

# LCD

# 500, 1500

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## Safety and Operating instructions Hydraulic core drill





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## ENGLISH

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## Introduction

Thank you for choosing a product from Atlas Copco. Since 1873, we have been committed to finding new and better ways of fulfilling our customers' needs. Through the years, we have developed innovative and ergonomic product designs that have helped customers improve and rationalize their daily work.

Atlas Copco has a strong global sales and service network, consisting of customer centers and distributors worldwide. Our experts are highly trained professionals with extensive product knowledge and application experience. In all corners of the world, we can offer product support and expertise to ensure that our customers can work at maximum efficiency at all times.

For more information please visit: [www.atlascopco.com](http://www.atlascopco.com).

## About the Safety and operating instructions

The aim of the instructions is to provide you with knowledge of how to use the machine in an efficient, safe way. The instructions also give you advice and tell you how to perform regular maintenance on the machine.

Before using the machine for the first time you must read these instructions carefully and understand all of them.

## Safety instructions

To reduce risk of serious injury or death to yourself or others, read these safety instructions before operating the machine.

Post these safety instructions at work locations, provide copies to employees, and make sure that everyone reads the safety instructions before operating or servicing the machine.

Comply with all safety regulations.

## Safety signal words

The safety signal words Danger, Warning and Caution have the following meanings:

<b>Danger</b>	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
<b>Warning</b>	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
<b>Caution</b>	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

## Personal precautions and qualifications

Only qualified and trained persons may operate or maintain the machine. Always use your common sense and good judgement.

### Installation, storage, maintenance and disposal

Installation, storage, maintenance and disposal of the machine may only be undertaken by persons who:

- ▶ are aware of all the relevant national safety instructions and accident prevention instructions
- ▶ and have read and understood the Safety and operating instructions.

### Personal protective equipment

Always use approved protective equipment. Operators and all other persons in the working area must wear protective equipment, including at a minimum:

- ▶ Protective helmet
- ▶ Hearing protection
- ▶ Impact resistant eye protection with side protection
- ▶ Respiratory protection when appropriate

- ▶ Protective gloves
- ▶ Proper protective boots

### Drugs, alcohol or medication

#### Warning

Drugs, alcohol or medication may impair your judgment and powers of concentration. Poor reactions and incorrect assessments can lead to severe accidents or death.

- ▶ Never use the machine when you are tired or under the influence of drugs, alcohol or medication.
- ▶ No person who is under the influence of drugs, alcohol or medication may operate the machine.

## Installation, precautions

### Hydraulic system

#### Hydraulic oil at high pressure

#### Warning

Thin jets of hydraulic oil under high pressure can penetrate the skin and cause permanent damage.

- ▶ Immediately consult a doctor if hydraulic oil has penetrated the skin.
- ▶ Never use your fingers to check for hydraulic fluid leaks.
- ▶ Keep your face away from any possible leaks.

#### Spilled hydraulic oil

#### Warning

Spilled hydraulic oil can cause burns, accidents by slippery conditions and will also harm the environment.

- ▶ Take care of all spilled oil and handle it according to your safety and environment regulations.
- ▶ Never dismount the machine when the hydraulic oil is hot.

#### Skin eczema

#### Caution

Hydraulic oil can cause eczema when it comes in contact with the skin.

- ▶ Avoid getting hydraulic oil on your hands.
- ▶ Always use protective gloves when working with hydraulic oil.

## Operation, precautions

### Explosion hazard

#### **Danger**

If an insertion tool comes into contact with explosives or explosive gases, an explosion could occur. During operating with certain materials, sparks and ignite can occur. Explosions will lead to severe injuries or death.

- ▶ Never operate the machine in any explosive environment.
- ▶ Never use the machine near flammable materials, fumes or dust.
- ▶ Make sure that there are no undetected sources of gas or explosives.
- ▶ Never drill in an old hole.

### Unexpected movements

#### **Warning**

The inserted tool is exposed to heavy strains when the machine is used. The inserted tool may break due to fatigue after a certain amount of use. If the inserted tool breaks or gets stuck, there may be sudden and unexpected movement that can cause injuries. Furthermore, losing your balance or slipping may cause injury.

- ▶ Make sure that you always keep a stable position with your feet as far apart as your shoulder width, and keeping a balanced body weight.
- ▶ Always inspect the equipment prior to use. Never use equipment if you suspect that it is damaged.
- ▶ Make sure that the handles are clean and free from grease and oil.
- ▶ Keep your feet away from the inserted tool.
- ▶ Stand firmly and always hold on to the machine with both hands.
- ▶ Never drill in an old hole.
- ▶ Never start the machine when it is lying on the ground.
- ▶ Never "ride" on the machine with one leg over the handle.
- ▶ Never strike or abuse the equipment.
- ▶ Check regularly for wear on the insertion tool, and check whether there are any signs of damage or visible cracks.
- ▶ Pay attention and look at what you are doing.

### Stalling hazard

#### **Warning**

If the insertion tool gets caught during operation, the whole machine will start to rotate if you lose your grip on it. This unexpected rotation of the entire machine may cause serious injury or death.

- ▶ Stand firmly and always hold on to the machine with both hands.
- ▶ Make sure that the handles are clean and free from grease and oil.
- ▶ Never drill in an old hole.

### Trapping hazard

#### **Warning**

There is risk of items getting dragged into or caught by the rotating insertion tool. This may cause serious injury or death.

- ▶ Never grab or touch a rotating drill bit.
- ▶ Avoid wearing clothing that may get caught.
- ▶ Cover your long hair with a hair net.

### Silica hazard

#### **Warning**

Exposure to crystalline silica (sometimes called 'silica dust') as a result of breaking, drilling, hammering or other activities involving rock, concrete, asphalt or other materials may cause silicosis (a serious lung disease), silicosis-related illnesses, cancer or death. Silica is a major component of rock, sand and mineral ores. To reduce silica exposure:

- ▶ Use proper engineering controls to reduce the amount of silica in the air and the build-up of dust on equipment and surfaces. Examples of such controls include: Exhaust ventilation and dust collection systems, water sprays, and wet drilling. Make sure that controls are properly installed and maintained.
- ▶ Wear, maintain, and correctly use approved particulate respirators when engineering controls alone are not adequate to reduce exposure below permissible levels.
- ▶ Participate in air monitoring, medical exams, and training programs offered by your employer and when required by law.
- ▶ Wear washable or disposable protective clothes at the worksite; shower and change into clean clothes before leaving the worksite to reduce exposure of silica to yourself, other persons, cars, homes, and other areas.
- ▶ Never eat, drink, or use tobacco products in areas where there is dust containing crystalline silica.

- ▶ Wash your hands and face before eating, drinking, or using tobacco products outside of the exposure area.
- ▶ Work with your employer to reduce silica exposure at your worksite.

#### Dust hazard

### Warning

Some dusts, fumes or other airborne material created during use of the machine may contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Some examples of such chemicals are:

- ▶ Crystalline silica and cement and other masonry products.
- ▶ Arsenic and chromium from chemically-treated rubber.
- ▶ Lead from lead based paints.

To reduce your exposure to these chemicals, work in a well ventilated area and work with approved safety equipment, such as dust masks that are specially designed to filter out microscopic particles.

#### Electric shock

### Warning

The machine is not insulated against electric current. Should the machine come in contact with electric circuits or other electrical power sources, there is a risk of severe injury or death.

- ▶ Never work in the proximity of electric circuits or other electrical power sources.
- ▶ Make sure there are no hidden electric circuits in your working area.

#### Projectiles

### Warning

During operating, splinters or other particles from the working material may become projectiles and cause personal injury by striking the operator or other persons. Small objects falling from great heights can cause extensive damage.

- ▶ Use approved personal protective equipment, including impact resistant eye protection with side protection.
- ▶ Make sure that no unauthorised persons trespass into the working zone.
- ▶ Keep the workplace free from foreign objects.

#### Vibration hazards

### Warning

Overexposure to vibration may cause, contribute to, or aggravate injury or disorders to the operator's fingers, hands, wrists, arms, shoulders and/or other body parts, including debilitating and/or permanent injuries or disorders that may develop gradually over periods of weeks, months, or years. Such injury or disorder may include damage to the blood circulatory system, damage to the nervous system, damage to joints, and possibly damage to other body structures.

If numbness, tingling, pain, clumsiness, weakened grip, whitening of the skin, or other symptoms occur at any time, when operating the machine or when not operating the machine, do not resume operation of the machine and seek medical attention. Continued use of the machine after the occurrence of any such symptom may increase the risk of symptoms becoming more severe and/or permanent.

#### Concealed object hazard

### Warning

During operating, concealed wires and pipes constitute a danger that can result in serious injury.

- ▶ Check the composition of the material before operating.
- ▶ Watch out for concealed cables and pipes e.g. electricity, telephone, water, gas and sewage lines etc.
- ▶ If the inserted tool seems to have hit a concealed object, switch off the machine immediately.
- ▶ Make sure that there is no danger before continuing.

#### Involuntary start

### Warning

Involuntary start of the machine may cause injury.

- ▶ Keep your hands away from the start and stop device until you are ready to start the machine.
- ▶ Learn how the machine is switched off in the event of an emergency.
- ▶ Release the start and stop device immediately in all cases of power supply interruption.
- ▶ Whenever fitting/removing the insertion tool switch off the hydraulic oil supply and disconnect the machine from the power source. Bleed the machine by pressing the start and stop device.



**Noise hazard****⚠ Warning**

High sound levels may cause permanent hearing loss.

- ▶ Use hearing protection in accordance with occupational health and safety regulations.

**Fragmentation hazard****⚠ Warning**

Using a drill bit with a larger diameter than intended for the size of the machine may lead to fragmentation of the drill bit.

Fragments from a drill bit can lead to serious or fatal injury.

- ▶ Always use a drill bit that fits the size of the machine.

**Pressure relief valve setting****⚠ Warning**

Do not readjust the pressure relief valve in the machine. That may lead to a higher torque, which may damage the machine and result in serious or fatal injury.

**Storage, precautions**

Clean the machine and drill bits properly before storage.

Always store the machine and drill bits in a dry and safe place, out of the reach of children.

**Maintenance, precautions****Hydraulic system under high pressure****⚠ Warning**

Maintenance work on a machine under high pressure can lead to severe injuries. Connections can loosen suddenly, parts can suddenly move and hydraulic oil can be ejected.

- ▶ Depressurise the hydraulic system before performing maintenance on the machine.

**Machine modification****⚠ Warning**

Any machine modification may result in bodily injuries to yourself or others.

- ▶ Never modify the machine.
- ▶ Always use original parts and accessories approved by Atlas Copco.
- ▶ Change damaged parts immediately.
- ▶ Replace worn components in good time.

**Hot insertion tool****⚠ Warning**

If the machine is used for dry drilling applications, the tip of the insertion tool becomes hot when used. Touching it can lead to burns.

- ▶ Never touch a hot insertion tool.
- ▶ Wait until the insertion tool has cooled down before carrying out maintenance work.

## Overview

To reduce risk of serious injury or death to yourself or others, read the safety instructions section found on the previous pages of this manual before operating the machine.

## Design and function

The Atlas Copco LCD 500 and LCD 1500 core drills are sturdy and reliable core drills designed for working together with Atlas Copco power packs.

The Atlas Copco core drills are delivered in a practical suitcase and are fitted with 2 m  $\frac{3}{8}$ " tail-hoses with  $\frac{1}{2}$ " Flat-Face quick-release couplings for easy connection.

The core drill is available in a 600 and a 1500 rpm version (when running at 20 l.p.m.), designed for drilling with various sizes of diamond core drill bits. When running at 30 l.p.m., the rpm values are 900 and 2250 respectively. The core drills are small, flexible and reliable machines with a high performance compared to weight. The core drills are easy to use and the perfect choice for public and private construction jobs.

The direct-driven hydraulically powered design provides consistent rotation and torque when drilling in concrete, brickwork, blocks etc. It also makes underwater drilling possible.

The core drill is designed for water flushed diamond drilling but can also be used for dry drilling applications, which will not harm the seals. With prolonged use in dry drilling applications, the housing and shaft may become extremely warm. If this occurs, it is advised to remove the drill bit and run water through the housing and shaft for approximately one minute to dissipate the heat built up.

The water can be supplied directly from a source, or a separate water kit can be used:



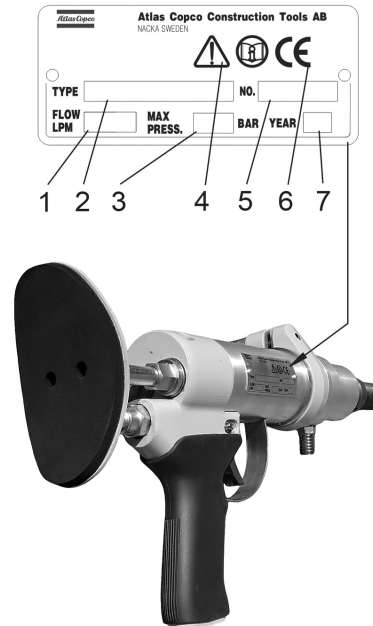
A separate water kit with pressure tank is available (see the spare parts list).

The Atlas Copco core drills can be used in drilling rigs. The bearing housing is designed with a 60 mm cylindrical surface that fits into industry standard drilling rig mounting collars.

## Signs and stickers on the machine

The machine is fitted with signs and stickers containing important information about personal safety and machine maintenance. The signs and stickers shall always be easy to read. New signs and stickers can be ordered by using the spare parts list.

### Data plate



1. Maximum hydraulic oil flow.
2. Machine type.
3. Maximum hydraulic pressure.
4. The warning symbol together with the book symbol means that the user must read the Safety and operating instructions before the machine is used for the first time.
5. Serial number.
6. The CE symbol means that the machine is CE-approved. See the CE declaration of Conformity which is delivered with the machine for more information.
7. Year of manufacture.

### E.H.T.M.A. category

The European Hydraulic Tool Manufacturers Association (E.H.T.M.A.) has categorised hydraulic power packs and tools in terms of flow rate and working pressure.

Our core drills are categorised by the E.H.T.M.A. as category C and D.

The Atlas Copco hydraulic core drills are clearly marked with E.H.T.M.A. category. It is important that any power source used with the core drills is of a compatible category. If in any doubt, consult your Atlas Copco dealer.



## Installation

### Hoses

#### Whipping hydraulic hose

##### ⚠ Warning

Hydraulic hoses under pressure can whip uncontrollably if screws loosen or are loosened. A whipping hydraulic hose can cause severe injuries.

- ▶ Depressurize the hydraulic system before loosening the connection of a hydraulic hose.
- ▶ Tighten the nuts on the connections of the hydraulic hoses to required torque.

### Water flushing

For diamond bit core drilling water flushing is required. Use only just enough water to flush away the material.

### Drill bit

#### Choosing drill bit

A correct drill bit is a condition for good operation. To avoid unnecessary machine damage, it is important to choose drill bits with a high quality.

#### Fitting and removing the drill bit

Smaller diameter drill bits are fitted directly into the machine drive shaft (½" BSP). For use of larger diameter drill bits, an ½" BSP male x 1¼ UNC male drive adaptor is included with the machine.

To prevent an accidental start: Switch off the hydraulic oil supply and disconnect the machine from the power source.

Screw the drill bit into the core drill. Lock the spindle using a spanner and tighten the drill bit.

Bleed the machine by pressing the start and stop device.

## Operation

#### Involuntary start

##### ⚠ Warning

Involuntary start of the machine may cause injury.

- ▶ Keep your hands away from the start and stop device until you are ready to start the machine.
- ▶ Learn how the machine is switched off in the event of an emergency.
- ▶ Release the start and stop device immediately in all cases of power supply interruption.
- ▶ Whenever fitting/removing the insertion tool switch off the hydraulic oil supply and disconnect the machine from the power source. Bleed the machine by pressing the start and stop device.

### Start and stop

- ▶ Start the machine by pressing the trigger while firmly holding the handle. By gradually applying pressure on the trigger, the speed may be reduced to obtain a soft start.
- ▶ Stop the machine by releasing the trigger. The trigger returns automatically to the stop position.
- ▶ The machine is fitted with a trigger lock, which should only be used when the machine is mounted in a drilling rig. To activate this constant operation function, activate the trigger and press the trigger lock. To deactivate the function, press and release the trigger.

### Operating

The following checks should be made each time you start to use the core drill. All these checks concern the serviceability of the core drill. Some concern your safety:

- ▶ Clean all safety stickers. Replace any that are missing or cannot be read.
- ▶ Inspect the hoses generally for signs of damage.
- ▶ Check for fluid leakages.
- ▶ Ensure that the hydraulic couplings are clean and fully serviceable.
- ▶ Check that the drill bit is in a good condition and has the correct diameter for the size of the core drill.
- ▶ Screw the drill bit into the nose end drive of the shaft and tighten by means of the spanner flats provided.

- ▶ Ensure that any power source you plan to use is compatible with the core drill model used (see the "Technical data").
- ▶ Atlas Copco recommends using an LFD oil flow divider, if the flow from the power source can exceed the maximum allowed oil flow.

**Note!** Do not exceed the maximum flow for the core drill, as this might lead to failure of the drill bit and damage of the machine.

**Note!** The maximum pressure of the power source is important, as the pressure created in case of incorrectly or not fitted return line coupling would cause overloading, which could harm the machine and result in bodily injuries. The maximum pressure of the power source is 150 bar (by its safety valve adjustment).

**Note!** Do not readjust the pressure relief valve in the core drill. That might lead to a higher torque, which could harm the machine and result in serious injury or death.

- ▶ Connect the hydraulic hoses.
- ▶ Connect the water hose to the water tap.
- ▶ Screw the handle lightly into the handle ring and place the handle in a position that is comfortable for the operator.
- ▶ Lock the handle ring in this position by tightening the handle to grip the bearing housing. Ensure that the handle remains locked throughout the drilling operation.
- ▶ Start the power source.
- ▶ Activate the water supply
- ▶ Stand steady and make sure that your feet and hands are at a safe distance from the drill bit.
- ▶ To start the drilling it is advisable to either turn the core drill to one side in order to obtain an initial groove and then slowly return to horizontal or vertical position, as soon as the drill bit has engaged in the material to be drilled

or

provide a guide to stop the drill bit skidding across the surface of the material to be drilled.

- ▶ Place the core drill at a right angle to the surface to be drilled and activate the trigger.
- ▶ When the drill bit has started to cut, increase the axial pressure to the core drill using the breast plate and hold the trigger fully in for maximum rotation and penetration speed.

- ▶ Let the machine do the work; do not press too hard.
- ▶ Should the core drill jam in the hole, release the trigger and any axial pressure on the core drill, gradually re-apply trigger pressure and when the drill bit is rotating again re-apply axial pressure. The normal cause of jamming is the operator pushing the drill off line.

**Note!** The trigger is fitted with a trigger lock that should only be used, when the drill is mounted in a drilling rig.

- ▶ When the work is done, stop the core drill by releasing the trigger and stop the power source. Disconnect the hoses and fit the protective caps to the quick-release couplings.

## When taking a break

- ▶ During all breaks you must place the machine away in such a way that there is no risk for it to be unintentionally started.
- ▶ In event of a longer break or when leaving the workplace: Switch off the hydraulic oil supply and then bleed the machine by activating the start and stop device.

## Maintenance

Regular maintenance is a basic requirement for the continued safe and efficient use of the machine. Follow the operating instructions carefully.

- ▶ Use only authorised parts. Any damage or malfunction caused by the use of unauthorised parts is not covered by Warranty or Product Liability.
- ▶ When cleaning mechanical parts with solvent, comply with appropriate health and safety regulations and ensure there is satisfactory ventilation.
- ▶ For major service to the machine, contact your nearest authorised workshop.

### Every day

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- ▶ Clean and inspect the machine.
- ▶ Conduct a general inspection for leaks and damage.
- ▶ Check the function of the trigger. Make sure that it returns to its stop position when it is released.

### Every 3 months

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- ▶ Check tightness of nuts, bolts, screws and hose fittings after the first days of operation and thereafter every 3 months.

### Every 300 hours or every year

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- ▶ After each operating period of approximately 300 working hours or once a year the machine must be dismantled and all parts be cleaned and checked. This work must be performed by authorized staff, trained for this task.

## Troubleshooting

Problem	Cause	Solution
Core drill will not operate	Core drill not connected properly	Check the performance and connection of the power source. Make sure that the return line coupling is completely fitted with no clearance
	Oil flow and/or pressure too low	Check the power source and ensure that the flow and pressure are according to the technical specifications
Core drill runs at low speed	Oil flow and/or pressure too low	Check the power source and ensure that the flow and pressure are according to the technical specifications
	Contaminated hydraulic system	Clean system
	Internal leakage	Carefully check the O-ring seals in the trigger valve bushing and replace damaged ones
Core drill runs without trigger pushing	Untightened trigger valve bushing	Tighten trigger valve bushing properly
	O-ring failure	Replace the O-ring at the bottom of the trigger valve bushing hole
	Check valve spring broken	Replace spring
Trigger lever stuck	Flow too high	Check the power source and ensure that the flow and pressure are according to the technical specifications - and that the connections are correct
	Improper pressure/return line connection	
	Back pressure too high	
	Impurities	Check trigger valve/reversing valve for seizing
Trigger lever cannot be released	Trigger lever blocked in locked position	Readjust the flat spring through the two screws on the motor housing
System overheats	Flow too high	Reduce the flow from the power source. If necessary, use a flow divider to control the flow
	Insufficient cooling	Use a power source with higher cooling capacity or add an additional oil cooler in the return line

## Storage

- ▶ Clean the machine properly before storage.
- ▶ Always store the machine in a dry place.

## Disposal

A used machine must be treated and disposed of in such a way that the greatest possible portion of the material can be recycled and any negative influence on the environment is kept as low as possible.

**Note!** Before a used machine is scrapped, it must be emptied and cleaned from all hydraulic oil. Remaining hydraulic oil must be deposited in a responsible manner.

## Technical data

### Machine data

Weight without hoses and drill bit	7 kg (15.4 lb)
Oil flow range	20-30 l.p.m. (5-8 US gal/min)
Pressure relief valve setting (max.)	150 bar (2200 psi)
E.H.T.M.A. category	C and D
Max. back pressure in return line (measured at core drill)	14 bar (200 psi)
Oil working temperature	30-70°C (86-158°F)
Required cooling capacity	Approx. 2 kW

	20 l.p.m. (5 US gal/min)		30 l.p.m. (8 US gal/min)	
Core drill type	rpm	Drill bit diameter mm (in)	rpm	Drill bit diameter mm (in)
LCD 500	600	75-202 (3-8)	900	50-100 (2-4)
LCD 1500	1500	25-75 (1-3)	2250	12-30 (0.5-1.2)

### Noise and vibration declaration statement

Sound pressure level **L<sub>PA</sub>** in accordance with EN/ISO 15744.

Vibration value in accordance with EN/ISO 8662-5.

These declared values were obtained by laboratory type testing in accordance with the stated directive or standards and are suitable for comparison with the declared values of other tools tested in accordance with the same directive or standards. These declared values are not adequate for use in risk assessments, and values measured in individual work places may be higher. The actual exposure values and risk of harm experienced by an individual user are unique and depend upon the way the user works, in what material the machine is used, as well as upon the exposure time and the physical condition of the user, and the condition of the machine.

We, Atlas Copco, cannot be held liable for the consequences of using the declared values, instead of values reflecting the actual exposure, in an individual risk assessment in a work place situation over which we have no control.

### Noise and vibration data

Model	Noise	Vibration
	EN/ISO 15744	EN/ISO 8662-5
	1 m LPA dB re 20 µPa	Level m/s <sup>2</sup>
LCD 500	<70	<2.5
LCD 1500	<70	<2.5



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