

PULCHRA

Universal mini-invasive stem

ADLER[®]
ORTHO

**SURGICAL
TECHNIQUE**



PULCHRA STEM.

The PULCHRA stem is an implant with metaphyseal grip requiring low invasiveness and extremely versatile.

The implant employs the MODULA® system in order to reconstruct optimum joint biomechanics.

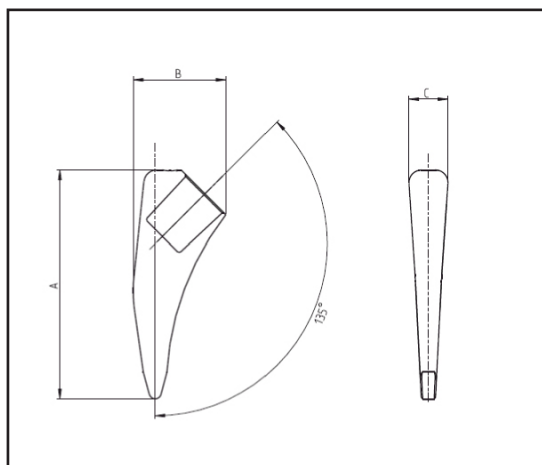
The implant surface features the three-dimensional Ti-Por® structure (Fig. A) that, thanks to its extreme roughness, further increases the primary stability and consequently bone regrowth.

PULCHRA is manufactured using a highly innovative technology, using titanium powders solidified by an electron beam.



Close up of the Ti-Por® surface. This is not a coating, the structure is constructed in a single piece with its substrate.

Sizes and Dimensions



ITEM DESCRIPTION	A	B	C
PULCHRA UNCEMENTED STEM SIZE 0 STANDARD	78,4	33,3	14,7
PULCHRA UNCEMENTED STEM SIZE 0 OFFSET	78,4	33,3	14,7
PULCHRA UNCEMENTED STEM SIZE 1	82,7	34	15
PULCHRA UNCEMENTED STEM SIZE 2	81,2	34,1	15
PULCHRA UNCEMENTED STEM SIZE 3	81,2	34,2	15,1
PULCHRA UNCEMENTED STEM SIZE 4	82,7	34,5	15,2
PULCHRA UNCEMENTED STEM SIZE 5	83,2	35,3	15,3
PULCHRA UNCEMENTED STEM SIZE 6	85,4	36,4	15,4
PULCHRA UNCEMENTED STEM SIZE 7	87,5	37,5	15,5
PULCHRA UNCEMENTED STEM SIZE 8	89,5	38,9	15,9
PULCHRA UNCEMENTED STEM SIZE 9	91,2	40,2	16,5
PULCHRA UNCEMENTED STEM SIZE 10	93,6	41,8	17,2

Indications and Contraindications.

Note: The following are guidance notes. The indications for the use of a particular implant will still need to be decided by the operator based on their experience and direct knowledge of the specific clinical case being treated.

Indications.

- Primary and secondary osteoarthritis of the coxo-femoral joint.
- Avascular and post-traumatic necrosis of the femoral head.
- Mild hip dysplasia
- Fractures of the femoral neck.

Contraindications.

- Infections in place.
- Metabolic disorders or autoimmune diseases that make unsuitable the use of a cementless implant.
- Patients with excessive osteoporosis.
- Severe hip dysplasia.

PRE-OPERATIVE PLANNING.



Fig.1

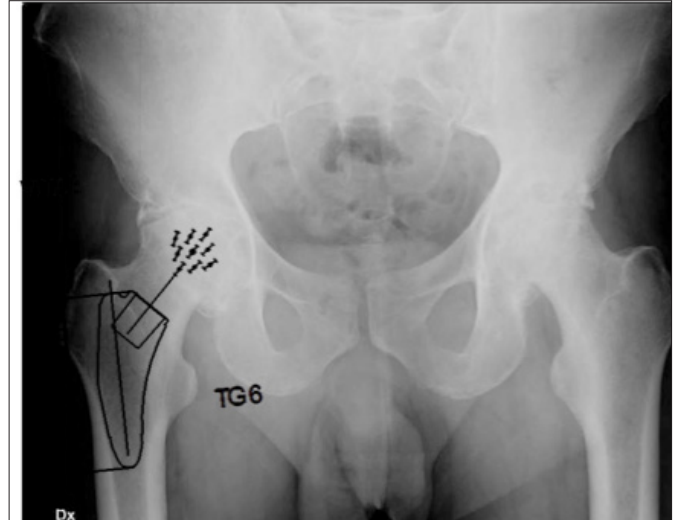


Fig.2

Accurate preoperative planning requires the x-rays of the joint being operated from the anterior-posterior as well as the mediolateral side, as well as a radiographic frontal image of the whole pelvis.

The level of the femoral resection and the sizing of the stem to be used will be determined by the surgeon using a template, available in both traditional and digital formats.

The surgeon must select the size of the stem which, in his opinion, better fills the femoral metaphysis.

Once the size of the system has been determined, the anatomy of the patient (offset and length and, if necessary, anteversion or retroversion) can be accurately reconstructed, thanks to the various options offered by the Modula® modular system.

Further adjustments can be made, after having selected the most suitable modular neck for the patient, to the offset and length with the three options of femoral heads (Fig.1, 2, 3) available.

The PULCHRA Stem can be implanted using all surgical approaches.

The surgeon can therefore position the patient as required and follow the most suitable surgical access.

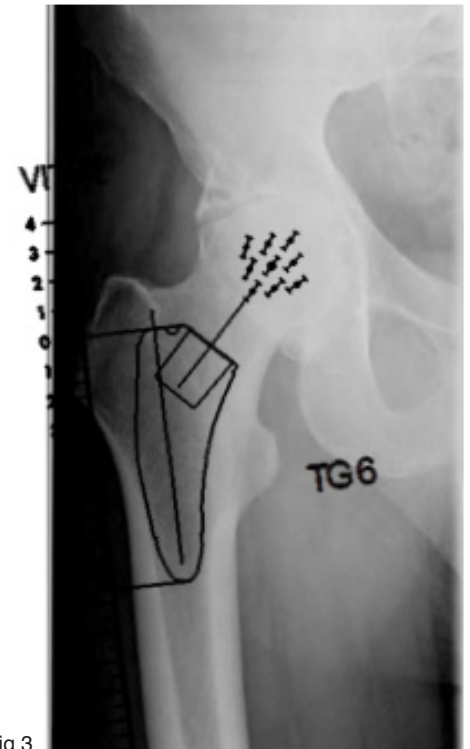


Fig.3

SURGICAL TECHNIQUE

1. Femoral Head resection

Generally speaking the PULCHRA stem requires a resection of about 2-3 cm proximal to the lesser trochanter and inclined approximately 45°, relative to the axis of the diaphysis (Fig. 4, Fig 5).

The proper level of resection must be determined by the surgeon based on his experience and the type of patient being operated.

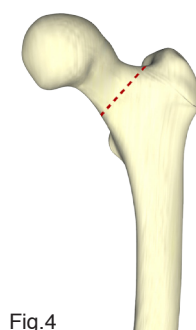


Fig.4

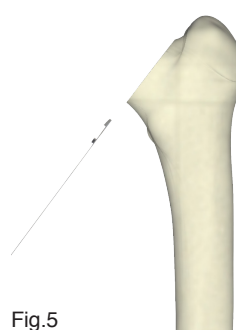


Fig.5



Fig.6

2. Box Chisel

After performing the osteotomy of the neck, a box chisel is used in order to eliminate the residual lateral-most surface of the neck and expose the femoral metaphysis (Fig.6).

The instrument set contains a smaller box chisel to be used as shown in the figure (Fig. 6A) and that can be useful in case of particularly sclerotic bone or if there are particular anatomies.

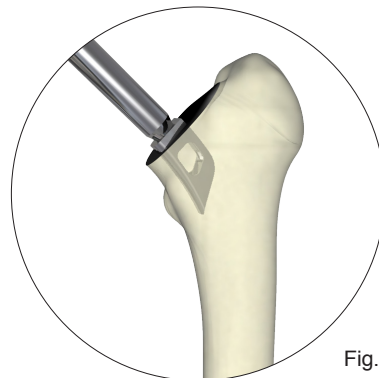


Fig.6 A

3. Smooth impactor 0.

Preparation of the femoral metaphysis.

The first tool is a smooth monoblock impactor size 0. This tool has the function of impacting the cancellous bone of the femoral metaphysis and does not remove tissue.

The surgeon must make sure that the impactor handle is parallel to the femoral diaphysis.

This ensures the correct varus/valgus positioning of the instrument (Fig. 7 and 7A).



Fig.7

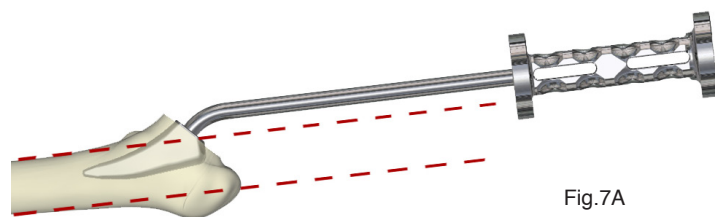


Fig.7A

4. Monoblock rasp 0.

Subsequently the monoblock rasp 0 is used as shown in figure (Fig.8 and 8A).

The rasp 0, as with subsequent modular rasps, must be pushed in the femoral metaphysis until its proximal border does not coincide with the level of the osteotomy. Always make sure that the axis of the rasp handle is parallel with the axis of the femoral diaphysis.



Fig.8

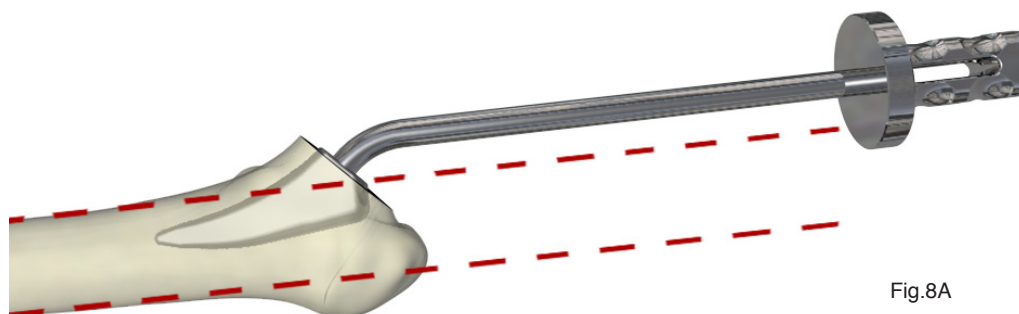


Fig.8A

5.Final Rasps



Fig.9



Fig.10

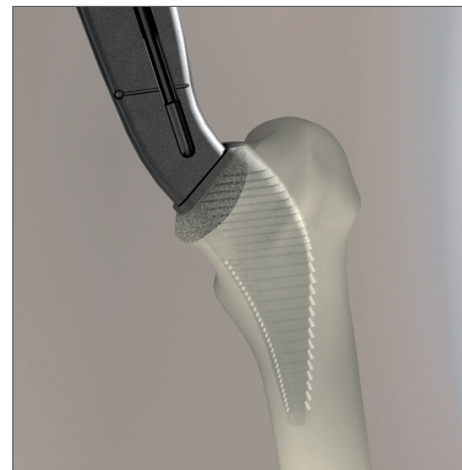
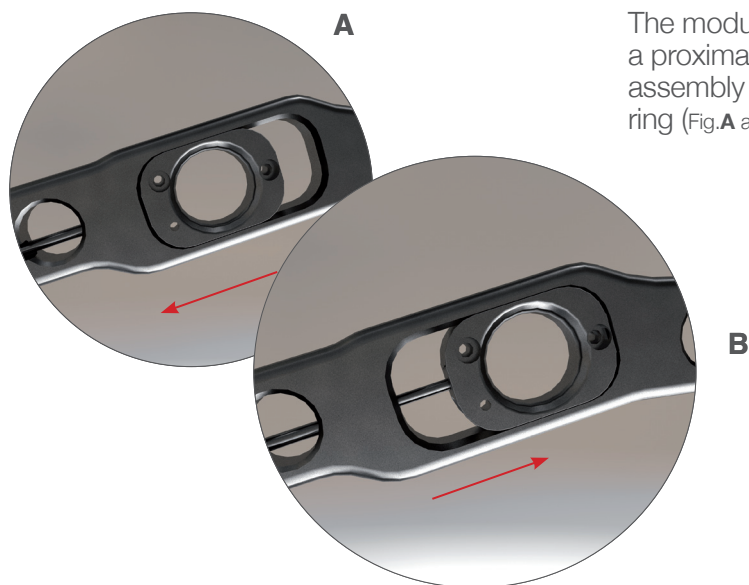


Fig.11

Rasping is performed by inserting the smaller modular rasp (size 1) first and then gradually moving up to the larger ones (size 2 and following). (Fig.9;10;11) Rasps should be introduced in the neutral position, neither varus or valgus, and impacted with care. (Fig.A e B)



The modular handle features a proximal system with assembly / disassembly ring (Fig.A and B).

The surgeon must gradually increase the size of the rasps until he achieves the size determined during preoperative planning and, in any case, until the metaphysis is filled acceptably and a suitable primary stability is achieved.

6.Trial Reduction – Modular Stems (Sizes 1-10).



Fig.12

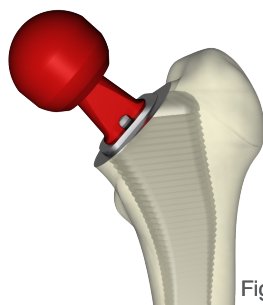


Fig.12A

If desired the last rasp can be used for the trial reduction. This is obtained by leaving the latter in situ and releasing the modular handle.

The modular neck chosen in planning will be housed in the proximal slot of the rasp.

After having placed the most appropriate trial head the trial reduction can be performed as well as execute all assessments such as joint stability, range of motion and limb length. (Fig. 12: 12A).

The PULCHRA stem is characterized by the linear system of Modula® modular necks, which will be described in a specific section of this surgical technique.

6A Trial Reduction – Monolithic Stems (Size 0)

The Pulchra stem smallest size (Size 0) is monolithic and it's available in two options: "Standard and "Offset". The latter provides an higher degree of lateralization. In case the Surgeon decides to use that size he'll have to perform the trial reduction employing the size 0 smooth trial stem. This trial stem can be positioned in the medullary canal employing the modular broach handle. (Fig. 12B)

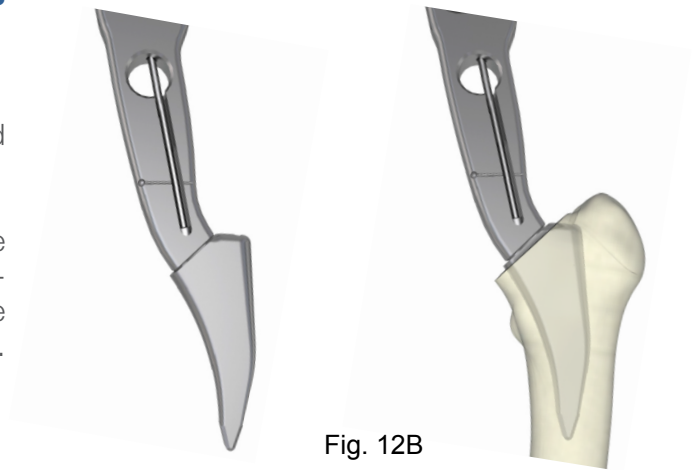


Fig. 12B

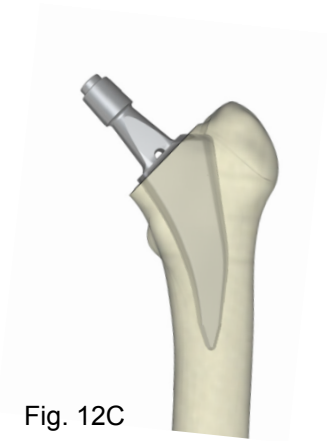


Fig. 12C

After broach handle removal the surgeon will have to choose the modular trial neck that's better fitting the patient anatomy.(Fig.12C).

The surgeon will have a choice between:
"Standard" Trial neck – COLOR GREY
"Offset" Trial neck – COLOR BLACK

The Black Trial "Offset" neck allows, with respect to the Grey Trial "Standard" neck to increase stem lateralization by 5mm without changing the leg length. (Fig 12D)

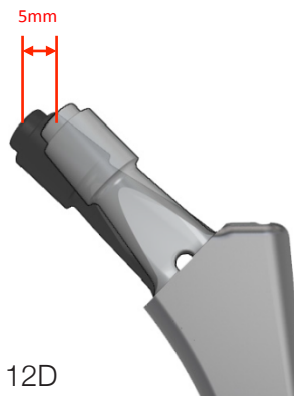


Fig 12D

7. Final Implant.

The definitive stem implanted by the surgeon must have the same measurement as the last rasp used.

There are two different types of stem impactors in the instrumentation set.

One impactor engages on the proximal slot of the stem (Fig. 13), whilst the other impactor is attached to the stem with the threaded hole in the proximal part of the implant (Fig. 13A and 13B).

This latter impactor can also be used as an extraction instrument of the implant itself.

The surgeon must take care to impact the final system without rotation and without excessive hammering.

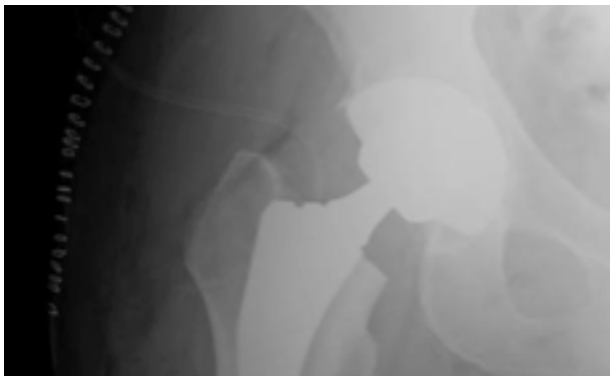


Fig.13



Fig.13 A



Fig.13 B

Modular neck extractor.

The instrument used for the extraction of the modular neck consists of a fork and a handle with a spherical tip (Fig.14). The extraction is performed by using the antero-posterior fins on the modular neck as support, thanks to the principle of the inclined plane. The system has the advantage of exercising the extraction force in a perfectly axial direction in relation to the taper and thus minimizing the stress on the stem (Fig. 15).

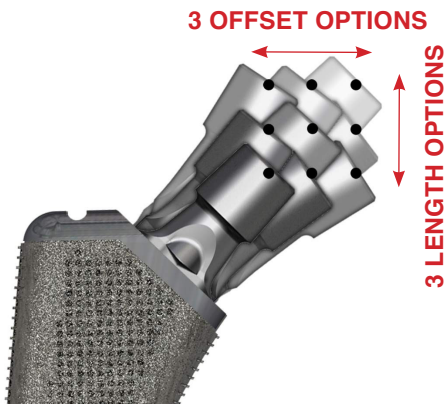


The extraction fork can be applied on the stem both MEDIALY and laterally and is therefore compatible with all types of surgical access.



MODULA® System LOGICAL, SIMPLE, COMPLETE

Logical



Frontal view of MODULA® matrix. The surgeon can choose among three offset and length options

Modula® is a unique system based on a three dimensional linear square matrix. On the frontal plane it has 9 equidistant positions. The surgeon can then move independently on two axes:

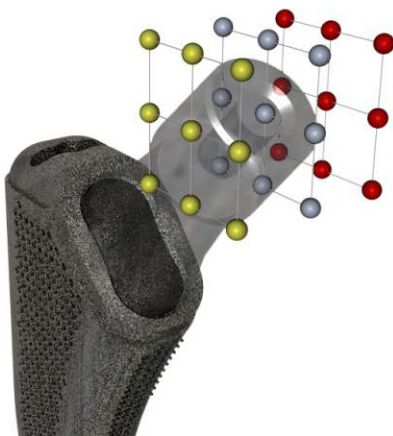
- Vertical for length regulation.
- Horizontal for offset regulations.

Simple



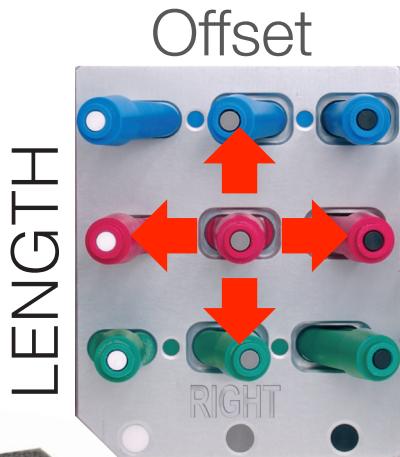
The trial necks are housed on a white support reproducing the square matrix on the frontal plane and helps the surgeon in the choice. Two further supports are available for housing the anteverted and retroverted necks.

Complete



15 different necks can cover all 27 points of the three-dimensional matrix. Combining the options offered by the modular necks with those of the heads the operator has 81 different options for the accurate reconstruction of joint biomechanics.





The possibilities of movement for the surgeon starting from the central neck on the matrix.

To choose the ideal neck only three steps:

- **Starting neck:** thanks to the preoperative planning you can choose the starting neck for trial reduction or you can choose to start from the central neck of the matrix
- **Determination of the ideal combination offset/length:** starting from the neck of departure (e.g.: central neck), the surgeon can modify only the offset acting on the horizontal plan of the matrix or only the length acting on the vertical plan.
- **Optimization:** the surgeon can still optimize the result achieved by using the three available options of heads.

If during the trial reduction there is risk of impingement, the surgeon can choose an anteverted or retroverted neck corresponding to the neutral already defined without changing the combination of offset and length chosen.

Colour Code

The trial necks are coloured on the frontal plane according to their length:

Blue: Long Neck;

Red: Medium neck;

Green: Short neck;

The same colours are displayed on the trial necks lodging plate. The tip of the necks use a colour code identifying the offset:

White: Minus Offset;

Grey: Medium Offset;

Black: Plus Offset.

These colours are also shown on the trial necks lodging plate.

Two further colours:

Yellow

Red

Yellow and Red, are used to identify the anteverted and retroverted options.



IMPLANTS SET

CODE	DESCRIPTION
0109200	PULCHRA STEM UNCEMENTED SIZE 1 0 STANDARD
0109300	PULCHRA STEM UNCEMENTED SIZE 1 0 OFFSET
0109101	PULCHRA STEM UNCEMENTED SIZE 1
0109102	PULCHRA STEM UNCEMENTED SIZE 2
0109103	PULCHRA STEM UNCEMENTED SIZE 3
0109104	PULCHRA STEM UNCEMENTED SIZE 4
0109105	PULCHRA STEM UNCEMENTED SIZE5
0109106	PULCHRA STEM UNCEMENTED SIZE 6
0109107	PULCHRA STEM UNCEMENTED SIZE 7
0109108	PULCHRA STEM UNCEMENTED SIZE 8
0109109	PULCHRA STEM UNCEMENTED SIZE 9
0109110	PULCHRA STEM UNCEMENTED SIZE 10



CODE	DESCRIPTION	SIZE	
0514281	DELTA CERAMIC HEAD	DIAM.28	SHORT
0514282	DELTA CERAMIC HEAD	DIAM.28	MEDIUM
0514283	DELTA CERAMIC HEAD	DIAM.28	LONG
0514321	DELTA CERAMIC HEAD	DIAM.32	SHORT
0514322	DELTA CERAMIC HEAD	DIAM.32	MEDIUM
0514323	DELTA CERAMIC HEAD	DIAM.32	LONG
0514361	DELTA CERAMIC HEAD	DIAM.36	SHORT
0514362	DELTA CERAMIC HEAD	DIAM.36	MEDIUM
0514363	DELTA CERAMIC HEAD	DIAM.36	LONG
0514401	DELTA CERAMIC HEAD	DIAM.40	SHORT
0514402	DELTA CERAMIC HEAD	DIAM.40	MEDIUM
0514403	DELTA CERAMIC HEAD	DIAM.40	LONG
0540321	Cr-Co-Mo HEAD	DIAM.32	SHORT
0540322	Cr-Co-Mo HEAD	DIAM.32	MEDIUM
0540323	Cr-Co-Mo HEAD	DIAM.32	LONG
0540361	Cr-Co-Mo HEAD	DIAM.36	SHORT
0540362	Cr-Co-Mo HEAD	DIAM.36	MEDIUM
0540363	Cr-Co-Mo HEAD	DIAM.36	LONG
0540401	Cr-Co-Mo HEAD	DIAM.40	SHORT
0540402	Cr-Co-Mo HEAD	DIAM.40	MEDIUM
0540403	Cr-Co-Mo HEAD	DIAM.40	LONG
0520281	Cr-Co-Mo HEAD	DIAM.28	SHORT
0520282	Cr-Co-Mo HEAD	DIAM.28	MEDIUM
0520283	Cr-Co-Mo HEAD	DIAM.28	LONG

MODULA® NECK S.F

0460110	MODULA® NECK S.F	12/14	0X
0460210	MODULA® NECK S.F	12/14	0A
0460220	MODULA® NECK S.F	12/14	0Y
0460310	MODULA® NECK S.F	12/14	0B
0460320	MODULA® NECK S.F	12/14	0C
0460330	MODULA® NECK S.F	12/14	0Z
0469110	MODULA® NECK S.F	12/14	9X
0469120	MODULA® NECK S.F	12/14	9AA
0469130	MODULA® NECK S.F	12/14	9BB
0469210	MODULA® NECK S.F	12/14	9A
0469220	MODULA® NECK S.F	12/14	9Y
0469230	MODULA® NECK S.F	12/14	9CC
0469310	MODULA® NECK S.F	12/14	9B
0469320	MODULA® NECK S.F	12/14	9C
0469330	MODULA® NECK S.F	12/14	9Z

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INSTRUMENTATION SET

IH28000	TRIAL HEAD	DIAM. 28 CC
IH28100	TRIAL HEAD	DIAM. 28 CM
IH28200	TRIAL HEAD	DIAM. 28 CL
IH32000	TRIAL HEAD	DIAM. 32 CC
IH32100	TRIAL HEAD	DIAM. 32 CM
IH32200	TRIAL HEAD	DIAM. 32 CL
IH36400	TRIAL HEAD	DIAM. 36 CC
IH36500	TRIAL HEAD	DIAM. 36 CM
IH36600	TRIAL HEAD	DIAM. 36 CL
IH40000	TRIAL HEAD	DIAM. 40 CC
IH40100	TRIAL HEAD	DIAM. 40 CM
IH40200	TRIAL HEAD	DIAM. 40 CL
IL01000	PULCHRA BROACH	TG. 1
IL01009	PULCHRA BROACH	TG. 2
IL01010	PULCHRA BROACH	TG. 3
IL01011	PULCHRA BROACH	TG. 4
IL01012	PULCHRA BROACH	TG. 5
IL01013	PULCHRA BROACH	TG. 6
IL01014	PULCHRA BROACH	TG. 7
IL01015	PULCHRA BROACH	TG. 8
IL01016	PULCHRA BROACH	TG. 9
IL01017	PULCHRA BROACH	TG. 10
IL01018	PULCHRA BROACH	TG. 18
IG01000	ALATA STEMS IMPACTOR HANDLE	
IG03000	ALATA STEMS IMPACTOR	
IC05400	DIAPASN HAMMER 900GR 15MM OPENING	
IV01200	PULCHRA BROACH SZ. 0 WITH HANDLE	
IC10302	STEM IMPACTOR HANDLE SLEEVE	
IC11601	STEM IMPACTOR HANDLE M5 THREAD.	
IC00300	UNIVERSALE HANDLE	
IC08300	STEM IMPACTOR HANDLE	
IC02400	NECK IMPACTOR	
IC02200	RASP EMERGENCY EXTRACTOR	
IC00400	THREADED STEM EXTRACTOR	
IC06500	STRAIGHT BOX CHISEL	
IM07702	SPHERIC HEAD IMPACTOR FOR NECK EXTRACTION FORK	
IC00500	HEAD IMPACTOR	
IM07701	NECK EXTRACTOR FORK	
IM07704	NECK EXTRACTOR FORK H2mm	
IC10500	BROACH HANDLE TRS EVO	
IV02800	PULCHRA STEM SIZE 0 TRIAL STEM	
IV02900	PULCHRA SIZE 0 STANDARD TRIAL NECK	
IV02910	PULCHRA SIZE 0 OFFSET TRIAL NECK	
IM00100	MODULA NECK S.C. 12/14 0B BLU t. WHT L	
IM00200	MODULA NECK S.C. 12/14 0C BLU t. GRY L	
IM00300	MODULA NECK S.C. 12/14 0Z BLU t. BLK L	
IM00400	MODULA NECK S.C. 12/14 0A RED t. WHT M	
IM00500	MODULA NECK S.C. 12/14 0Y RED t. GRY M	
IM00600	MODULA NECK S.C. 12/14 0C RED t. BLK M	
IM00700	MODULA NECK S.C. 12/14 0X GRN t. WHT S	
IM00800	MODULA NECK S.C. 12/14 0A GRN t. GRY S	
IM00900	MODULA NECK S.C. 12/14 0B GRN t. BLK S	
IM01100	MODULA NECK S.C. 12/14 9B BLU t. WHT p. YLW L	
IM01200	MODULA NECK S.C. 12/14 9C BLU t. GRY p. YLW L	
IM01300	MODULA NECK S.C. 12/14 9Z BLU t. BLK p. YLW L	
IM01400	MODULA NECK S.C. 12/14 9A RED t. WHT p. YLW M	
IM01500	MODULA NECK S.C. 12/14 9Y RED t. GRY p. YLW M	
IM01600	MODULA NECK S.C. 12/14 9CC RED t. BLK p. YLW M	
IM01700	MODULA NECK S.C. 12/14 9X GRN t. WHT p. YLW S	
IM01800	MODULA NECK S.C. 12/14 9AA GRN t. GRY p. YLW S	
IM01900	MODULA NECK S.C. 12/14 9BB GRN t. BLK p. YLW S	
IM02100	MODULA NECK S.C. 12/14 9BB BLU t. WHT p. RED	
IM02200	MODULA NECK S.C. 12/14 9CC BLU t. GRY p. RED L	
IM02300	MODULA NECK S.C. 12/14 9Z BLU t. BLK p. RED L	
IM02400	MODULA NECK S.C. 12/14 9AA RED t. WHT p. RED M	
IM02500	MODULA NECK S.C. 12/14 9Y RED t. GRY p. RED M	
IM02600	MODULA NECK S.C. 12/14 9C RED t. BLK p. RED M	
IM02700	MODULA NECK S.C. 12/14 9X GRN t. WHT p. RED S	
IM02800	MODULA NECK S.C. 12/14 9A GRN t. GRY p. RED S	
IM02900	MODULA NECK S.C. 12/14 9B GRN t. BLK p. RED S	
IM03100	TRAY MODULA NECK S.C. RIGHT/LEFT GRAY	
IM03200	TRAY MODULA NECK S.C. ANTI RIGHT/RETRO LEFT RED	
IM03300	TRAY MODULA NECK S.C. RETRO RIGHT/ANTI LEFT YELLOW	
IM03100	TRAY COLLI DI PROVA RIGHT/LEFT GRAY	
IM03200	TRAY COLLI DI PROVA ANTI RIGHT/RETRO LEFT RED	
IM03300	TRAY COLLI DI PROVA RETRO RIGHT/ANTI LEFT YELLOW	



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PULCHRA 11-2013