Electric Pen Drive. Compact system for a wide range of applications.

User's Manual

SYNTHES® Instruments and implants approved by the AO Foundation

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Indications

The Electric Pen Drive is indicated for screw insertion, pin and wire placement, cutting of bone and metal, drilling, decorticating, shaping and smoothing of bones and teeth in a wide variety of surgical procedures, including but not limited to general orthopaedic trauma, foot, hand, maxillofacial, neurosurgical, oral, otolaryngological, reconstructive, and spine surgery.

Drilling

K-wire insertion

Specifications — System

The device complies with the following standards:
IEC 60601-1/60601-1/60601-1-2/60601-1-4
IEC 61000-6-1/61000-6-2/61000-6-3/6000-6-4
Medical Electrical Equipment

UL 60601-1

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

Environmental conditions

	Operation	Transportation and storage
Temperature	10°–40°C 50°–104°F	–20°–50°C –4°–122°F
Relative humidity	30%–75%	10%–75%
Atmospheric pressure	500–1,060 hPA 0.5–1.06 bar	500–1,060 hPA 0.5–1.06 bar

Duty cycle ⚠

Intermittent operation	$X_{sec\ on}$	$Y_{sec\ off}$	Cycles
Drill/Burr Attachments	30	30	unlimited
Reciprocating Saw Attachment	30	60	5 cycles
Oscillating Saw Attachment	25	60	5 cycles
Sagittal Saw Attachment	30	60	5 cycles

These recommendations for times of use for the attachments for Electric Pen Drive have been determined under average load with an ambient air temperature of 25°C (77°F).

Generally, electrical systems can heat up if in constant use. For this reason, the duty cycle times listed above should be followed to allow the Drive Unit and attachment to cool down after constant use. If this is observed, the system will avoid overheating and possibly harming the patient or user. After the above indicated number of cycles, the respective attachments must be allowed to cool down for 30 minutes. The user is responsible for following the duty cycles indicated. If longer periods of constant use are required, an additional Drive Unit and/or attachment should be used.

Caution
- Carefully observe the above recommended duty cycles.
- Always use new cutting tools to prevent heating of the system due to reduced cutting performance.
- For oral surgery, it is recommended to prevent any contact of warm components with soft tissues as temperatures even around 45°C may damage the lips and oral mucosa.
- Careful maintenance of the system will reduce heat development in the Drive Unit and the attachments. The use of the Synthes Maintenance Station (05.001.099) is strongly recommended.
- The Electric Pen Drive should not be stored or operated in an explosive atmosphere.

Specifications—Standard Console with Irrigation (05.001.000)

Specifications

– Weight: 5.4 kg (12 lbs)
– Dimensions: 250 mm x 155 mm x 175 mm
(9.8 in x 6.1 in x 6.9 in)
– Operating voltage: 100 VAC–240 VAC, 50/60 Hz
– Degree of protection: IP X0

Slide control
For adjusting maximum speed for Drive Unit 2

Selection switch
For torque limiting

Slide control
For adjusting maximum speed for Drive Unit 1

ON/OFF LED

Connector
For Light Adaptor for Small Battery Drive

Selection switch
For irrigation

Flow rate adjustment knob
For irrigation

Connector
For Drive Unit 1

Connector
For Drive Unit 2

Connector
For Foot Switch

Irrigation pump

Additional instrument

05.001.001*	Standard Console without irrigation

The standard console is also available without the pump module.

* Also available

Specifications—Basic Console (05.001.002)

The Basic Console includes connectors for one Drive Unit, a Foot Switch and the Light Adaptor for Small Battery Drive. It includes speed control for the Drive Unit but does not offer torque limiting or irrigation options.

Connector
For Drive Unit

ON/OFF LED

Connector
For Foot Switch

Connector
For Light Adaptor for Small Battery Drive

Specifications—Electric Pen Drive, 60,000 rpm (05.001.010)

Specifications

- Weight: 183 g (6.45 oz)
- Length: 130 mm (5.1 in)
- Clockwise and counterclockwise rotation
- Continuously variable speed: 0 to 60,000 rpm
- Degree of protection: IP 54
- Removable variable-speed Hand Switch controls rotational speed
- Attachment release ring facilitates one-handed insertion/removal of attachments
- Mode switch turns Drive Unit to off/lock ( ) for safety during Drive Unit and/or attachment exchange, selects clockwise (FWD) or counterclockwise (REV) rotation, and allows cable insertion/removal ( ).
- Locking mechanism prevents inadvertent changes to mode switch

Important:

- Do not lay the Drive Unit on magnetic sterile covers or in the immediate vicinity of other magnetic objects. This could activate the Drive Unit.
- When two 60,000 rpm Drive Units are connected and the speed is controlled with the Foot Switch, one Drive Unit must be switched to LOCK ( ). Otherwise, neither of the Drive Units will function for safety reasons.
- In all other cases, the first speed control device to be activated functions. As long as this device is activated, all others are deactivated (including the Small Battery Drive).
- When a 90,000 rpm Electric Pen Drive and a 60,000 rpm Electric Pen Drive are connected simultaneously, the 90,000 rpm Electric Pen Drive only works if the 60,000 rpm Electric Pen Drive is set to the LOCK ( ) position on the mode switch. Otherwise the 60,000 rpm Electric Pen Drive works.

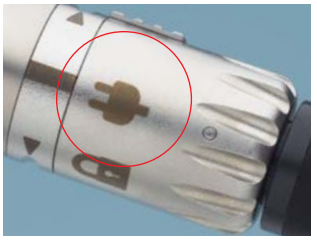
Cable insertion

Locking mechanism for mode switch

Forward (clockwise)

Reverse (counterclockwise)

Lock (Drive Unit off)



Cable insertion/removal

Specifications—Electric Pen Drive, 90,000 rpm (05.001.011)

Specifications
- Weight: 124 g (4.4 oz)
- Length: 102 mm (4 in)
- Clockwise and counterclockwise rotation
- Continuously variable speed: 0 to 90,000 rpm
- Degree of protection: IP 54

The 90,000 rpm Electric Pen Drive can only be operated with a Foot Switch. The FWD/REV changeover must to be done with the 2-pedal Foot Switch (05.001.017).

The cable is permanently fixed to the pen.

To use the 90,000 rpm Electric Pen Drive, you need a console with the latest software. Those consoles are identifiable with the following features:

Serial number:
- Higher than 00773 for the Standard Console with irrigation (05.001.000)
- Higher than 01152 for the Standard Console without irrigation (05.001.001)
- Higher than 0336 for the Basic Console (05.001.002)
- If a console has a lower serial number than mentioned above, but has a **round, green sticker** on the bottom plate label of the console, the console has already been upgraded to the latest software version.

Consoles with a lower serial number and without a sticker on the bottom plate, must be sent to Synthes customer service for a software update, for use with the 90,000 rpm Electric Pen Drive.

Important:
- Only the Burr Attachments are compatible with this Drive Unit.
- The Hand Switch cannot be used.
- It is not possible to use two 90,000 rpm Electric Pen Drives. If two of them are plugged in, neither of them will work for safety reasons.
- When a 90,000 rpm Electric Pen Drive and a 60,000 rpm Electric Pen Drive are connected simultaneously, the 90,000 rpm Electric Pen Drive only works if the 60,000 rpm Electric Pen Drive is set to the LOCK (🔒) position on the mode switch. Otherwise the 60,000 rpm Electric Pen Drive works.

Specifications—Hand Switch (05.001.012) and Foot Switches (05.001.016, 05.001.017)

Hand Switch

– May be removed without disconnecting the cable from the Drive Unit
– Allows variable speed control of the Drive Unit
– Includes a safety switch and pull-out finger rest

Foot Switch (05.001.016)

– Dimensions: 220 mm x 160 mm x 150.5 mm
(8.7 in x 6.3 in x 5.9 in) bar included
– Degree of protection: IP X8
– Allows variable speed control of the Drive Unit
– Includes an irrigation ON/OFF switch

Foot Switch, 2 pedals (05.001.017)

– Dimensions: 350 mm x 210 mm x 160 mm
(13.8 in x 8.3 in x 6.3 in) bar included
– Degree of protection: IP X8
– Allows variable speed and directional control of the Drive Unit
– Includes an irrigation ON/OFF switch

Specifications—Attachments for Electric Pen Drive

Drilling Attachments

The drilling speed attachments are geared to decrease the maximum speed from 60,000 rpm to 1,800 rpm.

05.001.030	Drill Attachment, mini quick coupling
05.001.031	Drill Attachment, J-latch coupling
05.001.032	Drill Attachment, AO coupling
05.001.110	Drill Attachment, hex coupling

Function:

– Accept drill bits and burrs with mini quick, J-latch, hex, and AO couplings

45° Drill Attachments

05.001.042	45° Drill Attachment, mini quick coupling
05.001.043	45° Drill Attachment, J-latch coupling
05.001.044	45° Drill Attachment, AO coupling

Function:

– Accept drill bits and burrs with mini quick, J-latch and AO couplings

90° Drill Attachments

05.001.035	90° Drill Attachment, short, mini quick coupling
05.001.036	90° Drill Attachment, long, mini quick coupling

Functions:

– Improve visibility during operations with narrow access

– Accept drill bits and burrs with mini quick coupling

45° Drill Attachment, cannulated

05.001.120 Drill Attachment with Jacobs chuck

Speed:
– approx. 1,800 rpm

Function:
– 1.6 mm cannulation permits the use of this attachment for drilling and reaming over K-wires (e.g. for cannulated screws and for cup and cone technique)

45° Oscillating Drill Attachment

05.001.033 45° Oscillating Drill Attachment, mini quick coupling

Frequency:
– 3,200 oscillations/minute

Functions:
– Accepts drill bits and burrs with mini quick coupling
– Prevents tissue and nerves from wrapping around the drill bit or burr

Screw Insertion Attachments

05.001.028 Screw Attachment, AO coupling
05.001.029 Screw Attachment, hex coupling
05.001.034 Screw Attachment, mini quick coupling

Speed:
– 0 to 400 rpm

Function:
– Accept mini quick, hex and AO coupling screwdriver shafts

K-Wire Attachment

05.001.037 K-Wire Attachment

Speed:
– 0 to 2,700 rpm

Function:
– To insert/remove Kirschner wires 0.6 mm to 1.6 mm (0.02 in. to 0.06 in.) in diameter, of any length

Specifications—Attachments for Electric Pen Drive continued

Sawing Attachments

05.001.038 Oscillating Saw Attachment

Frequency:
– 22,000 oscillations/minute
Function:
– Accepts Synthes crescentic and mandibular saw blades for Electric Pen Drive

05.001.039 Sagittal Saw Attachment

Frequency:
– 22,000 oscillations/minute
Function:
– Accepts Synthes sagittal saw blades for Electric Pen Drive

05.001.040 Reciprocating Saw Attachment

Frequency:
– 18,000 oscillations/minute
Function:
– Accepts Synthes reciprocating saw blades and Synthes rasps for Electric Pen Drive

Burring Speed Attachments

The burring speed attachments transfer the speed of the Drive Unit, with a maximum speed of 60,000 rpm (with 05.001.010) and 90,000 rpm (with 05.001.011).

Speed:

– 0 to 60,000 rpm and 0 to 90,000 rpm

Function:

– Accept Synthes short, medium and long burrs for Electric Pen Drive

05.001.045 Burr Attachment, short

05.001.048 Burr Attachment, short, angled

05.001.046 Burr Attachment, medium

05.001.049 Burr Attachment, medium, angled

05.001.047 Burr Attachment, long

05.001.050 Burr Attachment, long, angled

Burring Speed Attachments continued

05.001.063 Burr Attachment, XL, angled

05.001.055 Burr Attachment, XXL, angled

Light Adaptor for Small Battery Drive

05.001.108 Light Adaptor for Small Battery Drive

The Light Adaptor for Small Battery Drive allows the user to power the Small Battery Drive through the console.

Connecting the cable to the Drive Unit

The Electric Pen Drive System offers various length cables to connect the Drive Unit to the console:

Instruments	
05.001.020*	2 meter cable
05.001.025*	3 meter cable
05.001.021	4 meter cable

Always slide the lock in the direction of the arrows prior to turning the mode switch. The lock will automatically return to the locked position.

Ensure that the mode switch is in the cable insertion/removal ( ) position.

Align the groove on the plug with the notch on the mode switch and insert the plug. Do not force the plug into the mode switch as this may damage the plug and/or the Drive Unit.

Turn the mode switch into the lock ( ) position. The cable is now firmly locked in the Drive Unit and the Drive Unit is in the OFF mode.

To remove the cable, return the mode switch to the cable insertion/removal ( ) position and pull gently on the plug.

* Also available

Forward and reverse modes

The Electric Pen Drive can be used in clockwise or counter-clockwise rotation. Changing the direction of rotation with the mode switch will affect operations with both the Hand Switch and the Foot Switch. Always slide the lock prior to turning the mode switch.

For clockwise rotation, turn the mode switch to the forward (FWD) position.

For counterclockwise rotation, turn the mode switch to the reverse (REV) position.

For safety, always turn the mode switch to the lock ( ) position while changing attachments or tools.

Attaching the Hand Switch to the Drive Unit

Instrument

05.001.012 Hand Switch

Position the Hand Switch on the Drive Unit by aligning the positioning arrows on the Hand Switch and the positioning arrows on the Drive Unit, above the guide grooves.

Press down on the Hand Switch until it clicks into place on the Drive Unit.

Attaching the Hand Switch to the Drive Unit continued

Correct position for the Hand Switch. The Synthes logo is in the upright position with the Hand Switch facing up (Figure 1).

Incorrect position for the Hand Switch (Figure 2).

Figure 1 – Correct position

Figure 2 – Incorrect position

Removing the Hand Switch from the Drive Unit

To remove the Hand Switch, grasp the lever and pull it away from the Drive Unit.

Operating the Hand Switch

For safety, slide the switch to the LOCK position during Drive Unit and/or attachment exchange.

Operating the Hand Switch continued

To operate the Drive Unit, slide the switch to the ON position. The speed can be continuously adjusted by depressing the Hand Switch.

Adjusting the Hand Switch

The pull-out finger rest can be adjusted by sliding it in and out of the Hand Switch.

Inserting attachments on the Drive Unit

Important: To prevent injuries, the mode switch on the Drive Unit or the ON/LOCK switch on the Hand Switch should be in the LOCK position when inserting or removing attachments or instruments.

The attachments can be inserted in 8 different positions, in 45° increments.

Turn the release ring clockwise until it locks in the open position. The release ring will protrude slightly from the main body of the Drive Unit.

Insert the attachment into the coupling, aligning the positioning pins of the attachment with the grooves on the release ring.

Press the attachment lightly against the Drive Unit; the release ring will lock automatically. Pull lightly on the attachment to confirm that it is secure.

Note: If the release ring closes before the attachment is fully inserted, align the positioning pins of the attachment with the grooves on the release ring and turn the attachment clockwise while applying slight pressure against the Drive Unit until the attachment engages. Pull lightly on the attachment to confirm that it is secure.

Removing attachments from the Drive Unit

While holding the Drive Unit with the attachment facing up, turn the release ring clockwise until it locks in the open position (Figure 1).

Remove the attachment. The release ring should stay in the open position, ready for the next attachment (Figure 2).

Figure 1

Figure 2

Setup

Confirm that the power switch is in the OFF (**o**) position.

Connect the console to a power outlet using the supplied electrical cord (Figure 1).

Turn on the console by setting the power switch to the ON (**I**) position (Figure 2).

The LED marked (⏻) on the front of the console will illuminate, indicating that the console is under power (Figure 3). Refer to the troubleshooting guide at the end of this manual if the LED does not illuminate, or flashes.

Figure 1

Figure 2

Figure 3

Connecting cables to the console

To connect cables to the console, align the red dot on the plug with the red dot on the connector and push the plug into the connector. Note that the plugs are specific to the device being connected. Do not force the plug into the connector as this may damage the plug and/or the console. (Figure 1).

To remove the cable, retract the release sleeve on the plug and pull back (Figure 2).

Figure 1

Figure 2

The connectors are used to connect these devices:

	Light Adaptor for Small Battery Drive
Pen 1	Electric Pen Drive
Pen 2	Electric Pen Drive (not available on the Basic Console)
	Foot Switch

Attention: To ensure adequate ventilation and prevent overheating, do not place consoles directly against a wall. Maintain a distance of at least 3 cm (1.2 in). Place consoles on smooth surfaces only. Do not lay textiles or objects under the console. These can interfere with ventilation. Do not pull on the cable! Always remove the cable by retracting the release sleeve.

Adjustment of the maximum speed for Drive Unit 1 and Drive Unit 2.

The maximum speed will vary depending on the attachment (see Specifications, pages 10–14). In addition to controlling the speed with the variable-speed-control Hand Switch or Foot Switch, the maximum speed can be reduced in 25% increments using the slide control. When using the high-speed burring attachments, the slide control should be set to the maximum speed recommended by Synthes for each burr. A letter code on each burr indicates the maximum recommended speed. Foil stickers provided with the console can be applied as a reference.

Markings for maximum speed

Marking Code on Burr	Console Setting (60,000 rpm Drive Unit)	Console Setting (90,000 rpm Drive Unit)
A	100%	100%
B	100%	75%
C	75%	50%
D	50%	25%
E	25%	25%

Slide control
For adjusting maximum speed for Drive Unit 1

Slide control
For adjusting maximum speed for Drive Unit 2

Standard Console

Slide control

Basic Console

Torque limiting function

The Electric Pen Drive System allows the surgeon to implant and tighten screws under power. This function is particularly helpful when using the Synthes locking compression plate (LCP) systems, which require the screws to be locked into the plate with a specific torque.

Torque calibration

Instruments	
05.001.028	Screw Attachment, AO coupling
05.001.029	Screw Attachment, hex coupling
05.001.034	Screw Attachment, mini quick coupling
05.001.060*	0.4 Nm Torque Calibration Unit
05.001.061*	0.8 Nm Torque Calibration Unit

Connect the Drive Unit with a cable to connection (2) (Figure 1).

Attach the Screw Attachment to the Drive Unit (Figure 2).

Figure 1

Figure 2

* Also available

Torque calibration continued

Insert the Screw Attachment into the torque calibration unit (Figure 3).

Set the Torque Limiting Switch to the calibration position (Figure 4).

Press the Foot or Hand Switch to start the calibration process. Do not release the switch until the process has been completed and the Drive Unit stops. The Drive Unit can now be removed from the torque calibration unit (Figure 5).

Figure 3

Figure 4

Figure 5

Set the Torque Limiting Switch to ON. The LED will light, showing that the calibration has been successfully carried out and that the system is ready.

Using torque limiting function

Insert an appropriate screwdriver blade in the screw attachment and pick up the desired screw.

Using torque limiting function continued

Position the screw and fully depress the Foot or Hand Switch. The speed will automatically increase progressively to help guide the screw. When locking the head of the screw into the plate, the Electric Pen Drive limits the torque to the previously calibrated value and stops automatically.

Do not release the Foot or Hand Switch until the screw is locked and the Drive Unit has stopped automatically (Figure 1).

To then work without torque limitation, set the Torque Limiting Switch to OFF. The calibrated value is stored and will be reactivated when the Torque Limiting Switch is returned to the ON position. The LED will light, indicating that the system is ready.

To set a different torque limit, return the Torque Limiting Switch to CAL and repeat the calibration steps described previously.

The calibrated torque limit is stored until the calibration is set to a new value, the Drive Unit is disconnected from connection 2, or the console is switched off (Figure 2).

Attention: The torque must be recalibrated before each operation. Do not release the calibration unit during the calibration process. If the LED for torque limiting flashes, consult the troubleshooting section on page 64.

Figure 1

Figure 2

Irrigation

The Electric Pen Drive Standard Console with irrigation features an integrated irrigation system. Irrigation provides cooling of the cutting tools, to prevent necrosis due to excessive heat. Irrigation can be used with either Drive Unit 1 or Drive Unit 2.

When the irrigation switch is in the OFF position, the irrigation pump will not activate.

When the irrigation switch is in the CON position, a constant quantity of irrigation fluid will be supplied to Drive Unit 1 or Drive Unit 2. This constant flow rate can be adjusted between 10 and 100 ml/min. (0.34 to 3.4 oz/min.) using the flow rate adjustment knob.

When the irrigation switch is in the VAR position, the quantity of irrigation fluid supplied to Drive Unit 1 or Drive Unit 2 will be directly proportional to the speed of the drill; the faster the drill, the higher the irrigation flow. The maximum flow rate can be set between 10 ml/min. and 100 ml/min. (0.34 to 3.4 oz/min.) using the flow rate adjustment knob.

Irrigation (OFF)

Constant irrigation (CON)

Variable irrigation (VAR)

Using the Foot Switch with irrigation

Instruments	
05.001.016	Foot Switch, 1 pedal
05.001.017	Foot Switch, 2 pedals

Briefly pressing the irrigation switch turns the irrigation ON or OFF. In the ON position, the setting defaults to the irrigation setting selected on the console.

Continuously pressing the irrigation switch will activate the irrigation pump without activating the Drive Unit. The flow of irrigation is controlled by the flow rate adjustment knob on the console and can be adjusted between 10 and 100 ml/min. (0.34 to 3.4 oz/min.).

Setting up irrigation

Instruments	
05.001.069.01S*	Irrigation Tubing Set, single pack, sterile
05.001.069.05S*	Irrigation Tubing Set, sterile (5/pkg.)

The Synthes Irrigation Tubing Set for Electric Pen Drive should be used whenever irrigation is required to prevent necrosis due to excessive heating. The Irrigation Tubing Set requires the use of irrigation nozzles.

Remove the sterile irrigation tubing from the sterile package (Figure 1).

For all attachments except the Sagittal Saw Attachment, secure the irrigation nozzle on the attachment by pushing the irrigation nozzle over the attachment from the front (Figure 2).

Figure 1

Figure 2

* Also available

Setting up irrigation continued

For the Sagittal Saw Attachment, push the irrigation nozzle from the coupling end of the attachment before attaching the attachment to the Drive Unit (Figure 3).

Secure the end of the irrigation tubing onto the irrigation nozzle (Figure 4).

Figure 3

Figure 4

Attach the irrigation tubing to the cable using the provided clips (Figure 5).

Open the access lid of the irrigation pump by turning it in the direction of the arrow (Figure 6).

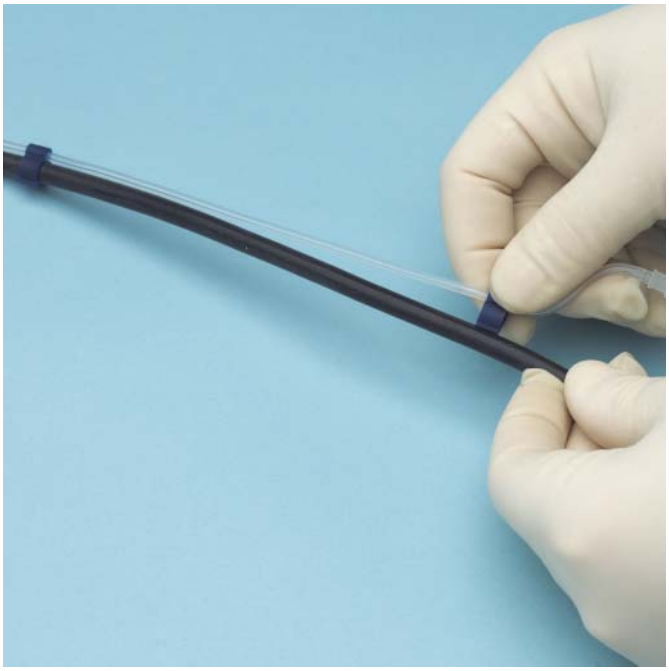


Figure 5

Figure 6

Setting up irrigation continued

Insert the tubing into the pump in accordance with the markings (Figure 7).

Close the access lid of the irrigation pump (Figure 8).

Figure 7

Figure 8

Remove the protective cap from the cannula and connect the cannula to the irrigation bag, taking care not to contact the connection spike.

Inserting an instrument

Instruments	
05.001.030	Drill Attachment, mini quick coupling
05.001.031	Drill Attachment, J-latch coupling
05.001.032	Drill Attachment, AO coupling
05.001.033	45° Oscillating Drill Attachment, mini quick coupling
05.001.042	45° Drill Attachment, mini quick coupling
05.001.043	45° Drill Attachment, J-latch coupling
05.001.044	45° Drill Attachment, AO coupling
05.001.110	Drill Attachment, hex coupling

For operating instructions to insert attachments in the Drive Unit, please refer to the operating instructions for the Drive Unit on page 21.

Important: To prevent injuries, the mode switch on the Drive Unit or the ON/LOCK switch on the Hand Switch should be in the LOCK position when inserting or removing attachments or instruments.

Pull back the collar of the attachment and insert the instrument, turning it slightly to align the keyway.

Release the collar of the attachment and pull lightly on the instrument to confirm that it is secure.

Removing an instrument

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

Inserting an instrument in 90° Drill Attachment

Instruments	
05.001.035	90° Drill Attachment, short, mini quick coupling
05.001.036	90° Drill Attachment, long, mini quick coupling

Move the locking lever of the attachment to the side as indicated by the arrow on the attachment.

Important: To prevent injuries, the mode switch on the Drive Unit or the ON/LOCK switch on the Hand Switch should be in the LOCK position when inserting or removing attachments or instruments.

Inserting an instrument in 90° Drill Attachment continued

Insert the instrument, turning it slightly to align the keyway (Figure 1).

Lock the instrument in place by pushing the locking lever back. Pull lightly on the instrument to confirm that it is secure (Figure 2).

Figure 1

Figure 2

Removing an instrument

Move the locking lever of the attachment to the side as indicated by the arrow on the attachment and remove the instrument.

Inserting an instrument

Instruments	
05.001.028	Screw Attachment, AO coupling
05.001.029	Screw Attachment, hex coupling
05.001.034	Screw Attachment, mini quick coupling

Pull back the collar of the attachment and insert the instrument, turning it slightly to align the keyway.

Release the collar of the attachment and pull lightly on the instrument to confirm that it is secure.

Important: To prevent injuries, the mode switch on the Drive Unit or the ON/LOCK switch on the Hand Switch should be in the LOCK position when inserting or removing attachments or instruments.

Removing an instrument

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

Operating Instructions—K-Wire Attachment

Inserting a K-wire

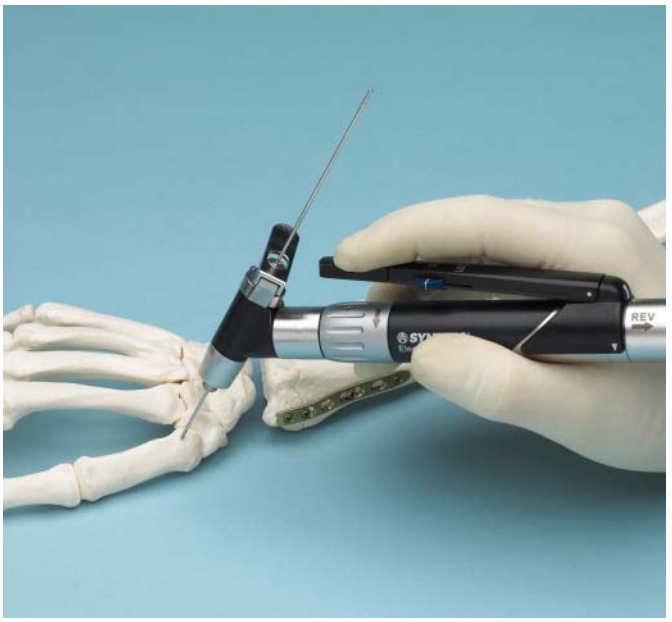
Instrument

05.001.037 K-Wire Attachment

Press the tensioning lever and insert a Kirschner wire into the attachment. The tensioning lever can be rotated 300° for surgeon preference.

Release the tensioning lever to grip the wire. The wire can now be inserted into the bone.

Important: To prevent injuries, the mode switch on the Drive Unit or the ON/LOCK switch on the Hand Switch should be in the LOCK position when inserting or removing attachments or instruments.



Repositioning or removing a K-wire

To reposition the wire in the attachment, press the tensioning lever and pull back the unit along the Kirschner wire. Release the tensioning lever once the wire is repositioned.

Inserting a saw blade or rasp

Instruments	
05.001.040	Reciprocating Saw Attachment
05.001.074	Handhold for Tool Change

Reciprocating saw blades are shown on page 74.

The variable speed on the Electric Pen Drive allows control of the cutting frequency from 0 to 18,000 osc/minute. The Reciprocating Saw Attachment is designed for Synthes reciprocating saw blades and rasps. Ensure the Drive Unit is running prior to contacting the bone.

Synthes recommends using a new saw blade for each surgery, as used saw blades may increase the risk of necrosis and increase the cutting time. All reciprocating saw blades are sold sterile.

Important: To prevent injuries, the mode switch on the Drive Unit or the ON/LOCK switch on the Hand Switch should be in the LOCK position when inserting or removing attachments or instruments.

Turn the release ring on the attachment clockwise until it locks in place.

Insert a saw blade or rasp into the coupling, turning it slightly to align the keyway. The instrument will automatically lock in place. Pull lightly on the instrument to confirm that it is secure.

Removing a saw blade or rasp

Turn the release ring of the attachment clockwise until it locks in place. Remove the instrument.

Attention: Saw blades cannot be resharpened. Use only Synthes saw blades. The use of other saw blades voids the device warranty. For easier exchange of cutting tools, the attachment should be attached to the Drive Unit, or the Handhold for Tool Change should be used.

Inserting a saw blade in Sagittal Saw Attachment

Instruments	
05.001.039	Sagittal Saw Attachment
05.001.074	Handhold for Tool Change

Sagittal saw blades are shown on page 72.

The variable speed on the Electric Pen Drive allows control of the cutting frequency from 0 to 22,000 osc/min. Ensure the Drive Unit is running prior to contacting the bone. Optimal cutting performance is achieved by gently moving back and forth in the plane of the saw blade. Imprecise cuts indicate a worn-out saw blade, excessive pressure, or jamming of the saw blade.

Synthes recommends using a new saw blade for each surgery, as used saw blades may increase the risk of necrosis and increase the cutting time. All sagittal saw blades are sold sterile.

Important: To prevent injuries, the mode switch on the Drive Unit or the ON/LOCK switch on the Hand Switch should be in the LOCK position when inserting or removing attachments or instruments.

Press the clamping button on the attachment.

Insert a sagittal saw blade into the saw blade coupling and move it into the desired position (variable in 45° increments).

Release the clamping button. Pull lightly on the saw blade to confirm that it is secure.

Removing a saw blade

Press the clamping button on the attachment, lift the saw blade and remove it.

Attention: Saw blades cannot be resharpened. Use only Synthes saw blades. The use of other saw blades voids the device warranty. For easier exchange of cutting tools, the attachment should be attached to the Drive Unit or the Handhold for Tool Change should be used.

Inserting a saw blade in Oscillating Saw attachment

Instruments	
05.001.038	Oscillating Saw Attachment
05.001.074	Handhold for Tool Change

Oscillating and intraoral saw blades are shown on page 73.

The variable speed on the Electric Pen Drive allows control of the cutting frequency from 0 to 22,000 osc/min. The Oscillating Saw Attachment is designed for crescentic and mandibular saw blades. Ensure the Drive Unit is running prior to contacting the bone.

Synthes recommends using a new saw blade for each surgery, as used saw blades may increase the risk of necrosis and increase the cutting time. All oscillating and intraoral saw blades are sold sterile.

Important: To prevent injuries, the mode switch on the Drive Unit or the ON/LOCK switch on the Hand Switch should be in the LOCK position when inserting or removing attachments or instruments.

Pull back the collar of the attachment.

Insert a saw blade into the saw blade coupling and move it into the desired position.

Release the collar. Pull lightly on the saw blade to confirm that it is secure.

Removing a saw blade

Pull back on the collar of the attachment, and remove the saw blade.

Attention: Saw blades cannot be resharpened. Use only Synthes saw blades. The use of other saw blades voids the device warranty. For easier exchange of cutting tools, the attachment should be attached to the Drive Unit, or the Handhold for Tool Change should be used.

Attaching and removing the Guide for Kirschner Wires

Instrument

05.001.121 Guide for K-Wires

Secure the optional Guide for Kirschner Wires on the Oscillating Saw Attachment by pushing the guide as far as possible over the attachment from the front. Attach the attachment on the Drive Unit.

Operating Instructions—Burring Speed Attachments

For operating instructions to insert attachments in the Drive Unit, refer to page 21.

Synthes recommends using a new burr for each surgery, as used burrs may increase the risk of necrosis and increase the cutting time. All burrs are sold sterile.

Important: To prevent injuries, the mode switch on the Drive Unit or the ON/LOCK switch on the Hand Switch should be in the LOCK position when inserting or removing attachments or instruments.

Burrs should only be used with the attachment for which they were intended. The S,M and L markings on the burr and attachments should be matched. Use only Synthes burrs. The use of other cutting tools voids the device warranty.

Attention: Burrs must be cooled with irrigation liquid to prevent necrosis. The integrated irrigation pump and tubing or manual irrigation should be used. For easier exchange of cutting tools, the attachment should be connected to the Drive Unit or the Handhold for Tool Change should be used. Synthes recommends wearing protective goggles when working with burrs.

Inserting a burr

Instruments	
05.001.045	Burr Attachment, short
05.001.046	Burr Attachment, medium
05.001.047	Burr Attachment, long
05.001.048	Burr Attachment, short, angled
05.001.049	Burr Attachment, medium, angled
05.001.050	Burr Attachment, long, angled
05.001.055*	Burr Attachment, XXL, angled
05.001.063*	Burr Attachment, XL, angled
05.001.074	Handhold for Tool Change

Burrs are shown on pages 66–71.

* Also available

Attach the burring attachment to the Drive Unit or insert it in the Handhold for Tool Change (Figure 1).

Turn the release ring of the burring attachment to the UNLOCK position (Figure 2).

Figure 1

Figure 2

Inserting a burr continued

Insert the burr as far as possible, turning it slightly to align the keyway. The burr is fully inserted when the S, M or L mark on the burr shank is no longer visible (Figure 3).

Turn the release ring of the attachment to the LOCK position and pull lightly on the instrument to confirm that it is secure (Figure 4).

Figure 3

Figure 4

Correct and incorrect insertion of the burr.

Correct

Incorrect

Removing a burr

Turn the release ring of the Burr Attachment to the UNLOCK position. Remove the burr.

Operating Instruction—Light Adaptor for Small Battery Drive

Inserting Light Adaptor into Small Battery Drive

Instruments	
05.001.108	Light Adaptor for Small Battery Drive
532.010*	Small Battery Drive

The Light Adaptor for Small Battery Drive allows the user to power the Drive Unit with the Electric Pen Drive Console.

Insert the adaptor into the Drive Unit, confirming the contacts on the adaptor align with the contacts in the recess of the Drive Unit. Press firmly to ensure the adaptor is engaged correctly, and check by pulling lightly downward on the adaptor. For safety, the adaptor can be inserted fully only when in the correct orientation.

Removing Light Adaptor for Small Battery Drive

Press both release buttons simultaneously on the Drive Unit to remove the Light Adaptor.

*Also available

Connecting Light Adaptor for Small Battery Drive to console

To connect the adaptor cable to the console, align the red dot on the plug with the red dot on the connector for the Small Battery Drive ( ) and push the plug into the connector. Do not force the plug into the connector as this may damage the plug and/or the console.

To remove the cable, retract the release sleeve on the plug and pull back.

Sterilization

Electric Pen Drive

Caution:
Do not sterilize the consoles! Consoles will no longer function!

Do not sterilize the Foot Switch! Foot Switch will no longer function!

Disassemble the Seal Nipple for Cable from the ends of the cable before sterilization!

Important:
All items must be cleaned and lubricated before sterilization. Please refer to the Maintenance and Cleaning Chart for cleaning and lubrication instructions.

The Electric Pen Drive Set should be steam sterilized in the Graphic Case (690.580) in accordance with the following guidelines:

- Ensure all accessories, attachments and cables are disassembled from the Drive Unit.
- All items must be cleaned before sterilization
- Position the components in the correct orientation in the Graphic Case.
- Ensure the Graphic Case is used to sterilize the set by the following parameters.

Method	Cycle	Minimum Temperature	Minimum Exposure Time	Minimum Dry Time
Steam	Prevacuum (Wrapped)	132°C (270°F)	4 minutes	20 minutes*

These parameters are validated to sterilize only these devices. The autoclave manufacturer's operating instructions and recommended guidelines for maximum sterilization load should be followed. The autoclave must be properly installed, maintained, and calibrated. Only legally marketed, FDA cleared sterilization wrap/pouches should be used by the end-user for packaging terminally sterilized devices.

* Synthes recommends a minimum dry time of 20 minutes for this device when sterilized using the recommended parameters. However, because dry time can be influenced by various factors such as autoclave performance, sterilization load, sterilization wrap/package materials, steam quality, varying cool-down time, and environmental conditions, adequate drying of this device should be verified by visual inspection.

Important:
Times represent exposure times only, and not total cycle times.

Do not accelerate the cooling process. A thermal overload circuit prevents operation of the Drive Unit when hot. This safety feature requires the unit to have cooled sufficiently following sterilization before use. This also switches the unit off if it begins to overheat during operation. The unit becomes operational when it has cooled sufficiently.

Hot air, ethylene oxide, plasma and formaldehyde sterilization are not recommended.

Troubleshooting

Problem	Possible Causes	Remedy
Drive Unit does not start up.	Console is not switched on or connected.	Connect and/or switch on console.
	Drive Unit is not connected to console.	Connect Drive Unit to console.
	Mode switch on Drive Unit is set to LOCK position.	Set mode switch to FWD or REV position.
	Release sleeve for burr on Burr Attachment set to UNLOCK position.	Set release sleeve on Burr Attachment to LOCK position.
	Two Drive Units and one Foot Switch are connected and mode switches of both Drive Units are set to FWD/REV.	With Foot Switch connected, mode switch of one Drive Unit must be switched to LOCK.
	Machine has not cooled down sufficiently following sterilization (thermal overload protection is activated).	Wait until machine has cooled down.
	Hand Switch turned by 180°.	Turn Hand Switch by 180° and fit as described in the Hand Switch section on page 17.
	Safety switch on Hand Switch is in LOCK position.	Set safety switch to ON position.
System suddenly stops.	System is overheated (thermal overload protection is activated).	Wait until system has cooled down.
Attachments cannot be coupled to unit.	Attachment coupling is blocked by deposits.	Remove solid objects with a pair of tweezers. **Attention:** When removing objects, set unit to off (LOCK).
Cutting tool (saw blade, drill bit, burr, etc.) cannot be coupled or can only be coupled with difficulty.	Shaft geometry of cutting tool damaged.	Replace cutting tool or send to the Synthes Service Department.
Bones and cutting tool heat up during working process.	Cutting edges of cutting tool are dull.	Replace cutting tool.

Problem	Possible Causes	Remedy
Irrigation fluid does not flow to Drive Unit when pump is operating	Irrigation tube inserted in wrong direction.	Insert irrigation tube as described on page 33.
Hand Switch does not function.	Hand Switch has been dropped on floor. Magnet is demagnetized.	Send Hand Switch to the Synthes Service Department.
LED (⏻) on console flashes.	Console defective.	Send console to the Synthes Service Department.
LED for torque limiting ON is flashing, when selection switch for torque limiting is set to CAL and Drive Unit is plugged into connector 2.	Drive Unit is not set to (FWD).	For calibration, set Drive Unit to (FWD) position.
	Calibration cannot be repeated.	Set the selection switch to OFF and then follow the instructions on page 27.
Drive Unit is plugged into connector 2, switch for *torque limiting is in the ON position and LED for torque limiting is flashing*.	Torque is not calibrated correctly.	Calibrate torque as described on page 27.
	Torque calibration has failed.	Repeat calibration.
	Calibration unit is out of calibration.	Send calibration unit to the Synthes Service Department for recalibration.

If the suggested solutions are unsuccessful, please contact the Synthes Service Department at 1 (800) 288-6698.

Synthes recommends an annual preventive maintenance service by qualified Synthes personnel.

Electric Pen Drive Set (01.001.580)

Graphic Case

690.580	Graphic Case, for Electric Pen Drive

Instruments

05.001.000	Standard Console with irrigation
05.001.010	Drive Unit, 60,000 rpm
05.001.012	Hand Switch
05.001.016	Foot Switch, 1 pedal
05.001.021	Cable, Drive Unit to Console, 4 m
05.001.022	Cable, Foot Switch to Console
05.001.027	Seal Nipple for Cables
05.001.028	Screw Attachment, AO coupling
05.001.029	Screw Attachment, hex coupling
	Drill Attachments
05.001.030	Mini quick coupling
05.001.031	J-latch coupling
05.001.032	AO coupling
05.001.033	45° Oscillating Drill Attachment, mini quick coupling
05.001.034	Screw Attachment, mini quick coupling
05.001.035	90° Drill Attachment, short, mini quick coupling
05.001.036	90° Drill Attachment, long, mini quick coupling
05.001.037	K-Wire Attachment
	Saw Attachments
05.001.038	Oscillating
05.001.039	Sagittal
05.001.040	Reciprocating
	45° Drill Attachments
05.001.042	Mini quick coupling
05.001.043	J-latch coupling
05.001.044	AO coupling

Instruments continued

	Burr Attachments
05.001.045	Short
05.001.046	Medium
05.001.047	Long
05.001.048	Short, angled
05.001.049	Medium, angled
05.001.050	Long, angled
	Irrigation Nozzles
05.001.066	Short
05.001.067	Medium
05.001.068	Long
05.001.070	For Sagittal Saw Attachment
05.001.071	For Reciprocating Saw Attachment
05.001.111	For Hex Drilling Attachment
05.001.074	Handhold for Tool Change for Attachments
05.001.099	Maintenance Station
05.001.104	Pheumatic Connection, DISS coupling for 05.001.099
05.001.105	Pheumatic Connection, Schrader coupling for 05.01.099
05.001.108	Light Adaptor for Small Battery Drive
05.001.110	Drill Attachment, hex coupling
05.001.120	Drill Attachment, with Jacobs chuck
05.001.121	Guide for K-wires for Oscillating Saw Attachment

Electric Pen Drive Hand and Foot Set (01.001.581)

Graphic Case

690.580	Graphic Case, for Electric Pen Drive

Instruments

05.001.000	Standard Console with irrigation
05.001.010	Drive Unit, 60,000 rpm
05.001.012	Hand Switch
05.001.016	Foot Switch, 1 pedal
05.001.021	Cable, Drive Unit to Console, 4 m
05.001.022	Cable, Foot Switch to Console
05.001.027	Seal Nipple for Cables
05.001.028	Screw Attachment, AO coupling
	Drill Attachments
05.001.030	Mini quick coupling
05.001.031	J-latch coupling
05.001.032	AO coupling
05.001.034	Screw Attachment, mini quick coupling
05.001.037	K-Wire Attachment
	Saw Attachments
05.001.038	Oscillating
05.001.039	Sagittal
05.001.040	Reciprocating
	Burr Attachments
05.001.045	Short
05.001.046	Medium
05.001.074	Handhold for Tool Change for Attachments
05.001.099	Maintenance Station

Note: All parts are also available to CMF customers.
Add .98 to part number when ordering.

Electric Pen Drive Craniomaxillofacial Set (01.001.582)

Graphic Case

690.580.98 Graphic Case, for Electric Pen Drive

Instruments

05.001.000.98 Standard Console with irrigation
05.001.010.98 Drive Unit, 60,000 rpm
05.001.012.98 Hand Switch
05.001.016.98 Foot Switch, 1 pedal
05.001.021.98 Cable, Drive Unit to Console, 4 m
05.001.022.98 Cable, Foot Switch to Console
05.001.027.98 Seal Nipple for Cables
05.001.028.98 Screw Attachment, AO coupling
05.001.029.98 Screw Attachment, hex coupling

Drill Attachments
05.001.030.98 Mini quick coupling
05.001.031.98 J-latch coupling
05.001.032.98 AO coupling

05.001.033.98 45° Oscillating Drill Attachment, mini quick coupling
05.001.034.98 Screw Attachment, mini quick coupling
05.001.035.98 90° Drill Attachment, short, mini quick coupling
05.001.036.98 90° Drill Attachment, long, mini quick coupling
05.001.037.98 K-Wire Attachment

Saw Attachments
05.001.038.98 Oscillating
05.001.039.98 Sagittal
05.001.040.98 Reciprocating

Burr Attachments
05.001.046.98 Medium
05.001.047.98 Long
05.001.049.98 Medium, angled
05.001.050.98 Long, angled

05.001.074.98 Handhold for Tool Change for Attachments
05.001.099.98 Maintenance Station
05.001.110.98 Drill Attachment, hex coupling

Also Available

01.001.580.98 Electric Pen Drive Set
(same contents as set 01.001.580)

90,000 rpm Electric Pen Drive Set (01.001.593)

Graphic Case and Insert Tray

690.594	Insert Tray for 90,000 RPM Pen
690.596	Single Level Modular Graphic Case

Instruments

05.001.000	Standard Console with irrigation, for Electric Pen Drive
05.001.011	Electric Pen Drive, 90,000 RPM
05.001.017	Foot Switch, 2 pedals, for Electric Pen Drive

Note: All parts are also available to CMF customers.
Add .98 to part number when ordering.

60,000 rpm Electric Pen Drive Set–Also Available

Instruments

05.001.027	Seal Nipple for Cables, for Electric Pen Drive
05.001.020	Cable, Drive Unit to Console, 2 m
05.001.025	Cable, Drive Unit to Console, 3 m
05.001.060	0.4 Nm Torque Calibration Unit
05.001.061	0.8 Nm Torque Calibration Unit

Note: All parts are also available to CMF customers.
Add .98 to part number when ordering.

60,000 rpm and 90,000 rpm Electric Pen Drive Set–Also Available

Instruments	
05.001.001	Standard Console without irrigation
05.001.002	Basic Console
05.001.026	Cable, Foot Switch to Foot Switch, 2 m
	Burr Attachments, for Electric Pen Drive
05.001.045	S
05.001.046	M
05.001.047	L
05.001.048	S, angled
05.001.049	M, angled
05.001.050	L, angled
05.001.063	XL, 20°
05.001.055	XXL, 20°
	Irrigation Nozzles, for Electric Pen Drive
05.001.066	Short, for 05.001.045 and 05.001.048
05.001.067	Medium, for 05.001.046 and 05.001.049
05.001.068	Long, for 05.001.047 and 05.001.050
05.001.065	for 05.001.063
05.001.069.01S	Irrigation Tubing Set, single pack, sterile
05.001.069.05S	Irrigation Tubing Set, 5 pack, sterile
05.001.075	Cleaning Brush for K-wire Attachments
05.001.094	Maintenance Kit for Maintenance Station
05.001.095	Oil Dispenser with Synthes oil, 50 ml
05.001.098	Maintenance Spray
05.001.101	Adaptor for Maintenance Spray, for Drive Unit
05.001.102	Adaptor for Maintenance Spray, for Attachments
05.001.104	Pneumatic Connection, DISS coupling, for Maintenance Station 05.001.099
05.001.105	Pneumatic Connection, Schrader coupling, for Maintenance Station 05.001.099
05.001.122	Irrigation Nozzle, Extra long

Note: All parts are also available to CMF customers.
Add .98 to part number when ordering.

Graphic Cases

690.586	Three Level Modular Graphic Case (includes lid)
690.596	Single Level Modular Graphic Case (includes lid)
690.597	Two Level Modular Graphic Case (includes lid)

Graphic Case Accessories and Replacement Parts

306.763	Label Sheet for Electric Pen Drive Module
68.000.007	Support for Cutting Tools
690.578	Module Insert, 4 Compartments (includes dividers and screws)
690.578.04	Divider Kit for Module Insert (for extra divider inserts and screws)
690.579	Module Insert, 2 Compartments (includes dividers and screws)
690.581	Lid, for Graphic Case
690.582	Attachment Rack, for Graphic Case
690.585	Graphic Case Base
690.587	Insert Tray for 60,000 rpm Drive Unit
690.588	Attachment Tray Assembly
690.589	Lid for Modular Graphic Case
690.594	Insert Tray for 90,000 rpm Drive Unit

Extended Warranty and Service Programs

W1.01.001.581	One-year Extended Warranty and Annual Service Program for Electric Pen Drive Set, Trauma (for 01.001.580 and 01.001.581)
W3.01.001.581	Three-year Extended Warranty and Annual Service Program for Electric Pen Drive Set, Trauma (for 01.001.580 and 01.001.581)
W1.01.001.582	One-year Extended Warranty and Annual Service Program for Electric Pen Drive Set, Craniomaxillofacial (for 01.001.580.98 and 01.001.582)
W3.01.001.582	Three-year Extended Warranty and Annual Service Program for Electric Pen Drive Set, Craniomaxillofacial (for 01.001.580.98 and 01.001.582)

Note: All parts are also available to CMF customers.
Add .98 to part number when ordering.

Burrs for burring speed attachments

For use with the following burr attachments:

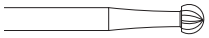
05.001.045	Short
05.001.046	Medium
05.001.047	Long
05.001.048	Short, angled
05.001.049	Medium, angled
05.001.050	Long, angled
05.001.055	XXL, angled*
05.001.063	XL, angled*
05.001.074	Handhold for Tool Change for Attachments

The burrs with an EPD coupling are available short, medium and long. Refer to the table for the last three digits of the product number. All burrs are provided sterile-packed.

Notes:
Short (S) = 45 mm burr length
Medium (M) = 70 mm burr length
Long (L) = 95 mm burr length

Exposed distance:
The exposed distance between the beginning of the burr head and the end of the attachment of the same type (S, M, or L) is always 10 mm. When using a longer burr than attachment (i.e. a medium burr and short attachment or a long burr and medium attachment), the distance is 35 mm.

Round burrs
03.000.XXXS



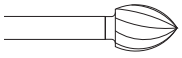
Diameter (mm)	Attachment Type S	Attachment Type M	Attachment Type L
1.0	000	001	002
1.5	003	004	005
2.0	230	231	232
2.5	006	007	008
3.0	009	010	011
4.0	012	013	014
5.0	015	016	017
6.5	018	019	020
8.0	021	022	023

* XL and XXL, angled attachments use the same burrs as the Long and Long, angled attachments (type L)

Round burrs, diamond-coated
03.000.XXXS

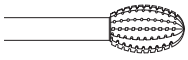
Diameter (mm)	Attachment Type S	Attachment Type M	Attachment Type L
1.0	030	031	032
1.5	033	034	035
2.0	036	037	038
2.5	039	040	041
3.0	042	043	044
3.5	045	046	047
4.0	048	049	050
5.0	051	052	053
6.0	054	055	056

Acorn-shaped burrs
03.000.XXXS



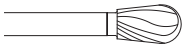
Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
5.0	6.7	233	234	235
6.0	8.0	060	061	062
7.5	9.5	063	064	065
9.0	11.4	066	067	068

Egg-shaped burrs
03.000.XXXS



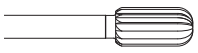
Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
4.0	8.0	070	071	072
5.5	10.0	073	074	075

Pear-shaped burrs
03.000.XXXS



Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
4.0	6.9	236	237	238
5.0	8.3	076	077	078
6.0	9.7	079	080	081

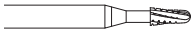
Barrel-shaped burrs
03.000.XXXS



Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
4.0	9.0	239	240	241
5.0	10.0	082	083	084
6.0	11.0	242	243	244

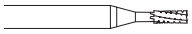
Burrs for burring speed attachments continued

Fissure burrs, tapered carbide
03.000.XXXS



Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
1.0–1.6	4.5	085	086	087
1.6–2.3	5.2	088	089	090
2.1–2.6	6.8	091	092	093

Fissure burrs, cylindrical carbide
03.000.XXXS

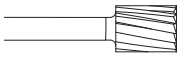


Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
1.6	4.3	094	095	096
3.0	16.0	097	098	099

Inverted cone burrs
03.000.XXXS

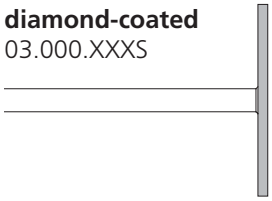
Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
6.5	6.1	100	101	102

Drum burrs
03.000.XXXS



Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
4.7	7.9	245	246	247
6.0	7.9	103	104	105
9.1	7.9	106	107	108

Circular burrs diamond-coated
03.000.XXXS

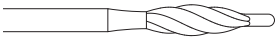


Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
25.0	0.7	109	110	111

Lindemann burrs
03.000.XXXS

Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
1.8–2.3	20.2	112	113	114

Swanson burrs
03.000.XXXS

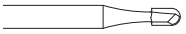


Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
2.0	6.3	115	116	117
3.0	9.7	118	119	120
4.0	12.7	121	122	123
5.0	15.8	160	161	162

Pin-shaped burrs
03.000.XXXS

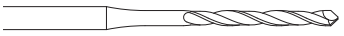
Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
1.1–1.4	6.0	127	128	129
1.5–2.1	12.0	130	131	132
3.0	19.5	248	249	250

Neuro burrs
03.000.XXXS



Maximum Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M	Attachment Type L
1.7	2.3	133	134	135
2.2	3.7	136	137	138
2.9	3.8	139	140	141

Drill bits
03.000.XXXS



Maximum Diameter (mm)	Attachment Type S	Attachment Type M
1.0	142	143
1.1	144	145
1.3	146	147
1.5	148	149
2.0	150	151
2.5	152	153

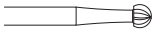
Wire pass drill bits
03.000.XXXS

Maximum Diameter (mm)	Head Length (mm)	Attachment Type S	Attachment Type M
1.1	5.0	154	155
1.5	7.0	156	157
2.0	7.0	158	159

Burrs with mini quick and J-latch couplings

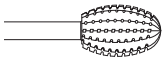
Note: Refer to the table for the last three digits of the product number. All burrs are provided sterile-packed.

Round burrs
03.000.XXXS



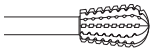
Maximum Diameter (mm)	Overall Length 28 mm	Overall Length 45 mm	
3.0	170	171	Mini quick
	200	201	J-latch
5.0		172	Mini quick
		202	J-latch

Egg-shaped burrs
03.000.XXXS



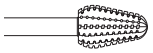
Maximum Diameter (mm)	Head Length (mm)	Overall Length 28 mm	Overall Length 45 mm	
7.0	11.0	173	174	Mini quick
		203	204	J-latch
8.0	4.8	175	176	Mini quick
		205	206	J-latch

Pear-shaped burrs
03.000.XXXS



Maximum Diameter (mm)	Head Length (mm)	Overall Length 23 mm	Overall Length 28 mm	Overall Length 45 mm	
5.0	8.3	183	184	185	Mini quick
		213	214	215	J-latch
6.0	9.7	186	187	188	Mini quick
		216	217	218	J-latch

Conical burrs
03.000.XXXS



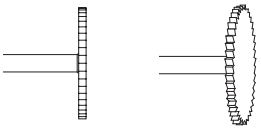
Maximum Diameter (mm)	Head Length (mm)	Overall Length 23 mm	Overall Length 28 mm	Overall Length 45 mm	
5.0	8.3	177	178	179	Mini quick
		207	208	209	J-latch

Maximum Diameter (mm)	Head Length (mm)	Overall Length 24 mm	Overall Length 28 mm	Overall Length 45 mm	
6.0	9.7	180	181	182	Mini quick
		210	211	212	J-latch

Fissure burrs, tapered
03.000.XXXS

Maximum Diameter (mm)	Head Length (mm)	Overall Length 31 mm	Overall Length 45 mm	
1.0–2.1	11.3	189	190	Mini quick
		219	220	J-latch
1.6–3.2	12.0	191	192	Mini quick
		221	222	J-latch

Circular burrs
03.000.XXXS



Maximum Diameter (mm)	Overall Length 28 mm	
8.0	193	Mini quick
	223	J-latch
10.0	194	Mini quick
	224	J-latch
12.0	195	Mini quick
	225	J-latch
15.0	196	Mini quick
	226	J-latch

Lindemann burrs
03.000.XXXS

Diameter (mm)	Head Length (mm)	Overall Length 45 mm	
2.0–2.3	35	197	Mini quick
		227	J-latch

Saw Blades for Sagittal Saw Attachment (05.001.039)

All saw blades are sterile-packed unless indicated.

		Usable Length (mm)	Blade Width (mm)	Cut Thickness (mm)
	03.000.314S	18.0	2.5	0.38
	03.000.300S	18.0	4.0	0.38
	03.000.301S	15.0	6.0	0.38
	03.000.302S	31.0	6.0	0.38
	03.000.303S 03.000.317*	22.0 22.0	8.0 8.0	0.38 0.40
	03.000.304S	15.0	10.0	0.38
	03.000.305S	31.0	10.0	0.38
	03.000.306S	22.0	12.0	0.38
	03.000.307S	15.0	16.0	0.38
	03.000.308S	27.0	6.0	0.60
	03.000.309S	27.0	10.0	0.60
	03.000.310S	27.0	14.0	0.60
	03.000.315S	43	20.0	0.60

* Not available sterile

Saw Blades for Oscillating Saw Attachment (05.001.038)

All saw blades are sterile-packed.

Crescent Blades for halux valgus		Usable Length (mm)	Blade Width (mm)	Cut Thickness (mm)	Diameter (mm)
	03.000.311S	26.5	13.3	0.6	18.0
	03.000.312S	25.0	16.3	0.6	18.0
	03.000.313S	30.0	17.9	0.6	22.0
	03.000.316S	30.0	21.9	0.6	22.0

Saw Blades, 105° angled for intraoral		Usable Length (mm)	Blade Width (mm)	Cut Thickness (mm)	Shank Length (mm)
	03.000.343S	12.0	4.5	0.4	70.0
	03.000.342S	12.0	9.5	0.4	70.0
	03.000.341S	12.0	11.5	0.4	70.0
	03.000.340S	7.0	12.0	0.4	70.0

Saw Blades for Reciprocating Saw Attachment (05.001.040)

All saw blades are sterile-packed.

		Cutting Edge Length (mm)	Blade Height (mm)	Cut Thickness (mm)	Design, Special Application
	03.000.320S	13.0	6.4/2.9	0.6	
	03.000.321S	20.0	6.4/2.9	0.6	
	03.000.322S	7.0	4.0	0.6	
	03.000.323S	14.0	6.4	0.6	
	03.000.324S	14.5	4.0	0.6	
	03.000.325S	25.0	5.5	0.6	For rhinoplasty
	03.000.326S	27.0	6.4	0.6	
	03.000.327S	27.0	6.4/2.9	0.6	
	03.000.328S	33.5	6.4	0.6	
	03.000.329S	35.0	5.0/2.5	0.6	Crescent-shaped for vertical osteotomy
	03.000.330S	33.5	6.4	0.6	Downward offset
	03.000.331S	33.5	6.4	0.6	Right offset
	03.000.332S	33.5	6.4	0.6	Left offset
	03.000.334S	20.0	6.4/2.9	0.6	Elongated, LeFort I osteotomy, rhinoplasty
	03.000.335S	27.0	6.4/2.9	0.6	Elongated, LeFort I osteotomy, rhinoplasty

		Cutting Edge Length (mm)	Blade Height (mm)	Cut Thickness (mm)	Design, Special Application
	03.000.336S	13.0	3.20	0.4	Thin, intradental
	03.000.337S	20.0	3.16	0.4	Thin, intradental

I.B.O Saw Blades for Reciprocating Saw Attachment (05.001.040)

		Cutting Edge Length (mm)	Blade Height (mm)	Cut Thickness (mm)	Design, Special Application
	03.000.338S	9.20	7.40	0.50	Left–BSSO
	03.000.339S	9.20	7.40	0.50	Right–BSSO

Rasps for Reciprocating Saw Attachment (05.001.040)

All rasps are sterile-packed.

		Usable Length (mm)	Blade Height (mm)	Cut Thickness (mm)	Design, Special Application
	03.000.360S	11.0	5.0		Cross-grinding for rhinoplasty
	03.000.361S	14.0	7.0		Cross-grinding for rhinoplasty
	03.000.362S	11.0	5.0		Straight-grinding for rhinoplasty
	03.000.363S	14.0	7.0		Straight-grinding for rhinoplasty
	03.000.364S	19.0	4.5	4.5	Interphalangeal joint replacement, proximal
	03.000.365S	19.0	6.0	6.0	Interphalangeal joint replacement, distal

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