MARQUARDT
Medizintechnik

WINSTA-R
Distal Radius System

Table of Contents

Note:

The surgery instructions outlined below reflect the surgical procedure usually chosen by the clinical consultant. However, each surgeon must decide individually which course of action offers the best chance of success in the individual case.

Introduction

WINSTA-R System

- High stability with small implant dimensions.
- Use of multiaxial screws / buttress pins (***ML*** Screws / ***ML*** Buttress Pins) with a deflection of ± 10 ° from the normal position permits high variability in the fixation of fragments, with minimal screw head protrusion.
- Rounded plate profile for optimal soft tissue protection.
- Simple and ergonomically designed instrument set with only one Ø-2.0-mm drill bit provides a high level of safety and security for the surgeon and the surgical staff.
- The locking buttress pins allow quick fixation of the fragments to the plate.

WINSTA-R Distal Radius Plates

- The ***WINSTA-R System*** consists of several plates with anatomically correct shape for reconstruction of the “palmar tilt”, taking into account the Watershed Line.
- Additional dorsal support of the articular surface and the dorsal edge fragment via radius plates with a second row of screws.
- Locking plates for palmar and dorsal treatment.

Indication

- Extra-articular fractures of AO-Type 23-A2 and A3
- Partial intra-articular fractures of AO-Type 23-B1 and B3
- Total intra-articular fractures of AO-Type 23-C1 to C3

WINSTA-R Distal Ulna Plates

- Anatomically preformed plates, side-specific for the right and the left ulna.
- Plate versions with and without distal hook.
- Plates with distal hooks for better fixation of the ulnar styloid process.

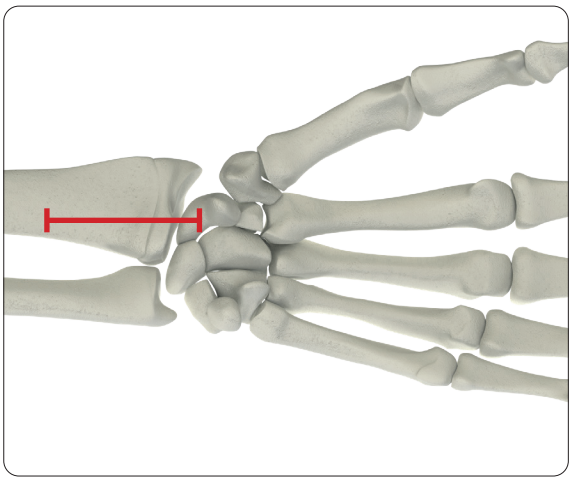
Indication

- Fixation of capital and sub-capital fractures of the distal ulna.

Surgical Technique

1. Palmar access for radius plate

- On the palmar side, a straight skin incision parallel to the flexor carpi radialis tendon is created.
- Take care not to hurt the arteria radialis on the radial and the nervus medianus on the medial side.
- Detach the pronator quadratus on the radial side from the radial shaft.

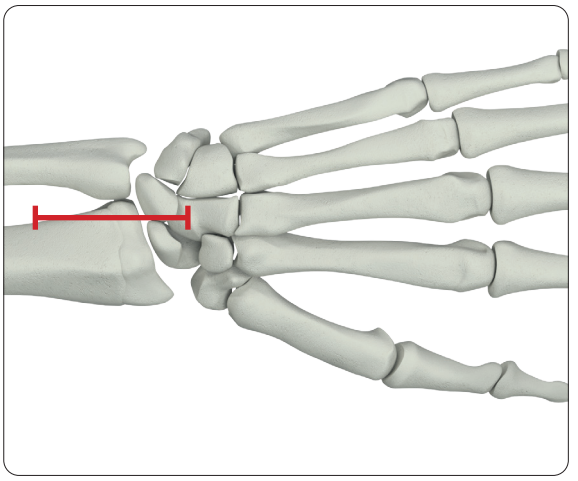


Note:

- In case of multifragmentary involvement of the joint fragment, the fragments should be left associated to facilitate ligamentotaxis.

2. Dorsal access for radius plate

- Dorsally, create a longitudinal incision over the distal radius, between the 2nd and 3rd dorsal extensor tendon compartment.
- Perform a longitudinal incision between the 1st and 2nd extensor tendon compartment to expose the extensor retinaculum.
- For easier access to the fracture site, carefully lift the 3rd extensor compartment (extensor pollicis longus), mobilise it proximally and distally and relocate it radially.
- Lift the second dorsal tendon compartment subperiostally radially and the fourth dorsal tendon compartment subperiostally ulnarly, to preserve the integrity of the compartments.



3. Positioning of the radius plate

Instruments

REF 11.90012.150 *Kirschner Wire Ø 1.2 mm*

- While applying tension to the fingers and in palmar flexion of the wrist, reduce the fracture until the joint fragment abuts against the distal end of the plate.
- In the event of a dorsal fragment zone it can be helpful to apply dorsal pressure onto this zone with one finger while filling the distal plate holes; this will ensure the retention of the fragments through the stabilising screw/pins inserted in anatomical position.
- Attention must be paid to correct reduction of the fracture.
- Once the fracture has been reduced into an anatomically correct position, the plate is fixed temporarily with Kirschner wires in the distal and proximal areas.

4. Fixation of the plate in the slide hole

Instruments

REF 10.20010.020(S) *Drill Bit Ø 2.0 mm*
REF 12.20060.017 *Double Drill Guide 2.0 / 1.7*

- The slot is filled with a cortical screw Ø 2.7 mm.
- The screw hole is pre-drilled using the drill bit via the double drill guide.

Instruments

REF 03.20100.040 *Length Determination Instrument, for Screws up to 40 mm*

- Next, the required screw length is determined using the length determination instrument.
- The length determination instrument is placed directly on the plate, and after hooking onto the opposite cortex, the value can be read.

Instruments

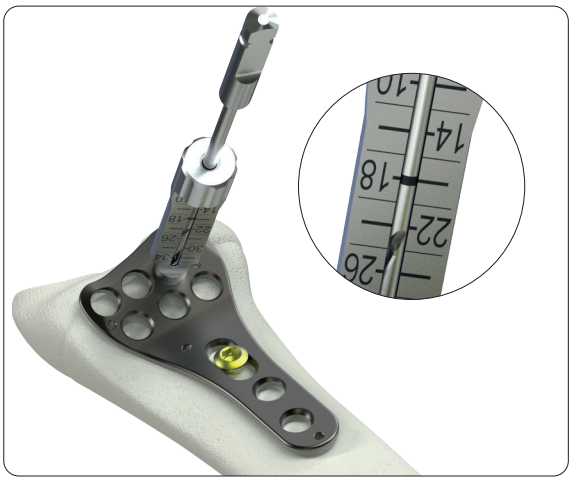
REF 03.20040.030 *Screwdriver, hex 2.5 mm*

- After the required screw length has been determined, the appropriate cortical screw can be inserted with the screwdriver.
- The screw is initially tightened only slightly, so that the plate position can be corrected distally and proximally as required.
- Check the plate position once more and correct it, if necessary, with image amplifier monitoring.
- Once the plate position is correct, the screws are finally tightened, and the plate is thus fixed on the radius shaft.

5. Distal screwing

Instruments

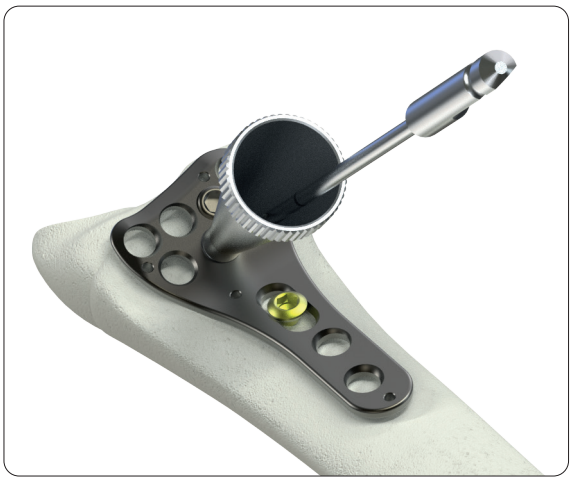
REF 10.20010.020(S) *Drill Bit Ø 2.0 mm*
REF 10.20060.047 *Drill Guide 2.0*
REF 03.20100.040 *Length Determination Instrument, for Screws up to 40 mm*
REF 03.20040.030 *Screwdriver, hex 2.5 mm*



- For locking cortical screws of Ø 3.0 mm, the scaled drill guide is screwed into the screw hole to be filled.
- When the drill bit is used, the required screw length can be read directly on the scale of the drill guide.
- Alternatively, for determining the required screw length the length determination instrument, as described before, can be used.
- After determination of the required screw lengths, the locking cortical screws are screwed in using the screwdriver.

Note:

- The drill holes for the locking cortical screws should be created only when the cortical screws are tightened. Otherwise, the plate position relative to the bone may slightly change, causing the drilling axes not to match exactly anymore.

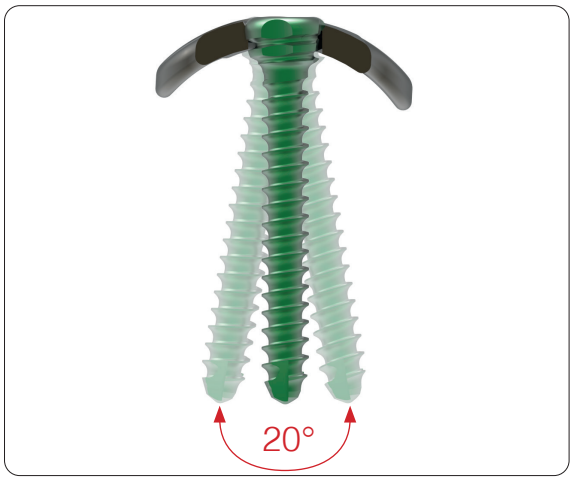


6. Insertion of ML Screws

Instruments

REF 10.20010.020(S)	*Drill bit Ø 2.0 mm*
REF 10.20050.025	*ML Drill Guide 2.0*
REF 03.20100.040	*Length Determination Instrument, for Screws up to 40 mm*
REF 03.20040.030	*Screwdriver, hex 2.5 mm*

- For ML screws Ø 2.7 mm, the ML drill guide is used. The funnel-shaped drill guide is screwed into the corresponding screw hole and allows stepless multiaxial drilling in a cone of 20°.
- After drilling the screw length is determined using the length determination instrument.
- After determination of the required screw lengths, the ML screws are screwed in using the screwdriver.

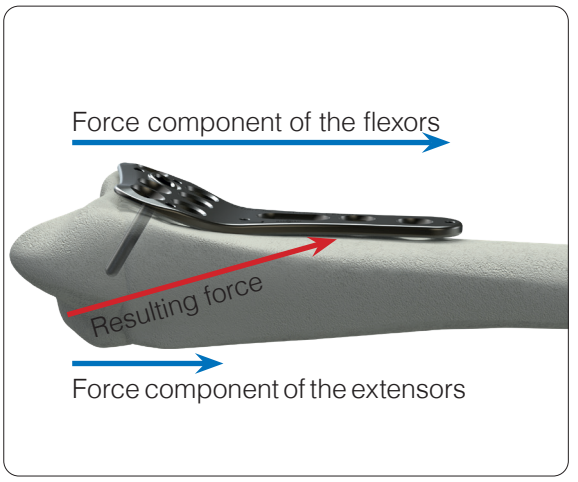


Note:

- The range of 20° must not be exceeded, since otherwise correct locking between screw and plate cannot be guaranteed.

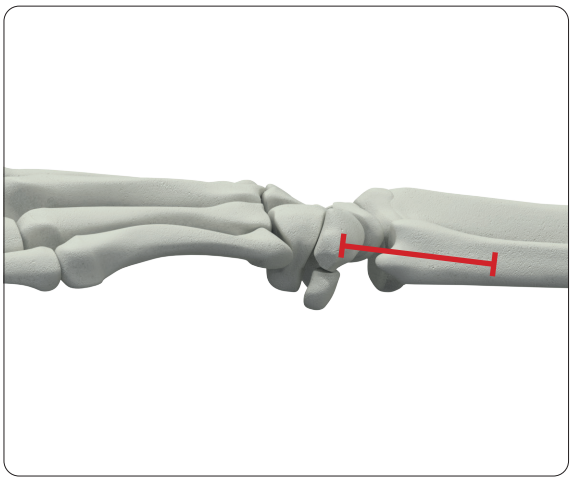
7. Use of locking buttress pins

- The locking buttress pins allow quick and persistent fixation of the reduction. Due to the tensile forces on the forearm, the flexors clearly dominate, always creating a resultant force that pulls the fragments against the plate and onto the pins.
- It is advisable first to fill one of the two central holes of the distal row.
- Subsequently, the other holes should be filled with pins or screws.



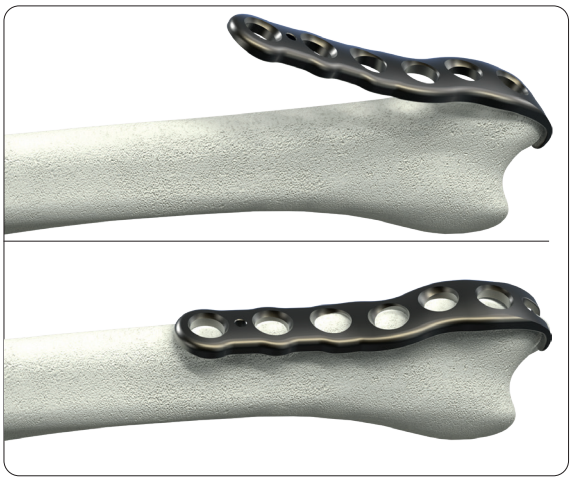
8. Proximal screwing

- Here the procedure for inserting the proximal locking cortical screws corresponds to item 5.
- When all screw holes are filled, a final radiographic control is performed.



9. Access ulna plate & ulna hook plate

- Create a longitudinal incision over the palpable ulna.
- Take care not to hurt the dorsal branch of the ulnar nerve.
- After the distal ulna has been exposed, dissect subperiostally, expose the fragments and reduce them.
- Carefully hold back the dorsal branch of the ulnar nerve.
- In order to facilitate the insertion and positioning of the ulna hook plate, notching of the capsular tissue at the level of the ulnea styloid processus with two parallel incisions is helpful.



10. Positioning of the ulna plates

Distal Ulna Hook Plate:

- Expose and reduce the fracture.
- The reduced fracture and the plate can be temporarily fixed by means of Kirschner wires.
- Place the hooks of the ulna hook plate around the tip of the ulnar styloid process as a reference for positioning.
- Then position the plate on the subcutaneous edge of the distal ulna and fixate in both the head and shaft.
- The distal ulna hook plate is fixated as described above with cortical screws, locking cortical screws or ML screws.
- Final radiographic control.

Distal Ulna Plate:

- Expose and reduce the fracture.
- The reduced fracture and the plate can be temporarily fixed by means of Kirschner wires.
- First, fill the long hole with a cortical screw Ø 2.7 mm as described in item 4.
- Then fixate the plate in the head and shaft areas as described above.
- Final radiographic control.

Product Information

Implants

WINSTA-R Distal Radius Plate

- 3-hole, left and right
- Material: Titanium
- Anodisation: Type II

Article Number *	Shaft	Orientation
10.11915.102	2-hole	right
10.11915.104	4-hole	right
10.11915.202	2-hole	left
10.11915.204	4-hole	left

WINSTA-R Distal Radius Plate

- 4-hole, left and right
- Material: Titanium
- Anodisation: Type II

Article Number *	Shaft	Orientation
10.11915.302	2-hole	right
10.11915.304	4-hole	right
10.11915.308	8-hole	right
10.11915.402	2-hole	left
10.11915.404	4-hole	left
10.11915.408	8-hole	left

WINSTA-R Distal Radius Plate

- 4-hole, left and right
- Material: Titanium
- Anodisation: Type II

Article Number *	Shaft	Orientation
10.11915.316	16-hole	right
10.11915.416	16-hole	left

WINSTA-R Distal Radius Plate

- 5-hole, left and right
- Material: Titanium
- Anodisation: Type II

Article Number *	Shaft	Orientation
10.11915.602	2-hole	right
10.11915.604	4-hole	right
10.11915.608	8-hole	right
10.11915.502	2-hole	left
10.11915.504	4-hole	left
10.11915.508	8-hole	left

WINSTA-R Distal Radius Plate

- 6-hole, left and right
- Material: Titanium
- Anodisation: Type II

Article Number *	Shaft	Orientation
10.11915.802	2-hole	right
10.11915.804	4-hole	right
10.11915.808	8-hole	right
10.11915.702	2-hole	left
10.11915.704	4-hole	left
10.11915.708	8-hole	left

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

Article Number *	Shaft	Orientation
10.11917.002	2-hole	right
10.11917.004	4-hole	right
10.11917.102	2-hole	left
10.11917.104	4-hole	left

WINSTA-R Distal Radius Plate

- 7-hole, left and right
- Material: Titanium
- Anodisation: Type II

Article Number *	Shaft	Orientation
10.11917.202	2-hole	right
10.11917.204	4-hole	right
10.11917.302	2-hole	left
10.11917.304	4-hole	left

WINSTA-R Distal Radius Plate, narrow

- 7-hole, left and right
- Material: Titanium
- Anodisation: Type II

Article Number *	Shaft	Orientation
10.11916.302	2-hole	right
10.11916.304	4-hole	right
10.11916.402	2-hole	left
10.11916.404	4-hole	left

WINSTA-R Dorsal Radius Plate

- 5-hole, left and right
- Material: Ti6Al4V
- Anodisation: Type II

Article Number *	Shaft	Orientation
10.11918.006	6-hole	right
10.11918.008	8-hole	right
10.11918.106	6-hole	left
10.11918.108	8-hole	left

WINSTA-R Distal Ulna Hook Plate

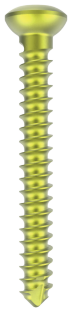
- 6 and 8 hole, left and right
- Material: Ti6Al4V
- Anodisation: Type II

Article Number *	Shaft	Orientation
10.11918.007	7-hole	right
10.11918.107	7-hole	left

WINSTA-R Distal Ulna Plate

- 7-hole, left and right
- Material: Ti6Al4V
- Anodisation: Type II

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



Cortical Screw Ø 2.7 mm, self-tapping

- Thread diameter: 2.7 mm
- Core diameter: 1.9 mm
- Head diameter: 5.0 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V

Article Number *	Length
03.03527.010	10 mm
03.03527.012	12 mm
03.03527.014	14 mm
03.03527.016	16 mm
03.03527.018	18 mm
03.03527.020	20 mm
03.03527.022	22 mm
03.03527.024	24 mm
03.03527.026	26 mm
03.03527.028	28 mm
03.03527.030	30 mm
03.03527.032	32 mm
03.03527.034	34 mm
03.03527.036	36 mm

ML Screw Ø 2.7 mm, self-tapping

- Thread diameter: 2.7 mm
- Core diameter: 1.9 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V

Article Number *	Length
03.03540.008	8 mm
03.03540.010	10 mm
03.03540.012	12 mm
03.03540.014	14 mm
03.03540.016	16 mm
03.03540.018	18 mm
03.03540.020	20 mm
03.03540.022	22 mm
03.03540.024	24 mm
03.03540.026	26 mm
03.03540.028	28 mm
03.03540.030	30 mm
03.03540.032	32 mm
03.03540.034	34 mm
03.03540.036	36 mm

ML Buttress Pins Ø 2.0 mm

- Core diameter: 2.0 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V

Article Number	Length
10.03560.016	16 mm
10.03560.018	18 mm
10.03560.020	20 mm
10.03560.022	22 mm
10.03560.024	24 mm
10.03560.026	26 mm
10.03560.028	28 mm
10.03560.030	30 mm

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

Article Number *	Length
10.03530.008	8 mm
10.03530.010	10 mm
10.03530.012	12 mm
10.03530.014	14 mm
10.03530.016	16 mm
10.03530.018	18 mm
10.03530.020	20 mm
10.03530.022	22 mm
10.03530.024	24 mm
10.03530.026	26 mm
10.03530.028	28 mm
10.03530.030	30 mm
10.03530.032	32 mm
10.03530.034	34 mm
10.03530.036	36 mm

Locking Cortical Screw Ø 3.0 mm, self-tapping

- Thread diameter: 3.0 mm
- Core diameter: 1.9 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V
- Anodisation: Type II

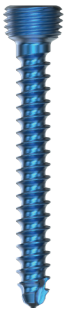
Article Number *	Length
10.03520.016	16 mm
10.03520.018	18 mm
10.03520.020	20 mm
10.03520.022	22 mm
10.03520.024	24 mm
10.03520.026	26 mm
10.03520.028	28 mm
10.03520.030	30 mm

Locking Buttress Pins Ø 2.0 mm

- Core diameter: 2.0 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V
- Anodisation: Type II

Article Number *	Length
03.05527.010	10 mm
03.05527.012	12 mm
03.05527.014	14 mm
03.05527.016	16 mm
03.05527.018	18 mm
03.05527.020	20 mm
03.05527.022	22 mm
03.05527.024	24 mm
03.05527.026	26 mm
03.05527.028	28 mm
03.05527.030	30 mm
03.05527.032	32 mm
03.05527.034	34 mm
03.05527.036	36 mm

Locking Cortical Screw Ø 2.7 mm, self-tapping



- Thread diameter: 2.7 mm
- Core diameter: 1.9 mm
- Head diameter: 4.75 mm
- Hexagon socket: 2.5 mm
- Material: Ti6Al4V

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

Instruments

11.90012.150 Kirschner Wire Ø 1.2mm, trocar tip, L 150mm

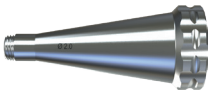
10.20010.020(S) Drill Bit Ø 2.0mm, AO-Coupling, L 112/84mm

03.20100.040 Length Determination Instrument, for Screws up to 40mm

12.20060.017 Double Drill Guide 2.0/1.7

10.20060.047 Drill Guide 2.0, scaled

10.20050.025 ML Drill Guide 2.0



03.20040.030 Screwdriver, hex 2.5mm, ball handle, L 200/85mm

02.20120.015 Screw Forceps, self-holding

Templates

Article Number	Shaft	Orientation
10.21915.102	2 holes	right
10.21915.104	4 holes	right
10.21915.202	2 holes	left
10.21915.204	4 holes	left

WINSTA-R Distal Radius Plate, 3/x holes

Article Number	Shaft	Orientation
10.21915.302	2 holes	right
10.21915.304	4 holes	right
10.21915.402	2 holes	left
10.21915.404	4 holes	left

WINSTA-R Distal Radius Plate, 4/x holes

Article Number	Shaft	Orientation
10.21915.602	2 holes	right
10.21915.604	4 holes	right
10.21915.502	2 holes	left
10.21915.504	4 holes	left

WINSTA-R Distal Radius Plate, 5/x holes

Article Number	Shaft	Orientation
10.21915.802	2 holes	right
10.21915.804	4 holes	right
10.21915.702	2 holes	left
10.21915.704	4 holes	left

WINSTA-R Distal Radius Plate, 6/x holes

WINSTA-R Distal Radius Plate, 7/x holes

Article Number	Shaft	Orientation
10.21917.002	2 holes	right
10.21917.004	4 holes	right
10.21917.102	2 holes	left
10.21917.104	4 holes	left

WINSTA-R Distal Radius Plate, 7/x holes, narrow

Article Number	Shaft	Orientation
10.21917.202	2 holes	right
10.21917.204	4 holes	right
10.21917.302	2 holes	left
10.21917.304	4 holes	left

WINSTA-R Distal Ulna Hook Plate

Article Number	Shaft	Orientation
10.21918.006	6 holes	right
10.21918.106	6 holes	left

WINSTA-R Distal Ulna Plate

Article Number	Shaft	Orientation
10.21918.007	7 holes	right
10.21918.107	7 holes	left

MRI Safety Information

Non-clinical testing has demonstrated that the plates 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 **8min and 15s** of continuous RF (a sequence or back-to-back series/scan without breaks) followed by a wait time of **8min and 15s** if this limit is reached.

    3.0 T: 2 W/kg whole-body average SAR for **6min and 19s** of continuous RF (a sequence or back-to-back series/scan without breaks) followed by a wait time of **6min and 19s** if this limit is reached.
- The plates are expected to produce a maximum temperature rise of 8.5 °C at 1.5 T and 6.9 °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.

Release date: 12.03.2024 • 10.99100.002 • Rev.: 010/00

MARQUARDT
Medizintechnik

Dieter Marquardt Medizintechnik GmbH

Robert-Bosch-Straße 1 • 78549 Spaichingen, Germany
Telefon +49 7424 9581-0 • Telefax +49 7424 501441
info@marquardt-medizintechnik.de • www.marquardt-medizintechnik.de

CE 0297