Cannulated Screws 2.7-7.5

Surgical Technique

Cannulated Screws 2.7–7.5

Surgical Technique

Contents •

Disclaimer

This surgical technique is solely for the use of medical professionals, particularly physicians, and therefore cannot be regarded as a source of information for non-medical persons. The description of this surgical technique does not constitute medical advice or medical recommendations nor does it convey any diagnostic or therapeutic information on individual cases. Therefore, the attending physician is fully responsible for instructing and obtaining the informed consent of the patient which this surgical technique cannot supersede.
The description of this surgical technique has been complied by medical experts and trained staff of aap Implantate AG with utmost diligence and to the best of their knowledge.
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• Introduction

By choosing titanium cannulated screws from **aap** you have decided for the state-of-the-art, progressive approach to screw osteosynthesis.

The development of cannulated screw systems took into particular account the need for secure primary fixation of the bone fragments. The use of guide wires considerably simplifies the preliminary fixation of bone fragments and the accurate insertion of the screw. The outstanding features of the **aap** cannulated screw system offer various advantages to the surgeon, resulting in a time-saving and safe operation.

Tray for Screws and Instruments

The screw sets, for small and large cannulated screws, have a compact design. The small cannulated screw set provides the surgeon with a tray containing

- the screw racks
- the instruments and
- the guide-wires

for a choice of 3 screw sizes.

The large screw set has also been designed as a user-friendly system, consisting of one tray for implants and the appropriate instruments (CS 7.5) respectively one tray for implants and instrumentation (CS 5.8 & CS 6.5).

The screws have been anodized in different colors (according to diameter) to ensure accurate differentiation between the various screw diameters and to facilitate the course of the operation. The respective instruments have the same color-coding.

Material

For the manufacture of cannulated screws, materials are used which have been proven to be successful in medical technology for decades. Cannulated screws are made of titanium alloy (TiAl6V4).

All materials employed comply with national and international standards. They are characterized by good biocompatibility, a high degree of reliability against allergic reactions and good mechanical properties.

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Description

- Self-drilling: Because of its sharp cutting tips, the screw drills easily and securely into the bone without pre-drilling. This eliminates the drilling step and prevents over-drilling and loosening of the guide-wires due to excessive drill depth. Pre-drilling with a twist drill is only needed for extremely hard compact bone (e.g. pediatric or sclerotic bones) or for insertion at steep angles
- Self-tapping, forward: Reduces the number of instruments and procedural steps needed by eliminating the thread tap
- Self-tapping, reverse: Facilitates implant removal, even after the implant has been in situ for longer periods of time, thus minimizing the risk of implant failure following screw removal
- Color-coded screws: For easier identification of screw diameter and the respective instruments (only for small cannulated screws)
- Flat-headed screw: The head of the screw protrudes only slightly from the bone. If necessary, the head of the screw can be set lower with the countersink
- Guide wires have directional stability due to increased diameters
- Primary fixation by guide wire can be easily repeated if reduction is unsatisfactory
- ø2.7 + ø3.5 mm cannulated screws with cortical thread
- ø4.0 + ø4.5 mm cannulated screws with cancellous thread
- ø5.8 + ø6.5 + ø7.5 mm cannulated screws with cancellous thread

Processing (Sterilization & Cleaning)

Instruments and implants are supplied non-sterile.

Before every use, instruments as well as implants must be processed.
Reference is here made to the Instructions for Use.

Implant components which may have come into contact with infectious fluids (e.g. blood) must not be resterilized and reused in another surgery. They must be returned to the manufacturer. Resterilization is prohibited under any circumstances (see Instructions for Use).

Cleaning of Instruments

To ensure faultless instrument performance, the cannulated instruments must be cleaned thoroughly prior to every resterilization.
During the surgery and, generally, after each surgery, the cannulation should be cleaned with the cleaning device. This prevents build-up of residues and the resulting blockage of the instrument via the guide wire.
Avoid using any harsh or abrasive cleaning substances on any components contained in the system.

Typical Applications

For fractures and joint reconstructions cannulated screws can be used as minimal invasive osteosynthesis. Thereby isolated fractures may be treated with cannulated screws. For complex fractures cannulated screws can be used as additive osteosynthesis together with other implants such as nails, plates, fixateur externe. Typical applications are given in the following table:

	Cannulated Screws ø [mm]						
	2.7	3.5	4.0	4.5	5.8	6.5	7.5
Glenoid and humeral head	●	●	●	●			
Elbow joint	●	●	●	●			
Distal radius	●	●	●				
Carpal (scaphoid)	●						
Sacroiliac joint, sucrum					●	●	●
Pelvis, acetabulum				●	●		
Femoral neck						●	●
Supracondylar fractures of the femur				●	●	●	●
Tibial head				●	●	●	●
Pilon tibiale		●	●	●			
Upper ankle joint		●	●	●			
Tarsal bone	●	●					
Ligament avulsion injuries (apophysis)		●	●	●			
Calcaneus and talus		●	●	●			
Arthrodeses of the upper & lower ankle joint					●	●	

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Indications

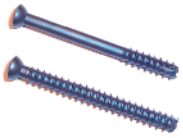
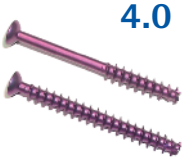
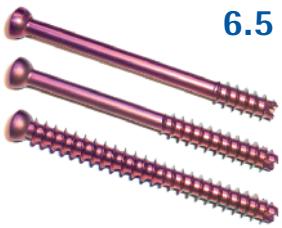
- Minimally invasive reconstruction of fractures and joints
- Adjuvant for osteosynthesis in complex joint fractures
- Multifragment joint fractures
- Fractures of the femoral head and neck
- Supracondylar femoral fractures
- Tibial plateau fractures
- Simple metaphyseal fractures
- Simple epiphyseal fractures such as:
  - Fractures of the humeral head
  - Fractures of the tibial plateau
  - Pilon fractures
  - Fractures of the radius
- Fractures of the wrist, ankle, elbow, and shoulder
- Scaphoid fracture and other fractures of the hand
- Metatarsal fractures and other fractures of the foot
- Ligament fixation at the proximal humerus
- Acetabular fractures
- Fractures of the posterior pelvic ring
- Condylar fractures
- Epiphyseal and metaphyseal fractures in children
- Ligament avulsion injuries
- Fractures of small joints, such as:
  - Ankle fractures
  - Navicular fractures
- Calcaneal and talar fractures
- Arthrodesis of the ankle
- Avulsion fractures and fractures of metatarsal V
- Tarsal fractures

Contraindications

Inflammation, sepsis and osteomyelitis are absolute contraindications.
Any other applications not covered by the indications and the medical literature are also contraindicated.
In addition, the success of the operation may also be marred by:

- Unacceptably high risk for anesthesia
- Inadequate soft tissue coverage
- Acute or chronic systemic or localized infection/inflammation
- Vascular, muscular or neurologic disorders impairing the affected limb
- Any concomitant disorders possibly affecting implant function
- Osteopathy with loss of bone substance, such as severe osteoporosis
- Obesity: an obese patient may overload the implant to the point where the fixation or implant may fail.
- Whenever the implant is impairing the anatomical structures or normal physiology

• Overview Cannulated Screws

			Length [mm]	Drill-ø [mm]	K-wire-ø [mm]
Cortical	2.7		Short thread Long thread	10-30 14-32	Thread hole 2.0 Gliding hole 2.7	1.2
	3.5		Partial thread Full thread	10-50 10-50	Thread hole 2.7 Gliding hole 3.5	1.2 1.2
Cancellous	4.0		Partial thread Full thread	10-50 10-50	Thread hole 2.5 Gliding hole 4.0	1.2
	4.5		6 mm thread Partial thread Full thread	20-72 20-72 20-72	Thread hole 3.0 Gliding hole 4.5	1.6
	5.8		16 mm thread	30-100	Thread hole 4.3	2.0
	6.5		16 mm thread 32mm thread Full thread	35-120 45-120 35-120	Thread hole 4.4	2.5
	7.5		8 mm thread 16 mm thread 32 mm thread Full thread	30-130 30-130 45-130 30-130	Thread hole 5.0	3.0

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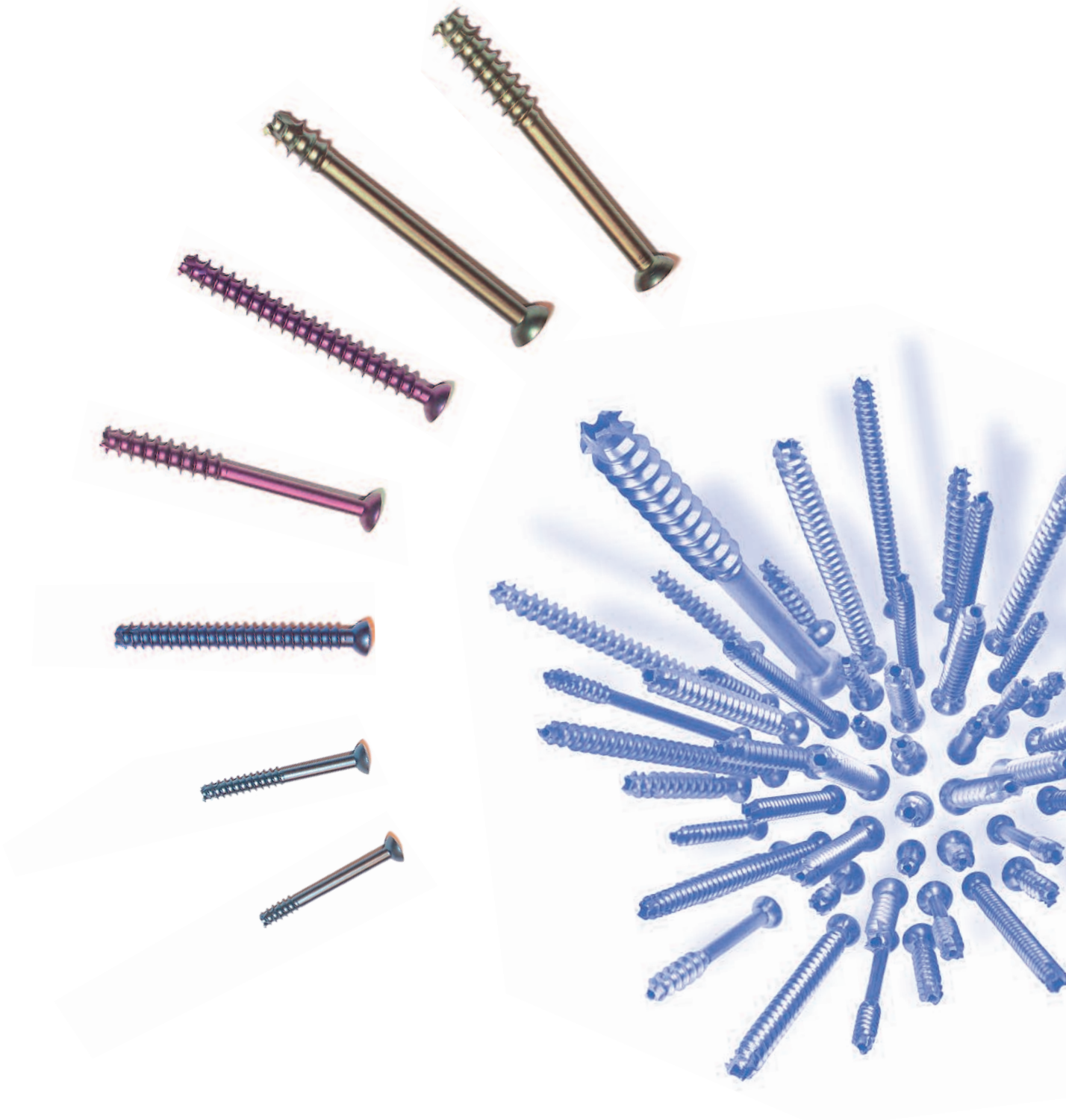
Cannulated Screws
ø 2.7 – ø 4.5 mm



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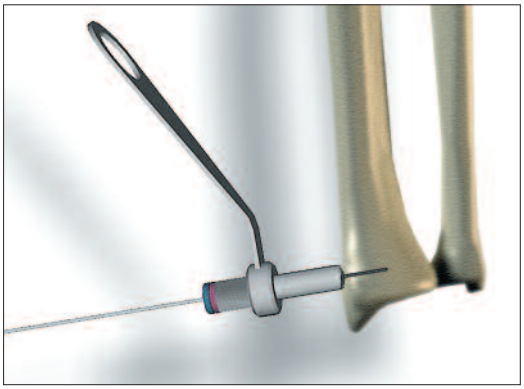
Preoperative Planning

The following criteria must be taken into consideration during preoperative planning to ensure successful use of the cannulated screws:

- Fracture site
- Choice of implant
- Implant position
- Knowledge of the surgical technique

Surgical Technique

- Stab incision for insertion of the tissue protection sleeve



- Insert tissue protection sleeve, fitted with obturator, down to the bone
- Fracture reposition and preliminary fixation with K-wire under image intensifier monitoring
- Image intensifier inspection in two planes
- Replacement of K-wire if fracture reposition is not satisfactory

◆ NOTE:

The position of the K-wire defines the final position of the cannulated screw in the bone.

◆ CAUTION:

High compressive forces may lead to a deflection of the wire. Therefore the risk of breakage is higher.

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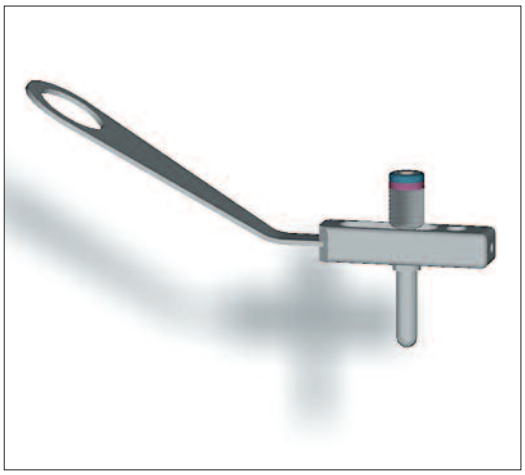
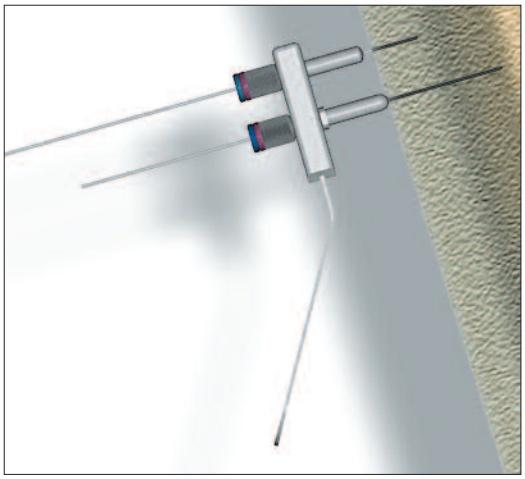
Following successful reposition:

- Remove the obturator
- Unscrew the retaining nut of the parallel drill guide insert
- Place parallel drill guide into the longitudinal groove and secure with the retaining nut
- Advance parallel drill guide with application along the guide wire



◆ NOTE:
If the fracture has a straight course, use of a parallel drill guide is recommended when placing a second K-wire.

- Fix desired position by moving the parallel drill guide insert
- Secure parallel drill guide insert by tightening the retaining nut
- Insert obturator into the round hole



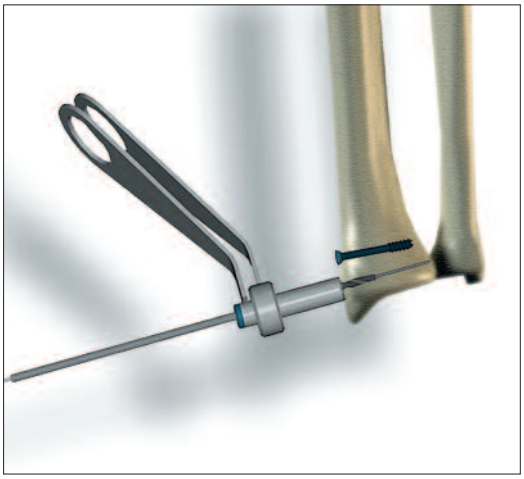
• CS 2.7-4.5

Further procedure for cannulated screw implantation as described below:

◆ **Note:**

The rule for all cannulated screws is that pre-drilling is obligatory for pediatric or sclerotic bones. The procedure is as follows:

- Remove obturator
- Insert appropriate drill sleeve into tissue protection sleeve (for ø3.5 mm cannulated screws, use drill sleeve for threaded hole)
- Pre-drill bone via the K-wire

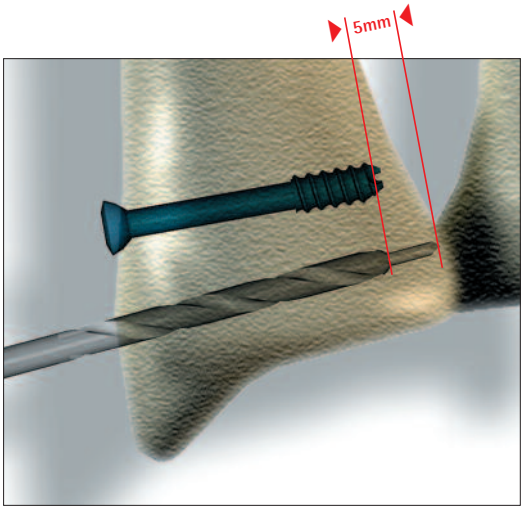


◆ **Caution:**

Pre-drill with low speed and steady compression to avoid damaging the K-wire or the drill.

◆ **Caution:**

Drill depth equals screw length minus 5 mm - do not over drill the guide wire!



- Remove drill and drill sleeve

◆ **Note:**

For lag screw technique with a ø3.5 fully threaded cannulated screw, use ø3.5 mm drill provided in the set.

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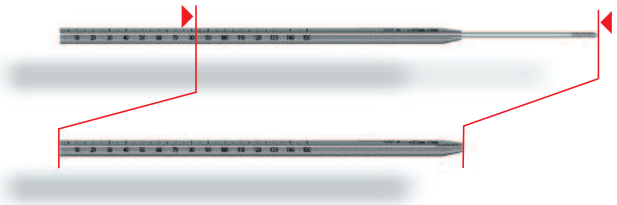
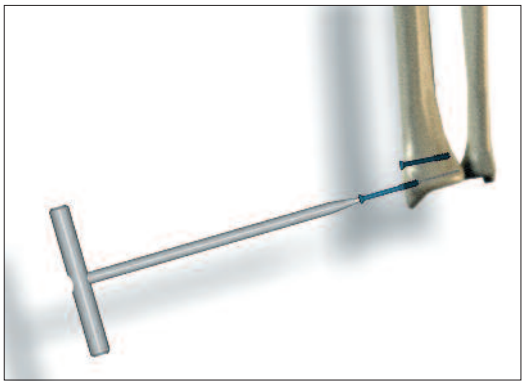
- Determine screw length by using the appropriate direct measuring device along the pre-measured K-wire (differential measurement)



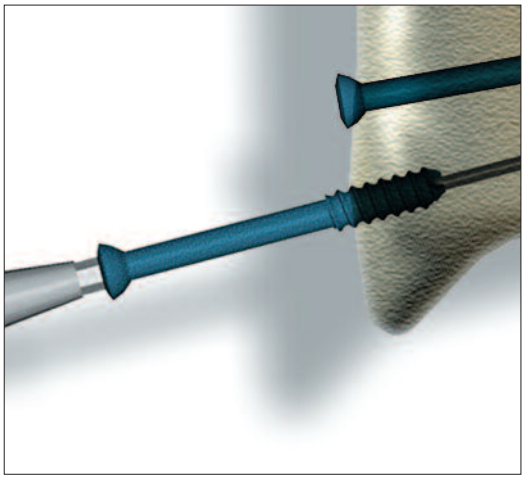
- Using the screwdriver, place the selected screw over the K-wire onto the bone

- Drive the screw clockwise into the bone using **gentle pressure**



◆ **Caution:**
Avoid excessive force when turning the screw. Take note of the bone structure. Avoid rotational dislocation of the secured fragments.

◆ **Note:**
The use of washers stops the screw penetrating the bone too far and reduces tension peaks between the head of the screw and the bone.



◆ **Note:**
The countersink may be used where soft tissue coverage is minimal.

◆ **Caution:**
For replacement of a screw during surgery select a longer screw or larger diameter to prevent a loss of stability in the bone.

- Remove and discard the K-wire

◆ **Caution:**
Single-use products like K-wires or drills marked accordingly have to be discarded after use.

- Wound closure

Explantation

- Stab incision in the region of the old scar

◆ NOTE:
For screw removal a solid screwdriver is to be used.

- Remove screw by unscrewing slowly and carefully

- Wound closure

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Cannulated Screws
ø 5.8 – ø 7.5 mm

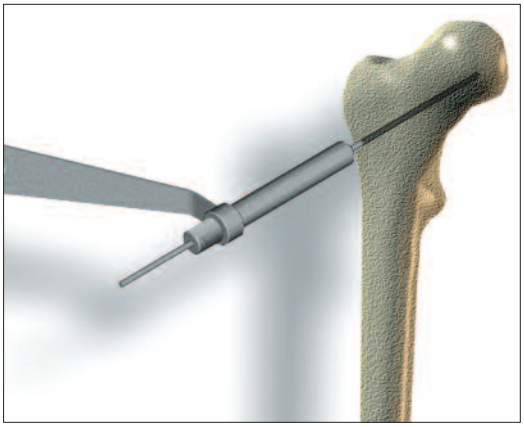
Preoperative Planning

The following criteria must be taken into consideration during preoperative planning to ensure successful use of the cannulated screws:

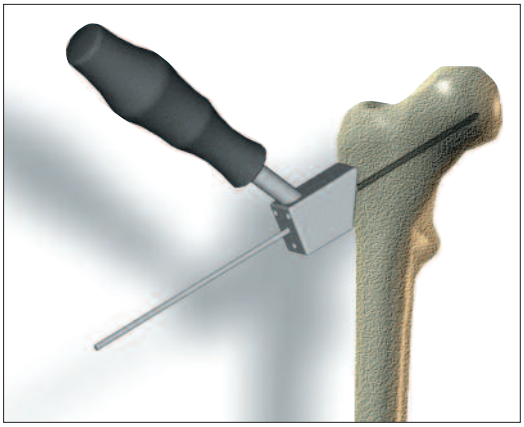
- Fracture site
- Choice of implant
- Implant position
- Knowledge of the surgical technique

Surgical Technique

- Stab incision for insertion of the tissue protection sleeve
- Insert tissue protection sleeve, fitted with obturator, down to the bone
- Fracture reposition and preliminary fixation with K-wire under image intensifier monitoring
- Image intensifier inspection in two planes
- Replacement of wires if fracture position is not satisfactory



◆ NOTE:
The position of the K-wire defines the final position of the cannulated screw in the bone



◆ CAUTION:
High compressive forces may lead to a deflection of the wire. Therefore the risk of breakage is higher.

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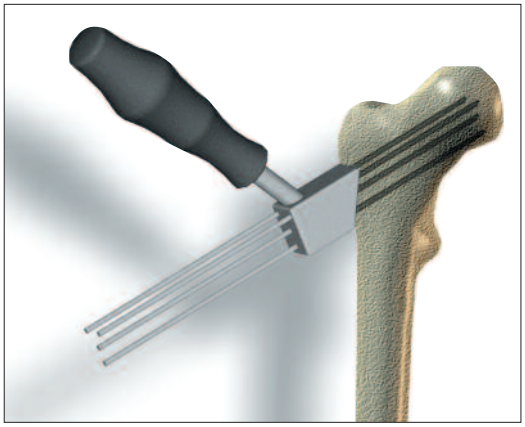
Following successful reposition:

- Remove the obturator

◆ NOTE:
If possible, use the drill guide when placing any additional K-wires.

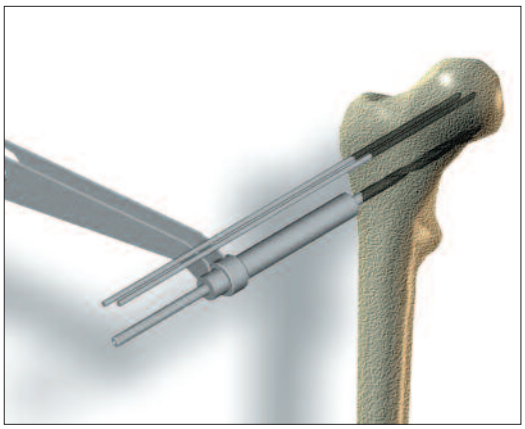


- Advance parallel drill guide along K-wire

- Place additional K-wires through the drill guide cannulations and remove the instrument

◆ NOTE:
For biomechanical reasons, when fixing the femoral neck with three screws, always use two screws on top and one screw below. Washers can be used with the upper screws to prevent sinkage of the screw head if the cortical bone is thin or damaged.

◆ NOTE:
The rule for all cannulated screws is that pre-drilling is obligatory for pediatric or sclerotic bones. The procedure is as follows:

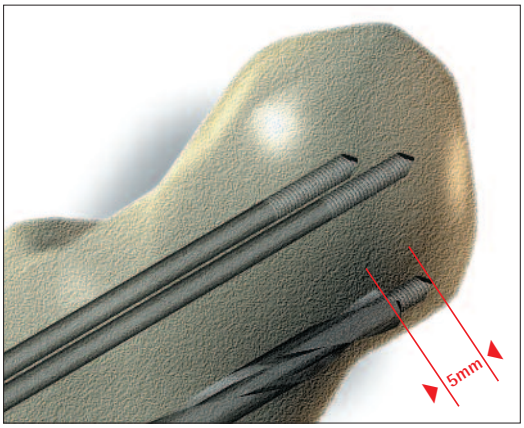


- Insert appropriate drill sleeve into tissue protection sleeve

• CS 5.8–7.5

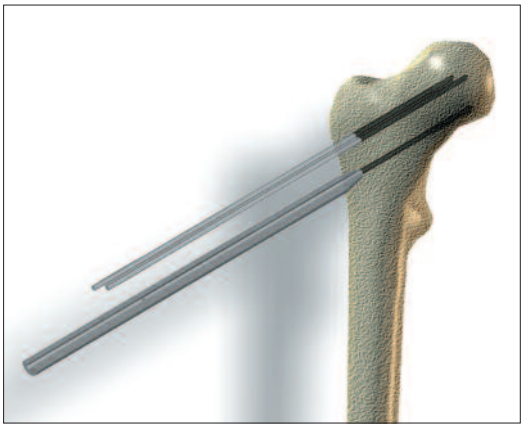
- Pre-drill bone via the K-wire

◆ **Caution:**
Pre-drill with low speed and steady compression to avoid damaging the K-wire or the drill.

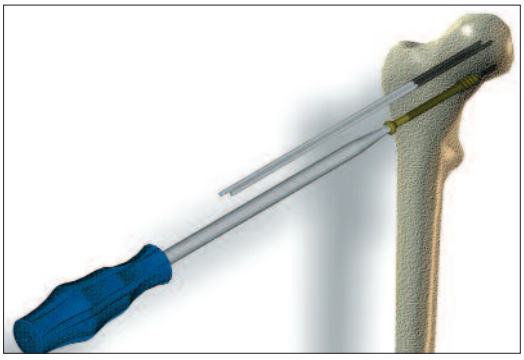


◆ **Caution:**
Drill depth equals screw length minus 5 mm – do not drill deeper than the guide wire!

- Remove drill and drill sleeve

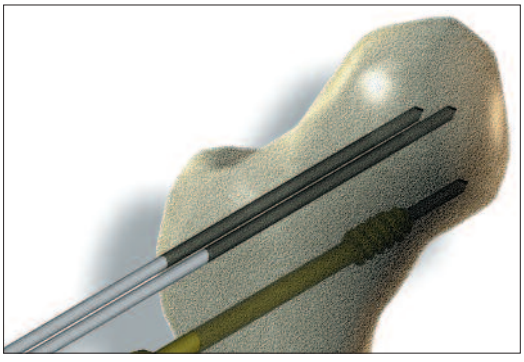


- Determine screw length by using the appropriate measuring device along the pre-measured K-wire (differential measurement)



- Using the screwdriver, place the selected screw over the K-wire onto the bone
- Drive the screw clockwise into the bone using **gentle pressure**
- Follow the same procedure to place additional screws

◆ **Caution:**
Avoid excessive force when turning the screw. Take note of the bone structure. Avoid rotational dislocation of the secured fragments.



◆ **Note:**
The countersink may be used where soft tissue coverage is minimal.

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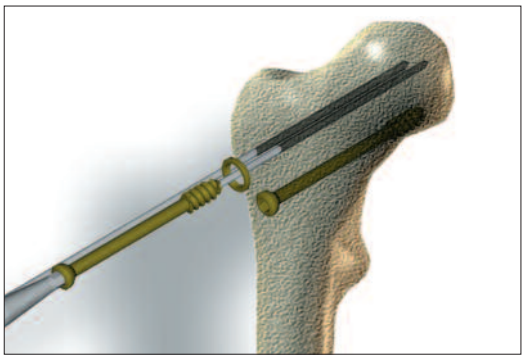
◆ NOTE:
The use of washers stops the screw penetrating the bone too far and reduces tension peaks between the head of the screw and the bone.

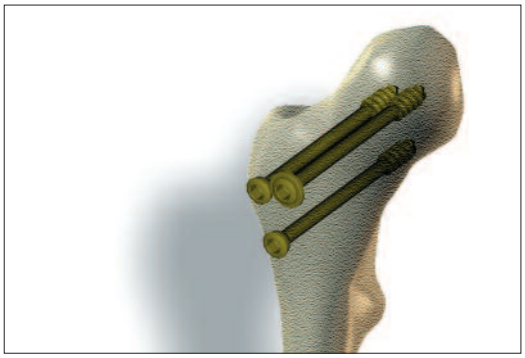
◆ CAUTION:
For replacement of a screw during surgery select a longer screw or larger diameter to prevent a loss of stability in the bone.

- Remove and discard the K-wire

◆ CAUTION:
Single-use products like K-wires or drills marked accordingly have to be discarded after use.

- Wound closure



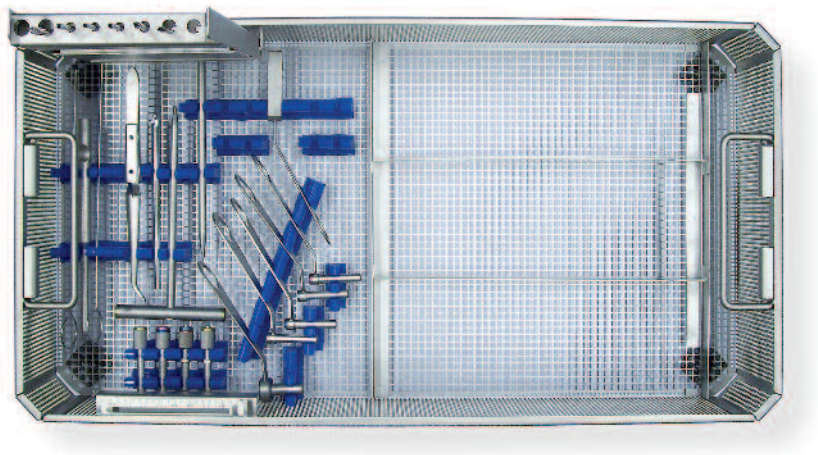


Explantation

- Stab incision in the region of the old scar
- Remove screw by unscrewing slowly and carefully
- Wound closure

• CS 2.7-4.5

Basic Tray CS 2.7/3.5/4.0/4.5



	ART.-NO.
Basic Tray for CS 2.7/3.5/4.0/4.5, empty	IC 2071-00
Lid for tray	IC 2008-00

• Set of Instruments CS 2.7/3.5/4.0/4.5 IC 2072-00

	ARTICLE	QUANTITY	ART.-NO.
INSTRUMENTS	Basic Tray for CS 2.7/3.5/4.0/4.5, empty	1	IC 2071-00
	Tissue protection sleeve, long, CS 2.7/3.5/4.0/4.5	1	IS 1004-00
	Obturator CS 2.7/3.5/4.0	1	IS 1005-12
	Obturator CS 4.5	1	IS 1005-16
	Drill sleeve CS 4.0, I-ø2.6	1	IS 1006-25
	Drill sleeve CS 3.5, I-ø2.8	1	IS 1006-27
	Drill sleeve CS 4.5, I-ø3.1	1	IS 1006-30
	Drill sleeve CS 3.5, I-ø3.6	1	IS 1006-35
	*Screwdriver cannulated, CS 2.7/3.5/4.0 hexagonal, ø2.5, T-handle	1	IS 1202-12
	Screwdriver cannulated, CS 4.5 hexagonal, ø2.5, T-handle	1	IS 1202-16
	Countersink CS 2.7/3.5/4.0/4.5, for Jacobs chuck	1	IS 1302-16
	Parallel drill guide CS 3.5/4.0/4.5, basic device	1	IS 1602-00
	Drill guide insert CS 2.7/3.5/4.0	1	IS 1602-12
	Drill guide insert CS 4.5	1	IS 1602-16
	Cleanig wire ø1.2, CS 2.7/3.5/4.0	1	IS 1702-12
	Cleanig wire ø1.6, CS 4.5	1	IS 1702-16
	Drill CS 4.0, ø2.5, L 130, I-ø1.4, coil 30	1	IU 7325-13
	Drill CS 3.5, ø2.7, L 120, I-ø1.4, coil 30	1	IU 7327-12
	Drill CS 4.5, ø3.0, L 140, I-ø1.8, coil 30	1	IU 7330-14
	Drill CS 3.5, ø3.5, L 120, I-ø1.4, coil 40	1	IU 7335-12
	Direct measuring device, L 150, CS 2.7/3.5/4.0/4.5	1	IU 7915-02
	Screw forceps, self-holding	1	IU 8004-00
	K-wire with trocar point, ø1.2, L 150	6	NK 0012-15
	K-wire with trocar point and thread ø1.6, L 150	6	NK 1016-15

*alternative:
Screwdriver
CS 2.7/3.5/4.0,
hexagonal, ø2.5,
a) with round handle:
IS 1203-12
b) for Jacobs chuck:
IS 1204-12

**alternative:
Screwdriver CS 4.5,
hexagonal, ø2.5,
a) with round handle:
IS 1203-16
b) for Jacobs chuck:
IS 1204-16

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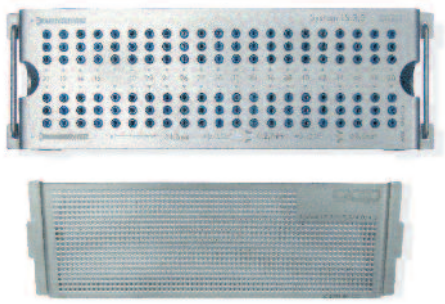
optional:	ART.-NO
Screwdriver solid, hexagonal, ø2.5	IU 7840-00
Drill CS 2.7, ø2.0, L 85, quick coupling	IU 7020-13
Drill CS 4.0, ø2.5, L 130, quick coupling	IU 7025-13
Drill CS 2.7/3.5, ø2.7, L 130, quick coupling	IU 7027-13
Drill CS 4.5, ø3.0, L 130, quick coupling	IU 7030-13
Drill CS 3.5, ø3.5, L 130, quick coupling	IU 7035-13
Drill CS 4.0, ø4.0, L 130, quick coupling	IU 7040-13
Drill CS 4.5, ø4.5, L 130, quick coupling	IU 7045-13

Percutaneous Set CS 2.7/3.5/4.0/4.5 IC 2030-01

ARTICLE	QUANTITY	ART.-NO.	
Tissue protection sleeve, long CS 2.7/3.5/4.0/4.5	1	IS 1004-10	
Direct measuring device, L 200 CS 2.7/3.5/4.0/4.5	1	IU 7920-02	
K-wire with trocar point ø1.2, L 200, without thread	6	NK 0012-20	2.7/3.5/4.0
Obturator, long, CS 2.7/3.5/4.0	1	IS 1005-13	
Drill guide insert long, CS 2.7/3.5/4.0	1	IS 1603-12	
K-wire with trocar point ø1.6, L 200, with thread	6	NK 1016-20	4.5
Obturator, long, CS 4.5	1	IS 1005-17	
Drill guide insert, long, CS 4.5		IS 1603-16	



The basic tray IC 2072-00 has space for 3 of the 4 available screw racks:

	ART.-NO.
Screw rack CS 2.7, with screws	IC 2041-27
Screw rack CS 3.5, with screws	IC 2011-35
Screw rack CS 4.0, with screws	IC 2021-40
Screw rack CS 4.5, with screws	IC 2031-45

• CS 2.7, short thread

- self-tapping, forward and reverse
- self-drilling

Titanium-Alloy

Thread	Cortical
Thread-ø	2.7 mm
Core-ø	2.0 mm
Stem-ø	2.0 mm
Hole-ø	1.35 mm
Width A/F	2.5 mm
Head-ø	5.0 mm

			TITANIUM
LENGTH	THREAD	QUANTITY*	ART NO.
10 mm	4 mm	3	SC 2704-10-2
12 mm	4 mm	3	SC 2704-12-2
14 mm	4 mm	3	SC 2704-14-2
16 mm	4 mm	3	SC 2704-16-2
18 mm	5 mm	3	SC 2705-18-2
20 mm	5 mm	3	SC 2705-20-2
22 mm	5 mm	3	SC 2705-22-2
24 mm	6 mm	3	SC 2706-24-2
26 mm	6 mm	3	SC 2706-26-2
28 mm	6 mm	3	SC 2706-28-2
30 mm	6 mm	3	SC 2706-30-2

*in IC 2041-27

• CS 2.7, long thread

- self-tapping, forward and reverse
- self-drilling

Titanium-Alloy

Thread	Cortical
Thread-ø	2.7 mm
Core-ø	2.0 mm
Stem-ø	2.0 mm
Hole-ø	1.35 mm
Width A/F	2.5 mm
Head-ø	5.0 mm

			TITANIUM
LENGTH	THREAD	QUANTITY*	ART.-NO.
14 mm	6 mm	3	SC 2706-14-2
16 mm	7 mm	3	SC 2707-16-2
18 mm	8 mm	3	SC 2708-18-2
20 mm	9 mm	3	SC 2709-20-2
22 mm	10 mm	3	SC 2710-22-2
24 mm	10 mm	3	SC 2710-24-2
26 mm	10 mm	3	SC 2712-26-2
28 mm	12 mm	3	SC 2712-28-2
30 mm	14 mm	3	SC 2714-30-2
32 mm	14 mm	3	SC 2714-32-2

*in IC 2041-27

- Drill bit for thread hole ø2.0 mm
  - quick coupling IU 7020-13
- Note:
  - Sterile and single use
- Drill bit for gliding hole ø2.7 mm
  - Jacobs chuck IU 7327-12
  - quick coupling IU 7027-13
- Countersink
  - Jacobs chuck IS 1302-16
  - quick coupling IS 1305-16
- Screwdriver hexagonal, ø2.5,
  - T-handle IS 1202-12
  - round handle IS 1203-12
  - quick coupling IS 1205-12
- K-wire ø1.2 mm without thread
  - Length 150 mm (10 pieces) NK 0012-15

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CS 3.5, short thread •

- self-tapping, forward and reverse
- self-drilling

LENGTH	THREAD	QUANTITY*	TITANIUM ART NO.
10 mm	4 mm	3	SC 3504-10-2
12 mm	4 mm	3	SC 3504-12-2
14 mm	5 mm	3	SC 3505-14-2
16 mm	5 mm	3	SC 3505-16-2
18 mm	6 mm	3	SC 3506-18-2
20 mm	7 mm	3	SC 3507-20-2
22 mm	7 mm	3	SC 3507-22-2
24 mm	8 mm	3	SC 3508-24-2
26 mm	8 mm	3	SC 3508-26-2
28 mm	9 mm	3	SC 3509-28-2
30 mm	10 mm	3	SC 3510-30-2
32 mm	10 mm	3	SC 3510-32-2
34 mm	10 mm	3	SC 3510-34-2
36 mm	10 mm	3	SC 3510-36-2
38 mm	10 mm	3	SC 3510-38-2
40 mm	10 mm	3	SC 3510-40-2
42 mm	10 mm	3	SC 3510-42-2
44 mm	10 mm	3	SC 3510-44-2
46 mm	10 mm	3	SC 3510-46-2
48 mm	10 mm	3	SC 3510-48-2
50 mm	10 mm	3	SC 3510-50-2

*in IC 2011-35

Titanium-Alloy

Thread	Cortical
Thread-ø	3.5 mm
Core-ø	2.5 mm
Stem-ø	2.5 mm
Hole-ø	1.35 mm
Width A/F	2.5 mm
Head-ø	5.0 mm

- Drill bit for thread hole ø2.7 mm
  - Jacobs chuck IU 7327-12
  - quick coupling IU 7027-13
- Drill bit for gliding hole ø3.5 mm
  - Jacobs chuck IU 7335-12
  - quick coupling IU 7035-13
- Countersink
  - Jacobs chuck IS 1302-16
  - quick coupling IS 1305-16
- Screwdriver hexagonal, ø2.5,
  - T-handle IS 1202-12
  - round handle IS 1203-12
  - quick coupling IS 1205-12
- K-wire ø1.2 mm without thread
  - Length 150 mm (10 pieces) NK 0012-15

CS 3.5, full thread •

- self-tapping, forward and reverse
- self-drilling

LENGTH	QUANTITY*	TITANIUM ART NO.
10 mm	3	SC 3500-10-2
12 mm	3	SC 3500-12-2
14 mm	3	SC 3500-14-2
16 mm	3	SC 3500-16-2
18 mm	3	SC 3500-18-2
20 mm	3	SC 3500-20-2
22 mm	3	SC 3500-22-2
24 mm	3	SC 3500-24-2
26 mm	3	SC 3500-26-2
28 mm	3	SC 3500-28-2
30 mm	3	SC 3500-30-2
32 mm	3	SC 3500-32-2
34 mm	3	SC 3500-34-2
36 mm	3	SC 3500-36-2
38 mm	3	SC 3500-38-2
40 mm	3	SC 3500-40-2
42 mm	3	SC 3500-42-2
44 mm	3	SC 3500-44-2
46 mm	3	SC 3500-46-2
48 mm	3	SC 3500-48-2
50 mm	3	SC 3500-50-2

*in IC 2011-35

Titanium-Alloy

Thread	Cortical
Thread-ø	3.5 mm
Core-ø	2.5 mm
Hole-ø	1.35 mm
Width A/F	2.5 mm
Head-ø	5.0 mm

• CS 4.0, short thread

- self-tapping, forward and reverse
- self-drilling

Titanium-Alloy

Thread	Cancellous
Thread-ø	4.0 mm
Core-ø	2.3 mm
Stem-ø	2.3 mm
Hole-ø	1.35 mm
Width A/F	2.5 mm
Head-ø	6.0 mm

			TITANIUM
LENGTH	THREAD	QUANTITY*	ART NO.
10 mm	5 mm	3	SC 4005-10-2
12 mm	5 mm	3	SC 4005-12-2
14 mm	5 mm	3	SC 4005-14-2
16 mm	6 mm	3	SC 4006-16-2
18 mm	7 mm	3	SC 4007-18-2
20 mm	8 mm	3	SC 4008-20-2
22 mm	9 mm	3	SC 4009-22-2
24 mm	10 mm	3	SC 4010-24-2
26 mm	12 mm	3	SC 4012-26-2
28 mm	14 mm	3	SC 4014-28-2
30 mm	14 mm	3	SC 4014-30-2
32 mm	15 mm	3	SC 4015-32-2
34 mm	15 mm	3	SC 4015-34-2
36 mm	15 mm	3	SC 4015-36-2
38 mm	16 mm	3	SC 4016-38-2
40 mm	16 mm	3	SC 4016-40-2
42 mm	16 mm	3	SC 4016-42-2
44 mm	17 mm	3	SC 4017-44-2
46 mm	17 mm	3	SC 4017-46-2
48 mm	18 mm	3	SC 4018-48-2
50 mm	18 mm	3	SC 4018-50-2

*in IC 2021-40

• CS 4.0, full thread

- self-tapping, forward and reverse
- self-drilling

Titanium-Alloy

Thread	Cancellous
Thread-ø	4.0 mm
Core-ø	2.3 mm
Hole-ø	1.35 mm
Width A/F	2.5 mm
Head-ø	6.0 mm

		TITANIUM
LENGTH	QUANTITY*	ART NO.
10 mm	3	SC 4000-10-2
12 mm	3	SC 4000-12-2
14 mm	3	SC 4000-14-2
16 mm	3	SC 4000-16-2
18 mm	3	SC 4000-18-2
20 mm	3	SC 4000-20-2
22 mm	3	SC 4000-22-2
24 mm	3	SC 4000-24-2
26 mm	3	SC 4000-26-2
28 mm	3	SC 4000-28-2
30 mm	3	SC 4000-30-2
32 mm	3	SC 4000-32-2
34 mm	3	SC 4000-34-2
36 mm	3	SC 4000-36-2
38 mm	3	SC 4000-38-2
40 mm	3	SC 4000-40-2
42 mm	3	SC 4000-42-2
44 mm	3	SC 4000-44-2
46 mm	3	SC 4000-46-2
48 mm	3	SC 4000-48-2
50 mm	3	SC 4000-50-2

*in IC 2021-40

- Drill bit for thread hole ø2.5 mm
  - Jacobs chuck IU 7325-13
  - quick coupling IU 7025-13
- Countersink
  - quick coupling IS 1302-16
  - quick coupling IS 1305-16
- Screwdriver hexagonal, ø2.5,
  - T-handle IS 1202-12
  - round handle IS 1203-12
  - quick coupling IS 1205-12
- K-wire ø1.2 mm without thread
  - Length 150 mm (10 pieces) NK 0012-15

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CS 4.5, short thread •

- self-tapping, forward and reverse
- self-drilling

LENGTH	THREAD LENGTH	QUANTITY*	TITANIUM ART NO.
20 mm	7 mm	3	SC 4507-20-2
22 mm	7 mm	3	SC 4507-22-2
24 mm	8 mm	3	SC 4508-24-2
26 mm	9 mm	3	SC 4509-26-2
28 mm	9 mm	3	SC 4509-28-2
30 mm	10 mm	3	SC 4510-30-2
32 mm	11 mm	3	SC 4511-32-2
34 mm	11 mm	3	SC 4511-34-2
36 mm	12 mm	3	SC 4512-36-2
38 mm	13 mm	3	SC 4513-38-2
40 mm	13 mm	3	SC 4513-40-2
42 mm	14 mm	3	SC 4514-42-2
44 mm	15 mm	3	SC 4515-44-2
46 mm	15 mm	3	SC 4515-46-2
48 mm	16 mm	3	SC 4516-48-2
50 mm	16 mm	3	SC 4516-50-2
52 mm	17 mm	3	SC 4517-52-2
54 mm	18 mm	3	SC 4518-54-2
56 mm	19 mm	3	SC 4519-56-2
60 mm	20 mm	3	SC 4520-60-2
64 mm	21 mm	3	SC 4521-64-2
68 mm	23 mm	3	SC 4523-68-2
72 mm	24 mm	3	SC 4524-72-2

*in IC 2031-45

Titanium-Alloy

Thread	Cancellous
Thread-ø	4.5 mm
Core-ø	2.8 mm
stem-ø	2.8 mm
Hole-ø	1.75 mm
Width A/F	2.5 mm
Head-ø	6.0 mm

CS 4.5, full thread •

- self-tapping, forward and reverse
- self-drilling

LENGTH	QUANTITY*	TITANIUM ART.-NO.
20 mm	3	SC 4500-20-2
22 mm	3	SC 4500-22-2
24 mm	3	SC 4500-24-2
26 mm	3	SC 4500-26-2
28 mm	3	SC 4500-28-2
30 mm	3	SC 4500-30-2
32 mm	3	SC 4500-32-2
34 mm	3	SC 4500-34-2
36 mm	3	SC 4500-36-2
38 mm	3	SC 4500-38-2
40 mm	3	SC 4500-40-2
42 mm	3	SC 4500-42-2
44 mm	3	SC 4500-44-2
46 mm	3	SC 4500-46-2
48 mm	3	SC 4500-48-2
50 mm	3	SC 4500-50-2
52 mm	3	SC 4500-52-2
54 mm	3	SC 4500-54-2
56 mm	3	SC 4500-56-2
60 mm	3	SC 4500-60-2
64 mm	3	SC 4500-64-2
68 mm	3	SC 4500-68-2
72 mm	3	SC 4500-72-2

*in IC 2031-45

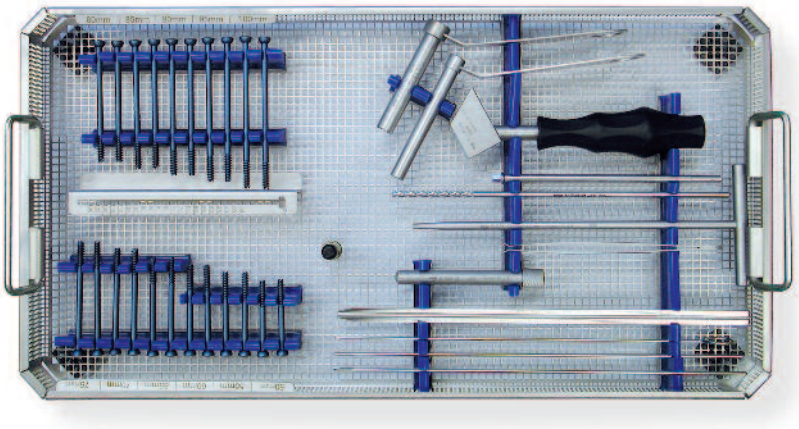
Titanium-Alloy

Thread	Cancellous
Thread-ø	4.5 mm
Core-ø	2.8 mm
Hole-ø	1.75 mm
Width A/F	2.5 mm
Head-ø	6.0 mm

- Drill bit for thread hole ø3.0 mm
  - Jacobs chuck IU 7330-14
  - quick coupling IU 7030-13
- Countersink
  - Jacobs chuck IS 1302-16
  - quick coupling IS 1305-16
- Screwdriver hexagonal, ø2.5,
  - T-handle IS 1202-16
  - round handle, IS 1203-16
  - quick coupling IS 1205-16
- K-wire ø1.6 mm with thread
  - Length 150 mm (10 pieces) NK 1016-15
  - Length 200 mm (10 pieces) NK 1016-20

• CS 5.8

Complete Set CS 5.8 IC 2003-00



	ART.-NO.
Basic tray CS 5.8, empty	IC 2003-01
Lid for tray	IC 2008-00

• Set of Instruments CS 5.8 IC 2003-10

INSTRUMENTS

ARTICLE	QUANTITY	ART.-NO.
Basic tray for instruments and implants CS 5.8, empty	1	IC 2003-01
Drill sleeve CS 5.8/6.5, I-ø4.5	1	IS 1010-27
Cleaning wire ø2.0, CS 5.8	1	IS 1702-20
Tissue protection sleeve CS 5.8/6.5/7.5	1	IS 2000-01
Obturator CS 5.8	1	IS 2000-22
Countersink CS 5.8, Jacobs chuck	1	IS 2310-22
Screwdriver cannulated CS 5.8 hexagonal, ø3.5, T-handle*	1	IS 2400-22
Parallel guide for K-wires CS 5.8	1	IS 2505-22
Drill CS 5.8, ø4.3, L 220, I-ø2.2, coil 54	1	IU 7343-22
Direct measuring device CS 5.8, L 270	1	IU 7927-10
Screw forceps, long	1	IU 8002-00
K-wire with trocar point and thread, ø2.0, L 270	10	NK 1020-27

* alternative:
Screwdriver cannulated CS 5.8, hexagonal, ø3.5,
a) with round handle: IS 2401-22 b) for Jacobs Chuck: IS 2404-22

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CS 5.8, 16 mm thread

- self-tapping, forward and reverse
- self-drilling

Titanium-Alloy

Thread	Cancellous
Thread-ø	5.8 mm
Core-ø	3.7 mm
Stem-ø	4.2 mm
Hole-ø	2.2 mm
Width A/F	3.5 mm
Head-ø	8.5 mm

Drill for thread hole ø4.3 mm
- Jacobs chuck IU 7343-22

Countersink IS 2310-22

Screwdriver hexagonal, ø3.5
- T-handle IS 2400-22
- Round handle IS 2401-22
- Jacobs chuck IS 2404-22

K-wire ø2.0 mm with thread
- Length 270 mm (10 pieces) NK 1020-27

	TITANIUM	
LENGTH	QUANTITY*	ART.-NO.
50 mm	2	SC 5816-50-2
55 mm	2	SC 5816-55-2
60 mm	2	SC 5816-60-2
65 mm	2	SC 5816-65-2
70 mm	2	SC 5816-70-2
75 mm	2	SC 5816-75-2
80 mm	2	SC 5816-80-2
85 mm	2	SC 5816-85-2
90 mm	2	SC 5816-90-2
95 mm	2	SC 5816-95-2
100 mm	2	SC 5816-00-2

*in IC 2003-00

optional:	ART.-NO.
30 mm	SC 5816-30-2
35 mm	SC 5816-35-2
40 mm	SC 5816-40-2
45 mm	SC 5816-45-2

Washer

for CS 5.8
5 pcs./package

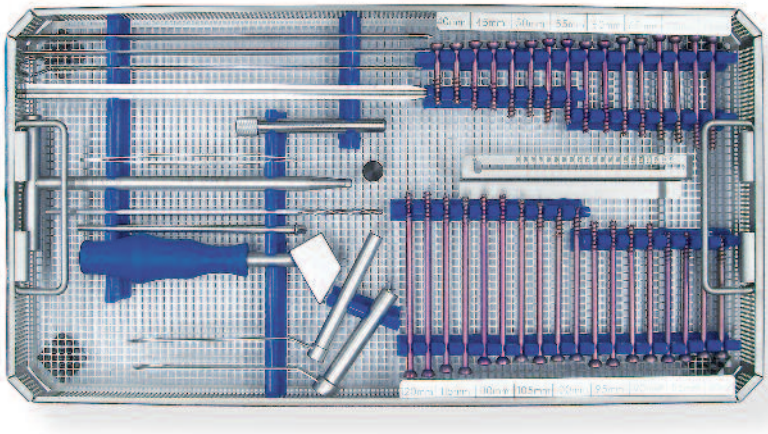
Titanium-Alloy

		TITANIUM	
INNER-ø	OUTER-ø	QUANTITY*	ART NO.
6.6 mm	13.0 mm	5	SU 0513-00-2

*in IC 2003-00

• CS 6.5

Complete Set CS 6.5 IC 2005-00



	ART.-NO.
Basic tray CS 6.5, empty	IC 2005-01
Lid for tray	IC 2008-00

• Set of Instruments CS 6.5 IC 2005-10

INSTRUMENTS

ARTICLE	QUANTITY	ART.-NO.
Basic tray for instruments and implants CS 6.5, empty	1	IC 2005-01
Drill sleeve CS 5.8/6.5, I-ø4.5	1	IS 1010-27
Cleaning wire ø2.5, CS 6.5	1	IS 1702-25
Tissue protection sleeve CS 5.8/6.5/7.5	1	IS 2000-01
Obturator CS 6.5	1	IS 2000-27
Countersink CS 6.5/7.5, Jacobs chuck	1	IS 2310-32
Screwdriver cannulated CS 6.5/7.5 hexagonal, ø5.0, T-handle*	1	IS 2400-32
Parallel guide for K-wires CS 6.5	1	IS 2505-27
Drill CS 6.5, ø4.4, L 220, I-ø2.7, coil 54	1	IU 7344-22
Direct measuring device CS 7.5/6.5, L 270	1	IU 7927-00
Screw forceps, long	1	IU 8002-00
K-wire with trocar point and thread, ø2.5, L 270	10	NK 1025-27

* alternative:
Screwdriver CS 6.5/7.5, hexagonal, ø5.0mm,
a) with round handle: IS 2401-32 b) for Jacobs chuck: IS 2402-32

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CS 6.5, 16 mm thread

- self-tapping, forward and reverse
- self-drilling

Titanium-Alloy

Thread	Cancellous
Thread-ø	6.5 mm
Core-ø	4.0 mm
Stem-ø	4.3 mm
Hole-ø	2.7 mm
Width A/F	5.0 mm
Head-ø	9.5 mm

- Drill for thread hole ø4.4 mm
  - Jacobs chuck IU 7344-22
- Countersink IS 2310-32
- Screwdriver hexagonal, ø3.5
  - T-handle IS 2400-32
  - Round handle IS 2401-32
  - Jacobs chuck IS 2402-32
- K-wire ø2.5 mm with thread
  - Length 270 mm (10 pieces) NK 1025-27

	TITANIUM	
LENGTH	QUANTITY*	ART.-NO.
40 mm	2	SC 6516-40-2
45 mm	2	SC 6516-45-2
50 mm	2	SC 6516-50-2
55 mm	2	SC 6516-55-2
60 mm	2	SC 6516-60-2
65 mm	2	SC 6516-65-2
70 mm	2	SC 6516-70-2
75 mm	2	SC 6516-75-2
80 mm	2	SC 6516-80-2
85 mm	2	SC 6516-85-2
90 mm	2	SC 6516-90-2
95 mm	2	SC 6516-95-2
100 mm	2	SC 6516-00-2
105 mm	2	SC 6516-01-2
110 mm	2	SC 6516-02-2
115 mm	2	SC 6516-03-2
120 mm	2	SC 6516-04-2

*in IC 2005-00

optional:	ART.-NO.
35 mm	SC 6516-35-2

Washer

for CS 6.5
5 pcs./package

Titanium-Alloy

		TITANIUM	
INNER-ø	OUTER-ø	QUANTITY*	ART NO.
8.5 mm	13.0 mm	5	SU 0913-00-2
8.6 mm	16.0 mm	–	SU 0916-00-2
8.6 mm	19.0 mm	–	SU 0919-00-2

*in IC 2005-00

• Basic Tray of Implants CS 6.5 IC 2005-05

- empty
- for screws CS 6.5, 32 mm & full thread
- not included in set IC 2005-00

• CS 6.5, 32 mm thread

- self-tapping, forward and reverse
- self-drilling
- not included in set IC 2005-00

Thread	Cancellous
Thread-ø	6.5 mm
Core-ø	4.0 mm
Stem-ø	4.3 mm
Hole-ø	2.7 mm
Width A/F	5.0 mm
Head-ø	9.5 mm

Titanium-Alloy

	TITANIUM
LENGTH	ART.-NO.
45 mm	SC 6532-45-2
50 mm	SC 6532-50-2
55 mm	SC 6532-55-2
60 mm	SC 6532-60-2
65 mm	SC 6532-65-2
70 mm	SC 6532-70-2
75 mm	SC 6532-75-2
80 mm	SC 6532-80-2
85 mm	SC 6532-85-2
90 mm	SC 6532-90-2
95 mm	SC 6532-95-2
100 mm	SC 6532-00-2
105 mm	SC 6532-01-2
110 mm	SC 6532-02-2
115 mm	SC 6532-03-2
120 mm	SC 6532-04-2
125 mm	SC 6532-05-2
130 mm	SC 6532-06-2

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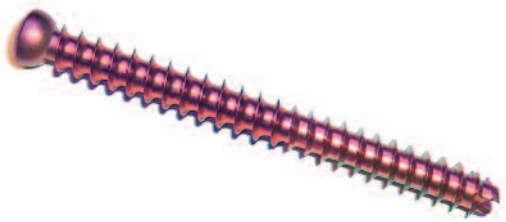
CS 6.5, full thread •

- self-tapping, forward and reverse
- self-drilling
- not included in set IC 2005-00



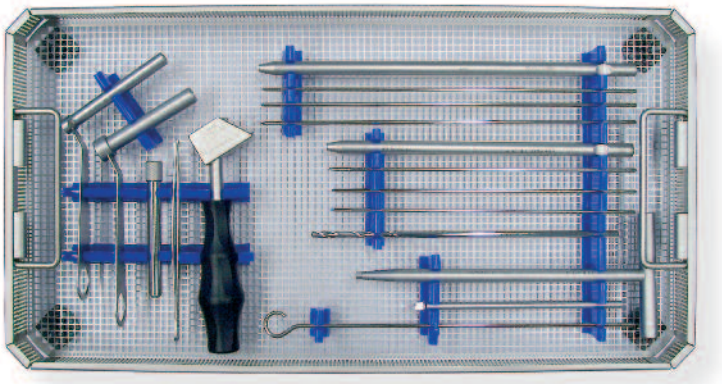
Titanium-Alloy

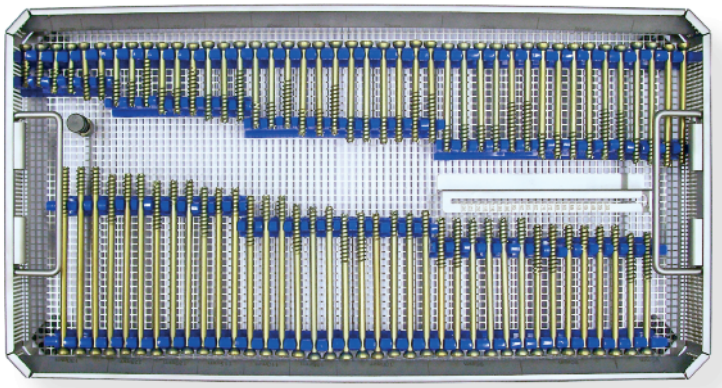
Thread	Cancellous
Thread-ø	6.5 mm
Core-ø	4.0 mm
Stem-ø	4.3 mm
Hole-ø	2.7 mm
Width A/F	5.0 mm
Head-ø	9.5 mm

	TITANIUM
LENGTH	ART.-NO.
35 mm	SC 6500-35-2
40 mm	SC 6500-40-2
45 mm	SC 6500-45-2
50 mm	SC 6500-50-2
55 mm	SC 6500-55-2
60 mm	SC 6500-60-2
65 mm	SC 6500-65-2
70 mm	SC 6500-70-2
75 mm	SC 6500-75-2
80 mm	SC 6500-80-2
85 mm	SC 6500-85-2
90 mm	SC 6500-90-2
95 mm	SC 6500-95-2
100 mm	SC 6500-00-2
105 mm	SC 6500-01-2
110 mm	SC 6500-02-2
115 mm	SC 6500-03-2
120 mm	SC 6500-04-2

• CS 7.5

Complete Set CS 7.5 IC 2000-00





	ART.-NO.
Basic tray for instruments CS 7.5, empty	IC 2001-00
Basic tray for implants CS 7.5, empty	IC 2002-00
Lid for tray	IC 2008-00

• Set of Instruments CS 7.5 IC 2001-75

INSTRUMENTS

ARTICLE	QUANTITY	ART.-NO.
Basic Tray for instruments CS 7.5, empty	1	IC 2001-00
Drill sleeve CS 7.5, I-ø5.2	1	IS 1010-32
Cleaning wire, ø3.0, CS 7.5	1	IS 1702-30
Tissue protection sleeve CS 5.8/6.5/7.5	1	IS 2000-01
Obturator CS 7.5	1	IS 2000-32
Countersink CS 6.5/7.5, Jacobs chuck	1	IS 2310-32
Screwdriver cannulated CS 6.5/7.5 hexagonal, ø5.0, T-handle*	1	IS 2400-32
Parallel guide for K-wires, CS 7.5	1	IS 2505-32
Drill CS 7.5, ø5.0, L 220, I-ø3.3, coil 60	1	IU 7350-22
Direct measuring device CS 7.5, L 220	1	IU 7922-00
Direct measuring device CS 6.5/7.5, L 270	1	IU 7927-00
Screw forceps, long	1	IU 8002-00
K-wire with trocar point and thread, ø3.0, L 220	6	NK 1030-22
K-wire with trocar point and thread, ø3.0, L 270	6	NK 1030-27

* alternative:
Screwdriver CS 6.5/7.5, hexagonal ø5.0,
a) with round handle: IS 2401-32 b) for Jacobs Chuck: IS 2402-32

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Titanium-Alloy

Set of Implants CS 7.5 IC 2002-75

- Tray for implants, empty IC 2002-00

- Drill for thread hole ø5.0 mm
  - Jacobs chuck IU 7350-22
- Countersink IS 2310-32
- Screwdriver hexagonal, ø3.5
  - T-handle IS 2400-32
  - Round handle IS 2401-32
  - Jacobs chuck IS 2402-32
- K-wire ø3.0 mm with thread
  - Length 220 mm (10 pieces) NK 1030-22
  - Length 270 mm (10 pieces) NK 1030-27

CS 7.5, 16 mm thread

- self tapping, forward and reverse
- self drilling

Thread	Cancellous
Thread-ø	7.5 mm
Core-ø	5.0 mm
Stem-ø	4.9 mm
Hole-ø	3.2 mm
Width A/F	5.0 mm
Head-ø	9.3 mm

TITANIUM

LENGTH	QUANTITY*	ART.-NO.
30 mm	2	SC 7516-30-2
35 mm	2	SC 7516-35-2
40 mm	2	SC 7516-40-2
45 mm	2	SC 7516-45-2
50 mm	2	SC 7516-50-2
55 mm	2	SC 7516-55-2
60 mm	2	SC 7516-60-2
65 mm	2	SC 7516-65-2
70 mm	4	SC 7516-70-2
75 mm	4	SC 7516-75-2
80 mm	4	SC 7516-80-2
85 mm	4	SC 7516-85-2
90 mm	4	SC 7516-90-2
95 mm	4	SC 7516-95-2
100 mm	4	SC 7516-00-2
105 mm	2	SC 7516-01-2
110 mm	2	SC 7516-02-2
115 mm	2	SC 7516-03-2
120 mm	2	SC 7516-04-2
125 mm	2	SC 7516-05-2
130 mm	2	SC 7516-06-2

*in IC 2000-00

CS 7.5, 32 mm thread

- self-tapping, forward and reverse
- self-drilling

Thread	Cancellous
Thread-ø	7.5 mm
Core-ø	5.0 mm
Stem-ø	4.9 mm
Hole-ø	3.2 mm
Width A/F	5.0 mm
Head-ø	9.3 mm

LENGTH	QUANTITY*	ART.-NO.
45 mm	1	SC 7532-45-2
50 mm	1	SC 7532-50-2
55 mm	1	SC 7532-55-2
60 mm	1	SC 7532-60-2
65 mm	1	SC 7532-65-2
70 mm	2	SC 7532-70-2
75 mm	2	SC 7532-75-2
80 mm	2	SC 7532-80-2
85 mm	2	SC 7532-85-2
90 mm	2	SC 7532-90-2
95 mm	2	SC 7532-95-2
100 mm	2	SC 7532-00-2
105 mm	1	SC 7532-01-2
110 mm	1	SC 7532-02-2
115 mm	1	SC 7532-03-2
120 mm	1	SC 7532-04-2
125 mm	1	SC 7532-05-2
130 mm	1	SC 7532-06-2

*in IC 2000-00

CS 7.5, 8 mm thread

- self-tapping, forward and reverse
- self-drilling
- not included in set IC 2000-00

Titanium-Alloy

Thread	Cancellous
Thread-ø	7.5 mm
Core-ø	5.0 mm
Stem-ø	4.9 mm
Hole-ø	3.2 mm
Width A/F	5.0 mm
Head-ø	9.3 mm

	TITANIUM
LENGTH	ART.-NO.
30 mm	SC 7508-30-2
35 mm	SC 7508-35-2
40 mm	SC 7508-40-2
45 mm	SC 7508-45-2
50 mm	SC 7508-50-2
55 mm	SC 7508-55-2
60 mm	SC 7508-60-2
65 mm	SC 7508-65-2
70 mm	SC 7508-70-2
75 mm	SC 7508-75-2
80 mm	SC 7508-80-2
85 mm	SC 7508-85-2
90 mm	SC 7508-90-2
95 mm	SC 7508-95-2
100 mm	SC 7508-00-2
105 mm	SC 7508-01-2
110 mm	SC 7508-02-2
115 mm	SC 7508-03-2
120 mm	SC 7508-04-2
125 mm	SC 7508-05-2
130 mm	SC 7508-06-2

Washer

for CS 7.5
5 pcs./package

Titanium-Alloy

			TITANIUM
INNER-ø	OUTER-ø	QUANTITY*	ART NO.
8.5 mm	13.0 mm	5	SU 0913-00-2
8.6 mm	16.0 mm	–	SU 0916-00-2
8.6 mm	19.0 mm	–	SU 0919-00-2

*in IC 2000-00

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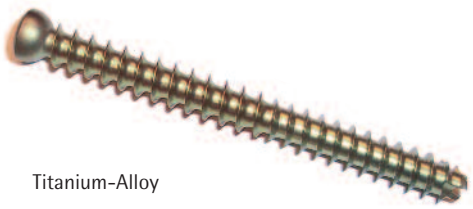
CS 7.5, full thread

- self-tapping, forward and reverse
- self-drilling
- not included in set IC 2000-00



Titanium-Alloy

Thread	Cancellous
Thread-ø	7.5 mm
Core-ø	5.0 mm
Stem-ø	4.9 mm
Hole-ø	3.2 mm
Width A/F	5.0 mm
Head-ø	9.3 mm

	TITANIUM
LENGTH	ART.-NO.
30 mm	SC 7500-30-2
35 mm	SC 7500-35-2
40 mm	SC 7500-40-2
45 mm	SC 7500-45-2
50 mm	SC 7500-50-2
55 mm	SC 7500-55-2
60 mm	SC 7500-60-2
65 mm	SC 7500-65-2
70 mm	SC 7500-70-2
75 mm	SC 7500-75-2
80 mm	SC 7500-80-2
85 mm	SC 7500-85-2
90 mm	SC 7500-90-2
95 mm	SC 7500-95-2
100 mm	SC 7500-00-2
105 mm	SC 7500-01-2
110 mm	SC 7500-02-2
115 mm	SC 7500-03-2
120 mm	SC 7500-04-2
125 mm	SC 7500-05-2
130 mm	SC 7500-06-2

•Notes

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Subject to technical modifications,
errors and misprints.

WM 2003-11 / 1112

Layout, typesetting:
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