Operation manual

High TorQ power tools for major bone surgery

Cordless Drilling and Sawing System for Orthopaedics

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1 Introduction

1.1 General information

These operating instructions are for individual units incl. accessories. They can be purchased as a system or separate units.

1.1.1 Purpose

The system consists of battery-powered drives with a range of attachments and accessories for drilling, milling and screw-driving, placing pins and wires and cutting bones or hard tissue in general trauma and endoprosthetic surgery.

The sternum saw featured in the system is used for operations in the thorax region; used for severing the sternum.

There are no known contraindications, preventing the drives and the accessories being used.

Caution:

Any use of the system other than what is described above is not intended or has not been tested and is prohibited.

Warning: hazard to patient and user!

1.1.2 Safety instructions

Only use the system on a patient after reading these operating instructions very carefully. We recommend always keeping a replacement system at the ready as technical problems can never be completely ruled out.

The system is only intended for use by a surgeon and medical staff trained in its handling and use.

Warning: hazard to patient and user!

DO NOT USE components which are visibly damaged.

Be careful: equipment defect!

Do NOT operate the system in the presence of oxygen, nitrous monoxide or inflammable mixtures consisting of volatile anaesthetics and air.

Warning: Danger of explosion!

In order to ensure correct system operation, only use original accessories from Nouvag AG or tools suggested by Nouvag AG.

Be careful: equipment defect!

Prior to first and all further uses drives, attachments and accessories have to undergo the complete reprocessing procedure.

Protective covers and films must be completely removed before sterilisation.

Warning: Risk of infection!

In order to ensure normal system operation, Nouvag AG specifies that the system be cleaned and serviced in accordance with the instructions in the chapter “Care and Maintenance” after every use.

Regular maintenance and care in accordance with these instructions can considerably extend the service life of the system.

Only use special oil to lubricate moving parts.

Be careful: High degree of wear and premature equipment defect!

Efficiently working cutting tools are a basic requirement for a successful operation. For this reason Nouvag AG specifies that new cutting tools be used for every surgical procedure. Always cool cutting
tools with irrigation liquid to prevent heat necrosis.

**Warning:** Deterioration of healing!

The user bears responsibility for the proper intraoperative handling and use of this product. If you use the system in connection with an implant system, do not fail to follow the respective "surgical technique".

**Warning:** patient hazard!

For important information on electromagnetic compatibility (EMC) see the chapter "Electromagnetic Compatibility" in this manual.

The system is a Type Class BF applied part and provides protection against electric shock in the event of permissible leakage. The system is suitable for use on patients in accordance with IEC 60601-1.

In order to ensure correct system operation, Nouvag AG specifies annual maintenance and inspection by a Nouvag AG customer service centre. The manufacturer does not accept responsibility for damage arising from improper use or maintenance by unauthorized third parties.

**Warning:** hazard to patient and user!

**Caution:**
- In order to prevent injury, the lock mechanism must be activated before putting the unit away, i.e. set the selector switch to the LOCK position (bolted lock symbol).

**Warning:** hazard to users!
- Only operate the unit with a fully charged PowerPack. For this, ensure that the PowerPack is promptly charged. We recommend that you put the PowerPack back into the battery charger immediately after completing an operation.

**Warning:** lengthening of the surgery time!
- Never process or sterilise the PowerPack (manual or mechanical cleaning).

**Be careful:** Destruction of the PowerPack with consequential damage!

### 1.1.3 Accessories/Parts supplied

The system comprises several handpieces (drill, drill/milling machine, sagittal saw, sternum saw and oscillating saw), one or more PowerPacks (battery, motor and electronics) and various attachments which form part of the system.

To charge the PowerPacks, use the corresponding Nouvag AG battery charger with one (3706) or four (3707) charging bays.

For perfect functioning of the system the cutting tool manufacturers recommended by Nouvag AG have to be used, otherwise Nouvag AG cannot guarantee responsibility for perfect functioning.

For system cleaning and care there are special aids available such as cleaning brushes and spray oil (3727). No third-party oils may be used, as otherwise Nouvag AG cannot guarantee responsibility for perfect functioning.

For sterilisation and storage use the Nouvag AG screen box (3728) which is compatible with the system, as otherwise Nouvag AG cannot guarantee responsibility for perfect functioning.

The following components are crucial for operation:
- a handpiece (e.g. 3701)
- PowerPack (3705)
- sterile funnel (3725)
- battery charger (e.g. 3706)

At least an attachment with tool which forms part of the system.

An overview of the components which form part of the system is to be found at the end of these operating instructions.
1.1.4 Storage and transport

Use the original packaging for dispatch and transport. If they are no longer available, contact Nouvag AG.

See the section "Environmental Conditions" in Chapter 4.7 for the environmental conditions for storage and transport.

1.1.5 Guarantee

We do not guarantee units and accessories in the event of inappropriate use, violated quality seals and inappropriate storage and transport. Neither does the manufacturer accept responsibility for damage arising from repair or maintenance by unauthorized third parties.

See also the General Terms of Business.
2 Operating the unit

2.1 Description of controls, indicator functions and symbols

2.1.1 Drill and milling machine (3701)

1. Release sleeve for attachments
2. Trigger for speed regulation
3. Slider for switching clockwise rotation, lock (safety position), anticlockwise rotation
4. Slider for unlocking the cover
5. Switch lever for function oscillation mode ON or OFF
6. Rotating bezel for operating mode DRILL or REAM (milling)
7. Sight-glass for LED display and illumination

| Trigger extended | Drive switched off |
| Trigger retracted | Drive switched on, Trigger in the intermediate position | Speed dependent on the position of the trigger |
| Slider in the central position | LOCK/SAFETY POSITION. Unit cannot be started inadvertently |
| Slider retracted | Clockwise rotation |
| Slider extended | Anticlockwise rotation |
| Oscillation mode switched on |
| Oscillation mode switched off |
| Cover locked (in the direction of the arrow) |
| Cover open (in the direction of the arrow) |
| Position for pressing with the thumb (to lock the cover) |
### 2.1.2 Drill (3700)

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Release sleeve for attachments</td>
</tr>
<tr>
<td>2</td>
<td>Trigger for speed regulation</td>
</tr>
<tr>
<td>3</td>
<td>Slider for switching clockwise rotation, lock (safety position), anticlockwise rotation</td>
</tr>
<tr>
<td>4</td>
<td>Slider for unlocking the cover</td>
</tr>
<tr>
<td>5</td>
<td>Switch lever for function oscillation mode ON or OFF</td>
</tr>
<tr>
<td>6</td>
<td>Sight-glass for LED display and illumination</td>
</tr>
</tbody>
</table>

- **Trigger extended**: Drive switched off
- **Trigger retracted**: Drive switched on,
- **Trigger in the intermediate position**: Speed dependent on the position of the trigger

- **Slider in the central position**: LOCK/SAFETY POSITION. Unit cannot be started inadvertently.
- **Slider retracted**: Clockwise rotation
- **Slider extended**: Anticlockwise rotation
- **Oscillation mode switched on**
- **Oscillation mode switched off**
- **Cover locked (in the direction of the arrow)**
- **Cover open (in the direction of the arrow)**
- **Position for pressing with the thumb (to lock the cover)**
2.1.3 Oscillating saw (3702)

1. Locking ring for saw blade tension
2. Trigger for speed regulation/frequency of oscillation
3. Slider for switching ON, lock (safety position), ON
4. Slider for unlocking the cover
5. Switch lever for operating modes "Normal" and "Fast"
6. Release sleeve for adjusting the sawing head in 45° increments
7. Sight-glass for LED display and illumination
### 2.1.4 Jig saw (3703)

1. Saw blade release
2. Trigger for speed regulation/stroke frequency
3. Slider for switching ON, lock (safety position), ON
4. Slider for unlocking the cover
5. Switch lever for stroke frequency I "Normal" and II "Fast"
6. Sight-glass for LED display and illumination

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trigger extended</td>
<td>Drive switched off</td>
</tr>
<tr>
<td>Trigger retracted</td>
<td>Drive switched on</td>
</tr>
<tr>
<td>Trigger in the intermediate position</td>
<td>Speed dependent on the position of the trigger</td>
</tr>
<tr>
<td>Slider in the central position</td>
<td>LOCK/SAFETY POSITION. Unit cannot be started inadvertently.</td>
</tr>
<tr>
<td>Slider retracted</td>
<td>switched on</td>
</tr>
<tr>
<td>Slider extended</td>
<td>switched on</td>
</tr>
<tr>
<td>Frequency/speed set to Step &quot;I&quot;</td>
<td></td>
</tr>
<tr>
<td>Frequency/speed set to Step &quot;II&quot;</td>
<td></td>
</tr>
<tr>
<td>Cover locked (in the direction of the arrow)</td>
<td></td>
</tr>
<tr>
<td>Cover open (in the direction of the arrow)</td>
<td></td>
</tr>
<tr>
<td>Position for pressing with the thumb (to lock the cover)</td>
<td></td>
</tr>
</tbody>
</table>
2.1.5 Sternum saw (3704)

1. Saw blade release
2. Trigger for speed regulation/stroke frequency
3. Slider for switching ON, lock (safety position), ON
4. Slider for unlocking the cover
5. Switch lever for stroke frequency I "Normal" and II "Fast"
6. Sight-glass for LED display and illumination

| Trigger extended | Drive switched off |
| Trigger retracted | Drive switched on, |
| Trigger in the intermediate position | Speed dependent on the position of the trigger |

| Slider in the central position | LOCK/ SAFETY POSITION. Unit cannot be started inadvertently. |

| Slider retracted | switched on |
| Slider extended | switched on |
| Frequency/speed set to Step "I" |
| Frequency/speed set to Step "II" |
| Cover locked (in the direction of the arrow) |
| Cover open (in the direction of the arrow) |
| Position for pressing with the thumb (to lock the cover) |
2.1.6 PowerPack (3705)

1. Fold-out lever
2. LED display and illumination
2.1.7 Battery charger (3706)

1. Charging bay
2. PowerPack display information
3. Battery charger display information
4. POAG connection (POAG connection cable enclosed) on the rear side of the unit (not shown)
5. Mains connection (mains connection cable enclosed) on the rear side of the unit (not shown)

Note: Additional battery chargers with four charging bays (3707) available for order.
### 2.2 Putting into operation

#### 2.2.1 Insert PowerPack

Use the following procedure with all handpieces.

In order to maintain sterility, two people insert the PowerPack into the sterile handpiece casing, one of whom has to be dressed sterile:

1. The "sterile" person holds the open, sterile handpiece with the open side facing upwards

2. The "sterile" person puts the sterile sterile funnel on the handpiece and checks for the correct alignment.
   **Note:** the sterile funnel ensures that the non-sterile PowerPack is not exposed to the exterior of the sterile handpiece.

3. Using the unfolded handle the "non-sterile" person carefully pushes the non-sterile PowerPack through the sterile funnel into the handpiece.
<table>
<thead>
<tr>
<th>Exert firm pressure on the PowerPack to ensure that it is correctly aligned in the handpiece. Fold in the handle. During insertion make sure that the Power-Pack is correctly aligned and that the &quot;non-sterile&quot; person does not touch the outside of the sterile handpiece.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. The &quot;non-sterile&quot; person takes the sterile funnel from the handpiece.</td>
</tr>
<tr>
<td>5. The person dressed sterile closes the cover.</td>
</tr>
</tbody>
</table>

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### 2.2.2 Removing the PowerPack

Use the following procedure with all handpieces.

After the operation remove the PowerPack from the handpiece and place it in the battery charger. The handpiece must be prepared (cleaning/sterilisation).

1. Hold the handpiece in one hand with the cover upwards. With the other hand pull the slider for unlocking the cover, the cover springs open. Do not turn the handpiece until after having removed the PowerPack. **Be careful**: destruction of the PowerPack with consequential damage!

2. Grip the cover between your thumb and index finger and open.
3. Unfold the handle on the PowerPack and pull the PowerPack out of the handpiece using the handle.

   **Note:**
   if you change the PowerPack during the surgery, it has to be removed by the "non-sterile" person.
   Then re-insert the PowerPack into the battery charger.
   Forward the handpiece, attachments and accessories for reprocessing.

---

**Caution:**

Never immerse the PowerPack in liquid, or wash or sterilise.

**Be careful:** destruction of the PowerPack with consequential damage!
2.2.3 Available battery capacity

The capacity of a fully charged PowerPack is sufficient to perform even lengthy and complex operations without it being charged. (For technical details see 5.2 Equipment Specification)

The LED indicators show the charge of the PowerPack while it is being used for surgery. (See 2.1.6 PowerPack)

The PowerPack can remain in the battery charger between operations and so is fully charged and operational.

**Caution:**
- always only run the unit with a fully charged PowerPack. Therefore always ensure that the PowerPack is charged in good time.

*We recommend returning the PowerPack to the battery charger promptly after completing an operation.*

**Warning:** lengthening of the surgery time!
- If in doubt check the charge before use by inserting the PowerPack into the battery charger.

**Warning:** lengthening of the surgery time!
- To ensure sterility, the power pack may only be changed during surgery as instructed above. (See 2.2.1 Inserting a PowerPack and 2.2.2 Removing a PowerPack)

**Warning:** patient hazard!
- Sterilise the sterile funnel after each use to ensure sterility when inserting the non-sterile power pack into the sterile handpiece.

**Warning:** patient hazard!
- Check a PowerPack that has been subjected to a slight mechanical impact or collision for mechanical damage, tears, etc. Damaged PowerPacks must not be used and have to be sent in for repair. If there is no visible damage evident, check the functionality of the PowerPack with a handpiece.

To do so, insert the power pack into a handpiece and lock the cover. Press the trigger for the speed regulation. If the drive is running and all the functions are met the PowerPack can continue to be used. Send the PowerPack in for repair in the event of malfunction or no function.

**Warning:** patient hazard!
2.2.4 Protecting the PowerPack against overheating

Electrical devices become warm during continuous use. To avoid exceeding the permissible surface temperature of the unit, the corresponding cooling phases have to be observed, see 5.1 Operating Cycle.

**Warning:** hazard to patient and user!

A safety system protects battery and motor against damage due to overheating:

- If the cooling phases are not adhered to and the battery or motor become too hot, the unit automatically switches off. The drive can only be restarted after the PowerPack has cooled.

**Caution:**

If surgery is lengthy, a second unit must be kept at the ready or allow for time for cooling the unit.

2.2.5 Eco mode

The device control is always disconnected from the power supply by an integrated switch.

This makes a power consuming standby function unnecessary.
2.2.6 Charging and storing the PowerPack

Handle the PowerPack which contains a motor, battery and electronics with care.

To ensure perfect functioning of the unit, the following points need to be observed:

**Charging**
- Charge the PowerPack fully before use. (See Chapter 2.2.8.3)
- Charge the PowerPack at an environmental temperature of +10°C to +40°C.

**Storage**
- Never expose the PowerPack to temperatures above +55°C (Chapter 5.3)

*Be careful: equipment defect!*
- The PowerPack's battery cells discharge slightly even when not in use (physical effect). We urge you to always leave the PowerPack in the battery charger when not in use.

Before using the PowerPack, always inspect whether it is fully charged.

**Caution:**
- Do not wash, rinse, sterilise, drop or exert pressure or use force. This would destroy the PowerPack and would cause possible consequential damage!

*Be careful: equipment defect!*
- Only use a Nouvag battery charger to charge the PowerPack (e.g. 3706). Other power sources can damage the PowerPack and so also invalidate the guarantee.

*Be careful: equipment defect!*
- Do not use faulty PowerPacks; send them in to the Nouvag AG service centre responsible.

**Warning:** hazard to patient and user!
- Only use the PowerPack in the handpieces intended for its use.

*Be careful: equipment defect!*
- The PowerPack may only be opened by the original manufacturer or an authorized service centre. Unauthorized opening will invalidate the guarantee.
2.2.7 Indicator lights when being operated with a handpiece

Putting the handpiece into operation by pressing the trigger causes certain information in the unit, which is described below, to be queried and visually indicated. Releasing the trigger shows information for two seconds on the battery charge.

Note: Chapter 2.2.7.8 describes the indicators while charging the PowerPack.

Do not look straight into the white illumination LEDs.

**Warning:** Glare hazard!

2.2.7.1 Trigger pressed indicator light

2.2.7.1.1 White indicator lights continuously on (four illumination LEDs), trigger pressed

The white indicator lights signal a running motor and are used to assist in illuminating the surgery field.

2.2.7.1.2 White indicator lights flashing (four illumination LEDs), trigger pressed

Flashing white indicator lights signal that the unit’s automatic safety shut-down will shortly cut in due to high temperatures.

2.2.7.1.3 Coloured indicator lights, trigger pressed

2.2.7.1.3.1 Green indicator lights, trigger pressed

Battery capacity remaining is over 50 % of overall capacity

2.2.7.1.3.2 Yellow indicator lights, trigger pressed

Battery capacity remaining is between 10 and 50 % of overall capacity.

2.2.7.1.3.3 Red indicator lights, trigger pressed

Remaining battery capacity is under 10 % of overall capacity. To prevent the battery cells from discharging too deeply, the automatic safety shut-down will shortly cut in. It is no longer possible to continue working in this condition.

**Caution:**
If surgery is lengthy, a second unit must be kept at the ready

Nouvag AG recommends that only fully charged PowerPacks be used in the unit.

**Warning:** lengthening of the surgery time!
2.2.7.1.3.4 Red/green flashing indicator lights, trigger pressed

Red/green flashing indicator lights signal that the unit's automatic safety shut-down has cut in due to high temperatures. The red indicator light symbolizes the elevated temperature, the green light indicates the remaining battery capacity; the remaining battery capacity in this case is more than 50 % of the overall capacity. It is only possible to resume working after the unit has cooled.

Caution:
With lengthy operations a second unit needs to be kept at the ready or the time for the cooling of the unit to be allowed for.

2.2.7.1.3.5 Red/yellow flashing indicator lights, trigger pressed

Red/yellow flashing lights signal that the unit's automatic safety shut-down has cut in due to high temperatures. The red indicator light symbolizes the increased temperature, the yellow indicator light gives an indication of the remaining battery capacity; here the remaining battery capacity is between 10 and 50 % of the overall capacity. It is only possible to resume working after the unit has cooled.

Caution:
With lengthy operations a second unit needs to be kept at the ready or the time for the cooling of the unit to be allowed for.

2.2.7.1.3.6 Red indicator light, trigger pressed

If the indicator light changes to red during the operation (trigger pressed), the motor stops and the white indicator lights go out at the same time, the load is too high and the drive switches off for safety reasons. If the load is no longer so high the drive can be immediately restarted.

If, however, the drive's white LEDs already flash beforehand, the temperature shut-down cuts in and it must first be left to cool before work can be resumed with it.
2.2.7.2 Indicator lights for trigger not pressed
(Illuminated for two seconds after releasing the trigger)

Note: The indicator lights after releasing the trigger are visible for two seconds and then go out.

The indicator lights indicate the battery capacity remaining

2.2.7.2.1.1 Green indicator lights
Battery capacity remaining is over 50% of overall capacity

2.2.7.2.1.2 Yellow indicator lights
Battery capacity remaining is between 10 and 50% of overall capacity.

2.2.7.2.1.3 Red indicator lights
Remaining battery capacity is under 10% of overall capacity.

To prevent the battery cells from discharging too deeply, the automatic safety shut-down will shortly cut in. It is no longer possible to continue working in this condition.

Caution:
If surgery is lengthy, a second unit must be kept at the ready

Nouvag AG recommends that only fully charged PowerPacks be used in the unit.
Warning: Lengthening of the surgery time!
Battery chargers
To charge the PowerPack, one of the following battery chargers must be used:
- 3706 battery charger with one charging bay
- 3707 battery charger with four charging bays

No other battery chargers may be used. The PowerPack can incur damage. This invalidates the guarantee.

Be careful: equipment defect!

2.2.7.3 Putting the battery charger into operation
Before putting the battery charger into operation, ensure that there is no PowerPack in the charging bay.
Using the POAG cable provided, connect the battery charger and the building's equipotential bonding bar.
Only connect the battery charger to the power supply with the mains cable provided.
The battery charger is ready for use as soon as it is connected to the power supply with the mains cable. The green control light on the top of the battery charger illuminates.

2.2.7.4 Cleaning the battery chargers
Only clean when the chargers are unplugged. Wipe the battery charger from time to time with a dry cloth (Do not use solvents).

2.2.7.5 Charging the PowerPack

1. Insert the PowerPack to be charged oriented correctly into a vacant charging bay.
Only one power pack can be charged per charging bay. However, all charging bays can always be used at the same time (only for battery chargers with more than one charging bay). After automatically recognizing the charge, charging starts (PowerPack glows yellow/battery charger indicator glows yellow or reddish).
2. As soon as the PowerPack is fully charged, the battery charger switches to trickle charging (PowerPack indicator glows green/battery charger indicator glows green). You can remove the PowerPack from the charging bay at any time. But the full battery capacity is only available when the PowerPack’s green LED lights up.

2.2.7.6 Charging a new or long unused PowerPack

New PowerPacks and PowerPacks, which have not been used for over one month and have not been in the battery charger, only return to their maximum capacity after three to five full charging cycles.

2.2.7.7 Storing the PowerPack

Remove the PowerPack from the handpiece (drill, saw,…) after every use and immediately recharge. Never store PowerPacks that have been used uncharged. Always keep unused PowerPacks in a battery charger that is connected to the power supply. The battery charger also constantly checks the charge at full charge (indicator glows green) and automatically recharges if necessary. Therefore inserted PowerPacks are always available fully charged and are optimally stored. Only store the PowerPack away from the charging bay if all the charging bays are already in use.

Do not use PowerPacks which have not been taken directly from the battery charger and in which the display glowed green on the PowerPack (fully charged). The charge might otherwise be too low for use.

**Warning:** lengthening of the surgery time!
2.2.7.8 Charge control indicators on the battery charger and the PowerPack

There is a yellow (reddish) or green indicator for each charging bay. Every PowerPack features control lights (green, yellow, red) with the following meaning.

2.2.7.8.1 Indicator on the charging bay glows yellow (reddish) and the indicator on the PowerPack glows yellow

The PowerPack is being charged.

2.2.7.8.2 Indicator on the charging bay glows yellow (reddish) and the indicator on the PowerPack glows green

The PowerPack is operational for surgical use, but not yet fully charged.

2.2.7.8.3 Indicator on the charging bay glows green and the indicator on the PowerPack glows green

The PowerPack is operational for surgical applications, fully charged and should be left in the battery charger until it is used for optimal storage and conserving the charge.

2.2.7.8.4 Display on the PowerPack glows red

The PowerPack has too high a temperature and needs to cool before automatically resuming charging. If the PowerPack is not noticeably warm and the indicator glows for longer than 60 minutes, remove the PowerPack briefly from the charging bay and reinsert it.

If the display repeats, the PowerPack is defective and must be sent back for inspection and, if necessary, for repair to the manufacturer.

2.2.7.8.5 Indicator on the PowerPack flashes yellow

If the battery charger is not connected to the mains, remove the PowerPack from the charging bay, connect the battery charger to the power supply and reinsert the PowerPack.

2.2.7.8.6 No indicator illuminates on the battery charger

The unit does not have a power supply or is faulty. If defective, it must be checked by the manufacturer and if necessary repaired.

2.2.7.8.7 No indicator illuminates on a charging bay
(battery chargers with more than one charging bay)

The charging bay does not have a power supply or is faulty. If defective it must be checked by the manufacturer and if necessary repaired.
2.2.7.9 Indicator on the PowerPack after removal from the battery charger

If the PowerPack has been removed from the battery charger before being fully charged, no indicators illuminate on the PowerPack.

After fully charging the PowerPack and its removal from the battery charger, the display glows green. The indicator light goes out automatically after two hours have elapsed or after putting into operation with a handpiece. The display is meant to alert the surgery staff that the PowerPack is fully charged and can be used.

2.2.7.10 Disconnecting the battery charger from the mains supply

Ensure that there is no PowerPack in the charging bay before you disconnect the battery charger from the mains supply. If the mains cable has been removed, you can disconnect the POAG cable which links the battery charger and the building's equipotential bonding bar.

Caution:
- After power failures or having switched to the emergency power supply, the battery charger powers up again automatically.

- Only PowerPacks (3705) may be charged in the battery charger.
Charging different batteries or cells will cause a fire and explosion hazard.
Warning: hazard to users!
2.2.8 How to use the drill/milling machines (3701 and 3700)

Caution:
- If you do not need the drill/milling machine during the operation, lay it down to ensure that it is stored stable and cannot tip over. Set the drill/milling machine only in an upright position on the sterile table for mounting or removing attachments and cutting tools.

Be careful: equipment defect!
- To protect from injury, every time you assemble/disassemble a cutting tool and before you lay the unit down, move the slider to the central LOCK/SAFETY POSITION.

Warning: hazard to users!

2.2.8.1 Putting into operation
Set the slider to clockwise or anticlockwise mode depending upon use.
You can set the speed using the trigger for speed regulation. Releasing the trigger stops the unit.

Note: the operating mode (Drill) is non-adjustable on the drill (3700).

2.2.8.1.1 Switching the oscillation mode on and off
The switch lever enables you to switch the oscillation mode on or off. Moving the switch lever to the upper position (symbol ) activates the oscillation mode. The lower position (symbol ) deactivates the oscillation mode.

2.2.8.1.2 Changing the operating mode between drilling (Drill) and milling (Ream) (only with 3701)
Stop the unit (release the trigger) and remove from the patient.
Secure the unit against unintended start-up ( LOCK/SAFETY POSITION).
Then rotate the turning ring for the operating selector switch to the desired position. Set the slider for clockwise or anticlockwise mode. Before using on a patient, ensure that you set the correct operating mode, i.e. start the unit in the air.

The following modes of operation are possible (only with 3701):
- drilling mode/DRILL (up to max. 1000 rpm)
- milling mode/REAM (up to max. 250 rpm)

Caution:
Do not change the operating mode when the unit is running.

Be careful: equipment defect!
2.2.9 Mounting/removing drill/milling machine attachments (3701 and 3700)

**Notes:**
The instructions below apply to all attachments.

**Caution:**
- When mounting/removing attachments and cutting tools always secure the unit against inadvertent start-up (LOCK/SAFETY POSITION).

**Warning:** hazard to users!
- After mounting an attachment or a cutting tool check for proper tightness by pulling on the attachment or tool.

**Warning:** hazard to users and patient!
- Only use original attachments and tools from Nouvag AG or manufacturers suggested by Nouvag AG.

**Be careful:** equipment defect!
- Damage incurred through using attachments and cutting tools from other manufacturers is not covered by the guarantee.
- Cooling the cutting tools with coolant is recommended to protect against heat necrosis.

**Warning:** patient hazard!
- Only use cutting tools once.

**Warning:** patient hazard!
- Use the tools in the operating mode recommended by the manufacturer (DRILL up to max. 1000 rpm/REAM up to max. 250 rpm) (only with 3701).

**Warning:** patient hazard!
### 2.2.9.1 Mounting attachments

Secure unit against unintended start-up (slider to LOCK/SAFETY POSITION).

**Warning:** hazard to users!

1. Pull the release sleeve back to the stop and hold.
   It is recommended to hold the unit in the position shown.

2. Push the attachment from the front as far as it will go.

3. Release the release sleeve.
   Then check for correct alignment by slightly pulling on the attachment.

Adjust the turning ring to the desired operating mode (DRILL up to max. 1000 rpm/REAM up to max. 250 rpm) (only with 3701).

Before using on a patient, ensure that you set the correct operating mode, i.e. start the unit in the air.

### 2.2.9.2 Inserting cutting tools into attachments and removing them

See detailed description of all the attachments (from Chapter 2.2.10 onwards).
2.2.9.3 Removing attachments

Secure unit against unintended start-up (slider to LOCK/SAFETY POSITION).

**Warning:** hazard to users!

We recommend that you hold the unit in the position shown. The attachment should be pointed slightly upwards to prevent it falling.

- Pull the release sleeve back to the stop and hold. Grip and remove the attachment with the other hand.
- Release the release sleeve again.
- Put the removed attachment aside.
2.2.10 Rotary attachments

When mounting/dismantling attachments and cutting tools, always secure the unit against unintended start-up (LOCK/SAFETY POSITION).

Warning: hazard to users!

2.2.10.1 Drill chuck with key (3718, 3719, 3720)

Speed: max. 1000 rpm (DRILL mode) / max. 250 rpm (REAM mode/milling mode)

Span:
- with 3718 up to Ø 4 mm
- with 3719 up to Ø 6.5 mm
- with 3720 up to Ø 7 mm

Cannulation: 4.3 mm

2.2.10.1.1 Mounting and removing the cutting tools

Open the drill chuck with the supplied key, hold the rear ring of the drill chuck securely and turn the front ring clockwise.

To close, insert/remove the cutting tool, hold the rear ring of the drill chuck securely and turn the front ring anticlockwise. Tighten with the key.
2.2.10.2 Drill chuck, without key (3721, 3722, 3723)

Speed: max. 1000 rpm (DRILL mode) / max. 250 rpm (REAM mode/milling mode)

Span:
- with 3721 up to Ø 6 mm
- with 3722 up to Ø 6 mm
- with 3723 up to Ø 3.5 mm

Cannulation: 4.3 mm

2.2.10.2.1 Mounting and removing the cutting tools

In order to open the drill chuck, pull the lock sleeve back and hold (only with 3721) and then turn the front ring clockwise.

For locking it is not necessary to retract the lock sleeve, turn the front ring anticlockwise.

With 3722 and 3723 hold the rear ring of the drill chuck to open and turn the front ring clockwise.

To close, insert/remove the cutting tool, hold the rear ring of the drill chuck securely and turn the front ring anticlockwise.

Caution:
Never switch the drive on in order to close the attachments.

Warning: hazard to users!
2.2.10.1 Quick-coupling for cutting tools

2.2.10.1.1 AO attachment small (3712)
Speed: max. 1000 rpm (DRILL mode) / max. 250 rpm (REAM mode/milling mode)
Cannulation: 2.5 mm

2.2.10.1.2 AO adaptor large (3713)
Speed: max. 1000 rpm (DRILL mode) / max. 250 rpm (REAM mode/milling mode)
Cannulation: 4.3 mm

2.2.10.1.3 ¼” adaptor (3714)
Speed: max. 1000 rpm (DRILL mode) / max. 250 rpm (REAM mode/milling mode)
Cannulation: 4.3 mm

2.2.10.1.4 Hudson attachment (3715)
Speed: max. 1000 rpm (DRILL mode) / max. 250 rpm (REAM mode/milling mode)
Cannulation: 4.3 mm

2.2.10.1.5 Harris attachment (3716)
Speed: max. 1000 rpm (DRILL mode) / max. 250 rpm (REAM mode/milling mode)
Cannulation: 4.3 mm

2.2.10.1.6 Hexagonal attachment SW6 (3717)
Speed: max. 1000 rpm (DRILL mode) / max. 250 rpm (REAM mode/milling mode)
Cannulation: 4.3 mm

2.2.10.1.6.1 Mounting and removing the cutting tools

**Mounting:** insert the cutting tool into the front of the attachment exerting slight pressure and slightly rotating it. At the same time push the coupling sleeve of the attachment backwards. Having noticeably pushed the cutting tool as far as the stop, release the coupling sleeve. Check the tool for secure alignment by slightly pulling it.

**Removing:** to remove the cutting tool, push the coupling sleeve of the attachment to the rear and remove the tool.
**Caution:**
- Set the gear sleeve to REAM/milling mode to drive in screws.

**Be careful:** equipment defect!

- Driving screws in using a drive takes special care.
Never drive screws in all the way with the drive. The last few twists or locking should always be done by hand.

**Warning:** patient hazard!

### 2.2.10.1.6.2 Mounting and removing the cutting tools

Pull the coupling sleeve back and completely insert/remove the tool with a slight rotary motion.

These instructions apply to all the attachments in Chapter 2.2.12.4.

**Caution:** Nouvag AG cannot give any warranty for function and result when you use tools from other manufacturers.
2.2.10.2 Quick-coupling for Kirschner wires (3708 and 3709)

For inserting/removing any length of Kirschner wires with a diameter of 1.0 to 4.0 mm.

Speed: max. 1000 rpm (DRILL mode) / max. 250 rpm (REAM mode/milling mode)

Cannulation: 4.0 mm (completely open)

We recommend that you set the gear sleeve to DRILL mode for inserting and removing Kirschner wires.

Only use attachment 3708 with drilling/milling machine 3701.
Only use attachment 3709 with drill 3700.

Be careful: function not guaranteed!

2.2.10.2.1 Inserting Kirschner wire into the attachment

1. Adjust the setting sleeve on the front end of the attachment to the diameter of the Kirschner wire

2. Insert the Kirschner wire into the front of the attachment. This slightly clamps the Kirschner wire which then remains in the selected position.
2.2.10.2.2 Inserting Kirschner wire into the bone

Pull the lever to the handpiece to tension the Kirschner wire and press the trigger (slider set to clockwise rotation). Release the lever if necessary to adjust the position of the Kirschner wire in the attachment.

2.2.10.2.3 Removing Kirschner wire from the bone

Set the required diameter on the attachment's setting sleeve. Push the setting sleeve and the attachment over the Kirschner wire. Pull the lever to the handpiece to grip the Kirschner wire and press the trigger (slider to anticlockwise rotation) to pull the wire from the bone.

2.2.10.2.4 Extension sleeve for Kirschner wires (3710)

Always use the extension sleeve (3710) with long Kirschner wires which exceed the unit's dimensions and protrude at the back beyond the cover of the unit's barrel.

Warning: hazard to users!

Screw the extension sleeve into the cover of the unit's barrel.

We recommend that the extension sleeve be generally used for all work with the quick-couplings. Warning: hazard to users!
2.2.10.3 Adaptor for radiolucent angular gear (3711)

**Speed:** max. 1000 rpm (DRILL mode)

### 2.2.10.3.1 Mounting radiolucent angular gear on the drive

1. Mount the adapter (3711) for the radiolucent angular gear on the handpiece. Then push the radiolucent angular gear over the adapter up to the stop.

2. Turn the radiolucent angular gear to the desired working position. Hold the radiolucent angular gear with your other hand.

To remove the radiolucent angular gear, repeat the procedure in reverse.

**Caution:**
- Hold the radiolucent angular gear which is mounted on the drive firmly if you point the unit downwards.

**Be careful:** equipment defect!

- Only special three-fluted twist drills may be used. The supplier is Synthes.

**Warning:** patient hazard!

- Always handle the radiolucent angular gear with extreme care. Drills must not come into contact with intramedullary nails.

**Warning:** patient hazard!

- Depending on the setting of the image intensifier, a non-radiolucent zone may appear in the rear section of the radiolucent angular gear. This, however, in no way impairs aiming and working with the unit.

**Warning:** patient hazard!

- To protect the gear, the radiolucent angular gear features a sliding clutch which disengages if there is an overload. This can be recognized by a rattling noise.

- The following instances can bring about an overload:
  - correction of the drilling angle while the drill's cutting grooves are completely within the bone.

**Warning:** hazard to patient and user!

**Be careful:** equipment defect!

- Blocking the drill by drilling into the nail.

**Warning:** patient hazard!

**Be careful:** equipment defect!
- Work can be resumed after the following corrective action:

---correction of the drilling angle: pull the drill out until the cutting grooves are visible and restart drilling.

---drilling into the nail: pull the drill out until the cutting grooves are visible, aim again or, if necessary, replace the drill.
2.2.11 How to use the oscillating saw (3702)

**Caution:**
- If you do not need the saw during the operation, lay it down to ensure that it is stored stable and cannot tip over. Only place the saw in an upright position on the sterile table to mount or remove cutting tools.

**Be careful:** equipment defect!

- To protect against injury set the slider to \( \text{LOCK/SAFETY POSITION} \) each time you mount/remove a cutting tool, position a saw head and before laying the unit down.

**Warning:** hazard to users!

2.2.11.1 Putting the oscillating saw into operation

Move the slider to ON (slider to the left or right).

Using the trigger for speed regulation you can set the frequency of oscillation. Releasing the trigger stops the unit.

The maximum stroke frequency can be preselected with the switch lever. Setting the switch lever to Position I selects the "Normal" mode. The mode "Fast" is preset in Position II.

2.2.11.2 Positioning the saw head

The saw head can be locked in eight different positions (45° division).

To set the desired position, pull the sleeve back for positioning the saw head and turn the saw head into the selected position. Release the sleeve.

Turn the saw head slightly to the left or right until it engages in the exact position.

**Caution:**
To position the saw head, set the slider to \( \text{LOCK/SAFETY POSITION} \).

**Warning:** hazard to users!

- To prevent injury in positioning the saw head, always keep the saw head with the mounted saw blade pointing away from your body.

**Warning:** hazard to users!
2.2.11.3 Replacing saw blades

Only use saw blades with the Synthes AO connector.

Warning: hazard to patient and user!

Be careful: equipment defect!

Nouvag AG recommends saw blades from Gomina AG. No guarantee can be given for saw blades from other manufacturers. These are optimally matched to the specifications of the saw. Other products can reduce the durability and service life of the system.

Be careful: equipment defect!

To protect against injury set the slider to LOCK/SAFETY POSITION each time you mount/remove a cutting tool.

Warning: hazard to users!

1. Open the saw blade quick-coupling by turning the locking ring anti-clockwise.

2. Lift and remove the saw blade
2.2.11.4 Working with the oscillating saw

Start up the unit before putting onto the bone. To prevent the saw blade blocking, do not exert excessive pressure on it. To obtain optimum sawing power, move the unit slightly back and forth in the plane of the saw blade, so that both sides of the blade swing slightly over the bone. Calmly guiding the saw enables very precise incisions to be made. Inaccurate cuts suggest worn out saw blades, excessive pressure or the saw blade having been tilted.

Warning: patient hazard!

2.2.11.5 Instructions for handling saw blades

To obtain optimum results, Nouvag AG specifies that a new saw blade be used for every operation. This guarantees that the saw blade is always optimally sharpened and clean. Used saw blades harbour the following risks:
- necrosis due to strong production of heat
- infections due to residue
- longer cutting time due to decreased sawing power patient hazard!

Warning: patient hazard!

Under the following conditions noises and vibrations can differ significantly from the standard values:
- use of non-standard saw blades
- sawing vertically
- working with tools in bad condition
- use of saw blades from other manufacturers
Always cool saw blades with coolant to prevent heat necroses.

**Warning:** patient hazard!
2.2.12 How to use the jig-saw (3703)

Caution:
- If you do not need the saw during the operation, lay it down to ensure that it is stored stable and cannot tip over. Only place the saw in an upright position on the sterile table to mount or remove cutting tools.
Be careful: equipment defect!

- To protect against injury set the slider to LOCK/SAFETY POSITION each time you mount/remove a cutting tool, and before laying the unit down.
Warning: hazard to users!

2.2.12.1 Putting the jig-saw into operation
Move the slider to ON.
Using the trigger for speed regulation you can set the stroke frequency. Releasing the trigger stops the unit.
The maximum stroke frequency can be preselected with the switch lever. Setting the switch lever to the Position I selects the "Normal" mode. The mode "Fast" is preset in Position II.

2.2.12.2 Replacing saw blades
Only use saw blades with the Stryker connector.
Warning: hazard to patient and user!
Be careful: equipment defect!
Nouvag AG recommends saw blades from Gomina AG. No guarantee can be given for saw blades from other manufacturers. These are optimally matched to the specifications of the saw. Other products can reduce the durability and service life of the system.
Be careful: equipment defect!
To protect against injury set the slider to LOCK/SAFETY POSITION each time you mount/remove a cutting tool.
Warning: hazard to users!

1. Turn the saw blade release in the direction of the arrow and hold
2. Remove the saw blade

3. Push in a new saw blade and move it into the desired position. The saw blade can be locked in four different positions.

4. Release the saw blade release
   Check for secure alignment of the saw blade by pulling it in a longitudinal direction

### 2.2.12.1 Working with the jig-saw

Start up the unit before placing the saw. To prevent the saw blade blocking, do not exert excessive pressure on it. Calmly guiding the saw enables very precise incisions to be made. Inaccurate cuts suggest worn out saw blades, excessive pressure or the saw blade having been tilted. **Warning:** patient hazard!

### 2.2.12.2 Instructions for handling saw blades

To obtain optimum results, Nouvag AG specifies that a new saw blade be used for every operation. This guarantees that the saw blade is always optimally sharpened and clean. Used saw blades harbour the following risks:
- necrosis due to strong production of heat
- infections due to residue
- longer cutting time due to decreased sawing power.
**Warning:** patient hazard!

Under the following conditions noises and vibrations can differ significantly from the standard values:
- use of non-standard saw blades
- working with tools in bad condition
- use of saw blades from other manufacturers
Always cool saw blades with coolant to prevent heat necroses.

Warning: patient hazard!
2.2.13 How to use the sternum saw (3704)

Caution:
- If you do not need the saw during the operation, lay it down to ensure that it is stored stable and cannot tip over. Only place the saw in an upright position on the sterile table to mount or remove cutting tools.
Be careful: equipment defect!
- To protect against injury, set the slider to LOCK/SAFETY POSITION each time you mount/remove a cutting tool, and before laying the unit down.
Warning: hazard to users!

2.2.13.1 Putting the sternum saw into operation
Move the slider to ON.
Using the trigger for speed regulation you can set the stroke frequency. Releasing the trigger stops the unit.
The maximum stroke frequency can be preselected with the switch lever. Setting the switch lever to Position I selects the "Normal" mode. The mode "Fast" is preset in Position II.

2.2.13.2 Replacing saw blades
Only use saw blades with the Stryker connector.
Warning: hazard to patient and user!
Be careful: equipment defect!
Nouvag AG recommends saw blades from Risa GmbH. No guarantee can be given for saw blades from other manufacturers. These are optimally matched to the specifications of the saw. Other products can reduce the durability and service life of the system.
Be careful: equipment defect!
Changing the saw blade with the sternum attachment corresponds to the procedure for the jig-saw. In this case feed the saw blade through the bottom of the attachment.
Caution:
- Only use the saw blade intended for the sternum attachment. The length of this saw blade matches the sternum attachment.

2.2.13.3 Working with the sternum saw
Start up the unit before placing the saw. To prevent the saw blade blocking, do not exert excessive pressure on it. Calmly guiding the saw enables very precise incisions to be made. Inaccurate cuts suggest worn out saw blades, excessive pressure or the saw blade having been tilted.
Warning: patient hazard!
2.2.13.4 Instructions for handling saw blades

To obtain optimum results, Nouvag AG specifies that a new saw blade be used for every operation. This guarantees that the saw blade is always optimally sharpened and clean. Used saw blades harbour the following risks:
- necrosis due to strong production of heat
- infections due to residue
- longer cutting time due to decreased sawing power

**Warning:** patient hazard!

Under the following conditions noises and vibrations can differ significantly from the standard values:
- use of non-standard saw blades
- working with tools in bad condition
- use of saw blades from other manufacturers

Always cool saw blades with coolant to prevent heat necroses.

**Warning:** patient hazard!
3 Servicing and maintenance (in accordance with a validated cleaning and sterilisation procedure)

3.1 General information

Drives and attachments have a limited service life due to the frequent mechanical stress during their use. Proper use and regular maintenance extend the service life of surgical tools and instruments.

Repeated clinical processing has little impact on the duration of function of the drive and attachments. Careful servicing and maintenance and thorough lubrication can significantly increase the reliability and service life of the system components.

Nouvag AG recommends annual inspection and maintenance by the original manufacturer or selected authorized service centres. The manufacturer does not accept responsibility for damage arising from inappropriate operation or unauthorized maintenance. The unit has a life span of at least 5 years if treated properly and specified maintenance is carried out.

Caution:
- Clinical preparation should always take place immediately after use.

Be careful: equipment defect!
- Cannulations, release sleeves and other poorly accessible sites require particularly careful cleaning.

Be careful: equipment defect!
- Nouvag AG recommends the use of cleaning agents with a pH value of 7 - 9.5. Depending on the particular cleaning agent, cleaners with a pH value higher than 11 can attack aluminium, aluminium alloy, plastic or composite material surfaces and should only be used after consideration of data on the cleaner's material compatibility as specified in its data sheet. The surface of stainless steel can also be attacked at pH values exceeding 11. Follow the enzyme cleaner or cleaning agent manufacturer's instructions to achieve the right dilution, temperature, action time and water quality. If there is no manufacturer data as to temperature and action time, use Nouvag AG's recommendations (See from 3.2 onwards). Instruments should be cleaned in a fresh newly prepared solution.

Be careful: equipment defect!
- The cleaning agents being used come into contact with the following materials: stainless steel, aluminium, plastic and rubber seals.

- Nouvag AG specifies that new sterile cutting tools be used for each operation.

3.1.1 Atypical transferable pathogens

Always operate with single-use instruments in the case of patients who are considered to be at risk in relation to Creutzfeldt Jakob disease (CJD) and associated infections.

After an operation dispose of and/or follow currently valid national recommendations for instruments by means of which a patient suspected of CJD or with proven disease has received surgery.
Caution:
The instructions for clinical preparation shown here have been reviewed by Nouvag AG. They meet the requirements of the international standard ISO 17664:2004 and ANSI/AAMI ST81: 2004 and they are suitable for preparing non-sterile Nouvag AG medical devices.

See the national laws and guidelines for additional information. The hospital's internal guidelines and SOPs, the cleaning agent and disinfectant manufacturers' recommendations and instructions, and the systems for clinical preparation also have to be followed.

The user is responsible for ensuring that the preparation is performed by correspondingly trained staff and using suitable, properly installed, maintained and reviewed systems and materials in order to obtain the desired result. Any deviation from the instructions specified above must be properly reviewed and judged in terms of its efficacy and any adverse effects.

3.2 Preparation for cleaning

3.2.1 Disassembly

If possible, take the drive apart, ensure that all the moving parts are open, and remove the power pack from the drive /handpiece.

**Be careful:** equipment defect!

PowerPacks and battery chargers can be wiped with a cloth.

Insert the PowerPack into the battery charger after each use.

**Warning:** lengthening of the surgery time!

**Caution:**
The PowerPacks must not be washed, rinsed, disinfected or sterilised. Never clean the handpiece in the ultrasonic bath or immerse in other liquids, this could impair the duration of the function of the system.

**Be careful:** equipment defect!

The clinical preparation of handpieces and attachments can be done by

a) manual cleaning or

b) automatically with previous manual cleaning. (See the following sections)
3.3 Manual cleaning

3.3.1 Drive/Handpiece

1.) Remove residue
Rinse handpieces (drive casing e.g. drill, oscillating saw) under running, cold tap water for at least 3 minutes. Remove heavy-duty contamination and residue with a sponge, a lint-free cloth and/or a soft brush. Clean all cannulations with the cleaning brush provided for the purpose (3739). Move triggers, attachment release sleeves, function selector switches and other moving parts under running, cold water across the full range of movement and operation at least 5 times to loosen and remove heavy-duty residue.

**Caution:**
Do not use pointed or sharp items when cleaning.
**Be careful:** equipment defect!

2.) Spray with cleaning agent
Spray all components with an enzyme cleaner, a cleaning solution or cleaning foam, allow to take effect for at least 3 minutes and then wipe. Follow the enzyme cleaner or cleaning agent manufacturer's instructions for the correct dilution, temperature, action time and water quality so as to achieve the optimum cleaning efficiency.

3.) Rinse with tap water
Rinse under running cold tap water for at least 2 minutes. Rinse the cannulations and other sites which are hard to access with a syringe, a pipette or a water pistol.

4.) Clean with a cleaning solution
Clean under running water with an enzyme cleaner or a cleaning solution for at least 5 minutes. Move moving parts under running water across the full range of movement and operation at least 5 times. Remove visible contamination and residue using a soft brush and/or a lint-free cloth.

Follow the enzyme cleaner or cleaning agent manufacturer's instructions for the correct dilution, temperature, action time and water quality so as to achieve the optimum cleaning efficiency.

5.) Rinse with tap water
Rinse the components thoroughly under cold to lukewarm, running tap water for at least 2 minutes. Rinse out the cannulations and channels with a syringe, a pipette or a water pistol. Move joints, handles and other moving parts across the full range of movement and operation at least 5 times to rinse these areas thoroughly under running water.

6.) Check components visually
Check cannulations, coupling sleeves etc. for visible contamination. Repeat steps 1 to 6 until all components are rid of any visible contamination.

7.) Final rinsing with DI/PURW water
As a final step, rinse components with fully demineralised water (DI/PURW) for at least 2 minutes.

8.) Dry
Dry handpiece and components with a soft, lint-free cloth or purified compressed air.
3.3.2 Attachments

1.) Remove residue
Immerse attachments (e.g. drill chucks/quick-action chucks) in cold tap water for 5 min.
Then move all moving parts under running, cold water across the full range of movement and operation at least 5 times to loosen and remove heavy-duty residue.
Remove heavy-duty contamination and residue with a sponge, a lint-free cloth and/or a soft brush until no further contamination is visible. Clean all cannulations with the cleaning brushes provided for the purpose (3739).

Caution:
Do not use pointed or sharp items when cleaning.
Be careful: equipment defect!

2.) Ultrasonic bath cleaning
Treat attachments for 5 min. in an ultrasonic bath (0.5% cleaning solution of Neodisher MediClean (Dr. Weigert, Hamburg), 40°C).

3.) Water pistol cleaning
Rinse all gaps, joints and cavities for at least 20 sec. each with a water pistol.

4.) Clean with a cleaning solution
Clean under running water with an enzyme cleaner or a cleaning solution for at least 5 minutes. Move moving parts under running water across the full range of movement and operation at least 5 times.
Remove visible contamination and residue using a soft brush and/or a lint-free cloth.
Follow the enzyme cleaner or cleaning agent manufacturer's instructions for the correct dilution, temperature, action time and water quality so as to achieve the optimum cleaning efficiency.

5.) Rinse with tap water
Rinse the components thoroughly under cold to lukewarm, running tap water for at least 2 minutes.
Rinse out the cannulations and channels with a syringe, a pipette or a water pistol. Move joints, handles and other moving parts across the full range of movement and operation at least 5 times to rinse these areas thoroughly under running water.

6.) Check components visually
Check cannulations, coupling sleeves etc. for visible contamination. Repeat steps 1 to 6 until all components are rid of any visible contamination.

7.) Final rinsing with DI/PURW water
As a final step, rinse components with fully demineralised water (DI/PURW) for at least 2 minutes.

8.) Dry
Dry handpiece and components with a soft, lint-free cloth or purified compressed air.
3.4 Mechanical cleaning after manual pre-cleaning

Caution:
- Manual cleaning prior to mechanical/automated cleaning/disinfection is important to ensure that cannulations and other poorly accessible sites are clean.

Warning: patient hazard!
Be careful: equipment defect!

- No alternative cleaning/disinfection procedures to those (including manual pre-cleaning) described below have been validated by Nouvag AG.

Warning: hazard to patient and user!
Be careful: equipment defect!

3.4.1 Manually pre-cleaning the drive/handpiece

1.) Remove residue
Rinse handpieces (drive casing e.g. drill, oscillating saw) under running, cold tap water for at least 2 minutes. Remove heavy-duty contamination and residue with a sponge, a lint-free cloth and/or a soft brush. Clean all cannulations with the cleaning brush provided for the purpose (3739). Move triggers, attachment release sleeves, function selector switches and other moving parts under running, cold water across the full range of movement and operation at least 5 times to loosen and remove heavy-duty residue.

Caution:
Do not use pointed or sharp items when cleaning.
Be careful: equipment defect!

2.) Spray with cleaning agent
Spray all components with an enzyme cleaner, a cleaning solution or a cleaning foam (0.5% Neodisher MediClean), allow to take effect for at least 2 minutes and then wipe

Follow the enzyme cleaner or cleaning agent manufacturer's instructions for the correct dilution, temperature, action time and water quality so as to achieve the optimum cleaning efficiency.

3.) Clean with a cleaning solution
Clean under running water with an enzyme cleaner or a cleaning solution (0.5% Neodisher MediClean) for at least 5 minutes. Move moving parts under running water across the full range of movement and operation at least 5 times. Remove visible contamination and residue using a soft brush and/or a lint-free cloth.

Follow the enzyme cleaner or cleaning agent manufacturer's instructions for the correct dilution, temperature, action time and water quality so as to achieve the optimum cleaning efficiency.

4.) Rinse with tap water
Rinse the components thoroughly under cold to lukewarm, running tap water for at least 2 minutes. Rinse out the cannulations and channels with a syringe, a pipette or a water pistol. Move joints, handles and other moving parts across the full range of movement at least 5 times to rinse these areas thoroughly under running water.

5.) Check components visually
Repeat steps 1 to 5 until all components are rid of any visible contamination.

Mechanical/automated cleaning has to be performed after the manual pre-cleaning described above. For more, see section 3.4.3 Mechanical cleaning.
3.4.2 Manually pre-cleaning the attachments

1.) Remove residue
Immerse attachments (e.g. drill chucks/quick-action chucks) in cold tap water for 5 min.
Then move all moving parts under running, cold water across the full range of movement and operation at least 5 times to loosen and remove heavy-duty residue.
Remove heavy-duty contamination and residue with a sponge, a lint-free cloth and/or a soft brush until no further contamination is visible. Clean all cannulations with the cleaning brushes provided for the purpose (3739).

Caution:
Do not use pointed or sharp items when cleaning.
Be careful: equipment defect!

2.) Ultrasonic bath cleaning
Treat attachments for 5 min. in an ultrasonic bath (0.5% cleaning solution of Neodisher MediClean (Dr. Weigert, Hamburg), 40°C).

3.) Water pistol cleaning
Rinse all gaps, joints and cavities for at least 20 sec. each with a water pistol.

4.) Check components visually
Repeat steps 1 to 5 until all components are rid of any visible contamination.
Mechanical/automated cleaning has to be performed after the manual pre-cleaning described above. For more, see section 3.4.3 Mechanical cleaning.
3.4.3 Mechanical cleaning

1.) Fill washing machine basket

Place all the items into the specially developed screen basket (3739) for the system. Ensure that all cannulations (attachments) are stored vertically, i.e. upright. Attach the rinsing adapters (3733/3722) to the handpieces. Connect the rinsing adaptors across the washing machine basket to the rinsing medium system (internal rinsing of the handpieces).

Machines and associated rinsing adaptors

Drill/milling machine (3701) with:
- universal rinsing adaptor (3732)
- drill rinsing adaptor (3733)

Drill (3700) with:
- universal rinsing adaptor (3732)
- drill rinsing adaptor (3733)
High TorQ power tools for major bone surgery

Oscillating saw (3702) with:
- universal rinsing adaptor (3732)

Fret saw (3703) with:
- universal rinsing adaptor (3732)
- jig-sternum saw rinsing adaptor (3734)

Sternum saw (3704) with:
- universal rinsing adaptor (3732)
- jig-sternum saw rinsing adaptor (3734)
2.) **Cleaning program**

**Note:** The cleaning/disinfection unit should meet the requirements of international norm ISO 15883.

Cleaner: neodischer MediClean (Dr. Weigert, Hamburg)

- 2 min. pre-washing with cold drinking water
- Empty
- 5 min. cleaning at 55°C with 0.5% cleaning solution
- Empty
- 2 min. neutralization (Neodisher® Z)
- Empty
- 3 min. rinse with cold fully demineralised water
- Empty
- 2 min. final rinse with cold fully demineralised water
- Empty
- 5 min. thermal disinfection with hot fully demineralised water (≥93°C)
- 40 min. drying (≥90°C)

3.) **Check components**

Remove all the components from the washing machine basket. Check cannulations, coupling sleeves etc. for visible contamination.

Repeat the automated cleaning with manual pre-cleaning if necessary.

Devices/handpieces, especially seals and bearings, are particularly stressed during mechanical cleaning/disinfection. After cleaning, make, in particular, a careful examination of the all-round seal in the cover for damage.

Components need to be oiled properly and regularly serviced.

Nouvag AG specifies that servicing be carried out at least once a year.
3.5 Lubrication/maintenance

Regularly lubricating the units/handpieces and the attachments ensures a long service life and trouble free operation. All accessible moving parts of the units/handpieces, covers and attachments have to be lubricated with the spray oil (3727). Wipe off excess oil with a cloth.

**Be careful:** equipment defect!

Nouvag AG recommends that lubrication stand (3724) be used for lubricating the units/handpieces.

The following require oiling:

**3.5.1 Drill (3701)**

The oil has to be sprayed directly at three points with the spray tube. For this purpose, each time insert the end of the spray tube as far as it will go in the intended position and pause there. Then deliver a burst of spray for about 1 second. Afterwards remove the spray tube from the point. Repeat the step at the other defined points.

<table>
<thead>
<tr>
<th>1.</th>
<th>Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image.png" alt="Image of lubrication process" /></td>
<td></td>
</tr>
</tbody>
</table>
2. Front plate

3. Release sleeve
   Apply the oil with the spray tube to the points shown in the picture (short burst of spray). Operate the release sleeve several times to distribute the oil.
4. **Trigger and lever**

   Apply the oil with the spray tube to both sides of the trigger guide (short spray burst). Press the trigger several times to distribute the oil.

Oil has to be sprayed in at three points with the corresponding oil spraying adaptor. To achieve this, insert the end of the spray tube into the tube of the adaptor in each case. Then insert the adaptor into the drill as far as it will go and pause. Deliver a burst of spray for about 1 second. Afterwards remove the spray tube and the adaptor from the point. Repeat the step at the other defined points.

5. **Socket:**

   use oil spraying adaptor 3729

Spraying adaptor for drill 3729
Colour: orange

Universal spraying adaptor (3728)
Colour: lilac
6. Socket:
use oil spraying adaptor 3729

7. PowerPack socket:
use oil spraying adaptor 3728

Wipe excess oil off the unit's surface with a cloth.
3.5.2 Rigid drill (3700)

The oil has to be sprayed directly at three points with the spray tube. For this purpose, each time insert the end of the spray tube as far as it will go in the intended position and pause there. Then deliver a burst of spray for about 1 second. Afterwards remove the spray tube from the point. Repeat the step at the other defined points.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cover</td>
</tr>
<tr>
<td>2.</td>
<td>Front plate</td>
</tr>
</tbody>
</table>
3. **Release sleeve**  
   Apply the oil with the spray tube to the points shown in the picture (short burst of spray). Operate the release sleeve several times to distribute the oil.

4. **Trigger and lever**  
   Apply the oil with the spray tube to both sides of the trigger guide (short spray burst). Press the trigger several times to distribute the oil.
Oil has to be sprayed in at two points with the corresponding oil spraying adaptor. To achieve this, insert the end of the spray tube into the tube of the adaptor in each case. Then insert the adaptor into the drill as far as it will go and pause. Deliver a burst of spray for about 1 second. Afterwards remove the spray tube and the adaptor from the point. Repeat the step at the other defined points.

**5. Socket:**
use oil spraying adaptor 3729

**6. PowerPack socket:**
use oil spraying adaptor 3728

Wipe excess oil off the unit's surface with a cloth.
### 3.5.3 Oscillating saw (3702)

The oil has to be sprayed in directly at two points with the spray tube. For this purpose, each time insert the end of the spray tube as far as it will go in the intended position and pause there. Then deliver a burst of spray for about 1 second. Afterwards remove the spray tube from the point. Repeat the step at the other defined points.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cover</td>
</tr>
<tr>
<td></td>
<td><img src="image.jpg" alt="Image of Cover" /></td>
</tr>
<tr>
<td>2.</td>
<td>Front plate</td>
</tr>
<tr>
<td></td>
<td><img src="image.jpg" alt="Image of Front Plate" /></td>
</tr>
</tbody>
</table>
3. **Trigger and lever**
   Apply the oil with the spray tube to both sides of the trigger guide (short spray burst). Press the trigger several times to distribute the oil.

4. **Cover in the centre:**
Oil has to be sprayed in at one point with the oil spraying adaptor. To achieve this, insert the end of the spray tube into the tube of the adaptor. Then insert the adaptor into the saw as far as it will go and pause. Deliver a burst of spray for about 1 second. Afterwards remove the spray tube and the adaptor from the point.

Universal spraying adaptor (3728)
Colour: lilac

5. PowerPack socket: use oil spraying adaptor 3728

Wipe excess oil off the unit's surface with a cloth.
### 3.5.4 Jig saw (3703)

The oil has to be sprayed in directly at two points with the spray tube. For this purpose, each time insert the end of the spray tube as far as it will go in the intended position and pause there. Then deliver a burst of spray for about 1 second. Afterwards remove the spray tube from the point. Repeat the step at the other defined points.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cover</td>
</tr>
<tr>
<td>2.</td>
<td>Front plate</td>
</tr>
</tbody>
</table>
3. Trigger and lever

Apply the oil with the spray tube to both sides of the trigger guide (short spray burst). Press the trigger several times to distribute the oil.

Oil has to be sprayed in at three points with the corresponding oil spraying adaptor. To achieve this, insert the end of the spray tube into the tube of the adaptor in each case. Then insert the adaptor into the saw as far as it will go and pause. Deliver a burst of spray for about 1 second. Afterwards remove the spray tube and the adaptor from the point. Repeat the step at the other defined points.

Spraying adaptor front for saws (3731)
Colour: yellow

Spraying adaptor for saws (3730)
Colour: blue

Universal spraying adaptor (3728)
Colour: lilac
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Cover in the centre: use oil spraying adaptor 3730</td>
</tr>
<tr>
<td>5.</td>
<td>Front: use oil spraying adaptor 3731</td>
</tr>
<tr>
<td>6.</td>
<td>PowerPack socket: use oil spraying adaptor 3728</td>
</tr>
</tbody>
</table>

Rub excess oil off the unit's surface with a dry cloth.
### 3.5.5 Sternum saw (3704)

The oil has to be sprayed in directly at two points with the spray tube. For this purpose, each time insert the end of the spray tube as far as it will go in the intended position and pause there. Then deliver a burst of spray for about 1 second. Afterwards remove the spray tube from the point. Repeat the step at the other defined points.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cover</td>
</tr>
<tr>
<td>2.</td>
<td>Front plate</td>
</tr>
</tbody>
</table>

![Image of the saw](image_url)
3. **Trigger and lever**

Apply the oil with the spray tube to both sides of the trigger guide (short spray burst). Press the trigger several times to distribute the oil.

Oil has to be sprayed in at three points with the corresponding oil spraying adaptor. To achieve this, insert the end of the spray tube into the tube of the adaptor in each case. Then insert the adaptor into the saw as far as it will go and pause. Deliver a burst of spray for about 1 second. Afterwards remove the spray tube and the adaptor from the point. Repeat the step at the other defined points.

- Spraying adaptor front for saws (3731)
  - Colour: yellow

- Spraying adaptor for saws (3730)
  - Colour: blue

- Universal spraying adaptor (3728)
  - Colour: lilac
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Cover in the centre: use oil spraying adaptor 3730</td>
</tr>
<tr>
<td>5.</td>
<td>Front: use oil spraying adaptor 3731</td>
</tr>
<tr>
<td>6.</td>
<td>PowerPack socket: use oil spraying adaptor 3728</td>
</tr>
</tbody>
</table>

Rub excess oil off the unit's surface with a dry cloth.
3.6 Packaging

Put the cleaned and dry products into the designated screen basket positions. Additionally pack the screen basket in a sterile barrier system in accordance with ISO 11607, e.g. in a sterilisation fleece provided for it or a re-usable sterilisation container.

Prevent implants, pointed or sharp instruments from touching and incurring damage.

Be careful: equipment defect!

Ensure that pointed or sharp items do not damage the sterile barrier system.

Warning: patient hazard!

3.7 Sterilisation

Caution:

Remove the PowerPack from the unit/handpiece. Never sterilise PowerPacks, which will damage them.

Warning: hazard to users!

Be careful: equipment defect!

The systems can be re-sterilised by means of validated steam sterilisation (ISO 17665 or national norms). The Nouvag AG recommends the following parameters for instruments and strainer baskets packed in the sterile barrier system:

<table>
<thead>
<tr>
<th>Sterilisation procedure (cycle)</th>
<th>Sterilisation duration</th>
<th>Sterilisation temperature</th>
<th>Drying time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steam sterilisation (fractionated pre-vacuum) (at least 3 intervals)</td>
<td>at least 4 minutes</td>
<td>at least 132°C at the most 138°C</td>
<td>20-60 minutes</td>
</tr>
<tr>
<td></td>
<td>at least 5 minutes</td>
<td>at least 134°C at the most 138°C</td>
<td>20-60 minutes</td>
</tr>
</tbody>
</table>

The drying times vary between 20 and 60 minutes due to diverse packing materials (sterile barrier system consisting of a sterilisation fleece or a re-usable sterilisation container), the steam quality, the materials, the products being sterilised, the total weight, the performance characteristics of the steriliser and variable cooling times.

Caution:

- The following maximum values must not be exceeded: 143°C for a maximum of 22 minutes.
- Do not speed up the cooling.
- No hot-air, ethylene oxide, sterrad, plasma and formaldehyde sterilisation may be used.

Be careful: equipment defect!
3.8 Symbols used

The following symbols are indicated on the unit or individual components:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>!</td>
<td>Attention. Before using the unit, read the operating instructions provided.</td>
</tr>
<tr>
<td>💦</td>
<td>Before using the unit, read the operating instructions provided.</td>
</tr>
<tr>
<td>🚨</td>
<td>Do not immerse the unit in liquids.</td>
</tr>
<tr>
<td>🛋️</td>
<td>Do not wet the unit with liquids.</td>
</tr>
<tr>
<td>⚠️</td>
<td>The unit corresponds to Type B classification against electric shock and leakage currents. The unit is suitable for use on patients in accordance with the norm IEC 60601-1.</td>
</tr>
<tr>
<td>🚧</td>
<td>The unit contains batteries (Li-ion = chem. symbol of the pollutant). Batteries must be properly disposed of for reasons of environmental protection. Disposal in accordance with national laws or in accordance with the European Battery Directive 2006/66/EC.</td>
</tr>
<tr>
<td>🚨</td>
<td>Caution: Danger of fire, explosion and burns. Do not cut up, short circuit, shred, heat to over + 60°C or burn the cells (batteries)</td>
</tr>
<tr>
<td>🔌</td>
<td>cMETus With regard to electrical shock, fire and mechanical hazards only in accordance with UL 60601-1</td>
</tr>
<tr>
<td>🎯</td>
<td>The unit meets the requirements of the European Directive 93/42/EEC for medical devices. It is approved by an independent appointed body with the labelling 0197. Therefore it bears the CE mark.</td>
</tr>
<tr>
<td>⚡</td>
<td>Trigger extended → Drive switched off</td>
</tr>
<tr>
<td>⚡</td>
<td>Trigger retracted → Drive switched on,</td>
</tr>
<tr>
<td>⚡</td>
<td>Trigger in the intermediate position → Speed dependent on the position of the trigger</td>
</tr>
<tr>
<td>⚡</td>
<td>Slider in the central position → LOCK/SAFETY POSITION. Unit cannot be started inadvertently.</td>
</tr>
<tr>
<td>⚡</td>
<td>Slider retracted → Clockwise rotation</td>
</tr>
<tr>
<td>⚡</td>
<td>Slider extended → Anticlockwise rotation</td>
</tr>
<tr>
<td>⚡</td>
<td>Oscillation mode switched on</td>
</tr>
<tr>
<td>⚡</td>
<td>Oscillation mode switched off</td>
</tr>
</tbody>
</table>
### 3.9  Repair and technical service

Send the unit in for repair at Nouvag AG or an authorized representative in the event of a defect or malfunction.  
**Be careful:** equipment defect!

A unit that has been dropped must be sent in for inspection and repair.  
**Be careful:** equipment defect!

Do not continue using faulty units.  
**Warning:** hazard to patient and user!

---

<table>
<thead>
<tr>
<th>Slide</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Slider" /></td>
<td>Slider retracted → switched on</td>
</tr>
<tr>
<td><img src="image" alt="Slider" /></td>
<td>Slider extended → switched on</td>
</tr>
<tr>
<td><img src="image" alt="Frequency/speed" /></td>
<td>Frequency/speed set to Position &quot;I&quot;</td>
</tr>
<tr>
<td><img src="image" alt="Frequency/speed" /></td>
<td>Frequency/speed set to Position &quot;II&quot;</td>
</tr>
<tr>
<td><img src="image" alt="Cover locked" /></td>
<td>Cover locked (in the direction of the arrow)</td>
</tr>
<tr>
<td><img src="image" alt="Cover open" /></td>
<td>Cover open (in the direction of the arrow)</td>
</tr>
<tr>
<td><img src="image" alt="Position" /></td>
<td>Position for pressing with the thumb (to lock the cover)</td>
</tr>
<tr>
<td><img src="image" alt="PowerPack" /></td>
<td>PowerPack shows green indicators and is fully charged (PowerPack inserted in the battery charger)</td>
</tr>
<tr>
<td><img src="image" alt="PowerPack" /></td>
<td>PowerPack shows yellow indicators and is fully charged (PowerPack inserted in the battery charger)</td>
</tr>
<tr>
<td><img src="image" alt="PowerPack" /></td>
<td>PowerPack has a malfunction, battery is not charging: follow the operating instructions (Power pack inserted in the battery charger)</td>
</tr>
<tr>
<td><img src="image" alt="Ready" /></td>
<td>Battery charger ready for use</td>
</tr>
<tr>
<td><img src="image" alt="Ready" /></td>
<td>Battery charger is charging the PowerPack (yellow/orange/reddish display)</td>
</tr>
</tbody>
</table>
If a repair is no longer possible or makes no sense, the device must be disposed of. See instructions below in the chapter: Disposal.

Except for the measures for care and maintenance described above, no servicing may be performed by the user or third parties.

**Warning:** hazard to patient and user!

**Be careful:** equipment defect!

Nouvag AG specifies that the unit and accessories such as attachments be serviced regularly (once a year) by the original manufacturer or authorized service centres.

**Caution:** "SV 661 in ADR 2013" applies to the transport of damaged lithium batteries.

Damaged lithium batteries especially include:
- batteries in which the manufacturer has found faults which impair safety,
- batteries with damaged or considerably deformed casings,
- leaky batteries or batteries releasing gas or
- batteries with faults that cannot be diagnosed before being sent to the place of the analysis.

There are no special conditions if batteries are merely non-functional.

**Warning:** hazard to users!

**Caution:**
The manufacturer does not accept responsibility for damage arising from repair or maintenance by unauthorized third parties.

**Warning:** hazard to patient and user!

**Be careful:** equipment defect!
3.10 Disposal

Defective units can usually be repaired, for this see Chapter 3.8 Repair and technical service.

The units contain lithium-ion cells (Li-ion = chem. symbol of the pollutant) and have to be properly disposed for environmental protection reasons.

Disposal in accordance with national laws or in accordance with the European Battery Directive 2006/66/EC and Electrical and Electronics Equipment 2002/96/EC.

**Caution:**
Danger of fire, explosion and burns.
- Do not damage, open, cut up, short circuit, shred, expose to liquid, heat to over + 60°C or burn the cells (batteries).

**Warning:** hazard to users!
- To protect against infections, the units/handpieces, attachments have to undergo the full process of clinical preparation prior to disposal.

**Warning:** hazard to users!

Send units which have reached the end of their service life to Nouvag AG or an authorized agency. This ensures that disposal takes place in accordance with national regulations.

The unit must not be disposed of with the general household waste
## 4 Trouble shooting

### 4.1 Unit/handpiece and cover

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive will not start</td>
<td>No PowerPack in the handpiece</td>
<td>Insert charged PowerPack</td>
</tr>
<tr>
<td></td>
<td>PowerPack is discharged</td>
<td>Charge the PowerPack</td>
</tr>
<tr>
<td></td>
<td>Safety system is activated (slider in the safety position)</td>
<td>Move the slider to clockwise or anticlockwise mode or to &quot;ON&quot;</td>
</tr>
<tr>
<td></td>
<td>PowerPack is defective</td>
<td>Send in the PowerPack to the Nouvag AG service centre</td>
</tr>
<tr>
<td></td>
<td>The overheating protection is activated; the white indicators have already flashed</td>
<td>Allow the drive to cool</td>
</tr>
<tr>
<td>Drive has too little power</td>
<td>PowerPack is discharged; indicator on the PowerPack already red</td>
<td>Charge the PowerPack</td>
</tr>
<tr>
<td></td>
<td>Drive is being operated in the wrong mode (e.g. milling mode (REAM) instead of drilling mode (DRILL))</td>
<td>Change mode (DRILL/REAM)</td>
</tr>
<tr>
<td></td>
<td>Drive and/or attachments are badly maintained</td>
<td>Send in the drive and attachments to the Nouvag AG service centre</td>
</tr>
<tr>
<td>Drive suddenly stops</td>
<td>PowerPack is discharged; indicator on the PowerPack glows red</td>
<td>Charge the PowerPack</td>
</tr>
<tr>
<td></td>
<td>Drive has overheated; the white indicators have already flashed Display on the PowerPack glows red</td>
<td>Allow the drive to cool</td>
</tr>
<tr>
<td></td>
<td>Drive or PowerPack is defective</td>
<td>Insert a fully charged PowerPack into the drive. If that does not help, send in the drive to the Nouvag AG service centre</td>
</tr>
<tr>
<td>Problem</td>
<td>Possible cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>---------</td>
<td>---------------</td>
<td>--------</td>
</tr>
<tr>
<td>Drive continues to run after releasing the trigger</td>
<td>Trigger is blocked by deposits (e.g. blood)</td>
<td>Press the trigger several times, clean and service the drive as specified</td>
</tr>
<tr>
<td></td>
<td>PowerPack is defective</td>
<td>Take out the PowerPack and run the drive until it stops. Then send it in to the Nouvag AG service centre</td>
</tr>
<tr>
<td>Drive becomes noticeably warm/hot</td>
<td>Drive was overstressed</td>
<td>Allow the drive to cool</td>
</tr>
<tr>
<td>Motor runs too slowly</td>
<td>Wrong mode set (e.g. REAM instead of DRILL)</td>
<td>Set the correct mode (DRILL/REAM) for drilling and milling attachment</td>
</tr>
<tr>
<td>Drive saws too slowly</td>
<td>Wrong frequency/speed set for sawing (e.g. Step I instead of Step II)</td>
<td>Correct frequency/speed set for sawing (Step II)</td>
</tr>
<tr>
<td>Drive runs too fast</td>
<td>Wrong mode set (e.g. DRILL instead of REAM)</td>
<td>Set the correct mode (DRILL/REAM) for drilling and milling attachment</td>
</tr>
<tr>
<td>Drive saws too fast</td>
<td>Wrong frequency/speed set for sawing (e.g. Step II instead of Step I)</td>
<td>Correct frequency/speed set for sawing (Step I)</td>
</tr>
<tr>
<td>Oscillating saw vibrates too strongly</td>
<td>Saw blade locking mechanism is not tightened or has come loose</td>
<td>Tighten the lock button on the saw blade quick coupling</td>
</tr>
<tr>
<td>Attachments cannot be mounted on the drive</td>
<td>Drive clutch is clogged by deposits</td>
<td>Remove deposits by thorough cleaning and then lubricate.</td>
</tr>
<tr>
<td></td>
<td>Locking mechanism is detective</td>
<td>Lubricate mechanism and move, if it then still does not function, send the drive in to the Nouvag AG service centre</td>
</tr>
<tr>
<td>Attachments cannot be removed from the drive</td>
<td>Release sleeve for attachments is blocked/clogged by deposits</td>
<td>Inspect release sleeve, possibly clean and lubricate.</td>
</tr>
<tr>
<td></td>
<td>Locking mechanism is detective</td>
<td>Send the drive in to the Nouvag AG service centre</td>
</tr>
</tbody>
</table>
### 4.2 PowerPack

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerPack cannot be inserted into the handpiece</td>
<td>PowerPack was inserted in the wrong direction</td>
<td>Rotate the PowerPack by 180° and insert again. Pay attention to the shape of the PowerPack and handpiece</td>
</tr>
<tr>
<td>PowerPack cannot be removed from the handpiece</td>
<td>PowerPack is deformed, possibly by a fall.</td>
<td>Send the PowerPack in to the Nouvag AG service centre, follow Section 3.9 Repair and technical service.</td>
</tr>
<tr>
<td>Fully charged PowerPack does not work</td>
<td>Safety system is activated (slider in the safety position)</td>
<td>Move the slider to clockwise or anticlockwise mode or to &quot;ON&quot;</td>
</tr>
<tr>
<td>Charge indicator is glowing continuously</td>
<td>The PowerPack is faulty as it, for example, was dropped after removal from the battery charger or was exposed to liquid.</td>
<td>Send the PowerPack in to the Nouvag AG service centre, follow Section 3.9 Repair and technical service.</td>
</tr>
<tr>
<td>Charge indicator is not glowing</td>
<td>The PowerPack is in the battery charger</td>
<td>No defect. The charge indicators are glowing continuously in the powered up battery charger.</td>
</tr>
<tr>
<td>PowerPack flashes yellow</td>
<td>The fully charged PowerPack has been taken out of the battery charger and not yet used in the handpiece</td>
<td>No defect. After removal of a fully charged PowerPack from the battery charger the green charge indicators glow for a 2-hour period.</td>
</tr>
<tr>
<td>Condition</td>
<td>Cause</td>
<td>Action</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PowerPack was inadvertently washed, immersed in liquids or sterilised and is faulty</td>
<td>Staff negligence</td>
<td>Send the PowerPack in to the Nouvag AG service centre, follow Section 3.9 Repair and technical service.</td>
</tr>
<tr>
<td>Charge indicator is not glowing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power pack inserted into the battery charger</td>
<td>The battery charger is not plugged in to the mains</td>
<td>Connect the battery charger to the power supply with the supplied mains cable.</td>
</tr>
<tr>
<td></td>
<td>The battery charger has a fault</td>
<td>Have the battery charger checked by the Nouvag AG service centre and if necessary repaired.</td>
</tr>
<tr>
<td></td>
<td>The PowerPack has a fault</td>
<td>Send the PowerPack in to the Nouvag AG service centre, follow Section 3.9 Repair and technical service.</td>
</tr>
<tr>
<td>The PowerPack's casing is visibly damaged</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The PowerPack was subjected to too much heat</td>
<td>Send the PowerPack in to the Nouvag AG service centre, follow Section 3.8 Repair and technical service.</td>
</tr>
<tr>
<td></td>
<td>The PowerPack was dropped</td>
<td>Send the PowerPack in to the Nouvag AG service centre, follow Section 3.9 Repair and technical service.</td>
</tr>
<tr>
<td>The PowerPack is not giving enough power</td>
<td>The PowerPack was stored for over 1 month outside the battery charger and was not used.</td>
<td>3 - 5 charging/discharging cycles are needed to restore the PowerPack to optimum capacity.</td>
</tr>
</tbody>
</table>
### 4.3 Attachments and tools

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attachments cannot be mounted on the drive</td>
<td>The attachment coupling is clogged by deposits</td>
<td>Remove deposits by thorough cleaning and then lubricate.</td>
</tr>
<tr>
<td>Attachments cannot be removed from the drive</td>
<td>Release sleeve for attachments is blocked/clogged by deposits</td>
<td>Inspect release sleeve, possibly clean and lubricate. If necessary, send the drive in to the Nouvag AG service centre</td>
</tr>
<tr>
<td>Cutting tool cannot be mounted to an attachment or only with difficulty</td>
<td>The locking mechanism is clogged by deposits</td>
<td>Remove deposits by thorough cleaning and then lubricate.</td>
</tr>
<tr>
<td></td>
<td>Attachment or tool is deformed due to improper use (e.g. fall), wear</td>
<td>Replace the attachment or tool or send in to the Nouvag AG service centre</td>
</tr>
<tr>
<td>Attachment becomes noticeably warm/hot</td>
<td>Attachment was overstressed</td>
<td>Allow the attachment to cool and lubricate prior to next use.</td>
</tr>
<tr>
<td>Rotary attachment turns too slowly</td>
<td>Wrong mode set (e.g. REAM instead of DRILL)</td>
<td>Set the correct mode (DRILL/REAM) for drilling and milling attachment</td>
</tr>
<tr>
<td>Rotary attachment turns too fast</td>
<td>Wrong mode set (e.g. DRILL instead of REAM)</td>
<td>Set the correct mode (DRILL/REAM) for drilling and milling attachment</td>
</tr>
<tr>
<td>Kirschner wire cannot be inserted into Kirschner wire attachment</td>
<td>Kirschner wire attachment is not open</td>
<td>Set the setting sleeve on the end of the attachment to the correct wire size.</td>
</tr>
<tr>
<td>Kirschner wire cannot be gripped despite operating the tensioning lever</td>
<td>Kirschner wire attachment is too far open</td>
<td>Set the setting sleeve on the end of the attachment to the correct wire size.</td>
</tr>
<tr>
<td>Kirschner wire is jammed in the attachment and will no longer move</td>
<td>Kirschner wire was introduced at an angle and has jammed in the attachment</td>
<td>Send the Kirschner wire attachment in to the Nouvag AG service centre</td>
</tr>
<tr>
<td>Bones and tool heat up due to the work procedure</td>
<td>The cutting tool is blunt</td>
<td>Replace the tool</td>
</tr>
</tbody>
</table>
## 4.4 Battery chargers

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No indicators illuminated on the battery charger</td>
<td>The mains cable is not plugged in</td>
<td>Connect the battery charger to the power supply with the supplied mains cable.</td>
</tr>
<tr>
<td></td>
<td>The battery charger has a fault</td>
<td>Have the battery charger checked by the Nouvag AG service centre and if necessary repaired.</td>
</tr>
<tr>
<td>With the PowerPack inserted no indicators illuminate on the PowerPack</td>
<td>The mains cable is not plugged in</td>
<td>Connect the battery charger to the power supply with the supplied mains cable.</td>
</tr>
<tr>
<td></td>
<td>The battery charger has a fault</td>
<td>Have the battery charger checked by the Nouvag AG service centre and if necessary repaired.</td>
</tr>
<tr>
<td></td>
<td>The PowerPack has a fault</td>
<td>Have the battery charger checked by the Nouvag AG service centre and if necessary repaired.</td>
</tr>
<tr>
<td>PowerPack with red indicator</td>
<td>The PowerPack has too high a temperature</td>
<td>Leave the PowerPack in the charging bay, after cooling charging will start automatically</td>
</tr>
<tr>
<td></td>
<td>Deeply discharged PowerPack</td>
<td>Fully discharged PowerPack was not recharged immediately after use and was not used for several weeks. Several cycles of charging/discharging are needed to restore the PowerPack to optimum capacity.</td>
</tr>
<tr>
<td>PowerPack flashes yellow</td>
<td>The mains cable is not plugged in</td>
<td>Connect the battery charger to the power supply with the supplied mains cable.</td>
</tr>
</tbody>
</table>

Note: if you do not succeed through the suggested solutions shown above, please contact the Nouvag AG service centre responsible for your area.
5 Specifications

5.1 Operating cycle

<table>
<thead>
<tr>
<th>Device</th>
<th>Switch-on time</th>
<th>Switch-off time</th>
<th>Cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>3701 drill, switchable</td>
<td>60 seconds</td>
<td>60 seconds</td>
<td>5</td>
</tr>
<tr>
<td>3700 drill</td>
<td>60 seconds</td>
<td>60 seconds</td>
<td>5</td>
</tr>
<tr>
<td>3702 oscillating saw</td>
<td>60 seconds</td>
<td>60 seconds</td>
<td>5</td>
</tr>
<tr>
<td>3703 jig-saw</td>
<td>60 seconds</td>
<td>60 seconds</td>
<td>5</td>
</tr>
<tr>
<td>3704 sternum saw</td>
<td>60 seconds</td>
<td>60 seconds</td>
<td>5</td>
</tr>
</tbody>
</table>

A surgeon operating with a sternum saw must not work for longer than 30 min a day.

**Warning:** hazard to users!

The recommendations for the duration of using the units were calculated with an average charge and at a room temperature +20°C.

Electrical devices become warm during continuous use.

Therefore, after the above time powered-up the handpiece and attachments used should cool for at least the switch-off time. The handpiece and attachments should cool for at least 30 minutes after five cycles. Adherence to these specifications will prevent the system from overheating and rule out injury to patients or users. The user is responsible for applying and complying with the cooling phases. We recommend keeping an additional unit and additional attachments at the ready for extended continuous use.

**Warning:** hazard to patient and user!

**Be careful:** equipment defect!

**Caution:**
- Always adhere to the recommended operating cycles.

**Be careful:** equipment defect!

- Only use new cutting tools to prevent the system from heating up due to reduced cutting power.

**Be careful:** equipment defect!

- To prevent heat necrosis, always rinse cutting tools with coolant. Rinse manually.

**Warning:** patient hazard!

- Caring for and maintaining the system reduces heat generation in the handpiece and attachments.

**Be careful:** equipment defect!
### 5.2 Device specification

#### 3701 Drill, switchable

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions of handpiece (without attachment)</td>
<td>162 x 93 x 198 mm</td>
</tr>
<tr>
<td>Weight of handpiece with PowerPack</td>
<td>1850 g</td>
</tr>
<tr>
<td>Infinitely variable speed</td>
<td>0 - 1000 rpm (drill mode)</td>
</tr>
<tr>
<td></td>
<td>0 - 250 rpm (ream mode)</td>
</tr>
<tr>
<td>Cannulation</td>
<td>Ø 4.3 mm cannulation</td>
</tr>
<tr>
<td>Protection class</td>
<td>B, EN 60601-1</td>
</tr>
<tr>
<td>Power supply</td>
<td>Internal battery</td>
</tr>
</tbody>
</table>

#### 3700 Drill, rigid

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions of handpiece (without attachment)</td>
<td>137 x 93 x 197 mm</td>
</tr>
<tr>
<td>Weight of handpiece with PowerPack</td>
<td>1660 g</td>
</tr>
<tr>
<td>Infinitely variable speed</td>
<td>0 - 40,000 rpm</td>
</tr>
<tr>
<td>Cannulation</td>
<td>Ø 4.3 mm cannulation</td>
</tr>
<tr>
<td>Protection class</td>
<td>B, EN 60601-1</td>
</tr>
<tr>
<td>Power supply</td>
<td>Internal battery</td>
</tr>
</tbody>
</table>

#### 3702 oscillating saw

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions of handpiece (without attachment)</td>
<td>163 x 93 x 202 mm</td>
</tr>
<tr>
<td>Weight of handpiece with PowerPack</td>
<td>1760 g</td>
</tr>
<tr>
<td>Infinitely variable speed</td>
<td>0 - 9000 rpm (Step I)</td>
</tr>
<tr>
<td></td>
<td>0 - 11000 rpm (Step II)</td>
</tr>
<tr>
<td>Protection class</td>
<td>B, EN 60601-1</td>
</tr>
<tr>
<td>Power supply</td>
<td>Internal battery</td>
</tr>
</tbody>
</table>
### 3703 Jig-saw

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions of handpiece (without attachment)</td>
<td>180 x 93 x 196 mm</td>
</tr>
<tr>
<td>Weight of handpiece with PowerPack</td>
<td>1730 g</td>
</tr>
<tr>
<td>Infinitely variable speed</td>
<td>0 - 6000 rpm (Step I)</td>
</tr>
<tr>
<td></td>
<td>0 - 6500 rpm (Step II)</td>
</tr>
<tr>
<td>Protection class</td>
<td>B, EN 60601-1</td>
</tr>
<tr>
<td>Power supply</td>
<td>Internal battery</td>
</tr>
</tbody>
</table>

### 3704 Sternum Saw

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions of handpiece (without attachment)</td>
<td>217 x 93 x 197 mm</td>
</tr>
<tr>
<td>Weight of handpiece with PowerPack</td>
<td>1750 g</td>
</tr>
<tr>
<td>Infinitely variable speed</td>
<td>0 - 6000 rpm (Step I)</td>
</tr>
<tr>
<td></td>
<td>0 - 6500 rpm (Step II)</td>
</tr>
<tr>
<td>Protection class</td>
<td>B, EN 60601-1</td>
</tr>
<tr>
<td>Power supply</td>
<td>Internal battery</td>
</tr>
</tbody>
</table>

### 3705 PowerPack (battery):

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>89 x 87 x 102 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>760 g</td>
</tr>
<tr>
<td>Type</td>
<td>Li-ion</td>
</tr>
<tr>
<td>Max. voltage</td>
<td>16.8 V</td>
</tr>
<tr>
<td>Operating voltage (nominal voltage)</td>
<td>14.4 V</td>
</tr>
<tr>
<td>Capacity</td>
<td>2.1 Ah</td>
</tr>
<tr>
<td>Typical charging time</td>
<td>&lt; 90 min</td>
</tr>
</tbody>
</table>
### 3706 Battery charger (single bay)

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>157 x 140 x 79 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>1740 g</td>
</tr>
<tr>
<td>Type</td>
<td>Li-ion battery charger</td>
</tr>
</tbody>
</table>
| Input            | 100-240 VAC  
|                  | 50-60 Hz  
|                  | 0.9 A |
| Output           | 16.8 VDC  
|                  | 2.0 A |

### 3707 Battery charger (4 bays)

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>636 x 140 x 79 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>6960 g</td>
</tr>
<tr>
<td>Type</td>
<td>Li-ion battery charger</td>
</tr>
</tbody>
</table>
| Input            | 100-240 VAC  
|                  | 50-60 Hz  
|                  | 0.9 A |
| Output           | 16.8 VDC  
|                  | 2.0 A |

Note: All the specifications are subject to tolerances.
5.3 Environmental conditions

<table>
<thead>
<tr>
<th></th>
<th>Operation</th>
<th>Transport and storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>![Temperature Chart] 35°C</td>
<td>![Temperature Chart] 55°C</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>![Humidity Chart] 90% 30%</td>
<td>![Humidity Chart] 90% 10%</td>
</tr>
<tr>
<td>Atmospheric pressure</td>
<td>![Pressure Chart] 1060 hPa 500</td>
<td>![Pressure Chart] 1060 hPa 500</td>
</tr>
</tbody>
</table>

Caution: Do not store or operate the units in an explosive atmosphere.

5.4 Applicable standards

The units conform to the following standards and guidelines:

Medical device guidelines 93/42/EC and 2007/47/EC

IEC 60601-1, 3rd edition
5.5 Electromagnetic compatibility

Caution:
Basically, interference between electrical devices can never be completely ruled out. You are strongly advised to adhere to the following instructions (distances) and to adhere to any instructions relating to the other electrical devices being used.

Support documents in accordance with IEC 60601-1-2 according to 5.2.2

Table 1:

<table>
<thead>
<tr>
<th>Interference emission measurements</th>
<th>Conformance</th>
<th>Electromagnetic environment - guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF emissions in accordance with CISPR 11</td>
<td>Group 1</td>
<td>The system uses HF energy only for its internal function. Therefore its HF emissions are very low, and it is unlikely that neighbouring electronic devices are disrupted.</td>
</tr>
<tr>
<td>HF emissions in accordance with CISPR 11</td>
<td>Class B</td>
<td></td>
</tr>
<tr>
<td>Harmonic emissions in accordance with IEC 61000-3-2</td>
<td>Not applicable</td>
<td>The system is suitable for use in other facilities than living areas and such which are directly linked to a public utility network which also supplies buildings that are used for residential purposes.</td>
</tr>
<tr>
<td>Voltage fluctuations/flicker emissions in accordance with IEC 61000-3-3</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>
Table 2:

<table>
<thead>
<tr>
<th>Interference immunity tests</th>
<th>IEC 60601-Test level</th>
<th>Conformance level</th>
<th>Electromagnetic environment - Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge of static electricity (ESD) in accordance with IEC 61000-4-2</td>
<td>± 6 kV contact discharge</td>
<td>± 6 kV contact discharge</td>
<td>Flooring should be made from wood or concrete or feature ceramic tiles. If the floor is covered with synthetic material, the relative humidity must be at least 30%.</td>
</tr>
<tr>
<td></td>
<td>± 8 kV air discharge</td>
<td>± 8 kV air discharge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical fast transients/bursts in accordance with IEC 61000-4-4</td>
<td>± 2 kV for power cables</td>
<td>Not applicable</td>
<td>The quality of the supply voltage should correspond to that of a typical business or hospital environment.</td>
</tr>
<tr>
<td></td>
<td>± 1 kV for input and output cables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surges in accordance with IEC 61000-4-5</td>
<td>± 1 kV voltage phase conductor-phase conductor</td>
<td>Not applicable</td>
<td>The quality of the supply voltage should correspond to that of a typical business or hospital environment.</td>
</tr>
<tr>
<td></td>
<td>± 2 kV voltage phase conductor-ground</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage dips, brief interruptions and fluctuations in supply voltage in accordance with IEC 61000-4-11</td>
<td>&lt; 5 % $U_T$ (&gt; 95 % dip in $U_T$) for 1/2 period</td>
<td>Not applicable</td>
<td>The quality of the supply voltage should correspond to that of a typical business or hospital environment. Users of the system requiring continued operation, even if power supply interruptions occur, are advised to supply the system from an uninterruptible power supply or a battery.</td>
</tr>
<tr>
<td></td>
<td>&lt; 40 % $U_T$ (&gt; 60 % dip in $U_T$) for 5 periods</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt; 70 % $U_T$ (&gt; 30 % dip in $U_T$) for 25 periods</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt; 5 % $U_T$ (&gt; 95 % dip in $U_T$) for 5 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnetic field at the supply frequency (50/60 Hz) in accordance with IEC 61000-4-8</td>
<td>3 A/m</td>
<td>3 A/m</td>
<td>Magnetic fields at mains frequency should correspond to the typical values to be found in business and hospital environments.</td>
</tr>
</tbody>
</table>

Note: $U_T$ is the mains supply voltage prior to applying the test levels.
Table 4:

### Guidance and manufacturer’s declaration – Electromagnetic interference immunity

The system is intended for operation in such an electromagnetic environment as shown below. The customer or user of the system must ensure that it is used in such an environment.

<table>
<thead>
<tr>
<th>Interference immunity tests</th>
<th>IEC 60601-Test level</th>
<th>Conformance level</th>
<th>Electromagnetic environment - Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conducted HF disturbances in accordance with IEC 61000-4-6</td>
<td>3 V&lt;sub&gt;effective value&lt;/sub&gt; 150 kHz to 80 MHz</td>
<td>Not applicable</td>
<td>Portable and mobile radio equipment should not be used at a smaller distance to the system including cables than the recommended safety distance that is calculated according to the equation which is applicable to the transmitter frequency. Recommended safety distance:</td>
</tr>
<tr>
<td>Conducted HF disturbances in accordance with IEC 61000-4-3</td>
<td>3 V/m 80 MHz to 2.5 GHz</td>
<td>3 V/m</td>
<td></td>
</tr>
</tbody>
</table>

\[
d = 1.2\sqrt{P}
\]

for 80 MHz to 800 MHz

\[
d = 2.3\sqrt{P}
\]

for 800 MHz to 2.5 GHz

with P as the nominal output of the transmitter in watts (W) as specified by the transmitter manufacturer and d as the recommended safety distance in metres (m).

At all frequencies the field strength of stationary radio transmitters based on an on-site examination should be lower than the conformance levels.\( ^a \)

Interference is possible in the area surrounding equipment which bears the following symbol.

\( ^a \) Field strengths from fixed transmitters, such as base stations for wireless telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted from theory with any accuracy. To determine the electromagnetic environment regarding stationary transmitters, a study of the electromagnetic phenomena of the location should be considered. If the measured field strength in the location where the system is used exceeds the above conformance level, the system should be monitored to verify the intended operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the system.

\( ^b \) Above the frequency range of 150 kHz to 80 MHz the field strength should be lower than 3 V/m.

---

Note 1 At 80 MHz and 800 MHz the higher frequency range applies

Note 2 This guidance may not apply in all cases. The spread of electromagnetic disturbances is affected by absorptions and reflections from buildings, objects and people.
The system is intended for use in an electromagnetic environment in which HF disturbances are controlled. The customer or the user of the system can help prevent electromagnetic interference by keeping a minimum distance between portable and mobile HF telecommunications equipment (transmitters) and the system according to the maximum output power of the communication equipment as shown below.

<table>
<thead>
<tr>
<th>Rated transmitter output W</th>
<th>Safety distance, subject to the transmitter frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150 kHz to 80 MHz</td>
</tr>
<tr>
<td></td>
<td>$d = 1.2\sqrt{P}$</td>
</tr>
<tr>
<td>0.01</td>
<td>12 cm</td>
</tr>
<tr>
<td>0.1</td>
<td>38 cm</td>
</tr>
<tr>
<td>1</td>
<td>1.2 m</td>
</tr>
<tr>
<td>10</td>
<td>3.8 m</td>
</tr>
<tr>
<td>100</td>
<td>12 m</td>
</tr>
</tbody>
</table>

For transmitters the maximum nominal output of which is not given in the above table, the recommended safety distance $d$ in metres (m) can be calculated using the equation corresponding to the respective column, whereby $P$ is the maximum nominal output of the transmitter in watts (W) as specified by the transmitter manufacturer.

Note 1 At 80 MHz and 800 MHz the higher frequency range applies.

Note 2 This guidance may not apply in all cases. The spread of electromagnetic disturbances is affected by absorptions and reflections from buildings, objects and people.
### Order information

#### Drives

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3701</td>
<td>Drill</td>
<td>3703</td>
<td>Jig-saw</td>
</tr>
<tr>
<td>3700</td>
<td>Drill, rigid</td>
<td>3704</td>
<td>Sternum saw</td>
</tr>
<tr>
<td>3702</td>
<td>Oscillating saw</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Attachments

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3708</td>
<td>Transfixion wire chuck (for drill)</td>
<td>3716</td>
<td>Harris attachment</td>
</tr>
<tr>
<td>3709</td>
<td>Transfixion wire chuck (for drill, rigid)</td>
<td>3717</td>
<td>Hexagonal attachment SW6</td>
</tr>
<tr>
<td>3710</td>
<td>Extension for transfixion wire chuck</td>
<td>3718</td>
<td>Jacobs drill chuck small</td>
</tr>
<tr>
<td>3711</td>
<td>Adapter for radiolucent angular gear</td>
<td>3719</td>
<td>Jacobs drill chuck large</td>
</tr>
<tr>
<td>3712</td>
<td>AO attachment small</td>
<td>3720</td>
<td>Röhm drill chuck</td>
</tr>
<tr>
<td>3713</td>
<td>AO attachment large</td>
<td>3721</td>
<td>Quick-action chuck with lock</td>
</tr>
<tr>
<td>3714</td>
<td>¼&quot; attachment</td>
<td>3722</td>
<td>Quick-action chuck without lock</td>
</tr>
<tr>
<td>3715</td>
<td>Hudson attachment</td>
<td>3723</td>
<td>Albrecht quick-action chuck</td>
</tr>
</tbody>
</table>

#### Accessories

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>31523</td>
<td>Instructions</td>
<td>3731</td>
<td>Spraying adapter front for saws (for 3703/3704)</td>
</tr>
<tr>
<td>3705</td>
<td>PowerPack</td>
<td>3740</td>
<td>Screen basket with cover</td>
</tr>
<tr>
<td>3724</td>
<td>Lubrication stand</td>
<td>3740</td>
<td>Cover for screen basket</td>
</tr>
<tr>
<td>3725</td>
<td>Sterile funnel</td>
<td>3739</td>
<td>Screen basket</td>
</tr>
<tr>
<td>3706</td>
<td>Battery charger (1 charging bay)</td>
<td>3732</td>
<td>Universal rinsing adaptor (for all drives)</td>
</tr>
<tr>
<td>3707</td>
<td>Battery charger (4 charging bays)</td>
<td>3733</td>
<td>Rinsing adapter for drill (for 3701/3700)</td>
</tr>
<tr>
<td>22279</td>
<td>Country-specific plug for battery chargers (EU)</td>
<td>3734</td>
<td>Rinsing adapter for jig/sternum saw (for 3703/3704)</td>
</tr>
<tr>
<td>Ref. No.</td>
<td>Description</td>
<td>Code</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>22283</td>
<td>Country-specific plug for battery chargers (UK)</td>
<td>3735</td>
<td>Rinsing set</td>
</tr>
<tr>
<td>22282</td>
<td>Country-specific plug for battery chargers (US)</td>
<td>3736</td>
<td>Rinsing adapter, Miele/Stielco/Webeco</td>
</tr>
<tr>
<td>22284</td>
<td>Country-specific plug for battery chargers (AU)</td>
<td>3737</td>
<td>Rinsing adapter, Belimed</td>
</tr>
<tr>
<td>3726</td>
<td>POAG cable for battery chargers</td>
<td>3738</td>
<td>Rinsing adapter, Maquet/MediKomp/Getinger</td>
</tr>
<tr>
<td>3727</td>
<td>Spray oil, sterilisable</td>
<td>3739</td>
<td>Cleaning brush set</td>
</tr>
<tr>
<td>3728</td>
<td>Universal rinsing adaptor (for all drives)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3729</td>
<td>Spraying adaptor for drill (for 3701/3700)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3730</td>
<td>Spraying adapter for saws (for 3702/3703/3704)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7 Address

Nouvag AG
St.Gallerstr. 23 - 25
CH- 9403 Goldach
Telefon: +41 (0)71 846 66 00
Telefax: +41 (0)71 845 35 36
E-Mail: info@nouvag.com
Wir, die Firma
We, of the company
Nous, la firme
Noi, della ditta
Nosotros, la empresa

erklären in alleiniger Verantwortung, dass
declare on our own responsibility that
déclarent sous notre propre responsabilité que
dichiariamo sotto propria responsabilità che
declaramos bajo nuestra propia responsabilidad

das Medizinprodukt
the medical device
le dispositif médical
il dispositivo medico
que el dispositivo médico

allen Anforderungen der Medizinprodukte-Richtlinie 93/42/EWG entspricht.
meets all the provisions of the medical directive 93/42/EEC which apply to him.
remplit toutes les exigences de la directive sur les dispositifs médicaux 93/42/CEE qui le concernent.
addempi a tutte le esigenze della direttiva 93/42/CEE che lo riguardano.
cumple con todos los requisitos establecidos en la Directiva Médica 93/42/CEE que le corresponden.

Klassifizierung
Classification
Classification
Clasificación

Angewandte harmonisierte Normen
Applied harmonized norms
Normes harmonisées appliquées
Norme armonizzate applicate
Normas acordes aplicadas

Konformitätsbewertungsverfahren
Conformity assessment procedures
Procédure d'évaluation de la conformité
Procedimento d'evaluazione della conformità
Procedimiento de evaluación de la conformidad

93/42/EWG, Anhang II
93/42/EEC, Appendix II
93/42/CEE, Appendice II
93/42/CEE, Apêndice II

Gültigkeitsdauer Konformitätserklärung
Validity of declaration of conformity
Durée de validité de la declaration de conformité
Tempo di validità della dichiarazione di conformità
Tiempo de validez de la declaración de conformidad

27. Januar 2021 (Gültigkeit EG-Zertifikat
Reg.-Nr. HD 60108201 0001)

Benannte Stelle
Notified body
Organisme notifié
Organismo notificato
Organismo notificado

TÜV Rheinland LGA Products GmbH
Tillystrasse 2
DE-90431 Nürnberg

Goldach, 29.03.2016
Ort, Datum / place, date
lieu, date / luogo, data
lugar/ fecha

B. Hutter, President