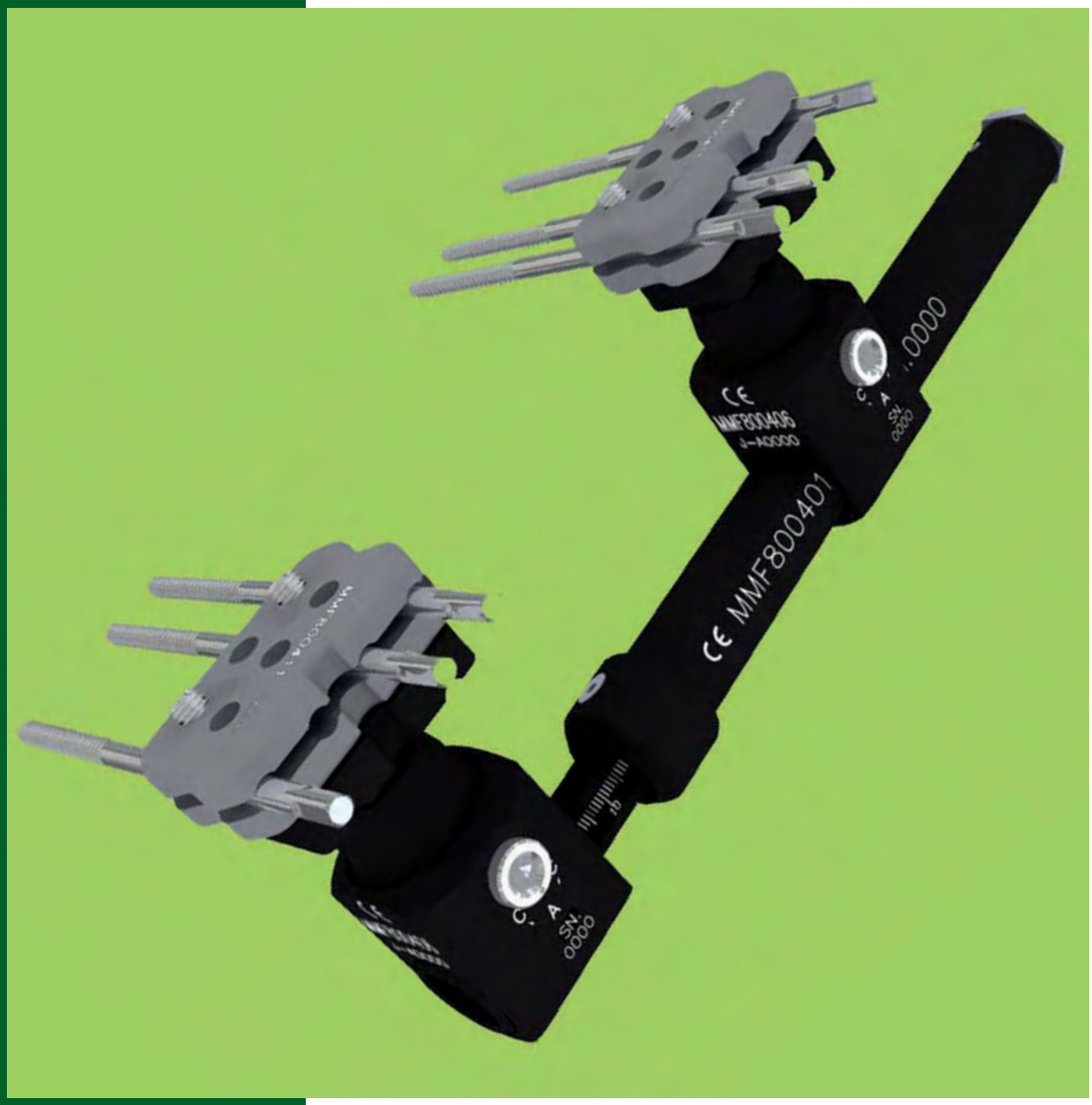
MMF

MONOLATERAL FIXATOR

Micrometric system for reduction and external fixation



INDICATIONS

- Open fractures
- Comminuted fractures
- Infected fractures
- Pseudoarthrosis
- Epiphyseal distraction
- Elongation/angular corrections of the axis

ADVANTAGES

The MMF fixation system consists of two units:

Reduction unit

Fig. 1

A **reduction unit**, or “brain”, which makes it possible to reduce the fracture (fig.1).

Fixation unit

a - Fixator for humerus

A **fixation unit**, which guarantees stabilization (fig.2 a - b - c).

Fig. 2

b - Standard fixator

c - Short fixator

Main characteristics of the system:

- Extreme facility in fracture reduction
- High level of stability
- Gradual and precise micrometric correction of the fracture.
- Dynamic or static management of the fracture.
- Minimum profile well tolerated by patient.
- Point of correction situated centrally on axis of the bone (the ideal distance between the correction head and the axis of the bone should be around 6 cm).
- Self-locking function: the forces acting on the fixator do not twist or otherwise modify the position of the correction heads.
- The fracture can be re-operated at any time by applying the reduction unit to the fixation unit.

REDUCTION UNIT

The micrometric – self-locking mechanism of the heads provides easy and precise reduction and keeps the correction stable.

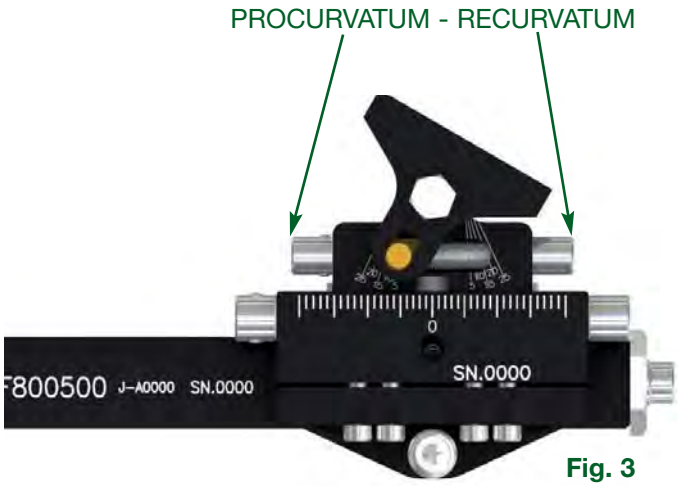


Fig. 3

The reduction heads can be independently adjusted in planes I (procurvatum and recurvatum) and corrected 2 x 25°, as shown in fig.3, and II (varus and valgus), as shown in fig.4.

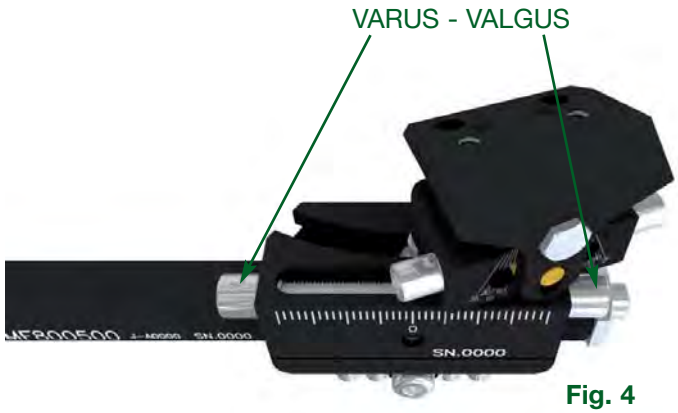


Fig. 4

The telescopic tubular mechanism ensures stability and provides for longitudinal movement (100 mm).

Fig. 5

REDUCTION TECHNIQUE

DISTRACTION

Fig. 6

The telescopic tubes are moved longitudinally by acting on the central screw on the end of the reduction unit.
Thus, the fracture can be distracted without any particular traction.

ROTATION

Fig. 7

Rotational correction is obtained by manually turning the rotary reduction head.
The fixation screw must be loosened to allow alignment and then tightened again immediately afterwards.

ANGULAR REDUCTION

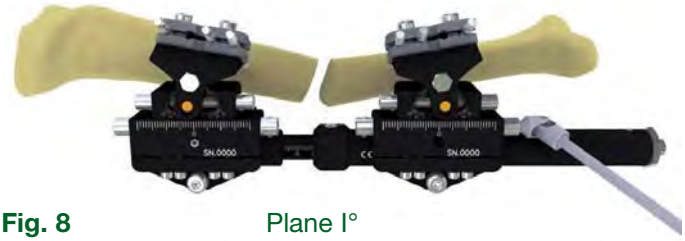
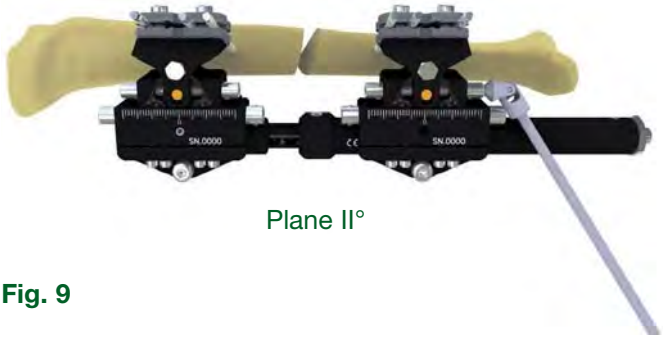


Fig. 8 Plane I°

Reduction of the fracture in plane I is obtained by turning the screws (Varus - Valgus).



Plane II°

Fig. 9

Reduction of the fracture in plane II is obtained by turning the screws (Procurvatum - Recurvatum).

COMPRESSION

Fig. 10

Longitudinal compression is obtained by turning the centre screw on the end of the reduction unit.
Compression of oblique fractures can be optimised by turning the screws for correction in planes I and II.

FIXATION UNIT

Fig. 11 Having obtained reduction, the clamps and Schanz pins are transferred to the lighter stable fixation unit.

This does not alter the reduction of the fracture in any way.

Fig. 12 Place the fixation unit, with the clamps fully open, on the reduction unit.

Fig. 13 Insert and tighten the two hexagonal screws in each clamp.
The reduction unit clamps are thus fixed to the stable fixation unit.

Fig. 14 Tighten the spherical joints on the fixation unit using the appropriate dynamometric wrench on the hexagonal bushes of the supports.

Fig. 15 Remove the wrench from the clamp and use instrument cod. 800-451 to “snap” the wrench into the next work position (fig.15).

Fig. 16 Loosen the two hexagonal screws on each clamp that fixed the reduction unit to the clamps; once free, the reduction unit can be removed.

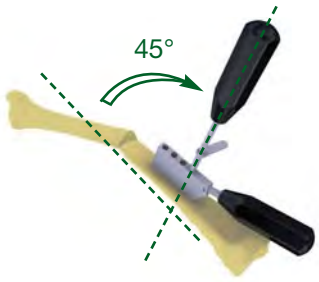
Fig. 17

SURGICAL TECHNIQUE

Fig. 1

Determine the pre-selected position in which to insert the first Schanz pins. Having cut the skin, introduce the trocar into the soft tissue protector and then in the template.

Fig. 2



The pins should be inserted into the diaphysis at an angle of around 45° anteromedially (tibia) and anterolaterally (humerus and femur).

Fig. 3

Introduce the sheath for the drill bit in the soft tissue protector.

Fig. 4

Drill the tibia crest medially following the 45° angle.
Remove the drill bit sheath and introduce the first Schanz pins; repeat this procedure for the other screws.

Fig. 5

Having inserted all the proximal pins, insert the pins in the distal bone fragment using the same procedure.

Fig. 6

Loosen the screws on the reduction unit as shown. Make sure the rotation correction clamp is positioned distally.

Fig. 7

Mount the reduction unit on the Schanz pins. The low positioning of the reduction unit ensures the subsequent higher positioning of the definitive fixation unit.

Fig. 8

Tighten the locking screw to ensure longitudinal fixation

Fig. 9

Distract the fracture by turning the centre screw on the end of the reduction unit.

Fig. 10

Rotation correction is obtained by manually turning the rotary reduction head. The fixation screw must be loosened to allow alignment and then tightened again immediately afterwards.

Fig. 11

Reduce the fracture on the 2 planes using the brilliance amplifier. The long universal screwdriver is used to make corrections without exposing yourself to X rays.

Fig. 12

Loosen the hexagonal bushes on the fixation unit.

Fig. 13

Mount the fixation unit on the clamps of the reduction unit.

Fig. 14

Insert and tighten the four screws on the plates of the fixation unit.

Fig. 15

Tighten the hexagonal bushes on the fixation unit using the appropriate pre-calibrated dynamometric wrench.

Fig. 16

Remove the wrench from the clamp and use instrument cod. 800-451 to “snap” the wrench into the next work position.

Fig. 17

Loosen the four screws on the reduction unit.

Fig. 18

Remove the reduction unit.

Fig. 19

Fixation is thus completed. The fixator can be subsequently dynamized by substituting the stopper nut on the end of telescopic tube (+1 or +2mm).

FIXATORS

REDUCTION UNIT

- MMF reduction unit without pin clamps and screws Cod. 800-500
- MMF reduction unit with 2 pin clamps and 4 screws Cod. 800-501

STABILIZATION UNIT

- Standard monolateral external fixator with 2 pin clamps and 4 screws Cod. 800-400

- Standard short monolateral external fixator with 2 pin clamps and 4 screws Cod. 800-420

- Standard monolateral external fixator for humerus with 2 pin clamps and 4 screws Cod. 800-300

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ACCESSORIES

- Standard pin clamp Cod. 800-411

- Condylar pin clamp Cod. 800-412

- Locking (hexagonal) screws for pin clamp (package of 4 pieces) Cod. 800-410

- Stopper nut, 1mm clearance Cod. 800-402
- Stopper nut, 2mm clearance Cod. 800-403

- Standard ball joint for MMF Cod. 800-406

- Ball joint for humerus Cod. 800-306

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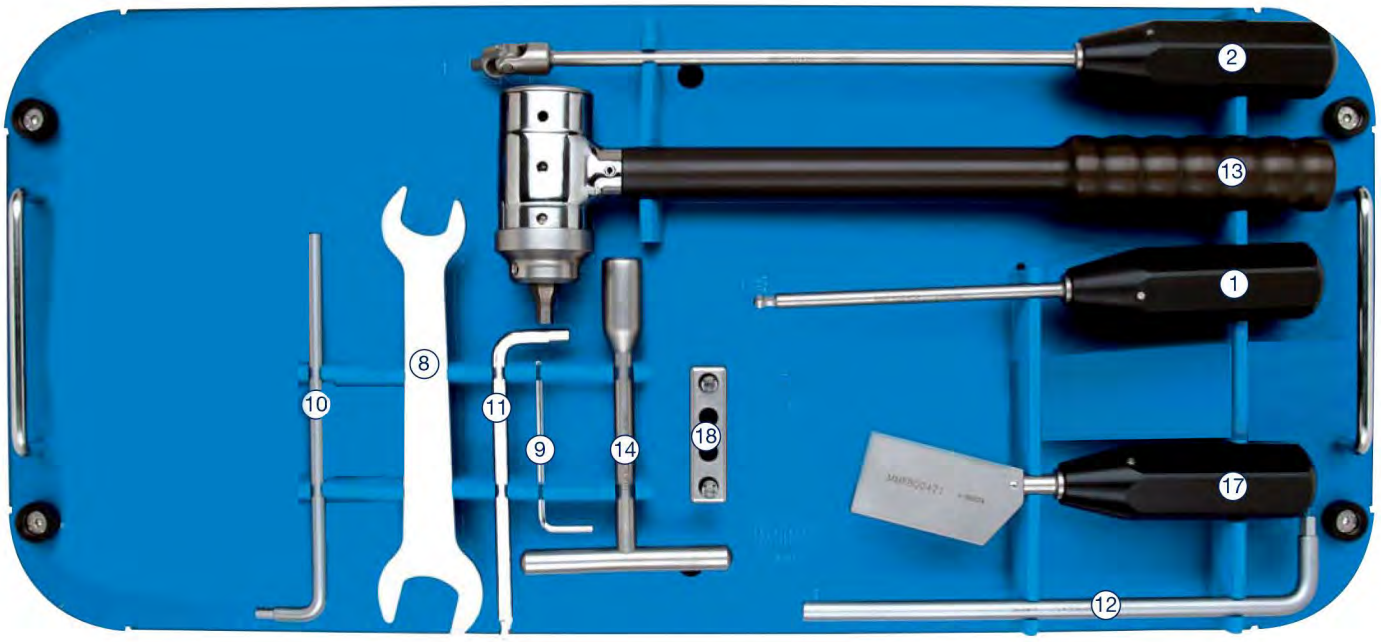
INSTRUMENTS



0.	**Code 800-702**	Lower sterilization tray
1.	**Code 800-458**	Screwdriver with 5mm hexagonal spherical head
2.	**Code 800-459**	Hinged screwdriver, 5mm
8.	**Code 800-451**	Wrench, 18-22 mm
9.	**Code 800-456**	L-shaped hexagonal wrench, 2.5mm
10.	**Code 800-454**	L-shaped hexagonal wrench, 4mm
11.	**Code 800-455**	L-shaped hexagonal wrench, 5mm
12.	**Code 800-457**	High torque L-shaped hexagonal wrench, 6mm
13.	**Code 800-452**	Dynamometric wrench
14.	**Code 800-460**	T-wrench for Schanz pins
17.	**Code 800-471**	Multiple drilling guide with handle
18.	**Code 800-470**	Fixed multiple drilling guide

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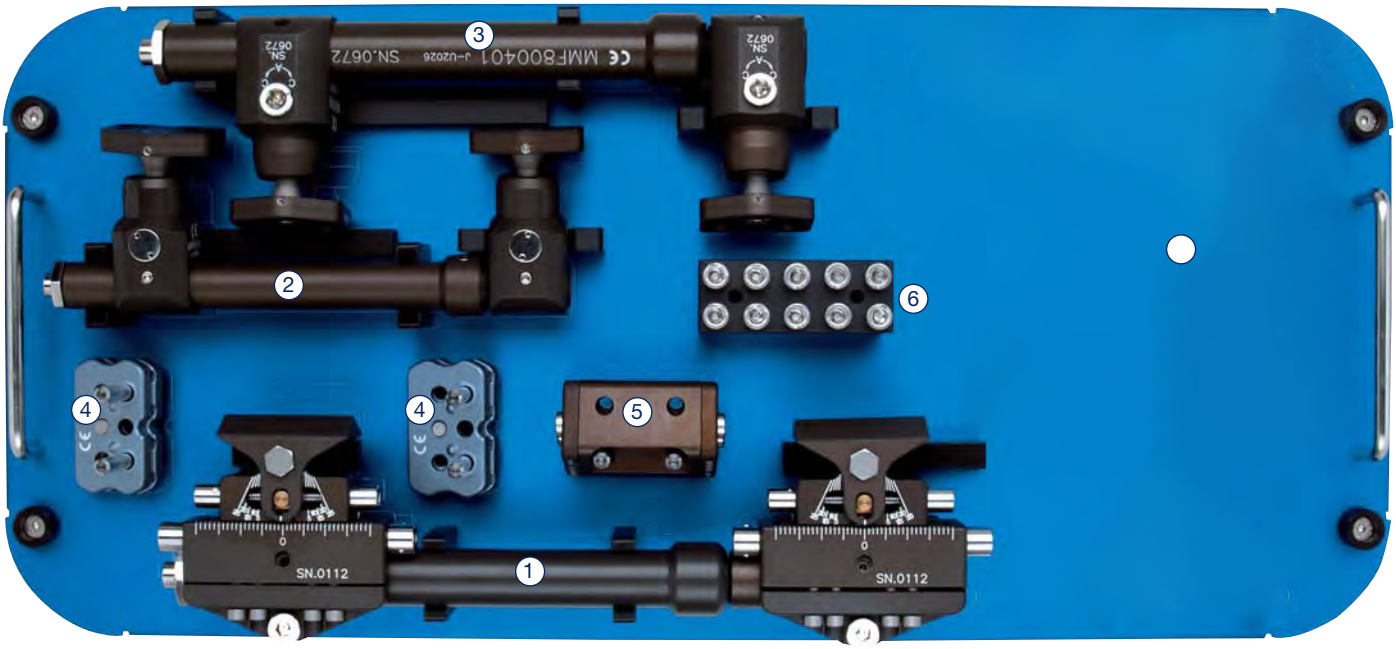
EQUIPMENT



0.	Code 800-701	Upper sterilization tray
1.	Code 800-500	MMF reduction unit
2.	Code 800-299	MMF fixator for humerus
3.	Code 800-399	Standard MMF fixator
4.	Code 800-411	Standard pin clamp
5.	Code 800-412	Condylar pin clamp
6.	Code 800-410	Locking (hexagonal) screws for pin clamp

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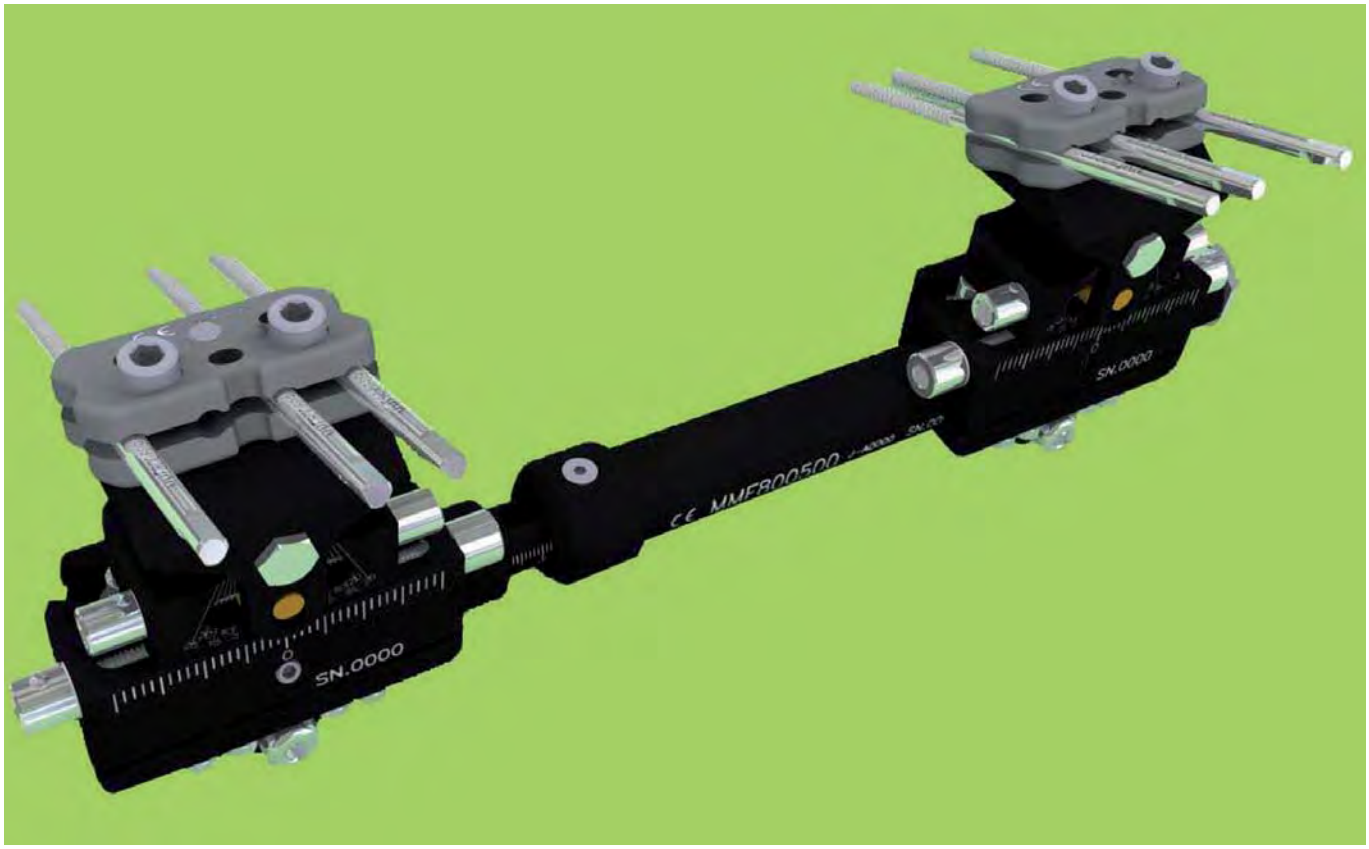

Manufacturer

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