

Cannulated Screws
Ø 3.5mm, Ø 4.0mm, Ø 4.5mm

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Note:

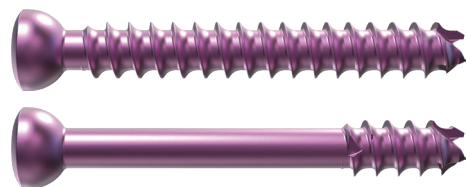
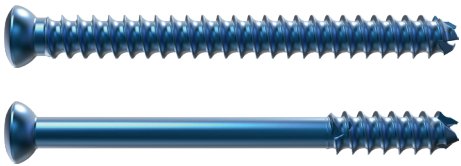
The surgical technique outlined below reflect the surgical procedure usually chosen by the clinical advisor. However, each surgeon must decide which surgical method and which approach is the most successful for his patient.

Cannulated Screws 3.5, 4.0 and 4.5

► Introduction

Product Specification

- The Marquardt **Cannulated Screw System** offers a wide range of cannulated screws from Ø 3.5 to Ø 4.5mm. Cannulated screws are intended for fracture fixation in small or medium-sized bones. They can also be used in combination with other Marquardt plate systems.



Indication

- Fixation of small fragments. (Cannulated Screws Ø 3.5mm)
- Fixation of small and medium-sized bone fragments. (Cannulated Screws Ø 4.0mm)
- Fixation of intermediate fragments of metaphyseal bone. (Cannulated Screws Ø 4.5mm)
- Prevent the head of a screw splitting the cortex and sinking into the bone. (Washer)

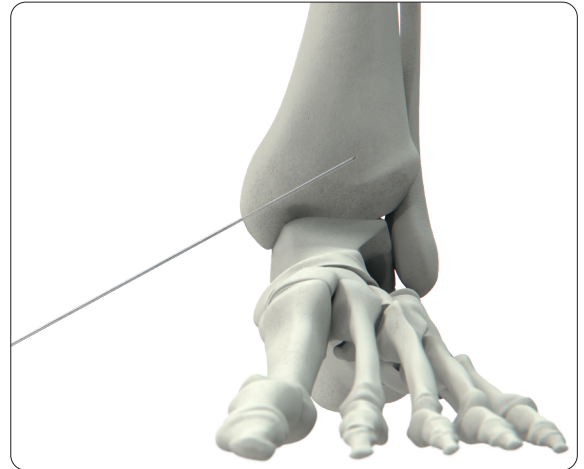
► Surgical Technique - Ø 3.5 and Ø 4.0mm

Fracture Reduction

Instruments

REF 11.90212.150 *Kirschner Wire Ø 1.2mm, L 150mm*

- After the incision, the Ø 1.2mm K-wire is inserted into the bone.

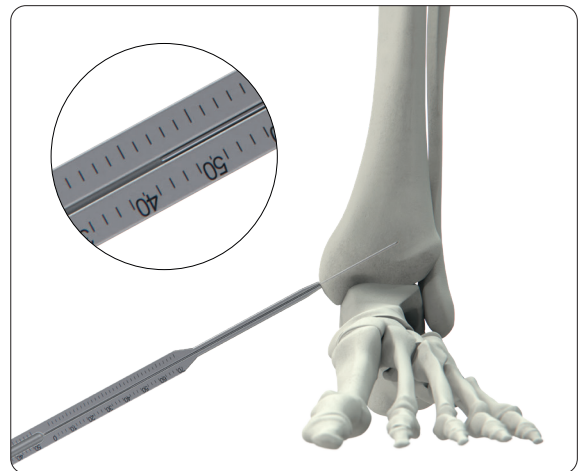


Screw Insertion

Instruments

REF 08.20100.035 *Length Determination Instrument, for
Kirschner Wire Ø 1.2mm x 150mm*

- The length determination instrument is advanced to the cortex.
- The screw length can be read directly from the scale of the length determination instrument (end of the K-wire).



Insertion of the Drill Guide Assembly

Instruments

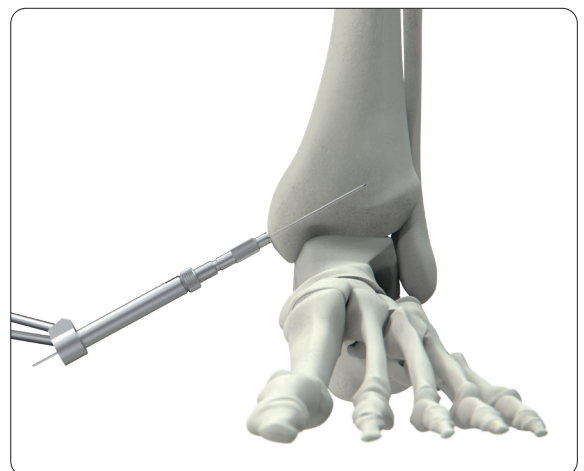
REF 08.20060.035 *Drill Guide with Stop 3.5/2.7*

REF 08.20060.036 *Drill Guide Insert 2.7*

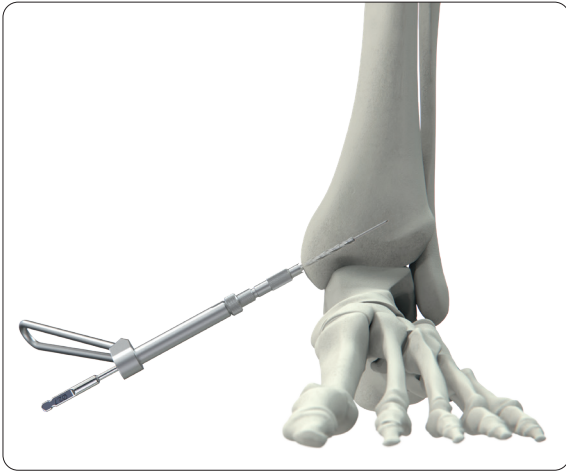
- The mounted drill guide assembly is advanced to the bone via the K-wire.

Note:

Alternatively, the double drill guide can be used.



Cannulated Screws 3.5, 4.0 and 4.5

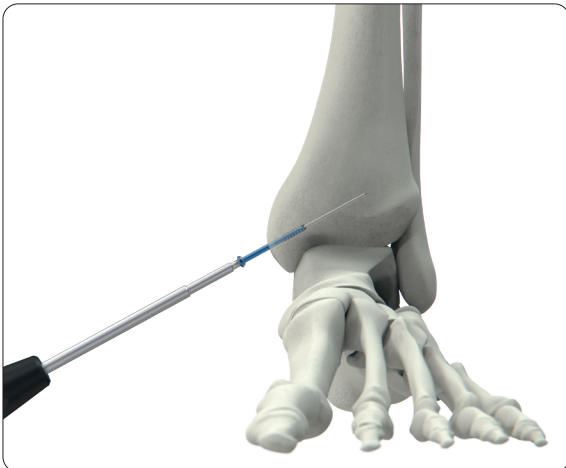


Drilling

Instruments

REF 08.20010.027 Drill Bit Ø 2.7mm

- To predrill the hole, the cannulated drill bit is used.



Screw Insertion

Instruments

REF 08.20040.025 Screwdriver, hex 2.5mm

- Finally, the cannulated screwdriver is used to insert the corresponding cannulated screw.

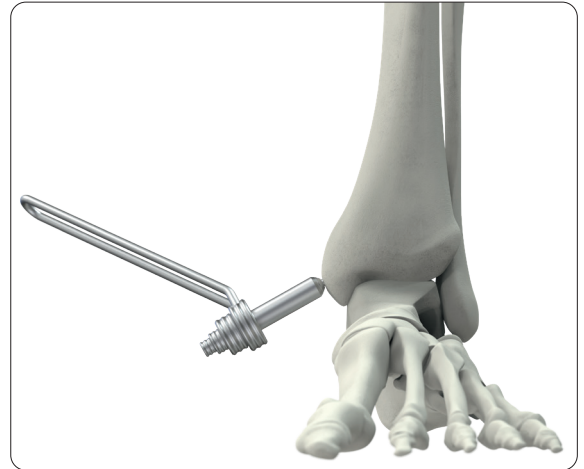
► Surgical Technique - Ø 4.5mm

Fracture Reduction

Instruments

REF 08.20120.045	Protection sleeve 9.5/7.0
REF 08.20060.032	Centering Sleeve 3.2
REF 08.20060.070	Drill Sleeve 7.0/3.2
REF 08.20120.016	Trocar Ø 1.6mm

- After reduction, the sleeve assembly is advanced through the incision to the bone.



Guide Wire Insertion

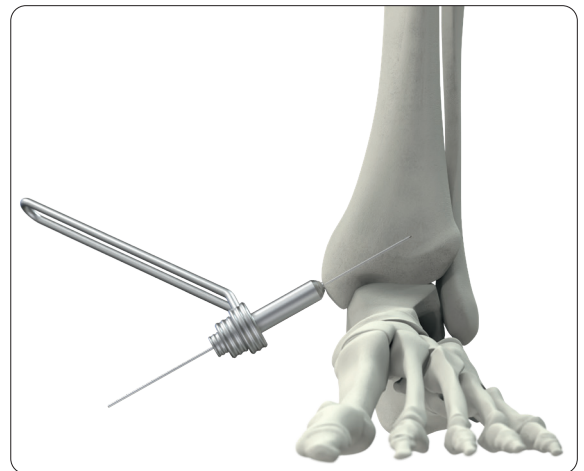
Instruments

REF 11.90216.150	Kirschner Wire Ø 1.6 mm, L 150mm
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- Remove the trocar from the sleeve assembly.
- The K-wire is then advanced through the sleeve assembly and placed in the bone.

Note:

With the parallel target device there is the possibility to insert a second K-wire.

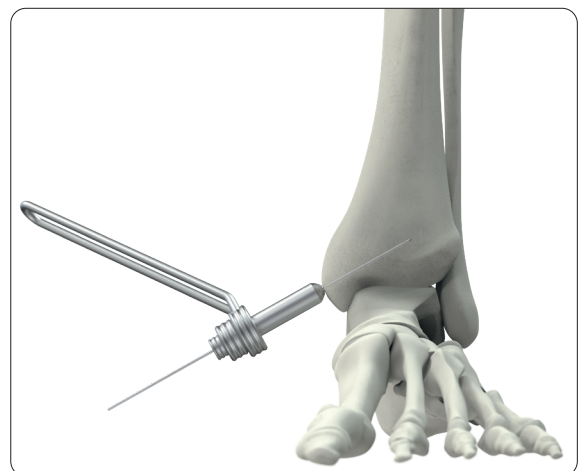


Screw Length Determination

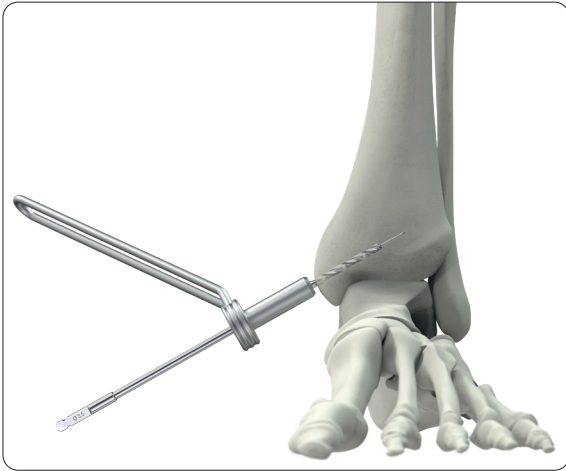
Instruments

REF 08.20100.045	Length Determination Instrument, for Kirschner Wire Ø 1.6mm x 150mm
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- To determine the screw length, the centering sleeve and the drill sleeve must first be removed from the sleeve assembly.
- The length determination instrument is then advanced through the protection sleeve to the cortex.
- The screw length can be read directly from the scale of the length determination instrument (end of the K-wire).



Cannulated Screws 3.5, 4.0 and 4.5



Drilling

Instruments

REF 08.20060.070 Drill Sleeve 7.0/3.2

REF 08.20010.032 Drill Bit Ø 3.2mm

- The drill sleeve is inserted into the protection sleeve.
- The cannulated drill Ø 3.2mm is used to predrill the hole through the drill guide.

Note:

For a compression hole, the use of the cannulated drill bit Ø 4.5mm is recommended for the close fragment.



Screw Insertion

Instruments

REF 08.20040.135 Screwdriver, hex 3.5mm

- To insert the cannulated screw, the drill sleeve must be removed.
- Finally, the cannulated screwdriver is used to insert the corresponding cannulated screw through the protection sleeve.

► Product Information

Implants

Article Number Stainless Steel	Article Number * Titanium	Screw Length	Thread Length
08.02535.010	08.03535.010	10mm	4mm
08.02535.012	08.03535.012	12mm	4mm
08.02535.014	08.03535.014	14mm	5mm
08.02535.016	08.03535.016	16mm	5mm
08.02535.018	08.03535.018	18mm	6mm
08.02535.020	08.03535.020	20mm	7mm
08.02535.022	08.03535.022	22mm	7mm
08.02535.024	08.03535.024	24mm	8mm
08.02535.026	08.03535.026	26mm	8mm
08.02535.028	08.03535.028	28mm	9mm
08.02535.030	08.03535.030	30mm	10mm
08.02535.032	08.03535.032	32mm	11mm
08.02535.034	08.03535.034	34mm	11mm
08.02535.036	08.03535.036	36mm	12mm
08.02535.038	08.03535.038	38mm	12mm
08.02535.040	08.03535.040	40mm	13mm
08.02535.042	08.03535.042	42mm	14mm
08.02535.044	08.03535.044	44mm	14mm
08.02535.046	08.03535.046	46mm	15mm
08.02535.048	08.03535.048	48mm	15mm
08.02535.050	08.03535.050	50mm	16mm

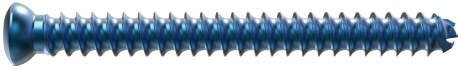


Cannulated Screw Ø 3.5mm, short threaded, self-drilling

- Thread diameter: 3.5mm
- Shaft diameter: 2.5mm
- Head diameter: 5.0mm
- Hexagon socket: 2.5mm
- Cannulation: 1.35mm

* All implants are also available in sterile. Therefore, add suffix "S" to article number.

Cannulated Screws 3.5, 4.0 and 4.5



Cannulated Screw Ø 3.5mm, fully threaded, self-drilling

- Thread diameter: 3.5mm
- Head diameter: 5.0mm
- Hexagon socket: 2.5mm
- Cannulation: 1.35mm

Article Number Stainless Steel	Article Number * Titanium	Screw Length
08.02500.010	08.03500.010	10mm
08.02500.012	08.03500.012	12mm
08.02500.014	08.03500.014	14mm
08.02500.016	08.03500.016	16mm
08.02500.018	08.03500.018	18mm
08.02500.020	08.03500.020	20mm
08.02500.022	08.03500.022	22mm
08.02500.024	08.03500.024	24mm
08.02500.026	08.03500.026	26mm
08.02500.028	08.03500.028	28mm
08.02500.030	08.03500.030	30mm
08.02500.032	08.03500.032	32mm
08.02500.034	08.03500.034	34mm
08.02500.036	08.03500.036	36mm
08.02500.038	08.03500.038	38mm
08.02500.040	08.03500.040	40mm
08.02500.042	08.03500.042	42mm
08.02500.044	08.03500.044	44mm
08.02500.046	08.03500.046	46mm
08.02500.048	08.03500.048	48mm
08.02500.050	08.03500.050	50mm

* All implants are also available in sterile. Therefore, add suffix "S" to article number.

Cannulated Screws 3.5, 4.0 and 4.5

Article Number Titanium	Screw Length	Thread Length
08.03644.010	10mm	5.5mm
08.03644.012	12mm	5.5mm
08.03644.014	14mm	5.5mm
08.03644.016	16mm	5.5mm
08.03644.018	18mm	6.5mm
08.03644.020(S)	20mm	7.5mm
08.03644.022(S)	22mm	7.5mm
08.03644.024(S)	24mm	8.5mm
08.03644.026(S)	26mm	9.5mm
08.03644.028 (S)	28mm	9.5mm
08.03644.030(S)	30mm	10.5mm
08.03644.032(S)	32mm	11.5mm
08.03644.034(S)	34mm	11.5mm
08.03644.036(S)	36mm	12.5mm
08.03644.038(S)	38mm	12.5mm
08.03644.040(S)	40mm	13.5mm
08.03644.042(S)	42mm	14.5mm
08.03644.044(S)	44mm	14.5mm
08.03644.046(S)	46mm	15.5mm
08.03644.048(S)	48mm	15.5mm
08.03644.050(S)	50mm	16.5mm
08.03644.055(S)	55mm	16.5mm
08.03644.060(S)	60mm	16.5mm



Cannulated Screw Ø 4.0mm, short threaded, self-drilling

- Thread diameter: 4.0mm
- Shaft diameter: 2.5mm
- Head diameter: 5.0mm
- Hexagon socket: 2.5mm
- Cannulation: 1.35mm

Cannulated Screws 3.5, 4.0 and 4.5



Cannulated Screw Ø 4.0mm, fully threaded, self-drilling

- Thread diameter: 4.0mm
- Head diameter: 5.0mm
- Hexagon socket: 2.5mm
- Cannulation: 1.35mm

Article Number * Titanium	Screw Length
08.03640.010	10mm
08.03640.012	12mm
08.03640.014	14mm
08.03640.016	16mm
08.03640.018	18mm
08.03640.020	20mm
08.03640.022	22mm
08.03640.024	24mm
08.03640.026	26mm
08.03640.028	28mm
08.03640.030	30mm
08.03640.032	32mm
08.03640.034	34mm
08.03640.036	36mm
08.03640.038	38mm
08.03640.040	40mm
08.03640.042	42mm
08.03640.044	44mm
08.03640.046	46mm
08.03640.048	48mm
08.03640.050	50mm
08.03640.055	55mm
08.03640.060	60mm

* All implants are also available in sterile. Therefore, add suffix "S" to article number.

Cannulated Screws 3.5, 4.0 and 4.5

Article Number Stainless Steel	Article Number * Titanium	Screw Length	Thread Length
08.02654.020	08.03654.020	20mm	7mm
08.02654.022	08.03654.022	22mm	7mm
08.02654.024	08.03654.024	24mm	8mm
08.02654.026	08.03654.026	26mm	9mm
08.02654.028	08.03654.028	28mm	9mm
08.02654.030	08.03654.030	30mm	10mm
08.02654.032	08.03654.032	32mm	11mm
08.02654.034	08.03654.034	34mm	11mm
08.02654.036	08.03654.036	36mm	12mm
08.02654.038	08.03654.038	38mm	13mm
08.02654.040	08.03654.040	40mm	13mm
08.02654.042	08.03654.042	42mm	14mm
08.02654.044	08.03654.044	44mm	15mm
08.02654.046	08.03654.046	46mm	15mm
08.02654.048	08.03654.048	48mm	16mm
08.02654.050	08.03654.050	50mm	17mm
08.02654.052	08.03654.052	52mm	17mm
08.02654.054	08.03654.054	54mm	18mm
08.02654.056	08.03654.056	56mm	19mm
08.02654.060	08.03654.060	60mm	20mm
08.02654.064	08.03654.064	64mm	21mm
08.02654.068	08.03654.068	68mm	23mm
08.02654.072	08.03654.072	72mm	24mm

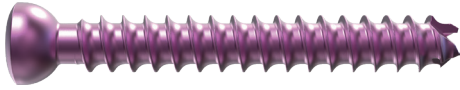


Cannulated Screw Ø 4.5mm, short threaded, self-drilling

- Thread diameter: 4.5mm
- Shaft diameter: 3.2mm
- Head diameter: 6.5mm
- Hexagon socket: 3.5mm
- Cannulation: 1.75mm

* All implants are also available in sterile. Therefore, add suffix "S" to article number.

Cannulated Screws 3.5, 4.0 and 4.5



Cannulated Screw Ø 4.5mm, fully threaded, self-drilling

- Thread diameter: 4.5mm
- Head diameter: 6.5mm
- Hexagon socket: 3.5mm
- Cannulation: 1.75mm

Article Number Stainless Steel	Article Number * Titanium	Screw Length
08.02650.020	08.03650.020	20mm
08.02650.022	08.03650.022	22mm
08.02650.024	08.03650.024	24mm
08.02650.026	08.03650.026	26mm
08.02650.028	08.03650.028	28mm
08.02650.030	08.03650.030	30mm
08.02650.032	08.03650.032	32mm
08.02650.034	08.03650.034	34mm
08.02650.036	08.03650.036	36mm
08.02650.038	08.03650.038	38mm
08.02650.040	08.03650.040	40mm
08.02650.042	08.03650.042	42mm
08.02650.044	08.03650.044	44mm
08.02650.046	08.03650.046	46mm
08.02650.048	08.03650.048	48mm
08.02650.050	08.03650.050	50mm
08.02650.052	08.03650.052	52mm
08.02650.054	08.03650.054	54mm
08.02650.056	08.03650.056	56mm
08.02650.060	08.03650.060	60mm
08.02650.064	08.03650.064	64mm
08.02650.068	08.03650.068	68mm
08.02650.072	08.03650.072	72mm



Washer Ø 7.0mm, for Screws Ø 2.7 to 4.0mm

Article Number Stainless Steel	Article Number Titanium	Thickness
03.90000.070	03.91000.070	0.80mm



Washer Ø 10.0mm, for Screws Ø 4.0 to 4.5mm

Article Number Stainless Steel	Article Number Titanium	Thickness
08.90000.100	08.91000.100	1.00mm

* All implants are also available in sterile. Therefore, add suffix "S" to article number.

Cannulated Screws 3.5, 4.0 and 4.5

Instruments

Cannulated Screws Ø 3.5 and Ø 4.0mm

11.90212.150 Kirschner Wire Ø 1.2mm, threaded tip, L 150mm



08.20010.027 Drill Bit Ø 2.7/1.35mm, cannulated, AO Coupling, L 160/130mm



08.20010.035 Drill Bit Ø 3.5/1.35mm, cannulated, AO Coupling, L 160/130mm



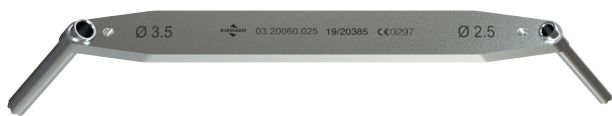
08.20020.035 Tap Ø 3.5/1.35mm, cannulated, AO Coupling, L 160/50mm



08.20030.035 Countersink, cannulated, für Cannulated Screws Ø 3.5/4.0mm, AO Coupling



03.20060.025 Double Drill Guide 3.5/2.5



08.20060.027 Double Drill Guide 2.7/1.25



08.20060.035 Drill Guide with Stop 3.5/2.7, with two Inserts



08.20060.036 Drill Guide Insert 2.7 für REF 08.20060.035



08.20060.037 Drill Guide Insert 3.5 für REF 08.20060.035



08.20100.035 Length Determination Instrument for Kirschner Wires Ø 1.2mm x 150mm



08.20040.025 Screwdriver, hex 2.5mm, cannulated, L 199/89mm



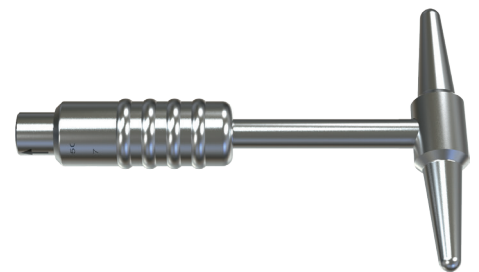
08.20040.125 Screwdriver Shaft, hex 2.5mm, cannulated, AO Coupling, L 100/70mm



03.20040.125 Screwdriver Shaft, hex 2.5mm, AO Coupling, L 100/70mm



03.20050.035 T-Handle with AO Coupling



02.20120.015 Screw Forceps, self-holding



08.20120.135 Cleaning Wire Ø 1.2mm, L 200mm



Cannulated Screws 3.5, 4.0 and 4.5

Cannulated Screws Ø 4.5mm

11.90216.150 Kirschner Wire Ø 1.6mm, threaded tip, L 150mm

02.20010.015 Drill Bit Ø 1.5mm, AO Coupling, L 85/55mm



08.20010.032 Drill Bit Ø 3.2/1.85mm, cannulated, AO Coupling, L 170/140mm



08.20010.045 Drill Bit Ø 4.5/1.85mm, cannulated, AO Coupling, L 170/140mm



08.20020.045 Tap Ø 4.5/1.85mm, cannulated, AO Coupling, L 180/70mm



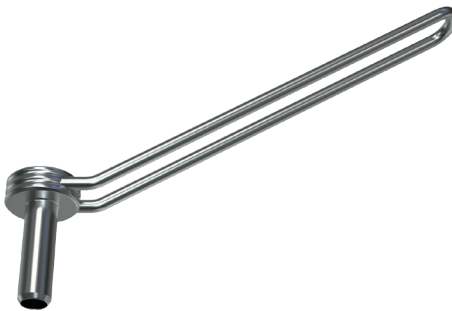
08.20030.045 Countersink, cannulated, for Cannulated Screws Ø 4.5mm, AO Coupling



04.20060.045 Double Drill Guide 4.5/3.2



08.20120.045 Protection Sleeve 9.5/7.0



08.20060.070 Drill Sleeve 7.0/3.2



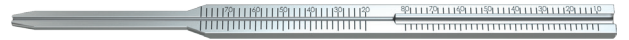
08.20060.032 Centering Sleeve 3.2 für Kirschner Wires Ø 1.6mm



08.20120.016 Trocar Ø 1.6mm



08.20100.045 Length Determination Instrument for Kirschner Wires Ø 1.6mm x 150mm



08.20040.135 Screwdriver, hex 3.5mm, cannulated, L 199/89mm



08.20040.235 Screwdriver Shaft, hex 3.5mm, cannulated, AO Coupling, L 100/70mm



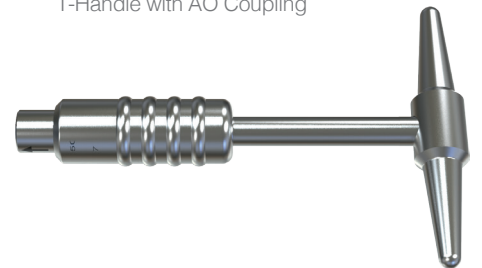
04.20040.135 Screwdriver Shaft, hex 3.5mm, AO Coupling, L 100/70mm



08.20060.016 Parallel Guide for Kirschner Wires Ø 1.6mm, adjustable



03.20050.035 T-Handle with AO Coupling



02.20120.015 Screw Forceps, self-holding



08.20120.145 Cleaning Wire Ø 1.6mm, L 210mm





MRI Safety Information

Non-clinical testing has demonstrated that the screw range from Marquardt Medizintechnik is MR Conditional in accordance with the ASTM F2503-20 standard definitions. A patient with this device can be safely scanned in an MR system meeting the following conditions:

- Cylindrical-bore
- Horizontal magnetic field (B_0)
- Spatial field gradient lower than or equal to
 - **1.5 T:** 23.45 T/m (2345 G/cm)
 - **3.0 T:** 11.75 T/m (1175 G/cm)
- Radiofrequency (RF) field exposure:
 - RF excitation: Circularly Polarized (CP)
 - RF transmit coil: whole-body transmit coil
 - RF receive coil type: whole-body receive coil
 - Maximum permitted whole-body averaged specific absorption rate (SAR):
Normal Operating Mode, 2 W/kg.
 - Scan duration and wait time:
 - 1.5 T:** 2 W/kg whole-body average SAR for **10min and 55s** of continuous RF (a sequence or back-to-back series/scan without breaks) followed by a wait time of **10min and 55s** if this limit is reached.
 - 3.0 T:** 2 W/kg whole-body average SAR for **7min and 54s** of continuous RF (a sequence or back-to-back series/scan without breaks) followed by a wait time of **7min and 54s** if this limit is reached.
- The screws are expected to produce a maximum temperature rise of 6.2 °C at 1.5 T and 6.5 °C at 3 T both after the scanning periods presented above.
- The presence of this implant may produce an image artifact. Some manipulation of scan parameters may be needed to compensate for the artifact. In non-clinical testing, the image artifact caused by the device extends approximately 83 mm from the device edge when imaged with a spin echo pulse sequence and 65 mm with a gradient echo, both at 1.5 T.
- Patients with uncompromised thermoregulation and under uncontrolled conditions or patients with compromised thermoregulation (all persons with impaired systemic or reduced local thermoregulation) and under controlled conditions (a medical doctor or a dedicated trained person can respond instantly to heat induced physiological stress).

Note:

Undergoing an MRI scan, there is a potential risk for patients with a metallic implant. The electromagnetic field created by an MRI scanner can interact with the metallic implant, resulting in displacement of the implant, heating of the tissue near the implant, or other undesirable effects.



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