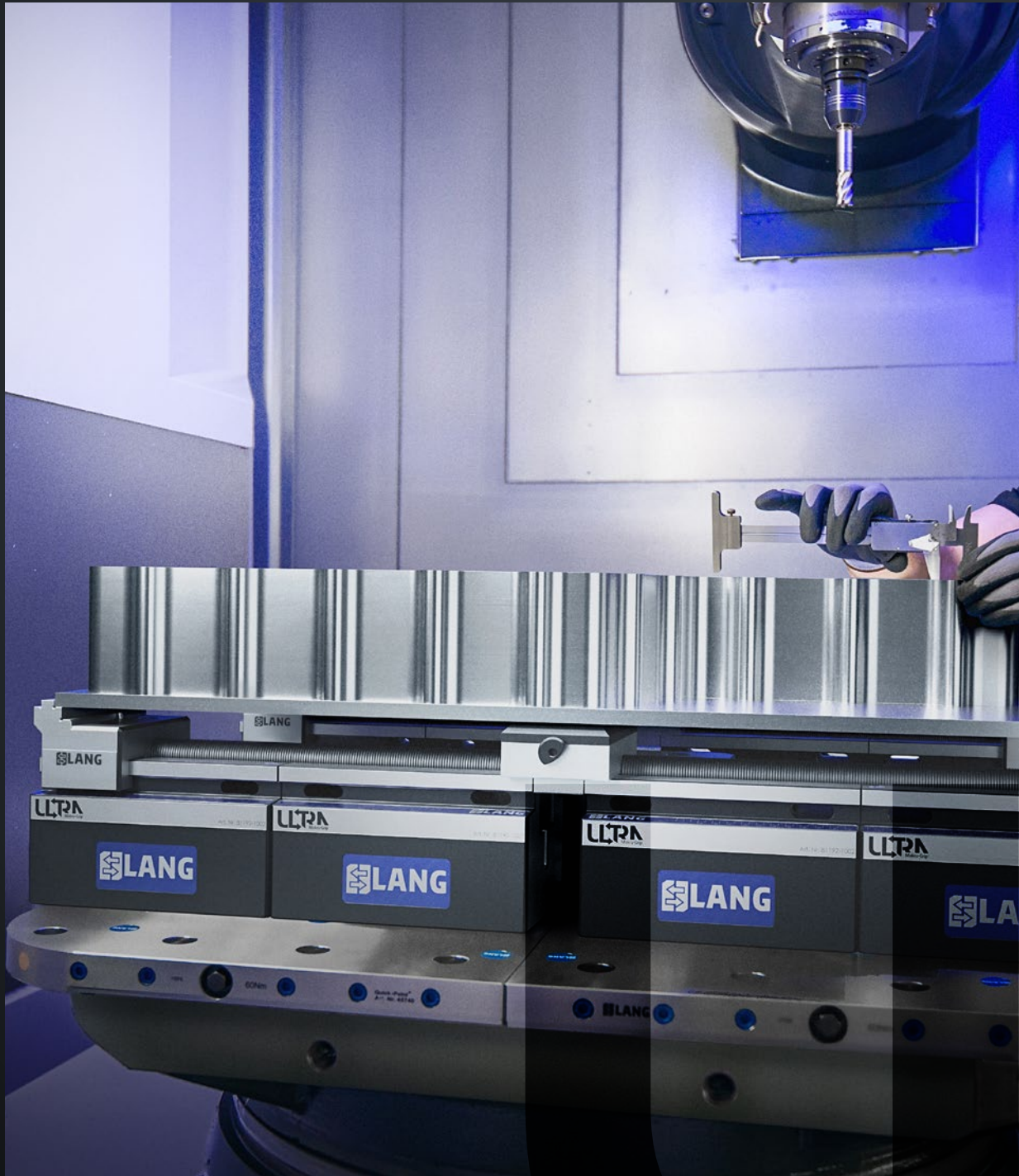


# Makro·Grip<sup>®</sup> Ultra

PATENT PENDING





**Incredible modularity meets enormous application variety! The completely new product line Makro-Grip® Ultra offers countless clamping possibilities and can be changed quickly and easily at the same time.**

Thanks to the expandability of its modules Makro-Grip® Ultra is capable of clamping parts of 810 mm length and beyond safely. With its size it pushes the LANG workholding to new heights and is suitable for mould making and clamping applications of flat and large parts.

Different system heights, individually expandable clamping ranges, interchangeable clamping jaw types and useful accessories – Makro-Grip® Ultra is extremely flexible and equally applicable for single part or multiple clamping, cubic, round or asymmetrical workpieces. Through its wide range of possible configurations the modular system practically covers any imaginable clamping application.

#### **At a glance:**

- Clamping ranges up to 410 / 610 / 810 mm, flexibly extendable
- 3 different system heights: 45 / 109 / 189 mm
- 3 different, interchangeable clamping jaw types
- Based on the Quick-Point® 96 zero-point clamping system

#### **Applications:**

- Mould making
- Plate clamping
- Fixture construction
- Large parts
- Deformation-sensitive parts

# Makro-Grip®

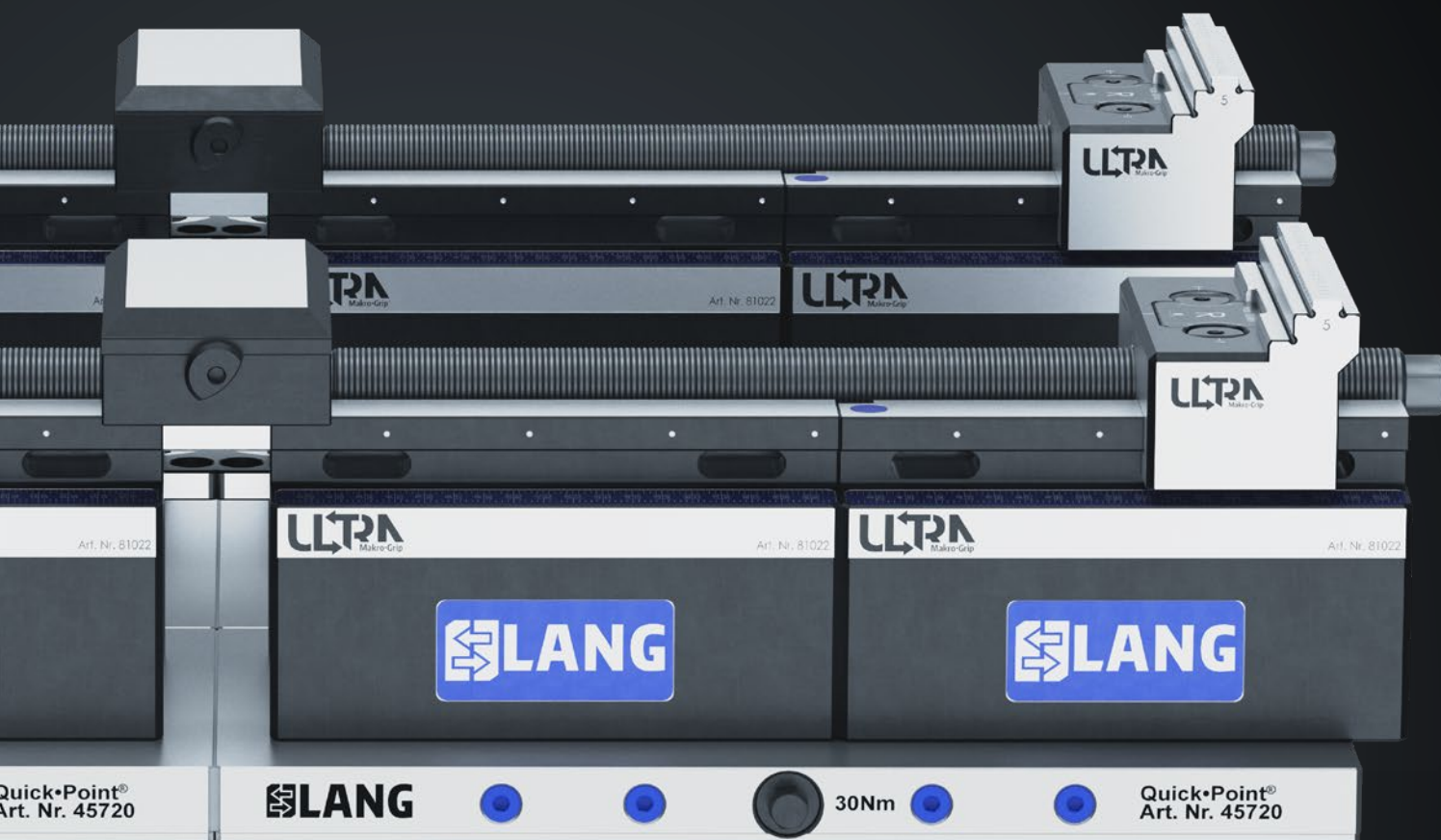


## Advantages of Makro-Grip® Ultra:

- Changeover of clamping situation within seconds
- Highly accurate positioning of the base bodies in the Quick-Point® 96 grid in x/y direction for varying clamping ranges
- Robust and low-wear mechanics
- Simple cleaning and maintenance
- Flexible change between centric single-part clamping and compensating multiple clamping
- Low-vibration and distortion-low clamping of thin and flat material
- All-around machining without changing over the clamping system
- Integration of automated machining processes possible without removing the clamping system
- Clamping of asymmetrical parts due to individually adjustable clamping jaws







# The clamping system at a glance

## 1 Makro-Grip® Ultra Clamping Jaw

The Makro-Grip® Ultra clamping jaw which is made from solid is available in two different types, either with a clamping depth of 3 mm or 5 mm. The clamping jaw has the same serration as regular Makro-Grip® 5-Axis Vices and grips the workpiece by form-closure effect. This way highest holding forces can be accomplished, gently and virtually wear-free. Additionally LANG offers a hardened jaw without serration but with a plain clamping step (clamping depth 16 mm) which is making use of the Avanti dovetail technology. This means that also regular Avanti top jaws can be mounted, in order to clamp parts that are not cubic. More information about the different jaw types can be found on pages 19 and 23.

## 2 Base Body

The case-hardened, robust base body with integrated zero-point interface impresses with its simplicity, however it offers some technical refinements. Available are two different lengths, each in three different heights. Clamping ranges of 410, 610 and 810 mm are realised when putting them together in different compositions. The base bodies are positioned so accurately that you almost do not notice the transition from one base to the other when sliding the clamping jaws over the rails. Thanks to the exact spindle seat an exceptionally high centring accuracy is achieved. Different centring plates mounted to the inner ends of the base bodies allow for clamping parts either centrally or in combination with a centre jaw multiple parts can be clamped. The base bodies also have a practical snap-in function which makes it easier to locate the jaws.



### 3 Threaded Cap

Each clamping jaw is individually secured by a threaded cap and thus can be moved independently from other clamping jaws. Removing the threaded cap with a magnet allows the clamping jaw's position to be shifted quickly without actuating the spindle.

### 4 Spindle

The spindle (M 26 x 2) comes in three different lengths and is equally used for single-part and multiple clamping. For clamping ranges beyond 800 mm the spindle can be ordered as a customised solution in a longer version. The actuation torque is 170 Nm.

### 5 Quick-Point® Zero-Point Clamping System

The interface between Makro-Grip® Ultra and the machine table is the ultra-precise Quick-Point® zero-point clamping system. Depending on requirements and workpiece size, its 96 mm grid allows supplementary base bodies to be placed next to each other and connected with each other.



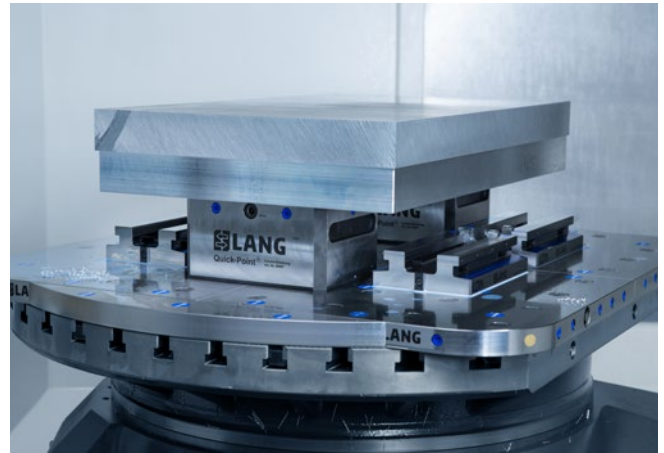


# Diverse applications

## 6-face machining without changeover



One of the main advantages of Makro-Grip® Ultra is its ability to machine all six faces of a workpiece without a changeover. Depending on the requirements of the workpiece the operator can choose between different approaches and configurations for the first and second operation. In this example the workpiece



was initially clamped using the Avanti technology. Before flipping around the workpiece four threaded bores were drilled in order to attach Quick-Point® clamping studs. The second operation was done by clamping the workpiece directly in the 5-axis riser of the zero-point clamping system.

## Clamping multiple parts



Centre jaws can be used for clamping multiple parts simultaneously – both with serration or plain clamping steps. A special type of centring plate at the inner ends of the base bodies ensures that

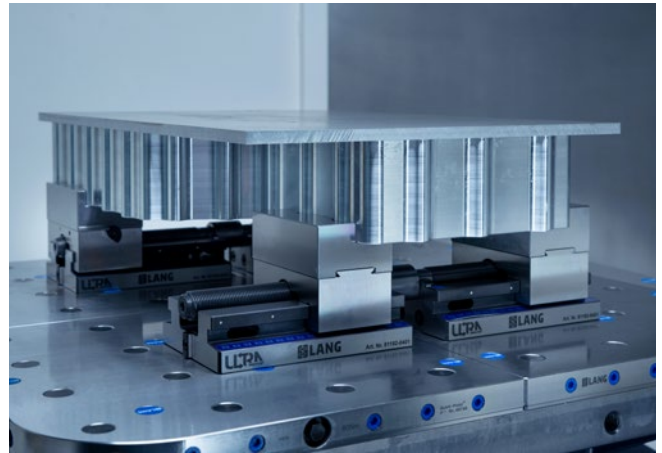


the spindle has a clearance of 4 mm to compensate for workpieces that are not identically long.

## Asymmetrical parts

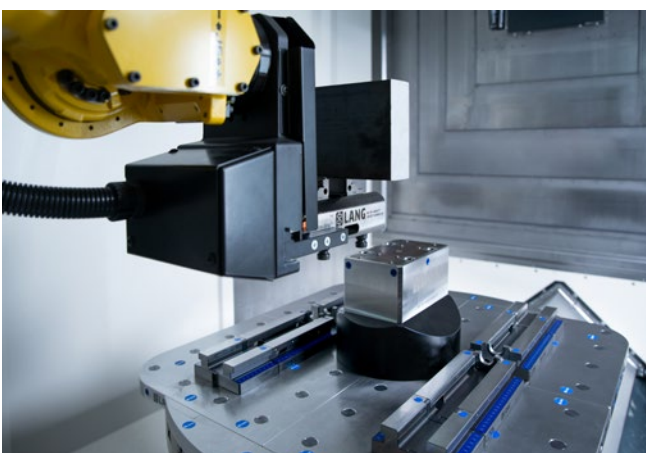


Each clamping jaw is individually secured by a threaded cap and thus can be moved independently from other clamping jaws. By that, asymmetrical and shaped parts can be clamped. Here the



first operation was done using the Makro-Grip® Ultra serrated jaws. The part was then finished with Avanti jaws in an asymmetrical jaw positioning.

## Automated manufacturing



Batch production of smaller parts at night, larger parts manually during the day? No problem with Makro-Grip® Ultra! Depending on the machine table's size you can do both without removing the fixtures from the table.



This provides a maximum of flexibility to cover a huge variety of workpieces with one single machine. An increased machine utilisation also has positive effects on the cost structure of the machined parts.



# Great functions

## Modularity



The modularity and small number of components, as well as the consistent Quick-Point® 96 zero-point grid allow to change the clamping setup immediately. Adding base bodies to increase the

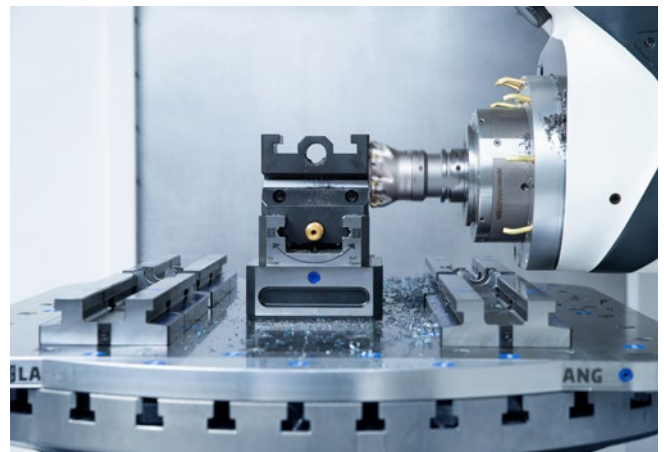


clamping range, a complete exchange of base bodies to alter the system height and changing jaw types can be done in a few simple steps without special tools.

## Easy setting and cleaning

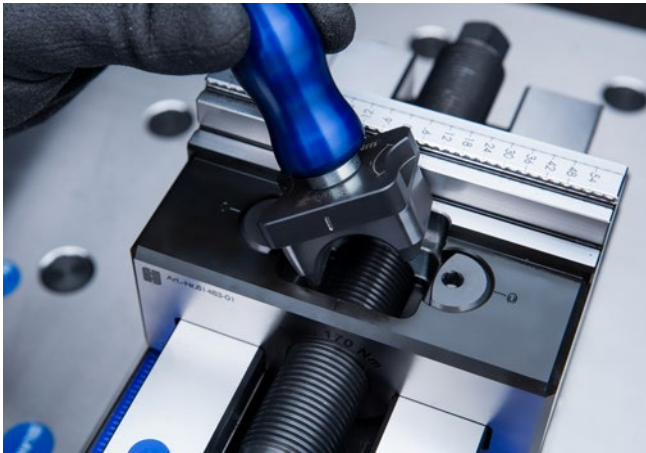


Just as quickly as it is set up, Makro-Grip® Ultra can be disassembled. Clamping jaws and spindles are removed easily which simplifies cleaning and maintenance after and in between machining processes. Clamping tasks that are performed with

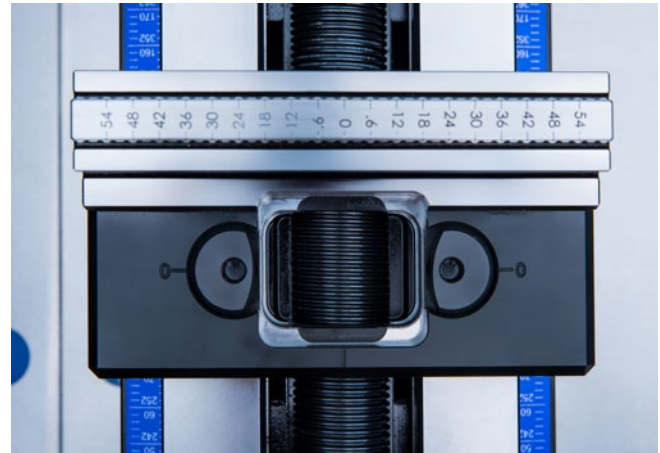


other fixtures are possible even without having to remove the Makro-Grip® Ultra system. Accessibility still remains and the risk of swarf clogging is low.

## Quick jaw adjustment



By removing the threaded cap with a magnetic handle the position of the clamping jaws can be changed in no time without actuating the spindle. Despite their high accuracy of fit the clamping jaws



glide smoothly over the guide surface. The threaded cap is kept in place by two extremely resilient hexagon screws (5 mm) which are opened/locked with half a turn.

## Scale and snap-in function



For a quick adjustment into the desired position the clamping jaws feature an integrated snap-in function as an orientation aid where the operator feel resistance every 48 mm. Each base body also has



a scale which provides a visual aid when positioning the clamping jaws.

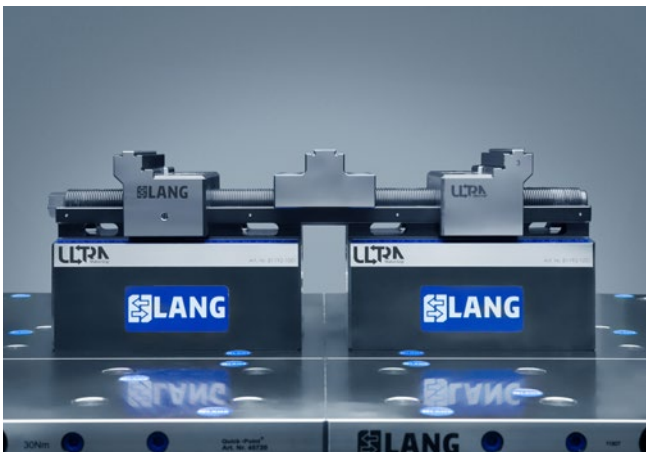
## Centre flexibility



The Makro-Grip Ultra spindle is solely fitted between two high-precision centring plates which allows for a quick and comfortable setup process.



In order to offer an additional resting surface and to limit possible vibrations, a support jaw can be mounted to the centre of the clamping system.



A centre top jaw (serrated or with plain clamping steps) allows for clamping multiple parts. In this case centring plates are used which makes it possible to clamp workpieces with a 4 mm variance in length.



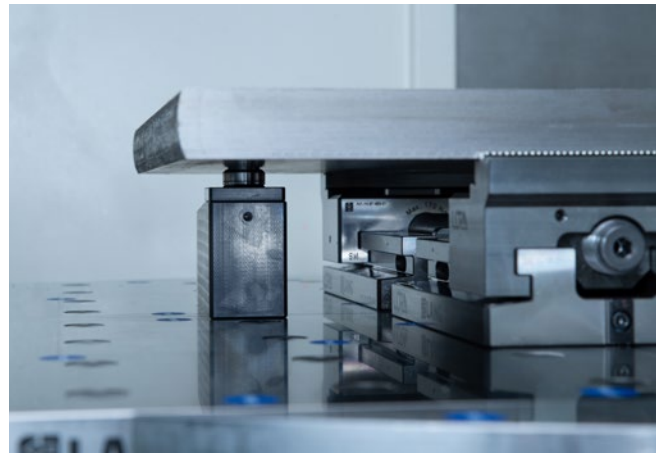
Even without centre top or support jaw the centre base jaw can be used as a resting surface.



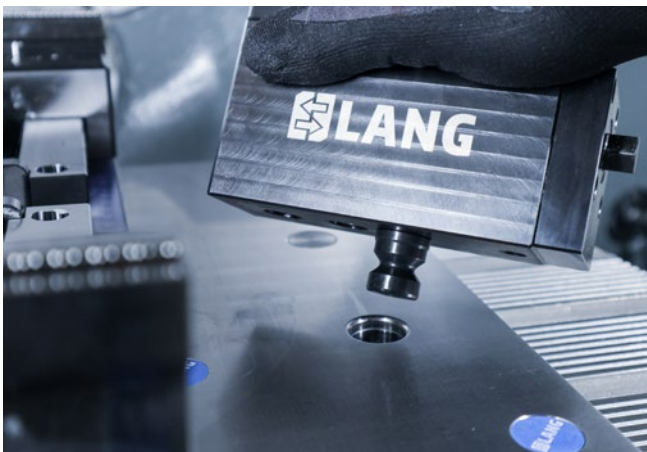
## Hydro•Sup screw jack



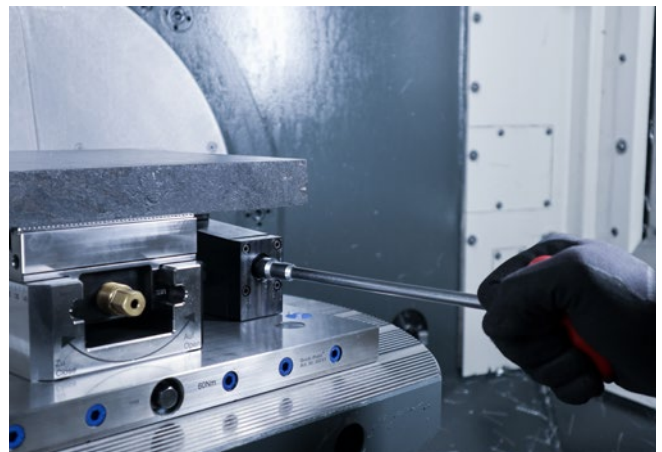
A specific hydraulic screw jack and spacers to match the respective height of the base bodies have a supporting effect on the clamping process which is particularly important with flat and wide material.



The screw jack which is actuated by a socket wrench adapts to the workpiece with its self-aligning support and reduces vibrations, which contributes to an increased surface quality.



Hydro•Sup is mounted and fixed just like any other LANG workholding device with its clamping stud to the Quick•Point® zero-point clamping system.



Due to its height of 86 mm the Hydro•Sup screw jack can also be used – without spacers – when clamping overhanging parts in a regular Makro-Grip® 5-Axis Vice 125.

# Makro-Grip® Ultra – What customers say



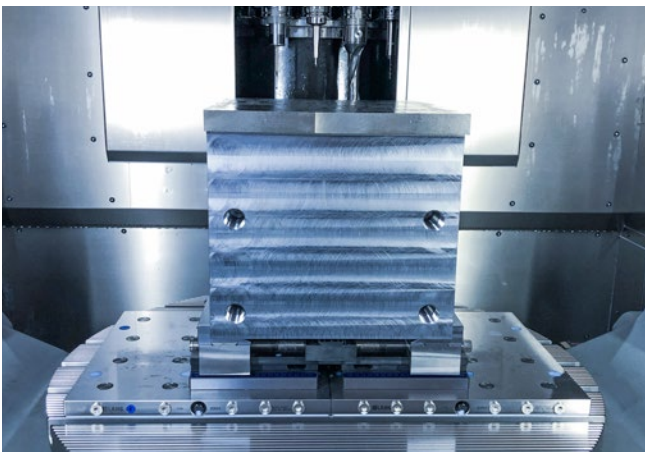
Part size: Ø 420 x 10 mm, material: 1.7131, Makro-Grip® Ultra Basic Set 410 S with Avanti top jaws



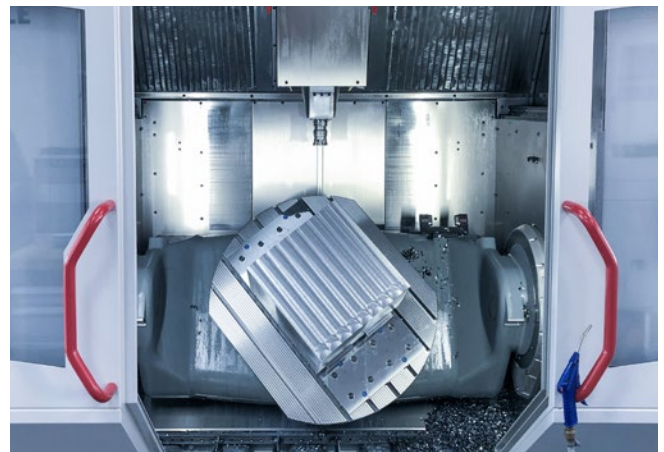
Makro-Grip® Ultra offers us the opportunity to clamp components, for which we had no solution so far. I was especially impressed by how fast we were able to solve an existing clamping tasks. From

→ Simon Großmann, **Großmann Präzisionstechnik**, 73235 Weilheim unter Teck

getting to know the system to the first chip in our production it did not even take 3 hours.



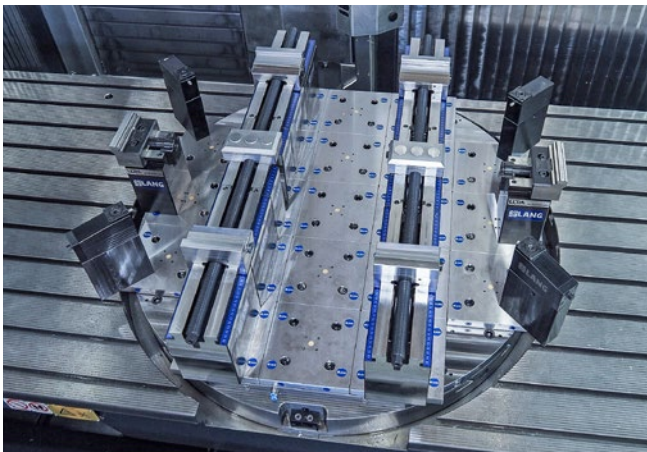
Machine-tool: Hermle C 650, part size: 400 x 400 x 350 mm, material: 1.0570



With the new system by LANG we are now able to clamp large workpieces concentrically. The modularity of Makro-Grip® Ultra combined with the zero-point clamping system made it possible to process various parts in no time. The quick jaw adjustment is designed to be very user-friendly. Also the stamping technology was put to test successfully once again. In this application we

→ Michael Kupke, **MKTec Meisterbetrieb**, 86567 Hilgertshausen

clamped a steel block with a height of 350 mm at a clamping depth of only 5 mm. Roughing was done using a high feed milling cutter. With Avanti top jaws the second operation is realised in a few simple steps. In terms of accuracy the LANG system leaves nothing to be desired.



Machine-tools: DMG Mori DMF 360, customised Makro-Grip® Ultra solution with a clamping range up to 1.000 mm

„As a manufacturer who is often processing small lots we need an interface that allows us to change between different clamping set-ups quickly and accurately in order to remain flexible. Preferably

→ Gerhard Galler, **Galler Zerspanungstechnik GmbH & Co. KG**, 94419 Reisbach

with a fine zero-point grid where you can add support components at critical points. No other manufacturer offers us this level of flexibility“.



# Makro·Grip® Ultra sales items

Base Set including Quick·Point® clamping studs, spindle and centring plates



## BASE SET

ITEM NO.	DESCRIPTION	HEIGHT	SPINDLE LENGTH	CLAMPING RANGE	WEIGHT
81400	Base Set <b>410 S</b>	45 mm	441 mm	40 – 410 mm	12,8 kg
81415	Base Set <b>410 M</b>	109 mm	441 mm	40 – 410 mm	26,0 kg
81423	Base Set <b>410 L</b>	189 mm	441 mm	40 – 410 mm	43,2 kg
81600	Base Set <b>610 S</b>	45 mm	617 mm	40 – 610 mm	19,1 kg
81615	Base Set <b>610 M</b>	109 mm	617 mm	40 – 610 mm	40,1 kg
81623	Base Set <b>610 L</b>	189 mm	617 mm	40 – 610 mm	66,9 kg
81800	Base Set <b>810 S</b>	45 mm	825 mm	40 – 810 mm	25,3 kg
81815	Base Set <b>810 M</b>	109 mm	825 mm	40 – 810 mm	51,7 kg
81823	Base Set <b>810 L</b>	189 mm	825 mm	40 – 810 mm	85,7 kg

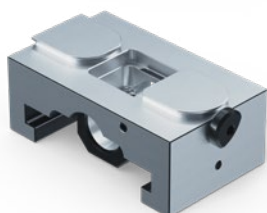
Note: Included in delivery of Base Sets 610 and 810 are two connection plates as well.

Hexagon wrenches (size 5 and 19) and a cover plug remover are included with every Base Set.

## Clamping jaws

Depending on the desired clamping principle, you can choose between serrated Makro-Grip® Ultra clamping jaws, Avanti top jaws with plain clamping steps or conventional Avanti top jaws for shaped parts. Both types of Avanti jaws use the familiar dovetail

technology. The serrated Makro-Grip® Ultra clamping jaws are milled from solid and are guided directly on the rails of the base body.



### MAKRO-GRIP® ULTRA, SERRATED CLAMPING JAW, STEEL (HARDENED)

ITEM NO.	CLAMPING DEPTH	CLAMPING BY	WEIGHT
81483	3 mm	form-closure	2,2 kg
81485	5 mm	form-closure	2,2 kg

Selling unit: 1 piece. For each clamping unit 2 pieces are required.  
The specified weight relates to 1 piece.

### BASE JAW AVANTI, STEEL (HARDENED)

ITEM NO.	APPLICATION	WEIGHT
81440	As a base for the top jaws below	2,2 kg

Selling unit: 1 piece. For each clamping unit 2 pieces are required.  
The specified weight relates to 1 piece.

These top jaws fit:



### AVANTI TOP JAW WITH PLAIN CLAMPING STEP, STEEL (HARDENED)

ITEM NO.	CLAMPING DEPTH	CLAMPING BY	WEIGHT
81450	16 mm	friction	2,6 kg

Selling unit: 1 piece. The specified weight relates to 1 piece.

### AVANTI TOP JAW (SOFT)

ITEM NO.	MATERIAL	HEIGHT	WEIGHT
44258-46	Steel (16 MnCr 5)	46 mm	3,3 kg
44258-76	Steel (16 MnCr 5)	76 mm	5,5 kg
44259-46	Aluminium (F50)	46 mm	1,1 kg
44259-76	Aluminium (F50)	76 mm	1,8 kg

Selling unit: 1 piece. The specified weight relates to 1 piece.



### THREADED CAP

ITEM NO.	DESCRIPTION	WEIGHT	QUANTITY
81080	Threaded cap, right	0,2 kg	1 piece
81090	Threaded cap, left	0,2 kg	1 piece

For each clamping unit 1 left and 1 right threaded cap is required.

# Individual Base Body

An individual base body is needed especially when an existing base set is to be expanded. For instance, if you want to go from a clamping range of 410 mm to 610 mm / 810 mm or beyond. With an individual base body Quick-Point® clamping studs are included

(4 pcs. for long base bodies, 2 pcs. for short base bodies). Also included are a slot nut and the respective scaling. For stringing together individual base bodies, connecting plates are required which can be found on page 22.



## SHORT BASE, HEIGHT "S"

ITEM NO.	HEIGHT	LENGTH	WEIGHT
81011	45 mm	96 mm	2,8 kg



## LONG BASE, HEIGHT "S"

ITEM NO.	HEIGHT	LENGTH	WEIGHT
81021	45 mm	192 mm	5,5 kg





#### SHORT BASE, HEIGHT "M"

ITEM NO.	HEIGHT	LENGTH	WEIGHT
81012	109 mm	96 mm	6,7 kg



#### LONG BASE, HEIGHT "M"

ITEM NO.	HEIGHT	LENGTH	WEIGHT
81022	109 mm	192 mm	12,1 kg



#### SHORT BASE, HEIGHT "L"

ITEM NO.	HEIGHT	LENGTH	WEIGHT
81013	189 mm	96 mm	11,7 kg



#### LONG BASE, HEIGHT "L"

ITEM NO.	HEIGHT	LENGTH	WEIGHT
81023	189 mm	192 mm	20,7 kg

## More individual components of the Base Set



### SPINDLE

ITEM NO.	DESCRIPTION	LENGTH	WEIGHT
81004	Spindle unit 410	441 mm	1,8 kg
81006	Spindle unit 610	617 mm	2,5 kg
81008	Spindle unit 810	825 mm	3,3 kg

The spindle (M 26 x 2) comes in three different lengths and is equally used for single-part and multiple clamping. For clamping ranges beyond 800 mm the spindle can be ordered as a customised solution in a longer version. The actuation torque is 170 Nm.



### CENTRING PLATE

ITEM NO.	APPLICATION	QUANTITY
81010	Single-part clamping, concentric	1 pc
81040	Multiple clamping, compensating	1 pc

For each clamping unit 2 centring plates of the same kind are required. They are mounted to the inner ends of the base bodies and ensure the accurate positioning of the spindle. Two different versions are available for single-part and multiple clamping. The centring plate for multiple clamping has a recess which allows to clamp workpieces with a 4 mm variance in length.



### CONNECTION PLATE

ITEM NO.	DESCRIPTION	QUANTITY
81015	Connection plate	1 pc

Connection plates are already included in delivery of Base Sets. They are used for stringing together base bodies.



### PLASTIC COVERS

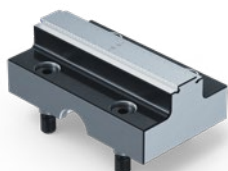
ITEM NO.	DESCRIPTION	QUANTITY
81500	Plastic covers for base bodies	20 pcs.

To cover the bores on the upper guide surface of the base body, if centre jaws are not mounted.

## Centre jaws

Depending on the application, a serrated centre jaw or Avanti base jaw with various choices of top jaws are applicable in order to clamp multiple parts simultaneously. As an alternative, the Avanti

base jaw might be used in combination with a support top jaw for single part machining (but not necessarily needed!) to provide an additional resting support.



### MAKRO-GRIP® ULTRA SERRATED CENTRE JAW, STEEL (HARDENED)

ITEM NO.	CLAMPING DEPTH	APPLICATION	WEIGHT
81483-TG	3 mm	Multiple clamping by form-closure	2,2 kg
81485-TG	5 mm	Multiple clamping by form-closure	2,2 kg

Selling unit: 1 piece. The specified weight relates to 1 piece.

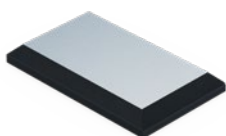


### CENTRE BASE JAW AVANTI, STEEL (HARDENED)

ITEM NO.	APPLICATION	WEIGHT
81440-TG	As a base for the support and top jaws below	1,8 kg

Selling unit: 1 piece. The specified weight relates to 1 piece.

These top jaws fit:



### SUPPORT JAW, STEEL (SOFT)

ITEM NO.	FOR	APPLICATION	WEIGHT
81403	81483 / 81450	Single-part clamping by form-closure / friction	1,0 kg
81405	81485	Single-part clamping by form-closure	0,9 kg

Selling unit: 1 piece. The specified weight relates to 1 piece.



### CENTRE TOP JAW AVANTI WITH PLAIN CLAMPING STEP, STEEL (HARDENED)

ITEM NO.	CLAMPING DEPTH	APPLICATION	WEIGHT
81450-TG	16 mm	Multiple clamping by friction	2,0 kg

Selling unit: 1 piece. The specified weight relates to 1 piece.



### AVANTI TOP JAW (SOFT)

ITEM NO.	MATERIAL	HEIGHT	WEIGHT
44258-46	Steel (16 MnCr 5)	46 mm	3,3 kg
44258-76	Steel (16 MnCr 5)	76 mm	5,5 kg
44259-46	Aluminium (F50)	46 mm	1,1 kg
44259-76	Aluminium (F50)	76 mm	1,8 kg

Selling unit: 1 piece. The specified weight relates to 1 piece.



# Accessories



## HYDRO•SUP SCREW JACK

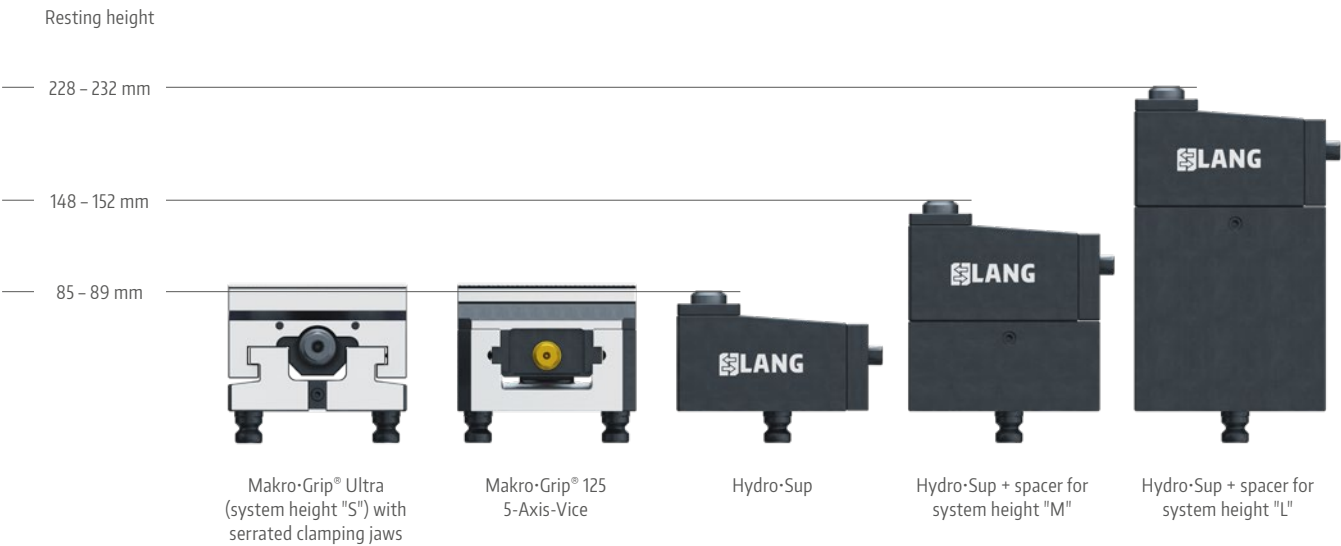
ITEM NO.	DESCRIPTION	RESTING HEIGHT	WEIGHT
81586	Hydro-Sup hydraulic screw jack	85 – 89 mm	3,0 kg
81515	Spacer for system height "M"	148 – 152 mm	2,9 kg
81523	Spacer for system height "L"	228 – 232 mm	6,7 kg

The hydraulic screw jack Hydro-Sup helps to minimise vibrations during the machining process of overhanging workpieces. The height of 86 mm is identical to Makro-Grip® Ultra system height "S". With the addition of spacers system heights "M" and "L" can be matched.



## HYDRO•SUP HEXAGON WRENCH

ITEM NO.	LENGTH	WRENCH SIZE
45512	230 mm	12 mm



The hydraulic screw jack with its spacers is suitable for all Makro-Grip® Ultra system heights. It can also be used with regular Makro-Grip® 5-Axis-Vices 125 in order to support overhanging workpieces.



## WRENCHES

ITEM NO.	FOR	WRENCH SIZE
45505	Internal hexagon	5 mm
45519	External hexagon	19 mm

Wrenches for the initial clamping setting (external hexagon) and actuation of the threaded caps' screws (internal hexagon).



## HEXAGON SOCKET

ITEM NO.	SQUARE DRIVE	WRENCH SIZE
45511	1 / 2 "	19 mm

Hexagon socket for commercial torque wrenches.



## QUICK-POINT® COVER PLUG REMOVER

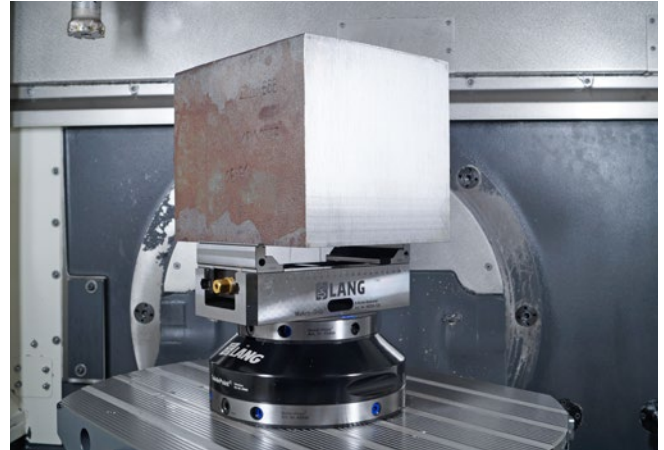
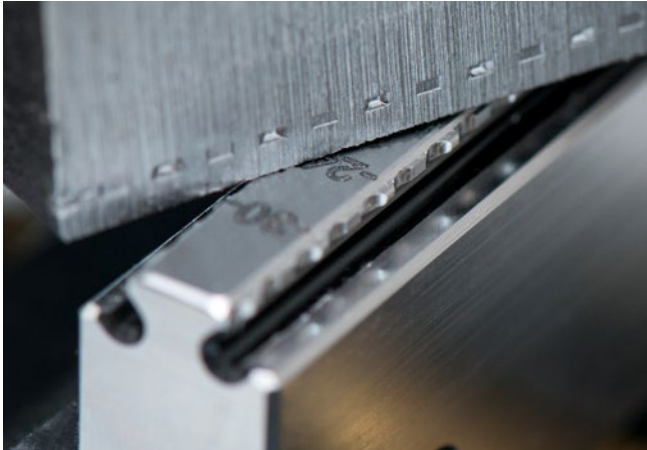
ITEM NO.	DESCRIPTION
45000-30	Cover Plug Remover

Comfortable magnetic handle for removing threaded caps from the clamping jaws and steel plugs from the Quick-Point® plates.

# Makro·Grip® Ultra Stamping Unit



## The Stamping Technology

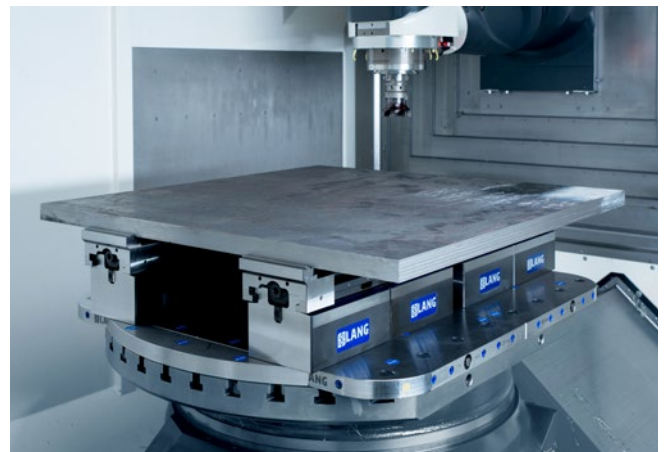


Form-Closure Technology refers to a technology in which the workpiece to be clamped is “pre-stamped” with a defined contour under high stamping pressure (up to 20 t) outside of the machine tool, before it is clamped in the clamping device. Due to the great amount

of advantages for the actual clamping process through “pre-stamping”, the Makro·Grip® technology is considered a benchmark in the 5-sided machining of blanks and absolutely beneficial to automated manufacturing.

### Why pre-stamp a workpiece?

The form-closure effect between the gripping serration of the clamping jaws and stamping indentation guarantees highest holding forces and maximum process reliability at a very low clamping pressure. This practically eliminates any material deformation which is crucial to clamping flat and deformation-sensitive material and a key factor in achieving the desired milling quality. The stamping technology completes the Makro·Grip® Ultra system and raises the quality of plate and large part clamping to a new level.





# Makro-Grip® Ultra stamping system

The Makro-Grip® Ultra stamping unit is available in three different sizes for the market launch. Fundamentally they are identical, but differ in their base plate's size and number of grooves and locking holes.

The system is designed as a dual-stamping unit which can be placed flexibly in the 96 mm grid of the base plate. The stamping unit is operated conveniently via push button. Included in delivery are two different sets of parallels which match the clamping depth of the serrated Makro-Grip® Ultra clamping jaws (3 mm and 5 mm).



## MAKRO-GRIP® ULTRA STAMPING SYSTEM

ITEM NO.	TYPE	BASE PLATE	MAX. STAMPING RANGE
83420	Standard	680 × 612 mm	420 mm
83420-HE	High-End	680 × 612 mm	420 mm
83630	Standard	880 × 804 mm	630 mm
83630-HE	High-End	880 × 804 mm	630 mm
83810	Standard	1080 × 996 mm	810 mm
83810-HE	High-End	1080 × 996 mm	810 mm

- Scope of delivery:
- Frame with base plate
  - 2 stamping units
  - 2 pairs of stamping jaws
  - 2 pairs of each parallel type (3 mm + 5 mm)
  - Pneumatic-hydraulic power multiplier (1 – 360 bar)
  - Scaled endstops and protection shields
  - Push button for operation by hand
  - Gauging blocks for measuring the wear of the serration



## MAKRO-GRIP® ULTRA STAMPING JAWS

ITEM NO.	TYPE	FOR MATERIALS	QUANTITY
83111	Standard	up to 35 HRC	1 pair
83112	High-End	up to 45 HRC	1 pair

Note: Stamping jaws are sold without parallels.



## MAKRO-GRIP® ULTRA STAMPING JAW PARALLELS

ART.-NR.	CLAMPING DEPTH	QUANTITY
83111-03	3 mm	1 pair
83111-05	5 mm	1 pair