Aesculap S4® Spinal System FRI

Fracture Reduction Instrumentation
Surgical Technique

Aesculap Spine

B BRAUN
SHARING EXPERTISE

S4® Spinal System

Small

The S4® Spinal System features a revolutionary pressure vessel design capable of delivering unmatched biomechanical stability while maintaining an exceptionally small implant volume. This low profile, low volume aspect of S4® reduces the risk of facet and soft tissue impingement which ultimately leads to better mechanical stability and reduced soft tissue irritation.

S4® also features an inner Set Screw for locking the construct which greatly improves distraction and compression maneuvers and guarantees a "low run on the rod" throughout all implant components.

Stable

The S4® Spinal System features a unique closure mechanism that maximizes surface contact area which effortlessly stabilizes the whole construct and ensures a high overall biomechanical strength.

In addition, the interconnection strength between the bone screw and body is extremely stable due to a special shaped seat inside the body which creates the revolutionary pressure vessel that efficiently transfers force throughout the rod-screw construct. Lateral stability can also be achieved with S4® using the various rigid and adjustable cross-connectors!

S4® Spinal System

From initial conception, the S4® Spinal System was developed to meet the spine surgeon's need for an extremely low profile and incredibly stable thoracolumbar spinal fixation system.

By combining the exceptionally small yet stable design of the screw construct with simple instrumentation, the S4® Spinal System emerges as a remarkably safe system for posterior column fixation. The development elements – small, stable, simple, and safe – define the S4® Spinal System as the state-of-the-art pedicle fixation system of choice for surgeons requiring performance oriented top-loading pedicle screw systems!

Simple

S4® instruments were designed to meet the surgeons demand for a quicker yet simpler surgical procedure.
The multiaxial capability of the polyaxial screws provide 42° total range of motion, which allows for easier rod placement.
The small implant volume greatly improves distraction and compression maneuvers, especially in narrow conditions, and enhances the surgeon's ability to place interbody fusion spacers when distracting off pedicle screws.

By combining the S4® Spinal System with the ProSpace® interbody fusion spacers, Aesculap offers a true three-column stabilization portfolio, capable of providing the surgeon all it takes to operate in spine surgery!

Safe

The top-loading, inner Set Screw of S4® features an exclusive undercut thread design that virtually eliminates cross threading. This unique undercut thread actually directs the forces inward to prevent splaying of the body, which ultimately results in improved force transmission and efficiency throughout the rod screw construct.

The small volume and low profile design of the S4® implant also minimizes interference with anatomical structures thereby allowing the surgeon the ability to remove less facet joint!

S4® FRI

S4® FRI

The S4® Fracture Reduction Instrumentation (FRI) is a complement to the S4® Spinal System and is intended to correct deformities of the human spine caused by fractures. To achieve this, the reduction instruments are mounted together with the set screw on the monoaxial cannulated screws.

The S4® FRI can be used for both open and percutaneous approach. This manual describes the percutaneous approach. The placement of the screws in the open approach is described in the manual 026702.

Note:
The fracture reduction instrumentation must always be used in combination with monoaxial cannulated screws. Due to their special design the cannulated screws are suited to withstand the forces created during the reduction process.

S4®

Percutaneous Approach

Traditionally, pedicle screws and rods are placed into the spine through an open approach. This means there is a midline incision. The large bands of muscles in the back are stripped free from their attachments to the spine and retracted off to each side. This allows for excellent visualization of the spine and easy access to the pedicles for implantation of the pedicle screws.
The downside of open surgery is that there can be considerable back pain from the muscle retraction, and the muscles develop some degree of permanent scar formation and damage as a result of the necessary retraction.

To overcome this disadvantage an intermuscular (Wiltse) approach is preferred by some surgeons. The Wiltse technique is a paramedian approach to the lumbosacral junction. Unlike a midline incision, where the exposure is created by cutting through the muscle planes, a Wiltse approach utilizes a muscle dividing technique of dissecting between the fascial planes of the multifidus and longissimus muscles to create the exposure. That approach enables the surgeon to access the spine in a less invasive way than a transmuscular approach.
This manual describes the percutaneous surgical technique.

S4® SRI

S4® CS

S4® FRI

Content

S4® FRI

Surgical Technique

Fig. 1

Fig. 2

A.1 Pedicle Preparation

After determination of the screw entry point the guiding instrument consisting of trocar FW271R and K-Wire aiming device FW258R is introduced at the junction of the facet to the processus transversus.

Note:
The K-Wire aiming device should be placed at the pedicle-vertebral body junction to facilitate the placement of the K-Wire.

The trocar FW271R is removed while the K-Wire aiming device FW258R remains in position.

- FW258R - K-Wire Aiming Device
- FW271R - Trocar

FW258R *FW271R*

S4® FRI

Surgical Technique

A.1

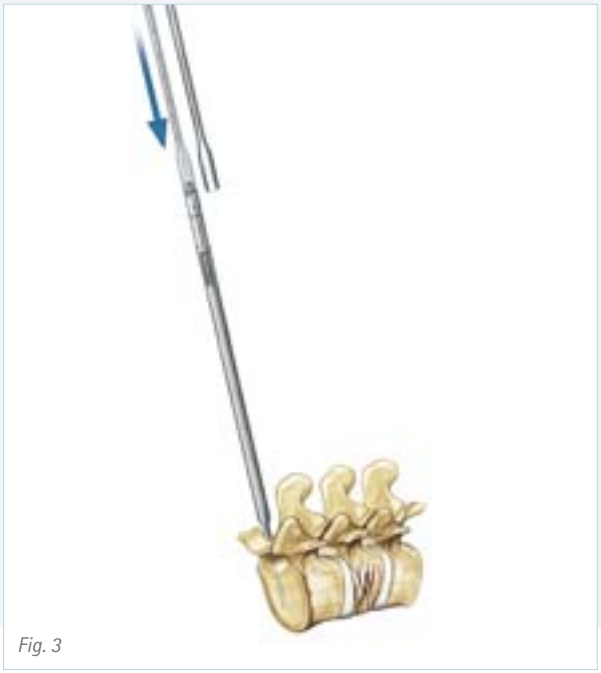


Fig. 3

Fig. 4

The K-Wire FW247S is now introduced through the K-Wire aiming device. In order to avoid oscillating or bending of the K-Wire the protection tube FW352R may be used.

Note:
The K-Wire should be introduced in a way that its distal tip represents the end position of the pedicle screw tip. This is essential for the determination of the screw length.

Danger:
It has to be avoided that the K-wire is pushed too far forward because there is potential rsik of perforation of the aorta!

In preparation for the screw positioning the operative field has to be dilated: insert the dilator FW354R over the aiming device.

- FW247S - K-Wire
- FW352R - K-Wire Protection Tube
- FW354R - Dilator

FW247S *FW352R* *FW354R*

Fig. 5

Fig. 6

Then place the blue tissue protection tube FW355P over the dilator.

Remove the K-Wire aiming device FW258R and the dilator FW354R while carefully holding the K-Wire in place.

Note:
Use the handle FW274R to facilitate the removal of the K-Wire aiming device FW258R.

- FW355P – Tissue Protection Tube
- FW274R – Handle for the removal of the K-Wire Aiming Device

FW355P

FW274R

S4® FRI

Surgical Technique

Fig. 7

Fig. 8

The perforation of the pedicle is performed with the cannulated straight pedicle probe: insert the probe carefully over the K-Wire.

Although the S4® cannulated screws are self-tapping, screw taps are available in all diameters.
To tap, attach either the straight ratchet handle FW165R or t-shaped ratchet handle FW167R to the appropriate tap, based on screw diameter.

- FW263R – Cannulated Pedicle Probe
- FW264R – Screw Tap, 4.5 mm (blue)
- FW265R - Screw Tap, 5.5 mm (yellow)
- FW266R - Screw Tap, 6.5 mm (grey)
- FW267R - Screw Tap, 7.5 mm (light blue)
- FW268R - Screw Tap, 8.5 mm (purple)
- FW165R – Ratchet Handle, straight
- FW167R – Ratchet Handle, t-shaped

FW263R

FW264R

FW165R

FW167R

Fig. 9

A.2 Determination of rod length

Introduce the screw length measuring device FW351R over the K-Wire until it touches the pedicle entry point.
The lower end of the middle marking of the K-Wire indicates now the length of the screw.

- FW351R – Screw Length Measuring Device

FW351R

S4® FRI

Surgical Technique

A.3

Fig. 10

Fig. 11

A.3 Screw Application

To place a monoaxial screw insert and fully seat the rounded tip of the monoaxial screwdriver FW262R into the slot of the monoaxial screw. Attach a ratchet handle (FW165R or FW167R) to the screwdriver. Then introduce it over the K-Wire and screw it into the prepared pedicle.

Note:
The K-Wire can be removed once the screw has traversed the pedicle to prevent inadvertent advancement.

Before removing the screwdriver the screws have to be aligned. For that purpose the two wings of the tactile alignment at the upper end of the screwdriver have to be positioned in a way that they show in the cranial and caudal direction.

- FW262R – Monoaxial Screwdriver
- FW165R – Ratchet Handle, straight
- FW167R – Ratchet Handle, t-shaped
- LX182R - Grasping Forceps

FW262R

LX182R

A.3

Fig. 12

After the placement of the screw pull the screwdriver back through the tissue protection tube.
Repeat this process until all screws are placed.

S4® FRI

Surgical Technique

A.4

Fig. 13

Fig. 14

A.4 Rod Placement

Determine the length of the rod by means of the rod measuring instrument FW242R (Fig. 13a).
It is inserted through the tissue protection tube into the screw heads.
The etched scale on top indicates the required length (Fig. 13b).

Note:
When using a pre-bent rod 10 mm has to be added to the indicated length.

The FRI outer sleeves are now placed through the tissue protection tubes with the long slot placed caudally.
Introduction is facilitated if the screw length measuring instrument FW351R is used: seat it in the screw head and pass the outer tube over it.
Repeat the step until all outer sleeves are placed and remove then the tissue protection tubes.

Note:
It is recommended to first place the two outer sleeves FW353R on one side, introduce the rod and then fix it with the construct consisting of lever threadpipe FW229R, screwdriver FW228R and set screw FW375T.

- FW242R – Rod Length Measuring Instrument
- FW353R – Outer Sleeve

FW242R

FW353R

Fig. 15

Fig. 16

The locking mechanism of the rod insertion instrument FW240R is released by turning the distal knob counter clockwise. The rod can now be inserted. By turning the knob clockwise the rod becomes fixed.

Note:
Make sure that the distal tip of pre-bent rods face upwards when locked.

The rod is now inserted through the long slot of the outer sleeve. Make sure to press the outer sheaths slightly onto the screws in order to give them a firm seat during the rod insertion.
Repeat this process on the contra-lateral side.

Note:
Slightly downward pressure should be applied to the two outer sleeves FW353R to ensure a secure hold onto the pedicle screw while inserting the rod.

FW240R – Rod Insertion Instrument

FW240R

S4® FRI

Surgical Technique

A.4

Fig. 17

Practical Advice for the rod insertion:
Before placing the outer sleeve FW353R the site is kept open by means of Langenbeck hooks in order to insert the rod.

Fig. 18

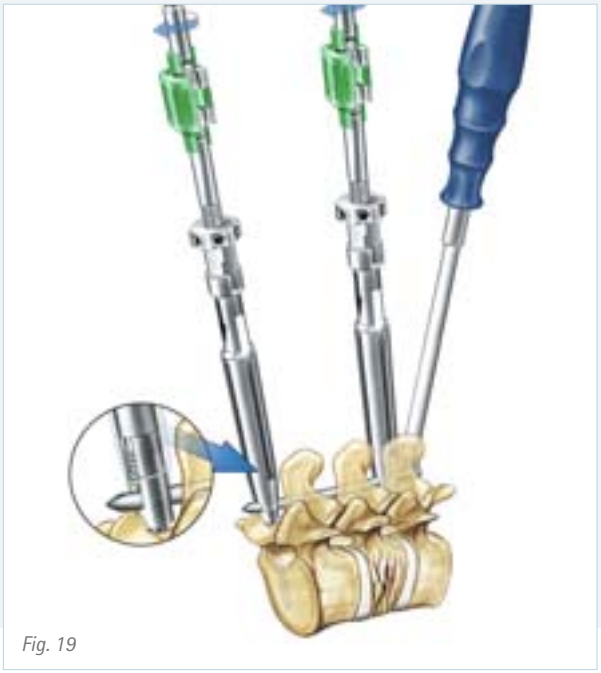


Fig. 19

A.5 Lever Placement

The screwdriver FW228R is now inserted into the lever threadpipe FW229R and fixed with the spacer FW141P.
Pick up the set screw FW375R from the storage with the screwdriver.

The construct is now inserted through the outer tube until it touches the screw head. Then screw it down until it blocks. For further manipulation of the set screw the spacer FW141P has to be removed.

- FW228R – Screwdriver
- FW229R – Lever Threadpipe
- FW141P – Spacer Device
- FW375R – Cannulated Set Screw

FW228R

FW229R

FW141P

FW375R

S4® FRI

Surgical Technique

A.6

Fig. 20a

Fig. 20b

Fig. 20

Fig. 21a

Fig. 21b

Fig. 21

A.6 Placement of the distractor

The distractor (consisting of FW238R and FW239R) is now fixed to the cranial and caudal outer sleeves by sliding the pivots down the guiding groove.
Repeat this process on the contra-lateral side.

Note:
The distraction arms have to be inserted parallel to the outer tube.

Distraction can be carried out by means of the regulating screw. Distraction can be effected in very small increments by rotating the distraction nut. The opposing nut can be set to avoid over-distraction.

Note:
Distraction takes place alternatively under C-arm control.

- FW237R – Tommy Bar
- FW238R – Distractor
- FW239R – Distraction Arm

FW238R

FW239R

FW237R

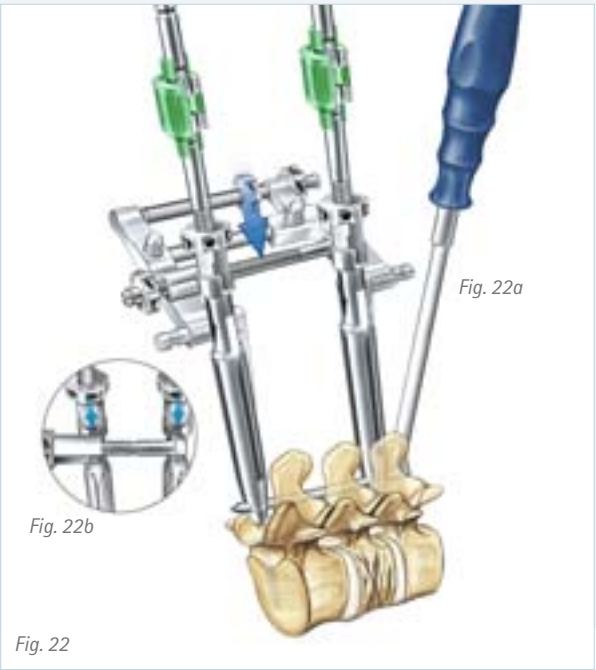


Fig. 22a

Fig. 22b

Fig. 22

Fig. 23

A.7 Reduction

If necessary the natural lordosis can be restored with the distraction spindle.
The pivots of the spindle are inserted into the grove on the upper part of the outer sleeve.

Note:
The insertion of the distraction spindle has to be placed parallel to the outer sleeve to avoid canting.
Repeat this process on the contra-lateral side.

With the regulating screw kyphosis can be corrected. This process is carried out alternatively.
The regulating screw can be manipulated by hand or with the tommy bar.

- FW241R – Distraction Spindle

FW241R

S4® FRI

Surgical Technique

A.8

Fig. 24

Fig. 25

A.8 Final Tightening

With the regulating screw of the lever threadpipe the outer sleeve is threaded down until it blocks. The rod is now seated in the screw head.
The regulating screw of the lever threadpipe has to be threaded back by a quarter turn in order not to block the screwdriver.

Note:
A ratchet handle is mounted to the screwdriver. The spacer has to be removed in order to finger tighten the set screw.

Afterwards the screwdriver is pulled out. The lever threadpipe is removed by attaching the handle and unscrewing.

A.8

Fig. 26

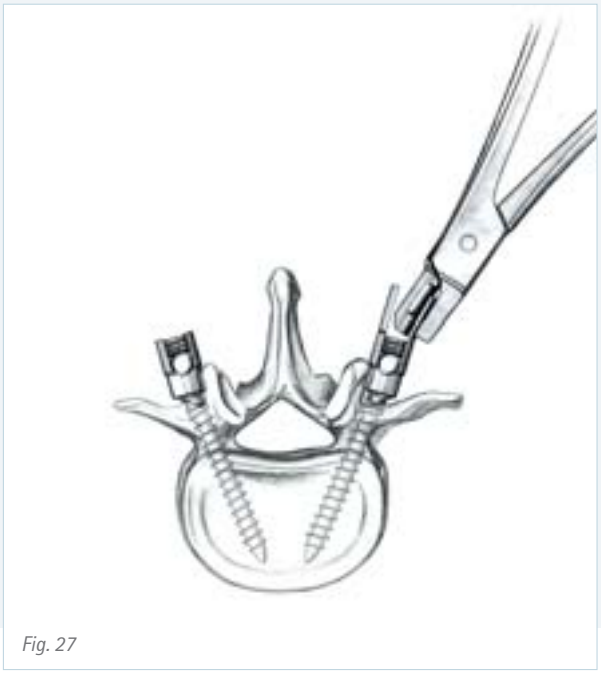


Fig. 27

Final tightening of each set screw is completed using the torque limiting wrench FW170R along with the counter torque FW236R. The counter torque is attached to the hexagonal bolt of the outer sleeve.
The locking mechanism of the rod inserter is opened and the rod released.

Note:
It is important to only tighten the set screw to the specified setting of 10Nm (90 in/lbs). Overtightening will lead to damaging

Caution:
Do not use the torque limiting wrench without the counter torque. This could lead to thread jumping of the set screw within the screw body.
Dismantle the FRI instrumentation and remove the tabs with the tab breaker. The site is kept open with Langenbeck hooks.

- FW170R – Torque Limiting Wrench
- FW236R – Counter Torque
- FW179R – Tab Breaker

FW170R

FW236R

FW179R

S4® FRI

Instrumentation

B.1

B.1 Implants – Overview

Monoaxial Screws

 ø 4.5 mm	SW421T	**S4® Monoaxial Screw, cannulated, ø 4.5 mm**	4.5 x 25 mm
	SW422T	S4® Monoaxial Screw, cannulated	4.5 x 30 mm
	SW423T	S4® Monoaxial Screw, cannulated	4.5 x 35 mm
	SW424T	S4® Monoaxial Screw, cannulated	4.5 x 40 mm
	SW426T	S4® Monoaxial Screw, cannulated	4.5 x 45 mm
	SW427T	S4® Monoaxial Screw, cannulated	4.5 x 50 mm
 ø 5.5 mm	SW431T	**S4® Monoaxial Screw, cannulated, ø 5.5 mm**	5.5 x 25 mm
	SW432T	S4® Monoaxial Screw, cannulated	5.5 x 30 mm
	SW433T	S4® Monoaxial Screw, cannulated	5.5 x 35 mm
	SW434T	S4® Monoaxial Screw, cannulated	5.5 x 40 mm
	SW436T	S4® Monoaxial Screw, cannulated	5.5 x 45 mm
	SW437T	S4® Monoaxial Screw, cannulated	5.5 x 50 mm
 ø 6.5 mm	SW441T	**S4® Monoaxial Screw, cannulated, ø 6.5 mm**	6.5 x 25 mm
	SW442T	S4® Monoaxial Screw, cannulated	6.5 x 30 mm
	SW443T	S4® Monoaxial Screw, cannulated	6.5 x 35 mm
	SW444T	S4® Monoaxial Screw, cannulated	6.5 x 40 mm
	SW446T	S4® Monoaxial Screw, cannulated	6.5 x 45 mm
	SW447T	S4® Monoaxial Screw, cannulated	6.5 x 50 mm
	SW448T	S4® Monoaxial Screw, cannulated	6.5 x 55 mm
	SW449T	S4® Monoaxial Screw, cannulated	6.5 x 60 mm
 ø 7.5 mm	SW461T	**S4® Monoaxial Screw, cannulated, ø 7.5 mm**	7.5 x 25 mm
	SW462T	S4® Monoaxial Screw, cannulated	7.5 x 30 mm
	SW463T	S4® Monoaxial Screw, cannulated	7.5 x 35 mm
	SW464T	S4® Monoaxial Screw, cannulated	7.5 x 40 mm
	SW466T	S4® Monoaxial Screw, cannulated	7.5 x 45 mm
	SW467T	S4® Monoaxial Screw, cannulated	7.5 x 50 mm
	SW468T	S4® Monoaxial Screw, cannulated	7.5 x 55 mm
	SW469T	S4® Monoaxial Screw, cannulated	7.5 x 60 mm
 ø 8.5 mm	SW472T	**S4® Monoaxial Screw, cannulated, ø 8.5 mm**	8.5 x 30 mm
	SW473T	S4® Monoaxial Screw, cannulated	8.5 x 35 mm
	SW474T	S4® Monoaxial Screw, cannulated	8.5 x 40 mm
	SW476T	S4® Monoaxial Screw, cannulated	8.5 x 45 mm
	SW477T	S4® Monoaxial Screw, cannulated	8.5 x 50 mm
	SW478T	S4® Monoaxial Screw, cannulated	8.5 x 55 mm
	SW479T	S4® Monoaxial Screw, cannulated	8.5 x 60 mm
	SW375T	S4® Set screw for monaxial-/polyaxial screws, cannulated	

S4® Rod with hexagonal connection, pre-bent, ø 5.5 mm

SW554T	with tip and hexagonal connection	5.5 x 35 mm
SW555T	with tip and hexagonal connection	5.5 x 40 mm
SW556T	with tip and hexagonal connection	5.5 x 45 mm
SW557T	with tip and hexagonal connection	5.5 x 50 mm
SW558T	with tip and hexagonal connection	5.5 x 55 mm
SW559T	with tip and hexagonal connection	5.5 x 60 mm
SW561T	with tip and hexagonal connection	5.5 x 70 mm
SW562T	with tip and hexagonal connection	5.5 x 80 mm
SW563T	with tip and hexagonal connection	5.5 x 90 mm
SW564T	with tip and hexagonal connection	5.5 x 100 mm
SW566T	with tip and hexagonal connection	5.5 x 110 mm
SW567T	with tip and hexagonal connection	5.5 x 120 mm

S4® Rod with hexagonal connection, straight, ø 5.5 mm

SW573T	with tip and hexagonal connection	5.5 x 35 mm
SW574T	with tip and hexagonal connection	5.5 x 40 mm
SW576T	with tip and hexagonal connection	5.5 x 45 mm
SW577T	with tip and hexagonal connection	5.5 x 50 mm
SW578T	with tip and hexagonal connection	5.5 x 55 mm
SW579T	with tip and hexagonal connection	5.5 x 60 mm
SW581T	with tip and hexagonal connection	5.5 x 70 mm
SW582T	with tip and hexagonal connection	5.5 x 80 mm
SW583T	with tip and hexagonal connection	5.5 x 90 mm
SW584T	with tip and hexagonal connection	5.5 x 100 mm
SW585T	with tip and hexagonal connection	5.5 x 110 mm
SW586T	with tip and hexagonal connection	5.5 x 120 mm
SW587T	with tip and hexagonal connection	5.5 x 150 mm
SW588T	with tip and hexagonal connection	5.5 x 180 mm
SW589T	with hexagonal connection	5.5 x 200 mm
SW590T	with hexagonal connection	5.5 x 300 mm
SW591T	with hexagonal connection	5.5 x 400 mm
SW592T	with hexagonal connection	5.5 x 500 mm

Storage Pins for Monoaxial Screws*

SW864P	Pin for Monoaxial Screw, dark blue	ø 4.5 mm
SW865P	Pin for Monoaxial Screw, yellow	ø 5.5 mm
SW866P	Pin for Monoaxial Screw, grey	ø 6.5 mm
SW867P	Pin for Monoaxial Screw, light blue	ø 7.5 mm
SW868P	Pin for Monoaxial Screw, purple	ø 8.5 mm

* Note: 1 Pack contains 10 pieces

S4® FRI

Instrumentation

B.2

B.2 Implants – Set

Art. No.	Component	Recommended	Optional
[1] FW259P	Implant Tray	1	
SW421T	**S4® Monoaxial Screw, cannulated, ø 4.5 mm**		
SW422T	S4® Monoaxial Screw, cannulated, ø 4.5 mm		
SW423T	S4® Monoaxial Screw, cannulated, ø 4.5 mm		
SW424T	S4® Monoaxial Screw, cannulated, ø 4.5 mm		
SW426T	S4® Monoaxial Screw, cannulated, ø 4.5 mm		
SW427T	S4® Monoaxial Screw, cannulated, ø 4.5 mm		
SW431T	**S4® Monoaxial Screw, cannulated, ø 5.5 mm**		
SW432T	S4® Monoaxial Screw, cannulated, ø 5.5 mm		
SW433T	S4® Monoaxial Screw, cannulated, ø 5.5 mm		4
SW434T	S4® Monoaxial Screw, cannulated, ø 5.5 mm	6	
SW436T	S4® Monoaxial Screw, cannulated, ø 5.5 mm	6	
SW437T	S4® Monoaxial Screw, cannulated, ø 5.5 mm		4
SW441T	**S4® Monoaxial Screw, cannulated, ø 6.5 mm**		
SW442T	S4® Monoaxial Screw, cannulated, ø 6.5 mm		
SW443T	S4® Monoaxial Screw, cannulated, ø 6.5 mm		2
SW444T	S4® Monoaxial Screw, cannulated, ø 6.5 mm	6	
SW446T	S4® Monoaxial Screw, cannulated, ø 6.5 mm	6	
SW447T	S4® Monoaxial Screw, cannulated, ø 6.5 mm	6	
SW448T	S4® Monoaxial Screw, cannulated, ø 6.5 mm		2
SW449T	S4® Monoaxial Screw, cannulated, ø 6.5 mm		2
SW461T	**S4® Monoaxial Screw, cannulated, ø 7.5 mm**		
SW462T	S4® Monoaxial Screw, cannulated, ø 7.5 mm		
SW463T	S4® Monoaxial Screw, cannulated, ø 7.5 mm		
SW464T	S4® Monoaxial Screw, cannulated, ø 7.5 mm		
SW466T	S4® Monoaxial Screw, cannulated, ø 7.5 mm		
SW467T	S4® Monoaxial Screw, cannulated, ø 7.5 mm		
SW468T	S4® Monoaxial Screw, cannulated, ø 7.5 mm		
SW469T	S4® Monoaxial Screw, cannulated, ø 7.5 mm		
SW472T	**S4® Monoaxial Screw, cannulated, ø 8.5 mm**		
SW473T	S4® Monoaxial Screw, cannulated, ø 8.5 mm		
SW474T	S4® Monoaxial Screw, cannulated, ø 8.5 mm		
SW476T	S4® Monoaxial Screw, cannulated, ø 8.5 mm		
SW477T	S4® Monoaxial Screw, cannulated, ø 8.5 mm		
SW478T	S4® Monoaxial Screw, cannulated, ø 8.5 mm		
SW479T	S4® Monoaxial Screw, cannulated, ø 8.5 mm		

[1] **Recommended container:** bottom JK441 and lid JK489

B.2

Art. No.	Component	Recommended	Optional
S4® Rod with hexagonal connection, pre-bent, ø 5.5 mm			
SW554T	with tip and hexagonal connection, 35 mm		
SW555T	with tip and hexagonal connection, 40 mm		
SW556T	with tip and hexagonal connection, 45 mm		
SW557T	with tip and hexagonal connection, 50 mm		
SW558T	with tip and hexagonal connection, 55 mm		
SW559T	with tip and hexagonal connection, 60 mm		2
SW561T	with tip and hexagonal connection, 70 mm		2
SW562T	with tip and hexagonal connection, 80 mm	2	
SW563T	with tip and hexagonal connection, 90 mm	2	
SW564T	with tip and hexagonal connection, 100 mm	2	
SW566T	with tip and hexagonal connection, 110 mm		2
SW567T	with tip and hexagonal connection, 120 mm		2
S4® Rod with hexagonal connection, straight, ø 5.5 mm			
SW573T	with tip and hexagonal connection, 35 mm		
SW574T	with tip and hexagonal connection, 40 mm		
SW576T	with tip and hexagonal connection, 45 mm		
SW577T	with tip and hexagonal connection, 50 mm		
SW578T	with tip and hexagonal connection, 55 mm		
SW579T	with tip and hexagonal connection, 60 mm		2
SW581T	with tip and hexagonal connection, 70 mm		2
SW582T	with tip and hexagonal connection, 80 mm	2	
SW583T	with tip and hexagonal connection, 90 mm	2	
SW584T	with tip and hexagonal connection, 100 mm	2	
SW585T	with tip and hexagonal connection, 110 mm		2
SW586T	with tip and hexagonal connection, 120 mm		2
SW587T	with tip and hexagonal connection, 150 mm		
SW588T	with tip and hexagonal connection, 180 mm		
SW589T	with hexagonal connection, 200 mm		2
SW590T	with hexagonal connection, 300 mm		
SW591T	with hexagonal connection, 400 mm		
SW592T	with hexagonal connection, 500 mm		
SW375T	S4® Set screw for monaxial-/polyaxial screws, cannulated	16	8

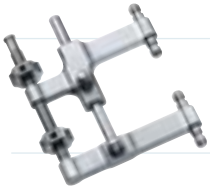
Note:
Pins for Mono-/Polyaxial screws are included in implant tray FW259P.

S4® FRI

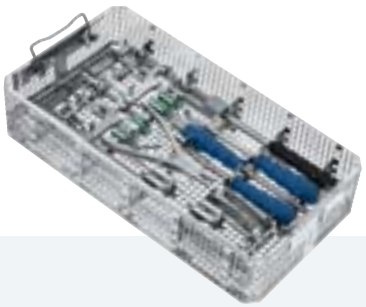
Instrumentation

B.3

B.3 S4® FRI Instruments – Set

	Art. No.	Component	Recommended	Optional
	[2] FW379R	Wire basket FRI	1	
	JH217R	Basket Lid for FW379R	1	
	TE995	Graphic Template	1	
	FW229R	Lever Threadpipe	4	
	FW228R	Screwdriver	4	
	FW141P	Spacer	4	
	FW353R	Outer Sleeve	4	
	FW352R	K-Wire Protection Tube	1	
	FW351R	Screw Length Measuring Device	1	
	FW236R	Counter Torque	1	
	FW237R	Tommy Bar	2	
	FW238R	Distractor	2	
	FW239R	Distraction Arm	4	
	FW240R	Rod Insertion Instrument	2	
	FW241R	Distraction Spindle	2	

[2] **Recommended Container:** Bottom JK442 and Lid JK489



B.3

	Art. No.	Component	Recommended	Optional
	FW274R	Handle for removal of FW258R	1	
	LX182R	Grasping Forceps	1	
	FW271R	Trocar	1	
	FW263R	Cannulated Pedicle Probe	1	
	FW264R	Screw Tap, cannulated, ø 4.5 mm	1	
	FW265R	Screw Tap, cannulated, ø 5.5 mm	1	
	FW266R	Screw Tap, cannulated, ø 6.5 mm	1	
	FW267R	Screw Tap, cannulated, ø 7.5 mm	1	
	FW268R	Screw Tap, cannulated, ø 8.5 mm	1	
	FW243R	Slotted Hammer 12.5 mm	1	
	FW242R	Rod Length Measuring Instrument	1	
	FW258R	K-Wire Aiming Device	2	
	FW354R	Dilation Tube	2	
	FW355P	Tissue Protection Sleeve	4	
	FW247S	K-Wire, blunt	8	

Note: S4® FRI has always to be used in combination with the instruments stored in the trays FW260P and FW261P. The monoaxial screwdriver FW262R, the ratchet handles FW165R/FW167R, the cannulated pedicle probe FW263R and the torque limiting wrench FW170R are stored in the trays FW260P/FW261P.

Aesculap AG | Am Aesculap-Platz | 78532 Tuttlingen | Germany
Phone +49 (0) 74 61 95-0 | Fax +49 (0) 74 61 95-26 00 | www.aesculap.com

Aesculap – a B. Braun company

Brochure No. 026102 1209/2/1