

# metabo®

PROFESSIONAL POWER TOOL SOLUTIONS

**BS 18 LTX BL I**  
**BS 18 LTX BL Q I**  
**SB 18 LTX BL I**  
**SB 18 LTX BL Q I**

**BS 18 LTX-3 BL Q I Metal**  
**BS 18 LTX-3 BL I Metal**  
**SB 18 LTX-3 BL Q I Metal**  
**SB 18 LTX-3 BL I Metal**

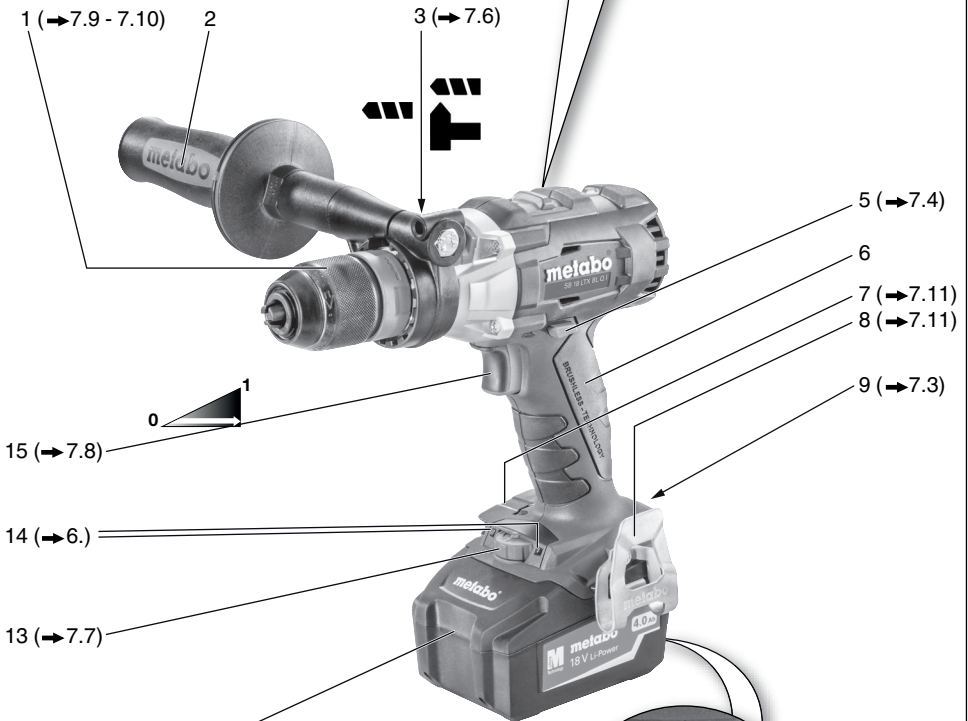
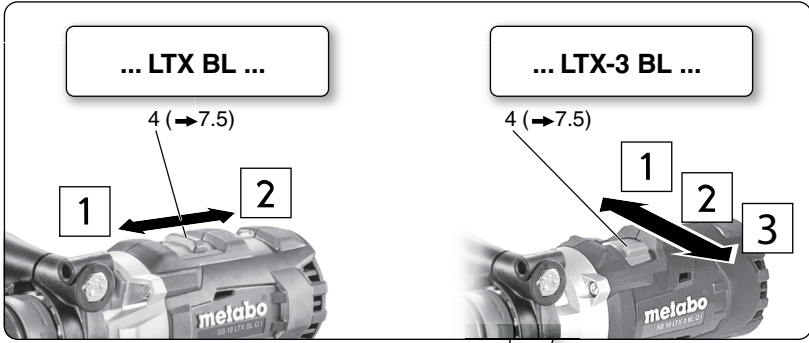
**BS 18 LTX-3 BL Q I**  
**SB 18 LTX-3 BL Q I**



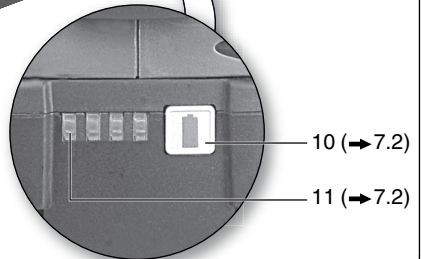
**de** Originalbetriebsanleitung 7  
**en** Original instructions 12  
**fr** Notice originale 17  
**nl** Oorspronkelijke gebruiksaanwijzing 22  
**it** Istruzioni originali 27  
**es** Manual original 32  
**pt** Manual original 37  
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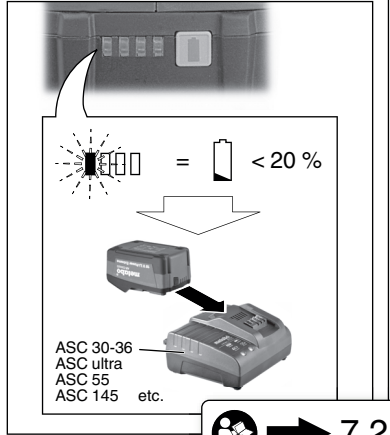
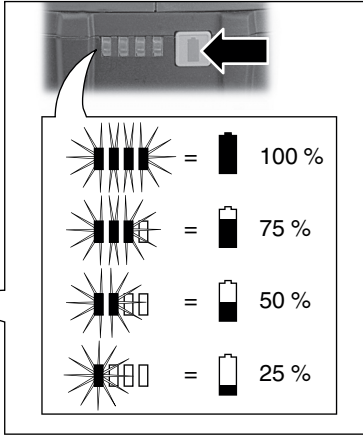
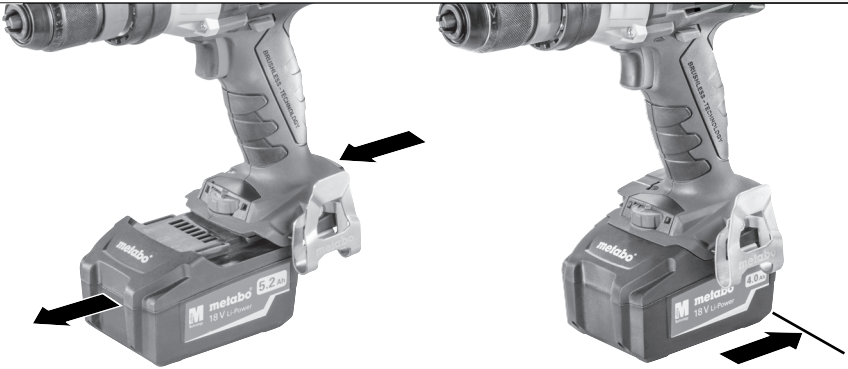
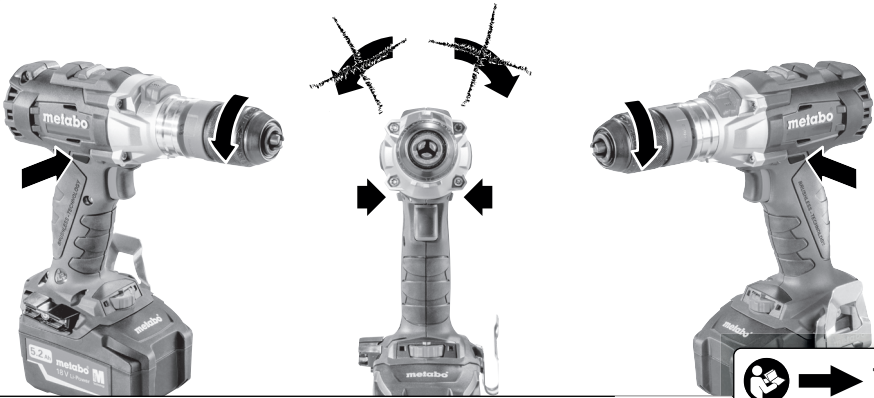
**fi** Alkuperäiset ohjeet 46  
**no** Original bruksanvisning 50  
**da** Original brugsanvisning 54  
**pl** Instrukcja oryginalna 59  
**el** Πρωτότυπο οδηγιών χρήσης 64  
**hu** Eredeti használati utasítás 69  
**ru** Оригинальное руководство по эксплуатации 74  
**uk** Оригінальна інструкція з експлуатації 80

**A**



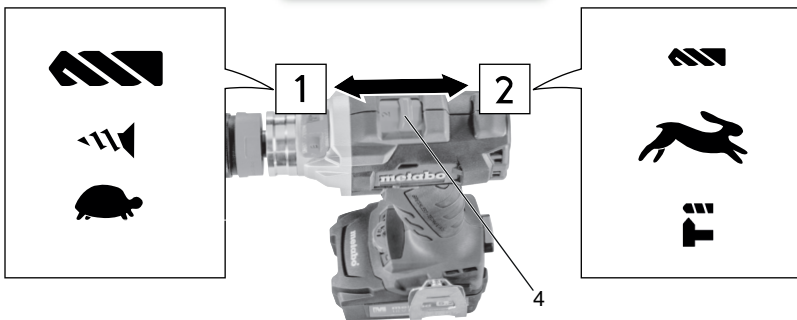
12 (→7.3)	18 V	Li-Power	4,0 Ah	6.25591
	18 V	Li-Power	5,2 Ah	6.25592
	18 V	LiHD	5,5 Ah	6.25342
				etc.



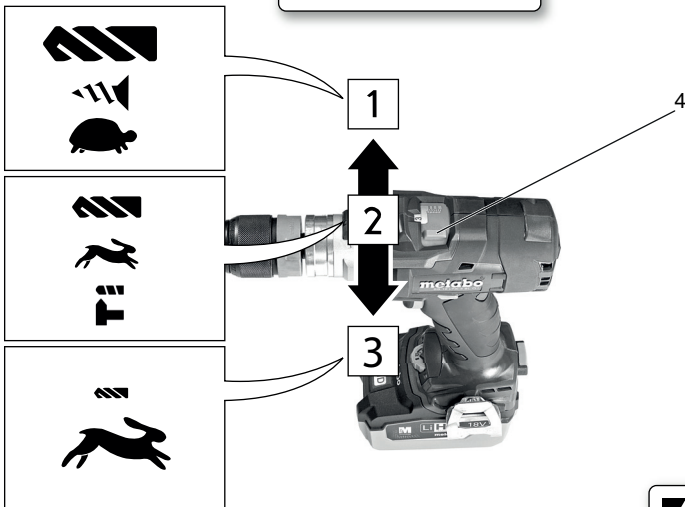
**B**
 → 7.2
**C**
 → 7.3
**D**
 → 7.4

E

... LTX BL ...




... LTX-3 BL ...




F



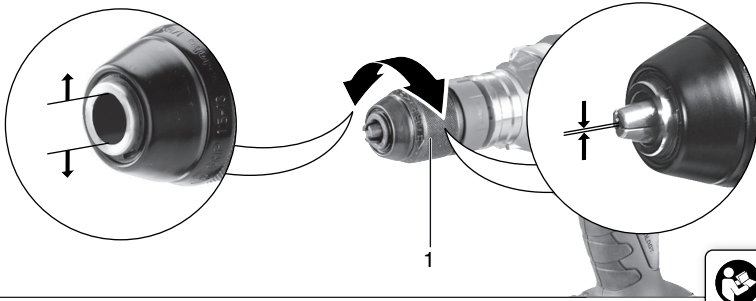
 = Impuls

1...10 = Nm... Nm

 = max. Nm



G



 → 7.9

H

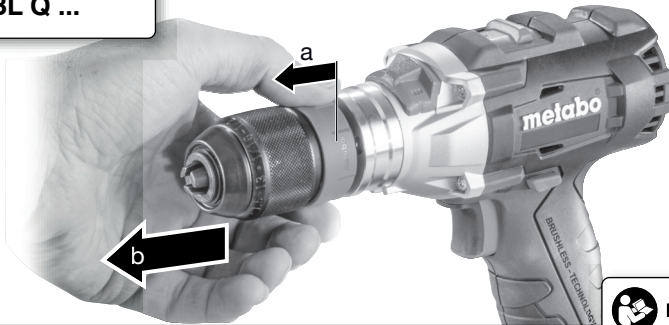
... Metal



 → 7.9

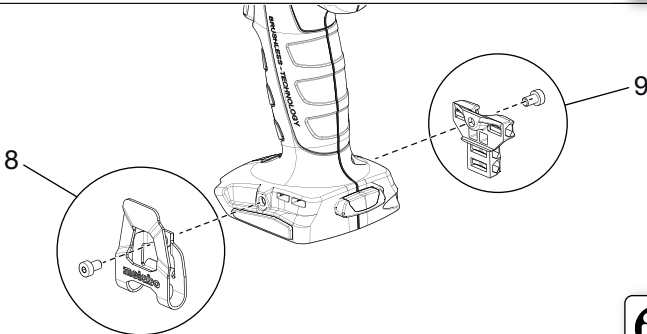
I

... BL Q ...



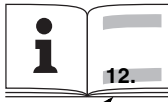
 → 7.10

J



 → 7.11

K



		BS 18 LTX BL I *1) Serial Number: 02368..		BS 18 LTX BL Q I *1) Serial Number: 02369..		SB 18 LTX BL I *1) Serial Number: 02360..		SB 18 LTX BL Q I *1) Serial Number: 02361..		BS 18 LTX-3 BL Q I Metal *1) Serial Number: 03180..		BS 18 LTX-3 BL I Metal *1) Serial Number: 03181..		SB 18 LTX-3 BL Q I Metal *1) Serial Number: 03182..		SB 18 LTX-3 BL I Metal *1) Serial Number: 03183..		BS 18 LTX-3 BL Q I *1) Serial Number: 03184..		SB 18 LTX-3 BL Q I *1) Serial Number: 03185..	
U	V	18																			
n <sub>0</sub>	/min, rpm	1	0 - 550								0 - 450										
		2	0 - 2000								0 - 2000										
		3	-								0 - 4000										
M <sub>1</sub>	Nm (in-lbs)	65 (575)								65 (575)											
M <sub>2</sub>	Nm (in-lbs)	65 (575)								65 (575)											
M <sub>3</sub>	Nm (in-lbs)	130 (1150)								130 (1150)											
M <sub>4</sub>	Nm (in-lbs)	1	3 - 20 (26.6 - 177)								3 - 18 (26.6 - 159.3)										
		2	1 - 9 (8.9 - 79.7)								1 - 11 (8.9 - 97.4)										
		3	-								7,5 (66.4)										
D <sub>1 max</sub>	mm (in)	13 (1/2)								16 (5/8)				13 (1/2)							
D <sub>2 max</sub>	mm (in)	68 (2 11/16)								68 (2 11/16)											
D <sub>3 max</sub>	mm (in)	2/3	-		16 (5/8)		-		16 (5/8)		-		16 (5/8)								
s	/min, bpm	-		38000		-		38000		-		39000									
m	kg (lbs)	2,3 (5.1)		2,4 (5.3)		3,0(6.6)		2,9(6.4)		3,1(6.8)		3,0(6.6)		2,8(6.2)		3,0(6.6)					
G	UNF(in)	1/2" - 20 UNF	-	1/2" - 20 UNF	-	-	1/2" - 20 UNF	-	1/2" - 20 UNF	-	1/2" - 20 UNF	-	-								
D <sub>max</sub>	mm (in)	13 (1/2)																			
a <sub>h, ID/K<sub>h, ID</sub></sub>	m/s <sup>2</sup>	-		17,3 / 1,5		-		16,5 / 1,7		-		16,5 / 1,7									
a <sub>h, D/K<sub>h, D</sub></sub>	m/s <sup>2</sup>	< 2,5 / 1,5		< 2,5 / 1,5		< 2,5 / 1,5		< 2,5 / 1,5		< 2,5 / 1,5		< 2,5 / 1,5									
a <sub>h, s/K<sub>h, s</sub></sub>	m/s <sup>2</sup>	< 2,5 / 1,5								< 2,5 / 1,5											
L <sub>pA/K<sub>pA</sub></sub>	dB(A)	77 / 3		98 / 3		75 / 3		98 / 3		75 / 3		98 / 3									
L <sub>WA/K<sub>WA</sub></sub>	dB(A)	88 / 3		109 / 3		85 / 3		109 / 3		85 / 3		109 / 3									



12.

L



\*2) 2014/30/EU, 2006/42/EC, 2011/65/EU

\*3) EN 62841-1:2015, EN 62841-2-1:2018+A11:2019, EN IEC 63000:2018

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 Direktor Produktentstehung & Qualität (Vice President Product Engineering & Quality)

\*4) Metabowerke GmbH - Metabo-Allee 1 - 72622 Nuertingen, Germany



1.

# Originalbetriebsanleitung

## 1. Konformitätserklärung

Wir erklären in alleiniger Verantwortlichkeit: Diese Akku-Bohrschrauber und -Schlagbohrschrauber, identifiziert durch Type und Seriennummer \*1), entsprechen allen einschlägigen Bestimmungen der Richtlinien \*2) und Normen \*3). Technische Unterlagen bei \*4) - ➔ Abb. K+L

## 2. Bestimmungsgemäße Verwendung

Die Akku-Bohrschrauber und -Schlagbohrschrauber sind geeignet zum Bohren ohne Schlag in Metall, Holz, Kunststoff und ähnlichen Materialien sowie zum Schrauben und Gewindebohren.

Die Akku-Schlagbohrmaschinen sind zusätzlich zum Schlagbohren in Mauerwerk, Ziegel und Stein geeignet.

Für Schäden durch nicht bestimmungsgemäßen Gebrauch haftet allein der Benutzer.

Allgemein anerkannte Unfallverhütungsvorschriften und beigelegte Sicherheitshinweise müssen beachtet werden.

## 3. Allgemeine Sicherheitshinweise



Beachten Sie die mit diesem Symbol gekennzeichneten Textstellen zu Ihrem eigenen Schutz und zum Schutz Ihres Elektrowerkzeugs!



**WARNUNG** – Zur Verringerung eines Verletzungsrisikos Betriebsanleitung lesen.



**WARNUNG** – Lesen Sie alle **Sicherheitshinweise, Anweisungen, Bilderungen und technischen Daten, mit denen dieses Elektrowerkzeug versehen ist.** *Versäumnisse bei der Einhaltung der nachfolgenden Anweisungen können elektrischen Schlag, Brand und/oder schwere Verletzungen verursachen.*

**Bewahren Sie alle Sicherheitshinweise und Anweisungen für die Zukunft auf.**

Geben Sie Ihr Elektrowerkzeug nur zusammen mit diesen Dokumenten weiter.

## 4. Spezielle Sicherheitshinweise

**Tragen Sie Gehörschutz beim Schlagbohren (Maschinen mit der bezeichnung SB).** Die Einwirkung von Lärm kann Gehörverlust bewirken.

**Benutzen Sie den mit dem Gerät gelieferten Zusatzhandgriff.** Der Verlust der Kontrolle kann zu Verletzungen führen.

**Stützen Sie das Elektrowerkzeug vor der Benutzung gut ab.** Dieses Elektrowerkzeug erzeugt ein hohes Drehmoment. Wenn das Elektrowerkzeug während des Betriebs nicht sicher abgestützt wird, kann es zu einem Verlust der Kontrolle und zu Verletzungen kommen.

**Halten Sie das Elektrowerkzeug an den isolierten Griffflächen, wenn Sie Arbeiten ausführen, bei denen das Einsatzwerkzeug, oder die Schrauben, verborgene Stromleitungen treffen kann.** Der Kontakt mit einer spannungsführenden Leitung kann auch metallene Geräteteile unter Spannung setzen und zu einem elektrischen Schlag führen.

**Sicherheitshinweise bei Verwendung langer Bohrer:**

- a) **Arbeiten Sie auf keinen Fall mit einer höheren Drehzahl als der für den Bohrer maximal zulässigen Drehzahl.** Bei höheren Drehzahlen kann sich der Bohrer leicht verbiegen, wenn er sich ohne Kontakt mit dem Werkstück frei drehen kann, und zu Verletzungen führen.
- b) **Beginnen Sie den Bohrvorgang immer mit niedriger Drehzahl und während der Bohrer Kontakt mit dem Werkstück hat.** Bei höheren Drehzahlen kann sich der Bohrer leicht verbiegen, wenn er sich ohne Kontakt mit dem Werkstück frei drehen kann, und zu Verletzungen führen.
- c) **Üben Sie keinen übermäßigen Druck und nur in Längsrichtung zum Bohrer aus.** Bohrer können sich verbiegen und dadurch brechen oder zu einem Verlust der Kontrolle und zu Verletzungen führen.

Überzeugen Sie sich, dass sich an der Stelle, die bearbeitet werden soll, **keine Strom-, Wasser- oder Gasleitungen** befinden (z.B. mit Hilfe eines Metallsuchgerätes).

Die Maschine immer mit beiden Händen an den vorgesehenen Handgriffen festhalten, einen sicheren Stand einnehmen und konzentriert arbeiten.



Akkupacks vor Nässe schützen!



Akkupacks nicht dem Feuer aussetzen!

Keine defekten oder deformierten Akkupacks verwenden!

Akkupacks nicht öffnen!

Kontakte der Akkupacks nicht berühren oder kurzschließen!



Aus defekten Li-Ion-Akkupacks kann eine leicht saure, brennbare Flüssigkeit austreten!



Falls Akkufflüssigkeit austritt und mit der Haut in Berührung kommt, spülen Sie sofort mit reichlich Wasser. Falls Akkufflüssigkeit in Ihre Augen gelangt, waschen Sie sie mit sauberem Wasser aus und begeben Sie sich unverzüglich in ärztliche Behandlung!



# Original instructions

## 1. Declaration of Conformity

We declare and accept sole responsibility for ensuring: these cordless drills/screwdrivers and cordless hammer drills identified by their type and serial number \*1) conform to all relevant provisions of the directives \*2) and standards \*3). Technical documents at \*4) - ➔ Fig. K+L.

### For UK only:

**UK** We as manufacturer and authorized person to  
**CA** compile the technical file, see \*4) ➔ Fig. L., hereby declare under sole responsibility that these battery-powered drilling screwdrivers and impact drills, identified by type and serial number \*1) ➔ Fig. K, fulfill all relevant provisions of following UK Regulations S.I. 2016/1091, S.I. 2008/1597, S.I. 2012/3032 and Designated Standards EN 62841-1:2015, EN 62841-2-1:2018+A11:2019, EN IEC 63000:2018.

## 2. Specified Conditions of Use

The cordless drills/screwdrivers and cordless hammer drills are suitable for drilling without impact in metal, wood, plastic and similar materials as well as for screwdriving and thread tapping.

The cordless hammer drills are also suitable for impact drilling in masonry, brickwork and stone.

The user bears sole responsibility for any damage caused by inappropriate use.

Generally accepted accident prevention regulations and the enclosed safety information must be observed.

## 3. General Safety Information



For your own protection and for the protection of your power tool, pay attention to all parts of the text that are marked with this symbol!



**WARNING** – Read the operating instructions to reduce the risk of injury.



**WARNING** – Read all safety warnings, instructions, illustrations and specifications provided with this power tool. Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury.

**Keep all safety instructions and information for future reference.**

Always include these documents when passing on your power tool.

## 4. Special safety instructions

**Wear ear protectors when impact drilling (machines with the designation SB).** Exposure to noise can cause hearing loss.

**Use the additional handle supplied with the tool.** Loss of control can cause personal injury.

**Brace the power tool properly before use.** This tool produces a high output torque and without properly bracing the tool during operation, loss of control may occur resulting in personal injury.

**Hold the power tool by insulated gripping surfaces, when performing an operation where the cutting accessory may contact hidden wiring.** Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.

**Safety instructions when using long drill bits:**

a) **Never operate at higher speed than the maximum speed rating of the drill bit.** At higher speeds, the bit is likely to bend if allowed to rotate freely without contacting the workpiece, resulting in personal injury.

b) **Always start drilling at low speed and with the bit tip in contact with the workpiece.** At higher speeds, the bit is likely to bend if allowed to rotate freely without contacting the workpiece, resulting in personal injury.

c) **Apply pressure only in direct line with the bit and do not apply excessive pressure.** Bits can bend causing breakage and loss of control, resulting in personal injury.

Ensure that the spot where you wish to work is free of **power cables, gas lines or water pipes** (e.g. using a metal detector).

Always hold the machine with both hands on the designated handles, take a secure stance and concentrate on the work.



Protect battery packs from water and moisture!



Do not expose battery packs to fire!



Do not use faulty or deformed battery packs!

Do not open battery packs!

Do not touch or short circuit battery pack contacts!



A slightly acidic, flammable fluid may leak from defective Li-ion battery packs!



If battery fluid leaks out and comes into contact with your skin, rinse immediately with plenty of water. If battery fluid leaks out and comes into contact with your eyes, wash them with clean water and seek medical attention immediately!

If the machine is defective, remove the battery pack from the machine.

Remove the battery pack from the machine before making any adjustments, changing tools, maintaining or cleaning.

Make sure that the tool is switched off before fitting the battery pack.

Keep hands away from the rotating tool!



Remove chips and similar material only when the machine is at a standstill.

Secure the workpiece to prevent slipping or rotation (e.g. by securing with screw clamps).

LED light (14): do not observe the LED radiation directly with optical instruments.



CAUTION Do not stare at operating lamp.

### Reducing dust exposure:

**WARNING** - Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints,
- Crystalline silica from bricks and cement and other masonry products, and
- 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 your exposure to these chemicals: work in a well-ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

This also applies to dust from other materials such as some timber types (like oak or beech dust), metals, asbestos. Other known diseases are e.g. allergic reactions, respiratory diseases. Do not let dust enter the body.

Observe the relevant guidelines and national regulations for your material, staff, application and place of application (e.g. occupational health and safety regulations, disposal).

Collect the particles generated at the source, avoid deposits in the surrounding area.

Use suitable accessories for special work. In this way, fewer particles enter the environment in an uncontrolled manner.

Use a suitable extraction unit.

Reduce dust exposure with the following measures:

- do not direct the escaping particles and the exhaust air stream towards yourself or nearby persons or towards dust deposits,
- use an extraction unit and/or air purifiers,
- ensure good ventilation of the workplace and keep it clean using a vacuum cleaner. Sweeping or blowing stirs up dust.
- Vacuum or wash protective clothing. Do not blow, beat or brush protective gear.

### Transport of li-ion battery packs:

The shipping of li-ion battery pack is subject to laws related to the carriage of hazardous goods (UN 3480 and UN 3481). Inform yourself of the currently valid specifications when shipping li-ion battery packs. If necessary, consult your freight forwarder. Certified packaging is available from Metabo.

Only send the battery pack if the housing is intact and no fluid is leaking. Remove the battery pack from the machine for sending. Prevent the contacts

from short-circuiting (e.g. by protecting them with adhesive tape).

## 5. Figures

Illustrations are provided at the beginning of the operating instructions.

### Symbol explanation:

	Movement direction
	Drill bit
	Slow
	Fast
	First gear
	Second gear
	Third gear
	Screws
	Drills, screws, threaded rods
	Impact drilling
Nm	Torque

## 6. Overview

→ Fig. A

- 1 Keyless chuck
- 2 Additional handle
- 3 Slide switch (normal drilling, impact drilling) \*
- 4 Gear switch
- 5 Rotation selector switch (rotation setting, transport lock) - both sides of the machine
- 6 Handle
- 7 Bit depot \*
- 8 Belt hook \*
- 9 Battery pack release button
- 10 Capacity indicator button
- 11 Capacity and signal indicator
- 12 Battery pack \*
- 13 Setting wheel for
  - Pulse function
  - Torque control
  - max. torque
- 14 LED lamp (Working light and red warning lamp)
- 15 Trigger switch
- 16 C-wrench (to open the drill chuck of machines with the designation ....metal) \*

\*equipment-specific

## 7. Use

### 7.1 Electronic safety shutdown

In case of sudden rotation of the power tool around the drill axis, e.g. due to catching/jamming of the accessory, the machine switches off automatically - for better control of the machine and high user protection compared to machines without this function.

The shutdown is indicated by a single red flashing of the LED light (14) and a single beep.

## 7.2 Battery pack, capacity and signal indicator ➔ Fig. B

Charge the battery pack before use.


Recharge the battery pack if performance diminishes.

Instructions on charging the battery pack can be found in the operating instructions of the Metabo charger.

## 7.3 Removing and inserting the battery pack ➔ Fig. C

## 7.4 Setting the direction of rotation, engaging the transporting safety device (switch-on lock) ➔ Fig. D


## 7.5 Select the gear ➔ Fig. E


 Do not set the gear switch (4) unless the motor has stopped completely!

## 7.6 Set drill, hammer drill ➔ Fig. A

Activate slide switch (3).

## 7.7 Setting torque control, maximum torque, pulse function

 For the protection of the user and the machine: Perform metric screw connection with M8 thread size or larger only with torque limitation on settings 1 to 5. Otherwise the machine can get damaged by the torque shock during the screw-driving process or the user can get injured by a kick-back of the machine.


 Do not work for long periods with pulse function switched on! (The motor can overheat.)

➔ Fig. F

Set the desired operating mode at the setting wheel (13):

1...10 = Torque control

 = maximum torque

 = Impulse function (for loosening jammed screws without tearing them off)

## 7.8 Switching On/Off, setting the speed ➔ Fig. A

**Switching on, speed:** press the trigger switch (15). Press in the trigger switch to increase the rotational speed.

**Switching off:** release the trigger switch (15). Note: the noise that the machine makes when it switches off is due to the design (quick stop) and has no influence on the function or the service life of the machine.

## 7.9 Keyless chuck ➔ Fig. G

With a soft tool shank, retightening may be required after a short drilling period.

### Instructions for machines with the designation SB...:

1. The grating sound which may be heard after opening the chuck is functional and is stopped by turning the sleeve in the opposite direction.
2. Clamping the tool:


Turn sleeve in direction "GRIP, ZU" until the noticeable mechanical resistance has been overcome.

**Caution! The tool is not yet clamped!** Keep turning the sleeve (**it must "click" when turning**), until it cannot be turned any further - **only now** is the tool **securely** clamped.

**Cleaning:** from time to time, hold the machine vertically with the chuck facing downwards and turn the sleeve fully in the direction "GRIP, ZU" and then turn fully in the direction "AUF, RELEASE". The dust collected falls from the keyless chuck.

### Instructions for machines with the designation ...metal:

If the drill chuck cannot be opened by hand use the C-wrench (16) as shown. ➔ Fig. H.

 Do not use the C-wrench (16) for tensioning the drill chuck.

## 7.10 Chuck with quick-change system Quick (for machines with the designation ...BL Q...) ➔ Fig. I.

**To remove:** Push the interlock ring forward (a), advance and pull off the chuck (b).

**To fit:** push the interlock ring forward and move the chuck as far as the limit stop on the drill spindle.

## 7.11 Fitting the belt hook (equipment-specific) / bit depot (equipment-specific) ➔ Fig. J

Fit the belt hook (8) as shown.


Fit the bit depot (7) as shown.


## 8. Troubleshooting

### 8.1 Defective electronic safety shutdown

Red continuous lighting of the LED lamp (14) signals a defective safety shutdown. Have the machine repaired. See chapter 10.

### 8.2 The machine's multifunctional monitoring system

 If the machine switches off automatically, the machine electronics have activated automatic protection mode. There will be a warning signal (beep). The beeping stops after a maximum of 30 seconds or when the trigger switch (15) is released.

 In spite of this protective function, overloading is still possible with certain applications and can result in damage to the machine.

### Causes and remedies:

- Battery pack almost empty** → Fig. A, B (The electronics protect the battery pack against damage through total discharge).  
If one LED (11) is flashing, the battery pack is almost flat. If necessary, press the button (10) and check the LED lamps (11) to see the charge level. If the battery pack is almost flat, it must be recharged.
- Long continuous overloading of the machine will activate the **temperature cut-out**.  
Leave the machine or battery pack to cool.  
**Note:** if the battery pack feels very warm, the pack will cool more quickly in an "AIR COOLED" charger.  
**Note:** the machine will cool more quickly if you operate it at idling speed.
- Metabo **safety shutdown**: the machine has SHUT DOWN by itself. If the speed suddenly drops (for example, if the machine suddenly seizes or kickback occurs), the machine switches off. Switch off the machine at the trigger switch (15). Switch it on again and continue to work as normal. Try to prevent the machine from seizing.

### 8.3 Note:

The LED lamp (14) switches off automatically after a specific time.

## 9. Accessories


Use only original Metabo or CAS (Cordless Alliance System) battery packs and accessories.

Use only accessories that fulfil the requirements and specifications listed in these operating instructions.

Fit accessories securely. If the machine is operated in a holder: secure the machine well. Loss of control can cause personal injury.

See [www.metabo.com](http://www.metabo.com) or the catalogue for a complete range of accessories.

## 10. Repairs

 Repairs to electrical tools must only be carried out by qualified electricians!

Contact your local Metabo representative if you have Metabo power tools requiring repairs. For addresses see [www.metabo.com](http://www.metabo.com).

You can download a list of spare parts from [www.metabo.com](http://www.metabo.com).

## 11. Environmental Protection

Observe national regulations on environmentally compatible disposal and on the recycling of disused machines, packaging and accessories.

Packaging materials must be disposed of according to their labelling in accordance with municipal

guidelines. Further information can be found at [www.metabo.com](http://www.metabo.com) in the "Service" section.

Battery packs may not be disposed of with regular waste. Return faulty or used battery packs to your Metabo dealer!

Do not allow battery packs to come into contact with water!



Protect the environment, and do not dispose of power tools and battery packs with household waste. Observe national regulations on separated collection and recycling of disused machines, packaging and accessories.

Discharge the battery pack in the power tool before disposal. Prevent the contacts from short-circuiting (e.g. by protecting them with adhesive tape).

## 12. Technical Data

→ Fig. K. We reserve the right to make technical improvements.

U = Voltage of battery pack  
n<sub>0</sub> = No-load speed

Tightening torque for screwing:

M<sub>1</sub> = Soft screwing application (wood)

M<sub>2</sub> = Pulse torque

M<sub>3</sub> = Hard screwing applications (metal)

M<sub>4</sub> = Adjustable torque

Max. drill diameter:

D<sub>1 max</sub> = in steel

D<sub>2 max</sub> = in softwood

D<sub>3 max</sub> = in masonry

s = Max. impact rate

m = Weight (with the smallest battery pack)

G = Spindle thread

D<sub>max</sub> = Chuck clamping range

Measured values determined in conformity with EN 62841.

Permitted ambient temperature during operation:  
-20 °C to 50 °C (limited performance with temperatures below 0 °C). Permitted ambient temperature for storage: 0 °C to 30 °C

== direct current

The technical specifications quoted are subject to tolerances (in compliance with relevant valid standards).

### Emission values

These values make it possible to assess the emissions from the power tool and to compare different power tools. The actual load may be higher or lower depending on operating conditions, the condition of the power tool or the accessories used. Please allow for breaks and periods when the load is lower for assessment purposes. Arrange protective measures for the user, such as organisational measures based on the adjusted estimates.

**Vibration total value** (vector sum of three directions) determined in accordance with EN 62841:

a<sub>h, ID</sub> = Vibration emission value  
(impact drilling in concrete)

## en ENGLISH

- $a_{h,D}$  = Vibration emission value  
(Drilling in metal)
- $a_{h,S}$  = Vibration emission value (screwing  
without impact)
- $K_{h,...}$  = Uncertainty (vibration)

Typical A-effective perceived sound levels:

$L_{pa}$  = sound-pressure level

$L_{WA}$  = Acoustic power level

$K_{pA}, K_{WA}$  = Uncertainty (noise level)

During operation the noise level can exceed  
80 dB(A).



**Wear ear protectors!**