Air Power Line II. Air driven power tool system for orthopedics and traumatology.

Instructions for Use

This publication is not intended for distribution in the USA.

Instruments and implants approved by the AO Foundation.

DePuy Synthes
Companies of Johnson & Johnson
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## Care and Maintenance

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## System Specifications

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## Ordering Information

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<th>Section</th>
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<td></td>
<td>46</td>
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</table>
Introduction

General Information

Intended use
The Air Power Line II is a compressed air powered system to be used for treatment in orthopedic and traumatology surgery, i.e. drilling, reaming, cutting, placing of Kirschner Wires on bone of human skeleton.

Safety Instructions
The surgeon has to evaluate if the machine is suitable for an application, based on power limitation of the machine, attachment and cutting tool regarding bone strength/anatomical situation as well as handling of the machine, attachment and cutting tool regarding bone size. In addition, the contraindications of the implant have to be respected. Please refer to the corresponding “Surgical Techniques” of the implant system used.

The Air Power Line System is only to be used for patient treatment after careful consultation of the instructions for use. It is recommended that an alternative system is available to use during application, as technical problems can never be completely ruled out.

The Air Power Line System is designed for use by physicians and trained medical personnel.

DO NOT use any apparently damaged components.

DO NOT use any component if the packaging is damaged.

To ensure correct operation of the Air Power Line, use only Synthes original accessories.

Recommended operating pressure: 6–7 bar (max 10 bar).

Only use original Synthes hoses for compressed air.

Before the first and every use and prior returning for service, power tools and their accessories/attachments have to run through the complete reprocessing procedure. Protective covers and films must be fully removed before sterilization.

The user of the product is responsible for proper user of the equipment during surgery.

Check correct operation of the tools before using it on the patient.

High torque of the powerful Reamer/Drill (511.606) must always be observed.

For the tool to function properly, Synthes recommends that it is cleaned and serviced after each use in accordance with the process defined in the “Care and Maintenance” section. Compliance with these specifications can considerably extend the service life of the tool and reduce the risk of malfunction or harm to the user and patient. Only use Synthes Special Oil (519.970) to lubricate the tool.

We recommend using new Synthes cutting tools for every surgical procedure. Efficiently working cutting tools are the basis for successful surgery. Therefore, check used cutting tools after every use for wear and/or damage and replace them if necessary.

Cutting tools must be cooled with irrigation fluid to prevent heat necrosis.

Unusual Transmissible Pathogens
Surgical patients identified as at risk for Creutzfeldt-Jakob disease (CJD) and related infections should be treated with single-use instruments. Dispose of the instruments used or suspected of use on a patient with CJD after surgery and/or follow the current national recommendations.

Servicing
This system requires regular maintenance service, at least once a year, in order to maintain its functionality. This service has to be performed by the original manufacturer or an authorized site.

The manufacturer assumes no responsibility for damage resulting from improper operation, neglected or unauthorized maintenance of the tool.
Introduction

Accessories/Scope of delivery
The Air Power Line consists of three different handpieces, air hoses and a range of attachments and accessories designed for the system. Please refer to the “Ordering Information” section for an overview of the components of the system.

To reach the specified performance only Synthes cutting tools should be used. These are optimized to meet the specific requirements of the tool. Non Synthes saw blades can considerably reduce the lifetime of the system.

Special auxiliaries such as cleaning brushes (516.101) and Synthes Special Oil (519.970) are available for cleaning and servicing the system.

No oils from other manufacturers may be used. Only Synthes Special Oil (519.970) must be used to lubricate the power tools and attachments. Lubricants with other compositions may cause jamming, have a toxic effect or have a negative impact on the sterilization results. Only lubricate the power tool and the attachments when clean.

Precautions:
- Always wear personal protective equipment (PPE) including safety goggles when handling with the Air Power Line system.
- DO NOT use this equipment in presence of oxygen, nitrous oxide or a mixture consisting of flammable anesthetic and air (danger of explosion). Only use compressed air or nitrogen for this equipment.
- To avoid injuries, the locking mechanism of the tool has to be activated before every manipulation and before placing the tool back down, i.e. the trigger has to be in the LOCK position (refer to page 7, Safety system).
- Should the machine drop on the floor and have visible defects, do not use it anymore and send it to the Synthes Service Center.
- If a product drops on the floor, fragments may split off. This represents a danger for the patient and user as:
  - these fragments may be sharp.
  - unsterile fragments may enter the sterile field or hit the patient.
- Should the system have corroded parts, do not use it anymore and send it to the Synthes Service Center.

Locating of the instrument or fragments of instruments
Synthes instruments are designed and manufactured to perform within the scope of their intended use. However, if a Power Tool or accessory/attachment breaks during use, a visual inspection or a medical imagine device (e.g. CT, Radiation Devices, etc.) can aid in locating the fragments and/or components of the instrument.

Storage and transport
Only use the original packaging for dispatch and transport as otherwise damage may occur. If the packing material is no longer available, please contact your local Synthes office.

For storage and transport environmental conditions please refer to the section “System specification”.

Warranty/Liability
The warranty for the tools and accessories does not cover damage of any kind resulting from wear, improper use, improper reprocessing and maintenance, damaged seal, use of non Synthes cutting tools and lubricants or improper storage and transport.

The manufacturer excludes liability for damage resulting from improper use, neglected or unauthorized maintenance or servicing of the tool.

For further information on the warranty please contact your local Synthes office.
Explanation of symbols used
The following symbols are applied to the device or individual components. Information on additional symbols is given in the relevant sections of this document.

Caution
Read the provided Instructions for Use before operating the device.

Do not reuse
Products intended for single use must not be reused.

Reuse or reprocessing (e.g. cleaning and resterilization) may compromise the structural integrity of the device and/or lead to device failure, which may result in patient injury, illness or death. Furthermore, reuse or reprocessing of single use devices may create a risk of contamination e.g. due to the transmission of infectious material from one patient to another. This could result in the injury or death of the patient or user.

Synthes does not recommend reprocessing contaminated products. Any Synthes product that has been contaminated by blood, tissue and/or bodily fluids/matter should never be used again and should be handled according to hospital protocol. Even though they may appear undamaged, the products may have small defects and internal stress patterns that may cause material fatigue.

This symbol indicates that the corresponding device may not be immersed in liquids.

The device meets the requirements of directive 93/42/EEC for medical devices. It is authorized by an independent notified body for which it bears the CE symbol.

Date of manufacture and manufacturer
Date of manufacture
Non sterile
Non sterile
The marked device shall only be used within a specified temperature range.
Relative humidity
Atmospheric pressure
Do not use if package is damaged.

This symbol indicates that the corresponding device may not be immersed in liquids.
Startup of the
Air Power Line system

Connecting the compressed air hose to the handpiece
Attach the hose coupling over the air inlet nipple on the unit up to the stop. The coupling will lock by itself with an audible click.

Removing the compressed air hose
Disconnect the hose by pulling back the hose coupling sleeve.

Precaution:
The air hose has to be connected properly and should never be squeezed or obstructed by any loads. Non-respect might lead to bursting of the outer hose.
Working with
the Air Power Line system

Operating the trigger
The trigger smoothly regulates the speed of the Air Reamer/Drill II (511.606) and the frequency of the Air Oscillator (511.610) and the Air Reciprocator (511.615).

Safety system
Air Power Line power tools have a safety system that prevents unintentional operation.

To lock the trigger, pull it forward according to the marking on the handle and then turn it. To unlock the trigger, twist it in the opposite direction and then push it back.
Air Reamer/Drill II

Power Tool

1. Attachment coupling
2. Unlocking ring for attachment coupling
3. Trigger and safety device
4. Air inlet
5. Knob for forward and reverse

Reverse operation of the Air Reamer/Drill II

The Air Reamer/Drill is equipped with a knob for forward and backward 5.

By turning the knob in the indicated direction, the tool switches from forward to reverse or vice versa.

Caution:
- Do not switch the direction of rotation while the tool is operating.
- Use reverse only with tools that are approved for such use. Otherwise the tool may break and cause damage.

Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rpm, without attachment:</td>
<td>0–340 rpm</td>
</tr>
<tr>
<td>Weight:</td>
<td>1,100 g</td>
</tr>
<tr>
<td>Air consumption at 6 bar:</td>
<td>max. 380 l/min</td>
</tr>
<tr>
<td>Recommended operating pressure:</td>
<td>6–7 bar (max. 10 bar)</td>
</tr>
<tr>
<td>Cannulation:</td>
<td>Ø 4.0 mm</td>
</tr>
</tbody>
</table>

Technical data is subject to tolerances.
Attachments for the Air Reamer/Drill II

Please observe the safety instructions and warnings on the relevant pages when working with attachments.

Mounting the attachments
Insert the attachment into the front of the attachment coupling and turn until the positioning pins lock into the grooves of the unlocking ring. Applying slight pressure, turn the attachment clockwise until it has completely locked into position. Check that it is fitted properly by lightly pulling the attachment.

Removing the attachments
Turn the unlocking ring for the attachment coupling (see page 8) clockwise and remove the attachment.

Precautions:
To prevent injury, the tool must be locked with the safety system (see page 7) during each manipulation. Make sure not to press the triggers when mounting and removing the attachments.
Only use original attachments and tools from Synthes. Damage that might arise from using attachments and tools of other manufacturers is not covered by the warranty. Properly functioning attachments are essential to the success of an operation. For this reason, used attachments must be checked for wear and/or damage after each use and replaced if necessary.

Precaution:
During reaming procedure, high torque values must be provided by the power tool to the reaming head to allow efficient bone removal. In cases where the reaming head suddenly is blocked, these high torque values can be transferred onto the user’s hand, wrist and/or the patient’s body. In order to prevent injuries it therefore is essential that:
- The power tool is held in an ergonomic position with a firm grip.
- If the reamer head blocks, the speed trigger is released immediately.
- The correct function of the speed trigger (immediate stop of the system when the trigger is released) is checked before the reaming process.
Color marking on the attachments

Some rotating attachments are available in two different speeds for drilling and reaming, respectively. The attachments are marked accordingly (Figs. 1 and 2):

**Drill attachments:**

*Blue color marking* and inscribed with **DRILL**

All drilling speed attachments are geared to increase the maximum drive speed to **930 rpm** while reducing the maximum torque to **8.0 Nm**.

**Ream attachments:**

*Red color marking* and inscribed with **REAM**

All reaming speed attachments transfer the speed and torque of the drive unit with a maximum speed of **340 rpm** and a maximum torque of **20 Nm**.

Technical data is subject to tolerances.
<table>
<thead>
<tr>
<th>Quick Coupling Type</th>
<th>Speed</th>
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</thead>
<tbody>
<tr>
<td>AO/ASIF Quick Coupling (530.750)</td>
<td>0–930 rpm</td>
</tr>
<tr>
<td>Quick Coupling for DHS/DCS Triple Reamers (530.760)</td>
<td>0–930 rpm</td>
</tr>
<tr>
<td>AO/ASIF Quick Coupling for Reamer (530.780)</td>
<td>0–340 rpm</td>
</tr>
<tr>
<td>Hudson Quick Coupling (530.782)</td>
<td>0–340 rpm</td>
</tr>
<tr>
<td>Hudson Quick Coupling (530.792)</td>
<td>0–930 rpm</td>
</tr>
<tr>
<td>Trinkle Quick Coupling, modified (530.783)</td>
<td>0–340 rpm</td>
</tr>
<tr>
<td>Trinkle Quick Coupling, modified (530.793)</td>
<td>0–930 rpm</td>
</tr>
<tr>
<td>Trinkle Quick Coupling (530.784)</td>
<td>0–340 rpm</td>
</tr>
<tr>
<td>Trinkle Quick Coupling (530.794)</td>
<td>0–930 rpm</td>
</tr>
<tr>
<td>Trinkle Quick Coupling XXL, modified (530.795)</td>
<td>0–340 rpm</td>
</tr>
</tbody>
</table>

Technical data is subject to tolerances.
Inserting the tools in the attachments
(on page 9)

Attaching cutting tools
Pull the unlocking sleeve on the attachment backwards (forwards for the DHS/DCS Quick Coupling, 530.760) and completely insert the tool (e.g. drill bit) by lightly turning it.

Once the tool is completely locked in place, release the unlocking sleeve. Turn slightly to ensure that the tool is properly locked into the coupling.

For the AO/ASIF Quick Coupling (530.750/530.780) the tool can be inserted without moving the unlocking sleeve (“click-in”).

Removing cutting tools
Pull the unlocking sleeve on the attachment backwards (forwards for the DHS/DCS Quick Coupling, 530.760) and remove the tool.

Caution:
Properly operating tools are essential to the success of an operation. For this reason, used tools must be checked for wear and/or damage after each use and should be replaced if necessary.
**Quick Coupling for Guide Pins** (510.790)
(Speed: 0–930 rpm)

*Load the guide pin and insert into the bone*

1. Adjust the adjusting sleeve 1 to fit the diameter of the guide pin to be used. Slightly press the adjusting sleeve axially against the tool and rotate the sleeve.
2. Apply a slight amount of pressure to insert the guide pin from the front or back into the cannulation 1. The guide pin is held automatically.
3. Adjust the working length by pulling on the guide pin.
4. To fit the guide pin pull the tension lever 2 against the tool. Only pull the tension lever against the tool as much as necessary. The clamping force can be varied by pulling and releasing the clamping lever.
5. Insert the guide pin into the bone. Apply the clamping force as long as the guide pin is advanced.
6. To regrip the guide pin, reduce the clamping force and move the tool to the desired length. Reclamp the guide pin by pulling on the tension lever.

The guide pin is removed from the bone analogue as described above.

Technical data is subject to tolerances.
Accept round and triangular shafts up to $\varnothing$ 7.3 mm

**Loading tools into the chuck**

**Drill chuck with key (530.730, 530.732)**
Open the clamps of the drill chuck with the key provided (510.191): Insert the key into the suitable shaft and turn anti-clockwise. Insert the shaft of the tool into the centre of the opened chuck.

Close the chuck in reverse order.

Ensure that the shaft of the tool is fitted between the centre of the three clamps of the chuck. Turn the key clockwise to tighten. The teeth of the key must be properly seated in the gear of the drill chuck. The teeth of the chuck and of the key must not be worn.

**Drill Chuck, keyless (530.731)**
Open the clamps manually be holding the retaining ring and turning the securing ring clockwise. Insert the shaft of the tool into the centre of the opened chuck. Lock and tighten the chuck by holding the retaining ring and turning the securing ring clockwise. Ensure that the shaft of the tool is loaded between the centre of the three clamps of the chuck.
Caution:
Do not allow the tools fitted in the keyless Drill Chuck to rotate backwards, as the Drill Chuck can otherwise open. Use the Drill Chuck with Key for reverse mode (530.730, 530.732).

Precaution:
To ensure secure fixation of the instrument, make sure the toothed rims on the drill chuck and key are not worn. Replace damaged or worn components. Only use original Synthes key.

Removing cutting tools

Drill Chuck with key (530.730, 530.732)
Release the chuck by turning the key (510.190) anticlockwise and remove the tool. The teeth of the chuck and of the key must not be worn.

Universal Drill Chuck, Keyless (530.731)
Hold the Drill Chuck on the retaining ring and release the securing ring by turning anticlockwise. Remove the tool from the Drill Chuck.

Technical data is subject to tolerances.
Coupling the Radiolucent Drive to the power tool
Attach the Adapter for Radiolucent Drive (530.741) to the Air Reamer/Drill II (for information please refer to page 9, Mounting the attachments). Push the Radiolucent Drive as far as it will go over the quick coupling and the adapter, and rotate it into the desired working position. Support the drive with your free hand.

For removal, follow the same procedure in reverse.

Inserting the drill
Pull the ring on the attachment forward, and push the drill into the coupling as far as it can go while rotating it slightly (Fig. 1). Push the ring on the attachment back to fix the drill. Check if the drill is seated correctly by gently pulling on it.

For removal, follow the same procedure in reverse.
Using the Radiolucent Drive
Before positioning the Radiolucent Drive, align the image intensifier until the distal locking hole of the medullary nail is round and easily visible.

After the incision, position the Radiolucent Drive and center the drill bit tip over the locking hole. On the monitor of the image intensifier, you can see both the drill bit and the target rings of the drive.

Swing the drive up and center it precisely so that the drill bit appears as a round point and the locking hole is visible around it. The target rings also assist centring. The locking hole can now be drilled directly.

For further information on the Radiolucent Drive and on the special 3-flute spiral drill bits please consult the relevant Instructions for Use (036.000.150) or your local Synthes office.

Notes:
Grip the coupled Radiolucent Drive tightly when switching on the power tool, particularly if the power tool is held face down.
- Only special 3-flute spiral drill bits can be used. Your Synthes representative will provide you with additional information on which drill bits can be used.
- Handle the Radiolucent Drive with great care. Do not allow contact between the drill bit and the medullary nail.
- Depending on the setting of the image intensifier, a zone may appear in the rear of the Radiolucent Drive that is not radiolucent. However, this does not inhibit aiming and working with the device.
- To protect the gears, the Radiolucent Drive is equipped with a slip clutch that disengages in case of an overload and emits an audible rattling noise.
- The following procedures can cause an overload:
  - Correcting the drilling angle when the cutting edge of the drill bit are completely in the bone.
  - Hitting the nail with the drill bit.
- Drilling can continue after making the following corrections:
  - Correcting the drilling angle: Remove the drill bit until the flutes are visible and then restart the drilling.
  - Hitting a nail: Remove the drill bit until the flutes are visible, and reaim the drill bit or exchange the drill bit if necessary.
## Air Oscillator

### Power Tool

1. Locking knob for the saw blade quick coupling
2. Sliding sleeve for positioning the saw head
3. Trigger and safety device
4. Air inlet

### Technical data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Continuously adjustable frequency:</td>
<td>0–14000 1/min</td>
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<tr>
<td>Weight:</td>
<td>1,260 g</td>
</tr>
<tr>
<td>Air consumption at 6 bar:</td>
<td>max. 380 l/min</td>
</tr>
<tr>
<td>Recommended operating pressure:</td>
<td>6–7 bar (max. 10 bar)</td>
</tr>
<tr>
<td>Saw blade deflection:</td>
<td>4.5°</td>
</tr>
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</table>

Technical data is subject to tolerances.
Attaching the Saw Blades

The single variable-speed trigger allows control of the oscillating frequency from 0 to 14 000 oscillations per minute. When the trigger is released, the power tool stops immediately. 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, allowing the blade to oscillate freely slightly beyond the bone.

Mounting the saw blades
Open the quick coupling for saw blades by turning the locking knob 1 (Fig. page 18) counter clockwise. Use a slight amount of pressure to slide the saw blade against the screw head and turn it to the desired position. Lock the saw blade coupling by tightening the locking knob clockwise.

Removing the saw blade
Open the quick coupling for saw blades by turning the locking knob 1 (Fig. page 18) counter clockwise, and remove the saw blade.

Precautions:
Make sure that the locking knob for the saw blade quick coupling is firmly tightened. Otherwise the screw can loosen during use causing the saw blade to vibrate.

To prevent injuries, the trigger should always be in the lock position when inserting or removing saw blades, or adjusting the sawing plane.
Positioning the Saw Head

The saw head can be locked in eight operating positions (8 × 45°).

To choose the operating working position, pull the sliding sleeve backwards and rotate the saw head into the required position. Release the sliding sleeve. It will lock automatically as soon as the correct position is reached.

**Instructions for handling saw blades**

Synthes recommends using a new saw blade for each operation to ensure that the saw blade is optimally sharpened and clean.

The following risks are associated with used saw blades:

- Thermal necrosis caused by excessive heat build-up
- Infection caused by residues
- Extended cutting time due to poor sawing performance
- Potentially, splintering of the teeth or the saw blade

The use of irrigation fluid is recommended to cool the cutting tools and prevent heat necrosis.

Check the cutting tools for wear and/or damage after each use, and replace if necessary. For optimal performance only use Synthes saw blades. These are optimized to meet the specific requirements of the tool. Non Synthes saw blades can considerably reduce the lifetime of the system.

Detailed ordering information on saw blades for the Air Power Line II system can be found in the brochure "Large Bone Saw Blades" (036.001.681).
Power Tool

1. “Click-in” saw blade coupling
2. Sliding sleeve for positioning the saw blade
3. Trigger and safety device
4. Air inlet

**Technical data**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuously adjustable frequency:</td>
<td>0–14000 l/min</td>
</tr>
<tr>
<td>Weight:</td>
<td>1,060 g</td>
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<tr>
<td>Air consumption at 6 bar:</td>
<td>max. 380 l/min</td>
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<tr>
<td>Recommended operating pressure:</td>
<td>6–7 bar (max. 10 bar)</td>
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<tr>
<td>Stroke:</td>
<td>4 mm</td>
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</tbody>
</table>

Technical data is subject to tolerances.
Attaching the Saw Blades

The single variable-speed trigger allows control of the oscillating frequency from 0 to 14,000 oscillations per minute. When the trigger is released, the power tool stops immediately. 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, allowing the blade to oscillate freely slightly beyond the bone.

Mounting the saw blades
Insert the saw blade into the guide slot of the saw blade coupling until the lock knob springs back into locked position with a click. Check the correct seating of the saw blade by pulling it slightly forward in an axial direction.

Removing the saw blade
Turn the lock knob in the direction of the arrow until the saw blade jumps forward approx. 1 mm. Remove the saw blade from the holder.

Precautions:
Make sure that the locking knob for the saw blade quick coupling is firmly tightened. Otherwise the screw can loosen during use causing the saw blade to vibrate.

To prevent injuries, the trigger should always be in the lock position when inserting or removing saw blades, or adjusting the sawing plane.
Positioning the Saw Head

The saw head can be locked in eight operating positions (8 × 45°).

To choose the operating working position, pull the sliding sleeve backwards and rotate the saw head into the required position. Release the sliding sleeve. It will lock automatically as soon as the correct position is reached.

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The following risks are associated with used saw blades:

– Thermal necrosis caused by excessive heat build-up
– Infection caused by residues
– Extended cutting time due to poor sawing performance
– Potentially, splintering of the teeth or the saw blade

The use of irrigation fluid is recommended to cool the cutting tools and prevent heat necrosis.

Check the cutting tools for wear and/or damage after each use, and replace if necessary. For optimal performance only use Synthes saw blades. These are optimized to meet the specific requirements of the tool. Non Synthes saw blades can considerably reduce the lifetime of the system.

Detailed ordering information on saw blades for the Air Power Line II system can be found in the brochure "Large Bone Saw Blades" (036.001.681).
Care and Maintenance

General Information

Power tool units and attachments are frequently exposed to high mechanical loads and shocks during use and should not be expected to last indefinitely. Proper handling and maintenance help extend the useful life of surgical instruments.

Gentle care and maintenance with proper lubrication can substantially increase the reliability and life of the system components and reduce the risk of malfunction or harm to the user and patient.

Synthes power tools must be serviced and inspected annually by the original manufacturer or an authorized site. Yearly maintenance will ensure that the equipment maintains the highest standard of performance and will prolong the life of the system. The manufacturer assumes no warranty for damages arising from improper use, neglected or unauthorized servicing of the tool.

For more information about Care and Maintenance, please refer to the Air Power Line II Care and Maintenance Poster (038.000.017).

Precautions:

- Reprocessing must be performed immediately after each use.
- Cannulations, unlocking sleeves and other narrow sites require special attention during cleaning.
- Cleaners with a pH of 7–9.5 are recommended. The use of cleaners with higher pH-values can – depending on the cleaner – cause dissolution of the surface of aluminum, titanium and its alloys, plastics or compound materials. The use of such cleaners should be subject to the data regarding material compatibility in the corresponding data sheet.
  
  At pH values higher than 11, the surface of stainless steel can be affected.
  
  For detailed information about material compatibility, refer to the document "Important Information" at www.synthes.com/reprocessing. Please refer to the chapter "Material Compatibility of Synthes Instruments in Clinical Processing". Concerning the clinical reprocessing of the Air Power Line II system please refer to the following section of this document.
  
  - Follow the enzymatic cleaner instructions for use for correct dilution/concentration, temperature and water quality. Devices should be cleaned in a fresh, newly-made solution.
  
  - Detergents used on the products will be in contact with the following materials: stainless steel, aluminum, plastic, and rubber seals.
  
  - Never immerse the handpiece or attachments in aqueous solutions or in an ultrasonic bath. Do not use pressurized water as this will cause damage to the system.
  
  - Synthes recommends using new sterile cutting tools for each operation. Refer to "Clinical Processing of Cutting Tools" (036.000.499) for detailed clinical processing instructions.
Unusual Transmissible Pathogens
Surgical patients identified as at-risk for Creutzfeldt-Jakob disease (CJD) and related infections should be treated with single-use instruments. Dispose of instruments, power tools and attachments used, or suspected to have been used, on a patient with CJD after surgery by incineration and/or follow current national recommendations.

Notes:
- The clinical processing instructions provided have been validated by Synthes for preparing a non-sterile Synthes medical device; these instructions are provided in accordance with ISO 17664:2004 and ANSI/AAMI ST81:2004.
- Consult national regulations and guidelines for additional information. Furthermore, compliance with internal hospital policies and procedures and recommendations of manufacturers of detergents, disinfectants, and any clinical processing equipment is additionally required.
- Cleaning Agent Information: Synthes used the following cleaning agents during validation of these reprocessing recommendations. These cleaning agents are not listed in preference to other available cleaning agents which may perform satisfactorily – neutral pH enzymatic detergents (e.g. Prolystica 2X Concentrate Enzymatic Cleaner).
- It remains the responsibility of the processor to ensure that the processing performed achieves the desired result using the appropriate, properly installed, maintained and validated equipment, materials and personnel in the processing unit. Any deviation by the processor from the instructions provided should be properly evaluated for effectiveness and potential adverse consequences.
Preparation prior to Cleaning

In the operating room
Remove surface soiling with a disposable lint-free cloth. Re-process an instrument directly after it is used so that blood does not dry on it.

Preparation for cleaning
- Reprocessing must be carried out immediately after each use.
- Before cleaning and disinfection, all attachments and instruments must be removed from the machine.
- The unit and attachments may not be immersed.
- Make sure that no cleaning solution enters the machine’s air inlet (Fig. 4). Follow the procedure described in the table below.
- Do not use pointed objects for cleaning.
- When cleaning the unit, do not insert objects into the inlet and outlet holes for the air connector since this would damage the microfilter (Fig. 4)
- The unlocking ring (page 8), the trigger and sliding sleeve (Fig. 1), the knob for forward and reverse (Fig. 2) and the locking knob for the saw blade coupling (Fig. 3) must all be free of residue so that they can move freely.

Handpieces, attachments and air hoses may be processed using
- manual cleaning
- automated cleaning with manual pre-cleaning

Preparation for manual cleaning and automated cleaning with manual pre-cleaning:

<table>
<thead>
<tr>
<th>Article number</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Power Line II handpieces</td>
<td>Put the seal nipple (519.596) on the machine’s air inlet.</td>
</tr>
<tr>
<td>511.606</td>
<td></td>
</tr>
<tr>
<td>511.610</td>
<td></td>
</tr>
<tr>
<td>511.615</td>
<td></td>
</tr>
<tr>
<td>Synthes Double Air Hoses</td>
<td>Seal the Synthes Double Air Hose by joining the inlet and outlet.</td>
</tr>
<tr>
<td>519.510</td>
<td></td>
</tr>
<tr>
<td>519.530</td>
<td></td>
</tr>
<tr>
<td>519.550</td>
<td></td>
</tr>
<tr>
<td>Dräger Double Air Hoses</td>
<td>Connect both sides of the Dräger Double Air Hose with the seal nipple (519.596).</td>
</tr>
<tr>
<td>519.610</td>
<td></td>
</tr>
<tr>
<td>519.630</td>
<td></td>
</tr>
<tr>
<td>519.650</td>
<td></td>
</tr>
<tr>
<td>BOC/Schrader Double Air Hoses</td>
<td>Connect both sides of the BOC/Schrader Air Hose with the seal nipple (519.591 or 519.592).</td>
</tr>
<tr>
<td>519.511</td>
<td></td>
</tr>
<tr>
<td>519.531</td>
<td></td>
</tr>
</tbody>
</table>

Note: Before connecting the air inlet of the handpiece and both sides of the air hose with the seal nipple, make sure that the surfaces, which the seal nipple will cover, are not contaminated. If they are, first wipe off or spray these surfaces with alcohol-based disinfectant and then put the seal nipple on. Make sure that no solution enters the hose.

Precaution: Clean all movable parts in opened or unlocked position.
Manual Cleaning Instructions

1. Remove debris
Rinse the device under running cold tap water for a minimum of 2 minutes. Make sure that no liquids enter the air inlet. Plug the air inlet with the seal nipple (519.596). Use a sponge, soft lint-free cloth or soft-bristled brush to assist in removing gross soil. For cannulations of the handpiece and attachments, the cleaning brush (516.101) shown below should be used. (Fig. 5)

Precautions:
- Do not use pointed objects for cleaning.
- Brushes and other cleaning tools shall be either single-use items or, if reusable, be decontaminated at least daily using a solution as detailed in section "3. Spray and wipe".
- Brushes shall be inspected before daily use and discarded if they have degraded to the point where they may scratch instrument surfaces or be ineffective due to worn or missing bristles.
- Make sure that no cleaning solution enters the machine’s air inlet.
- Never immerse the handpiece or attachments in aqueous solutions or in an ultrasonic bath. Do not use pressurized water as this will cause damage to the system.

2. Manipulate moving parts
Manipulate all moving parts such as triggers, sliding sleeves, attachment release rings, saw blade coupling, locking knob for the saw blade quick coupling and switches under running tap water to loosen and remove gross debris.

3. Spray and wipe
Spray and wipe the device using a neutral pH enzymatic solution for a minimum of 2 minutes. Follow the enzymatic detergent manufacturer’s directions for correct temperature, water quality (i.e. pH, hardness) and concentration/dilution.

Cleaning brush (516.101)
4. **Clean with detergent**
Clean the device manually under running warm water using an enzymatic cleaner or detergent for a minimum of 5 minutes. Manipulate all moving parts under running water. Use a soft-bristled brush and/or soft lint-free cloth to remove all visible soil and debris. Follow the enzymatic cleaner or detergent manufacturer’s instructions for use for correct temperature, water quality and concentration/dilution.

5. **Rinse with tap water**
Rinse the device thoroughly using cool to lukewarm running water for a minimum of 2 minutes. Use a syringe or pipette to flush lumens and channels. Actuate joints, handles and other movable device features in order to rinse thoroughly under running water.

6. **Visually inspect device**
Inspect the cannulations, sliding sleeves, attachment release rings, etc. for visible soil. Repeat steps 1–6 if visible soil remains.

7. **Final rinse with deionized/purified water**
Final rinse with deionized or purified water for a minimum of 2 minutes.

8. **Dry**
Dry device using a clean, soft lint-free cloth or medical grade compressed air.
Automated Cleaning Instructions with Manual Pre-cleaning

Manual pre-cleaning prior to automated cleaning/disinfection is important to ensure cannulations and other difficult to access areas are clean.

Alternative cleaning/disinfection procedures other than in the procedure described below (including manual pre-cleaning) have not been validated by Synthes.

Preparation for manual cleaning and automated cleaning with manual pre-cleaning:

<table>
<thead>
<tr>
<th>Article number</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Power Line II handpieces</td>
<td>Put the seal nipple (519.596) on the machine’s air inlet.</td>
</tr>
<tr>
<td>511.606</td>
<td></td>
</tr>
<tr>
<td>511.610</td>
<td></td>
</tr>
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<td>511.615</td>
<td></td>
</tr>
<tr>
<td>Synthes Double Air Hoses</td>
<td>Seal the Synthes Double Air Hose by joining the inlet and outlet.</td>
</tr>
<tr>
<td>519.510</td>
<td></td>
</tr>
<tr>
<td>519.530</td>
<td></td>
</tr>
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<td>519.550</td>
<td></td>
</tr>
<tr>
<td>Dräger Double Air Hoses</td>
<td>Connect both sides of the Dräger Double Air Hose with the seal nipple (519.596).</td>
</tr>
<tr>
<td>519.610</td>
<td></td>
</tr>
<tr>
<td>519.630</td>
<td></td>
</tr>
<tr>
<td>519.650</td>
<td></td>
</tr>
<tr>
<td>BOC/Schrader Double Air Hoses</td>
<td>Connect both sides of the BOC/Schrader Air Hose with the seal nipple (519.591 or 519.592).</td>
</tr>
<tr>
<td>519.511</td>
<td></td>
</tr>
<tr>
<td>519.531</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Before connecting the air inlet of the handpiece and both sides of the air hose with the seal nipple, make sure that the surfaces, which the seal nipple will cover, are not contaminated. If they are, first wipe off or spray these surfaces with alcohol-based disinfectant and then put the seal nipple on. Make sure that no solution enters the hose.

**Precaution:** Clean all movable parts in opened or unlocked position.
1. Remove debris
Rinse the device under running cold tap water for a minimum of 2 minutes. Make sure that no liquids enter the air inlet. Plug the air inlet with the seal nipple (519.596). Use a sponge, soft lint-free cloth or soft-bristled brush to assist in removing gross soil. For cannulations of the handpiece and attachments, the cleaning brush (516.101) shown below should be used.

Precautions:
- Do not use pointed objects for cleaning.
- Brushes and other cleaning tools shall be either single use items or, if reusable, be decontaminated at least daily using a solution as detailed on page 31 in section “3. Spray and wipe”.
- Brushes shall be inspected before daily use and discarded if they have degraded to the point where they may scratch instrument surfaces or be ineffective due to worn or missing bristles.
- Make sure that no cleaning solution enters the machine’s air inlet.
- Never immerse the handpiece or attachments in aqueous solutions or in an ultrasonic bath. Do not use pressurized water as this will cause damage to the system.
2. Manipulate moving parts
Manipulate all moving parts such as triggers, sliding sleeves, attachment release rings, saw blade coupling, locking knob for the saw blade quick coupling and switches under running tap water to loosen and remove gross debris.

3. Spray and wipe
Spray and wipe the device using a neutral pH enzymatic solution for a minimum of 2 minutes. Follow the enzymatic detergent manufacturer’s directions for correct temperature, water quality (i.e. pH, hardness) and concentration/dilution.

4. Clean with detergent
Clean the device manually under running warm water using an enzymatic cleaner or detergent for a minimum of 5 minutes. Manipulate all moving parts under running water. Use a soft-bristled brush and/or soft lint-free cloth to remove all visible soil and debris. Follow the enzymatic cleaner or detergent manufacturer’s instructions for use for correct temperature, water quality and concentration/dilution.

5. Rinse with tap water
Rinse the device thoroughly using cool to lukewarm running water for a minimum of 2 minutes. Use a syringe or pipette to flush lumens and channels. Actuate joints, handles and other movable device features in order to rinse thoroughly under running water.

6. Visually inspect device
Inspect the cannulations, sliding sleeves, attachment release rings, etc. for visible soil. Repeat steps 1–6 if visible soil remains.

7. Load the washing tray
Place all articles in the washing tray in a way that an effective washing/disinfection can be performed. Ensure that the attachments are positioned in an upright position and fully opened. Ensure that the water can flow off any surface. Damage due to improper reprocessing is not covered by the warranty.
8. Automated cleaning cycle parameters

Note:
The washer/disinfector should fulfill requirements specified in ISO 15883.

<table>
<thead>
<tr>
<th>Step</th>
<th>Duration (minimum)</th>
<th>Cleaning Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rinse</td>
<td>2 minutes</td>
<td>Cold tap water</td>
</tr>
<tr>
<td>Pre-wash</td>
<td>1 minute</td>
<td>Warm water (≥ 40°C); use detergent</td>
</tr>
<tr>
<td>Clean</td>
<td>2 minutes</td>
<td>Warm water (≥ 45°C); use detergent</td>
</tr>
<tr>
<td>Rinse</td>
<td>5 minutes</td>
<td>Rinse with deionized (DI) or purified water (PURW)</td>
</tr>
<tr>
<td>Thermal disinfection</td>
<td>5 minutes processing</td>
<td>Hot DI water, ≥ 90°C</td>
</tr>
<tr>
<td>Dry</td>
<td>40 minutes</td>
<td>≥ 90°C</td>
</tr>
</tbody>
</table>

9. Inspect device
Remove all devices from the washing tray.

Remove the seal nipple on the machine’s air inlet and from the Double Air Hose, inspect the cannulations, sliding sleeves, etc. for visible soil. If necessary, repeat the manual pre-cleaning/automated cleaning cycle. Confirm that all parts are completely dry.

Precaution:
Mechanical cleaning is an additional stress for power equipment, especially for seals and bearings. Therefore, devices must be properly lubricated after automated cleaning. Furthermore, the device must be serviced at least once per year as specified under the section “Repairs and Technical Services” on page 38.
Maintenance and Lubrication

Prior to maintenance refer to the following procedures:

<table>
<thead>
<tr>
<th>Article number</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Power Line II handpieces</td>
<td>Remove the seal nipple (519.596) on the machine’s air inlet.</td>
</tr>
<tr>
<td>511.606</td>
<td>511.610</td>
</tr>
<tr>
<td>Synthes Double Air Hoses</td>
<td>Ensure that the inlet and outlet of the Synthes Double Air Hose are not connected.</td>
</tr>
<tr>
<td>519.510</td>
<td>519.530</td>
</tr>
<tr>
<td>Dräger Double Air Hoses</td>
<td>Remove the seal nipple (519.596) from the Dräger Double Air Hose and ensure that the inlet and outlet are not connected.</td>
</tr>
<tr>
<td>519.610</td>
<td>519.630</td>
</tr>
<tr>
<td>BOC/Schrader Double Air Hoses</td>
<td>Remove the seal nipple (519.591 or 519.592) from the BOC/Schrader Double Air Hose and ensure that the inlet and outlet are not connected.</td>
</tr>
<tr>
<td>519.511</td>
<td>519.531</td>
</tr>
</tbody>
</table>

**Oiling the power tools**
- After each use, apply around 5 drops of the Synthes special oil (oil dispenser 519.970) into the air inlet of the cleaned power tool (Fig. 1).
- Connect the power tool to a double hose using the lubrication adapter (519.790) (Fig. 2).
- Wrap gauze or a cloth around the hose coupling to absorb the exiting oil.
- Run the power tool for approximately 20 seconds.
- If dirty oil exits, the process must be repeated.

Make sure that the unlocking ring (Page 8 ②), the trigger and sliding sleeve (Page 18 ①, ②), the forward and reverse knob (Page 8 ⑤) and the saw blade coupling (Page 18 ①, top arrow) are lubricated after each use. After lubricating the trigger shaft, press the trigger several times.

**Oiling the attachments**
After each use, oil the rings on all the cleaned attachments and the jaws of the cleaned drill chuck with 1 drop of Synthes special oil (Fig. 3).

Distribute the oil by moving the parts, and remove excess oil with a cloth.
**Precautions:**
To ensure long service life and reduce repairs, it is necessary that the accessible moving parts of the handpiece and attachment are lubricated after each use. Failing to lubricate the parts will lead to damage and malfunction, increasing the risk of harm to the user and patient. For further information on lubrication, please refer to the Instruction for Use of the Synthes Special Oil 519.970 (60099544) and the APL II Care and Maintenance Poster (038.000.017).

- Power tools and accessories may only be lubricated with Synthes special oil (519.970). The composition of the vapor-permeable and biocompatible oil is optimized for the specific requirements of the power tools. Lubricants with other compositions can cause the power tools to jam and be toxic.
- Only lubricate the power tools and attachments when clean.
- Compressed air hoses should never contact oil. When lubricating, never use a double hose without the lubrication adapter (519.790) since leaking oil could otherwise damage the hose.

**Warning:**
The Radiolucent Drive (511.300) does not require lubrication.
Inspection and Function Test

Visually inspect for damage and wear (e.g. unrecognizable markings, missing or removed part numbers, corrosion, etc.).

Check the handpiece controls for smooth operation and function.

All movable parts should be moving smoothly. Check that the triggers do not remain blocked in the handpiece when pressing on them. Check that no residuals prevent the movable parts from moving smoothly.

Check the release ring of the handpiece and attachments for smooth operation, and check for function together with cutting tools.

Check instruments and cuttings tools for correct adjustment and functioning prior to every use.

Do not use damaged, worn or corroded components but send them instead to the Synthes Service Center.

Failing to follow these instructions will lead to damage and malfunction, increasing the risk of harm to the user and patient. For further information on inspection and function test, please refer to the APL II Care and Maintenance Poster (038.000.017).
Packaging, Sterilization and Storage

Packaging
Put cleaned and dry products into their proper places in the Synthes Air Power Line Vario Case (68.001.550). Additionally, use an appropriate sterilization wrap or re-usable rigid container system for sterilization, such as a Sterile Barrier System according to ISO 11607. Care should be taken to prevent pointed and sharp instruments from contact with other objects that may damage the surface or the Sterile Barrier System. Pack hoses separately since contact with hot metal can damage the plastic.

Sterilization
Synthes Air Power Line II system may be re-sterilized using validated steam sterilization methods (ISO 17665 or national standards). Synthes recommendations for packed devices and cases are as follows.

<table>
<thead>
<tr>
<th>Cycle type</th>
<th>Sterilization exposure time (minutes)</th>
<th>Sterilization exposure temperature</th>
<th>Dry time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturated steam-forced air removal (pre-vacuum)</td>
<td>Minimum 4</td>
<td>Minimum 132°C</td>
<td>20–60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 138°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minimum 3</td>
<td>Minimum 134°C</td>
<td>20–60</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maximum 138°C</td>
<td></td>
</tr>
</tbody>
</table>

Drying times generally range from 20 to 60 minutes due to differences in packaging materials (Sterile Barrier System, e.g., wraps or re-usable rigid container systems), steam quality, device materials, total mass, sterilizer performance and varying cool-down time.
Precautions:
- The following maximum values may not be exceeded:
  138°C over a maximum of 18 minutes. Higher values can damage the sterilized products.
- Observe the packages prior to storage for visual moisture or dampness and if found on or within the pack, the product should be repackaged and sterilized with an increased drying time.
- Do not accelerate the cooling process as it will damage the electronic components of the power tool and could result in harm to the user and patient.
- Hot air, ethylene oxide, plasma and formaldehyde sterilization are not recommended.
- Ensure that the seal nipple (519.596) is removed from the machine’s air inlet and that the air hose's inlet and outlet are disconnected prior to sterilization.

Storage
Storage conditions for products labeled “STERILE” are printed on the packaging label. Packaged and sterilized products should be stored in a dry, clean environment, protected from direct sunlight, pests, and extremes of temperature and humidity. Use products in the order in which they are received (“first-in, first-out principle”), taking note of any expiration date on the label.
Repairs and Technical Service

The power tool should be sent to the Synthes office for repair if it is faulty or malfunctions.

Contaminated products have to run through the complete reprocessing procedure before being sent to the Synthes office for repair or technical service.

To prevent damage during shipping use the original packaging to return devices back to Synthes. If the packing material is no longer available, please contact the Synthes affiliate.

This system requires regular maintenance service, at least once a year, in order to maintain its functionality. This service has to be performed by the original manufacturer or an authorized site.

Faulty devices may not be used. If it is no longer possible or feasible to repair the power tool it should be disposed of, cf. the following section “Disposal of waste”.

Other than the above-mentioned care and maintenance, no further maintenance work may be carried out independently or by third parties.

The manufacturer excludes liability for damage resulting from improper use, neglected or unauthorized maintenance or servicing of the tool.
Disposal of Waste

In most cases, faulty power tools can be repaired (refer to the previous section “Repairs and Technical Service”).

Please send devices that are no longer used to your local Synthes representative. This ensures that they are disposed of in accordance with the national application of the respective directive. The device may not be disposed of with household waste.

To prevent damage during shipping use the original packaging to return devices back to Synthes. If this is not possible, please contact the Synthes affiliate.

Precaution:
Contaminated products have to run through the complete reprocessing procedure in order to rule out any risk of infection in case of disposal.
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible causes</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power tools do not enough power.</td>
<td>Operating pressure is too low.</td>
<td>Set operating pressure on pressure regulator to 6–7 bar overpressure.</td>
</tr>
<tr>
<td></td>
<td>Microfilter is blocked.</td>
<td>Exchange microfilter in the central air supply.</td>
</tr>
<tr>
<td></td>
<td>Air inlet is blocked.</td>
<td>Remove particles from the air inlet with tweezers. Do not use sharp objects for this.</td>
</tr>
<tr>
<td></td>
<td>Hose is too long.</td>
<td>Check that the entire length of the hose does not exceed 8 m.</td>
</tr>
<tr>
<td></td>
<td>Hose coupling is defective.</td>
<td>Check wall and power tool hose couplings for leaks.</td>
</tr>
<tr>
<td></td>
<td>Central air system is blocked.</td>
<td>Have someone check the central air system.</td>
</tr>
<tr>
<td>Power tool continues to operate after releasing the trigger.</td>
<td>The trigger is blocked by deposits of blood, etc.</td>
<td>Press trigger several times; clean and oil according to instructions. Use only Synthes Special Oil (Oil Dispenser 519.970).</td>
</tr>
<tr>
<td>Trigger is blocked.</td>
<td>Safety system is activated.</td>
<td>Unlock the power tool by turning and pushing the trigger according to the markings on the power tool.</td>
</tr>
<tr>
<td>Air Reamer/Drill does not start.</td>
<td>Compressed air motor is blocked from not operating for a long time.</td>
<td>Lock the power tool. Rotate the unlocking sleeve by hand without pressing the trigger. Release the lock and run the machine.</td>
</tr>
<tr>
<td>Problem</td>
<td>Possible causes</td>
<td>Solution</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Attachments cannot be coupled to the Air Reamer/Drill.</td>
<td>Attachment coupling and/or unlocking sleeve are blocked.</td>
<td>Lock the power tool. Remove particles with a tweezer. Do not use sharp objects for this. If necessary, clean and oil the power tool and move the moving parts a few times.</td>
</tr>
<tr>
<td>Tool cannot be coupled.</td>
<td>Coupling geometry of the tool has changed due to wear.</td>
<td>Exchange the tool, or send it to your local Synthes Service Center.</td>
</tr>
<tr>
<td>Bone and tool heat up during surgery.</td>
<td>The tool blades are blunt.</td>
<td>Replace the tool.</td>
</tr>
<tr>
<td>Oscillating saw vibrates too much.</td>
<td>The saw blade has come loose.</td>
<td>Tighten the fixation knob for the saw blade quick coupling more firmly.</td>
</tr>
<tr>
<td>Saw blade is difficult to couple or cannot be coupled.</td>
<td>General wear and tear has affected the connection geometry of the saw blade.</td>
<td>Replace the saw blade.</td>
</tr>
</tbody>
</table>
System Specifications

Environmental Conditions

<table>
<thead>
<tr>
<th></th>
<th>Operation</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature</strong></td>
<td>40°C (104°F)</td>
<td>40°C (104°F)</td>
</tr>
<tr>
<td></td>
<td>10°C (50°F)</td>
<td>10°C (50°F)</td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
<td>90%</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Atmospheric pressure</strong></td>
<td>1060 hPa (1.06 bar)</td>
<td>1060 hPa (1.06 bar)</td>
</tr>
<tr>
<td></td>
<td>700 hPa (0.7 bar)</td>
<td>700 hPa (0.7 bar)</td>
</tr>
<tr>
<td><strong>Altitude</strong></td>
<td>0–3000 m</td>
<td>0–3000 m</td>
</tr>
</tbody>
</table>

Transportation*

<table>
<thead>
<tr>
<th><strong>Temperature</strong></th>
<th><strong>Duration</strong></th>
<th><strong>Humidity</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>–29°C; –20°F</td>
<td>72 h</td>
<td>uncontrolled</td>
</tr>
<tr>
<td>38°C; 100°F</td>
<td>72 h</td>
<td>85 %</td>
</tr>
<tr>
<td>60°C; 140°F</td>
<td>6 h</td>
<td>30 %</td>
</tr>
</tbody>
</table>

*products have been tested according to ISTA 2A

**Precaution:**
The machine must not be stored or operated in explosive atmospheres.
Duty Cycle
To prevent overheating, always follow the duty cycles for each handpiece and attachment listed below.

Intermittent operation guidelines

<table>
<thead>
<tr>
<th></th>
<th>Xₜ on</th>
<th>Yₜ off</th>
<th>Cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drilling and tapping threads</td>
<td>60 sec</td>
<td>60 sec</td>
<td>5</td>
</tr>
<tr>
<td>Kirschner wire and pin setting</td>
<td>30 sec</td>
<td>90 sec</td>
<td>5</td>
</tr>
<tr>
<td>Reaming</td>
<td>60 sec</td>
<td>60 sec</td>
<td>5</td>
</tr>
<tr>
<td>Oscillating sawing</td>
<td>30 sec</td>
<td>90 sec</td>
<td>5</td>
</tr>
<tr>
<td>Reciprocating sawing</td>
<td>20 sec</td>
<td>120 sec</td>
<td>5</td>
</tr>
</tbody>
</table>

Generally, Power Tools systems heat up if in constant use. For this reason the handpiece and the attachments should be allowed to cool for at least 60 seconds (Yₜ off) following the time of constant use (Xₜ on) as outlined on the table above. After a certain amount of cycles (defined in the above table under “Cycles”) the handpiece and attachment should be allowed to cool down. Observing these instructions prevents the system from overheating and possibly harming the patient or user.

The user is responsible for the application and for turning off the system as prescribed. If longer periods of constant use are required, an additional handpiece and/or attachment should be used.

Depending on the cutting tool used and the load applied, the heat generated by the handpiece, attachment and/or cutting tool can vary.

Precautions:
- Carefully observe the above recommended duty cycles.
- Always control the temperature of the system to prevent overheating and possibly harming the patient or user.
- Above mentioned duty cycles should be reduced if higher loads are being applied and if the ambient temperature is above 20 °C/68 °F. This needs to be taken into consideration during the planning of the surgical intervention.
- Always use new cutting tools to prevent heating up of the system due to reduced cutting performance.
- Cutting tools must be cooled with irrigation fluid to prevent heat necrosis. For this purpose, irrigate manually.
- Careful maintenance of the system will reduce heat development in the handpiece and the attachments.
- The Air Power Line II must not be stored or operated in an explosive atmosphere.
Declaration of the emission sound pressure level and the power level according to the EU Directive 2006/42/EG Annex I

Measurements of the sound pressure level [LpA] are carried out in accordance with standard EN ISO 11202.

Measurements of the sound power level [LwA] are carried out in accordance with standard EN ISO 3746.

<table>
<thead>
<tr>
<th>Handpiece</th>
<th>Attachment</th>
<th>Cutting Tool</th>
<th>Sound Pressure Level (LpA) in [dB(A)]</th>
<th>Sound Power Level (LwA) in [dB(A)]</th>
<th>Max. daily exposure time without hearing protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Reamer/Drill II* 511.606</td>
<td>Drill/Ream*</td>
<td>–</td>
<td>78</td>
<td>–</td>
<td>&gt; 8 h</td>
</tr>
<tr>
<td>Air Oscillator II** 511.610</td>
<td>–</td>
<td>Saw Blade (519.115)</td>
<td>83</td>
<td>94</td>
<td>&gt; 8 h</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>Saw Blade (519.170)</td>
<td>83</td>
<td>94</td>
<td>&gt; 8 h</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>Saw Blade (05.002.105)</td>
<td>85</td>
<td>96</td>
<td>8 h</td>
</tr>
<tr>
<td>Air Reciprocator II*** 511.615</td>
<td>–</td>
<td>Saw Blade (511.905)</td>
<td>83</td>
<td>95</td>
<td>&gt; 8 h</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>Saw Blade (511.912)</td>
<td>85</td>
<td>95</td>
<td>8 h</td>
</tr>
</tbody>
</table>

Operation condition:
* Handpiece 511.606 with 530.750 at idle speed (450 rpm) and with 6 bar.
** Handpiece 511.610 at idle speed (14 000 Osc./min) and with 6 bar.
*** Handpiece 511.615 at idle speed (14 000 Osc./min) and with 6 bar.

Technical data is subject to tolerances.
The values are determined with Synthes saw blades.
### Declaration of vibration emission according to the EU Directive 2006/42/EG Annex I

The assessment of the vibration emissions [m/s²] is to be made to the hand-arm system according to EN ISO 8662.

<table>
<thead>
<tr>
<th>Handpiece</th>
<th>Attachment</th>
<th>Cutting Tool</th>
<th>Vibration emission [m/s²]</th>
<th>Max. daily exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Reamer/Drill II* 511.606</td>
<td>Drill/Ream*</td>
<td>–</td>
<td>&lt; 2.5</td>
<td>No limitation</td>
</tr>
<tr>
<td>Air Oscillator II** 511.610</td>
<td>–</td>
<td>Saw Blade (519.115)</td>
<td>6.3</td>
<td>5 h</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>Saw Blade (519.170)</td>
<td>4.7</td>
<td>No limitation</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>Saw Blade (05.002.105)</td>
<td>5.2</td>
<td>7 h 28 min</td>
</tr>
<tr>
<td>Air Reciprocator II*** 511.615</td>
<td>–</td>
<td>Saw Blade (511.905)</td>
<td>11.6</td>
<td>1 h 28 min</td>
</tr>
<tr>
<td>–</td>
<td>–</td>
<td>Saw Blade (511.912)</td>
<td>11.5</td>
<td>1 h 32 min</td>
</tr>
</tbody>
</table>

**Operation condition:**

* Handpiece 511.606 with 530.750 at idle speed (450 rpm) and with 6 bar.
** Handpiece 511.610 at idle speed (14 000 Osc./min) and with 6 bar.
*** Handpiece 511.615 at idle speed (14 000 Osc./min) and with 6 bar.

Technical data is subject to tolerances.
The values are determined with Synthes saw blades.
## Ordering Information

### Power Tools
- **511.606** Air Reamer/Drill II
- **511.610** Air Oscillator
- **511.615** Air Reciprocator

### Attachments
- **530.780** AO/ASIF Quick Coupling for Reamers, for Power Line
- **530.750** AO/ASIF Quick Coupling, for Power Line
- **530.760** Quick Coupling for DHS/DCS Triple Reamers, for Power Line
- **530.730** Drill Chuck (930 1/min), with Key, for Power Line
- **530.732** Drill Chuck (340 1/min), with Key, for Power Line
- **510.191** Spare Key for Drill Chuck, clamping range up to Ø 7.3 mm
- **530.731** Drill Chuck, keyless, for Power Line
- **510.790** Quick Coupling for Guide Pins Ø 1.5 to 4.0 mm
- **530.782** Hudson Quick Coupling (340 1/min), for Power Line
- **530.792** Hudson Quick Coupling (930 1/min), for Power Line
- **530.783** Trinkle Quick Coupling (340 1/min), modified, for Power Line
- **530.793** Trinkle Quick Coupling (930 1/min), modified, for Power Line
- **530.784** Trinkle Quick Coupling (340 1/min), for Power Line
- **530.794** Trinkle Quick Coupling (930 1/min), for Power Line
- **530.741** Adapter for RDL for Power Line
- **530.795** Trinkle Quick Coupling XXL (340 1/min), modified, for Power Line
- **511.300** Radiolucent Drive
### Air hoses

<table>
<thead>
<tr>
<th></th>
<th>Wall coupling</th>
<th>Dräger</th>
<th>BOC/Schrader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double air hose 3 m</td>
<td>519.510</td>
<td>519.610</td>
<td>519.511</td>
</tr>
<tr>
<td>Double air hose 5 m</td>
<td>519.530</td>
<td>519.630</td>
<td>519.531</td>
</tr>
<tr>
<td>Double spiral air hose</td>
<td>519.550</td>
<td></td>
<td>519.650</td>
</tr>
<tr>
<td>up to 2 m</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>516.101</td>
<td>Cleaning brush for APL II / BPL / TRS</td>
</tr>
<tr>
<td>519.970</td>
<td>Oil dispenser with Synthes special oil</td>
</tr>
<tr>
<td>519.790</td>
<td>Lubrication adapter, for SYNTHES compressed air units</td>
</tr>
<tr>
<td>519.591</td>
<td>Seal Nipple for BOC/Schrader Double Air Hoses, silver</td>
</tr>
<tr>
<td>519.592</td>
<td>Seal Nipple for BOC/Schrader Double Air Hoses, beige</td>
</tr>
<tr>
<td>519.596</td>
<td>Seal Nipple for Compact Air Drive and for Dräger Double Air Hoses</td>
</tr>
<tr>
<td></td>
<td>(Can also be used to close the air intake of compressed air-operated drive</td>
</tr>
<tr>
<td></td>
<td>units during washing.)</td>
</tr>
<tr>
<td>68.001.550</td>
<td>Vario Case, size 1/1, height 88 mm, for Air Power Line II,</td>
</tr>
<tr>
<td></td>
<td>without lid, without contents</td>
</tr>
<tr>
<td>68.001.551</td>
<td>Insert, size 1/2 for Reciprocator, for Vario Case No. 68.001.550</td>
</tr>
<tr>
<td>689.507</td>
<td>Lid (stainless steel), size 1/1, for Vario Case</td>
</tr>
</tbody>
</table>

For further information please contact your local Synthes representative.

### Cutting tools

Detailed ordering information on saw blades for the Air Power Line II system can be found in the brochure “Large Bone Saw Blades” (036.001.681).

Detailed ordering information on the special 3-flute drill bits for the Radiolucent Drive can be found in the brochure “Working with the Radiolucent Drive” (036.000.150).

Technical data is subject to tolerances.