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S M R REVISION STEM

OPERATING TECHNIQUE



SMR REVISION STEM

REVISION
MODULAR
STEM

OPERATING TECHNIQUE

The SMR hip revision stem is a modular system designed for prosthesis replacement in cases of serious bone loss (Paprosky grades II and III).

With over 20 years of clinical history, the femoral implant consists of three elements: a proximal component, a distal component and a locking screw.

The SMR stem allows customized reconstructions thanks to the wide range of modular combinations of proximal and distal components.





INDICATIONS

The indications are tied to hip pathologies that require an arthroplasty to reduce or eliminate pain and / or improve joint function. The general guidelines are: Non-inflammatory degenerative joint disease such as primary or secondary osteoarthritis; Aseptic necrosis of the femoral head; Rheumatoid Arthritis; Post-traumatic Arthritis; Correction of functional deformity; Outcomes of fractures of the femoral neck; Outcomes of traumatic dislocations of the hip; Failures of osteotomy; Outcomes of arthrodesis.

The SMR stem is indicated in revision surgery of femoral components, following failure of primary cemented or uncemented prosthesis with proximal bone loss, enlargement of the medullary canal and thinning of the cortical bone of the proximal femur. Revision of a mobilized femoral component, after sub prosthetic or periprosthetic fracture. Femoral reconstruction in cases of alterations of bone morphology after fractures or osteotomies.

This stem is indicated for cementless implants

CONTRAINDICATIONS

The hip joint surgery is absolutely contraindicated in cases of: systemic or local infection, sepsis, and osteomyelitis. It is relatively contraindicated in case of: Osteoporosis; Patient uncooperative or suffering from neurological disorders, unable to follow directions; Systemic disorders and / or metabolic problems that lead to a progressive deterioration of bone support; Neurological or neuromuscular disorders that could create an unacceptable risk to the prostheses instability or lead to a failure of prostheses fixation; Osteomalacia; Active infection or suspected latent infection in the hip joint; Distant focus of infection that could spread to the implant site; Vascular insufficiency, muscular atrophy, neuromuscular diseases; Incomplete or insufficient presence of soft tissue around the knee joint; Obesity; Inadequate bone stock for the prostheses support or fixation; Skeletal immaturity; Local or disseminated neoplastic diseases; Incurable severe deformities.

MATERIALS

Titanium alloy Ti 6Al 4V Grade 5 ELI (ISO 5832-3), which ensures excellent bio-compatibility and mechanical strength.



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1 Pre-operative planning

Thorough pre-operative planning enables the surgeon to adopt a correct approach to the operation and foresee certain situations that might arise.

The objective is to choose the diameter and length of the distal component and size of the proximal component. Pre-operative choice of components is indicative, as the definitive size will be determined intra-operatively.

Pre-operative planning requires an anterior-posterior X-ray of the pelvis and pre-operative templates of the SMR stem (provided in the instrument kit).

The templates have a 15% enlargements.

Align the template with the anatomical axis of the femur to determine the size of the distal component, making sure that it's well anchored to good quality cortical bone.

Any anatomical differences may be corrected using the femoral heads and proximal components, which come in different lengths.

Also determine the exact position of the longitudinal osteotomy, where possible.



FIG.1

2 Reaming of distal component

Having completed the removal of the previous implant, proceed to reaming with the conical reamers (Ref. 120540514 ÷ 120540524*, 120540714 ÷ 120540724*). (FIG. 2a, FIG. 2b)

Reaming may be done manually with the "T" handle (Ref. 110381521) or with a motor, using the Jacobs Adaptor (Ref. 110381525).

The instrument kit has reamers with diameters from 14mm to 20mm, in 1mm steps, and 22mm and 24mm.

Start with a reamer that's one or two millimetres smaller than the measurement taken in pre-operative planning.

The reamers must be inserted into the femoral canal till the depth indicator is aligned with the apex of the greater trochanter.

NB: in case of cemented distal component implant, use only the Conical Reamers L.160 (Ref. 120540514 ÷ 120540524*)

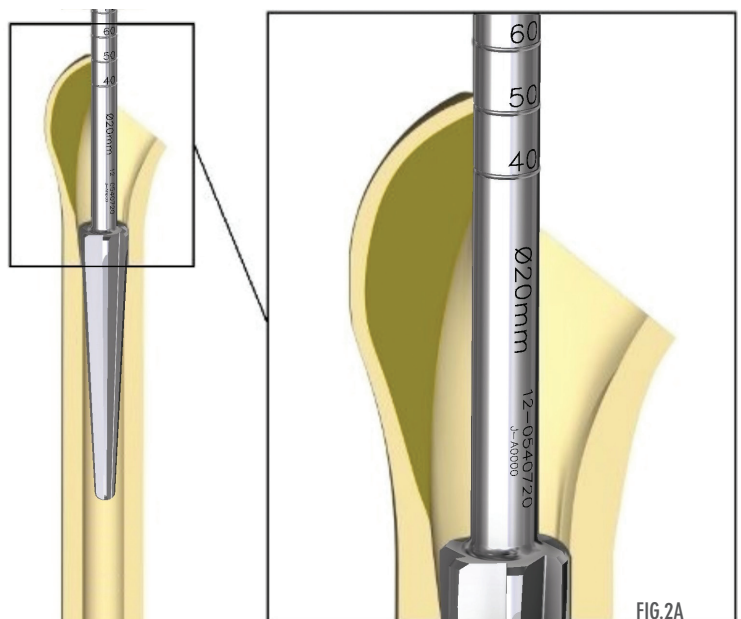


FIG.2A

3

Insertion of distal component

The shaft of the conical reamers L.160 (Ref. 120540514 ÷ 120540524*) is graduated and divided into three groups of numbers, from 40 to 70, corresponding to the four available sizes of the proximal components, while the three groups refer to the three lengths of the distal stem (160, 200, 240mm). (FIG. 2b)

For example, if the reamer stops at 60 in the first groups of numbers (the one closest to the tip of the reamer), a 160mm long stem with a 60mm proximal component will be used.

The shaft of the reamers L.100 (Ref. 120540714 ÷ 120540724) is graduated and divided from 40 to 70, corresponding to the four available sizes of the proximal components. (FIG. 2b)

Work with conical reamers of successive sizes till achieving optimum stability and resistance and coming into contact with the cortical.

Use of the reamers yields information on the diameter and correct depth of the distal component in the cortical.

Mount the distal component inserter (Ref. 120540410) on the chosen component and proceed to feed it into the previously prepared canal.

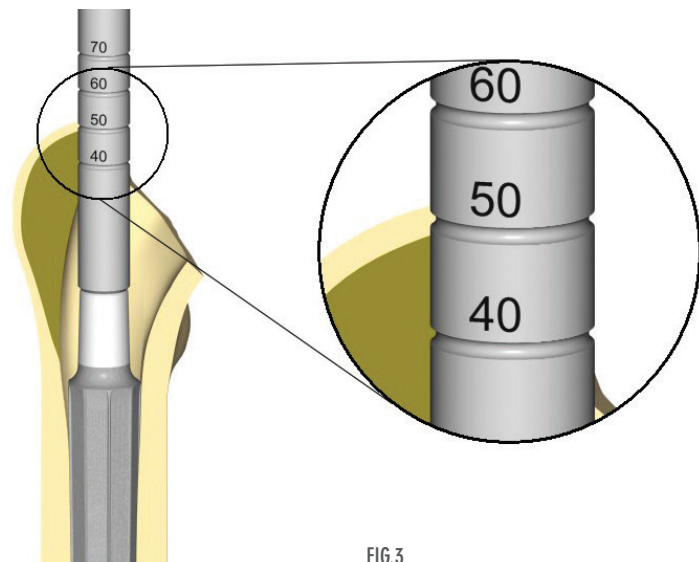
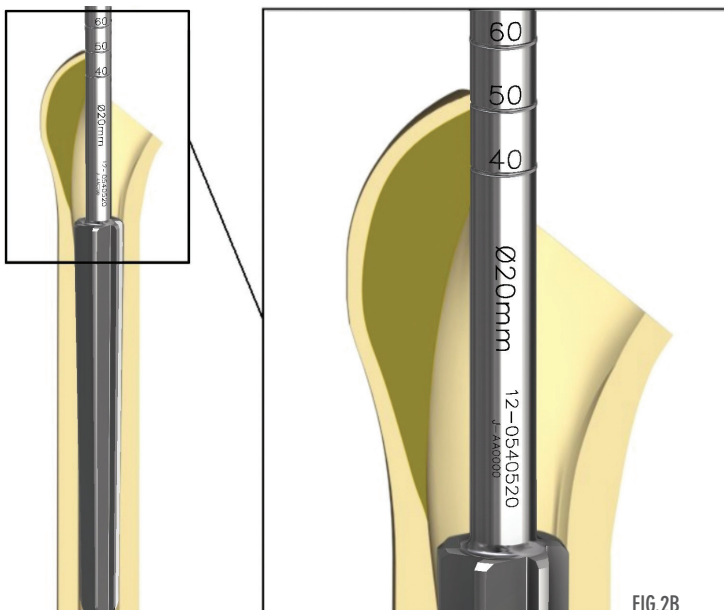
The long distal components (200mm and 240mm) must be aligned with the femoral pro-curvedness (3°).

Proceed to insertion with the distal component inserter advancing gradually and checking the depth, as far as the maximum, to obtain good torsional stability and avoiding any unexpected penetration under load. (FIG.3)

NB: in the case of a 240mm distal component implant, the final component to be implanted must be one size bigger than the last reamer used.

NB: in the case of a cemented distal component implant, to guarantee the appropriate cement layer, the diameter of the cemented distal component must be at least 1mm smaller than that of the last reamer used.

Indicatively, the final position of the component will correspond to the mark identified on the reamer in the previous phase. Any difference may be corrected using the proximal components and femoral heads, which come in different lengths.



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4 Preparation of the bone for the proximal component

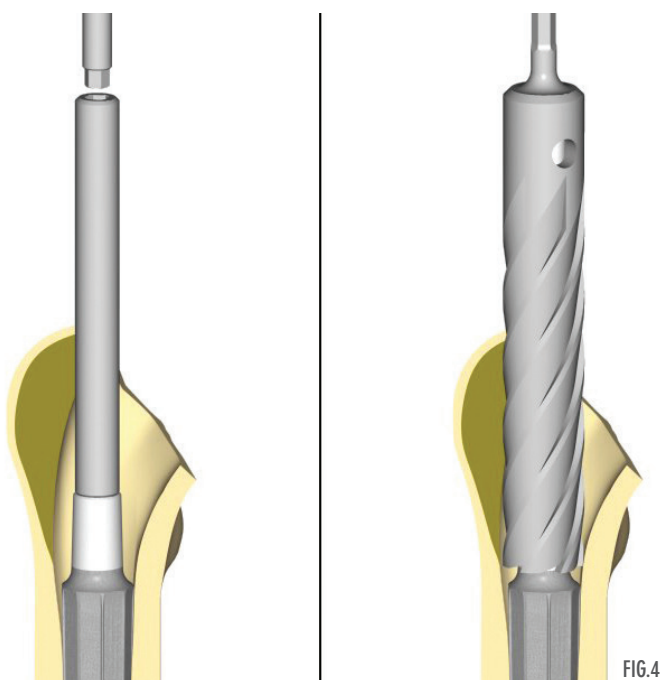
Remove the distal component inserter (Ref. 120540410) from the distal component, screw the guide shaft for tubular reamer (Ref. 120540415) onto the distal component. (FIG.4a)

When carrying out this operation, make sure it's done in the right direction, as a mistake could irreparably damage the distal component and compromise all the successive phases.

Now ream the proximal portion with the appropriate tubular reamer (Ref. 120540400) to prepare a housing for the proximal component. (FIG.4b)

Attention: proceed with prudence in the bone reaming phase to avoid damaging any soft tissue in the field of action.

Attention: the reamer must rest on the apex of the Guide in order to avoid difficulties with insertion in the subsequent housing of the proximal components. To be certain of carrying out the procedure correctly, make sure there is no residue inside the reamer that might hinder its correct penetration in the bone. There is an inspection hole on the reamers for checking there are no residues.



5 Insertion of trial proximal component

Insert the trial proximal component (Ref. 12540140 ÷ 1205401701; 12540240 ÷ 120540270) and lock it with the appropriate screw (Ref. 120540040 ÷ 120540070). Do not tighten excessively. (FIG.5)



6 Trial reduction

Mount the trial head (Ref. 110380860 ÷ 110380890, 110380960 ÷ 110380990, 110381060 ÷ 110381090) on the taper of the trial proximal component (Ref. 120540140 ÷ 120540170, 120540240 ÷ 120540270). (FIG. 6)

Carry out the trial reduction and assess the stability of the hip, the length of the limb and the breadth of movement.

Also check for the desired anteversion, marking the bone by the reference line marked laterally on the trial proximal component.



7 Insertion of the definitive proximal component

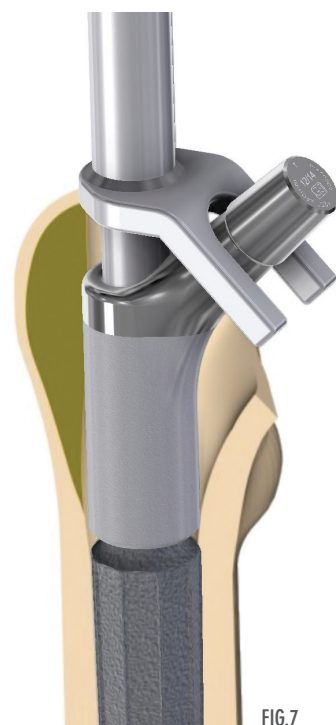
Remove the trial head and trial proximal component using the revision proximal component extractor (Ref. 120540420).

Proceed with prudence in the extraction phase and make sure the correct direction is chosen, as a mistake could compromise all the successive phases.

Take the definitive proximal component (having the same size as the trial one) and use the revision proximal component impactor (Ref. 120540411) to insert it in the Morse taper of the previously cleaned distal component. (FIG.7) Be careful to observe the correct anteversion by aligning the reference line on the proximal component with the marking previously made on the bone.

Definitively impact the proximal component.

The filling proximal component does not require any steps beyond those indicated in the proximal component technique.



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8 Blocking the proximal component

Insert the locking screw (of the appropriate size for the proximal component used) and tighten it with the screwdriver for revision/resection prostheses (Ref. 120540405). When tightening the screw, use the non-rotation device (Ref. 120540412), which fits into the Morse taper, to prevent rotation during assembly. (FIG.8)

The locking screw ensures additional anchoring between the distal and proximal components, as well as holding the Morse taper.

Insert the definitive head (corresponding to the trial used) by impacting it with the appropriate adaptor for head impactor 36mm (Ref. 110380812) mounted on the head impactor (Ref. 110380800) and reduce the prosthesis.

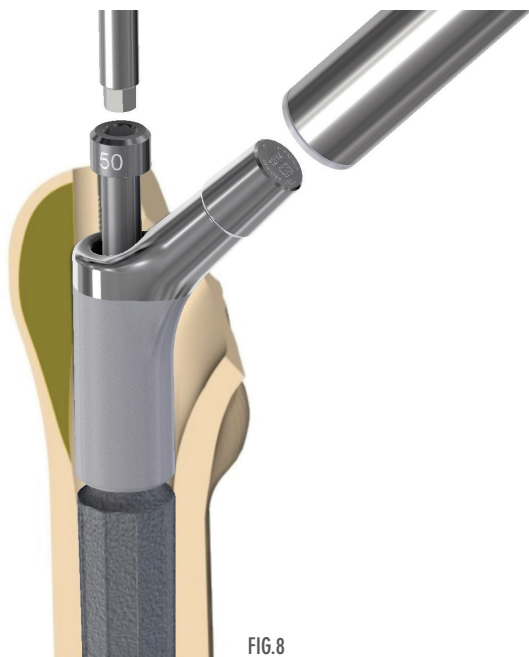


FIG.8

9 Extraction of SMR proximal component

Should it be necessary to extract the proximal component of the SMR stem, remove the locking screw, screw the extractor for revision proximal component (Ref. 120540420) into the locking screw hole and turn until it's fully extracted. (FIG. 9)

10 Extraction of SMR distal component

Should it be necessary to extract the distal component of the SMR Stem, use the instruments provided for the purpose.

Screw the extension for distal component extraction (Ref. 120540421)

Onto the distal component and use the slap hammer (Ref. 140030665) to extract it.

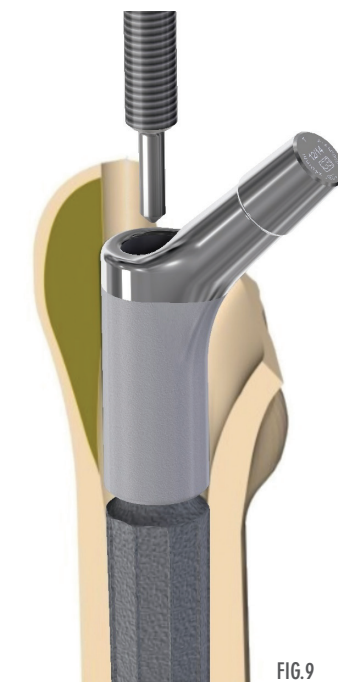
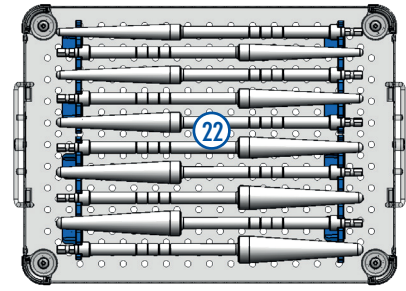
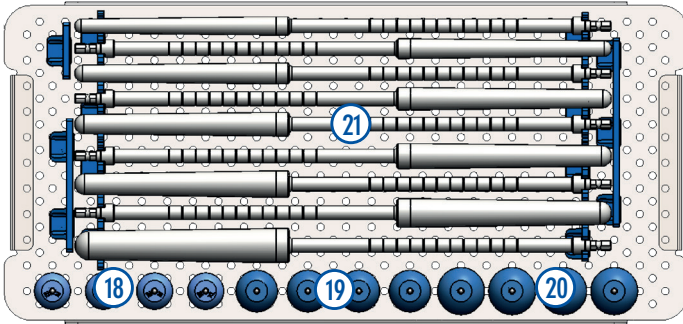
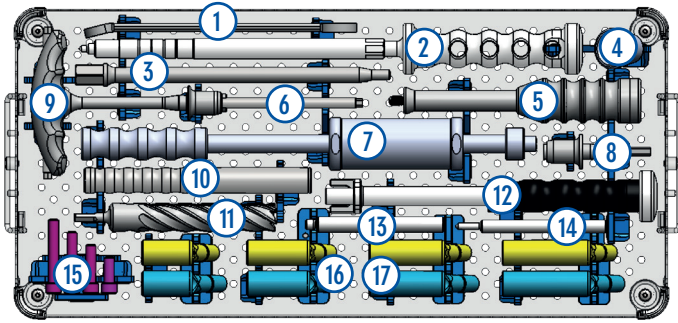


FIG.9



Tray and cover for instruments
SMR SYSTEM
REF: 120540650, 120540651

Tray and cover for instruments
SMR 100's
REF: 120540730

	DESCRIPTION	REF.	LENGTH	QNT
1	Wrench for distal inserter component	120540409	-	1
2	Inserter for distal component	120540410	-	1
3	Extensor for distal component extraction*	120540421*	-	1
4	Adaptor for head impactor 36mm*	110380812*	-	1
5	Head Impactor*	110380800*	-	1
6	Exagonal screw driver	120540405	-	1
7	Slap Hammer*	140030665*	-	1
8	Jacobs Adaptor*	110381525*	-	1
9	Manico a "T" Zimmer per alesatori	110381521	-	1
10	Non-rotation device	120540412	-	1
11	Tubular reamer	120540400	-	1
12	Impactor for proximal component	120540411	-	1
13	Guide shaft for tubular reamer	120540415	-	1
14	Extractor for proximal component	120540420	-	1
15	Vite per componente prossimale di prova	120540040	40	1
		120540050	50	1
		120540060	60	1
		120540070	70	1
16	Trial proximal component 135°	120540240	40	1
		120540250	50	1
		120540260	60	1
17	Trial proximal component 125°	120540270	70	1
		120540140	40	1
		120540140	50	1
18	28mm Trial Head	120540140	60	1
		120540140	60	1
		120540140	70	1

	DESCRIPTION	REF.	NECK	QNT
18	28mm Trial Head	110380860	S	1
			M	1
		110380880	L	1
19	32mm Trial Head	110380890	XL	1
		110380960	S	1
		110380970	M	1
20	36mm Trial Head	110380980	L	1
		110380990	XL	1
		110381060	S	1
21	Zimmer conical reamer L.160	110381070	M	1
		110381080	L	1
		110381090	XL	1

	DESCRIPTION	REF.	DIAM	QNT		
21	Zimmer conical reamer L.160	120540514	14mm	1		
		120540515	15mm	1		
		120540516	16mm	1		
		120540517	17mm	1		
		120540518	18mm	1		
		120540519	19mm	1		
		120540520	20mm	1		
		120540521*	21mm	1		
		120540522	22mm	1		
		120540524*	24mm	1		
		22	Zimmer conical reamer L.100	120540714	14mm	1
				120540715	15mm	1
120540716	16mm			1		
120540717	17mm			1		
120540718	18mm			1		
120540719	19mm			1		
120540720	20mm			1		
120540721	21mm			1		
120540722	22mm			1		
120540724	24mm			1		

*Upon request

SMR PROXIMAL COMPONENT

REF.	CCD	LENGTH
120362540	125°	40mm
120362550	125°	50mm
120362560	125°	60mm
120362570	125°	70mm
120363540	135°	40mm
120363550	135°	50mm
120363560	135°	60mm
120363570	135°	70mm

SMR FILLING PROXIMAL COMPONENT

REF.	CCD	LENGTH
120372540	125°	40mm
120372550	125°	50mm
120372560	125°	60mm
120372570	125°	70mm
120373540	135°	40mm
120373550	135°	50mm
120373560	135°	60mm
120373570	135°	70mm

SMR LOCKING SCREW

REF.	LENGTH
120376140	40mm
120376150	50mm
120376160	60mm
120376170	70mm

SMR CORTICAL SCREW DIAM 4.5MM

REF.	LENGTH
200146030	30mm
200146034	34mm
200146038	38mm
200146042	42mm
200146046	46mm
200146050	50mm

SMR DISTAL COMPONENT

REF.	LENGTH	DIAM
120373914	100mm	14mm
120373915	100mm	15mm
120373916	100mm	16mm
120373917	100mm	17mm
120373918	100mm	18mm
120373919	100mm	19mm
120373920	100mm	20mm
120373921	100mm	21mm
120373922	100mm	22mm
120373924*	100mm	24mm

REF.	LENGTH	DIAM
120374014	160mm	14mm
120374015	160mm	15mm
120374016	160mm	16mm
120374017	160mm	17mm
120374018	160mm	18mm
120374019	160mm	19mm
120374020	160mm	20mm
120374021*	160mm	21mm
120374022	160mm	22mm
120374024*	160mm	24mm

REF.	LENGTH	DIAM
120375014	200mm	14mm
120375015	200mm	15mm
120375016	200mm	16mm
120375017	200mm	17mm
120375018	200mm	18mm
120375019	200mm	19mm
120375020	200mm	20mm
120375021*	200mm	21mm
120375022	200mm	22mm
120375024*	200mm	24mm

REF.	LENGTH	DIAM
120376014	240mm	14mm
120376015	240mm	15mm
120376016	240mm	16mm
120376017	240mm	17mm
120376018	240mm	18mm
120376019	240mm	19mm
120376020	240mm	20mm
120376021*	240mm	21mm
120376022	240mm	22mm
120376024*	240mm	24mm

SMR RESECTION DISTAL COMPONENT

REF.	LENGTH	DIAM
110266022	140mm	12mm
110266024	160mm	12mm
110266026*	180mm*	12mm*
110266030	140mm	13mm
110266032	160mm	13mm
110266034	180mm	13mm
110266038	140mm	14mm
110266040	160mm	14mm
110266042	180mm	14mm
110266046	160mm	16mm
110266048	180mm	16mm

OPTIONAL UPON REQUEST

FEMORAL HEAD CRCO
DIAM. 22.2mm, CONE 12/14

REF.	NECK	R.I.C.
110207105E	S	-2.0mm
110207110E	M	0mm
110207115E	L	+2.0mm

FEMORAL HEAD CRCO
DIAM. 28mm, CONE 12/14

REF.	NECK	R.I.C.
110210105E	S	-3.5mm
110210110E	M	0mm
110210115E	L	+3.5mm
110210120E	XL	+7.0mm
110210125E	XXL	+11mm

FEMORAL HEAD STAINLESS STEEL
DIAM. 28mm, CONE 12/14

REF.	NECK	R.I.C.
110205105E	S	-3.5mm
110205110E	M	0mm
110205115E	L	+3.5mm
110205120E	XL	+7.0mm
110205125E	XXL	+11mm

FEMORAL HEAD BIOLOX® DELTA
DIAM. 28mm, CONE 12/14

REF.	NECK	R.I.C.
110240205	S	-3.5mm
110240210	M	0mm
110240215	L	+3.5mm

FEMORAL HEAD ZTA CERAMIC
DIAM. 28mm, CONE 12/14

REF.	NECK	R.I.C.
110240605	S	-3.5mm
110240610	M	0mm
110240615	L	+3.5mm

FEMORAL HEAD CRCO
DIAM. 32mm, CONE 12/14

REF.	NECK	R.I.C.
110207105E	S	-4.0mm
110220110E	M	0mm
110207115E	L	+4.0mm
110207120E	XL	+7.0mm

FEMORAL HEAD STAINLESS STEEL
DIAM. 32mm, CONE 12/14

REF.	NECK	R.I.C.
110205205E	S	-4.0mm
110205210E	M	0mm
110205215E	L	+4.0mm
110205220E	XL	+7.0mm

FEMORAL HEAD BIOLOX® DELTA
DIAM. 32mm, CONE 12/14

REF.	NECK	R.I.C.
110240305	S	-4.0mm
110240310	M	0mm
110240315	L	+4.0mm
110240320	XL	+7.0mm

FEMORAL HEAD ZTA CERAMIC
DIAM. 32mm, CONE 12/14

REF.	NECK	R.I.C.
110240625	S	-4.0mm
110240630	M	0mm
110240635	L	+4.0mm
110240640	XL	+7.0mm

FEMORAL HEAD CRCO
DIAM. 36mm, CONE 12/14

REF.	NECK	R.I.C.
110367705	S	-4.0mm
110367710	M	0mm
110367715	L	+4.0mm
110367720	XL	+8.0mm

FEMORAL HEAD BIOLOX® DELTA
DIAM. 36mm, CONE 12/14

REF.	NECK	R.I.C.
110240405	S	-4.0mm
110240410	M	0mm
110240415	L	+4.0mm
110240420	XL	+8.0mm

FEMORAL HEAD ZTA CERAMIC
DIAM. 36mm, CONE 12/14

REF.	NECK	R.I.C.
110240655	S	-4.0mm
110240660	M	0mm
110240665	L	+4.0mm
110240670	XL	+8.0mm

Website

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IFU

Use the QR-Code to view complete product informations, including instructions for use, indications and contraindications, precautions and warnings



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GRUPPO BIOIMPIANTI S.R.L.

Via Liguria 28, 20068 Peschiera Borromeo (Milan) Italy

Tel. +39 02 51650371 - Fax +39 02 51650393

info@bioimpianti.it

infofrance@bioimpianti.it

bioimpianti.it