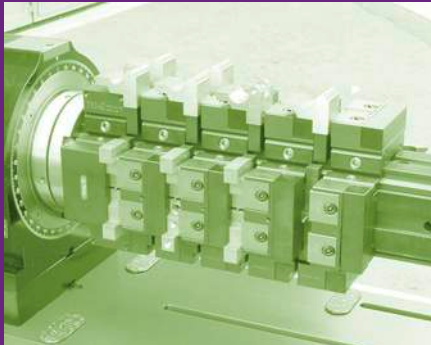
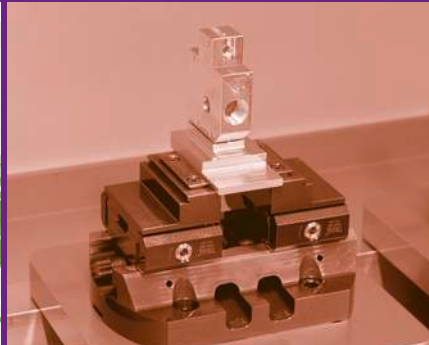
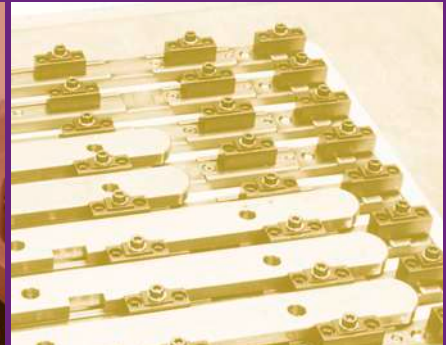




powerCLAMP



triCENTRO



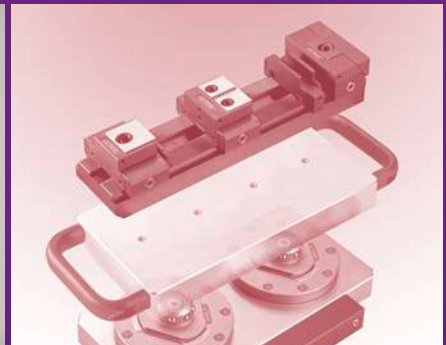
**microCLAMP
compactCLAMP**



aptoCLAMP



tripoxyMINERAL



oppSystem



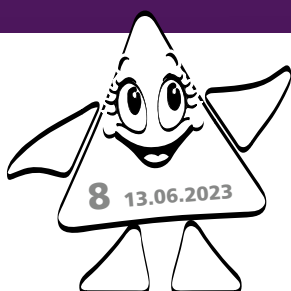
trivaCLAMP



triGEL



**Zubehör
Accessories**



Gesamtkatalog
General catalogue



Aktuellste Version / Latest version: www.triag-int.ch/download/gk

Eigenes Engineering
Eigene Produktion
Weltweiter Vertrieb

*In-house Engineering
In-house Manufacturing
Worldwide distribution*



Triag International AG
Boesch 84 / CH-6330 Huenenberg



triag-int.ch

Official Website



1990 Seit der Gründung der **Triag AG** im Jahre 1990 entwickelten und produzierten wir Spannsysteme für die spanabhebende Fertigung für den Weltmarkt und vertrieben Zerspanungswerkzeuge namhafter Hersteller in der Schweiz.

HEUTE Ab dem 1. Juli 2013 konzentrieren wir uns unter dem neuen Namen **Triag International AG** auf die Entwicklung, Produktion und den weltweiten Vertrieb unserer Spannsysteme.

Unsere Motivation ist es, für unsere Kunden den grösstmöglichen Nutzen ihrer Anlagen zu fördern. Sei es mit unserem tiefen und breiten Sortiment an Modulsparntechnik oder mittels werkstückspezifischen Sonderlösungen. Unsere modularen Spannsysteme finden Anwendung von der konventionellen Fräsmaschine bis zu 5-Achsen Fräszentren mit und ohne Automatisierung. Diese Effizienz nutzen wir auch in der Herstellung unserer Spannsysteme in unserer modernen Fertigung.

Auf ein gutes Arbeitsklima und unsere Umwelt legen wir sehr grossen Wert, denn nur mit einem funktionierendem Team und einem grossen Umweltbewusstsein können wir unsere Kunden offen und nachhaltig bedienen.

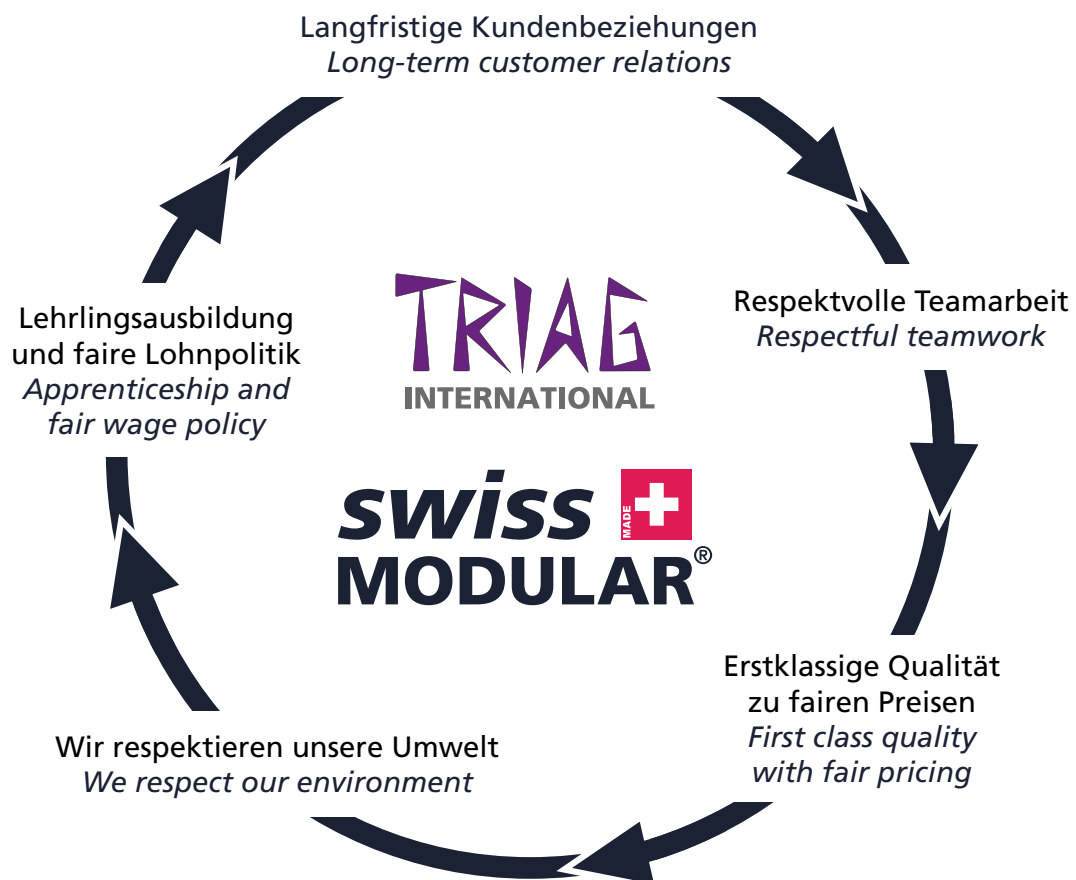
1990 Since the formation of **Triag AG** 1990 we have developed and produced workholding systems for the world market. Beside that we sold cutting tools also for the swiss market.

TODAY Since the 1st of July 2013 **Triag International AG** concentrates on workholding systems for the world market. Our goal is to develop, produce and distribute solutions for all application in the metal cutting industry.

Our motivation is to give our customers the best support to achieve the highest output of their investments in machine tools. We offer modular vise systems as standard and dedicated solutions for the highest performance. The modular system find it's application from conventional machines to high end 5-axis automated systems as well as many time on horizontal machines. Naturally we use for our production our own clamp systems so we have our own practical experience.

In a good working atmosphere and environment, we attach great importance, because only with a functioning team and a great environmental awareness, we can serve our customers open and sustainably.

UNSERE MOTIVATION OUR MOTIVATION





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powerCLAMP

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modular



triCENTRO

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microCLAMP

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aptoCLAMP

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tripoxyMINERAL

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oppSystem

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trivaCLAMP

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triGEL

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Time to say goodbye
to the dinosaur vises!



Warum moderne Spannsysteme nutzen ? *Why using modern workholding system*

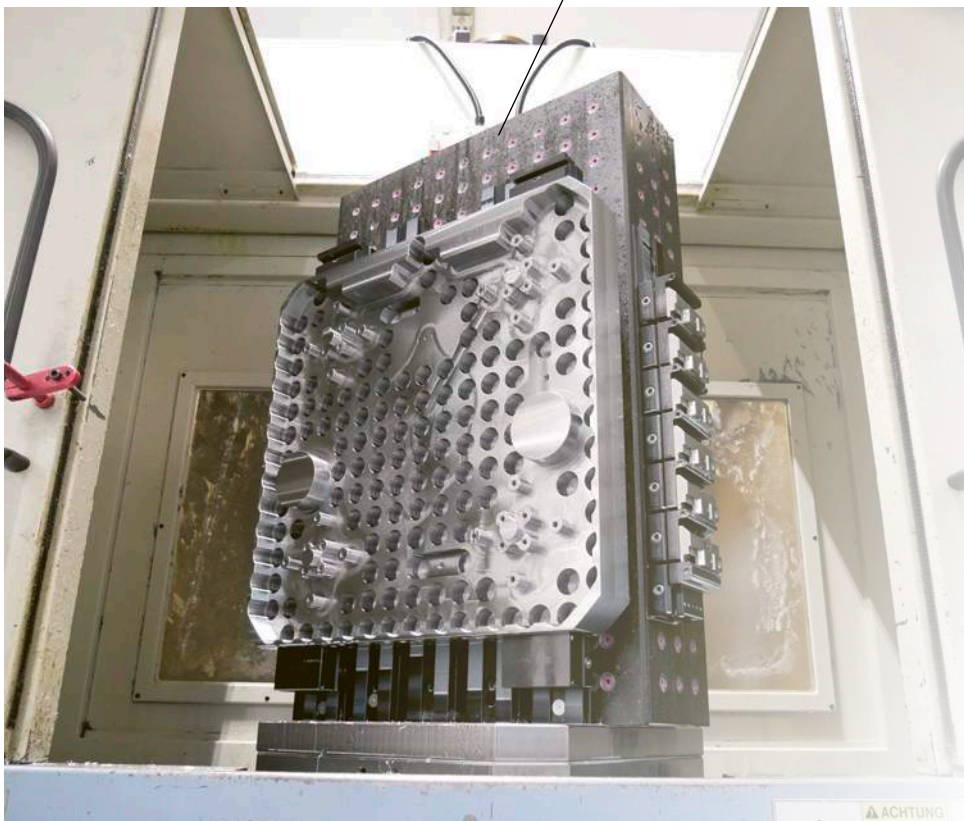
In Ihrem Gebäude werden doch auch alle Wohnungen vermietet...

Don't you rent out all flats in your building? So...



...weshalb nicht auch in Ihrem
Bearbeitungszentrum?

*...why not in your CNC milling
machine?*



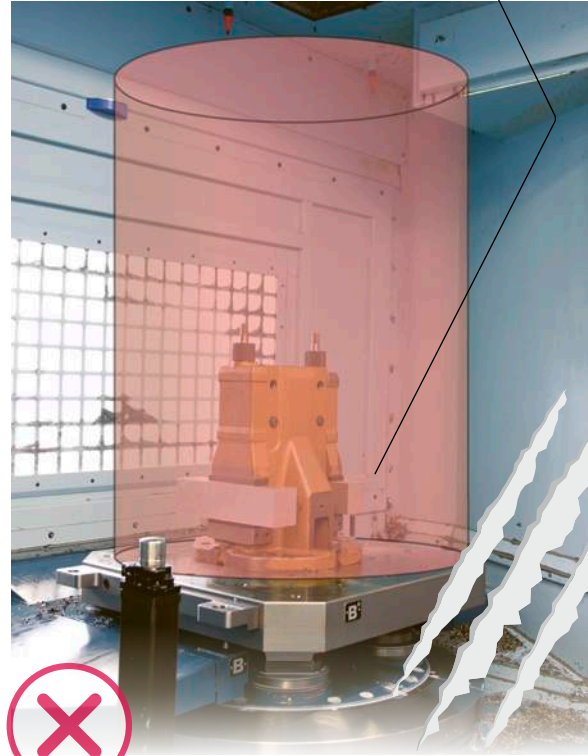
80%

...aller Bearbeitungszentren werden nicht voll ausgenutzt!

...of all machines are not fully used!



Max. mögliche Bearbeitungsgrösse
Max. working area



Verschenden Sie nicht einen Grossteil Ihrer Investition!
Don't waste a great part of your investment!

Die Lösung:

Modulares Spannen! Oder Sondervorrichtungen!

Mit unseren modularen Spannsystemen adaptieren Sie einfach und schnell
einzelne oder mehrere Werkstücke in Ihrem Maschinen Verfahrbereich.
Das Umrüsten wird schneller und es können viel mehr
Werkstücke gespannt werden.

The solution:

Modular workholding! Or dedicated fixtures!

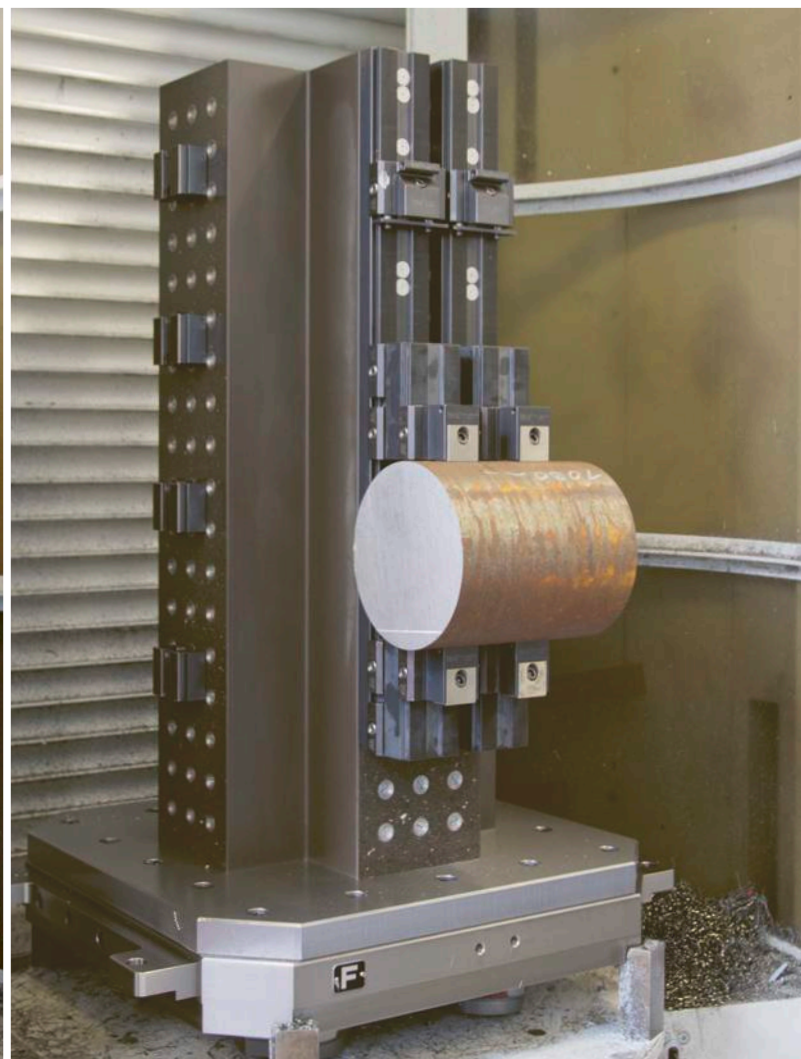
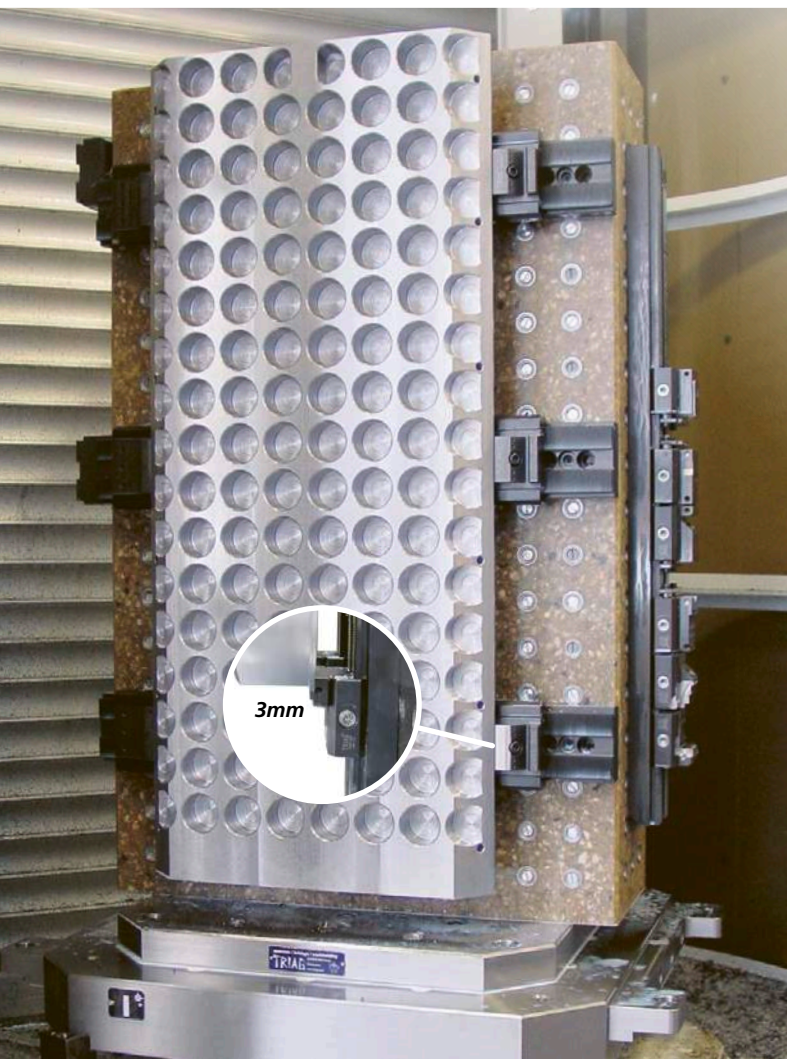
With our modular workholding devices you change fast and adapt one
or more workpieces into your machine xyz travel envelope !
You can clamp more than one or two parts at once.

«Modular» bedeutet:

3 dimensionales Anpassen an Werkstück und Maschine

Vorteile des modularen Mehrfachspannens:

- Möglichkeit der chaotischen Produktion
- Schneller Werkstückwechsel
- Vielseitigkeit durch Kombination mehrerer Komponenten, 3D modular (Schienen, mechanisch oder hydraulisch betätigte Spannelemente etc.)
- Einfache Montageprozesse
- Lange Lebensdauer, geringe zusätzliche Instandhaltungskosten
- Beschädigte Komponenten können einfach ersetzt werden
- Längere unbemannte Laufzeit
- Deutlich weniger Werkzeug- und Palettenwechsel
- Schont die Maschine, da der gesamte Bearbeitungsraum genutzt wird
- Preis: Kann trotz der Vorteile mit einem Spannstock mithalten
- Geringerer Aufwand in der Logistik, Lagerhaltung und Beschaffung
- Höhere Spanndichte, mehr Teile aufgespannt
- Spannen von kleinen wie grossen Werkstücken



«Modular» means:

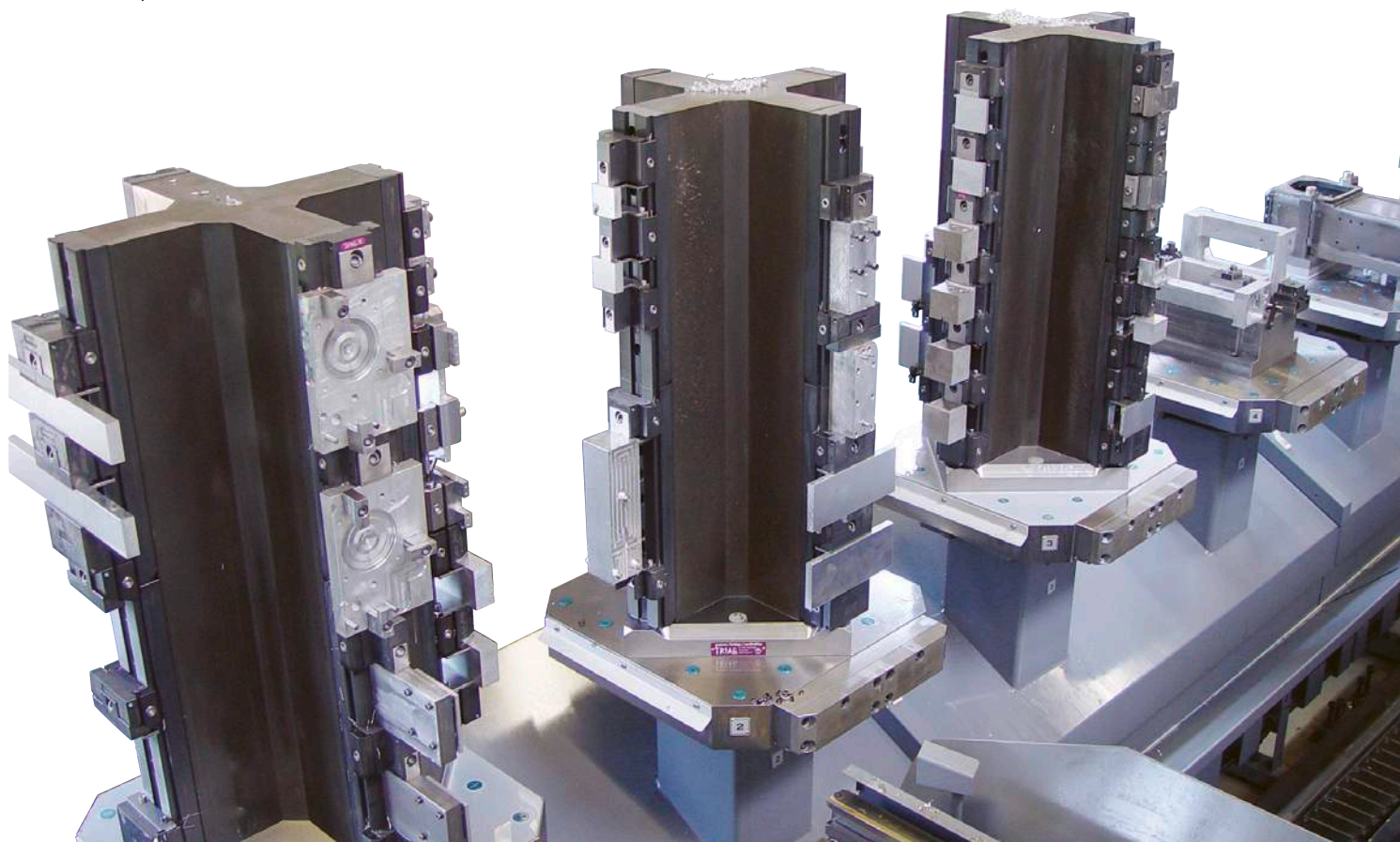
Adapting to workpiece and machine situation in 3 dimensions

Advantage of modular workholding:

- Possibility of chaotical manufacturing
- Fast workpiece change
- Flexibility because of different components, 3D modular
- Simple to set up
- Cost effective
- Easy to replace spare parts
- Long unmanned production
- Less tool changes
- The machines are used in the whole working area
- Competitive price to standart vises
- Simple to be purchased and used on different machines
- High density workholding, you clamp more parts!
- Long and reliable live with low maintenance cost

Chaotische Spannung für das Erledigen von verschiedenen Jobs gleichzeitig.
Optimale Nutzung eines Horizontal-Bearbeitungszentrums.

*Mixed set up on a Mazak horizontal machine with
18 pallets. This is used for unmanned production of
small quantities of different materials.*



Das schlummernde Potenzial

Aus der Fachpresse

Modulare Mehrfachspannsysteme werden in ihrer Bedeutung für die Zerspanung noch immer unterschätzt. Dabei sind sie sowohl in der Einzelteillfertigung als auch für Grossserien flexibel einsetzbar. Zurückzuführen ist diese Flexibilität auf das Konstruktionsprinzip der Systeme, ihre handhabbare, kompakte Bauweise wie auch die hohe Spannkraft und Spanndichte.

Bei der Beurteilung modularer Mehrfachspannsysteme gibt es eine eigentümliche Konstellation: Zum einen sieht der Einzelteil- und Kleinserienfertiger enorme Vorteile für die Anwendung in der Serienfertigung, beispielsweise rückbaubarer Vorrichtungsbaukasten. Zum anderen erkennt der Serienfertiger genau diese Vorzüge für die Einzelteil- und Kleinserienfertigung. Diese Sichtweise zu hinterfragen und zu verdeutlichen, worin die fertigungsspezifischen Vorteile modularer Mehrfachspannsysteme liegen, ist Ziel des Beitrags.

Modulare Mehrfachspannsysteme sind flexibel anwendbar

Für viele Zerspanungsarbeiten ist der klassische Maschinenschraubstock auch heute noch die passende Spannung. Mit den ständig neuen und erhöhten Anforderungen geht allerdings die Entwicklung der Spanntechnik in eine andere Richtung. Will man ein hohes Mass an Flexibilität und eine grosse Spanndichte erzielen und sollen gleichzeitig verschiedene Werkstücke auf kleinstem Raum gespannt werden, kommt der klassische Maschinenschraubstock oft an seine Grenzen. Häufig führt hier nur ein modulares Mehrfachspannsystem zum Erfolg. Spannsysteme müssen heute möglichst flexibel sein. Damit lassen sie sich an veränderte Umstände anpassen und können so die Wirtschaftlichkeit des Bearbeitungsprozesses erhalten. Modular ist ein Spannsystem, wenn es nach dem Baukastenprinzip aus Elementen zusammengesetzt und erweiterbar ist. Neben diesen grundsätzlichen Eigenschaften bedarf das Spannsystem jedoch weiterer prägnanter Merkmale: So muss es einfach und schnell zu handhaben sein, eine kompakte Bauweise mit hoher Spannkraft und Spanndichte verbinden und möglichst autarke Spannstellen aufweisen, deren Spanndruck einzeln zu verstellen ist. Im Idealfall kann mit nur einer Basisschiene ein breites Backenprogramm mit geringem Aufwand aufgebaut werden.

In der Serienfertigung besteht der wohl grösste Vorteil modularer Mehrfachspannsysteme darin, dass sich das System als rückbaubarer Vorrichtungsbaukasten für ein vielseitig gefächertes Werkstückspektrum einsetzen lässt. So spart sich der Anwender oft teilespezifische, teure Vorrichtungen. Mehrfachspannsysteme können zudem das Engineering vereinfachen, da sich auf vorhandenes Spannmaterial zurückgreifen lässt. So sind kurze Planungs- und Umrüstzeiten realistisch. Darüber hinaus trägt das modulare System zur erhöhten Prozesssicherheit bei und fördert die Qualitätstreue, die heute ein elementares, unabdingbares Kriterium der modernen Fertigung ist. Schliesslich ist ein Mehrfachspannsystem mit mehreren unabhängigen Spannstellen auch für den Einsatz in der Serie ideal, da so mehrere Werkstückspannungen mit unterschiedlichen Parametern möglich sind.

Anwendung ist bei horizontalem und vertikalem Aufbau möglich

Häufig wird bei der Serienfertigung eine Maschine mit horizontalem Aufbau, Palettenbahnhof und Spanntürmen verwendet. Was aber ist mit vertikalen Bearbeitungszentren? Wo liegen hier die Vorteile eines Mehrfachspannsystems? Spanntürme, die in der Serienfertigung mit modularen Mehrfachspannsystemen bestückt werden, weisen eine hohe Spanndichte auf, die zur verlängerten Spindelzeit führt. Gleichzeitig ist auch eine hervorragende Zugänglichkeit der Werkzeuge gewährleistet.



1

Vertikalmaschinen, deren komplette Tischflächen mit einem modularen Mehrfachspannsystem bestückt sind, ermöglichen Spanndichten, die denen auf Horizontalmaschinen gleichen

Mit einer vierten Achse kann eine Vertikalmaschine zur Serienmaschine mit Mehrseitenbearbeitung aufgerüstet werden, wobei auch hier eine hohe Spanndichte und Zugänglichkeit erreicht wird. Die horizontale und die vertikale Strategie lässt sich mit dem gleichen Spannsystem umsetzen, was bei Maschinenausfall mitunter eine echte Problemlösung darstellt.

Autarke Spannstellen sind auch für die Kleinserie wichtig

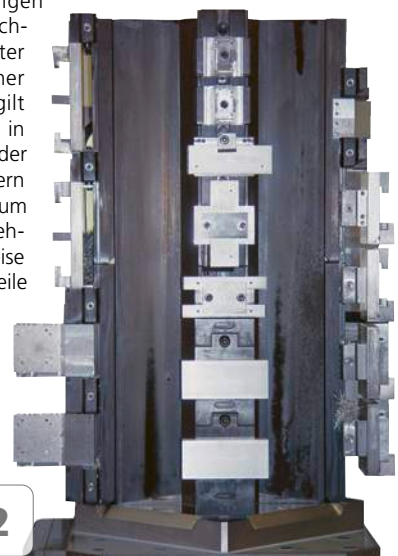
In der Einzelteil- und Kleinserienfertigung spielen modulare Mehrfachspannsysteme grundsätzlich die gleichen Vorteile wie in der Serienfertigung aus: hohe Spanndichte, geringere Werkzeugwechselzeiten, bessere Tischauslastung, gute Zugänglichkeit, einfache Handhabung, einfaches Engineering. Besonders wichtig ist hier jedoch die Flexibilität der Spanntechnik. Gerade bei kleinen Losgrößen geht viel Zeit beim Umrüsten verloren. Um diesen Vorgang zu optimieren, ist der Einsatz modularer Spannsysteme häufig das einzige Mittel. Daher ist die schnelle Verstellbarkeit der einzelnen Spannstellen in Spanndruck, Backenbreite oder Backenausführung unabdingbar.

Autarke Spannstellen sind gerade für den Einzelteillfertiger immens wichtig. Mit ihnen kann er sicherstellen, dass sich verschiedene Werkstücke aus unterschiedlichen Materialien gleichzeitig und prozessspezifisch spannen lassen (siehe Bild 2).

Der notwendige Spanndruck wird dabei ebenso gewährleistet wie die Verformungsfreiheit des Werkstücks. Letztlich resultiert aus der höheren Spanndichte eine längere Spindelzeit. Bei wiederkehrenden Kleinserien ist die reproduzierbare Spannsituation sehr wichtig. Wie in der Grossserie kann auch bei Kleinserien oder Einzelteilen die Tischfläche mit einem Mehrfachspannsystem besser ausgenutzt, der Werkzeugwechsel reduziert und die Wirtschaftlichkeit erhöht werden (siehe Bild 3).

Bei genauer Betrachtung der verschiedenen Fertigungsstrategien - Horizontal- oder Vertikal-BAZ sowie Serien-, Einzelteil- oder Kleinserienfertigung - wird die Vermischung der Verfahren deutlich. Die vermeintlichen Unterschiede sind oft nicht gross. Auch ist die Investition, die beim Übergang von einer Strategie zur anderen notwendig wird, jederzeit vertretbar und zu argumentieren. So erweist sich beispielsweise eine hochwertige Spannschiene mit drei oder vier Spannstellen als weitgehend preisneutral zu einem klassischen Maschinenschraubstock.

Für viele Anwendungen sind modulare Mehrfachspannsysteme ein echter Problemlöser und daher unumgänglich. Dies gilt sowohl für den Einsatz in der Serie als auch in der Einzelteillfertigung. Insofern haben beide Anwender - um zum Anfang zurückzukehren - mit ihrer Sichtweise recht. Nur gelten die Vorteile eben nicht nur für den jeweils anderen Bereich, sondern vor allem auch für den eigenen.



2

Kleinserienfertigung auf Horizontalmaschinen: Autarke Spannstellen ermöglichen die gleichzeitige, spezifische Fixierung unterschiedlicher Werkstücke.

Small batch production of different work pieces on a horizontal machining centre (family of parts)

The dormant potential

From the press

Modular and multiple workholding systems are still underestimated in their economic potential. But they have proven their point in many practical applications in batch production, in some cases even on small series. This is due to their modular, compact design resulting in a very high workpiece density. In spite of their compact size, the clamping force is considerable. Producers of small batches see the advantages of these systems mainly in the quantity production, whereas the mass producer uses these modular vice elements on some occasions to quickly set up a fixture for only a few parts. The reason for this fact you will find in this editorial.

Modular workholding systems are very flexible in their use

For many machining applications the classical machine vice is still the suitable workholding solution. Since the introduction of the CNC machining centres the demand for flexible, modular systems has constantly increased. These systems allow the accommodation of many parts in a limited workspace. Also the number of tool changes are considerably reduced, which means less machining time per part and longer spindle time between the loading stops. Consequently the machine productivity goes up.

Modern multiple workholding systems must be flexible. The setting up of their modules must be simple and quick. The kit like components have to be adaptable to many different workholding configurations, just by placing them into other locations or changing jaws. Their clamping force must be adjustable to protect the workpiece. In the ideal case the base rail must be able to accommodate many different vice modules and jaws.

In the production of larger batches the modular workholding systems have the greatest advantages. Their interchangeable modules can be placed to suit the workpieces often replacing expensive dedicated fixtures. Engineering of fixtures may be simplified.

Hence planning and set up from one part to the next can be shortened. Multiple workholding systems contribute also to more constant and precise parts improving the interchangeability of products, an important criterion in today's industrial world. In some cases it is even possible to clamp a family of parts in one setup. Some of our customers take advantage of this feature.

Installation possible on horizontal and vertical machines

On horizontal machines tombstones (fixture carrying towers) are often installed on the pallets. This arrangement allows for machining on three faces even with very high workpiece density. What about machines with vertical spindles? Where are the advantages of multiple workholding

systems on such machines. The machine table can be filled with several workholding systems side by side allowing many parts to be clamped in a small area. If an indexer (fourth axis) is installed with a bridge or a trunnion exactly the same machining features are possible as on a horizontal

The output of a vertical machine with a fully loaded table surface is similar to that of a horizontal machine.

machines – lots of parts even when machining on three faces. If independent base rails are used they can be installed vertically as well as horizontally. A high interchangeability of components gives good flexibility in case of a machine break down.

Multiple workholding also for small batch production and families of parts

A very important advantage besides the points mentioned for large quantity production, is the workholding of part families, particularly if the parts are produced at intervals. In such cases the flexibility and the simplicity of set up is of great importance. For instance shaped jaws may be stored in the tool room ready for the next production run. In some applications users build dedicated fixtures and install Compact Clamp or microCLAMP vice modules on their own fixtures (see picture 2).

Naturally the rail based systems like the Power Clamp or the Compact Clamp can be used as a conventional vice if only one vice module and one end module is used. For wider workpieces sometimes two or more systems are installed side by side. Doing that, the vice modules and the reference surfaces are aligned by the serrations or the pins in the base rail.

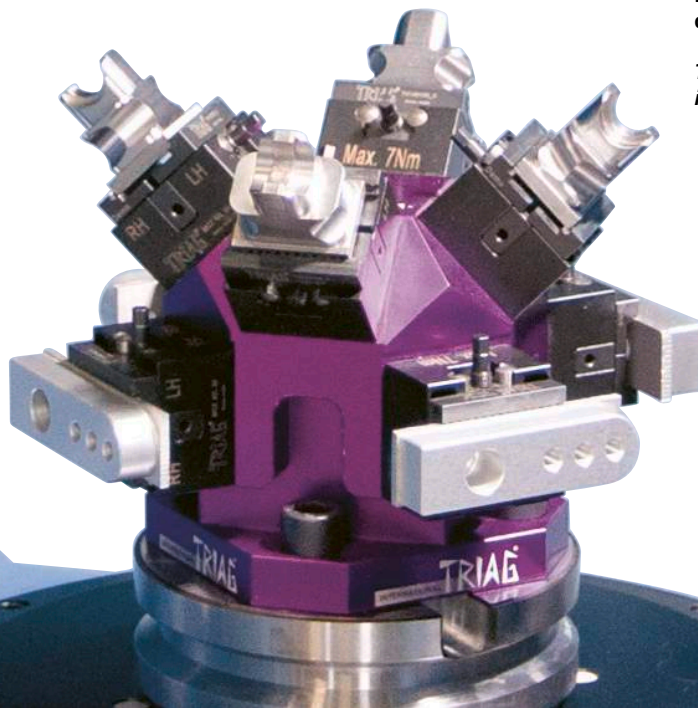
Again, the clamping of different workpieces allows the use of the same tool on various cuts therefore giving longer machining cycles and less tool changes (see picture 3).

The investment in a multiple workholding system with three or four workholding stations is about the same as that for a conventional machine vice. But the multiple workholding system gives the user much greater flexibility and versatility.



Die Verwendung von Mehrfachspannsystemen auch in der Kleinserienfertigung reduziert den Werkzeugwechsel und erhöht die Wirtschaftlichkeit.

The use of a multiple workholding system is also beneficial in small batch machining.

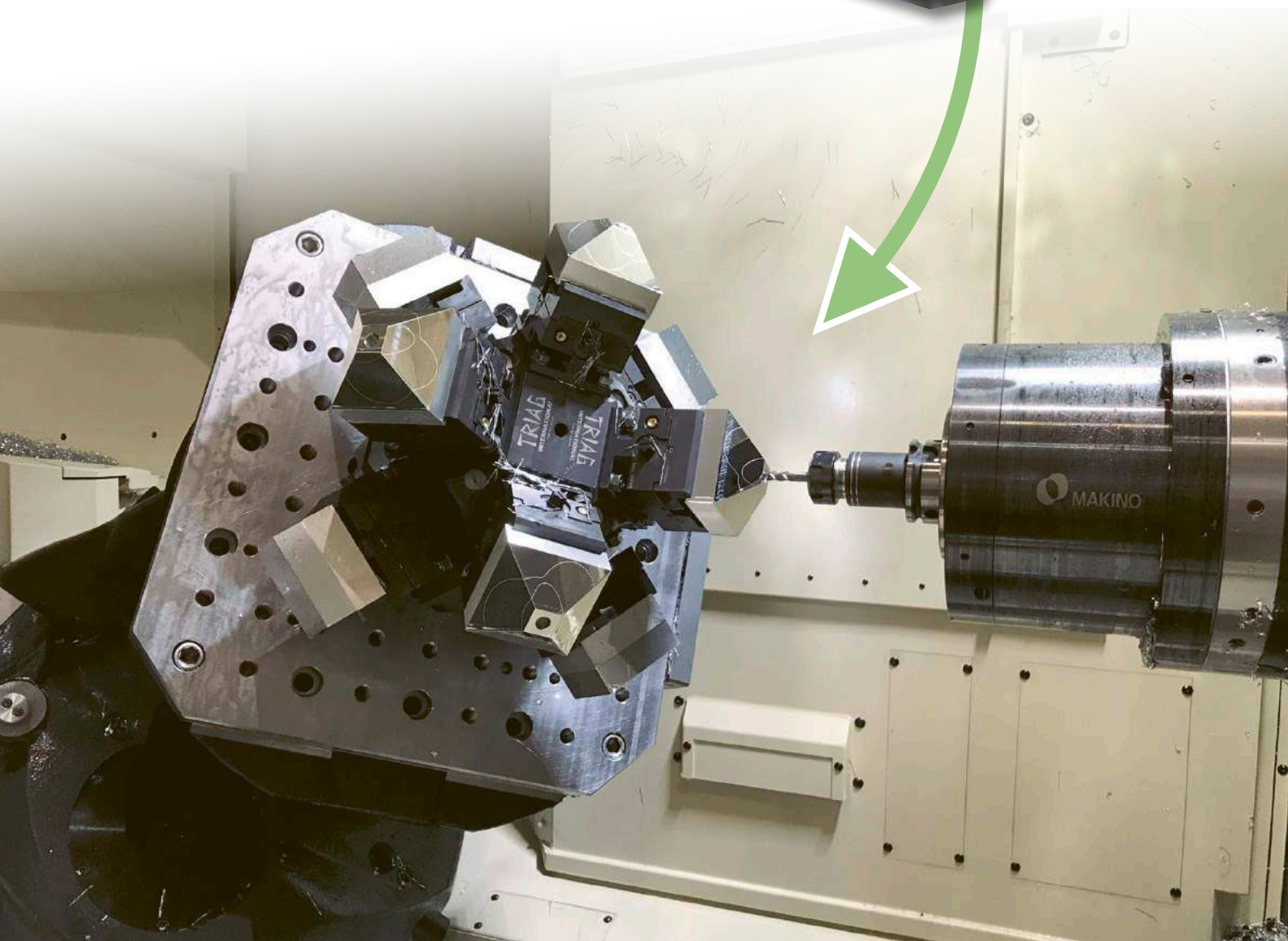
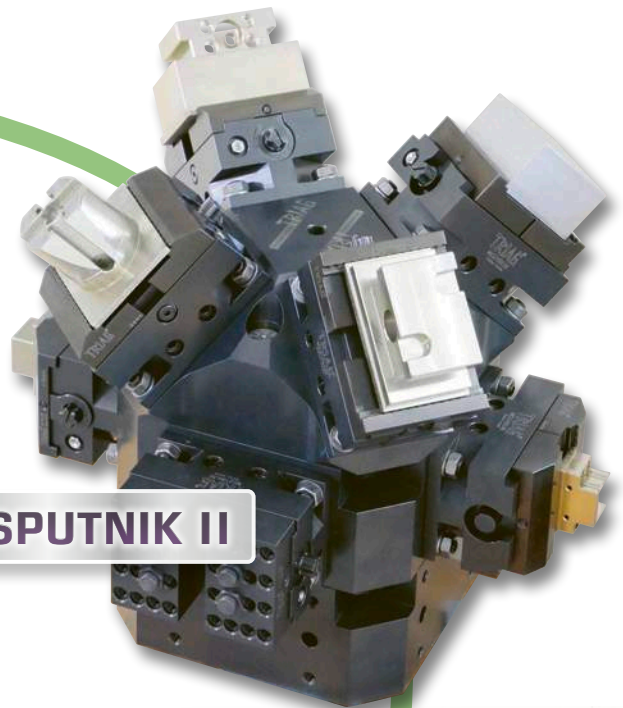


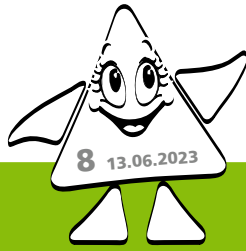
Mehrfachspannung auf Sputnik 1
Multiple workholding on Sputnik 1

MAKINO a500Z & Sputnik II

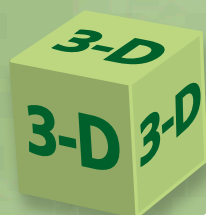
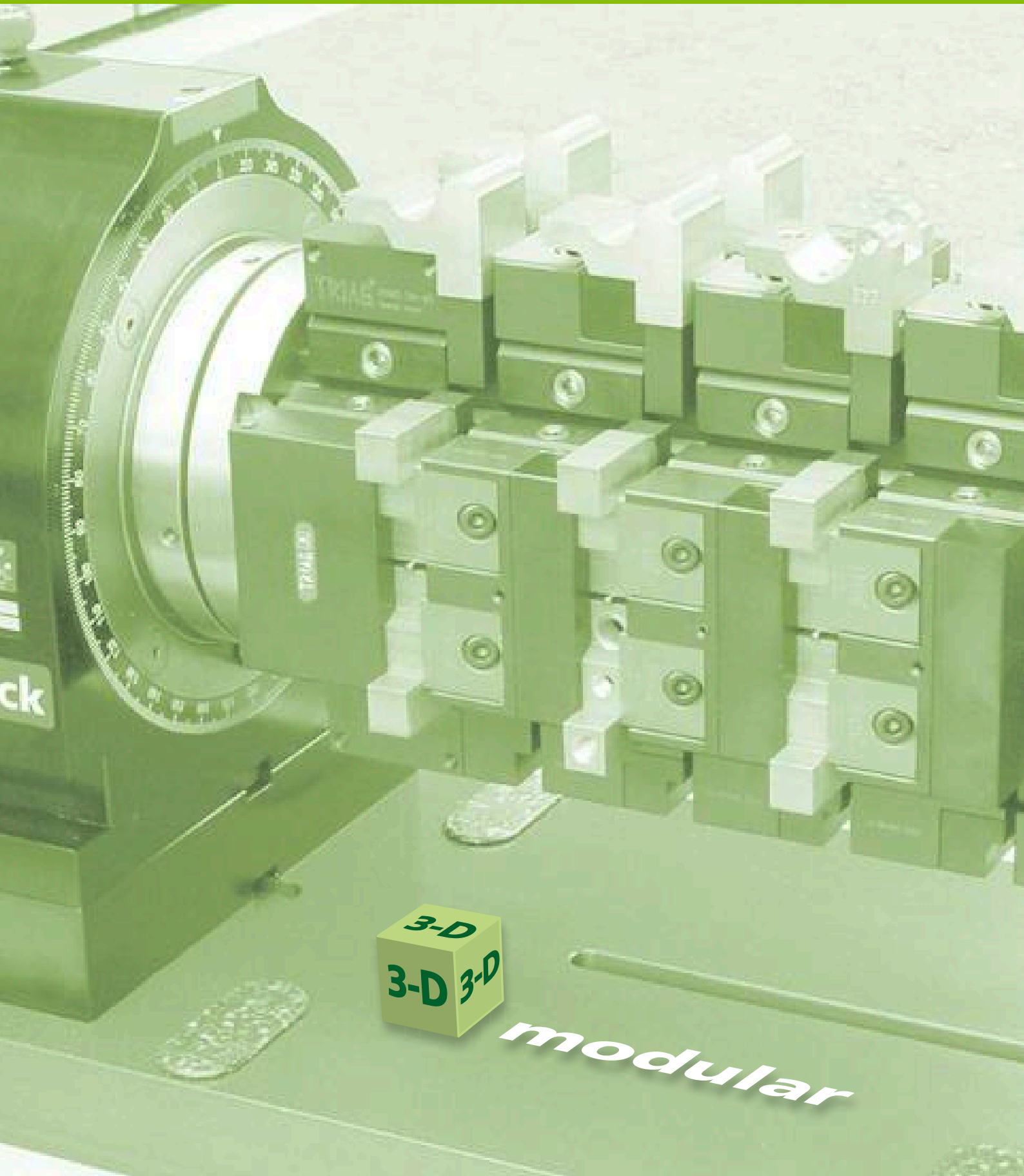


SPUTNIK II





***power*CLAMP & 5axes**



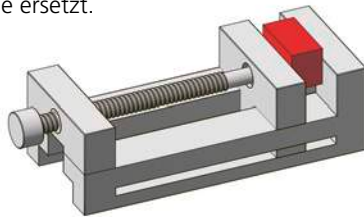
modular



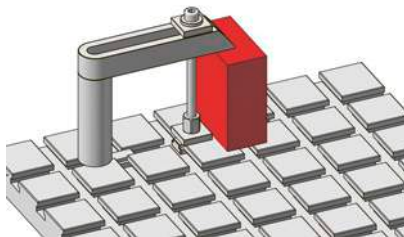
	Einleitung <i>Introduction</i>	15 - 21
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Der klassische Maschinenschraubstock ist für gewisse Zerspanungsarbeiten vielfach die richtige Wahl, obwohl man einen Spannstock ohne Mehrkosten auch mit einem Modularesystem aufbauen kann. Er wird durch die ständig erhöhten Anforderungen an die Prozessoptimierung immer mehr durch modulare Spannsysteme ersetzt.

The classic machine vise is for some application still a good option, on the other hand can you set up the same with a modular clamp system at not higher costs! Because of always increasing demand and high competition you see more modular systems at endusers places, to keep up with productivity.



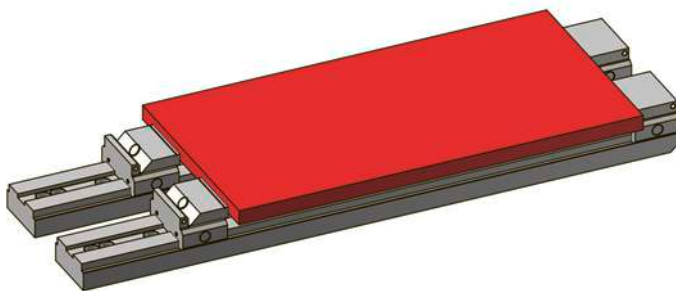
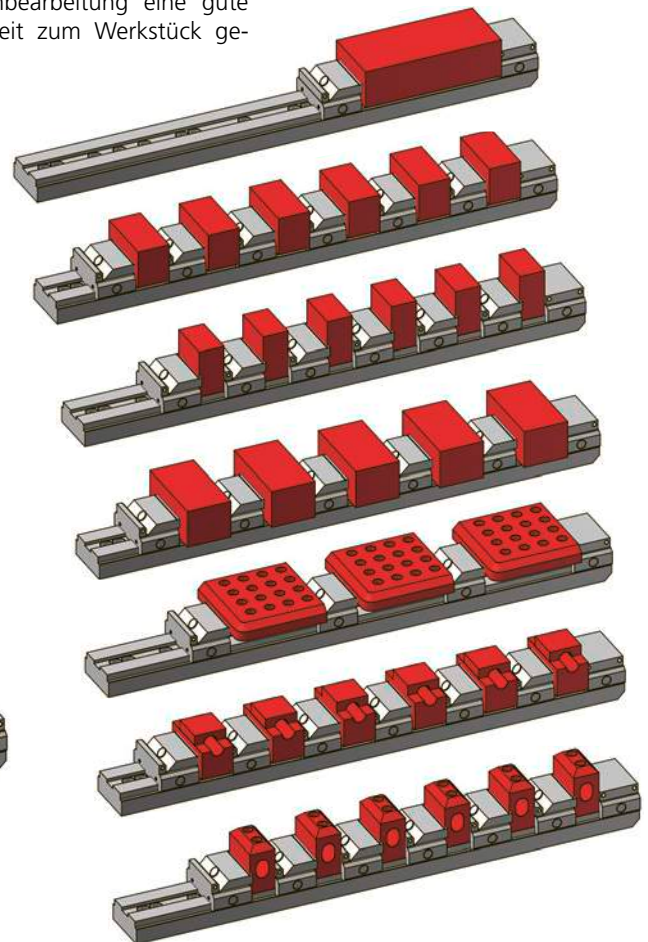
Spannen mit dem Spannstock
Clamping with the machine vise



Spannen mit Spannpratzen
Clamps in operation

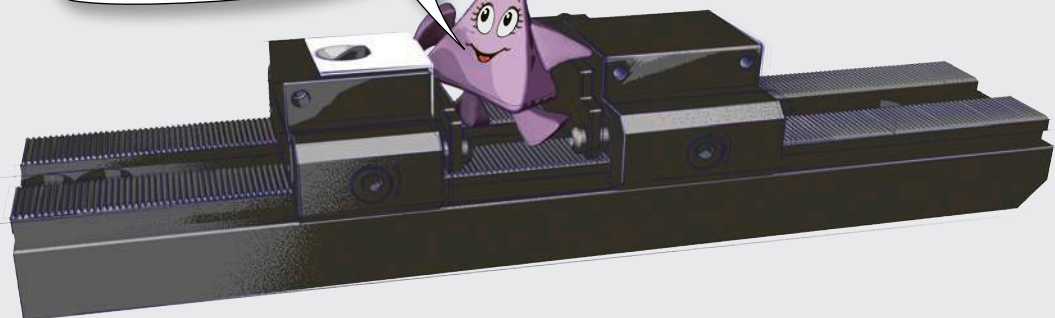
Mit den modularen Systemen wird ein hohes Mass an Flexibilität und grosser Spanndichte erreicht. Dies führt auch bei der Einzelteil- und Kleinserienfertigung zur Senkung der kostenintensiven Nebenzeiten, die einen wichtigen Faktor in der Wertschöpfungskette darstellen. Gegenüber Vorrichtungen ist der Vorteil, dass bei einem modularisiertem Aufbau die Aufspannung aus einem Baukastensystem (also standardisierten Einzelbauteilen) besteht, die kostengünstiger sind und für andere Aufspannungen wiederverwendet werden können. Zudem wird für die 3-Seitenbearbeitung eine gute Zugänglichkeit zum Werkstück gewährleistet.

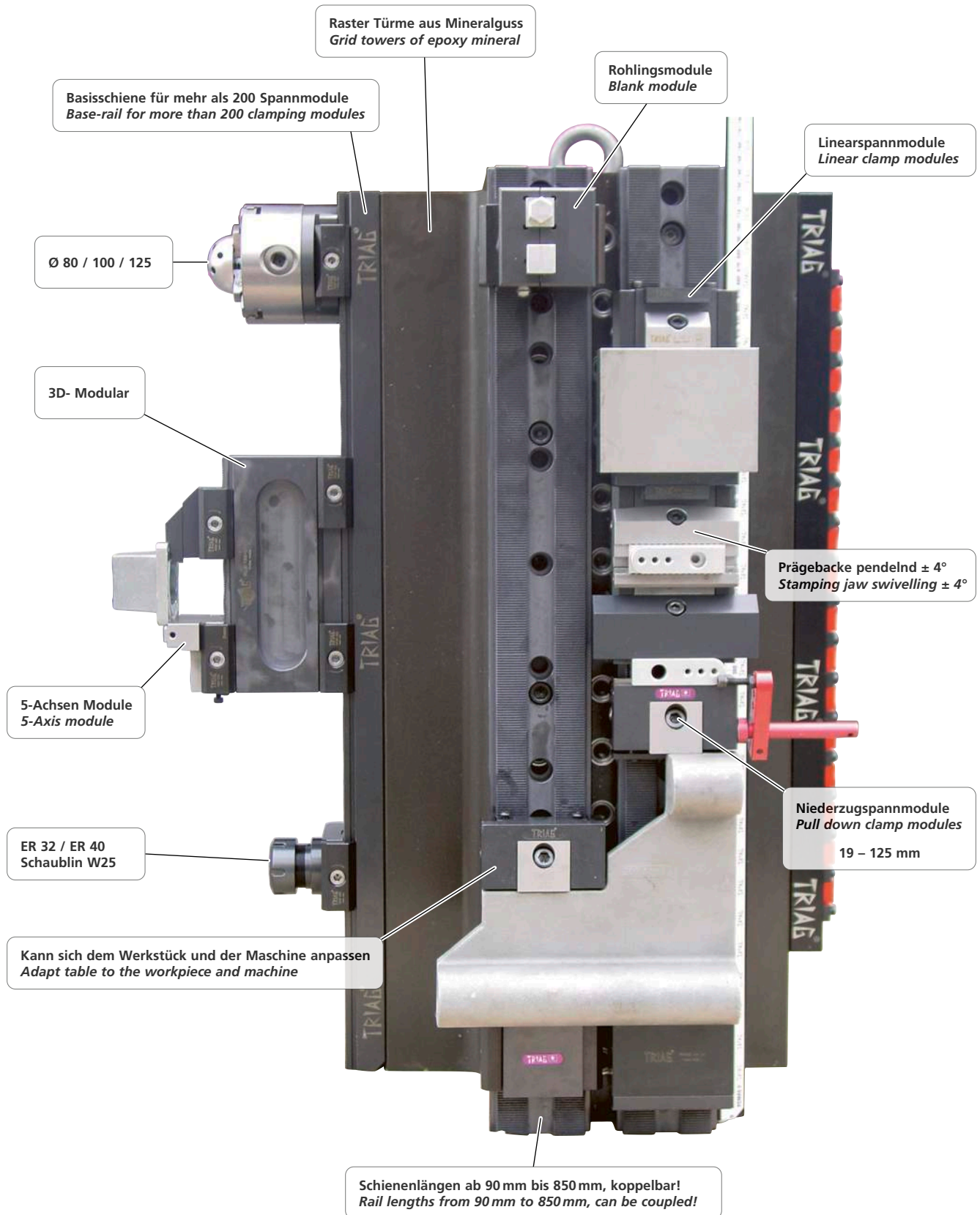
With modular clamp system you achieve a high flexibility and also high density of holding workpieces. This brings you big advantages also by producing single parts or small quantities! Compared to dedicated fixtures you can use this vises for many different applications.



Ausserdem / And:

Ich bin auch ein Spannstock!
I'm also a vise!





Modulares Spannen = Einzelspannung, Mehrfachspannung sowie auch das Spannen von kleinen, grossen oder unförmigen Werkstücken. Chaotisches, gemischtes spannen!

Modular workholding = Single clamping, multiple clamping small parts and large workpieces can be clamped, also shaped parts are possible to clamp. Mixed setups in chaotical clamp situation!



Mit dem Spannsystem Power Clamp hat die Triag International ein Produkt entwickelt, welches die Vorteile des klassischen Maschinenschraubstocks mit der Modularität eines innovativen Spannsystems in einer optimalen Art und Weise kombiniert und eine enorme Vielseitigkeit bietet. Einfache Spannungen sind genauso möglich wie Mehrfachspannungen und Spannungen von schwierigen Werkstücken.

With Power Clamp Triag has developed a product which includes the advantages of a classical vise and has the features of an advanced modular system. It can be used to clamp single parts (small and big) or multiple workholding as well as difficult to clamp parts.

Schnelligkeit / Quickness



1

Eine Schraube lösen
Loosen a screw



2

Abheben und neu platzieren
lift and change position



3

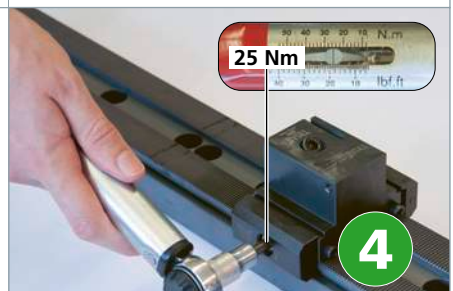
Eine Schraube anziehen
fasten one screw

Mit nur einer Schraubspindel, welche von beiden Seiten her zugänglich ist, werden die positionierten Module in einem patentierten Patzensystem zuverlässig geklemmt.

Die Module können an jeder Stelle der Trägerschienen aufgesetzt werden. Verglichen mit dem üblichen axialen Aufchieben beschleunigt das den Aufbau von Mehrfachspannern und ermöglicht, diese Spannsysteme auch bei beengten Platzverhältnissen komfortabel zu rüsten.

With only one bolt screw (left and right hand thread) the clamp modules can be lifted and change position in 2mm steps.

This patented system is unique and fast, as well as accurate.



4

Drehmoment beachten
Observe the torque

Geringes Gewicht Low weight



= Einfaches Handling
= Easy handling

Das Modul kann mit zwei Fingern abgehoben werden.
The clamp module can be moved by two fingers.



Darum haben wir dieses Symbol gewählt:
Thats why we have chosen this symbol:



Einfache Reinigung Easy cleaning



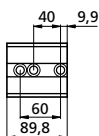
Keine spänefüllenden T-Nuten (im Gegensatz zu vielen Wettbewerbsprodukten) - Basis bilden stabile, mit Teilstücken verlängerbare Trägerschienen. Sie verfügen über eine hochgenau gefräste Verzahnung.

Eine Vielzahl an Spannmodulen mit unterschiedlichen Spannelementen lassen sich auf den Trägerschienen in einem Raster von 2 mm positionieren.

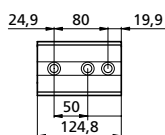
No chip catching T-slots (opposite of many competitors). The base rails are rigid and can be used modular in length width and height. The serration is accurate and checked for each base rail.

Many different clamp modules can be used on only one type base rail (step 2 mm)

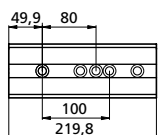
90 mm



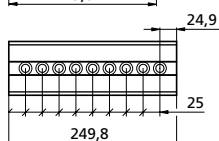
125 mm



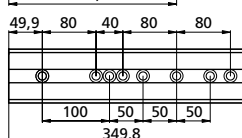
220 mm



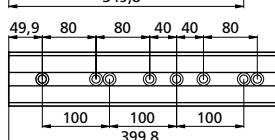
250 mm



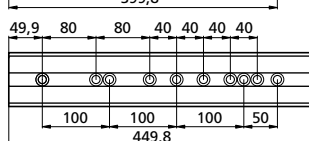
350 mm



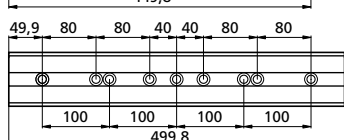
400 mm



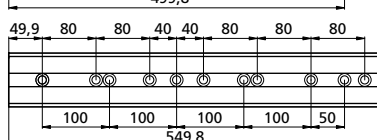
450 mm



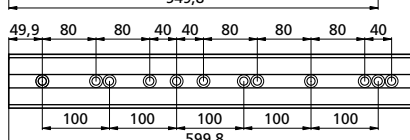
500 mm



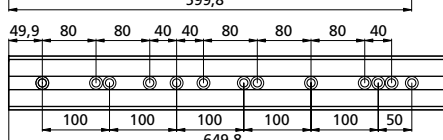
550 mm



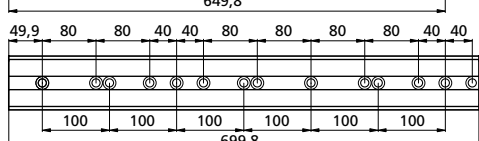
600 mm



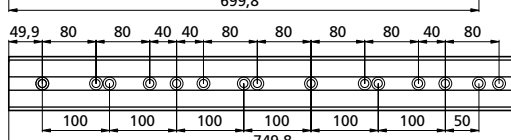
650 mm



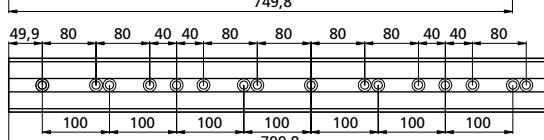
700 mm



750 mm

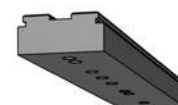


800 mm

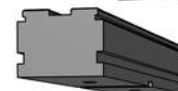


Schienen sind in den folgenden Höhen lieferbar:

Rails are in following ups available:



➔ 35 mm



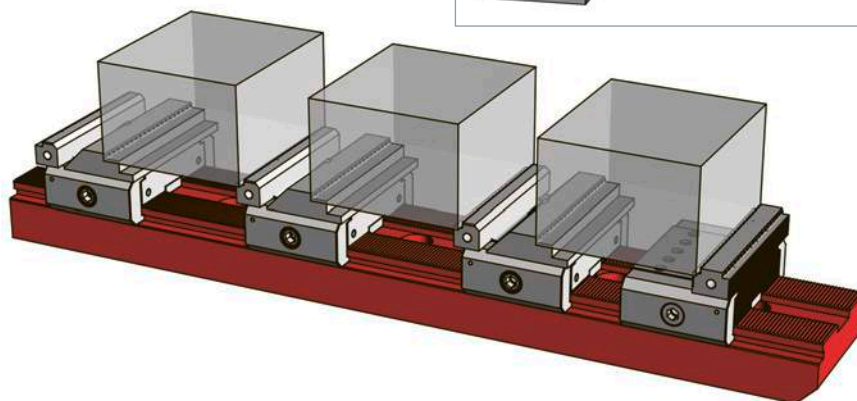
➔ 60 mm



➔ 80 mm



➔ 175 mm



Basisschiene

Die Basisschiene ist das Grundelement des modularen Spannsystems von Triag International und ist in den Höhen 35 mm, 60 mm, 80 mm und 175 mm verfügbar. Auf der Basisschiene werden alle Spann- und Anschlagmodule über eine Schraubspindel mit einer Haltekraft von 15.000 daN (= 15 t) befestigt. Eine schnelle und genaue Positionierung ist durch die Verzahnung (2 mm Teilung) auf der Basisschiene gewährleistet und sorgt somit für kurze Rüstzeiten.

Durch den Einsatz von Erhöhungsmodulen wird die Werkstück-Zugänglichkeit speziell bei 5-Achsenmaschinen auch mit kurzen Werkzeugaufnahmen ermöglicht. Somit ist die Maximalgröße der Werkstücke nur noch durch die Maschinengröße eingeschränkt. Die Basisschiene dient in diesem Zusammenhang als mechanisches Nullpunktsystem.

Die Basisschienen sind für eine schnelle Aufspannung auf den gängigsten Palettsystemen konzipiert. Aus Gewichtsgründen können auch die eigens entwickelten Spanntürme aus Mineralguss eingesetzt werden. Diese verfügen über eine so hohe Vibrationsdämpfung, dass dadurch im oberen Bereich der Türme sehr präzise gearbeitet und dabei eine exzellente Oberflächengüte erreicht werden kann.

Basisschienen / Base rails



Masssystem / Measurement system = metric & inch

powerCLAMP



Mit verschiedenen Basismodulen kann man auch die 3. Dimension Modular gestalten! Mit der Höhe von 60 mm kann die Modulhöhe auf 94 respektive auf 109 mm erhöht werden (34/49 Modulhöhe). Die Länge von 130 mm erlaubt es jeweils ein Spannmodul und ein Anschlagmodul zu platzieren.

There are different sizes of riser blocks to increase the height of the clamp modules. This way you can get from 34 to a clamp height of 94 or 109 mm depending on the clamp module you choose. This riser blocks makes the power clamp system 3D-modular!

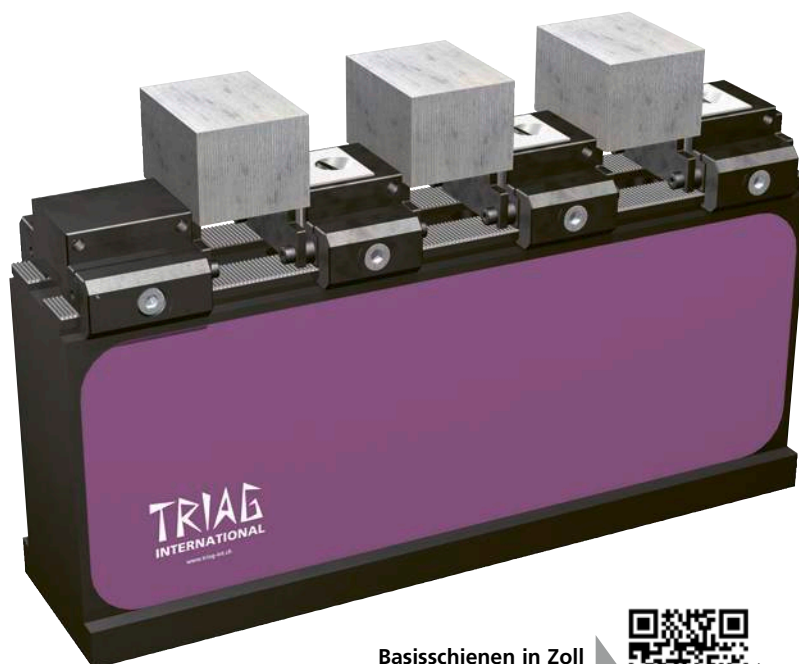
Mehr auf Seite | More on Page 48

Base rail

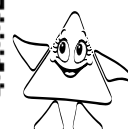
The base rail is the basic element of the Triag modular clamp system. We offer them in different lengths and heights and more than a hundred different standard clamp modules will fit onto the base rails.

Holding force which the clamp modules are clamped to the base rail is 15'000 daN (15t). The precision serration in 2mm pitch allows to fit the clamps fast and accurate.

All three dimension are modular!
You can double or triple the length with coupling the rails or you can use them side words in a row. Also the height is modular (please see next page)



Basisschienen in Zoll
Base rails in inch



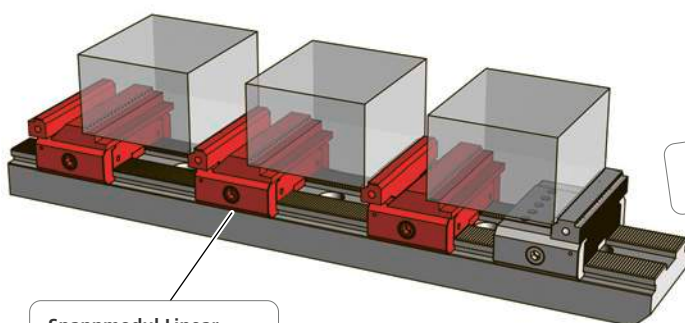
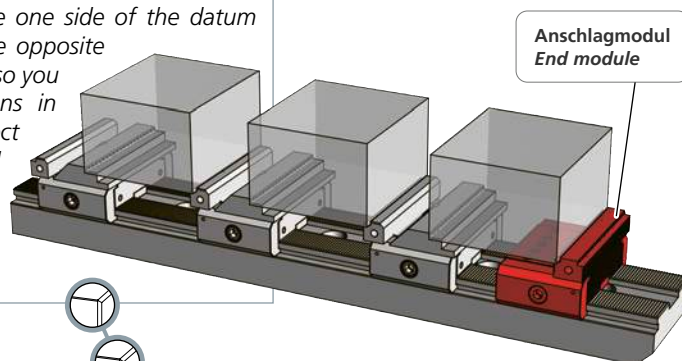
Das Anschlagmodul / End modules

Für das Spannsystem «Power Clamp» ist in der Regel nur ein Anschlagmodul als «feste Backe» notwendig. Mittels der 2 mm Verzahnung lässt sich das Modul sehr genau auf der Basisschiene positionieren und ist mit der Schraubspindel schnell befestigt.

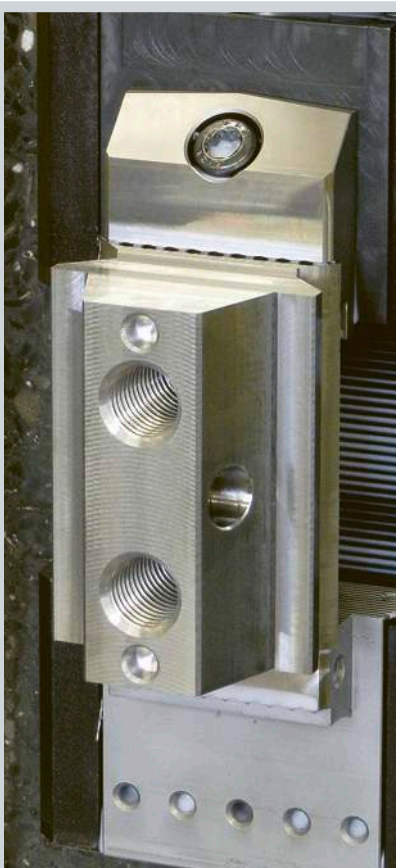
Für die unterschiedlichen Bearbeitungssituationen steht eine Vielzahl von Ausführungen zur Verfügung. Diese unterscheiden sich in der Breite der Backen (ab 19 mm bis max. 150 mm) als auch in der Beschaffenheit der Spannflächen (glatt, geriffelt, gerillt, hartmetallbeschichtet oder mit Prägeverzahnung, mit der direkt geprägt werden kann).

In a row of parts there is usually one end module followed by the clamp modules. For all the different clamp situation we offer a wide range of different end modules from 19 mm to 150 mm.

Usually you have one side of the datum face flat and the opposite double serrated so you have two options in one. Also direct stamping end modules with a workholding step of 3 mm are available.



Verschiedene Ausführungen der Anschlagflächen!
Different styles at grip surfaces!



Lineare Direktprägespannung
Linear direct stamping module

Das Spannmodul / Clamp modules

Die «beweglichen Backen» gibt es in zwei Ausführungen. Zum einen für das Niederzugspannsystem und zum anderen für das Linearspannsystem. Dabei dient das Spannmodul bei beiden Systemen wiederum als Anschlagmodul für die nächste Aufspannung.

Die Breite der Spannfläche bewegt sich wie bei den Anschlagmodulen im Bereich zwischen 19 mm und 125 mm. Durch die innovativen Ausführungen der Spannflächen wie z. B. die Prägebacken oder Druckstifte werden enorme Haltekräfte erreicht.

Bei umfangreichen Testreihen zu der Werkstückverschiebung bei einer Spannkraft von 2000 daN und einer Zerspankraft von bis zu 600 daN wurden bei der Verwendung von Prägebacken nur minimale Abweichungen vom Nullpunkt festgestellt. Leichte Abweichungen von der Parallelität der Werkstücke werden mit der Pendelfunktion ($\pm 4^\circ$) ausgeglichen.

Innovative Lösungen gibt es auch für spezielle Spannaufgaben, wie z.B. Formbacken, Dreibacken- und Spannzangenfutter, Vakuumplatten oder Magnetspannplatten.

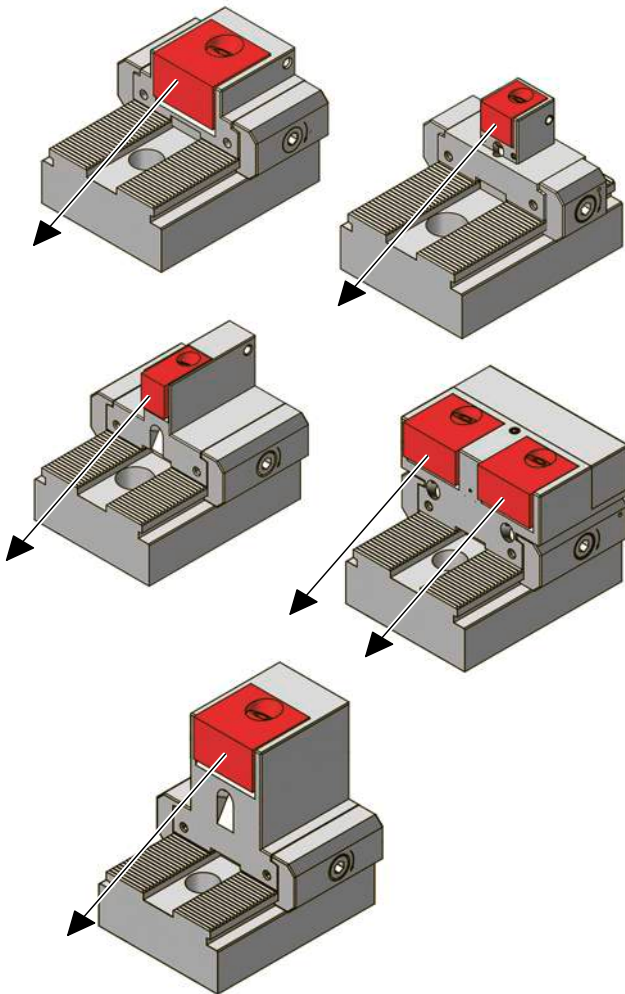
There are mainly two different types of clamp modules. Linear and pull down jaws both with integrated datum face for the next workpiece. Datum face can normally be double serrated or flat.

The movable jaws you can get in various versions such as hardened flat, carbide coated soft jaws double serrated, linear pull down, direct stamping dovating and more. The width of the clamps modules starts from 19 mm up to 125 mm.

Clamping force goes to a maximum of 2800 daN (2,8t).

For special clamping situations we offer also chucks, collet chucks vacuum plates or even magnet plates which fits onto the Power Clamp base rails.

Niederzugspannmodule
Pull down clamp modules



Die Fakten beim Niederzugspannsystem

Verstellbereich: 0- 4,1 mm
 Spannkraft: Bis 2'800 daN

Vorteile beim Niederzugspannsystem:

- Höhere Haltekräfte
- Hohe Wiederholgenauigkeit
- Optimale Spannmethode für Kleinteile
- Mit Schnellwechselbacken
- Doppelspannsystem in einer Backe zum Spannen und Bearbeiten von zwei Kleinteilen
- Mit Vorsatz als Linearspannsystem einsetzbar
- Auch Anschläge mit Niederzugeffekt erhältlich

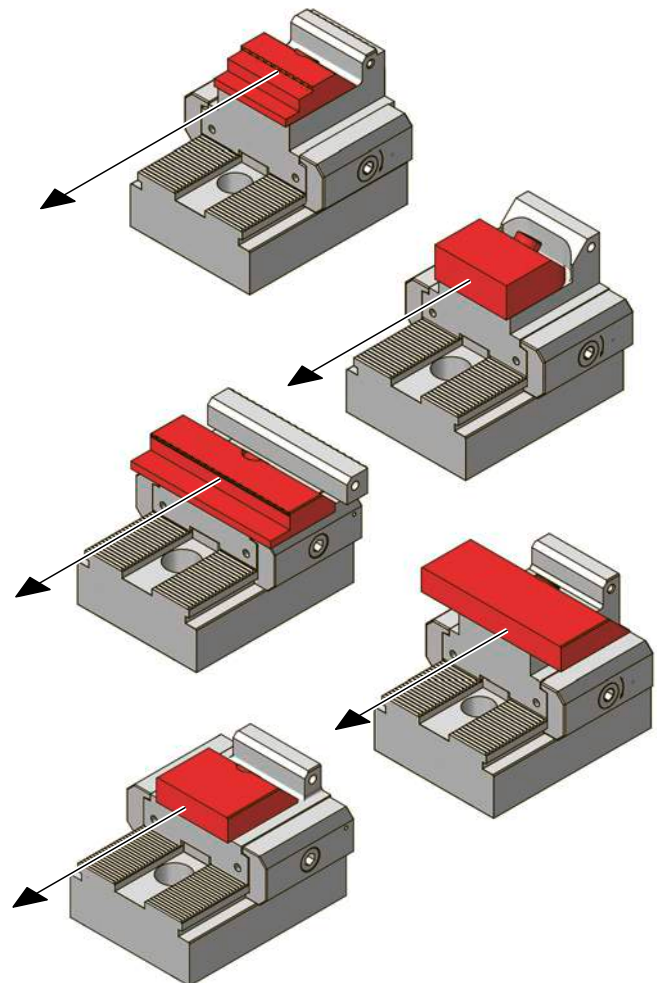
Facts for pull down clamp modules

Jaw range: 0- 4,1 mm
 Clamping force: up to 2'800 daN

Advantages pull down jaws:

- Higher holding force
- With linear adaptable jaws
- Also with pull down jaws for the stop side available
- With adapter set can be changed to linear
- Also pull down jaws for datum face

Linearspannmodule
Linear clamp modules



Die Fakten beim Linearspannsystem

Verstellbereich: 0- 5,0 mm
 Spannkraft: Bis 1'600 daN

Vorteile beim Linearspannsystem:

- Spannstockähnliches Spannen
- Prozesssichere Positionierung der zweiten Aufspannung
- Gut geeignet für die Erstellung von individuellen Formbacken
- Sicherer Halt mit Prägetechnik

Facts for linear clamp modules

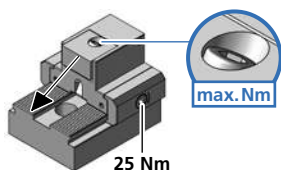
Jaw range: 0- 5,0 mm
 Clamping force: up to 1'600 daN

Advantages linear jaws:

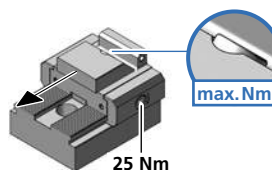
- Similar clamp as conventional vise
- Good for shaped jaws
- Secure clamped with direct stamping jaws
- Higher accuracy



ACHTUNG / CAUTION



Niederzug Spannmodule
Pull adown module



Linear Spannmodule
Linear module



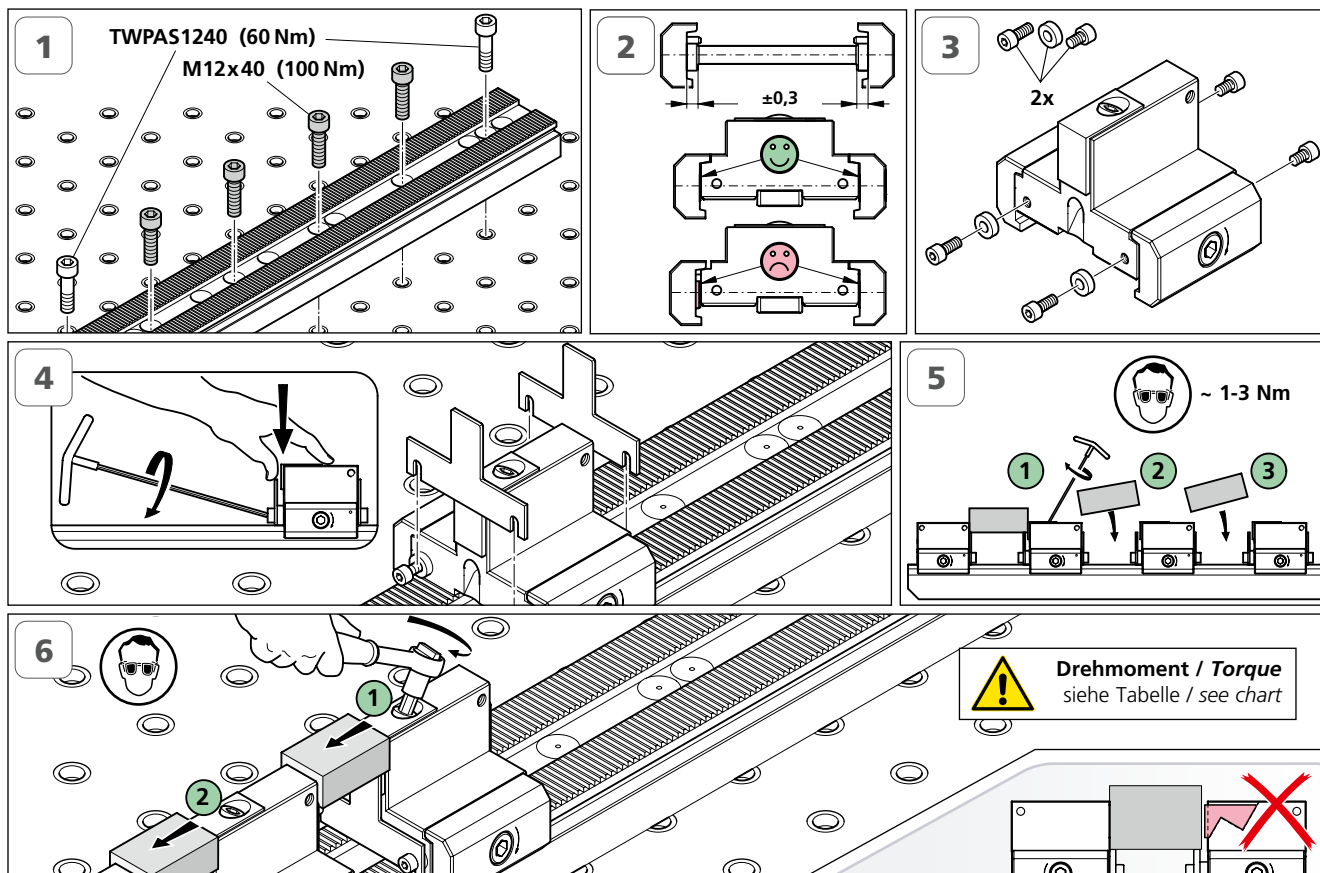
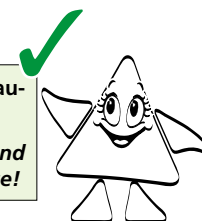
Schraube / Screw	Drehmoment / Torque		Spannkraft / Workholding force		
	Nm	(lb-ft)	~daN	~(lb)	~t
M5 + M6	4	3	= 500	1100	0,50
	5	3,7	= 580	1280	0,58
	6	4,4	= 690	1520	0,69
	7	5,2	= 780	1720	0,78
	8	5,9	= 880	1940	0,88
	9	6,6	= 980	2160	0,98
M6	10	7,4	= 1020	2250	1,02
	12	8,9	= 1220	2690	1,22
	14	10,4	= 1450	3200	1,45
M8	15	11	= 1520	3350	1,52
	4	3	= 410	900	0,41
	5	3,7	= 490	1080	0,49
	6	4,4	= 560	1230	0,56
	7	5,2	= 660	1450	0,66
	8	5,9	= 730	1600	0,73
	9	6,6	= 810	1790	0,81
	10	7,4	= 900	1980	0,90
M10	15	11	= 1520	3350	1,52
	20	14,8	= 1810	3990	1,81
	25	18,4	= 2100	4630	2,10
	10	7,4	= 400	880	0,40
	20	14,8	= 1400	3090	1,40
	30	22,1	= 2000	4410	2,00
	40	29,5	= 2800	6170	2,80

Schraube Screw	Drehmoment Torque		Spannkraft Workholding force		
	Nm	(lb-ft)	~daN	~(lb)	~t
M8	10	7,4	= 400	880	0,4
	20	14,8	= 800	1760	0,8
	30	22,2	= 1200	2650	1,2
	40	29,6	= 1600	3530	1,6

WICHTIG: Die angegebenen Drehmomente sind die absoluten Maximalwerte. Über die Spannkraften geben die Tabellen Auskunft.

IMPORTANT: The torque numbers specified represent the absolute maximum. The table at the bottom of this page provides further information on the workholding forces.

Die Spannbacken und Schrauben regelmässig fetten!
Lubricate clamping jaw and screw regularly with grease!



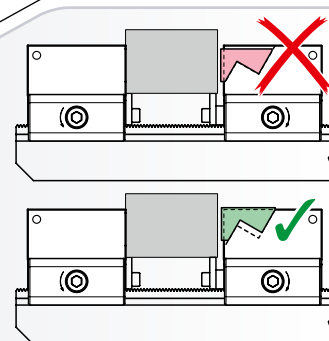
7

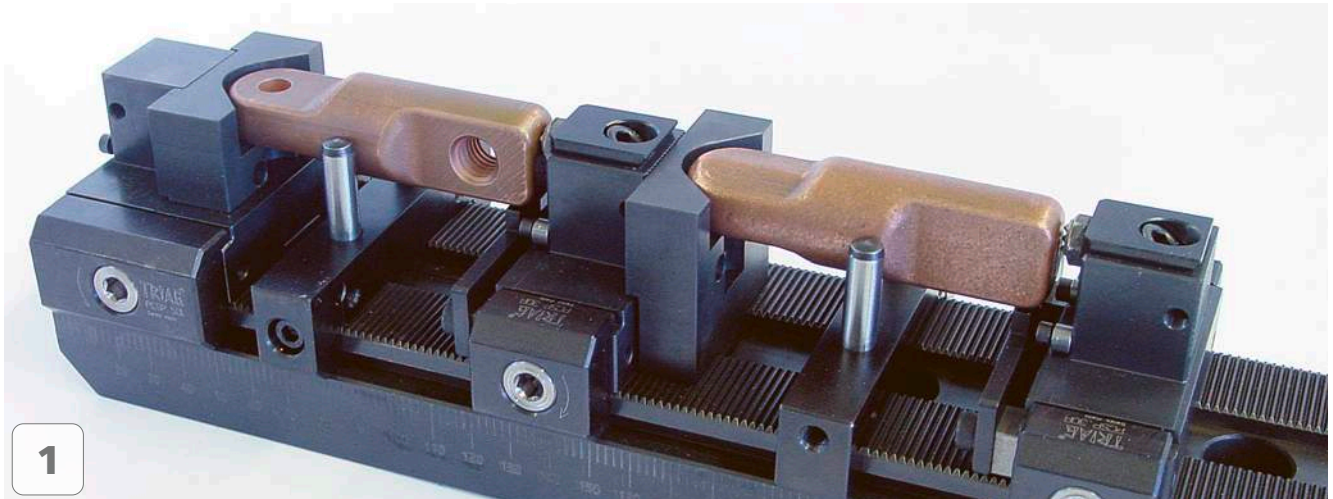
WICHTIG:

Vor dem Positionieren der Spannmodule für ein neues Werkstück, ist die **Spannbacke ganz zurück zu stellen**, dies gewährleistet eine sichere Spannung!

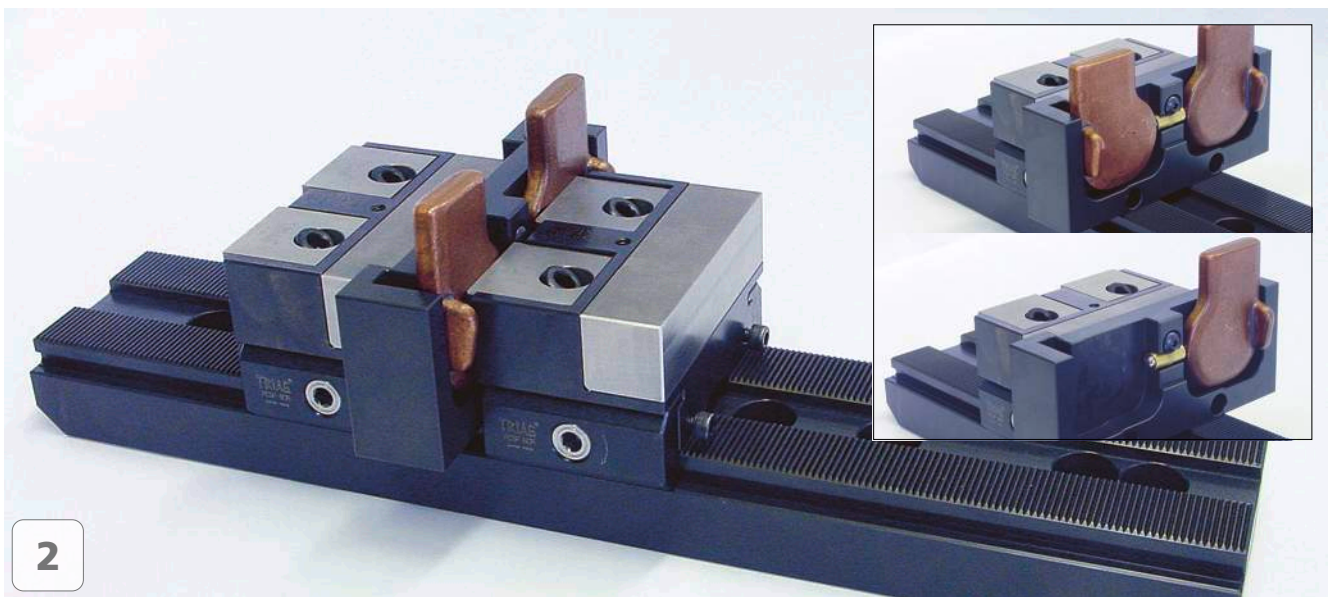
IMPORTANT:

Prior to setting up a new clamping module the **clamping jaw of the vice module must be retracted all the way!** This guarantees proper clamping of the new workpiece.

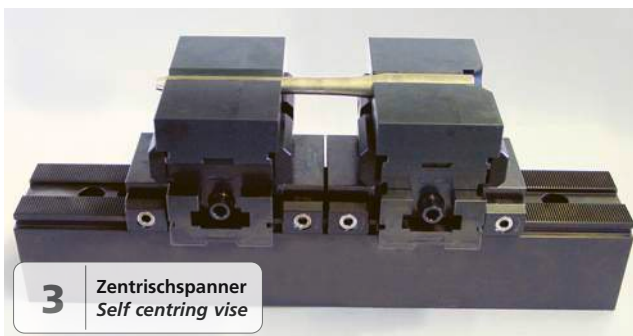




1



2



3

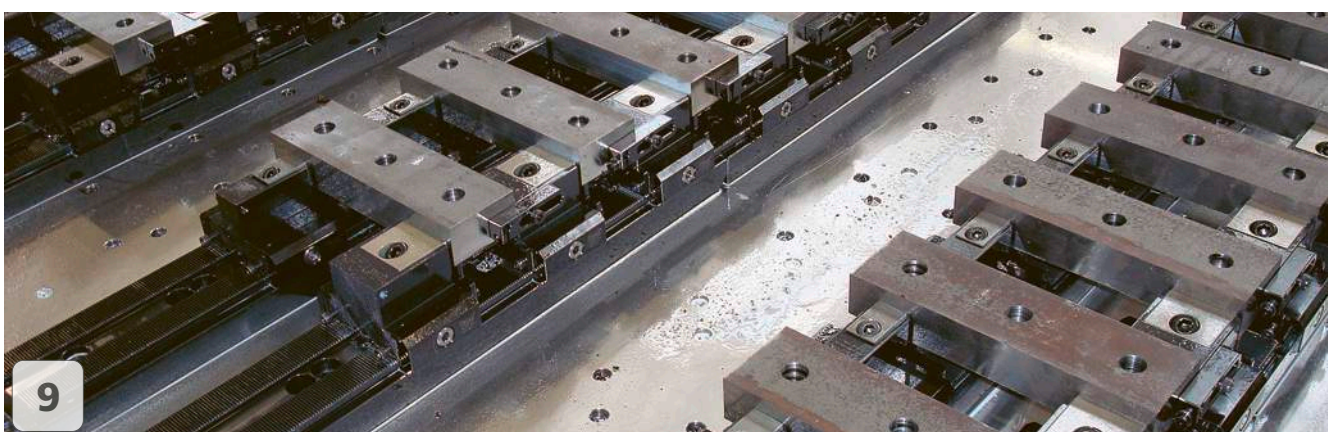
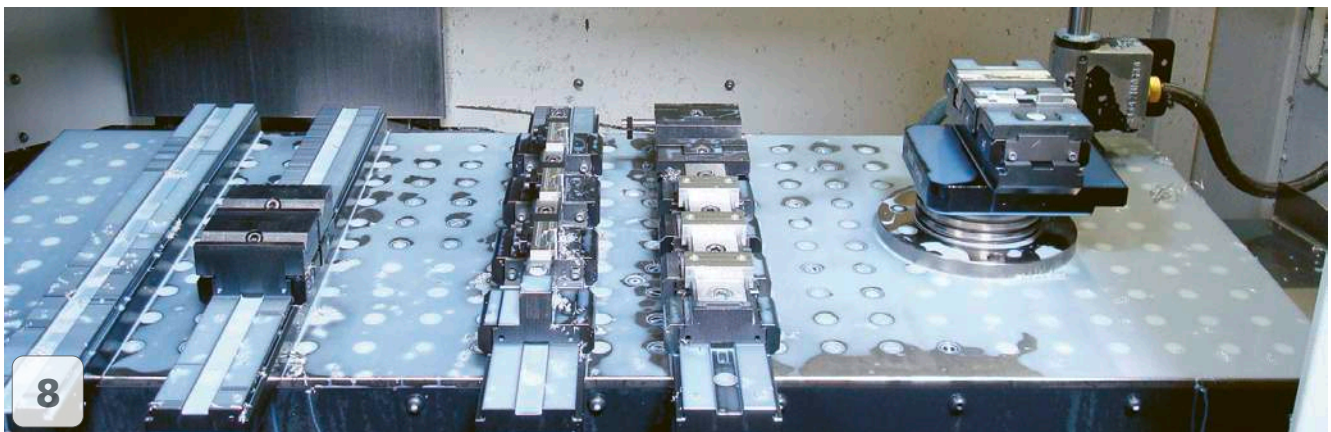
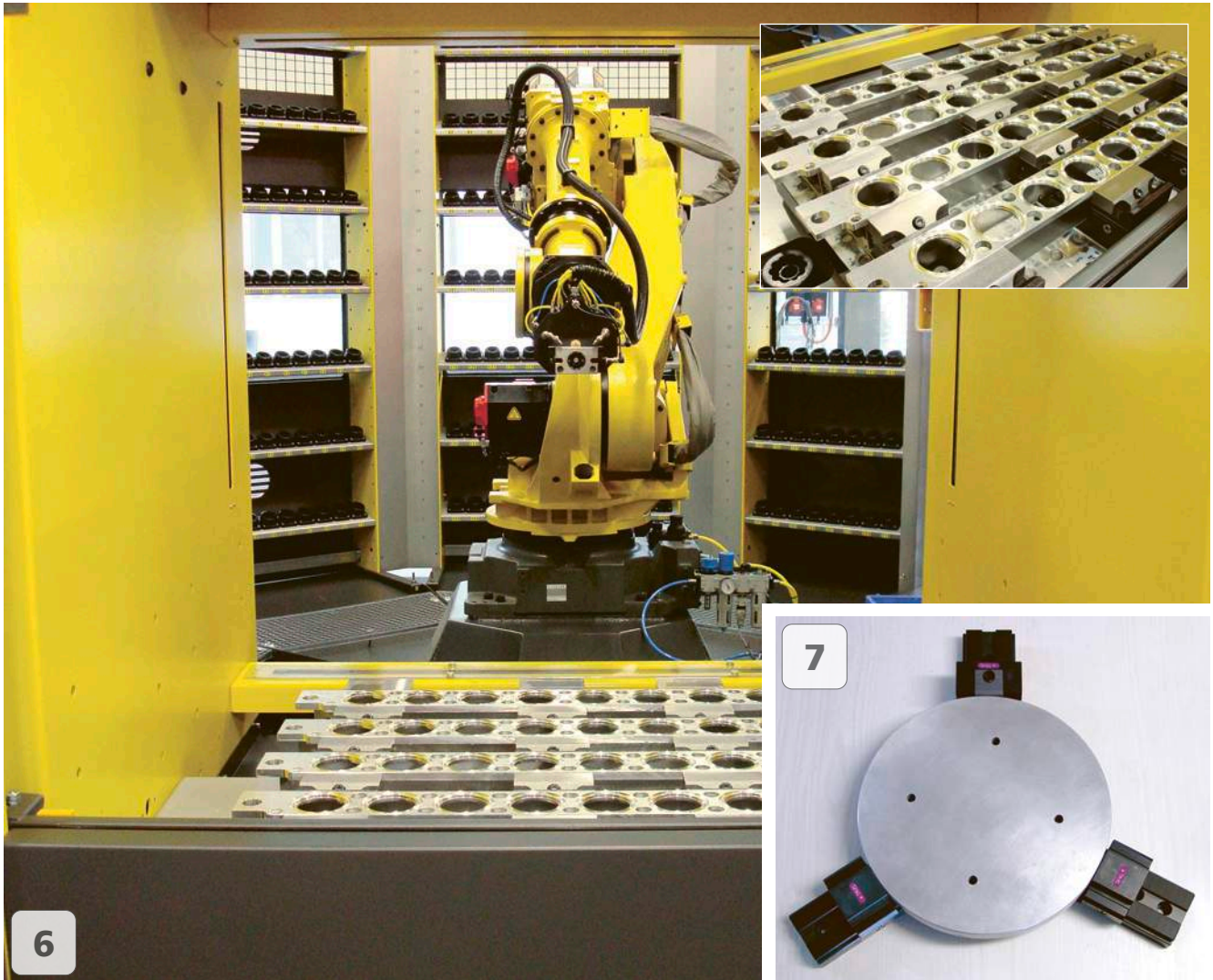
Zentrischspanner
Self centring vise

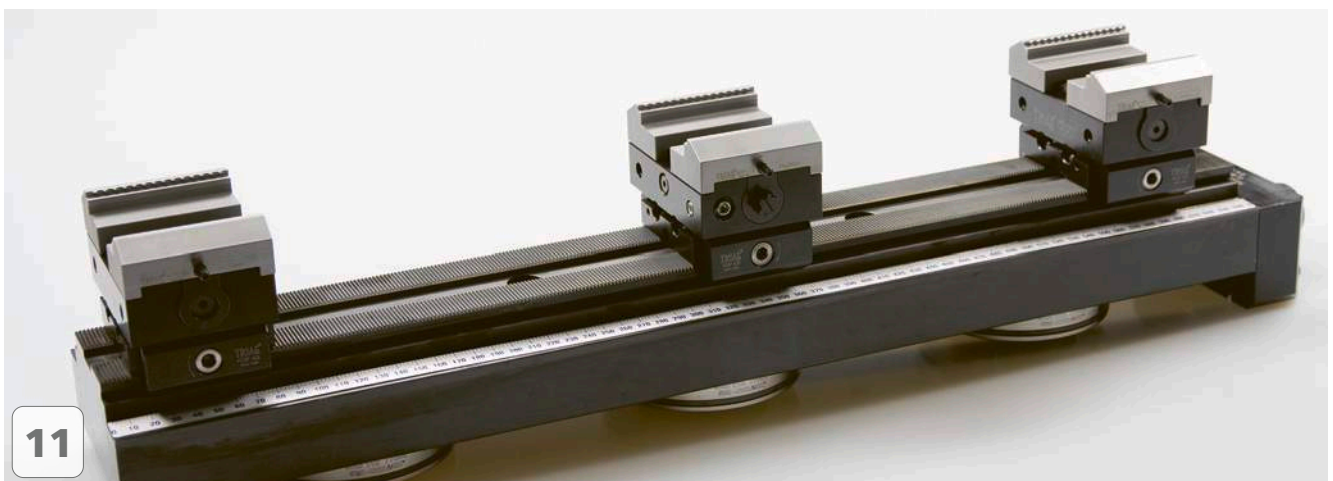
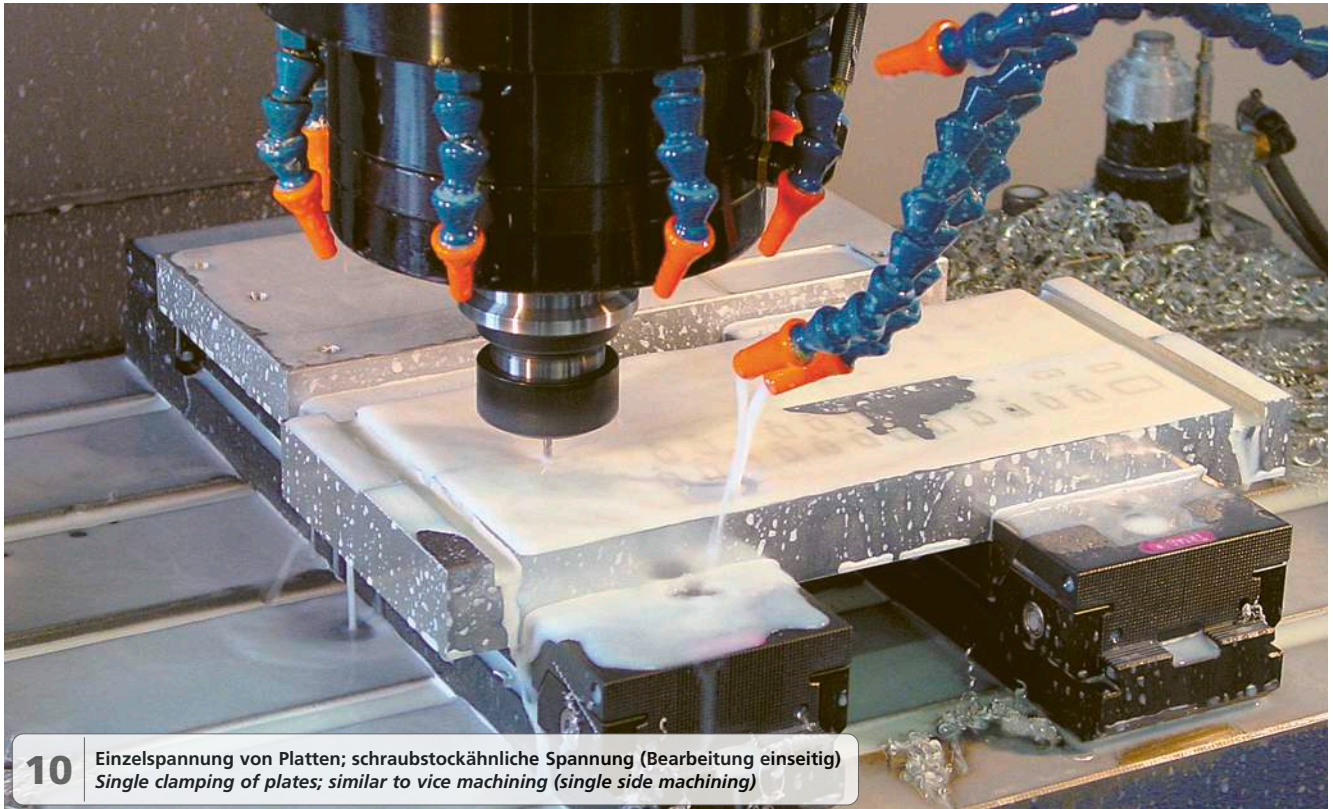


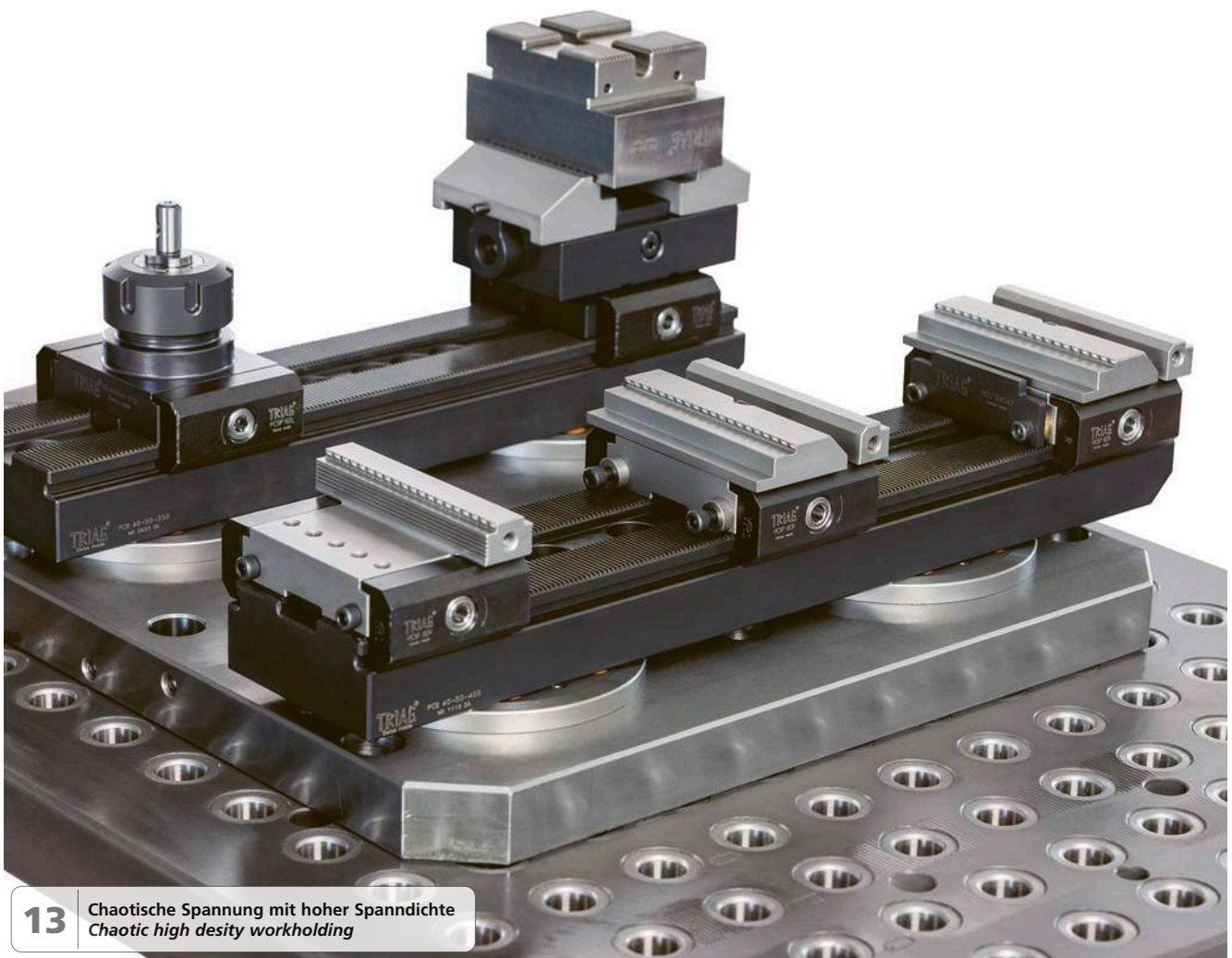
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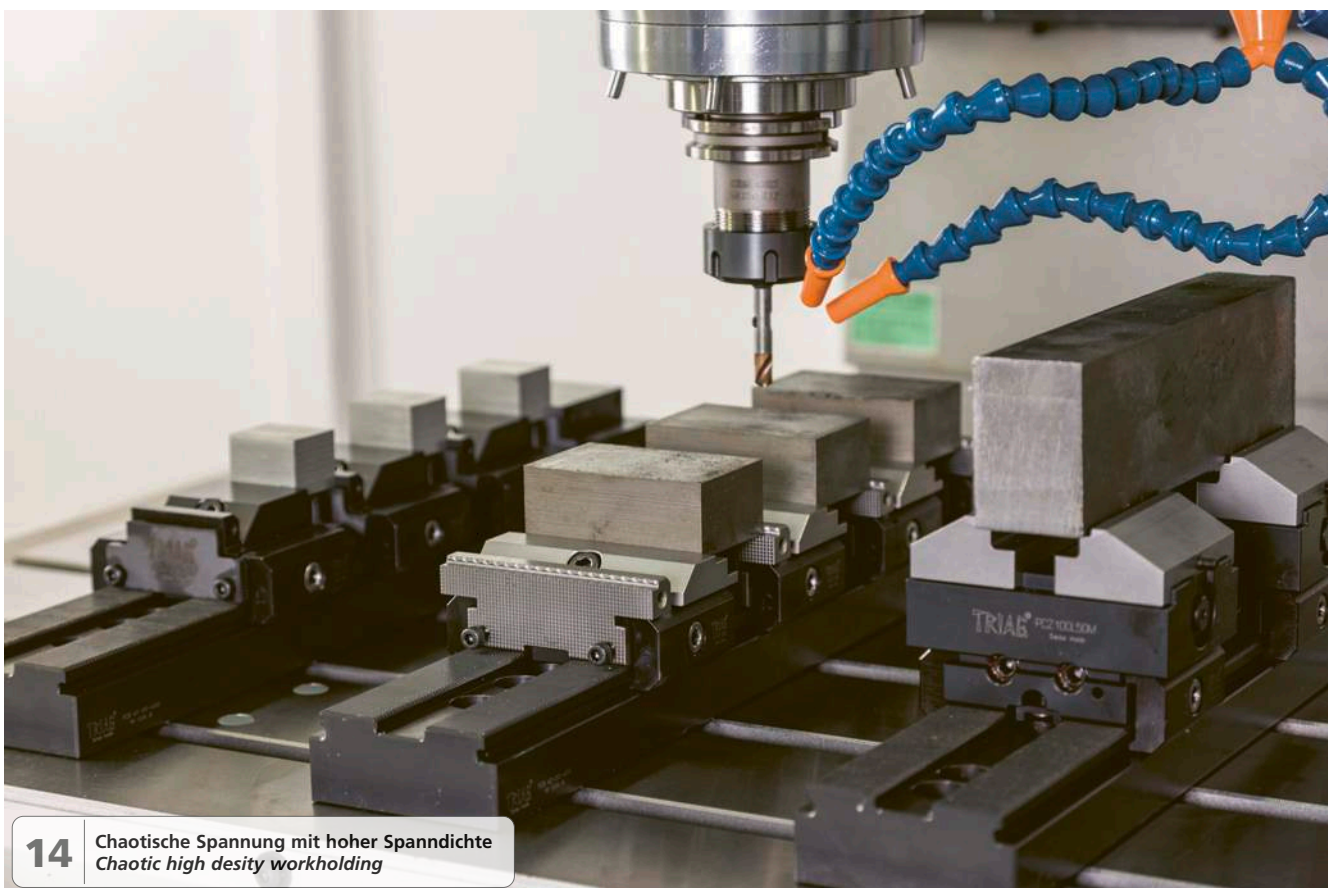
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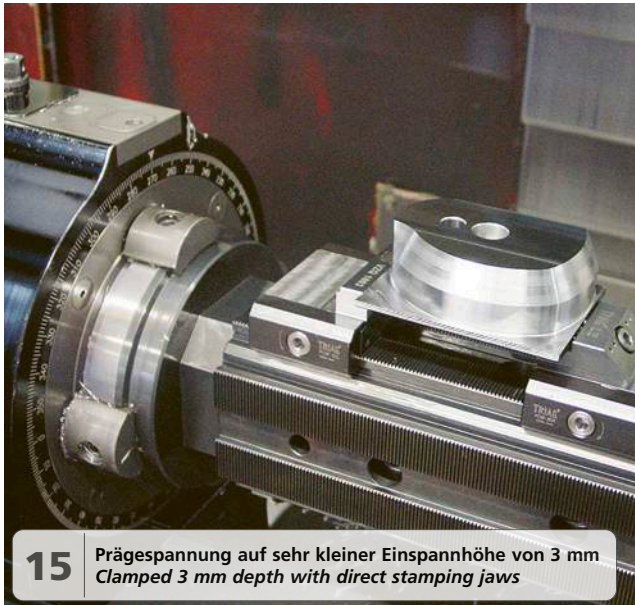




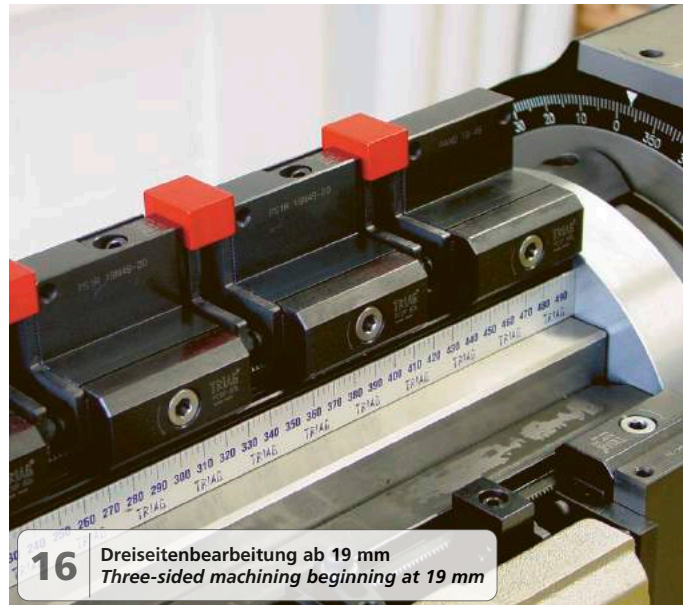
13 Chaotische Spannung mit hoher Spanndichte
Chaotic high density workholding



14 Chaotische Spannung mit hoher Spanndichte
Chaotic high density workholding



15 Prägespannung auf sehr kleiner Einspannhöhe von 3 mm
Clamped 3 mm depth with direct stamping jaws



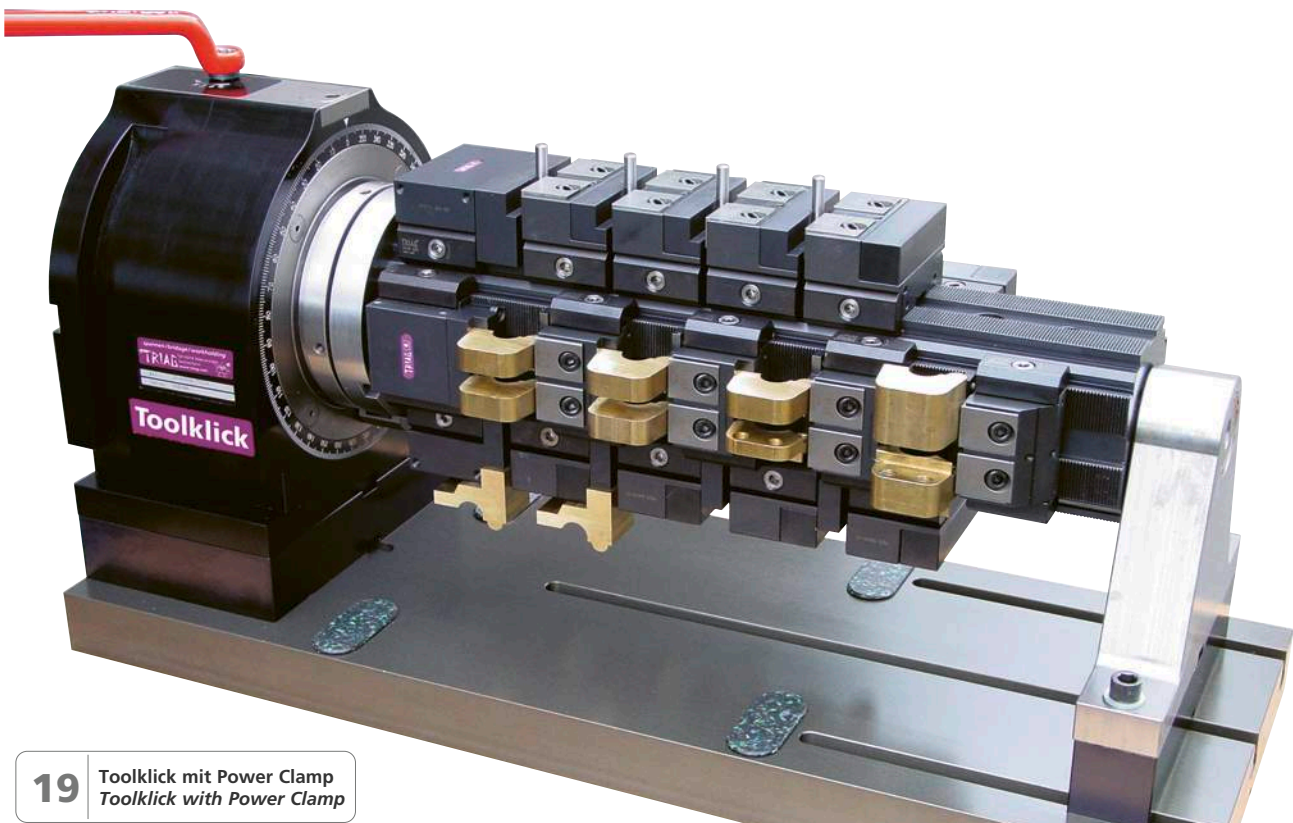
16 Dreiseitenbearbeitung ab 19 mm
Three-sided machining beginning at 19 mm



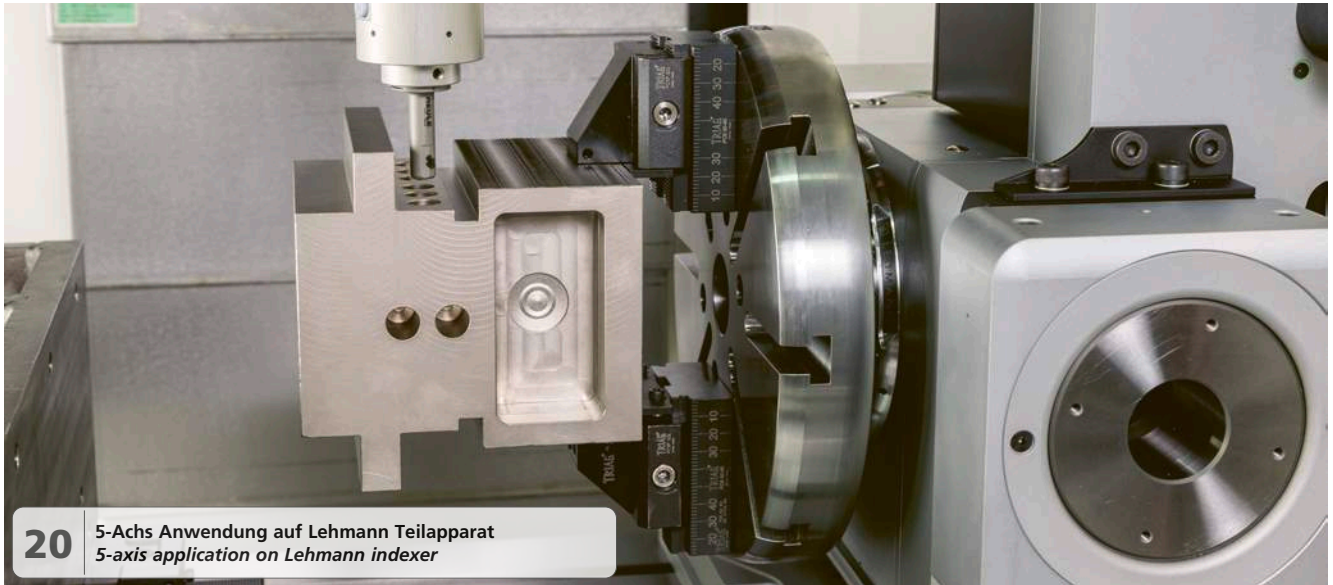
17 ... im Einsatz auf der 4. Achse
... in action on the 4th axis



18 Das Triag Power Clamp im Einsatz als Spannstock (Starterset)
Triag Power Clamp in action as machine vise (starter set)



19 Toolclick mit Power Clamp
Toolclick with Power Clamp

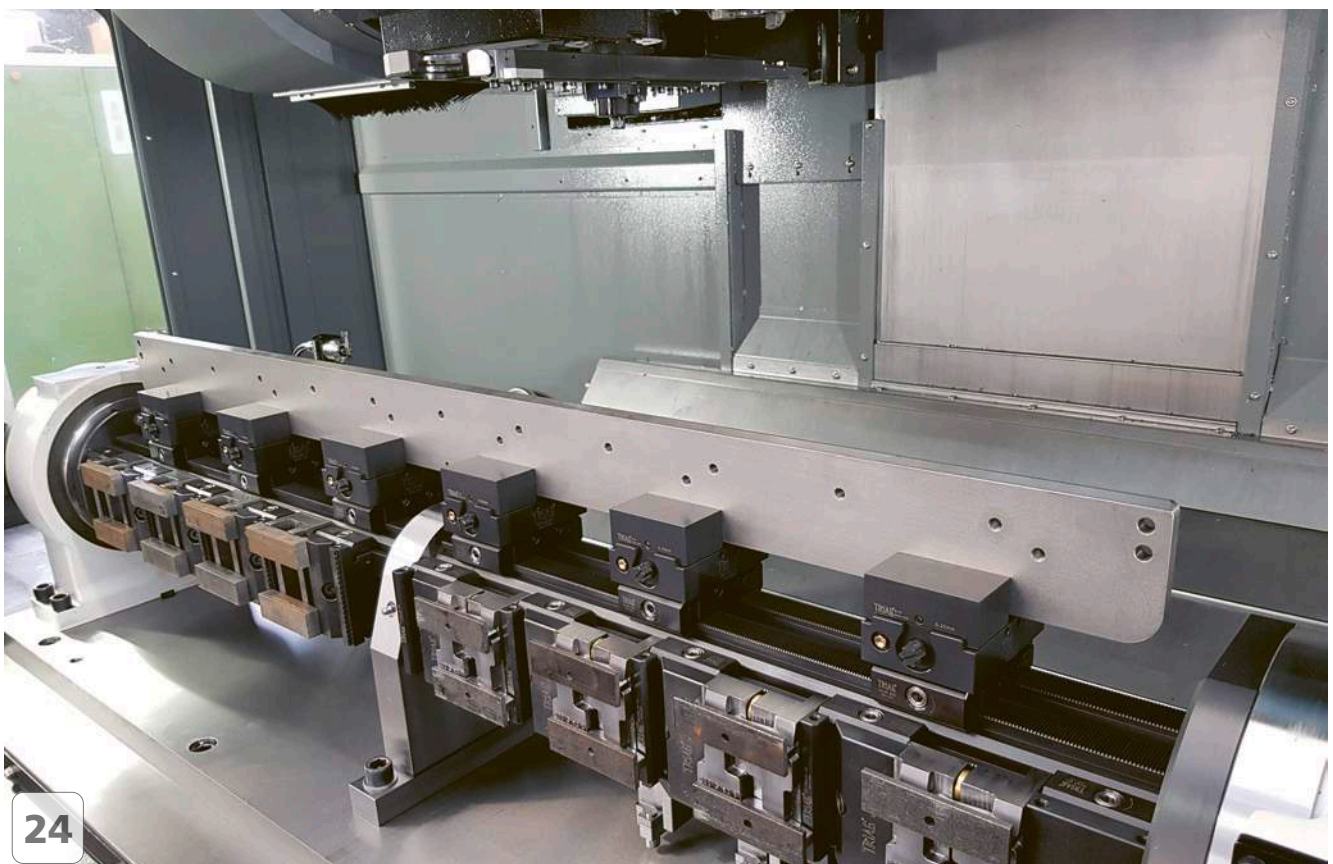
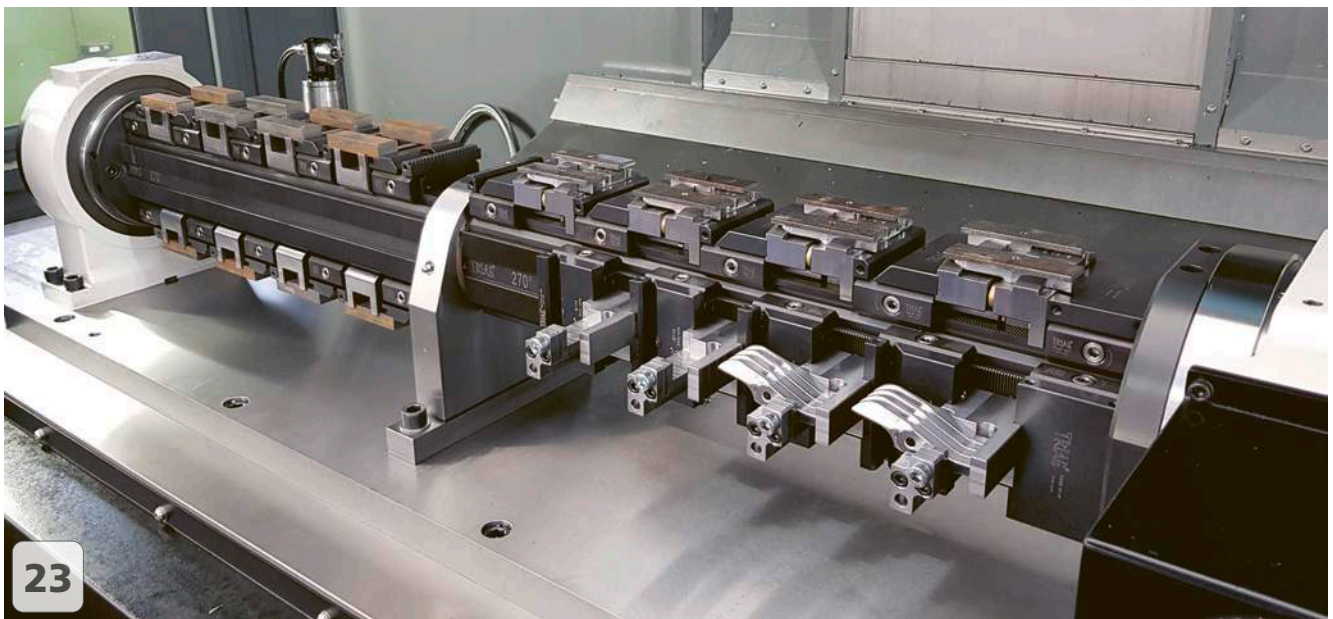
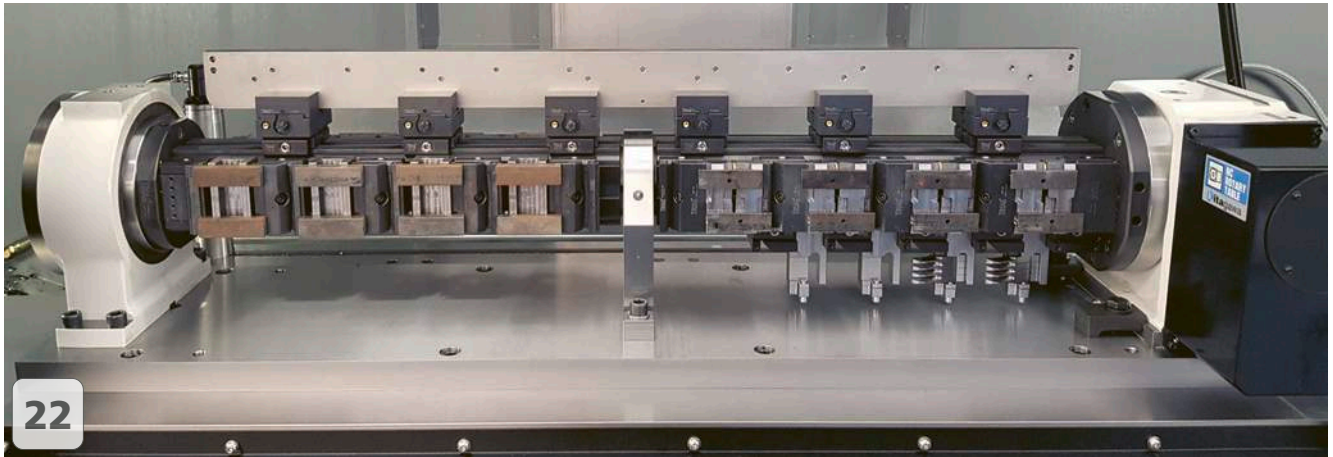


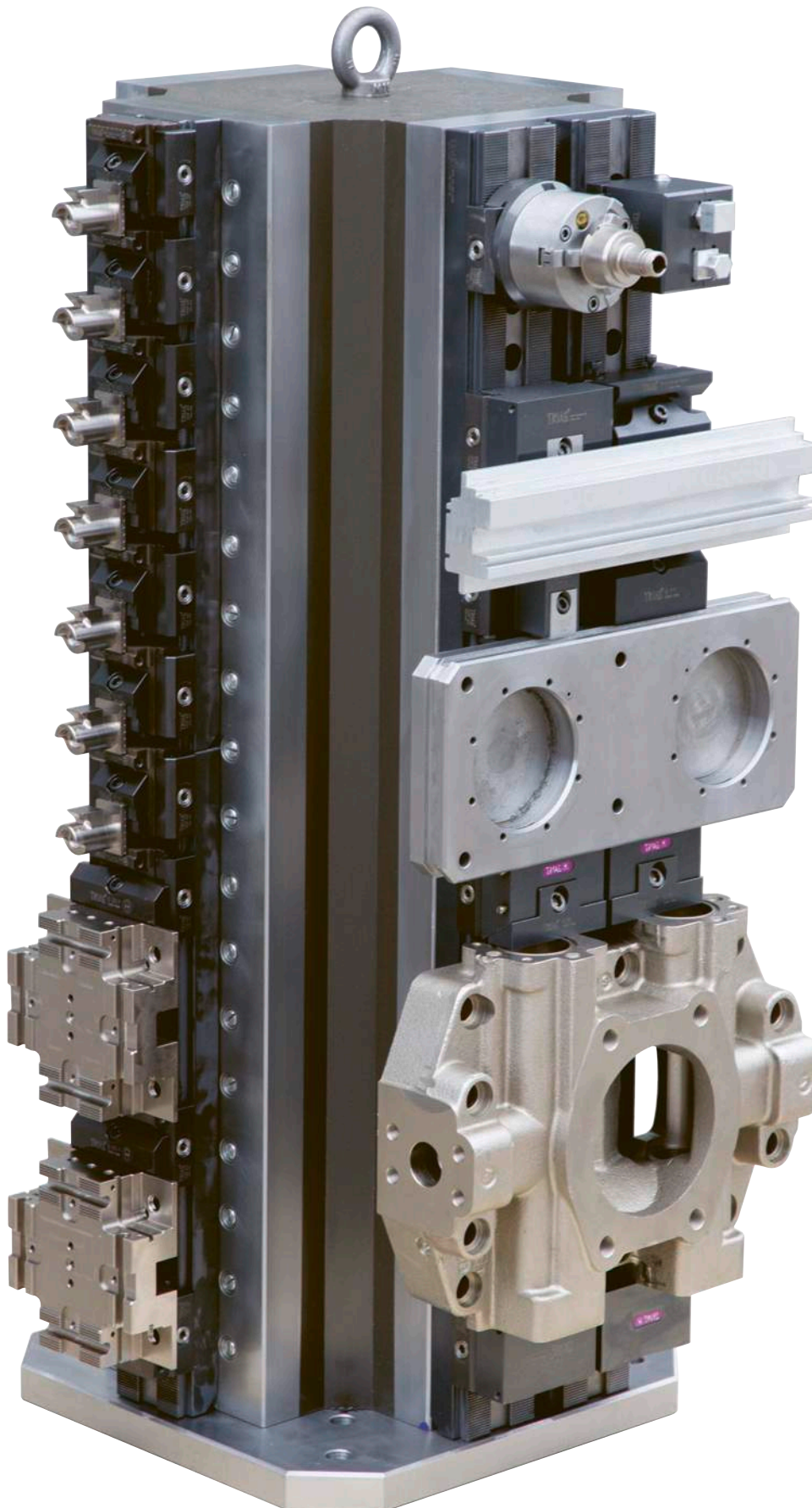
20

5-Achs Anwendung auf Lehmann Teilapparat
5-axis application on Lehmann indexer



21

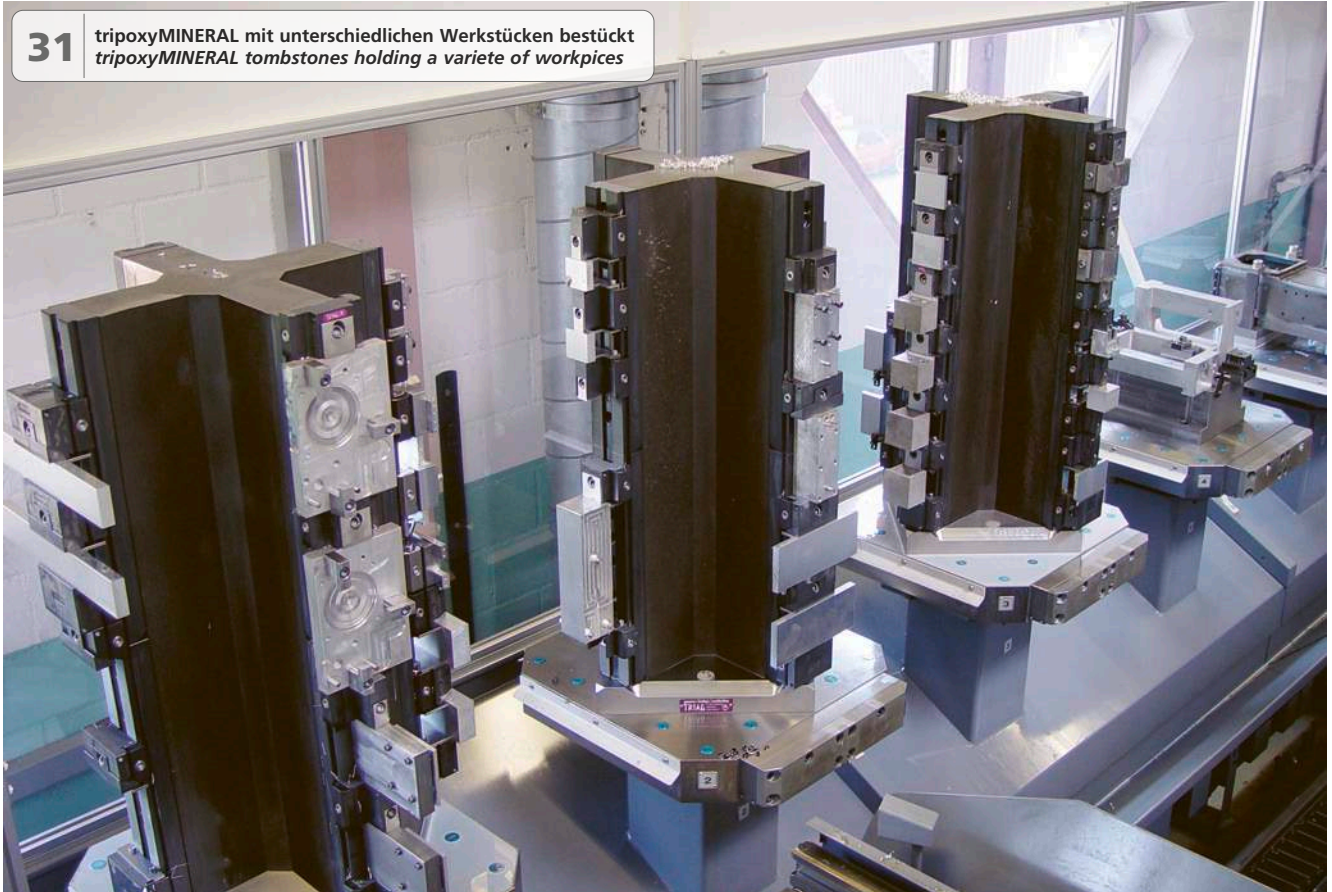




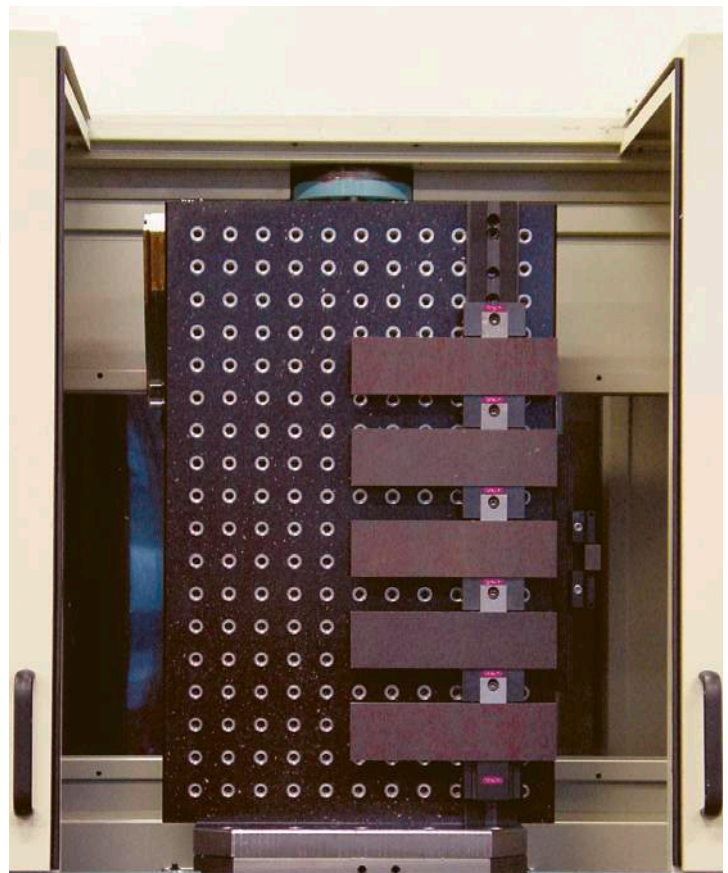
25

tripoxymINERAL Kreuzturm mit PowerCLAMP Schienen für chaotische Spannung
tripoxymINERAL Cross version with PowerCLAMP baserails for chaotic workholding

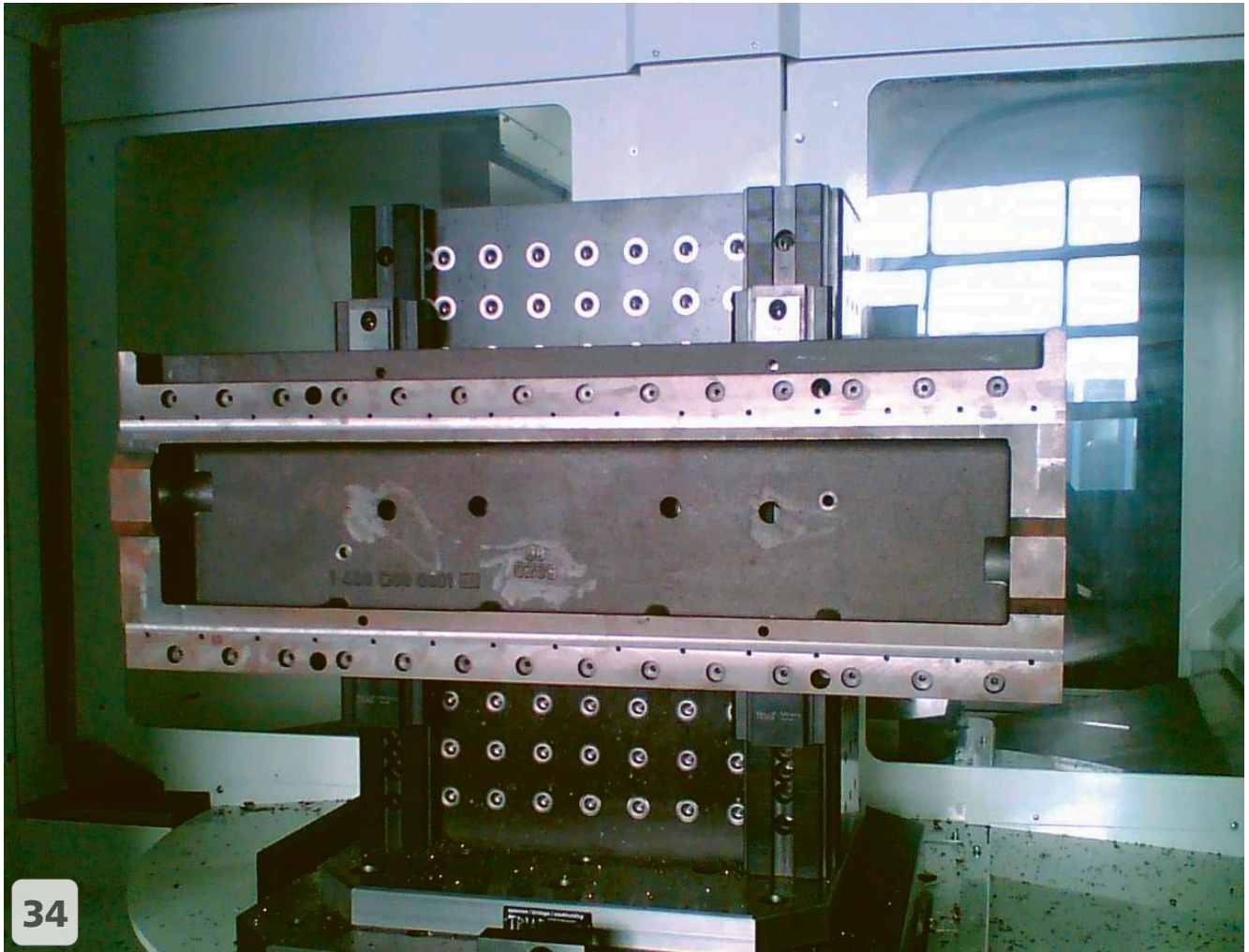
31 tripoxyMINERAL mit unterschiedlichen Werkstücken bestückt
tripoxyMINERAL tombstones holding a variety of workpieces



32 Zentrischspanner auf einem Spezialturm
Centric vices installed on a special tombstone



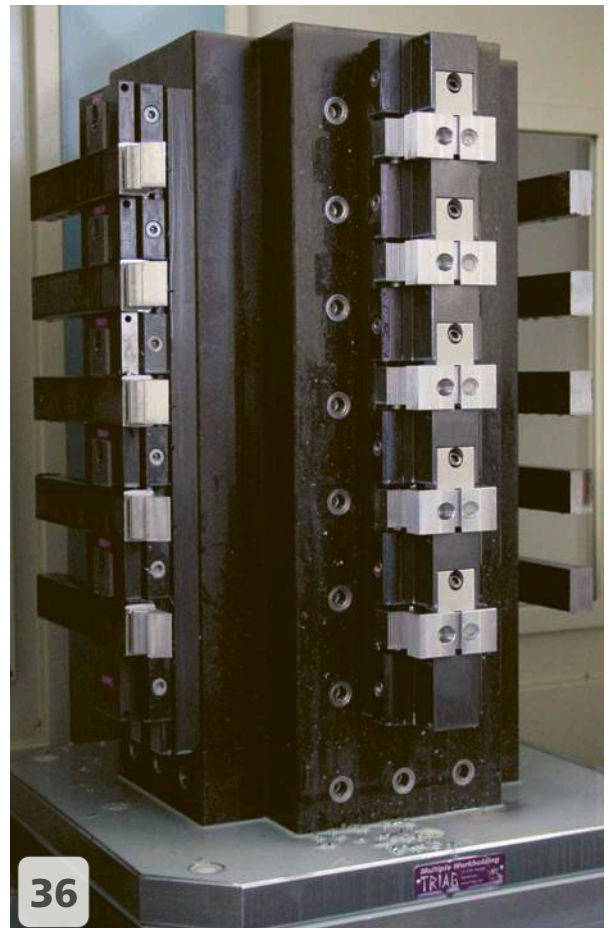
33 Aufspannung mit Power Clamp auf einem Mineralgussturm
Set up with Power Clamp on a tombstone made of composite concrete



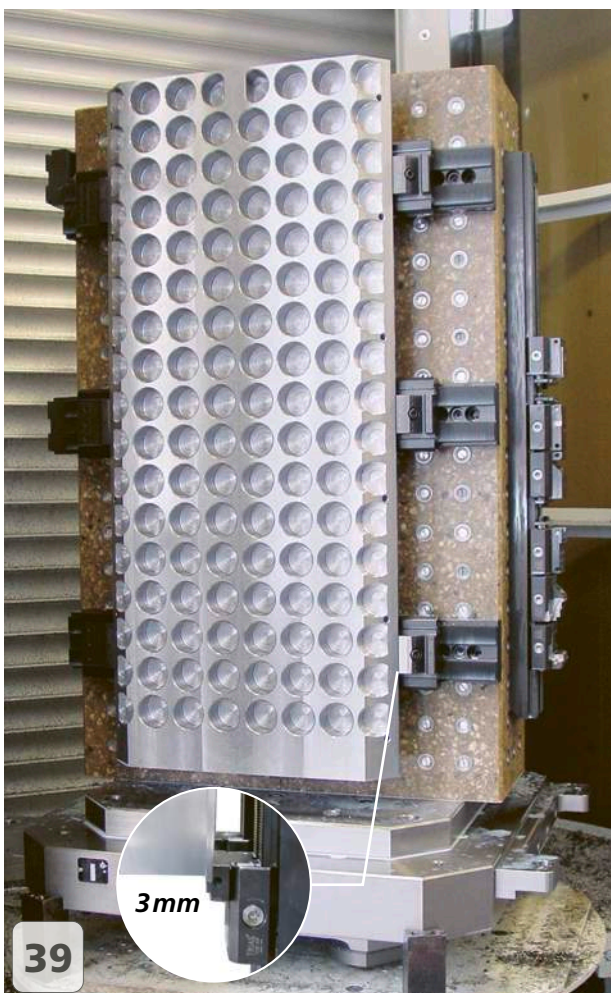
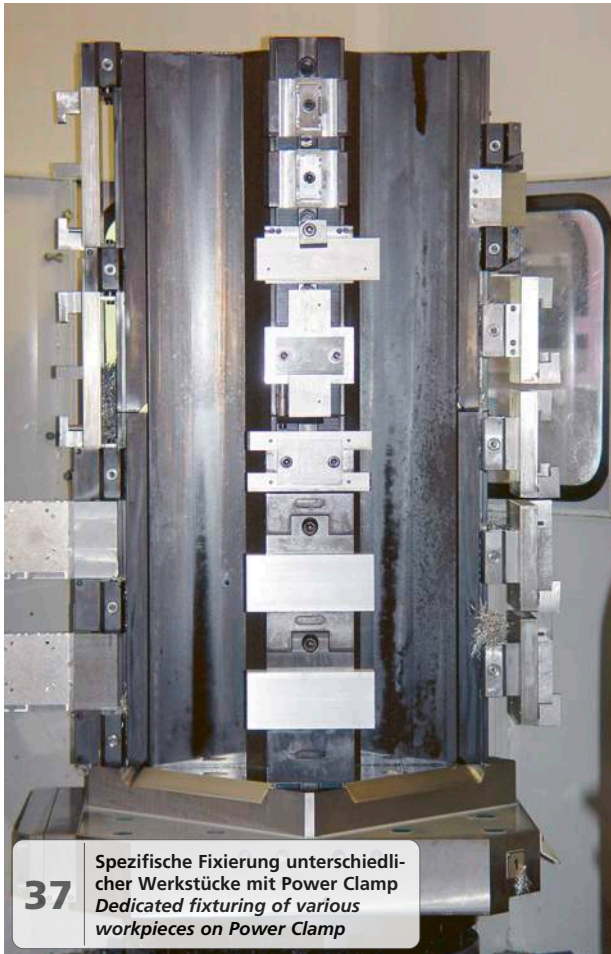
34

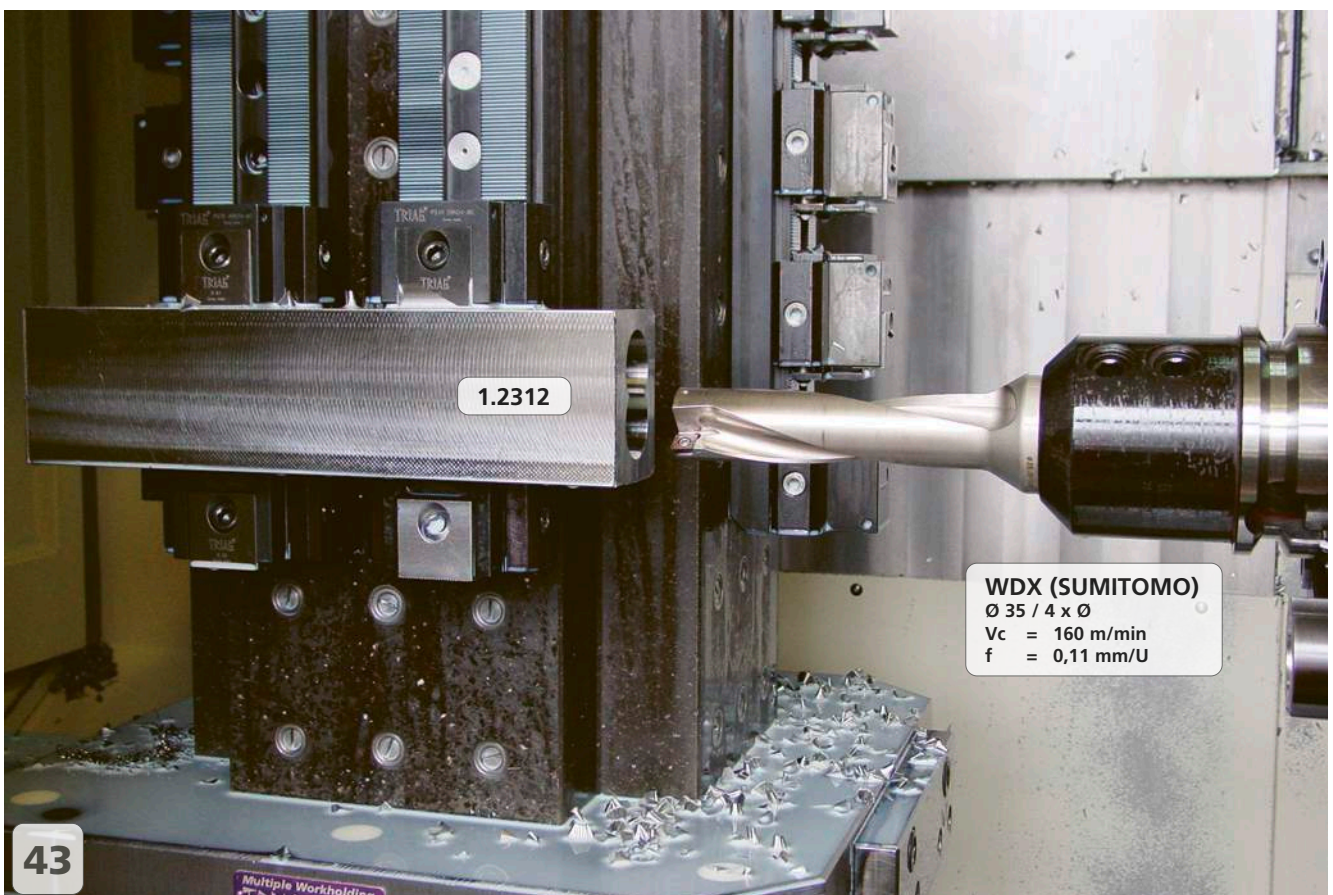
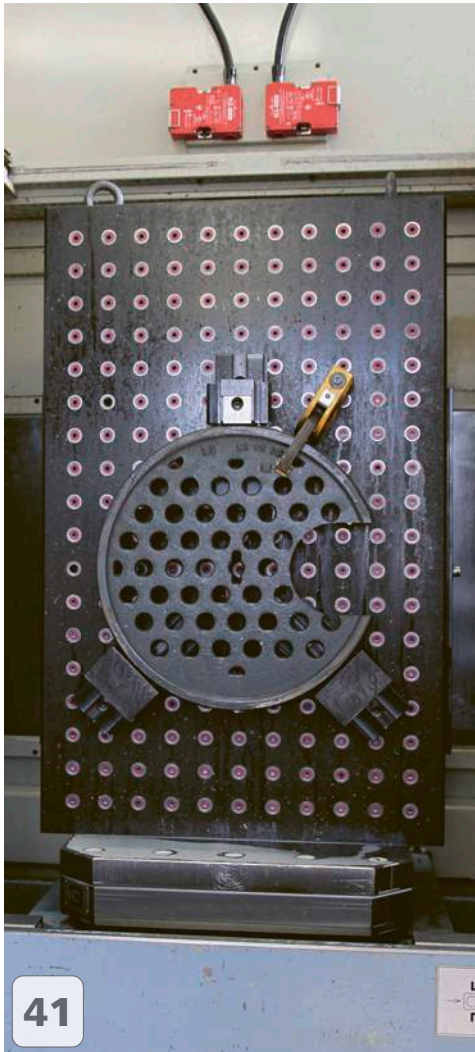


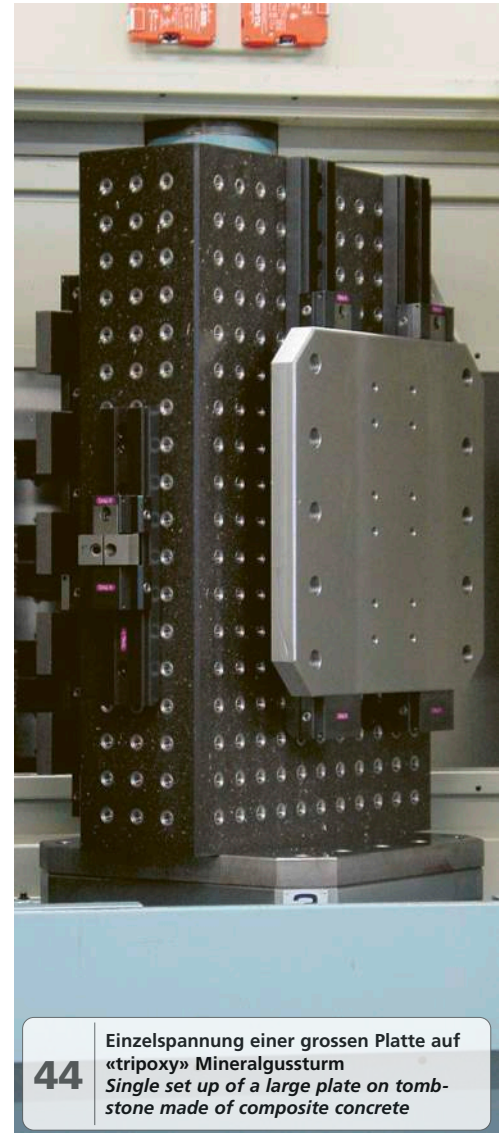
35

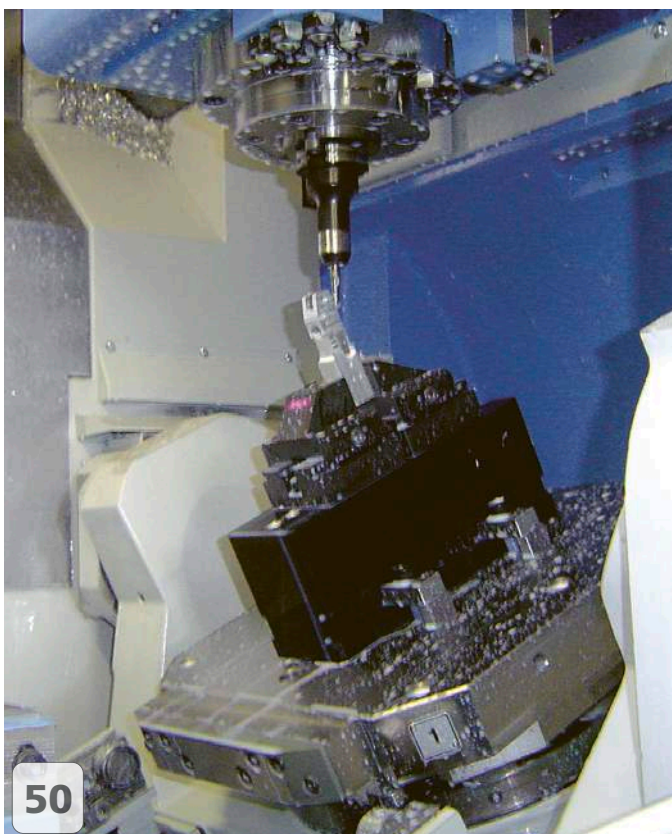
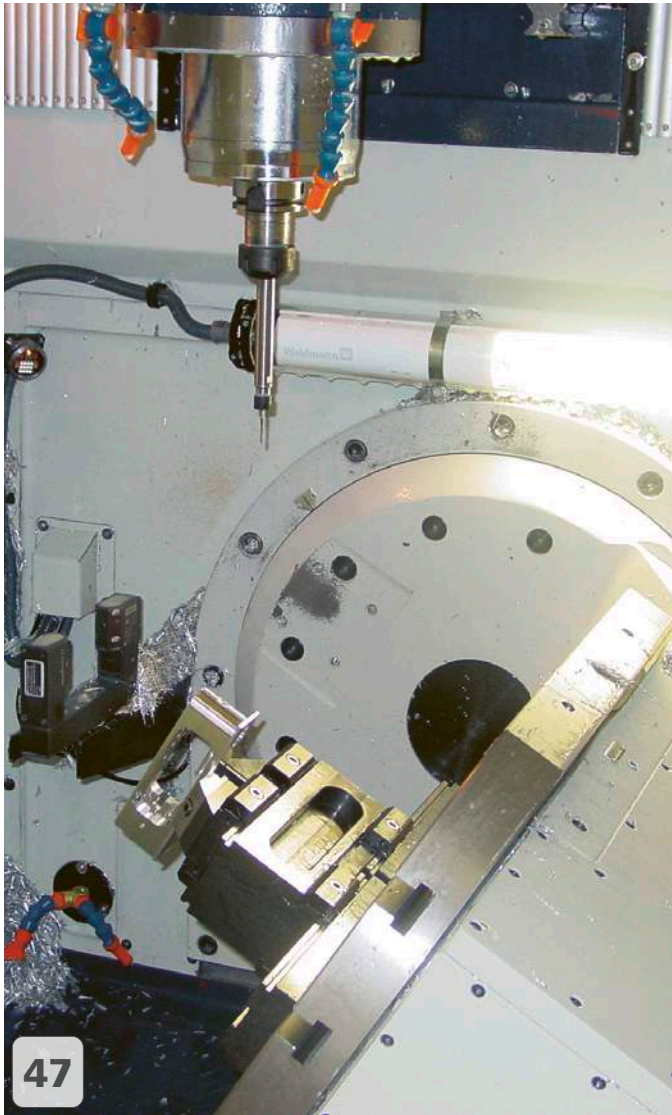


36







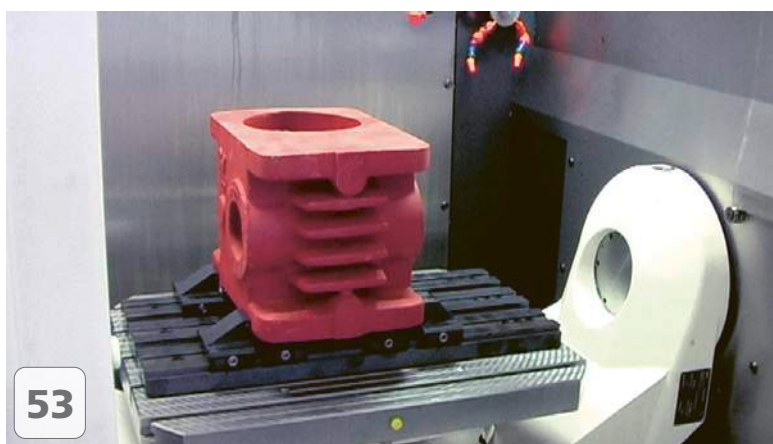




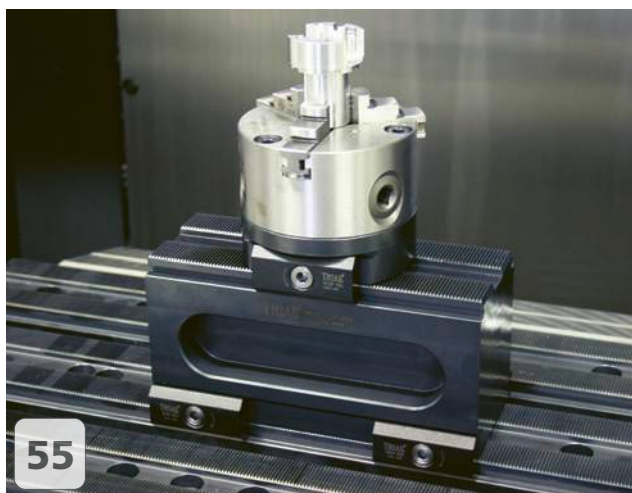
52



54



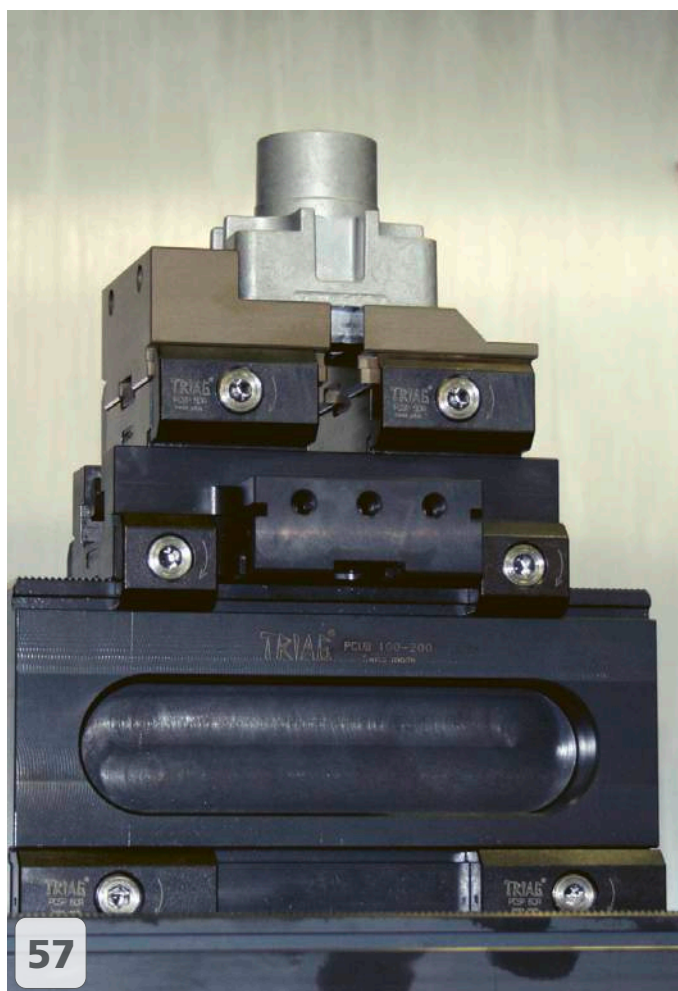
53



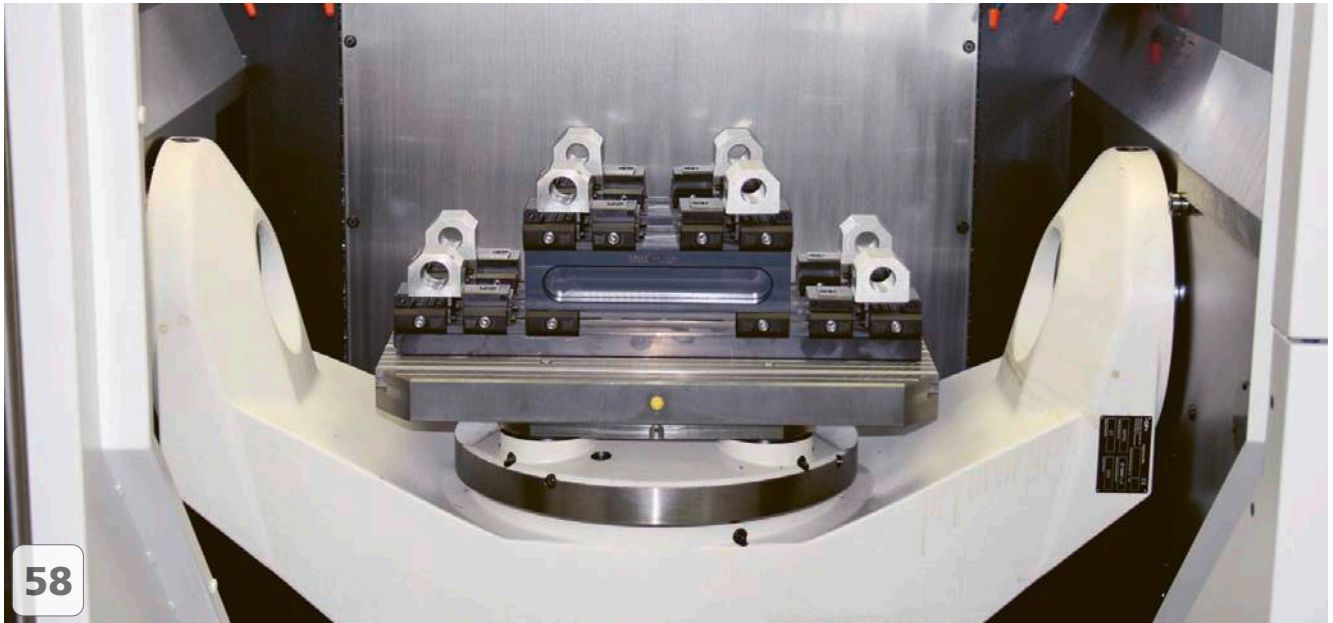
55



56



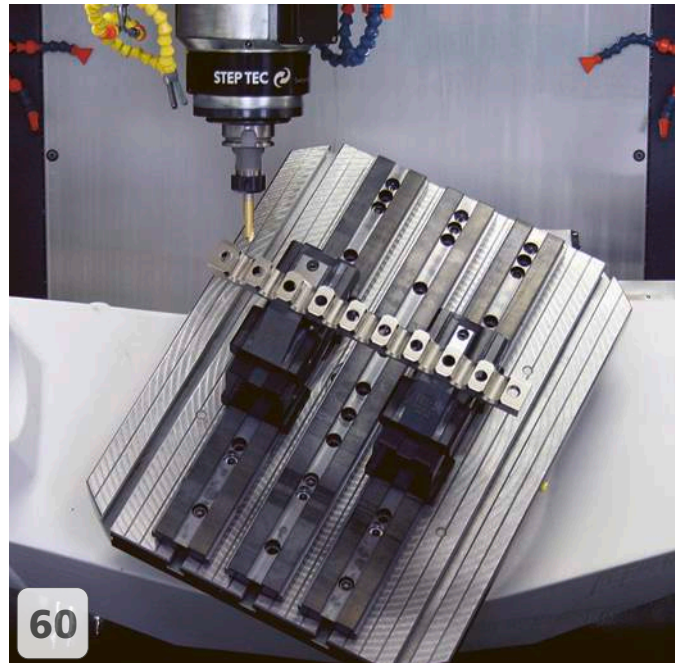
57



58



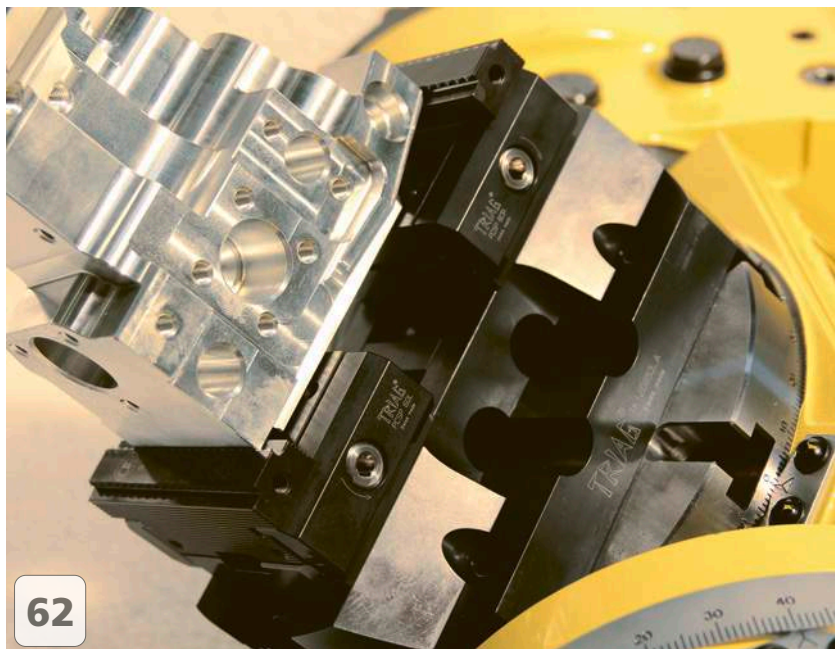
59



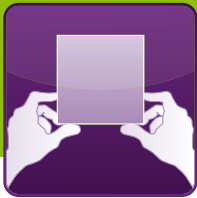
60



61



62



Modulares Mehrfachspannen auf 5-Achsen-Maschinen

Immer öfter werden die 5-Achsen-Maschinen in den Produktionsabläufen eingesetzt, um den Ansprüchen der heutigen effizienten Herstellung gerecht zu werden und weltweit wettbewerbsfähig zu bleiben. Die Werkstückspannung ist sehr anspruchsvoll und fordert die technischen Mitarbeiter ausserordentlich, wie auf den nachfolgenden Bildern dargestellt.

Modular workholding system for 5-axis machines

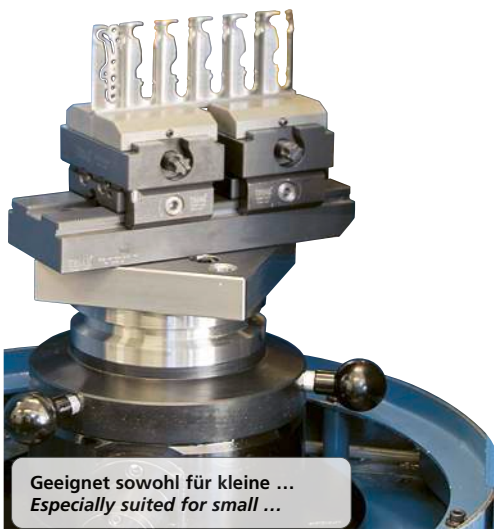
Increasingly, the 5-axis machines are used in the production processes to be in accordance with the demands of today's efficient manufacturing and remain globally competitive. The workpiece clamping is very demanding and calls for extremely technical staff, as shown on the following pictures.

Vorteile der Triag 5-Achsen Spannsysteme:

- Die unteren Basisschienen dienen sowohl als mechanisches Nullpunktspannsystem, aber auch als Spannstock.
- Die Spannkraft wirkt direkt beim Werkstück, trotzdem ist das Werkstück ob klein, lang oder gross mit kurzen Werkzeugen sehr gut zugänglich. (Die Einschränkung ist der Maschinentisch)!
- Bei der Dreiseitenbearbeitung ist auch Mehrfachspannung möglich.
- Es können über 200 verschiedene Spannmodule, sowie Rohmodule, Zentrischspanner, Dreibackenfutter, Spannzangenfutter, Vakuumschraubmodule usw. aufgesetzt werden. Die Schnittstelle ist immer dieselbe.
- Sehr schnelles Umrüsten!
- Wenig Reinigungsaufwand, da keine T-Nuten vorhanden sind.
- Besonders gut geeignet für 5-Achsen-Maschinen. Alle Spannvorrichtungen können auch auf Horizontal- und Vertikalmaschinen universell eingesetzt werden.

Benefits of Triag 5-axis workholding systems:

- The lower base rails serve both as a mechanical zero-point clamping system, but also as a vice.
- The tension acts directly at the workpiece, the workpiece is still, whether small, long or large, very accessible with short tools. The constraint is the machine table!
- 3-side machining is possible as well.
- There may be placed over 200 different clamping modules, as well as raw modules, self-centring modules, three jaw chuck, collet chuck, vacuum clamping modules and so on. The interface is always the same.
- Very fast setup!
- Reduced cleaning required, since no T-slots available.
- Especially suitable for 5-axis machines. All clamping devices can also be used universally on horizontal and vertical machines.



Geeignet sowohl für kleine ...
Especially suited for small ...



... als auch für grosse Werkstücke!
... as well as large workpieces!



System System		bei Anschlagmodulen for end module		Modulnutzbreite Module clamping width		Modulnutzhöhe Module clamping height			
A	Apto Clamp	N	nitriertgehärtet nitrated	19		34			
P	Power Clamp	D	durchgehärtet through hardened	25		44			
C	Compact Clamp	bei Spannmodulen for vice modules		26		49			
M	Micro Clamp	1	Anzahl Spannbacken Number of jaws	34		62			
V	Vorrichtungsbau module Workholding modules for dedicated fixtures	2		43		75			
		3		48		78			
		-	keine Spannbacke no clamping jaw	58					
				61					
				68					
				78					
				94					
				125					
P		S		1		R			
48		N		34		-80			
Modultyp Type of module		Anschlagfläche der Module Datum face		Backenhub Stroke of clamping jaw		Spannbackentyp Type of clamping jaw			
A	Anschlagmodul End module	F	Anschlagfläche glatt Datum face flat	N	Niederzug Pull down	B01	Spannbacken Clamping jaws		
S	Spannmodul Clamping module	R	Anschlagfläche geriffelt Datum face double serrated	L	linear / parallel linear / parallel	- B313	Modul ohne Spannbacken Module without clamping jaw		
T	Trägermodul Supporting module	D	eine Seite glatt, eine Seite geriffelt one face flat, one face double serrated	-	ohne Spannbacke no clamping jaw	-013			
R	Rohling Blank	G	Anschlagfläche gerillt Datum face serrated			-105			
		X	spezielle Ausführung special execution						
		5X	5axes Clamp						
		P	Fläche unterhalb der Prägung gerillt Area below the stamping serrated						
		PF	Fläche unterhalb der Prägung glatt Smooth surface below the stamping						
		PV	Präge vorstehend, Fläche unterhalb der Prägung glatt Stamping protruding, surface below the stamping flat						
		P6	prägen / stamping						



Die Basisschiene ist die Grundlage des Power Clamp Spannsystems

Der Einsatz der Basisschiene als Modularspannstock ist jedem Mechaniker ein Begriff. Die Vorteile ihres Einsatzes als mechanisches Nullpunktsystem sind in der Zwischenzeit ebenfalls ins Planungsdenken der mechanischen Fertigung eingeflossen.

Die Power Clamp-Schiene dient als Basis für über 200 verschiedene Spannmodule, Zentrischspanner, Rohlingsmodule und Vakuumplatten.

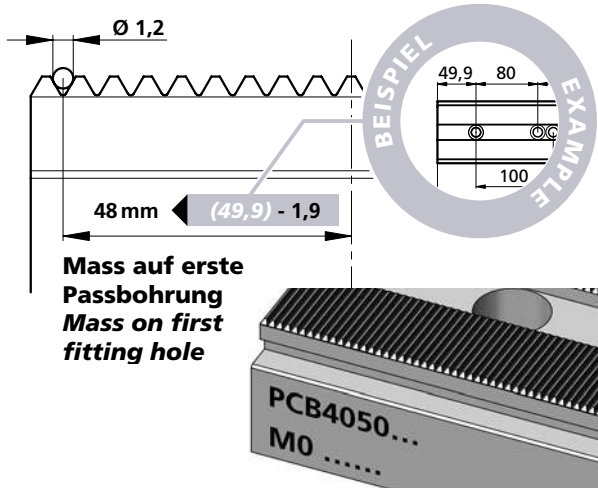
The serrated base rail is the basic structure of the Power Clamp workholding system

Using the base rail as a modular workholding vise is standard practice to any mechanic. The advantages of using it as a zero point system have also widely influenced the planning stages of mechanical production.

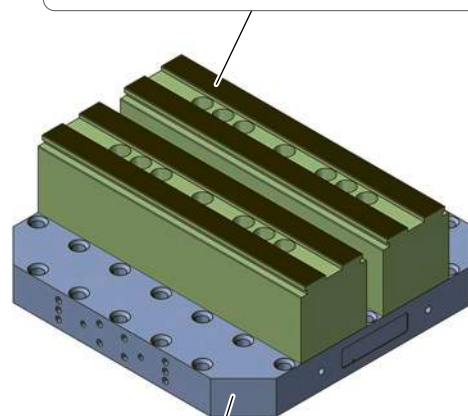
The Power Clamp base rail serves as a supporting plate for more than 200 different clamping modules, self centring vises, blank modules and vacuum clamping plates.

Toleranz gilt für alle PCB-Basisschienen / Tolerance applies to all PCB base rails

Toleranzklassen Tolerance classes	
P6	+0.06
P5	+0.05
P4	+0.04
P3	+0.03
P2	+0.02
P1	+0.01
P0	+0.005
M0	-0.005
M1	-0.01
M2	-0.02
M3	-0.03
M4	-0.04
M5	-0.05
M6	-0.06



PCB50320(H35) / PCB50320H60 / PCB50320H80

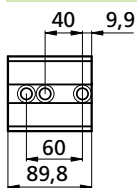


EROWAUPCR50 / ER018570 / ER016003

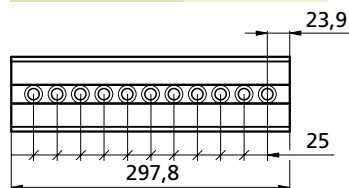
Separat bestellen / Order separately



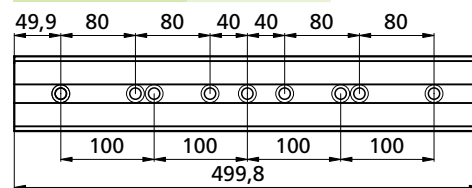
PCB6090 kg ~1,8



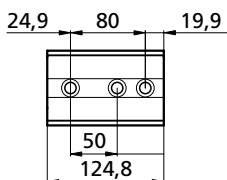
PCB25300 kg ~5,4



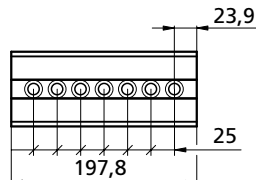
PCB4050500 kg ~9,9



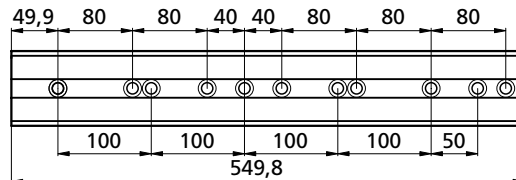
PCB4050125 kg ~2,3



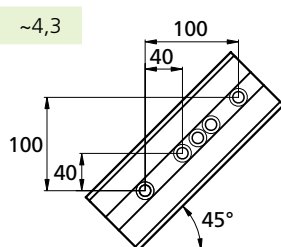
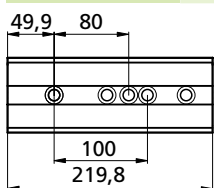
PCB25200 kg ~3,6



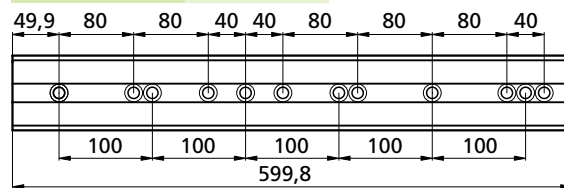
PCB4050550 kg ~10,8



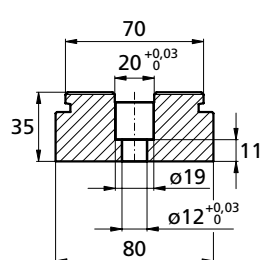
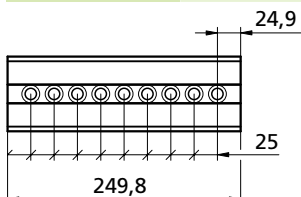
PCB4050220W2 kg ~4,3



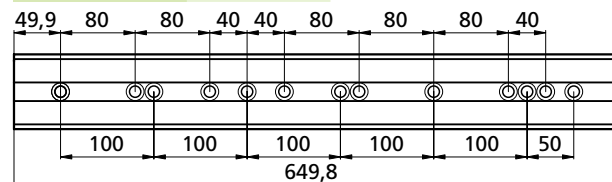
PCB4050600 kg ~11,8



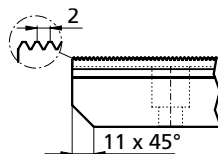
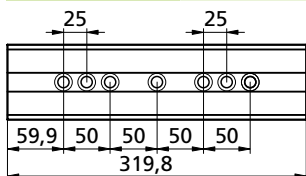
PCB2550250 kg ~4,8



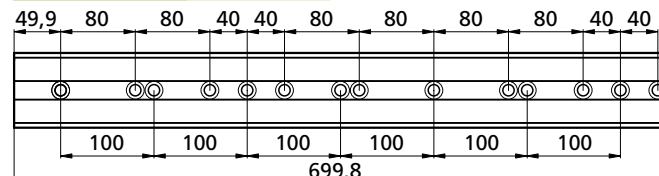
PCB4050650 kg ~12,8



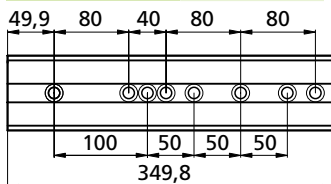
PCB50320 kg ~6,0



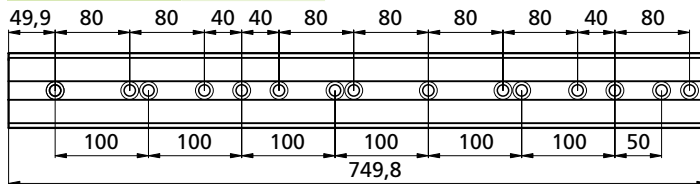
PCB4050700 kg ~13,8



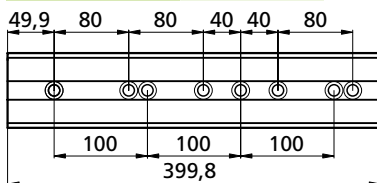
PCB4050350 kg ~6,9



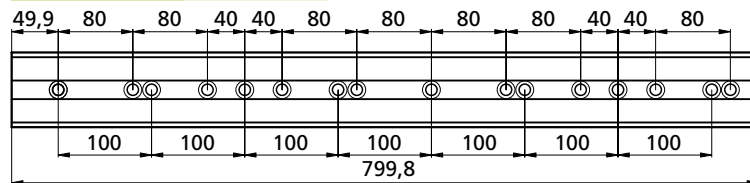
PCB4050750 kg ~14,1



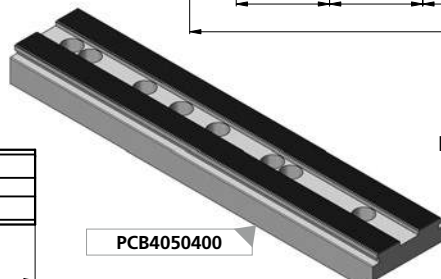
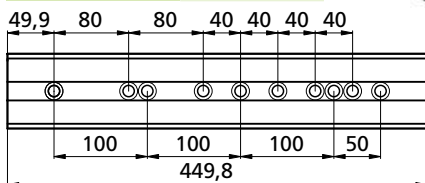
PCB4050400 kg ~7,9



PCB4050800 kg ~15,3

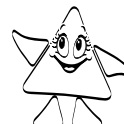


PCB4050450 kg ~8,9

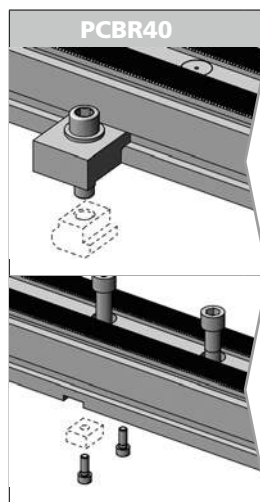
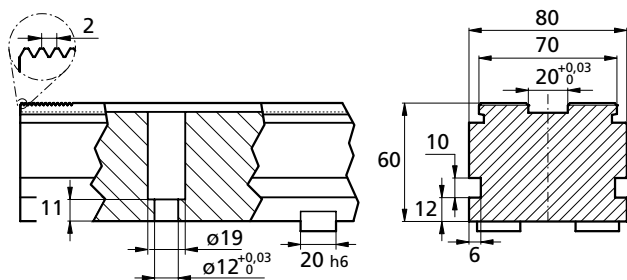


PCB4050400

Basisschienen in Zoll
Base rails in inch



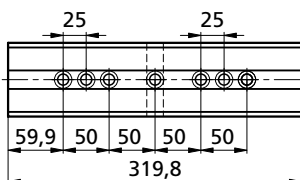
Bestellbeispiel / Ordering example: **PCB4050125**



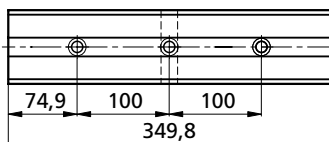
1. Befestigung **1. Fastening**
Mit den seitlichen
Pratzen, kann die
Basisschiene frei
auf Ihrem Maschi-
nentisch montiert
werden.
*With the lat-
eral clamps, the
base-rail can be
mounted freely
on your machine
table.*

2. Befestigung **2. Fastening**
Diese Nutensteine
sind zum Aus-
richten der Basis-
schiene auf Ihrem
Maschinentisch.
*These t-slot nuts
are for aligning
the base-rail on
your machine ta-
ble.*

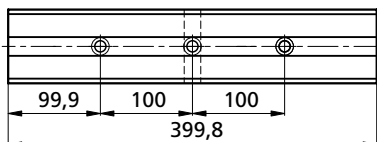
PCB50320H60
1x TF190449
2x M6X12ISO4762
2x SM1136-20
kg ~10,5



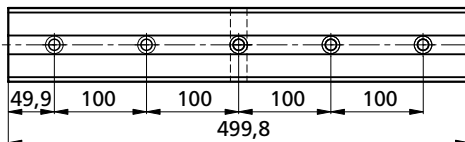
PCB100350H60
1x TH170888
2x M6X12ISO4762
2x SM1136-20
kg ~12,0



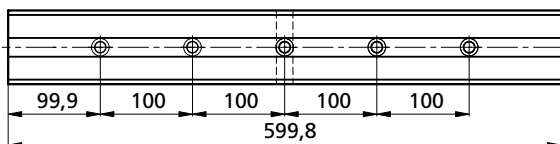
PCB100400H60
1x TB140546
2x M6X12ISO4762
2x SM1136-20
kg ~13,6



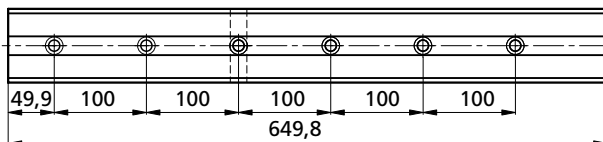
PCB100500H60
1x TB140553
2x M6X12ISO4762
2x SM1136-20
kg ~17,0



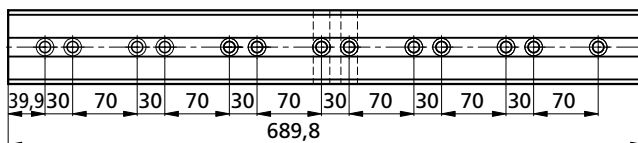
PCB100600H60
1x TB140556
2x M6X12ISO4762
2x SM1136-20
kg ~20,5



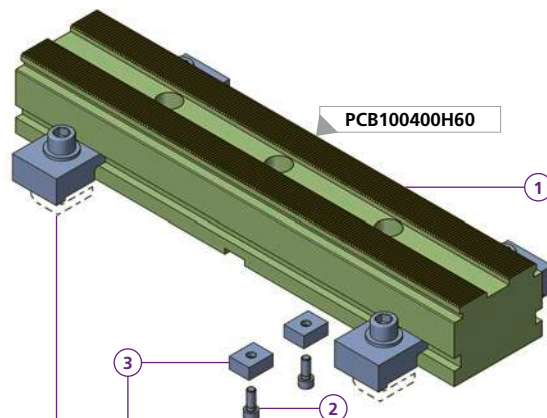
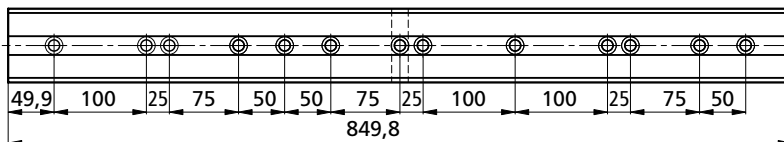
PCB100650H60
1x TB140559
2x M6X12ISO4762
2x SM1136-20
kg ~22,0



PCB100690H60
1x ZL100122
2x M6X12ISO4762
2x SM1136-20
kg ~22,6



PCB100850H60
1x TB140562
2x M6X12ISO4762
2x SM1136-20
kg ~28,2



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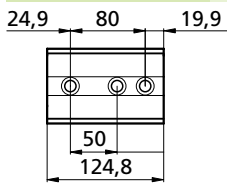
PCBR40	
4	1x M12X45ISO4762
5	1x TN100251
6	1x TK200035
kg ~0,25	

T-Nutensteine
T-slot nuts
T-Nutensteine je nach
Maschinentisch, muss
separat bestellt wer-
den.
*T-slot nuts depending
on the machine ta-
ble, must be ordered
separately.*

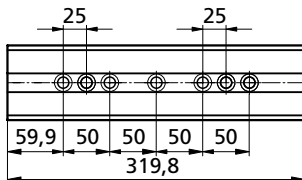
Bestellbeispiel / Ordering example: 1x PCB100400H60 & 2x M6X12ISO4762 & 2x SM1136-20



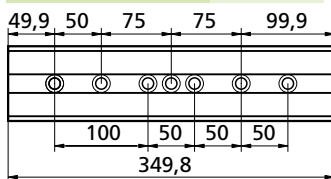
PCB4050125H80 kg ~7,5



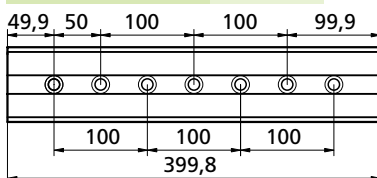
PCB50320H80 kg ~14,4



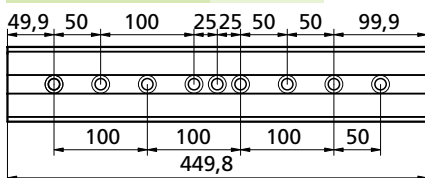
PCB50350H80 kg ~15,8



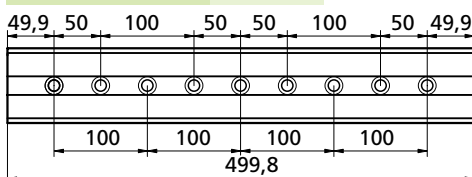
PCB50400H80 kg ~18,2



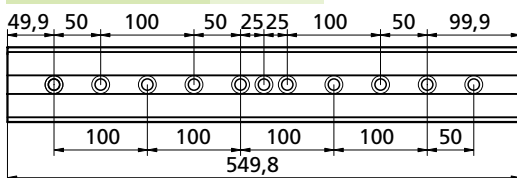
PCB50450H80 kg ~20,3



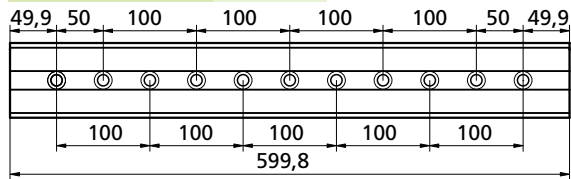
PCB50500H80 kg ~22,8



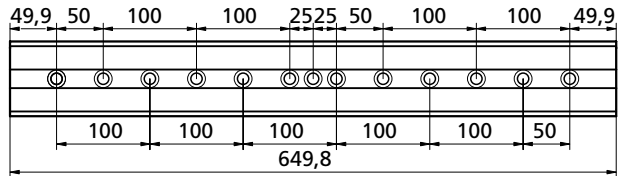
PCB50550H80 kg ~24,8



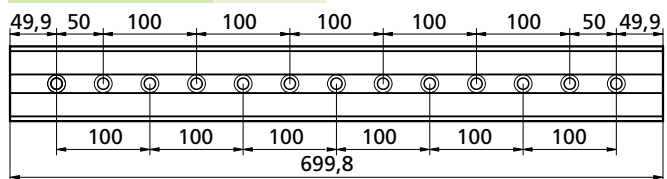
PCB50600H80 kg ~27,3



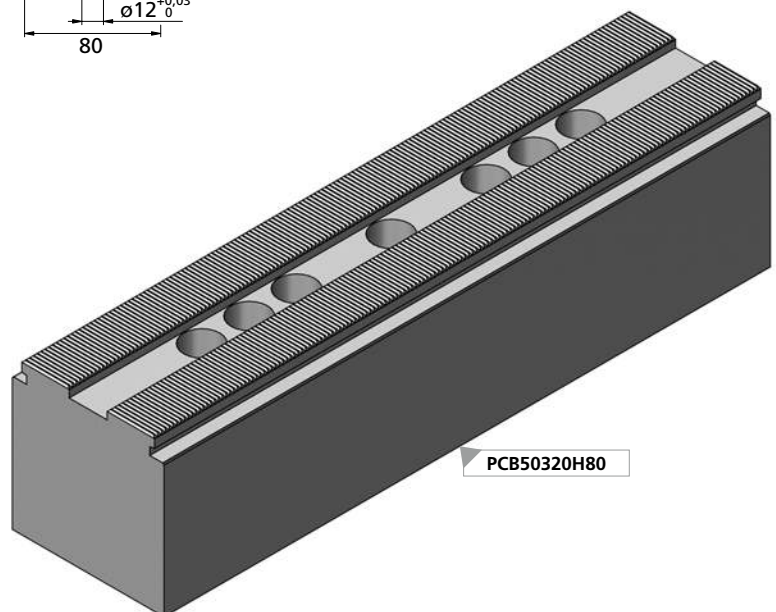
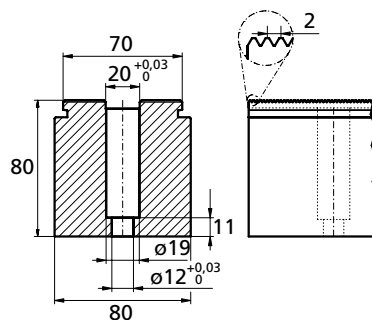
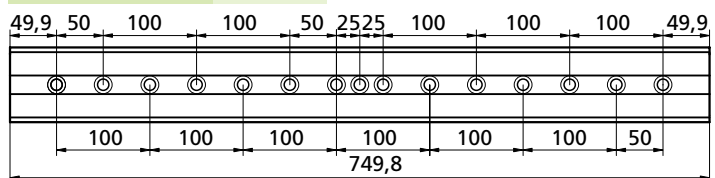
PCB50650H80 kg ~29,4



PCB50700H80 kg ~31,8



PCB50750H80 kg ~33,9



PCB50320H80

Basisschiene Stahl-Mineralguss

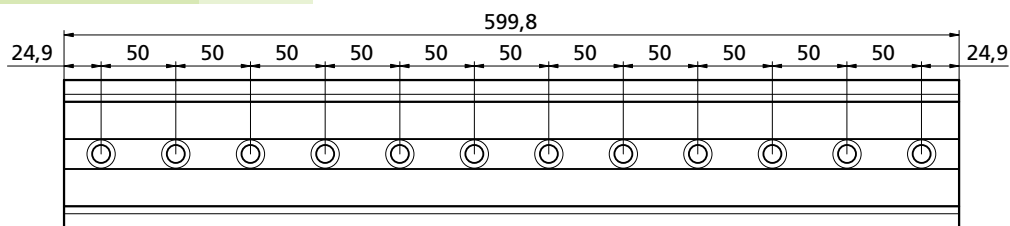
Base-rail steel-epoxy mineral tombstones

H175

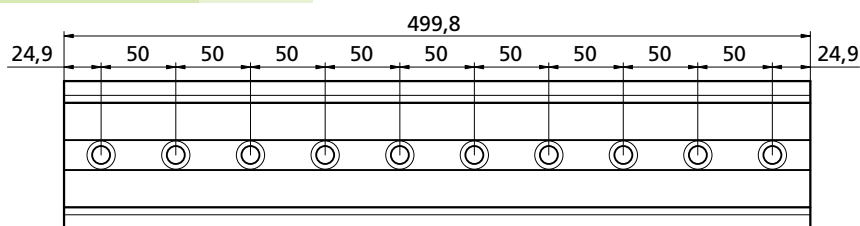


powerCLAMP

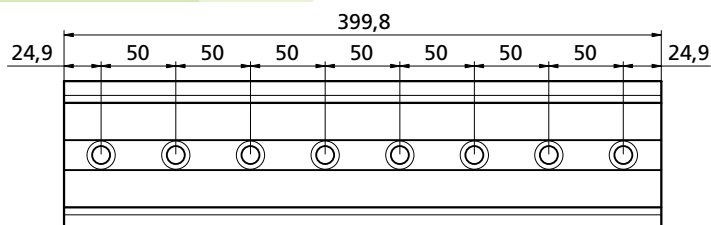
PCMB50600H175 kg ~39



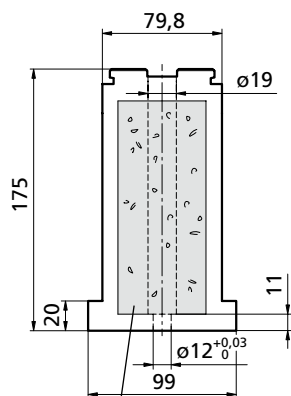
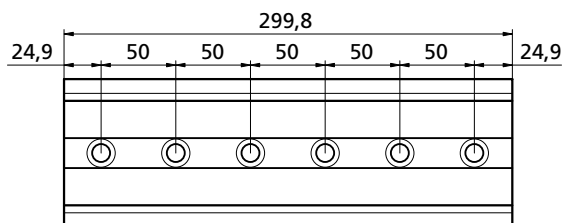
PCMB50500H175 kg ~34



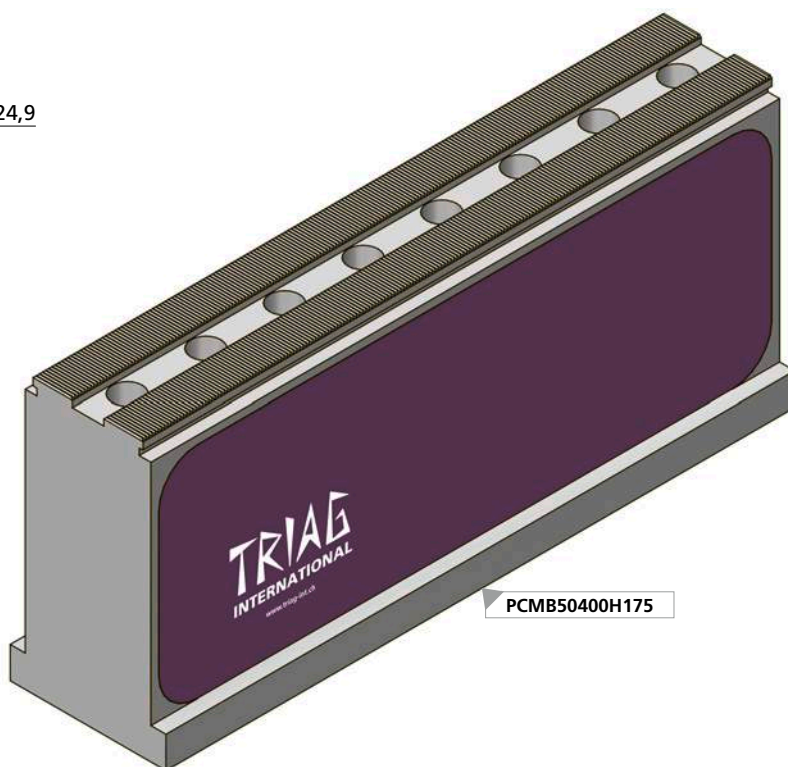
PCMB50400H175 kg ~27



PCMB50300H175 kg ~22



Epoxy Mineral
Für gute Vibrationsdämpfung
For brilliant dampening effect



Bestellbeispiel / Ordering example: PCMB50600H175



Kupplungsstücke für PCB Basisschiene auf Mineralguss-Türmen

Mit diesen Kupplungsstücken ist es möglich, die PCB Basisschienen zu verlängern. Aufgrund des durchgängigen Kraftschlusses wird eine übermäßige Belastung des Mineralgussturmes vermieden. Erforderlich ist eine Modifikation der Enden der Basisschienen gemäss der untenstehenden Zeichnung durch den Anwender. Selbstverständlich können neue Schienen bereits mit dieser Modifikation ausgeliefert werden.

So können die zwei Kupplungsstücke montiert werden, die nach dem Platzieren der Schienen eingesetzt und festgezogen werden. Eine zusätzliche Schraube (B) nimmt allfällige, senkrecht zur Befestigungsfläche auftretende Kräfte auf.

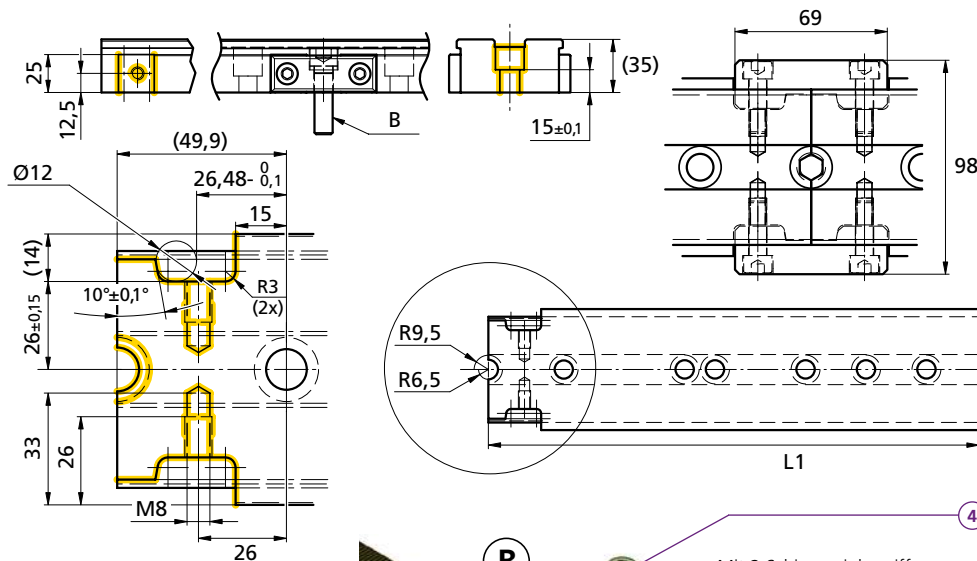
Coupling element for PCB base rails mounted on epoxy mineral tombstones

With this coupling element, it is possible to extend the PCB base rail by a second rail. Due to the frictional connection, the behaviour of the associated items is approximate to the behaviour of a continuous rail. A modification according to the drawing below (made by the customer) is required at the end of the base rails. New base rails can be supplied with this modification.

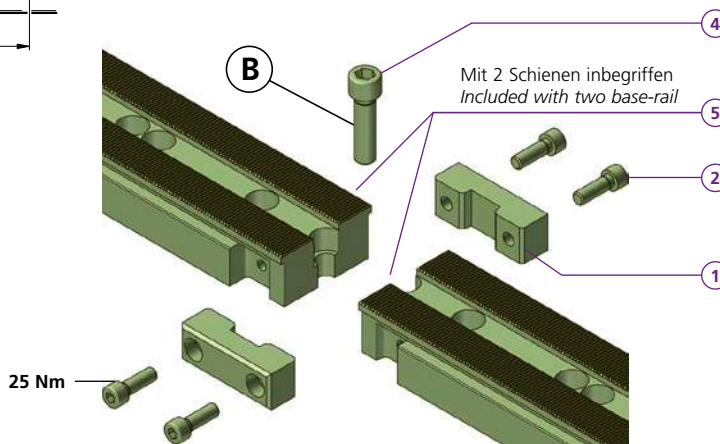
So the two coupling elements can be placed between the base rails. An additional screw (B) is taken the force flatwise to the seating.

Detailzeichnung zum Bearbeiten aller Basisschienen H35, um die Aussparung für das Kupplungsstück bei vorhandenen Schienen nachträglich herzustellen.

Detail drawing for machining all base rails H35 to retrofit the recess for the coupling piece on existing rails.



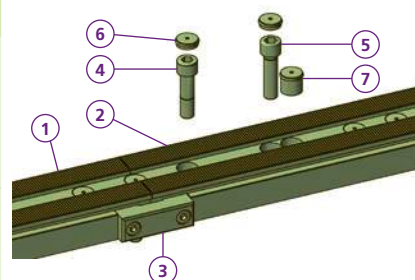
Montageanleitung siehe Video
Assembly instructions see video



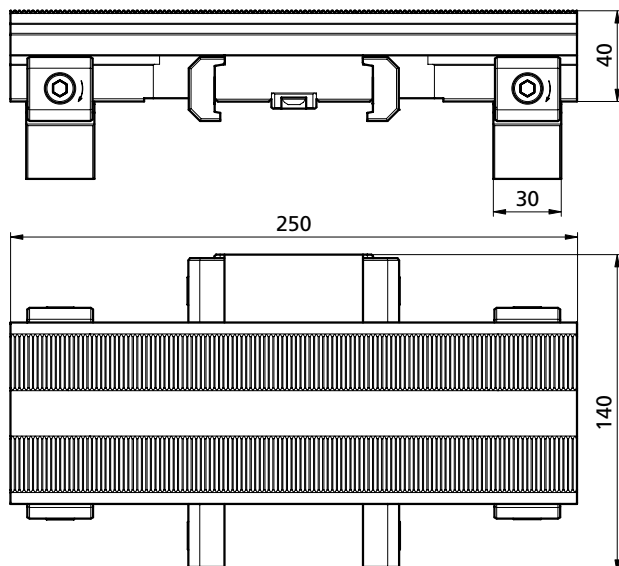
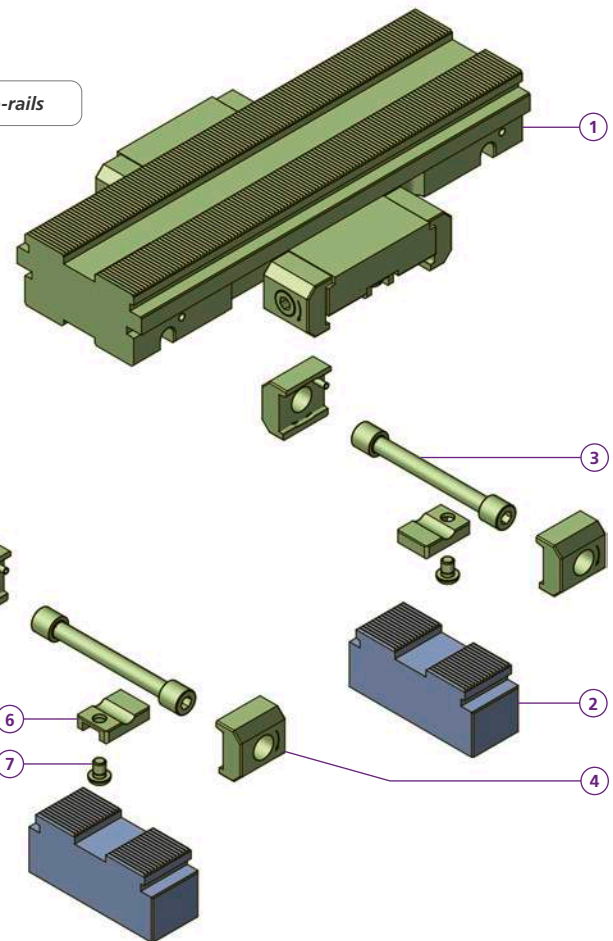
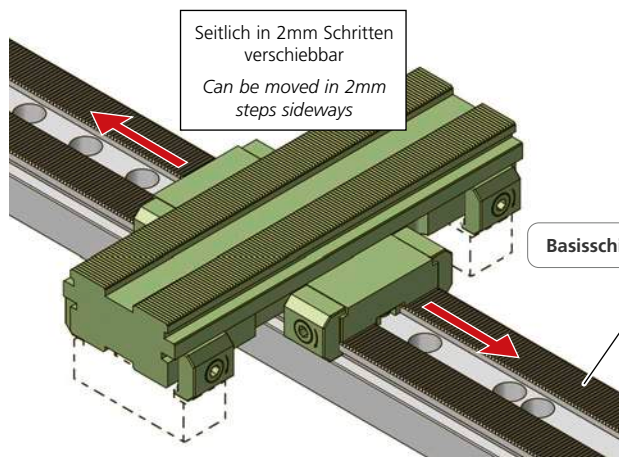
PCBP69SET		PCB4050250KP	PCB4050400KP	PCB4050450KP	PCB4050500KP	PCB4050650KP	PCB4050700KP
1	2x TW090078	5	5	5	5	5	5
2	4x M8X25ISO4762	L1 = 250	L1 = 400	L1 = 450	L1 = 500	L1 = 650	L1 = 700
4	1x M12X45ISO4762	kg ~5,1	kg ~7,9	kg ~8,9	kg ~9,9	kg ~12,8	kg ~13,8
kg	~0,4						

Bestellbeispiel / Ordering example: PCB4050250KP

PCB850SET		PCB900SET		PCB950SET		PCB1000SET	
1	1x PCB4050400KP	1	1x PCB4050650KP	1	1x PCB4050700KP	1	2x PCB4050500KP
2	1x PCB4050450KP	2	1x PCB4050250KP	2	1x PCB4050250KP	3	1x PCBP69SET
3	1x PCBP69SET	3	1x PCBP69SET	3	1x PCBP69SET	4	4x TWPAS1240
4	4x TWPAS1240	4	4x TWPAS1240	4	4x TWPAS1240	5	6x M12X40ISO4762
5	5x M12X40ISO4762	5	6x M12X40ISO4762	5	7x M12X40ISO4762	6	10x PCPF16L6
6	9x PCPF16L6	6	10x PCPF16L6	6	11x PCPF16L6	7	8x PCPF16L18
7	9x PCPF16L18	7	12x PCPF16L18	7	12x PCPF16L18	kg	~20,9
kg	~17,8	kg	~18,7	kg	~19,8		



Bestellbeispiel / Ordering example: PCB850SET

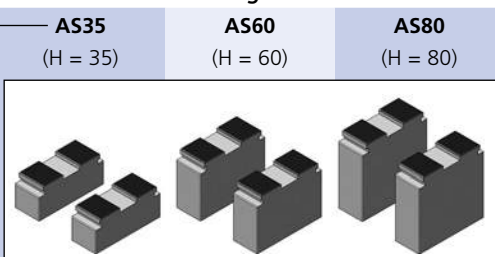


Schienenhöhe / Rail height

PCB250Q90H35

1	1x TH151032
2	2x
3	4x PCS14
4	4x PCSP30L
5	4x PCSP30R
6	4x PCGU2030
7	1x M6X8ISO7380

kg ~8,18



Seitliche Stützen

Bei Gebrauch der Querschiene 90°, werden je nach Höhe der Basisschiene auf dessen sie aufgesetzt sind, zwei seitliche Stützen AS35 / AS60 / AS80 unterlegt.

Side support

When using the cross rail 90°, a side support AS35 / AS60 / AS80 is underlaid, depending on the height of the base rail on which it is placed.

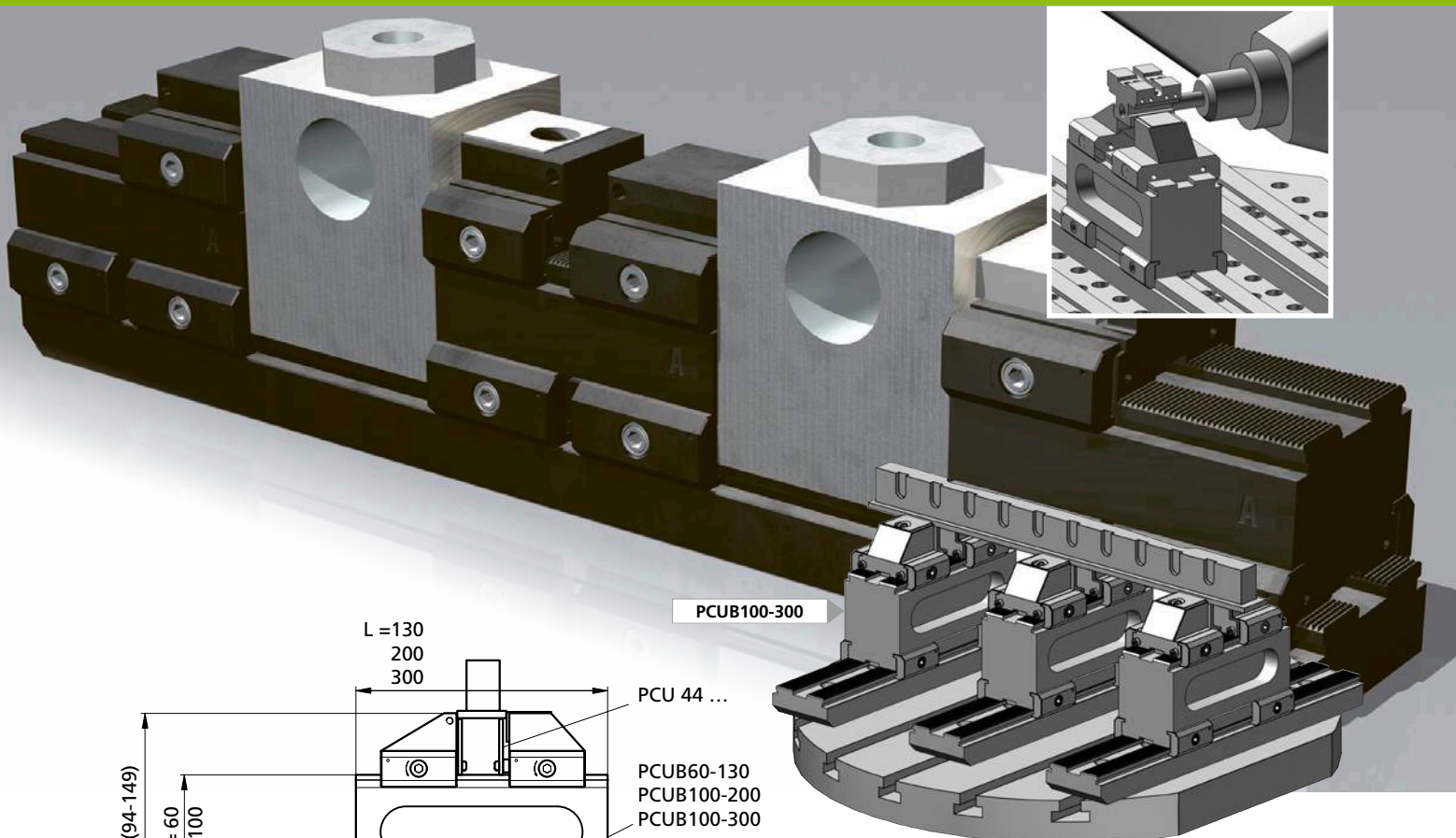
Bestellbeispiel / Ordering example: PCB250Q90H35

Erhöhung für 5-Achsenmaschinen
Riser for 5-axis machines

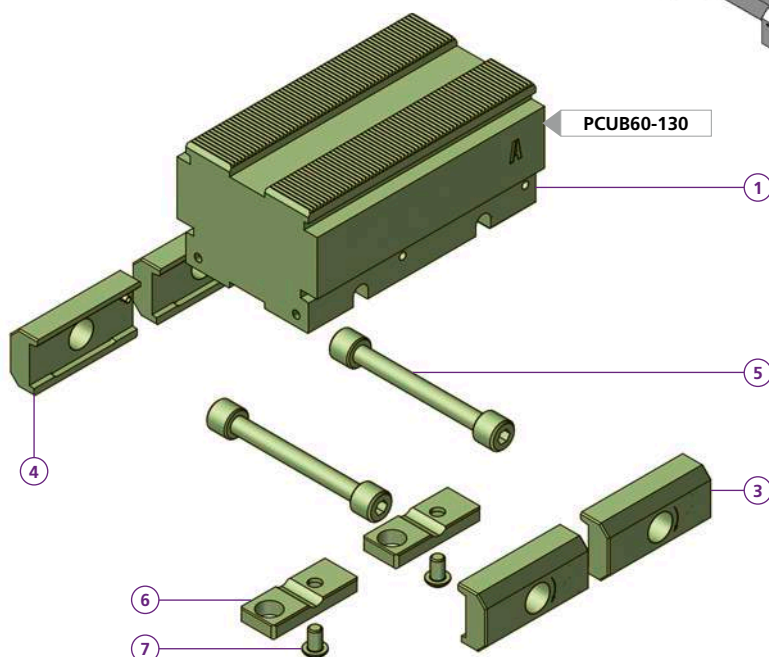
PCUB60-130
PCUB100-200
PCUB100-300



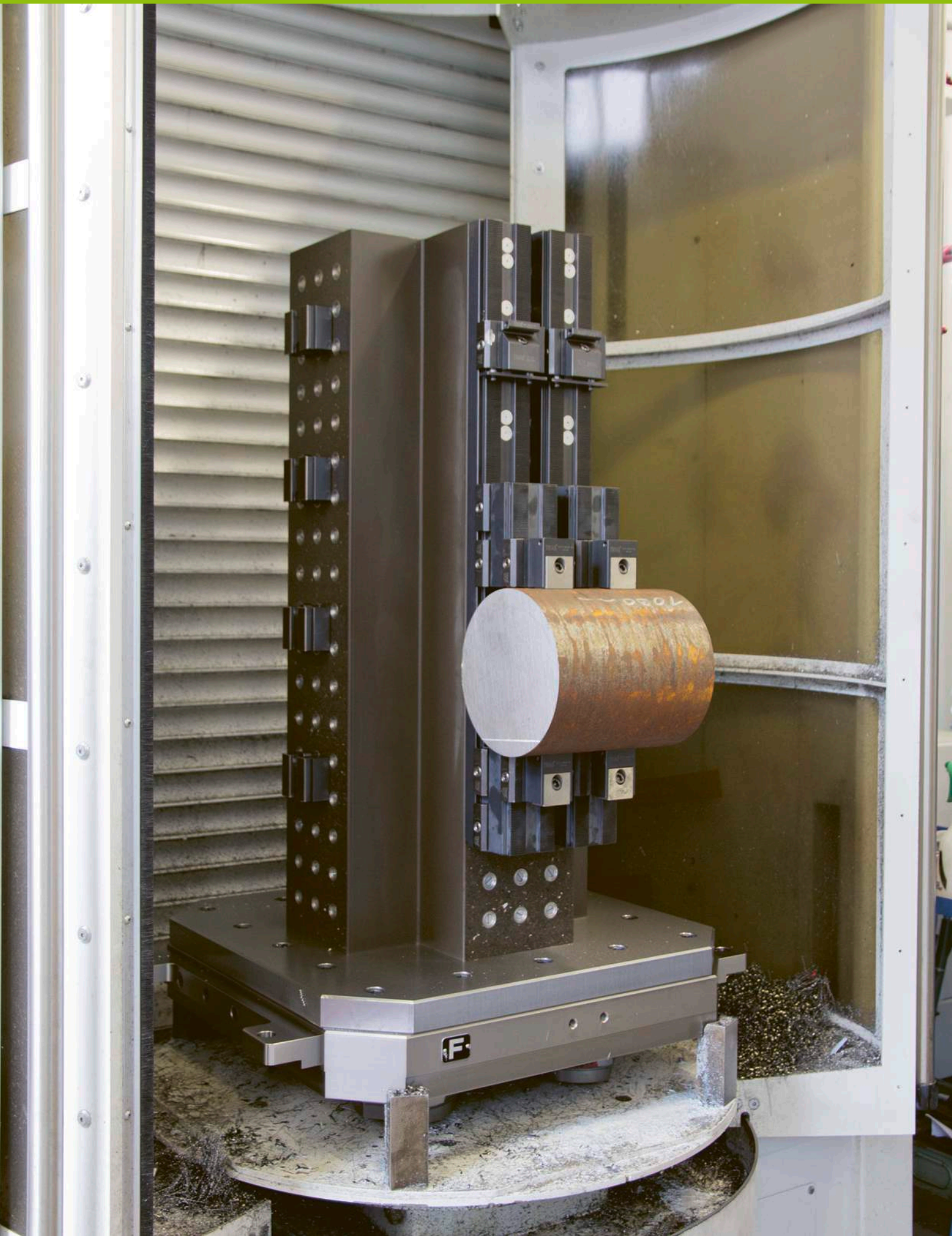
powerCLAMP

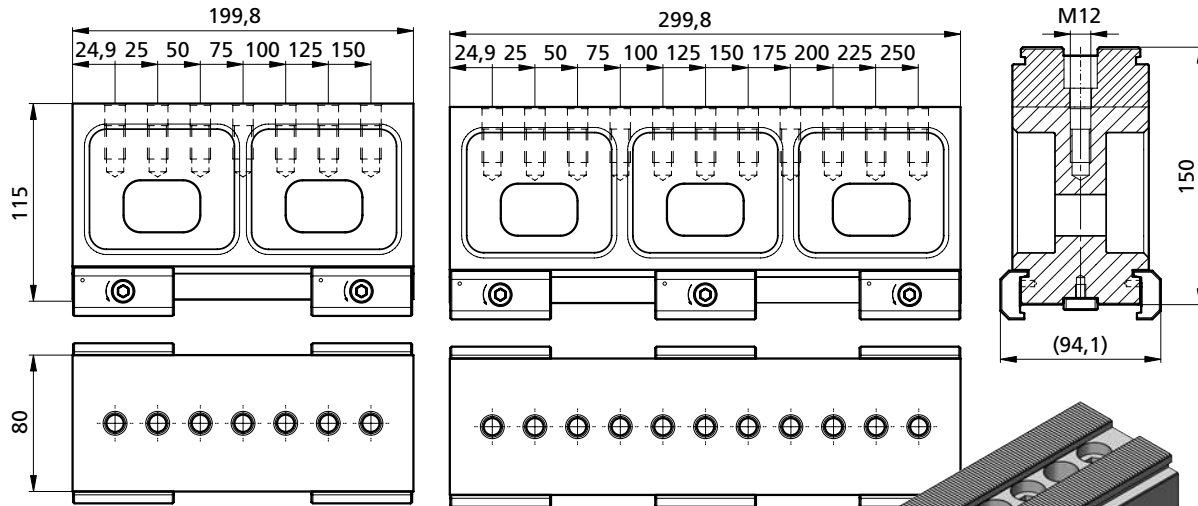


PCUB60-130	
①	1x TK120596
③	2x PCSP60R
④	2x PCSP60L
⑤	2x PCS14
⑥	2x PCGU2049
⑦	2x M6X8ISO7380
L	= 130
H	= 60
kg	~5,8
PCUB100-200	
①	1x TK130108
L	= 200
H	= 100
kg	~10,5
PCUB100-300	
①	1x TK130109
③	3x PCSP60R
④	3x PCSP60L
⑤	3x PCS14
⑥	3x PCGU2049
⑦	3x M6X8ISO7380
L	= 300
H	= 100
kg	~16

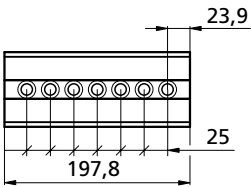


Bestellbeispiel / Ordering example: **PCUB100-200**

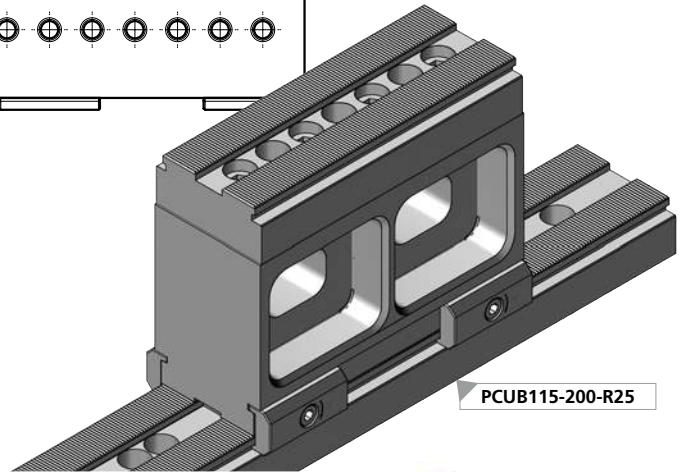
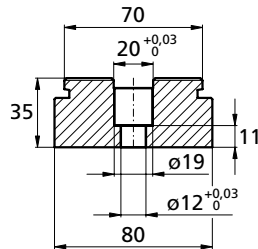
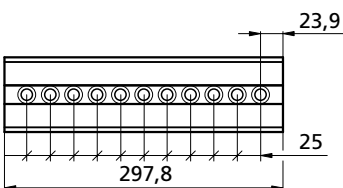




PCB25200 kg ~3,6



PCB25300 kg ~5,4



PCUB115-200-R25

PCUB115-200-R25

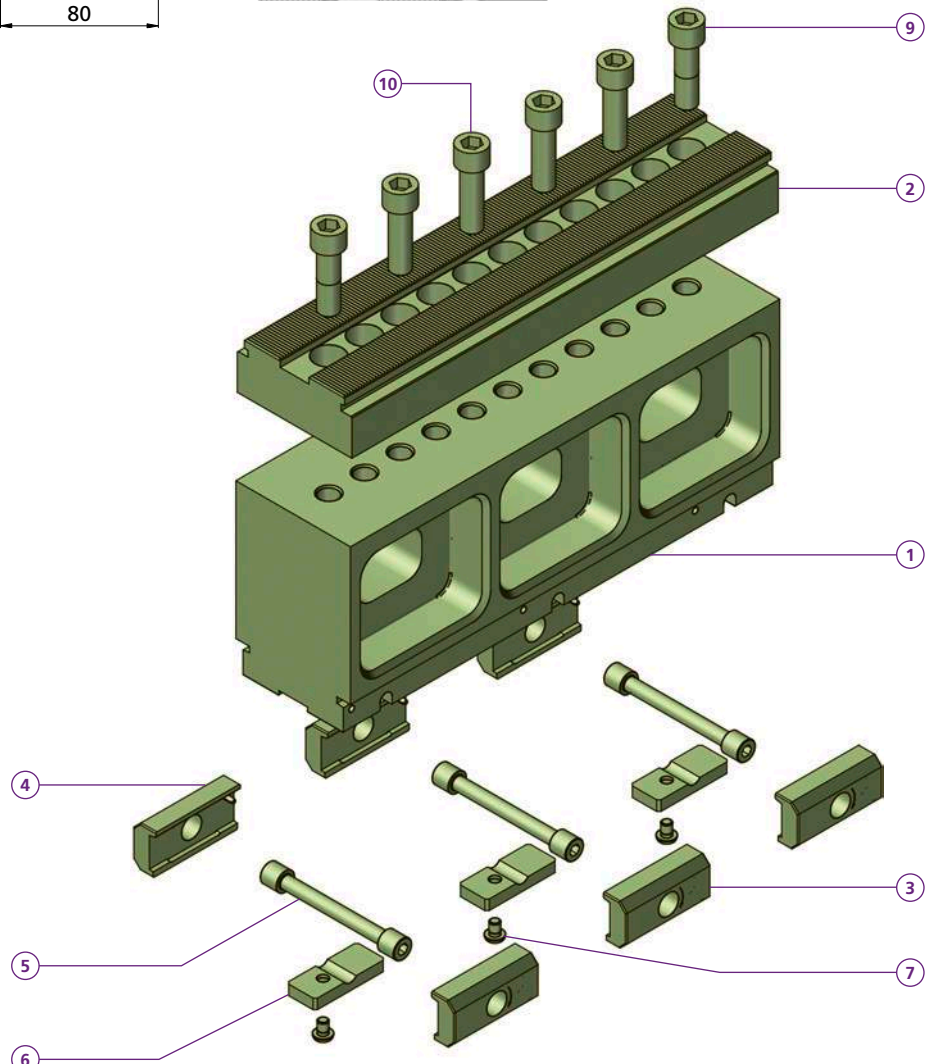
- 1 1x TK130323
- 2 1x PCB25200
- 3 2x PCSP60R
- 4 2x PCSP60L
- 5 2x PCS14
- 6 2x PCGU2049
- 7 2x M6X8ISO7380
- 9 2x TWPAS1240
- 10 2x M12X40ISO4762

kg ~13

PCUB115-300-R25

- 1 1x TK130324
- 2 1x PCB25300
- 3 3x PCSP60R
- 4 3x PCSP60L
- 5 3x PCS14
- 6 3x PCGU2049
- 7 3x M6X8ISO7380
- 9 2x TWPAS1240
- 10 4x M12X40ISO4762

kg ~19,6

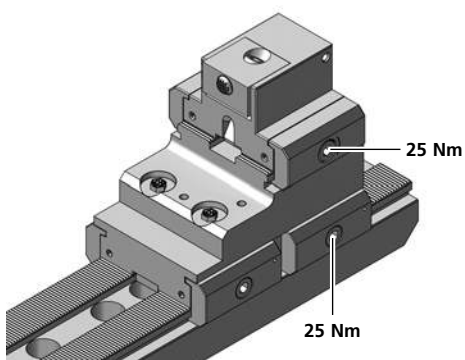
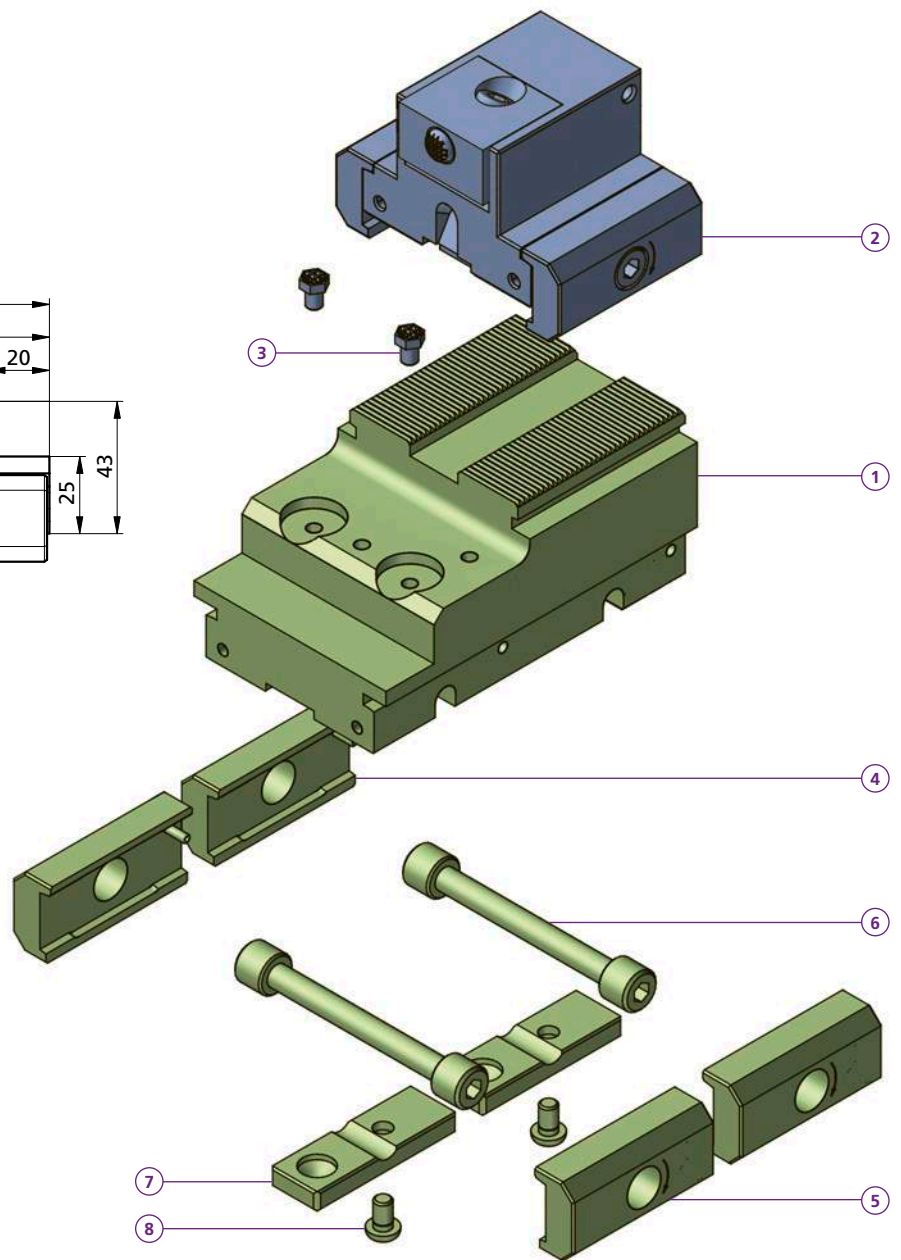
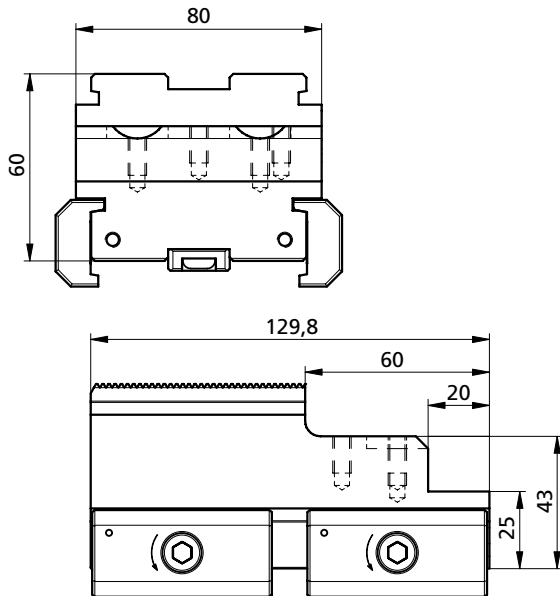


Bestellbeispiel / Ordering example: PCUB115-300-R25



PCUB60-70-130

powerCLAMP



PCUB60-70-130	
①	1x TK130707
②	1x PS1F43N49-60
③	2x CCHMR
④	2x PCSP60L
⑤	2x PCSP60R
⑥	2x PCS14
⑦	2x PCGU2049
⑧	2x M6X8ISO7380
kg	~4,3

p. 64

Zubehör / Accessories p. 337

Bestellbeispiel / Ordering example: PCUB60-70-130

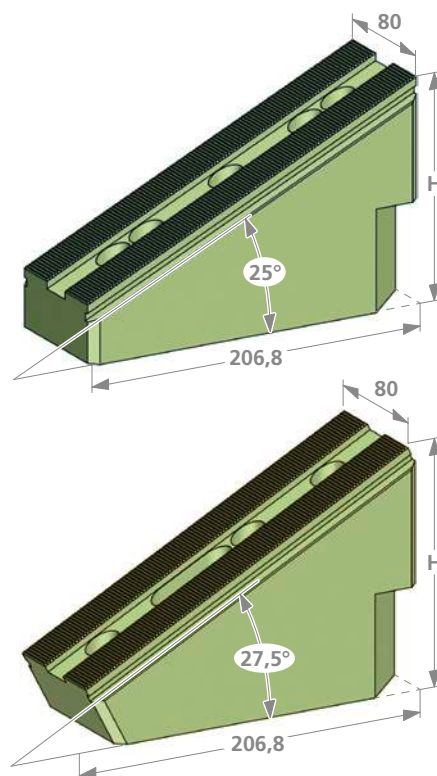
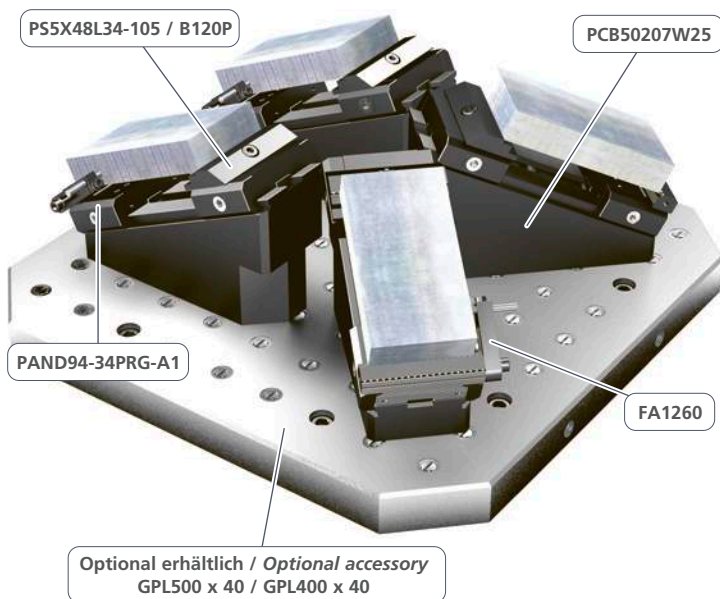
Separat bestellen / Order separately

Schräge Basisschiene für 5-Achsenmaschinen Slanted base rail for 5-axis machines



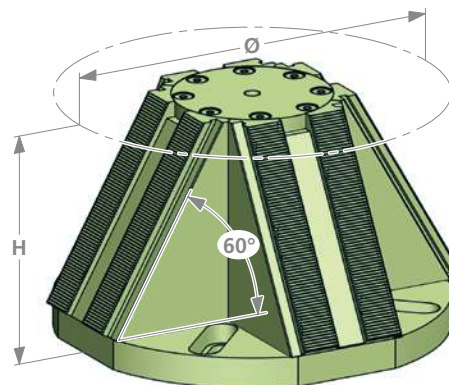
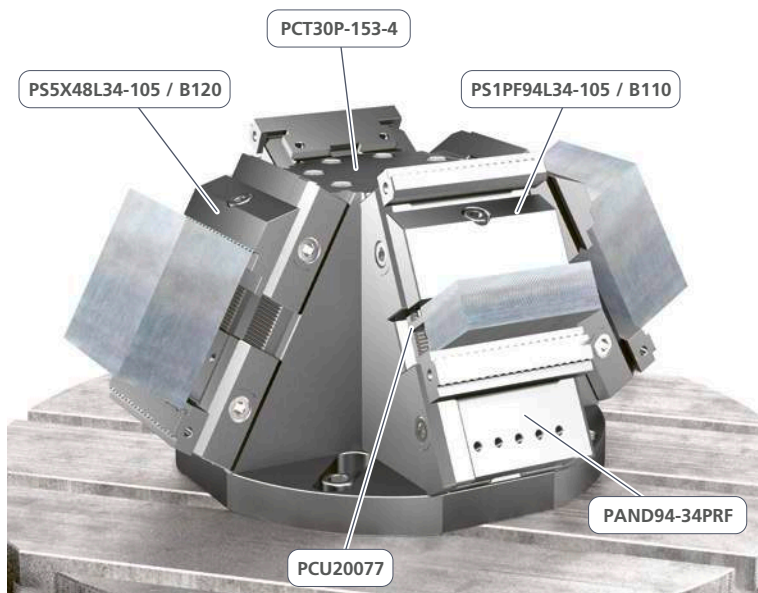
powerCLAMP

Art. Nr.	kg	Δ	H
PCB50207W25	~9,2	25°	131,5
PCB50207W27	~9,5	27,5°	139,7



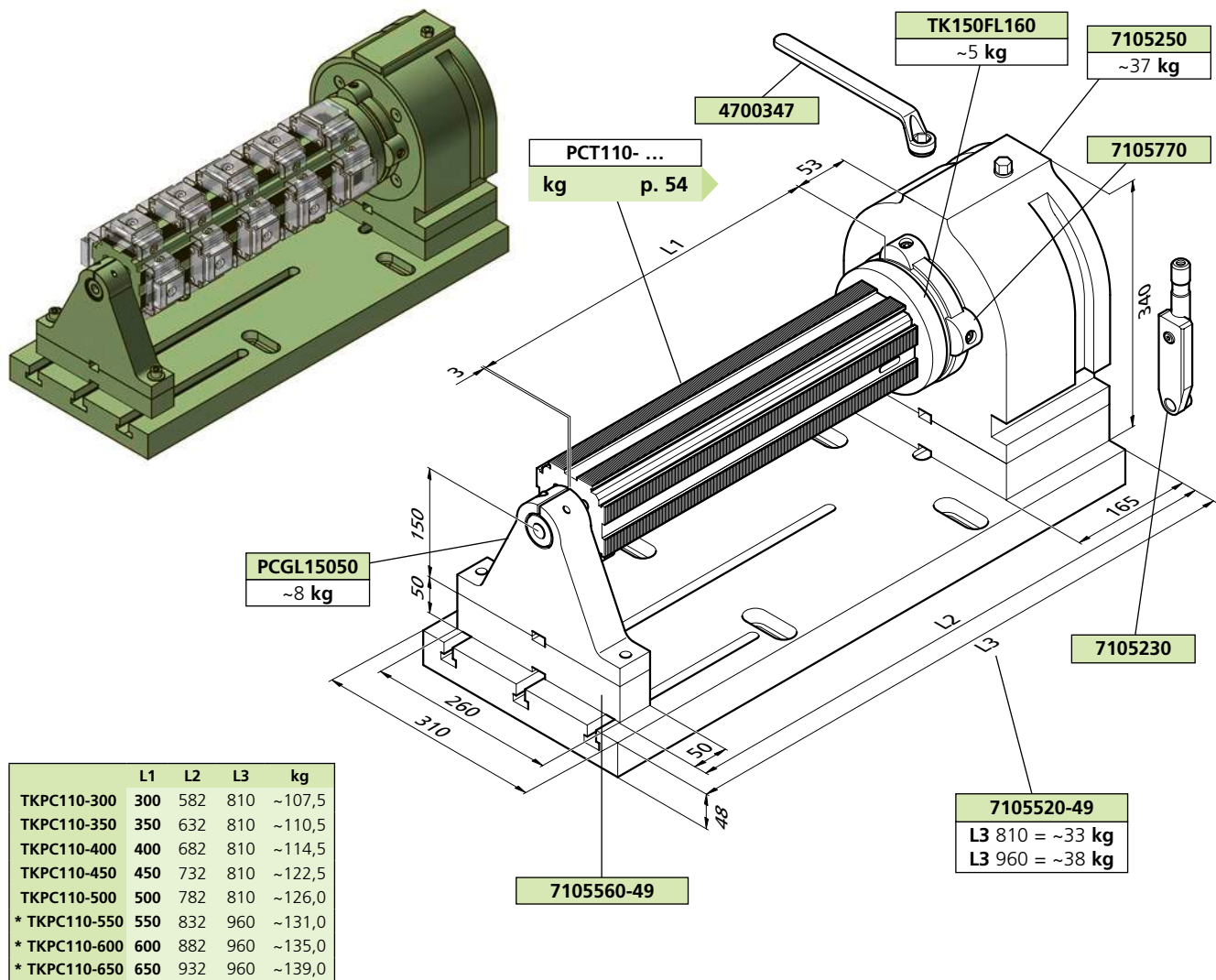
Die Basisschienen können auf einem 50 mm Raster je nach Bedarf parallel oder diagonal platziert werden.
The base rails can be placed on a 50 mm grid either parallel or diagonal as required.

Art. Nr.	kg	Δ	Ø	H
PCT30P-153-4	~24	60°	266	152,4



Die Stahl-Mineralgusspyramide verfügt über eine powerCLAMP Schnittstelle und ermöglicht eine kompakte und zugleich flexible 5-Achs-Bearbeitung. Die Module werden in einem Winkel von 60° montiert. Dank dem eingesetzten Mineralguss, hat die Konstruktion ein relativ tiefes Gewicht bei einer hohen Festigkeit.
The steel mineral casting pyramid has a powerCLAMP interface and enables compact and, at the same time, flexible 5-axis machining. The modules are mounted at an angle of 60°. Due to the mineral cast used, the construction has a relatively low weight with a high rigidity.





* Entspricht nicht der Abbildung
Does not correspond to the illustration

Bestellbeispiel / Ordering example: **TKPC110-300**



Balken zu Teilapparat

Monobloc Power Clamp for 4th-axis



powerCLAMP

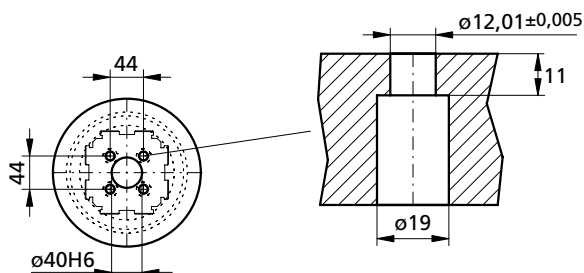
Störkreis für Balken zu Teilapparat

Workpiece diameter for monobloc Power Clamp for 4th-axis

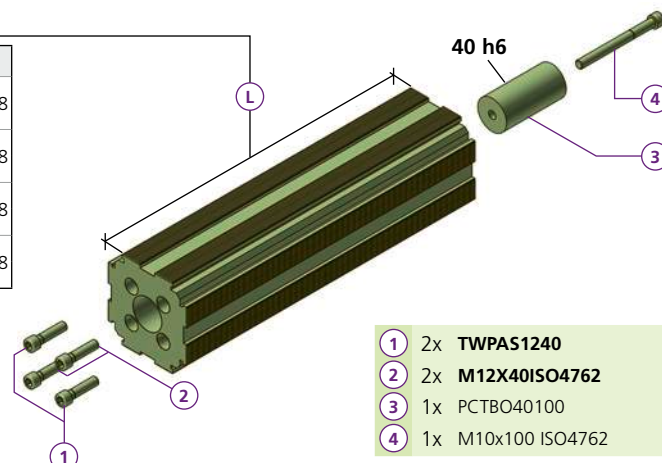
L	kg	Ø D
PCT110-300 ~24,5 B=110x110	255	241 211 224
PCT110-350 ~27,5 B=110x110	255	241 211 224
PCT110-400 ~31,5 B=110x110	255	241 211 224
PCT110-450 ~35,5 B=110x110	255	241 211 224
PCT110-500 ~39,5 B=110x110	255	241 211 224
PCT110-550 ~43,0 B=110x110	255	241 211 224
PCT110-600 ~47,0 B=110x110	255	241 211 224
PCT110-650 ~51,0 B=110x110	255	241 211 224
PCT110-700 ~55,2 B=110x110	255	241 211 224

L	kg	Ø D
PCMT150-700 ~83 B=150x150	238	266 278
PCMT150-750 ~89 B=150x150	238	266 278
PCMT150-800 ~95 B=150x150	238	266 278
PCMT150-850 ~101 B=150x150	238	266 278

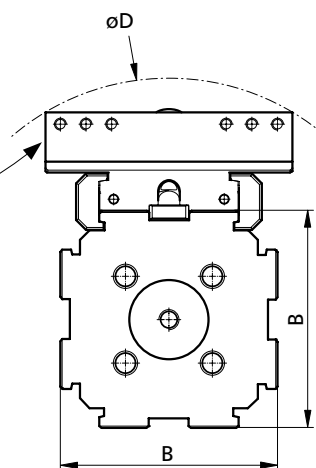
PS1R43N49-B60
PS1R94N34-B80
PS1R94N49-B90
PS1R125N49-B95



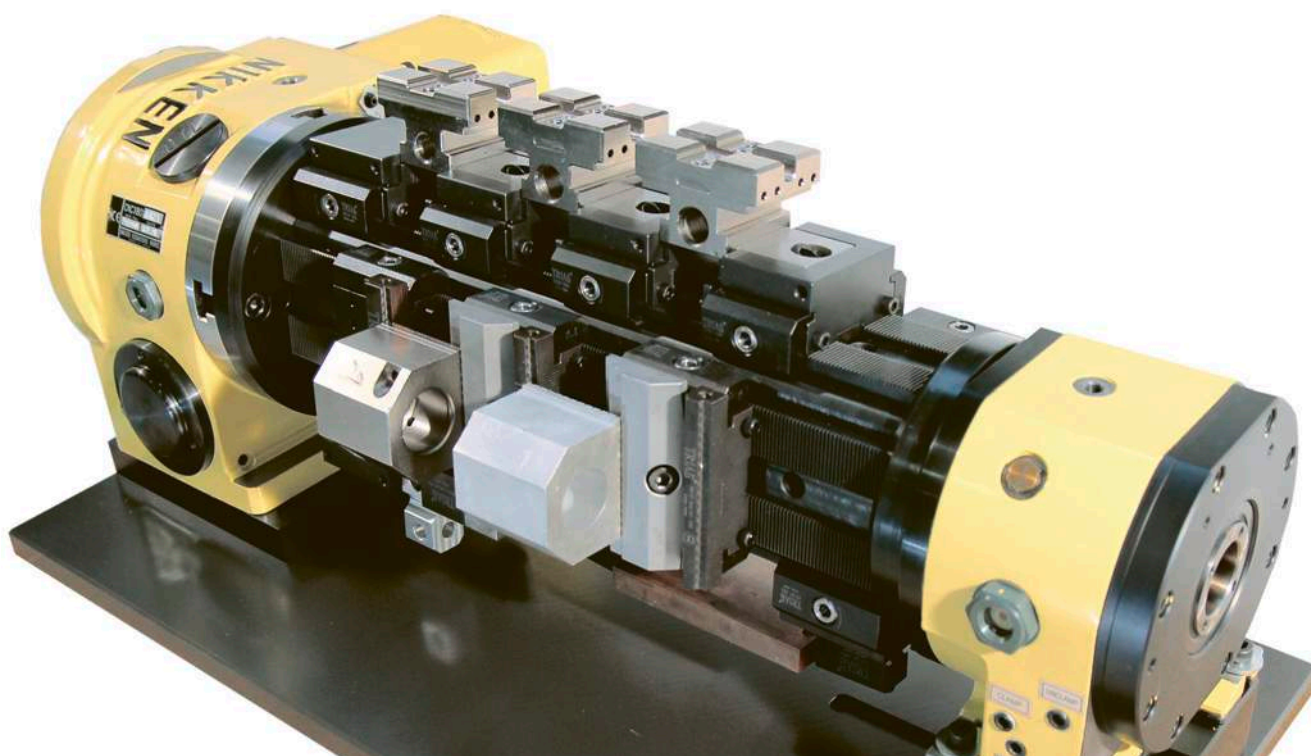
Monobloc powerCLAMP 110 x 110 x ...



- 1 2x TWPAS1240
- 2 2x M12X40ISO4762
- 3 1x PCTBO40100
- 4 1x M10x100 ISO4762



Bestellbeispiel / Ordering example: PCT110-500





microCLAMP



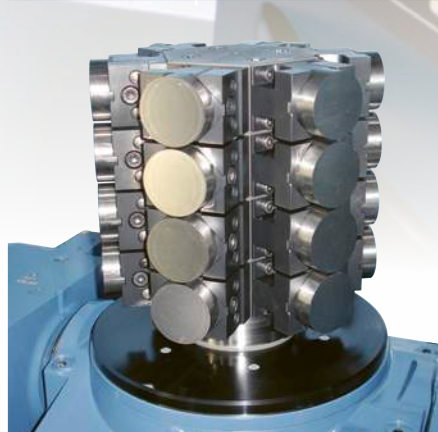
powerCLAMP



triCENTRO



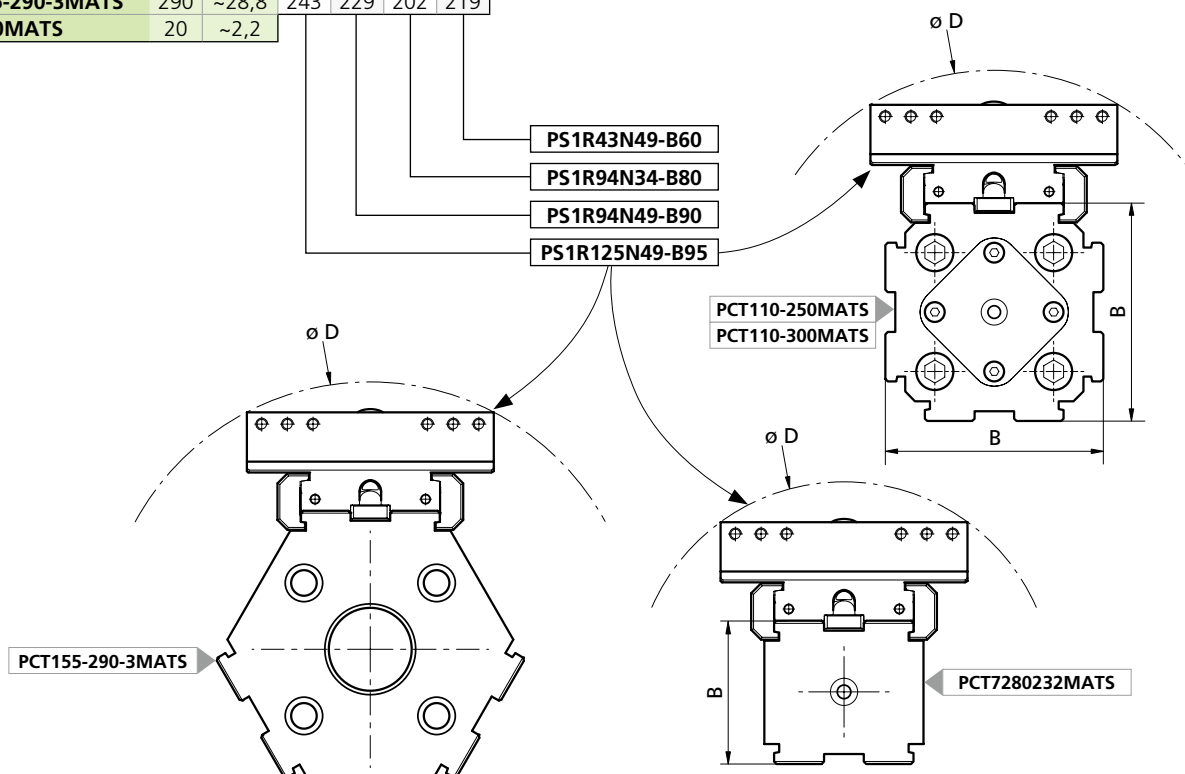
microCLAMP





Störkreis für MATS-Spanntürme
Workpiece diameter for MATS clamping towers

	H	kg	Ø D			
PCT110-250MATS	250	~20	255	241	211	224
PCT110-300MATS	300	~24	255	241	211	224
PCT7280232MATS	232	~11	211	195	161	176
PCT155-290-3MATS	290	~28,8	243	229	202	219
GPL160MATS	20	~2,2				



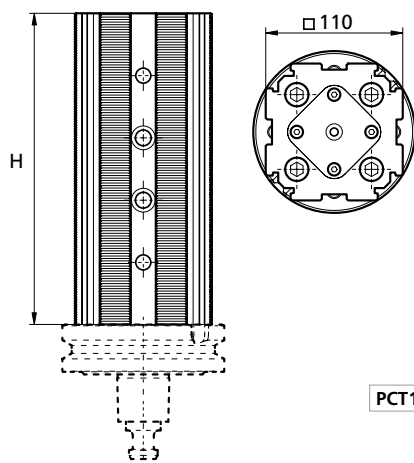
Bestellbeispiel / Ordering example: **PCT110-250MATS**

PCT110-250MATS
PCT110-300MATS
PCT155-290-3MATS

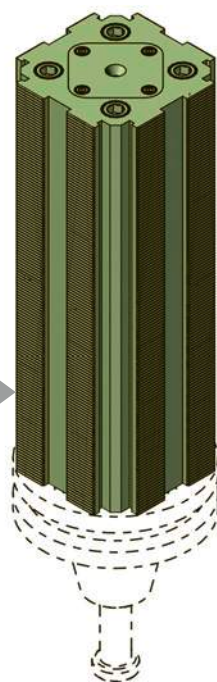
PCT7280232MATS
GPL160MATS



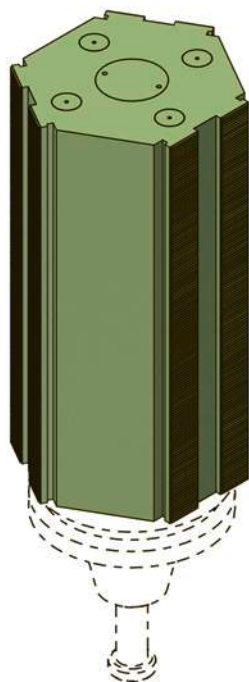
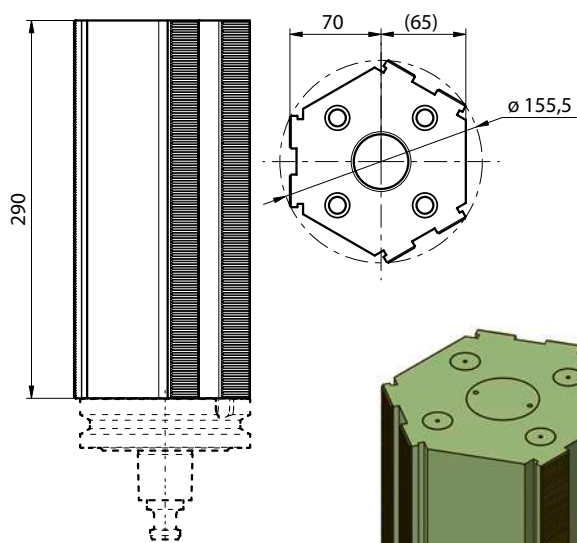
powerCLAMP



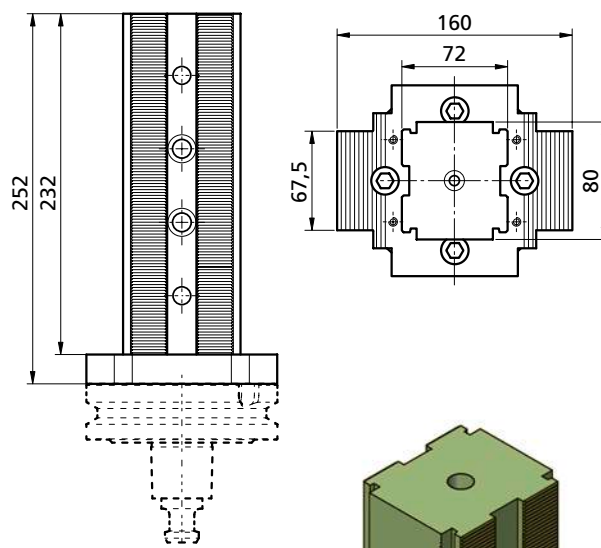
PCT110-250MATS



	H	kg
PCT110-250MATS	250	~20
PCT110-300MATS	300	~24

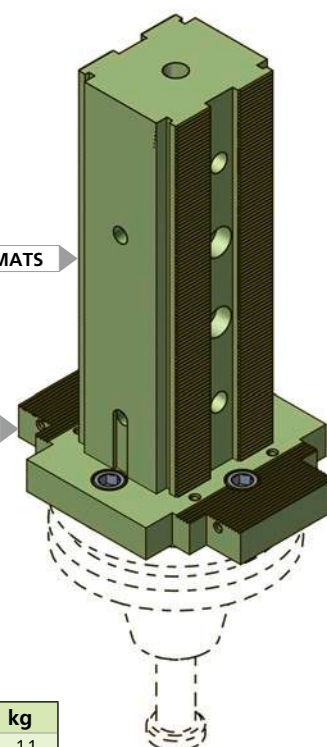


	H	kg
PCT155-290-3MATS	290	~28,8



PCT7280232MATS

GPL160MATS



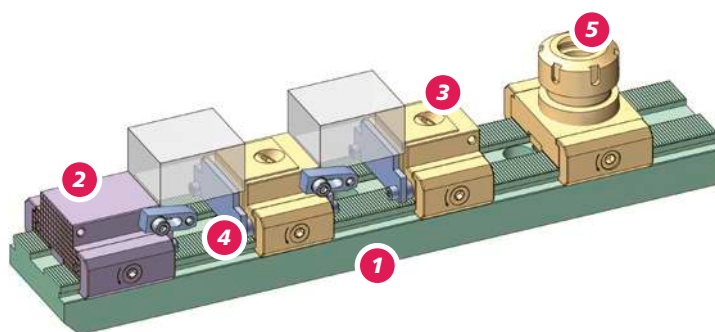
	H	kg
PCT7280232MATS	232	~11
GPL160MATS	20	~2,2

Separat bestellen / Order separately



BESTELLBEISPIEL / ORDERING EXAMPLE

1x PCSET18-450A 2x PCSET18-N3 1x PS1X50N62-ER32



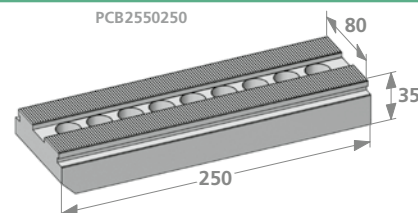
Zu jeder Basisschiene gehört 1 Anschlagmodul «Tabelle 2» nach Ihrer Wahl!
Each base rail comes with 1 end module "table 2" of your choice!

1

Basisschienen / Base-rails

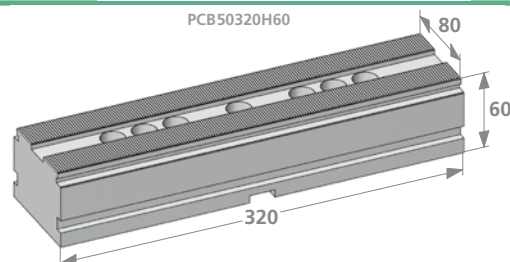
PCSET18-250A	PCB2550250	PCSET18-600A	PCB4050600
PCSET18-350A	PCB4050350	PCSET18-650A	PCB4050650
PCSET18-400A	PCB4050400	PCSET18-700A	PCB4050700
PCSET18-450A	PCB4050450	PCSET18-750A	PCB4050750
PCSET18-500A	PCB4050500	PCSET18-800A	PCB4050800
PCSET18-550A	PCB4050550		

PCB2550250



PCSET18-320B	PCB50-320H60
PCSET18-400B	PCB100-400H60
PCSET18-500B	PCB100-500H60
PCSET18-600B	PCB100-600H60
PCSET18-650B	PCB100-650H60
PCSET18-690B	PCB100-690H60
PCSET18-850B	PCB100-850H60

PCB50320H60

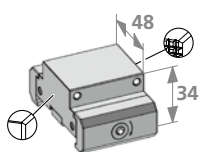


2

Anschlagmodule / End modules

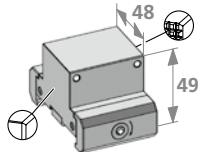
48

PAND 48-34



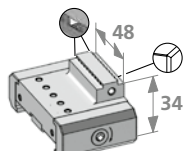
01

PAND 48-49



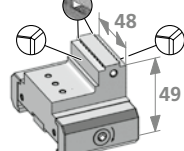
02

PAND 48-34 PRF-A1



03

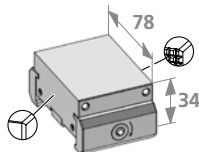
PAND 48-49 PRF-A1



04

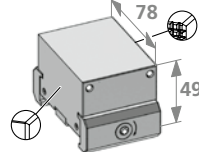
78

PAND 78-34



05

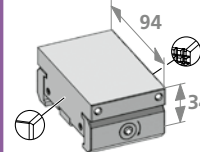
PAND 78-49



06

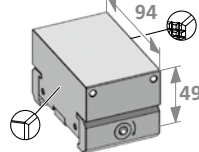
94

PAND 94-34



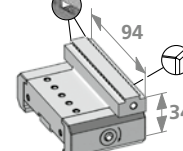
07

PAND 94-49



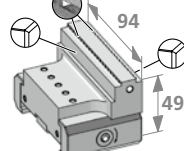
08

PAND 94-34 PRF-A1



09

PAND 94-49 PRF-A1



10

F = glatt / flat

R = geriffelt / double serrated

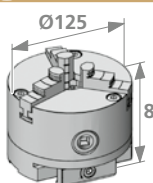
☉ = Direktprägebacken / Direct stamping



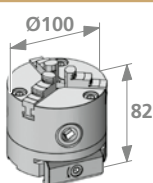
5

Dreibackenfutter | Spannzangenmodul | Mini-Zentrischspanner Three-jaw chuck | Collet module | Mini-self centering vise

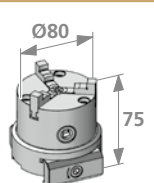
Inkl. 2 Backen
Incl. 2 jaws



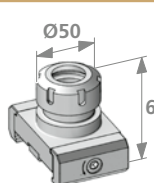
PS3X125L87BSET



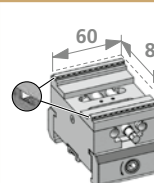
PS3X100L82BSET



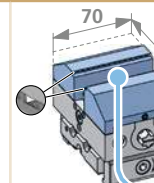
PS3X80L75BSET



PS1X50N62-ER32



PCZ80L40PRG62



PCZ100L50





3 Niederzugspannmodule / Pull down clamp modules

48		78		94	
PS1R48N34 B80N 	PS1R48N49 B80N 	PS1R78N49 B90R78 	PS1F48N49 B90F78 	PS1R94N49 B90 	PS1F94N49 B90
PCSET18-N1	PCSET18-N2	PCSET18-N5	PCSET18-N6	PCSET18-N7	PCSET18-N8
PS1F48N34 B80N 	PS1F48N49 B80N 	F = glatt / flat R = geriffelt / double serrated = Direktprägebacken / Direct stamping		PS1R94N49 B93 	
PCSET18-N3	PCSET18-N4			PCSET18-N9	

Linearspannmodule / Linear clamp modules

PS1 PF 48L34 B115P 	PS1 PF 48L49 B115P 	PS1R78L34 B141 	PS1F78L34 B140 	PS1 PF 94L34 B120P 	PS1 PF 94L49 B120P
PCSET18-L1	PCSET18-L2	PCSET18-L5	PCSET18-L6	PCSET18-L9	PCSET18-L11
PS1R48L49 B106 	PS1F48L49 B105 	PS1R78L49 B141 	PS1F78L49 B140 	PS1R94L34 B111 	PS1F94L34 B110
PCSET18-L3	PCSET18-L4	PCSET18-L7	PCSET18-L8	PCSET18-L12	PCSET18-L13
PS1R48L34 B106 	PS1F48L34 B105 	Bei jedem Niederzug und Linear Spannmodul sind 2 Parallelunterlagen nach Ihrer Wahl und 1 Fräsanschlag enthalten. 		PS1R94L49 B111 	PS1F94L49 B110
PCSET18-L16	PCSET18-L17	Each pull-down and linear clamping module includes 2 parallels of your choice and 1 milling buffer.		PCSET18-L14	PCSET18-L15

4 Parallelunterlagen / Steel parallels

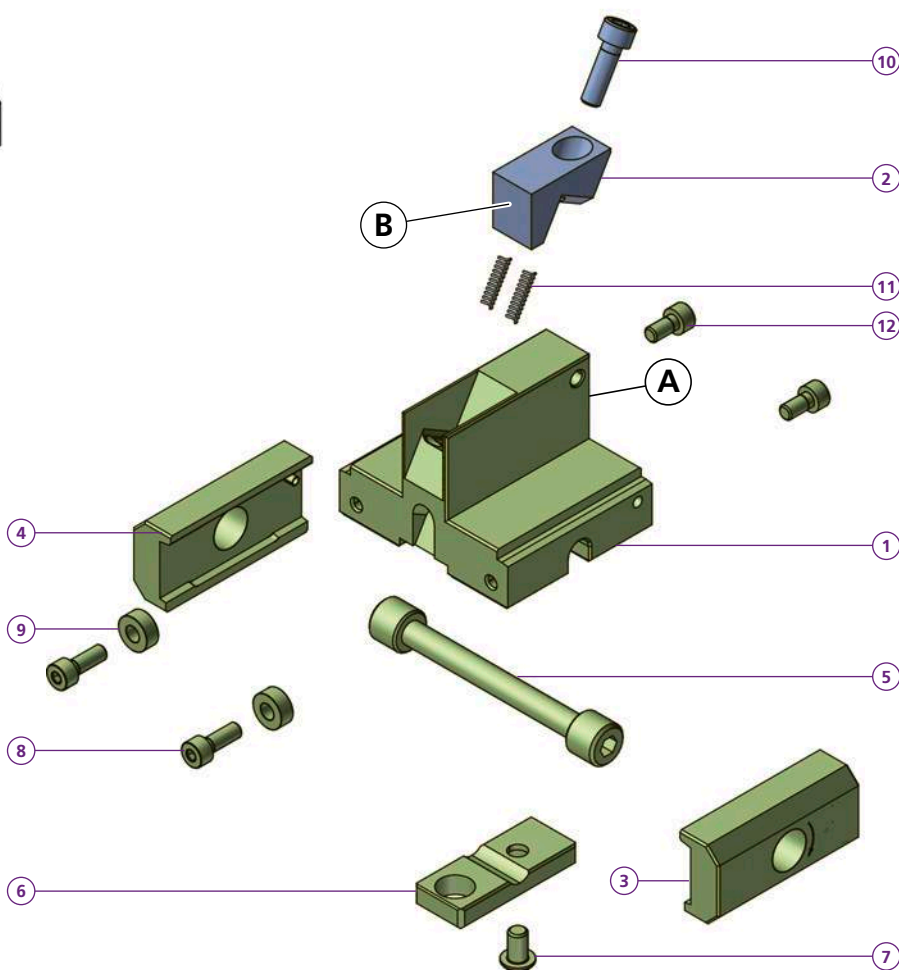
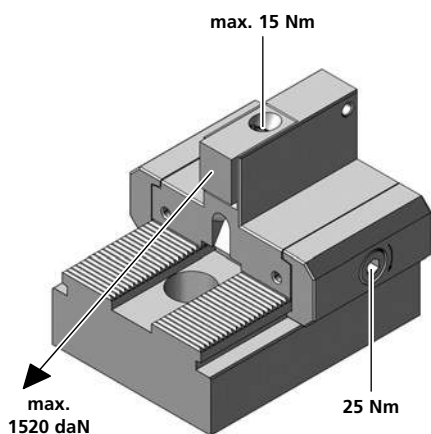
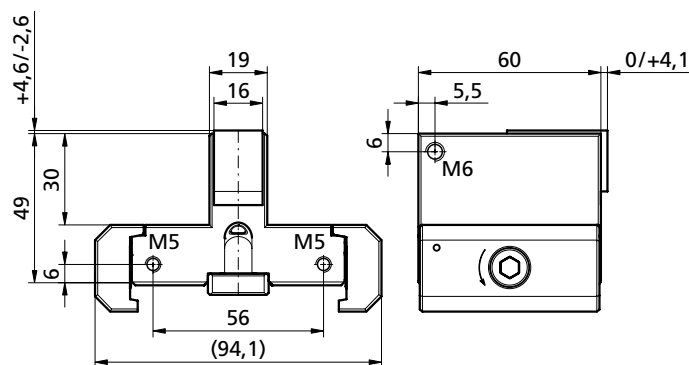
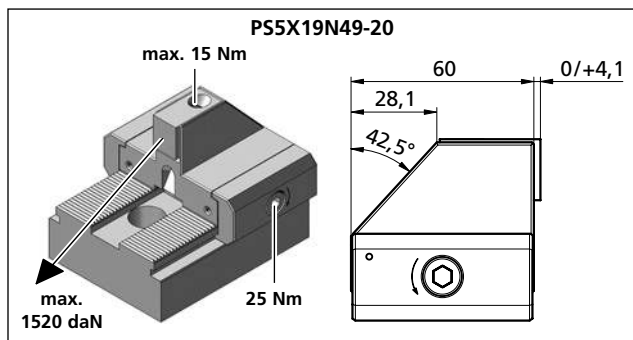
48	78	94
PCU29047 H PCU 20 047 PCU 24 047 PCU29047 PCU 31 047 PCU 34 047 PCU 39 047 PCU 44 047 PCU 46 047 B48- ...	PCU39077 H PCU 20 077 PCU 24 077 PCU 29 077 PCU 31 077 PCU 34 077 PCU39077 PCU 44 077 PCU 46 077 B78- ...	PCU29093 H PCU 14 093 PCU 20 093 PCU 24 093 PCU29093 PCU 31 093 PCU 34 093 PCU 39 093 PCU 44 093 PCU 46 093 PCU 47 093 B94- ...

Fräsanschlag / Milling buffer

FA1240

1 x Inklusive / Included

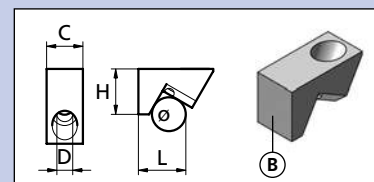




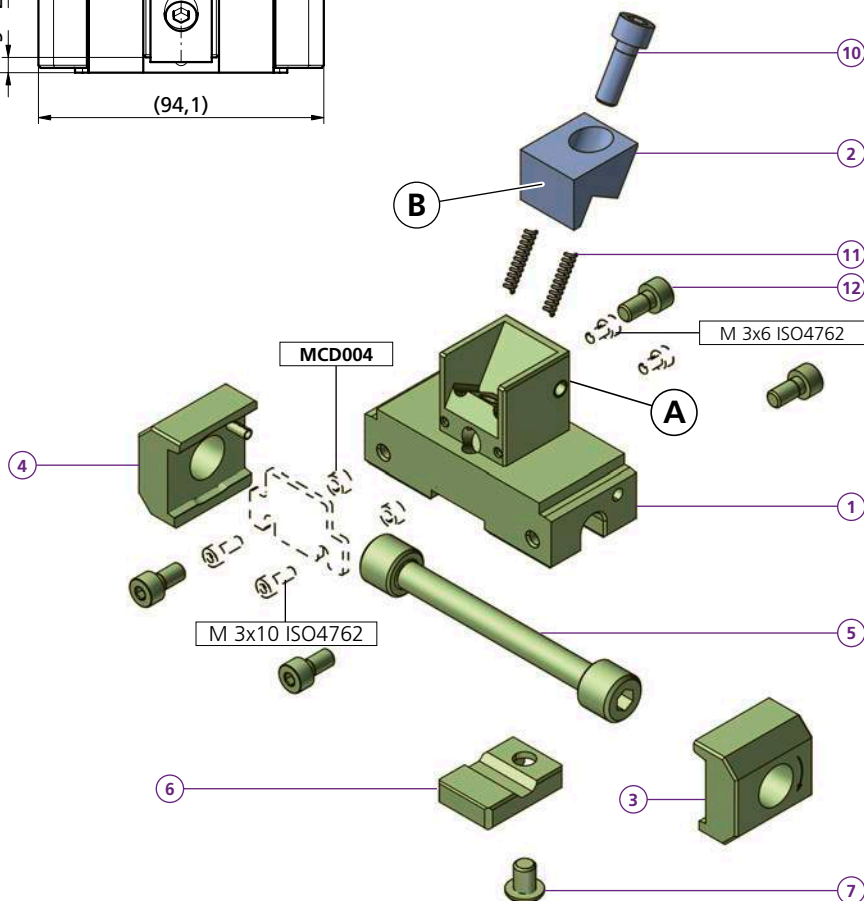
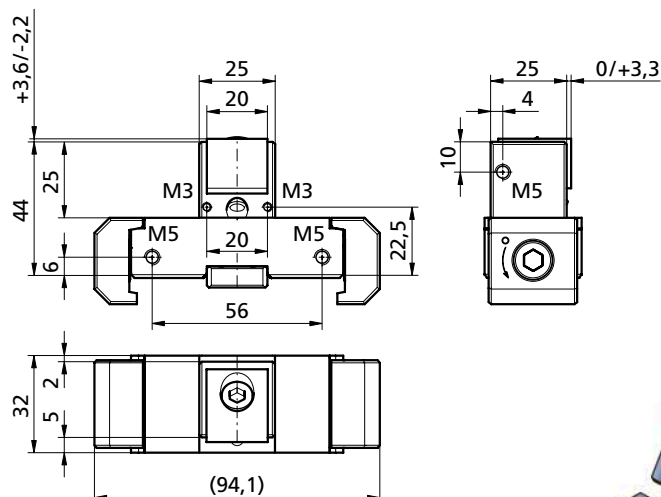
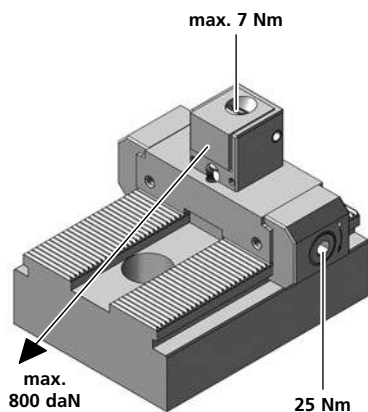
	PS5X19N49-20
1	1x TF140449
9	2x PCD005
8	2x M5X14ISO4762
kg	~1,1
	PS1F19N49-20
1	1x TF150961
	PS1R19N49-20
1	1x TF140448
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2049
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M6X20ISO4762
11	2x FED0418
12	2x M5X10ISO4762
kg	~1,2

	B20	B21	B22
C	16	16	16
H	20	20	20
L	19	19	19
D	6,5	6,5	6,5
ø	12	12	12
i	HV700	HV700	*
	x0,2mm	x0,2mm	
kg	~0,06	~0,06	~0,06

Bestellbeispiel / Ordering example: 1x **PS1R19N49-20** & 1x **B21**

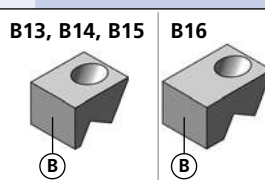
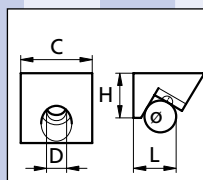


Separat bestellen / Order separately



PS1F25N44-13	
1	1x TF150960
PS1R25N44-13	
1	1x TF140450
2	1x
3	1x PCSP30R
4	1x PCSP30L
5	1x PCS14
6	1x PCGU2030
7	1x M6X8ISO7380
kg	~0,6

	B13	B14	B15	B16
C	20	20	20	20
H	16	16	16	16
L	13,8	13,8	13,8	19
D	6,5	6,5	6,5	6,5
ø	10	10	10	10
i	HV700 x0,2mm	HV700 x0,2mm	*	*
kg	~0,05	~0,05	~0,05	~0,06



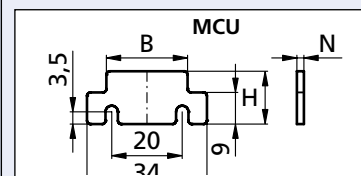
Bestellbeispiel / Ordering example: 1x PS1R25N44-13 & 1x B14

	H	B	N	kg
MCU11037	11	23	2	~0,004
MCU15037	15	23	2	~0,006
MCU18037	18	23	2	~0,008
MCU20037	20	23	2	~0,008
MCU22537	22,5	23	2	~0,008

2x M3X10ISO4762

2x M3X6ISO4762

2x MCD004



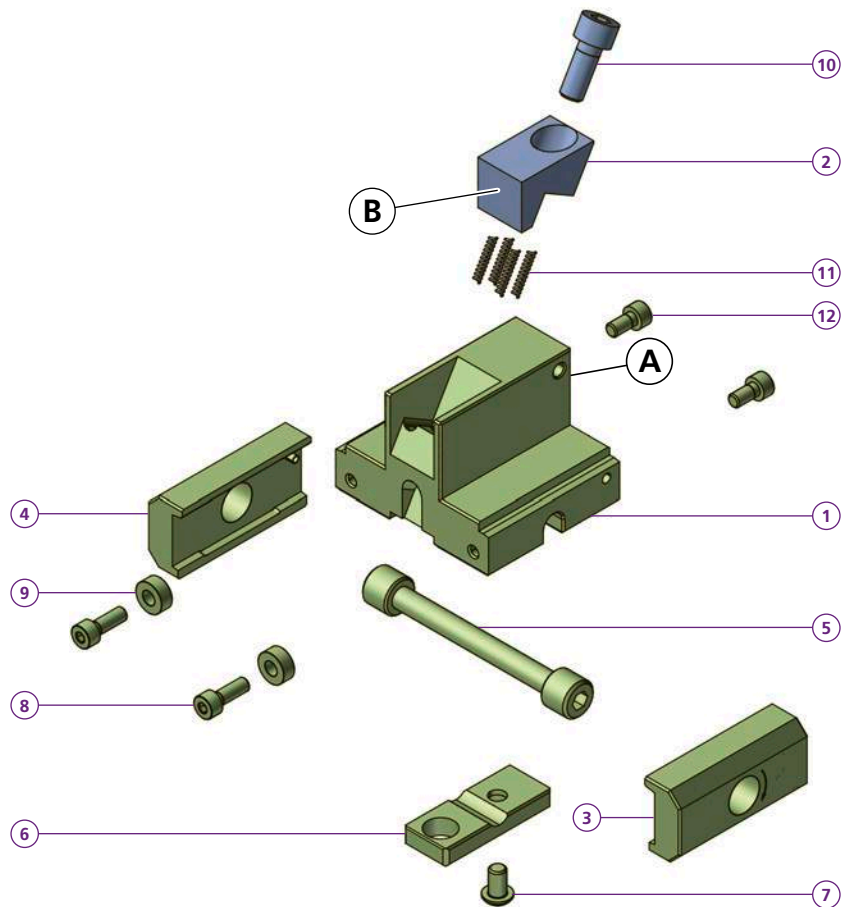
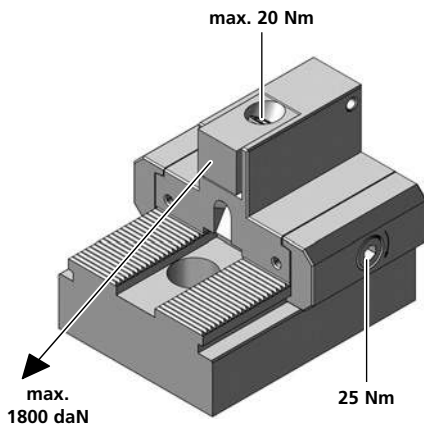
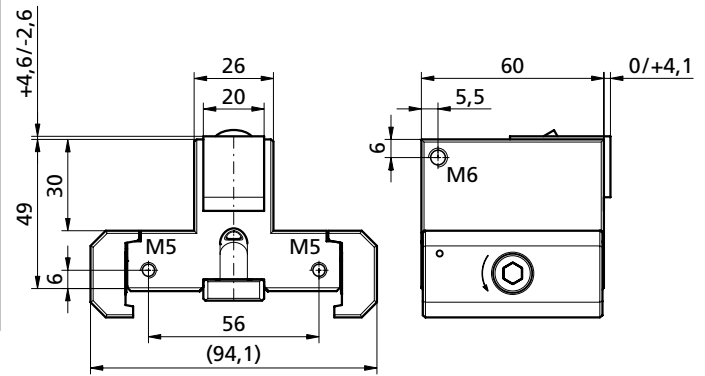
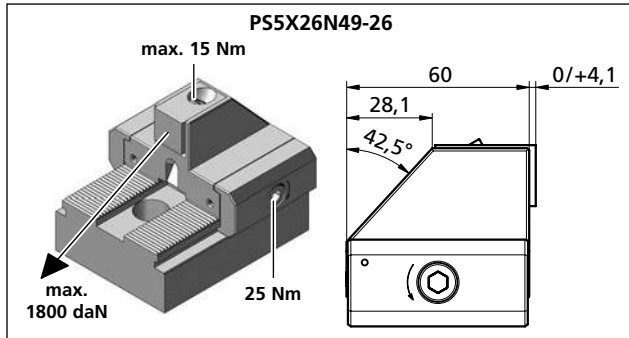
* = weicher Stahl / soft steel



PS1R/F26N49-26

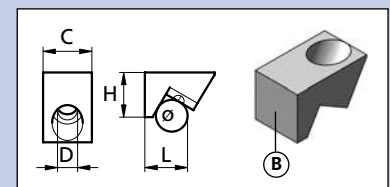
PS5X26N49-26

powerCLAMP



PS5X26N49-26	
1	1x TF140453
9	2x PCD005
8	2x M5X14ISO4762
kg	~1,1
PS1F26N49-26	
1	1x TF140451
PS1R26N49-26	
1	1x TF140452
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2049
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M8X20ISO4762
11	4x FED0418
12	2x M5X10ISO4762
kg	~1,2

Bestellbeispiel / Ordering example: 1x PS1R26N49-26 & 1x B26		
	B26	B27
C	20	20
H	20	20
L	19	19
D	9	9
ø	12	12
i	HV700	HV700
	x0,2mm	x0,2mm
kg	~0,07	~0,07
		*
		~0,07

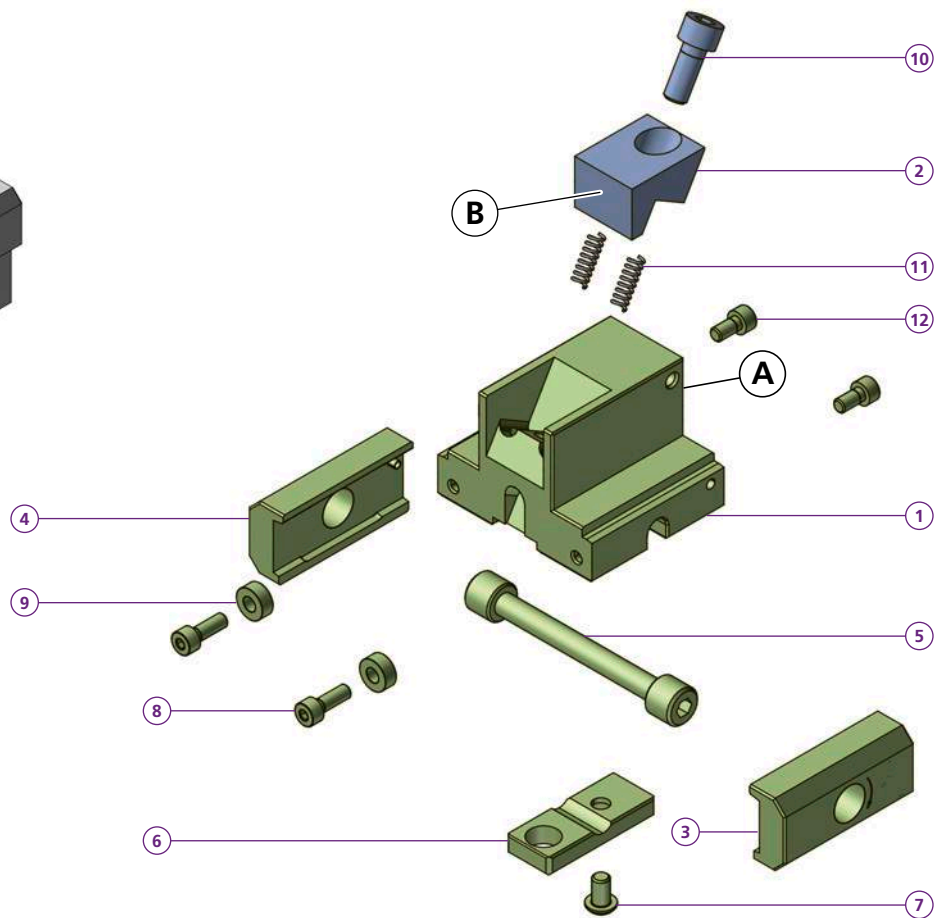
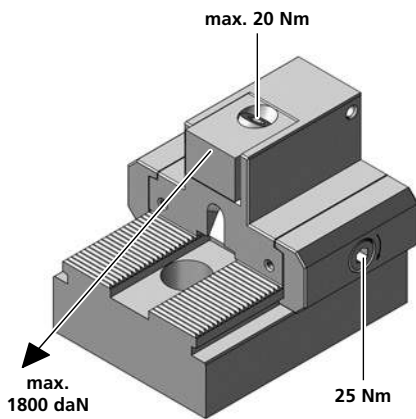
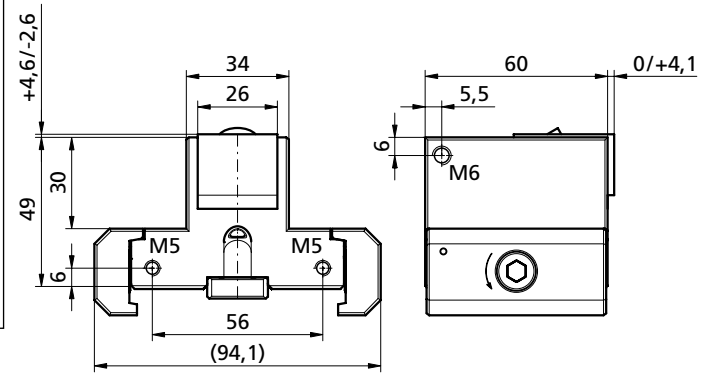
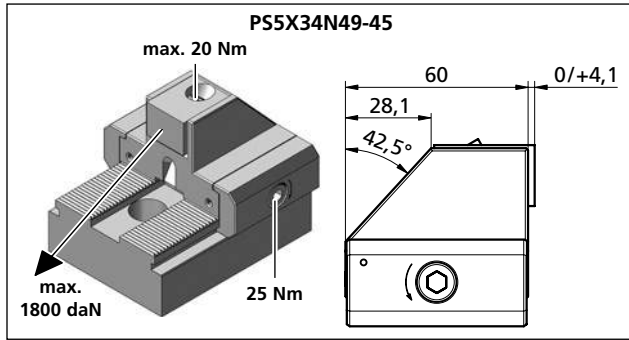




PS1R/F34N49-45

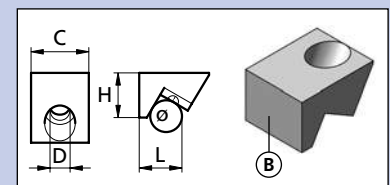
PS5X34N49-45

powerCLAMP



	PS5X34N49-45
1	1x TF140455
9	2x PCD005
8	2x M5X14ISO4762
kg	~1,2
	PS1F34N49-45
1	1x TF191071
	PS1R34N49-45
1	1x TF140454
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2049
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M8X20ISO4762
11	2x FED0618
12	2x M5X10ISO4762
kg	~1,3

	Bestellbeispiel / Ordering example: 1x PS5X34N49-45 & 1x B47HM			
	B45	B46	B47	B47HM
C	26	26	26	26
H	20	20	20	20
L	19	19	19,1	19,1
D	9	9	9	9
ø	12	12	12	12
i	HV700	HV700	*	HM
	x0,2mm	x0,2mm		
kg	~0,1	~0,1	~0,1	~0,1



* = weicher Stahl / soft steel

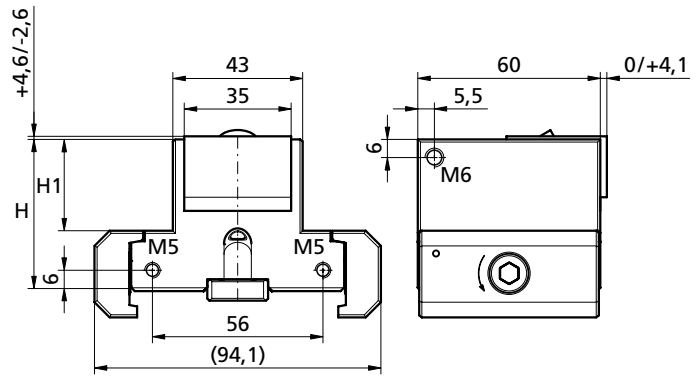
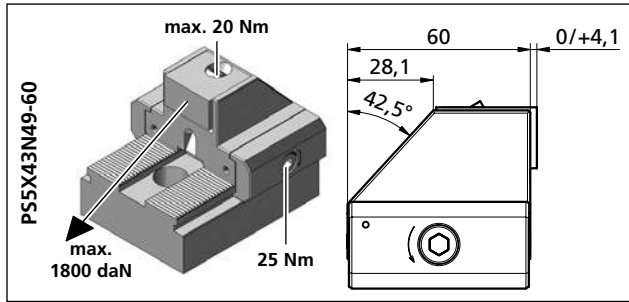
HM = Hartmetallbeschichtet / Carbide coated

PS1R/F43N49-60

PS1R/F43N62-60

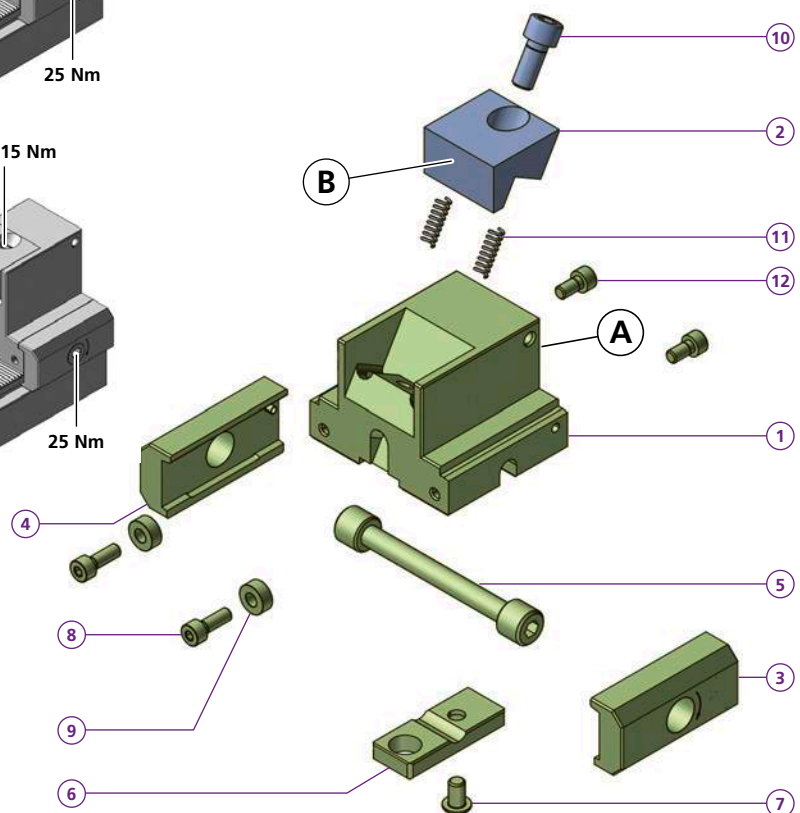
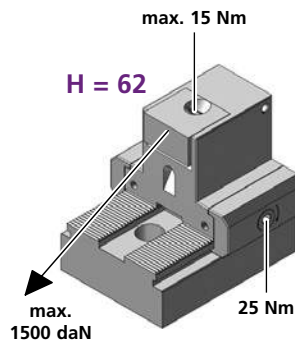
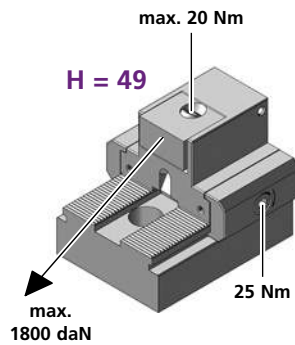
PS5X43N49-60


powerCLAMP



PS5X43N49-60	
1	1x TF140458
9	2x PCD005
8	2x M5X14ISO4762
kg	~1,3
PS1F43N49-60	
1	1x TF140456
PS1R43N49-60	
1	1x TF140457
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2049
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M8X20ISO4762
11	2x FED0618
12	2x M5X10ISO4762
H	= 49
H1	= 30
kg	~1,4

PS1F43N62-60	
1	1x TF140459
PS1R43N62-60	
1	1x TF140460
H	= 62
H1	= 43
kg	~1,7



Bestellbeispiel / Ordering example: 1x PS1R43N49-60 & 1x B61

Bestellbeispiel / Ordering example: 1x PS1R43N49-60 & 1x B61													
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B69	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	25	20	20	20
L	26	19	19	19	19	19	19	24	26	22	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9	9
o	12	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	*	56HRC	HV700 x0,2mm	HV700 x0,2mm
kg	~0,07	~0,12	~0,12	~0,12	~0,12	~0,12	~0,12	~0,14	~0,15	~0,15	~0,12	~0,18	~0,18

B69
M5X10ISO4762

FED 0628

B58

B60, B61, B62, B62HM

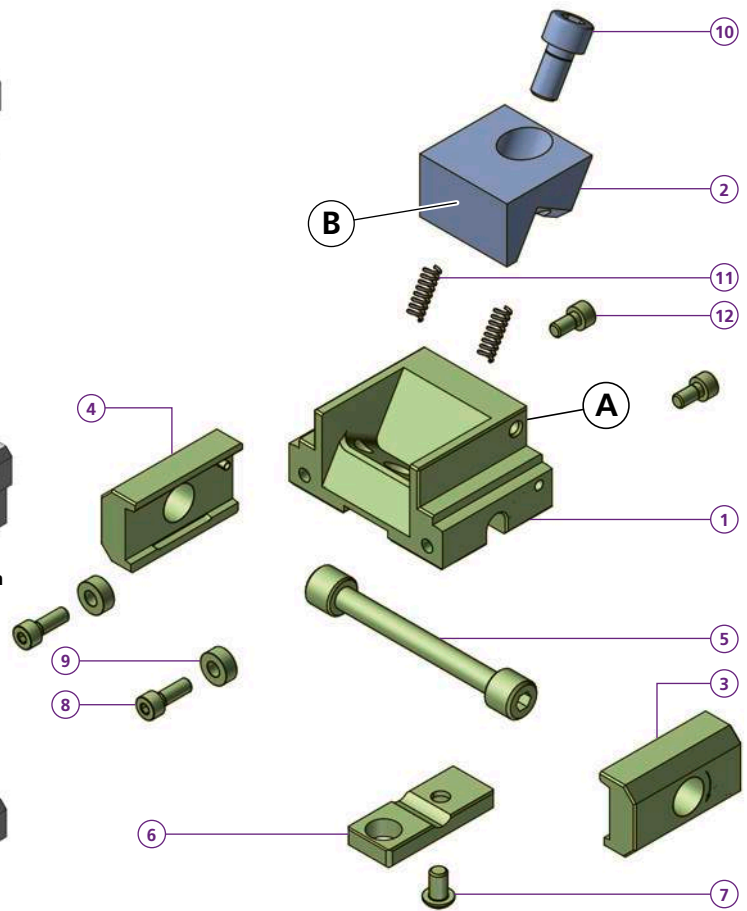
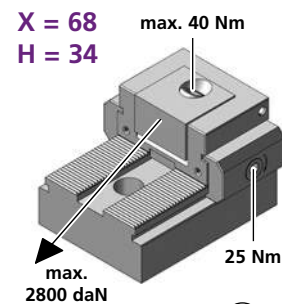
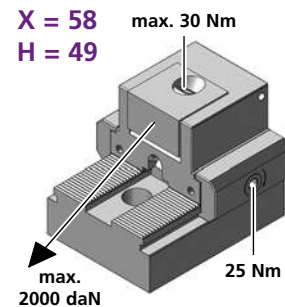
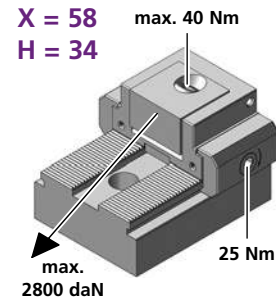
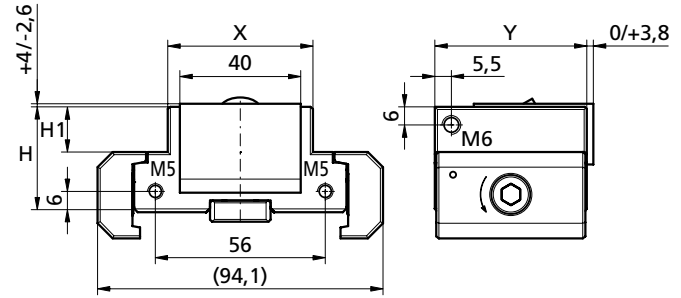
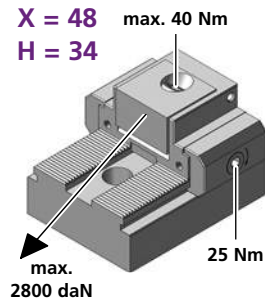
B65, B66, B67

B68

B77

B79F, B79R

Spannbacke mit CCPDR
Jaw with CCPDR

**PS1F48N34-80**

① 1x TF140461

PS1R48N34-80

① 1x TF140462

② 1x

③ 1x PCSP50R

④ 1x PCSP50L

⑤ 1x PCS14

⑥ 1x PCGU2049

⑦ 1x M6X8ISO7380

⑧ 2x M5X14ISO4762

⑨ 2x PCD005

⑩ 1x M10X25ISO4762

⑪ 2x FED0618

⑫ 2x M5X10ISO4762

X = 48

H = 34

H1 = 15

Y = 50

kg ~0,9

PS1F58N34-80

① 1x TF140463

PS1R58N34-80

① 1x TF140464

X = 58

H = 34

H1 = 15

Y = 50

kg ~0,9

PS1R58N49-80

① 1x TK120129

③ 1x PCSP60R

④ 1x PCSP60L

X = 58

H = 49

H1 = 30

Y = 60

kg ~1,6

PS1F68N34-80

① 1x TF140465

PS1R68N34-80

① 1x TF140466

X = 68

H = 34

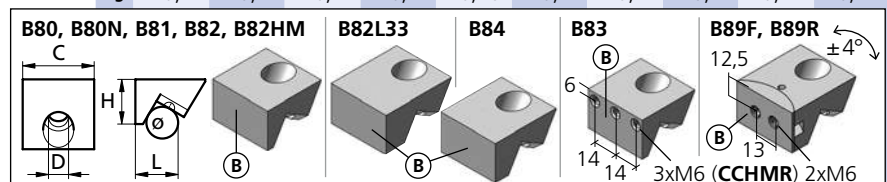
H1 = 15

Y = 50

kg ~1,0

Bestellbeispiel / Ordering example: 1x **PS1F68N34-80** & 1x **B82HM**

	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
e	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2	~0,2	~0,2	~0,28	~0,2	~0,2	~0,2	~0,24	~0,24



* = weicher Stahl / soft steel

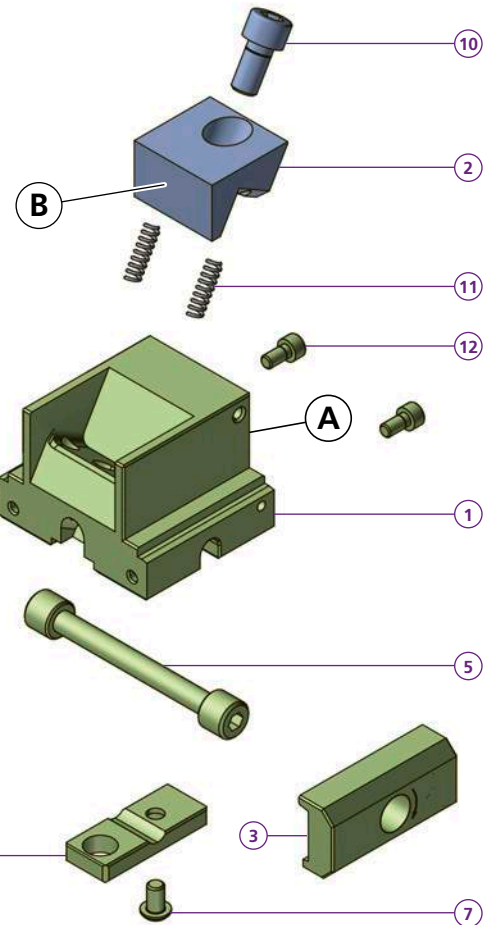
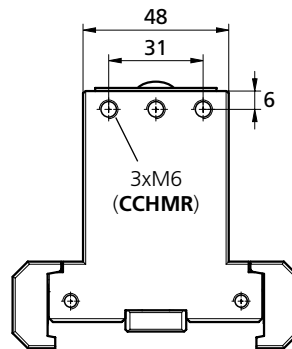
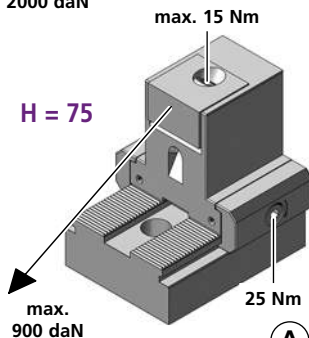
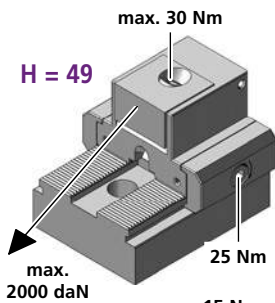
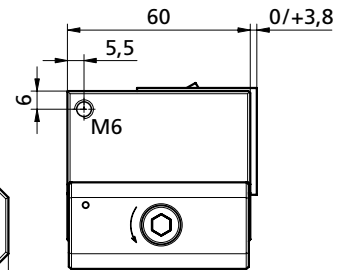
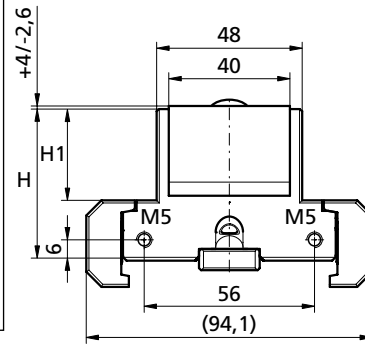
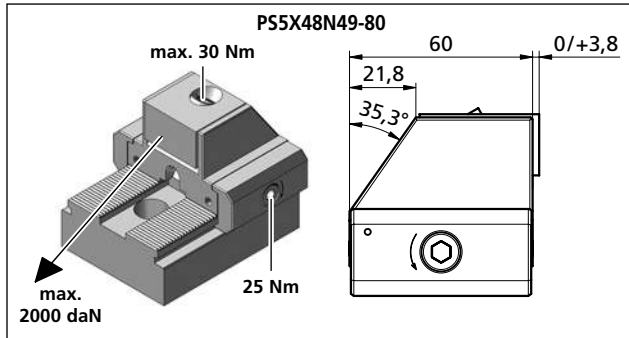
HM = Hartmetallbeschichtet / Carbide coated

PS1R/F48N49-80

PS1R48N75-80

PS5X48N49-80


powerCLAMP

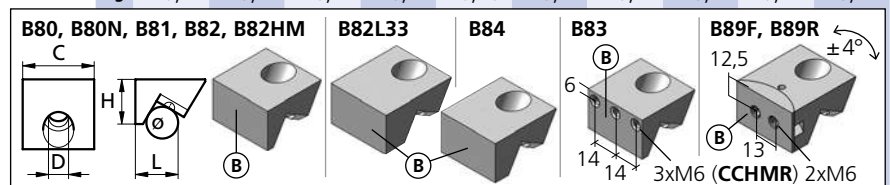


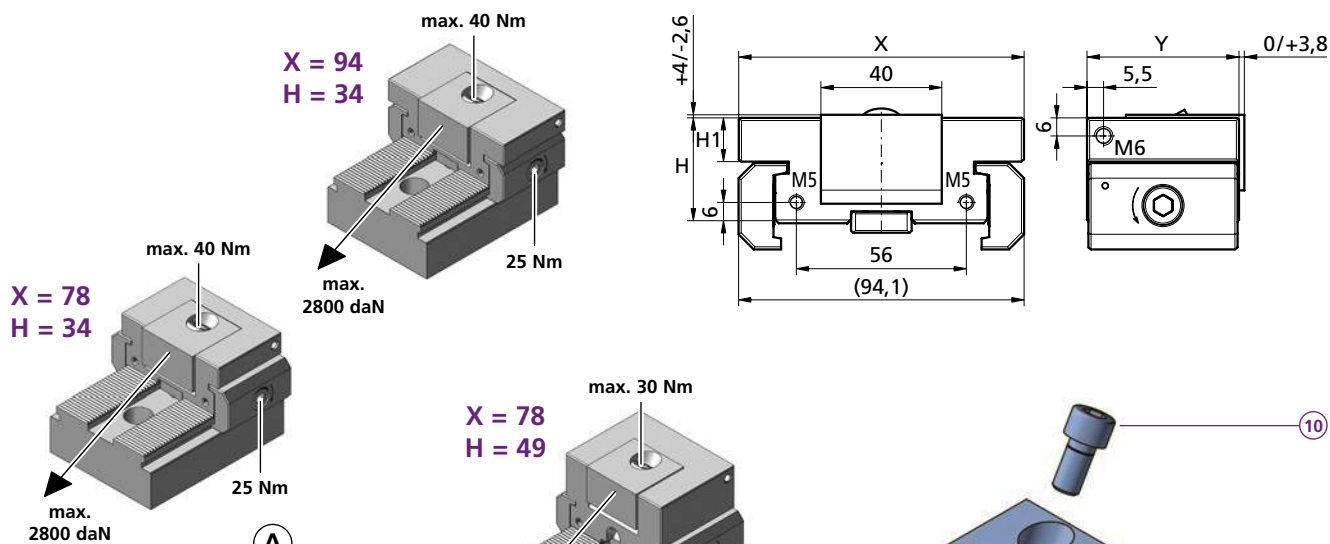
PS5X48N49-80	
1	1x TF140469
9	2x PCD005
8	2x M5X14ISO4762
kg	~1,3
PS1F48N49-80	
1	1x TF140467
PS1R48N49-80	
1	1x TF140468
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2049
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M10X25ISO4762
11	2x FED0618
12	2x M5X10ISO4762
H	= 49
H1	= 30
kg	~1,4

PS1R48N75-80	
1	1x TF140471
H	= 75
H1	= 56
kg	~2,0

Bestellbeispiel / Ordering example: 1x PS1F48N49-80 & 1x B80

	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
ø	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2	~0,2	~0,2	~0,28	~0,2	~0,2	~0,2	~0,24	~0,24

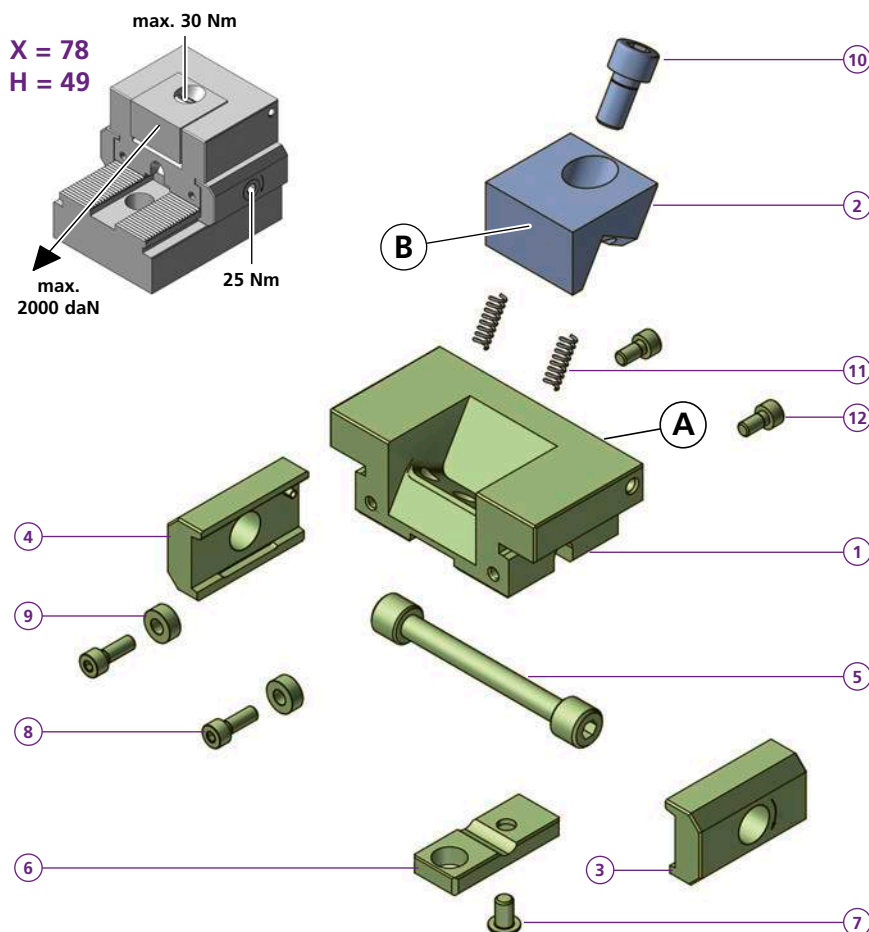




PS1F78N34-80	
1	1x TF140472
PS1R78N34-80	
1	1x TF140473
2	1x
3	1x PCSP50R
4	1x PCSP50L
5	1x PCS14
6	1x PCGU2049
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M10X25ISO4762
11	2x FED0618
12	2x M5X10ISO4762
X	= 48
H	= 34
H1	= 15
Y	= 50
kg	~1,1

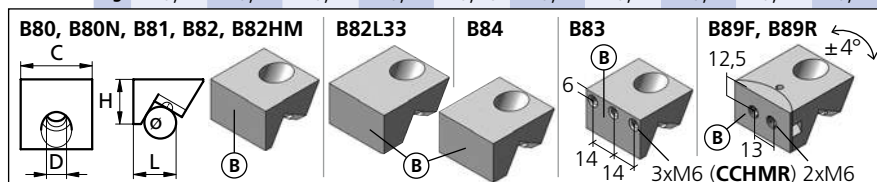
PS1F94N34-80	
1	1x TF140476
PS1R94N34-80	
1	1x TF140477
X	= 94
H	= 34
H1	= 15
Y	= 50
kg	~1,1

PS1F78N49-80	
1	1x TF140474
PS1R78N49-80	
1	1x TF140475
3	1x PCSP60R
4	1x PCSP60L
X	= 78
H	= 49
H1	= 30
Y	= 60
kg	~1,8



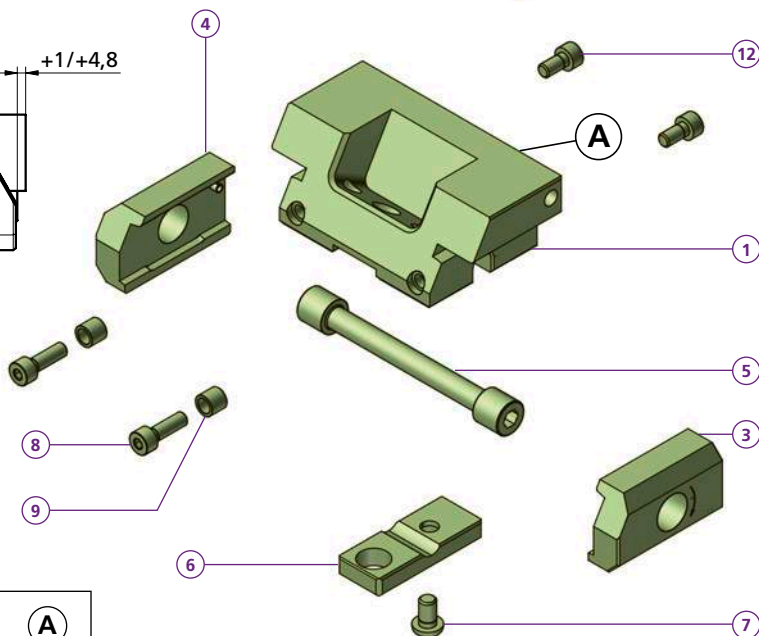
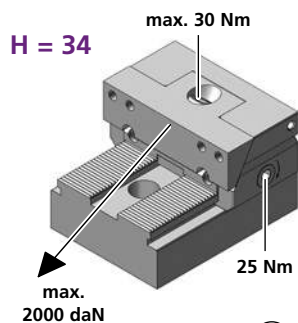
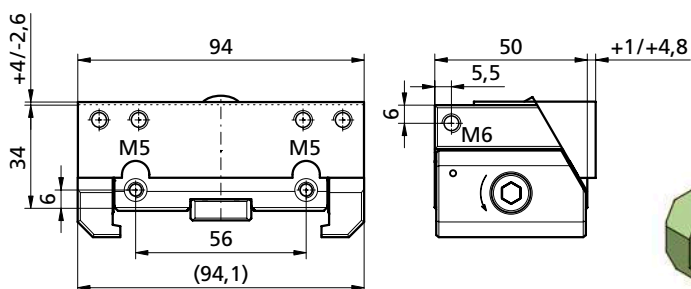
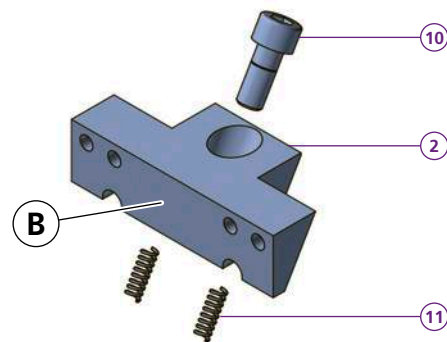
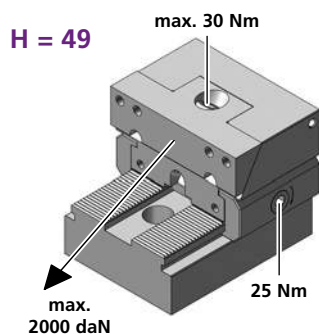
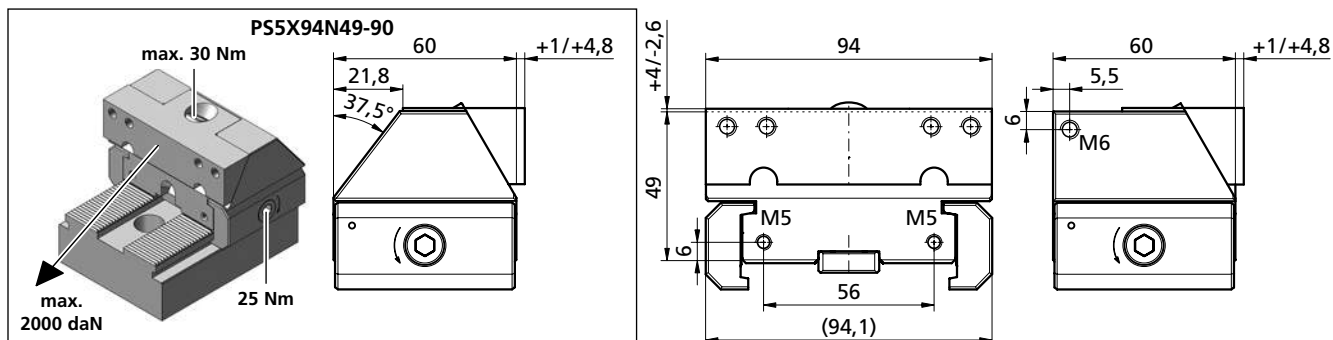
Bestellbeispiel / Ordering example: 1x PS1R94N34-80 & 1x B80

	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
e	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2	~0,2	~0,2	~0,28	~0,2	~0,2	~0,2	~0,24	~0,24



* = weicher Stahl / soft steel

HM = Hartmetallbeschichtet / Carbide coated



max.
2000 daN

25 Nm

PS1F94N34-90

1	1x	TF140478
PS1R94N34-90		
1	1x	TF140479
2	1x	
3	1x	PCSP50RF
4	1x	PCSP50LF
5	1x	PCS14
6	1x	PCGU2049
7	1x	M6X8ISO7380
8	2x	M5X16ISO4762
9	2x	PCD008
10	1x	M10X25ISO4762
11	2x	FED0618
12	2x	M5X10ISO4762

H = 34
kg ~1,0

PS5X94N49-90

1	1x	TF140482
3	1x	PCSP60R
4	1x	PCSP60L
9	2x	PCD005
8	2x	M5X14ISO4762

kg ~1,8

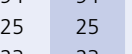
PS1F94N49-90

1	1x	TF140480
PS1R94N49-90		
1	1x	TF140481
2	1x	
3	1x	PCSP60R
4	1x	PCSP60L
8	2x	M5X14ISO4762
9	2x	PCD005

H = 49
kg ~2,0

Bestellbeispiel / Ordering example:
 1x **PS1F94N34-90** & 1x **B91**

	B90	B91	B92	B93	B94
C	94	94	94	94	94
H	25	25	25	25	25
L	23	23	23	23	40
D	11	11	11	11	11
ø	15	15	15	15	15
i	HV700 x0,2mm	HV700 x0,2mm	*	HV700 x0,2mm	*
kg	~0,33	~0,33	~0,33	~0,33	~0,64



B90, B91, B92, B93

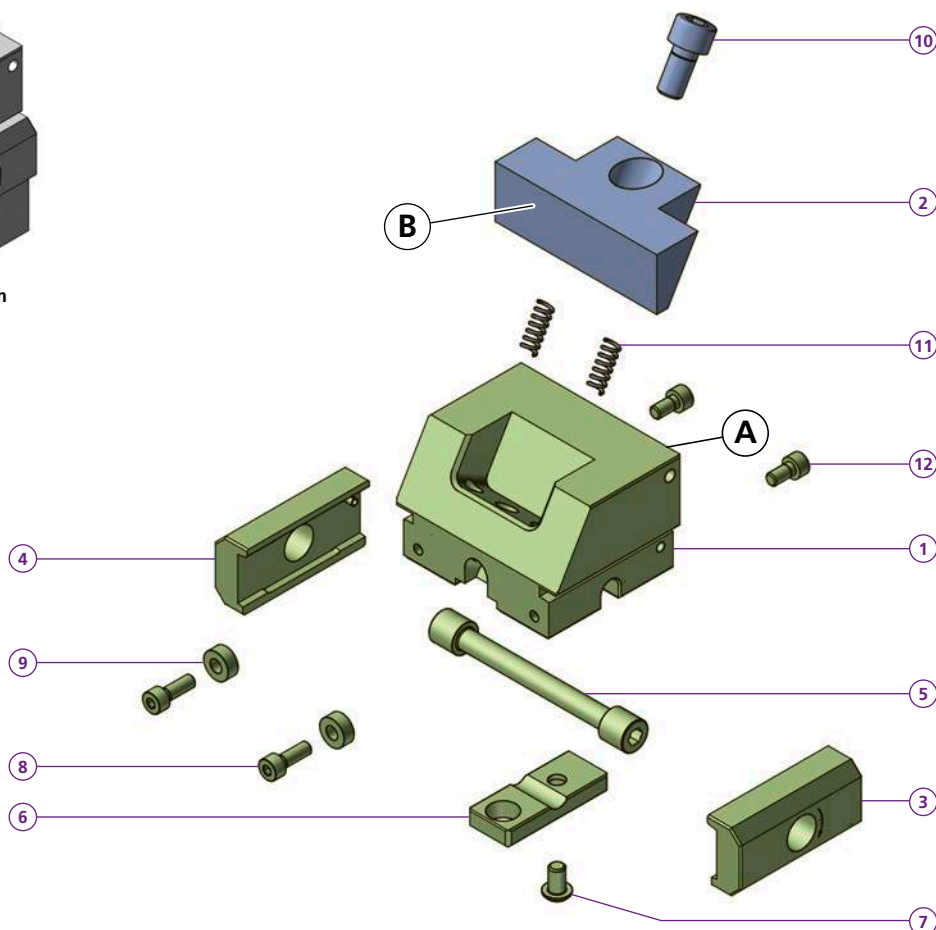
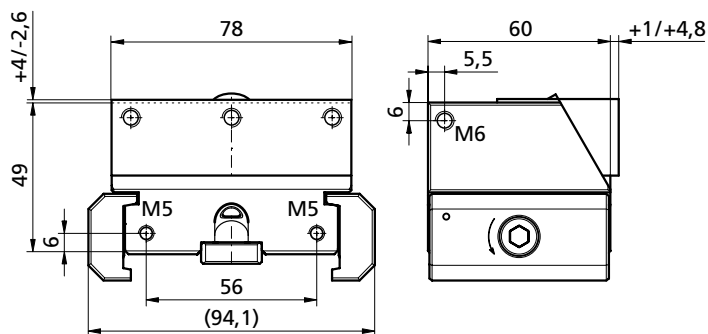
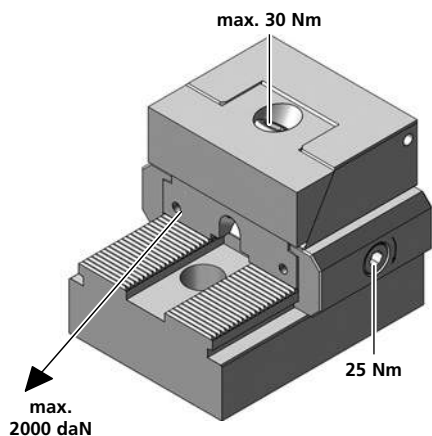


B94



PS1R/F78N49-90

powerCLAMP



Bestellbeispiel / Ordering example:
1x PS1F78N49-90 & 1x B90F78

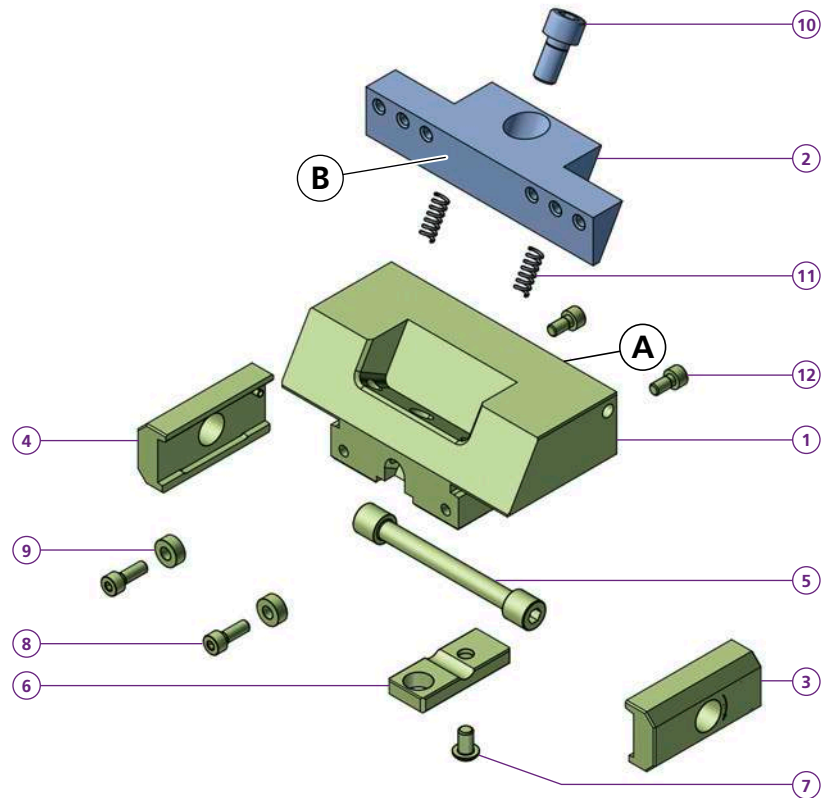
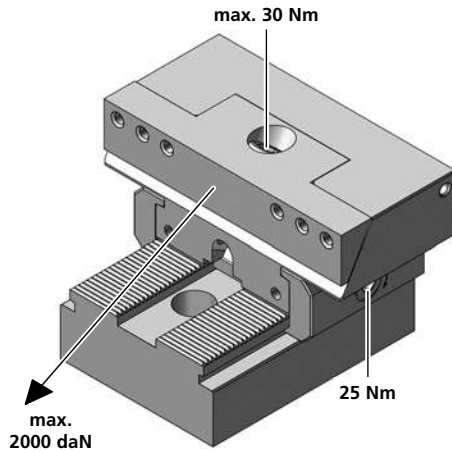
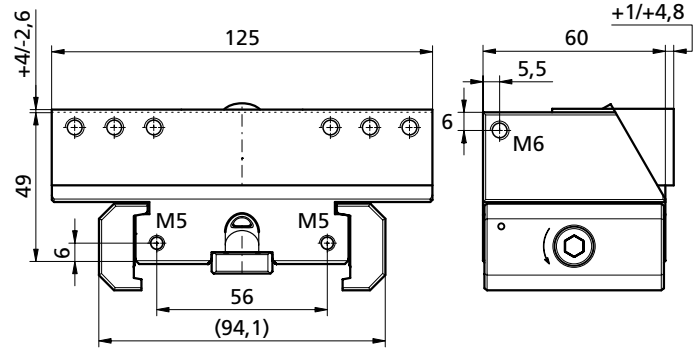
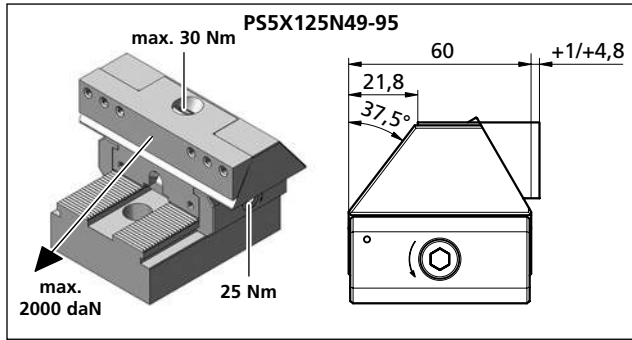
PS1F78N49-90	
1	1x TH160490
PS1R78N49-90	
1	1x TH160490
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2049
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M10X25ISO4762
11	2x FED0618
12	2x M5X10ISO4762
kg	~1,8

	B90F78	B90W78	B90R78
C	78	78	78
H	25	25	25
L	23	28	23
D	11	11	11
e	15	15	15
i	HV700	*	HV700
	x0,2mm		x0,2mm
kg	~0,3	~0,37	~0,3

B90F78, B90W78	

* = weicher Stahl / soft steel

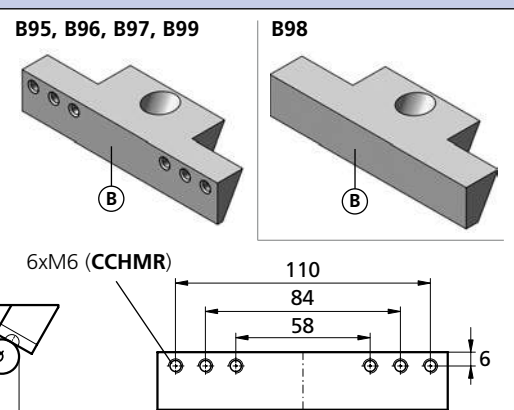
Separat bestellen / Order separately



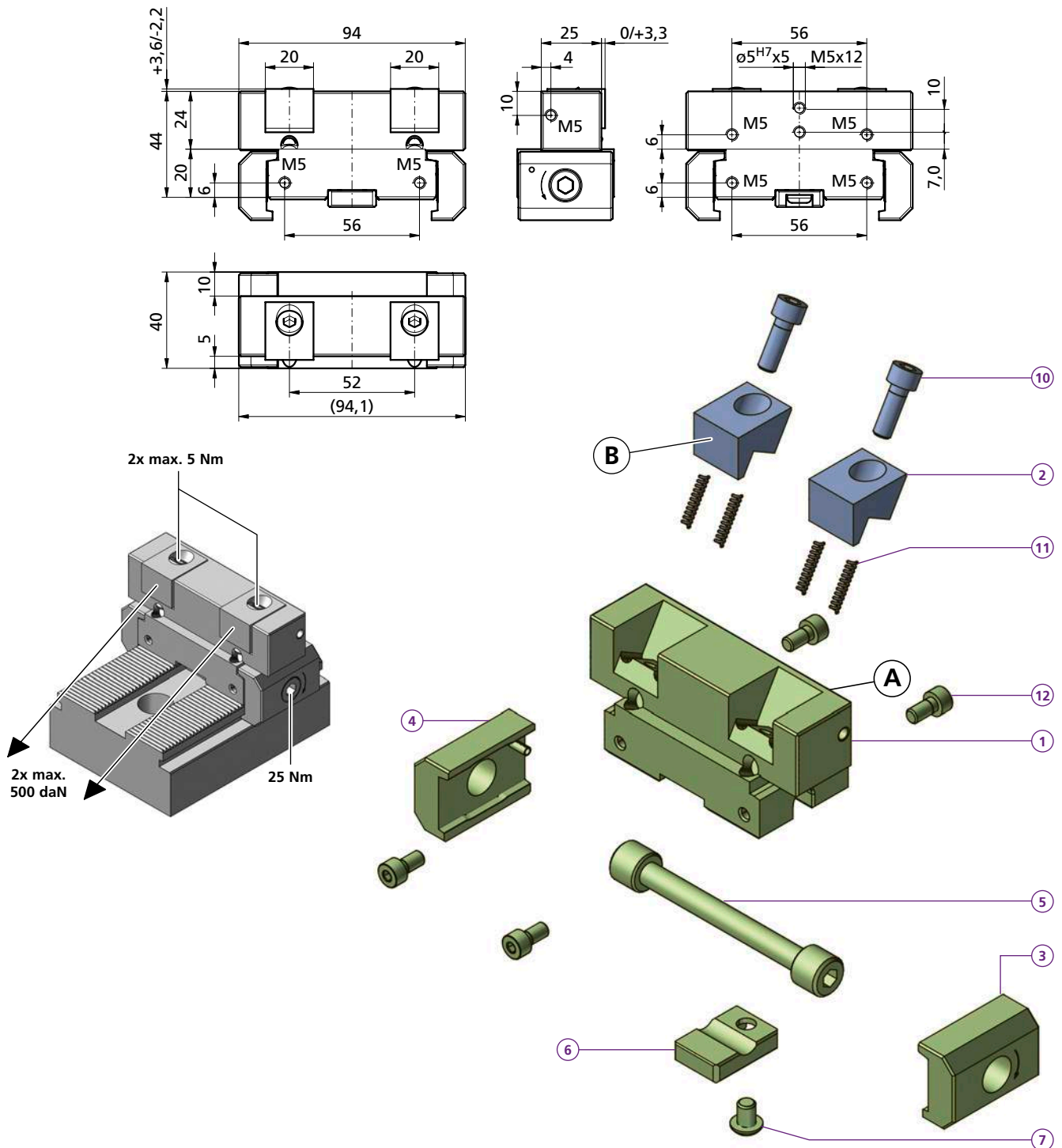
PS5X125N49-95	
1	1x TF140485
9	2x PCD005
8	2x M5X14ISO4762
kg	~2,0
PS1F125N49-95	
1	1x TF140483
PS1R125N49-95	
1	1x TF140484
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2049
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M10X25ISO4762
11	2x FED0618
12	2x M5X10ISO4762
kg	~2,3

	B95	B96	B97	B98	B99
C	125	125	125	125	125
H	25	25	25	25	25
L	23	23	23	30	23
D	11	11	11	11	11
ø	15	15	15	15	15
i	HV700	HV700	*	*	HV700
	x0,2mm	x0,2mm			x0,2mm
kg	~0,46	~0,45	~0,46	~0,63	~0,45

Bestellbeispiel / Ordering example: 1x PS5X125N49-95 & 1x B95

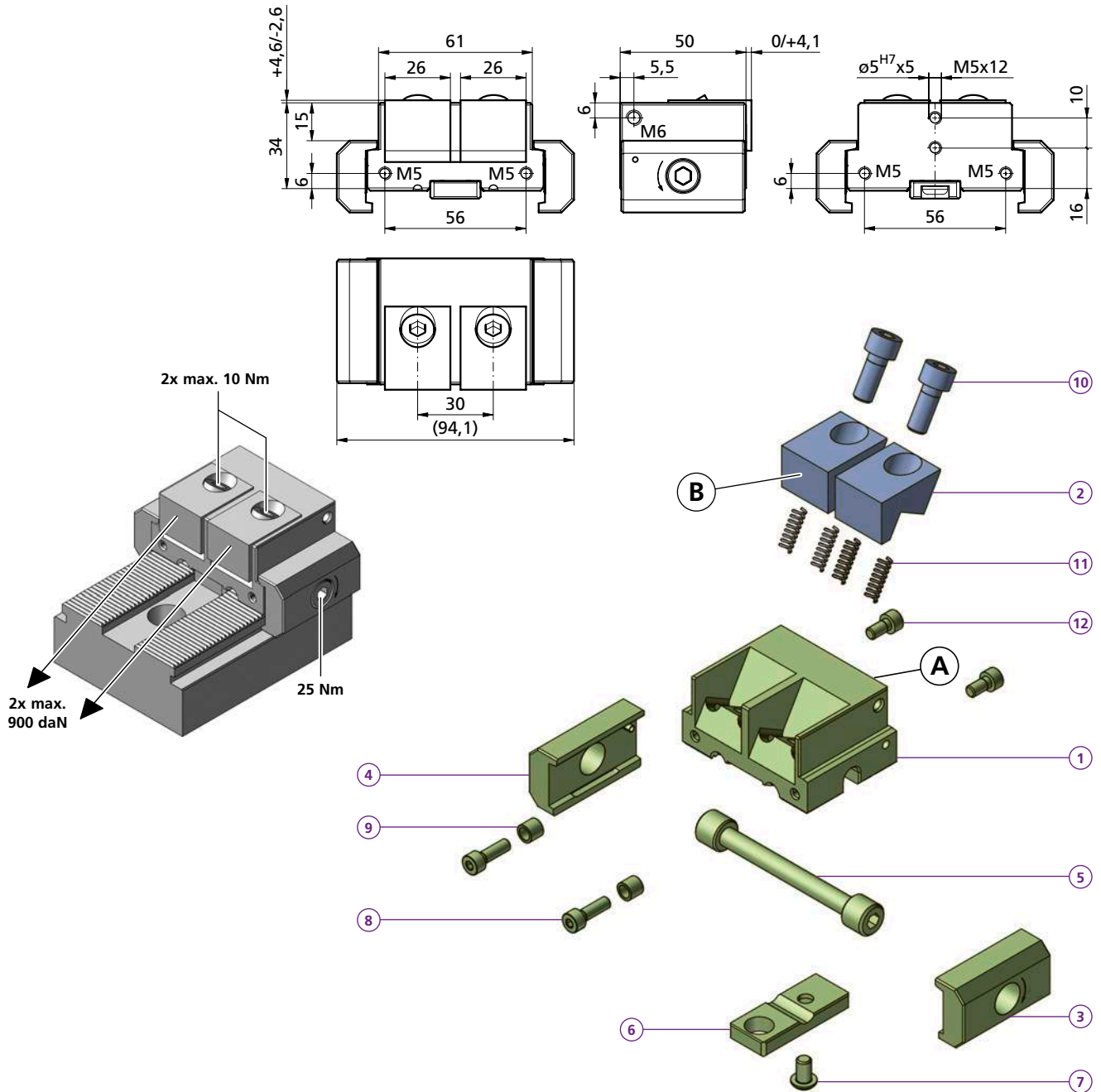


Separat bestellen / Order separately



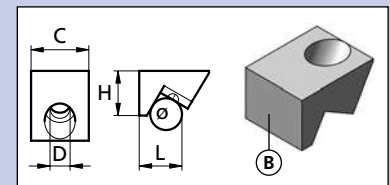
PS2G94N44-13		Bestellbeispiel / Ordering example: 1x PS2G94N44-13 & 2x B14			
		B13	B14	B15	B16
1x TF140486					
2x					
1x PCSP40R					
1x PCSP40L					
1x PCS14					
1x PCGU2030					
1x M6X8ISO7380					
2x M6X16ISO4762					
4x FED0318					
4x M5X10ISO4762					
kg	~1,0				

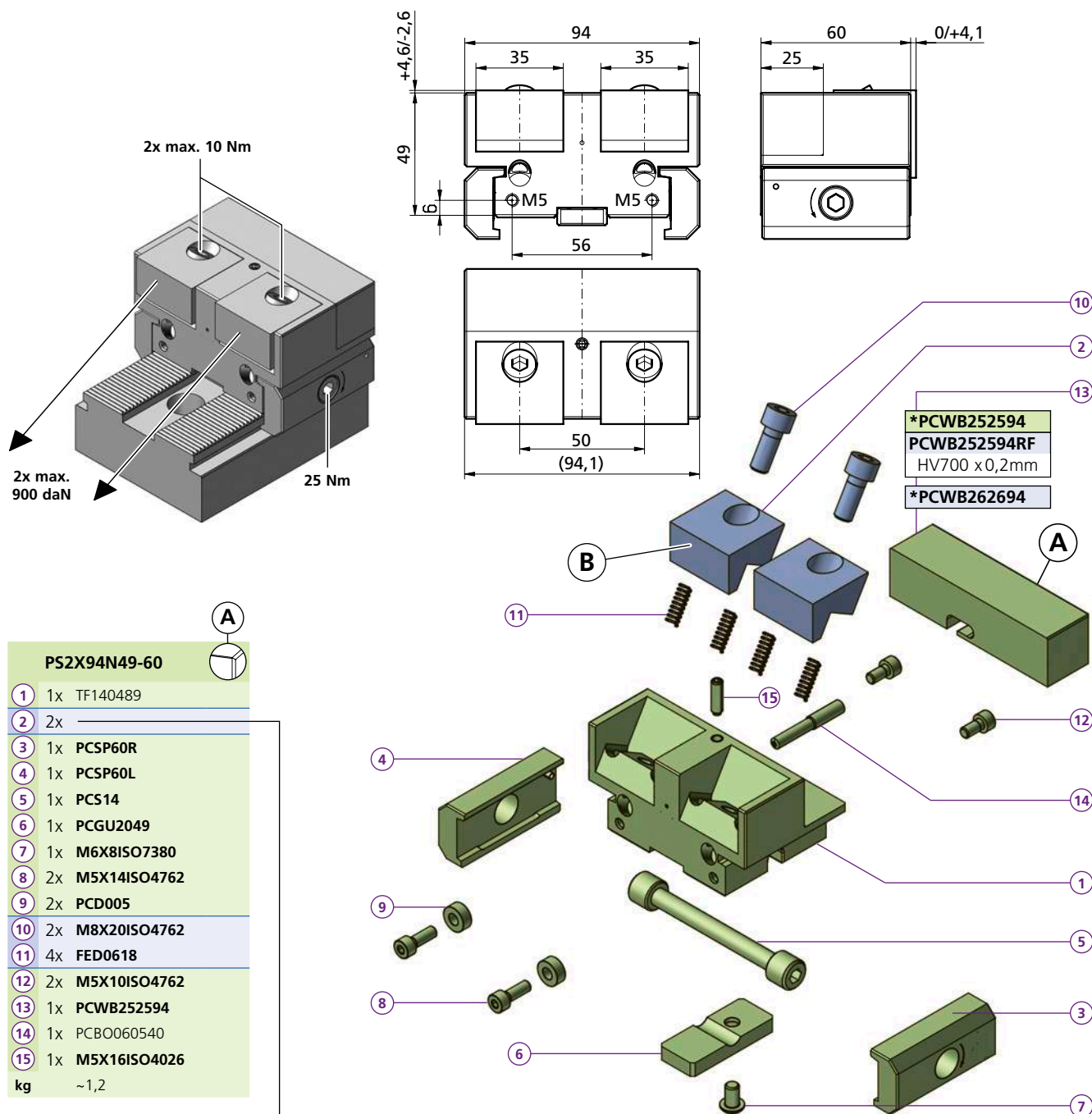
* = weicher *Stahl* / *soft steel*



PS2F61N34-45	
1	1x TF140487
PS2R61N34-45	
1	1x TF140488
2	2x
3	1x PCSP50R
4	1x PCSP50L
5	1x PCS14
6	1x PCGU2049
7	1x M6X8ISO7380
8	2x M5X16ISO4762
9	2x PCD008
10	2x M8X20ISO4762
11	4x FED0618
12	2x M5X10ISO4762
kg	~1,0

Bestellbeispiel / Ordering example: 1x PS2R61N34-45 & 2x B47HM				
	B45	B46	B47	B47HM
C	26	26	26	26
H	20	20	20	20
L	19	19	19,1	19,1
D	9	9	9	9
ø	12	12	12	12
i	HV700	HV700	*	HM
	x0,2mm	x0,2mm		
kg	~0,1	~0,1	~0,1	~0,1



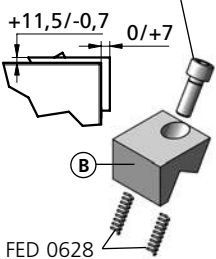


B

Bestellbeispiel / Ordering example: 1x **PS2X94N49-60** & 2x **B58**

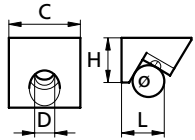
													
B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B69	B77	B79F	B79R	
C	35	35	35	35	35	35	35	35	35	35	35	35	
H	20	20	20	20	20	20	20	20	20	25	20	20	
L	26	19	19	19	19	19	19	24	26	22	22	25	
D	9	9	9	9	9	9	9	9	9	9	9	9	
ø	12	12	12	12	12	12	12	12	12	12	12	12	
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	*	56HRC	HV700 x0,2mm	HV700 x0,2mm
kg	~0,07	~0,12	~0,12	~0,12	~0,12	~0,12	~0,12	~0,14	~0,15	~0,15	~0,12	~0,18	~0,18

B69
M5X10ISO4762

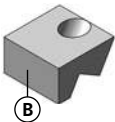


B

FED 0628

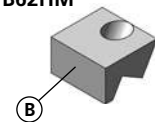


B58



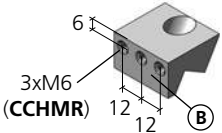
B

B60, B61, B62, B62HM



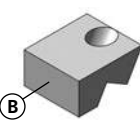
B

B65, B66, B67



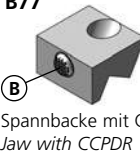
B

B68



B

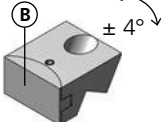
B77



B

± 9°

B79F, B79R



B

± 4°

Spannbacke mit CCPDR
Jaw with CCPDR

PS1P48L34-105

PS1P48L49-105

PS1PF48L49-105

PS1PF48L34-105

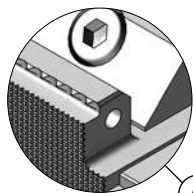
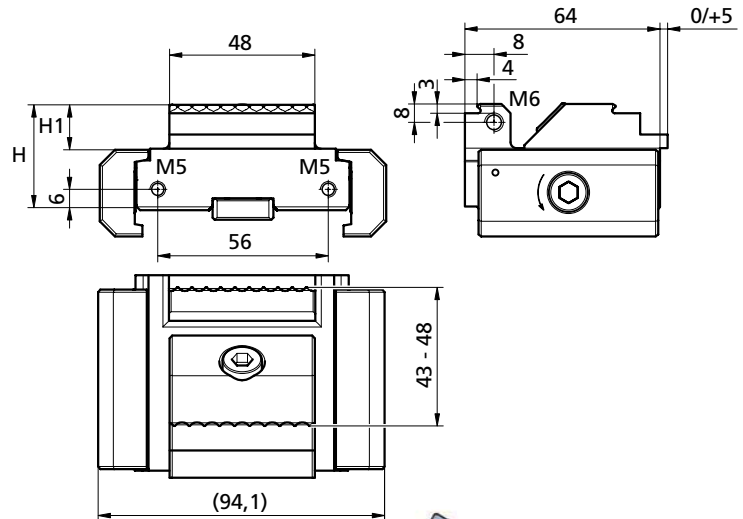
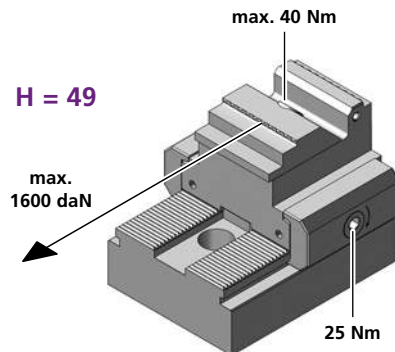
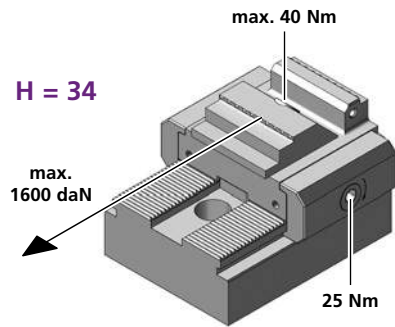
Linear



prägen
stamping

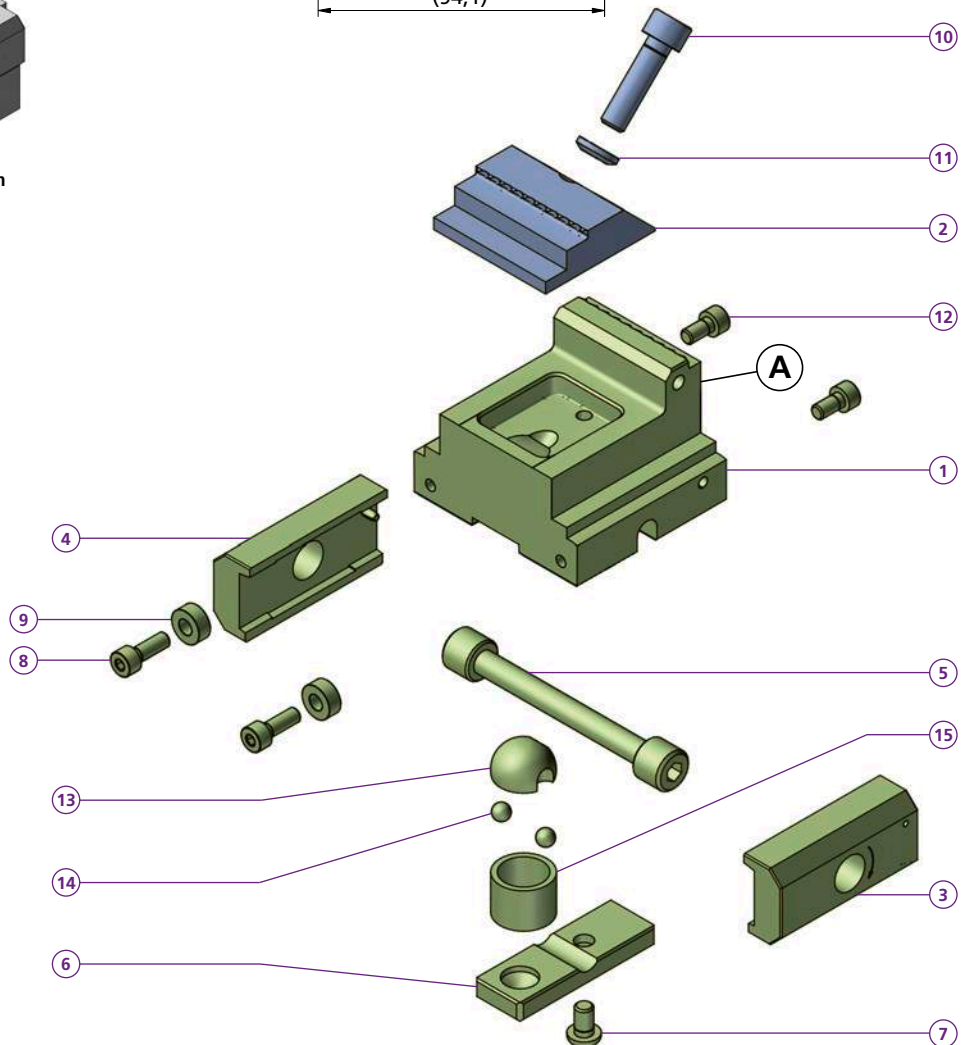


powerCLAMP



PS1P48L34-105

- 1 1x TW100098-01
- 2 1x
- 3 1x PCSP60R
- 4 1x PCSP60L
- 5 1x PCS14
- 6 1x PCGU2059
- 7 1x M6X8ISO7380
- 8 2x M5X14ISO4762
- 9 2x PCD005
- 10 1x M8X28ISO4762
- 11 1x PCUSR16
- 12 2x M5X10ISO4762
- 13 1x PCKMR45M8
- 14 2x D=6 DIN 5401
- H = 34
- H1 = 15
- kg ~1,0



p. 84, 85

PS1PF48L34-105

- 1 1x TK140780
- H = 49
- H1 = 30
- kg ~1,0

PS1P48L49-105

- 1 1x TK120011
- 15 1x PCD20L15
- H = 49
- H1 = 30
- kg ~1,4

PS1PF48L49-105

- 1 1x TK140781
- 15 1x PCD20L15
- H = 49
- H1 = 30
- kg ~1,4

Bestellbeispiel / Ordering example:
1x PS1P48L34-105 & 1x B115

Drehmoment Torque		Spannkraft Workholding force			
Nm	(lb-ft)	~daN	~(lb)	~t	
10	7,4	= 400	880	0,4	
20	14,8	= 800	1'760	0,8	
30	22,2	= 1'200	2'650	1,2	
40	29,6	= 1'600	3'530	1,6	

Separat bestellen / Order separately

PS1P94L34-105

PS1P694L34-105

PS1P94L49-105

PS1PF94L49-105

PS1PF94L34-105

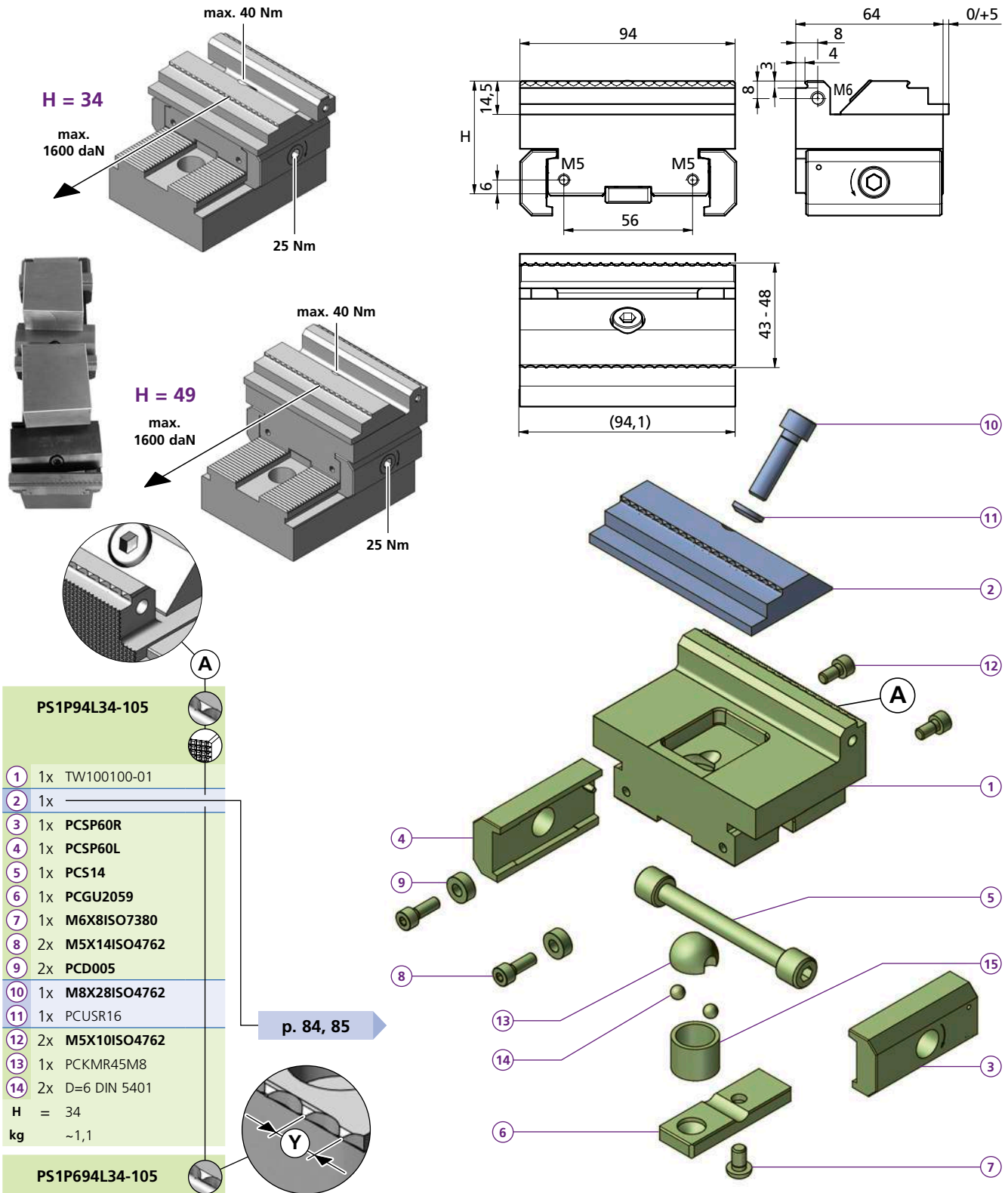
Linear



prägen
stamping



powerCLAMP



PS1P94L34-105

- 1 1x TW100100-01
- 2 1x
- 3 1x PCSP60R
- 4 1x PCSP60L
- 5 1x PCS14
- 6 1x PCGU2059
- 7 1x M6X8ISO7380
- 8 2x M5X14ISO4762
- 9 2x PCD005
- 10 1x M8X28ISO4762
- 11 1x PCUSR16
- 12 2x M5X10ISO4762
- 13 1x PCKMR45M8
- 14 2x D=6 DIN 5401
- H = 34
- kg ~1,1

PS1P694L34-105

- 1 1x TW100100-02
- Y 6,0 mm
- kg ~1,1

PS1PF94L34-105

- 1 1x TK140782
- H = 49
- kg ~1,1

PS1P94L49-105

- 1 1x TK120857
- 15 1x PCD20L15
- H = 49
- kg ~1,8

PS1PF94L49-105

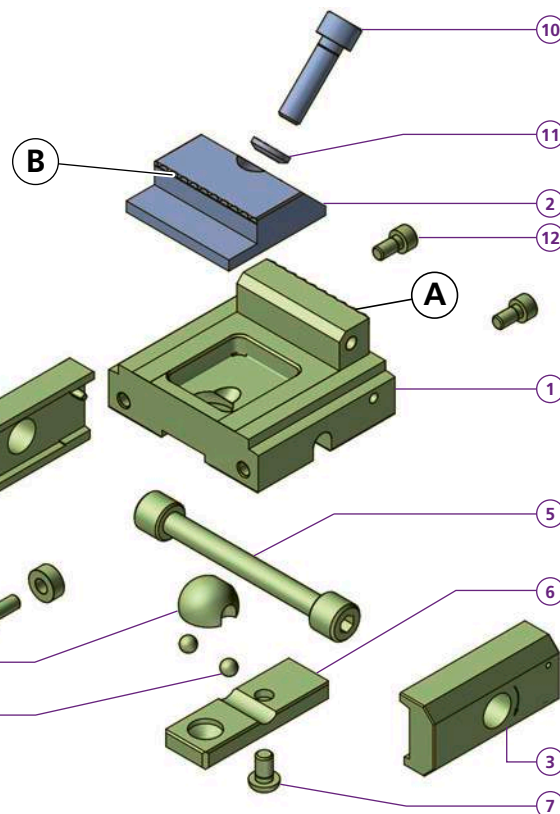
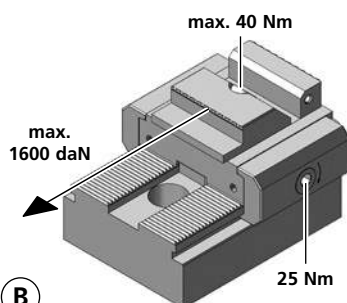
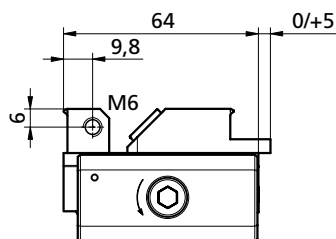
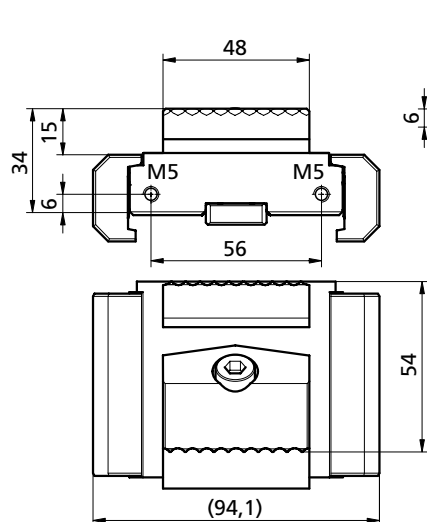
- 1 1x TK140783
- 15 1x PCD20L15
- H = 49
- kg ~1,8

Bestellbeispiel / Ordering example:
1x PS1P94L34-105 & 1x B120

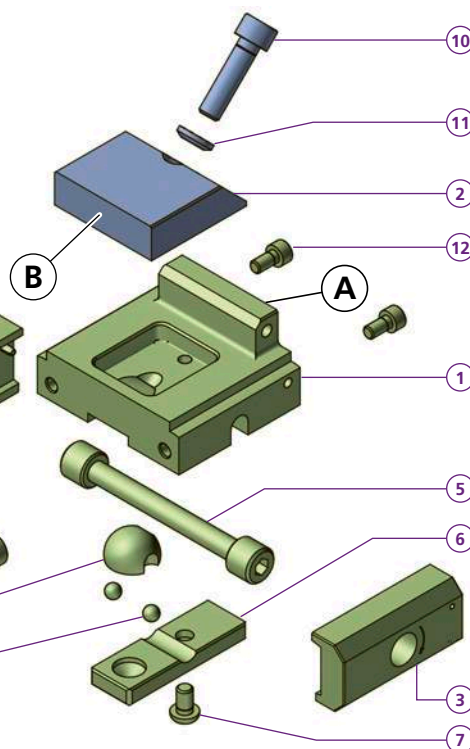
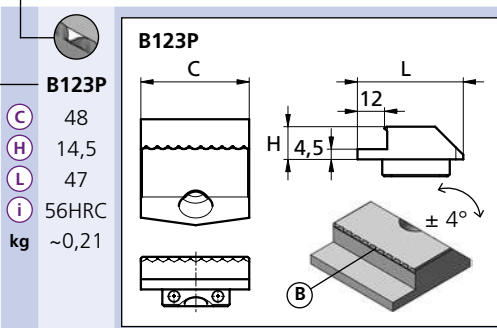
Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1'760	0,8
30	22,2	= 1'200	2'650	1,2
40	29,6	= 1'600	3'530	1,6

Separat bestellen / Order separately

PS1PV48L34-105
PS1R/F48L34-105

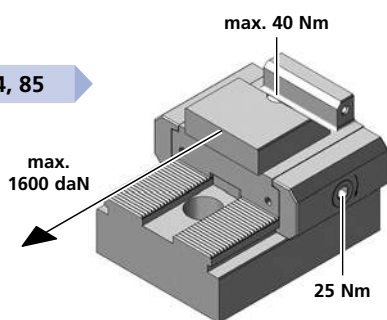


PS1PV48L34-105	
1	1x TK140762
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2059
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M8X28ISO4762
11	1x PCUSR16
12	2x M5X10ISO4762
13	1x PCKMR45M8
14	2x D=6 DIN 5401
kg	~1,0



PS1R48L34-105	
1	1x TF140573
PS1F48L34-105	
1	1x TF140572
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2059
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M8X30ISO4762
11	1x PCUSR14
12	2x M5X10ISO4762
13	1x PCKMR45M8
14	2x D=6 DIN 5401
kg	~1,0

p. 84, 85



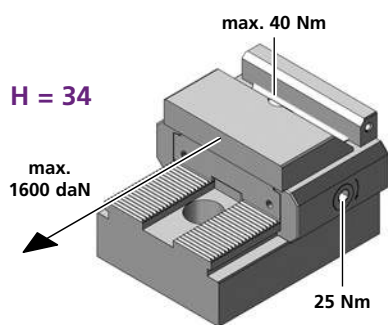
Bestellbeispiel / Ordering example:
1x PS1R48L34-105 & 1x B123P

Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1'760	0,8
30	22,2	= 1'200	2'650	1,2
40	29,6	= 1'600	3'530	1,6

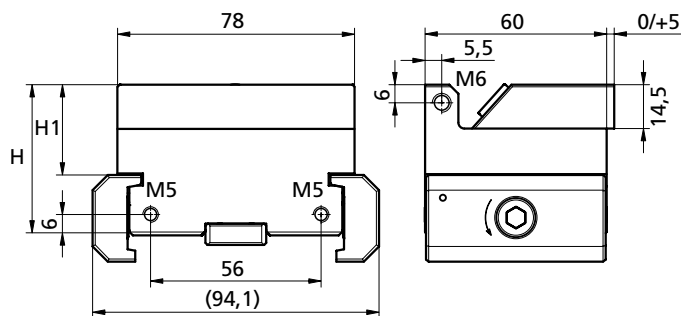
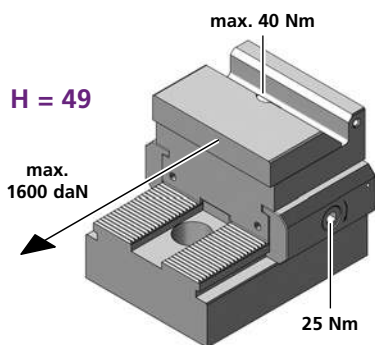
Separat bestellen / Order separately



H = 34



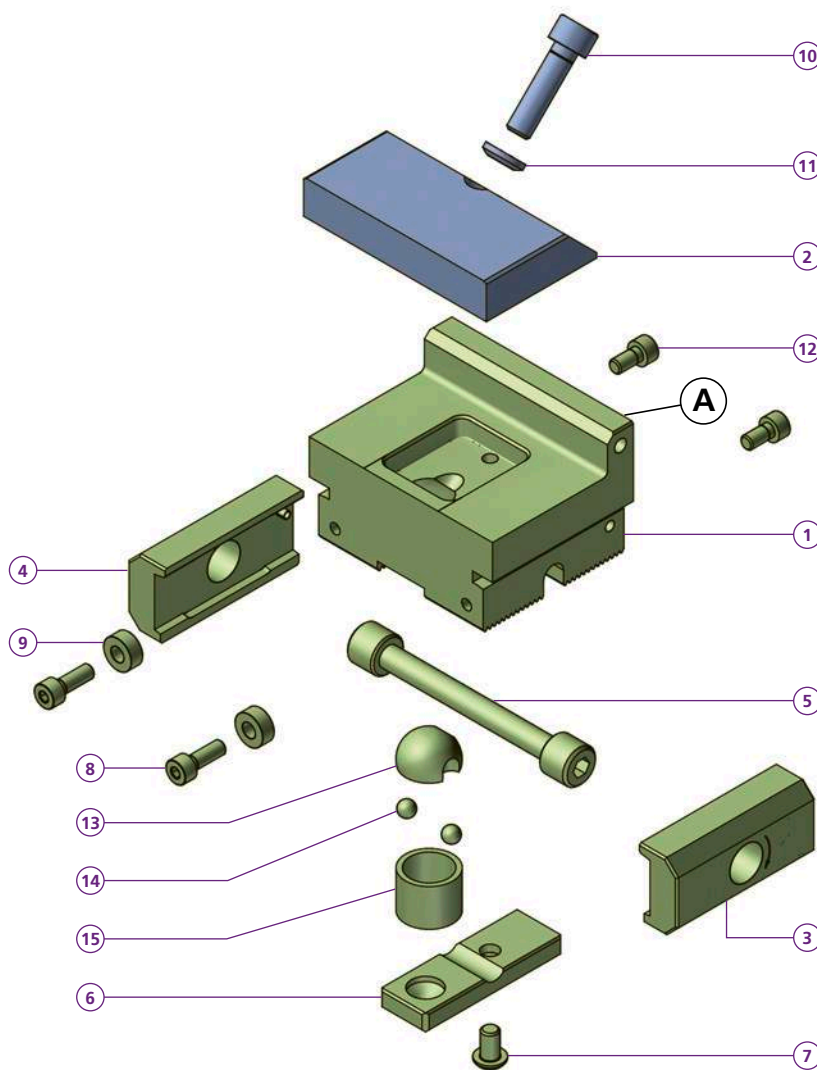
H = 49



PS1R78L34-105	
1	1x TF140575
PS1F78L34-105	
1	1x TF140574
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2059
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M8X30ISO4762
11	1x PCUSR14
12	2x M5X10ISO4762
13	1x PCKMR45M8
14	2x D=6 DIN 5401
H	= 34
H1	= 15
kg	~1,0

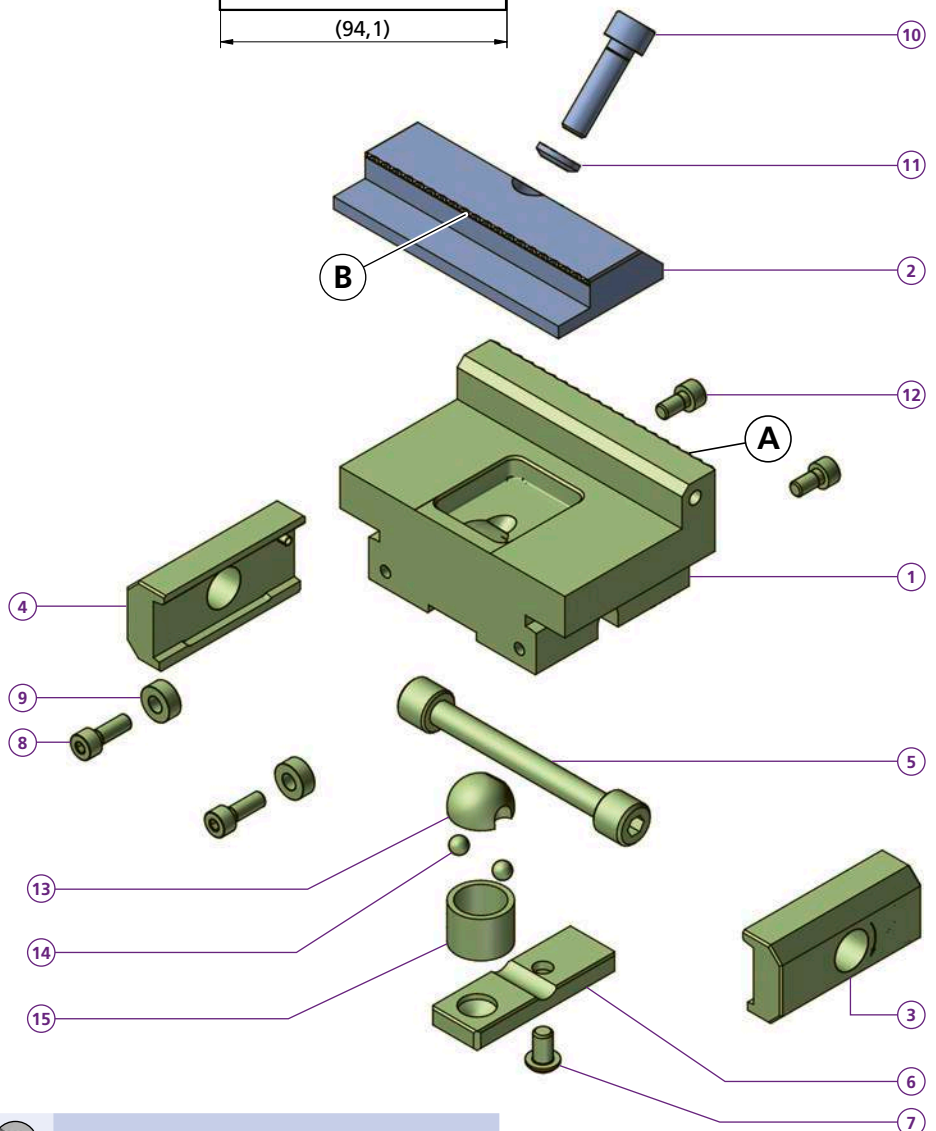
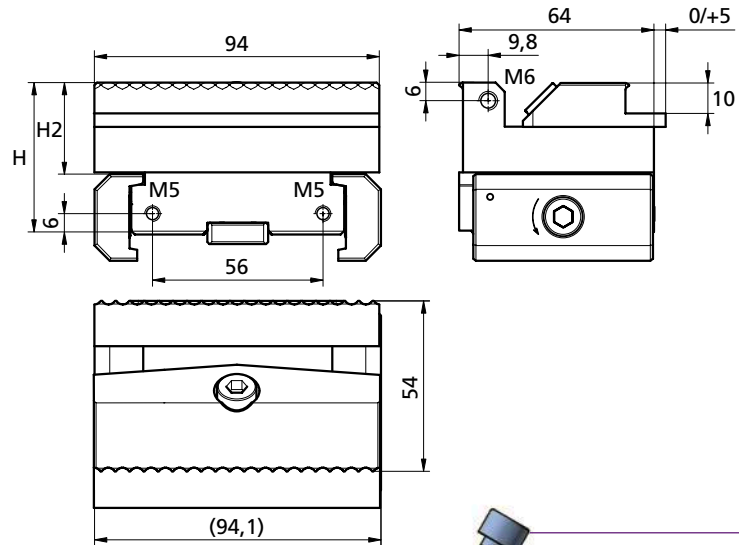
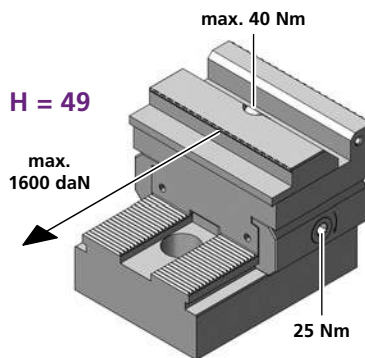
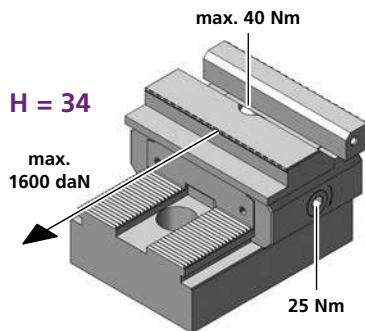
p. 84, 85

PS1R78L49-105	
1	1x TK110399
15	2x PCD20L15
PS1F78L49-105	
1	1x TK110400
15	2x PCD20L15
H	= 49
H1	= 30
kg	~1,5



Bestellbeispiel / Ordering example:
1x PS1R48L34-105 & 1x B105

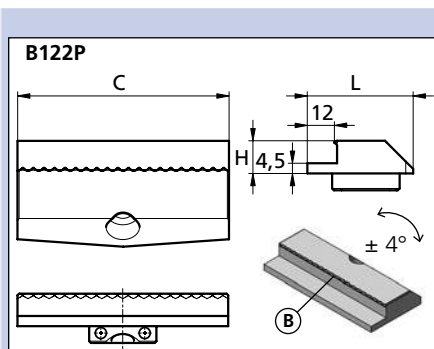
Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1'760	0,8
30	22,2	= 1'200	2'650	1,2
40	29,6	= 1'600	3'530	1,6



PS1PV94L34-105	
1	1x TK120230
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2059
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M8X28ISO4762
11	1x PCUSR16
12	2x M5X10ISO4762
13	1x PCKMR45M8
14	2x D=6 DIN 5401
H	= 34
H1	= 15
kg	~1,1

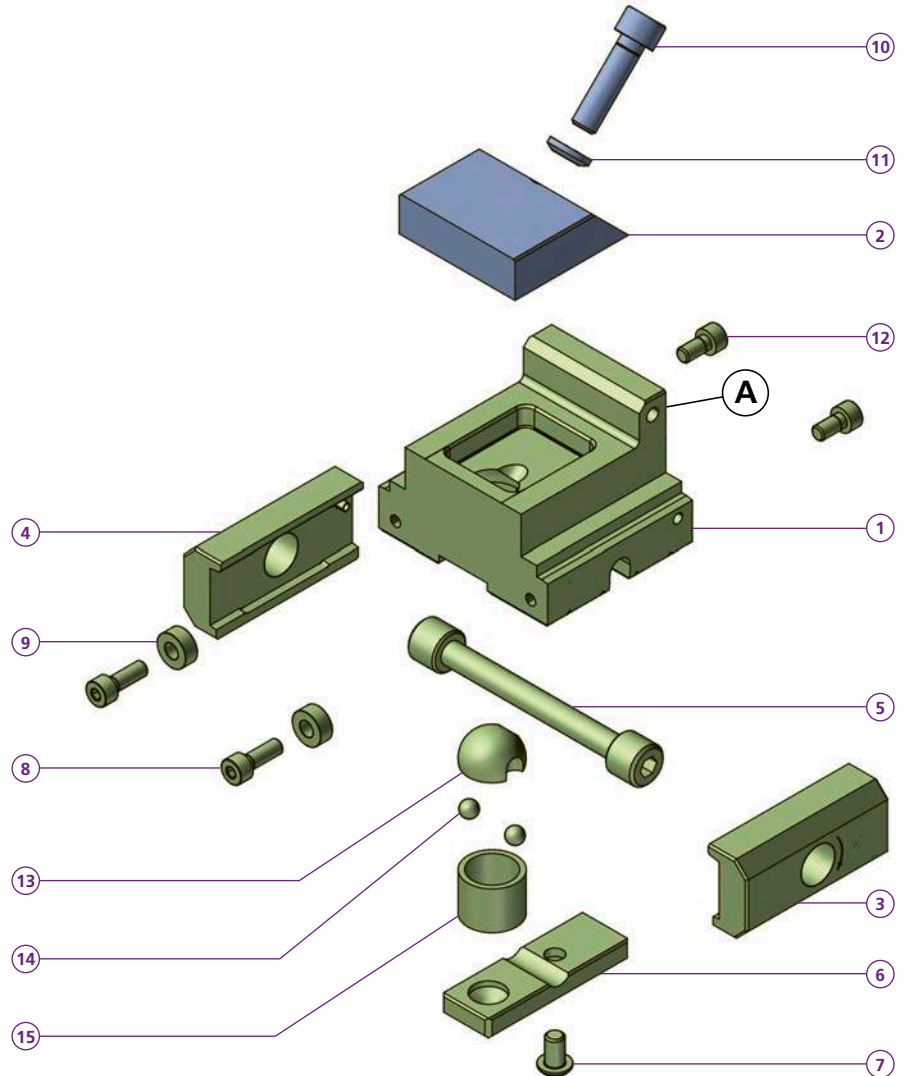
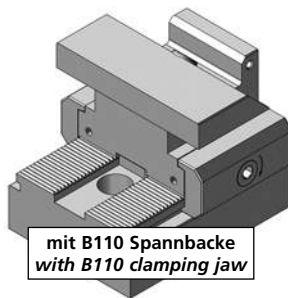
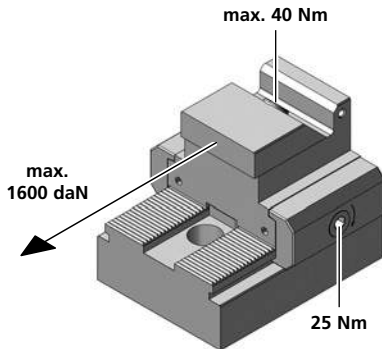
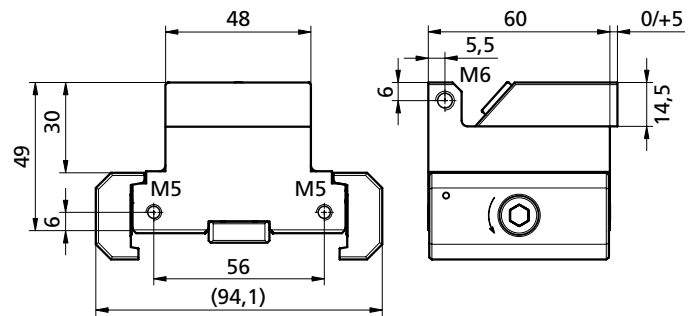
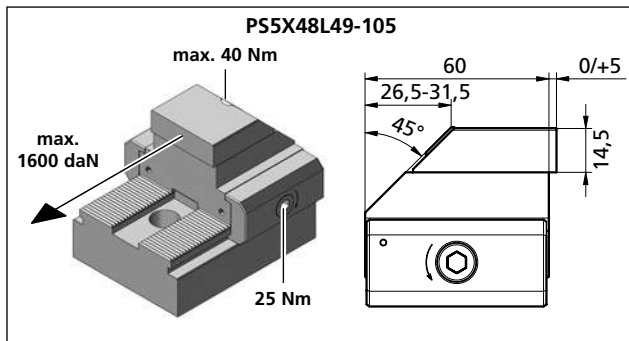
PS1PV94L49-105	
1	1x TK110250
15	1x PCD20L15
H	= 49
H1	= 30
kg	~1,8

B122P	
C	94
H	14,5
L	47
i	56HRC
kg	~0,37



Bestellbeispiel / Ordering example:
1x PS1PV94L49-105 & 1x B122P

Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1'760	0,8
30	22,2	= 1'200	2'650	1,2
40	29,6	= 1'600	3'530	1,6



45°	PS5X48L49-105
1	1x TF190651
9	2x PCD005
8	2x M5X14ISO4762
kg	~1,2
	PS1F48L49-105
1	1x TF140673
	PS1R48L49-105
1	1x TF140672
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2059
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M8X30ISO4762
11	1x PCUSR14
12	2x M5X10ISO4762
13	1x PCKMR45M8
14	2x D=6 DIN 5401
15	1x PCD20L15
kg	~1,3

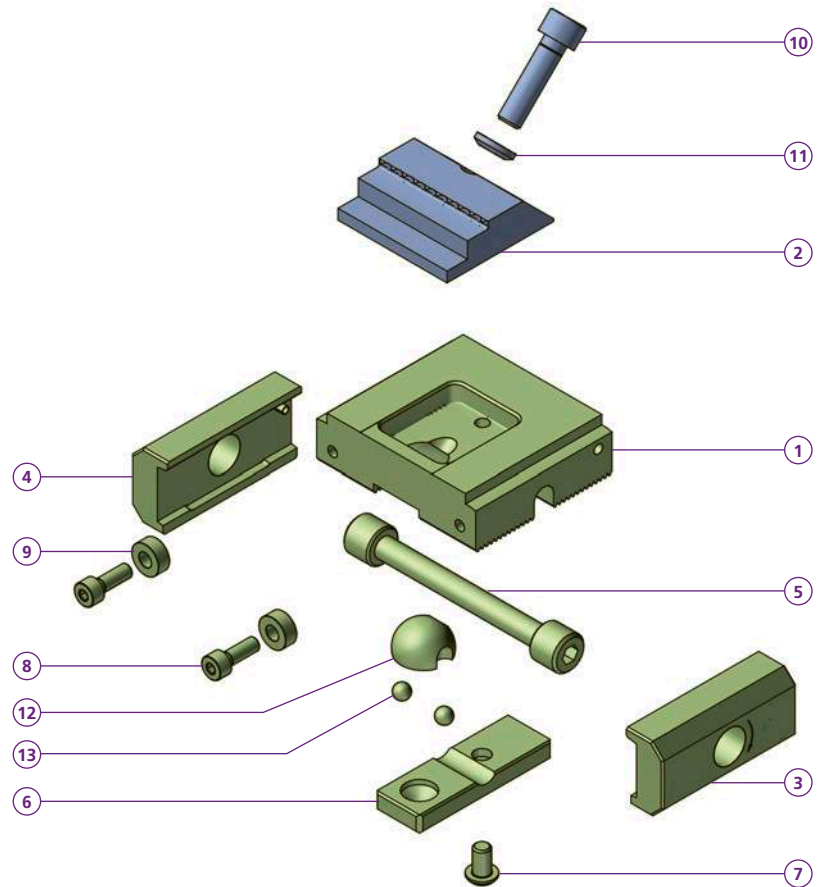
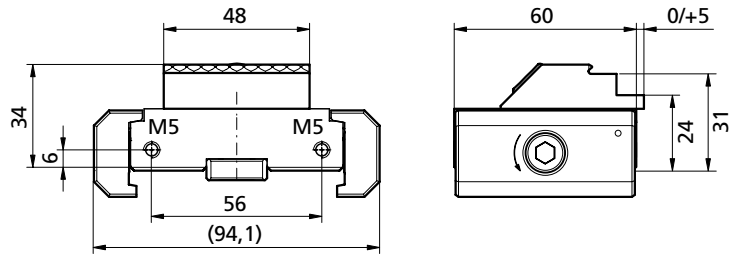
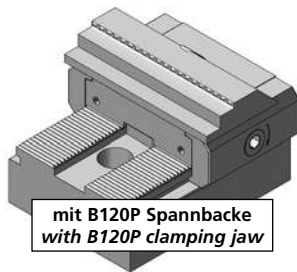
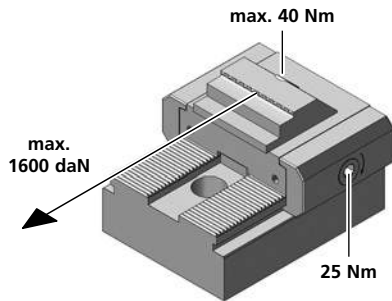
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Bestellbeispiel / Ordering example:
1x PS1F48L49-105 & 1x B105

Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1'760	0,8
30	22,2	= 1'200	2'650	1,2
40	29,6	= 1'600	3'530	1,6

PS5X48L34-105



PS5X48L34-105

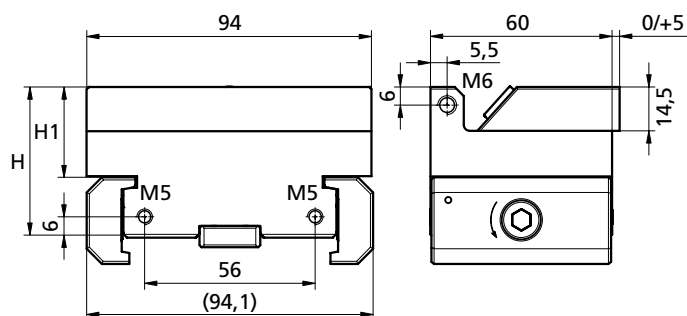
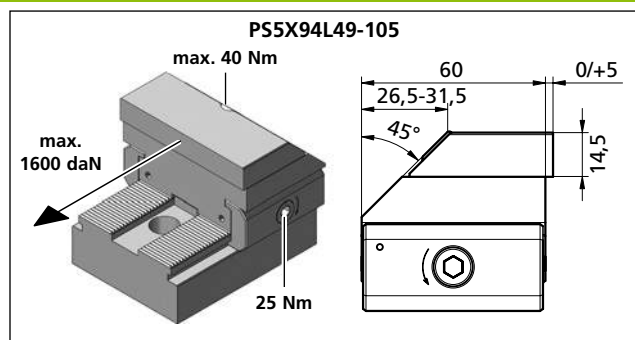
1	1x T00365
2	1x
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2059
7	1x M6X8ISO7380
8	2x M5X14ISO4762
9	2x PCD005
10	1x M8X28ISO4762
11	1x PCUSR16
12	1x PCKMR45M8
13	2x D=6 DIN 5401
kg	~0,9

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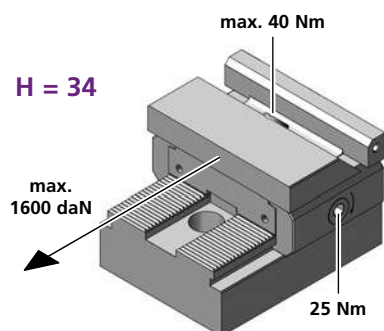
Bestellbeispiel / Ordering example:
1x PS5X48L34-105 & 1x B105

Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1'760	0,8
30	22,2	= 1'200	2'650	1,2
40	29,6	= 1'600	3'530	1,6

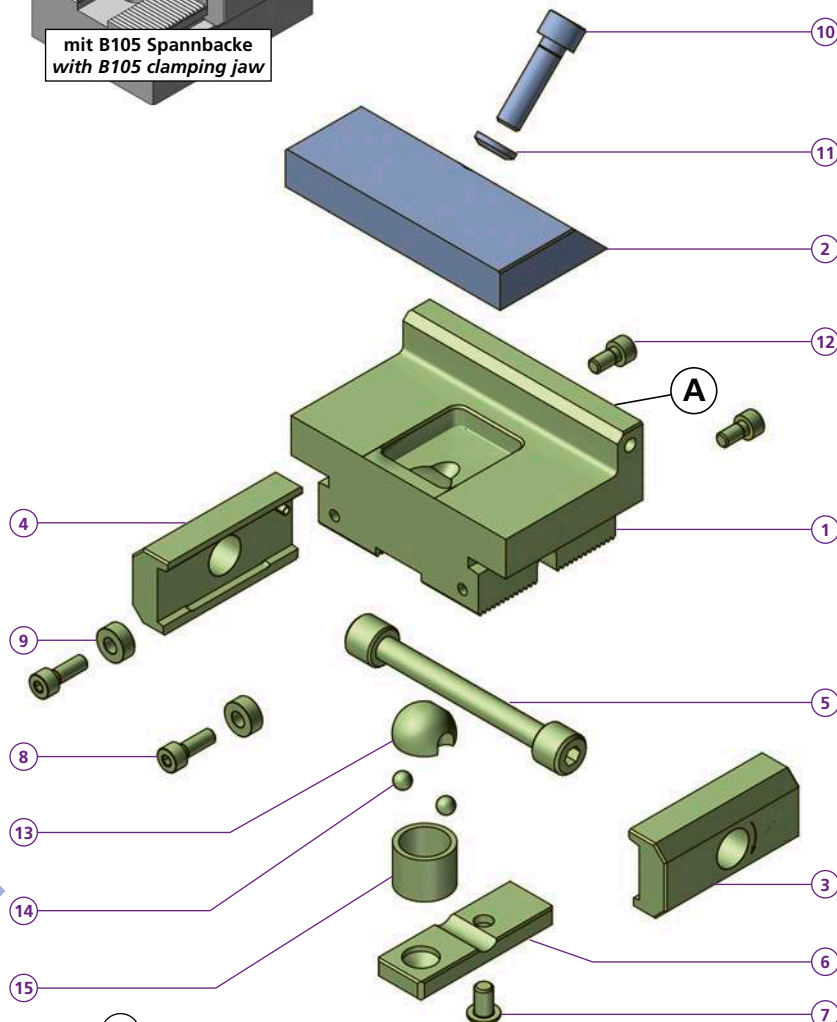
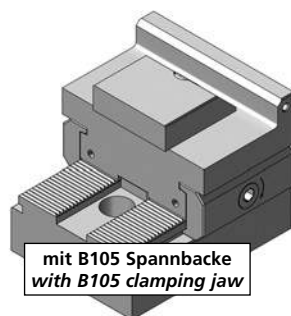
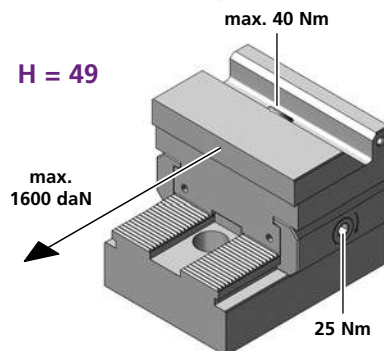
Separat bestellen / Order separately



H = 34



H = 49



PS5X94L49-105

- 1x TW100186
- 2x PCD20L15
- 2x PCD005
- 2x M5X14ISO4762

kg ~1,5

PS1F94L34-105

- 1x TH130785

PS1R94L34-105

- 1x TH130786

- 1x

p. 84, 85

- 1x PCSP60R

- 1x PCSP60L

- 1x PCS14

- 1x PCGU2059

- 1x M6X8ISO7380

- 2x M5X14ISO4762

- 2x PCD005

- 1x M8X30ISO4762

- 1x PCUSR14

- 2x M5X10ISO4762

- 1x PCKMR45M8

- 2x D=6 DIN 5401

H = 34

H1 = 15

kg ~1,0

PS1F94L49-105

- 1x TF140674

- 2x PCD20L15

PS1R94L49-105

- 1x TF140675

- 2x PCD20L15

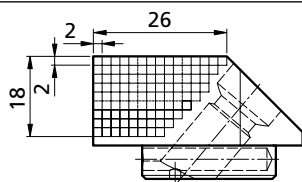
H = 49

H1 = 30

kg ~1,7

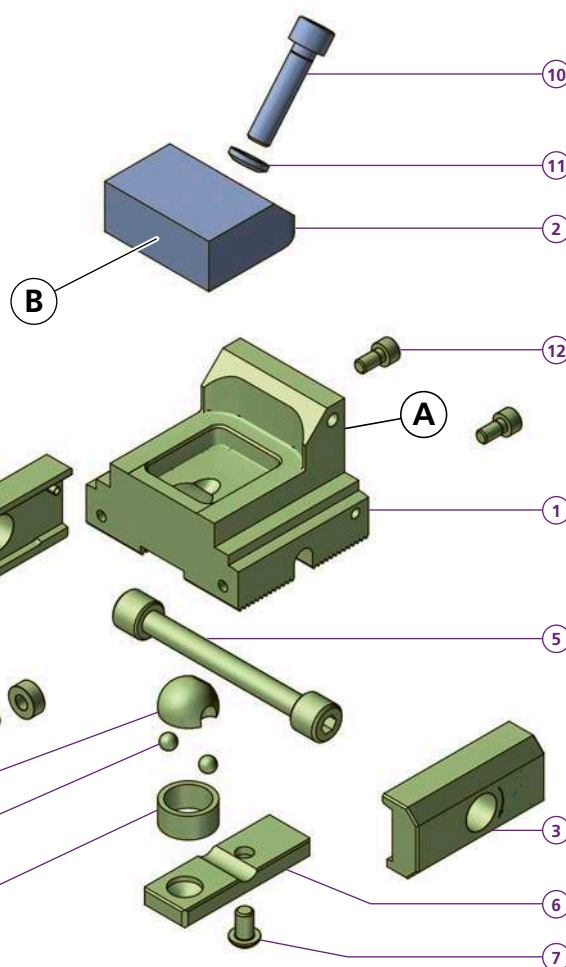
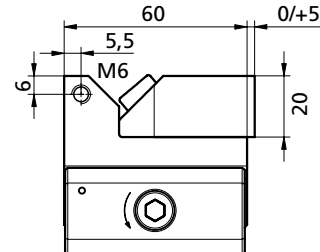
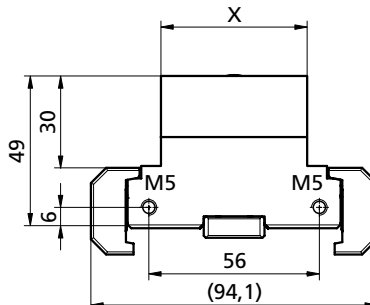
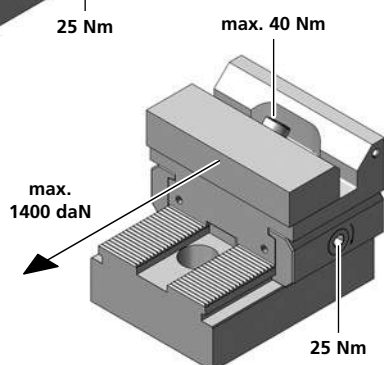
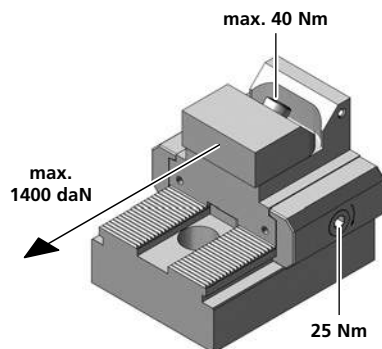
Bestellbeispiel / Ordering example:
1x PS1R94L49-105 & 1x B105

Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1'760	0,8
30	22,2	= 1'200	2'650	1,2
40	29,6	= 1'600	3'530	1,6



Zum Erstellen Ihrer individuellen Formbacke: If a dedicated jaw is being machined:

Schnittzeichnung zum Ermitteln der maximalen Bearbeitungsprofiltiefe
Sectional drawing to determine the maximum machining depth



PS1R48L49-105H20

- 1x TW100161-01
- 1x
- 1x PCSP60R
- 1x PCSP60L
- 1x PCS14
- 1x PCGU2059
- 1x M6X8ISO7380
- 2x M5X14ISO4762
- 2x PCD005
- 1x M8X35ISO4762
- 1x PCUSR14
- 2x M5X10ISO4762
- 1x PCKMR45M8
- 2x D=6 DIN 5401
- 1x PCD20L095
- X = 48
- kg ~1,2

PS1R94L49-105H20

- 1x TW100161-07
- X = 94
- kg ~1,5

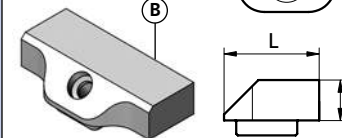
Bestellbeispiel / Ordering example: 1x PS1R48L49-105H20 & 1x B107H20

	B105H20	B106H20	B107H20	B110H20	B111H20	B112H20
C	48	48	48	94	94	94
H	20	20	20	20	20	20
L	47	47	47	47	47	47
i	HV700	HV700	*	HV700	HV700	*
	x0,2mm	x0,2mm		x0,2mm	x0,2mm	
kg	~0,38	~0,38	~0,38	~0,57	~0,56	~0,56

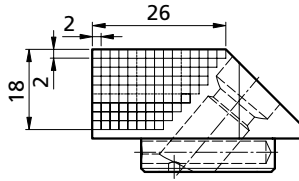
B105H20, B106H20, B107H20



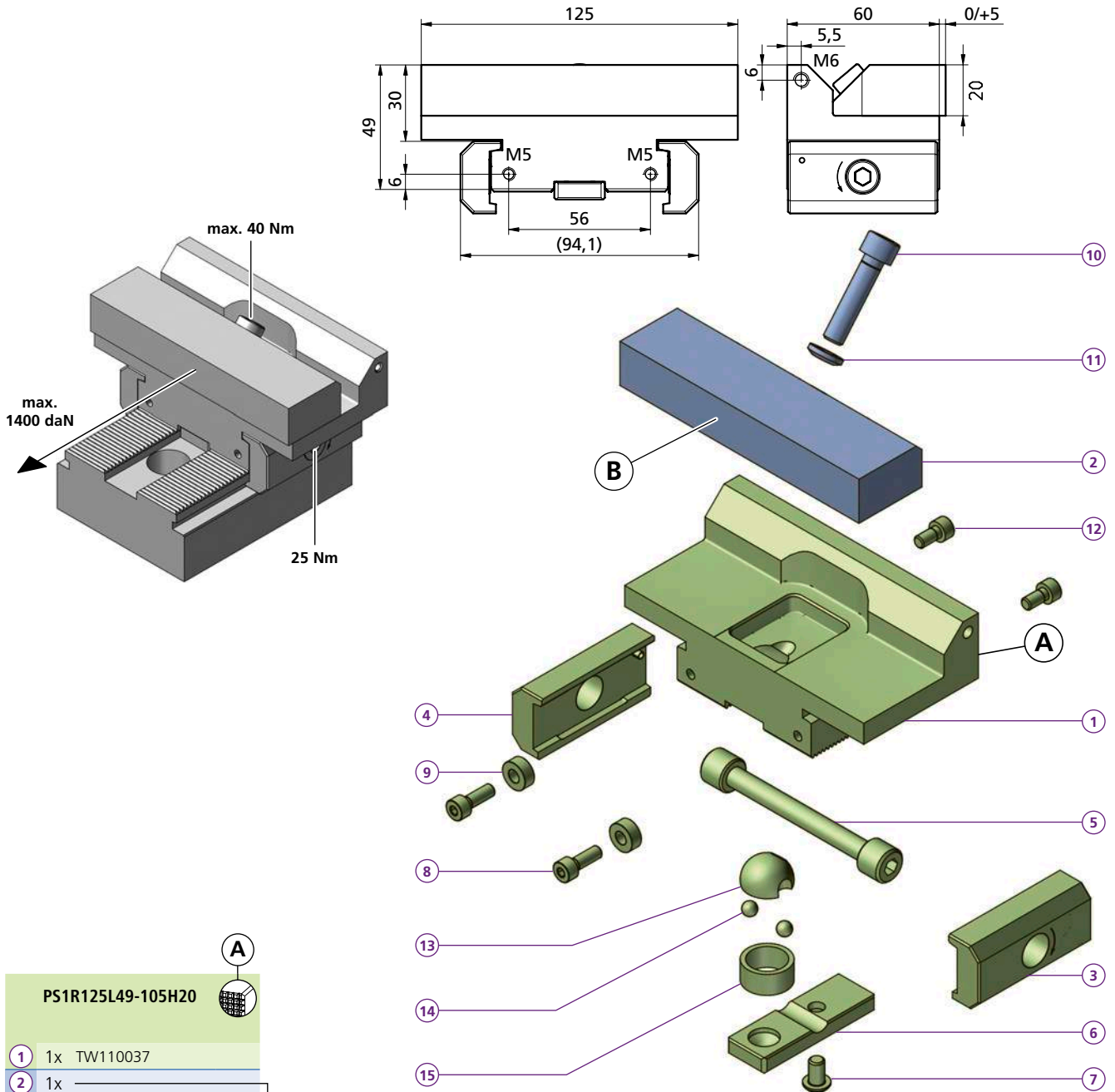
B110H20, B111H20, B112H20



Separat bestellen / Order separately



Zum Erstellen Ihrer individuellen Formbacke: *If a dedicated jaw is being machined:*
Schnittzeichnung zum Ermitteln der maximalen Bearbeitungsprofiltiefe
Sectional drawing to determine the maximum machining depth



PS1R125L49-105H20

1	1x	TW110037
2	1x	
3	1x	PCSP60R
4	1x	PCSP60L
5	1x	PCS14
6	1x	PCGU2059
7	1x	M6X8ISO7380
8	2x	M5X14ISO4762
9	2x	PCD005
10	1x	M8X35ISO4762
11	1x	PCUSR14
12	2x	M5X10ISO4762
13	1x	PCKMR45M8
14	2x	D=6 DIN 5401
15	1x	PCD20L095
kg		~1,7

Bestellbeispiel / Ordering example: 1x PS1R125L49-105H20 & 1x B132H20P			
	B130H20P	B131H20P	B132H20P
C	125	125	125
H	20	20	20
L	47	47	47
i	HV700	HV700	*
	x0,2mm	x0,2mm	
kg	~0,71	~0,71	~0,71

B130H20P, B131H20P, B132H20P

* = weicher Stahl / soft steel



zum Einsatz in unterschiedlichen Spannsituationen
for use in different clamping situations

Art. Nr.				kg
B110	HV700 x 0,2mm			~0,49
B110P	HV700 x 0,2mm			~0,49



mit Prägeeinsätzen
with direct-stamping inserts

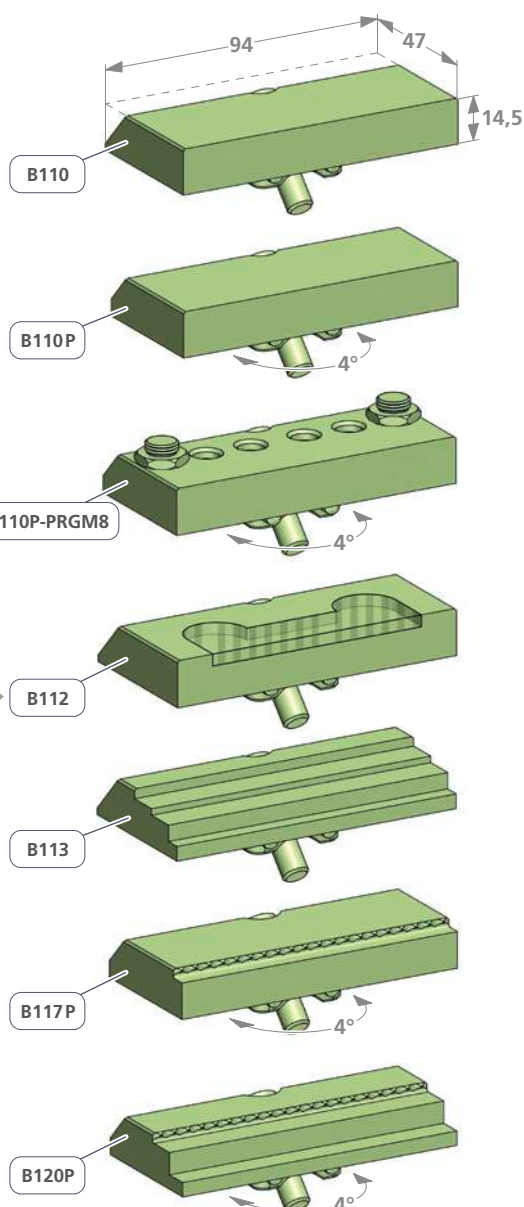
Art. Nr.			kg
B110P-PRGM8	HV700 x 0,2mm		~0,46

Art. Nr.				kg
B111	HV700 x 0,2mm			~0,48
B111P	HV700 x 0,2mm			~0,48

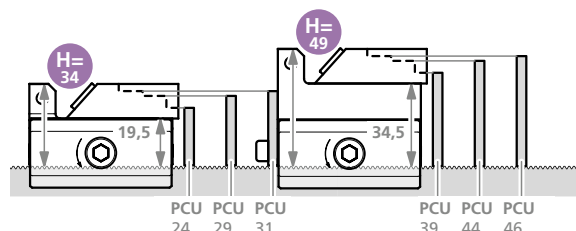
B112	weicher Stahl soft steel (1.2312)			~0,49
B112P	weicher Stahl soft steel (1.2312)			~0,49
B112HG	Hochgenau High-precision			~0,49
B112E	Einsatzstahl (1.5752) Case hardening steel			~0,49
B112EP	Einsatzstahl (1.5752) Case hardening steel			~0,47

B113	HV700 x 0,2mm			~0,39
B113P	HV700 x 0,2mm			~0,39
B117P	57HRC			~0,46

B120	57HRC			~0,4
B120P	57HRC			~0,4



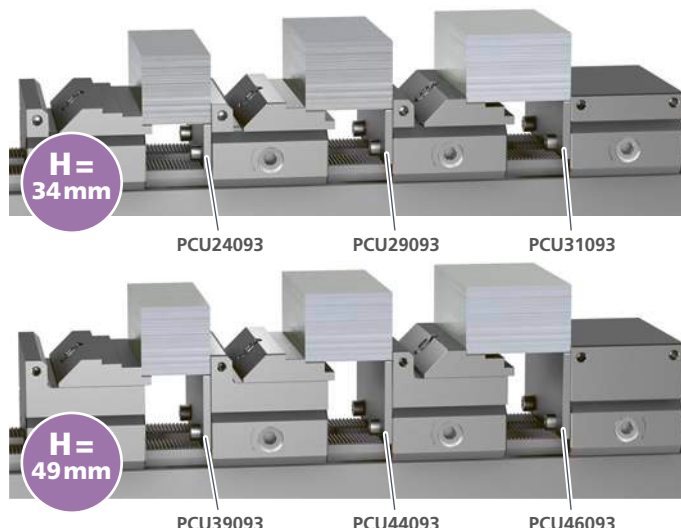
Modulhöhen / Module heights 34 / 49 mm



Beim Einsatz einer Stufenbacke, ist die richtige Modulspannhöhe 34 mm/49 mm zu berücksichtigen. Die Werkstücke auf der Anschlagseite werden mit den passenden Parallelunterlagen abgestützt.

When using a step jaw is applied, the correct module clamping height 34 mm/49 mm must be taken into account. The workpieces on the end module are supported with the appropriate steel parallel.

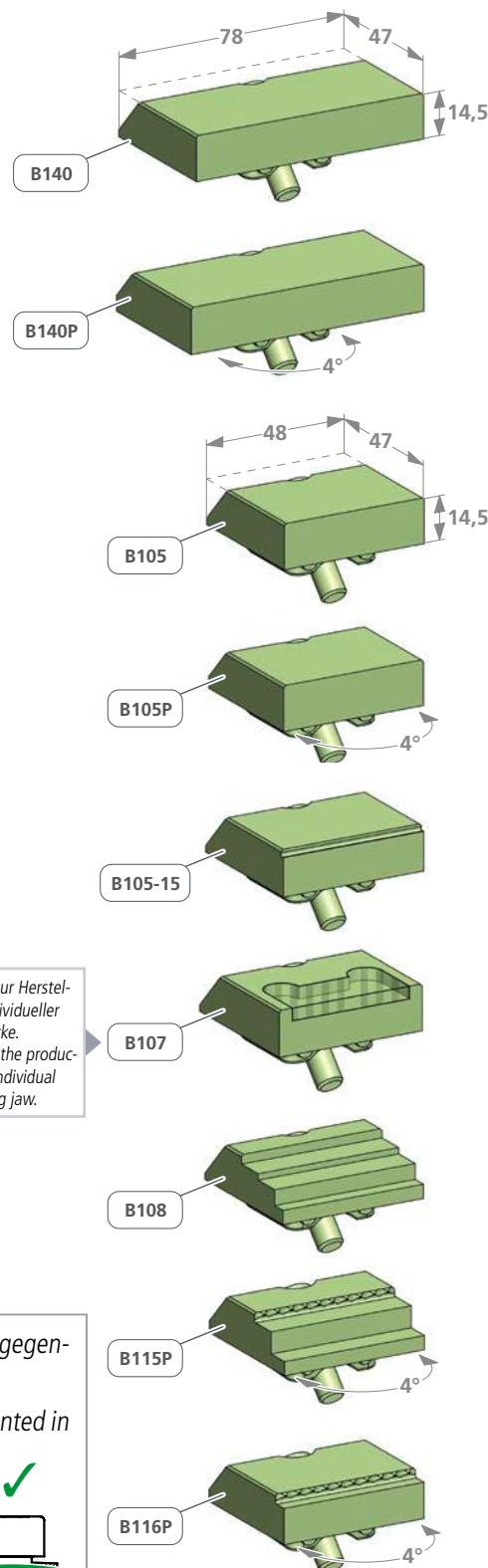
Eingesetzte Stufenbacken / Inserted stepped jaws (B113)





zum Einsatz in unterschiedlichen Spannsituationen
for use in different clamping situations

Art.Nr.				kg
B140	HV700 x 0,2mm			~0,41
B140P	HV700 x 0,2mm			~0,41
B141	HV700 x 0,2mm			~0,41
B141P	HV700 x 0,2mm			~0,41
B105	HV700 x 0,2mm			~0,27
B105P	HV700 x 0,2mm			~0,27
B105-15	HV700 x 0,2mm			~0,27
B106	HV700 x 0,2mm			~0,27
B106P	HV700 x 0,2mm			~0,27
B107	weicher Stahl soft steel (1.2312)			~0,27
B107P	weicher Stahl soft steel (1.2312)			~0,27
B108	HV700 x 0,2mm			~0,22
B108P	HV700 x 0,2mm			~0,22
B115	57HRC			~0,21
B115P	57HRC			~0,21
B116P	57HRC			~0,25



Weich, zur Herstellung individueller Formbacke.
Soft, for the production of individual moulding jaw.

Für Prägebacken / For stamping jaws

PF-SET Krafterhaltung mit Nachfederung
Spring loaded mechanism to maintain clamping force

Bei allen Prägebacken kann die Krafterhaltung mit den nachfedernden Tellerfedern eingesetzt werden um ein Freiwigeln des Werkstücks zu verhindern.

On every spring loaded stamping jaw, the force retention with the disc springs can be used to prevent the workpiece from wiggling free.

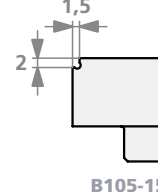
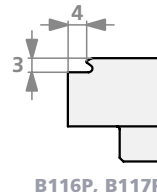
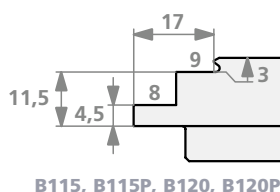
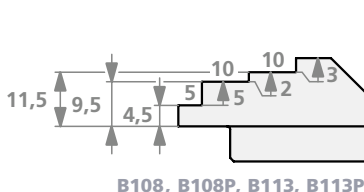


Die Tellerfedern werden gegenläufig montiert.

The disc springs are mounted in opposite directions.



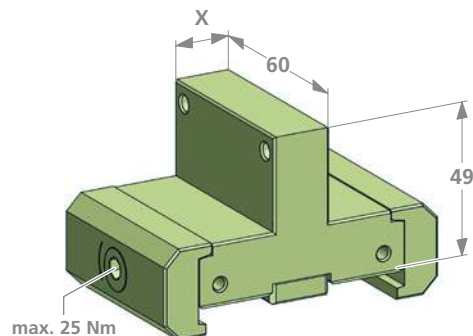
Detailvermessung der Stufenbacken / Detailed dimensioning of the stepped jaws





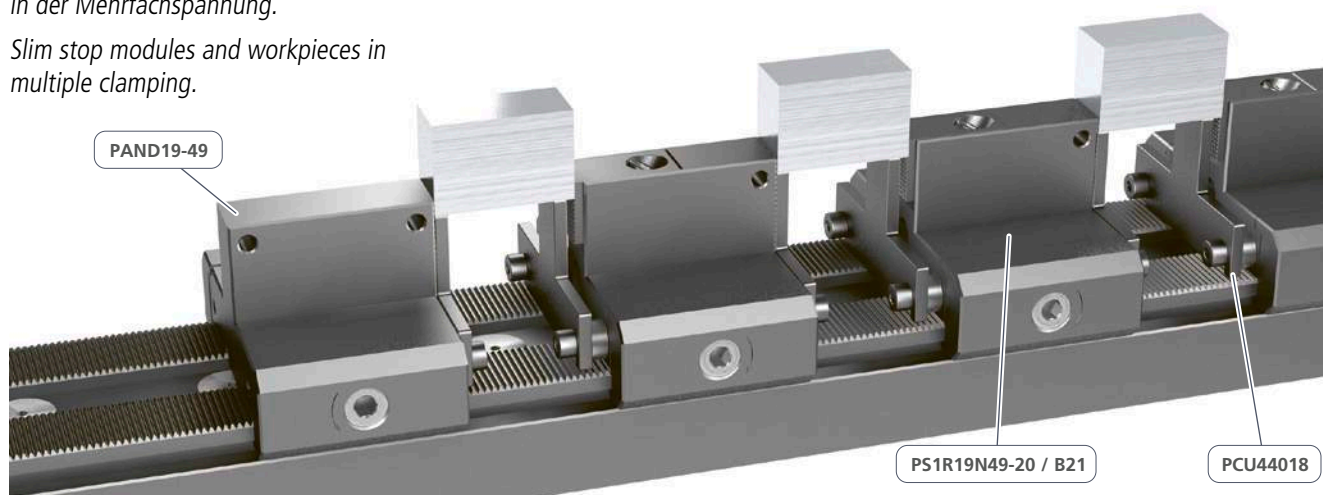
für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

Art. Nr.		kg	X
PAND19-49		~1,2	19
PAND26-49		~2,2	26
PAND34-49		~2,3	34



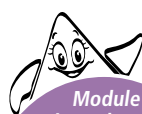
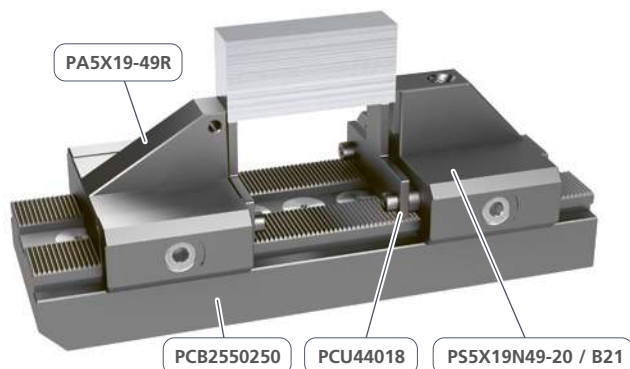
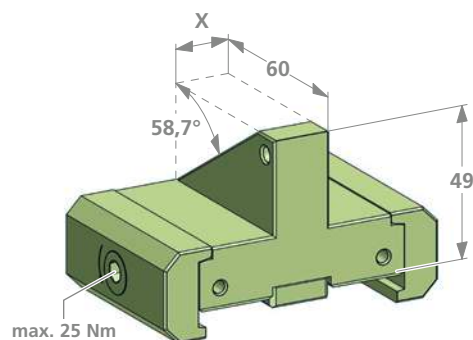
Schmale Anschlagmodule und Werkstücke
in der Mehrfachspannung.

Slim stop modules and workpieces in
multiple clamping.



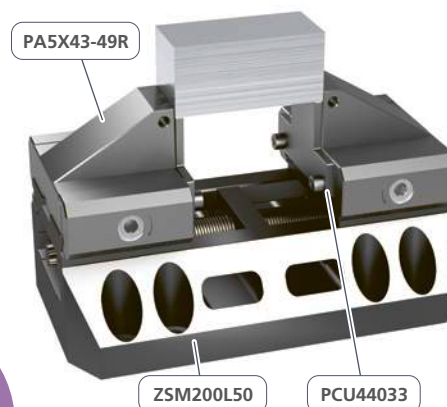
für 5-Achs Bearbeitung
for 5-axis machining

Art. Nr.		kg	X
PA5X19-49F		~1,1	19
PA5X19-49R		~1,1	19
PA5X26-49F		~1,2	26
PA5X26-49R		~1,2	26
PA5X34-49F		~1,2	34
PA5X34-49R		~1,2	34



Module
einsetzbar auf
Zentrischspannern
oder Basisschienen.

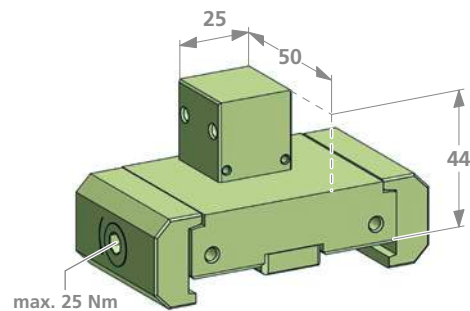
Modules
can be used on self
centrig vises or
base rails.





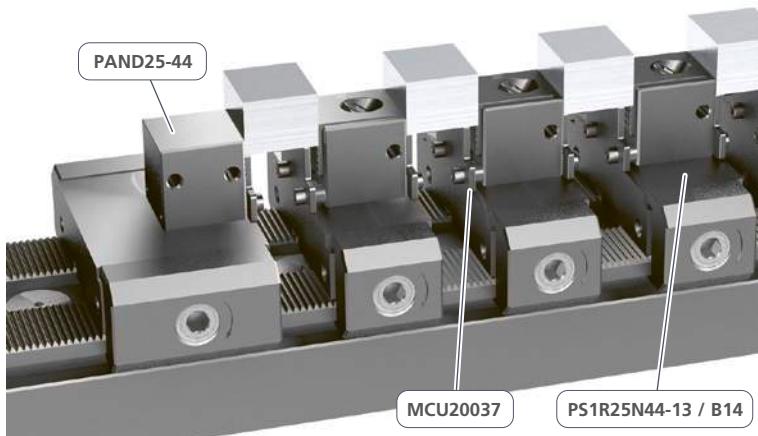
für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

Art. Nr.	kg
PAND25-44	~1,1

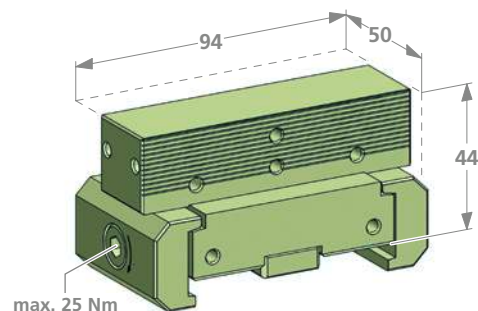


Schlankes und kurzes Anschlagmodul für Kleinteil-Serien (Mehrfachspannung).

Slim and short end module for small part series (Multiple workholding).

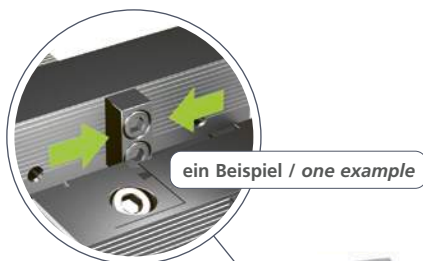


Art. Nr.	kg
PAND94-44	~1,3



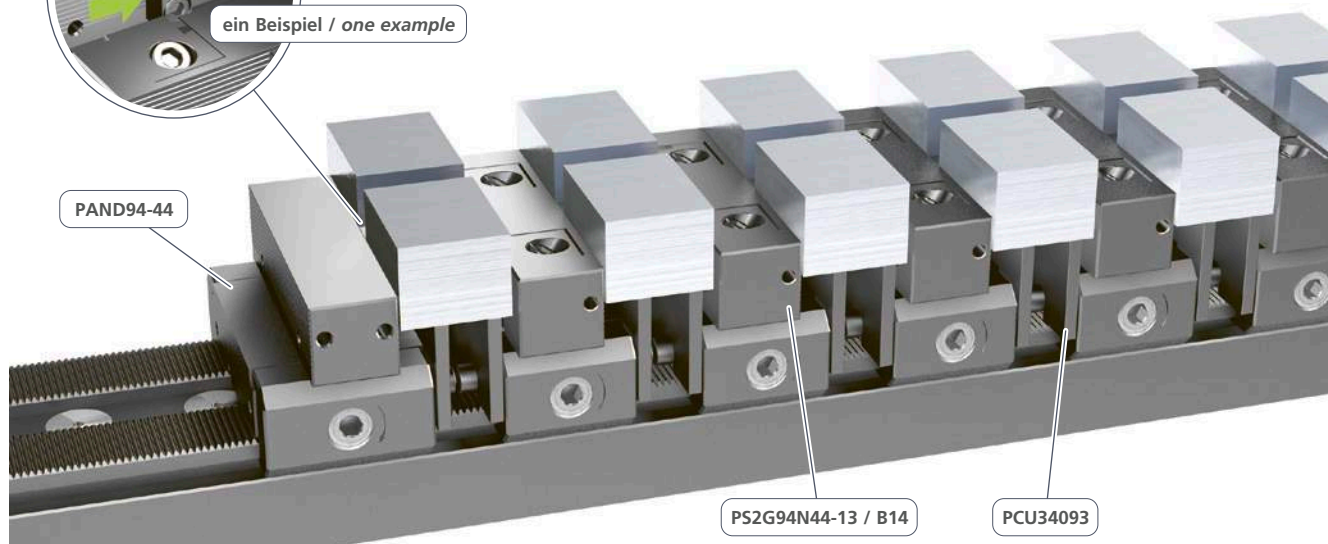
Die Anschlagfläche enthält 2 Passbohrungen. Mit MS50 Passschrauben kann mittig ein Seitenanschlag präzise platziert werden.

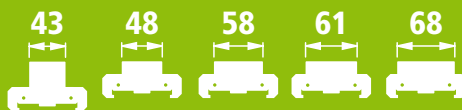
The stop surface contains 2 fitting holes. A side stop can be placed precisely in the centre with MS50 fitting screws.



Anschlagmodul mit Doppelspannfunktion. Verdoppelt die Anzahl Spannbereiche auf gleichbleibendem Raum.

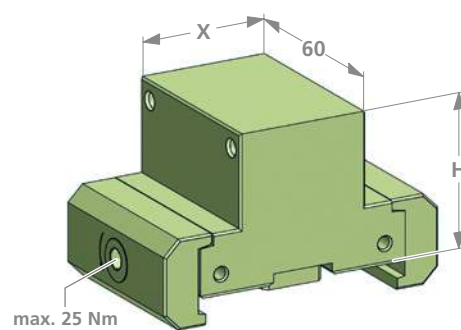
End module with double clamping function. Doubles the number of clamping areas in the same amount of working space.



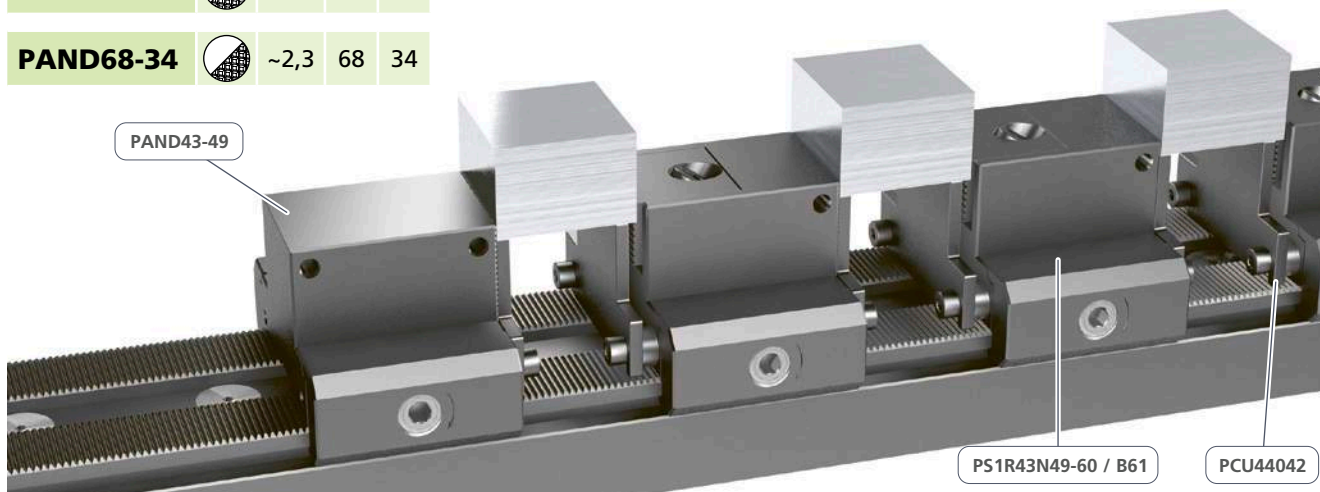


für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

Art. Nr.		kg	X	H
PAND43-49		~1,6	43	49
PAND48-34		~1,3	48	34
PAND48-49		~1,6	48	49
PAND48-75		~2,2	48	75
PAND58-34		~1,4	58	34
PAND58-49		~1,8	58	49
PAND61-34		~1,4	61	34
PAND68-34		~2,3	68	34



43 mm bis 68 mm breite Anschlagmodule für die Einzel- und Mehrfachspannung.
43 mm to 68 mm wide end modules for single and multiple clamping.

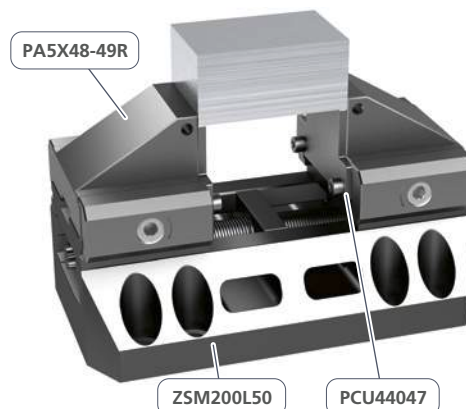
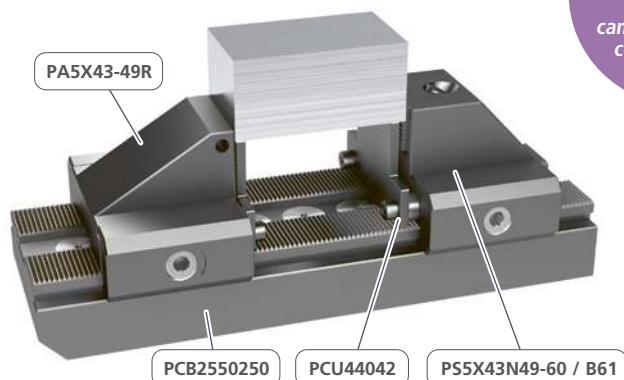
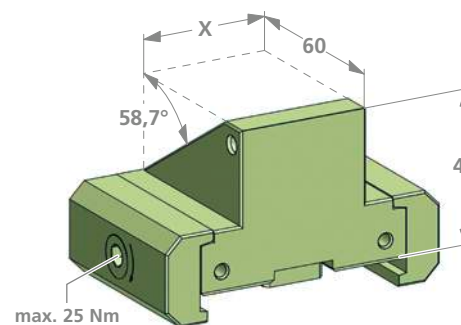


für 5-Achs Bearbeitung
for 5-axis machining

Art. Nr.		kg	X
PA5X43-49F		~1,3	43
PA5X43-49R		~1,3	43
PA5X48-49F		~1,4	48
PA5X48-49R		~1,4	48



Module einsetzbar auf Zentrischspannern oder Basisschienen.
Modules can be used on self centrig vises or base rails.



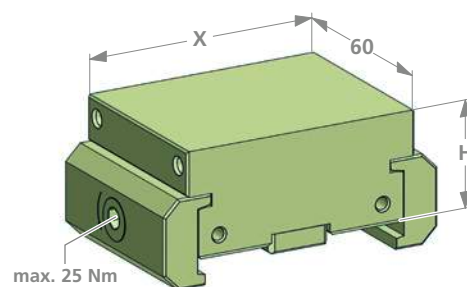
Anschlagmodule ... End module ...



powerCLAMP

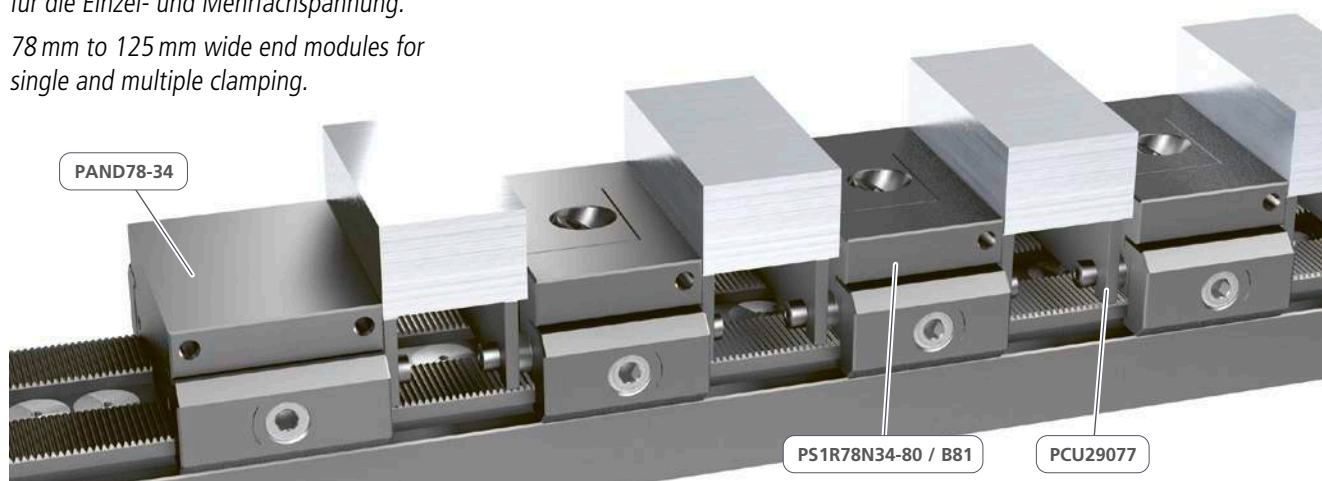
für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

Art. Nr.		kg	X	H
PAND78-34		~1,5	78	34
PAND78-49		~2,1	78	49
PAND94-34		~2,3	94	34
PAND94-49		~2,7	94	49
PAND125-49		~2,7	125	49



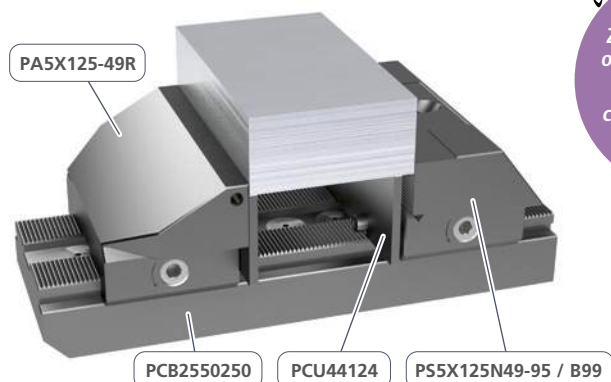
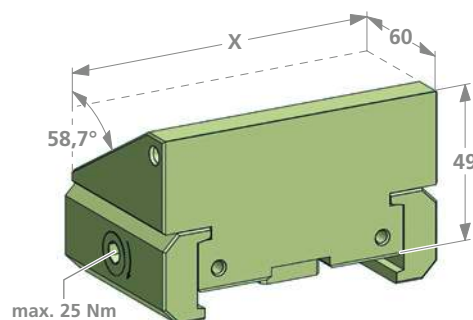
78 mm bis 125 mm breite Anschlagmodule
für die Einzel- und Mehrfachspannung.

78 mm to 125 mm wide end modules for
single and multiple clamping.

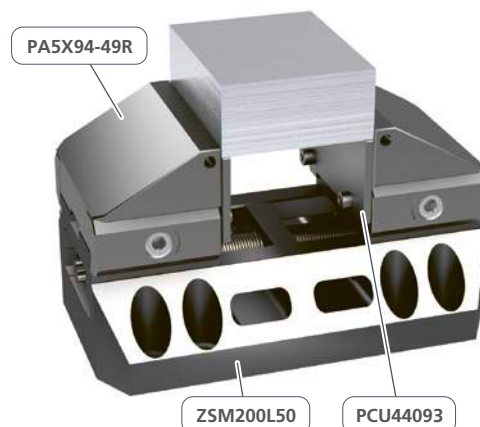


für 5-Achs Bearbeitung
for 5-axis machining

Art. Nr.		kg	X
PA5X94-49F		~1,8	94
PA5X94-49R		~1,8	94
PA5X125-49F		~2,0	125
PA5X125-49R		~2,0	125



Module
einsetzbar auf
Zentrischspannern
oder Basisschienen.
Modules
can be used on self
centrig vises or
base rails.



SCAN OR
CLICK



PDF



STEP

PAND48-34PRG/F-A1
PAND48-49PRG/F-A1
PAND94-34PRG/F-A1

PAND94-49PRG/F-A1
PAND125-49PRG-A1



prägen
stamping



powerCLAMP

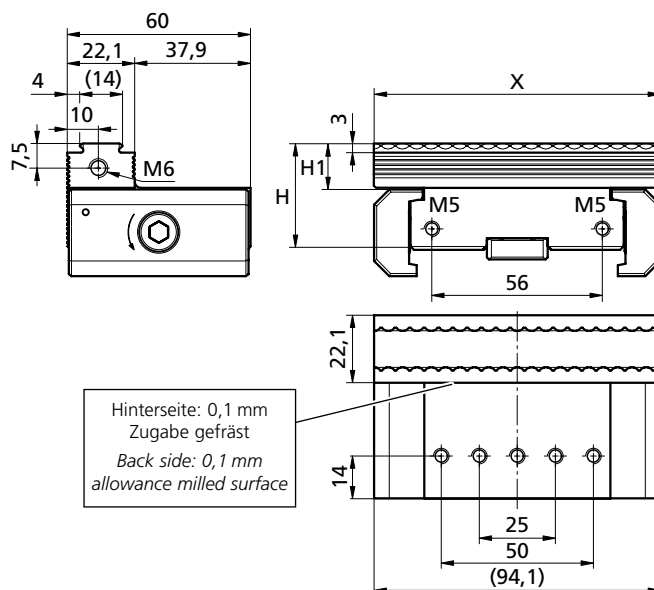
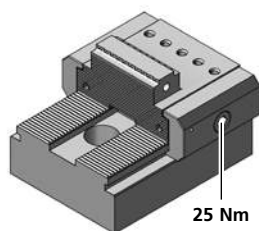
PAND48-34PRG-A1

1x TH120684

PAND48-34PRF-A1

1x TK140239
 3x PCSP60R
 4x PCSP60L
 5x PCS14
 6x PCGU2049
 7x M6X8ISO7380
 12x M5X10ISO4762

X = 48
 H = 34
 H1 = 15
 kg ~1,1



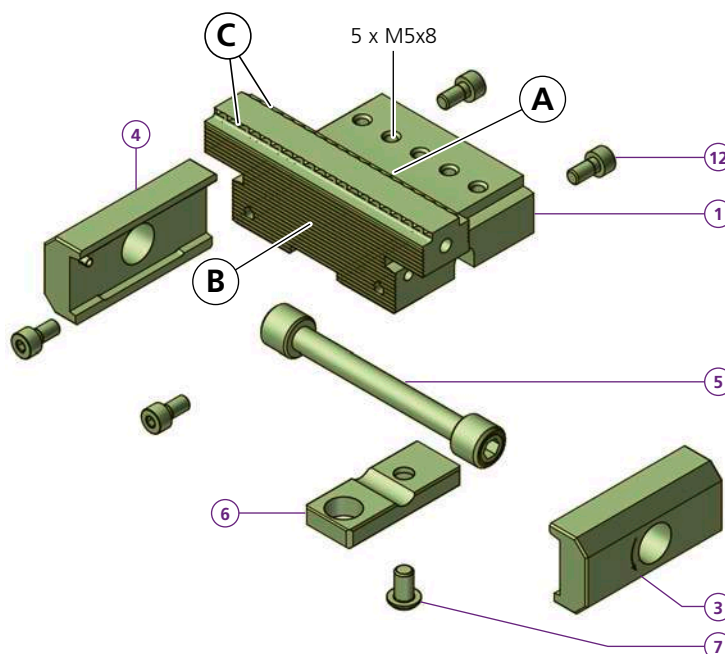
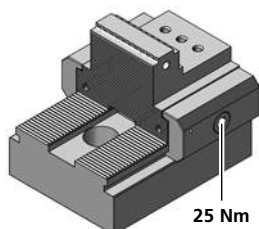
PAND48-49PRG-A1

1x TH120685

PAND48-49PRF-A1

1x TK140597

X = 48
 H = 49
 H1 = 30
 kg ~1,3



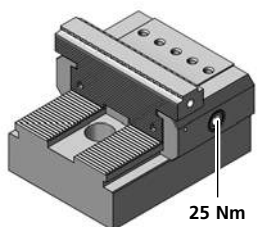
PAND94-34PRG-A1

1x TH120686

PAND94-34PRF-A1

1x TH140185

X = 94
 H = 34
 H1 = 15
 kg ~1,2



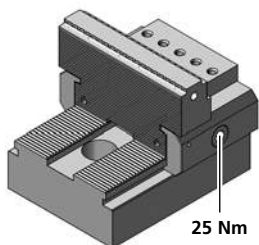
PAND94-49PRG-A1

1x TH120687

PAND94-49PRF-A1

1x TH130754

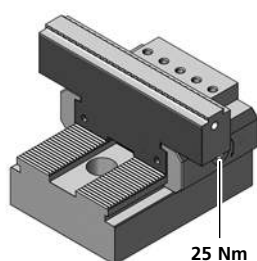
X = 94
 H = 49
 H1 = 30
 kg ~1,6



PAND125-49PRG-A1

1x TB160295

X = 125
 H = 49
 H1 = 30
 kg ~1,7



Bestellbeispiel / Ordering example: **PAND94-34PRG-A1**

PAND125-34PRG-A1

PAND150-34PRG-A1

PAND94-34PRGV

PAND94-49PRGV

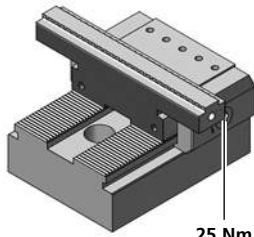


prägen
stamping

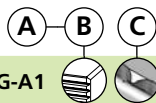


powerCLAMP

X = 125



25 Nm



PAND125-34PRG-A1

1 1x TB180899

X = 125

kg ~1,2

PAND150-34PRG-A1

1 1x TB160145

3 1x PCSP50R

4 1x PCSP50L

5 1x PCS14

6 1x PCGU2049

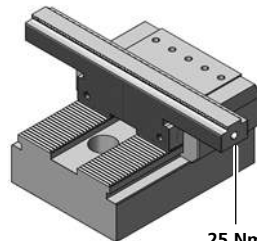
7 1x M6X8ISO7380

12 4x M5X10ISO4762

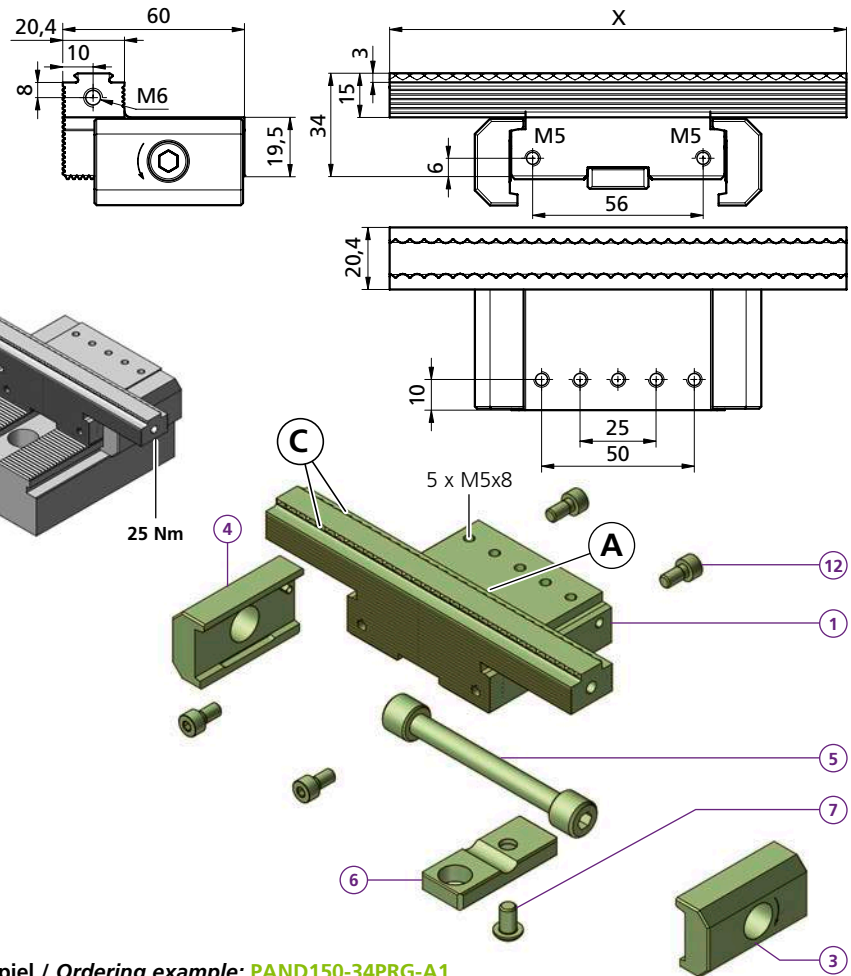
X = 150

kg ~1,2

X = 150

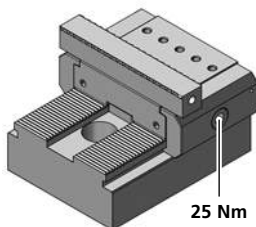


25 Nm



Bestellbeispiel / Ordering example: PAND150-34PRG-A1

H = 34



25 Nm



PAND94-34PRGV

1 1x TH171180

3 1x PCSP60R

4 1x PCSP60L

5 1x PCS14

6 1x PCGU2049

7 1x M6X8ISO7380

12 4x M5X10ISO4762

H = 34

H1 = 15

A = 17,5

kg ~1,2

PAND94-49PRGV

1 1x TH171179

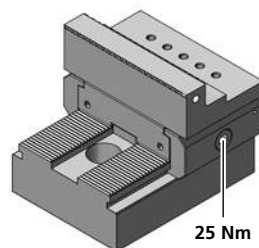
H = 49

H1 = 30

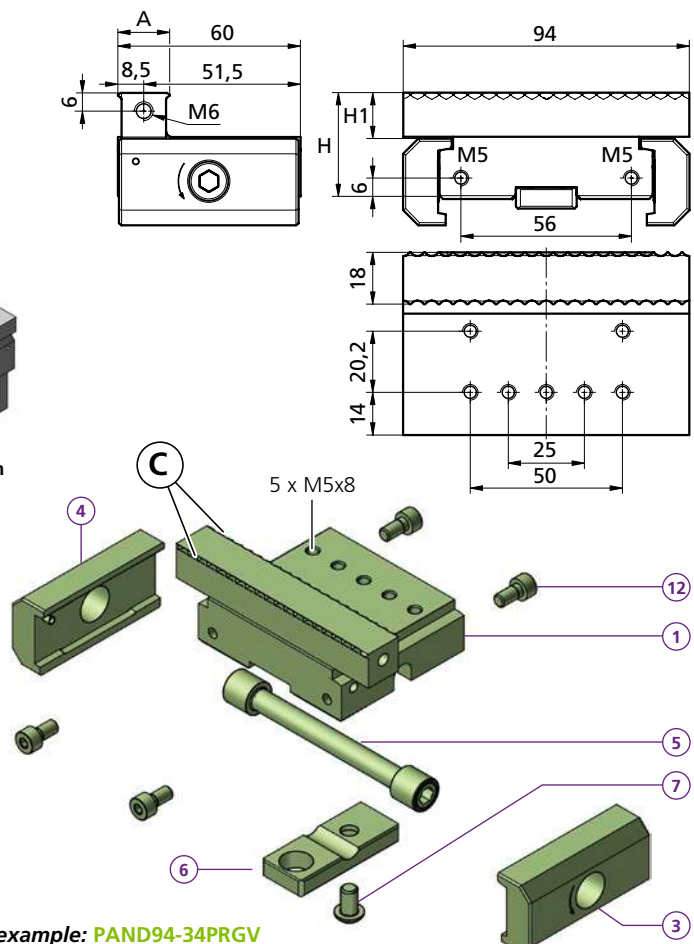
A = 17

kg ~1,6

H = 49

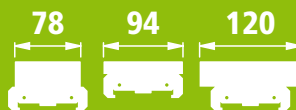


25 Nm



Bestellbeispiel / Ordering example: PAND94-34PRGV

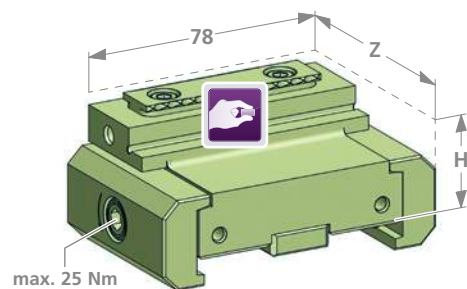
Anschlagmodule zum Prägen ... End modules for stamping ...



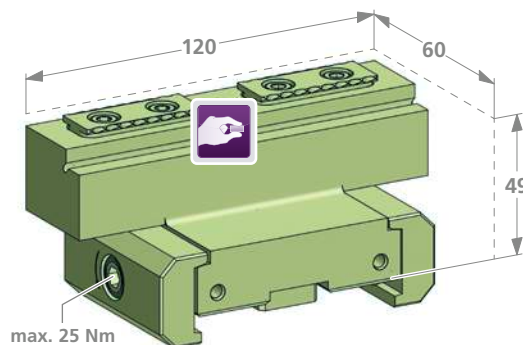
powerCLAMP

für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

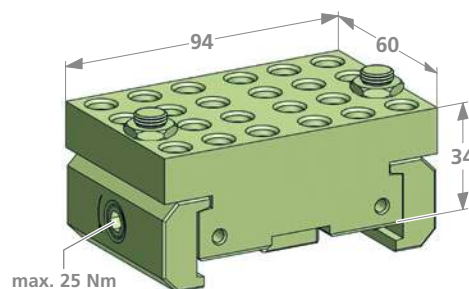
Art. Nr.		kg	Z	H
PAND78-34UPRG	 	~1,2	60	34
PAND78-49UPRG	 	~1,5	60	49
PAND78-34X50UPRG	 	~1,0	50	34



Art. Nr.		kg
PAND120-49UPRG	 	~1,8



Art. Nr.		kg
PANF94-34PRGM8	 	~1,5

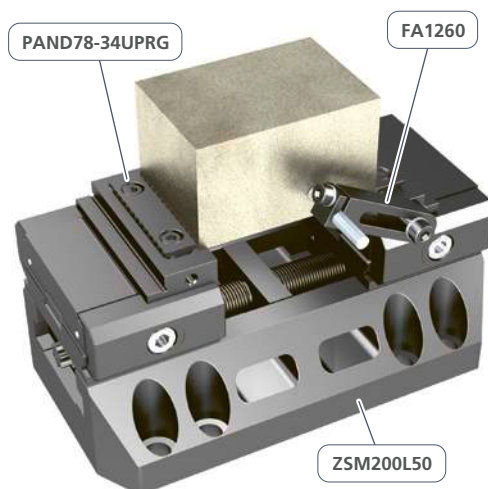
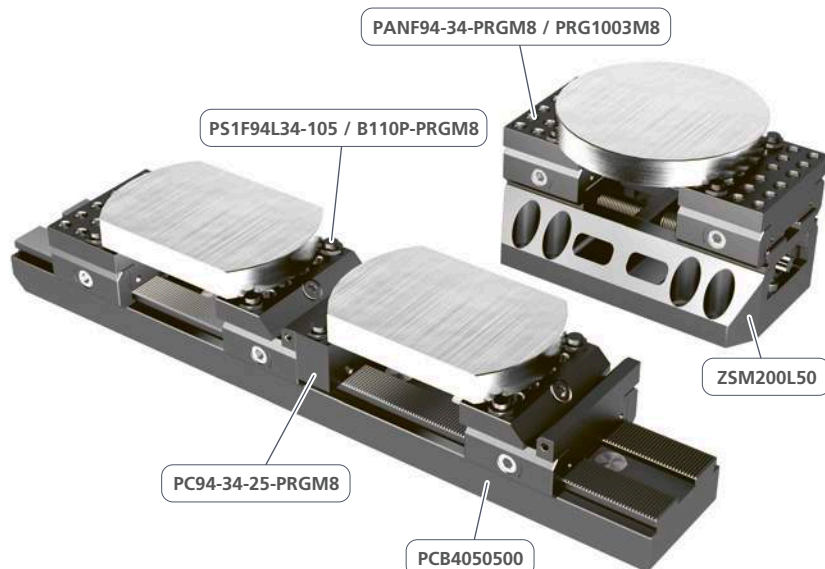


Module
einsetzbar auf
Zentrischspannern
oder Basisschienen.

Modules
can be used on self
centrig vises or
base rails.

Der Einsatz dieser Spannmodule erweitert
die Spannmöglichkeiten für runde und un-
förmige Werkstücke erheblich.

The use of these clamping modules ex-
pands the clamping possibilities for round
and bulky workpieces considerably.



Bei knapp gespannten Werkstücken sind direkt-
Prägebacken die ideale Wahl zum spannen.

For tight clamped workpieces, direct stamping
jaws are the ideal choice for clamping.

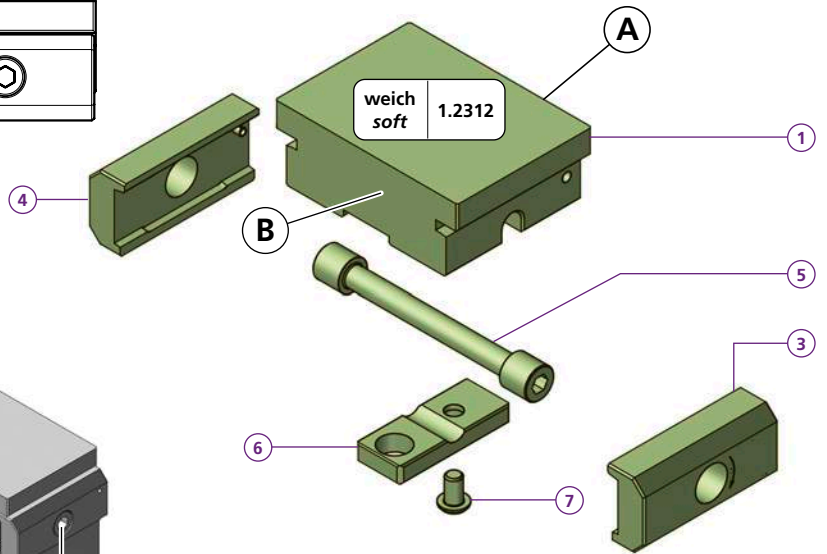
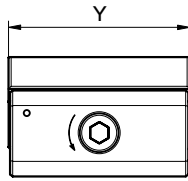
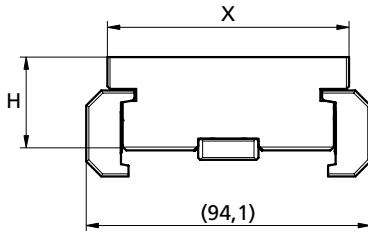
Rohlingsmodule Blank module

PT-F80-30X60
PT-F80-30X60NS
PT-F80-30X30NS

PT-F61-25X60
PT-F61-25X50
PT-F61-25X30



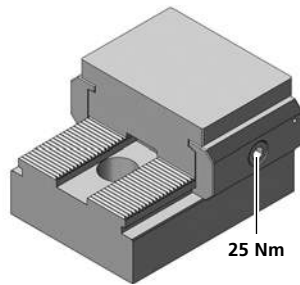
powerCLAMP



PT-F80-30X60

- 1x TF140637
- 1x PCSP60R
- 1x PCSP60L
- 1x PCS14
- 1x PCGU2049
- 1x M6X8ISO7380

X = 80
H = 30
Y = 60
kg ~1,4

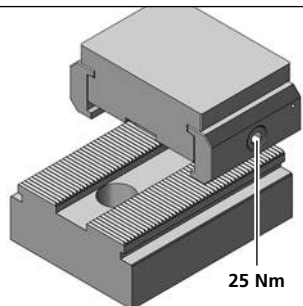


PT-F80-30X60NS

- 1x TF140635
- 1x PCSP60R
- 1x PCSP60L
- 1x PCS14
- 1x PCGU2049
- 1x M6X8ISO7380

X = 80
H = 30
Y = 60
kg ~1,4

NS = Rohlingsmodul freie Positionierung
ohne Verzahnung
Carrier module without positioning
serration for free positioning

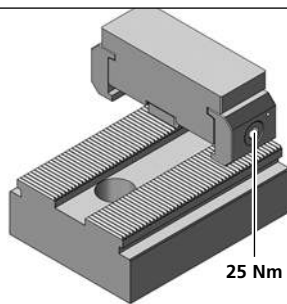


PT-F80-30X30NS

- 1x TF140749
- 1x PCSP30R
- 1x PCSP30L
- 1x PCS14
- 1x PCGU2030
- 1x M6X8ISO7380

X = 80
H = 30
Y = 30
kg ~0,7

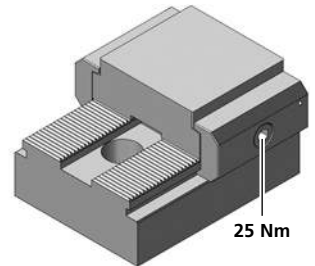
NS = Rohlingsmodul freie Positionierung
ohne Verzahnung
Carrier module without positioning
serration for free positioning



PT-F61-25X60

- 1x TF140638
- 1x PCSP60R
- 1x PCSP60L
- 1x PCS14
- 1x PCGU2049
- 1x M6X8ISO7380

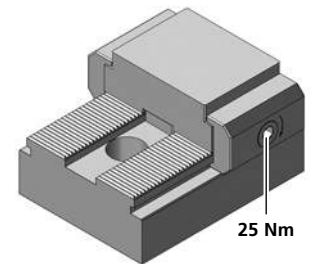
X = 61
H = 25
Y = 60
kg ~1,1



PT-F61-25X50

- 1x TF140750
- 1x PCSP50R
- 1x PCSP50L
- 1x PCS14
- 1x PCGU2049
- 1x M6X8ISO7380

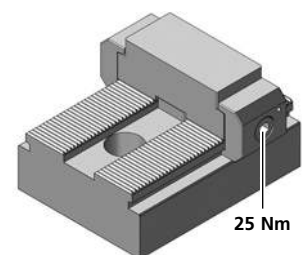
X = 61
H = 25
Y = 50
kg ~1,0



PT-F61-25X30

- 1x TF140636
- 1x PCSP30R
- 1x PCSP30L
- 1x PCS14
- 1x PCGU2049
- 1x M6X8ISO7380

X = 61
H = 25
Y = 30
kg ~0,6



Bestellbeispiel / Ordering example: PT-F80-30X60

Rohlingsmodule Blank module

PR94-49SET

PR125-49SETALU

PT-F132-34RDSET

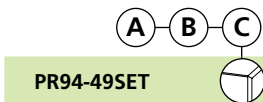
PR94-39-50SET

PR150-49SET

PR125-49SET



powerCLAMP



PR94-49SET

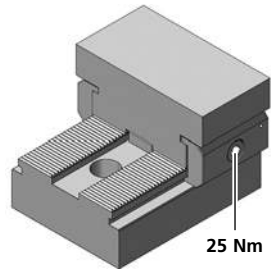
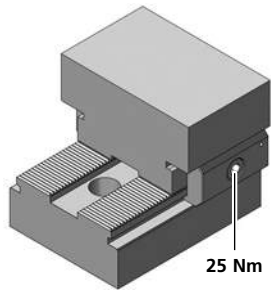
- 1x PR94-49
- 1x PCSP50R
- 1x PCSP50L
- 1x PCS14
- 1x PCGU2049
- 1x M6X8ISO7380

X = 94

H = 49

Y = 60,4

kg ~2,3



PR94-39-50SET

- 1x PR94-39-50

X = 94

H = 39

Y = 50,4

kg ~1,6

PR125-49SET

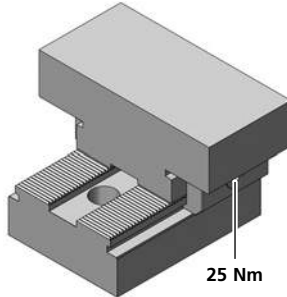
- 1x PR125-49

X = 125

H = 49

Y = 60,4

kg ~2,7



PR125-49SETALU

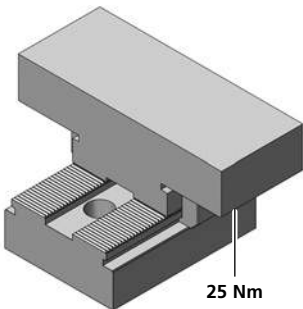
- 1x *PR125-49ALU

X = 125

H = 49

Y = 60,4

kg ~0,83



PR150-49SET

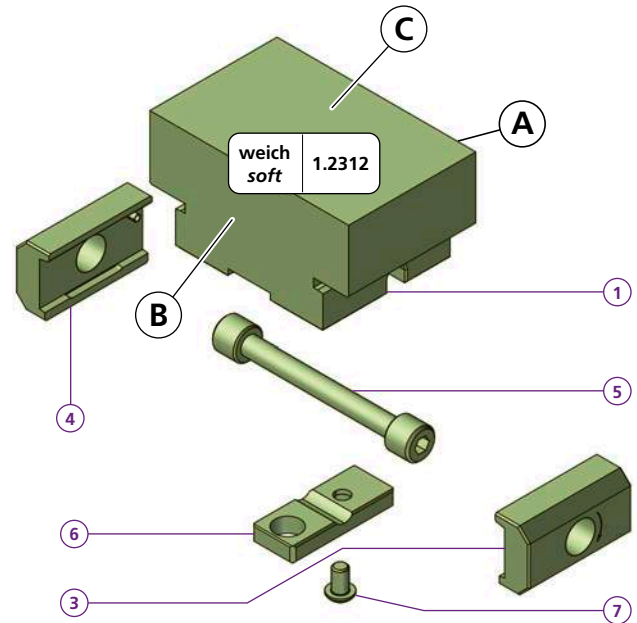
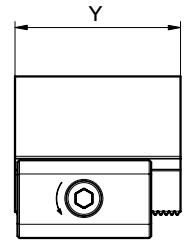
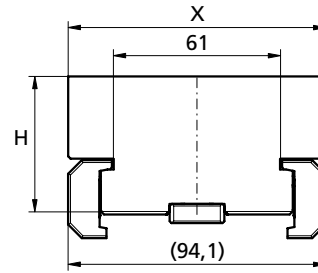
- 1x PR150-49

X = 150

H = 49

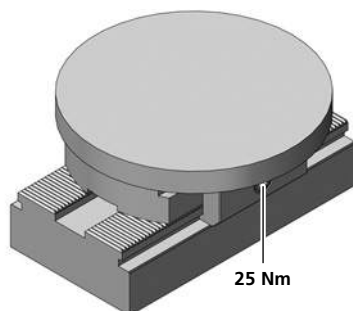
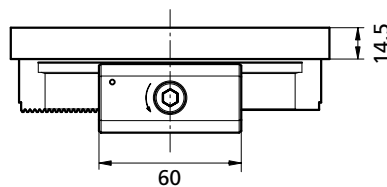
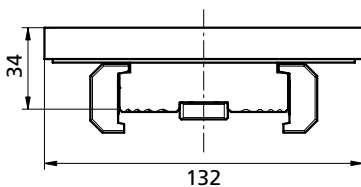
Y = 60,4

kg ~3,1



* ALU = ENAW-7022

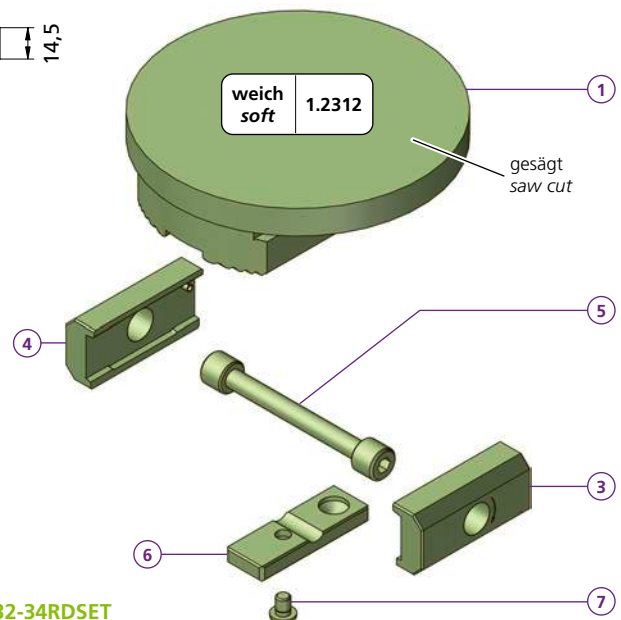
Bestellbeispiel / Ordering example: PR94-49SET



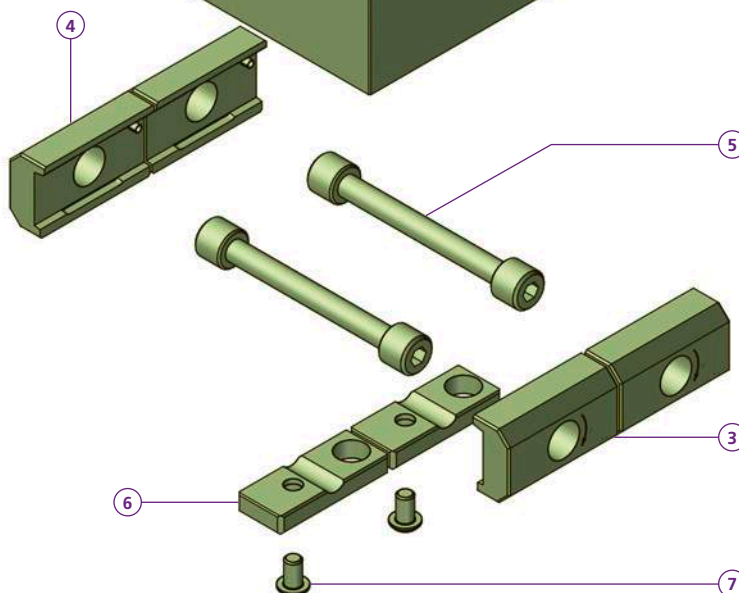
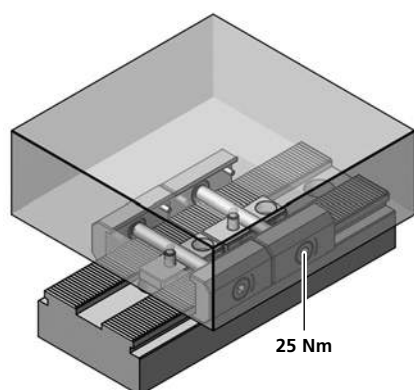
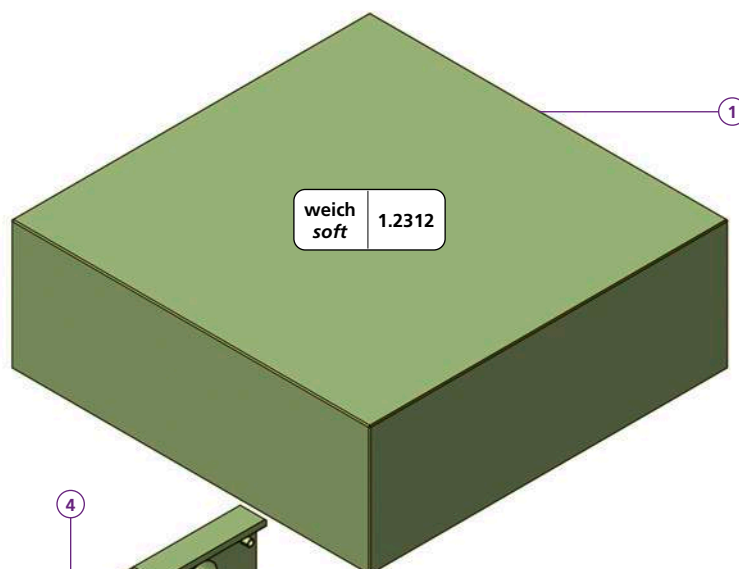
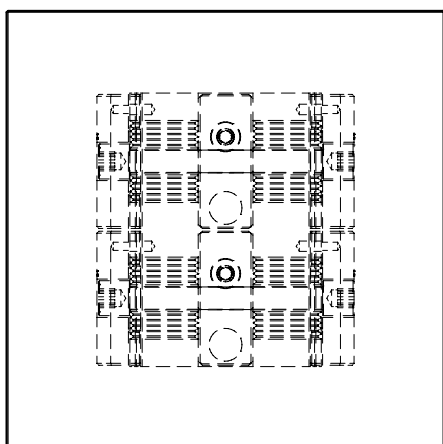
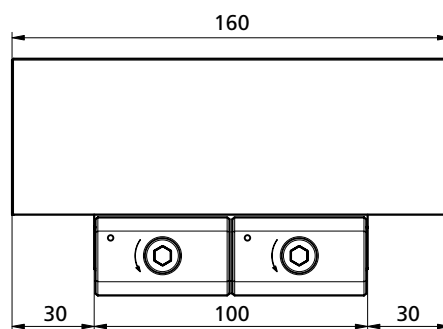
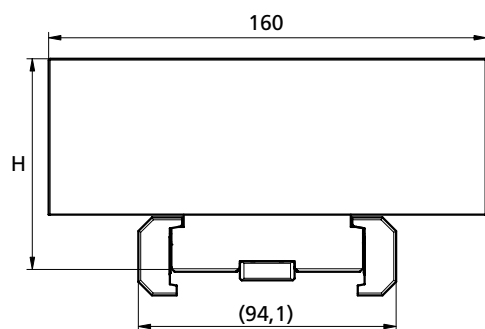
PT-F132-34RDSET

- 1x PT-F132-34RD
- 1x PCSP60R
- 1x PCSP60L
- 1x PCS14
- 1x PCGU2059
- 1x M6X8ISO7380

kg ~3,1



Bestellbeispiel / Ordering example: PT-F132-34RDSET

**PTX160-57S**

- ① 1x TH130539
- ③ 2x PCSP50R
- ④ 2x PCSP50L
- ⑤ 2x PCS14
- ⑥ 2x PCGU2049
- ⑦ 2x M6X8ISO7380

H = 57

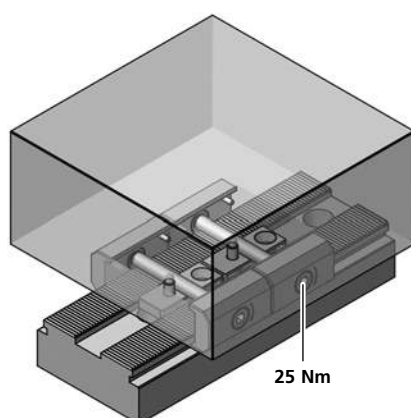
kg ~9

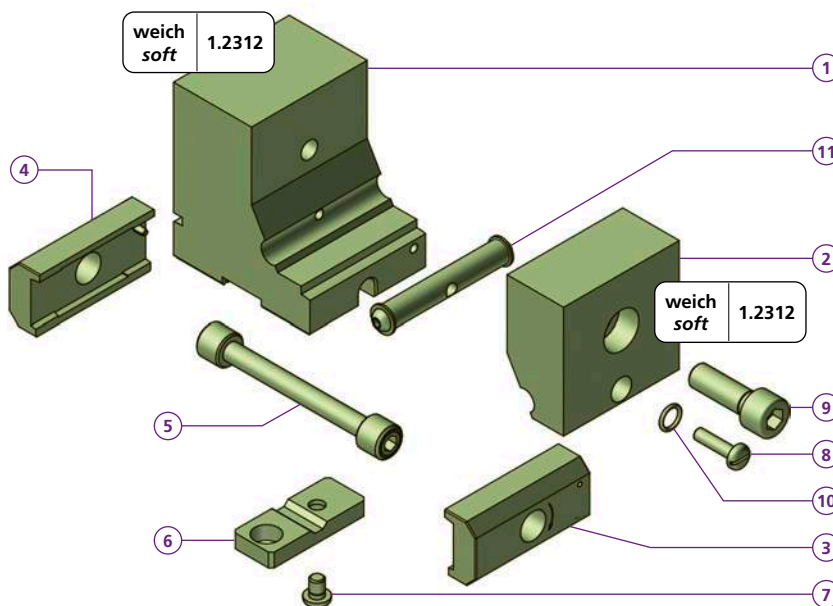
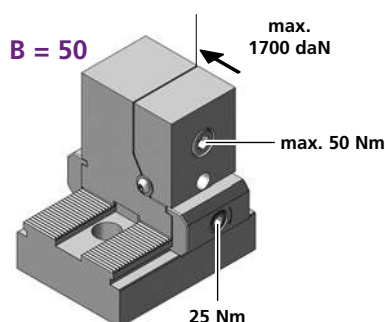
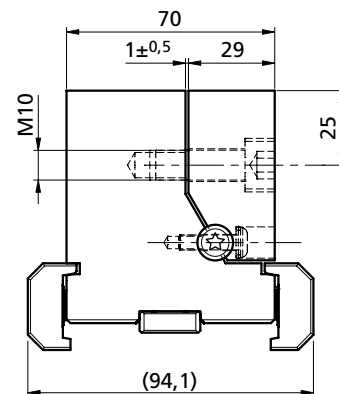
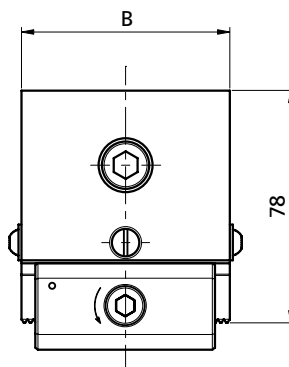
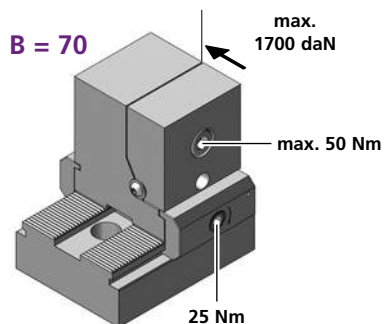
PTX160-77S

- ① 1x TH130723

H = 77

kg ~13

Bestellbeispiel / Ordering example: **PTX160-57S**



PS1X70L78ST

- 1 1x PRS7078AST
- 2 1x PRS7078SST
- 3 1x PCSP60R
- 4 1x PCSP60L
- 5 1x PCS14
- 6 1x PCGU2049
- 7 1x M6X8ISO7380
- 8 1x M5X20BN1362
- 9 1x M10X30ISO4762
- 10 1x OR Ø 8x1,5
- 11 1x PRS7078G
- B = 70
- kg ~3,2

PS1X50L78ST

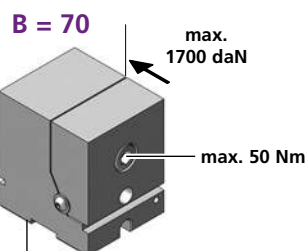
- 1 1x PRS5078AST
- 2 1x PRS5078SST
- 3 1x PCSP50R
- 4 1x PCSP50L
- 11 1x PRS5078G
- B = 50
- kg ~2,3

PRS70L78ST

- 1 1x PRS7078AST
- 2 1x PRS7078SST
- 11 1x PRS7078G
- B = 70
- kg ~2,8

PRS50L78ST

- 1 1x PRS5078AST
- 2 1x PRS5078SST
- 11 1x PRS5078G
- B = 50
- kg ~2,0



PRS = Rohlingsmodul ohne Spannpratzen
 Blank module side clamp

Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1'760	0,8
30	22,2	= 1'200	2'650	1,2
40	29,6	= 1'600	3'530	1,6



Spannbacken Rohling auf Kundenwunsch angepasst
 Jaw blank machined to customer specification

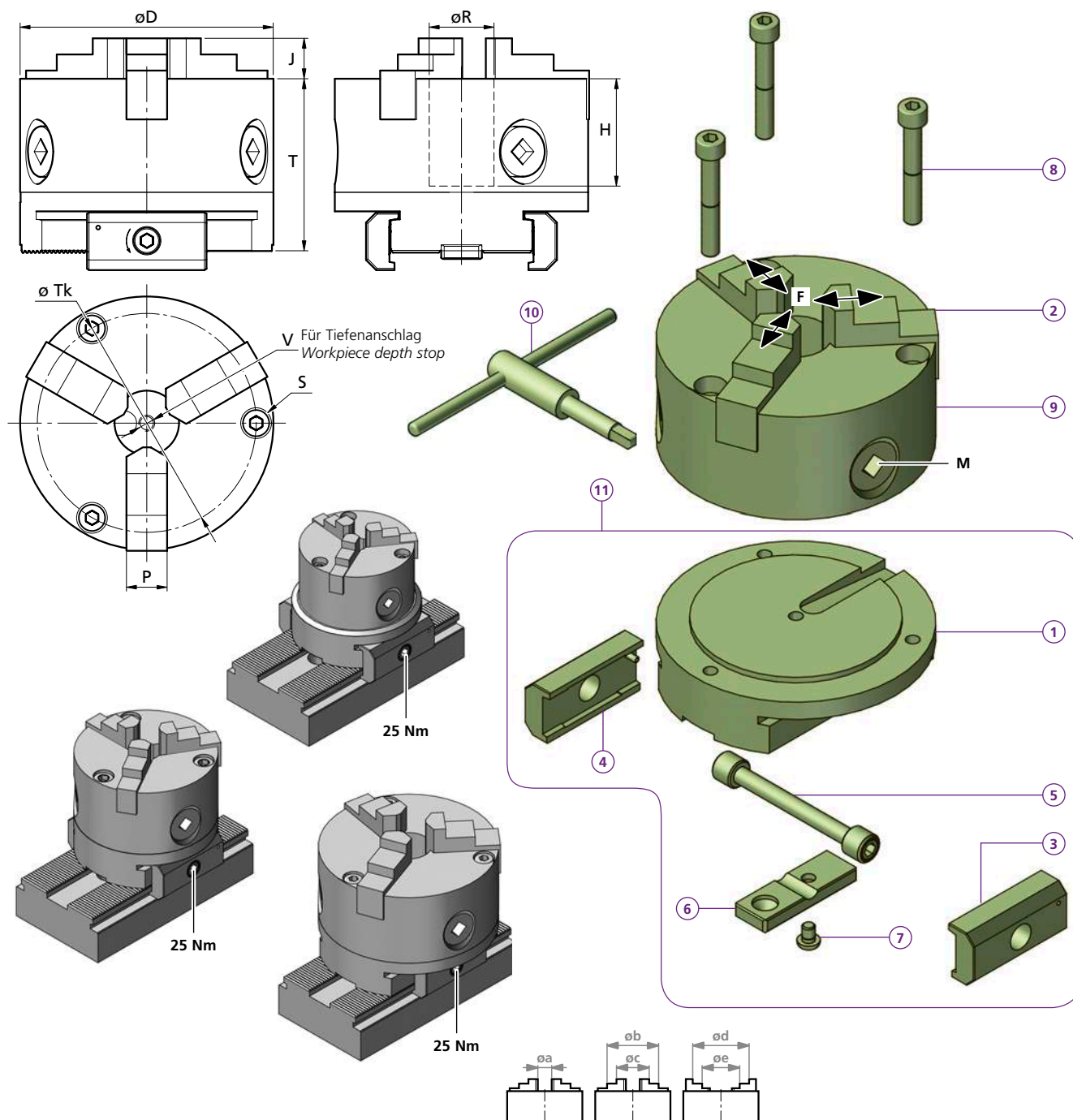
Bestellbeispiel / Ordering example: PS1X70L78ST

Dreibackenfutter Three jaw chuck

PS3X80L75BSET
PS3X100L82BSET
PS3X125L87BSET



powerCLAMP



	D	J	T	R	H	P	V	a mm	b mm	c mm	d mm	e mm	M (max.)	F (max.)	$\varnothing T_k$	S
PS3X80L75BSET	80	13	75	15	42,5	10	M6	3...27	48...73	23...48	52...76	27...51	28 Nm	1300 daN	67	M6
PS3X100L82BSET	100	17	82	20	49,5	14	M8	3...39	58...94	24...60	64...100	30...66	38 Nm	1600 daN	83	M8
PS3X125L87BSET	125	19	87	32	55	16	M8	3...49	70...116	30...75	83...125	38...84	55 Nm	2600 daN	108	M8

PS3X80L75BSET	
1	1x TW090013_01
2	2x 3 Stk. / pcs
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGU2059
7	1x M6X8ISO7380
8	3x M6X45ISO4762
9	1x 243809.0083220
10	1x 243864.0080000
11	PTX80-30
kg	~2,8

PS3X100L82BSET	
1	1x TW090012_01
2	2x 3 Stk. / pcs
8	3x M8X50ISO4762
9	1x 243809.0103220
10	1x 243864.0100000
11	PTX100-30
kg	~4,3

PS3X125L87BSET	
1	1x TW080027_01
2	2x 3 Stk. / pcs
8	3x M8X55ISO4762
9	1x 243809.0123220
10	1x 243864.0120000
11	PTX125-29
kg	~6,3

$\varnothing$ 80 100 125	243849.0083200 243849.0103200 243849.0123200	243850.0083200 243850.0103200 243850.0123200	*243834.0083300 *243834.0103300 *243834.0123300
 $\varnothing 3 - 49$	 $\varnothing 38 - 125$	 3x *Weich Soft 16MnCr5	

Bestellbeispiel / Ordering example: PS3X125L87BSET

Separat bestellen / Order separately

PS1X50N62-ER32

Ø 1 - 22 mm

PS1X50N100-ER32

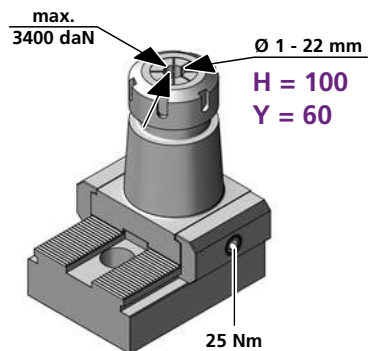
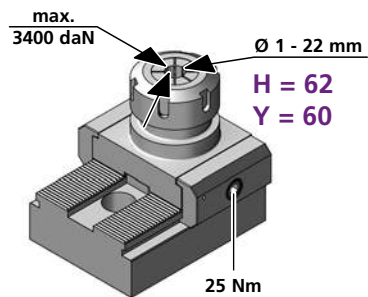
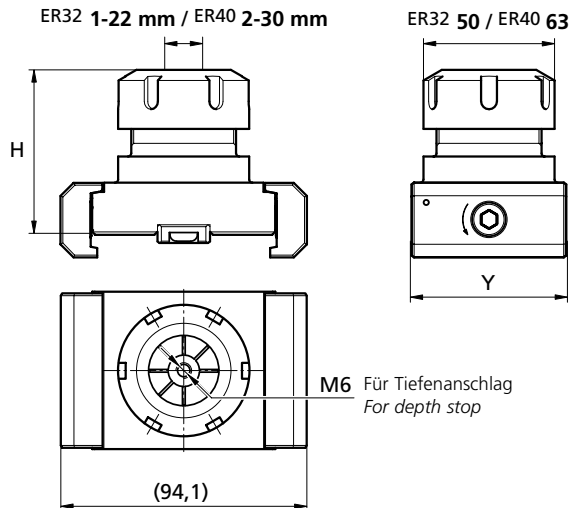
Ø 1 - 22 mm

PS1X63N100-ER40

Ø 2 - 30 mm



powerCLAMP



PS1X50N62-ER32

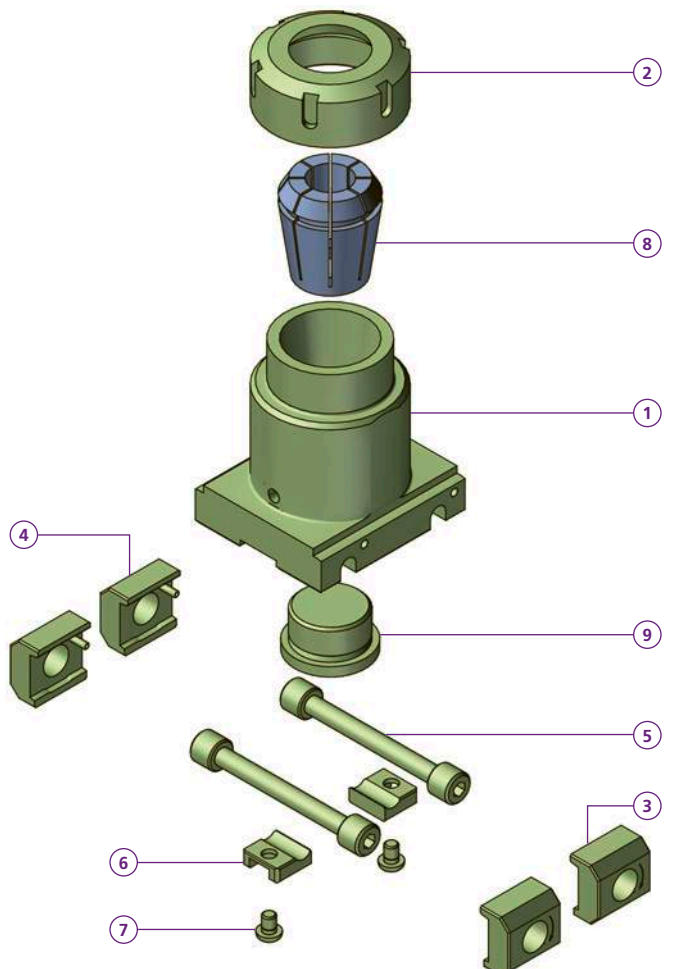
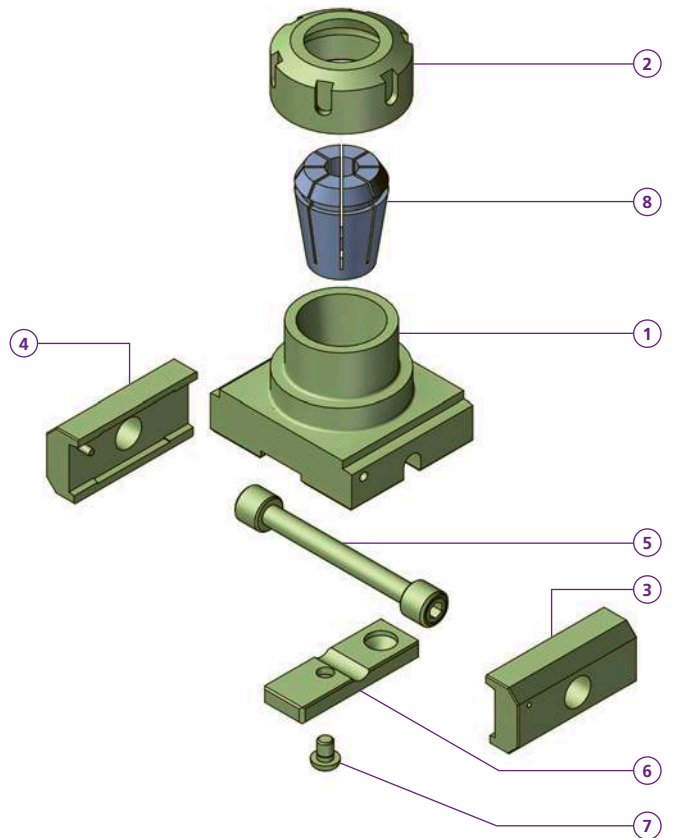
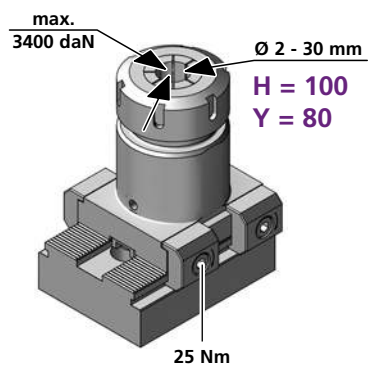
- 1x TW090089-01
 - 1x ER32
 - 1x PCSP60R
 - 1x PCSP60L
 - 1x PCS14
 - 1x PCGU2059
 - 1x M6X8ISO7380
 - 1x ER/ESX32
- H = 62
Y = 60
kg ~1,3

PS1X50N100-ER32

- 1x TW090047-01
- H = 100
Y = 60
kg ~2,2

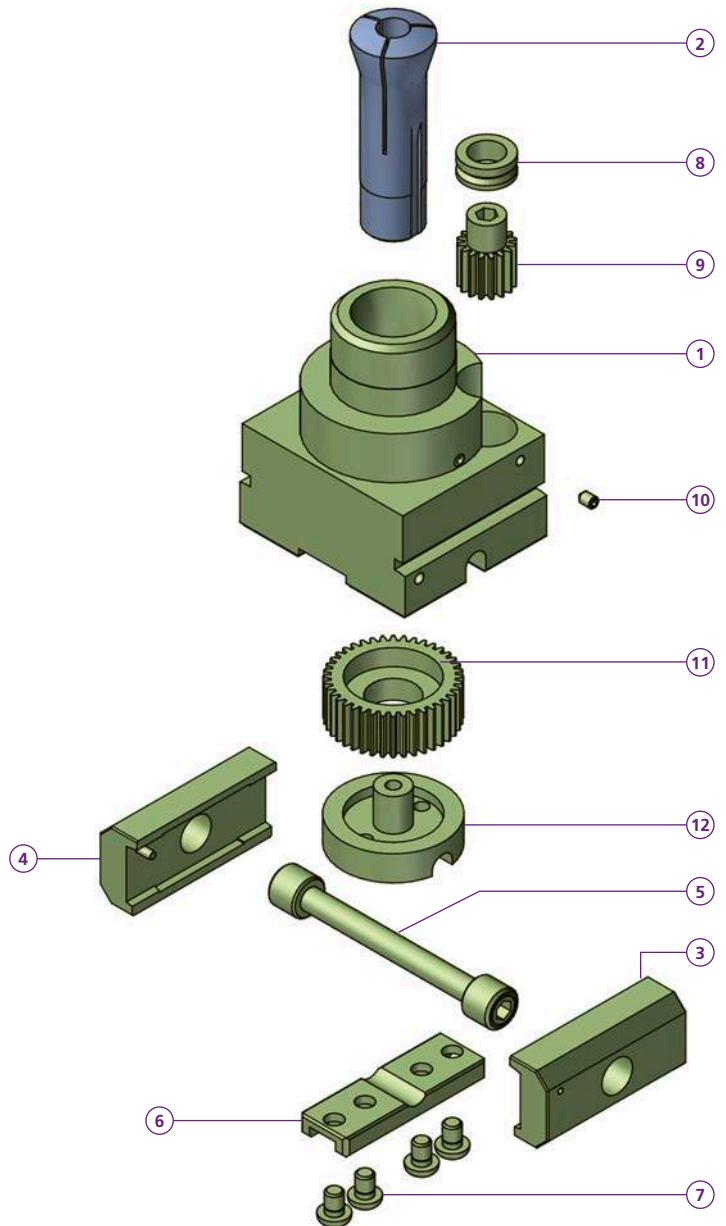
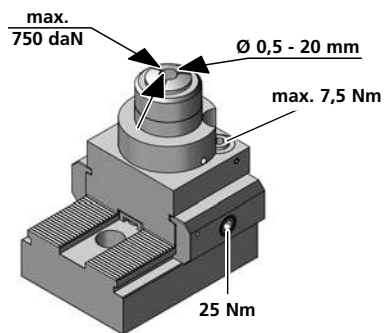
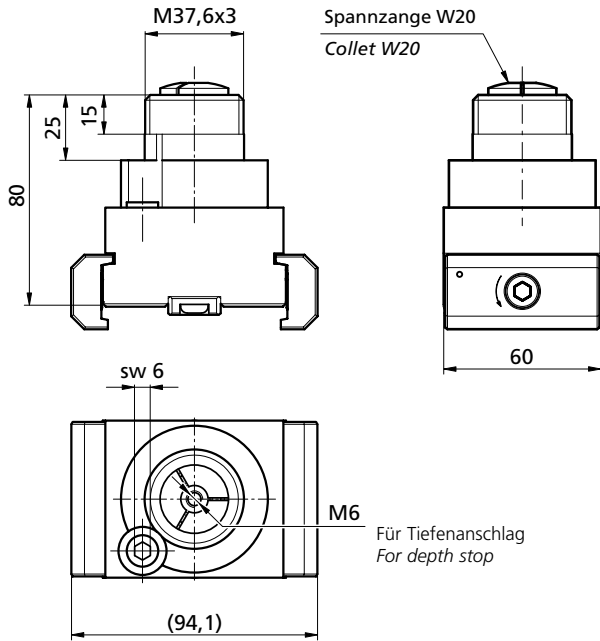
PS1X63N100-ER40

- 1x TW110026-01
 - 1x ER40
 - 2x PCSP30R
 - 2x PCSP30L
 - 2x PCS14
 - 2x PCGU2020
 - 2x M6X8ISO7380
 - 1x ER/ESX40
 - 1x M33x2 DIN908
- H = 100
Y = 80
kg ~2,3

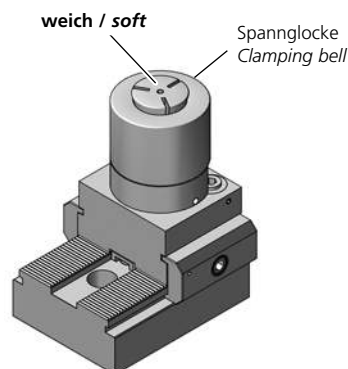


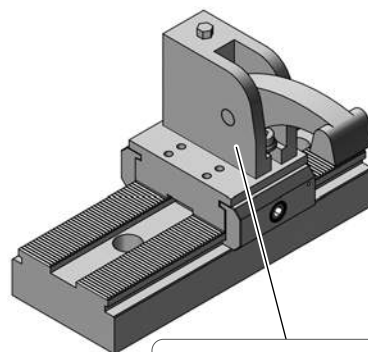
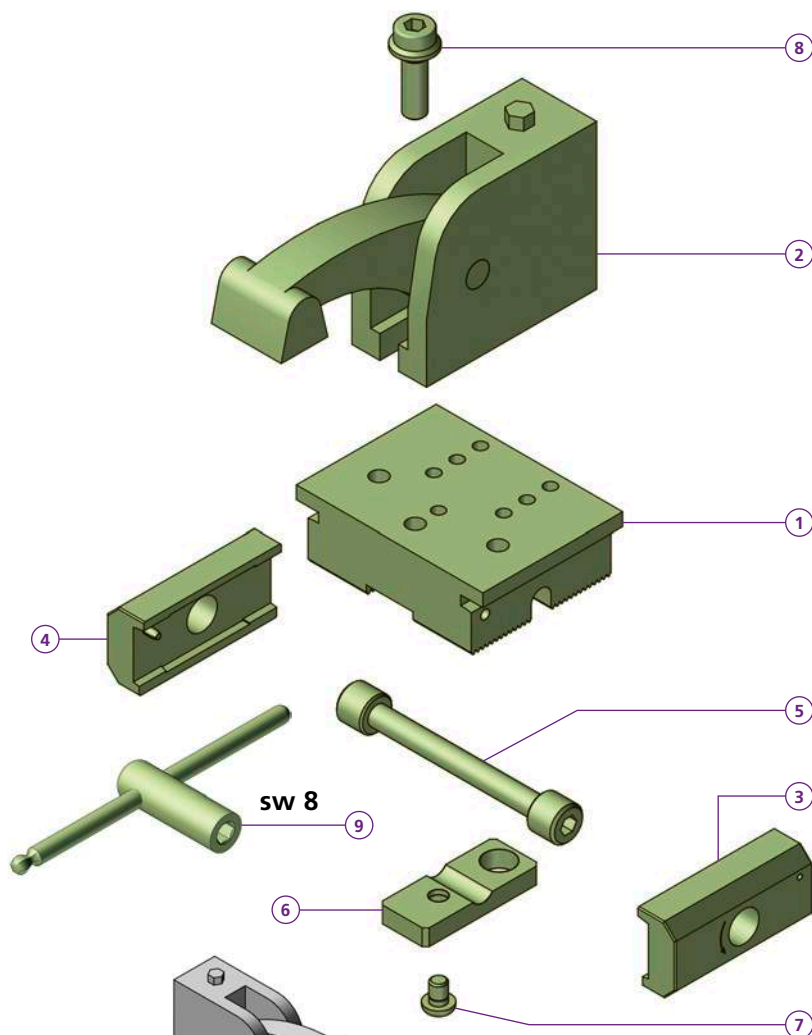
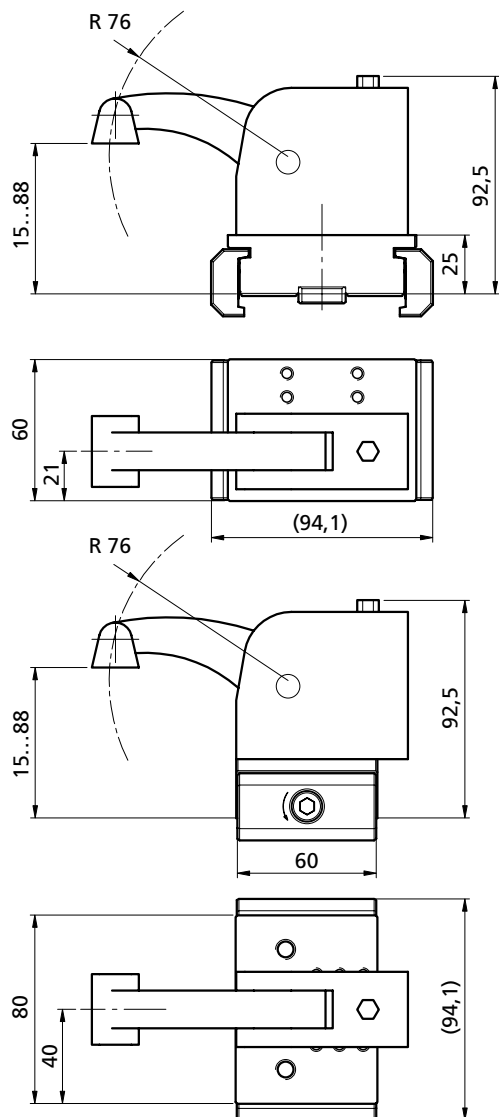
Bestellbeispiel / Ordering example: 1x PS1X 50N62 -ER32 & 1x ER32

Separat bestellen / Order separately

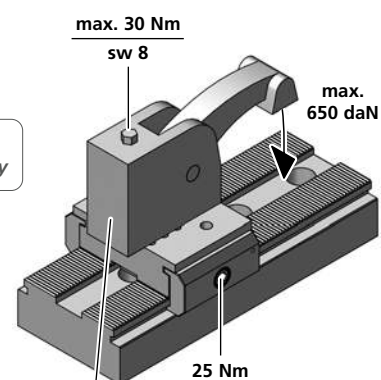


PS1X68N80-W20	
1	1x TW080018-01
2	1x W20
3	1x PCSP60R
4	1x PCSP60L
5	1x PCS14
6	1x PCGUW20
7	4x M6X8ISO7380
8	1x PCD1808
9	1x PCRZ1825
10	1x M4X6ISO4027
11	1x PCZM4215
12	1x PCABD4221
kg	~1,8





Spanner quer montiert
Clamp mounted transversely



Spanner längs montiert
Clamp mounted longitudinally



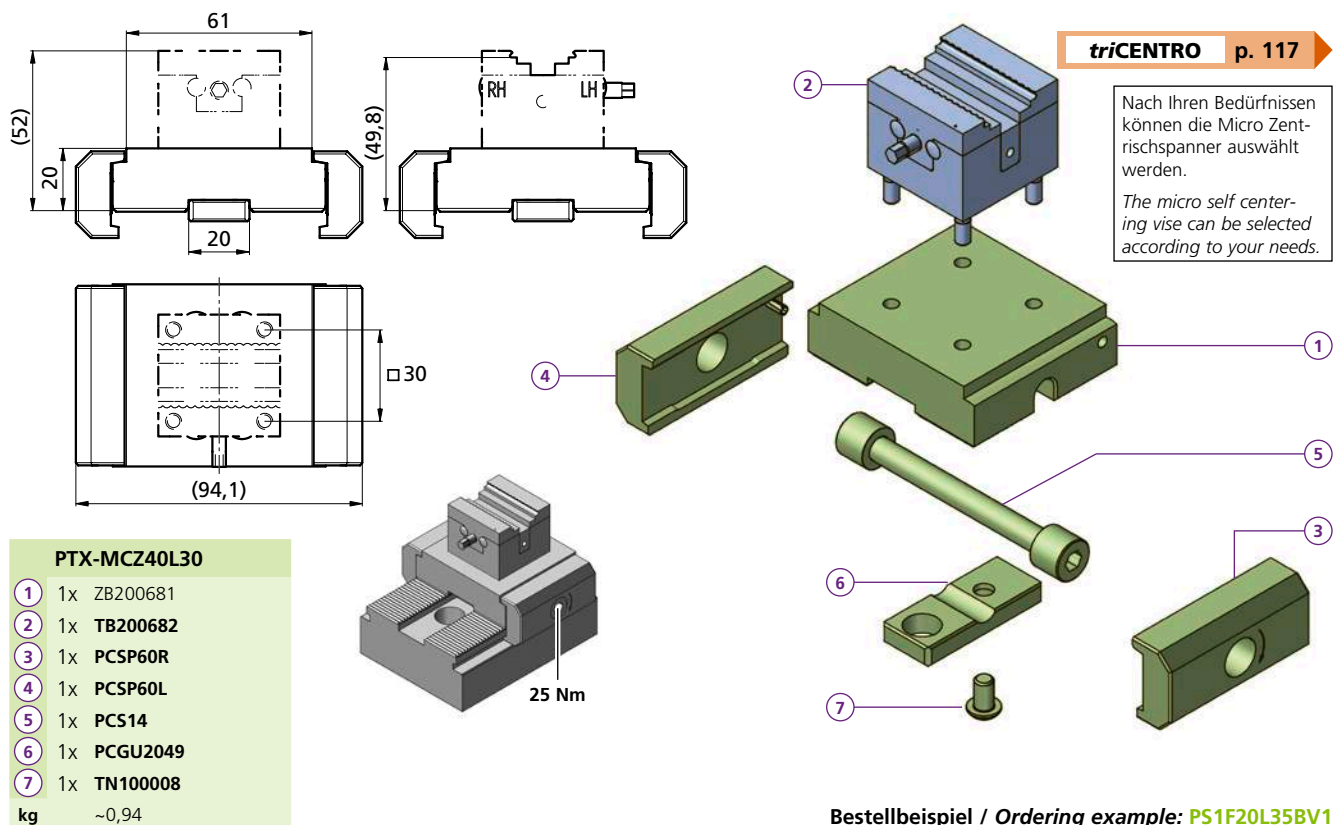
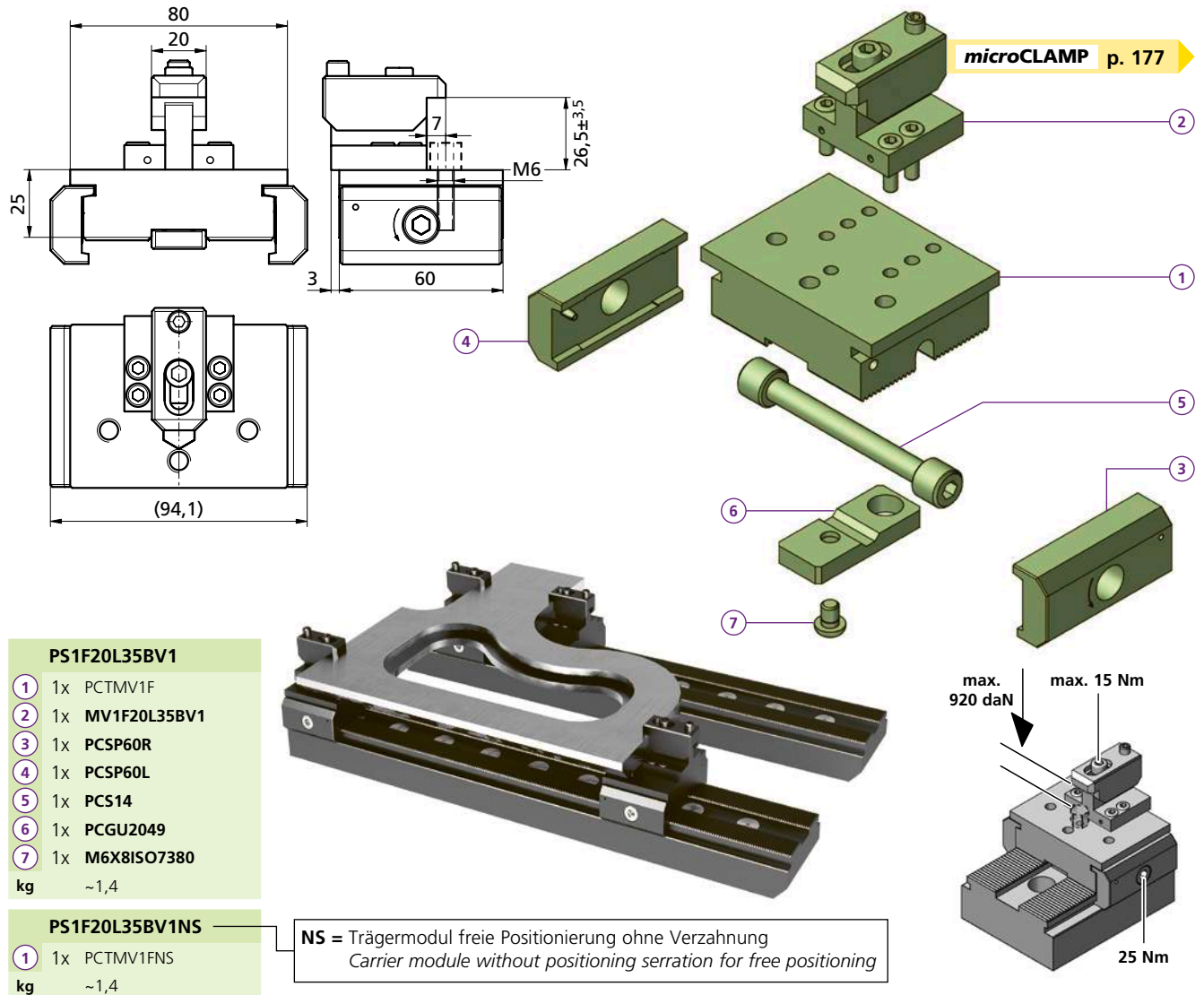
NS = Trägermodul freie Positionierung ohne Verzahnung
Carrier module without positioning serration for free positioning

PS1F-KLD1

- 1 1x PCTMV1F
- 2 1x 07-020
- 3 1x PCSP60R
- 4 1x PCSP60L
- 5 1x PCS14
- 6 1x PCGU2049
- 7 1x M6X8ISO7380
- 8 1x M8x25 TW080012-02
- 9 1x 07-180
- kg ~2,1

PS1F-KLD1NS

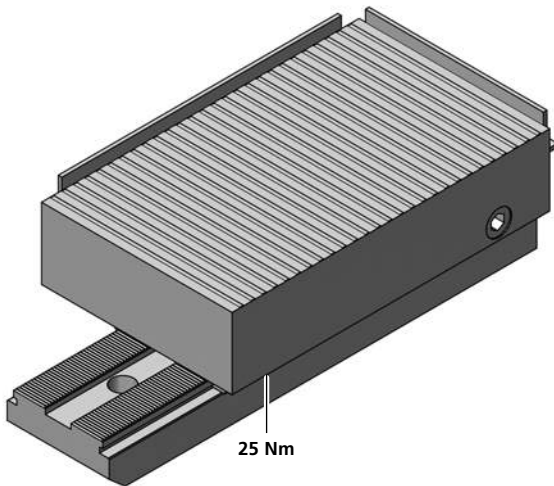
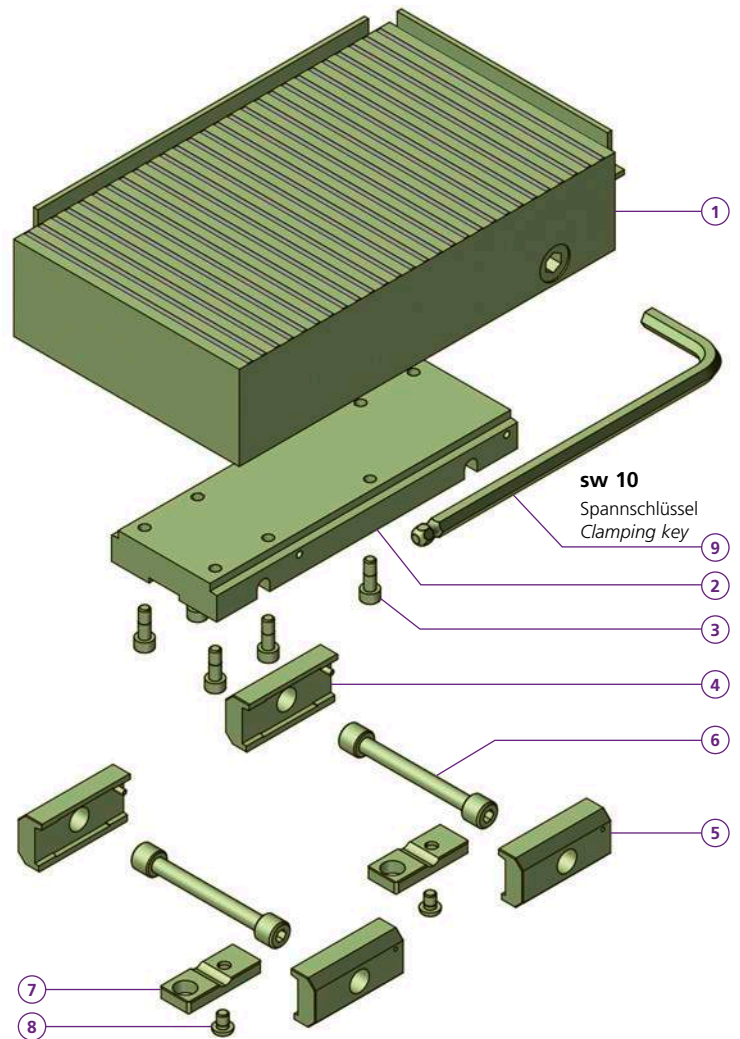
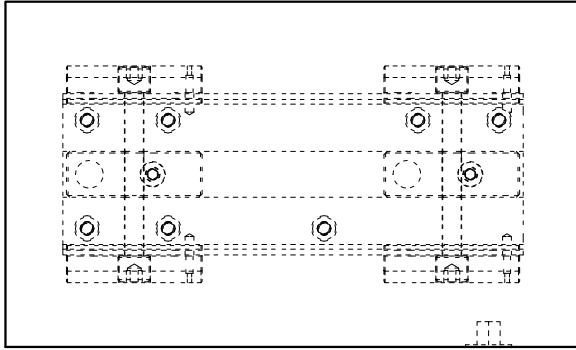
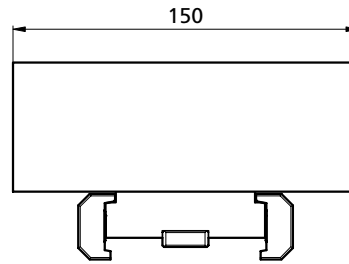
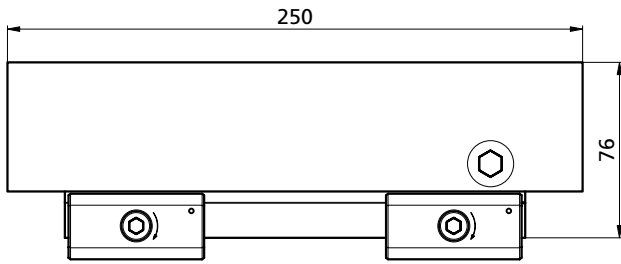
- 2 1x PCTMV1FNS
- kg ~2,1



Magnetspannplatte Magnetic chuck

PS1X150L60-250MAG11

powerCLAMP

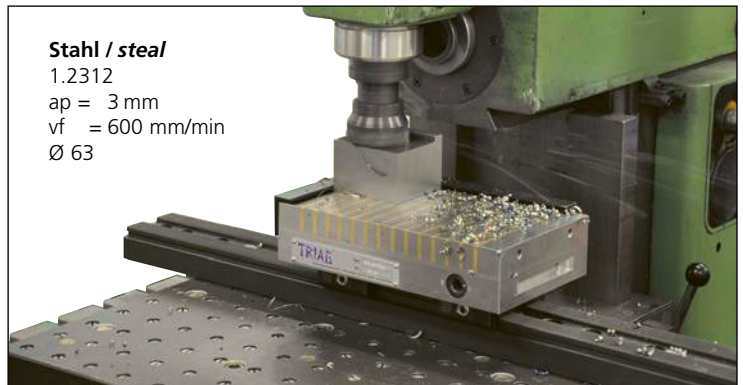


PS1X150L60-250MAG11

- | | |
|----|---------------------|
| 1 | 1x XNeomill 250x150 |
| 2 | 1x TL110010-01 |
| 3 | 7x MS60 |
| 4 | 2x PCSP60L |
| 5 | 2x PCSP60R |
| 6 | 2x PCS14 |
| 7 | 2x PCGU2049 |
| 8 | 2x M6X8ISO7380 |
| 9 | 1x ISL10 DIN 911L |
| kg | ~19,5 |

Stahl / steel

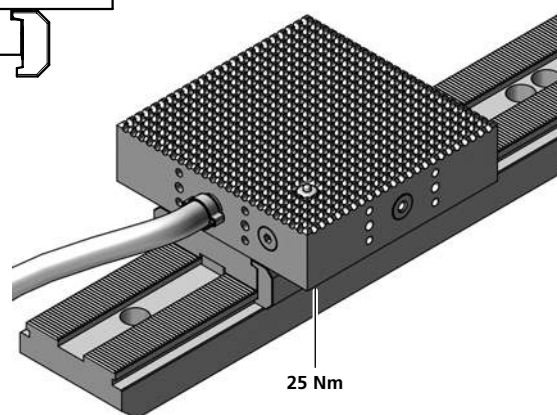
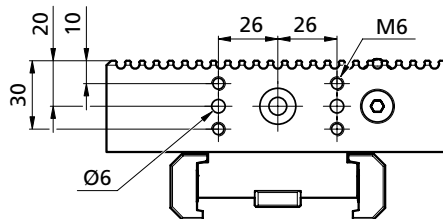
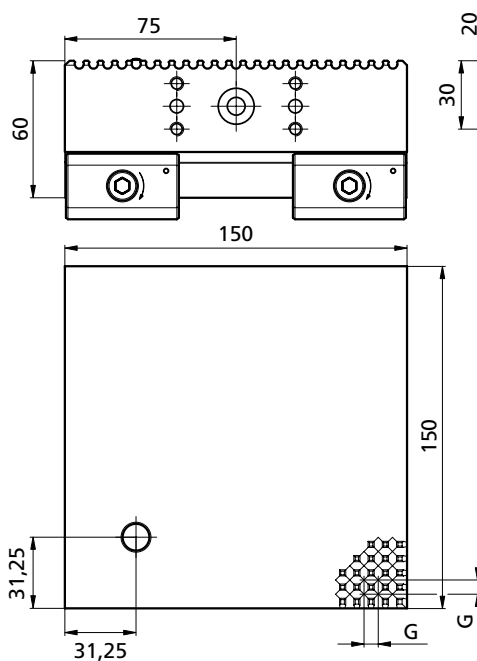
1.2312
ap = 3 mm
vf = 600 mm/min
Ø 63



max. Haltekraft / max. holding force = 120 N/cm²

- Werkstücke ab 26 mm Länge und 6 mm Stärke werden optimal gespannt
- Workpieces from 26 mm length and 6mm thickness will be optimally hold

Bestellbeispiel / Ordering example: PS1X150L60-250MAG11



Bestellbeispiel / Ordering example: **PS1X150L60-VAC**

Mehr Informationen siehe Vacuum
 For more information check the vacuum workholding

trivaCLAMP p. 318

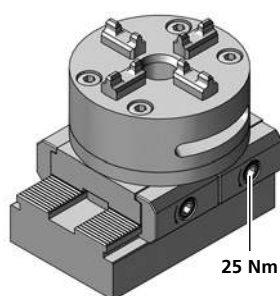
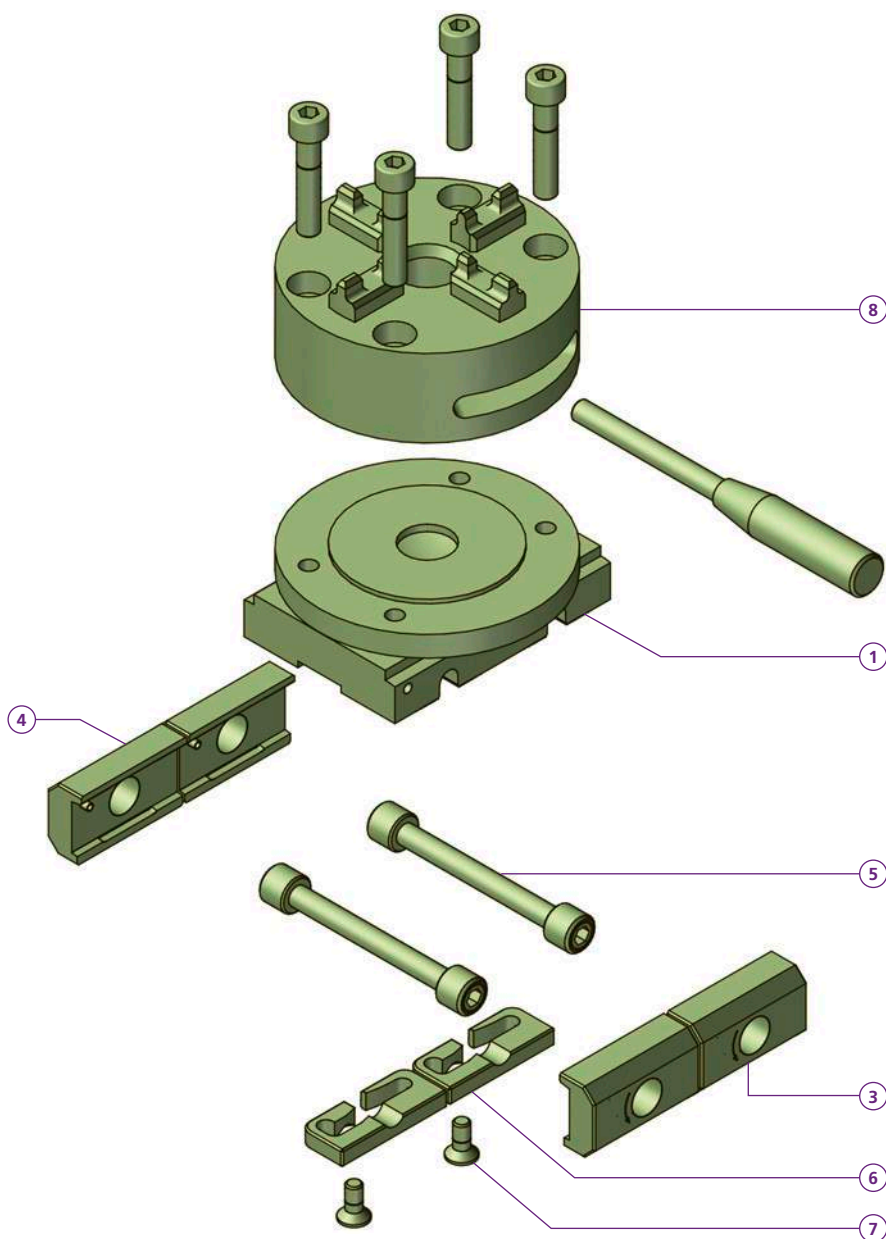
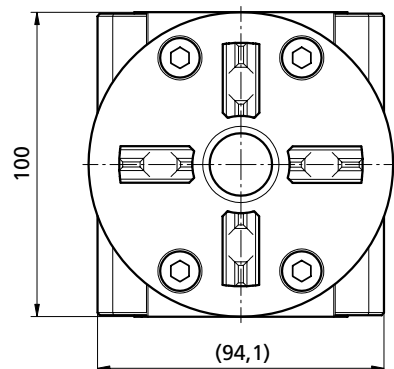
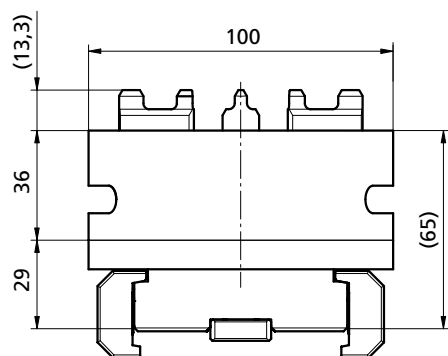
ZSM170L65GH200PCB

Mehr Informationen siehe Zentrischspanner
 For more information check the self centring vise p. 146, 151

PCZ100L50

Mehr Informationen siehe Zentrischspanner
 For more information check the self centring vise p. 126 - 127

triCENTRO p. 113 - 152

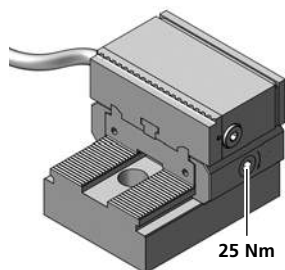
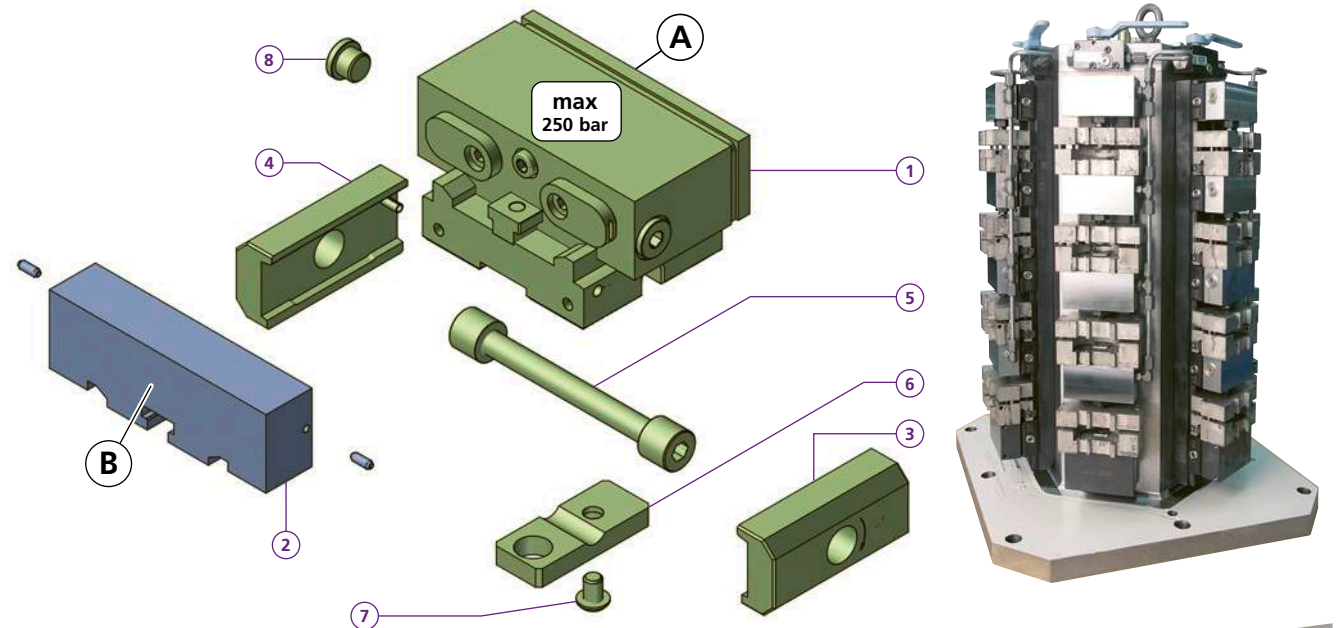
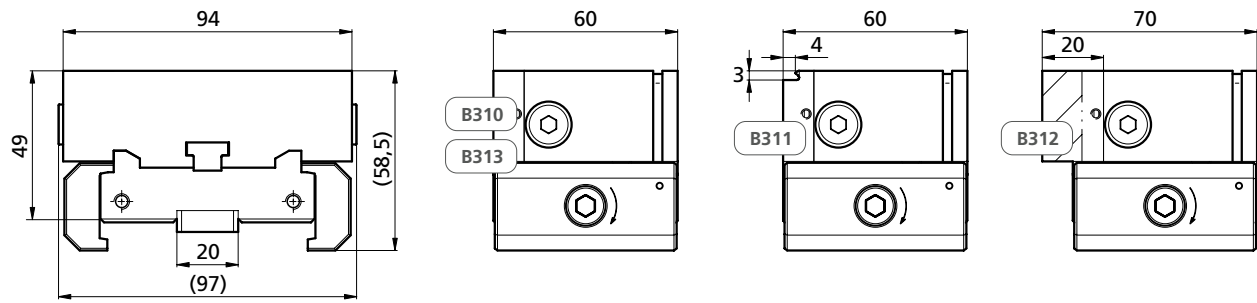


PS1X100-65ER-036345

- 1x PTX100-29
- 2x PCSP50L
- 2x PCSP50R
- 2x PCS14
- 2x PCGU2049F
- 2x M6X14ISO10642
- 1x ER-036345

kg ~4,0

Bestellbeispiel / Ordering example: PS1X100-65ER-036345



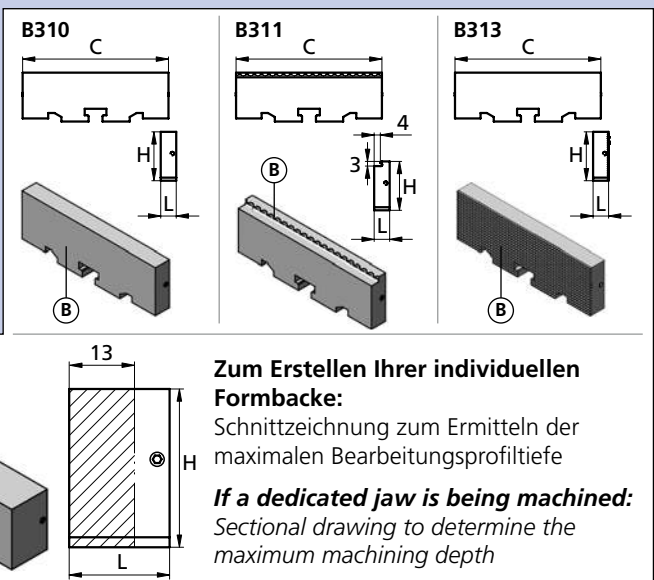
Ölvolumen / Oil volume			
Spannen / Clamping			
8 cm ³			
5 mm Hub / Stroke			
bar	~daN	~(lb)	~t
100	= 960	2116	0,96
150	= 1'440	3175	1,44
200	= 1'920	4233	1,92
250	= 2'400	5291	2,4



Bestellbeispiel / Ordering example: **PSH1X94L49-310** & 1 x **B310**

	B310	B311	B312	B313
C	94	94	94	94
H	31,5	31,5	31,5	31,5
L	10	10	20	10
i	HV700 x0,2mm	57HRC	*	HV700 x0,2mm
kg	~0,18	~0,17	~0,39	~0,17

PSH1X94L49-310	A
1x ZF191349	
1x	
1x PCSP60R	
1x PCSP60L	
1x PCS14	
1x PCGU2049	
1x M6X8ISO7380	
2x TN100014	
kg	~1,94

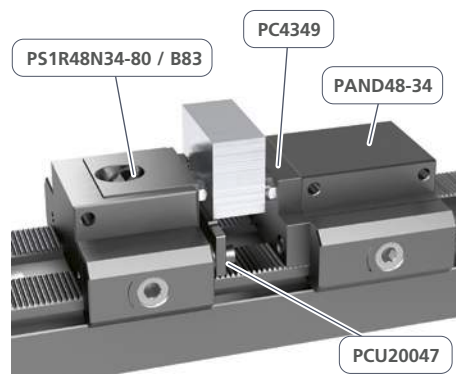
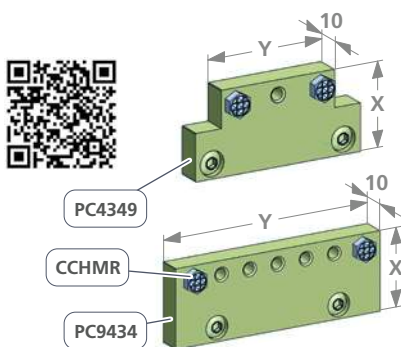


* = weich / soft (1.7225 Vergütungsstahl / Tempering steel)



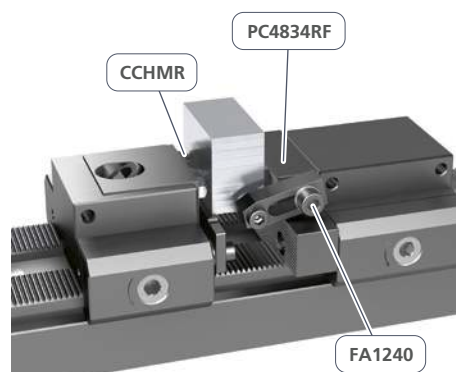
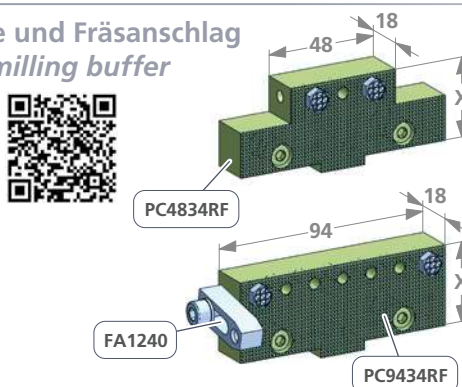
für Hartmetalldruckstücke
for carbide grippers

Art. Nr.	kg	Y	X
PC4349	~0,21	43	49
PC4834	~0,17	48	34
PC9434	~0,23	94	34
PC12549	~0,46	125	49



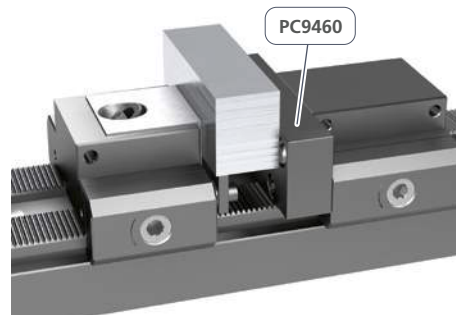
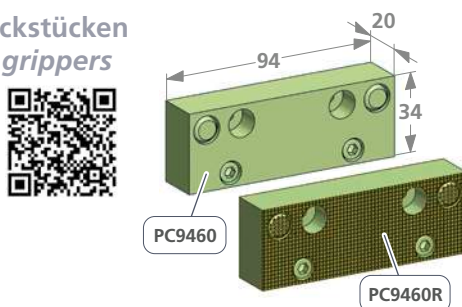
für Hartmetalldruckstücke und Fräsanschlag
for carbide grippers and milling buffer

Art. Nr.	kg	X
PC4834RF	~0,34	34
PC4849RF	~0,44	49
PC9434RF	~0,43	34
PC9449RF	~0,43	49



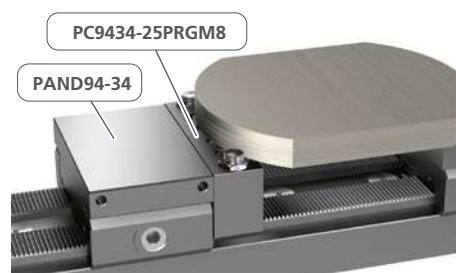
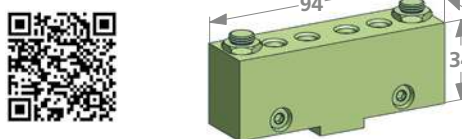
mit pendelnden Kugeldruckstücken
with swinging ball thrust grippers

Art. Nr.	kg
PC9460	~0,45
PC9460R	~0,45



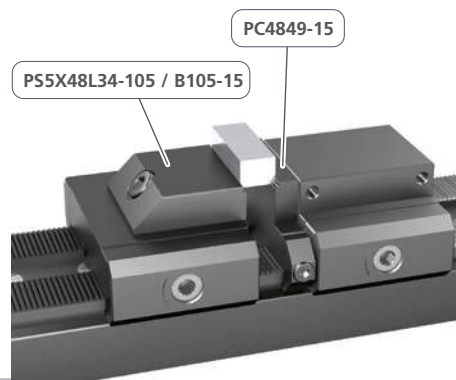
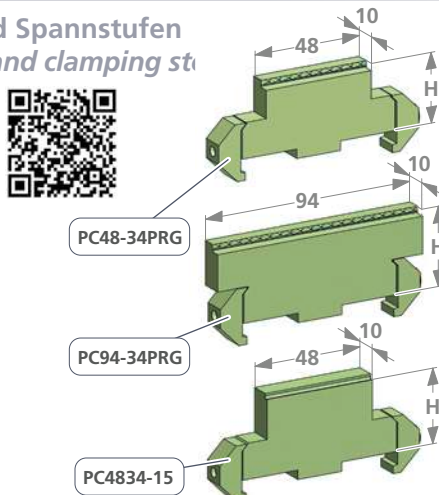
mit Prägeeinsätzen
with embossed inserts

Art. Nr.	kg
PC9434-25PRGM8	~0,64



mit direkt-Prägezähnen und Spannstufen
with direct stamping teeth and clamping steps

Art. Nr.	kg	H
PC48-34PRG	~0,18	34
PC48-49PRG	~0,24	49
PC94-34PRG	~0,25	34
PC94-49PRG	~0,48	49
PC4834-15	~0,19	34
PC4849-15	~0,24	49





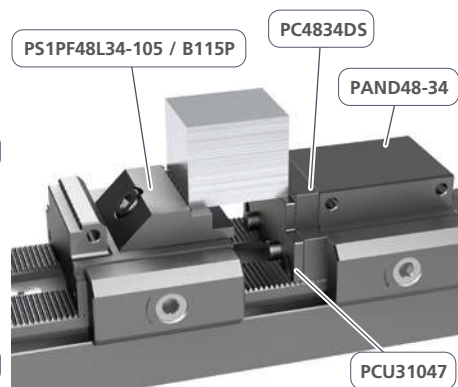
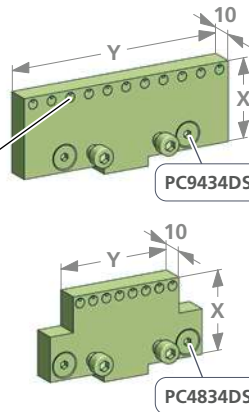
mit Druckstiften
with pressure pins

Art. Nr.	kg	Y	X
PC4349DS	~0,22	43	49
PC4834DS	~0,17	48	34
PC4849DS	~0,23	48	49
PC9434DS	~0,27	94	34
PC9449DS	~0,38	94	49
PC12549DS	~0,49	125	49



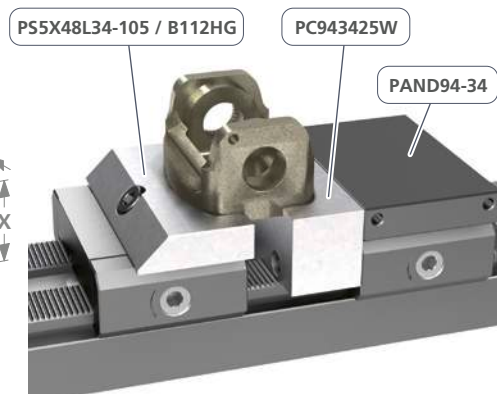
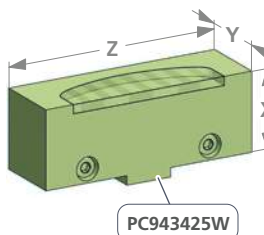
Druckstift
Pressure pin
DSE0402-60°

weitere Druckstücke
more gripping pens
p. 337



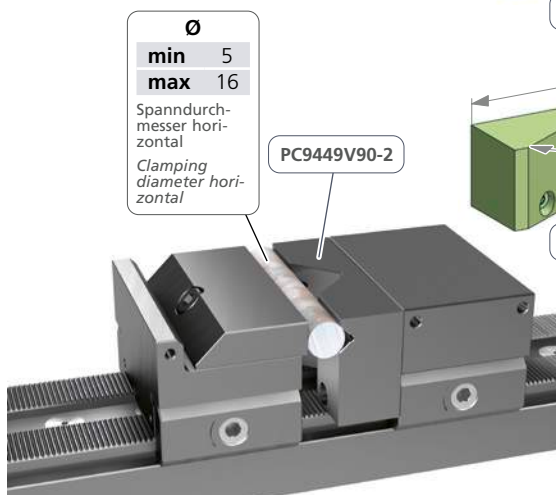
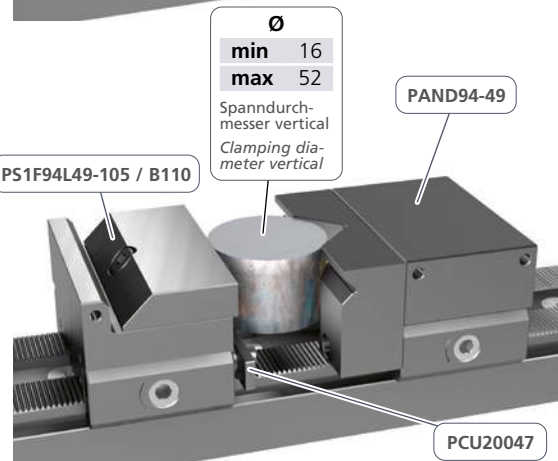
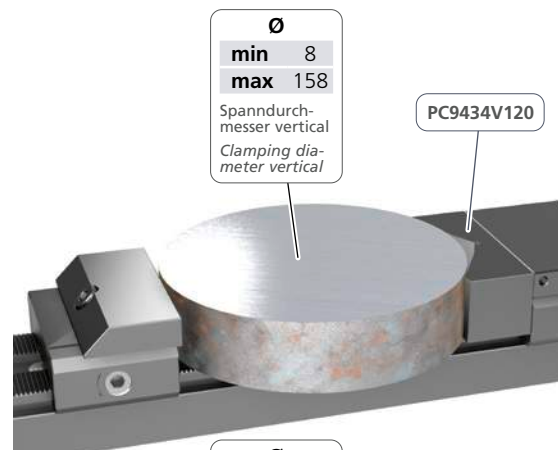
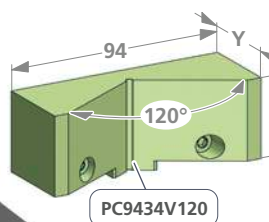
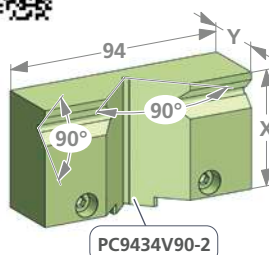
aus weichem Stahl, zur Herstellung Ihrer individuellen Backe
made of soft steel, for the production of your individual clamping jaw

Art. Nr.	kg	Z	Y	X
PC943425W weicher Stahl (1.0570)	~0,64	94	25	34
PC943430W weicher Stahl (1.0570)	~0,77	94	30	34
PC944930W weicher Stahl (1.0570)	~1,10	94	30	49
PC1254930W weicher Stahl (1.0570)	~1,46	125	30	49



in Prismaform
in prism form

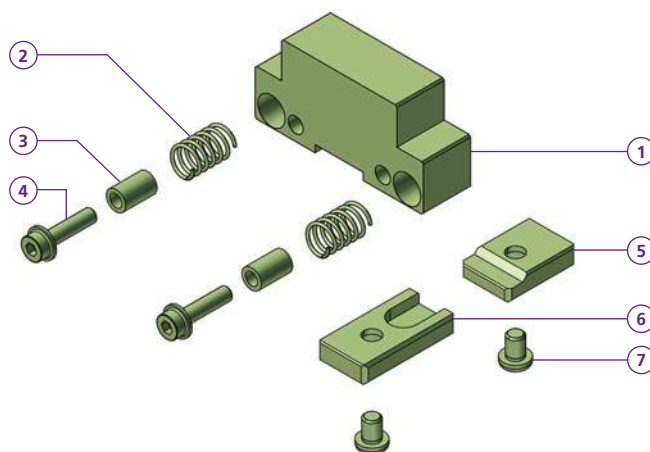
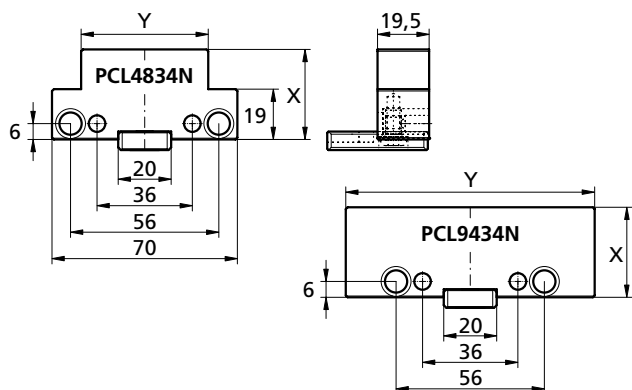
Art. Nr.	kg	Y	X
PC9434V90-2	~0,58	28	34
PC9449V90-2	~0,58	28	49
PC9434V120	~0,62	35	34
PC9449V120	~0,89	35	49





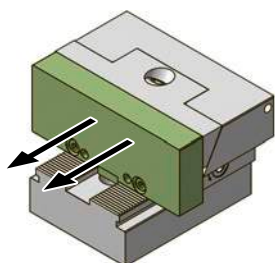
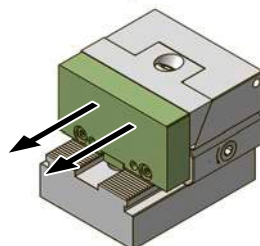
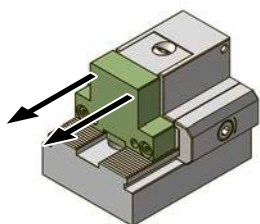
Von Niederzug zu Linear!

From pull down jaws to linear stroke!



PCL4349N

- 1 1x TF140697
- 2 2x FED10175
- 3 2x PCD0813
- 4 2x M5X20BN1392
- 5 1x PCGU2028
- 6 1x PCGU2030LB
- 7 2x M6X8ISO7380
- X = 49
- Y = 43
- kg ~0,43



PCL9449N

- 1 1x TF140700
- X = 49
- Y = 94
- kg ~0,74

PCL12549N

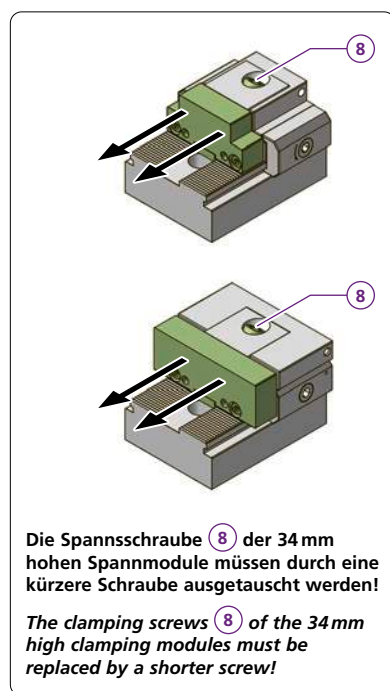
- 1 1x T00317
- X = 49
- Y = 125
- kg ~0,97

PCL4834N

- 1 1x TF140698
- 2 2x FED10175
- 3 2x PCD0813
- 4 2x M5X20BN1392
- 5 1x PCGU2028
- 6 1x PCGU2030LB
- 7 2x M6X8ISO7380
- 8 1x M10X22ISO4762
- X = 34
- Y = 48
- kg ~0,35

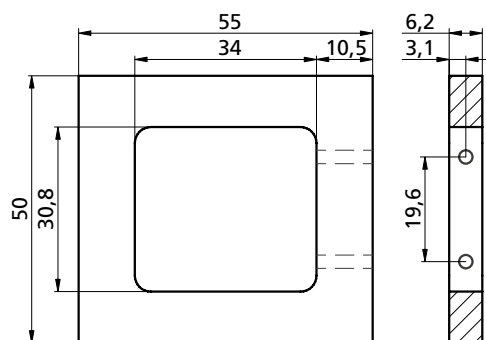
PCL9434N

- 1 1x TF140699
- X = 34
- Y = 94
- kg ~0,52



Bestellbeispiel / Ordering example: PCL4834N

Montagehilfe und Ersatzteile für Linearbacken
Assembling tool for linear jaws and spare parts

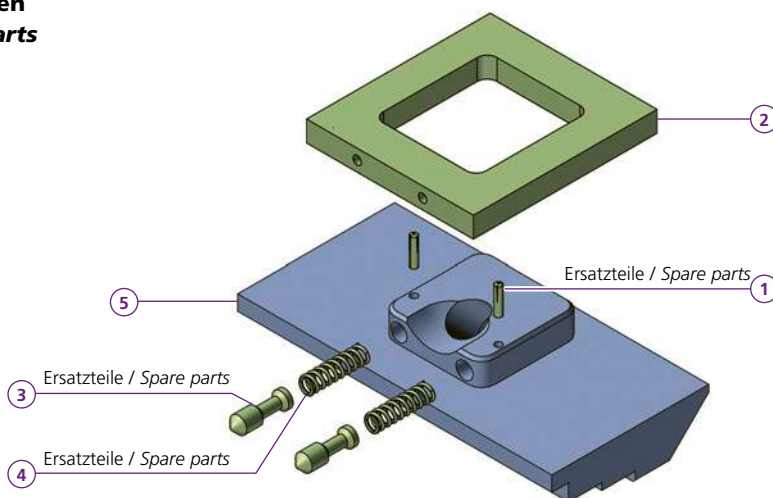


BL-SET

- 1 2x TN100823
- 2 1x TK160609
- 3 2x PCR0516
- 4 2x TN100614
- 5 1x
- kg ~0,08

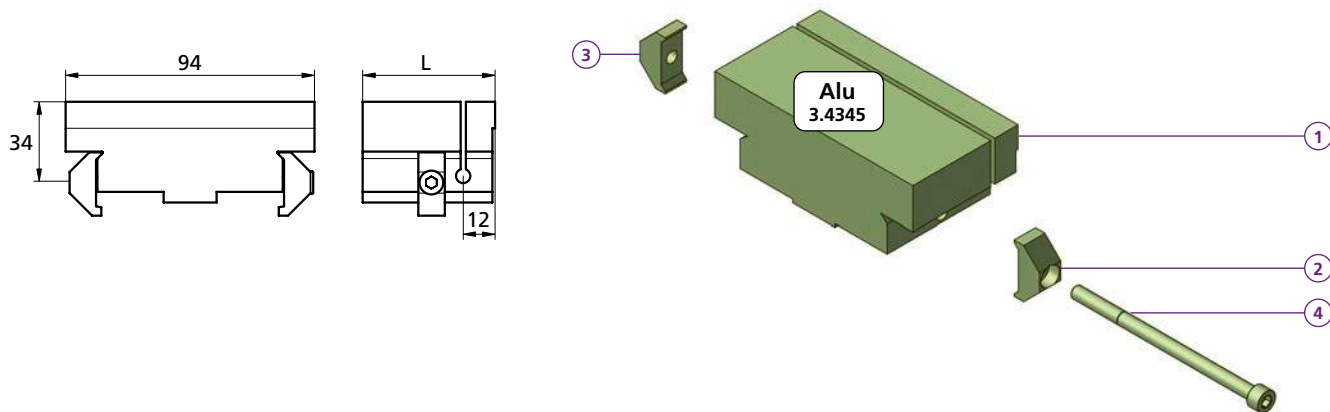
p. 84, 85

Alle Linearbacken
All linear jaws



Montageanleitung siehe Video
Assembly instructions see video





PCFX30

- ① 1x TF140702
- ② 1x PCSP10B
- ③ 1x PCSP10G
- ④ 1x M5X85ISO4762

L = 30
kg ~0,27

PCFX35

- ① 1x TF140703
- L = 35
kg ~0,31

PCFX50

- ① 1x TF140704
- ② 1x PCSP10B
- ③ 1x PCSP10G
- ④ 1x M5X85ISO4762

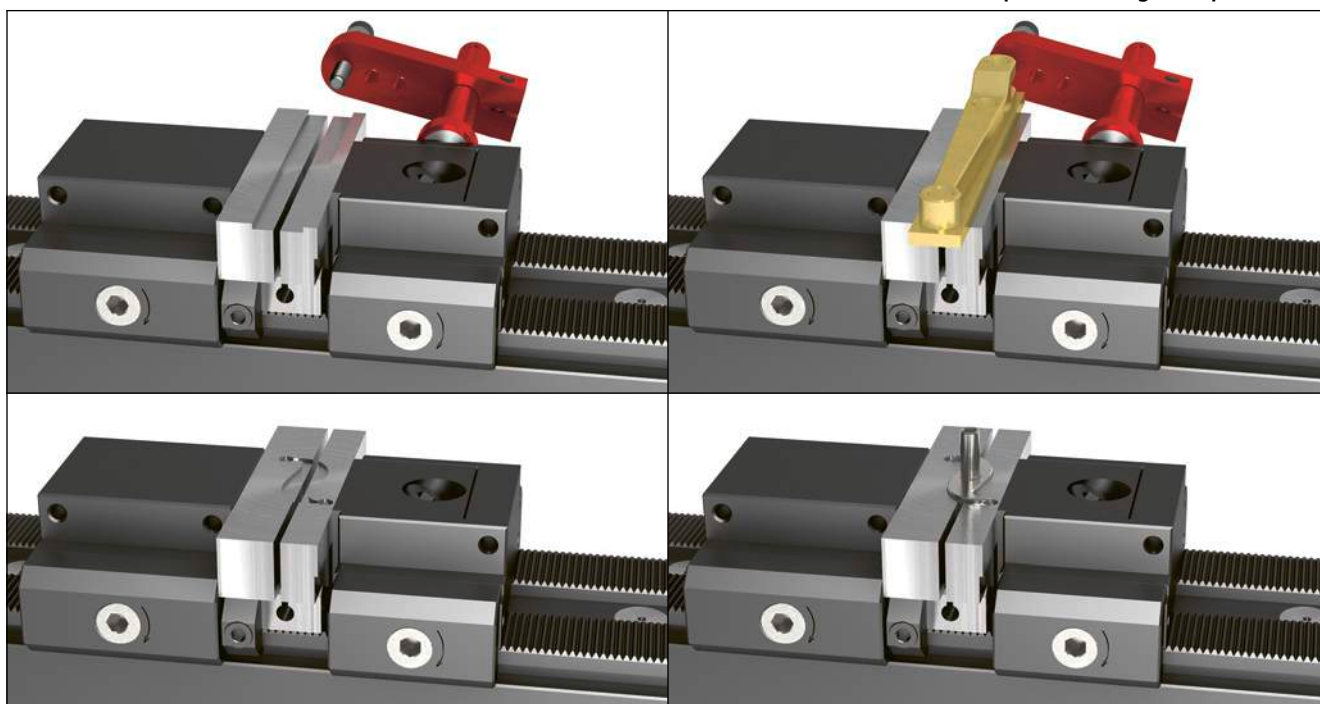
L = 50
kg ~0,45

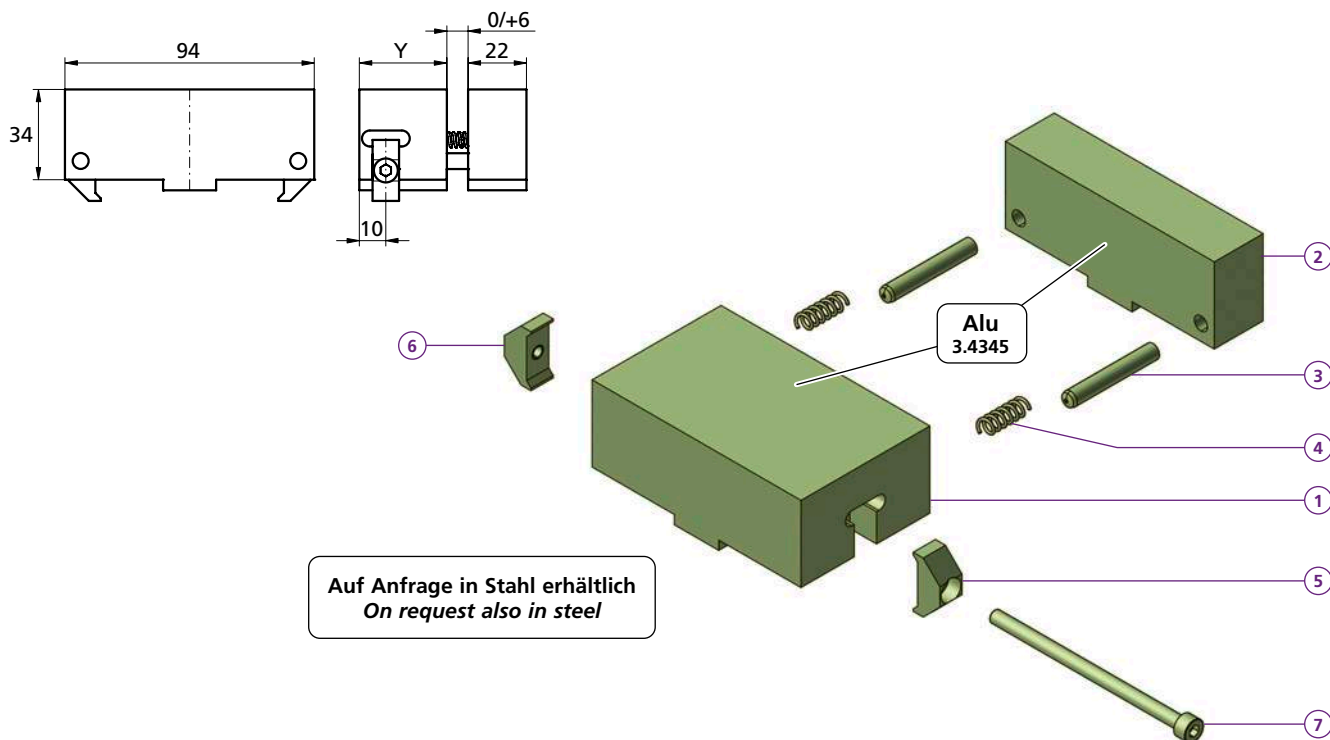
PCFX70

- ① 1x TF140705
- L = 70
kg ~0,62

Auf Anfrage in Stahl erhältlich
On request also in steel

Bestellbeispiel / Ordering example: **PCFX30**



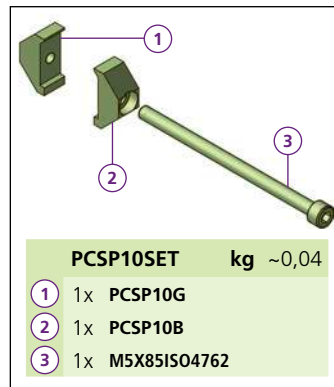
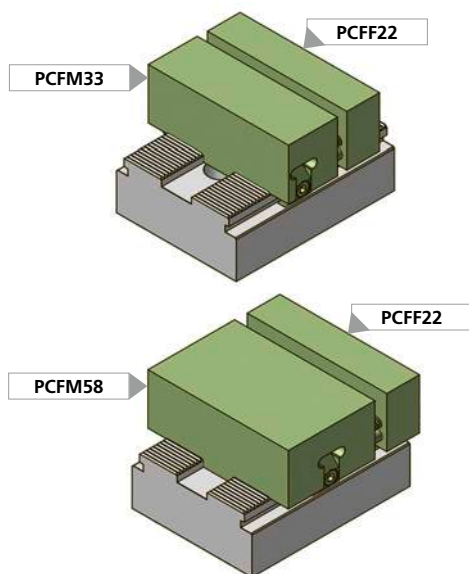
**PCFM3322**

- ① 1x PCFM33
- ② 1x PCFF22
- ③ 2x CCBO0801
- ④ 2x FED0618
- ⑤ 1x PCSP10B
- ⑥ 1x PCSP10G
- ⑦ 1x M5X85ISO4762

Y = 33
kg ~0,52

PCFM5822

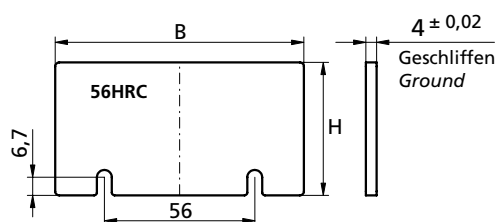
- ① 1x PCFM58
- Y = 58
kg ~0,75



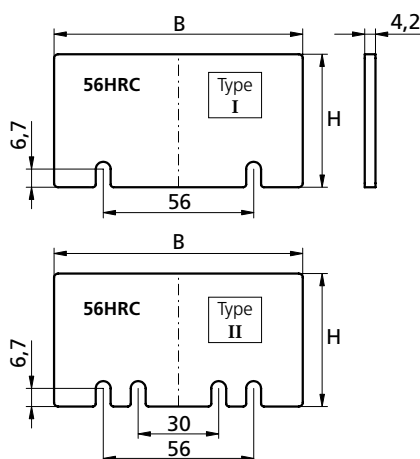
PCSP10SET kg ~0,04

- ① 1x PCSP10G
- ② 1x PCSP10B
- ③ 1x M5X85ISO4762

Bestellbeispiel / Ordering example: **PCFM3322**

Anschlagbacke flach
Jaw flat stop


	B	H	kg
PCUD34093TG	93	34	~0,11
PCUD49093TG	93	49	~0,14

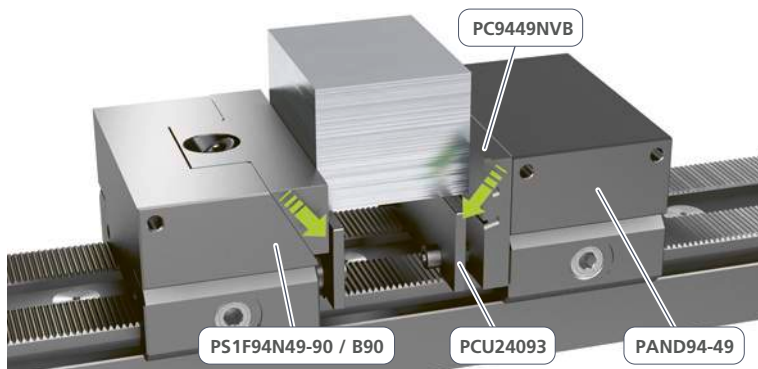
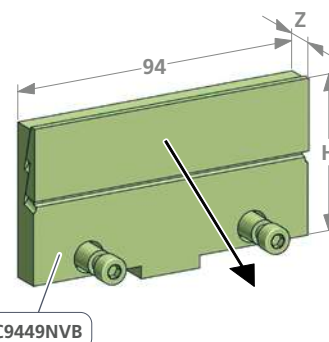
Unterlagen gehärtet und geschliffen
Parallels hardened and ground


Type		B	H	kg
I	PCUD14093	93	14	~0,05
I	PCUD20093	93	20	~0,06
I	PCUD24093	93	24	~0,08
I	PCUD29093	93	29	~0,09
II	PCUD31093	93	31	~0,10
I	PCUD34093	93	34	~0,11
I	PCUD39093	93	39	~0,12
I	PCUD44093	93	44	~0,14
II	PCUD46093	93	46	~0,14
I	PCUD47093	93	37	~0,15



Niederzugbacken für die Anschlagseite
Pull-down jaws for the solid reference face

Art. Nr.	kg	H	Z
PC9434NVB	~0,24	49,8 – 49	10,21 – 10
PC9449NVB	~0,35	34,8 – 34	10,21 – 10

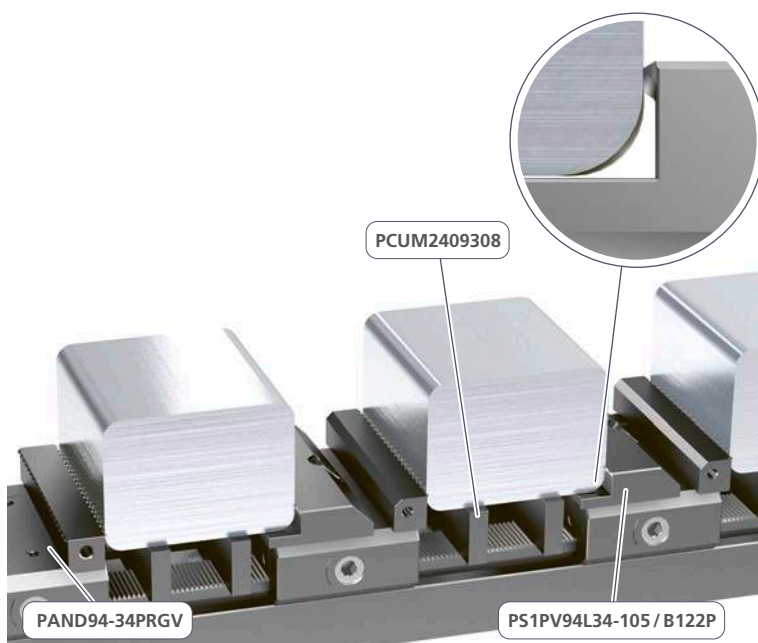
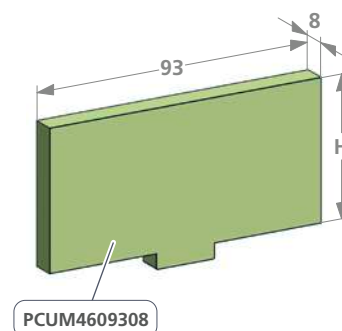


Die Niederzugbacke dient um einen zusätzlichen Niederzug-Klemmdruck auf der Anschlagseite zu erhalten.

The pull-down jaw is used to obtain an additional pull-down clamping pressure on the end module side.

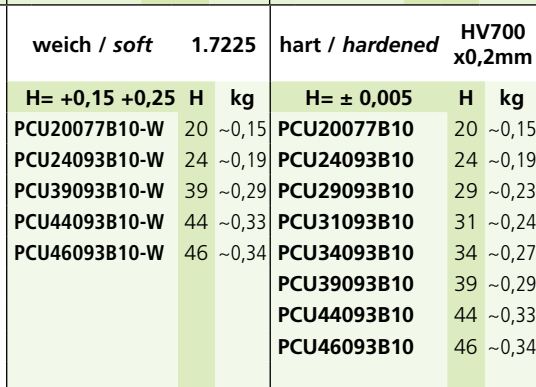
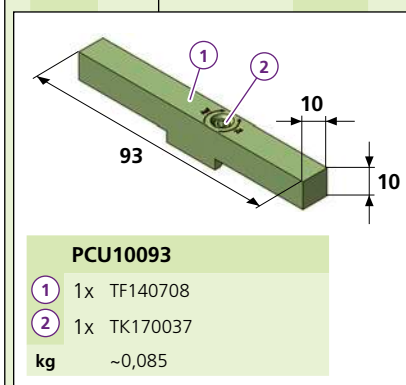
Magnetische Parallelunterlagen
Magnetic steel parallels

Art. Nr.	kg	H
PCUM1409308	~0,09	14
PCUM2009308	~0,13	20
PCUM2409308	~0,15	24
PCUM2909308	~0,18	29
PCUM3109308	~0,20	31
PCUM3409308	~0,21	34
PCUM3909308	~0,24	39
PCUM4409308	~0,27	44
PCUM4609308	~0,28	46



Mit diesen magnetischen Parallelunterlagen ist die Positionierung auf der Basisschiene frei wählbar. Bei Werkstücken mit grösseren Rundungen sind die Spannbacken B122P / B123P zusammen mit den Anschlagmodulen PAND94-34PRGV / PAND94-49PRGV bestens geeignet.

With these magnetic steel parallels, the positioning on the base rail is freely selectable. For workpieces with larger curves, the clamping jaws B122P / B123P together with the end modules PAND94-34PRGV / PAND94-49PRGV are best suited.

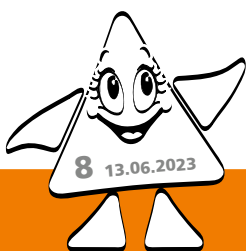
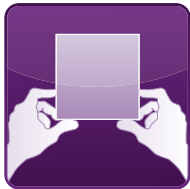


PCUH2594

1x	TF140706
2x	M5X8ISO4762
1x	M5X22ISO4762

kg -0,19

112

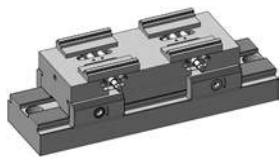
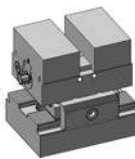
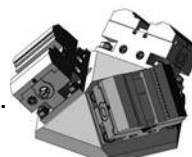
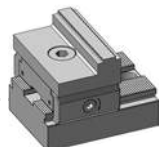
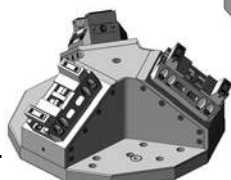


triCENTRO





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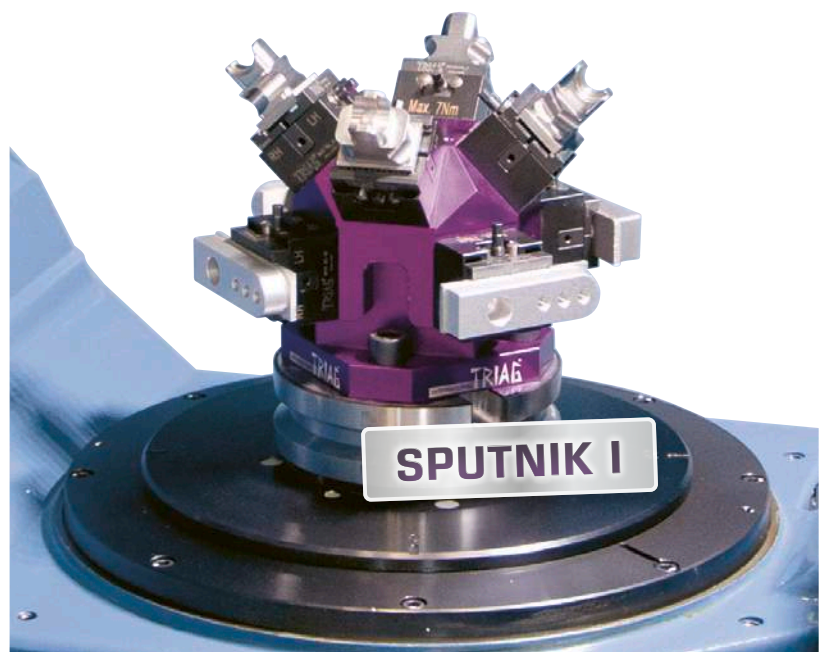
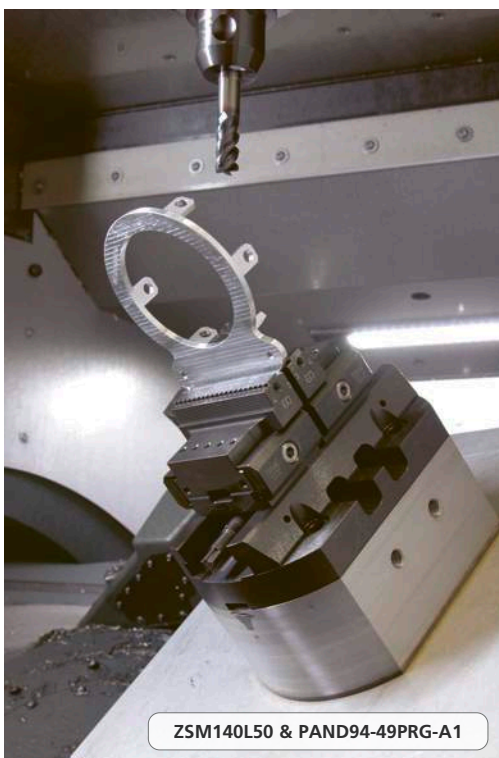
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Triag International AG bietet ein breites Sortiment an Zentrischspannern an. Neben den Zentrischspannern, die auf die Schienensysteme Power Clamp das Nullpunktsystem oppSystem passen, sind auch Ausführungen für Lochraster erhältlich.

Mit unseren modularen Zentrischspannblöcken bieten wir eine optimale Lösung für die Mehrfachspannung in Ihrer 5-Achs Fräsmaschine an. Für alle Zentrischspanner sind verschiedene Aufsatz- und Prägebacken erhältlich.

Triag International AG offers a wide range of self centering vices. In addition to the self centering vise that fit into the rail systems Power Clamp the zero point system oppSystem, mechanical self centering vice are also available.

With our modular self centric vice blocks we offer an optimal solution for multiple workholding in your 5-axis milling machine. Different jaws and stamping jaws are available for all self centering vices.



Für den Vorrichtungsbau / Mit einstellbarem Mittellager
For dedicated fixtures / With adjustable center positio

Art. Nr.	kg
MCZ40L30E	~0,24



Das Zentrum kann durch das Mittellager um $\pm 0,5$ mm
verstellt werden. Eine schwimmende
Werkstückspannung ist auch möglich.

Lieferzustand:

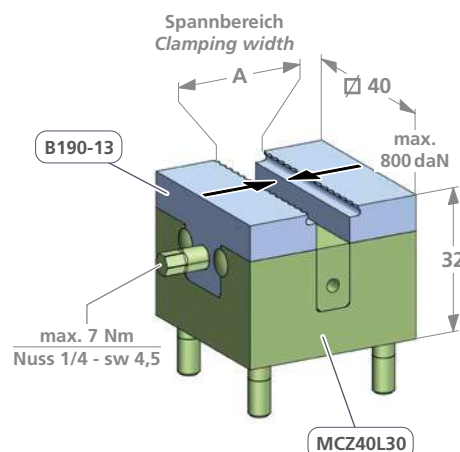
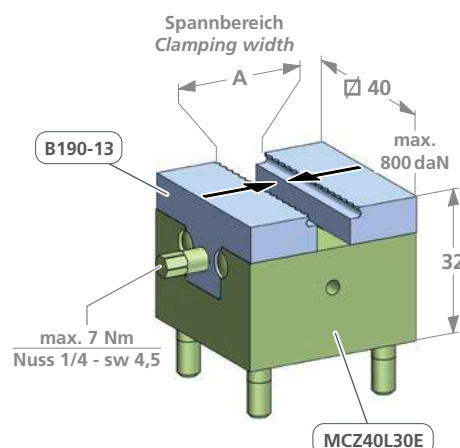
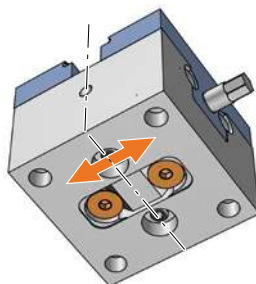
Zentriert mit einer Toleranz von $\pm 0,03$ mm

The center can be adjusted by $\pm 0,5$ mm through the center
support. A floating fixture is also possible.

Delivery condition:

Centered with a tolerance of $\pm 0,03$ mm

Bedienungsanleitung
Operating instruction



Ohne einstellbares Mittellager
Without adjustable center positio

Art. Nr.	kg
MCZ40L30	~0,24



Prägebacken / direct stamping jaws

Art. Nr.	B190-13	B190-22	B190-31	B190W6-40
	57HRC	57HRC	57HRC	weicher Stahl soft steel (1.7225)
kg	~0,09	~0,08	~0,08	~0,08

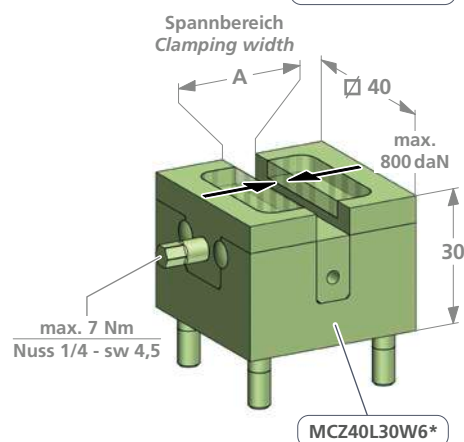
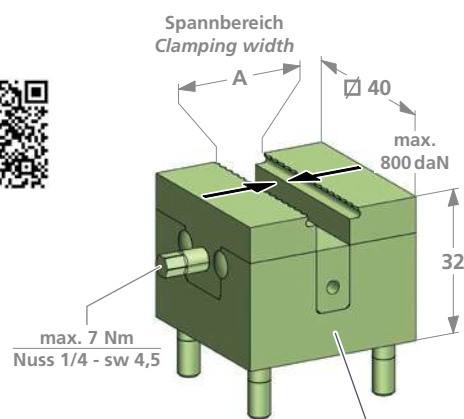
weiche Stahlbacken / with soft steel jaws

Art. Nr.	B190W10-40	B190W20-40	B190W30-40
	weicher Stahl soft steel (1.7225)	weicher Stahl soft steel (1.7225)	weicher Stahl soft steel (1.7225)
kg	~0,012	~0,22	~0,32

Weich, zur Herstellung individueller Formbacken. / Soft, for the production of individual moulding jaw.

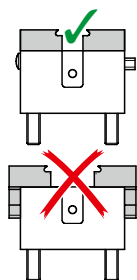
Für den Vorrichtungsbau
For dedicated fixtures

Art. Nr.			i	A	kg
MCZ40L30PRG13				3 – 13 mm	~0,34
MCZ40L30PRG22				12 – 22 mm	~0,33
MCZ40L30PRG31				21 – 31 mm	~0,32
MCZ40L30W6			weicher Stahl soft steel (1.7225)	0 – 10 mm	~0,33
MCZ40L30W10			weicher Stahl soft steel (1.7225)	0 – 10 mm	~0,37
MCZ40L30W20			weicher Stahl soft steel (1.7225)	0 – 10 mm	~0,47
MCZ40L30W30			weicher Stahl soft steel (1.7225)	0 – 10 mm	~0,57



NUSS 1/4" 4.5MM

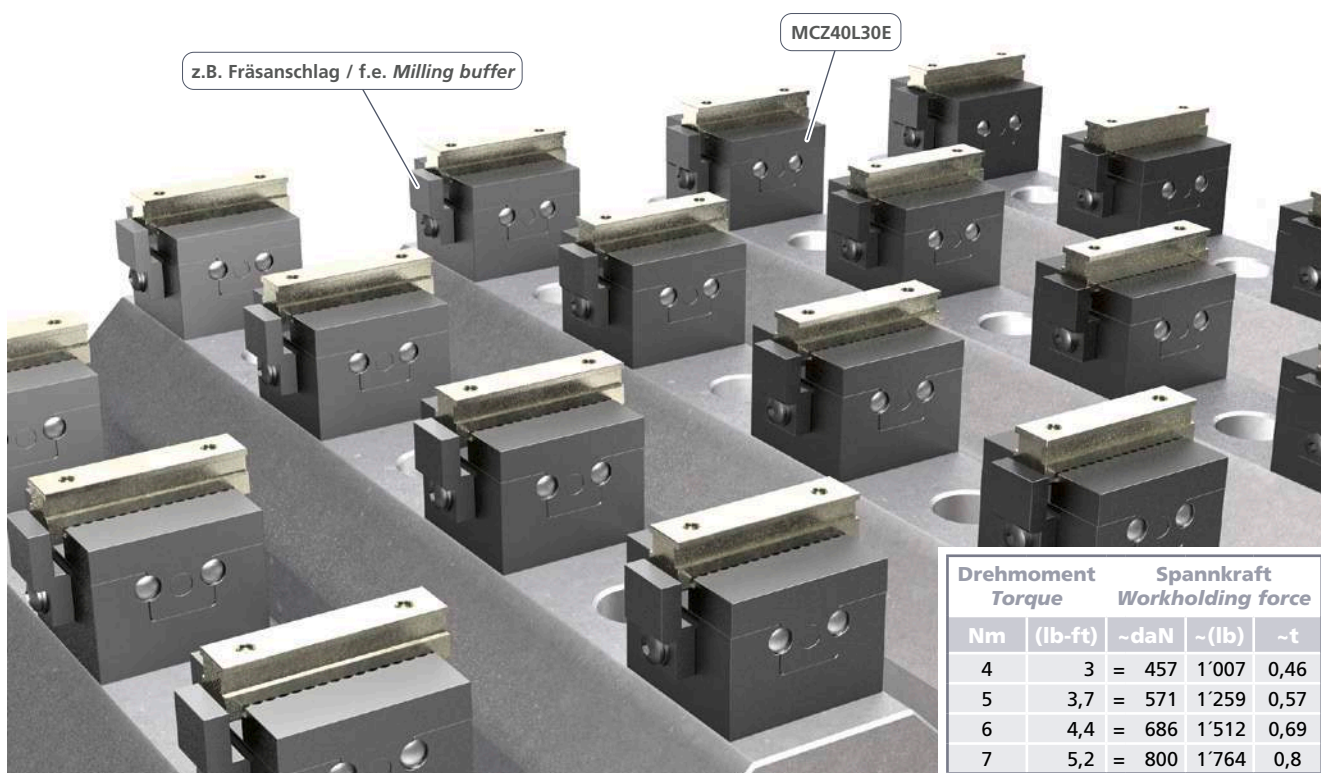
WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



ACHTUNG / CAUTION

Die Angaben der Spannbereiche bei den verschiedenen Backen sind unbedingt zu beachten! Bei unsachgemäßer Anwendung übernimmt TRIAG International keine Haftung.

The details of the clamping ranges for the different jaws must be strictly followed! In case of improper use, TRIAG International assumes no liability.



Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
4	3	= 457	1'007	0,46
5	3,7	= 571	1'259	0,57
6	4,4	= 686	1'512	0,69
7	5,2	= 800	1'764	0,8



Sputnik I

Die Sputnik Baureihe wurde speziell für die effizientere Nutzung von 5-Achsen Maschinen entwickelt. Dabei zeichnen sich alle drei Baureihen der Sputnik Serie mit unterschiedlichen Merkmalen aus.

Sehr kompakte Bauweise zur Aufnahme von 4 oder 8 Micro Zentrischspannmodulen. Für die Rohteilebearbeitung gibt es drei Bausätze Prägebacken (3–13 mm, 12–22 mm und 21–31 mm).

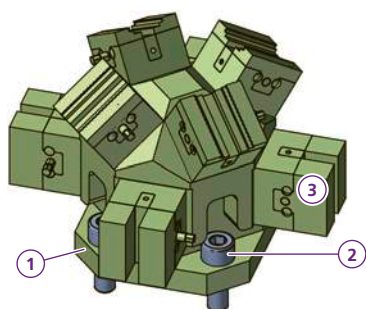
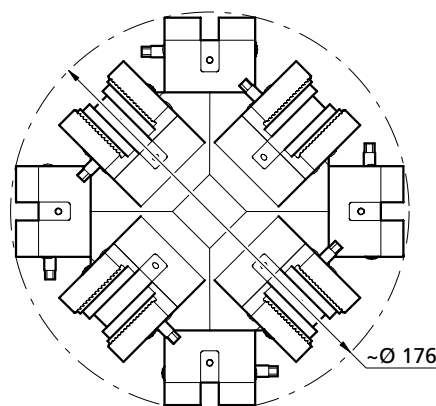
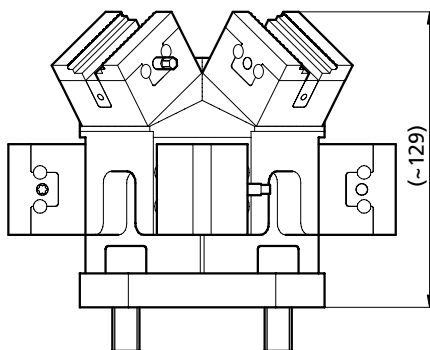
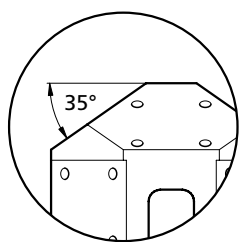
Für die zweite Spannung gibt es vier Sätze unterschiedlicher Backenrohlinge für die Einarbeitung einer Kontur. Die Spannkraft liegt bei 7 Nm 0,8 t 800 daN.

Sputnik I

The Sputnik series was specially developed to improve the output of 5-axis machines. All three types of the Sputnik series have different features.

Very compact design to hold 4 or 8 micro self centering clamping modules. There are three assembly kits of stamping jaws (3–13 mm, 12–22 mm and 21–31 mm) for raw part machining.

For the second clamping, there are four sets of different jaw blanks to integrate any shapes. The clamping force is at 7 Nm 0.8 t 800 daN.



UB5AXMCZ4035SET8

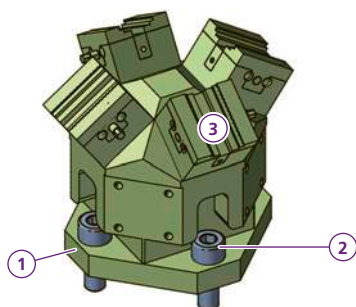
- 1x TB170676
- 4x M12X35ISO4762
- 8x Ihre Wahl / Your choice

kg ~5,1



Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

p. 116 - 117



UB5AXMCZ4035SET4

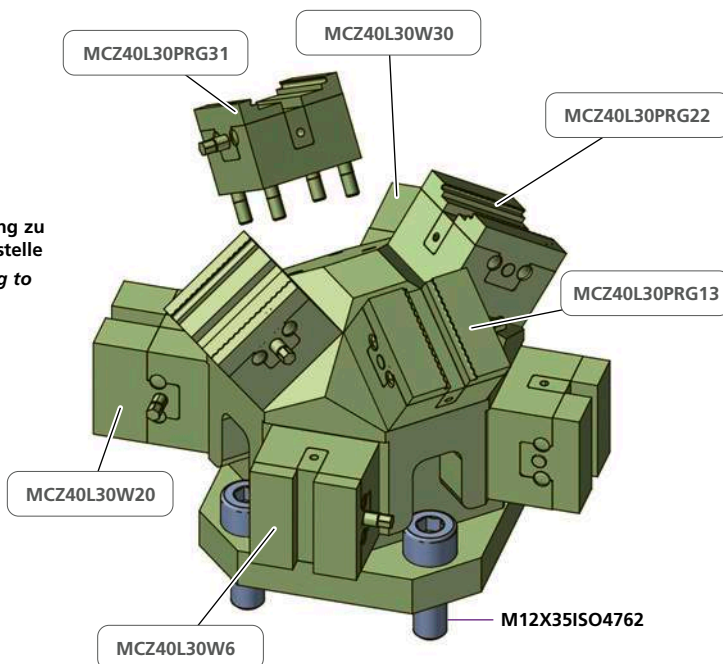
- 1x TB170676
- 4x M12X35ISO4762
- 4x Ihre Wahl / Your choice

kg ~3,2



Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

p. 116 - 117



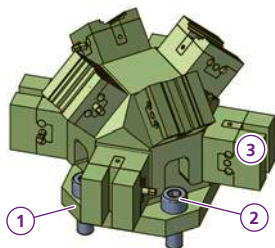
WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

Nuss 1/4 - sw 4,5



Bestellbeispiel / Ordering example:
2 x UB5AXMCZ40-35SET8 & 8 x MCZ40L30W10 &
8 x MCZ40L30PRG22 & 1 x Nuss 1/4 - sw 4,5

Separat bestellen / Order separately



45° UB5AXMCZ40-45SET8

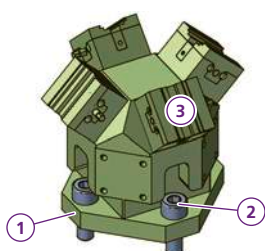
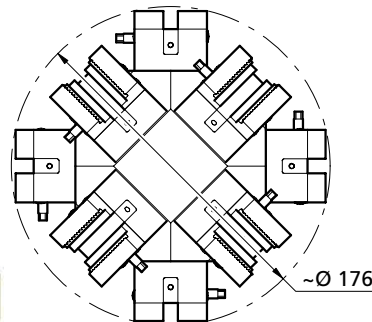
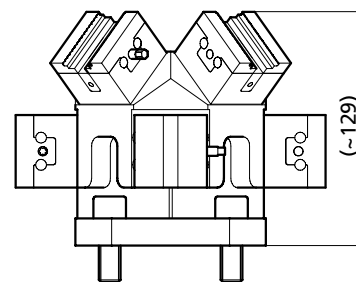
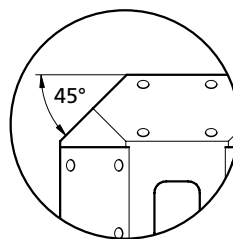
- 1x TK140867
- 4x M12X35ISO4762
- 8x Ihre Wahl / Your choice

kg ~5,2



Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

p. 116 - 117



45° UB5AXMCZ4045SET4

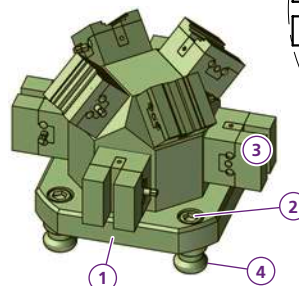
- 1x TK140867
- 4x M12X35ISO4762
- 4x Ihre Wahl / Your choice

kg ~4,2



Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

p. 116 - 117



45° UB5AXMCZ4045SET8-OPBM

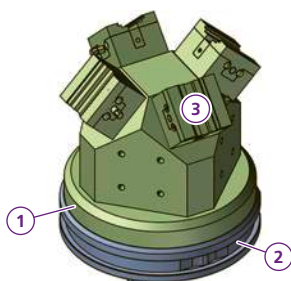
- 1x TK160869
- 4x M12X20ISO4762
- 8x Ihre Wahl / Your choice
- 4x OPBM18M12

kg ~6,2



Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

p. 116 - 117



45° UB5AXMCZ4045SET4-ER

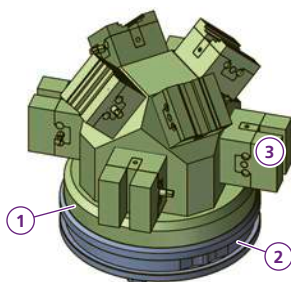
- 1x TB161062
- 1x ER041912 EROWA ITS-Palette
- 4x Ihre Wahl / Your choice

kg ~4,1



Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

p. 116 - 117



45° UB5AXMCZ40-45SET8-ER

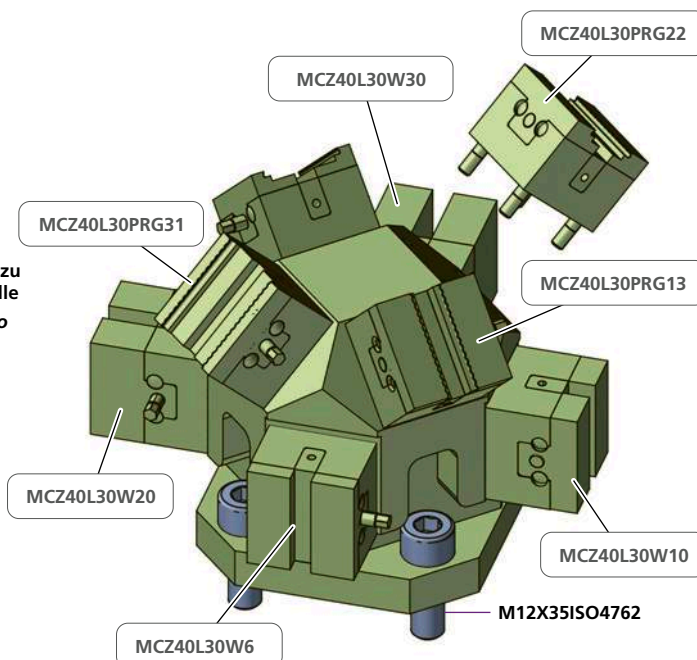
- 1x TB161062
- 1x ER041912 EROWA ITS-Palette
- 8x Ihre Wahl / Your choice

kg ~6,1



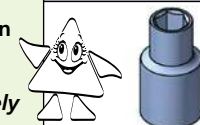
Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

p. 116 - 117



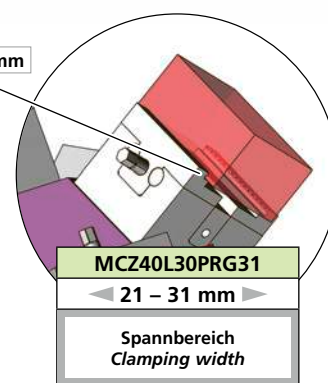
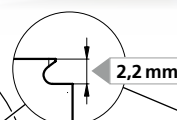
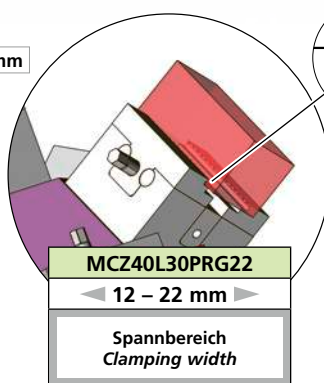
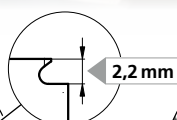
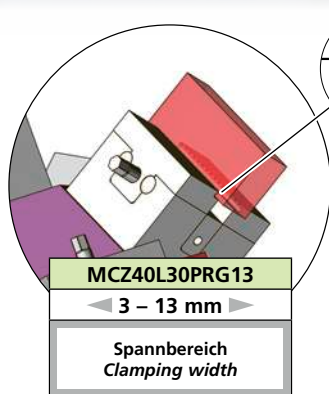
WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

Nuss 1/4 - sw 4,5



Bestellbeispiel / Ordering example:
2 x UB5AXMCZ40-45SET8 & 8 x MCZ40L30W20 &
8 x MCZ40L30PRG22 & 1 x Nuss 1/4 - sw 4,5

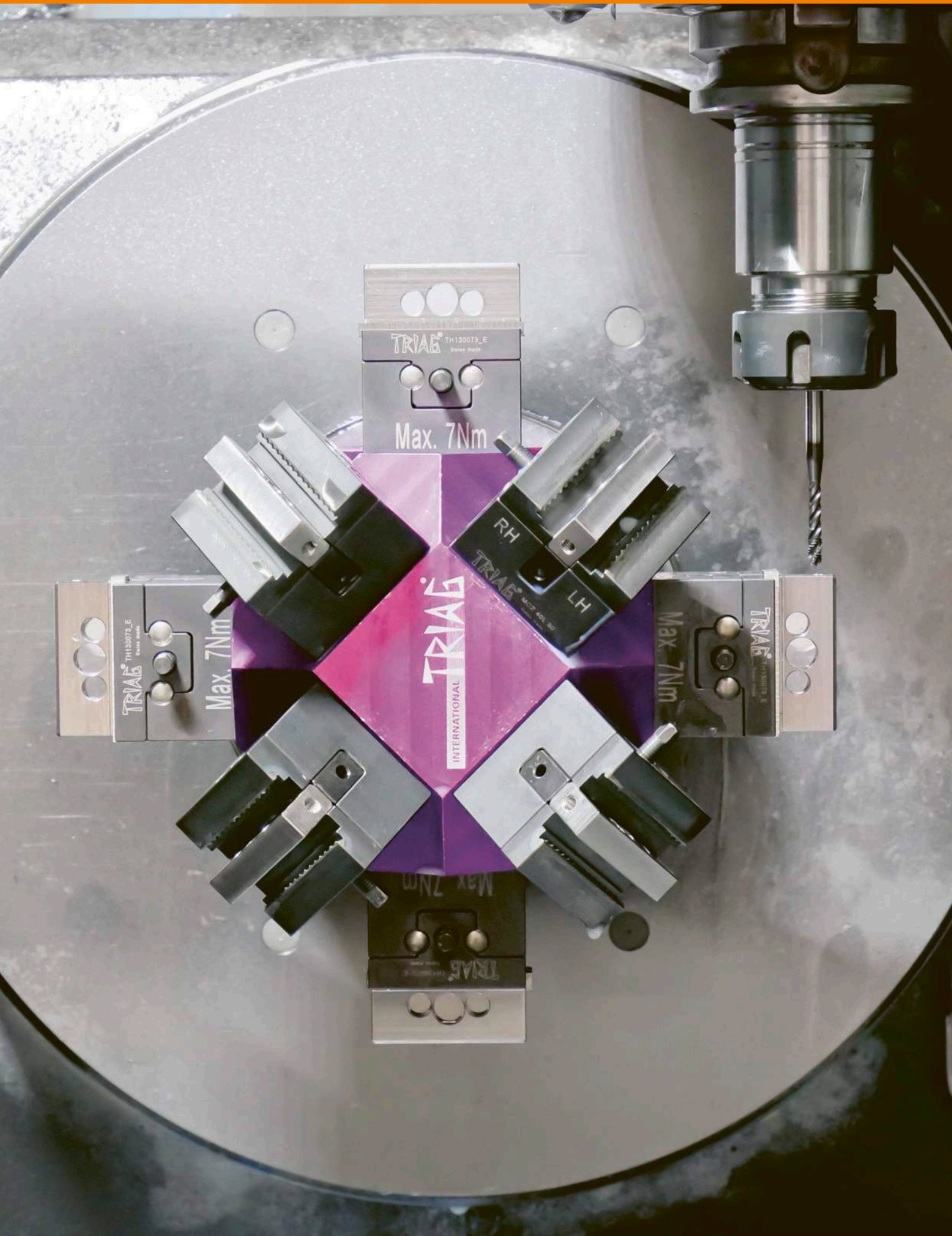
Separat bestellen / Order separately



p. 116 Micro Zentrischspanner / Micro - self centering vise

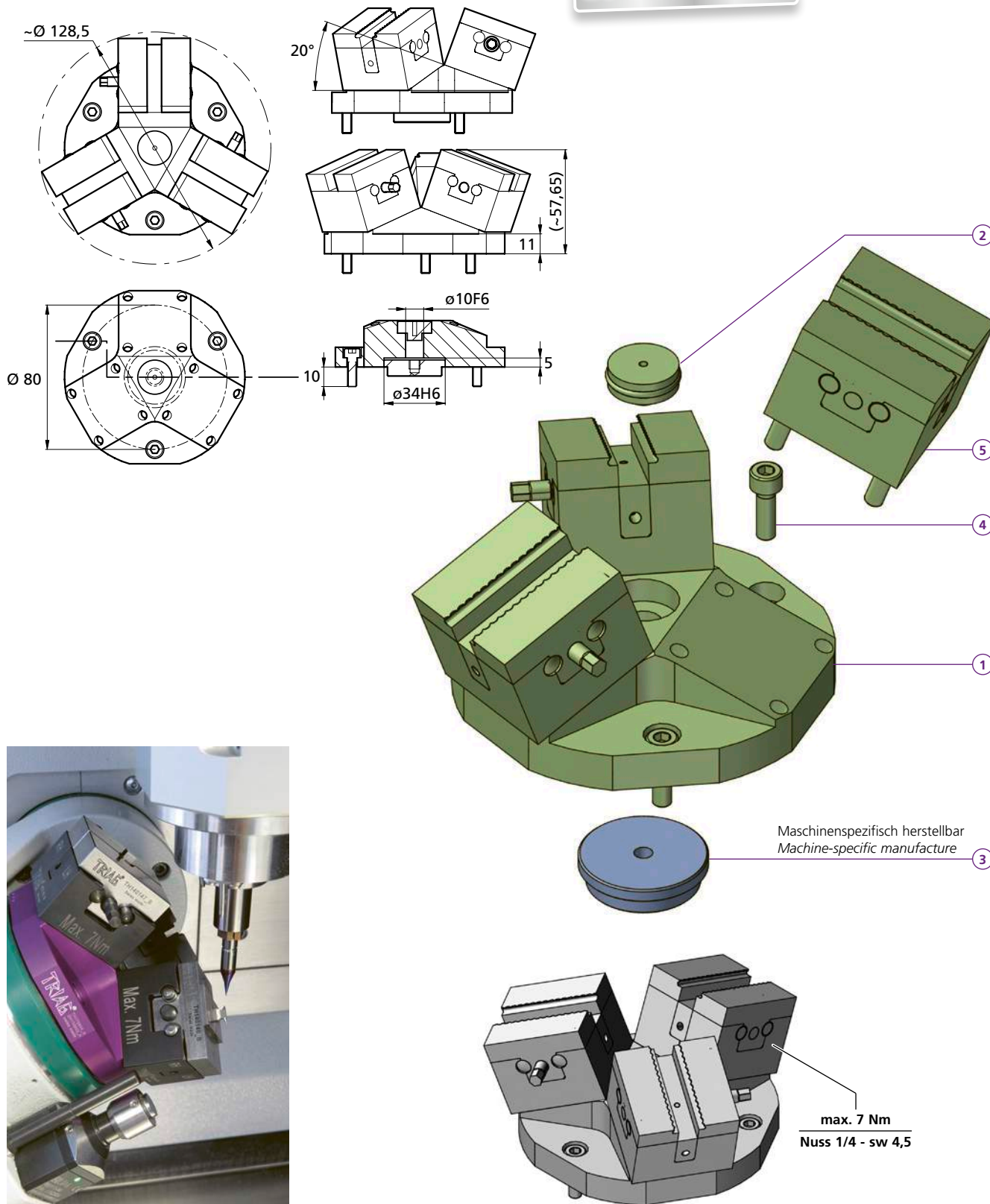


p. 116 Micro Zentrischspanner / Micro - self centering vise





SPUTNIK I-3



20° UB5AXSET18-3

- ① 1x TH170934
- ② 1x PCPF16L6
- ③ 1x TH171176
- ④ 3x M5X16ISO4762
- ⑤ 3x Ihre Wahl / Your choice

p. 116 - 117

kg ~1,45

Drehmoment und Spannkraft siehe Seite
 Torque and clamping force see page

117

WICHTIG!
 Bitte separat bestellen!
IMPORTANT!
 Please order separately!

Nuss 1/4 - sw 4,5



Bestellbeispiel / Ordering example : 1 x UB5AXSET18-3 & 1x TH171176 & 3x M5x16

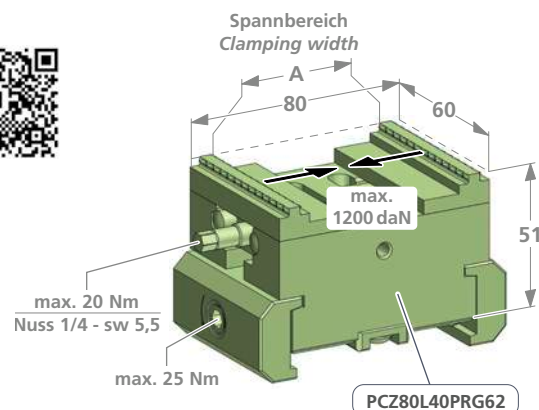
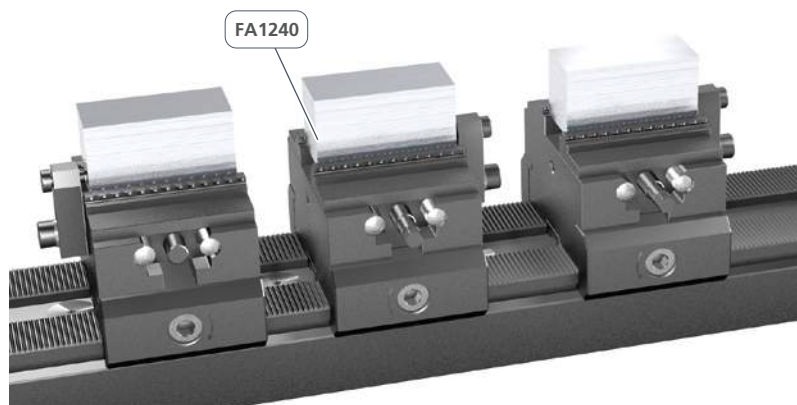
Separat bestellen / Order separately

Kompakter Zentralspanner Compact self centering vise



triCENTRO

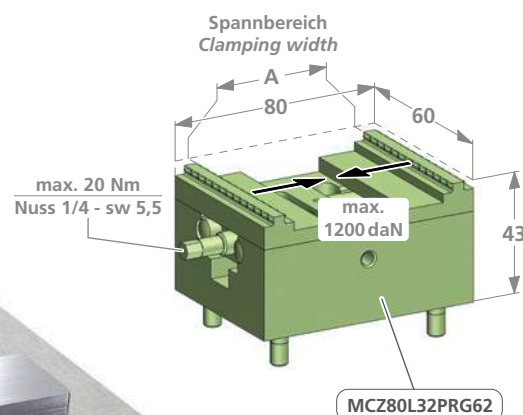
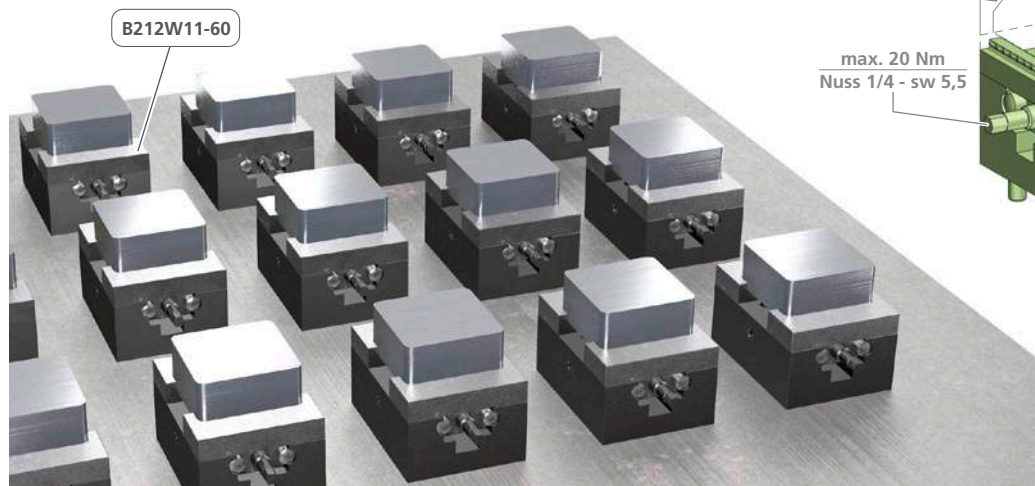
Art. Nr.		A	B	kg
PCZ80L40PRG62	 	32 – 62 mm	6 – 35 mm	~1,71



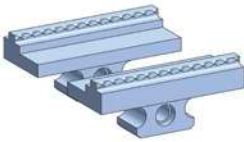
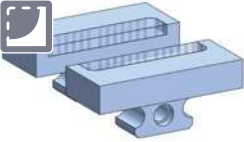
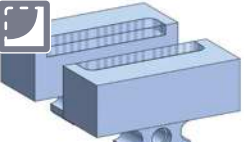
Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
5	3,7	= 410	900	0,41
10	7,4	= 830	1'830	0,83
15	11,0	= 1'250	2'760	1,25
20	14,8	= 1'650	2'640	1,65

Für den Vorrichtungsbau
For dedicated fixtures

Art. Nr.		A	B	kg
MCZ80L32PRG62	 	32 – 62 mm	6 – 35 mm	~1,39



Linear- Spannbacke / Linear clamping jaw →

Art. Nr.	B210-62	B212W11-60	B212W20-60
	57HRC	Vergütungsstahl Tempering steel (1.7225)	Vergütungsstahl Tempering steel (1.7225)
kg	~0,31	~0,31	~0,52
			

NUSS 1/4" 5.5MM

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



Weich, zur Herstellung individueller Formbacke. / Soft, for the production of individual moulding jaw.



**SEPARAT BESTELLEN
ORDER SEPARATELY**

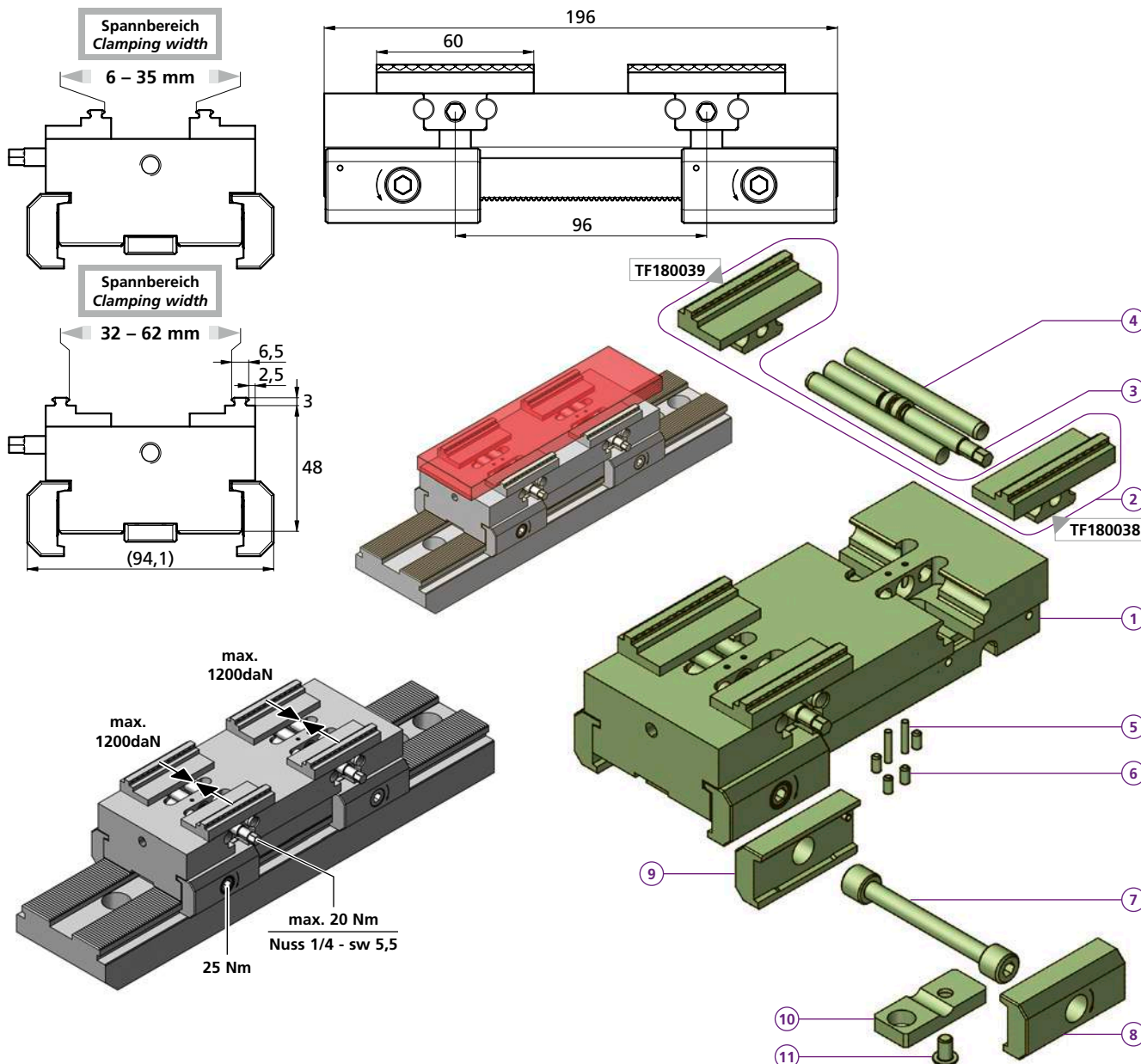
Kompakter doppelter Zentrischspanner

Compact double self centering vise

PCZ280L40PRG62



triCENTRO



Drehmoment Torque		Spannkraft Workholding force			
Nm	(lb-ft)	~daN	~(lb)	~t	
5	3,7	= 410	900	0,41	
10	7,4	= 830	1'830	0,83	
15	11,0	= 1'250	2'760	1,25	
20	14,8	= 1'650	3'640	1,65	

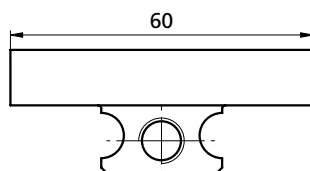
PCZ280L40PRG62

- 1x TS170942
- 2x B210-62
- 2x TB150998
- 4x 8h6x80 DIN6325
- 4x 3h6x16 DIN6325
- 8x M4X8DIN913
- 2x PCS14
- 2x PCSP60R
- 2x PCSP60L
- 2x PCGU2049
- 2x M6X10ISO7380

kg ~4,7

Weiche Backen zu Kompakter Zentrischspanner

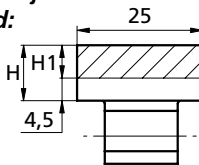
Soft jaws for compact self centering vise



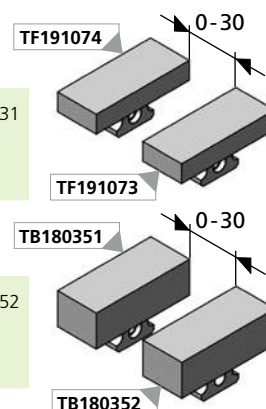
B212W11-60* kg ~0,31
H = 11 mm
H1 = 6,5 mm

H1: Zum Erstellen Ihrer individuellen Formbacke:
Schnittzeichnung zum Ermitteln der maximalen Bearbeitungsprofiltiefe

H1: If a dedicated jaw is being machined:
Sectional drawing to determine the maximum machining depth



B212W20-60* kg ~0,52
H = 20 mm
H1 = 15,5 mm



WICHTIG!
Bitte separat bestellen!

IMPORTANT!
Please order separately!



Nuss 1/4 - sw 5,5

Bestellbeispiel / Ordering example: PCZ280L40PRG62 & 1 x Nuss 1/4 - sw 5,5

* = weich / soft (1.7225 Vergütungsstahl / Tempering steel)

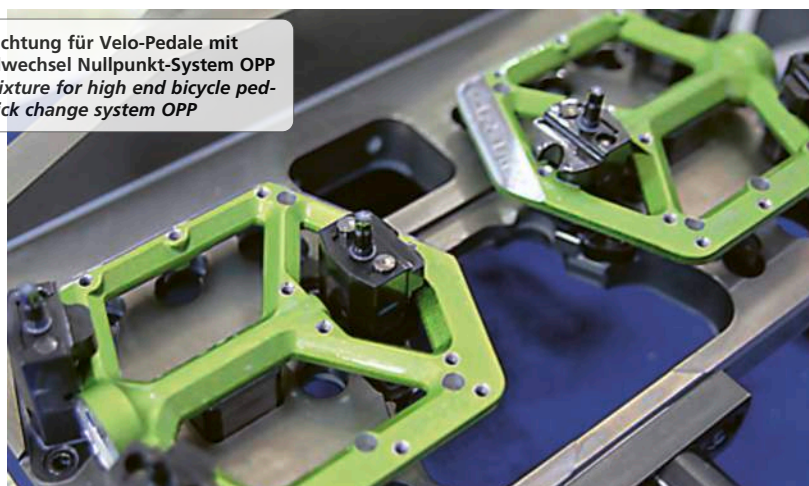
Separat bestellen / Order separately



Zwei Mini - Zentrischspanner mit Direktprägebacken halten verschieden lange Titanbleche. Um die verschiedenen Längen zu adaptieren, können die Spanner in 2 mm schritten seitlich versetzt werden.

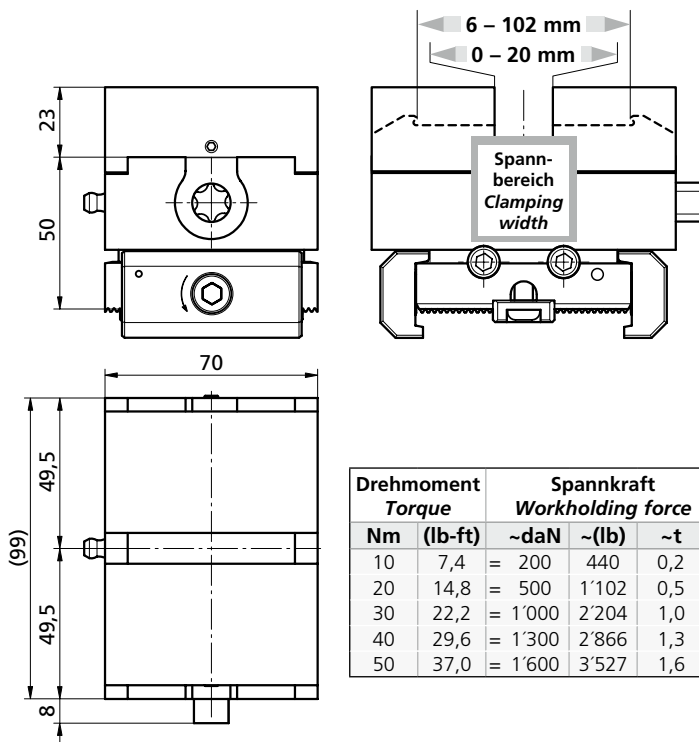
Two mini - self centering vises with direct stamping jaws holding titanium sheets in different length. To adapt the different length's the vises can be moved side words in 2 mm steps.

Sondervorrichtung für Velo-Pedale mit dem schnellwechsel Nullpunkt-System OPP
Dedicated fixture for high end bicycle pedals with quick change system OPP



siehe Video
see video





Innenspannung-Set / Inner clamping set

Mit diesem Set ist es möglich das Werkstück von innen zu spannen. With this set it is possible to clamp the workpiece from the inside.

ACHTUNG / CAUTION

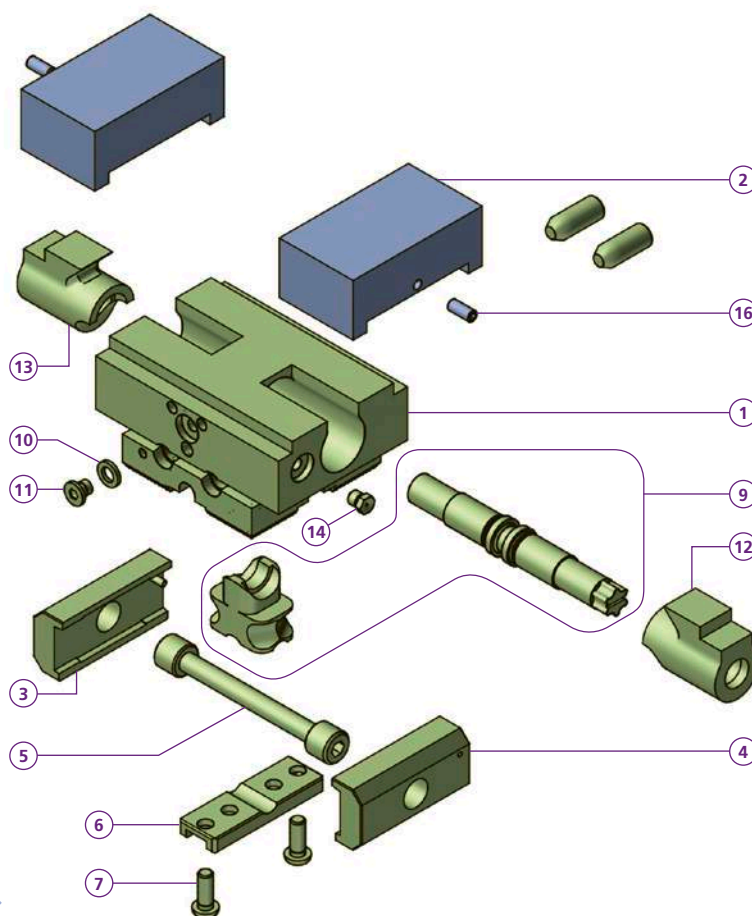
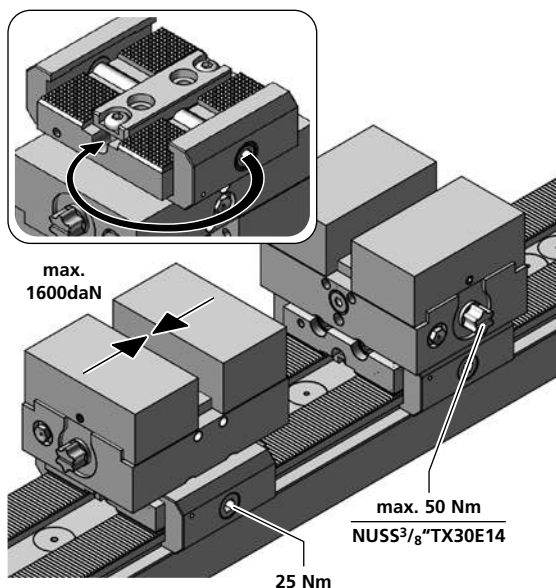
Folgende Spannbacken sind dazu nicht geeignet.

The following clamping jaws are not suitable for this purpose.

B175-102, B175-121, B173-102

PCZS2439-ID-SET

Nullpunkt des Zentrischspanners neu einstellen
How to readjust the zero point adjustment



PCZ100L50

- 1 1x PCZ100L50M
- 2 2x
- 3 1x PCSP60L
- 4 1x PCSP60R
- 5 1x PCS14
- 6 1x PCGUW20
- 7 2x M6X16ISO7380
- 9 1x PCS14M107SET
- 10 1x BN726 ISO 7092 M6
- 11 1x BN1206 M6x6
- 12 1x PCZS2439L
- 13 1x PCZS2439R
- 14 1x PCZSNP
- 15 4x PCZJ1025
- 16 2x TN100140

kg ~2,5

p. 128 - 129

WICHTIG!

Bitte separat bestellen

IMPORTANT!

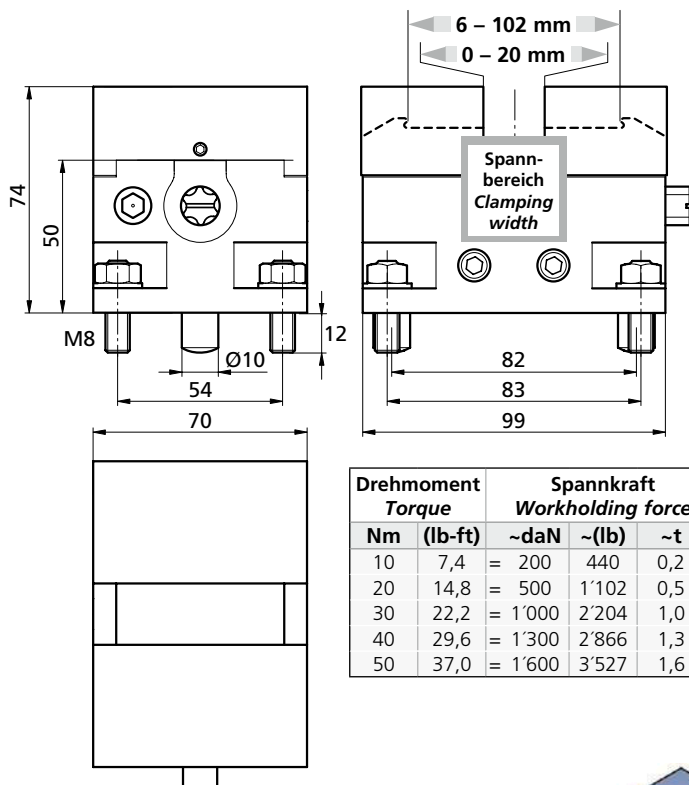
Please order separately

NUSS3/8\"/>



Bestellbeispiel / Ordering example:

3 x PCZ100L50 & 6 x B170 & 1 x NUSS3/8\"/>



Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 200	440	0,2
20	14,8	= 500	1'102	0,5
30	22,2	= 1'000	2'204	1,0
40	29,6	= 1'300	2'866	1,3
50	37,0	= 1'600	3'527	1,6

Innenspannung-Set / Inner clamping set

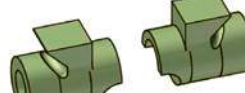
Mit diesem Set ist es möglich das Werkstück von innen zu spannen. With this set it is possible to clamp the workpiece from the inside.

ACHTUNG / CAUTION

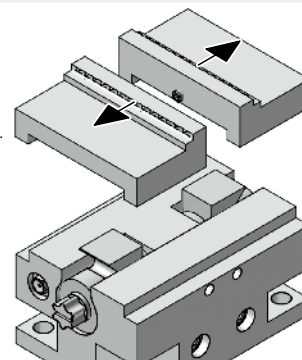
Folgende Spannbacken sind dazu nicht geeignet.

The following clamping jaws are not suitable for this purpose.

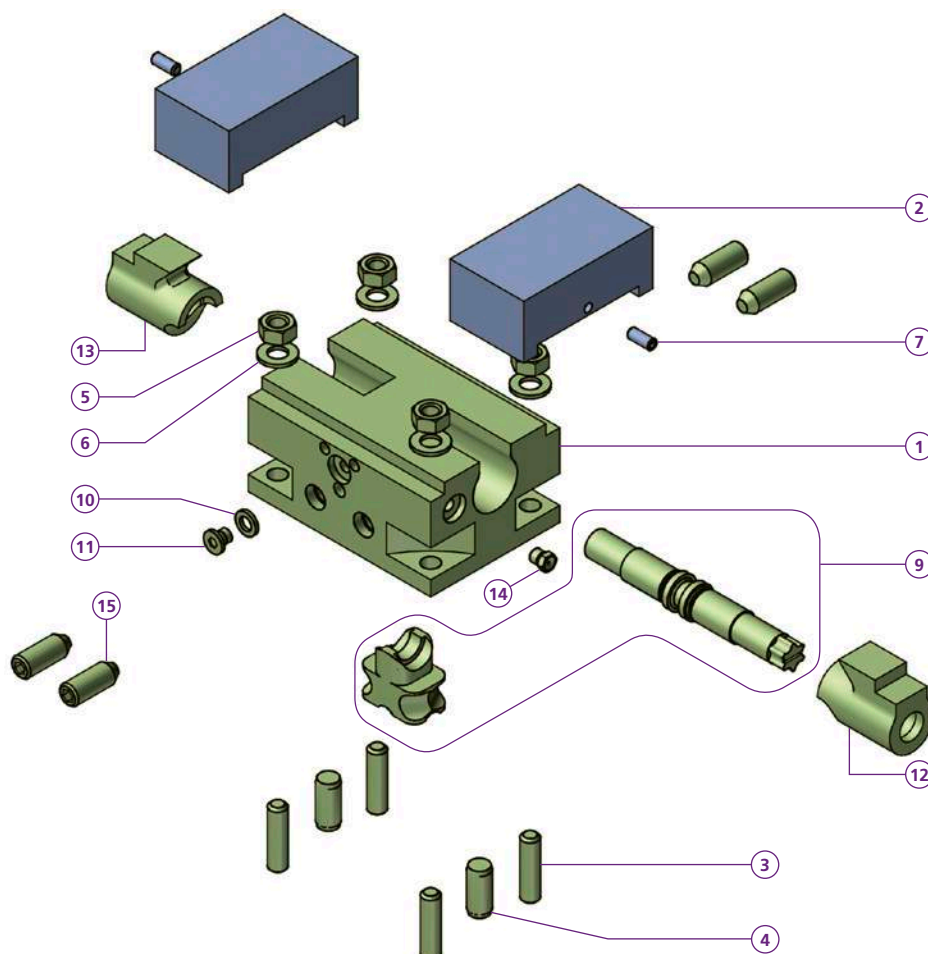
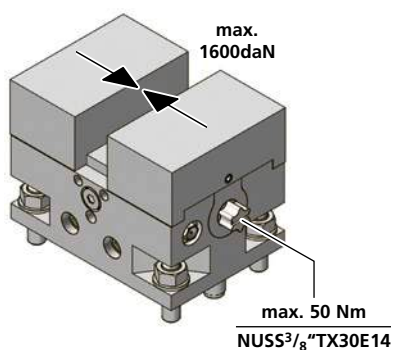
B175-102, B175-121, B173-102



PCZS2439-ID-SET



Nullpunkt des Zentrischspanners neu einstellen
How to readjust the zero point adjustment



MCZ100L50

1	1x MCZ100L50M
2	2x
3	2x 10m6x22 ISO 8734
4	4x M8X30DIN913
5	4x M8 DIN 934
6	4x 8,4 DIN 125 A
7	2x TN100140
9	1x PCS14M107SET
10	1x BN726 ISO 7092 M6
11	1x BN1206 M6x6
12	1x PCZS2439L
13	1x PCZS2439R
14	1x PCZSNP
15	4x PCZJ1025
kg	~2,6

p. 128 - 129

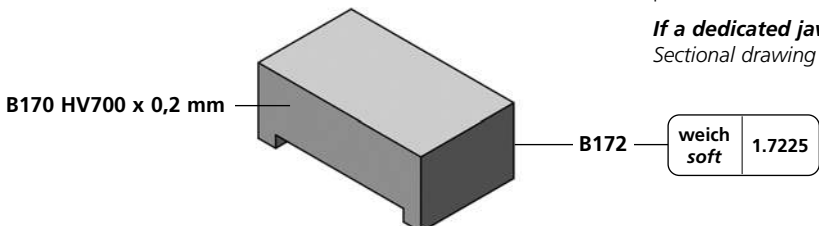
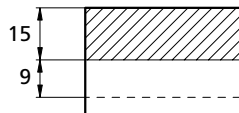
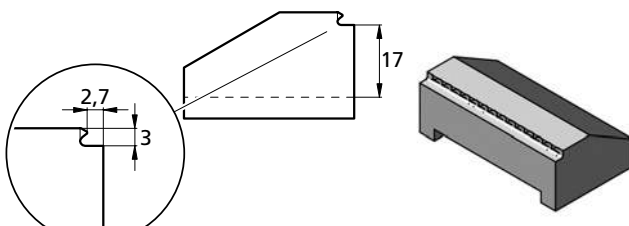
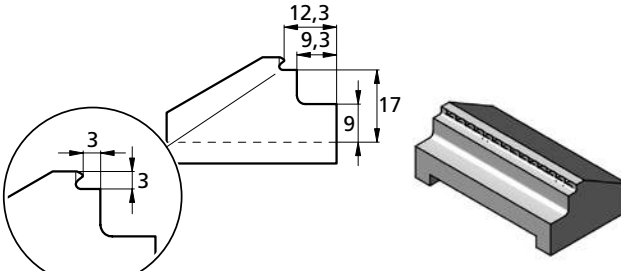
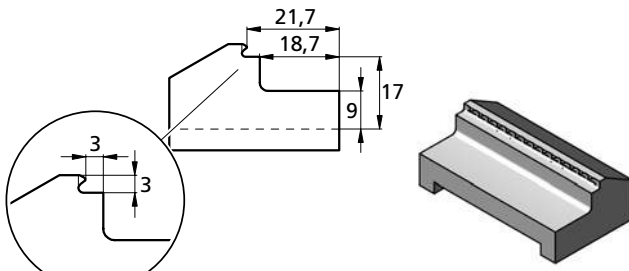
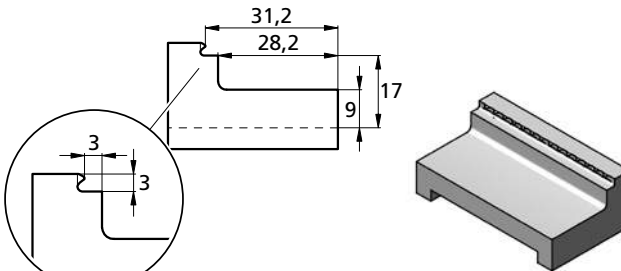
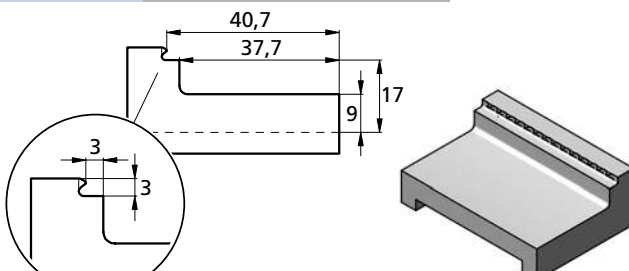
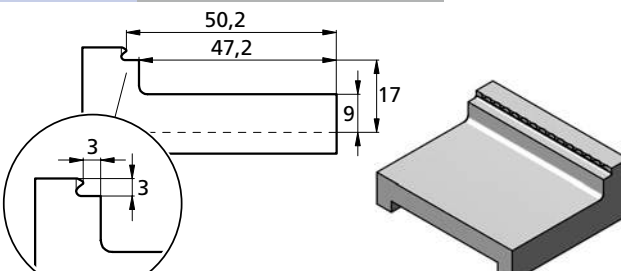
WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

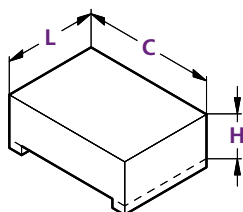
NUS53/8"TX30E14



Bestellbeispiel / Ordering example:
3 x MCZ100L50 & 6 x B170 & 1 x NUS53/8"TX30E14

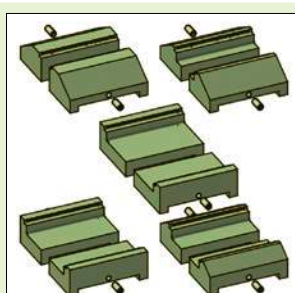


B170, B172	Spannbereich / Clamping width	◀ 0 – 20 mm ▶	Zum Erstellen Ihrer individuellen Formbacke: Schnittzeichnung zum Ermitteln der maximalen Bearbeitungsprofiltiefe If a dedicated jaw is being machined: Sectional drawing to determine the maximum machining depth   für / for B170, B172
B175-26	Spannbereich / Clamping width	◀ 6 – 26 mm ▶	
B175-45	Spannbereich / Clamping width	◀ 25 – 45 mm ▶	
B175-64	Spannbereich / Clamping width	◀ 44 – 64 mm ▶	
B175-83	Spannbereich / Clamping width	◀ 63 – 83 mm ▶	
B175-102	Spannbereich / Clamping width	◀ 82 – 102 mm ▶	
B175-121	Spannbereich / Clamping width	◀ 101 – 121 mm ▶	



B

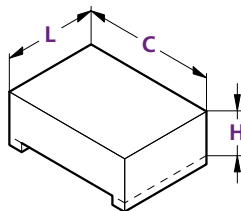
Bestellbeispiel / Ordering example: 2 x **B170**

	B170	B172	B175-26	B175-45	B175-64	B175-83	B175-102	B175-121	B175SET	
C	70	70	70	70	70	70	70	70	2x B175-26	
H	24	24	20	20	20	20	20	20	2x B175-45	
L	40	40	40	40	40	40	50	60	2x B175-64	
i	HV700	*	57HRC	57HRC	57HRC	57HRC	57HRC	57HRC	2x B175-83	
	x0,2mm								2x B175-102	
kg	~0,5	~0,5	~0,34	~0,29	~0,28	~0,25	~0,31	~0,37		

* = weich / soft (1.7225 Vergütungsstahl / Tempering steel)

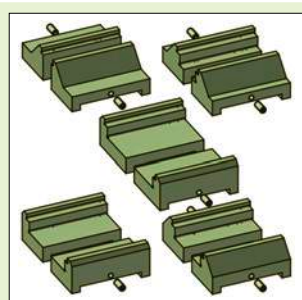


B173-26 Spannereich / Clamping width ◀ 6 – 26 mm ▶ 	B173-45 Spannereich / Clamping width ◀ 25 – 45 mm ▶
B173-64 Spannereich / Clamping width ◀ 44 – 64 mm ▶ 	B173-83 Spannereich / Clamping width ◀ 63 – 83 mm ▶
B173-102 Spannereich / Clamping width ◀ 82 – 102 mm ▶ 	B176-80 Spannereich / Clamping width ◀ 8 – 80 mm ▶
ZK160798M5 Extra Zubehör: Schraube zum schnellen Wechseln der Backen Additional accessories: Screw for quick change of jaws	PRG1003M8 Bohrbild Hole pattern



Bestellbeispiel / Ordering example: 2 x **B173-26**

B	B173-26	B173-45	B173-64	B173-83	B173-102	B176-80	B173SET
C	70	70	70	70	70	70	2x B173-26
H	24	24	24	24	24	20	2x B173-45
L	40	40	40	40	50	40	2x B173-64
i	HV700	HV700	HV700	HV700	HV700	HV700	2x B173-83
	x0,2mm	x0,2mm	x0,2mm	x0,2mm	x0,2mm	x0,2mm	2x B173-102
kg	~0,31	~0,32	~0,32	~0,28	~0,34	~0,4	





Doppelt so spannend – doppelt so effizient

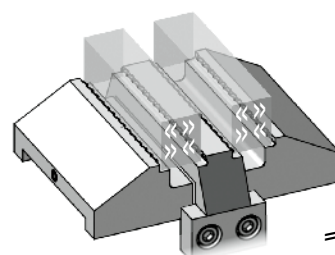
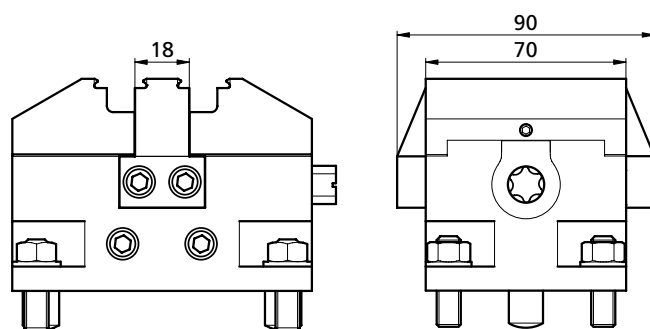
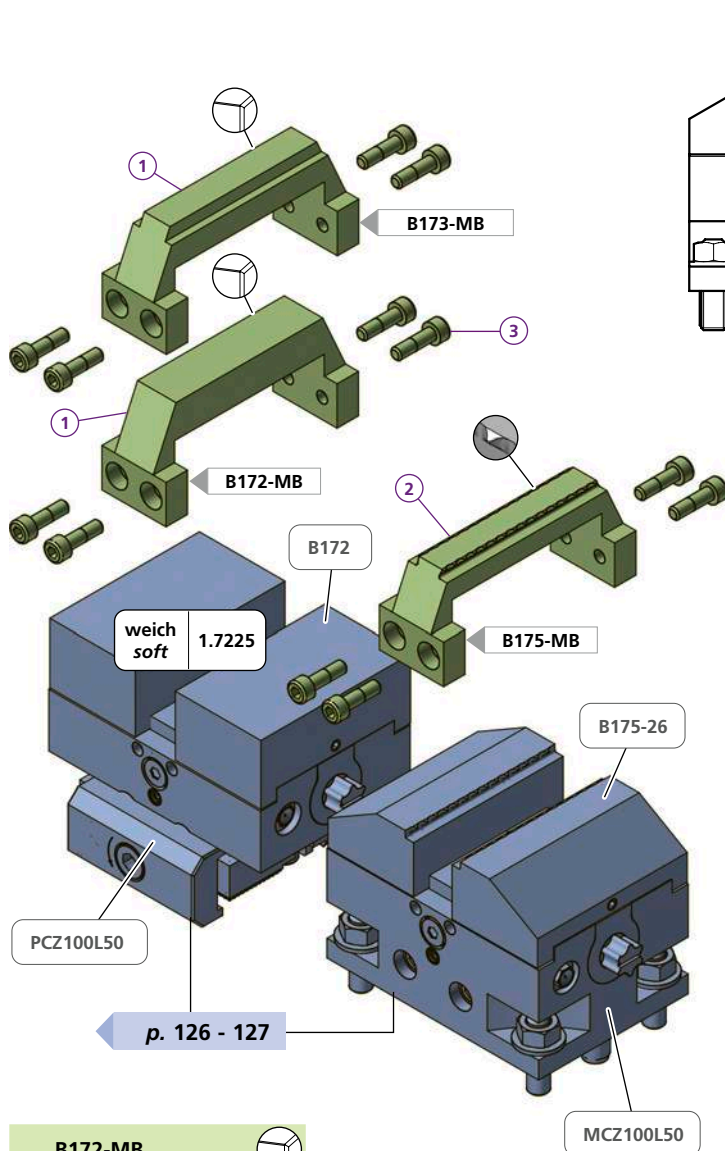
Die bewährten Zentrischspanner **PCZ100L50** und **MCZ100L50** sind nun auch als Doppelspanner erhältlich.

Im Doppelspannmodus können Bauteile im Spannbereich von 8 mm bis 43 mm mit den Standardbacken **B173-...** und **B175-...** gespannt werden.

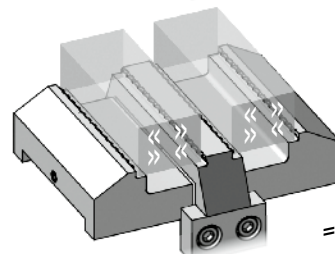
Twice as clamping – twice as efficient

The proven self-centering vices **PCZ100L50** and **MCZ100L50** are now also available as dual clamping devices.

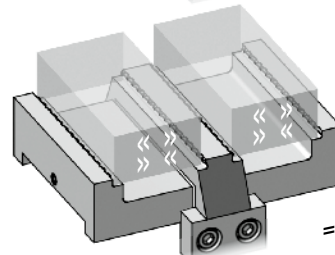
In the dual clamping mode, components can be clamped in the range from 8 mm to 43 mm with the standard jaws **B173-...** and **B175-...**



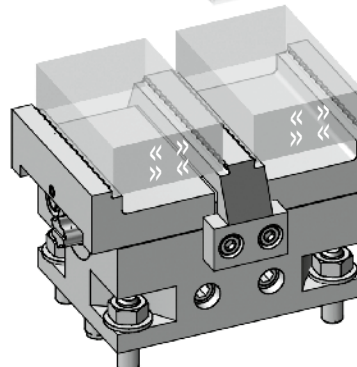
B175-45
Spannbereich
Clamping width
= 2 x 8 - 15,45 mm



B175-64
Spannbereich
Clamping width
= 2 x 16 - 24,95 mm



B175-83
Spannbereich
Clamping width
= 2 x 25 - 34,45 mm



B175-102
Spannbereich
Clamping width
= 2 x 35 - 43,95 mm

B172-MB	
1	1x TB190542
3	4x MS50
i	*
kg	~0,3

B173-MB	
1	1x TH160304
3	4x MS50
i	HV700x0,2
kg	~0,3

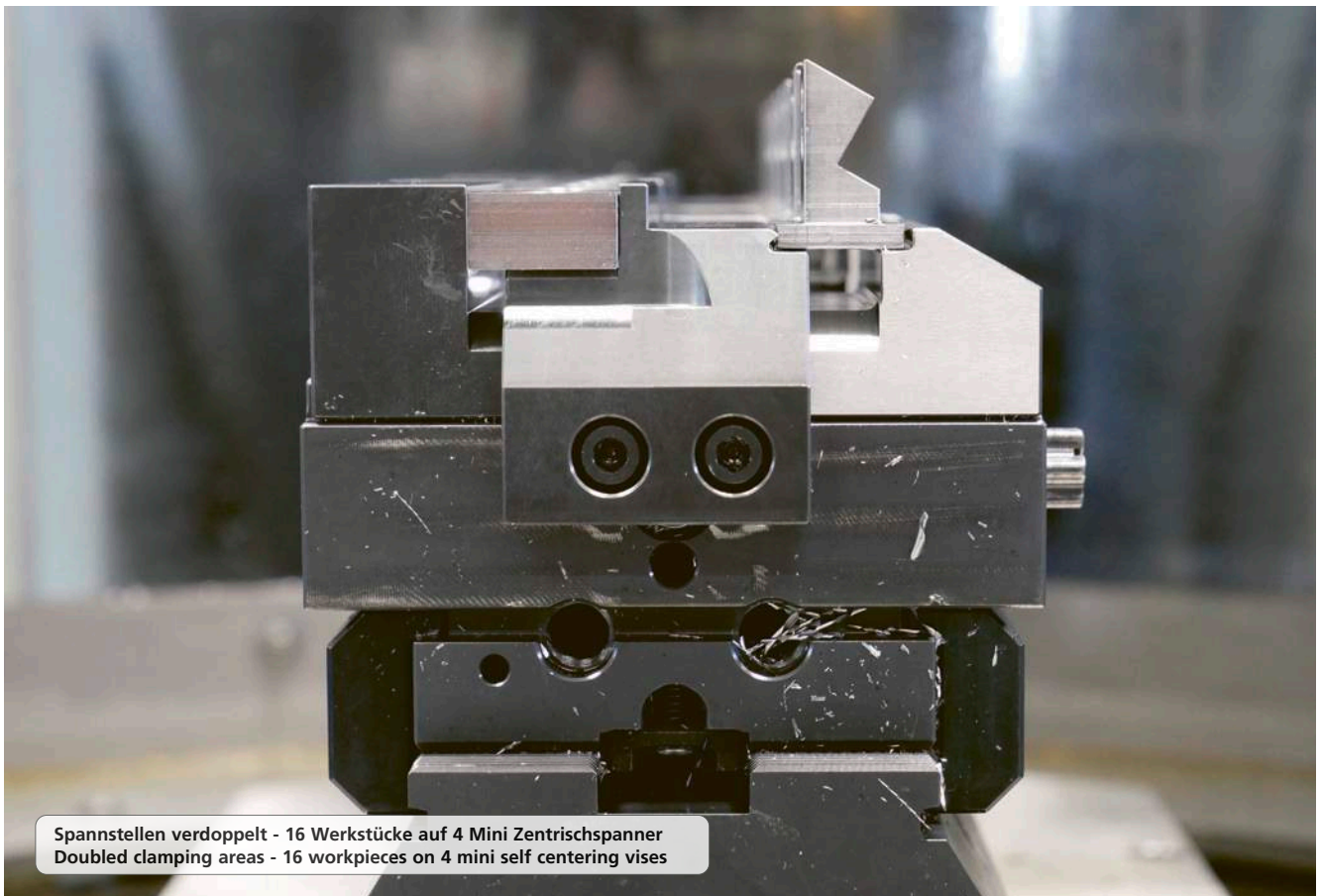
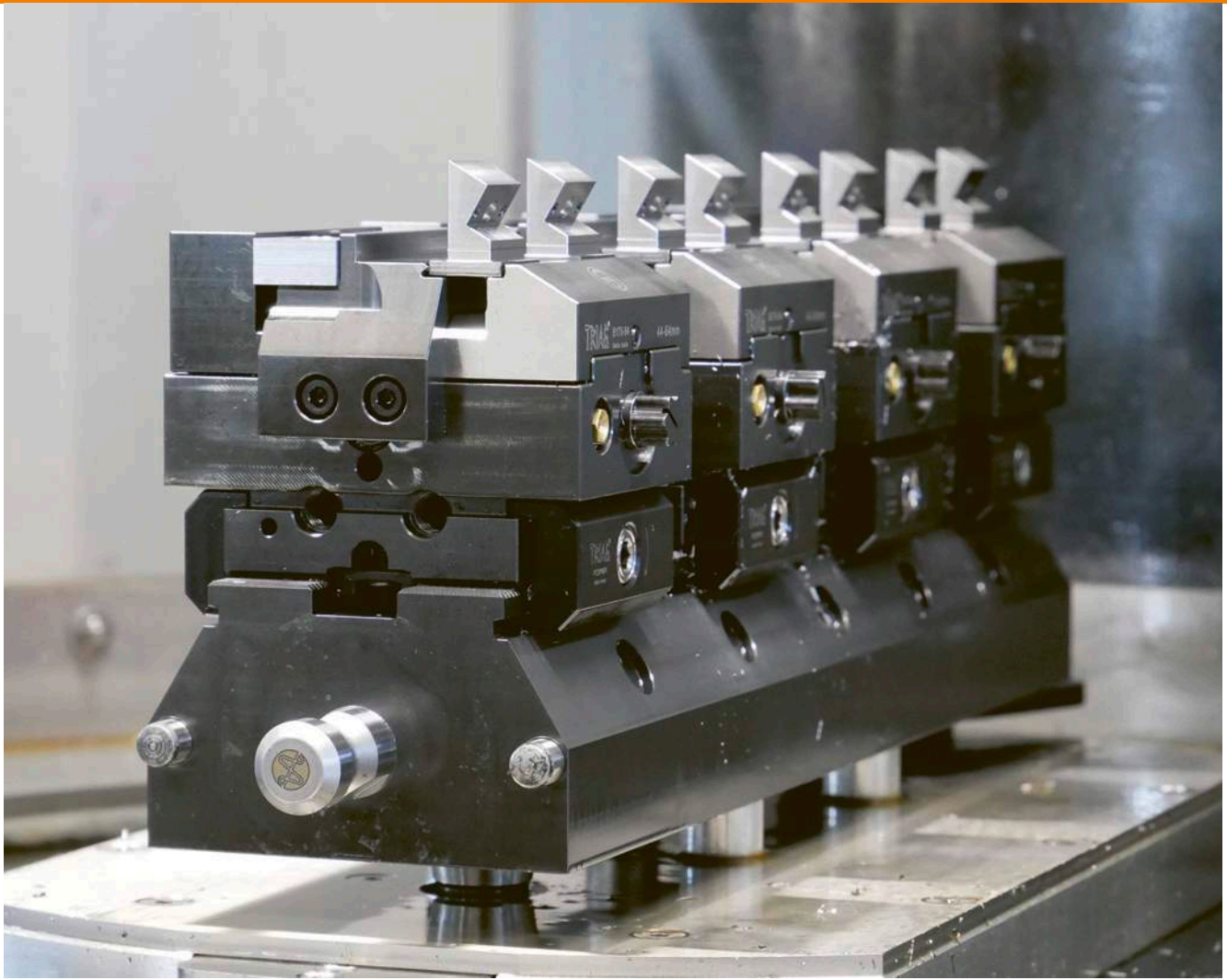
B175-MB	
2	1x TH160301
3	4x MS50
i	57HRC
kg	~0,3



Montageanleitung der
Anschlagbrücke auf dem
Mini-Zentrischspanner
Operating instructions
for this pneumatic self
centering vise

Bestellbeispiel / Ordering example: **B172-MB** & 1 x **PCZ100L50**

* = weich / soft (1.7225 Vergütungsstahl / Tempering steel)





B176-80

B175-26

B175-45

B175-64

B175-83

B175-102

B175-121

MCZ100L50



B173-26

B173-45

B173-64

B173-83

B173-102

B170, B172

PCZ100L50

13 verschiedene Backen-varianten passend zu dieser Schnellwechselschnittstelle.

More than **13** different jaw modules to match this rapidly changing interface.



SPUTNIK II

Sputnik II

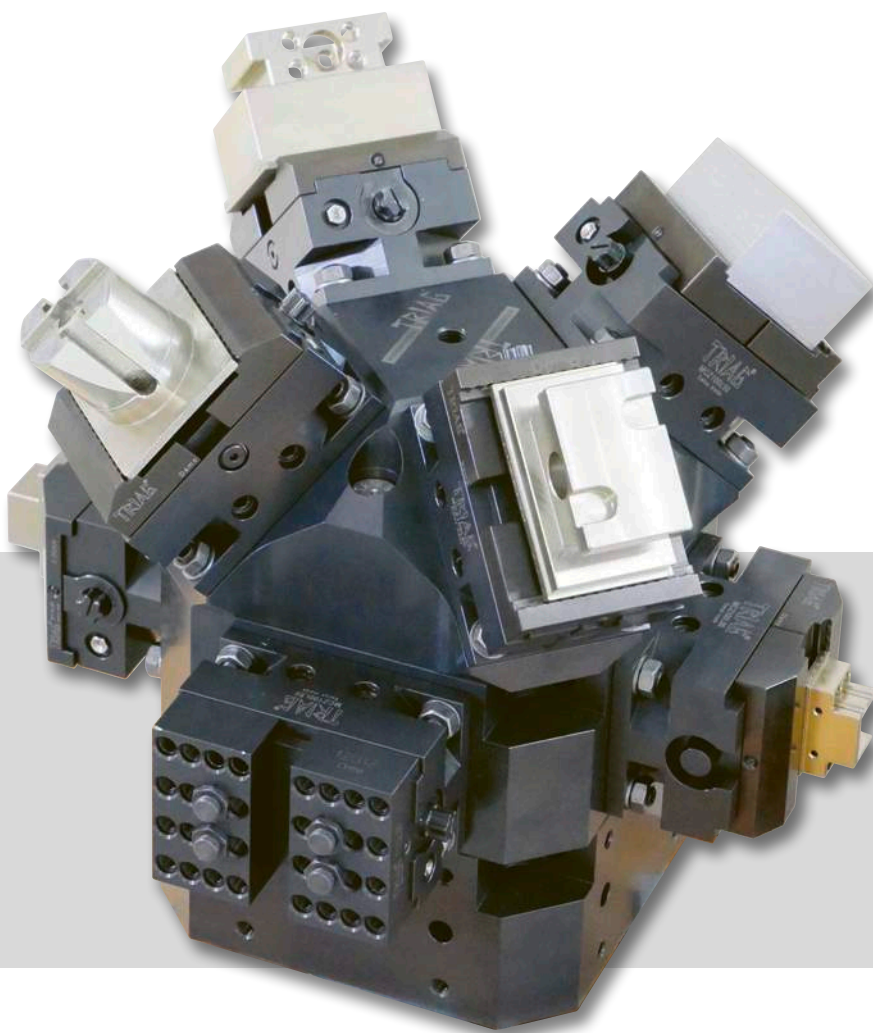
Ein einzigartig auf Modulbauweise ausgelegtes Spannkonzzept für den Einsatz der Zentrischspanner MCZ100L50.

Es können 4, 8 oder gar 12 Spanner, je nach Wunsch, eingesetzt werden. Das Ganze ist so modular wie ein «Lego»-Baukasten-System. Wieder stehen Prägebacken, weiche Backen und zusätzlich Stufen- und Universalbacken zur Verfügung. Sogar das Zentrum der einzelnen Spannstöcke kann eingestellt werden.

Sputnik II

A unique clamping concept with modular construction design for using the self-centering vice MCZ100L50.

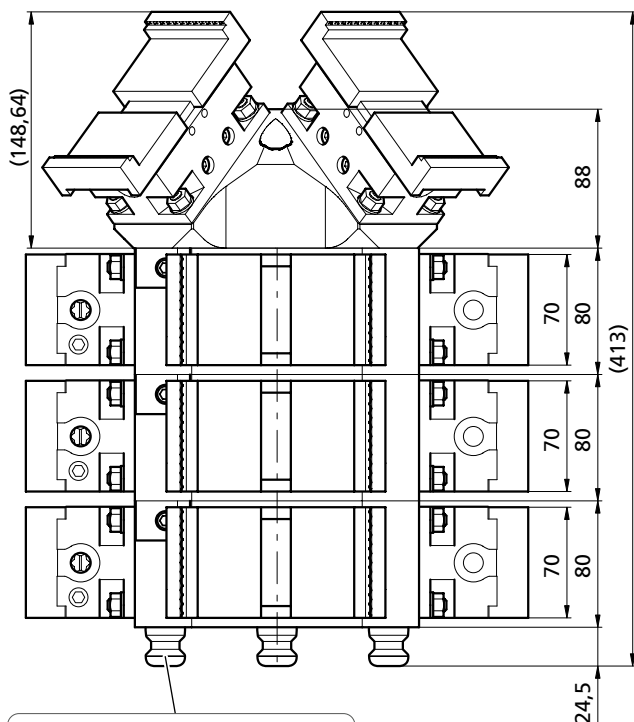
Four, eight or even twelve clamping vices can be used as needed. The whole system is modular like a «Lego» building kit. Again, stamping jaws, soft jaws and universal as well as stepped jaws are available. Even the centre of the individual vices can be adjusted.



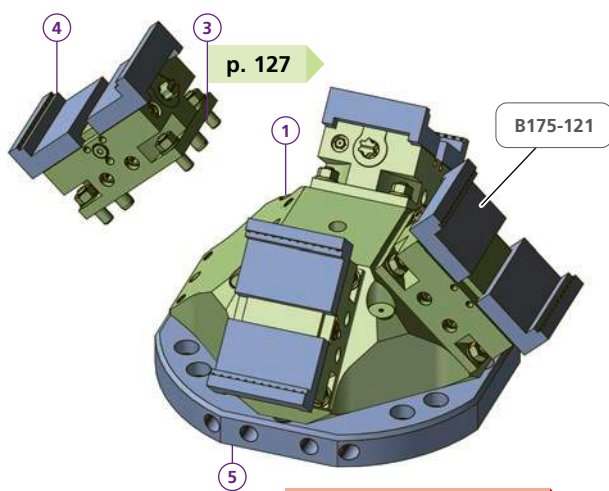
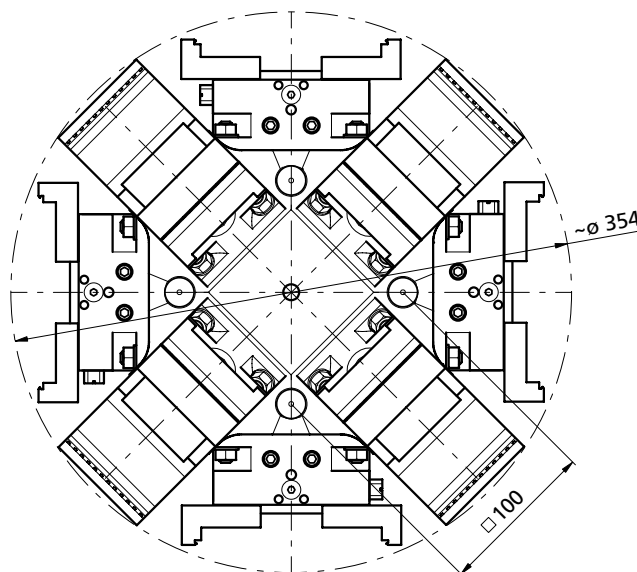
SPUTNIK II



SPUTNIK II



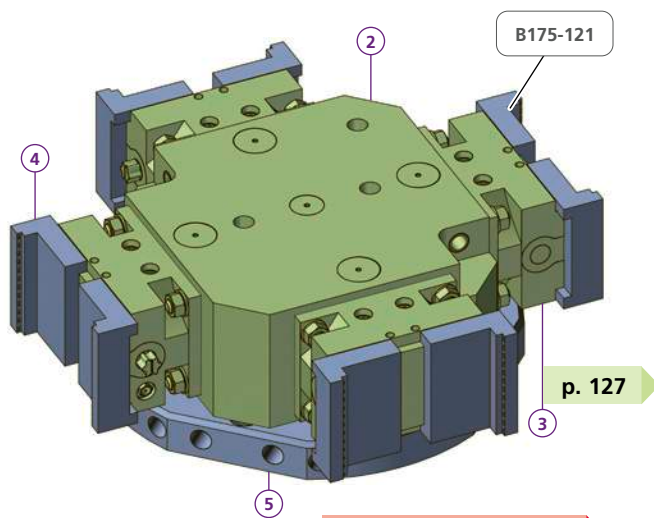
OPP-Schnittstelle Nullpunkt-System
OPP interface Zero-point system



p. 127

B175-121

oppSystem p. 287



B175-121

p. 127

oppSystem p. 287

5AXMCZ100-45-4

- 1x TS160110
- 4x MCZ100L50
- 8x —————
- 1x TB160379

kg ~26



Detailzeichnung
zu dieser
Schnittstelle
Detail drawing
to interface

p. 128 - 129

5AXMCZ100-90-4

- 1x TS160111
- 4x MCZ100L50
- 8x —————
- 1x TB160379

kg ~28,7

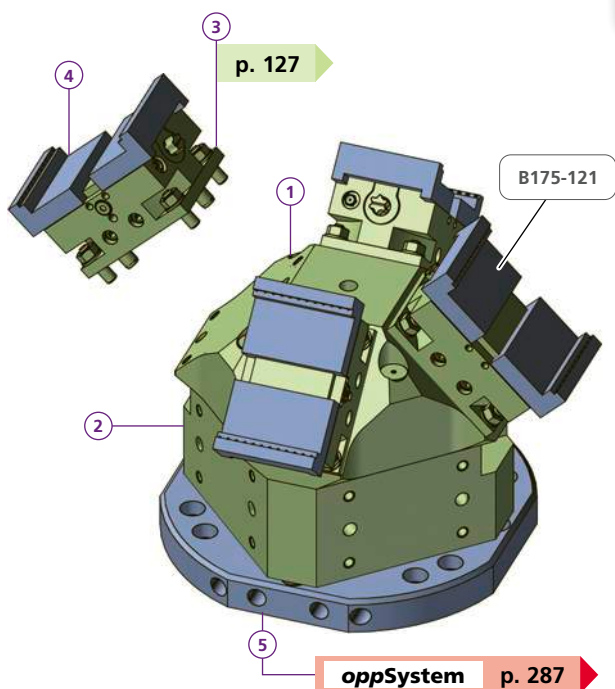


Detailzeichnung
zu dieser
Schnittstelle
Detail drawing
to interface

p. 128 - 129



SPUTNIK II


5AXMCZ100-45-4H

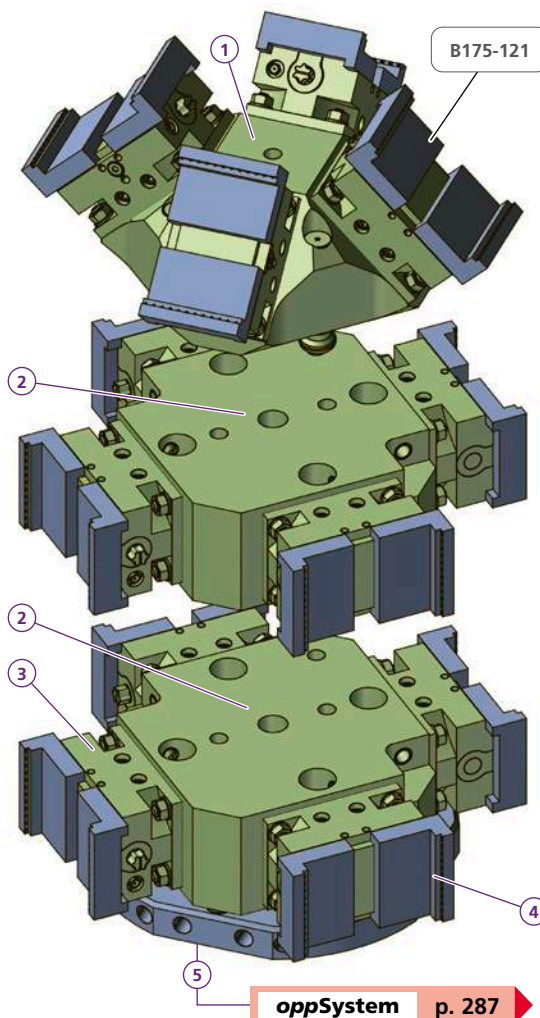
- 1 1x TS160110
- 2 1x TS160111
- 3 4x MCZ100L50
- 4 8x —
- 5 1x TB160379

kg ~41,2



Detailzeichnung
zu dieser
Schnittstelle
Detail drawing
to interface

p. 128 - 129


5AXMCZ100-45-12

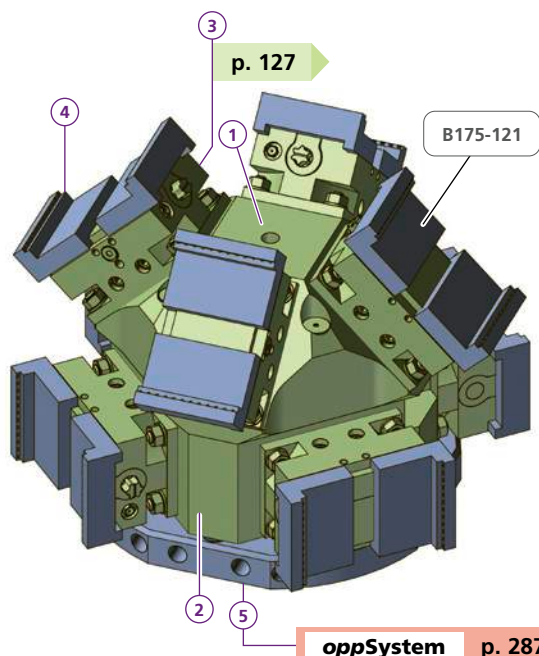
- 1 2x TS160110
- 2 1x TS160111
- 3 12x MCZ100L50
- 4 24x —
- 5 1x TB160379

kg ~83,3



Detailzeichnung
zu dieser
Schnittstelle
Detail drawing
to interface

p. 128 - 129


5AXMCZ100-45-8

- 1 1x TS160110
- 2 1x TS160111
- 3 8x MCZ100L50
- 4 16x —
- 5 1x TB160379

kg ~54,6



Detailzeichnung
zu dieser
Schnittstelle
Detail drawing
to interface

p. 128 - 129



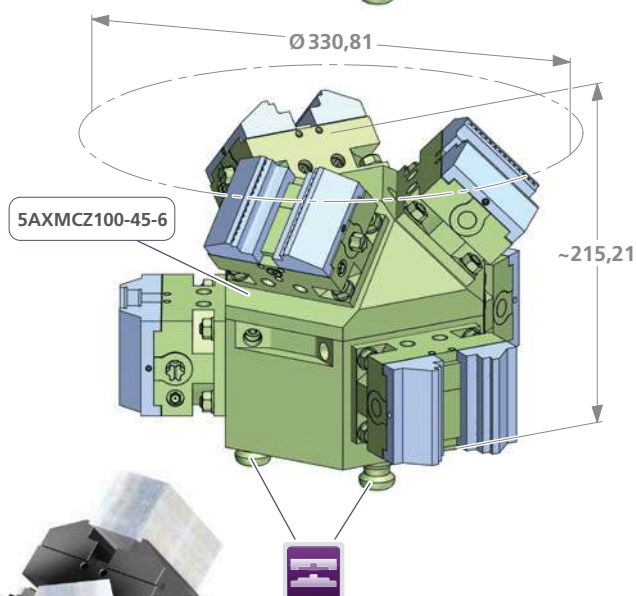
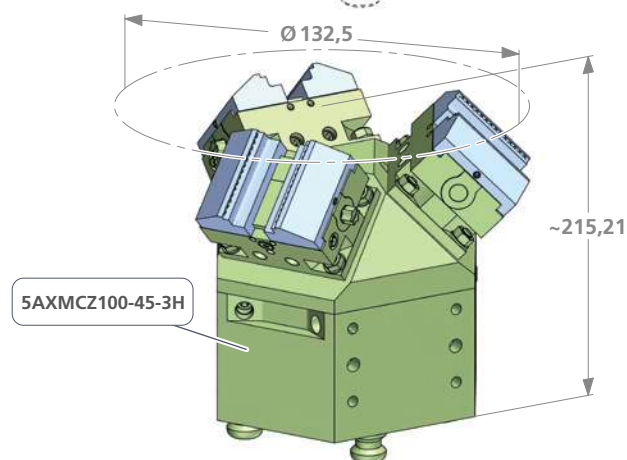
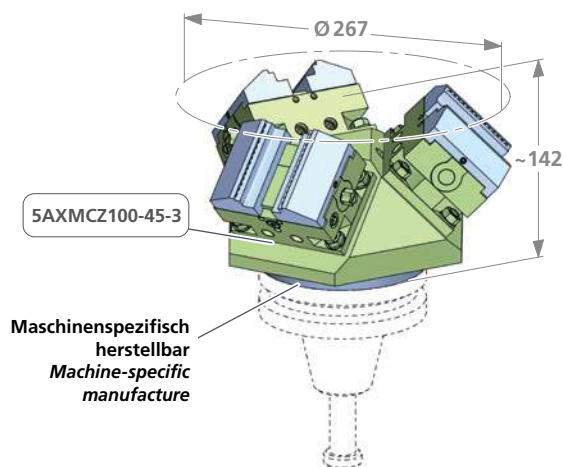
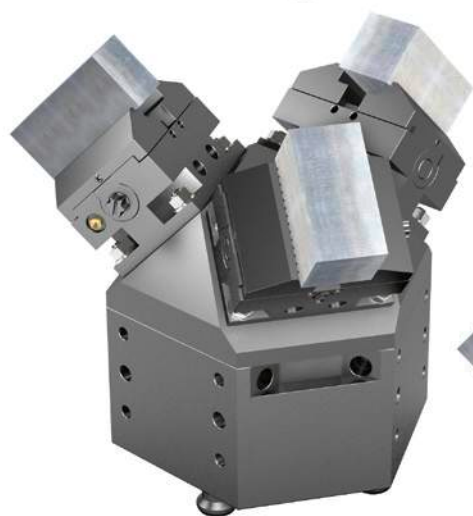
SPUTNIK II-3

Art. Nr.	kg
5AXMCZ100-45-3	~19
5AXMCZ100-45-3H	~35
5AXMCZ100-45-6	~43



Bei dieser Pyramidenlösung ist die Zugänglichkeit der Spindel beim Bearbeiten von Werkstücken sehr gut.

With this pyramid solution, the accessibility of the spindle is very good when machining workpieces.





Durchgehend modular!

Clevere Zentrischspanner passen sich der Maschine, den Werkstücken und den Anforderungen an.

Constant modular!

Clever self centering vise adapt to the machine, the workpiece and the requirements.

X

**Spannkrafterhaltung
und Nachfederung**

*Spring loaded
mechanism to maintain
clamping force*

M

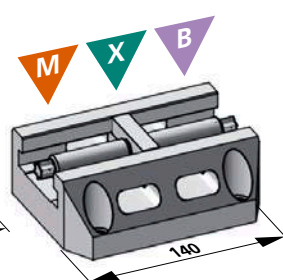
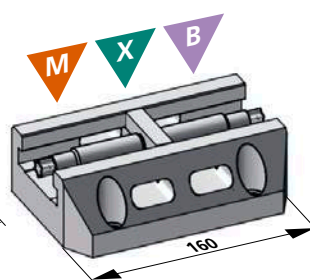
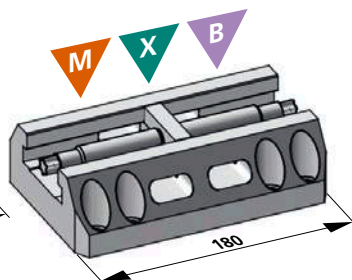
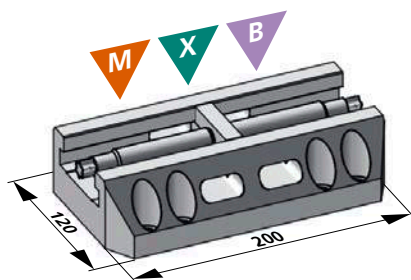
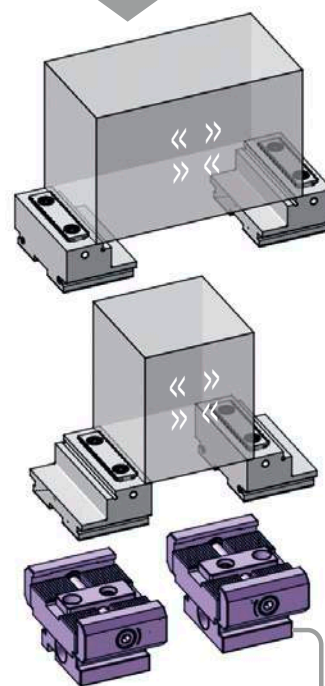
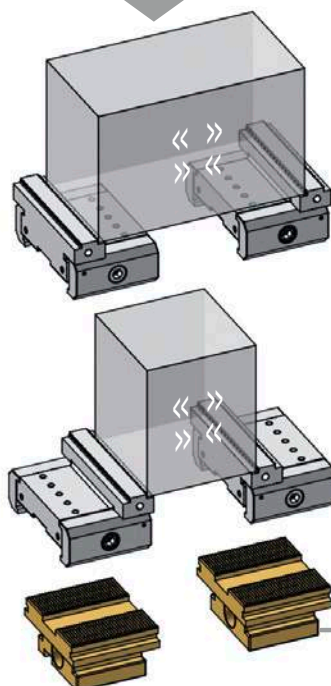
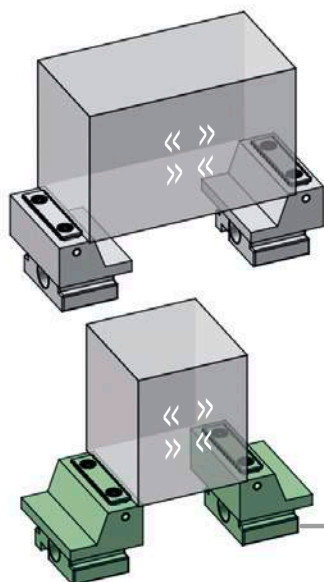
Mehr als **69** verschiedene
Backenvarianten passend
zu dieser Schnellwechsel-
schnittstelle.

*More than **69** different
jaw modules to match this
rapidly changing interface.*

B

Mehr als **8** verschiedene
Backenvarianten passend
zu dieser Schnellwechsel-
schnittstelle.

*More than **8** different jaw
modules to match this
rapidly changing interface.*



Bestellnummer Order number	kg
ZS X 200L50UPRG	~8,8
ZS X 180L50UPRG	~8,1
ZS X 160L50UPRG	~7,7
ZS X 140L50UPRG	~7,1

Bestellnummer Order number	kg
ZS M 200L50UPRG	~7,4
ZS M 180L50UPRG	~6,9
ZS M 160L50UPRG	~6,4
ZS M 140L50UPRG	~5,7

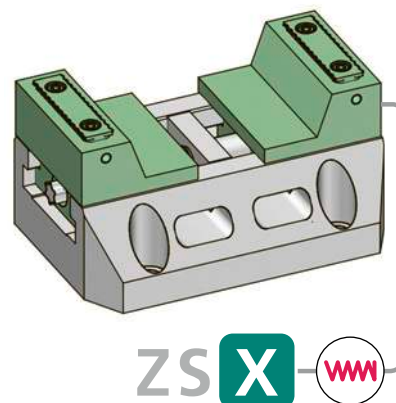
Bestellnummer Order number	kg
ZS B 200L50UPRG	~8,4
ZS B 180L50UPRG	~7,9
ZS B 160L50UPRG	~7,4
ZS B 140L50UPRG	~6,7

Zentrischspanner mit Spannkrafterhaltung und Direkt-Prägebacken

- ✓ für die erste Aufspannung mittels Direkt-Prägebacken ab 3 mm
- ✓ Einzigartiges integriertes Federpaket
- ✓ Beste Zugangs-Möglichkeit
- ✓ für OP10 und OP20 ausgelegt
- ✓ Bestens geeignet für 5-Achsen Maschinen mit kleinerem Tisch
- ✓ Bestens geeignet für den Einsatz auf Rundtischen

Self-centering vise with spring loaded mechanism and direct stamping jaws

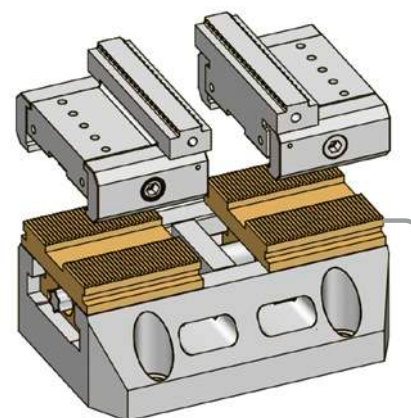
- ✓ for the first clamping using direct stamping jaws from 3 mm
- ✓ Unique integrated spring package
- ✓ Best access option
- ✓ Designed for OP10 and OP20
- ✓ Ideally suited for 5-axis machines with smaller tables
- ✓ Ideally suited for use on rotary tables


ZSX
Zentrischspanner für den Einsatz mit Power Clamp Modulen

- ✓ Höchste Modularität, alle Power Clamp Module können eingesetzt werden
- ✓ Schneller Backenwechsel (eine Schraube lösen und Modul nach oben abheben)
- ✓ Backen von 19 bis 150 mm
- ✓ weiche Backen
- ✓ Direktprägebacken und Bearbeitung ab 3 mm

Self-centering vice for use with Power Clamp modules

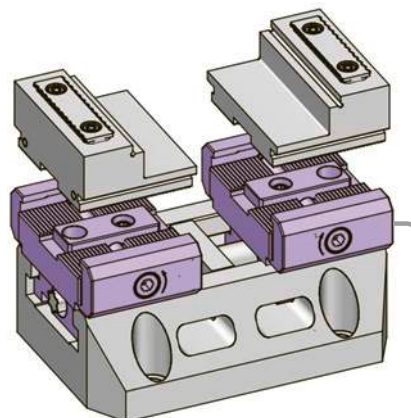
- ✓ Highest modularity, all Power Clamp modules can be used
- ✓ Quick jaw change (loosen one screw and lift the module up)
- ✓ Jaws from 19 to 150 mm
- ✓ soft jaws
- ✓ Direct stamping jaws, machining from 3 mm


ZSM
Zentrischspanner für den Einsatz von Schnellwechselbacken

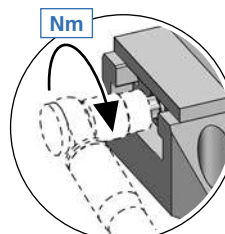
- ✓ Hohe Backenvielfalt
- ✓ Weiche Backen zum selbst bearbeiten
- ✓ Direktprägebacken für OP10
- ✓ Schneller Backenwechsel (eine Schraube lösen, Backe nach oben abheben)
- ✓ Die Seitenbacken sind an den Schlitten montiert und müssen nicht jedes Mal mit den Backen gekauft werden

Self-centering vice for the use of quick-change jaws

- ✓ Great variety of jaws
- ✓ Soft jaws for individual machining
- ✓ Direct stamping jaws for OP10
- ✓ Quick jaw change (loosen one screw and lift the jaw up)
- ✓ The side clamps are integrated in the moving slides and must not be ordered with the jaws each time

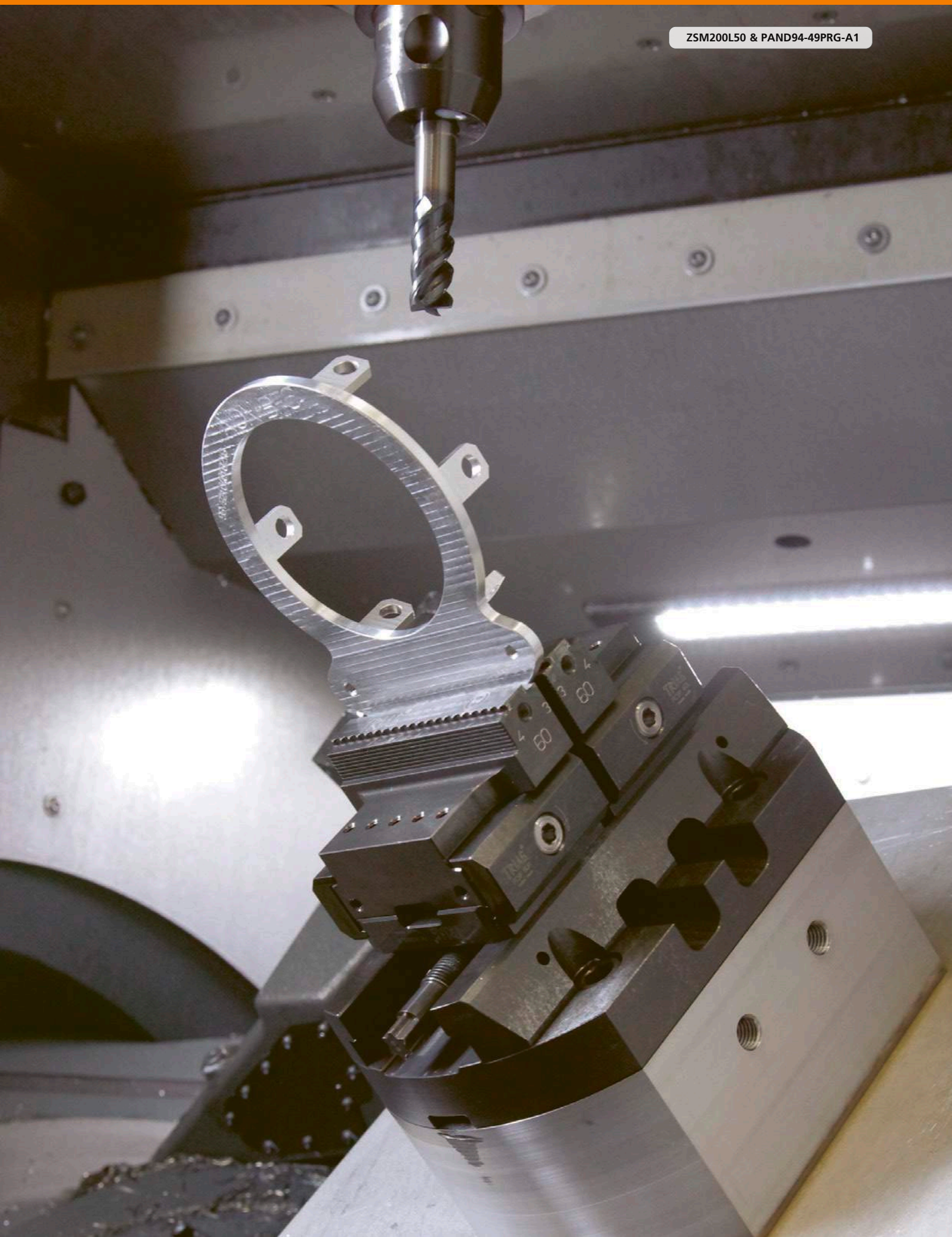

ZSB

Drehmoment Torque		Spannkraft Workholding force			Gut zu Wissen Good to know
Nm	(lb-ft)	~daN	~(lb)	~t	
10	7,4	= 200	440	0,2	Diese Spannkraften werden für den Dauerbetrieb empfohlen! These clamping forces are recommended for continuous operation!
20	14,8	= 500	1'102	0,5	
30	22,2	= 1'000	2'204	1,0	
40	29,6	= 1'300	2'866	1,3	
50	37,0	= 1'600	3'527	1,6	
60	44,4	= 1'800	3'968	1,8	Für kurzfristige Anwendung For short-term application
70	51,8	= 2'100	4'629	2,1	





ZSM200L50 & PAND94-49PRG-A1





Direkt-Prägebacken

Bei knapp gespannten Werkstücken, speziell in weichen Materialien, wie Alu und Rostfrei aber auch in praktisch allen anderen Materialien, besteht das Problem, dass sich die Werkstücke freiwiegeln! Dies vor allem bei weit auskragenden Werkstücken bei der 5-Achsen Bearbeitung, selbst wenn vorgeprägt wird.

Triag International hat deshalb einen nachfedernden Zentrisch Spannstock entwickelt, welcher ein Freiwiegeln der Werkstücke mittels Nachfederung verhindert.

Bei diesem patentiertem System wird mittels Tellerfedern eine Backe des Zentrischspannstockes nachgeschoben. So wird der Spanndruck aufrechterhalten. Die Einspanntiefe ist im Normalfall 3 mm, kann aber verstellt werden von ca. 1,8 bis 6 mm. Das Werkstück kann sich so praktisch nicht freiwiegeln.

Das heisst, man hat durchwegs die gleichen Bedingungen und das Werkstück hat während der Bearbeitung weniger Vibrationen und bewegt sich nicht. Oberfläche und Genauigkeit verbessern sich und sind konstanter.

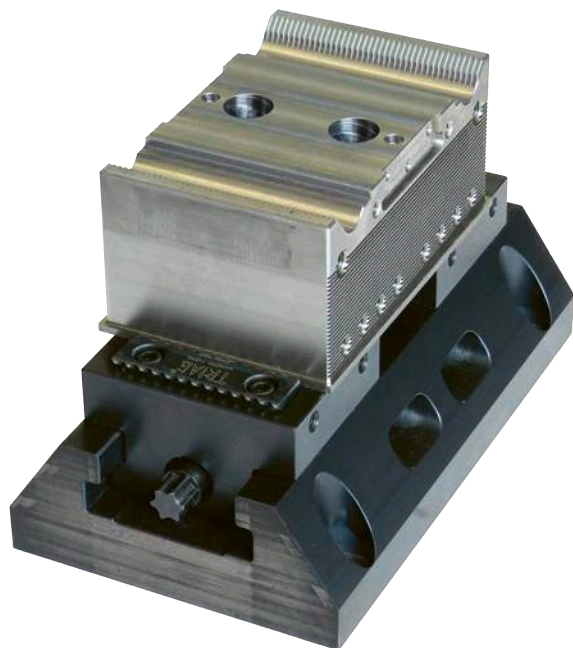
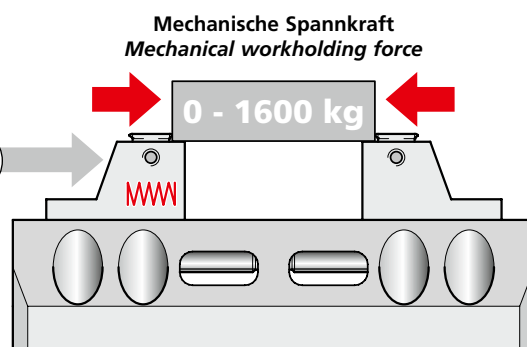
Direct spring loaded stamping jaws

This patented self centering vise is unique, as it can be used for direct stamping the blanks. It is different to others as the teeth bite into the raw material and even under vibrations, one of the two jaws will continuously move forward. This will hold the workpiece with the same force and strength as in the beginning.

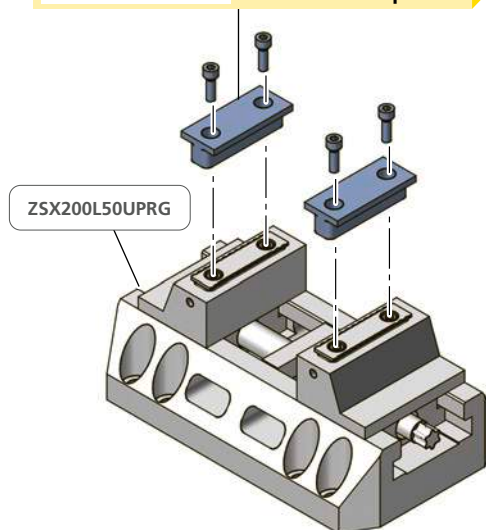
The problem in the past was that the other systems in the market were getting loose during heavy machining and accuracy was difficult to achieve.

Especially in soft materials such as alu and soft steels it has a great performance. Usually the workpiece is clamped only 3 mm but this hight can be changed from 1,8 to 6 mm if necessary.

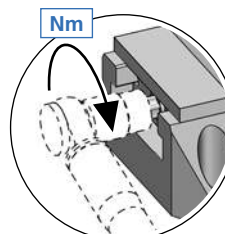
Spannkrafterhaltung und Nachfederung
Spring loaded mechanism to maintain clamping force

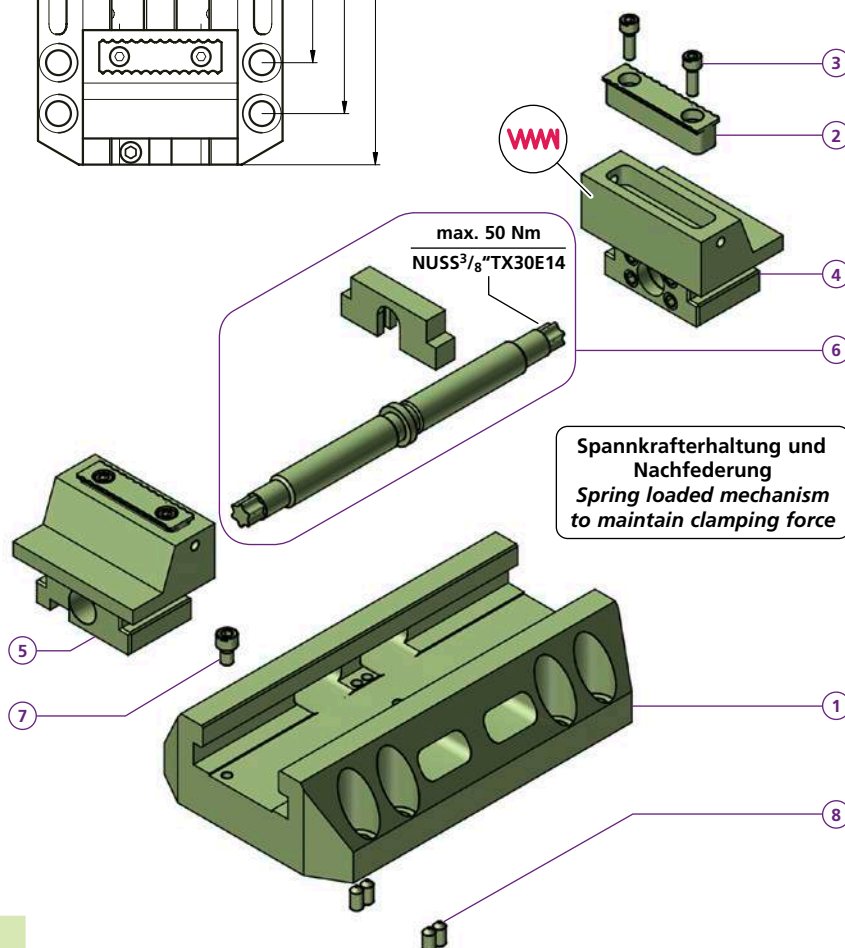
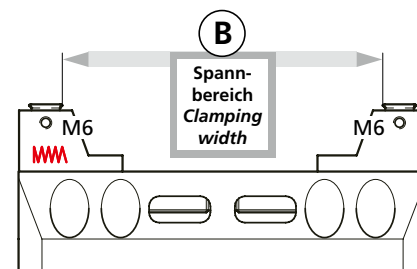
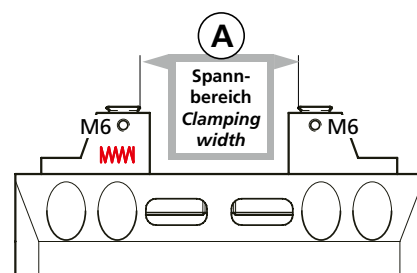
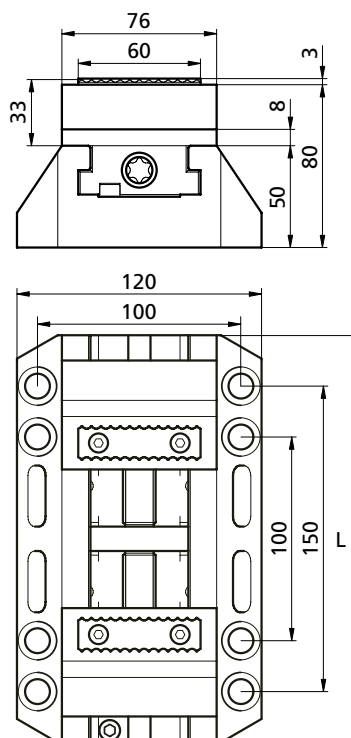
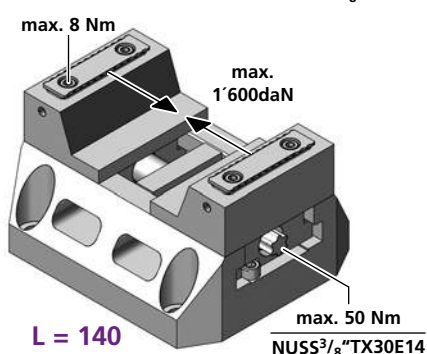
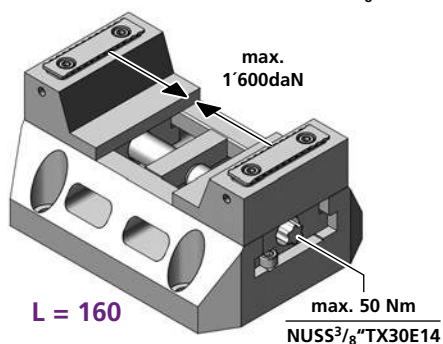
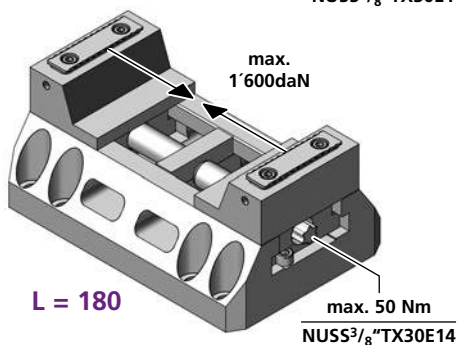
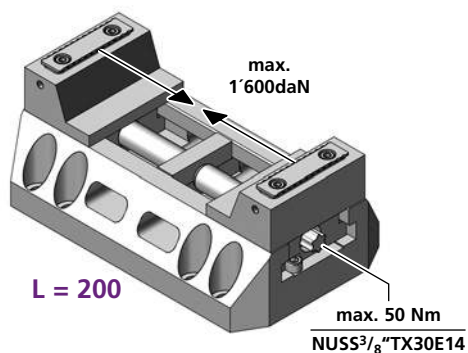


MANF58-14W25 microCLAMP p. 176



Drehmoment Torque		Spannkraft Workholding force			Gut zu Wissen Good to know
Nm	(lb-ft)	~daN	~(lb)	~t	
10	7,4	= 200	440	0,2	Diese Spannkräfte werden für den Dauerbetrieb empfohlen! These clamping forces are recommended for continuous operation!
20	14,8	= 500	1'102	0,5	
30	22,2	= 1'000	2'204	1,0	
40	29,6	= 1'300	2'866	1,3	
50	37,0	= 1'600	3'527	1,6	
60	44,4	= 1'800	3'968	1,8	Für kurzfristige Anwendung For short-term application
70	51,8	= 2'100	4'629	2,1	





ZSX200L50UPRG	
1	1x TK150025
2	2x MAND58-14PRG
3	4x M5X16ISO4762
4	1x ZB150787
5	1x ZB150786
6	1x PCS16TR200SET
7	1x M6X10ISO4762
8	4x M6X16DIN914
L = 200	
A	10 – 124 mm
B	62 – 178 mm
kg	~8,8

ZSX180L50UPRG	
1	1x TK150523
6	1x PCS16TR180SET
L = 180	
A	10 – 104 mm
B	62 – 158 mm
kg	~8,1

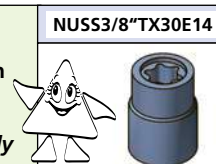
ZSX160L50UPRG	
1	1x TK150522
6	1x PCS16TR160SET
L = 160	
A	10 – 84 mm
B	62 – 138 mm
kg	~7,7

ZSX140L50UPRG	
1	1x TK150521
6	1x PCS16TR140SET
L = 140	
A	10 – 64 mm
B	62 – 118 mm
kg	~7,1

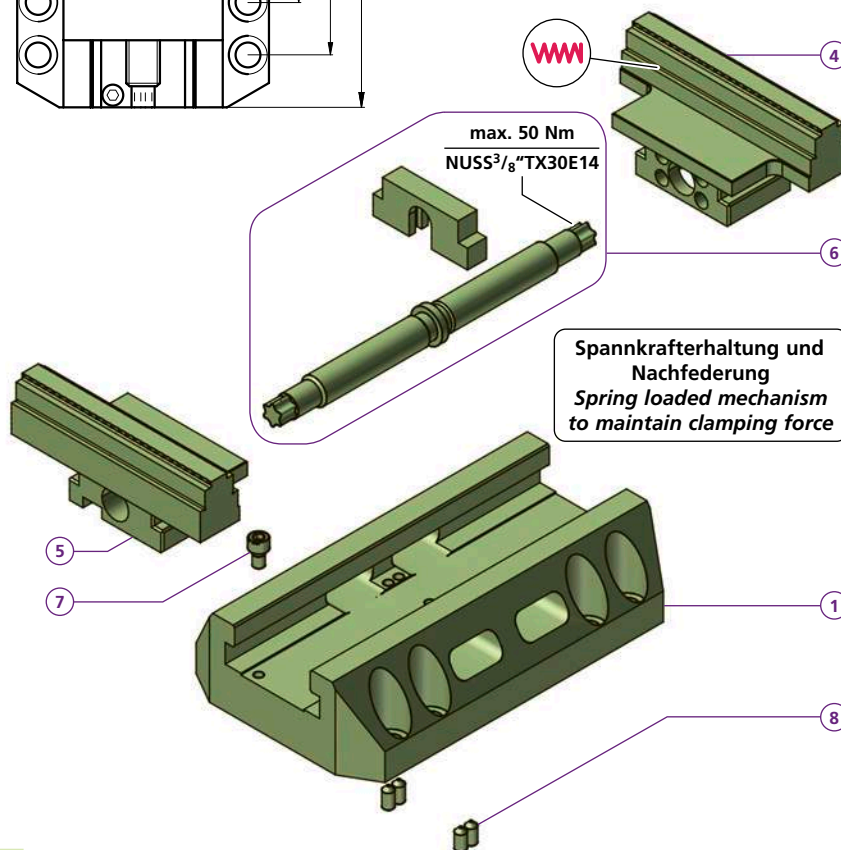
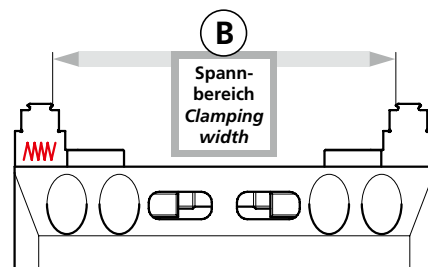
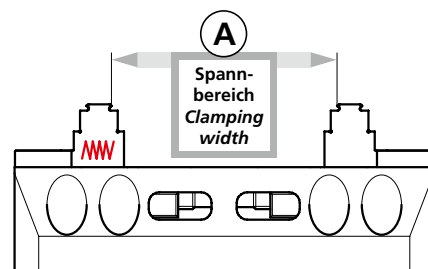
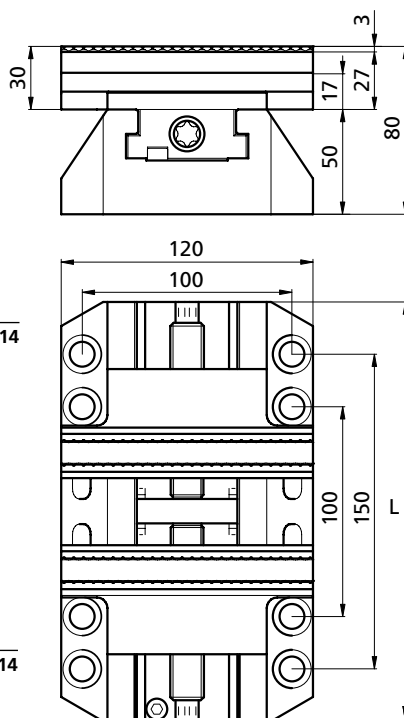
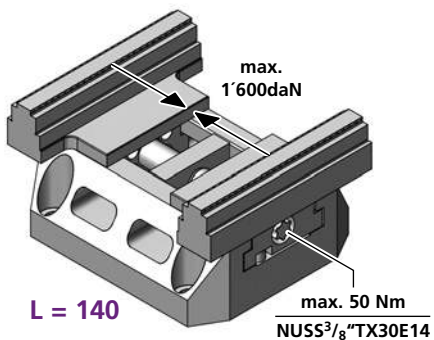
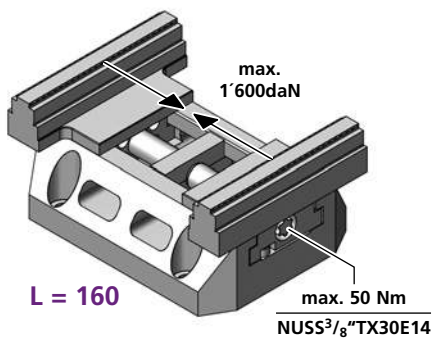
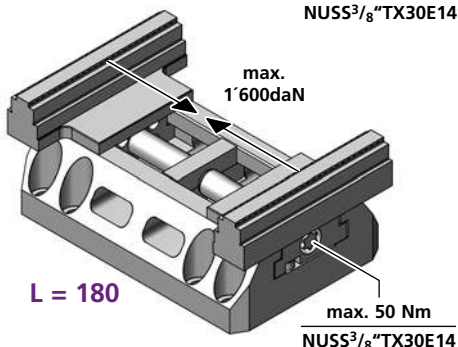
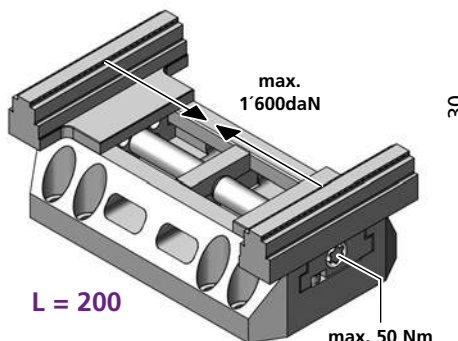
Drehmoment und Spannkraft siehe Seite
Torque and clamping force see page

140

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



Bestellbeispiel / Ordering example:
3 x ZSX200L50UPRG & 1 x NUS3/8"TX30E14



ZSX200L50PRG120	
1	1x TK150025
4	1x ZB170050
5	1x TB170051
6	1x PCS16TR200SET
7	1x M6X10ISO4762
8	4x M6X16DIN914
L = 200	
A	14 – 130 mm
B	70 – 186 mm
kg ~7,7	

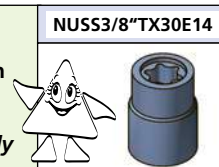
ZSX180L50PRG120	
1	1x TK150523
6	1x PCS16TR180SET
L = 180	
A	14 – 110 mm
B	70 – 166 mm
kg ~7,2	
ZSX160L50PRG120	
1	1x TK150522
6	1x PCS16TR160SET
L = 160	
A	14 – 90 mm
B	70 – 146 mm
kg ~6,6	

ZSX140L50PRG120	
1	1x TK150521
6	1x PCS16TR140SET
L = 140	
A	14 – 70 mm
B	70 – 126 mm
kg ~6,0	

Drehmoment und Spannkraft siehe Seite
Torque and clamping force see page

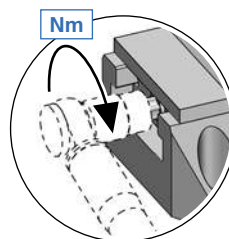
140

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



Bestellbeispiel / Ordering example:
3 x ZSX200L50PRG120 & 1 x Nuss3/8"TX30E14

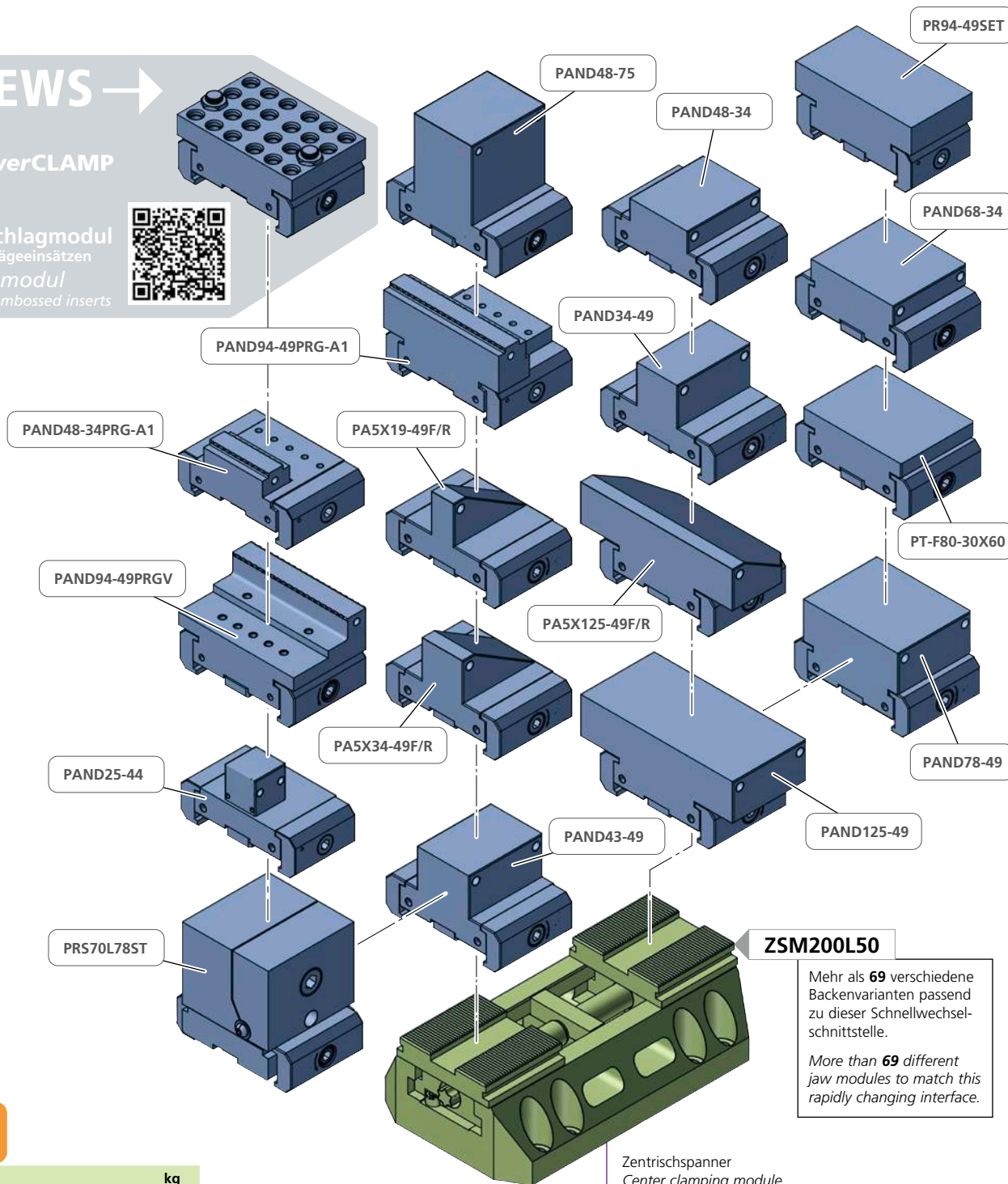
Drehmoment Torque		Spannkraft Workholding force			Gut zu Wissen Good to know
Nm	(lb-ft)	~daN	~(lb)	~t	
10	7,4	= 200	440	0,2	Diese Spannkraften werden für den Dauerbetrieb empfohlen! <i>These clamping forces are recommended for continuous operation!</i>
20	14,8	= 500	1'102	0,5	
30	22,2	= 1'000	2'204	1,0	
40	29,6	= 1'300	2'866	1,3	
50	37,0	= 1'600	3'527	1,6	
60	44,4	= 1'800	3'968	1,8	Für kurzfristige Anwendung <i>For short-term application</i>
70	51,8	= 2'100	4'629	2,1	



NEWS →

PowerCLAMP

Anschlagmodul
mit Prägeeinsätzen
End modul
with embossed inserts



ZSM200L50

Mehr als 69 verschiedene Backenvarianten passend zu dieser Schnellwechsel-schnittstelle.

More than 69 different jaw modules to match this rapidly changing interface.



	kg
1 ZSM200L50	~5,6
ZSM180L50	~5,0
ZSM160L50	~4,5
ZSM140L50	~4,0
2x	

powerCLAMP p. 86 - 96

Bestellbeispiel / Ordering example: 1 x ZSM200L50 & 2 x PAND94-49PRG-A1

Zentrischspanner mit **powerCLAMP** Schnittstelle

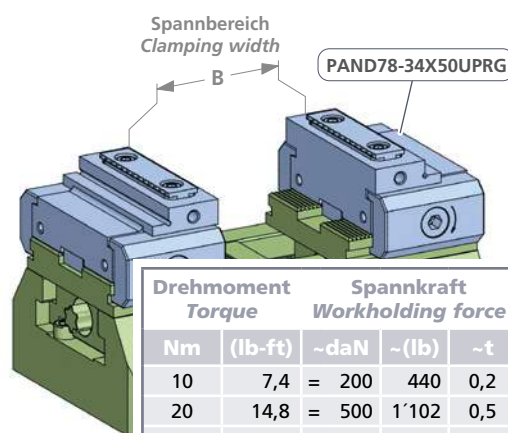
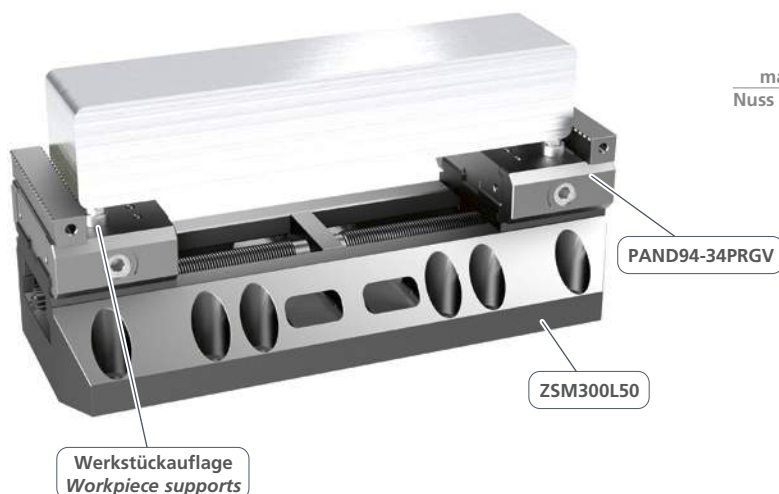
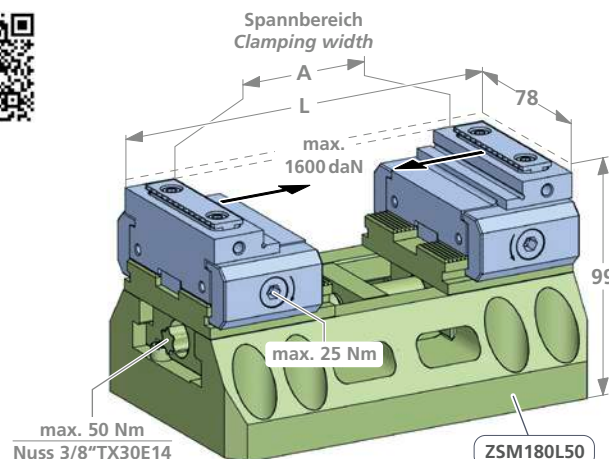
Compact self centering vise with **powerCLAMP** interface

Typ
Type



triCENTRO

Art. Nr.	A	B	kg	L
ZSM140L50	10 – 68 mm	60 – 120 mm	~5,7	140
ZSM160L50	10 – 88 mm	60 – 140 mm	~6,4	160
ZSM180L50	10 – 108 mm	60 – 160 mm	~6,9	180
ZSM200L50	10 – 128 mm	60 – 180 mm	~7,4	200
ZSM300L50	10 – 228 mm	60 – 280 mm	~10,5	300



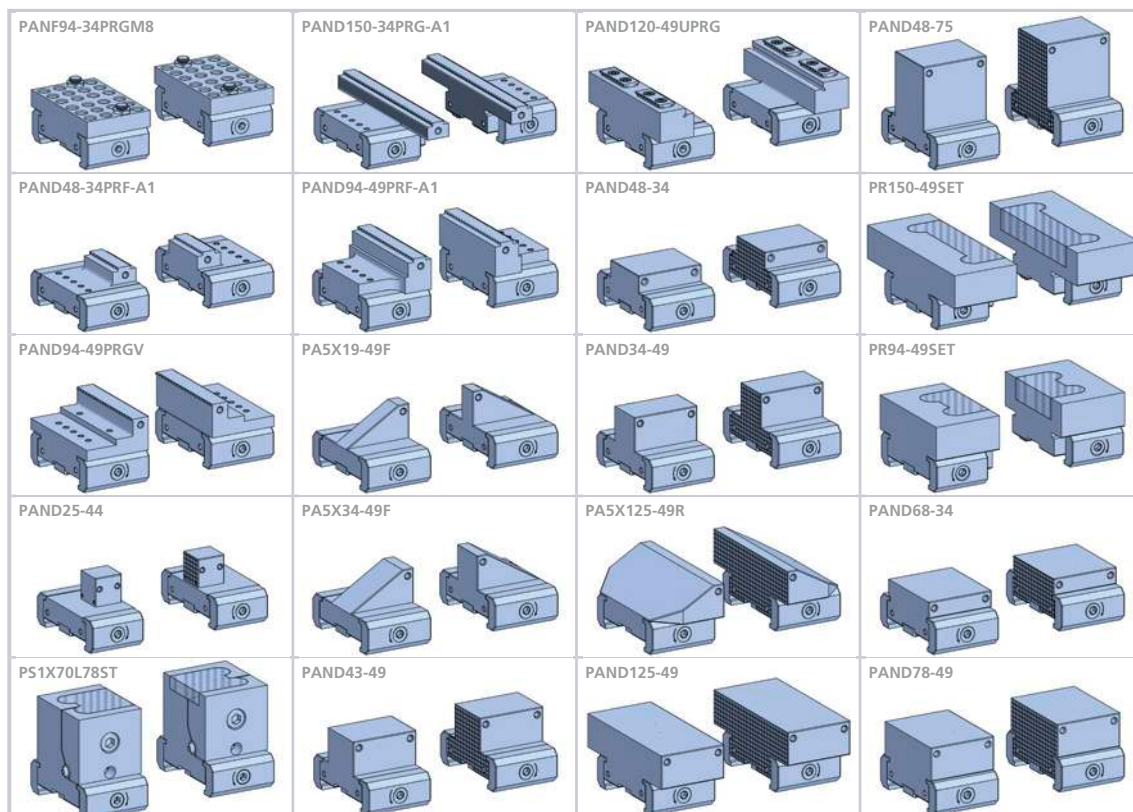
Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 200	440	0,2
20	14,8	= 500	1'102	0,5
30	22,2	= 1'000	2'204	1,0
40	29,6	= 1'300	2'866	1,3
50	37,0	= 1'600	3'527	1,6

Mehr als 60 verschiedene Backenvarianten
passend zu dieser Schnellwechselschnittstelle.

More than 60 different jaw modules
to match this rapidly changing interface.

NUSS3/8\"/>

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



Seitlich verstellbarer Zentrischspannstock

Passend auf alle Power Clamp Basisschienen können mehrere dieser Zentrischspanner, seitlich aneinander gereiht, lange Werkstücke spannen und sind dabei flexibel in 2 mm Schritten seitlich verschiebbar.

Auch können diese für Mehrfachspannung genutzt werden und mehrere Einzelteile an fixen Punkten gespannt werden.

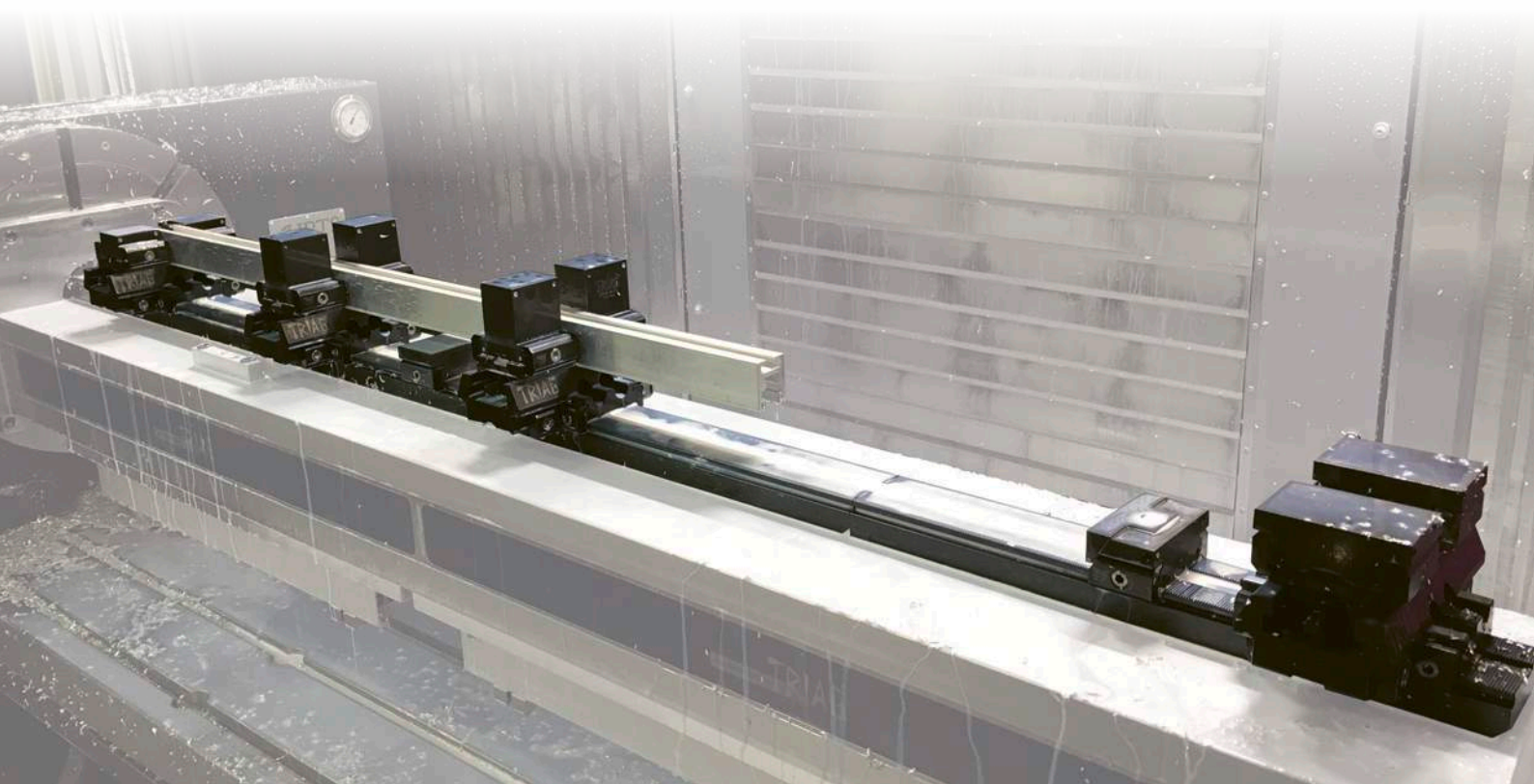
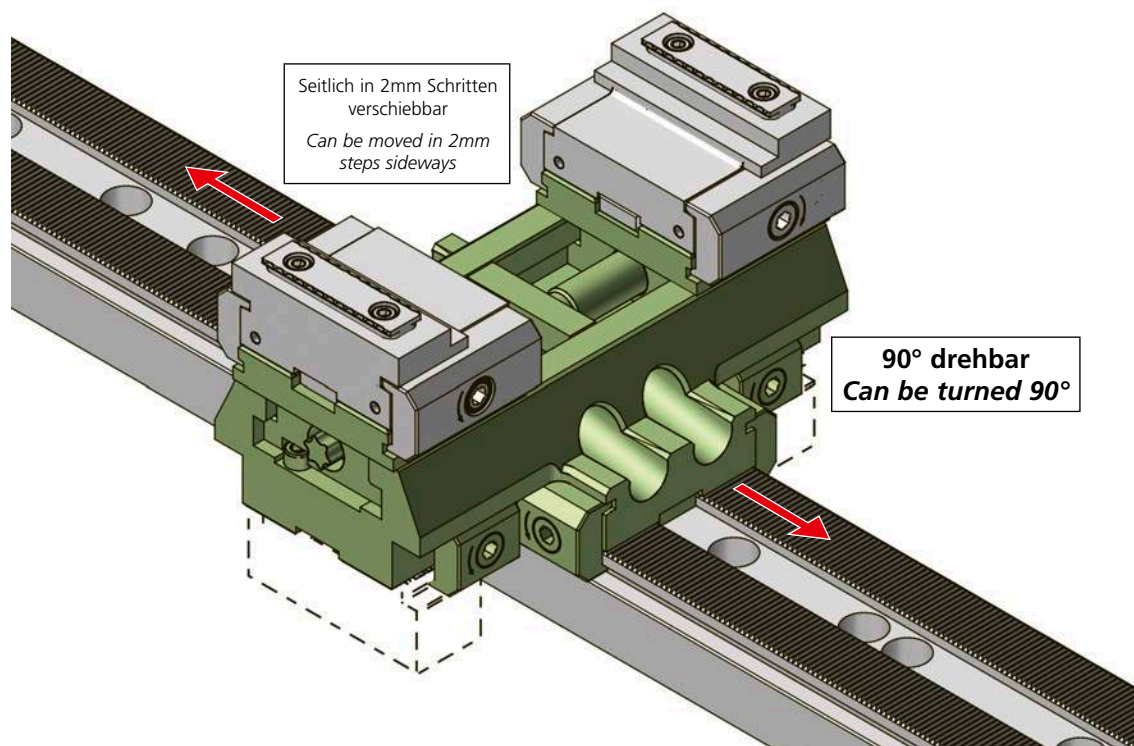
Einsatzgebiet für lange Profile, Stangen und Bleche aber auch Mehrfachspannung von fast allen Materialien.

Laterally adjustable centric vice

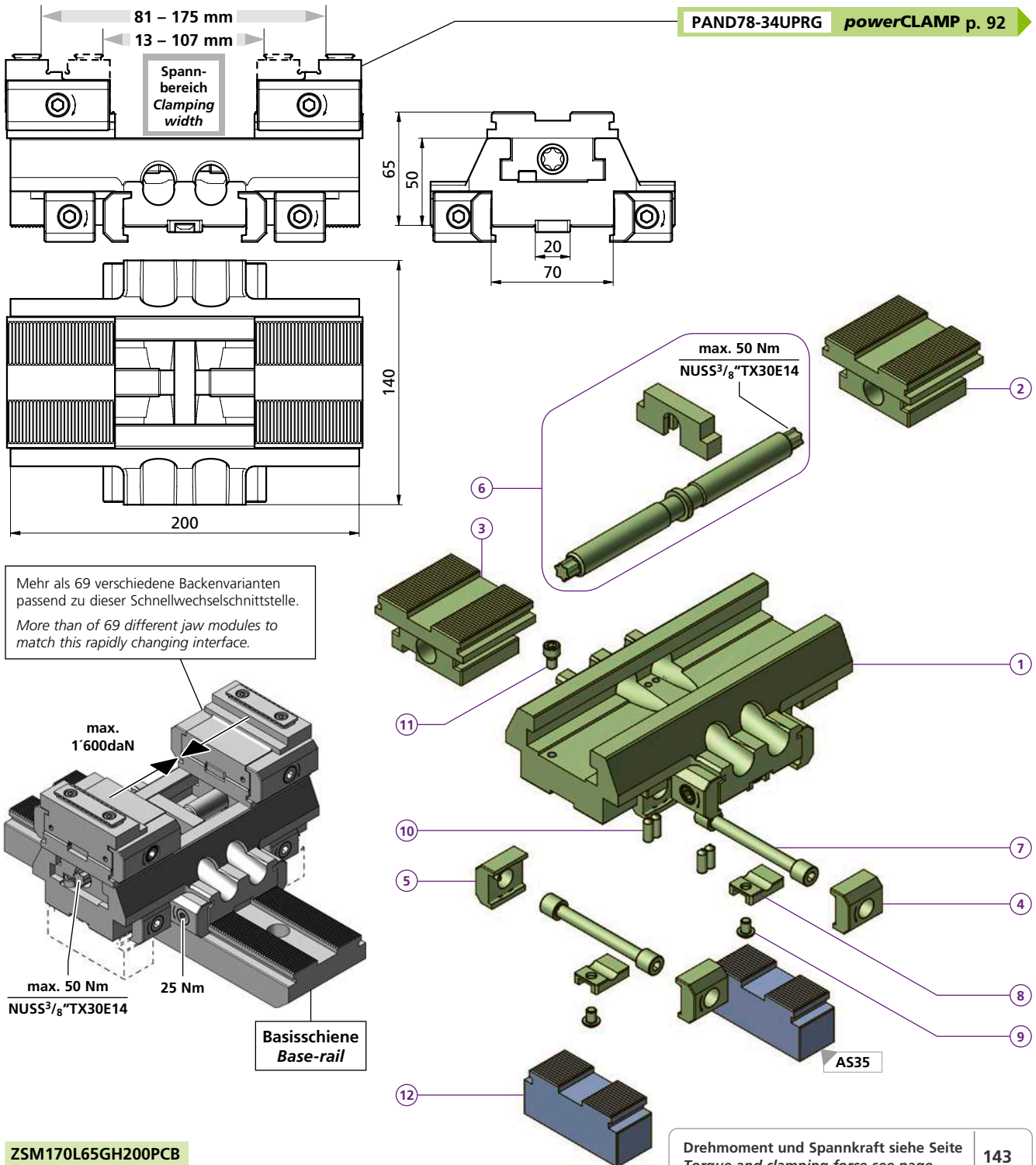
Fitting all Power Clamp basic rails, several of these self-centering vices can, arranged laterally in rows, clamp long work pieces and can hereby be flexibly shifted sideways in 2 mm steps.

They can also be used for multi clamping and several individual parts clamped at fixed points.

The field of application for long sections, rods and sheets but also multi clamping of almost all materials.



PAND78-34UPRG powerCLAMP p. 92



ZSM170L65GH200PCB

- 1x TB140566
- 1x TB150092
- 1x TB150091
- 4x PCSP30L
- 4x PCSP30R
- 1x PCS16TR200SET
- 4x PCS14
- 4x PCGU2030
- 4x M6X8ISO7380
- 4x M6X16DIN914
- 1x M6X10ISO4762
- 2x

kg ~8,6

Schienenhöhe / Rail height

AS35 (H = 35)	AS60 (H = 60)	AS80 (H = 80)

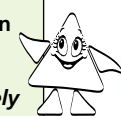
Drehmoment und Spannkraft siehe Seite
Torque and clamping force see page

143

WICHTIG!
Bitte separat bestellen

IMPORTANT!
Please order separately

NUS53/8"TX30E14



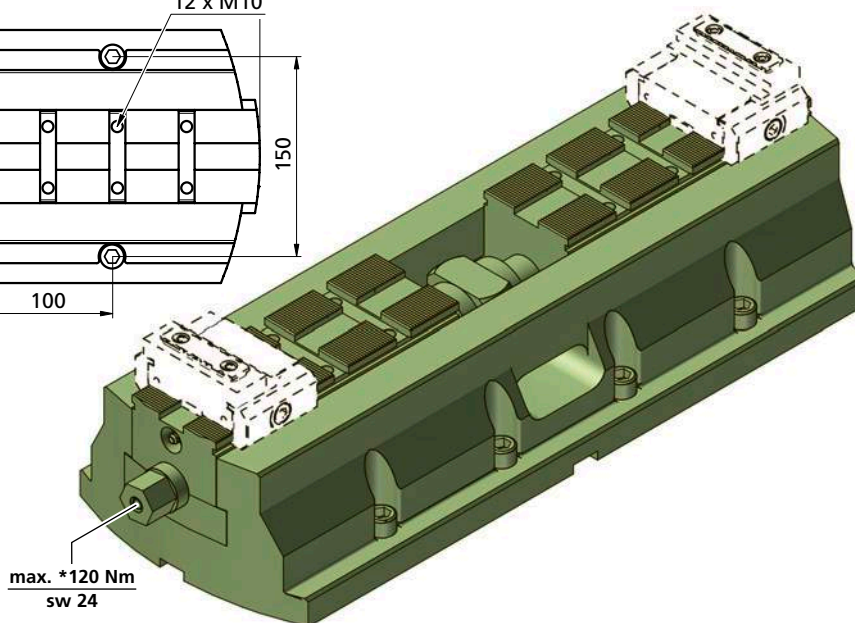
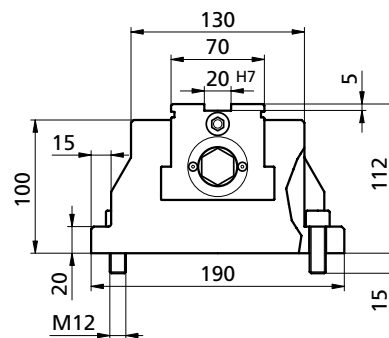
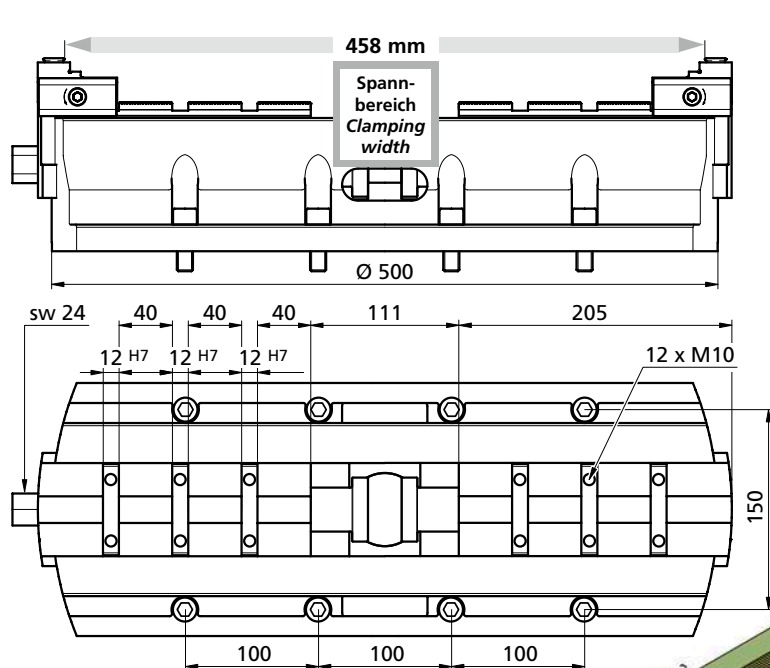
Seitliche Stützen

Bei Gebrauch dieses Zentrischspanners, werden je nach Höhe der Basisschiene auf dessen sie aufgesetzt wird, zwei seitliche Stützen AS35 / AS60 / AS80 unterlegt.

Side support

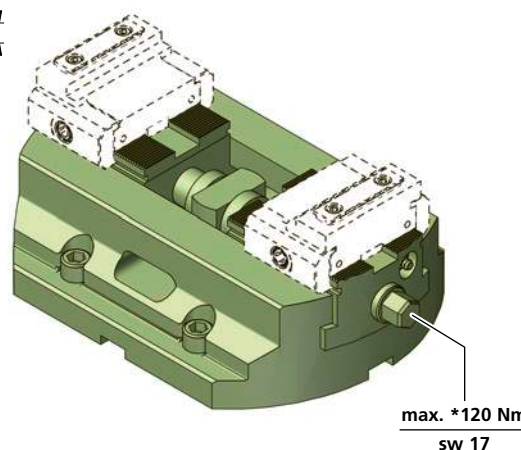
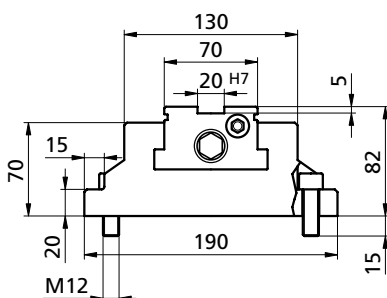
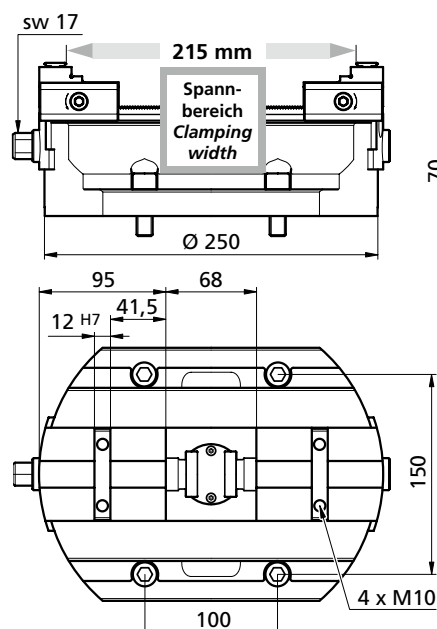
When using this self centering vise, a side support AS35 / AS60 / AS80 is underlaid, depending on the height of the base rail on which it is placed.

Bestellbeispiel / Ordering example: 2 x ZSM170L65GH200PCB & 4 x AS35 & 1 x NUS53/8"TX30E14



ZSMB500L112 kg = ~59

Backenhub (pro Backe)
Stroke of clamping (each jaw)
55 mm



ZSMB250L82 kg = ~19

Backenhub (pro Backe)
Stroke of clamping (each jaw)
35 mm

Drehmoment Torque		Spannkraft Workholding force			Gut zu Wissen Good to know
Nm	(lb-ft)	~daN	~(lb)	~t	
40	29,5	= 800	1798	0,8	Diese Spannkraften werden für den Dauerbetrieb empfohlen! These clamping forces are recommended for continuous operation!
60	44,26	= 1200	2697	1,2	
80	59	= 1600	3597	1,6	
100	73,75	= 2000	4496	2	
*120	88,5	= 2400	5395	2,4	Für kurzfristige Anwendung For short-term application

! Für längerfristige Anwendung ab 140 – 250 Nm müssen **geschraubte Backen** eingesetzt werden!
For longer-term use from 140 – 250 Nm the **screwed jaws** must be used!

Bestellbeispiel / Ordering example : **ZSMB500L112**

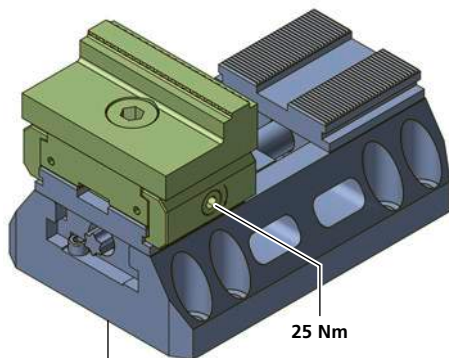
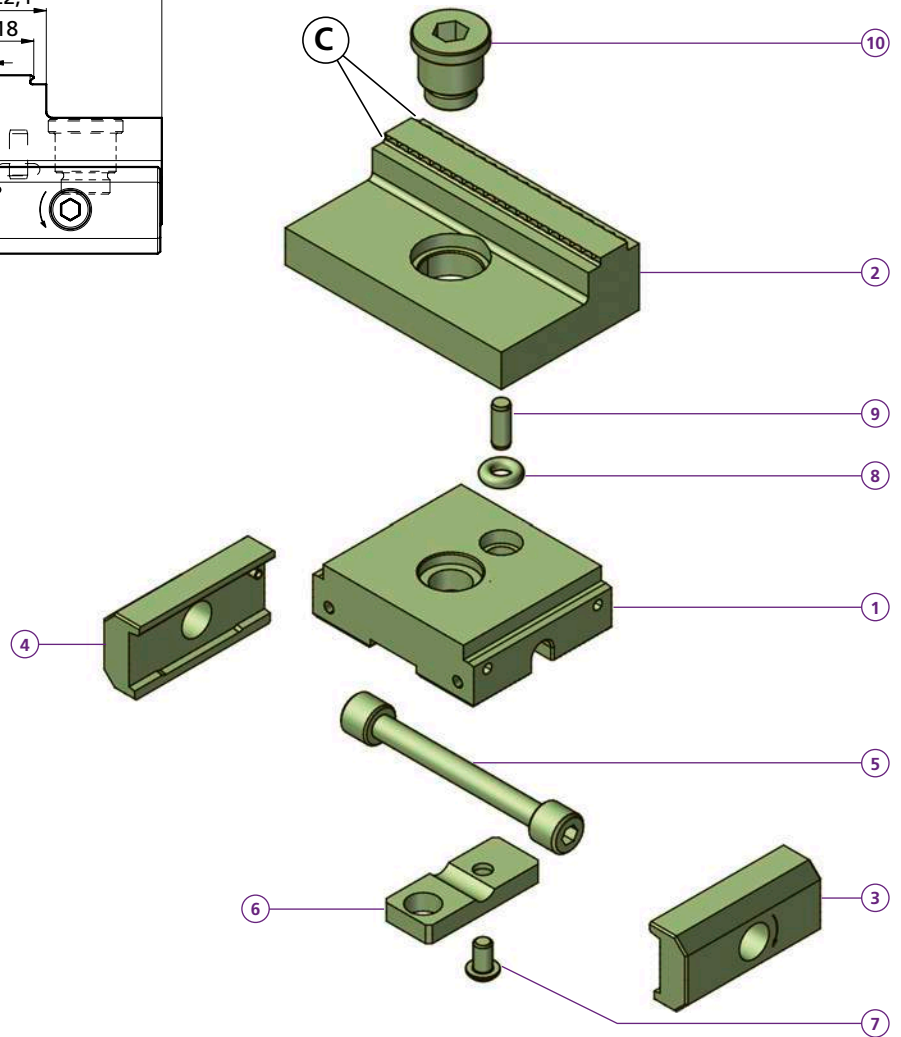
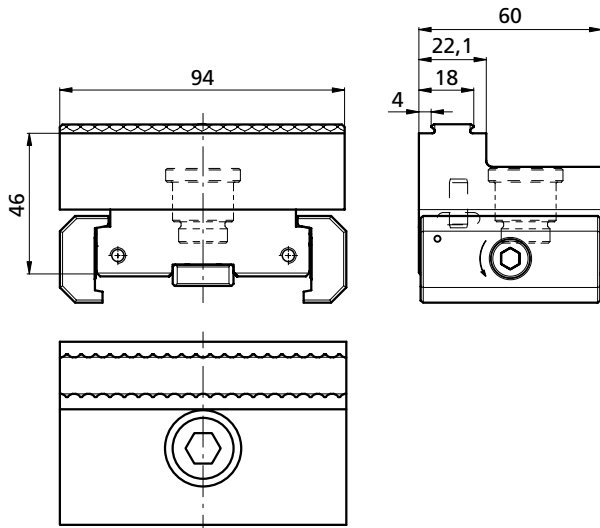


prägen
stamping



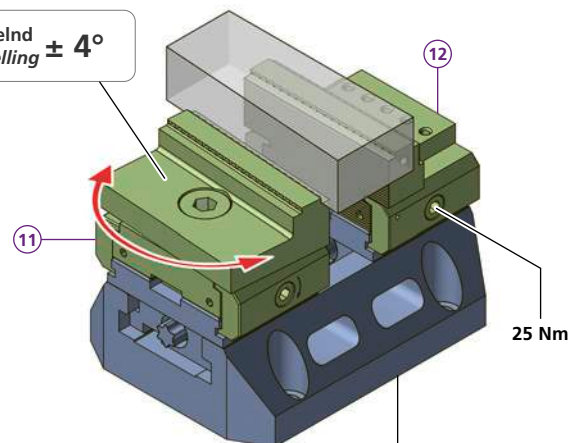
triCENTRO

PAND94-49PRF-A1-P



p. 144 ZSM180L50

pendelnd
swivelling $\pm 4^\circ$



p. 144 ZSM140L50

PAND94-49PRF-A1-P

- 1 1x TF180103
- 2 1x TF180102
- 3 1x PCSP60R
- 4 1x PCSP60L
- 5 1x PCS14
- 6 1x PCGU2049
- 7 1x M6X10ISO7380
- 8 1x OR6x4O-RingNBR70
- 9 1x 6m6x16DIN6325
- 10 1x TK130236

kg ~1,8

PAND94-49PRF-A1-P-NS18

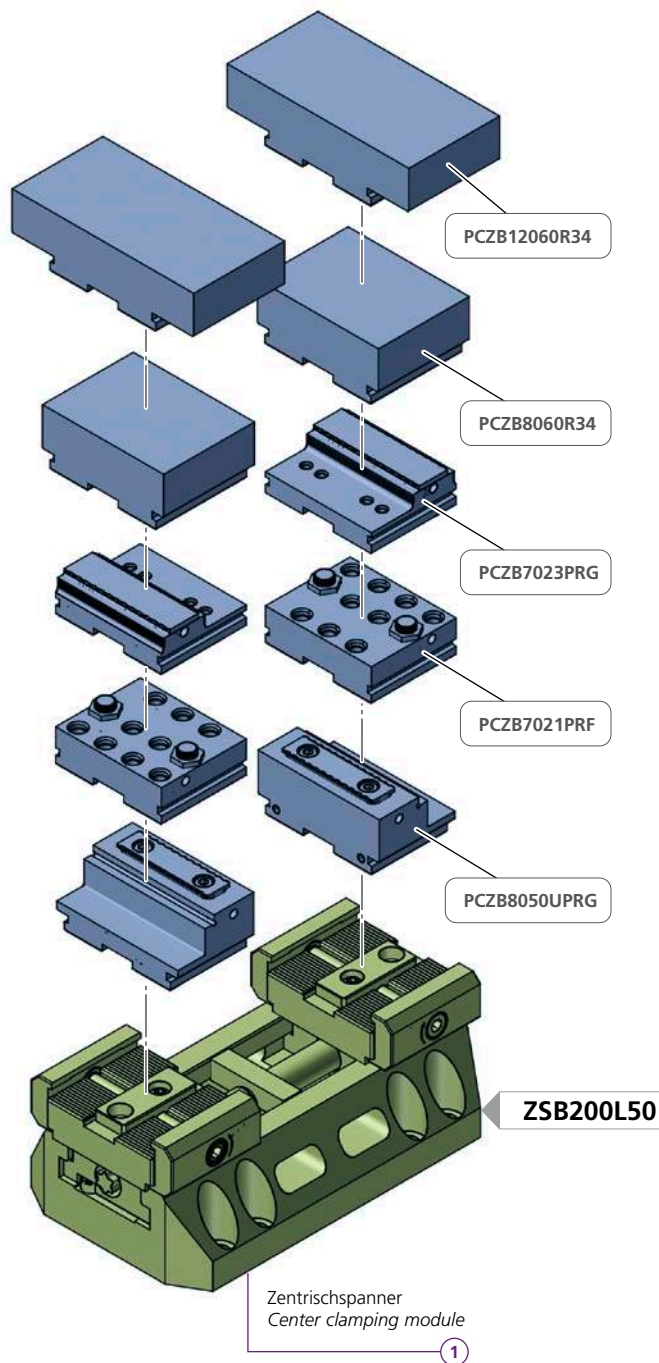
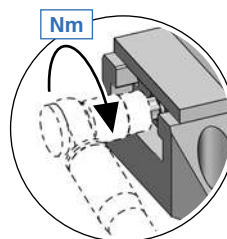
- 11 1x PAND94-49PRF-A1-P
- 12 1x PAND94-49PRG-A1

kg ~3,4

Bestellbeispiel / Ordering example: PAND94-49PRF-A1-P

Separat bestellen / Order separately

Drehmoment Torque		Spannkraft Workholding force			Gut zu Wissen Good to know
Nm	(lb-ft)	~daN	~(lb)	~t	
10	7,4	= 200	440	0,2	Diese Spannkräfte werden für den Dauerbetrieb empfohlen! <i>These clamping forces are recommended for continuous operation!</i>
20	14,8	= 500	1'102	0,5	
30	22,2	= 1'000	2'204	1,0	
40	29,6	= 1'300	2'866	1,3	
50	37,0	= 1'600	3'527	1,6	
60	44,4	= 1'800	3'968	1,8	Für kurzfristige Anwendung <i>For short-term application</i>
70	51,8	= 2'100	4'629	2,1	

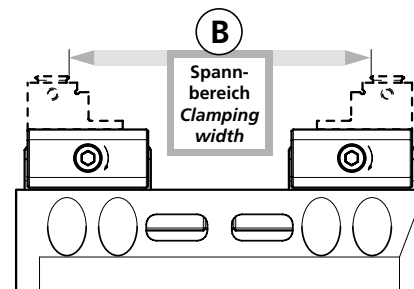
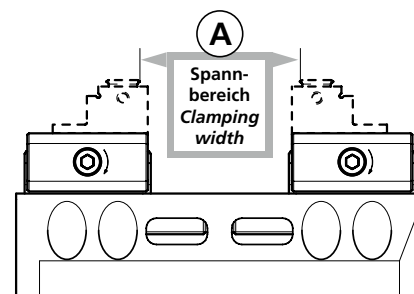
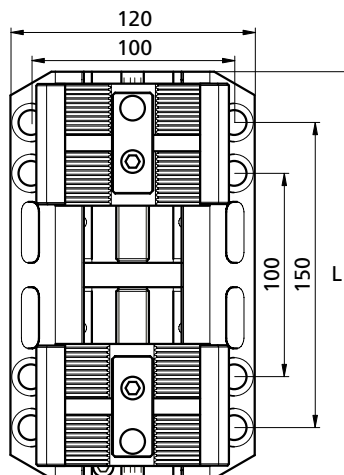
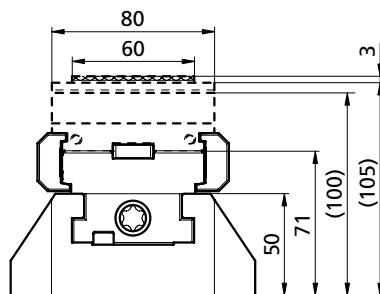
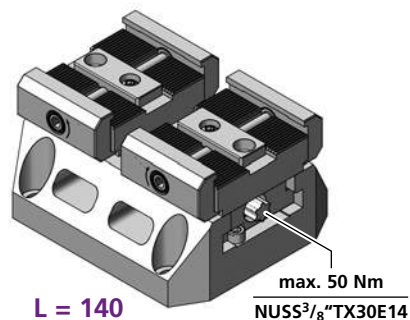
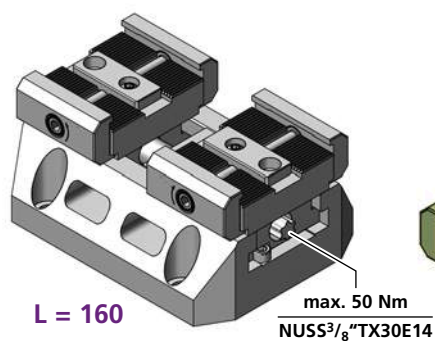
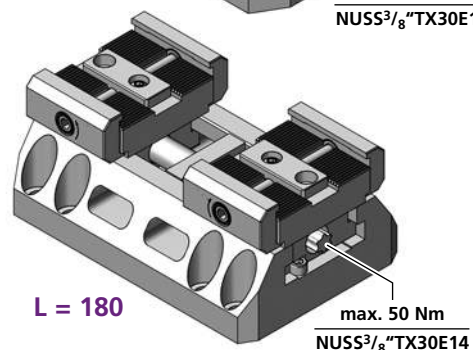
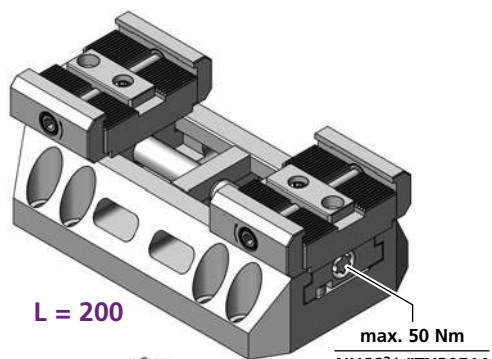


Mehr als **8** verschiedene Backenvarianten passend zu dieser Schnellwechsel-schnittstelle.
More than 8 different jaw modules to match this rapidly changing interface.

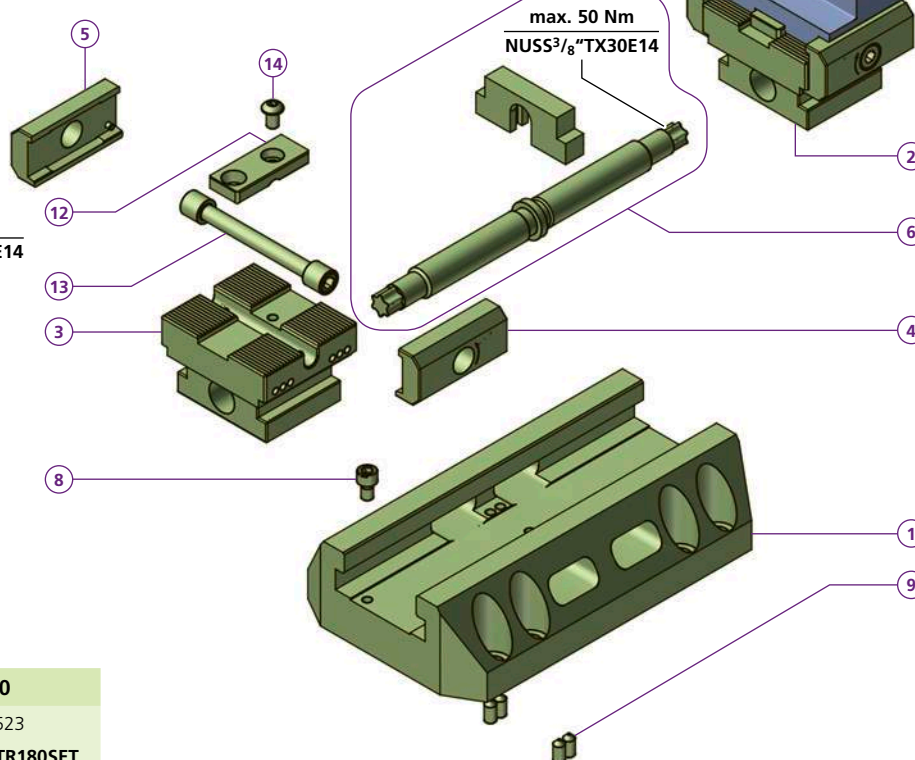
	kg
1 ZSB200L50	~8,4
ZSB180L50	~7,9
ZSB160L50	~7,4
ZSB140L50	~6,7
2x	

p. 152

Bestellbeispiel / Ordering example: 1 x ZSM200L50 & 2 x PCZB8050UPRG



PCZB8050UPRG p. 152



ZSB200L50

1	1x TK150025
2	1x ZB150791
3	1x ZB150792
4	2x PCSP60RG
5	2x PCSP60LG
6	1x PCS16TR200SET
8	1x M6X10ISO4762
9	4x M6X16DIN914
12	2x PCGU2049
13	2x PCS14
14	2x M6X8ISO7380
L = 200	
A	10 – 126 mm
B	58 – 174 mm
kg	~8,4

ZSB180L50

1	1x TK150523
6	1x PCS16TR180SET
L = 180	
A	10 – 104 mm
B	58 – 154 mm
kg	~7,9

ZSB160L50

1	1x TK150522
6	1x PCS16TR160SET
L = 160	
A	10 – 86 mm
B	58 – 134 mm
kg	~7,4

ZSB140L50

1	1x TK150521
6	1x PCS16TR140SET
L = 140	
A	10 – 65 mm
B	58 – 113 mm
kg	~6,7

Drehmoment und Spannkraft siehe Seite
Torque and clamping force see page

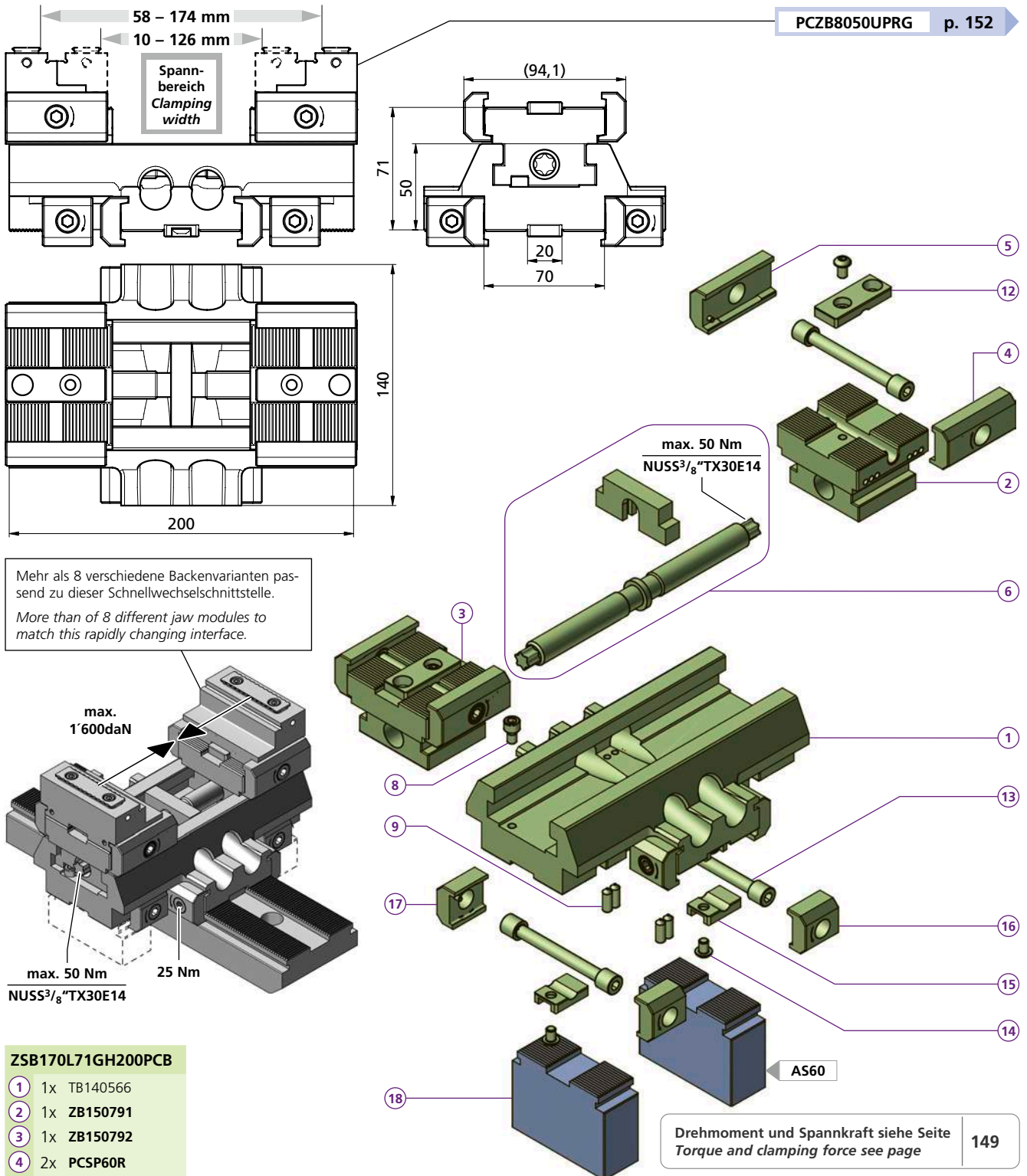
149

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

NUSS^{3/8}"TX30E14



Bestellbeispiel / Ordering example: 3 x ZSB200L50 & 6 x PCZB8050UPRG & 1 x NUS^{3/8}"TX30E14



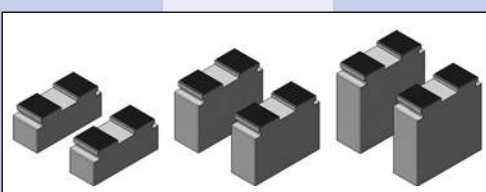
ZSB170L71GH200PCB

- 1 1x TB140566
- 2 1x ZB150791
- 3 1x ZB150792
- 4 2x PCSP60R
- 5 2x PCSP60L
- 6 1x PCS16TR200SET
- 8 1x M6X10ISO4762
- 9 4x M6X16DIN914
- 12 2x PCGU2049
- 13 4x PCS14
- 14 4x M6X8ISO7380
- 15 2x PCGU2030
- 16 4x PCSP30L
- 17 4x PCSP30R
- 18 2x

kg ~9,2

Schienenhöhe / Rail height

AS35 (H = 35)	AS60 (H = 60)	AS80 (H = 80)
------------------	------------------	------------------



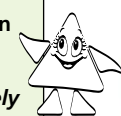
Bestellbeispiel / Ordering example: 1 x ZSB170L71GH200PCB & 2 x PCZB8050UPRG & 1 x NUSS3/8\"TX30E14

Drehmoment und Spannkraft siehe Seite
Torque and clamping force see page

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WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

NUSS3/8\"TX30E14

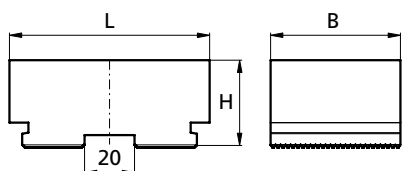


Seitliche Stützen

Bei Gebrauch dieses Zentrischspanners, werden je nach Höhe der Basisschiene auf dessen sie aufgesetzt sind, zwei seitliche Stützen AS35 / AS60 / AS80 unterlegt.

Side support

When using this self centering vise, a side support AS35 / AS60 / AS80 is underlaid, depending on the height of the base rail on which it is placed.



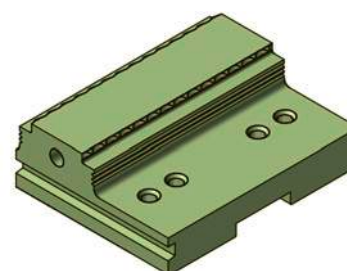
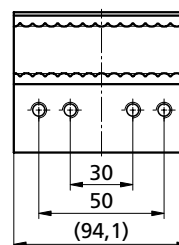
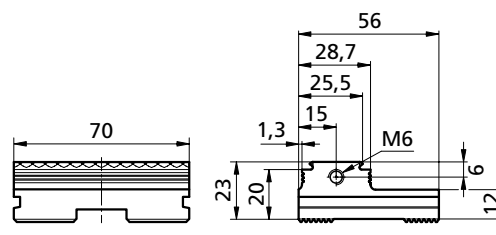
PCZB8060R34

PCZB12060R34

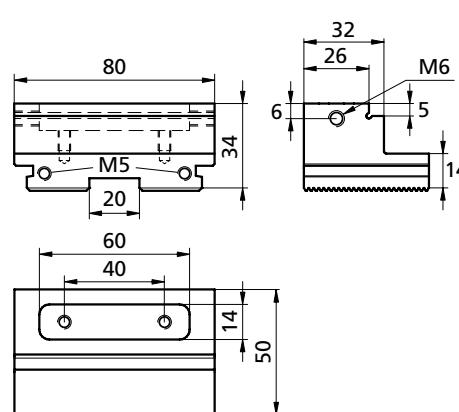
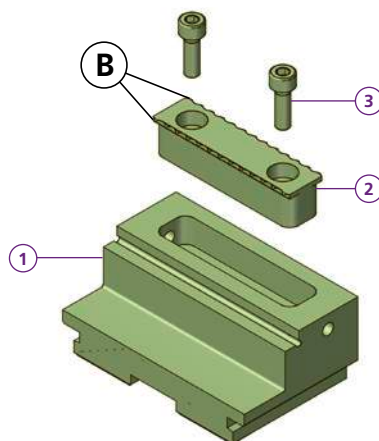
PCZB10060R50ST

PCZB8060R40ALU

		L	B	H	kg
PCZB8060R34	(Stahl/Steel)	80	60	34	~1,2
PCZB12060R34	(Stahl/Steel)	120	60	34	~1,7
PCZB10060R50ST	(Stahl/Steel)	101	60	50	~2,2
PCZB8060R40ALU	ALU	80	60	40	~0,52
PCZB10060R50	ALU	101	60	50	~0,76



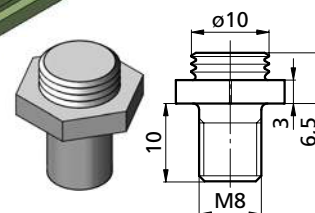
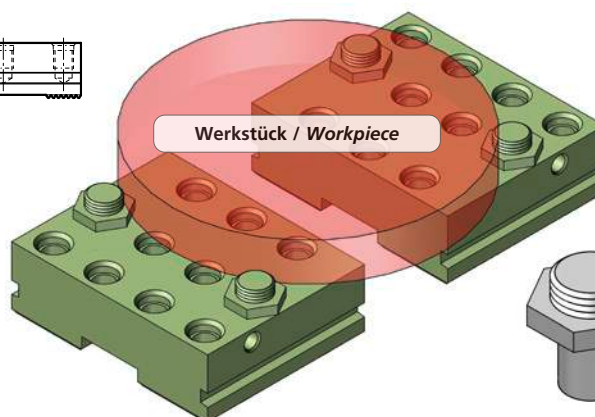
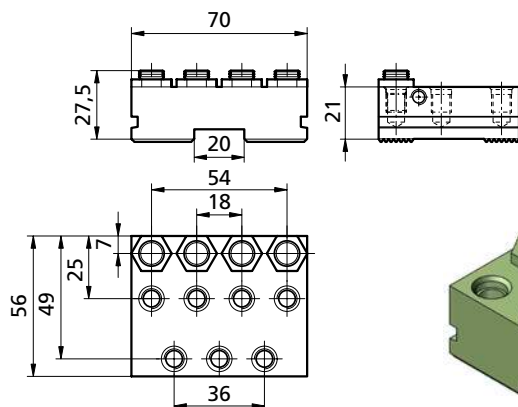
PCZB7023PRG kg ~0,54



PCZB8050UPRG

- ① 1x TB161200
- ② 1x MAND58-14PRG
- ③ 1x M5X16ISO4762

kg ~0,75



PCZB7021PRF kg ~0,6

PRG1003M8

Bestellbeispiel / Ordering example: 2 x PCZB7021PRF & 4 x PRG1003M8



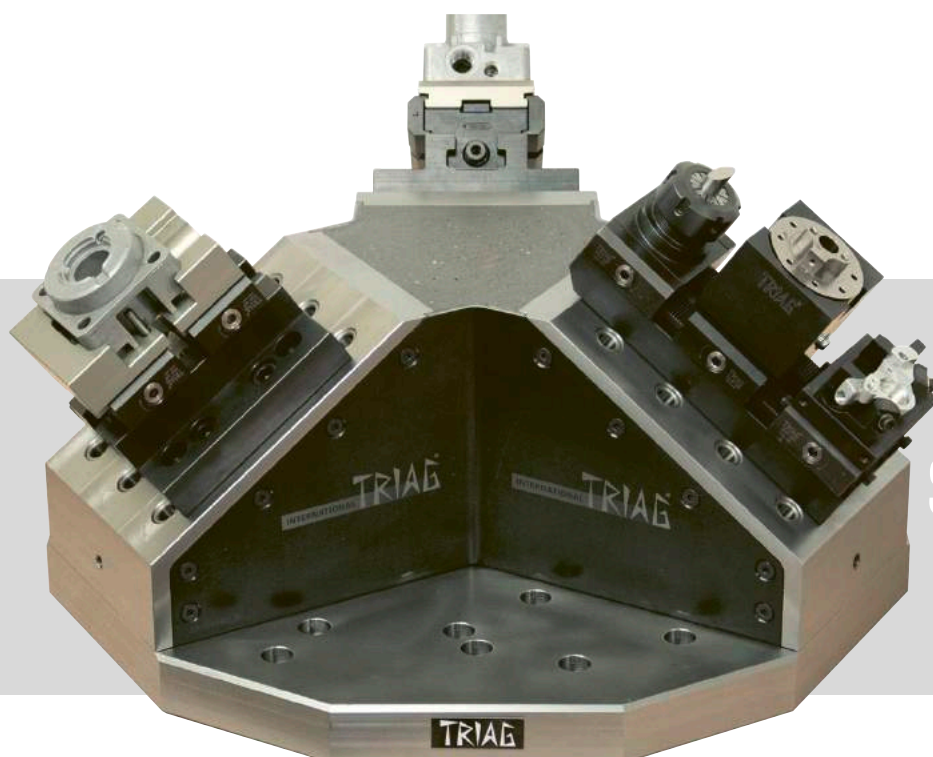
SPUTNIK III

Sputnik III

Spannbereich bis 180 mm, Spannkraft bei 70 Nm, 2,1 t/2100 daN. Hier kommen die «Grossen» unserer Zentrischspanner zum Einsatz. Speziell ist der Aufbau auf einer Stahl-Mineralgusspyramide um beste Verhältnisse bezüglich Vibrationsdämpfung zu bieten. Die Zentrischspanner dazu gibt es in vier Gehäuselängen (140, 160, 180 und 200 mm) und bis zu 60 Backenvarianten.

Sputnik III

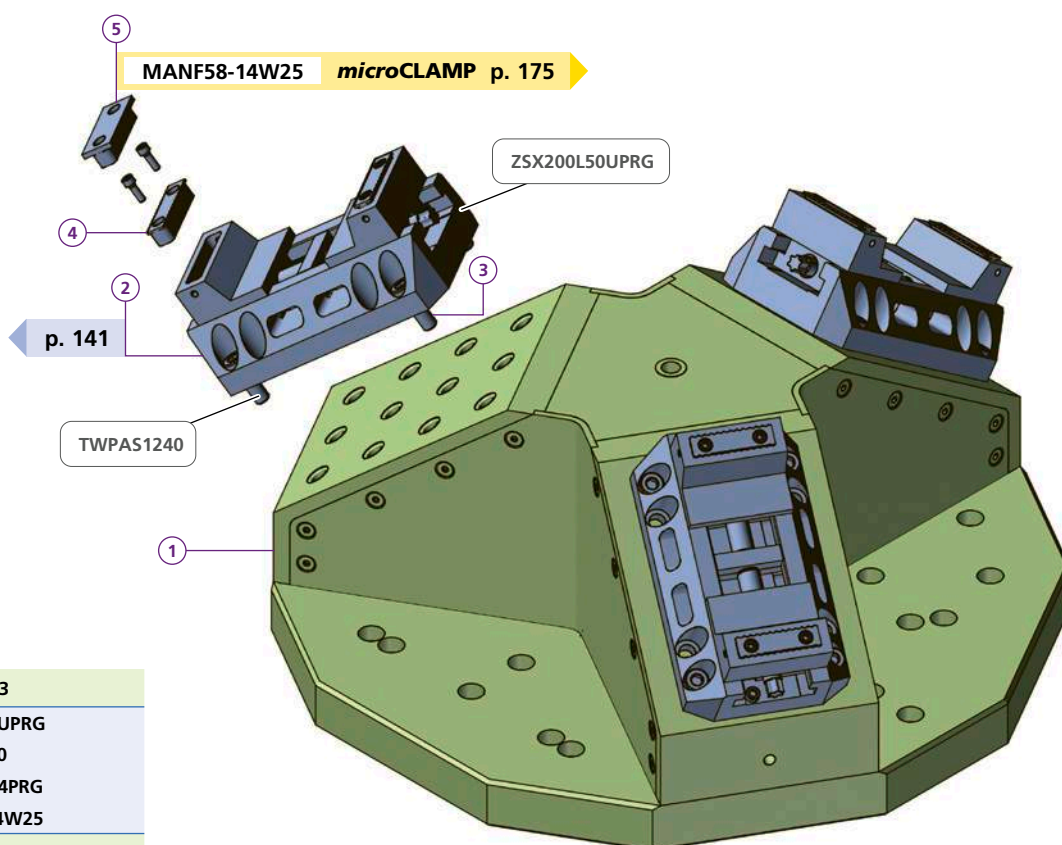
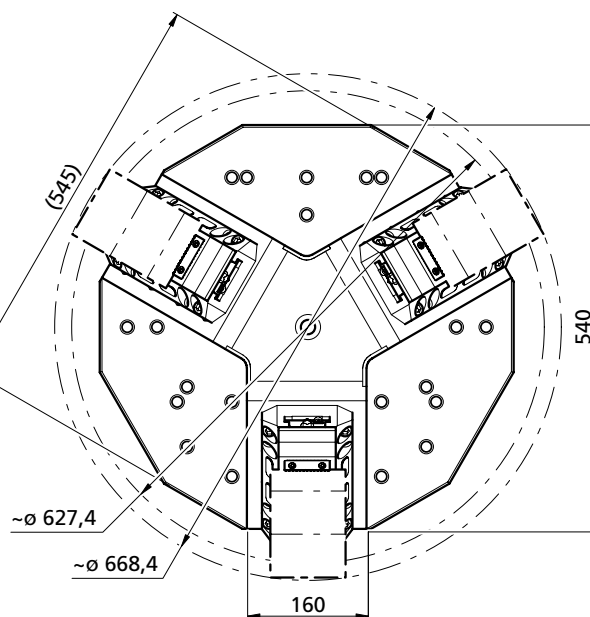
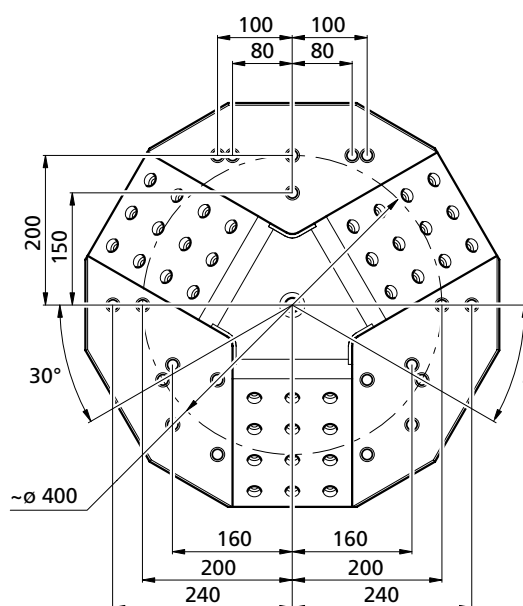
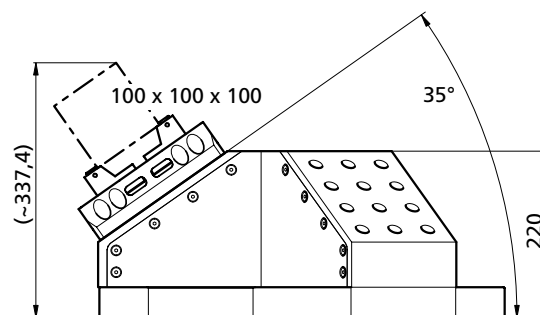
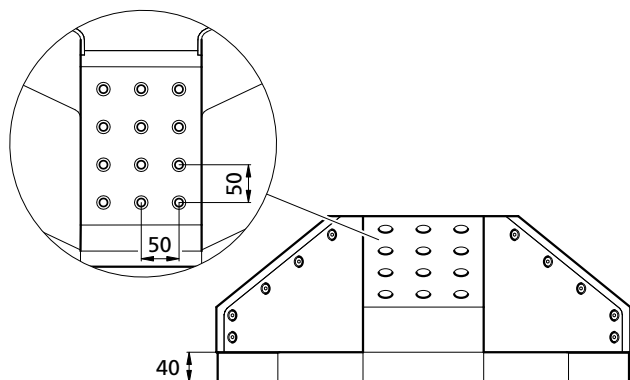
Spans of up to 180 mm, clamping force at 70 Nm, 2.1 t/2100 daN. Here the «big ones» of our self-centering vices go into action. And there is the special setup of a steel mineral casting pyramid to provide the best conditions for vibration dampening. The self-centering vice for this is available with four housing lengths (140, 160, 180 and 200 mm) and up to 60 jaw versions.



SPUTNIK III



SPUTNIK III

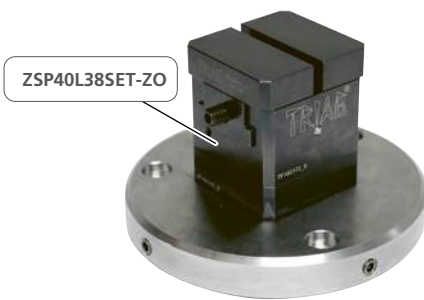


1	1x	5AXZSX35-3
2	3x	ZSX200L50UPRG
3	12x	TWPAS1240
4	6x	MANF58-14PRG
5	6x	MANF58-14W25
kg		~135

Bestellbeispiel / Ordering example: 1 x 5AXZSX35-3 & 3 x ZSX200L50UPRG & 6 x MANF58-14W25



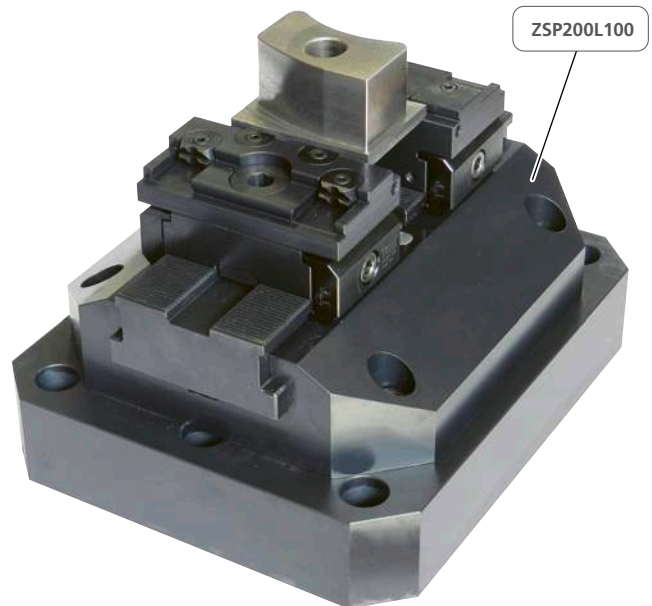
Zwei pneumatische Zentrischspanner auf einer Spannbrücke und Fanuc Robodrill.
 Über 100 verschiedene Standardbacken in Sekundenschnelle wechseln.
*Two pneumatic self centering vise on a Fanuc robodrill machining center.
 From more than 100 different standard jaw modules can be changed in a view second.*



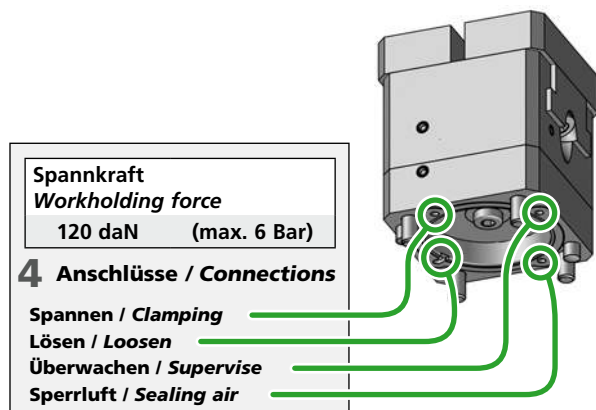
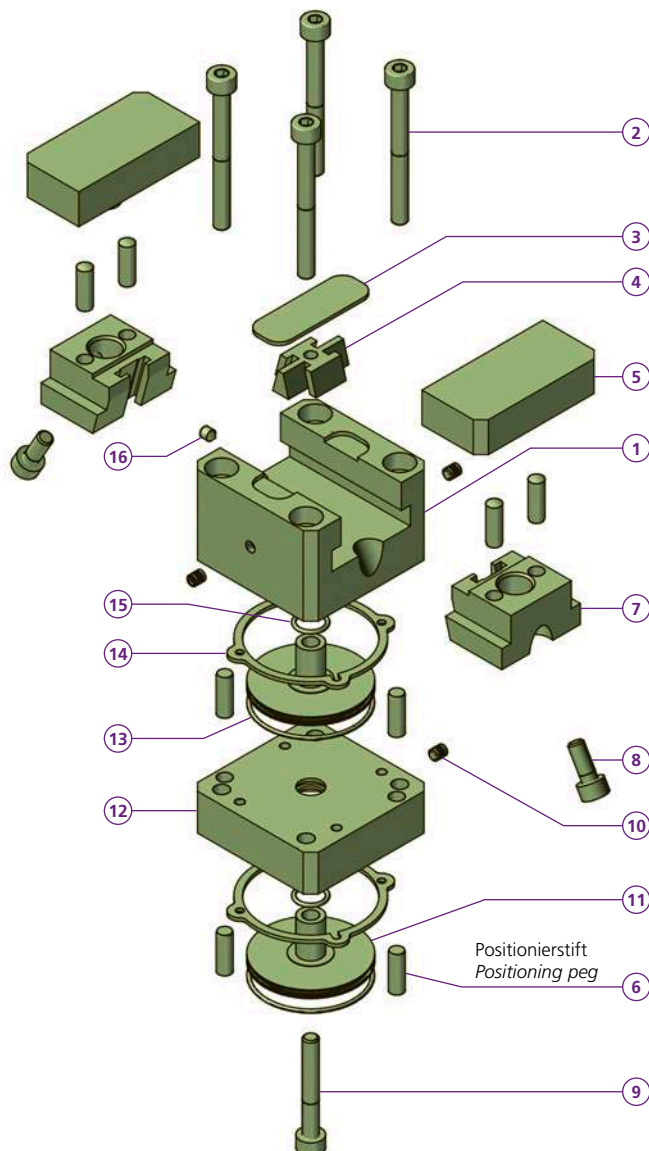
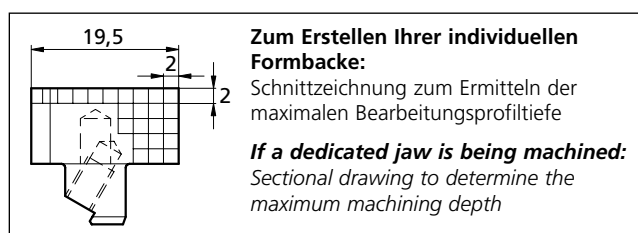
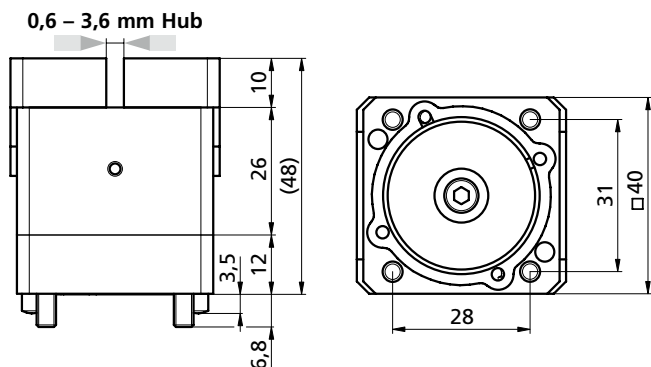
ZSP40L38SET-ZO



ZSP125L85-1



ZSP200L100



SET18ZSP40L38-2

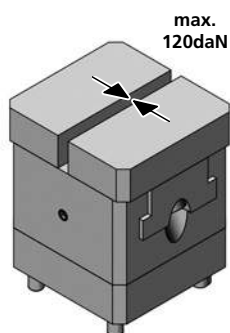
- 1 1x TF180166
- 2 4x TN100865
- 3 1x TF180169
- 4 1x TF180168
- 5 2x B222
- 6 8x TN100428
- 7 2x TF180167
- 8 2x TN100321
- 9 1x TB180316
- 10 3x TN100824
- 11 2x TF180170
- 12 1x TF180171
- 13 2x TN100819
- 14 2x TB180306
- 15 2x TN100818
- 16 1x TN10091

kg ~0,52

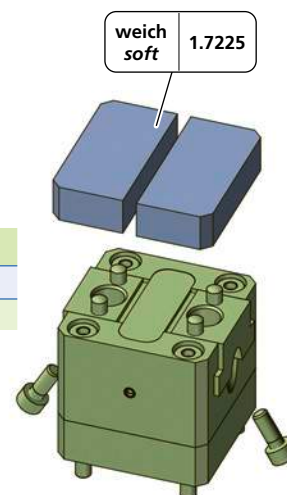
Luftvolumen / Air volume	
Spannen / Clamping	Lösen / Loosen
8,2cm ³	8,4cm ³



Bedienungsanleitung zu diesem pneumatischen Zentrischspanner
Operating instructions for this pneumatic self centering vise

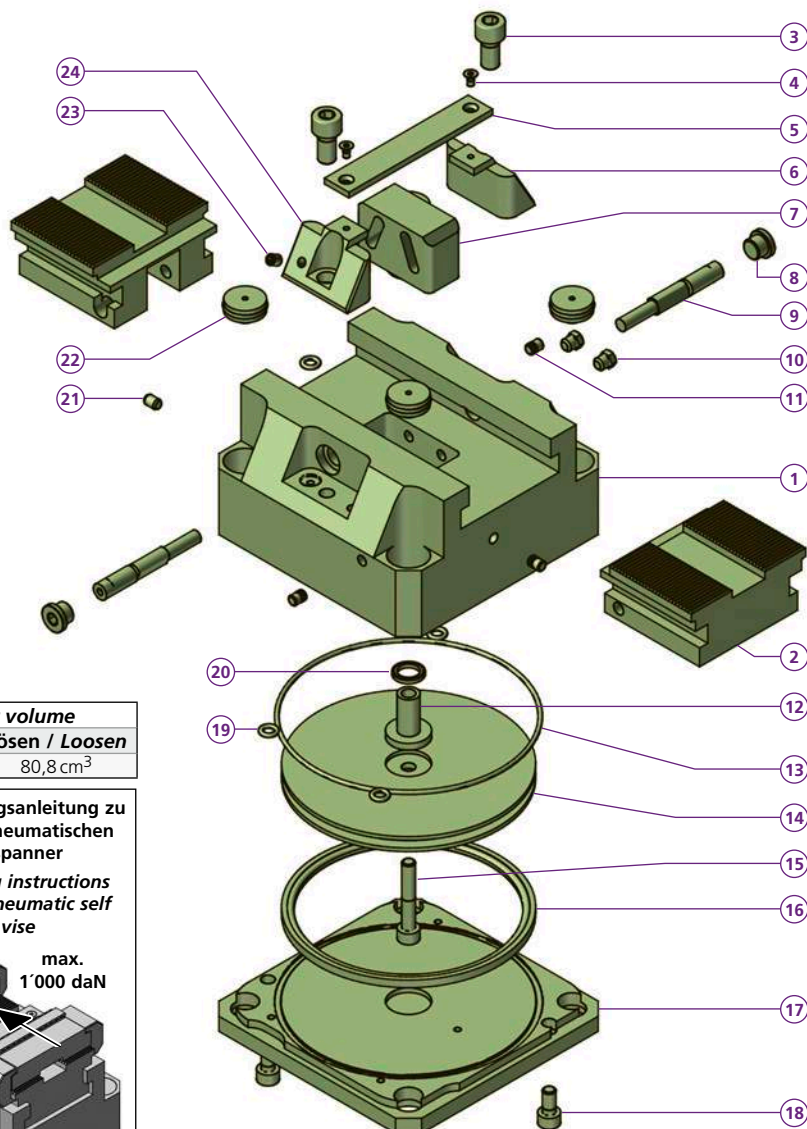
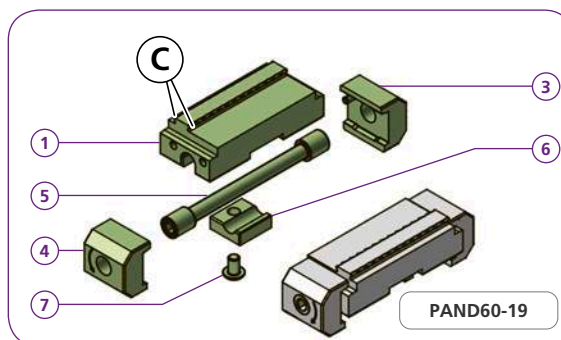
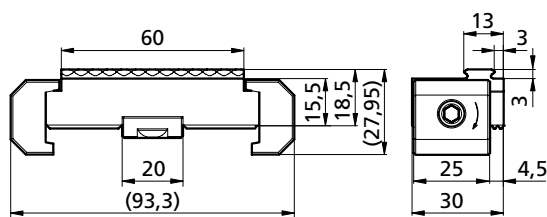
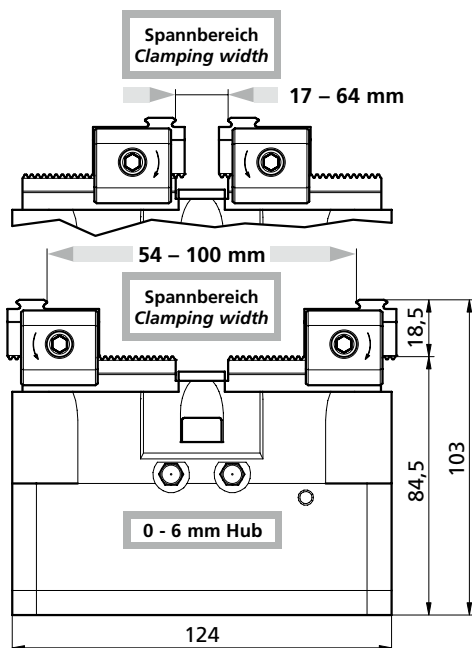


ZSP40L38-2	
5	2x B222
kg	~5,2



Bestellbeispiel / Ordering example: SET18ZSP40L38-2

Separat bestellen / Order separately



ZSP125L85-1

- 1 1x TB180474
 - 2 2x TB180476
 - 3 2x **M8X16ISO4762**
 - 4 2x M3X6DIN7991
 - 5 1x TB171140
 - 6 1x TB171141
 - 7 1x TB180477
 - 8 2x TN100014
 - 9 2x TB170530
 - 10 2x TN100021
 - 11 3x TN100009
 - 12 1x TK160467
 - 13 1x TN100012
 - 14 1x TK160075
 - 15 1x **M6X35ISO4762**
 - 16 1x TN100020
 - 17 1x TB180475
 - 18 2x TN100015
 - 19 4x TN100013
 - 20 1x TN100027
 - 21 1x TB180268
 - 22 4x PCPF16L6
 - 23 1x M5X6DIN913
 - 24 1x TB180478
- kg ~7,4

PAND60-19

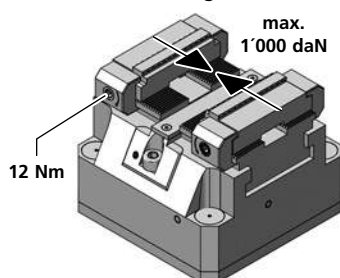


- 1 1x TB171149
 - 3 1x PCSP25L
 - 4 1x PCSP25R
 - 5 1x PCS10
 - 6 1x PCGU2019
 - 7 1x **M5X8ISO7380**
- kg ~0,4

Luftvolumen / Air volume	
Spannen / Clamping	Lösen / Loosen
80,1 cm ³	80,8 cm ³



Bedienungsanleitung zu
diesem pneumatischen
Zentrischspanner
*Operating instructions
for this pneumatic self
centering vise*

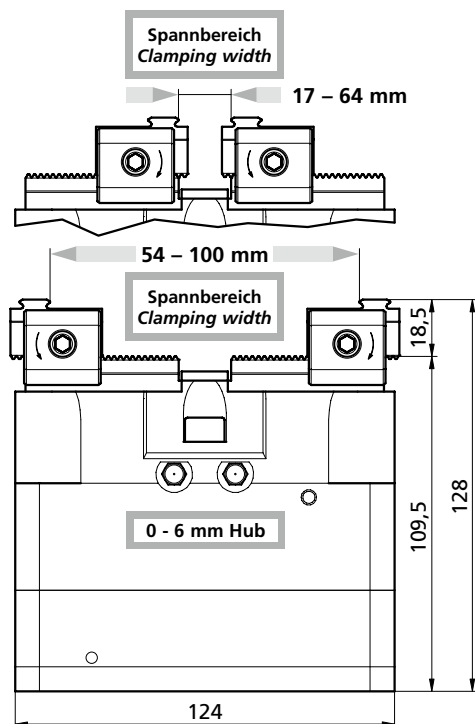


SET18ZSP125L85-1

- 1x **ZSP125L85-1**
 - 2x **PAND60-19**
- kg ~8,2

	Druck Pressure		Spannkraft Clamping force		
	Bar		~daN	~(lb)	~t
Einfacher Kolben Single piston	8	=	600	1'320	0,6
	10	=	800	1'760	0,8
	12	=	1'000	2'650	1,0

Bestellbeispiel / Ordering example: **SET18ZSP125L85-1**



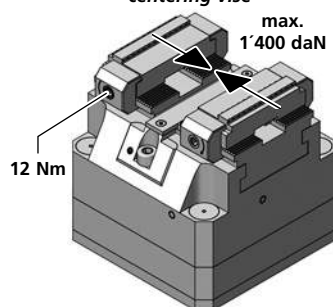
ZSP125L110-2

- 1 1x TB180474
 - 2 2x TB180476
 - 3 2x **M8X16ISO4762**
 - 4 2x M3X6DIN7991
 - 5 1x TB171140
 - 6 1x TB171141
 - 7 1x TB180477
 - 8 2x TN100014
 - 9 2x TB170530
 - 10 2x TN100021
 - 11 6x TN100009
 - 12 2x TK160467
 - 13 2x TN100012
 - 14 1x TB170147
 - 15 2x TN100020
 - 16 1x TB180480
 - 17 1x TK160075
 - 18 1x **M6X60ISO4762**
 - 19 1x TB180475
 - 20 2x **M6X40ISO4762**
 - 21 7x TN100013
 - 22 2x TN100027
 - 23 1x TB180268
 - 24 4x PCPF16L6
 - 25 1x M5X16DIN913
 - 26 1x TB180478
- kg ~9,4

Luftvolumen / Air volume	
Spannen / Clamping	Lösen / Loosen
160,2 cm ³	160,9 cm ³



Bedienungsanleitung zu diesem pneumatischen Zentrischspanner
 Operating instructions for this pneumatic self centering vise



SET18ZSP125L110-2

- 1x ZSP125L110-2
 - 2x PAND60-19
- kg ~11,3

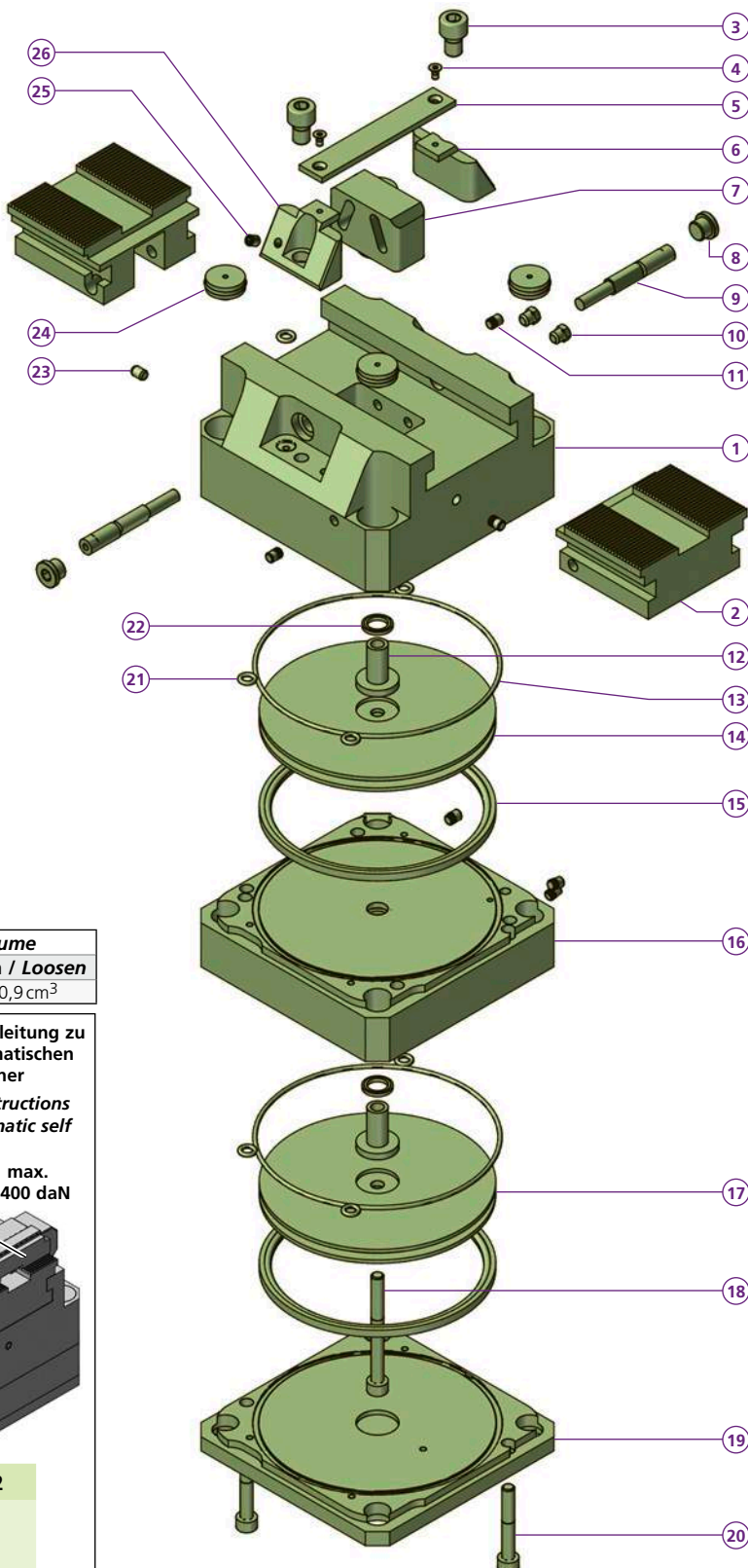
PAND60-19

- 1 1x TB171149
 - 3 1x PCSP25L
 - 4 1x PCSP25R
 - 5 1x PCS10
 - 6 1x PCGU2019
 - 7 1x **M5X8ISO7380**
- kg ~0,4

Masszeichnung &
Isometrische Darstellung:

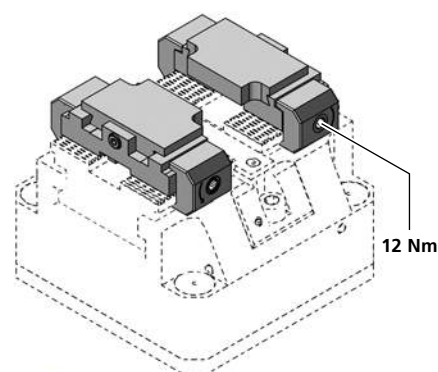
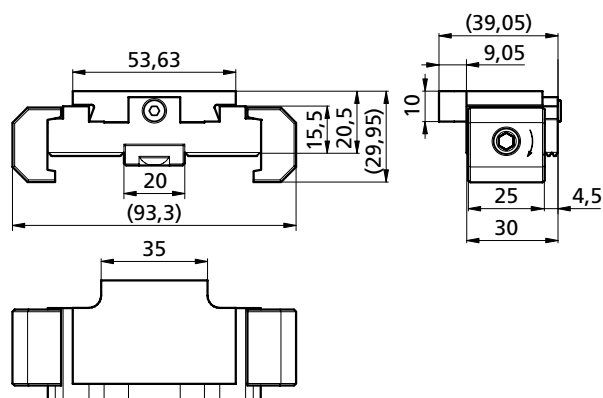
Siehe Seite | See page **p. 159**

Dimensional drawing &
Isometric representation:

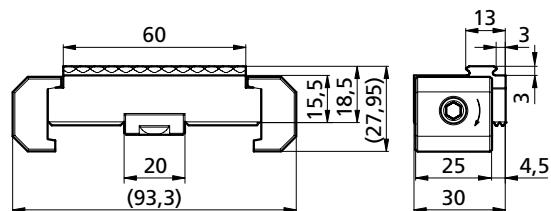
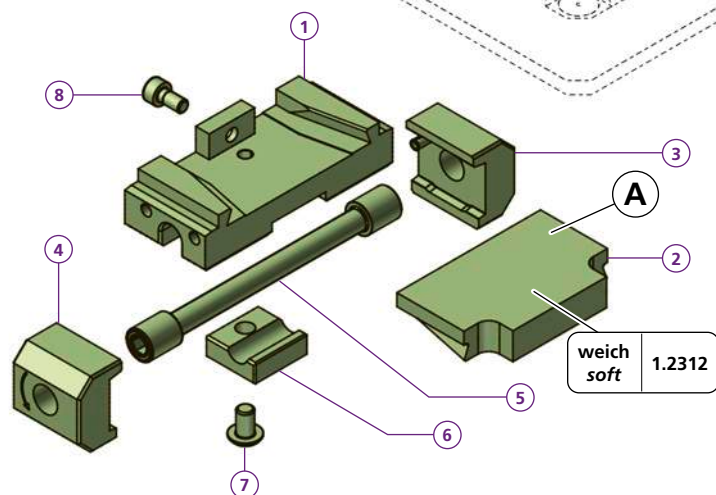


Druck Pressure	Spannkraft Clamping force			
	Bar	~daN	~(lb)	~t
Doppelkolben Double piston	8	= 1'000	2'200	1,0
	10	= 1'400	3'090	1,4

Bestellbeispiel / Ordering example : **SET18ZSP125L110-2**

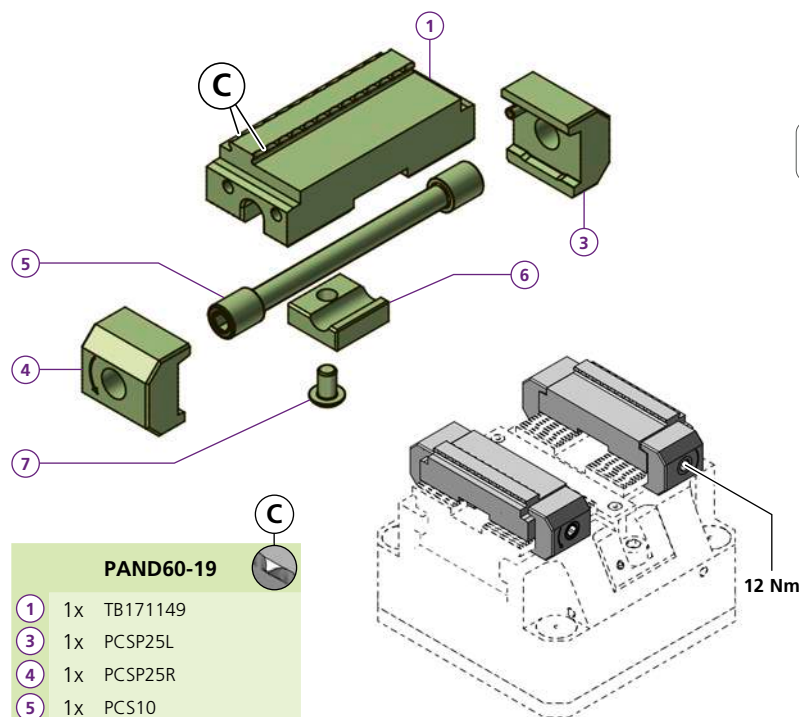


PAND60-20.5UWB	
1x	TK171294
1x	TK180360
1x	PCSP25L
1x	PCSP25R
1x	PCS10
1x	PCGU2019
1x	M5X8ISO7380
1x	M4X8ISO4762
kg	~0,3



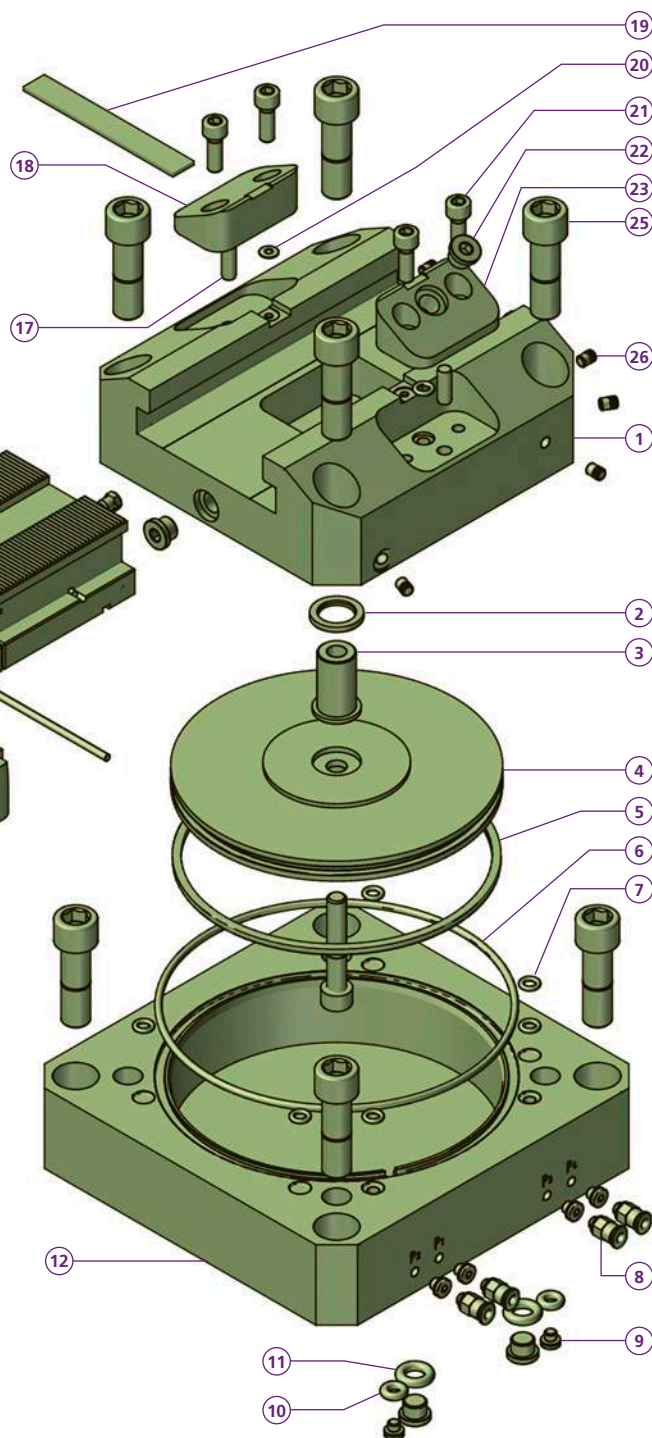
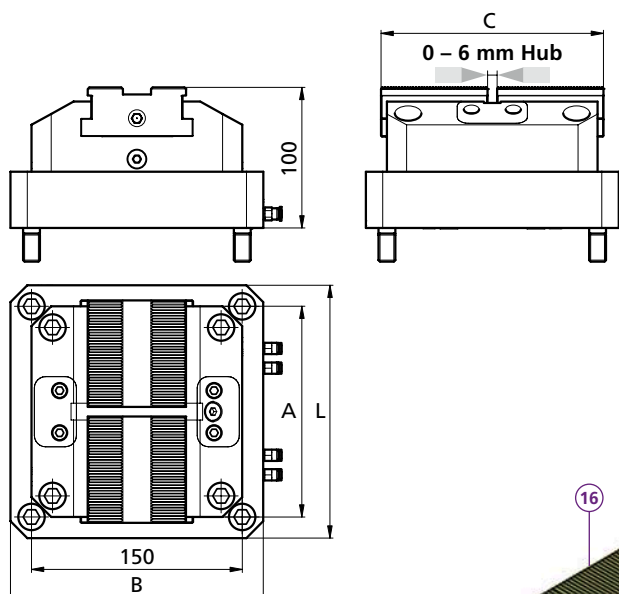
PAND60-20.5UWB

PAND60-19



PAND60-19	
1x	TB171149
1x	PCSP25L
1x	PCSP25R
1x	PCS10
1x	PCGU2019
1x	M5X8ISO7380
kg	~0,4

Bestellbeispiel / Ordering example: **PAND60-20.5UWB**

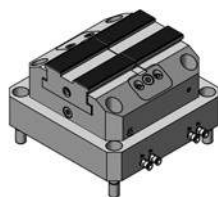


ZSP150L100

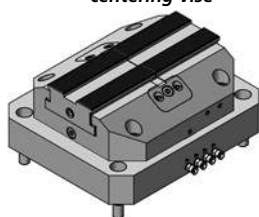
1	1x	TB190122
2	1x	TN100525
3	1x	TB140209
4	1x	TB190092
5	1x	TN100595
6	1x	TN100894
7	7x	TN100013
8	4x	TN100596
9	6x	TN100914
10	2x	TN100917
11	2x	TN100592
12	1x	TB190125
13	2x	TB190087
14	1x	TB190085
15	2x	TN100021
16	2x	TB190123
17	2x	TN100453
18	1x	TB190095
19	1x	TB190086
20	2x	TN100916
21	4x	M6X18ISO4762
22	5x	TN100014
23	1x	TB190094
24	8x	TWPAS1240
25	5x	TN100009
A	=	150
L	=	180
B	=	180
kg	=	~16



Bedienungsanleitung zu diesem pneumatischen Zentrischspanner
Operating instructions for this pneumatic self centering vise



Bedienungsanleitung zu diesem pneumatischen Zentrischspanner
Operating instructions for this pneumatic self centering vise

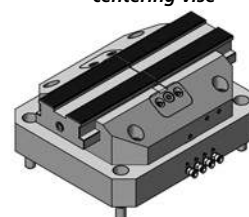


ZSP250L100

1	1x	TB190083
12	1x	TB190091
16	2x	TF190780
A	=	200
L	=	240
B	=	200
C	=	250
kg	=	~25,5



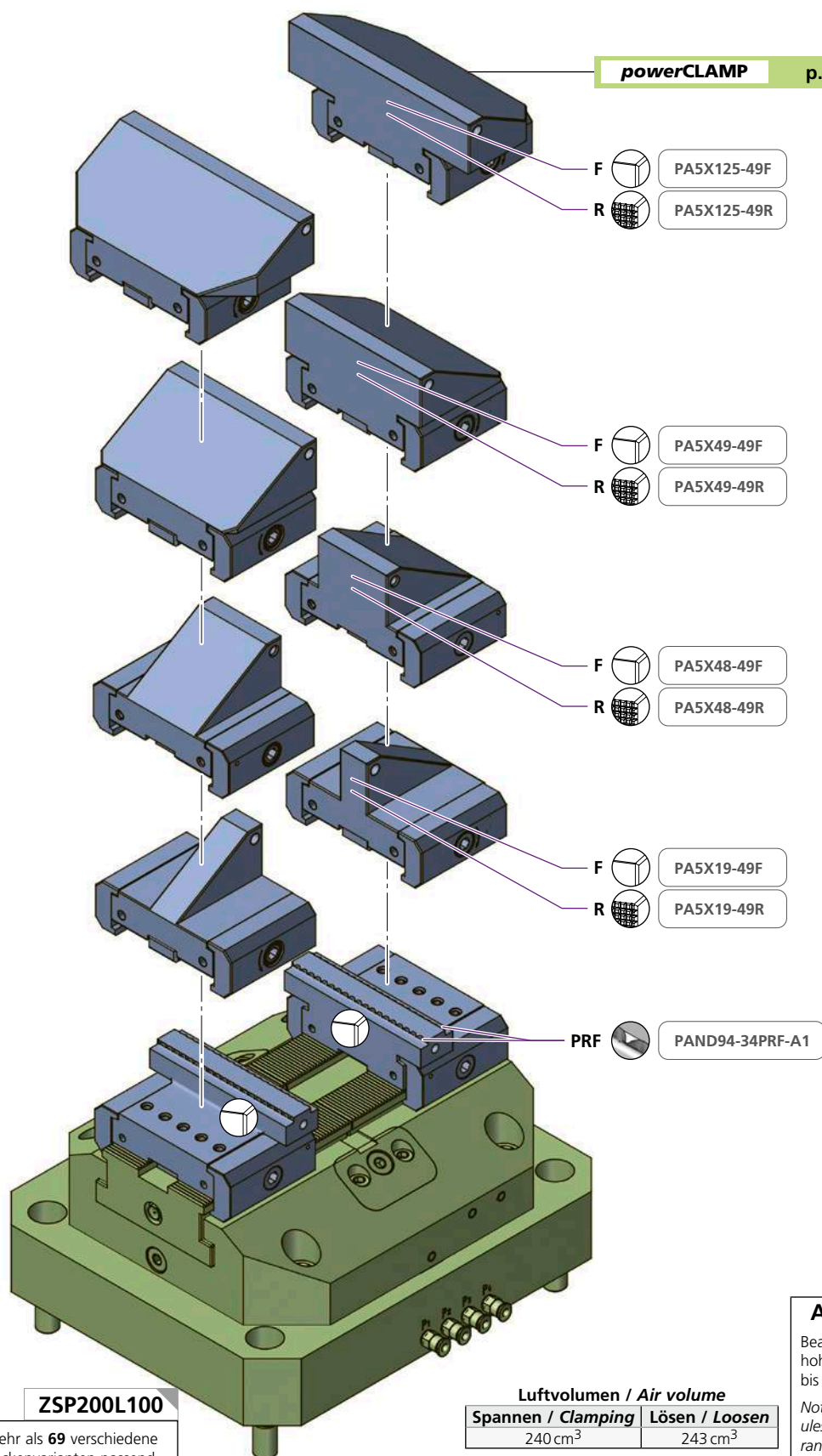
Bedienungsanleitung zu diesem pneumatischen Zentrischspanner
Operating instructions for this pneumatic self centering vise



Spannkraft siehe Seite
Clamping force see page

161

Bestellbeispiel / Ordering example: **ZSP150L100**



ZSP200L100

Mehr als **69** verschiedene Backenvarianten passend zu dieser Schnellwechselschnittstelle.

More than **69** different jaw modules to match this rapidly changing interface.

Luftvolumen / Air volume

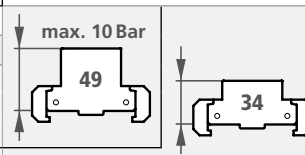
Spannen / Clamping	Lösen / Loosen
240 cm ³	243 cm ³

Druck / Pressure	Spannkraft / Clamping force			
	Bar	~daN	~(lb)	~t
Druckübersetzer Pressure intensifier 1:2	5	= 1'100	2'420	1,1
	8	= 1'500	3'300	1,5
	10	= 2'000	4'400	2,0
	12	= 2'400	5'290	2,4

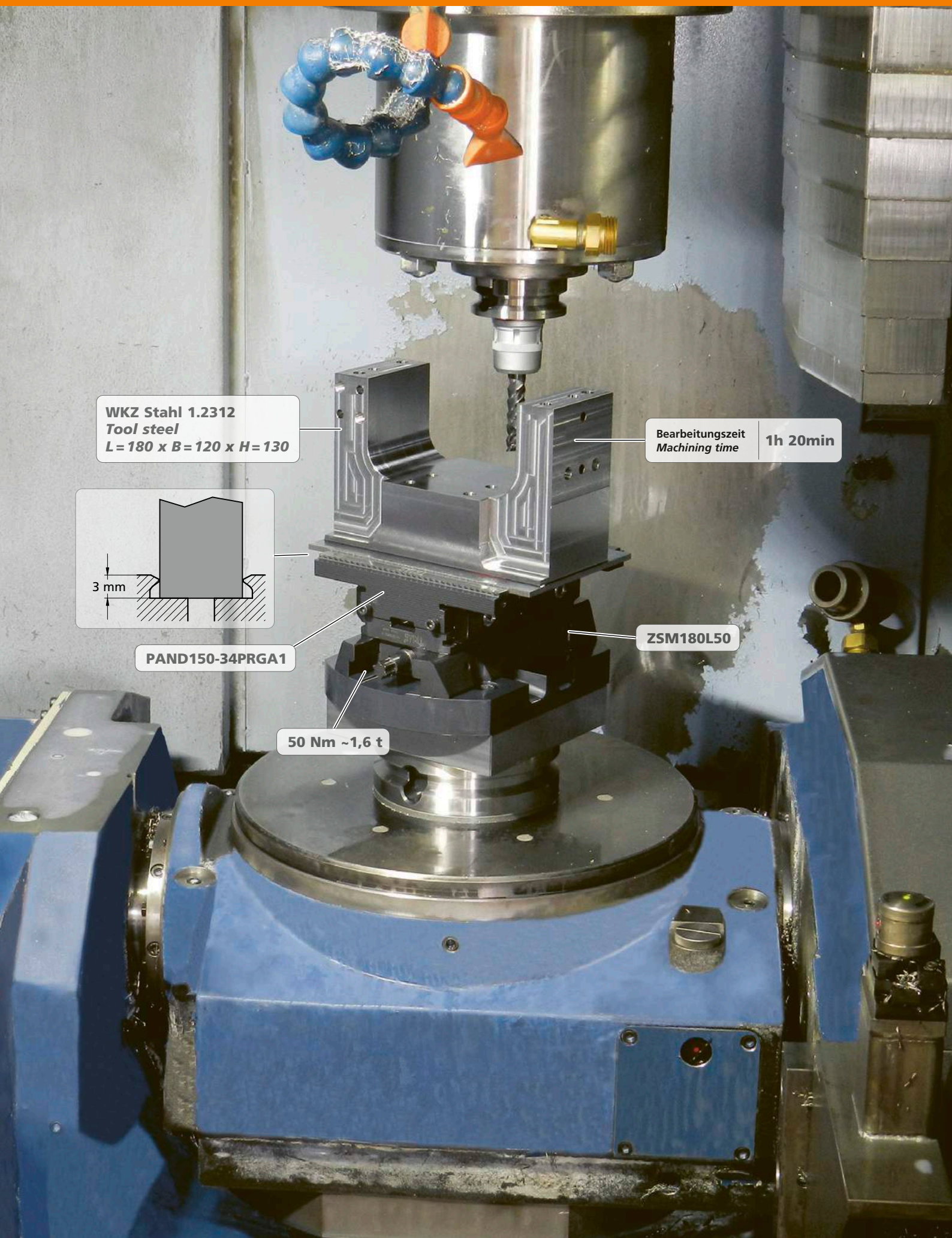
ACHTUNG / CAUTION

Beachten Sie, dass nur die 34 mm hohen Module für den Druckbereich bis 12 Bar eingesetzt werden dürfen.

Note that only the 34 mm high modules may be used for the pressure range up to 12 bar.

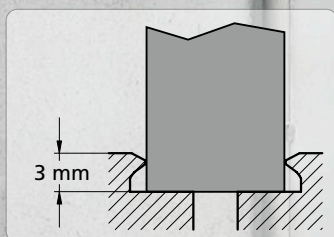


Bestellbeispiel / Ordering example: 1 x ZSP200L100 & 2 x PA5X48-49F



WKZ Stahl 1.2312
Tool steel
L = 180 x B = 120 x H = 130

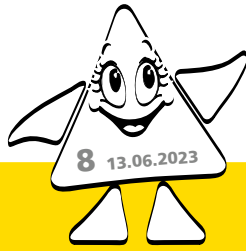
Bearbeitungszeit
Machining time 1h 20min



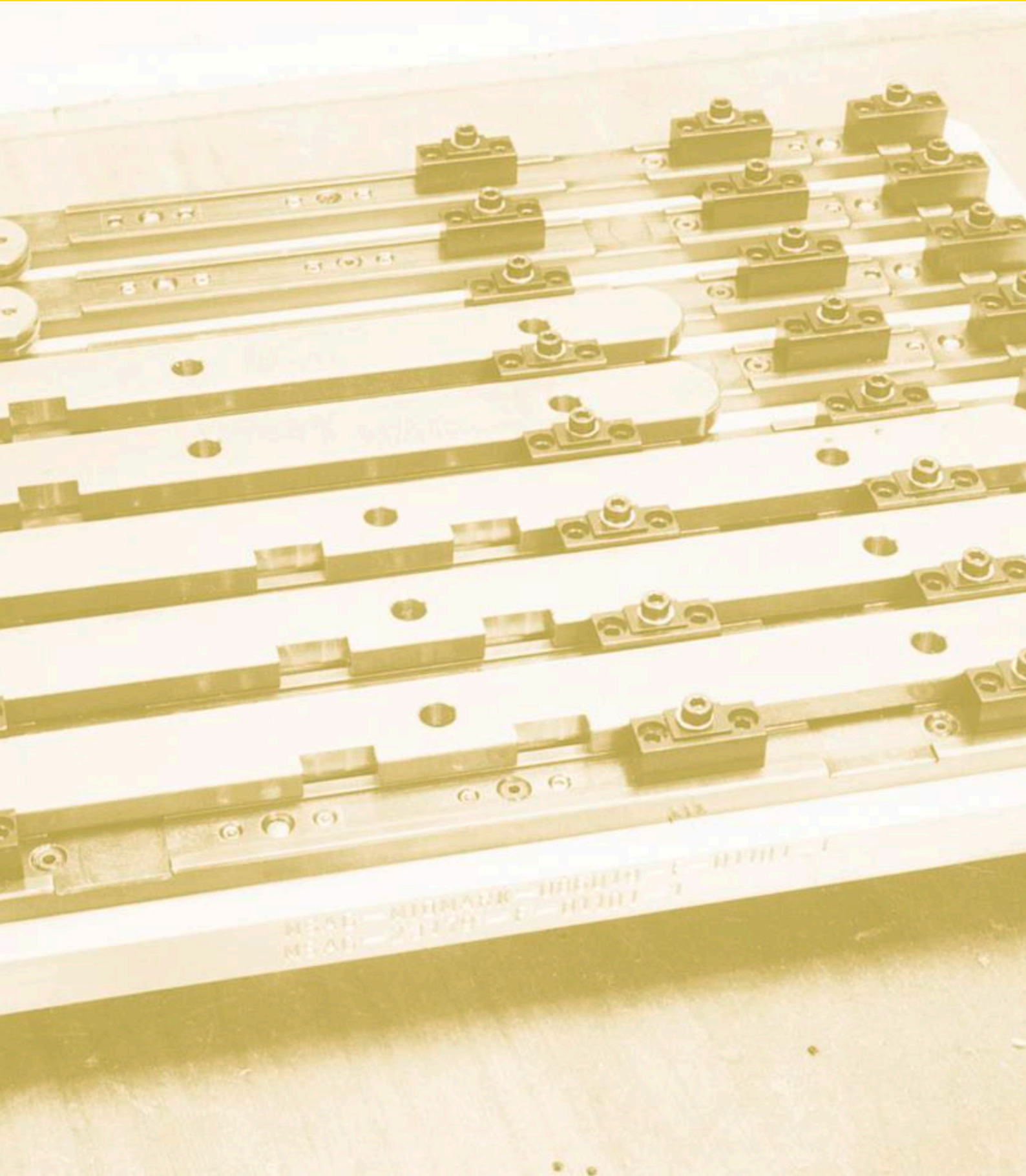
PAND150-34PRGA1

ZSM180L50

50 Nm ~1,6 t



***micro*CLAMP**



compactCLAMP

Mehrfachspannsystem / Multiple workholding system

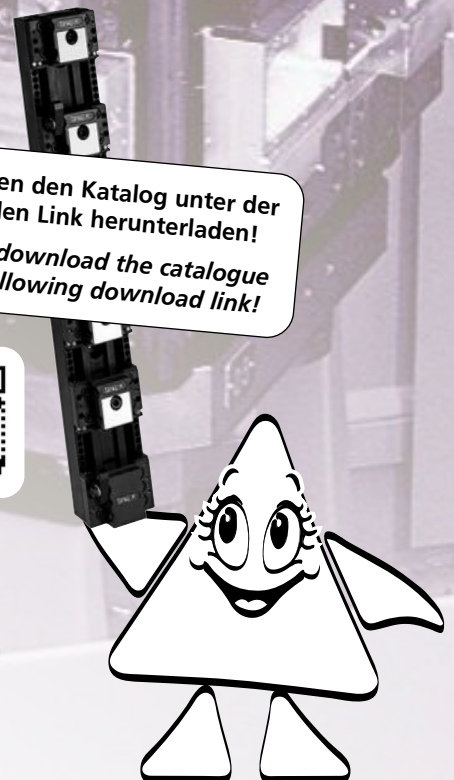
**Nur noch Ersatzteile und
Nachlieferungen!
Keine Compact Clamp
Neuentwicklungen mehr!**

Beim Compact Clamp lassen sich die Spannmodule auf einer Basisschiene mittels Passstiften massgenau positionieren. Die Schienen sind mit einem Lochraster mit 7,5 mm Teilung, die Spannmodule mit einer 10 mm-Teilung versehen. Dank Anwendung des Nonius-Prinzips entsteht ein kleinstmöglicher Positionierschritt von 2,5 mm. Bei einem Backenhub von 4 mm ist es somit möglich, an jedem beliebigen Punkt der Schiene nullpunktbezogen zu spannen. Ab 20 mm ist die Bearbeitung von drei Seiten möglich. Da das Spannmodul mit vier Schrauben in den T-Nuten verankert wird, ist es sinngemäss auch möglich, an Stelle der Original-Spannmodule individuelle Vorrichtungen und Sonderbacken zu befestigen. Das Compact Clamp Spannsystem ist ein System für Tüftler. Praktisch keine Spannprobleme bleiben damit ungelöst. Dafür sind die Umrüstzeiten etwas länger als beim Power Clamp. Compact Clamp-Basisschienen sind in den Längen 113 - 750 mm lieferbar. Die angebotenen Befestigungsraster sind 40 und 50 mm. Neben den Stahlschienen werden für leichte Arbeiten auch Schienen aus Aluminium hergestellt.

**Only spare parts and
additional deliveries! No
more new Compact Clamp
developments!**

In the Compact Clamp, the vise modules are positioned precisely on a base rail by means of alignment pins. On the base rail, positioning holes are located on a 7,5 mm grid, while on the vise module there is one with a 10 mm spacing. Following the vernier principle, the smallest possible positioning step is therefore 2,5 mm. With a jaw movement of 4 mm it is therefore possible to clamp the workpiece in any desired position with a known distance to program Zero (original datum face). From 20 mm up, three sided machining is possible. Special jaws or dedicated fixtures may easily be bolted onto the rails in place of standard vise modules if the need arises. They may be anchored in the T-slots and located by using alignment pins in the positioning holes. Hence the Compact Clamp is the ideal workholding system for "do it yourself" customers. Change over times are longer than with the Power Clamp, though. Available Compact Clamp base rails lengths: 113 - 750 mm. The fastening grids on the rails are 40 and 50 mm. In addition those made of steel we also produce rails made of aluminum for light work.

Sie können den Katalog unter der
folgenden Link herunterladen!
You can download the catalogue
at the following download link!





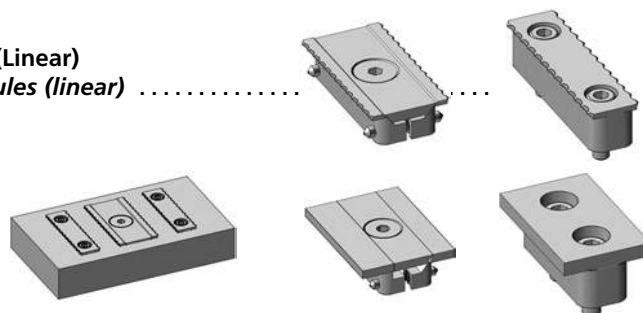
Einleitung <i>Introduction</i>	166 - 167
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Anwendungsbeispiele <i>Examples of application</i>	168 - 171
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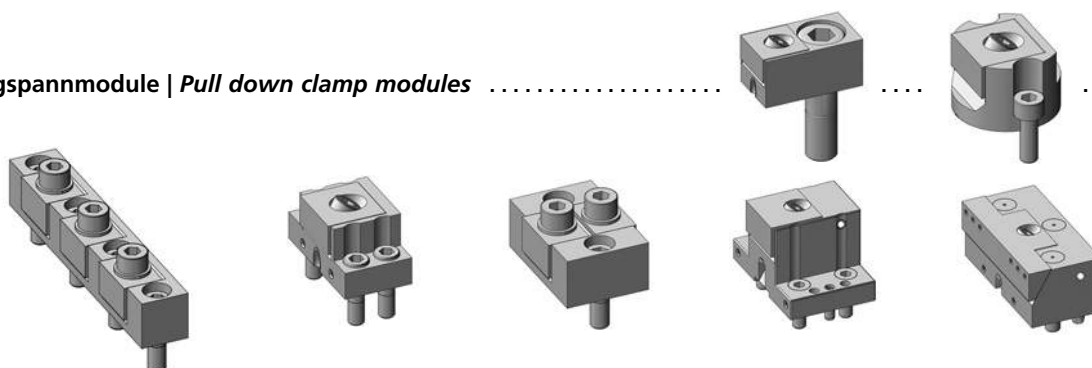


Spannkraft und Drehmoment <i>Workholding force and torque</i>	173
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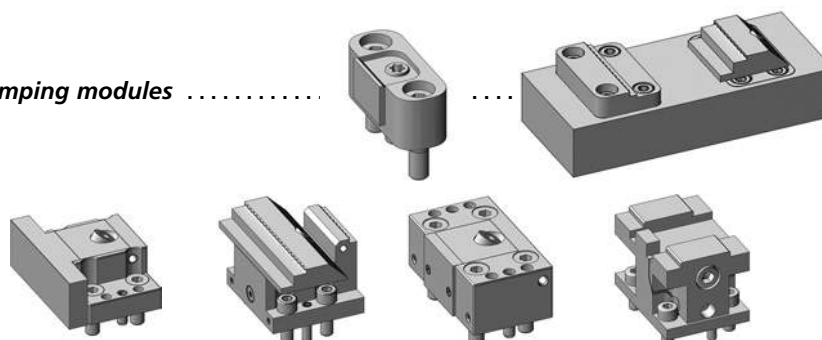
Vorrichtungsbau - Präge- und Anschlagmodule (Linear) <i>For dedicated fixture - stamping- and end modules (linear)</i>	174 - 176
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Niederzugspannmodule <i>Pull down clamp modules</i>	177 - 195
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Linearspannmodule <i>Linear clamping modules</i>	196 - 203
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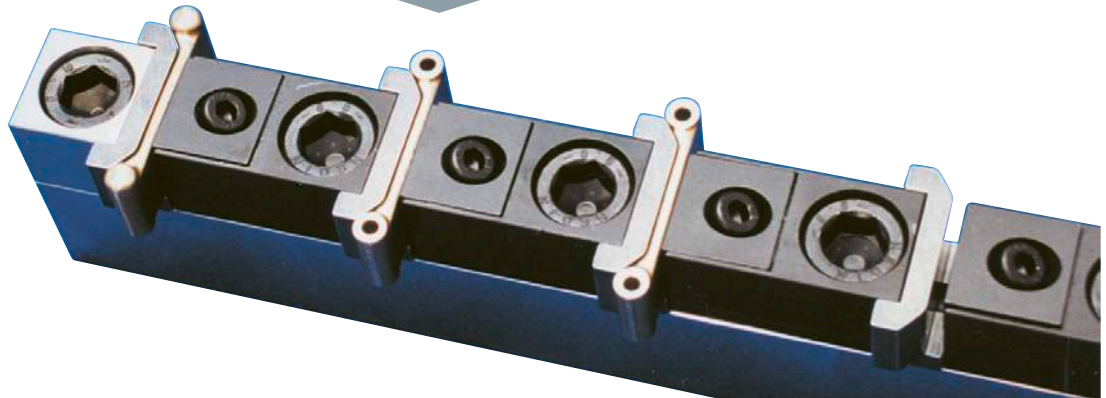
Zubehör <i>Accessories</i>	204 - 205
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Zum Aufbau kundenspezifischer Sondervorrichtungen für höchste Werkstückdichte im Arbeitsraum von Bearbeitungszentren ist das Spannsystem Micro Clamp ausgelegt (Spezielle Anschlagbacken, siehe Bild). Sehr kompakte Spannmodule mit Prägebacken verwirklichen eine zuverlässige Aufspannung bei nur etwa 2 mm Verlust an Rohmaterial

Clamps for dedicated fixtures for high density to get your best output from your machine. Clamping modules in different sizes and shapes and jaws with serrations also flat and carbide coated are available.



Kleinst-Spannmodule für den Vorrichtungsbau. *Extremely small clamping modules for dedicated fixtures.*

Hohe Spanndichte

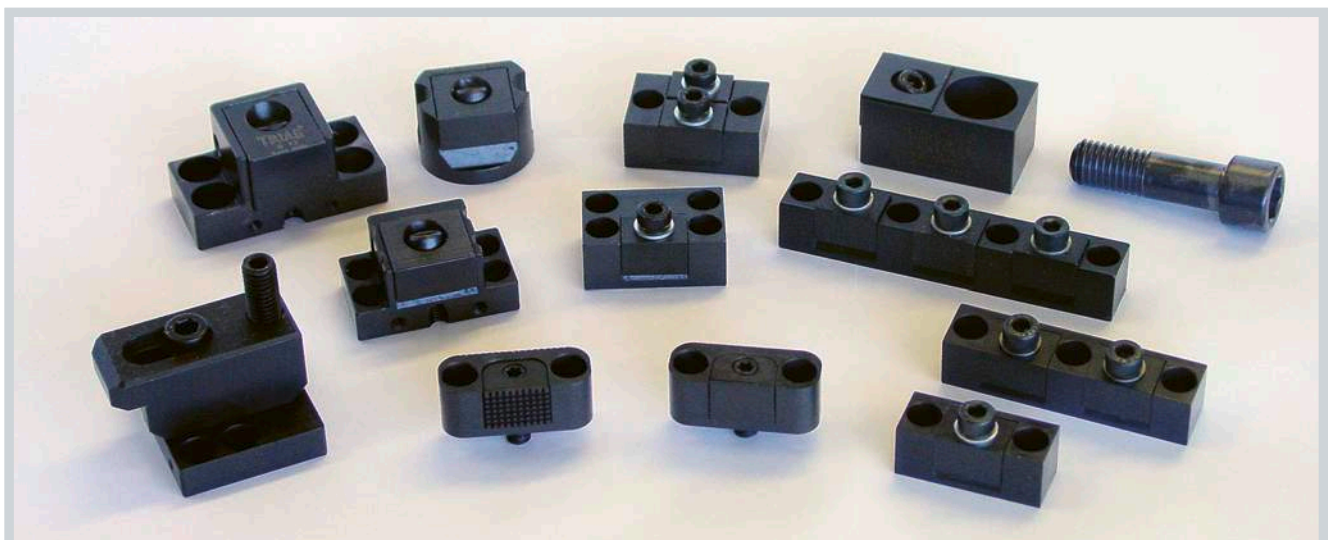
Die Spannmodule haben auf der Vorderseite eine Spannbacke, die Rückseite ist zu den Befestigungsbohrungen massgenau geschliffen oder gefräst. Damit kann diese Anschlagfläche für das folgende Werkstück genutzt werden. Diese Anordnung lässt eine sehr hohe Spanndichte zu. Beim kleinsten Micro Clamp-Modul sind nur 15 mm Spannabstand erforderlich.

- Maximale Spannkraft der Module 2,8t (28'000N)
- Benötigter Platz zwischen den Werkstücken ab 15 mm
- Spannhub ab 1,5 mm
- Genaue Positionierung durch Passschrauben und Positionierstifte

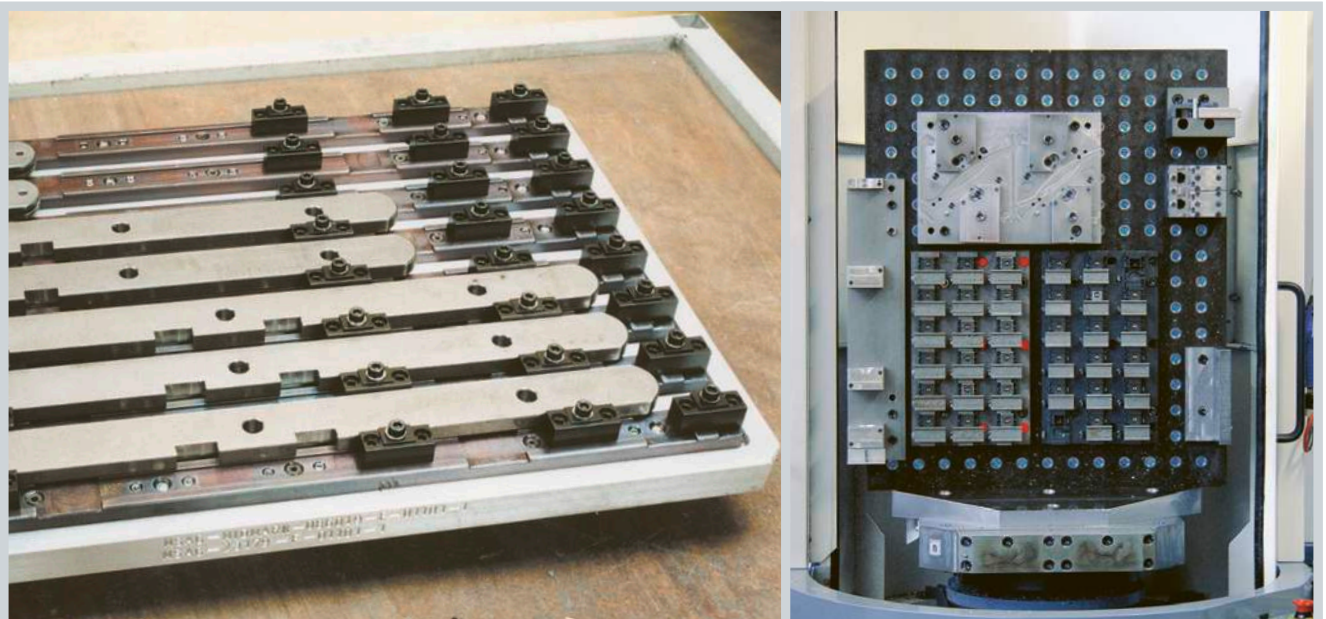
High workholding density

These clamping modules have a clamping jaw on the front, while rear is precisely ground or milled with reference to the fixing holes. This means that it can be used as a datum face for the following workpiece. This arrangement allows very high clamping densities. Only 15 mm clamping clearance is needed between workpieces using the smallest Micro Clamp module.

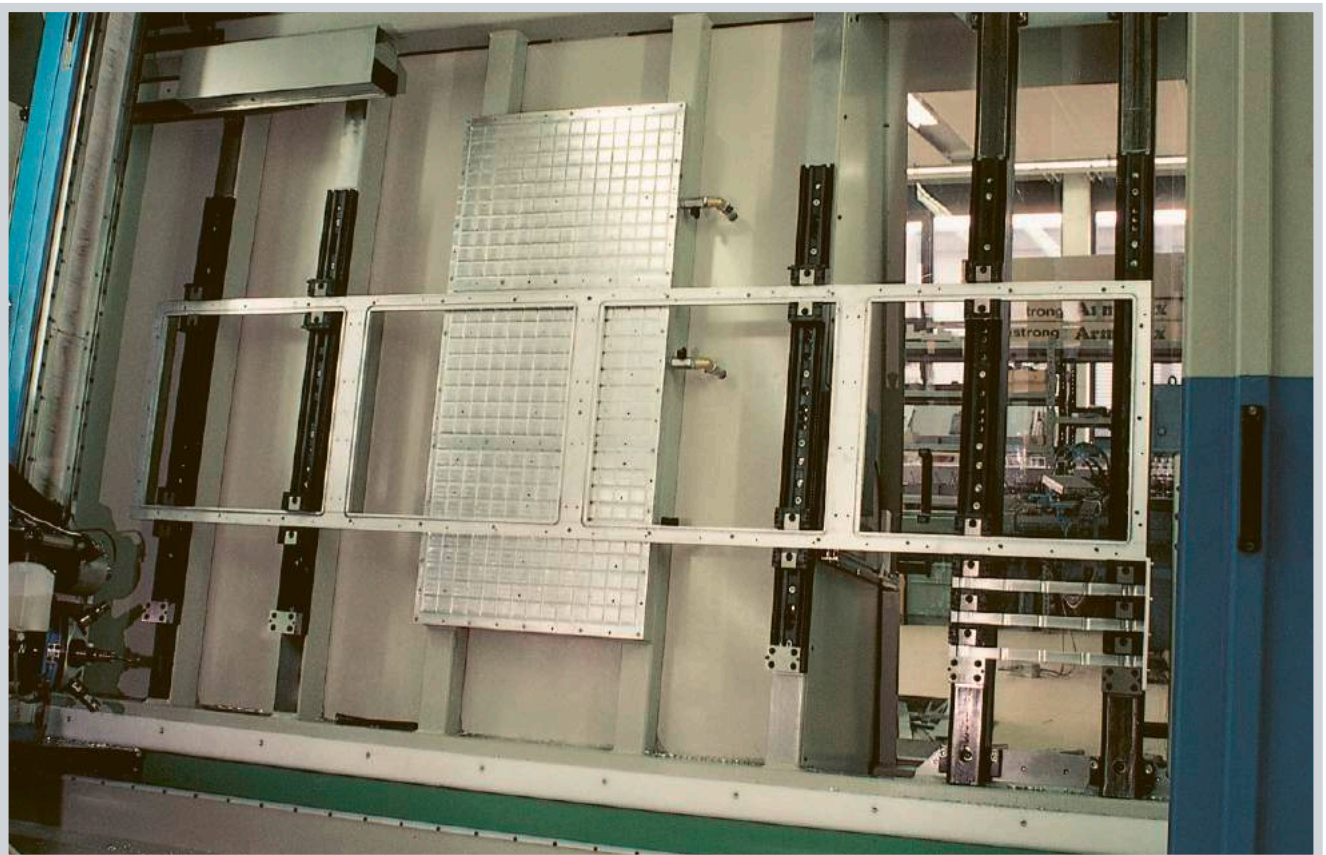
- Clamping force up to 2,8t (28'000N)
- Space between workpieces only 15 mm
- Stroke of jaw from 1,5 mm
- Precise positioning by ground shoulder screws or dowel pins

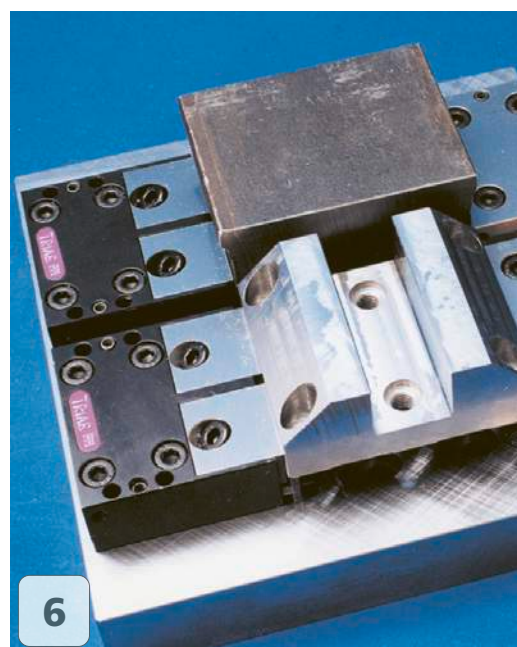
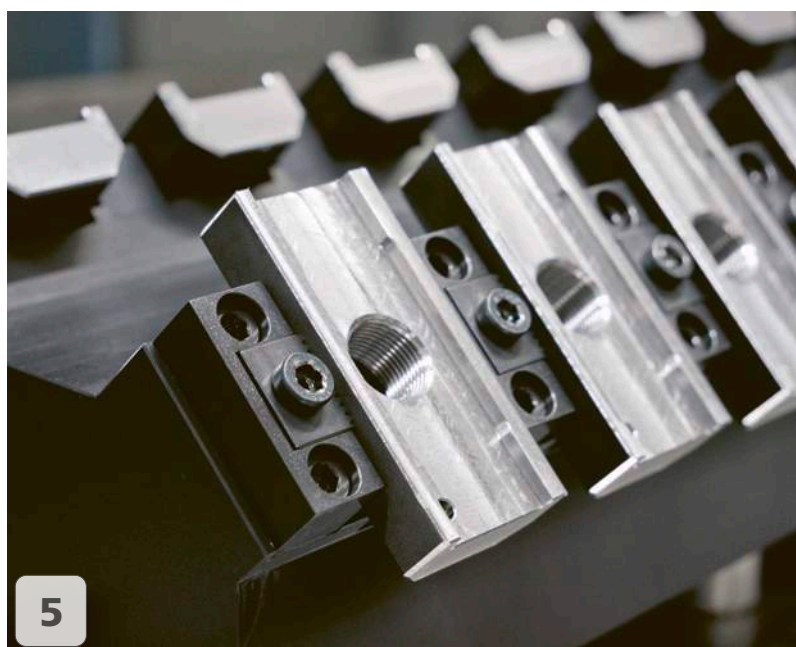
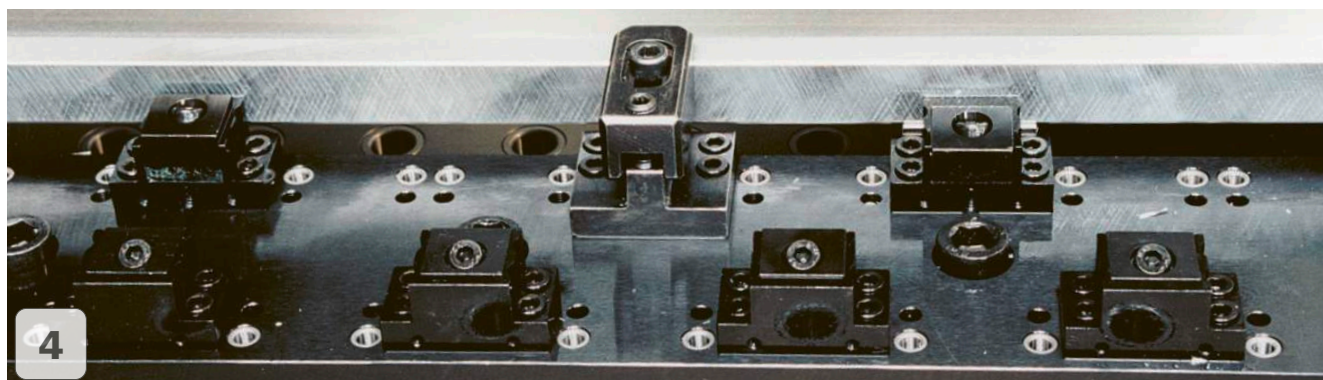
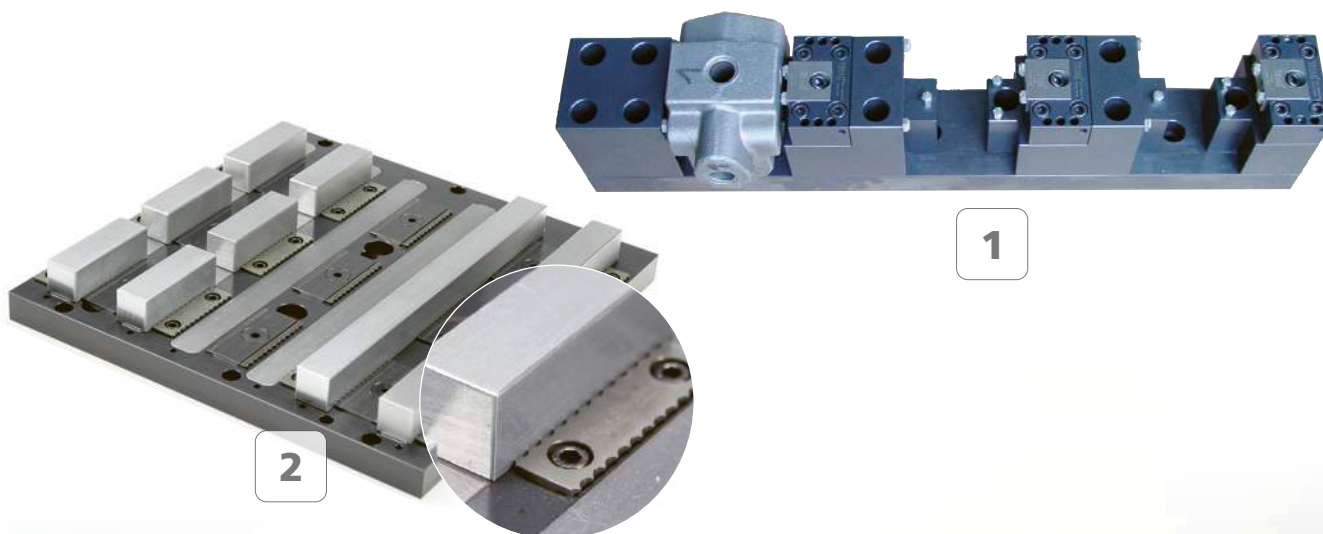


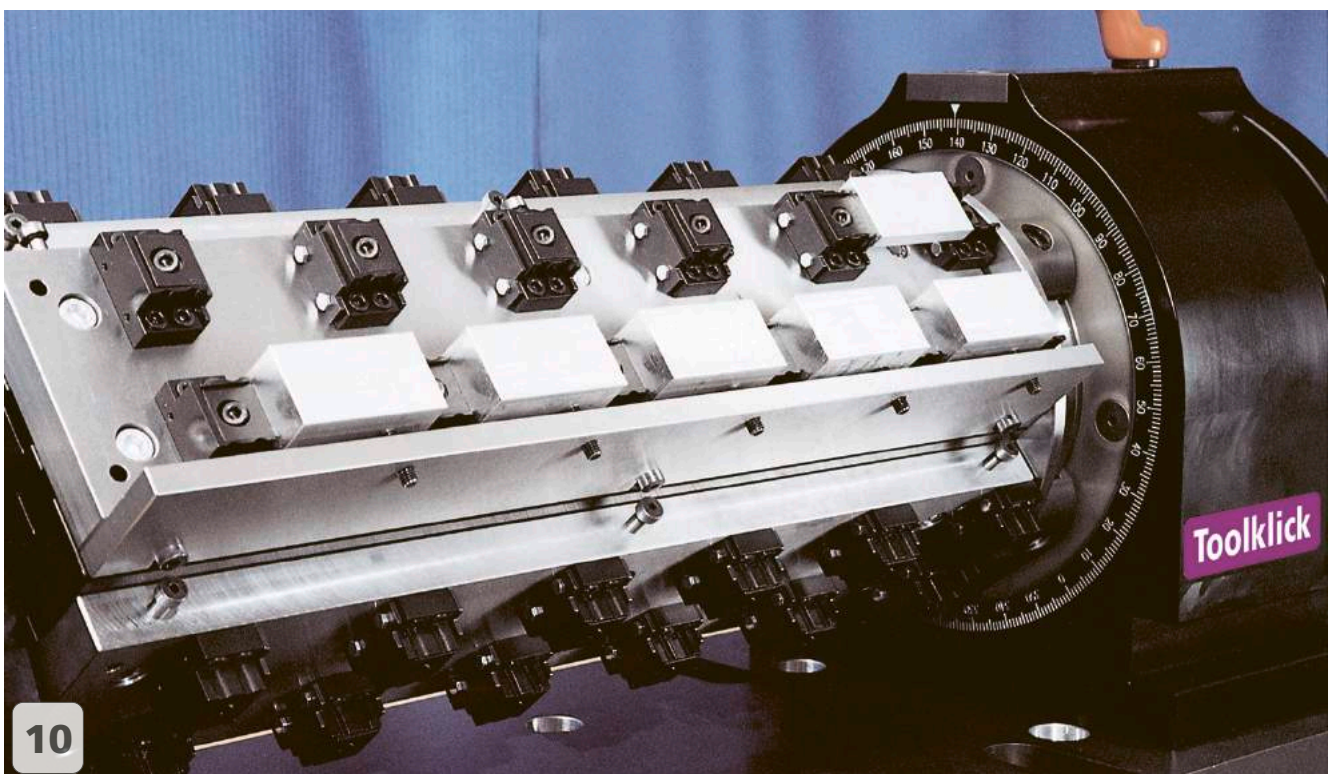
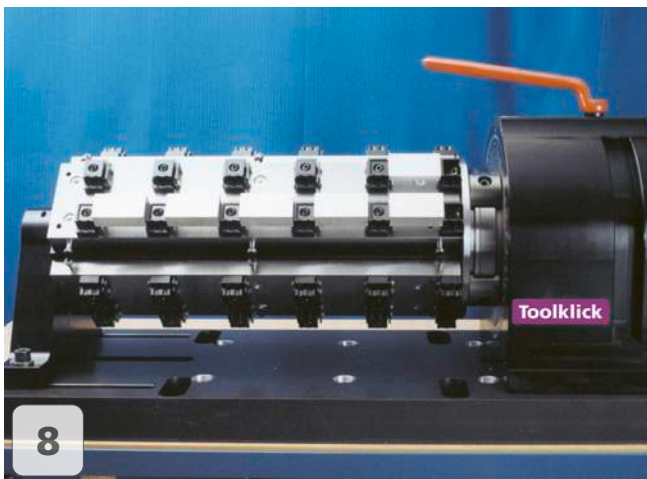
Ein grosses Angebot an verschiedensten Spannmodulen.
A wide range of clamp modules in different sizes are available

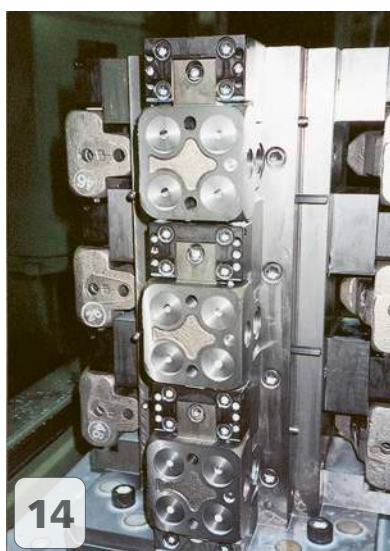
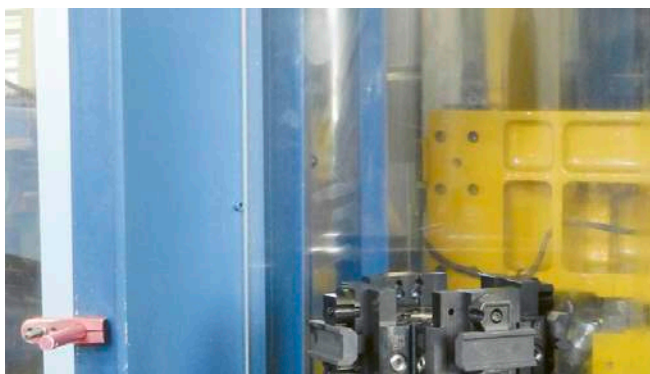
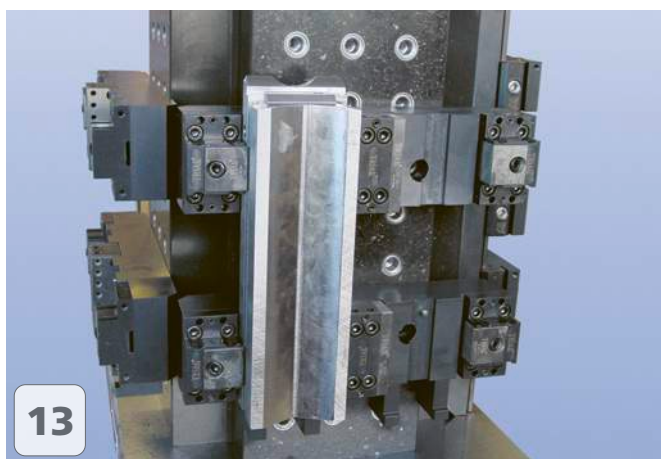


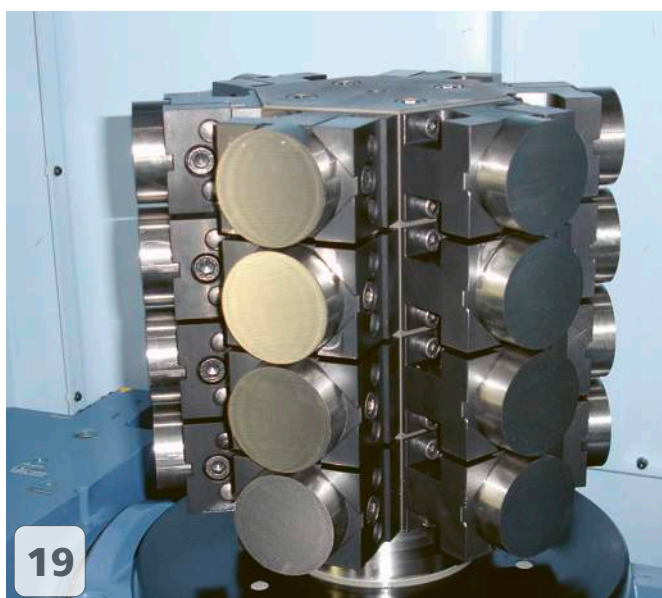
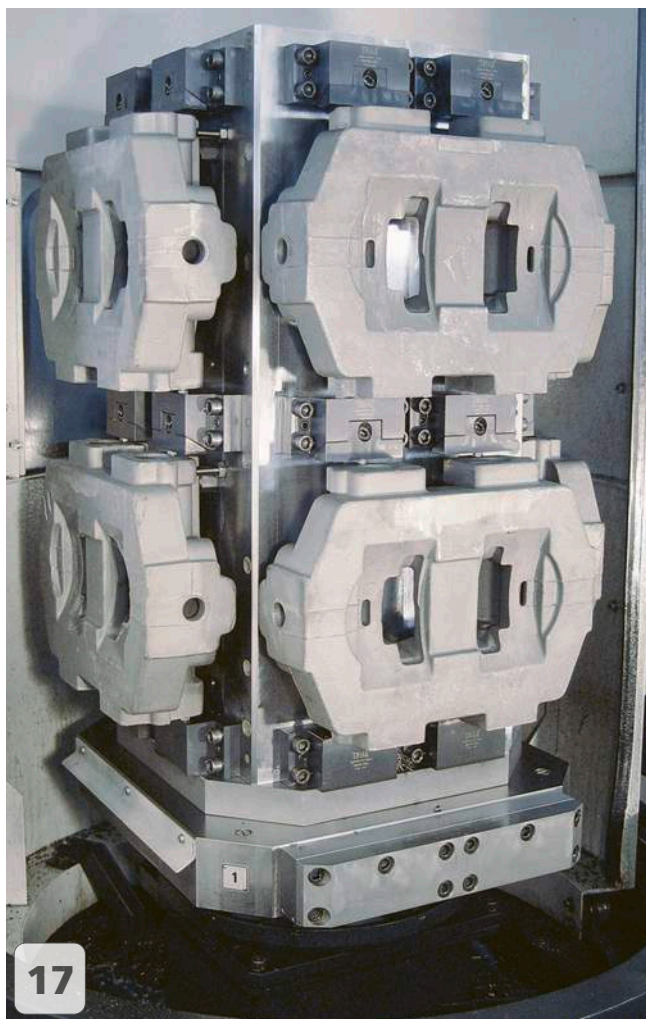
Hohe Spanndichte für Werkstücke in grossen Stückzahlen.
High density fixture plates for repeating orders in high quantities













System System		bei Anschlagmodulen for end module		Modulnutzbreite Module clamping width		Modulnutztiefe / -höhe Module clamping depth or height	
A	Apto Clamp	N	nitriert nitrided	19		MS: Tiefe Depth	
P	Power Clamp	D	durchgehärtet through hardened	25			
C	Compact Clamp	bei Spannmodulen for vice modules		26			
M	Micro Clamp	1	Anzahl Spannbacken Number of jaws	34			
V	Vorrichtungsbau module Workholding modules for dedicated fixtures	2		43			
		3		48			
		-	keine Spannbacke no clamping jaw	58			
				61			
				68			
				78			
				94			
				125			

M S 1 F 35 N 14 -01

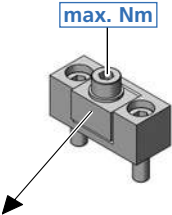
Modultyp Type of module		Anschlagfläche der Module Datum face		Backenhub Stroke of clamping jaw		Spannbackentyp Type of clamping jaw	
A	Anschlagmodul End module	F	Anschlagfläche glatt Datum face flat	N	Niederzug Pull down	B01	Spannbacke Clamping jaw
S	Spannmodul Clamping module	R	Anschlagfläche geriffelt Datum face double serrated	L	linear / parallel linear / parallel	B151	Modul ohne Spannbacken Module without clamping jaw
T	Trägermodul Supporting module	D	eine Seite glatt, eine Seite geriffelt one face flat, one face double serrated	-	ohne Spannbacke no clamping jaw	-01	
R	Rohling / Rundes Modul Blank / Round module	G	Anschlagfläche gerillt Datum face serrated			-150	
V	Vertikalspannmodul Vertical clamp	X	spezielle Ausführung special execution				
		5X	5axes Clamp				
		P	prägen stamping				



ACHTUNG / CAUTION

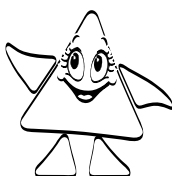
WICHTIG: Die im Micro Clamp Kapitel angegebenen Drehmomente sind die absoluten Maximalwerte. Über die Spannkraften gibt die untenstehende Tabelle Auskunft.

IMPORTANT: The torque numbers specified in the Micro Clamp chapter represent the absolute maximum. The table at the bottom of this page provides further information on the workholding forces.

Niederzug-Spannmodule Pull down module	MC-Module	Schraube Screw	Drehmoment Torque		Spannkraft Workholding force		
			Nm	(lb-ft)	~daN	~(lb)	~t
	MR1F 30N23 -07	M5	10	7,4	= 1020	2250	1,02
	MS1F 22N40 -07		10	7,4	= 1020	2250	1,02
	MS1F 24N22 -07		10	7,4	= 1020	2250	1,02
	MS1R/F 25N25 -13	M6	15	11	= 1520	3350	1,52
	MS1F 35N14 -01	M5	10	7,4	= 1020	2250	1,02
	MS1F 35N22 -01		10	7,4	= 1020	2250	1,02
	MS2X 25N23 -01		10	7,4	= 1020	2250	1,02
	MS2F 60N14 -01		10	7,4	= 1020	2250	1,02
	MS3F 85N14 -01		10	7,4	= 1020	2250	1,02
	VS1R 19N35 -20	M6	15	11	= 1520	3350	1,52
	VS1R 26N35 -26	M8	25	18,4	= 2100	4630	2,10
	VS1R 38N50 -60		25	18,4	= 2100	4630	2,10
	VS1R/F 41N30 -60		25	18,4	= 2100	4630	2,10
	VS1R/F 80N30 -36		25	18,4	= 2100	4630	2,10
	VS1R 80N50 -36		25	18,4	= 2100	4630	2,10
	VS1R/F 80N30 -60		25	18,4	= 2100	4630	2,10
	VS1R 80N50 -60		25	18,4	= 2100	4630	2,10
	VS1R/F 125N49 -95	M10	40	29,5	= 2800	6170	2,80
	VS2R 80N30 -60		25	18,4	= 2100	4630	2,10
	VS2F 90N30 -60		25	18,4	= 2100	4630	2,10
Linear-Spannmodule Linear module	MS1F (MS1R) 35L14 -152	M6x0,5	10	7,4	= 570	1260	0,57
	MS2P (MS2P) 58L14 PRG15	M8	15	11	= 600	1320	0,6
	MS2F (MS1F) 58L14 W251		15	11	= 600	1320	0,6
	VS1R 26L35 -31		25	18,4	= 2100	4630	2,10
	VS1R/F 41L30 -51		25	18,4	= 2100	4630	2,10
	VS1R/F 80L30 -51		25	18,4	= 2100	4630	2,10
	VS1X 68L20 -105		40	29,6	= 1600	3530	1,60
	VS1X 59L60 K	M10	50	37	= 1880	4140	1,88
	VS1X 59L60 H5		50	37	= 1640	3620	1,64

Die Spannbacken und Schrauben regelmässig fetten!

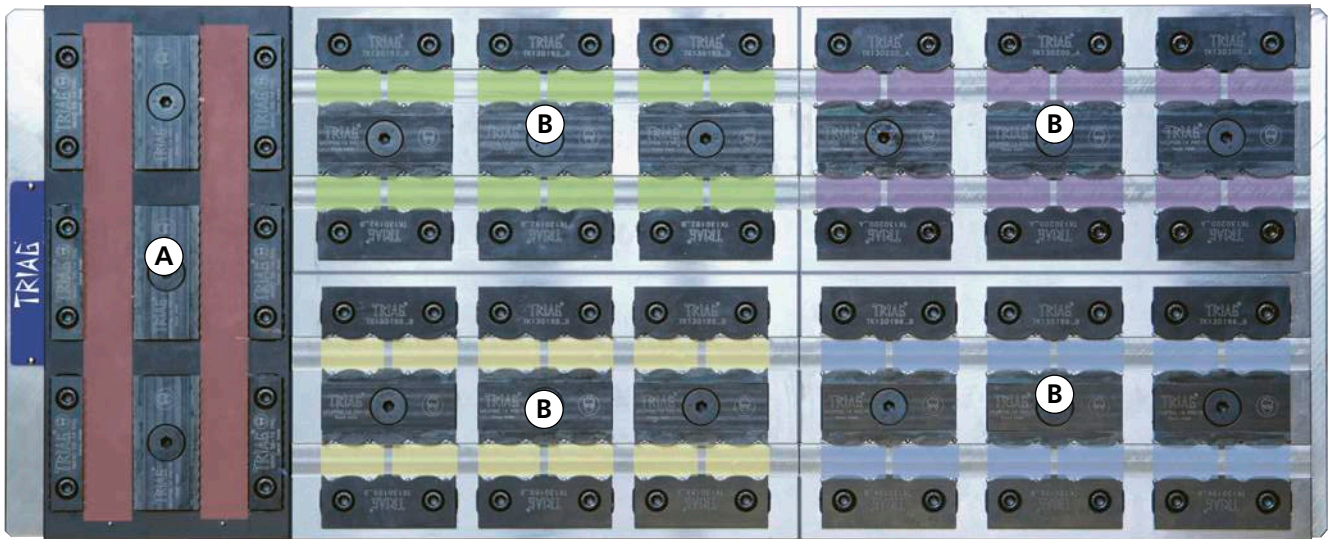
Lubricate clamping jaw and screw regularly with grease!



Schraube Screw	Drehmoment Torque		Spannkraft Workholding force		
M5 + M6	4	3	= 500	1100	0,50
	5	3,7	= 580	1280	0,58
	6	4,4	= 690	1520	0,69
	7	5,2	= 780	1720	0,78
	8	5,9	= 880	1940	0,88
	9	6,6	= 980	2160	0,98
	10	7,4	= 1020	2250	1,02
M6	12	8,9	= 1220	2690	1,22
	14	10,4	= 1450	3200	1,45
	15	11	= 1520	3350	1,52
M8	4	3	= 410	900	0,41
	5	3,7	= 490	1080	0,49
	6	4,4	= 560	1250	0,56
	7	5,2	= 660	1460	0,66
	8	5,9	= 730	1610	0,73
	9	6,6	= 810	1790	0,81
	10	7,4	= 900	1980	0,90
	15	11	= 1520	3350	1,52
	20	14,8	= 1810	3990	1,81
M10	25	18,4	= 2100	4630	2,10
	10	7,4	= 400	880	0,40
	20	14,8	= 1400	3090	1,40
	30	22,1	= 2000	4410	2,00
	40	29,5	= 2800	6170	2,80

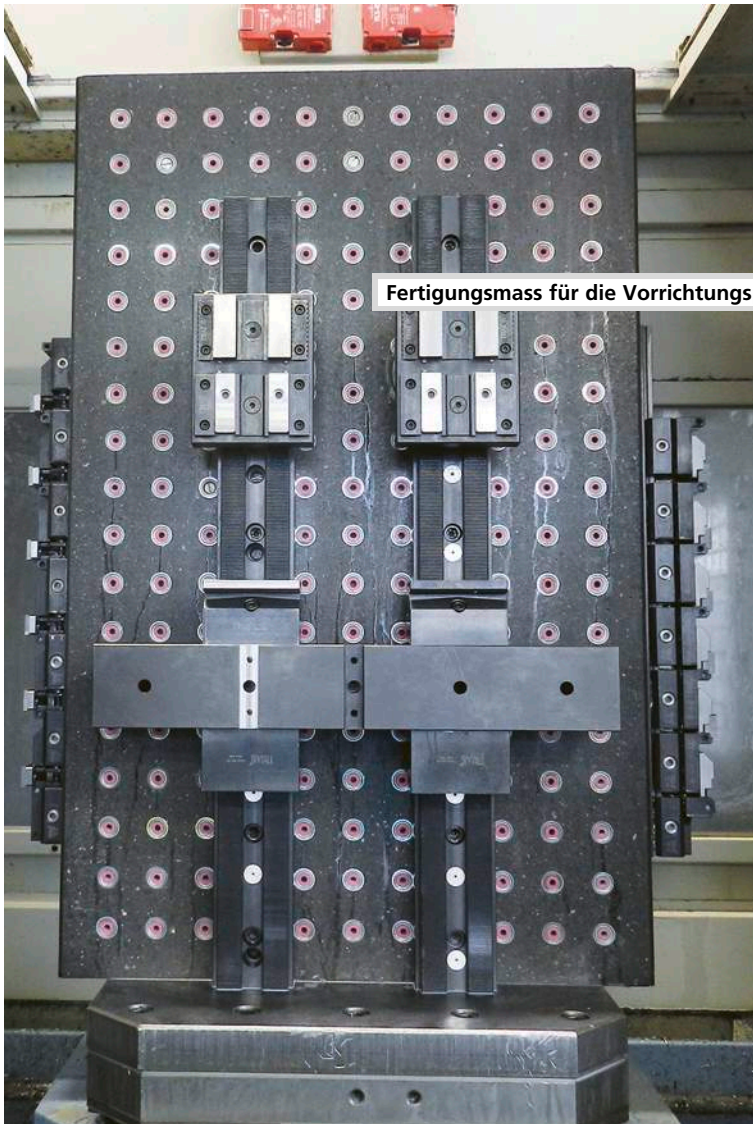
Keilspanner in weicher Ausführung zum Bearbeiten von Formbacken.

Double angle clamps with soft jaws for making shaped forms.



A Prägebacken Spanntiefe 1,8 mm
 12 Werkstücke werden hergestellt
*First clamp 12 parts with stamping jaws
 clamping depth 1,8 mm*

B 4 x 12 verschiedene Teile werden in der
 2. Spannung bearbeitet
*4 times 12 different parts are machined
 in the second operation*



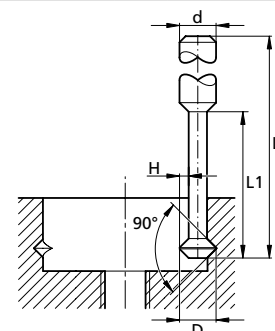
Fertigungsmass für die Vorrichtungplatte: / Machining data for the fixture plate: p. 175

Fräser / Milling cutter

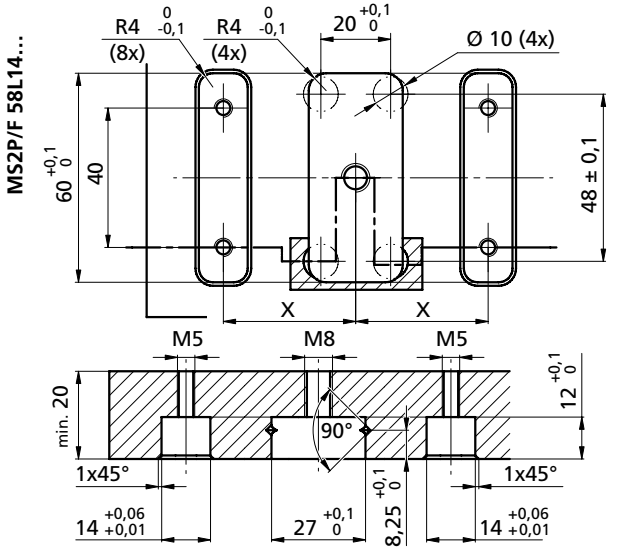
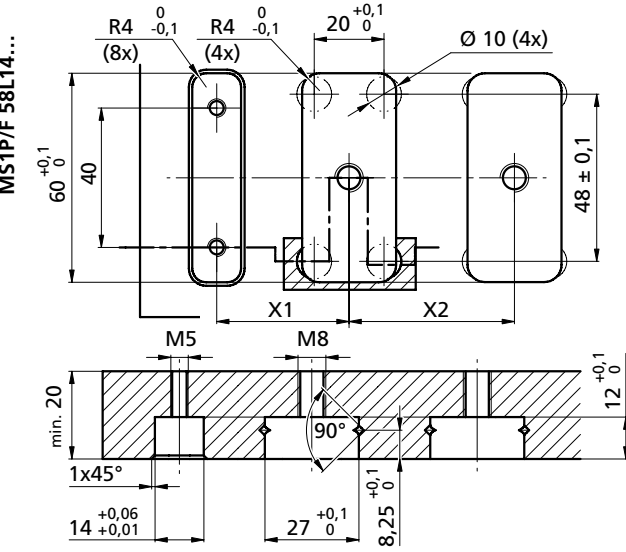
Der abgebildete Fräser benötigt man für die Herstellung der «Kerben».
 Siehe Fertigungsmasse für die Vorrichtungplatte Seite 175.

*The illustrated milling cutter is required for the production of "notches".
 Manufacturing drawing for the fixture plate on page 175.*

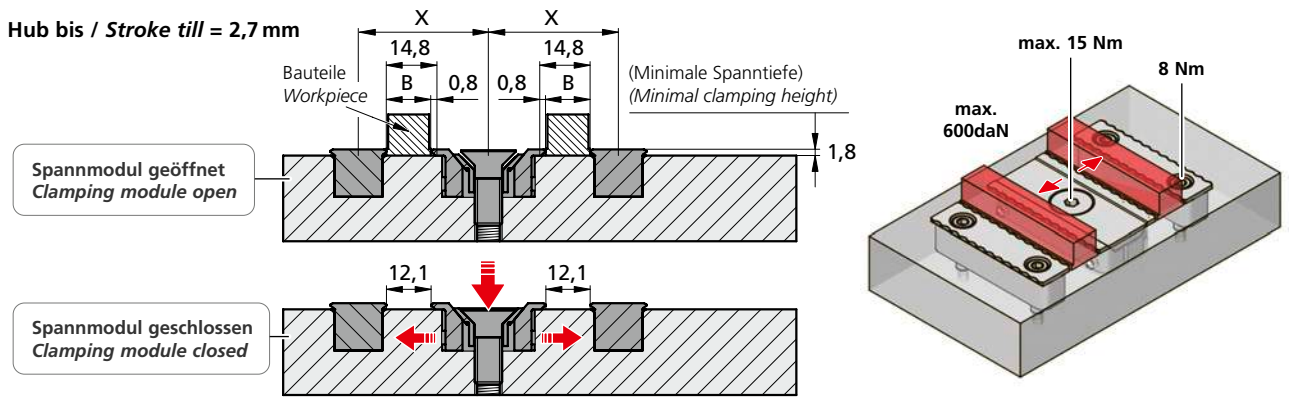
45°	d	D	L1	H	z	L
TK150057	6	6,0	24,0	1,5	3	58

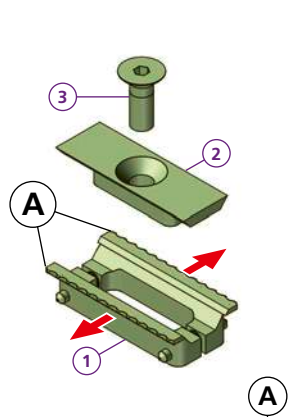


Fertigungsmasse für die Vorrichtungsplatte / Machining data for the fixture plate

 MS2P/F 58L14...	 MS1P/F 58L14...
Mass $X (X1) = B + 24 \text{ mm}$ Beispiel: Bauteilbreite = 14 mm Dimension $X (X1) = B + 24 \text{ mm}$ Example: Width of component part = 14 mm Taschenabstand $X = 14 + 24 = 38$ Das ergibt eine Einlegeluft von 0,8 mm (Hub bis 2,7 mm)	Mass $X2 = B + 33,5 \text{ mm}$ Beispiel: Bauteilbreite = 14 mm Dimension $X2 = B + 33,5 \text{ mm}$ Example: Width of component part = 14 mm Taschenabstand $X = 14 + 33,5 = 47,5$ Das ergibt eine Einlegeluft von 0,8 mm (Hub bis 2,7 mm)

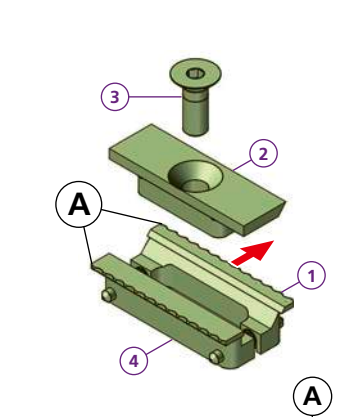
Hub bis / Stroke till = 2,7 mm





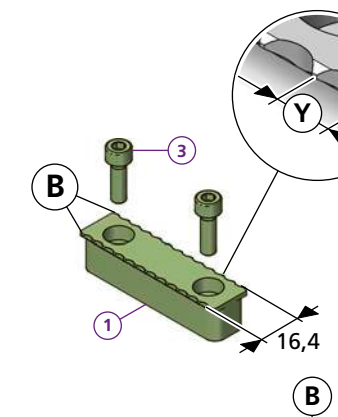
MS2P58L14PRG15

- 1 2x TK120225
- 2 1x TK120227
- 3 1x M8X22DIN7991
- Y 4,7 mm
- i 57HRC
- kg ~0,12



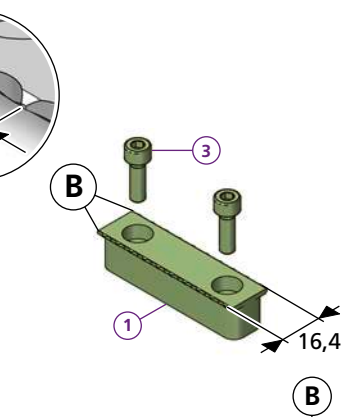
MS1P58L14PRG15

- 1 1x TK120225
- 2 1x TK120721
- 3 1x M8X22DIN7991
- 4 1x TK120720
- Y 4,7 mm
- i 57HRC
- kg ~0,12



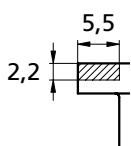
MAND58-14PRG

- 1 1x TK120226
- 3 2x M5X16ISO4762
- Y 4,7 mm
- i 57HRC
- kg ~0,08



MAND58-14PRG6

- 1 1x TB150282
- 3 2x M5X16ISO4762
- Y 6,0 mm
- i 57HRC
- kg ~0,08



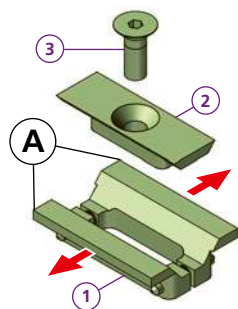
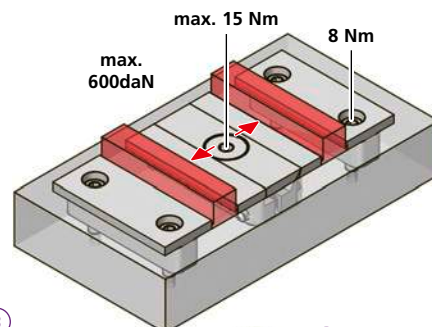
Zum Erstellen Ihrer individuellen Formbacke:

Schnittzeichnung zum Ermitteln der maximalen Bearbeitungsprofiltiefe

If a dedicated jaw is being machined:

Sectional drawing to determine the maximum machining depth

für / for TK120531 | TK120531 | TK120529 | TK160554

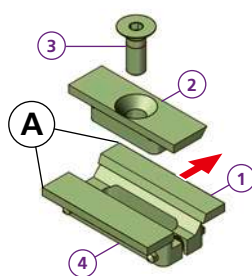


MS2F58L14W251

- 1 2x TK120531
- 2 1x TK120227
- 3 1x M8X22DIN7991

i *

kg ~0,12

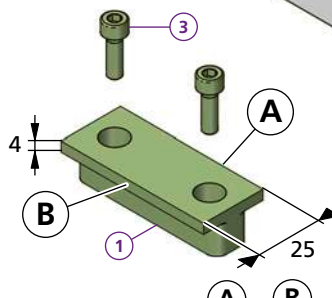


MS1F58L14W251

- 1 1x TK120531
- 2 1x TK120721
- 3 1x M8X22DIN7991
- 4 1x TH130566

i *

kg ~0,12



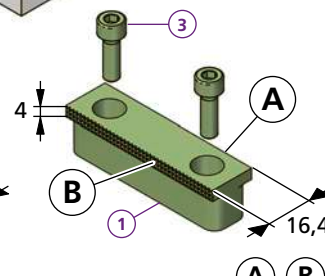
MANF58-14W25

- 1 1x TK120529
- 3 2x M5X16ISO4762
- i *

MANF58-14F25

- 1 1x TK150033
- 3 2x M5X16ISO4762
- i HV700 x 0,2mm

kg ~0,11



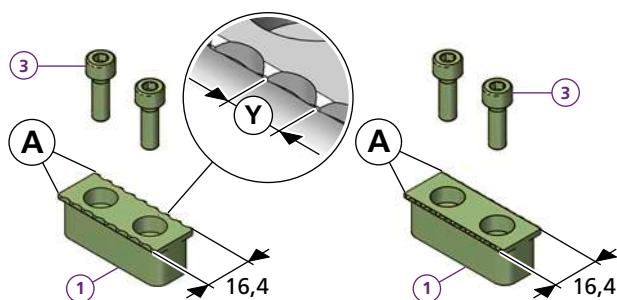
MANF58-14RF

- 1 1x TB160563
- 3 2x M5X16ISO4762

i HV700 x 0,2mm

kg ~0,11

p. 175 Fertigungsmass für die Vorrichtungplatte: / Machining data for the fixture plate:

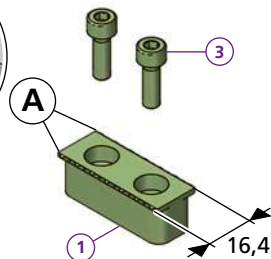


MAND38-14PRG

- 1 1x TB150234
- 3 2x M5X16ISO4762
- Y 4,7 mm

i 57HRC

kg ~0,08

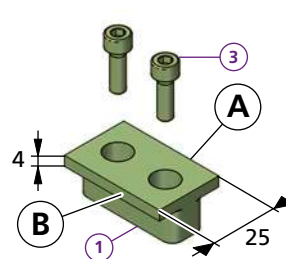


MAND38-14PRG6

- 1 1x TB150283
- 3 2x M5X16ISO4762
- Y 6,0 mm

i 57HRC

kg ~0,08



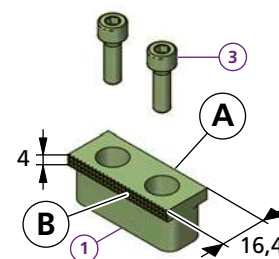
MANF38-14W25

- 1 1x TK160554
- 3 2x M5X16ISO4762
- i *

MANF38-14F25

- 1 1x TK160553
- 3 2x M5X16ISO4762
- i HV700 x 0,2mm

kg ~0,08



MANF38-14RF

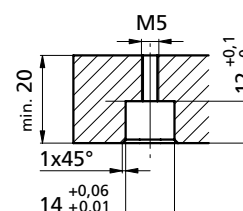
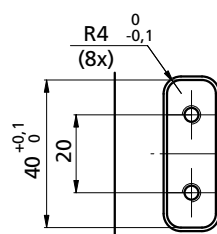
- 1 1x TB170062
- 3 2x M5X16ISO4762

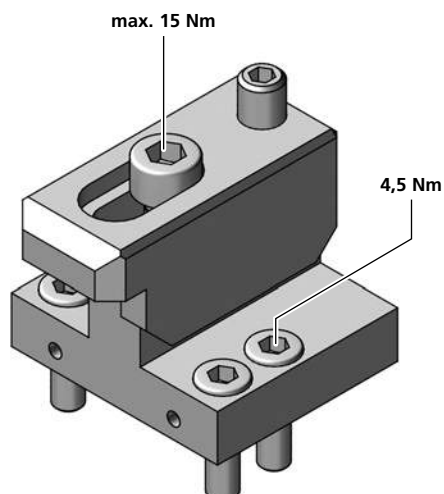
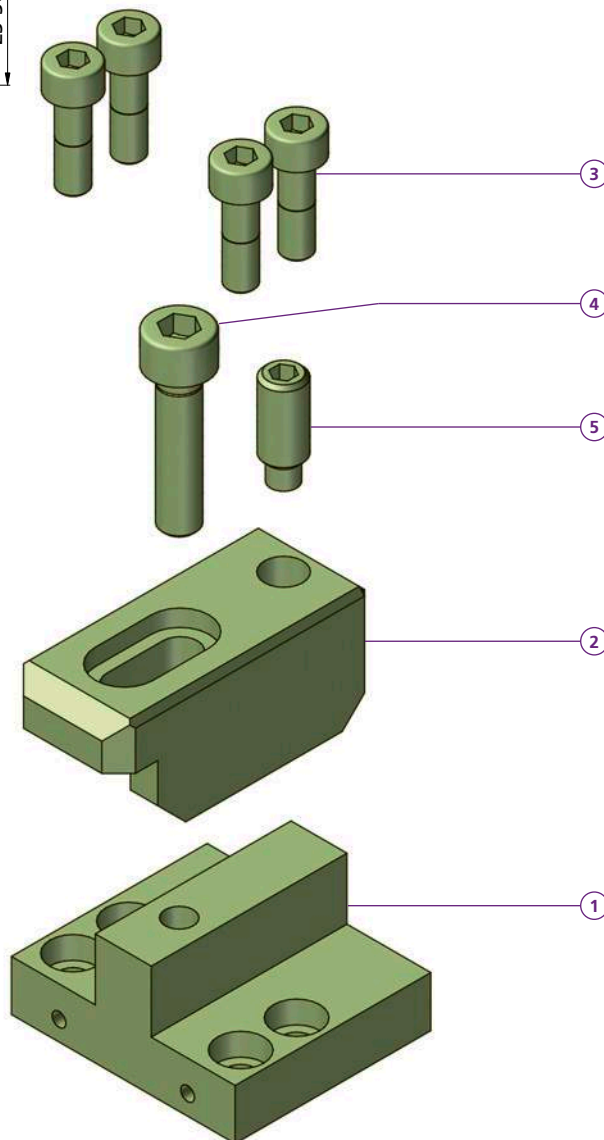
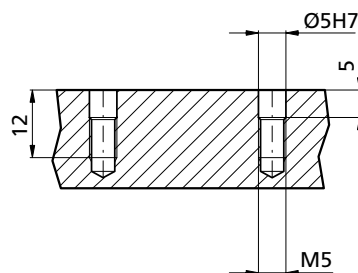
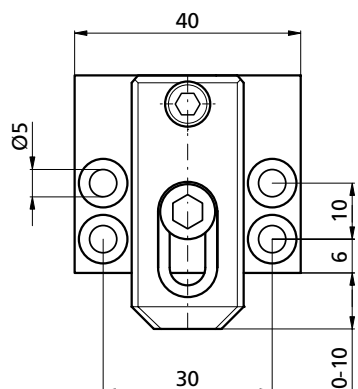
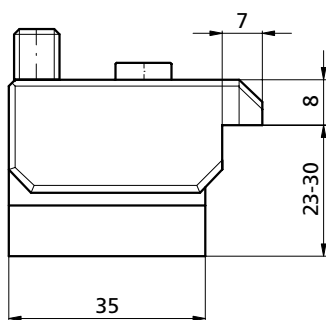
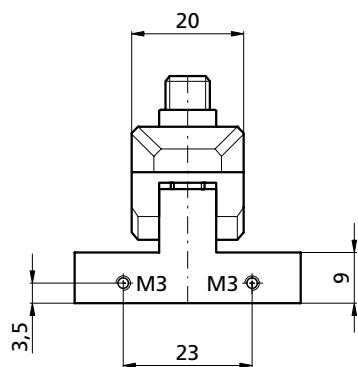
i HV700 x 0,2mm

kg ~0,08

Fertigungsmass für die Vorrichtungplatte
Machining data for the fixture plate

für / for TB150234 | TB150283 | TK160554 | TK160553 | TB170062





MV1F20L35BV1

- 1 1x TF140710
- 2 1x BV1
- 3 4x M550
- 4 1x M6X25ISO4762
- 5 1x M8x20ISO4028

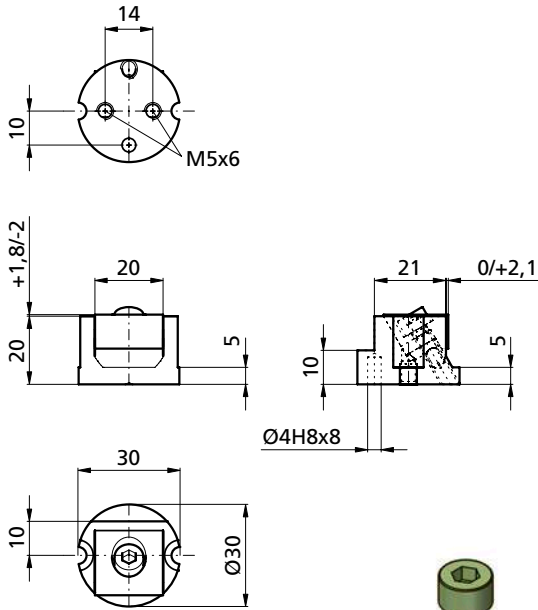
kg ~0,225

Bestellbeispiel / Ordering example : MV1F20L35BV1



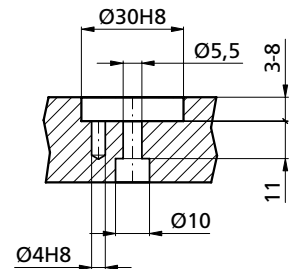
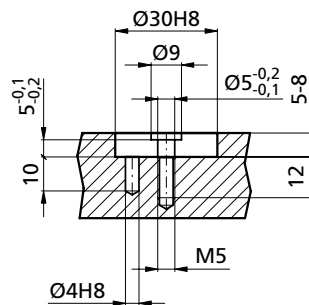
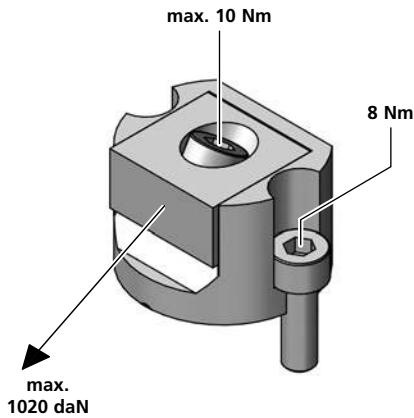
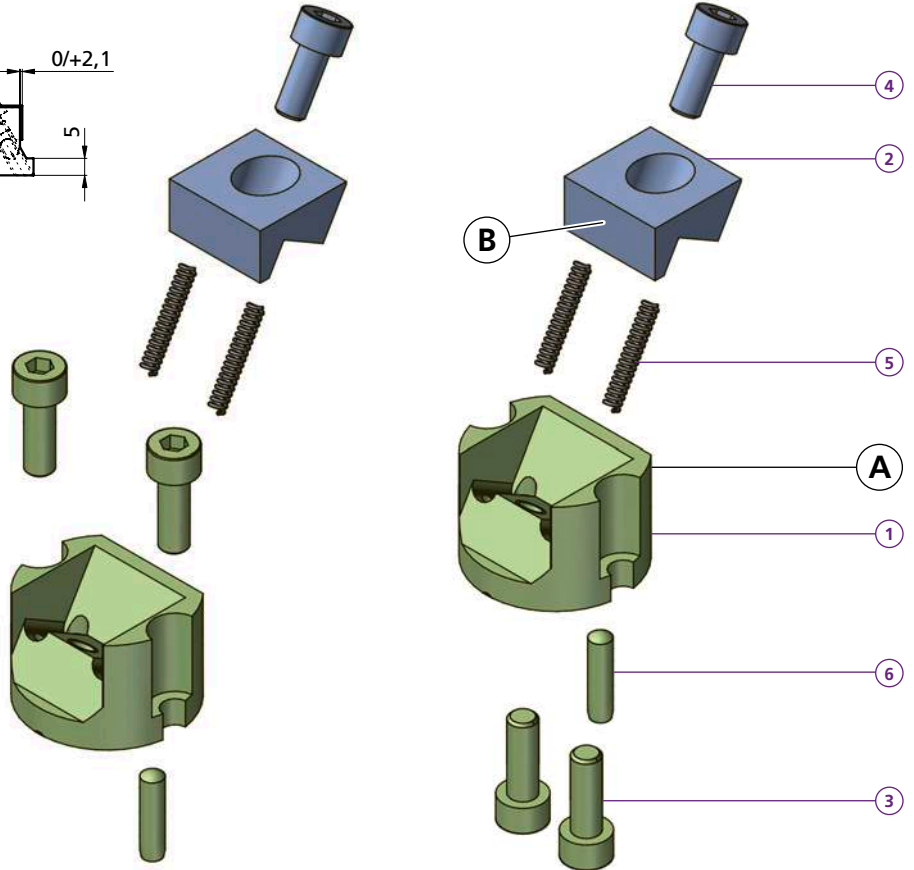
MR1F30N23-07

microCLAMP



Version 2

Version 1



Bestellbeispiel / Ordering example: 1x MR1F30N23-07 & 1x B08					
MR1F30N23-07					
1	1x	TF140711	B07	B08	B09
2	1x		B09+2	B09+5	
3	2x	M5X16ISO4762			
4	1x	M5X12ISO4762			
5	2x	FED03018			
6	1x	Ø4x14 DIN 6325			
kg		~0,095			

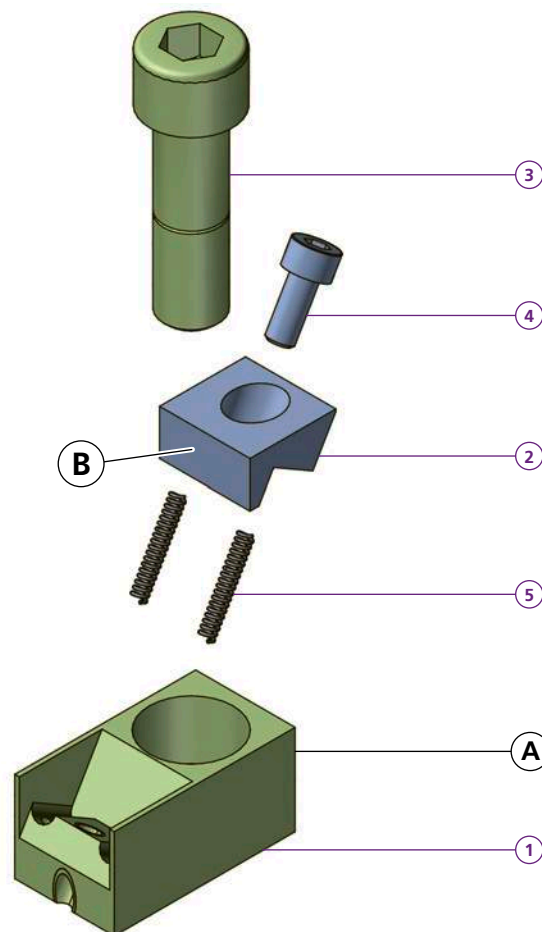
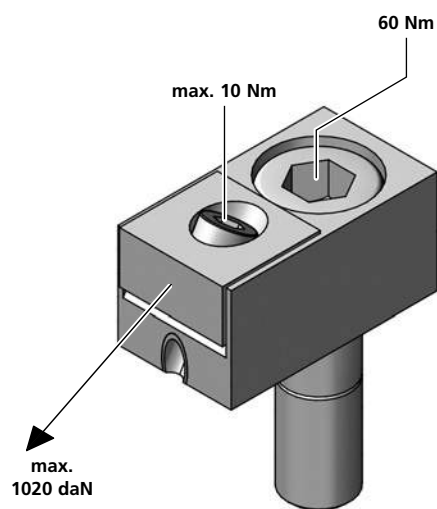
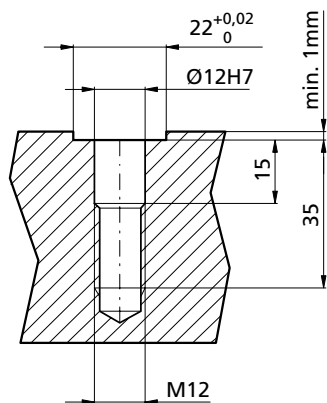
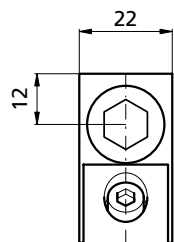
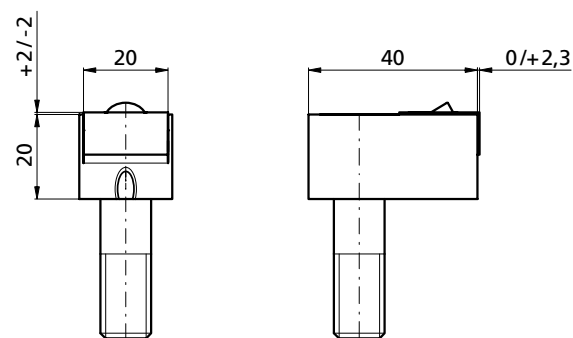
B07, B08, B09					
B09+2, B09+5					
C	20	20	20	20	20
H	10	10	10	10	10
L	9,5	9,5	9,5	11,5	14,5
D	5,5	5,5	5,5	5,5	5,5
Ø	6	6	6	6	6
i	HV700	HV700	*	*	*
	x0,2mm	x0,2mm			
kg	~0,02	~0,02	~0,02	~0,02	~0,02

B07, B08, B09		B09+2, B09+5	
C	H	C	H
D	L	D	L



MS1F22N40-07

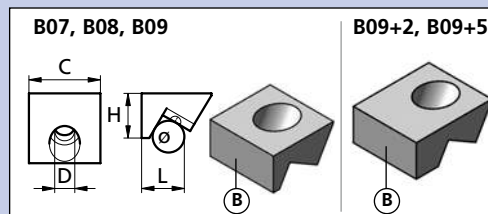
microCLAMP



MS1F22N40-07	
1	1x TF140712
2	1x
3	1x TWPAS1240
4	1x M5X12ISO4762
5	2x FED03018
kg	~0,15

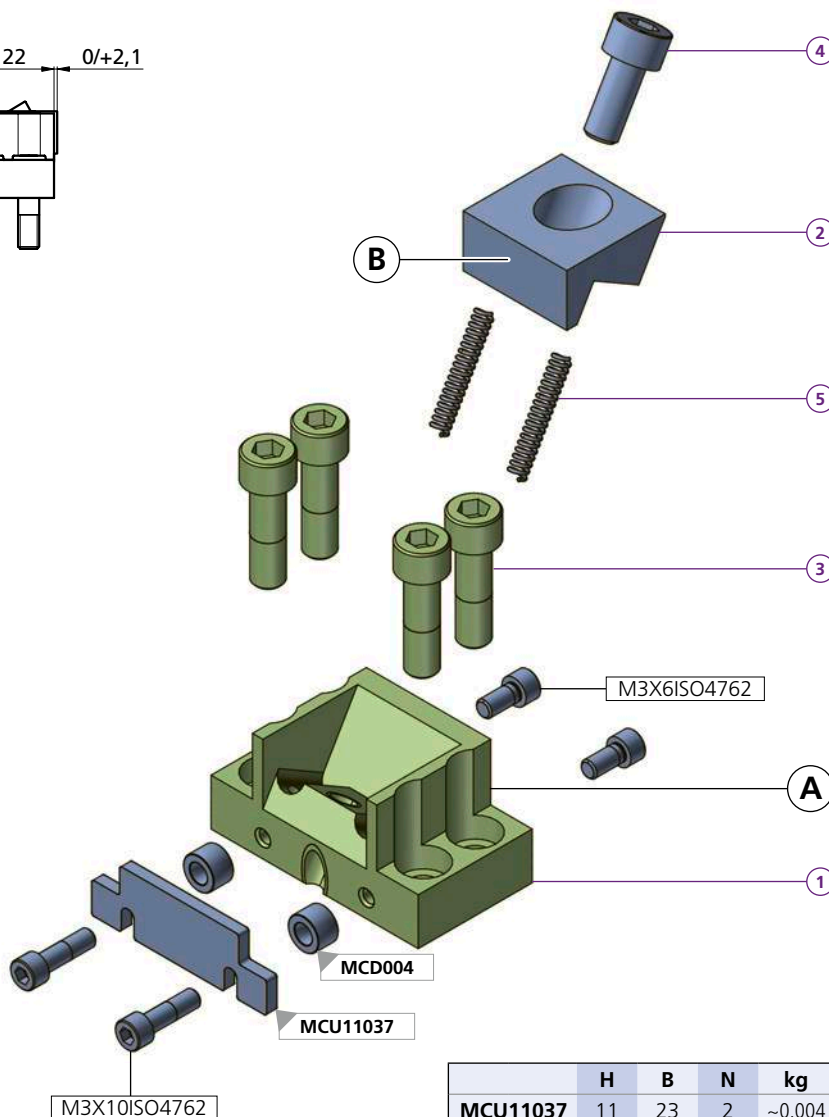
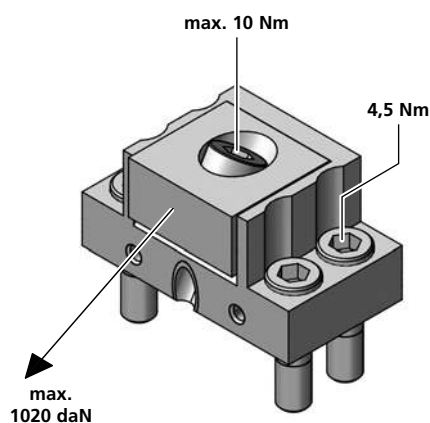
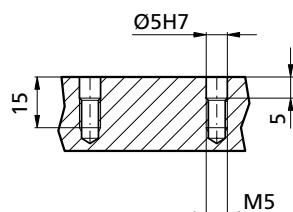
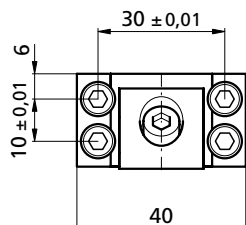
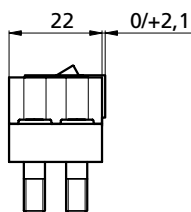
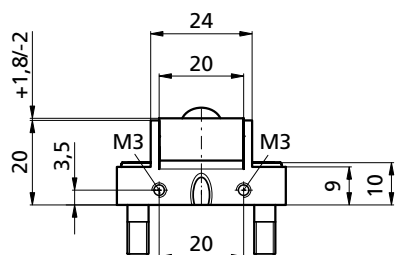
	B07	B08	B09	B09+2	B09+5
C	20	20	20	20	20
H	10	10	10	10	10
L	9,5	9,5	9,5	11,5	14,5
D	5,5	5,5	5,5	5,5	5,5
ø	6	6	6	6	6
i	HV700 x0,2mm	HV700 x0,2mm	*	*	*
kg	~0,02	~0,02	~0,02	~0,02	~0,02

Bestellbeispiel / Ordering example: 1x MS1F22N40-07 & 1x B08



* = weicher Stahl / soft steel

Separat bestellen / Order separately



	H	B	N	kg
MCU11037	11	23	2	~0,004
MCU15037	15	23	2	~0,006
MCU18037	18	23	2	~0,008
MCU20037	20	23	2	~0,008
MCU22537	22,5	23	2	~0,008

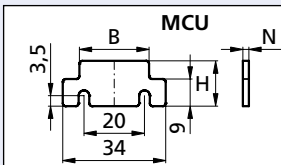
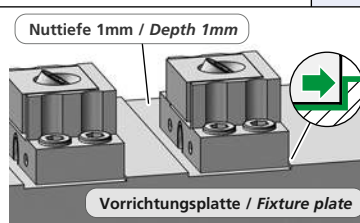
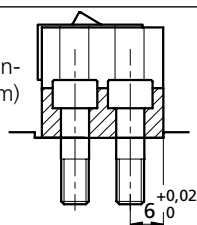
2x **M3X10ISO4762**

2x **M3X6ISO4762**

2x MCD004

Achtung: Bei Spannkraften über 400 daN (0,4t) muss das Spannmodul in eine Nut eingelassen werden (Nuttiefe mindestens 1mm)

Remark: Using forces higher than 400 daN, clamps must be mounted into a slot (depth minimum 1mm)

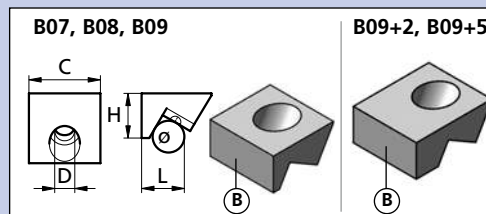


	MS1F24N22-07	
1	1x TF140713	
	MS1R24N22-07	
1	1x TW100172-01	
2	1x _____	
3	4x MS50	
4	1x M5X12ISO4762	
5	2x FED03018	

kg ~0.125

	Bestellbeispiel				
					
	B07	B08	B09	B09+2	B09+5
	20	20	20	20	20
	10	10	10	10	10
	9,5	9,5	9,5	11,5	14,5
	5,5	5,5	5,5	5,5	5,5
	6	6	6	6	6
	HV700 x0,2mm	HV700 x0,2mm	*	*	*
kg	~0,02	~0,02	~0,02	~0,02	~0,02

Bestellbeispiel / Ordering example: 1x **MS1F24N22-07** & 1x **B08**

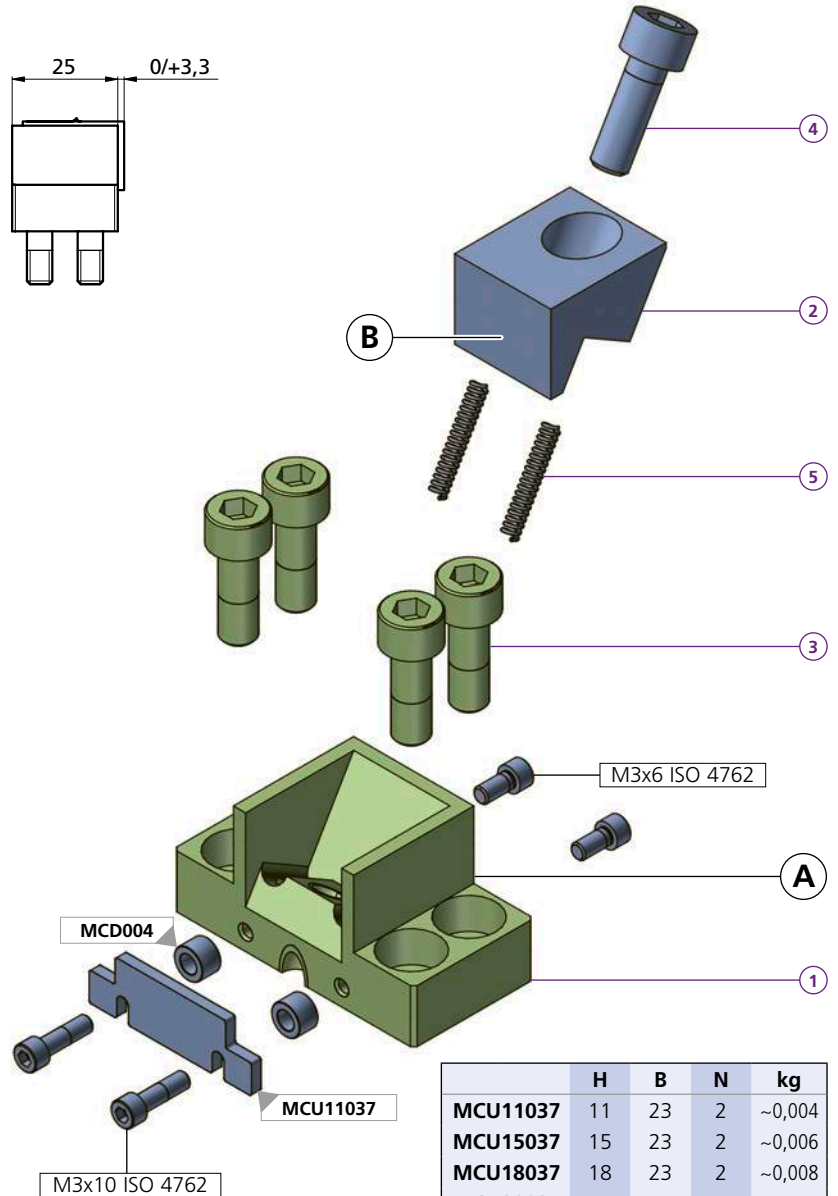
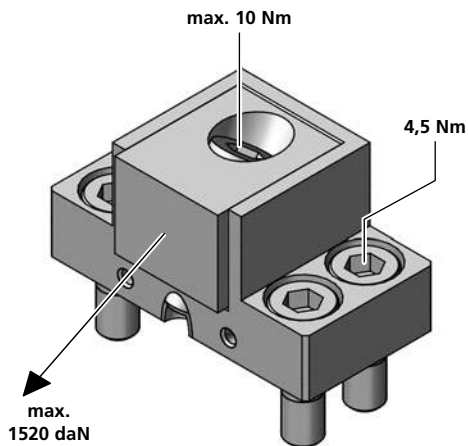
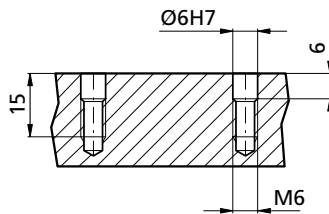
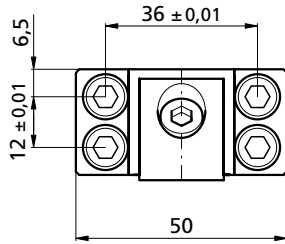
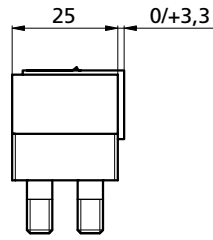
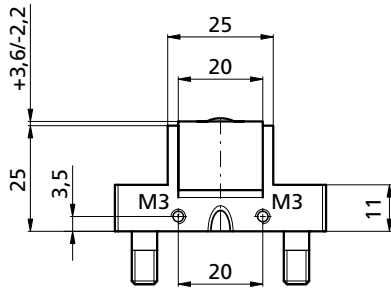


Separat bestellen / Order separately



MS1R/F25N25-13

microCLAMP



	H	B	N	kg
MCU11037	11	23	2	~0,004
MCU15037	15	23	2	~0,006
MCU18037	18	23	2	~0,008
MCU20037	20	23	2	~0,008
MCU22537	22,5	23	2	~0,008

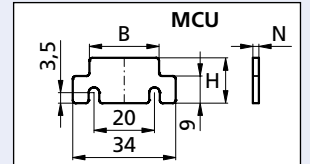
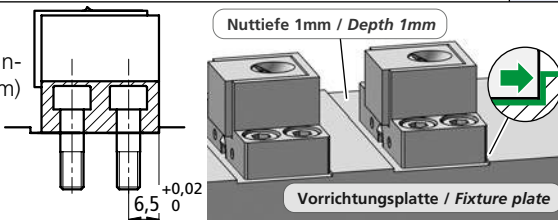
2x M3X10ISO4762

2x M3X6ISO4762

2x MCD004

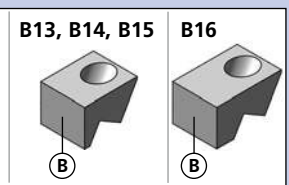
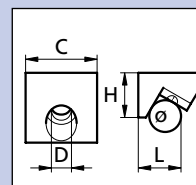
Achtung: Bei Spannkraften über 400 daN (0,4t) muss das Spannmodul in eine Nut eingelassen werden (Nuttiefe mindestens 1mm)

Remark: Using forces higher than 400 daN, clamps must be mounted into a slot (depth minimum 1mm)



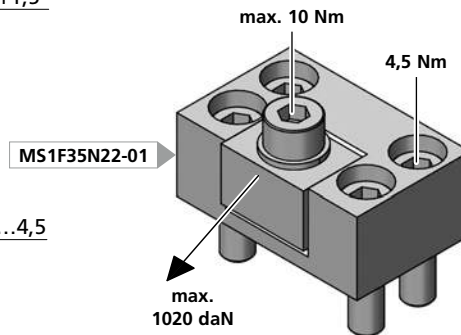
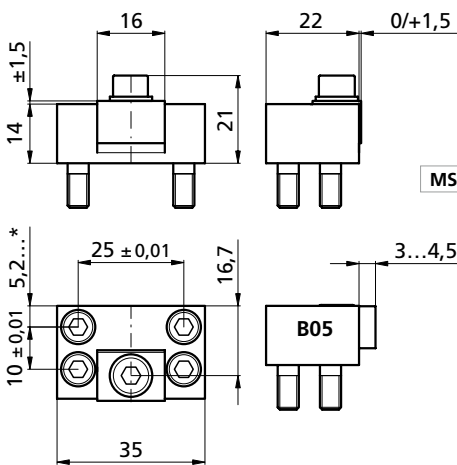
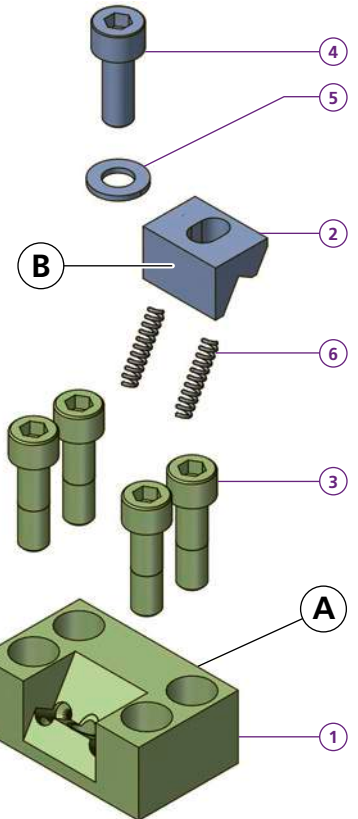
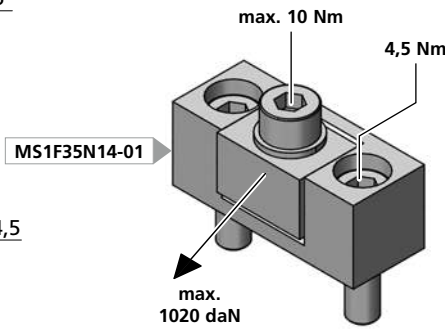
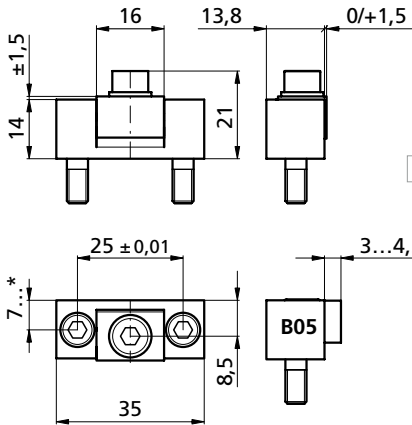
MS1F25N25-13	
1	1x TF140714
MS1R25N25-13	
1	1x TF140715
2	1x
3	4x MS60
4	1x M6X16ISO4762
5	2x FED03018
kg	~0,165

Bestellbeispiel / Ordering example: 1x MS1F25N25-13 & 1x B14				
	B13	B14	B15	B16
C	20	20	20	20
H	16	16	16	16
L	13,8	13,8	13,8	19
D	6,5	6,5	6,5	6,5
ø	10	10	10	10
i	HV700	HV700	*	*
	x0,2mm	x0,2mm		
kg	~0,05	~0,05	~0,05	~0,06

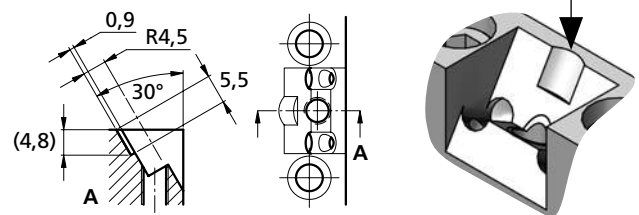


* = weicher Stahl / soft steel

Separat bestellen / Order separately

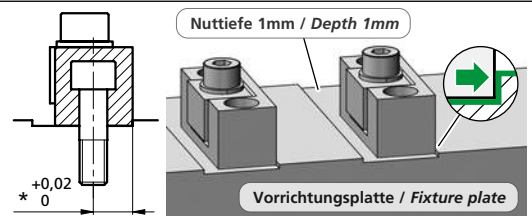
**MS1R/F35N14-01****MS1F35N22-01****microCLAMP****Beim Einsatz der Backe B05(R) Jaw B05(R) in use**

Nachbearbeitung am Modul, falls der gesamte Backenhub (1,1mm bis 1,5mm) benötigt wird.
 If a stroke of 1,1mm to 1,5mm is required the module must be machined according to this sketch.



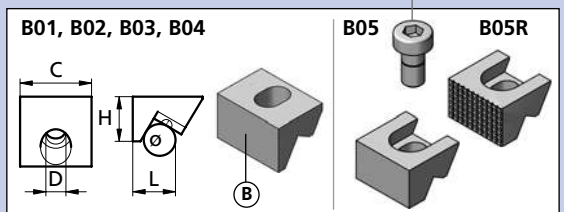
Achtung: Bei Spannkraften über 400 daN (0,4t) muss das Spannmodul in eine Nut eingelassen werden (Nuttiefe mindestens 1mm)

Remark: Using forces higher than 400 daN, clamps must be mounted into a slot (depth minimum 1mm)



MS1F35N14-01	
1	1x TF140718
MS1R35N14-01	
1	1x TK190150
2	1x
3	2x MS50
4	1x M5X14ISO4762
5	1x 5x10x1DIN125A
6	2x FED02813
kg	~0,05
MS1F35N22-01	
1	1x TF140719
3	4x MS50
kg	~0,08

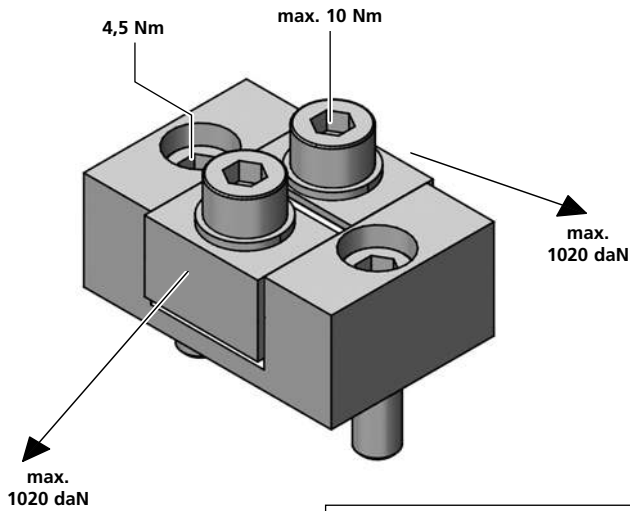
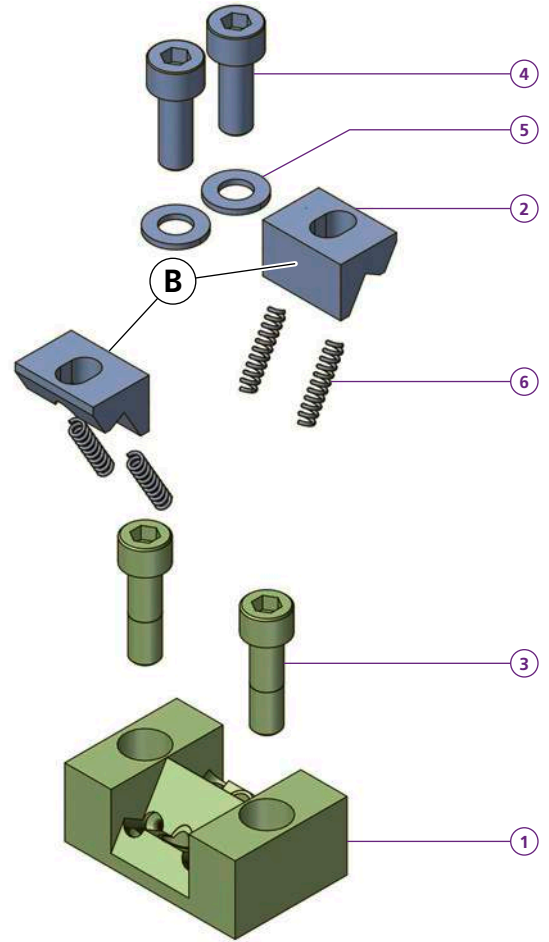
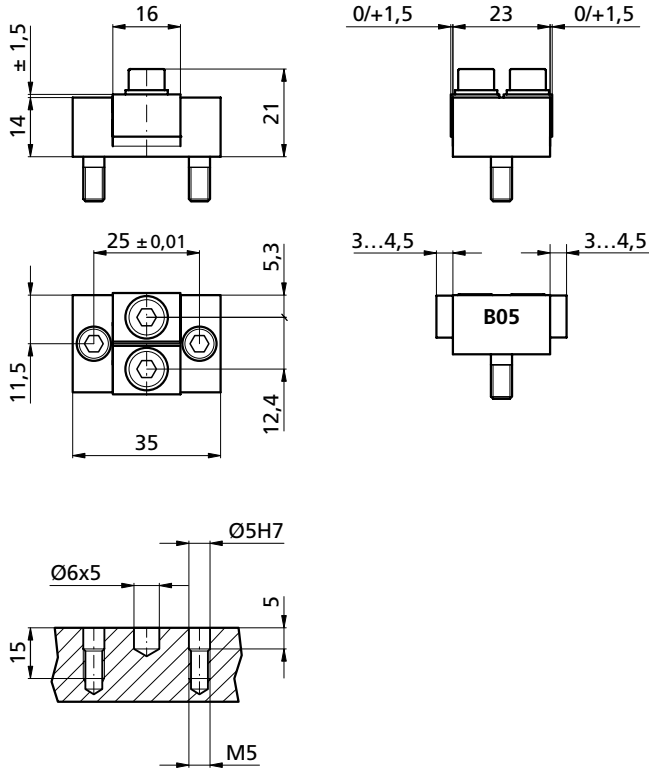
Bestellbeispiel / Ordering example: 1x MS1F35N14-01 & 1x B02						
	B01	B02	B03	B04	B05	B05R
C	16	16	16	16	16	16
H	10	10	10	10	10	10
L	8	8	11	8	10	10
D	5,5	5,5	5,5	5,5	5,2	5,2
ø	4	4	4	4	4	4
i	HV700	HV700	*	Messing	HV700	HV700
	x0,2mm	x0,2mm		Laiton	x0,2mm	x0,2mm
kg	~0,01	~0,01	~0,014	~0,012	~0,014	~0,014





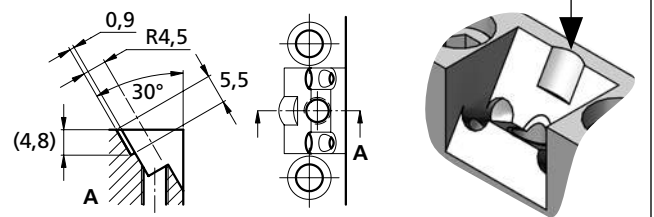
MS2X35N23-01

microCLAMP



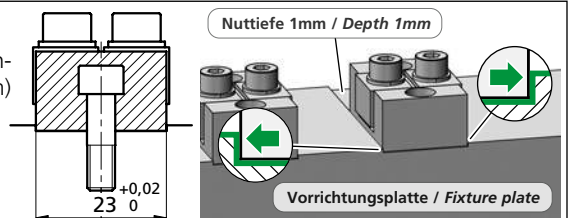
Beim Einsatz der Backe B05(R) Jaw B05(R) in use

Nachbearbeitung am Modul, falls If a stroke of 1,1mm to 1,5mm der gesamte Backenhub (1,1mm bis is required the module must be 1,5mm) benötigt wird. machined according to this sketch.



Achtung: Bei Spannkraften über 400 daN (0,4t) muss das Spannmodul in eine Nut eingelassen werden (Nuttiefe mindestens 1mm)

Remark: Using forces higher than 400 daN, clamps must be mounted into a slot (depth minimum 1mm)



MS2X35N23-01		Bestellbeispiel / Ordering example: 1x MS2X35N23-01 & 2x B02					
		B01	B02	B03	B04	B05	B05R
1	1x TF140720						
2	2x						
3	2x MS50						
4	2x M5X14ISO4762						
5	2x 5x10x1DIN125A						
6	4x FED02813						
kg	~0,085	kg	~0,01	~0,01	~0,014	~0,012	~0,014

	B01	B02	B03	B04	B05	B05R
C	16	16	16	16	16	16
H	10	10	10	10	10	10
L	8	8	11	8	10	10
D	5,5	5,5	5,5	5,5	5,2	5,2
ø	4	4	4	4	4	4
i	HV700	HV700	*	Messing	HV700	HV700
	x0,2mm	x0,2mm		Laiton	x0,2mm	x0,2mm

	B01, B02, B03, B04	B05	B05R
C			
H			
D			
ø			
L			

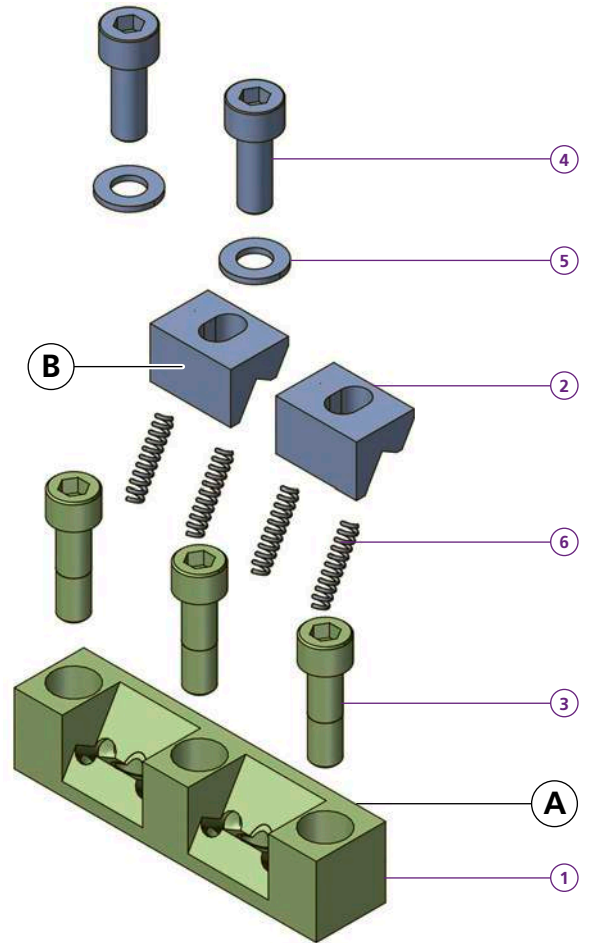
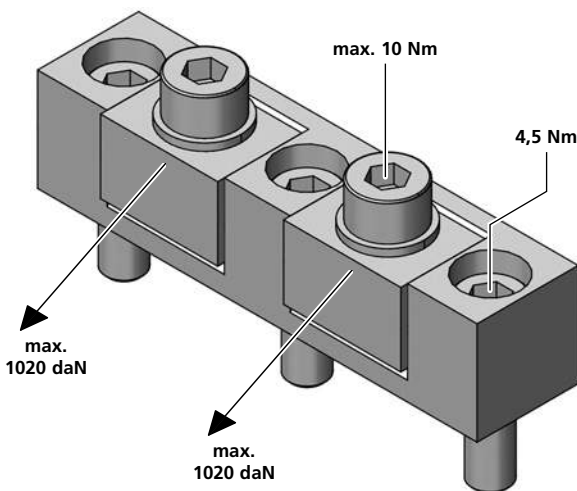
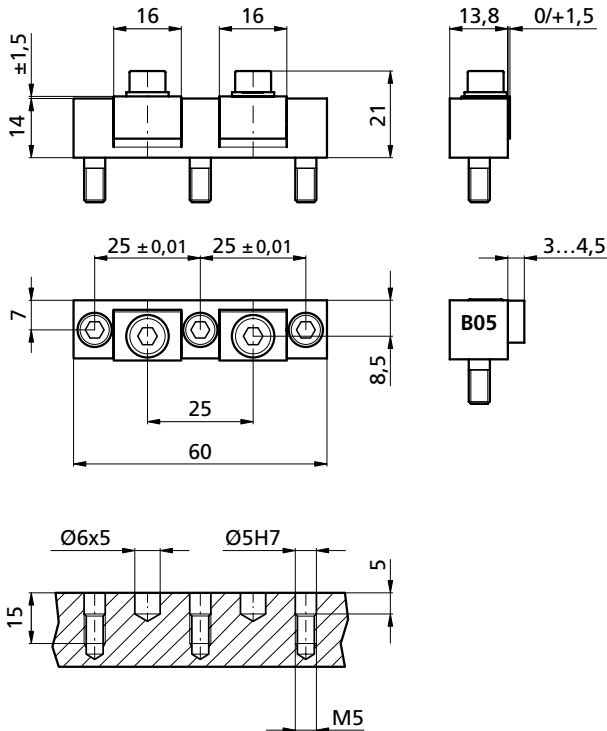
* = weicher Stahl / soft steel

Separat bestellen / Order separately



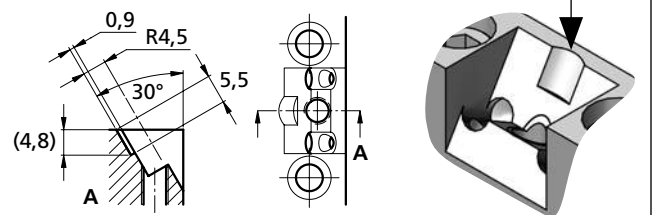
MS2F60N14-01

microCLAMP



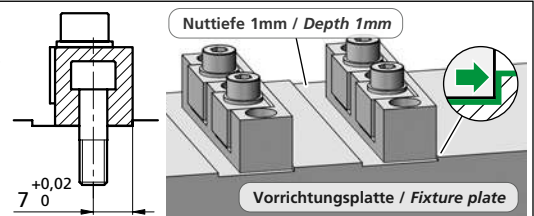
Beim Einsatz der Backe B05(R) Jaw B05(R) in use

Nachbearbeitung am Modul, falls If a stroke of 1,1mm to 1,5mm der gesamte Backenhub (1,1mm bis is required the module must be 1,5mm) benötigt wird. machined according to this sketch.



Achtung: Bei Spannkraften über 400 daN (0,4t) muss das Spannmodul in eine Nut eingelassen werden (Nuttiefe mindestens 1mm)

Remark: Using forces higher than 400 daN, clamps must be mounted into a slot (depth minimum 1mm)



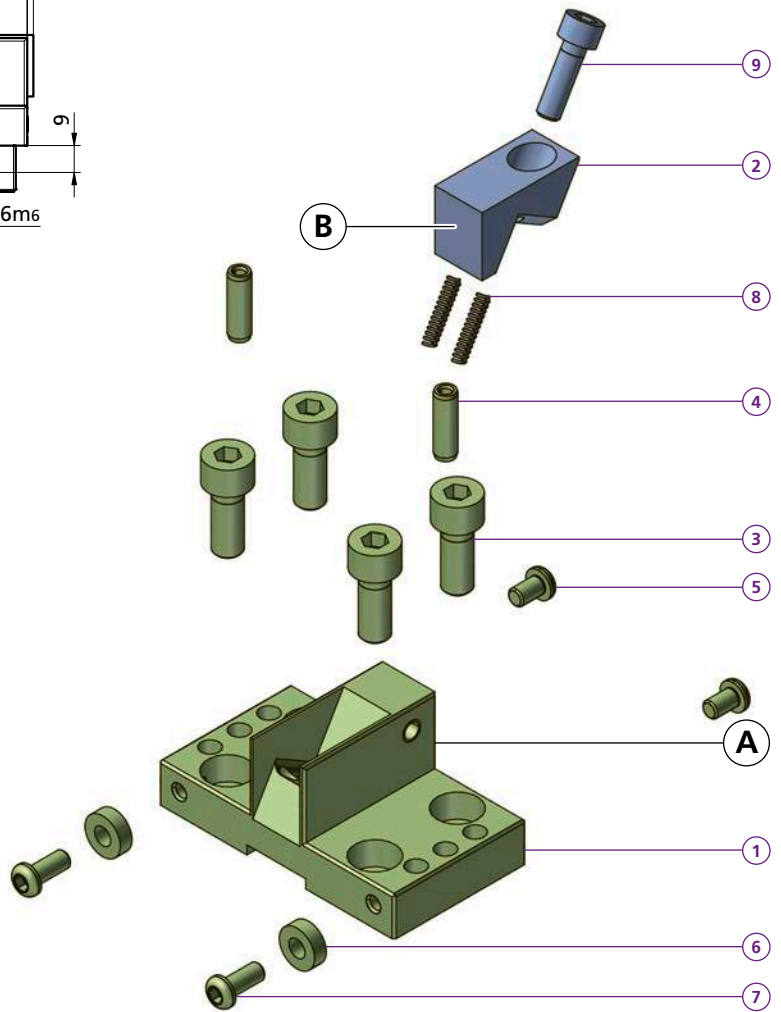
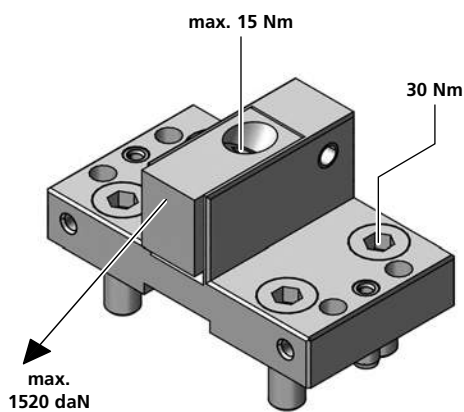
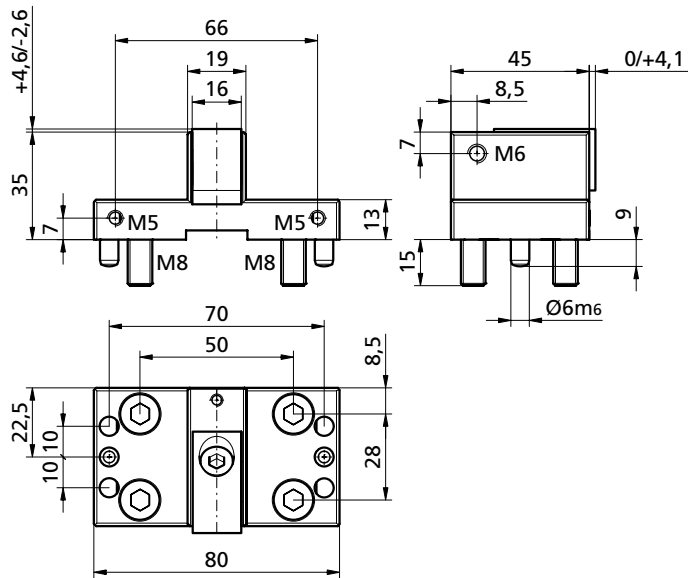
MS2F60N14-01		Bestellbeispiel / Ordering example: 1x MS2F60N14-01 & 2x B02					
		B01	B02	B03	B04	B05	B05R
1	1x TF140721						
2	2x						
3	3x MS50						
4	2x M5X14ISO4762						
5	2x 5x10x1DIN125A						
6	4x FED02813						
kg	~0,09	kg	~0,01	~0,01	~0,014	~0,012	~0,014

	C	H	L	D
B01, B02, B03, B04				
B05				
B05R				



VS1R/F19N35-20

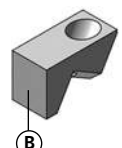
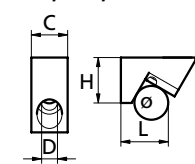
microCLAMP



	VS1F19N35-20
1	1x TF150029
	VS1R19N35-20
1	1x TF140723
2	1x
3	4x M8X20ISO4762
4	2x CCBO0802
5	2x M5X8ISO7380
6	2x CCD004
7	2x M5X12ISO7380
8	2x FED0418
9	1x M6X20ISO4762
kg	~0,505

	Bestellbeispiel / Ordering example: 1x VS1R19N35-20 & 1x B21		
	B20	B21	B22
C	16	16	16
H	20	20	20
L	19	19	19
D	6,5	6,5	6,5
o	12	12	12
i	HV700 x0,2mm	HV700 x0,2mm	*
kg	~0,011	~0,011	~0,011

B20, B21, B22

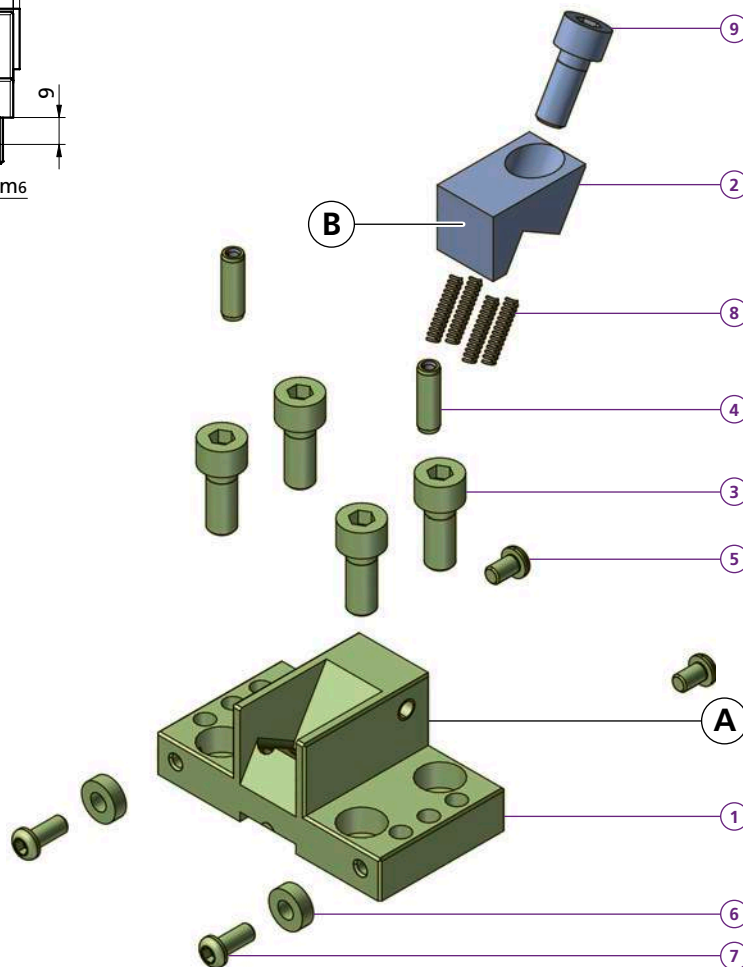
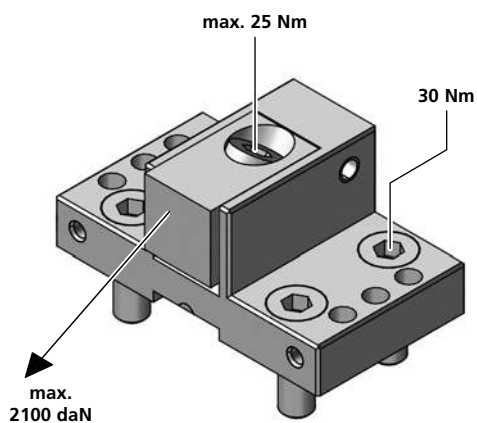
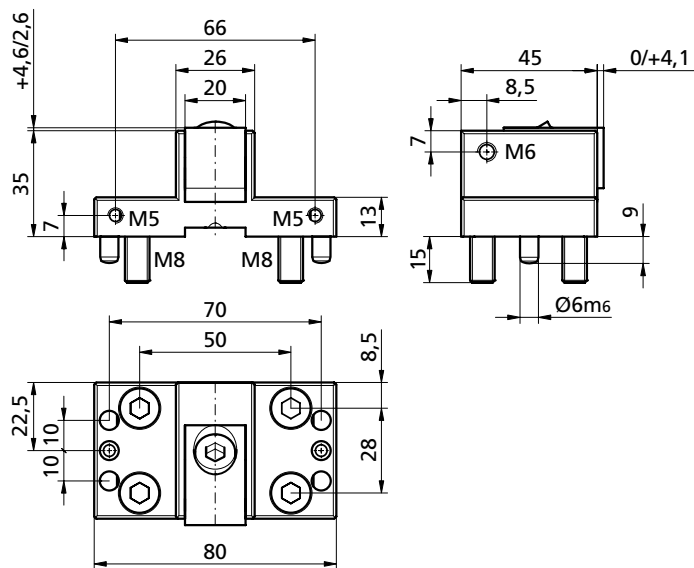


Separat bestellen / Order separately



VS1R26N35-26

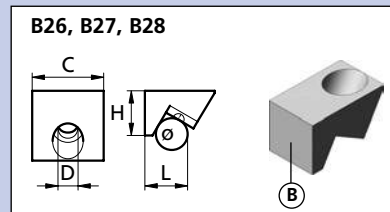
microCLAMP



VS1R26N35-26	
1	1x TF140725
2	1x
3	4x M8X20ISO4762
4	2x CCBO0802
5	2x M5X8ISO7380
6	2x CCD004
7	2x M5X12ISO7380
8	4x FED0418
9	1x M8X20ISO4762
kg	~0,55

* = weicher Stahl / soft steel

Bestellbeispiel / Ordering example: 1x VS1R26N35-26 & 1x B27			
	B26	B27	B28
C	20	20	20
H	20	20	20
L	19	19	19
D	9	9	9
ø	12	12	12
i	HV700	HV700	*
	x0,2mm	x0,2mm	
kg	~0,064	~0,064	~0,064

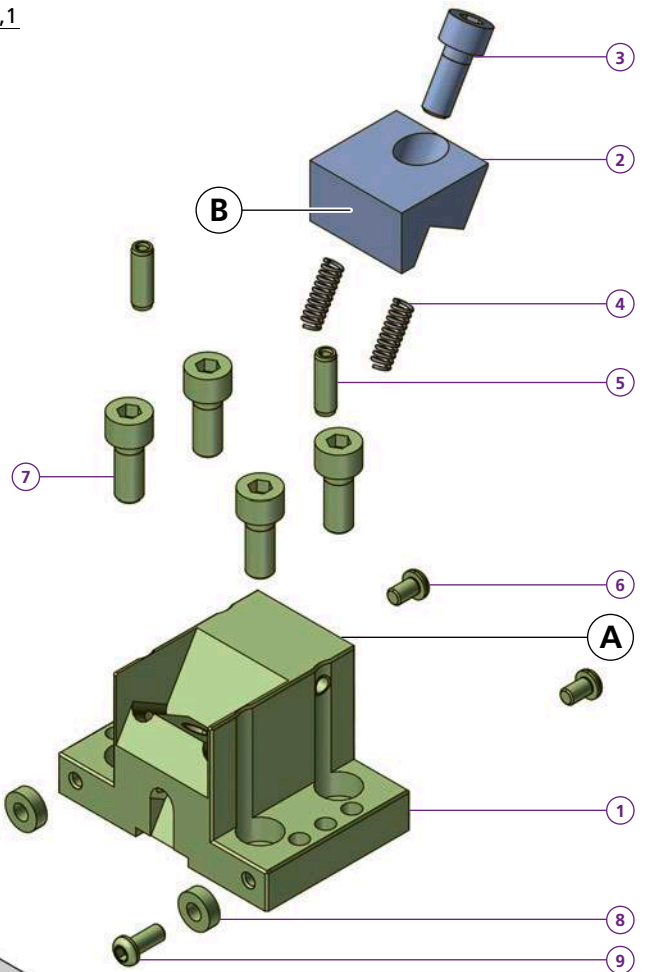
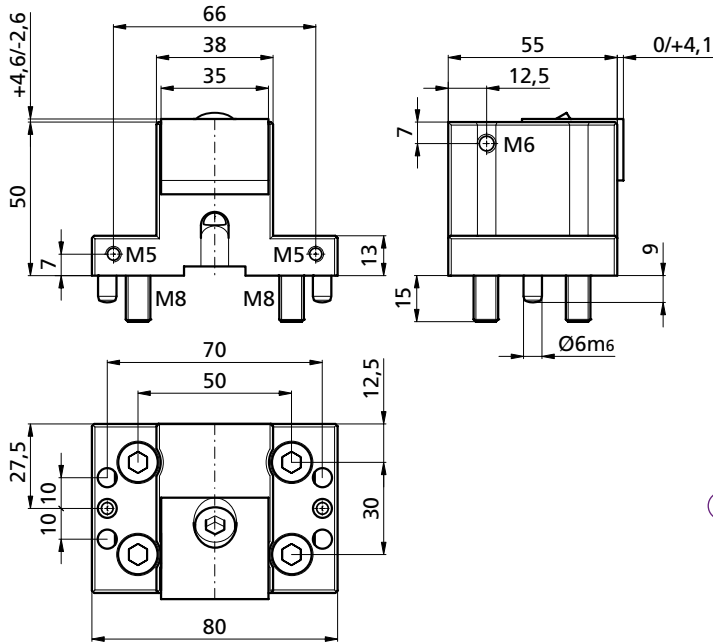


Separat bestellen / Order separately

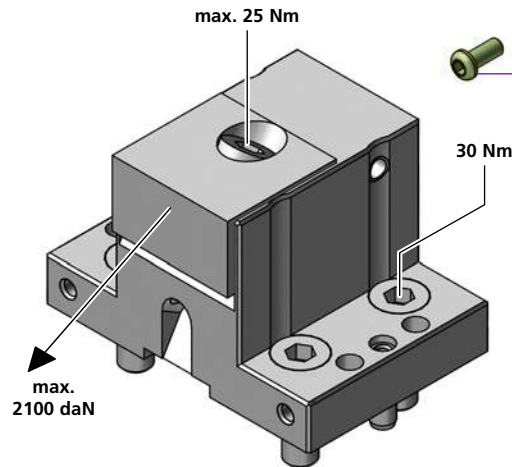


VS1R38N50-60

microCLAMP



VS1R38N50-60	
1	1x TF140726
2	1x
3	1x M8X20ISO4762
4	2x FED0618
5	2x CCBO0802
6	2x M5X8ISO7380
7	4x M8X20ISO4762
8	2x CCD004
9	2x M5X12ISO7380
kg	~1,01



Bestellbeispiel / Ordering example: 1x VS1R38N50-60 & 1x B61

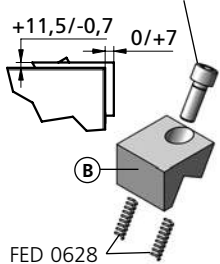
B

Bestellbeispiel / Ordering example: 1x **VS1R38N50-60** & 1x **B61**

													
B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B69	B77	B79F	B79R	
C	35	35	35	35	35	35	35	35	35	35	35	35	
H	20	20	20	20	20	20	20	20	25	20	20	20	
L	26	19	19	19	19	19	19	24	26	22	25	25	
D	9	9	9	9	9	9	9	9	9	9	9	9	
o	12	12	12	12	12	12	12	12	12	12	12	12	
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	*	56HRC	HV700 x0,2mm	HV700 x0,2mm
kg	~0,07	~0,12	~0,12	~0,12	~0,12	~0,12	~0,12	~0,14	~0,15	~0,15	~0,12	~0,18	~0,18

B69

M8X30ISO4762

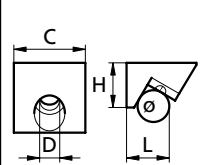


+11,5/-0,7

0/+7

B

FED 0628

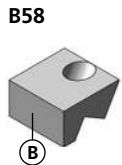


C

H

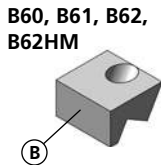
D

L



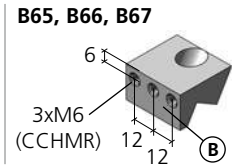
B58

B



B60, B61, B62, B62HM

B



B65, B66, B67

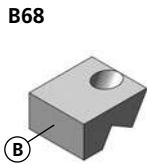
6

12

12

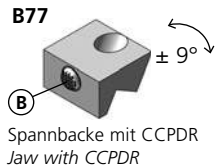
3xM6 (CCHMR)

B



B68

B

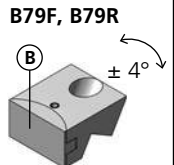


B77

B

± 9°

Spannbacke mit CCPDR
Jaw with CCPDR



B79F, B79R

B

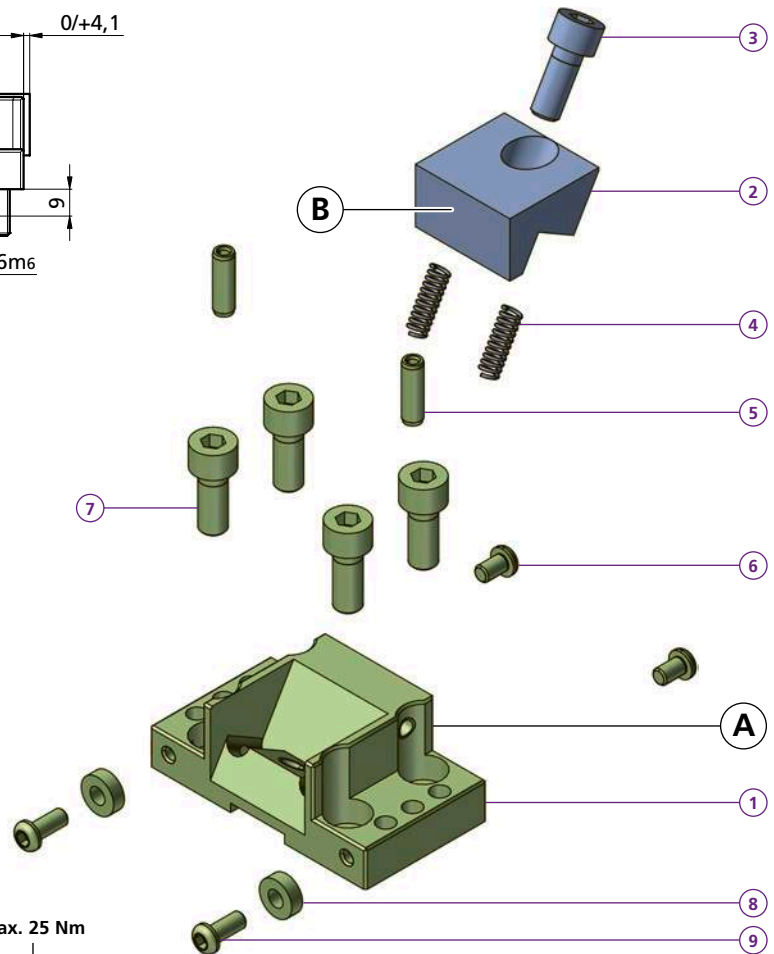
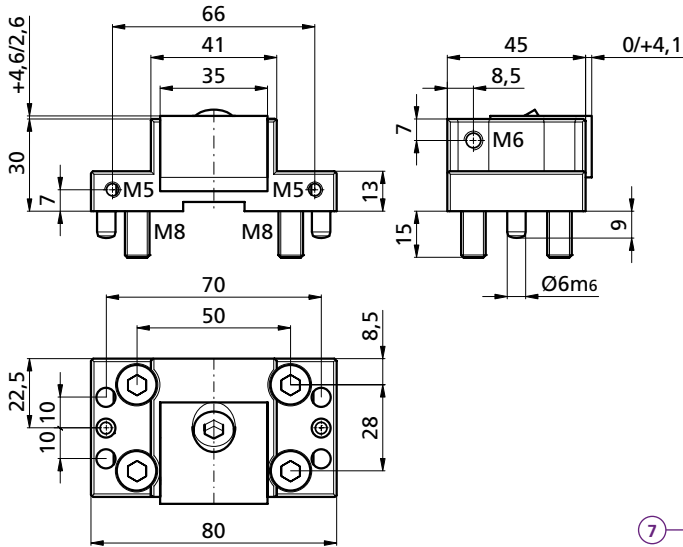
± 4°

Separat bestellen / Order separately

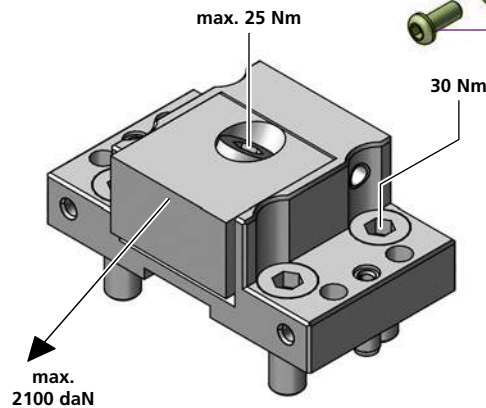


VS1R/F41N30-60

microCLAMP

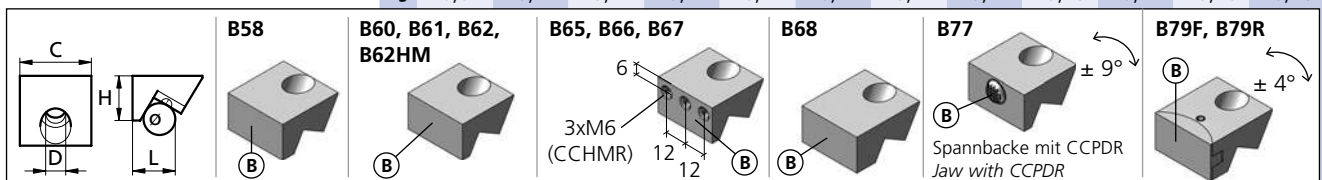


VS1F41N30-60	
1	1x TF140729
VS1R41N30-60	
1	1x TF140730
2	1x
3	1x M8X20ISO4762
4	2x FED0618
5	2x CCBO0802
6	2x M5X8ISO7380
7	4x M8X20ISO4762
8	2x CCD004
9	2x M5X12ISO7380
kg	~0,58



Bestellbeispiel / Ordering example: 1x VS1R41N30-60 & 1x B61

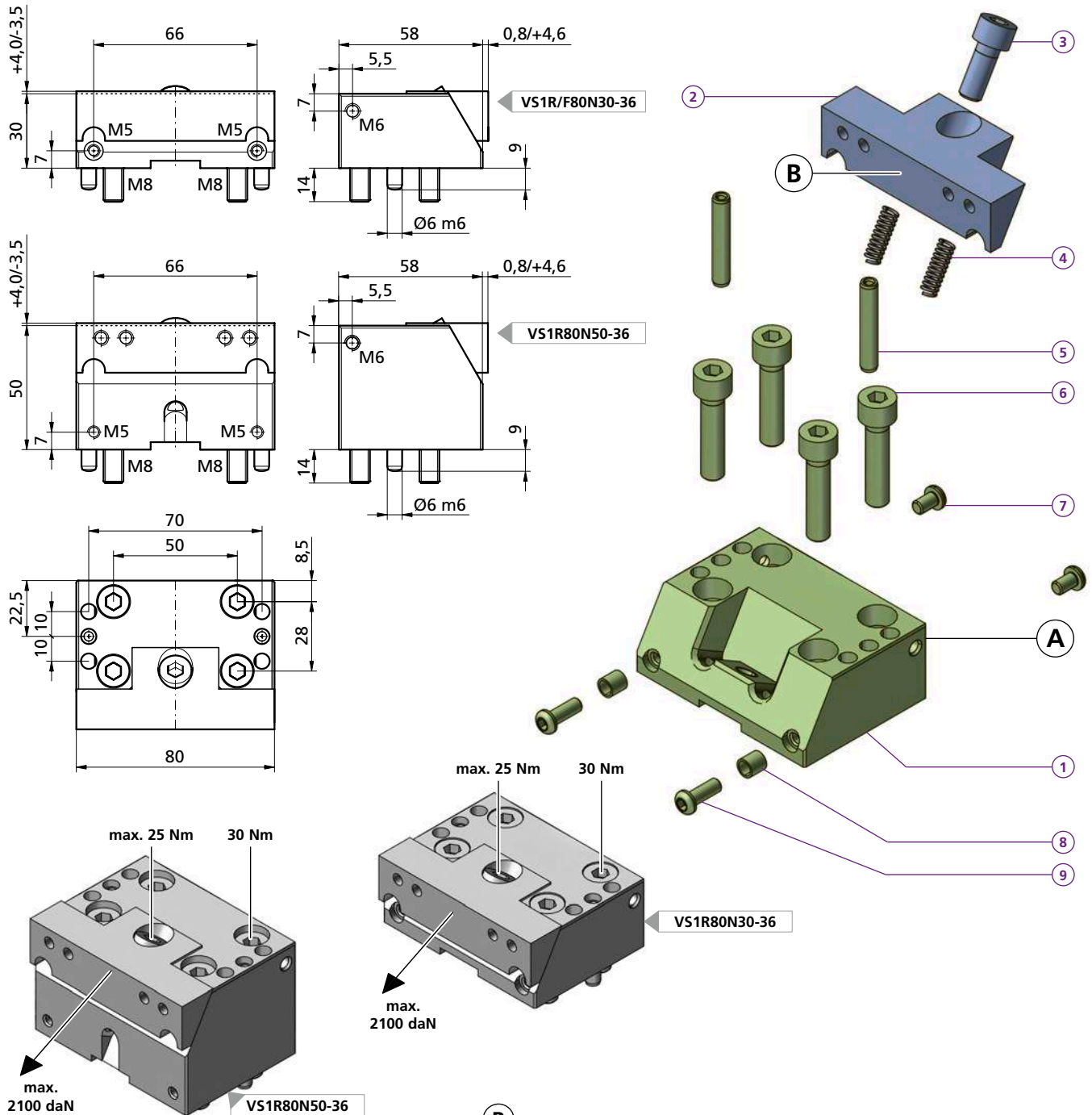
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	20	20	20
L	26	19	19	19	19	19	19	24	26	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	56HRC	HV700 x0,2mm	HV700 x0,2mm
kg	~0,07	~0,12	~0,12	~0,12	~0,12	~0,12	~0,12	~0,14	~0,15	~0,12	~0,18	~0,18



* = weicher Stahl / soft steel

HM = Hartmetallbeschichtet / Carbide coated

ALU = ENAW-7022



VS1F80N30-36	
1	1x TF140733
VS1R80N30-36	
1	1x TF140734
2	1x
3	1x M8X20ISO4762
4	4x FED0618
5	2x CCBO0801
6	4x M8X35ISO4762
7	2x M5X8ISO4762
8	2x CCD007
9	2x M5X16ISO7380
kg	~1,2

VS1R80N50-36	
1	1x TF140742
2	1x
5	2x CCBO0803
6	4x M8X55ISO4762
8	2x CCD007
9	2x M5X12ISO7380
kg	~1,9

Bestellbeispiel / Ordering example: 1x VS1R80N30-36 & 1x B37

	B36	B37	B38
C	80	80	80
H	20	20	20
L	19	19	19
D	9	9	9
ø	12	12	12
i	HV700	HV700	*
	x0,2mm	x0,2mm	
kg	~0,18	~0,18	~0,18

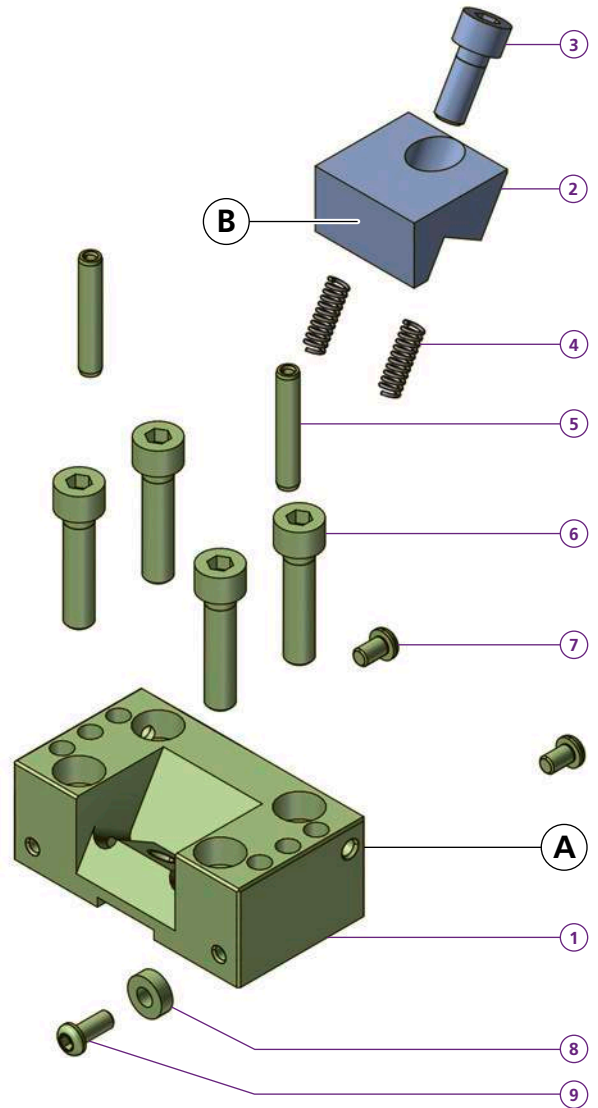
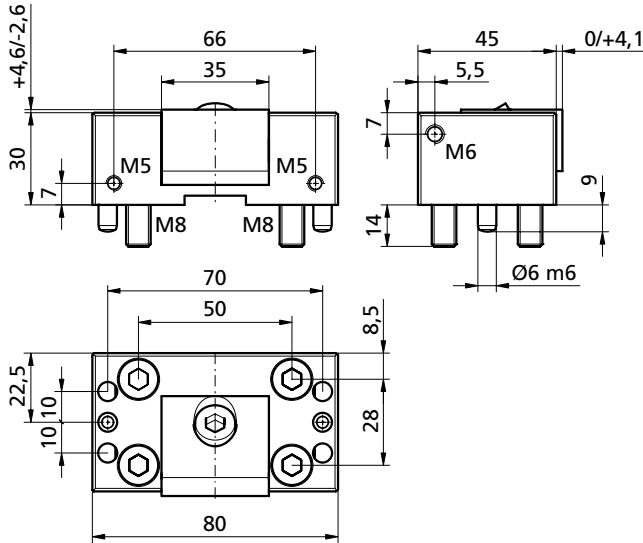
B36, B37, B38

4 x M6

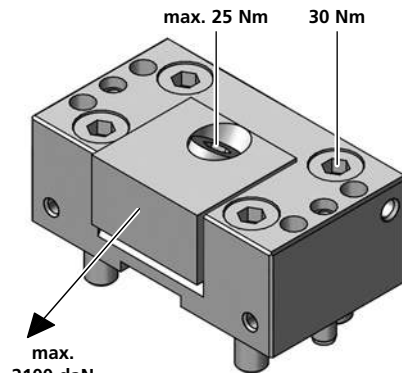


VS1R/F80N30-60

microCLAMP



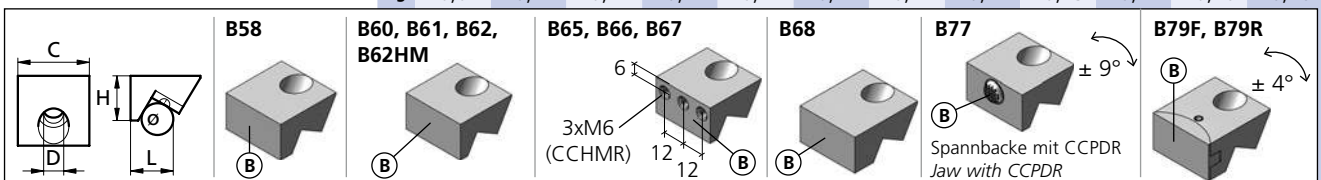
VS1F80N30-60	
1	1x TF140735
VS1R80N30-60	
1	1x TF140736
2	1x
3	1x M8X20ISO4762
4	2x FED0618
5	2x CCBO0801
6	4x M8X35ISO4762
7	2x M5X8ISO7380
8	2x CCD004
9	2x M5X12ISO7380
kg	~0,74



max. 2100 daN

Bestellbeispiel / Ordering example: 1x VS1F80N30-60 & 1x B61

	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	20	20	20
L	26	19	19	19	19	19	19	24	26	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	56HRC	HV700 x0,2mm	HV700 x0,2mm
kg	~0,07	~0,12	~0,12	~0,12	~0,12	~0,12	~0,12	~0,14	~0,15	~0,12	~0,18	~0,18



* = weicher Stahl / soft steel

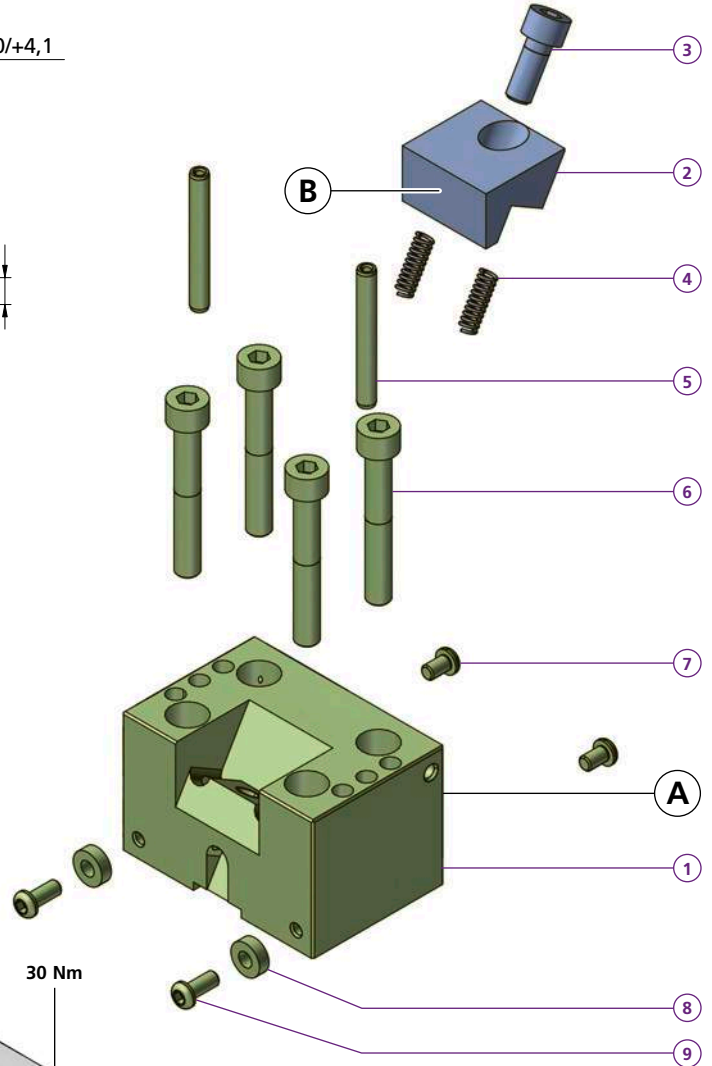
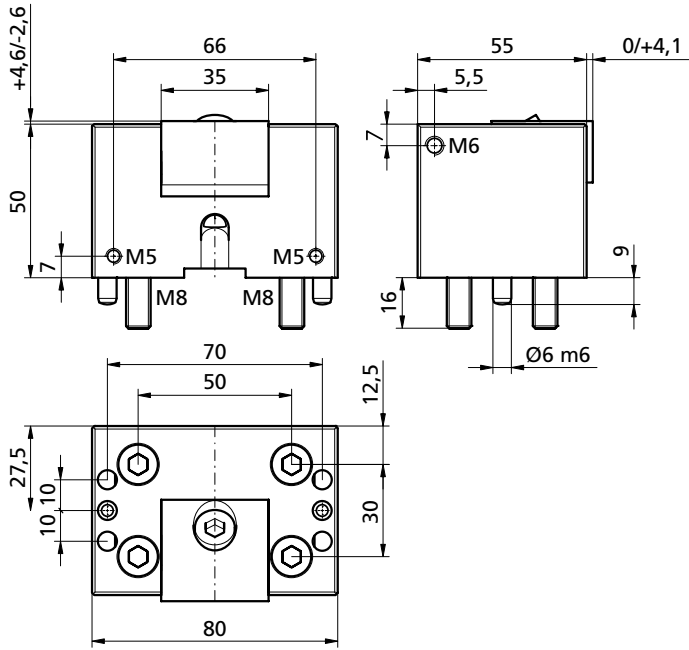
HM = Hartmetallbeschichtet / Carbide coated

ALU = ENAW-7022

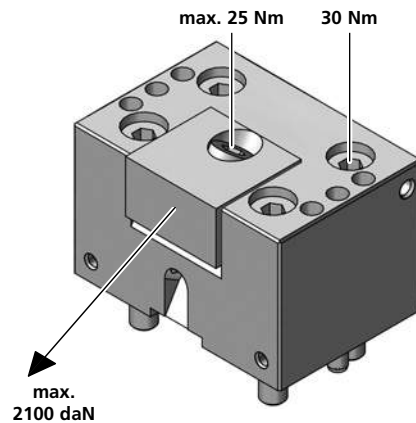


VS1R80N50-60

microCLAMP

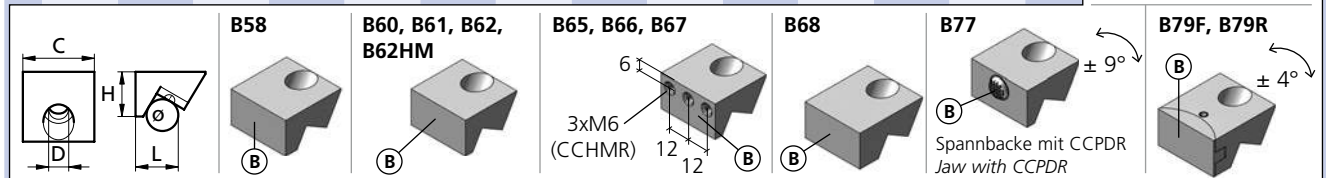
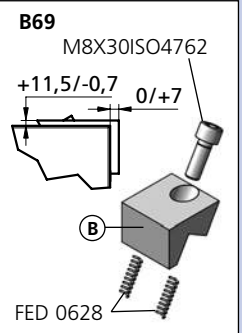


VS1R80N50-60	
1	1x TF140737
2	1x
3	1x M8X20ISO4762
4	2x FED0618
5	2x CCBO0803
6	4x M8X55ISO4762
7	2x M5X8ISO7380
8	2x CCD004
9	2x M5X12ISO7380
kg	~1,6



Bestellbeispiel / Ordering example: 1xVS1R80N50-60 & 1x B61

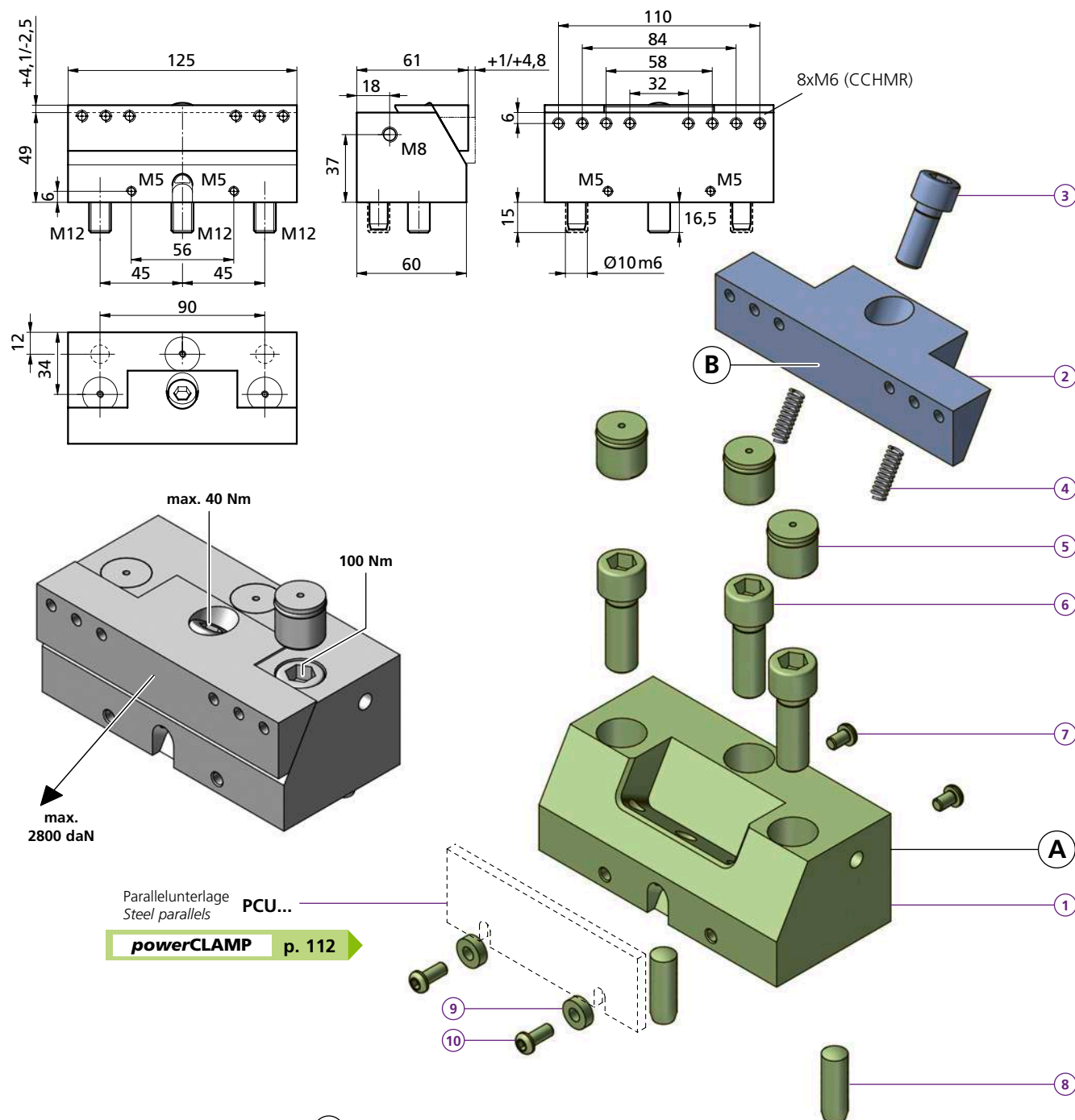
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B69	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	25	20	20	20
L	26	19	19	19	19	19	19	24	26	22	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9	9
o	12	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	*	56HRC	HV700 x0,2mm	HV700 x0,2mm
kg	~0,07	~0,12	~0,12	~0,12	~0,12	~0,12	~0,12	~0,14	~0,15	~0,15	~0,12	~0,18	~0,18





VS1R/F125N49-95

microCLAMP



Parallelunterlage
Steel parallels

powerCLAMP p. 112

Bestellbeispiel / Ordering example: 1x VS1R125N49-95 & 1x B96

	B95	B96	B97	B98	B99
VS1F125N49-95					
1x TF140738					
VS1R125N49-95					
1x TF140739					
1x					
1x M10X25ISO4762					
2x FED0618					
3x PCPF16L18Alu					
3x M12X35ISO4762					
3x M5X8ISO7380					
2x 10m6x30 DIN6325					
2x CCD004					
2x M5X12ISO7380					
kg	~2,6				

	B95	B96	B97	B98	B99
C	125	125	125	125	125
H	25	25	25	25	25
L	23	23	23	30	23
D	11	11	11	11	11
ø	15	15	15	15	15
i	HV700	HV700	*	*	HV700
	x0,2mm	x0,2mm			x0,2mm
kg	~0,45	~0,45	~0,45	~0,63	~0,45

	B95, B96, B97, B99	B98
6xM6 (CCHMR)		
110		
84		
58		
6		

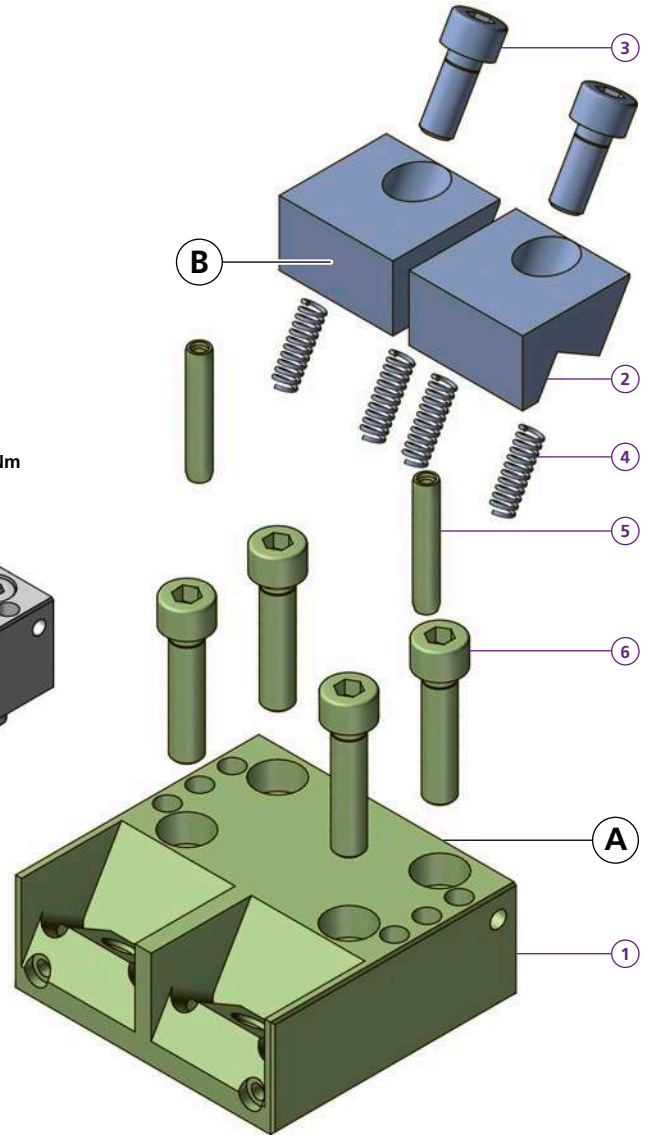
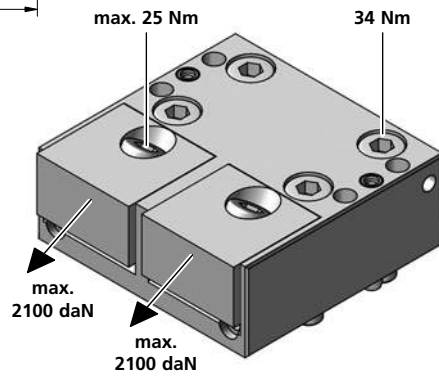
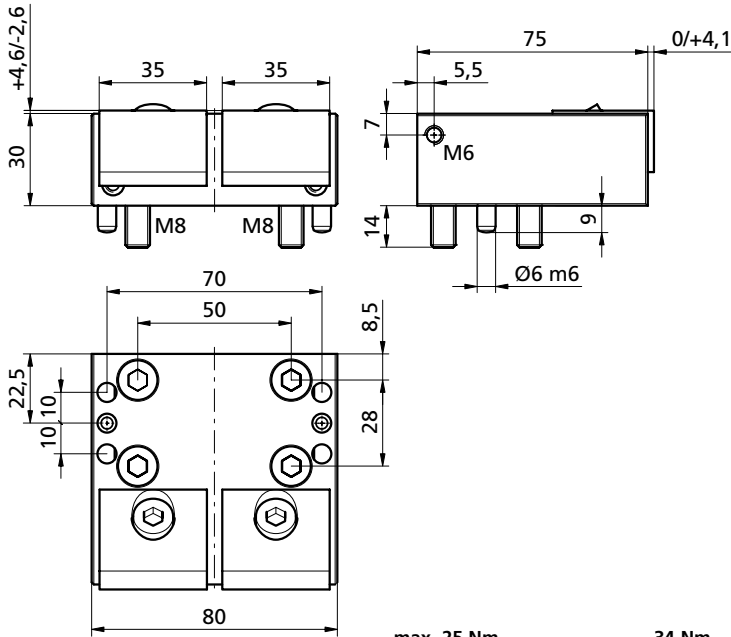
* = weicher Stahl / soft steel

Separat bestellen / Order separately



VS2R80N30-60

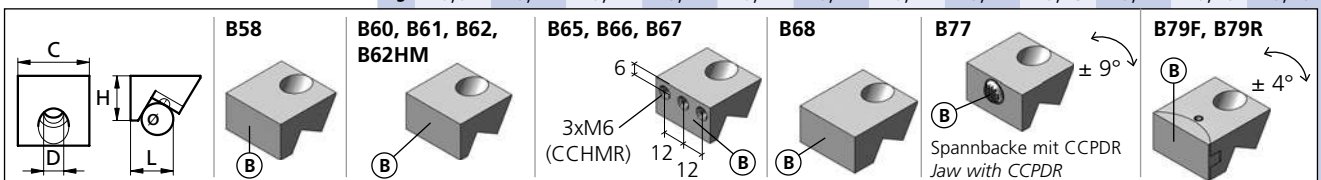
microCLAMP



VS2R80N30-60	
1	1x TF140740
2	2x
3	2x M8X20ISO4762
4	4x FED0618
5	2x CCBO0801
6	4x M8X35ISO4762
kg	~1,3

Bestellbeispiel / Ordering example: 1x VS2R80N30-60 & 2x B61

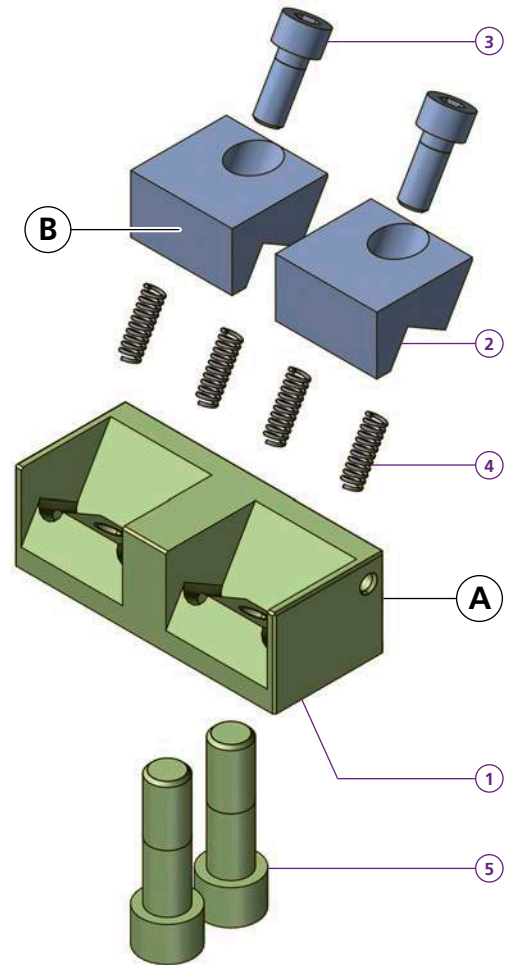
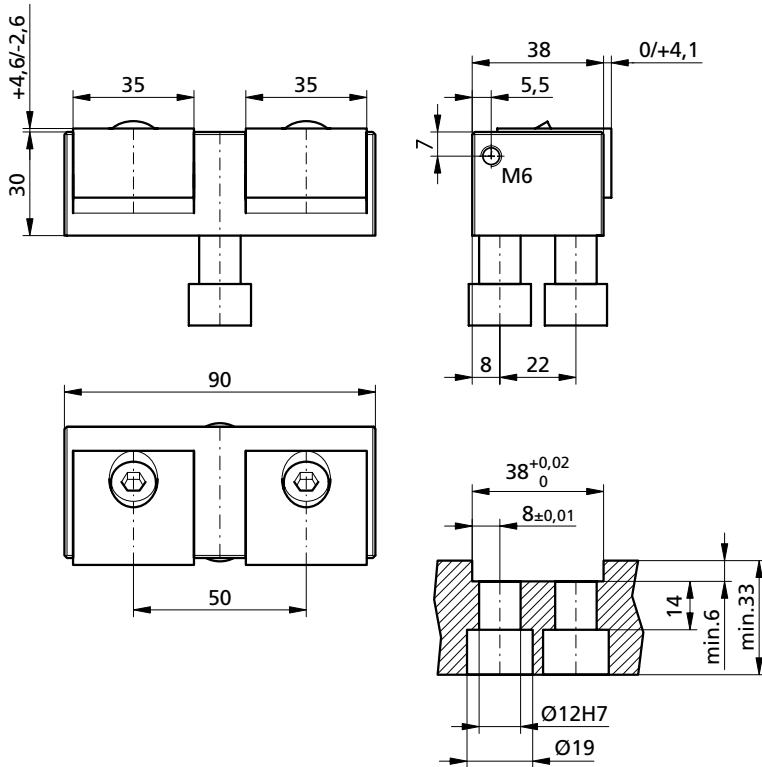
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	20	20	20
L	26	19	19	19	19	19	19	24	26	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	56HRC	HV700 x0,2mm	HV700 x0,2mm
kg	~0,07	~0,12	~0,12	~0,12	~0,12	~0,12	~0,12	~0,14	~0,15	~0,12	~0,18	~0,18



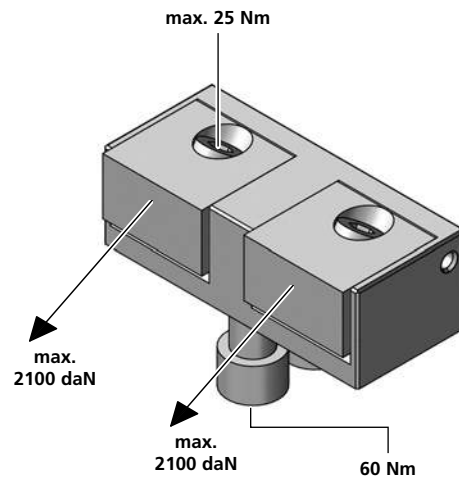


VS2F90N30-60

microCLAMP

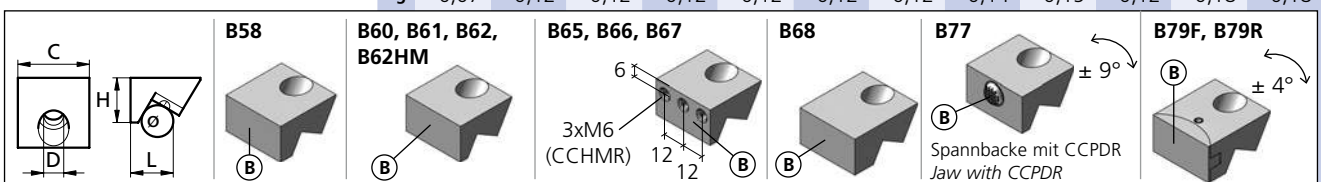


VS2F90N30-60	
1x	TF140741
2x	
2x	M8X20ISO4762
4x	FED0618
2x	TWPAS1232
kg	~0,85



Bestellbeispiel / Ordering example: 1x VS2F90N30-60 & 2x B61

	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	20	20	20
L	26	19	19	19	19	19	19	24	26	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9
o	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56HRC	56HRC	*	HM	HV700	HV700	HV700	*	56HRC	HV700	HV700
						x0,2mm	x0,2mm	x0,2mm			x0,2mm	x0,2mm
kg	~0,07	~0,12	~0,12	~0,12	~0,12	~0,12	~0,12	~0,14	~0,15	~0,12	~0,18	~0,18



* = weicher Stahl / soft steel

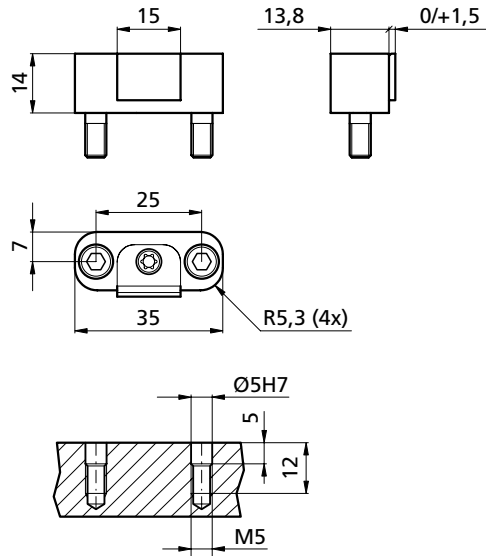
HM = Hartmetallbeschichtet / Carbide coated

ALU = ENAW-7022

MS1R/F35L14-152

***MS1R/F35L14-150* (Alte Version / Old Version)**

microCLAMP

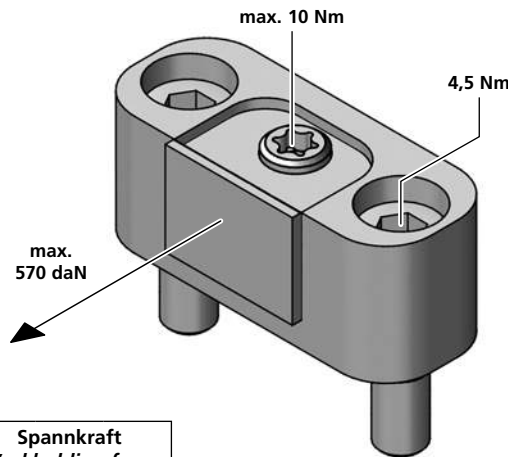
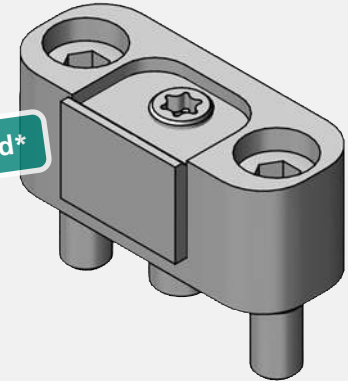


MS1R/F35L14-150

Semi Standard



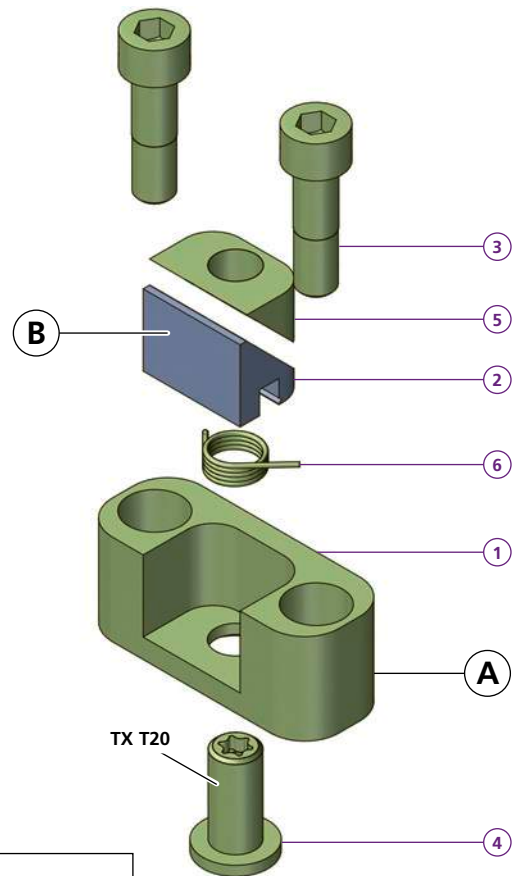
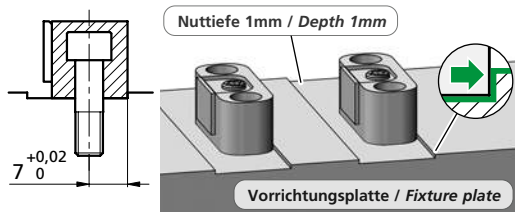
**Alte Version
Old Version**



Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
7	5,18	= 390	860	0,39
8	5,92	= 450	990	0,45
9	6,66	= 510	1120	0,51
10	7,4	= 570	1250	0,57

Achtung: Bei Spannkraften über 400 daN (0,4t) muss das Spannmodul in eine Nut eingelassen werden (Nuttiefe mindestens 1mm)

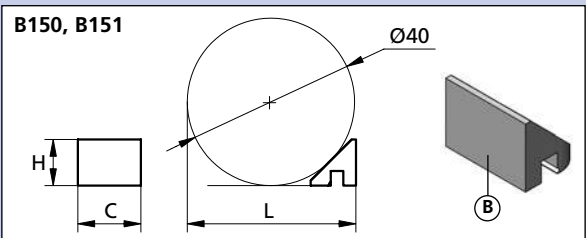
Remark: Using forces higher than 400 daN, clamps must be mounted into a slot (depth minimum 1mm)



MS1F35L14-152	
1	1x TK181266
MS1R35L14-152	
1	1x TF190596
2	1x
3	2x MS50
4	1x GEWST6L14
5	1x MSK15W45
6	1x SFED6W90
kg	~0,03

Bestellbeispiel / Ordering example: 1x MS1F35L14-152 & 1x B151	
B150	B151
C 15	15
H 11	11
L 40,3	40,3
ø 40	40
i HV700	HV700
x0,2mm	x0,2mm
kg ~0,004	~0,004

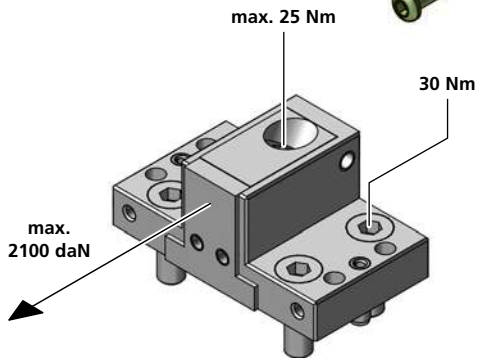
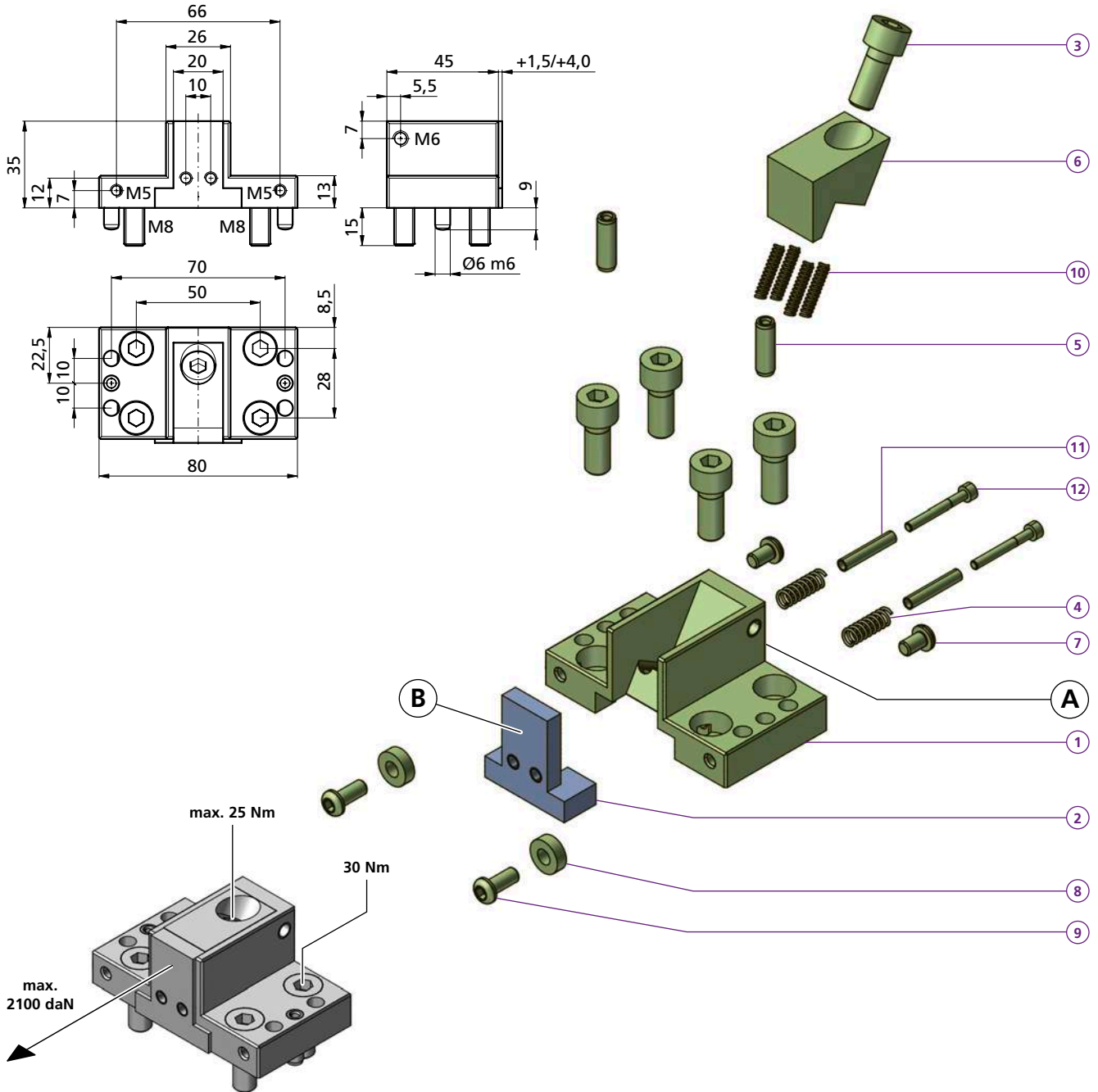
B150, B151



Separat bestellen / Order separately

VS1R26L35-31

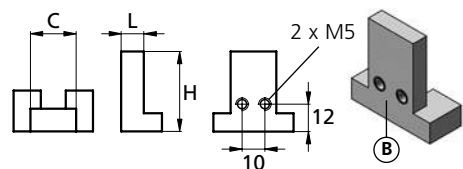
microCLAMP



VS1R26L35-31	
1	1x TF140724
2	1x
3	5x M8X20ISO4762
4	2x FED0618
5	2x CCBO0802
6	1x B30
7	2x M5X8ISO7380
8	2x CCD004
9	2x M5X12ISO7380
10	4x FED0418
11	2x CCD422
12	2x M3X25ISO4762
kg	~0,55

Bestellbeispiel / Ordering example: 1x VS1R26L35-31 & 1x B32			
	B31	B32	B33
C	20	20	20
H	35	35	35
L	6	6	6
D	-	-	-
e	-	-	-
i	HV700 x0,2mm	HV700 x0,2mm	*
kg	~0,046	~0,046	~0,046

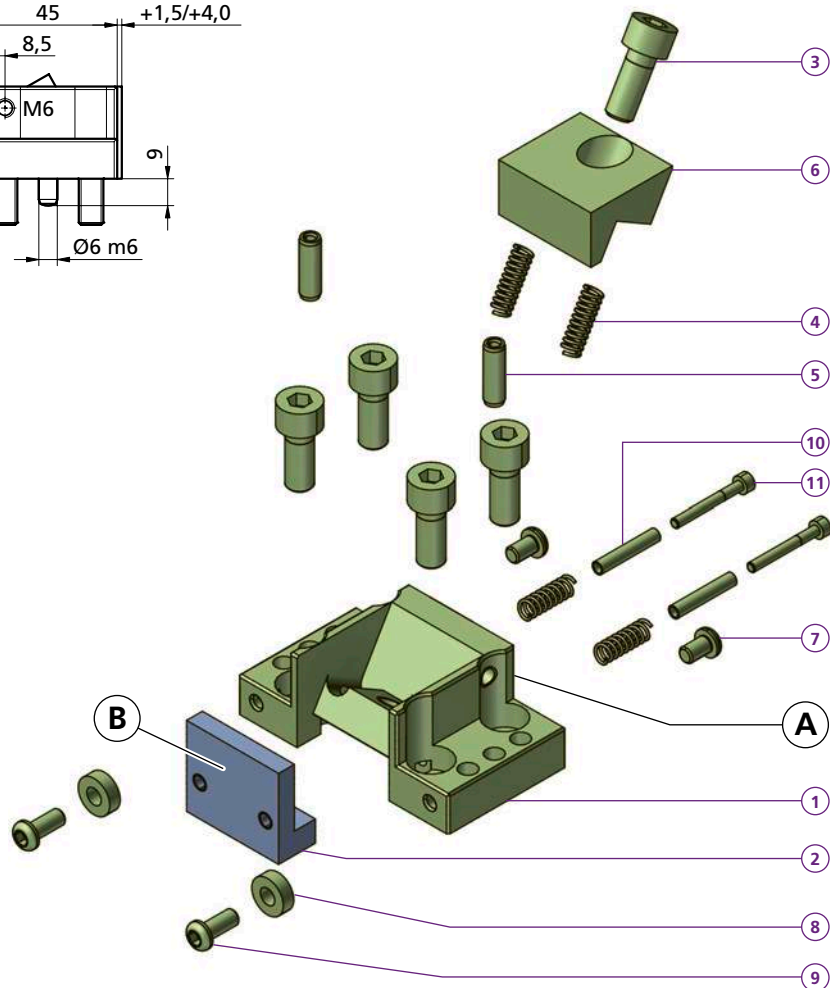
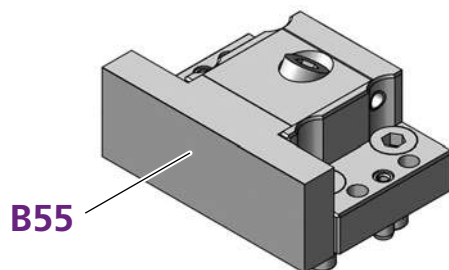
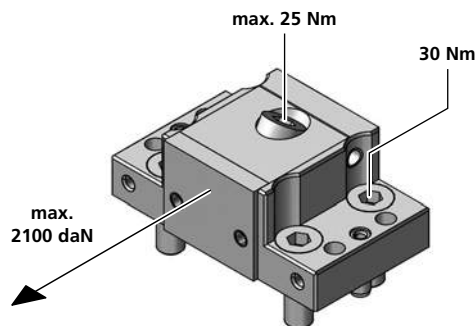
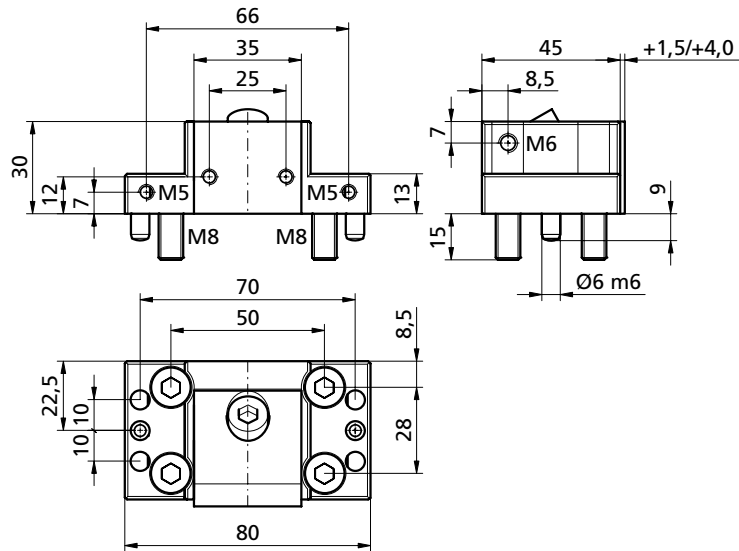
B31, B32, B33



* = weicher Stahl / soft steel

Separat bestellen / Order separately

VS1R/F41L30-51



VS1F41L30-51	
1	1x TF140727
VS1R41L30-51	
1	1x TF140728
2	1x
3	5x M8X20ISO4762
4	4x FED0618
5	2x CCBO0802
6	1x B78
7	2x M5X8ISO7380
8	2x CCD004
9	2x M5X12ISO7380
10	2x CCD422
11	2x M3X25ISO4762
kg	~0,545

Bestellbeispiel / Ordering example: 1x VS1R41L30-51 & 1x B52

	B51	B52	B53	B54	B55
C	35	35	35	35	80
H	30	30	30	35	30
L	6	6	10	10	11,5
D	-	-	-	-	-
e	-	-	-	-	-
i	HV700	HV700	*	*	*
	x0,2mm	x0,2mm			
kg	~0,06	~0,06	~0,06	~0,12	~0,27

B51, B52, B53, B54		B55
C	L	H
12	10	12
2 x M5		

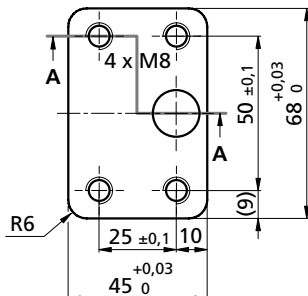
Vorrichtungsbau-Modul für Linearbacken

Alle bestehenden Linearbacken passen auf dieses Modul (**powerCLAMP** Seite 84 - 85). In die Vorrichtungsplatte wird eine Tasche gefräst um das Modul zu positionieren. Gut geeignet sind die Anschlagbacken **MAND** und **MANF** um als Gegenbacke zu dienen.

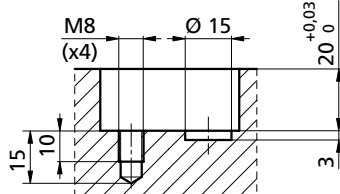
Fixture clamp module for linear jaws

All of our standard linear jaws fit to this clamp module (**powerCLAMP** Page 84 - 85). All to do is milling a pocket to fit and positioning the clamp modules. To use the **MAND** and **MANF** as datum stop will make a perfect match. (Seite / Page 175 - 176)

Fertigungsmasse für die Vorrichtungsplatte Machining data for the fixture plate

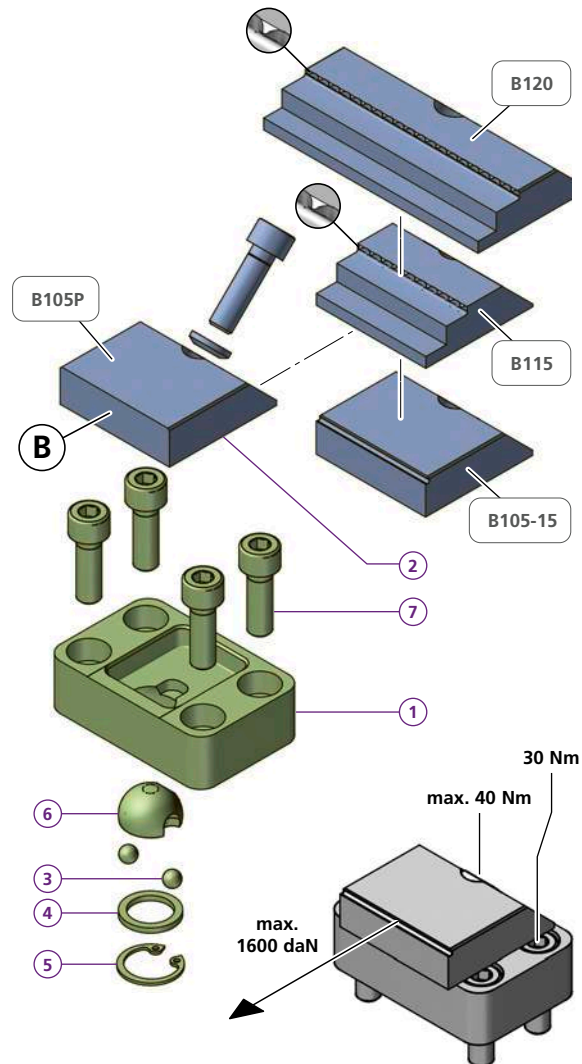
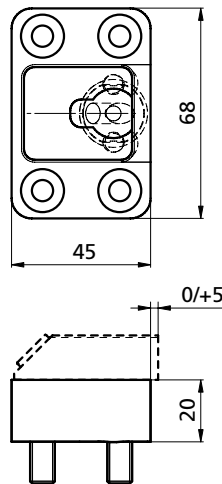


Schnitt / Section A-A

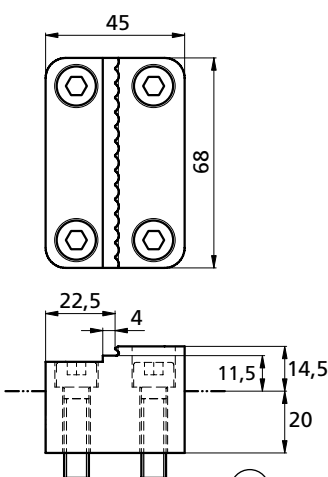


Das Fertigungsmass gilt auch für das Anschlagmodul.
The production dimension is also valid for the end module.

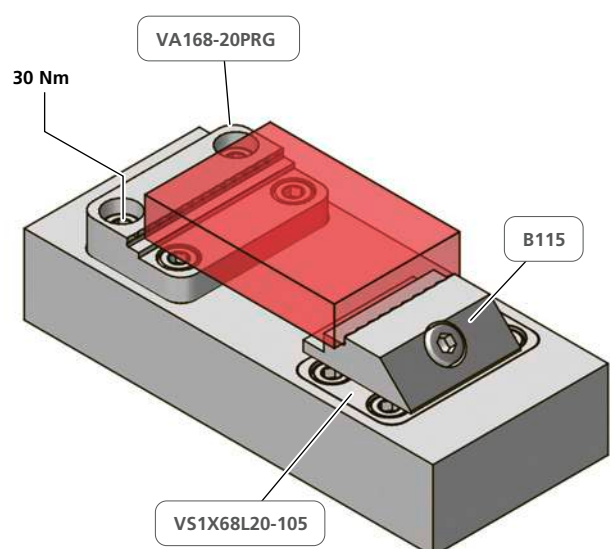
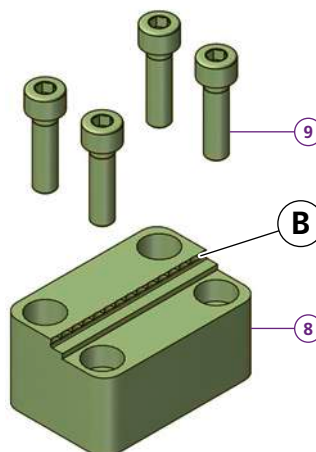
(VA168-20PRG)



VS1X68L20-105	
1	1x TB150170
2	1x powerCLAMP p 84 - 85
3	1x BN869d=6
4	1x TN100747
5	1x TN100779
6	1x PCKMR45M8
7	4x M8X20ISO4762
kg	~0,42

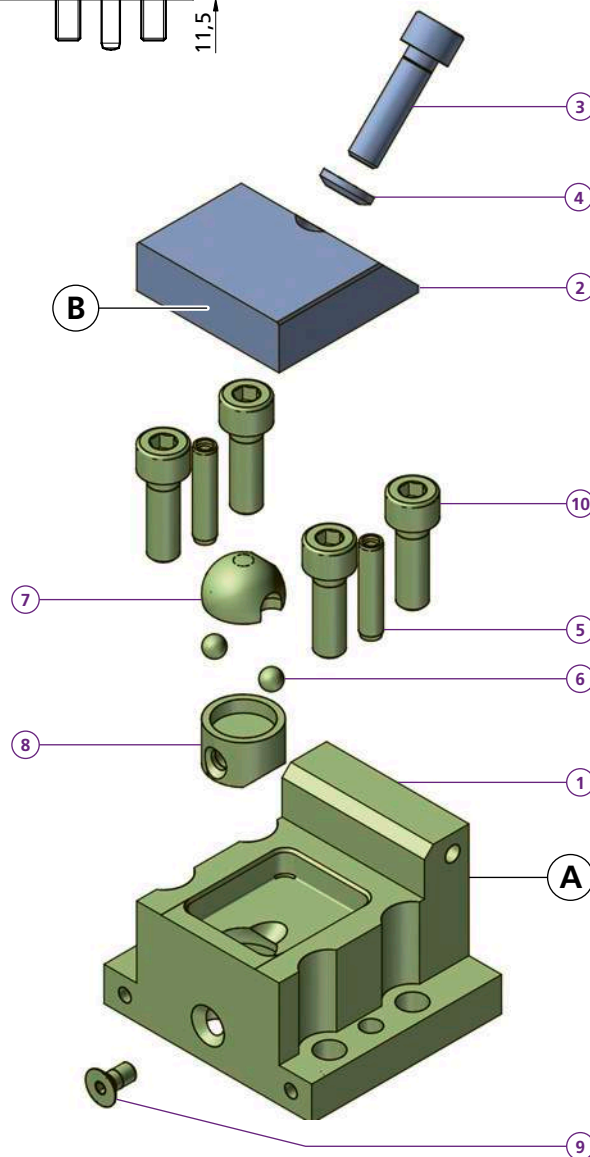
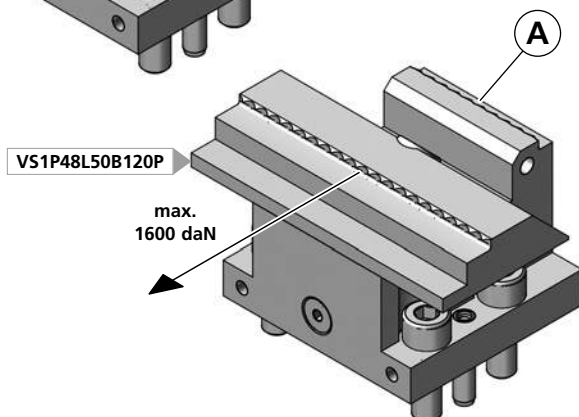
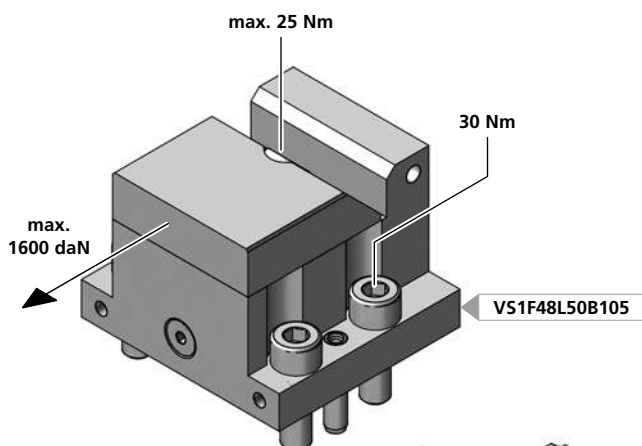
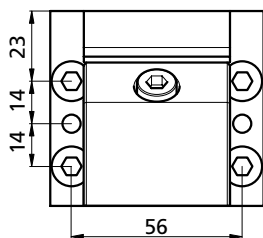
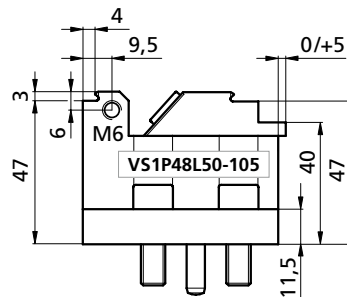
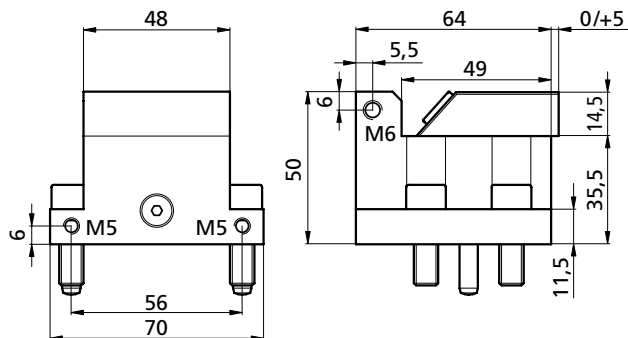


VA168-20PRG	
8	1x TH160280
9	4x M8X30ISO4762
kg	~0,75



VS1F48L50-105

VS1P48L50-105

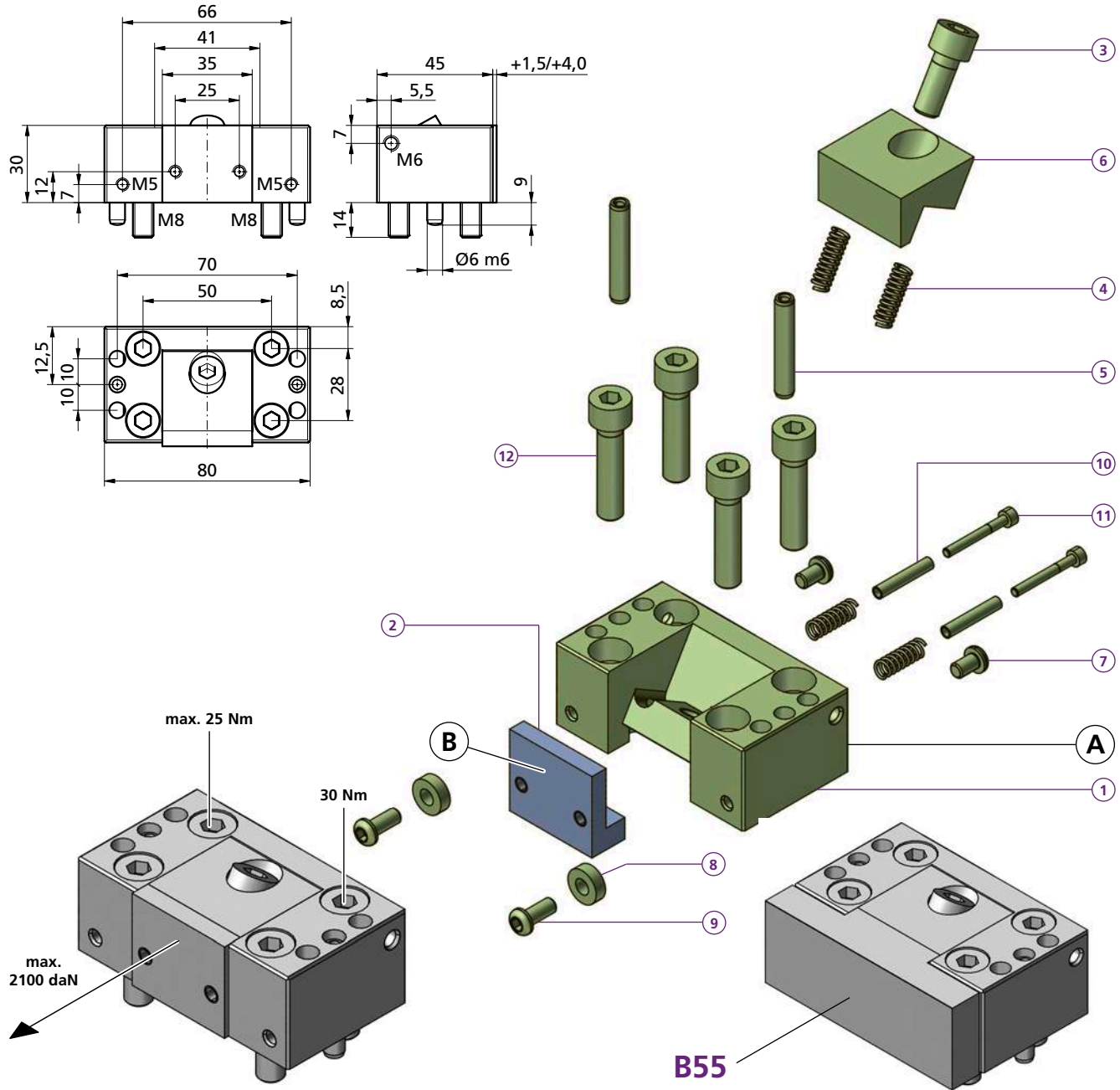


VS1F48L50-105	
1	1x TK120807
VS1P48L50-105	
1	1x TK120761
2	1x
3	1x M8X30ISO4762
4	1x PCUSR14
5	1x 6-m6x26 DIN 79790
6	2x BN869d=6
7	1x PCKMR45M8
8	2x TS120001-04
9	1x M5X10DIN7991
10	4x M8X25ISO4762
kg	~1,21

powerCLAMP p. 84 - 85

Bestellbeispiel / Ordering example: 1x VS1F48L50-105 & 1x B105

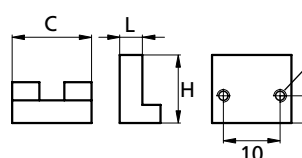
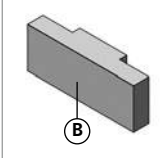
Separat bestellen / Order separately



VS1F80L30-51	
1	1x TF140731
VS1R80L30-51	
1	1x TF140732
2	1x
3	1x M8X20ISO4762
4	4x FED0618
5	2x CCBO0801
6	1x B78
7	2x M5X8ISO7380
8	2x CCD004
9	2x M5X12ISO7380
10	2x CCD422
11	2x M3X25ISO4762
12	4x M8X35ISO4762
kg	~0,74

Bestellbeispiel / Ordering example: 1x VS1R80L30-51 & 1x B52

	B51	B52	B53	B54	B55
C	35	35	35	35	80
H	30	30	30	35	30
L	6	6	10	10	11,5
D	-	-	-	-	-
e	-	-	-	-	-
i	HV700 x0,2mm	HV700 x0,2mm	*	*	*
kg	~0,06	~0,06	~0,06	~0,12	~0,27

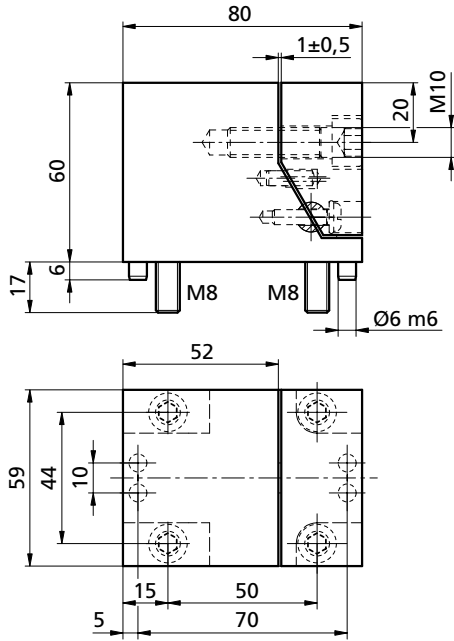
B51, B52, B53, B54		B55
		

* = weicher Stahl / soft steel

Separat bestellen / Order separately

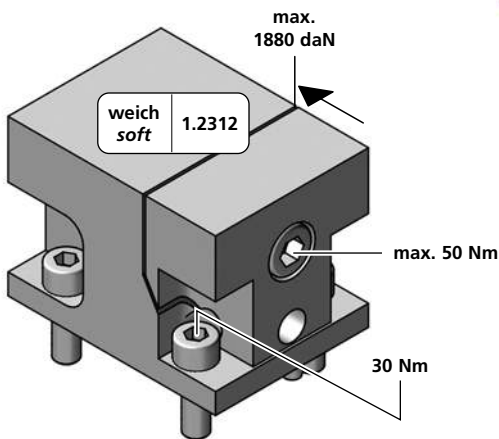
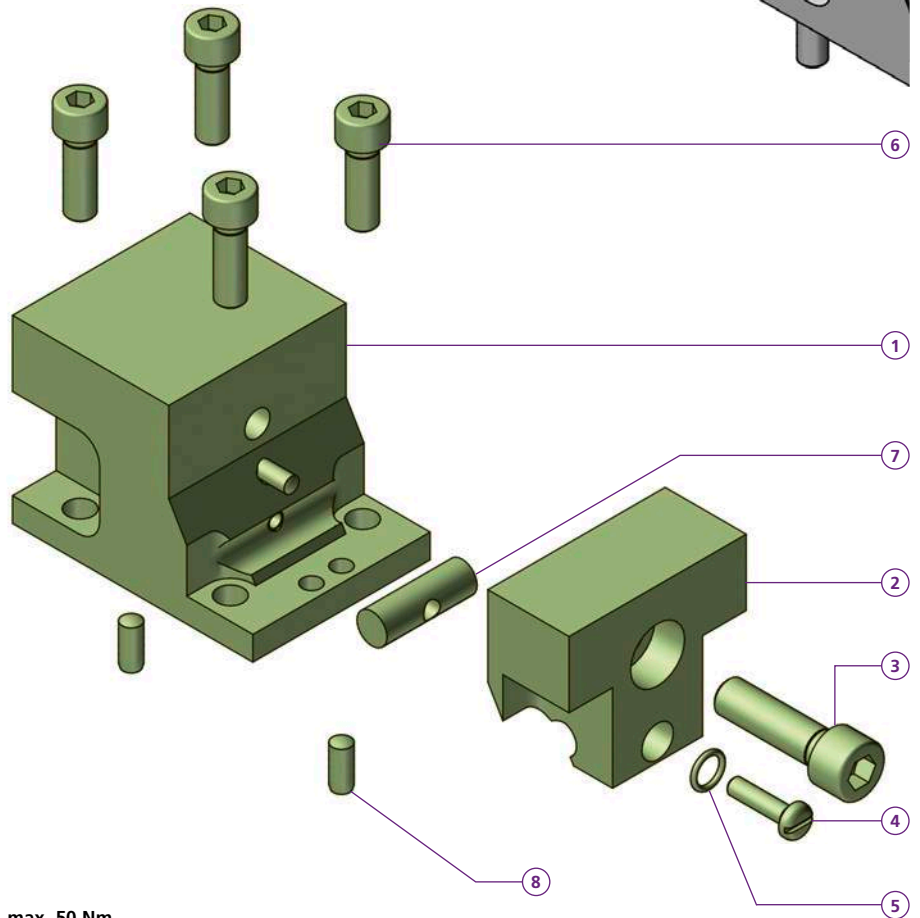
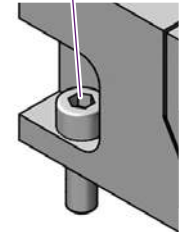
VS1X59L60K

microCLAMP

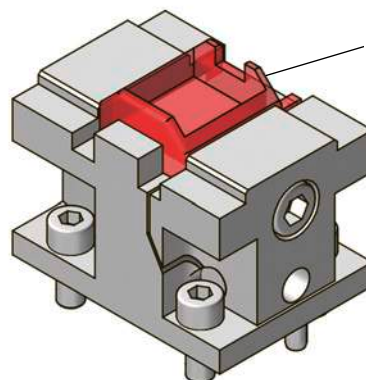


Empfohlener Sechskantschlüssel
Recommended hexagon wrench
PB2212L/6

100°



Spannstelle an Werkstück
angepasst und nitriert.
Clamping face machined to
the shape of the workpiece
and nitrided.



*VS1X59L60K

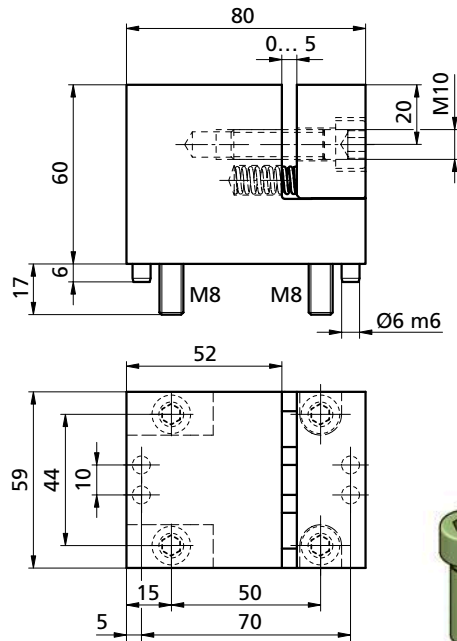
- ① 1x VS1X59L60H5KA
- ② 1x VS1X59L60H5KS
- ③ 1x M10X35ISO4762
- ④ 1x M5X20DIN85A
- ⑤ 1x ORØ8x1,5
- ⑥ 4x **M8X25ISO4762**
- ⑦ 1x VS1X59L60H5KG
- ⑧ 2x 6m6x14 DIN 6325

kg ~1,89

* = Stahl / steel 1.2312

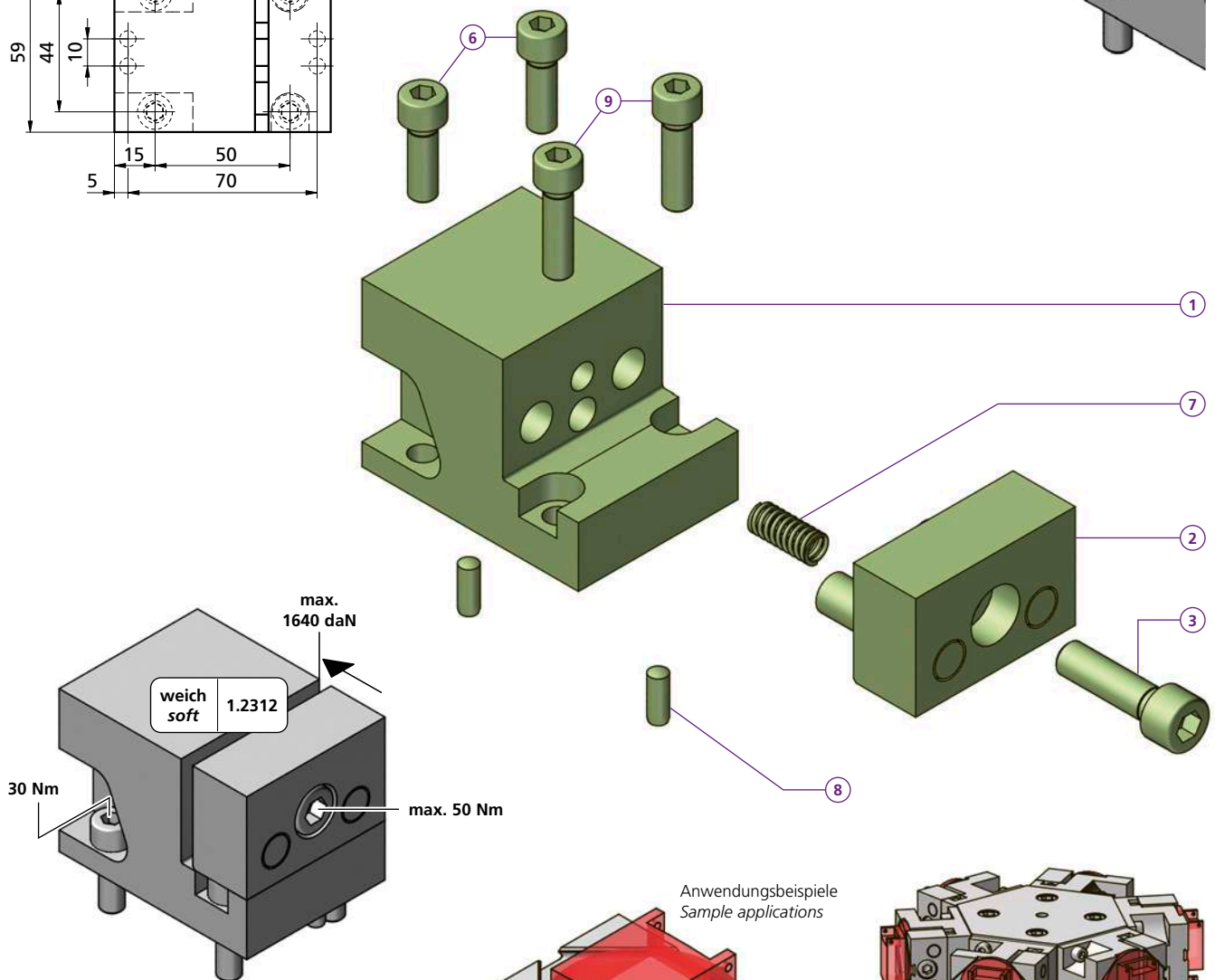
Bestellbeispiel / Ordering example : **VS1X59L60K**

VS1X59L60H5

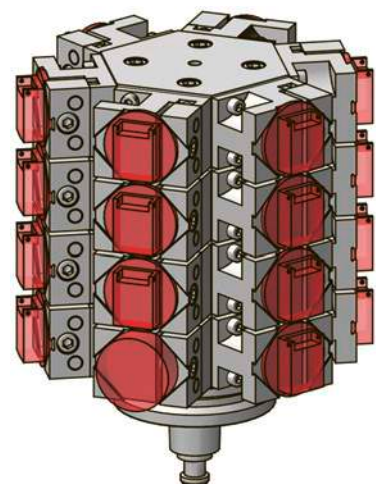
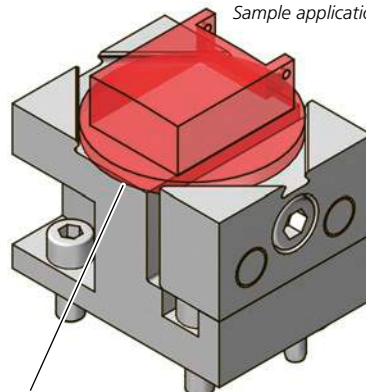


Empfohlener Sechskantschlüssel
Recommended hexagon wrench
PB2212L/6

100°



Anwendungsbeispiele
Sample applications



Spannstelle an Werkstück angepasst und nitriert.
Clamping face machined to the shape of the workpiece and nitrided.

*VS1X59L60H5

- ① 1x VS1X59L60H5A
- ② 1x VS1X59L60H5S
- ③ 1x M10X35ISO4762
- ⑥ 2x **M8X25ISO4762**
- ⑦ 1x FED0833
- ⑧ 2x 6m6x14 DIN 6325
- ⑨ 2x **M8X30ISO4762**
- kg ~1,94

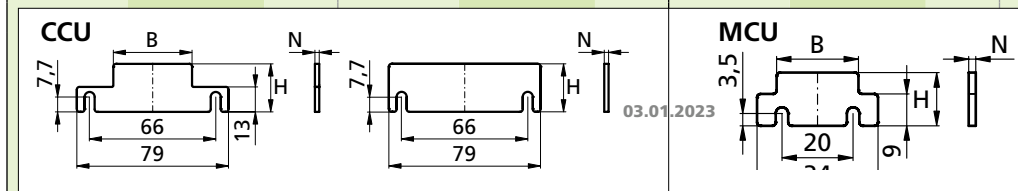
* = Stahl / steel 1.2312

Bestellbeispiel / Ordering example : **VS1X59L60H5**

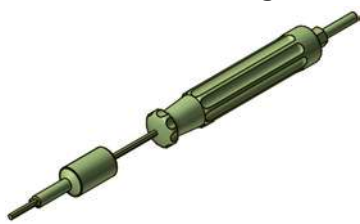
Separat bestellen / Order separately



durchgehärtet / through hardened										nitriert / nitrated									
26mm	B	H	N	kg	41mm	B	H	N	kg	23mm	B	H	N	kg	41mm	B	H	N	kg
CCU15026	26	15	2,2	~0,017	CCU15081	41	15	2,2	~0,018	MCU11037	23	11	2	~0,004	CCU15083	41	15	3	~0,025
CCU20026	26	20	2,2	~0,02	CCU20081	41	20	2,2	~0,022	MCU15037	23	15	2	~0,006	CCU20083	41	20	3	~0,029
CCU25026	26	25	2,2	~0,022	CCU25081	41	25	2,2	~0,025	MCU18037	23	18	2	~0,008	CCU25083	41	25	3	~0,034
CCU30026	26	30	2,2	~0,025	CCU27581	41	27	2,2	~0,027	MCU20037	23	20	2	~0,008	CCU27583	41	27,5	3	~0,036
CCU32526	26	32,5	2,2	~0,026	CCU30081	41	30	2,2	~0,029	MCU22537	23	22,5	2	~0,008					
38mm	B	H	N	kg	80mm	B	H	N	kg	26mm	B	H	N	kg	80mm	B	H	N	kg
CCU30039	38	30	2,2	~0,028	CCU15080	79	15	2,2	~0,019	CCU15027	26	15	3	~0,024	CCU15082	79	15	3	~0,026
CCU35039	38	35	2,2	~0,031	CCU20080	79	20	2,2	~0,027	CCU20027	26	20	3	~0,027	CCU20082	79	20	3	~0,036
CCU40039	38	40	2,2	~0,035	CCU25080	79	25	2,2	~0,035	CCU25027	26	25	3	~0,03	CCU25082	79	25	3	~0,045
CCU45039	38	45	2,2	~0,039	CCU27580	79	27,5	2,2	~0,039	CCU30027	26	30	3	~0,033	CCU27582	79	27,5	3	~0,049
					CCU30080	79	30	2,2	~0,043	CCU32527	26	32,5	3	~0,034					
					CCU35080	79	35	2,2	~0,05										
					CCU40080	79	40	2,2	~0,057										
					CCU45080	79	45	2,2	~0,063										

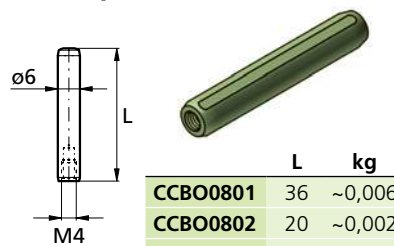


Schraubenzieher mit Konterung für
Screwdriver with holding sleeve for

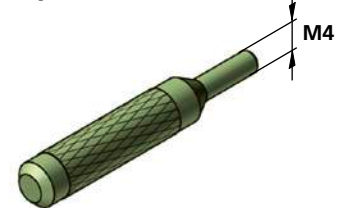


CCBXSK

Positionsbolzen
Position pin

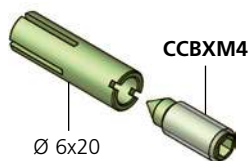


Bolzen-Auszieher
Pin puller

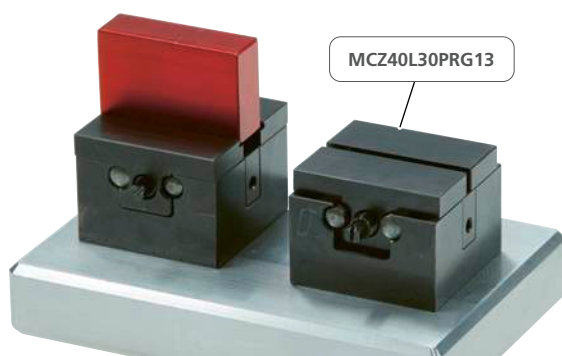


CCAZ1050

Positionierstift (spreizbar)
Locating pin (expandable)



CCBX0802



Mehr Informationen siehe Zentrischspanner
For more information check the self centring vise

p. 117



Mehr Informationen siehe Zentrischspanner
For more information check the self centring vise

p. 127



Universalbacke / Universal jaw

	A	B	X	Y	Z	i	kg
CC8011			30	24	10	56 HRC	~ 0,15
CC8025			50	44	10		~ 0,28
CC8040			30	24	20	*	~ 0,33

Weiche Backe / Soft jaw

	X	i	kg
*CC8030	30	1.1191	~ 0,35
*CC8050	50		~ 0,59

Backe mit 2 Pendeldruckstücken Jaw with 2 swivelling balls

	kg
CC8060	~0,30
CC8060R	~0,30

	A	B	X	Y	Z	i	kg
CC8021			30	24	10	56 HRC	~ 0,11
CC8026			50	44	10		~ 0,17
CC8041			30	24	20	*	~ 0,24

Backe für Druckstift / Jaw for pressure pin

	kg
CC8070	~ 0,17

Prismabacke / Prismatic jaw

	X	i	kg
CC8050V90	30	56 HRC	~0,38

	X	i	kg
CC8050V120	30	56 HRC	~0,41

Backe / Jaw

	A	B	kg
CC8210			~ 0,03
CC8211			~ 0,03

	A	B	i	kg
CC8220				~ 0,02

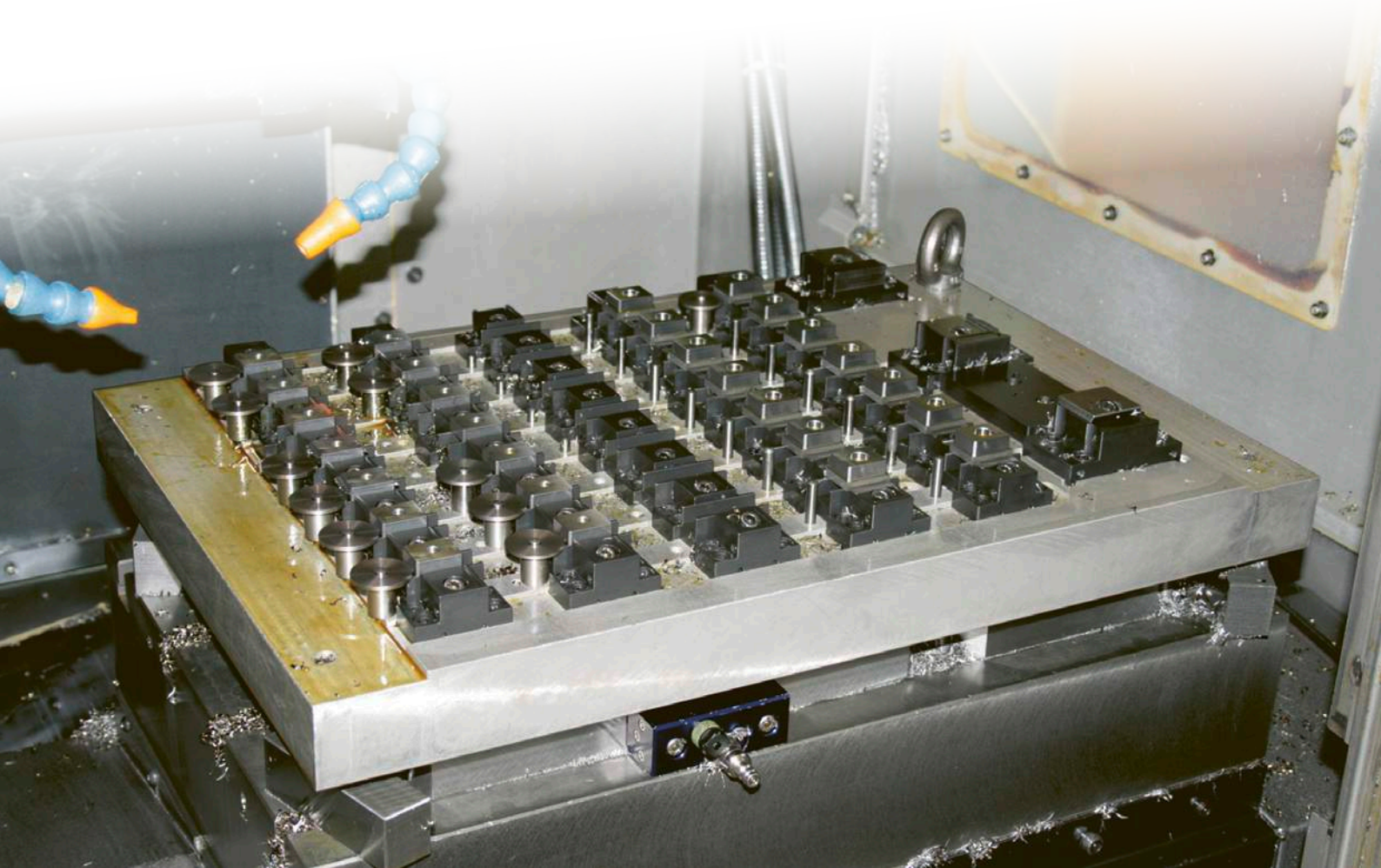
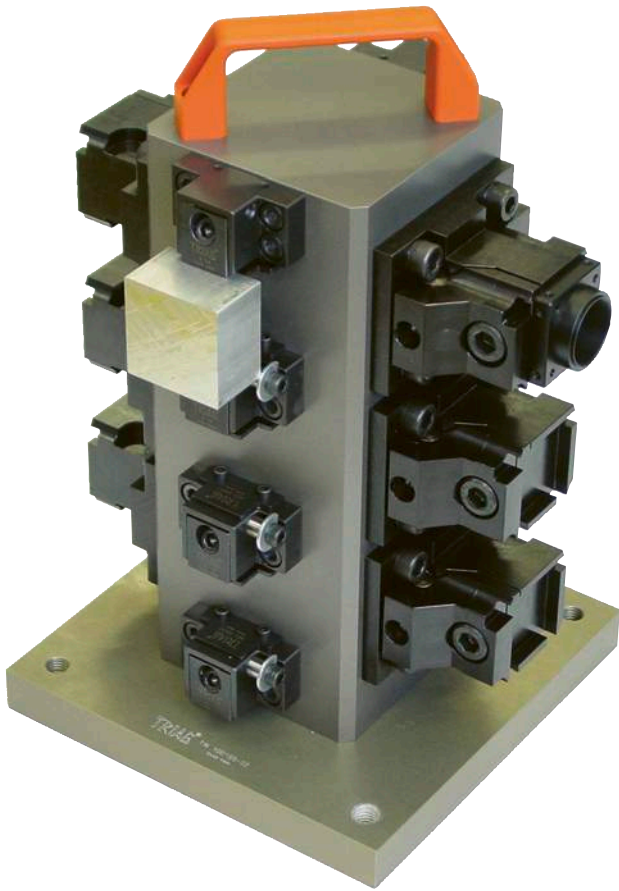
* = weicher Stahl / soft steel

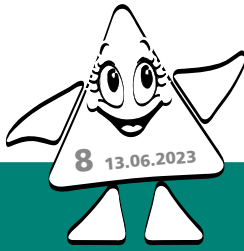
Bestellbeispiel / Ordering example: CC8011

Separat bestellen / Order separately

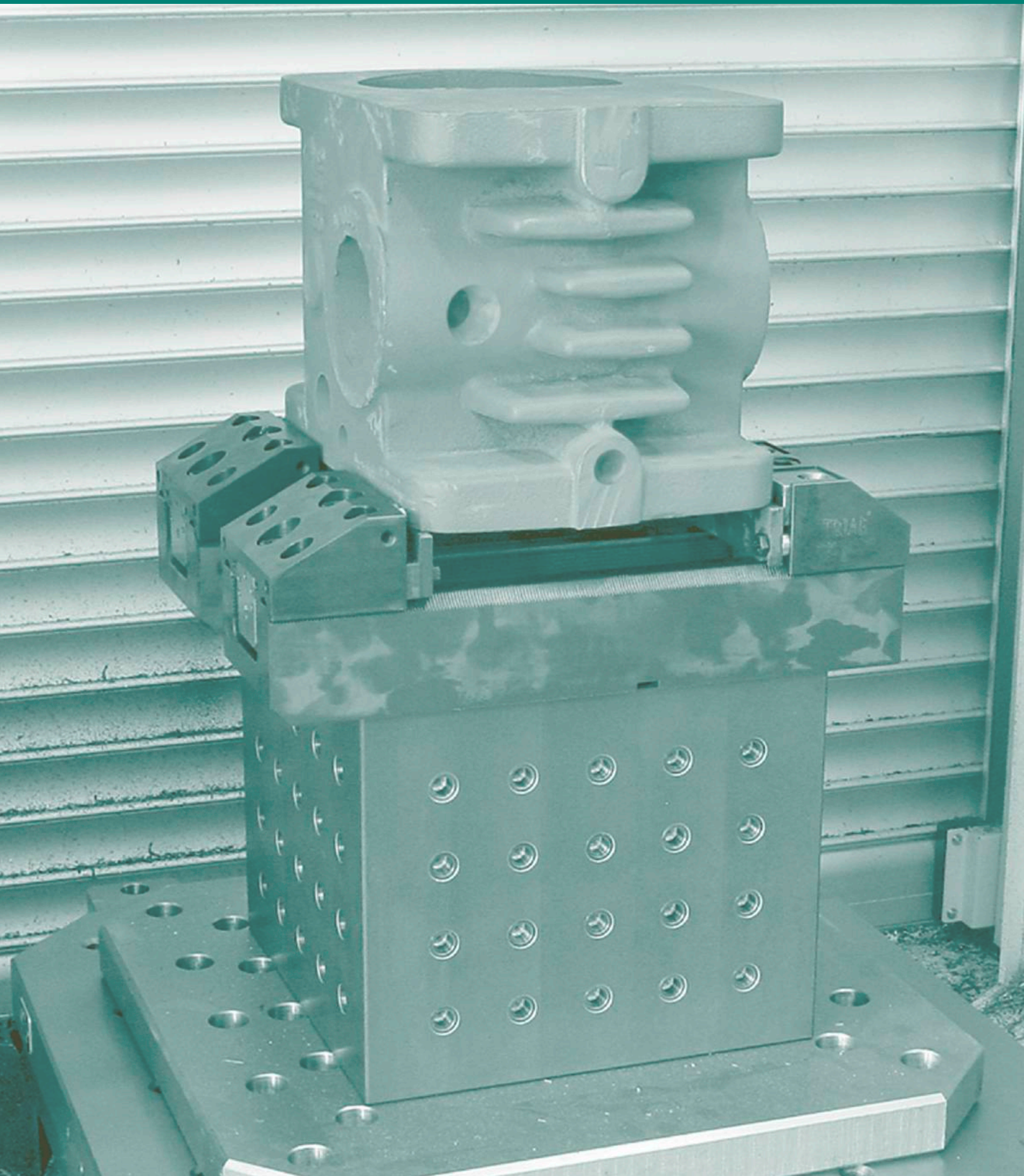


microCLAMP





aptoCLAMP & ***5axes***





Einleitung <i>Introduction</i>	209 - 212
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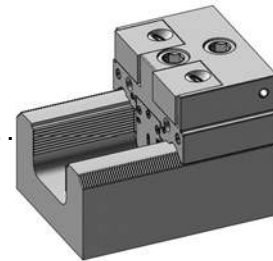
Bedienungsanleitung <i>Operating manual</i>	213 - 214
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Anwendungsbeispiele <i>Examples of application</i>	215 - 220
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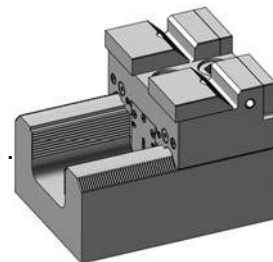
Basisschiene <i>Base-rail</i>	222
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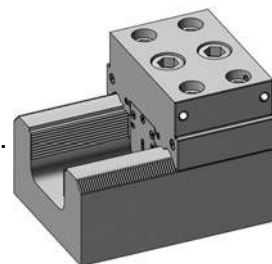
Niederzugspannmodule <i>Pull down clamp modules</i>	223 - 226
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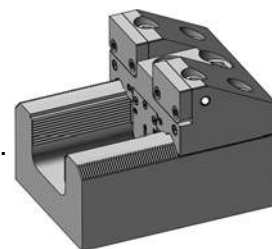
Linearspannmodule mit Präge- und Linearbacken <i>Linear clamping modules with stamping and linear jaws</i>	227
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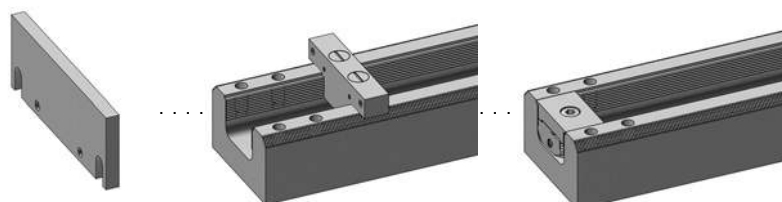
Anschlagmodule <i>End module</i>	228 - 230
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5-Achs Linearanschlagmodule mit Präge- und Linearbacken <i>5-axis linear clamping modules with stamping and linear jaws</i>	231
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Zubehör <i>Accessories</i>	232 - 233
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Die hohe Spannkraft dieses Systems ermöglicht den Einsatz für schwere Zerspanung.

Mit stabilen Kraftspannern können auf den Basisschienen auch grosse, bis zu mehrere tausend Kilogramm schwere Platten und Blöcke gespannt werden.

The high clamping force of the Apto Clamp enables heavy cuts. You achieve maximum rigidity with our Apto Clamp modular system! Even if your workpiece is thousands of kilograms you don't have to worry to clamp big parts and big plates.

Elefantenstark und anwenderfreundlich

Powerful and user-friendly



Zur Positionierung der Spannmodule hat das Apto Clamp neben einer Querverzahnung zusätzlich ein Ankersystem zur Arretierung an einer Längsverzahnung in der Basischiene. Durch die rechtwinklige Verkeilung wird eine von Mitbewerbern unerreichte Stabilität gewährleistet. Die Spannmodule liegen auf der genau geschliffenen Auflagefläche der Basis auf. Durch das Ankersystem und die geschliffene Auflagefläche wird das Spannmodul an der Basischiene extrem kraftschlüssig und präzise fixiert. Trotzdem können die Spannmodule völlig ungehindert entlang der Basis verstellt (verschoben) werden. Auch das Auswechseln der Module ist einfach, müssen doch diese nicht aus der Schiene ausgefahren, sondern können abgehoben werden.

For positioning the clamp modules on the base rails, has the Apto Clamp system next to a positioning serration a horizontal anchor system for locking with enornes force produced by two M16 screws. The end modules have additionally 4 M12 screws to give extra rigidity.



Darum haben wir dieses Symbol gewählt:
That's why we have chosen this symbol:



Schnelligkeit / Quickness



Zwei Schraube lösen
Loosen two screws



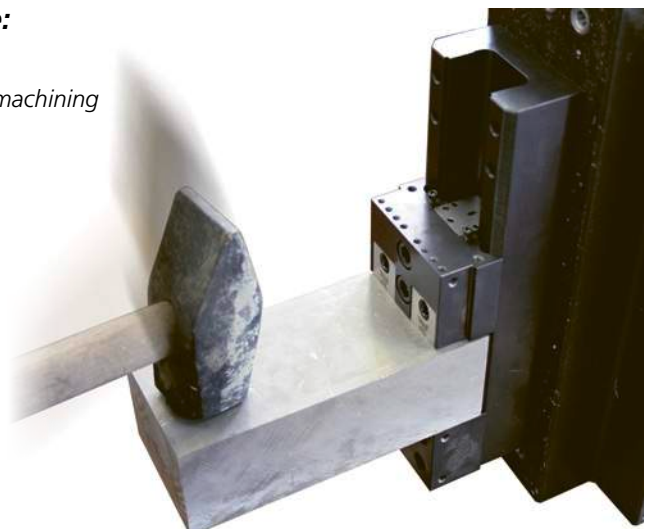
Abheben und neu platzieren
Lift and change position



Zwei Schrauben anziehen
Fasten two screws

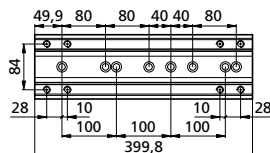
Vorteile auf einen Blick / Benefits at a glance:

- ➔ Sehr stabil, robuste Bauweise, dadurch hohe Präzision
Very stable, robust design allows high precision and heavy machining
- ➔ Module nach oben abhebbar, kein Ausfahren nötig
Modules can be lifted up, no extension needed
- ➔ Keine verschmutzbaren T-Nuten: Formschlüssig positioniert
No chip loading T-slots grooves: Positively positioned
- ➔ Verzahnung nicht dem Werkstück ausgesetzt
The teeth are not exposed to the workpiece
- ➔ Niederzug- und Linearspannung möglich
Pull-down and linear clamping possible
- ➔ Spannkraft bis 7000 daN pro Modul
Clamping force up to 7000 daN per module

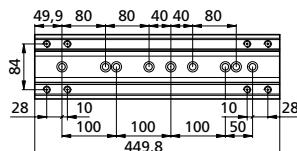




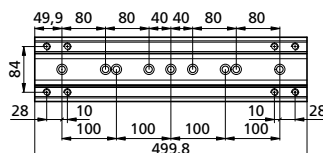
400 mm



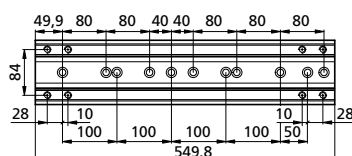
450 mm



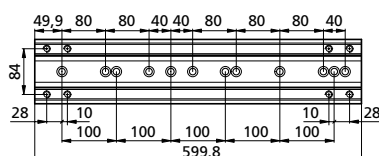
500 mm



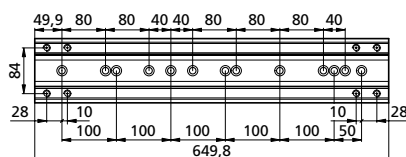
550 mm



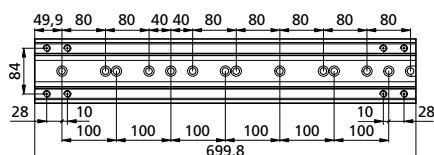
600 mm



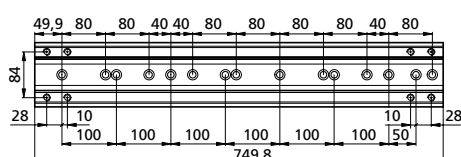
650 mm



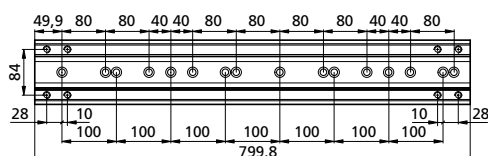
700 mm



750 mm



800 mm



Basisschiene / Base rail

Beim Apto Clamp ermöglicht eine Verzahnung mit 2 mm-Teilung auf der Basisschiene ein schnelles und genaues Positionieren der Spann- und Anschlagmodule.

With the new Apto Clamp a serration of 2mm pitch on the base rail allows a rapid and accurate positioning of the modules.

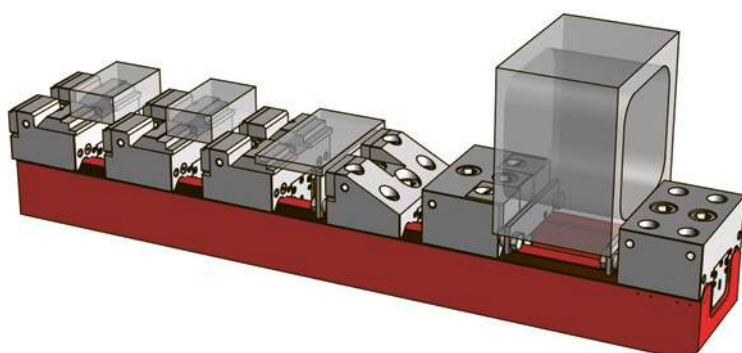
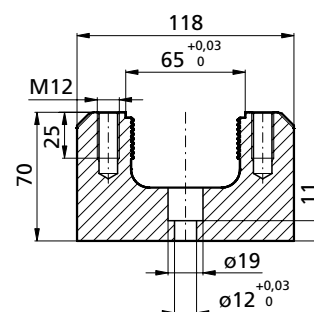
Durch gezielte elastische Deformation einer Lippe erfolgt eine spielfreie Paarung. Spann- und Bearbeitungskräfte werden einerseits an der ebenen, robusten Oberseite der Basisschiene aufgenommen, während andererseits das Spannmodul durch einen spreizenden Keil mit robustem Rundgewindeprofil in der Schiene verankert wird.

The outstanding development is that through elastic deformation of a lip, the engagement between the modules and the base rail is without play. Clamping and machining forces are absorbed on the upper surface of the base rail whereas the vice module is fixed to the rail by an expandable anchor which engages the round serration inside the base rail.

Das Einfügen zusätzlicher Module zwischen bestehenden Spannstellen ist problemlos möglich. Apto Clamp ist die konsequente Weiterentwicklung vom Power Clamp zur Bearbeitung noch grösserer Werkstücke.

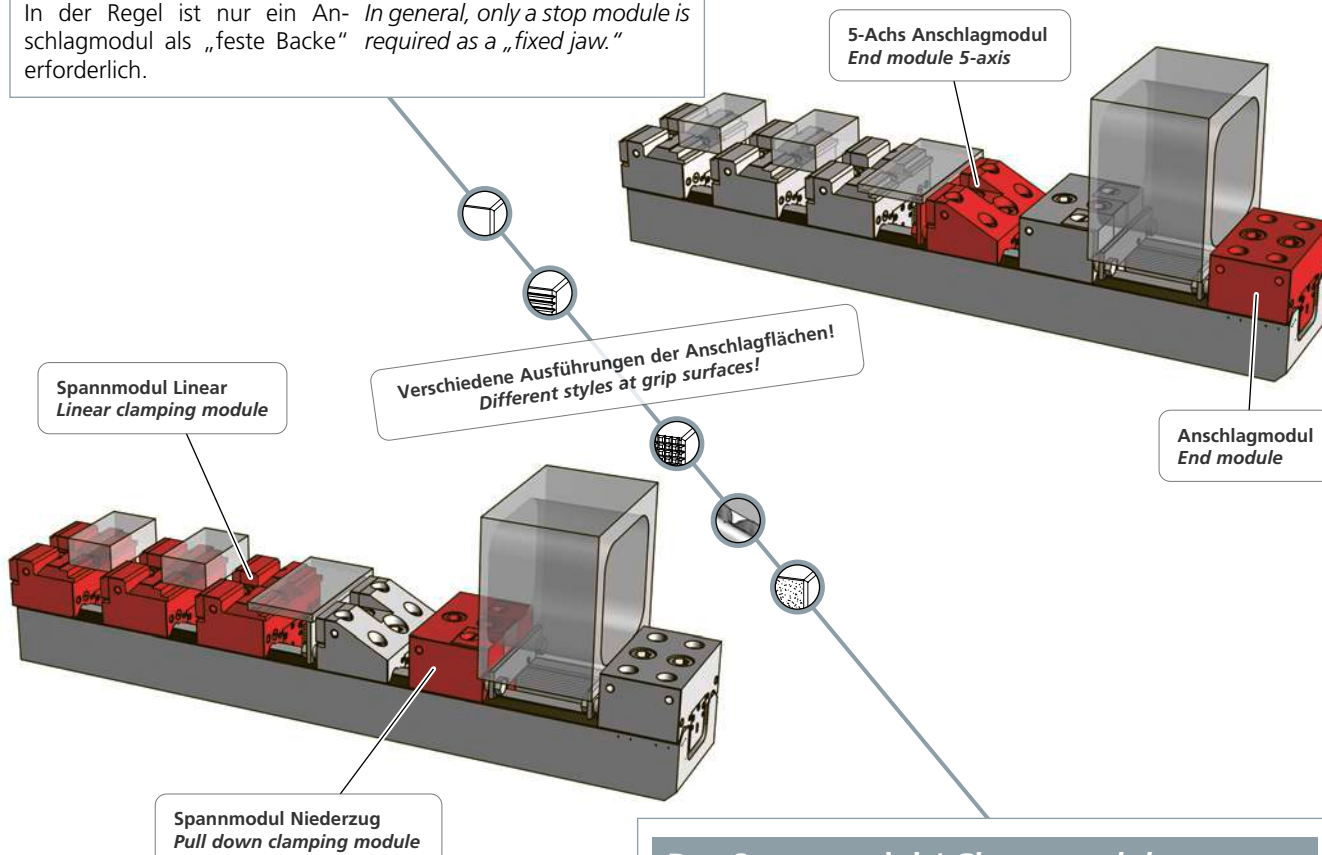
The insertion of additional vice modules can be accomplished without problems. Apto Clamp is the logical development of Power Clamp to handle even larger work pieces.

Schnittzeichnung Sectional view of der Basisschiene the base rail



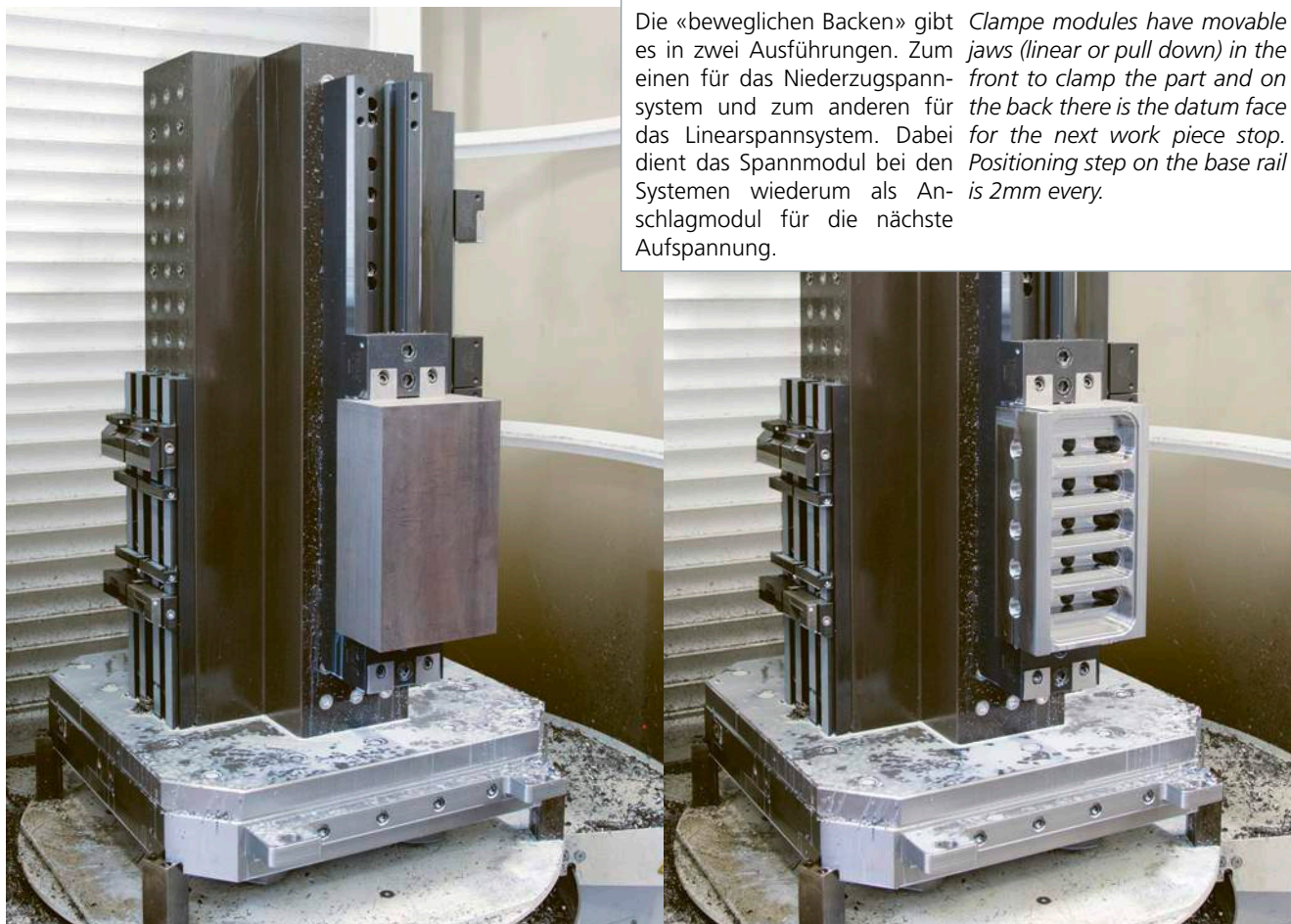
Das Anschlagmodul / End modules

In der Regel ist nur ein Anschlagmodul als „feste Backe“ erforderlich.
In general, only a stop module is required as a „fixed jaw.“

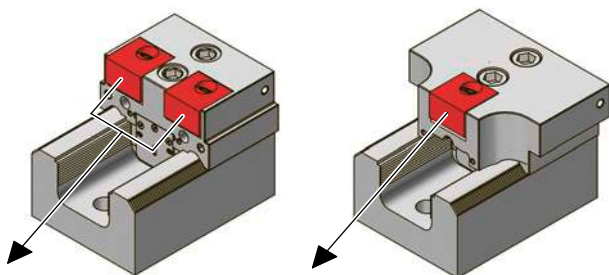


Das Spannmodul / Clamp modules

Die «beweglichen Backen» gibt es in zwei Ausführungen. Zum einen für das Niederzugspannsystem und zum anderen für das Linearspannsystem. Dabei dient das Spannmodul bei den Systemen wiederum als Anschlagmodul für die nächste Aufspannung.
Clampe modules have movable jaws (linear or pull down) in the front to clamp the part and on the back there is the datum face for the next work piece stop. Positioning step on the base rail is 2mm every.



Niederzugspannmodule
Pull down clamp modules



Die Fakten beim Niederzugspannsystem

Verstellbereich: 0- 3,8 mm
 Spannkraft: Bis 7'000 daN

Vorteile beim Niederzugspannsystem:

- Höhere Haltekraft
- Hohe Wiederholgenauigkeit
- Optimale Spannmethod für Kleinteile
- Mit Schnellwechselbacken
- Doppelspannsystem in einer Backe zum Spannen und Bearbeiten von zwei Kleinteilen

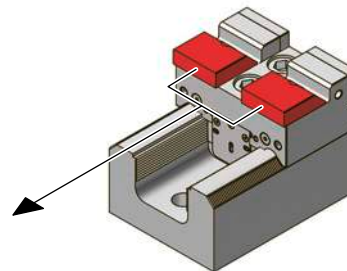
Facts for pull down clamp modules

Jaw range: 0- 3,8 mm
 Clamping force: up to 7'000 daN

Advantages pull down jaws:

- Higher holding force
- With linear adaptable jaws
- Also with pull down jaws for the stop side available
- With adapter set can be changed to linear
- Also pull down jaws for datum face

Linearspannmodule
Linear clamp modules



Die Fakten beim Linearspannsystem

Verstellbereich: 0- 5,0 mm
 Spannkraft: Bis 3'200 daN

Vorteile beim Linearspannsystem:

- Spannstockähnliches Spannen
- Prozesssichere Positionierung der zweiten Aufspannung
- Gut geeignet für die Erstellung von individuellen Formbacken
- Sicherer Halt mit Prägetechnik

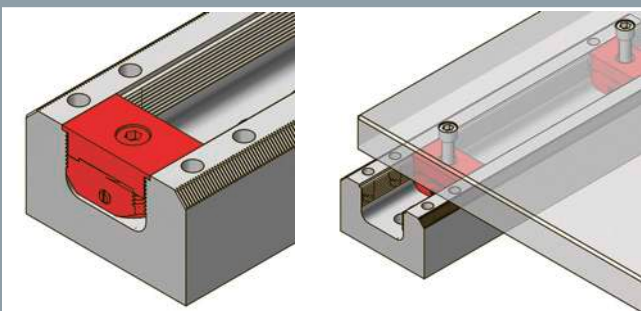
Facts for linear clamp modules

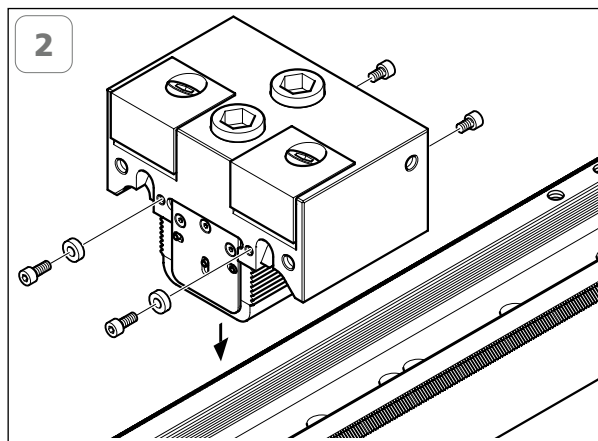
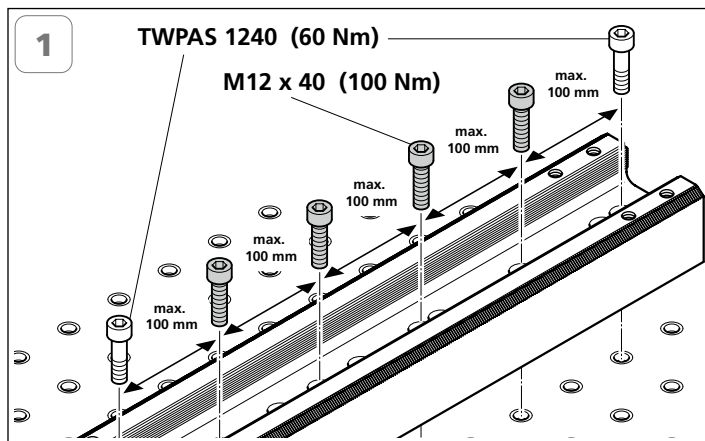
Jaw range: 0- 5,0 mm
 Clamping force: up to 3'200 daN

Advantages linear jaws:

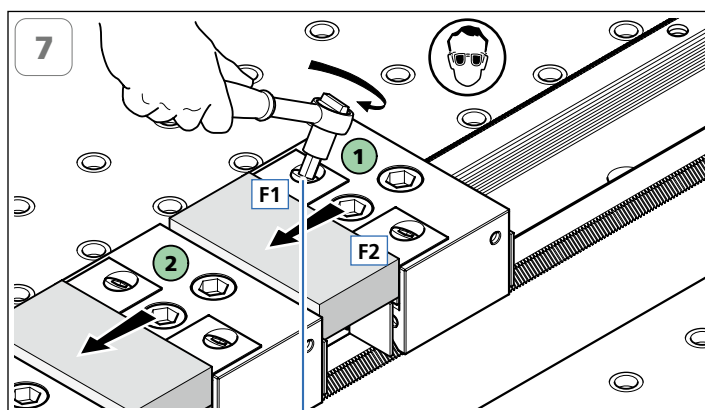
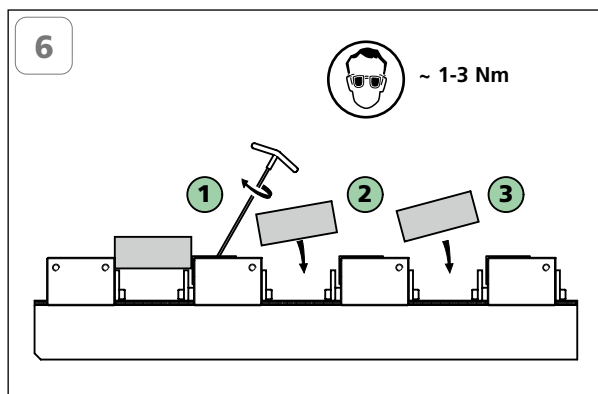
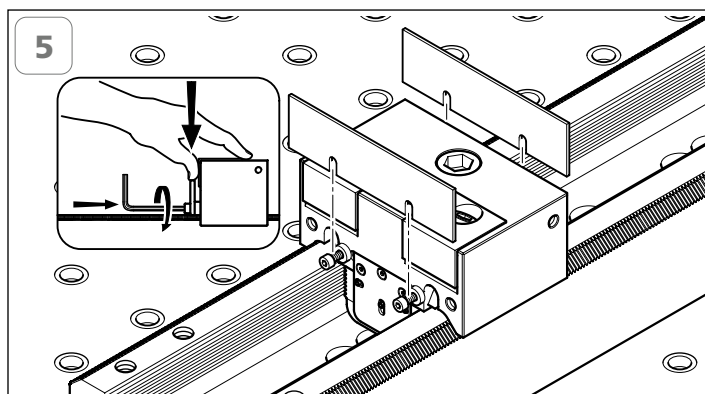
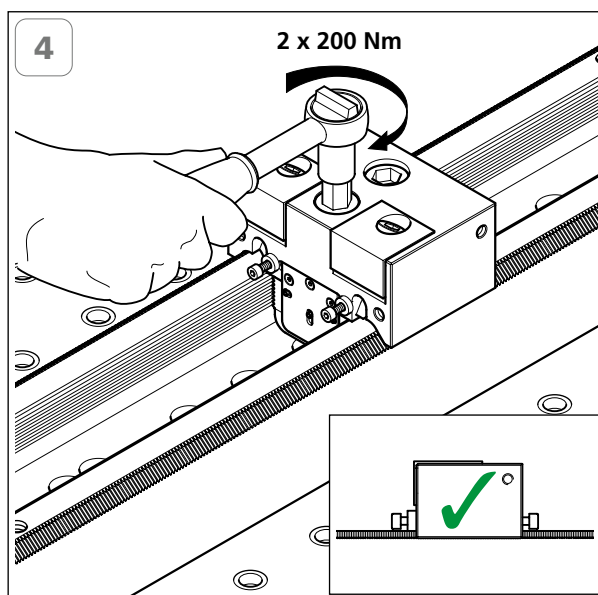
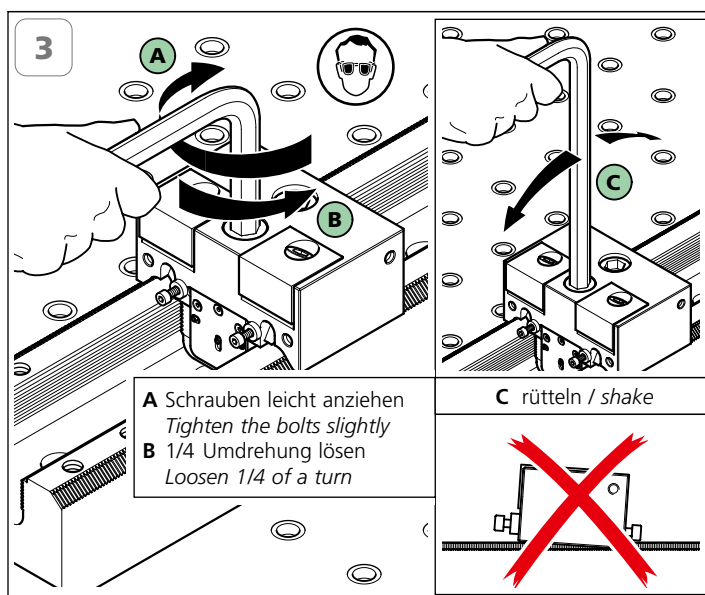
- Similar clamp as conventional vise
- Good for shaped jaws
- Secure clamped with direct stamping jaws
- Higher accuracy

Universalnutenstein
Universal nut





Ineinandergreifen der Verzahnung prüfen
Check matching of the teeth



max. Nm



max. Drehmoment beachten
Observe max. torque

Schraube Screw	Drehmoment Torque		Spannkraft (F1 & F2) Workholding force (F1 & F2)		
	Nm	(lb-ft)	~daN	~(lb)	~t
M10	10	7,4	= 1200	2'650	1,2
	20	14,8	= 2700	5'950	2,7
	30	22,2	= 4100	9'040	4,1
	40	29,5	= 5600	12'350	5,6
	50	37,0	= 7000	15'430	7,0

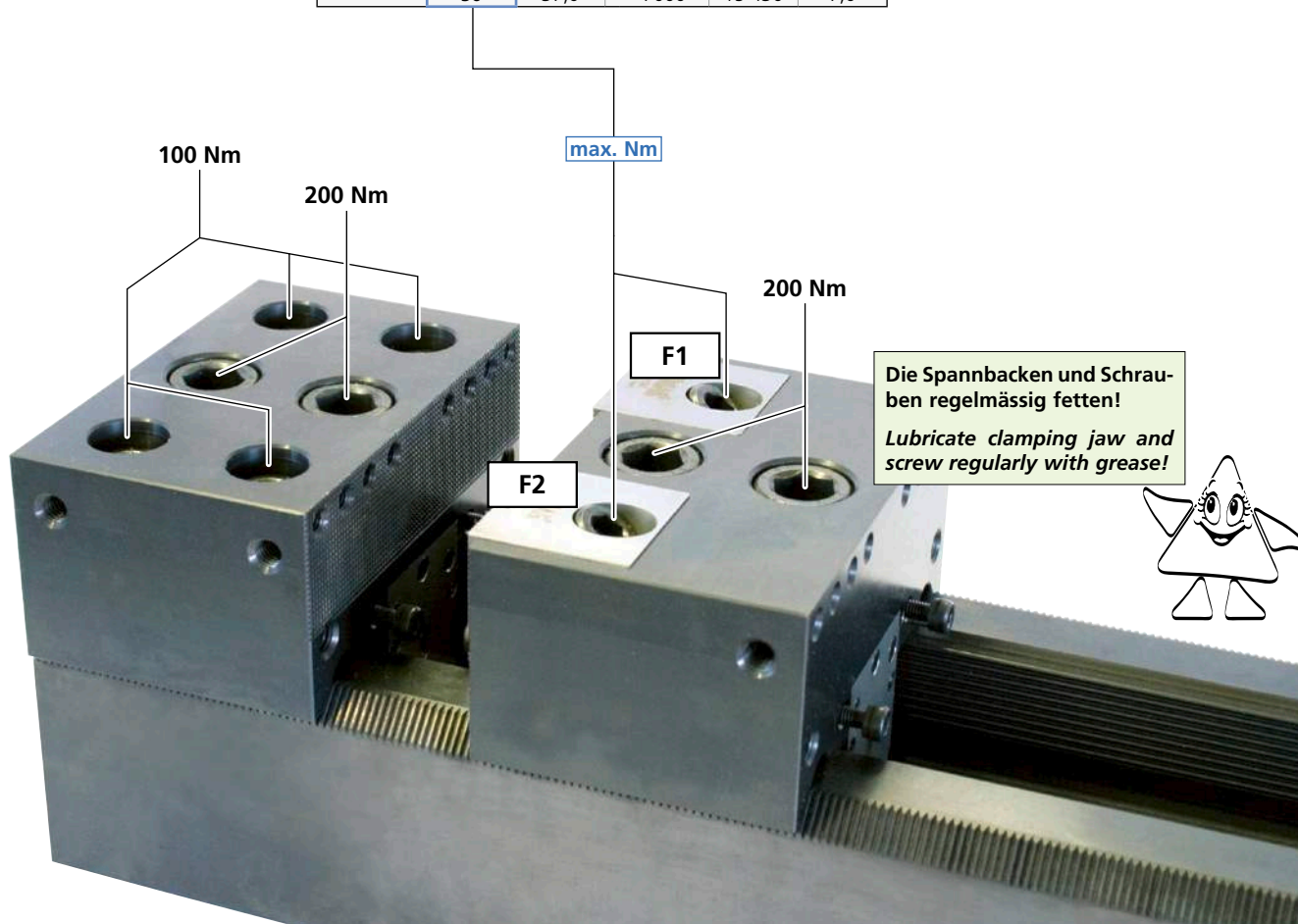


ACHTUNG / CAUTION

WICHTIG: Die angegebenen Drehmomente sind die absoluten Maximalwerte. Über die Spannkräfte gibt die untenstehende Tabelle Auskunft.

IMPORTANT: The torque numbers specified represent the absolute maximum. The table at the bottom of this page provides further information on the workholding forces.

Schraube Screw	Drehmoment Torque		Spannkraft (F1 & F2) Workholding force (F1 & F2)		
	Nm	(lb-ft)	~daN	~(lb)	~t
M10	10	7,4	= 1200	2'650	1,2
	20	14,8	= 2700	5'950	2,7
	30	22,2	= 4100	9'040	4,1
	40	29,5	= 5600	12'350	5,6
	50	37,0	= 7000	15'430	7,0

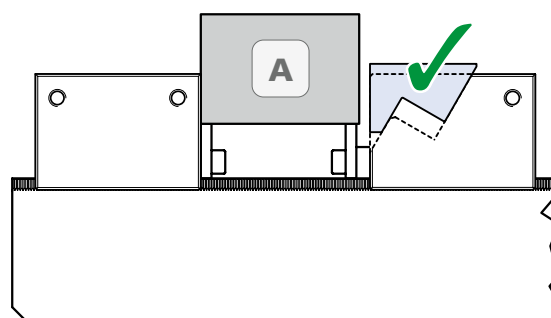
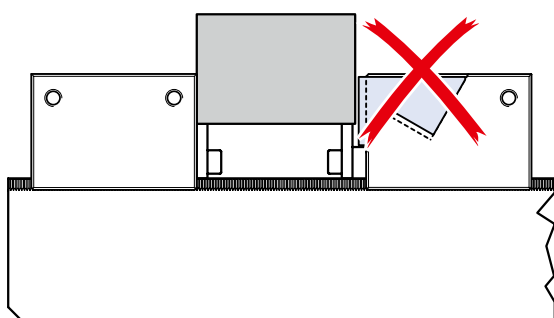


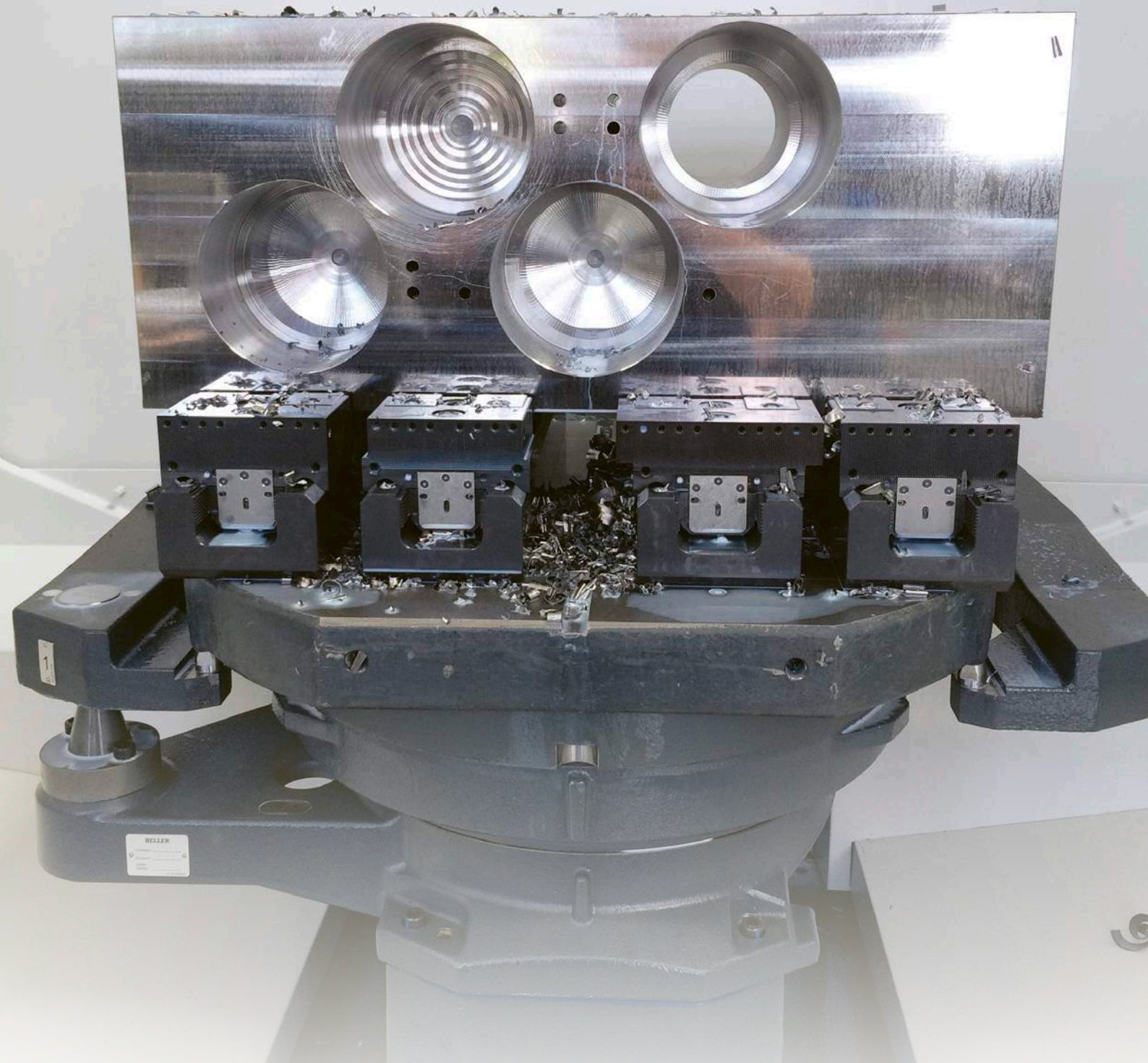
WICHTIG:

Vor dem Positionieren der Spannmodule für ein neues Werkstück ist die Spannbacke ganz zurück zu stellen, dies gewährleistet eine sichere Spannung (siehe Bild A)!

IMPORTANT:

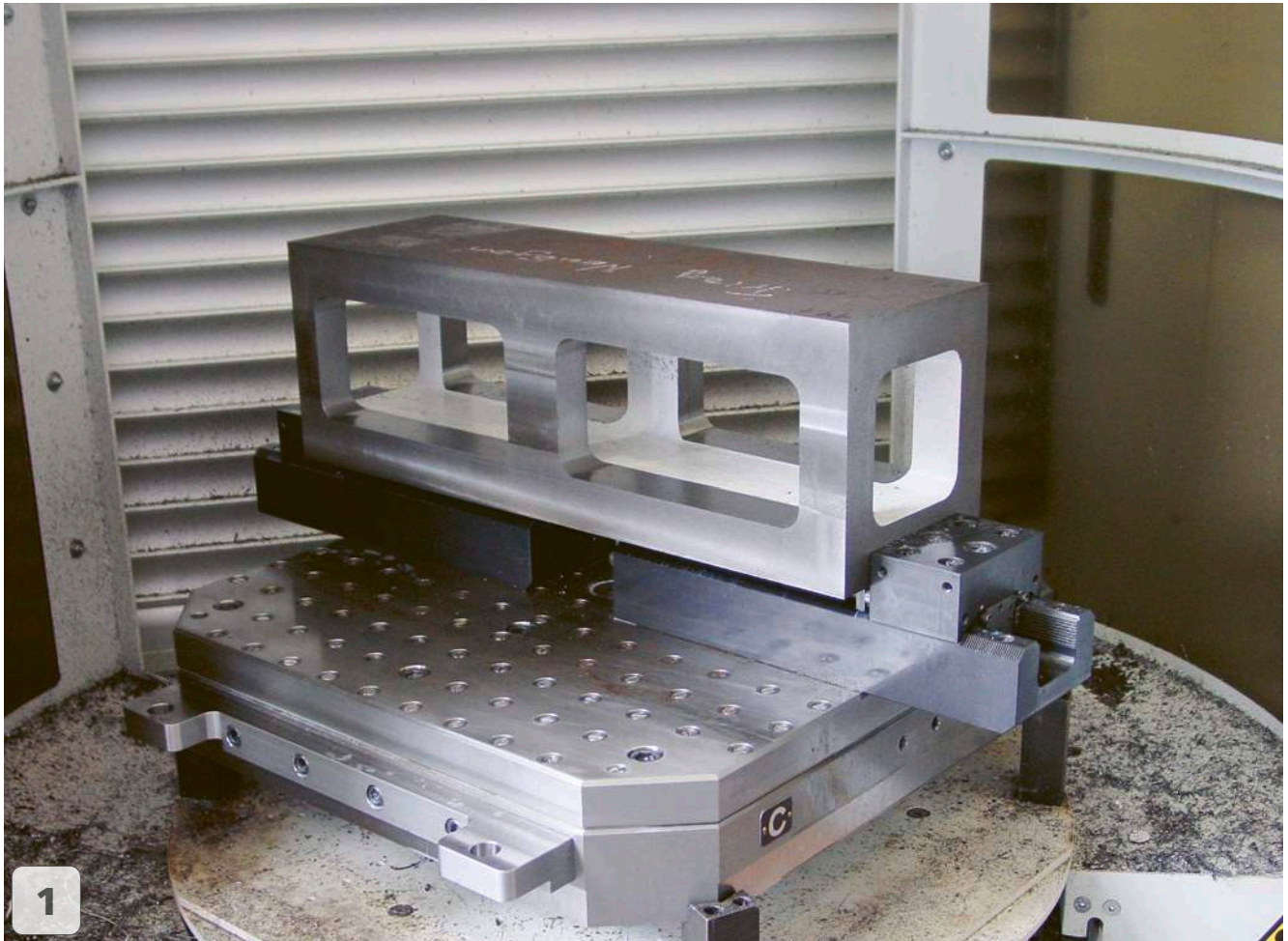
Prior to setting up a new clamping module the clamping jaw of the vice module must be retracted all the way (see picture A)! This guarantees proper clamping of the new workpiece.

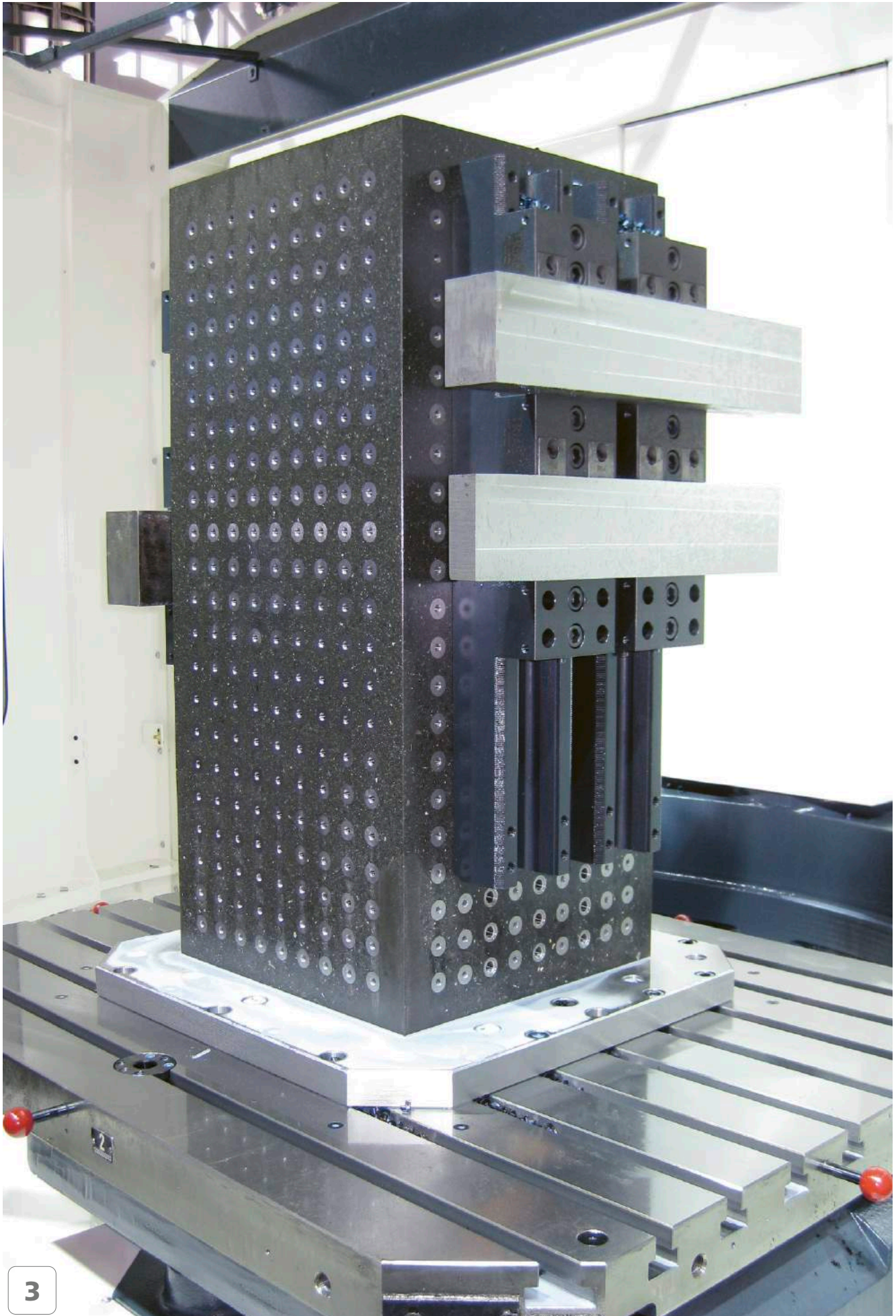


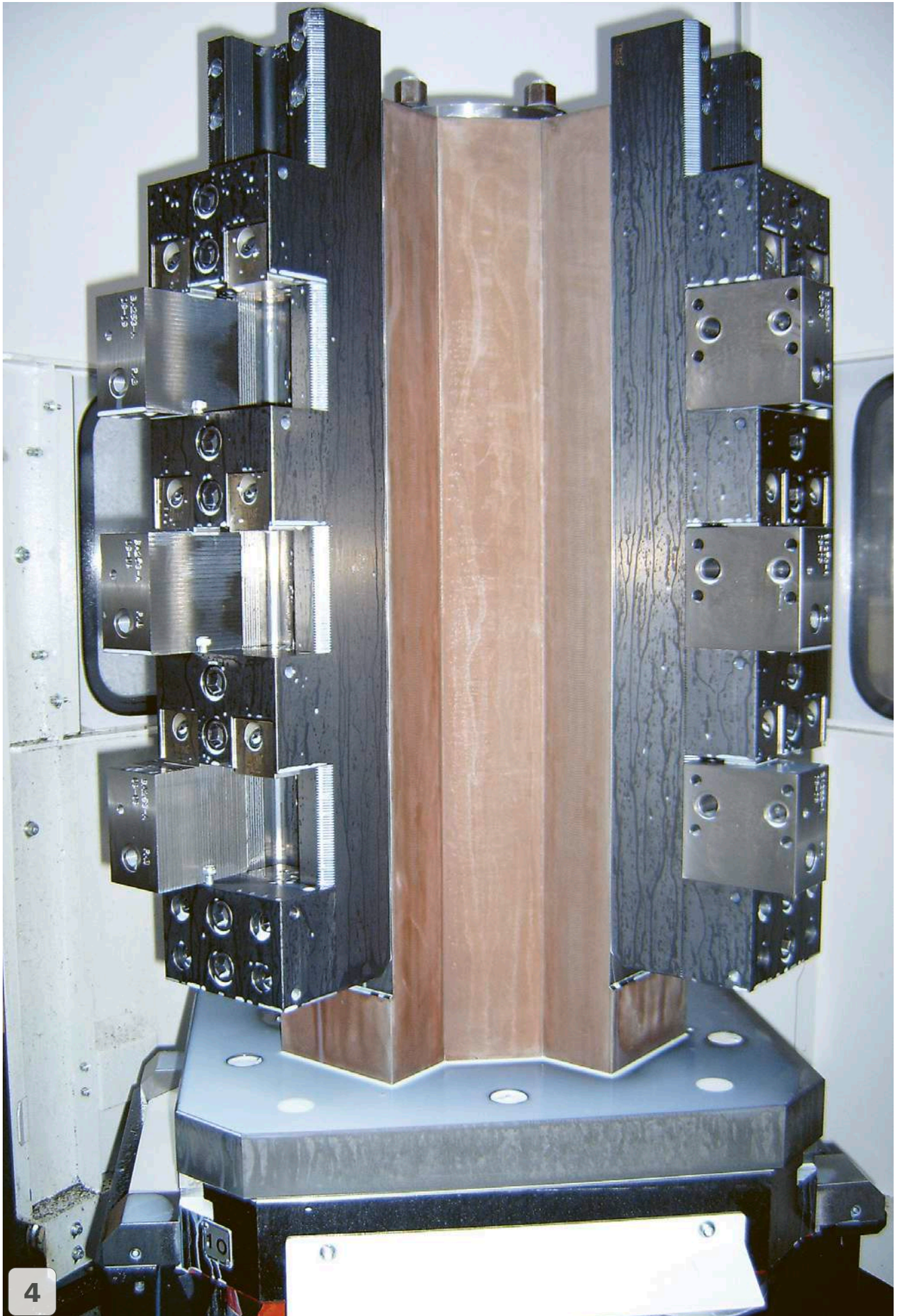


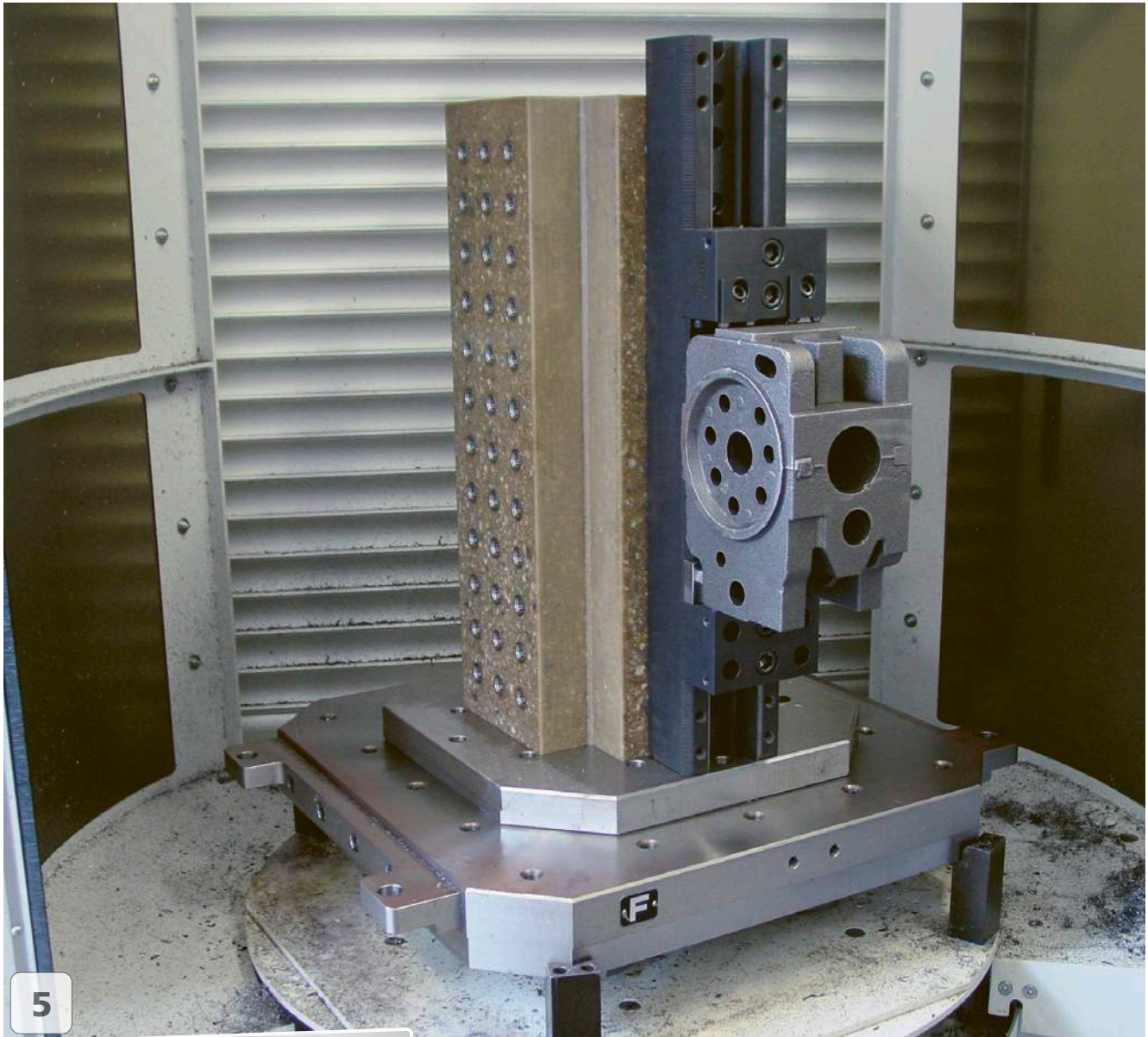
Material	42Cr Mo4
Bearbeitung mit Fräskopf	Ø 200
Machining with milling head	
Bohrer / Drills	Ø 124
Einspanntiefe / Clamping depth	24mm

Apto Clamp in der Schwerzerspannung auf Heller 5-Achsen-Maschine
Apto Clamp for heavy duty machining on a 5-axis machine



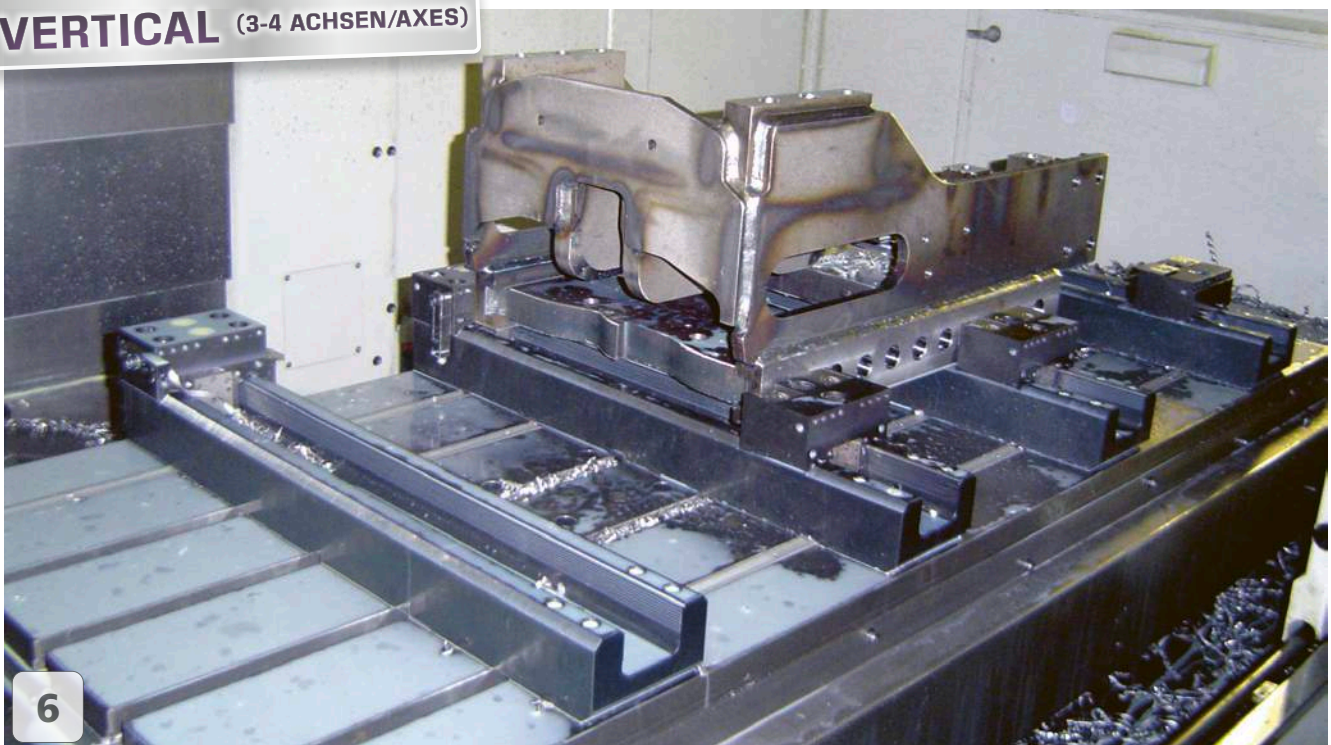




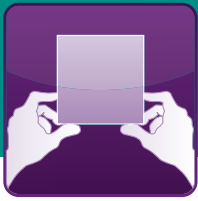


5

VERTICAL (3-4 ACHSEN/AXES)



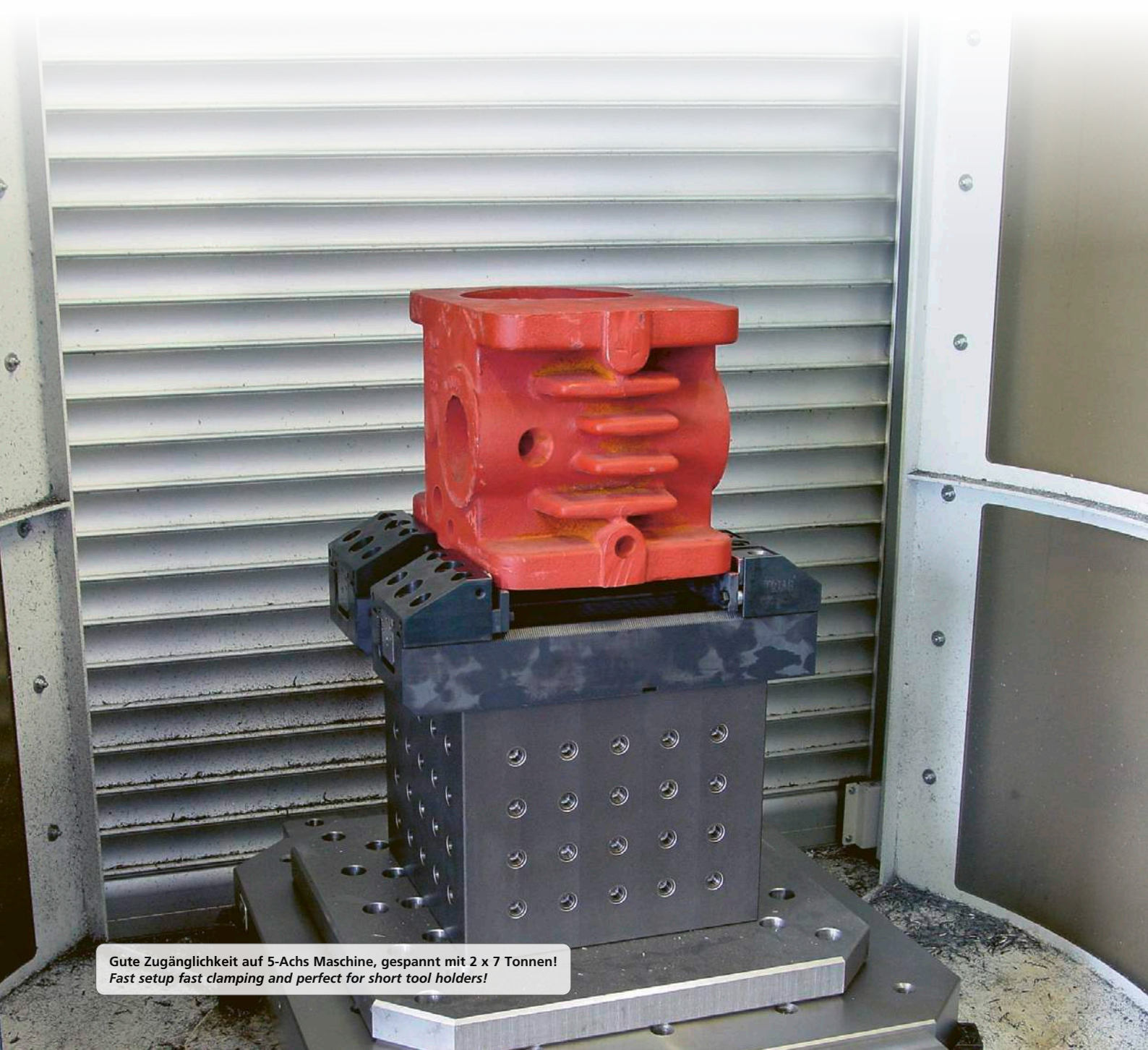
6



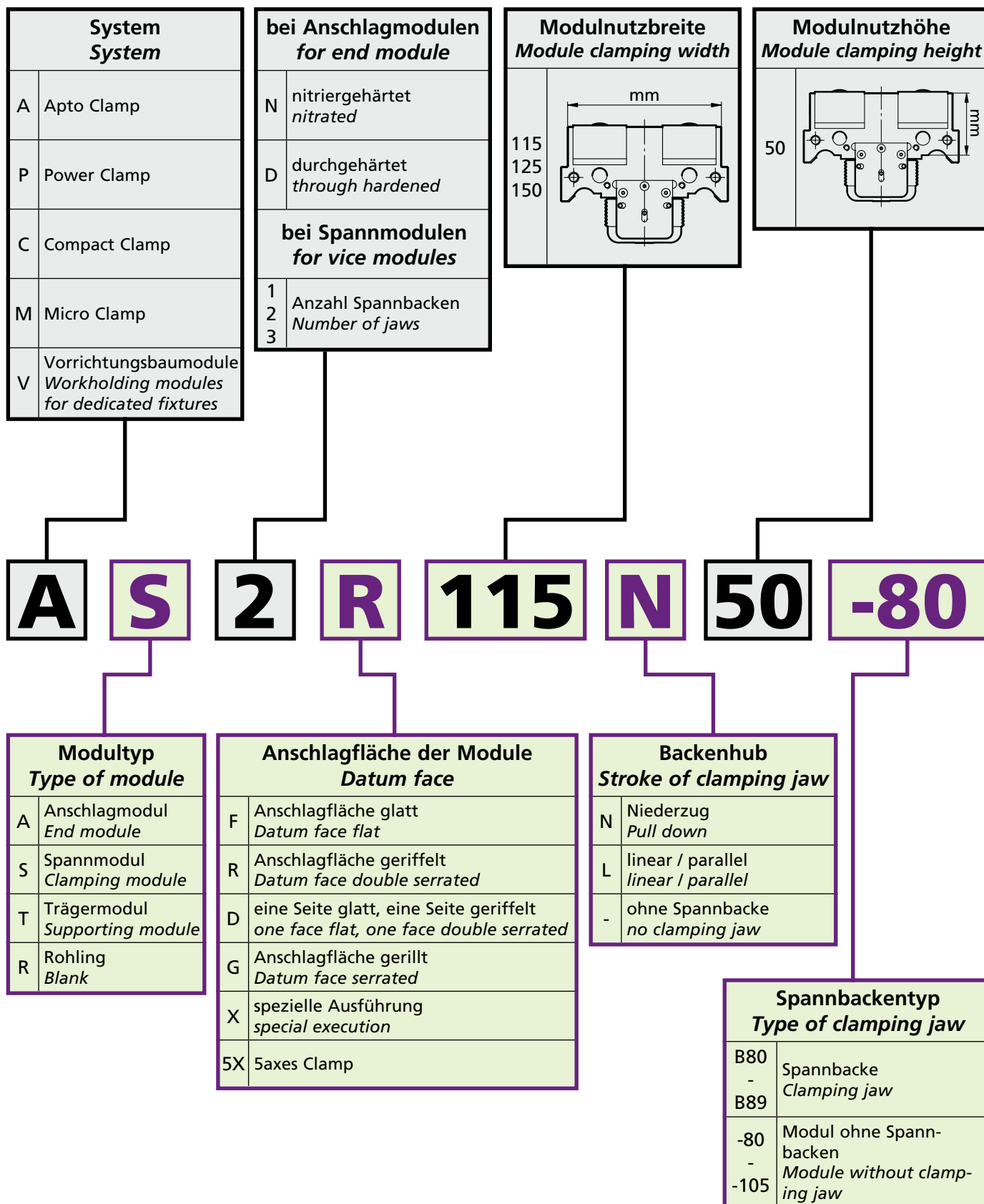
5axes aptoCLAMP

Es gibt zusätzlich Apto Clamp Module in angeschrägter Ausführung. Damit kann ein optimaler Zugang zum Werkstück bei der 5-Achsenmaschine gewährleistet werden. Die Spannmodule produzieren bis zu 7000daN (7 Tonnen) Spannkraft und sind für die Schwerzerspannung empfohlen.

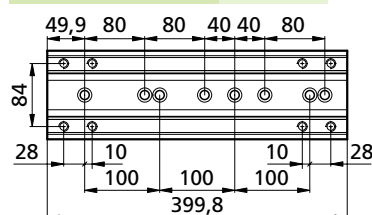
We offer Apto Clamp modules in slanted version. That ensures an optimal access to the workpieces on 5-axis machines. The clamping modules produce up to 7000daN (7 tons) clamping force and are recommended for heavy roughing workholding.



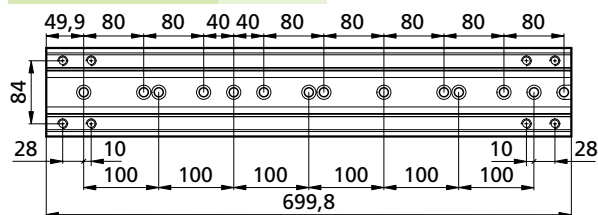
Gute Zugänglichkeit auf 5-Achs Maschine, gespannt mit 2 x 7 Tonnen!
Fast setup fast clamping and perfect for short tool holders!



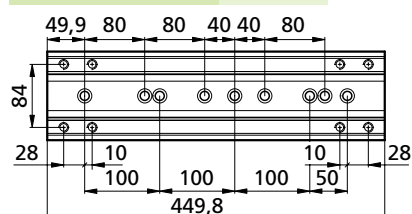
ACB4050400 kg ~18



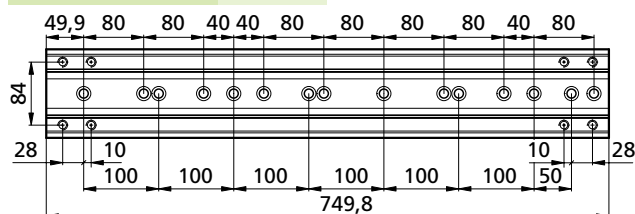
ACB4050700 kg ~31



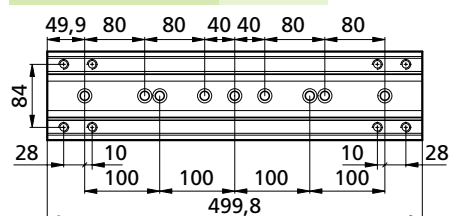
ACB4050450	kg ~20
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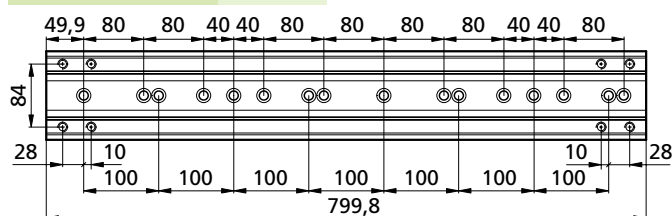
ACB4050750	kg ~33
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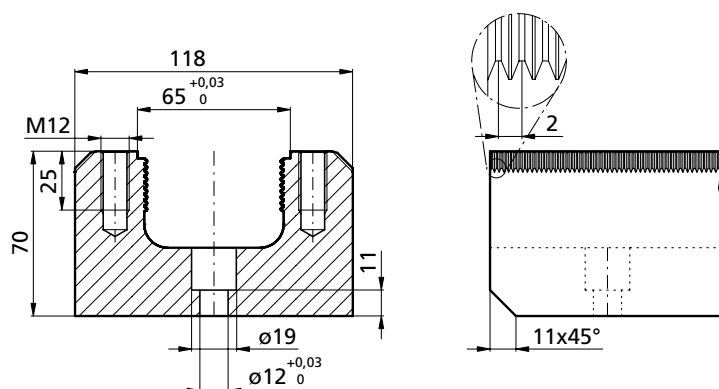
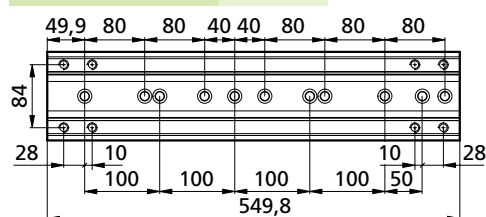
ACB4050500 kg ~22



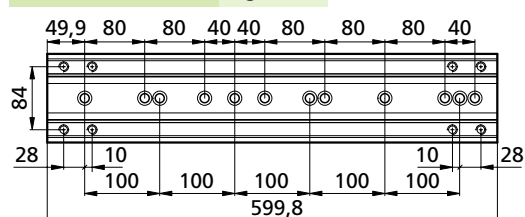
ACB4050800	kg ~35
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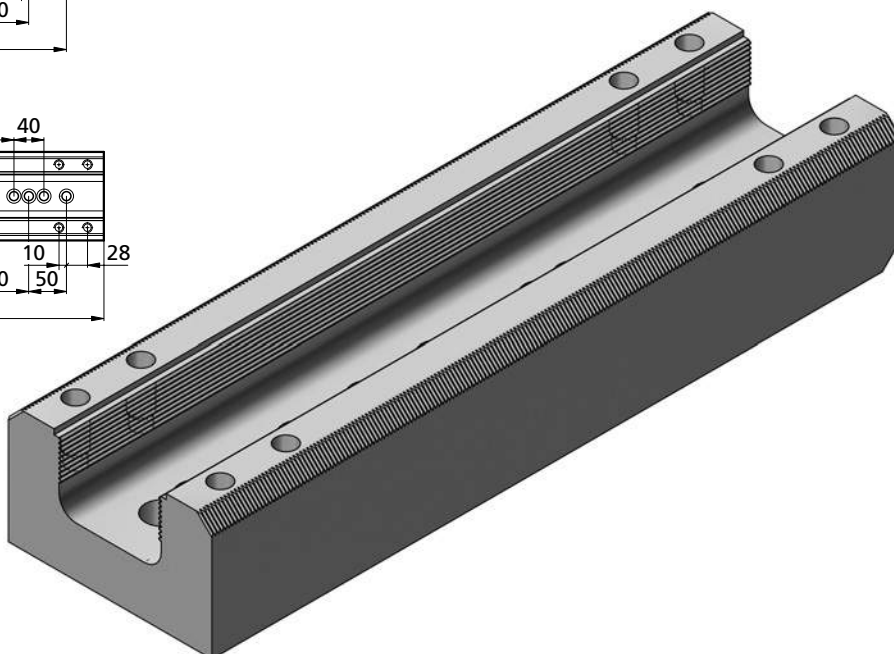
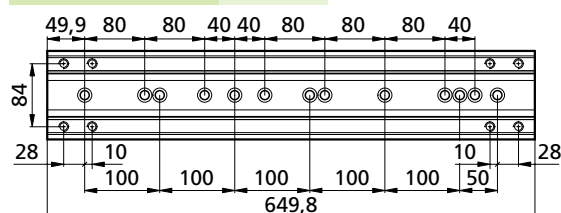
ACB4050550 kg ~24

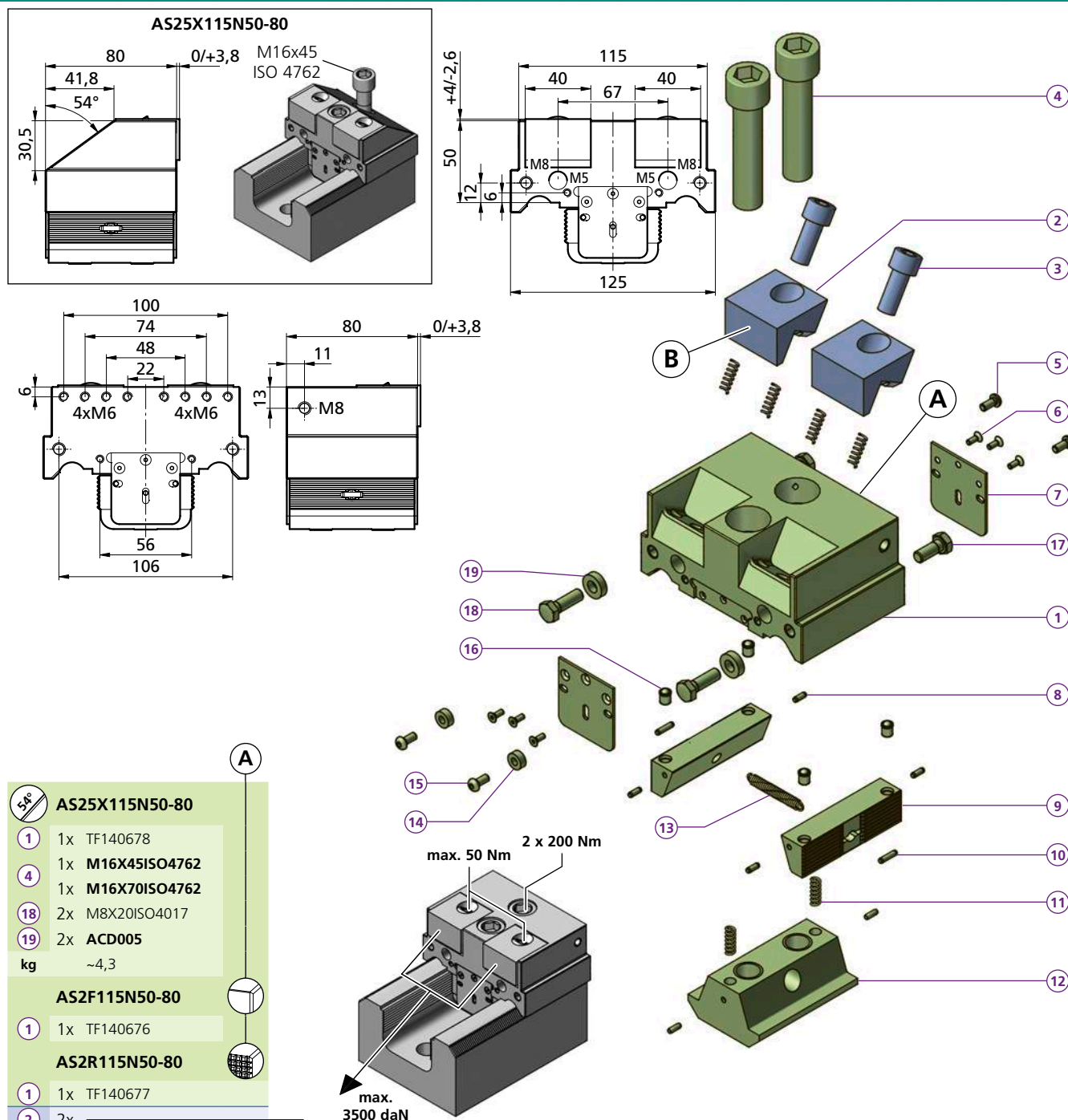


ACB4050600	kg ~26
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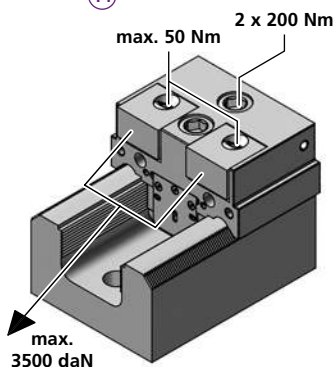


ACB4050650 kg ~29



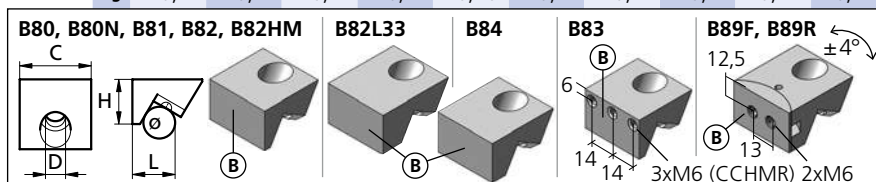


AS25X115N50-80	
1	1x TF140678
4	1x M16X45ISO4762
18	2x M8X20ISO4017
19	2x ACD005
kg	~4,3
AS2F115N50-80	
1	1x TF140676
AS2R115N50-80	
1	1x TF140677
2	2x
3	2x M10X25ISO4762
4	2x M16X70ISO4762
5	2x M5X10ISO7380-1
6	6x M3X6DIN7991
7	2x ACBL4243
8	6x Ø 3x8 VSM 12785
9	2x ACSP7620
10	2x Ø 3h 8x12 ISO 2338
11	6x FED0618
12	1x ACDK7632M16
13	1x FED Ø 5,5x39
14	2x PCD005
15	2x M5X14ISO7380-1
16	4x Ø 6-Niro SM1275-3
17	2x M8X16ISO4017
18	2x M8X20ISO4017
19	2x ACD005
kg	~4,8



Bestellbeispiel / Ordering example: 1x AS2R115N50-80 & 2x B80

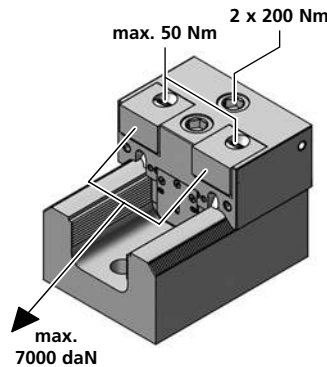
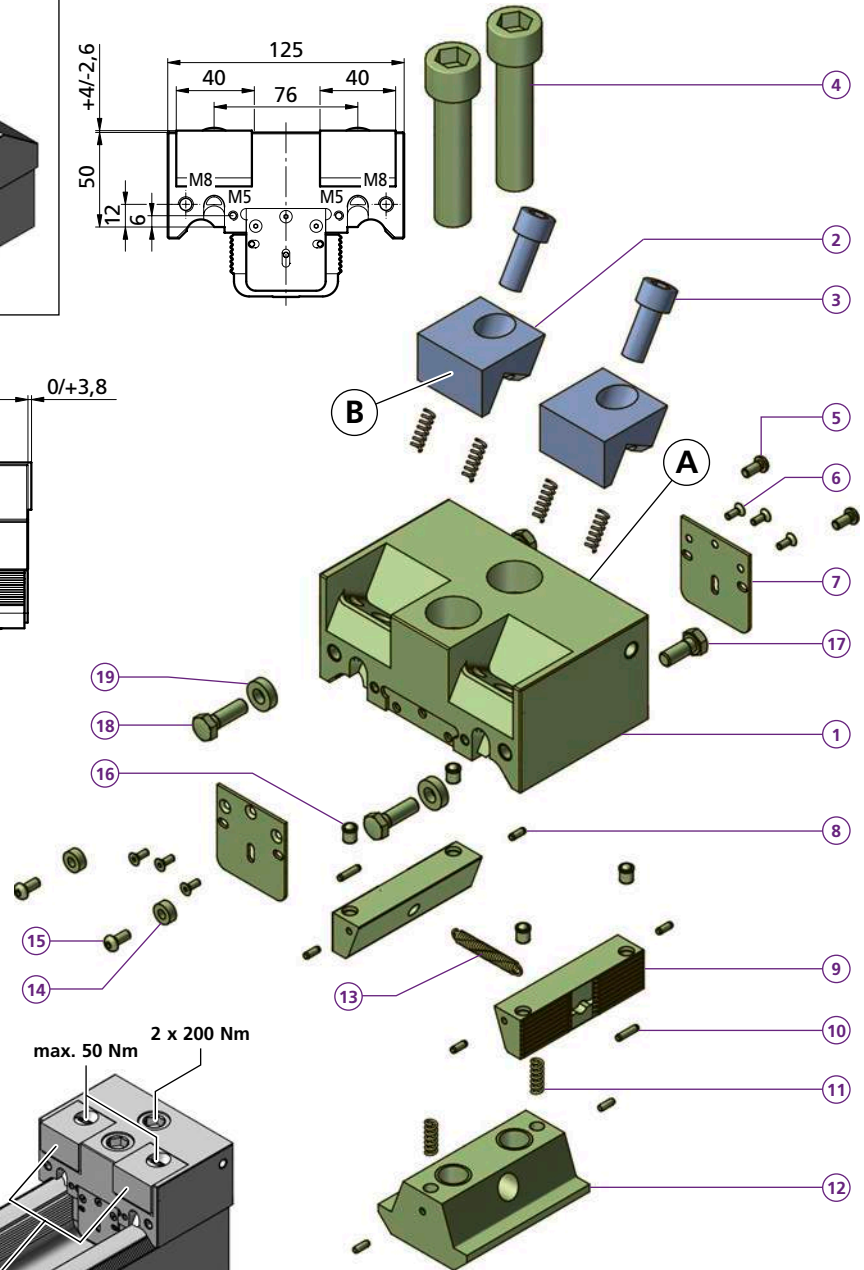
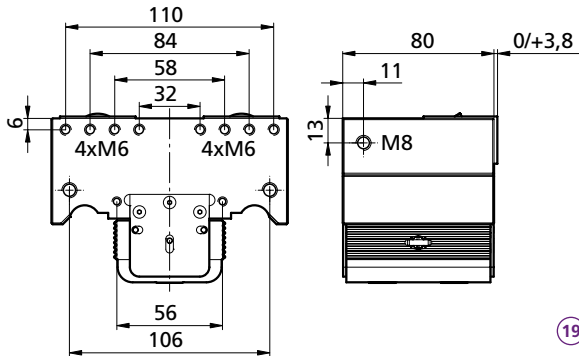
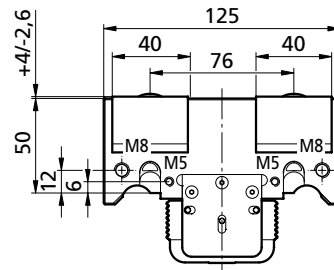
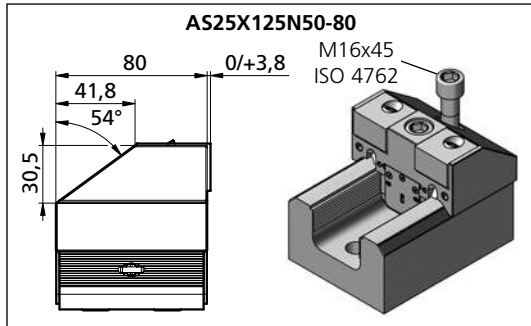
	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
e	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2	~0,2	~0,2	~0,28	~0,2	~0,2	~0,2	~0,24	~0,24



* = weich / soft

HM = Hartmetallbeschichtet / Carbide coated

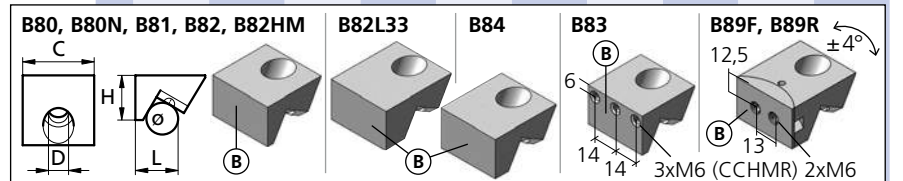
Separat bestellen / Order separately



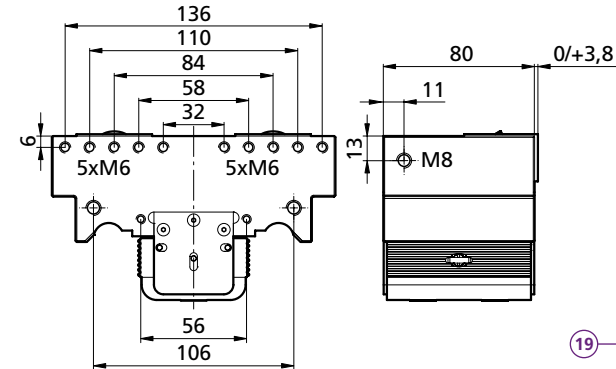
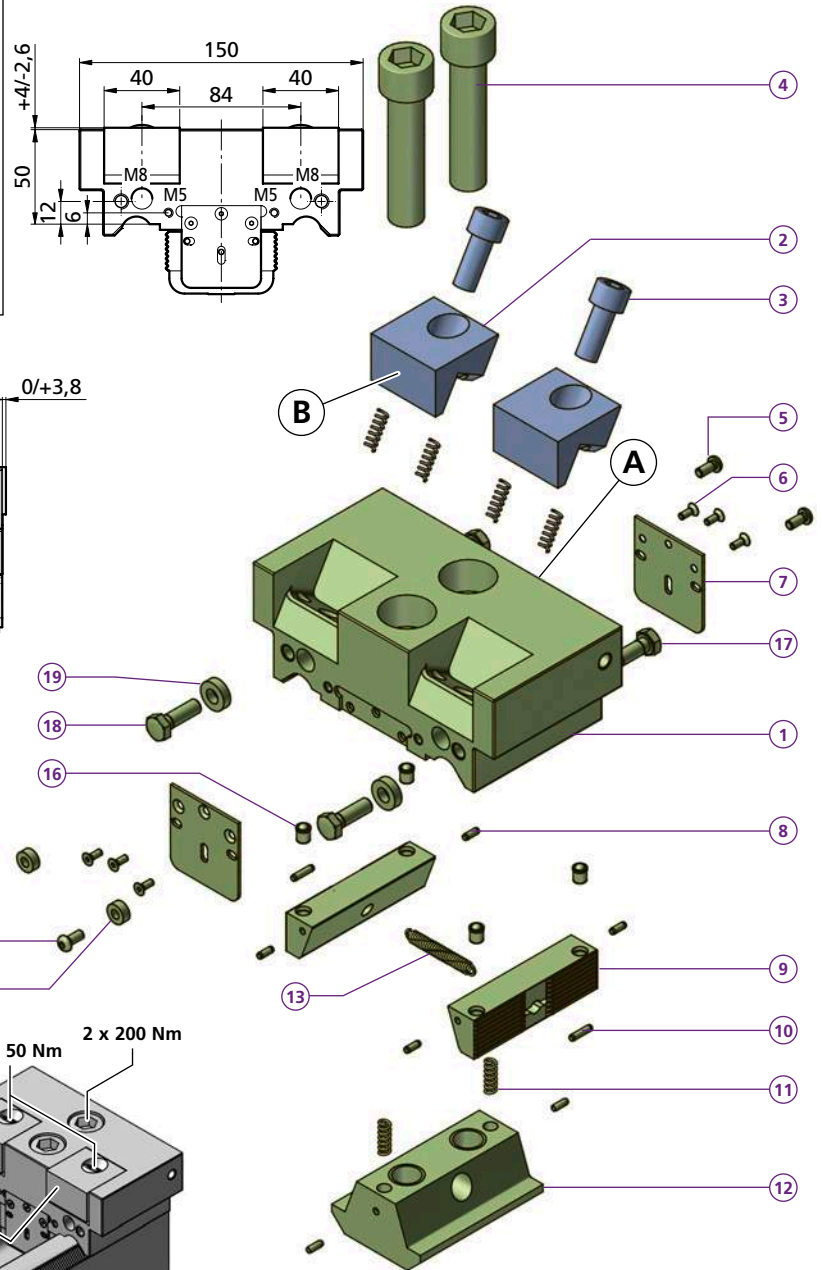
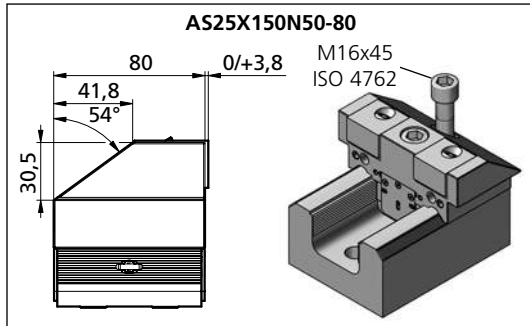
AS25X125N50-80	
1	1x TF140682
4	1x M16X45ISO4762
18	1x M16X70ISO4762
19	2x M8X20ISO4017
kg	~4,3
AS2F125N50-80	
1	1x TF140680
AS2R125N50-80	
1	1x TF140681
2	2x
3	2x M10X25ISO4762
4	2x M16X70ISO4762
5	2x M5X10ISO7380-1
6	6x M3X6DIN7991
7	2x ACBL4243
8	6x Ø 3x8 BN 879
9	2x ACSP7620
10	2x Ø 3h 8x12 ISO 2338
11	6x FED0618
12	1x ACD005
13	1x FED Ø 5,5x39
14	2x PCD005
15	2x M5X14ISO7380-1
16	4x Ø 6-Niro SM1275-3
17	2x M8X16ISO4017
18	2x M8X20ISO4017
19	2x ACD005
kg	~4,9

Bestellbeispiel / Ordering example: 1x AS2R125N50-80 & 2x B80

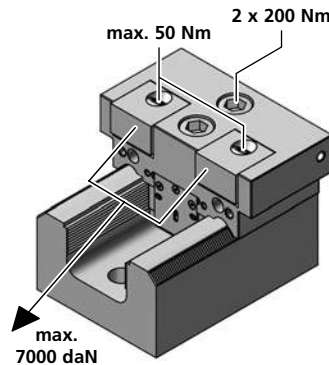
	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
e	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2	~0,2	~0,2	~0,28	~0,2	~0,2	~0,2	~0,24	~0,24



AS2R/F150N50-80 AS25X150N50-80

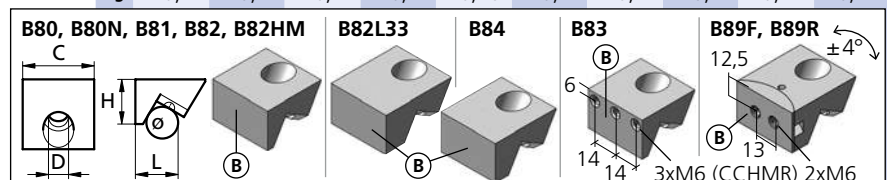


AS25X150N50-80	
1	1x TF140687
4	1x M16X45ISO4762
18	1x M16X70ISO4762
19	2x M8X20ISO4017
kg	~4,7
AS2F150N50-80	
1	1x TF140685
AS2R150N50-80	
1	1x TF140686
2	2x
3	2x M10X25ISO4762
4	2x M16X70ISO4762
5	2x M5X10ISO7380-1
6	6x M3X6DIN7991
7	2x ACBL4243
8	6x Ø 3x8 VSM 12785
9	2x ACSP7620
10	2x Ø 3h 8x12 ISO 2338
11	6x FED0618
12	1x ACSR7632M16
13	1x FED Ø 5,5x39
14	2x PCD005
15	2x M5X14ISO7380-1
16	4x Ø 6-Niro SM1275-3
17	2x M8X16ISO4017
18	2x M8X20ISO4017
19	2x ACD005
kg	~5,4



Bestellbeispiel / Ordering example: 1x AS2R150N50-80 & 2x B80

	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
e	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2	~0,2	~0,2	~0,28	~0,2	~0,2	~0,2	~0,24	~0,24



* = weich / soft

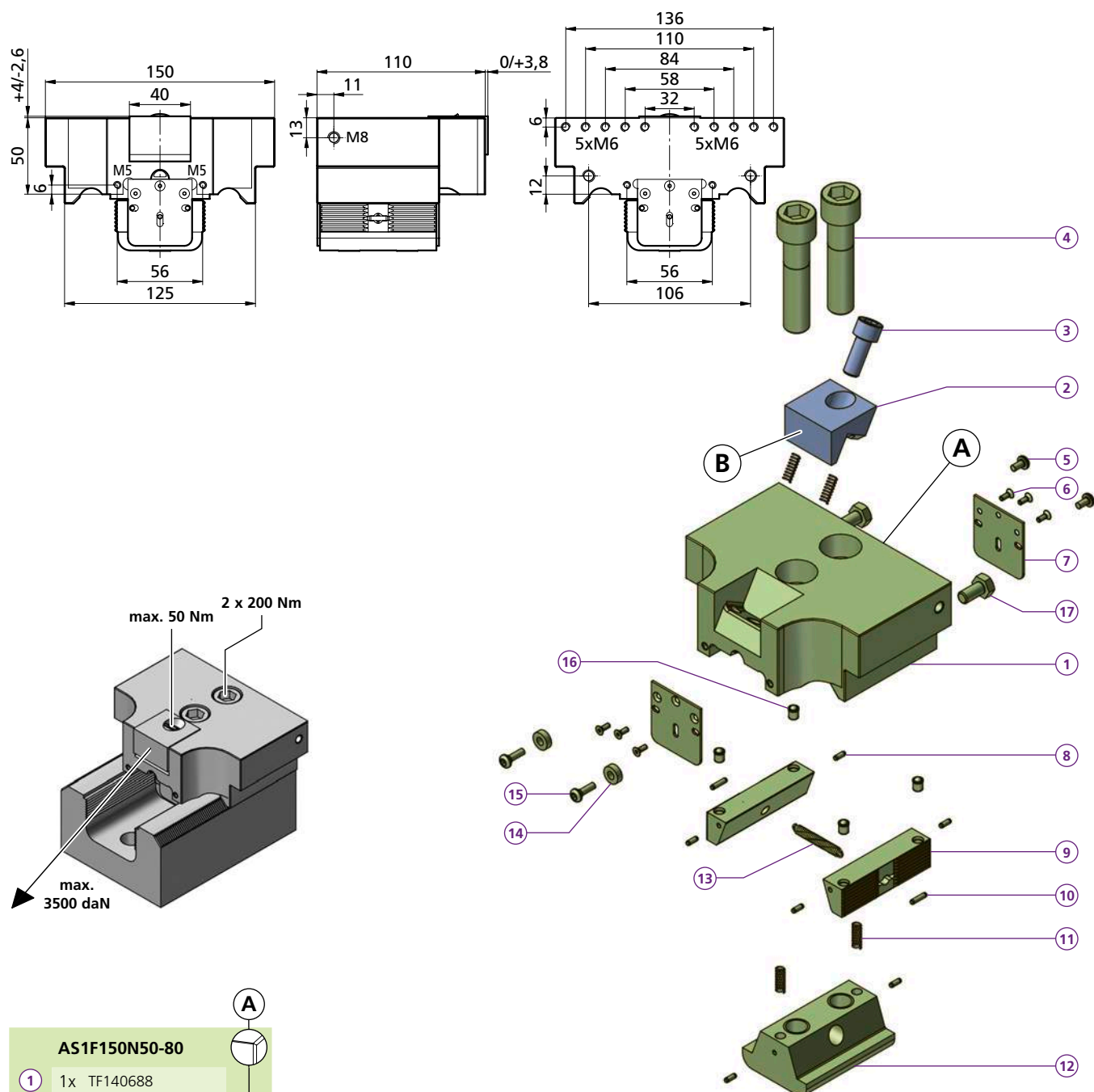
HM = Hartmetallbeschichtet / Carbide coated

Separat bestellen / Order separately



AS1R/F150N50-80

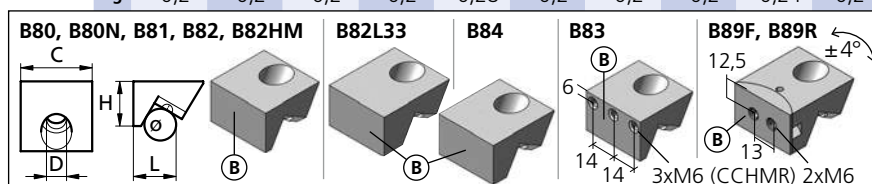
aptoCLAMP



AS1F150N50-80	
1	1x TF140688
AS1R150N50-80	
1	1x TF140689
2	2x
3	1x M10X25ISO4762
4	2x M16X70ISO4762
5	2x M5X10ISO7380-1
6	6x M3X6DIN7991
7	2x ACBL4243
8	6x Ø 3x8 VSM 12785
9	2x ACSP7620
10	2x Ø 3h 8x12 ISO 2338
11	4x FED0618
12	1x ACSK7632M16
13	1x FED Ø 5,5x39
14	2x PCD005
15	2x M5X14ISO7380-1
16	4x Ø 6-Niro SM1275-3
17	2x M8X16ISO4017
kg	~6,6

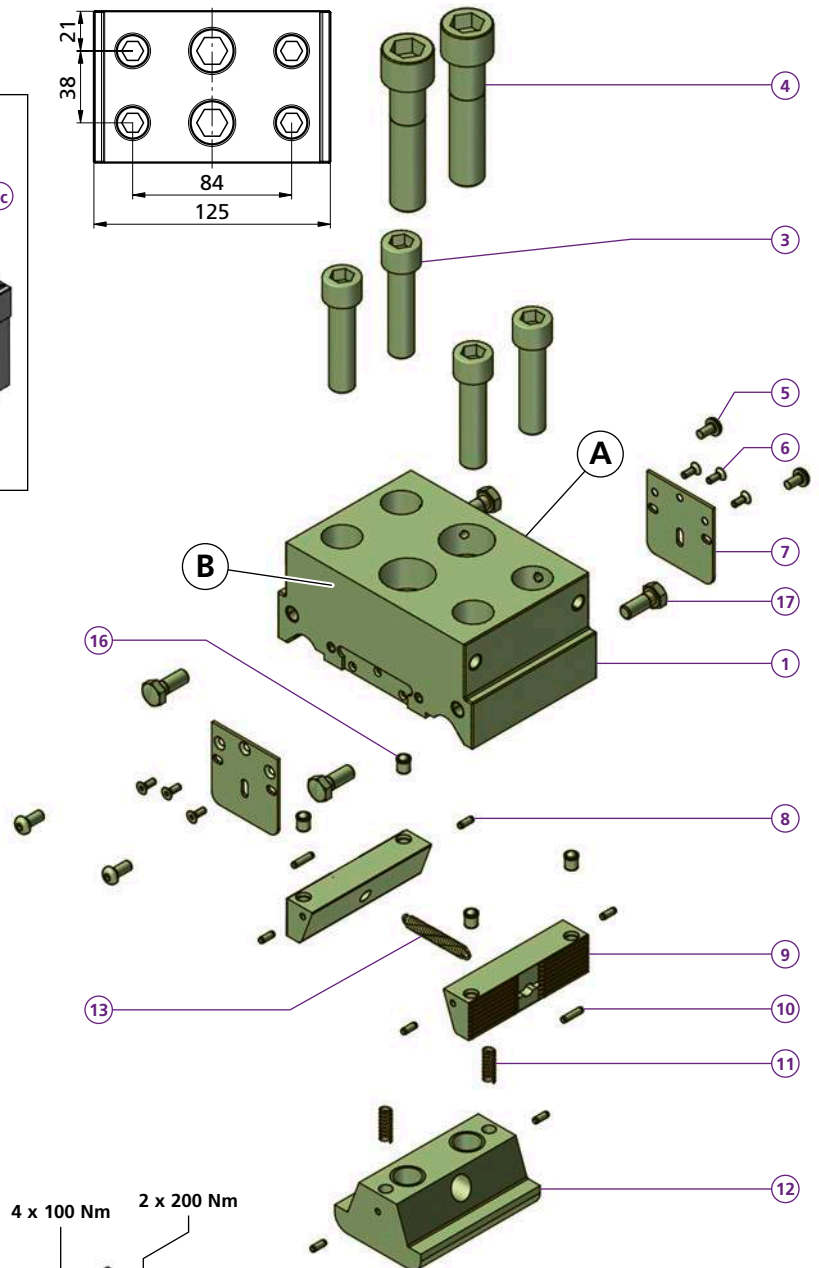
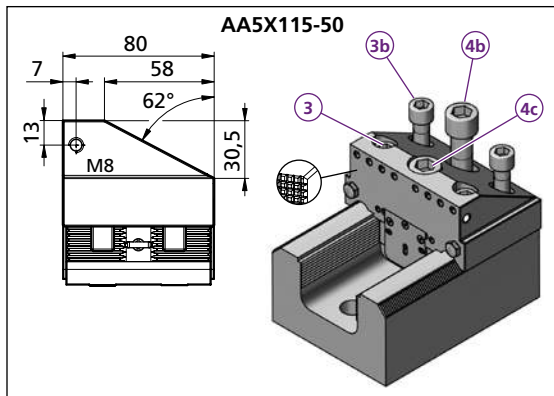
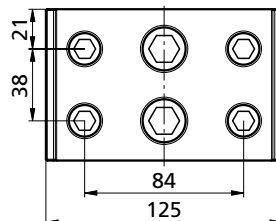
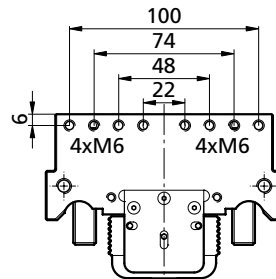
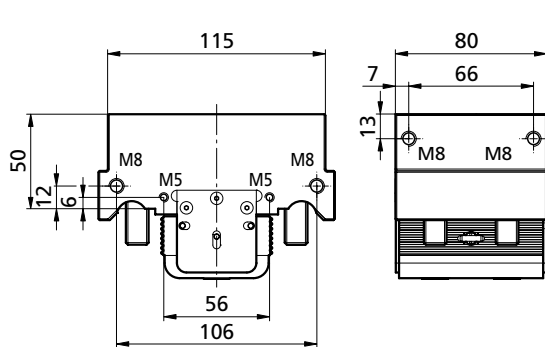
Bestellbeispiel / Ordering example: 1x AS1R150N50-80 & 1x B80

	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
e	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2	~0,2	~0,2	~0,28	~0,2	~0,2	~0,2	~0,24	~0,24



HM = Hartmetallbeschichtet / Carbide coated





AAND115-50

- 1x TF140690
- 4x M12X50ISO4762
- 2x M16X70ISO4762
- 4x M5X10ISO7380-1
- 6x M3X6DIN7991
- 2x ACBL4243
- 6x Ø 3x8 VSM 12785
- 2x ACSP7620
- 2x Ø 3h 8x12 ISO 2338
- 2x FED0618
- 1x ACSK7632M16
- 1x FED Ø 5,5x39

- 4x Ø 6-Niro SM1275-3
- 4x M8X16ISO4017

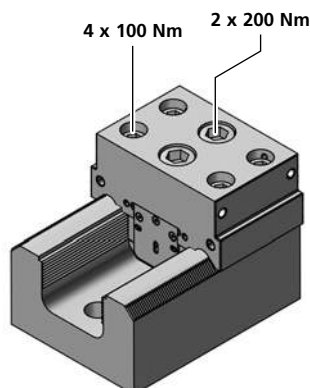
kg ~4,7

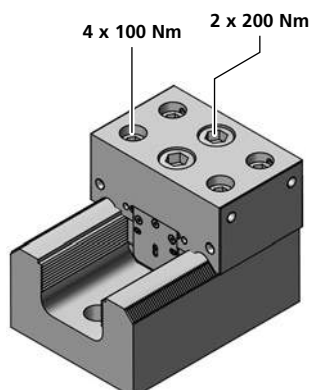
AA5X115-50

- 1x TF140691
- 2x M12X50ISO4762
- 2x M12X30ISO4762
- 1x M16X65ISO4762
- 1x M16X45ISO4762
- 2x M5X10ISO7380-1

- 2x M8X16ISO4017

kg ~4,6



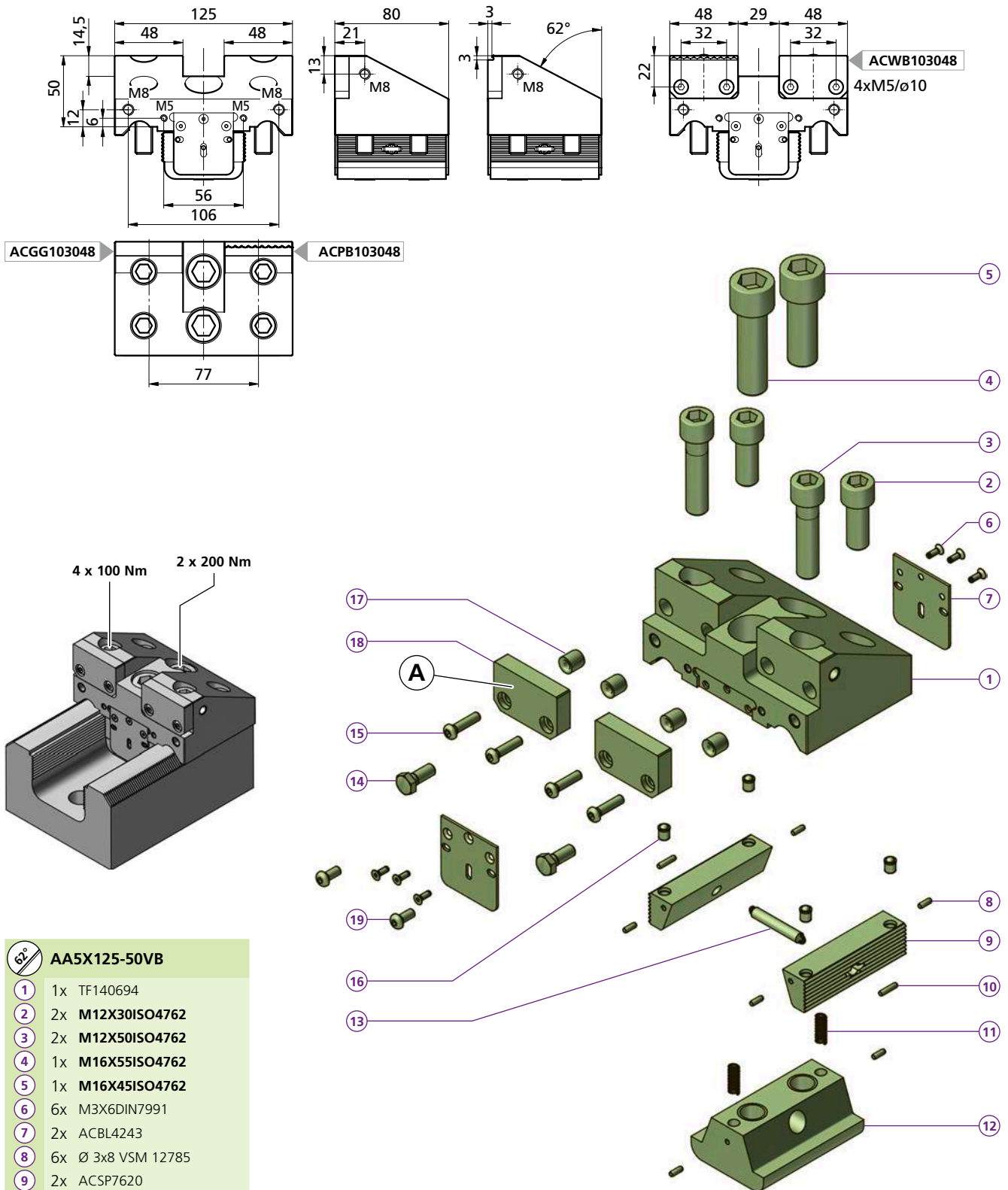






AA5X125-50VB

aptoCLAMP



AA5X125-50VB
1x TF140694
2x M12X30ISO4762
2x M12X50ISO4762
1x M16X55ISO4762
1x M16X45ISO4762
6x M3X6DIN7991
2x ACBL4243
6x Ø 3x8 VSM 12785
2x ACSP7620
2x Ø 3h 8x12 ISO 2338
2x FED0618
1x ACSV7632M16
1x FED Ø 5,5x39
2x M8X16ISO4017
4x M5X20ISO7380-1
4x Ø 6-Niro SM1275-3
4x 5,2x10x10 DIN179-A
2x M5X10ISO7380-1
kg ~4,5

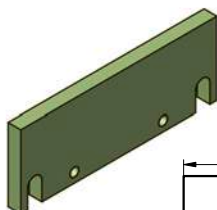
ACGGB103048	
*ACWB103048	
ACPB103048	
ACWB103048	
ACPB103048	

Bestellbeispiel / Ordering example:
1x AA5X125-50VB & 2x ACGGB103048

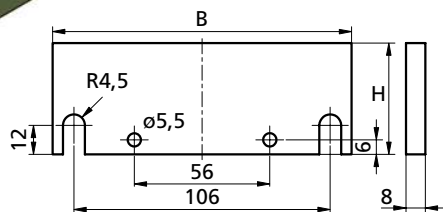
Separat bestellen / Order separately



Parallelunterlage
Steel parallels

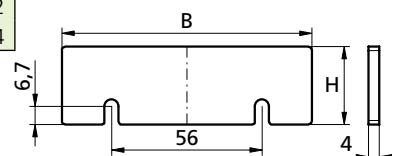


124mm	B	H	kg
ACU21124	124	21	~0,138
ACU36124	124	36	~0,250
ACU41124	124	41	~0,294
ACU46124	124	46	~0,328

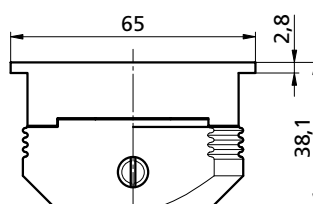
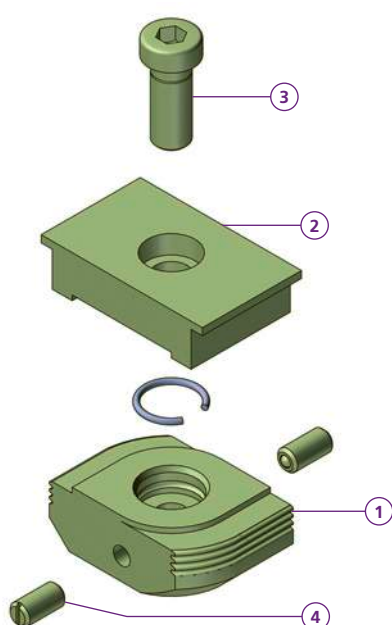


94mm	B	H	kg
PCU14093	93	14	~0,04
PCU20093	93	20	~0,06
PCU24093	93	24	~0,07
PCU29093	93	29	~0,09
PCU31093	93	31	~0,09
PCU34093	93	34	~0,10
PCU39093	93	39	~0,11
PCU44093	93	44	~0,12
PCU46093	93	46	~0,14

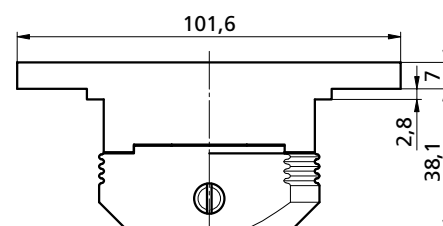
125mm	B	H	kg
PCU20124	124	20	~0,08
PCU24124	124	24	~0,09
PCU29124	124	29	~0,11
PCU31124	124	31	~0,12
PCU34124	124	34	~0,13
PCU39124	124	39	~0,15
PCU44124	124	44	~0,17



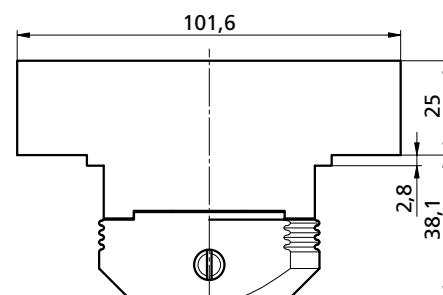
Universalnutenstein
Universal nut



ACES6540



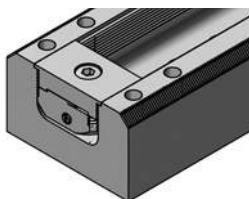
ACES10240H07



ACES10040H25W

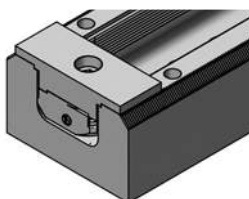
ACES6540

- ① 1x ACZS6540
 - ② 1x ACES6540
 - ③ 1x M12X30DIN7984
 - ④ 2x SM1275-1KSM8
- kg ~ 0,67



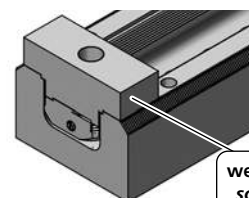
ACES10240H07

- ① 1x ACZS6540
 - ② 1x ACES10240H07
 - ③ 1x M12X30DIN7984
 - ④ 2x SM1275-1KSM8
- kg ~ 0,88

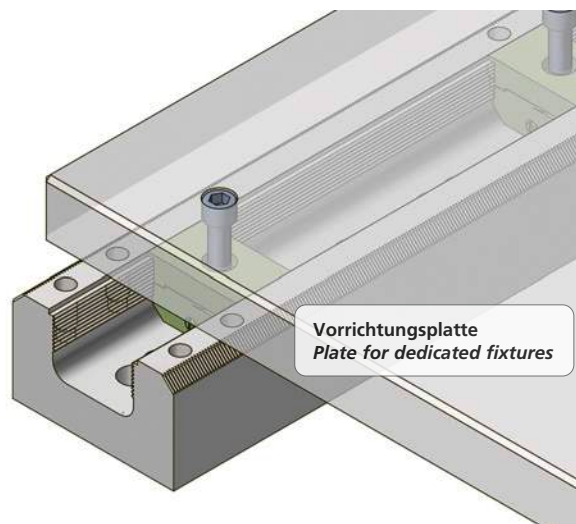


ACES10040H25W

- ① 1x ACZS6540
 - ② 1x ACES10040H25W
 - ③ 1x M12X30DIN7984
 - ④ 2x SM1275-1KSM8
- kg ~ 1,42



weich
soft 1.2312



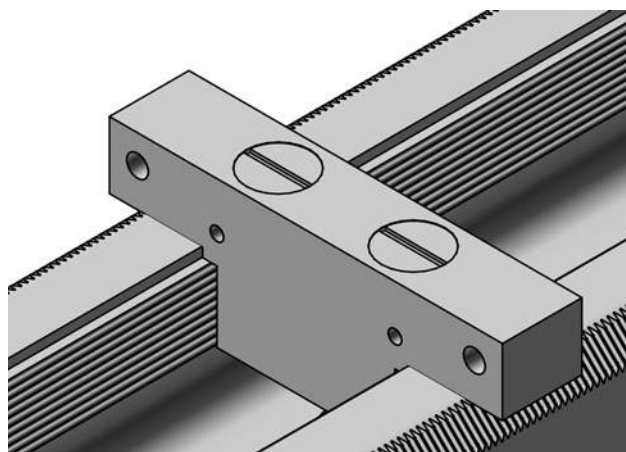
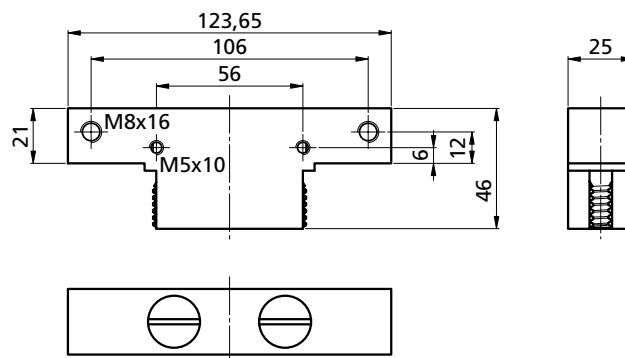
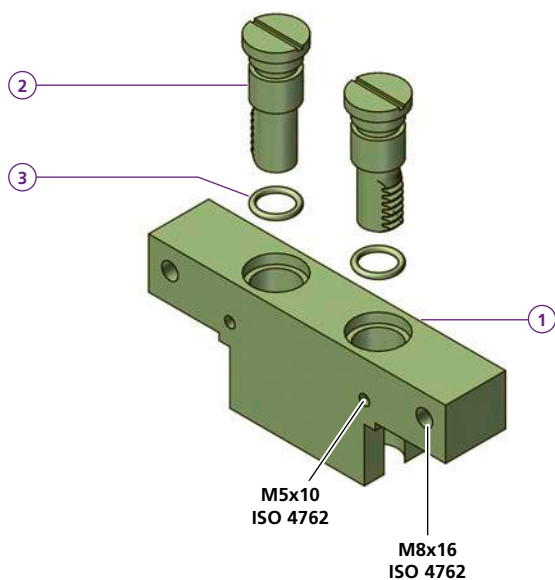
Bestellbeispiel / Ordering example: **ACES6540**

Universal - Unterlagenhalter

Universal holder for steel parallels



aptoCLAMP

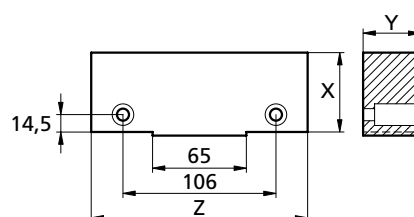
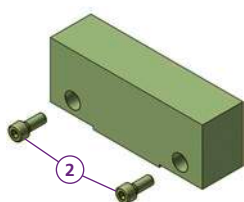


Bestellbeispiel / Ordering example: **ACUH21-124**

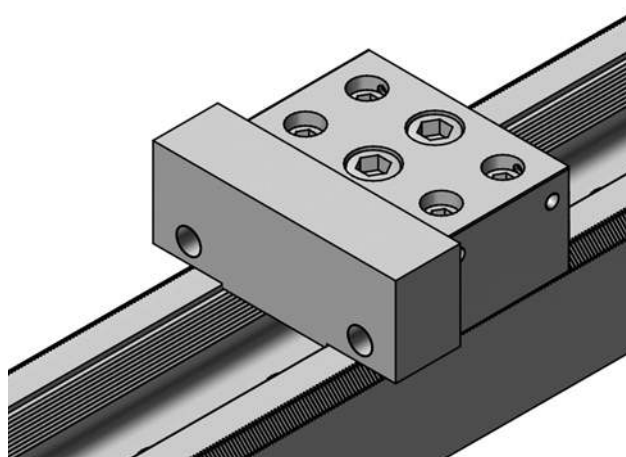
ACUH21-124

- ① 1x TW090086-02
 - ② 2x ACBS1646
 - ③ 2x OR Ø 12X2
- kg ~ 0,74

weiche Backe soft jaw



		X	Y	Z	kg
AC1505520W	②	55	20	150	~ 1,28
AC1505540W	M8X20ISO4762	55	40	150	~ 2,55



Bestellbeispiel / Ordering example: **AC1505520W**

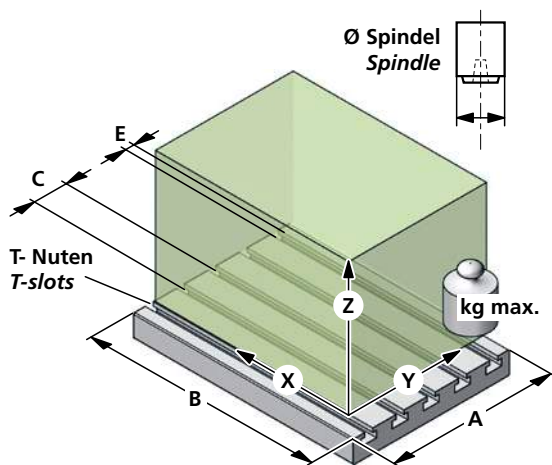
Maschinenplan für Angebot

Machines plan for offer

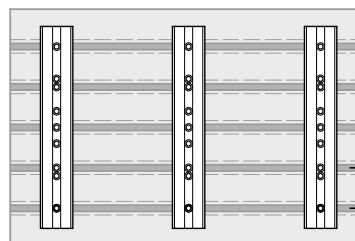
VERTICAL

Kunde Customer			
Maschine Machine		Werkstoff, Halbzeug, Rohteil-Nr., Modell- oder Gesenk-Nr. Raw material, blank or casting-Nr.	
X	Verfahrweg Traverse		mm
Y	Verfahrweg Traverse		mm
Z	Verfahrweg Traverse		mm
Z min.	kleinster Abstand von der Tischoberfläche zur Spindelnase smallest distance from table surface to spindle gauge line		mm
Z max.	grösster Abstand von der Tischoberfläche zur Spindelnase greatest distance from table surface to spindle gauge line		mm
Ø Spindel Spindle	Spindeldurchmesser Spindle diameter		mm
kg max.	Maximale Tischbelastung Maximum loading capacity		kg
A x B	Tischgrösse Size of the table		mm
E	T-Nuten Grösse T-slots size		mm
C	T-Nuten Abstand T-slots distance		mm
Rasterplatte Grid plate	H Raster Abstand Grid distance	mm	G Gewinde & Passungsdurchmesser Ø Thread & Precision Bohre
Anzahl Werkstücke pro Los Number of workpieces per lot			Stück Pieces

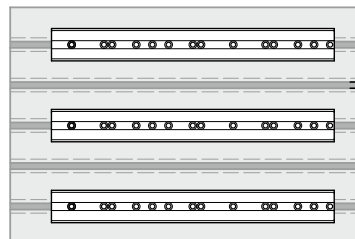
Maximal mögliche Bearbeitungsgrösse



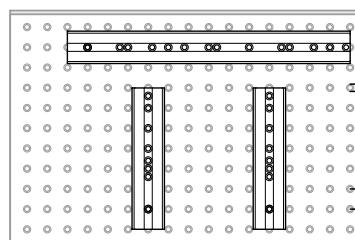
Montage der PC-Basisschiene auf dem Maschinentisch Assembly of the PC base-rail on the machine table



- 1**
Positionierung der
Basisschiene quer zur Nute
Positioning of the base-rail
crosswise to the nut

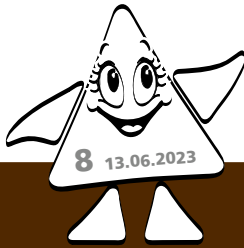
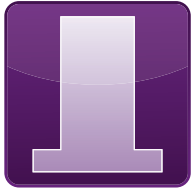


- 2**
Positionierung der
Basisschiene längs zur Nute
Positioning of the base-rail
lengthwise to the nut

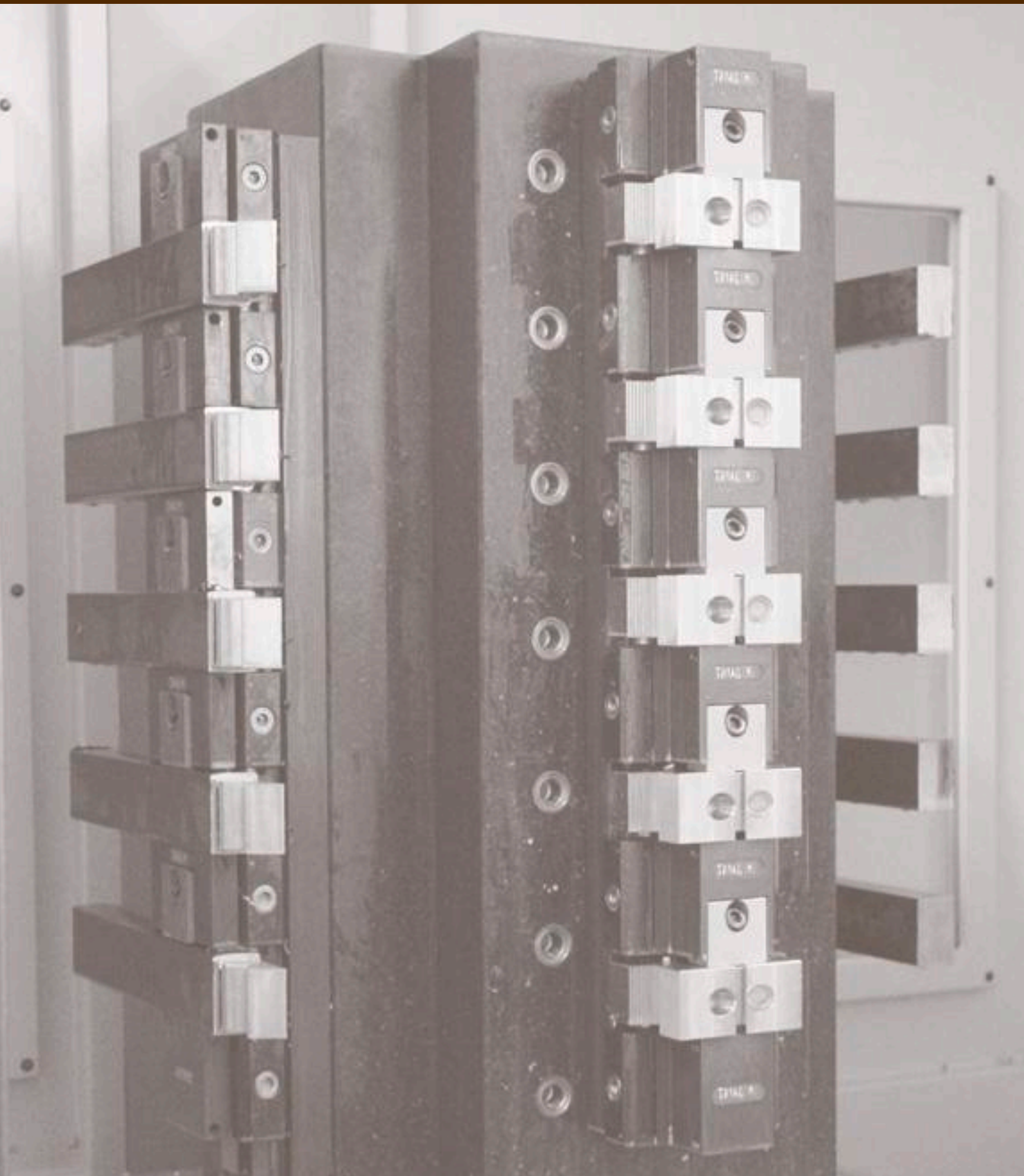


- 3**
Positionierung der
Basisschiene auf einer
Rasterplatte
Positioning of the base-rail
on a grid plate

Bitte Werkstückzeichnung beilegen und Bearbeitungsfolge markieren
Enclose drawing of workpiece and mark processing sequence, please



***tripoxy*MINERAL**





Einleitung | *Introduction* 238 - 243

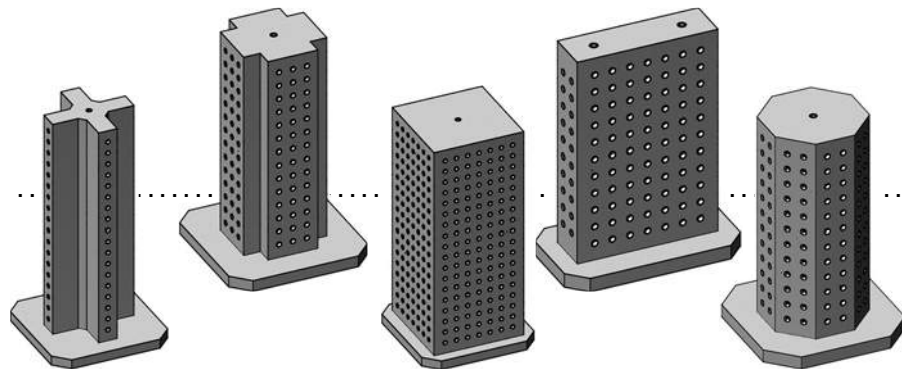


Bedienungsanleitung | *Operating manual* 244

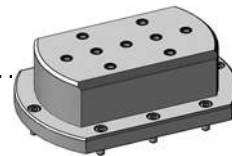
Reparaturanleitung für Mineralguss | *How to repair epoxy mineral casting* 245

Anwendungsbeispiele | *Examples of application* 247 - 248

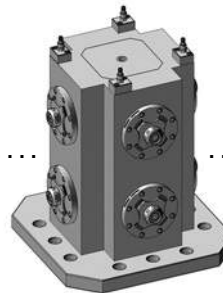
Mineralguss | *Epoxy mineral* 251 - 270



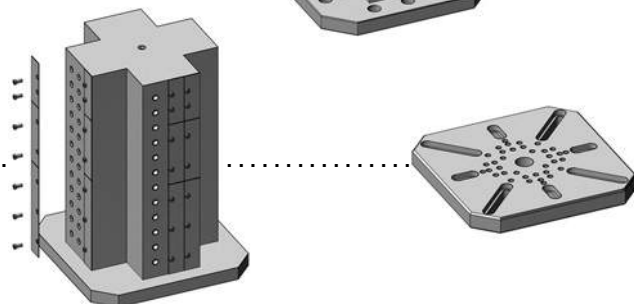
Mineralgusserhöhung für 5-Achsenmaschinen
Epoxy casting raises blocks for 5-axis machines 271



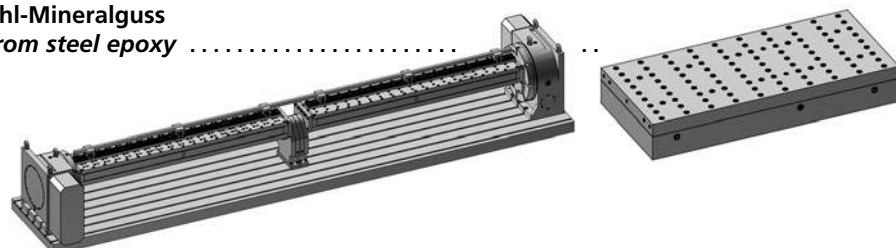
Stahl Mineralguss | *Steel epoxy mineral tombstones* 272 - 273



Zubehör | *Accessories* 274 - 275



Stahl Mineralgusserhöhungen mit integriertem Vakuum Anschluss / *Steel-epoxy raises block with integrated vacuum*
Balken und Würfel aus Stahl-Mineralguss
Trunion and cubes made from steel epoxy 277





tripoxyMINERAL

Es ist ein versprechen!
Unsere Mineralgusstürme stehen gerade!

It's a promise!
Our epoxy tomb stones stand upright!



Maschinenschonend und leicht, in fast allen Formen herstellbar

Bei den immer schneller werdenden Horizontalbearbeitungszentren ist Gewichtsreduktion der Zuladung ein wichtiger Faktor. Unsere Spanntürme aus Mineralguss haben ein kleineres spezifisches Gewicht als Alu.

Zudem werden Vibrationen derart reduziert, dass auch bei einer Bearbeitung im oberen Turmbereich präzise bearbeitet werden kann. In gewissen Fällen, z.B. bei Werkstückspannungen (ohne Basisschienen) direkt auf den Turm, kann auch ein stahlummantelter Mineralgussturm eine Ergänzung sein.

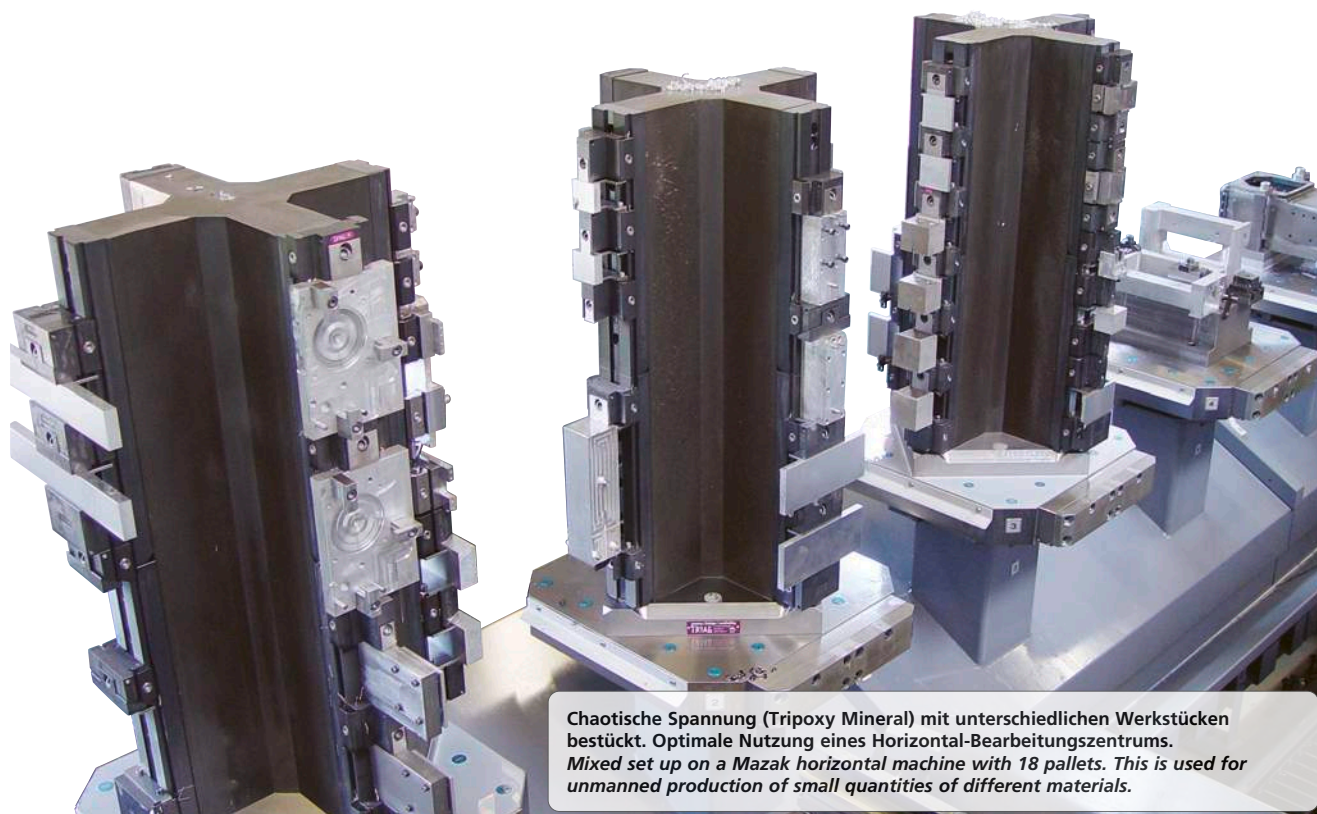
Reduces machine wear due to low specific weight - can be produced in all sorts of shapes

As the rapid traverse on modern horizontal machining centres is constantly increasing, the weight of the payload becomes obviously an important point. Our tombstones made of epoxy mineral casting are lighter in their specific weight than aluminium.

In addition, vibrations are greatly reduced in a way that even in the upper end of the tombstone high accuracy is guaranteed. In certain cases, as for instance when the fixture is designed without the base rail, that means directly mounted on the cube, the tombstone can be improved by a steel jacket.

- Leicht und stabil
- Vibrationsdämpfung 10 x besser als Grauguss und 100 x besser als Alu!
- Spezifisches Gewicht leichter als Aluminium
- Seitenflächen geschliffen mit Bohrungen (M12 / 12F7)
- Grundplatten nach Maschinenspezifikation
- Andere Formen auf Anfrage

- *Lightweight and rigid*
- *Damping effect 10 x better than cast iron 100 x better than alu!*
- *Specific weight lighter than aluminum*
- *Faces ground, hardened bushings (M12/12F7)*
- *Base plate made to machine specifications*
- *Other dimensions on request*



Chaotische Spannung (Tripoxy Mineral) mit unterschiedlichen Werkstücken bestückt. Optimale Nutzung eines Horizontal-Bearbeitungszentrums.
Mixed set up on a Mazak horizontal machine with 18 pallets. This is used for unmanned production of small quantities of different materials.

Mineralguss (auch Polymerbeton genannt) ist ein Kunststein, bestehend aus Quarzkies, Quarzsand und Gesteinsmehl. Als Binder dient ein hochwertiges Epoxidharz. Das gemischte Material wird in Giessformen gefüllt.

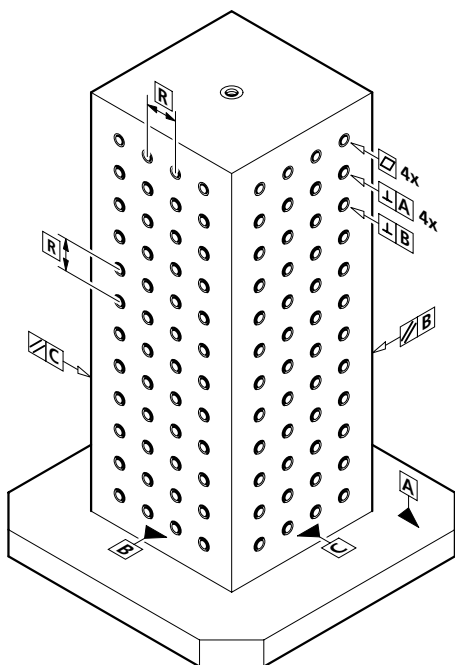
Während dem Giessprozess wird die Form, mittels Vibrations-tisch ständig vibriert, was zur Verdichtung und Entlüftung der Giessmasse führt. Das spezifische Gewicht ist mit 2,4 kg / dm³ geringer als das von Aluminium und die Vibrationsdämpfung ist 10 mal besser als bei Grauguss, 100 mal besser als Aluminium. Neben den guten Dämpfungseigenschaften ist auch die Temperaturstabilität (geringe Wärmeleitfähigkeit und hohe Wärmekapazität) zu erwähnen.

Das Material ist ausserdem chemisch beständig gegen Öle, Laugen, Säuren und die üblichen Kühlschmierstoffe. Im ausgegossenen Zustand sind die Türme «Umweltneutral».

Mineral casting (also called polymer concrete) is a stone composed of quartz gravel, silica sand and crushed rock. The binder is a high quality epoxy resin. The mixed material is filled into molds.

During the casting process, the form, constantly vibrating. Is resulting in the compaction and extraction of the casting mass. The specific weight is 2,4 kg / dm³ is lower than that of aluminum, and the vibration attenuation is 10 times better than that of cast iron 100 times better than alu. Besides the good damping properties, the temperature stability is to be mentioned (low thermal conductivity and high heat capacity).

The material is also chemically resistant to oils, alkalis, acids and the usual cooling lubricants.



Eigenschaften Caractéristiques	Mineral- guss Epoxy mineral	GG20	hochfestes Alu high density Alu
Dichte / Density [kg/dm ³]	ca. 2,4	ca. 7,1-7,3	ca. 2,76
Logarithmisches Dekrement grösser als (Vibrationsdämpfung) Logarithmic Decrement (damping)	0,035	0,004	0,0004
Längenausdehnungs-koeffizient Coefficient of linear expansion [1/K]	ca. 12x10 ⁻⁶	ca. 10x10 ⁻⁶	ca. 23x10 ⁻⁶
Zugfestigkeit / Tensile strength [N/mm ²]	15 - 20	200 - 400	470 - 520
Wärmeleitfähigkeit Thermal conductivity [W/mK]	ca. 2	ca. 50	ca. 140

Lagetoleranz der Rasterbohrungen Positioning tolerance of the holes		0 - 500 mm ± 0,01 501 - 1000 mm ± 0,02
Ebenheit Flatness		0,01 mm / 300 mm
Parallelität Parallelism		0,01 mm / 300 mm
Winkligkeit Deviation of angle		0,01 mm / 200 mm

Mineralguss wird unter anderem für folgende Anwendungen eingesetzt: Cast mineral is among other things the following Applications used:

- ➔ Maschinenbetten
Machine beds
- ➔ Maschinenstände und -portale
Machine column and portals
- ➔ Als Alternative zu Grauguss (Kosten, Umweltfreundlichkeit)
As an alternative to cast iron (cost, environmental friendliness)
- ➔ Als Alternative zu Schweisskonstruktionen
As an alternative to welded constructions
- ➔ Als Alternative zu Natursteinanwendungen (z.B. Messtische, Reinraumtechnologie)
As an alternative to natural stone applications (eg, measuring tables, clean room technology)
- ➔ Generell steifigkeits- und festigkeitsdimensionierte Strukturbauteile
General stiffness and strength-scale structural components
- ➔ Integrierte Funktionalität möglich (Schläuche, Ventile, Elektrik, Lastanker etc.), auch nachträgliches Eingiessen möglich
Integrated functionality possible (hoses, valves, electrical, anchor load, etc.), and subsequent pouring possible
- ➔ Füllung von Mineralguss in Blechmantelkonstruktionen (z.B. unsere Stahl-Mineralguss-Basissschienen)
Filling of mineral cast in metal shell constructions (eg, our steel rails with epoxy mineral cast base)

tripoxyMINERAL



Die Gewichtsreduktion der Zuladung ist bei den immer schneller werdenden Horizontalbearbeitungszentren ein wichtiger Faktor. Die Spanntürme aus Mineralguss haben ein kleineres spezifisches Gewicht als Aluminium. Diese verfügen über eine so hohe Vibrationsdämpfung, dass dadurch im oberen Bereich der Türme sehr präzise gearbeitet werden kann und dabei exzellente Oberflächengüten erreicht werden.

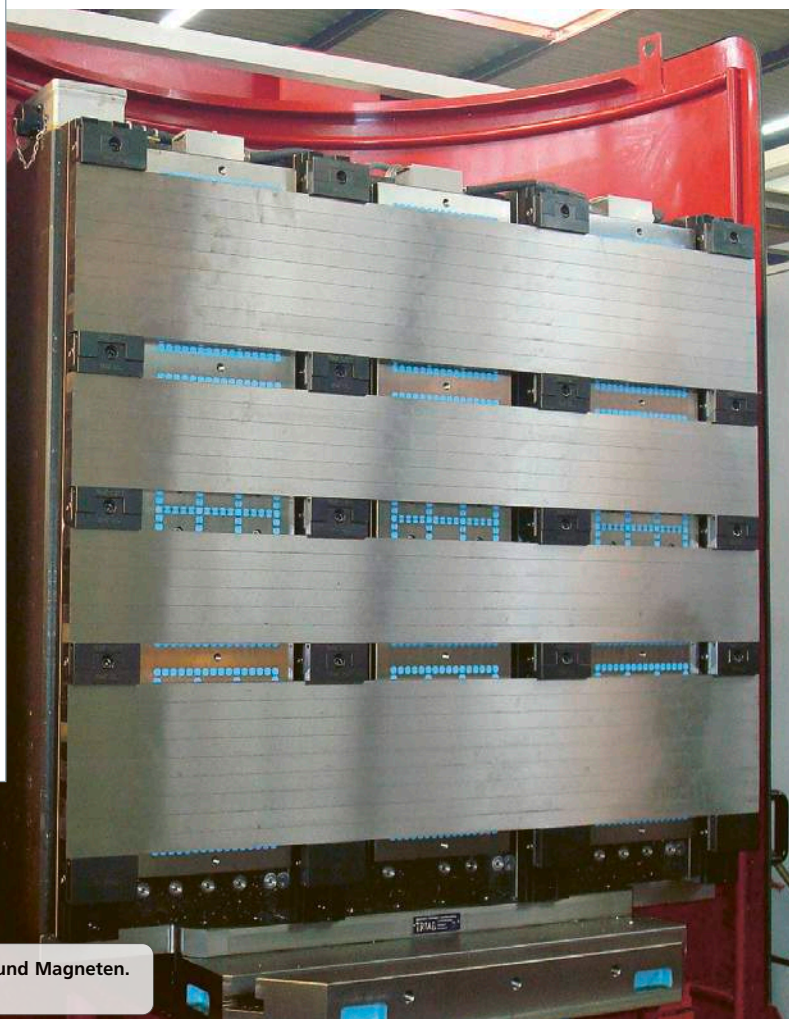
Seit Jahren bietet die Triag International AG aus eigener Produktion mit den Tripoxy Mineral-Spanntürmen eine sehr gute Alternative zu Spanntürmen aus anderen Materialien (z.B. Grauguss- oder Aluminium) an.

The weight reduction of the load is an important factor in the increasingly rapid horizontal machining centers. The tombstones of mineral casting have a lower specific weight than aluminum. Another big advantage is the vibration clamping which helps to achieve excellent surfaces on your workpieces, even on top of your tombstone. Beside that there are another two good reasons for epoxy mineral tombstones. One is the materials is not getting rusty and the slow thermal expansion.

For years, the Triag International AG offers its own production with the Tripoxy mineral tombstones, a very good alternative to tombstones made of other materials (such as cast iron or aluminum) to.

Mineralgusstürme samt Spannsystem aus einer Hand!

Epoxy mineral tombstones including clamping system from one source!



Mineralgussturm kombiniert bestückt mit Power Clamp und Magneten.
Epoxy cube equipped with magnet and Power Clamp



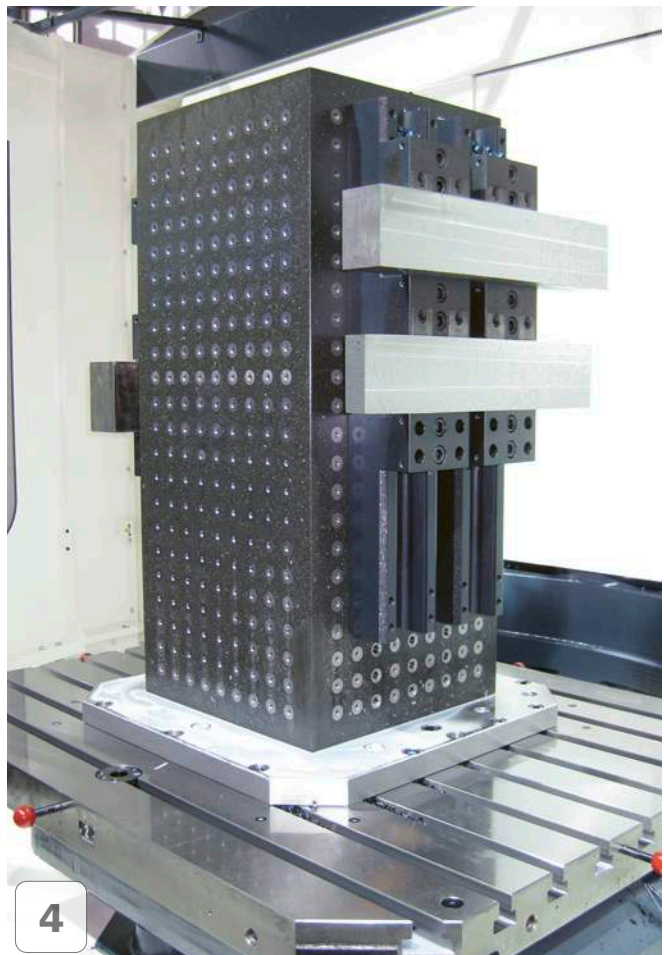
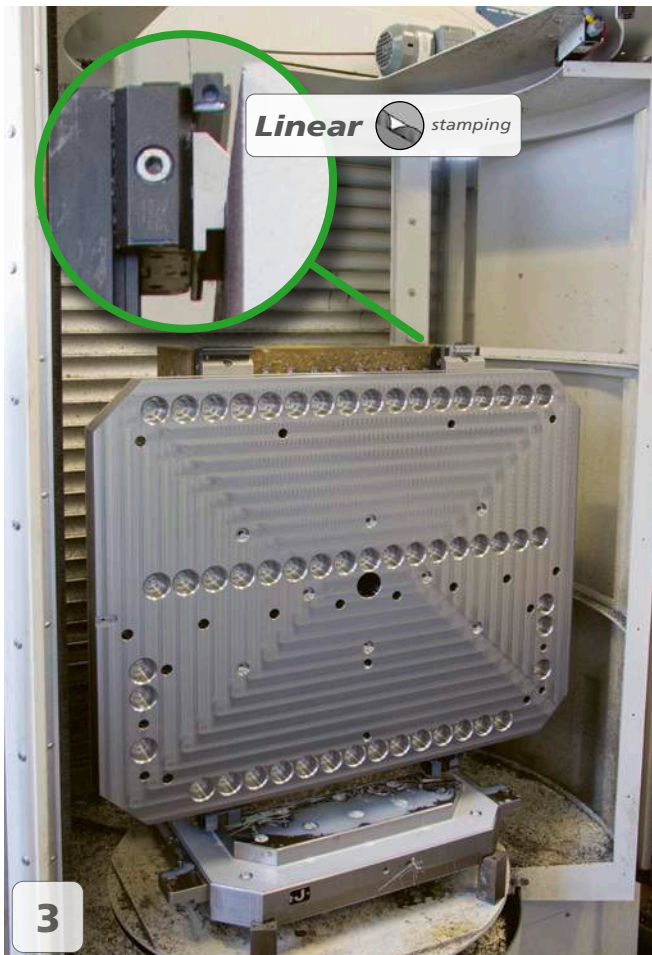
Grosse Platte auf einem rechteckigen Mineralgussturm.
Large plates on epoxy tombstone.



Chaotische Fertigung auf einem Mineralgussturm in Kreuzform.
Mixed set up on cross epoxy tombstone.



Spezielle Vorrichtung mit Micro Clamp Modulen auf einem Mineralgussturm.
Dedicated fixture on epoxy tombstone



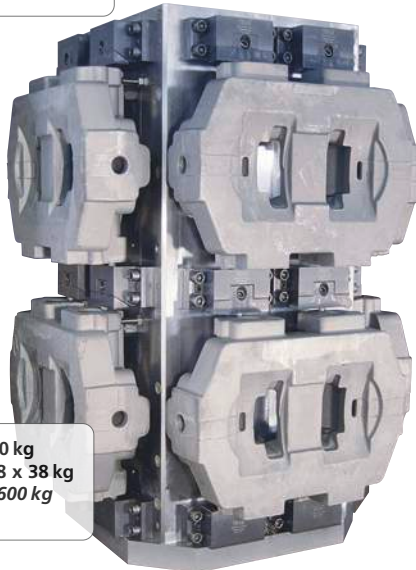
Stahl-Mineralguss seit 2004 - das ideale Material für Spanntürme

Die Firma Triag International AG hat seit 2004 diese stahlummantelten Türme mit sehr guten Ergebnissen bei Kunden im Einsatz. In den meisten Fällen können optimale Lösungen durch Standardangebote kostengünstig und modular eingerichtet werden.

Stahl-Mineralguss für die perfekte Vibrationsdämpfung
Steel epoxy tombstone for perfect vibration dampening

Max. Palettenzuladung auf Mazak H BZ
Max pallet load on this Mazak application
= 600kg H = 800

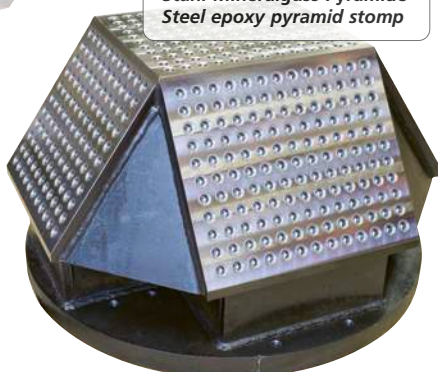
Komplettes Gewicht 600 kg inkl. Werkstücke WS = 8 x 38 kg
Complete load weighs 600 kg incl-parts



Stahl-Mineralguss Dreieck-Turm
Steel epoxy triangle cube



Stahl-Mineralguss Pyramide
Steel epoxy pyramid stomp



Steel-epoxy combinations since 2004 - the ideal material for tombstones and ricer cubes

Triag International AG customers are employing successfully tombstones with steel jackets since 2004. In most cases optimal solutions can be found with standard Triag clamping devices.



Es gibt eine Vielzahl von Standardformen

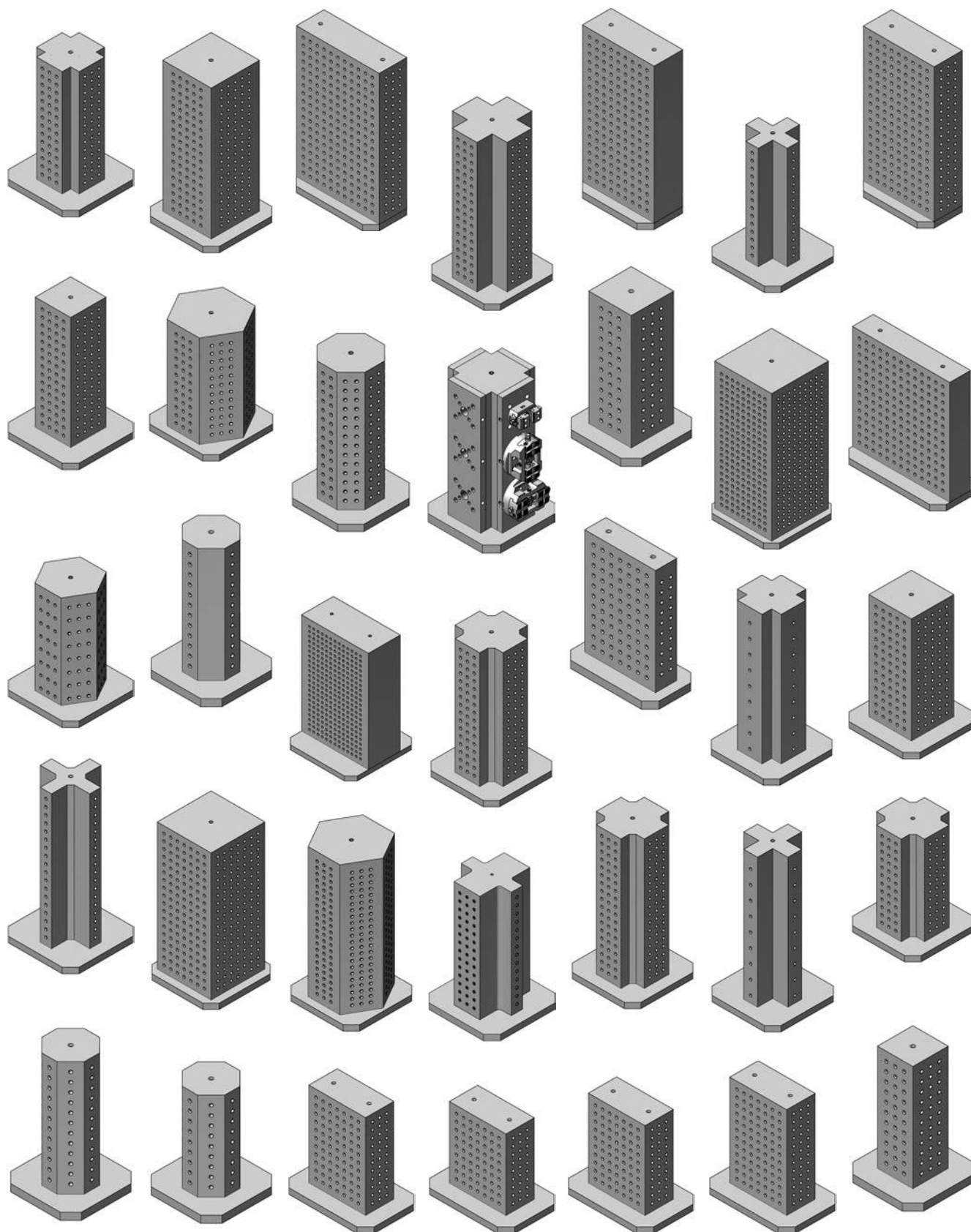
There are a variety of standard forms



tripoxymINERAL

Die Mineralgusstürme können in fast allen Formen hergestellt werden.

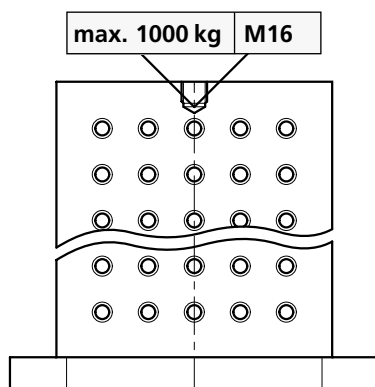
The epoxy mineral tombstones can be manufactured in almost any shape.

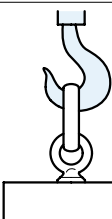
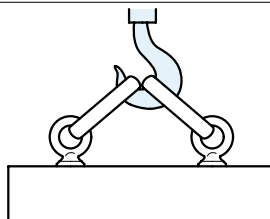


Andere Größen, Formen und Raster, welche nicht im Katalog sind, können nach Kundenwunsch produziert werden.
Other sizes, forms and grid which are not in the catalogue can be produced on customer's request.

ACHTUNG / CAUTION

Bevor Mineralgusstürme eingesetzt werden, beachten Sie bitte die folgenden Punkte! *Prior to inserting the tombstones please note the following points!*



Höchstlast des angehängten Stücks / Maximum load of the affixed piece		
Drahtseil Steel rope	Bei fest angezogener Schraube For tightened screw	Bei zwei Schrauben insgesamt For two tightened screws
		
MRD 12 = 500 kg MRD 16 = 1000 kg	M12 = 340 kg M16 = 700 kg (DIN 580)	M12 = 240 kg M16 = 500 kg (DIN 580)

Bitte beachten Sie, dass die meisten Ringschrauben eine maximale Last haben von: **M12: 340 kg / M16: 700 kg** auch muss die Ringschraube bis zum Anschlag eingedreht sein!

*Please note that most of the lifting screws have a maximum load of: **M12: 340 kg / M16: 700 kg** It is also important that the lifting screw is driven into the socket!*

Oberflächenabnutzung

Durch schnelle, auf die Turmoberfläche schlagende Späne, sowie durch Hochdruckkühlung, die direkt auf den Turm spritzt, kann die Oberfläche des Mineralgussturmes beschädigt werden!

Surface wear

The surface of the tombstone can be seriously damaged by chips hitting the tombstone quickly as well as by high pressure cooling water splashing directly onto the tombstone!

Massnahmen:

Dort wo lange Späne oder auch kurze abrasive Späne auf den Turm schlagen, Abdeckbleche benutzen!
(Abdeckbleche siehe Seite 244)

Measure:

*Use cover sheets wherever long or short abrasive chips hit the tombstone!
(Cover sheets page 244)*

Achtung Grenzfälle

Folgende Anwendungen können nur bedingt eingesetzt werden, da eine einzelne Schraube auf Zug ohne Gegenlast die eingegossene Buchse belastet!

Attention, limited application

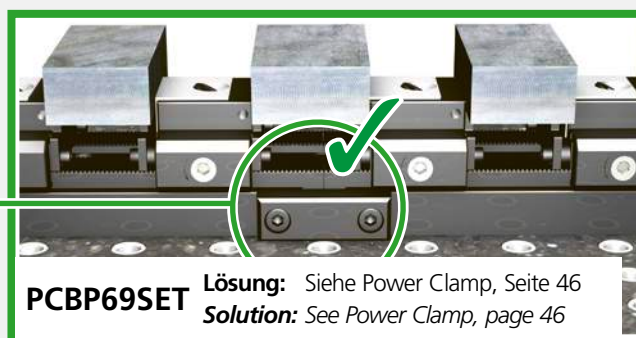
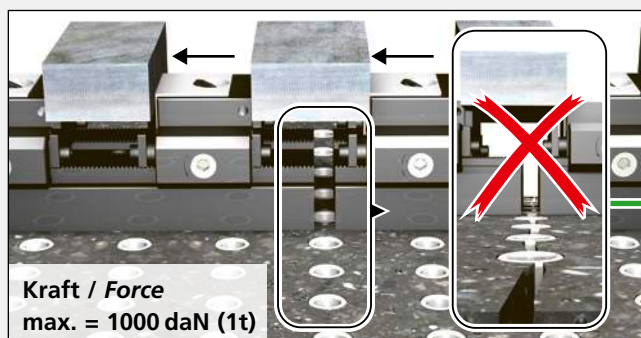
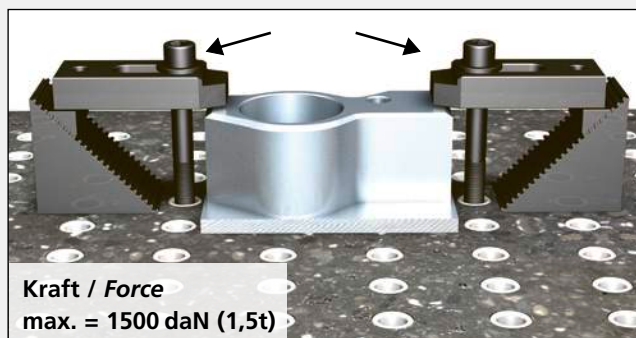
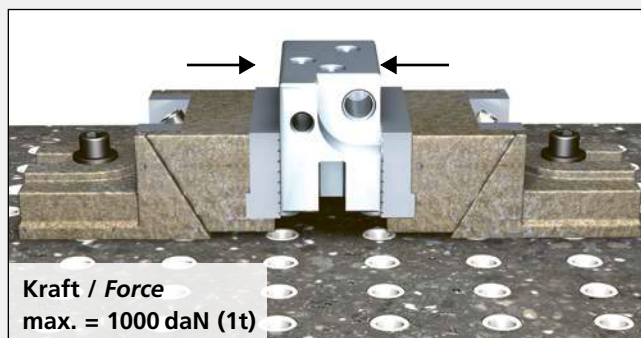
The following applications only have limited use as a single screw without a counterweight puts tremendous tension on the integral socket!



STOP
nicht empfohlen
not recommended

Max. Anzugsmomente beachten.

Note max. starting torques.





Bruchstelle

Bruchstelle des Mineralgussturmes mit Aceton reinigen, danach mit Metallplatte und Schraubzwinge einschalen. Bei grossen Reparaturen sollte die Platte zusätzlich mit Hartwachs (Bild 6) eingerieben, poliert und nachträglich mit Silikon abgedichtet werden. (Siehe Bilder 1-4)

Point of rupture

Clean the section of fracture with Acetone, then press metal plates with screw clamps onto the point of damage. If the damage is a major one the metal plates must be waxed first (picture No. 6) and sealed with Silicon if necessary (pls. note pictures 1 to 4)

Mineralgussreparaturset (Bild 5)

MREP-SET 0300 ~ 300 gr = ~ 2 dl

Das Reparaturset setzt sich aus dem Harz, Härter und Füller zusammen. Das Mischverhältnis ist: auf 27 gr Härter kommt 100 gr Harz und 150 gr Füller.

Repair kit for epoxy mineral castings (picture 5)

MREP-SET 0300 ~ 300 gr = ~ 2 dl

The repair kit consists of the resin, the hardener, and the filler. The mixture ratio is: 27 gr of hardener, 100 gr of resin and 150 gr of filler.

Das Verhältnis ist genau abgewogen. Wichtig ganze angelieferte Menge gebrauchen.

These components are exactly portioned in the kit and should be used up entirely.

Harz und Härter zusammengiessen und intensiv 2 Min. rühren. Das Durchmischen der Masse ist entscheidend für das optimale Abbinden des Mineralgusses. **Danach Füller dazugeben und das gleiche nochmals 2 Min.** lang untereinander mischen bis eine gipsähnliche Masse entsteht.

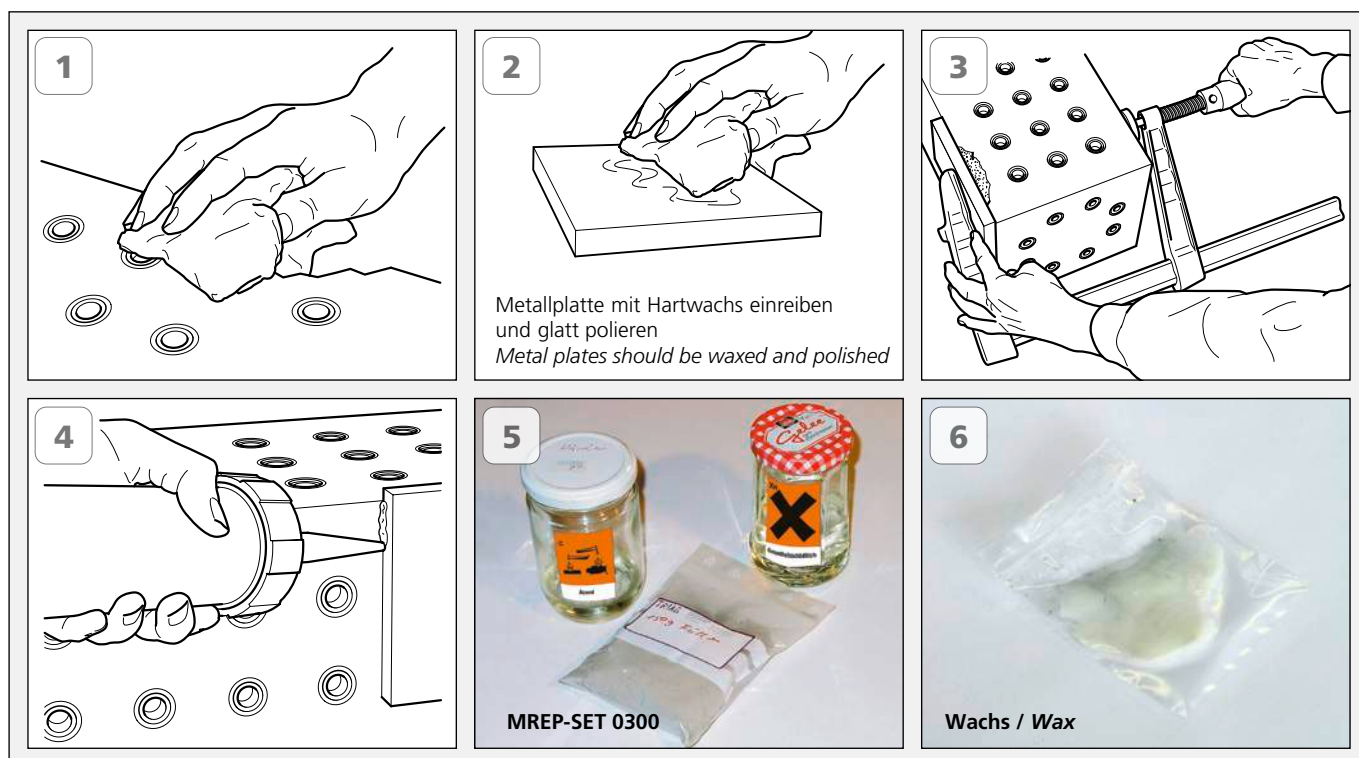
The resin and the hardener should be poured together and mixed for 2 min. This mixing process is essential for a good bonding with the mineral casting. **Then the filler should be added while mixing the mass another 2 min.** It will reach a consistency like plaster.

Die flüssige Masse wird nun in die Bruchstelle eingegossen.

This mortar must be poured into the point of rupture.

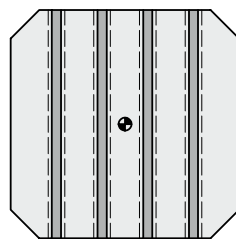
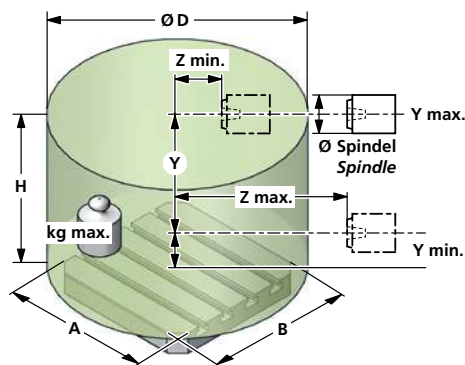
Das Aushärten der Reparaturmasse beträgt 24 Std. Die Unebenheit der frisch eingegossenen Fläche, wird mit einem Schleifstein plangeschliffen.

The hardening process takes 24 hours. Protruding material can be levelled with a grindstone.



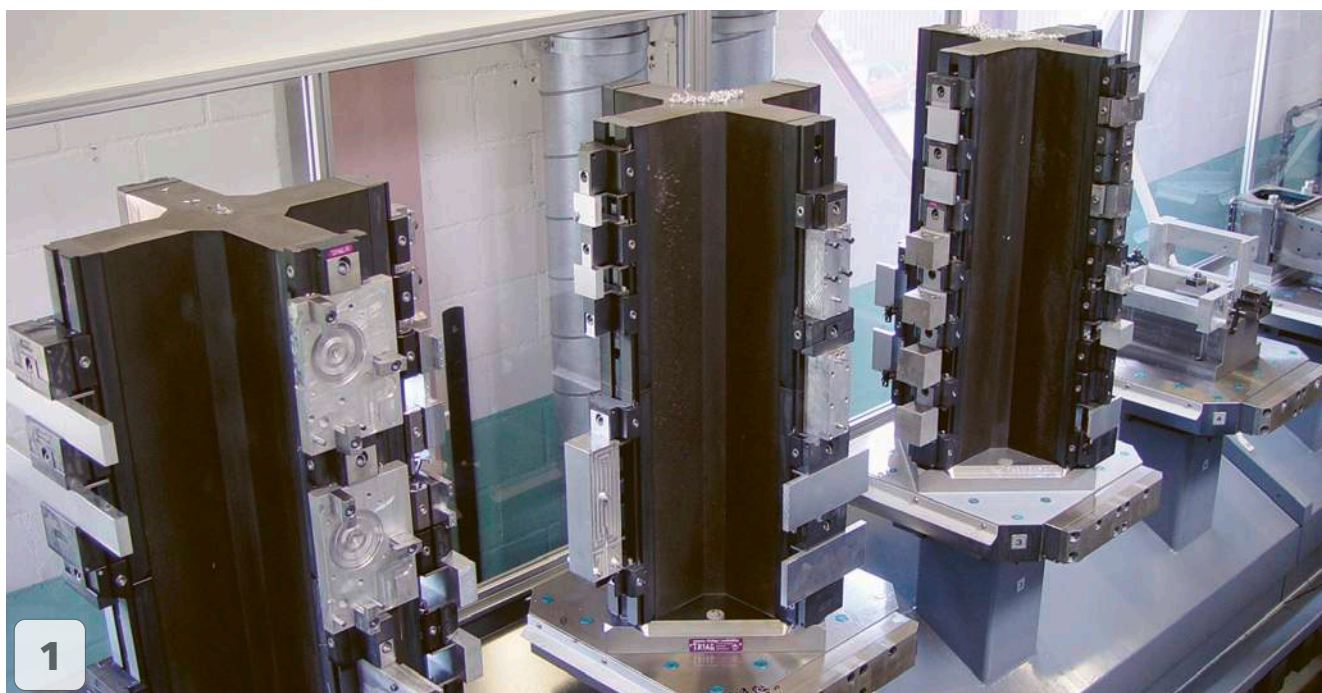
Kunde <i>Customer</i>			
Maschine <i>Machine</i>		Werkstoff, Halbzeug, Rohteil-Nr., Modell- oder Gesenk-Nr. <i>Raw material, blank or casting-Nr.</i>	
X max.	X Achse Hub <i>X axis stroke</i>		mm
Y min.	Kleinsten Abstand von der Palettenoberseite zur Spindelachse <i>Smallest distance from pallet surface to spindle center</i>		mm
Y max.	Grösster Abstand von der Palettenoberseite zur Spindelachse <i>Greatest distance from pallet surface to spindle center</i>		mm
Z min.	Kleinsten Abstand von der Palettenachse zur Spindelnase <i>Smallest distance from pallet center to spindle gauge line</i>		mm
Z max.	Grösster Abstand von der Palettenachse zur Spindelnase <i>Greatest distance from pallet center to spindle gauge line</i>		mm
Ø Spindel <i>Spindle</i>	Spindeldurchmesser <i>Spindle diameter</i>		mm
kg max.	Maximale Tischbelastung <i>Maximum loading capacity</i>		kg
øD max.	Maximaler Störkreis des Werkstücks <i>Maximum workpiece diameter</i>		mm
H max.	Maximale Beladehöhe des Werkstücks <i>Maximum workpiece height</i>		mm
A x B	Palettenabmessung <i>Size of pallet</i>		mm
	Anzahl Werkstücke pro Los <i>Number of workpieces per lot</i>		Stück <i>Piece</i>

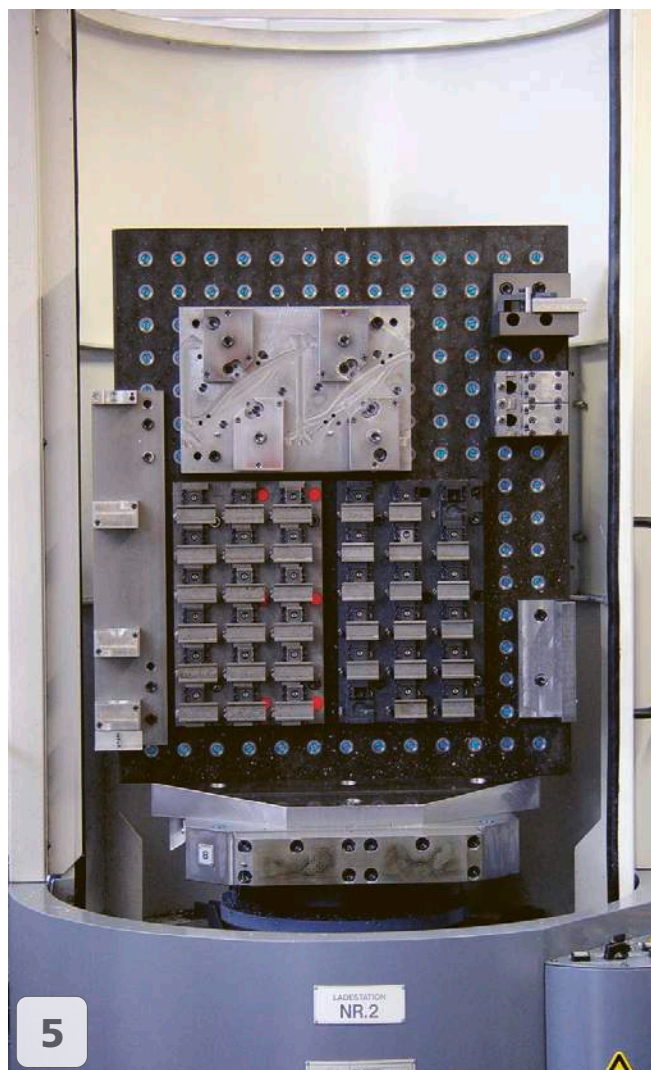
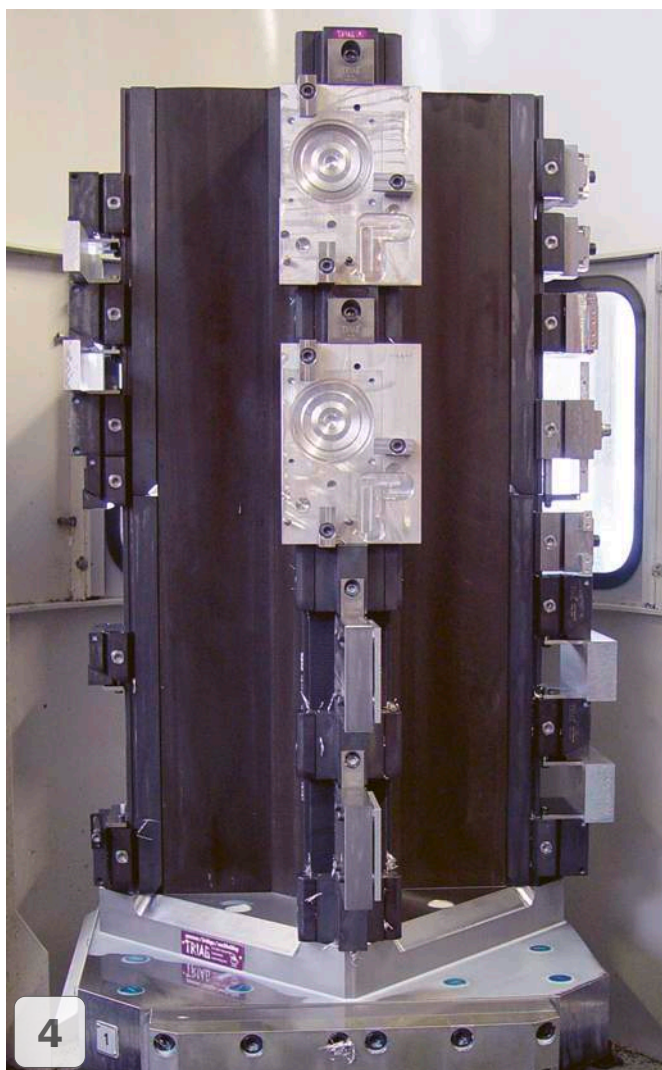
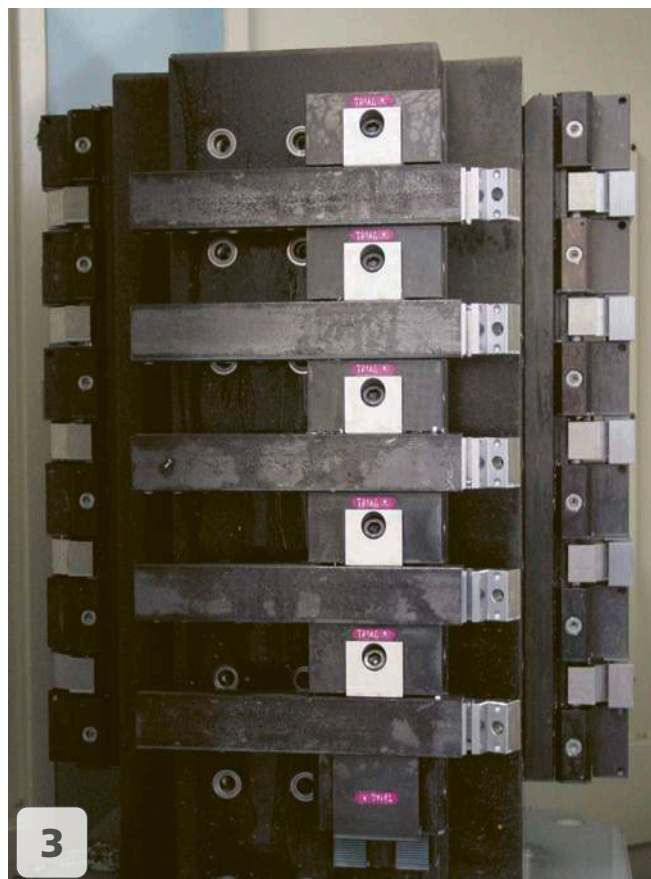
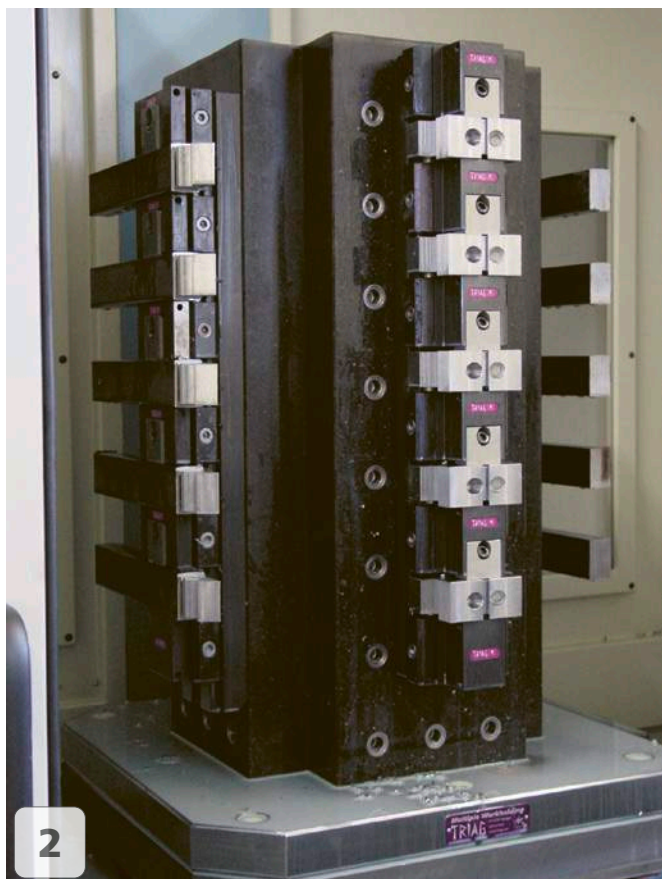
Maximal mögliche Bearbeitungsgrösse / Maximum possible machining size

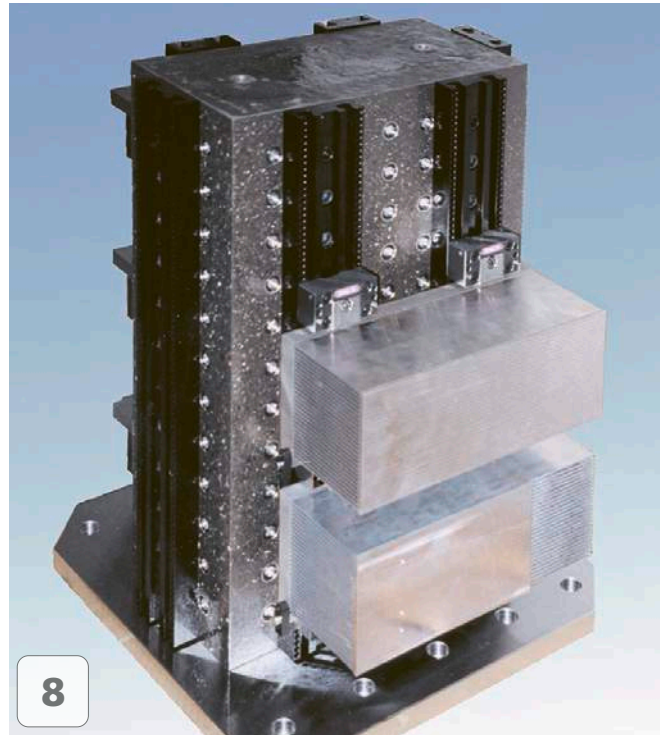


Bitte Werkstückzeichnung beilegen und Bearbeitungsfolge markieren

Enclose drawing of workpiece and mark processing sequence, please



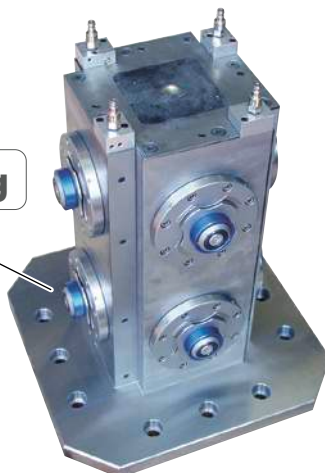




Stahl-Mineralguss Lösungen / Steel epoxy mineral tombstones solutions

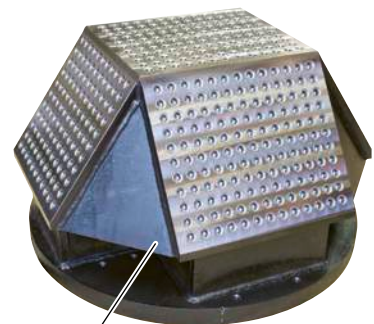
SMK24-24-42 OPP200

~ 120kg



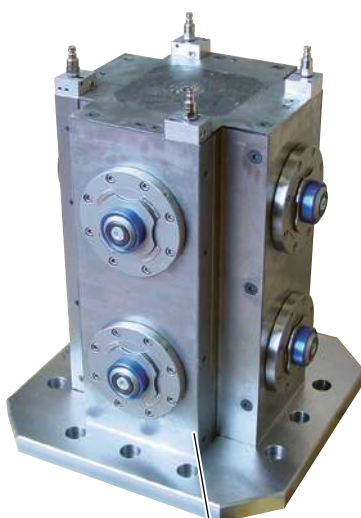
Pyramidenstumpf
Truncated pyramid

~ 474kg



SMK30-17-42 OPP200

~ 142kg





Turm-Material <i>Tombstone material</i>	
M	Mineralguss mit Stahldübel <i>Epoxy mineral with steel anchor</i>
SM	Stahl Mineralguss <i>Steel epoxy mineral tombstones</i>
G	Grauguss <i>Cast iron</i>

Grösste Schlüsselweite <i>Major width</i>	
12	120 mm
20	200 mm
24	240 mm
25	250 mm
30	300 mm
32	320 mm
35	350 mm
40	400 mm
42	420 mm
50	500 mm
60	600 mm
63	630 mm
70	700 mm

Höhe <i>Height</i>	
50	500 mm
55	550 mm
56	567 mm
60	600 mm
62	620 mm
65	650 mm
66	660 mm
70	700 mm
75	750 mm
80	800 mm
85	850 mm
90	900 mm
95	950 mm

M

K

35

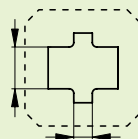
18

95

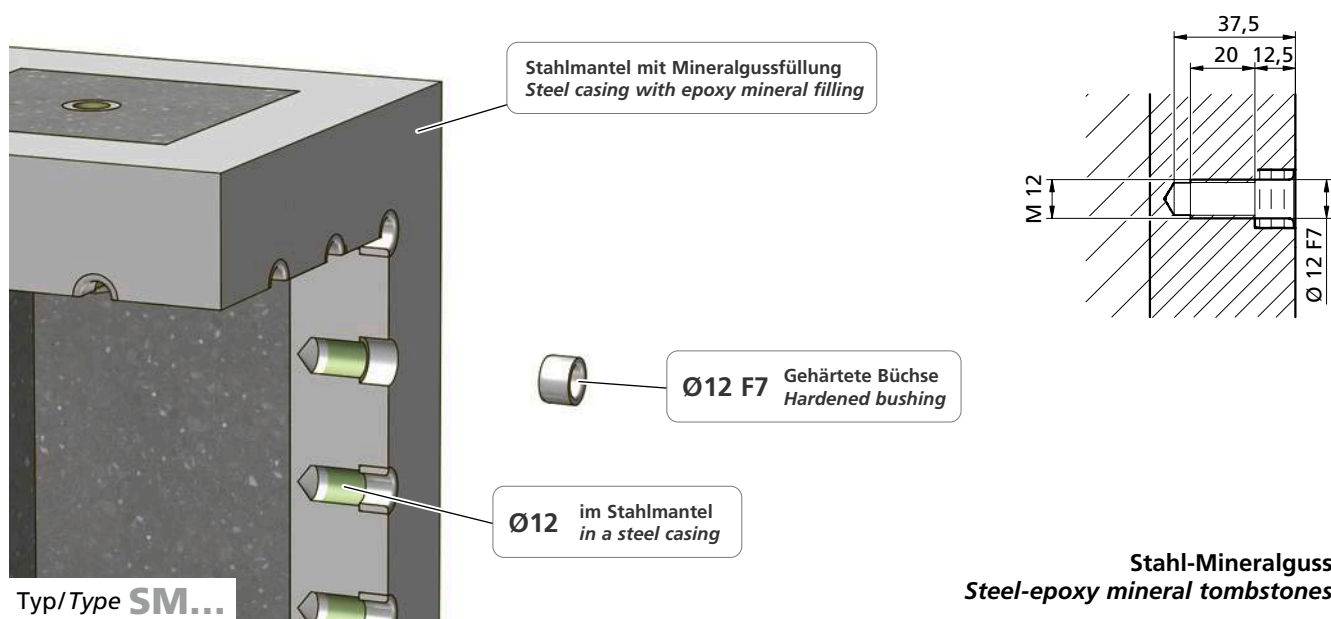
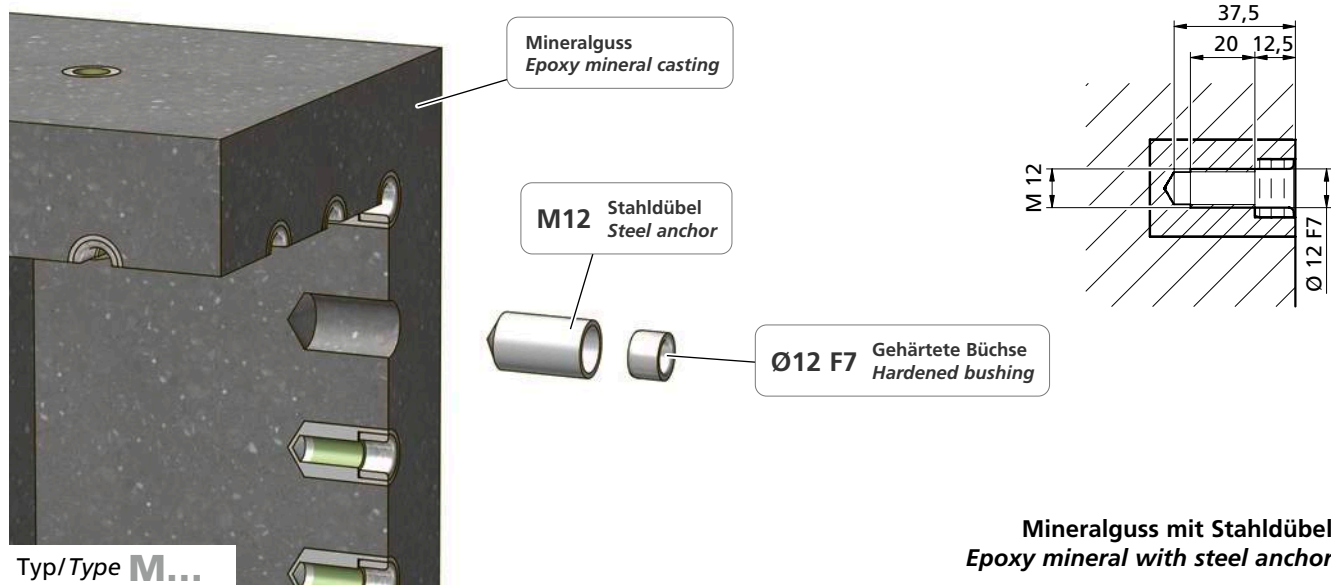
R50

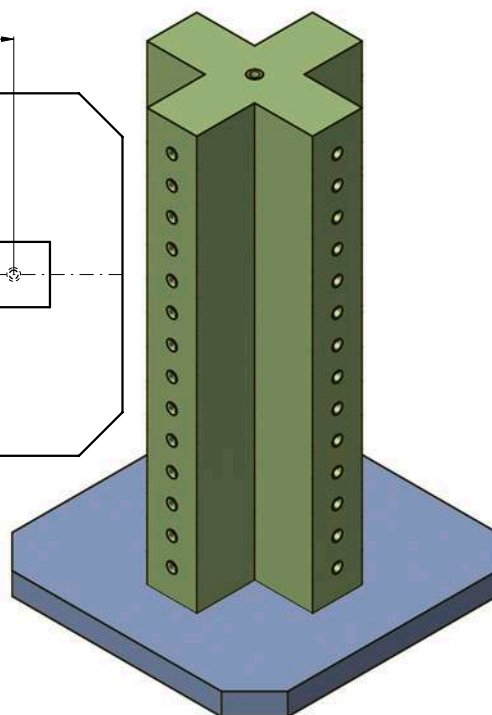
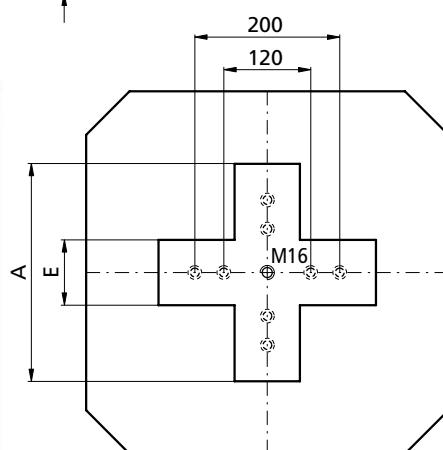
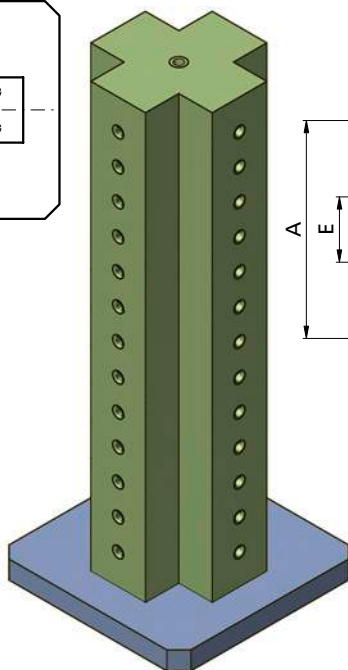
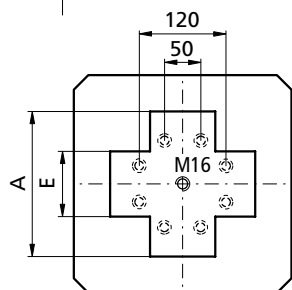
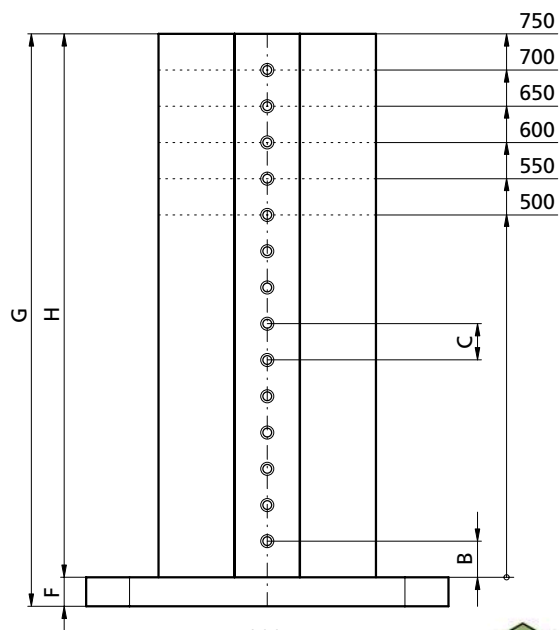
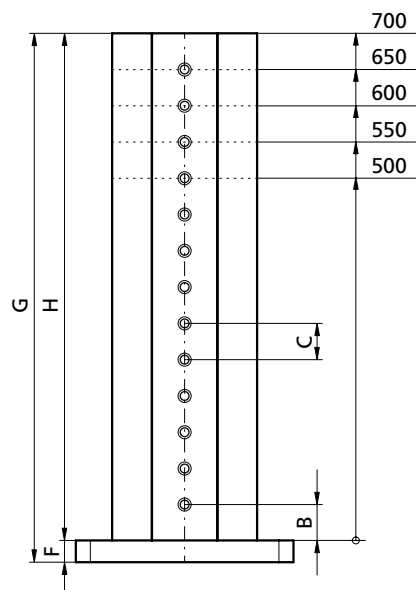
Modultyp <i>Type of module</i>	
K	Kreuz <i>Cross</i>
Q	Quadrat <i>Square</i>
R	Rechteck <i>Rectangular</i>
S	Sechseck <i>Hexagonal</i>
A	Achteck <i>Octagonal</i>
X	Spezialform <i>Special shape</i>

Aufspannbreite <i>Usable width</i>	
08	80 mm
09	90 mm
86	86 mm
10	100 mm
12	120 mm
15	150 mm
16	160 mm
18	180 mm
1808	180 / 80 mm
19	184 mm
20	200 mm
23	231 mm
24	240 mm
25	250 mm
30	300 mm
35	350 mm
40	400 mm
42	420 mm

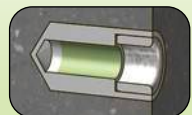


Raster <i>Grid</i>	
R40	40 mm
R50	50 mm
R80	80 mm
R100	100 mm
OPP	200 mm





**Mineralgussturm mit
 Stahldübel**
**Epoxy Mineral with
 Steel Anchor**



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Bestellbeispiel

Ordering example: **MK200965R50** &

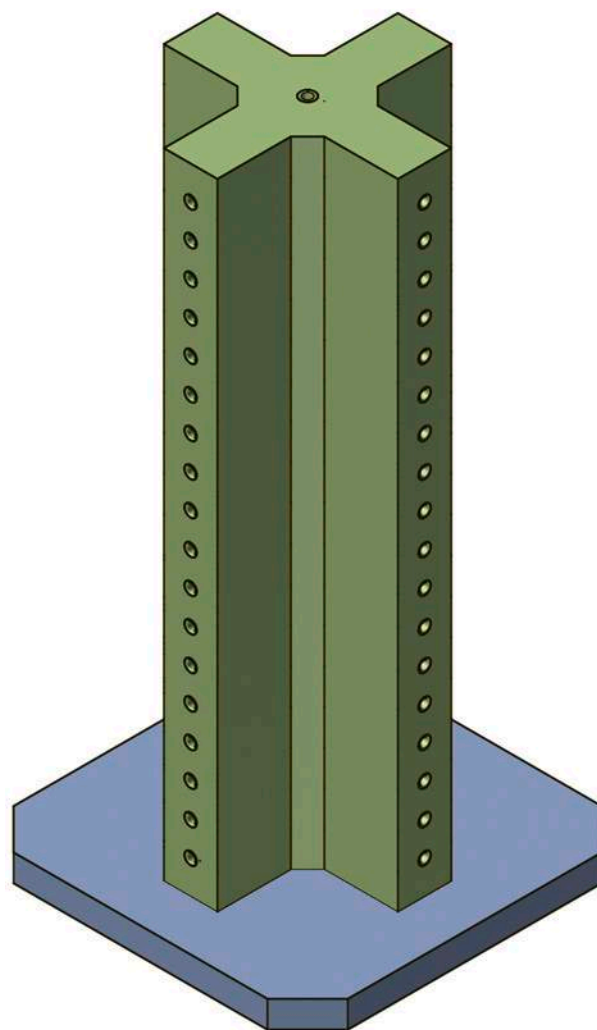
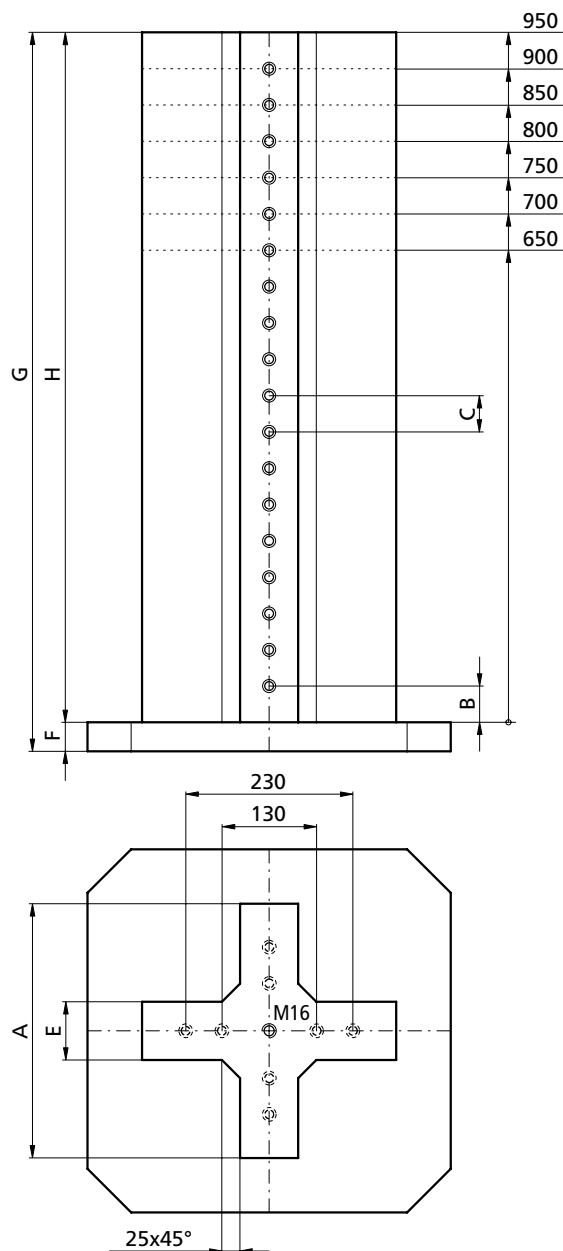
p. 274

**Grundplatte wird passend
 zu Ihrer Maschinenpalette
 hergestellt und muss separat
 bestellt werden!**

**Base plate according to your
 machine configuration please
 order extra!**

	kg*	A	B	C	E	F	G	H	Raster / Grid
MK200950R50	~38	200	50	50	90	(30)	(530)	500	36 x M12/12F7
MK200955R50	~42	200	50	50	90	(30)	(580)	550	40 x M12/12F7
MK200960R50	~45	200	50	50	90	(30)	(630)	600	44 x M12/12F7
MK200965R50	~49	200	50	50	90	(30)	(680)	650	48 x M12/12F7
MK200970R50	~53	200	50	50	90	(30)	(680)	700	48 x M12/12F7
MK300950R50	~60	300	50	50	90	(40)	(540)	500	36 x M12/12F7
MK300955R50	~66	300	50	50	90	(40)	(590)	550	40 x M12/12F7
MK300960R50	~72	300	50	50	90	(40)	(640)	600	44 x M12/12F7
MK300965R50	~78	300	50	50	90	(40)	(690)	650	48 x M12/12F7
MK300970R50	~84	300	50	50	90	(40)	(740)	700	52 x M12/12F7
MK300975R50	~90	300	50	50	90	(40)	(790)	750	56 x M12/12F7

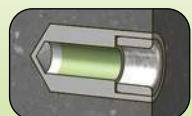
* Gewicht ohne Grundplatte! / Weight without baseplate!



Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!

*Base plate according to your
machine configuration please
order extra!*

Mineralgussturm mit
Stahldübel
Epoxy Mineral with
Steel Anchor



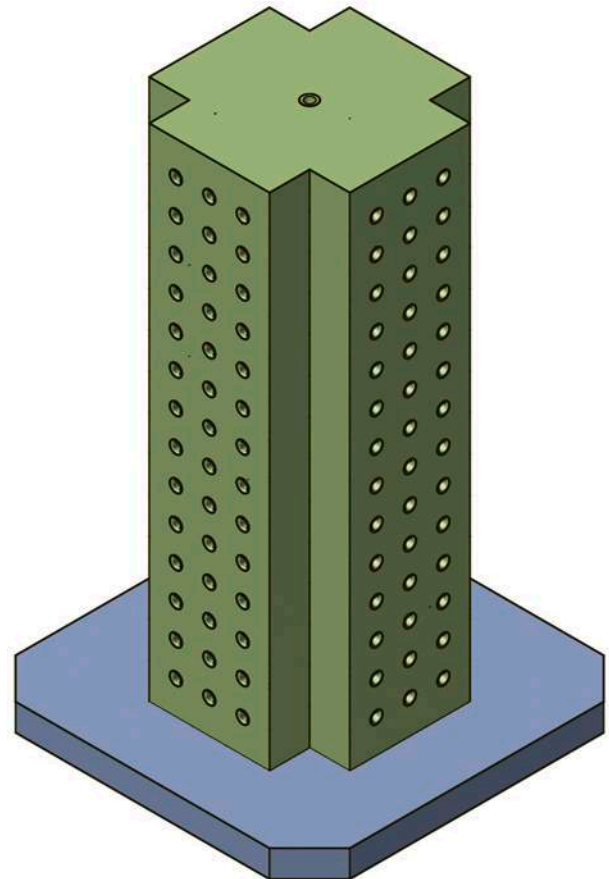
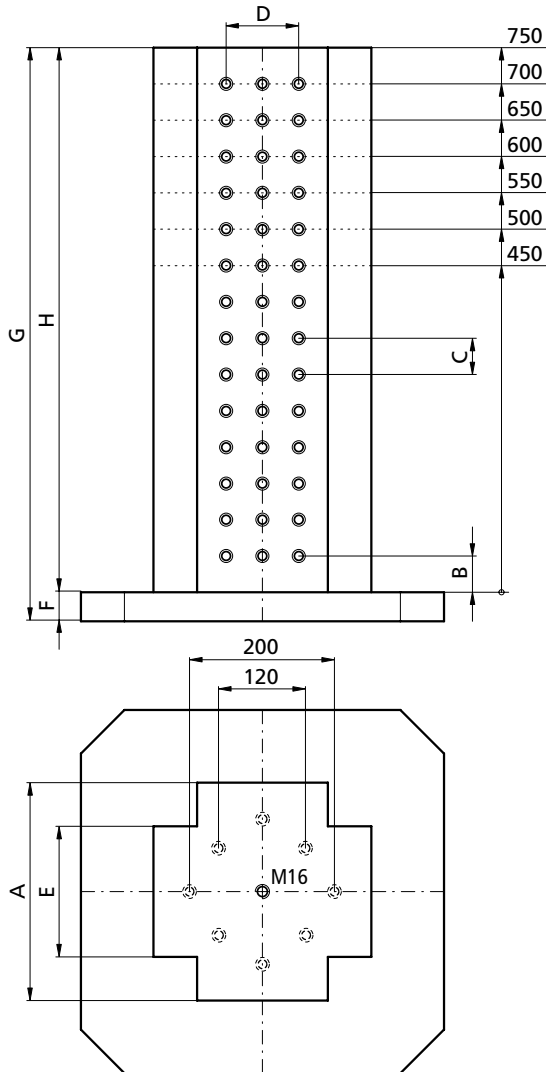
Seite / Page 250

Bestellbeispiel

Ordering example: **MK350865R50** & _____ p. 274

	kg*	A	B	C	E	F	G	H	Raster / Grid
MK350865R50	~85	350	50	50	80	(40)	(690)	650	48 x M12/12F7
MK350870R50	~92	350	50	50	80	(40)	(740)	700	52 x M12/12F7
MK350875R50	~99	350	50	50	80	(40)	(790)	750	56 x M12/12F7
MK350880R50	~105	350	50	50	80	(40)	(840)	800	60 x M12/12F7
MK350885R50	~112	350	50	50	80	(40)	(890)	850	64 x M12/12F7
MK350890R50	~118	350	50	50	80	(40)	(940)	900	68 x M12/12F7
MK350895R50	~125	350	50	50	80	(40)	(990)	950	72 x M12/12F7

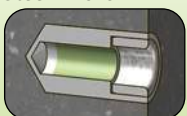
* Gewicht ohne Grundplatte! / Weight without baseplate!



Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!
*Base plate according to your
machine configuration please
order extra!*

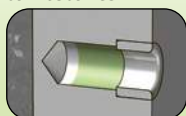
p. 274

Mineralgussturm mit
Stahldübel
*Epoxy Mineral with
Steel Anchor*



kg*

Stahl-Mineralguss
*Steel-epoxy mineral
tombstones*



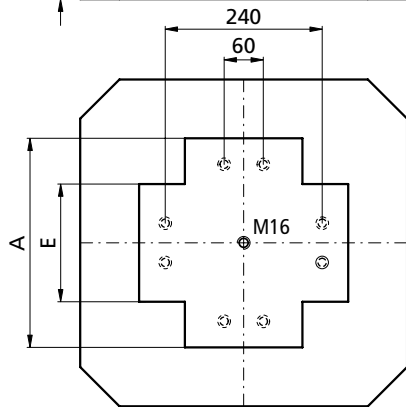
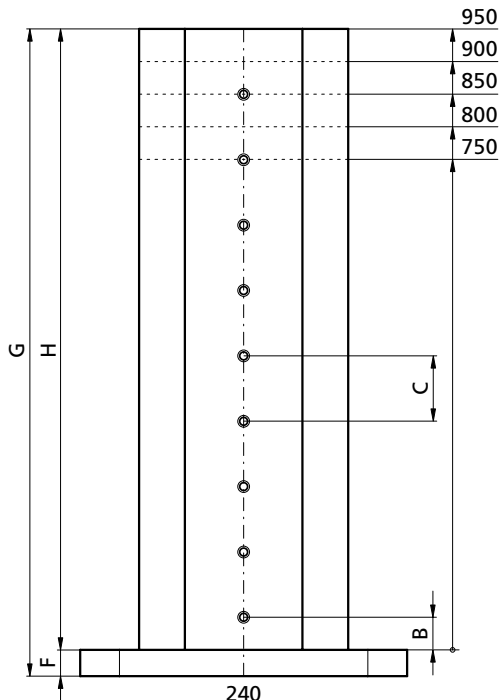
kg*

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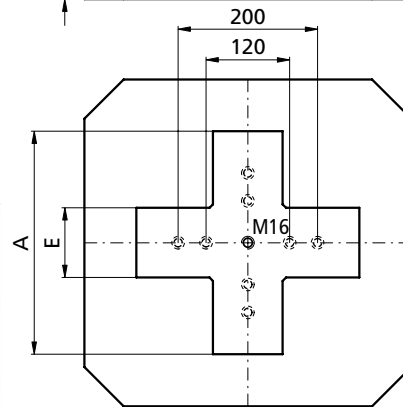
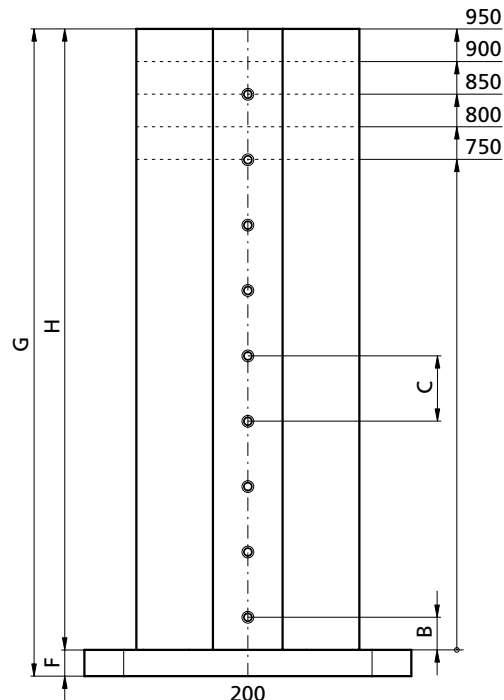
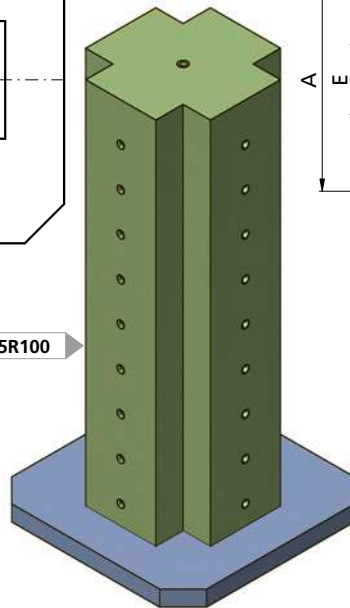
Bestellbeispiel
Ordering example: MK301850R50 &

	A	B	C	D	E	F	G	H	Raster / Grid
MK301845R50 ~77	300	50	50	100	180	(40)	(440)	450	96xM12/12F7
MK301850R50 ~86	300	50	50	100	180	(40)	(540)	500	108xM12/12F7
MK301855R50 ~94	300	50	50	100	180	(40)	(590)	550	120xM12/12F7
MK301860R50 ~102	300	50	50	100	180	(40)	(640)	600	132xM12/12F7
MK301865R50 ~110	300	50	50	100	180	(40)	(690)	650	144xM12/12F7
MK301870R50 ~117	300	50	50	100	180	(40)	(740)	700	156xM12/12F7
MK301875R50 ~125	300	50	50	100	180	(40)	(790)	750	168xM12/12F7

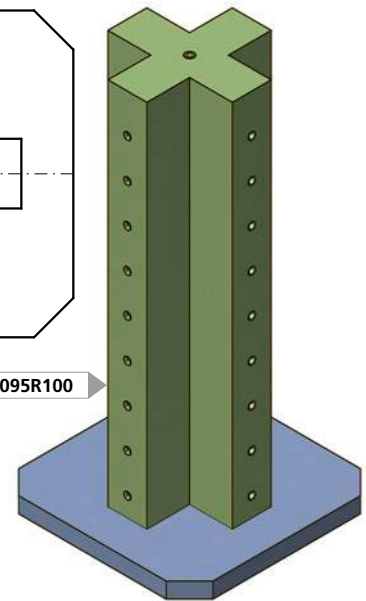
* Gewicht ohne Grundplatte! / *Weight without baseplate!*



MK321895R100



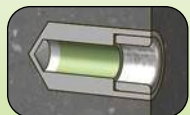
MK321095R100



Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!

Base plate according to your
machine configuration please
order extra!

Mineralgussturm mit
Stahldübel
Epoxy Mineral with
Steel Anchor



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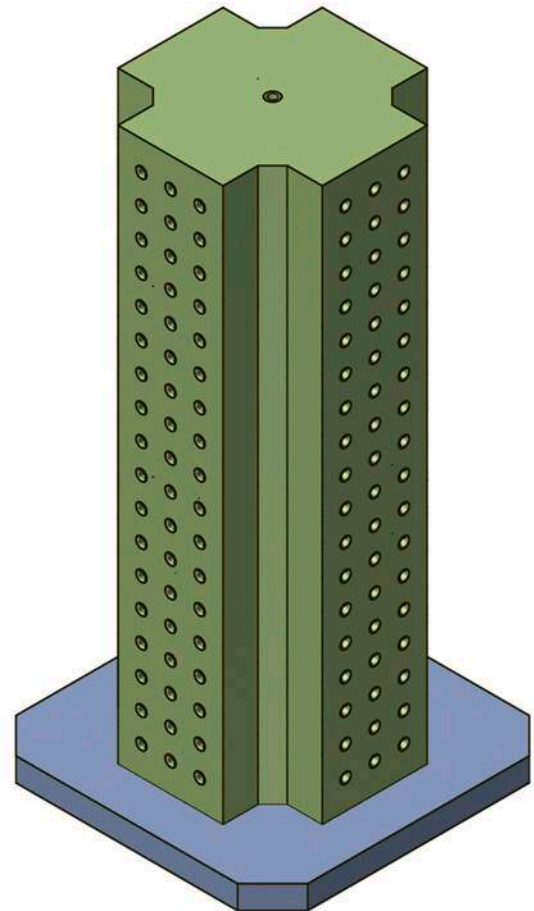
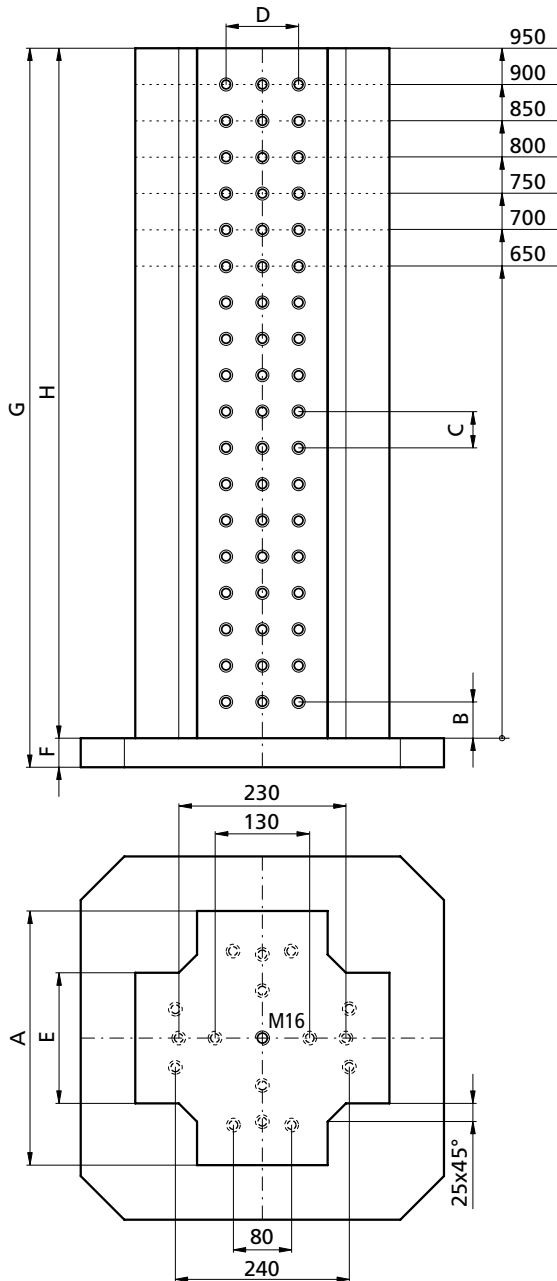
Bestellbeispiel

Ordering example: MK321075R100 & p. 274

	kg*	A	B	C	E	F	G	H	Raster / Grid
MK321075R100	~101	320	50	100	100	(40)	(790)	750	20 x M12/12F7
MK321080R100	~108	320	50	100	100	(40)	(840)	800	24 x M12/12F7
MK321085R100	~115	320	50	100	100	(40)	(890)	850	28 x M12/12F7
MK321090R100	~121	320	50	100	100	(40)	(940)	900	32 x M12/12F7
MK321095R100	~128	320	50	100	100	(40)	(990)	950	36 x M12/12F7
MK321875R100	~106	320	50	100	180	(40)	(790)	750	20 x M12/12F7
MK321880R100	~116	320	50	100	180	(40)	(840)	800	24 x M12/12F7
MK321885R100	~126	320	50	100	180	(40)	(890)	850	28 x M12/12F7
MK321890R100	~135	320	50	100	180	(40)	(940)	900	32 x M12/12F7
MK321895R100	~145	320	50	100	180	(40)	(990)	950	36 x M12/12F7

* Gewicht ohne Grundplatte! / Weight without baseplate!

MK3518 ... R50
SMK3518 ... R50

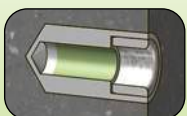


Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!

*Base plate according to your
machine configuration please
order extra!*

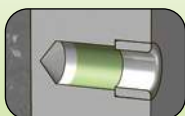
p. 274

Mineralgussturm mit
Stahldübel
*Epoxy Mineral with
Steel Anchor*



kg*

Stahl-Mineralguss
*Steel-epoxy mineral
tombstones*



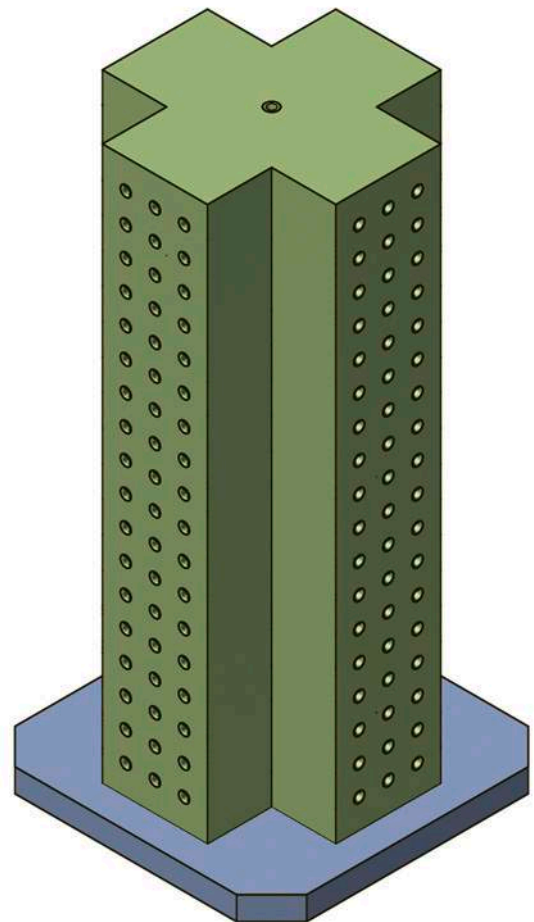
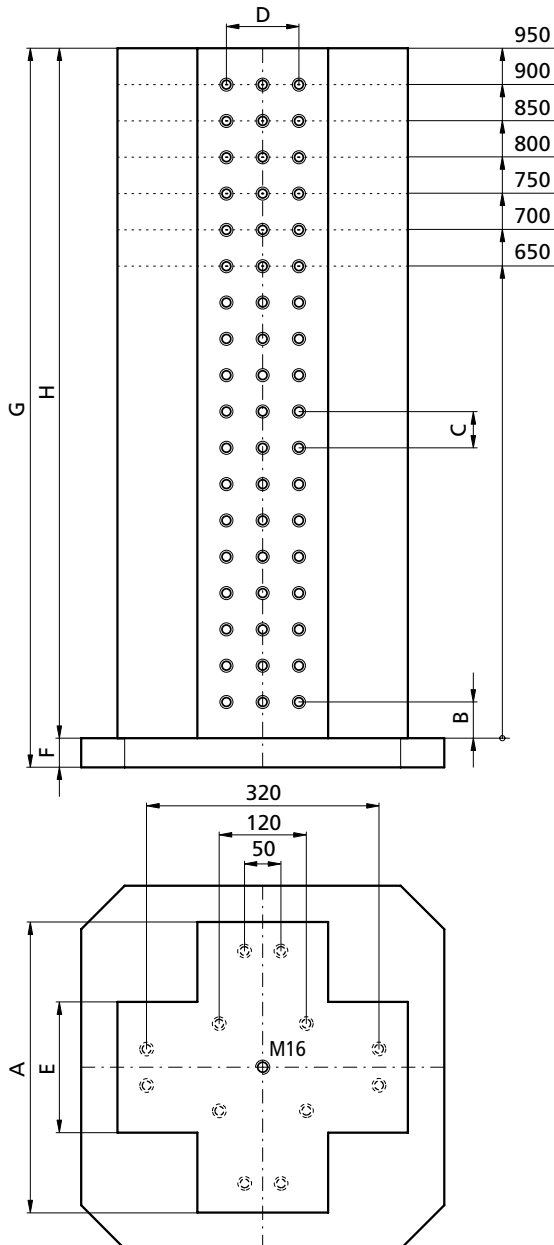
kg*

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Bestellbeispiel
Ordering example: **MK351865R50** &

					A	B	C	D	E	F	G	H	Raster / Grid
MK351865R50	~134	SMK351865R50	~165		350	50	50	100	180	(40)	(690)	650	144 x M12/12F7
MK351870R50	~144	SMK351870R50	~180		350	50	50	100	180	(40)	(740)	700	156 x M12/12F7
MK351875R50	~153	SMK351875R50	~190		350	50	50	100	180	(40)	(790)	750	168 x M12/12F7
MK351880R50	~163	SMK351880R50	~205		350	50	50	100	180	(40)	(840)	800	180 x M12/12F7
MK351885R50	~172	SMK351885R50	~215		350	50	50	100	180	(40)	(890)	850	192 x M12/12F7
MK351890R50	~182	SMK351890R50	~230		350	50	50	100	180	(40)	(940)	900	204 x M12/12F7
MK351895R50	~191	SMK351895R50	~240		350	50	50	100	180	(40)	(990)	950	216 x M12/12F7

* Gewicht ohne Grundplatte! / Weight without baseplate!

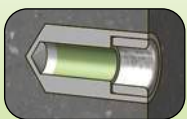


Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!

Base plate according to your
machine configuration please
order extra!

p. 274

Mineralgussturm mit
Stahldübel
Epoxy Mineral with
Steel Anchor



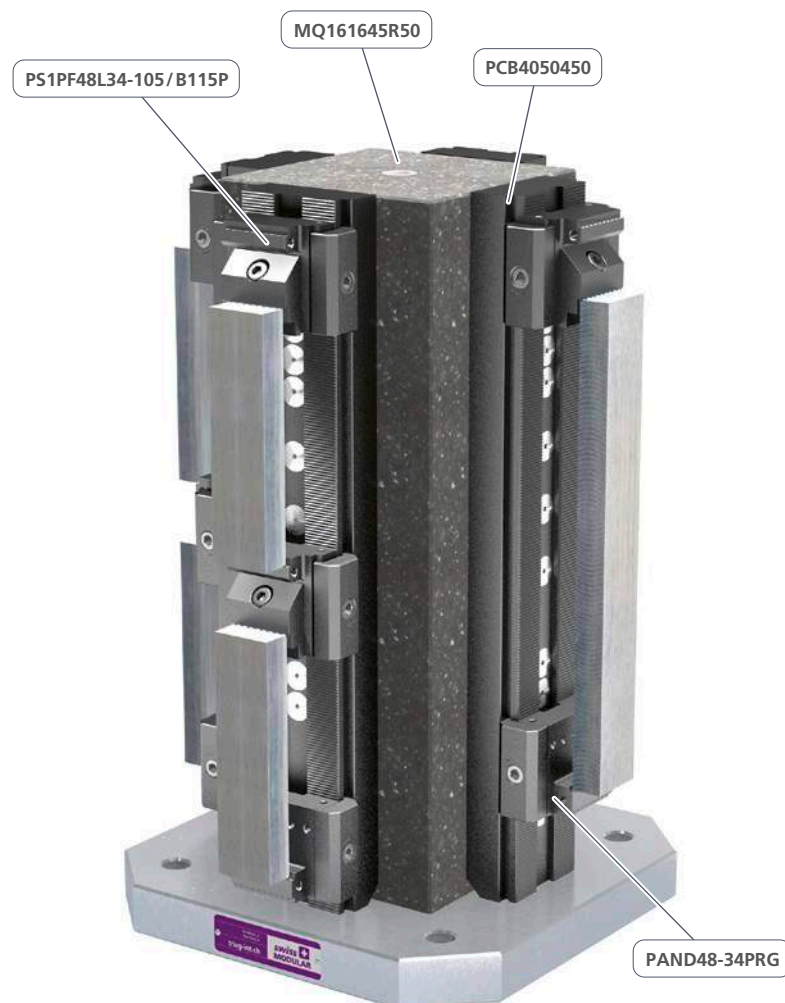
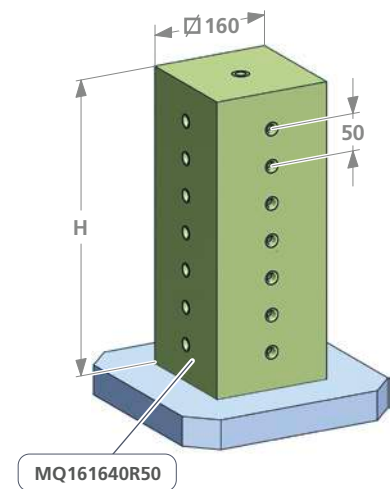
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Bestellbeispiel
Ordering example: **MK401865R50** & _____

	kg*	A	B	C	D	E	F	G	H	Raster / Grid
MK401865R50	~161	400	50	50	100	180	(40)	(690)	650	144 x M12/12F7
MK401870R50	~172	400	50	50	100	180	(40)	(740)	700	156 x M12/12F7
MK401875R50	~184	400	50	50	100	180	(40)	(790)	750	168 x M12/12F7
MK401880R50	~195	400	50	50	100	180	(40)	(840)	800	180 x M12/12F7
MK401885R50	~207	400	50	50	100	180	(40)	(890)	850	192 x M12/12F7
MK401890R50	~218	400	50	50	100	180	(40)	(940)	900	204 x M12/12F7
MK401895R50	~230	400	50	50	100	180	(40)	(990)	950	216 x M12/12F7

* Gewicht ohne Grundplatte! / Weight without baseplate!

Art. Nr.	kg	Raster / Grid	H
MQ161630R50	~19	20 x M12/12F7	300
MQ161635R50	~22	24 x M12/12F7	350
MQ161640R50	~25	28 x M12/12F7	400
MQ161645R50	~28	32 x M12/12F7	450
MQ161650R50	~31	36 x M12/12F7	500

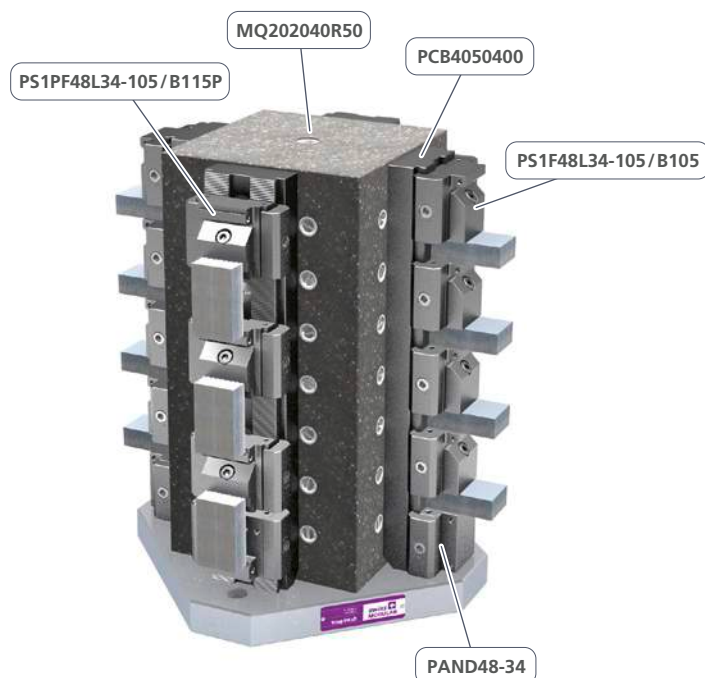
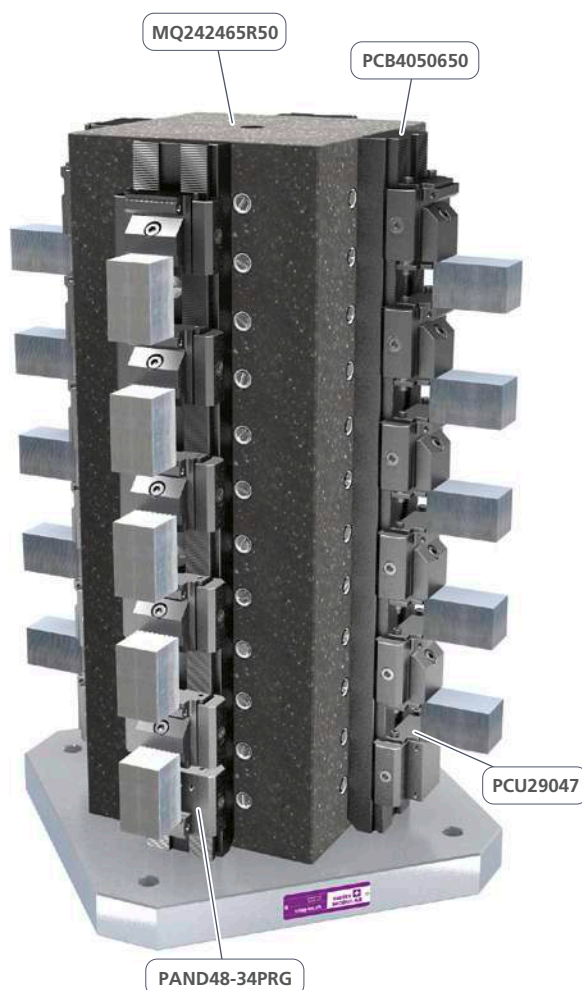
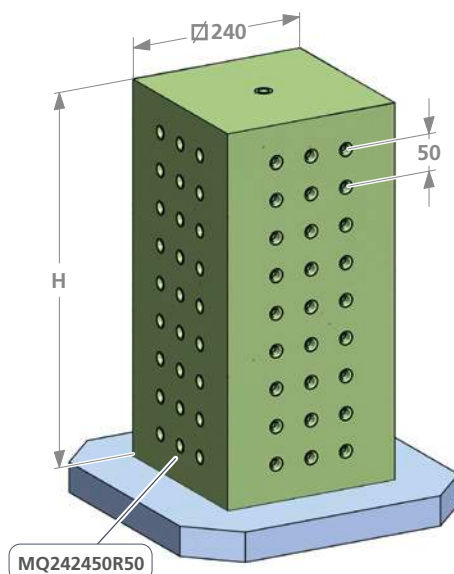
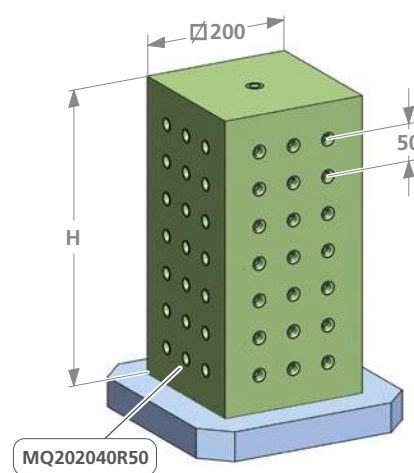


*Maschinenschonend und leicht,
fast in allen Formen herstellbar.*

*Reduces machine wear due to low
specific weight - can be produced in
all sorts of shapes.*



Art. Nr.	kg	Raster / Grid	H
MQ202040R50	~42	84 x M12/12F7	400
MQ202045R50	~53	96 x M12/12F7	450
MQ202050R50	~59	108 x M12/12F7	500
MQ202055R50	~64	120 x M12/12F7	550
MQ202060R50	~70	132 x M12/12F7	600
MQ202065R50	~76	144 x M12/12F7	650
MQ202070R50	~81	156 x M12/12F7	700
MQ242450R50	~81	108 x M12/12F7	500
MQ242455R50	~89	120 x M12/12F7	550
MQ242460R50	~97	132 x M12/12F7	600
MQ242465R50	~103	144 x M12/12F7	650





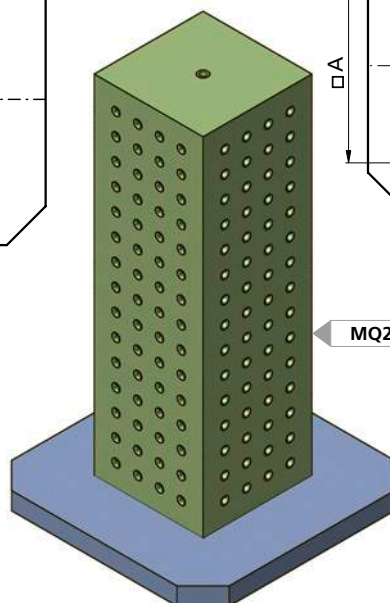
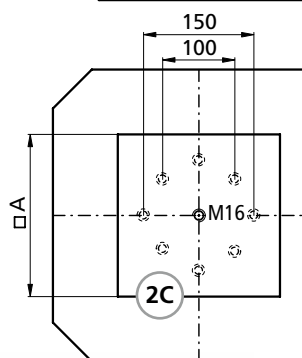
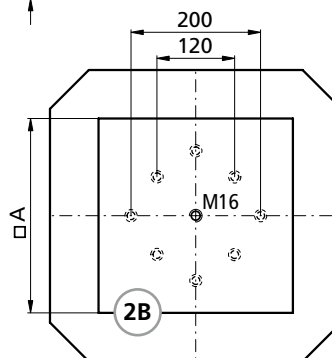
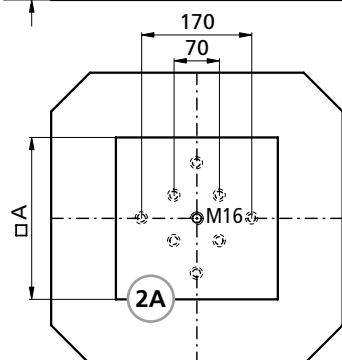
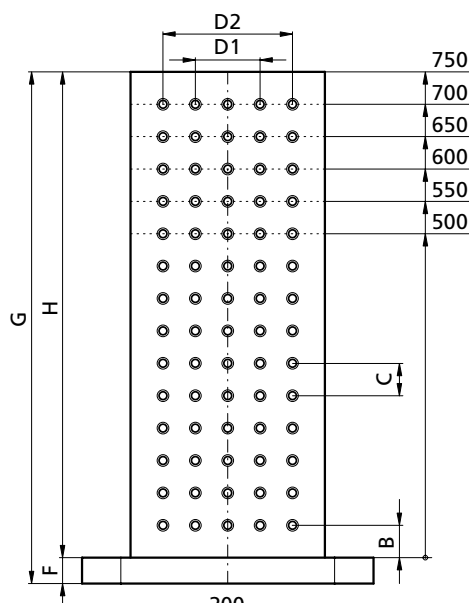
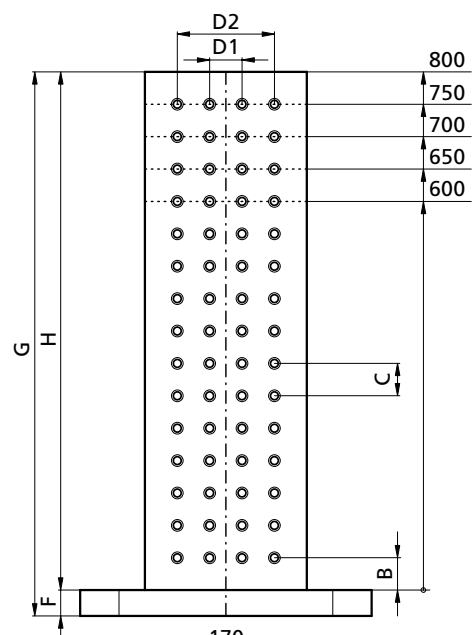
Quadrat
Square



MQ2525 ... R50

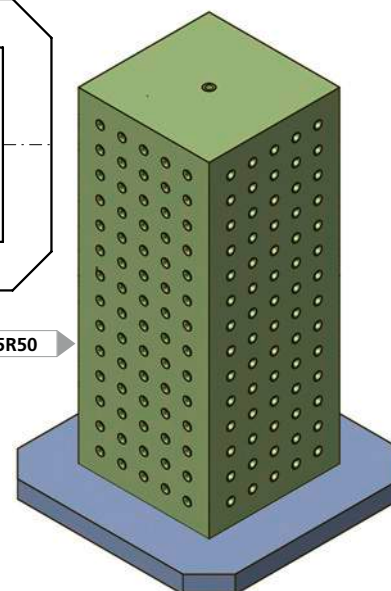
MQ3030 ... R50

tripoxyMINERAL



MQ303075R50

MQ252580R50

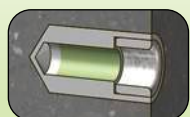


Grundplatte wird passend
zu Ihrer Maschinenpalette
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bestellt werden!
Base plate according to your
machine configuration please
order extra!

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Mineralgussturm mit
Stahldübel

Epoxy Mineral with
Steel Anchor



kg*

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Bestellbeispiel
Ordering example: MQ252560R50 &

		Bohrbild Hole pattern	A	B	C	D1	D2	F	G	H	Raster / Grid
MQ252560R50	~107	2A	250	50	50	100	150	(40)	(640)	600	176 x M12/12F7
MQ252565R50	~116	2A	250	50	50	100	150	(40)	(690)	650	192 x M12/12F7
MQ252570R50	~125	2A	250	50	50	100	150	(40)	(740)	700	208 x M12/12F7
MQ252575R50	~134	2C	250	50	50	100	150	(40)	(790)	750	224 x M12/12F7
MQ252580R50	~143	2C	250	50	50	100	150	(40)	(840)	800	240 x M12/12F7
MQ303050R50	~109	2B	300	50	50	100	200	(40)	(540)	500	180 x M12/12F7
MQ303055R50	~119	2B	300	50	50	100	200	(40)	(590)	550	200 x M12/12F7
MQ303060R50	~129	2B	300	50	50	100	200	(40)	(640)	600	220 x M12/12F7
MQ303065R50	~139	2B	300	50	50	100	200	(40)	(690)	650	240 x M12/12F7
MQ303070R50	~149	2B	300	50	50	100	200	(40)	(740)	700	260 x M12/12F7
MQ303075R50	~162	2B	300	50	50	100	200	(40)	(790)	750	280 x M12/12F7

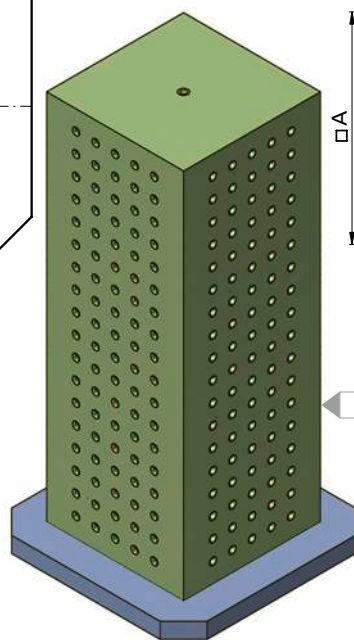
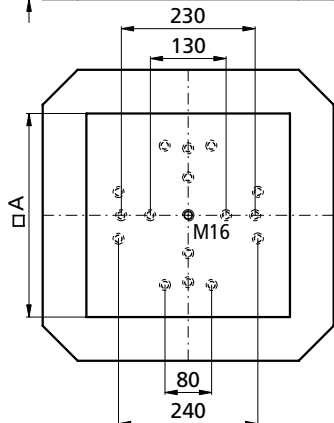
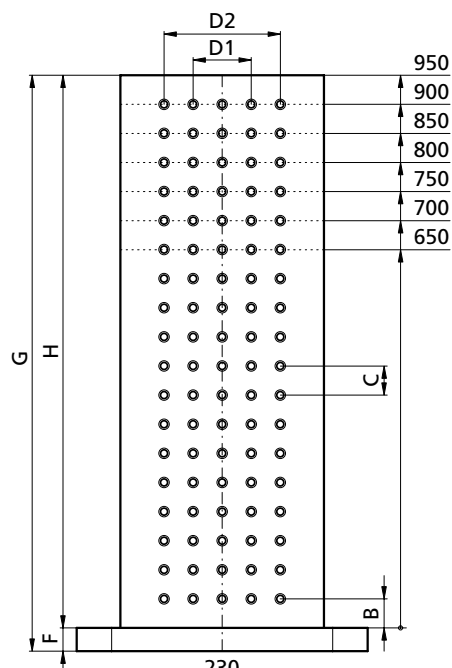
* Gewicht ohne Grundplatte! / Weight without baseplate!

MQ4040 ... R50

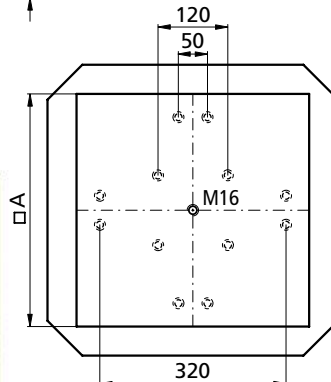
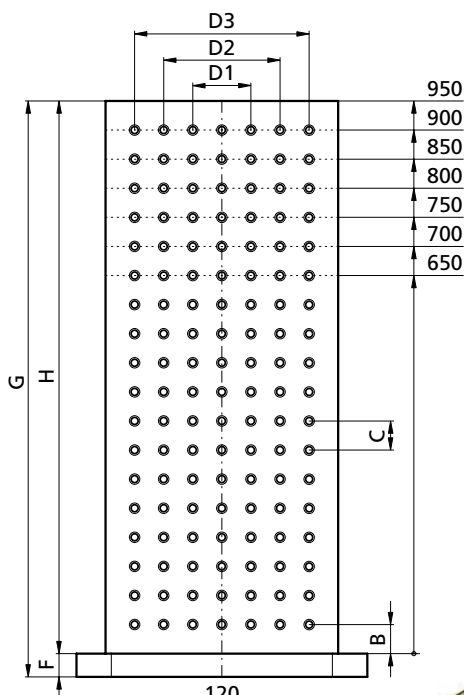
MQ3535 ... R50

Quadrat
Square

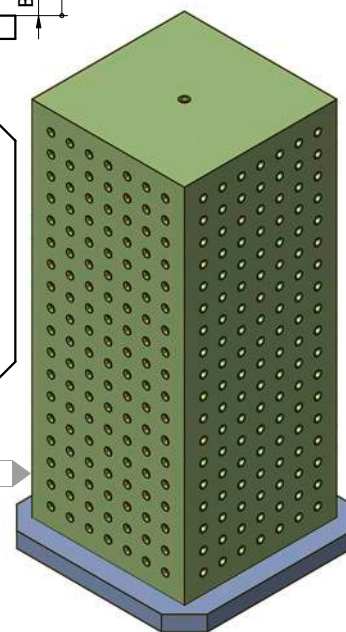
tripoxyMINERAL



MQ3535R50

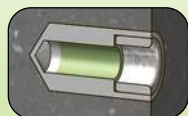


MQ4040R50



Grundplatte wird passend
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bestellt werden!
Base plate according to your
machine configuration please
order extra!

Mineralgussturm mit
Stahldübel
Epoxy Mineral with
Steel Anchor

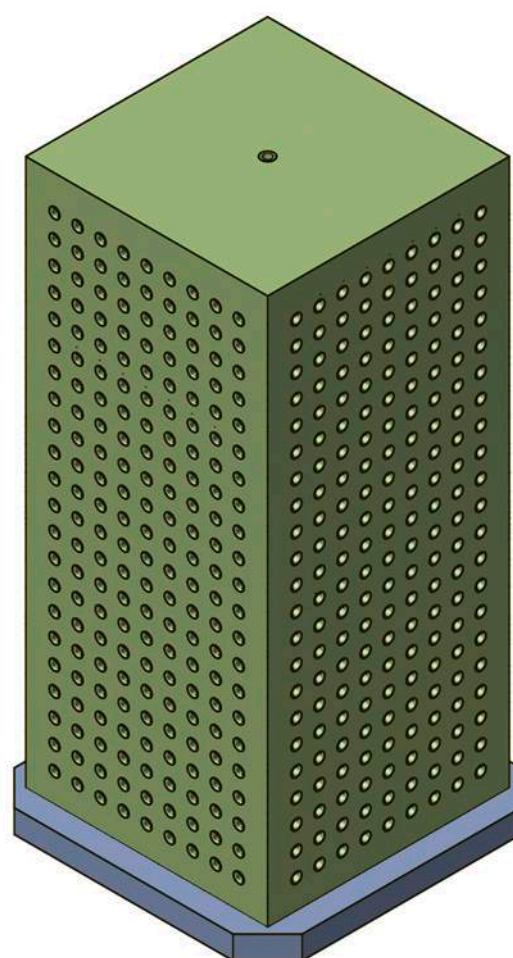
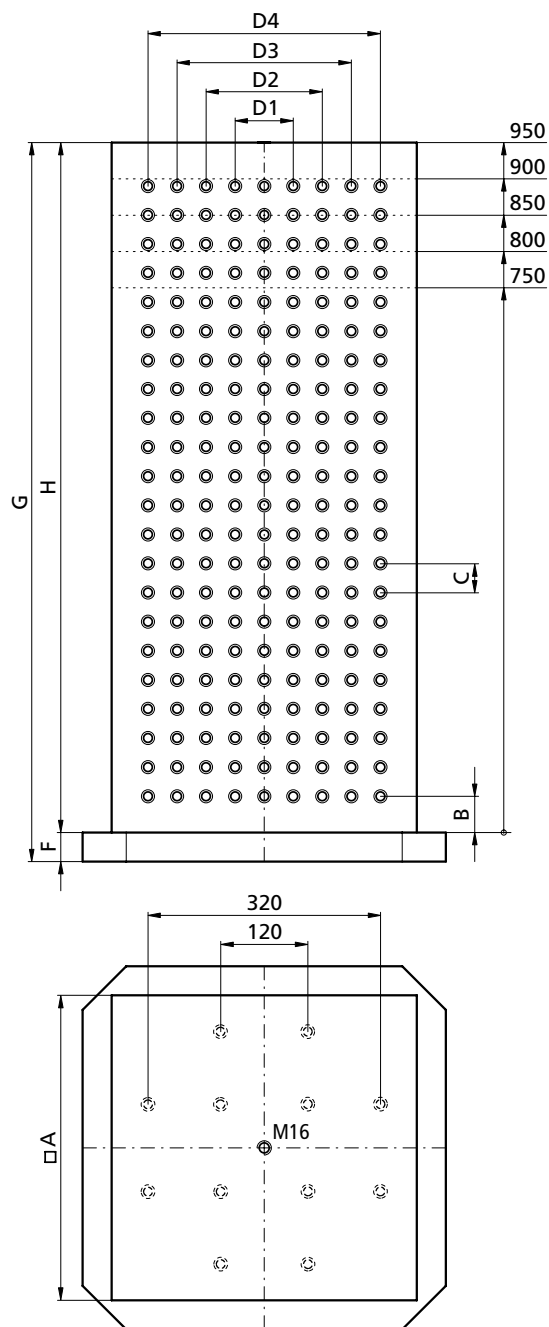


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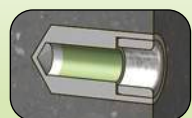
Bestellbeispiel

Ordering example: MQ353565R50 & p. 274

	kg*	A	B	C	D1	D2	D3	F	G	H	Raster / Grid
MQ353565R50	~175	350	50	50	100	200		(40)	(690)	650	240 x M12/12F7
MQ353570R50	~187	350	50	50	100	200		(40)	(740)	700	260 x M12/12F7
MQ353575R50	~200	350	50	50	100	200		(40)	(790)	750	280 x M12/12F7
MQ353580R50	~213	350	50	50	100	200		(40)	(840)	800	300 x M12/12F7
MQ353585R50	~225	350	50	50	100	200		(40)	(890)	850	320 x M12/12F7
MQ353590R50	~238	350	50	50	100	200		(40)	(940)	900	340 x M12/12F7
MQ353595R50	~250	350	50	50	100	200		(40)	(990)	950	360 x M12/12F7
MQ404065R50	~217	400	50	50	100	200	300	(40)	(690)	650	336 x M12/12F7
MQ404070R50	~232	400	50	50	100	200	300	(40)	(740)	700	364 x M12/12F7
MQ404075R50	~247	400	50	50	100	200	300	(40)	(790)	750	392 x M12/12F7
MQ404080R50	~262	400	50	50	100	200	300	(40)	(840)	800	420 x M12/12F7
MQ404085R50	~277	400	50	50	100	200	300	(40)	(890)	850	448 x M12/12F7
MQ404090R50	~292	400	50	50	100	200	300	(40)	(940)	900	476 x M12/12F7
MQ404095R50	~307	400	50	50	100	200	300	(40)	(990)	950	504 x M12/12F7



Mineralgussturm mit
Stahldübel
Epoxy Mineral with
Steel Anchor



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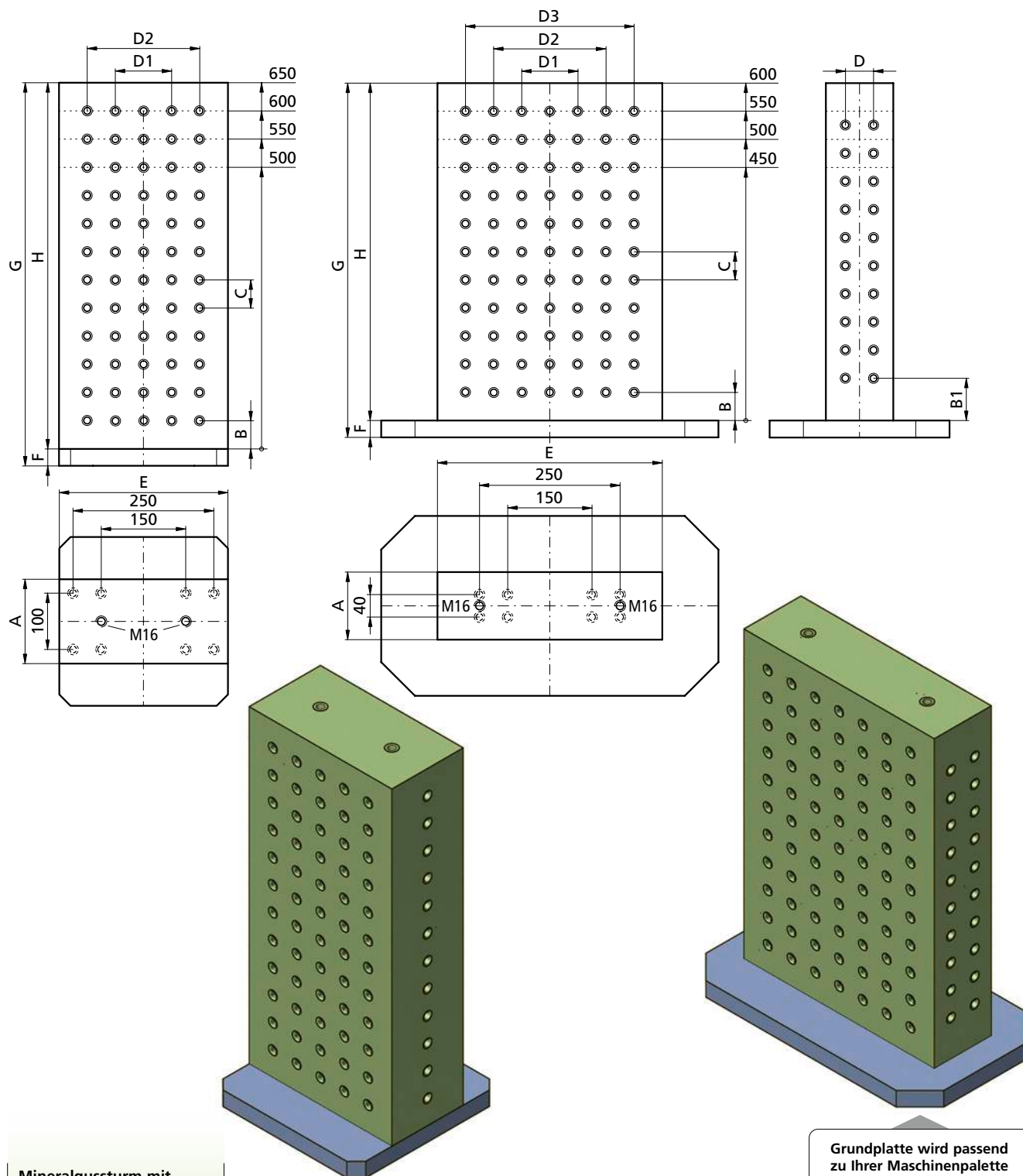
Bestellbeispiel

Ordering example: **MQ424275R40** & _____ p. 274

Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!
Base plate according to your
machine configuration please
order extra!

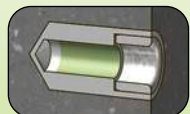
	kg*	A	B	C	D1	D2	D3	D4	F	G	H	Raster / Grid
MQ424275R40	~329	420	50	40	80	160	240	320	(40)	(790)	750	612 x M12/12F7
MQ424280R40	~349	420	50	40	80	160	240	320	(40)	(840)	800	648 x M12/12F7
MQ424285R40	~373	420	50	40	80	160	240	320	(40)	(890)	850	684 x M12/12F7
MQ424290R40	~393	420	50	40	80	160	240	320	(40)	(940)	900	720 x M12/12F7
MQ424295R40	~413	420	50	40	80	160	240	320	(40)	(990)	950	756 x M12/12F7

* Gewicht ohne Grundplatte! / Weight without baseplate!



Mineralgussturm mit
Stahldübel

Epoxy Mineral with
Steel Anchor



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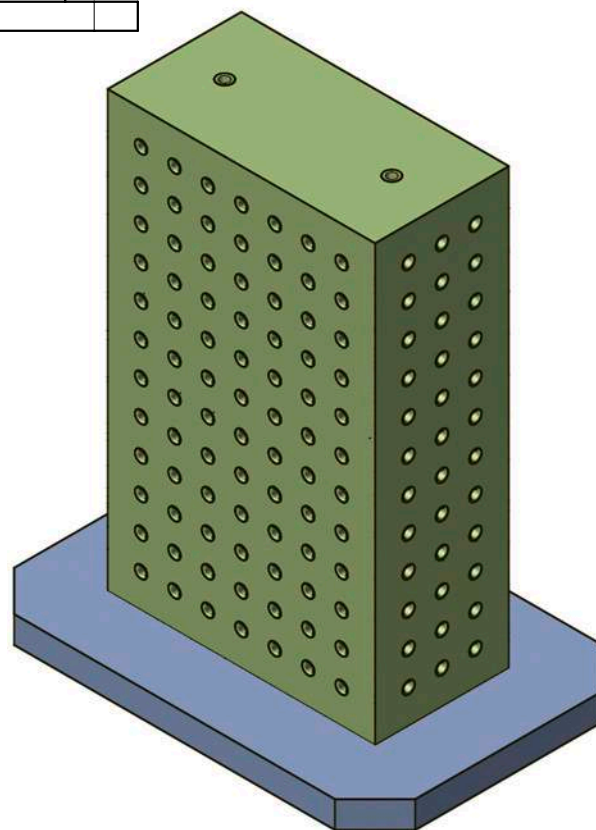
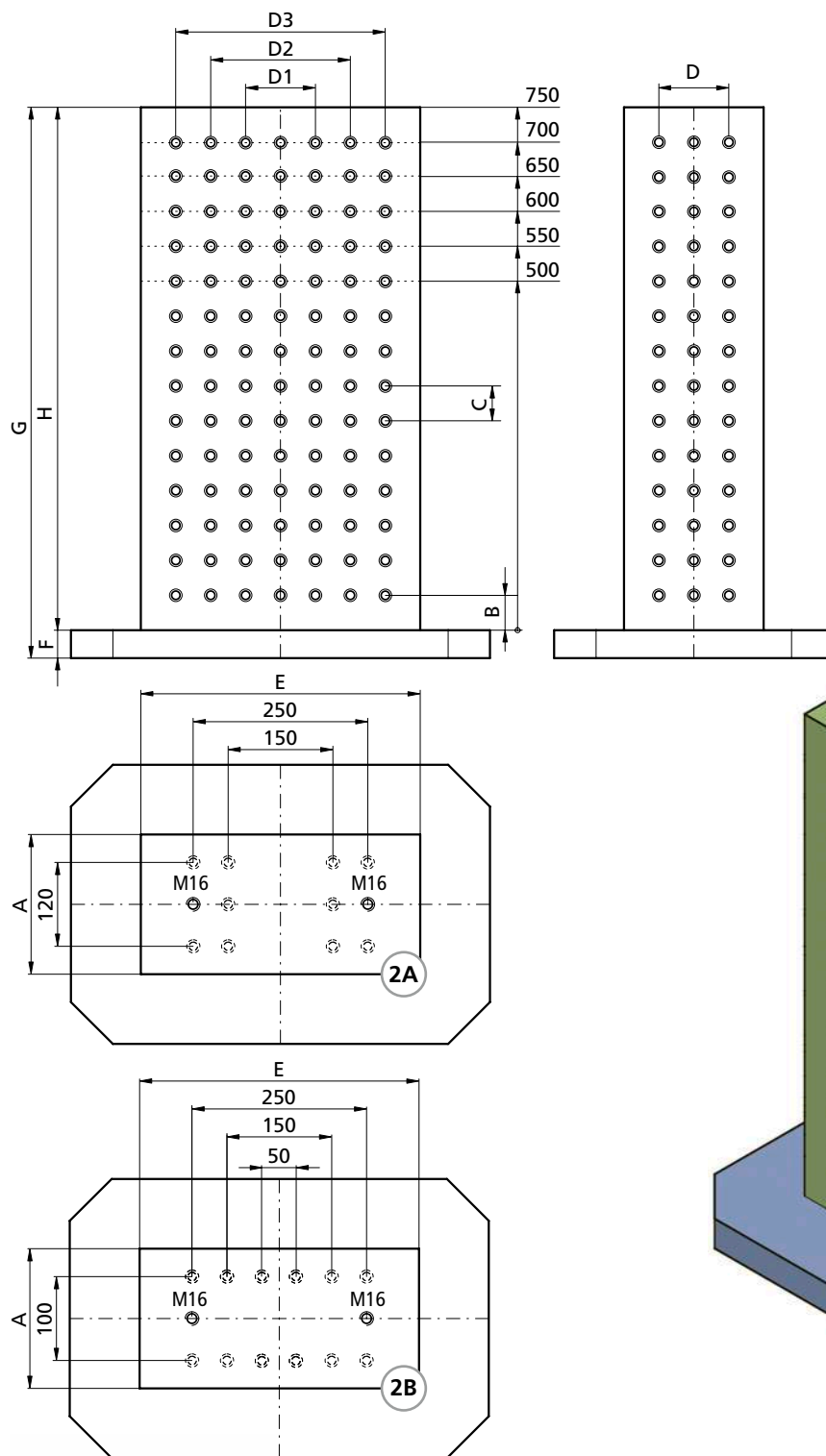
Bestellbeispiel

Ordering example: **MR401245R50** & p. 274

Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!

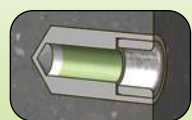
Base plate according to your
machine configuration please
order extra!

	kg*	A	B	B1	C	D	D1	D2	D3	E	F	G	H	Raster / Grid
MR301550R50	~65	150	50		50		100	200		300	(30)	(530)	500	63 x M12/12F7
MR301555R50	~72	150	50		50		100	200		300	(30)	(580)	550	70 x M12/12F7
MR301560R50	~78	150	50		50		100	200		300	(30)	(630)	600	77 x M12/12F7
MR301565R50	~85	150	50		50		100	200		300	(30)	(680)	650	84 x M12/12F7
MR401245R50	~64	120	50	75	50	50	100	200	300	400	(30)	(480)	450	140 x M12/12F7
MR401250R50	~71	120	50	75	50	50	100	200	300	400	(30)	(530)	500	158 x M12/12F7
MR401255R50	~78	120	50	75	50	50	100	200	300	400	(30)	(580)	550	176 x M12/12F7
MR401260R50	~85	120	50	75	50	50	100	200	300	400	(30)	(630)	600	194 x M12/12F7



Mineralgussturm mit
Stahldübel

Epoxy Mineral with
Steel Anchor



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Bestellbeispiel

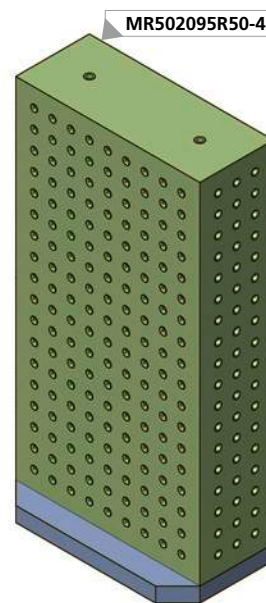
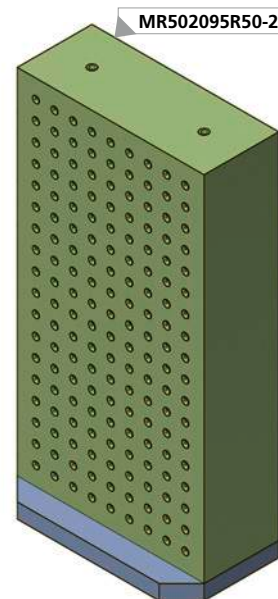
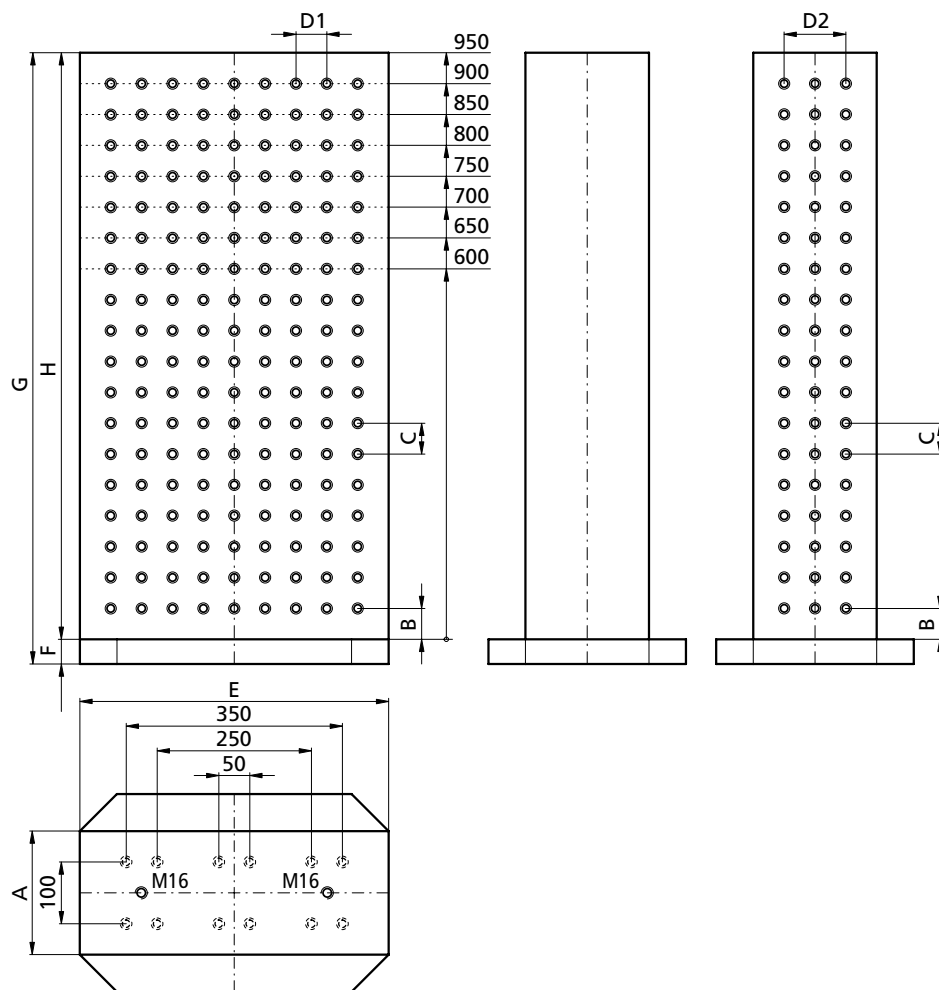
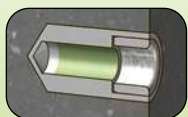
Ordering example: **MR402050R50** & _____ p. 274

Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!

Base plate according to your
machine configuration please
order extra!

	kg*	Bohrbild / Hole pattern	A	B	C	D	D1	D2	D3	E	F	G	H	Raster / Grid
MR402050R50	~115	2A	200	50	50	100	100	200	300	400	(40)	(540)	500	180 x M12/12F7
MR402055R50	~126	2A	200	50	50	100	100	200	300	400	(40)	(590)	550	200 x M12/12F7
MR402060R50	~138	2A	200	50	50	100	100	200	300	400	(40)	(640)	600	220 x M12/12F7
MR402065R50	~149	2A	200	50	50	100	100	200	300	400	(40)	(690)	650	240 x M12/12F7
MR402070R50	~162	2B	200	50	50	100	100	200	300	400	(40)	(740)	700	260 x M12/12F7
MR402075R50	~172	2B	200	50	50	100	100	200	300	400	(40)	(790)	750	280 x M12/12F7

* Gewicht ohne Grundplatte! / Weight without baseplate!

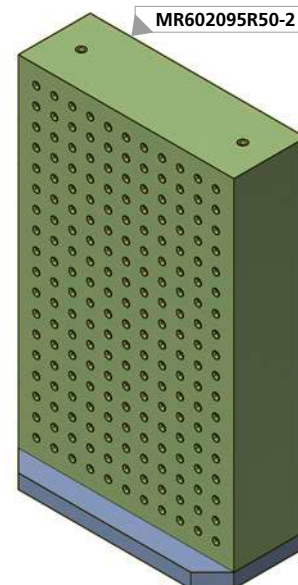
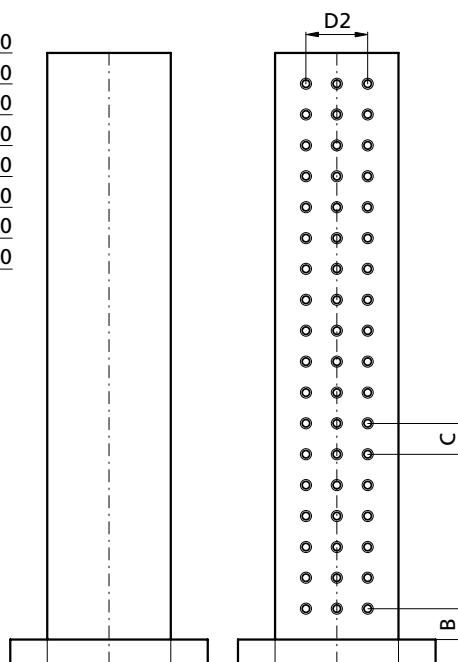
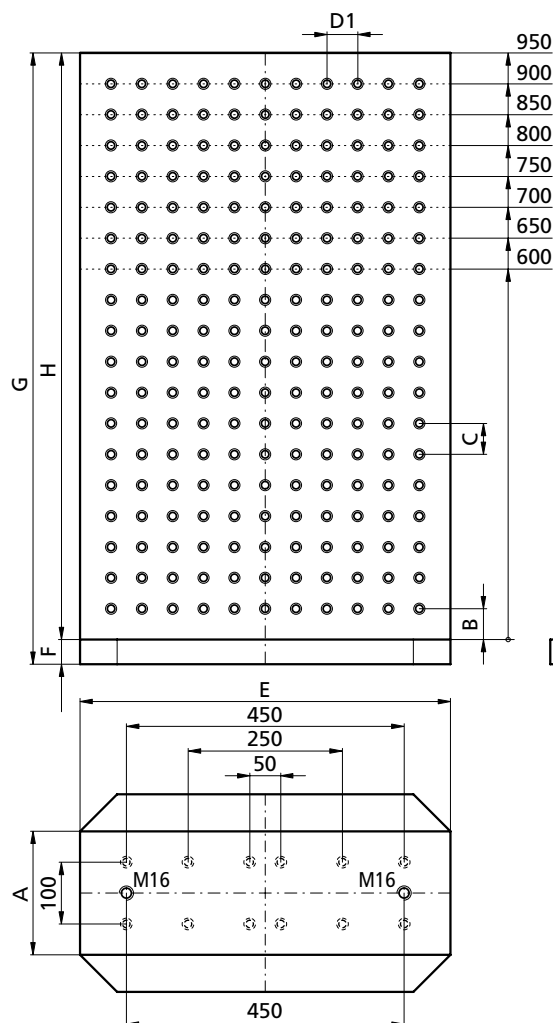
Mineralgussturm mit
StahldübelEpoxy Mineral with
Steel Anchor

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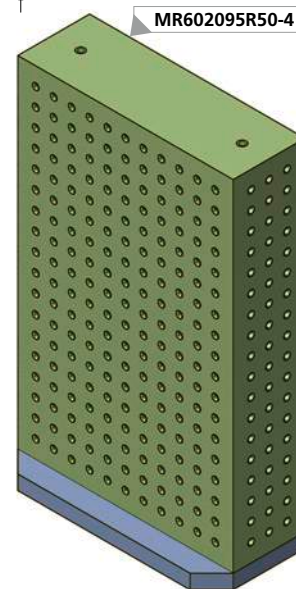
Bestellbeispiel

Ordering example: **MR502060R50-2** & p. 274Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!Base plate according to your
machine configuration please
order extra!

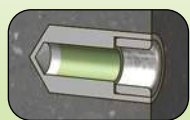
	kg*	A	B	C	D1	D2	E	F	G	H	Raster / Grid
MR502060R50-2	~165	200	50	50	50		500	(40)	(640)	600	198 x M12/12F7
MR502065R50-2	~179	200	50	50	50		500	(40)	(690)	650	216 x M12/12F7
MR502070R50-2	~193	200	50	50	50		500	(40)	(740)	700	234 x M12/12F7
MR502075R50-2	~208	200	50	50	50		500	(40)	(790)	750	252 x M12/12F7
MR502080R50-2	~222	200	50	50	50		500	(40)	(840)	800	270 x M12/12F7
MR502085R50-2	~236	200	50	50	50		500	(40)	(890)	850	288 x M12/12F7
MR502090R50-2	~251	200	50	50	50		500	(40)	(940)	900	306 x M12/12F7
MR502095R50-2	~265	200	50	50	50		500	(40)	(990)	950	324 x M12/12F7
MR502060R50-4	~171	200	50	50	50	100	500	(40)	(640)	600	264 x M12/12F7
MR502065R50-4	~185	200	50	50	50	100	500	(40)	(690)	650	288 x M12/12F7
MR502070R50-4	~199	200	50	50	50	100	500	(40)	(740)	700	312 x M12/12F7
MR502075R50-4	~214	200	50	50	50	100	500	(40)	(790)	750	336 x M12/12F7
MR502080R50-4	~228	200	50	50	50	100	500	(40)	(840)	800	360 x M12/12F7
MR502085R50-4	~242	200	50	50	50	100	500	(40)	(890)	850	384 x M12/12F7
MR502090R50-4	~257	200	50	50	50	100	500	(40)	(940)	900	408 x M12/12F7
MR502095R50-4	~271	200	50	50	50	100	500	(40)	(990)	950	432 x M12/12F7



MR602095R50-2



MR602095R50-4

Mineralgussturm mit
StahldübelEpoxy Mineral with
Steel Anchor

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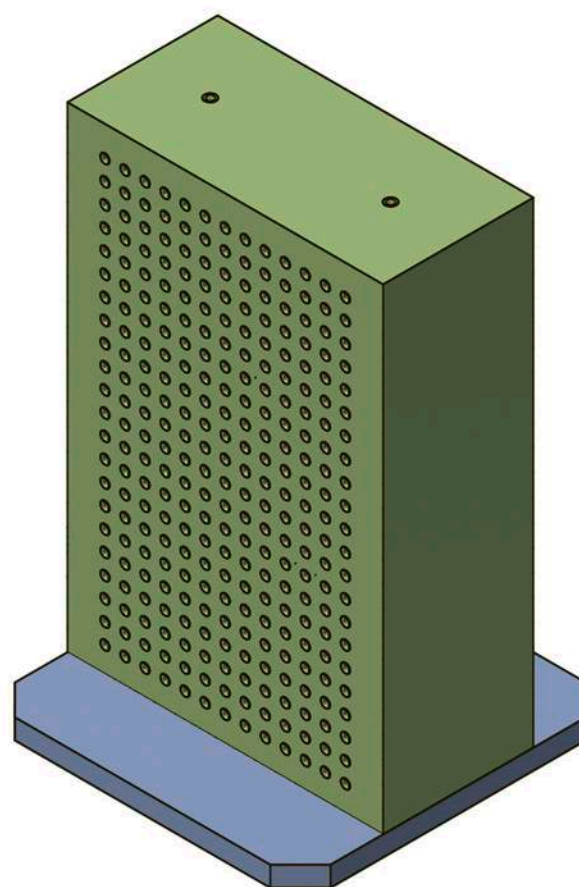
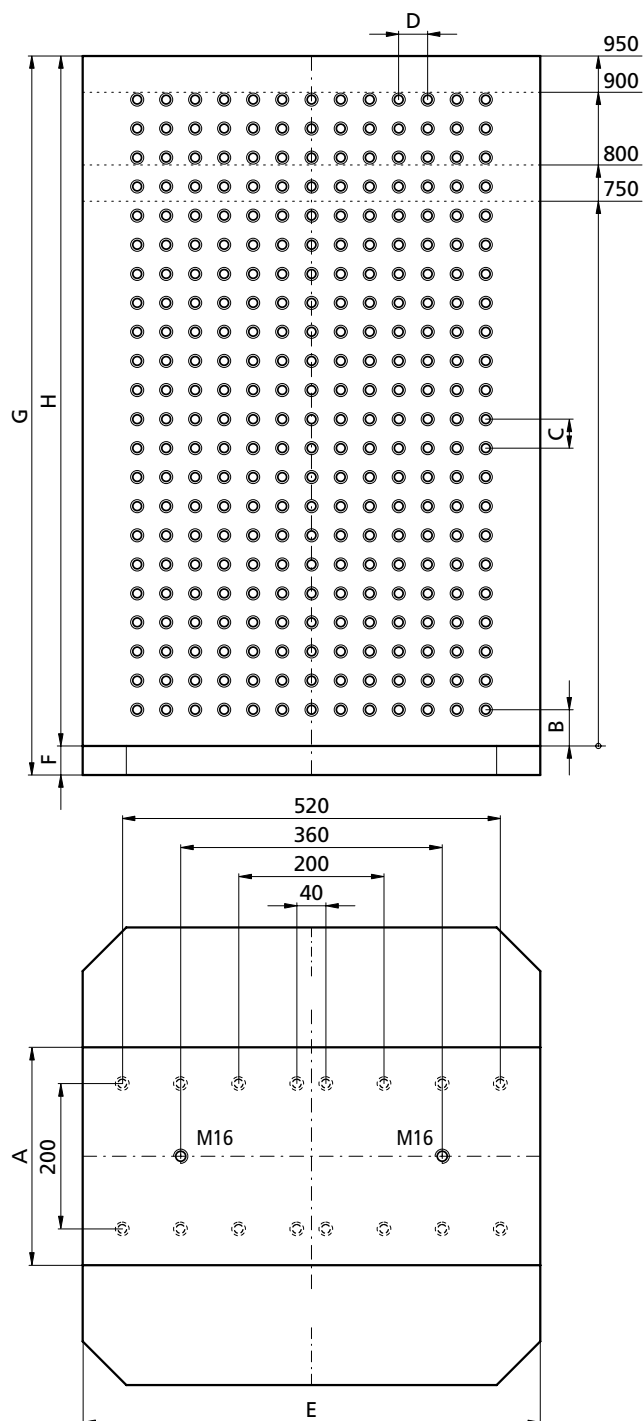
Bestellbeispiel

Ordering example: MR602060R50-2 & p. 274

Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!Base plate according to your
machine configuration please
order extra!

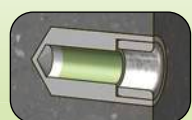
	kg*	A	B	C	D1	D2	E	F	G	H	Raster / Grid
MR602060R50-2	~200	200	50	50	50		600	(40)	(640)	600	242 x M12/12F7
MR602065R50-2	~217	200	50	50	50		600	(40)	(690)	650	264 x M12/12F7
MR602070R50-2	~234	200	50	50	50		600	(40)	(740)	700	286 x M12/12F7
MR602075R50-2	~250	200	50	50	50		600	(40)	(790)	750	308 x M12/12F7
MR602080R50-2	~267	200	50	50	50		600	(40)	(840)	800	330 x M12/12F7
MR602085R50-2	~284	200	50	50	50		600	(40)	(890)	850	352 x M12/12F7
MR602090R50-2	~301	200	50	50	50		600	(40)	(940)	900	374 x M12/12F7
MR602095R50-2	~317	200	50	50	50		600	(40)	(990)	950	396 x M12/12F7
MR602060R50-4	~205	200	50	50	50	100	600	(40)	(640)	600	308 x M12/12F7
MR602065R50-4	~222	200	50	50	50	100	600	(40)	(690)	650	336 x M12/12F7
MR602070R50-4	~239	200	50	50	50	100	600	(40)	(740)	700	364 x M12/12F7
MR602075R50-4	~256	200	50	50	50	100	600	(40)	(790)	750	392 x M12/12F7
MR602080R50-4	~273	200	50	50	50	100	600	(40)	(840)	800	420 x M12/12F7
MR602085R50-4	~290	200	50	50	50	100	600	(40)	(890)	850	448 x M12/12F7
MR602090R50-4	~307	200	50	50	50	100	600	(40)	(940)	900	476 x M12/12F7
MR602095R50-4	~324	200	50	50	50	100	600	(40)	(990)	950	504 x M12/12F7

* Gewicht ohne Grundplatte! / Weight without baseplate!



Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!
Base plate according to your
machine configuration please
order extra!

Mineralgussturm mit
Stahldübel
Epoxy Mineral with
Steel Anchor

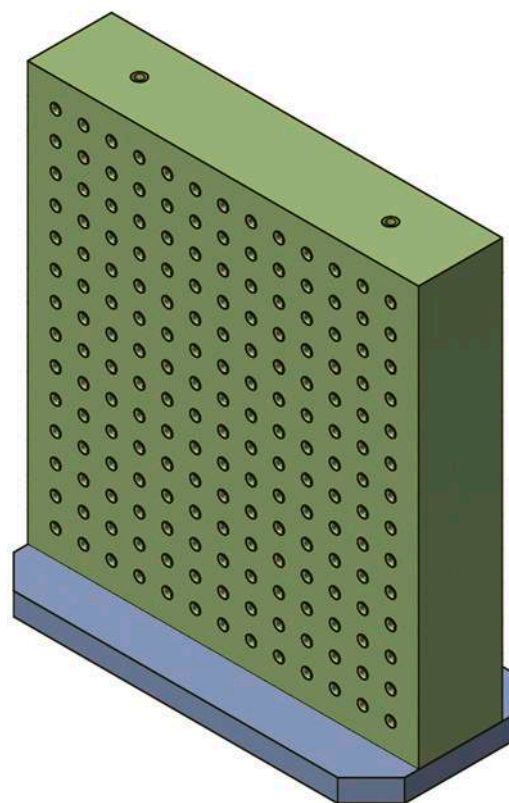
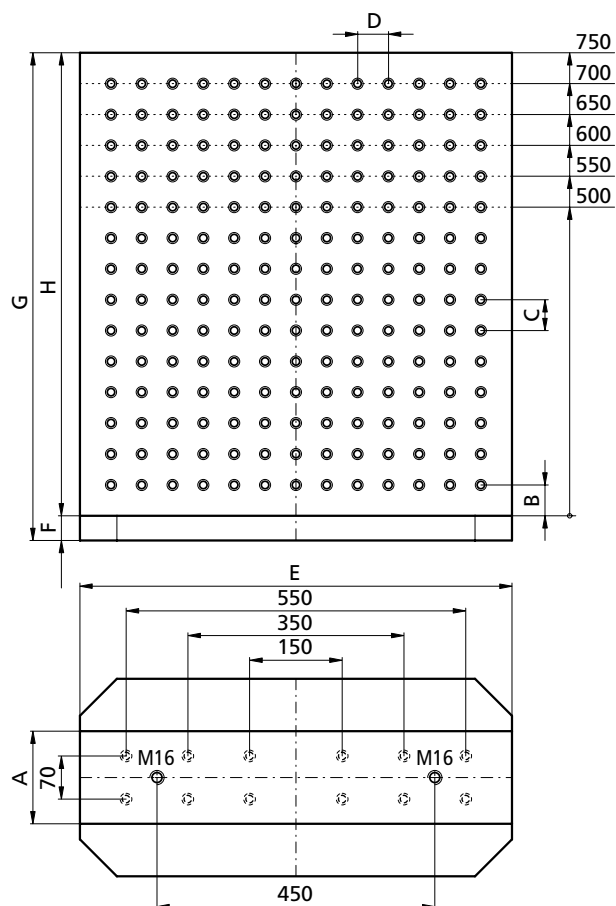


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Bestellbeispiel

Ordering example: **MR633075R40** & _____ p. 274

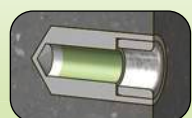
	kg*	A	B	C	D	E	F	G	H	Raster / Grid
MR633075R40	~314	300	50	40	40	630	(40)	(790)	750	468 x M12/12F7
MR633080R40	~333	300	50	40	40	630	(40)	(840)	800	494 x M12/12F7
MR633090R40	~374	300	50	40	40	630	(40)	(940)	900	546 x M12/12F7
MR633095R40	~393	300	50	40	40	630	(40)	(990)	950	572 x M12/12F7



Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!
Base plate according to your machine configuration please order extra!

Mineralgusssturm mit
Stahldübel

Epoxy Mineral with
Steel Anchor



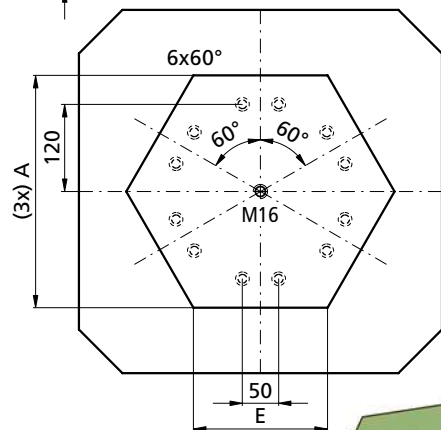
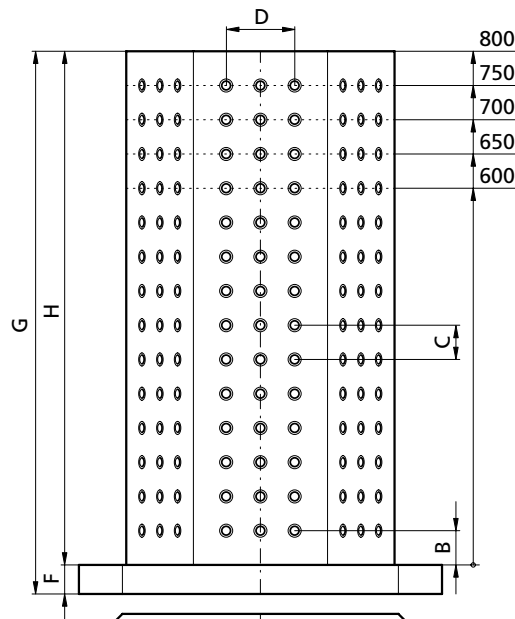
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Bestellbeispiel

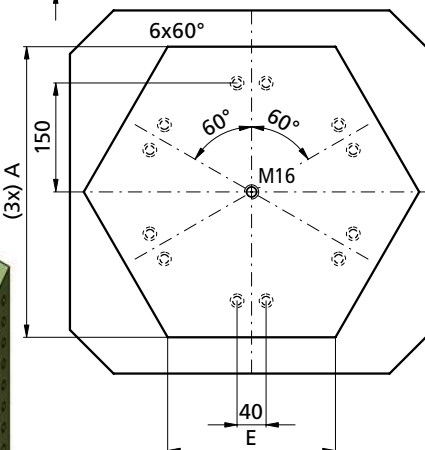
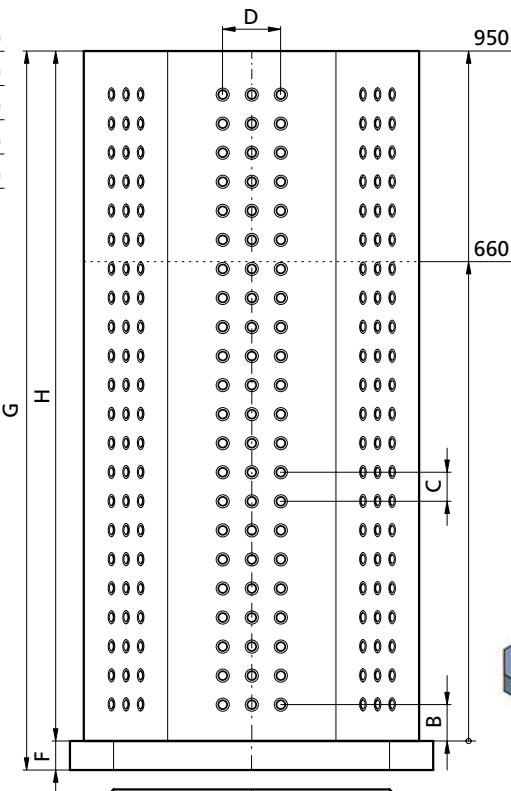
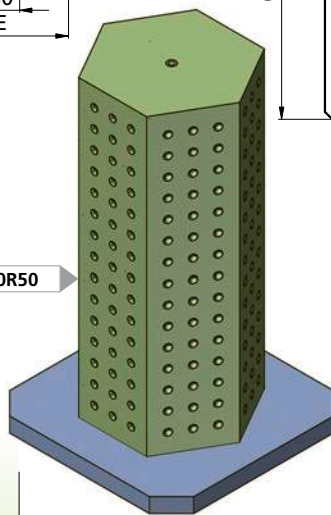
Ordering example: **MR701550R50** & _____ p. 274

	kg*		A	B	C	D	E	F	G	H	Raster / Grid
MR701550R50	~153		150	50	50	50	700	(40)	(540)	500	234 x M12/12F7
MR701555R50	~168		150	50	50	50	700	(40)	(590)	550	260 x M12/12F7
MR701560R50	~183		150	50	50	50	700	(40)	(640)	600	286 x M12/12F7
MR701565R50	~199		150	50	50	50	700	(40)	(690)	650	312 x M12/12F7
MR701570R50	~214		150	50	50	50	700	(40)	(740)	700	338 x M12/12F7
MR701575R50	~229		150	50	50	50	700	(40)	(790)	750	364 x M12/12F7

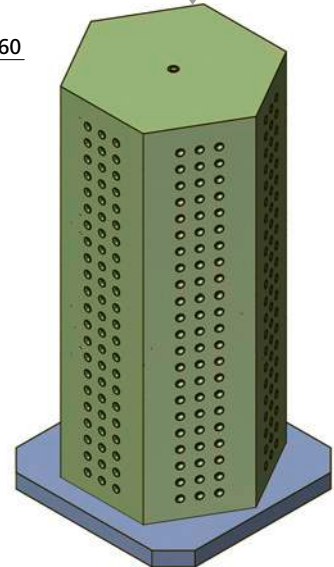
* Gewicht ohne Grundplatte! / Weight without baseplate!



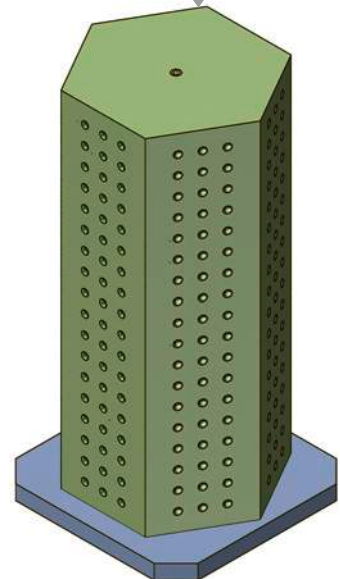
MS321980R50



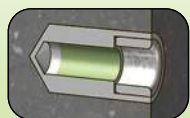
MS402395R40



MS402395R50



Mineralgussturm mit
Stahldübel
Epoxy Mineral with
Steel Anchor



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Bestellbeispiel

Ordering example: MS321966R80 &

p. 274

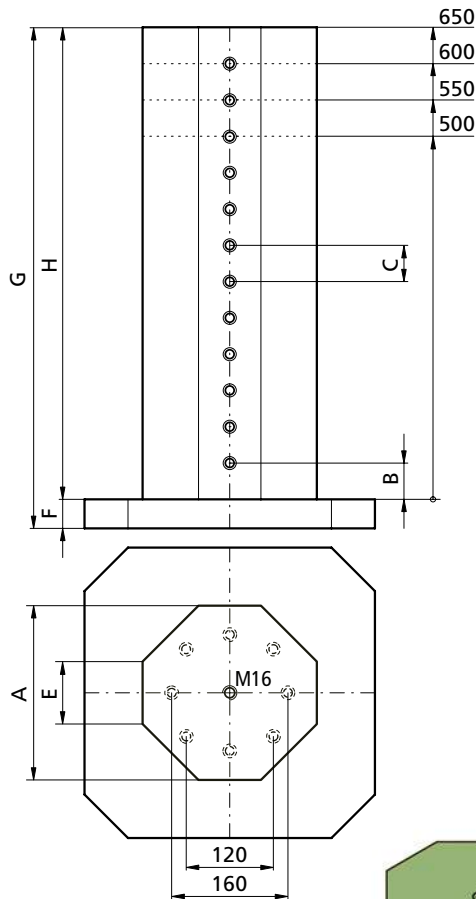
Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!

Base plate according to your
machine configuration please
order extra!

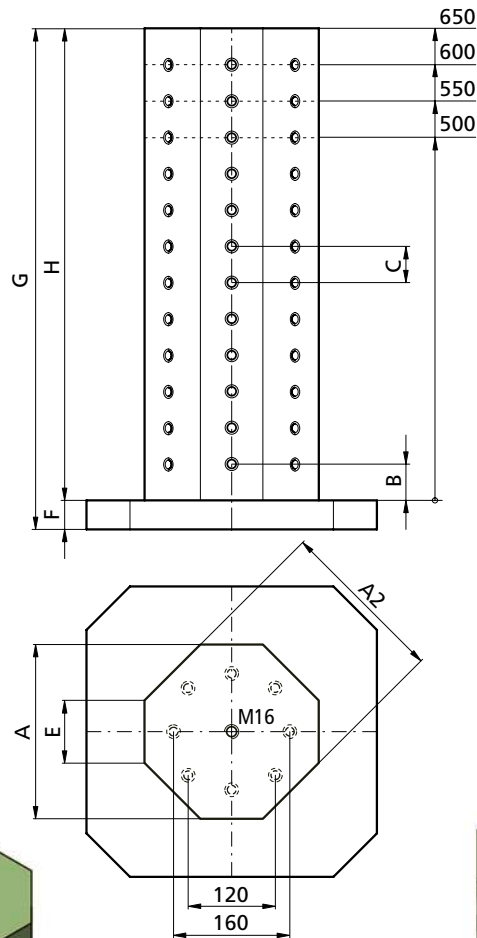
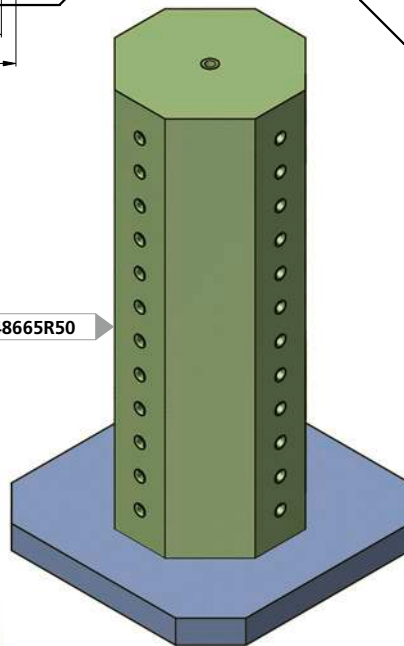
kg*

		A	B	C	D	E	F	G	H	Raster / Grid
MS321960R50	~120	320	50	50	100	184	(40)	(640)	600	198 x M12/12F7
MS321965R50	~131	320	50	50	100	184	(40)	(690)	650	216 x M12/12F7
MS321970R50	~142	320	50	50	100	184	(40)	(740)	700	234 x M12/12F7
MS321975R50	~154	320	50	50	100	184	(40)	(790)	750	252 x M12/12F7
MS321980R50	~165	320	50	50	100	184	(40)	(840)	800	270 x M12/12F7
MS402366R40	~167	400	50	40	80	231	(40)	(700)	660	270 x M12/12F7
MS402395R40	~311	400	50	40	80	231	(40)	(990)	950	396 x M12/12F7
MS402366R50	~160	400	50	50	100	231	(40)	(700)	660	216 x M12/12F7
MS402395R50	~260	400	50	50	100	231	(40)	(990)	950	324 x M12/12F7

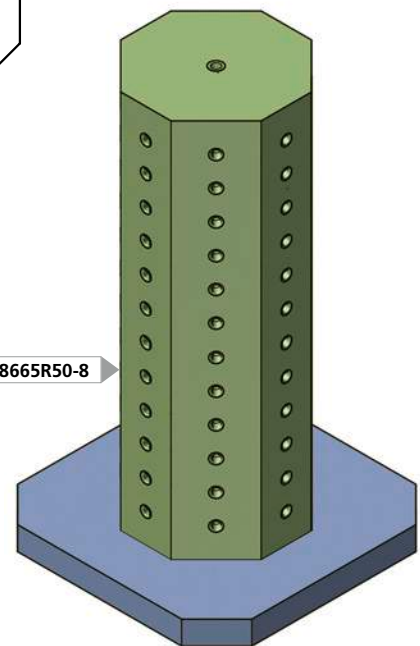
* Gewicht ohne Grundplatte! / Weight without baseplate!



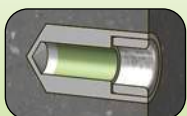
MA248665R50



MA248665R50-8



Mineralgussturm mit
Stahldübel
Epoxy Mineral with
Steel Anchor



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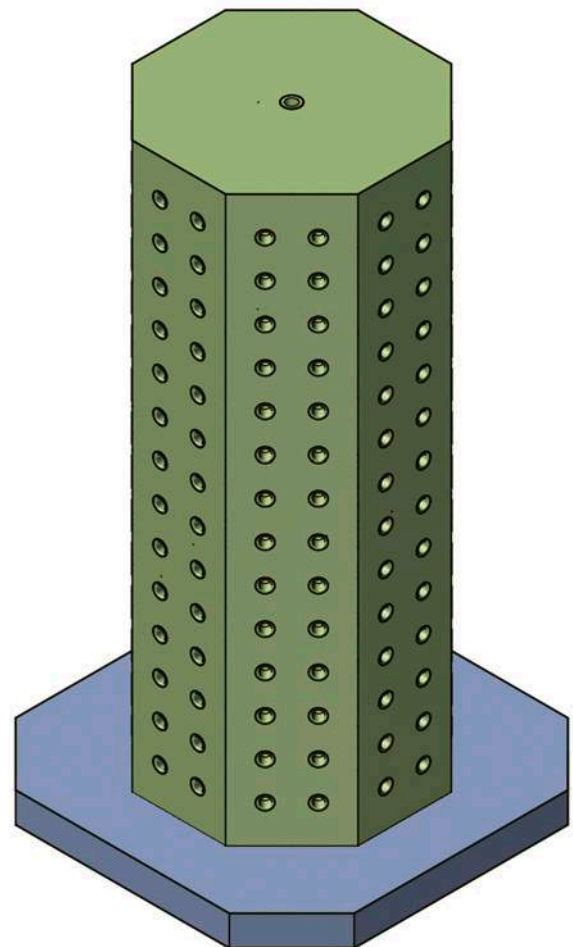
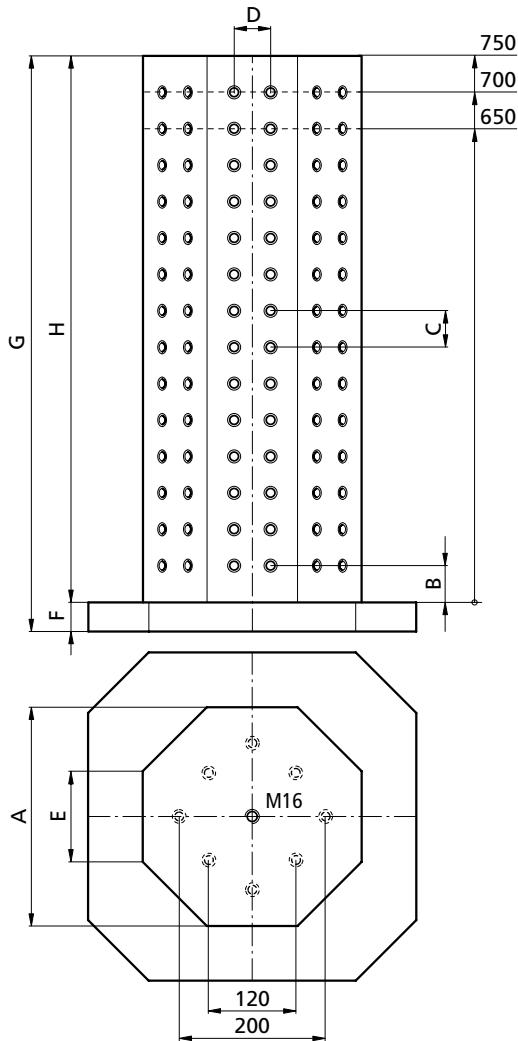
Bestellbeispiel
Ordering example: **MR248650R50** &

p. 274

Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!
Base plate according to your
machine configuration please
order extra!

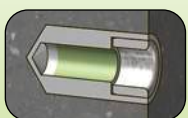
	kg*				A	A2	B	C		E	F	G	H	Raster / Grid
MA248650R50	~56				240		50	50		86	(40)	(540)	500	36 x M12/12F7
MA248655R50	~61				240		50	50		86	(40)	(590)	550	40 x M12/12F7
MA248660R50	~70				240		50	50		86	(40)	(640)	600	44 x M12/12F7
MA248665R50	~72				240		50	50		86	(40)	(690)	650	48 x M12/12F7
MA248650R50-8	~61				240	230	50	50		86	(40)	(540)	500	72 x M12/12F7
MA248655R50-8	~67				240	230	50	50		86	(40)	(590)	550	80 x M12/12F7
MA248660R50-8	~71				240	230	50	50		86	(40)	(640)	600	88 x M12/12F7
MA248665R50-8	~79				240	230	50	50		86	(40)	(690)	650	96 x M12/12F7

* Gewicht ohne Grundplatte! / Weight without baseplate!



Grundplatte wird passend
zu Ihrer Maschinenpalette
hergestellt und muss separat
bestellt werden!
*Base plate according to your
machine configuration please
order extra!*

Mineralgussturm mit
Stahldübel
*Epoxy Mineral with
Steel Anchor*



andere Höhen auf Anfrage
other heights on request

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Bestellbeispiel

Ordering example: **MA301265R50-8-2** & _____ p. 274

	kg*	A	B	C	D	E	F	G	H	Raster / Grid
MA301265R50-8-2	~118	300	50	50	50	125	(40)	(690)	650	192 x M12/12F7
MA301270R50-8-2	~130	300	50	50	50	125	(40)	(740)	700	208 x M12/12F7
MA301275R50-8-2	~156	300	50	50	50	125	(40)	(790)	750	224 x M12/12F7

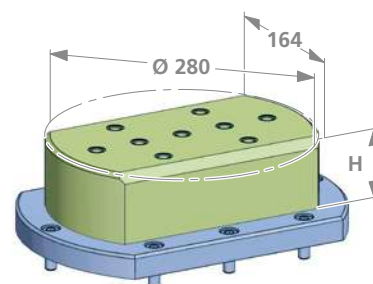
* Gewicht ohne Grundplatte! / *Weight without baseplate!*

Mineralgusserhöhung für 5-Achsenmaschinen Epoxy casting raises blocks for 5-axis machines



tripoxyMINERAL

Art. Nr.	kg	H	Raster / Grid R50
MUB2817-H85	~8,7	85	9 x M12/12F7
MUB2817-H100	~10,3	100	
MUB2817-H125	~12,9	125	



Mineralgusserhöhungen um eine optimale Bearbeitungshöhe und Zugänglichkeit mit der Spindel zu erreichen.

Epoxy casting raises to achieve an optimal machining height and accessibility with the spindle.

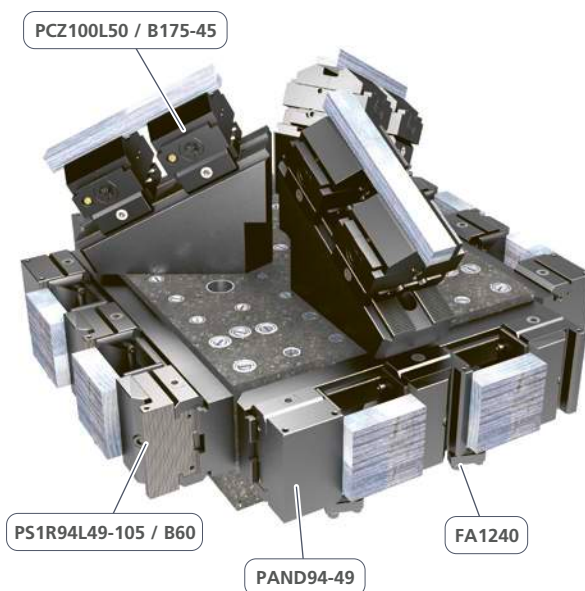
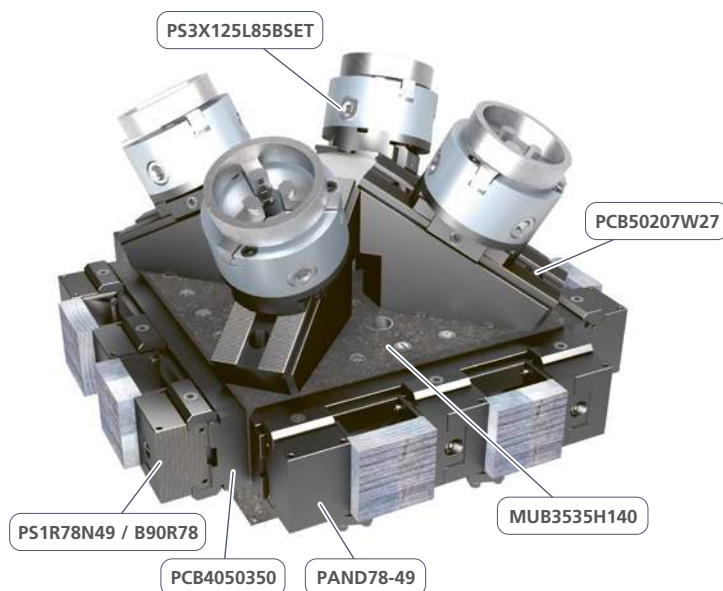
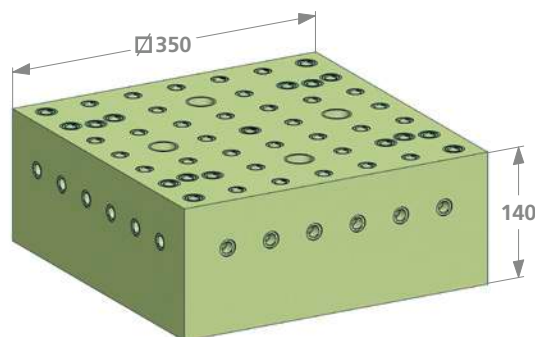


Art. Nr.	kg	Raster / Grid R50
MUB3535H140	~44,1	73 x M12/12F7



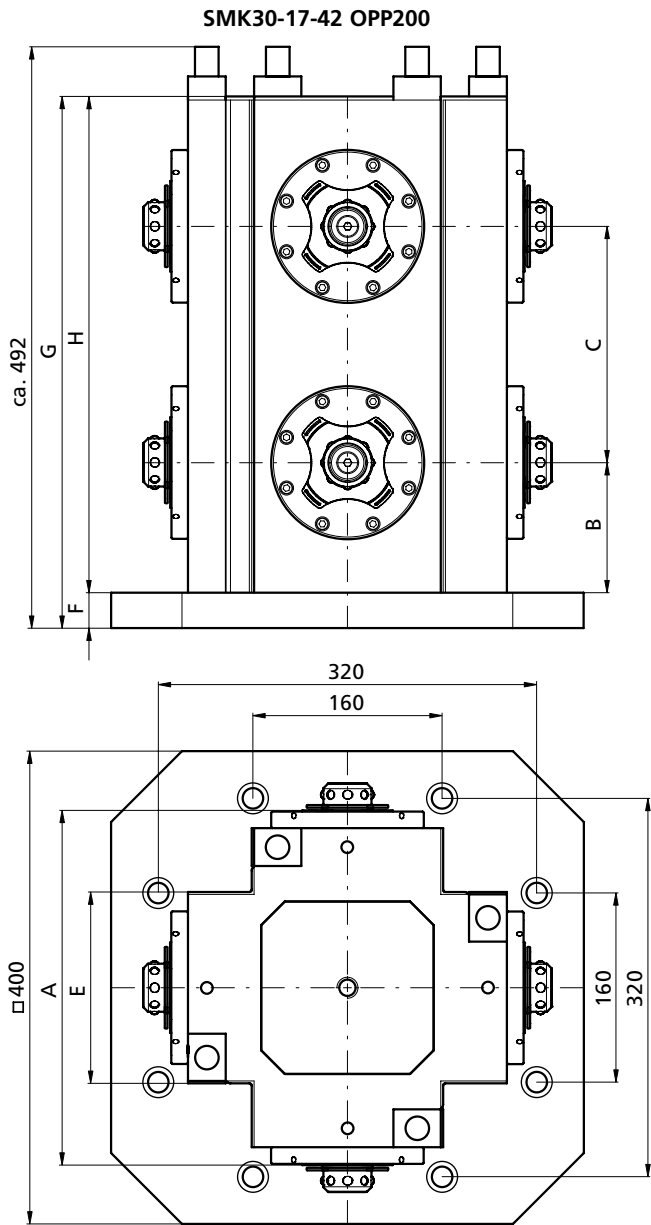
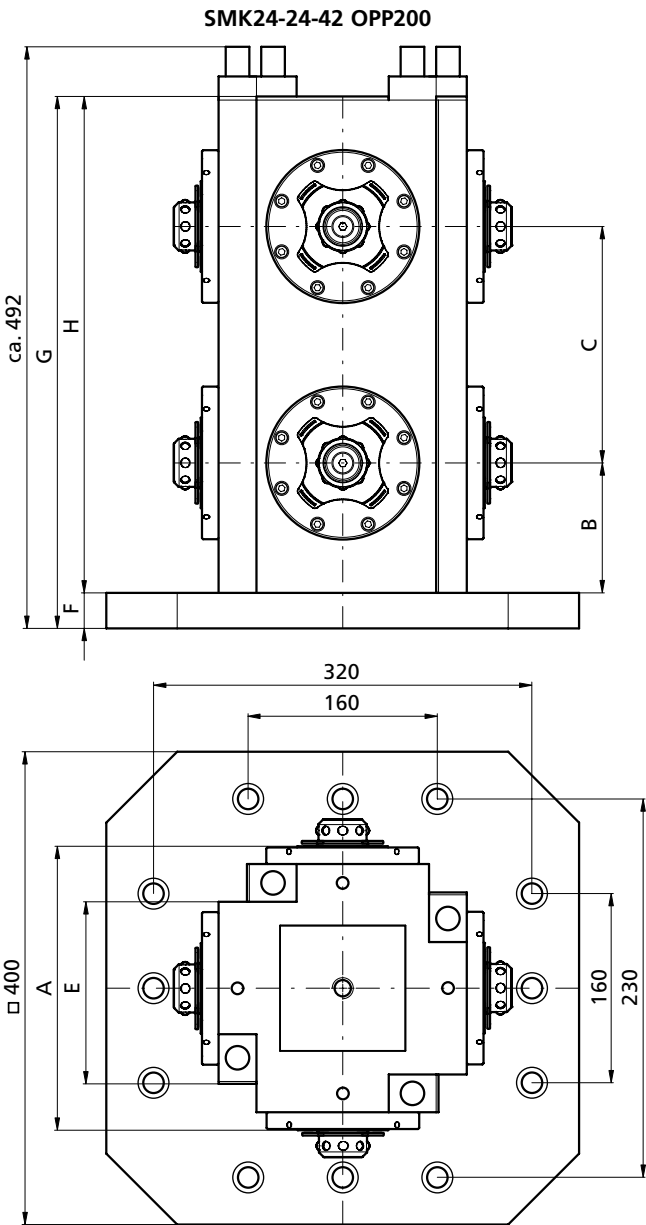
Diese Mineralgusserhöhung mit schrägen Basisschienen (PCB50207W27) und einer seitlichen Anordnung weiterer Spannstellen, bietet Ihnen eine Vielzahl an Spannmöglichkeiten.

This mineral casting raises with inclined base rails (PCB50207W27) and a lateral arrangement of further clamping points offers you a wide range of clamping possibilities.

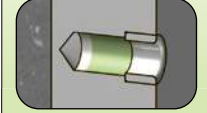


PCB50207W27
p. 52

SEPARAT BESTELLEN
ORDER SEPARATELY



Stahl-Mineralguss
Steel-epoxy mineral
tombstones

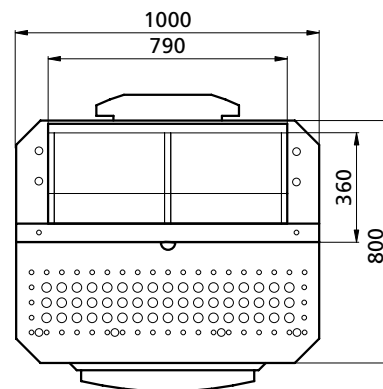
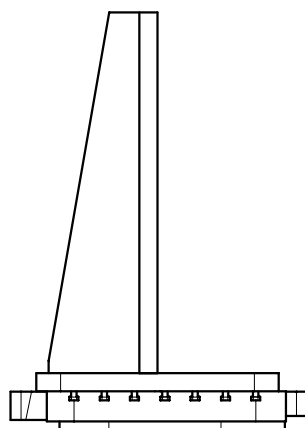
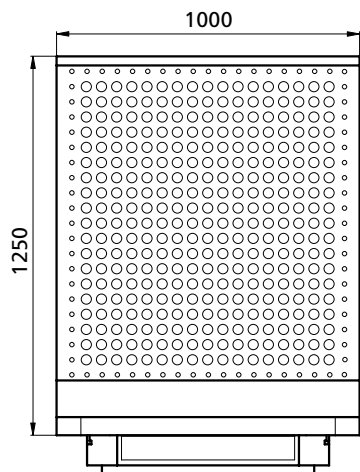


andere Höhen auf Anfrage
 other heights on request

Seite / Page 250

Bestellbeispiel
Ordering example: SMK242442OPP-200

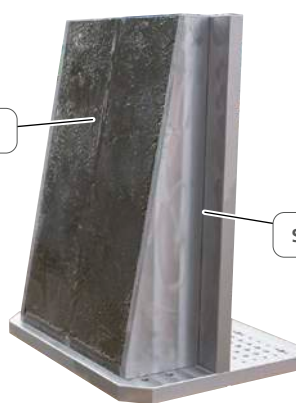
	kg	A	B	C	E	F	G	H	Raster / Grid
SMK24-24-42OPP200	~120	240	110	200	166	(30)	(450)	420	OPP-200
SMK30-17-42OPP200	~142	300	110	200	166	(30)	(450)	420	OPP-200



Gesamtgewicht
Total weight ~1300kg



Epoxy



Stahl / Steel

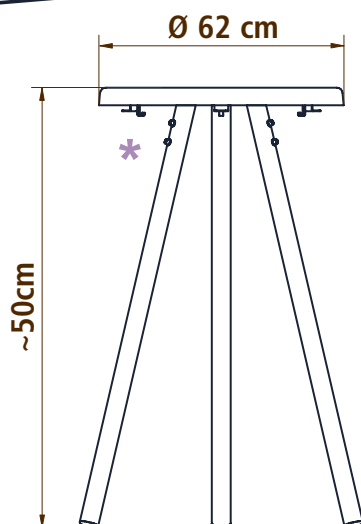


SPECIALS

Patent pending



Beine aus rostfreiem Stahl oder Holz
 Legs made of stainless steel or wood



* Inkl. 3x Flaschenöffner / Kleiderhaken
 Incl. 3x bottle opener / coat hook



Ihr Logo hier
 Your logo here



Salontisch Salon table

Jeder Tisch
 ist ein Unikat
 - Hergestellt
 aus Schweizer
 Stein-Granulat

Each table is
 unique
 - Made from
 Swiss stone
 granulate

Art. Nr.

MST-TRI-600

Grundplatten für Mineralgusstürme

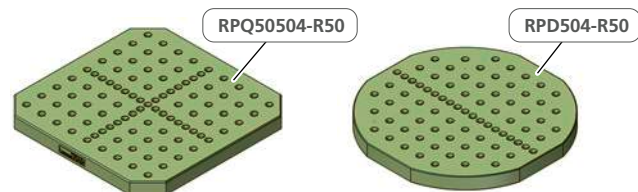
Base plate for epoxy mineral tombstone

	A	B	C	kg
GPL30040	300	300	40	~27
GPL40040	400	400	40	~47
GPL50040	500	500	40	~74
GPL45040	450	450	40	~61
GPL50040040	500	400	40	~58
GPL63040	630	630	40	~120
GPL80040	800	800	40	~195

Rasterplatten für 5AX-Master

Grid plate for 5AX-Master

	A	B	C	Raster / Grid	kg
RPQ50504-R50	500	500	40	M12/12F7	~74
RPD504-R50	Ø 500		40	M12/12F7	~64



Andere Größen auf Anfrage

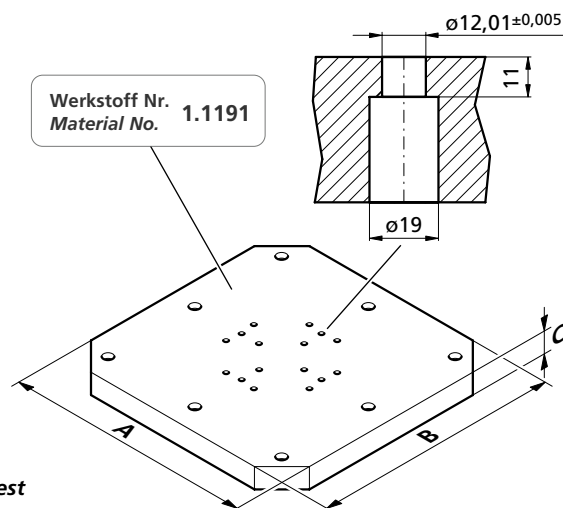
Other dimensions available on request

Im Lieferumfang: Schrauben zur Befestigung des Turms,
ohne Positionierzapfen und Schrauben maschinenseitig.

The package: Screws for fixing the tombstone,
without screws and counter piece to the machine side.

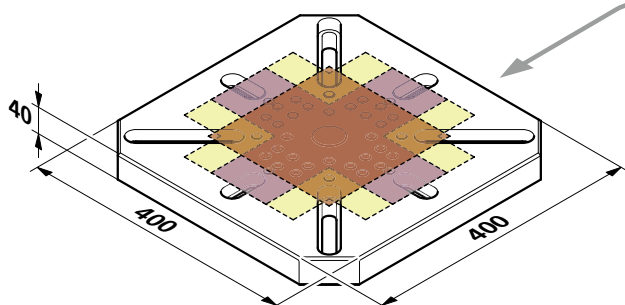
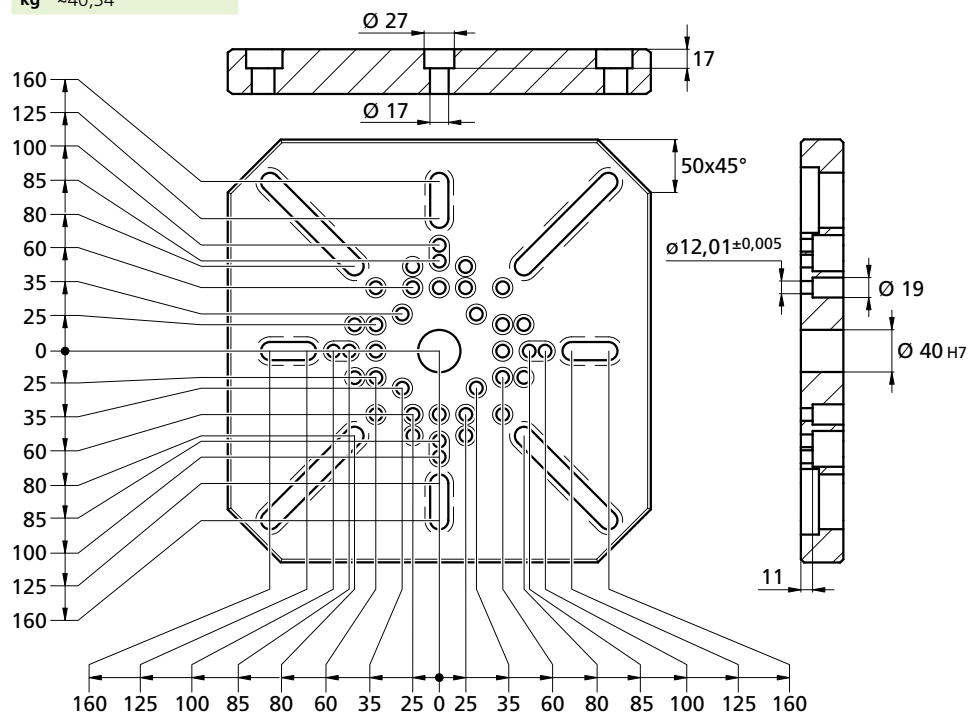
Bohrungen der Grundplatte / Drill holes in the baseplate:

Kundenspezifisch an die Maschine angepasst
Made up to customer's specifications

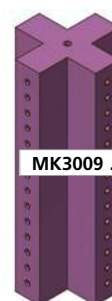


GPL40040-UV

kg ~40,34



27 verschiedene Mineralgusstürme
passend zu dieser Grundplatte.
27 different Epoxy mineral tombstone
are suitable for this base plate.



MK3009 ... R50



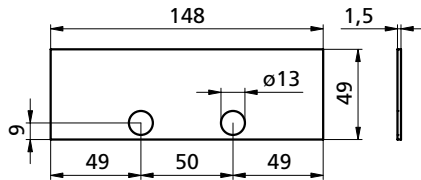
MK3018 ... R50



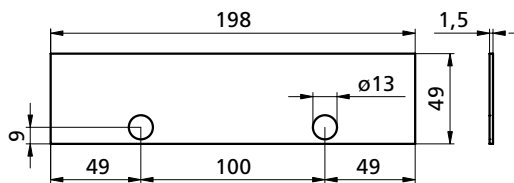
MQ2020 ... R50

Abdeckbleche zum Schutz der Oberfläche der Mineralgusstürme
Cover plates for surface protection of epoxy mineral tombstones

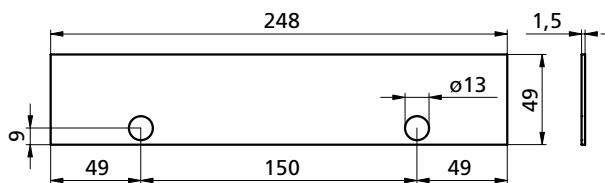
MABD501550



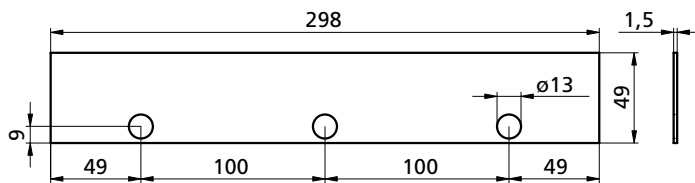
MABD502050



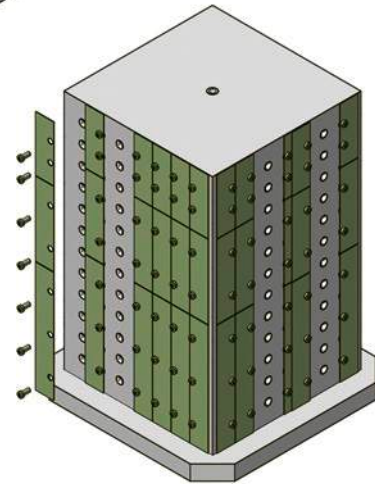
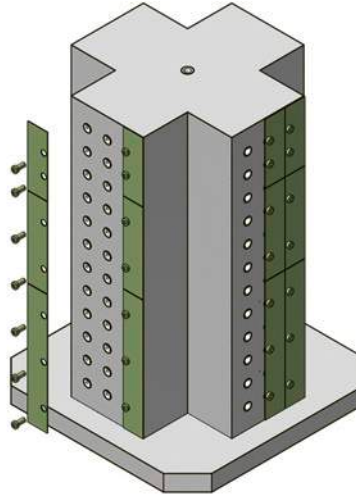
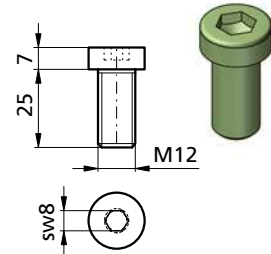
MABD502550



MABD503050

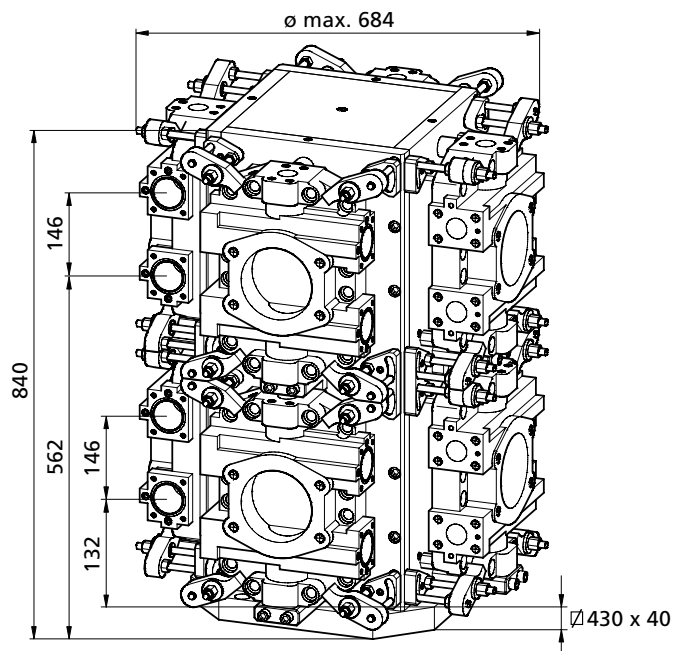


M12X25DIN7984



Stahl-Mineralguss

Steel-epoxy mineral tombstones

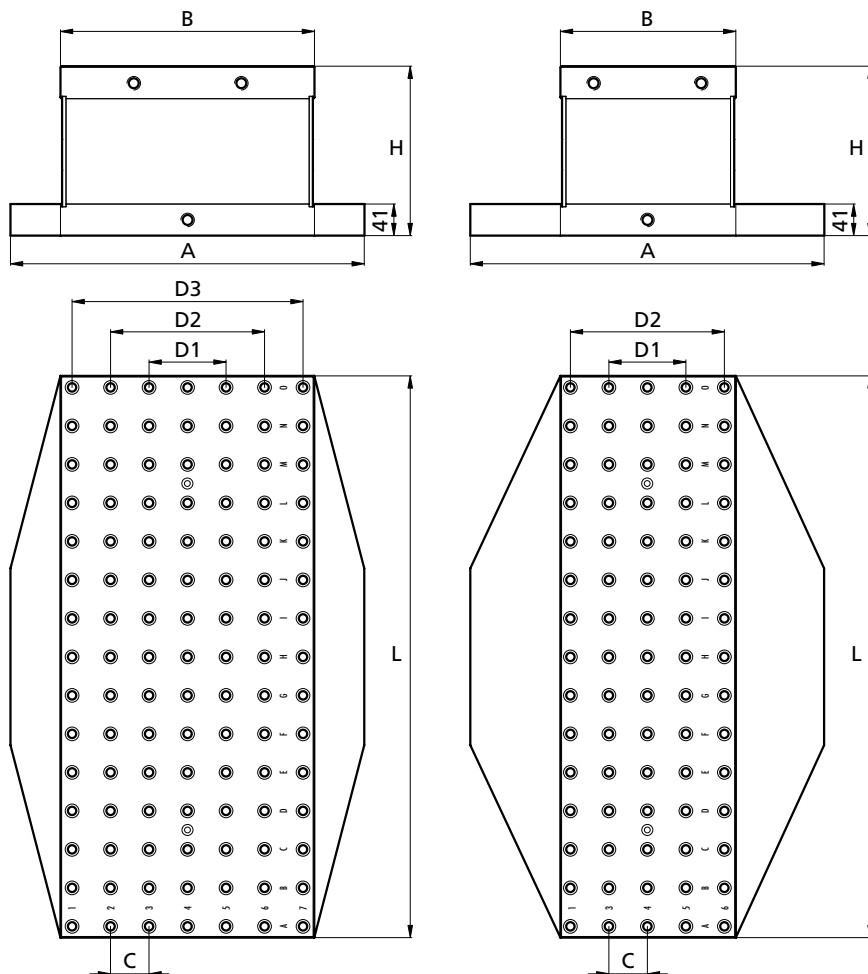


Gesamtgewicht
Total weight

~600 kg

~38 kg





**Entwickelt für die Luftfahrt.
Gewappnet für höchste
Anforderungen.**

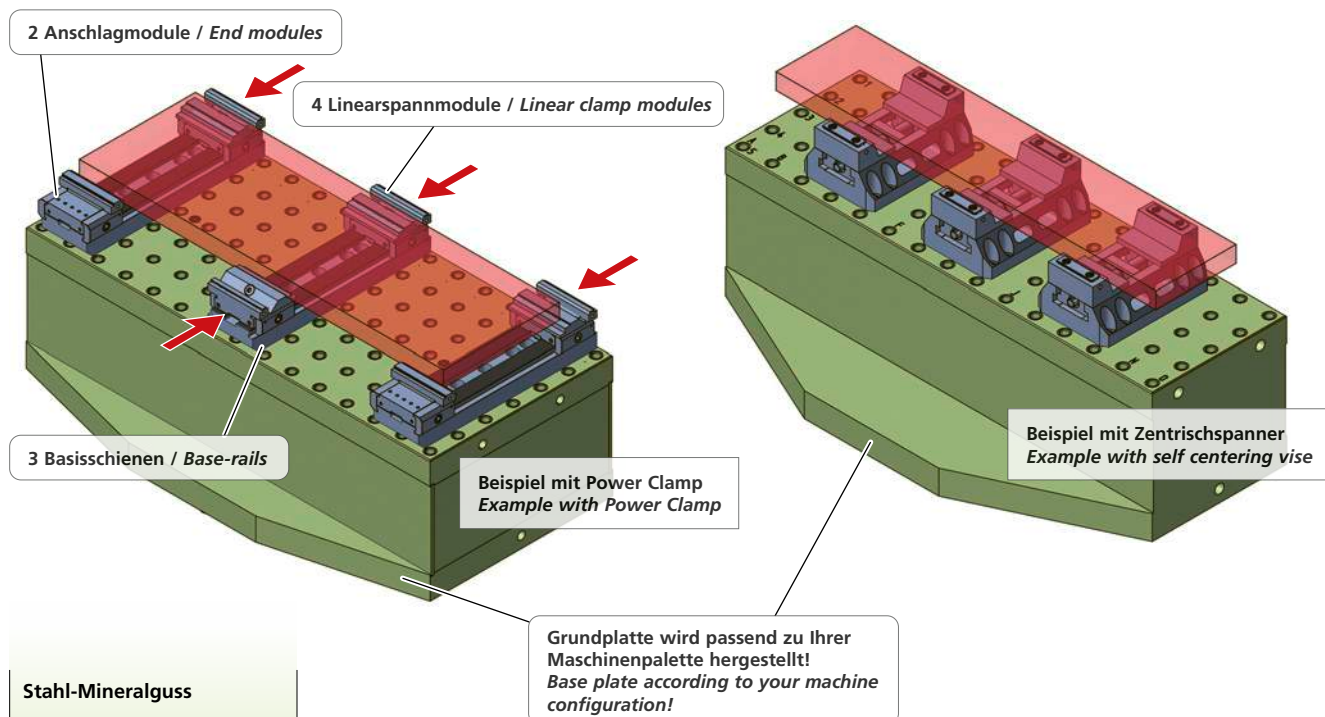
Sehr hohe Vibrationsdämpfung dank Kern aus Mineralguss. Hohe Festigkeit dank Ummantelung aus Stahl. Begünstigt die Gewichtsreduktion wodurch die Maschine geschont wird.

Mit integrierten Vakuum Kanälen erhältlich.

**Developed for aviation.
Prepared for the highest
requirements**

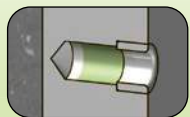
Very high vibration damping thanks to mineral cast core. High strength thanks to the coat made of steel. Supports weight reduction which protects the machine.

Raisers can be made with integrated vacuum channels.



Stahl-Mineralguss

Steel-epoxy mineral
tombstones

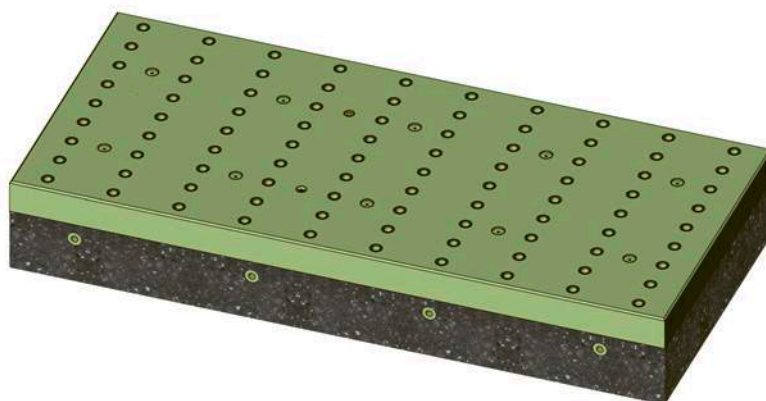
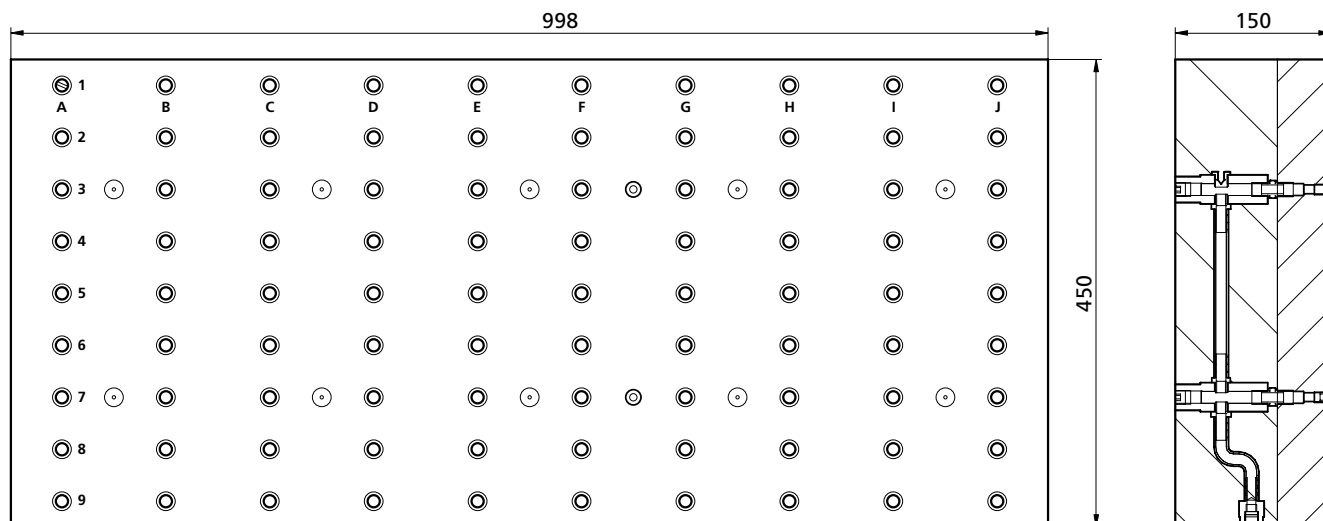


kg

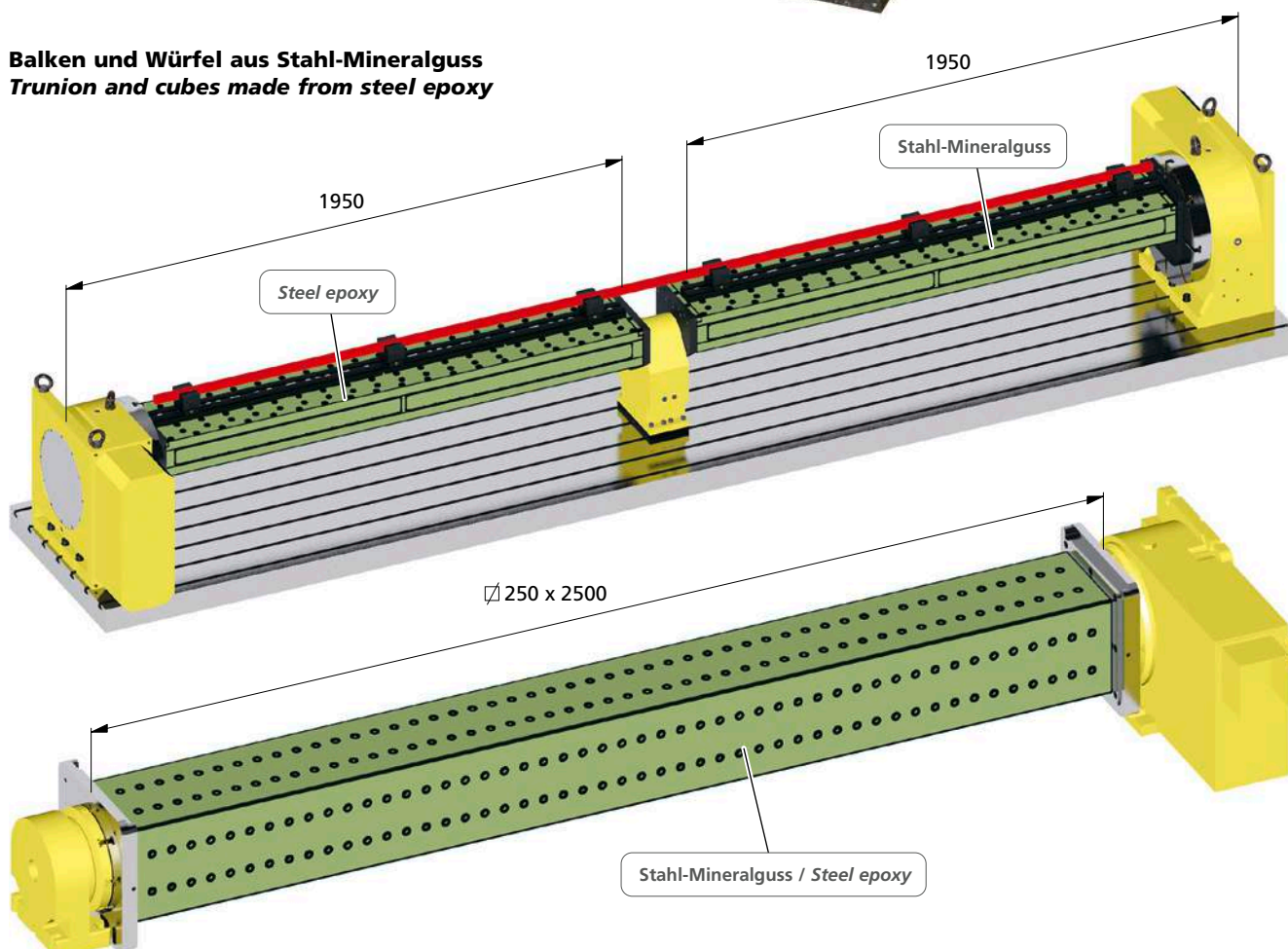
Bestellbeispiel

Ordering example: **SMUB2373H220**

		A	B	C	D1	D2	D3	H	L	Raster / Grid
SMUB2373H220	~168,0	460	230	50	100	200		220	730	75 x M12/12F7
SMUB3373H220	~214,4	460	330	50	100	200	300	220	730	105 x M12/12F7

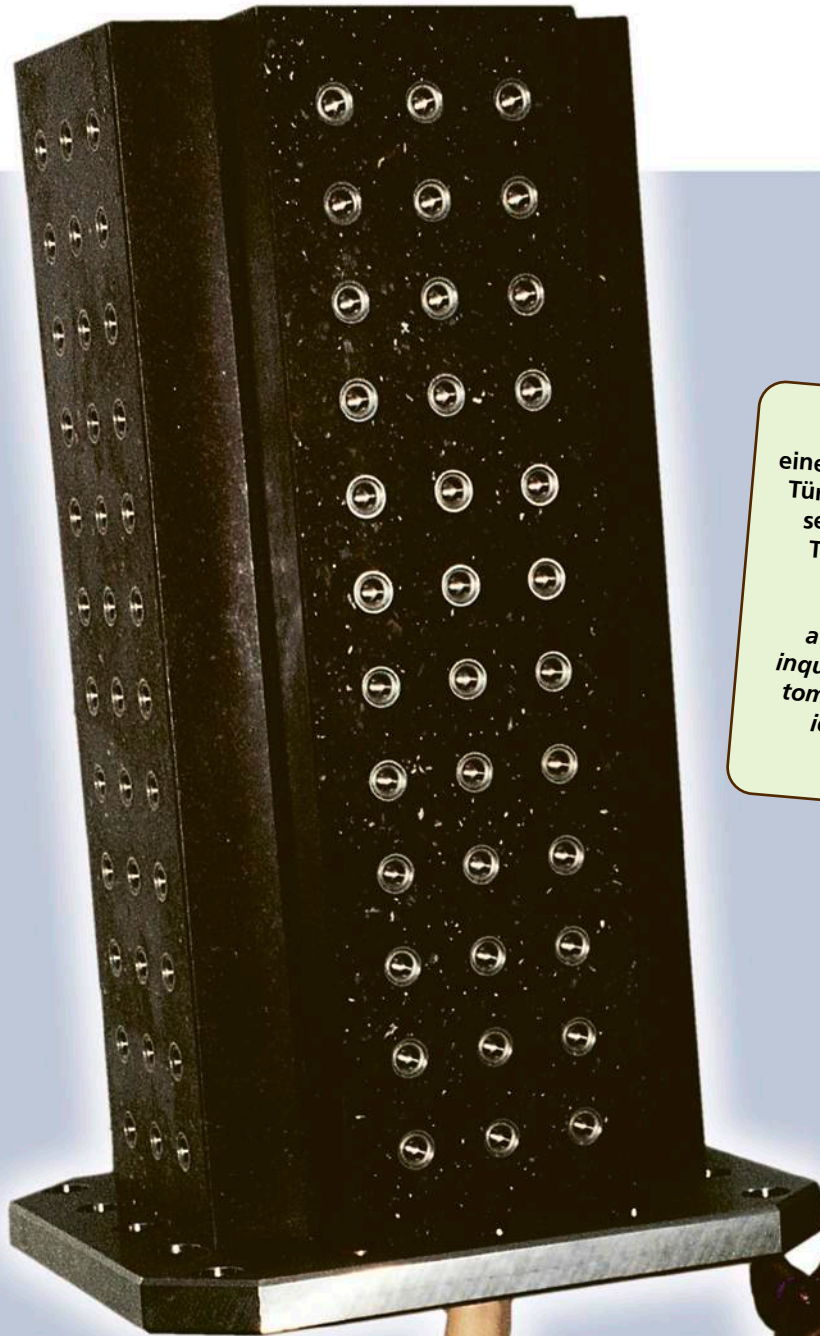


Balken und Würfel aus Stahl-Mineralguss
Trunion and cubes made from steel epoxy



Mineralgusstürme seit
Epoxy tombstones since

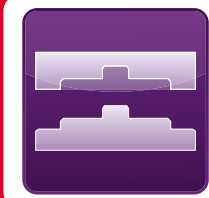
1998



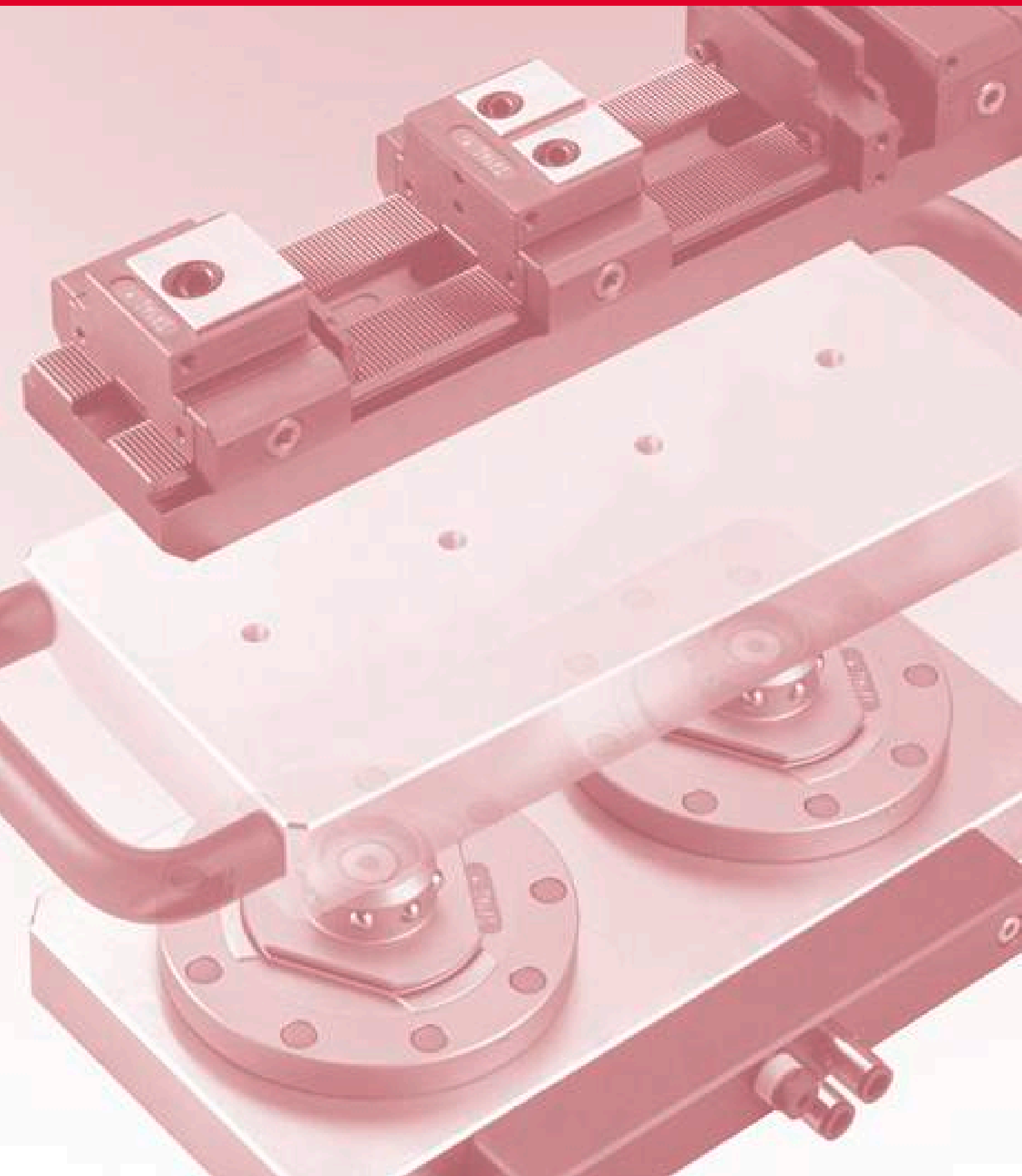
Beat Baumgartner erhält von einem Kunden eine Anfrage für leichte Türme, die aber nicht aus Aluminium sein dürfen. Er hat die Idee, einen Turm aus Mineralguss zu bauen.

Beat Baumgartner receives a request from a customer who inquires about light, non-aluminium tombstones. He comes up with the idea to build a mineral epoxy tombstone.





oppSystem





Einleitung | *Introduction* 281 - 283

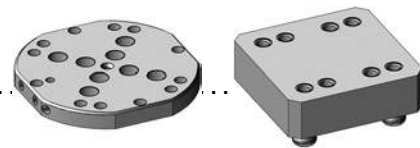
Anwendungsbeispiele | *Examples of application* 284 - 285

Mechanisches Nullpunktsystem mit diversen Spannlösungen
Mechanical zero point system with different workholding solutions 286

0-Punkt Schnellwechselsystem | *Mechanical zero point system* 287



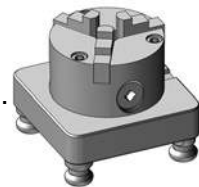
0-Punkt Erhöhung | *Zero point riser*
Universal Flansch | *Universal flange* 288



Ausrichtplatte | *Alignment plate* 289



Dreibackenfutter | *Three-jaw chuck* 290



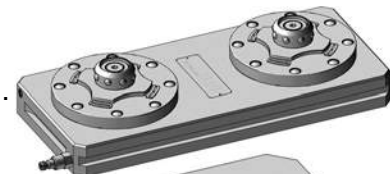
Klemmbüchse | *Clamping-case* 291



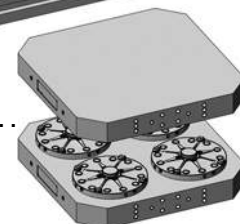
Zentriereinheit | *Chuck unit* 292



Palettenträger | *Receiver chuck with chucks* 293



MTS Palettier-System | *MTS palleting system* 297 - 300

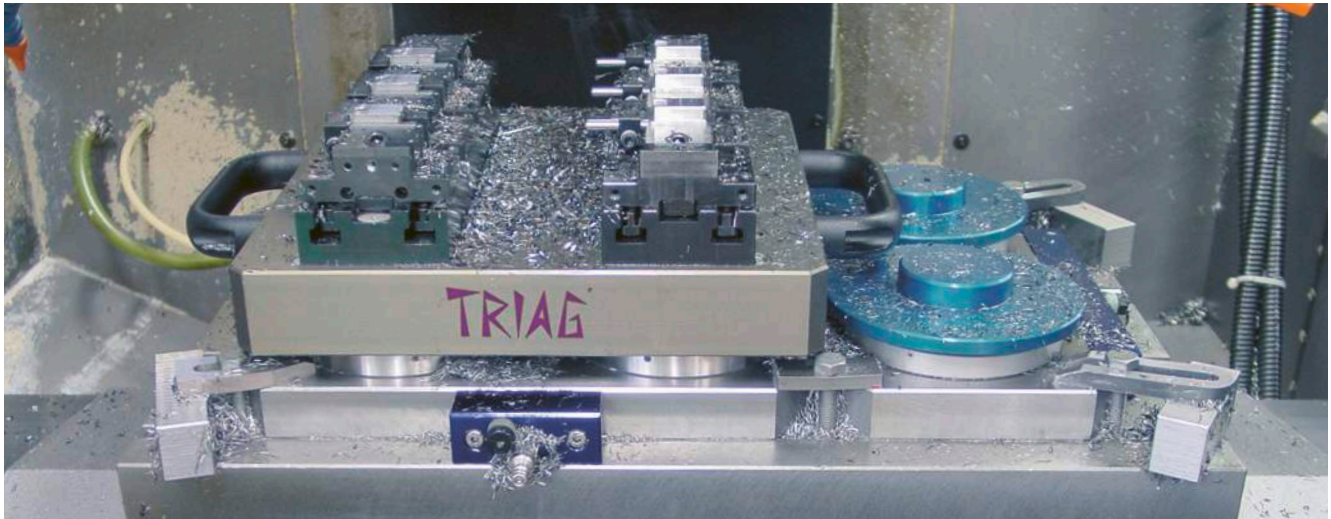


Zubehör | *Accessoires* 301



Nullpunkt-Palettiersystem

Zero-point palleting system



In den letzten Jahren wurden die Werkzeugmaschinen viel leistungsfähiger. Damit wurden die Bearbeitungszeiten wesentlich kürzer. Aufgrund der vom Auftraggeber verlangten Lieferzeiten „just in time“ sind aber die Losgrößen geringer geworden, was zu vermehrten Einrichtzeiten führt.

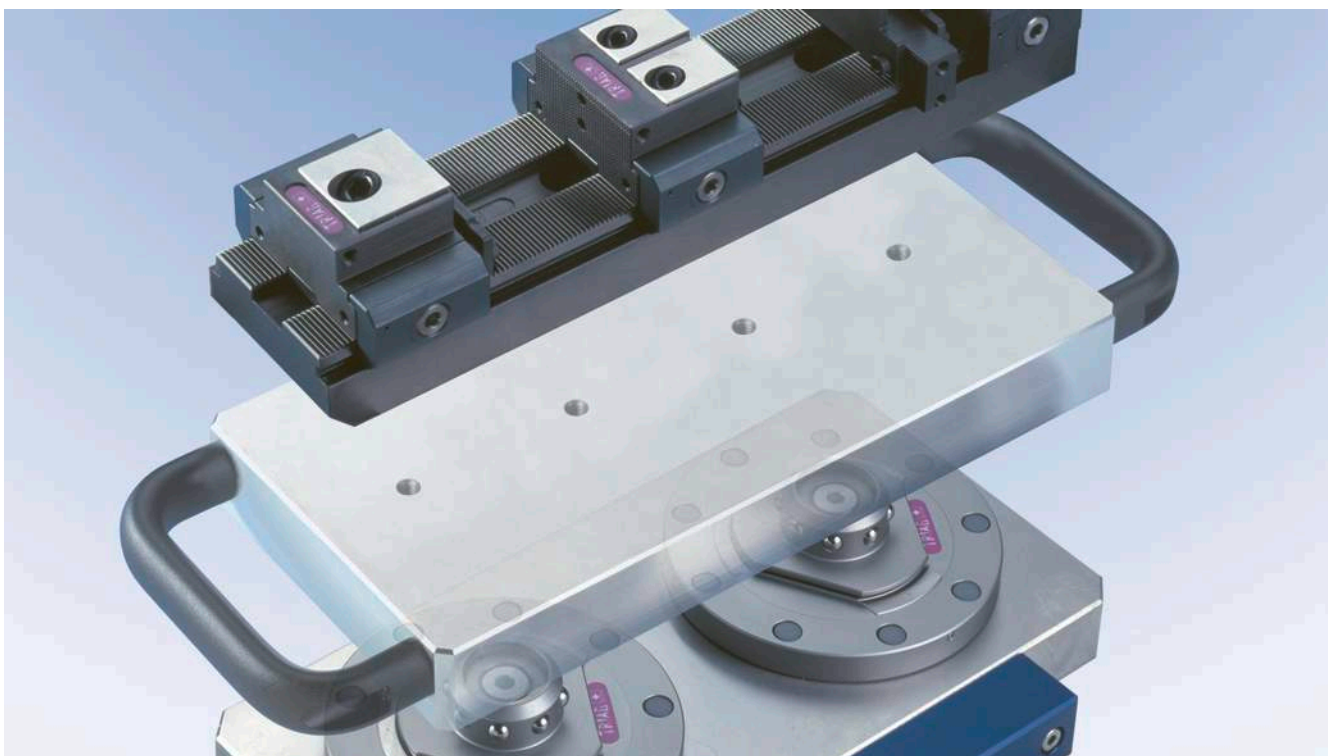
The productivity of modern machining centers has been drastically increased over the past years. Hence the time per workpiece is falling. On the contrary the batch sizes are getting smaller due to the increasing trend to „just in time“ production.

Auch die technisch hochentwickelten Maschinen sind jedoch immer noch mit einem T- Nuten Tisch ausgerüstet. Die Befestigung und das Ausrichten des zu bearbeitenden Werkstückes auf dem T-Nutentisch kann nur während der (teuren) Maschinen-Stillstandszeit erledigt werden. Diese Unproduktivität kumuliert sich, wenn die Werkstückbearbeitung mehrere Maschinenprozesse und somit mehrmaliges Befestigen und Ausrichten erfordert.

This means that the machine must be set up more frequently. Is the machine not equipped with a pallet changer, the set up and the changing of workpieces may only be accomplished during the stand still of the machine. This idling of the machine results in the loss of costly productive machine time. As it is, the aim of any machining facility to keep the spindle turning, the unproductive time must be minimized. As any machinist knows, the set up and alignment of workpieces on a T-slot table is very awkward and time consuming.

Die Lösung, die wir Ihnen für dieses Problem bieten, ist unser neuartiges, modulares Palettiersystem, das oppSystem.

The TRIAG opp (Zero-Point-Palleting) System represents an ideal interface between machining table and workholding device.



Das System besteht aus dem auf dem Maschinentisch der Werkzeugmaschine montierten Palettenträger und mindestens zwei Paletten oder mit Zentrier- und Klemmbüchsen ausgestatteten Werkstückträgern. Die sehr präzise gefertigte Schnittstelle zwischen dem Palettenträger und der Palette ermöglicht ein sekundenschnelles Ein- und Auswechseln der Paletten, auf welcher ausserhalb der Werkzeugmaschine das zu bearbeitende Werkstück montiert und positioniert wird. Es wird eine sehr hohe Ausnutzung der theoretisch zur Verfügung stehenden Maschinenlaufzeit erreicht. Dies erhöht die Produktivität der Maschine und damit die Wirtschaftlichkeit des ganzen Betriebes.

Im Gegensatz zu vielen anderen Palettiersystemen auf dem Markt ist die Dimension des oppSystems in Form von Stichmassen genormt und richtet sich damit nach den individuellen Werkstückdimensionen. Die patentierte Konstruktion erlaubt überdies auch die unbemannte Be- und Entladung mit Hilfe eines Beschickungsgerätes.

Mit dem oppSystem sind 750'000 Spannungen ohne Referenzverlust möglich, bei einer Repetiergenauigkeit von $\pm 0,002$ mm. Das Lösen erfolgt pneumatisch mit ca. 6 bar, womit keine Mehrkosten für Hydraulikaggregate entstehen. Eine allfällig entstehende Wärmeausdehnung wird über die federnde Zentrierung kompensiert. Alle wichtigen Bauteile sind wartungsarm, leicht zu überprüfen und im Bedarfsfall einfach auszutauschen.

On the machine table the receiver chuck is installed. This chuck may consist of one, two, four, six or more receiver units. Onto these air operated receiver chucks a pallet, a fixture or a vice is mounted within a matter of seconds. On the bottom surface of the workholding devices centering rings are inserted. These centering rings are ground to a very high accuracy permitting the locking down of the workholding device with a repeatability of ± 0.002 mm on all three axes. The chucks are locked by spring force and unlocked by compressed air of 6 bar. This means that no hose connection is necessary during machining. Hydraulic pumps or hydraulic amplifiers are superfluous.

The patented oppSystem allows for 750'000 locking and unlocking cycles without loss of positioning accuracy. If necessary, the changing of the pallet may be accomplished by a robot or a handling system. Thermal expansion is compensated for by the spring loaded centering units.

Due to the unique oppSystem it is possible to bring the loading and unloading of the actual workpiece out of the machine which guarantees a maximum of productive machine time. Maintenance is simple as all components are easily accessible and replaceable. There are standard receiver chucks and pallets available with two or four receiver units. For other solutions or dedicated fixture you should contact TRIAG or your nearest dealer.

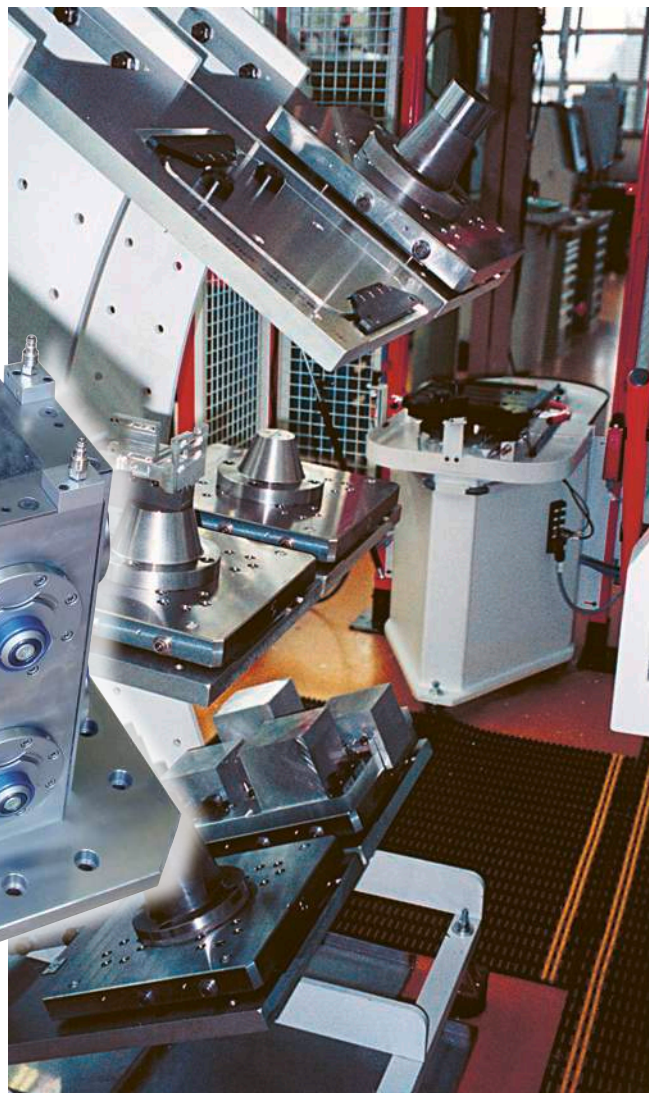
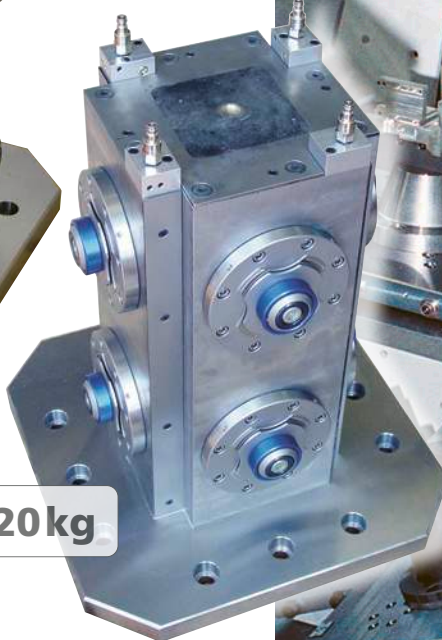
SMK30-17-42 OPP200

~ 142 kg



SMK24-24-42 OPP200

~ 120 kg



Nullpunkt-System OPP & Erowa MTS

In Verbindung mit dem Spannsystem Power Clamp bilden die Nullpunkt-Paletten OPP-Systeme sehr kompakte, hochgenaue und schnell wechselbare Spannvorrichtungseinheiten.

Zentrischspanner mit OPP-Anschluss

Das neue mechanische 0-Punktsystem (**OPBM4Q100R50**) findet seine Einsatzmöglichkeiten in allen Bereichen.

Von der einfachen Schnellwechselpalette zur Einzelteilmontage bis hin zur Mehrfachspannung in modernen Fräszentren.

Dank der hohen Wiederholgenauigkeit lassen sich Grossserien problemlos und in höchster Genauigkeit fertigen.

Zero-point system OPP & Erowa MTS

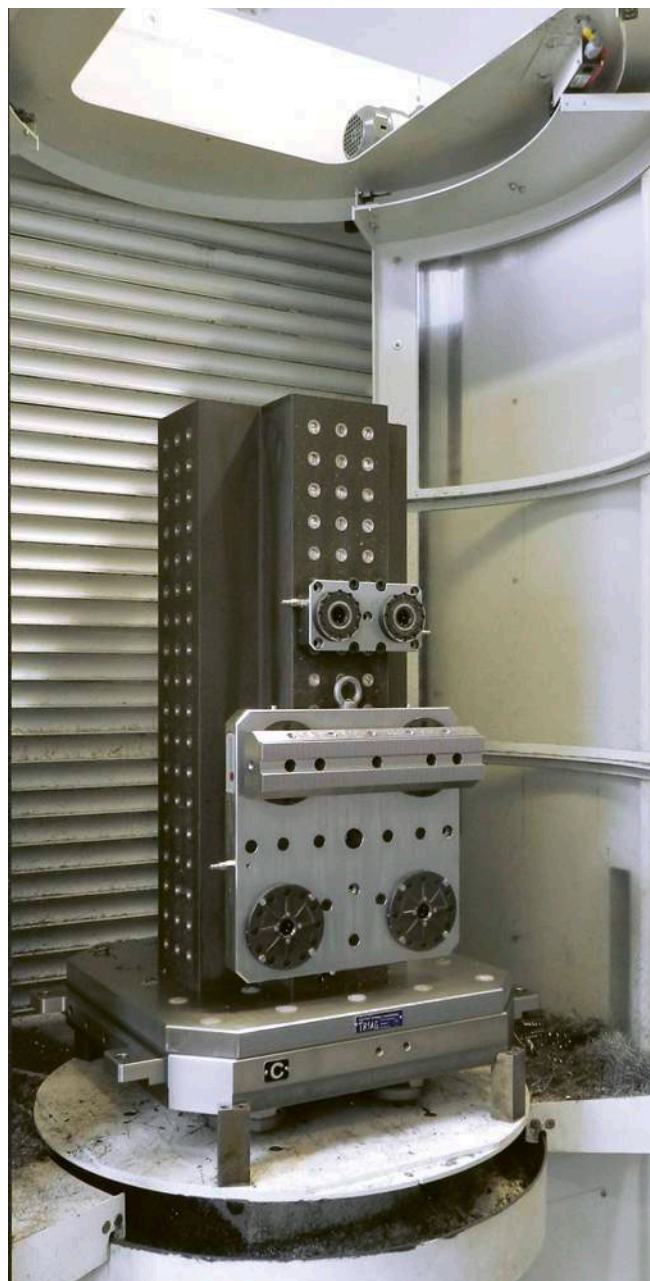
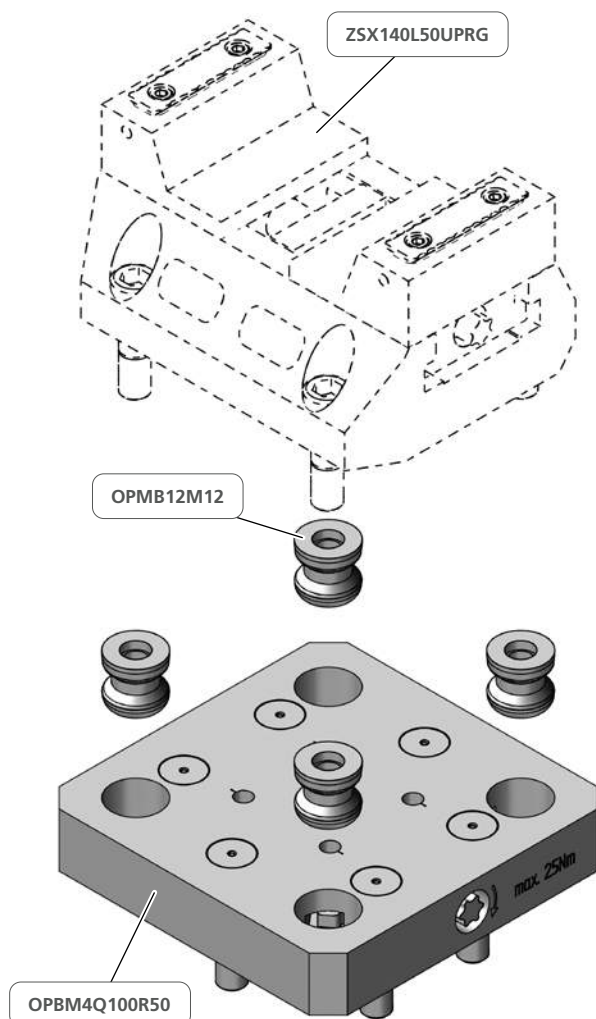
Together the modular system with zero point pallets, give a great performance! Fast changing and accurate!

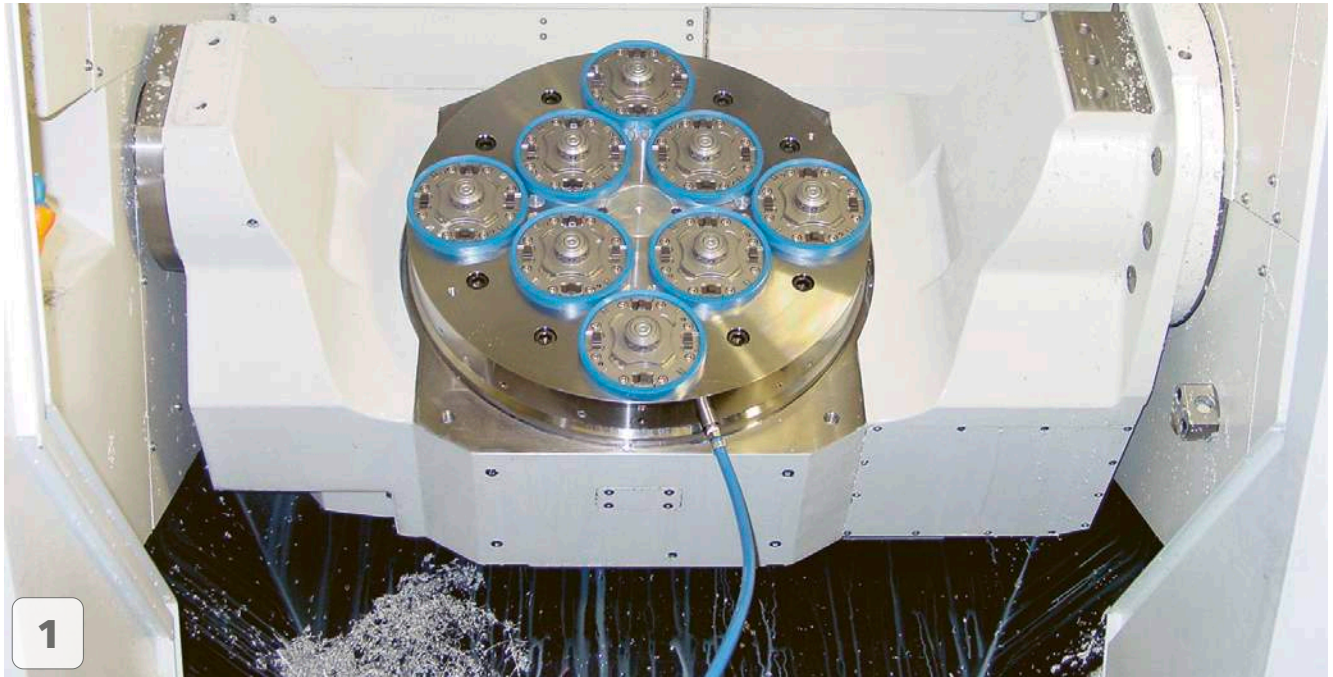
Self centering vise with integrated zero point adaptation OPP

Because of its compact build body this self centering vise gives a perfect performance to automated 5 axis machines!

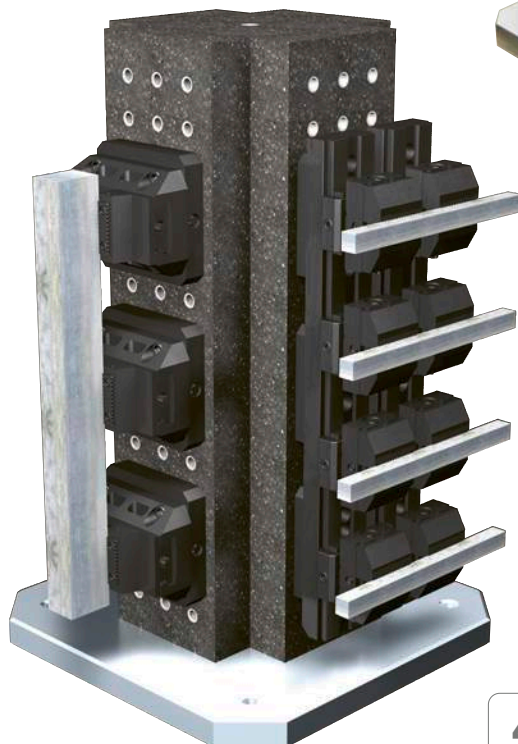
The index zero point system is built into the body of the vise, a sub pallet as you normally mount the vises!

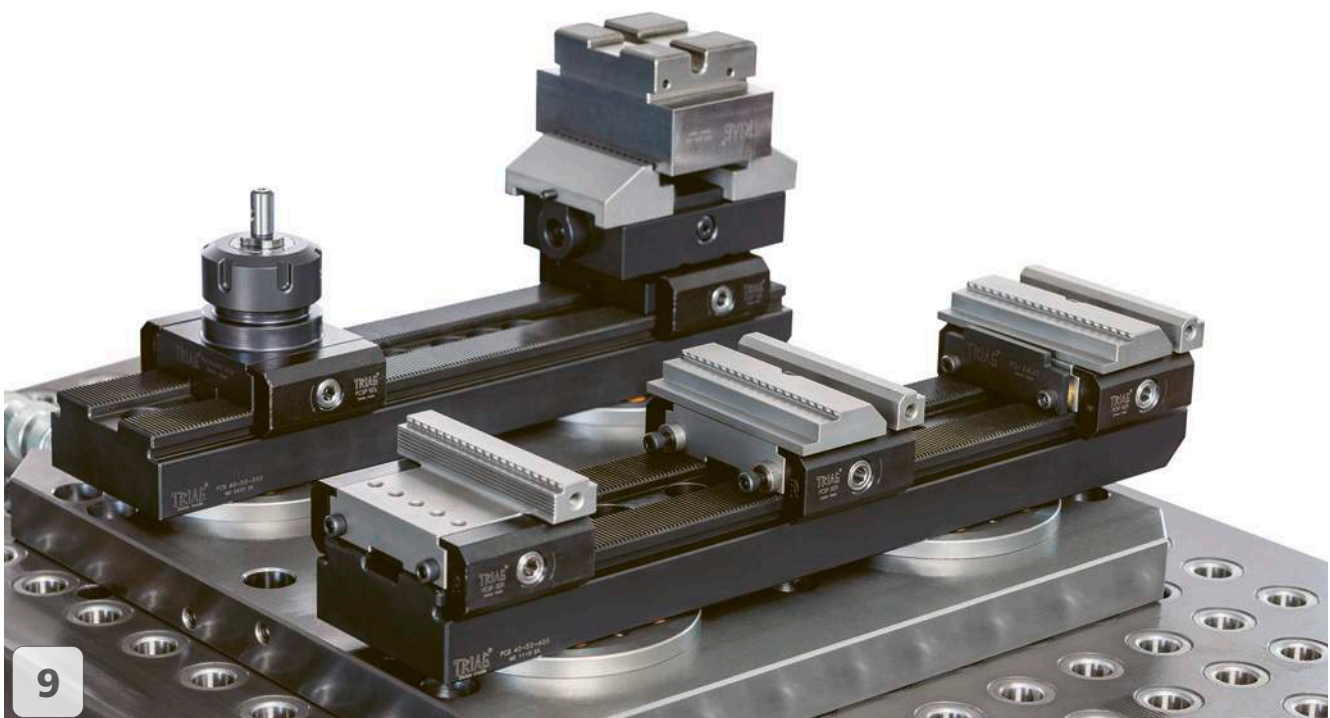
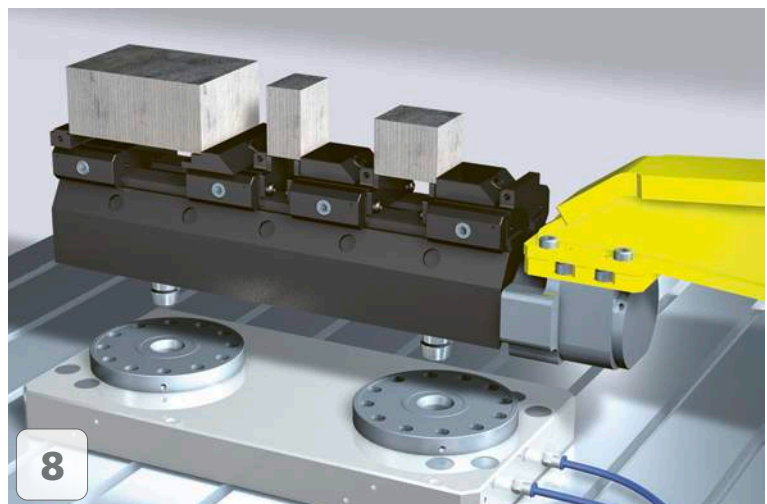
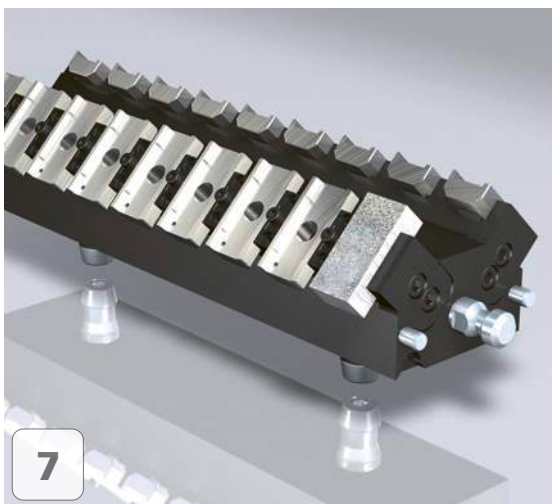
The OPP system is a very accurate system reliable and durable! We guarantee 150'000 changes within $\pm 0,002\text{mm}$





HORIZONTAL





Mechanisches Nullpunktsystem mit diversen Spannlösungen

Mechanical zero point system with different workholding solutions



Da die Anforderungen an „just in time“ Produktion in den letzten Jahren stetig gewachsen sind, ist ein modulares Nullpunkt Schnellwechselsystem der richtige Weg um lange Standzeiten der Werkzeugmaschine zu verhindern.

Since the requirements for „just in time“ production have grown steadily in the recent years, a modular zero-point quick-change system is the right way to prevent long down time of a machine tool.

- ✓ Sehr tiefe Bauhöhe (28 mm)
- ✓ Wiederholgenauigkeit 0.01 mm
- ✓ 6000 dAN Haltekraft
- ✓ Abhebefunktion ein- und ausschaltbar (3-4 mm)

- ✓ Very low height (28mm)
- ✓ Repeat accuracy of 0.01mm
- ✓ 6000daN holding force
- ✓ Lift-off function can be switched on and off (3-4 mm)

p. 290

triCENTRO p. 141

triCENTRO p. 119

4 x TWPAS1227

4 x TWPAS1240

7

10

2 x TWPAS1227

2 x TWPAS1240

9

D

A

B

C

0-Punkt Basis / 0-point base kg

A	OPBM4Q100R50	~3,8
B	OPBM4Q100R200	~7,6
C	OPBM4Q100D184	~7,6
D	ZF211785	~7,6

3-Backenfutter / 3-jaw chuck kg

	OPM3X80L75	~5,8
1	OPM3X100L82	~7,3
	OPM3X125L88	~9,5

Zentrischspanner / Self centering vise

	Spannbereich / Clamping area	kg
2	ZSX140L50UPRG-OPM	62-118 ~7,1
	ZSX160L50UPRG-OPM	62-138 ~7,7
	ZSX180L50UPRG-OPM	62-158 ~8,1
	ZSX200L50UPRG-OPM	62-178 ~8,8

Sputnik I kg

3	UB5AXMCZ4045SET8-OPBM	~6,2
---	-----------------------	------

PowerCLAMP Set kg

4	PCSET18250-OPM	
	1x PCSET18-250A / 03	~5,9
	2x PCSET18-L1 / B48-20	~2,65

Basisschiene diagonal / Baserail diagonal kg

5	PCSET18220W2-OPM	~8,2
---	------------------	------

PC Schiene / PC Rail 250 mm kg

6	PCB2550250-OPM	~4,8
---	----------------	------

Abdeckung / Cover kg

7	OPMAD	~0,8
---	-------	------

Erhöhung / Raiser block kg

8	OPUB150H44	~8,5
---	------------	------

Rasterplatte / Grid plate kg

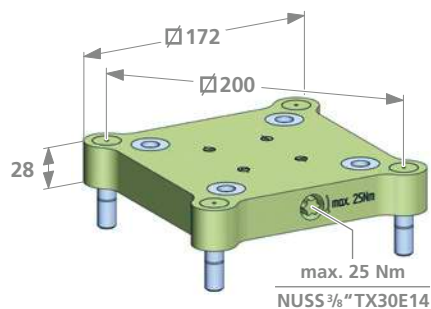
9	OPM25-15R50H28	~7,7
---	----------------	------

Aluminiumplatte / Aluminium plate kg

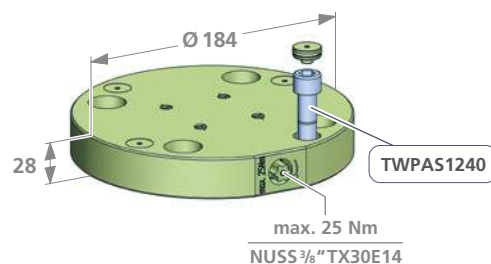
10	OPM25-15RH40	~4,3
----	--------------	------



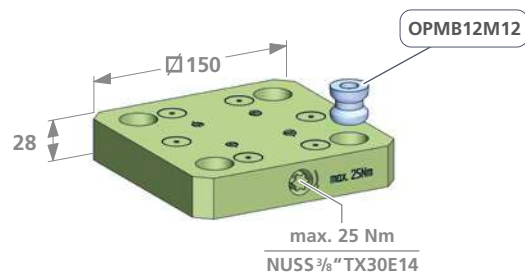
Art. Nr.	kg
OPBM4Q100R200	~4,27



Art. Nr.	kg
OPBM4Q100D184	~5,05

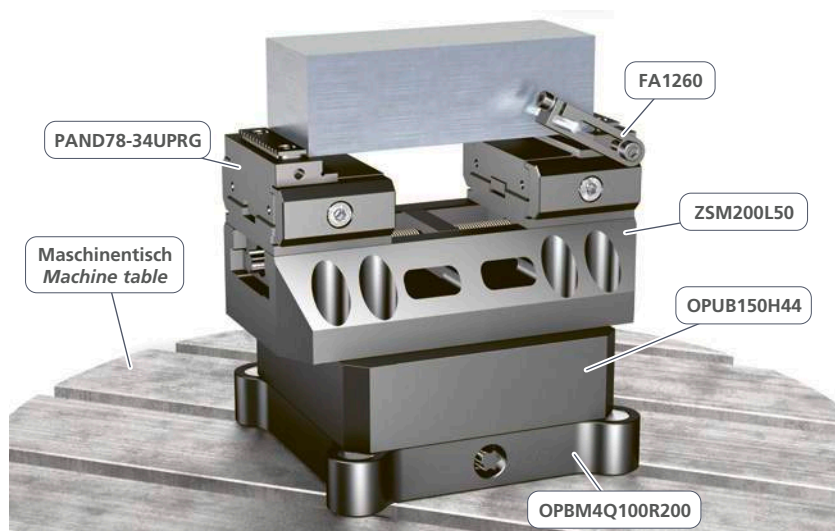
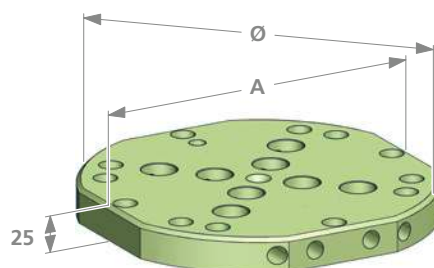


Art. Nr.	kg
OPBM4Q100R50	~5,05



Positionier-Flansch Positioning-flange

Art. Nr.	A	Ø	kg
ZF211785	235	250	~7,6
ZF222333	172	180	~3,7



Die Verbindung zwischen Maschinentisch und dem opp-Schnellwechselsystem
The connection between the machine table and the opp-quick-change system

0-Punkt Erhöhung

Zero point riser

OPUB150H44

0-Punkt Basis

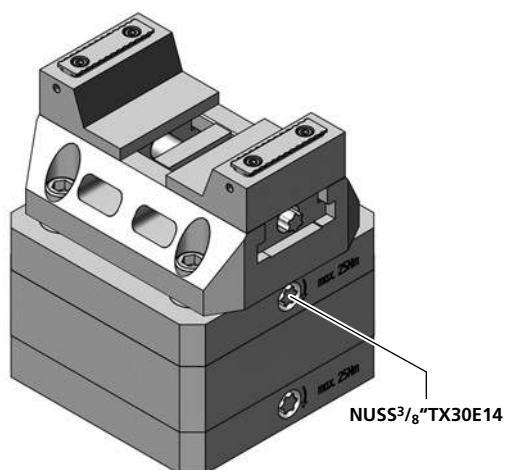
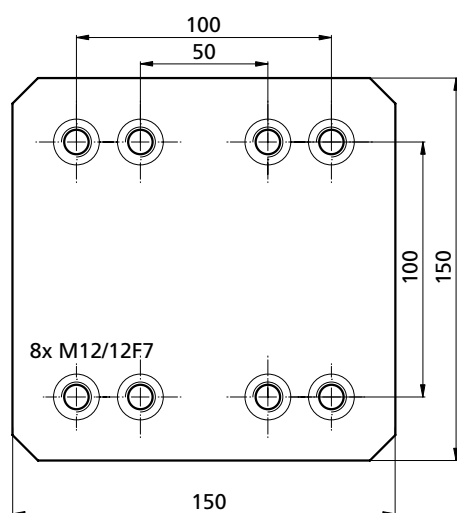
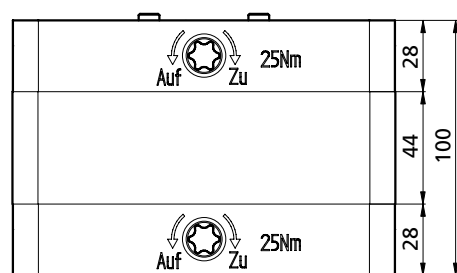
0-point base



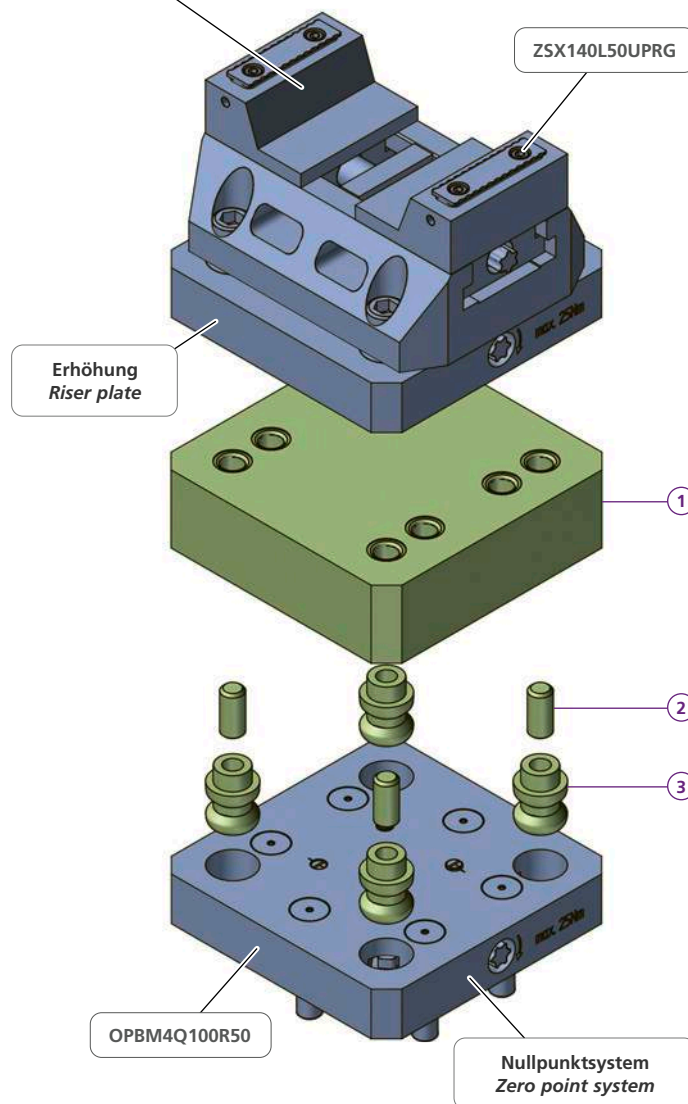
oppSystem

Optimal kombinierbar mit der Erhöhung (**OPUB150H44**) für eine bessere Zugänglichkeit zum Werkstück.

Ideally combined with the riser (**OPUB150H44**) for better access to work piece.



Anwendungsbeispiel mit Zentrischspanner
Application example with self centring vise



OPUB150H44

- 1x TB150756
- 4x TN100067
- 4x OPMB18M12

kg ~8,5

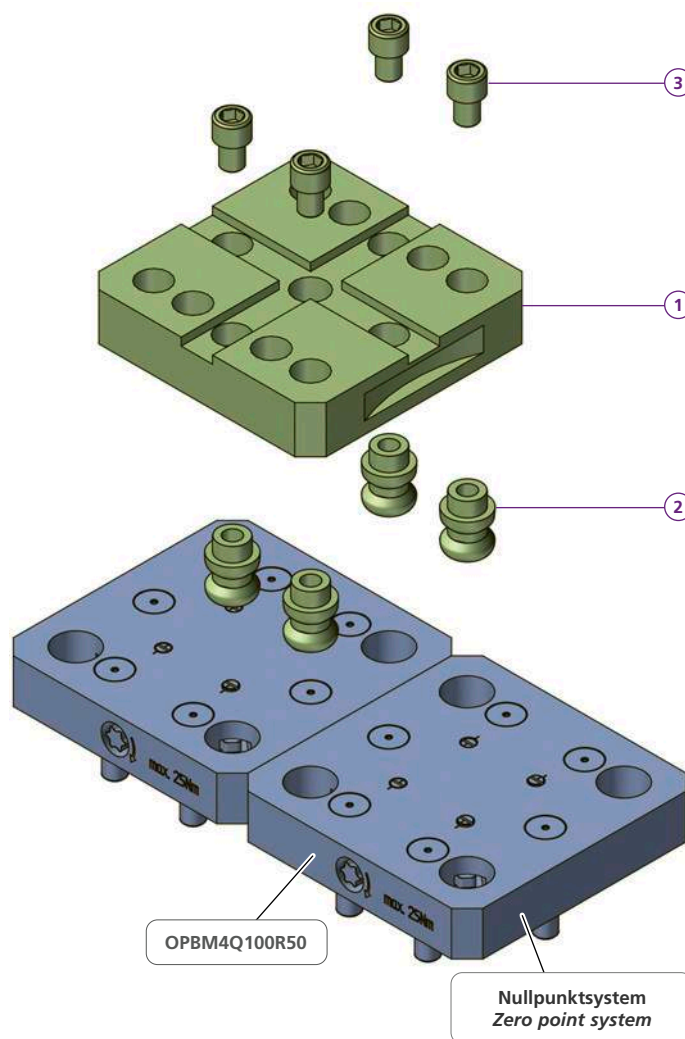
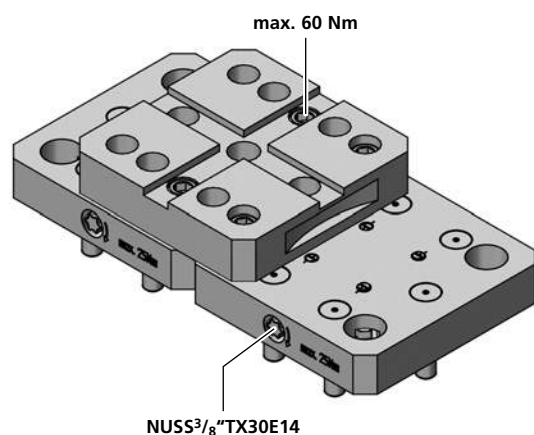
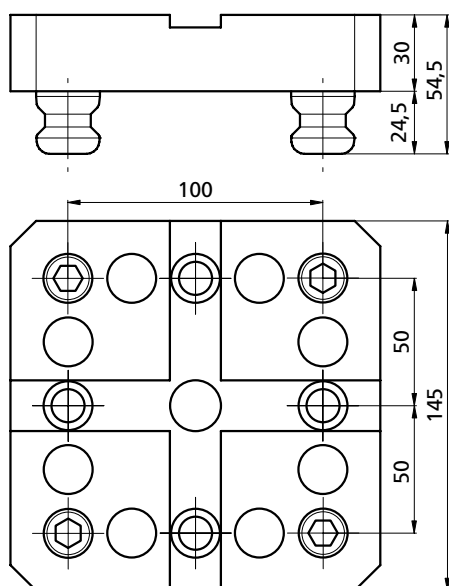
WICHTIG!
Bitte separat bestellen

IMPORTANT!
Please order separately



NUSS³/₈TX30E14

Bestellbeispiel / Ordering example: 1 x **OPUB150H44** & 2 x **OPBM4Q100R50** & 1 x **ZSX140L50UPRG** & 1 x **NUSS³/₈TX30E14**



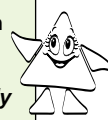
OPMAW

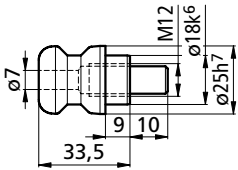
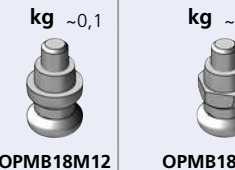
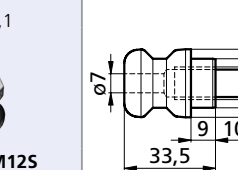
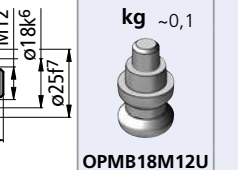
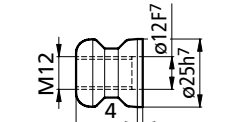
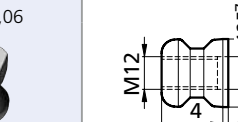
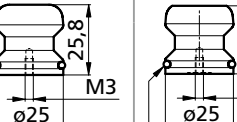
- ① 1x TB151141
- ② 4x OPMB18M12
- ③ 4x M12X16ISO4762

kg ~3,54

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

NUSS3/8"TX30E14



Nullpunkt Zentrier- und Klemmbolzen Zero point pull studs	Nullpunkt Schwertbolzen Diamond pull studs	Klemmbolzen mit Untermass Pull studs with minus tolerance	Schutzbolzen Protection bolts	
 OPMB18M12 kg ~0,1	 OPMB18M12S kg ~0,1	 OPMB18M12U kg ~0,1	 OPMBL kg ~0,08	 OPMBL-25 kg ~0,07
 OPMB12M12 kg ~0,06	 OPMB12M12S kg ~0,06	 OPMB12M12U kg ~0,06	 OPMBL kg ~0,08	 OPMBL-25 kg ~0,07

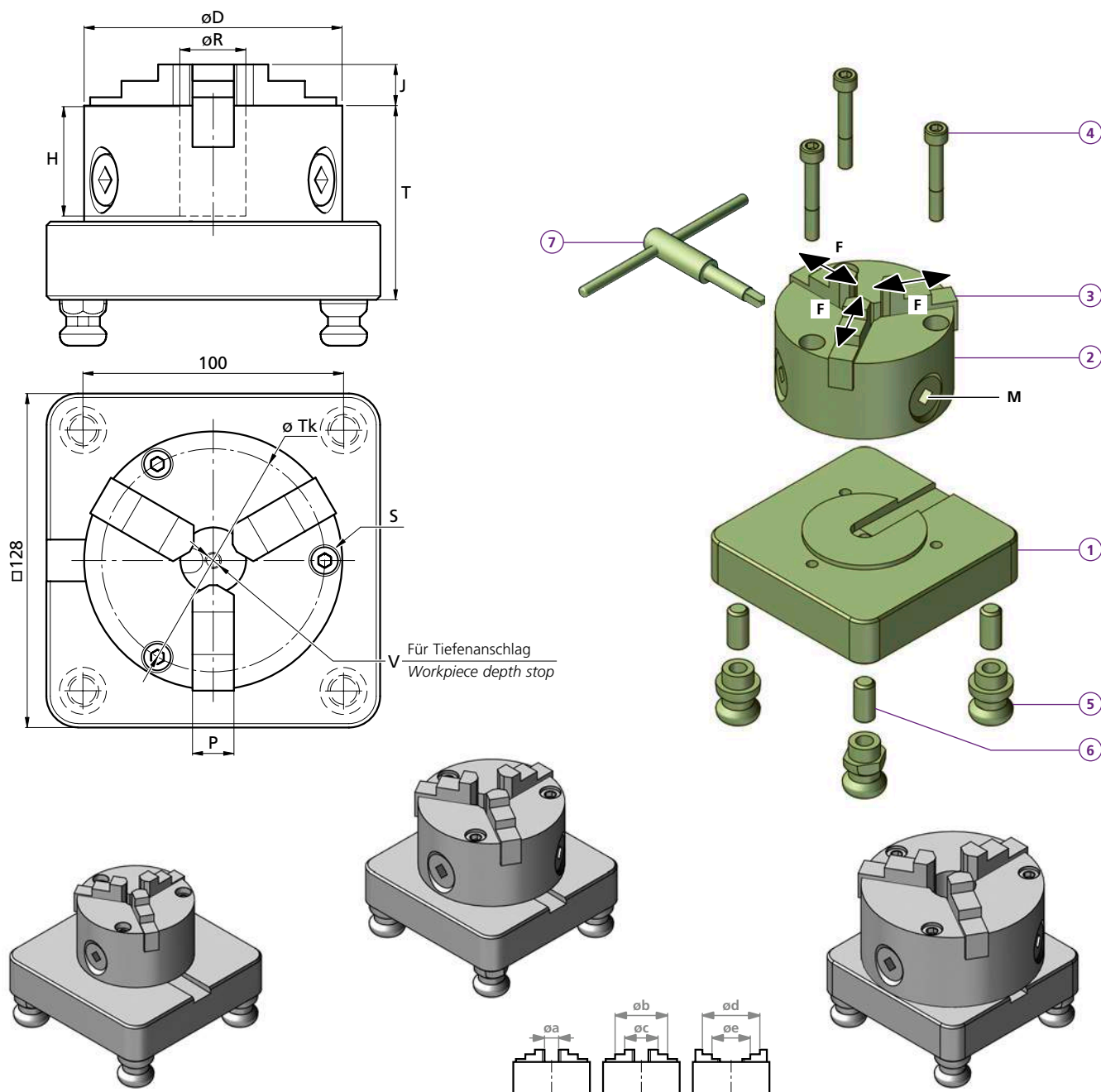
Bestellbeispiel / Ordering example : 1x **OPMAW**

Dreibackenfutter Three-jaw chuck

OPM3X80L75
OPM3X100L82
OPM3X125L88



oppSystem



	D	J	T	R	H	P	V	a mm	b mm	c mm	d mm	e mm	M (max.)	F (max.)	$\varnothing T_k$	S
OPM3X80L75	80	13	75	15	42,5	10	M6	3...27	48...73	23...48	52...76	27...51	28 Nm	1300 daN	67	M6
OPM3X100L82	100	17	82	20	49,5	14	M8	3...39	58...94	24...60	64...100	30...66	38 Nm	1600 daN	83	M8
OPM3X125L88	125	19	88	32	55	16	M8	3...49	70...116	30...75	83...125	38...84	55 Nm	2600 daN	108	M8

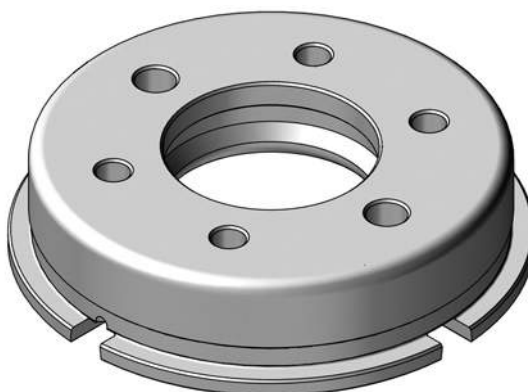
OPM3X80L75	OPM3X100L82	OPM3X125L88	
1x TB161207	1x TB161208	1x TB161209	Ø 80
1x 243809.0083220	1x 243809.0103220	1x 243809.0123220	Ø 100
2x 3 Stk. / pcs	2x 3 Stk. / pcs	2x 3 Stk. / pcs	Ø 125
3x TN100346	3x TN100360	3x TN100361	243849.0083200
1x OPMB18M12	1x OPMB18M12	1x OPMB18M12	243850.0083200
2x OPMB18M12U	2x OPMB18M12U	2x OPMB18M12U	243849.0103200
1x OPMB18M12S	1x OPMB18M12S	1x OPMB18M12S	243850.0103200
4x TN100067	4x TN100067	4x TN100067	243849.0123200
1x 243864.0080000	1x 243864.0100000	1x 243864.0120000	243850.0123200
kg ~ 5,8	kg ~ 7,3	kg ~ 9,5	3x Ø 3 - 49 3x Ø 38 - 125 3x *Weich Soft 16MnCr5

Bestellbeispiel / Ordering example: OPM3X80L75

Separat bestellen / Order separately



OP92BUE23

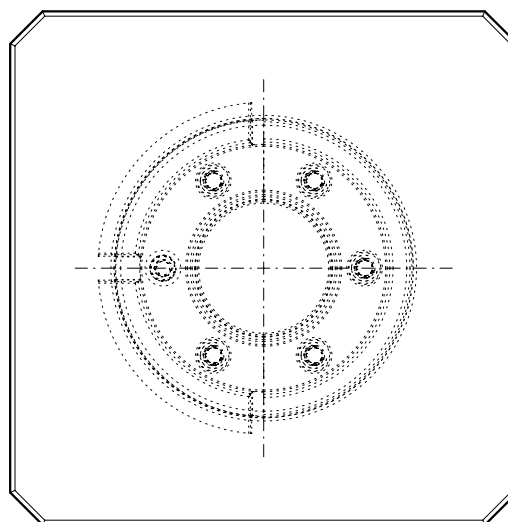
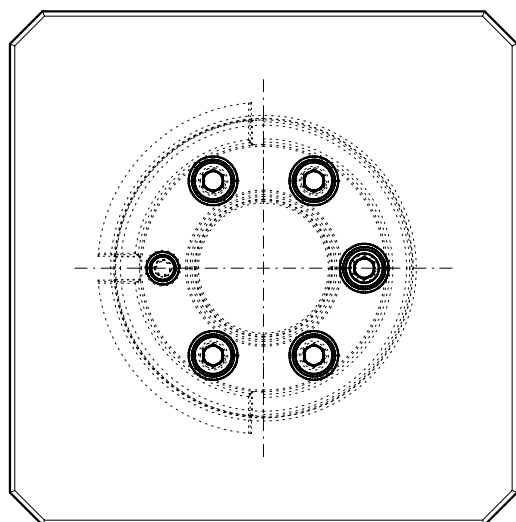
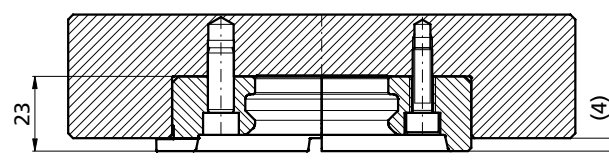
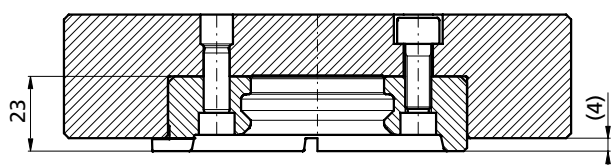
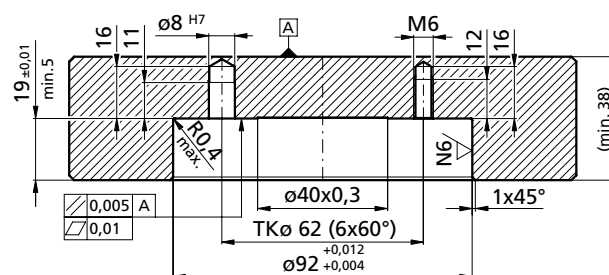
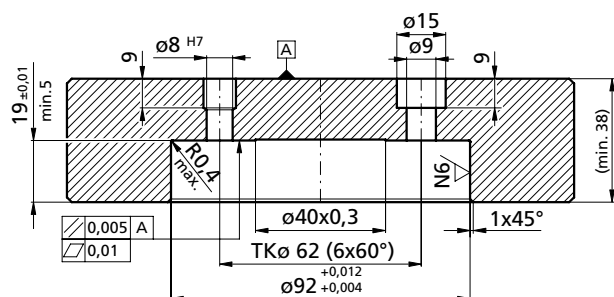


OP92BUE23ID

	kg
OP92BUE23	~0,75
OP92BUE23ID	~0,78

Bestellbeispiel / Ordering example: **OP92BUE23**

Einbauanleitung / Assembling instructions

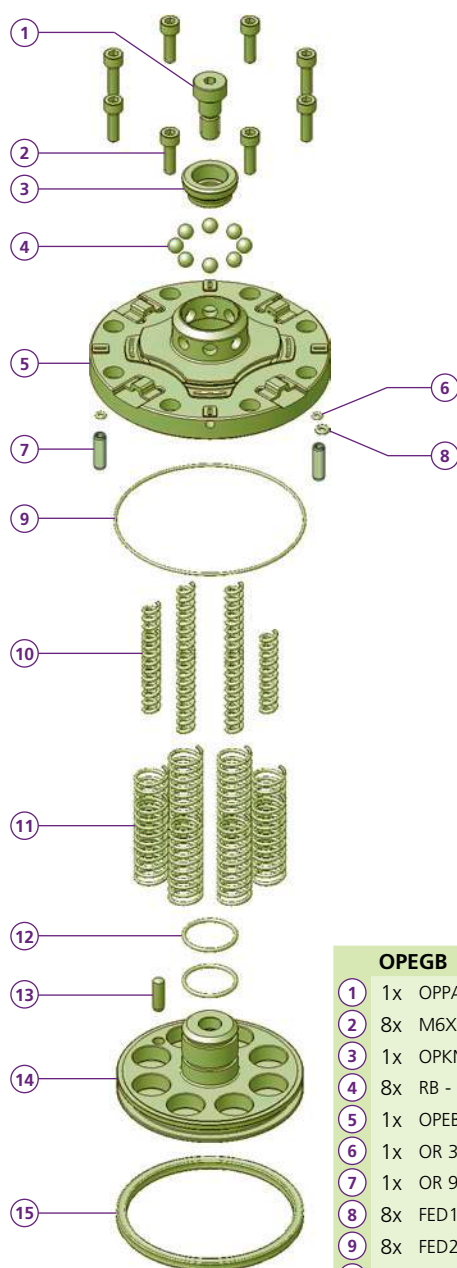


Zentriereinheit Chuck unit

Zentrierkörper Chuck body



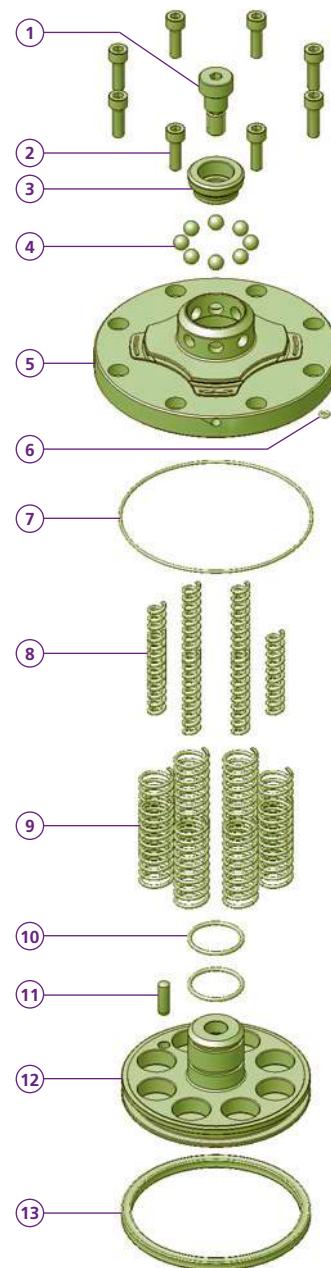
oppSystem



OPEGBID (Index)

- 1 1x OPPAS M10x12
- 2 8x M6X20 ST
- 3 1x OPKN 30x13,5
- 4 8x RB - 8/G20W
- 5 1x OPEBID
- 6 1x OR 3x1,5
- 7 2x **CCBO0801**
- 8 1x OR 5x1,5
- 9 1x OR 90x1,5
- 10 8x FED1044
- 11 8x FED2051
- 12 2x OR 26x2
- 13 1x 6m6x20 DIN 6325
- 14 1x OPKLB100
- 15 1x OPDR885

kg ~2,28



OPEGB

- 1 1x OPPAS M10x12
- 2 8x M6X20 ST
- 3 1x OPKN 30x13,5
- 4 8x RB - 8/G20W
- 5 1x OPEB
- 6 1x OR 3x1,5
- 7 1x OR 90x1,5
- 8 8x FED1044
- 9 8x FED2051
- 10 2x OR 26x2
- 11 1x 6m6x20 DIN 6325
- 12 1x OPKLB100
- 13 1x OPDR885

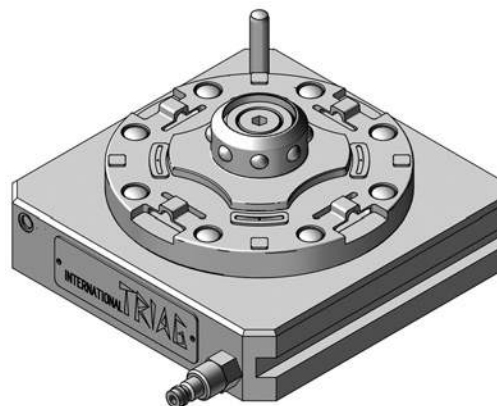
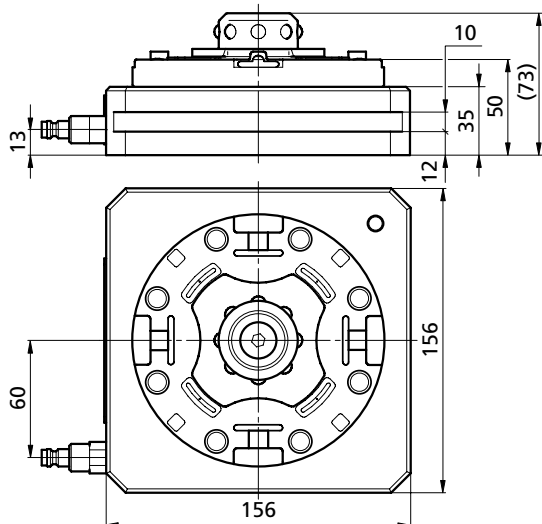
kg ~2,26

Bestellbeispiel
Ordering example: **OPEGBID**

1er Palettenträger Receiver chuck with 1 chucks



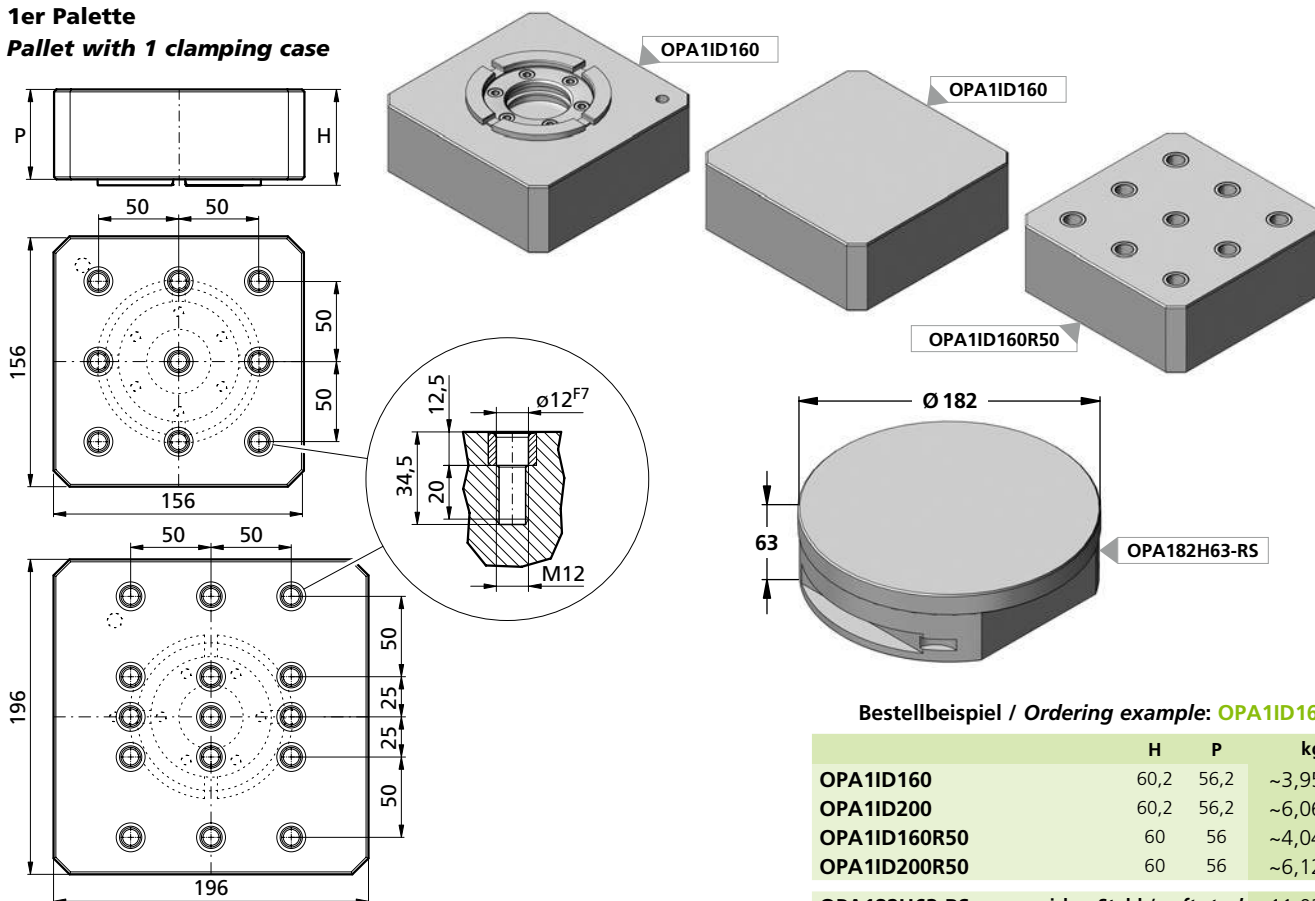
oppSystem



Bestellbeispiel / Ordering example : **OPB1ID**

	kg
OPB1ID (Index)	~8,0

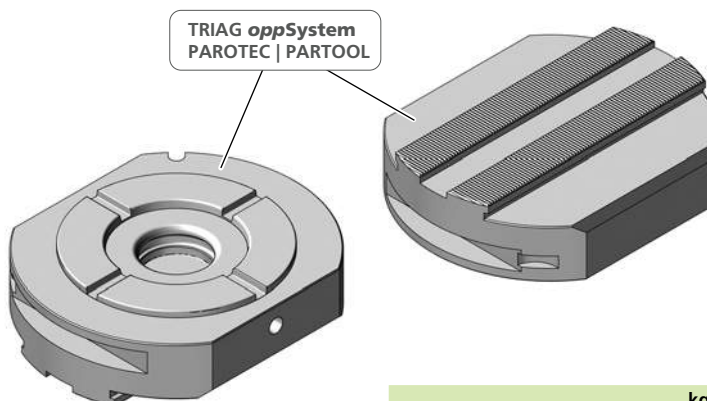
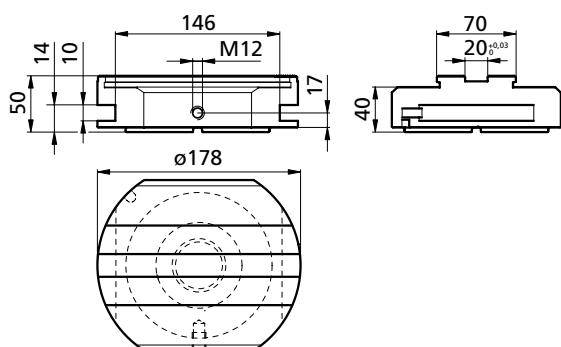
1er Palette Pallet with 1 clamping case



Bestellbeispiel / Ordering example: **OPA1ID160**

	H	P	kg
OPA1ID160	60,2	56,2	~3,95
OPA1ID200	60,2	56,2	~6,06
OPA1ID160R50	60	56	~4,04
OPA1ID200R50	60	56	~6,12
OPA182H63-RS	= weicher Stahl / soft steel		~11,03

Basis mit integrierter 0-Punkt Index Aufnahme oppSystem Base rail with integrated oppSystem index



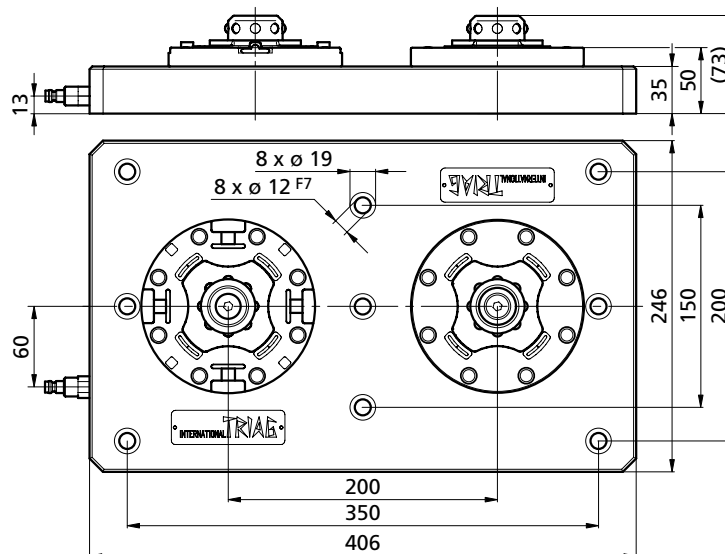
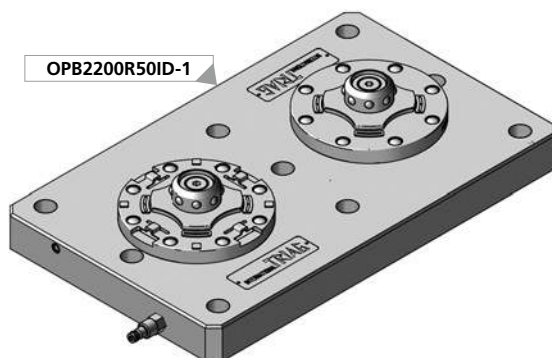
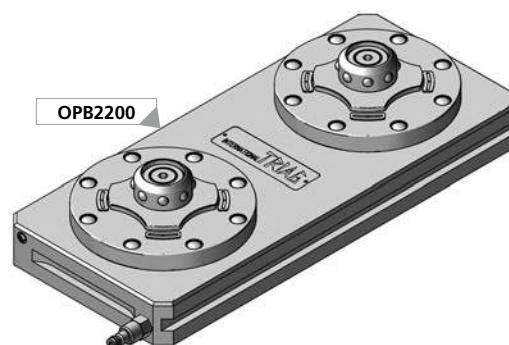
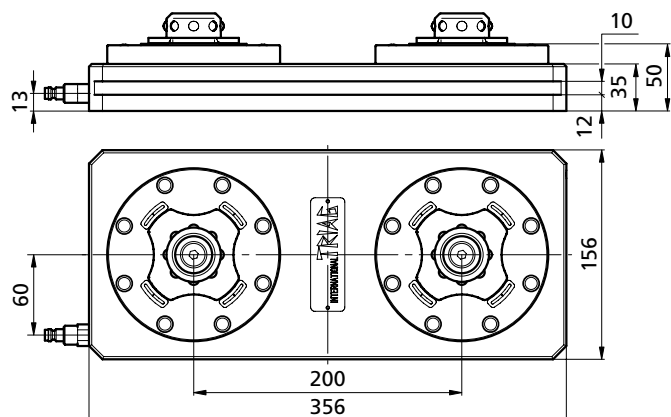
Bestellbeispiel / Ordering example: **OPA1IDPCB178**

	kg
OPA1IDPCBD178	~7,0

2er Palettenträger Receiver chuck with 2 chucks



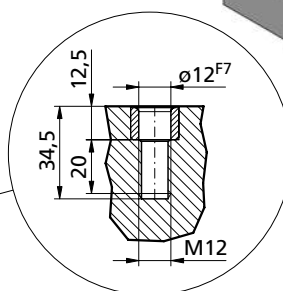
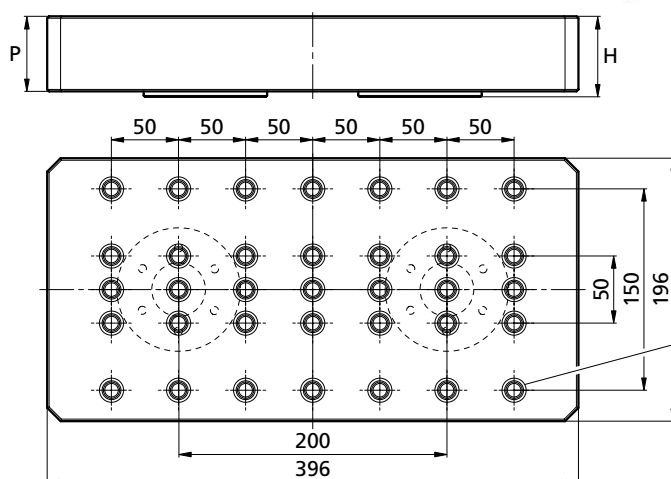
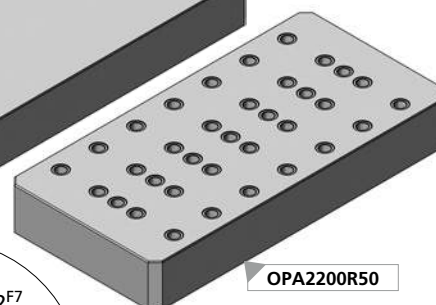
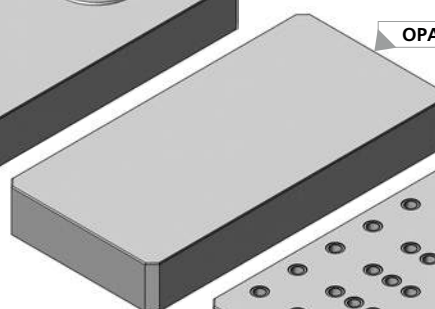
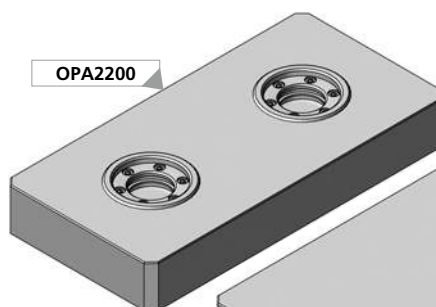
oppSystem



	kg
OPB2200	~17,50
OPB2200R50	~30,00
OPB2200R50ID-1 (Index)	~30,00
OPB2200R50ID-2 (Index)	~30,00

Bestellbeispiel / Ordering example: **OPB2160**

2er Palette Pallet with 2 clamping case



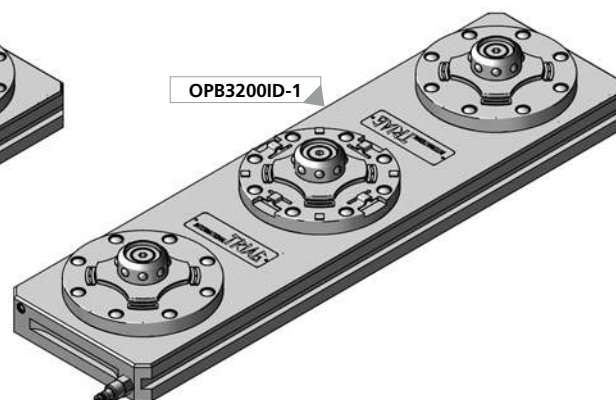
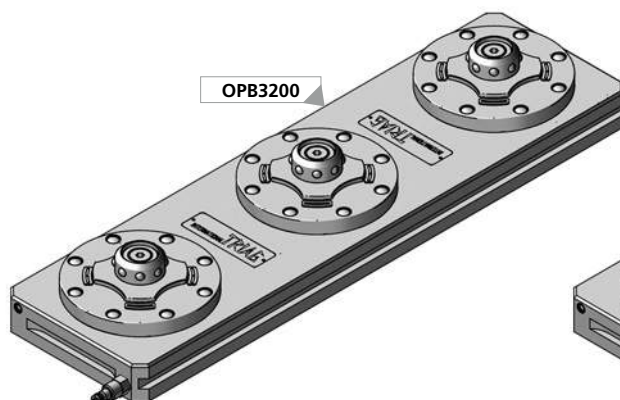
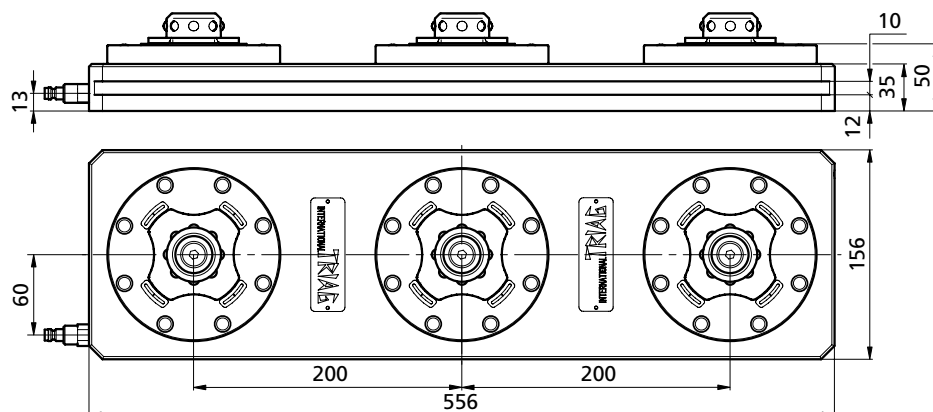
	H	P	kg
OPA2200	60,2	56,2	~12,18
OPA2200R50	60	56	~12,32

Bestellbeispiel / Ordering example: **OPA2200R50**

3er Palettenträger Receiver chuck with 3 chucks



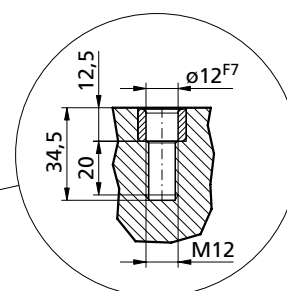
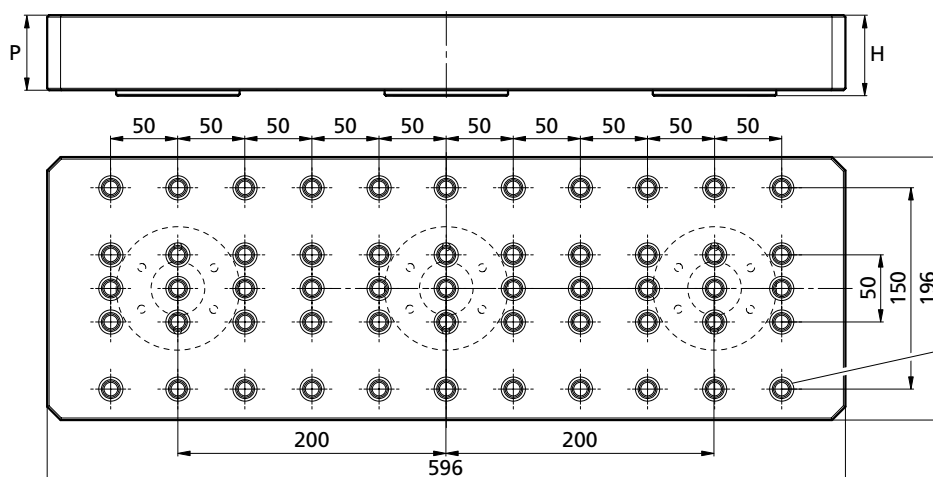
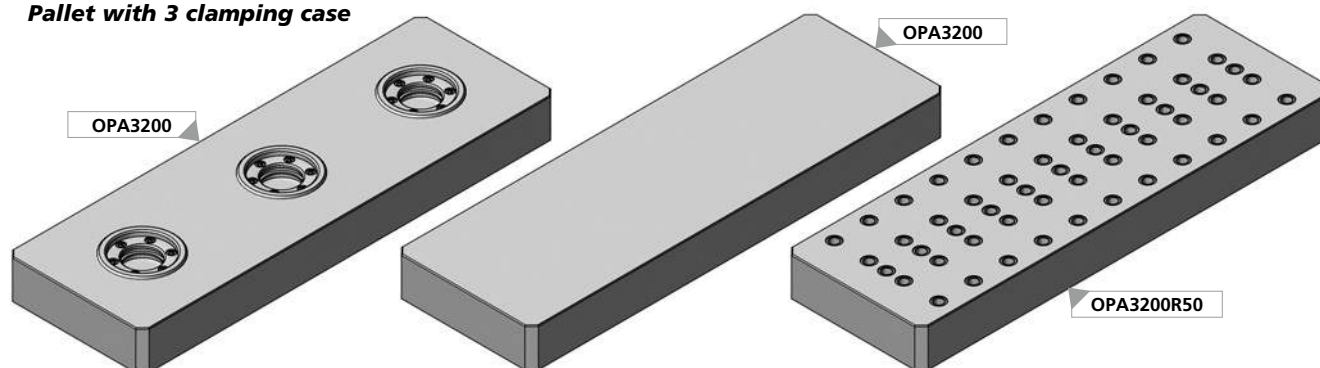
oppSystem



	kg
OPB3200	~27,00
OPB3200ID-1 (Index)	~27,00

Bestellbeispiel / Ordering example: **OPB3200**

3er Palette Pallet with 3 clamping case



	H	P	kg
OPA3200	60,2	56,2	~18,36
OPA3200R50	60	56	~18,57

Bestellbeispiel / Ordering example: **OPA3200**

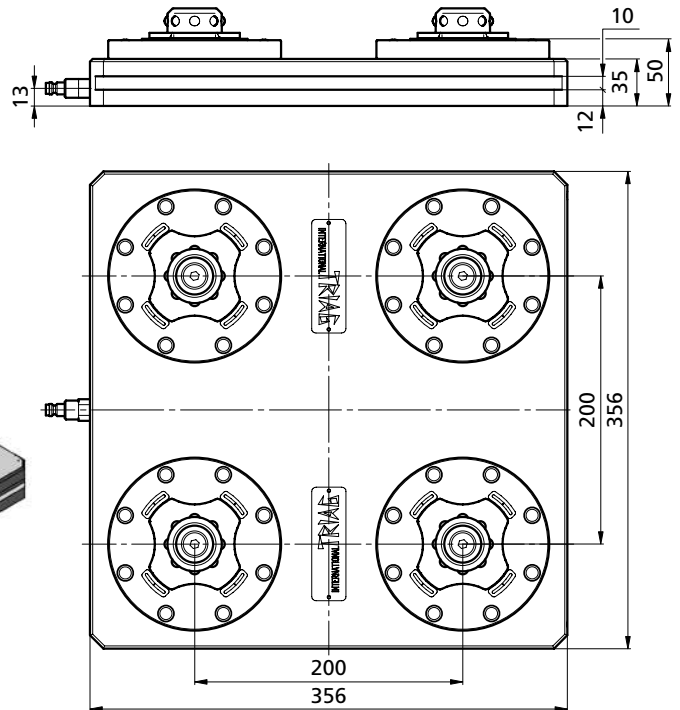
4er Palettenträger Receiver chuck with 4 chucks



oppSystem

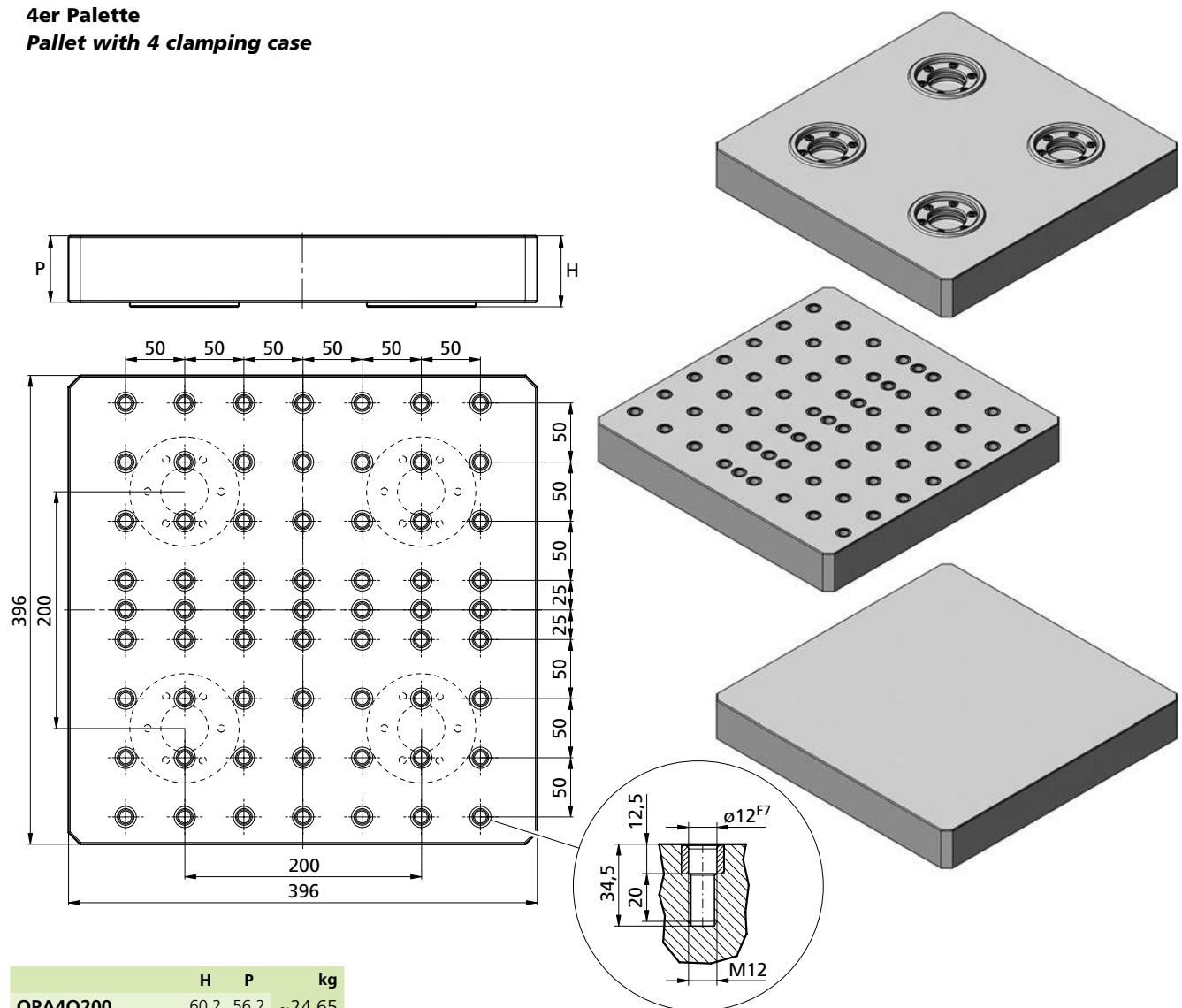


	kg
OPB4Q200	~39,00
OPB4Q200ID-4	~39,00



Bestellbeispiel / Ordering example: **OPB4Q200**

4er Palette Pallet with 4 clamping case



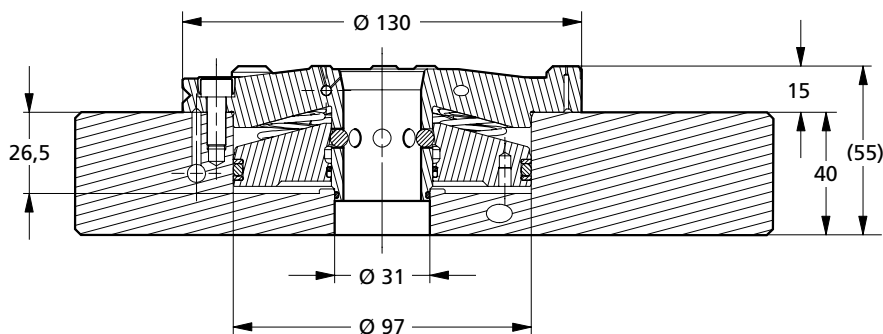
	H	P	kg
OPA4Q200	60,2	56,2	~24,65
OPA4Q200R50	60	56	~24,88

Bestellbeispiel / Ordering example: **OPA4Q200**

EROWA MTS Einbauspannfutter / Integral chucks

Einbauvariante (gültig für MTS IntegralChuck Single und Multi). Toleranzen entsprechend der Einbauanleitung beachten!

Integration variant (applicable to MTS IntegralChucks Single and Multi). Observe tolerances according to integration instructions!



Manuelle Bedienung
Manual operation



Geeignet zur Anwendung unter Flüssigkeit
Suited for submerged operation



Geeignet für automatische Anwendung
Suited for automatic operation



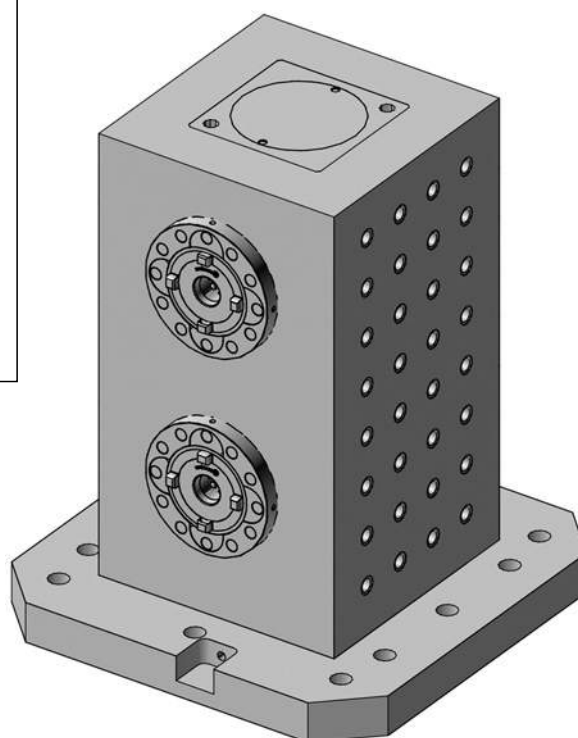
Mit Druckluftpistole bedienen
Operate with compressed air jet



Für spanabhebende Bearbeitung
For chip-removing processes



Zum Senkerodieren
For EDM sinking



1 Präzise

Spelfreie Kurzkegel-Zentrierung.
 Repetiergenauigkeit: < 0,005 mm.
 Leichtes Einfahren der Paletten.

2 Spannmechanismus

Zuverlässiger Spannmechanismus durch selbsthemmenden Kugerverschluss.

3 Öffnen

MTS Spannfutter werden pneumatisch betätigt.

4 Sauberkeit

Flüssigkeit kann ablaufen, keine Schmutzecken.

1 Precise

Play-free round-cone centering.
 Repeatability: <0.005 mm.
 Easy insertion of the pallets.

2 Clamping mechanism

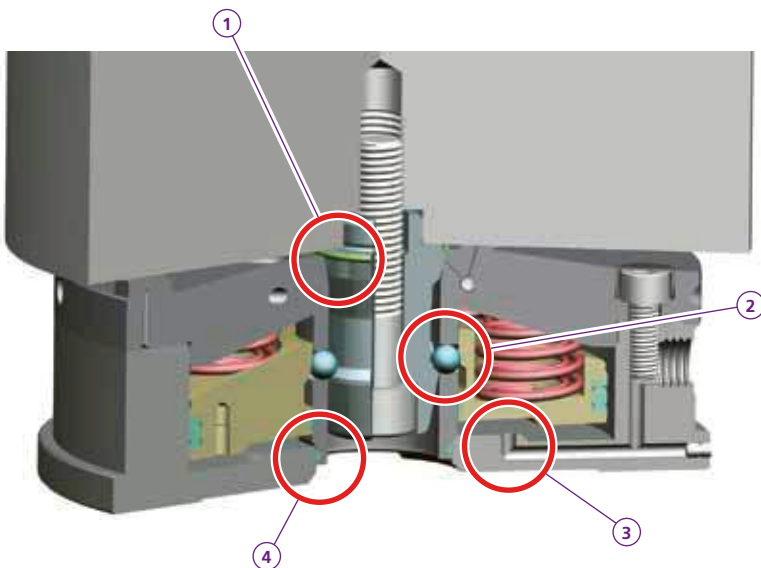
Reliable clamping mechanism through self-locking ball lock.

3 Open

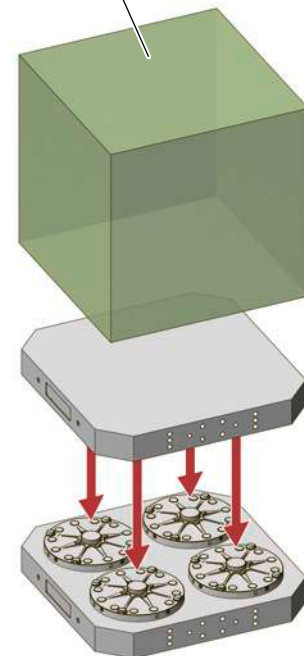
MTS are operated pneumatically.

4 Cleanliness

Liquids can drain off. No dirt traps.



L x B x H: Maschinenabhängig
L x W x H: Depending on the machine



MTS Spannfutter

Das pneumatische MTS Spannfutter benötigt trotz der hohen Spannkraft von 12'000 N dank interner Kraftverstärkung nur 7 bar Öffnungsdruck.

MTS Chuck

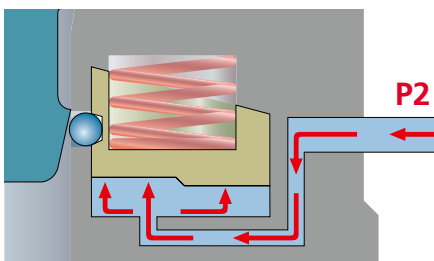
A mere 7 bar of opening pressure results in 12,000 N clamping power thanks to internal power boosting.

MTS Spannfutter, automatisierbar

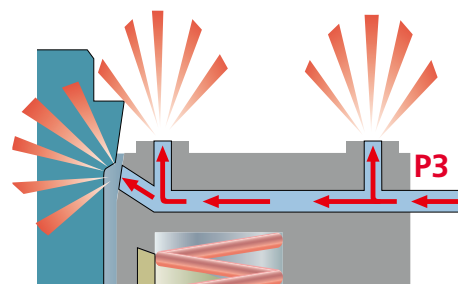
Automatische Reinigung der Auflageflächen und des Zentrierzapfens beim Werkstückwechsel.

MTS chuck, automatable

Automatic cleaning of contact surfaces and of the centering spigot cone while the workpiece is changed.



P2 Anschluss (P2)
 Öffnen
Prise (P2)
 Ouverture



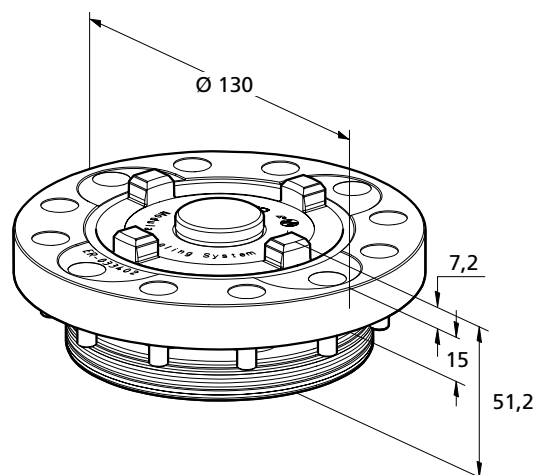
Anschluss (P3)
 Reinigen
Prise (P3)
 Cleaning

MTS IntegralChuck S-P (single + multiple /manually)

ER-033402



- Ausführung** Für den direkten Einbau in Maschinentische, Platten, Spanntürme, Winkel oder Teilapparate.
- Anschlüsse** Zum Öffnen: Pneumatisch.
- Anwendung** Zur Aufnahme von Einzel- oder Mehrfachpaletten.
- Version** For direct integration in machine tables, plates, tombstones, squares or dividing heads.
- Connections** To open: pneumatic or hydraulic.
- Application** To accommodate single or multiple pallets.

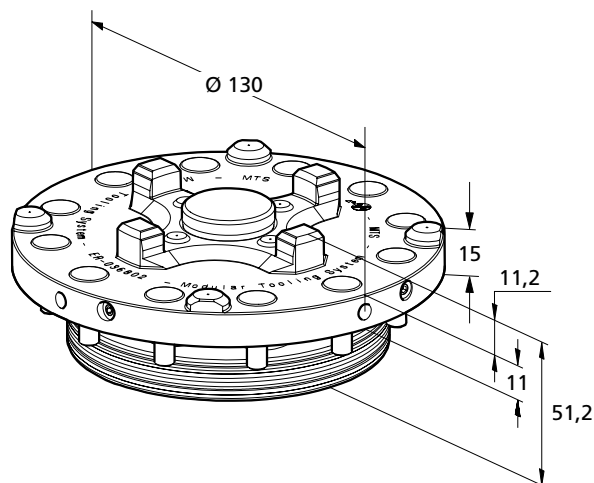


MTS IntegralChuck S-P/A (single + multiple /auto)

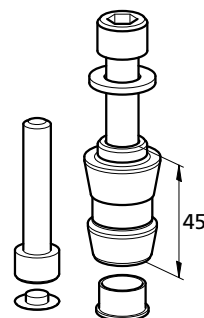
ER-036802



- Ausführung** Für den direkten Einbau in Maschinentische, Platten, Spanntürme, Winkel oder Teilapparate.
- Anschlüsse** Zum Öffnen: Pneumatisch.
- Anwendung** Zur Aufnahme von Einzel- oder Mehrfachpaletten.
- Version** For direct integration in machine tables, plates, tombstones, squares or dividing heads.
- Connections** To open: pneumatic.
To clean: pneumatic.
- Application** To accommodate single or multiple pallets.



Spannzapfen / Spigot		
ER-033800	manuell / 0-Punkt Zapfen manually zero point locating	
ER-039201	auto / Ausgleichszapfen auto / alignment spigot	
ER-039200	auto / Zapfen mit Spiel auto / spigot with clearance	
ER-038000	auto / 0-Punkt Zapfen auto / Zero point spigot	



Um Ihnen die schnelle Orientierung über die Anwendungsbereiche der EROWA Produkte zu erleichtern, verwenden wir die folgenden Zeichen:

To make it easier for you to find your way about the fields of application for EROWA products, we use the following symbols:

S = Single
M = Multi
A = Automatisierbar / Able to automate
P = Pneumatisch betätigt / Pneumatically operated



Manuelle Bedienung
 Manual operation



Geeignet zur Anwendung unter Flüssigkeit
 Suited for submerged operation



Geeignet für die automatische Anwendung
 Suited for automatic operation



Für spanabhebende Bearbeitung
 For chip-removing processes



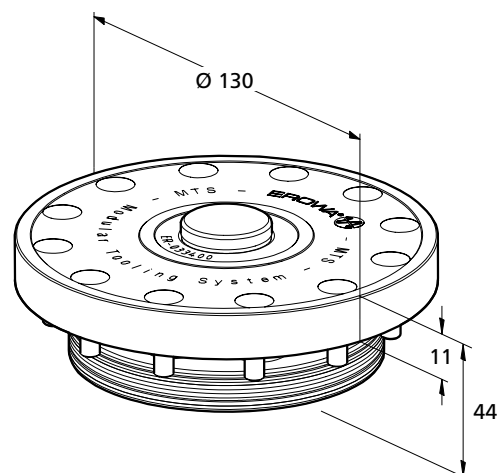
Zum Senkerodieren
 For EDM sinking

MTS IntegralChuck M-P (multiple / manually)

ER-033400



- Ausführung** Für den direkten Einbau in Maschinentische, Platten, Spanntürme, Winkel oder Teilapparate.
- Anschlüsse** Zum Öffnen: Pneumatisch.
- Anwendung** Zur Aufnahme von Einzel- oder Mehrfachpaletten.
- Version** For direct integration in machine tables, plates, tombstones, squares or dividing heads.
- Connections** To open: pneumatic or hydraulic.
- Application** To accommodate single or multiple pallets.

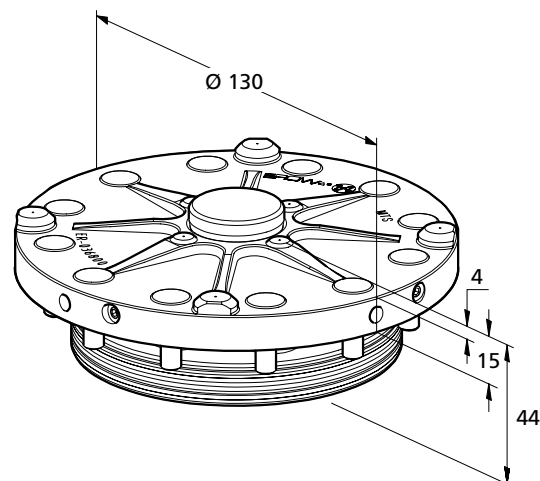


MTS IntegralChuck M-P/A (multiple / auto)

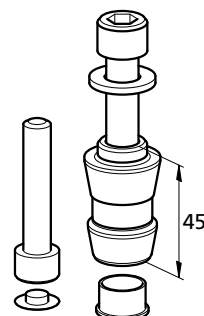
ER-036800



- Ausführung** Für den direkten Einbau in Maschinentische, Platten, Spanntürme, Winkel oder Teilapparate.
- Anschlüsse** Zum Öffnen: Pneumatisch.
Zum Reinigen: Pneumatisch.
- Anwendung** Zur Aufnahme von Einzel- oder Mehrfachpaletten.
- Version** For direct integration in machine tables, plates, tombstones, squares or dividing heads.
- Connections** To open: pneumatic.
To clean: pneumatic.
- Application** To accommodate single or multiple pallets.



Spannzapfen / Spigot		
ER-033800	manuell / 0-Punkt Zapfen manually zero point locating	
ER-039201	auto / Ausgleichszapfen auto / alignment spigot	
ER-039200	auto / Zapfen mit Spiel auto / spigot with clearance	
ER-038000	auto / 0-Punkt Zapfen auto / Zero point spigot	



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Manuelle Bedienung
Manual operation



Geeignet zur Anwendung unter Flüssigkeit
Suited for submerged operation



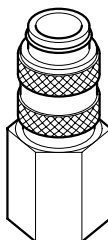
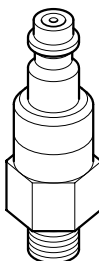
Geeignet für die automatische Anwendung
Suited for automatic operation

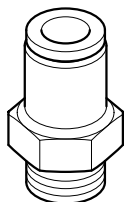


Für spanabhebende Bearbeitung
For chip-removing processes



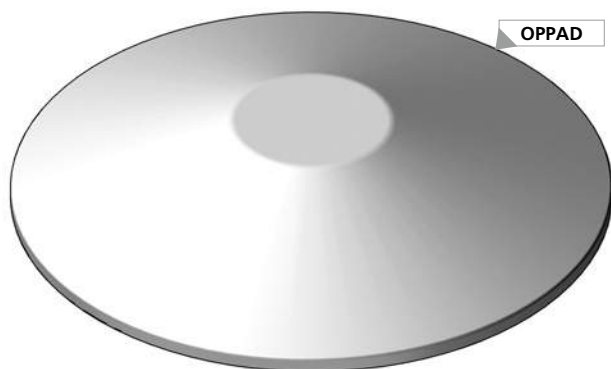
Zum Senkerodieren
For EDM sinking

OPSKU	G1/4" Innengewinde <i>Internal thread</i>	OPST-NI	G1/8" Aussengewinde <i>Male thread</i>	OPRV	G1/8" Aussengewinde <i>Male thread</i>
					
Schnellkupplung <i>Quick fitting coupling</i>		Stecknippel verschmutzungsgeschützt <i>Plug nipple protected against staining</i>		Rückschlagventil <i>Nonreturn valve</i>	
OPANS-8	G1/4" Aussengewinde <i>Male thread</i>				

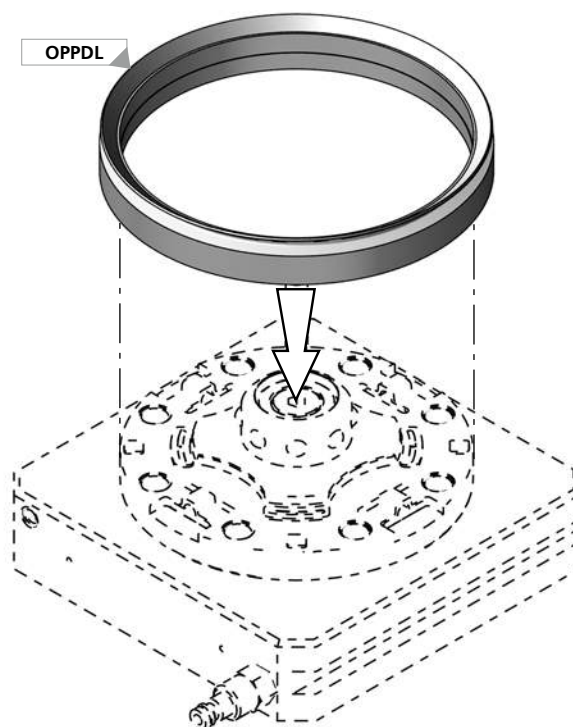


Für 8 mm Schlauch / *For hose*

Abdeckung
Cover



Dichtlippe
Leakproof cover

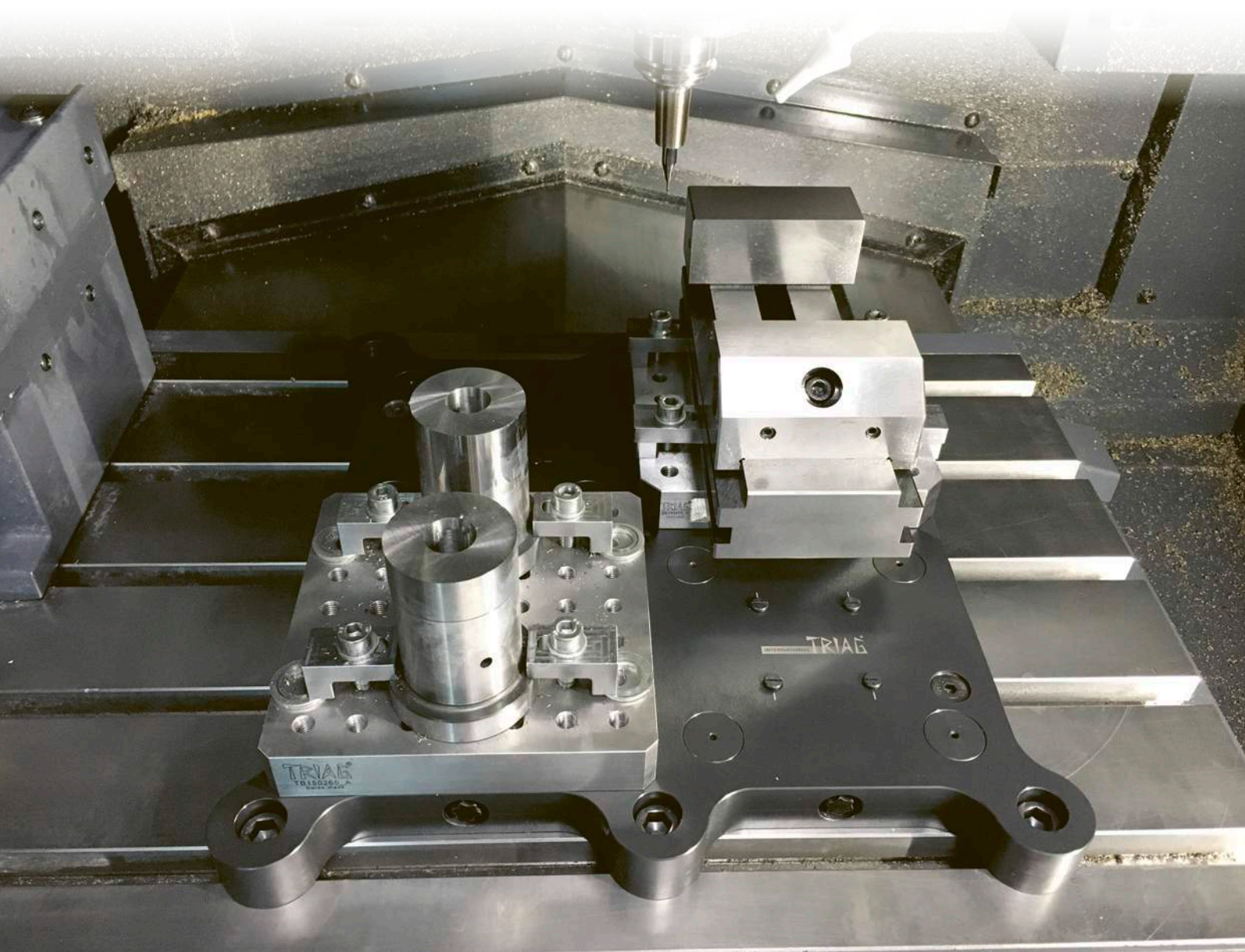


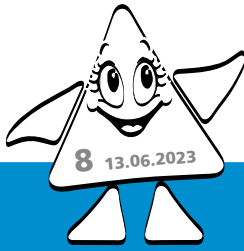
	kg
OPPDL	~0,525
OPPDL	~0,075

Bestellbeispiel / *Ordering example* : 1x **OPPDL**

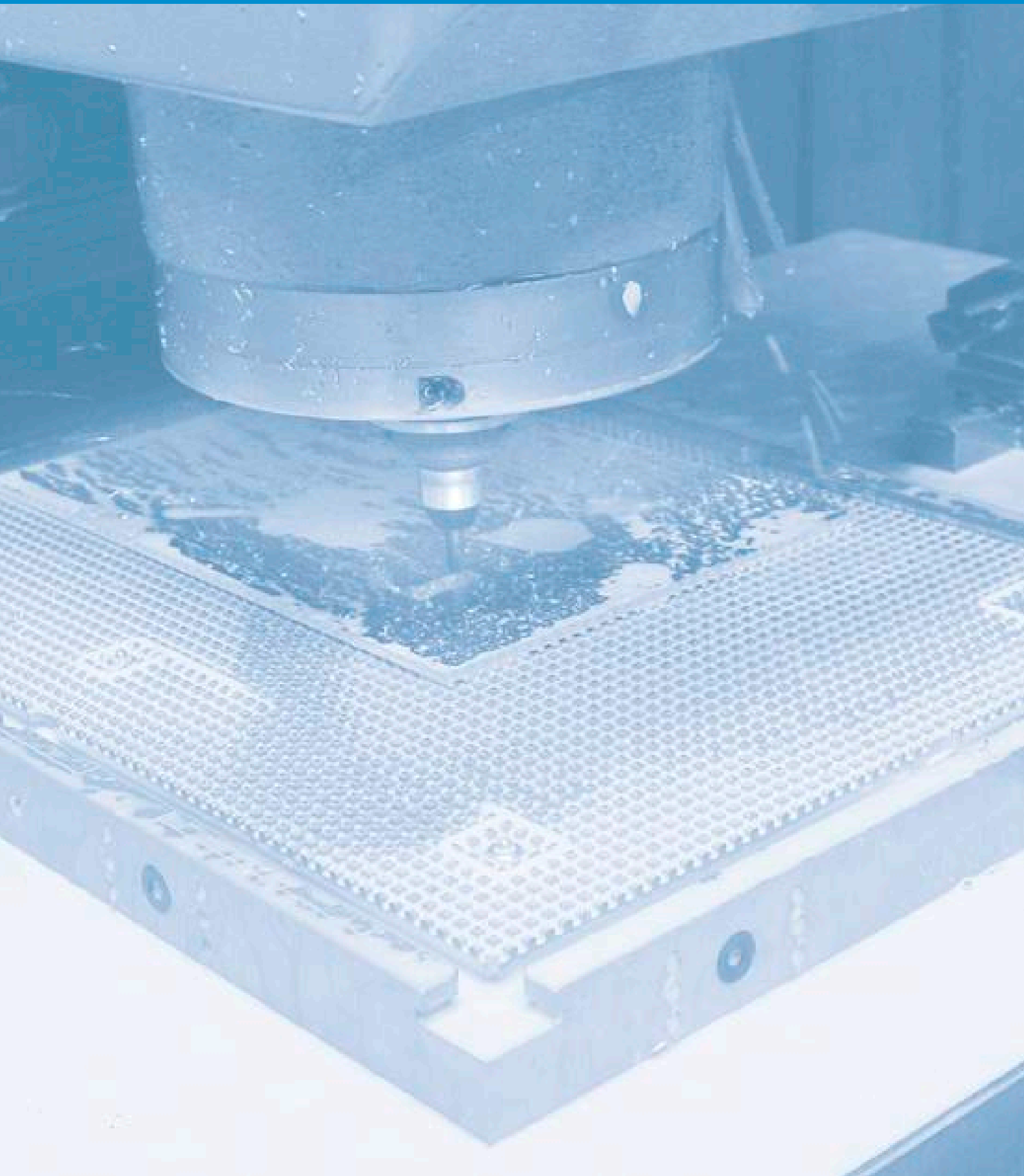


oppSystem





***triva*CLAMP**





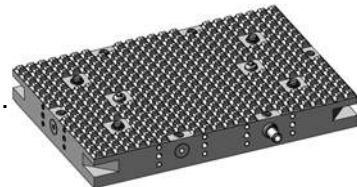
Einleitung | *Introduction* 305 - 307



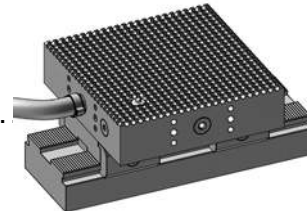
Bedienungsanleitung | *Operating manual* 308 - 309

Anwendungsbeispiele | *Examples of application* 310 - 312

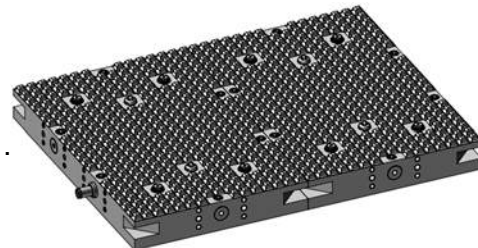
Modulare Vakuumplatten | *Modular vacuum plates* 314 - 317



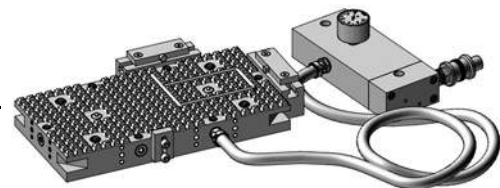
Vakuum-Modul für powerCLAMP | *Vacuum module for powerCLAMP* 318 - 319



Kombinationsvarianten (Vakuumplatten)
Possible combination of vacuum plates 320



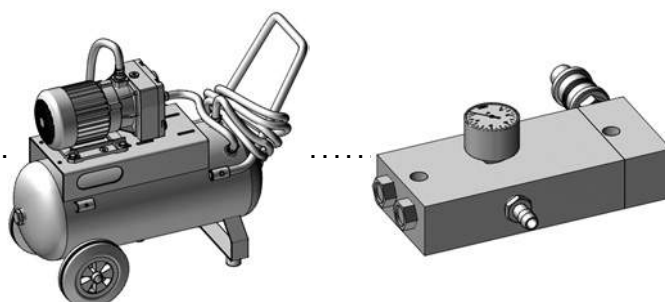
Startersets nach Ihrer Wahl | *Starter kit (Your choice)* 321



Zubehör | *Accessories* 322 - 324



Vakuum erzeugen | *Generate vacuum* 325 - 327



Vakuumspannen

Die mechanische Spannung hat bekanntlich auch Nachteile. Hohe Kräfte auf das Werkstück können zu Druckmarken und Verformungen führen. Vor allem bei grösseren Werkstücken besteht zudem die Gefahr, dass das Werkstück vibriert.

Workholding by vacuum

Mechanical clamping, as described before, has disadvantages. High specific forces on the workpiece can cause pressure marks and distortions. And, particularly on large parts, there is a risk that the workpiece will vibrate.



Bei der Spannung mit Vakuum wird der Druck nicht mechanisch auf das Werkstück sondern durch die umgebende Atmosphäre ausgeübt. Dadurch werden die Werkstücke schonend und gleichmässig über die ganze Auflagefläche fixiert, so dass kaum Vibrationen entstehen.

Der Beschickungs- und Arbeitsraum bleibt zudem frei von Bränden und Spannmittel.

In vacuum clamping the clamping force is not applied to the work piece mechanically, but is provided by the surrounding atmosphere. This means that the work piece is gently and evenly pulled down over the whole supporting surface, so that vibration is minimized. As there are no obstructing brackets, clamps or workholding modules in the working and loading area, there are fewer chances for collisions with the tool.

- Diese Spannmethode ist vor allem für grossflächige, dünnwandige, auch nichtmagnetische Werkstücke geeignet.

- This clamping method is particularly suitable for large surface, thin-walled and also non magnetic work pieces.

Triva Clamp besteht aus folgenden Funktionsteilen:

Triva Clamp consists of the following functional devices:

- **Vakuumpplatten** mit passenden Anschlagleisten für den Einsatz mit seitlich einwirkenden Kräften.
- **Dichtschnur aus Silikongummi**, die immer entlang der Peripherie des Werkstücks eingelegt wird. Die Haltekraft wächst proportional zur Aufspannfläche, die durch die Dichtschnur begrenzt wird.
- **Rotations-Vakuumpumpe** mit Schaltventil und Druckwächter optional.
- **Injektorpumpe** mit Schaltventil.

- **Vacuum plates** with suitable stop gauges for application with lateral workholding forces.
- **Silicone-rubber sealing cord** inlaid along the periphery of the work piece. The clamping force increases proportionally to the surface area defined by the sealing cord.
- **Rotary vacuum pump** with control unit and pressure sensor.
- **Injector pump** with control unit.

Die Ansaugbohrungen werden mit Hilfe von **Triva Clamp-Ventilen** versiegelt. Wenn die Ventile geschlossen sind, sind keine Löcher in der Platte vorhanden, so dass kaum Kühlflüssigkeit eindringen kann. Das **Triva Clamp-Ventil** wird bei der Auflage des Werkstückes automatisch aktiviert. Ständiges manuelles Öffnen und Verschliessen der Bohrungen entfällt somit.

*The suction holes are sealed by the **Triva Clamp valves**. With these valves closed there are no holes in the plate so that hardly any coolant can enter. The **Triva Clamp valve** is automatically activated by placing the work piece on the vacuum plate. Hence constant opening and closing of the suction holes is omitted.*

Theoretische Haltekraft:

Unter Einbezug eines Sicherheitsfaktors für atmosphärische Druckschwankungen und Leckagen im Vakuumkreislauf rechnen wir mit einem zur Verfügung stehenden Druck von 0,85 bar Vakuum oder 8,5 N/cm² (wobei der Druck von der Höhe über Meer abhängig ist).

Diesen Druck bezeichnen wir als theoretisch 100%. Bei 300 cm² Spannfläche ergibt sich also eine theoretische Spann-/Haltekraft von 8,5 N/cm² x 300 cm² = 2550N.

Diese theoretische Haltekraft basiert auf einem vollständigen Hohlraum unter dem Werkstück. Dies ist in der Praxis jedoch nicht möglich, weil das Werkstück abgestützt werden muss.

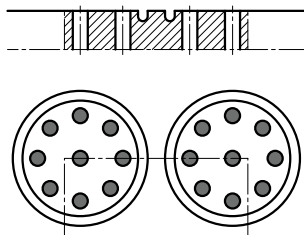
Effektive Haltekraft:

Das heisst, je grösser der Hohlraum unter dem Werkstück und je geringer die Auflagefläche für das Werkstück, desto grösser sind die Haltekräfte.

Die effektive Haltekraft ist folglich abhängig vom Wirkungsgrad des Vakuumspannsystems.

Vakuumspannsysteme im Vergleich:

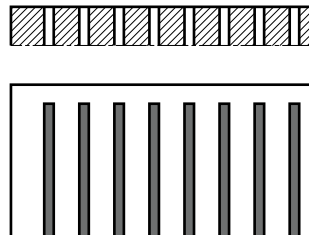
Lochplatte Plate with suction holes



Pro Element Ø 40 mm
9 Bohrungen Ø 4 mm.
Each section of Ø 40 mm
having 9 bores of Ø 4 mm.

Wirkungsgrad: 9%
Degree of efficiency: 9%

Schlitzplatte Plate with slots



Steg 8 mm, Schlitz 2 mm
Slots 2 mm, bar 8 mm

Wirkungsgrad: 25%
Degree of efficiency: 25%

Theoretical holding force:

Including a safety factor for atmospheric pressure variations and leaks within the vacuum circuit, we calculate an available pressure of 0,85 bar (12,1psi) vacuum equalling 8,5 N/cm² (whereas pressure is dependent on altitude).

This amount of pressure is referred to as theoretically attainable 100%. For 300 cm² /46,5 sq inch the pressure thus is 8,5 N/cm² x 300 cm² = 2550N (12,1psi x 46,5sq in = 562lbs).

This theoretically calculated holding force is based upon a hollow space underneath the entire work piece. This is not possible because the work piece must be supported. Therefore we have to subtract the area supporting the workpiece.

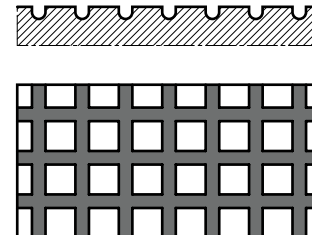
Effective holding force:

In other words: the larger the work piece supporting area, thus reducing the hollow space representing the holding area, the lesser the holding force.

Consequently, the effective holding force depends entirely upon the rate of efficiency of the vacuum system.

Comparison of various vacuum systems:

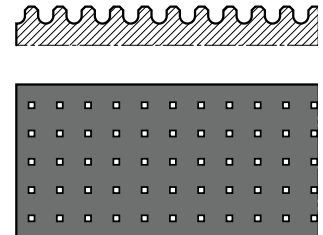
Nutenplatte Plate with U-shaped grooves



Raster 10x10 mm, Nute 3 mm
Grid 10x10 mm, grooves 3 mm

Wirkungsgrad: 51%
Degree of efficiency: 51%

Triva Clamp Waffelmuster Triva Clamp waffle pattern



Raster 6,5 mm, Nute 5 mm
Grid 6,5 mm, grooves 5 mm

Wirkungsgrad: 92%
Degree of efficiency: 92%

Besonderheiten von Triva Clamp:

Durch die besondere Formgebung der Werkstückauflage (Waffelmuster) erreicht Triva Clamp einen kaum zu übertreffenden **Wirkungsgrad von theoretisch 92% = 2346 N bei einem maximal erreichbaren Wert von 2550 N (bezogen auf 300 cm² Spannfläche).**

Special features Triva Clamp:

The unique shape of the Triva Clamp workpiece supporting area (waffle pattern) guarantees maximum attainable holding force with a rate of **efficiency of theoretically 92%, equalling 2346 N holding force applied to the work piece of 300cm² (46,5sq in) holding surface.**

Toleranzen

Höhe 40 mm ± 0,02 / 400 mm
Ebenheit über alles: ± 0,03 / 400 mm

Tolerances

Height 40 mm ± 0,02 / 400 mm
Flatness all over: ± 0,03 / 400 mm

Alle Vakuumplatten sind aus hochfestem Aluminium hergestellt und für eine lange Lebensdauer **Hartanodisiert** beschichtet. Durch an jeder Seite angebrachte Koppelbohrungen wird es möglich, die Spannfläche nach Bedarf allseitig zu erweitern.

Vacuum plates are made from high tensile aluminum alloy, are **hard anodized** treated for long tool life. Triva plates can be coupled longitudinally and transversely with any holding plate to suit workpieces, limited by machine table size only.

Mechanische Spannung = Druck auf das Werkstück,
daraus resultieren:

- Belastung des Werkstücks
- Druckmarken in weichen Werkstoffen
- Verformung labiler Teile
- Risiko von Vibrationen

Mechanical clamping = pressure applied to workpiece,
result:

- Stress applied to workpiece
- Pressure marks in soft materials
- Deforming of delicate workpieces
- Risk of vibrations

Vakuumspannung = Druck auf Spannplatte

Durch die umgebende Atmosphäre, daraus folgt:

- Schonende, gleichmässige Fixierung jeglicher Werkstoffe über die ganze Auflagefläche
- Keine Vibrationen
- Freier Bestückungs- und freier Arbeitsraum

Vacuum clamping = pressure upon vacuum-plate

By the surrounding atmosphere, resulting in:

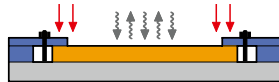
- Equal distribution of holding force over the Entire workpiece holding surface
- Machining with no risk of vibrations
- Free, clear loading and processing area

Spannen von Platten mit Klemm-Briden

Haltekraft nur am Rand. Vibrationen in Werkstückmitte. Folgeoperationen notwendig.

Clamping of plates, using clamps

Edges fixed only - Vibrations in center of workpiece - Subsequent operations required.

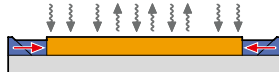


Spannen von Platten mit Tiefspannbacken

Haltekraft nur am Rand, Vibrationen in Werkstückmitte. Hoher Spanndruck erzeugt Spannung und Verformung.

Clamping of plates, using clamping jaws

Also high pressure applied to workpiece, holding effect at the edges - Risk of deformation and vibrations.



Kubus spannen im Schraubstock

Belastung des Werkstücks - Risiko von Druckmarken.

Clamping of cubic-shaped items, using vise

Stress applied - Risk of pressure marks in workpiece.

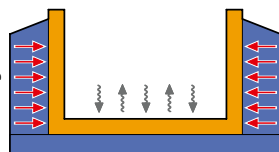


Spannen von U-Profilen im Schraubstock

Risiko von Deformationen und Vibrationen.

Clamping of U-profile, using vise

Risk of deformation and vibrations during processing.

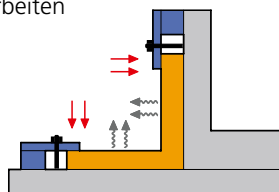


Spannen von Winkelprofil mit Briden

Umständliches Bestücken und Bearbeiten sowie grosse Vibrationen.

Clamping of angled workpiece, using clamps

Bothersome clamps, vibrations, subsequent operation.

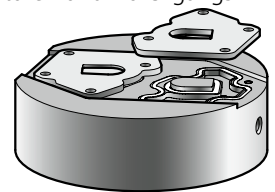


Spannen von unförmigen Werkstücken

Für Werkstücke mit unförmigen Konturen und Durchgangsbohrungen stellen wir Spezialvorrichtungen her.

Holding of bulky workpieces

We build special devices for workpieces with bulky outlines and through bore-holes.

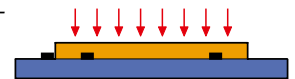


Spannen von Platten auf Vakuum-Platte

Haltekraft gleichmässig über ganze Auflagefläche verteilt. Keine Vibrationen - Freier Arbeitsraum.

Holding of plates, using vacuum-plate

Holding force equally spread all over the workpiece holding area - No vibrations - Free processing area.

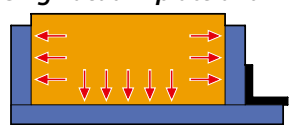


Kubisches Werkstück spannen mit Vakuum-Platte und Steilwänden

Werkstück an 3 (bis 5) Seiten ohne mechanischen Druck gehalten.

Holding of cubic-shaped item, using vacuum-plate and vertical walls

Workpiece held from 3 (up to 5) directions. No stress applied - No stress applied - No pressure marks.

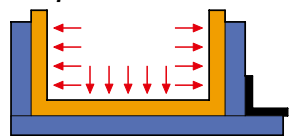


Spannen von U-Profilen mit Vakuum-Platte und Steilwänden

Allseitig gleichmässige, druckfreie Aufspannung. Bearbeitung ohne Risiko von Vibrationen.

Holding of U-profile, using vacuum-plate and 2 vertical walls

Uniform, stressfree holding from 3 directions - No risk of deformations or vibrations during processing.

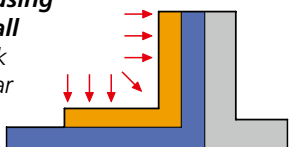


Spannen von Winkelprofil mit Vakuum-Platte und 1 Steilwand

Gleichmässig verteilte Haltekraft. Leichtes Bestücken und freier Arbeitsraum. Keine Vibrationen, keine Nacharbeit notwendig.

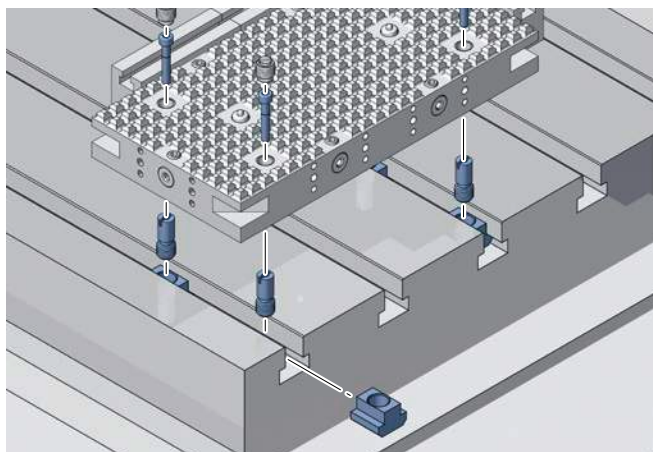
Holding of angled workpiece, using vacuum-plate and 1 vertical wall

Uniform stressfree holding - No risk of vibrations - No clamps, free, clear work area for easier, faster loading and processing.

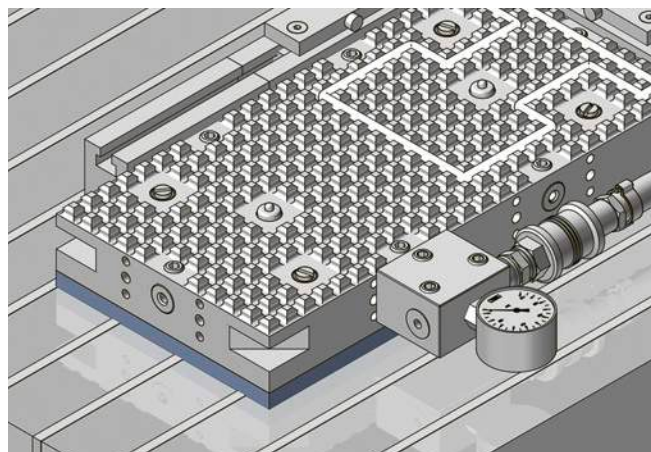


Rote Pfeile → zeigen die Spannrichtung, graue Pfeile ~→ zeigen Vibrationskräfte
Red arrows → show the holding force direction, gray arrows ~→ show vibration forces

Vakuumplatte auf Maschinentisch befestigen / Mounting vacuum plate on machine table

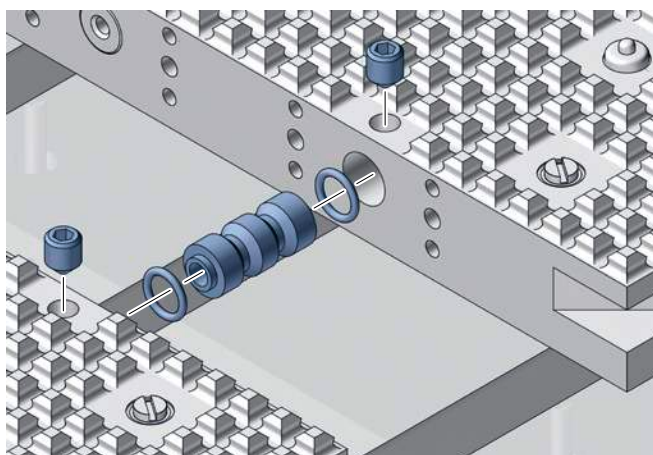


Mechanisch befestigt / Mechanical mounting

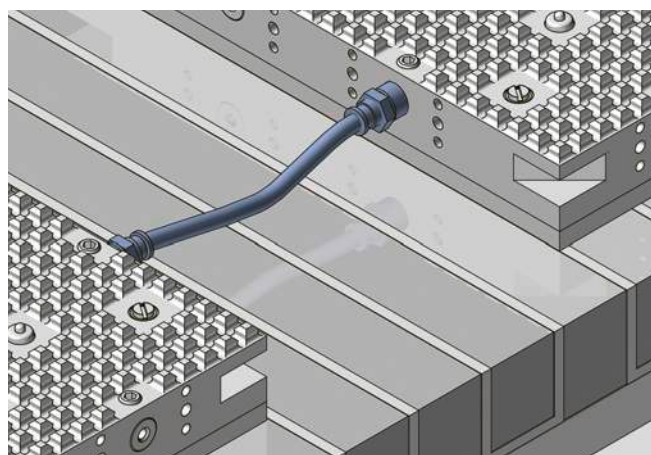


Magnetisch befestigt / Magnetical mounting

Platten koppeln / Connect plates

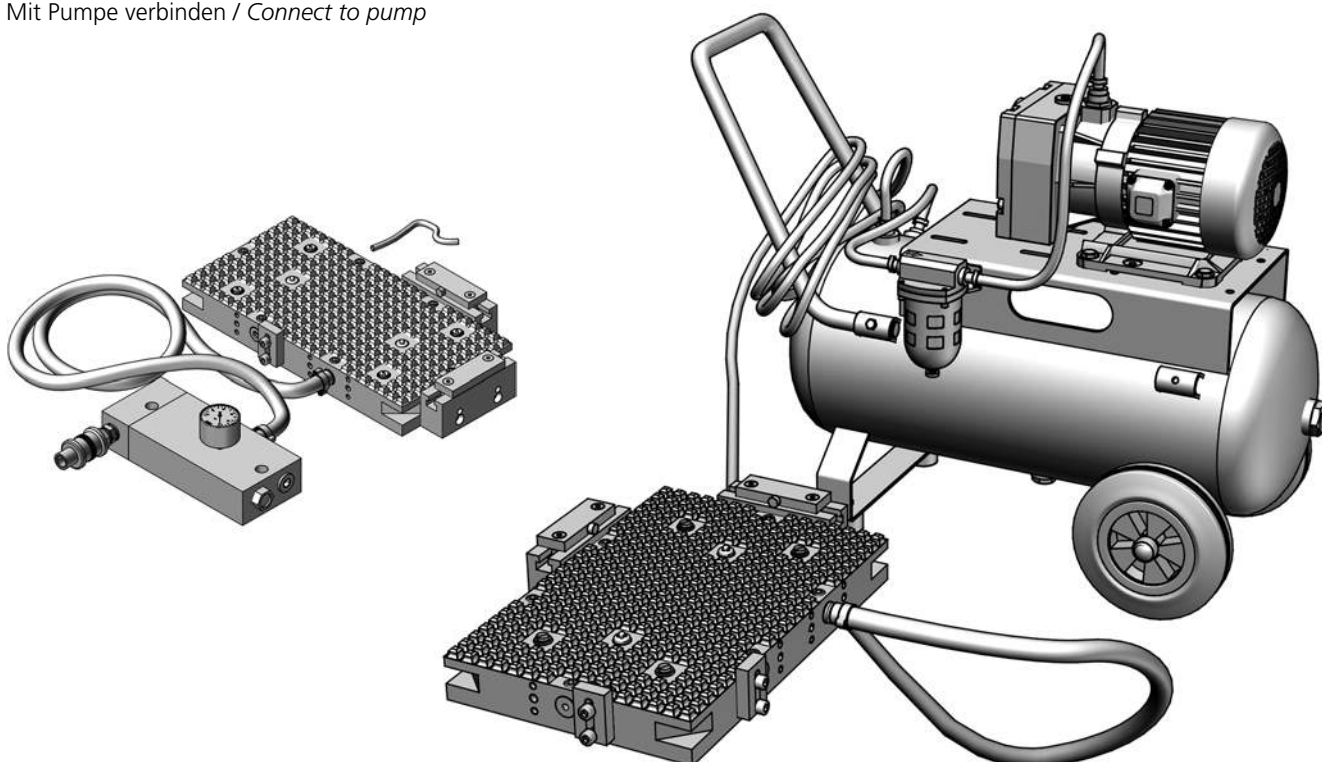


Mit Vakuumverbinder / With vacuum circuit connector

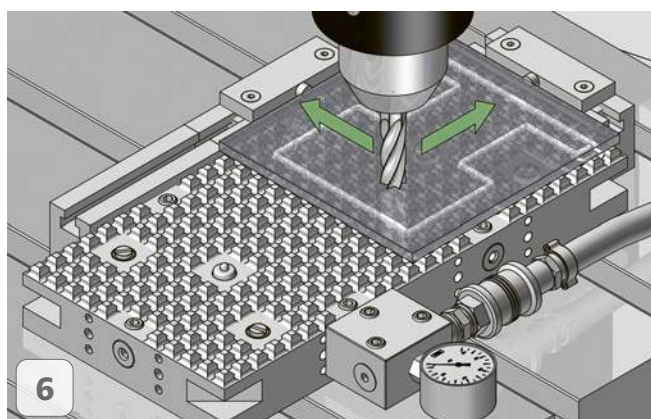
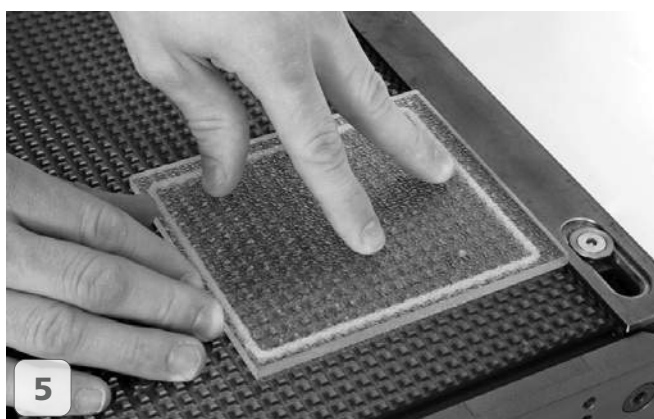
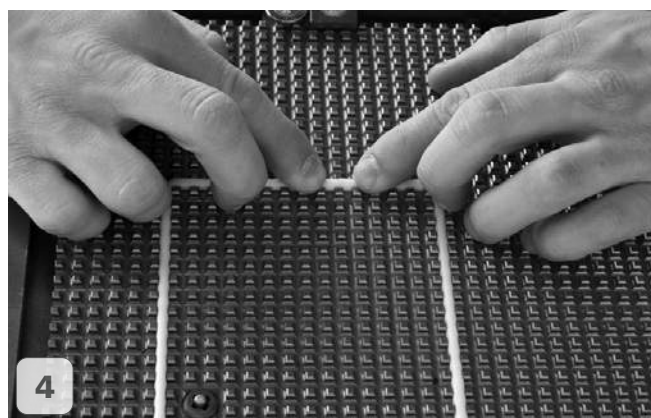
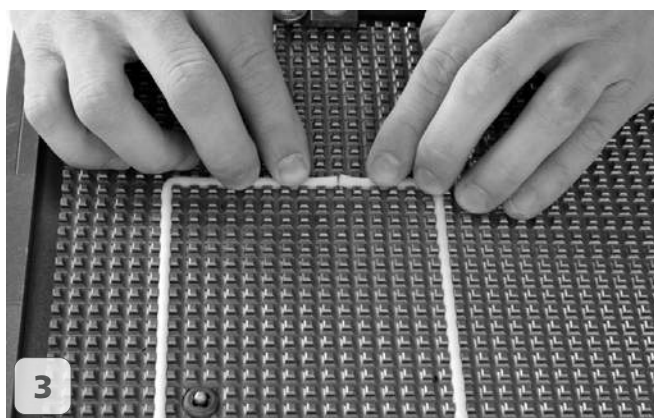
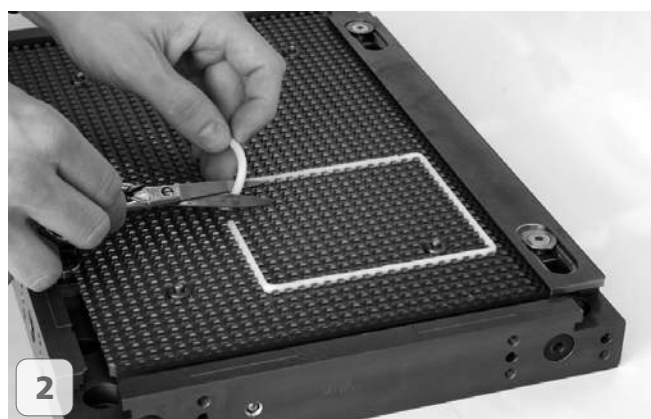
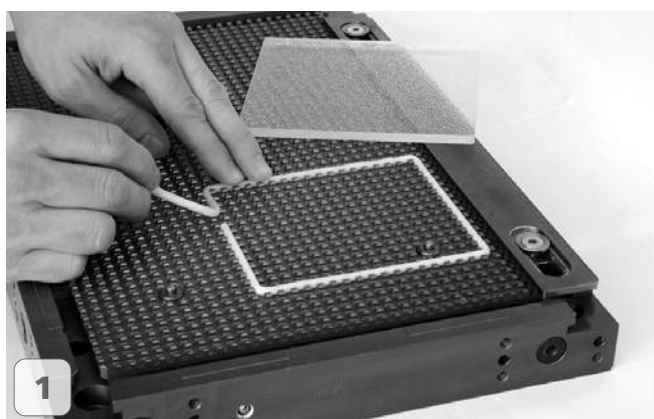


Mit Verbindungsschlauch / With connector-tube

Mit Pumpe verbinden / Connect to pump



Dichtschnur und Werkstück einlegen / Insert sealing cord and workpiece



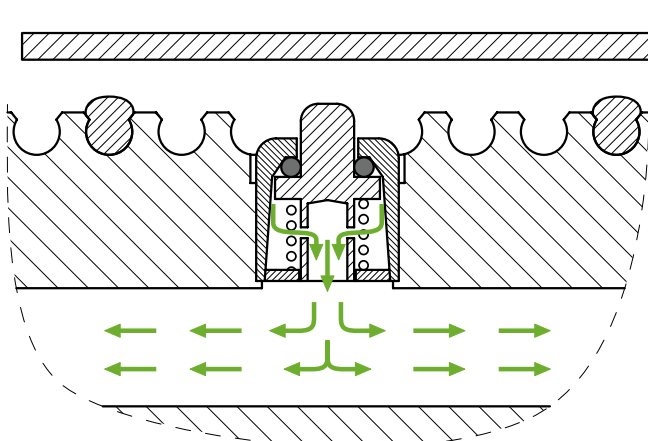
Fräsrichtung beachten:



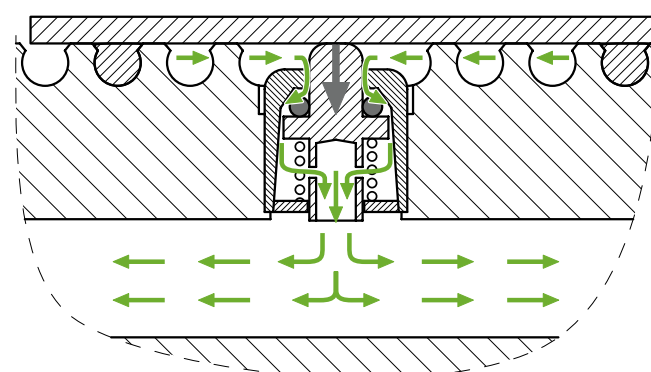
wenn möglich, gegen Festanschläge fräsen.

Pay attention to machining direction:

if possible, toward stop gages milling.

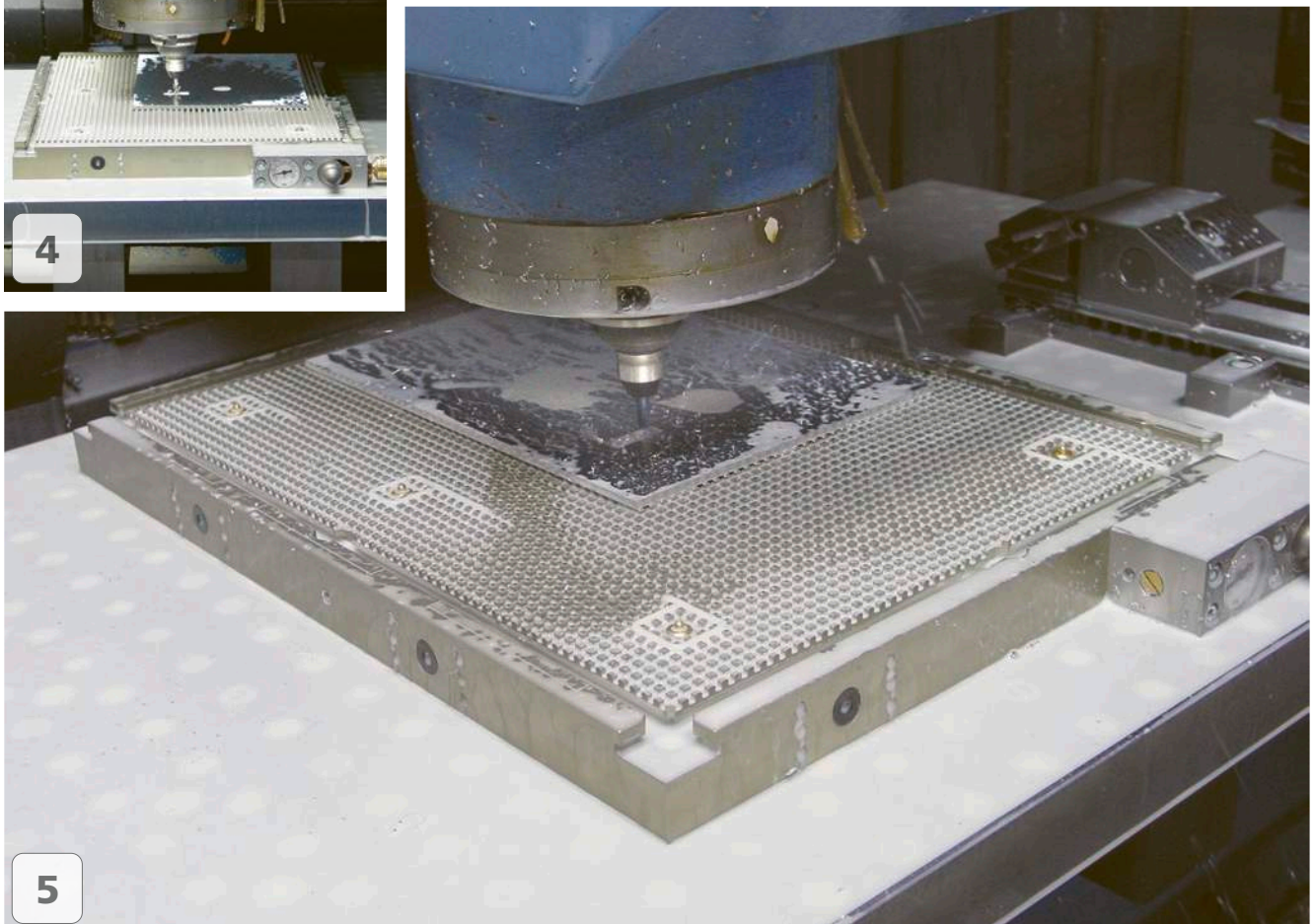
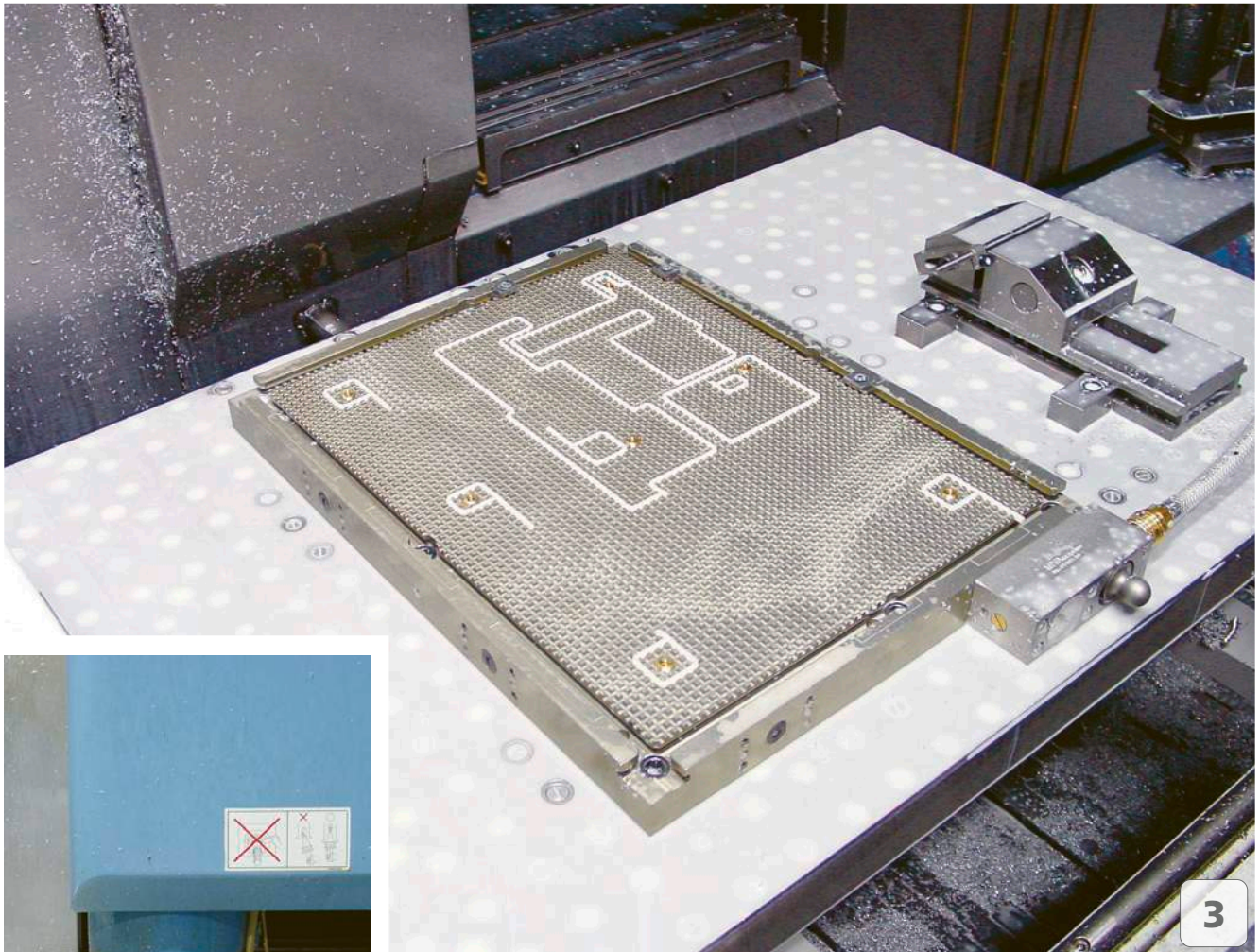


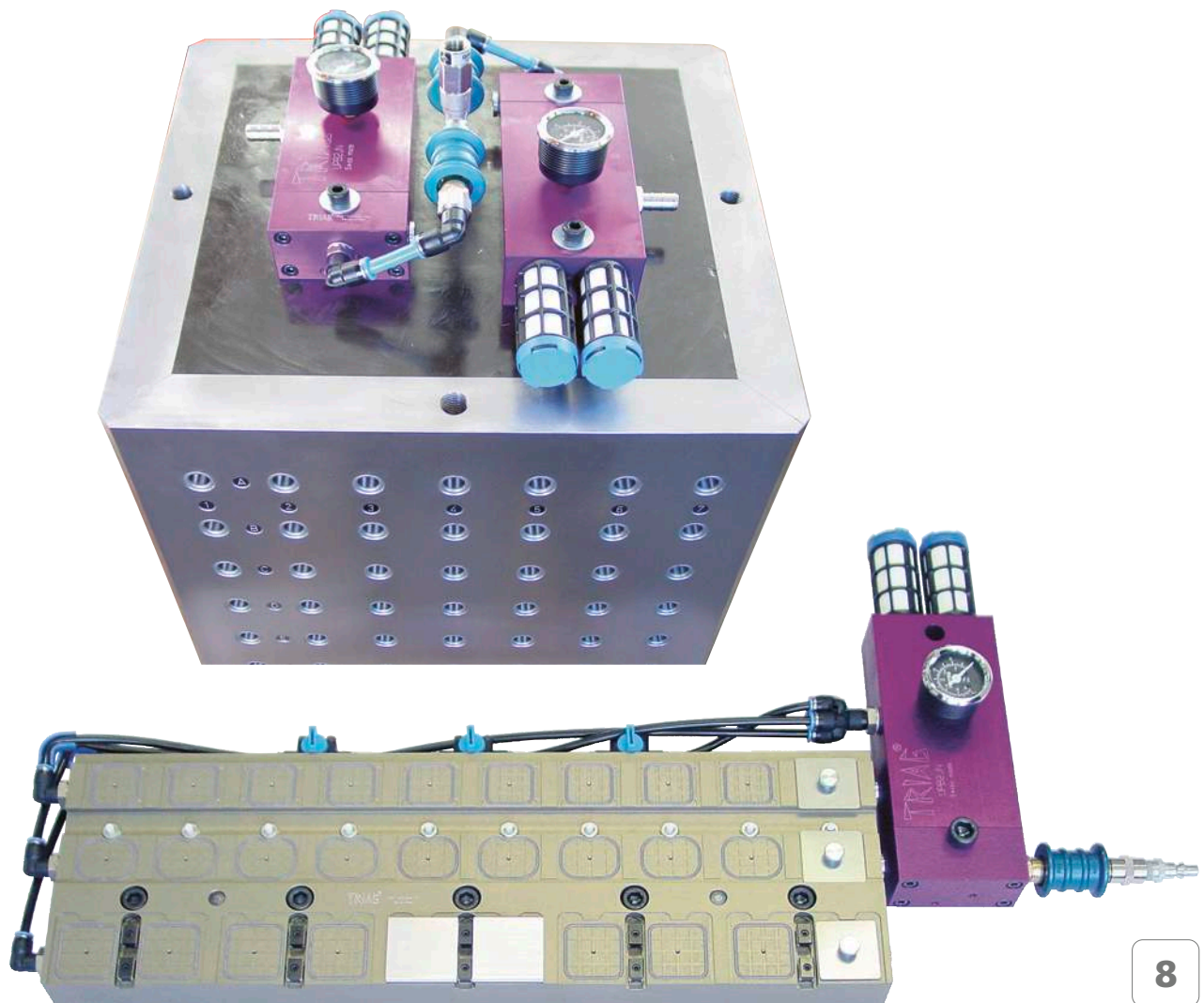
Ventil geschlossen / Valve sealed

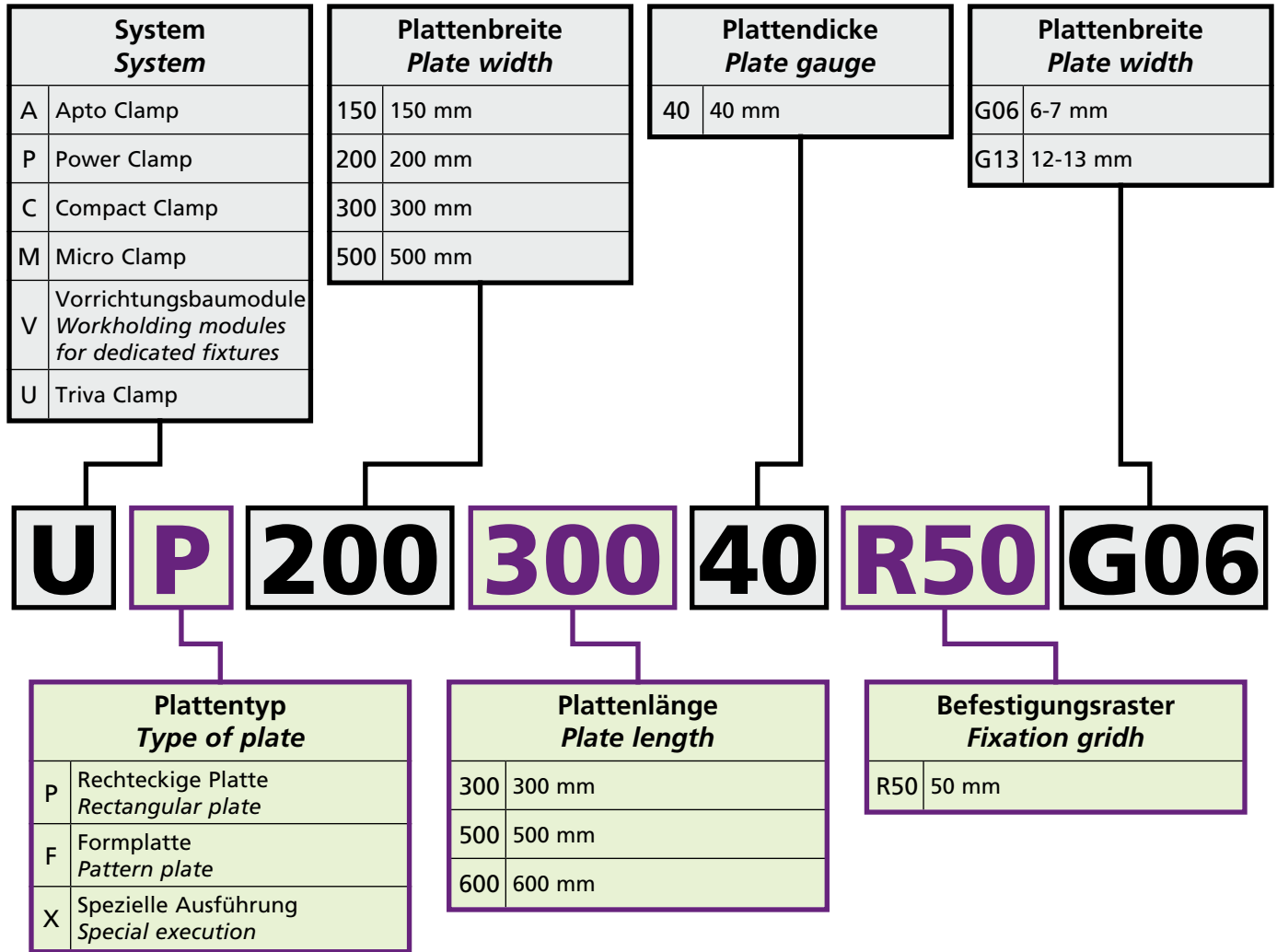


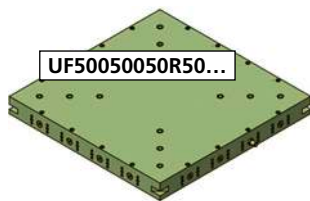
Werkstück eingelegt: Ventil offen
Workpiece inserted: Valve open









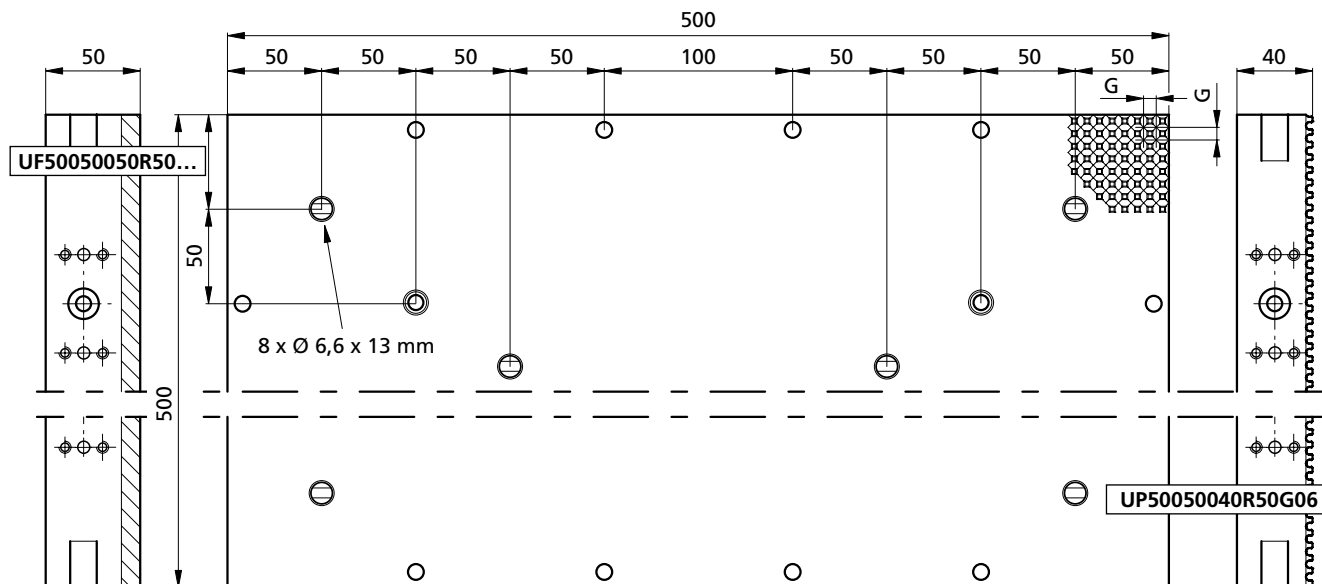


Formplatten

Für spezielle Werkstücke, die für das Spannen auf den Standardplatten ungeeignet sind, haben wir Rohplatten entwickelt, die bis zu 3 mal überfräst werden können. So lassen sich bis zu 3 verschiedene Werkstücke nacheinander bearbeiten.

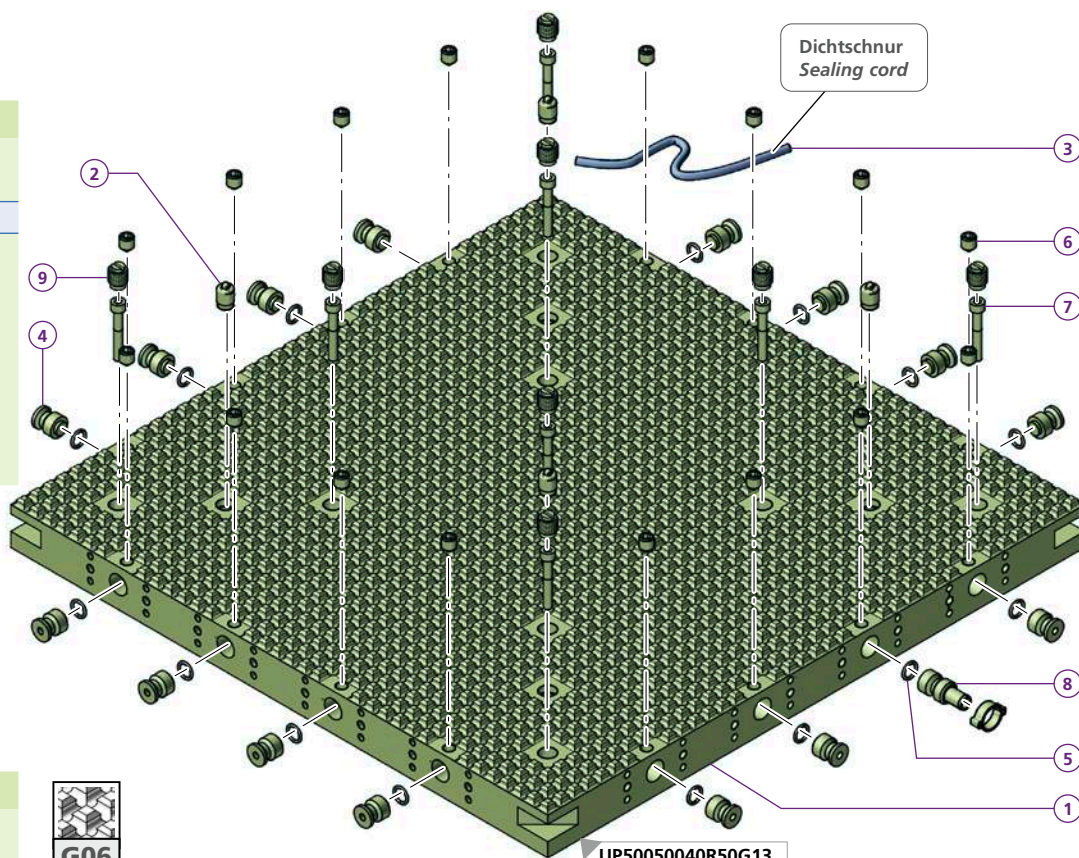
Die plates

For special work pieces that are unsuitable for clamping on the standard plates, we have developed raw plates that can be milled again up to 3 times. This way, up to 3 different work pieces can be machined one after the other.



UP50050040R50G13

- 1 1x TH160150
- 2 4x 0700100
- 3 1x 1110100
- 4 15x 0920000
- 5 16x 1111003
- 6 16x M10X12ISO4027
- 7 8x M6X45ISO4762
- 8 1x 0910001
- 9 8x 0700102
- G = 12,5 mm
- kg ~24



Dichtschnur
Sealing cord

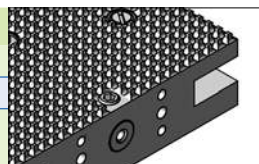
UF50050050R50...

- 1 1x TH160151
- 2 4x 0700100
- 3 1x 1110100
- 4 15x 0920000
- 5 16x 1111003
- 6 16x M10X12ISO4027
- 7 8x M6X45ISO4762
- 8 1x 0910001
- 9 8x 0700102
- kg ~32,5



UP50050040R50G06

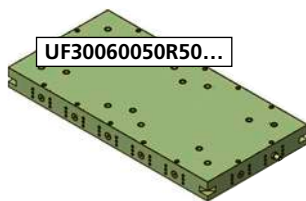
- 1 1x TB160159
- 3 1x 1120100
- G = 6,5 mm
- kg ~26



Profilfräser / Carbide end mills G13 / G06 p. 324

Dichtschnüre je nach Bedarf / Sealing cords as needed

Bestellbeispiel / Ordering example:
UP50050040R50G13 & 1x 1110100

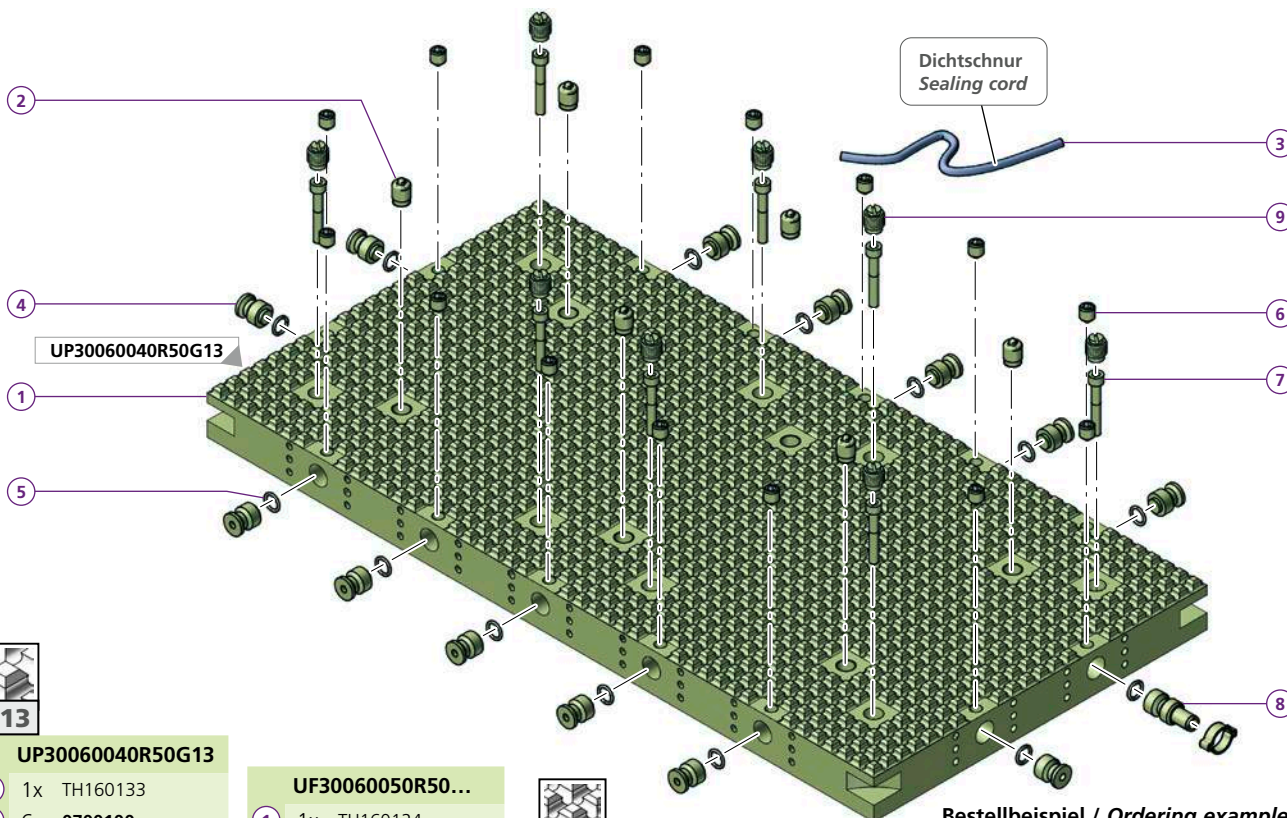
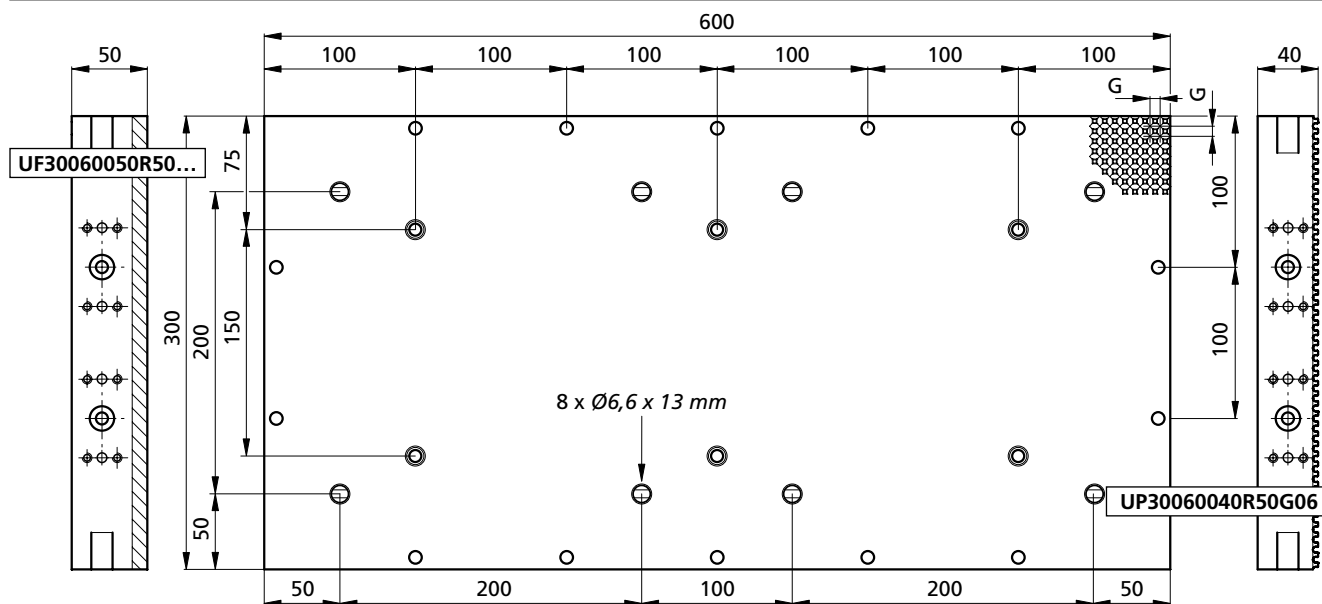


Formplatten

Für spezielle Werkstücke, die für das Spannen auf den Standardplatten ungeeignet sind, haben wir Rohplatten entwickelt, die bis zu 3 mal überfräst werden können. So lassen sich bis zu 3 verschiedene Werkstücke nacheinander bearbeiten.

Die plates

For special work pieces that are unsuitable for clamping on the standard plates, we have developed raw plates that can be milled again up to 3 times. This way, up to 3 different work pieces can be machined one after the other.



UP30060040R50G13

1	1x TH160133
2	6x 0700100
3	1x 1110100
4	13x 0920000
5	13x 1111003
6	14x M10X12ISO4027
7	8x M6X45ISO4762
8	1x 0910001
9	8x 0700102
G	= 12,5 mm
kg	~18

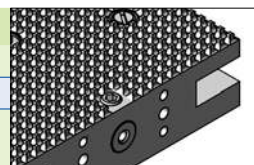
UF30060050R50...

1	1x TH160124
2	6x 0700100
3	1x
4	13x 0920000
5	13x 1111003
6	14x M10X12ISO4027
7	8x M6X45ISO4762
8	1x 0910001
9	8x 0700102
kg	~24,36



UP30060040R50G06

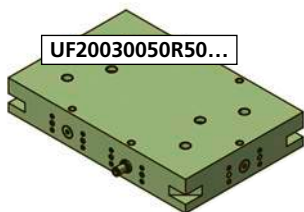
1	1x TH120176
3	1x 1120100
G	= 6,5 mm
kg	~18,5



Bestellbeispiel / Ordering example:
UP30060040R50G13 & 1x 1110100

Profilfräser / Carbide end mills G13 / G06 p. 324

Dichtschnüre je nach Bedarf / Sealing cords as needed

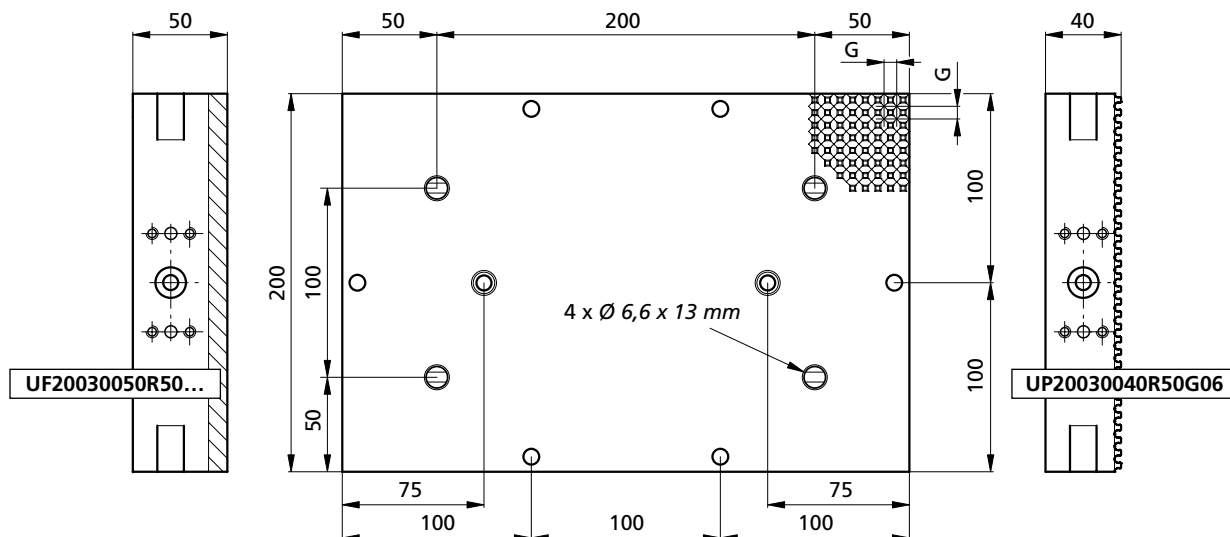


Formplatten

Für spezielle Werkstücke, die für das Spannen auf den Standardplatten ungeeignet sind, haben wir Rohplatten entwickelt, die bis zu 3 mal überfräst werden können. So lassen sich bis zu 3 verschiedene Werkstücke nacheinander bearbeiten.

Die plates

For special work pieces that are unsuitable for clamping on the standard plates, we have developed raw plates that can be milled again up to 3 times. This way, up to 3 different work pieces can be machined one after the other.



G13

UP20030040R50G13

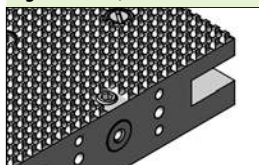
- ① 1x TH160135
- ② 2x 0700100
- ③ 1x 1110100
- ④ 5x 0920000
- ⑤ 6x 1111003
- ⑥ 6x M10X12ISO4027
- ⑦ 4x M6X45ISO4762
- ⑧ 1x 0910001
- ⑨ 4x 0700102
- G = 12,5 mm
- kg ~5,5



G06

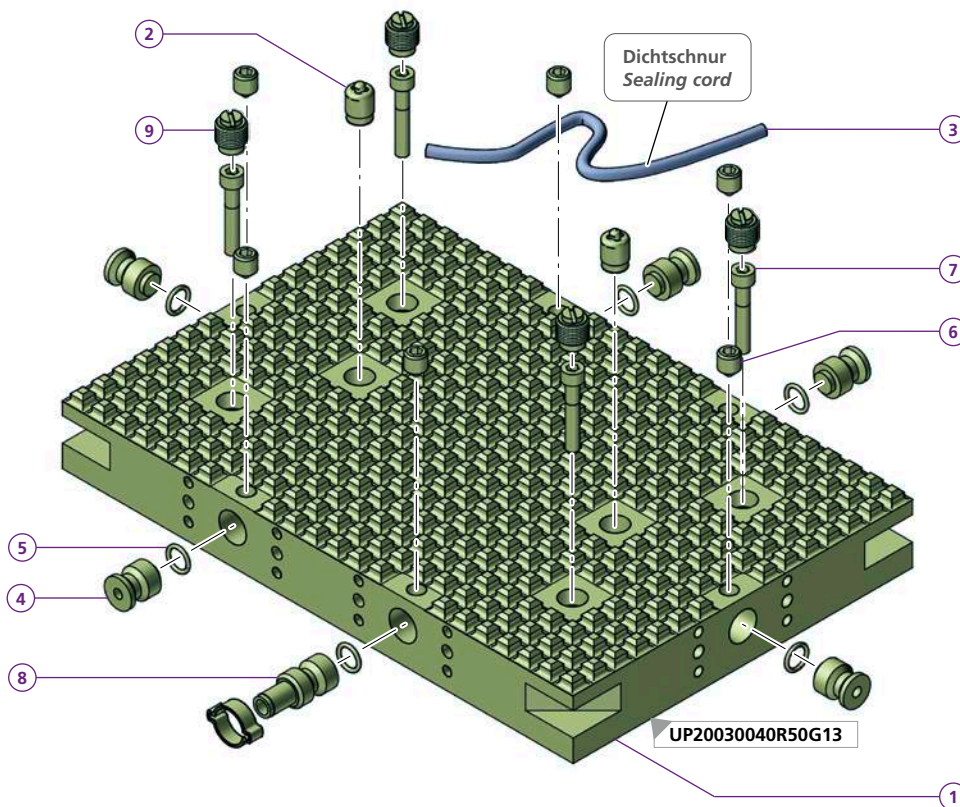
UP20030040R50G06

- ① 1x TH120175
- ③ 1x 1120100
- G = 6,5 mm
- kg ~6,0



UF20030050R50...

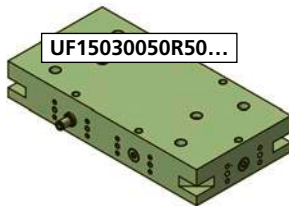
- ① 1x TH160136
- ② 2x 0700100
- ③ 1x
- ④ 5x 0920000
- ⑤ 6x 1111003
- ⑥ 6x M10X12ISO4027
- ⑦ 4x M6X45ISO4762
- ⑧ 1x 0910001
- ⑨ 4x 0700102
- kg ~8,09



Bestellbeispiel / Ordering example:
UP20030040R50G13 & 1x 1110100

Profilfräser / Carbide end mills G13 / G06 p. 324

Dichtschnüre je nach Bedarf / Sealing cords as needed

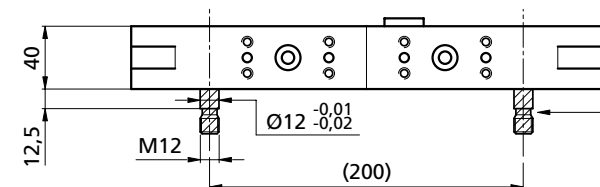


Formplatten

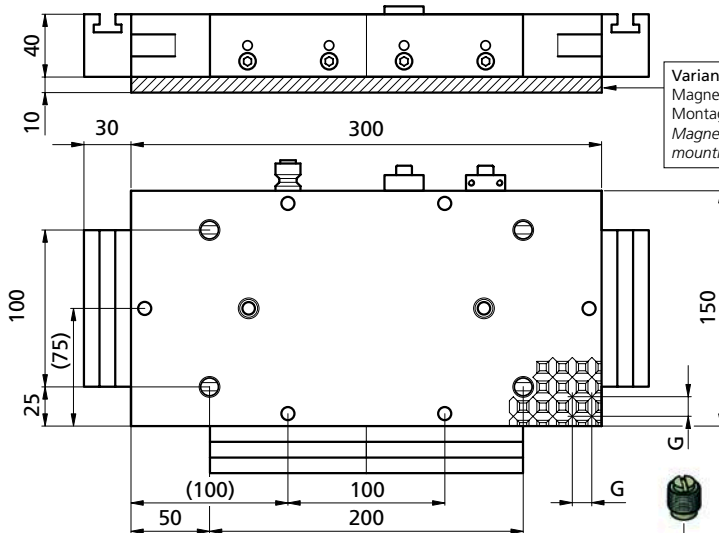
Für spezielle Werkstücke, die für das Spannen auf den Standardplatten ungeeignet sind, haben wir Rohplatten entwickelt, die bis zu 3 mal überfräst werden können. So lassen sich bis zu 3 verschiedene Werkstücke nacheinander bearbeiten.

Die plates

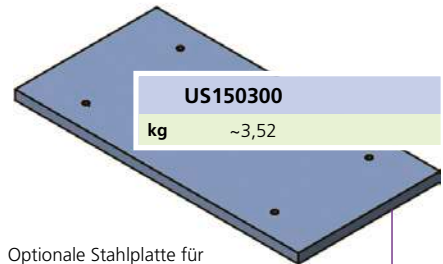
For special work pieces that are unsuitable for clamping on the standard plates, we have developed raw plates that can be milled again up to 3 times. This way, up to 3 different work pieces can be machined one after the other.



Variante / Variant:
Mechanische Befestigung auf Rasterplatte
Mechanical mounting on locking plate
R50 Ø12 M12



Variante / Variant:
Magnetische Befestigung auf Montageplatte
Magnetical fastening on mounting plate



Optionale Stahlplatte für Befestigung auf Magnetunterlage
Optional steel plate for fastening on magnetic basis

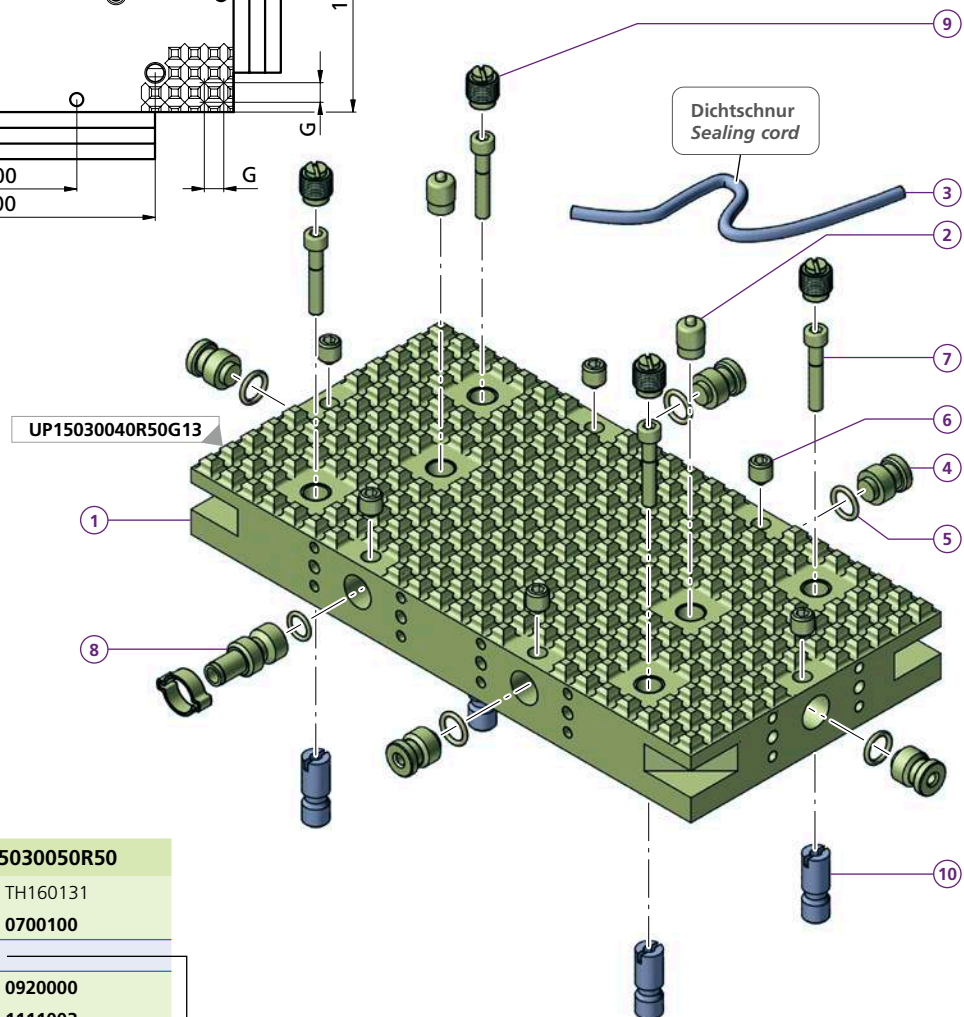


UP15030040R50G13	
1	1x TH150942
2	2x 0700100
3	1x 1110100
4	5x 0920000
5	6x 1111003
6	6x M10X12ISO4027
7	4x M6X35ISO4762
8	1x 0910001
9	4x 0700102
10	4x ADAPT6-12
G	= 12,5 mm
kg	~4,6



UP15030040R50G06	
1	1x TH160132
3	1x 1120100
G	= 6,5 mm
kg	~4,8

UF15030050R50	
1	1x TH160131
2	2x 0700100
3	1x
4	5x 0920000
5	6x 1111003
6	6x M10X12ISO4027
7	4x M6X35ISO4762
8	1x 0910001
9	4x 0700102
kg	~6



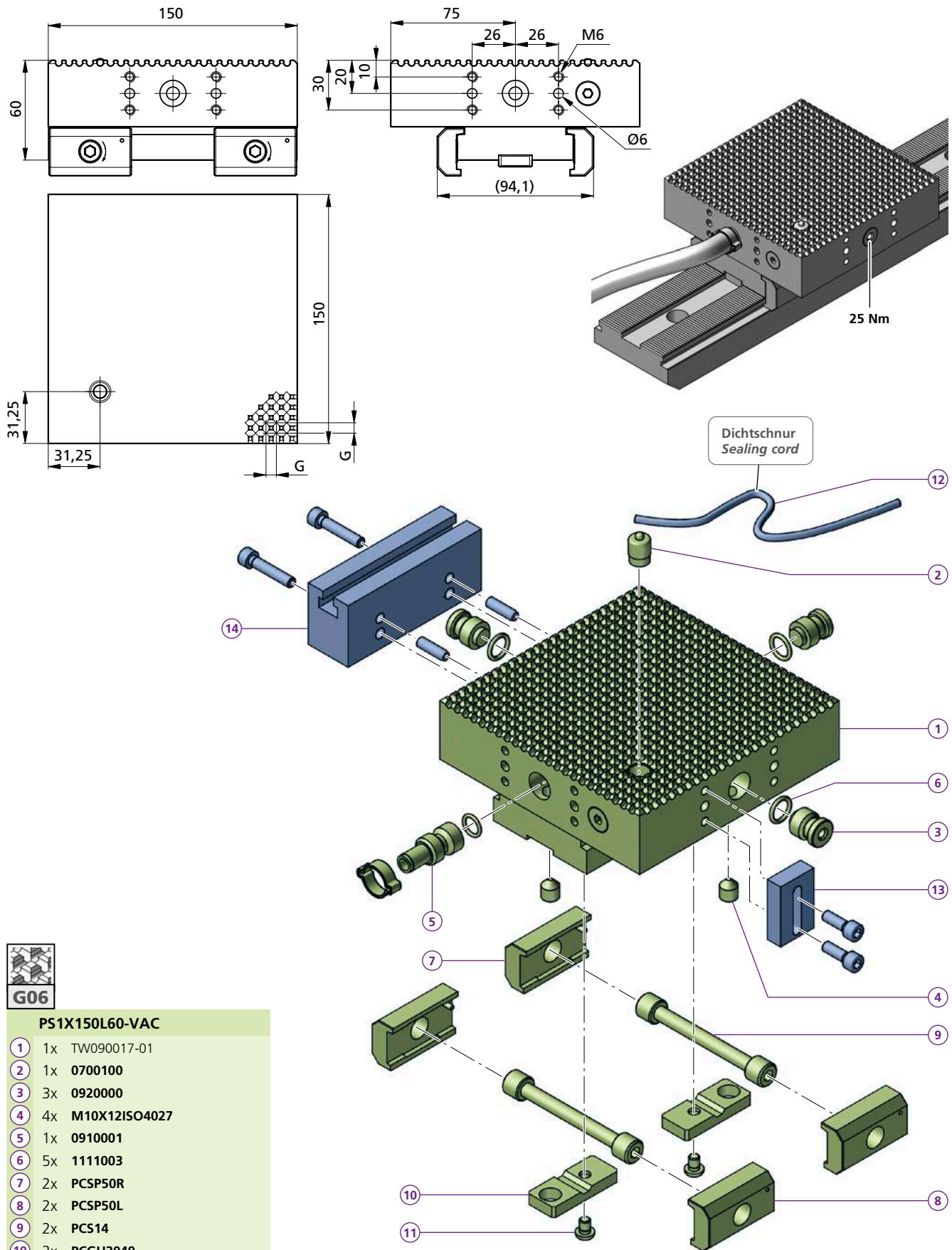
Bestellbeispiel / Ordering example:

UP15030040R50G13 & 1x ADAPT6-12 & 1x 1110100

Profilfräser / Carbide end mills G13 / G06 p. 324

Dichtschnüre je nach Bedarf / Sealing cords as needed

Separat bestellen / Order separately



PS1X150L60-VAC

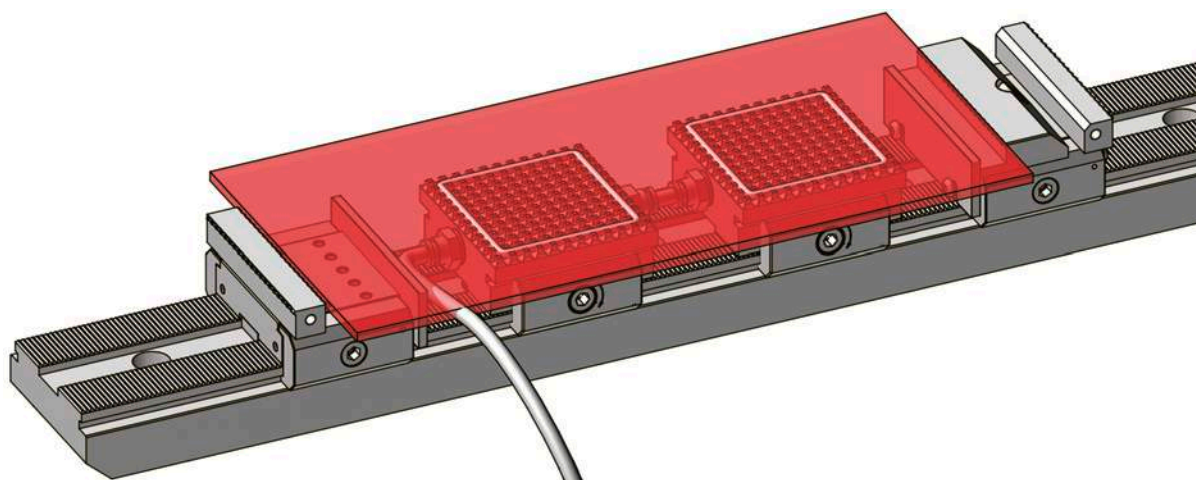
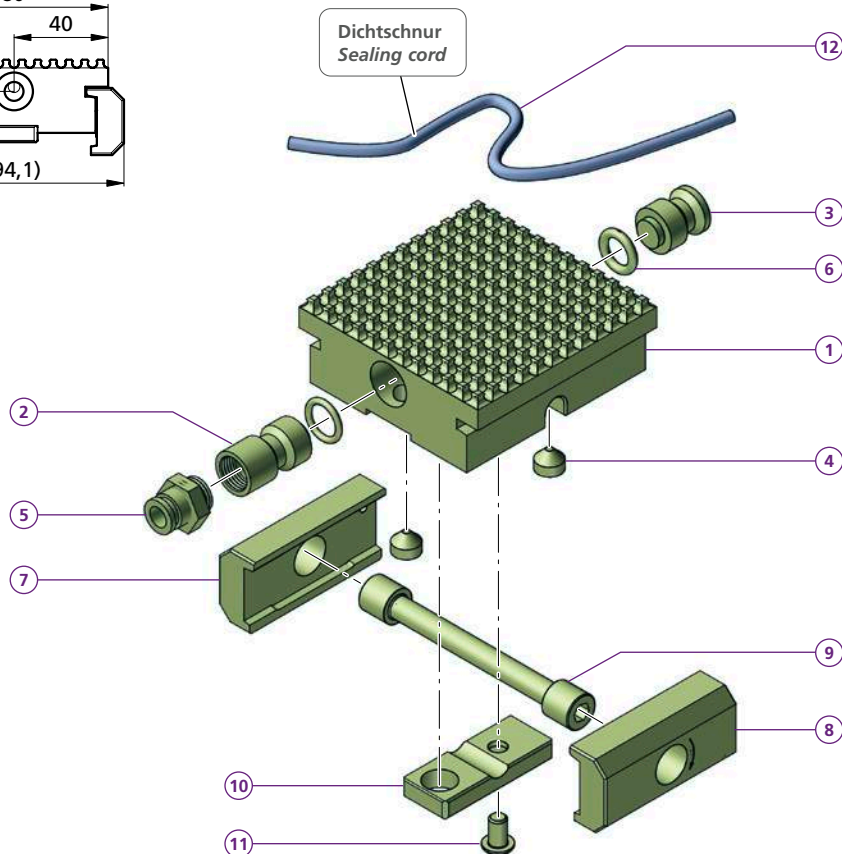
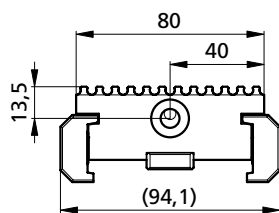
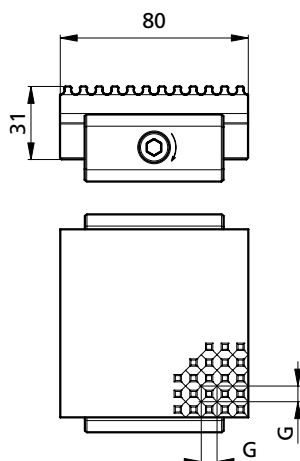
- ① 1x TW090017-01
- ② 1x 0700100
- ③ 3x 0920000
- ④ 4x M10X12ISO4027
- ⑤ 1x 0910001
- ⑥ 5x 1111003
- ⑦ 2x PCSP50R
- ⑧ 2x PCSP50L
- ⑨ 2x PCS14
- ⑩ 2x PCGU2049
- ⑪ 2x M6X8ISO7380
- ⑫ 1x 1120100 p. 324
- ⑬ 1x UA182540 p. 322
- ⑭ 1x UT1003040

G = 6,5 mm
kg ~3,6

Bestellbeispiel / Ordering example:

PS1X150L60-VAC & 1x 1120100 & 1x UA182540 & 1x UT1003040

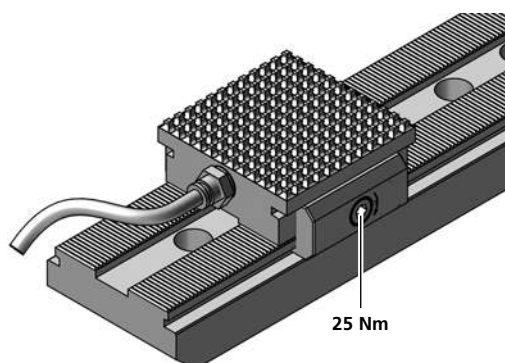
Separat bestellen / Order separately



PS1X80L31-VAC

- ① 1x TH140263
- ② 1x UZV16301/4
- ③ 1x 0920000
- ④ 2x M10X8DIN914
- ⑤ 1x Q5G1/4-8
- ⑥ 2x 1111003
- ⑦ 1x PCSP60R
- ⑧ 1x PCSP60L
- ⑨ 1x PCS14
- ⑩ 1x PCGU2049
- ⑪ 1x M6X8ISO7380
- ⑫ 1x 1120100

G = 6,5 mm
kg ~0,62



Bestellbeispiel / Ordering example: PS1X80L31-VAC & 1x 1120100

UP15030040R50 G06 / G13

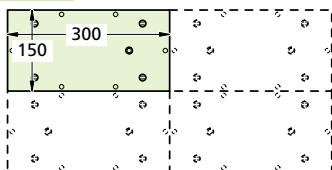
Platte / Plate

1 x = 150 x 300

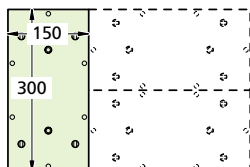
2 x = 150 x 600

2 x = 300 x 300

4 x = 300 x 600



3 x = 300 x 450



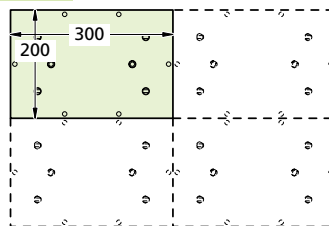
UP20030040R50 G06 / G13

Platte / Plate

1 x = 200 x 300

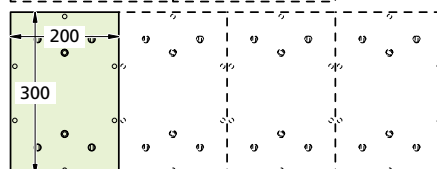
2 x = 200 x 600

4 x = 400 x 600



3 x = 300 x 600

4 x = 300 x 800



UP30060040R50 G06 / G13

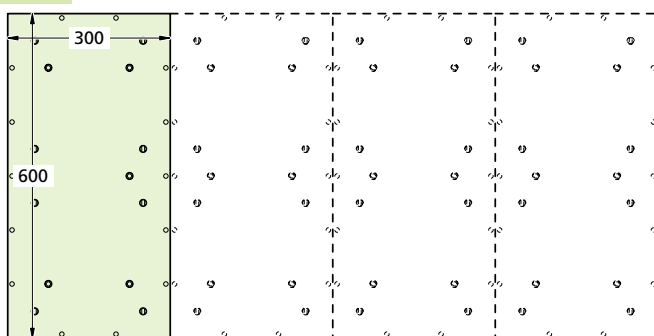
Platte / Plate

1 x = 300 x 600

2 x = 600 x 600

3 x = 600 x 900

4 x = 600 x 1200



UP30060040R50 G06 / G13

Platte / Plate

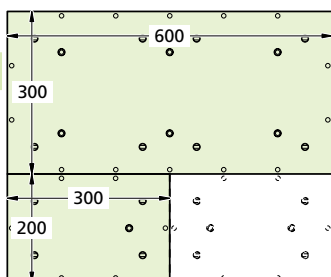
1 x = 300 x 600

UP20030040R50 G06 / G13

Platte / Plate

2 x = 200 x 300

= 500 x 600



UP30060040R50 G06 / G13

Platte / Plate

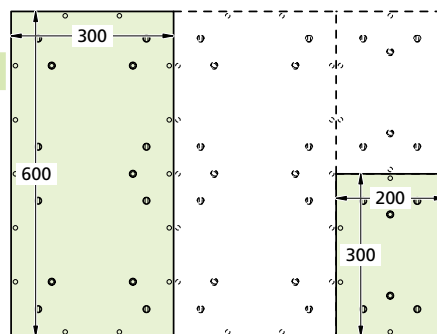
2 x = 300 x 600

UP20030040R50 G06 / G13

Platte / Plate

2 x = 200 x 300

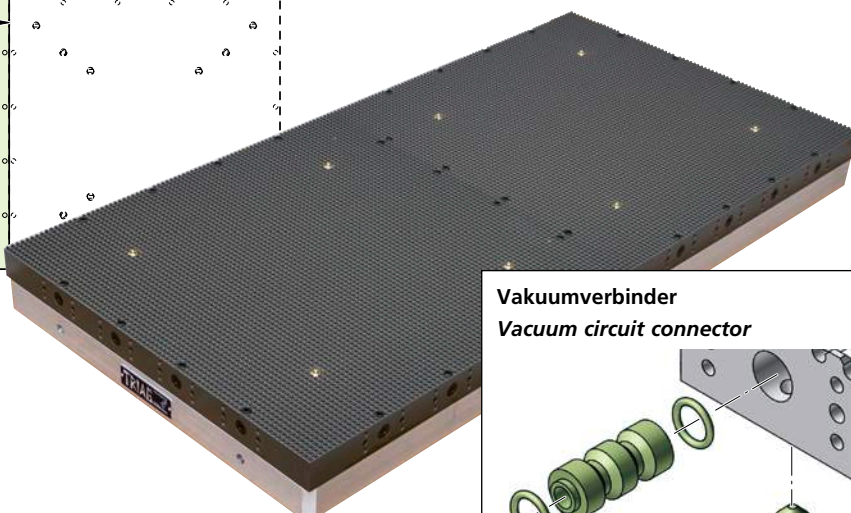
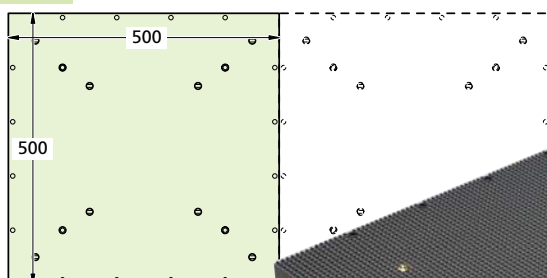
= 600 x 800



UP50050040R50 G06 / G13

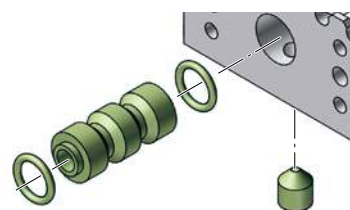
Platte / Plate

2 x = 500 x 1000



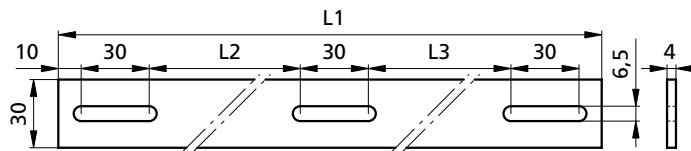
Vakuumverbinder

Vacuum circuit connector



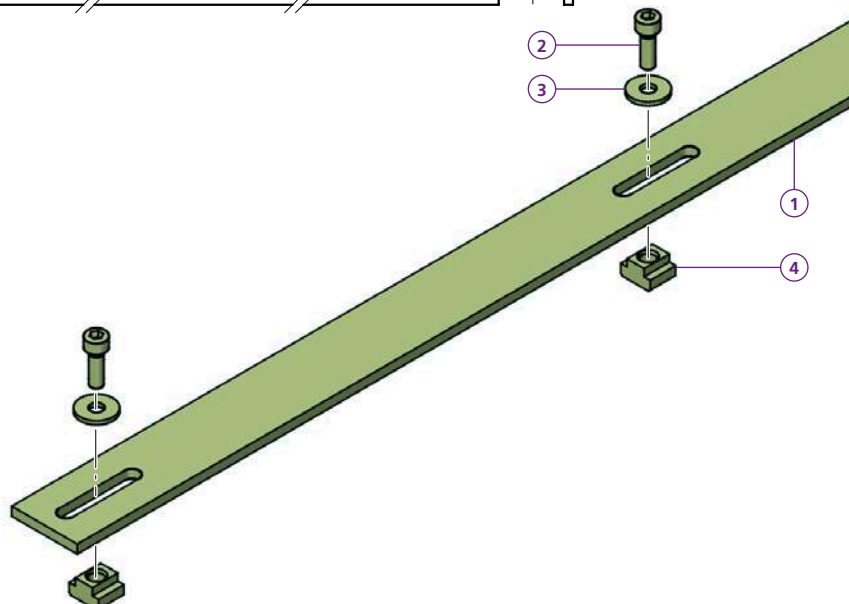
UPSET	D	1	V	G...
A UP50050040R50G13 500 500 UF50050050R50 G B UP30060040R50G13 300 600 UF30060050R50 H C UP20030040R50G13 200 300 UF20030050R50 I D UP15030040R50G13 150 300 UF15030050R50 J E PS1X150L60-VAC G06 F PS1X80L31-VAC G06	D UP15030040R50G13 150 300 UF15030050R50 J	1 UPB1JN 2 UPB2JN 3-5 UBA ...	UA3-660 UT1003040 V UA0770 UZA5015G13 UZA4012G06 UA182540	
G13 G06 Vakuumpalte <i>Vacuum plate</i>		Vakuum erzeugen <i>Generate vacuum</i>	Zubehör <i>Accessories</i>	
A 500 x 500 (UP50050040R50 G06 / G13) B 300 x 600 (UP30060040R50 G06 / G13) C 200 x 300 (UP20030040R50 G06 / G13) D 150 x 300 (UP15030040R50 G06 / G13) E 150 x 60 (PS1X150L60-VAC) F 80 x 31 (PS1X80L31-VAC) G 500 X 500 (UF50050050R50) H 300 X 600 (UF30060050R50) I 200 X 300 (UF20030050R50) J 150 X 300 (UF15030050R50)		1 UPB1JN 2 UPB2JN 3 UBA106230300 4 UBA106110250 5 UBA318400550	Z 2x UT1003040 1x UA182540 1x UA3-660 Y 2x UT1003040 1x UA182540 1x UA3-560 X 2x UT1003040 1x UA182540 1x UA3-360 W 2x UT1003040 1x UA182540 1x UA2-260 V 2x UT1003040 1x UA182540 2x UA0770 U 4x UZA4012G06 T 4x UZA5015G13	
Zu jedem SET werden zusätzlich 3 m Vakuumschlauch (0941000) und 25 m Dichtschnur mitgeliefert (1120100) Ø 4 oder (1110100) 6 mm inkl. (2 x 10100024). Each SET is supplied with an additional 3 m vacuum hose (0941000) and 25 m sealing cord (1120100) Ø 4 or (1110100) 6 mm incl. (2 x 10100024).				
Vakuumschlauch Vacuum hose 3 m: 0941000 Dichtschnur Sealing cord 25 m: 1120100				
Bestellbeispiel / Ordering example: UPSETD1VG13				

Anschlagleisten
Stop rails

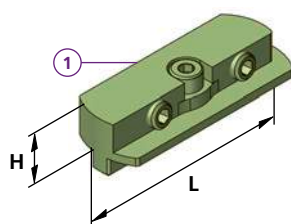


UA3-660		UA3-560	
1	1x TH160274	1	1x TH160275
2	3x M6X12ISO4762	2	3x M6X12ISO4762
3	3x 6,4 DIN9021	3	3x 6,4 DIN9021
4	3x SM1135M6X8	4	3x SM1135M6X8
L1	= 660 mm		= 560 mm
L2	= 270 mm		= 225 mm
L3	= 280 mm		= 225 mm
kg	~0,6		~0,5

UA3-360		UA2-260	
1	1x TH160277	1	1x TH160278
2	3x M6X12ISO4762	2	2x M6X12ISO4762
3	3x 6,4 DIN9021	2	2x 6,4 DIN9021
4	3x SM1135M6X8	2	2x SM1135M6X8
L1	= 360 mm		= 260 mm
L2	= 120 mm		= 180 mm
L3	= 130 mm		
kg	~0,32		~0,2



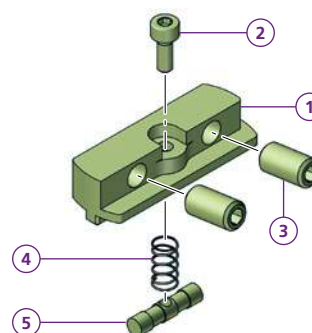
Anschlag
Stop rail



UZA5015G13	
1	1x TB170561
L	= 50 mm
H	= 9 mm
kg	~0,04

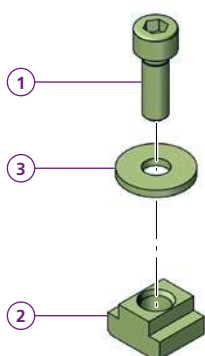


Bedienungsanleitung zu diesen zwei Anschlägen
Operating instructions for these two stops



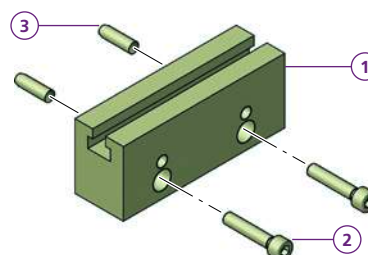
UZA4012G06	
1	1x TB170558
2	1x M4X10ISO4762
3	2x M6X16 DIN913
4	1x TN100535
5	1x TB170562
L	= 40 mm
H	= 8,5 mm
kg	~0,03

T-Nuten Stein
T-nuts



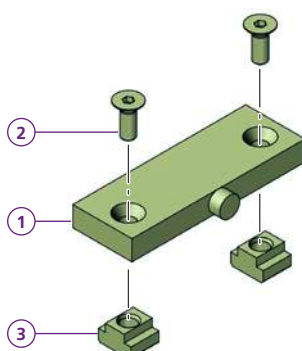
0802000-SET	
1	1x M6X12ISO4762
2	1x SM1135M6X8
3	1x 6,4 DIN9021
kg	~0,03

Ansetzbare T-Nuten
Attachable T-slots



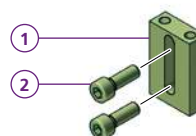
UT1003040	
1	1x TH160227
2	2x M6X25ISO4762
3	2x 6X20-B ISO8734
kg	~0,4

Seiten-/Wendeanschlag
Reversible stop gage



UA0770	
1	1x TH160259
2	2x TN100899
3	2x SM1135M6X8
kg	~0,14

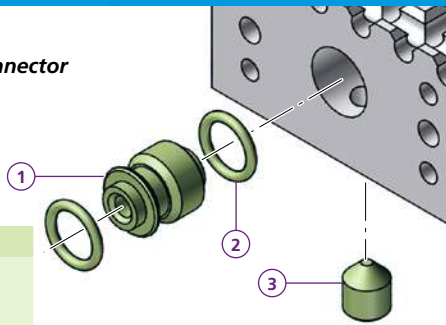
Seitenanschlag
Side lay



UA182540	
1	1x TH160098
2	2x M6X18ISO4762
kg	~0,1

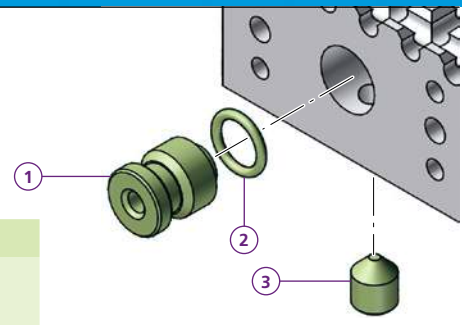
Vakuumverbinder
Vacuum circuit connector

0930000
1x TK110401
2x 1111003
1x M10X12ISO4027
kg ~0,02



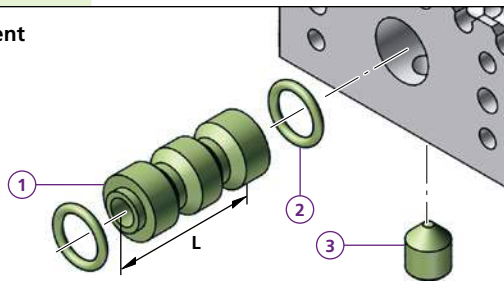
Blindstopfen
Blind plug

0920000
1x TK110402
1x 1111003
1x M10X12ISO4027
kg ~0,03



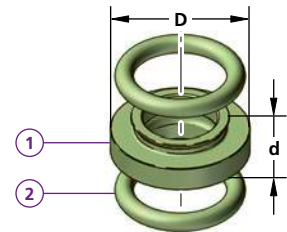
Koppelement
Link-up plug

0910000	0910080
1x TK110403	1x TK140763
2x 1111003	2x 1111003
1x M10X12ISO4027	1x M10X12ISO4027
L = 40 mm	L = 80 mm
kg ~0,03	kg ~0,04



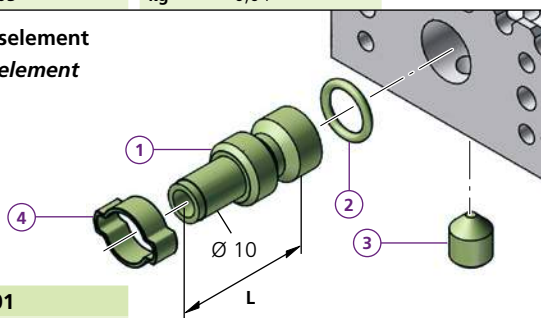
Vakuumverbinder
Vacuum circuit connector

TS150487
1x TS150487
2x TN100682
d = 5,8 mm
D = 15 mm



Anschlüsselement
Adapter element

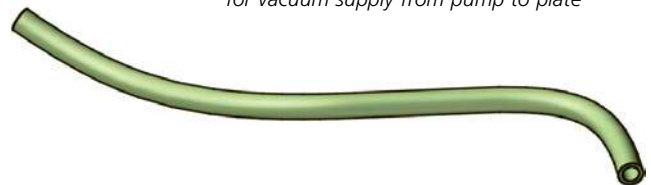
0910001
1x TK110404
1x 1111003
1x M10X12ISO4027
1x 10100024
L = 40 mm
kg ~0,04



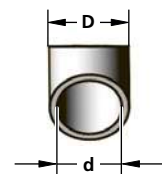
Vakuumschlauch (per Laufmeter)
Vacuum hose (per running meter)

D = 8 mm für Vakuumanbindung von Platte zu Platte
for vacuum supply from plates to accessories

D = 16 mm für Vakuumverbindung von Pumpe zu Platten
for vacuum supply from pump to plate



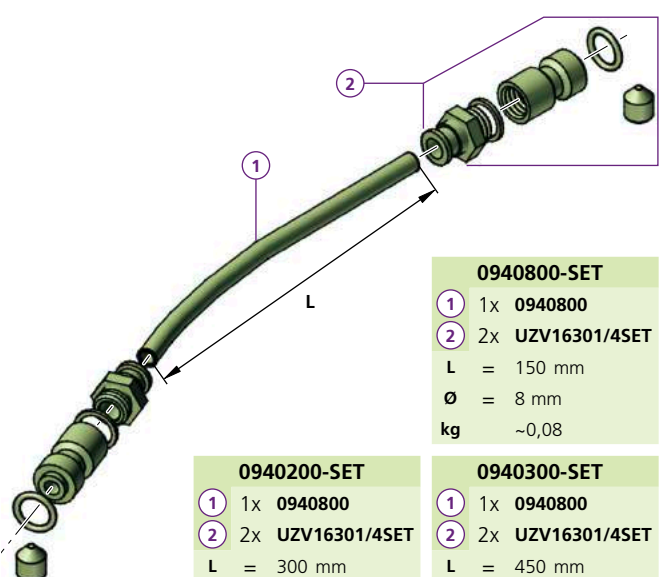
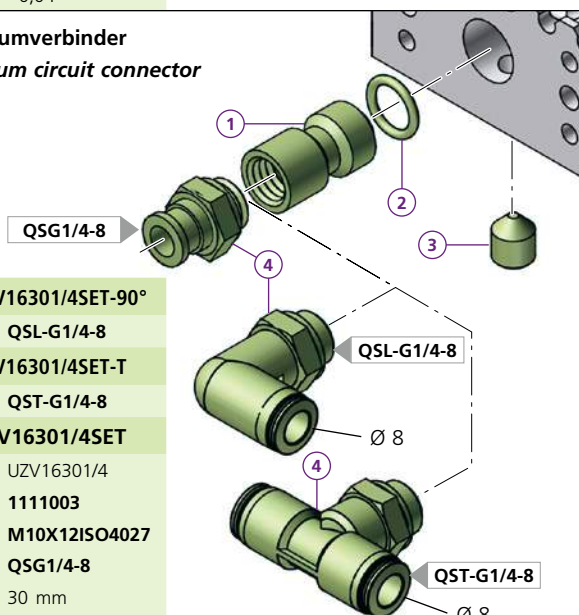
0940800	0941000
D = 8 mm	D = 16 mm
d = 5,5 mm	d = 10 mm



Verbindungsschlauch mit Koppelementen
Connector-tube with link-ups

Vakuumverbinder
Vacuum circuit connector

UZV16301/4SET-90°
1x QSL-G1/4-8
UZV16301/4SET-T
1x QST-G1/4-8
UZV16301/4SET
1x UZV16301/4
1x 1111003
1x M10X12ISO4027
1x QSG1/4-8
L = 30 mm
kg ~0,024



0940800-SET
1x 0940800
2x UZV16301/4SET
L = 150 mm
Ø = 8 mm
kg ~0,08

0940200-SET
1x 0940800
2x UZV16301/4SET
L = 300 mm
Ø = 8 mm
kg ~0,08

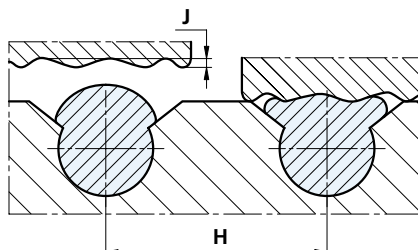
0940300-SET
1x 0940800
2x UZV16301/4SET
L = 450 mm
Ø = 8 mm
kg ~0,09

Dichtschnüre aus Silikon-Gummi

Beständig gegen Öle, Säuren, Emulsionen, Dielektrika, ionisiertes Wasser und Wärme bis 200°C

Silicone-rubber sealing cord

Resistant to oils, acids, coolants, dielectrics, activated water (EDM) and heat up to 200°C

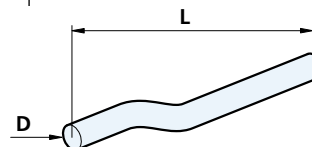


Dichtschnüre aus Gummi

- ölbeständig
- für spezielle Vorrichtungen

Rubber sealing cord

- oil resistance
- to fit special devices



G13



G06

weiss / white

1110100	1120100	1120100M	1130000
L = 25 m	L = 25 m	L = 25 m	L = 5 m
D = 6,5 mm ±0,5	D = 4 mm (4,3-4,6 mm)	D = 4 mm (4,0-4,3 mm)	D = 3 mm
J = max. 0,6 mm	J = max. 0,4 mm	J = max. 0,3 mm	
H = 12-13 mm	H = 6-7 mm	H = 6-7 mm	



G13

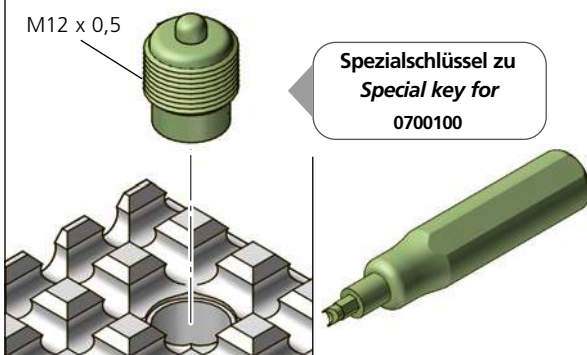
schwarz / black

weiss / white

1110100S	1110100SP	0130001	0130002
L = 25 m	L = 25 m	L = 1 m	L = 1 m
D = 6,0-6,5 mm	D = 6,6-7,0 mm	D = 2,15 mm	D = 1,65 mm
J = max. 0,6 mm	J = max. 0,6 mm		
H = 12-13 mm	H = 12-13 mm		

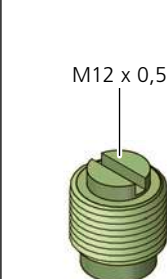
Triva Clamp Ventil / Triva Clamp valve

Montage von oben
Mounting from above



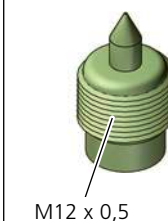
0700100	kg	~0,01	Triva Bit	kg	~0,14
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Ventil-Blindstopfen
Valve blind plug



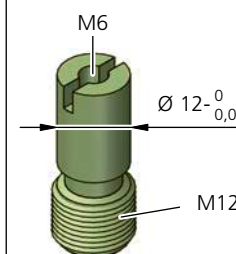
0700102	kg	~0,01
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Montage von unten, für Spezialvorrichtungen
Mounting from bottom side, for special devices



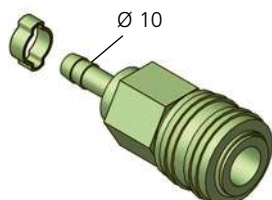
0700200	kg	~0,01
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Reduktionstück für Rasterplatten M12/12^{f7} auf M6
Adapter piece for Gridplates from M12/12^{f7} to M6



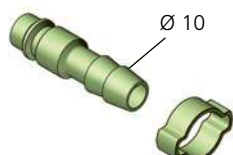
ADAPT6-12	kg	~0,02
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Schnellkupplung mit Bride Quick hose coupling including clip



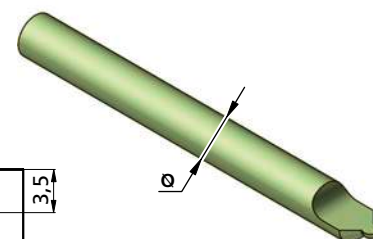
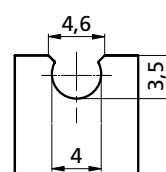
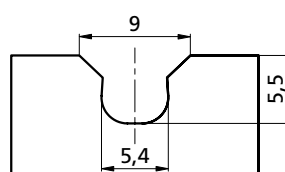
0520000	kg	~0,14
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Schlauchnippel mit Bride Hose nozzle including clip



0941010	kg	~0,03
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VHM Profilfräser für Vorrichtungsplatten Carbide end mills for plate for dedicated fixtures



G13

VFP10065L100 (Ø 6,5 mm)

Ø	= 10
L	= 100



G06

VFP08040L90 (Ø 4 mm)

Ø	= 8
L	= 90

Rotationspumpe auf Speichertank für Arbeiten mit Kühlwasser

Aggregat ausgerüstet mit:

- Vakuumpumpe, Enddruck 20 mbar
- Wasserabscheider mit Sintermetallfilter
- Fahrenbarem 50 Liter Behälter als Vakuumspeicher und Wasserreservoir
- 5 Meter Vakuumschlauch
- für 3-Phasenbetrieb wartungsfreie Drehstrommotoren
- für 1-Phasenbetrieb wartungsfreie Motoren mit Anlauf-Kondensatoren.

für Vakuumaufspannflächen:

- zusammenhängend, oder auf mehrere einzelne Platten verteilt

Rotary pumptank assembly Pump assembly for machining with flowing coolant

Assembly equipped with:

- Vacuum pump, pressure limit 20 mbar
- Liquid separator with sintered metall filter
- Pump mounted on a movable 50l (13gal) tank being both, vacuum reservoir and water collector
- 5 m (6.5ft) Vacuum hose
- maintenance-free motors for 3 phase operating
- single phase motors with capacitor starter.

To cover maximum holding surface:

- built by plate or plate-assembly, or display over several single plates mounted to various machine-tools

Technische Daten Technical data

Saugkraft Suction capacity

Spannfläche bis / Surface up to 1,8 m²

3-Phasen / Triple phase 400 V ± 10%, 50/60 Hz, 250/300 W	6 / 7,2 m ³ /h	UBA306400250
1-Phasen / Single phase 230 V ± 10%, 50/60 Hz, 300/360 W	6 / 7,2 m ³ /h	UBA106230300
1-Phasen / Single phase 110 V ± 10%, 60 Hz, 250/300 W	6 / 7,2 m ³ /h	UBA106110250

Spannfläche bis / Surface up to 5,0 m²

3-Phasen / Triple phase 400 V ± 10%, 50/60 Hz, 550/660 W	18 / 21 m ³ /h	UBA318400550
1-Phasen / Single phase 230 V ± 10%, 50/60 Hz, 600/720 W	18 / 21 m ³ /h	UBA118230600

Separater Tank / Separate tank

UBT40

Vol. 40l

Öl für Vakuumpumpe / Oil for vacuum pump

UB1-OIL

Vol. 1l



Bedienungsanleitung zu diesem
Vakuumpumpen
Operating instructions for this
vacuum pump

➔ Grössere Pumpen auf Anfrage
➔ Larger pumps on demand

Schaltventil und Druckwächter

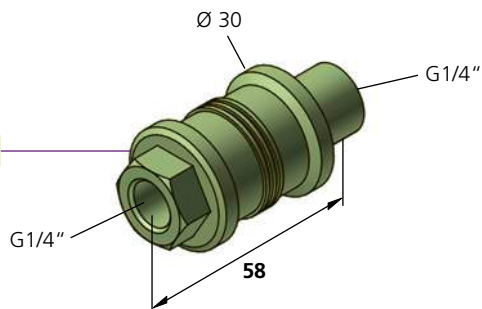
Control unit with pressure sensor switch



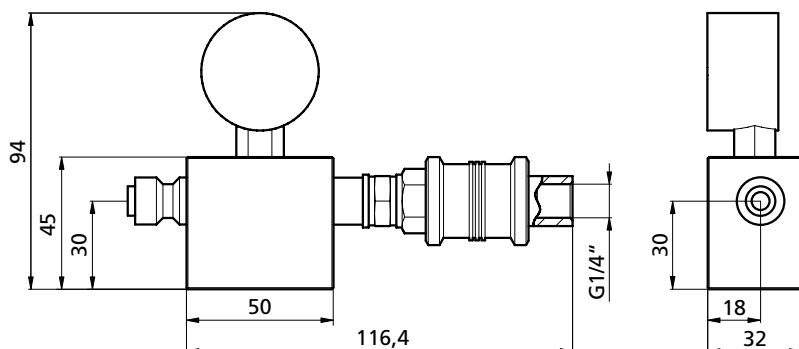
trivaCLAMP

Schaltventil
Control unit

TN100668 kg ~0,096



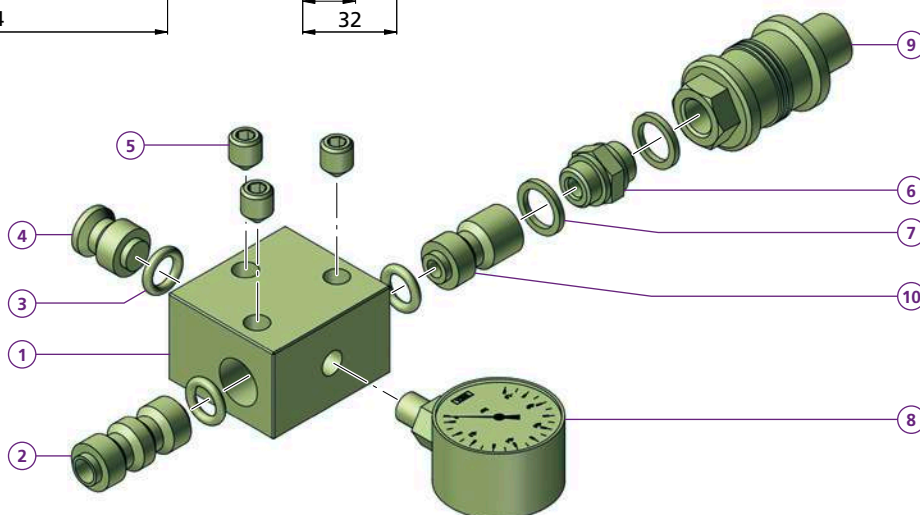
Schaltventil mit Unterdruckanzeige
Control unit valve with vacuum indicator



UBS5045

- 1x UBS5045-1
- 1x 0910000
- 3x TN100822
- 1x 0920000
- 3x TN100086
- 1x TN100671
- 2x TN100642
- 1x TN100925
- 1x TN100668
- 1x TH120180

kg ~0,74



Druckwächter / Pressure sensor switch

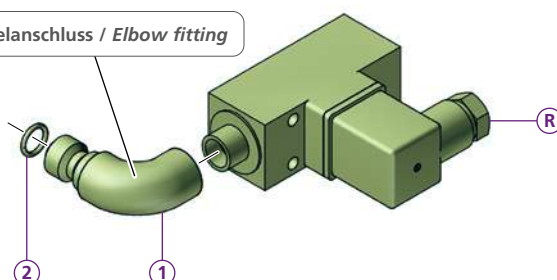
Druck einstellbar; je nach Aufspannung einzustellen.

With adjustable threshold value; to be adjusted according to clamping task.

Anschluss 24-250 V, 50-60 Hz am Ausgang (R) für Elektrokabel zu optischem oder akustischem Warnsignal, oder zum Stillsetzen der Werkzeugmaschine über deren Steuerung, normalerweise mit Funktion M 00 (Programm Stop).

Power supply (24-250 V, 50-60 Hz). Connecting point (R) for wiring to trigger a signal (light or whistle) or to switch the machine tool off via its control system, normally using function M 00 (machine stop), in the event of a drop of vacuum.

Winkelanschluss / Elbow fitting



0500205

- 1x 0940000
- 1x 1111003

➔ Weiteres Zubehör auf Anfrage
➔ Further accessories on demand

Vakuumspannplatte auf Power-Clamp mit Injektorpumpe für Trocken- und Nasseinsatz

Das modulare Triag Power Clamp Spannsystem kann nun mit Vakuumspannplatten bestückt werden. Die Vakuum Platten können mit oder ohne Zwischenräume gekoppelt werden. Die handliche Injektorpumpe wird mit Pressluft betrieben und kann im Trocken- oder Nasseinsatz verwendet werden.

Vacuum clamping plates on Power - Clamp with injector pump for dry and wet use

The modular Triag Power Clamp workholding system can now be equipped with vacuum plates. The vacuum plates can be coupled with or without gaps. The handy injector pump is operated with compressed air and can be used in dry and wet applications.

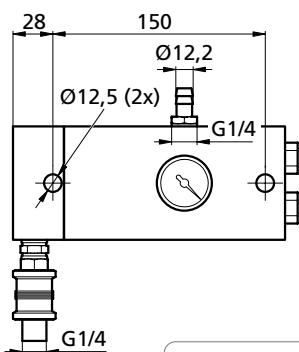
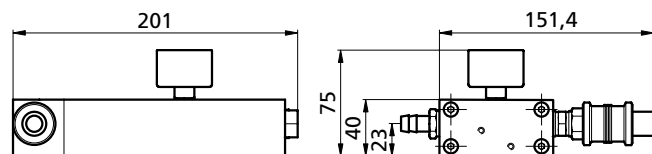
Maximaler zulässiger Speisedruck: 7 bar
Maximal erreichbares Vakuum: 0,92 bar

Maximum allowable supply pressure: 7 bar
Maximum attainable vacuum: 0,92 bar

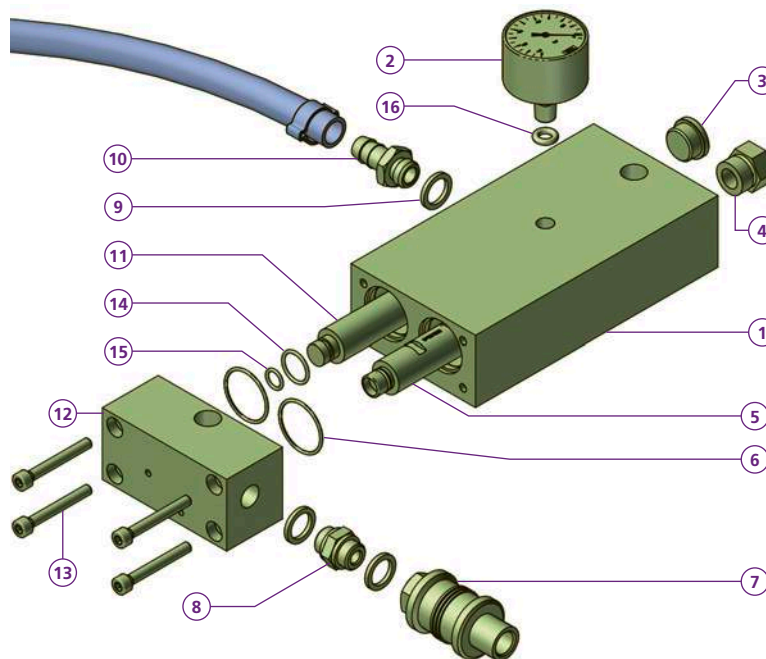
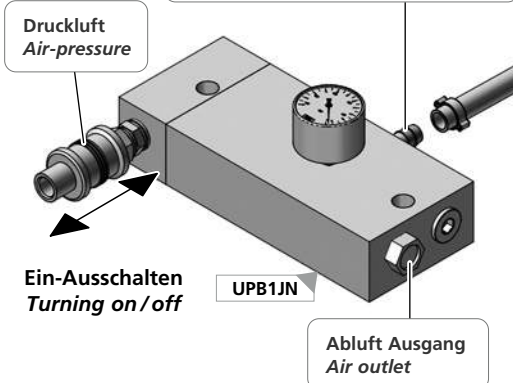
Der Normalliter (NI) entspricht dem Volumen, das eine bestimmte Menge (Masse) Gas bei atmosphärischem Druck einnehmen würde. Die Durchflussmenge wird berechnet aus Volumen pro Zeit (NI/s) unter Normalbedingungen (atmosphärischer Druck, 20°C).

The normal litres (NI) is the volume that would take a certain amount (mass) of gas at atmospheric pressure. The flow rate is calculated as volume per time (NI/s) under normal conditions (atmospheric pressure, 20° C).

Typ	Speisedruck	Luftverbrauch	Saugleistung bei 50% Vakuum	Saugleistung bei 90% Vakuum
Type	Feed pressure	Air consumption	Vacuum suction power at 50%	Vacuum suction power at 90%
	bar	NI/s	NI/s	NI/s
UPB1JN	5	2,0	0,6	0,02
	6	2,3	0,5	0,03
UPB2JN	5	4,0	1,2	0,04
	6	4,6	1,0	0,06



Vakuumananschluss (zur Spannplatte)
Vacuum adapter (to clamping plate)

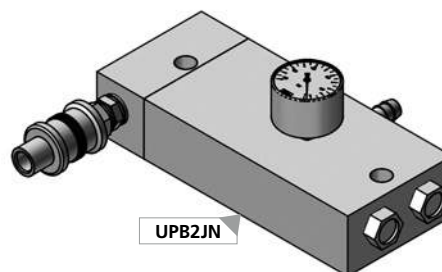


UPB1JN

- 1 1x TW090057
 - 2 1x TN100667
 - 3 1x TN100660
 - 4 1x TW100199
 - 5 1x TN100665
 - 6 2x TN100057
 - 7 1x **TN100668**
 - 8 1x TN100671
 - 9 3x TN100642
 - 10 1x TN100664
 - 11 1x TW090057
 - 12 1x TW90057-02
 - 13 4x TN100666
 - 14 1x TN100691
 - 15 1x TN100163
 - 16 1x TN100654
- kg ~1,61

UPB2JN

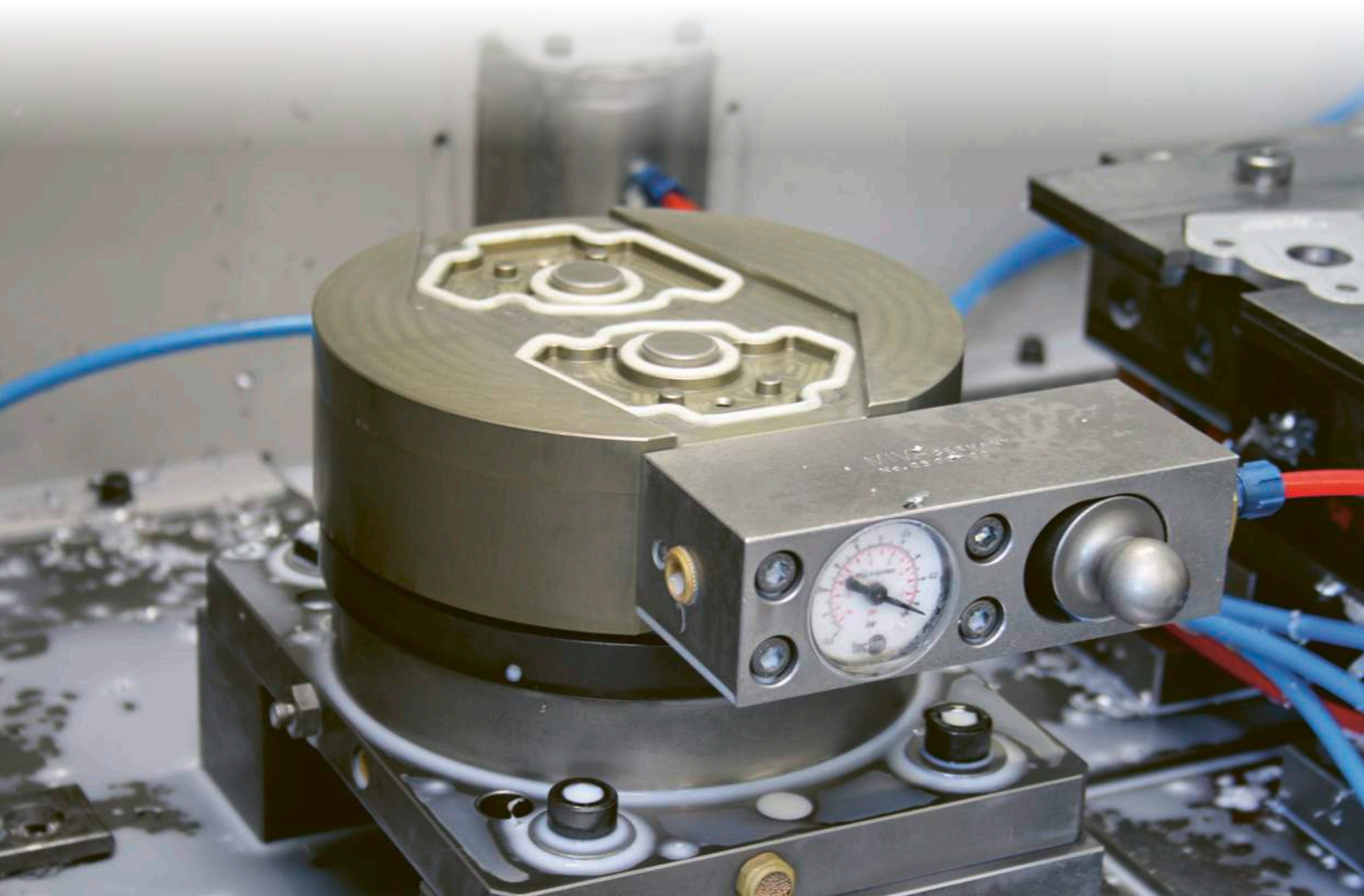
- 1 1x TW090057
 - 2 1x TN100667
 - 4 2x TW100199
 - 5 2x TN100665
 - 6 2x TN100057
 - 7 1x **TN100668**
 - 8 1x TN100671
 - 9 3x TN100642
 - 10 1x TN100664
 - 12 1x TW90057-02
 - 13 4x TN100666
 - 14 1x TN100691
 - 15 1x TN100163
 - 16 1x TN100654
- kg ~1,67

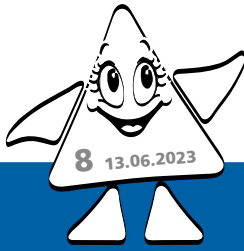


Bestellbeispiel / Ordering example: **UPB1JN**

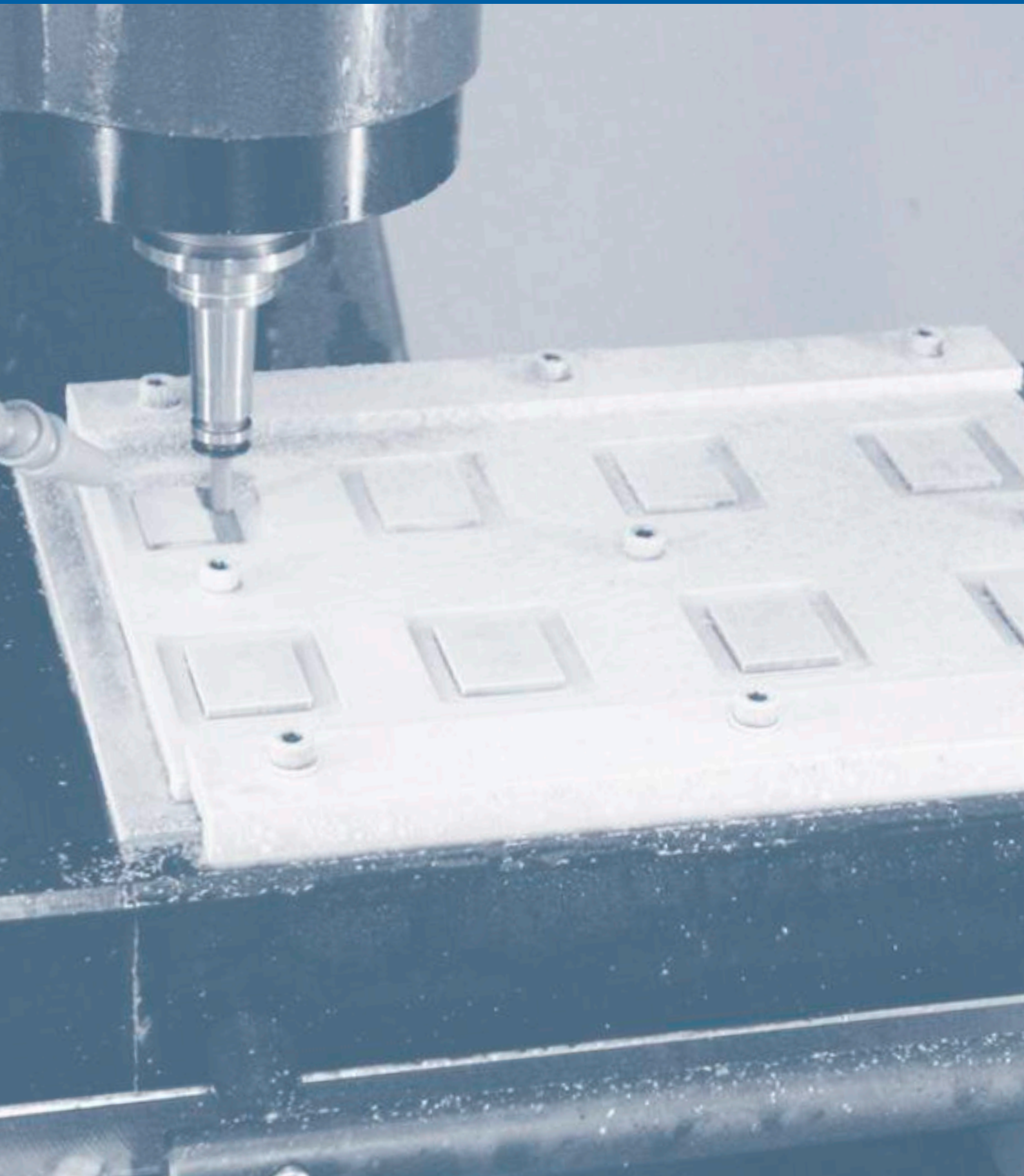


trivaCLAMP





triGEL





Beim Gefrierspannen werden Werkstücke festgefroren, ähnlich wie wenn man im Winter am Handlauf eines Metallgeländers "kleben" bleibt.

Diese Art von Spannung könnte thermo-elektrisch mit Halbleitern (Peltier-Effekt) oder durch Nutzung eines Kühlmediums erreicht werden. Wir haben uns für das zweite entschieden, weil es leistungsstärker ist. Dabei wird die Verdampfungskälte eines Kühlmediums (bei uns treibhausinaktives R4040) genutzt, das in einem geschlossenen Kühlkreislauf zirkuliert. Das kalte Gas wird durch das Kanallabyrinth des Arbeitstisches geleitet, wobei dessen Temperatur auf die normale Arbeitstemperatur von zirka -8°C fällt.

Der Arbeitstisch und die Werkstücke werden durch einen Wasserzerstäuber mit einem feinen Wasserfilm überzogen. Dadurch frieren die Teile in ca. 15 bis 60 Sekunden an. Um die Werkstücke wieder zu lösen, wird der Vorgang umgekehrt. Das Gerät arbeitet dann quasi als Wärmepumpe, wodurch sehr schnell der Auftaupunkt wieder erreicht wird und die Werkstücke freigegeben werden.

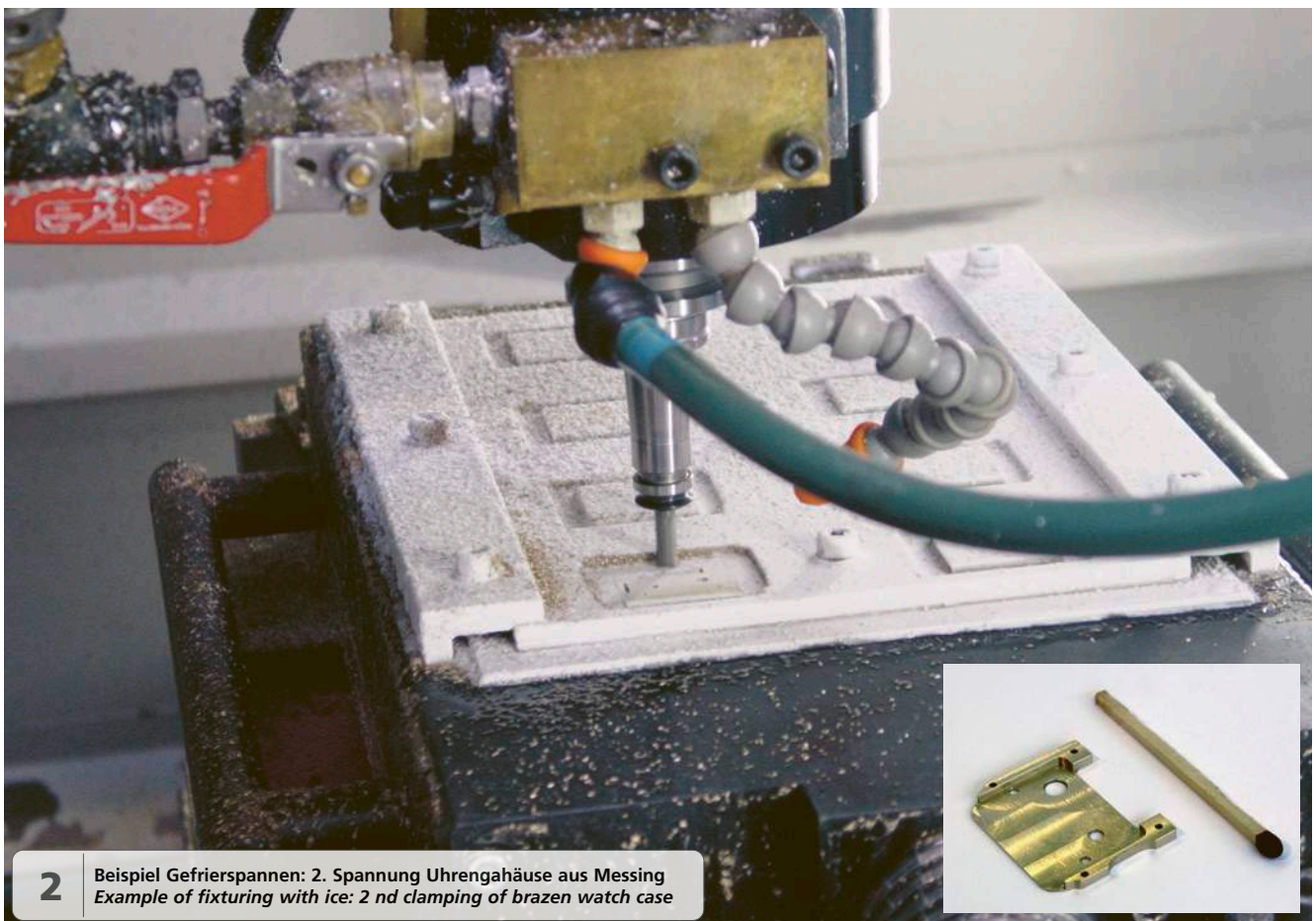
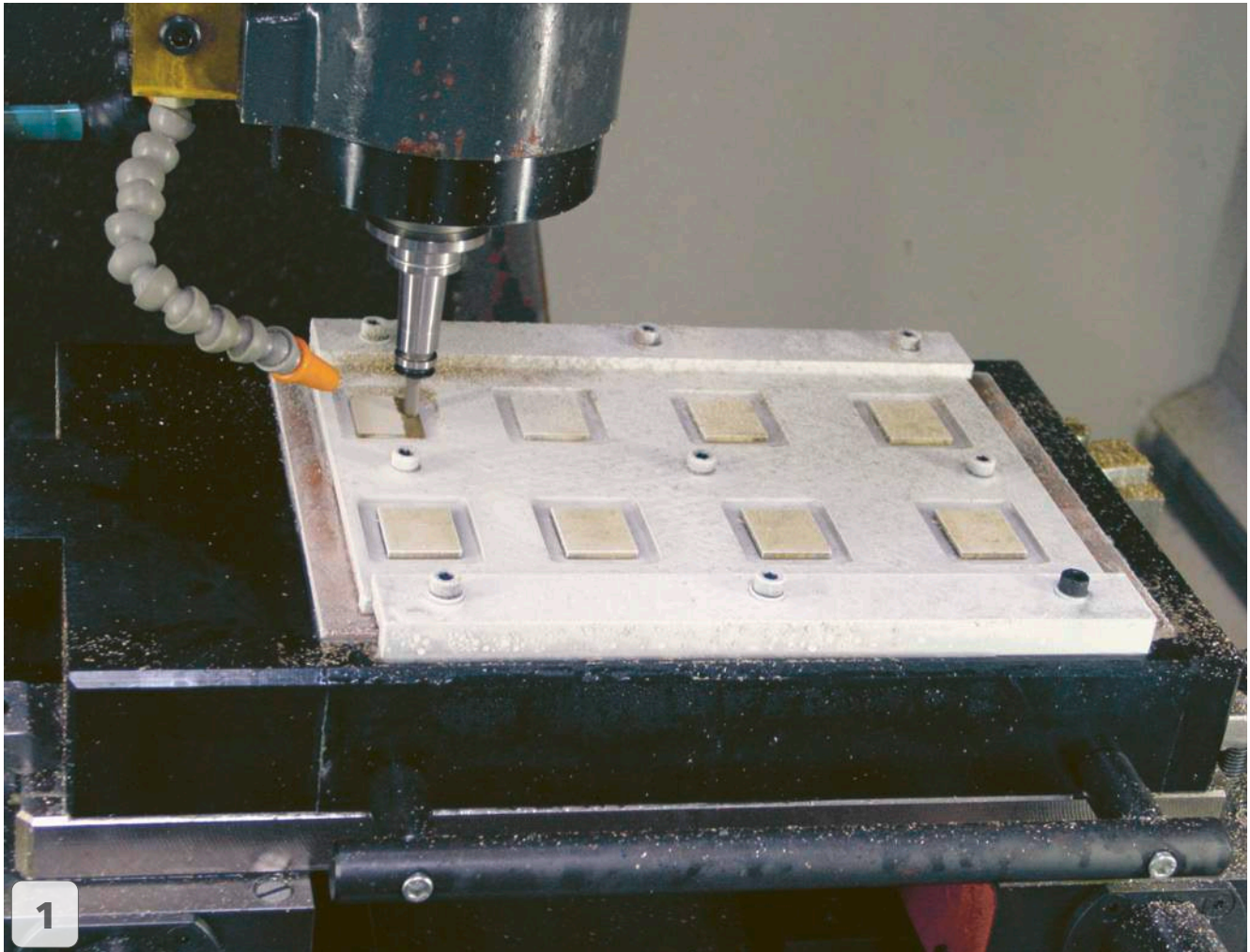
Ungeeignet ist diese Methode dann, wenn im Zerspanungsprozess zuviel Wärme entsteht, da dadurch die Eisschicht aufgetaut werden kann. Dieses Problem kann mit gut geschärften Werkzeugen verkleinert werden. Das Haftvermögen ist mit 2N/mm² (~2t/dm²) etwa 10 bis 20 mal höher als bei einer Vakuumspannung. Allerdings ist die Toleranz für harte mechanische Schocks kleiner. Die Dicke des Wasser- respektive Eisfilms ist vernachlässigbar klein. Unregelmässige Grundflächen werden in einem Wasserbad festgefroren. Spannbar sind alle metallischen, die meisten mineralischen Werkstoffe, sowie auch viele Kunststoffe. Heute findet das Spannen mit Eis nicht nur in der Uhren- und Schmuckindustrie seine Anwendung. Das Anwendungsfeld geht auch in die Medizintechnik und die allgemeine mechanische Fertigung.

Fixturing with ice is using a physical effect. If we take hold of a metal handrail in the winter, when the temperature is below zero, we suddenly can find ourselves stuck to it.

Windshield wipers, door locks and handbrakes frozen into place demonstrate the same effect. This phenomenon is used by ice clamping devices. Those made by TRIAG are known as triGEL devices. There are two different methods of achieving the necessary cooling of the machine table (working surface): one is the Peltier effect, and the other is the use of a cooling medium as it is commonly applied in a deep freezer. In this second method, the latent heat of evaporation of the cooling medium (for example R4040 which has no greenhouse effect) contained in a closed coolant circuit is used. The cold gas passes through a labyrinth of channels in the machine table, bringing its temperature to about -8°C.

Both the machine table and the workpieces are covered with a fine film of water using a water atomizer. This causes the workpiece to stick to the machine table within approximately 15 to 60 seconds. The process is reversed to release the workpieces. The device then operates rather like a heat pump, so that the dew point is reached again very quickly, and the workpieces are released.

The second method is significantly more powerful. TRIAG therefore uses this technique for their triGEL system. The adhesive strength, at 2N/mm², is approximately 10 to 20 times greater than that of vacuum clamping. Hard mechanical shocks should nevertheless be avoided. Since no clamping forces are applied to the workpiece, parts with plane base surfaces can be machined with very high precision. The thickness of the film of water or ice is negligibly small. Irregular base surfaces can be frozen solid in a water bath. All metallic and most mineral materials, as well as many plastics, can be clamped in the way. Ice clamping is now no longer confined for use in the watch making and jewellery industries. The range of applications extends from medical technology through to general mechanical production.



2 Beispiel Gefrierspannen: 2. Spannung Uhrengehäuse aus Messing
Example of fixturing with ice: 2 nd clamping of brazen watch case

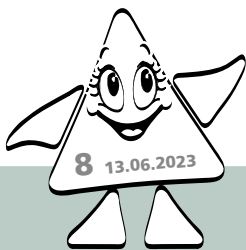
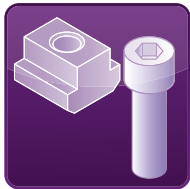
Die triGEL-Vorrichtung setzt sich aus zwei miteinander verbundenen Funktionsteilen zusammen:

1. Ein Arbeitstisch aus Kupfer (100x100 mm, 100x200 mm, 200x300 mm, 170x450 mm, 500x550 mm), der als Kälte-tauscher dient.
2. Schaltkasten mit folgenden Funktionen:
 - Anschluss der elektrischen Aussenleitung (220 oder 380 V)
 - Steuerung und Regelung der Kühl- und Heiztemperaturen mit den optimalen Werten während der Arbeiten in der Gefrierphase, sowie des Auftauens.
 - Sicherheit für die elektromechanischen Elemente gegen elektrische Störungen.
 - Lichtsignale kontrollieren den Arbeitsablauf
 - Temperaturüberwachung und Störungsmeldung an die Maschinensteuerung

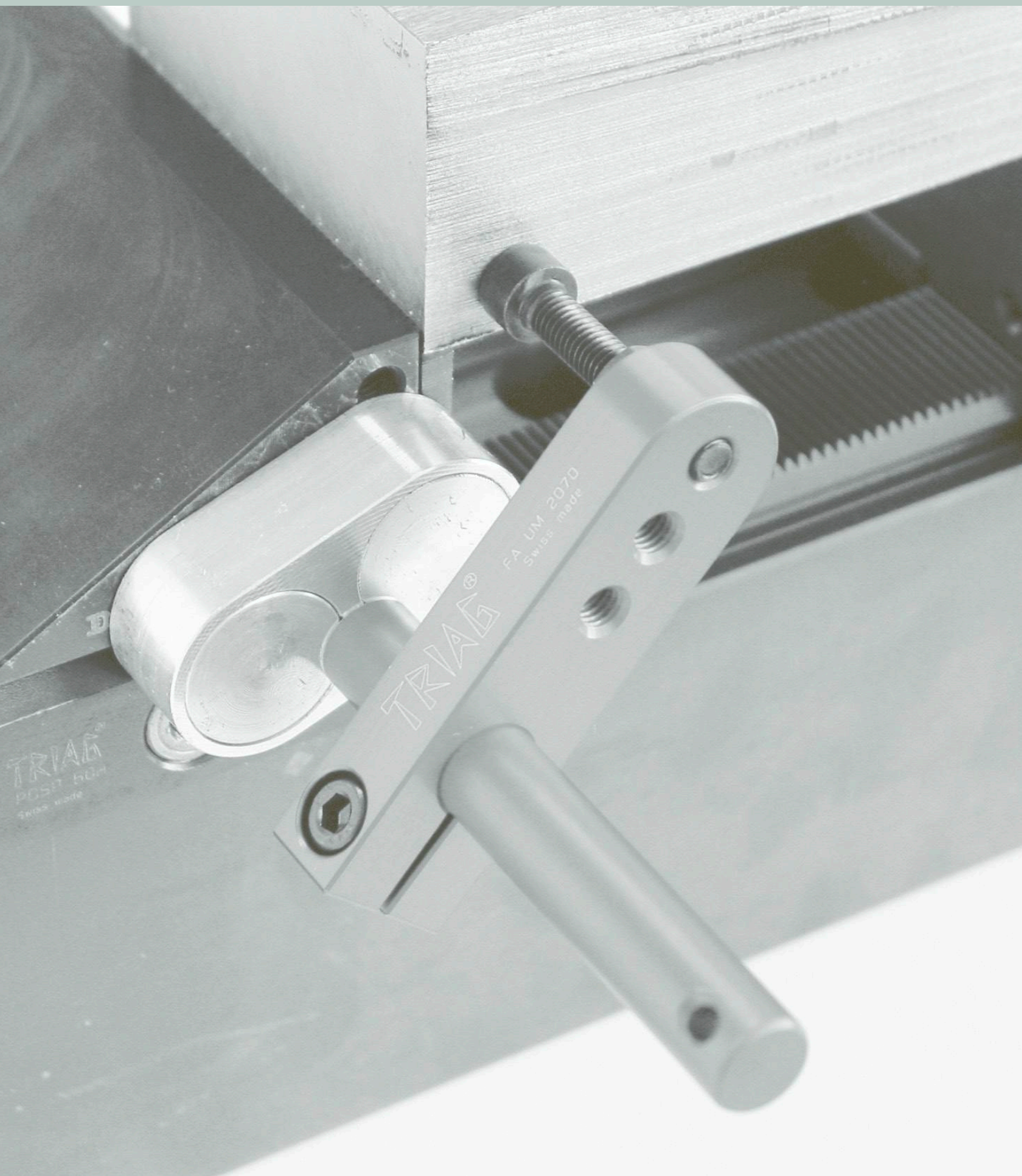
The triGEL-fixture system consists of two connected members:

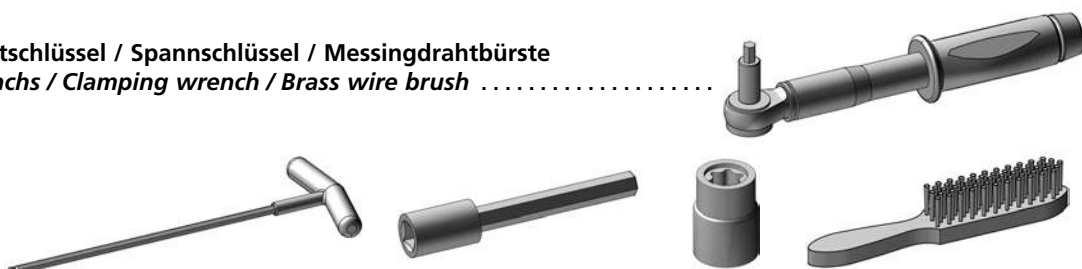
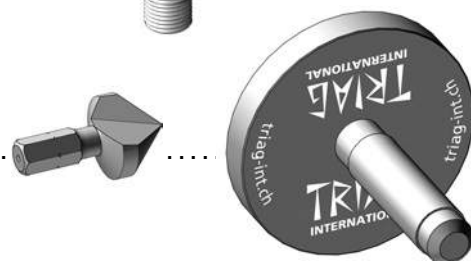
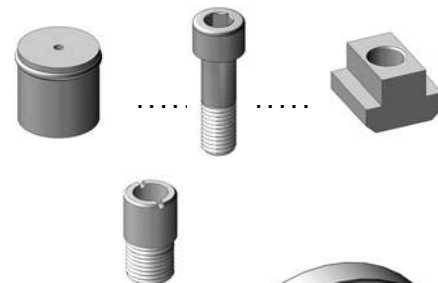
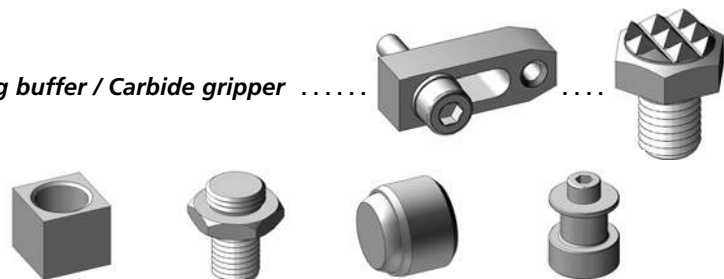
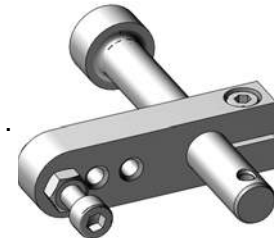
1. The workholding table made of thermo-conductive material (aluminum, copper). The reffridgerating gas R4040 is circulating inside (100x100mm, 100x200mm, 200x300mm, 170x450mm, 500x550mm, custom made sizes on request).
2. The control cabinet including:
 - Compressor and heat exchanger 220 or 380V
 - Thermostatic control for the freezing and the reheating process, includes the maintaining of a preset temperature.
 - Electrical safety circuitry.
 - Control lights to watch the workholding process.
 - Interface to the machine control for process monitoring.





Zubehör Accessories

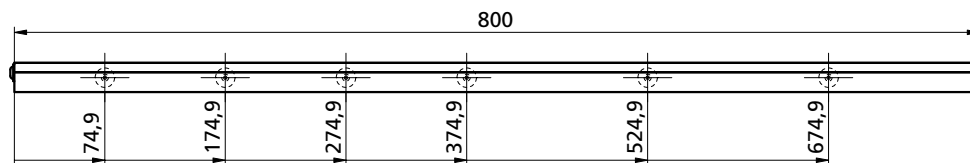




Massstab mit Magnetleiste
Scale with magnet profile

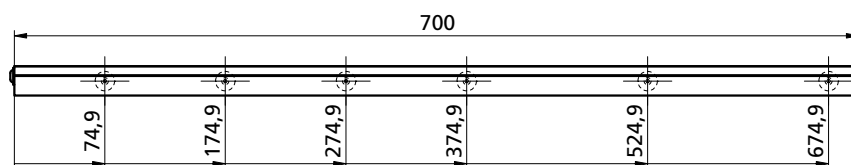
PCMAS800ML

- ① 1x PCMAS800ML
 - ② 2x MG1645
 - ③ 2x M3X10ISO4762
 - ④ 1x M6X12BN5128
- kg ~1,0



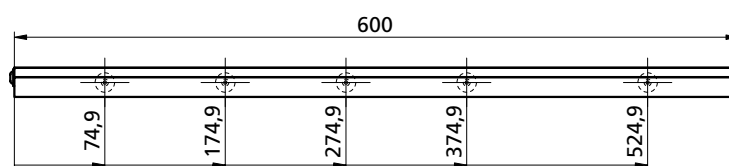
PCMAS700ML

- ① 1x PCMAS800ML
 - ② 2x MG1645
 - ③ 2x M3X10ISO4762
 - ④ 1x M6X12BN5128
- kg ~0,88



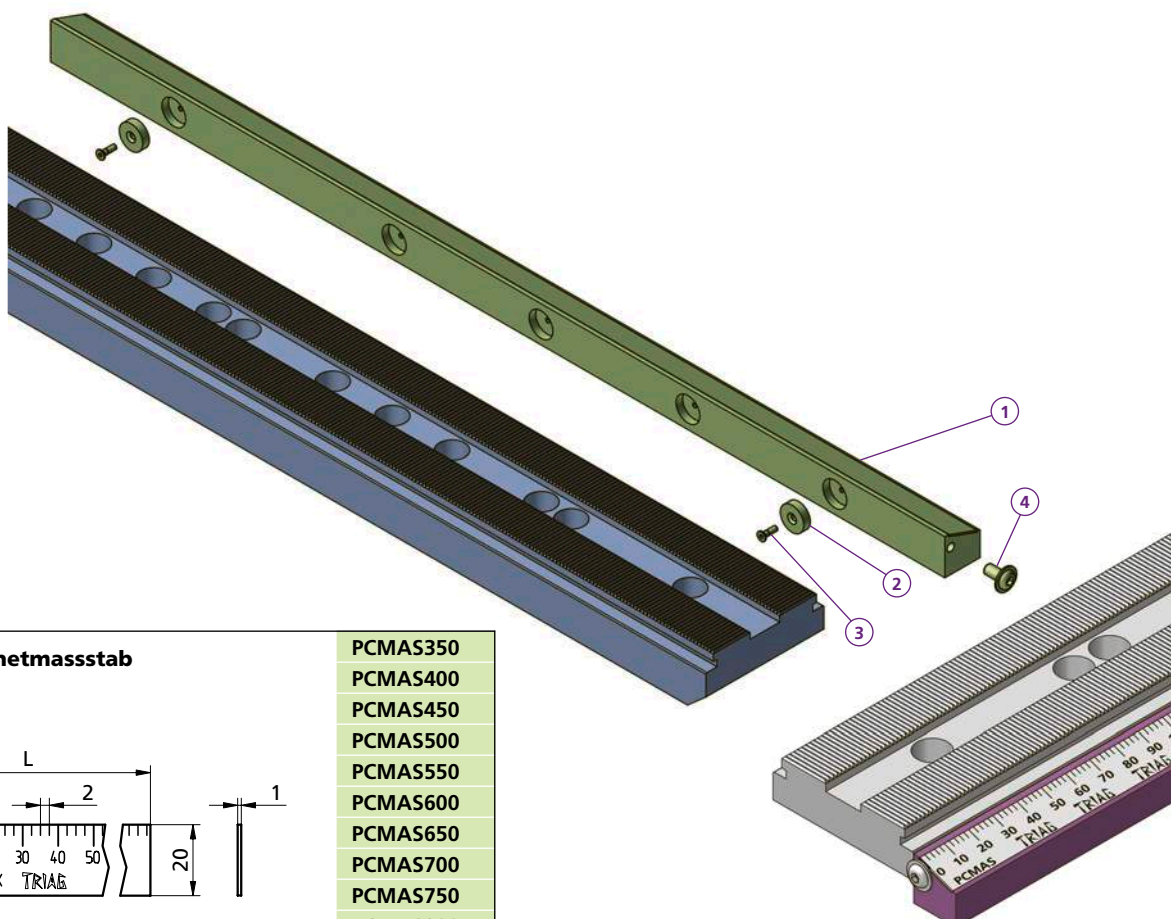
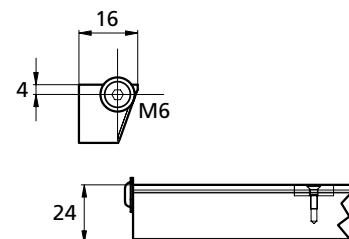
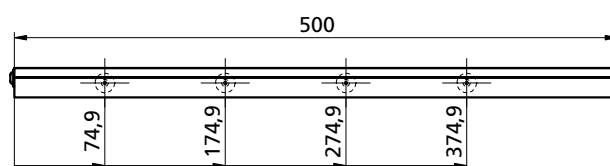
PCMAS600ML

- ① 1x PCMAS800ML
 - ② 2x MG1645
 - ③ 2x M3X10ISO4762
 - ④ 1x M6X12BN5128
- kg ~0,75

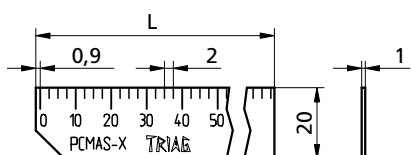


PCMAS500ML

- ① 1x PCMAS800ML
 - ② 2x MG1645
 - ③ 2x M3X10ISO4762
 - ④ 1x M6X12BN5128
- kg ~0,63



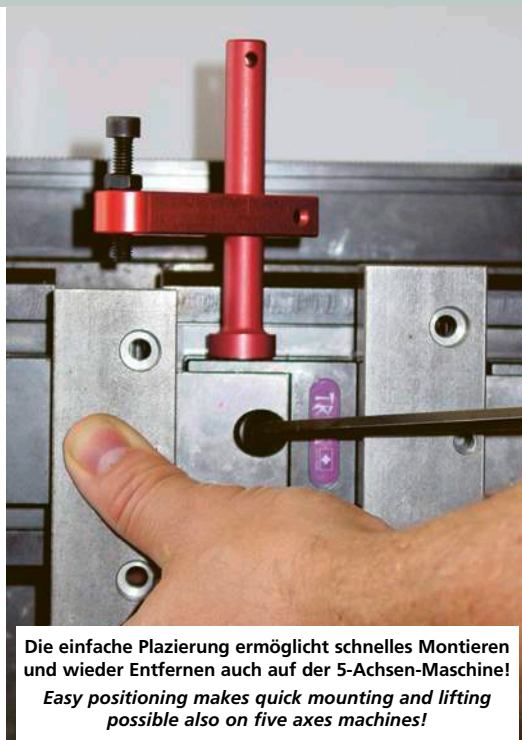
Alu - Magnetmassstab
Alu scale



- PCMAS350
- PCMAS400
- PCMAS450
- PCMAS500
- PCMAS550
- PCMAS600
- PCMAS650
- PCMAS700
- PCMAS750
- PCMAS800

Bestellbeispiel / Ordering example : **PCMAS800ML**

Separat bestellen / Order separately



Die 3 Sicherheitsstufen:

Durch seine **rote Farbe** ist der Anschlag besser sichtbar, was das Risiko vermindert, dass er in der Maschine vergessen wird.

Die **Bohrung** dient zum Befestigen einer Schnur am Handgelenk oder ausserhalb der Maschine.

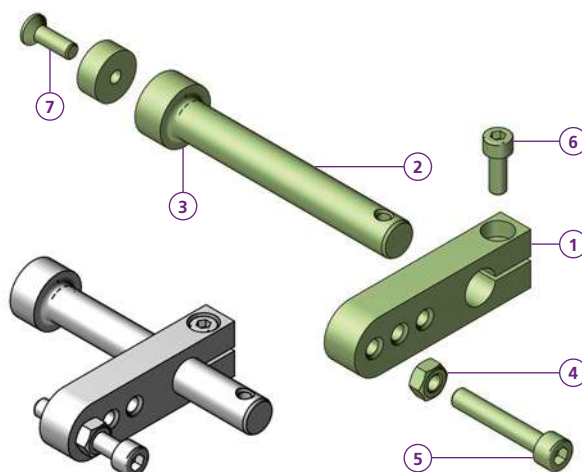
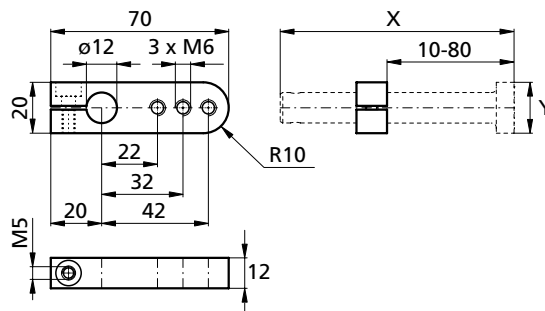
Dank dem **Magnet** ist der Anschlag auf allen magnetischen Materialien auf minimalem Platz einsetzbar, bei Kollision wird er weggedrückt. Es entstehen so keine teuren Werkzeugbrüche oder Maschinendefekte.

The 3 safety levels:

Because of its **red color**, the buffer is better visible. So the risk of forgetting the device in the machine is diminished.

The **drilling** serves to fasten a cord around the wrist or outside the machine.

Its **magnet** makes the buffer applicable on all magnetic materials on minimum space, in case of collision it gets pressed away, so there won't be any expensive breaking of tools or machines.



Haltekraft / Holding force
45N = 4,5daN (~4,5 kg)

FAUM2070

- 1x FA2070
- 1x FAD2092
- 2x MG1645
- 2x M6ISO4032
- 1x **M6X35ISO4762**
- 1x **M5X14ISO4762**
- 1x M3X8ISO10642

X = 92
Y = ø 20

kg ~0,084

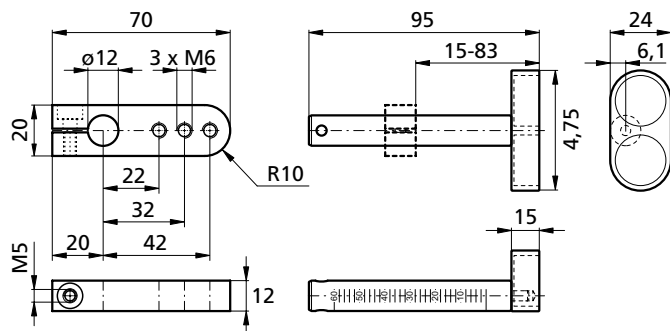
Haltekraft / Holding force
80N = 8daN (~8 kg)

FAUM2070S

- 1x FA2070
- 1x FAD2092S
- 1x MG2570
- 1x M6ISO4032
- 1x **M6X35ISO4762**
- 1x **M5X14ISO4762**
- 1x M5X16ISO10642

X = 95
Y = ø 25

kg ~0,1

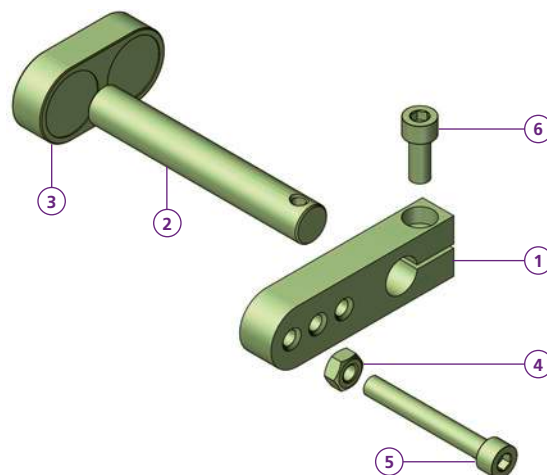
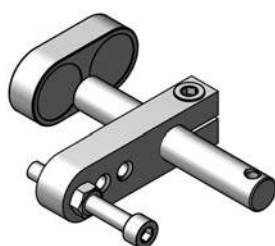


Haltekraft / Holding force
120N = 12daN (~12 kg)

FAUM2070US

- 1x FA2070
- 1x FAD1280
- 1x FUSSUS
- 1x M6ISO4032
- 1x **M6X35ISO4762**
- 1x **M5X14ISO4762**

kg ~0,146



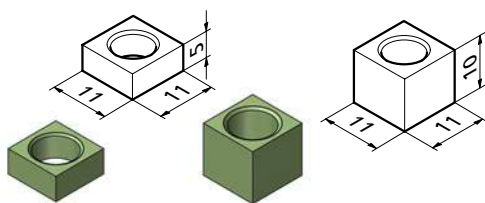
Bestellbeispiel Ordering example : **FAUM2070US**



Fräsanschlag / Milling buffer

FA1240 1x M6X18ISO4762 1x M5X12ISO4762 kg ~0,024	FA1260 1x M6X20ISO4762 1x M5X12ISO4762 kg ~0,07	FA1280 1x M6X12ISO4762 1x M8X25ISO4762 kg ~0,014	FA12100 1x M6X16ISO4762 1x M8X25ISO4762 kg ~0,022
---	--	---	--

Distanzbüchse zu Fräsanschlag
Spacers for workpiece stop



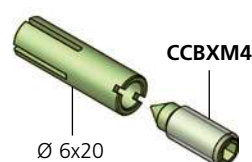
	L	kg
FAD12018	18	~0,012
FAD12023	23	~0,016
FAD12040	40	~0,026

CCD005

CCD010

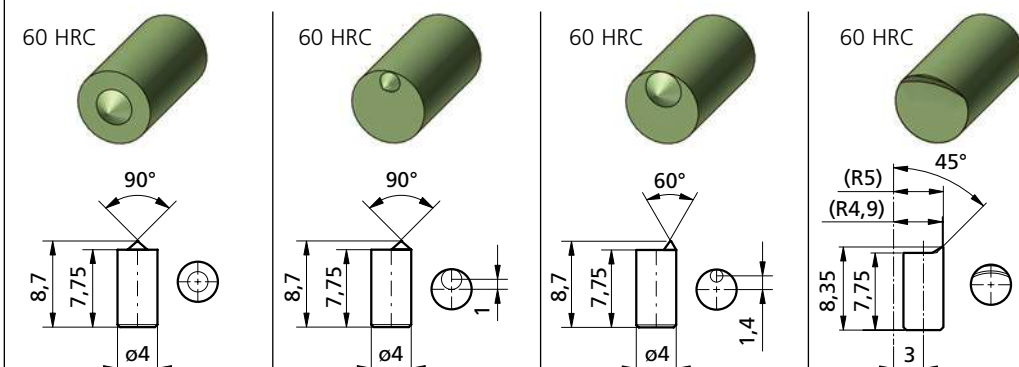
FAD12040

Positionierstift (spreizbar)
Locating pin (expandable)



CCBX0802

Druckstift / Gripping pins



DS0402-90°

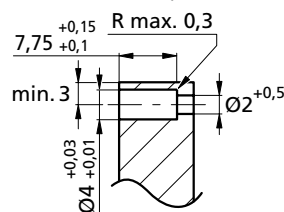
DSE0402-60°

DSE0402-90°

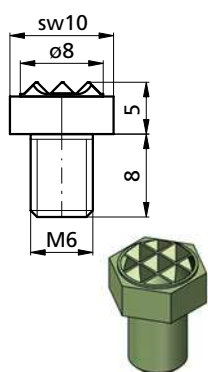
DSE0402-B5

Einbauanleitung
Installation guide

Bohrung vorbereiten
Preparation of drill-hole
Einkleben mit / Glue with
Loctite 641

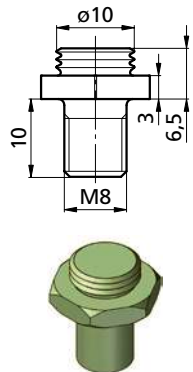


Hartmetalldruckstück
Carbide gripper



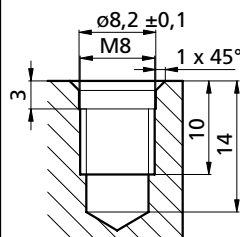
CCHMR

Prägespannschraube
Stamping roll screw

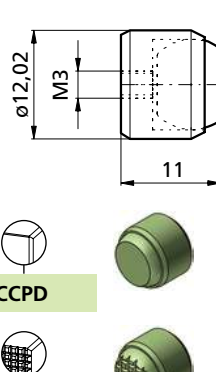


PRG1003M8

Bohrbild
Hole pattern

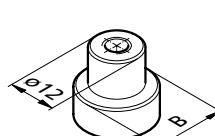


Kugeldruckstück
Gripper



CCPDR

Ausrichtzapfen für T-Nuten
Alignment-pins for t-slots



	B
TWADAPT10	10
TWADAPT12	12
TWADAPT14	14
TWADAPT16	16
TWADAPT18	18
TWADAPT20	20
TWADAPT22	22



338

Pneumatikschrauber Set

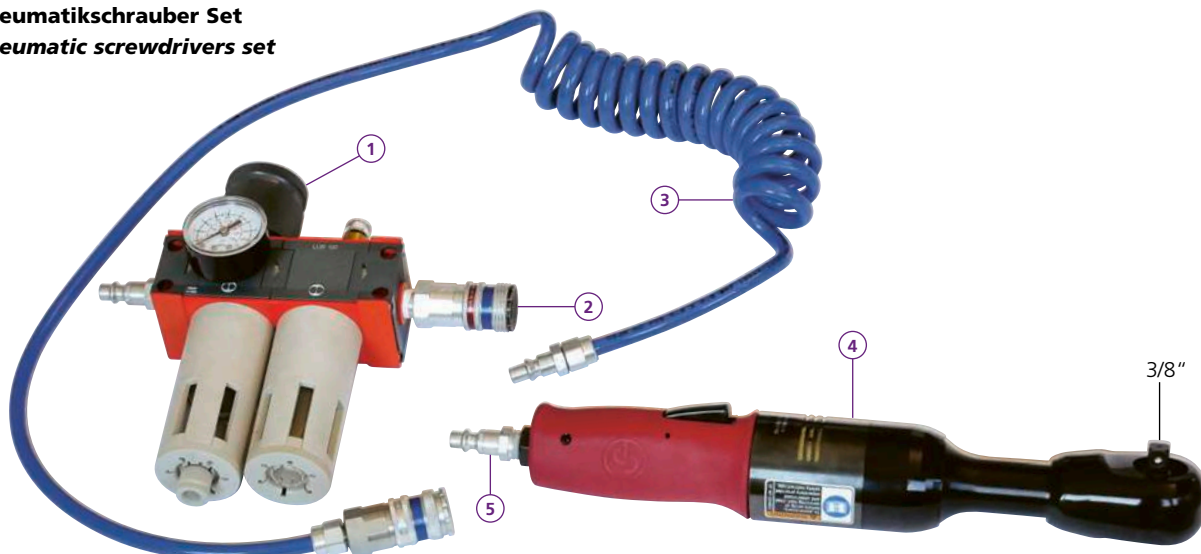
Pneumatic screwdrivers set

Triag Bitburr / Triag Bit



Zubehör / Accessories

Pneumatikschrauber Set Pneumatic screwdrivers set



RP9431SET

- ① 1x P1H-200-M3QG
 - ② 1x 103002152 (SERIE 300) 1/4"
 - ③ 1x 199589977 (5 x 8 mm, 300, 2 m)
 - ④ 1x RP9431
 - ⑤ 2x 103105152 1/4"
- kg ~1,5

Drehmomenttabelle / Torque table	Druck / Compression (bar)	Nm
	6	50
Schlauchdurchmesser 8 mm	5,5	45
Luftverbrauch 2,5 L Sek	5	40
	4,5	35
Hose diameters 8 mm	4	30
Air consumption 2,5 L sec	3,5	25
	3	20

mit Feder gehalten, nicht magnetisch
spring locked, not magnetic



mit Feder gehalten, nicht magnetisch
spring locked, not magnetic



siehe Video
see video

Triag Bit

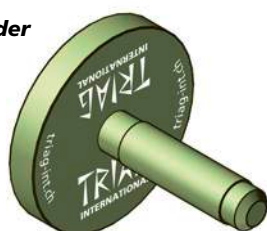
Triag Bitburr

Luftpistolen Gummiadapter Air gun rubber adapter



ARA14

Magnethalter Magnetic holder



Smiley

Einsatz für Triva Bit Insert for Triva Bit



BitT

Einsätze zu Bitburr Inserts for Bitburr



TC10



BitF63 $\varnothing 6,3-90^\circ$



BIT-KH



BitF104 $\varnothing 10,4-90^\circ$

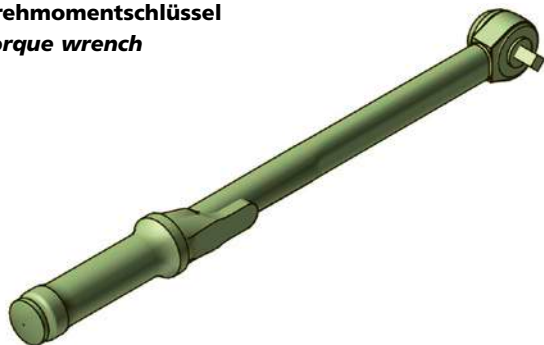


BIT-BF



BitF165 $\varnothing 16,5-90^\circ$

Bestellbeispiel / Ordering example: **RP9431SET**

Drehmomentschlüssel
Torque wrench


SL3

20-200 Nm ($1\frac{1}{2}$ ")

Steckschlüsseinsatz
Socket wrench insert

Torx


Sechskanteinsatz
Hexagon insert


NUSS3/8"TX30E14

für / for

MCZ, ZSX, ZSM, ZSB, PCZ

NUSS1/4"4.5MM

4,5 mm

für / for MCZ40L30,
UB5AXSET3, PCZ80L40PRG62

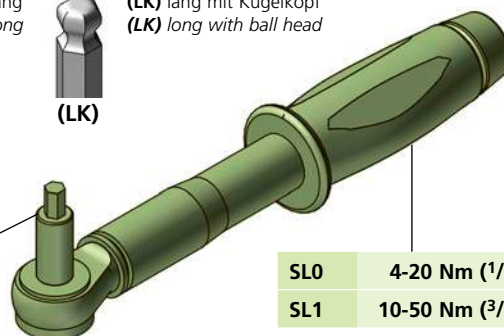
NUSS1/4"5.5MM

5,5 mm

Sechskantstifteinsatz
Hexagonal socket wrench

(L) lang
(L) long


(LK)

(LK) lang mit Kugelkopf
(LK) long with ball head


SL0

4-20 Nm ($1\frac{1}{4}$ ")

SL1

10-50 Nm ($3\frac{3}{8}$ ")

NUSS1/4"4MM

4 mm

NUSS3/8"6MM

6 mm

NUSS1/4"5MM

5 mm

NUSS3/8"6MML

6 mm

NUSS1/4"6MM

6 mm

NUSS3/8"6MMLK

6 mm

NUSS1/4"8MM

8 mm

NUSS3/8"8MM

8 mm

NUSS3/8"8MML

8 mm

NUSS3/8"8MMLK

8 mm

NUSS3/8"5MM

5 mm

NUSS3/8"10MM

10 mm

NUSS3/8"5MML

5 mm

NUSS3/8"10MML

10 mm

NUSS3/8"5MMLK

5 mm

NUSS3/8"10MMLK

10 mm

Spannschlüssel
Clamping wrench


02613160

4 mm

02613164

5 mm

02613168

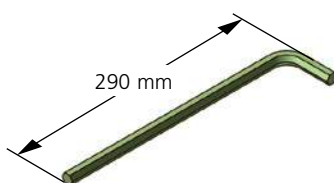
6 mm

02613172

8 mm

02613176

10 mm

Langer Spannschlüssel
Long clamping wrench


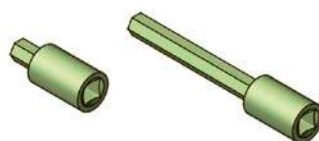
290 mm

ISL10

sw = 10 mm

ISL14

sw = 14 mm

Sechskantstifteinsatz
Hexagonal socket wrench


NUSS1/2"8MM

NUS1/2"14MML

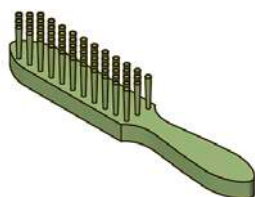
NUSS1/2"10MM

NUSS1/2"14MM

AD-BIT-1/4-1/4



AD-BIT-1/4-3/8

Messingdrahtbürste
Brass wire brush


PCMB4



Triag Ei

Mess-Gelenkstativ
Articulated indicator holders

3D


Aktionsradius / *Operating radius*

MGMS08130

130 mm

MGSS08130

130 mm

MGMS08280

280 mm



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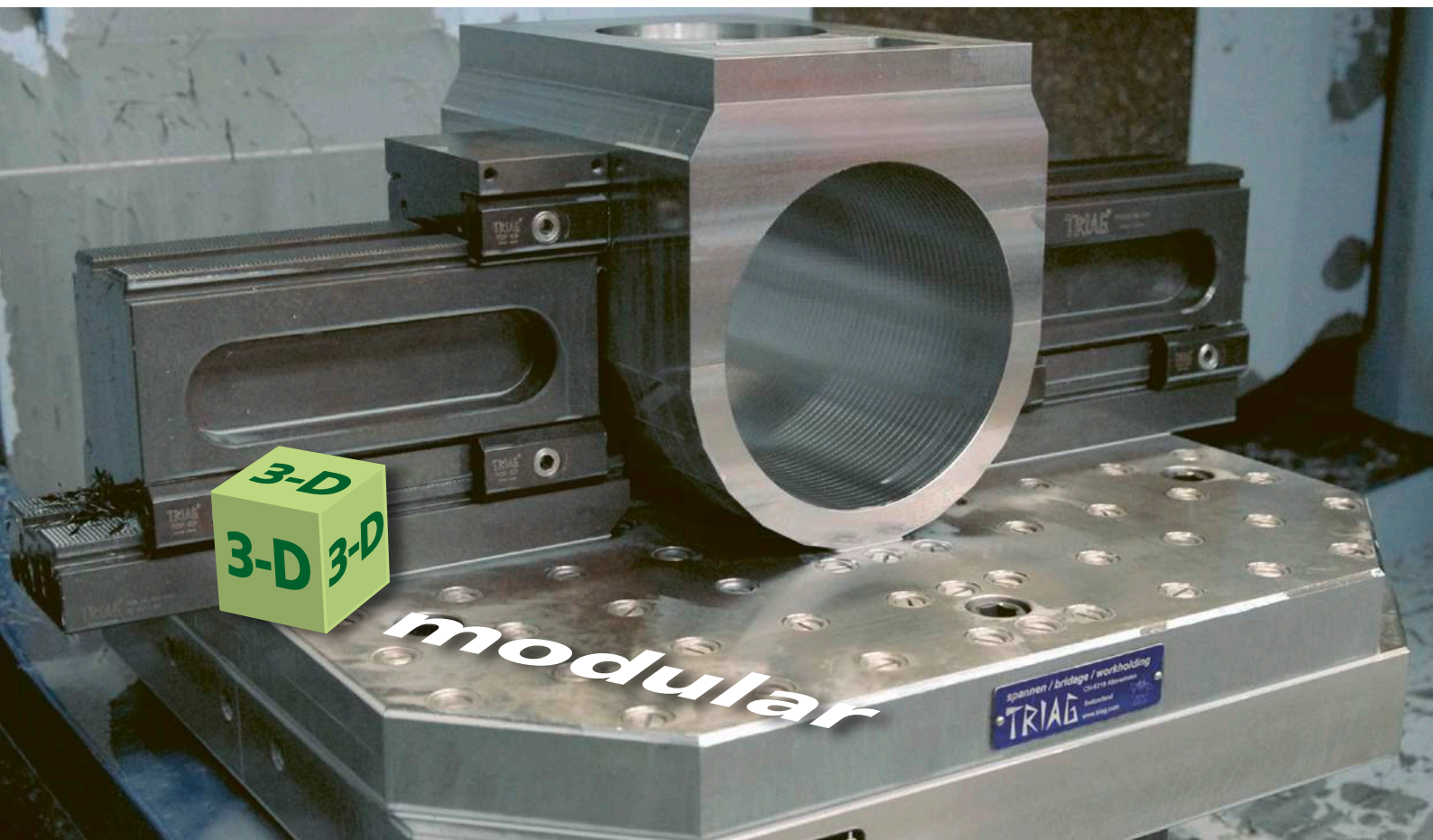
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Produktion einer Werkstück Familie
Producing a complete workpiece family



part 1 / OP 10

part 1 / OP 20

part 2 / OP 20

part 2 / OP 10

part 3 / OP 20

part 3 / OP 10

Zykluszeit / Cycle time



28 Min !



powerCLAMP & Saxes powerCLAMP

Das schnellstverstellbare Mehrfachspannsystem! Die Positionierung der Spannmodule erfolgt mittels einer Verzahnung auf der Schiene. Befestigung mit nur einer Schraube!

powerCLAMP & Saxes powerCLAMP

The quickest multiple workholding system for easy set up! Positioning of the clamping modules by teeth on the base rail. Repositioning by opening only one single screw!



triCENTRO & Saxes triCENTRO

Kleine bis grosse, sowie modulare Zentrischspanner in verschiedenen Ausführungen.

triCENTRO & Saxes triCENTRO

Small to big modular self centering vises in different variations.



microCLAMP

Kleinste Module für den Vorrichtungsbau. Sie haben eine grosse Spannkraft (bis 28'000N), der benötigte Abstand zwischen den Werkstücken ist im Optimalfall nur 15 mm.

microCLAMP

Smallest modules for dedicated fixtures. Having a high clamping force (up to 28'000N) the distance between workpieces is only 15 mm in optimum set up.



aptoCLAMP & Saxes aptoCLAMP

Die hohe Spannkraft dieses Systems ermöglicht den Einsatz für schwere Zerspanung.

aptoCLAMP & Saxes aptoCLAMP

The high clamping force of the aptoCLAMP enables heavy cuts.



triproxyMINERAL

Spanntürme aus Mineralguss. Die Vibrationsdämpfung ist zehnmal besser als bei Grauguss. Das spezifische Gewicht ist hingegen kleiner als bei Aluminium. Erhältlich in vielen verschiedenen Formen.

triproxyMINERAL

Tombstones made of composite concrete. Vibration damping effect is ten times better than with cast iron. Specific weight on the other hand is less than aluminum. Available in many different shapes.



oppSystem & Saxes oppSystem

Unser Nullpunkt-Palettiersystem ermöglicht ein genaues Positionieren von Mehrfachspannsystemen, Schraubstöcken und Vorrichtungen auf Maschinentischen oder Spanntürmen.

oppSystem & Saxes oppSystem

Our zero-point palletizing system allows exact positioning of multiple workholding systems, vices and dedicated fixtures on machining tables or tombstones.



trivaCLAMP

Vakuumspannsystem: Bestens geeignet für plattenförmige Werkstücke (auch nicht magnetische). Es können sowohl Druckstellen als auch Deformationen an labilen Teilen vermieden werden.

trivaCLAMP

Workholding by vacuum: Suited for plateshaped workpieces (also for non magnetical). Pressure marks as well as deformations on soft parts can be avoided.



triGEL

Unser Gefrierspannsystem. Sehr gut geeignet für unförmige Teile. Es erlaubt mehrseitiges Bearbeiten ohne Neuspannen. Das Haftvermögen ist sehr gross, wobei die Gefrier- und Auftauzeiten sehr gering sind.

triGEL

Workholding by freezing: Well suited for strangely shaped parts. It allows processing from more than one side without unclamping. Holding effects are very strong whereas freezing and defrosting times are very short.

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