Half Rings

Part No.	Internal Dia
D 100000080	80
D 100000100	100
D 100000110	110
D 100000120	120
D 100000130	130
D 100000140	140
D 100000150	150
D 100000160	160
D 100000180	180
D 100000200	200
D 100000220	220
D 100000240	240

Titanium Half Ring

Part No.	Internal Dia
D 219000080	80
D 219000100	100
D 219000110	110
D 219000120	120
D 219000130	130
D 219000140	140
D 219000150	150
D 219000160	160
D 219000180	180
D 219000200	200
D 219000220	220
D 219000240	240

Aluminium Half Ring

Part No.	Internal Dia
D 229000080	80#
D 229000100	100#
D 229000110	110#
D 229000120	120#
D 229000130	130#
D 229000140	140
D 229000160	160
D 229000180	180
D 229000200	200
D 229000220	220

Rings with Curved Extremities

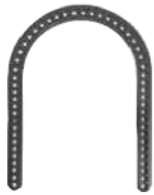
Part No.	Internal Dia
D 105000120	120
D 105000130	130
D 105000150	150
D 105000160	160

Aluminium 2/3 Rings

Part No.	Internal Dia
D 230000140	140
D 230000160	160
D 230000180	180
D 230000200	200
D 230000220	220

Aluminium Conventional Foot Rings Short Arm

Part No.	Internal Dia
D 234000120	120
D 234000140	140
D 234000160	160
D 234000180	180



Aluminium Foot Ring

Part No.	Internal Dia
D 231000120	120
D 231000140	140
D 231000160	160
D 231000180	180
D 231000200	200
D 231000220	220

Aluminium Conventional Foot Rings Long Arm

Part No.	Internal Dia
D 235000120	120
D 235000140	140
D 235000160	160
D 235000180	180

#

5/8 Rings

Part No.	Internal Dia.
D 102000100	100 #
D 102000110	110 #
D 102000120	120 #
D 102000130	130
D 102000140	140 #
D 102000150	150
D 102000160	160
D 102000180	180 #
D 102000200	200 #
D 102000220	220 #
D 102000240	240 #

#

Titanium 5/8 Ring

Part No.	Internal Dia
D 232000080	80
D 232000100	100
D 232000110	110
D 232000120	120
D 232000130	130
D 232000140	140
D 232000150	150
D 232000160	160
D 232000180	180
D 232000200	200
D 232000220	220
D 232000240	240

Arches with Holes

Part No.	Internal Radius
D 110000090	90
D 110000110	110
D 110000120	120 #
D 110000140	140

Italian Femoral Arches

Part No.	Description
D 108000190	90° Small
D 108001120	120° Small
D 108000390	90° Large
D 108003120	120° Large

Italian Femoral Arches with hole

Part No.	Description
D 228000190	90° Small
D 228001120	120° Small
D 228000390	90° Large
D 228003120	120° Large

Threaded Rods

Part No.	Length
D 111000040	40
D 111000060	60
D 111000080	80
D 111000100	100
D 111000120	120
D 111000150	150
D 111000200	200
D 111000250	250
D 111000300	300
D 111000350	350
D 111000400	400

Threaded Rods - Slotted

Part No.	Length
D 112000040	40
D 112000060	60
D 112000080	80
D 112000100	100

Threaded Rods - Partial

Part No.	Length
D 113000060	60 #
D 113000130	130
D 113000170	170
D 113000210	210

Telescopic Rods

Part No.	Length
D 114000060	60#
D 114000100	100
D 114000150	150
D 114000200	200
D 114000250	250
D 114000300	300#
D 114000350	350#
D 114000400	400#

Graduated Telescopic Rods

Part No.	Length
D 115000060	60
D 115000100	100
D 115000150	150
D 115000200	200
D 115000250	250

Hinges- Female

Part No.	Description
D 123000001	Standard
D 123000002	Low Profile

Hinges - Male

Part No.	Description
D 124000001	Standard
D 124000002	Low Profile

Hinges - 90

Part No.	Description
D 125000190	Standard
D 125000290	Low Profile

Post - Female

Part No.	Holes
D 121000002	2
D 121000003	3
D 121000004	4

Knurling post male

Part No. D242000000

Cannulated knurling bolt

Part No. D243000000

Post - Male

Part No.	Holes
D 122000002	2
D 122000003	3
D 122000004	4

Universal Joint

Part No. D 177001000

Rotational and Translational Device

Part No. D 179001000

Short Connection Plates

Part No.	Length	Holes
D 131000235	35	2
D 131000345	45	3
D 131000455	55	4
D 131000565	65	5
D 131000675	75	6
D 131000785	85	7
D 131000895	95	8
D 131009105	105	9
D 131010115	115	10

Long Connection Plates

Part No.	Length	Holes
D 133008155	155	8
D 133012235	235	12
D 133017335	335	17

Connected Plates with Threaded Ends

Part No.	Length	Holes
D 135005135	135	5
D 135007175	175	7
D 135009215	215	9
D 135011255	255	11

Twisted Plates

Part No.	Holes
D 140000245	2#
D 140000365	3
D 140000485	4

Curved Plates

Part No.	Holes
D 141000003	3

Bushing

Part No.	D 142000000

Threaded Sockets

Part No.	Holes
D 148000020	20
D 148000030	30
D 148000040	40
D 148000060	60

Connection Bolts

Part No.	Dia
D 149000010	10
D 149000016	16
D 149000020	20
D 149000030	30

Nut

Part No.	Description
D 150000006	Nut 6mm
D 150000013	Nut 13mm
D 151000000	Thin Nut
D 152000000	Nylon Insert Nut
D 153000000	Square Nut

Flat Sided Washers

Part No.	Thickness
D 156000020	2.0
D 156000040	4.0

Slotted washers

Part No.	Thickness
D 157000040	4.0

Spacing Washers

Part No.	Thickness
D 154000015	1.5
D 154000020	2.0

Split Locking Washers

Part No.	Thickness
D 155000020	2.0

Conical Washer Couple

Part No. D 158001000

Star Washers

Part No. D 159001000

Wire Fixation Bolts

Part No.	Description
D 163000000	Cannulated
D 164000000	Cannulated with Threaded Head
D 162000000	Slotted

Wire Fixation Buckle

Part No. D 169000000

Single Pin Fixation Bolt

Part No. D 167000000

Multiple Pin Fixation Clamp

Part No. D 168001000

Oblique Support Connection

Part No. D 180001000

Blocks For Half Pins

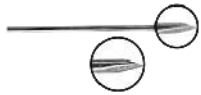
Part No.	Holes
D 176000001	1
D 176000002	2
D 176000003	3
D 176000004	4
D 176000005	5

Blocks For Half Pins to be used with Sleeves

Part No.	Holes
D 200000001	1
D 200000002	2
D 200000003	3
D 200000004	4
D 200000005	5

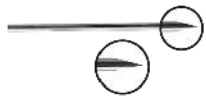
Sleeves

Part No.	Length
D 201000003	3mm#
D 201000004	4mm
D 201000005	5mm
D 201000006	6mm



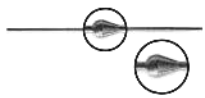
Wires : Bayonet Point - Cortical

Part No.	Dia
D 187015300	1.5
D 187018370	1.8



Wires : Trocar Point - Cancellous

Part No.	Dia
D 188015300	1.5
D 188018370	1.8



With Stopper (Bayonet Point)

Part. No.	Dia	Holes
D 189015300	1.5	300
D 189018400	1.8	400

Instruments for Block for Half Pins

Drill Guide & Trocar

Part No.	
D 507001000	Drill Guide 4.8 mm
D 508001000	Screw Guide 6 mm
D 509001000	Trocar 6 mm

Set Screw

Part No.	D 181000000

Straight Screw Driver for Set Screws

Part No.	
D 510001000	3mm Across Flat

90° Screw Driver for Set Screws

Part No.	
D 511001000	3mm Across Flat

Box Wrench for Nut

Part No. D 505001000

Box Wrench for Bolt

Part No. D 500001000

Combination Wrench

Part No.	Size
D 502101000	10mm
D 502131000	13mm
D 502191000	19mm

Wire Tensioner - Direct Measuring

Part No. D 503001000

Wire Tensioner - Mechanical

Part No. D 502001000

Corticotome

Part No.	Size
D 504001003	3mm
D 504001005	5mm
D 504001007	7mm
D 504001009	9mm

Half Pin Introducer

Part No. C 507001000

Container for Rings 80 to 130 mm

Part No. H 832001000

Container for Rings 140 to 180 mm

Part No. H 833001000

Container for Bolts, Nuts & Washers

Part No. H 827001000

Container for Plates

Part No. H 828001000

Container for Wires & Instruments

Part No. H 829001000

Container for Rods, Posts, Support & Hinges

Part No. H 830001000

Container for Telescopic Rod

Part No. H 831001000

Container for Rings 200 to 240 mm

Part No. H 825001000

Container for Special Rings & Arches

Part No. H 826001000

Container for Adult Tibial Basic Set

Part No. H 858001000

Container for Adult femoral Basic set

Part No. H 859001000

Container for Blocks for half pin components set

Part No. H 841001000

Container for Blocks for half pin components set

Part No. H 851001000

Container for Basic Instruments set

Part No. H 854001000

MAINTENANCE OF THE APPARATUS

The apparatus consists of various forms of stainless steel. It is very resistant to mechanical loading if properly assembled. Because the apparatus is used for a long time on patients, equipment integrity is of maximum concern. It is necessary to use a disinfectant cleaning solution that is well tolerated by the stainless steel material. It is also important to protect the equipment with a layer of neutral vaseline or to use a silicone spray that will not produce a skin reaction. The equipment is made to withstand repeated sterilisation using proper autoclaving techniques. At the end of surgery, unused portions of the apparatus should be cleaned well with soapy solution and brushed (especially the pieces which has holes and threaded rods). Equipment used on patients should not be reused since their integrity cannot be guaranteed. During use, the apparatus should be checked periodically for the surface discontinuities of the rings and arches in particular, cracks in or bending of the wires should also be checked. The pieces should be replaced if they are damaged in any way.

INDICATIONS

The device has been approved for the following indications:

1) Fracture fixation (Open & Closed)
2) Pseudoarthroses of long bones (Both congenital and acquired)
3) Limb lengthening by epiphyseal or metaphyseal distraction.
4) Correction of bony or soft tissue deformities.
5) Correction of bony or soft tissue defects.

The new external Ring Fixator developed using essentially a bloodless surgery technique, allows for the treatment of patients with complex diseases and bony defects that otherwise would have been unsuccessfully treated with traditional methods.

CONTRADICTIONS

1. Patients in whom cooperation or mental competence is lacking, thereby reducing patient compliance.

WARNING & PRECAUTIONS

PREOPERATIVE

1. Proper understanding of the device and technique are essential. Physicians are strongly encouraged to obtain instructions from experienced clinicians or to observe surgical application of the apparatus prior to initial use of the Ring Fixator.
2. Patient selection should be in accordance with the listed indications and contraindications for use of the Ring Fixator.
3. Preliminary frame assembly is recommended to reduce operative time and to assure an adequate supply of components before surgery.
4. Correction of varus, valgus, procuratum, and recurvatum movement of limb segments during distraction should be planned for preoperatively by selecting an appropriate prophylactic ring tilt and strategically positioning wires with stoppers, fulcrums and hinges.
5. All of the device components should be sterilized before use.

INTRAOPERATIVE

1. Wire placement requires strict anatomical consideration avoiding damage to nerves and vessels.
2. The proper wire diameter should be used to ensure sufficient wire strength and to maintain appropriate axial stiffness of the apparatus. The 1.8mm wires are usually recommended for the tibia and femur in normal adults, while the 1.5mm wire usually recommended for the upper limb and pediatric lower limbapplications.
3. The wire should be gently pushed through soft tissue, not drilled, to reduce the possibility of nerve or vessel injury.
4. Wire drilling of the bone should be done slowly to avoid heat necrosis of surrounding tissue and bone.
5. Caution should be used in handling the sharp tips of the wires. The tip of the wire should be held with a surgical sponge or soft cloth when clipped for removal. It is recommended that eye protection devices be worn by operating room personnel.
6. The diameter of the rings or assembled half rings are recommended to be used about 3cm larger than the maximum diameter of the operated limb segment. Ring sizes smaller or larger should not be used.
7. The wires should not be bent, scratched or marred during frame assembly. Bending can be avoided by using various types of washers to build the ring to the wire.
8. Appropriate tension should be applied to the regular wires: atleast 100kg. And no greater than 130kg.
9. Wires with stoppers or " olives " are not always placed under tension, depending upon the application.
10. The limb segments should be twisted carefully to verify completion of the corticotomy: The tibia should only be externally rotated to prevent undue traction on the peroneal nerve.
11. Proper fixation of components is essential. All wires and miscellaneous parts (bolts, rods, nuts, etc.) should be securely fastened with the appropriate instrument.

POSTOPERATIVE

1. Physiologic use of the affected limb and weight bearing when appropriate is advocated.
2. Meticulous wire-site care is crucial in reducing wire- tract infection. A suggested course is to surround the site with antiseptic soaked foam sponges. Persistent infection may necessitate wire removal.
3. The average recommended rate of bone or soft tissue distraction is 1mm/day, accomplished by 1/4mm movement every 6 hours. However, rates slower than this may be needed in situations of delayed consolidation, or faster than this in cases of premature consolidation of hinges are used.
4. Wire tension and frame integrity should be checked routinely. Some component bending or breakage may occur during use.
5. The patient should be instructed to report any adverse or unanticipated effects immediately to the physician. The patient should be instructed about apparatus distraction and adjustment.
6. Weekly to every other week post - operative follow-ups and radiographs are recommended during the distraction phase. This frequency may be reduced to monthly during the fixation phase.

POSSIBLE ADVERSE EFFECTS

1. Damage to nerves or vessels caused during insertion of the wires or during elongation of an anatomical segment.
2. Superficial or deep wire tract infection.
3. Edema or swelling ; possible compartment syndrome.
4. Joint contracture or loss of range of motion.
5. Septic arthritis and osteomyelitis.
6. Premature consolidation during bone elongation.
7. Loosening or breakage of the wires.
8. Poor result caused by patient non compliance.
9. Bone deformity.
10. Intractable pain.
11. Fracture of regenerated bone.
12. Joint subluxation or dislocation.
13. Foreign body reaction to wires or other components.
14. Tissue necrosis occuring during wire insertion.
15. Persistent drainage after wire removal; chronic wire site osteomyelitis.
16. Skin pressure problems caused by external components.
17. Limb length discrepancy.
18. Inadvertent injury to the patient or operating room personnel caused by the wire (eg. Projectile wire from tip cutting during surgery).

Manufactured against Special Order. Contact Mktg.Dept. for accurate delivery schedule.

Note : All composite carbon product range must be used with washers on either end for the expected performance of the product.

This information may be read carefully by end users of Ring Fixation System & Pediatric Ring Fixation System.

SS Half Ring

Part No.	Internal Dia.
E 110000060	60mm
E 110000070	70mm
E 110000080	80mm
E 110000090	90mm
E 110000100	100mm
E 110000110	110mm
E 110000120	120mm

Telescopic Rod

Part No.	Length
E 129000040	40 mm
E 129000060	60 mm
E 129000080	80 mm

Oblique Support

Part No. E 161001000

Universal Joint

Part No. E 122001000

Threaded Rods

Part No.	Length mm
E 127000040	40
E 127000060	60
E 127000080	80
E 127000100	100
E 127000120	120
E 127000150	150
E 127000200	200

Threaded Rod -Slotted

Part No.	Length
E 128000040	40
E 128000060	60

Wire fixation buckle

Part No. E 177001000

Bushings

Part No. E 121000000

Post Male

Part No.	Holes
E 135000002	2
E 135000003	3
E 135000004	4

Post Female

Part No.	Holes
E 136000002	2
E 136000003	3
E 136000004	4

Hinges Male

Part No.	E 142000001

Hinges Female

Part No.	E 143000001

Twisted Plate- 90°

Part No.	E 120000090

Wire fixation bolt

Part No.	Type
E 146000001	Cannulated
E 146000002	Slotted

Washers

Part No.	
E 152000010	1 mm
E 152000015	1.5 mm
E 153000000	Slotted

Connection Bolts & Nuts M5

Part No.	mm
E 150000010	10
E 150000016	16
E 150000020	20#
E 151000000	Nut M5
E 151000001	Nylon Nut M5
E 154000000	Triangular Nut

Plate Adaptor

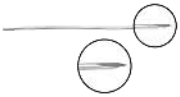
Part No.	Length
E 155000020	20mm
E 155000030	30mm

Block for Half Pins

Part No.	Hole
E 176000001	1
E 176000002	2

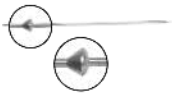
Conical Washer Couple

Part No. E 178001000



Wires

Part No.	Dia	Length
E 159010250	1.0	250
E 159012300	1.2	300
E 159015300	1.5	300



Wires: with Stoppers

Part No.	Dia	Length
E 160001250	1.0	250
E 160012250	1.2	250
D 189015300	1.5	300

INSTRUMENTS

Box wrench 8mm

Part No. E 500000008

Combination wrench 8 mm

Part No. E 501000008

Wire Tensioner Direct Measuring

Part No. E 505001000

Containers for Pediatric Ring Fixation System

Part No.	Container
H842001000	Pediatric ring & plate
H843001000	Pediatric Components

Manufactured against special order