressure while observing the drilling performance indicator.

**NOTE** The drilling performance indicator lights orange after switching on. Optimum drilling performance is achieved when the drilling performance indicator shows a green light. If the drilling performance indicator shows a red light, reduce the pressure applied to the core bit.

## 7.4 Using the machine with the water collection system **i4**



### **WARNING**

**The end stop screw must be fitted at the end of the guide rail when drilling in an upwards direction.**

### **WARNING**

**Water must not be allowed to run over the motor and cover.**

### **WARNING**

**A water collection system with wet-type vacuum cleaner must be used when drilling in an upwards direction.**

### **WARNING**

**Stop working if the vacuum removal system no longer functions.**

### **NOTE**

Do not use the power outlet on the vacuum cleaner.

### **NOTE**

The vacuum cleaner should be switched on manually before opening the water supply valve and switched off again manually after closing the water supply valve.

1. Switch the vacuum cleaner on. Do not use the vacuum cleaner in automatic mode.
2. Connect the water supply.
3. Open the water flow regulator.
4. Press the on/off switch on the machine (position "I"). The drilling performance indicator lights orange.
5. Release the carriage locking mechanism.
6. Turn the hand wheel until the diamond core bit is in contact with the base material.
7. Apply only light pressure until the diamond core bit has centered itself and then increase the pressure.

8. Regulate the contact pressure while observing the drilling performance indicator.

**NOTE** The drilling performance indicator lights orange after switching on. Optimum drilling performance is achieved when the drilling performance indicator shows a green light. If the drilling performance indicator shows a red light, reduce the pressure applied to the core bit.

## 7.5 Using the Rota-Rail (column swivel)

### **CAUTION**

**Do not use the Rota-Rail as a column extension.**

The Rota-Rail allows quick and easy access to the hole being drilled, or to the core, with no need to partly or fully dismantle the system.

1. Switch the machine off.
2. Lock the carriage on the channel by engaging the carriage locking mechanism and check that it is securely attached.
3. Remove the end stop screw from the end of the rail.
4. Attach the Rota-Rail so that the toothed racks are facing the same direction.
5. Tighten the screw on the Rota-Rail securely.
6. Release the carriage lock and run the carriage along the rail onto the Rota-Rail.
7. Release the Rota-Rail fastening screw and pivot the machine with the Rota-Rail to the left or right to provide access to the hole being drilled.
8. Remove the core or change the core bit.
9. Pivot the machine back to its original position, tighten the Rota-Rail fastening screw securely and then run the carriage back onto the column of the drill stand in order to continue drilling.
10. After removing the Rota-Rail, refit the end stop screw to the end of the rail.

## 7.6 Switching off **i5**

### **WARNING**

Exercise caution when drilling overhead : The diamond core bit fills with water during overhead drilling. **As a first step, carefully allow the water to drain away after completing overhead drilling. This is done by disconnecting the water supply from the water flow regulator and draining the water by opening the water flow regulator. Do not allow the water to run over the motor and cover.**

1. Remove the diamond core bit from the hole.
2. Engage the carriage lock.
3. Switch the machine off.
4. Close the water flow regulator.
5. Switch off the vacuum cleaner (if used).

## 7.7 Procedure in the event of the core bit sticking

The safety clutch releases in the event of the core bit binding and sticking. Following this, the motor is switched

off by the electronic control system. The core bit can be released by taking the following action:

### 7.7.1 Using an open-end wrench to release the core bit

1. Disconnect the supply cord plug from the power outlet.
2. Grip the core bit with a suitable open-end wrench close to the connection end and release the core bit by rotating it.
3. Plug the machine's supply cord into the power outlet.
4. Resume the drilling operation.

### 7.7.2 Using the hand wheel to release the core bit

1. Disconnect the supply cord plug from the power outlet.
2. Release the core bit from the hole by turning it with the hand wheel.
3. Plug the machine's supply cord into the power outlet.
4. Resume the drilling operation.

## 7.8 Dismantling

### CAUTION

Disconnect the supply cord plug from the power outlet.

1. For instructions on removing the diamond core bit, please refer to the section "Removing the diamond core bit".
2. Remove the core if necessary.
3. Detach the drill stand from the base material.

### 7.8.1 Removing the system as a unit

#### NOTE

If you wish to remove the drilling system as a complete unit (without first removing the core bit) it is recommended that the drive unit is lowered on the rail (after switching off) until in contact with the base material. This will help to prevent it tipping over.

### 7.9 Disposing of drilling slurry

Please refer to the section "Disposal".

### 7.10 Transport and storage

Open the water flow regulator before putting the machine into storage.

#### CAUTION

When temperatures drop below zero, check to ensure that no water remains in the power tool.

#### WARNING

Do not lift the machine and/or the drill stand by crane.

## 8 Care and maintenance

### CAUTION

Disconnect the supply cord plug from the power outlet.

### 8.1 Care of cutting tools and metal parts

Remove any dirt adhering to the surface of cutting tools, the chuck and drive spindle and protect their surfaces from corrosion by rubbing them with an oily cloth from time to time.

Always keep the connection end clean and lightly greased.

### 8.2 Care of the machine

#### CAUTION

Keep the machine, especially its grip surfaces, clean and free from oil and grease. Do not use cleaning agents which contain silicone.

The outer casing of the machine is made from impact-resistant plastic.

Never operate the machine when the ventilation slots are blocked. Clean the ventilation slots carefully using a dry brush. Do not permit foreign objects to enter the interior of the machine. Clean the outside of the machine at regular intervals with a slightly damp cloth. Do not use a spray, steam pressure cleaning equipment or running water for cleaning. This may negatively affect the electrical safety of the machine.

### 8.3 Maintenance

#### WARNING

Repairs to the electrical section of the machine may be carried out only by trained electrical specialists.

Check all external parts of the power tool for damage at regular intervals and check that all controls operate faultlessly. Do not operate the power tool if parts are damaged or when the controls do not function faultlessly. If necessary, the power tool should be repaired by Hilti Service.

### 8.4 Replacing the carbon brushes [16](#)



#### NOTE

The indicator lamp with wrench symbol lights up when the carbon brushes need to be replaced.

#### DANGER

The machine may be operated, serviced and repaired only by trained, authorized personnel. This personnel must be particularly informed of any possible hazards.

Failure to observe the following instructions may result in contact with dangerous electric voltage.

1. Disconnect the machine from the electric supply.
2. Open the carbon brush covers on the left-hand and right-hand side of the motor.
3. Take note of how the carbon brushes are fitted and how the conductors are positioned. Remove the worn carbon brushes from the machine.
4. Fit the new carbon brushes just as the old ones were fitted (spare part numbers: 100-127 V carbon brush set: 2006844, 220-240 V carbon brush set: 2006843).  
**NOTE** Take care to avoid damaging the insulation on the indicator lead as you insert the brushes.
5. Close the carbon brush covers on the left-hand and right-hand side of the motor and tighten the retaining screws.

6. Allow the machine to run in for approx. 1 min. under no load.

**NOTE** After replacing the carbon brushes the indicator lamp will go out after the machine has run for approx. 1 minute.

## 8.5 Adjusting the play between rail and carriage

### NOTE

Play between the rail and the carriage can be adjusted by turning the carriage play adjustment screws.

Use an Allen key to tighten the carriage adjustment screws to a torque of 5 Nm (finger-tight) and then turn the screws back 1/4 of a turn.

The carriage is correctly adjusted if it remains in position when no core bit is fitted but moves down under its own weight when a core bit is fitted.

## 8.6 Checking the power tool after care and maintenance

After carrying out care and maintenance, check that all protective and safety devices are fitted and that they function faultlessly.

## 9 Troubleshooting

Fault	Possible cause	Remedy
The machine doesn't start.	Interruption in the electric supply.	Plug in another electric appliance and check whether it works. Check the plug connections, supply cords and extension cords, GFCI and electric supply.
	On/off switch defective.	If necessary, the power tool should be repaired by Hilti Service.
	Interruption in the electric supply.	Check the supply cord, extension cord, supply cord plug, GFCI and have them replaced by a qualified electrician if necessary.
	The electronics are defective.	The machine should be repaired by Hilti Service.
	Water in the machine.	Dry the machine. The machine should be repaired by Hilti Service.
The service indicator lights.	The carbon brushes are worn; the machine will continue to run for a few hours.	The carbon brushes should be changed. See section: 8.4 Replacing the carbon brushes <a href="#">16</a>
The machine doesn't start and the service indicator lights.	The carbon brushes are worn.	Replace the carbon brushes. See section: 8.4 Replacing the carbon brushes <a href="#">16</a>
The machine doesn't start, carbon brushes have been changed, service indicator lights.	A fault has occurred in the power tool.	If necessary, the power tool should be repaired by Hilti Service.

Fault	Possible cause	Remedy
The machine doesn't run and the service indicator blinks.	The machine has overheated.	Wait a few moments until the motor has cooled down or allow it to run under no load in order to speed up the cooling-down process.
	Overload error.	Switch the machine off and on again.
The machine doesn't start, theft protection indicator blinks yellow.	The power tool has not been unlocked (tools with optional theft protection system).	Use the TPS key to unlock the power tool.
The motor runs. The diamond core bit doesn't rotate.	Gear selector doesn't engage.	Move the gear selector until felt to engage.
	The gearing is defective.	If necessary, the machine should be repaired by Hilti Service.
Drilling speed drops.	The diamond core bit is polished.	Sharpen the diamond core bit on a sharpening plate with water flowing.
	The diamond core bit is polished.	The wrong type of core bit has been used. Seek advice from Hilti.
	Water pressure / flow rate too high.	Reduce the water flow rate by adjusting the flow regulator.
	The core is stuck in the core bit.	Remove the core.
	Maximum drilling depth is reached.	Remove the core and use a core bit extension.
	The diamond core bit is defective.	Check the diamond core bit for damage and replace it if necessary.
	The slip clutch is disengaging prematurely or slipping.	If necessary, the machine should be repaired by Hilti Service.
	The carriage is locked.	Unlock the carriage.
	The water flow rate is too low.	Adjust (open) the water flow regulator. Check the water supply.
The handwheel turns but doesn't engage.	The retaining pin is broken.	Fit a new retaining pin.
Water escapes at the water swivel or gear housing.	The water pressure is too high.	Reduce the water pressure.
	The shaft seal is defective.	The machine should be repaired by Hilti Service.
The diamond core bit cannot be fitted into the chuck.	The core bit connection end or chuck is dirty or damaged.	Clean the connection end /chuck or replace if necessary.
Water escapes from the chuck during operation.	The core bit is not screwed securely into the chuck.	Tighten it securely.
	The core bit connection end / chuck is dirty.	Clean the connection end / chuck.
	The chuck or connection end seal is defective.	Check the seal and replace it if necessary.
Excessive play in the drilling system.	The core bit is not screwed securely into the chuck.	Tighten it securely.
	The leveling screws or clamping spindle are not tightened.	Tighten the leveling screws or clamping spindle.
	Excessive play at the carriage.	Adjust the play between rail and carriage. See section: 8.5 Adjusting the play between rail and carriage
	The core bit connection end is defective.	Check the connection end and replace it if necessary.
The motor cuts out.	Too much friction.	Guide the machine straight.

## 10 Disposal



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Most of the materials from which Hilti machines or appliances are manufactured can be recycled. The materials must be correctly separated before they can be recycled. In many countries, Hilti has already made arrangements for taking back old machines and appliances for recycling. Ask Hilti customer service or your Hilti representative for further information.

### Recommended pretreatment for disposal of drilling slurry

#### NOTE

The disposal of drilling slurry directly into rivers, lakes or the sewerage system without suitable pretreatment presents environmental problems. Ask the local public authorities for information about current regulations.

1. Collect the drilling slurry (e.g. using a wet-type industrial vacuum cleaner)
2. Allow the drilling slurry to settle and dispose of the solid material at a construction waste disposal site (the addition of a flocculent may accelerate the separation process).
3. The remaining water (alkaline, pH value > 7) must be neutralized by the addition of an acidic neutralizing agent or diluted with a large volume of water before it is allowed to flow into the sewerage system.

## 11 Manufacturer's warranty

Hilti warrants that the tool supplied is free of defects in material and workmanship. This warranty is valid so long as the tool is operated and handled correctly, cleaned and serviced properly and in accordance with the Hilti Operating Instructions, and the technical system is maintained. This means that only original Hilti consumables, components and spare parts may be used in the tool.

This warranty provides the free-of-charge repair or replacement of defective parts only over the entire lifespan of the tool. Parts requiring repair or replacement as a result of normal wear and tear are not covered by this warranty.

**Additional claims are excluded, unless stringent national rules prohibit such exclusion. In particular, Hilti is not obligated for direct, indirect, incidental or consequential damages, losses or expenses in connection with, or by reason of, the use of, or inability to use the tool for any purpose. Implied warranties of merchantability or fitness for a particular purpose are specifically excluded.**

For repair or replacement, send the tool or related parts immediately upon discovery of the defect to the address of the local Hilti marketing organization provided.

This constitutes Hilti's entire obligation with regard to warranty and supersedes all prior or contemporaneous comments and oral or written agreements concerning warranties.



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