Battery Power Line. Battery-driven power tool system for orthopaedics and traumatology.



User's Manual



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The Battery Power Line is a heavy-duty battery-driven system intended for orthopaedic and trauma applications including drilling, sawing, inserting/ removing K-wires, DHS/DCS, and intramedullary and acetabular reaming.

Battery reamer/drill



Drilling



Reaming



K-wire insertion

Battery oscillator



Oscillating sawing





Reciprocating sawing

Three drive units are available for various applications:

- Battery Reamer/Drill (530.605)
- Battery Oscillator (530.610)
- Battery Reciprocator (530.615)

Environmental conditions

	Operation	Transport and Storage
Temperature	10° to 40°C (50° to 104°F)	–20° to 50°C (–4° to 122°F)
Relative humidity	10%-100%	10%-75%
Atmospheric pressure	500–1060 hPa	500–1060 hPa

The machine may not be stored or operated in explosive atmospheres.

Protection systems

The Battery Power Line drive units have two protection systems.

Thermal overload protection—switches the unit off if it begins to overheat during operation. The unit returns to operational status when it has cooled sufficiently. This safety feature also ensures the unit has cooled sufficiently following steam sterilization, before use.

Battery low-discharge protection — prevents batteries from completely discharging, to ensure longer battery life.

Compliance

The devices comply with the following standards: UL 60601-1 (CAN/CSA C22.2 No. 601.1) EN 60601 (IEC 601-1) EN 60601-1-2 (DIN EN 60601-1-2)

Duty cycle

Intermittent operation

	X min on	Y min off
Drilling and tapping	3	45
Reaming	3	45
Sawing	3	45

To prevent overheating, the handpiece and the attachment should be allowed to cool for at least 45 minutes following 3 minutes of constant use. The user is responsible for following the indicated guidelines. If longer periods of constant use are required, an additional handpiece and/or attachment should be used.

Important:

- Always use new cutting tools to prevent overheating of the system due to reduced cutting performance.
- Careful maintenance of the system will reduce heat development in the handpiece and the attachments.

Explanation of symbols used

The following symbols are applied to the device or individual components.



Caution. Read the provided instructions for use before operating the device.



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Do not immerse device in liquids.

The device is classified as type BF against electrical shock and leakage current. The device is suitable for use on patients according to the standards defined by UL 60601-1CAN/CSA C22.2 No. 601.1 and IEC 60601-1.



The battery contains rechargeable NiMH (nickel metal hydride) cells. The battery is recyclable.



Batteries may not be disposed of with household garbage. Dispose of or recycle the batteries in accordance with local and national regulations.



The device fulfills the UL requirements for USA and Canada.

Battery Reamer/Drill (530.605)

- Speed (without attachment): 0–340 rpm (maximum speed varies with attachment)
- Torque (without attachment): 0–15 Nm (maximum torque varies with attachment)
- Weight (including battery pack): 1.85 kg
- Cannulation: 4.1 mm
- Protection against electric shock: BF
- Protection against water intrusion: IP X4
- Cleaning Brush (516.101) and Autoclavable Oil (519.97) included

Attachment release ring

Facilitates one-handed removal of attachments





Mode switch Turns drive OFF for safety during drive unit and/or attachment exchange, and selects clockwise (FWD) or counterclockwise (REV) rotation

Battery Oscillator (530.610)

- Speed: 0-12,000 oscillations per minute
- Weight (including battery pack): 2.10 kg
- Protection against electric shock: BF
- Protection against water intrusion: IP X4
- Autoclavable Oil (519.97) included







Mode switch Turns drive OFF for safety during drive unit and/or saw blade exchange, and ON for sawing

Battery Reciprocator (530.615)

- Speed: 0-14,000 oscillations per minute
- Weight (including battery pack): 2.00 kg
- Protection against electric shock: BF
- Protection against intrusion of water: IP X4
- Autoclavable Oil (519.97) included







Mode switch Turns drive OFF for safety during drive unit and/or saw blade exchange, and ON for sawing

- Voltage: 14.4 VDC
- Type: NiMH
- Capacity: 2.0 Ah
- Charging Time: 70 minutes (maximum)
- Working Temperature: 0° to 50°C (32° to 122°F)

Important: Do not sterilize* batteries! Batteries will no longer function.



* This product is validated for STERRAD® 100S sterilization system. Please, refer to your STERRAD® equipment manufacturer's manual for recommended STERRAD® sterilization protocol.

Specifications Universal Battery Charger II (05.001.204)

The Universal Battery Charger II includes four independent charging bays. Each charging bay has three slots; the Battery Power Line battery fits into the first slot.



10 Battery Power Line Battery (530.620)



- 4 Control display for each charging bay
- 5 Ventilation holes



Complies with standards: UL 60601-1, 1st Edition IEC 60601-1, 2nd Edition



Universal Battery Charger II With respect to electrical shock, fire and mechanical hazards only in accordance with UL 60601-1/CAN/CSA C22.2 No. 601.1

IEC 60601-1-2 IEC 60601-1-4

Note: Please refer to the Universal Battery Charger II User's Manual for additional information.

Attachments for Battery Reamer/Drill (530.605)

Drilling speed attachments

All the drilling speed attachments are geared to increase the maximum drive speed to 930 rpm while reducing the maximum torque to 6.0 Nm.*

530.730 Chuck with key Cannulation: 3.2 mm Accepts round and triangular shafts up to 7.3 mm



530.731 Chuck, keyless Cannulation: 3.2 mm Accepts round and triangular shafts up to 7.3 mm



530.741 Adaptor for Radiolucent Drive Couples Radiolucent Drive (511.30) to the Battery Reamer/Drill (530.605)



- 530.750 Quick Coupling for drill bits Cannulation: 1.2 mm Accepts cutting tools and instruments with AO quick coupling fitting
- 530.760 Large Quick Coupling Cannulation: 3.2 mm Accepts cutting tools and instruments with large quick coupling fitting



* Performance specifications on file at Synthes.

Attachments for Battery Reamer/Drill (530.605) continued

530.790	Quick Coupling for K-Wires Cannulation: 4.0 mm (fully open) To insert/remove Kirschner wires and guide pins, 1.5 mm–4.0 mm diameter (any length)	
530.792	Hudson Drilling Attachment Cannulation: 3.2 mm Accepts cutting tools and instruments with Hudson fitting	
530.793	Modified Trinkle Drilling Attachment Cannulation: 3.2 mm Accepts cutting tools and instruments with modified Trinkle fitting	
530.794	Trinkle Drilling Attachment Cannulation: 3.2 mm Accepts cutting tools and instruments with Trinkle fitting	

Reaming speed attachments

All the reaming speed attachments transfer the speed and torque of the drive unit, with a maximum speed of 340 rpm and a maximum torque of 15.0 Nm.*

530.732	Chuck with key Cannulation: 4.0 mm Accepts round and triangular shafts up to 7.3 mm	
530.780	AO Reaming Attachment Cannulation: 4.0 mm Accepts cutting tools and instruments with AO reaming fitting	
530.782	Hudson Reaming Attachment Cannulation: 4.0 mm Accepts cutting tools and instruments with Hudson fitting	
530.783	Modified Trinkle Reaming Attachment Cannulation: 4.0 mm Accepts cutting tools and instruments with modified Trinkle fitting	
530.784	Trinkle Reaming Attachment Cannulation: 4.0 mm Accepts cutting tools and instruments with Trinkle fitting	
530.795	Large Modified Trinkle Reaming Attachment Cannulation: 4.0 mm Accepts cutting tools and instruments with a large tapered modified Trinkle fitting	

* Performance specifications on file at Synthes.

Operating Instructions—Universal Battery Charger II (05.001.204)

Connect the electrical cord to the charger, and plug the cord into a grounded 110/120 VAC outlet.

Turn on the charger by pressing the "I" on the power switch (Figure 1).

The ON/OFF display light on the front of the charger will illuminate (Figure 2).*

Note: If the red caution display light for a single charging bay illuminates before the battery is inserted, this charging bay is damaged (Figure 3). The batteries can still be charged in the other charging bays, but it is recommended that the device be sent to the Synthes Service Department for repair.

Important: Do not operate the charger in the direct vicinity of radiators or other heat emitting devices, as these can affect the device.

Place the charger on a hard, non-slip, stable base. Ensure that the ventilation holes in the base of the device are not covered by towels or other objects.

Do not expose the device to direct sunlight or moisture.

Do not cover the side ventilation holes on the device.



Figure 1



Figure 2



Figure 3

*If LEDs do not follow this sequence, refer to the troubleshooting section, page 45.

Insert the battery into one of the appropriate charging bays. The yellow LED should remain illuminated, indicating that the battery is charging (Figure 4).*

When the green LED illuminates, the battery is fully charged (Figure 5).*

Note: Batteries can be removed during the charging process; however, they may not be fully charged and operational time may be shorter.

Important: Always leave the charger switched on when a battery is inserted in a charging bay.



Figure 4



Figure 5

*If LEDs do not follow this sequence, refer to the troubleshooting section, page 45.

Temperature monitoring

The battery and the charger heat up during the charging process. Therefore, the ventilation holes should not be covered.

If the temperature is too high, the yellow battery symbol will flash (Figure 1). To protect the battery, the device stops charging until the battery has cooled down. If this occurs, do not remove the battery from the charger until the yellow battery symbol stays illuminated. The charging time will be longer in this case.

Charging new batteries or batteries not recently used

New Battery Power Line batteries that have not been used for longer than 6 weeks and that have not been stored in an activated charger may require 3 to 5 charging cycles to reach their full capacity. When in doubt, the charger can be used to check the battery status and to refresh the battery (see page 17).

Errors during charging

The following errors may occur when charging a battery:

Yellow display light flashes (Figure 1):

The battery is too hot and must cool down before the charging process can automatically resume. The battery can be left in the charger.

Red display light illuminates (Figure 2): The battery is damaged and must be replaced.

No display light:

The battery has not engaged in the charging bay or has not been recognized by the device. Remove the battery and insert again or use another charging bay.



flashing

Figure 1



Figure 2

Diagnostic test

Battery Power Line batteries can be tested for remaining capacity or, if they have not been used for some time, can be refreshed with the Universal Battery Charger II.

The following can affect battery performance:

- new, unused battery
- battery not used for long period of time
- old battery

Important: The diagnostic test takes up to 10 hours and should only be carried out if there is enough time to do so.

After the battery is inserted, the yellow battery symbol illuminates. To refresh and check the battery, press the button with the exclamation mark on the charger display of the charging bay for at least 2 seconds (Figure 1) until the yellow arrow illuminates (Figure 2). The device then carries out the diagnostic test. The yellow arrow remains illuminated throughout the diagnostic process.



Figure 1



Figure 2

Diagnostic test continued Diagnosis

Green battery symbol illuminates (Figure 3): Battery has been tested, charged and is ready to use. Battery Power Line battery is charged with at least 70% capacity remaining.

Red caution symbol illuminates (Figure 4): Battery has been checked, is not charged and cannot be used. The battery must be replaced.

Important: The diagnostic test takes up to 10 hours and should only be carried out if there is enough time to do so.

Note: Batteries can be charged or undergo diagnostic tests independently in each charging bay.

Important:

- To recharge batteries normally, do not press the exclamation mark button.
- Checking the battery status and refreshing the battery have an impact on the battery. If this is carried out frequently, the lifespan of the battery may be affected.
- Do not remove the battery from the charging bay while the yellow display is illuminated. Wait until the diagnostic process has ended and the green or red display illuminates. Only then is the battery status clearly assessed.
- If the diagnostic process is interrupted, such as a power outage or a switch to the hospital's emergency power system, the diagnostic process must be restarted.



Figure 3



Figure 4

Synthes nonsterile batteries and advanced charging technology optimize intraoperative battery capacity, maximize battery lifespan, significantly decrease memory effect, and shorten turnaround time. One universal battery charger for all Synthes battery-driven systems simplifies the charging process. Simple aseptic technique preserves the sterile field when assembling the battery pack.

Instruments	
530.620	Battery
530.650	Battery Insertion Shield
530.680	Battery Casing
530.681	Battery Casing with Lock

Scrubbed person

- 1. Ensure the lid of the battery casing is fully open.
- **2.** Position the battery insertion shield securely on top of the battery casing. The battery insertion shield helps guide the battery into the battery casing and prevents contamination of the sterile casing by the nonsterile battery.





Operating Instructions—Battery Pack continued

Circulating person

- **3.** Insert the battery into the battery casing (3a) and press down to ensure it is seated fully (3b).
- 4. Remove the battery insertion shield.







Scrubbed person

5. Close the lid of the battery casing, taking care to not contact the battery. To lock the battery casing, press down with the palm of the hand and then turn the latch while maintaining pressure on the lid.

Note: One battery is usually sufficient for one operation; however, preparing additional battery packs for each drive unit prevents the need for intraoperative exchange of battery packs between drive units. It also allows rapid intraoperative battery pack exchange if required.

6. Insert the battery pack into the drive unit, ensuring the contacts on the battery pack align with the contacts in the recess of the drive unit (as shown). Press firmly to ensure the battery pack is engaged correctly, and check by pulling lightly downward on the battery pack. (For safety, the battery pack can be inserted fully only when in the correct orientation).

Important:

To prevent injuries, the mode switch of the drive unit should always be in the "OFF" position when inserting or removing the battery pack.

Installing the battery pack just before use prevents unwanted discharge of battery capacity.

7. Press both release buttons simultaneously on the drive unit to remove the battery pack.

Important: Do not sterilize batteries! Batteries will no longer function.









Operating Instructions—**Drive Units**

Battery Oscillator (530.610)

To operate the drive unit, turn the mode switch to the "ON" position.

The single variable-speed trigger allows control of the oscillating frequency from 0 to 12,000 oscillations per minute. Ensure the drive unit is running prior to contacting the bone. Optimal sawing performance is achieved by gently moving back and forth in the plane of the saw blade, so the blade can oscillate freely slightly beyond the bone.

Important: To prevent injuries, the mode switch of the drive unit should always be in the "OFF" position when inserting or removing saw blades, or adjusting the sawing plane.

To operate, turn the mode switch to the "ON" position.



Insert saw blade

- Ensure the saw blade coupling is fully open by turning the locking knob in the direction of the arrow.
- Insert an oscillating saw blade into the coupling and align the blade in the desired direction (variable in 45° increments).
- Turn the locking knob in the opposite direction to the arrow to secure the blade.

Adjust sawing plane

- Pull the collar back and rotate the saw head to adjust the sawing plane (variable in 45° increments).
- Release the collar and turn the saw head slightly until it locks in place.

Remove saw blade

Open the saw blade coupling fully by twisting the locking knob in the direction of the arrow and remove the oscillating saw blade.







Battery Reciprocator (530.615)

To operate the drive unit, turn the mode switch to the "ON" position.

The single variable-speed trigger allows control of the reciprocating frequency from 0 to 14,000 oscillations per minute. Ensure the drive unit is running prior to contacting the bone. Optimal sawing performance is achieved by gently moving back and forth in the plane of the saw blade, so the blade can reciprocate freely slightly beyond the bone.

Important: To prevent injuries, the mode switch of the drive unit should always be in the "OFF" position when inserting or removing saw blades, or adjusting the sawing plane.

To operate, turn the mode switch to the "ON" position.





Insert saw blade

Insert a reciprocating saw blade into the coupling and push until the saw blade locks in place. (If the blade cannot be inserted, turn the release knob in the direction of the arrow to open the coupling).

Adjust sawing plane

- Pull the collar back and rotate the saw head to adjust the sawing plane (variable in 45° increments).
- Release the collar and turn the saw head slightly until it locks in place.

Remove saw blade

Turn the release knob in the direction of the arrow to eject the reciprocating saw blade.







Operating Instructions—Drive Units continued



Battery Reamer/Drill attachments

Instrument

530.605 Battery Reamer/Drill

Important: To prevent injuries, the mode switch of the drive unit should always be in the "OFF" position when inserting or removing attachments and instruments.

Insert attachment

- Insert the attachment into the coupling of the battery reamer/drill, aligning the positioning pins of the attachment with the grooves on the release ring.
- Push and turn the attachment clockwise until it locks in place.

Remove attachment

Turn the attachment release ring in the direction of the arrow and remove the attachment.







Operating Instructions—Attachments continued

Drilling speed attachments

All the drilling speed attachments are geared to increase the maximum drive unit speed to 930 rpm while reducing the maximum torque to 6.0 Nm.*

Chuck with key (530.730)

Accepts round and triangular shafts up to 7.3 mm.



Insert an instrument

- Open the chuck jaws by turning the key counterclockwise, or by manually turning the collar.
- Insert the instrument shaft into the opened chuck.
- Close the chuck manually by rotating the collar, keeping the shaft centered in the jaws.
- Tighten the chuck by turning the key clockwise.

Remove an instrument

- Turn the key counterclockwise to open the jaws.
- Remove the instrument.







* Performance specifications on file at Synthes.

Chuck, keyless (530.731)

Accepts round and triangular shafts up to 7.3 mm.

Insert an instrument

- Open the chuck jaws by holding on to the retaining ring and manually turning the chuck clockwise.
- Insert the instrument shaft into the opened chuck.
- Close the chuck by holding on to the retaining ring and manually turning the chuck counterclockwise.
- Ensure the instrument shaft is centered in the chuck.

Remove an instrument

- Open the chuck jaws by holding on to the retaining ring and manually turning the chuck clockwise.
- Remove the instrument.







Operating Instructions—Attachments continued

Drilling speed attachments continued

Adaptor for Radiolucent Drive (530.741)

Instruments	
511.30	Radiolucent Drive
530.605	Battery Reamer/Drill
530.741	Adaptor for Radiolucent Drive

Adaptor allows the radiolucent drive to be used with the battery reamer/drill.

Assemble radiolucent drive

 After inserting the adaptor for radiolucent drive into the battery reamer/drill, slide the radiolucent drive over the attachment and twist until the drive shaft engages.

Remove radiolucent drive

- To remove, pull the radiolucent drive off the attachment.



Quick Coupling for drill bits (530.750)

Accepts cutting tools and instruments with an AO quick coupling fitting.

Insert an instrument

- Introduce the instrument into the attachment, then push and turn the instrument until it locks in place.
- Pull lightly on the instrument to ensure it is secure.

Note: It is not necessary to pull back the collar of the attachment to insert the instrument.

Remove an instrument

 Pull back the collar of the attachment and remove the instrument.







Drilling speed attachments continued

Large Quick Coupling (530.760)

Accepts cutting tools and instruments with a large quick coupling fitting. These include DHS/DCS triple reamers, large quick coupling screwdriver shafts, large quick coupling cannulated drill bits for Synthes intramedullary nailing systems and the Synthes Reamer/Irrigator/Aspirator (RIA) system.

Insert an instrument

- Push forward on the collar of the attachment and insert the instrument, turning it slightly to align the keyway.
- Release the collar, pulling lightly on the instrument to ensure it is secure.

Remove an instrument

 Push forward on the collar of the attachment and remove the instrument.







Quick Coupling for K-Wires (530.790)

Allows insertion and removal of Kirschner wires and guide pins with diameters from 1.5 mm to 4.0 mm, in any length.

Insert a K-wire/guide pin into the attachment

- Set the appropriate diameter range on the attachment.
- Insert the wire/pin into the front of the attachment. The attachment is spring-loaded to prevent the wire/pin from falling out.

Insert a K-wire/guide pin into the bone

- Pull the attachment lever toward the drive unit to grip the wire/pin and press the trigger to insert.
- Release the lever to reposition the attachment on the wire/pin, if required.

Remove a K-wire/guide pin from the bone

- Set the appropriate diameter range on the attachment.
- Slide the attachment over the wire/pin. Set the mode switch on the drive unit to "REV" (reverse).
- Pull the attachment lever toward the drive unit to grip the wire/pin. Press the trigger while pulling backward to remove.





Operating Instructions—Attachments continued

Drilling speed attachments continued

Hudson Drilling Attachment (530.792) Accepts cutting tools and instruments with a Hudson fitting.



Modified Trinkle Drilling Attachment (530.793) Accepts cutting tools and instruments with a modified Trinkle fitting.

Trinkle Drilling Attachment (530.794)

Accepts cutting tools and instruments with a Trinkle fitting.



Insert an instrument

- Pull back the collar of the attachment and insert the instrument, turning it slightly to align the keyway.
- Release the collar, pulling lightly on the instrument to ensure it is secure.

Remove an instrument

 Pull back the collar of the attachment and remove the instrument.



Reaming speed attachments

All the reaming speed attachments transfer the speed and torque of the drive unit, with a maximum speed of 340 rpm and a maximum torque of 15.0 Nm.*

Chuck with key (530.732)

Accepts round and triangular shafts up to 7.3 mm.



Insert an instrument

- Open the chuck jaws by turning the key counterclockwise, or by manually turning the collar.
- Insert the instrument shaft into the opened chuck.
- Close the chuck manually by rotating the collar, keeping the shaft centered in the jaws.
- Tighten the chuck by turning the key clockwise.

Remove an instrument

- Turn the key counterclockwise to open the jaws.
- Remove the instrument.





* Performance specifications on file at Synthes.
Reaming speed attachments continued

AO Reaming Attachment (530.780)

Accepts cutting tools and instruments with an AO reaming fitting including intramedullary reaming shafts with the AO reaming fitting.

Insert an instrument

- Insert the instrument into the attachment and turn it clockwise until it locks in place.
- Pull lightly on the instrument to ensure it is secure.

Note: It is not necessary to pull back the collar of the attachment to insert the instrument.

Remove an instrument

 Pull back the collar of the attachment and remove the instrument.







Hudson Reaming Attachment (530.782) Accepts cutting tools and instruments with a Hudson fitting.

Modified Trinkle Reaming Attachment (530.783) Accepts cutting tools and instruments with a modified Trinkle fitting.

Trinkle Reaming Attachment (530.784)

Accepts cutting tools and instruments with a Trinkle fitting.

Large Modified Trinkle Reaming Attachment (530.795) Accepts cutting tools and instruments with a large, tapered, modified Trinkle fitting.

Insert an instrument

- Pull back the collar of the attachment and insert the instrument, turning it slightly to align the keyway.
- Release the collar, pulling lightly on the instrument to ensure it is secure.

Remove an instrument

 Pull back the collar of the attachment and remove the instrument.











Operating Instructions—Graphic Case (690.570) and Attachment Rack (690.572)

The graphic case provides organized storage and serves as a sterilization container for the system.

The attachment rack provides organized storage and serves as a sterilization container for the attachments. It is also a stand for the drive units in the sterile field.

Grommets (690.574.04) provided with the attachment rack are designed to help OR personnel organize the attachments in the rack by plugging the holes for attachments they did not purchase. The grommets are autoclavable, allowing them to be left in the attachment rack for cleaning and sterilization.



Graphic Case, for Battery Power Line Set includes: Lid (690.571), Attachment Rack (690.572) and Insert Tray (690.573)

Use of the attachment rack in the sterile field

Up to three drive units with battery packs assembled can be holstered in the recesses of the lid. The attachment rack can be used to support the drive units, for assembling/ disassembling attachments, and for inserting/removing cutting tools.





Open the attachment rack

Lift the attachment rack out of the graphic case and stand it in the sterile field. Pull the handles up, fold the handles out, open the lid and push the handles down.



Pull handles up



Fold handles out



Open lid, push handles down

Close the attachment rack

Pull the handles up, fold the handles out, close the lid and fold the handles in. Return the attachment rack to the graphic case and push the handles down.



Pull handles up and fold out. Close lid.



Closed, handles down



Fold handles in to secure the lid

Regular care and maintenance according to the following guidelines can significantly increase the reliability and lifespan of the system. Synthes recommends annual preventive services. Yearly maintenance will ensure that the equipment maintains the highest standard of performance and will prolong the life of the system.

Important: Disassemble battery pack and return batteries to charger immediately after each use. **Do not disinfect, immerse, or sterilize batteries.** Batteries may be wiped with a cloth.

- Before cleaning and sterilization, remove attachments, instruments and cutting tools from the drive units.
- Cleaning and lubrication should be performed immediately after each use.
- Clean the drive units, attachments and battery casings by hand. Never immerse or clean in an automatic washer or ultrasonic cleaner.
- Use a neutral pH cleaning solution.

Caution: Do not sterilize* batteries! Batteries will no longer function.

Cleaning batteries and Universal Battery Charger II To clean batteries and charger, wipe with a soft cloth using a neutral enzymatic or neutral detergent solution.

Important: Do not use solvents to disinfect the batteries. Battery poles must not contact water or solvents: Danger of short circuiting!





* This product is validated for STERRAD® 100S sterilization system. Please, refer to your STERRAD® equipment manufacturer's manual for recommended STERRAD® sterilization protocol.

Battery storage and charging

After cleaning, insert the batteries into the charger. The charger continuously monitors the battery level and automatically recharges as required. This ensures the batteries are fully charged and ready for use at any time. When all four charging bays are occupied, additional batteries can be stored in a cool dry place. Before the next use, the batteries must be fully charged.

Important:

New batteries, and batteries stored out of the charger for a prolonged period of time, may require two or three charging cycles to achieve full capacity.

Always leave the charger switched on when a battery is inserted in a charging bay to ensure batteries are fully charged and to prevent discharge.

For care and maintenance of Battery Power Line Equipment please refer to "Manual Cleaning Instructions" chart (J9662) and "Lubrication Chart" (J9663) for Synthes battery-driven power equipment and the "Sterilization Guide for Battery Power Line Sets" (J5701).

Troubleshooting—**Drive Units and Attachments**

Problem	Possible Causes	Remedy
Drive unit does not start.	Mode switch OFF.	Set mode switch to ON/FWD/REV.
	Drive unit has not cooled after sterilization.	Allow to cool to room temperature.
	No electrical contact between drive unit and casing.	Reinsert or change battery casing.
	Battery is drained.	Charge or replace battery.
Drive unit lacks power.	Battery is drained.	Charge or replace battery.
Drive unit suddenly stops.	Battery is drained.	Charge or replace battery.
	Drive unit has overheated.	Allow to cool to room temperature.
Drive unit continues to run after releasing trigger.	Trigger is jammed by residue.	Immediately turn mode switch to OFF. Operate trigger repeatedly and follow care and maintenance guidelines.*
Attachments will not couple to battery reamer/drill.	Coupling is blocked by residue.	Turn mode switch to OFF. Remove solid particles with pickups and follow care and maintenance guidelines.*
Instruments are difficult or impossible to attach.	Attachment or instrument worn excessively.	Replace attachment or instrument.
Battery oscillator vibrates excessively.	Saw blade coupling is loose.	Retighten locking knob.
	Saw blade is inserted incorrectly.	Reposition saw blade and tighten locking knob.

* For additional information, please refer to the Manual Cleaning Instructions (J9662) and Lubrication Chart (J9663) for Synthes battery-driven power equipment.

Troubleshooting—Universal Battery Charger II

Problem	Possible Causes	Remedy
ON/OFF display does not illuminate.	Charger is switched off.	Turn charger power switch on.
	Power cord is not plugged in.	Connect power cord to charger, plug into wall outlet, and switch on.
	Power supply is interrupted (e.g., damaged fuse).	Check power supply. Replace fuse if necessary.
	Charger is damaged.	Send to Synthes Service Department.
ON/OFF display flashes.	Charger is damaged.	Send to Synthes Service Department.
Battery is inserted and charge display status does not illuminate.	Battery is not fully inserted.	Ensure the battery is inserted properly.
	Contacts in the charging bay are dirty.	Carefully clean contacts with soft brush
	Battery was not recognized by the charger.	Remove battery and reinsert in an open charging bay.
	Battery is damaged.	Replace battery.
	Charging bay is damaged.	Send to Synthes Service Department.
Red caution display A illuminates when no battery is inserted.	Charging bay is damaged.	Send to Synthes Service Department.
Yellow battery display 📼 flashes when charging.	Battery is too hot.	Leave battery inserted in charging bay. Charger automatically restarts the charging process once the battery has cooled.

Please refer to the Universal Battery Charger II User's Manual for additional information.

Problem	Possible Causes	Remedy	
Arrow display © does not illuminate when exclamation	Button was released too soon.	Press button and hold for at least 2 seconds.	
button ① is pressed.	Charging bay is damaged.	Send to Synthes Service Department.	
	Charger has an error.	Switch off charger, wait 3 seconds, and switch charger on. If the ON/OFF display flashes, send to Synthes Service Department.	
Battery is impossible to insert.	Battery is being inserted into wrong slot in charging bay.	Insert battery into correct slot in charging bay.	
	Contacts in charging bay are bent.	Send to Synthes Service Department.	
Charger is noisy.	Vents on sides, back or base are covered.	Position charger so that vents are exposed.	
	Charger positioned next to heat source.	Position charger away from heat source.	
Battery performance is low.	Insufficient battery status.	Refresh battery (see page 17).	
	Expected battery life is reached.	Test battery (see pages 17 and 18). If the red display <u>A</u> illuminates, replace battery.	
	Battery is not ready for use.	Charge battery until green display 📻 illuminates.	
	Drive unit or attachment is compromised. (i.e., due to insufficient maintenance)	Send drive unit to Synthes Service Department for repair.	

If the suggested solutions are unsuccessful, please contact the Synthes Service Department at 1 (800) 288-6698. Synthes recommends an annual preventive maintenance service by qualified Synthes personnel.

Graphic Case

Graphic Case, for Battery Power Line Set Includes: Lid (690.571), Attachment Rack (690.572) and Insert Tray (690.573)
Universal Synthes Battery Charger II
Battery Reamer/Drill
Battery Oscillator
Battery Reciprocator
Battery, 3 ea.
Battery Insertion Shield, 3 ea.
Battery Casing, 3 ea.
Chuck with key
Chuck, keyless
Adaptor for Radiolucent Drive
Quick Coupling for drill bits
Large Quick Coupling
AO Reaming Attachment
Hudson Reaming Attachment
Modified Trinkle Reaming Attachment
Trinkle Reaming Attachment
Quick Coupling for K-Wires
Hudson Drilling Attachment
Modified Trinkle Drilling Attachment
Trinkle Drilling Attachment



150.119





690.573

690.572

Battery Power Line Sets

Trauma (150.119TR) and Joint Replacement (150.119JR)

Battery Power Line Set—Trauma (150.119TR)

690.570	Graphic Case, for Battery Power Line Set Includes: Lid (690.571), Attachment Rack (690.572) and Insert Tray (690.573)
05.001.204	Universal Synthes Battery Charger II
530.605	Battery Reamer/Drill
530.610	Battery Oscillator
530.620	Battery, 2 ea.
530.650	Battery Insertion Shield, 2 ea.
530.680	Battery Casing, 2 ea.
530.730	Chuck with key
530.741	Adaptor for Radiolucent Drive
530.750	Quick Coupling for drill bits
530.760	Large Quick Coupling
530.780	AO Reaming Attachment
530.790	Quick Coupling for K-Wires



Battery Power Line Set—Joint Replacement (150.119JR)

690.570	Graphic Case, for Battery Power Line Set Includes: Lid (690.571), Attachment Rack (690.572) and Insert Tray (690.573)
05.001.204	Universal Synthes Battery Charger II
530.605	Battery Reamer/Drill
530.610	Battery Oscillator
530.615	Battery Reciprocator
530.620	Battery, 3 ea.
530.650	Battery Insertion Shield, 3 ea.
530.680	Battery Casing, 3 ea.
530.730	Chuck with key
530.782	Hudson Reaming Attachment
530.783	Modified Trinkle Reaming Attachment
530.792	Hudson Drilling Attachment
530.793	Modified Trinkle Drilling Attachment

Battery Power Line Components and Accessories

05.001.140	Medical Grade Power Cord
510.19	Replacement Key, for 4.5 mm Chuck
511.30	Radiolucent Drive
516.101	Cleaning Brush
519.97	Autoclavable Oil
530.681	Battery Casing with Lock, for Battery
	Power Line
530.732	Chuck with key, reaming speed
530.795	Large Modified Trinkle Reaming Attachment
690.574.04	Grommets (4/pkg.)
690.575	Graphic Case for Battery Power Line
	Reciprocator

Service and Extended Warranty Programs

- W1.150.119 One-Year Extended Warranty Program for Battery Power Line Set
- W3.150.119 Three-Year Extended Warranty Program for Battery Power Line Set



690.575



530.681

Sagittal Saw Blades for Battery Oscillator (530.610)

Saw blades with aggressive tooth, calibrated, sterile* for arthroplasty

1 5	Blade	Calibrated	Cutting
	Width (mm)	Length (mm)	Thickness (mm)
05.003.100S	12.5	90	0.89
05.003.1025	12.5	90	1.00
05.003.1035	12.5	90	1.07
05.003.104S	12.5	90	1.19
05.003.106S	12.5	90	1.27
05.003.1075	12.5	90	1.37
05.003.109S	12.5	90	1.47
05.003.110S	19	90	0.89
05.003.1125	19	90	1.00
05.003.1135	19	90	1.07
05.003.114S	19	90	1.19
05.003.116S	19	90	1.27
05.003.1175	19	90	1.37
05.003.1195	19	90	1.47
05.003.120S	19-12.5**	90	0.89
05.003.1225	19-12.5**	90	1.00
05.003.1235	19-12.5**	90	1.07
05.003.124S	19-12.5**	90	1.19
05.003.126S	19-12.5**	90	1.27
05.003.1275	19-12.5**	90	1.37
05.003.1295	19-12.5**	90	1.47
05.003.130S	25	90	0.89
05.003.1325	25	90	1.00
05.003.1335	25	90	1.07
05.003.134S	25	90	1.19
05.003.1365	25	90	1.27
05.003.1375	25	90	1.37
05.003.1395	25	90	1.47



05.003.100S



05.003.116S



05.003.1265



05.003.1365

* Please contact your Synthes Sales Consultant or Customer Service for additional information.

** Blade width-shaft width

Illustrations not to scale.

	Blade	Calibrated	Cutting
	Width (mm)	Length (mm)	Thickness (mm)
05.002.2015	12.5	90	0.89
519.1185	12.5	90	0.90
<u>05.002.405S</u>	12.5	90	1.00
05.002.2025	12.5	90	1.19
05.002.2035	12.5	90	1.27
05.002.204S	12.5	90	1.37
05.002.2055	12.5	90	1.47
05.002.0065	19	80	0.89
<u>05.002.0015</u>	19	95	0.89
519.107S	19	95	0.90
<u>05.002.0075</u>	19	95	1.00
05.002.0085	19	95	1.07
<u>05.002.002S</u>	19	95	1.19
519.114S	19	95	1.25
05.002.0035	19	95	1.27
05.002.004S	19	95	1.37
519.116S	19	95	1.40
05.002.0055	19	95	1.47
05.002.3015	19-12.5**	90	0.89
05.002.3065	19-12.5**	90	1.00
05.002.3025	19-12.5**	90	1.19
05.002.303S	19-12.5**	90	1.27
05.002.304S	19-12.5**	90	1.37
05.002.3055	19-12.5**	90	1.47
<u>05.002.501S</u>	25	60	0.89
519.1095	25	60	0.90

Saw blades with aggressive tooth, calibrated, sterile*



519.118S



05.002.0015



05.002.302S



519.109S

* Please contact your Synthes Sales Consultant or Customer Service

for additional information.

** Blade width-shaft width

Illustrations not to scale.

Sagittal Saw Blades for Battery Oscillator

(530.610) continued

Saw blades with aggressive tooth, calibrated, sterile* continued				
	Blade	Calibrated	Cutting	
	Width (mm)	Length (mm)	Thickness (mm)	
05.002.1015	25	95	0.89	
519.1085	25	95	0.90	
05.002.106S	25	95	1.00	
05.002.1075	25	95	1.07	
05.002.1025	25	95	1.19	
519.1155	25	95	1.25	
05.002.1035	25	95	1.27	
05.002.104S	25	95	1.37	
519.1175	25	95	1.40	
05.002.1055	25	95	1.47	
05.002.4015	25	85	1.47	



05.002.1015

Saw blades, calibrated, sterile*

Saw blades, ca	ibratea, sterile		
	Blade	Calibrated	Cutting
	Width (mm)	Length (mm)	Thickness (mm)
519.100S	27	50	0.6
<u>519.1035</u>	10	25	0.6
<u>519.1045</u>	10	50	0.6
<u>519.105S</u>	20	50	0.6
<u>519.1065</u>	19	70	1.0
<u>519.1135</u>	18	70	1.2
519.150S	14	50	0.6
<u>519.1705</u>	27	70	0.8
<u>519.1905</u>	50	70	0.8
519.200S	27	70	1.0
<u>519.2105</u>	27	70	1.2
<u>519.2305</u>	6	25	0.6
519.2505	14	25	0.6



519.106S



519.170S

* Please contact your Synthes Sales Consultant or Customer Service for additional information. Illustrations not to scale.

Reciprocating Saw Blades for Reciprocating Saw Attachment (05.001.225)

Saw blades, sterile*				
	Blade	Cutting	Cutting	
	Height (mm)	Length (mm)	Thickness (mm)	
511.9055	10	80	1.05	
511.906S	10	70	1.27	
511.9075	10	55	1.05	
511.9095	10	55	0.85	
511.9125	12	68	1.10	
			(double-sided)	
511.913S	12	68	1.00	
			(double-sided)	
511.914S	12	68	0.80	
			(double-sided)	
511.915S ⁺	10	40	1.10	



Drill Bits, Three-Fluted, Brad Point*, for Radiolucent Drive (511.30)

	Diameter (mm)	Length (mm)
511.411	2.0	150
511.412	2.5	150
511.413	2.7	150
511.414	3.2	150
511.415	3.5	150
511.416	3.6	150
511.417	4.0	150
511.418	4.5	150
511.431	3.2	105
511.432	4.0	105

Drill Bits, Three-Fluted, Needle Point*, for Radiolucent Drive (511.30)

	Diameter	Length	
	(mm)	(mm)	
03.010.100	3.2	145	
03.010.101	4.2	145	
03.010.102	5.0	145	

* Please contact your Synthes Sales Consultant or Customer Service for additional information.

 $^{\rm t}$ Use with Sternum Top for Reciprocating Saw Attachment (511.904).

511.417

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03.010.100



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