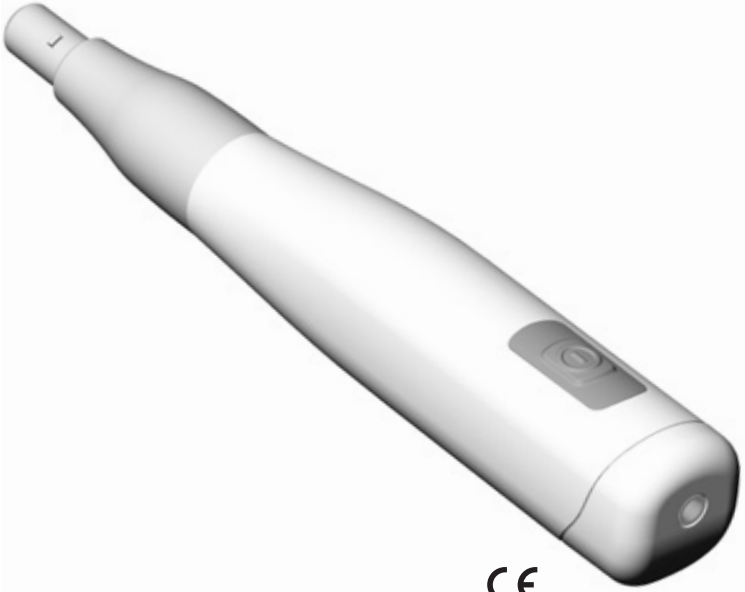
PEOPLE HAVE PRIORITY

Instructions for use



CE
0297

proxeo TWIST

PL-40 H

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Symbols in the instructions for use

WARNING!
(risk of injury)

ATTENTION!
(to prevent damage occurring)

General explanations,
without risk to persons or objects

Not for re-use

Call customer service

Symbols

on the handpiece drive / handpiece sleeve


Follow instructions for use


Date of manufacture


Do not dispose of with domestic waste


Data Matrix code for product information including UDI (Unique Device Identification)

CE mark with identification number of the Notified Body

Non-sterilizable

Sterilizable up to the stated temperature


Thermo washer disinfectable


Not suitable for intracardiac application – Type BF appliance


Non-ionizing electromagnetic radiation

The medical device with reference to electrical safety, mechanical safety and fire prevention conforms to UL 60601-1:2006, CAN/CSA-C22.2 No.601.1-M90:2005, CAN/CSA-C22.2 No. 60601-1:2008, ANSI/AAMI ES 60601-1:2005 25UX (Control No.)

Catalogue number

Serial number


DC – direct current

Symbols

on the foot control

CE mark
with identification number
of the Notified Body

Non-ionizing electromagnetic
radiation

REF Catalogue number

Do not dispose of with
domestic waste

DC – direct current

SN Serial number

Data Matrix code
for product information
including UDI (Unique Device
Identification)

IPX1 Protection against
dripping water

Date of manufacture

UL Component Recognition
Mark indicates compliance
with Canadian and
U.S. requirements

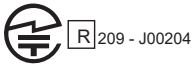
Foot control
cordless C-NW

Reset

Manufacturer

Symbols

radio symbol on the medical device / foot control



GITEKI (MIC) – Japan

RCM – Australian / New Zealand

12880-20-03402

ANATEL – Brazil

MSIP-CRM-BGT-BGM113

IC – South Korea

Contains FCC ID: QOQBGM113
Contains IC: 5123A-BGM113

FCC / IC – USA / Canada

Symbols on the packaging

CE XXXX
CE mark
with identification number
of the Notified Body


This way up


Fragile, handle with care


Keep dry

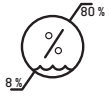

»Der Grüne Punkt« (The Green Dot) trademark of Duales System Deutschland GmbH

Trademark of RESY OfW GmbH
for identification of recyclable
transport and outer packaging
of paper and cardboard


Data Matrix code
for product information including UDI
(Unique Device Identification)

Data structure in accordance with
Health Industry Bar Code


Temperature limitation



Humidity limitation

Caution! According to Federal law, this medical device may only be sold by or on the order of a dentist, physician or any other medical practitioner licensed by the law of the State in which he or she practices and intends to use or order the use of this medical device.

1. Introduction

For your safety and the safety of your patients
These Instructions for Use explain how to use your medical device. However, we must also warn against possible hazardous situations. Your safety, the safety of your team and, of course, the safety of your patients are of paramount importance to us.

Observe the safety notes.

Intended use
PL-40 H: Battery driven electrical drive unit with wireless foot controller to perform cleaning and polishing of tooth surfaces and fillings.
C-NW: Foot control for operation of medical electrical equipment.

Misuse may damage the medical device and hence cause risks and hazards for patient, user and third parties.

Qualifications of the user
We have based our development and design of the medical device on the target group »dentist, dental hygienist, dental employees (prophylaxis) and dental assistants«.

Introduction

CE 0297

Production according to EU Directive
The handpiece drive meets the requirements of Directive 93/42/EEC.
The foot control meets the requirements of Directive 93/42/EEC and RED Directive 2014/53/EU.

Responsibility of the manufacturer
The manufacturer can only accept responsibility for the safety, reliability and performance of the medical device when it is used in compliance with the following directions:

> The medical device must be used in accordance with these instructions for use.
> Only the components approved by the manufacturer may be replaced (O-ring).
> Modifications or repairs must only be undertaken by an authorized W&H service partner (see page 49).
> The foot control has no components that can be repaired by the user.
> The electrical installation at the premises must comply with the regulations laid out in IEC 60364-7-710 (»Installation of electrical equipment in rooms used for medical purposes«) or with the regulations applicable in your country.
> Unauthorized opening of the medical device invalidates all claims under warranty and any other claims.

Improper use, unauthorized assembly, modification or repair to the medical device, non-compliance with our instructions or the use of accessories and spare parts which are not approved by W&H, invalidates all claims under warranty and any other claims.

2. Electromagnetic compatibility (EMC)

Medical electrical equipment is subject to particular precautions in regard to EMC and must be installed and put into operation in accordance with the EMC notes included.

W&H guarantees the compliance of the device with the EMC requirements only when used with original W&H accessories and spare parts. The use of accessories and spare parts not approved by W&H can lead to an increased emission of electromagnetic interference or to a reduced resistance against electromagnetic interference.

HF communication equipment
Portable HF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (11.8 inch) to the medical device. Otherwise, degradation of the performance of this medical device could result.

The medical device may be interfered by other equipment, even if these other devices comply with CISPR (International special committee on radio interference) emission requirements.

Use of this medical device adjacent to or stacked with other equipment should be avoided because it could result in improper operation. If such use is necessary, this medical device and the other equipment should be observed to verify that they are operating normally.

The medical device is not intended for use in the vicinity of HF surgical devices.

3. Scope of delivery

REF	Description
30317000	Handpiece drive
30316000	Foot control C-NW with Stick
07969610	Charger with adaptor
05882600	Handpiece holder

> Before using the medical device for the first time, store it at room temperature for 24 hours.
> Check the medical device for damage and loose parts each time before using.
> Do not operate the medical device if it is damaged.
> Always ensure that the correct operating conditions are provided.
> Perform a test run each time before using.
> Never touch the patient and the electrical contacts on the medical device simultaneously.
> Only put the medical device into operation when the handpiece sleeve is attached.
> Keep the foot control away from magnetic fields.
> Replace the foot control as soon as the resistance is noticeably reduced.

> Do not expose the medical device to any violent mechanical impacts.

Battery

> Do not charge the battery unattended.
> As soon as the charging cycles start to deteriorate send the medical device to an authorized W&H service partner.
> Defective or worn-out batteries must only be replaced by an authorized W&H service partner.

> Charge the battery of the medical device as soon as the status LED flashes.
> Incorrect use of the rechargeable battery can cause fire or corrosion.

The medical device is classed as »conventional equipment« (closed equipment without protection against the ingress of water).

The medical device is not approved for operation in potentially explosive atmospheres.

Charger

> Only use the charger supplied.

Hygiene and maintenance prior to initial use

> Clean and disinfect the medical device.
> Sterilize the handpiece sleeve.

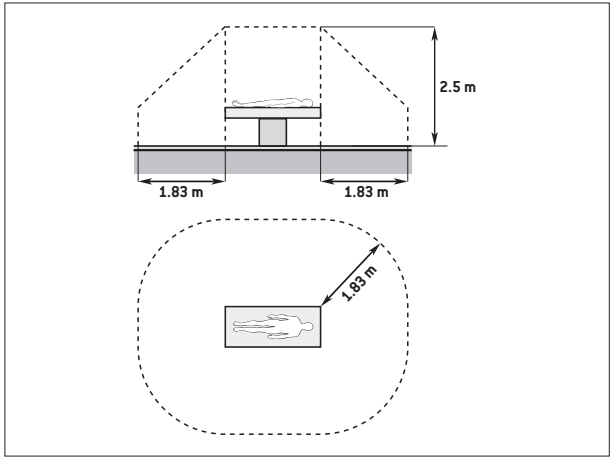
System failure

A total system failure does not constitute a critical fault.
Simply switch the unit off and then on again.

Risks due to electromagnetic fields

The functionality of implantable systems, such as cardiac pacemakers and implantable cardioverter defibrillators (ICD) can be affected by electric, magnetic and electromagnetic fields. This medical device complies with the reference values defined in EN 50527-2-1/2016 for unipolar and bipolar pacemakers and is therefore suitable for patients with pacemakers.

> Find out if patient and user have implanted systems before using the medical device and consider the application.
> Keep a safe distance of at least 7 cm (2.76 inch) between the medical device and the cardiac pacemakers.
> Make appropriate emergency precautions and take immediate action on any signs of ill-health.
> Symptoms such as raised heartbeat, irregular pulse and dizziness can be signs of a problem with a cardiac pacemaker or ICD.



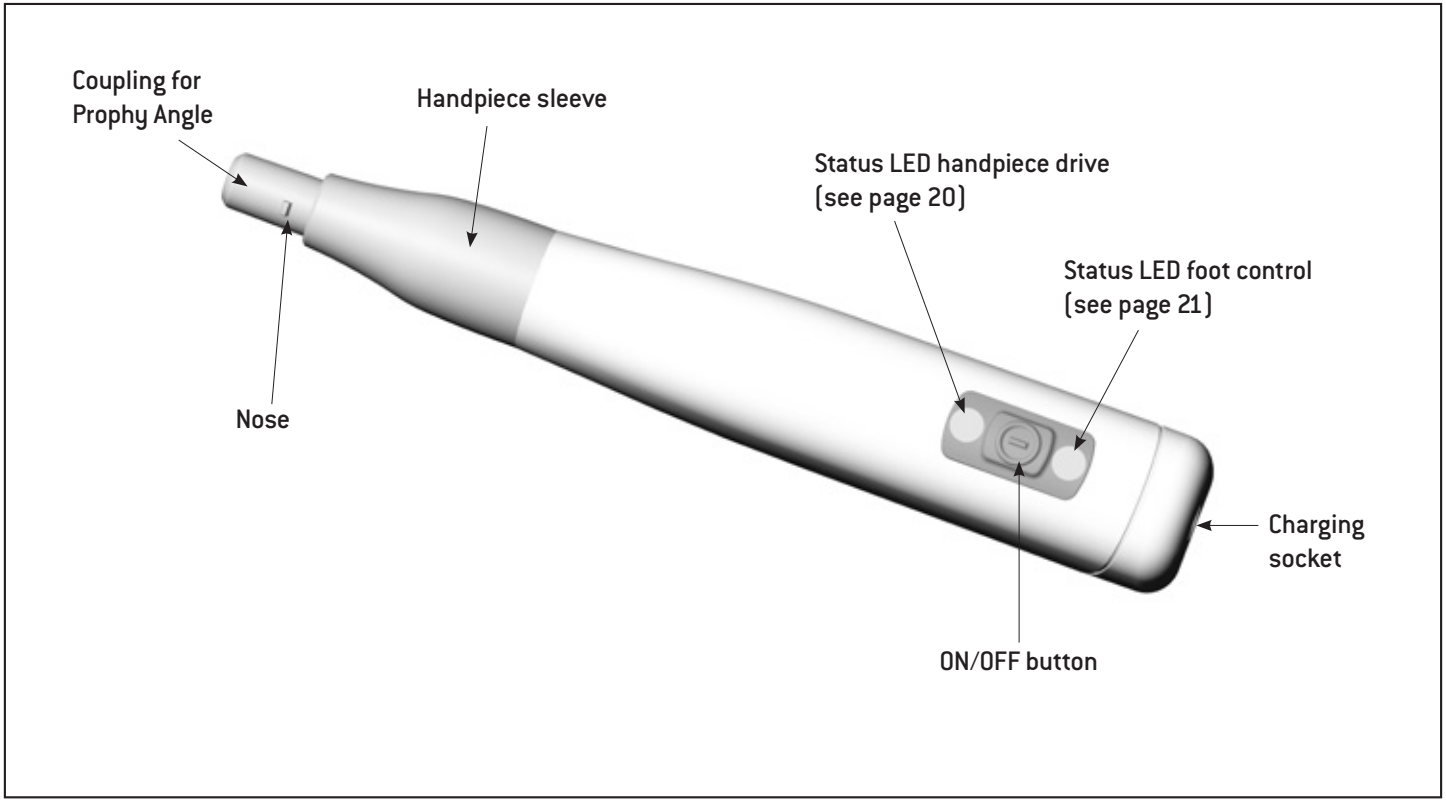
The patient environment (see diagram) encompasses the area up to 2.50 m above the patient and 1.83 m in all horizontal directions.

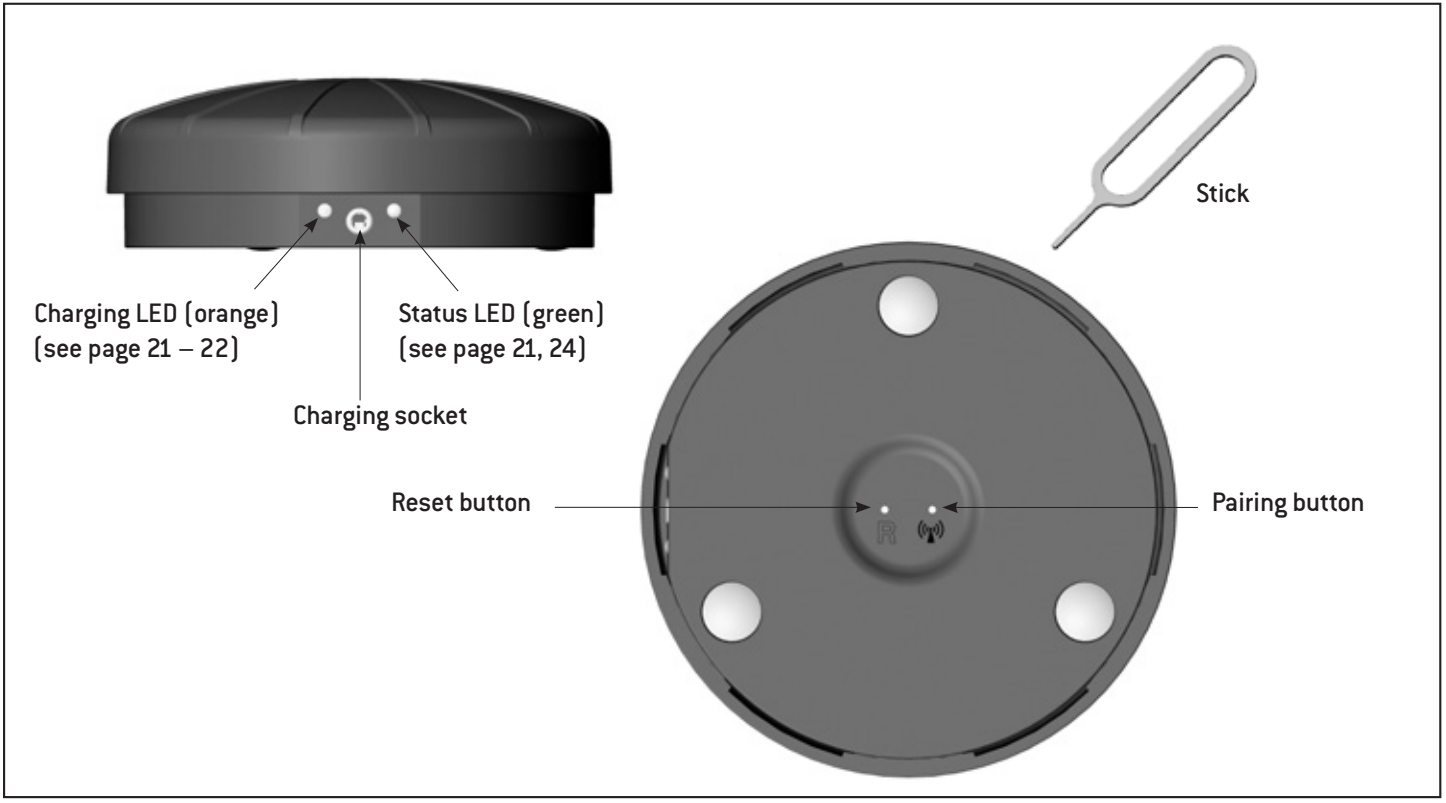
The charger must not be used within the patient environment.

The Prophy Angles are disposable articles.

> Use only Prophy Angles which are in perfect condition. Follow the operating instructions of the manufacturer.
> Insert the Prophy Angle only when the medical device is stationary.
> Never touch the Prophy Angle while it is still rotating.

> Only use Prophy Angles with plastic shanks for the Doriot system.
Prophy Angles with metal shanks damage the clamping chuck system.


Coupling for
Prophy Angle
Handpiece sleeve
Status LED handpiece drive
(see page 20)
Status LED foot control
(see page 21)
Nose
Charging
socket
ON/OFF button


Stick
Charging LED (orange)
(see page 21 – 22)
Status LED (green)
(see page 21, 24)
Charging socket
Reset button
Pairing button

Standby mode

> The handpiece can be activated with the ON/OFF button.
> If the handpiece drive is not used for longer than 4 minutes, it returns to standby mode automatically.

LED	steady	flashes	flashes intermittently
			
GREEN	→ Battery is 25–100 % charged → Pairing successful > Handpiece drive is ready for operation (charging cable must be disconnected)	→ Pairing active	
ORANGE	→ Battery is charging > Not ready for operation	→ Battery is 2–25 % charged > Complete the treatment > Do not start any further treatment > Charge the battery	→ Battery is 1 % charged > Charge the battery
RED		→ Error message > Contact an authorised W&H service partner	

LED	flashes	flashes alternately
		
ORANGE	➔ Battery of foot control is flat > Complete the treatment > Charge the battery of the foot control	➔ Pairing unsuccessful > Troubleshooting with pairing problems (see page 24)

Standby mode

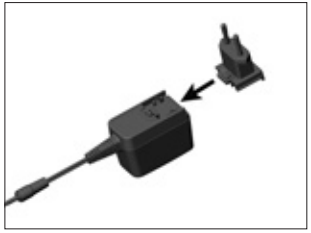
> The foot control can be activated by pressing.

LED	steady	steady	flashes	flashes intermittently*
				
GREEN	➔ Connection to paired medical device established		➔ Foot control is attempting to establish a connection to the paired medical device	➔ Battery is flat > Charge the battery
ORANGE		➔ Battery is charging		

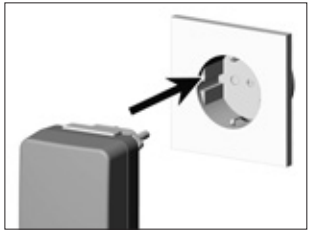
* The LED flashes for 40 milliseconds every 4 seconds

Charging the battery

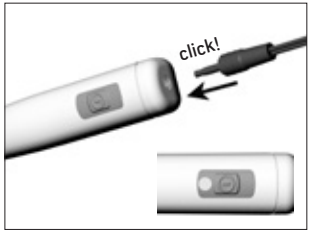
Charge the medical device fully before you use them for the first time.



❶ Attach the adaptor to the power supply unit.



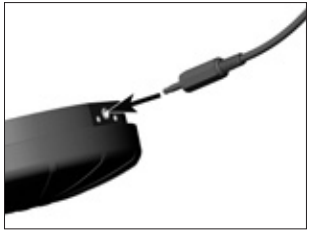
❷ Plug the charger into an power socket.



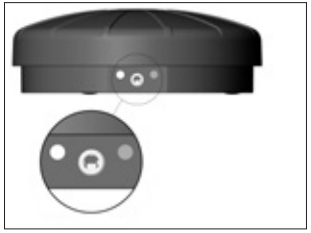
❸ Insert the charging cable into the handpiece drive charging socket until it audibly engages.

LED orange: Battery is charging.
LED green: Battery is charged.

The handpiece drive does not switch to standby mode and it is not ready for operation until it is connected to the charging cable.



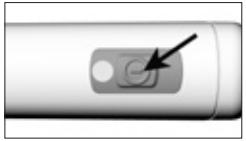
❹ Connect the charging cable into the foot control charging socket.



LED orange: Battery is charging.

LED off: Battery is charged.

You can query the battery status when the handpiece drive is switched on and during the charging process.

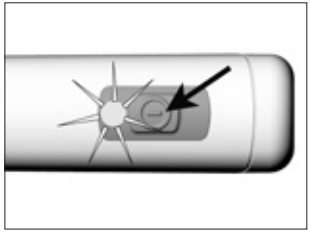


> Briefly press the ON/OFF button:

LED	flashes	Battery status
		
	3 x green	75–100 %
	2 x green	50–75 %
	1 x green	25–50 %
	orange	2–25 %

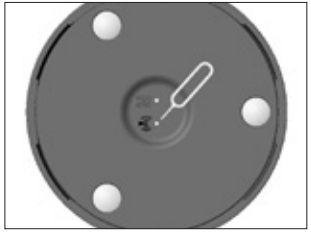
The foot control and handpiece drive are already paired when delivered!
If pairing is active: Status LED (green) flashes on the foot control.

> Both devices need to be in pairing mode for it to be possible to pair the handpiece drive and foot control.
> To activate the handpiece drive's pairing mode, place it in the vicinity of the foot control.

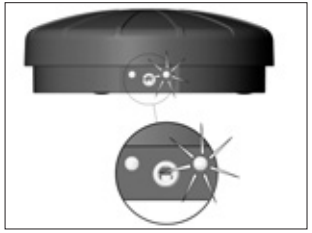


❶ Press the ON/OFF button on the handpiece drive for 5 seconds.

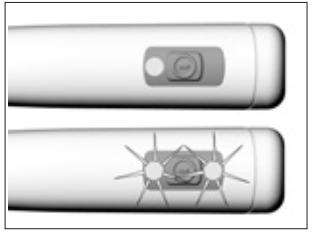
LED flashing green: The handpiece drive is in pairing mode for 30 seconds.



❷ Use the stick to press the pairing button on the foot control for 3 seconds.



After 3 seconds the status LED switches from flickering to flashing. The foot control's pairing mode is now activated.



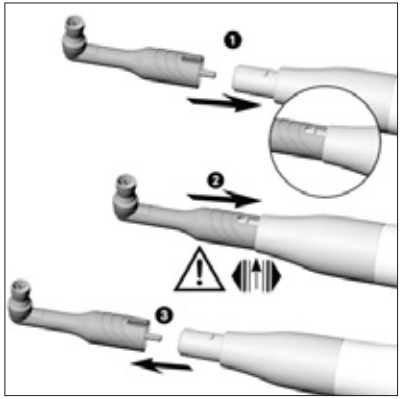
Pairing successful. LED green.

Pairing unsuccessful. LED flashing alternately orange. The LED goes out after 10 seconds.

Troubleshooting with pairing problems

> Remove any metallic objects located between the foot control and handpiece drive.
> Change the position of the foot control.
> Eliminate any sources of interference (e.g. brush motors, mobile telephones, radios, WLAN, ...)
> Use the stick to press the reset button on the foot control and try pairing again.

If the pairing problem cannot be remedied using the steps described above, the unit will need to be inspected by an authorized W&H service partner.

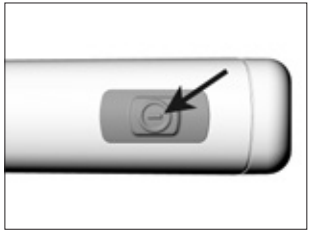


Prophy Angle Cup or Brush

❶ Position the groove on the Prophy Angle with the nose of the handpiece drive.
❷ Push the Prophy Angle onto the handpiece drive until the limit stop.

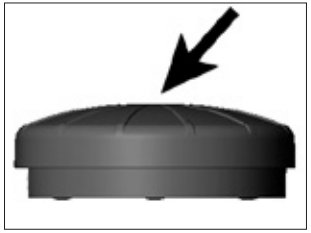
Verify full engagement.

❸ Hold the handpiece sleeve firmly. Remove the Prophy Angle.



Switch on

❶ Press the ON/OFF button.

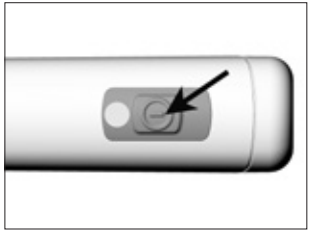


❷ Press the foot control to variably control the speed of the disposable contra-angle handpiece.

Press the foot control as far as it will go to attain the maximum speed of 3,000 rpm.

The following light signals are shown on the foot control:

Foot control pressed	
Status LED (green) flashes	Foot control is attempting to establish a connection to the paired medical device
Status LED (green) steady	Connection to paired medical device established



Switch off

❶ Keep the ON/OFF button depressed for 2 seconds.

Do not hold the handpiece drive at eye level!

> Attach the Prophy Angle to the handpiece drive.
> Operate the handpiece drive with the foot control.

In the event of operating malfunctions (e.g., vibrations, unusual noise, overheating, coolant failure or leakage) **stop the medical device immediately** and contact an authorized W&H service partner.

Follow your local and national laws, directives, standards and guidelines for cleaning, disinfection and sterilization.

> Wear protective clothing, safety glasses, face mask and gloves.

Cleaning agents and disinfectants

> Read the notes, follow the instructions and heed the warnings provided by the manufacturers of cleaning agents and/or disinfectants.
> Use only detergents which are intended for cleaning and/or disinfecting medical devices made of metal and plastic.
> It is imperative to comply with the concentrations and exposure times specified by the manufacturer of the disinfectant.
> Use disinfectants which have been tested and found effective by the Verbund für Angewandte Hygiene e.V. (VAH = Association for Applied Hygiene), the Österreichischen Gesellschaft für Hygiene, Mikrobiologie und Präventivmedizin (ÖGHMP = Austrian Society for Hygiene, Microbiology and Preventive Medicine), the Food and Drug Administration (FDA) and the U.S. Environmental Protection Agency (EPA).
> The user is responsible for validating its process if the specified cleaning agents and disinfectants are not available.

The product lifetime and the medical device's ability to operate correctly are mainly determined by mechanical stress during use and chemical influences due to processing.

> Send worn or damaged medical devices and/or medical devices with material changes to an authorized W&H service partner.

Processing cycles

> We recommend to replace the handpiece sleeve after 600 processing cycles.

> Clean the medical device immediately after every treatment.
> Wipe the entire handpiece drive, the handpiece sleeve, the handpiece holder and the foot control with disinfectant.

> Ensure that no fluids enter the medical device.

> Switch the handpiece drive off.
> The charger must not be connected.

> Note that the disinfectant used during pre-treatment is only for personal protection and cannot replace the disinfectant step after cleaning.

> Do not place the handpiece drive, the handpiece sleeve, the handpiece holder and the foot control in liquid disinfectant or in an ultrasonic bath.

> Do not immerse the handpiece drive and the foot control in water or clean them under running water.

Handpiece sleeve / Handpiece holder

> Clean the handpiece sleeve and the handpiece holder under running tap water (< 35°C / < 95°F).
> Rinse and brush off all internal and external surfaces.
> Remove any liquid residues using compressed air.

> W&H recommends wiping down with disinfectant.

Evidence of the basic suitability of the handpiece drive, the handpiece sleeve and the handpiece holder for effective manual disinfection was provided by an independent test laboratory using the »mikrozid® AF wipes« disinfectant (Schülke & Mayr GmbH, Norderstedt) and »CaviWipes™« (Metrex).

Handpiece sleeve

W&H recommends automated cleaning and disinfection using a washer-disinfector (WD).
Read the notes, follow the instructions and heed the warnings provided by the manufacturers of washer-disinfectors, cleaning agents and/or disinfectants.

> The handpiece drive, the handpiece holder and the foot control are not approved for automated processing in a washer-disinfector and for sterilization.

Evidence of the handpiece sleeve's basic suitability for effective automated disinfection was provided by an independent test laboratory using the »Miele PG 8582 CD« washer-disinfector (Miele & Cie. KG, Gütersloh) and the »Dr. Weigert neodisher® MediClean forte« cleaning agent (Dr. Weigert GmbH & Co. KG, Hamburg).

> Cleaning at 55°C (131°F) – 5 minutes
> Disinfection at 93°C (200°F) – 5 minutes

> Ensure that the medical device is completely dry internally and externally after cleaning and disinfection.

> Remove any liquid residues using compressed air.

> Check the medical device after cleaning and disinfection for damage, visible residual soiling and surface changes.
> Reprocess any medical devices that are still soiled.
> Sterilize the handpiece sleeve following cleaning and disinfection.

Handpiece sleeve

Pack the handpiece sleeve in sterilization packages that meet the following requirements:

> The sterilization package must meet the applicable standards in respect of quality and use and must be suitable for the sterilization method.
> The sterilization package must be large enough for the sterilization goods.
> The filled sterilization package must not be under tension.

Handpiece sleeve

W&H recommends sterilization according to EN 13060, EN 285 or ANSI/AAMI ST55.

> Read the notes, follow the instructions and heed the warnings provided by the manufacturers of steam sterilizers.
> The program selected must be suitable for the handpiece sleeve.

Recommended sterilization procedures

> Steam sterilization (type B, S)
> Sterilization time at least 3 minutes at 134°C (273°F)
> Maximum sterilization temperature 135°C (275°F)

Evidence of the handpiece sleeve basic suitability for effective sterilization was provided by an independent test laboratory using the LISA 517 B17L steam sterilizer (W&H Sterilization S.r.l., Brusaporto (BG)) and the Systec VE-150 steam sterilizer (Systec).

> »Dynamic-air-removal prevacuum cycle« (type B): temperature 134°C (273°F) – 3 minutes*
> »Steam-flush pressure-pulse cycle« (type S): temperature 134°C (273°F) – 3 minutes*

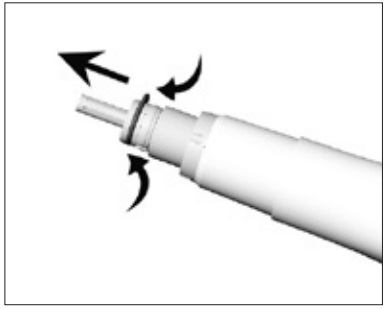
*EN 13060, EN 285, ISO 17665

Handpiece sleeve

> Store sterile goods dust-free and dry.
> The shelf life of the sterile goods depends on the storage conditions and type of packaging.

9. Replacing the O-ring

Do not use sharp tools!



1. Pull the handpiece sleeve off the handpiece drive.
2. Squeeze the O-ring between your thumb and index finger firmly so that it forms a loop.
3. Pull the old O-ring off.
4. Push the new O-ring on in its place.

10. Servicing

Regular checks
Regular servicing of function and safety including the accessories is necessary and should be carried out at least once every three years, unless shorter intervals are prescribed by law. The inspection must be undertaken by a qualified organization and must include the following procedures:

Handpiece drive
> External visual inspection
> Function test

Foot control
> External visual inspection
> Function test with check to see if the maximum speed can be reached

The regular checking must only be performed by an authorized W&H service partner.

Servicing

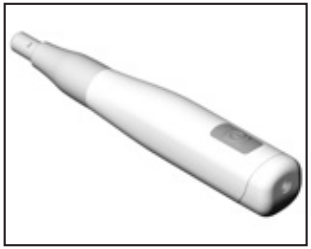
Repairs and returns
In the event of operating malfunctions immediately contact an authorized W&H service partner.
Repairs and maintenance work must only be undertaken by an authorized W&H service partner.

> Ensure that the medical device has been completely processed before returning it.

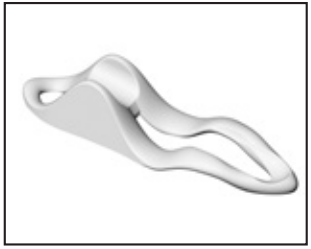
> Always return equipment in the original packaging!

11. W&H Accessories and spare parts

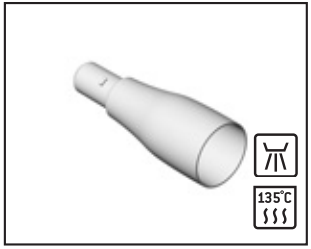
Use only original W&H accessories and spare parts or accessories approved by W&H.
Supplier: W&H partners



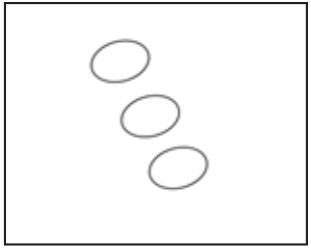
07954780
Handpiece drive



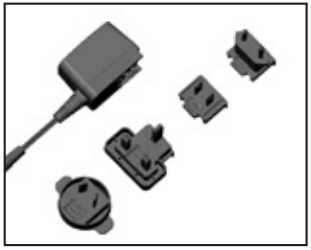
05882600
Handpiece holder



07918800
Handpiece sleeve



02695700
O-ring (3 pcs)



07969610
Charger incl. adaptor

30316000
Foot control C-NW
with Stick

07979710
Prophy Angle Cup, 105°,
firm / dark green (100 pcs)

07994950
Prophy Angle Cup, 105°,
soft / apple grren (100 pcs)

12. Technical data

Ambient conditions	
Temperature during storage and transport:	-20°C bis +60°C (-4°F to +140°F)
Humidity for storage and transport:	8% to 80% (relative), non-condensing
Temperature in operation:	+10°C to +35°C (+50°F to +95°F)
Humidity in operation:	15% to 80% (relative), non-condensing

Handpiece drive	**PL-40 H**
Battery type:	Li-Ion
Runtime:	8 treatments with a polishing duration of 6 min.
Standby:	automatically after 4 min.
Charging time:	approx. 2 h
Rated voltage:	3.7 V
Rated capacity:	680 mAh
Max. speed	3.000 rpm
Maximum torque:	2 Ncm
Dimensions (WxDxH):	160 x 25 x 28 mm
Weight:	118 g

Technical data

Foot control	**C-NW**
Battery type:	Li-ion
Runtime:	approx. 2 months
Standby:	automatically if not actuated
Charging time:	approx. 3 h
Rated voltage:	3.7 V
Rated capacity:	680 mAh
Dimensions (WxDxH):	117 x 117 x 38 mm
Weight:	190 g

Charger	
Rated voltage:	100 - 240 V
Permissible voltage fluctuation:	± 10 %
Frequency:	50 – 60 Hz
Power:	7 VA

Technical data

Classification according to Paragraph 6 of the General Specifications for the Safety of Medical Electrical Equipment according to IEC 60601-1/ANSI/AAMI ES 60601-1

Charger: Class II medical electrical equipment

Handpiece drive: Internally powered

Type BF applied part (not suitable for intracardiac application)

The C-NW foot control is protected against vertically falling drops of water (IPX1 as per IEC 60529)

Pollution level:	2
Overvoltage category:	II
Altitude:	up to 3,000 m above sea level

Temperature information

Temperature of the handpiece at the operator side:	max. 55°C (max. 131°F)
Temperature of the handpiece at the patient side:	max. 50°C (max. 122°F)

13. Disposal

Ensure that the parts are not contaminated on disposal.

Follow your local and national laws, directives, standards and guidelines for disposal.

> Medical device
> Waste electrical equipment
> Packaging

Explanation of warranty terms

This W&H medical device has been manufactured with great care by highly qualified specialists. A wide variety of tests and controls guarantees faultless operation. Please note that claims under warranty can only be validated when all the directions in the Instructions for Use have been followed.

As the manufacturer, W&H is liable for material or manufacturing defects within a warranty period of 12 months from the date of purchase. Accessories and consumables (handpiece holder, stick) are excluded from the warranty.

We accept no responsibility for damage caused by incorrect handling or by repairs carried out by third parties not authorized to do so by W&H!

Claims under warranty accompanied by proof of purchase must be sent to the vendor or to an authorized W&H service partner. The provision of service under warranty extends neither the warranty period nor any other guarantee period.

12 months warranty

Authorized W&H service partners

Find your nearest authorized W&H service partner at http://wh.com
Simply go to the menu option »Service« for full details.

Or simply scan the QR code.

Manufacturer's declaration

Electromagnetic compatibility (EMC)
WARNING: The use of cables, power supplies, accessories other than those specified by the manufacturer may result in increased emission and/or decreased immunity. Only use original W&H accessories.

cables and accessories	length	reference
Power supply	1.8 m	Manufacturer: FRIWO Gerätebau GmbH REF: 07969610
Wireless foot controller C-NW	Wireless transmission	Manufacturer: W&H GmbH REF: 30316xxx

Operate the product in a place with a maximum distance to electrical and magnetic interfering transmitters. If operation of the product close to other devices or together in a stack is necessary, observe the correct function of the system.

Electromagnetic Immunity I (Table 2, IEC 60601-1-2:2007)
The product is suitable for use in a specific electromagnetic environment. The customer and/or the user of the product should assure that it is used in an electromagnetic environment as described below.

Immunity Test	IEC 60601-Level (3rd Ed.)	IEC 60601-Level (4th Ed.)	Compliance Level	Electromagnetic Environment Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 8 kV contact ± 15 kV air	± 8 kV contact ± 15 kV air	Floor should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %
Electrical fast transient/bursts IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines 5kHz repetition rate	± 2 kV for power supply lines ± 1 kV for input/output lines 100kHz repetition rate	± 2 kV for power supply lines ± 1 kV for input/output lines Both repetition rates	Mains power quality should be that of a typical commercial and/or hospital environment
Surge IEC61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial and/or hospital environment
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle 40% U_T (60% dip in U_T) for 5 cycles 70% U_T (30% dip in U_T) for 25 cycles <5% U_T (>95% dip in U_T) for 5 sec	0% U_T 0.5 cycle @ 0°,45°,90°,135°,180°,225°,270° & 315° 0% U_T 1 cycle and 70% U_T 25/30* cycles @ 0° 0% U_T 250/300* cycle	Complies to both editions requirements	Mains power quality should be that of a typical commercial and/or hospital environment. If the user of the product requires continued operation during power mains interruptions, it is recommended that the product be powered from an uninterruptible power supply or a battery.
Power frequency(50/60 Hz) magnetic field IEC 61000-4-8	3A/m	30A/m	30A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

Note: U_T is the mains (AC) voltage before apply test levels
* 25/30 (250/300) means cycles at 50/60Hz

Electromagnetic Immunity II (Table 4, IEC 60601-1-2:2007)
The product is suitable for use in a specific electromagnetic environment. The customer and/or the user of the product should assure that it is used in an electromagnetic environment as described below.

Immunity Test	IEC 60601-Level (3rd Ed.)	IEC 60601-Level (4th Ed.)	Compliance Level	Electromagnetic Environment Guidance
				Portable and mobile RF communications equipment should be used no closer to any part of the product, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Conducted RF IEC 61000-4-6	3 V_{rms} 150 kHz to 80 MHz	3 V_{rms} 150 kHz to 80 MHz 6 V_{rms} in ISM and amateur radio bands* between 0,15 MHz and 80 MHz	6 V_{rms}	Recommended separation distance: $d = 1.2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	10 V/m 80 MHz to 2.7 GHz	10 V/m	$d = 1.2\sqrt{P}$ for 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ for 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in Watt (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m) Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey [a], should be less than the compliance level [b] in each frequency range  Interference may occur in the vicinity of equipment marked with the symbol described lateral.

Note 1: At 80 MHz and 800MHz, the higher frequency range applies.
Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, people and animals.

* The ISM (industrial, scientific and medical) bands between 0,15 MHz and 80 MHz are 6,765 MHz to 6,795 MHz; 13,553 MHz to 13,567 MHz; 26,957 MHz to 27,283 MHz; and 40,66 MHz to 40,70 MHz. The amateur radio bands between 0,15 MHz and 80 MHz are 1,8 MHz to 2,0 MHz, 3,5 MHz to 4,0 MHz, 5,3 MHz to 5,4 MHz, 7 MHz to 7,3 MHz, 10,1 MHz to 10,15 MHz, 14 MHz to 14,2 MHz, 18,07 MHz to 18,17 MHz, 21,0 MHz to 21,4 MHz, 24,89 MHz to 24,99 MHz, 28,0 MHz to 29,7 MHz and 50,0 MHz to 54,0 MHz.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered, if the measured field strength in the location in which the product is used exceeds the applicable RF compliance level above, the product should be observed, additional measures may be necessary, such as reorienting or relocating the product.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Immunity level of RF fields from wireless communication devices (Table 9, IEC 60601-1-2:2014)

Test frequency	Band[a]	Service[a]	Modulation[b]	Maximum power	Distance	IMMUNITY TEST LEVEL
(MHz)	(MHz)			(W)	(m)	(V/m)
385	380 – 390	TETRA 400	Pulse modulation[c] 18 Hz	1.8	0.3	27
450	430 – 470	GMRS 460, FRS 460	FM[c] ± 5 kH deviation 1 kHz sine	2	0.3	28
710						
745	704 – 787	LTE Band 13, 17	Pulse modulation[c] 217 Hz	0.2	0.3	9
780						
810						
870	800 – 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation[c] 18 Hz	2	0.3	28
930						
1720						
1845	1700 – 1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation[c] 217 Hz	2	0.3	28
1970						
2450	2400 – 2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation[c] 217 Hz	2	0.3	28
5240						
5500	5100 – 5800	WLAN 802.11 a/n	Pulse modulation[c] 217 Hz	0.2	0.3	9
5785						

NOTE If necessary to achieve the IMMUNITY TEST LEVEL, the distance between the transmitting antenna and the product may be reduced to 1 m. The 1 m test distance is permitted by IEC 61000-4-3.

[a] For some services, only the uplink frequencies are included.
[b] The carrier shall be modulated using a 50 % duty cycle square wave signal.
[c] As an alternative to FM modulation, 50 % pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

Recommended Separation Distances between portable and mobile HF- communications equipment and the product (Table 6, IEC 60601-1-2:2007)

The product is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the product can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the product – according on output power and frequency of the communications equipment – as recommended in the following table.

Rated maximum output power of transmitter in watts (W)	Separation distance according to the frequency of transmitter in meter (m)		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2,5 GHz $d = 2.3\sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

Note 1: At 80 MHz and 800MHz, the higher frequency range applies.
Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, people and animals.

Electromagnetic Emission (Table 1, IEC 60601-1-2:2007)

The product is suitable for use in a specific electromagnetic environment. The customer and/or the user of the product should assure that it is used in an electromagnetic environment as described below.

Emission Test	Compliance	Electromagnetic Environment Guidance
RF-emission CISPR 11	Group 1	The product use RF energy only for its internal function. Therefore, its RF emissions are very low and not likely to cause any interference in nearby electronic equipment. However, a separation distance of 30 cm shall be maintained.
RF-emission CISPR 11	Class B	The product is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purpose.
Harmonic emissions IEC 61000-3-2 (1)	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3 (1)	complies	

(1) Remark: for devices with power consumption of 75 W to 1000 W only

Manufacturer

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