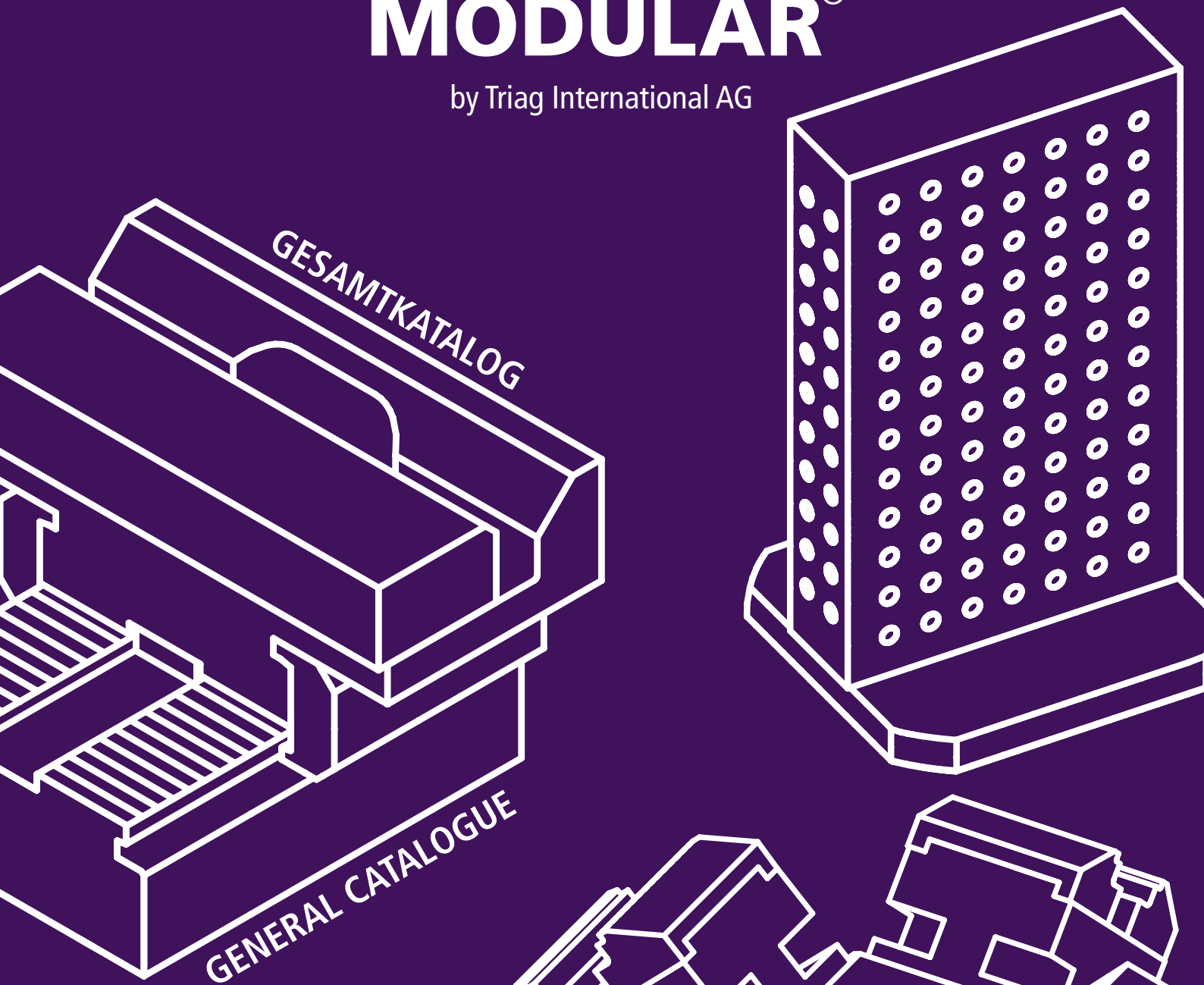
swiss MODULAR®

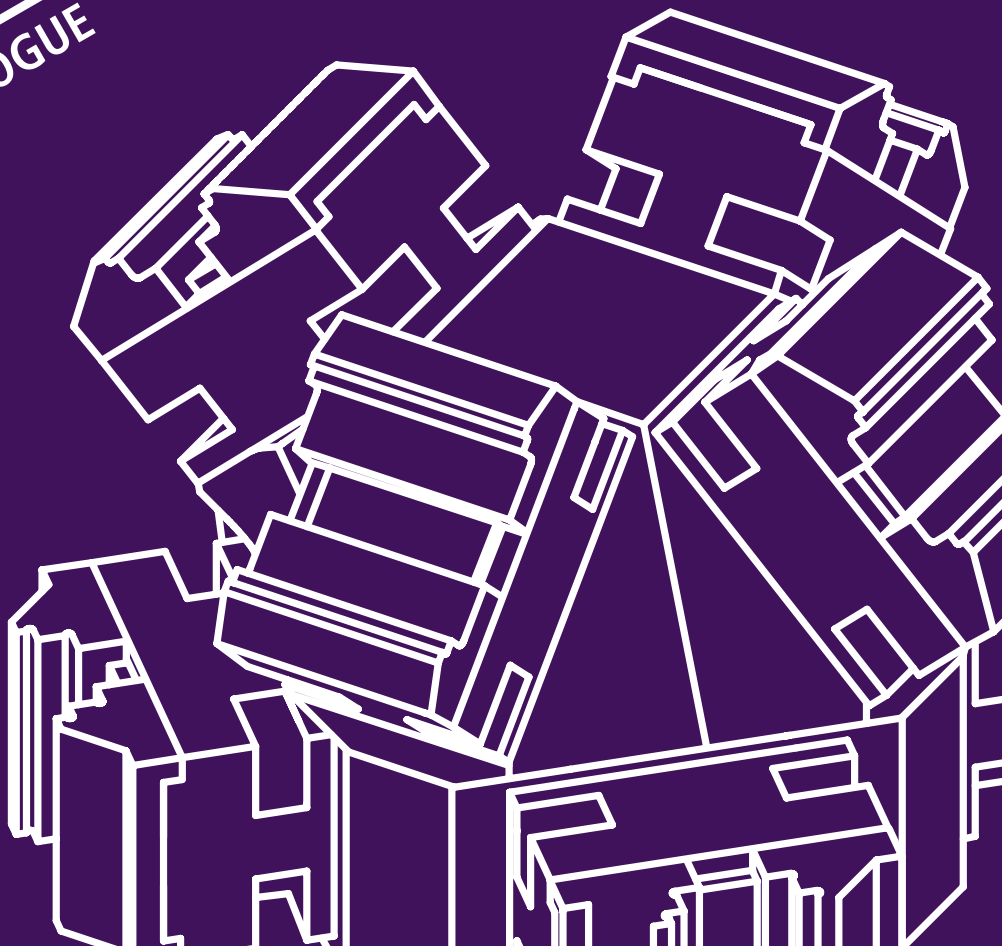
by Triag International AG

GESAMTKATALOG

GENERAL CATALOGUE







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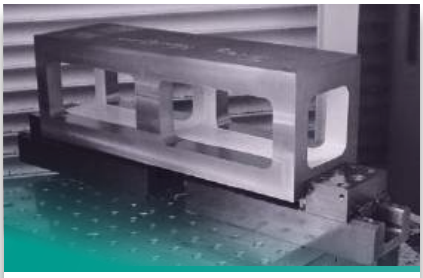

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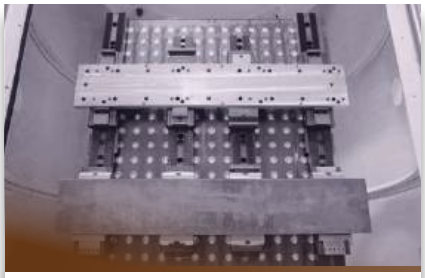

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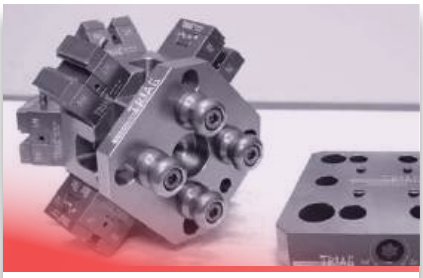
Eliminiert Vibrationen und ist leicht
Eliminates vibrations and is low in weight



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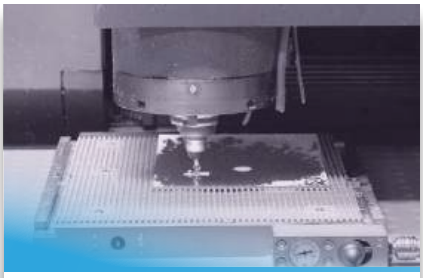

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Mass- und Konstruktionsänderungen bleiben uns vorbehalten.
We reserve the right to modify dimensions and structural design.

Über uns
About us

1990 Die Triag AG wurde im Jahr 1990 von Edi Zängerle, Ursula Landtwing und Beat Baumgartner gegründet. Sie vertrieb ihre Spannsysteme sowie Zerspanungswerkzeuge namhafter Hersteller hauptsächlich auf dem Schweizer Markt.

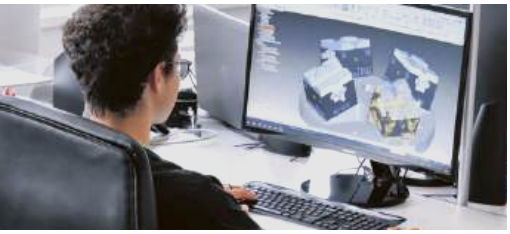
HEUTE Wir, die Triag International AG, konzentrieren uns seither auf die Entwicklung, Produktion sowie den weltweiten Vertrieb unserer modernen Spannsysteme. Sowohl mit unserem tiefen und breiten Standard Sortiment, als auch mittels werkstückspezifischen Sonderlösungen möchten wir unseren Kunden dabei helfen, ihren Maschinenraum optimal auszunutzen, um dadurch die grösstmögliche Effizienz zu erzielen. Unsere Spannsysteme können von der konventionellen Fräsmaschine bis hin zu modernen 5-Achs-Fräszentren mit oder ohne Automatisation eingesetzt werden. Diese Effizienz nutzen wir auch in der Herstellung unserer Spannsysteme in unserer eigenen Fertigung.

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

1990 Triag AG was founded in 1990 by Edi Zängerle, Ursula Landtwing and Beat Baumgartner. Triag AG distributed its clamping systems as well as cutting tools of well-known manufacturers primarily on the Swiss market.

TODAY Triag International AG concentrates on the development, manufacturing and worldwide distribution of our modern clamping systems. With our wide range of standard products as well as by means of custom-built solutions we aim to help our customers to get the most out of their machine space in order to achieve the highest efficiency possible. Our modular workholding systems can be applied from conventional up to 5-axis milling machines, with or without automation. We benefit this efficiency in in our own production too.

We focus on a good working atmosphere and place great value on our environment. We believe that these factors are essential to provide an open and sustainable service.







2024

Übernahme der Geschäftsleitung durch die nächste Generation.

Takeover of management by the next generation.

2023

Triag Internationa AG launcht die neue Marke swissMODULAR. Die Marke umfasst das gesamte Sortiment an Spannsystemen und Mineralgusstürmen.

Triag International AG has rebranded to swissMODULAR. The new brand includes the whole range of clamping systems and epoxy mineral tombstones.

2013

Entstehung der Triag International AG und der Schwesterfirma Tribur Invent GmbH, die sich auf den weltweiten Vertrieb mit eigenem Engineering, eigener Produktion und Mineralguss Giesserei konzentrieren.

The formation of Triag International AG and the sister company Tribur Invent GmbH, which are focusing on worldwide distribution with their own engineering, manufacturing and epoxy mineral casting.

1990

Gründung der Triag AG

Foundation of Triag AG

Im Herzen der Schweiz
In the heart of Switzerland



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Langfristige Kundenbeziehungen
Long-term customer relations

Respektvolle Teamarbeit
Respectful teamwork

Erstklassige Qualität
zu fairen Preisen
First class quality
with fair pricing

Wir respektieren unsere Umwelt
We respect our environment

Lehrlingsausbildung
und faire Lohnpolitik
Apprenticeship and
fair wage policy

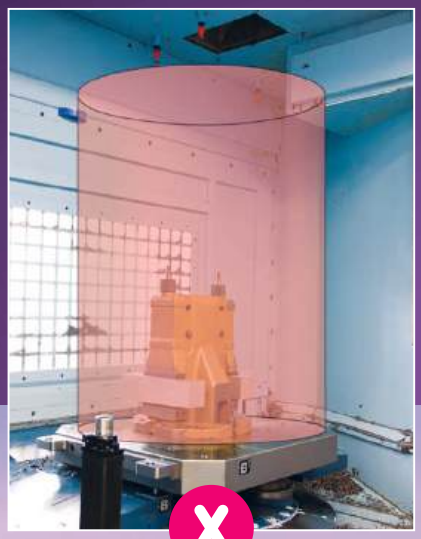
swiss MODULAR®
by Triag International AG



Time to say goodbye to the dinosaur vises!

SECRETS OF

RAUM
SPACE







«In Gebäuden ist es üblich, den Raum komplett zu vermieten. Wieso nicht auch in Ihrer Maschine?»

«In buildings, it is common to rent out the full space. Why not in your machine?»

ZEIT
TIME







«Flugzeuge sollen möglichst kurze Zeit geparkt bleiben. Das gleiche gilt für die Frässpindel.»

«Aircrafts should remain parked for the shortest amount of time. The same rule applies to the milling spindle.»

swiss MODULAR®
by Triag International AG

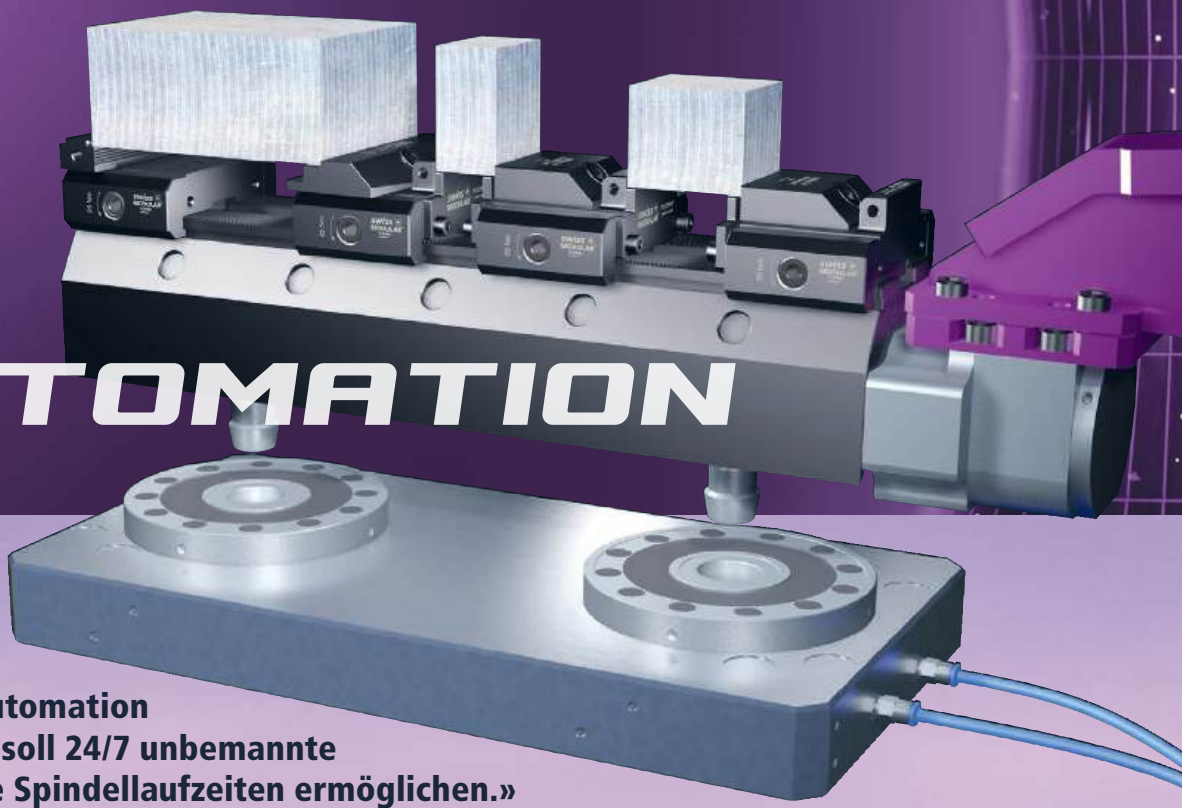


MIXED PRODUCTION



«Eine gute Mischung gibt ein gutes Müesli, warum dann nicht auch beim Fräsen?»

«A good mixture makes a good cereal, so why not also when milling?»



AUTOMATION

«Eine durchdachte Automation ist unverzichtbar. Sie soll 24/7 unbemannte Produktion und lange Spindellaufzeiten ermöglichen.»

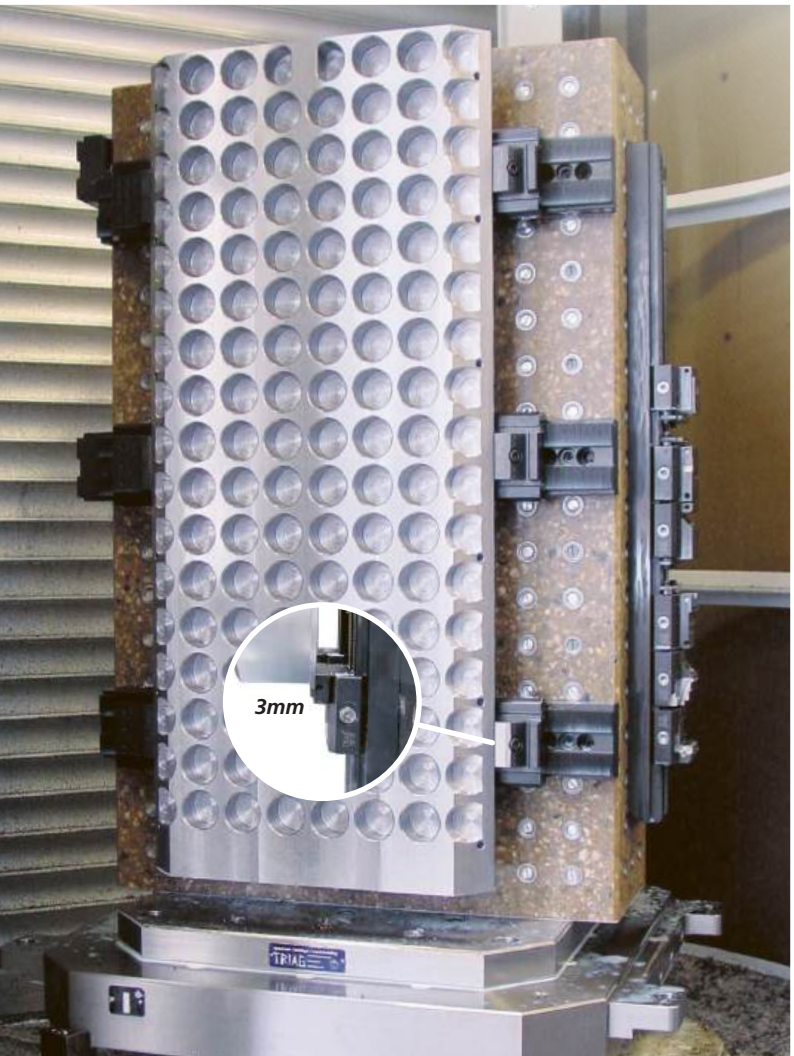
«A smart automation is essential. It should enable 24/7 unmanned production and long spindle running times.»

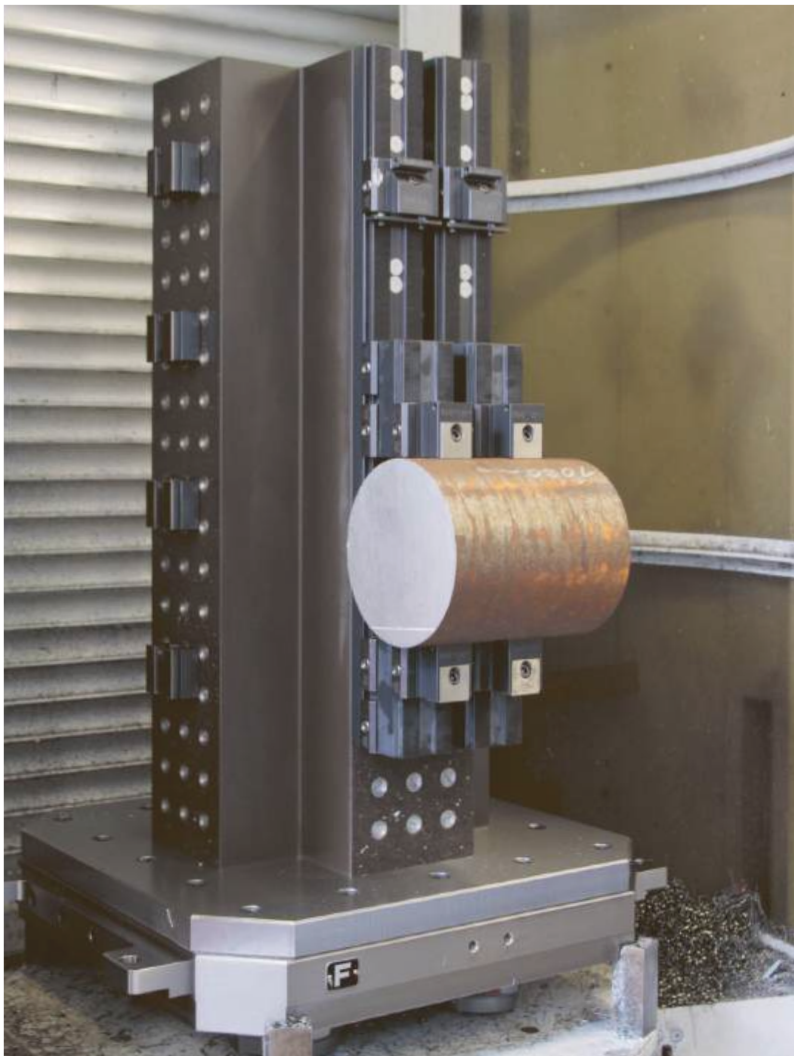
«Modular» bedeutet:

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





Adapting to workpiece <u>and</u> 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

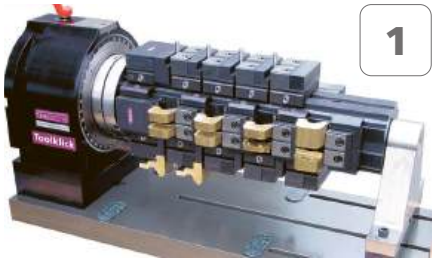
Modulare Mehrfachspannsysteme werden in ihrer Bedeutung für die Zerspanung noch immer unterschätzt. Dabei sind sie sowohl in der Einzelteilfertigung als auch für Grossserien flexibel einsetzbar. Zurückzuführen ist diese Flexibilität auf das Konstruktionsprinzip der Systeme, ihre handhabbare, kompakte 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 gewährleiste.



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

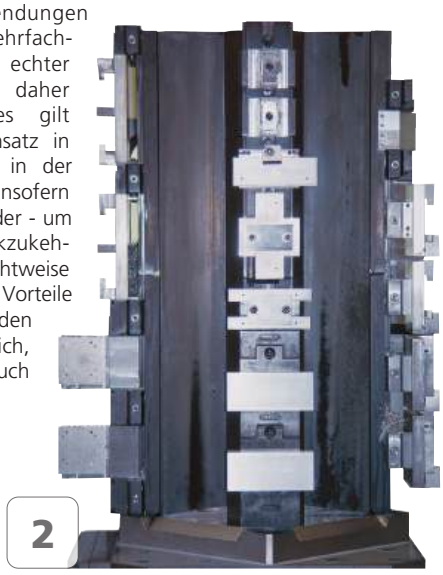
Mit einer vierten Achse kann eine Vertikalmaschine zur Serienmaschine mit Mehrseitenbearbeitung aufgerüstet werden, wobei auch hier eine hohe Spanndichte und Zugänglichkeit erreicht wird. Die horizontale und die vertikale Strategie lässt sich mit dem gleichen Spannsystem umsetzen, was bei Maschinenausfall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



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.



3

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

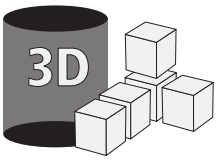
The use of a multiple workholding system is also beneficial in small batch machining.



Mehrfachspannung auf spaceGRIP 1
Multiple workholding on spaceGRIP 1

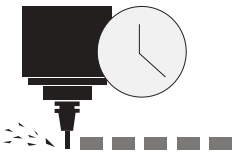


WIE? HOW?



3D-Modularität für eine optimale Raumnutzung

3D-Modularity for an optimal use of space



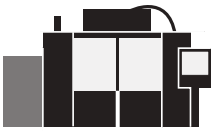
Mehrfachspannung für weniger Maschinenstandzeit

Multiple workholding for less machine down time



Chaotisches Spannen für das Erledigen von verschiedenen Jobs gleichzeitig

Mixed clamping for the manufacturing of different jobs at the same time



Grundvoraussetzung:
Zuverlässige Maschine mit ausreichenden Werkzeug und Paletten Plätzen und eine geeignete Automatisierungsmethode

Basic requirement:
Reliable machine with sufficient tool an palett places and a suitable automation method



9
05.11.2024

*power*CLAMP & *5axes*



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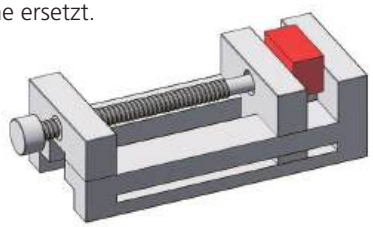
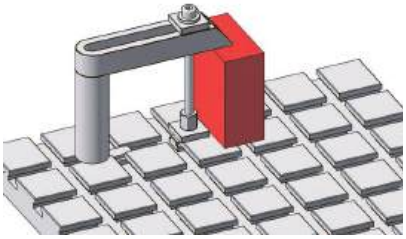
Der klassische Maschinenschraubstock ist für gewisse Zerspanungsarbeiten vielfach die richtige Wahl, obwohl man einen Spannstock ohne Mehrkosten auch mit einem Modularsystem aufbauen kann. Er wird durch die ständig erhöhten Anforderungen an die Prozessoptimierung immer mehr durch modulare Spannsysteme 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.



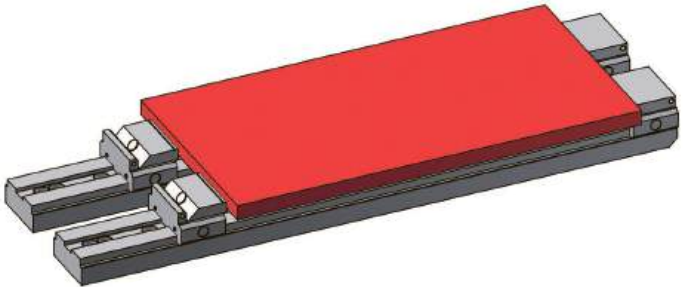
Spannen mit dem Spannstock
Clamping with the machine vise

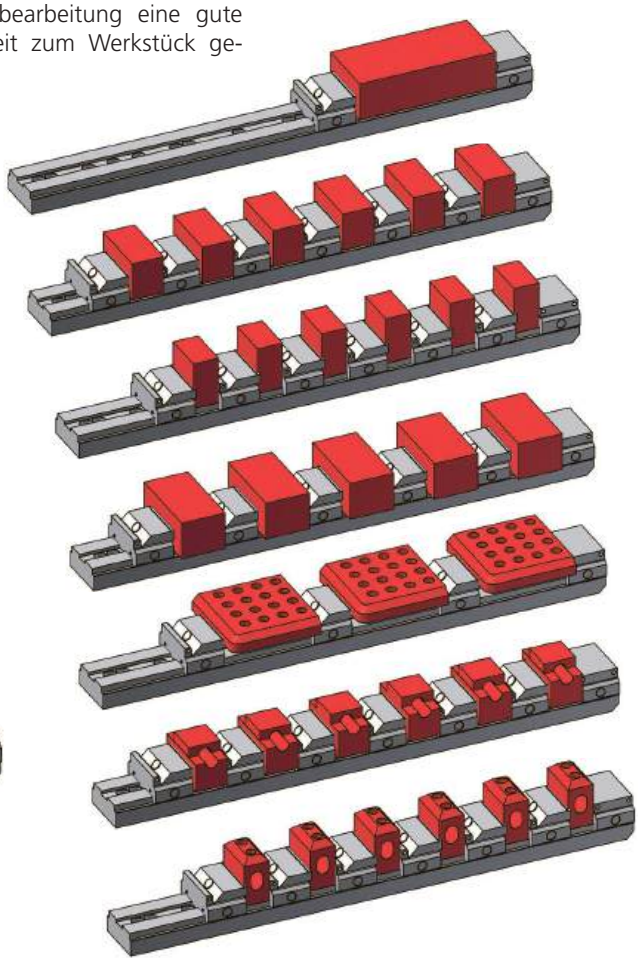


Spannen mit Spannpratzen
Clamps in operation

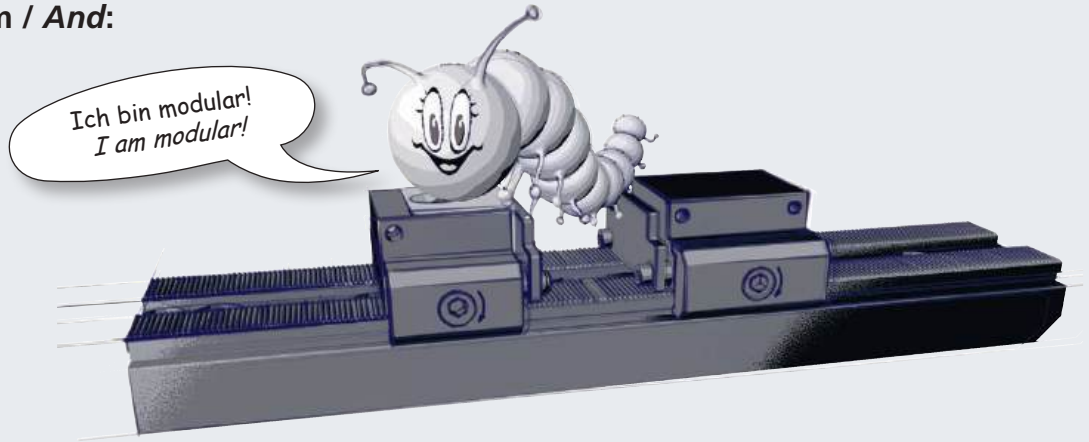
Mit den modularen Systemen wird ein hohes Mass an Flexibilität und grosser Spanndichte erreicht. Dies führt auch bei der Einzelteil- und Kleinserienfertigung zur Senkung der kostenintensiven Nebenzeiten, die einen wichtigen Faktor in der Wertschöpfungskette darstellen. Gegenüber Vorrichtungen ist der 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.

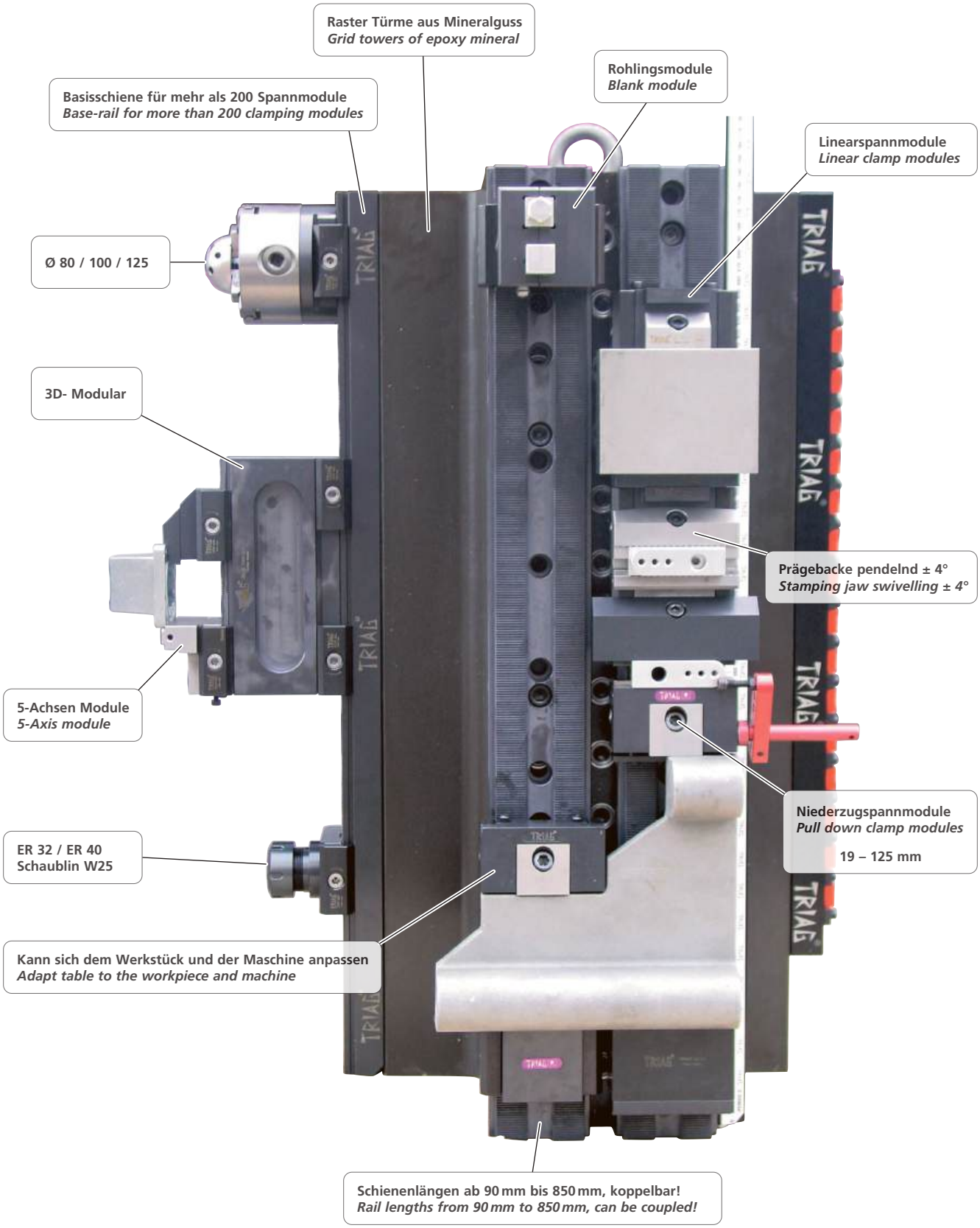
With modular clamp system you achieve a high flexibility and also high density of holding workpieces. This brings you big advantages also by producing single parts or small quantities! Compared to dedicated fixtures you can use this vises for many different applications.





Ausserdem / *And*:





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 produkt 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*



Eine Schraube lösen
Loosen a screw



Abheben und neu platzieren
lift and change position

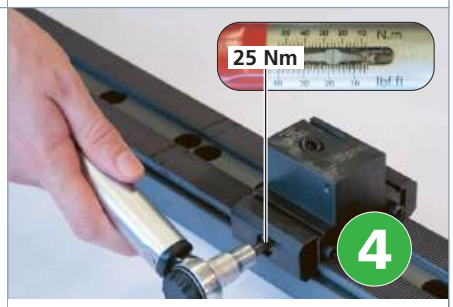


Eine Schraube anziehen
fasten one screw

Mit nur einer Schraubspindel, welche von beiden Seiten her zugänglich ist, werden die positionierten Module in einem patentierten Pratzensystem zuverlässig geklemmt.
Die Module können an jeder Stelle der Trägerschienen aufgesetzt werden. Verglichen mit dem üblichen axialen Aufschieben 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.



Drehmoment beachten
Observe the torque

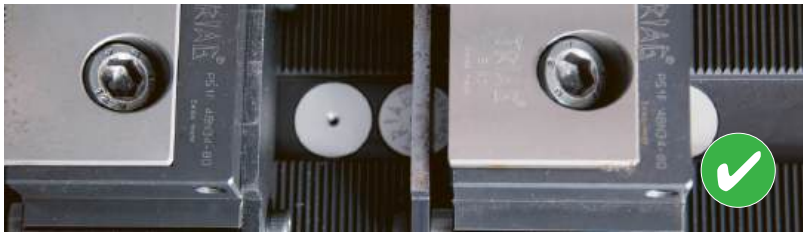
Geringes Gewicht
Low weight

= Einfaches Handling
= *Easy handling*

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



Einfache Reinigung
Easy cleaning

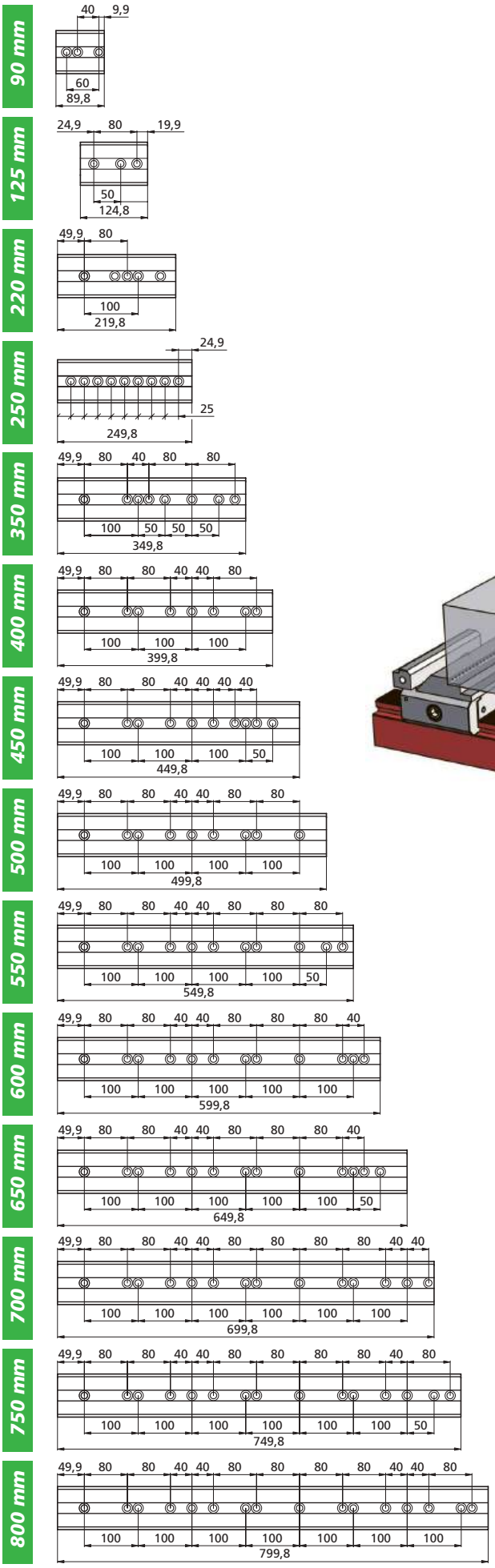


Keine spänefüllenden T-Nuten (im Gegensatz zu vielen Wettbewerbsprodukten) - Basis bilden stabile, mit Teilstücken verlängerbare Trägerschienen. Sie verfügen über eine hochgenau gefräste Verzahnung.
Eine Vielzahl an Spannmodulen mit unterschiedlichen Spannelementen lassen sich auf den Trägerschienen 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 hight. 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)

Basisschienen / *Base rails*

Masssystem / *Measurement system* = metric & *inch* powerCLAMP



Schienen sind in den folgenden Höhen lieferbar:
Rails are in following ups available:

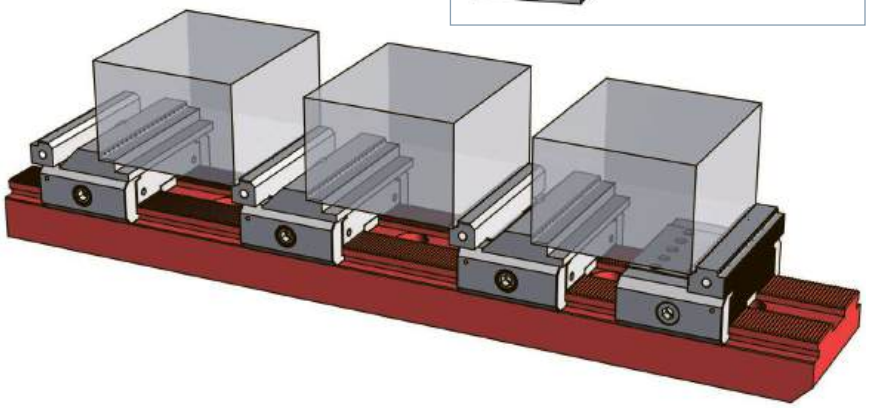


➥ 35 mm

➥ 60 mm

➥ 80 mm

➥ 175 mm



Basisschiene

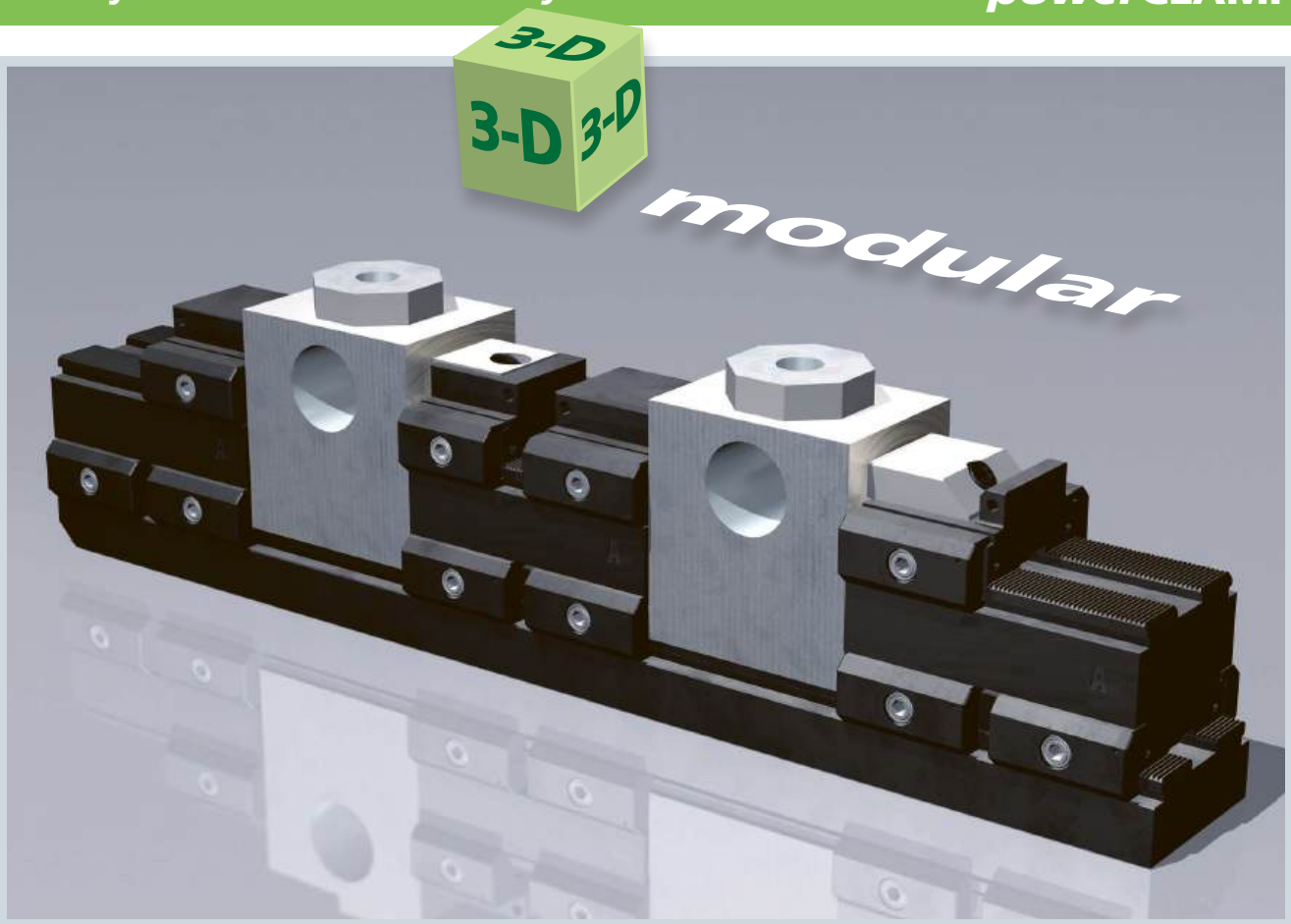
Die Basisschiene ist das Grundelement des modularen Spannsystems von Triag International und ist in den Höhen 35 mm, 60 mm, 80 mm und 175 mm verfügbar. Auf der Basisschiene werden alle Spann- und Anschlagmodule über eine Schraubspindel mit einer Haltekraft von 15.000 daN (= 15 t) befestigt. Eine schnelle 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 Palettensystemen 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 hight of the clamp modules. This way you can get from 34 to a clamp hight 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 (15 t). The precision serration in 2 mm pich 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)



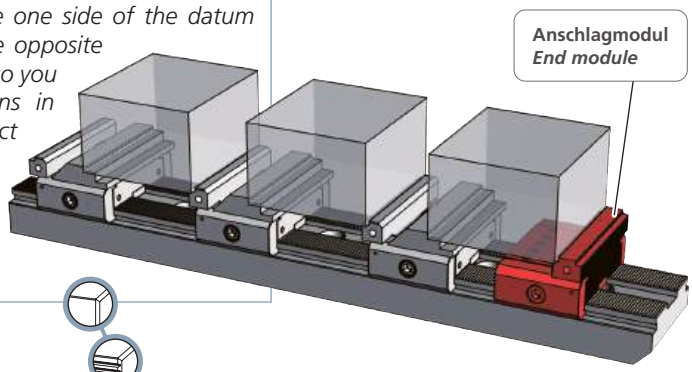
Basisschienen in Zoll
Base rails in inch

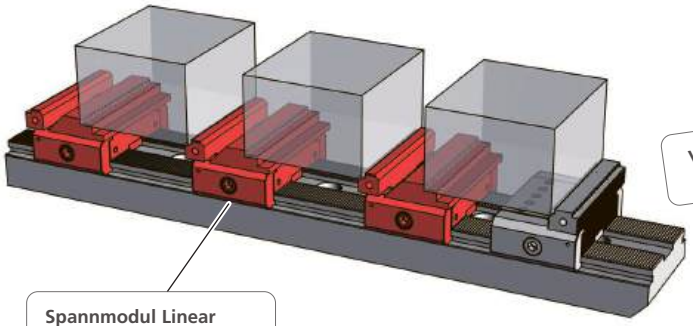
Das Anschlagmodul / *End modules*

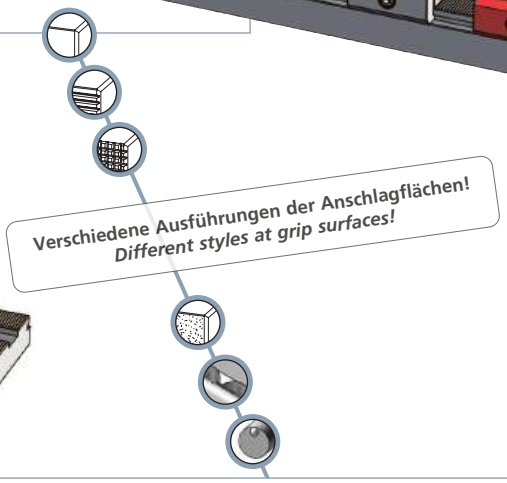
Für das Spannsystem «Power Clamp» ist in der Regel nur ein Anschlagmodul als «feste Backe» notwendig. Mittels der 2 mm Verzahnung lässt sich das Modul sehr genau auf der Basisschiene positionieren und ist mit der Schraubspindel schnell befestigt.
Für die unterschiedlichen Bearbeitungssituationen steht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









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 minimalste Abweichungen vom Nullpunkt festgestellt. Leichte Abweichungen von der Parallelität der Werkstücke werden mit der Pendelfunktion (± 4°) ausgeglichen.

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

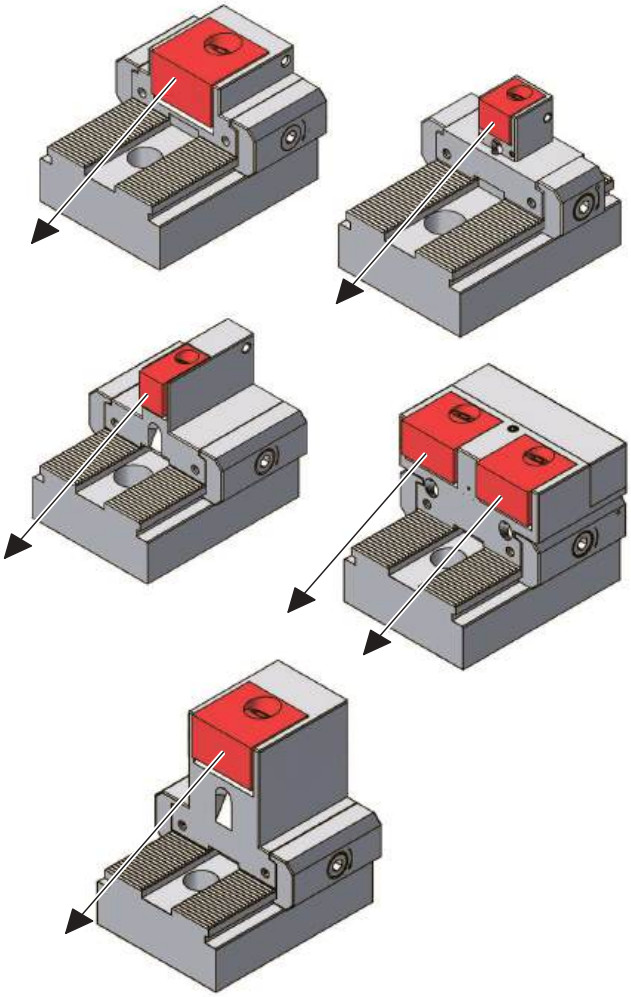
There are mainly two different types of clamp modules. Linear and pull down jaws both with integrated datum face for the next workpiece. Datum face can normally be double serrated or flat.

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

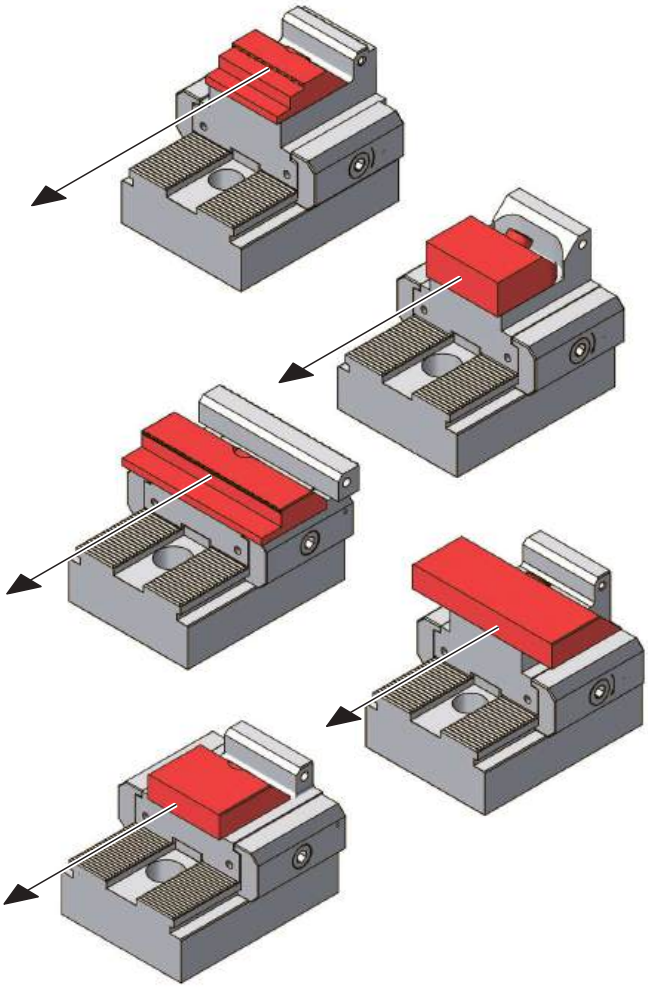
Facts for pull down clamp modules

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

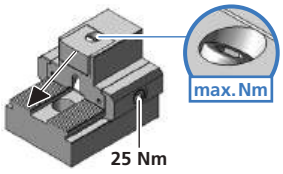
Facts for linear clamp modules

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

Advantages linear jaws:

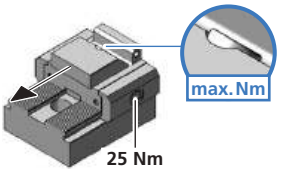
- *Similar clamp as conventional vise*
- *Good for shaped jaws*
- *Secure clamped with direct stamping jaws*
- *Higher accuracy*

ACHTUNG / *CAUTION*



Niederzug Spannmodule
Pull adown module

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
	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	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
	15	11	= 1520	3350	1,52
	20	14,8	= 1810	3990	1,81
	25	18,4	= 2100	4630	2,10
M10	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



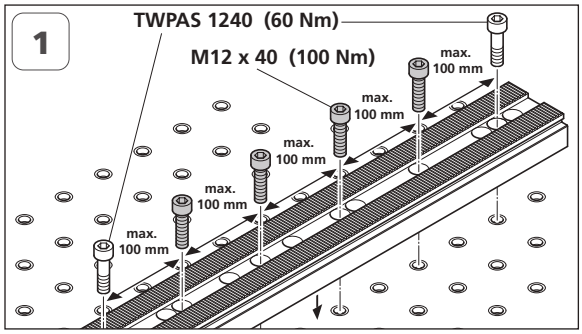
Linear Spannmodule
Linear module

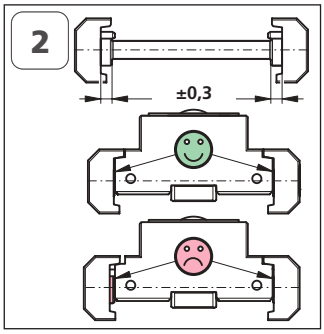
Schraube *Screw*	Drehmoment *Torque*		Spannkraft *Workholding force*		
	Nm	(lb-ft)	~daN	~(lb)	~t
M8	10	7,4	= 400	880	0,4
	20	14,8	= 800	1760	0,8
	30	22,2	= 1200	2650	1,2
	40	29,6	= 1600	3530	1,6

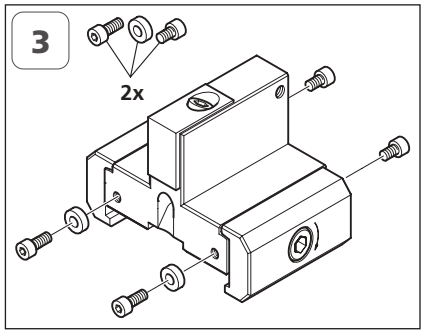
WICHTIG: Die angegebenen Drehmomente sind die absoluten Maximalwerte. Über die Spannkräfte geben die Tabellen Auskunft.

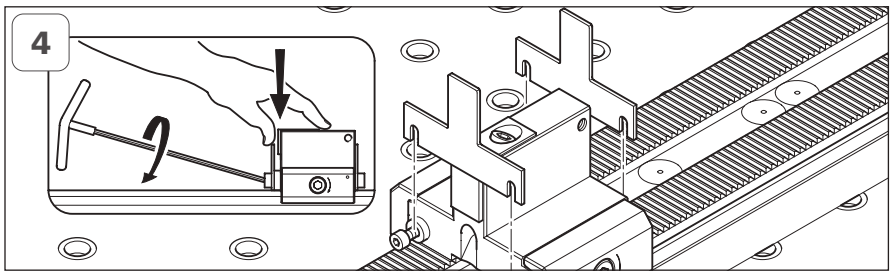
IMPORTANT: *The torque numbers specified represent the absolute maximum. The table at the bottom of this page provides further information on the workholding forces.*

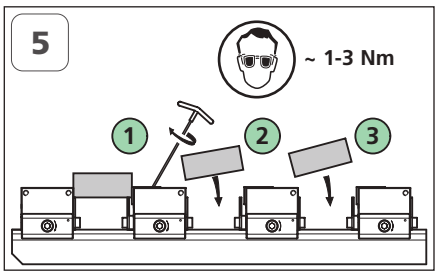


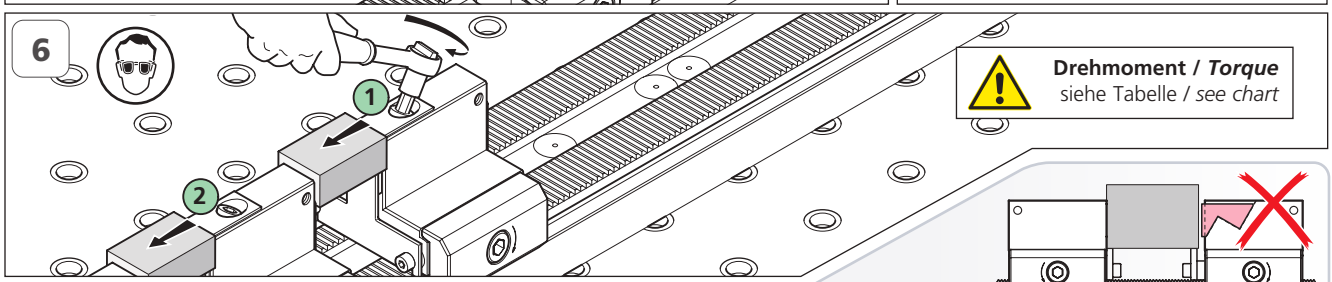


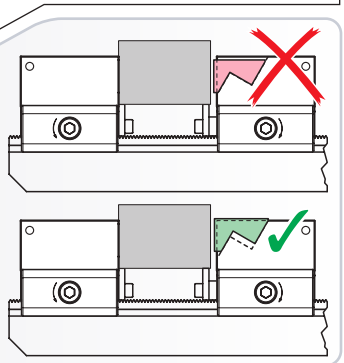








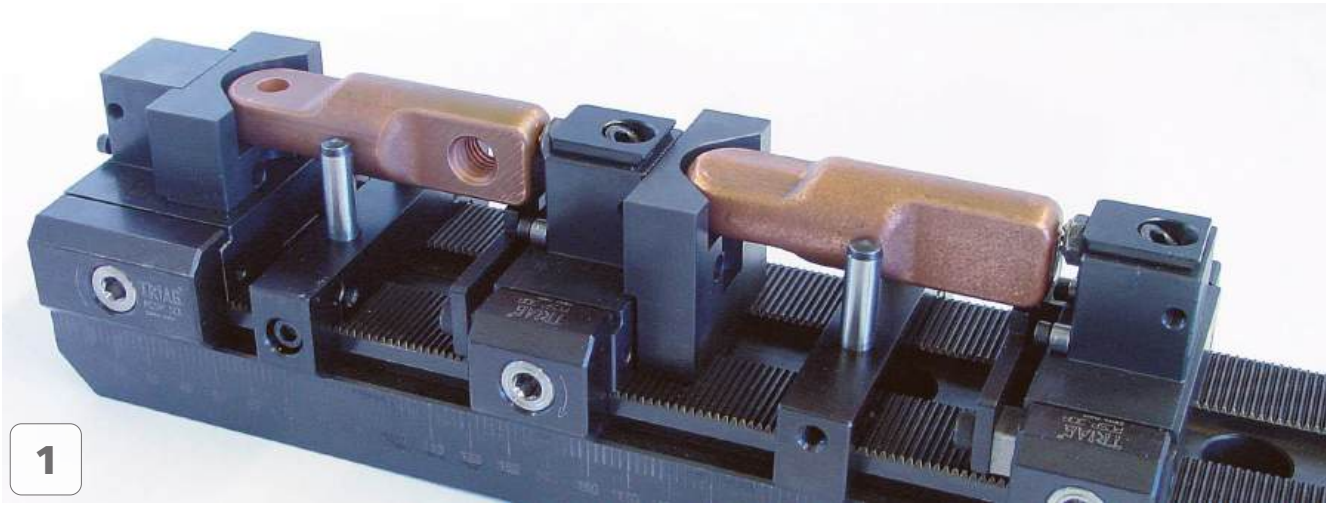




7

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 guaranties proper clamping of the new workpiece.*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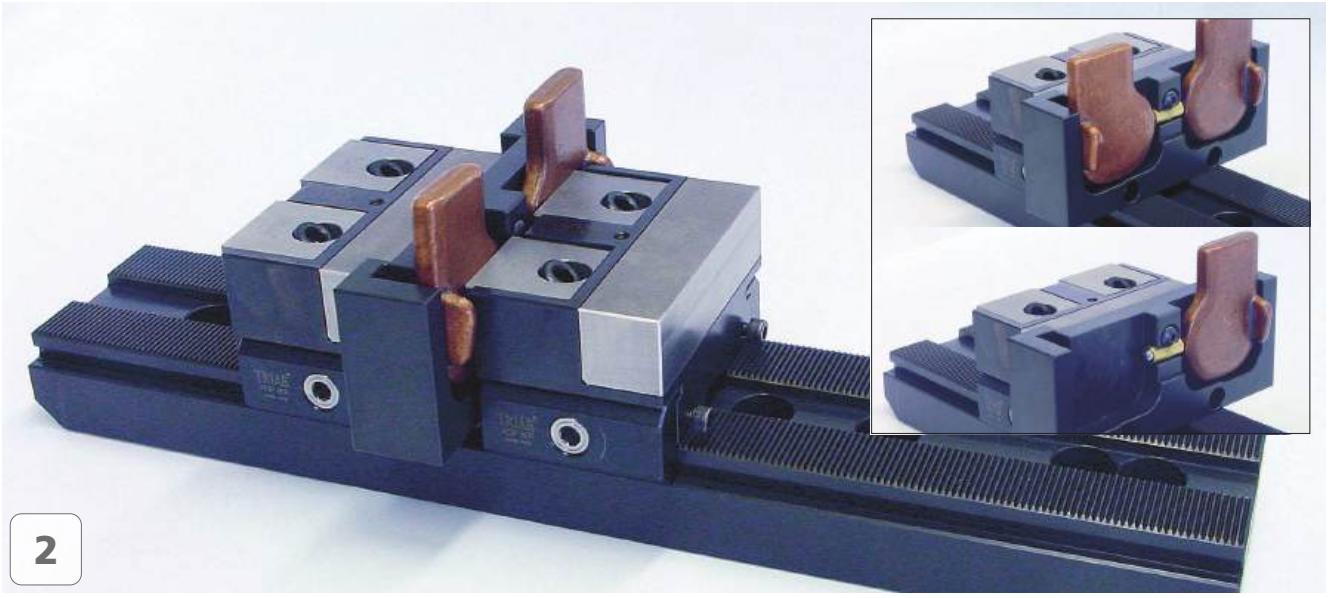
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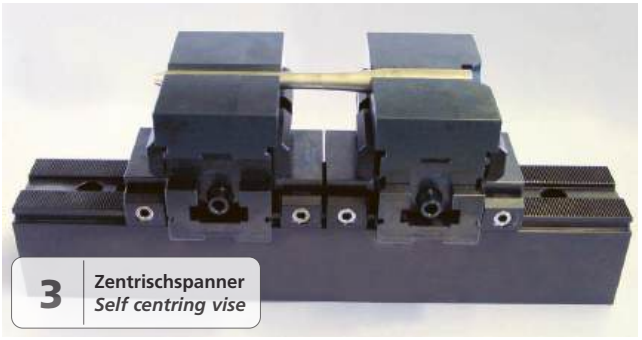
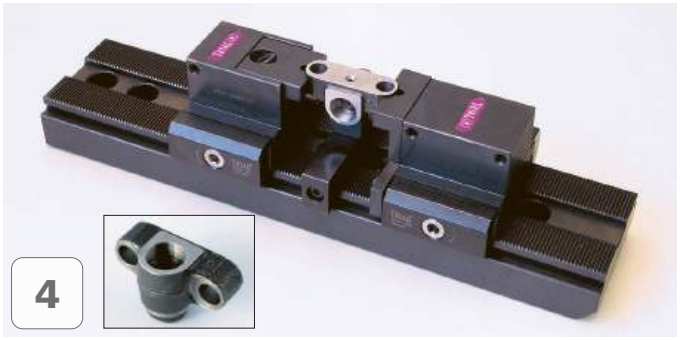

3 Zentrischspanner
Self centring vise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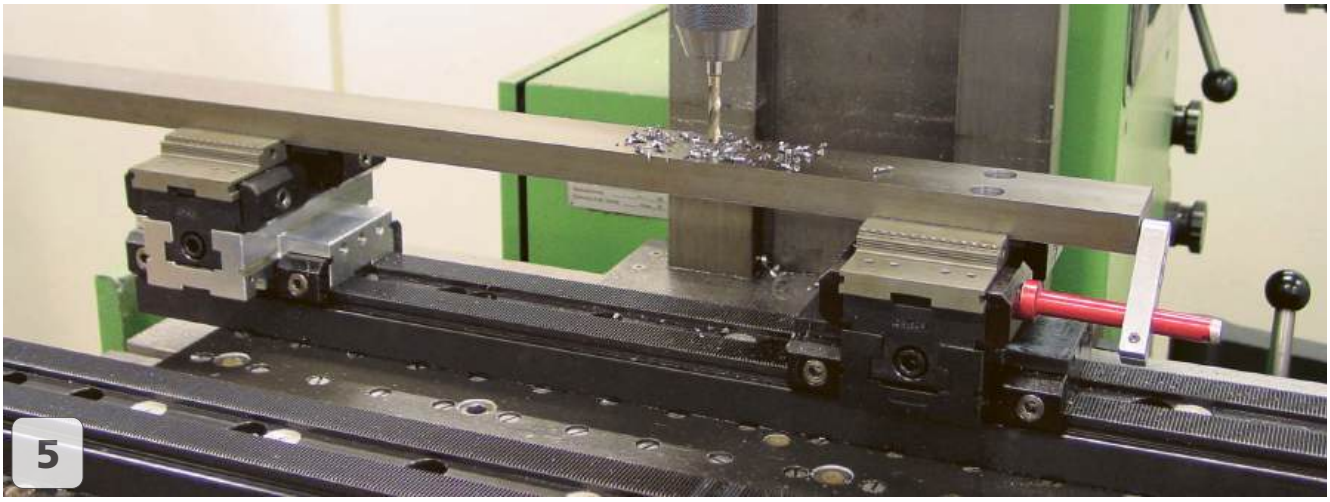
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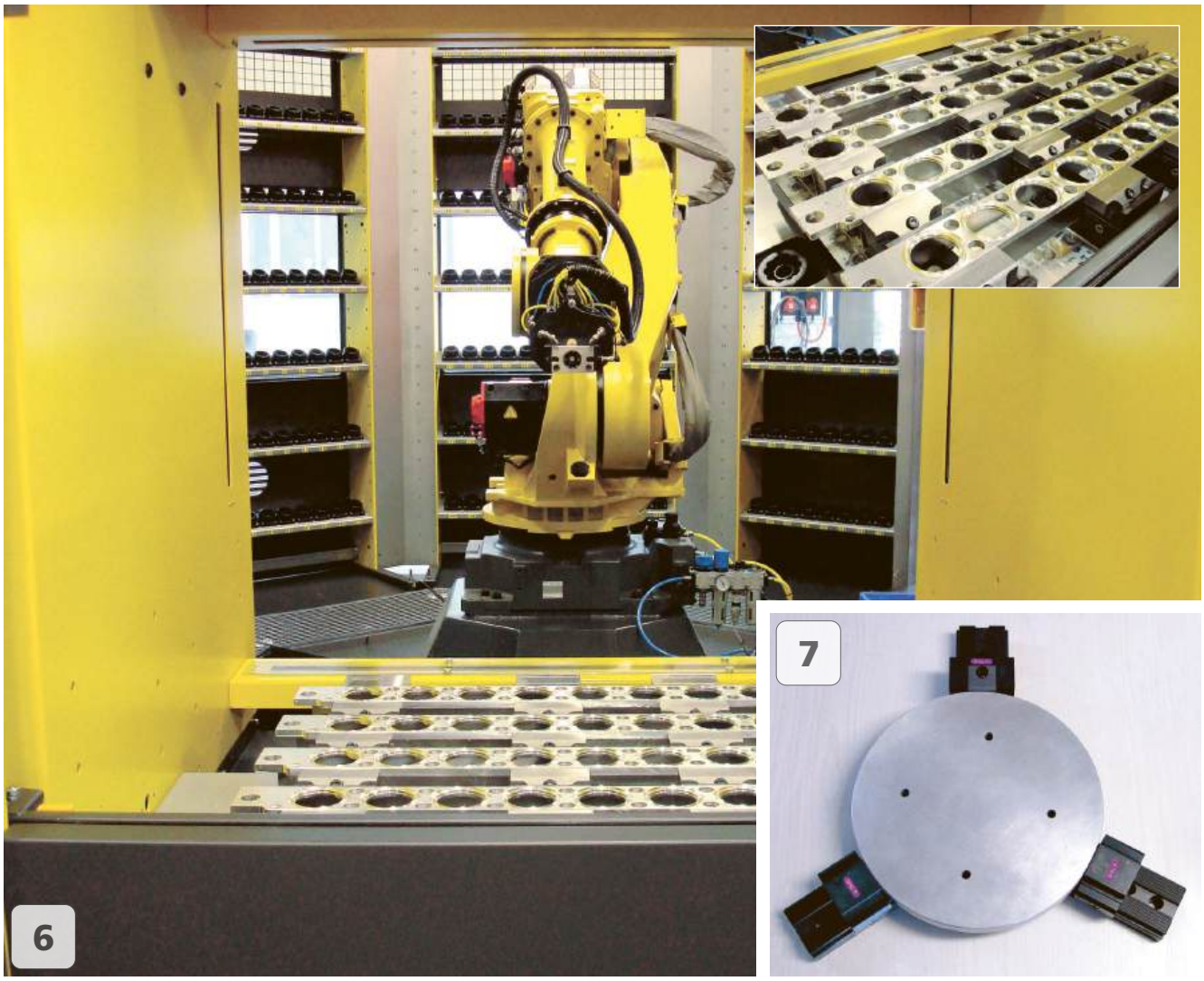
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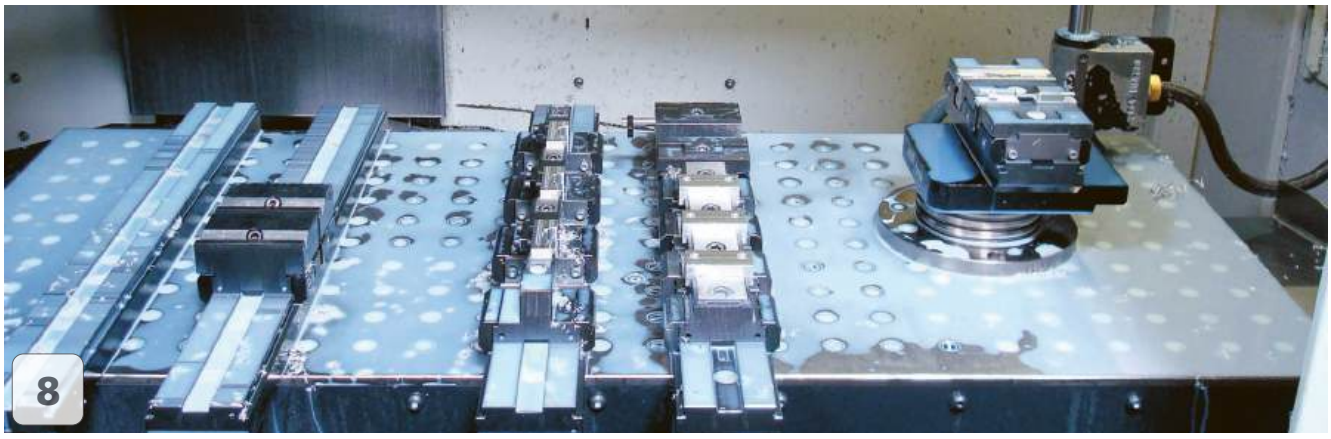
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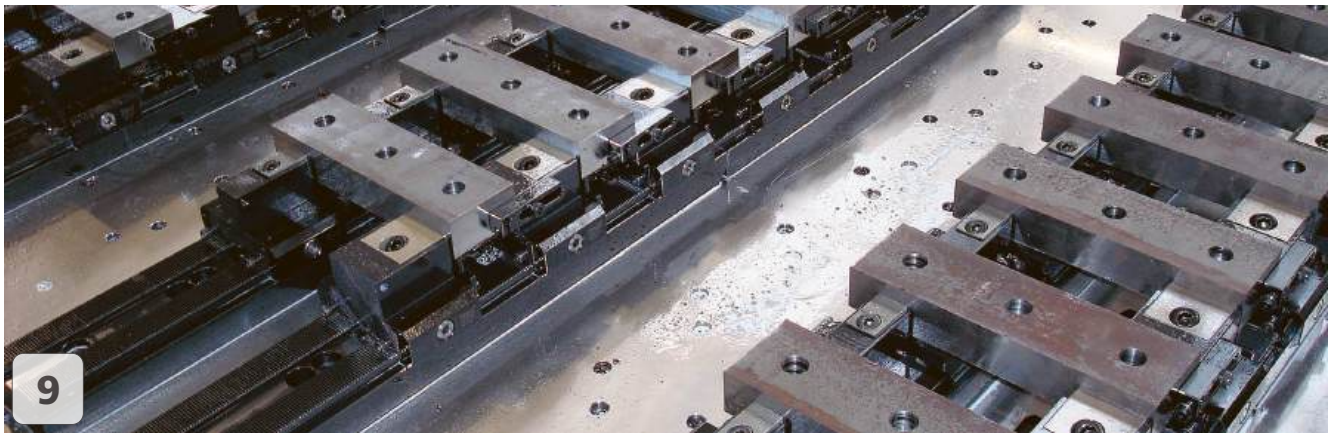
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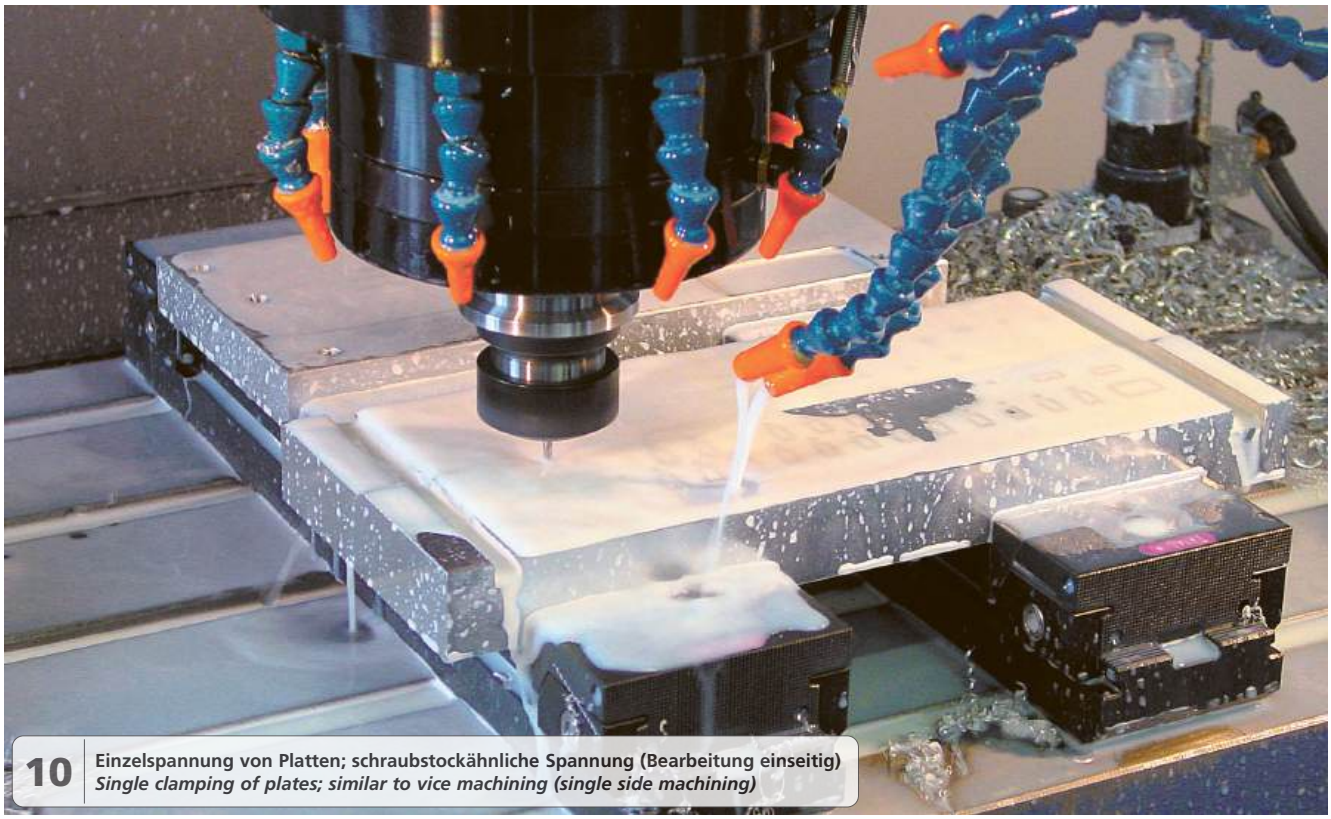
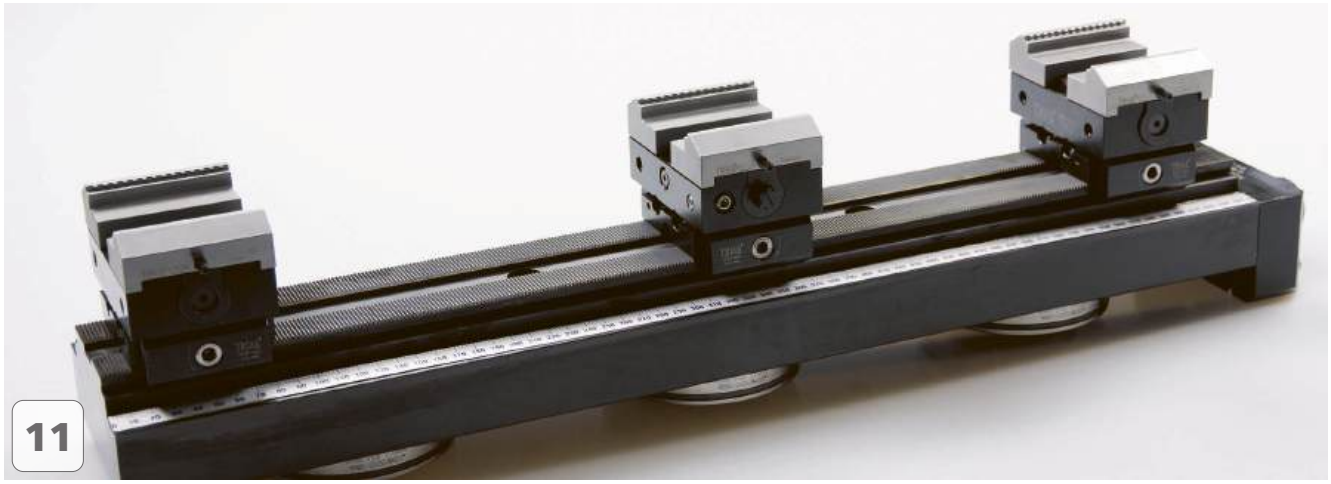


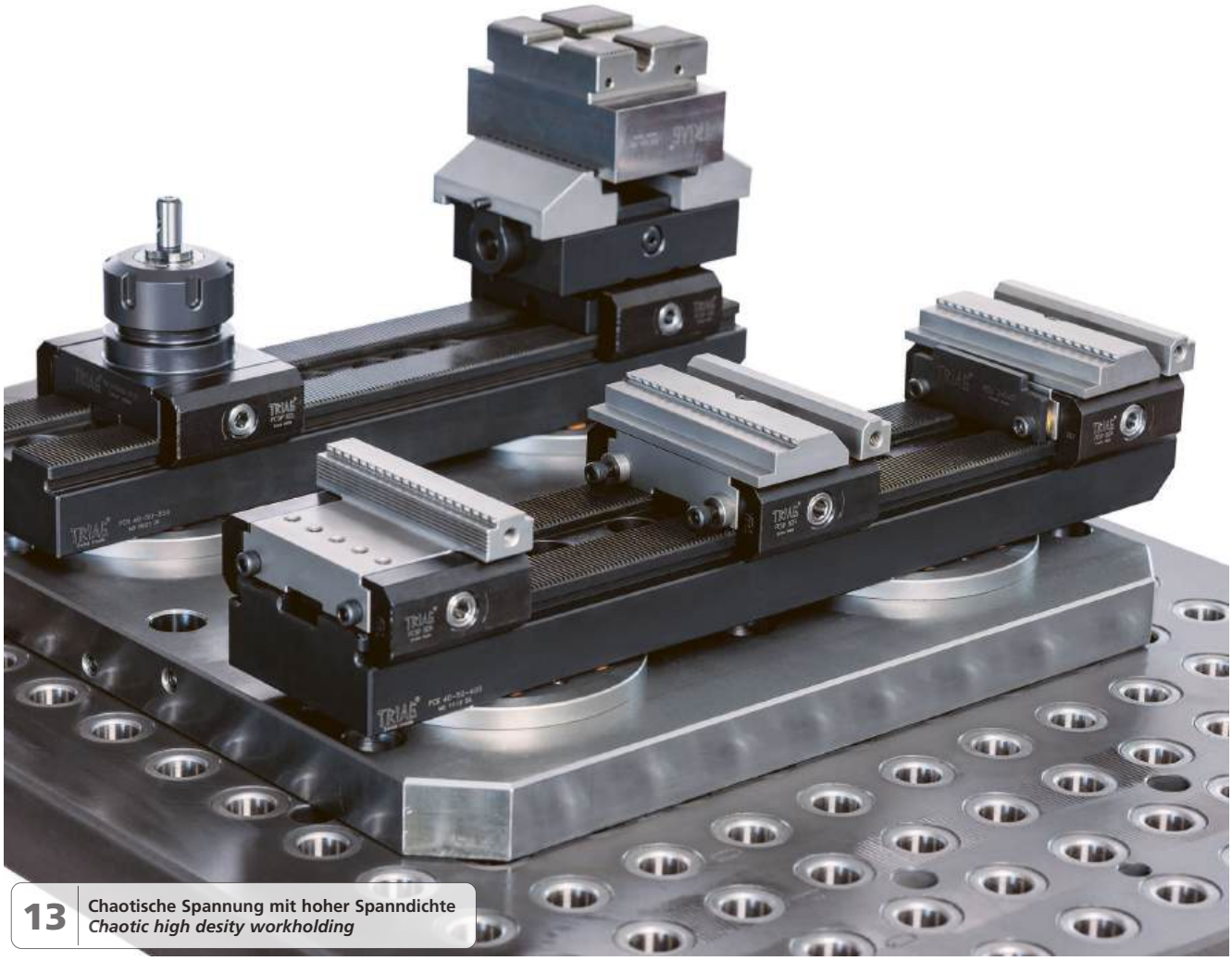
10 Einzelspannung von Platten; schraubstockähnliche Spannung (Bearbeitung einseitig)
Single clamping of plates; similar to vice machining (single side machining)



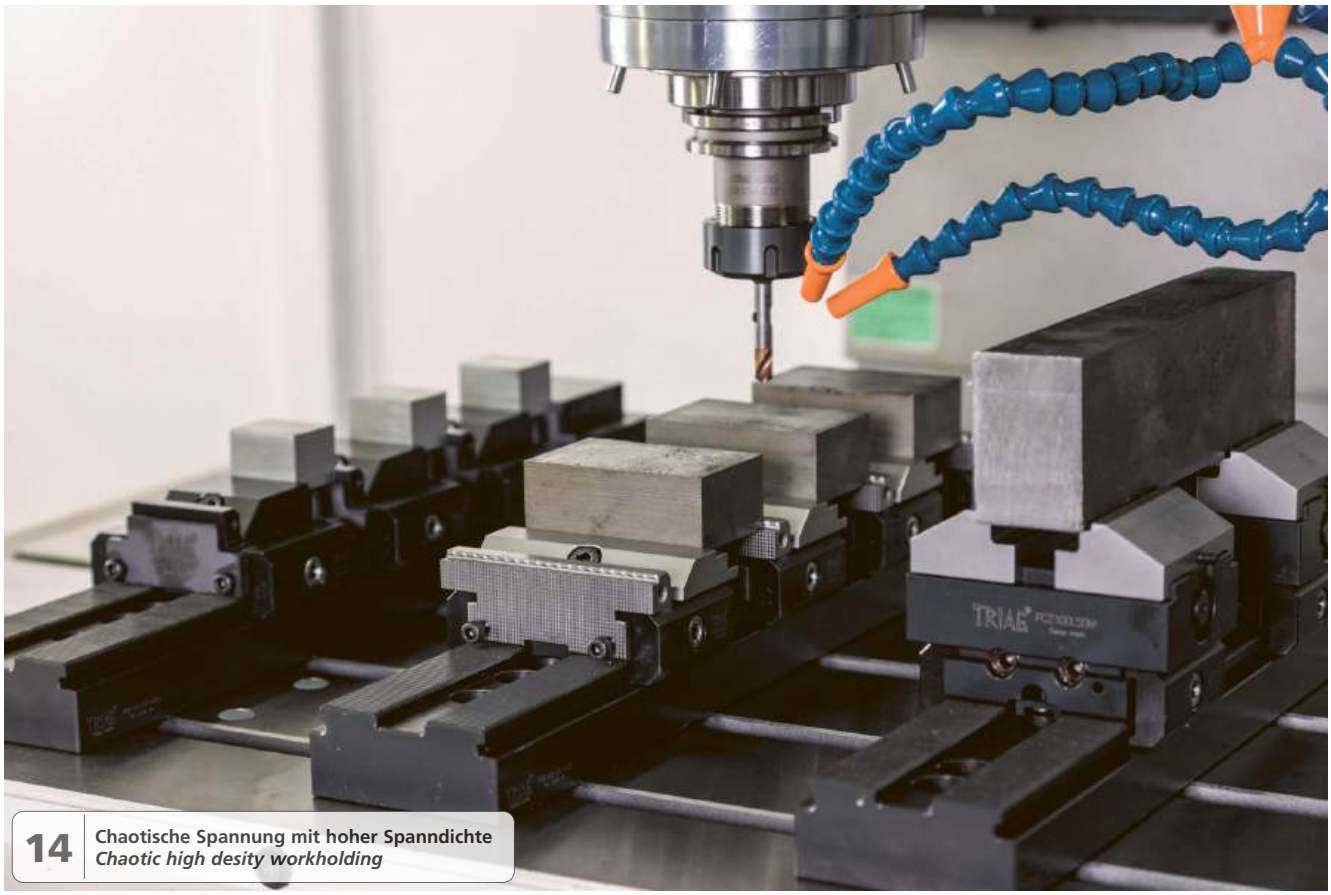
11



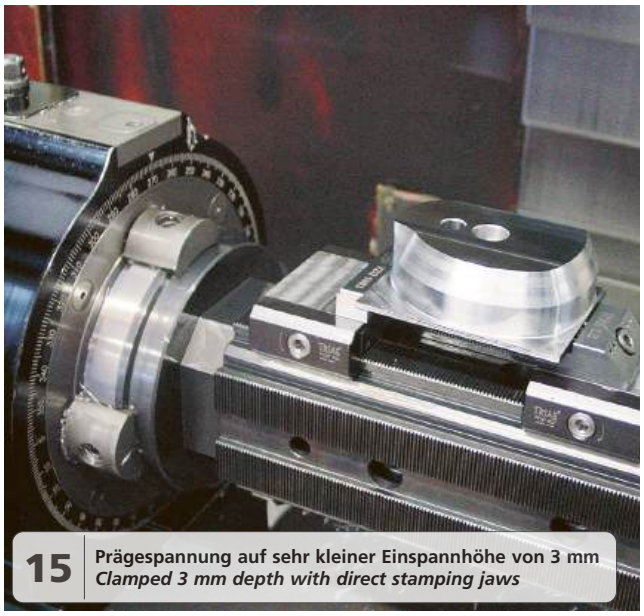
12 Verschiedene dringende Werkstücke in Bearbeitung, Grundplatte, Nutensteine und Keile (Total 9 Werkstücke)
Various urgent work pieces in progress, base plate, nuts and wedges (totally 9 pieces)



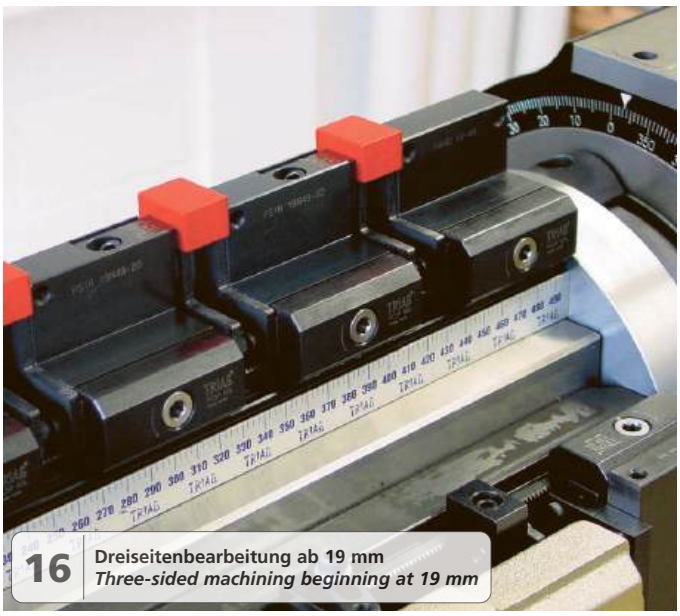
13 Chaotische Spannung mit hoher Spanndichte
Chaotic high desity workholding



14 Chaotische Spannung mit hoher Spanndichte
Chaotic high desity workholding



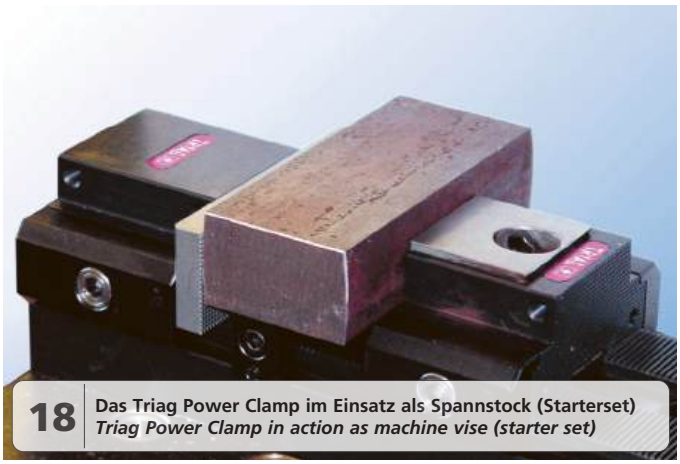
15 Prägespannung auf sehr kleiner Einspannhöhe von 3 mm
Clamped 3 mm depth with direct stamping jaws



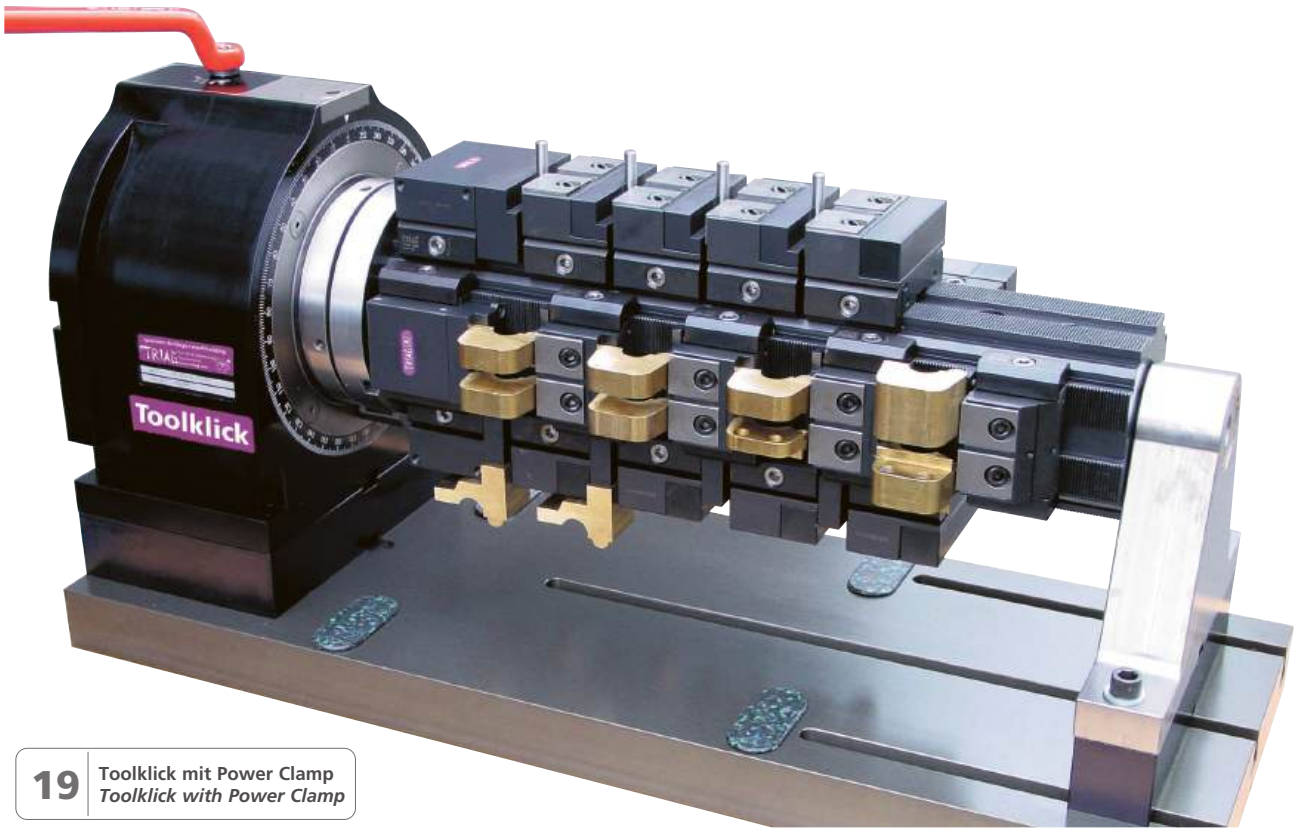
16 Dreiseitenbearbeitung ab 19 mm
Three-sided machining beginning at 19 mm



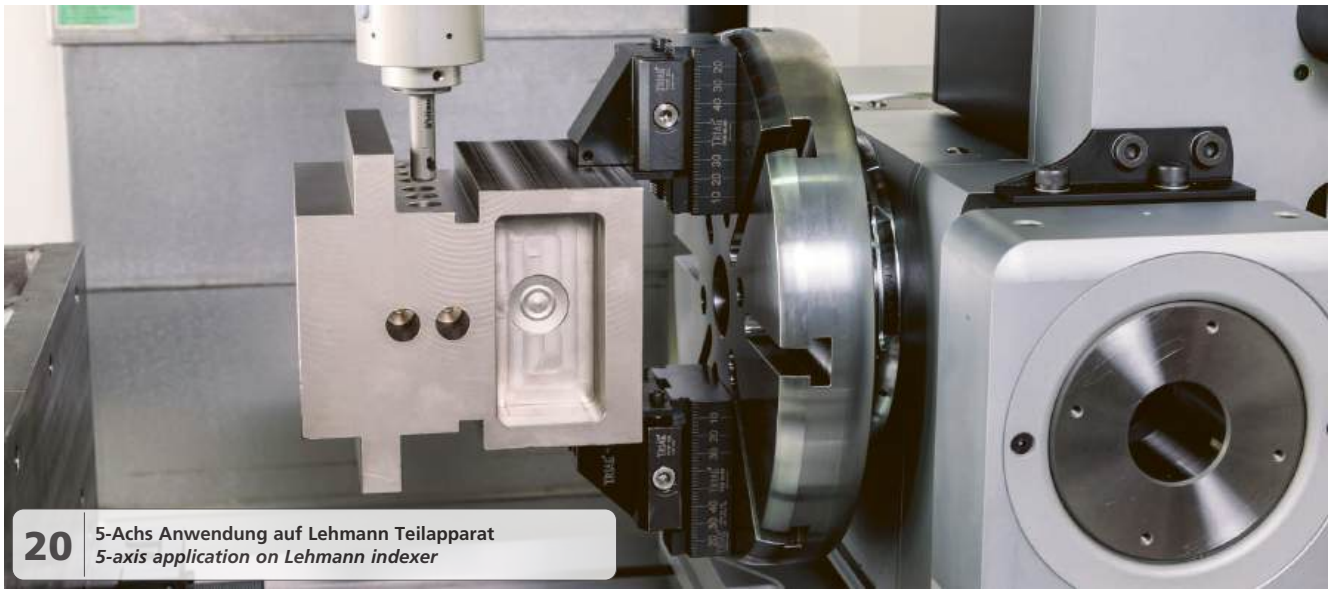
17 ... im Einsatz auf der 4. Achse
... in action on the 4th axis



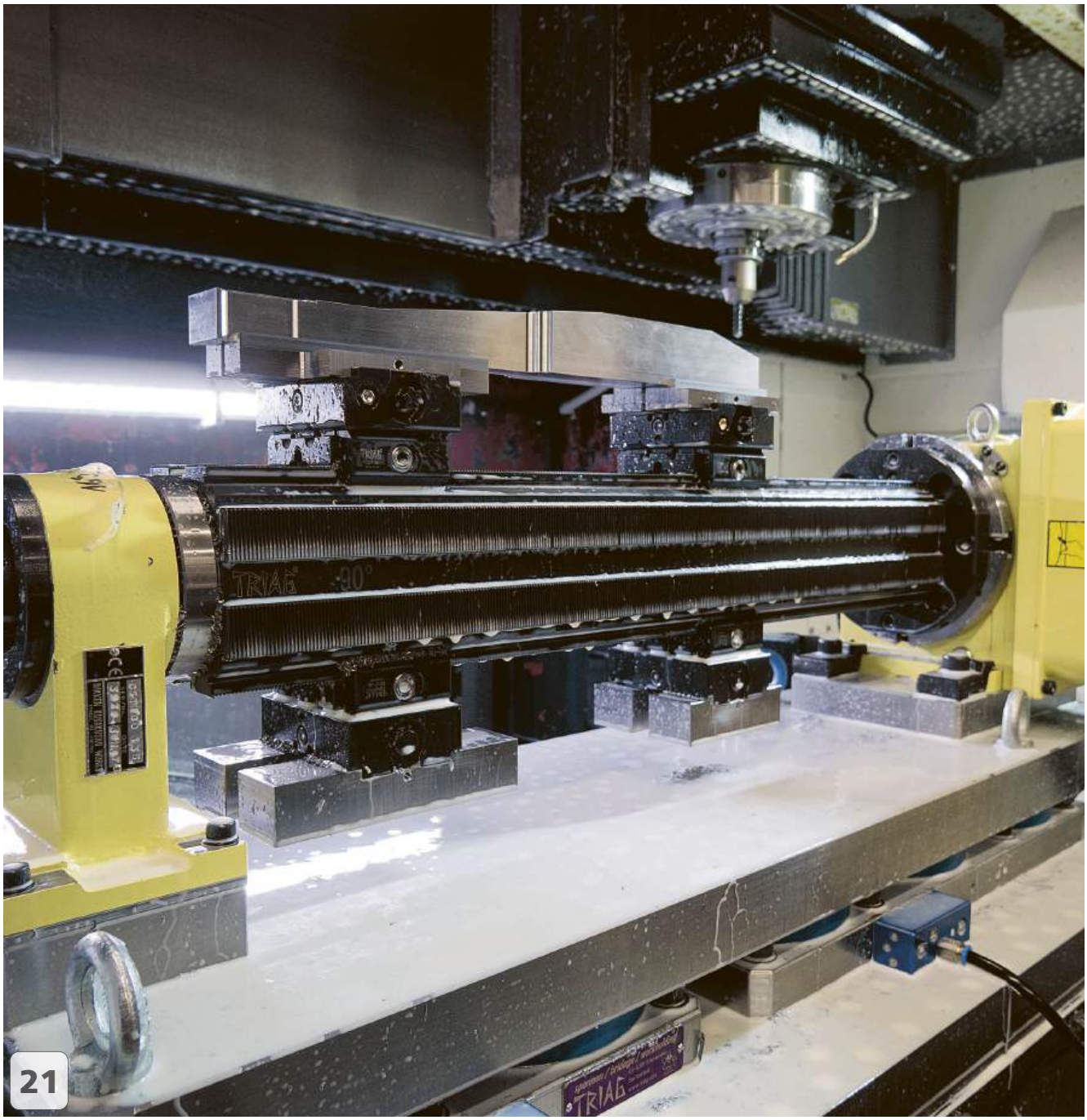
18 Das Triag Power Clamp im Einsatz als Spannstock (Starterset)
Triag Power Clamp in action as machine vise (starter set)



19 Toolklick mit Power Clamp
Toolklick with Power Clamp



20 5-Achs Anwendung auf Lehmann Teilapparat
5-axis application on Lehmann indexer



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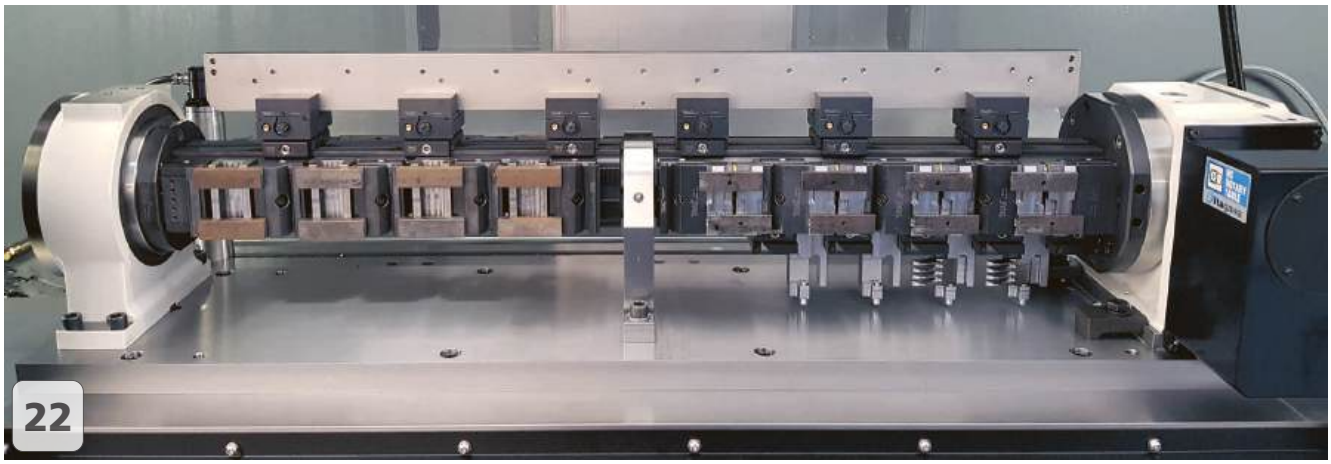
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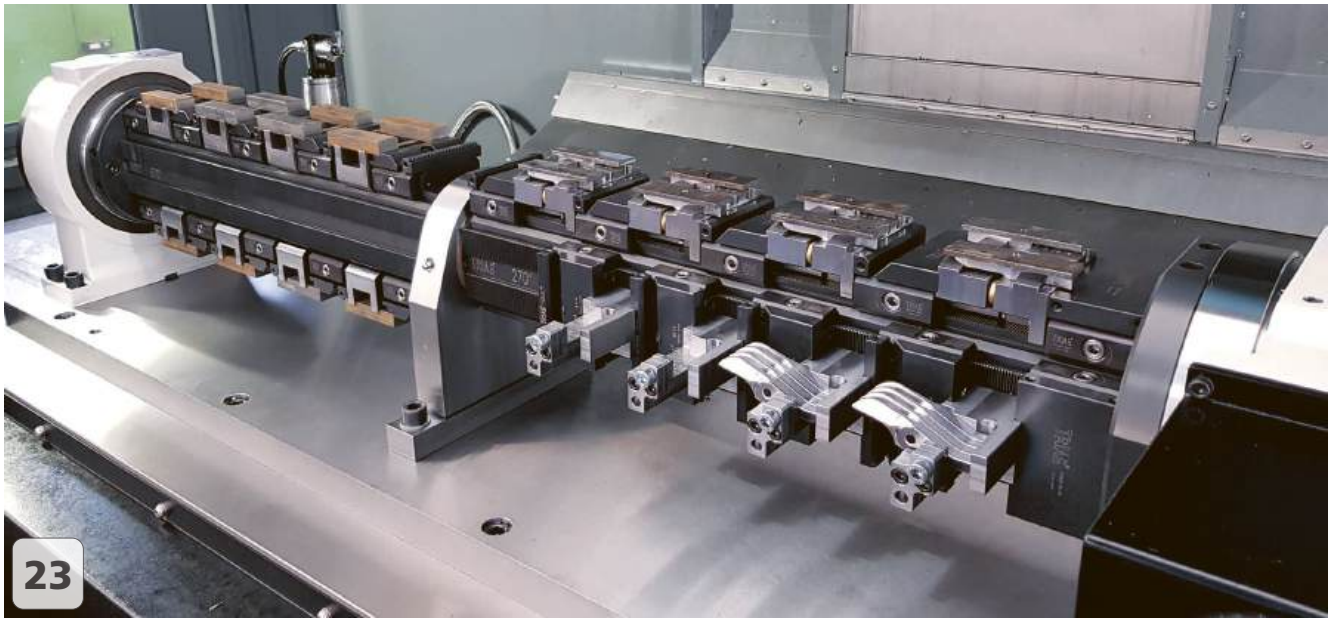
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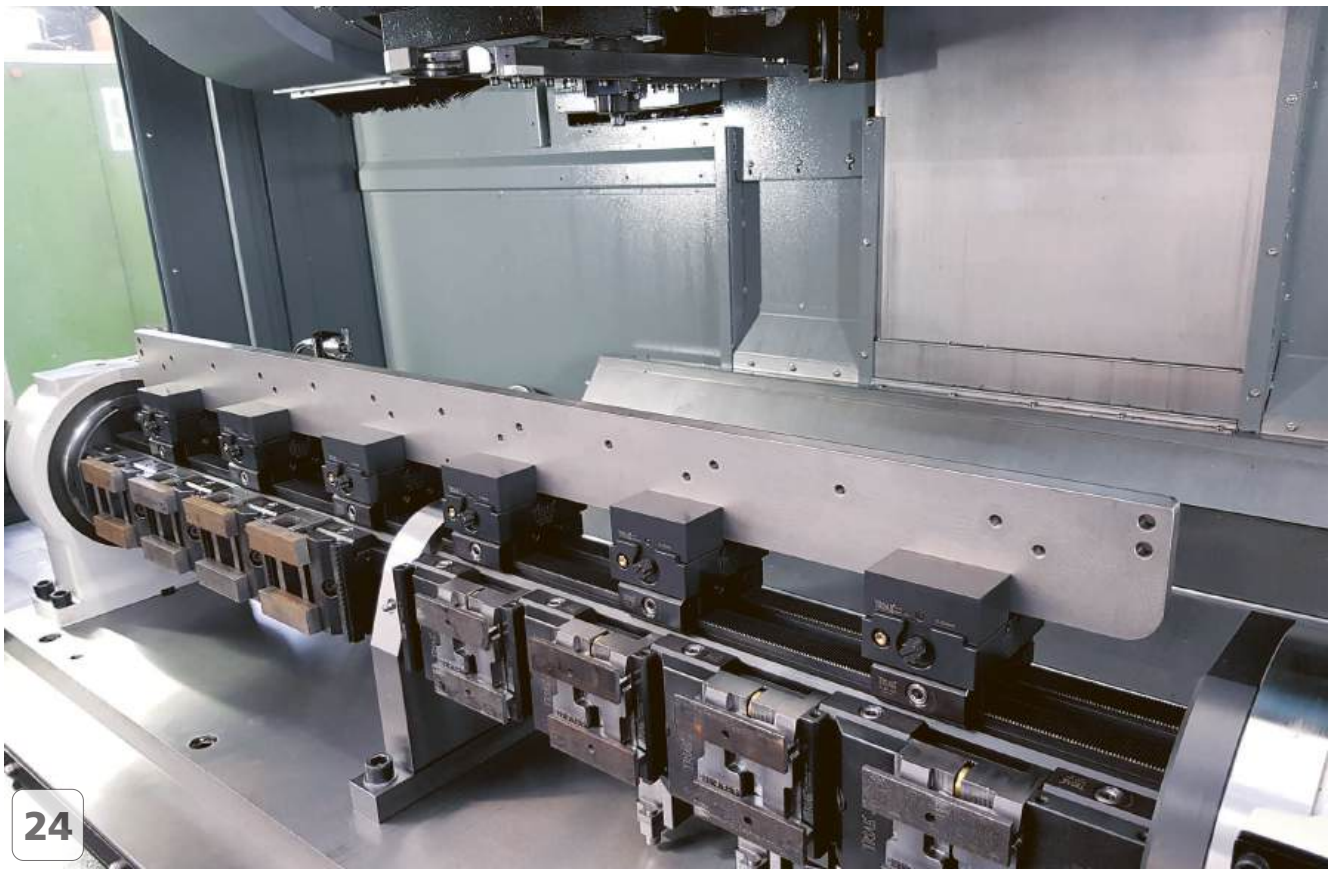
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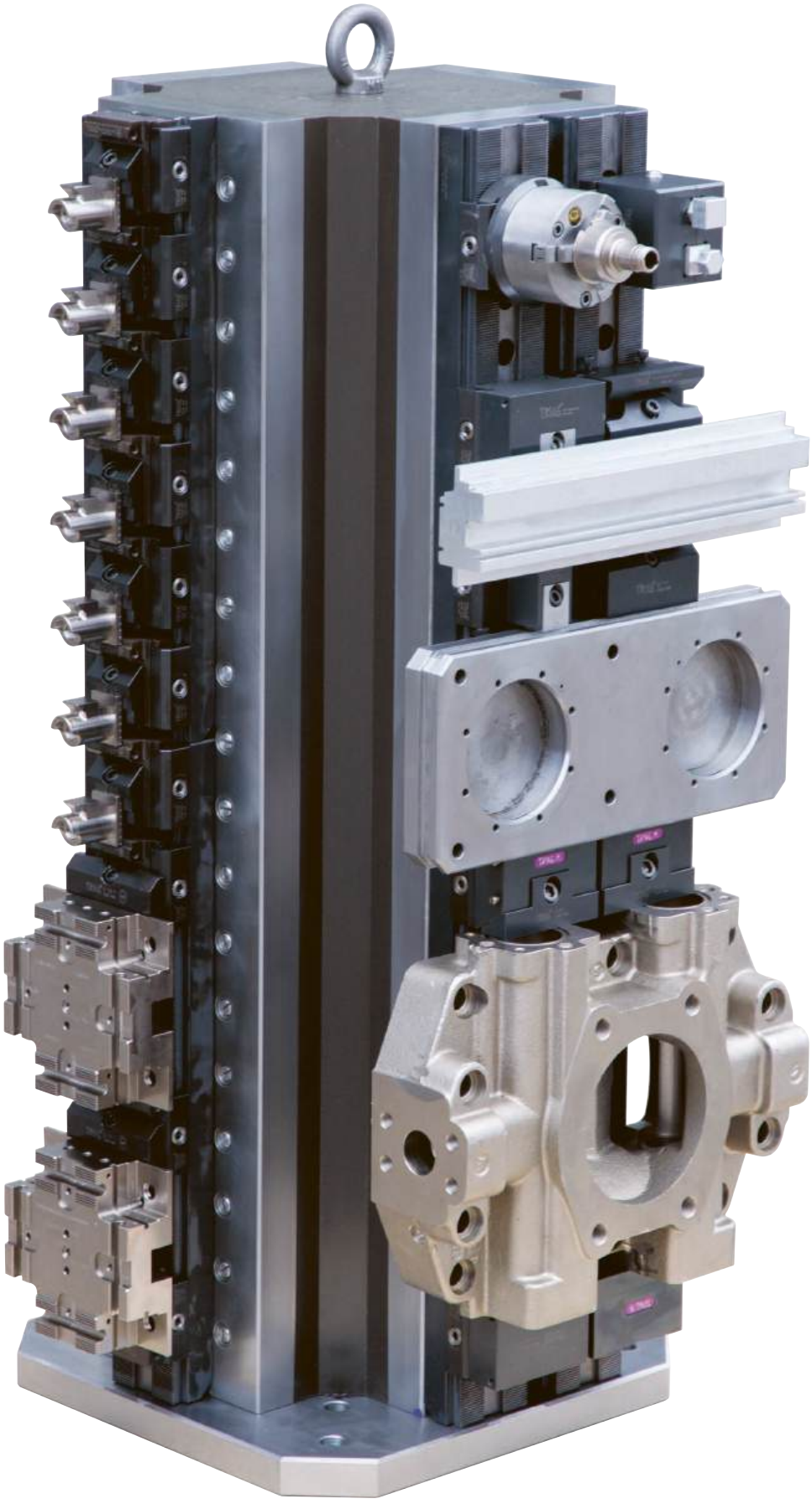
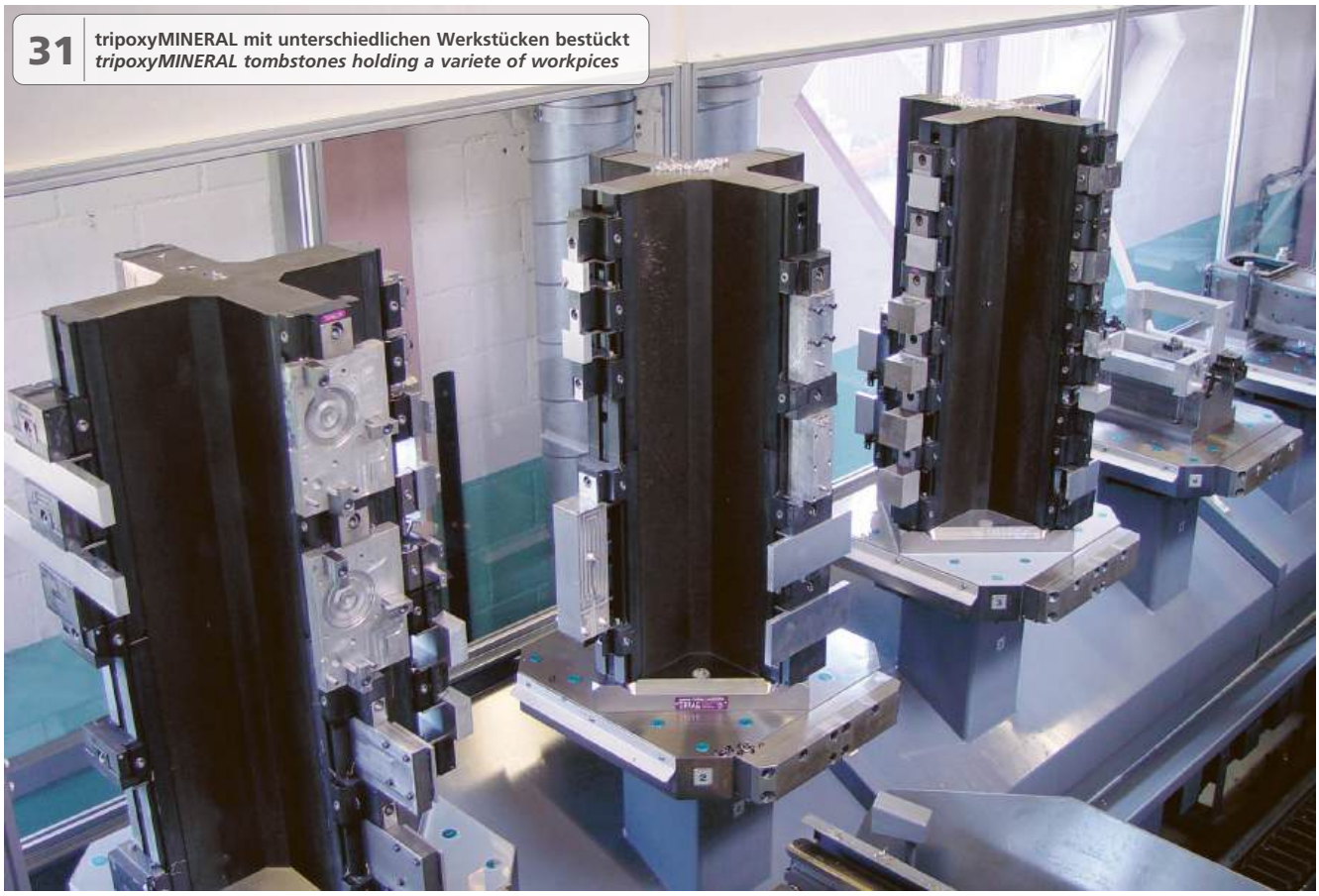


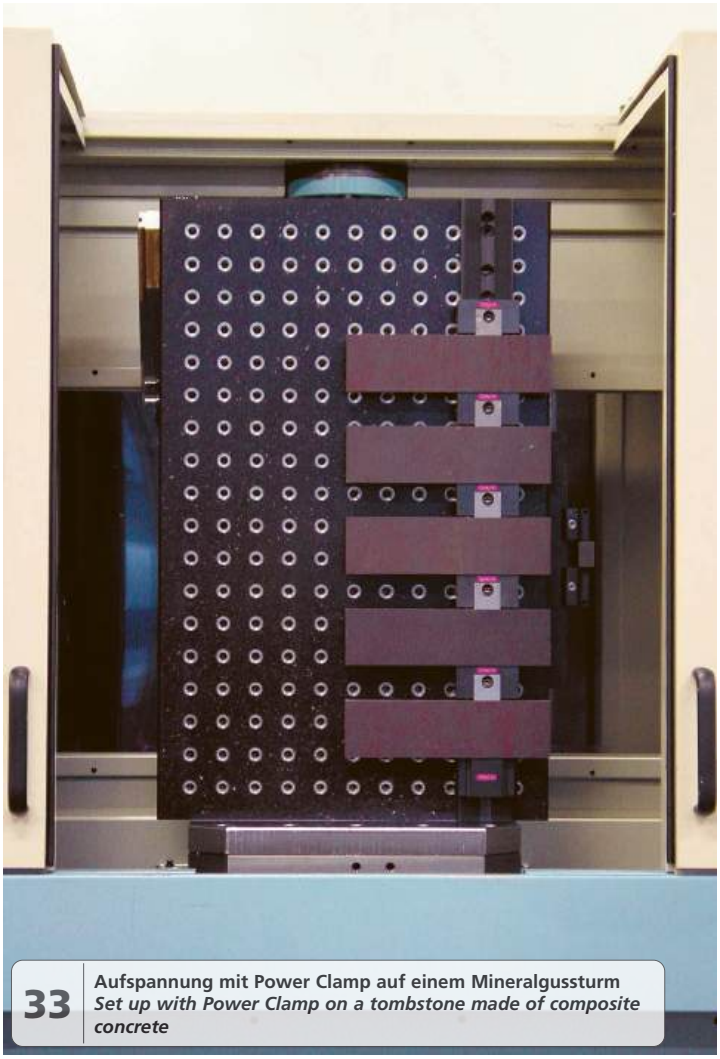
25 tripoxyMINERAL Kreuzturm mit PowerCLAMP Schienen für chaotische Spannung
tripoxyMINERAL Cross version with PowerCLAMP baserails for chaotic workholding



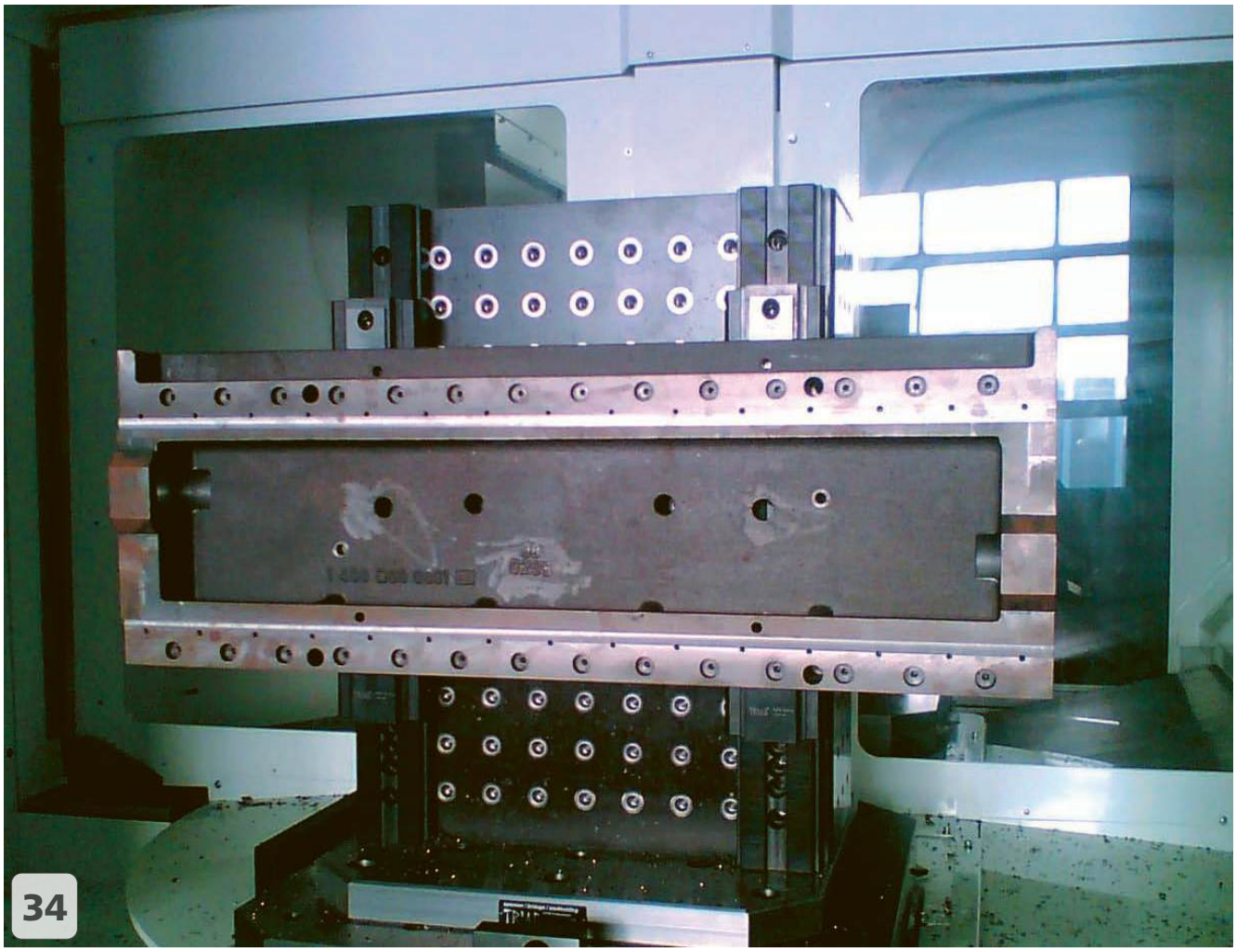
31 tripoxyMINERAL mit unterschiedlichen Werkstücken bestückt
tripoxyMINERAL tombstones holding a variete of workpices



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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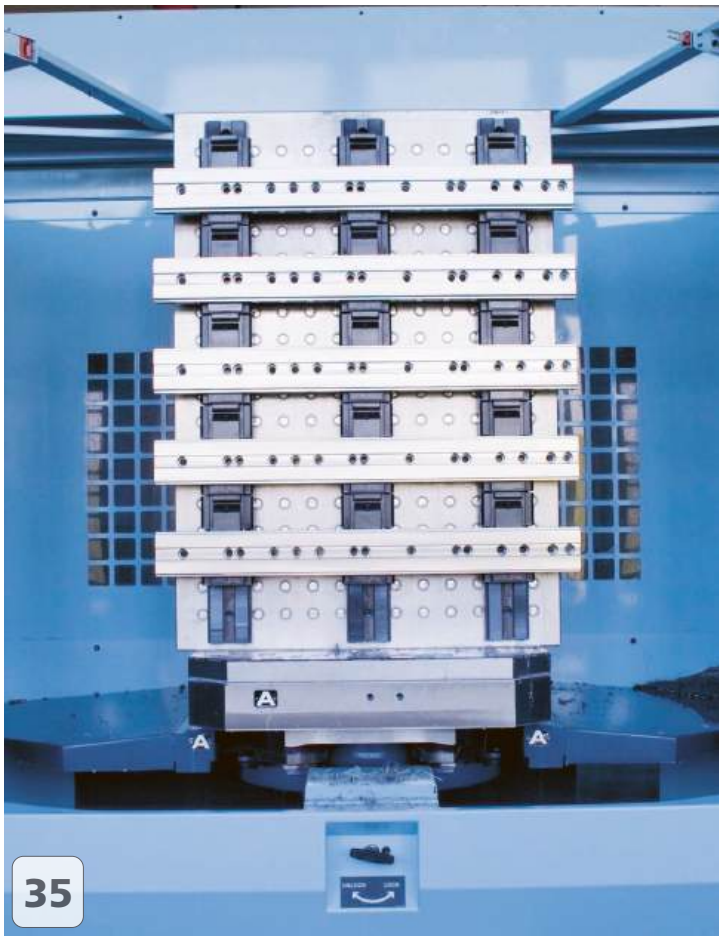
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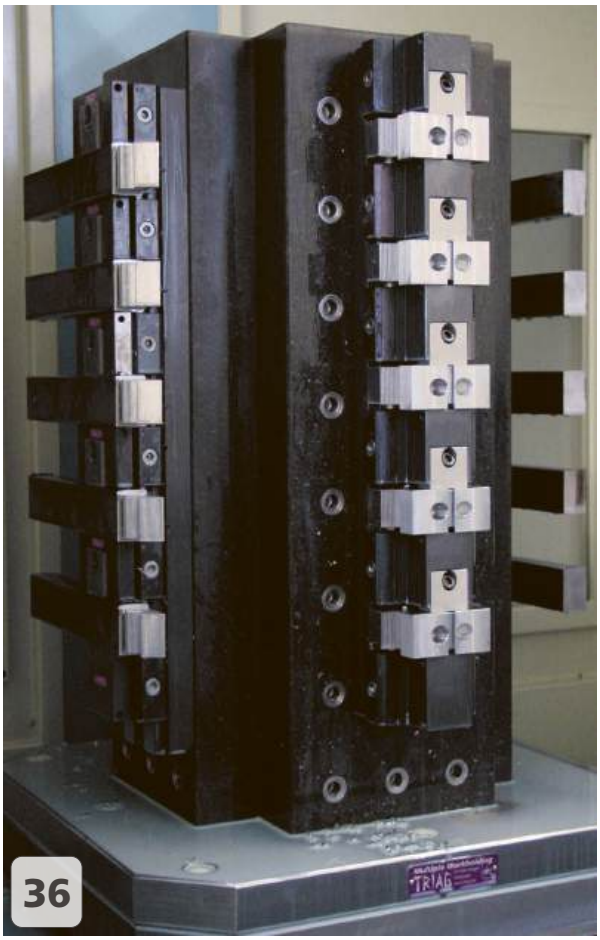
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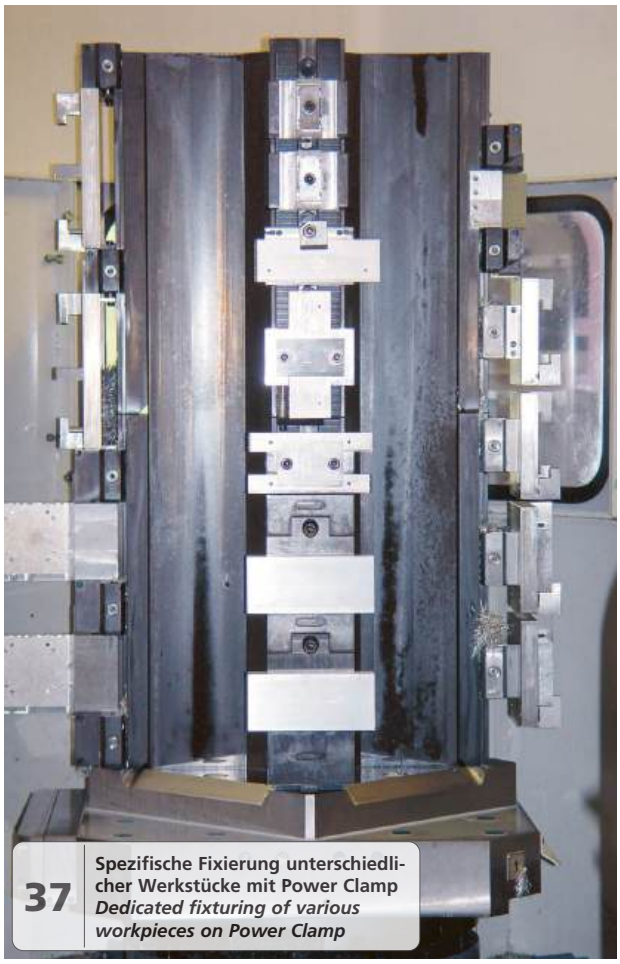
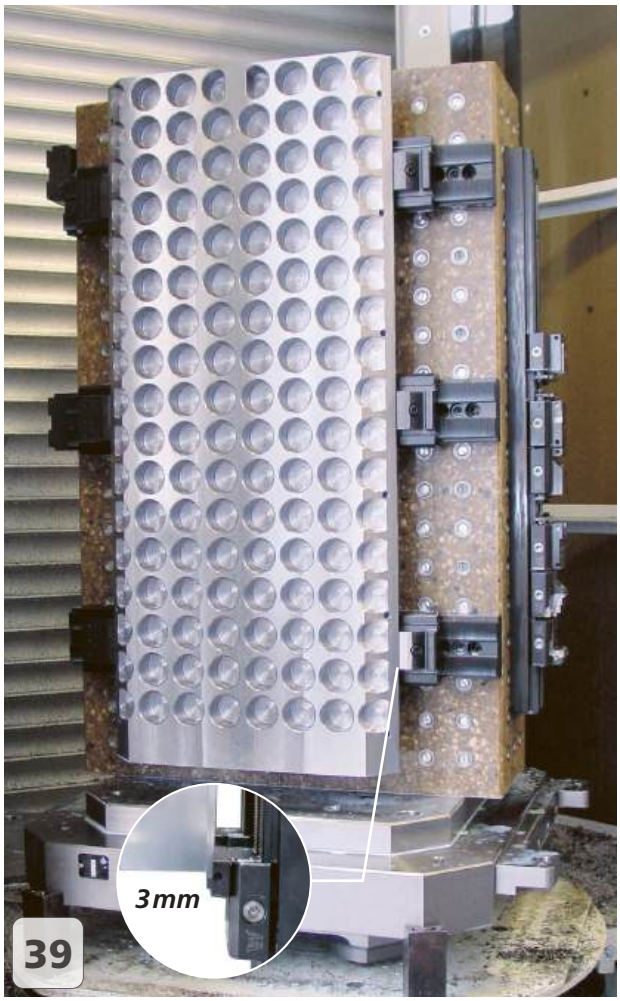


37 Spezifische Fixierung unterschiedlicher Werkstücke mit Power Clamp
Dedicated fixturing of various workpieces on Power Clamp



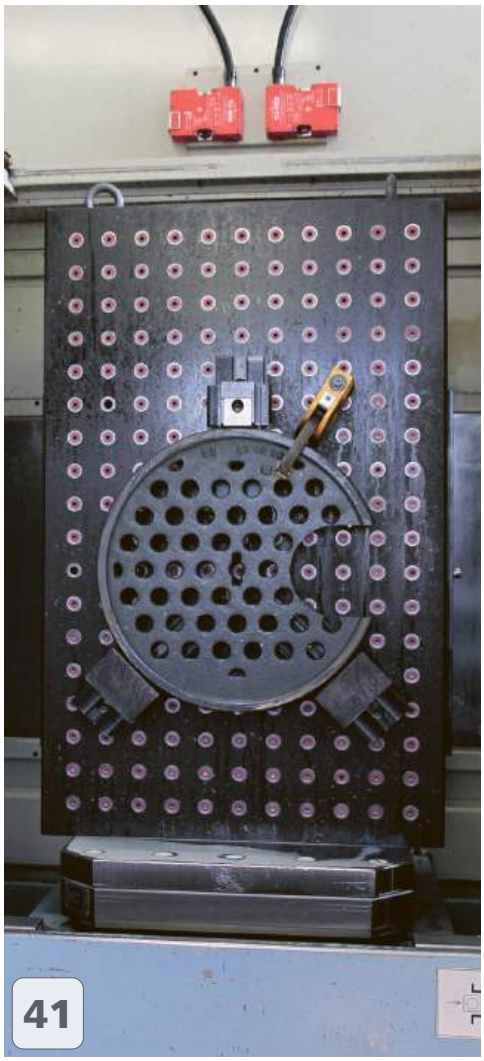
38 Prägespannung auf sehr kleiner Einspannhöhe von 3 mm
Clamped 3 mm depth with direct stamping jaws



39



40 Aufspannung mit Power Clamp auf einem „Tripoxy" Mineralgussturm
Set up with Power Clamp on a tombstone made of composite concrete



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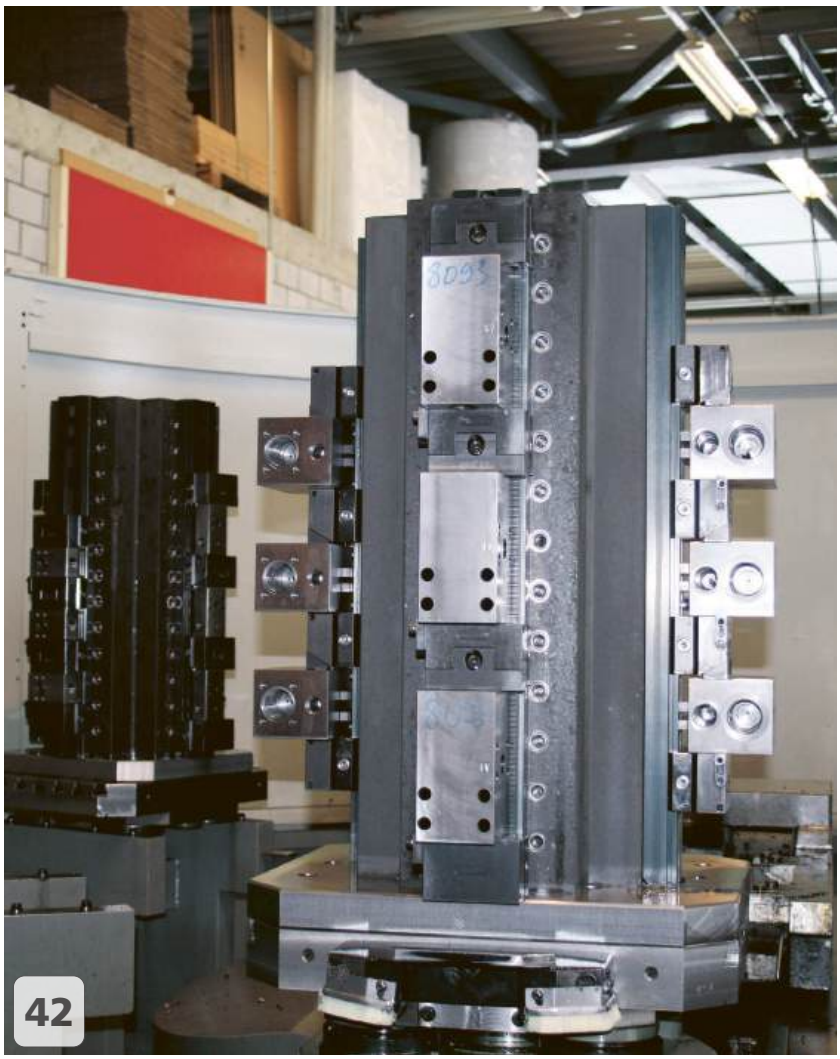

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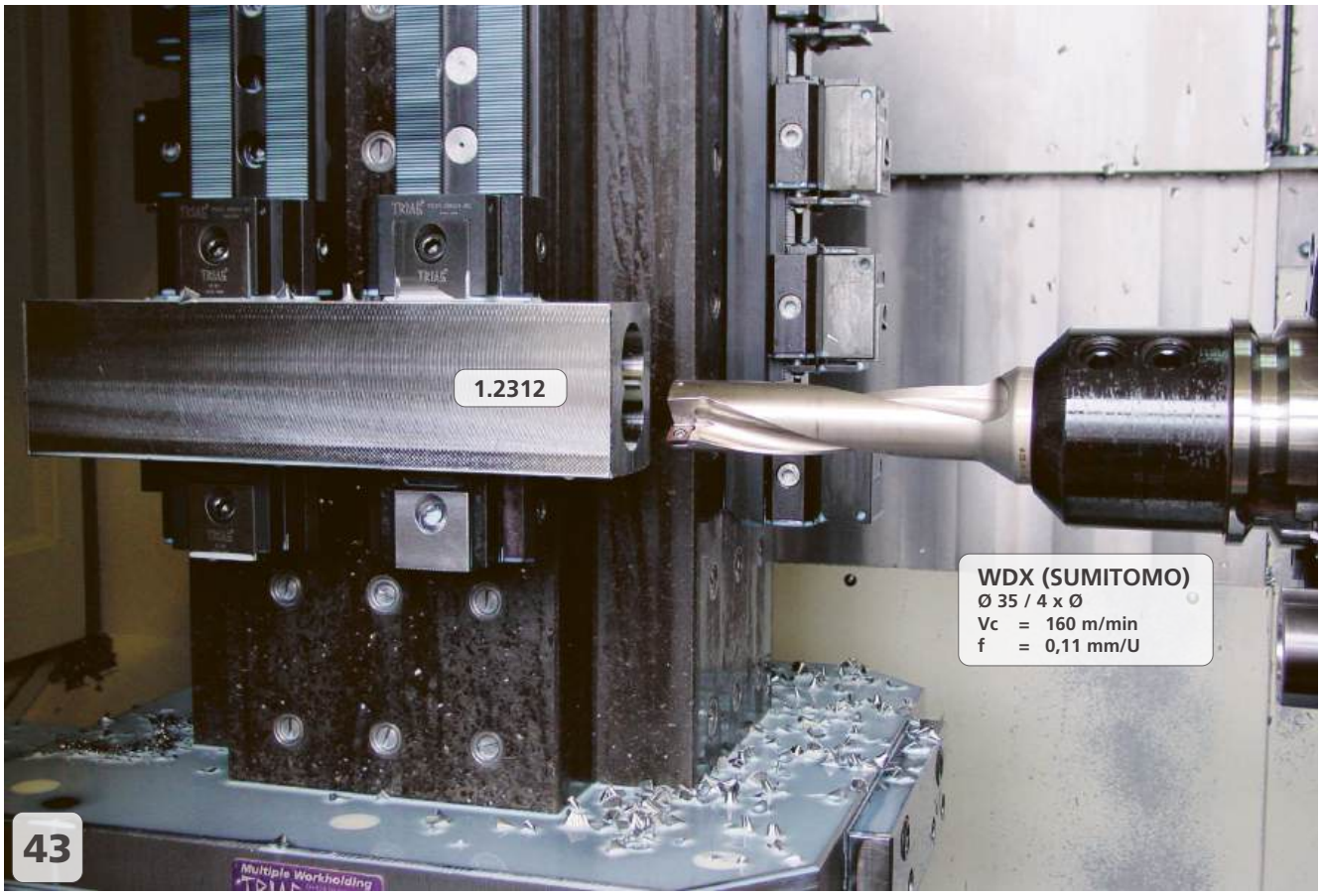

1.2312
WDX (SUMITOMO)
Ø 35 / 4 x Ø
Vc = 160 m/min
f = 0,11 mm/U
Multiple Workholding

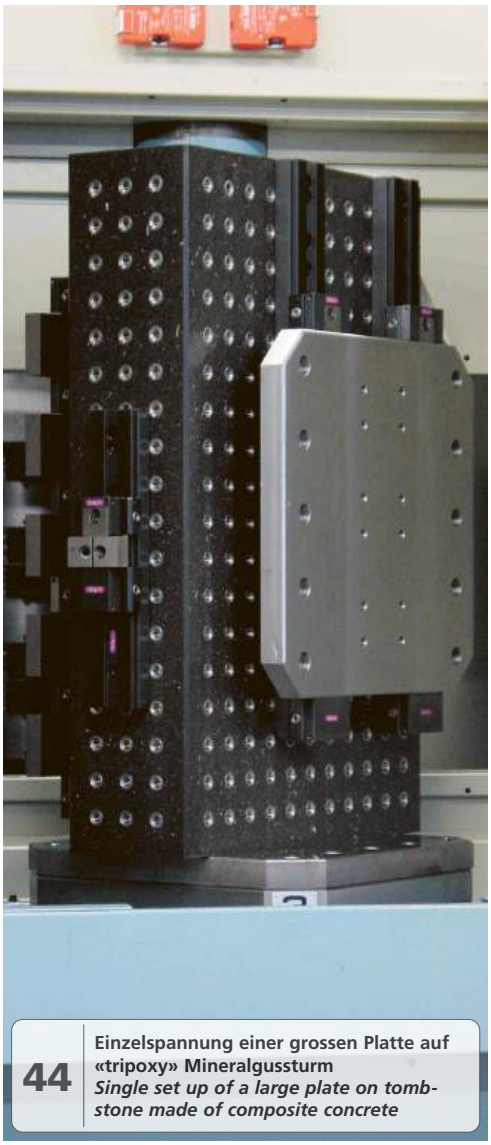
43



200 x 400 x 1330

Flügelteil für Airbus A320
Tail wing part for Airbus A320

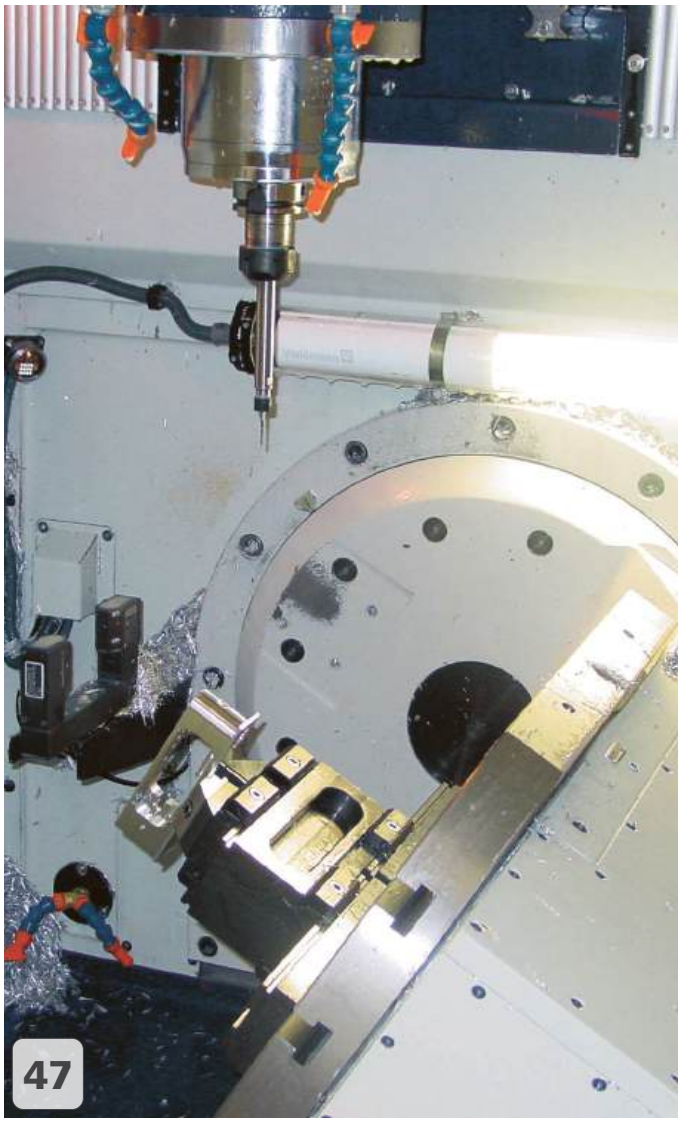
45 **Stahlmineralguss-Säulen mit Power Clamp für die Fertigung von Flügelteilen.**
Steel epoxy frames machining wing parts on a Makino machine



44 **Einzelspannung einer grossen Platte auf «tripoxy» Mineralgussturm**
Single set up of a large plate on tombstone made of composite concrete

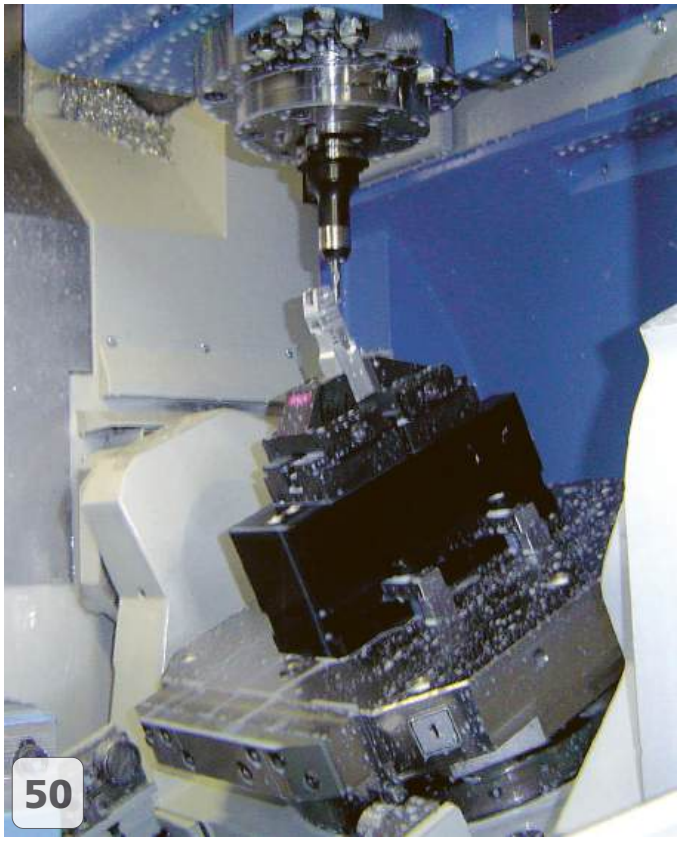


46

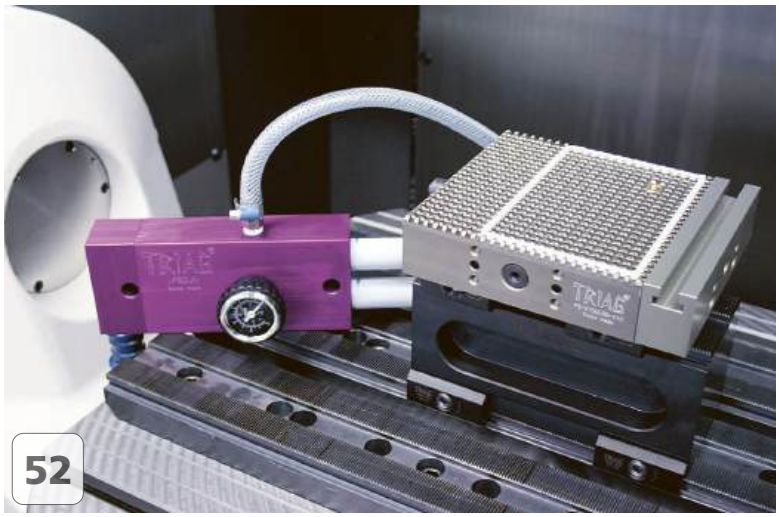

47


48 Im Einsatz auf der 5 Achsenmaschine
In action on a 5 axis machine

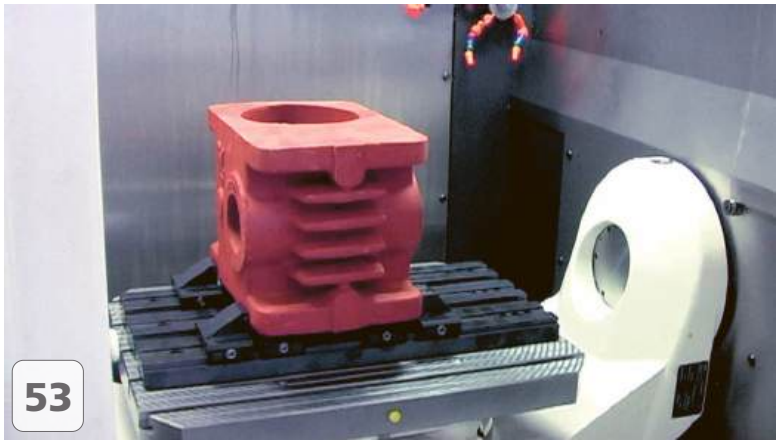

49 … im Einsatz auf der 5 Achsenmaschine
… in action on a 5 axis machine


50


51 oppSystem in Anwendung mit Werkstückwechsler
oppSystem in application with workpiece changer


52


STEP TEC
54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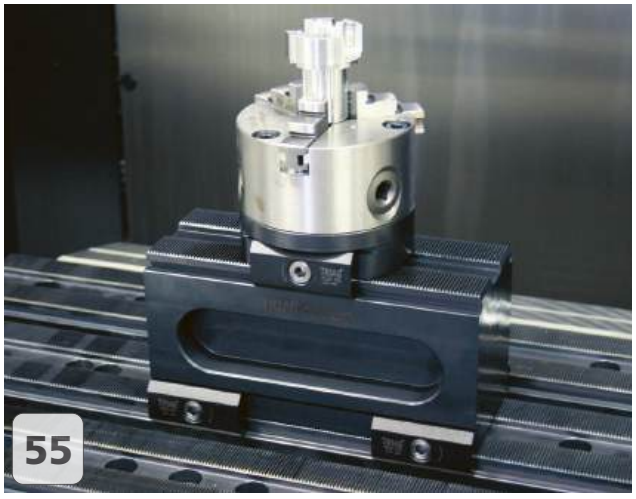
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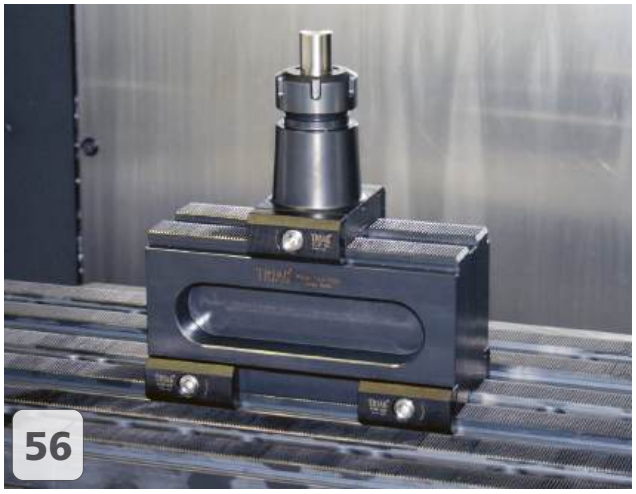
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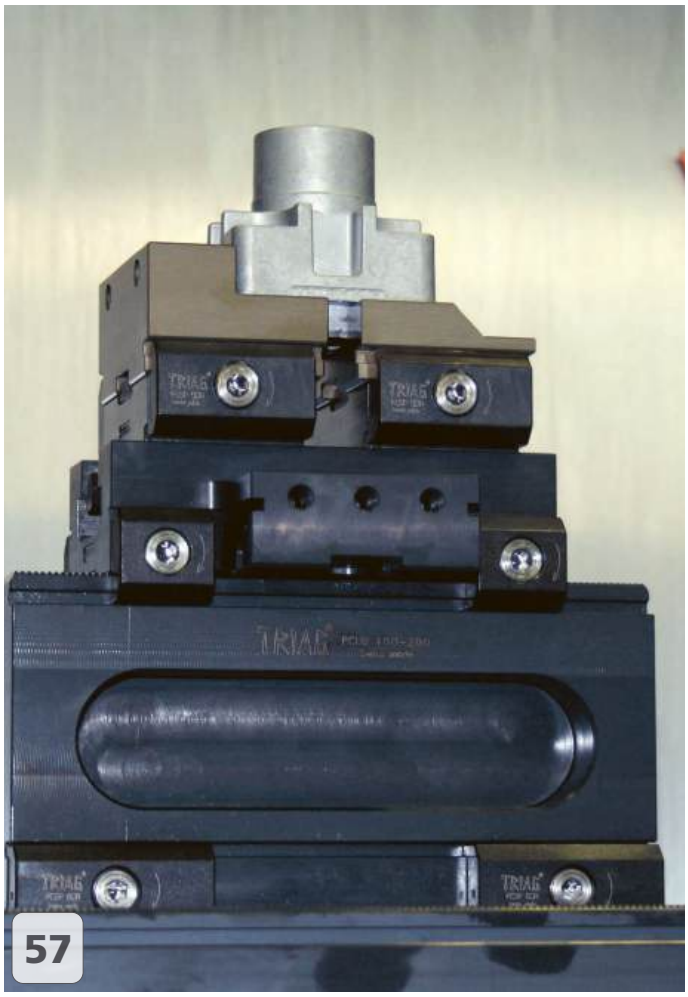
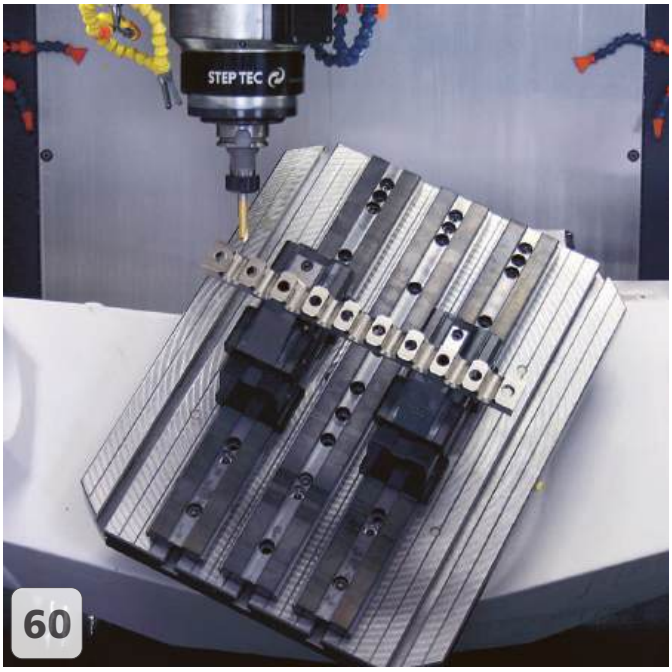
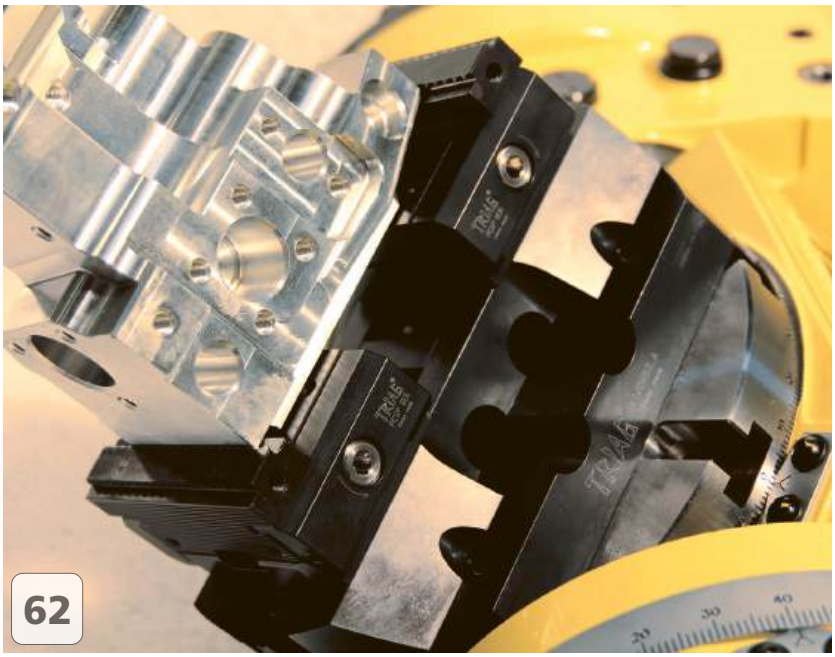

57


58


STEP TEC
59


STEP TEC
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, Vakuumspannmodule 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.*



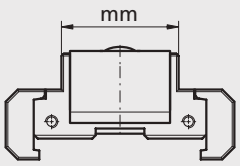
Geeignet sowohl für kleine ...
Especially suited for small ...

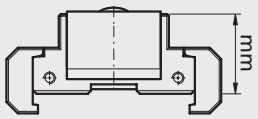


... als auch für grosse Werkstücke!
... as well as large workpieces!

System *System*	
A	Apto Clamp
P	Power Clamp
C	Compact Clamp
M	Micro Clamp
V	Vorrichtungsbaumodule *Workholding modules for dedicated fixtures*

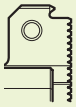
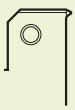
bei Anschlagmodulen *for end module*	
N	nitriergehärtet *nitrated*
D	durchgehärtet *through hardened*
bei Spannmodulen *for vice modules*	
1 2 3	Anzahl Spannbacken *Number of jaws*
-	keine Spannbacke *no clamping jaw*

Modulnutzbreite *Module clamping width*	
19 25 26 34 43 48 58 61 68 78 94 125	

Modulnutzhöhe *Module clamping height*	
34 44 49 62 75 78	

P S 1 R 48 N 34 -80

Modultyp *Type of module*	
A	Anschlagmodul *End module*
S	Spannmodul *Clamping module*
T	Trägermodul *Supporting module*
R	Rohling *Blank*

Anschlagfläche der Module *Datum face*	
F	Anschlagfläche glatt *Datum face flat*
R	Anschlagfläche geriffelt *Datum face double serrated*
D	eine Seite glatt, eine Seite geriffelt *one face flat, one face double serrated*
G	Anschlagfläche gerillt *Datum face serrated*
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*

Backenhub *Stroke of clamping jaw*	
N	Niederzug *Pull down*
L	linear / parallel *linear / parallel*
-	ohne Spannbacke *no clamping jaw*

Spannbackentyp *Type of clamping jaw*	
B01 - B313	Spannbacken *Clamping jaws*
-013 - -105	Modul ohne Spannbacken *Module without clamping jaw*





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.

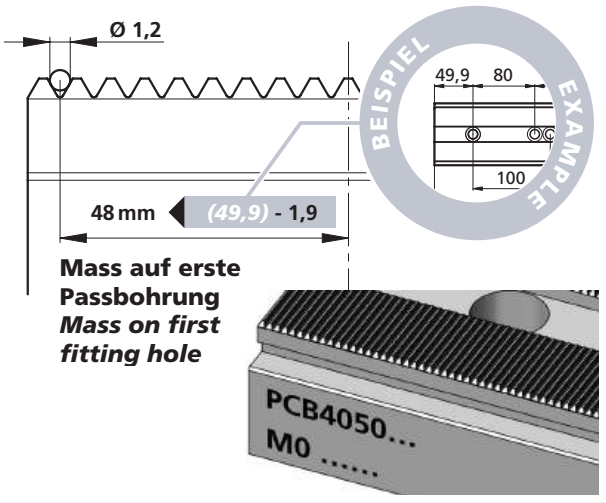
The serrated base rail is the basic structure of the Power Clamp workholding system

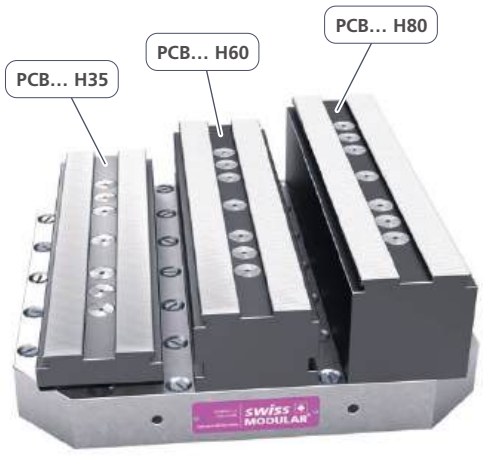
Using the base rail as a modular workholding vise is standard practice to any mechanic. The advantages of using it as a zero point system have also widely influenced the planning stages of mechanical production.

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*

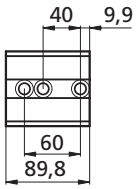
Toleranzenklassen *Tolerance classes*	
P6	+0.06
P5	+0.05
P4	+0.04
P3	+0.03
P2	+0.02
P1	+0.01
P0	+0.005
M0	-0.005
M1	-0.01
M2	-0.02
M3	-0.03
M4	-0.04
M5	-0.05
M6	-0.06



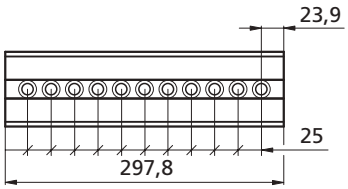


Basisschienen / *Base-rail* **p. 42 - 46**

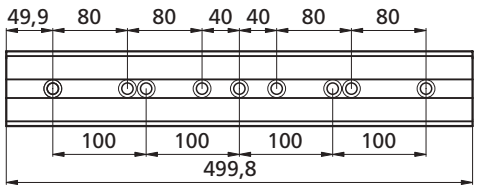
PCB6090 kg ~1,7



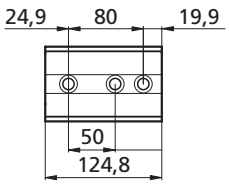
PCB25300 kg ~5,4



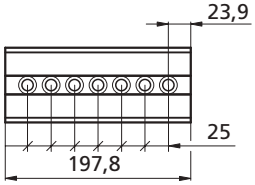
PCB4050500 kg ~9,5



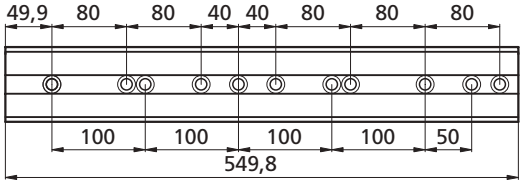
PCB4050125 kg ~2,3



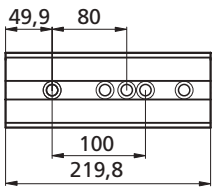
PCB25200 kg ~3,6

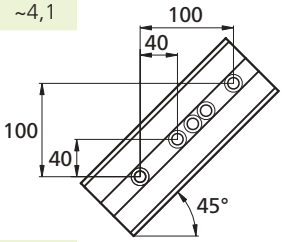


PCB4050550 kg ~10,3

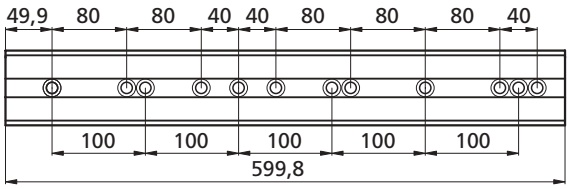


PCB4050220W2 kg ~4,1

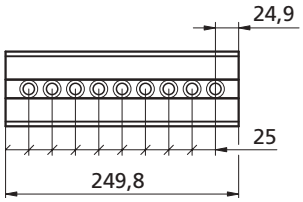


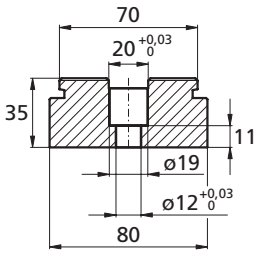


PCB4050600 kg ~11,3

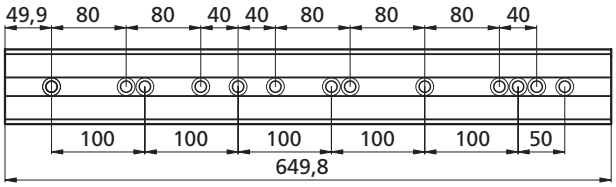


PCB2550250 kg ~4,5

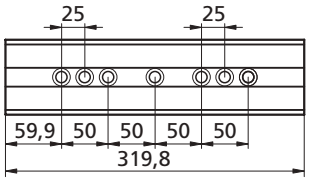


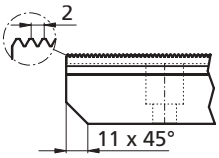


PCB4050650 kg ~12,2

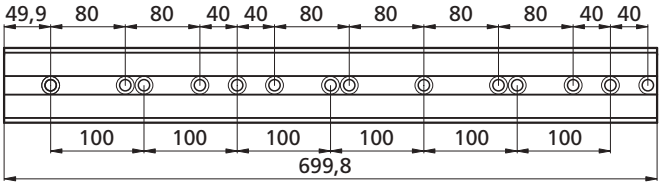


PCB50320 kg ~6,0

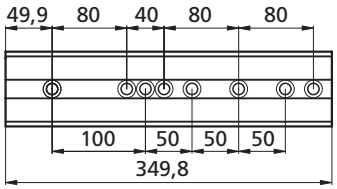




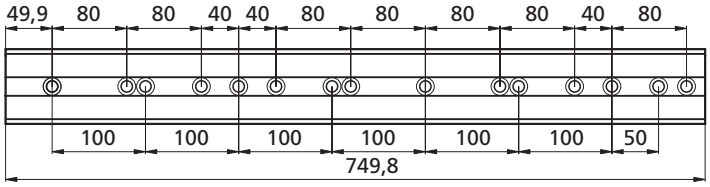
PCB4050700 kg ~13,2



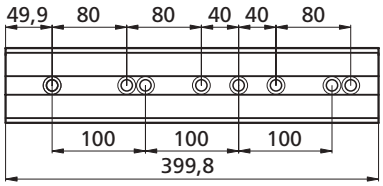
PCB4050350 kg ~6,5



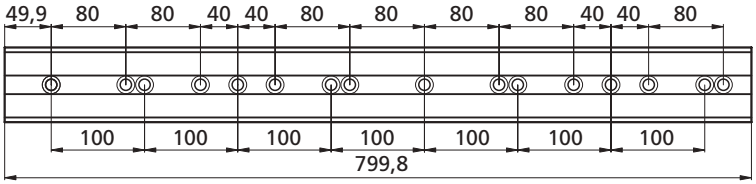
PCB4050750 kg ~14,1



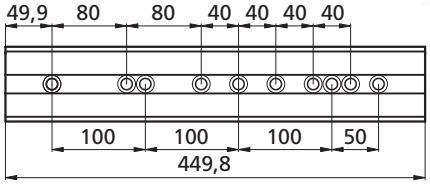
PCB4050400 kg ~7,5



PCB4050800 kg ~15,0



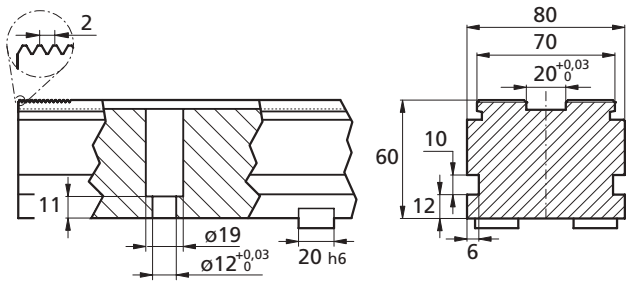
PCB4050450 kg ~8,4



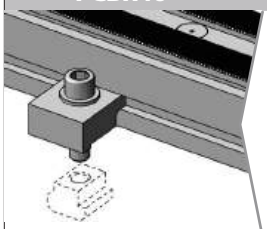


Basisschienen in Zoll
Base rails in inch

Bestellbeispiel / *Ordering example:* PCB4050125

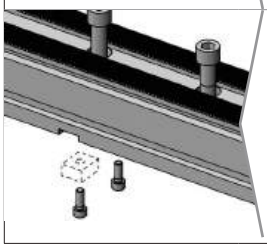


PCBR40



1. Befestigung
Mit den seitlichen Pratzen, kann die Basisschiene frei auf Ihrem Maschinentisch montiert werden.

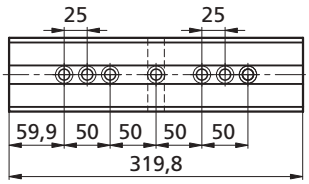
1. Fastening
With the lateral clamps, the base-rail can be mounted freely on your machine table.



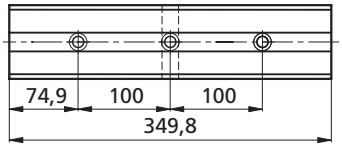
2. Befestigung
Diese Nutensteine sind zum Ausrichten der Basisschiene auf Ihrem Maschinentisch.

2. Fastening
These t-slot nuts are for aligning the base-rail on your machine table.

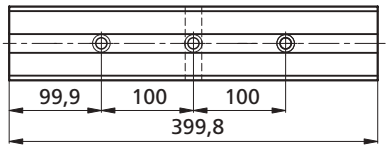
PCB50320H60	
1	1x TF190449
2	2x **M6X12ISO4762**
3	2x **SM1136-20**
kg	~10,3

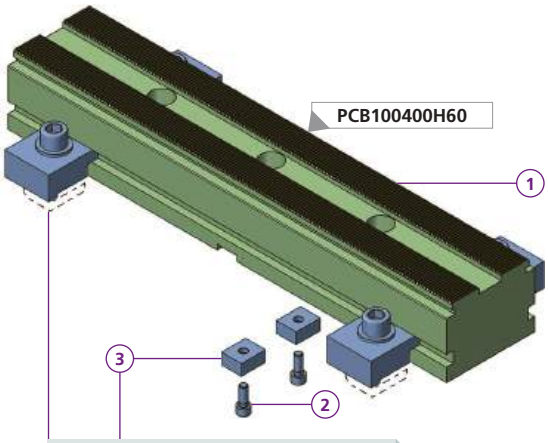


PCB100350H60	
1	1x TH170888
2	2x **M6X12ISO4762**
3	2x **SM1136-20**
kg	~11,7



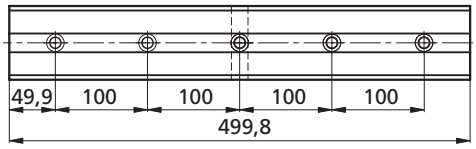
PCB100400H60	
1	1x TB140546
2	2x **M6X12ISO4762**
3	2x **SM1136-20**
kg	~13,4



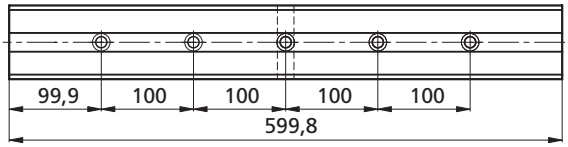


Zubehör / Accessories **p. 338**

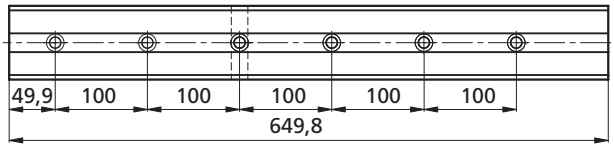
PCB100500H60	
1	1x TB140553
2	2x **M6X12ISO4762**
3	2x **SM1136-20**
kg	~16,7



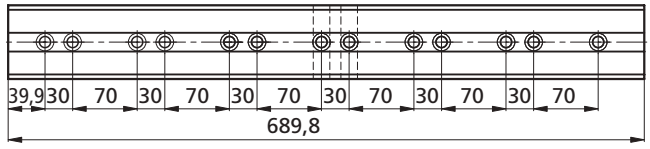
PCB100600H60	
1	1x TB140556
2	2x **M6X12ISO4762**
3	2x **SM1136-20**
kg	~20,1



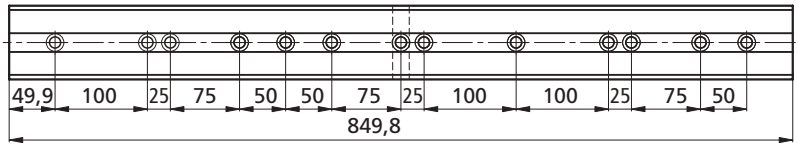
PCB100650H60	
1	1x TB140559
2	2x **M6X12ISO4762**
3	2x **SM1136-20**
kg	~21,8



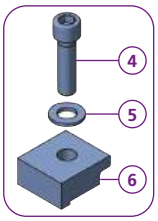
PCB100690H60	
1	1x ZL100122
2	2x **M6X12ISO4762**
3	2x **SM1136-20**
kg	~22,6



PCB100850H60	
1	1x TB140562
2	2x **M6X12ISO4762**
3	2x **SM1136-20**
kg	~27,9



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



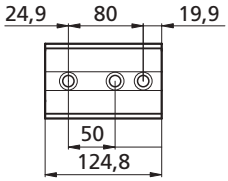
T-Nutensteine
T-slot nuts

T-Nutensteine je nach Maschinentisch, muss separat bestellt werden.

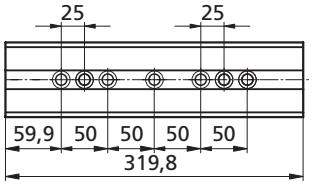
T-slot nuts depending on the machine table, must be ordered separately.

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

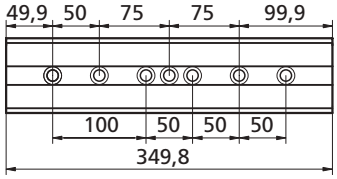
PCB4050125H80 **kg** ~5,5



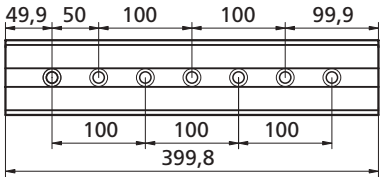
PCB50320H80 **kg** ~14,3



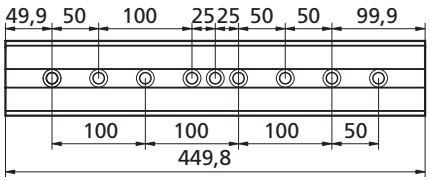
PCB50350H80 **kg** ~15,8



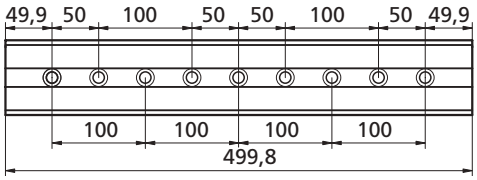
PCB50400H80 **kg** ~18,1



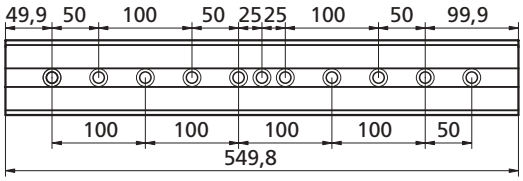
PCB50450H80 **kg** ~20,2



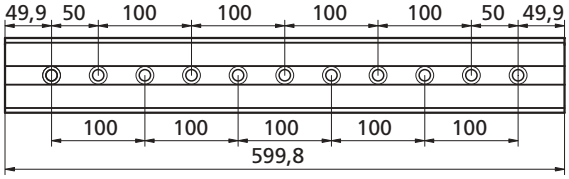
PCB50500H80 **kg** ~22,6



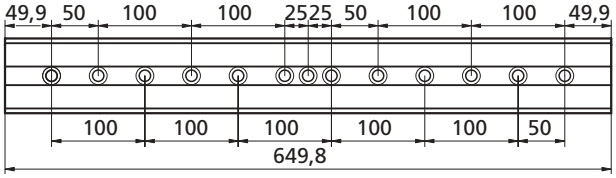
PCB50550H80 **kg** ~24,7



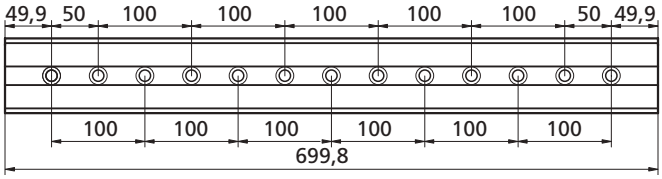
PCB50600H80 **kg** ~27,3



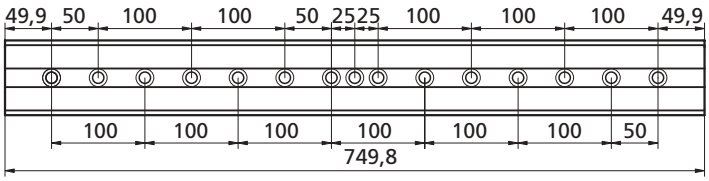
PCB50650H80 **kg** ~29,2

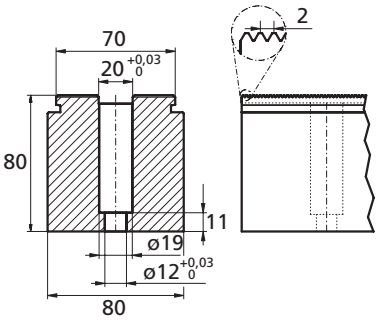


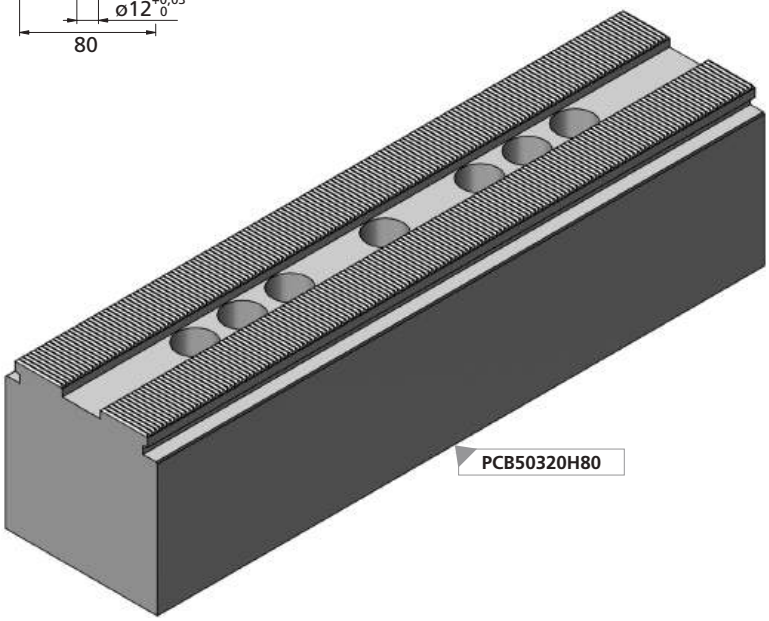
PCB50700H80 **kg** ~31,5



PCB50750H80 **kg** ~33,9

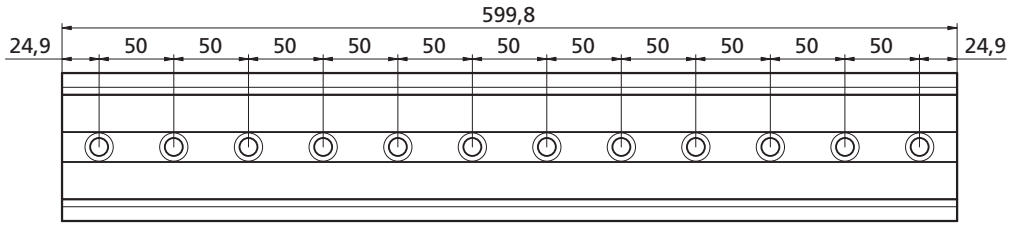




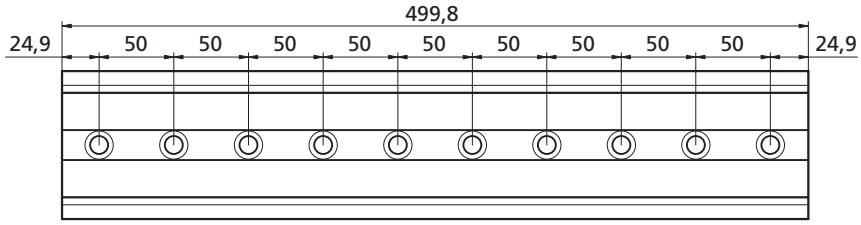


Bestellbeispiel / ***Ordering example:*** **PCB4050125H80**

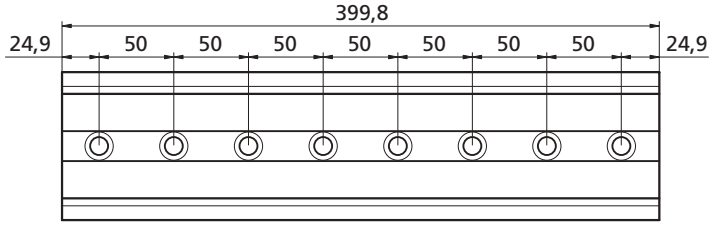
PCMB50600H175 **kg** ~39



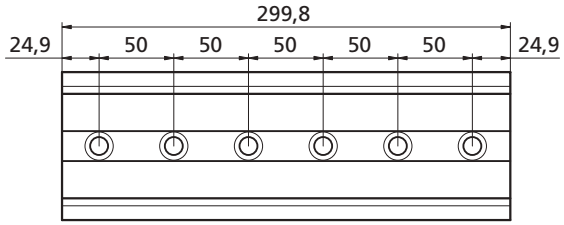
PCMB50500H175 **kg** ~34

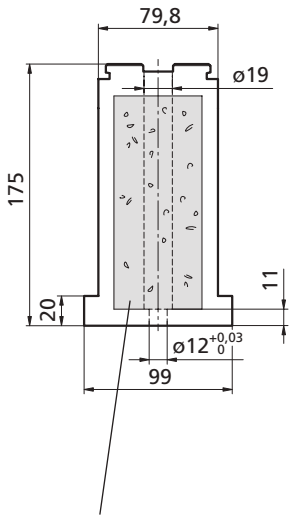


PCMB50400H175 **kg** ~27



PCMB50300H175 **kg** ~22





Epoxy Mineral
Für gute Vibrationsdämpfung
For brilliant dampening effect



Bestellbeispiel / *Ordering example:* PCMB50600H175

Kupplungsstück (Basisschienen zum koppeln)
Coupling element (Base rails for coupling)

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

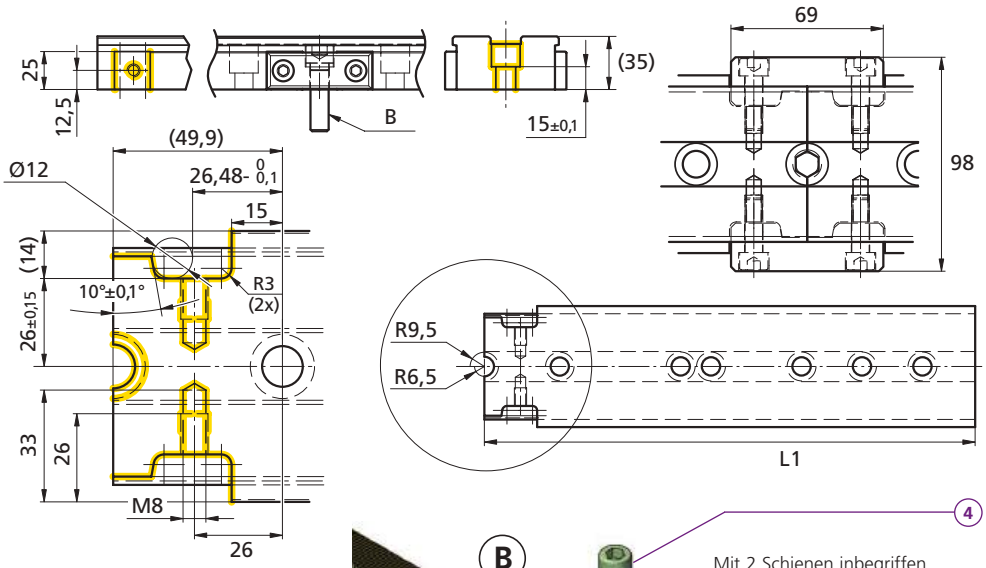
With this coupling element, it is possible to extend the PCB base rail by a second rail. Due to the frictional connection, the behaviour of the associated items is approximate to the behaviour of a continuous rail. A modification according to the drawing below (made by the customer) is required at the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

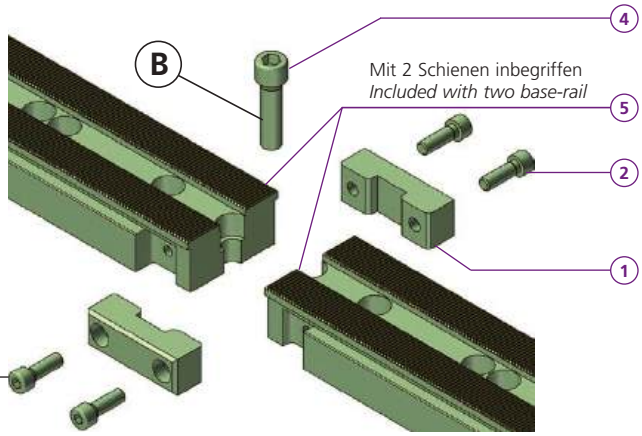
*So the two coupling elements can be placed between the base rails. An additional screw (**B**) is taken the force flatwise to the seating.*

Detailzeichnung zum Bearbeiten aller Basisschienen H35, um die Aussparung für das Kupplungstück 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	
1	2x TW090078
2	4x **M8X25ISO4762**
4	1x **M12X45ISO4762**
kg	~0,4

PCB4050250KP	
5	
L1	= 250
kg	~5,1

PCB4050400KP	
5	
L1	= 400
kg	~7,9

PCB4050450KP	
5	
L1	= 450
kg	~8,9

PCB4050500KP	
5	
L1	= 500
kg	~9,9

PCB4050650KP	
5	
L1	= 650
kg	~12,8

PCB4050700KP	
5	
L1	= 700
kg	~13,8

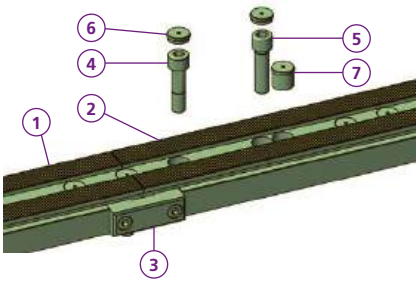
Bestellbeispiel / *Ordering example*: PCB4050250KP

PCB850SET	
1	1x **PCB4050400KP**
2	1x **PCB4050450KP**
3	1x **PCBP69SET**
4	4x **TWPAS1240**
5	5x **M12X40ISO4762**
6	9x **PCPF16L6**
7	9x **PCPF16L18**
kg	~17,1

PCB900SET	
1	1x **PCB4050650KP**
2	1x **PCB4050250KP**
3	1x **PCBP69SET**
4	4x **TWPAS1240**
5	6x **M12X40ISO4762**
6	10x **PCPF16L6**
7	8x **PCPF16L18**
kg	~18,2

PCB950SET	
1	1x **PCB4050700KP**
2	1x **PCB4050250KP**
3	1x **PCBP69SET**
4	4x **TWPAS1240**
5	6x **M12X40ISO4762**
6	10x **PCPF16L6**
7	9x **PCPF16L18**
kg	~19,1

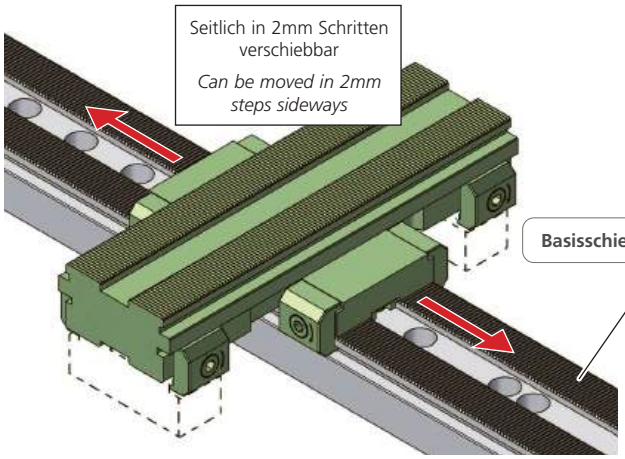
PCB1000SET	
1	2x **PCB4050500KP**
3	1x **PCBP69SET**
4	4x **TWPAS1240**
5	6x **M12X40ISO4762**
6	10x **PCPF16L6**
7	8x **PCPF16L18**
kg	~20,2

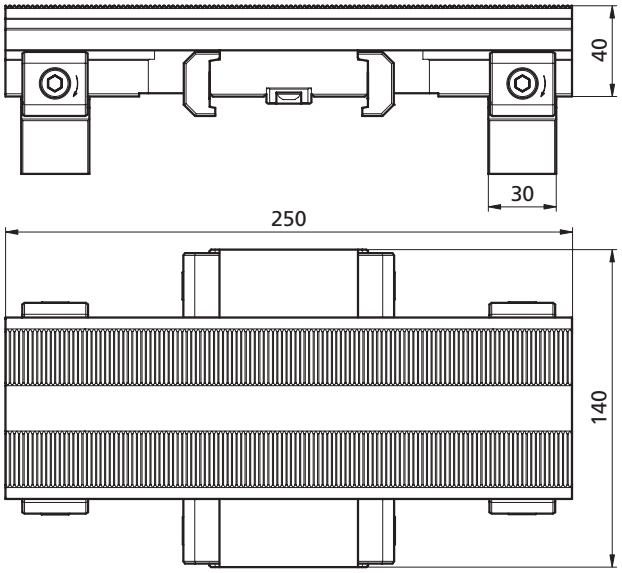


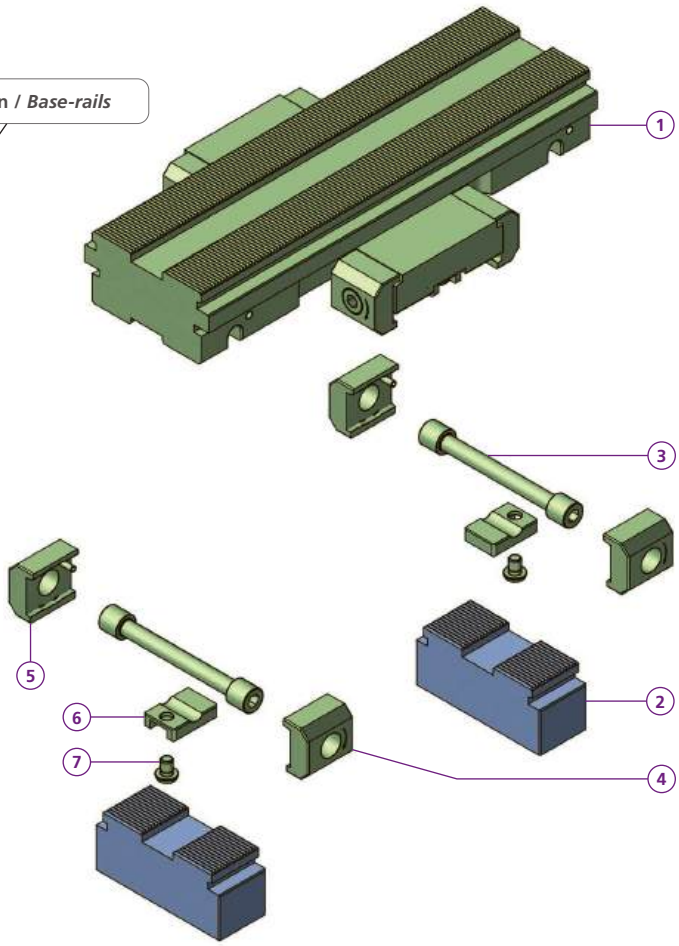
Bestellbeispiel / *Ordering example*: PCB850SET







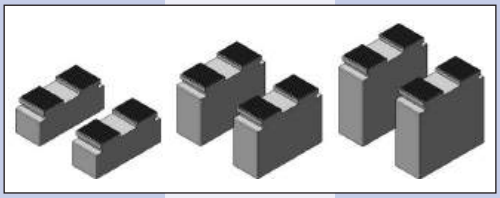




PCB250Q90H35		
1	1x	TH151032
2	2x	
3	4x	**PCS14**
4	4x	**PCSP30L**
5	4x	**PCSP30R**
6	4x	**PCGU2030**
7	1x	**M6X8ISO7380**
kg		~8,18

Schienenhöhe / ***Rail height***

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



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.*

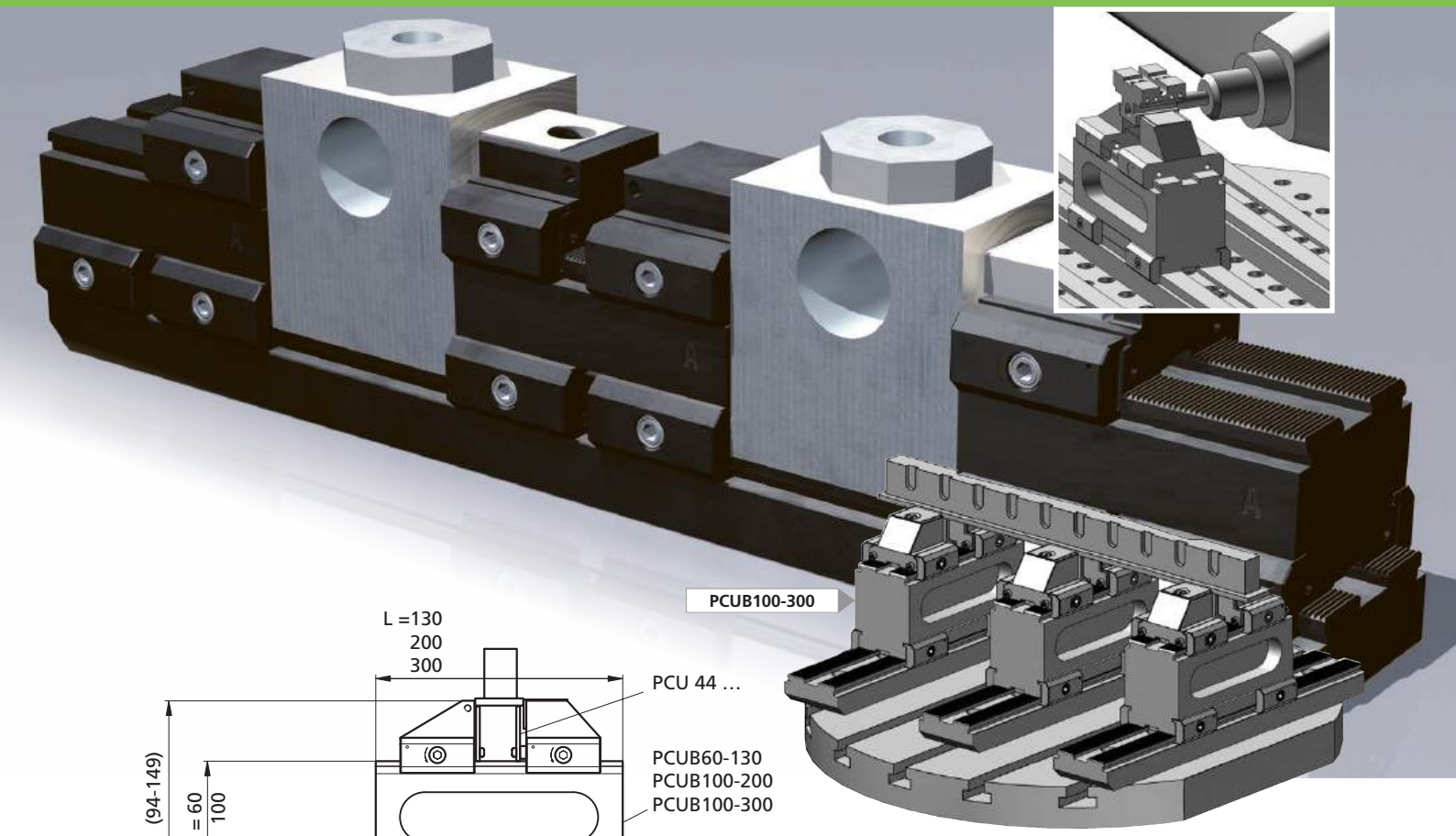
Bestellbeispiel / ***Ordering example*: PCB250Q90H35**

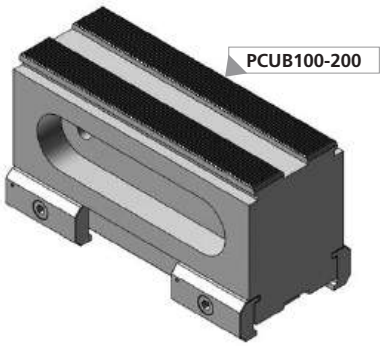
Separat bestellen / Order separately

Erhöhung für 5-Achsenmaschinen
Riser for 5-axis machines

PCUB60-130
PCUB100-200
PCUB100-300

powerCLAMP

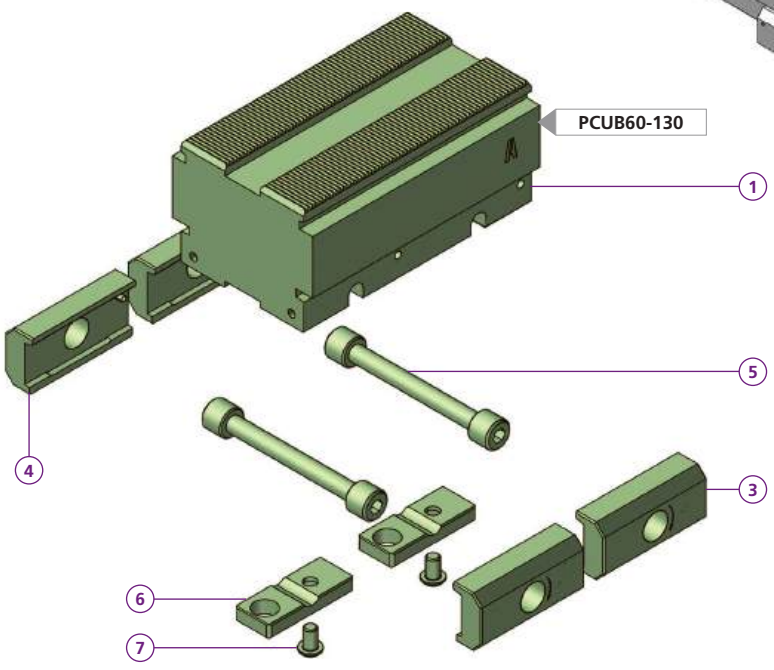




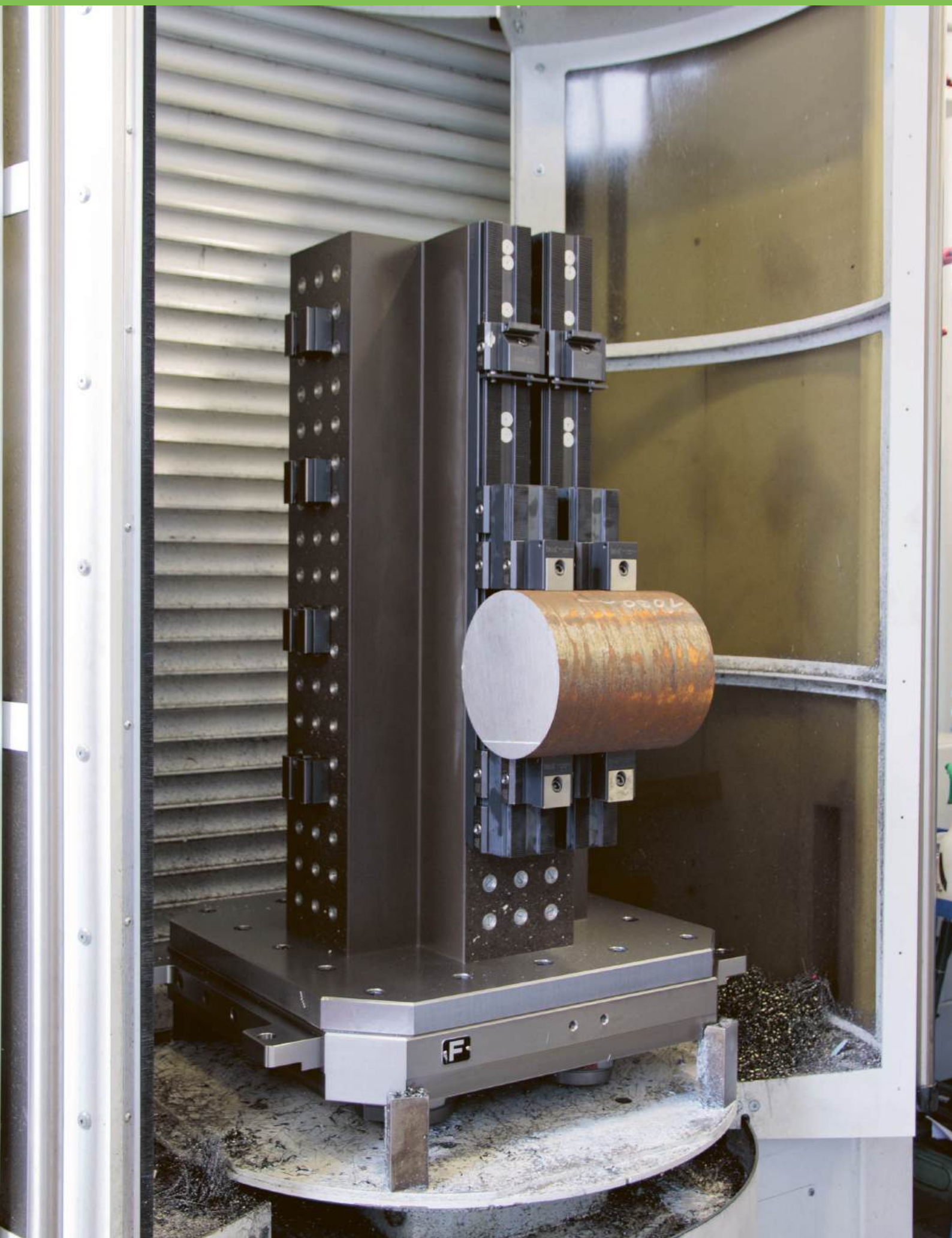
	PCUB60-130	
1	1x	TK120596
3	2x	**PCSP60R**
4	2x	**PCSP60L**
5	2x	**PCS14**
6	2x	**PCGU2049**
7	2x	**M6X8ISO7380**
L	=	130
H	=	60
kg		~5,8

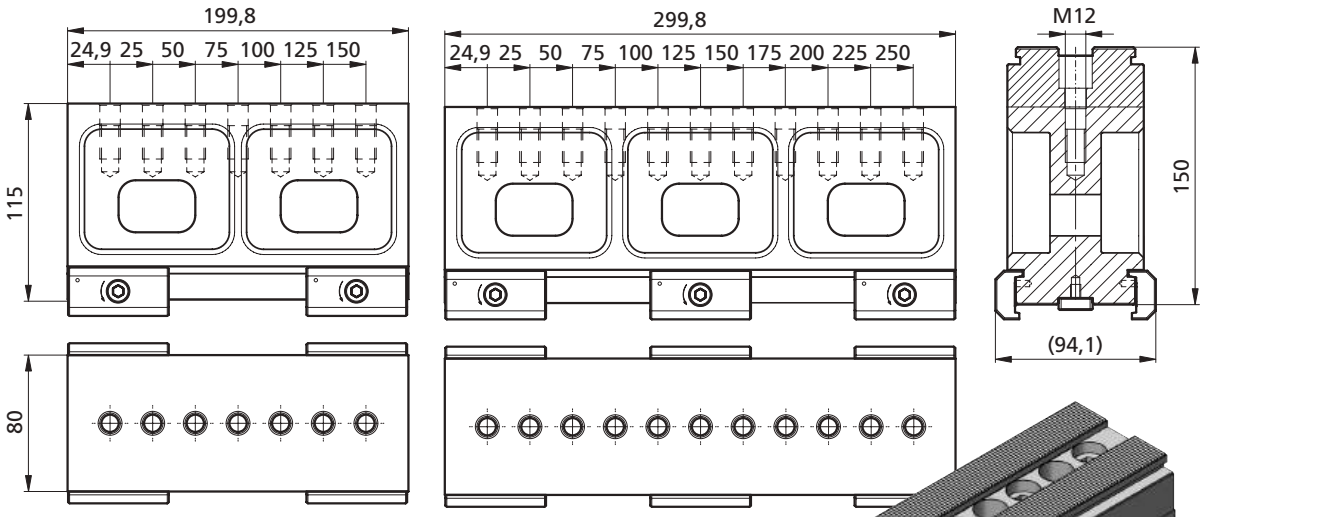
	PCUB100-200	
1	1x	TK130108
L	=	200
H	=	100
kg		~10,5

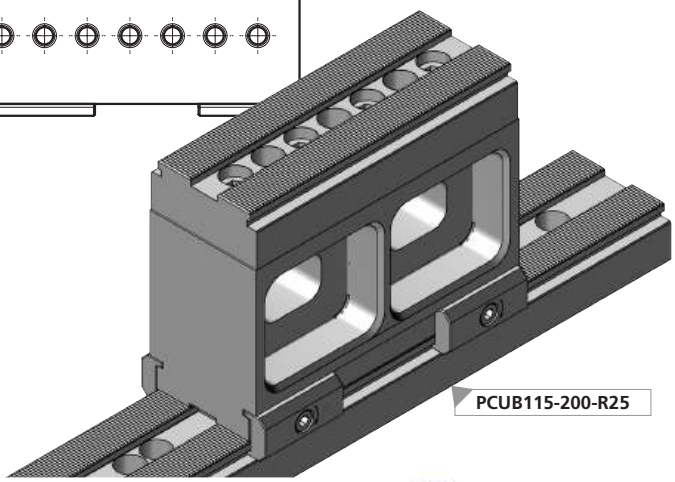
	PCUB100-300	
1	1x	TK130109
3	3x	**PCSP60R**
4	3x	**PCSP60L**
5	3x	**PCS14**
6	3x	**PCGU2049**
7	3x	**M6X8ISO7380**
L	=	300
H	=	100
kg		~16



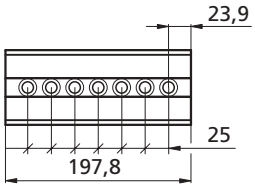
Bestellbeispiel / *Ordering example*: PCUB100-200

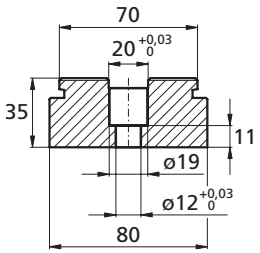




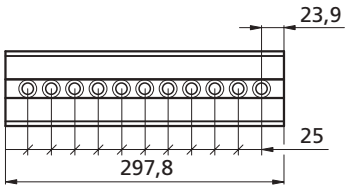


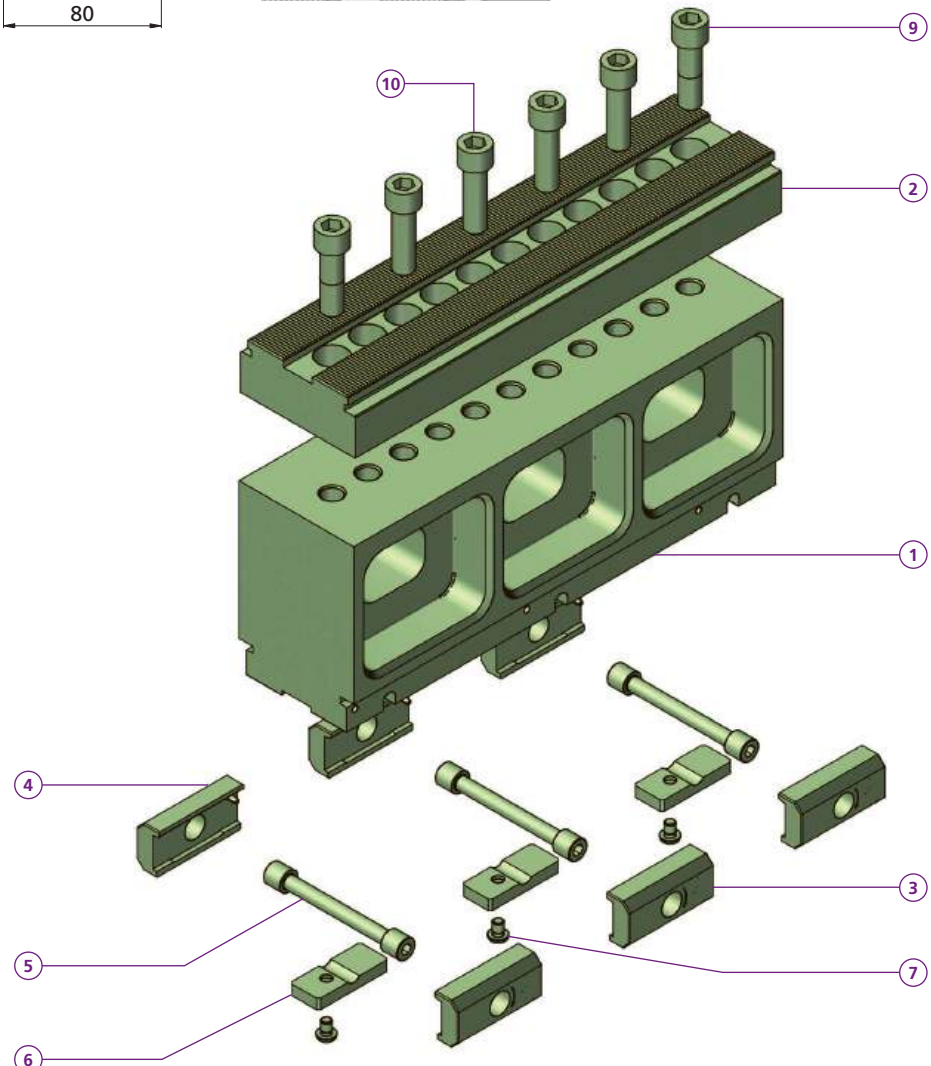
PCB25200	kg	~3,6





PCB25300	kg	~5,4

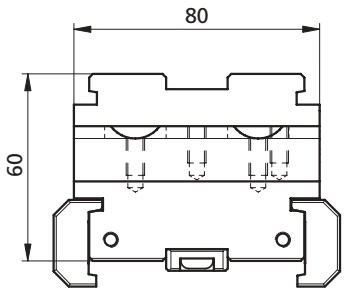


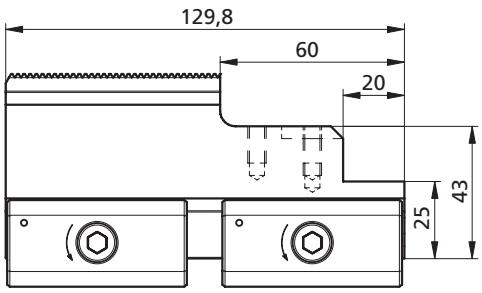


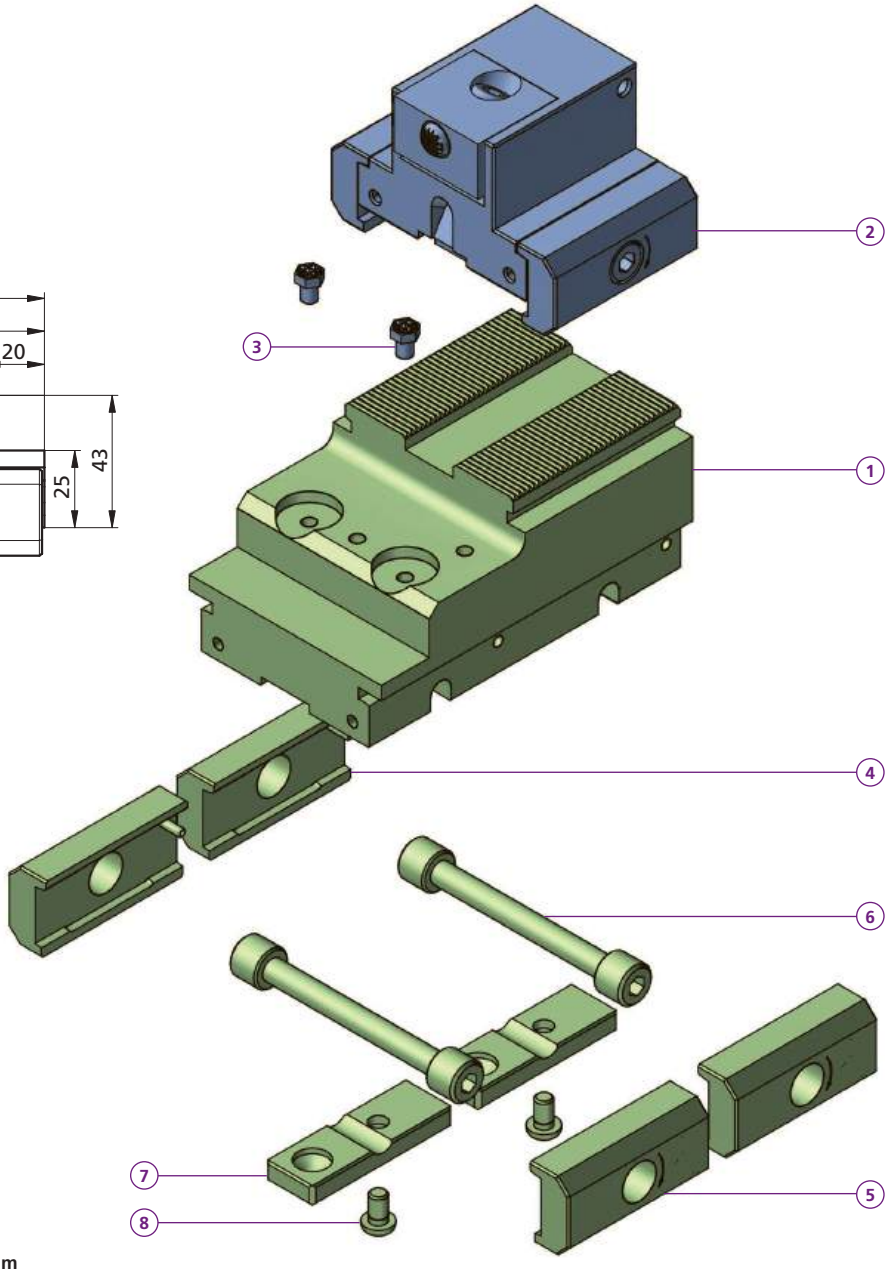
	PCUB115-200-R25	
1	1x	TK130323
2	1x	**PCB25200**
3	2x	**PCSP60R**
4	2x	**PCSP60L**
5	2x	**PCS14**
6	2x	**PCGU2049**
7	2x	**M6X8ISO7380**
9	2x	**TWPAS1240**
10	2x	**M12X40ISO4762**
kg		~13

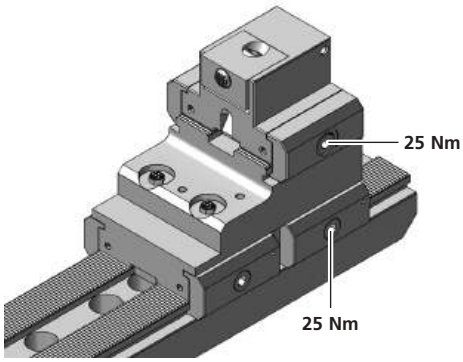
	PCUB115-300-R25	
1	1x	TK130324
2	1x	**PCB25300**
3	3x	**PCSP60R**
4	3x	**PCSP60L**
5	3x	**PCS14**
6	3x	**PCGU2049**
7	3x	**M6X8ISO7380**
9	2x	**TWPAS1240**
10	4x	**M12X40ISO4762**
kg		~19,6

Bestellbeispiel / *Ordering example*: PCUB115-300-R25











PCUB60-70-130		
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

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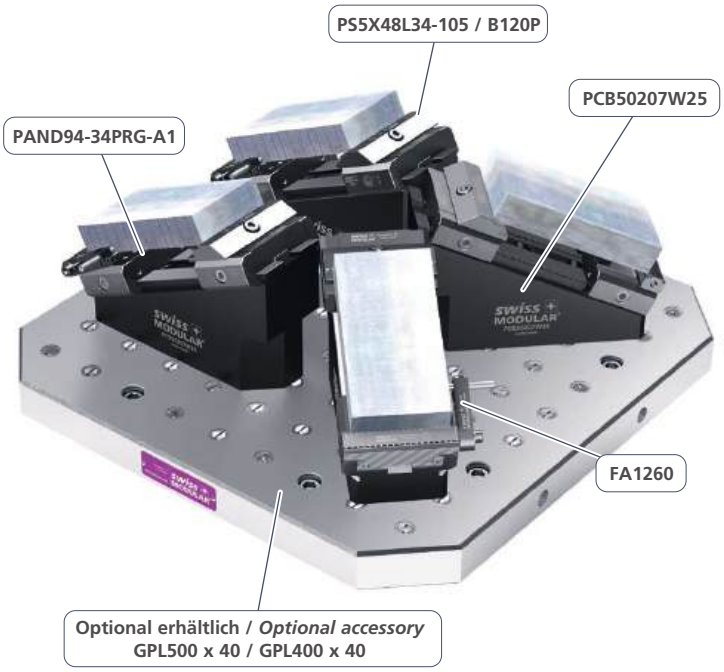
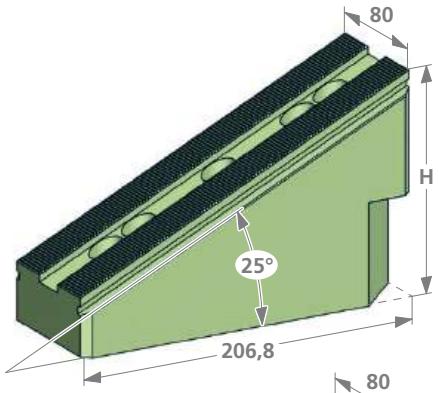
Zubehör / *Accessories* p. 337

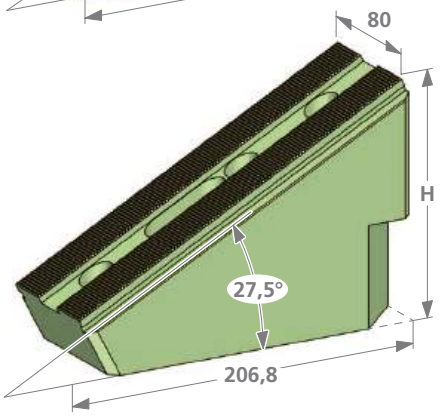
Bestellbeispiel / *Ordering example:* PCUB60-70-130

Separat bestellen / *Order separately*

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



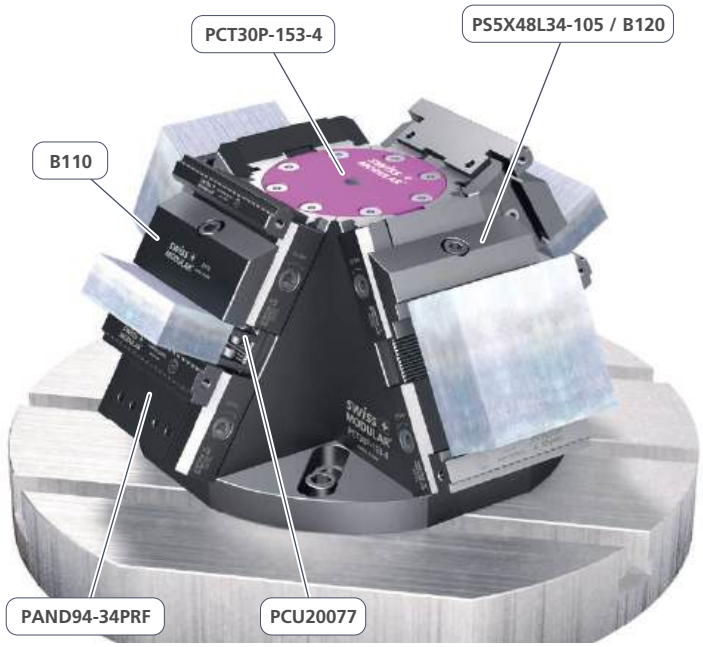


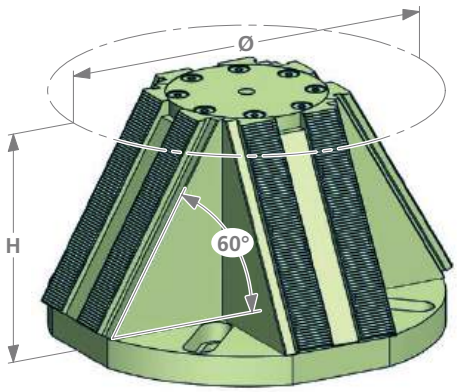


Die Basisschienen können auf einem 50 mm Raster je nach Bedarf parallel oder diagonal platziert werden.

The base rails can be placed on a 50 mm grid either paralell or diagonal as required.

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



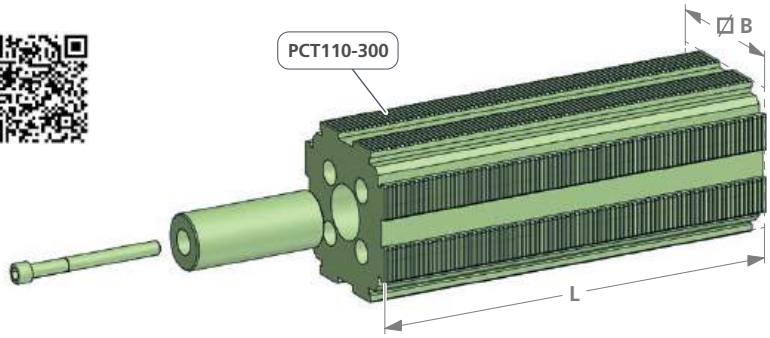


Die Stahl-Mineralgusspyramide verfügt über eine powerCLAMP Schnittstelle und ermöglicht eine kompakte und zugleich flexible 5-Achs-Bearbeitung. Die Module werden in einem Winkel von 60° montiert. Dank dem eingesetzten Mineralguss, hat die Konstruktion ein relativ tiefes Gewicht bei einer hohen Festigkeit.

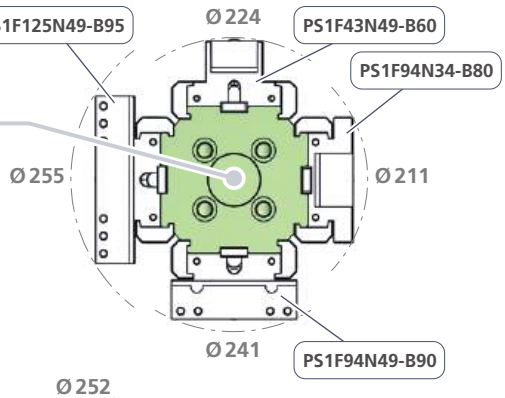
The steel mineral casting pyramid has a powerCLAMP interface and enables compact and, at the same time, flexible 5-axis machining. The modules are mounted at an angle of 60°. Due to the mineral cast used, the construction has a relatively low weight with a high rigidity.

SCAN OR CLICK PDF STEP

Art. Nr.	kg	L	B
PCT110-300	~24,5	300	110x110
PCT110-350	~27,5	350	110x110
PCT110-400	~31,5	400	110x110
PCT110-450	~35,5	450	110x110
PCT110-500	~39,5	500	110x110
PCT110-550	~43,0	550	110x110
PCT110-600	~47,0	600	110x110
PCT110-650	~51,0	650	110x110
PCT110-700	~55,2	700	110x110

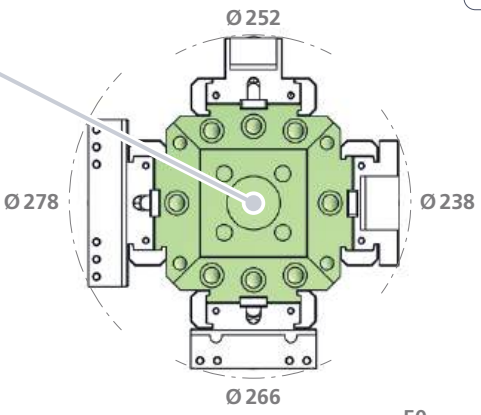


Störkreise bei verschiedenen Spannmodulen
Workpiece diameter with different clamping modules



Stahl-Mineralguss
Steel-expoxy mineral

Art. Nr.	kg	L	B
PCMT150-700	~83,0	700	150x150
PCMT150-750	~89,0	750	150x150
PCMT150-800	~95,0	800	150x150
PCMT150-850	~101,0	850	150x150

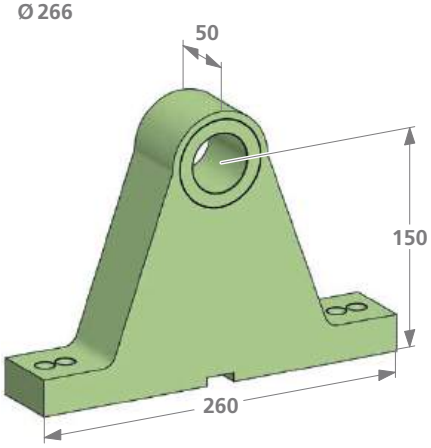


Gegenlager
Counterbearing

Art. Nr.	kg
PCGL15050	~8,0



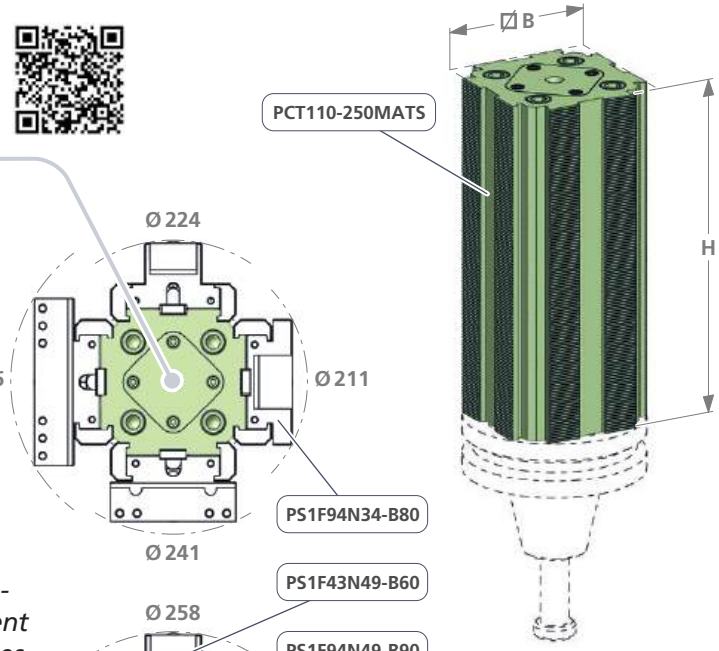
Reduziert Vibrationen und ist leicht
Reduces vibrations and is light





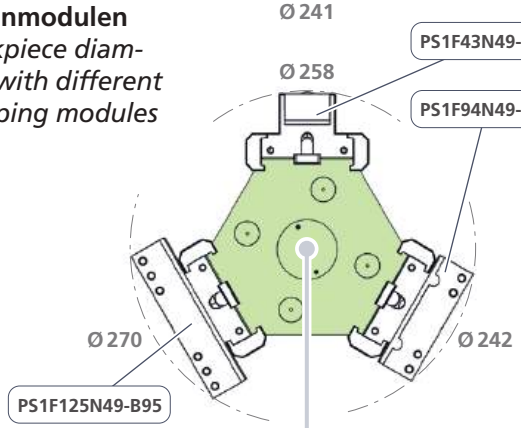
SCAN OR CLICK PDF STEP

Art. Nr.	kg	H	B
PCT110-250MATS	~17	250	110x110
PCT110-300MATS	~21	300	110x110





Störkreise bei verschiedenen Spannmodulen
Workpiece diameter with different clamping modules

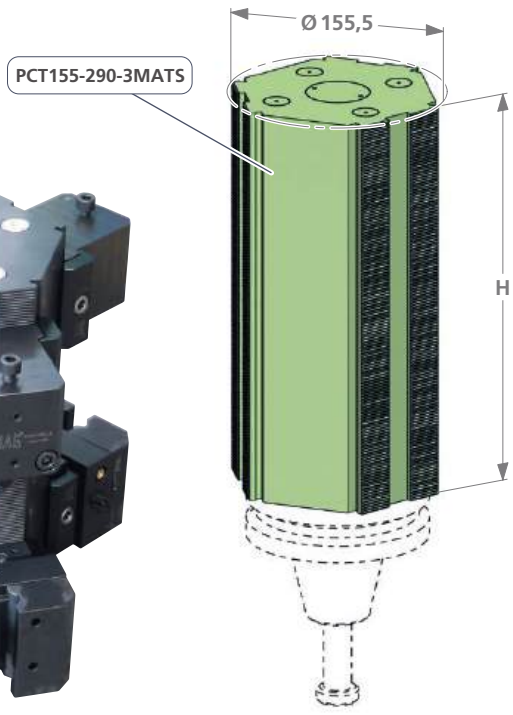




Art. Nr.	kg	H
PCT155-290-3MATS	~30	290







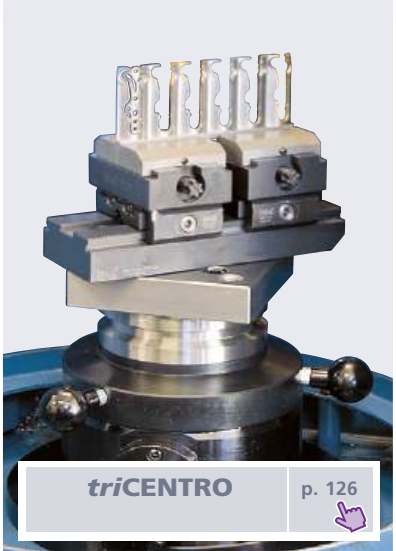
SCAN OR CLICK PDF STEP

Spanntürme zu 5-Achs Bearbeitungszentren
Clamping fixtures for 5 axis machines

powerCLAMP

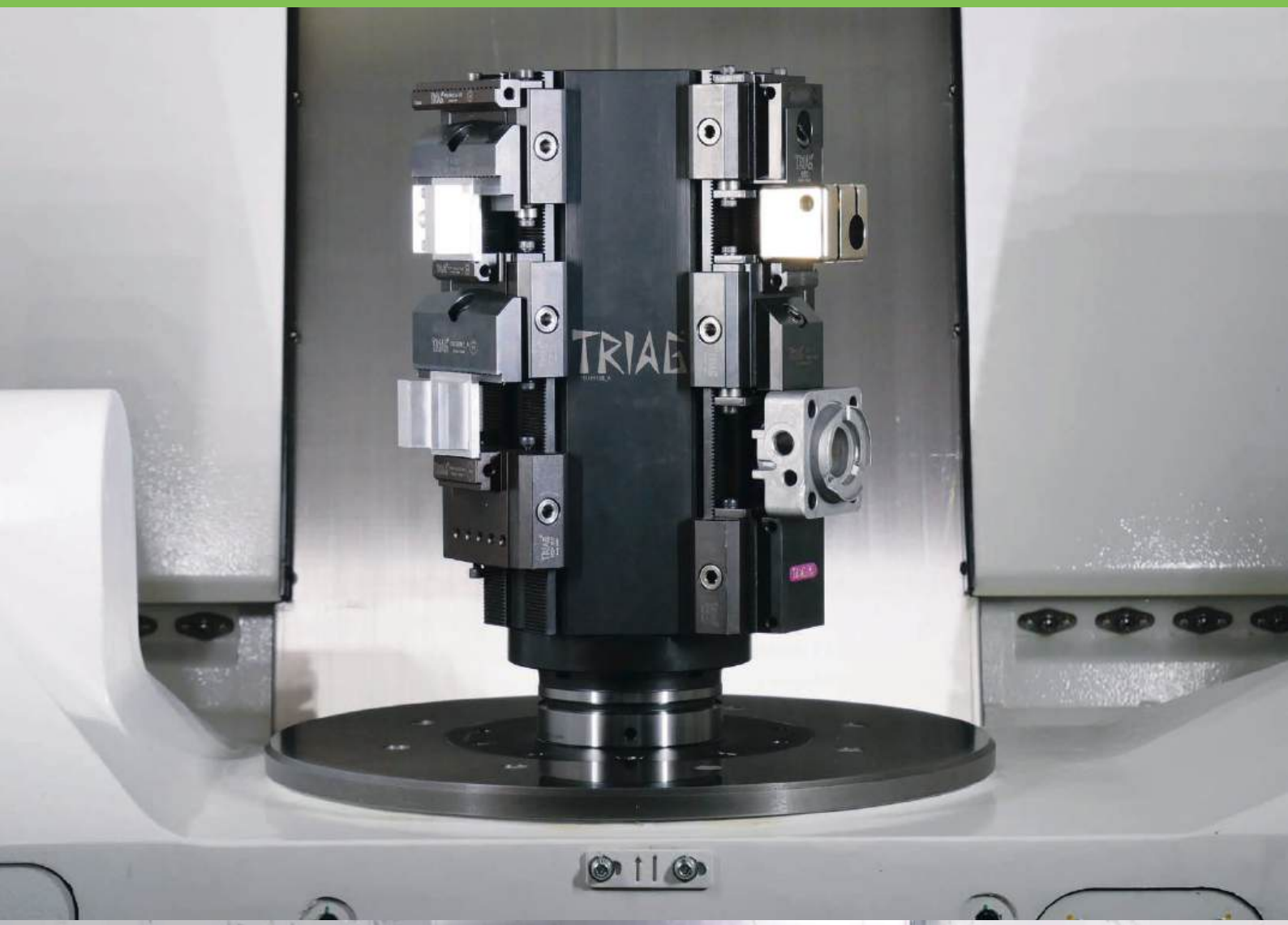




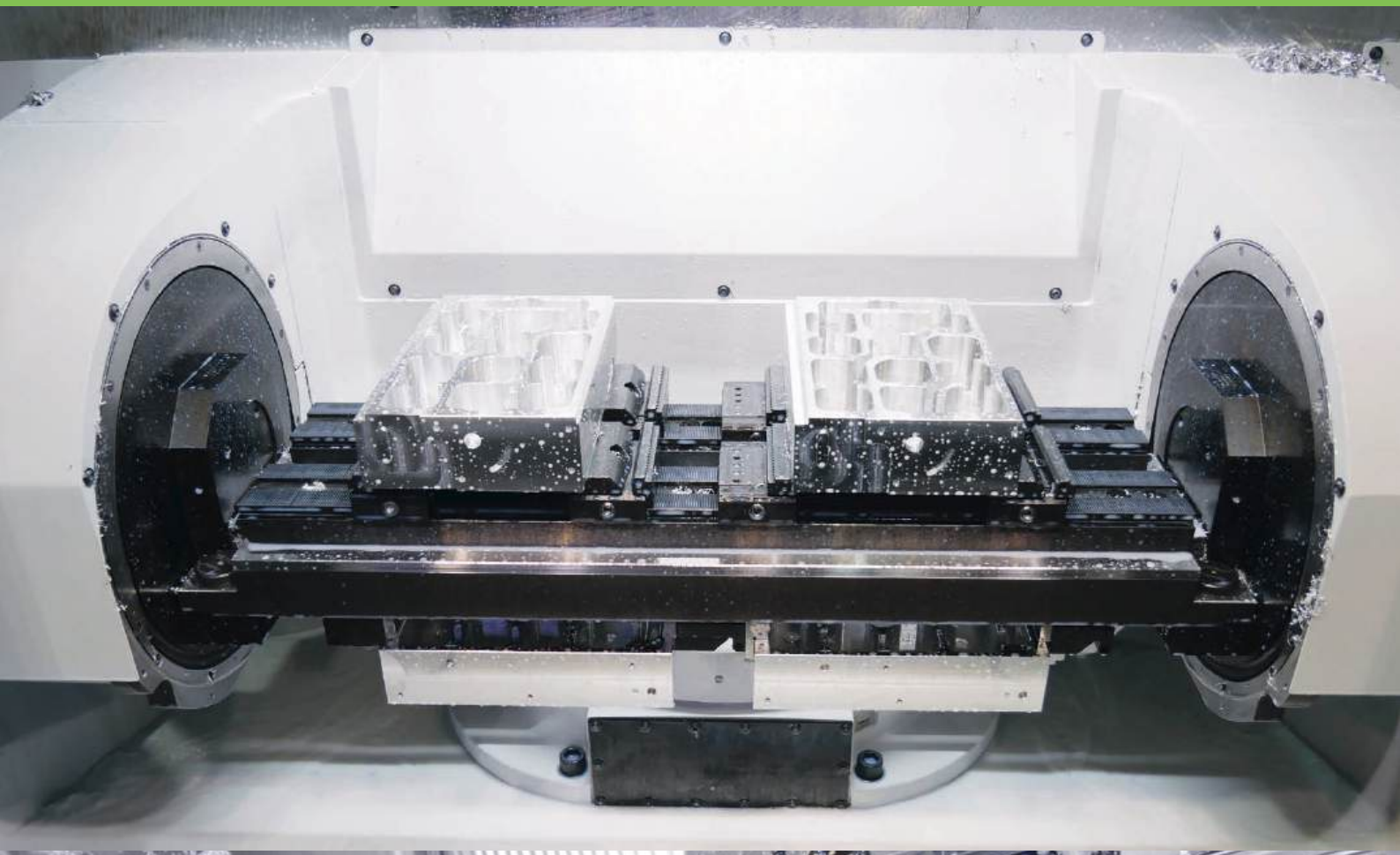


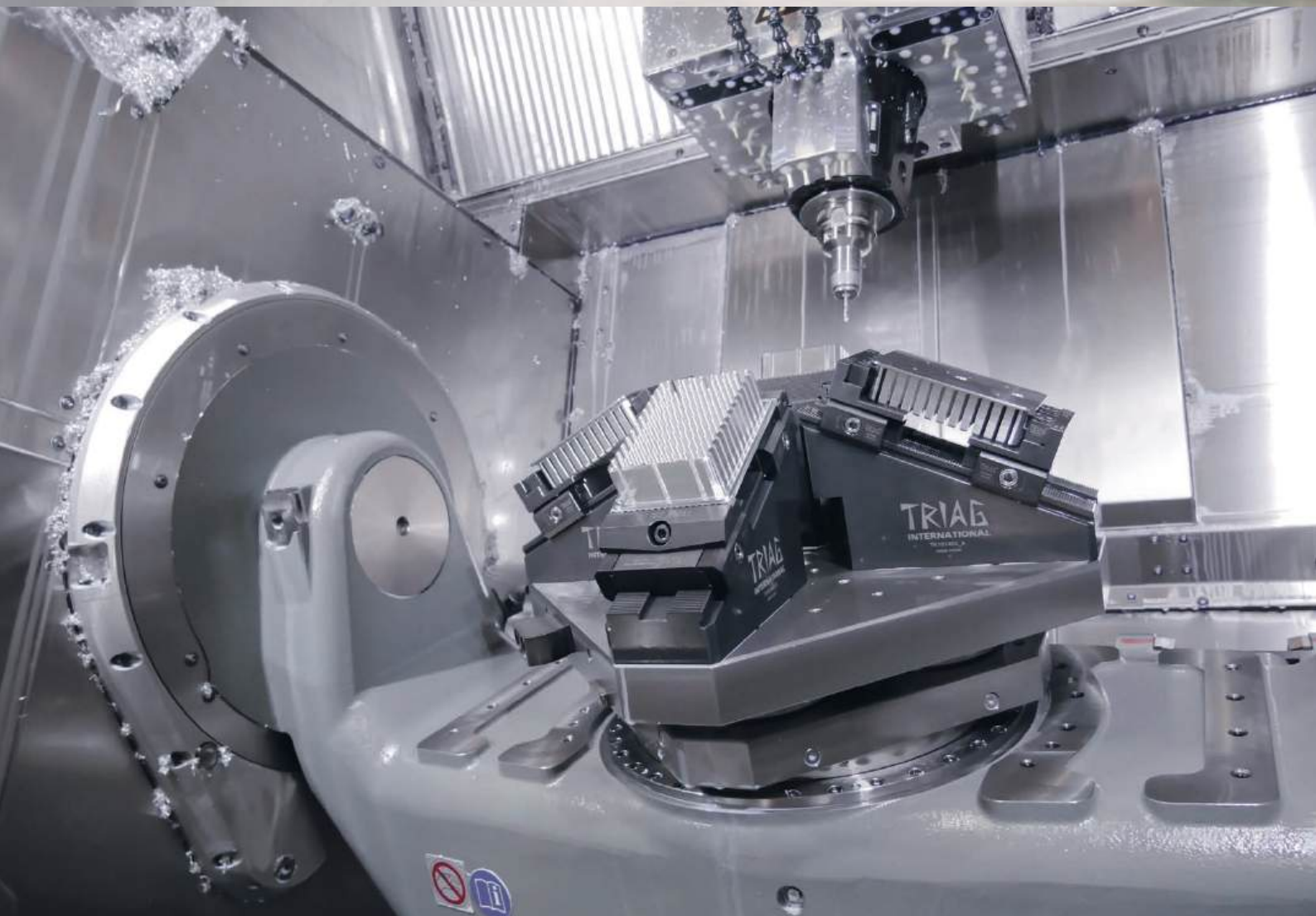










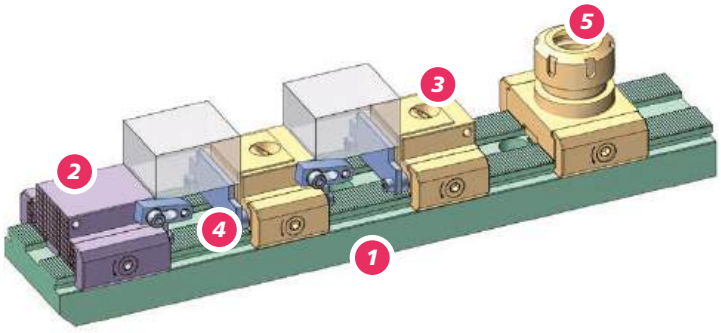

TRIAG
INTERNATIONAL
TRIAG

BESTELLBEISPIEL / *ORDERING EXAMPLE*

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

1 2 3 4 5

1x 01 *&4* B48-29

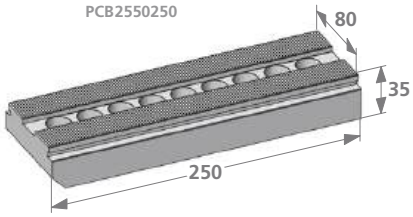


Zu jeder Basisschiene gehört 1 Anschlagmodul «Tabelle 2» nach Ihrer Wahl!
Each base rail comes with 1 end module "table 2" of your choice!

1 Basisschienen / *Base-rails*

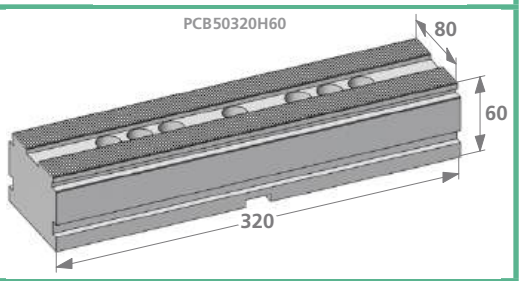
PCSET18-250A	PCB2550250	PCSET18-600A	PCB4050600
PCSET18-350A	PCB4050350	PCSET18-650A	PCB4050650
PCSET18-400A	PCB4050400	PCSET18-700A	PCB4050700
PCSET18-450A	PCB4050450	PCSET18-750A	PCB4050750
PCSET18-500A	PCB4050500	PCSET18-800A	PCB4050800
PCSET18-550A	PCB4050550		

PCB2550250



PCSET18-320B	PCB50320H60
PCSET18-400B	PCB100400H60
PCSET18-500B	PCB100500H60
PCSET18-600B	PCB100600H60
PCSET18-650B	PCB100650H60
PCSET18-690B	PCB100690H60
PCSET18-850B	PCB100850H60

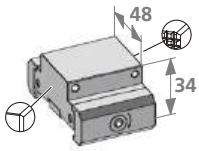
PCB50320H60



2 Anschlagmodule / *End modules*

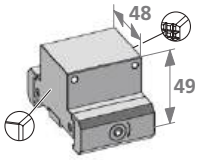
48

PAND 48-34



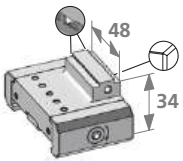
01

PAND 48-49



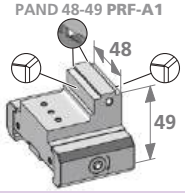
02

PAND 48-34 PRF-A1



03

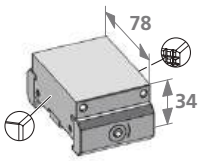
PAND 48-49 PRF-A1



04

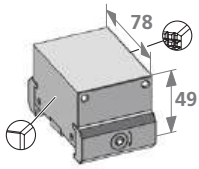
78

PAND 78-34



05

PAND 78-49



06

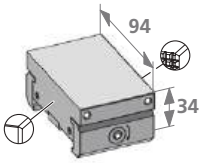
F = glatt / *flat*

R = geriffelt / *double serrated*

= Direktprägebacken / *Direct stamping*

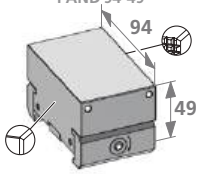
94

PAND 94-34



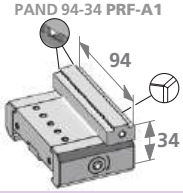
07

PAND 94-49



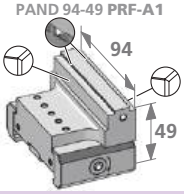
08

PAND 94-34 PRF-A1



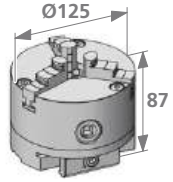
09

PAND 94-49 PRF-A1

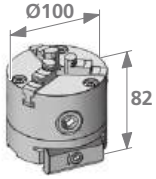


10

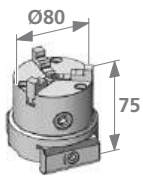
5 Dreibackenfutter | Spannzangenmodul | Mini-Zentrischspanner
Three-jaw chuck | Collet module | Mini-self centering vise



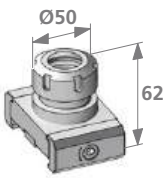
PS3X125L87BSET



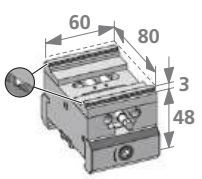
PS3X100L82BSET



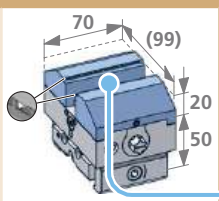
PS3X80L75BSET



PS1X50N62-ER32



PCZ80L40PRG62



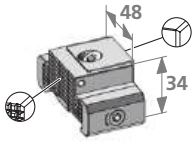
PCZ100L50

SEPARAT BESTELLEN *ORDER SEPARATELY* *tri*CENTRO p. 128 - 129

3 Niederzugspannmodule / *Pull down clamp modules*

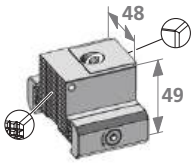
48

PS1 R 48N34 B80N



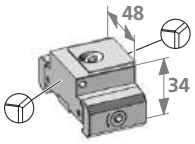
PCSET18-N1

PS1 R 48N49 B80N



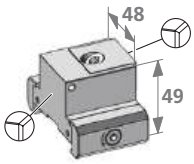
PCSET18-N2

PS1 F 48N34 B80N



PCSET18-N3

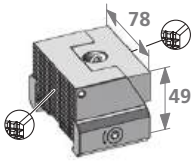
PS1 F 48N49 B80N



PCSET18-N4

78

PS1 R 78N49 B90R78



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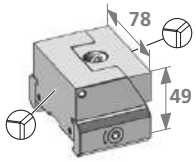


PCSET18-N6

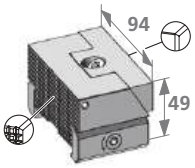
F = glatt / *flat*

R = geriffelt / *double serrated*

= Direktprägebacken / *Direct stamping*

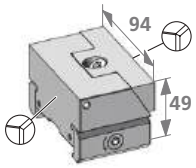
94

PS1 R 94N49 B90



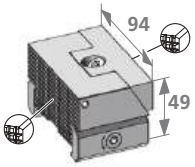
PCSET18-N7

PS1 F 94N49 B90



PCSET18-N8

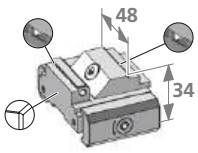
PS1 R 94N49 B93



PCSET18-N9

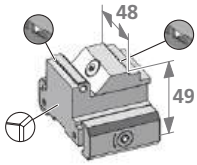
Linearspannmodule / *Linear clamp modules*

PS1 PF 48L34 B115P



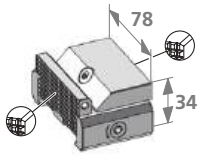
PCSET18-L1

PS1 PF 48L49 B115P



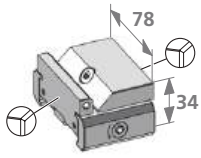
PCSET18-L2

PS1 R 78L34 B141



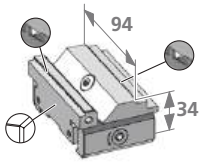
PCSET18-L5

PS1 F 78L34 B140



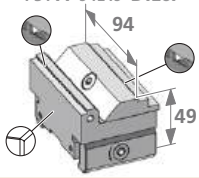
PCSET18-L6

PS1 PF 94L34 B120P



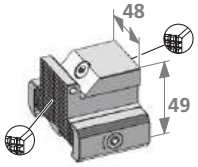
PCSET18-L9

PS1 PF 94L49 B120P



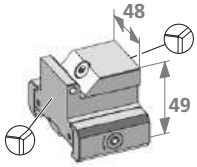
PCSET18-L11

PS1 R 48L49 B106



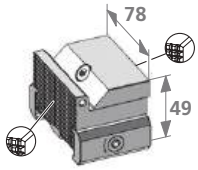
PCSET18-L3

PS1 F 48L49 B105



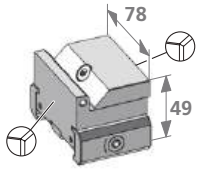
PCSET18-L4

PS1 R 78L49 B141



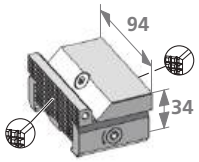
PCSET18-L7

PS1 F 78L49 B140



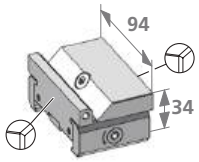
PCSET18-L8

PS1 R 94L34 B111



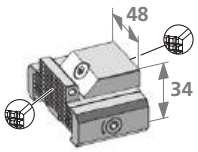
PCSET18-L12

PS1 F 94L34 B110



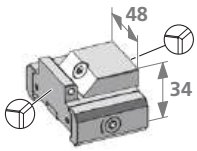
PCSET18-L13

PS1 R 48L34 B106



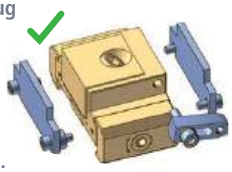
PCSET18-L16

PS1 F 48L34 B105



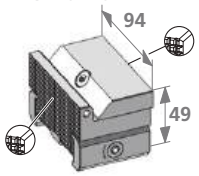
PCSET18-L17

Bei jedem Niederzug und Linear Spannmodul sind 2 Parallelunterlagen nach Ihrer Wahl und 1 Fräsanschlag enthalten.



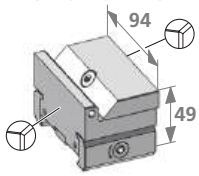
Each pull-down and linear clamping module includes 2 parallels of your choice and 1 milling buffer.

PS1 R 94L49 B111



PCSET18-L14

PS1 F 94L49 B110

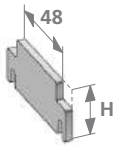


PCSET18-L15

4 Parallelunterlagen / *Steel parallels*

48

PCU29047



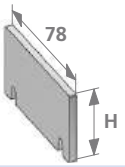
B48- ...

H

PCU 20 047
PCU 24 047
PCU 29 047
PCU 31 047
PCU 34 047
PCU 39 047
PCU 44 047
PCU 46 047

78

PCU39077



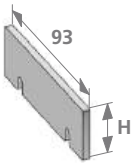
B78- ...

H

PCU 20 077
PCU 24 077
PCU 29 077
PCU 31 077
PCU 34 077
PCU 39 077
PCU 44 077
PCU 46 077

94

PCU29093



B94- ...

H

PCU 14 093
PCU 20 093
PCU 24 093
PCU 29 093
PCU 31 093
PCU 34 093
PCU 39 093
PCU 44 093
PCU 46 093
PCU 47 093

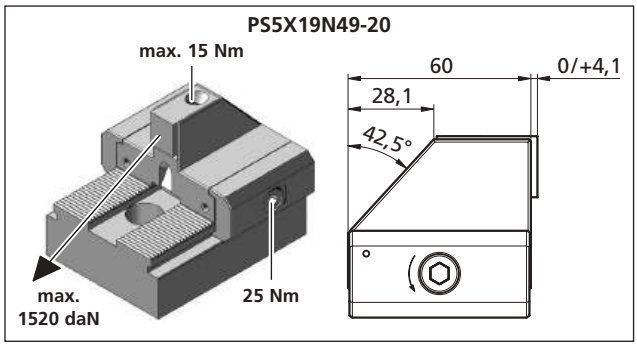
Fräsanschlag / *Milling buffer*

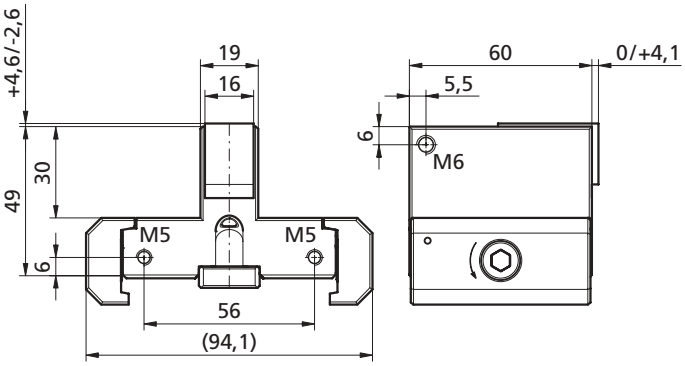
FA1240

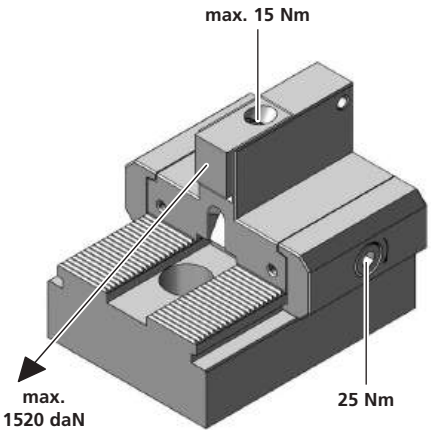


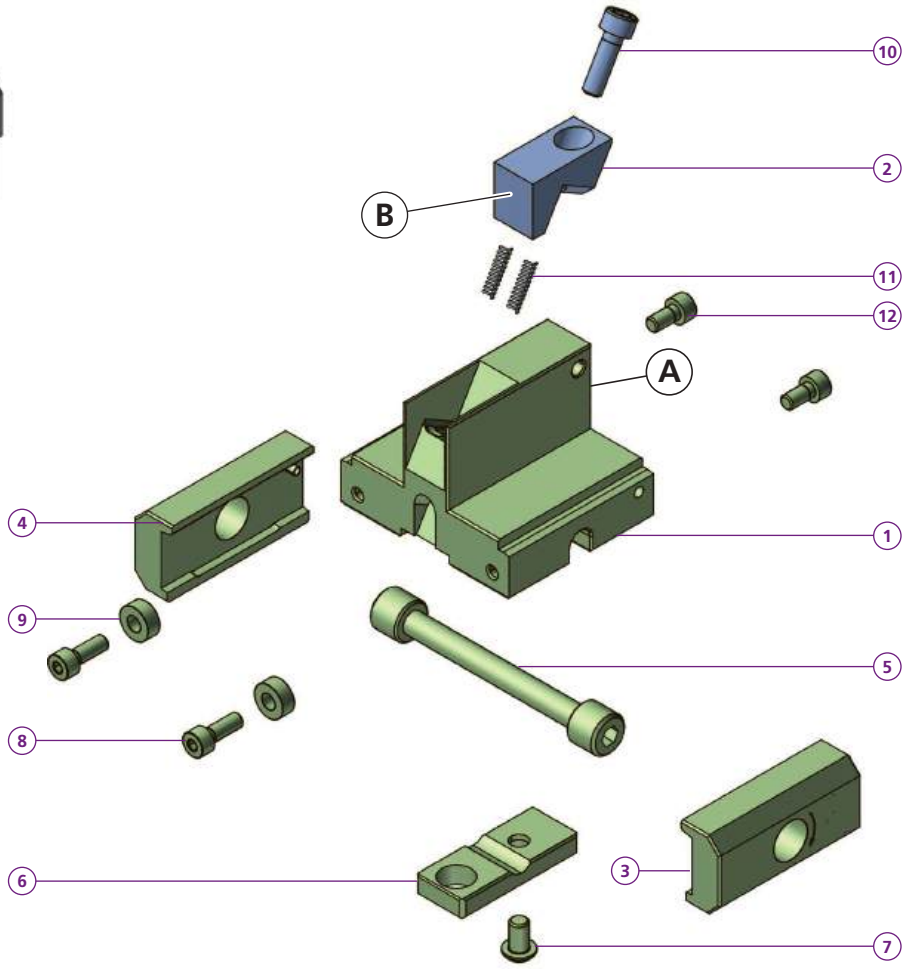
1 x Inklusive / *Included*

Für mehr Informationen (Genaue Bemassung, Material, Spannkraft, Drehmoment) p. 60 - 112
For further informations (exact dimensions, material, clamping forces, torque)









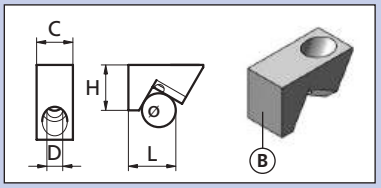
A

42,5°	**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

B

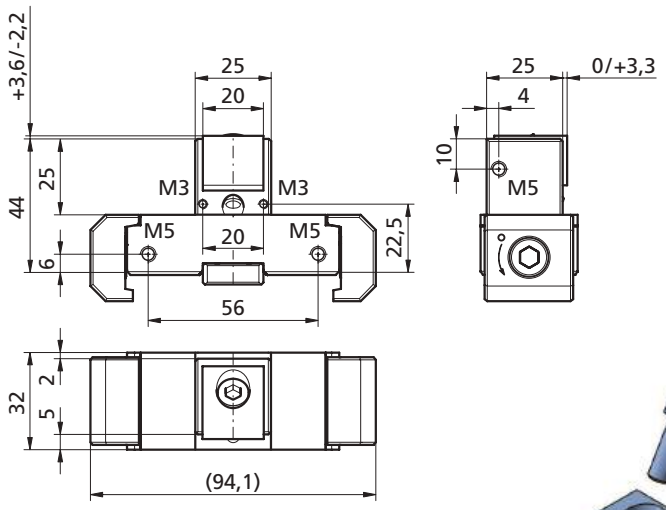
Bestellbeispiel / *Ordering example:* 1x **PS1R19N49-20** & 1x **B21**

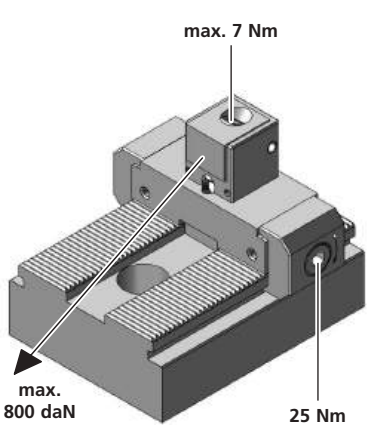
	B20	**B21**	**B22**
C	16	16	16
H	20	20	20
L	19	19	19
D	6,5	6,5	6,5
ø	12	12	12
i	HV700 x0,2mm	HV700 x0,2mm	*
kg	~0,06	~0,06	~0,06

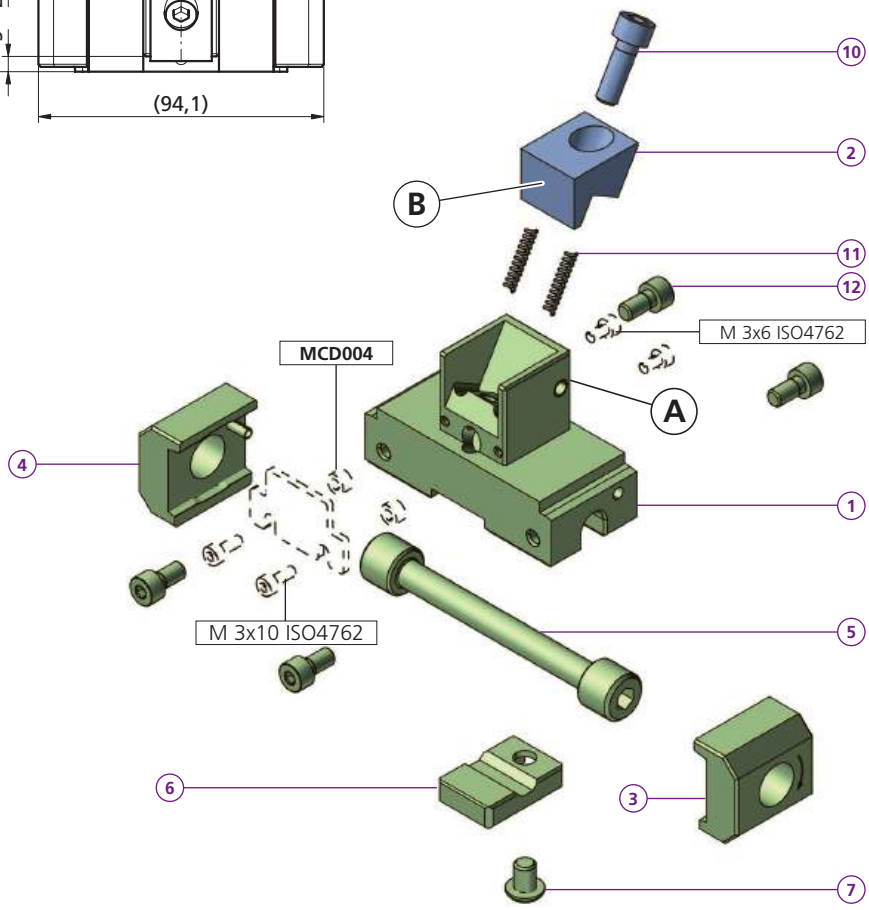


Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel*







PS1F25N44-13

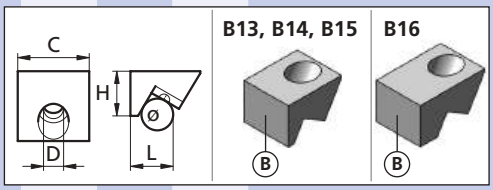
1	1x	TF150960

PS1R25N44-13

1	1x	TF140450
2	1x	
3	1x	**PCSP30R**
4	1x	**PCSP30L**
5	1x	**PCS14**
6	1x	**PCGU2030**
7	1x	**M6X8ISO7380**
10	1x	**M6X16ISO4762**
11	2x	**FED03018**
12	4x	**M5X10ISO4762**
kg		~0,6

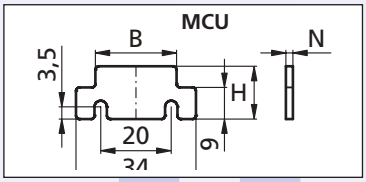
Bestellbeispiel / *Ordering example:* 1x **PS1R25N44-13** & 1x **B14**

	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 x0,2mm	HV700 x0,2mm	*	*
kg	~0,05	~0,05	~0,05	~0,06



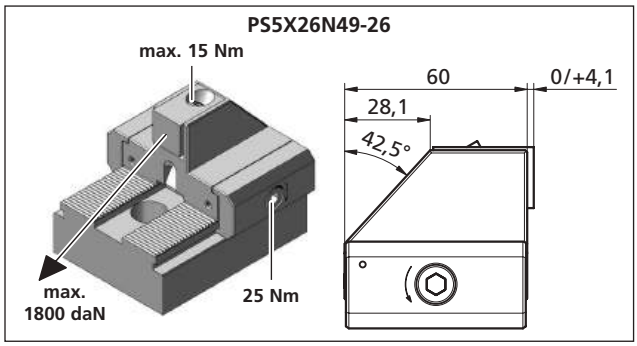
	H	B	N	kg
MCU11037	11	23	2	~0,004
MCU15037	15	23	2	~0,006
MCU18037	18	23	2	~0,008
MCU20037	20	23	2	~0,008
MCU22537	22,5	23	2	~0,008

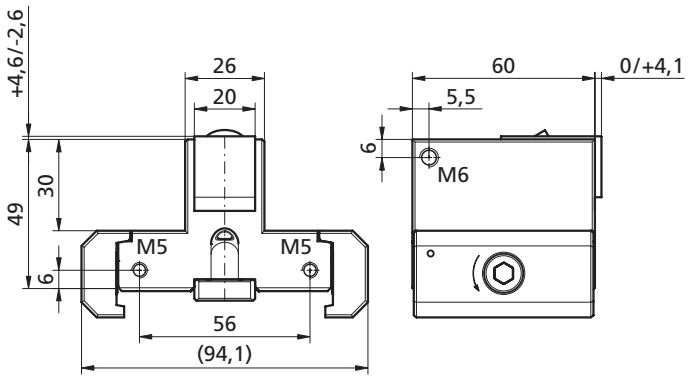
2x **M3X10ISO4762**
2x **M3X6ISO4762**
2x **MCD004**

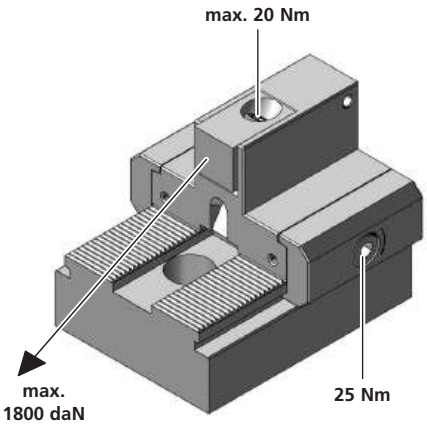


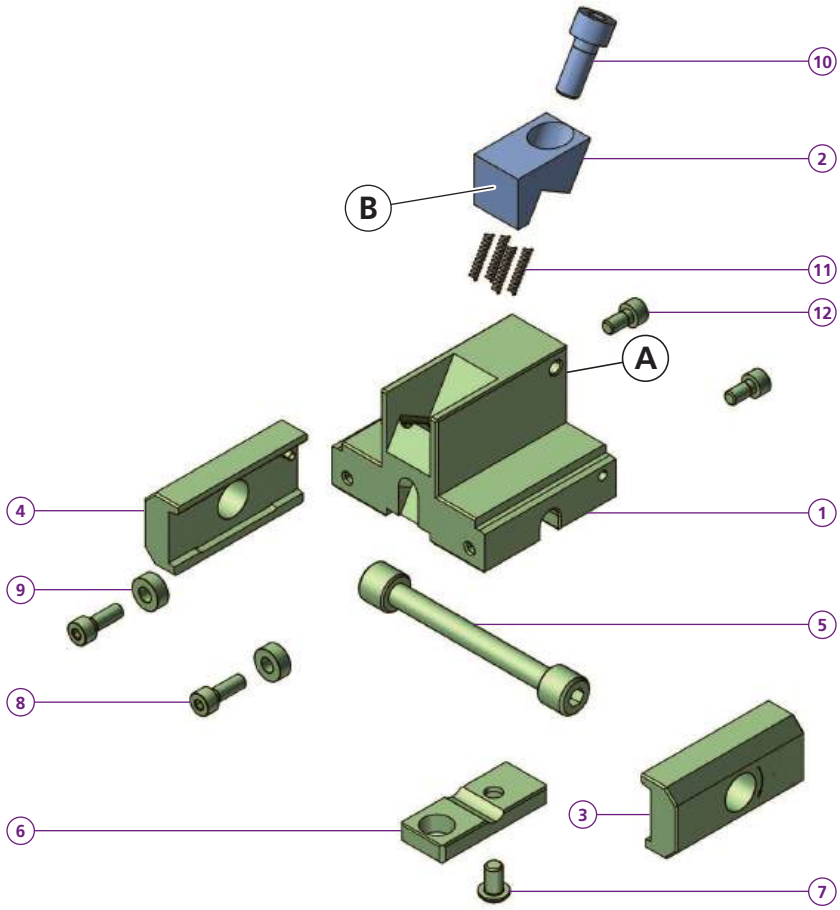
Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel*









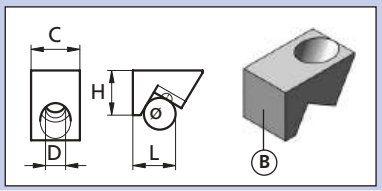
A

42,5°	**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

B

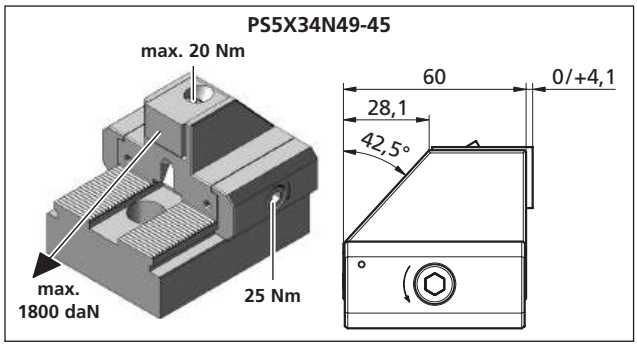
Bestellbeispiel / *Ordering example:* 1x **PS1R26N49-26** & 1x **B26**

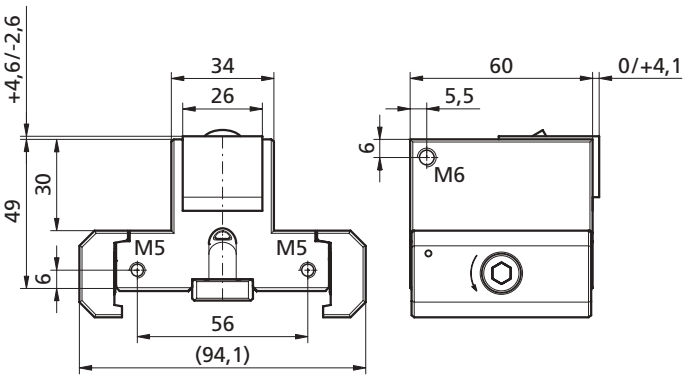
	B26	**B27**	**B28**
C	20	20	20
H	20	20	20
L	19	19	19
D	9	9	9
ø	12	12	12
i	HV700 x0,2mm	HV700 x0,2mm	*
kg	~0,07	~0,07	~0,07

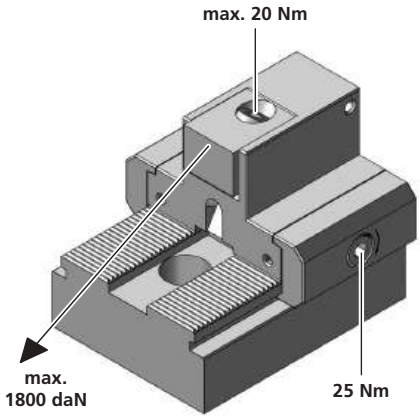


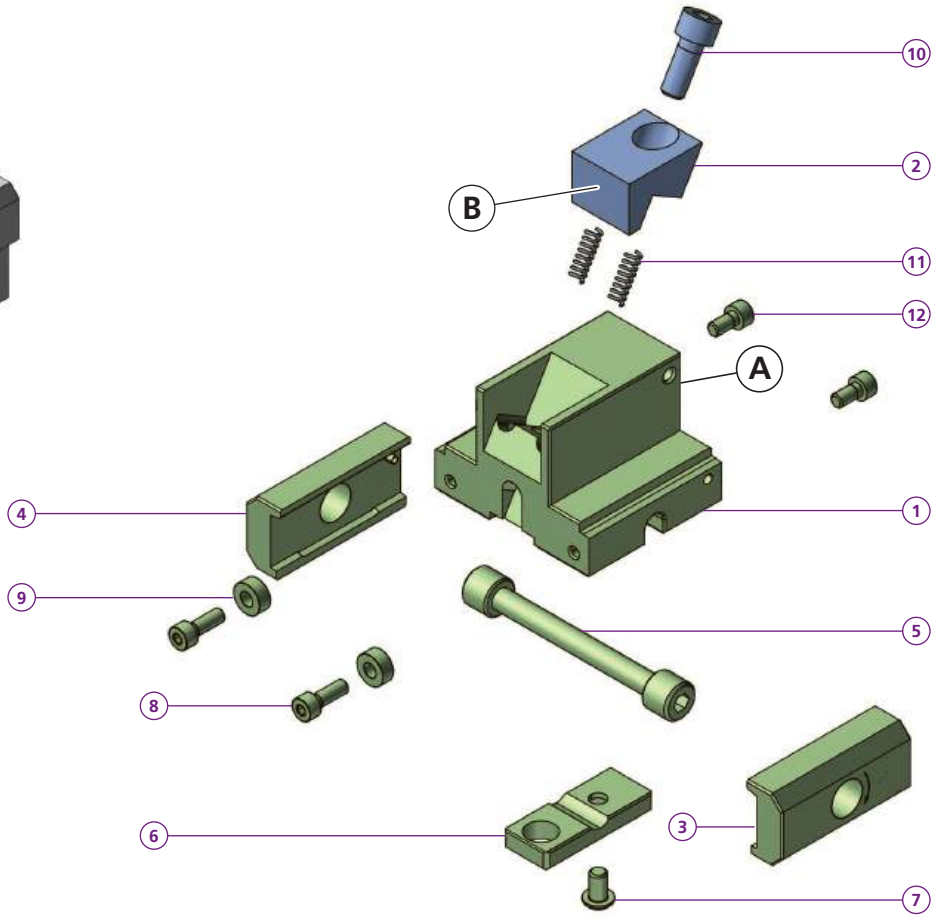
Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel*









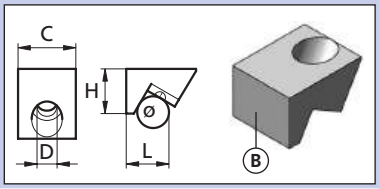
A

42,5°	**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

B

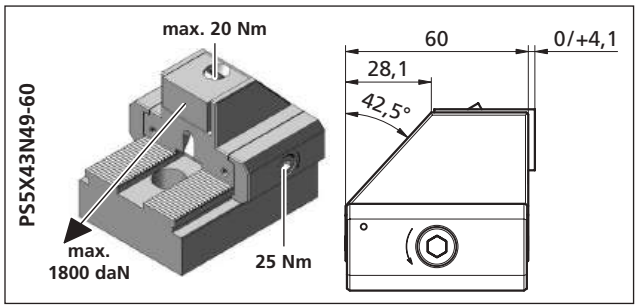
Bestellbeispiel / *Ordering example:* 1x **PS5X34N49-45** & 1x **B47HM**

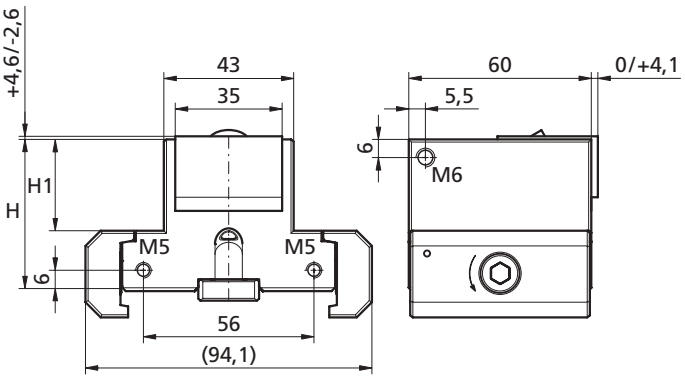
	B45	**B46**	**B47**	**B47HM**
C	26	26	26	26
H	20	20	20	20
L	19	19	19,1	19,1
D	9	9	9	9
ø	12	12	12	12
i	HV700 x0,2mm	HV700 x0,2mm	*	HM
kg	~0,1	~0,1	~0,1	~0,1



Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated*





A

42,5°

PS5X43N49-60

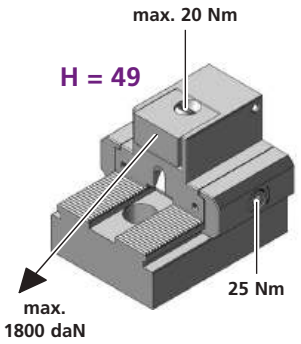
1	1x	TF140458
9	2x	**PCD005**
8	2x	**M5X14ISO4762**
kg		~1,3

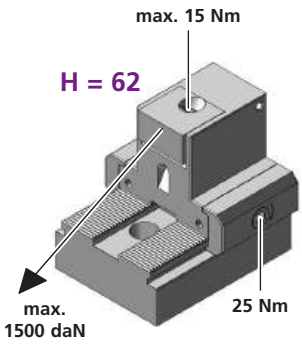
PS1F43N49-60

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



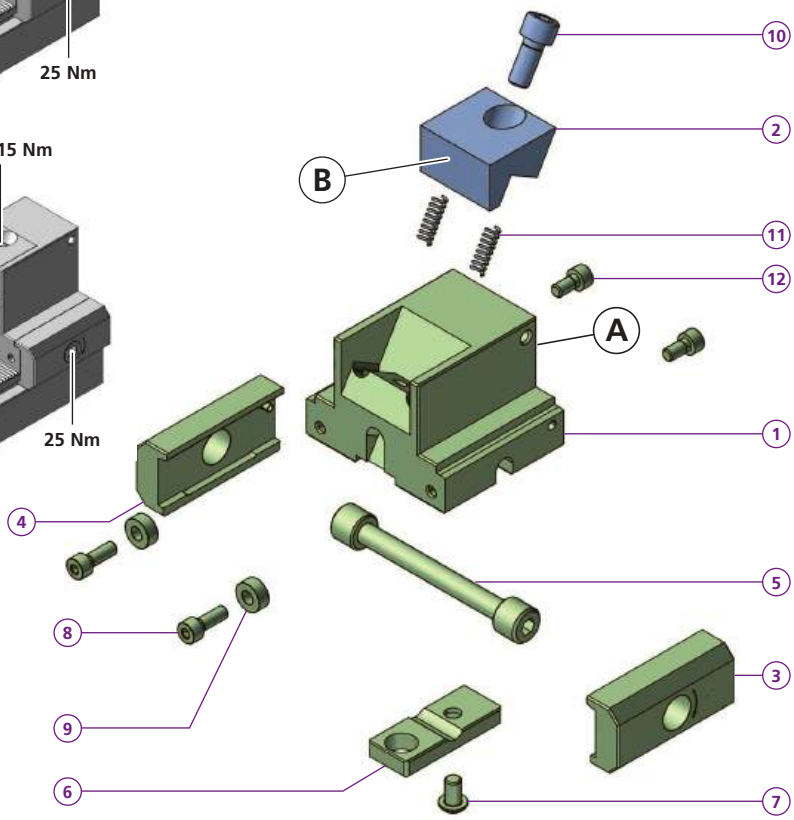


PS1F43N62-60

1	1x	TF140459

PS1R43N62-60

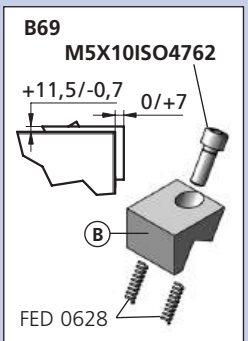
1	1x	TF140460
H	=	62
H1	=	43
kg		~1,7

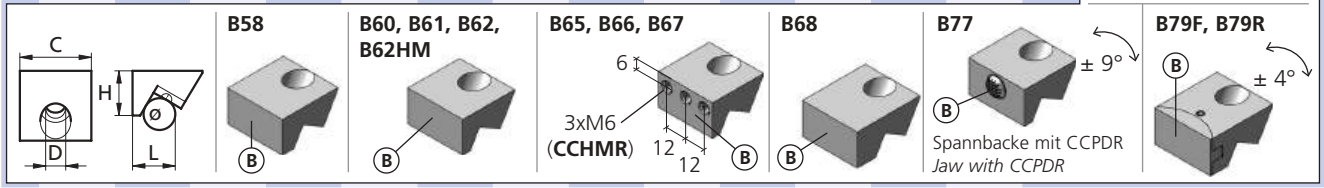


B

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
ø	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

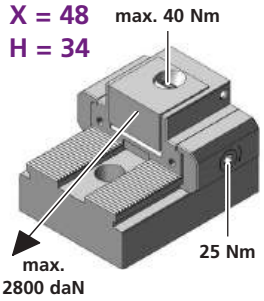


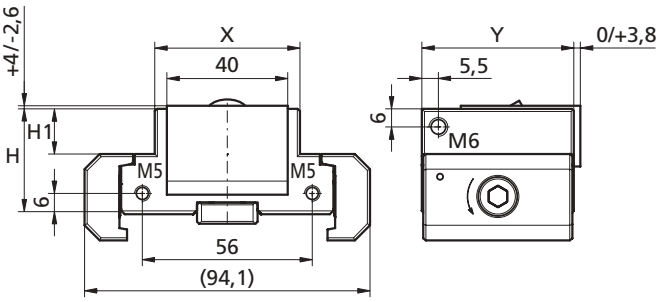


Separat bestellen / *Order separately*

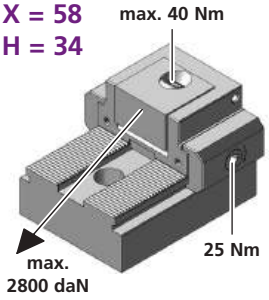
* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated* ALU = ENAW-7022

X = 48
H = 34

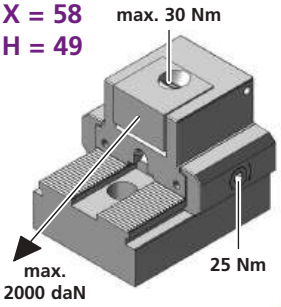




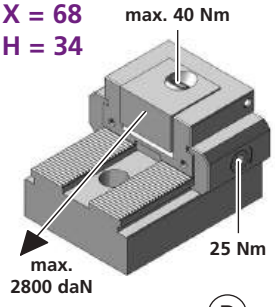
X = 58
H = 34

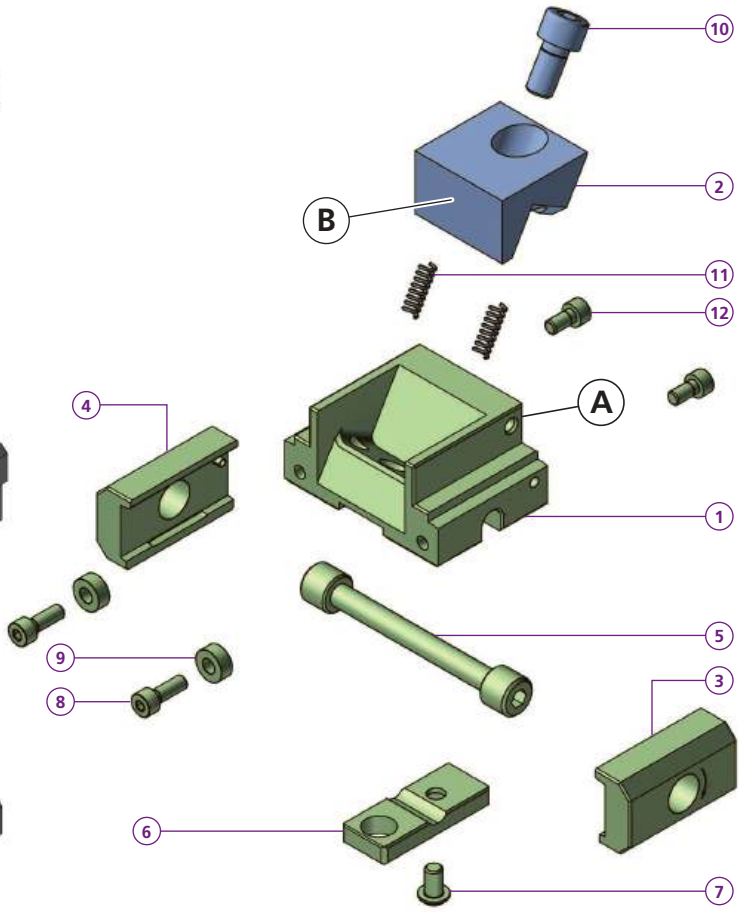


X = 58
H = 49



X = 68
H = 34





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

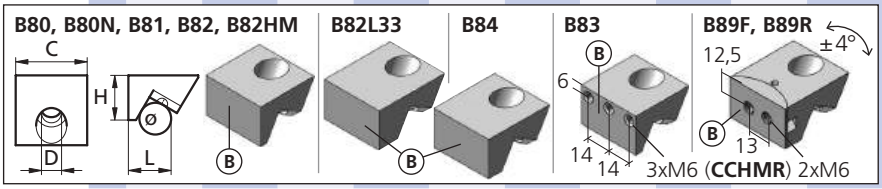
1	1x	TF140465

PS1R68N34-80

1	1x	TF140466
X	=	68
H	=	34
H1	=	15
Y	=	50
kg		~1,0

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

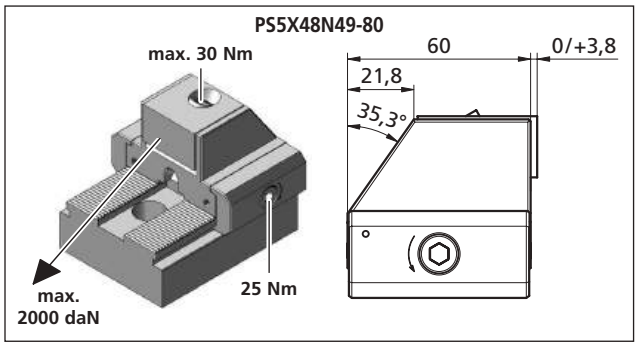
	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
ø	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2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

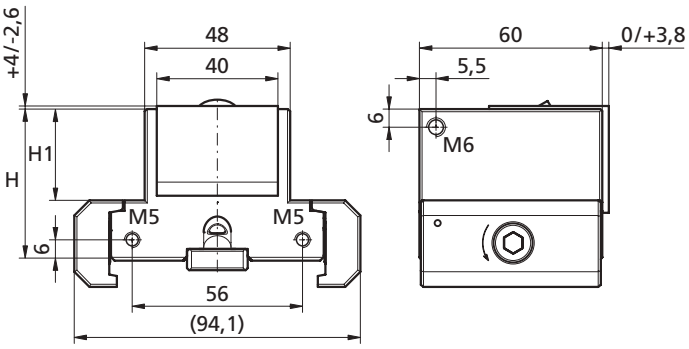


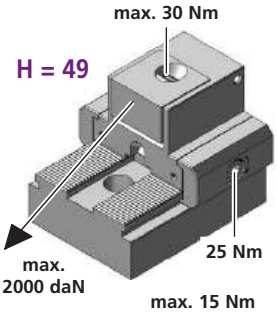
* = weicher *Stahl / soft steel*

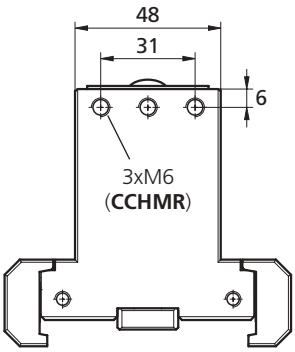
HM = Hartmetallbeschichtet / *Carbide coated*

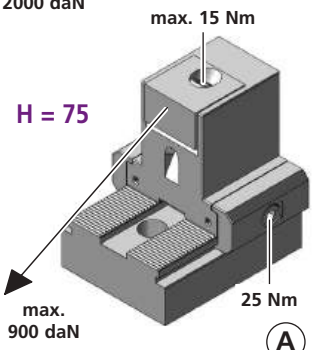
Separat bestellen / *Order separately*











A

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

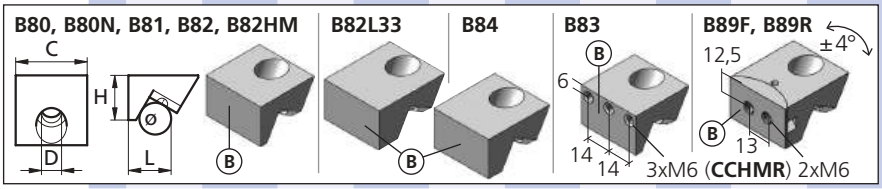
PS1R48N75-80

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

B

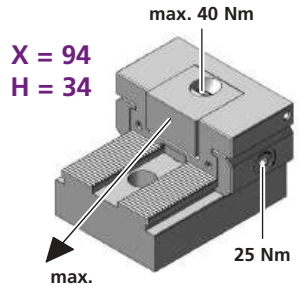
Bestellbeispiel / *Ordering example:* 1x **PS1F48N49-80** & 1x **B80**

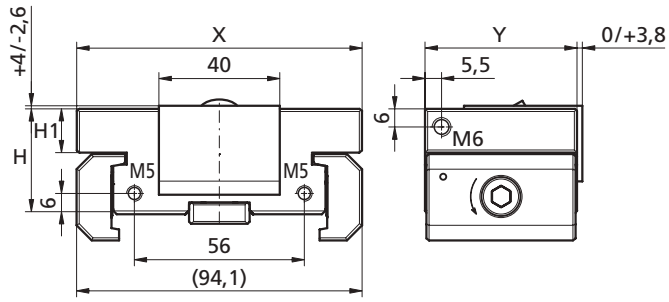
	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
ø	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2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

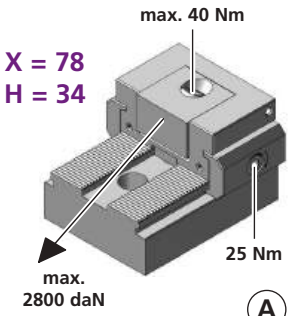


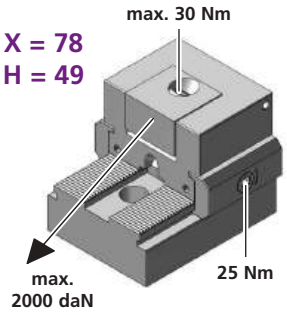
Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated*









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

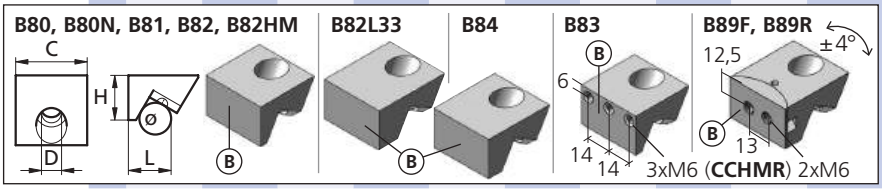
PS1R78N49-80

1	1x	TF140475
3	1x	**PCSP60R**
4	1x	**PCSP60L**
X	=	78
H	=	49
H1	=	30
Y	=	60
kg		~1,8

B

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

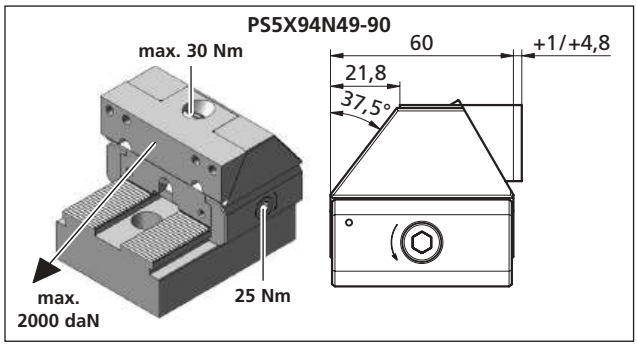
	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
ø	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2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

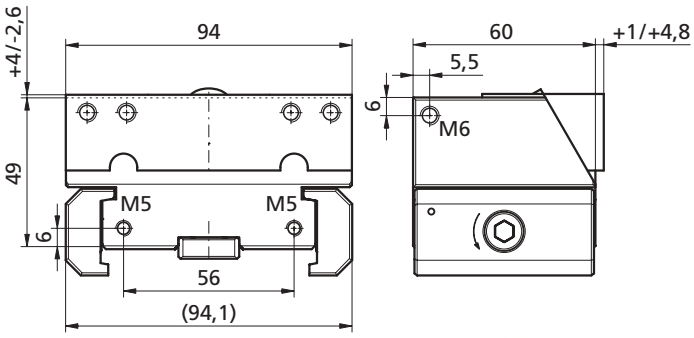


* = weicher *Stahl / soft steel*

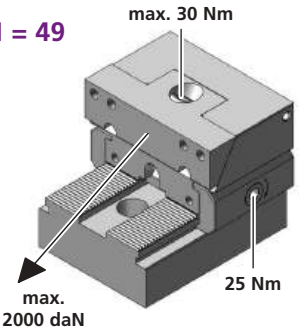
HM = Hartmetallbeschichtet / *Carbide coated*

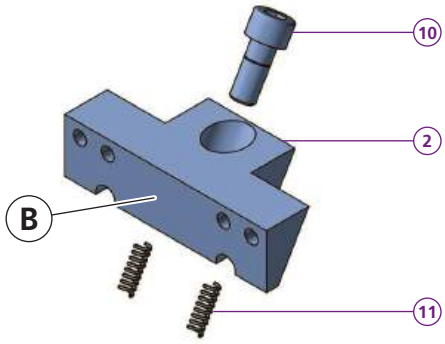
Separat bestellen / *Order separately*

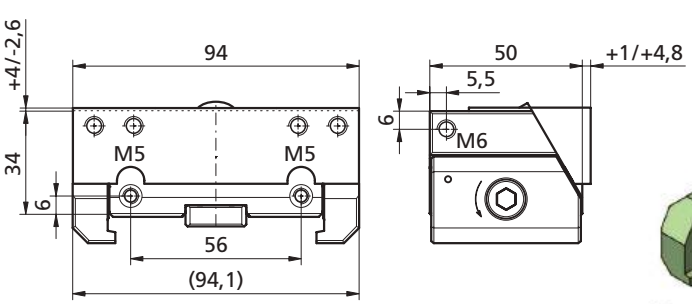


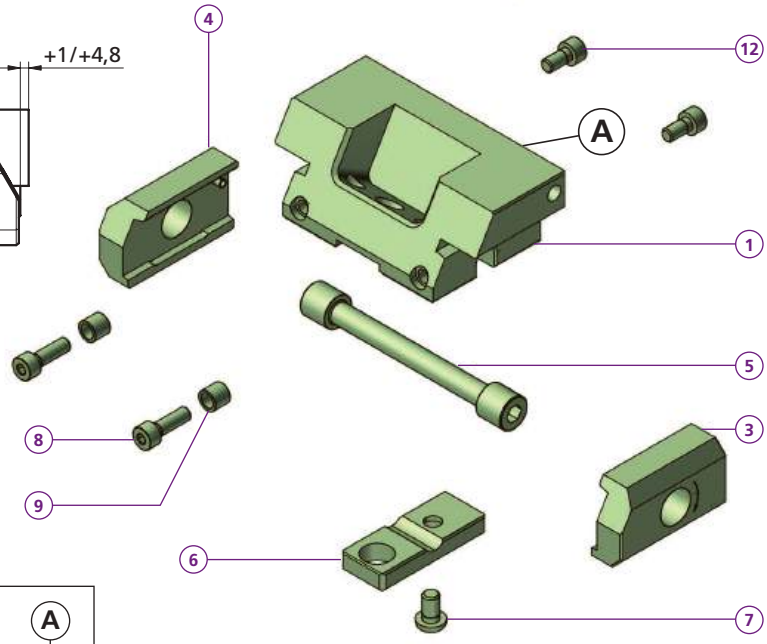


H = 49

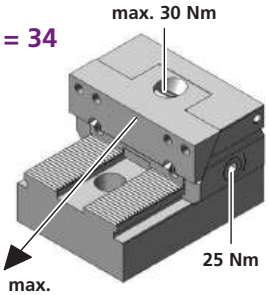








H = 34



A

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

A

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

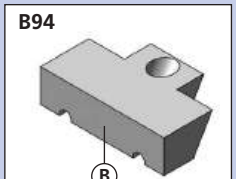
1	1x	TF140481
2	1x	
3	1x	**PCSP60R**
4	1x	**PCSP60L**
8	2x	**M5X14ISO4762**
9	2x	**PCD005**
H	=	49
kg		~2,0

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

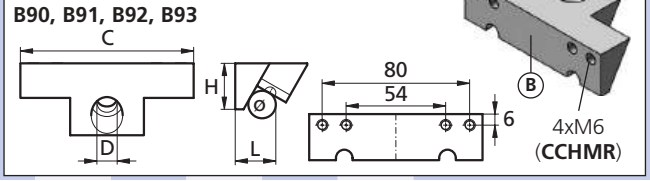
B

	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

B94

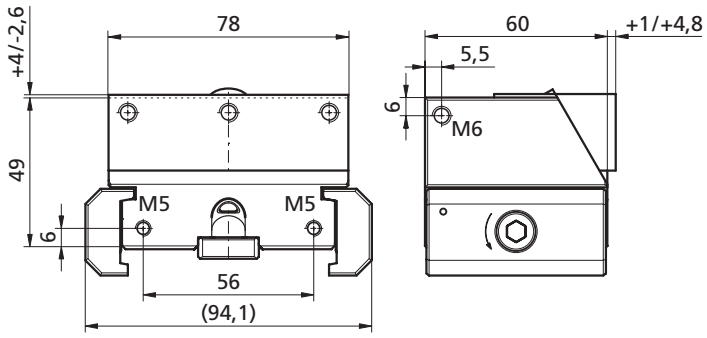


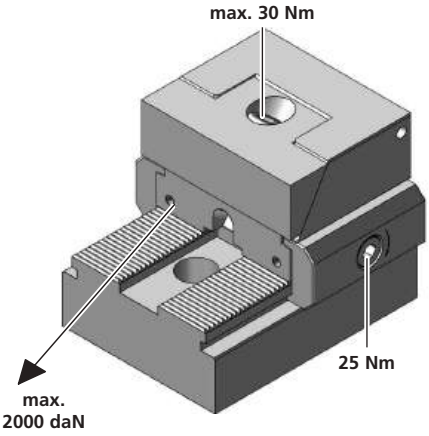
B90, B91, B92, B93

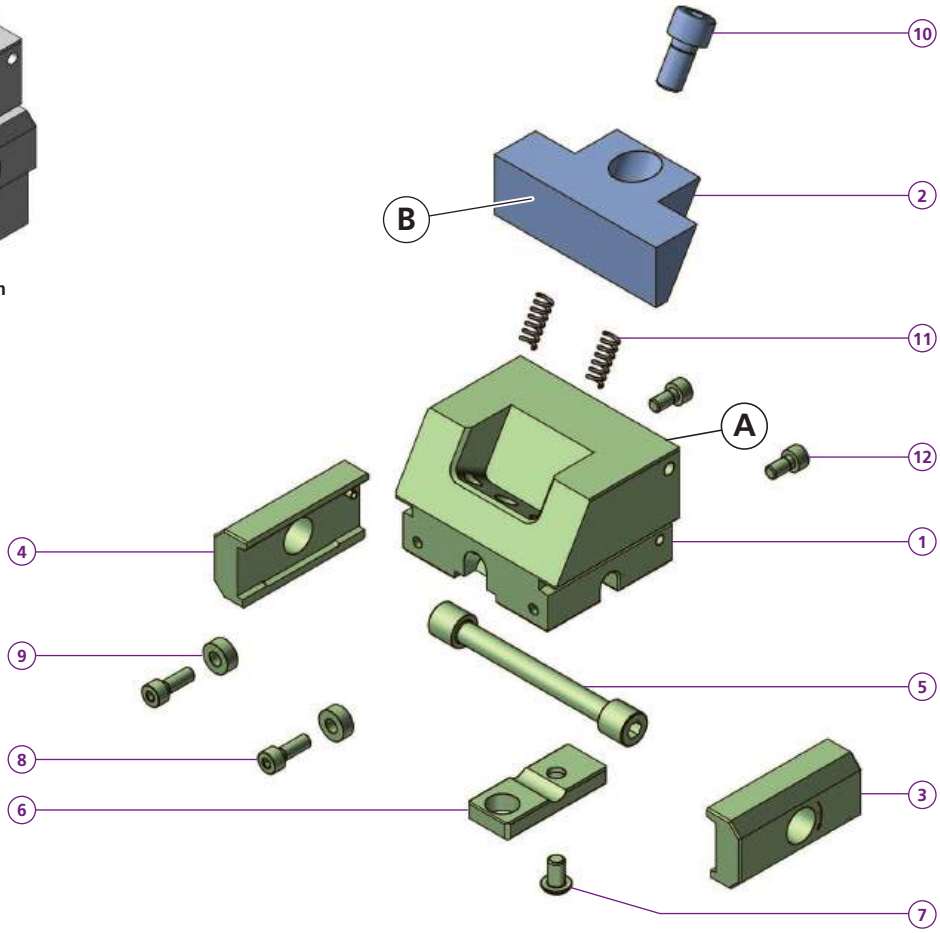


* = weicher *Stahl / soft steel*

Separat bestellen / *Order separately*







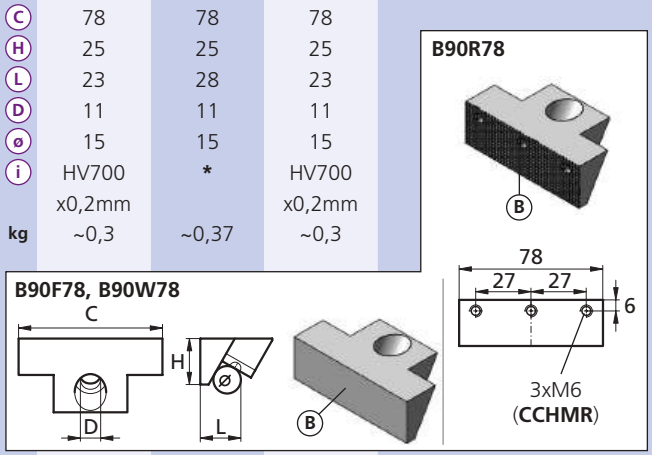
A

	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

B

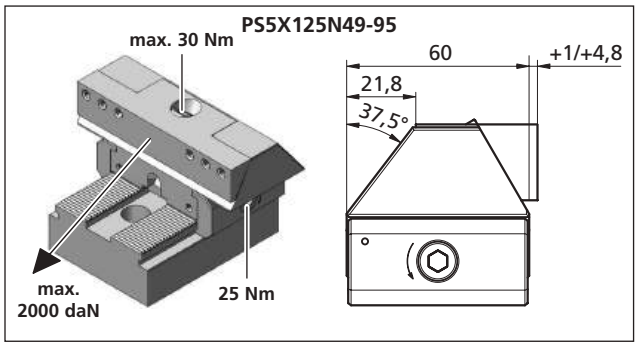
Bestellbeispiel / *Ordering example:*
1x PS1F78N49-90 & 1x B90F78

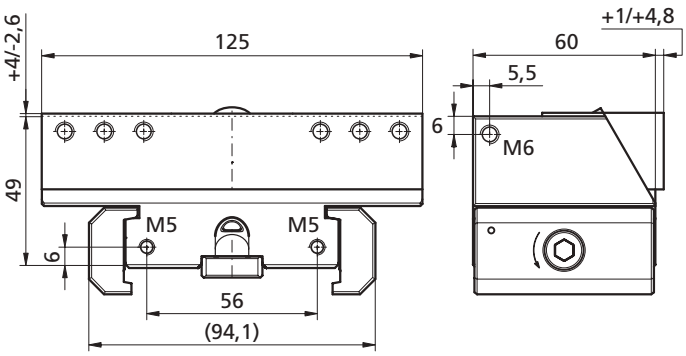
	B90F78	B90W78	B90R78
C	78	78	78
H	25	25	25
L	23	28	23
D	11	11	11
ø	15	15	15
i	HV700 x0,2mm	*	HV700 x0,2mm
kg	~0,3	~0,37	~0,3

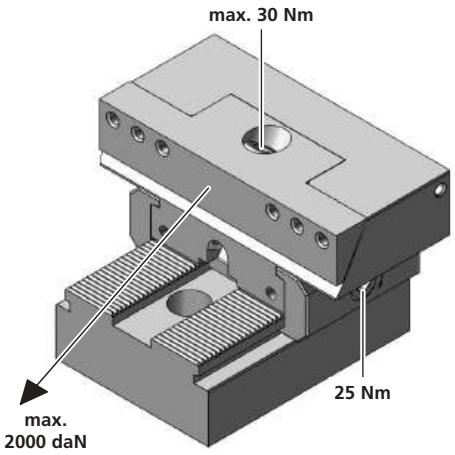


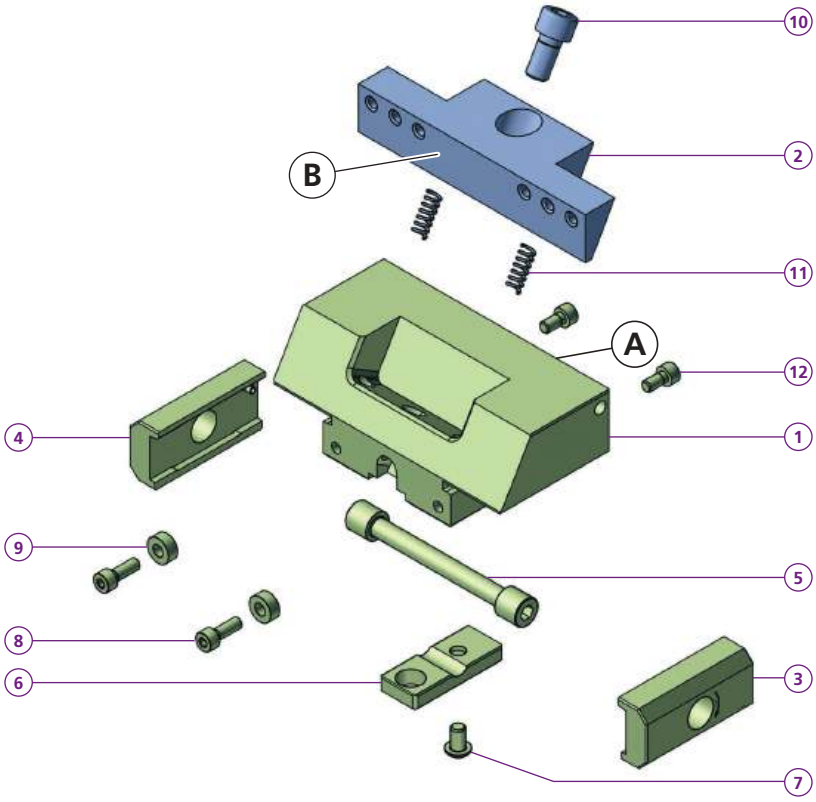
* = weicher *Stahl / soft steel*

Separat bestellen / *Order separately*









A

37,5° **PS5X125N49-95**

1	1x	TF140485
9	2x	**PCD005**
8	2x	**M5X14ISO4762**
kg		~2,0

PS1F125N49-95

1	1x	TF140483

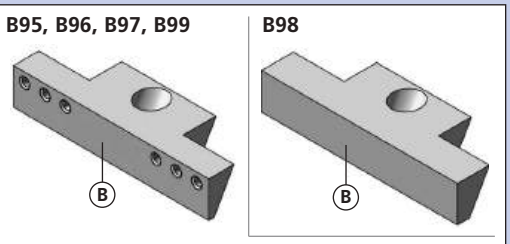
PS1R125N49-95

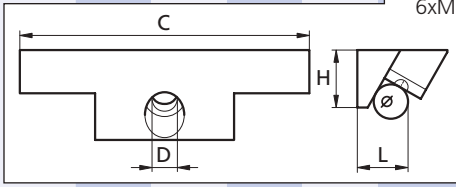
1	1x	TF140484
2	1x	
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
8	2x	**M5X14ISO4762**
9	2x	**PCD005**
10	1x	**M10X25ISO4762**
11	2x	**FED0618**
12	2x	**M5X10ISO4762**
kg		~2,3

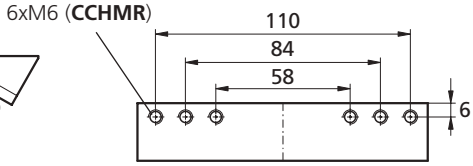
B

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

	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 x0,2mm	HV700 x0,2mm	*	*	HV700 x0,2mm
kg	~0,46	~0,45	~0,46	~0,63	~0,45

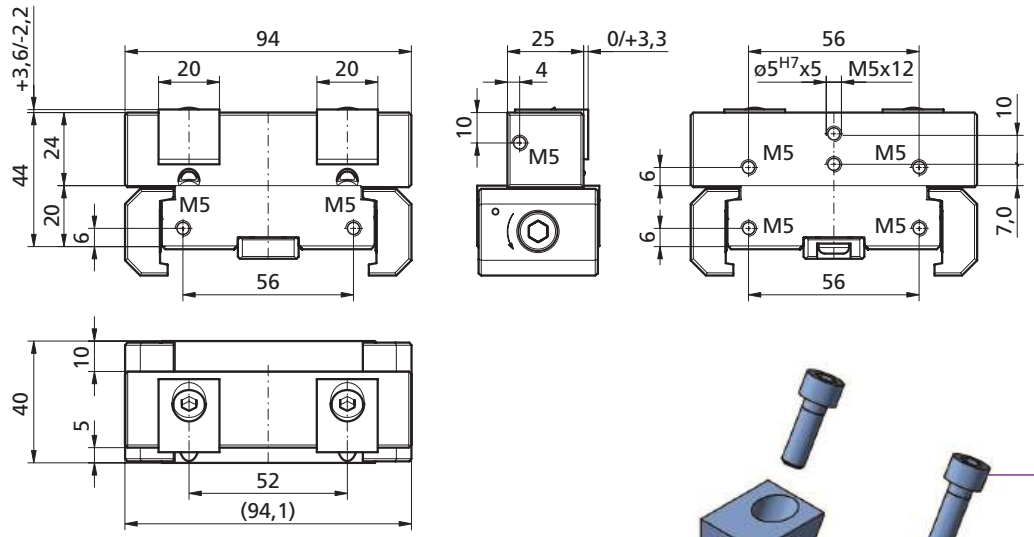


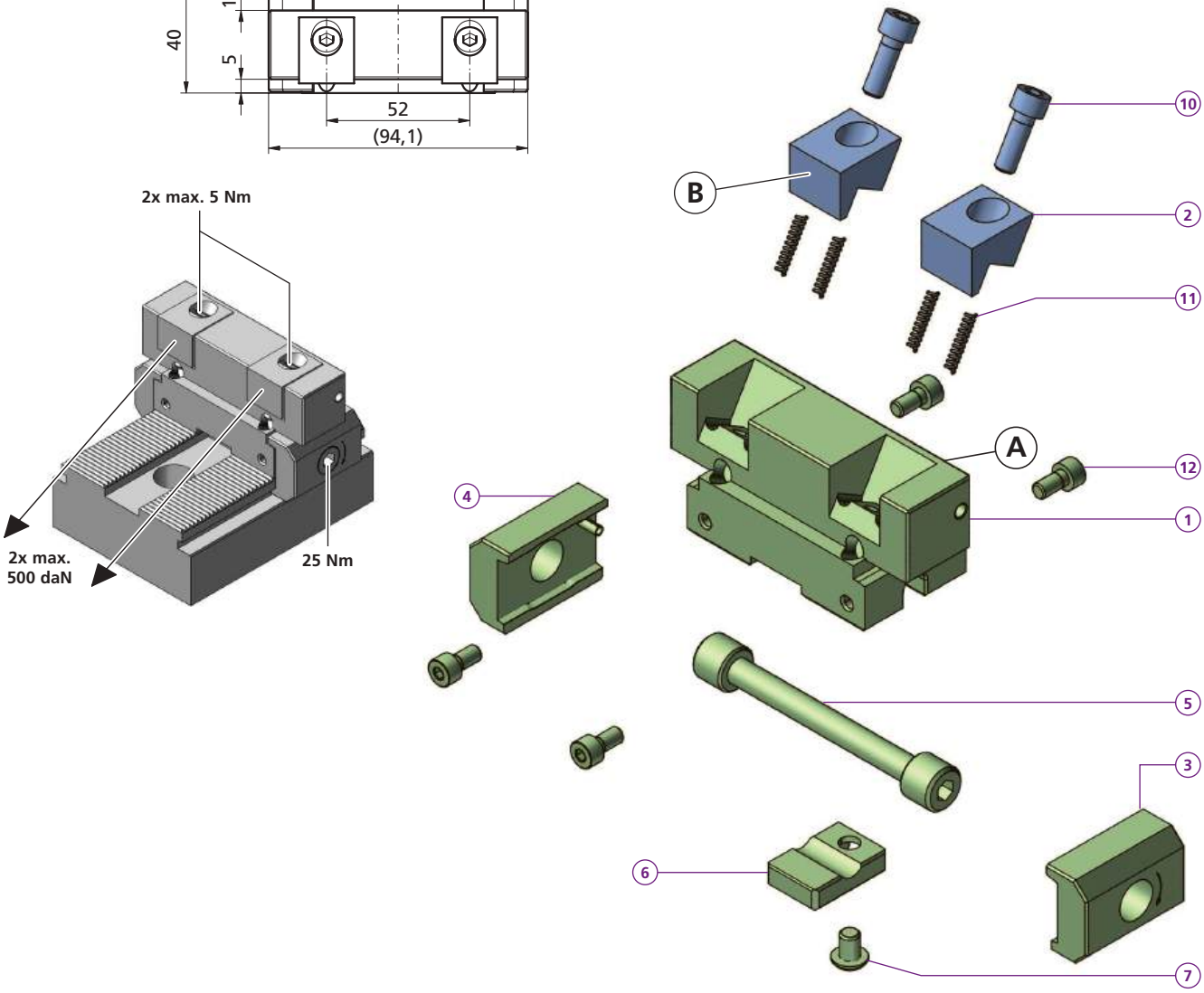




* = weicher *Stahl / soft steel*

Separat bestellen / *Order separately*



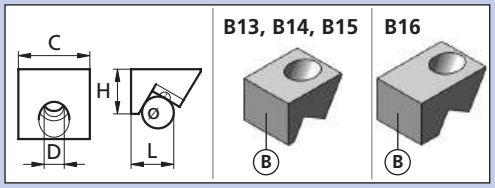


PS2G94N44-13

1	1x	TF140486
2	2x	
3	1x	**PCSP40R**
4	1x	**PCSP40L**
5	1x	**PCS14**
6	1x	**PCGU2030**
7	1x	**M6X8ISO7380**
10	2x	**M6X16ISO4762**
11	4x	**FED0318**
12	4x	**M5X10ISO4762**
kg		~1,0

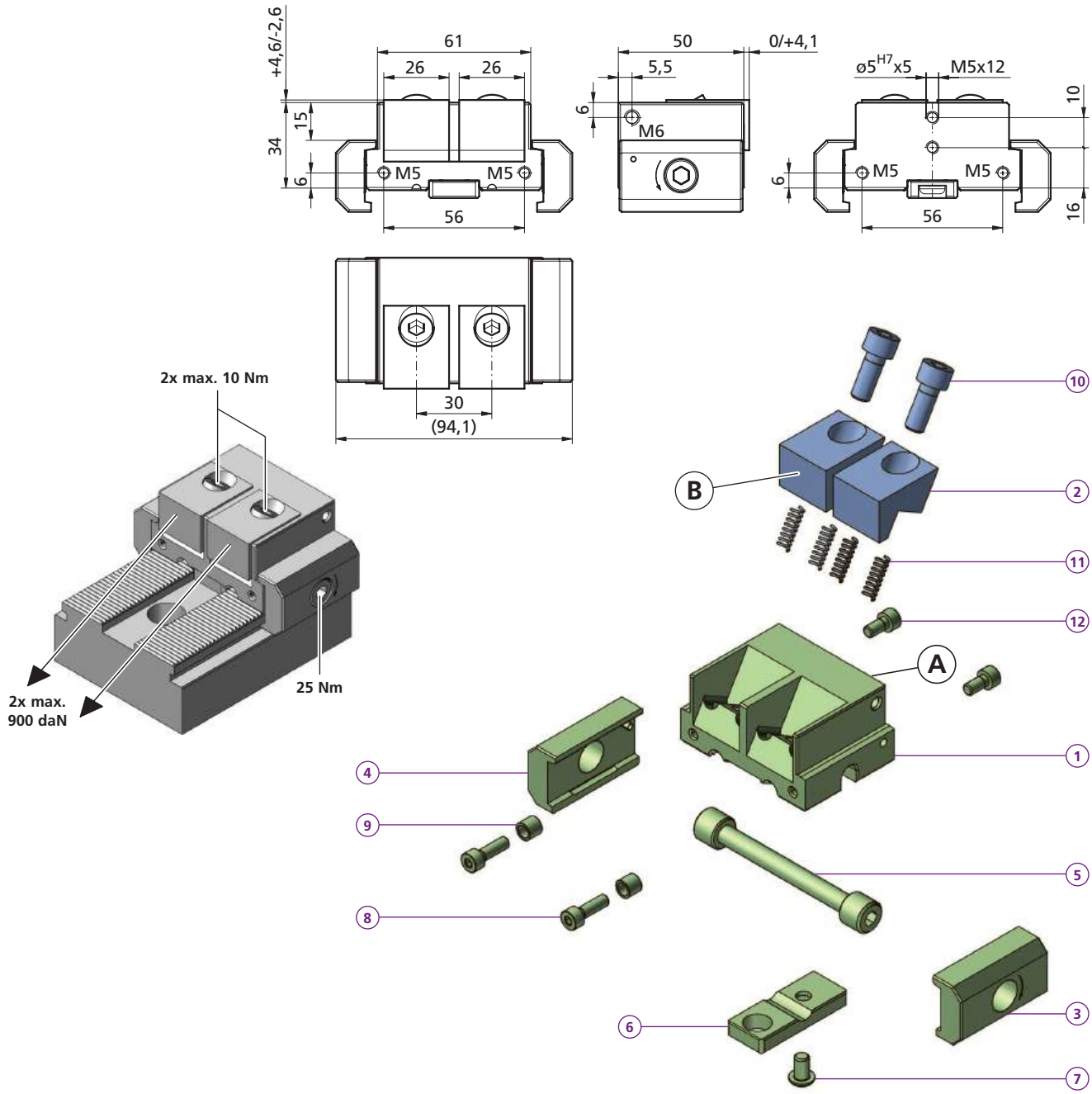
Bestellbeispiel / ***Ordering example:*** 1x **PS2G94N44-13** & 2x **B14**

	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 x0,2mm	HV700 x0,2mm	*	*
kg	~0,05	~0,05	~0,05	~0,06



* = weicher *Stahl / soft steel*

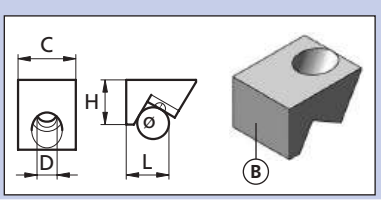
Separat bestellen / Order separately



	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

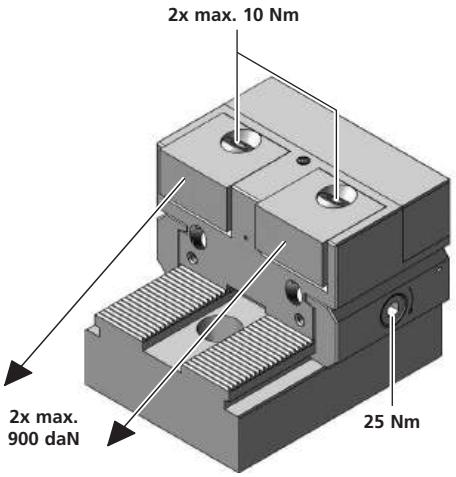
Bestellbeispiel / *Ordering example:* 1x **PS2R61N34-45** & 2x **B47HM**

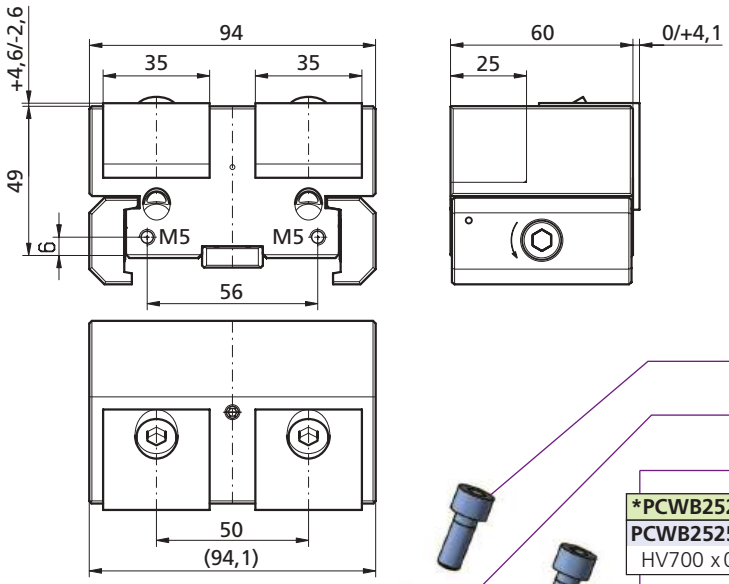
	B45	**B46**	**B47**	**B47HM**
C	26	26	26	26
H	20	20	20	20
L	19	19	19,1	19,1
D	9	9	9	9
ø	12	12	12	12
i	HV700 x0,2mm	HV700 x0,2mm	*	HM
kg	~0,1	~0,1	~0,1	~0,1

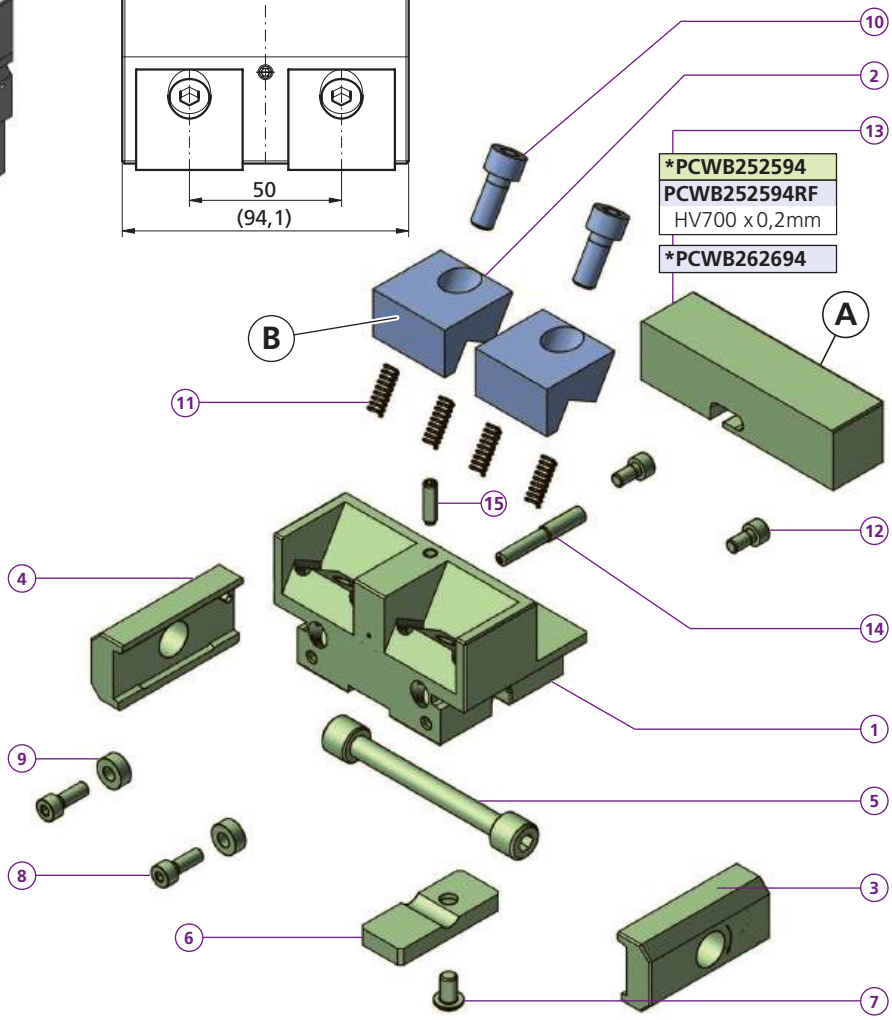


Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated*



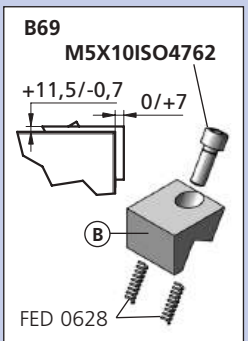


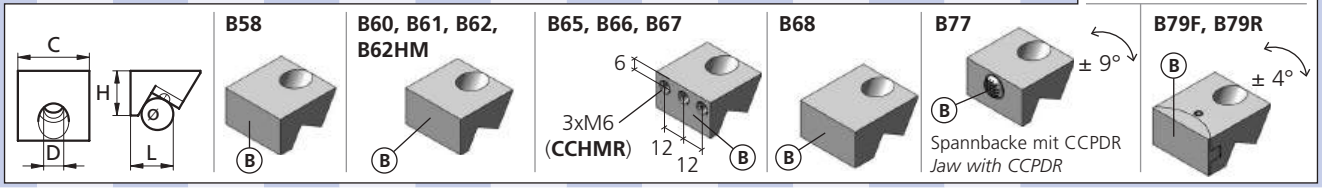


PS2X94N49-60		
1	1x	TF140489
2	2x	
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
8	2x	**M5X14ISO4762**
9	2x	**PCD005**
10	2x	**M8X20ISO4762**
11	4x	**FED0618**
12	2x	**M5X10ISO4762**
13	1x	**PCWB252594**
14	1x	PCBO060540
15	1x	**M5X16ISO4026**
kg		~1,2

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

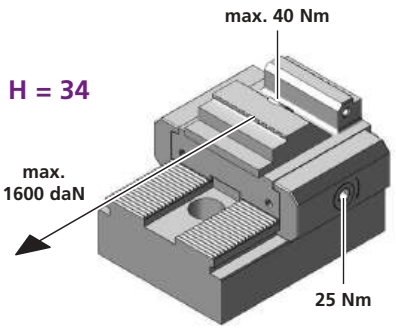
B	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B69	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	25	20	20	20
L	26	19	19	19	19	19	19	24	26	22	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56 HRC	56 HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm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

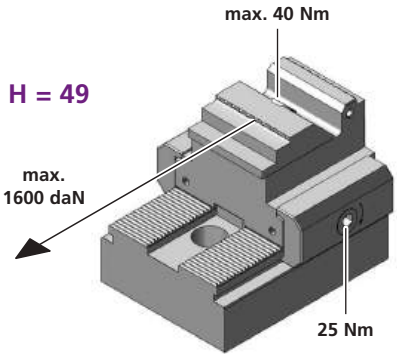


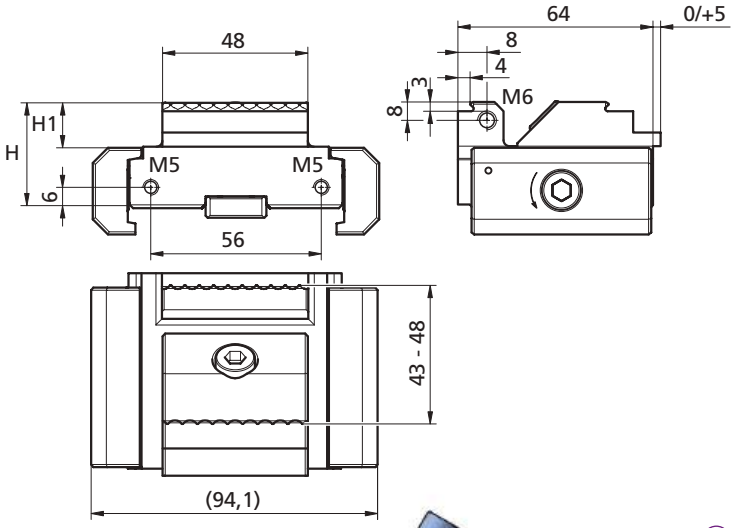


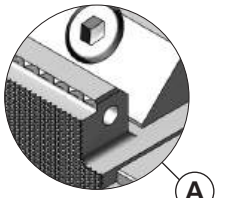
* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated* ALU = ENAW-7022

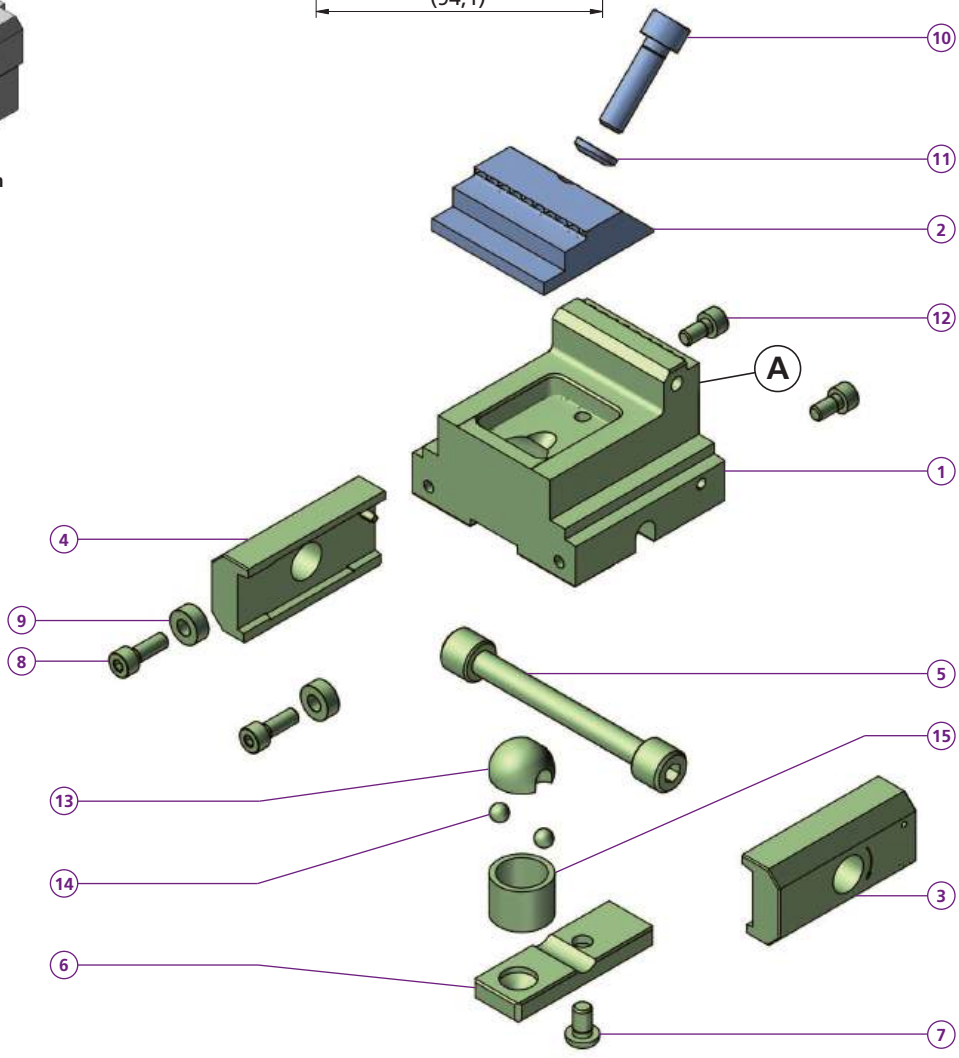
Separat bestellen / *Order separately*











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

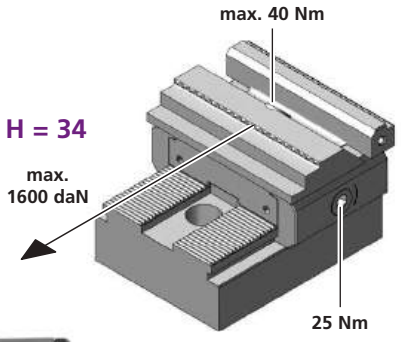
PS1PF48L49-105

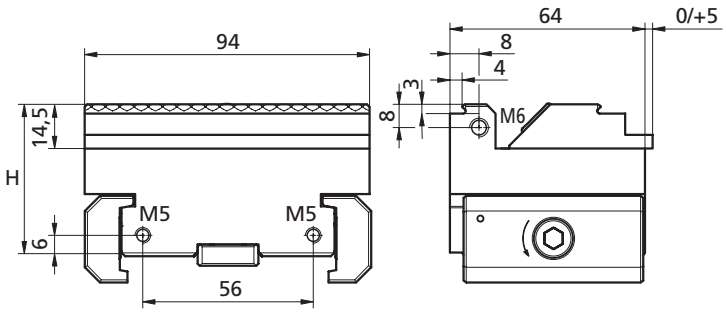
1	1x	TK140781
15	1x	PCD20L15
H	=	49
H1	=	30
kg		~1,4

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

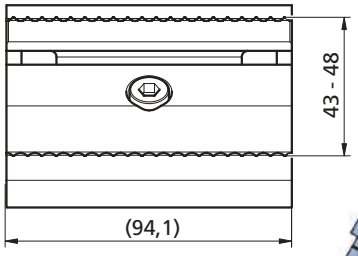
Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	**(lb-ft)**	**~daN**	**~(lb)**	**~t**
10	7,4	= 400	880	0,4
20	14,8	= 800	1´760	0,8
30	22,2	= 1´200	2´650	1,2
40	29,6	= 1´600	3´530	1,6

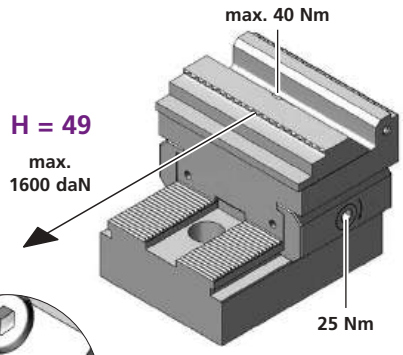
Separat bestellen / *Order separately*

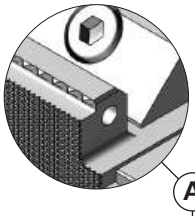


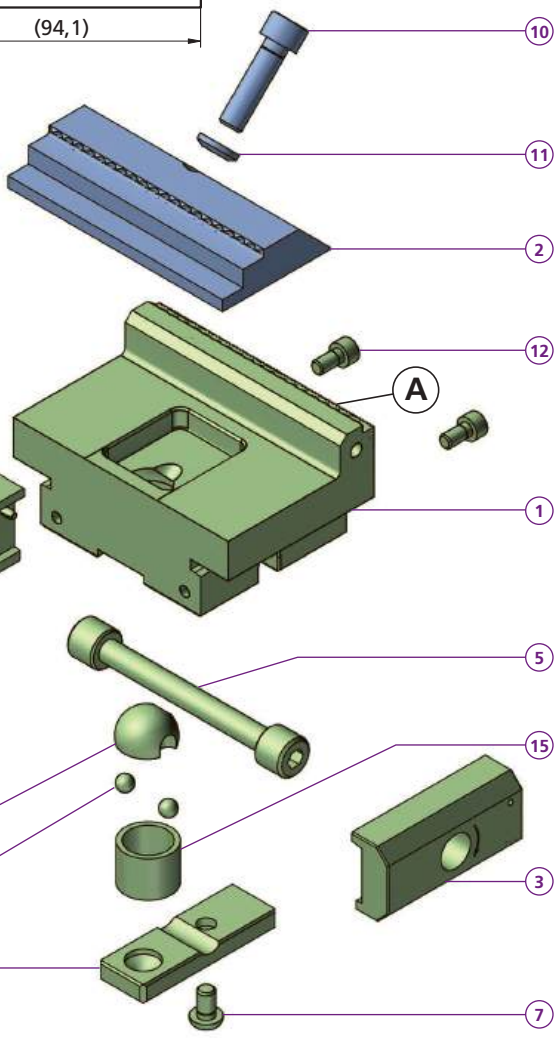








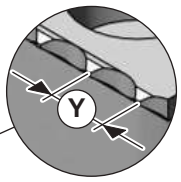




PS1P94L34-105

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

p. 84, 85



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

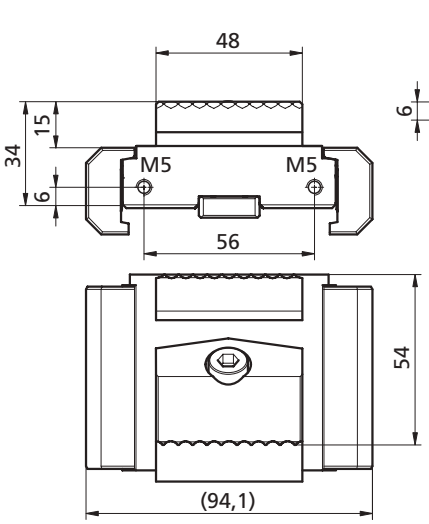
PS1PF94L49-105

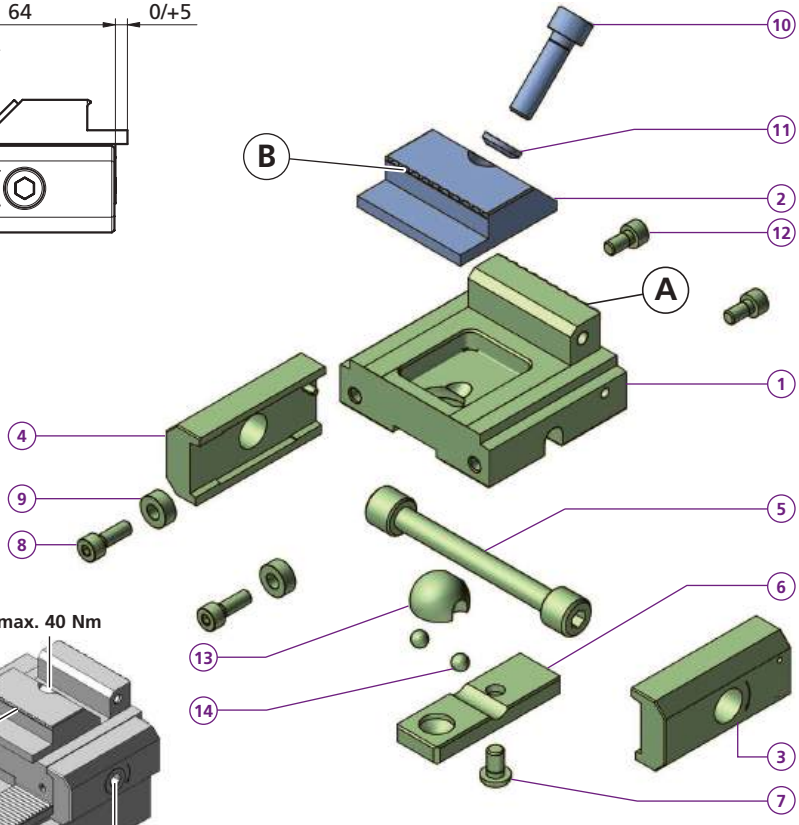
1	1x	TK140783
15	1x	PCD20L15
H	=	49
kg		~1,8

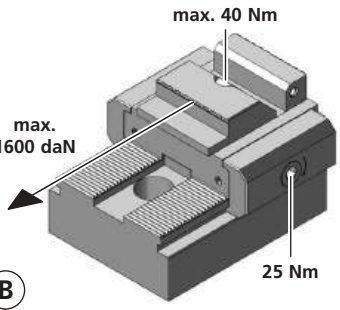
Bestellbeispiel / *Ordering example:*
1x **PS1P94L34-105** & 1x **B120**

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*





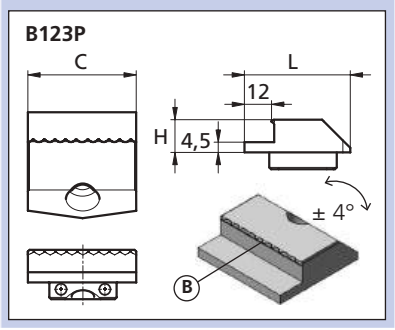


PS1PV48L34-105

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

B123P

C	48
H	14,5
L	47
i	56HRC
kg	~0,21



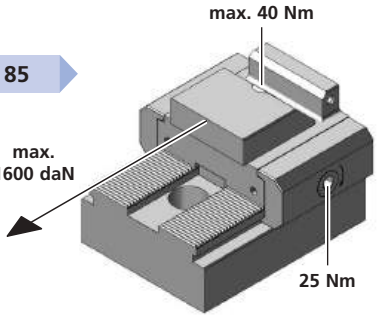
PS1R48L34-105

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

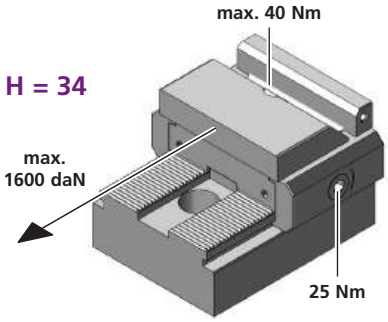
p. 84, 85

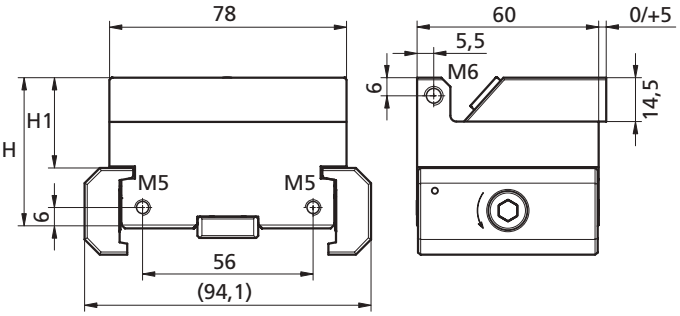


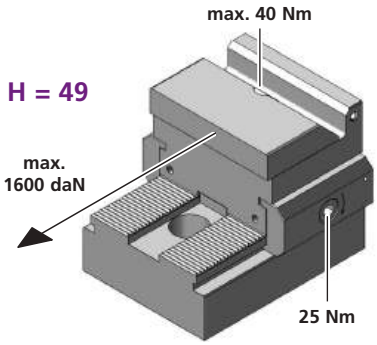
Bestellbeispiel / *Ordering example:*
1x PS1R48L34-105 & 1x B123P

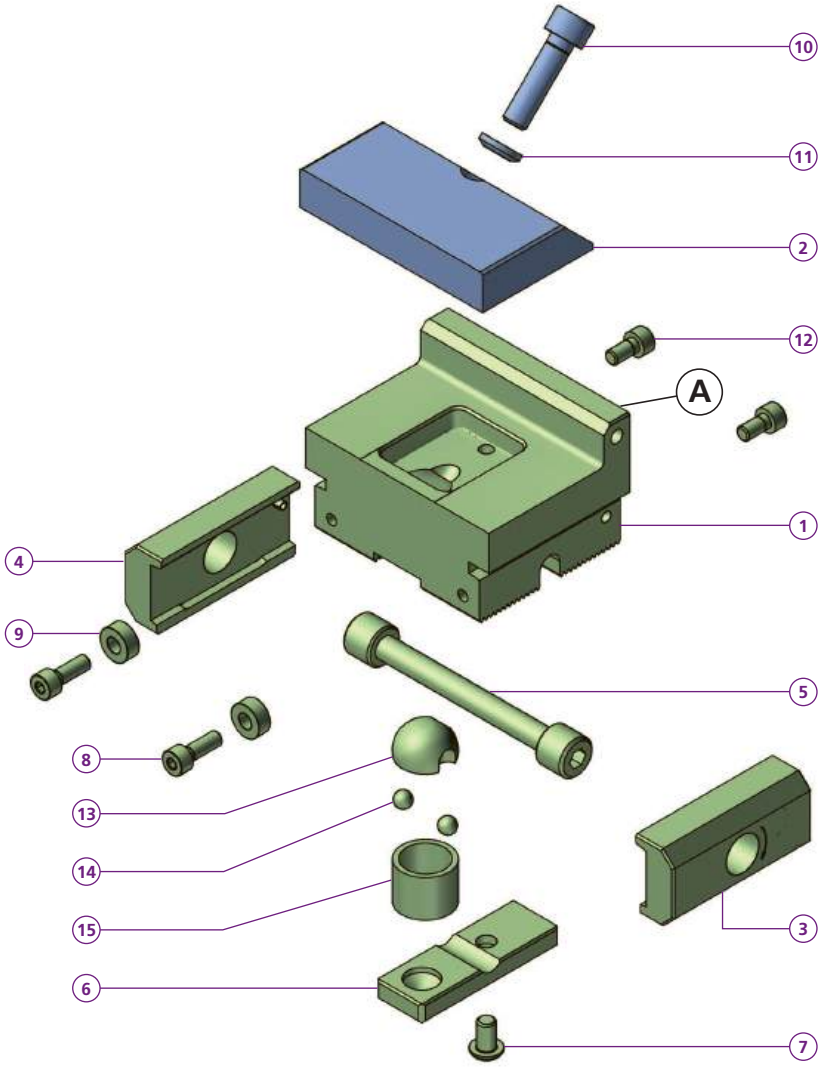
Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1´760	0,8
30	22,2	= 1´200	2´650	1,2
40	29,6	= 1´600	3´530	1,6

Separat bestellen / *Order separately*









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

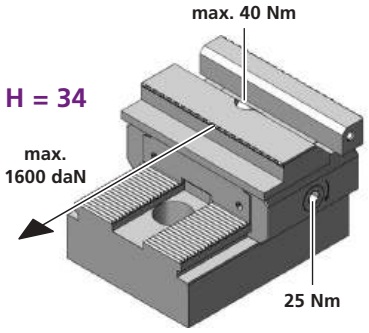
PS1F78L49-105

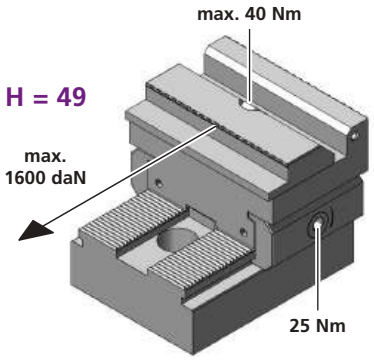
1	1x	TK110400
15	2x	PCD20L15
H	=	49
H1	=	30
kg		~1,5

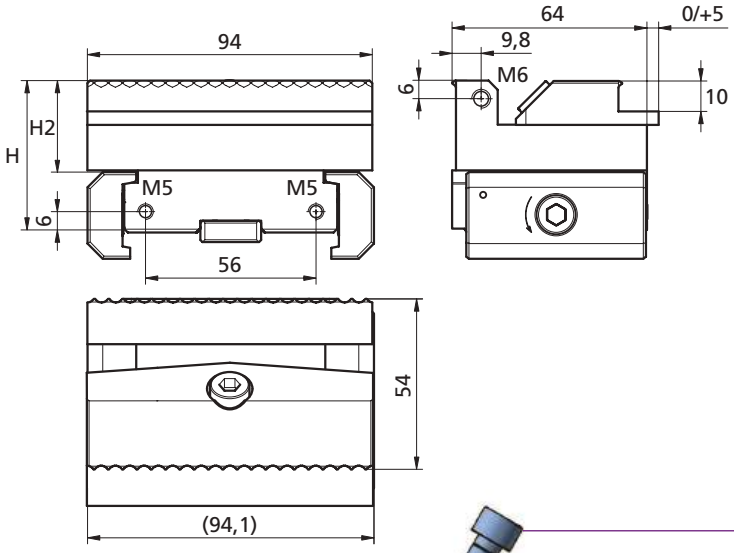
Bestellbeispiel / *Ordering example:*
1x PS1R48L34-105 & 1x B105

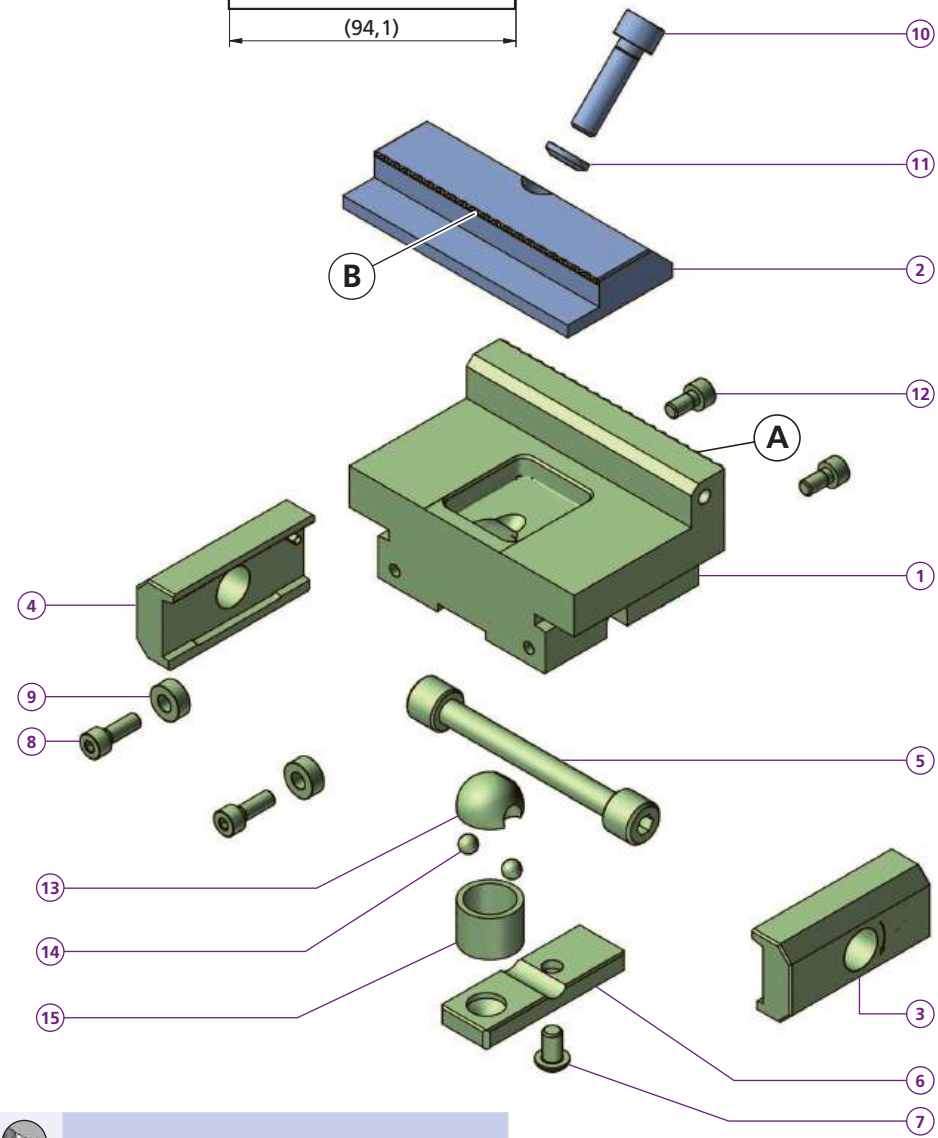
Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	**(lb-ft)**	**~daN**	**~(lb)**	**~t**
10	7,4	= 400	880	0,4
20	14,8	= 800	1´760	0,8
30	22,2	= 1´200	2´650	1,2
40	29,6	= 1´600	3´530	1,6

Separat bestellen / *Order separately*









PS1PV94L34-105

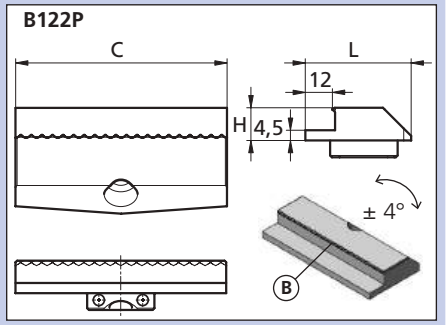
1	1x	TK120230
2	1x	
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2059**
7	1x	**M6X8ISO7380**
8	2x	**M5X14ISO4762**
9	2x	**PCD005**
10	1x	**M8X28ISO4762**
11	1x	PCUSR16
12	2x	**M5X10ISO4762**
13	1x	PCKMR45M8
14	2x	D=6 DIN 5401
H	=	34
H1	=	15
kg		~1,1

PS1PV94L49-105

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

B122P

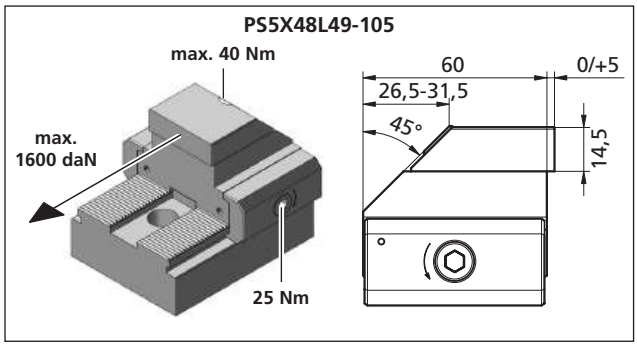
C	94
H	14,5
L	47
i	56HRC
kg	~0,37

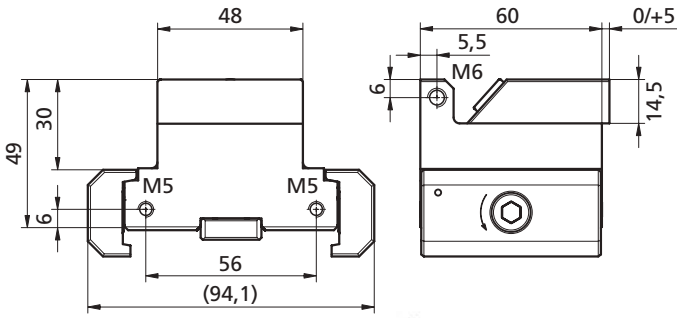


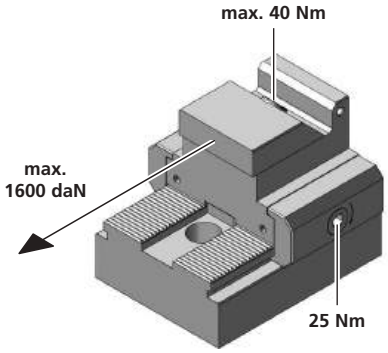
Bestellbeispiel / *Ordering example:*
1x PS1PV94L49-105 & 1x B122P

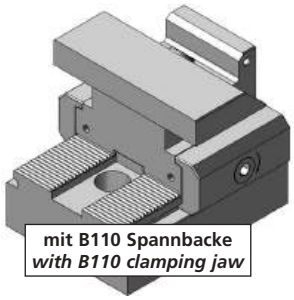
Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	**(lb-ft)**	**~daN**	**~(lb)**	**~t**
10	7,4	= 400	880	0,4
20	14,8	= 800	1´760	0,8
30	22,2	= 1´200	2´650	1,2
40	29,6	= 1´600	3´530	1,6

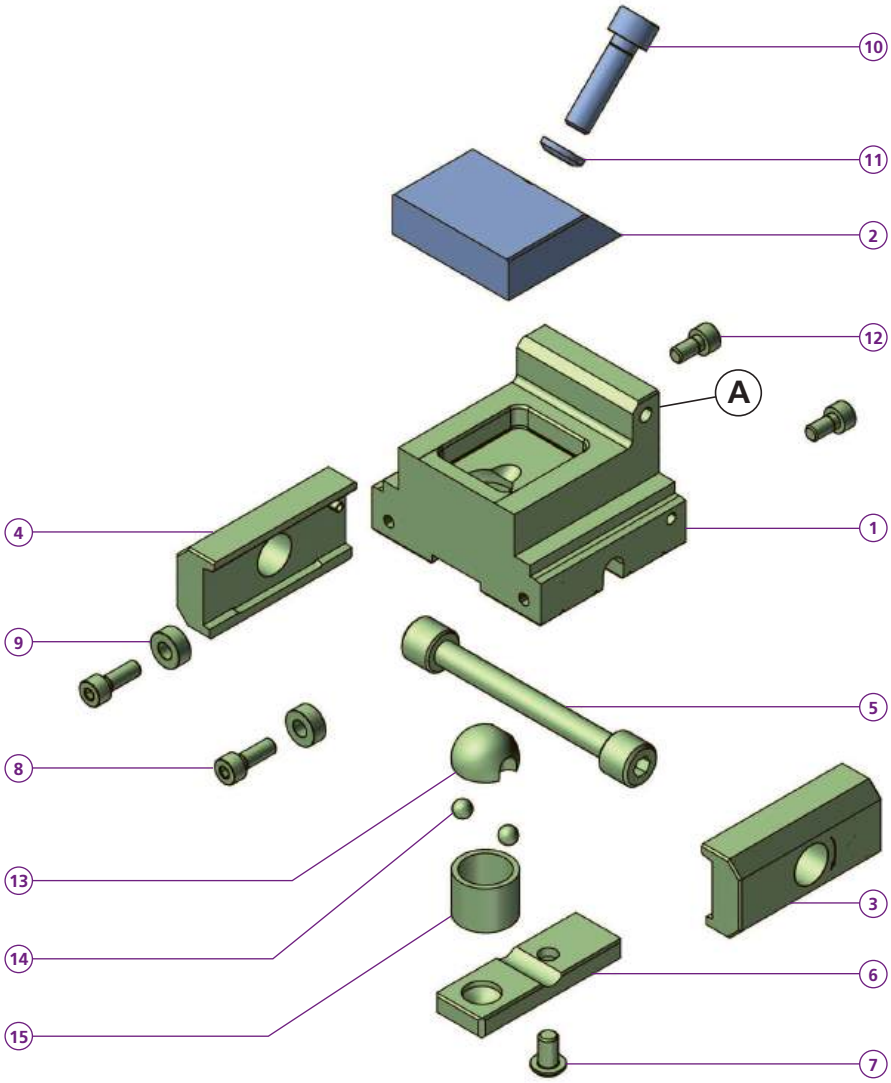
Separat bestellen / *Order separately*











A

45°

PS5X48L49-105

1	1x	TF190651
9	2x	**PCD005**
8	2x	**M5X14ISO4762**
kg		~1,2

PS1F48L49-105

1	1x	TF140673

PS1R48L49-105

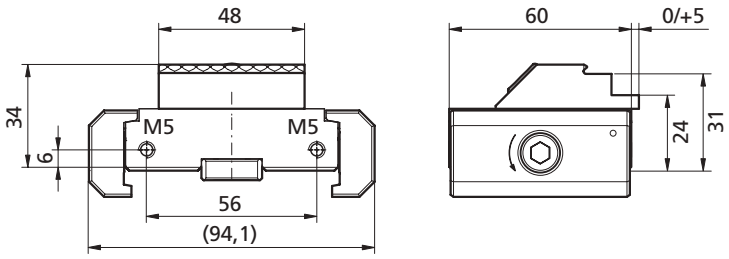
1	1x	TF140672
2	1x	p. 84, 85
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2059**
7	1x	**M6X8ISO7380**
8	2x	**M5X14ISO4762**
9	2x	**PCD005**
10	1x	**M8X30ISO4762**
11	1x	PCUSR14
12	2x	**M5X10ISO4762**
13	1x	PCKMR45M8
14	2x	D=6 DIN 5401
15	1x	PCD20L15
kg		~1,3

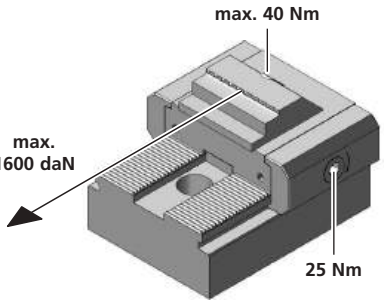


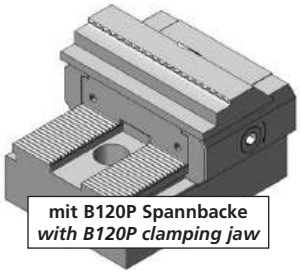
Bestellbeispiel / *Ordering example:*
1x **PS1F48L49-105** & 1x **B105**

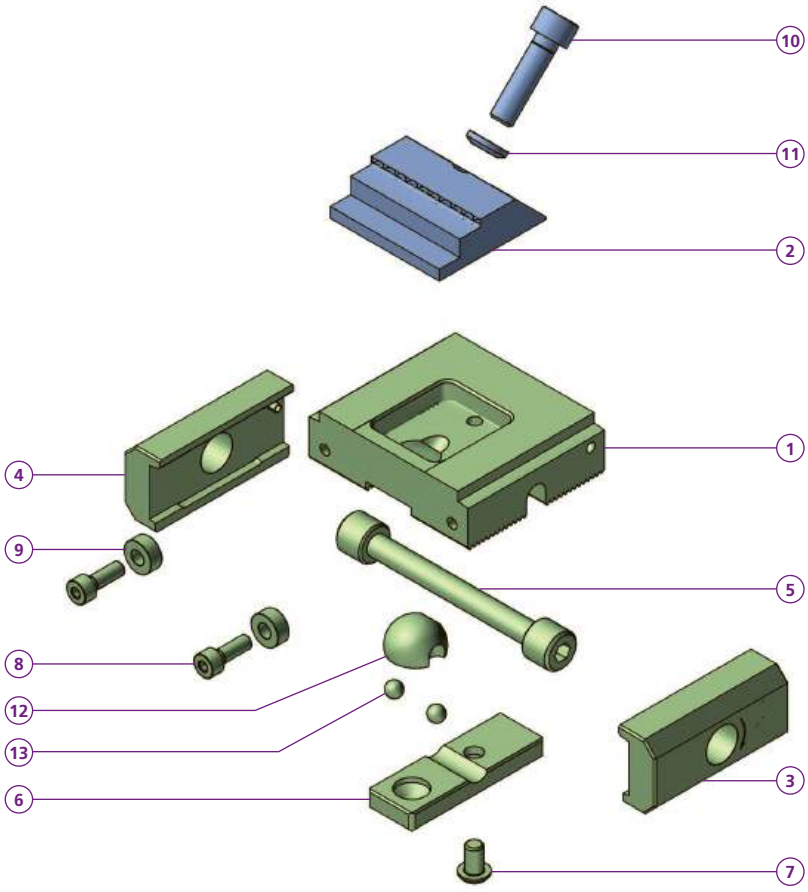
Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	**(lb-ft)**	**~daN**	**~(lb)**	**~t**
10	7,4	= 400	880	0,4
20	14,8	= 800	1´760	0,8
30	22,2	= 1´200	2´650	1,2
40	29,6	= 1´600	3´530	1,6

Separat bestellen / *Order separately*







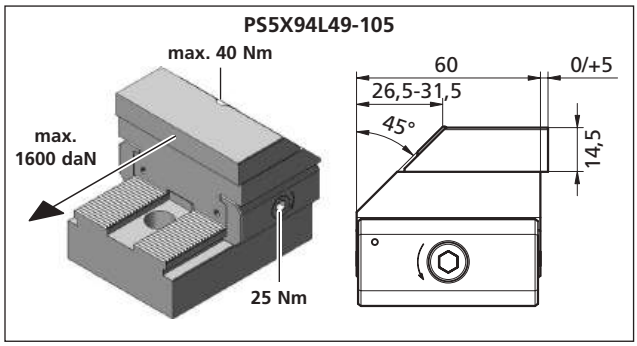


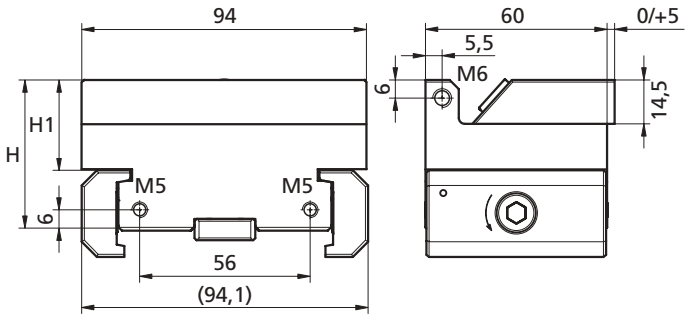
PS5X48L34-105		
1	1x	T00365
2	1x	p. 84, 85
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2059**
7	1x	**M6X8ISO7380**
8	2x	**M5X14ISO4762**
9	2x	**PCD005**
10	1x	**M8X28ISO4762**
11	1x	PCUSR16
12	1x	PCKMR45M8
13	2x	D=6 DIN 5401
kg		~0,9

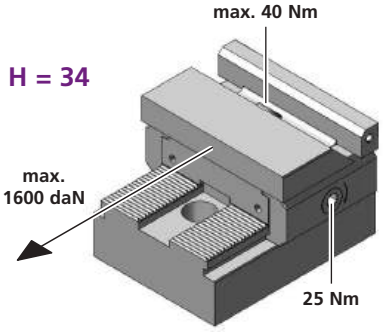
Bestellbeispiel / *Ordering example:*
1x PS5X48L34-105 & 1x B105

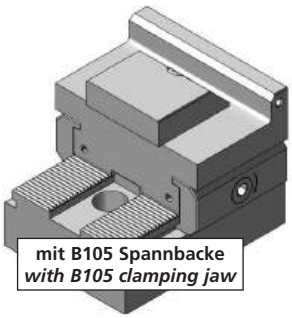
Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1´760	0,8
30	22,2	= 1´200	2´650	1,2
40	29,6	= 1´600	3´530	1,6

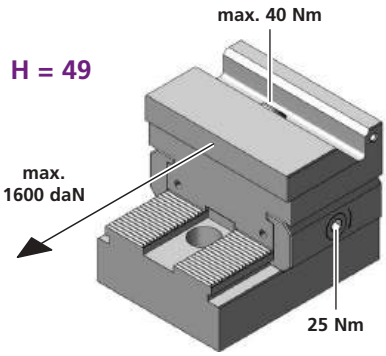
Separat bestellen / *Order separately*

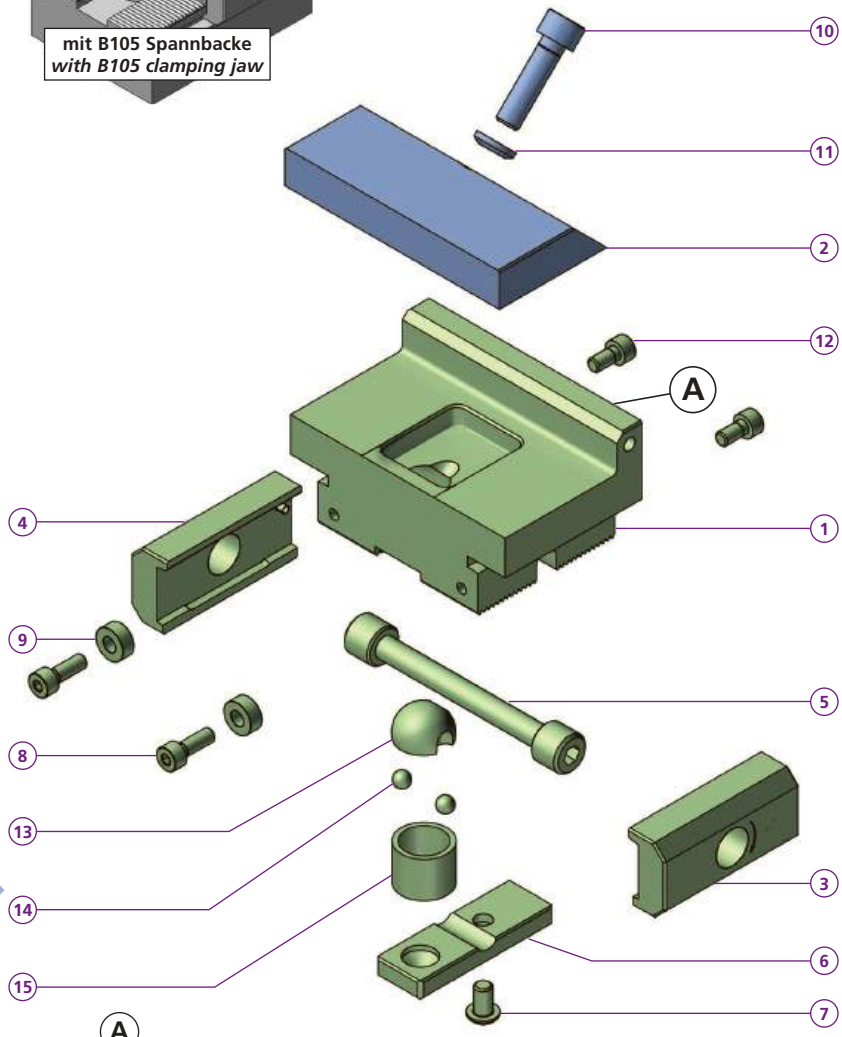












PS5X94L49-105

1	1x	TW100186
15	2x	PCD20L15
9	2x	**PCD005**
8	2x	**M5X14ISO4762**
kg		~1,5

PS1F94L34-105

1	1x	TH130785

PS1R94L34-105

1	1x	TH130786
2	1x	p. 84, 85
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

PS1F94L49-105

1	1x	TF140674
15	2x	PCD20L15

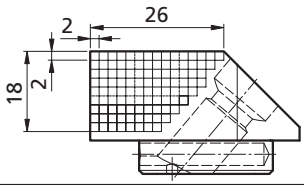
PS1R94L49-105

1	1x	TF140675
15	2x	PCD20L15
H	=	49
H1	=	30
kg		~1,7

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

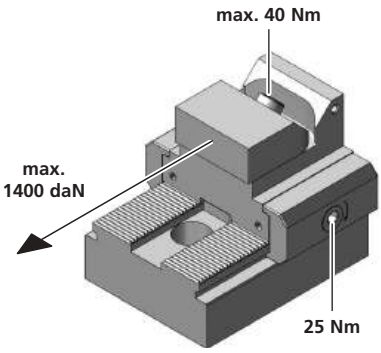
Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 400	880	0,4
20	14,8	= 800	1´760	0,8
30	22,2	= 1´200	2´650	1,2
40	29,6	= 1´600	3´530	1,6

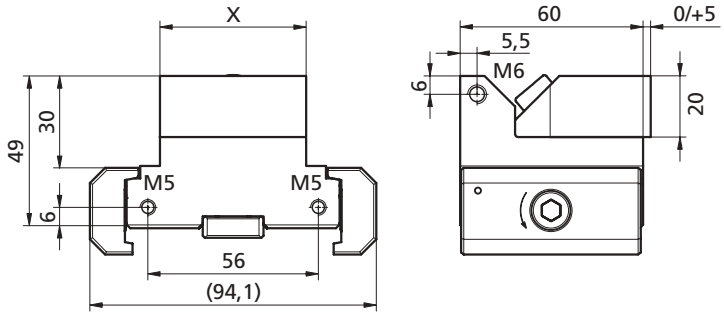
Separat bestellen / *Order separately*

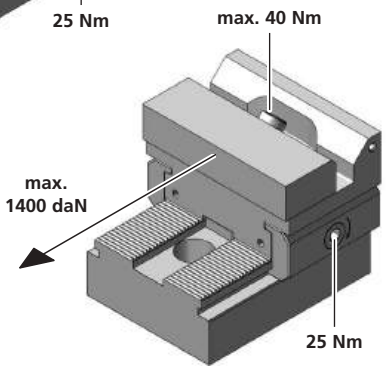


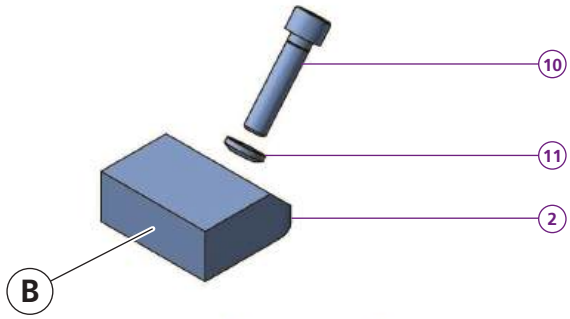
Zum Erstellen Ihrer individuellen Formbacke: Schnittzeichnung zum Ermitteln der maximalen Bearbeitungsprofiltiefe

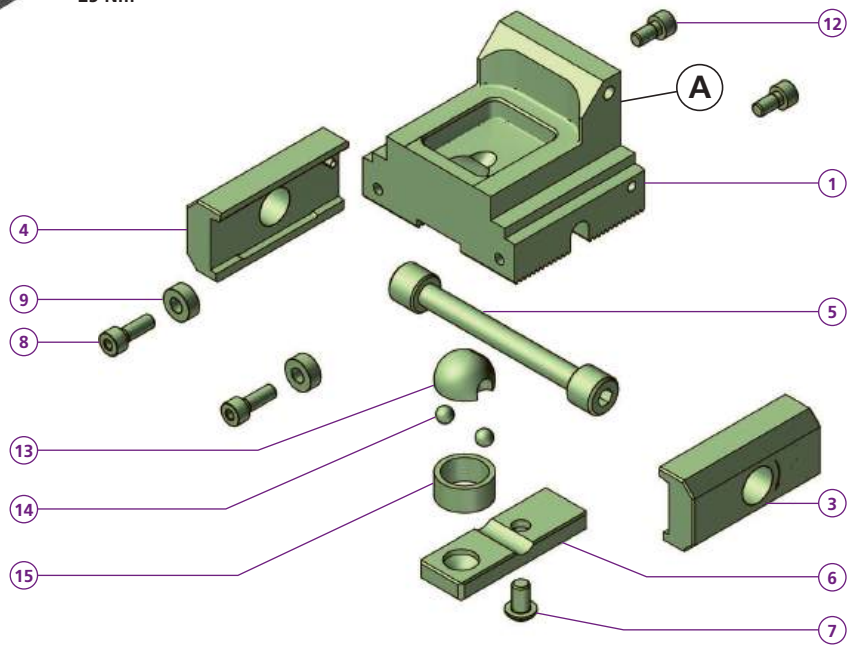
If a dedicated jaw is being machined: *Sectional drawing to determine the maximum machining depth*











PS1R48L49-105H20

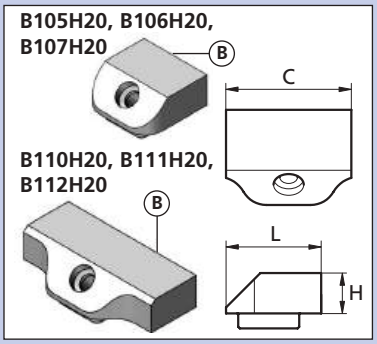
1	1x	TW100161-01
2	1x	
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2059**
7	1x	**M6X8ISO7380**
8	2x	**M5X14ISO4762**
9	2x	**PCD005**
10	1x	**M8X35ISO4762**
11	1x	PCUSR14
12	2x	**M5X10ISO4762**
13	1x	PCKMR45M8
14	2x	D=6 DIN 5401
15	1x	PCD20L095
X	=	48
kg		~1,2

PS1R94L49-105H20

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

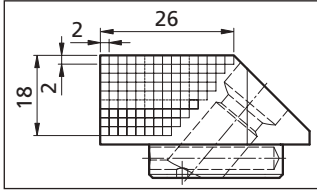
Bestellbeispiel / ***Ordering example:*** 1x **PS1R48L49-105H20** & 1x **B107H20**

	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 x0,2mm	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm	*
kg	~0,38	~0,38	~0,38	~0,57	~0,56	~0,56



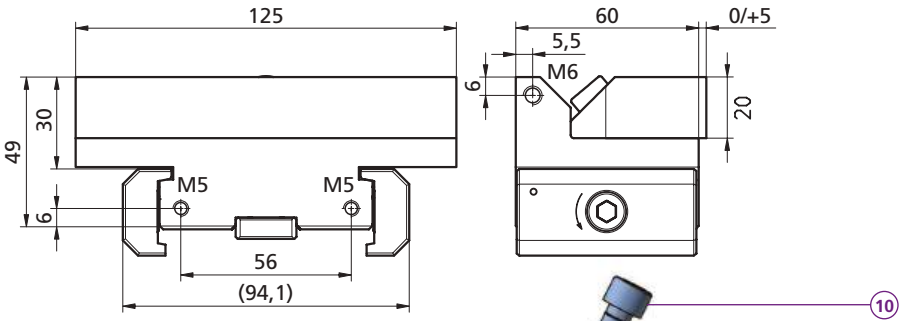
* = weicher *Stahl / soft steel*

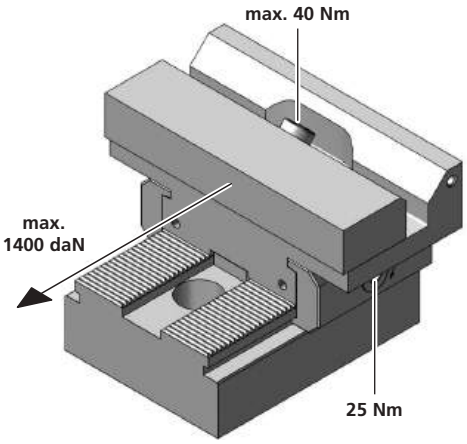
Separat bestellen / *Order separately*

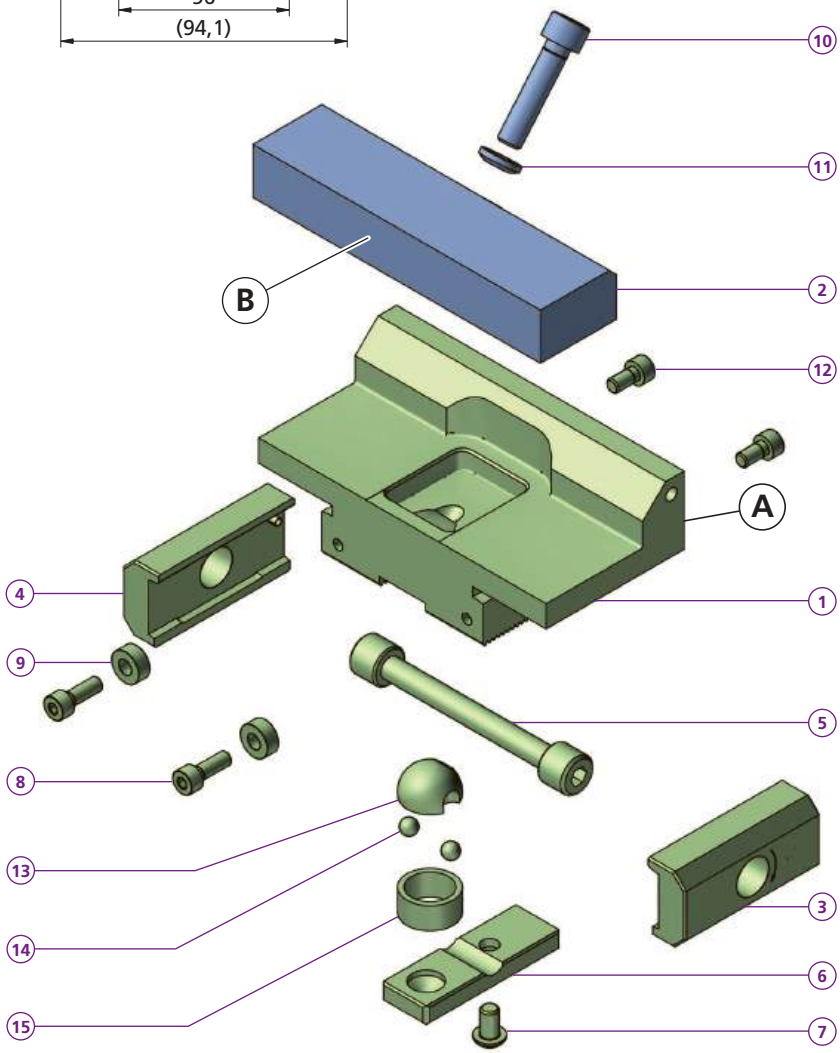


Zum Erstellen Ihrer individuellen Formbacke: Schnittzeichnung zum Ermitteln der maximalen Bearbeitungsprofiltiefe

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







A

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

PS1F125L49-105H20

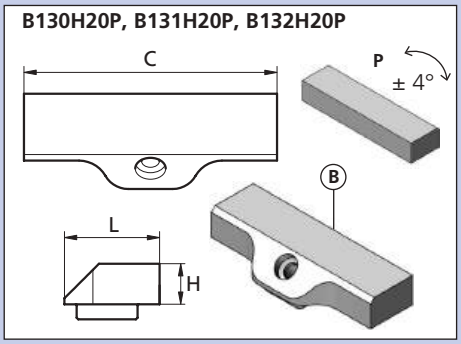
1	1x	TH150895
X	=	125
kg		~1,7

B

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 x0,2mm	HV700 x0,2mm	*
kg	~0,71	~0,71	~0,71

B130H20P, B131H20P, B132H20P



* = weicher *Stahl / soft steel*

Separat bestellen / *Order separately*

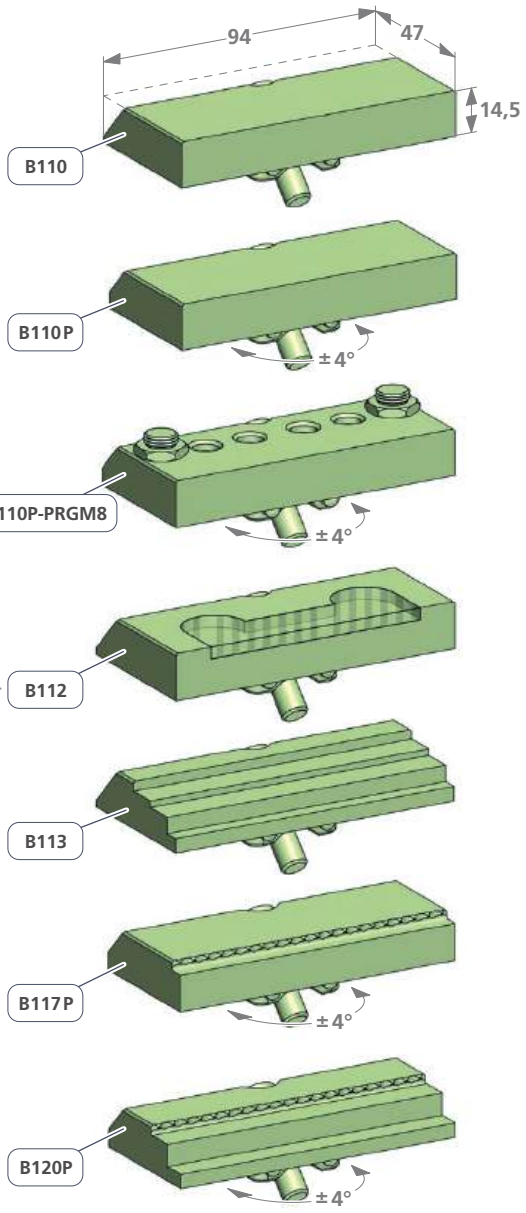
zum Einsatz in unterschiedlichen Spannsituationen
for use in different clamping situations

Art. Nr.					kg
B110	HV700 x 0,2mm				~0,49
B110P	HV700 x 0,2mm	±4°			~0,49

mit Prägeeinsätzen
with direct-stamping inserts

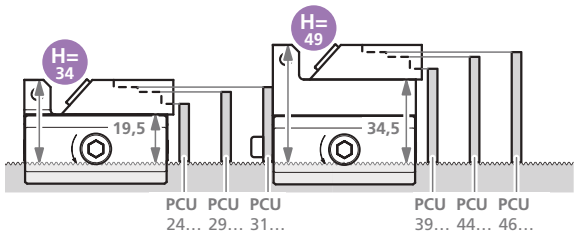
Art. Nr.					kg
B110P-PRGM8	HV700 x 0,2mm				~0,46

Art. Nr.					kg
B111	HV700 x 0,2mm				~0,48
B111P	HV700 x 0,2mm	±4°			~0,48
B112	weicher Stahl *soft steel* (1.2312)				~0,49
B112P	weicher Stahl *soft steel* (1.2312)	±4°			~0,49
B112HG	Hochgenau *High-precision*				~0,49
B112E	Einsatzstahl (1.5752) *Case hardening steel*				~0,49
B112EP	Einsatzstahl (1.5752) *Case hardening steel*	±4°			~0,47
B113	HV700 x 0,2mm				~0,39
B113P	HV700 x 0,2mm	±4°			~0,39
B117P	57HRC	±4°			~0,46
B120	57HRC				~0,4
B120P	57HRC	±4°			~0,4



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

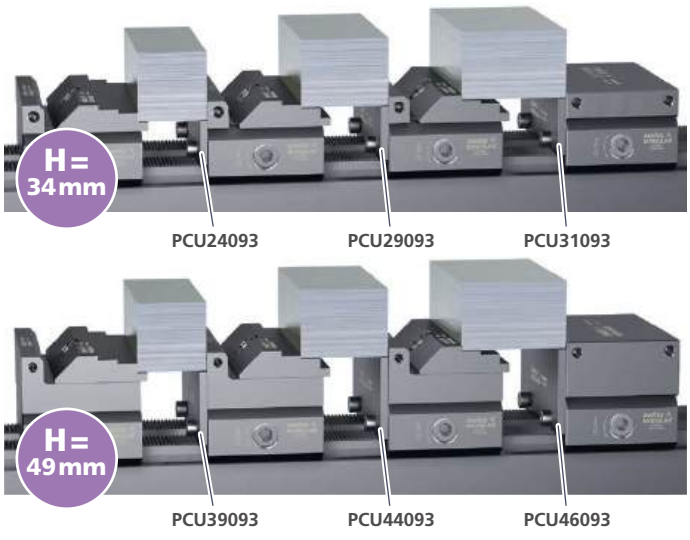
Modulhöhen / *Module heights* 34 / 49 mm



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)

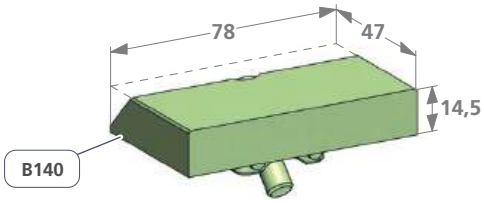


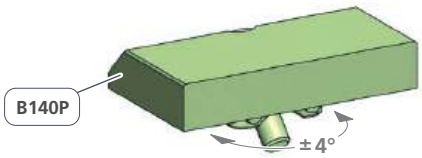
zum Einsatz in unterschiedlichen Spannsituationen
for use in different clamping situations

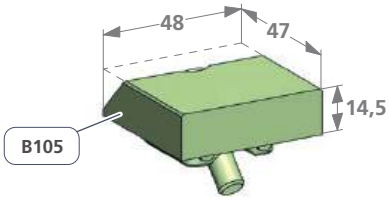
Art.Nr.					kg
B140	HV700 x 0,2mm				~0,41
B140P	HV700 x 0,2mm	±4°			~0,41
B141	HV700 x 0,2mm				~0,41
B141P	HV700 x 0,2mm	±4°			~0,41
B105	HV700 x 0,2mm				~0,27
B105P	HV700 x 0,2mm	±4°			~0,27
B105-15	HV700 x 0,2mm				~0,27
B106	HV700 x 0,2mm				~0,27
B106P	HV700 x 0,2mm	±4°			~0,27
B107	weicher Stahl *soft steel* (1.2312)				~0,27
B107P	weicher Stahl *soft steel* (1.2312)	±4°			~0,27
B108	HV700 x 0,2mm				~0,22
B108P	HV700 x 0,2mm	±4°			~0,22
B115	57HRC				~0,21
B115P	57HRC	±4°			~0,21
B116P	57HRC	±4°			~0,25

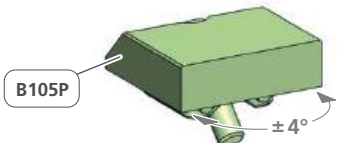
Für Prägebacken / *For stamping jaws*

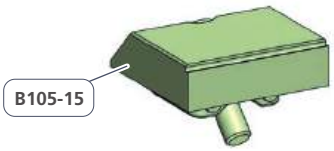
PF-SET	Krafterhaltung mit Nachfederung *Spring loaded mechanism to maintan clamping force*



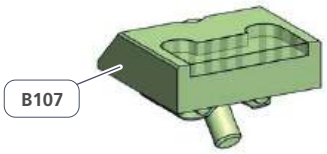


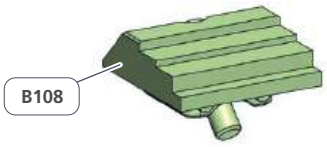


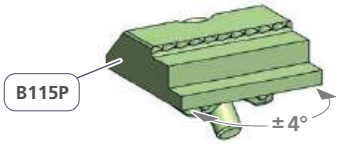


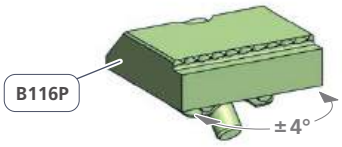


Weich, zur Herstellung individueller Formbacke.
Soft, for the production of individual moulding jaw.









Bei allen Prägebacken kann die Krafterhaltung mit den nachfedernden Tellerfedern eingesetzt werden um ein Freiwiegeln 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 wiggeling free.

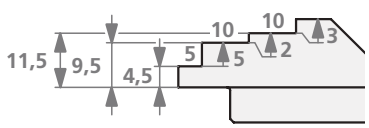


Die Tellerfedern werden gegenläufig montiert.

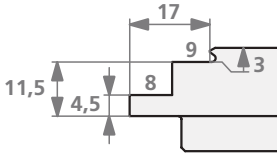
The disc springs are mounted in opposite directions.



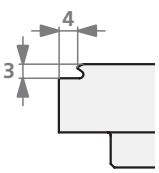
Detailvermassung der Stufenbacken / *Detailed dimensioning of the stepped jaws*



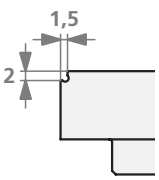
B108, B108P, B113, B113P



B115, B115P, B120, B120P



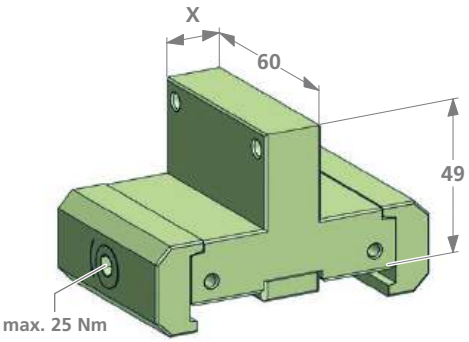
B116P, B117P



B105-15

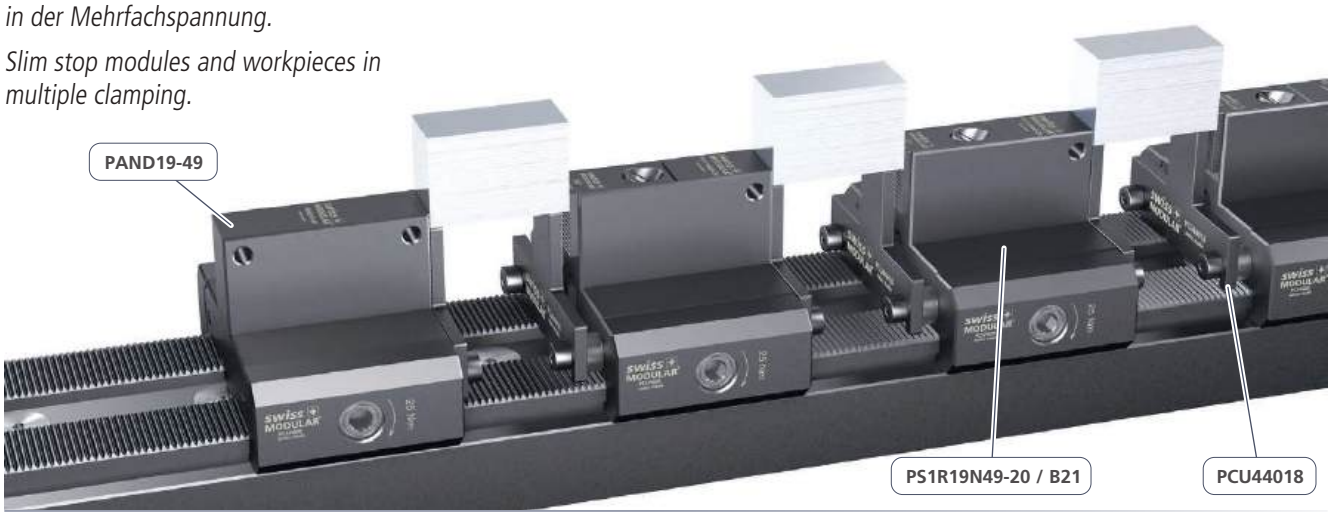
für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

Art. Nr.	kg	X
PAND19-49	~1,2	19
PAND26-49	~1,3	26
PAND34-49	~1,4	34



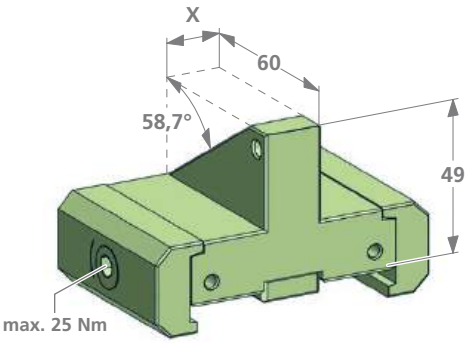
Schmale Anschlagmodule und Werkstücke in der Mehrfachspannung.

Slim stop modules and workpieces in multiple clamping.

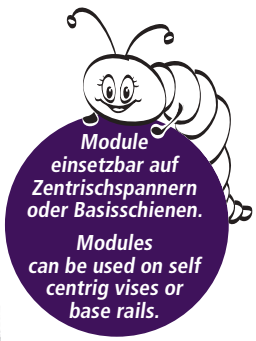


für 5-Achs Bearbeitung
for 5-axis machining

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







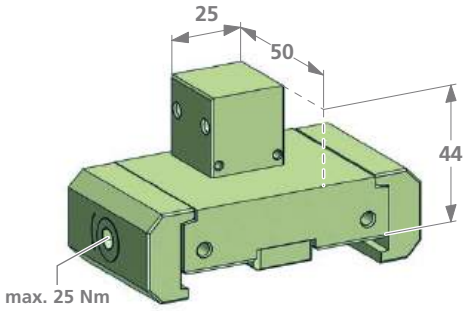


SCAN OR CLICK PDF STEP

für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

Art. Nr.		kg
PAND25-44		~0,9

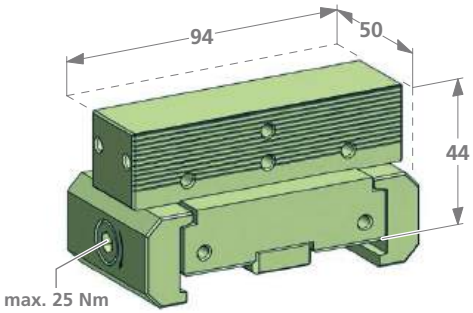




Schlankes und kurzes Anschlagmodul für Kleinteil-Serien (Mehrfachspannung).

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

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

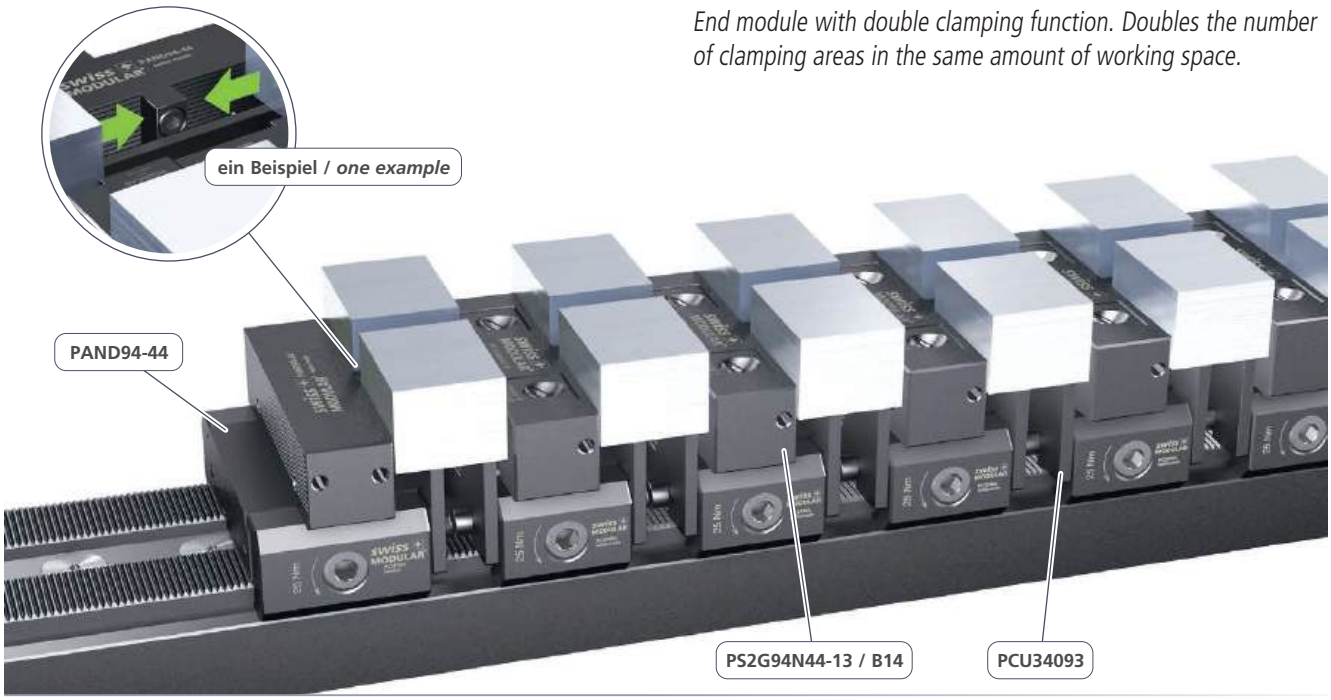


Die Anschlagfläche enthält 2 Passbohrungen. Mit MS50 Passschrauben kann mittig ein Seitenanschlag präzise platziert werden.

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

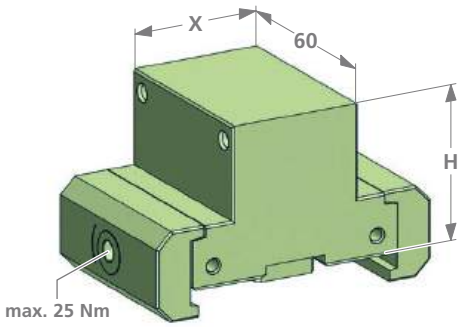
Anschlagmodul mit Doppelspannfunktion. Verdoppelt die Anzahl Spannbereiche auf gleichbleibendem Raum.

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		~1,4	68	34



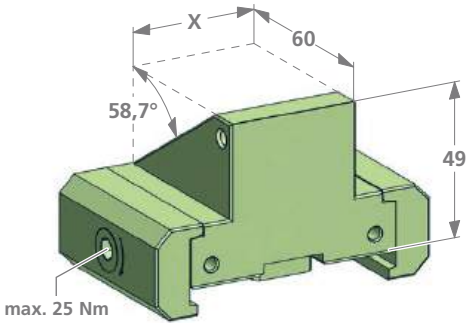
43 mm bis 68 mm breite Anschlagmodule für die Einzel- und Mehrfachspannung.

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.

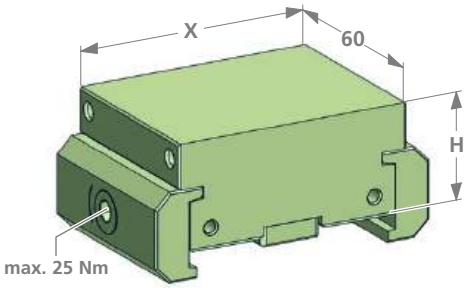




SCAN OR CLICK PDF STEP

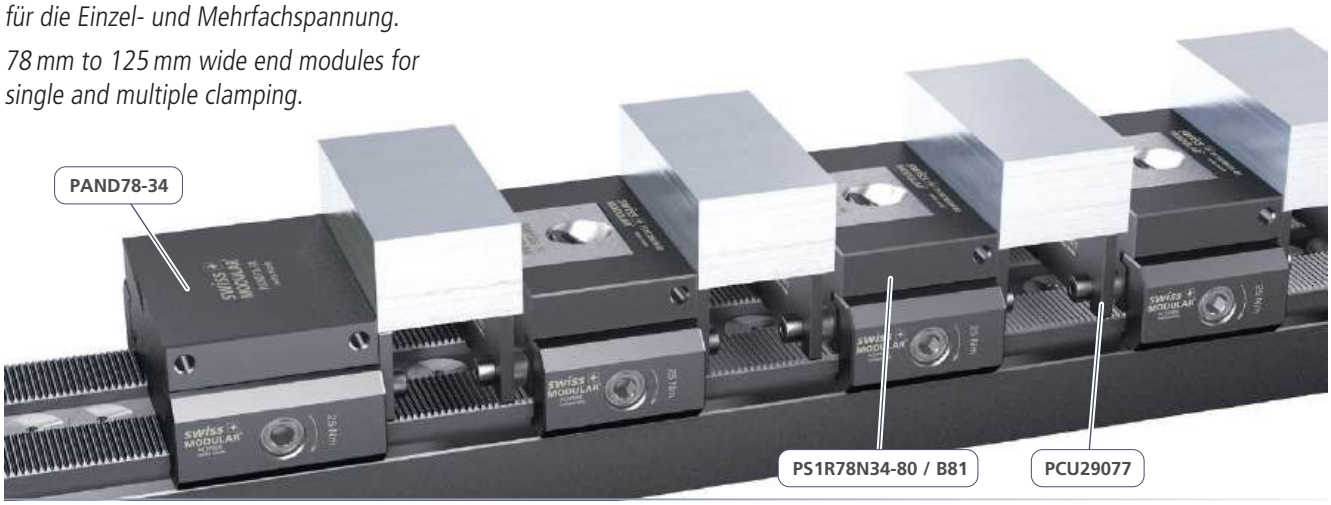
für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

Art. Nr.	kg	X	H
PAND78-34	~1,5	78	34
PAND78-49	~2,1	78	49
PAND94-34	~1,6	94	34
PAND94-49	~2,3	94	49
PAND125-49	~2,7	125	49



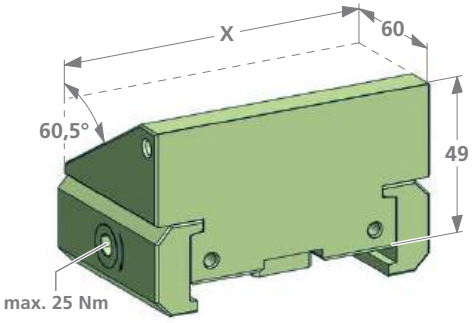
78 mm bis 125 mm breite Anschlagmodule für die Einzel- und Mehrfachspannung.

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.





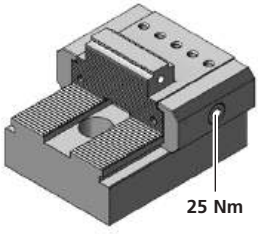
A B C

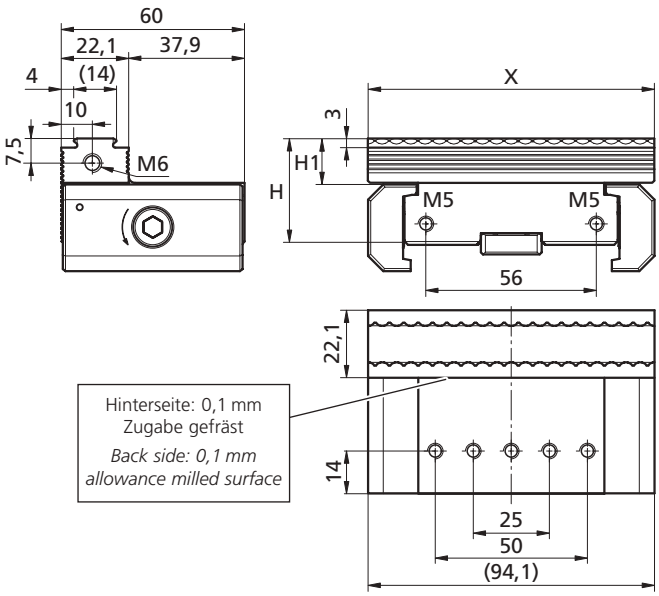
PAND48-34PRG-A1

1 1x TH120684

PAND48-34PRF-A1

1	1x	TK140239
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
12	4x	**M5X10ISO4762**
X	=	48
H	=	34
H1	=	15
kg		~1,1



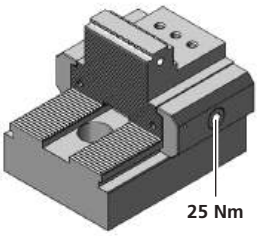


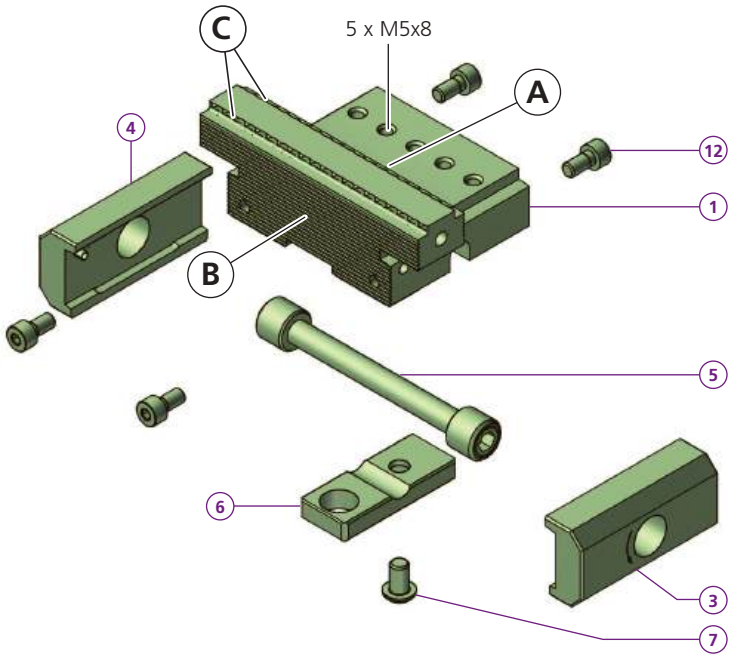
PAND48-49PRG-A1

1 1x TH120685

PAND48-49PRF-A1

1	1x	TK140597
X	=	48
H	=	49
H1	=	30
kg		~1,3





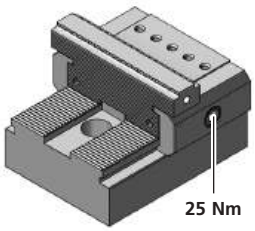
A B C

PAND94-34PRG-A1

1 1x TH120686

PAND94-34PRF-A1

1	1x	TH140185
X	=	94
H	=	34
H1	=	15
kg		~1,2

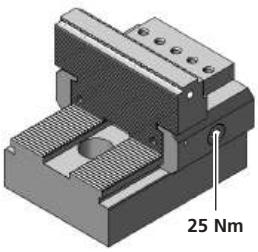


PAND94-49PRG-A1

1 1x TH120687

PAND94-49PRF-A1

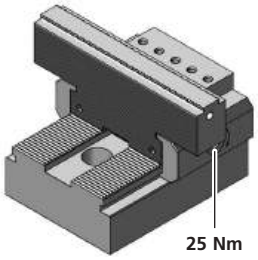
1	1x	TH130754
X	=	94
H	=	49
H1	=	30
kg		~1,6



A B C

PAND125-49PRG-A1

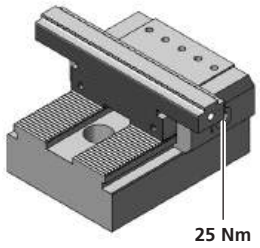
1	1x	TB160295
X	=	125
H	=	49
H1	=	30
kg		~1,7

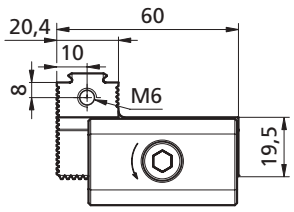


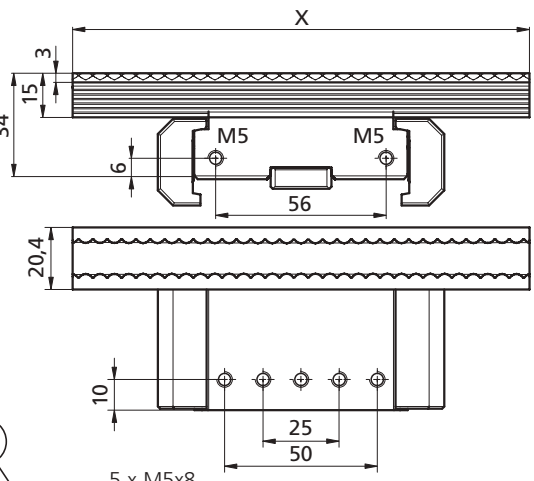


Bestellbeispiel / *Ordering example:* PAND94-34PRG-A1

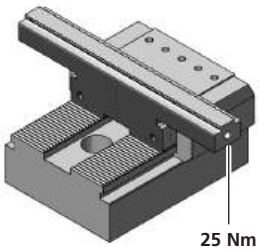
X = 125

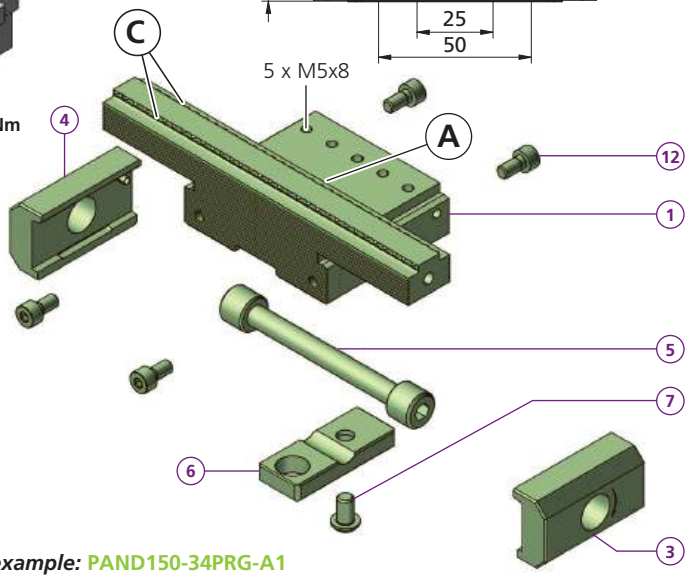






X = 150





A	B	C

PAND125-34PRG-A1

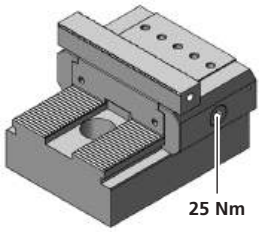
1	1x	TB180899
X	=	125
kg		~1,2

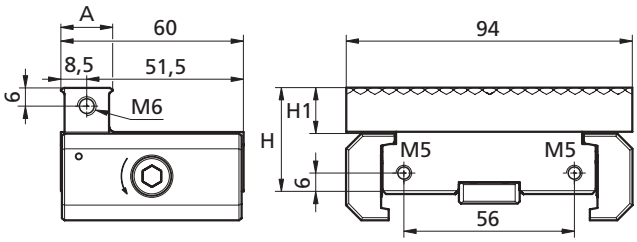
PAND150-34PRG-A1

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

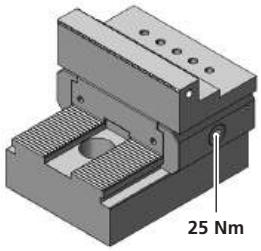
Bestellbeispiel / *Ordering example:* PAND150-34PRG-A1

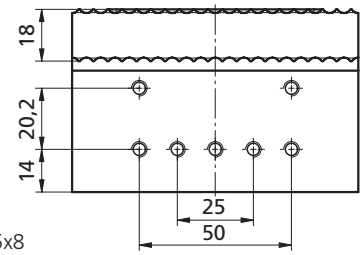
H = 34

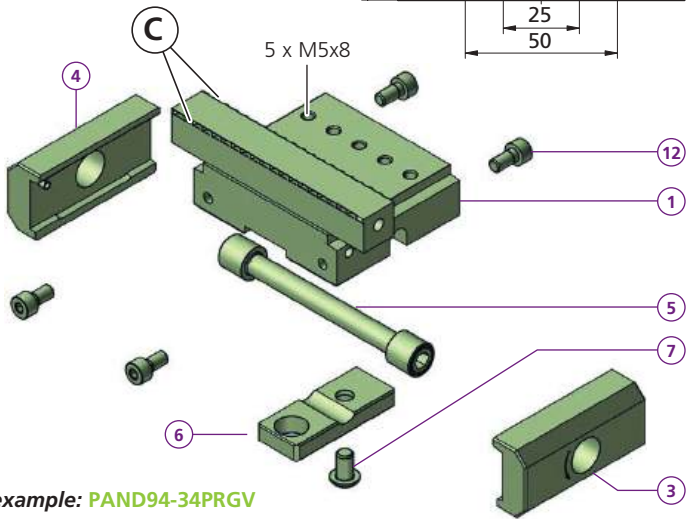




H = 49







C

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

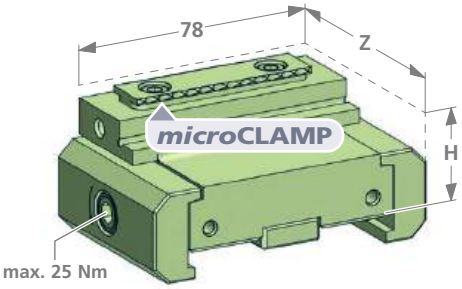
PAND94-49PRGV

1	1x	TH171179
H	=	49
H1	=	30
A	=	17
kg		~1,6

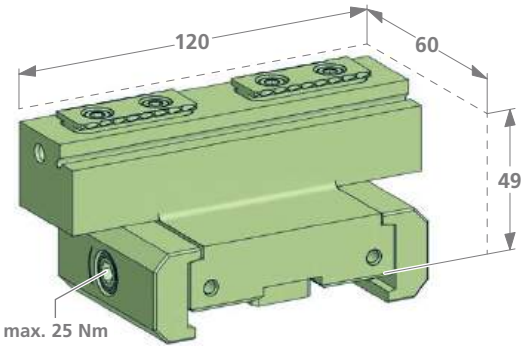
Bestellbeispiel / *Ordering example:* PAND94-34PRGV

für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

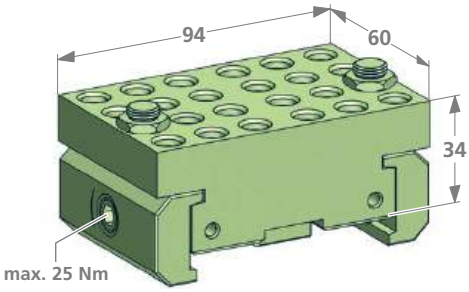
Art. Nr.			kg	Z	H
PAND78-34UPRG			~1,2	60	34
PAND78-49UPRG			~1,5	60	49
PAND78-34X50UPRG			~1,0	50	34



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



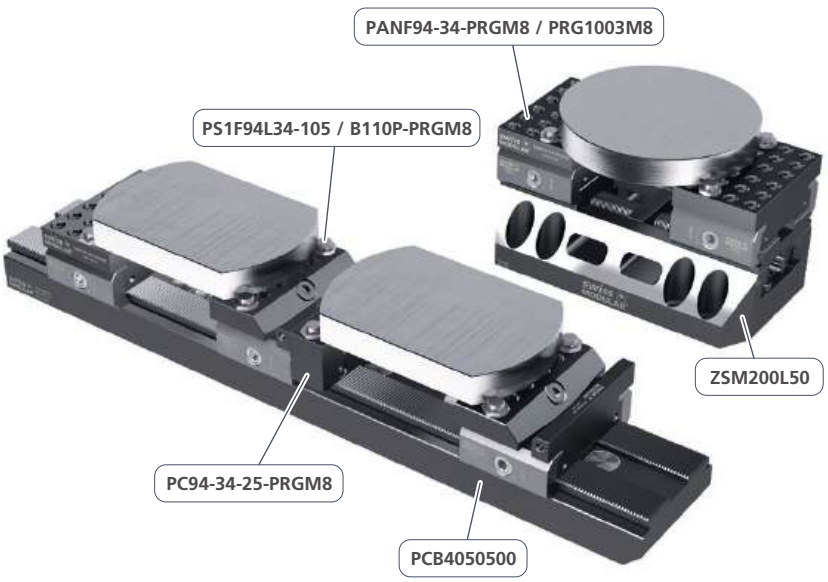
Art. Nr.			kg
PANF94-34PRGM8			~1,5





Der Einsatz dieser Spannmodule erweitert die Spannmöglichkeiten für runde und unförmige Werkstücke erheblich.

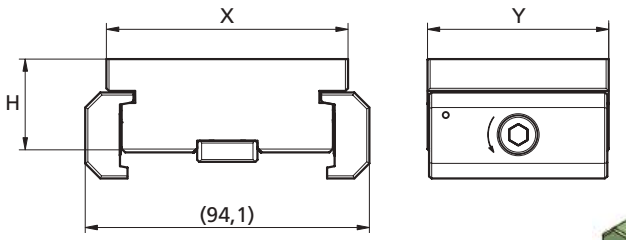
The use of these clamping modules expands the clamping possibilities for round and bulky workpieces considerably.

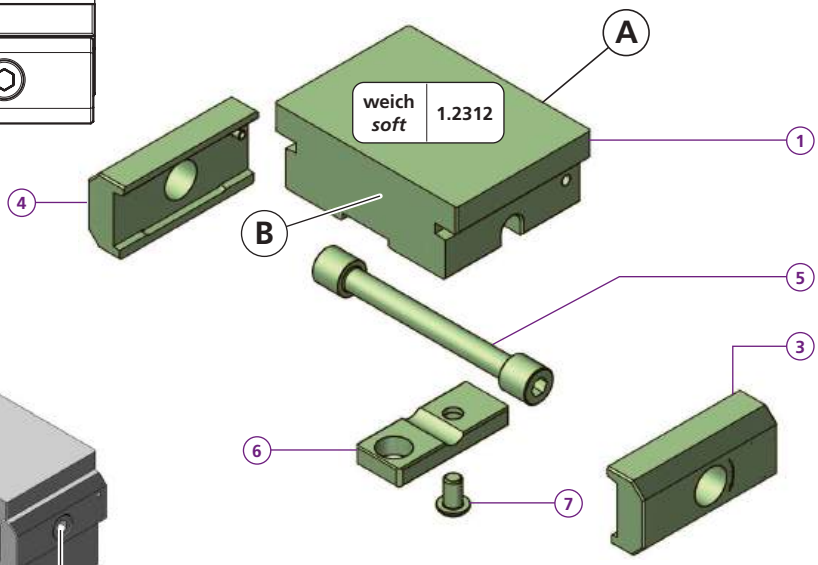




Bei knapp gespannten Werkstücken sind direkt-Prägebacken die ideale Wahl zum spannen.

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

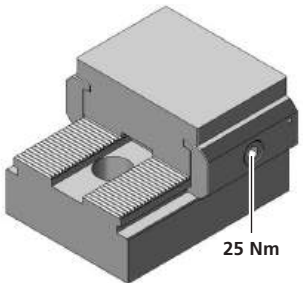




A — B

PT-F80-30X60

1	1x	TF140637
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
X	=	80
H	=	30
Y	=	60
kg		~1,4

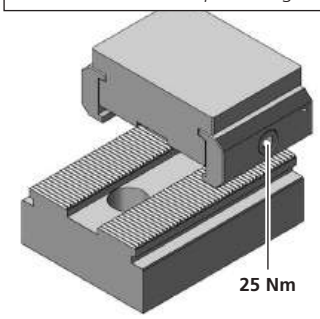


A — B

PT-F80-30X60NS

1	1x	TF140635
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	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

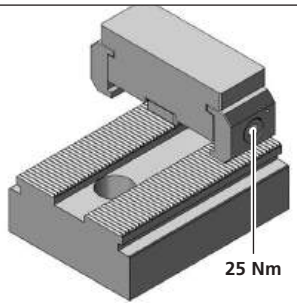


A — B

PT-F80-30X30NS

1	1x	TF140749
3	1x	**PCSP30R**
4	1x	**PCSP30L**
5	1x	**PCS14**
6	1x	**PCGU2030**
7	1x	**M6X8ISO7380**
X	=	80
H	=	30
Y	=	30
kg		~0,7

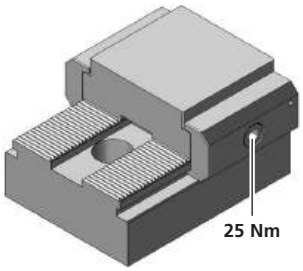
NS = Rohlingsmodul freie Positionierung ohne Verzahnung
Carrier module without positioning serration for free positioning



A — B

PT-F61-25X60

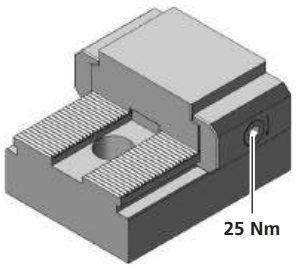
1	1x	TF140638
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
X	=	61
H	=	25
Y	=	60
kg		~1,1



A — B

PT-F61-25X50

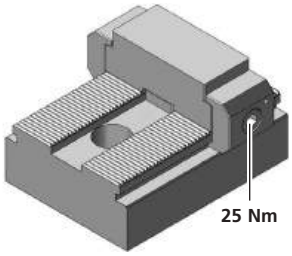
1	1x	TF140750
3	1x	**PCSP50R**
4	1x	**PCSP50L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
X	=	61
H	=	25
Y	=	50
kg		~1,0



A — B

PT-F61-25X30

1	1x	TF140636
3	1x	**PCSP30R**
4	1x	**PCSP30L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
X	=	61
H	=	25
Y	=	30
kg		~0,6

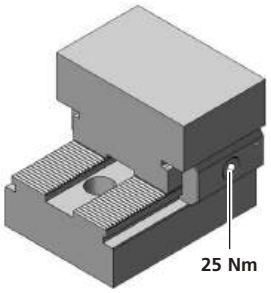


Bestellbeispiel / *Ordering example:* PT-F80-30X60

A B C

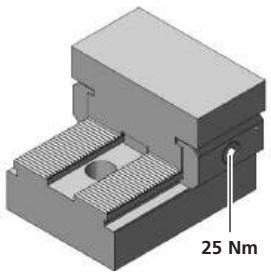
PR94-49SET

1	1x	PR94-49
3	1x	PCSP50R
4	1x	PCSP50L
5	1x	PCS14
6	1x	PCGU2049
7	1x	M6X8ISO7380
X	=	94
H	=	49
Y	=	60,4
kg		~2,3



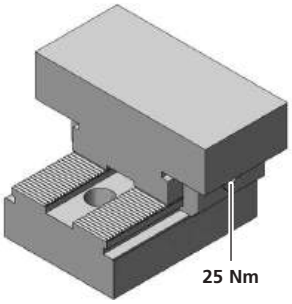
PR94-39-50SET

1	1x	PR94-39-50
X	=	94
H	=	39
Y	=	50,4
kg		~1,6



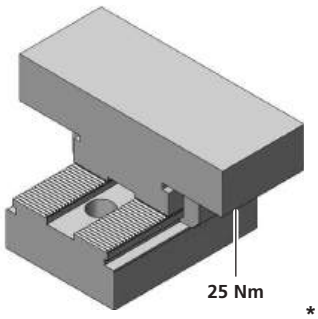
PR125-49SET

1	1x	PR125-49
X	=	125
H	=	49
Y	=	60,4
kg		~2,7



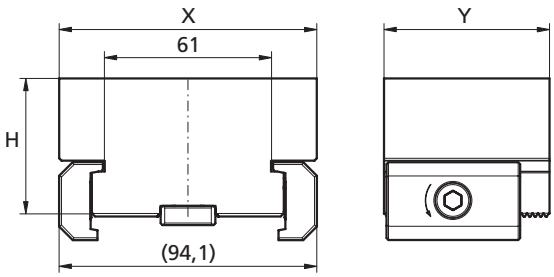
PR125-49SETALU

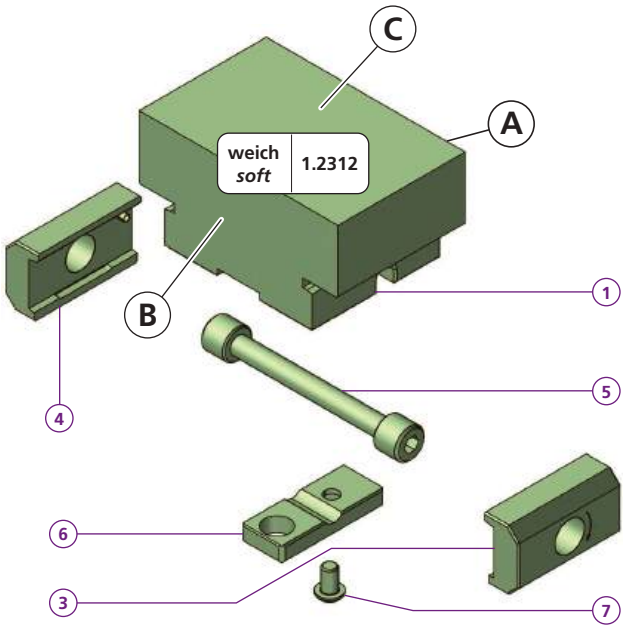
1	1x	*PR125-49ALU
X	=	125
H	=	49
Y	=	60,4
kg		~0,83



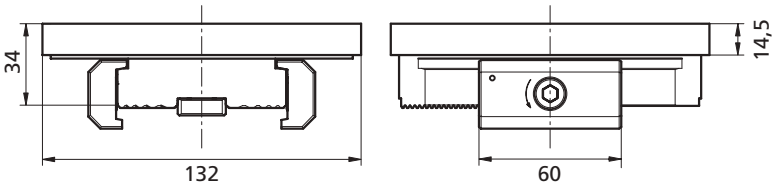
PR150-49SET

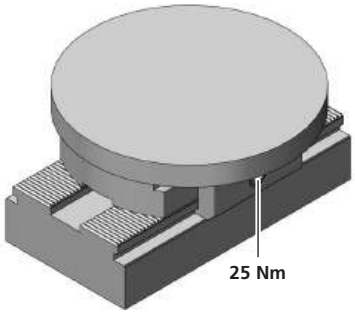
1	1x	PR150-49
X	=	150
H	=	49
Y	=	60,4
kg		~3,1





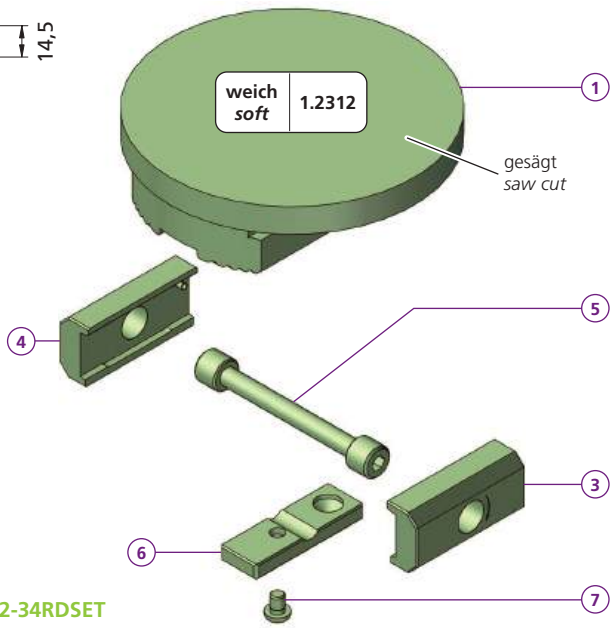
* ALU = ENAW-7022 Bestellbeispiel / *Ordering example:* PR94-49SET



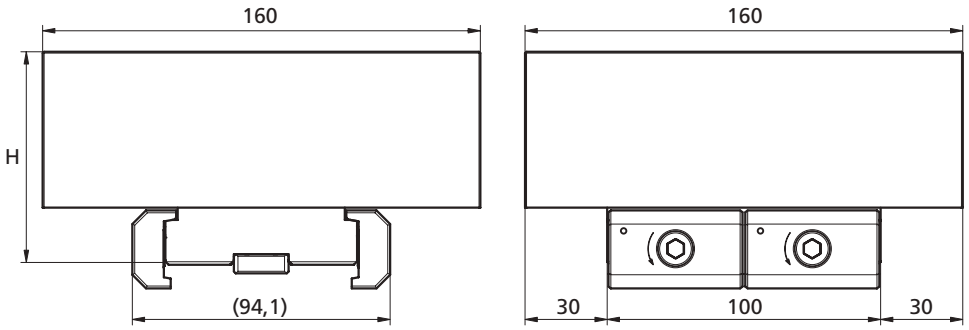


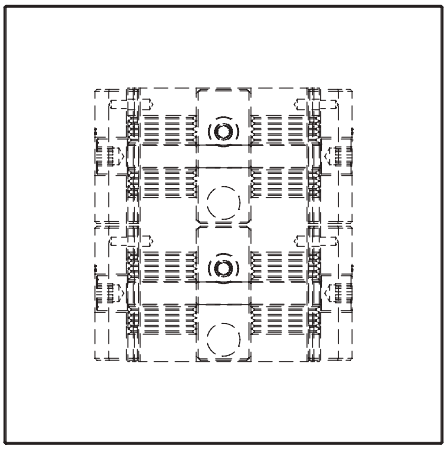
PT-F132-34RDSET

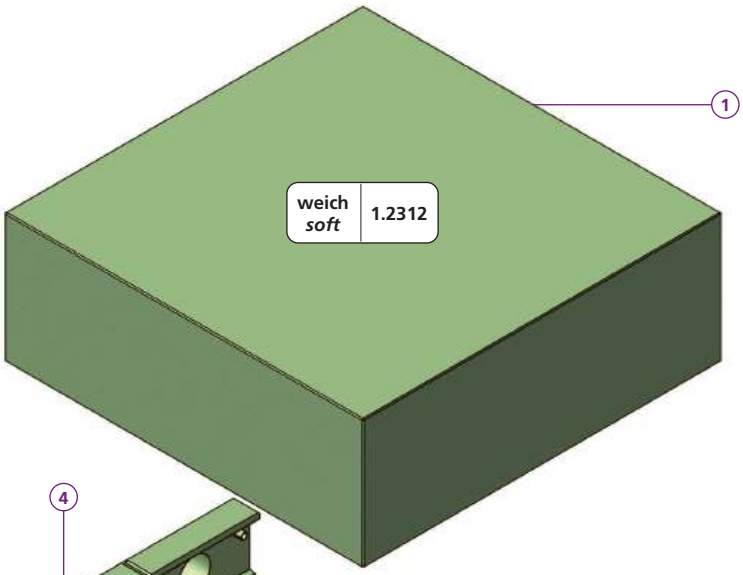
1	1x	PT-F132-34RD
3	1x	PCSP60R
4	1x	PCSP60L
5	1x	PCS14
6	1x	PCGU2059
7	1x	M6X8ISO7380
kg		~3,1

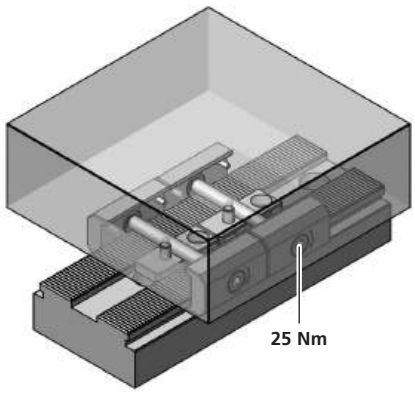


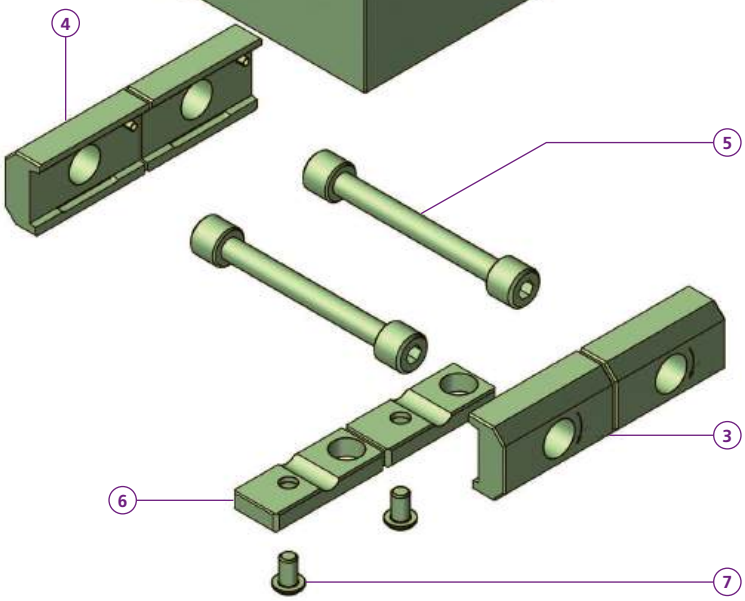
Bestellbeispiel / *Ordering example:* PT-F132-34RDSET





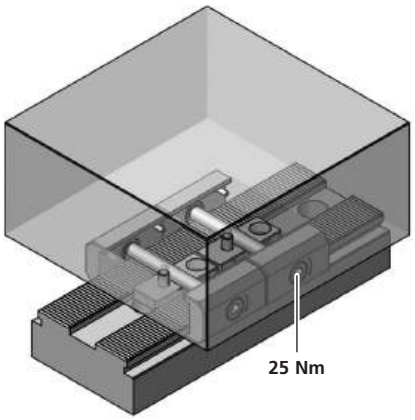






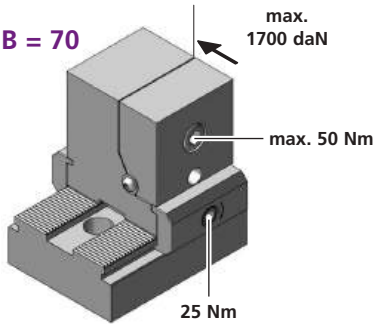
PTX160-57S		
1	1x	TH130539
3	2x	**PCSP50R**
4	2x	**PCSP50L**
5	2x	**PCS14**
6	2x	**PCGU2049**
7	2x	**M6X8ISO7380**
H	=	57
kg		~9

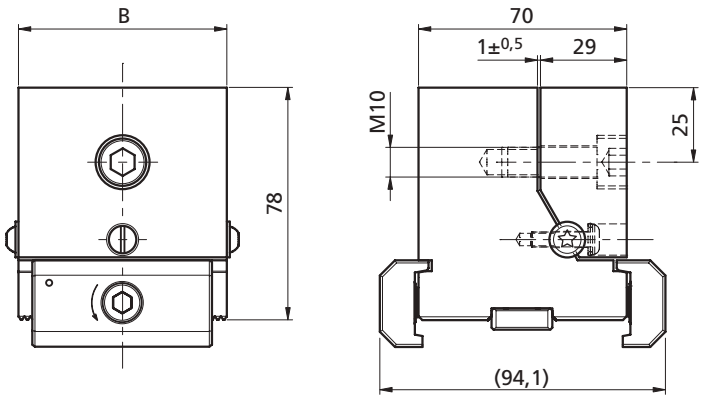
PTX160-77S		
1	1x	TH130723
H	=	77
kg		~13



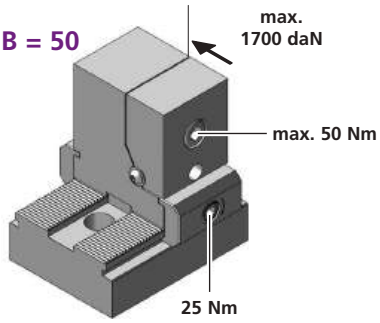
Bestellbeispiel / *Ordering example*: PTX160-57S

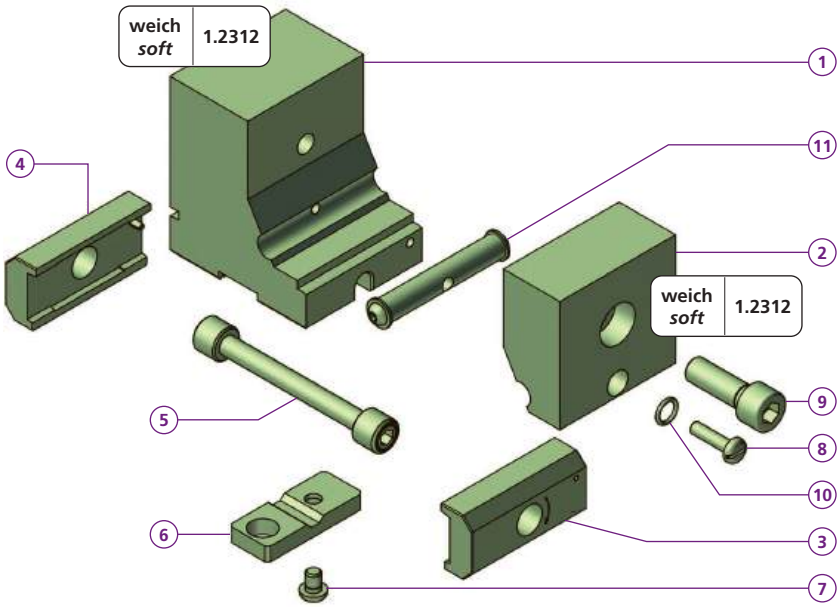
B = 70





B = 50



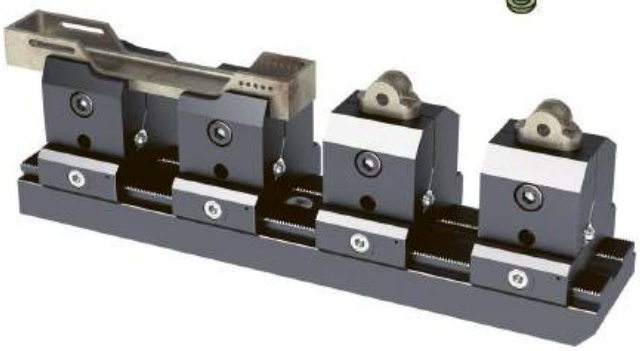


PS1X70L78ST		
1	1x	PRS7078AST
2	1x	PRS7078SST
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
8	1x	M5X20BN1362
9	1x	M10X30ISO4762
10	1x	OR Ø 8x1,5
11	1x	PRS7078G
B	=	70
kg		~3,2

PS1X50L78ST		
1	1x	PRS5078AST
2	1x	PRS5078SST
3	1x	**PCSP50R**
4	1x	**PCSP50L**
11	1x	PRS5078G
B	=	50
kg		~2,3

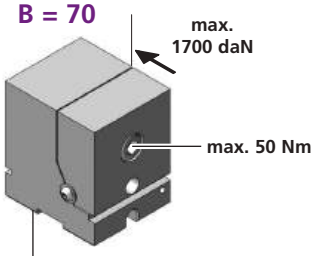
PRS70L78ST		
1	1x	PRS7078AST
2	1x	PRS7078SST
11	1x	PRS7078G
B	=	70
kg		~2,8

PRS50L78ST		
1	1x	PRS5078AST
2	1x	PRS5078SST
11	1x	PRS5078G
B	=	50
kg		~2,0



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

B = 70



PRS = Rohlingsmodul ohne Spannpratzen
Blank module side clamp

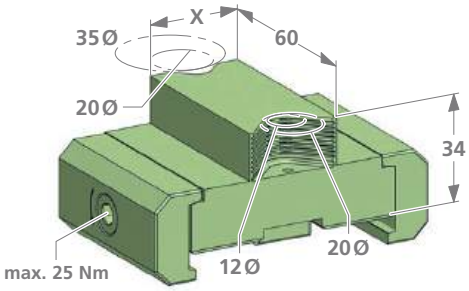


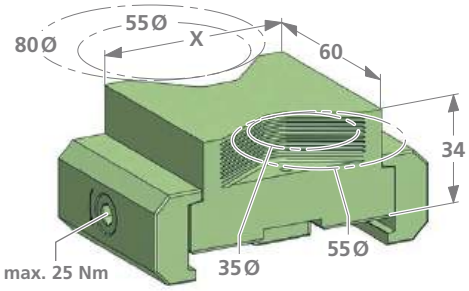
Spannbacken Rohling auf Kundenwunsch angepasst
Jaw blank machined to customer specification

Bestellbeispiel / *Ordering example*: PS1X70L78ST

Anschlagmodul für runde Werkstücke
Endmodule for round workpieces

Art. Nr.		Ø	X	kg
PAND30-34RV12-35		12 – 35	30	~1,1
PAND61-34RV35-80		35 – 80	61	~1,26



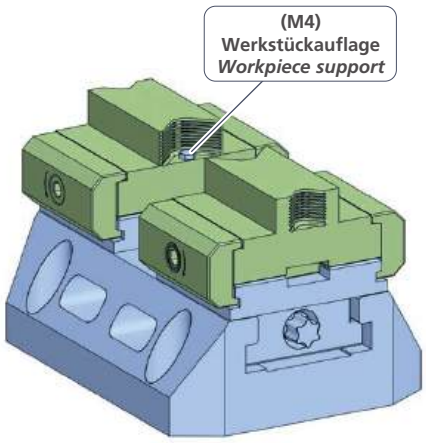


Runde Werkstücke, die einen Durchmesserbereich von 12 – 80 mm abdecken, können auf vielfältige Art gespannt werden.

Round workpieces covering a diameter range from 12 - 80 mm can be clamped in a variety of ways.







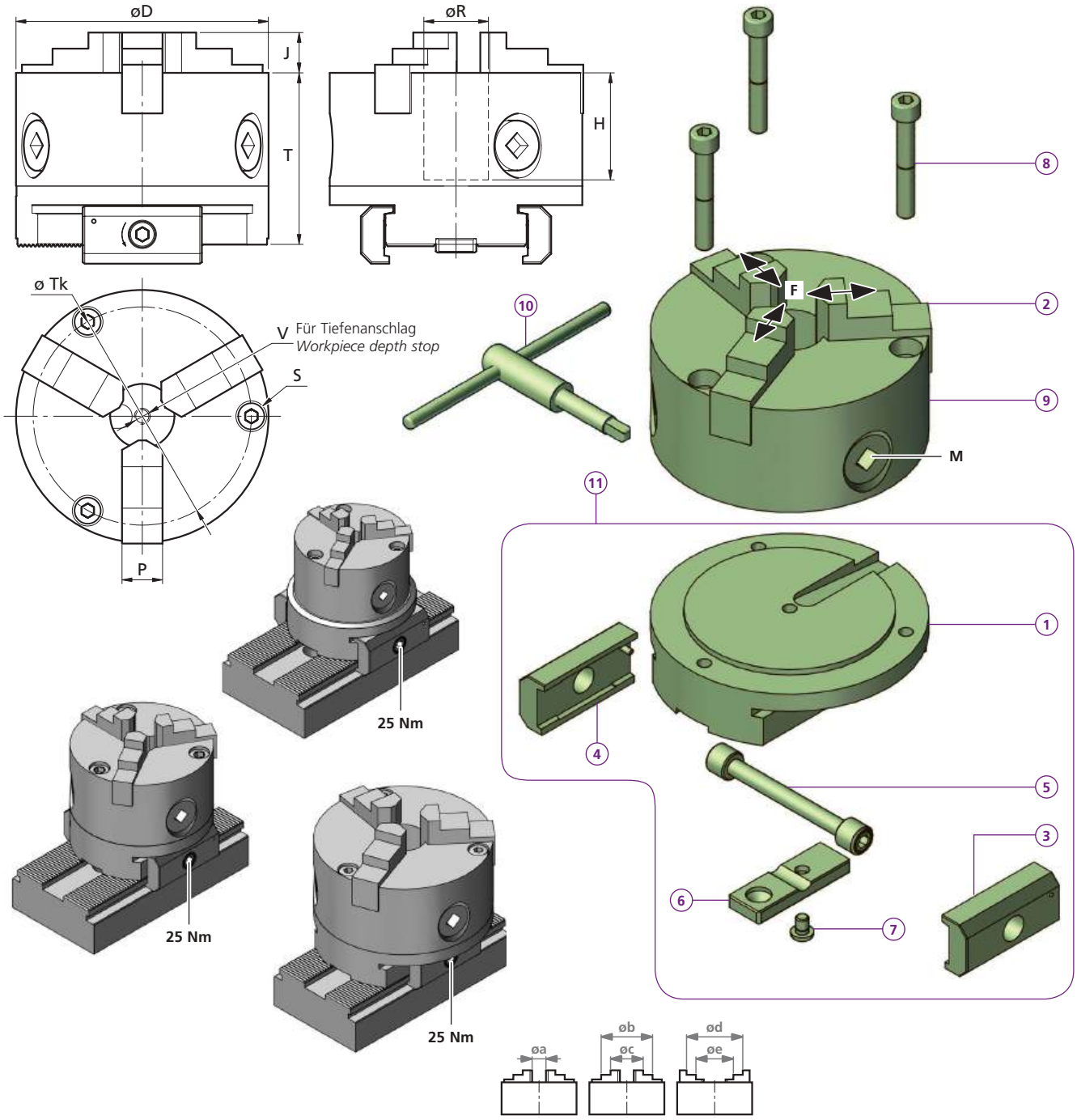


Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 200	440	0,2
20	14,8	= 500	1´102	0,5
30	22,2	= 1´000	2´204	1,0
40	29,6	= 1´300	2´866	1,3
50	37,0	= 1´600	3´527	1,6

NUSS3/8“TX30E14

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately





	D	J	T	R	H	P	V	a mm	b mm	c mm	d mm	e mm	M (max.)	F (max.)	ø Tk	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

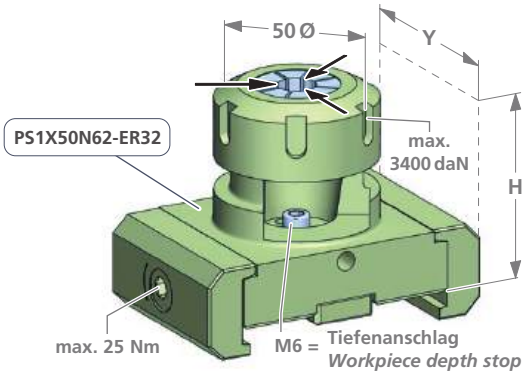
Ø			
80	243849.0083200	243850.0083200	***243834.0083300**
100	243849.0103200	243850.0103200	***243834.0103300**
125	243849.0123200	243850.0123200	***243834.0123300**
	3x	3x	3x *Weich *Soft*
	Ø 3 - 49	Ø 38 - 125	16MnCr5

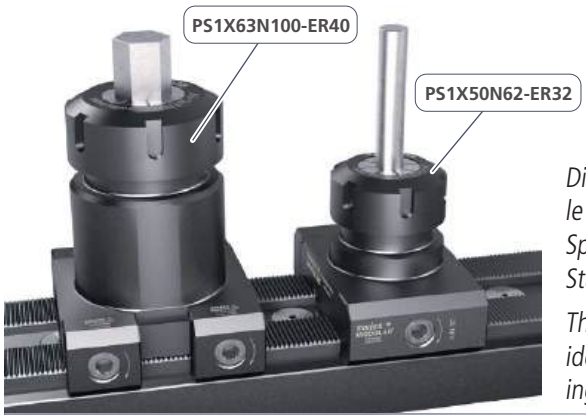
Bestellbeispiel / *Ordering example*: PS3X125L87BSET

Separat bestellen / *Order separately*

für die horizontale und vertikale Bearbeitung
for horizontal and vertical machining

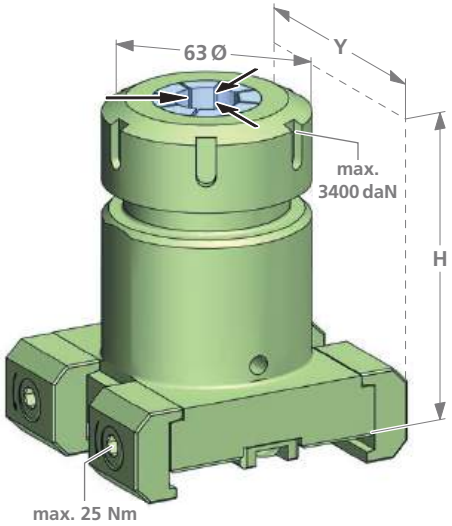
Art. Nr.	kg	Ø	Y	H
PS1X50N62-ER32	~1,3	2-22	60	62
PS1X50N100-ER32	~2,2	2-22	60	100
PS1X63N100-ER40	~2,3	3-29	80	100





Diese Spannzangenmodule ermöglichen das ideale Spannen und Bearbeiten von Stangenmaterial.

These collet modules enable ideal clamping and machining of bar material.



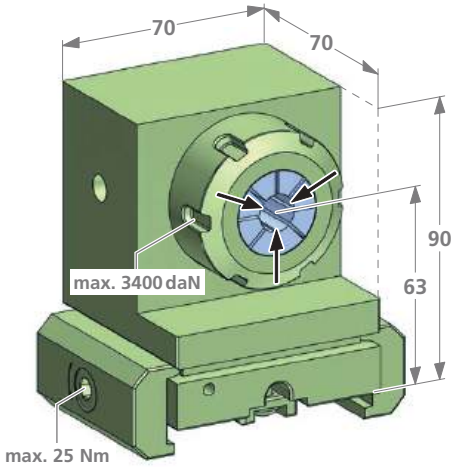
Art. Nr.	kg	Ø
PS1X50N70H-ER32-NS	~2,98	2-22

Die seitlichen Spannpratzen können um 90° gedreht werden, dadurch kann das Spannzangenmodul auch quer zur Schiene platziert werden.

The side clamps can be turned by 90°, the module can therefore be placed crosswise to the rail.

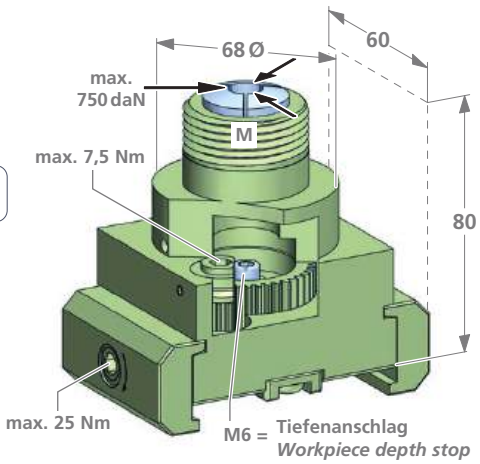


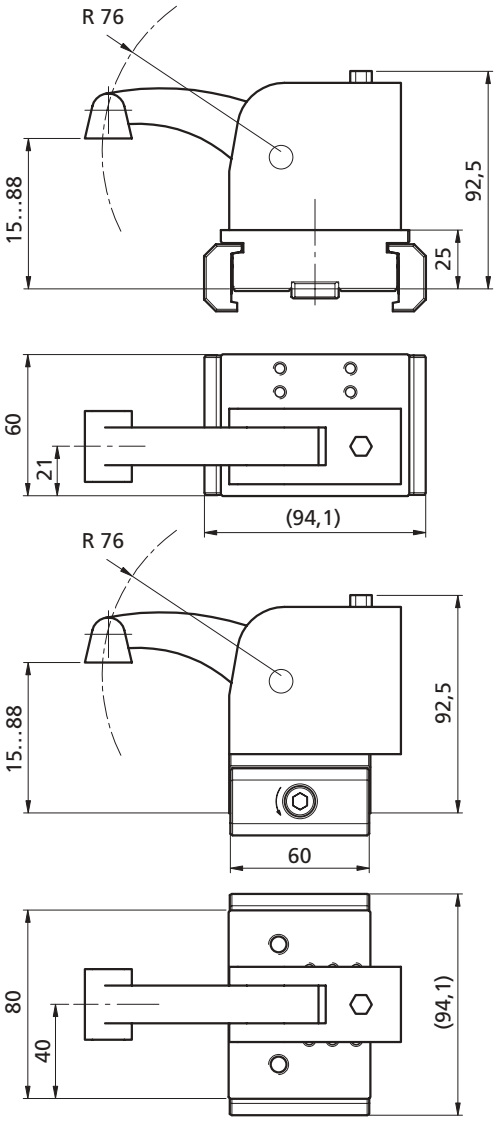
NS = freie Positionierung ohne Verzahnung
free positioning without interlocking

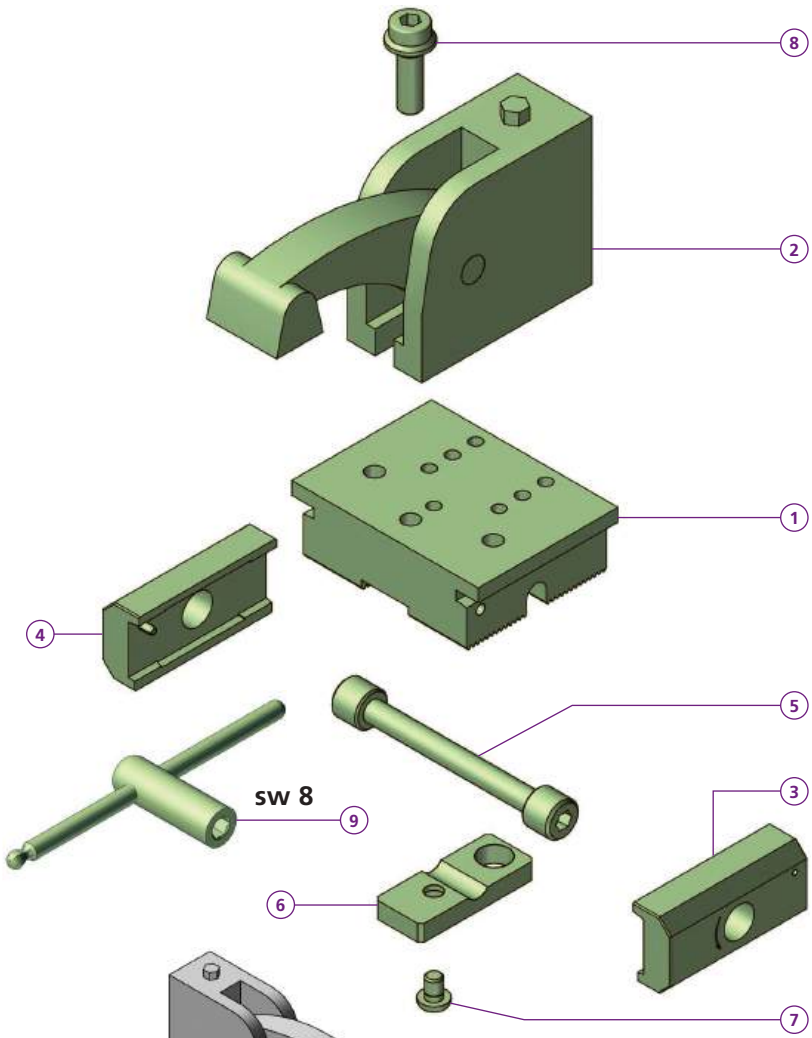


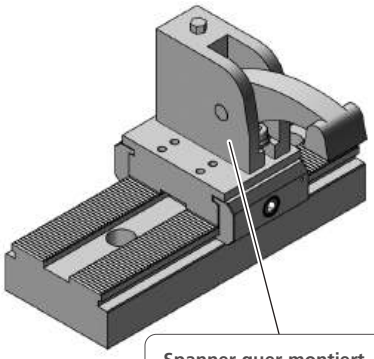
Art. Nr.	kg	Ø	M
PS1X68N80-W20	~1,8	0,5-20	M37,6x3



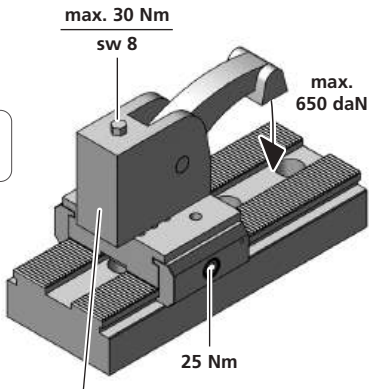








Spanner quer montiert
Clamp mounted transversely



Spanner längs montiert
Clamp mounted longitudinally

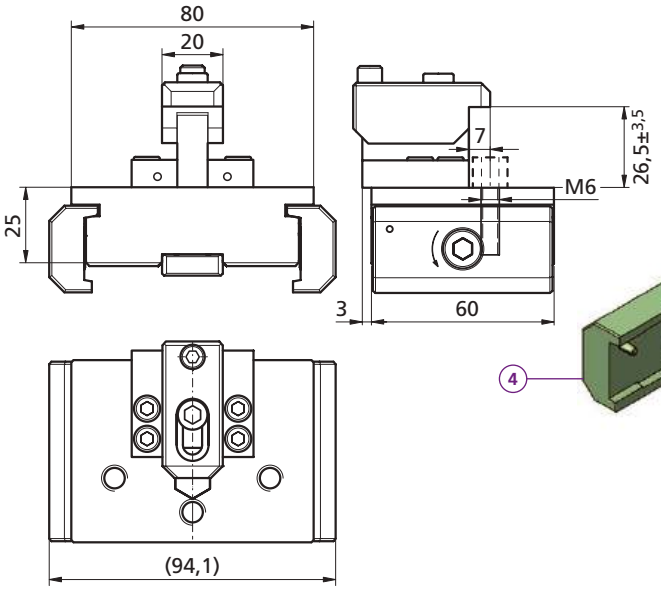


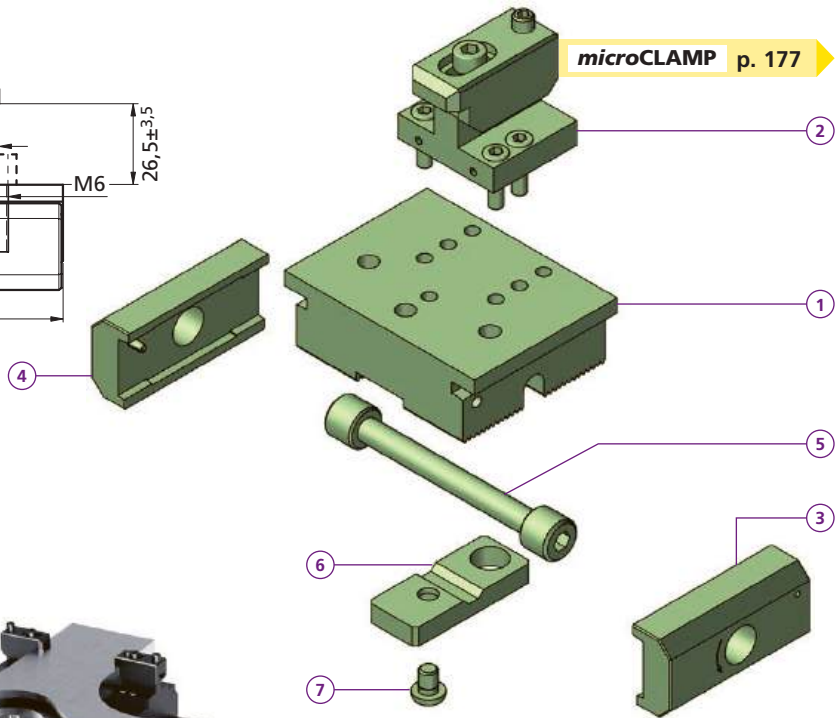
	PS1F-KLD1	
1	1x	PCTMV1F
2	1x	07-020
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
8	1x	M8x25 TW080012-02
9	1x	07-180
kg		~2,1

	PS1F-KLD1NS	
2	1x	PCTMV1FNS
kg		~2,1

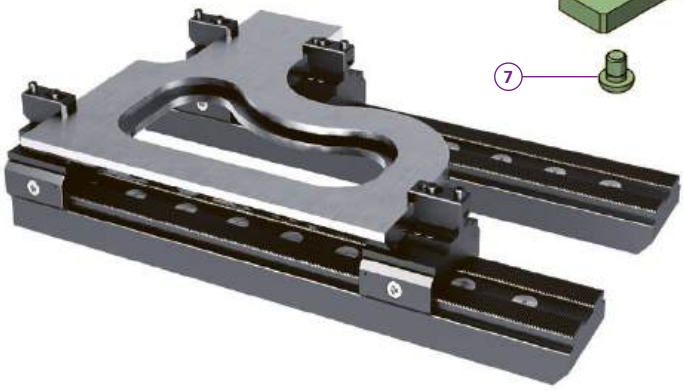
NS = Trägermodul freie Positionierung ohne Verzahnung
Carrier module without positioning serration for free positioning

Bestellbeispiel / *Ordering example:* PS1F-KLD1NS

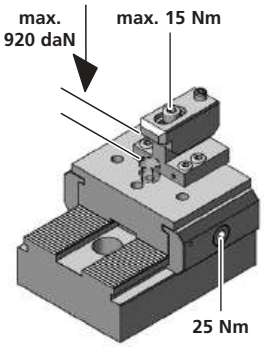




***micro*CLAMP** **p. 177**

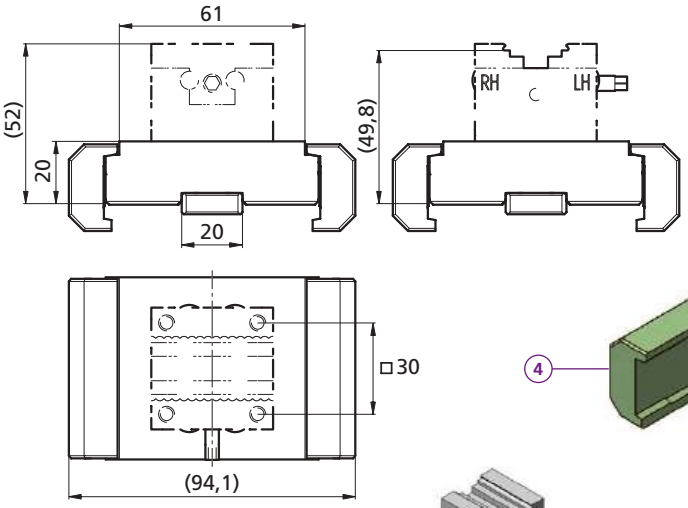


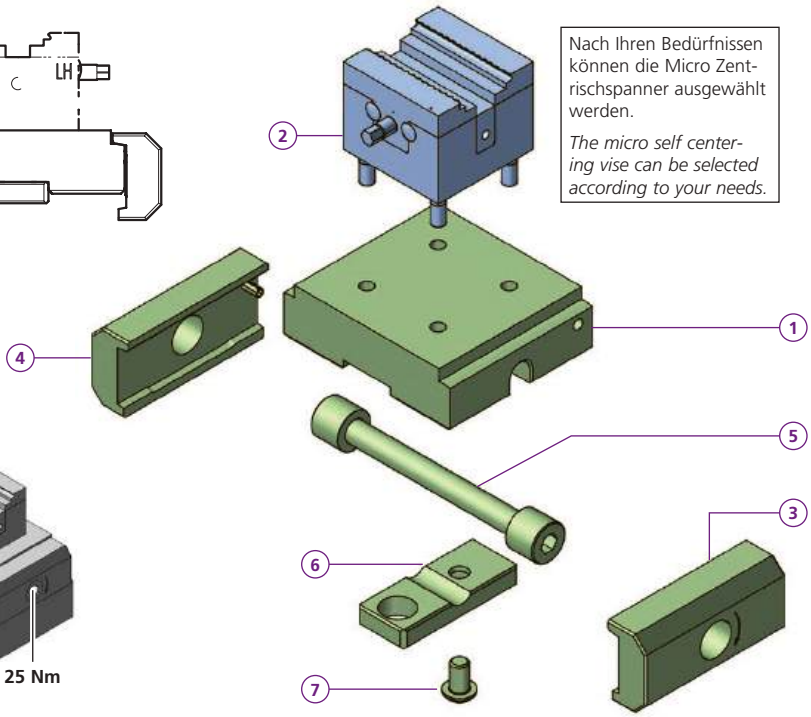
PS1F20L35BV1		
1	1x	PCTMV1F
2	1x	**MV1F20L35BV1**
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
kg		~1,4



PS1F20L35BV1NS		
1	1x	PCTMV1FNS
kg		~1,4

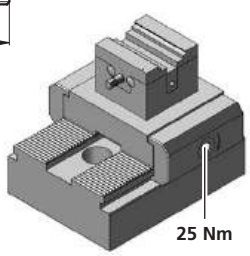
NS = Trägermodul freie Positionierung ohne Verzahnung
Carrier module without positioning serration for free positioning





Nach Ihren Bedürfnissen können die Micro Zentrischspanner ausgewählt werden.

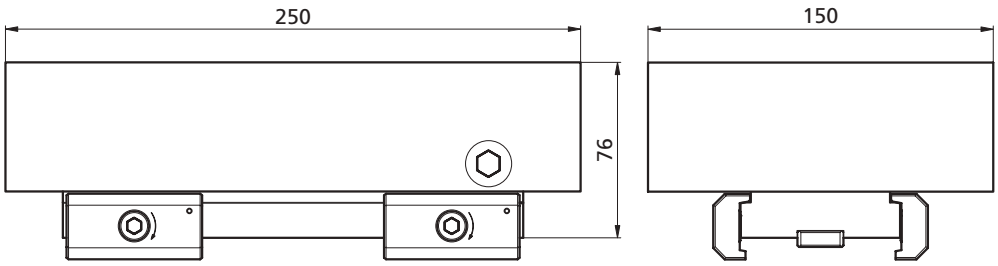
The micro self centering vise can be selected according to your needs.

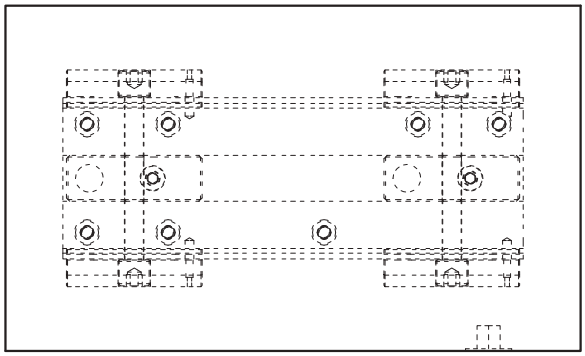


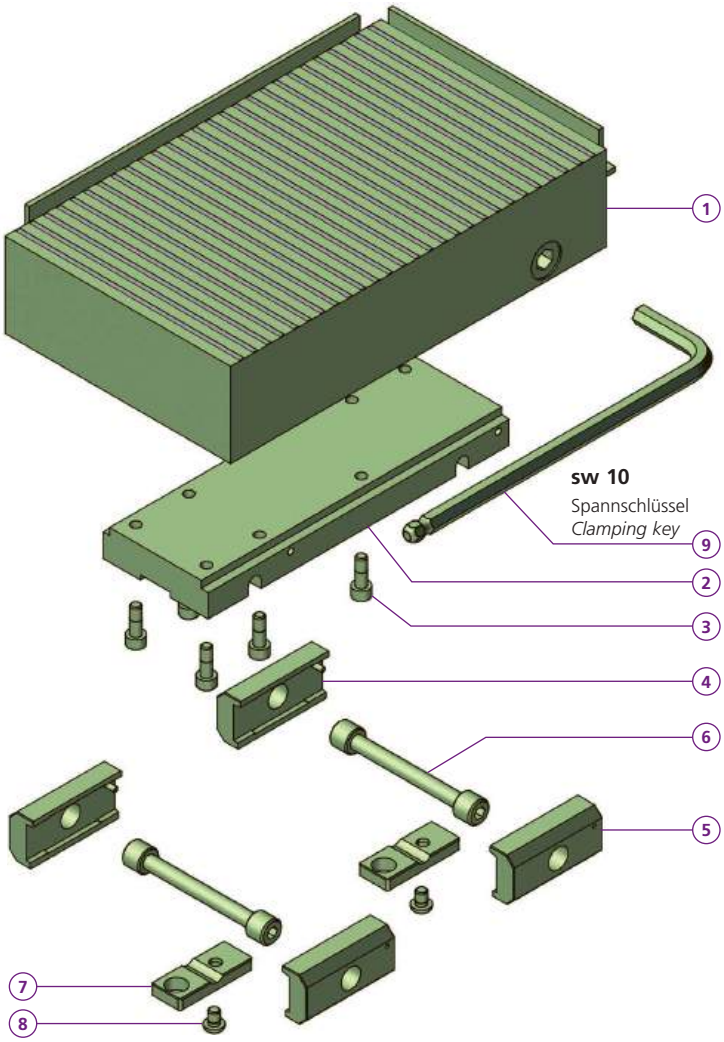
PTX-MCZ40L30		
1	1x	TB200682
2	1x	
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**TN100008**
kg		~0,94

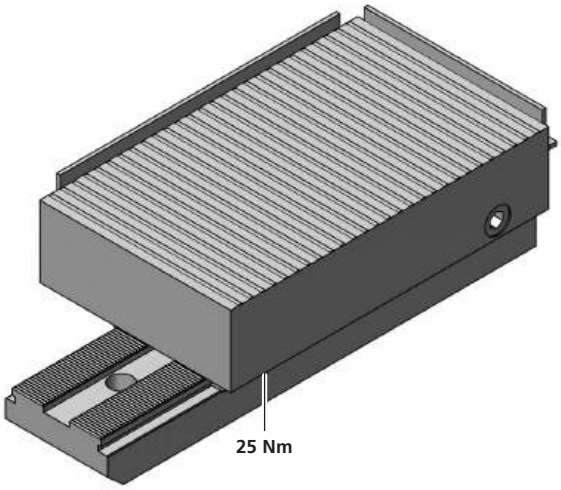
***tri*CENTRO** **p. 116**

Bestellbeispiel / *Ordering example:* PS1F20L35BV1

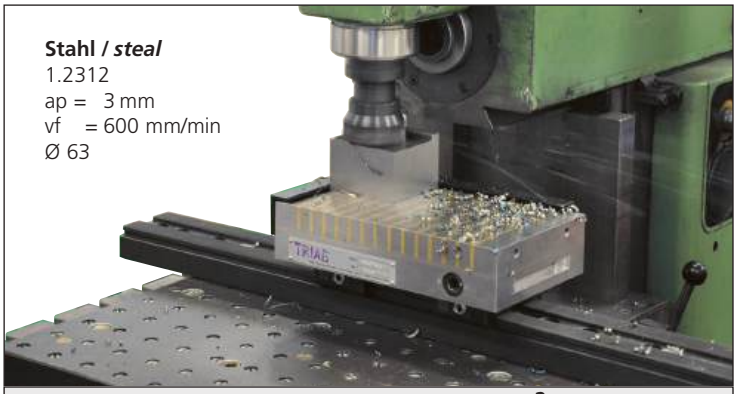








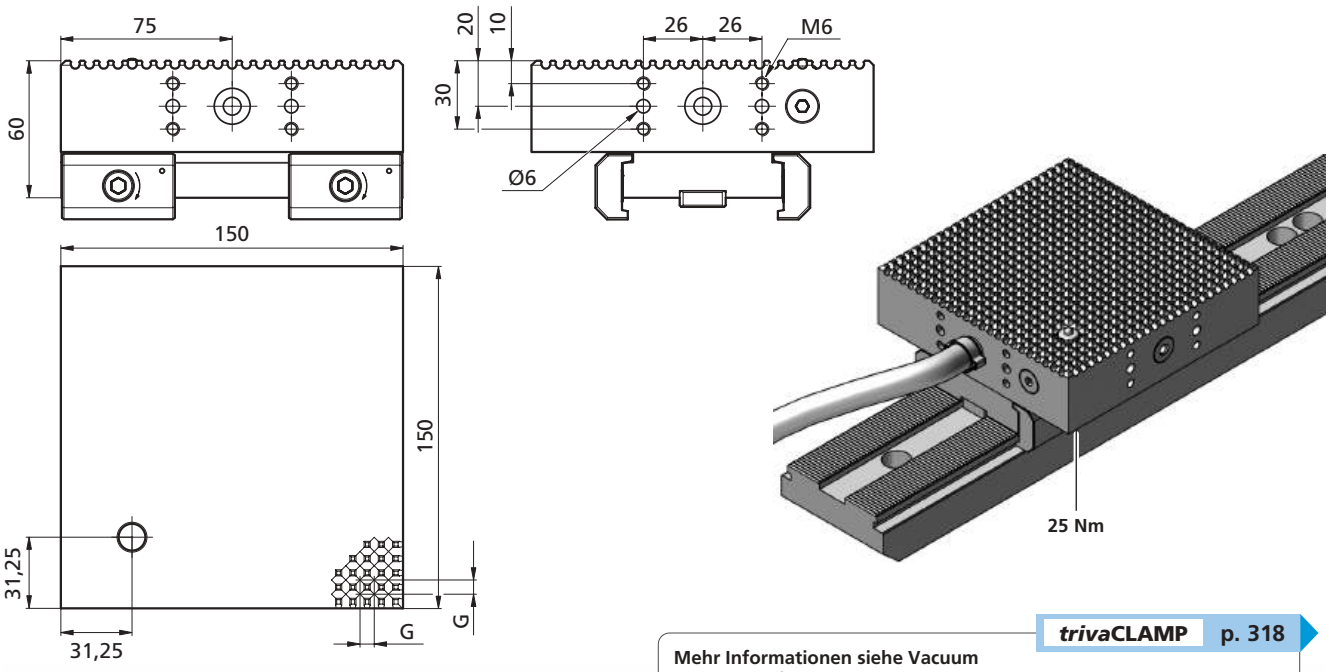
PS1X150L60-250MAG11		
1	1x	XNeomill 250x150
2	1x	TL110010-01
3	7x	MS60
4	2x	**PCSP60L**
5	2x	**PCSP60R**
6	2x	**PCS14**
7	2x	**PCGU2049**
8	2x	**M6X8ISO7380**
9	1x	ISL10 DIN 911L
kg		~19,5



max. Haltekraft / *max. holding force* = 120 N/cm^2

- 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



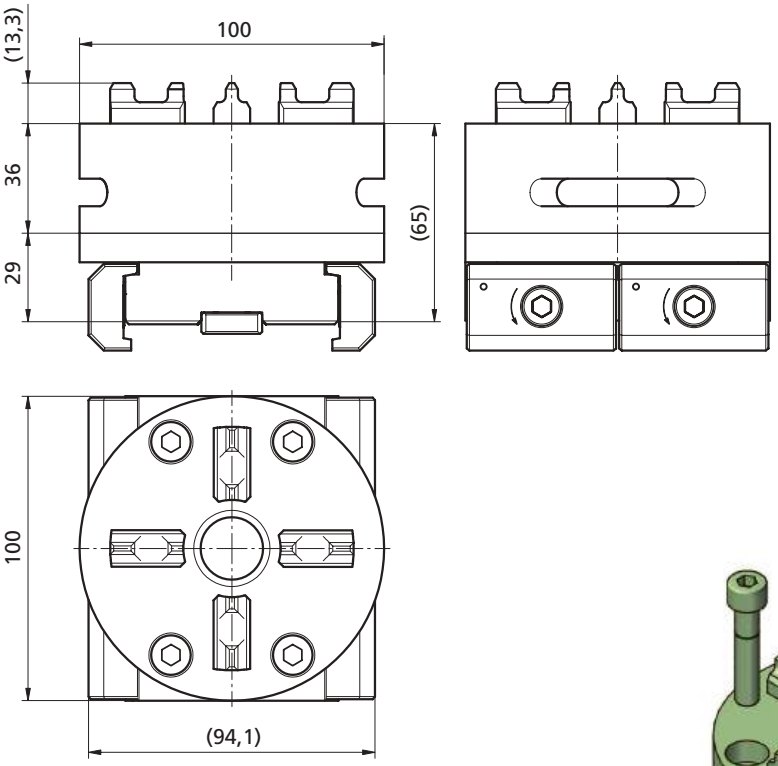
Bestellbeispiel / ***Ordering example:*** PS1X150L60-VAC

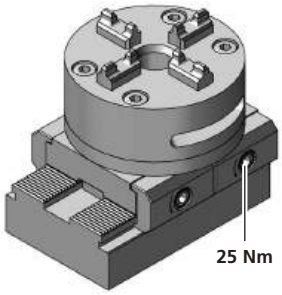
***triva*CLAMP** **p. 318**
Mehr Informationen siehe Vacuum
For more information check the vacuum workholding

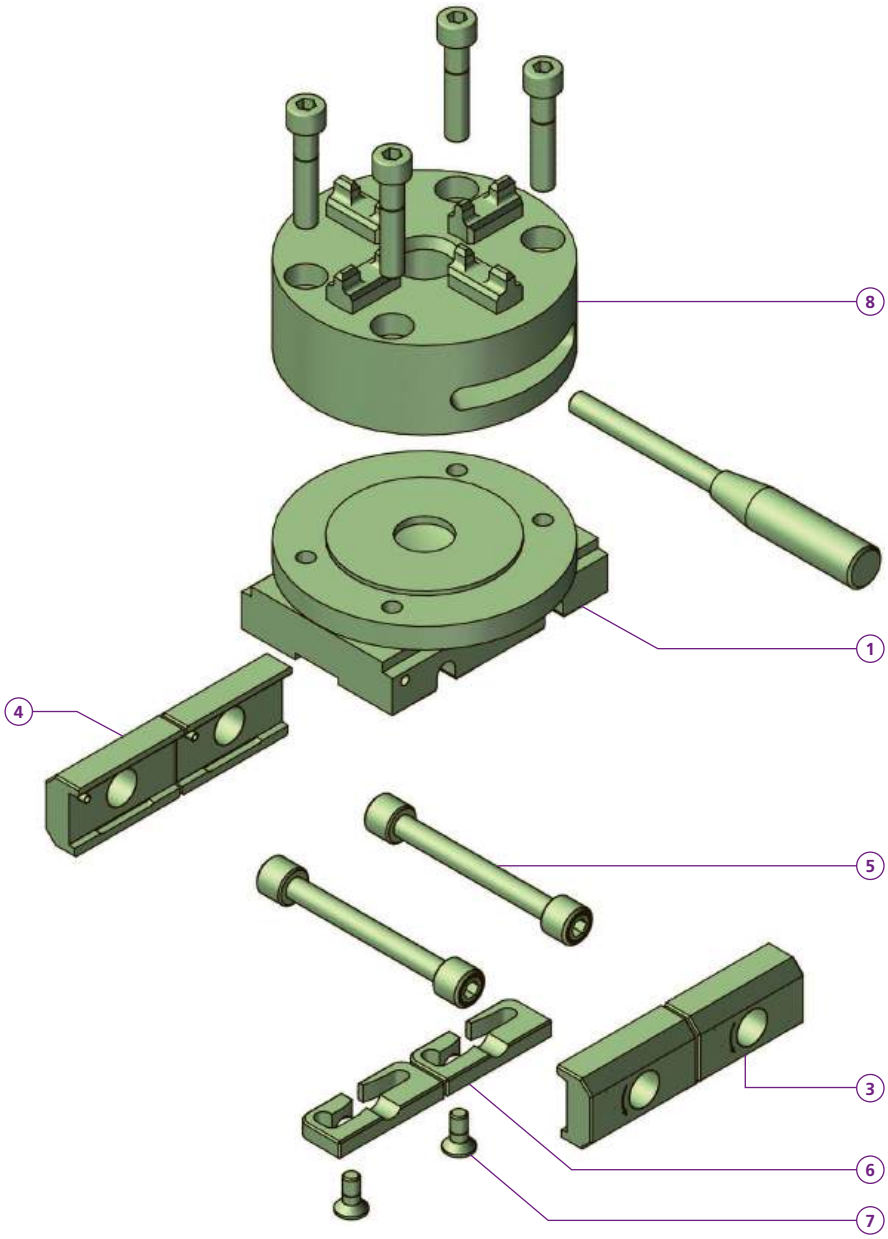


Mehr Informationen siehe Zentrischspanner
For more information check the self centring vise **p. 126 - 132**

***tri*CENTRO** **p. 113 - 152**

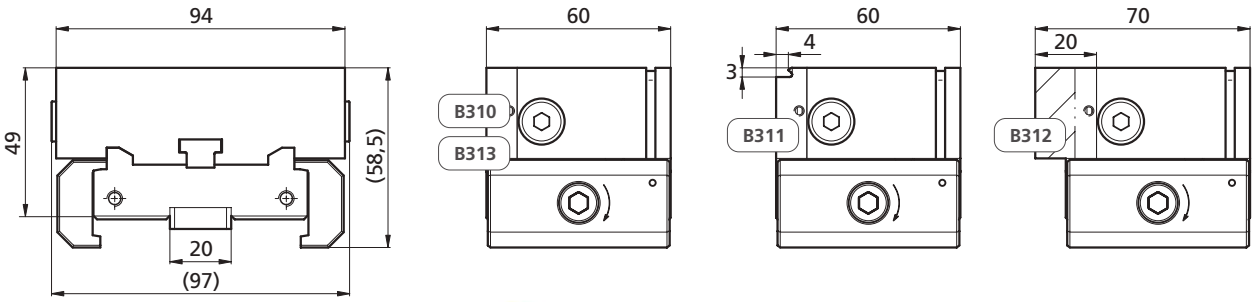


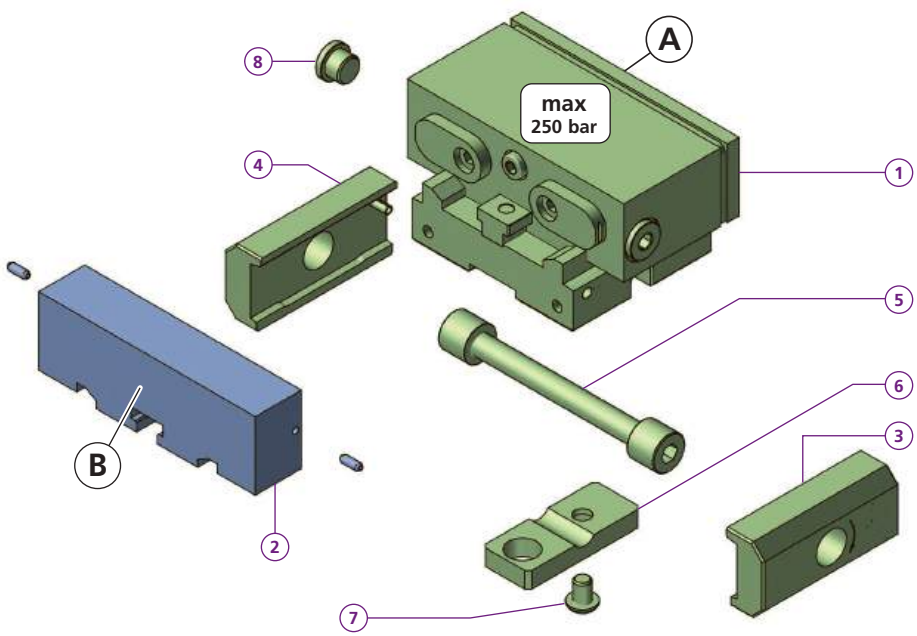




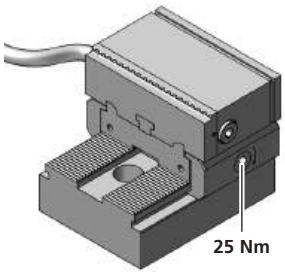
	PS1X100-65ER-036345
1	1x **PTX100-29**
3	2x **PCSP50L**
4	2x **PCSP50R**
5	2x **PCS14**
6	2x **PCGU2049F**
7	2x M6X14ISO10642
8	1x ER-036345
kg	~4,0

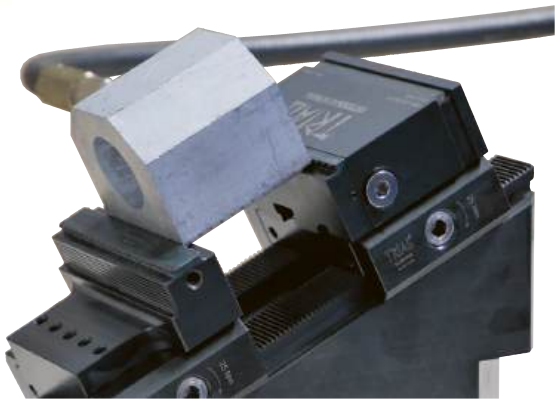
Bestellbeispiel / *Ordering example:* PS1X100-65ER-036345











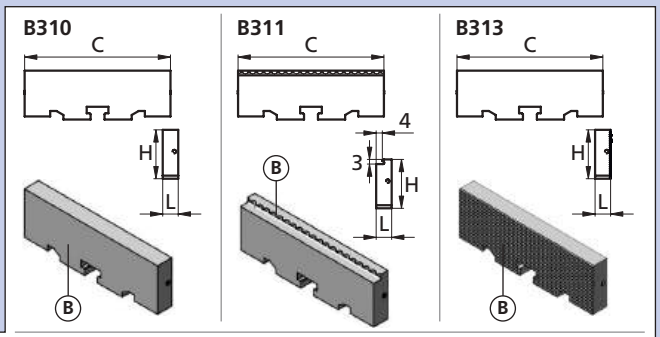
Ölvolumen / *Oil volume*
Spannen / *Clamping*
8 cm^3

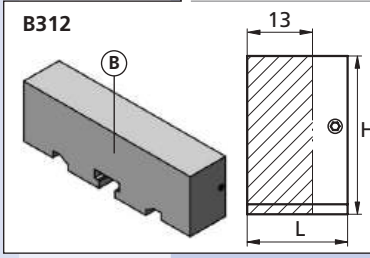
5 mm Hub / *Stroke*			
bar	**~daN**	**~(lb)**	**~t**
100	= 960	2116	0,96
150	= 1´440	3175	1,44
200	= 1´920	4233	1,92
250	= 2´400	5291	2,4

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

B

	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





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

A

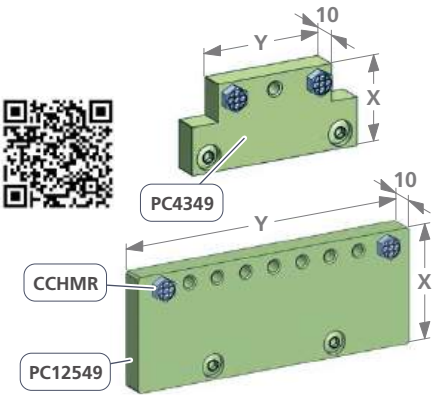
PSH1X94L49-310		
1	1x	ZF191349
2	1x	
3	1x	**PCSP60R**
4	1x	**PCSP60L**
5	1x	**PCS14**
6	1x	**PCGU2049**
7	1x	**M6X8ISO7380**
8	2x	TN100014
kg		~1,94

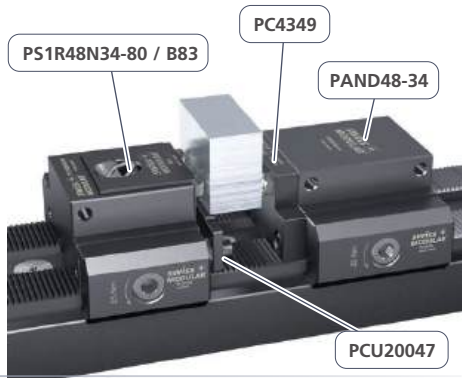
* = weich / *soft* (1.7225 Vergütungsstahl / *Tempering steel*)

Separat bestellen / *Order separately*

für Hartmetalldruckstücke
for carbide grippers

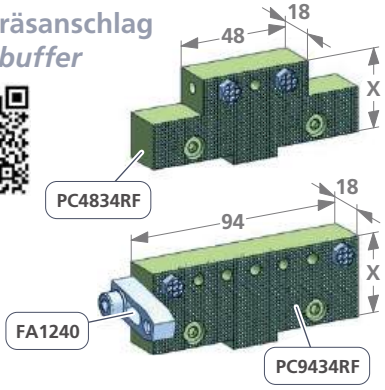
Art. Nr.	kg	Y	X
PC4349	~0,21	43	49
PC4834	~0,17	48	34
PC12549	~0,46	125	49

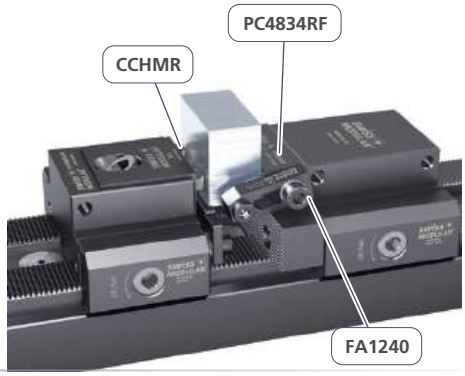




für Hartmetalldruckstücke und Fräsanschlag
for carbide grippers and milling buffer

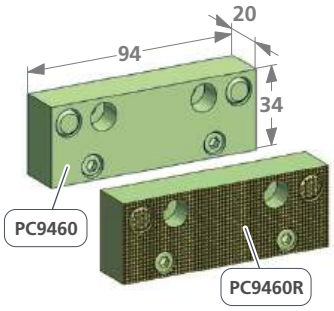
Art. Nr.	kg	X
PC4834RF	~0,34	34
PC4849RF	~0,44	49
PC9434RF	~0,43	34
PC9449RF	~0,63	49





mit pendelnden Kugeldruckstücken
with swinging ball thrust grippers

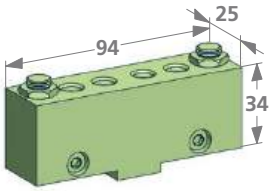
Art. Nr.	kg
PC9460	~0,45
PC9460R	~0,45





mit Prägeeinsätzen
with embossed inserts

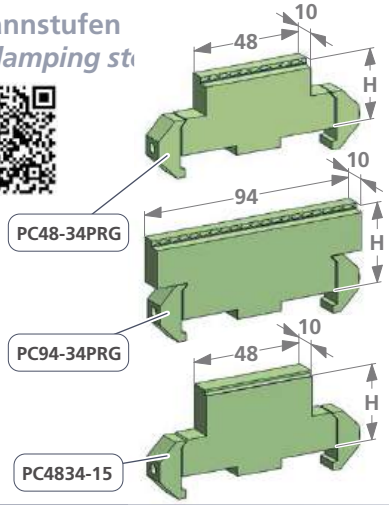
Art. Nr.	kg
PC9434-25PRGM8	~0,64





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

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



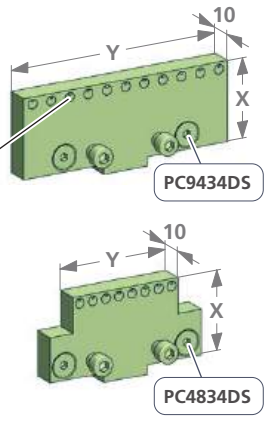


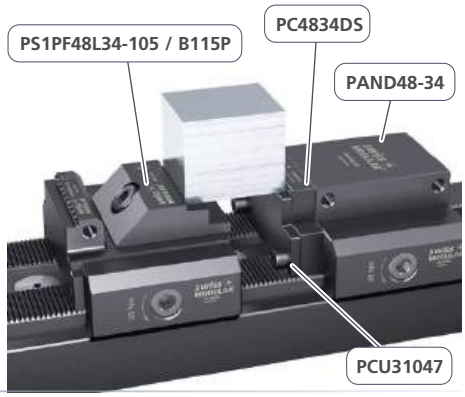
mit Druckstiften
with pressure pins

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°

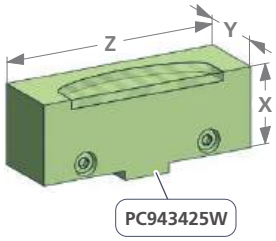
weitere Druckstücke
more gripping pens
p. 337





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

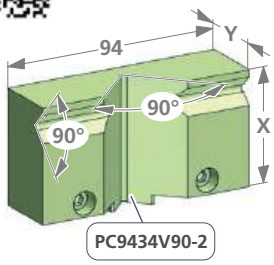
Art. Nr. ⓘ			kg	Z	Y	X
PC943425W	weicher Stahl *soft steel* (1.0570)		~0,64	94	25	34
PC943430W	weicher Stahl *soft steel* (1.0570)		~0,77	94	30	34
PC944930W	weicher Stahl *soft steel* (1.0570)		~1,10	94	30	49
PC1254930W	weicher Stahl *soft steel* (1.0570)		~1,46	125	30	49

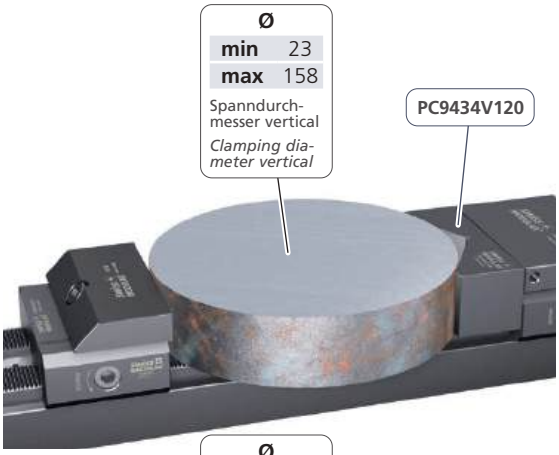


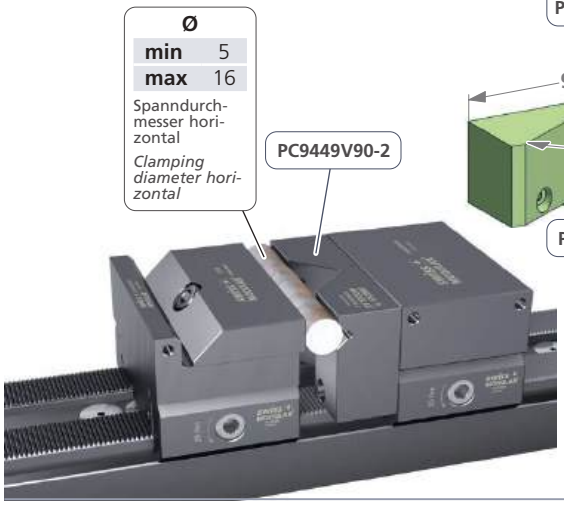


in Prismaform
in prism form

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





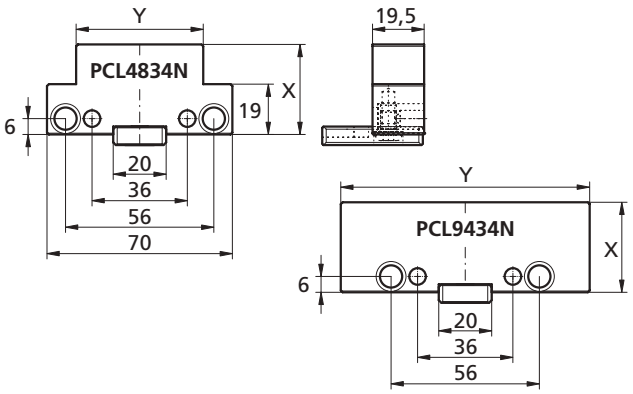


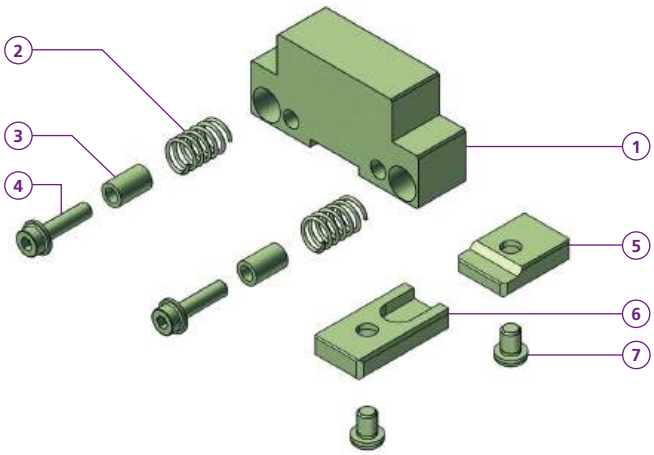


SCAN OR CLICK
PDF STEP

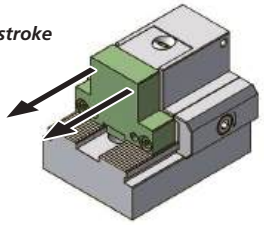
Formbacke
Moulding jaw

Von Niederzug zu Linear!
From pull down jaws to linear stroke!

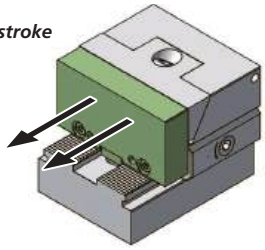




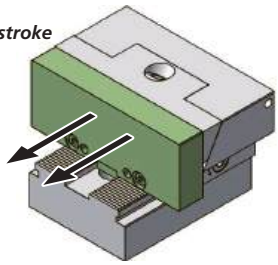
Spannhub *Clamping stroke* **0/+3,8**



Spannhub *Clamping stroke* **0/+3,8**



Spannhub *Clamping stroke* **0/+4,8**



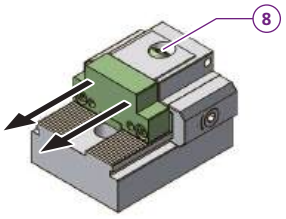
PCL4349N		
1	1x	TF140697
2	2x	FED10175
3	2x	PCD0813
4	2x	M5X20BN1392
5	1x	**PCGU2028**
6	1x	**PCGU2030LB**
7	2x	**M6X8ISO7380**
X	=	49
Y	=	43
kg		~0,43

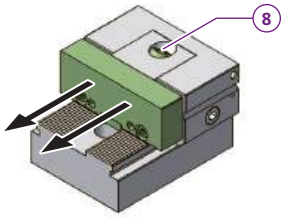
PCL9449N		
1	1x	TF140700
X	=	49
Y	=	94
kg		~0,74

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



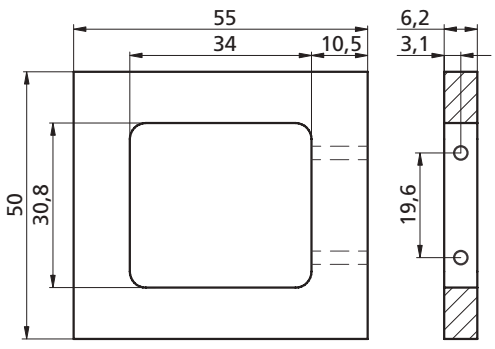


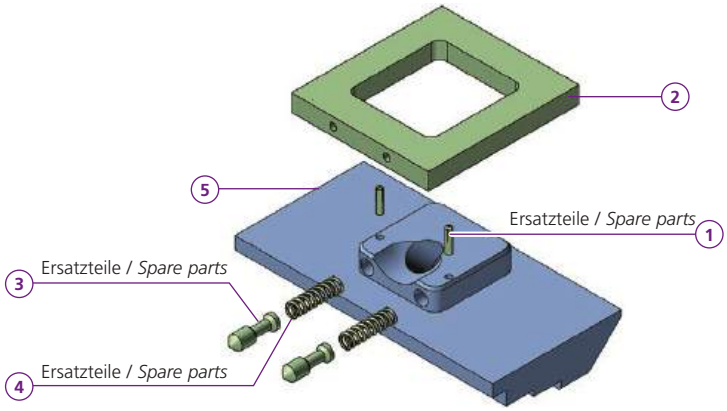
Die Spannsschraube (8) der 34 mm hohen Spannmodule müssen durch eine kürzere Schraube ausgetauscht werden!

The clamping screws (8) of the 34 mm high clamping modules must be replaced by a shorter screw!

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	PCRB0516
4	2x	TN100614
5	1x	
kg		~0,08

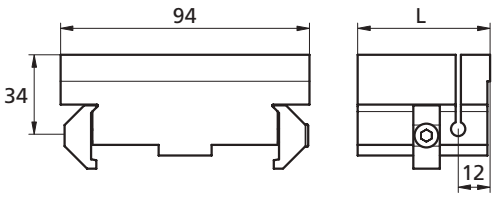
p. 84, 85 Alle Linearbacken *All linear jaws*

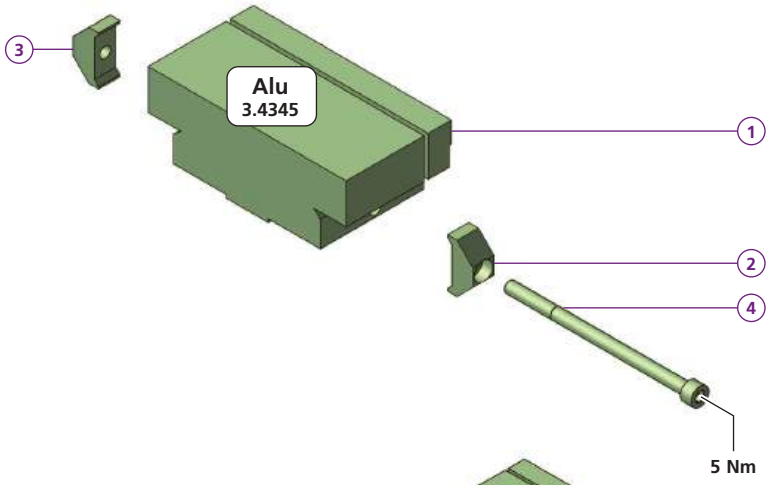
Version mit Stiften** / **Version with pins
ab August / as of August 2018

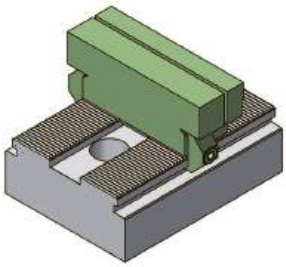
Montageanleitung siehe Video
Assembly instructions see video

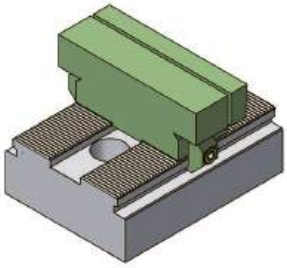
Version mit Kugeln** / **Version with balls
vor August / before August 2018

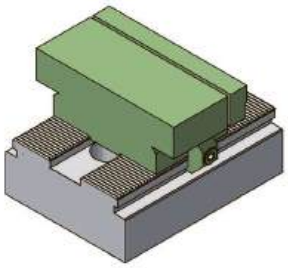
Separat bestellen / *Order separately*

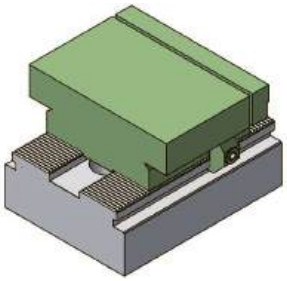












PCFX30		
1	1x	TF140702
2	1x	**PCSP10B**
3	1x	**PCSP10G**
4	1x	**M5X85ISO4762**
L	=	30
kg		~0,27

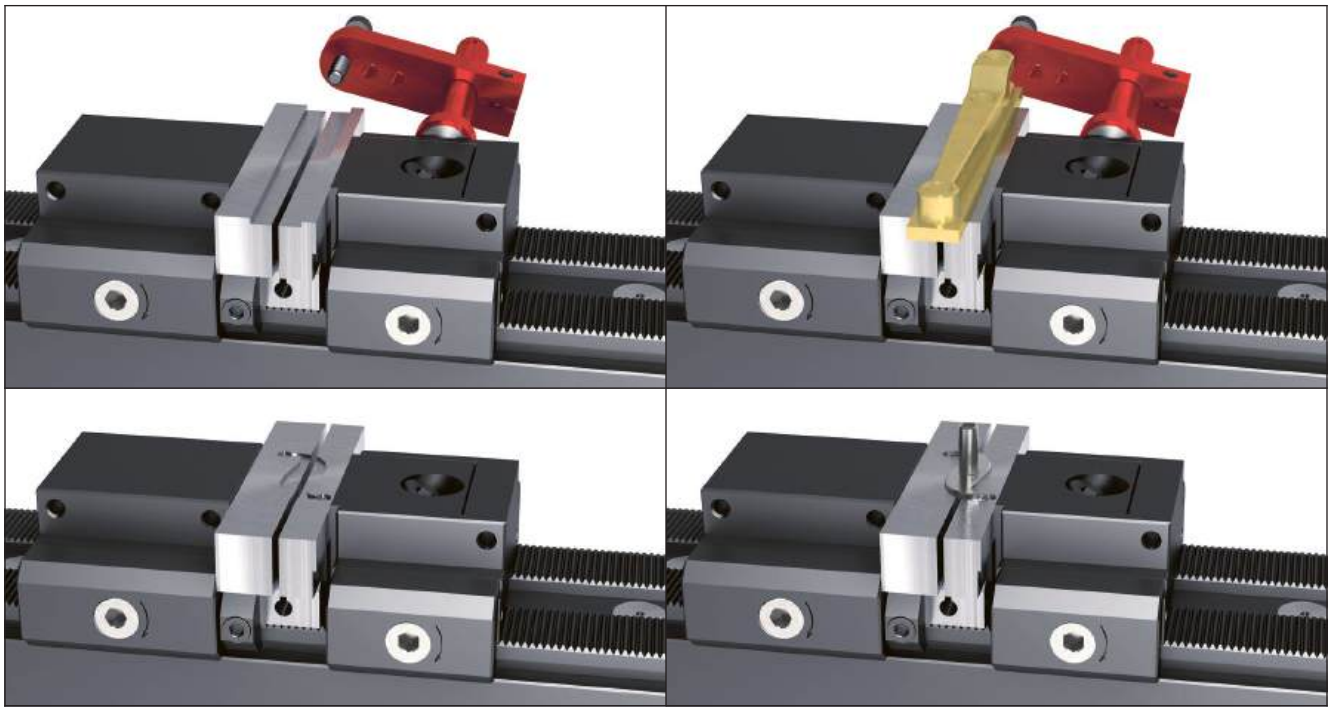
PCFX35		
1	1x	TF140703
L	=	35
kg		~0,31

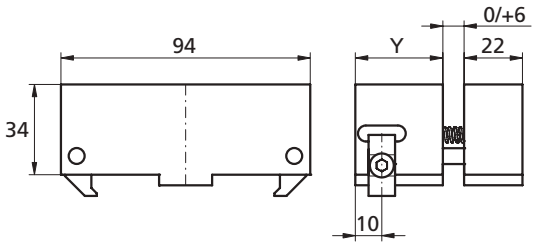
PCFX50		
1	1x	TF140704
2	1x	**PCSP10B**
3	1x	**PCSP10G**
4	1x	**M5X85ISO4762**
L	=	50
kg		~0,45

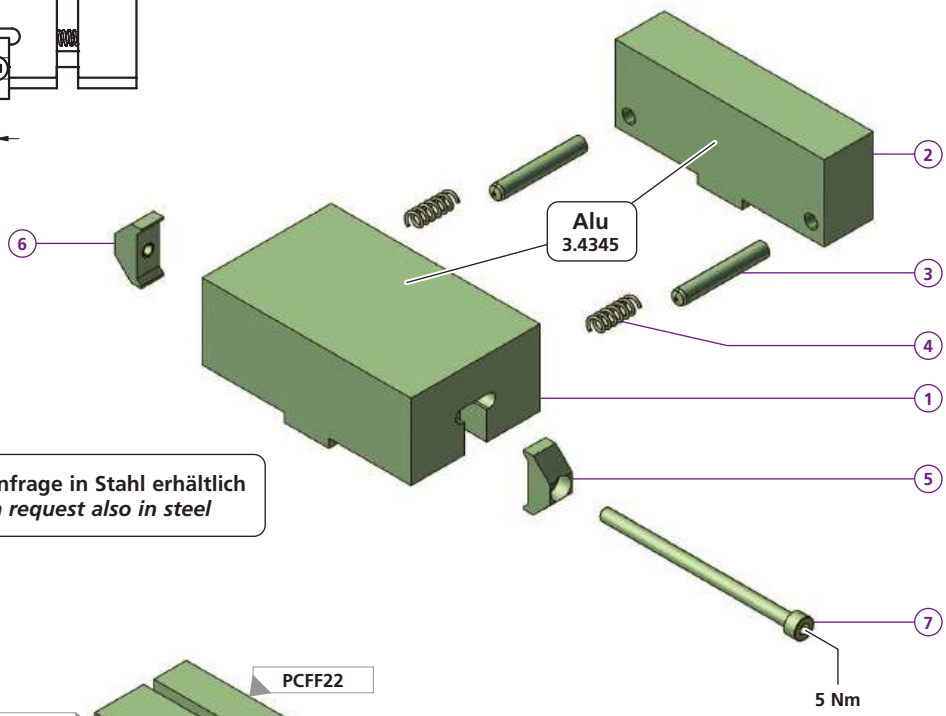
PCFX70		
1	1x	TF140705
L	=	70
kg		~0,62

Auf Anfrage in Stahl erhältlich
On request also in steel

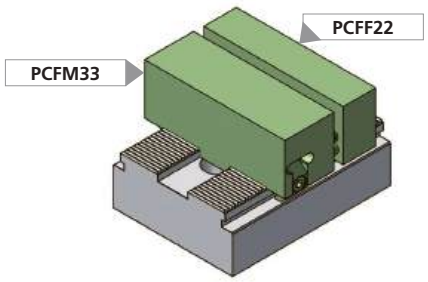
Bestellbeispiel / *Ordering example:* PCFX30

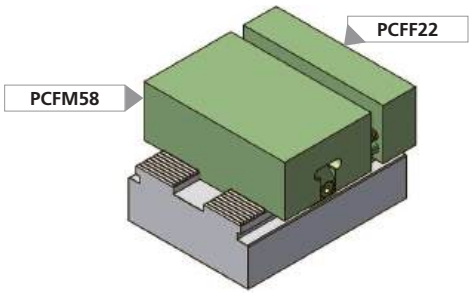






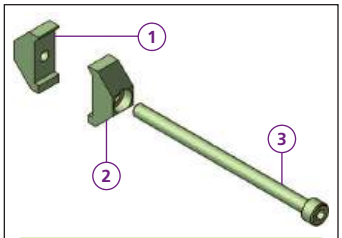
Auf Anfrage in Stahl erhältlich
On request also in steel





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

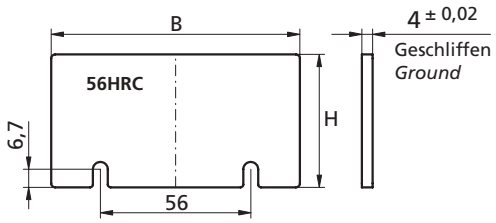
PCFM5822		
1	1x	PCFM58
Y	=	58
kg		~0,75



PCSP10SET	kg	~0,04
1	1x	PCSP10G
2	1x	PCSP10B
3	1x	M5X85ISO4762

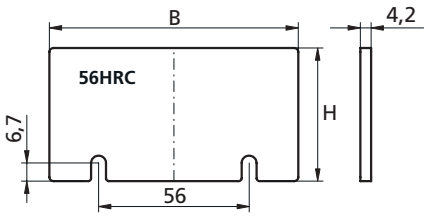
Bestellbeispiel / *Ordering example:* PCFM3322

Anschlagbacke flach
Jaw flat stop



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

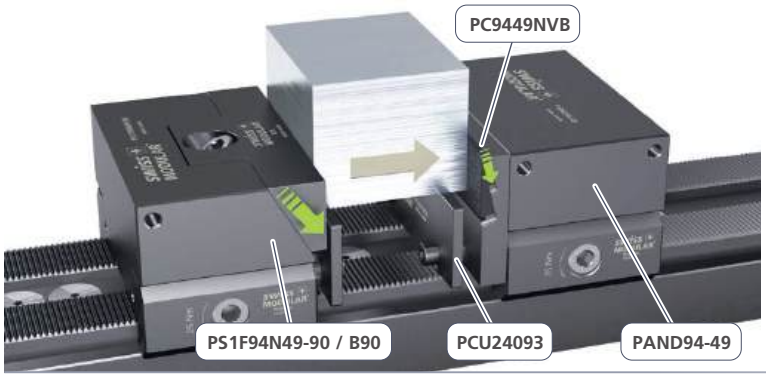
Unterlagen gehärtet und geschliffen
Parallels hardened and ground

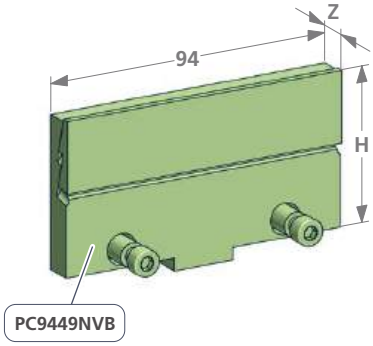


	B	H	kg
PCUD14093	93	14	~0,05
PCUD20093	93	20	~0,06
PCUD24093	93	24	~0,08
PCUD29093	93	29	~0,09
PCUD31093	93	31	~0,10
PCUD34093	93	34	~0,11
PCUD39093	93	39	~0,12
PCUD44093	93	44	~0,14
PCUD46093	93	46	~0,14
PCUD47093	93	37	~0,15

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

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



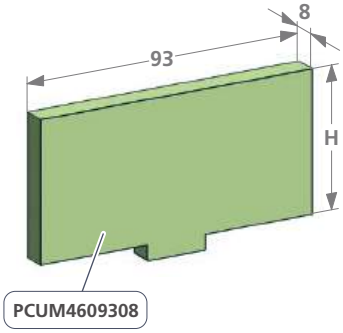


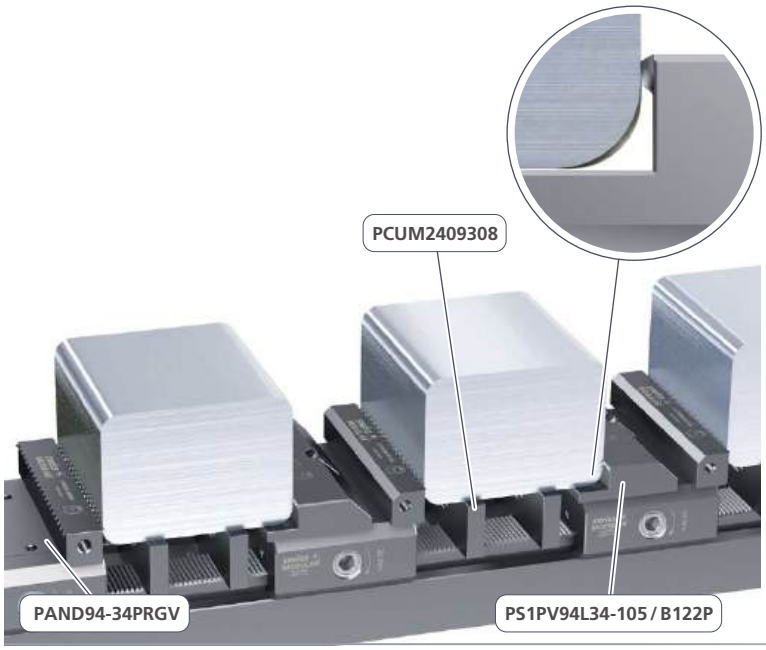
Die Niederzugbacke dient um einen zusätzlichen Niederzug-Klemmdruck auf der Anschlagseite zu erhalten.

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.

Parallelunterlage
Steel parallels

19mm	B	H	kg
PCU20018	18	20	~0,04
PCU24018	18	24	~0,04
PCU29018	18	29	~0,05
PCU31018	18	31	~0,05
PCU34018	18	34	~0,05
PCU39018	18	39	~0,05
PCU44018	18	44	~0,05
PCU46518	18	46,5	~0,06

34mm	B	H	kg
PCU20033	33	20	~0,04
PCU24033	33	24	~0,05
PCU29033	33	29	~0,05
PCU31033	33	31	~0,05
PCU34033	33	34	~0,06
PCU39033	33	39	~0,06
PCU44033	33	44	~0,07
PCU46033	33	46	~0,06
PCU46533	33	46,5	~0,07

48mm	B	H	kg
PCU20047	47	20	~0,04
PCU24047	47	24	~0,05
PCU29047	47	29	~0,05
PCU31047	47	31	~0,05
PCU34047	47	34	~0,07
PCU39047	47	39	~0,07
PCU44047	47	44	~0,08
PCU46047	47	46	~0,08

61mm	B	H	kg
PCU20060	60	20	~0,04
PCU24060	60	24	~0,05
PCU29060	60	29	~0,06
PCU31060	60	31	~0,06

68mm	B	H	kg
PCU20067	67	20	~0,04
PCU24067	67	24	~0,05
PCU29067	67	29	~0,06
PCU31067	67	31	~0,07

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
PCU47093	93	47	~0,14

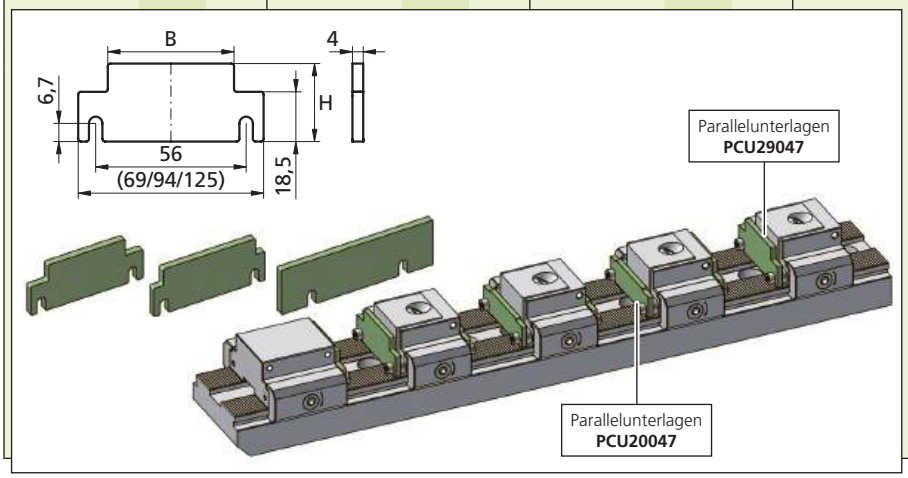
26mm	B	H	kg
PCU20025	25	20	~0,04
PCU24025	25	24	~0,05
PCU29025	25	29	~0,05
PCU31025	25	31	~0,05
PCU34025	25	34	~0,05
PCU39025	25	39	~0,06
PCU44025	25	44	~0,06
PCU46525	25	46,5	~0,06

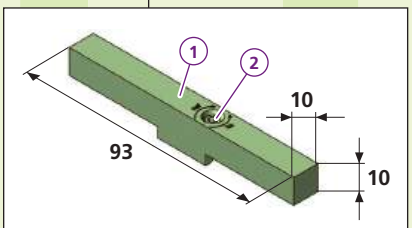
43mm	B	H	kg
PCU20042	42	20	~0,04
PCU24042	42	24	~0,05
PCU29042	42	29	~0,05
PCU31042	42	31	~0,06
PCU34042	42	34	~0,06
PCU39042	42	39	~0,07
PCU44042	42	44	~0,07
PCU46042	42	46	~0,08
PCU47042	42	47	~0,08

58mm	B	H	kg
PCU20057	57	20	~0,04
PCU24057	57	24	~0,05
PCU29057	57	29	~0,06
PCU31057	57	31	~0,06

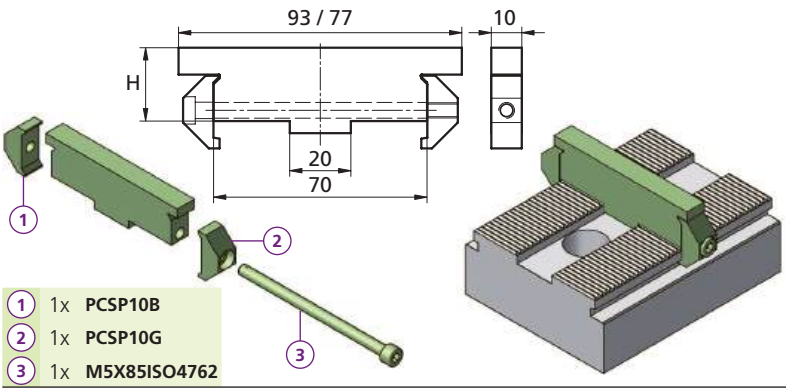
78mm	B	H	kg
PCU20077	77	20	~0,05
PCU24077	77	24	~0,06
PCU29077	77	29	~0,07
PCU31077	77	31	~0,08
PCU34077	77	34	~0,08
PCU39077	77	39	~0,09
PCU44077	77	44	~0,11

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
PCU46124	124	46	~0,18





PCU10093	
1	1x TF140708
2	1x TK170037
kg	~0,085

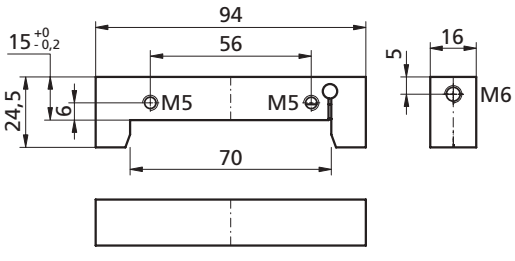


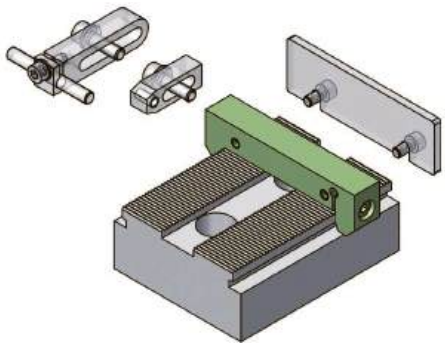
1	1x	PCSP10B
2	1x	PCSP10G
3	1x	M5X85ISO4762

weich / *soft* 1.7225		
H= +0,15 +0,25	H	kg
PCU20077B10-W	20	~0,15
PCU24093B10-W	24	~0,19
PCU39093B10-W	39	~0,29
PCU44093B10-W	44	~0,33
PCU46093B10-W	46	~0,34

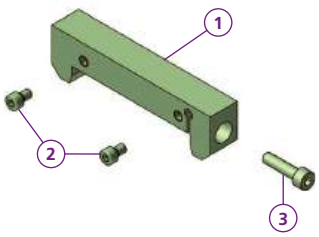
hart / *hardened* HV700 x0,2mm		
H= ± 0,005	H	kg
PCU20077B10	20	~0,15
PCU24093B10	24	~0,19
PCU29093B10	29	~0,23
PCU31093B10	31	~0,24
PCU34093B10	34	~0,27
PCU39093B10	39	~0,29
PCU44093B10	44	~0,33
PCU46093B10	46	~0,34

Unterlagen- und Fräsanschlaghalter
Holder for parallels and workpiece stop





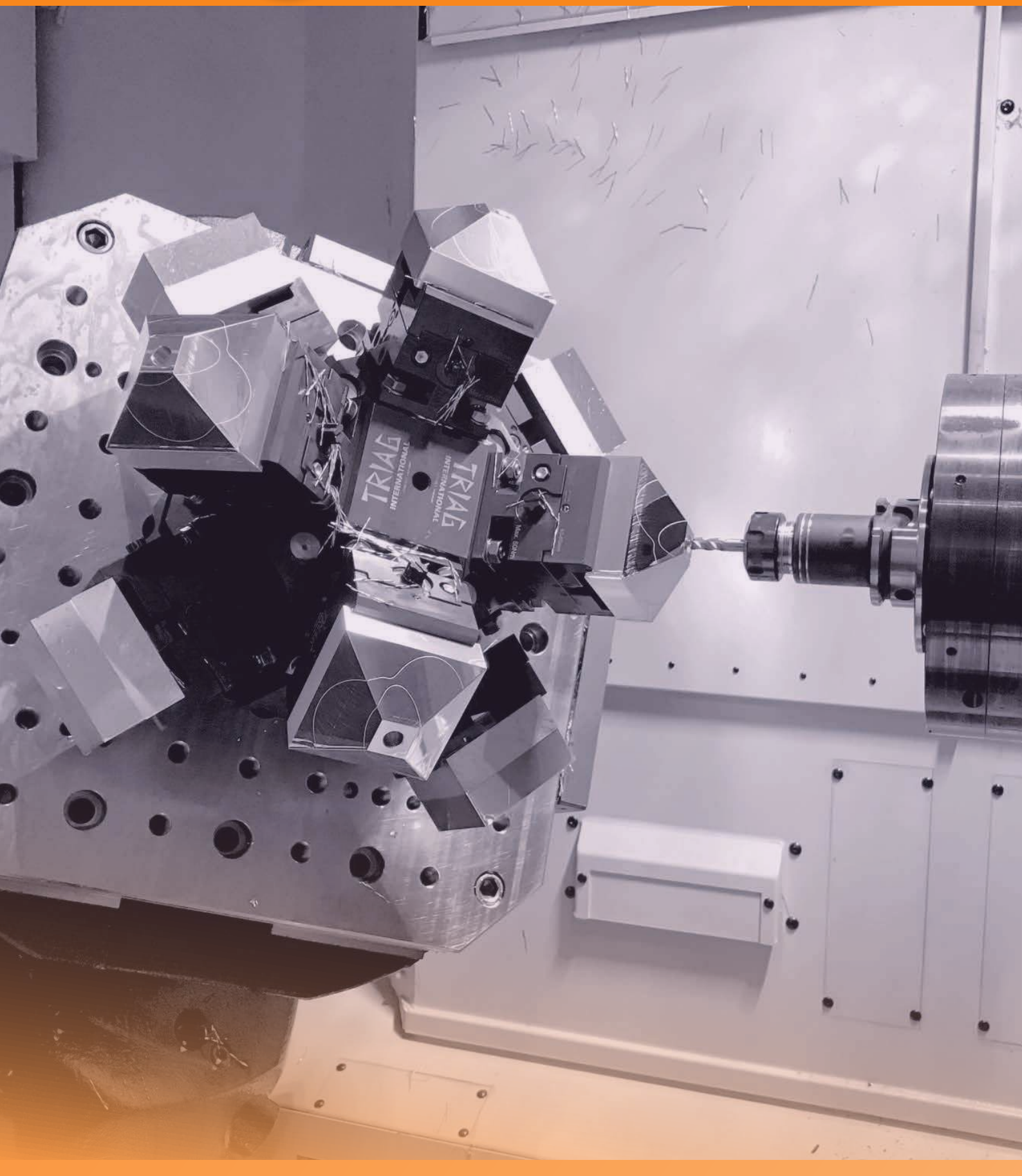
PCUH2594	
1	1x TF140706
2	2x M5X8ISO4762
3	1x M5X22ISO4762
kg	~0,19



Bestellbeispiel / *Ordering example:* PCUH2594

9
05.11.2024

triCENTRO



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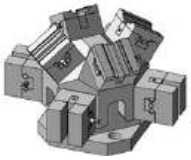
5-axis pyramid solutions 35°... .....  SPACEGRIP I 118

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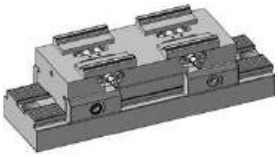
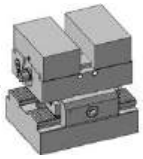
Kompakter Zentrischspanner | *Compact self centering vise* .....  ..... 123 - 124

Mini Zentrierspanner | *Mini - self centering vise* .....  ..... 126 - 129

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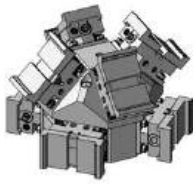
5-axis pyramid solutions 45° / 90° .....  SPACEGRIP II 133

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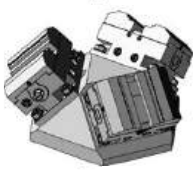
5-axis pyramid solutions 45° .....  SPACEGRIP II-3 136

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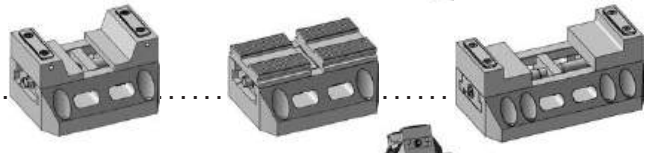
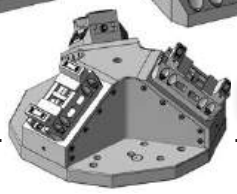
Self centering vises X M Q series .....  ..... 137 - 149

5-Achs Pyramidenlösungen
5-axis pyramid solutions 35°-3 .....  SPACEGRIP III ..... 153 - 154

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ZSP125 Mini - Pneumatischer Zentrischspanner (Doppelkolben)
ZSP125 Mini - Pneumatic self centering vise (Double piston) 158



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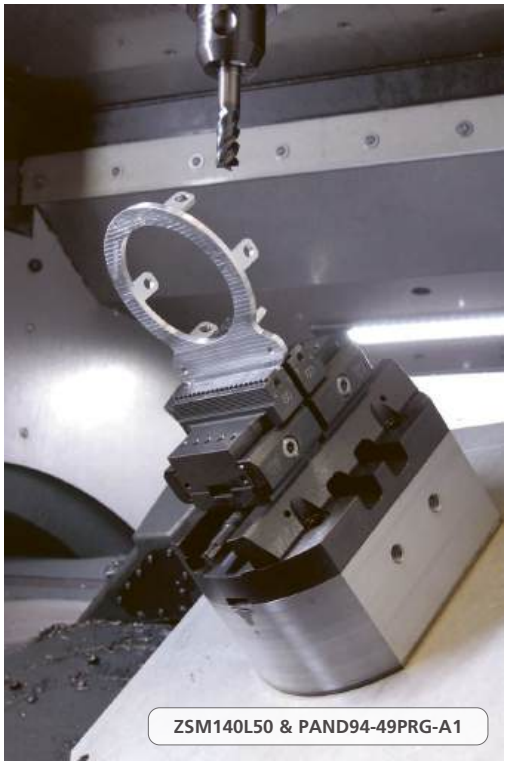
Triag International AG bietet ein breites Sortiment an Zentrischspannern an. Neben den Zentrischspannern, die auf die Schienensysteme Power Clamp das Nullpunktsystem oppSystem passen, sind auch Ausführungen für Lochraster erhältlich.

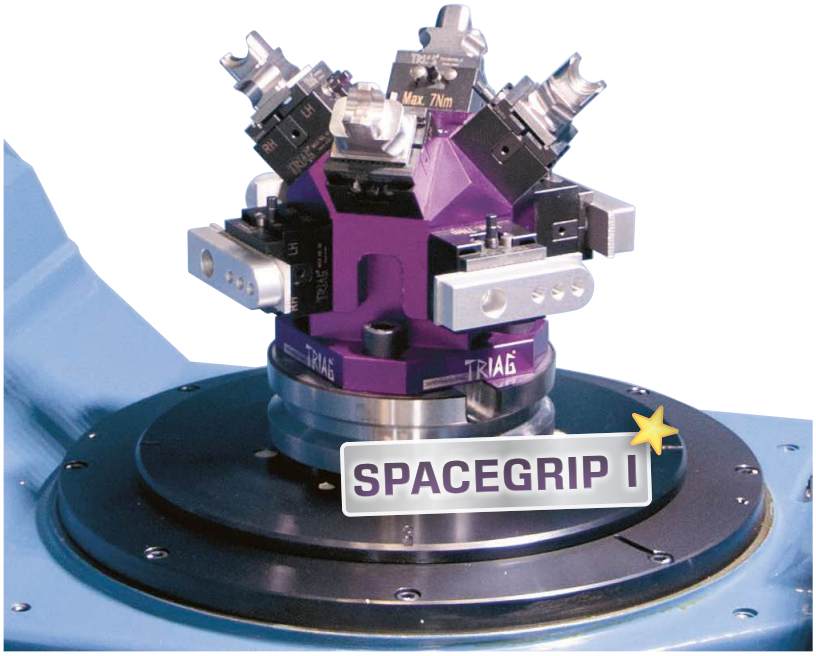
Mit unseren modularen Zentrischspannblöcken bieten wir eine optimale Lösung für die Mehrfachspannung in Ihrer 5-Achs Fräsmaschine an. Für alle Zentrischspanner sind verschiedene Aufsatz- und Prägebacken erhältlich.

Triag International AG *offers a wide range of self centering vices. In addition to the self centering vice 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.

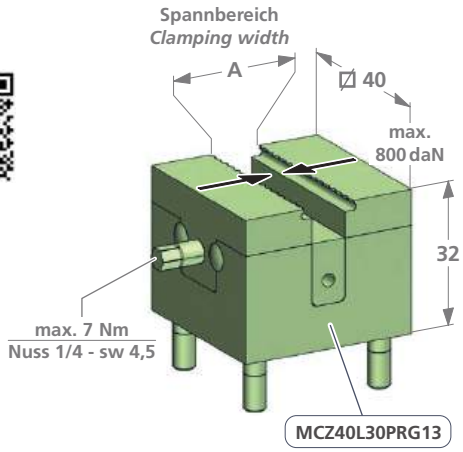


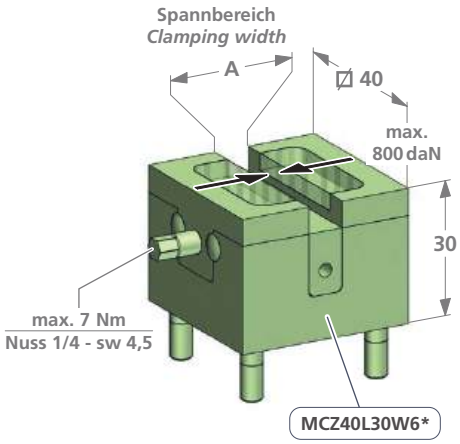




Für den Vorrichtungsbau
For dedicated fixtures

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

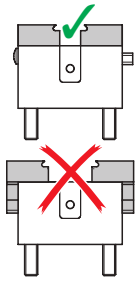




NUSS1/4"4.5MM

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately





ACHTUNG / *CAUTION*

Die Angaben der Spannbereiche bei den verschiedenen Backen sind unbedingt zu beachten und einzuhalten! 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.



Art. Nr.	B190-13	B190-22	B190-31
ⓘ	57HRC	57HRC	57HRC
kg	~0,09	~0,08	~0,08

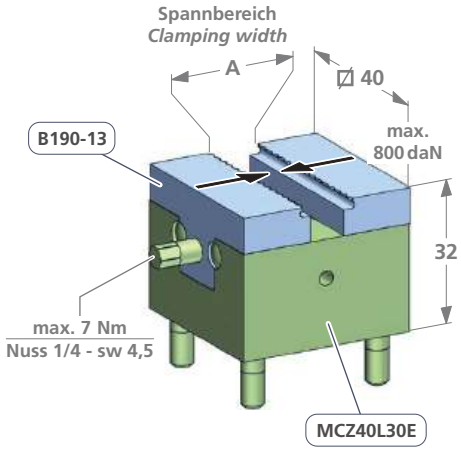
SCAN OR CLICK PDF STEP

Stufenbacke *Stepped jaw* Formbacke *Moulding jaw*

SEPARAT BESTELLEN *ORDER SEPARATELY*

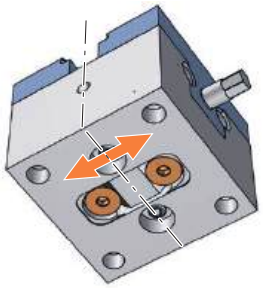
Für den Vorrichtungsbau / Mit einstellbarem Mittellager
For dedicated fixtures / With adjustable center positio

Art. Nr.	Backen *Jaws*	A mm	kg
MCZ40L30E	**B190-13**	3 – 13	~0,24
	B190-22	12 – 22	
	B190-31	21 – 31	
	B190W6-40	variabel	
	B190W10-40	variabel	
	B190W20-40	variabel	
	B190W30-40	variabel	



Das Zentrum kann durch das Mittellager um +/- 0,5 mm verstellt werden. Eine schwimmende Werkstückspannung ist auch möglich.
***Lieferzustand**:*
Zentriert mit einer Toleranz von +/- 0,03 mm

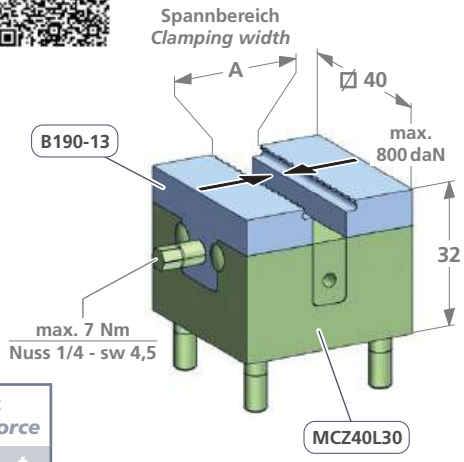
The center can be adjusted by +/- 0,5 mm through the center support. A floating fixture is also possible.
***Delivery condition**:*
Centered with a tolerance of +/- 0,03 mm



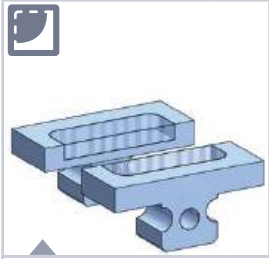
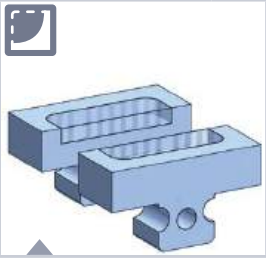
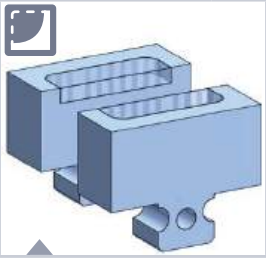
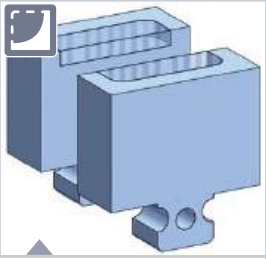
Bedienungsanleitung
Operating instruction

Ohne einstellbares Mittellager
Without adjustable center positio

Art. Nr.	Backen *Jaws*	A mm	kg
MCZ40L30	**B190-13**	3 – 13	~0,24
	B190-22	12 – 22	
	B190-31	21 – 31	
	B190W6-40	variabel	
	B190W10-40	variabel	
	B190W20-40	variabel	
	B190W30-40	variabel	



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

B190W6-40	**B190W10-40**	**B190W20-40**	**B190W30-40**
weicher Stahl *soft steel* (1.7225)	weicher Stahl *soft steel* (1.7225)	weicher Stahl *soft steel* (1.7225)	weicher Stahl *soft steel* (1.7225)
~0,08	~0,012	~0,22	~0,32
			

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

SCAN OR CLICK PDF STEP Stufenbacke *Stepped jaw* Formbacke *Moulding jaw*

SEPARAT BESTELLEN ***ORDER SEPARATELY***

spaceGRIP I

Die spaceGRIP Baureihe wurde speziell für die effizientere Nutzung von 5-Achsen Maschinen entwickelt. Dabei zeichnen sich alle drei Baureihen der spaceGRIP 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).

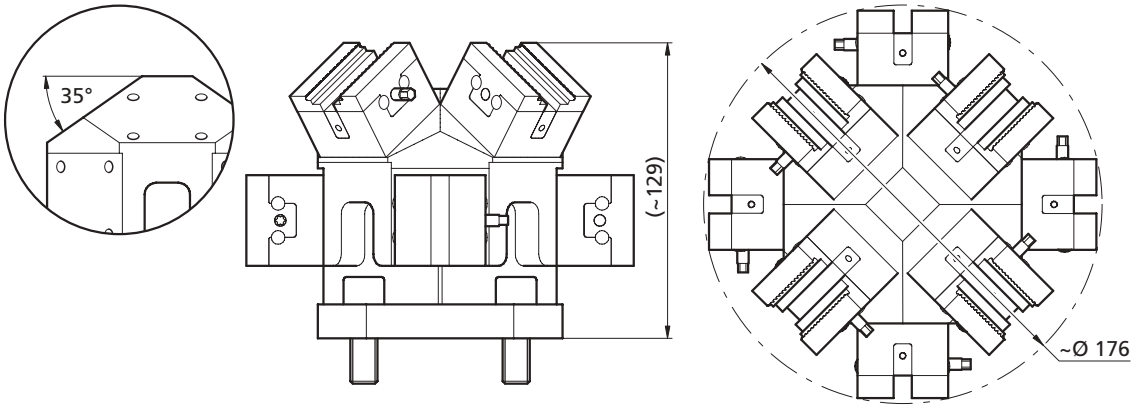
Für die zweite Spannung gibt es vier Sätze unterschiedlicher Backenrohlinge für die Einarbeitung einer Kontur. Die Spannkraft liegt bei 7 Nm 0,8 t 800 daN.

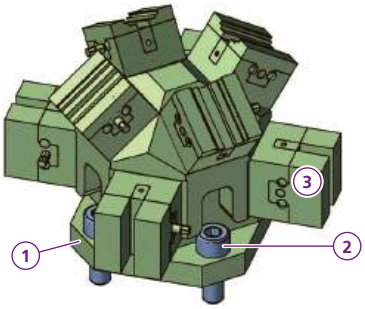
spaceGRIP I

The spaceGRIP series was specially developed to improve the out puts of 5-axis machines. All three types of the spaceGRIP 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.



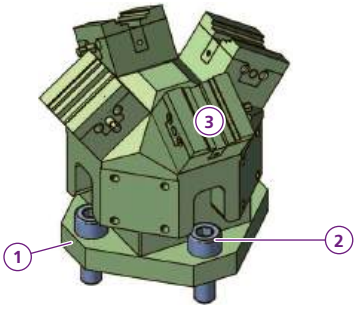


UB5AXMCZ4035SET8

1	1x	TB170676
2	4x	**M12X35ISO4762**
3	8x	**Ihre Wahl** / *Your choice*
kg		~5,1

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

p. 116 - 117

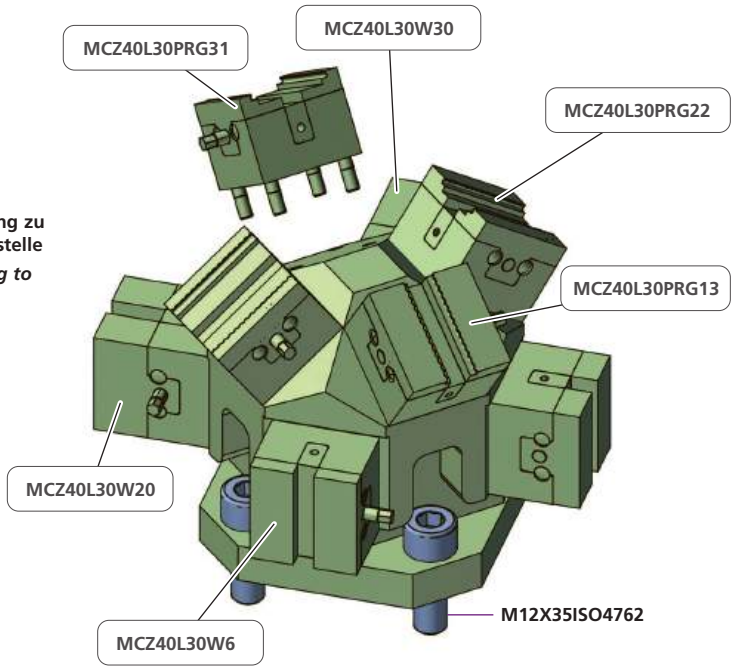


UB5AXMCZ4035SET4

1	1x	TB170676
2	4x	**M12X35ISO4762**
3	4x	**Ihre Wahl** / *Your choice*
kg		~3,2

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

p. 116 - 117



NUSS1/4"4.5MM

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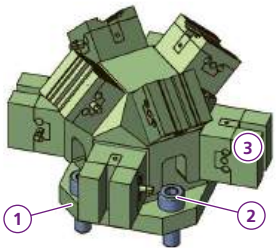
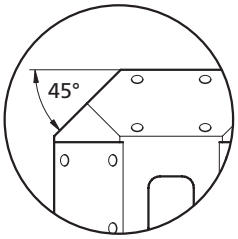
IMPORTANT!
Please order separately

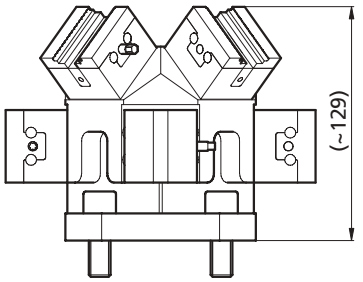


Bestellbeispiel / ***Ordering example***:
2 x UB5AXMCZ40-35SET8 **&** 8 x MCZ40L30W10 **&**
8 x MCZ40L30PRG22 **&** 1 x Nuss 1/4 - sw 4,5

Separat bestellen / *Order separately*

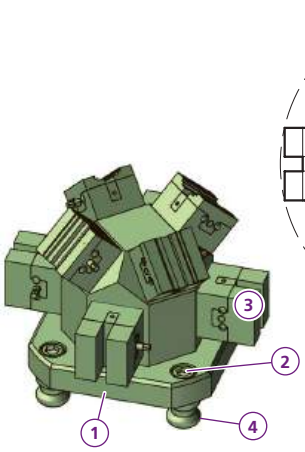


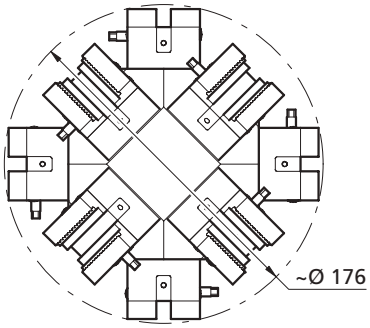


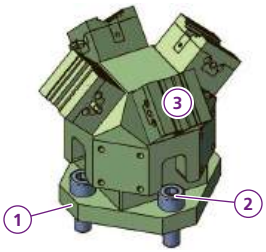


45°	UB5AXMCZ40-45SET8		
1	1x	TK140867	
2	4x	**M12X35ISO4762**	
3	8x	**Ihre Wahl / *Your choice***	**p. 116 - 117**
kg		~5,2	

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface





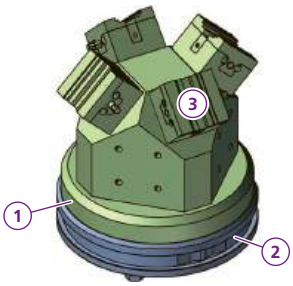


45°	UB5AXMCZ4045SET4		
1	1x	TK140867	
2	4x	**M12X35ISO4762**	
3	4x	**Ihre Wahl / *Your choice***	**p. 116 - 117**
kg		~4,2	

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

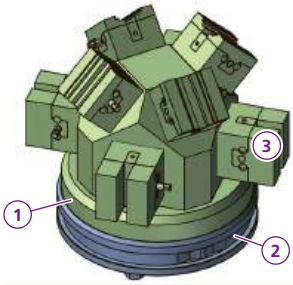
45°	UB5AXMCZ4045SET8-OPMB		
1	1x	TK160869	
2	4x	**M12X20ISO4762**	
3	8x	**Ihre Wahl / *Your choice***	**p. 116 - 117**
4	4x	**OPMB18M12**	
kg		~6,2	

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface



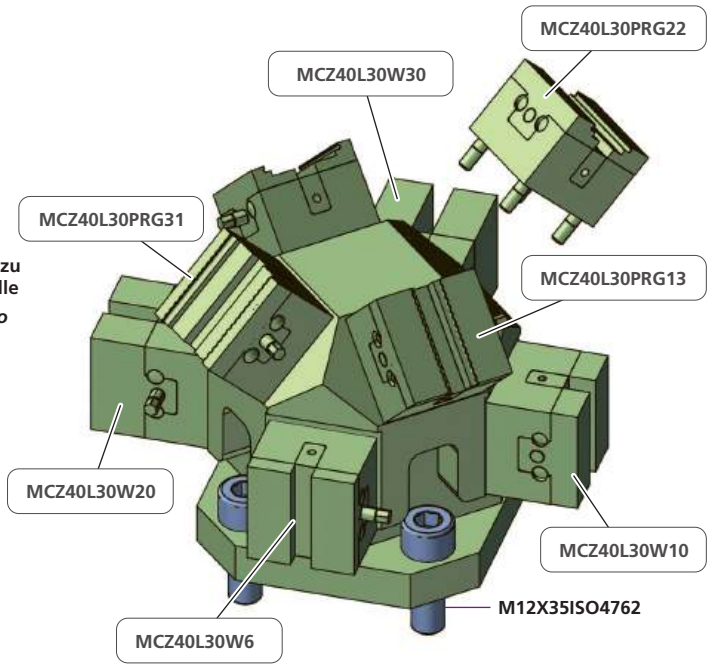
45°	UB5AXMCZ4045SET4-ER		
1	1x	TB161062	
2	1x	ER-129663 EROWA ITS-Palette	
3	4x	**Ihre Wahl / *Your choice***	**p. 116 - 117**
kg		~4,1	

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface



45°	UB5AXMCZ40-45SET8-ER		
1	1x	TB161062	
2	1x	ER-129663 EROWA ITS-Palette	
3	8x	**Ihre Wahl / *Your choice***	**p. 116 - 117**
kg		~6,1	

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface



NUSS1/4"4.5MM

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



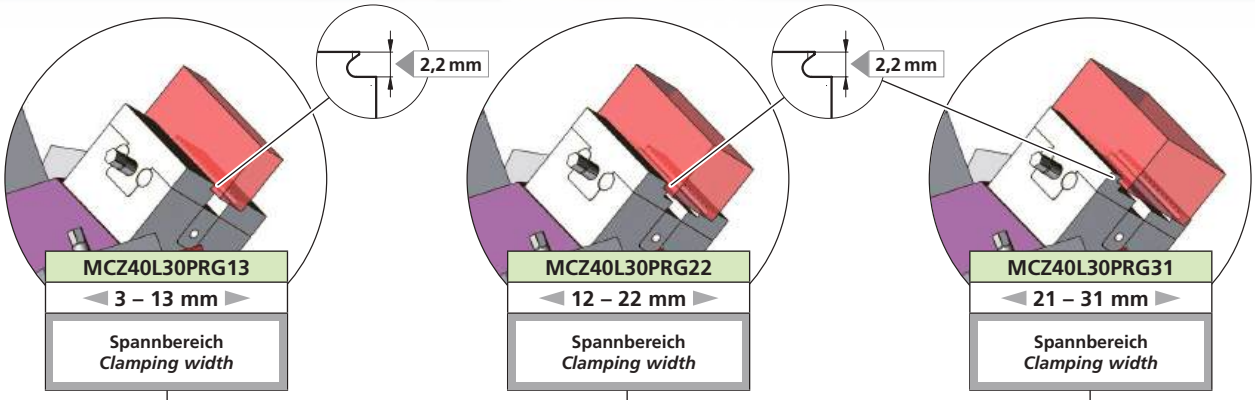
Bestellbeispiel / *Ordering example*:
2 x UB5AXMCZ40-45SET8 & 8 x MCZ40L30W20 &
8 x MCZ40L30PRG22 & 1 x Nuss 1/4 - sw 4,5

Separat bestellen / Order separately

45°-8

SPACEGRIP I



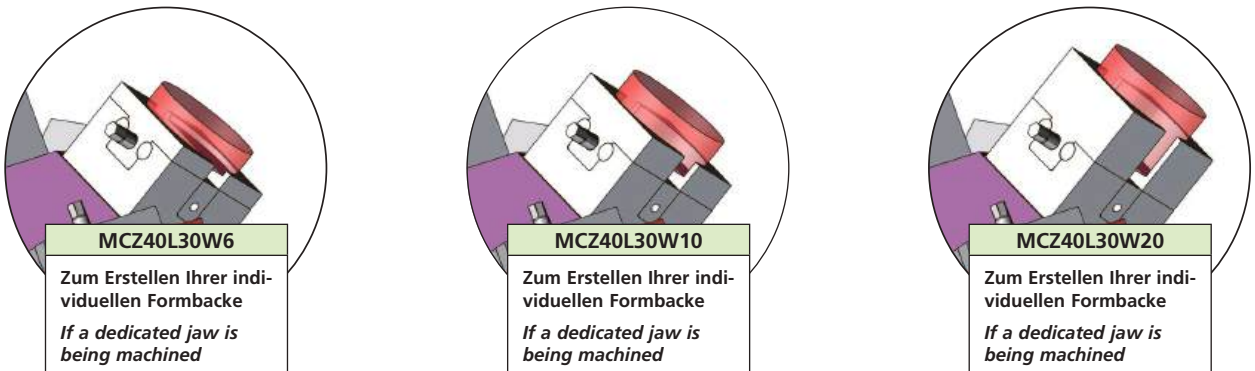


MCZ40L30PRG13
◄ 3 – 13 mm ►
Spannbereich
Clamping width

MCZ40L30PRG22
◄ 12 – 22 mm ►
Spannbereich
Clamping width

MCZ40L30PRG31
◄ 21 – 31 mm ►
Spannbereich
Clamping width

p. 116 Micro Zentrischspanner / *Micro - self centering vise*

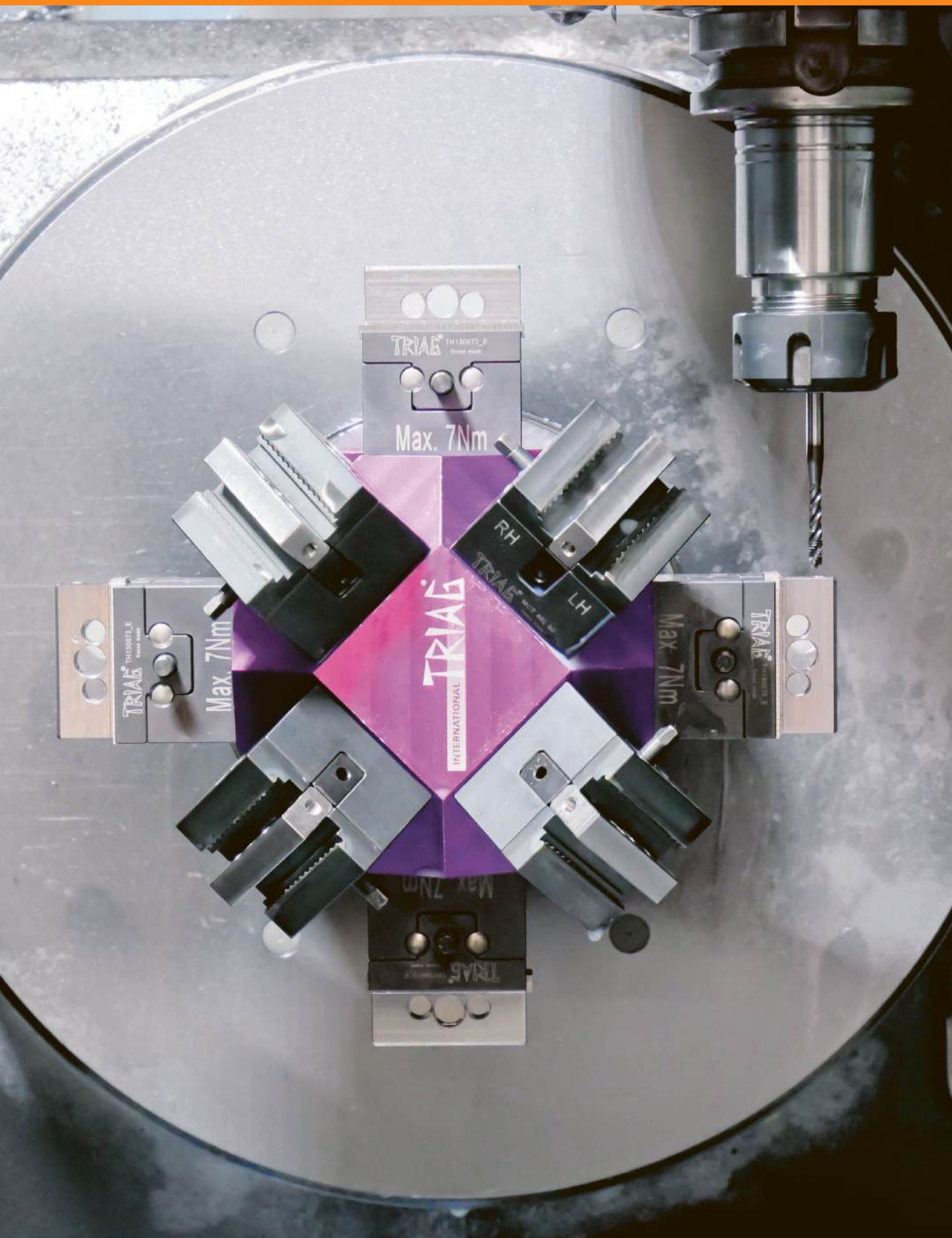


MCZ40L30W6
Zum Erstellen Ihrer individuellen Formbacke
If a dedicated jaw is being machined

MCZ40L30W10
Zum Erstellen Ihrer individuellen Formbacke
If a dedicated jaw is being machined

MCZ40L30W20
Zum Erstellen Ihrer individuellen Formbacke
If a dedicated jaw is being machined

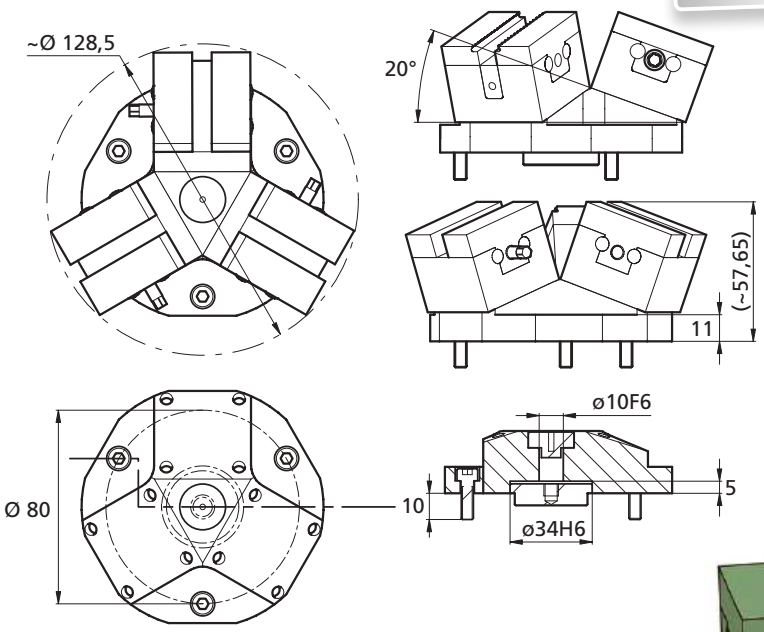
p. 116 Micro Zentrischspanner / *Micro - self centering vise*

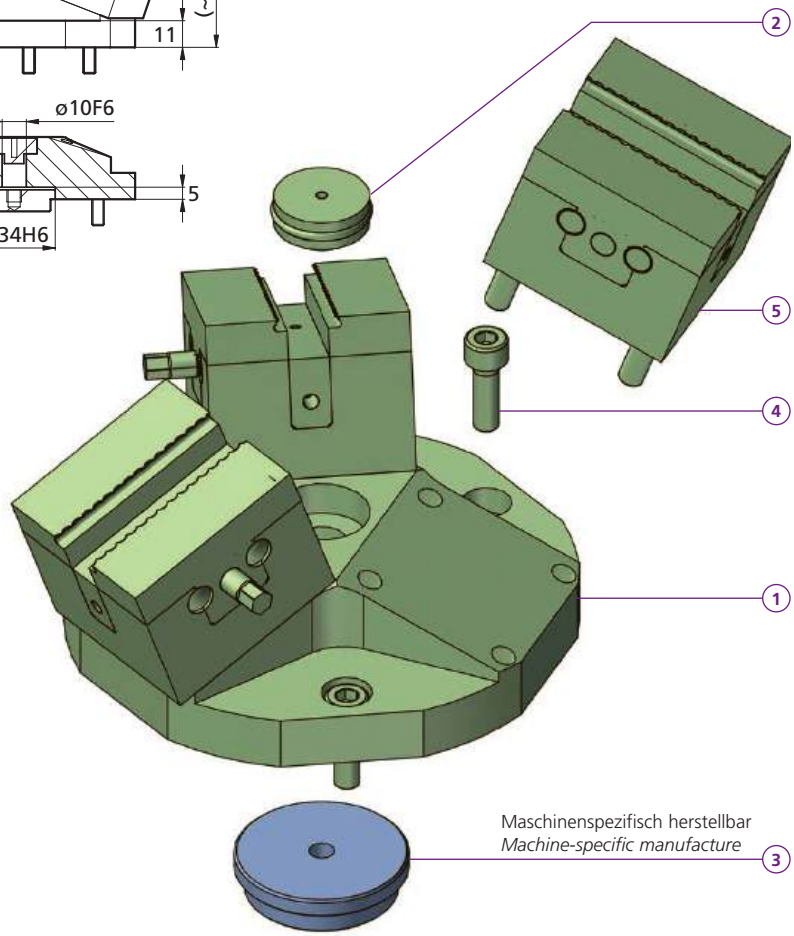

Max. 7Nm
RH
LH
INTERNATIONAL
TRIAG

20°-3

SPACEGRIP I-3

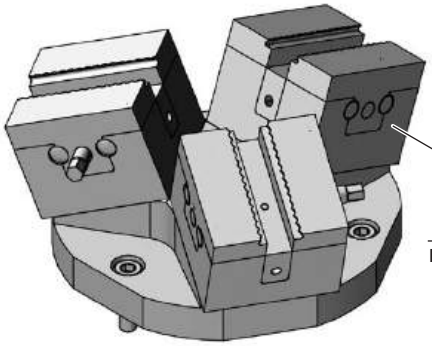
*tri*CENTRO





Maschinenspezifisch herstellbar
Machine-specific manufacture





max. 7 Nm
Nuss 1/4 - sw 4,5

20°	**UB5AXSET18-3**	
1	1x	TH170934
2	1x	PCPF16L6
3	1x	TH171176
4	3x	**M5X16ISO4762**
5	3x	**Ihre Wahl / *Your choice***
kg	~1,45	

p. 116 - 117

Drehmoment und Spannkraft siehe Seite / *Torque and clamping force see page* 117

NUSS1/4“4.5MM

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

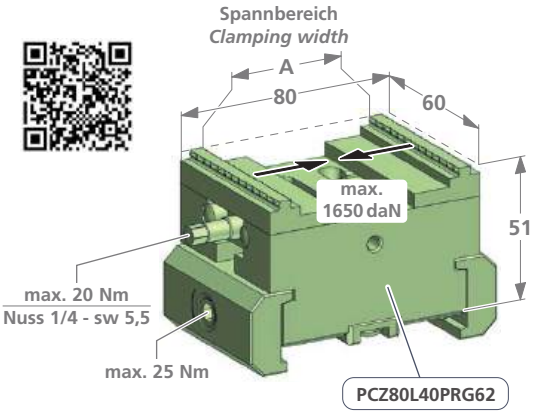


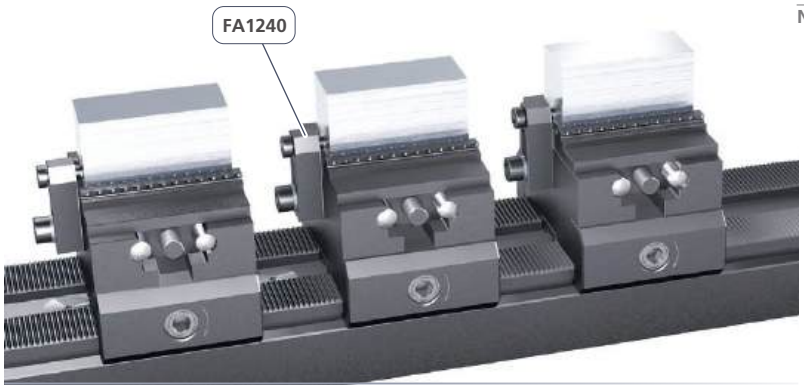
Bestellbeispiel / *Ordering example* : 1 x UB5AXSET18-3 & 1x TH171176 & 3x M5x16

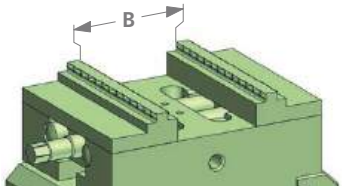
Separat bestellen / *Order separately*

Kompakter Zentrischspanner
Compact self centering vise

Art. Nr.	Backen *Jaws*	A mm	B mm	kg
PCZ80L40PRG62	B210-26	32 – 62	6 – 35	~1,71
	B210W11-60	variabel	variabel	
	B210W20-60	variabel	variabel	



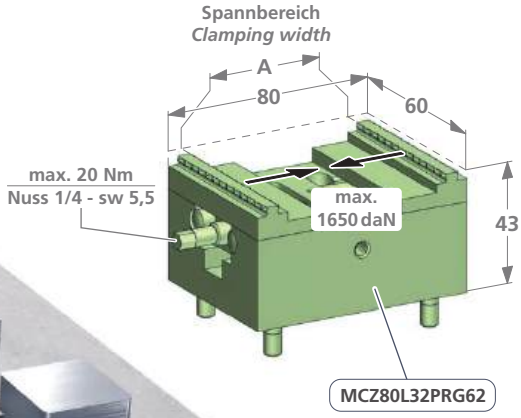


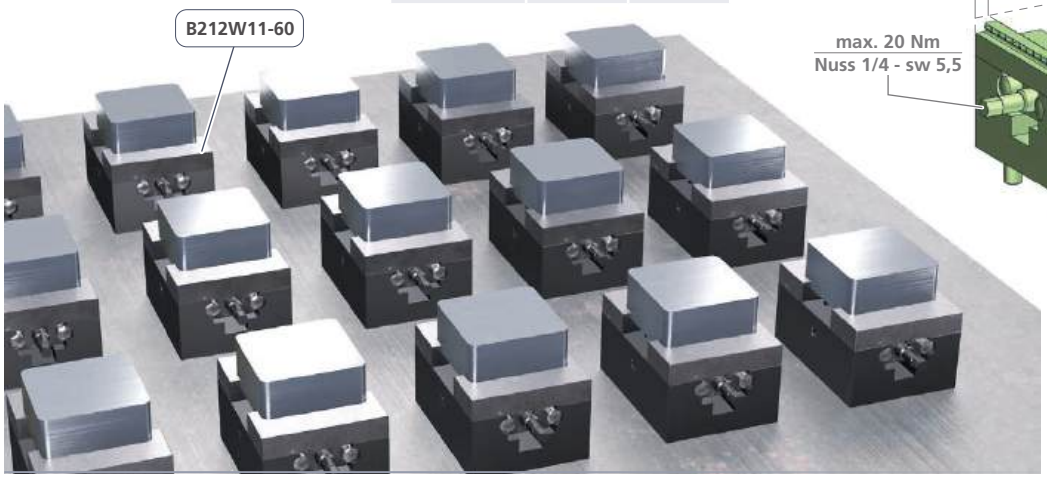


Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	(lb-ft)	~daN	~(lb)	~t
5	3,7	= 410	900	0,41
10	7,4	= 830	1´830	0,83
15	11,0	= 1´250	2´760	1,25
20	14,8	= 1´650	2´640	1,65

Für den Vorrichtungsbau
For dedicated fixtures

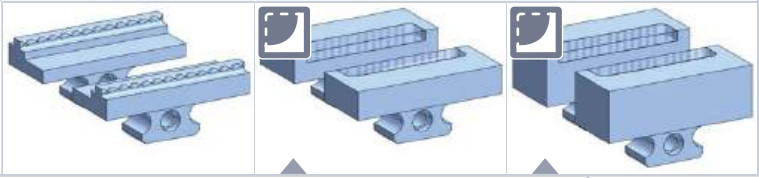
Art. Nr.	Backen *Jaws*	A mm	B mm	kg
MCZ80L32PRG62	B210-62	32 – 62	6 – 35	~1,39
	B210W11-60	variabel	variabel	
	B210W20-60	variabel	variabel	





Linear- Spannbacke / *Linear clamping jaw*

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



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

NUSS1/4“5.5MM

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

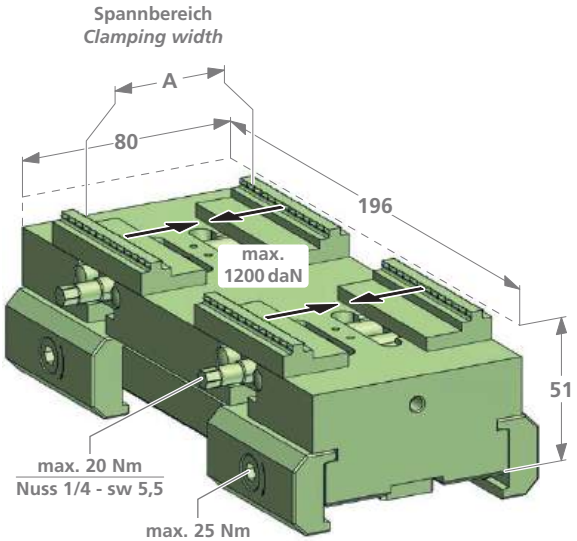


SCAN OR CLICK | PDF | STEP | Stufenbacke *Stepped jaw* | Formbacke *Moulding jaw*

SEPARAT BESTELLEN
ORDER SEPARATELY

Kompakter doppelter Zentrischspanner
Compact double self centering vise

Art. Nr.	Backen *Jaws*	A mm	B mm	kg
PC2Z80L40PRG62	**B210-26**	32 – 62	6 – 35	~4,7
	B210W11-60	variabel	variabel	
	B210W20-60	variabel	variabel	

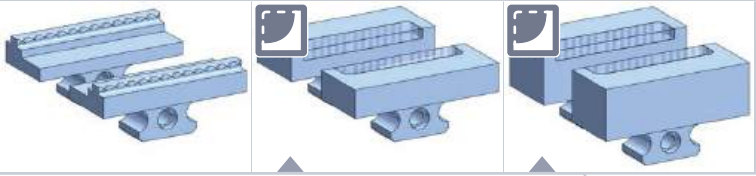


Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	(lb-ft)	~daN	~(lb)	~t
5	3,7	= 410	900	0,41
10	7,4	= 830	1´830	0,83
15	11,0	= 1´250	2´760	1,25
20	14,8	= 1´650	2´640	1,65



Linear- Spannbacke / *Linear clamping jaw*

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



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

NUSS1/4“5.5MM

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



SCAN OR CLICK PDF STEP

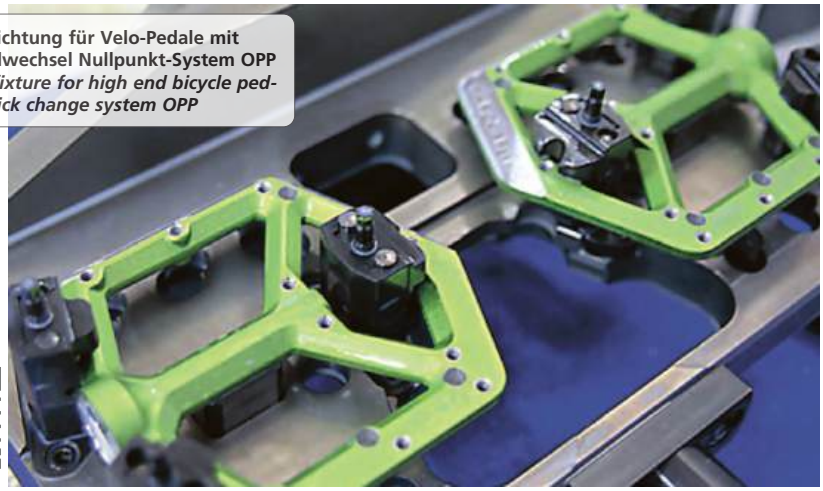
Formbacke *Moulding jaw* Stufenbacke *Stepped jaw*

SEPARAT BESTELLEN
ORDER SEPARATELY

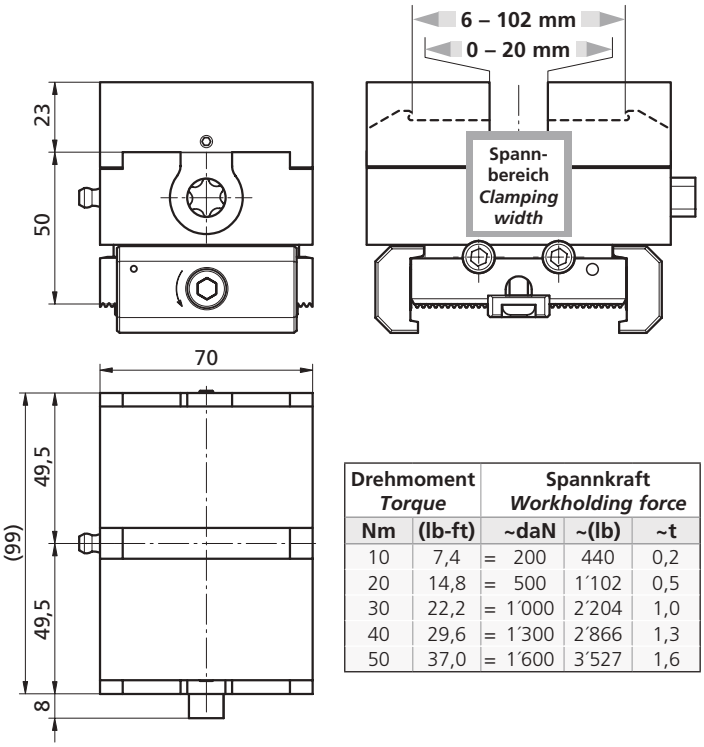
Zwei Mini - Zentrischspanner mit Direktprägebacken halten verschieden lange Titanbleche. Um die verschiedenen Längen zu adaptieren, können die Spanner in 2 mm schritten seitlich versetzt werden.

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



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.

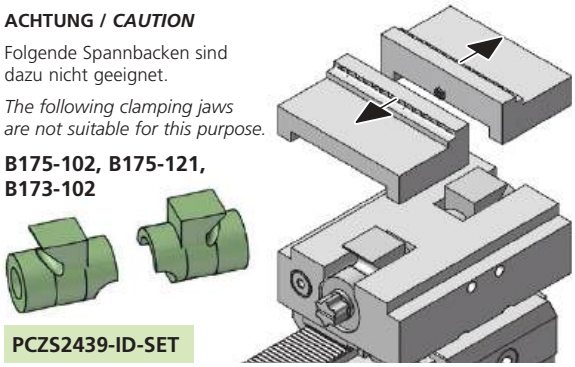
With this set it is possible to clamping the workpiece from the inside.

ACHTUNG / *CAUTION*

Folgende Spannbacken sind dazu nicht geeignet.

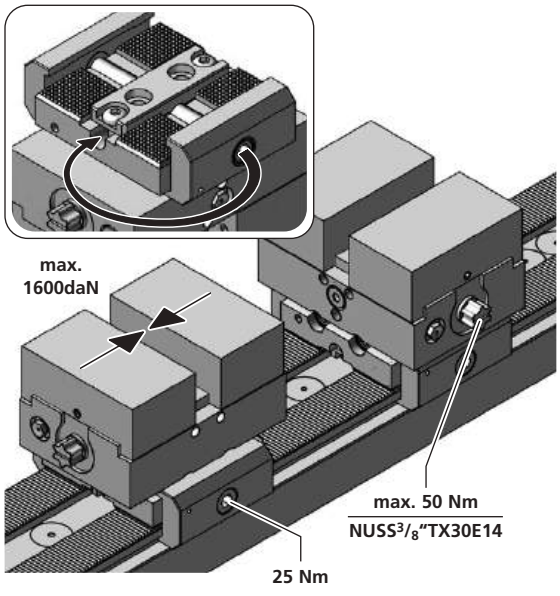
The following clamping jaws are not suitable for this purpose.

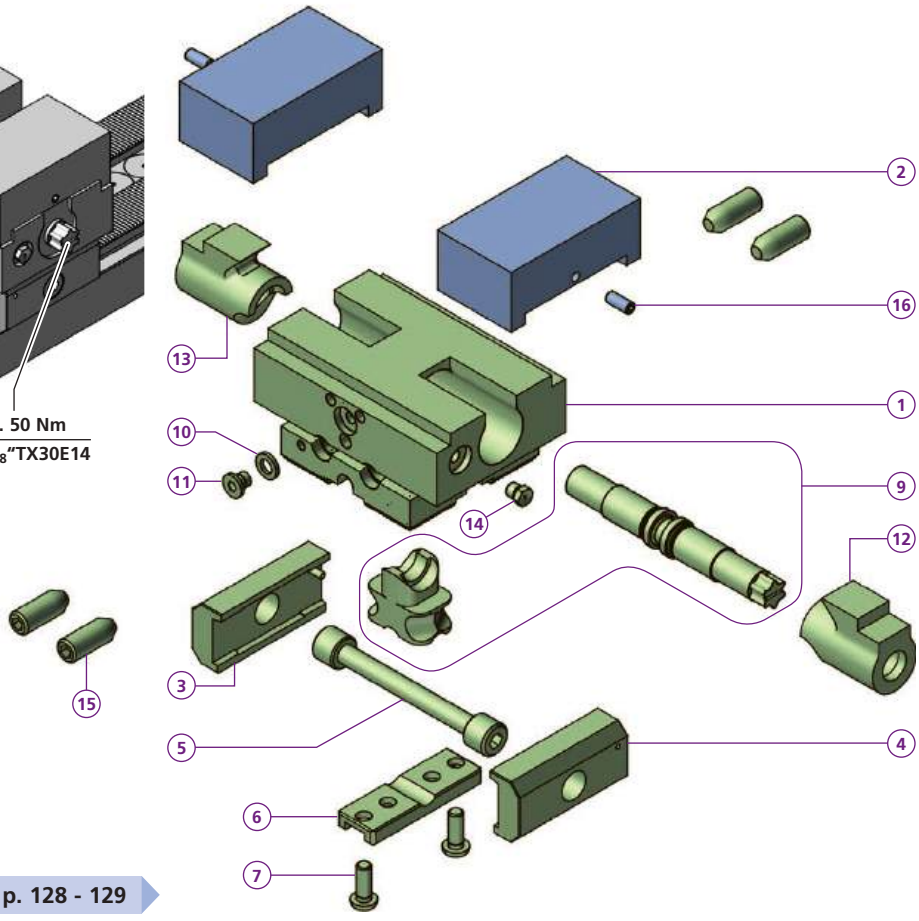
B175-102, B175-121, B173-102



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

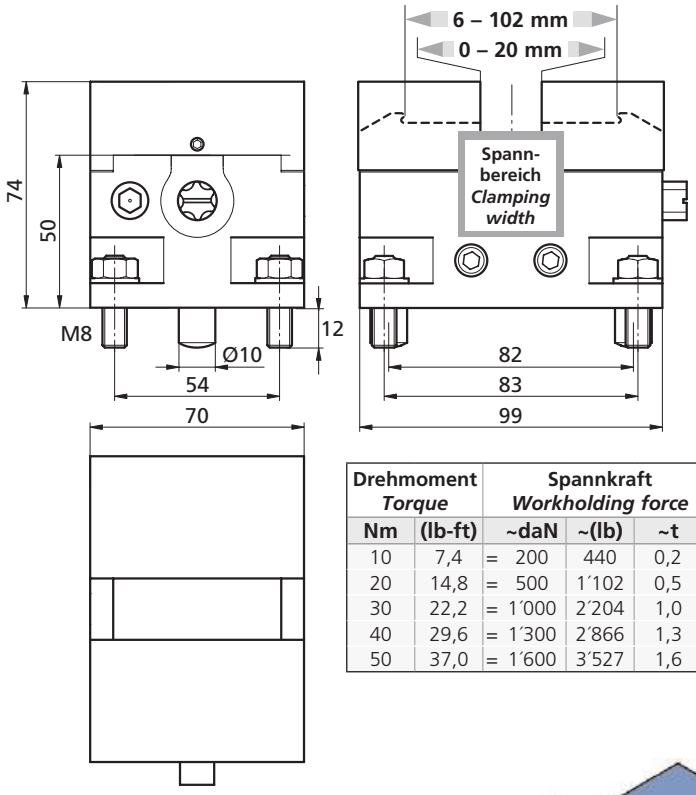
NUSS3/8"TX30E14

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



Bestellbeispiel / *Ordering example*:
3 x PCZ100L50 **&** 6 x B170 **&** 1 x NUSS3/8"TX30E14

Separat bestellen / *Order separately*



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*

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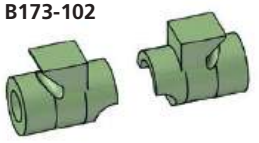
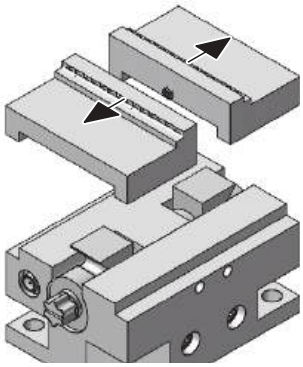
The following clamping jaws are not suitable for this purpose.

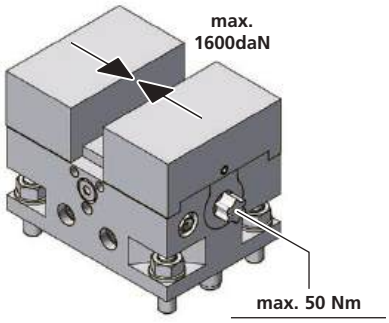
B175-102, B175-121, B173-102

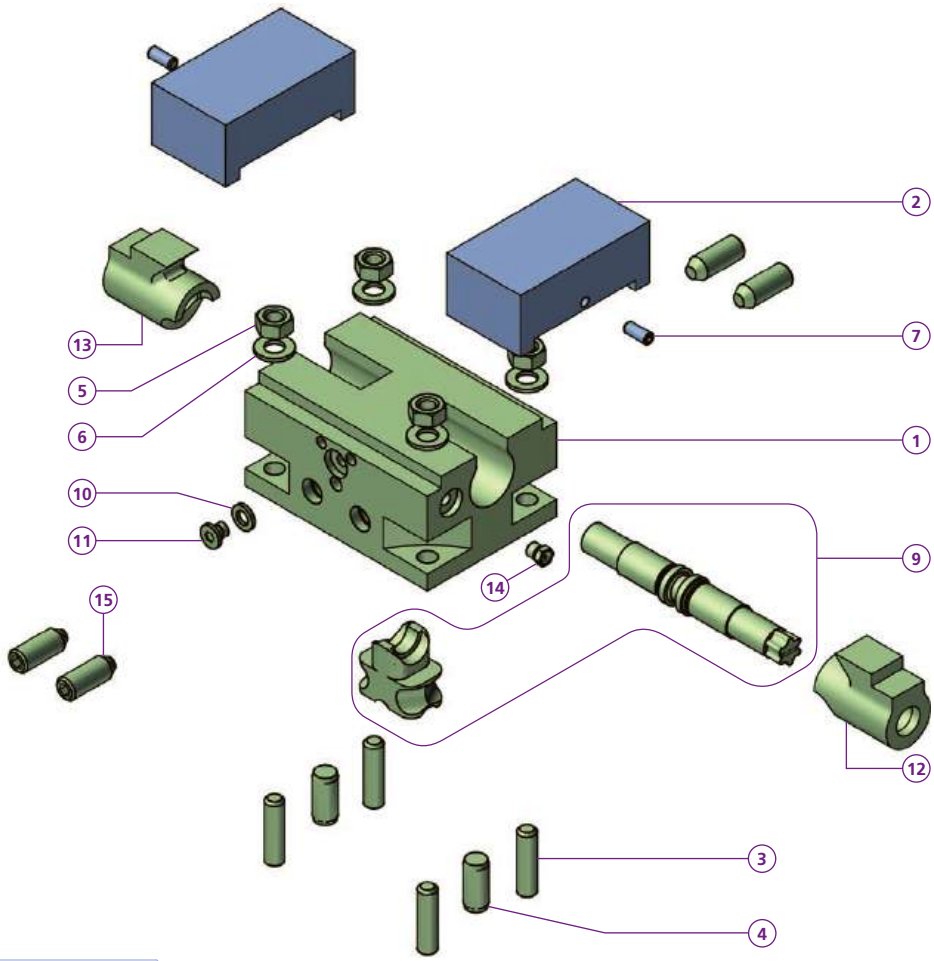




PCZS2439-ID-SET

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

NUSS3/8"TX30E14

WICHTIG!
Bitte separat bestellen

IMPORTANT!
Please order separately



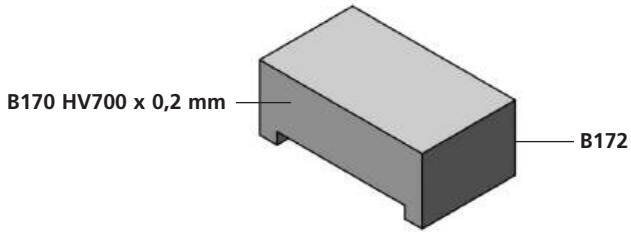
Bestellbeispiel / *Ordering example*:
3 x MCZ100L50 **&** 6 x B170 **&** 1 x NUSS3/8"TX30E14

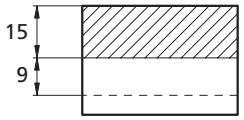
Separat bestellen / *Order separately*

B170, B172 Spannbereich / *Clamping width* ◄ 0 – 20 mm ►

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

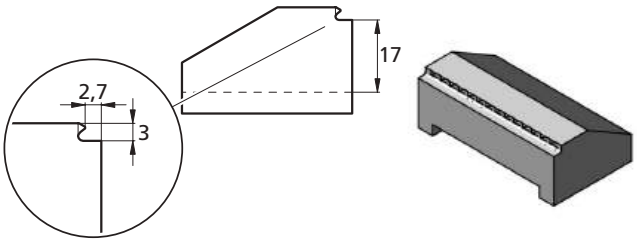
If a dedicated jaw is being machined:
Sectional drawing to determine the maximum machining depth



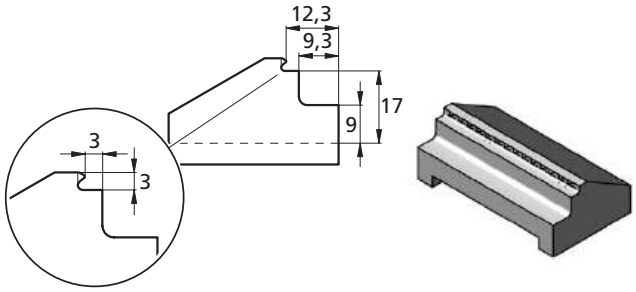


für / *for* B170, B172

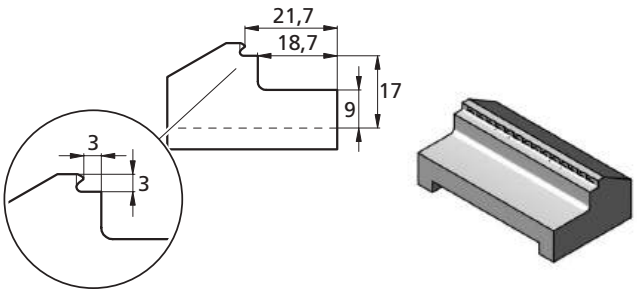
B175-26 Spannbereich / *Clamping width* ◄ 6 – 26 mm ►



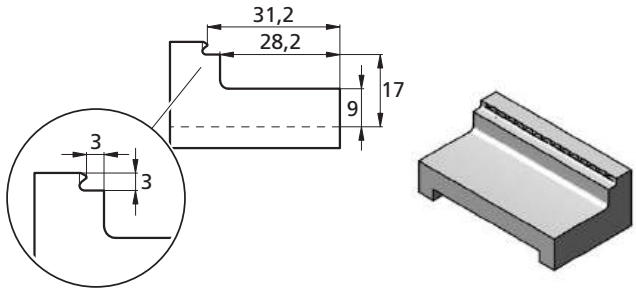
B175-45 Spannbereich / *Clamping width* ◄ 25 – 45 mm ►



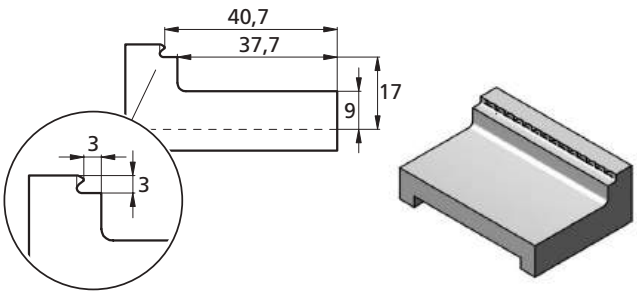
B175-64 Spannbereich / *Clamping width* ◄ 44 – 64 mm ►



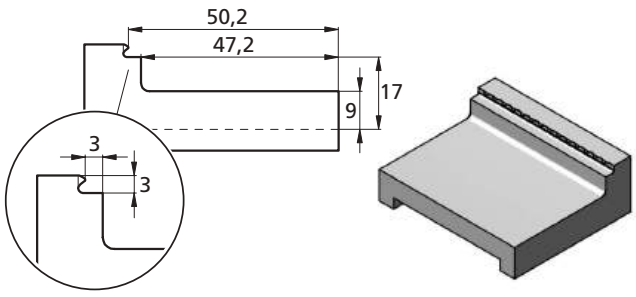
B175-83 Spannbereich / *Clamping width* ◄ 63 – 83 mm ►

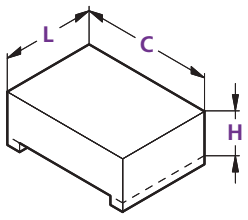


B175-102 Spannbereich / *Clamping width* ◄ 82 – 102 mm ►



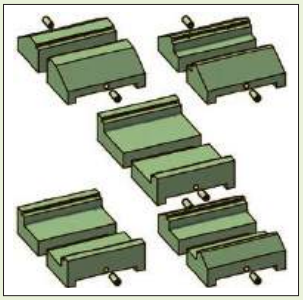
B175-121 Spannbereich / *Clamping width* ◄ 101 – 121 mm ►





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

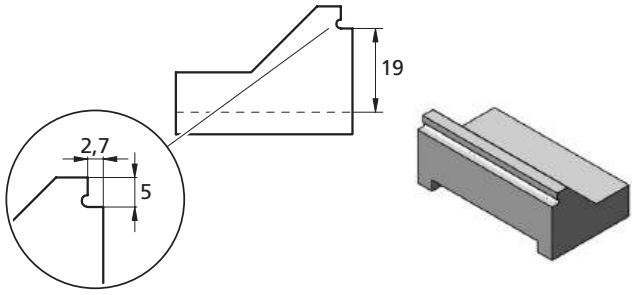
	B170	B172	B175-26	B175-45	B175-64	B175-83	B175-102	B175-121	B175SET
C	70	70	70	70	70	70	70	70	2x **B175-26**
H	24	24	20	20	20	20	20	20	2x **B175-45**
L	40	40	40	40	40	40	50	60	2x **B175-64**
i	HV700 x0,2mm	*	57HRC	57HRC	57HRC	57HRC	57HRC	57HRC	2x **B175-83**
									2x **B175-102**
kg	~0,5	~0,5	~0,34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



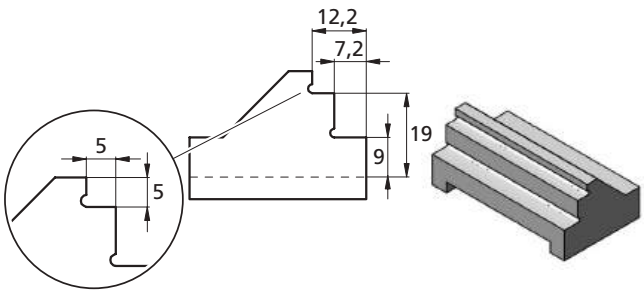
* = weich / *soft* (1.7225 Vergütungsstahl / *Tempering steel*)

Separat bestellen / *Order separately*

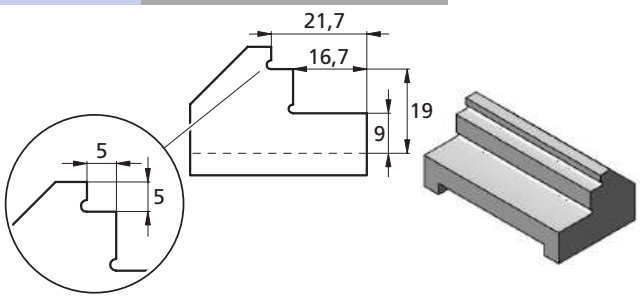
B173-26 Spannbereich / *Clamping width* ◄ 6 – 26 mm ►



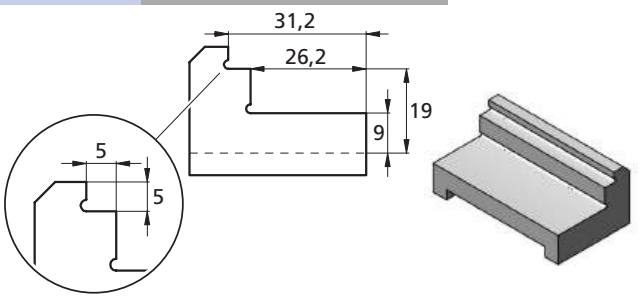
B173-45 Spannbereich / *Clamping width* ◄ 25 – 45 mm ►



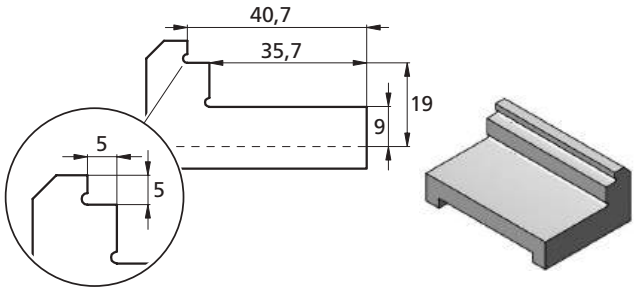
B173-64 Spannbereich / *Clamping width* ◄ 44 – 64 mm ►



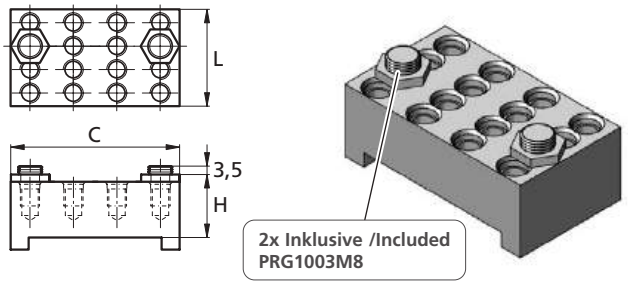
B173-83 Spannbereich / *Clamping width* ◄ 63 – 83 mm ►



B173-102 Spannbereich / *Clamping width* ◄ 82 – 102 mm ►



B176-80 Spannbereich / *Clamping width* ◄ 8 – 80 mm ►



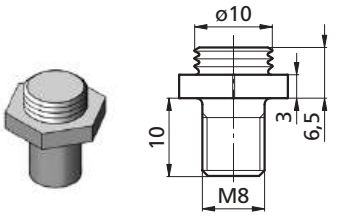
ZK160798M5

Extra Zubehör:
Schraube zum schnellen Wechseln der Backen

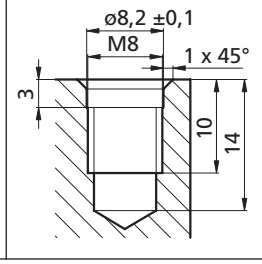
Additional accessories:
Screw for quick change of jaws

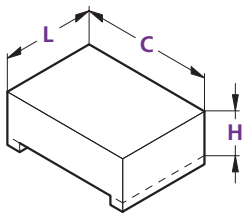


PRG1003M8



Bohrbild
Hole pattern





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

B

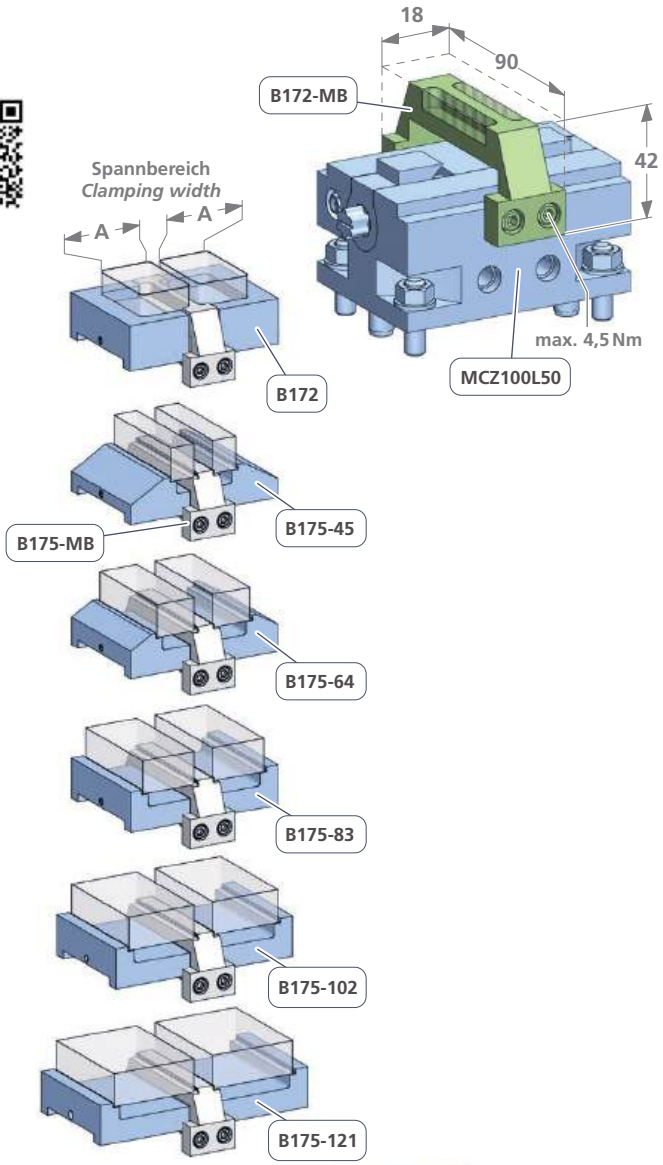
	B173-26	B173-45	B173-64	B173-83	B173-102	B176-80	B173SET
C	70	70	70	70	70	70	2x **B173-26**
H	24	24	24	24	24	20	2x **B173-45**
L	40	40	40	40	50	40	2x **B173-64**
i	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	2x **B173-83** 2x **B173-102**
kg	~0,31	~0,32	~0,32	~0,28	~0,34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



Separat bestellen / *Order separately*

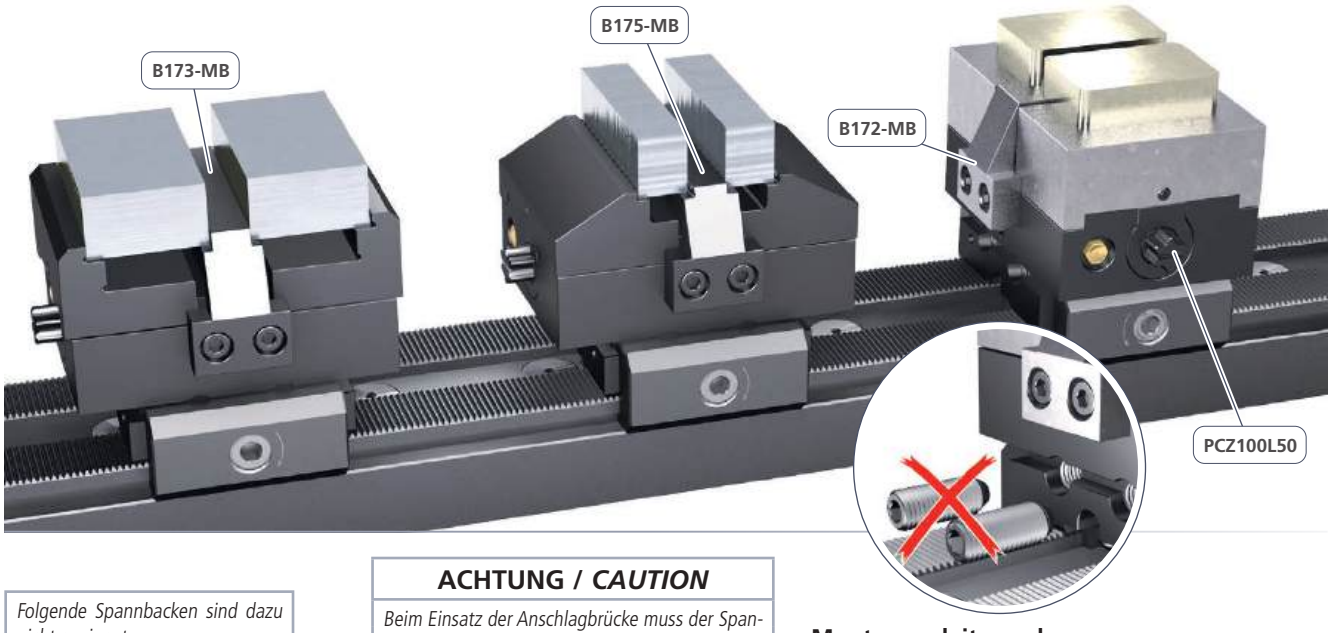
Doppelte Spannung – doppelt effizient
Twice the clamping – twice the efficiency

Art. Nr.	kg	Backen *Jaws*	A = 2 x
B172-MB	~0,3	B172	variabel
weicher Stahl *soft steel* (1.7225)			
B173-MB	~0,3	B173-45	10 – 17 mm
HV700 x 0,2mm		B173-64	17 – 27 mm
		B173-83	27 – 37 mm
		B173-102	36 – 46 mm
		B175-121	46 – 55 mm
B175-MB	~0,3	B175-45	8 – 16 mm
57HRC		B175-64	16 – 26 mm
		B175-83	25 – 35 mm
		B175-102	35 – 45 mm
		B175-121	45 – 54 mm



*Die Anschlagbrücken **B172-MB**, **B173-MB** und **B175-MB** können in Kombination mit den Zentrischspannern PCZ100L50 / MCZ100L50 als Doppelspanner eingesetzt werden.*

*The **B172-MB**, **B173-MB**, and **B175-MB** stop bridges can be used as double clamps in combination with the PCZ100L50 / MCZ100L50 self centering vise.*



Folgende Spannbacken sind dazu nicht geeignet.

The following clamping jaws are not suitable for this purpose.

B170, B173-26, B175-26, B176-80

ACHTUNG / *CAUTION*

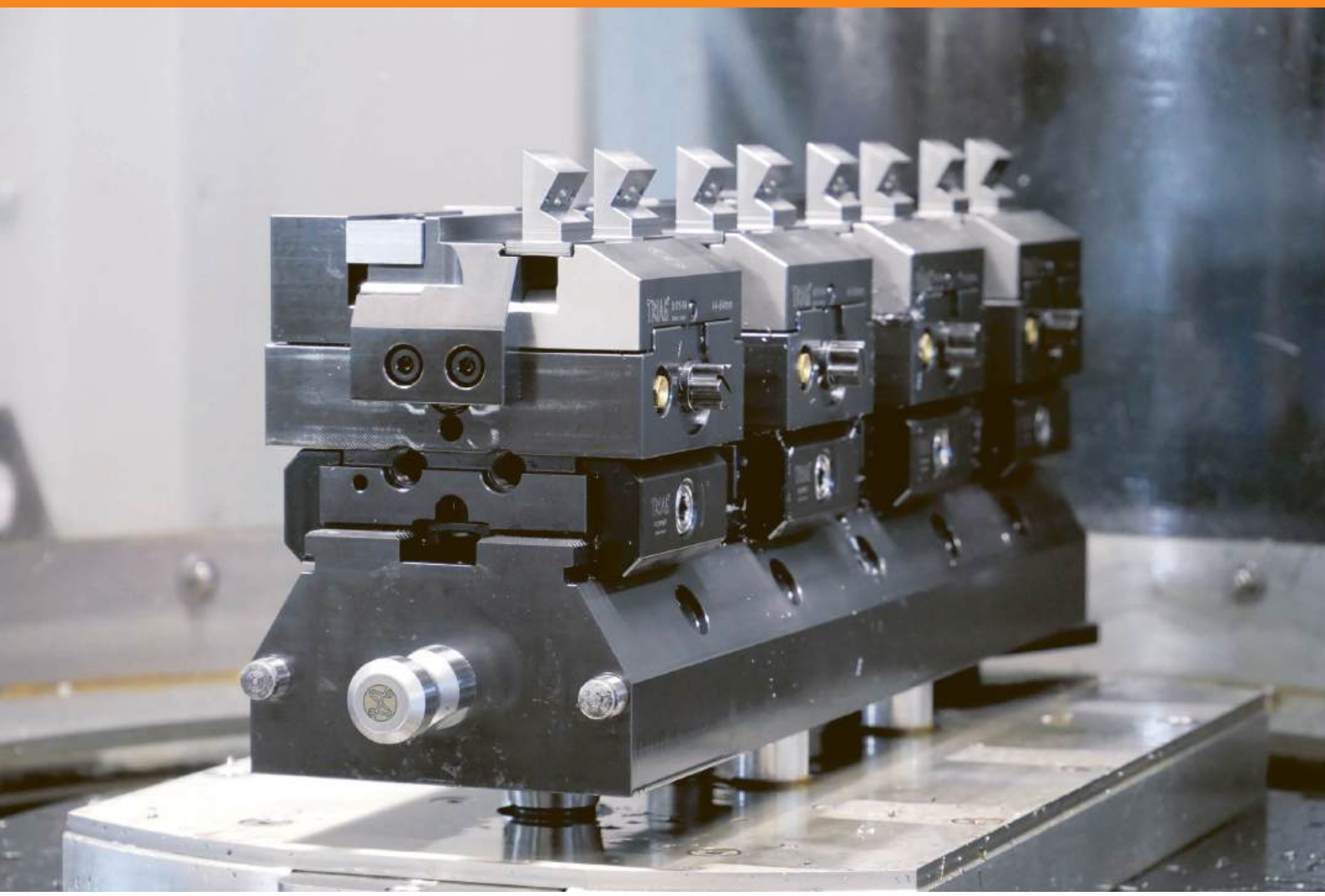
Beim Einsatz der Anschlagbrücke muss der Spanner schwimmend eingestellt werden, dabei werden die vier Zentrierschrauben entfernt.

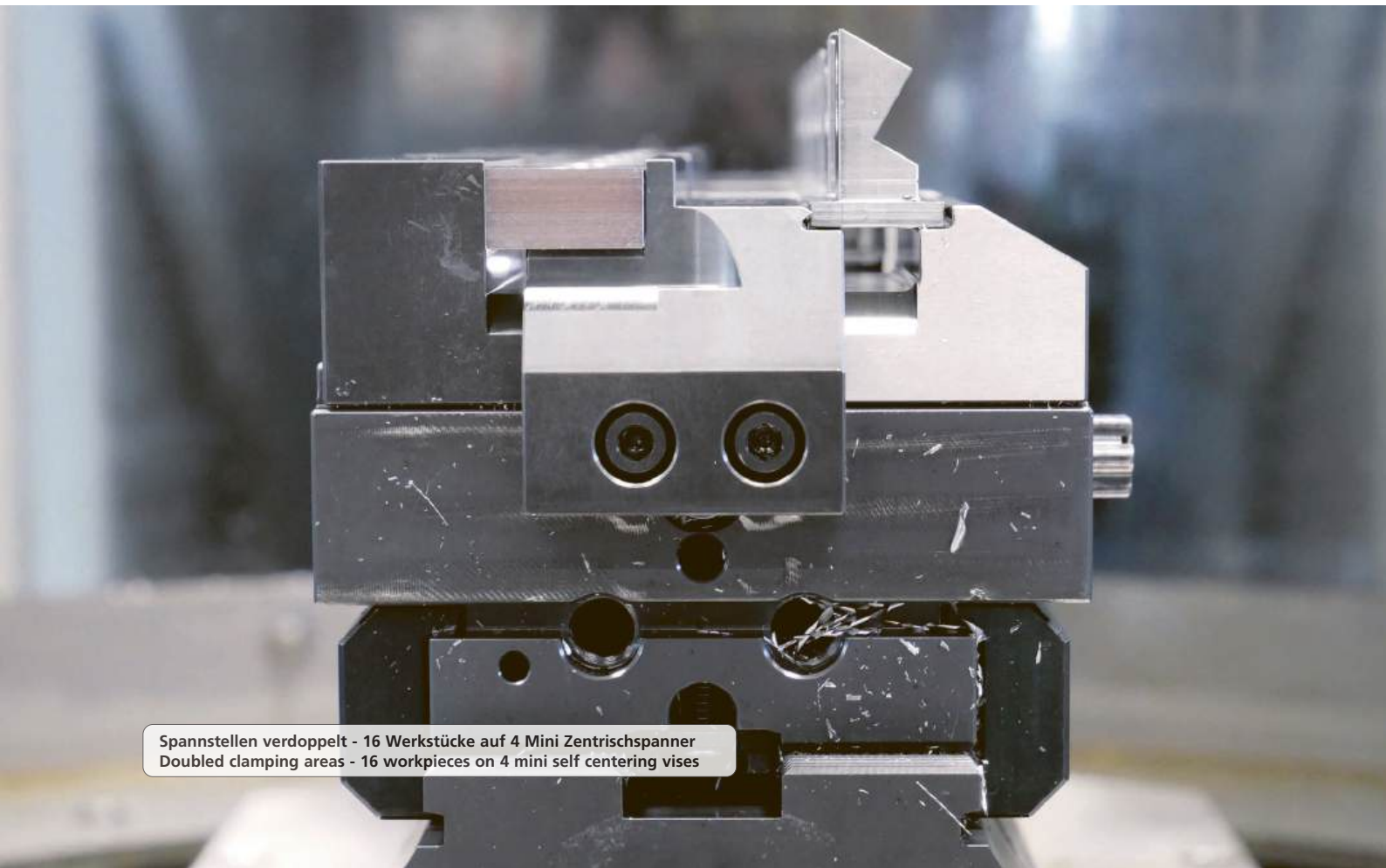
When using the stop bridge, the tensioner must be adjusted to float, removing the four centring screws in the process.

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

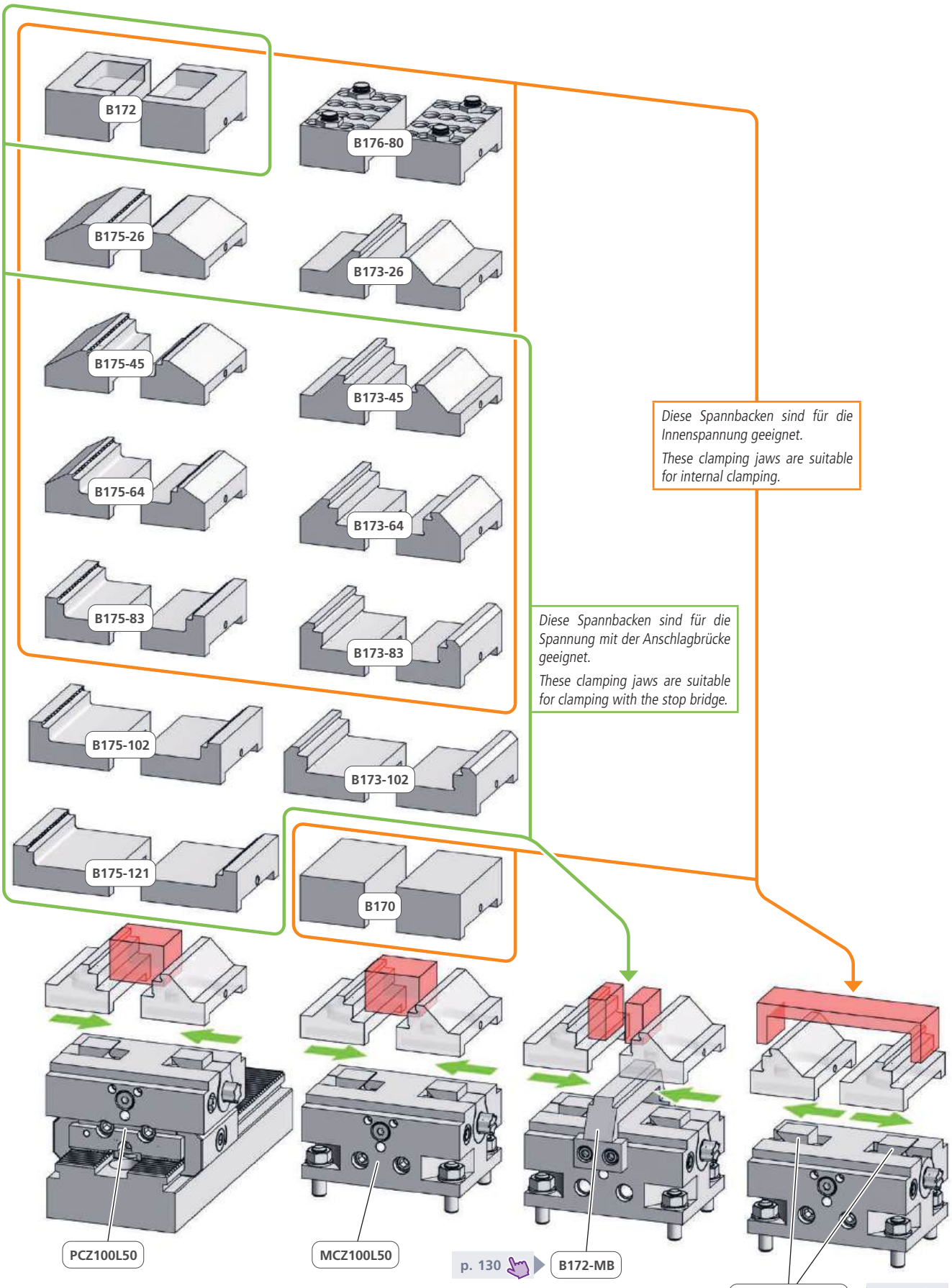
MINI

Zentrischspanner mit Anschlagbrücke
Self centering vise with center stop





Spannstellen verdoppelt - 16 Werkstücke auf 4 Mini Zentrischspanner
Doubled clamping areas - 16 workpieces on 4 mini self centering vises



Diese Spannbacken sind für die Innenspannung geeignet.
These clamping jaws are suitable for internal clamping.

Diese Spannbacken sind für die Spannung mit der Anschlagbrücke geeignet.
These clamping jaws are suitable for clamping with the stop bridge.

14 verschiedene Backenvarianten passend zu dieser Schnellwechselschnittstelle.
*More than **14** different jaw modules to match this rapidly changing interface.*

SPACEGRIP II

spaceGRIP II

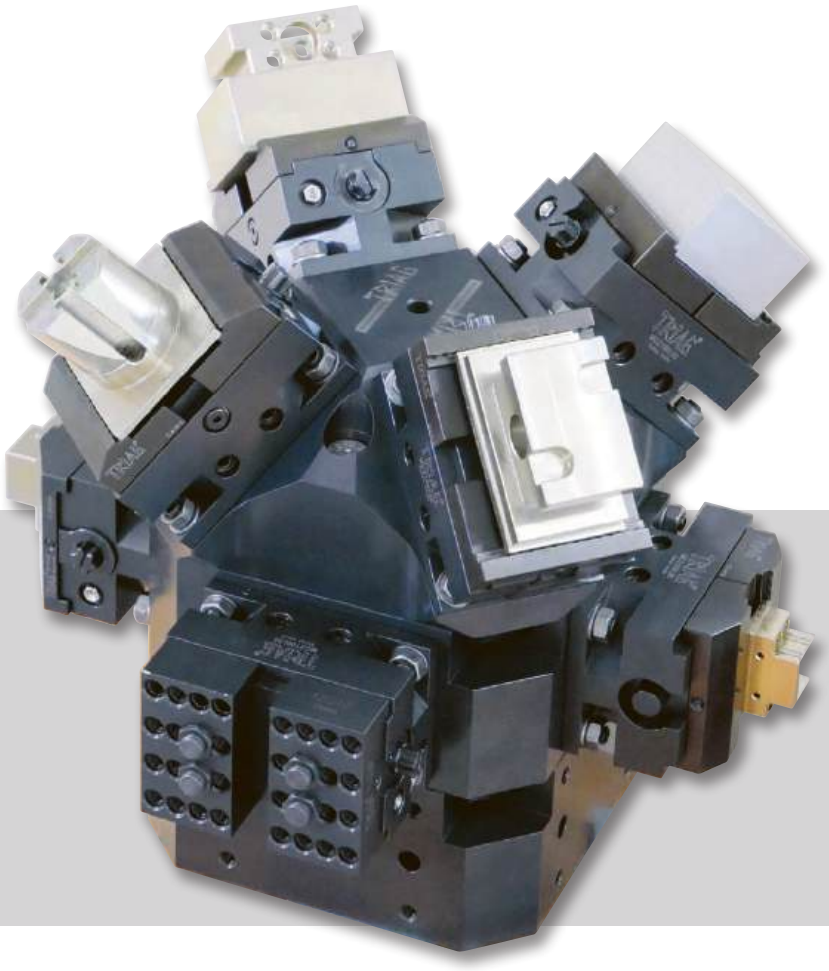
Ein einzigartig auf Modulbauweise ausgelegtes Spannkonzept für den Einsatz der Zentrischspanner **MCZ100L50**.

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.

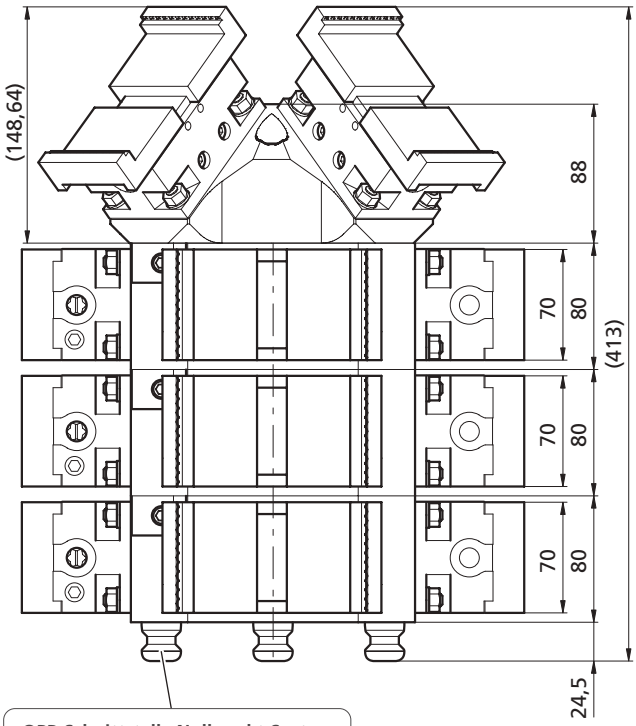
spaceGRIP II

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

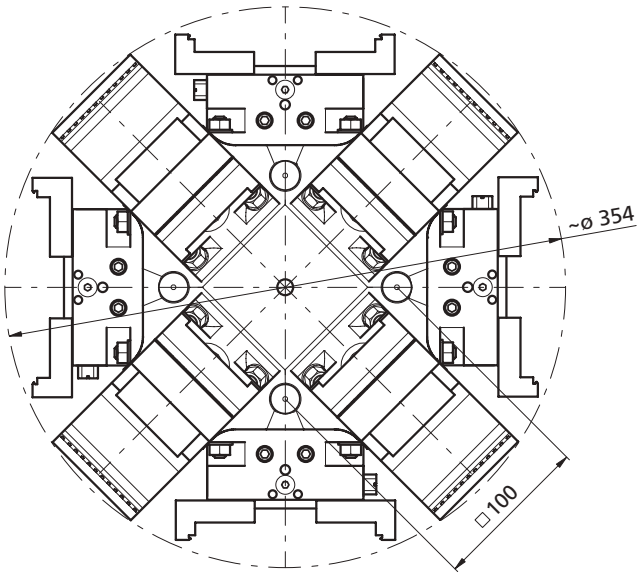
Four, eight or even twelve clamping vices can be used as needed. The whole system is modular like a «Lego» building kit. Again, stamping jaws, soft jaws and universal as well as stepped jaws are available. Even the centre of the individual vices can be adjusted.

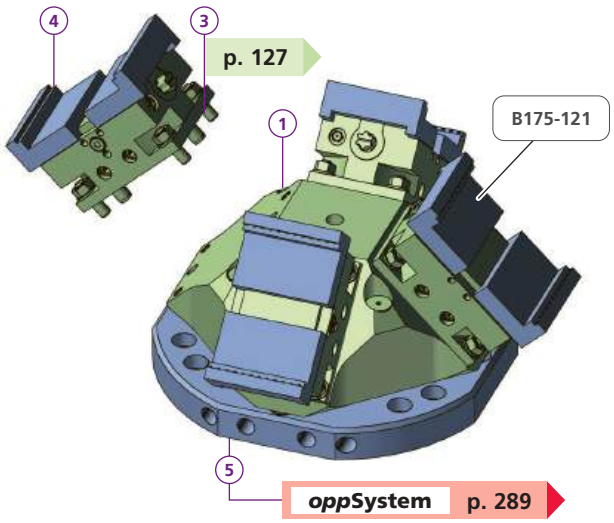


SPACEGRIP II



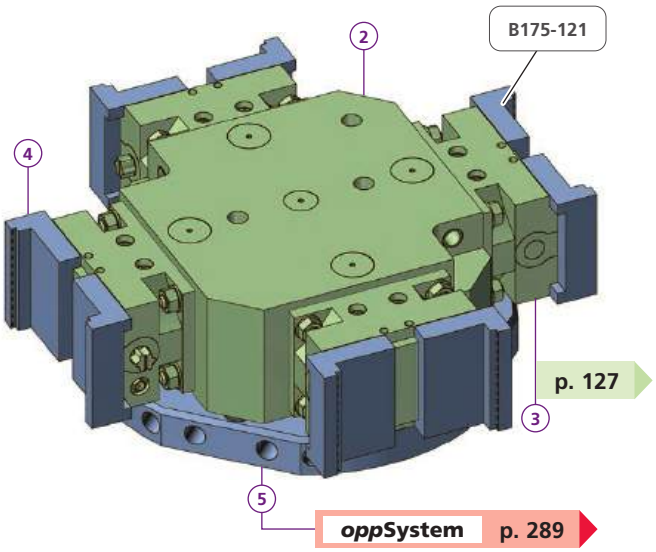
OPP-Schnittstelle Nullpunkt-System
OPP interface Zero-point system





5AXMCZ100-45-4		
1	1x TS160110	
3	4x **MCZ100L50**	
4	8x	p. 128 - 129
5	1x TB160379	
kg	~26	

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface



5AXMCZ100-90-4		
2	1x TS160111	
3	4x **MCZ100L50**	
4	8x	p. 128 - 129
5	1x TB160379	
kg	~28,7	

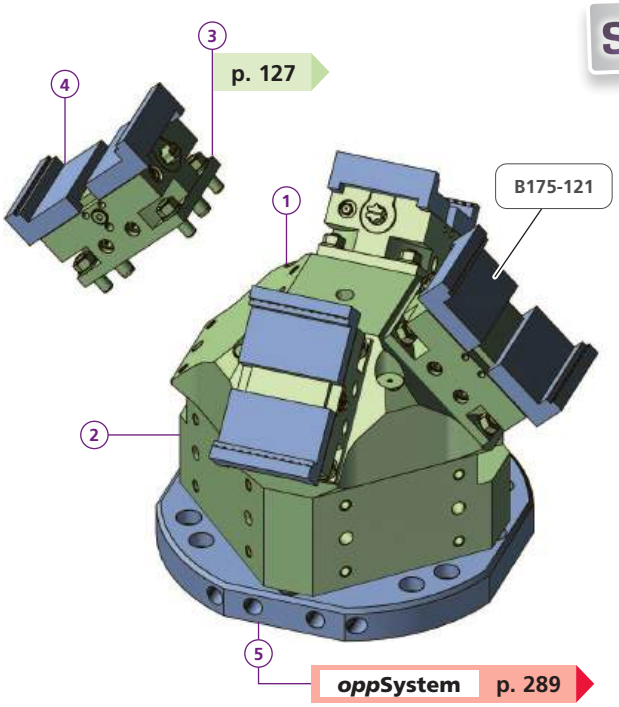
Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

Bestellbeispiel / ***Ordering example*** : 1 x 5AXMCZ100-90-4 **&** 8 x B175-121

Separat bestellen / *Order separately*

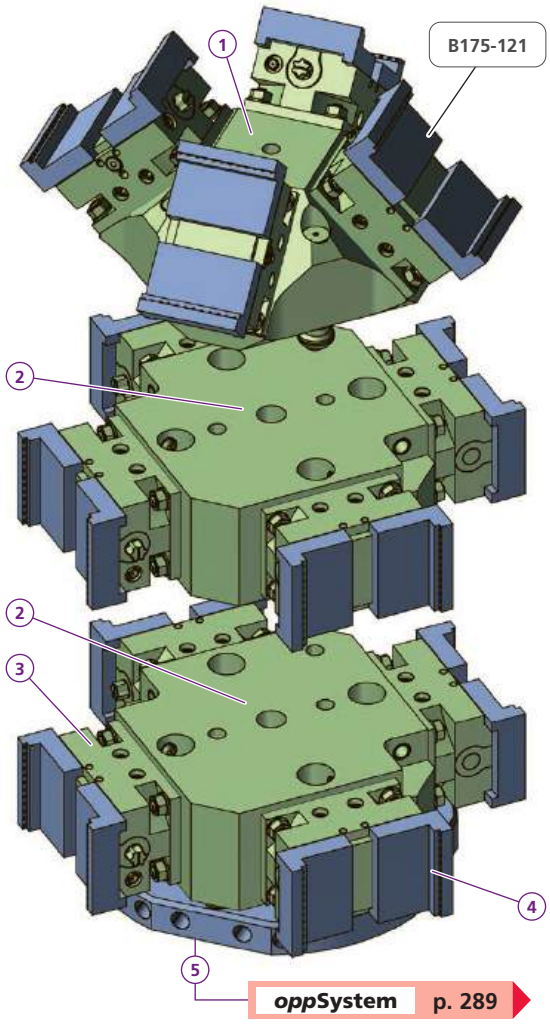
45°/90°/90°

SPACEGRIP II



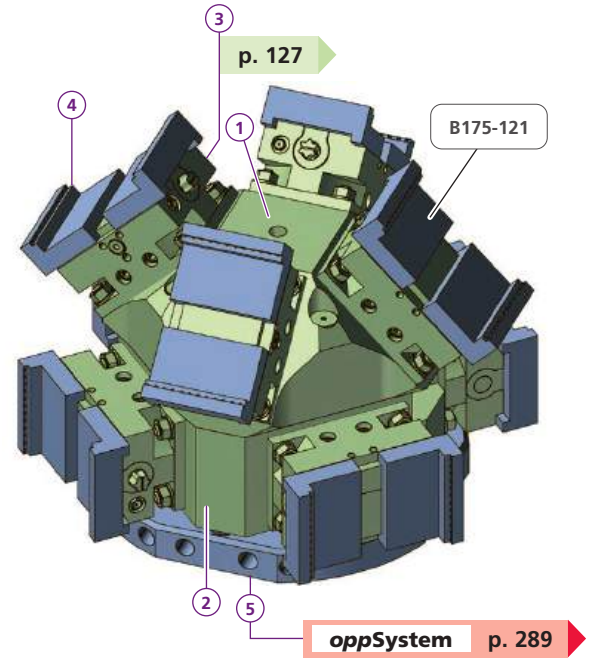
5AXMCZ100-45-4H		
1	1x	TS160110
2	1x	TS160111
3	4x	**MCZ100L50**
4	8x	p. 128 - 129
5	1x	TB160379
kg		~41,2

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface



5AXMCZ100-45-12		
1	2x	TS160110
2	1x	TS160111
3	12x	**MCZ100L50**
4	24x	p. 128 - 129
5	1x	TB160379
kg		~83,3

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface



5AXMCZ100-45-8		
1	1x	TS160110
2	1x	TS160111
3	8x	**MCZ100L50**
4	16x	p. 128 - 129
5	1x	TB160379
kg		~54,6

Detailzeichnung zu dieser Schnittstelle
Detail drawing to interface

Bestellbeispiel / ***Ordering example***: 1 x 5AXMCZ100-45-8 & 16 x B175-121

Separat bestellen / *Order separately*

SPACEGRIP II-3

Art. Nr.	kg
5AXMCZ100-45-3	~18
5AXMCZ100-45-3H	~35
5AXMCZ100-45-6	~43

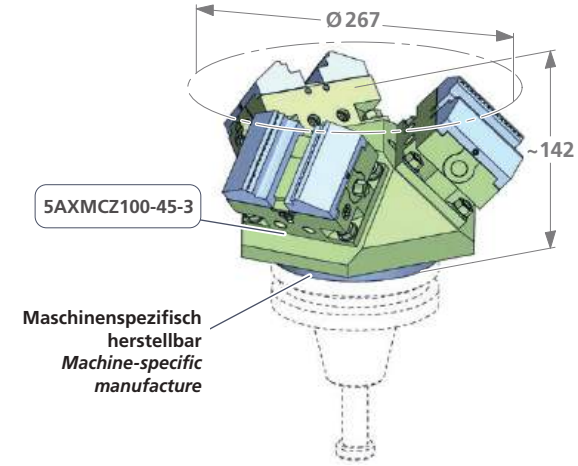
Bei dieser Pyramidenlösung ist die Zugänglichkeit der Spindel beim Bearbeiten von Werkstücken sehr gut.

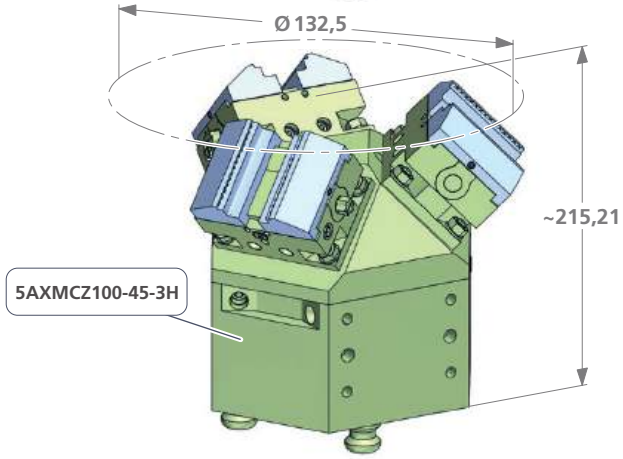
With this pyramid solution, the accessibility of the spindle is very good when machining workpieces.

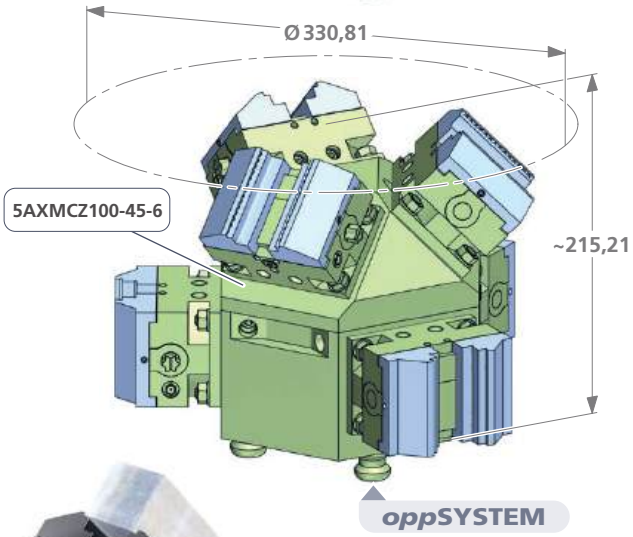












oppSYSTEM

Durchgehend modular!

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

Throughout modular!

Clever self centering vises which adapts to the machine, the workpiece and the requirements.

X

Spannkrafterhaltung und Nachfederung

Spring loaded mechanism to maintain clamping force

M

Mehr als **64** verschiedene Backenvarianten passend zu dieser Schnellwechselschnittstelle.

*More than **64** different jaw modules to match this rapidly changing interface.*

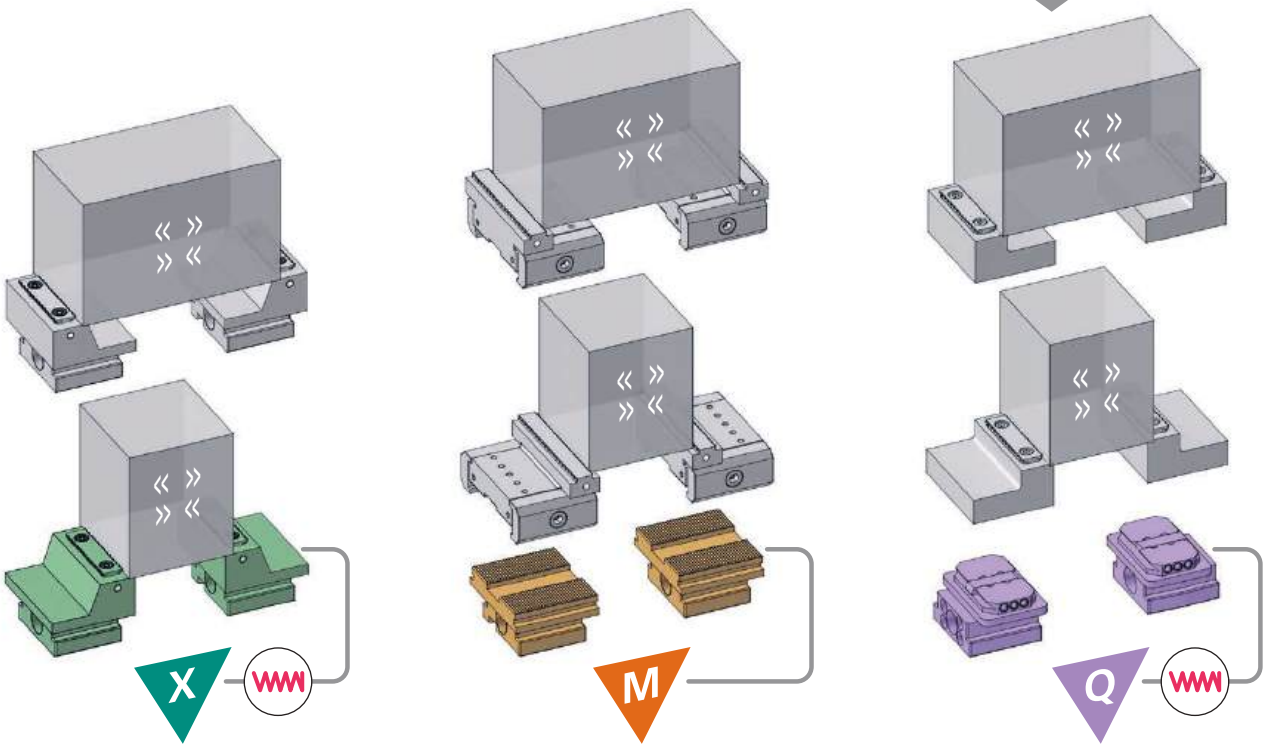
Q

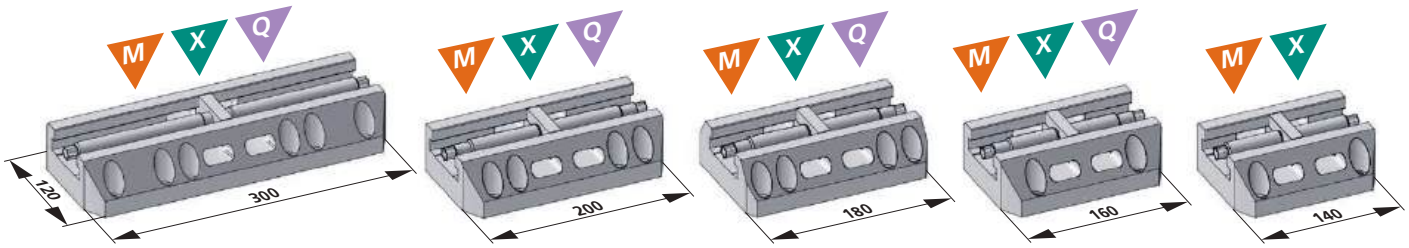
Schnellwechselbacken

Spannkrafterhaltung und Nachfederung

Quick-change jaws

Spring loaded mechanism to maintain clamping force





Art. Nr.	kg
ZS X 300L50UPRG	~10,65
ZS X 200L50UPRG	~8,8
ZS X 180L50UPRG	~8,1
ZS X 160L50UPRG	~7,7
ZS X 140L50UPRG	~7,1

Art. Nr.	kg
ZS M 300L50UPRG	~10,5
ZS M 200L50UPRG	~7,4
ZS M 180L50UPRG	~6,9
ZS M 160L50UPRG	~6,4
ZS M 140L50UPRG	~5,7

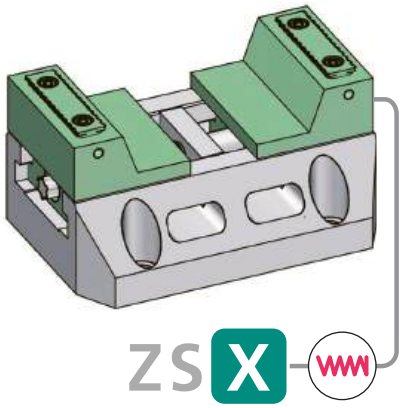
Art. Nr.	kg
ZS Q 300L50UPRG	~11,1
ZS Q 200L50UPRG	~8,1
ZS Q 200L50UPRG	~8,1
ZS Q 180L50UPRG	~7,5
ZS Q 160L50UPRG	~7,0

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*

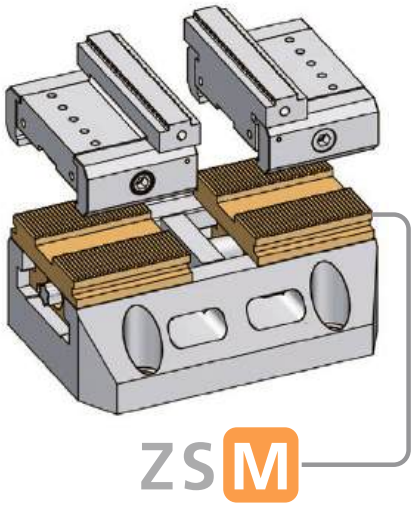


Zentrischspanner für den Einsatz mit Power Clamp Modulen

- ✔ 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*

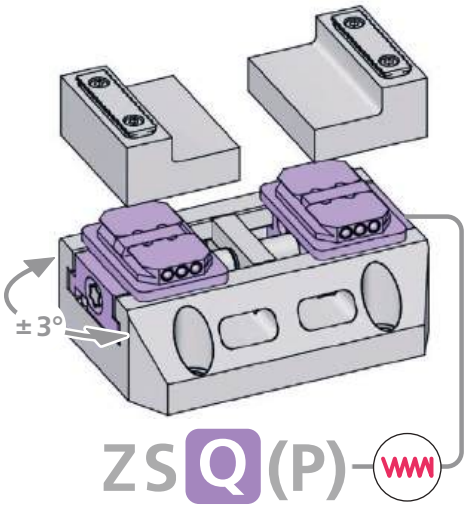


Zentrischspanner für den Einsatz von Schnellwechselbacken

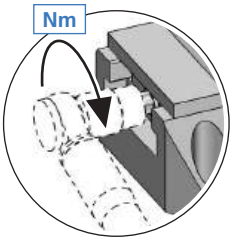
- ✔ Schnellwechselbacken (werden per Hand auf dem Spanner eingeklinkt)
- ✔ Weiche Backen zum selbst bearbeiten
- ✔ Direktprägebacken für OP10
- ✔ Einzigartiges integriertes Federpaket
- ✔ Für Rohteile können pendelde Schlitten (P) eingesetzt werden

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

- ✔ *Quick-change jaws (clicked on the vise by hand)*
- ✔ *Soft jaws for individual machining*
- ✔ *Direct stamping jaws for OP10*
- ✔ *Unique integrated spring package*
- ✔ *Pendulum slides (P) can be used for unmachined parts*



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	



Anwendungsbilder Zentrischspanner
Pictures of application to self centering vise

triCENTRO



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 aufrechtgehalten. 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.

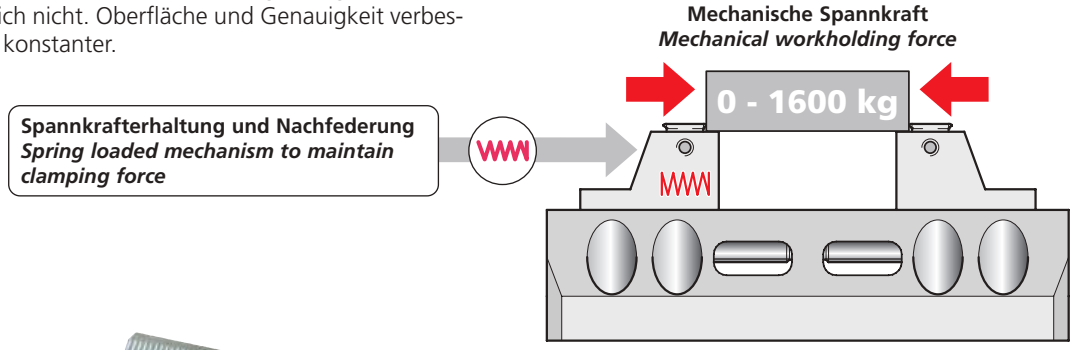
Das heisst, man hat durchwegs die gleichen Bedingungen und das Werkstück hat während der Bearbeitung weniger Vibrationen und bewegt sich nicht. Oberfläche und Genauigkeit verbessern sich und sind konstanter.

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.

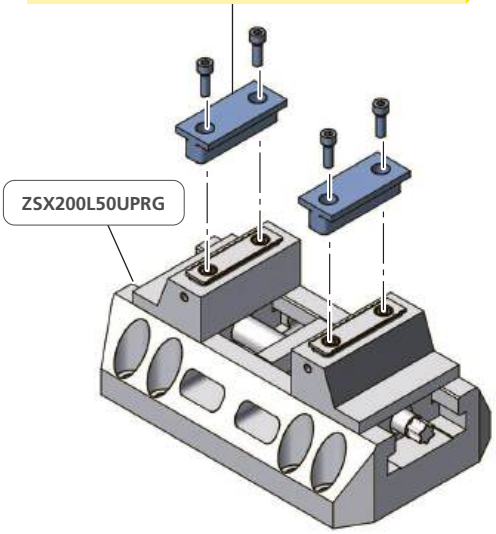
The problem in the past was that the other systems in the market were getting loose during heavy machining and accuracy was difficult to achieve.

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.





MANF58-14W25 *micro*CLAMP p. 176



Drehmoment *Torque*		Spannkraft *Workholding force*			Gut zu Wissen *Good to know*
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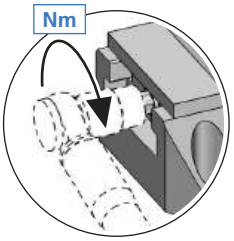
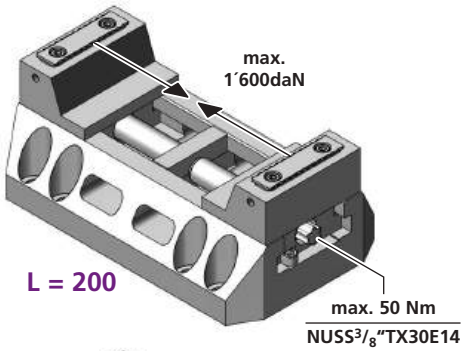
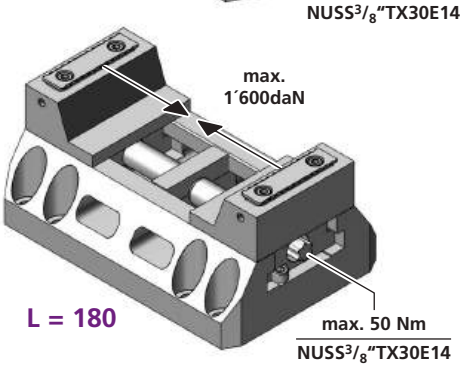
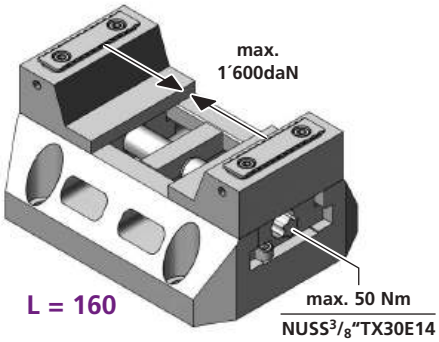
30	22,2	= 1´000	2´204	1,0	
40	29,6	= 1´300	2´866	1,3	
50	37,0	= 1´600	3´527	1,6	
60	44,4	= 1´800	3´968	1,8	**Für kurzfristige Anwendung** *For short-term application*
70	51,8	= 2´100	4´629	2,1	

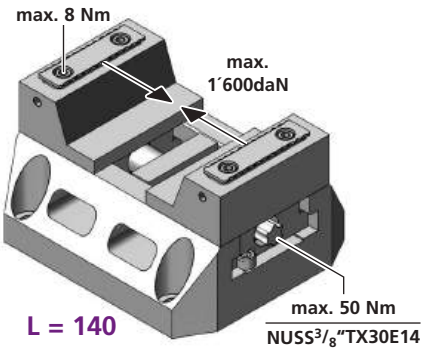


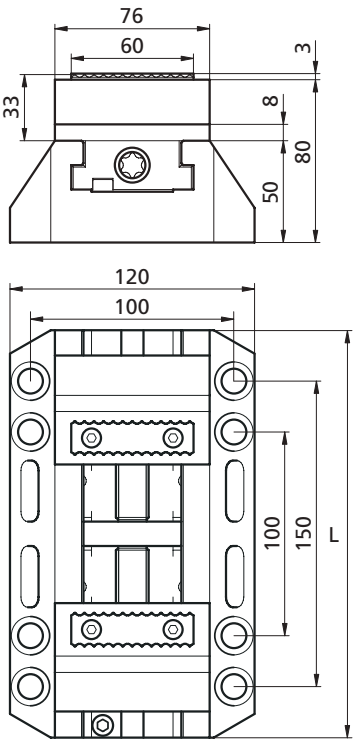
Separat bestellen / *Order separately*

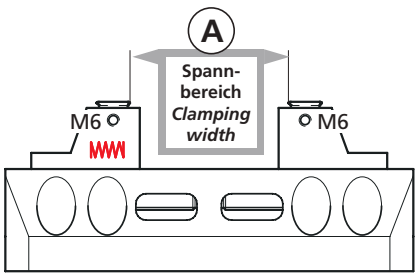


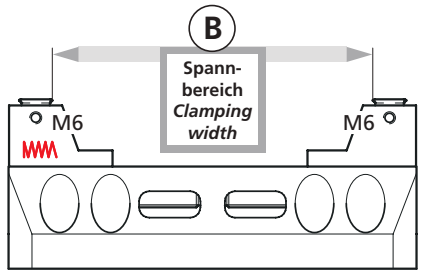


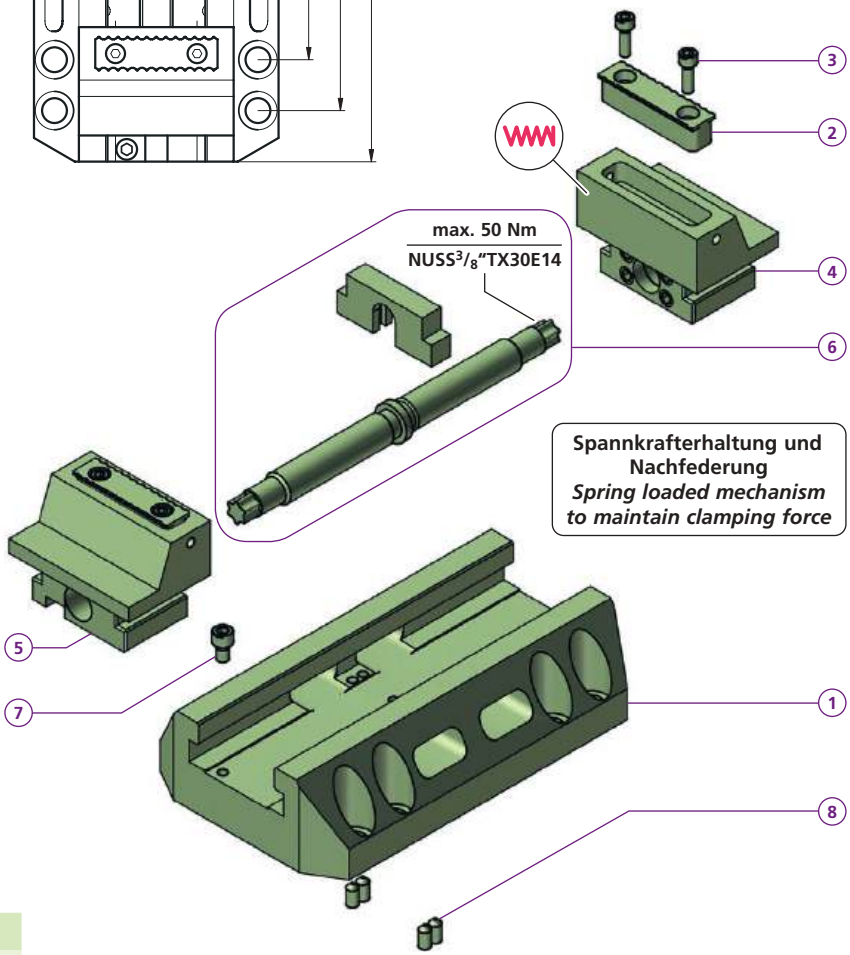












Spannkrafterhaltung und Nachfederung
Spring loaded mechanism to maintain clamping force

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

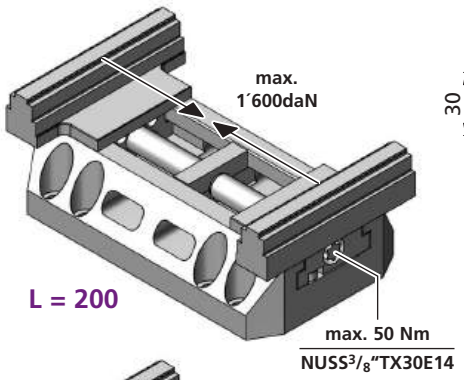
NUSS3/8"TX30E14

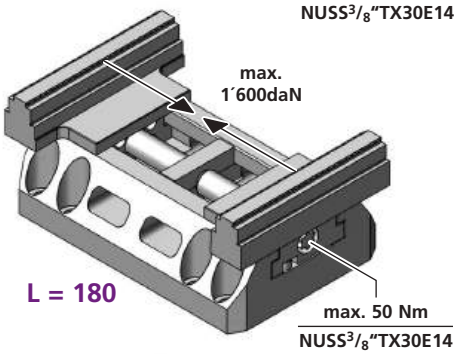
WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

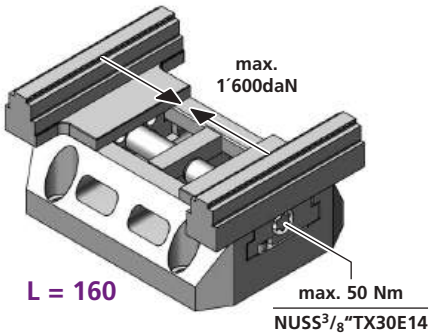


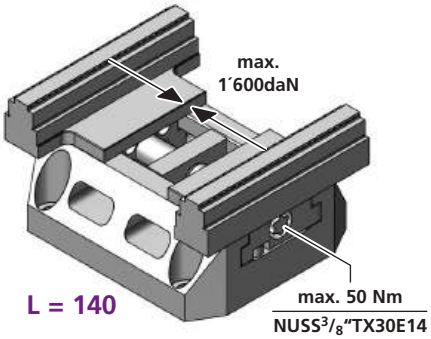
Bestellbeispiel / *Ordering example*:
3 x ZSX200L50UPRG **&** 1 x NUSS3/8"TX30E14

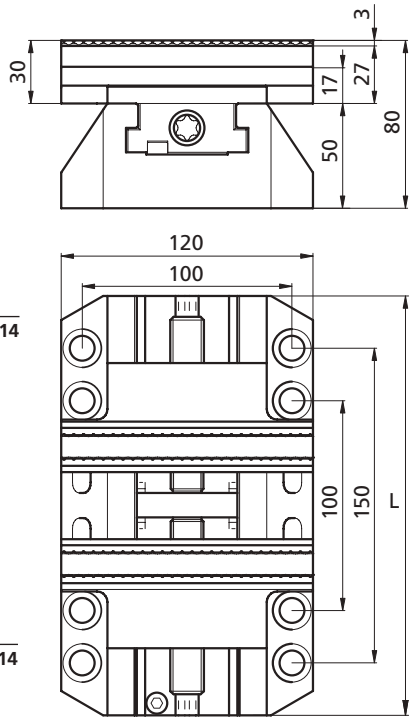
Separat bestellen / *Order separately*

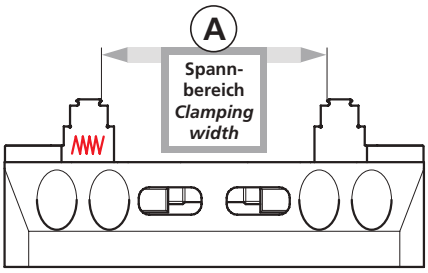


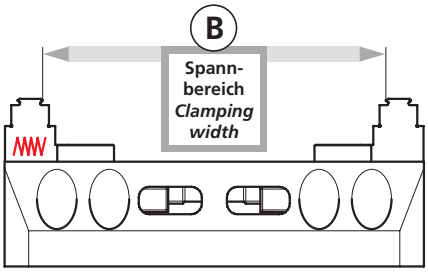


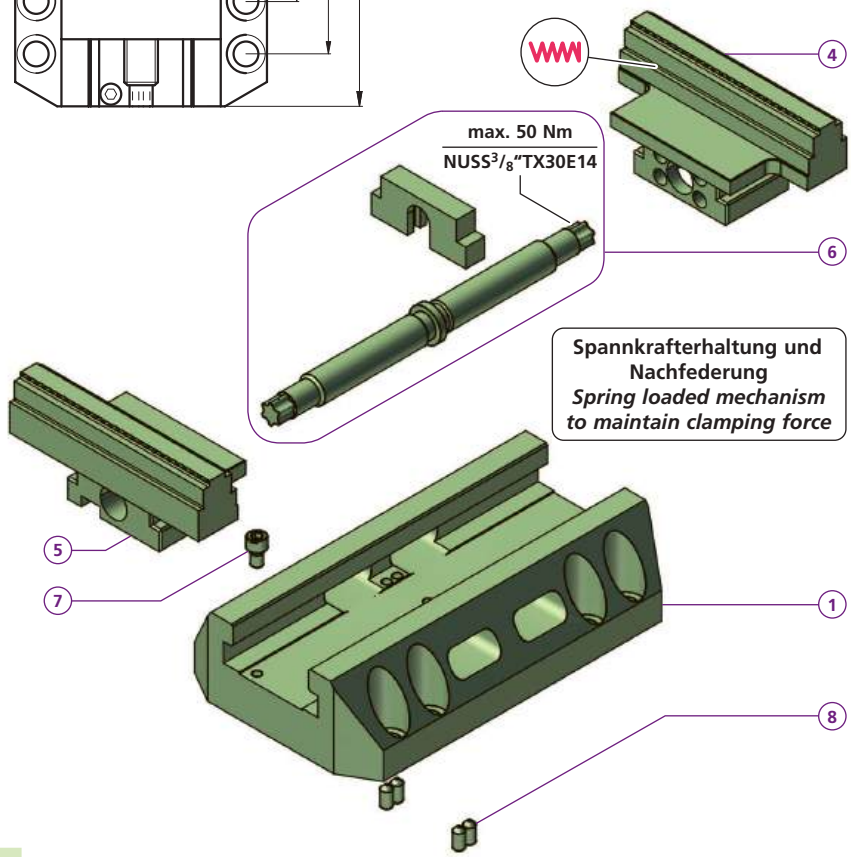












ZSX200L50PRG120		
1	1x	TK150025
4	1x	**ZB170050**
5	1x	**TB170051**
6	1x	**PCS16TR200SET**
7	1x	**M6X10ISO4762**
8	4x	M6X16DIN914
L	=	200
A		**14 – 130 mm**
B		**70 – 186 mm**
kg		~7,7

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

NUSS3/8“TX30E14

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



Bestellbeispiel / *Ordering example*:
3 x ZSX200L50PRG120 **&** 1 x NUSS3/8“TX30E14

Separat bestellen / *Order separately*

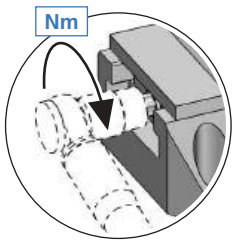
Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 200	440	0,2
20	14,8	= 500	1´102	0,5
30	22,2	= 1´000	2´204	1,0
40	29,6	= 1´300	2´866	1,3
50	37,0	= 1´600	3´527	1,6
60	44,4	= 1´800	3´968	1,8
70	51,8	= 2´100	4´629	2,1

Gut zu Wissen
Good to know

Diese Spannkräfte werden für den Dauerbetrieb empfohlen!

These clamping forces are recommended for continuous operation!

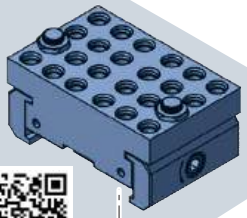
Für kurzfristige Anwendung
For short-term application



NEWS

PowerCLAMP

Anschlagmodul
mit Prägeeinsätzen
End modul
with embossed inserts



M

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

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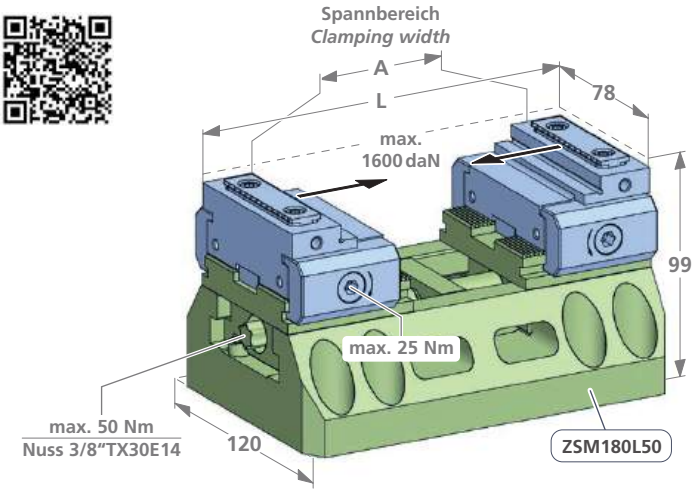
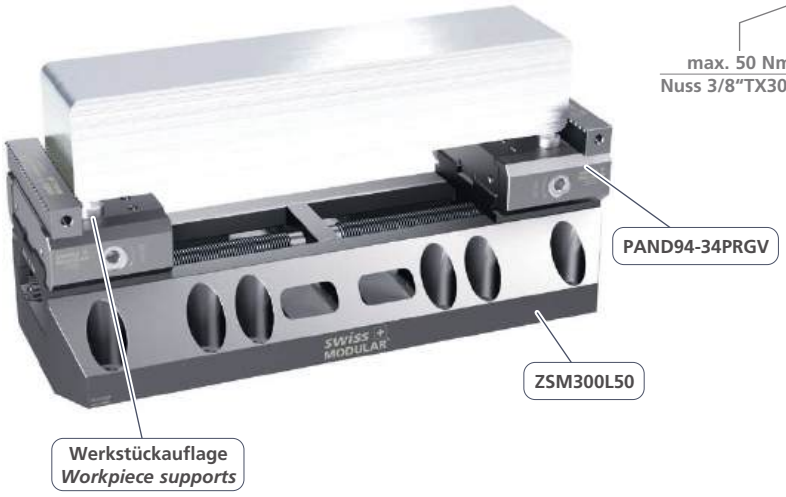
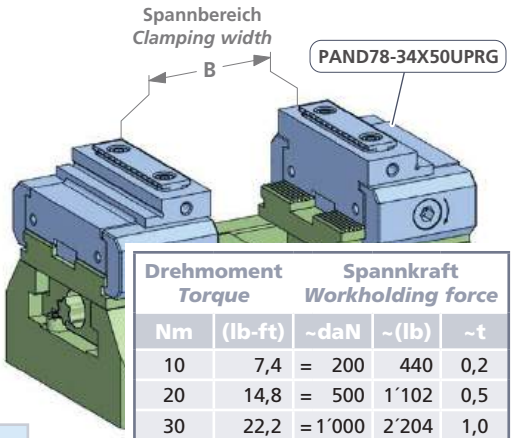
Bestellbeispiel / *Ordering example*: 1 x ZSM200L50 & 2 x PAND94-49PRG-A1

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







Drehmoment *Torque*		Spannkraft *Workholding force*		
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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"TX30E14

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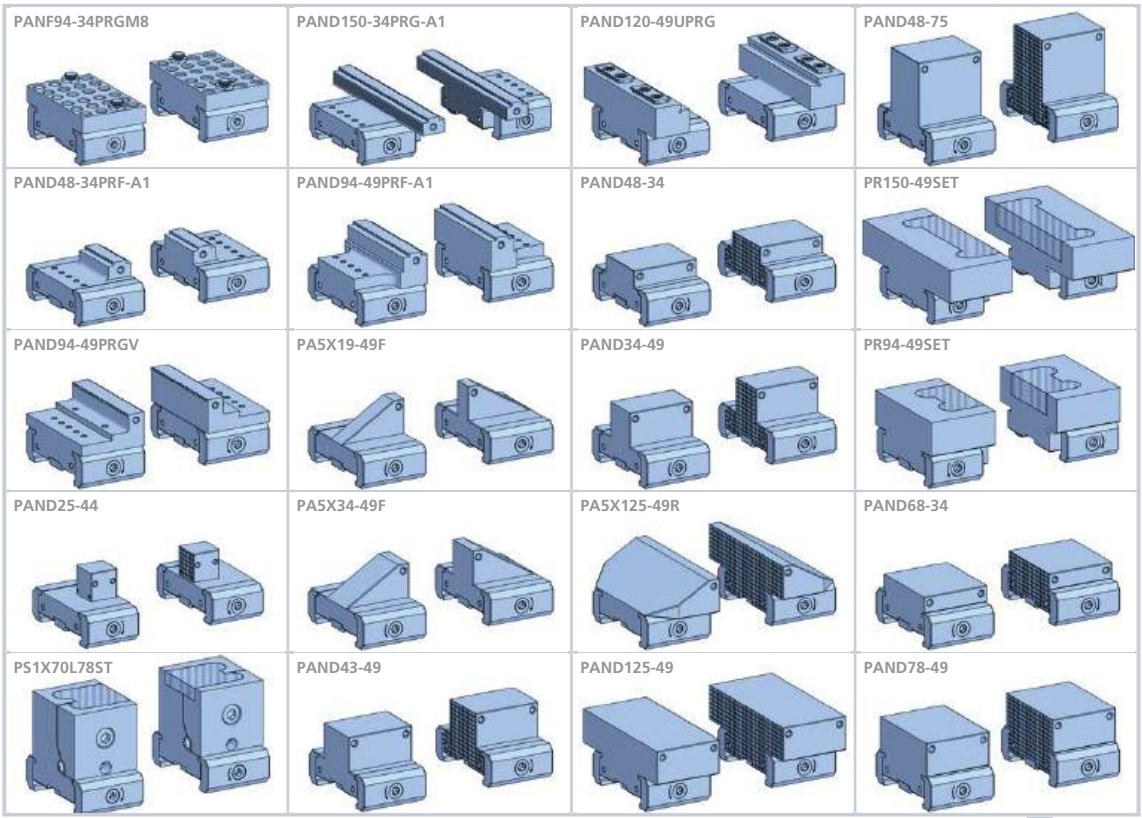
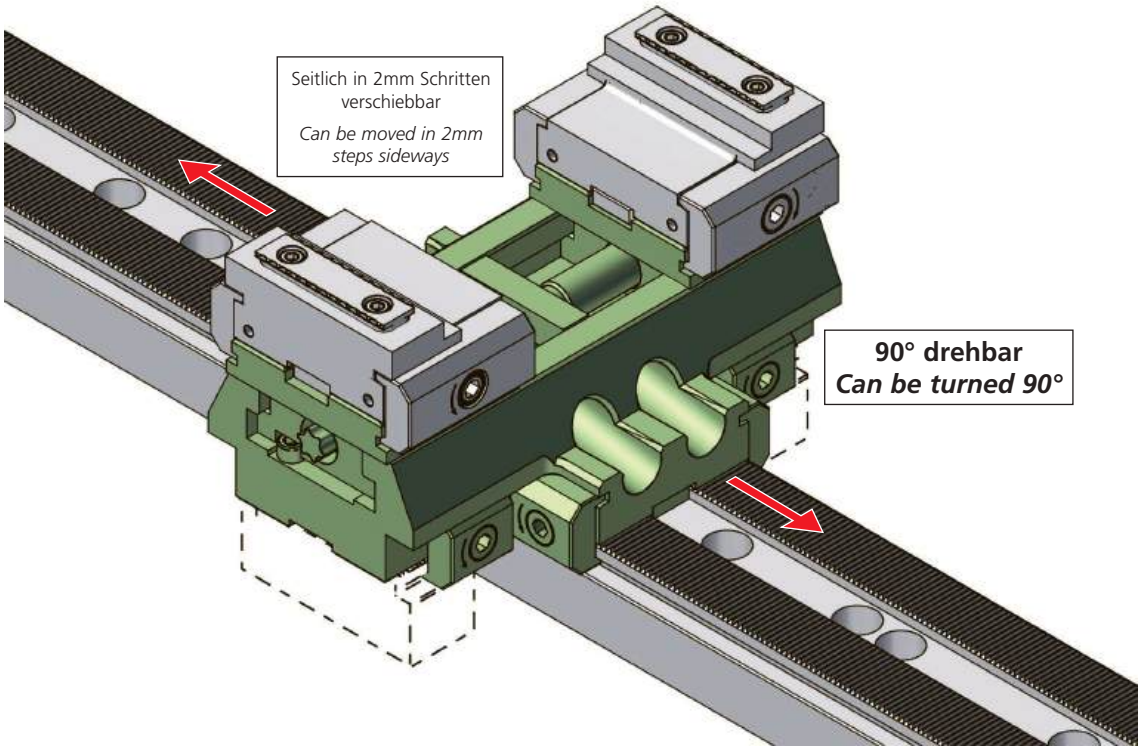
Please order separately

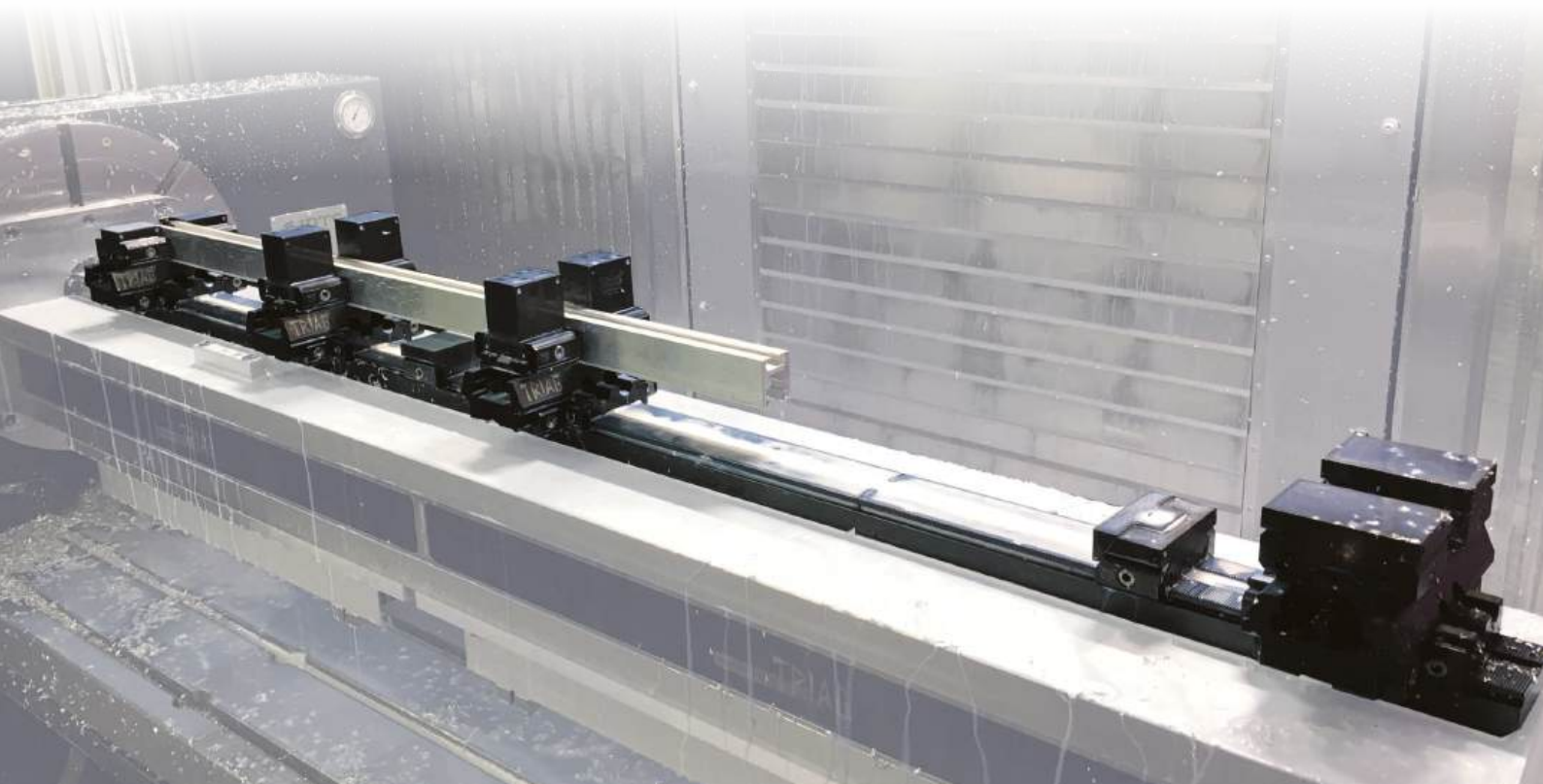


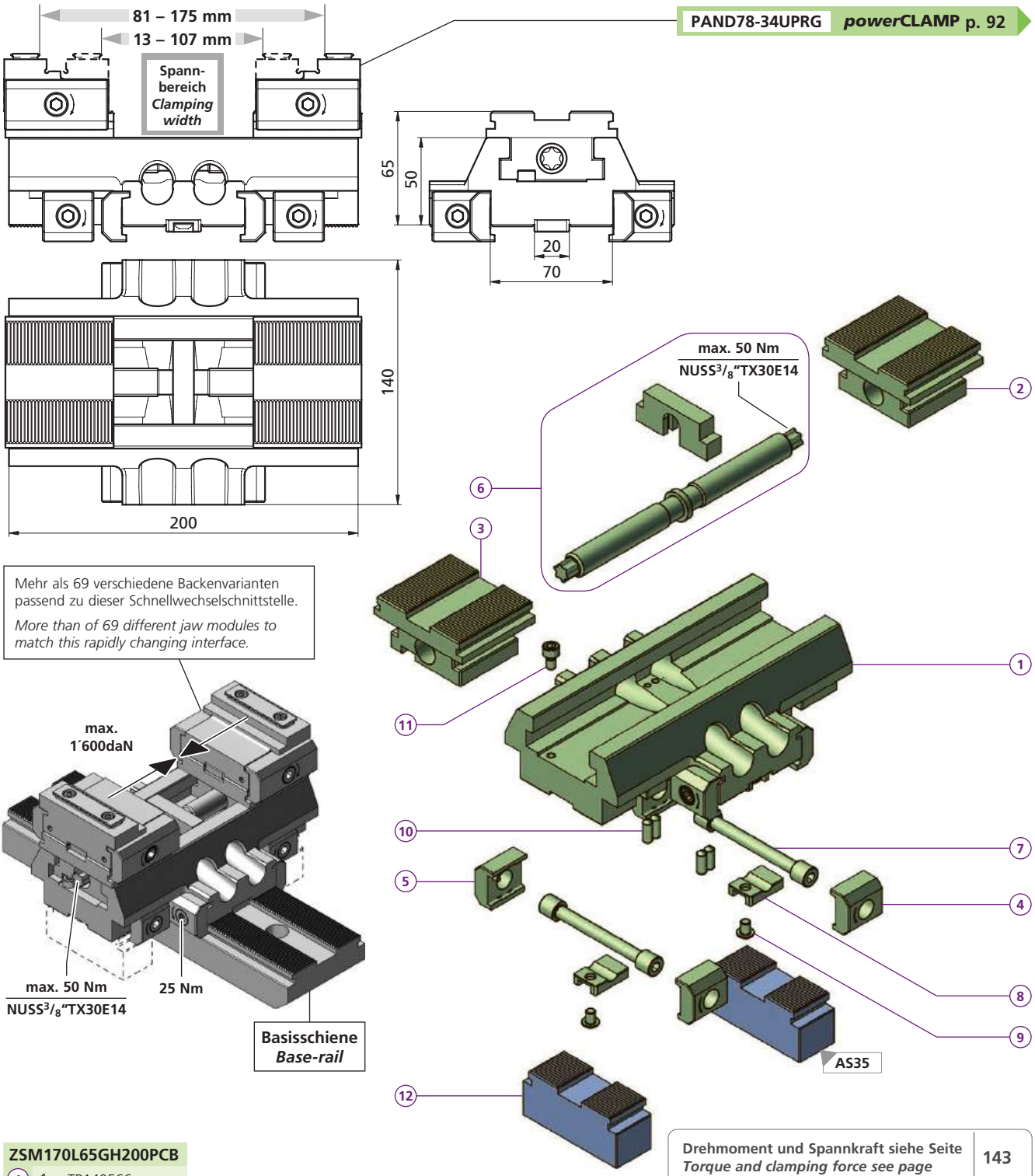


Seitlich verstellbarer Zentrischspannstock
Passend auf alle Power Clamp Basisschienen können mehrere dieser Zentrischspanner, seitlich aneinander gereiht, lange Werkstücke spannen und sind dabei flexibel in 2 mm Schritten seitlich verschiebbar.
Auch können diese für Mehrfachspannung genutzt werden und 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 *power*CLAMP p. 92

ZSM170L65GH200PCB

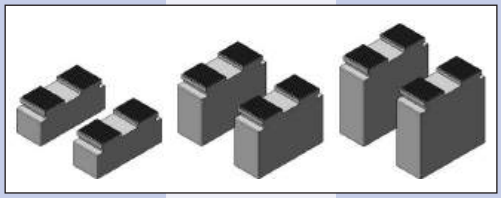
1	1x	TB140566
2	1x	**TB150092**
3	1x	**TB150091**
4	4x	**PCSP30L**
5	4x	**PCSP30R**
6	1x	**PCS16TR200SET**
7	4x	**PCS14**
8	4x	**PCGU2030**
9	4x	**M6X8ISO7380**
10	4x	M6X16DIN914
11	1x	**M6X10ISO4762**
12	2x	

kg ~8,6

Drehmoment und Spannkraft siehe Seite / *Torque and clamping force see page* 143

Schienenhöhe / *Rail height*

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



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.*

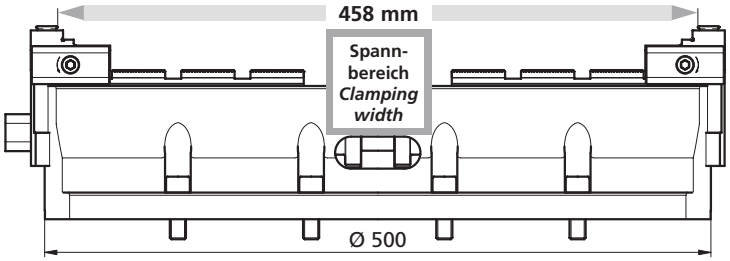
NUSS3/8"TX30E14

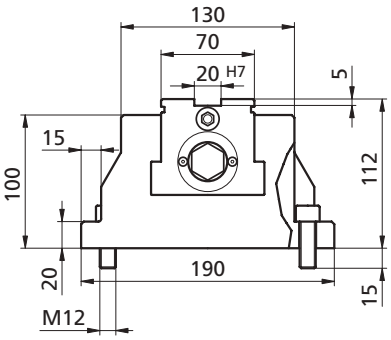
WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately

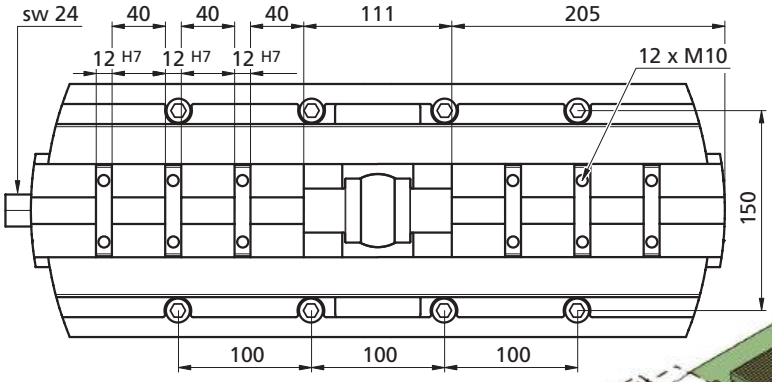


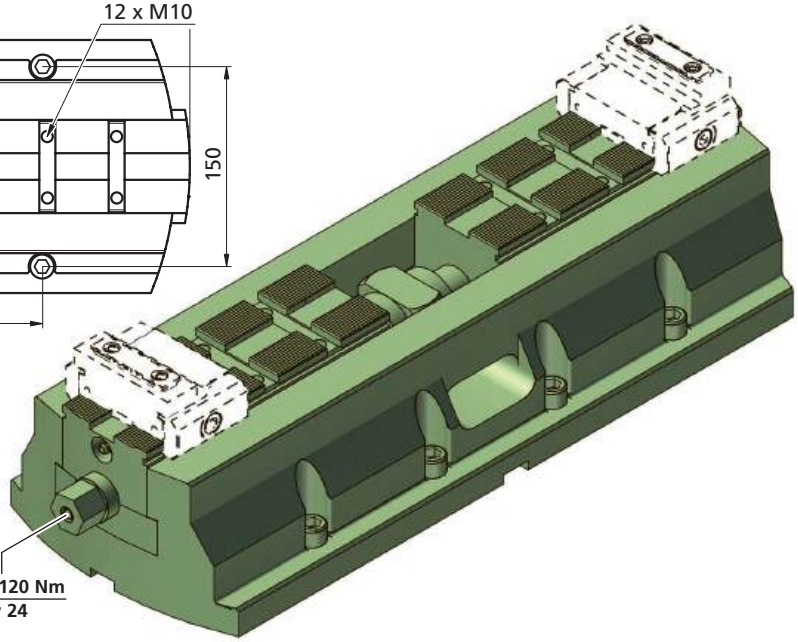
Bestellbeispiel / *Ordering example*: 2 x ZSM170L65GH200PCB & 4 x AS35 & 1 x NUSS3/8"TX30E14

Separat bestellen / *Order separately*

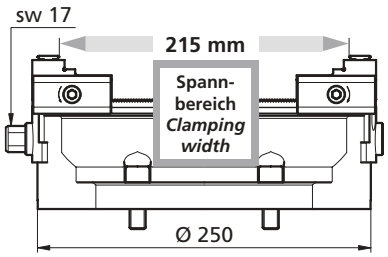


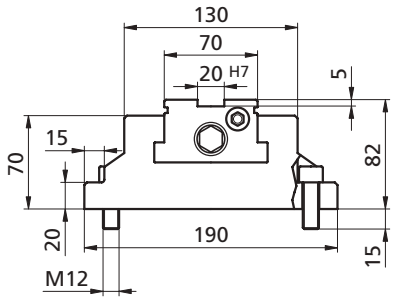




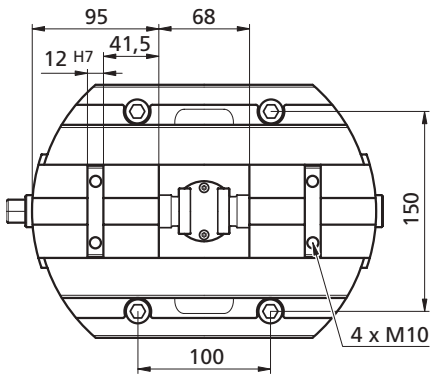


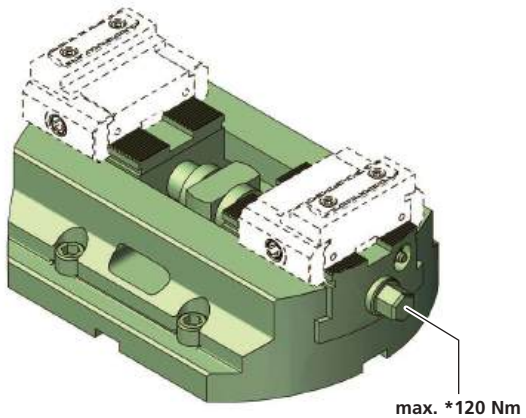
ZSMB500L112	kg = ~59
Backenhub (pro Backe) *Stroke of clamping (each jaw)* 55 mm	





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 Spannkräfte 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***

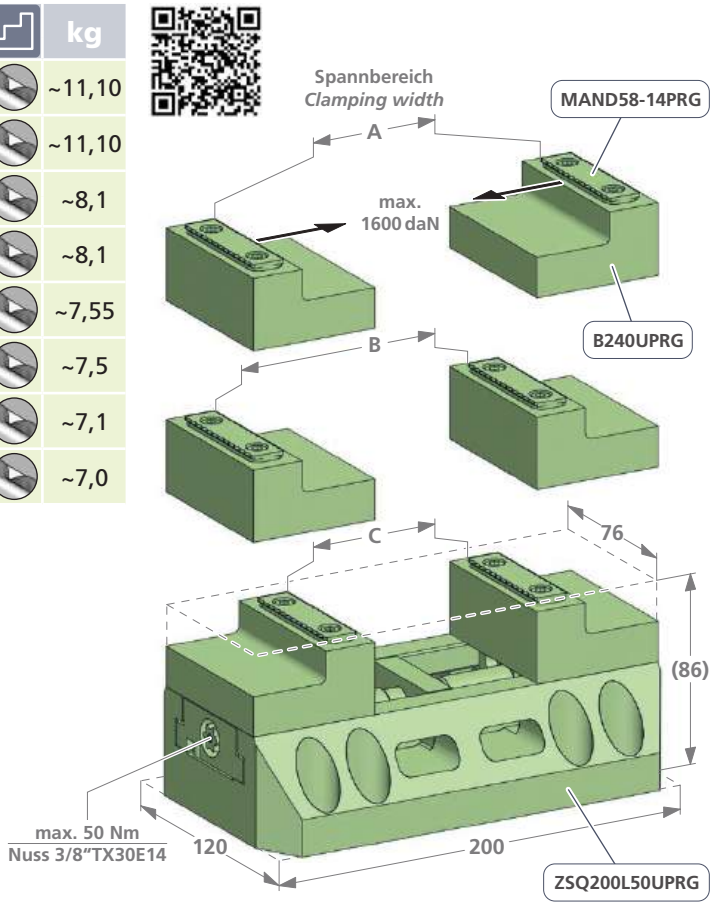
Für längerfristige Anwendung ab **140 – 250 Nm** müssen **geschraubte Backen** eingesetzt werden!

*For longer-term use from **140 – 250 Nm** the **screwed jaws** must be used!*

Bestellbeispiel / *Ordering example* : ZSMB500L112

Zentrischspanner mit Spannkrafterhaltung und Nachfederung
Self centering vise with spring loaded mechanism to maintain clamping force

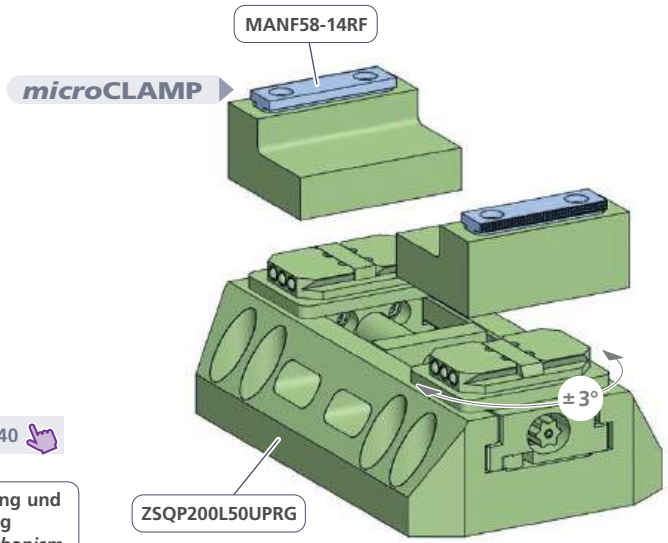
Art. Nr.	A mm	B mm	C mm			kg
ZSQ300L50UPRG	80 – 260		8 – 188			~11,10
ZSQP300L50UPRG	80 – 260		8 – 188	±3°		~11,10
ZSQ200L50UPRG	80 – 160	44 – 124	8 – 88			~8,1
ZSQP200L50UPRG	80 – 160	44 – 124	8 – 88	±3°		~8,1
ZSQ180L50UPRG	80 – 140	44 – 104	8 – 68			~7,55
ZSQP180L50UPRG	80 – 140	44 – 104	8 – 68	±3°		~7,5
ZSQ160L50UPRG	80 – 120	44 – 84	8 – 48			~7,1
ZSQP160L50UPRG	80 – 120	44 – 84	8 – 48	±3°		~7,0



Für die Montage der Backen B240UPRG wird kein Werkzeug benötigt, diese werden per Hand auf dem Spanner eigeklinkt.

No tools are required for mounting the B240UPRG jaws, which are clipped onto the clamp by hand.





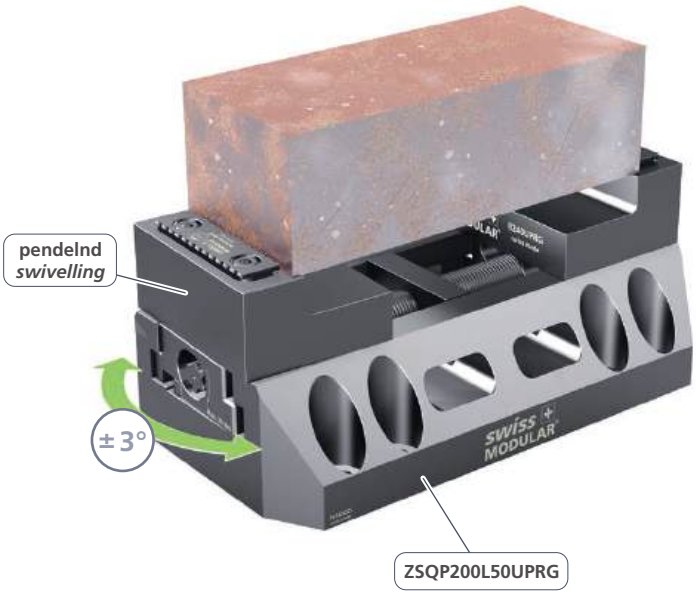
Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 200	440	0,2
20	14,8	= 500	1´102	0,5
30	22,2	= 1´000	2´204	1,0
40	29,6	= 1´300	2´866	1,3
50	37,0	= 1´600	3´527	1,6

NUSS3/8"TX30E14

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately





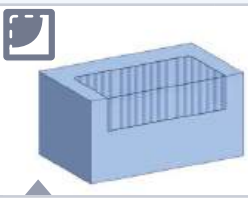






Spannbacke / *Clamping jaw*

Art. Nr.	B242W50-100	B240UPRG
i	Vergütungsstahl *Tempering steel* (1.7225)	57HRC
kg	~2	~0,52

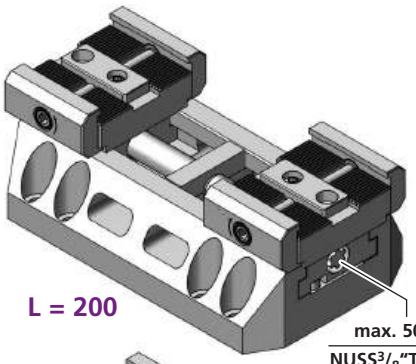


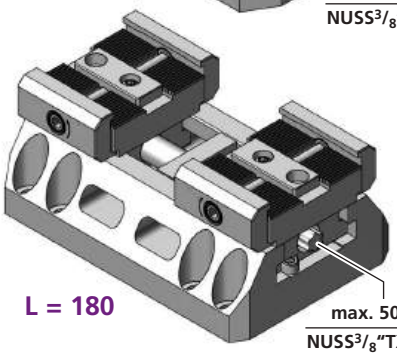


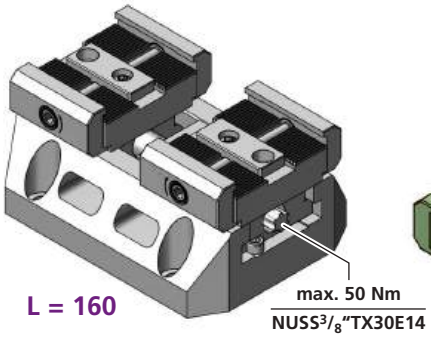
Weich, zur Herstellung individueller Formbacke. / Soft, for the production of individual moulding jaw.

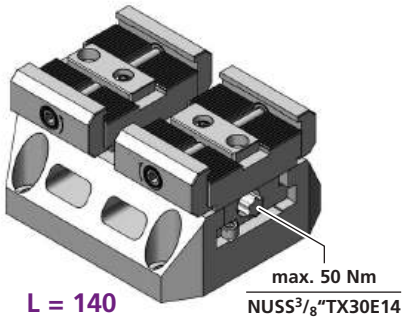
SCAN OR CLICK | PDF | STEP | Formbacke *Moulding jaw*

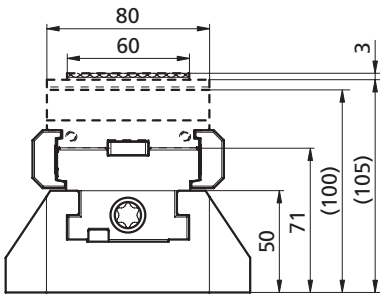
SEPARAT BESTELLEN *ORDER SEPARATELY*

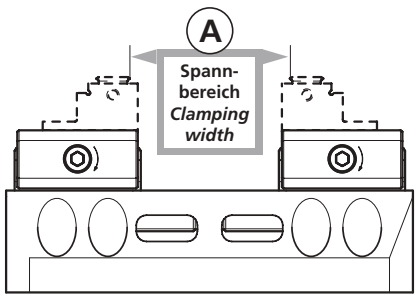


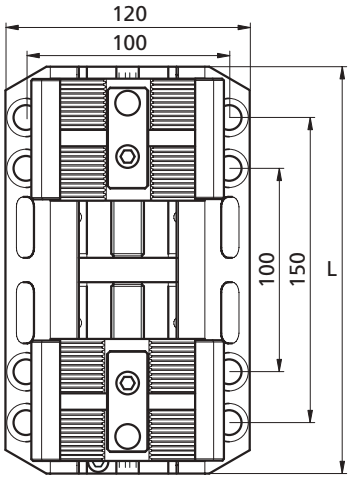


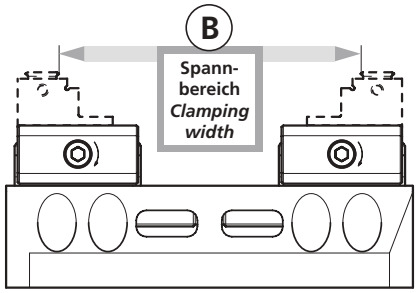




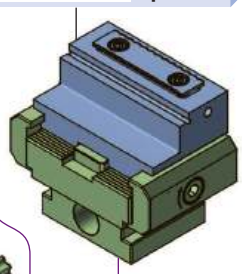


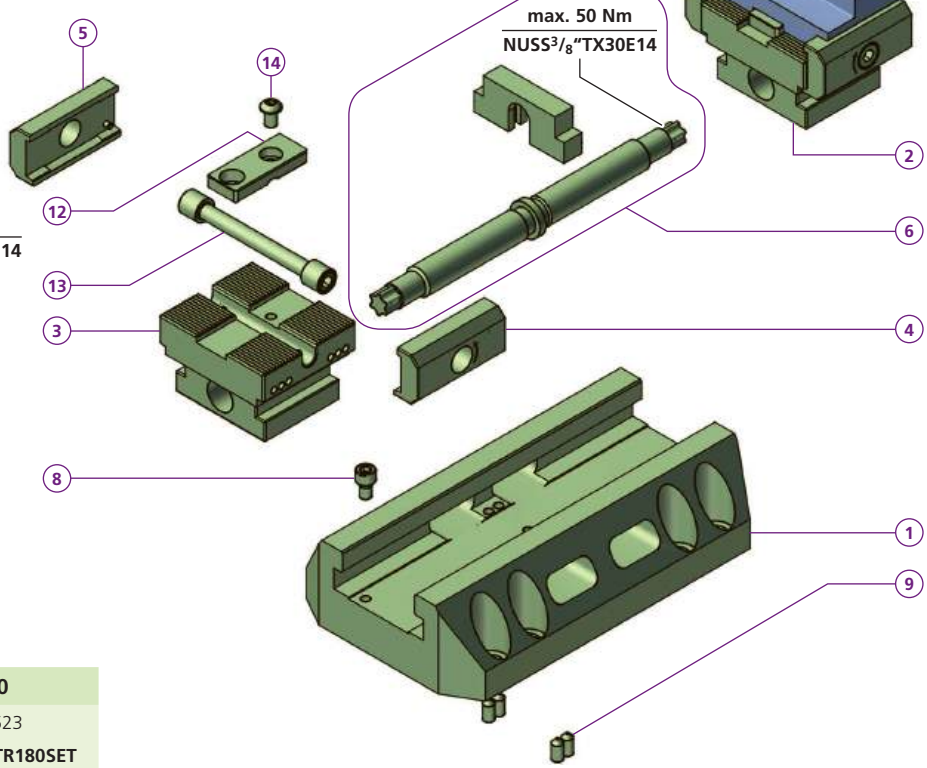






PCZB8050UPRG p. 152





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* 151

NUSS3/8"TX30E14

WICHTIG!
Bitte separat bestellen
IMPORTANT!
Please order separately



Bestellbeispiel / *Ordering example*: 3 x ZSB200L50 **&** 6 x PCZB8050UPRG **&** 1 x NUSS3/8"TX30E14

Separat bestellen / *Order separately*

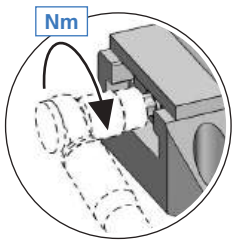
Drehmoment Torque		Spannkraft Workholding force		
Nm	(lb-ft)	~daN	~(lb)	~t
10	7,4	= 200	440	0,2
20	14,8	= 500	1´102	0,5
30	22,2	= 1´000	2´204	1,0
40	29,6	= 1´300	2´866	1,3
50	37,0	= 1´600	3´527	1,6
60	44,4	= 1´800	3´968	1,8
70	51,8	= 2´100	4´629	2,1

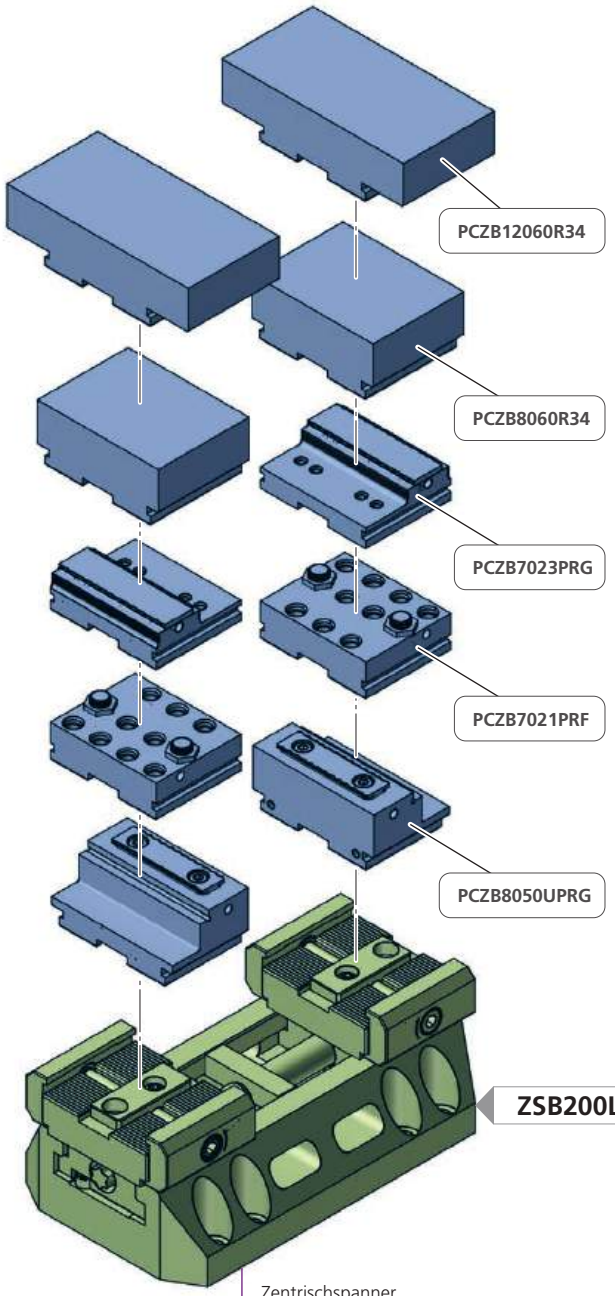
Gut zu Wissen
Good to know

Diese Spannkräfte werden für den Dauerbetrieb empfohlen!

These clamping forces are recommended for continuous operation!

Für kurzfristige Anwendung
For short-term application





ZSB200L50

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

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

Zentrischspanner
Center clamping module
(1)

B

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

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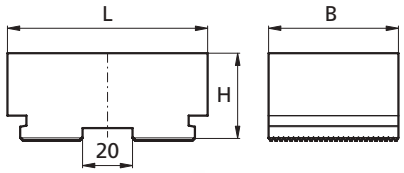
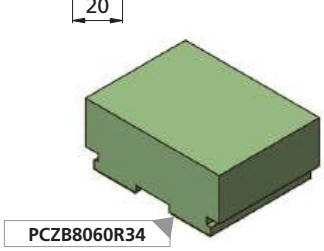
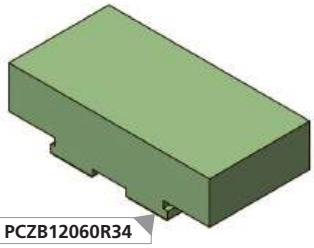
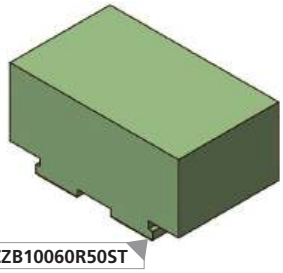
Bestellbeispiel / ***Ordering example***: 1 x ZSM200L50 **&** 2 x PCZB8050UPRG

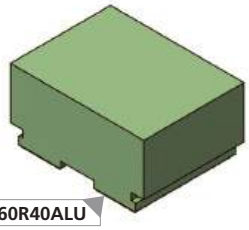
Separat bestellen / *Order separately*



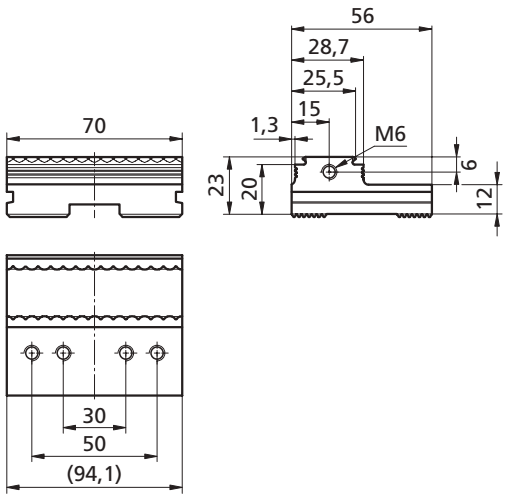


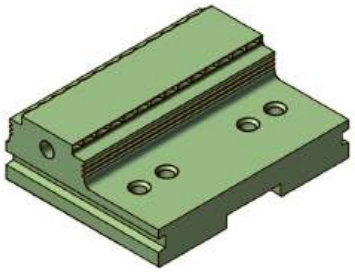




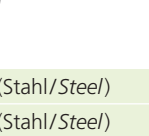


		L	B	H	kg
PCZB8060R34	(Stahl/*Steel*)	80	60	34	~1,2
PCZB12060R34	(Stahl/*Steel*)	120	60	34	~1,7
PCZB10060R50ST	(Stahl/*Steel*)	101	60	50	~2,2
PCZB8060R40ALU	ALU	80	60	40	~0,52
PCZB10060R50	ALU	101	60	50	~0,76





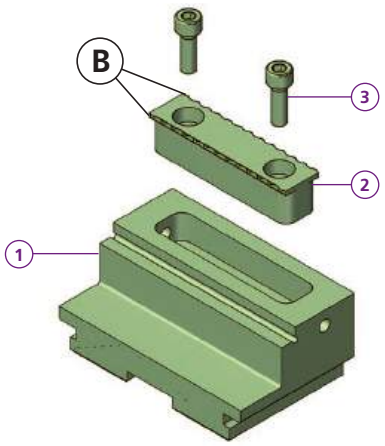
PCZB7023PRG kg ~0,54

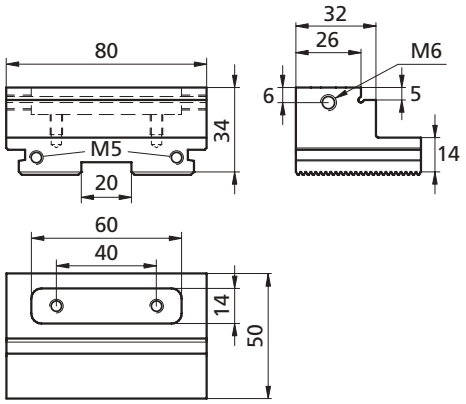


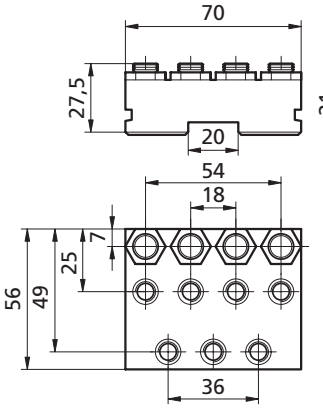
PCZB8050UPRG

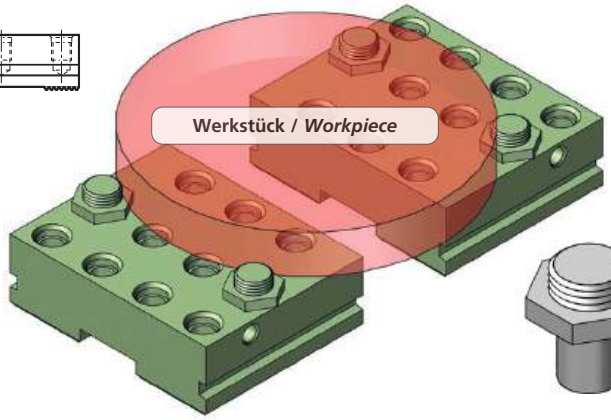
1. 1x TB161200
2. 1x **MAND58-14PRG**
3. 1x **M5X16ISO4762**

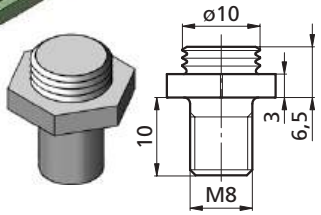
kg ~0,75











PCZB7021PRF kg ~0,6

PRG1003M8

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

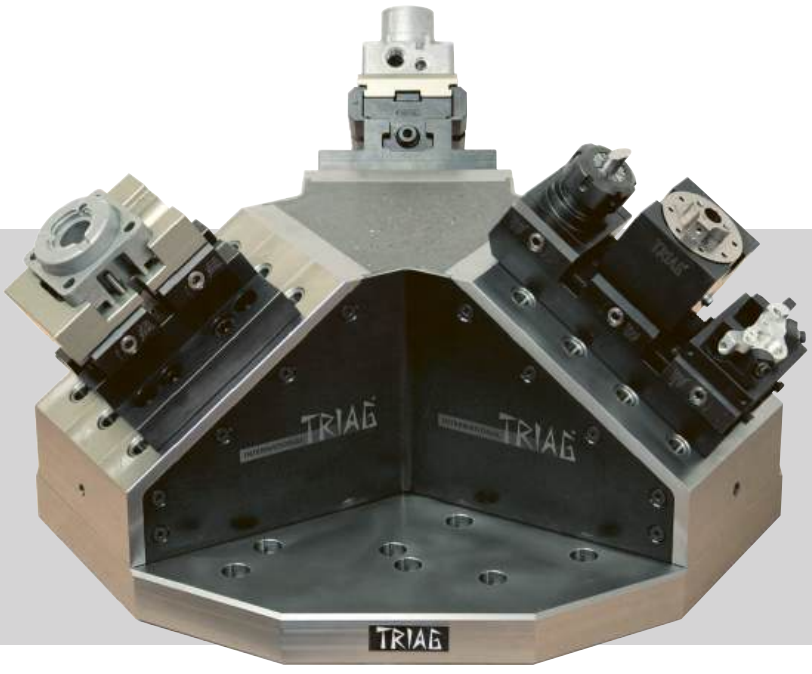
Separat bestellen / Order separately

spaceGRIP III

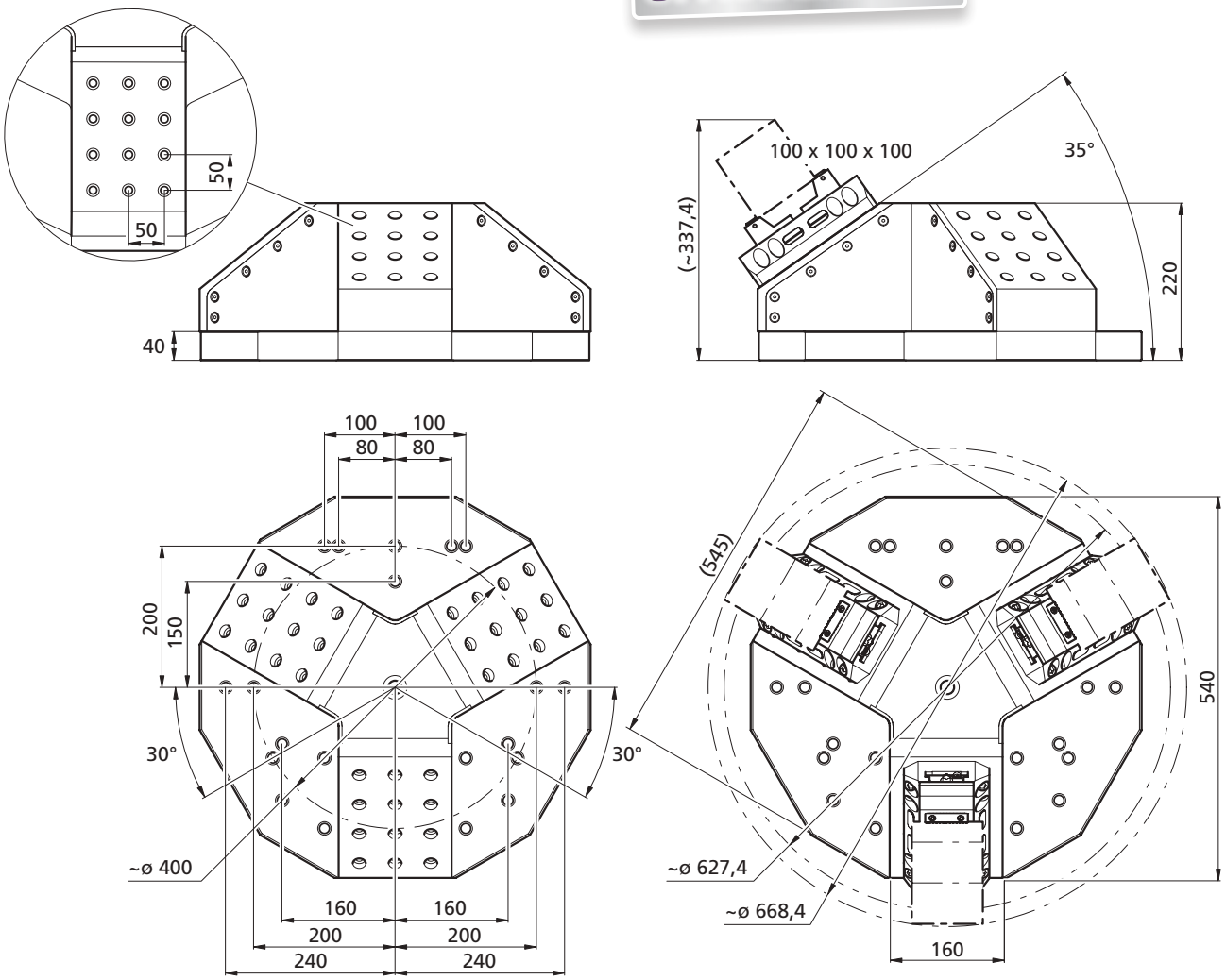
Spannbereich bis 180 mm, Spannkraft bei 70 Nm, 2,1 t 2100 daN. Hier kommen die «Grossen» unserer Zentrischspanner zum Einsatz. Speziell ist der Aufbau auf einer Stahl-Mineralgusspyramiede um beste Verhältnisse bezüglich Vibrationsdämpfung zu bieten. Die Zentrischspanner dazu gibt es in vier Gehäuselängen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

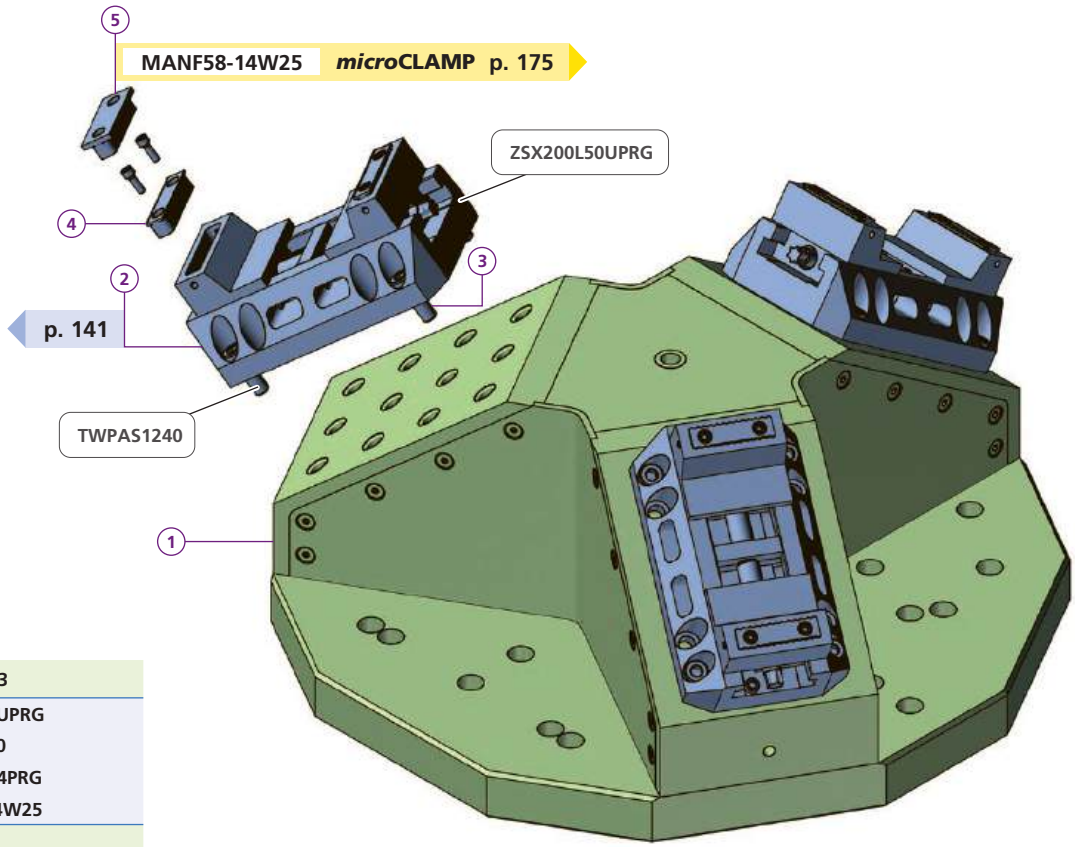
spaceGRIP III

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.



SPACEGRIP III

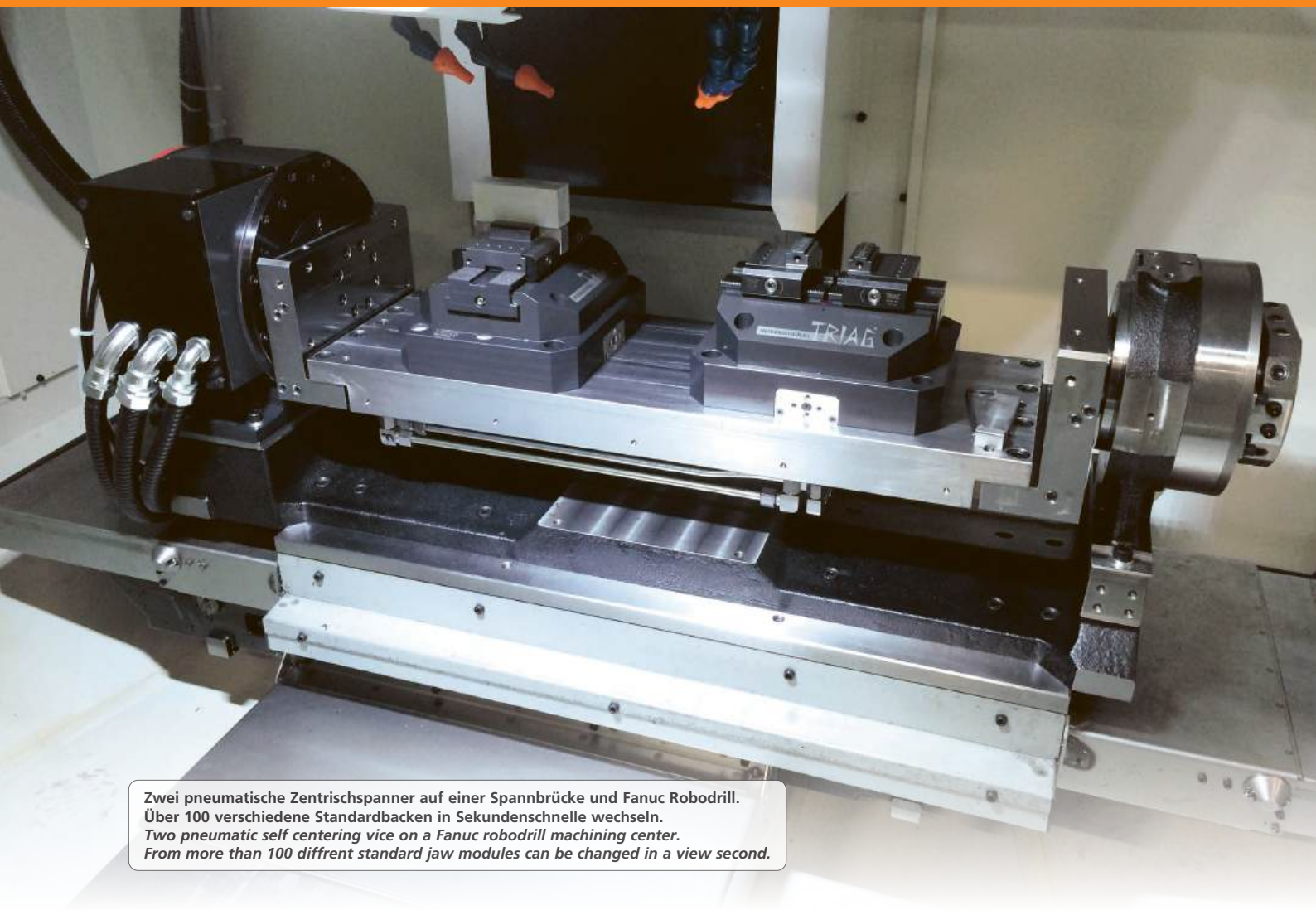




1	1x	5AXZSX35-3
2	3x	ZSX200L50UPRG
3	12x	TWPAS1240
4	6x	MAND58-14PRG
5	6x	MANF58-14W25
kg		~135

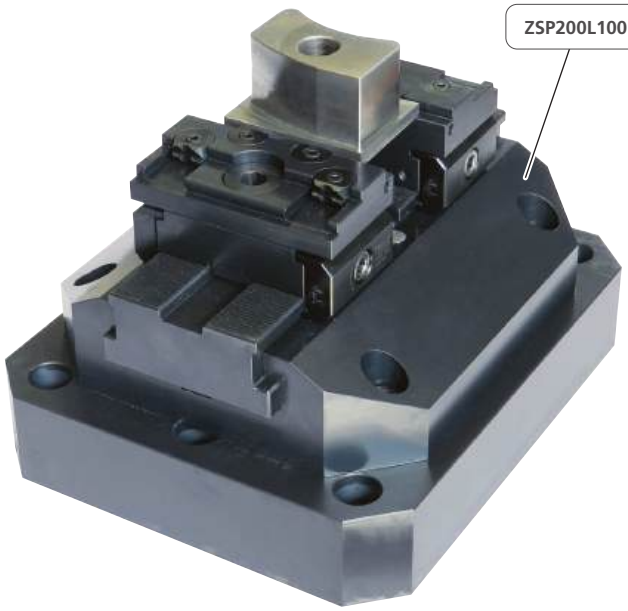
Bestellbeispiel / *Ordering example*: 1 x 5AXZSX35-3 **&** 3 x ZSX200L50UPRG **&** 6 x MANF58-14W25

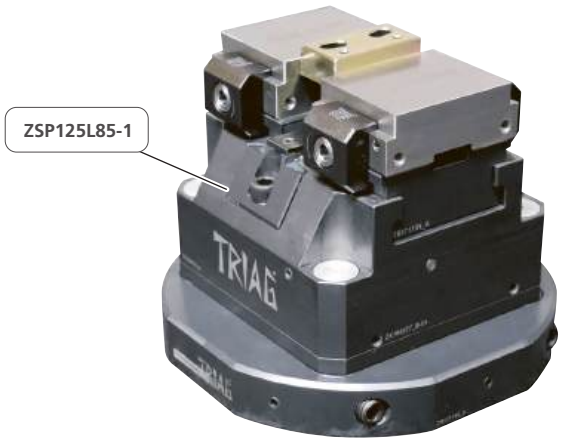
Separat bestellen / Order separately



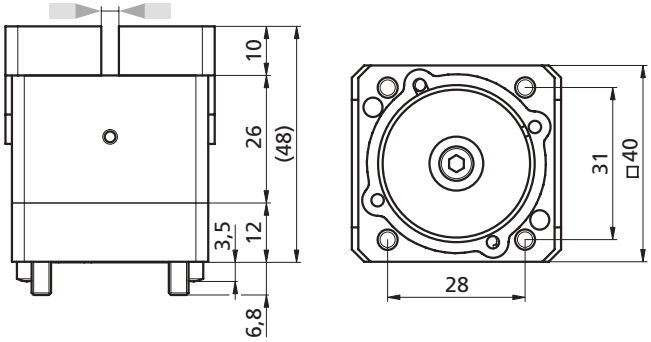
Zwei pneumatische Zentrischspanner auf einer Spannbrücke und Fanuc Robodrill.
Über 100 verschiedene Standardbacken in Sekundenschnelle wechseln.
Two pneumatic self centering vice on a Fanuc robodrill machining center.
From more than 100 diffrent standard jaw modules can be changed in a view second.

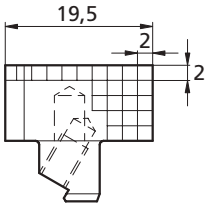






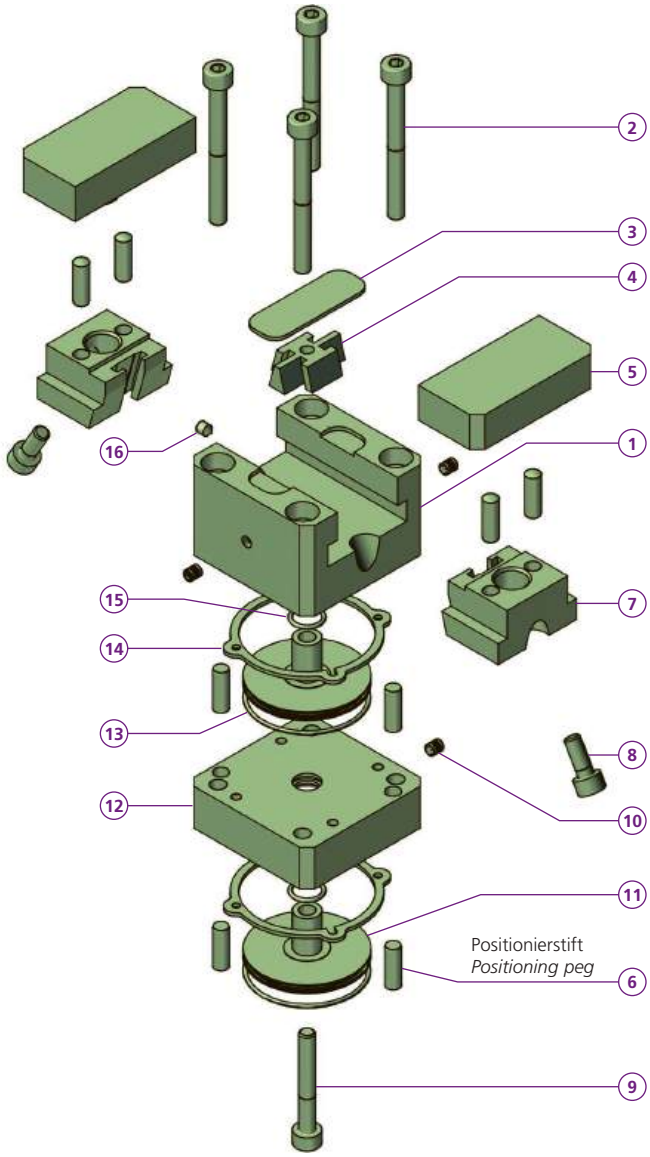
0,6 – 3,6 mm Hub





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

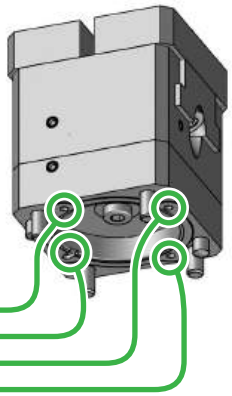
If a dedicated jaw is being machined:
Sectional drawing to determine the maximum machining depth



Spannkraft
Workholding force
120 daN (max. 6 Bar)

4 Anschlüsse / *Connections*

Spannen / *Clamping*
Lösen / *Loosen*
Überwachen / *Supervise*
Sperrluft / *Sealing air*

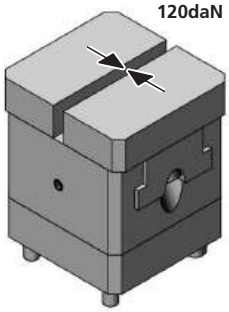


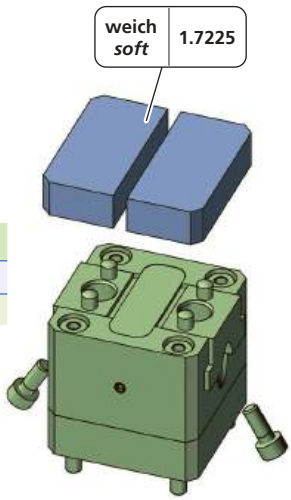
SET18ZSP40L38-2		
1	1x	TF180166
2	4x	TN100865
3	1x	TF180169
4	1x	TF180168
5	2x	**B222**
6	8x	TN100428
7	2x	TF180167
8	2x	TN100321
9	1x	TB180316
10	3x	TN100824
11	2x	TF180170
12	1x	TF180171
13	2x	TN100819
14	2x	TB180306
15	2x	TN100818
16	1x	TN10091
kg		~0,52

Luftvolumen / *Air volume*	
Spannen / *Clamping*	Lösen / *Loosen*
8,2cm³	8,4cm³

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

max. 120daN





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

Bestellbeispiel / *Ordering example*: SET18ZSP40L38-2

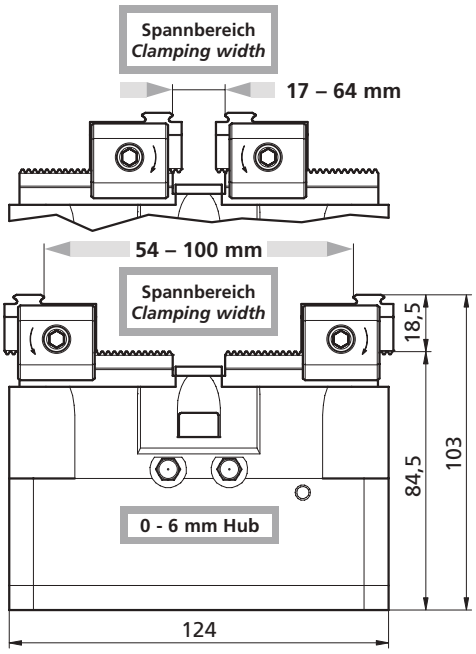
Separat bestellen / *Order separately*

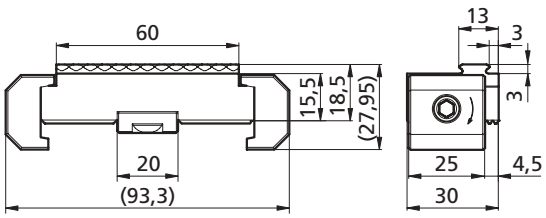
ZSP Mini

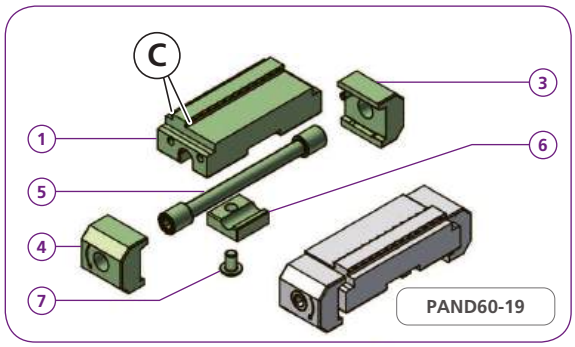
Pneumatischer Zentrischspanner (Doppelkolben)
Pneumatic self centering vise (Double piston)
SET18ZSP125L85-1

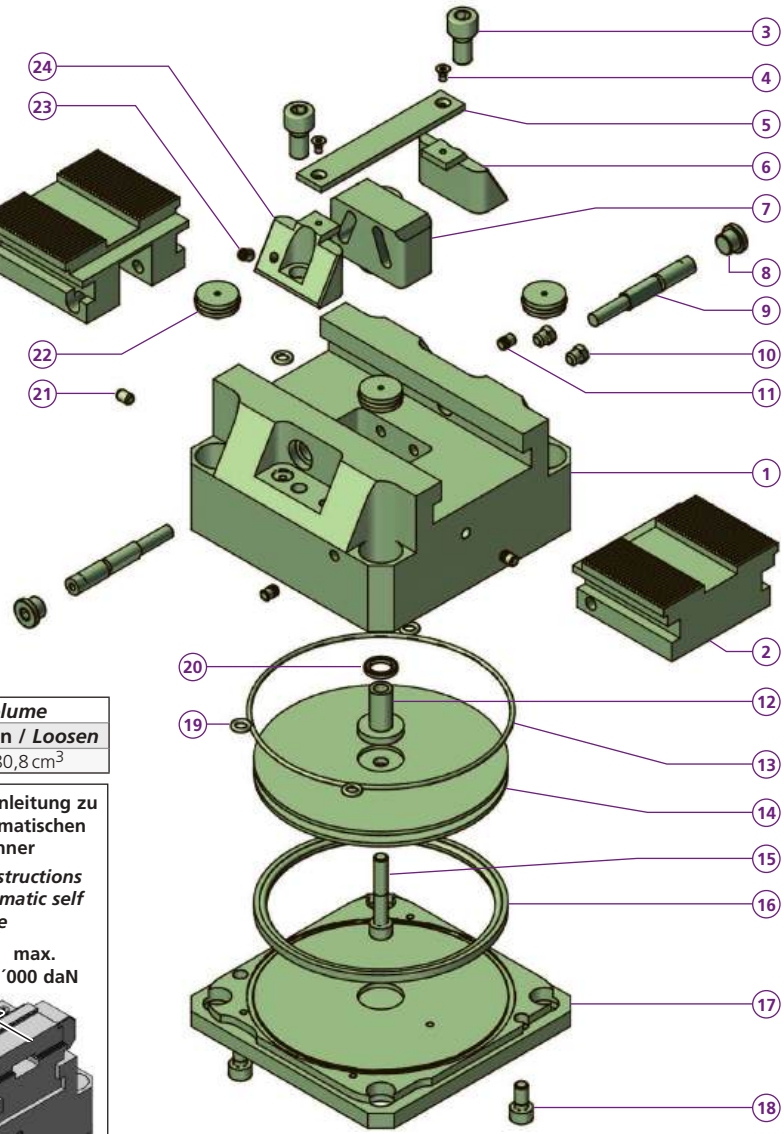
prägen *stamping*

***tri*CENTRO**







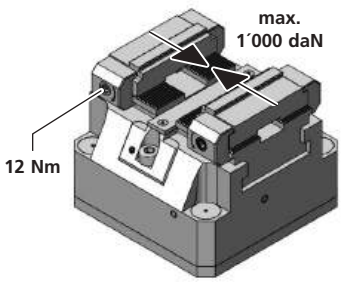


ZSP125L85-1		
1	1x	TB180474
2	2x	TB180476
3	2x	**M8X16ISO4762**
4	2x	M3X6DIN7991
5	1x	TB171140
6	1x	TB171141
7	1x	TB180477
8	2x	TN100014
9	2x	TB170530
10	2x	TN100021
11	3x	TN100009
12	1x	TK160467
13	1x	TN100012
14	1x	TK160075
15	1x	**M6X35ISO4762**
16	1x	TN100020
17	1x	TB180475
18	2x	TN100015
19	4x	TN100013
20	1x	TN100027
21	1x	TB180268
22	4x	PCPF16L6
23	1x	M5X6DIN913
24	1x	TB180478
kg		~7,4

PAND60-19 C		
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

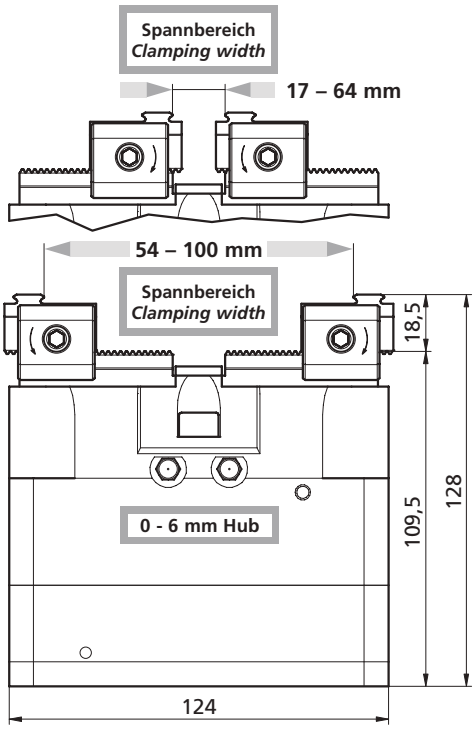
Bestellbeispiel / *Ordering example*: SET18ZSP125L85-1

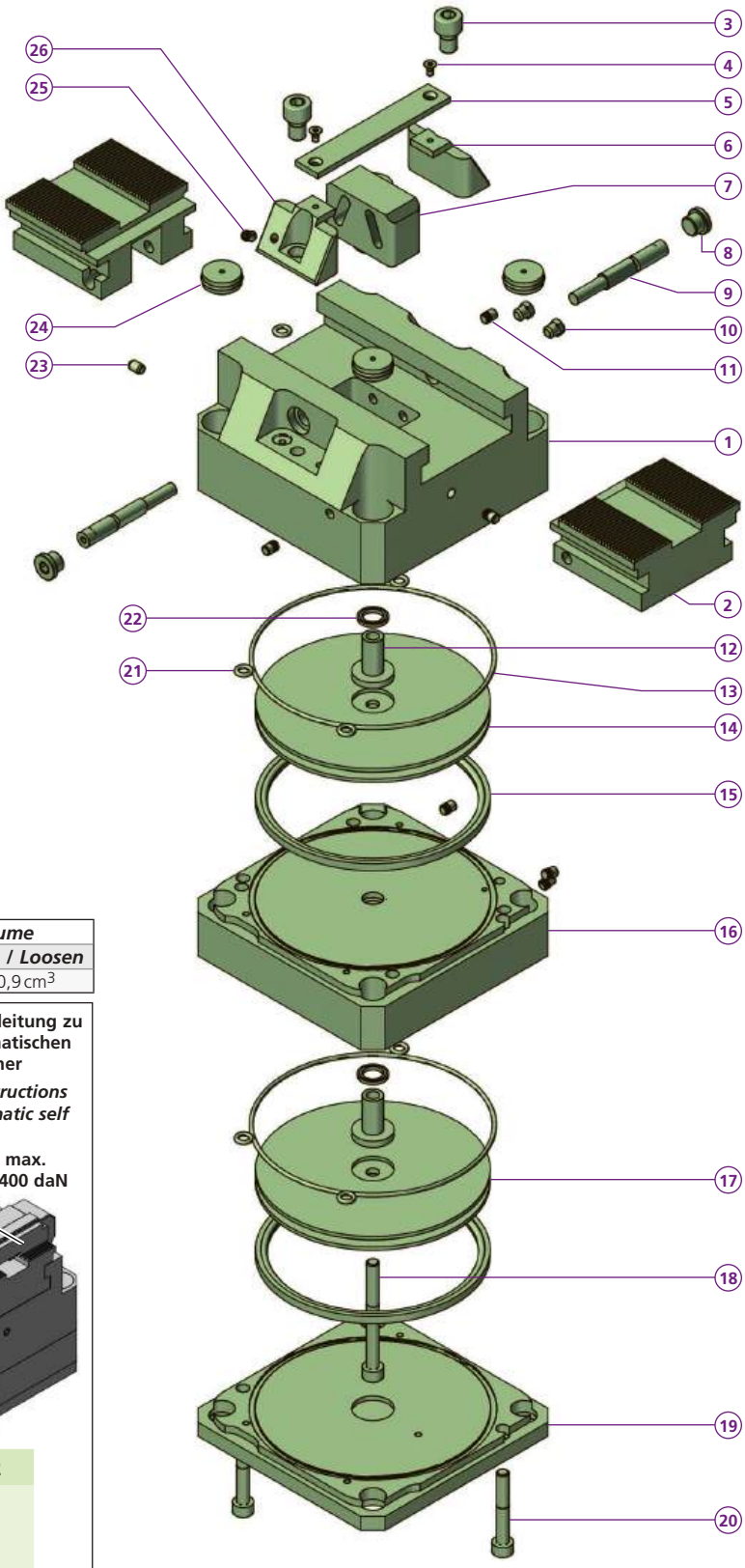
ZSP Mini

Pneumatischer Zentrischspanner (Doppelkolben)
Pneumatic self centering vise (Double piston)
SET18ZSP125L110-2 PAND60-19

prägen *stamping*

***tri*CENTRO**



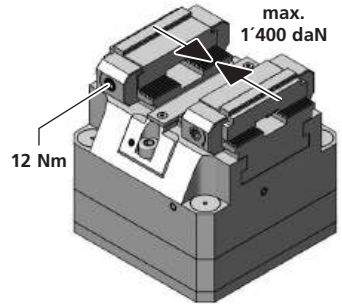


	ZSP125L110-2	
1	1x	TB180474
2	2x	TB180476
3	2x	**M8X16ISO4762**
4	2x	M3X6DIN7991
5	1x	TB171140
6	1x	TB171141
7	1x	TB180477
8	2x	TN100014
9	2x	TB170530
10	2x	TN100021
11	6x	TN100009
12	2x	TK160467
13	2x	TN100012
14	1x	TB170147
15	2x	TN100020
16	1x	TB180480
17	1x	TK160075
18	1x	**M6X60ISO4762**
19	1x	TB180475
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 cm³	160,9 cm³

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

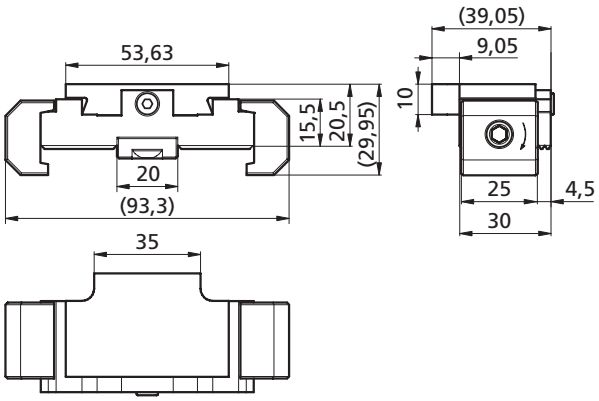
Masszeichnung & Isometrische Darstellung:

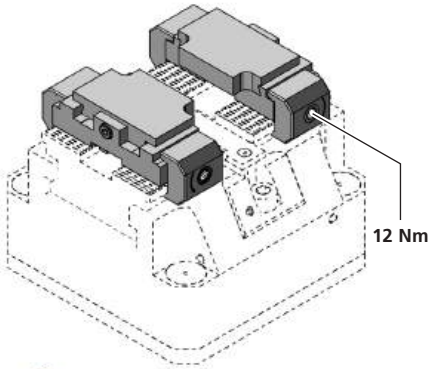
Siehe Seite | *See page* p. 159

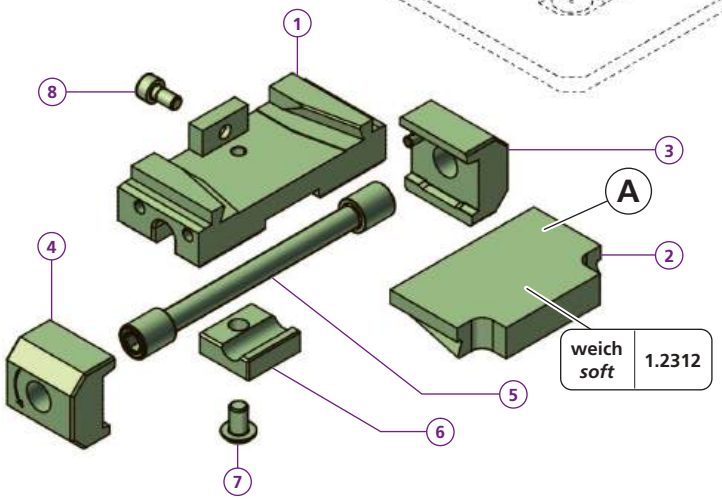
Dimensional drawing & Isometric representation:

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



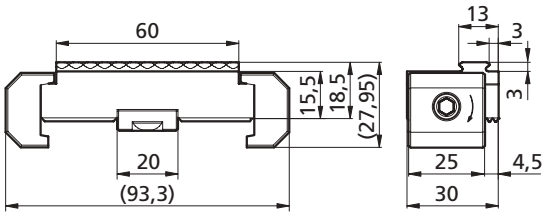


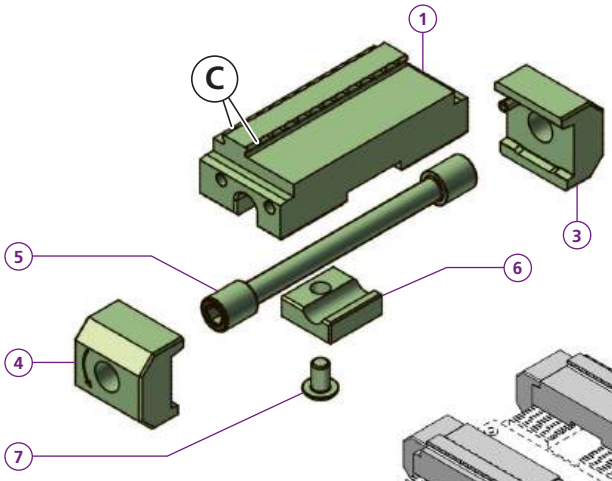


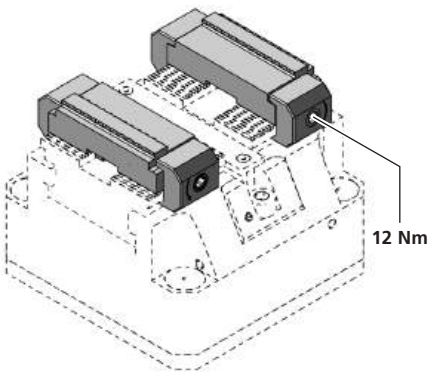
A

PAND60-20.5UWB

1	1x	TK171294
2	1x	TK180360
3	1x	PCSP25L
4	1x	PCSP25R
5	1x	PCS10
6	1x	PCGU2019
7	1x	**M5X8ISO7380**
8	1x	**M4X8ISO4762**
kg		~0,3



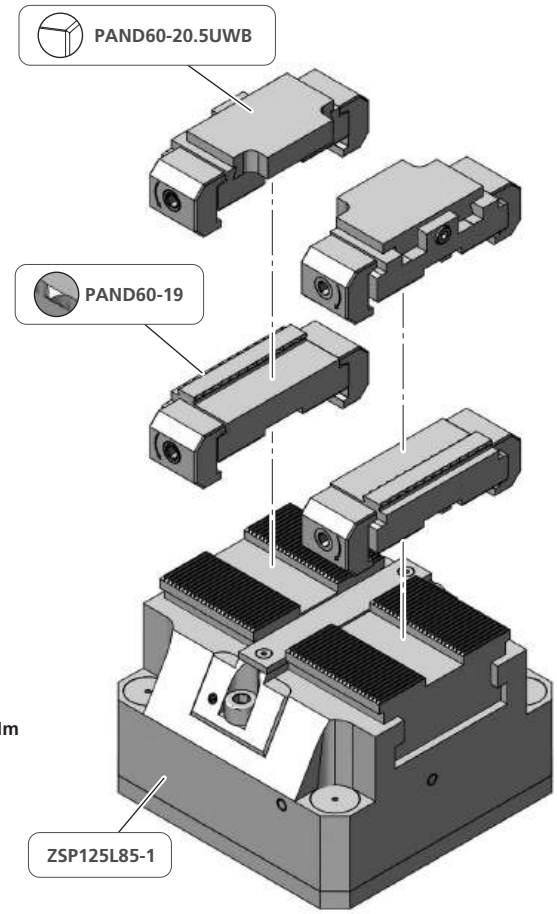




C

PAND60-19

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

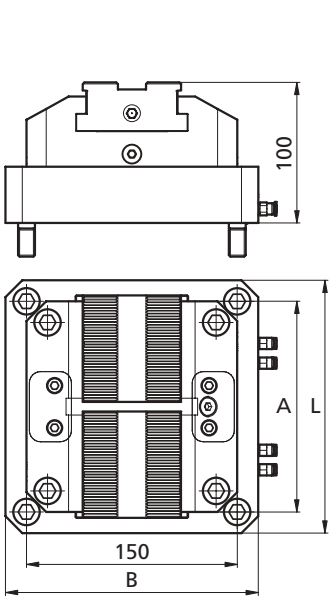


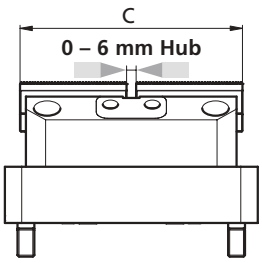
Bestellbeispiel / *Ordering example*: PAND60-20.5UWB

ZSP Grande

Pneumatischer Zentrischspanner
Pneumatic self centering vise

ZSP150L100 ZSP200L100 ZSP250L100 *tri*CENTRO





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

ZSP200L100

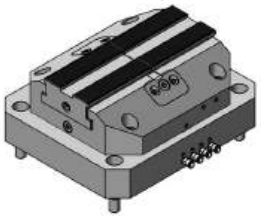
1	1x	TB190083
12	1x	TB190091
16	2x	TB190084
A	=	200
L	=	240
B	=	200
kg		~24,5

ZSP250L100

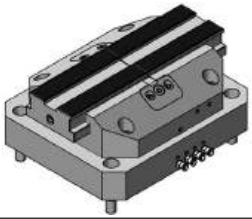
1	1x	TB190083
12	1x	TB190091
16	2x	TF190780
A	=	200
L	=	240
B	=	200
C	=	250
kg		~25,5

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

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

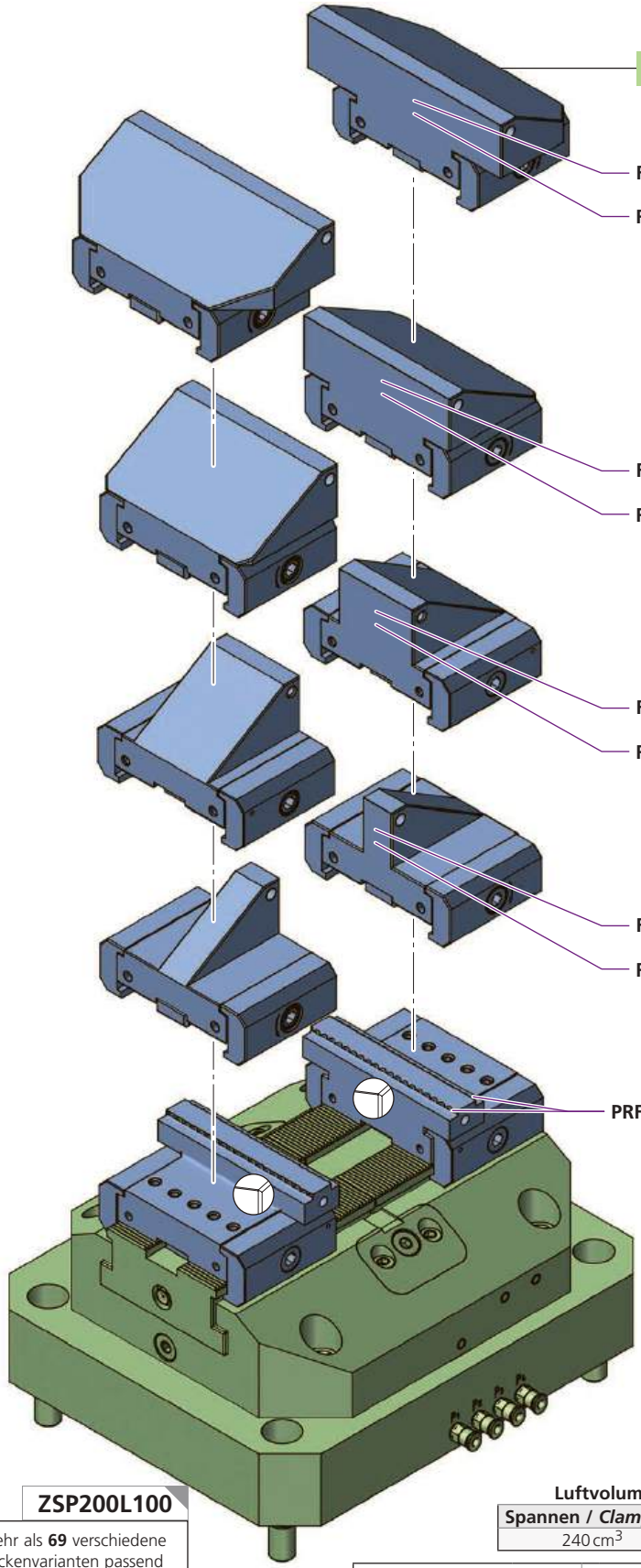


Bedienungsanleitung zu diesem pneumatischen Zentrischspanner
Operating instructions for this pneumatic self centering vise



Spannkraft siehe Seite
Clamping force see page 161

Bestellbeispiel / *Ordering example*: ZSP150L100



ZSP200L100

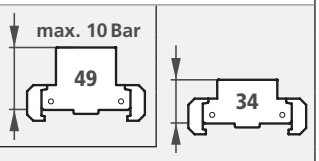
Mehr als **69** verschiedene Backenvarianten passend zu dieser Schnellwechsel-schnittstelle.

*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.

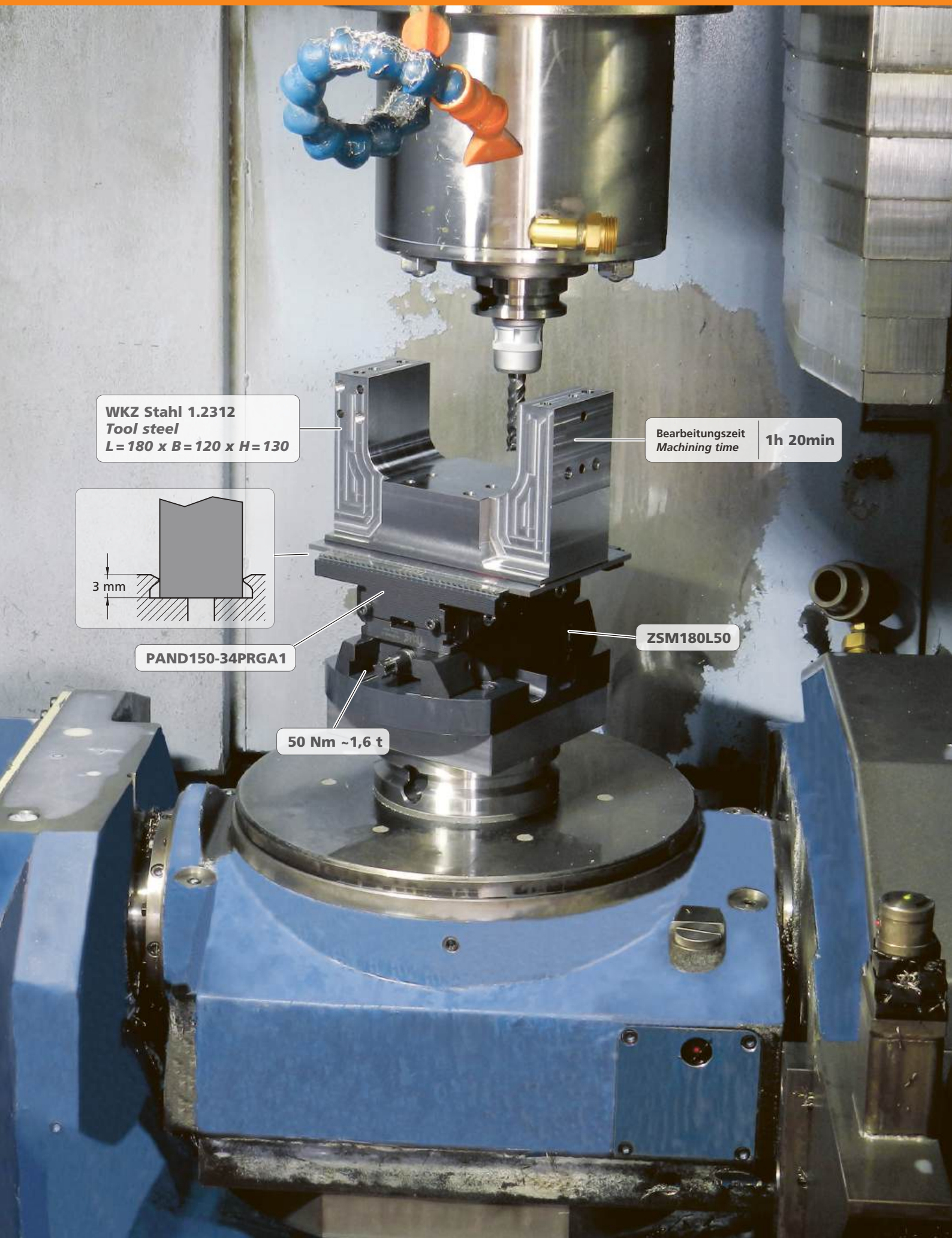
Note that only the 34 mm high modules may be used for the pressure range up to 12 bar.

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

Separat bestellen / *Order separately*

Anwendungsbilder Zentrischspanner
Pictures of application to self centering vise

***tri*CENTRO**



9
05.11.2024

microCLAMP



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, positioningholes 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 anchoredin 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.

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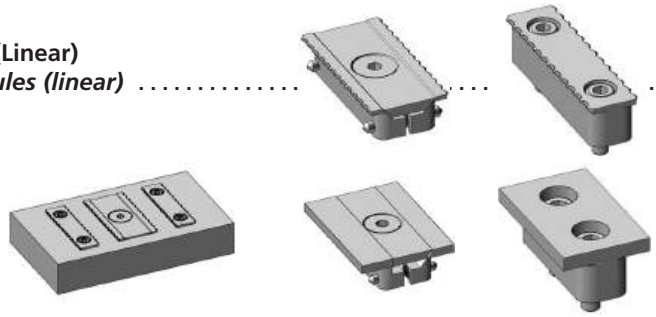
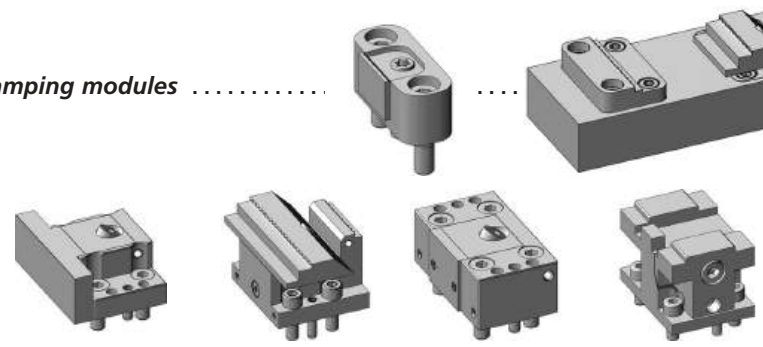
For dedicated fixture - stamping- and end modules (linear) ..... 174 - 176



Niederzugspannmodule | *Pull down clamp modules* ..... 177 - 195



Linearspannmodule | *Linear clamping modules* ..... 196 - 203



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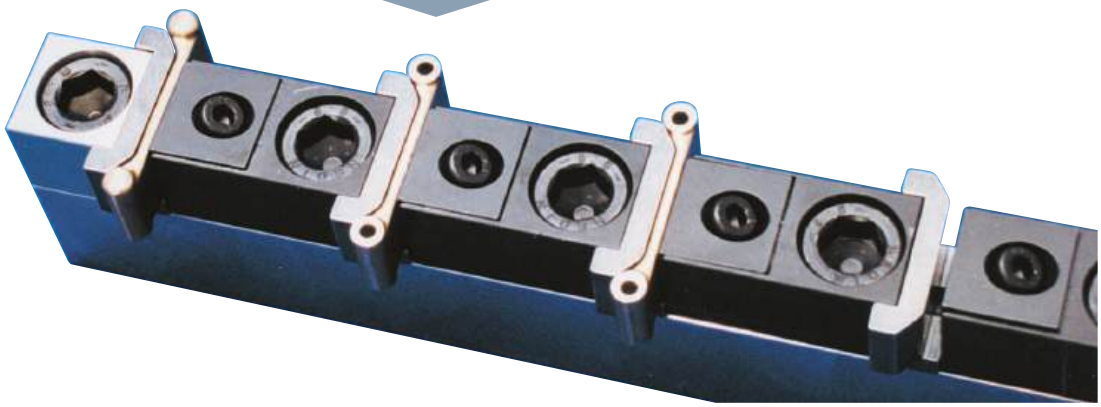
Zum Aufbau kundenspezifischer Sondervorrichtungen für höchste Werkstückdichte im Arbeitsraum von Bearbeitungszentren ist das Spannsystem Micro Clamp ausgelegt (Spezielle Anschlagbacken, siehe Bild). Sehr kompakte Spannmodule mit Prägebacken verwirklichen eine zuverlässige Aufspannung bei nur etwa 2 mm Verlust an Rohmaterial

Clams for dedicated fixtures for high density to get your best output from your machine. Clamping modules in diffrent 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

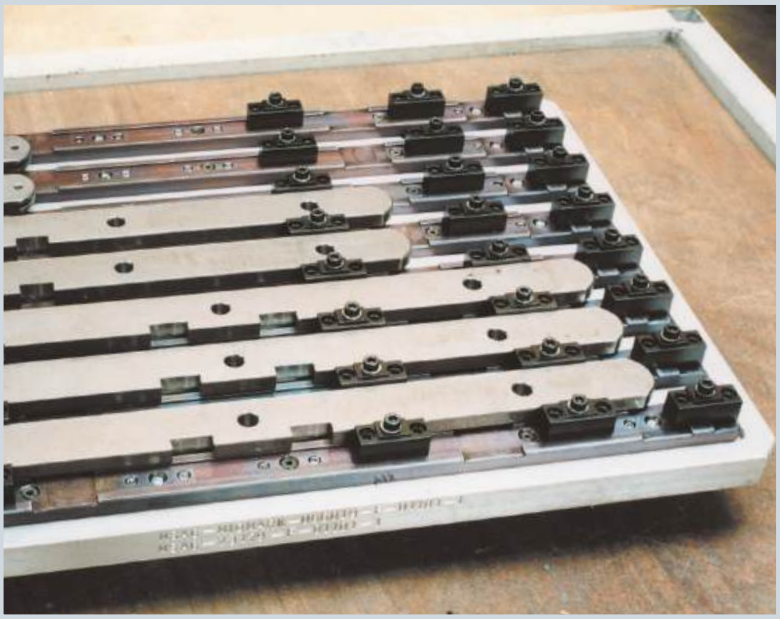
High workholding density

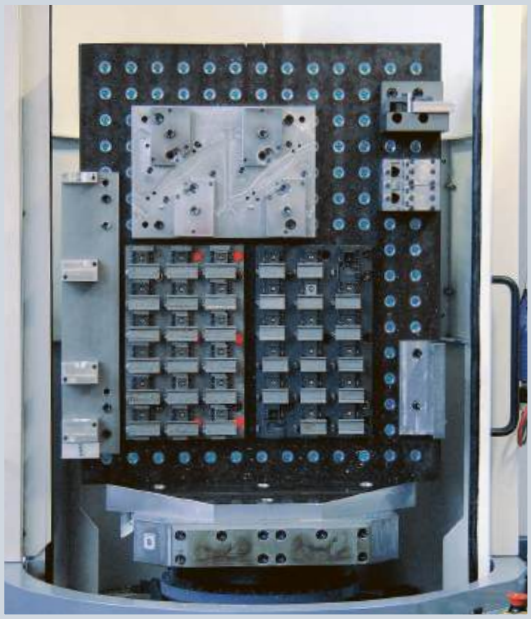
These clamping modules have a clamping jaw on the front, while rear is precisely ground or milled with reference to the fixing holes. This means that it can be used as a datum face for the following workpiece. This arrangement allows very high clamping densities. Only 15 mm clamping clearance is needed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

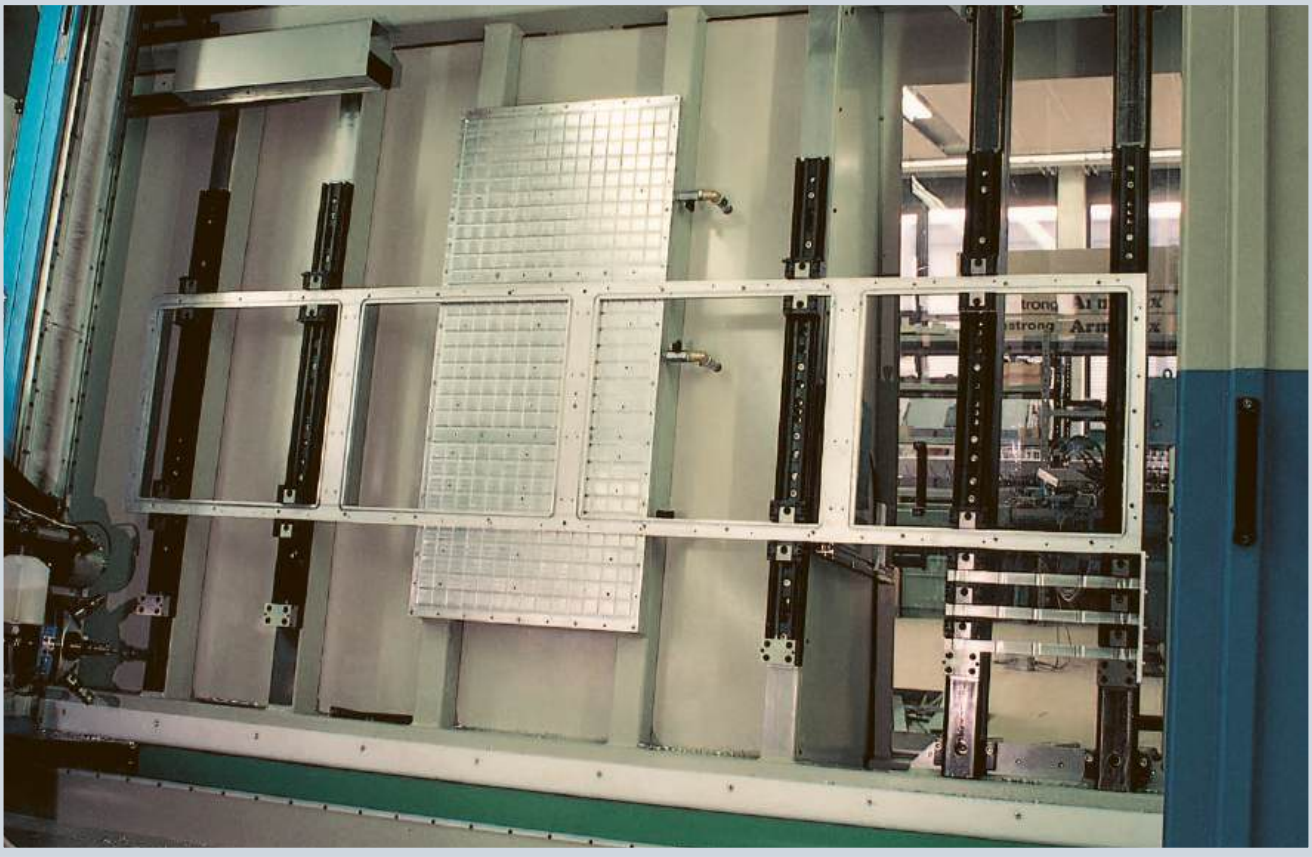


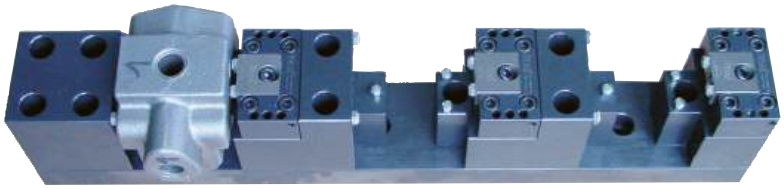
Ein grosses Angebot an verschiedensten Spannmodulen.
A wide range of clamp modules in diffrent sizes are avaiable





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





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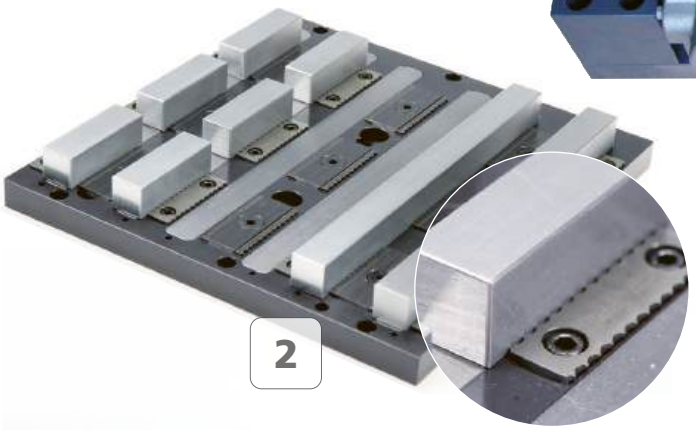

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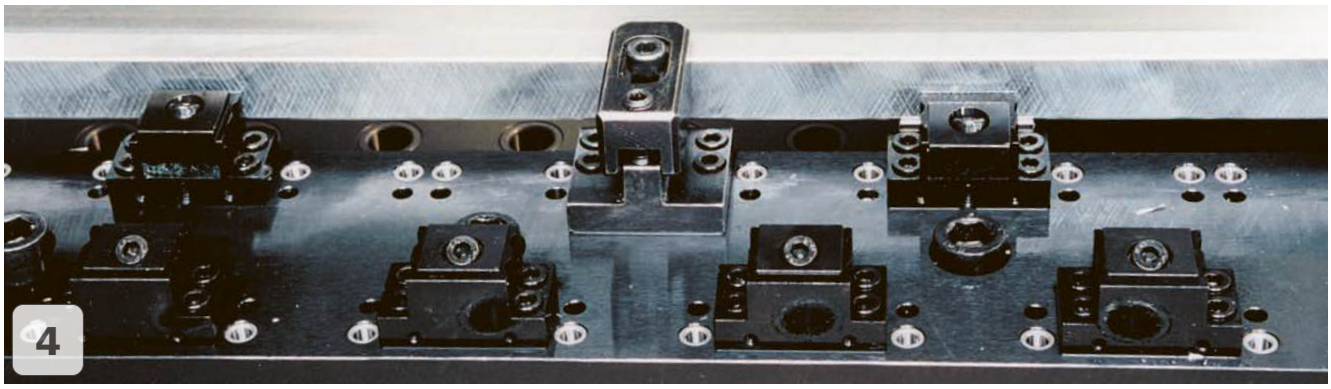
3



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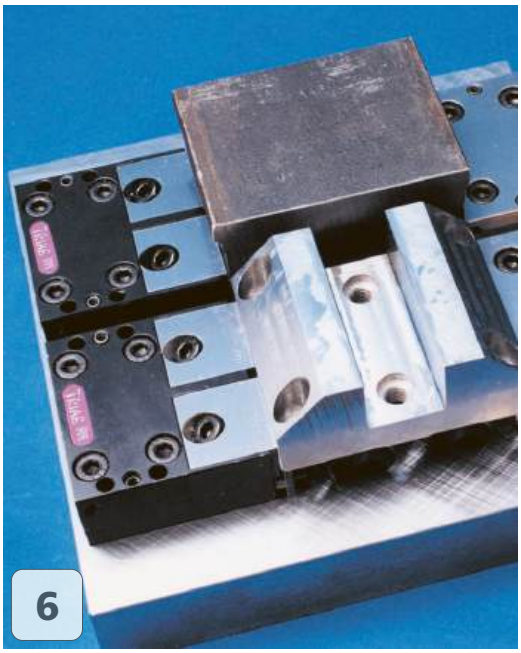


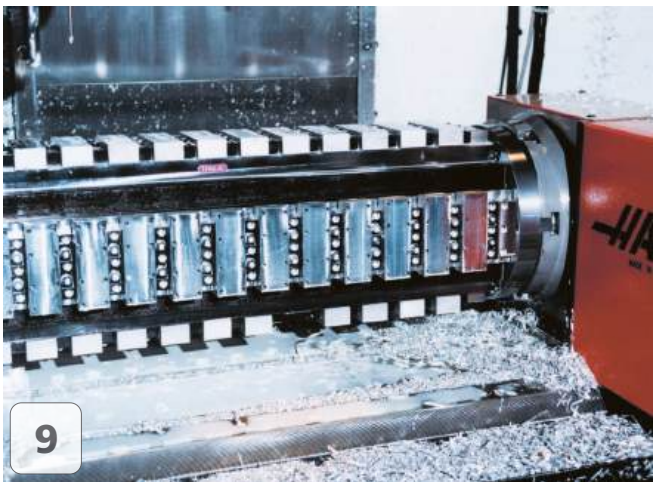
6



7 72 Teile sind hochgenau gespannt unter 10 my. Die Vorrichtungen sind auf einem EROWA ITS O-Punkt Spannsystem aufgebaut
72 parts are clamped within 10 microns the clamp fixtures are set up on a EROWA ITS palleting system



8



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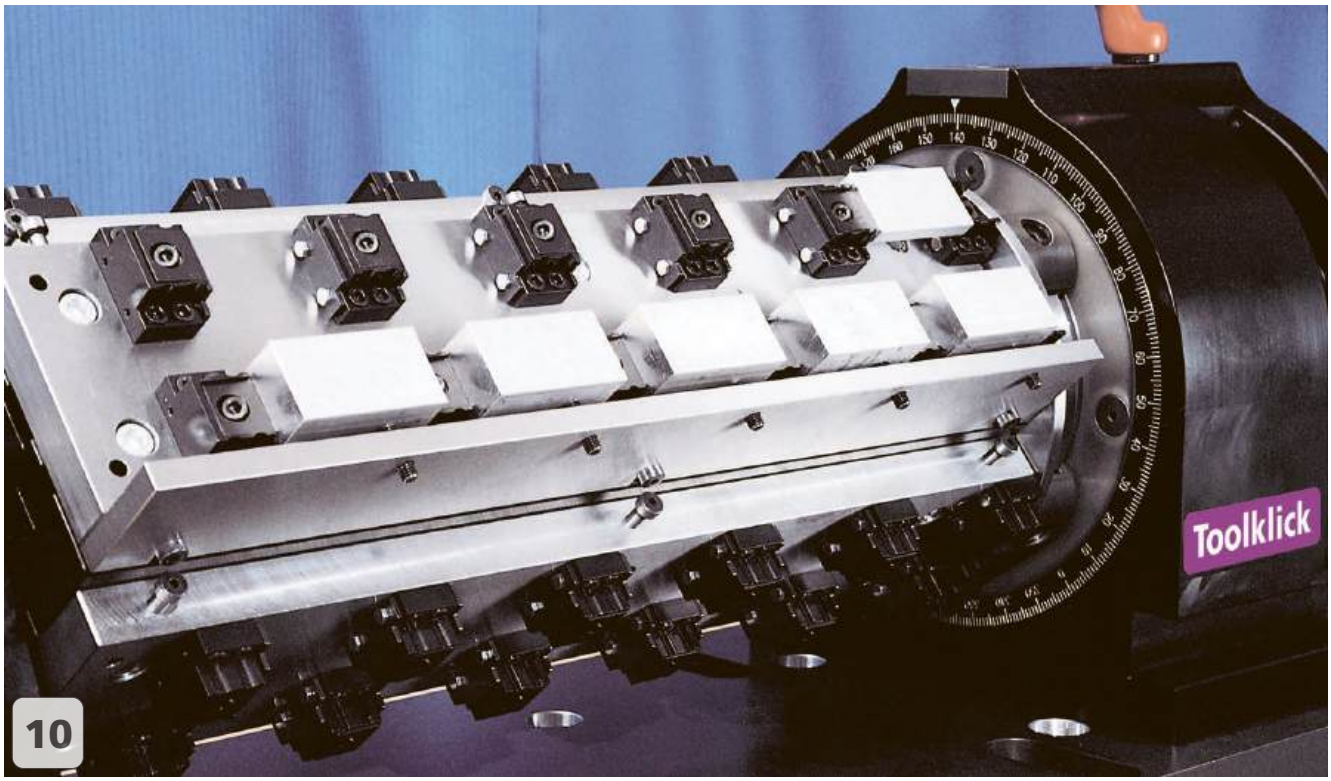
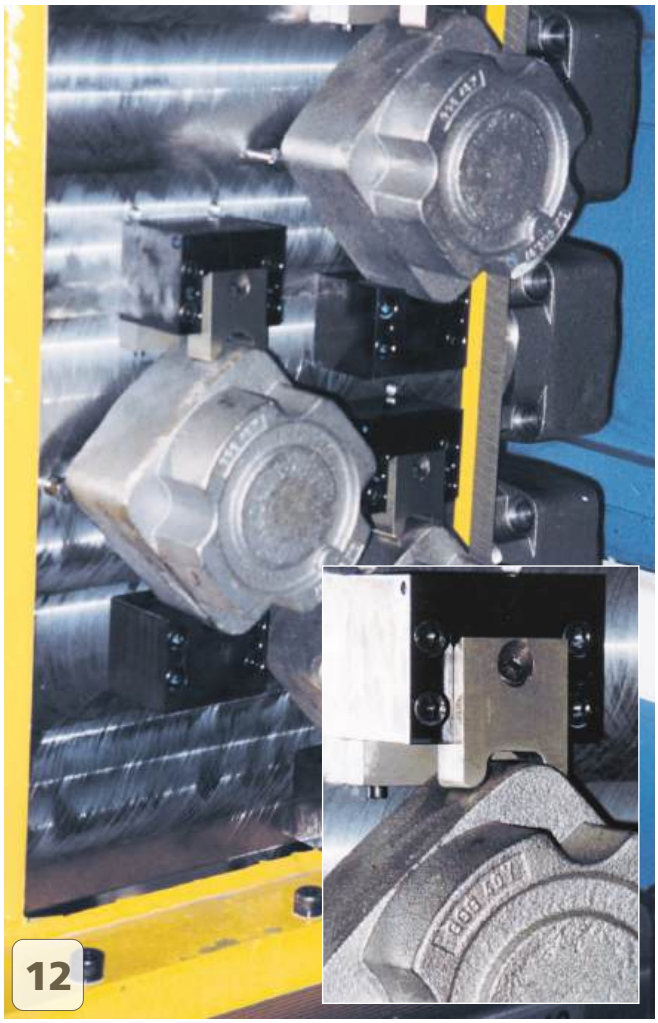


10



11 84 Teile sind gespannt mit Micro Clamp und werden jeweils nachts unbemannt produziert
84 parts are clamped with Micro Clamp and are machined always at right unmanned



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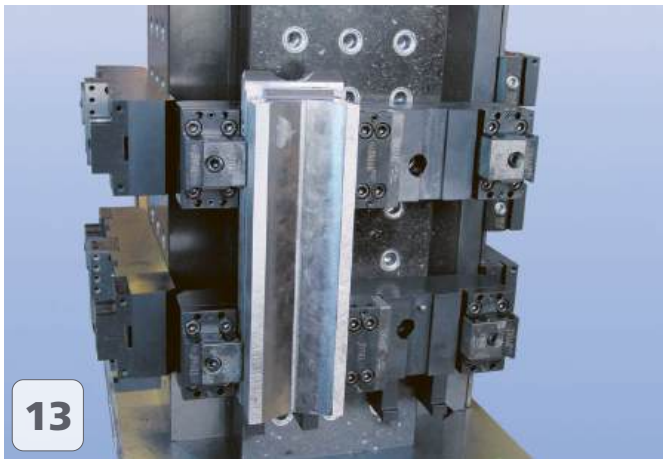

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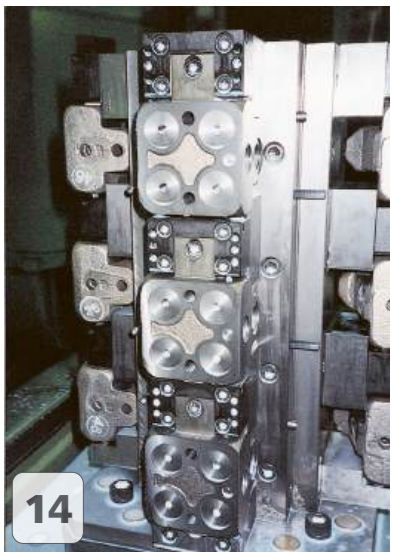

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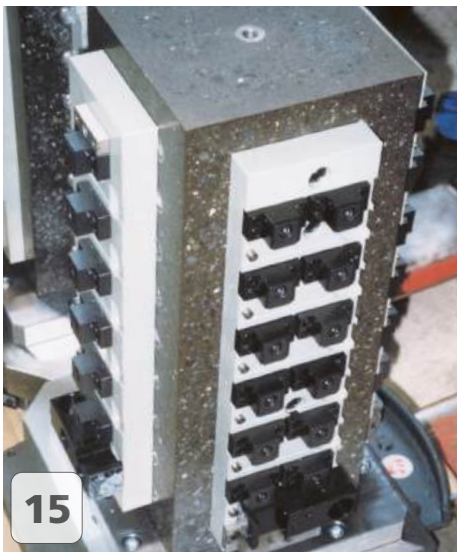

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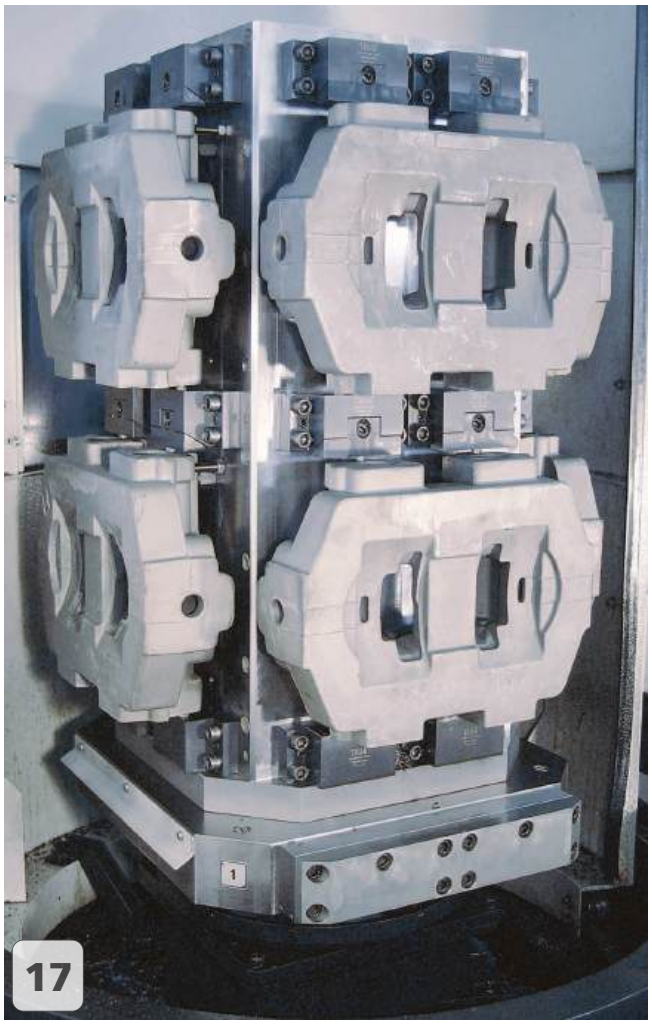
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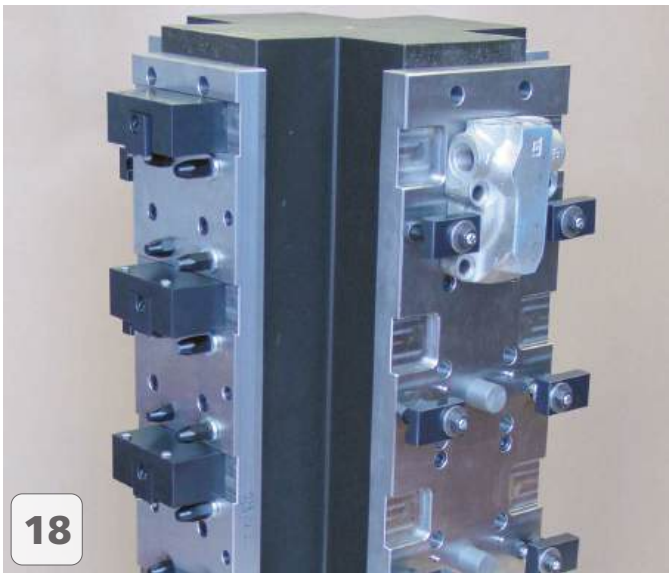
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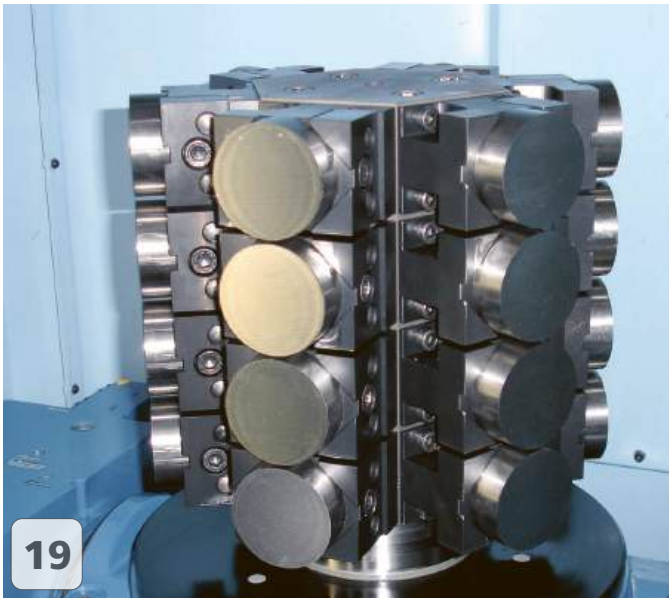

19

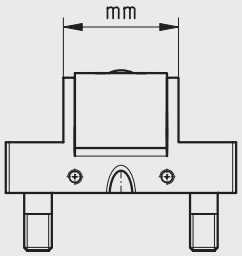

20

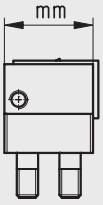
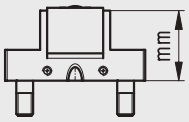

21

System *System*	
A	Apto Clamp
P	Power Clamp
C	Compact Clamp
M	Micro Clamp
V	Vorrichtungsbaumodule *Workholding modules for dedicated fixtures*

bei Anschlagmodulen *for end module*	
N	nitriergehärtet *nitrated*
D	durchgehärtet *through hardened*
bei Spannmodulen *for vice modules*	
1 2 3	Anzahl Spannbacken *Number of jaws*
-	keine Spannbacke *no clamping jaw*

Modulnutzbreite *Module clamping width*
19 25 26 34 43 48 58 61 68 78 94 125



Modulnutztiefe / -höhe *Module clamping depth or height*	
MS: Tiefe *Depth*	
VS: Höhe *Height*	

M S 1 F 35 N 14 -01

Modultyp *Type of module*	
A	Anschlagmodul *End module*
S	Spannmodul *Clamping module*
T	Trägermodul *Supporting module*
R	Rohling / Rundes Modul *Blank / Round module*
V	Vertikalspannmodul *Vertical clamp*

Anschlagfläche der Module *Datum face*	
F	Anschlagfläche glatt *Datum face flat*
R	Anschlagfläche geriffelt *Datum face double serrated*
D	eine Seite glatt, eine Seite geriffelt *one face flat, one face double serrated*
G	Anschlagfläche gerillt *Datum face serrated*
X	spezielle Ausführung *special execution*
5X	5axes Clamp
P	prägen *stamping*

Backenhub *Stroke of clamping jaw*	
N	Niederzug *Pull down*
L	linear / parallel *linear / parallel*
-	ohne Spannbacke *no clamping jaw*

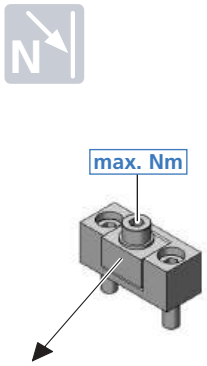
Spannbackentyp *Type of clamping jaw*	
B01 - B151	Spannbacke *Clamping jaw*
-01 - -150	Modul ohne Spannbacken *Module without clamping jaw*

ACHTUNG / CAUTION

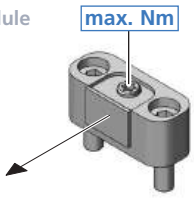
WICHTIG: Die im Micro Clamp Kapitel angegebenen Drehmomente sind die absoluten Maximalwerte. Über die Spannkräfte gibt die untenstehende Tabelle Auskunft.

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



Linear-Spannmodule
Linear module



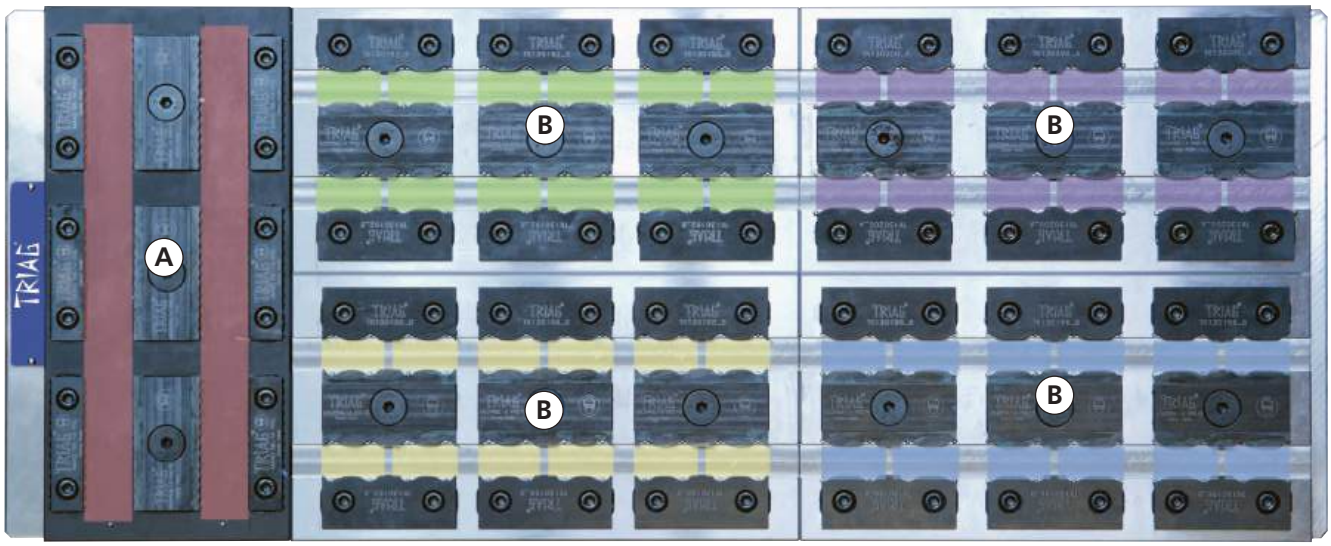
MC-Module	Schraube *Screw*	Drehmoment *Torque*		Spannkraft *Workholding force*		
		Nm	(lb-ft)	~daN	~(lb)	~t
MR1F 30N23 -07	M5	10	7,4	= 1020	2250	1,02
MS1F 22N40 -07		10	7,4	= 1020	2250	1,02
MS1F 24N22 -07		10	7,4	= 1020	2250	1,02
MS1R/F 25N25 -13	M6	15	11	= 1520	3350	1,52
MS1F 35N14 -01	M5	10	7,4	= 1020	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
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



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
	25	18,4	= 2100	4630	2,10
M10	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

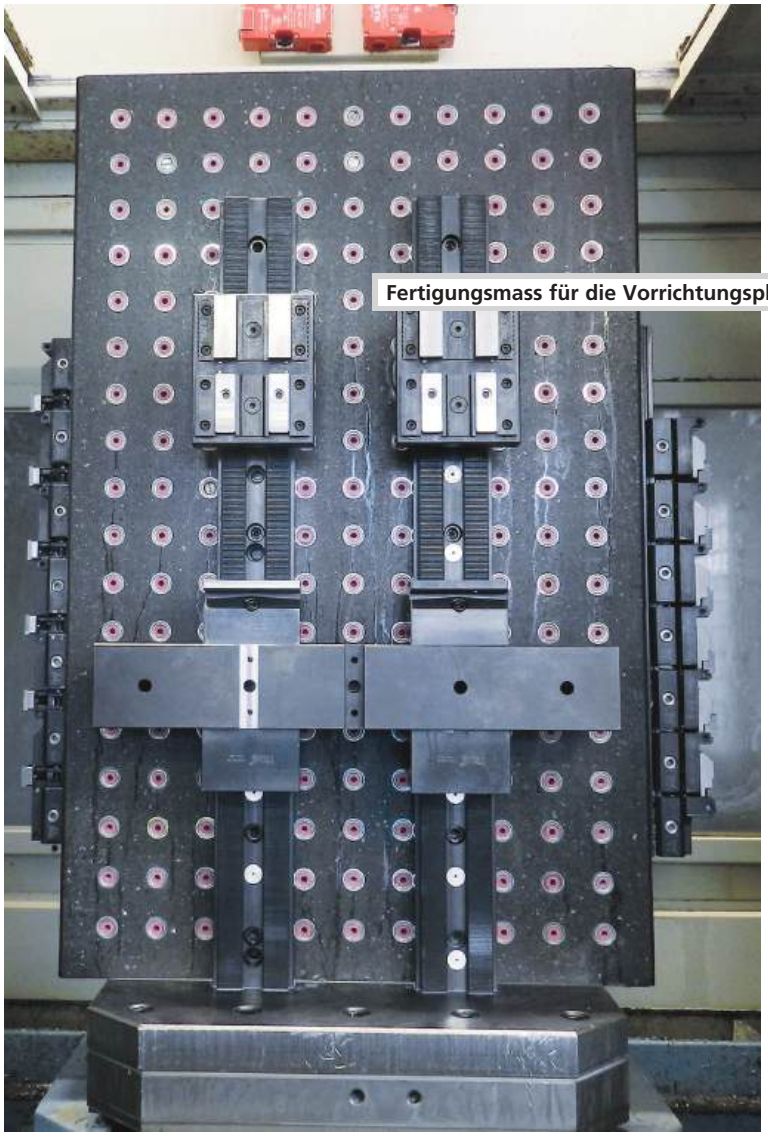
Keilspanner in weicher Ausführung zum Bearbeiten von Formbacken.

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

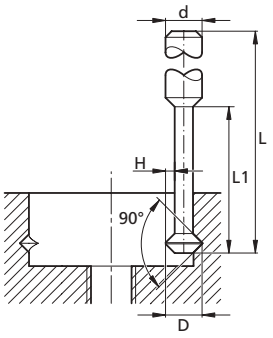


Fertigungsmass für die Vorrichtungsplatte: / Machining data for the fixture plate: p. 175

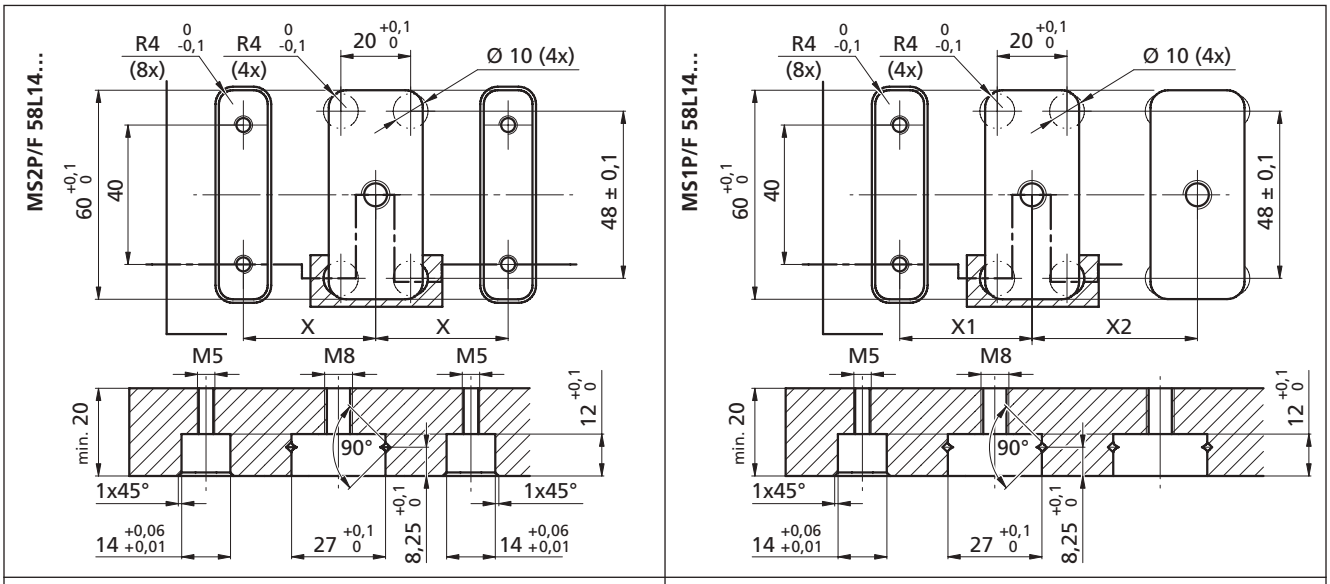
Fräser / *Milling cutter*
Der abgebildete Fräser benötigt man für die Herstellung der «Kerben».
Siehe Fertigungsmasse für die Vorrichtungsplatte Seite **175**.

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



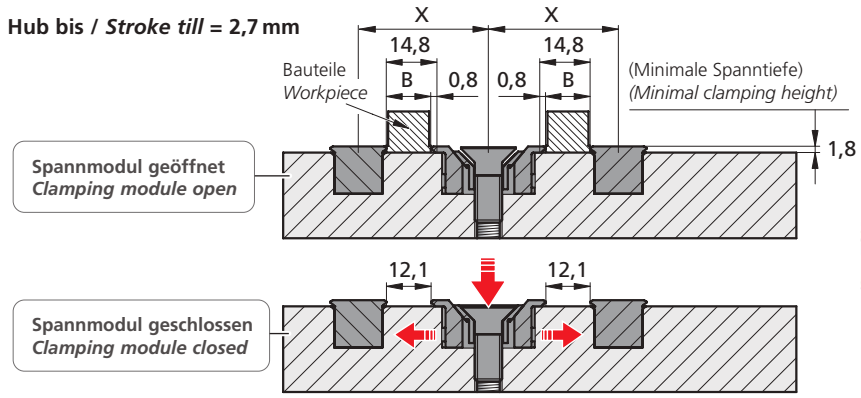
Fertigungsmasse für die Vorrichtungsplatte / *Machining data for the fixture plate*

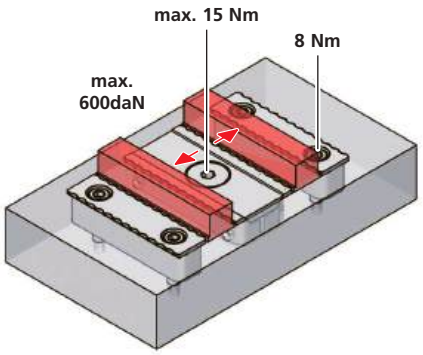


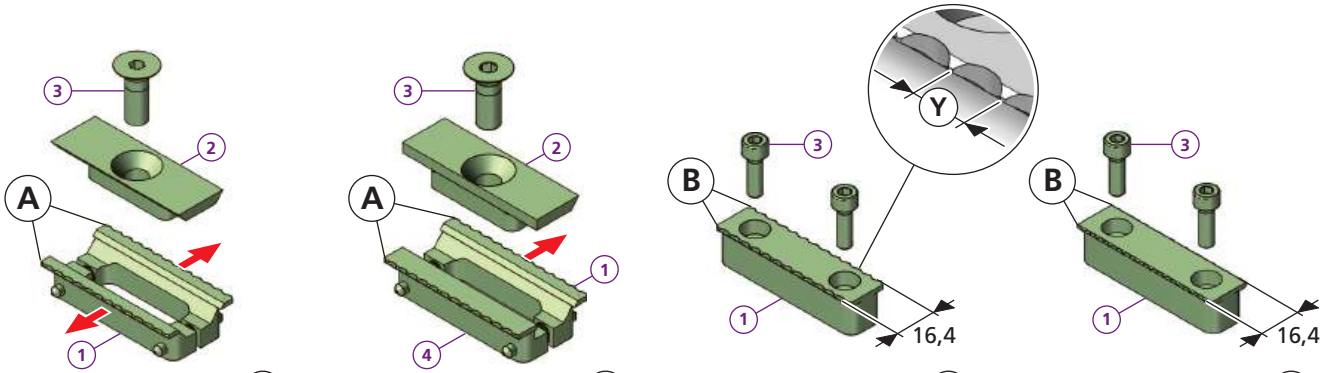
Mass **X (X1) = B + 24 mm** **Beispiel:** Bauteilbreite = 14 mm	***Dimension*** ***X (X1) = B + 24 mm*** ***Example:*** *Width of component part* = 14 mm
Taschenabstand X = 14 + 24 = 38 Das ergibt eine Einlegeluft von 0,8 mm (Hub bis 2,7 mm)	*Distance of pocket* X = 14 + 24 = 38 *This makes a play of 0,8 mm* *(stroke till 2,7 mm)*

Mass **X2 = B + 33,5 mm** **Beispiel:** Bauteilbreite = 14 mm	***Dimension*** ***X2 = B + 33,5 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)	*Distance of pocket* X = 14 + 33,5 = 47,5 *This makes a play of 0,8 mm (stroke till 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

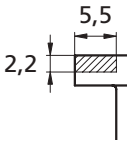
1	1x	TK120225
2	1x	TK120721
3	1x	**M8X22DIN7991**
4	1x	TK120720
Y		4,7 mm
i		57HRC
kg		~0,12

MAND58-14PRG

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

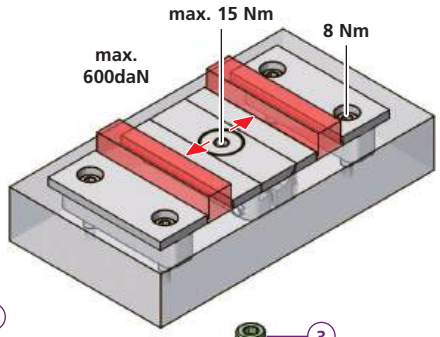
MAND58-14PRG6

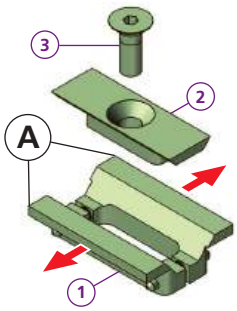
1	1x	TB150282
3	2x	**M5X16ISO4762**
Y		6,0 mm
i		57HRC
kg		~0,08



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

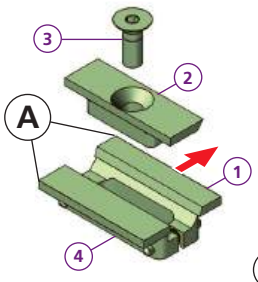




MS2F58L14W251

1	2x	TK120531
2	1x	TK120227
3	1x	**M8X22DIN7991**

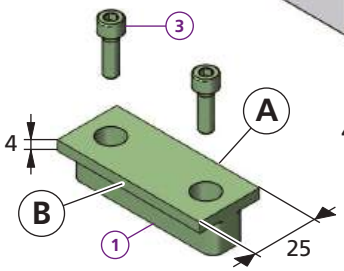
i *
kg ~0,12



MS1F58L14W251

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

i *
kg ~0,12



MANF58-14W25

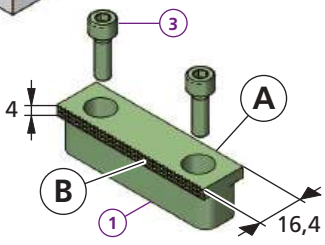
1	1x	TK120529
3	2x	**M5X16ISO4762**

i *

MANF58-14F25

1	1x	TK150033
3	2x	**M5X16ISO4762**

i HV700 x 0,2mm
kg ~0,11

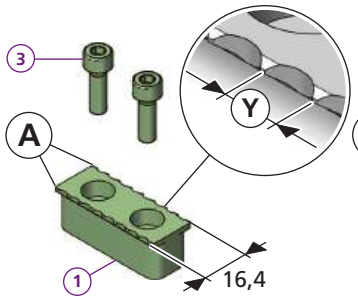


MANF58-14RF

1	1x	TB160563
3	2x	**M5X16ISO4762**

i HV700 x 0,2mm
kg ~0,11

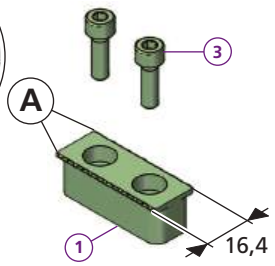
p. 175 **Fertigungsmass für die Vorrichtungsplatte: / Machining data for the fixture plate:**



MAND38-14PRG

1	1x	TK150234
3	2x	**M5X16ISO4762**
Y		4,7 mm

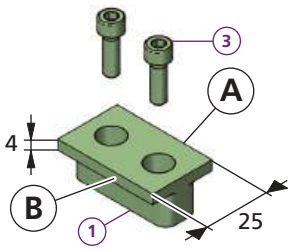
i 57HRC
kg ~0,08



MAND38-14PRG6

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

i 57HRC
kg ~0,08



MANF38-14W25

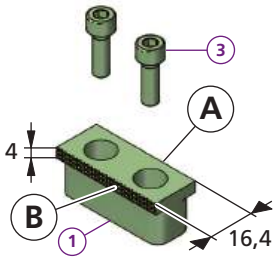
1	1x	TK160554
3	2x	**M5X16ISO4762**

i *

MANF38-14F25

1	1x	TK160553
3	2x	**M5X16ISO4762**

i HV700 x 0,2mm
kg ~0,08



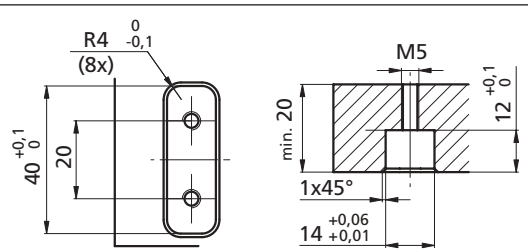
MANF38-14RF

1	1x	TB170062
3	2x	**M5X16ISO4762**

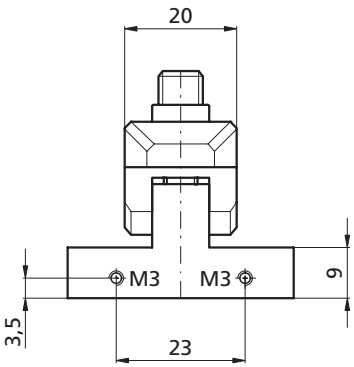
i HV700 x 0,2mm
kg ~0,08

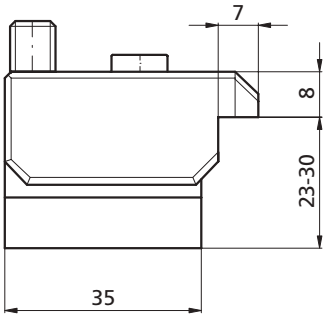
Fertigungsmass für die Vorrichtungsplatte
Machining data for the fixture plate

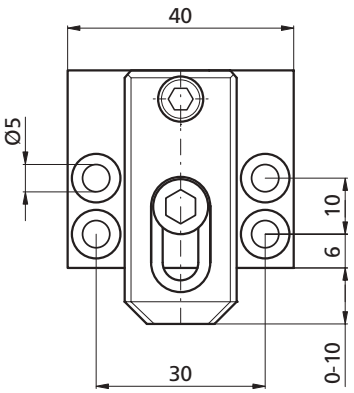
für / *for* TB150234 | TB150283 | TK160554 | TK160553 | TB170062

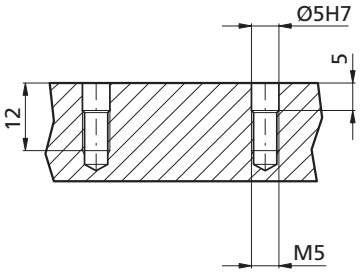


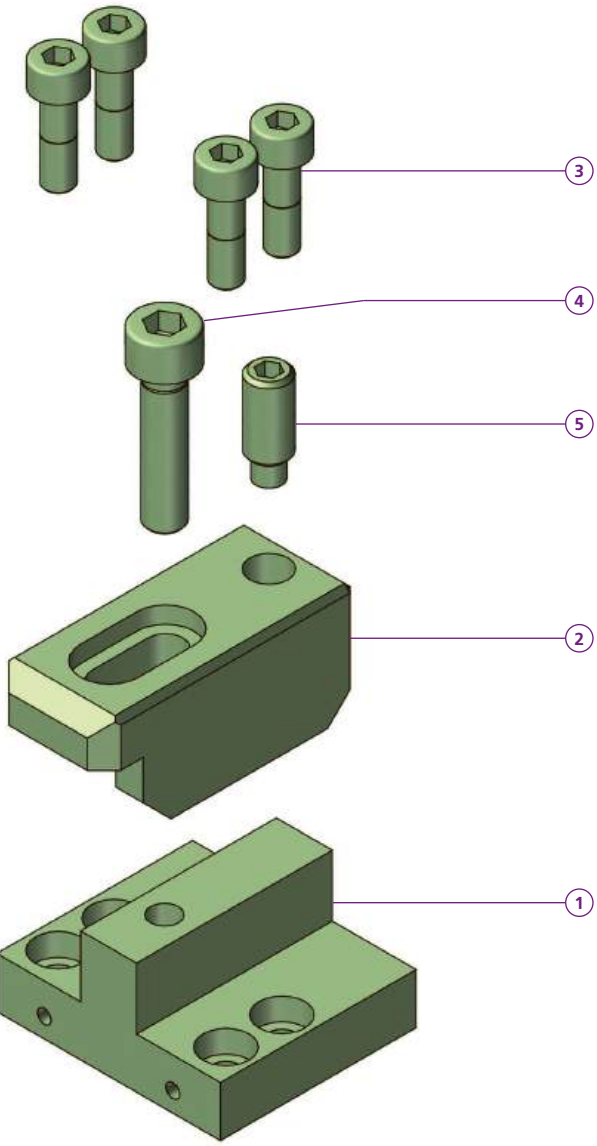
* = weicher *Stahl / soft steel*

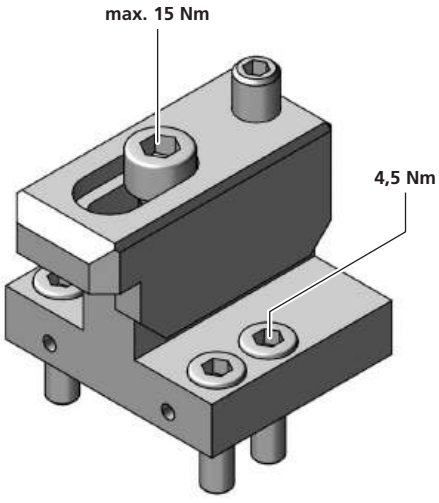






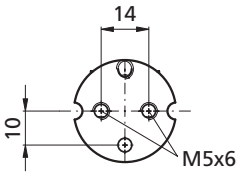


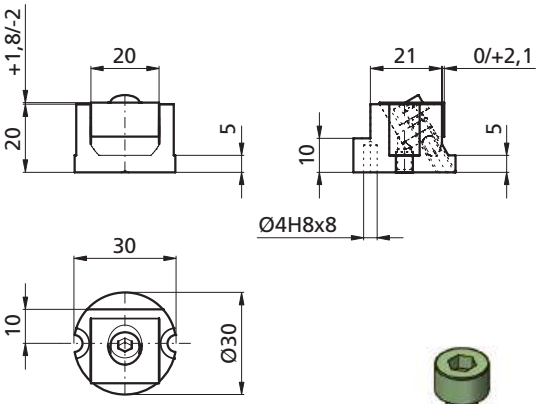




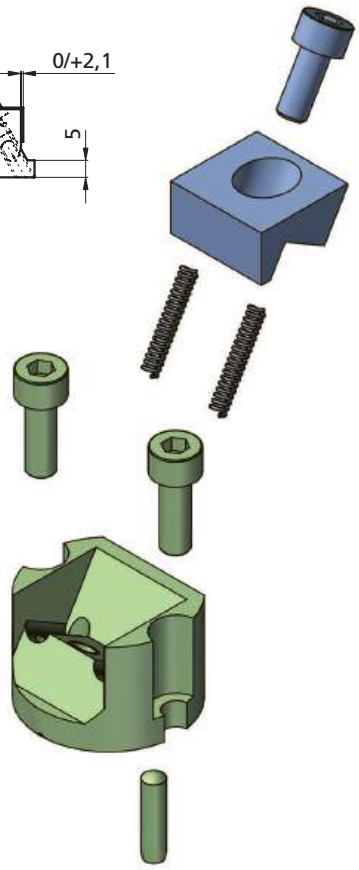
	MV1F20L35BV1	
1	1x	TF140710
2	1x	BV1
3	4x	**MS50**
4	1x	**M6X25ISO4762**
5	1x	M8x20ISO4028
kg		~0,225

Bestellbeispiel / *Ordering example* : MV1F20L35BV1

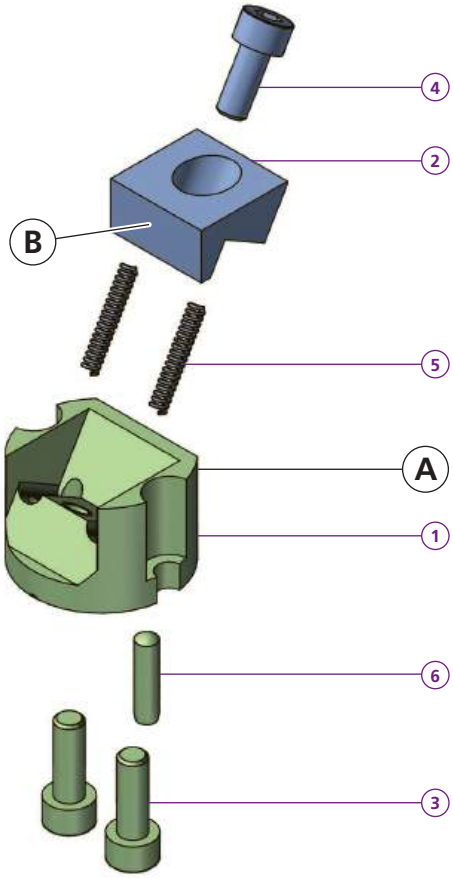


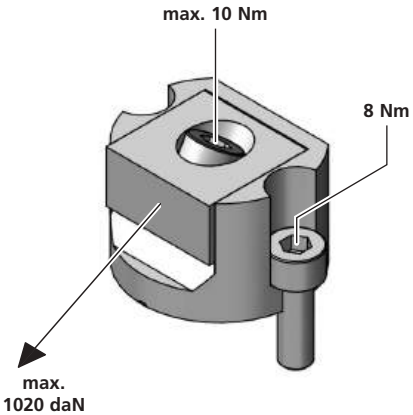


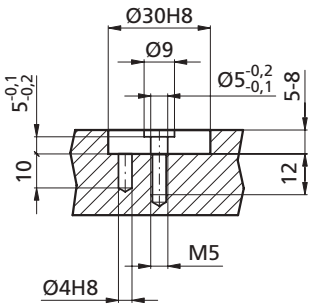
Version 2

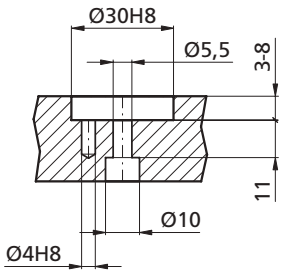


Version 1





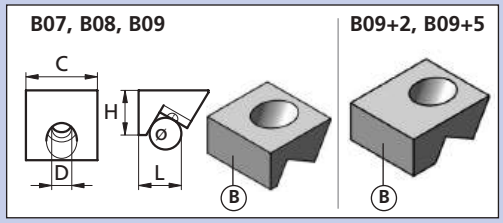




Bestellbeispiel / *Ordering example*: 1x MR1F30N23-07 & 1x B08

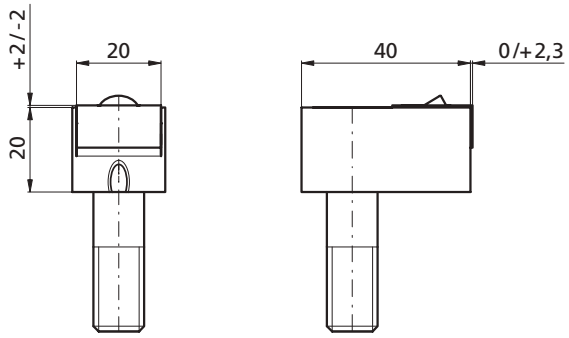
A	MR1F30N23-07
1	1x TF140711
2	1x
3	2x **M5X16ISO4762**
4	1x **M5X12ISO4762**
5	2x **FED03018**
6	1x Ø4x14 DIN 6325
kg	~0,095

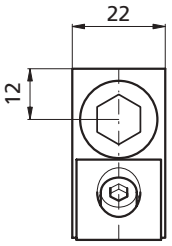
B	B07	B08	B09	B09+2	B09+5
C	20	20	20	20	20
H	10	10	10	10	10
L	9,5	9,5	9,5	11,5	14,5
D	5,5	5,5	5,5	5,5	5,5
ø	6	6	6	6	6
i	HV700 x0,2mm	HV700 x0,2mm	*	*	*
kg	~0,02	~0,02	~0,02	~0,02	~0,02

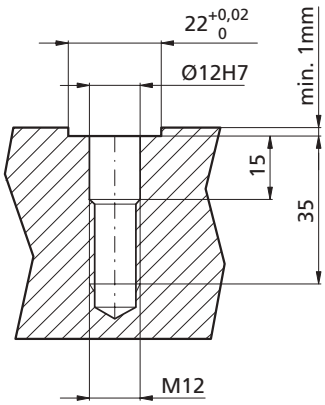


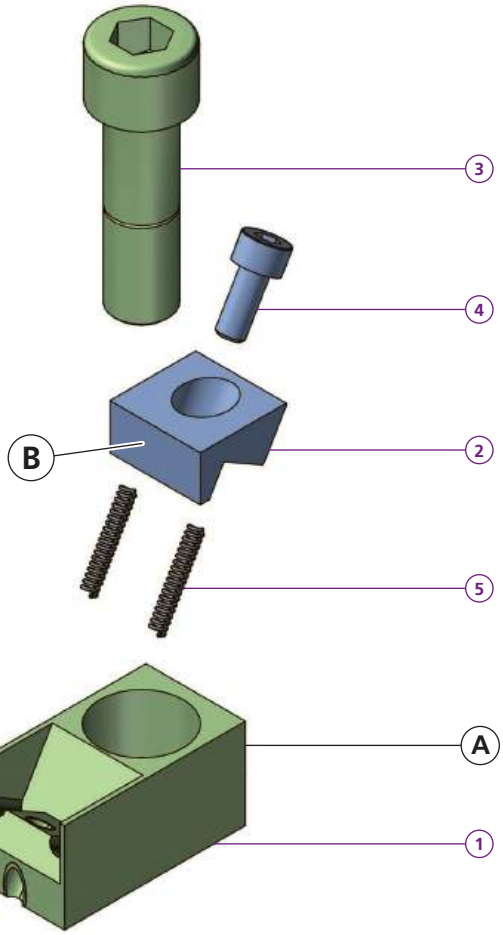
Separat bestellen / *Order separately*

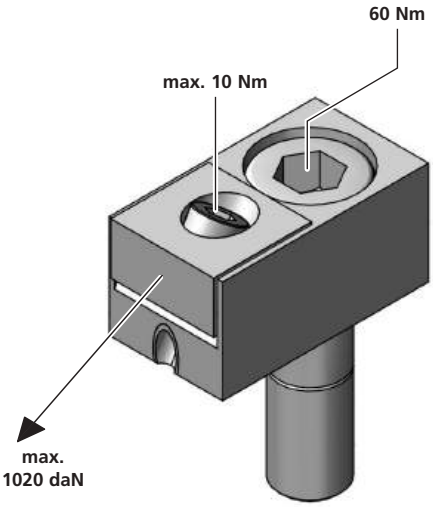
* = weicher *Stahl / soft steel*











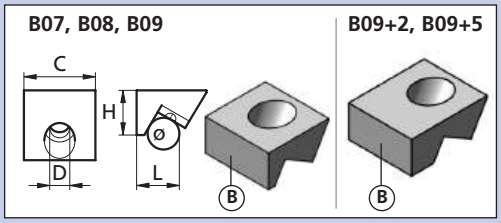
A

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

B

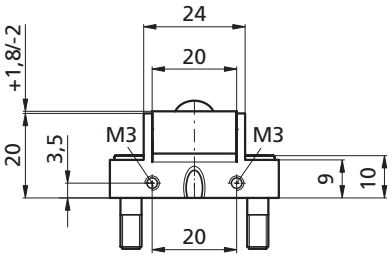
Bestellbeispiel / *Ordering example:* 1x MS1F22N40-07 & 1x B08

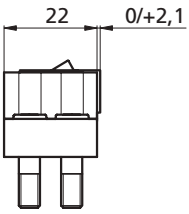
	B07	B08	B09	B09+2	B09+5
C	20	20	20	20	20
H	10	10	10	10	10
L	9,5	9,5	9,5	11,5	14,5
D	5,5	5,5	5,5	5,5	5,5
ø	6	6	6	6	6
i	HV700 x0,2mm	HV700 x0,2mm	*	*	*
kg	~0,02	~0,02	~0,02	~0,02	~0,02

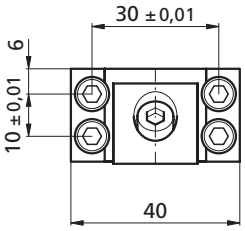


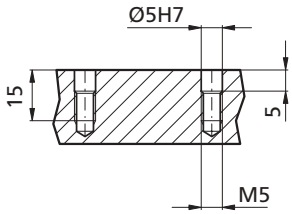
* = weicher *Stahl / soft steel*

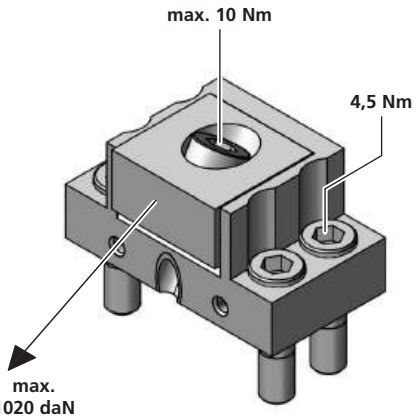
Separat bestellen / *Order separately*









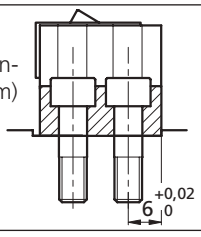


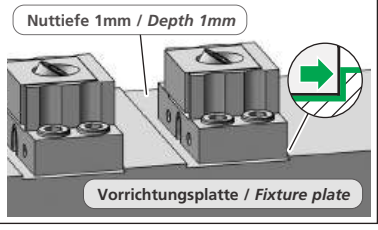
	H	B	N	kg
MCU11037	11	23	2	~0,004
MCU15037	15	23	2	~0,006
MCU18037	18	23	2	~0,008
MCU20037	20	23	2	~0,008
MCU22537	22,5	23	2	~0,008

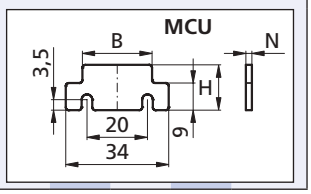
2x **M3X10ISO4762**
2x **M3X6ISO4762**
2x **MCD004**

Achtung: Bei Spannkräften 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

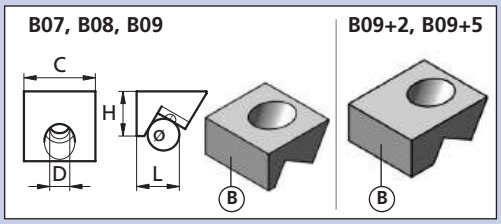
1	1x	TW100172-01
2	1x	
3	4x	**MS50**
4	1x	**M5X12ISO4762**
5	2x	**FED03018**

kg ~0,125



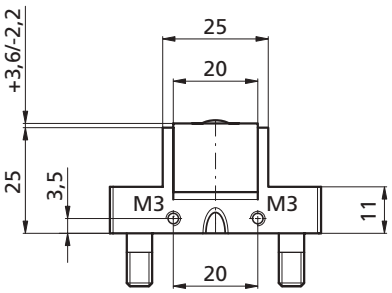
Bestellbeispiel / *Ordering example:* 1x MS1F24N22-07 & 1x B08

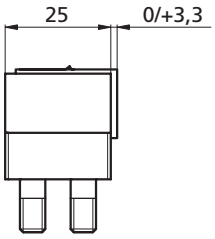
	B07	B08	B09	B09+2	B09+5
C	20	20	20	20	20
H	10	10	10	10	10
L	9,5	9,5	9,5	11,5	14,5
D	5,5	5,5	5,5	5,5	5,5
ø	6	6	6	6	6
i	HV700 x0,2mm	HV700 x0,2mm	*	*	*
kg	~0,02	~0,02	~0,02	~0,02	~0,02

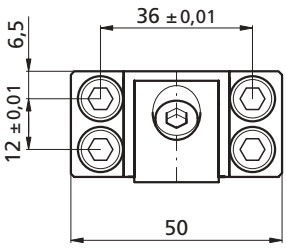


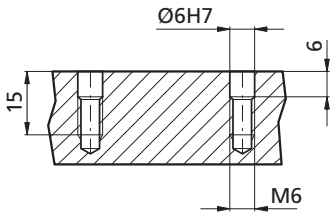
Separat bestellen / *Order separately*

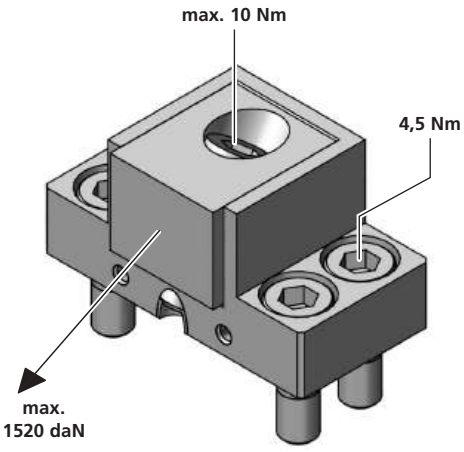
* = weicher *Stahl / soft steel*









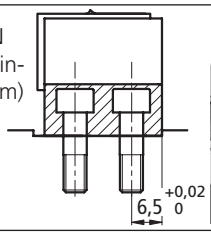


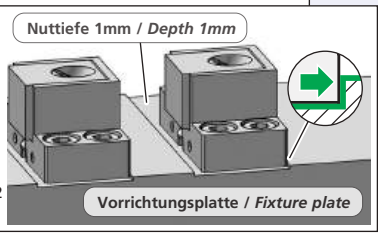
	H	B	N	kg
MCU11037	11	23	2	~0,004
MCU15037	15	23	2	~0,006
MCU18037	18	23	2	~0,008
MCU20037	20	23	2	~0,008
MCU22537	22,5	23	2	~0,008

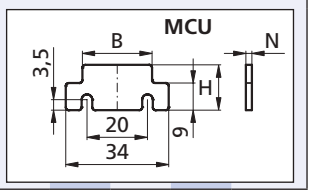
2x **M3X10ISO4762**
2x **M3X6ISO4762**
2x **MCD004**

Achtung: Bei Spannkräften 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)*



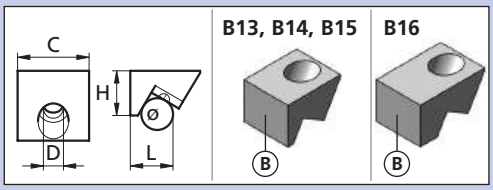




Bestellbeispiel / *Ordering example:* 1x MS1F25N25-13 & 1x B14

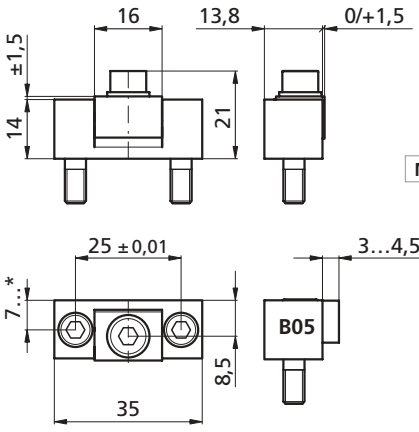
	MS1F25N25-13
1	1x TF140714
	MS1R25N25-13
1	1x TF140715
2	1x
3	4x **MS60**
4	1x **M6X16ISO4762**
5	2x **FED03018**
kg	~0,165

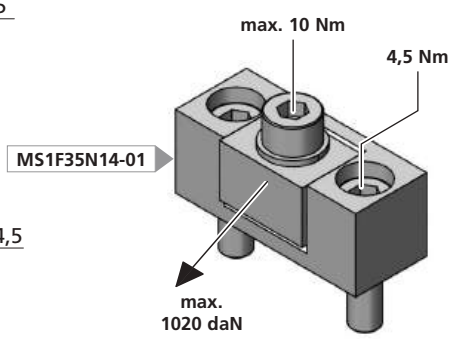
	B13	B14	B15	B16
C	20	20	20	20
H	16	16	16	16
L	13,8	13,8	13,8	19
D	6,5	6,5	6,5	6,5
ø	10	10	10	10
i	HV700 x0,2mm	HV700 x0,2mm	*	*
kg	~0,05	~0,05	~0,05	~0,06

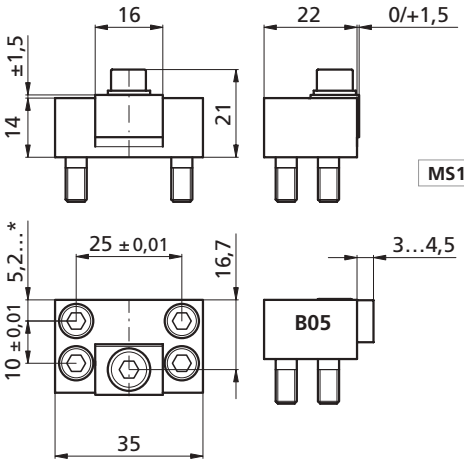


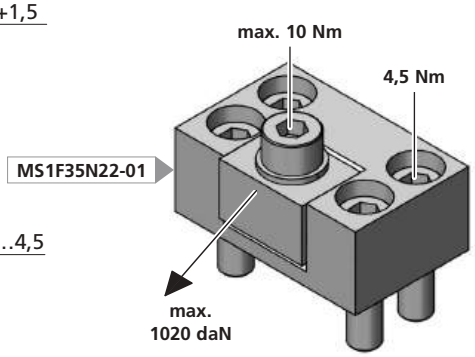
* = weicher *Stahl / soft steel*

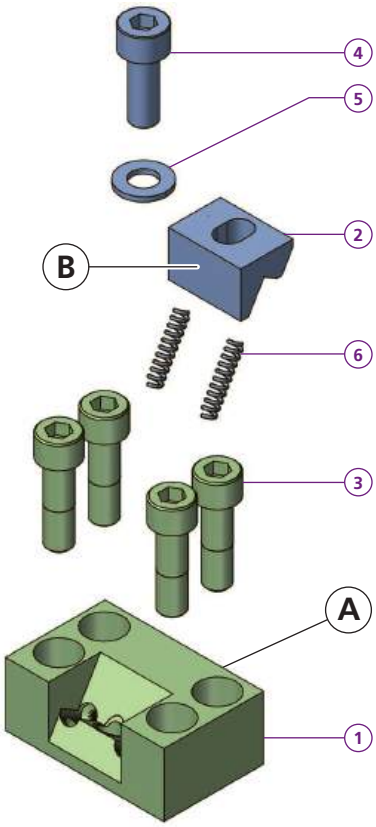
Separat bestellen / *Order separately*

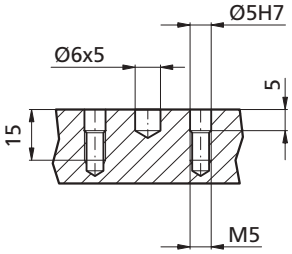






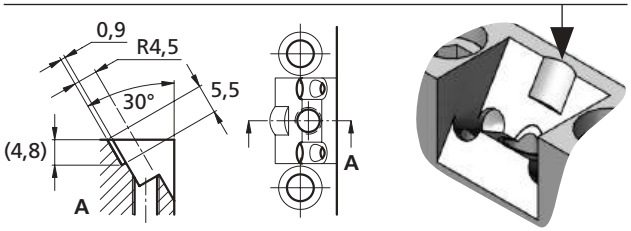






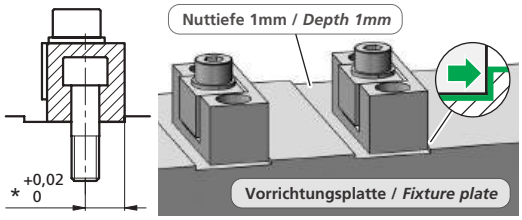
Beim Einsatz der Backe B05(R)
Nachbearbeitung am Modul, falls der gesamte Backenhub (1,1mm bis 1,5mm) benötigt wird.

Jaw B05(R) in use
If a stroke of 1,1mm to 1,5mm is required the module must be machined according to this sketch.



Achtung: Bei Spannkräften 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)*



A

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

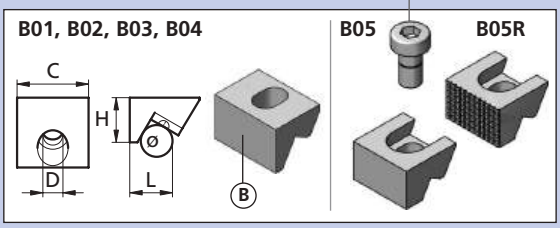
MS1F35N22-01
(1) 1x TF140719
(3) 4x **MS50**
kg ~0,08

B

Bestellbeispiel / *Ordering example:* 1x MS1F35N14-01 & 1x B02

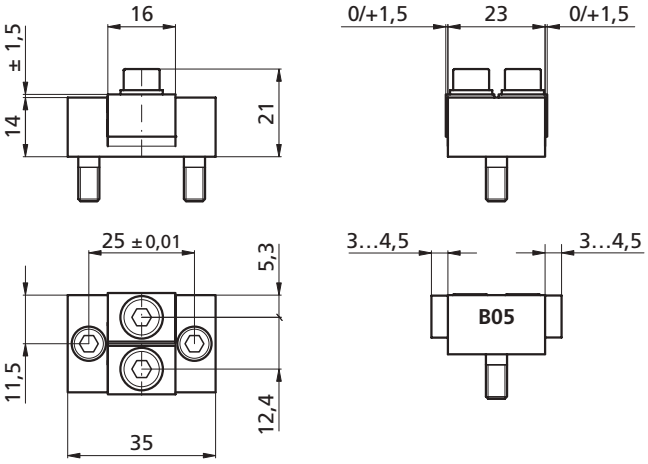
	B01	B02	B03	B04	B05	B05R
(C)	16	16	16	16	16	16
(H)	10	10	10	10	10	10
(L)	8	8	11	8	10	10
(D)	5,5	5,5	5,5	5,5	5,2	5,2
(ø)	4	4	4	4	4	4
(i)	HV700 x0,2mm	HV700 x0,2mm	*	Messing Laiton	HV700 x0,2mm	HV700 x0,2mm
kg	~0,01	~0,01	~0,014	~0,012	~0,014	~0,014

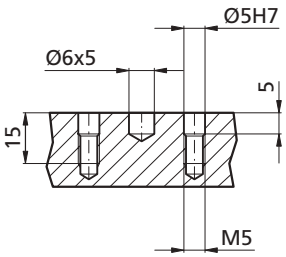
M5X10DIN6912

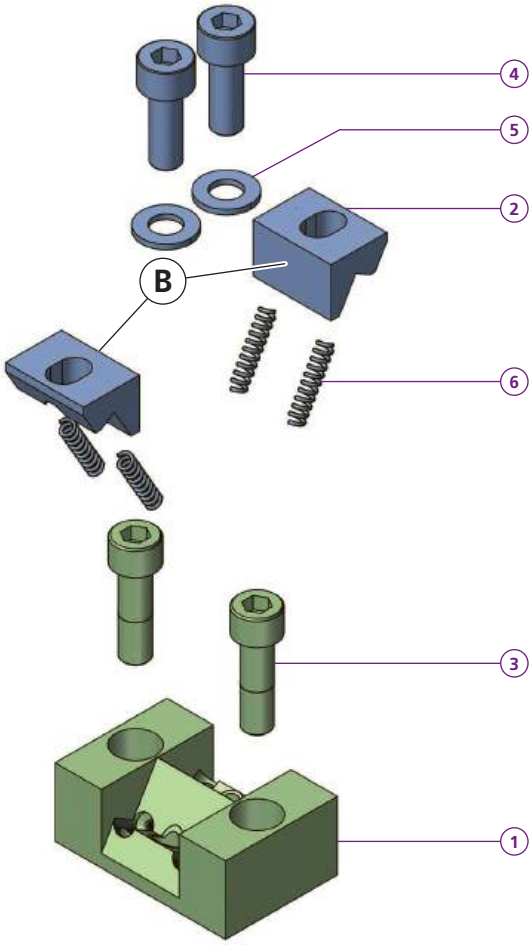


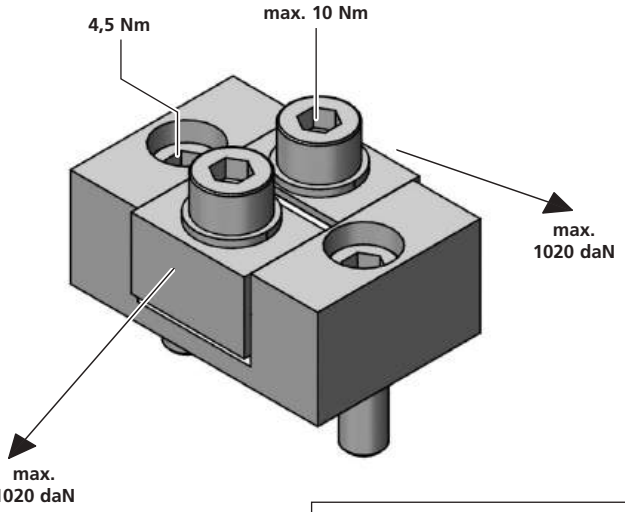
Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel*



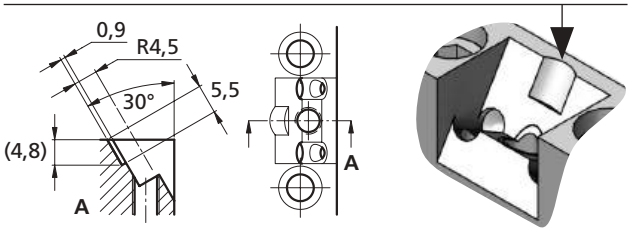






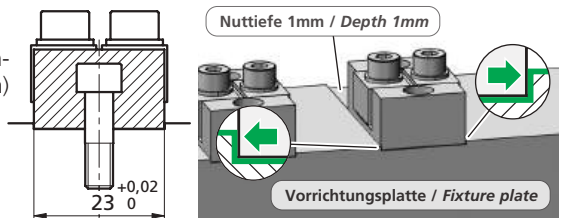
Beim Einsatz der Backe B05(R)
Nachbearbeitung am Modul, falls der gesamte Backenhub (1,1mm bis 1,5mm) benötigt wird.

Jaw B05(R) in use
If a stroke of 1,1mm to 1,5mm is required the module must be machined according to this sketch.



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

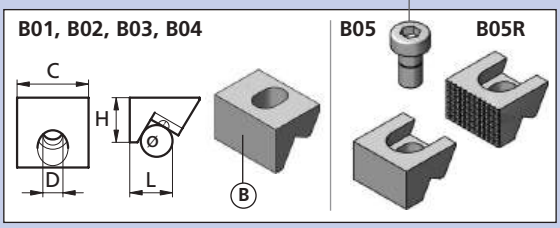
Remark: *Using forces higher than 400 daN, clamps must be mounted into a slot (depth minimum 1mm)*



Bestellbeispiel / *Ordering example:* **1x** MS2X35N23-01 **&** 2x B02

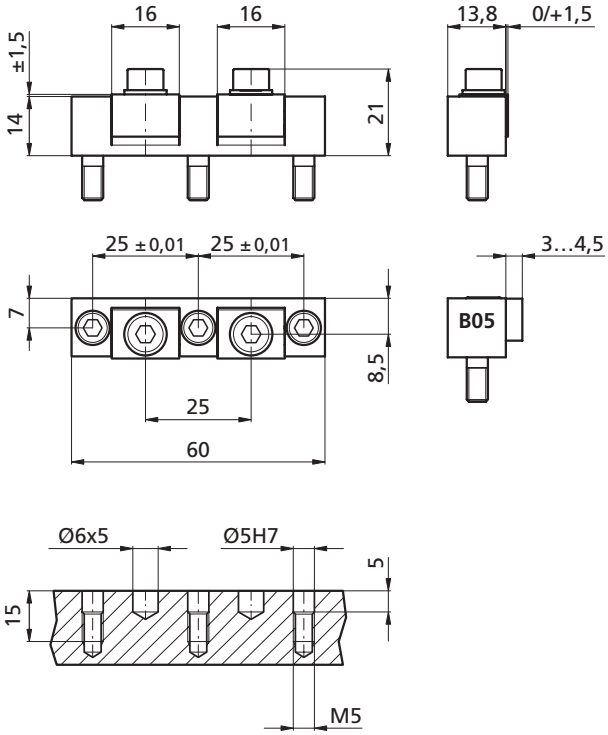
MS2X35N23-01		B01	B02	B03	B04	B05	B05R
1	1x TF140720						
2	2x						
3	2x **M5S0**						
4	2x **M5X14ISO4762**						
5	2x 5x10x1DIN125A						
6	4x **FED02813**						
C		16	16	16	16	16	16
H		10	10	10	10	10	10
L		8	8	11	8	10	10
D		5,5	5,5	5,5	5,5	5,2	5,2
ø		4	4	4	4	4	4
i		HV700	HV700	*	Messing	HV700	HV700
		x0,2mm	x0,2mm		Laiton	x0,2mm	x0,2mm
kg	~0,085	~0,01	~0,01	~0,014	~0,012	~0,014	~0,014

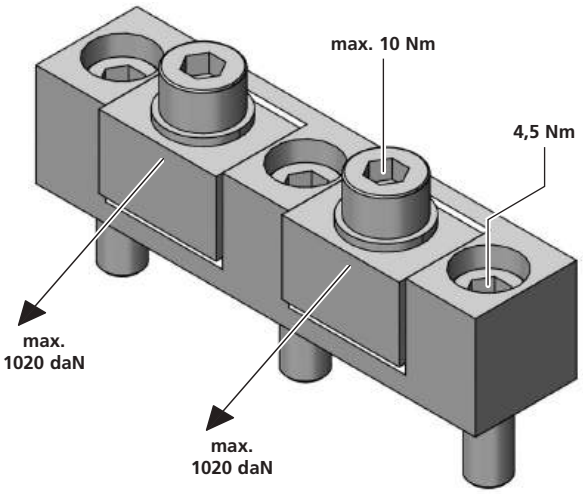
M5X10DIN6912

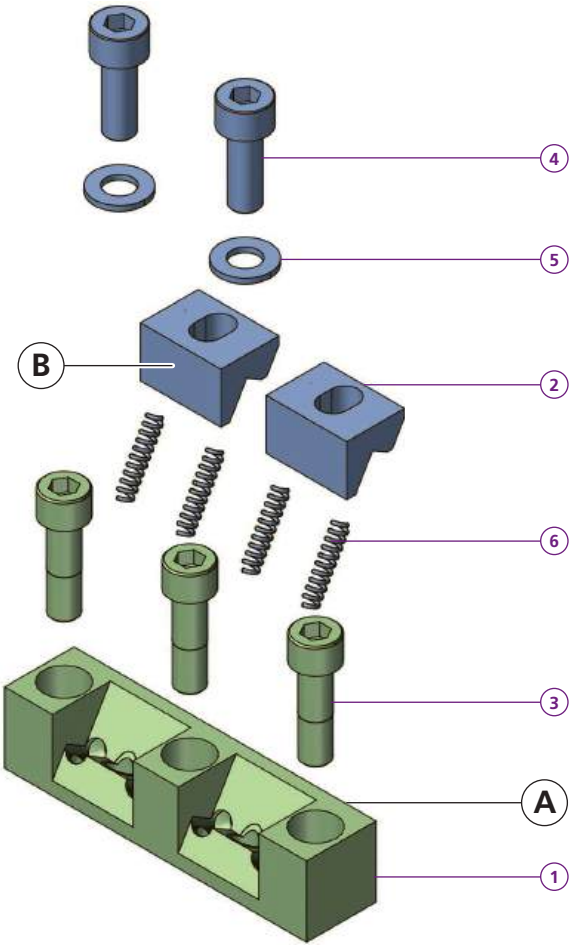


* = weicher *Stahl / soft steel*

Separat bestellen / *Order separately*

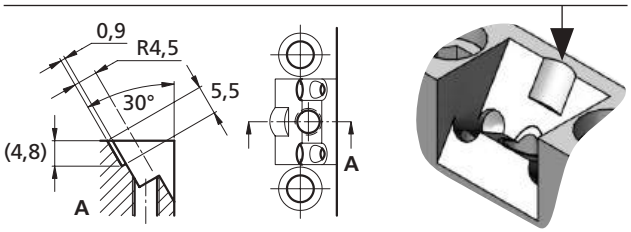






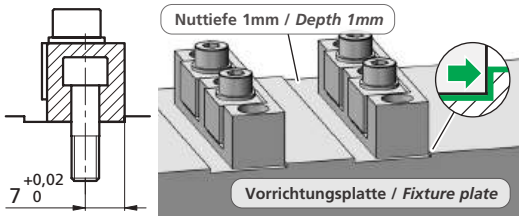
Beim Einsatz der Backe B05(R)
Nachbearbeitung am Modul, falls der gesamte Backenhub (1,1mm bis 1,5mm) benötigt wird.

Jaw B05(R) in use
If a stroke of 1,1mm to 1,5mm is required the module must be machined according to this sketch.



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

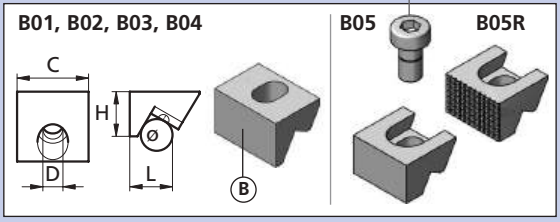
Remark: *Using forces higher than 400 daN, clamps must be mounted into a slot (depth minimum 1mm)*



Bestellbeispiel / *Ordering example:* **1x MS2F60N14-01 & 2x B02**

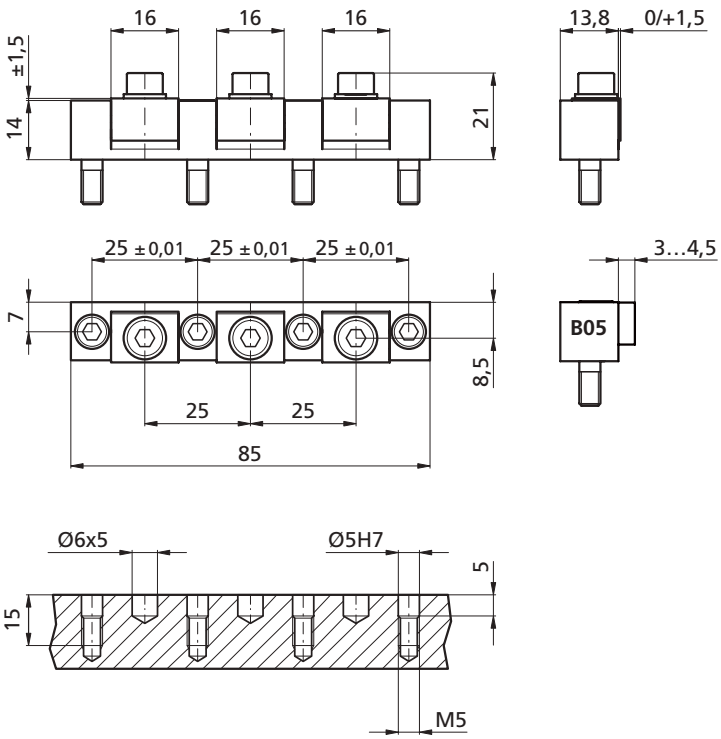
	MS2F60N14-01		B01	B02	B03	B04	B05	B05R
1	1x	TF140721						
2	2x							
3	3x	**MS50**						
4	2x	**M5X14ISO4762**						
5	2x	5x10x1DIN125A						
6	4x	**FED02813**						
C			16	16	16	16	16	16
H			10	10	10	10	10	10
L			8	8	11	8	10	10
D			5,5	5,5	5,5	5,5	5,2	5,2
ø			4	4	4	4	4	4
i			HV700	HV700	*	Messing	HV700	HV700
			x0,2mm	x0,2mm		Laiton	x0,2mm	x0,2mm
kg		~0,09	~0,01	~0,01	~0,014	~0,012	~0,014	~0,014

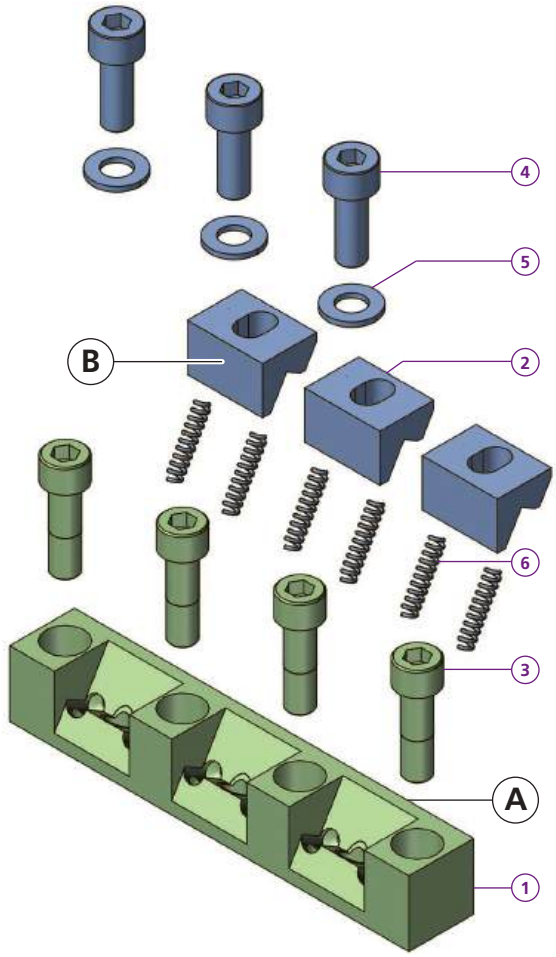
M5X10DIN6912

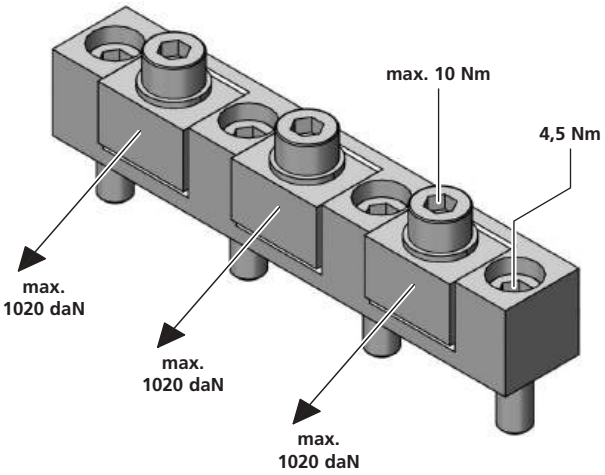


Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel*

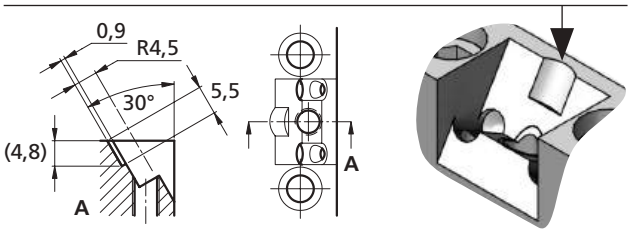






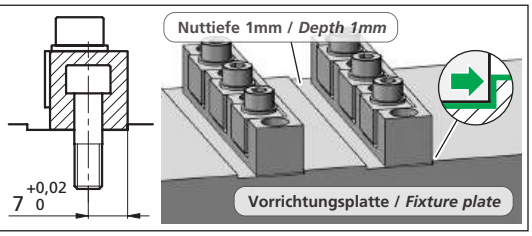
Beim Einsatz der Backe B05(R)
Nachbearbeitung am Modul, falls der gesamte Backenhub (1,1mm bis 1,5mm) benötigt wird.

Jaw B05(R) in use
If a stroke of 1,1mm to 1,5mm is required the module must be machined according to this sketch.



Achtung: Bei Spannkräften 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)*

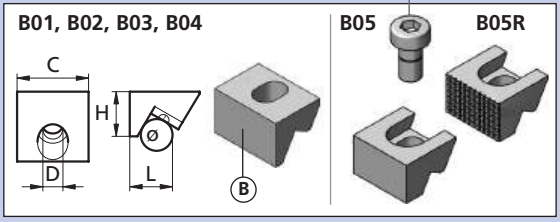


Bestellbeispiel / *Ordering example:* 1x MS3F85N14-01 & 3x B02

MS3F85N14-01		
1	1x	TH160579
2	3x	
3	4x	**MS50**
4	3x	**M5X14ISO4762**
5	3x	5x10x1DIN125A
6	6x	**FED02813**
kg		~0,125

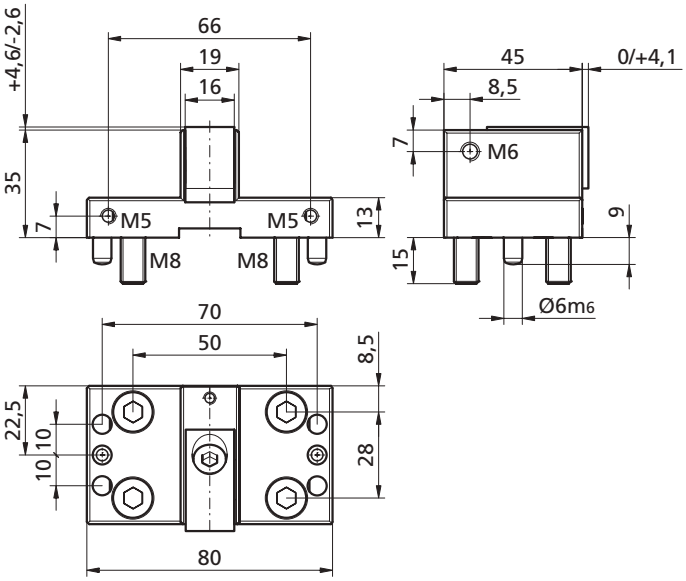
	B01	B02	B03	B04	B05	B05R
C	16	16	16	16	16	16
H	10	10	10	10	10	10
L	8	8	11	8	10	10
D	5,5	5,5	5,5	5,5	5,2	5,2
ø	4	4	4	4	4	4
i	HV700 x0,2mm	HV700 x0,2mm	*	Messing Laiton	HV700 x0,2mm	HV700 x0,2mm
kg	~0,01	~0,01	~0,014	~0,012	~0,014	~0,014

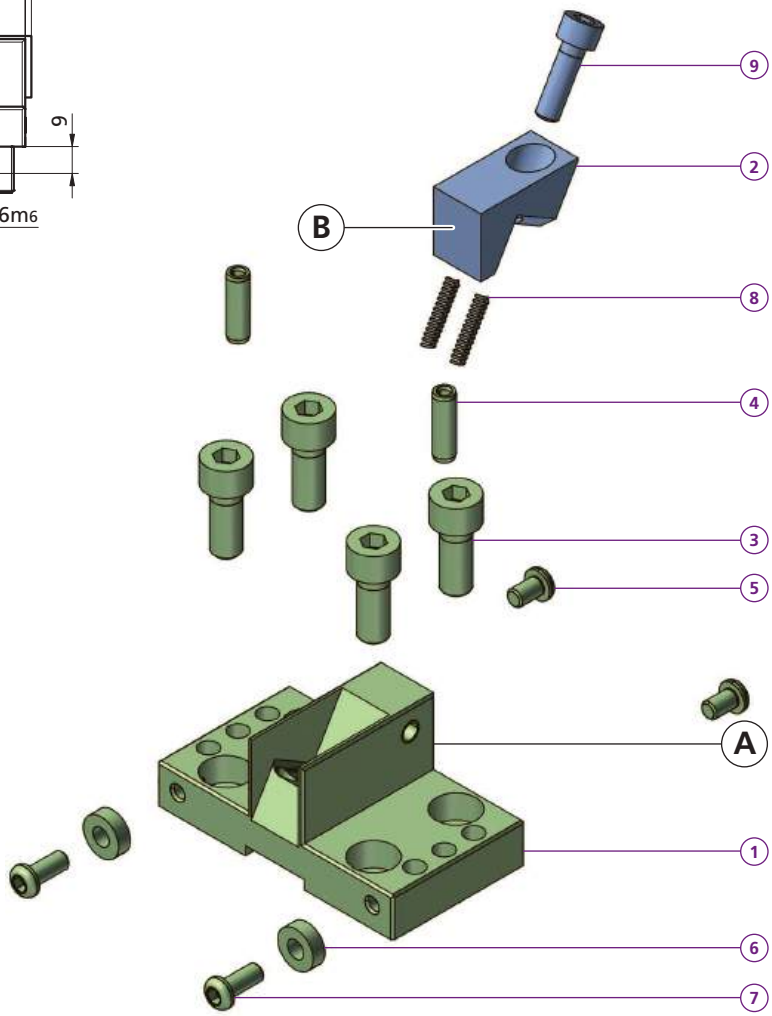
M5X10DIN6912

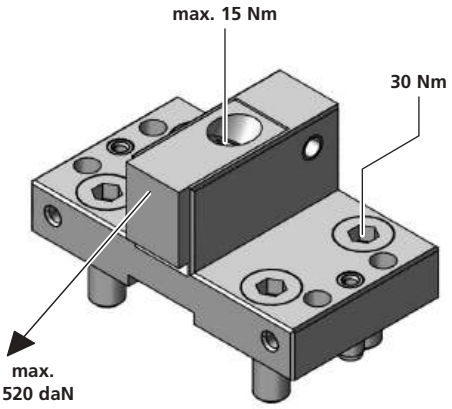


* = weicher *Stahl / soft steel*

Separat bestellen / *Order separately*



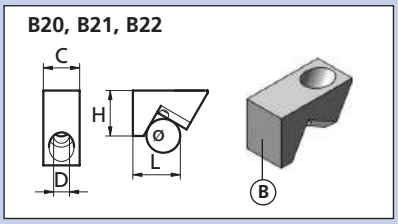




	VS1F19N35-20	
1	1x	TF150029
	VS1R19N35-20	
1	1x	TF140723
2	1x	
3	4x	**M8X20ISO4762**
4	2x	**CCBO0802**
5	2x	**M5X8ISO7380**
6	2x	**CCD004**
7	2x	**M5X12ISO7380**
8	2x	**FED0418**
9	1x	**M6X20ISO4762**
kg		~0,505

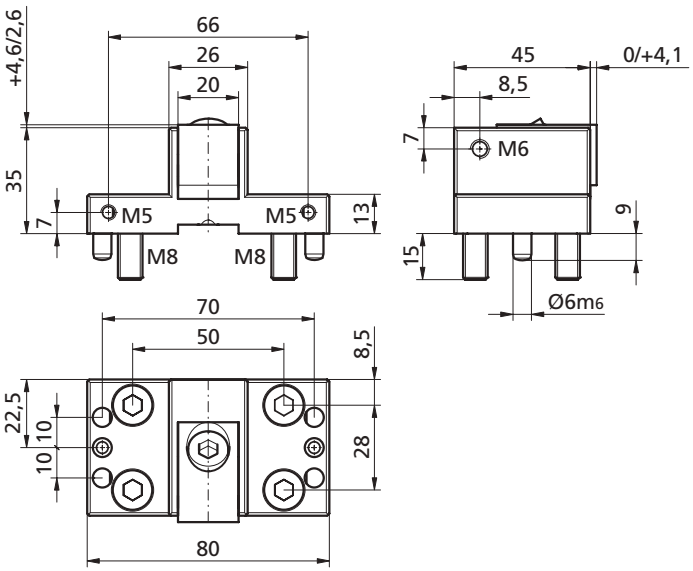
Bestellbeispiel / *Ordering example:* 1x VS1R19N35-20 & 1x B21

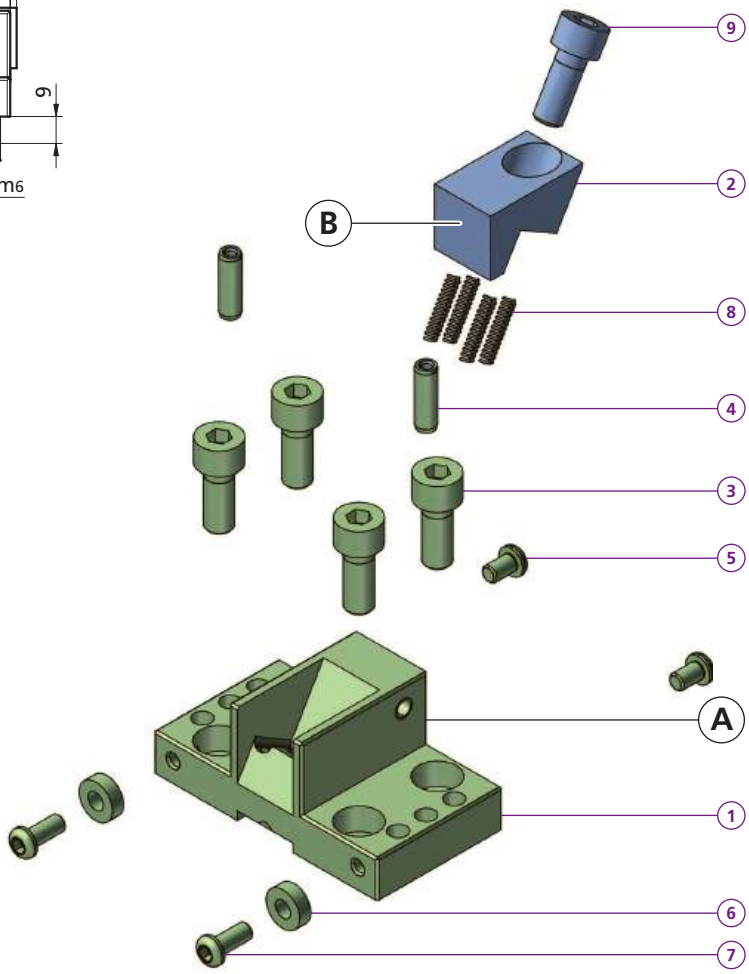
	B20	B21	B22
C	16	16	16
H	20	20	20
L	19	19	19
D	6,5	6,5	6,5
ø	12	12	12
i	HV700 x0,2mm	HV700 x0,2mm	*
kg	~0,011	~0,011	~0,011

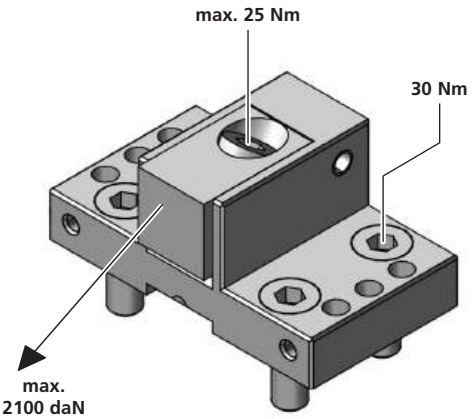


Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel*







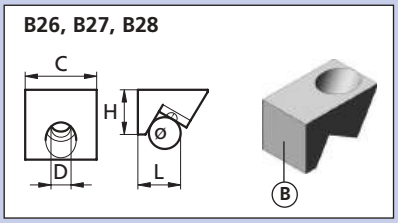
A

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

B

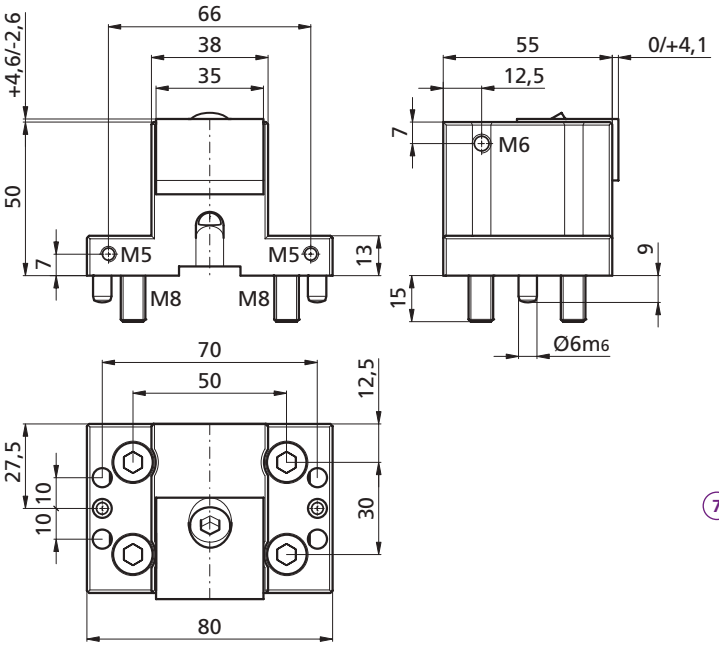
Bestellbeispiel / *Ordering example:* 1x VS1R26N35-26 & 1x B27

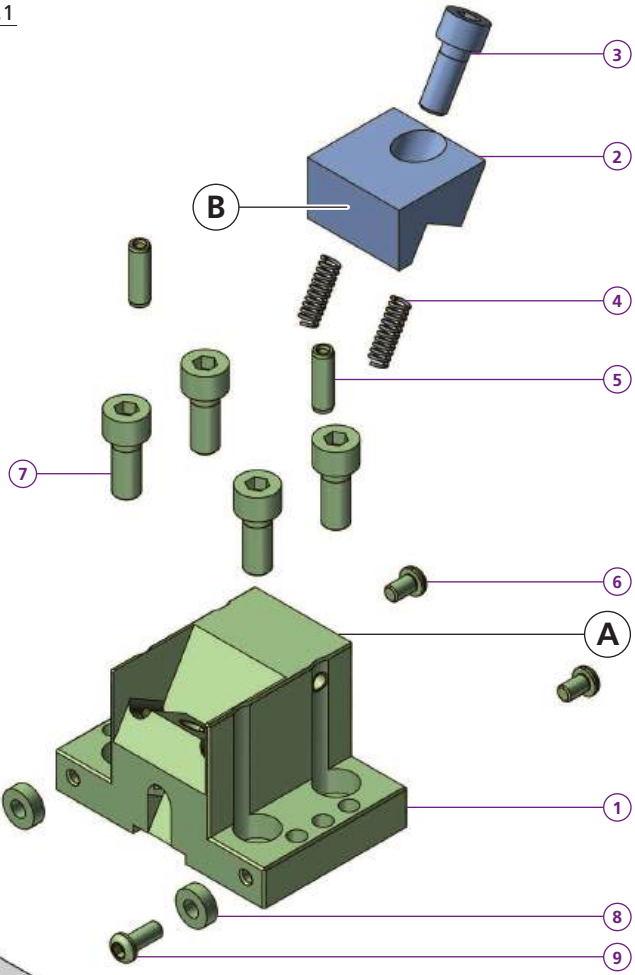
	B26	B27	B28
C	20	20	20
H	20	20	20
L	19	19	19
D	9	9	9
ø	12	12	12
i	HV700 x0,2mm	HV700 x0,2mm	*
kg	~0,064	~0,064	~0,064

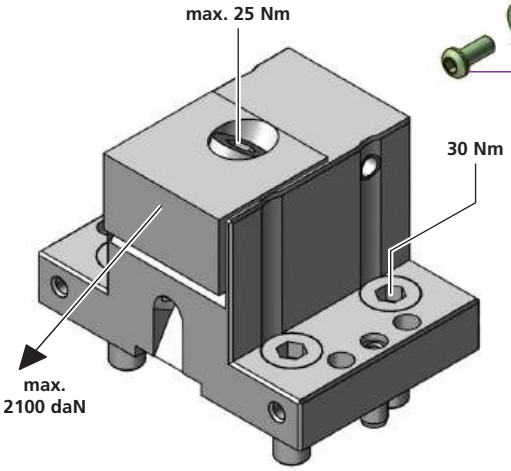


* = weicher *Stahl / soft steel*

Separat bestellen / *Order separately*







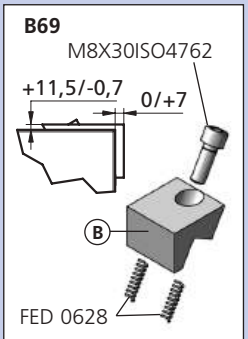
A

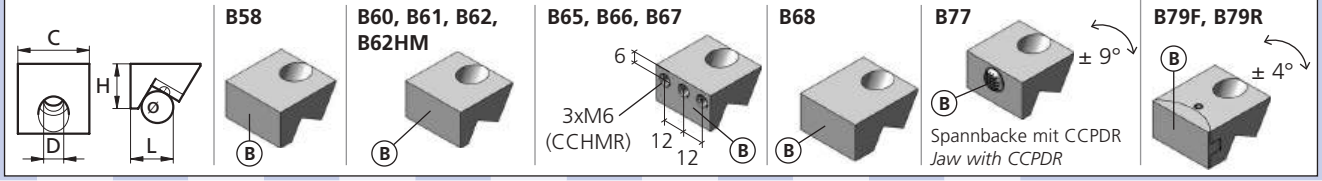
VS1R38N50-60		
1	1x	TF140726
2	1x	
3	1x	**M8X20ISO4762**
4	2x	**FED0618**
5	2x	**CCBO0802**
6	2x	**M5X8ISO7380**
7	4x	**M8X20ISO4762**
8	2x	**CCD004**
9	2x	**M5X12ISO7380**
kg		~1,01

B

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

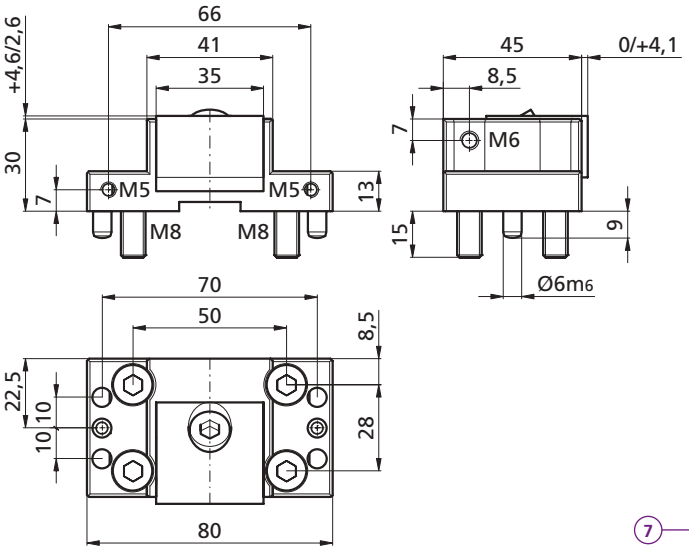
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B69	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	25	20	20	20
L	26	19	19	19	19	19	19	24	26	22	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700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

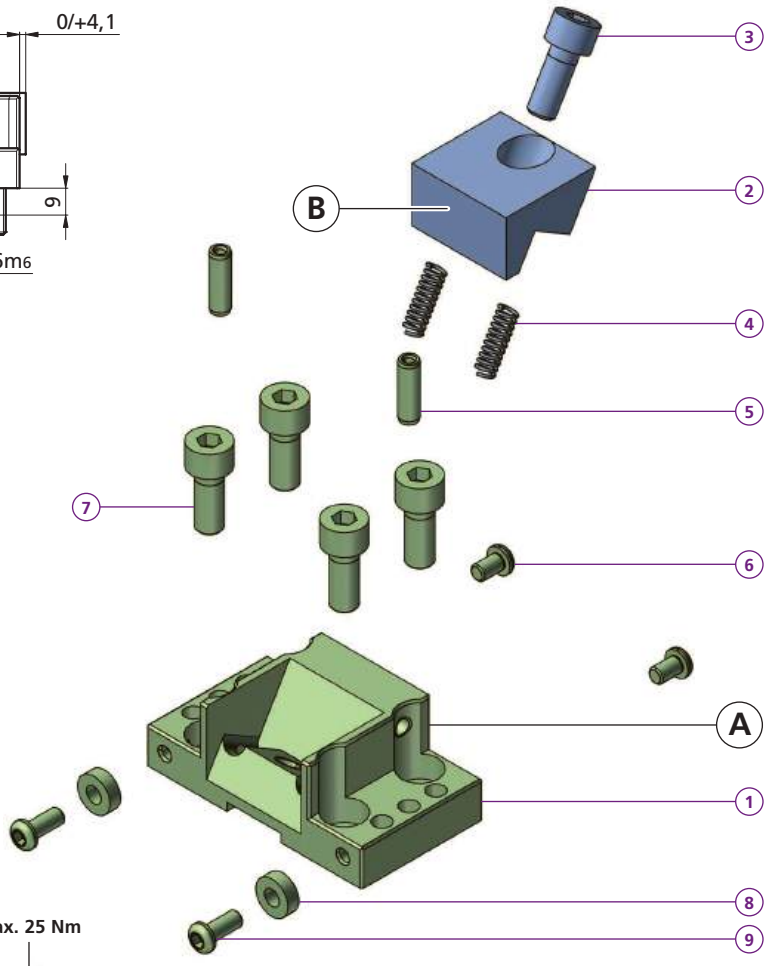


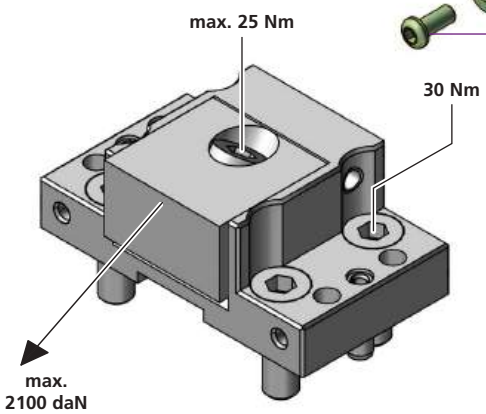


Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated* ALU = ENAW-7022







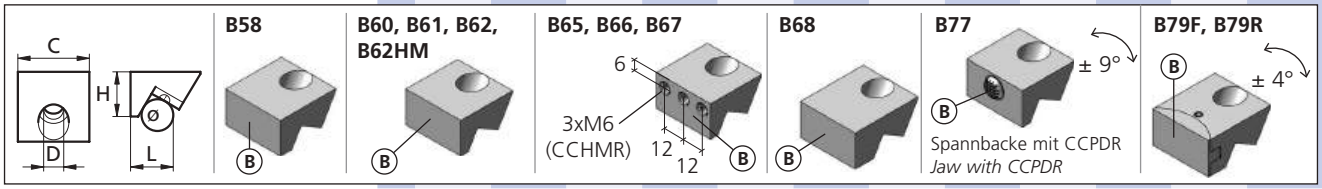
A

	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

B

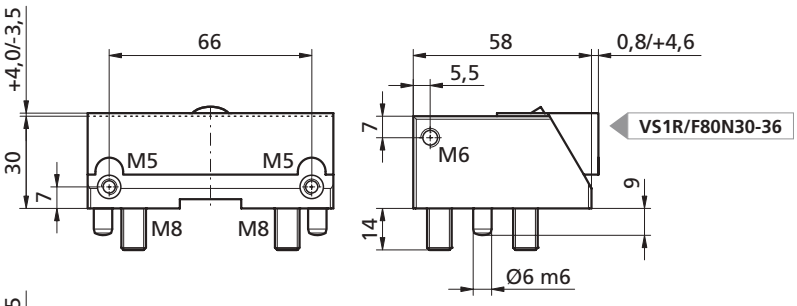
Bestellbeispiel / *Ordering example:* 1x **VS1R41N30-60** & 1x **B61**

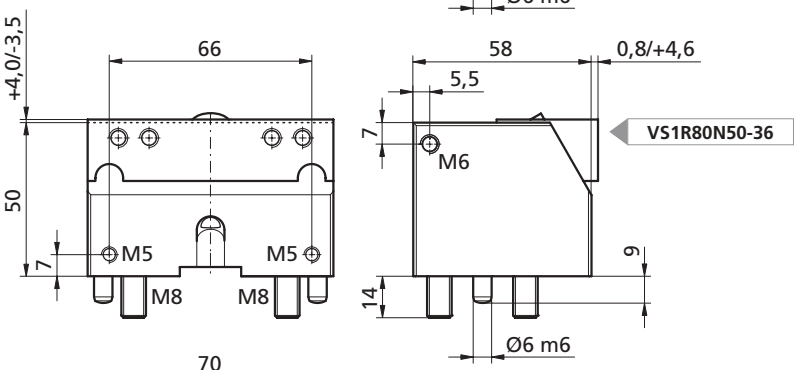
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	20	20	20
L	26	19	19	19	19	19	19	24	26	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	56HRC	HV700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

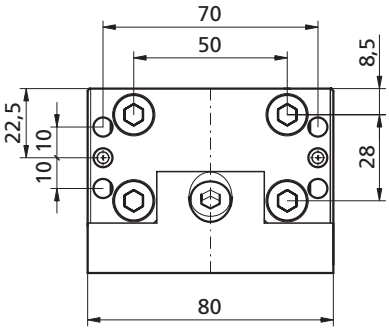


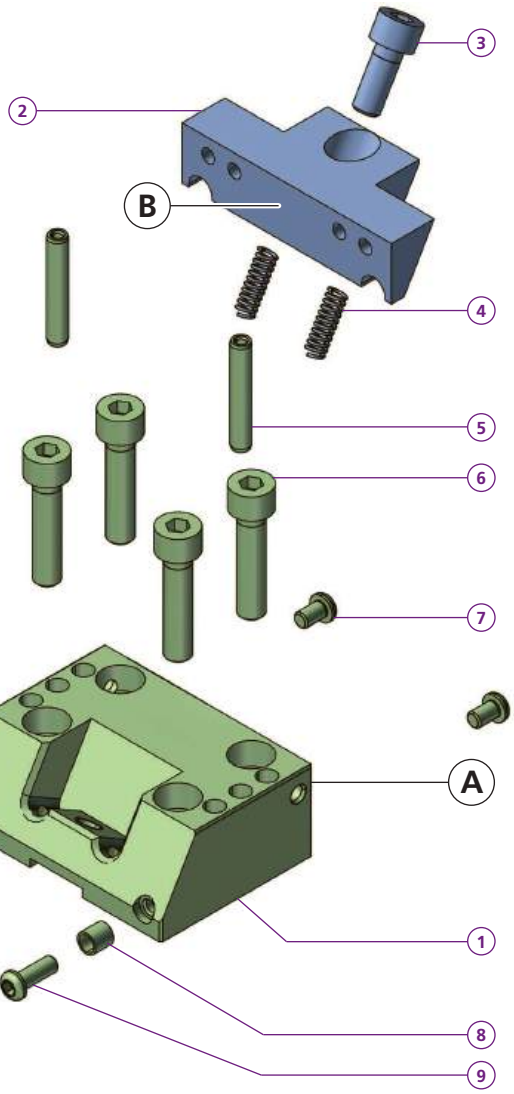
* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated* ALU = ENAW-7022

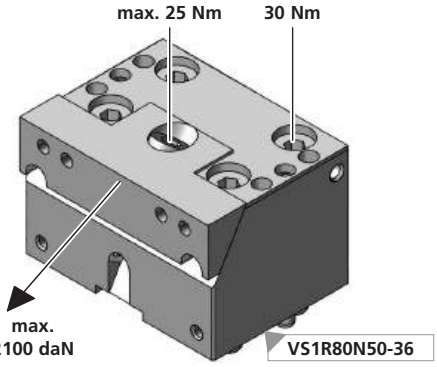
Separat bestellen / *Order separately*

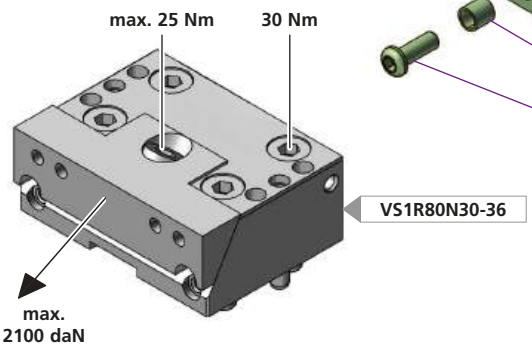






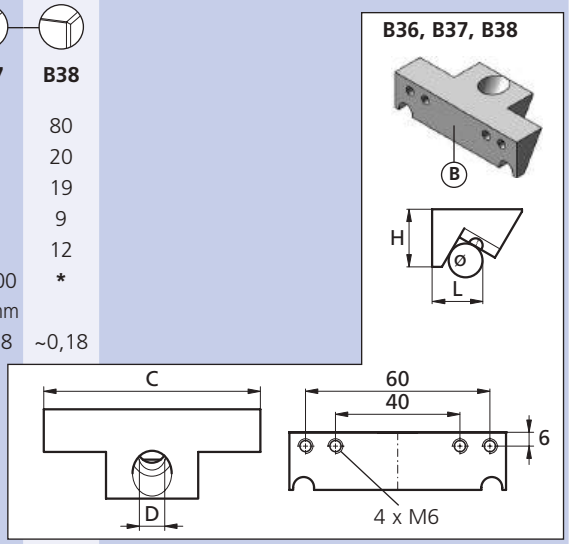






Bestellbeispiel / *Ordering example:* 1x VS1R80N30-36 & 1x B37

	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 x0,2mm	HV700 x0,2mm	*
kg	~0,18	~0,18	~0,18



VS1F80N30-36

1	1x	TF140733

VS1R80N30-36

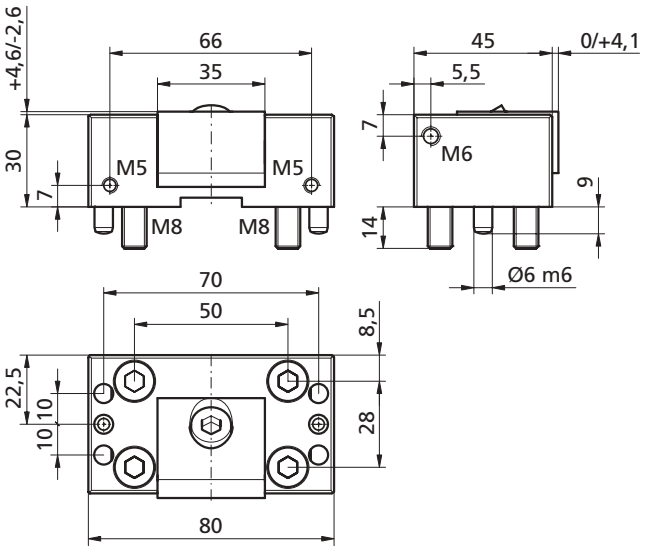
1	1x	TF140734
2	1x	
3	1x	**M8X20ISO4762**
4	4x	**FED0618**
5	2x	**CCBO0801**
6	4x	**M8X35ISO4762**
7	2x	**M5X8ISO4762**
8	2x	**CCD007**
9	2x	**M5X16ISO7380**
kg		~1,2

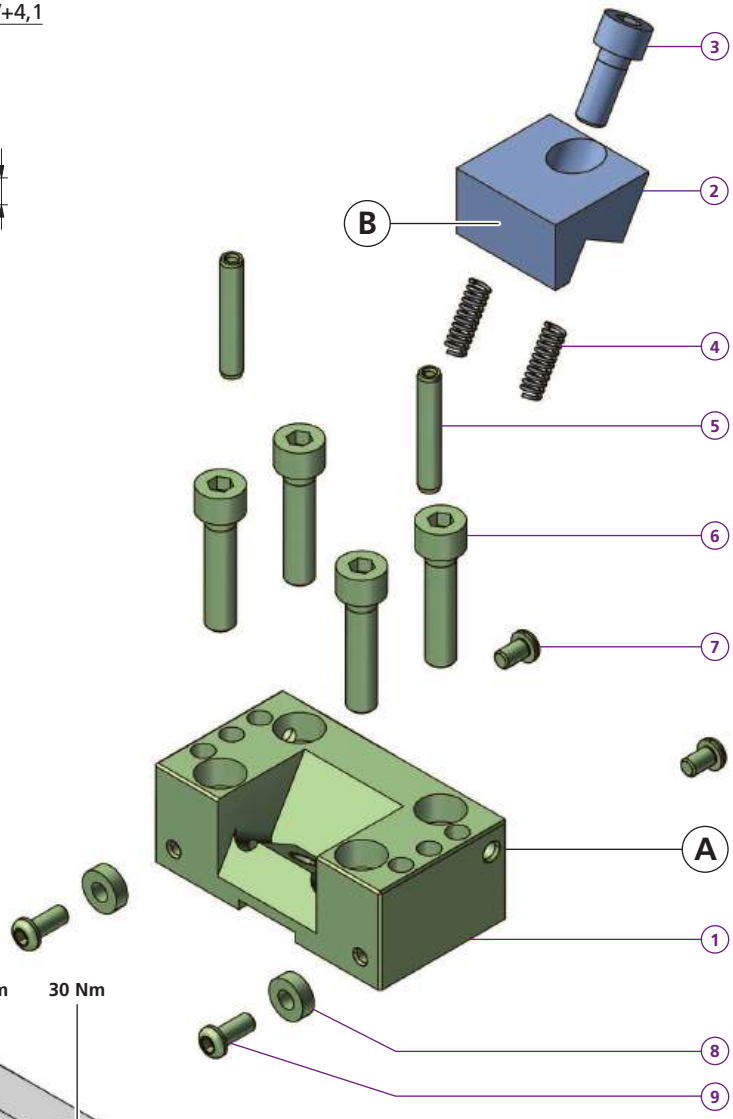
VS1R80N50-36

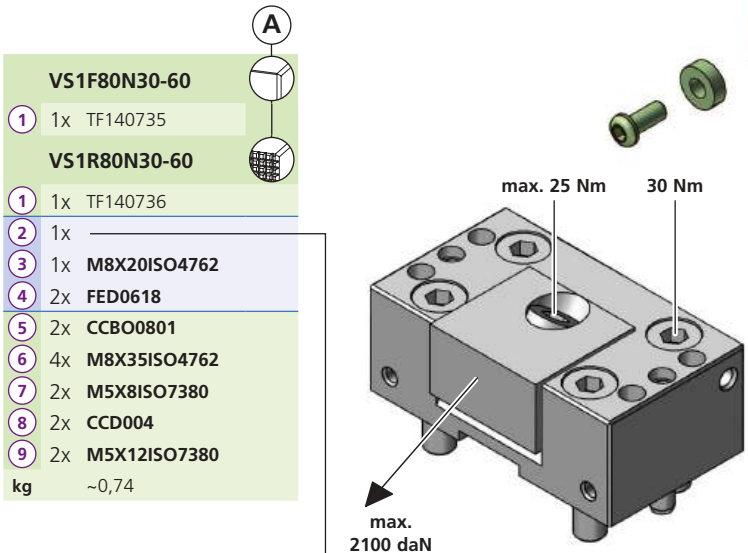
1	1x	TF140742
2	1x	
5	2x	**CCBO0803**
6	4x	**M8X55ISO4762**
8	2x	**CCD007**
9	2x	**M5X12ISO7380**
kg		~1,9

Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel*



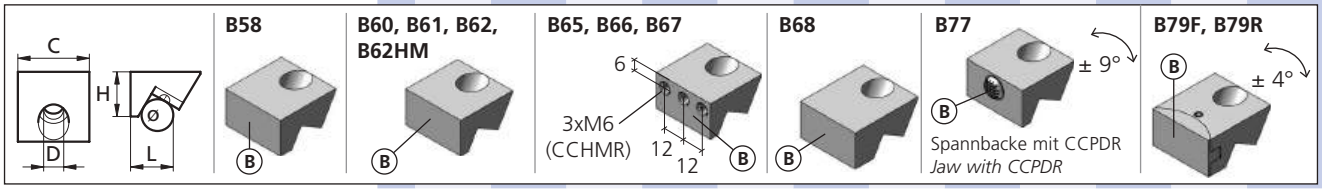




	VS1F80N30-60
1	1x TF140735
	VS1R80N30-60
1	1x TF140736
2	1x
3	1x **M8X20ISO4762**
4	2x **FED0618**
5	2x **CCBO0801**
6	4x **M8X35ISO4762**
7	2x **M5X8ISO7380**
8	2x **CCD004**
9	2x **M5X12ISO7380**
kg	~0,74

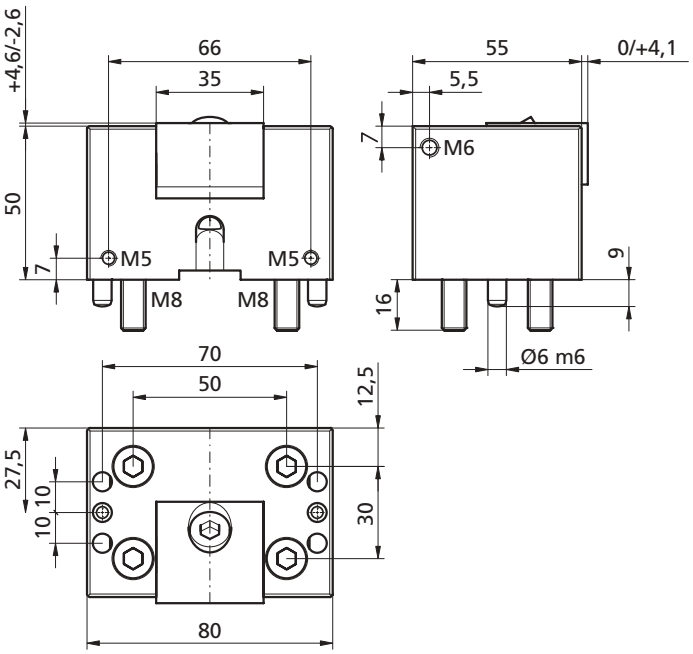
Bestellbeispiel / *Ordering example:* 1x VS1F80N30-60 & 1x B61

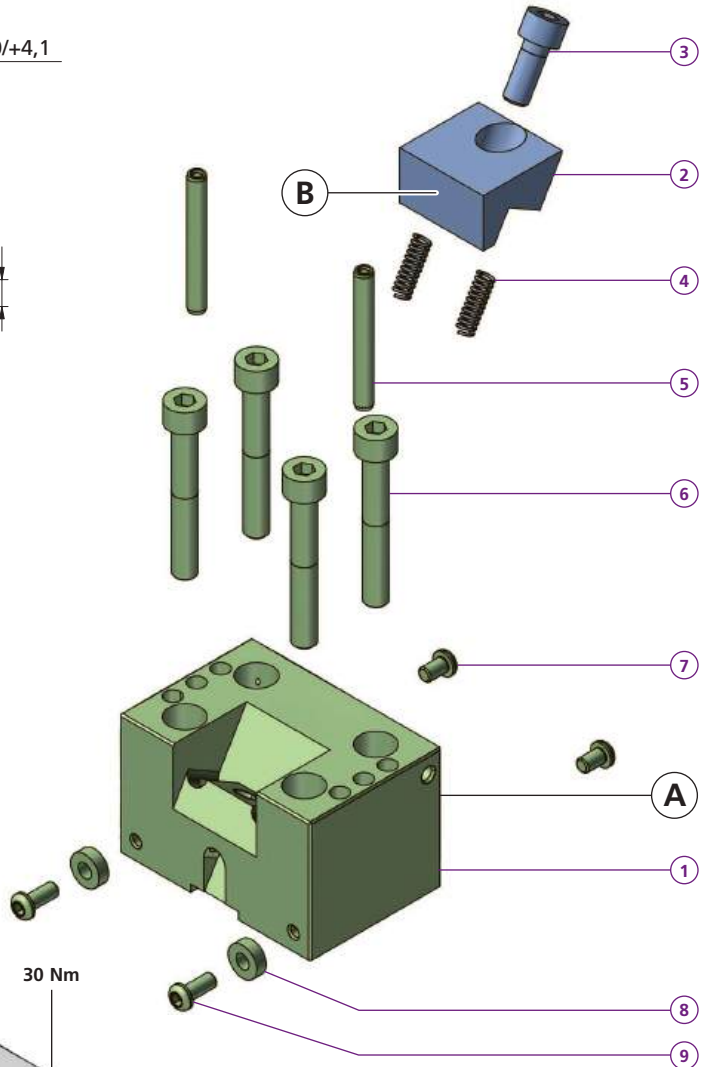
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	20	20	20
L	26	19	19	19	19	19	19	24	26	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56 HRC	56 HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	56 HRC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



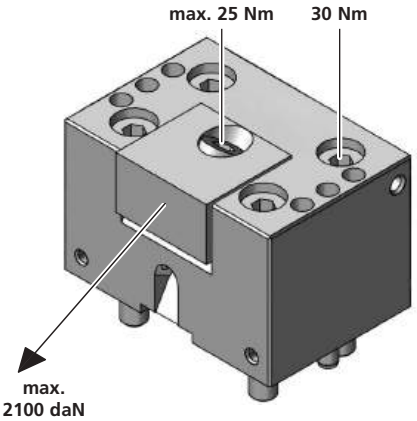
* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated* ALU = ENAW-7022

Separat bestellen / *Order separately*



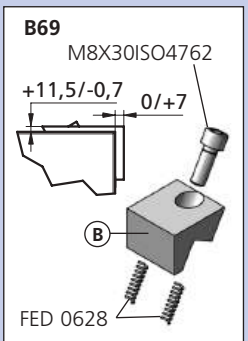


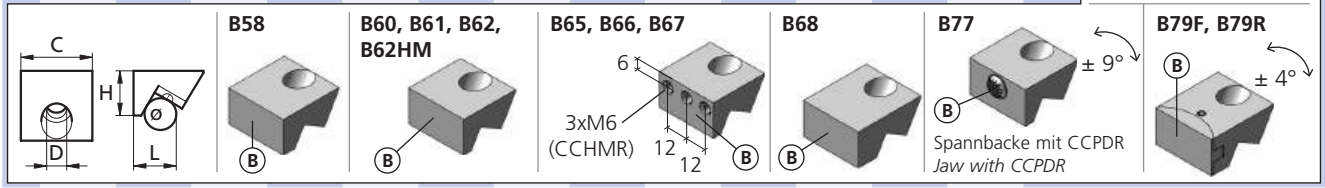
VS1R80N50-60		
1	1x	TF140737
2	1x	
3	1x	M8X20ISO4762
4	2x	FED0618
5	2x	CCBO0803
6	4x	M8X55ISO4762
7	2x	M5X8ISO7380
8	2x	CCD004
9	2x	M5X12ISO7380
kg		~1,6



Bestellbeispiel / *Ordering example:* 1x**VS1R80N50-60** & 1x **B61**

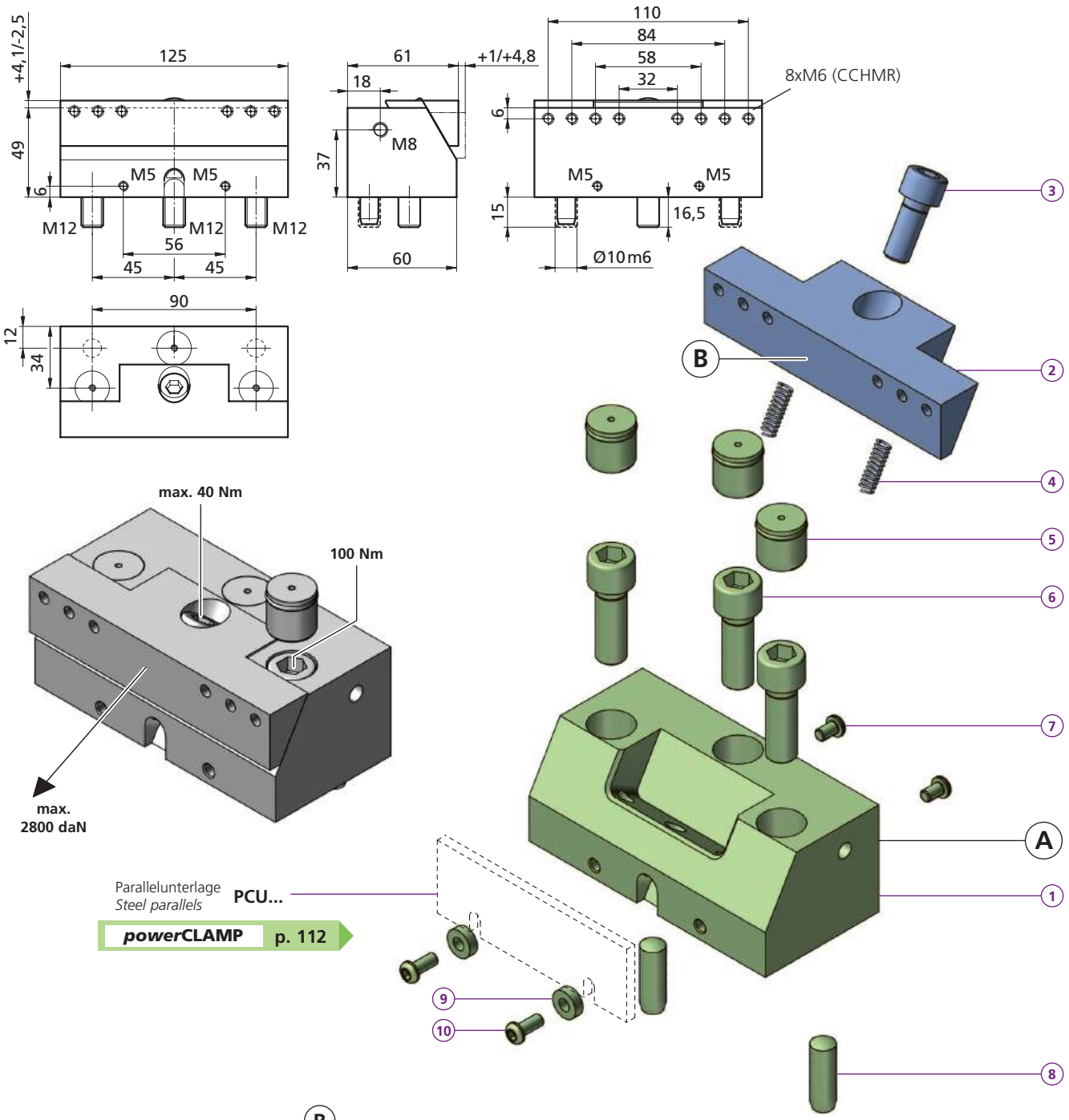
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B69	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	25	20	20	20
L	26	19	19	19	19	19	19	24	26	22	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56HRC	56HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700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





Separat bestellen / *Order separately*

* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated* ALU = ENAW-7022



Parallelunterlage
Steel parallels **PCU...**

powerCLAMP p. 112

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

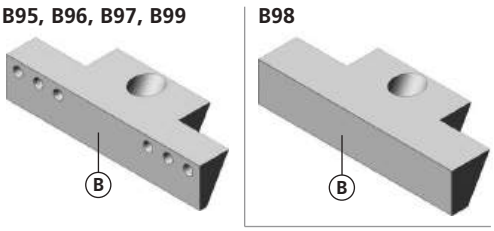
VS1F125N49-95

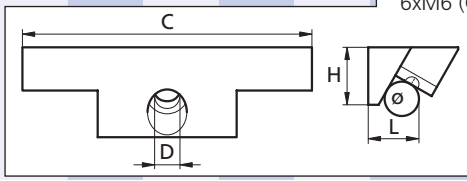
1	1x	TF140738

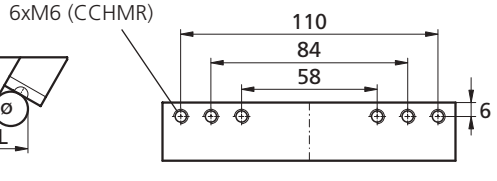
VS1R125N49-95

1	1x	TF140739
2	1x	
3	1x	**M10X25ISO4762**
4	2x	**FED0618**
5	3x	PCPF16L18Alu
6	3x	**M12X35ISO4762**
7	3x	**M5X8ISO7380**
8	2x	10m6x30 DIN6325
9	2x	**CCD004**
10	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 x0,2mm	HV700 x0,2mm	*	*	HV700 x0,2mm
kg	~0,45	~0,45	~0,45	~0,63	~0,45

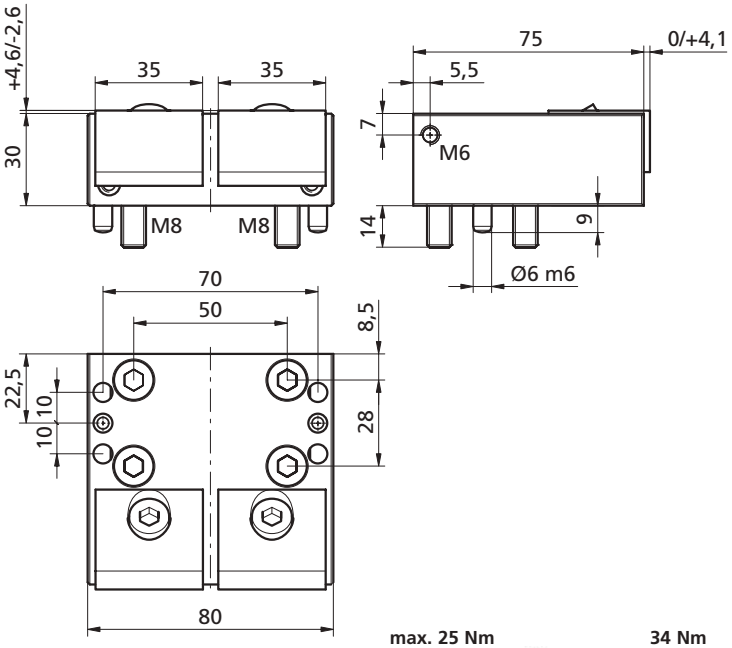


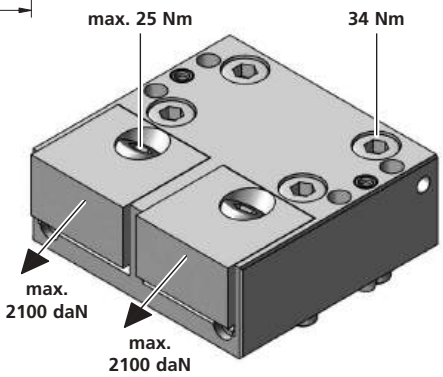


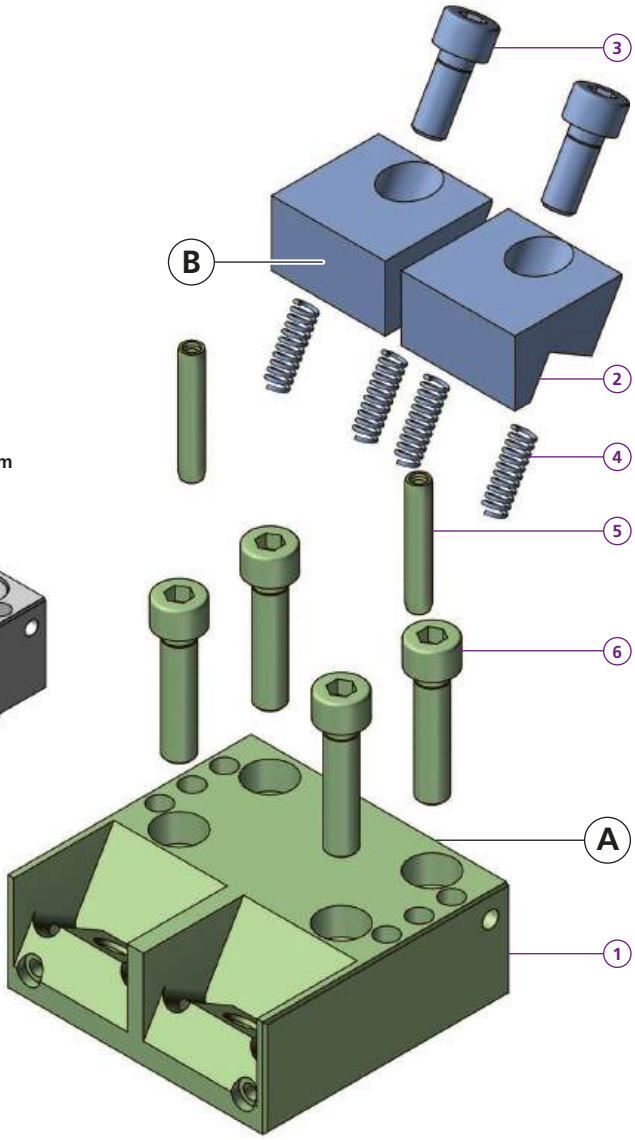


* = weicher *Stahl / soft steel*

Separat bestellen / *Order separately*







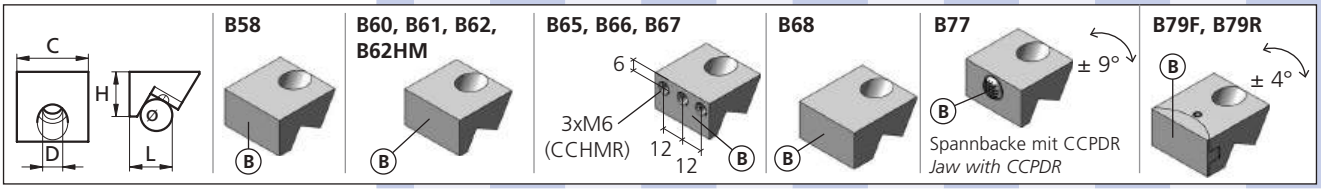
A

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

B

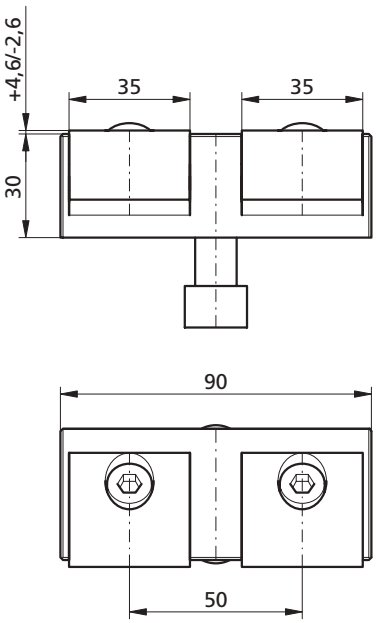
Bestellbeispiel / *Ordering example:* 1x VS2R80N30-60 & 2x B61

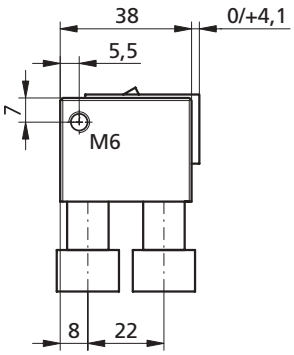
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	20	20	20
L	26	19	19	19	19	19	19	24	26	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56 HRC	56 HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	56 HRC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

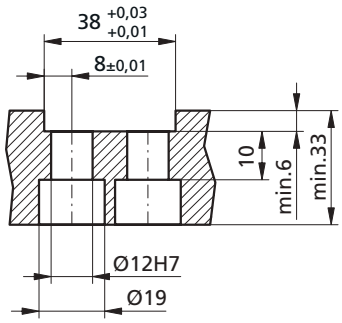


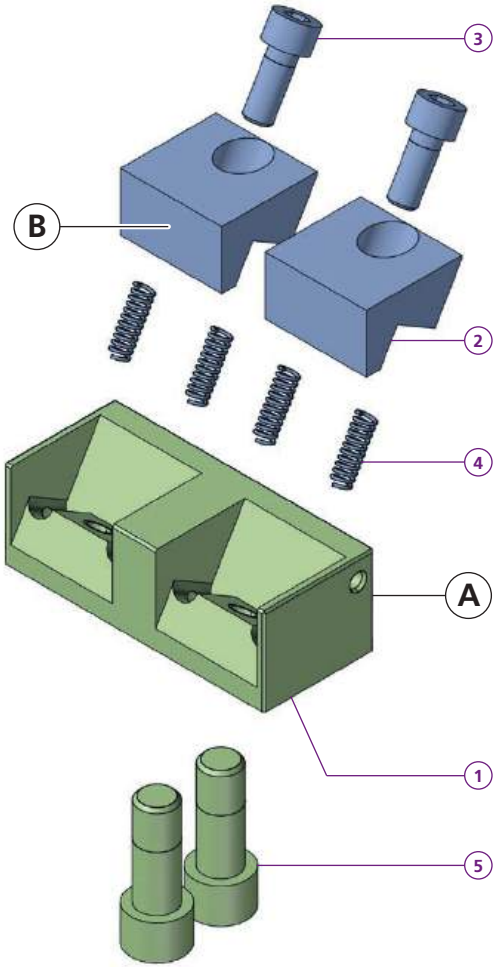
Separat bestellen / *Order separately*

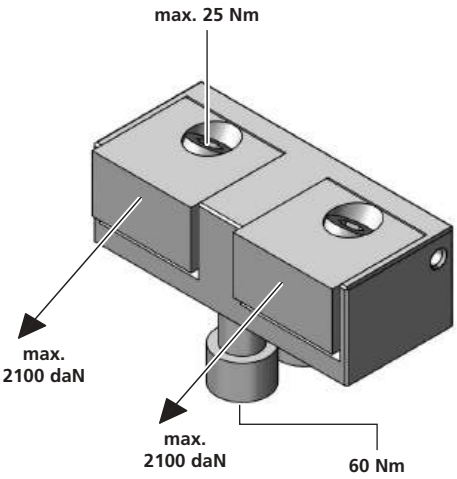
* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated* ALU = ENAW-7022











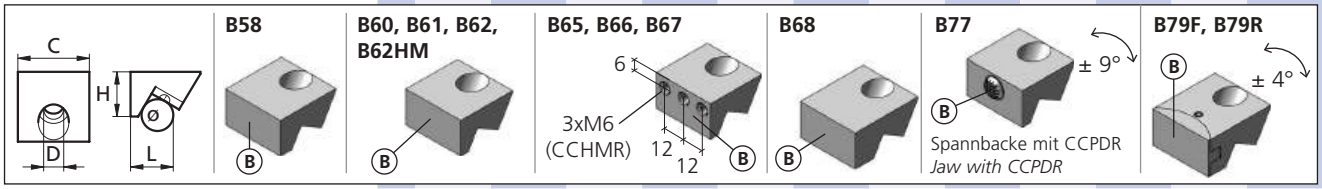
A

VS2F90N30-60	
1	1x TF140741
2	2x
3	2x **M8X20ISO4762**
4	4x **FED0618**
5	2x **TWPAS1232**
kg	~0,85

B

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

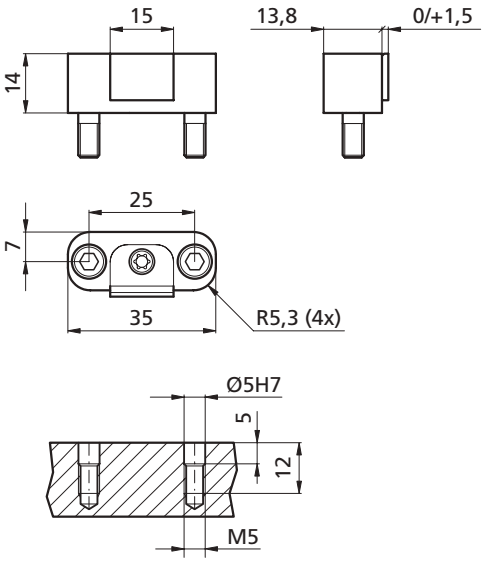
	B58	B60	B61	B62	B62HM	B65	B66	B67	B68	B77	B79F	B79R
C	35	35	35	35	35	35	35	35	35	35	35	35
H	20	20	20	20	20	20	20	20	20	20	20	20
L	26	19	19	19	19	19	19	24	26	22	25	25
D	9	9	9	9	9	9	9	9	9	9	9	9
ø	12	12	12	12	12	12	12	12	12	12	12	12
i	ALU	56 HRC	56 HRC	*	HM	HV700 x0,2mm	HV700 x0,2mm	HV700 x0,2mm	*	56 HRC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

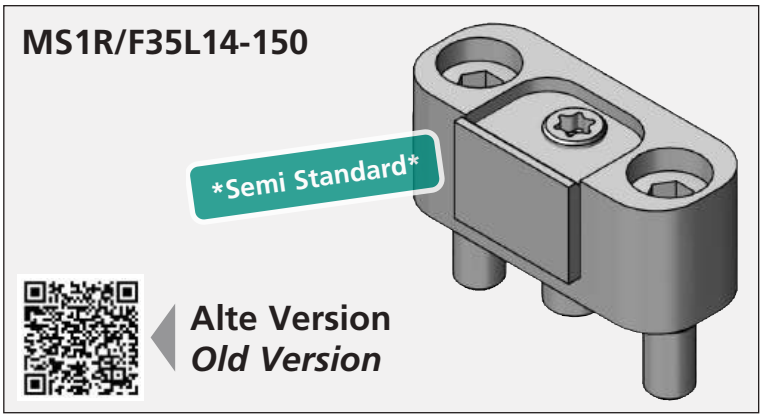


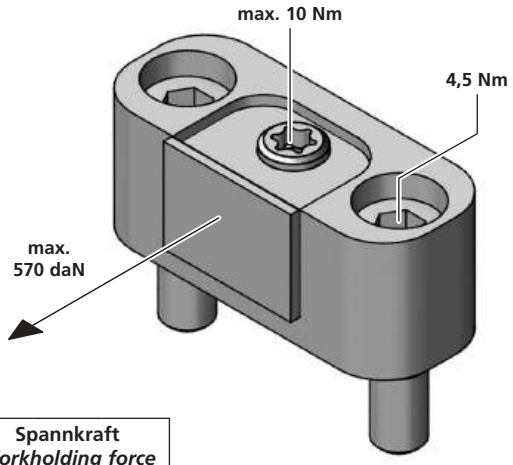
* = weicher *Stahl / soft steel* HM = Hartmetallbeschichtet / *Carbide coated* ALU = ENAW-7022

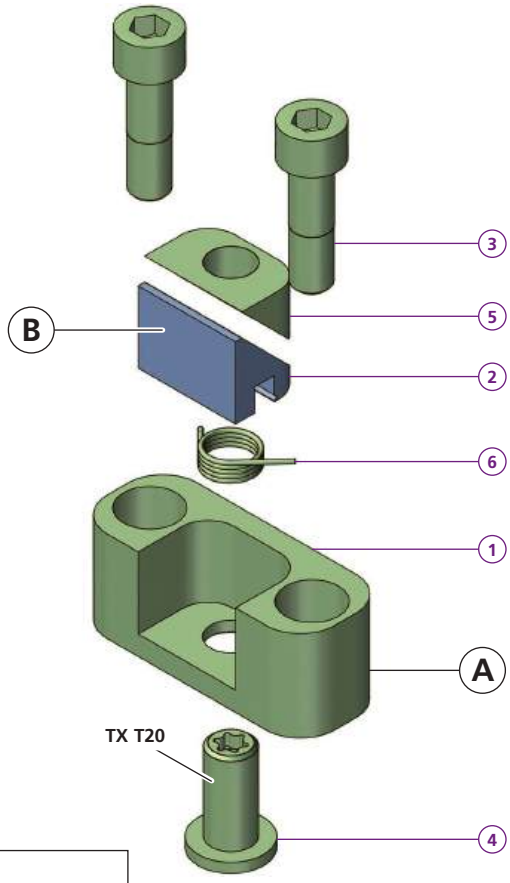
Separat bestellen / *Order separately*

MS1R/F35L14-152
MS1R/F35L14-150 (Alte Version / *Old Version*)





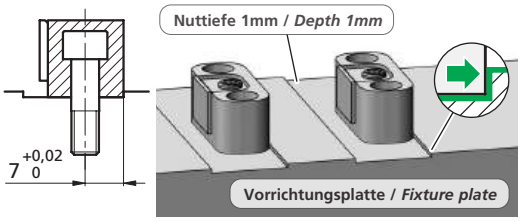




Drehmoment *Torque*		Spannkraft *Workholding force*		
Nm	(lb-ft)	~daN	~(lb)	~t
7	5,18	= 390	860	0,39
8	5,92	= 450	990	0,45
9	6,66	= 510	1120	0,51
10	7,4	= 570	1250	0,57

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

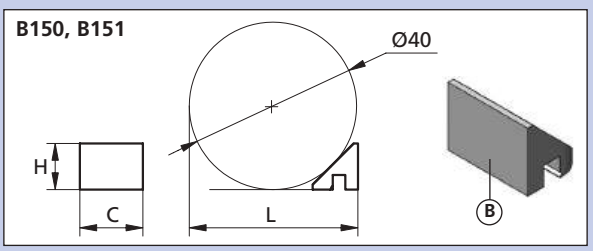
Remark: *Using forces higher than 400 daN, clamps must be mounted into a slot (depth minimum 1mm)*



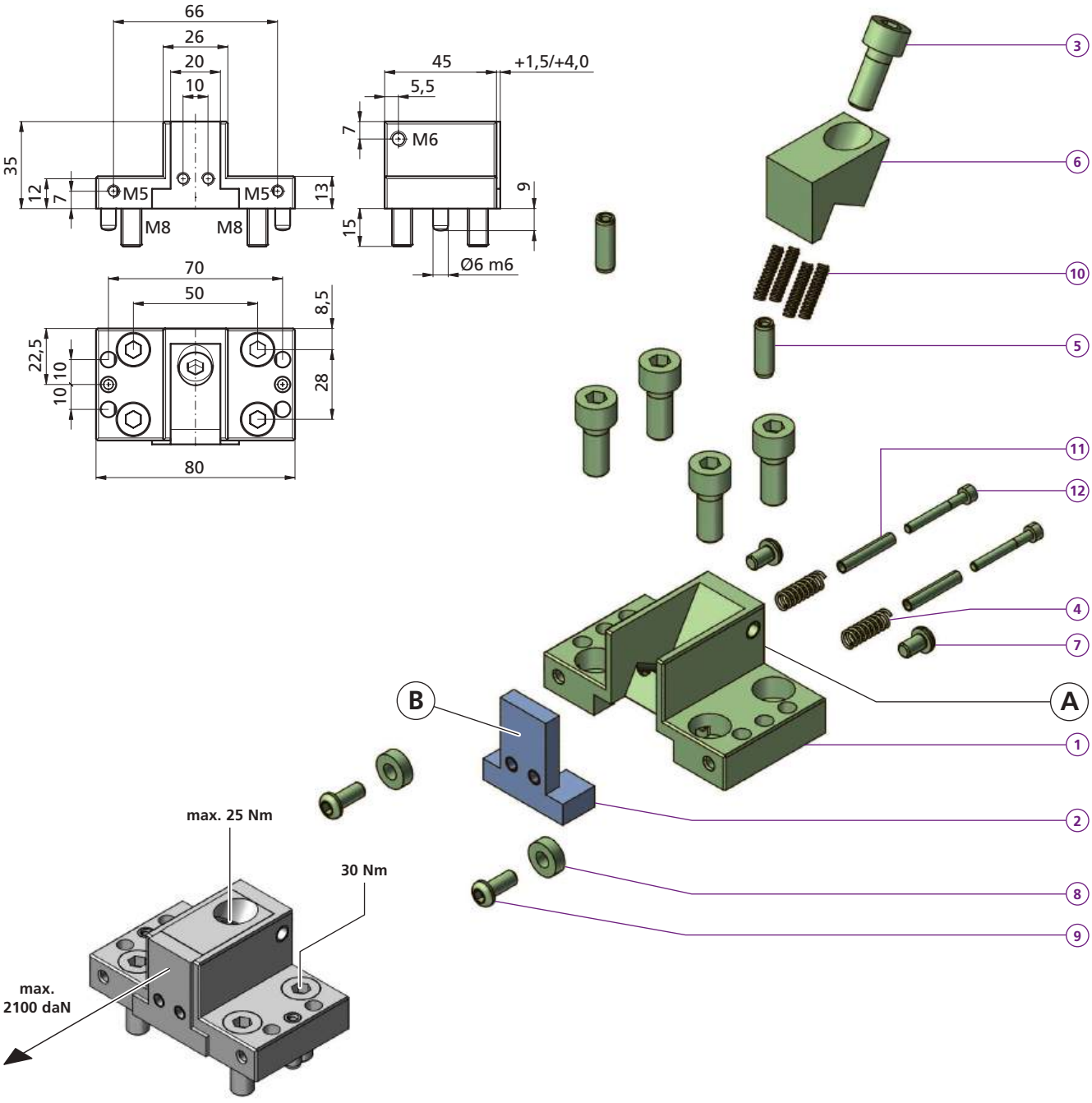
Bestellbeispiel / *Ordering example:* 1x MS1F35L14-152 & 1x B151

A		B	
	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		

	B150	B151
C	15	15
H	11	11
L	40,3	40,3
ø	40	40
i	HV700 x0,2mm	HV700 x0,2mm
kg	~0,004	~0,004



Separat bestellen / *Order separately*

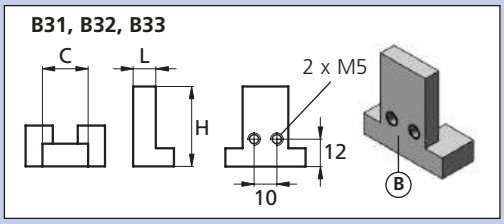


	VS1R26L35-31	A
1	1x TF140724	
2	1x	
3	5x **M8X20ISO4762**	
4	2x **FED0618**	
5	2x **CCBO0802**	
6	1x **B30**	
7	2x **M5X8ISO7380**	
8	2x **CCD004**	
9	2x **M5X12ISO7380**	
10	4x **FED0418**	
11	2x CCD422	
12	2x **M3X25ISO4762**	
kg	~0,55	

* = weicher *Stahl / soft steel*

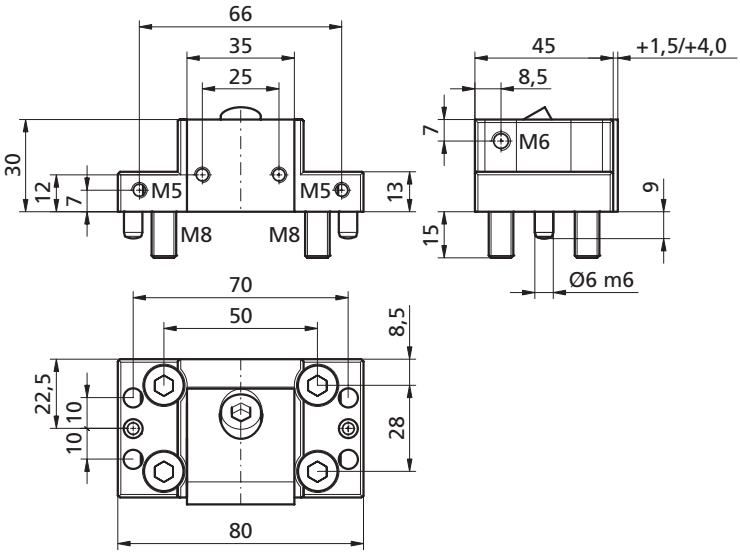
Bestellbeispiel / *Ordering example:* 1x VS1R26L35-31 & 1x B32

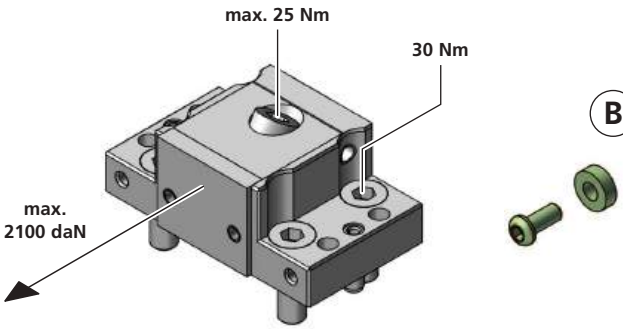
B	B31	B32	B33
C	20	20	20
H	35	35	35
L	6	6	6
D	-	-	-
ø	-	-	-
i	HV700 x0,2mm	HV700 x0,2mm	*
kg	~0,046	~0,046	~0,046

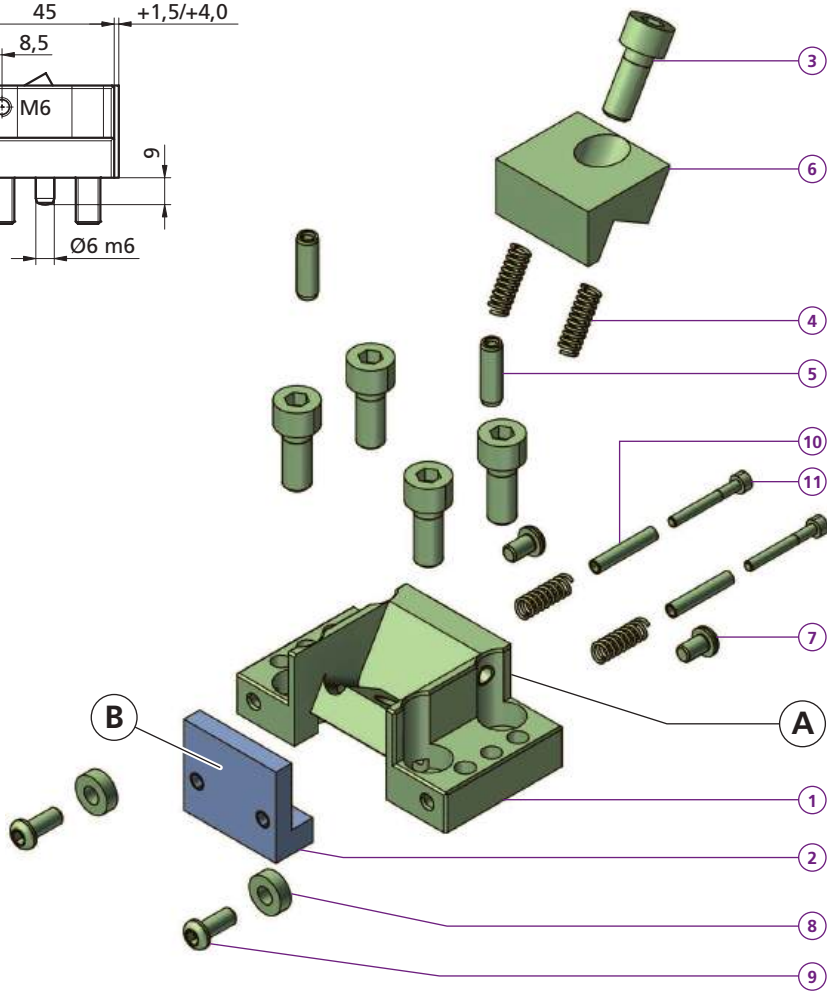


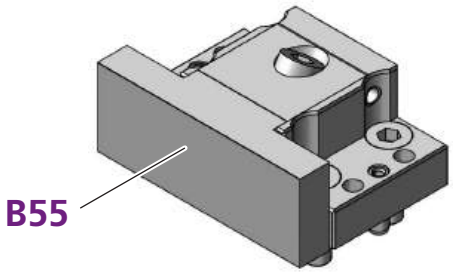
Separat bestellen / *Order separately*

VS1R/F41L30-51



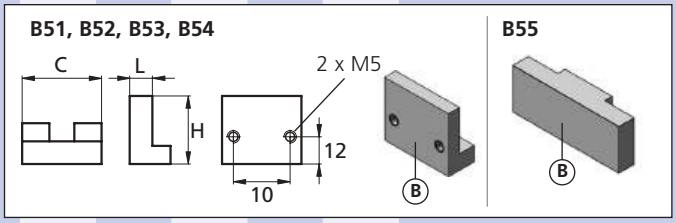






Bestellbeispiel / *Ordering example:* 1x VS1R41L30-51 & 1x B52

	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	-	-	-	-	-
ø	-	-	-	-	-
i	HV700 x0,2mm	HV700 x0,2mm	*	*	*
kg	~0,06	~0,06	~0,06	~0,12	~0,27



A		
	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

* = weicher *Stahl / soft steel*

Separat bestellen / *Order separately*

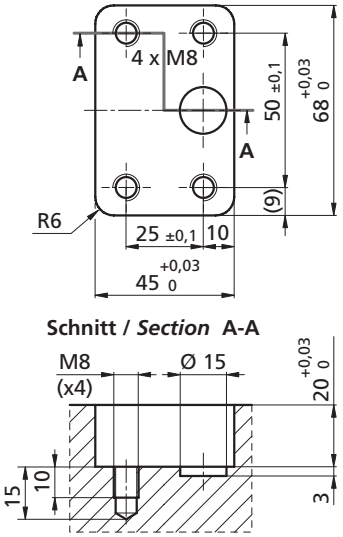
VS1X68L20-105
VA168-20PRG

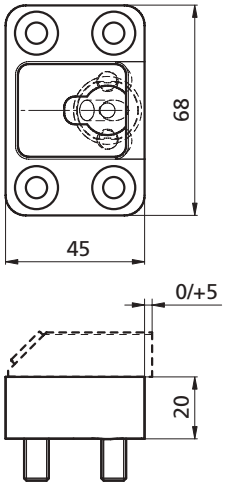
Vorrichtungsbau-Modul für Linearbacken
Alle bestehenden Linearbacken passen auf dieses Modul (***power*CLAMP** Seite **84 - 85**). In die Vorrichtungsplatte wird eine Tasche gefräst um das Modul zu positionieren. Gut geeignet sind die Anschlagbacken **MAND** und **MANF** um als Gegenbacke zu dienen.

Fixture clamp module for linear jaws
*All of our standard linear jaws fit to this clamp module (**power**CLAMP 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.*

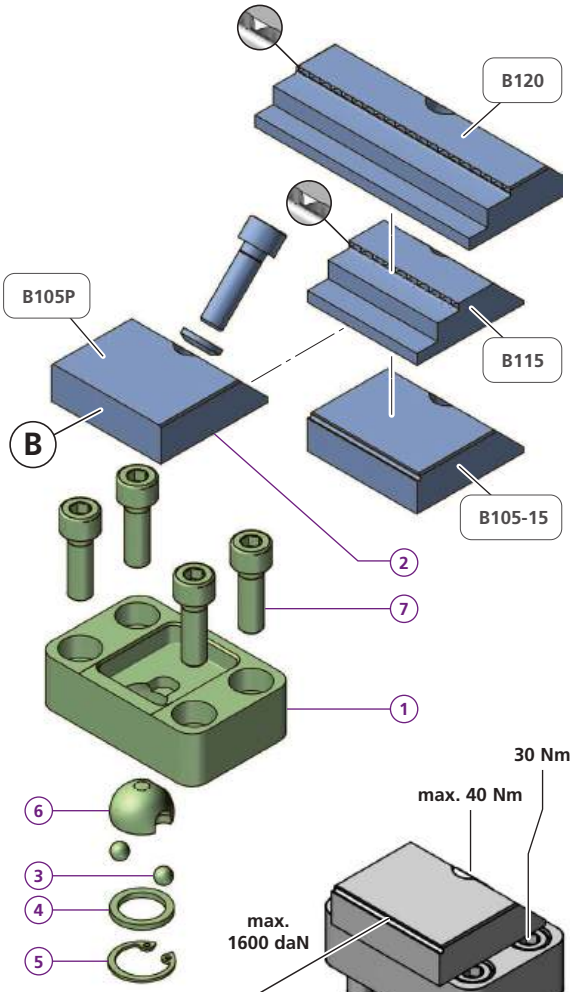
(Seite / *Page* **175 - 176**)

Fertigungsmasse für die Vorrichtungsplatte
Machining data for the fixture plate





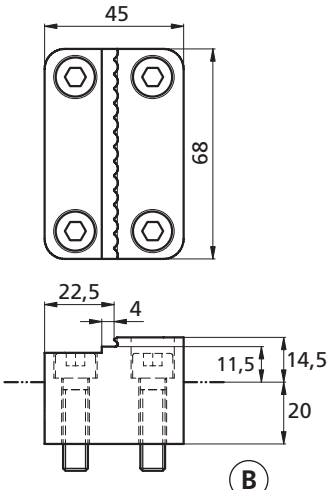
Das Fertigungsmass gilt auch für das Anschlagmodul.
The production dimension is also valid for the end module. **(VA168-20PRG)**

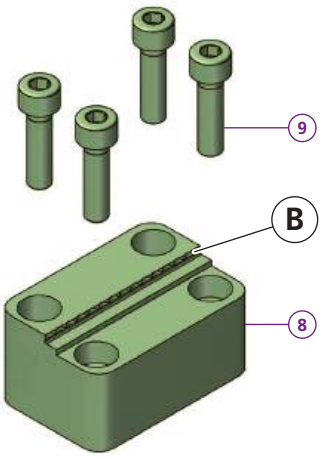


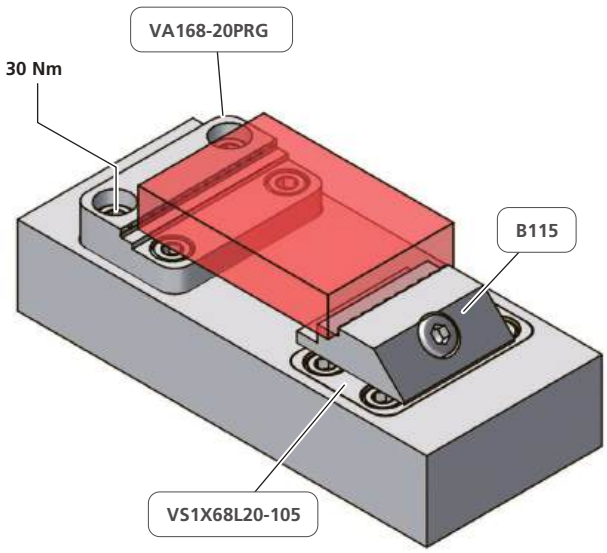
B

VS1X68L20-105

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







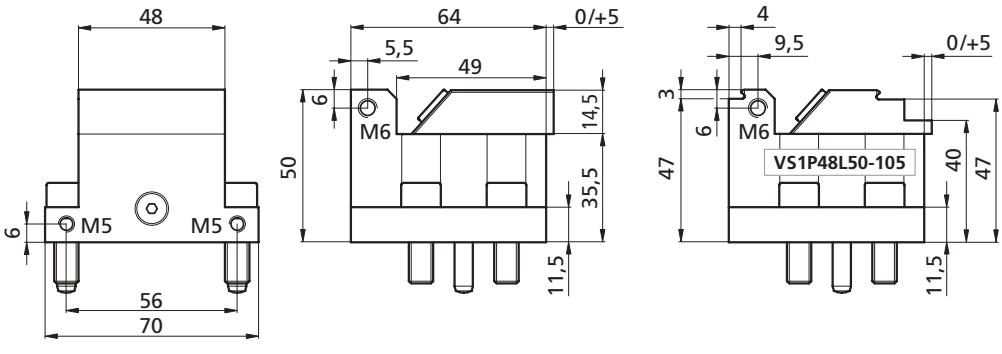
B

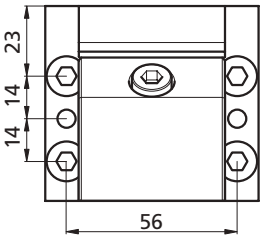
VA168-20PRG

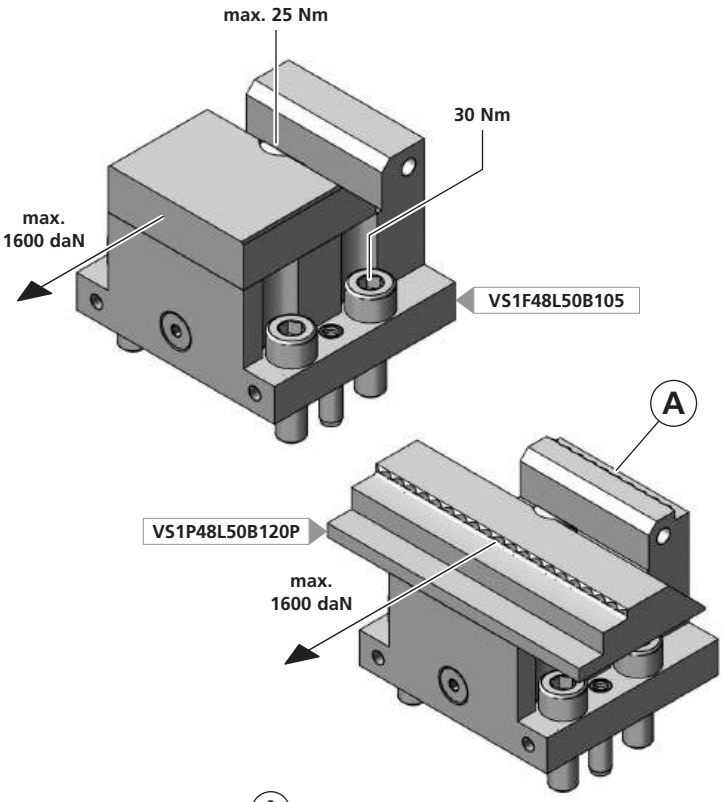
8	1x	TH160280
9	4x	**M8X30ISO4762**
kg		~0,75

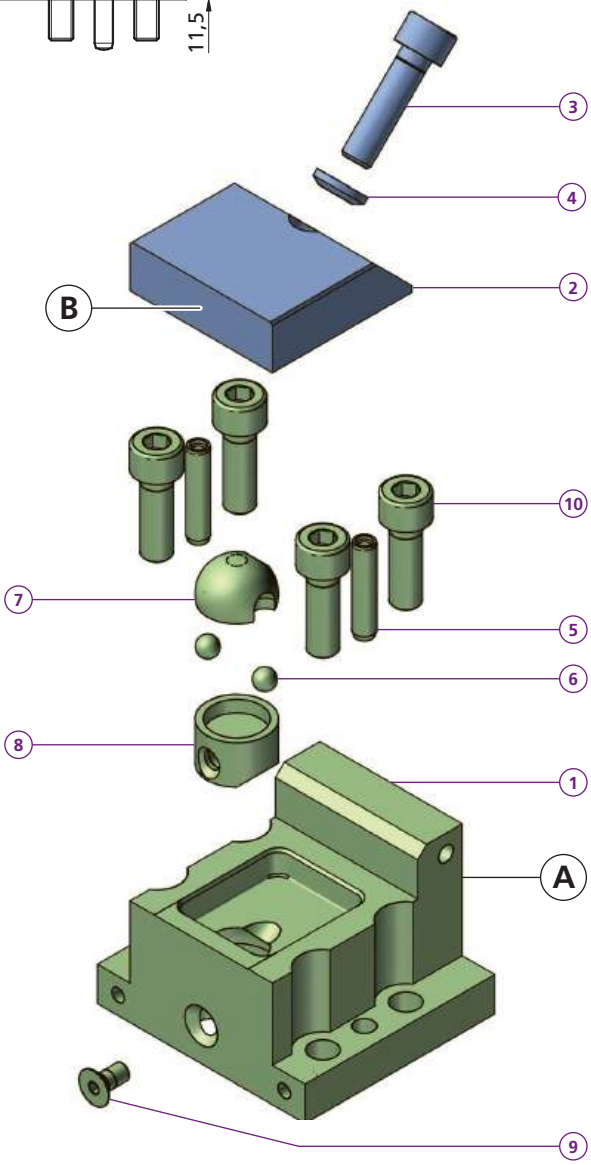
Bestellbeispiel / *Ordering example:* **1x VS1X68L20-105 & 1x B105P**

Separat bestellen / *Order separately*











VS1F48L50-105

1	1x	TK120807

VS1P48L50-105

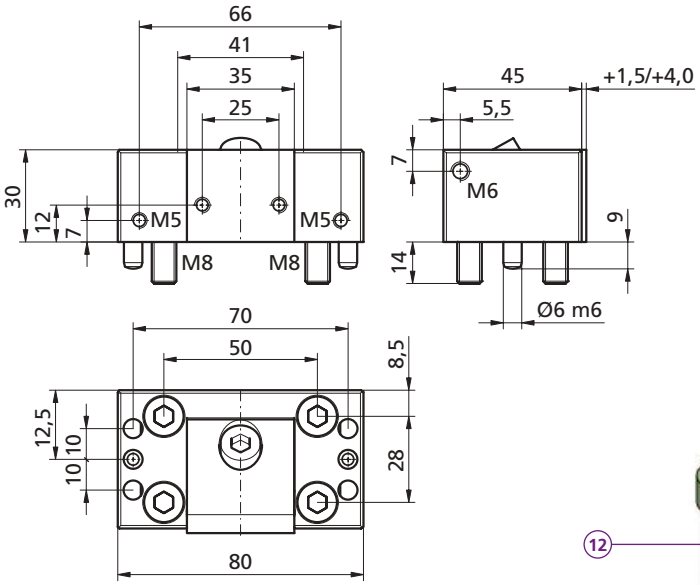
1	1x	TK120761
2	1x	———
3	1x	**M8X30ISO4762**
4	1x	**PCUSR14**
5	1x	6-m6x26 DIN 79790
6	2x	BN869d=6
7	1x	PCKMR45M8
8	1x	TS120001-04
9	1x	M5X10DIN7991
10	4x	**M8X25ISO4762**
kg		~1,21

*power*CLAMP p. 84 - 85

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

Separat bestellen / *Order separately*

VS1R/F80L30-51



VS1F80L30-51

1	1x	TF140731

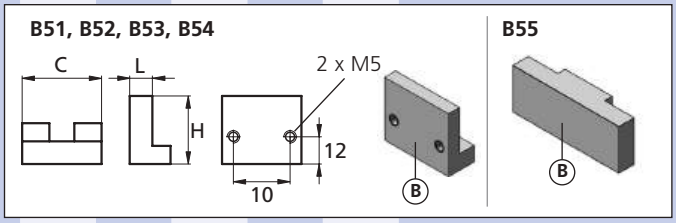
VS1R80L30-51

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

* = weicher *Stahl / soft steel*

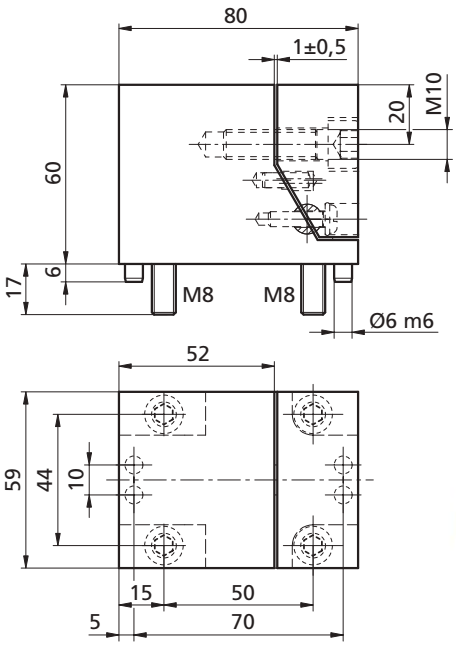
Bestellbeispiel / *Ordering example:* 1x VS1R80L30-51 & 1x B52

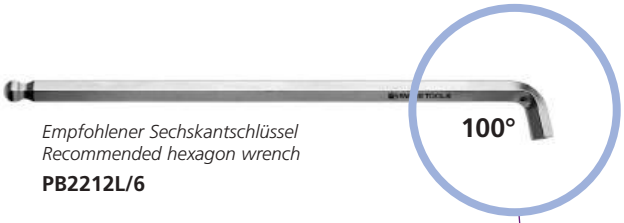
	B51	B52	B53	B54	B55
C	35	35	35	35	80
H	30	30	30	35	30
L	6	6	10	10	11,5
D	-	-	-	-	-
ø	-	-	-	-	-
i	HV700 x0,2mm	HV700 x0,2mm	*	*	*
kg	~0,06	~0,06	~0,06	~0,12	~0,27



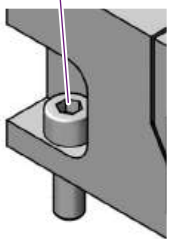
Separat bestellen / *Order separately*

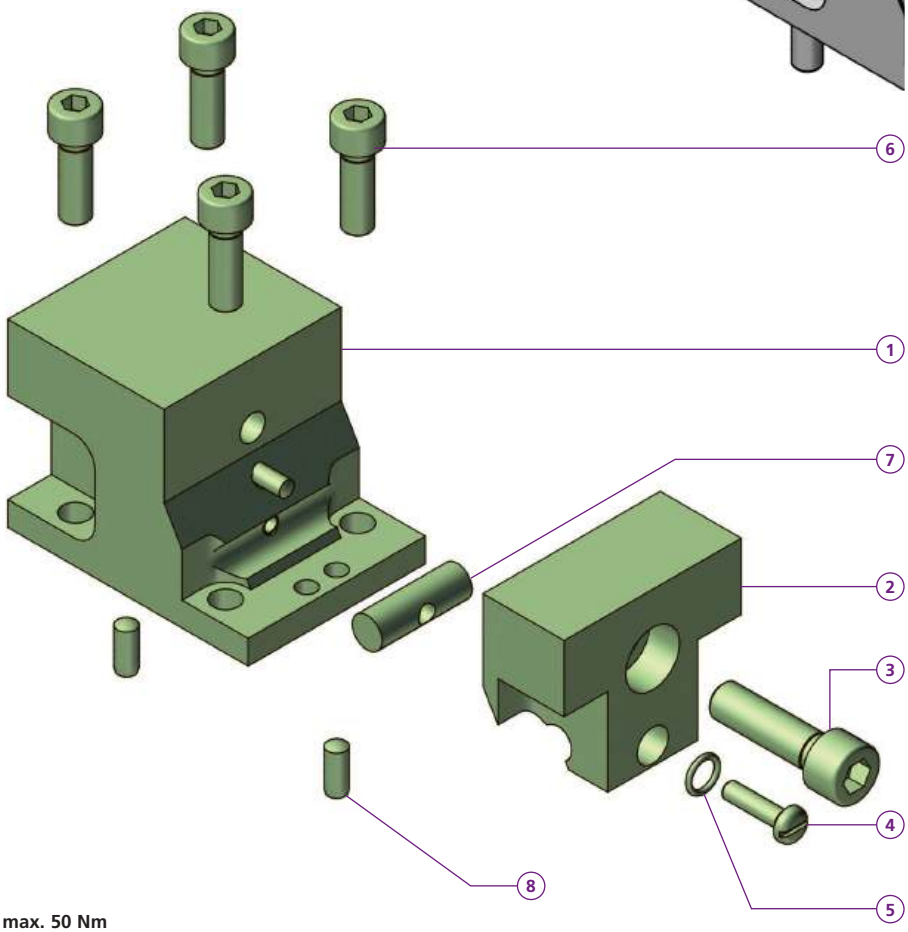
VS1X59L60K

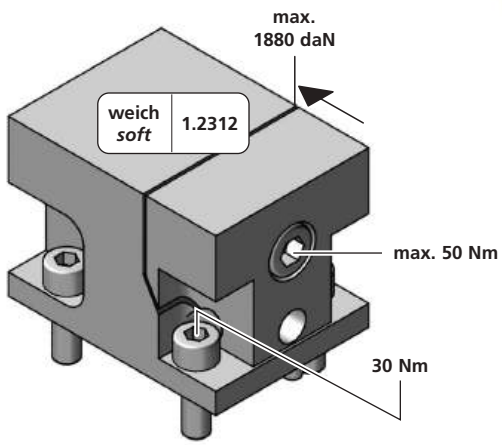


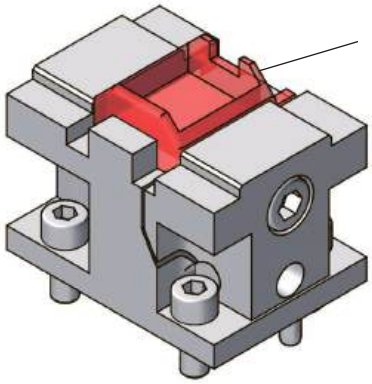


Empfohlener Sechskantschlüssel
Recommended hexagon wrench
PB2212L/6









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

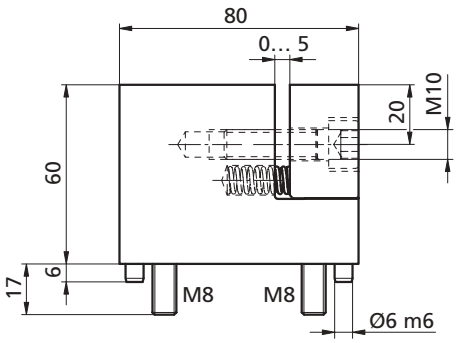
	*VS1X59L60K
1	1x VS1X59L60H5KA
2	1x VS1X59L60H5KS
3	1x M10X35ISO4762
4	1x M5X20DIN85A
5	1x ORØ8x1,5
6	4x **M8X25ISO4762**
7	1x VS1X59L60H5KG
8	2x 6m6x14 DIN 6325
kg	~1,89

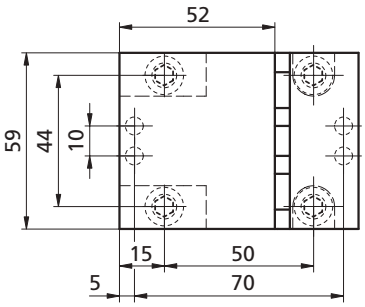
Bestellbeispiel / *Ordering example* : VS1X59L60K

Separat bestellen / *Order separately*

* = *Stahl / steel* 1.2312

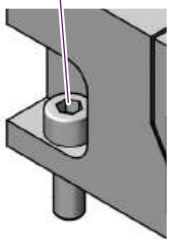
VS1X59L60H5

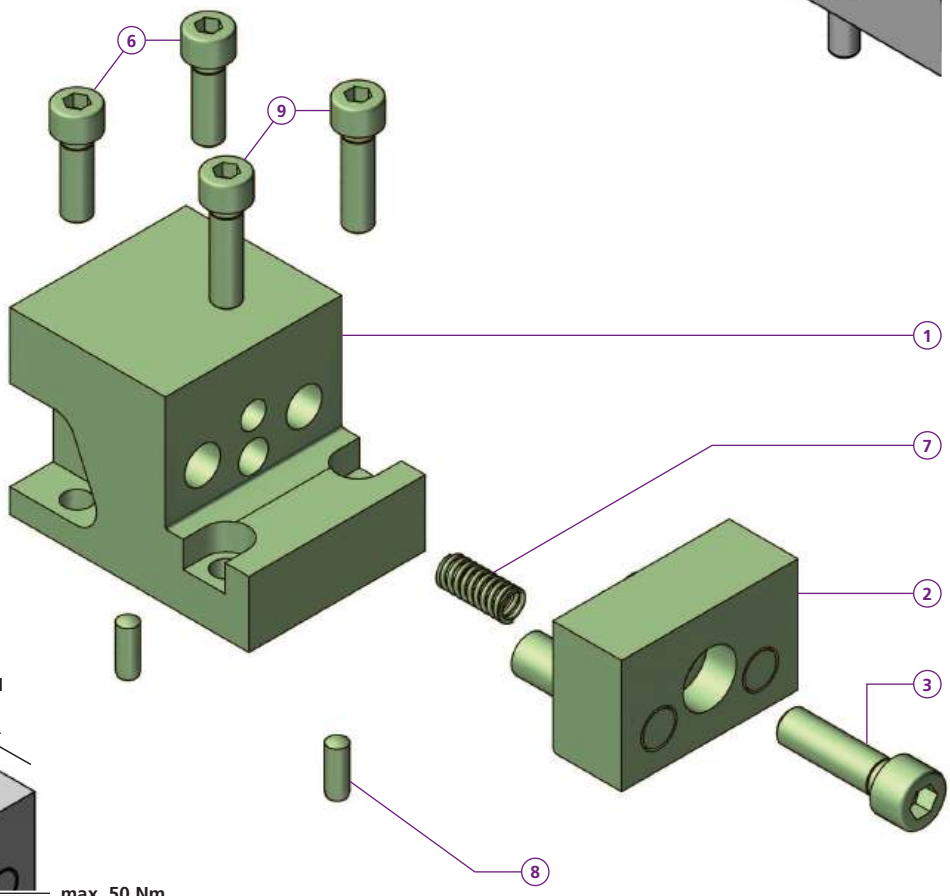


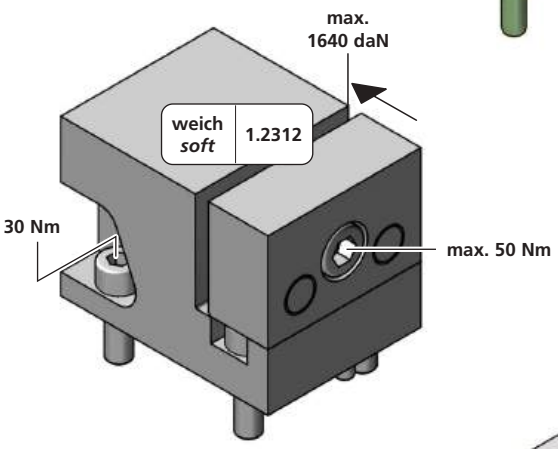




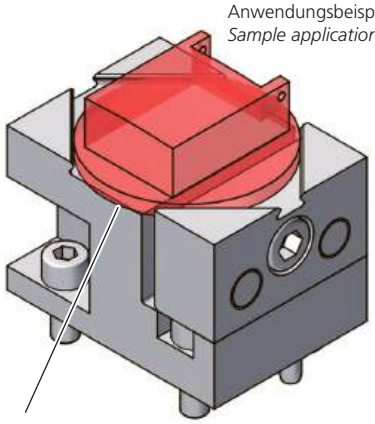
Empfohlener Sechskantschlüssel
Recommended hexagon wrench
PB2212L/6



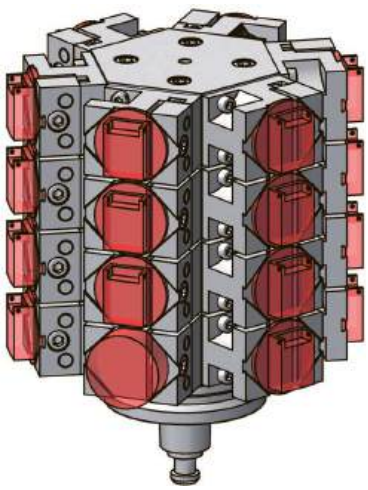




Anwendungsbeispiele
Sample applications



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*

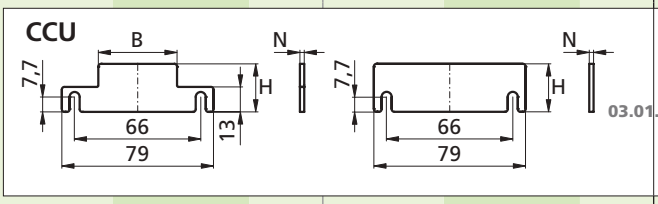
durchgehärtet / *through hardened*

26mm	B	H	N	kg
CCU15026	26	15	2,2	~0,017
CCU20026	26	20	2,2	~0,02
CCU25026	26	25	2,2	~0,022
CCU30026	26	30	2,2	~0,025
CCU32526	26	32,5	2,2	~0,026

41mm	B	H	N	kg
CCU15081	41	15	2,2	~0,018
CCU20081	41	20	2,2	~0,022
CCU25081	41	25	2,2	~0,025
CCU27581	41	27	2,2	~0,027
CCU30081	41	30	2,2	~0,029

38mm	B	H	N	kg
CCU30039	38	30	2,2	~0,028
CCU35039	38	35	2,2	~0,031
CCU40039	38	40	2,2	~0,035
CCU45039	38	45	2,2	~0,039

80mm	B	H	N	kg
CCU15080	79	15	2,2	~0,019
CCU20080	79	20	2,2	~0,027
CCU25080	79	25	2,2	~0,035
CCU27580	79	27,5	2,2	~0,039
CCU30080	79	30	2,2	~0,043
CCU35080	79	35	2,2	~0,05
CCU40080	79	40	2,2	~0,057
CCU45080	79	45	2,2	~0,063



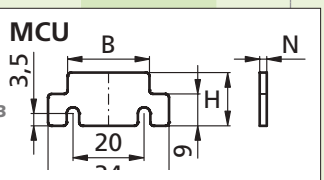
nitriert / *nitrated*

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

41mm	B	H	N	kg
CCU15083	41	15	3	~0,025
CCU20083	41	20	3	~0,029
CCU25083	41	25	3	~0,034
CCU27583	41	27,5	3	~0,036

26mm	B	H	N	kg
CCU15027	26	15	3	~0,024
CCU20027	26	20	3	~0,027
CCU25027	26	25	3	~0,03
CCU30027	26	30	3	~0,033
CCU32527	26	32,5	3	~0,034

80mm	B	H	N	kg
CCU15082	79	15	3	~0,026
CCU20082	79	20	3	~0,036
CCU25082	79	25	3	~0,045
CCU27582	79	27,5	3	~0,049

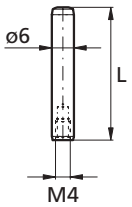


Schraubenzieher mit Konterung für
Screwdriver with holding sleeve *for*



CCBXSK

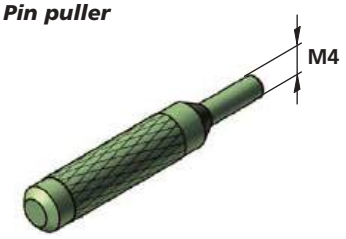
Positionsbolzen
Position pin





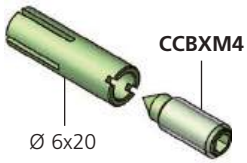
	L	kg
CCBO0801	36	~0,006
CCBO0802	20	~0,002
CCBO0803	50	~0,01

Bolzen-Auszieher
Pin puller

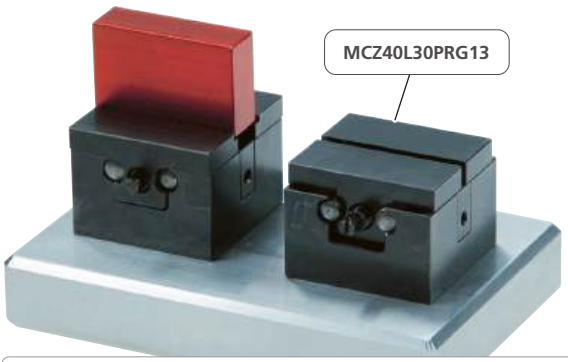


CCAZ1050

Positionierstift (spreizbar)
Locating pin *(expandable)*



CCBX0802

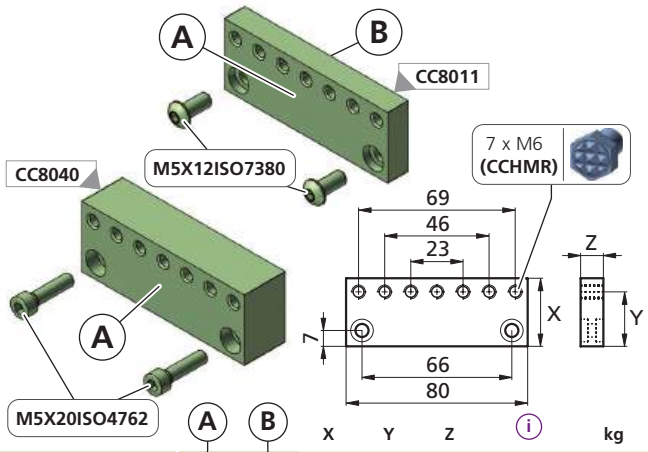




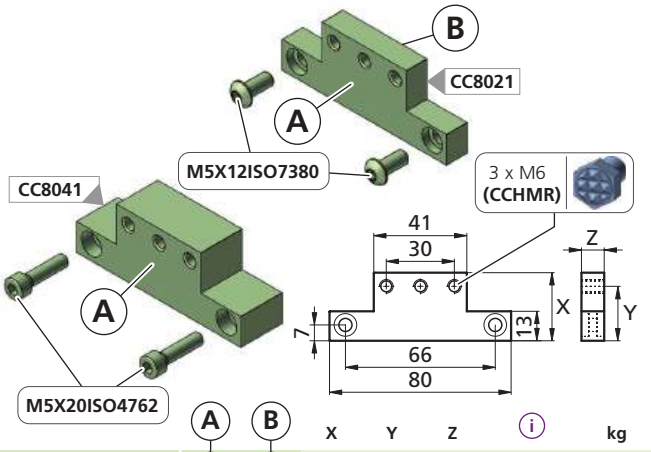
Mehr Informationen siehe Zentrischspanner
For more information check the self centring vise **p. 116**

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

Universalbacke / *Universal jaw*

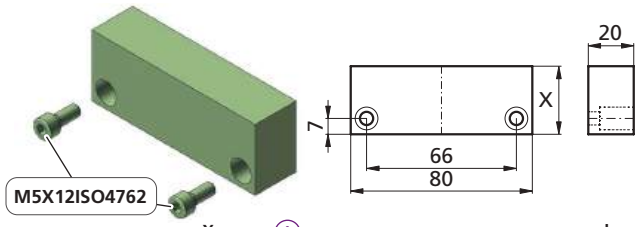


	A	B	X	Y	Z	i	kg
CC8011	●	●	30	24	10	56 HRC	~ 0,15
CC8025	●	●	50	44	10		~ 0,28
CC8040	●		30	24	20	*	~ 0,33



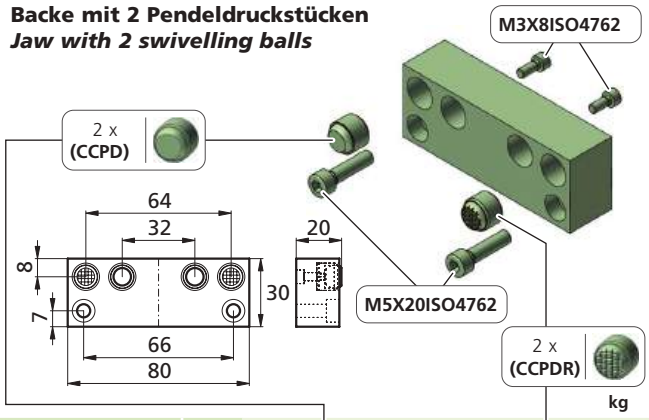
	A	B	X	Y	Z	i	kg
CC8021	●	●	30	24	10	56 HRC	~ 0,11
CC8026	●	●	50	44	10		~ 0,17
CC8041	●		30	24	20	*	~ 0,24

Weiche Backe / *Soft jaw*



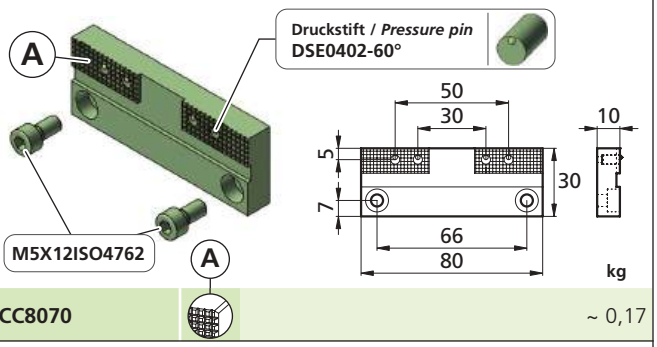
	X	i	kg
*CC8030	30	1.1191	~ 0,35
*CC8050	50		~ 0,59

Backe mit 2 Pendeldruckstücken
Jaw with 2 swivelling balls



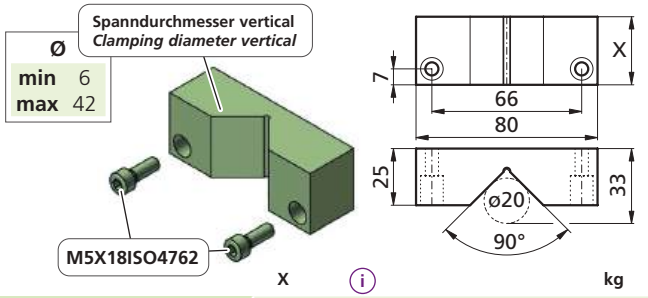
	kg
CC8060	~0,30
CC8060R	~0,30

Backe für Druckstift / *Jaw for pressure pin*

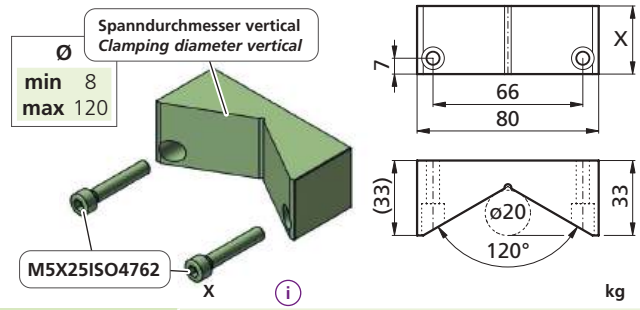


	kg
CC8070	~ 0,17

Prismabacke / *Prismatic jaw*

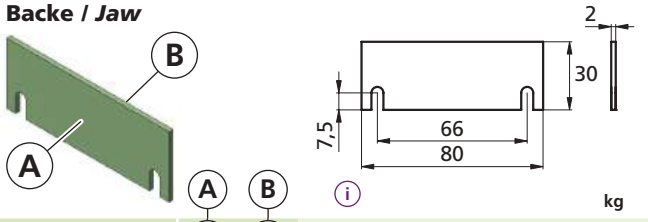


	X	i	kg
CC8050V90	30	56 HRC	~0,38

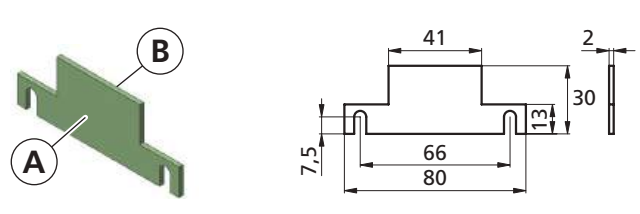


	X	i	kg
CC8050V120	30	56 HRC	~0,41

Backe / *Jaw*



	A	B	i	kg
CC8210	●	●	HV700 x 0,2mm	~ 0,03
CC8211	●	●		

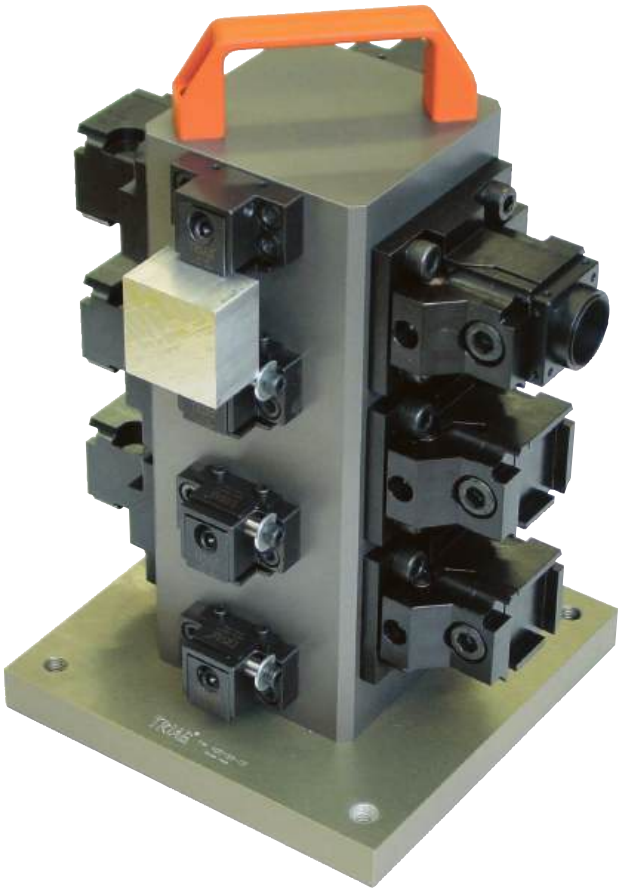


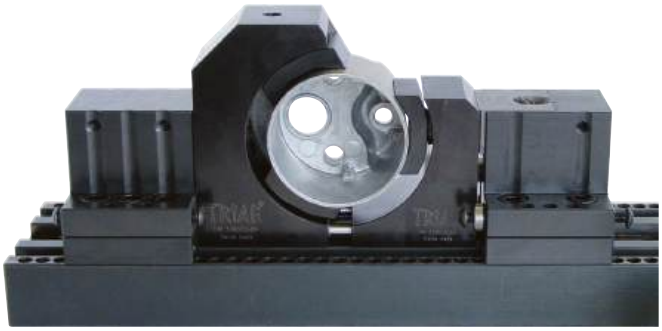
	A	B	i	kg
CC8220	●	●	HV700 x 0,2mm	~ 0,02

* = weicher *Stahl / soft steel*

Bestellbeispiel / *Ordering example:* CC8011

Separat bestellen / *Order separately*







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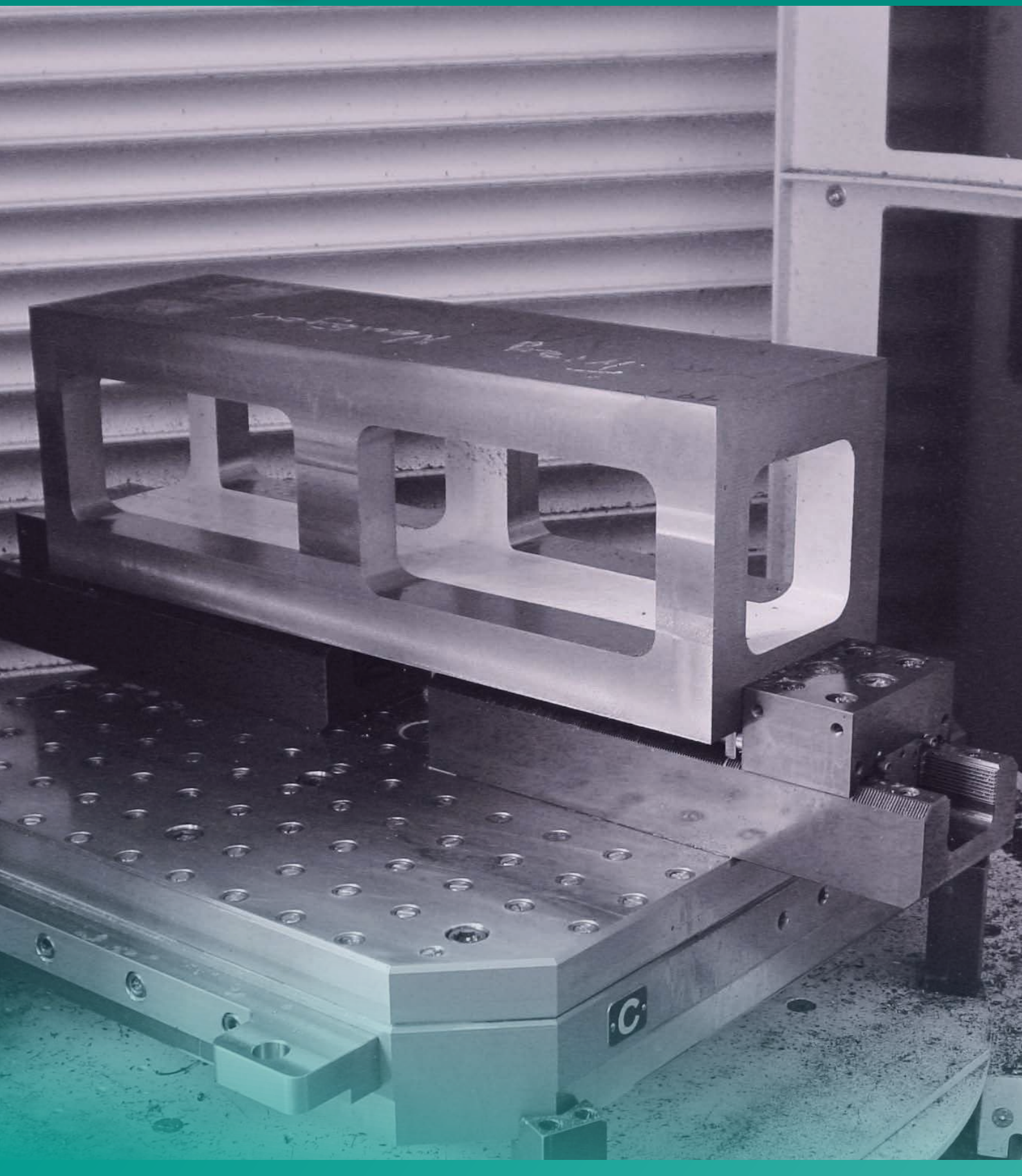
05.11.2024

*apto*CLAMP & *5axes*



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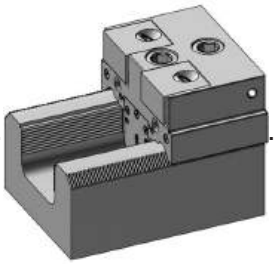
Niederzugspannmodule | *Pull down clamp modules* .....  ..... 223 - 226

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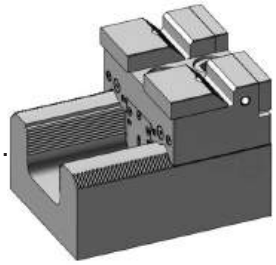
Linear clamping modules with stamping and linear jaws .....  227

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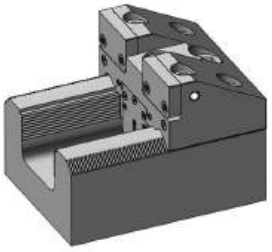
5-axis linear clamping modules with stamping and linear jaws .....  231

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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 kilogramms 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 Basisschiene. 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 Basisschiene extrem kraftschlüssig und präzis 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 enormes force produced by two M16 screws. The end modules have additionaly 4 M12 screws to give extra rigidity.



Schnelligkeit / *Quickness*



Zwei Schraube lösen
Loosen two screws



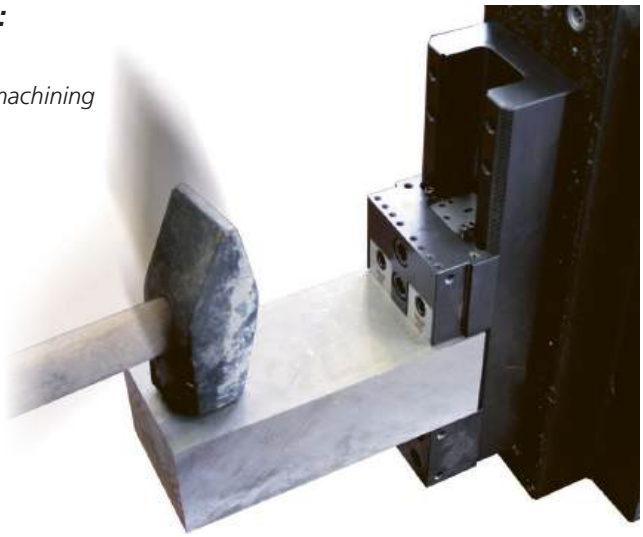
Abheben und neu platzieren
Lift and change position



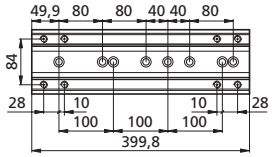
Zwei Schrauben anziehen
Fasten two screws

Vorteile auf einen Blick / *Benefits at a glance:*

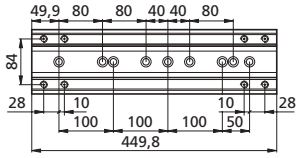
- Sehr stabil, robuste Bauweise, dadurch hohe Präzision
  Very stable, robust design allows high precision and heavy machining
- Module nach oben abhebbar, kein Ausfahren nötig
  Modules can be lifted up, no extension needed
- Keine verschmutzbaren T-Nuten: Formschlüssig positioniert
  No chip loading 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



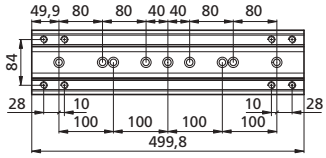
400 mm



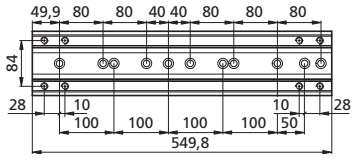
450 mm



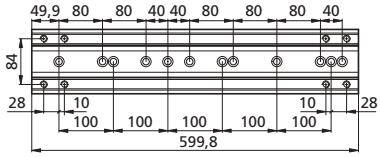
500 mm



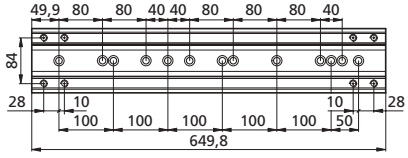
550 mm



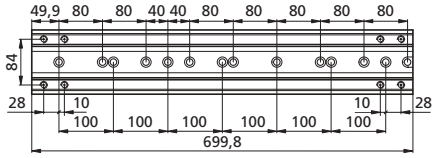
600 mm



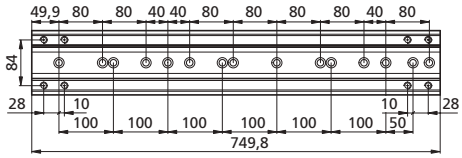
650 mm



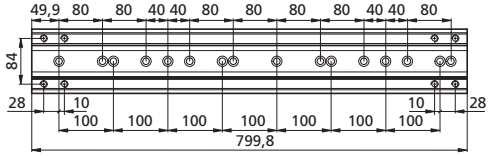
700 mm



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.

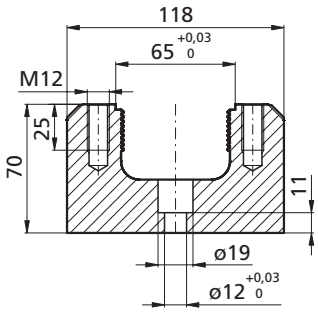
Durch gezielte elastische Deformation einer Lippe erfolgt eine spielfreie Paarung. Spann- und Bearbeitungskräfte werden einerseits an der ebenen, robusten Oberseite der Basisschiene aufgenommen, während anderseits das Spannmodul durch einen spreizenden Keil mit robustem Rundgewindeprofil in der Schiene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

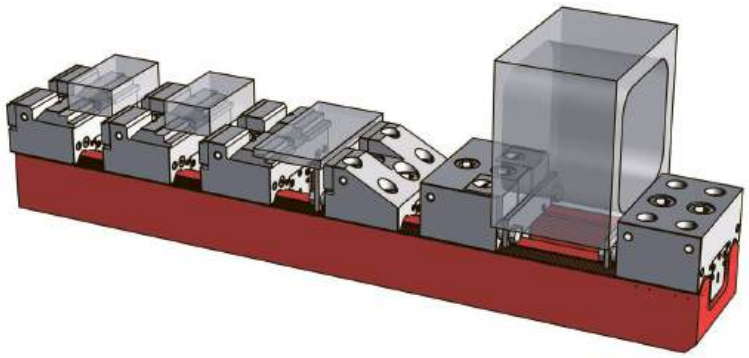
The outstanding development is that through elastic deformation of a lip, the engagement between the modules and the base rail is without play. Clamping and machining forces are absorbed on the upper surface of the base rail whereas the vice module is fixed to the rail by an expandable anchor which engages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

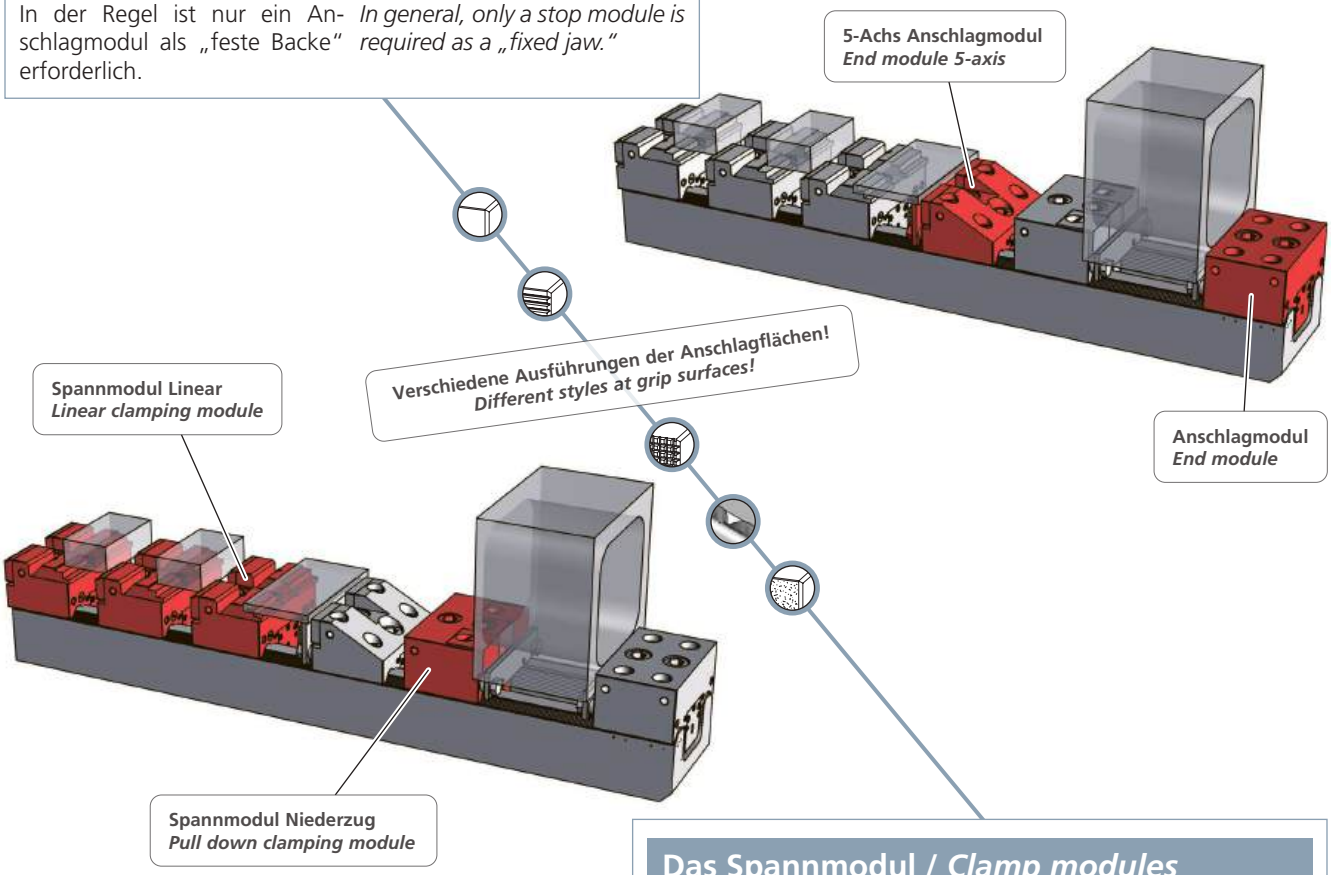




Das Anschlagmodul / *End modules*

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*

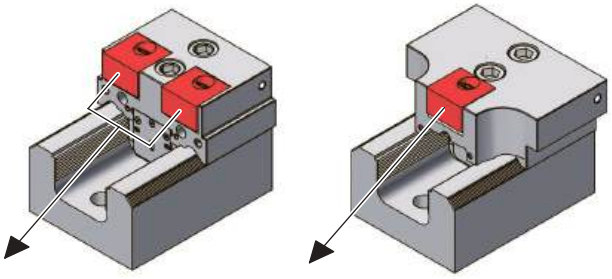
Die «beweglichen Backen» gibt es in zwei Ausführungen. Zum einen für das Niederzugspannsystem und zum anderen für das Linearspannsystem. Dabei dient das Spannmodul bei den Systemen wiederum als Anschlagmodul für die nächste Aufspannung.

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 Haltekräfte
- Hohe Wiederholgenauigkeit
- Optimale Spannmethode für Kleinteile
- Mit Schnellwechselbacken
- Doppelspannsystem in einer Backe zum Spannen und Bearbeiten von zwei Kleinteilen

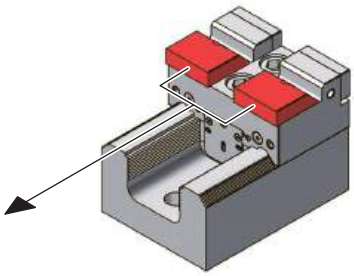
Facts for pull down clamp modules

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 Linearpannsystem

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

Vorteile beim Linearpannsystem:

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

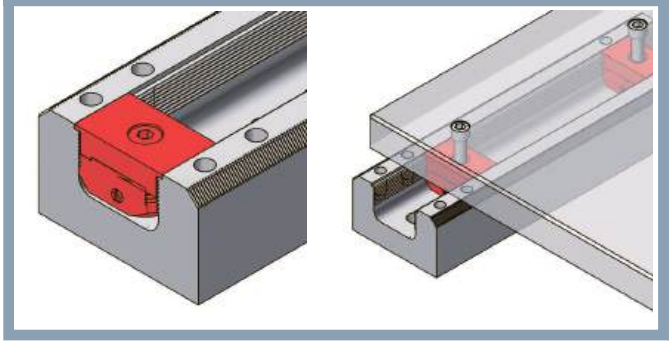
Facts for linear clamp modules

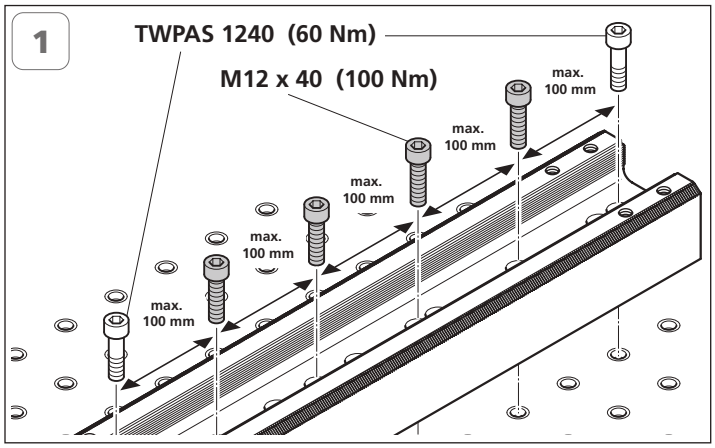
Jaw range: *0- 5,0 mm*
Clamping force: *up to 3´200 daN*

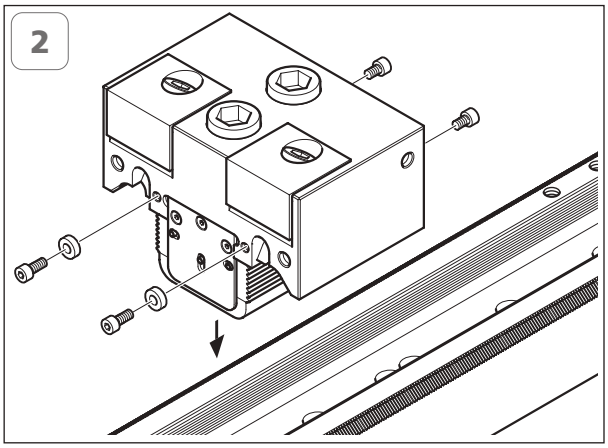
Advantages linear jaws:

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

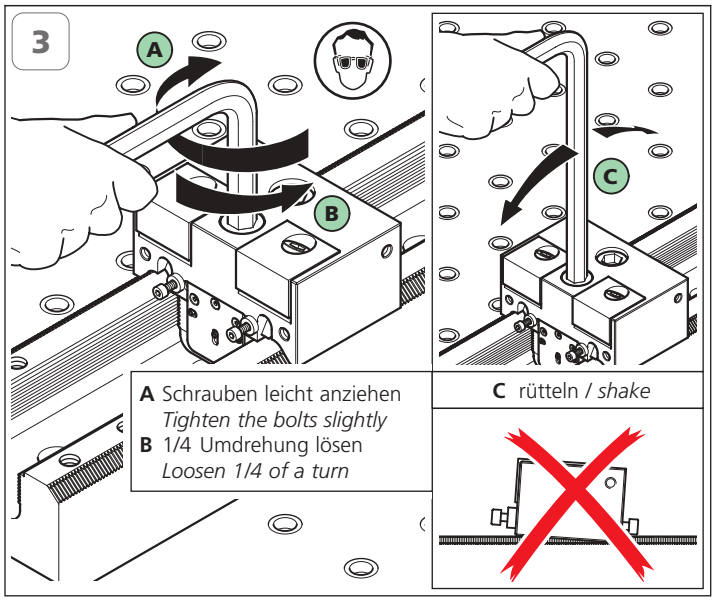
Universalnutenstein
Universal nut

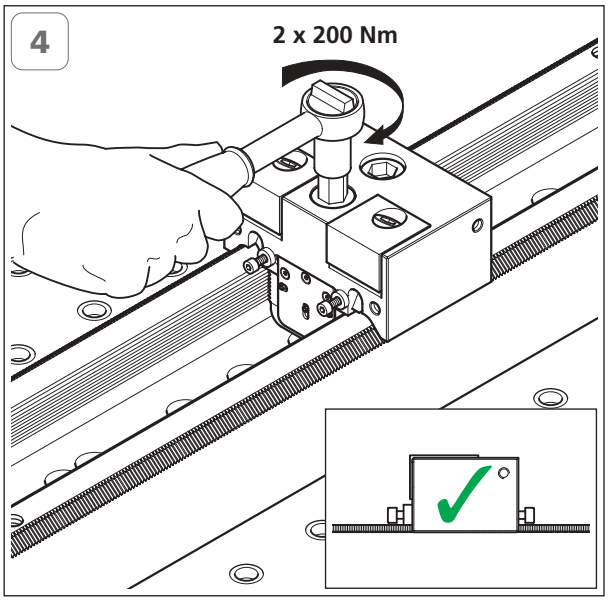


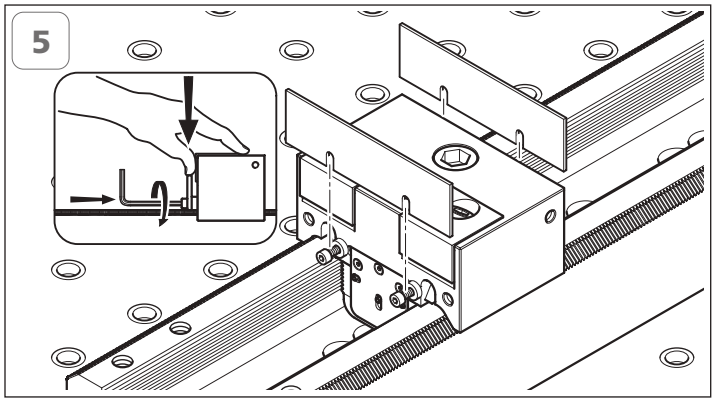


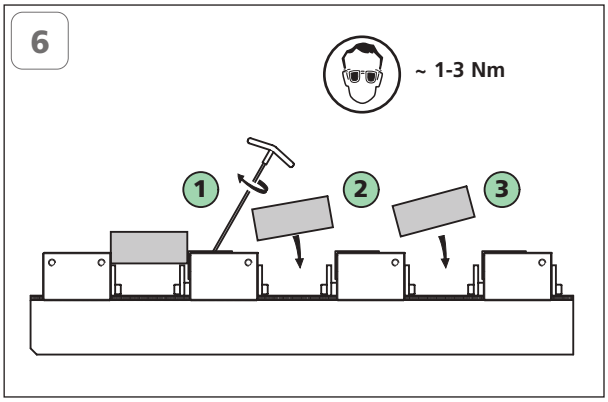


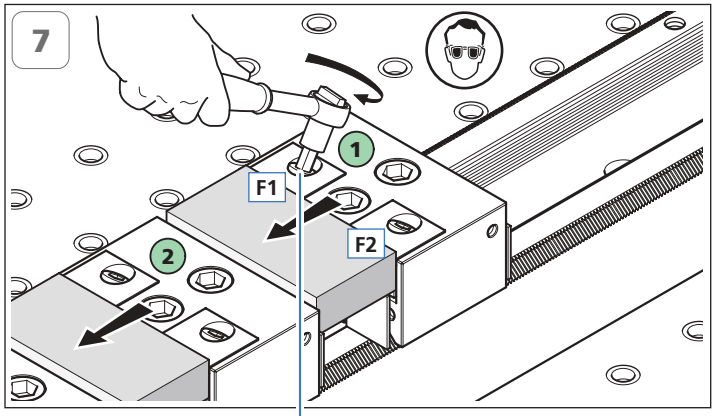
Ineinandergreifen der Verzahnung prüfen
Check matching of the teeth











max. 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
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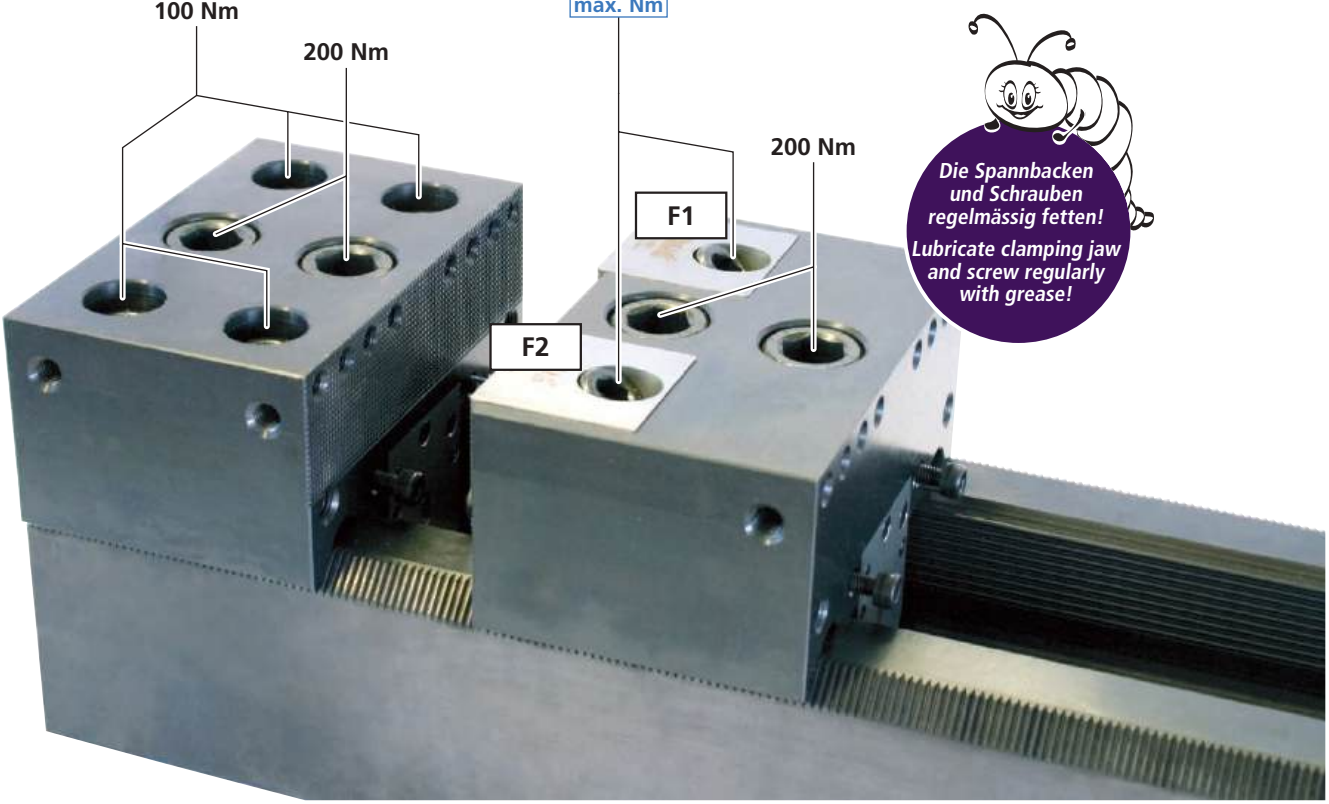
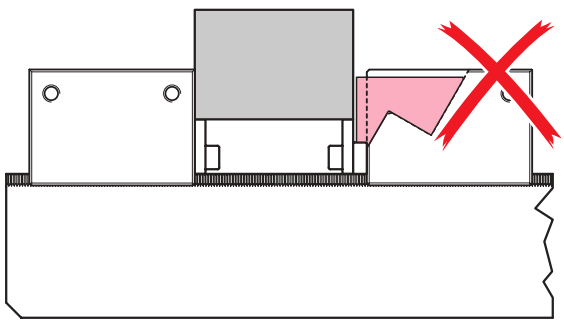
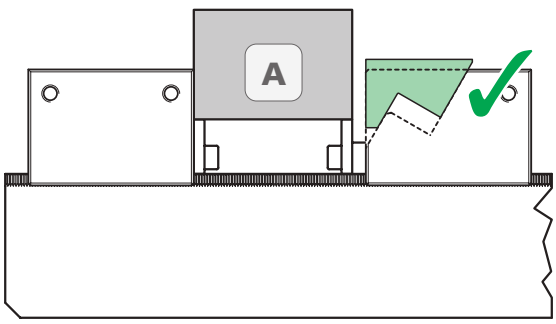
	50	37,0	= 7000	15'430	7,0

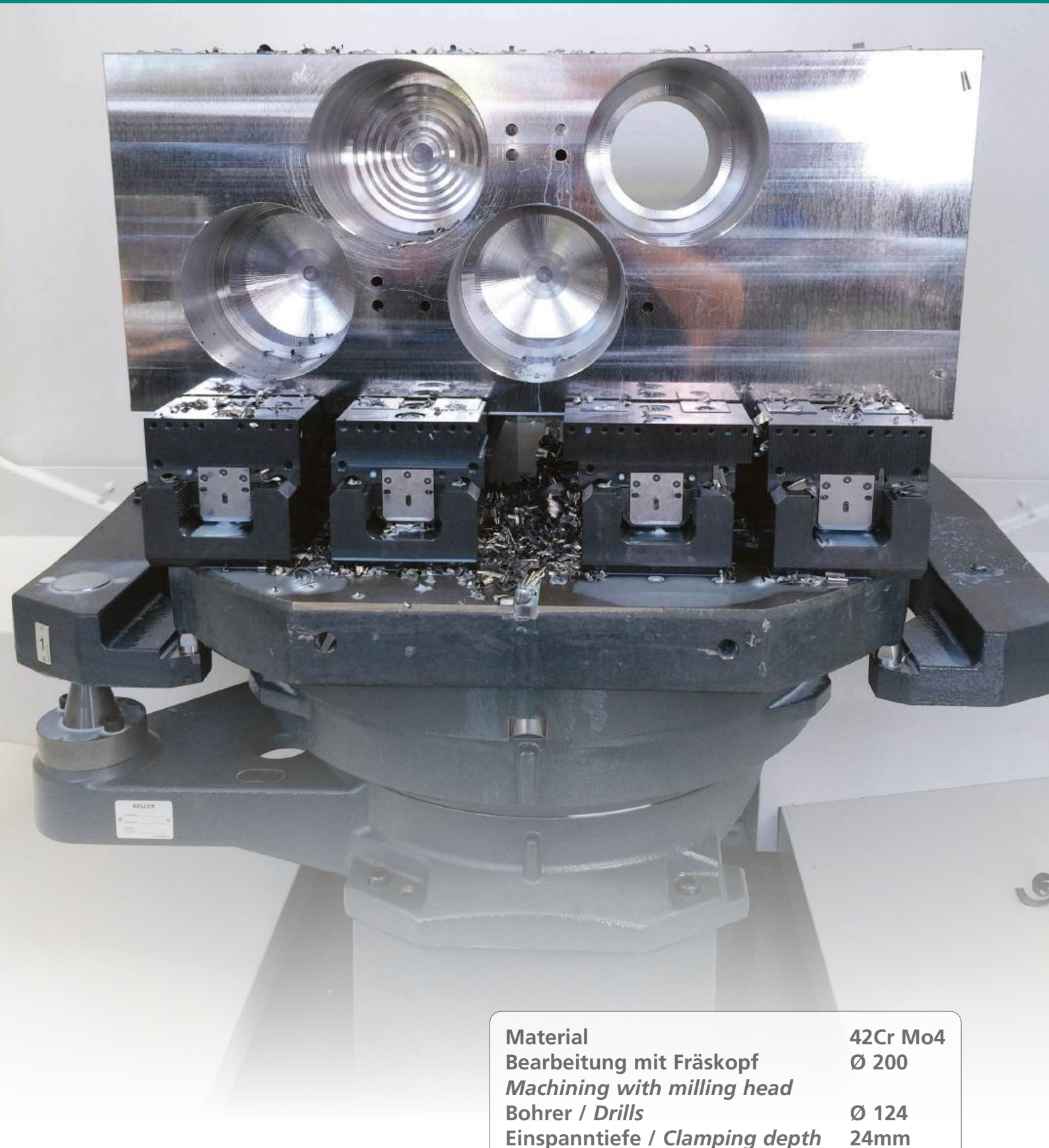


WICHTIG:
Vor dem Positionieren der Spannmodule für ein neues Werkstück ist die Spannbacke ganz zurück zu stellen, dies gewährleistet eine sichere Spannung (**siehe Bild A**)!

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 guaranties proper clamping of the new workpiece.*

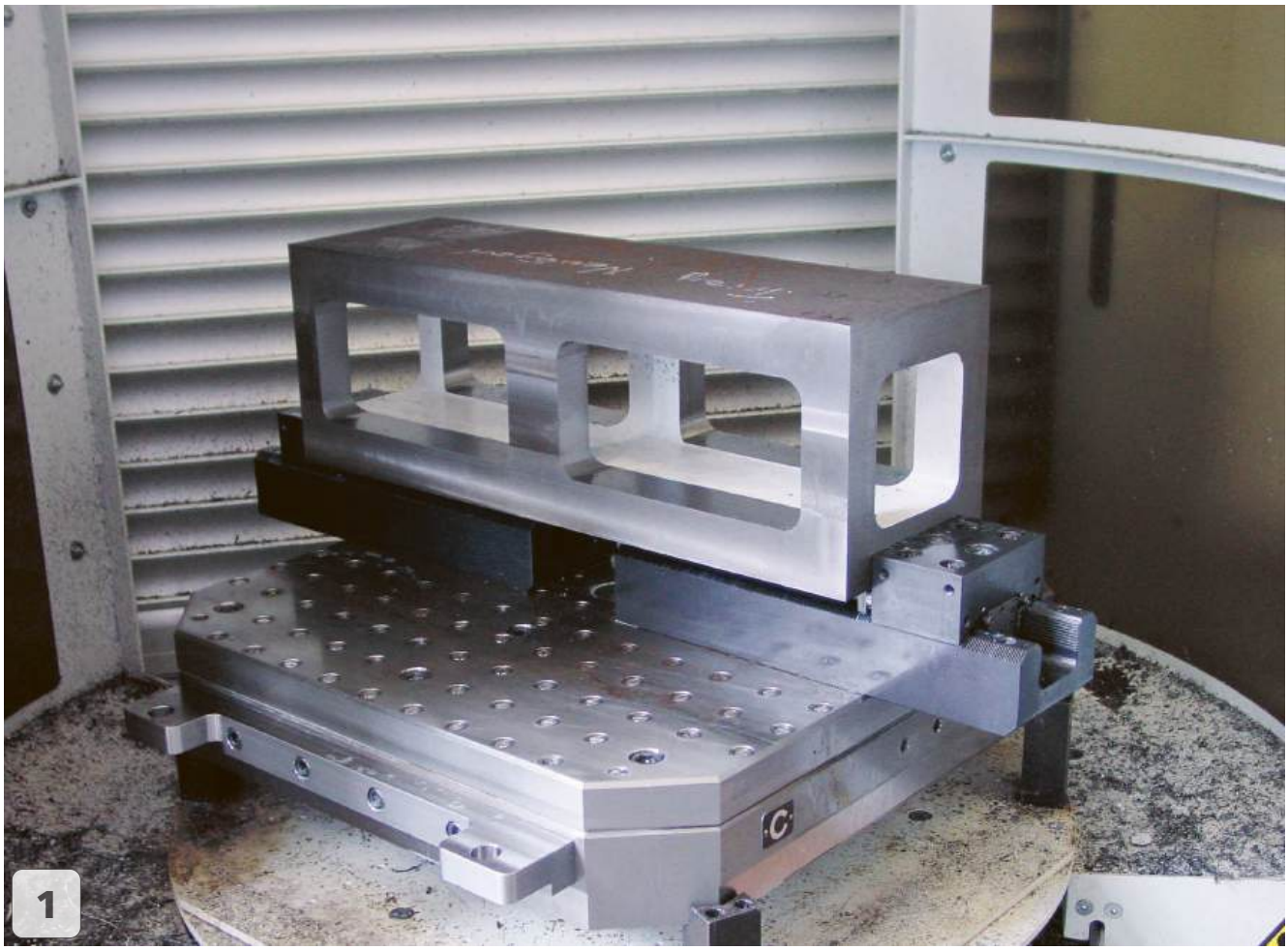




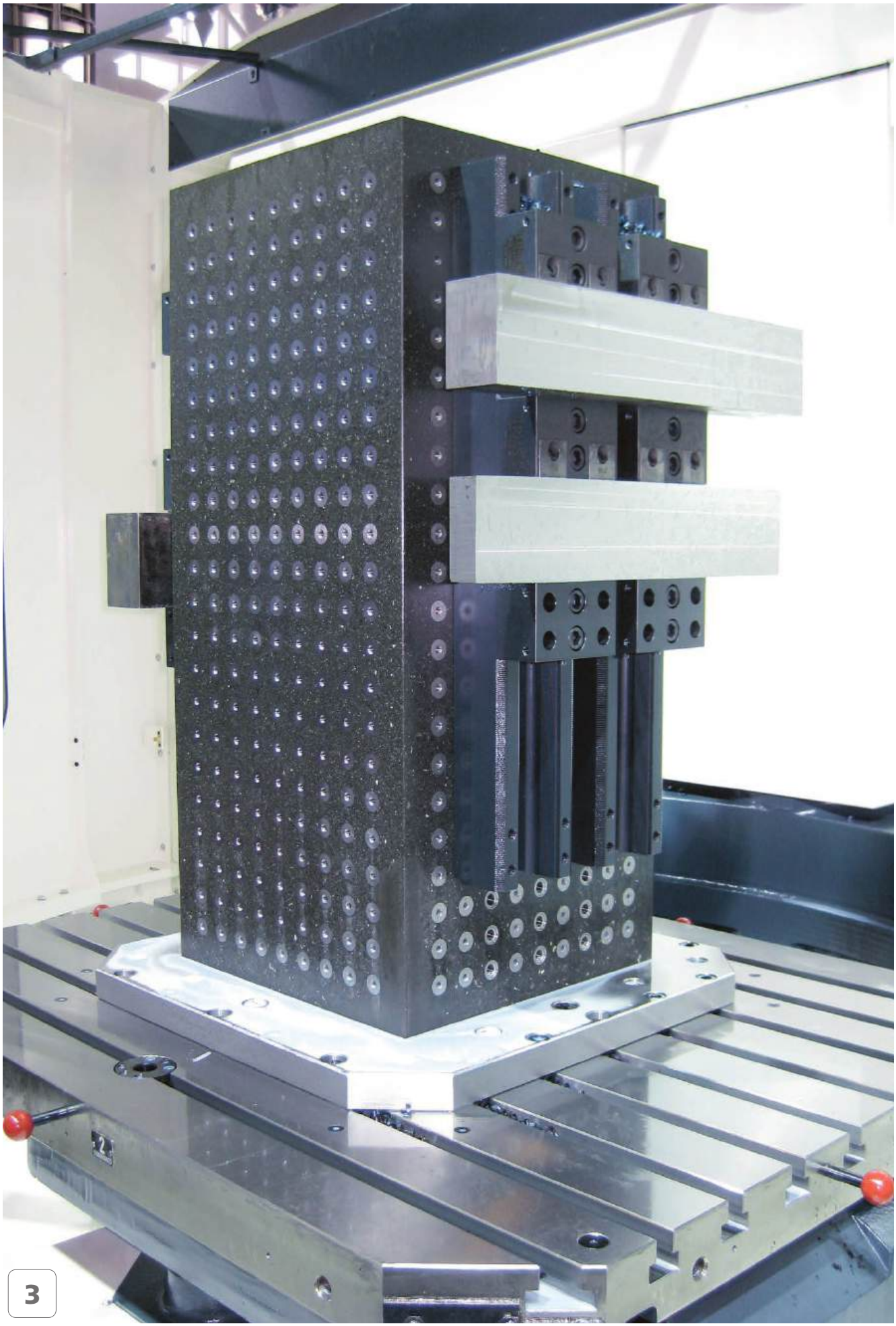


Material	42Cr Mo4
Bearbeitung mit Fräskopf *Machining with milling head*	Ø 200
Bohrer / *Drills*	Ø 124
Einspanntiefe / *Clamping depth*	24mm

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


1


2



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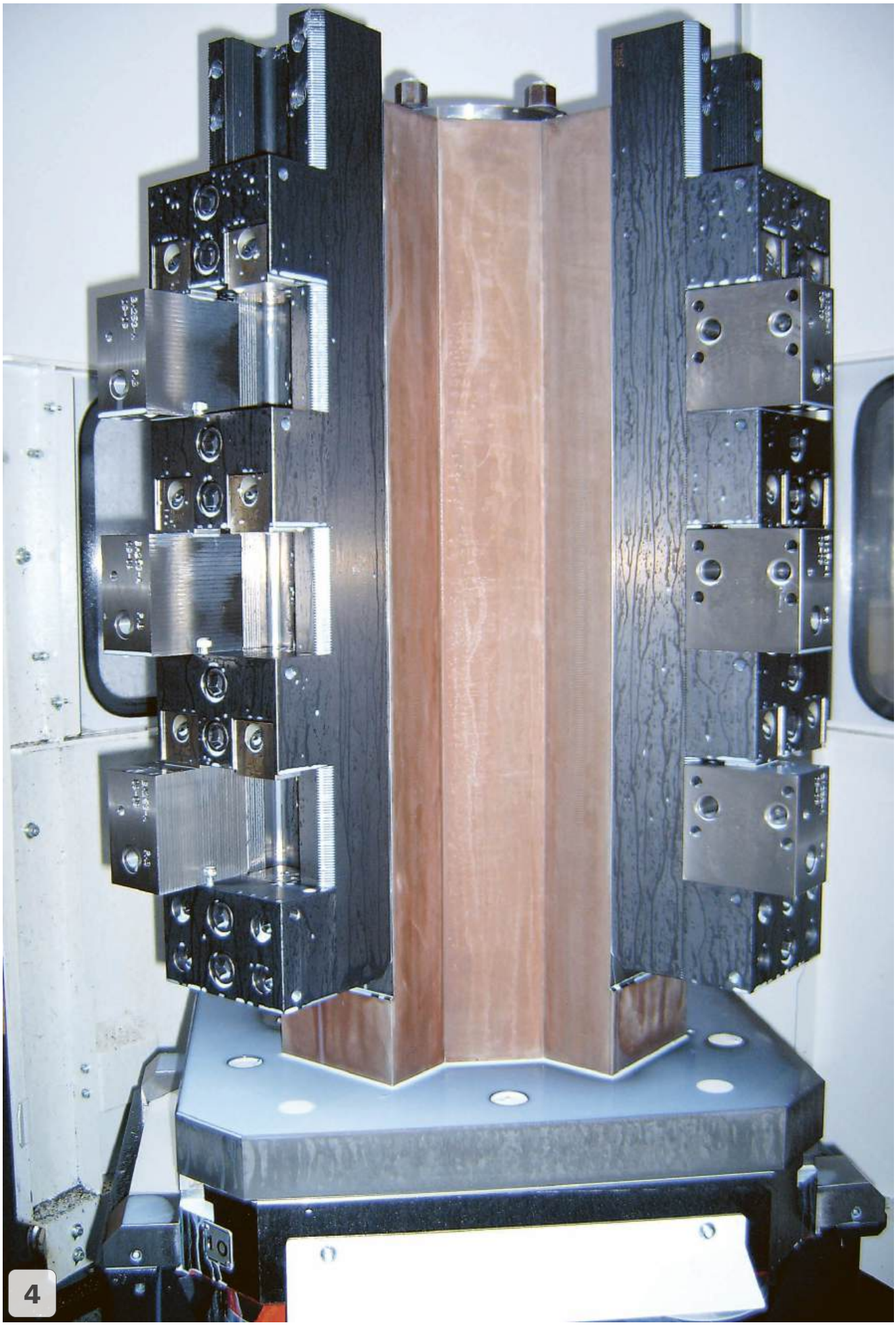

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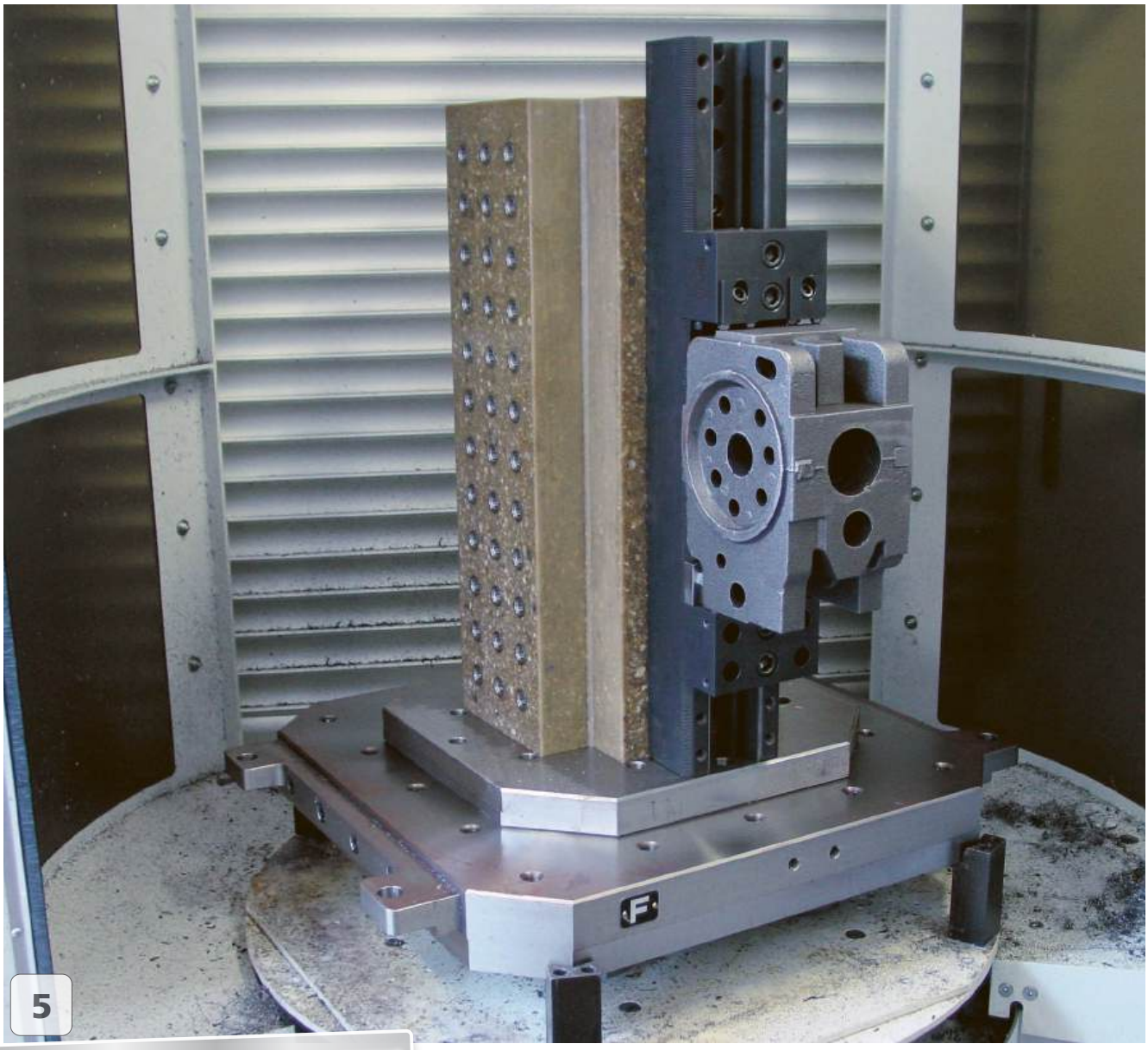
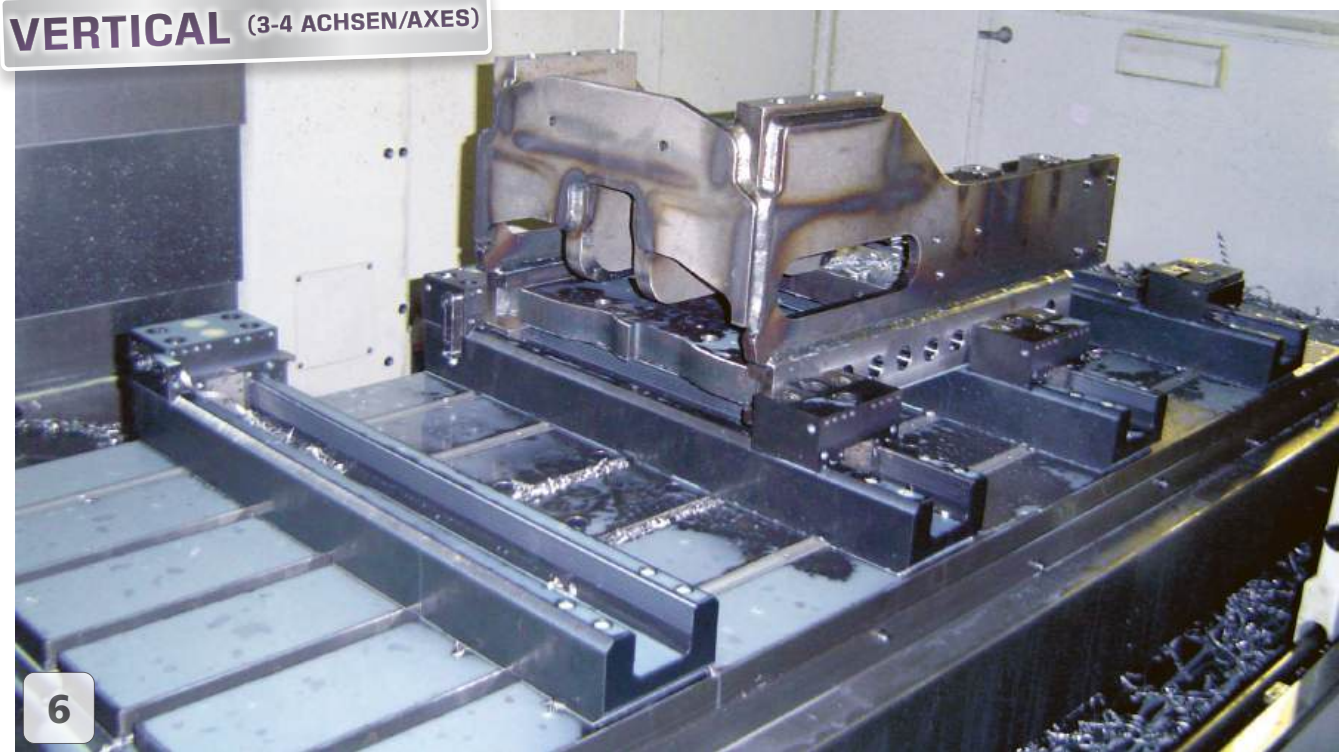


5

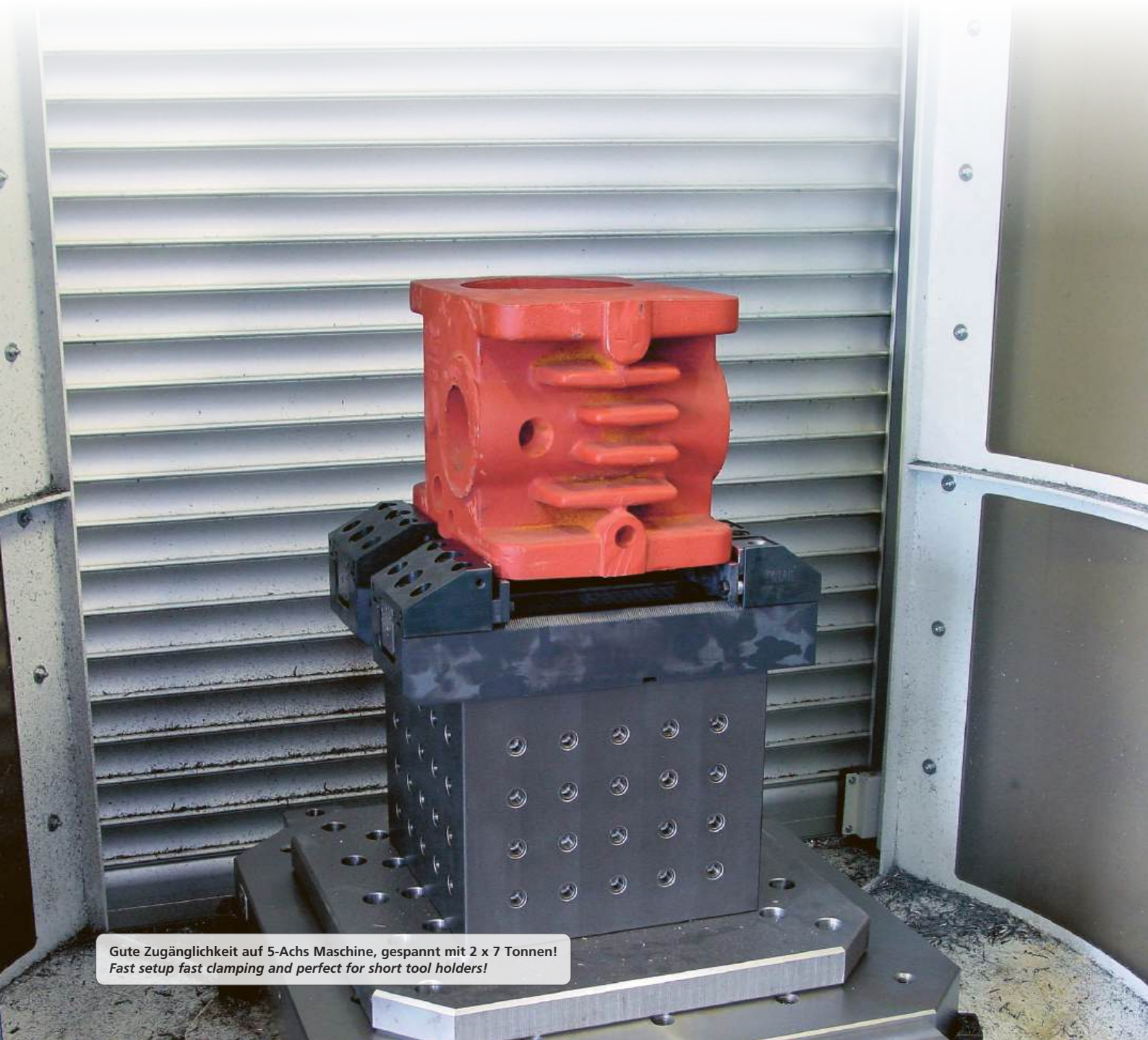
VERTICAL (3-4 ACHSEN/AXES)



6

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 7000 daN (7 Tonnen) Spannkraft und sind für die Schwerzerspanung empfohlen.

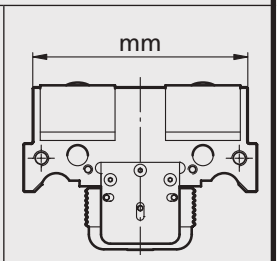
We offer Apto Clamp modules in slanted version. That ensures an optimal access to the workpieces on 5-axis machines. The clamping modules produce up to 7000 daN (7 tons) clamping force and are recommended for heavy roughing workholding.

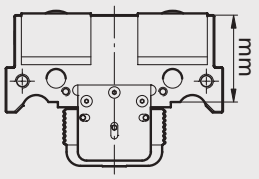


Gute Zugänglichkeit auf 5-Achs Maschine, gespannt mit 2 x 7 Tonnen!
Fast setup fast clamping and perfect for short tool holders!

System *System*	
A	Apto Clamp
P	Power Clamp
C	Compact Clamp
M	Micro Clamp
V	Vorrichtungsbaumodule *Workholding modules for dedicated fixtures*

bei Anschlagmodulen *for end module*	
N	nitriergehärtet *nitrated*
D	durchgehärtet *through hardened*
bei Spannmodulen *for vice modules*	
1 2 3	Anzahl Spannbacken *Number of jaws*

Modulnutzbreite *Module clamping width*	
115 125 150	

Modulnutzhöhe *Module clamping height*	
50	

A S 2 R 115 N 50 -80

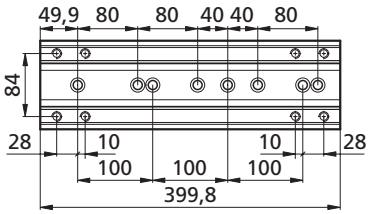
Modultyp *Type of module*	
A	Anschlagmodul *End module*
S	Spannmodul *Clamping module*
T	Trägermodul *Supporting module*
R	Rohling *Blank*

Anschlagfläche der Module *Datum face*	
F	Anschlagfläche glatt *Datum face flat*
R	Anschlagfläche geriffelt *Datum face double serrated*
D	eine Seite glatt, eine Seite geriffelt *one face flat, one face double serrated*
G	Anschlagfläche gerillt *Datum face serrated*
X	spezielle Ausführung *special execution*
5X	5axes Clamp

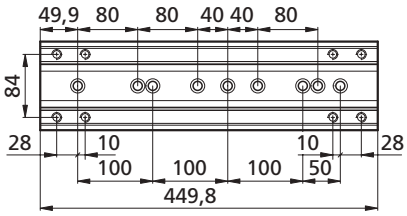
Backenhub *Stroke of clamping jaw*	
N	Niederzug *Pull down*
L	linear / parallel *linear / parallel*
-	ohne Spannbacke *no clamping jaw*

Spannbackentyp *Type of clamping jaw*	
B80 - B89	Spannbacke *Clamping jaw*
-80 - -105	Modul ohne Spann-backen *Module without clamp-ing jaw*

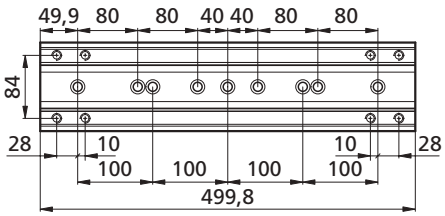
ACB4050400 **kg** ~18



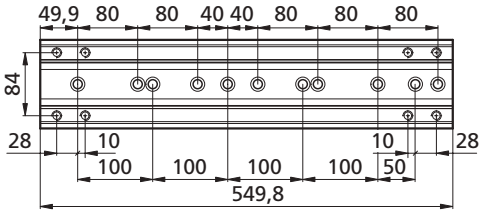
ACB4050450 **kg** ~20



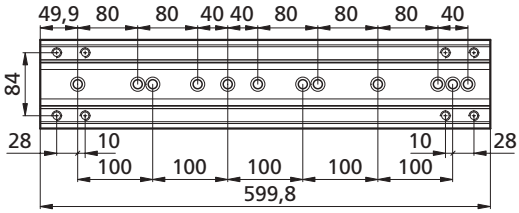
ACB4050500 **kg** ~22



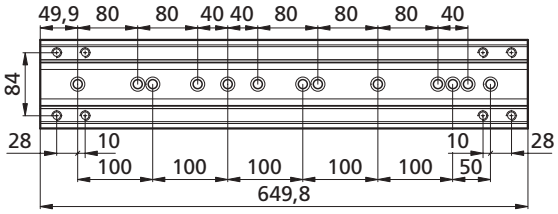
ACB4050550 **kg** ~24



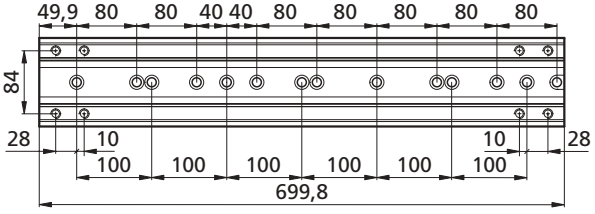
ACB4050600 **kg** ~26



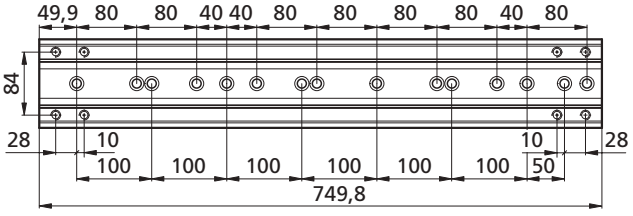
ACB4050650 **kg** ~29



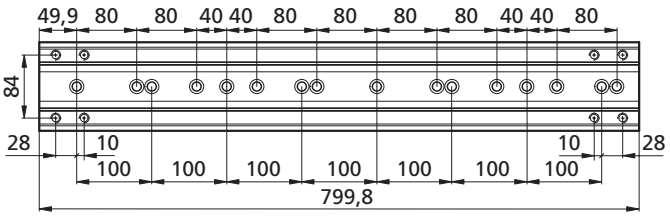
ACB4050700 **kg** ~31

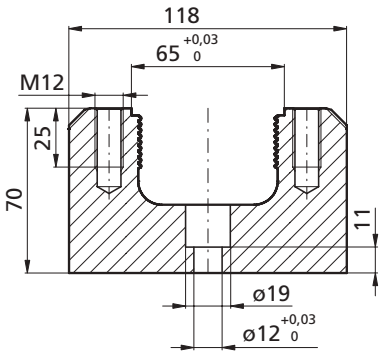


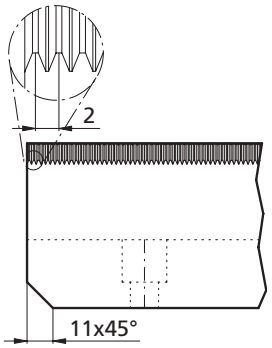
ACB4050750 **kg** ~33

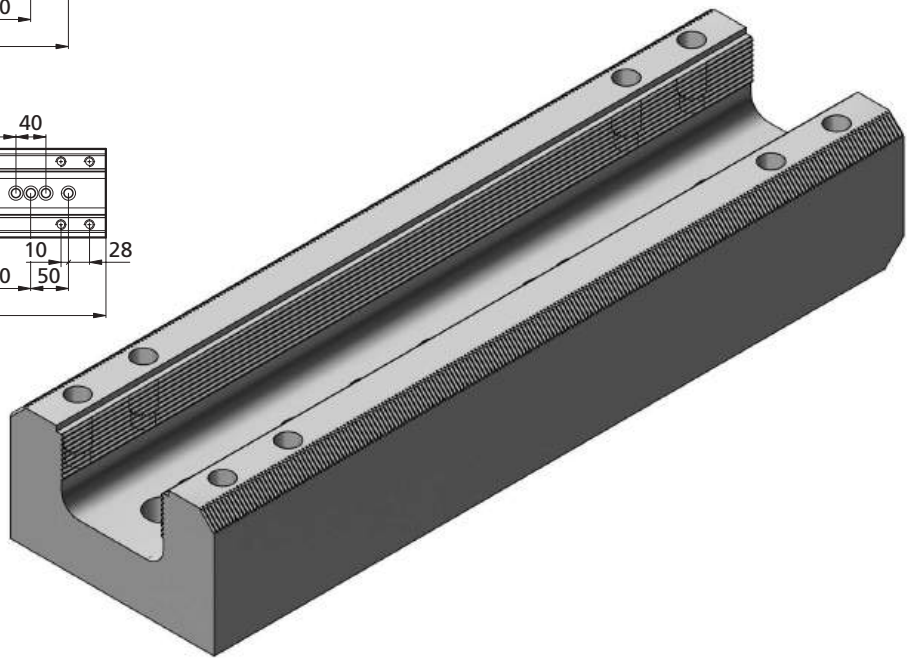


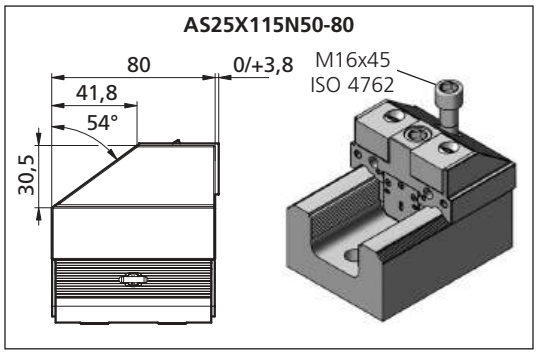
ACB4050800 **kg** ~35

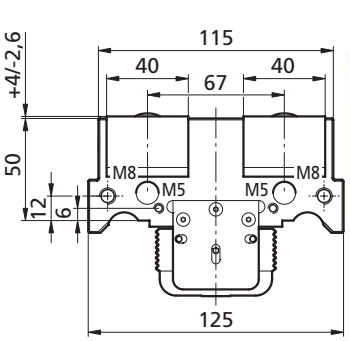


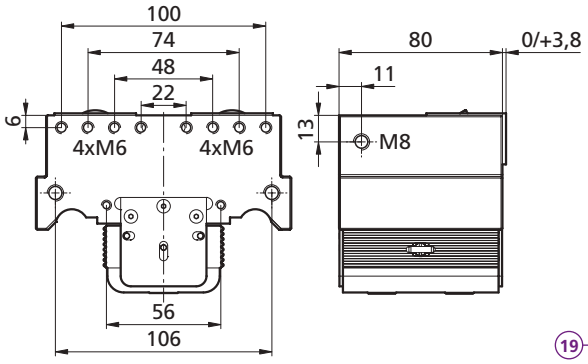












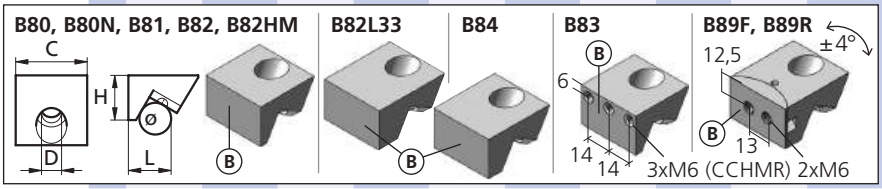
A

5axes	**AS25X115N50-80**	
1	1x	TF140678
4	1x	**M16X45ISO4762**
	1x	**M16X70ISO4762**
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	ACSK7632M16
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

B

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

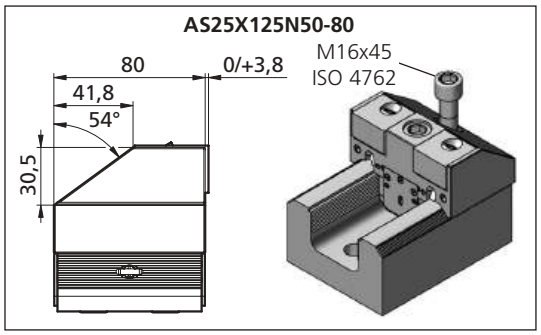
	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
ø	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2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

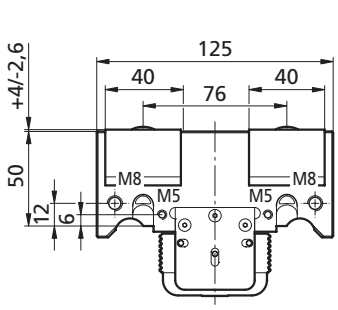


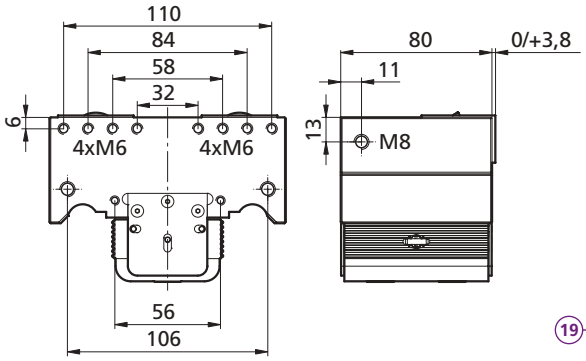
* = weich / *soft*

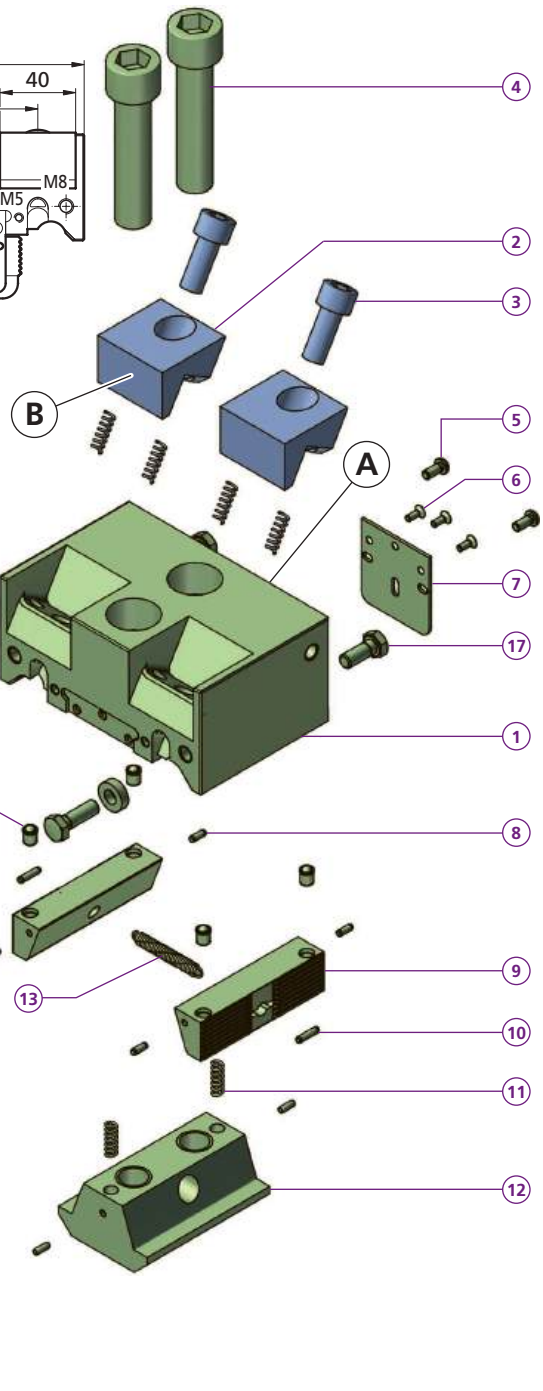
HM = Hartmetallbeschichtet / *Carbide coated*

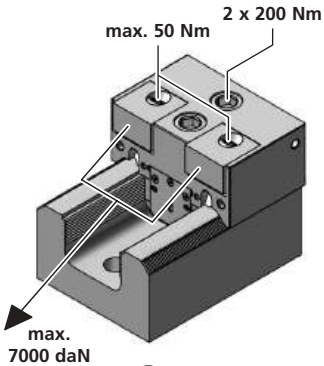
Separat bestellen / *Order separately*











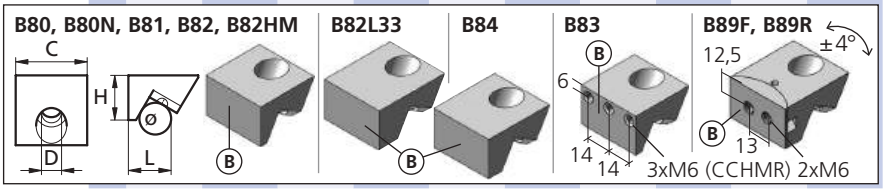
A

5axes	**AS25X125N50-80**
1	1x TF140682
4	1x **M16X45ISO4762**
	1x **M16X70ISO4762**
18	2x M8X20ISO4017
19	2x **ACD005**
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 ACSK7632M16
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

B

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

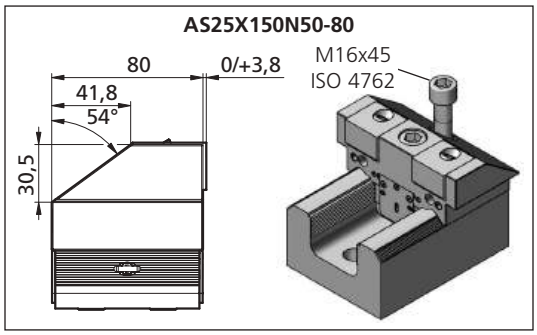
	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
ø	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2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

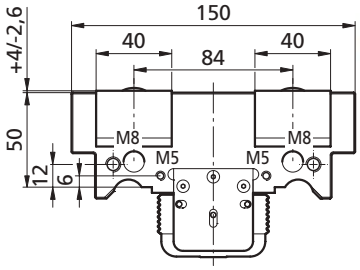


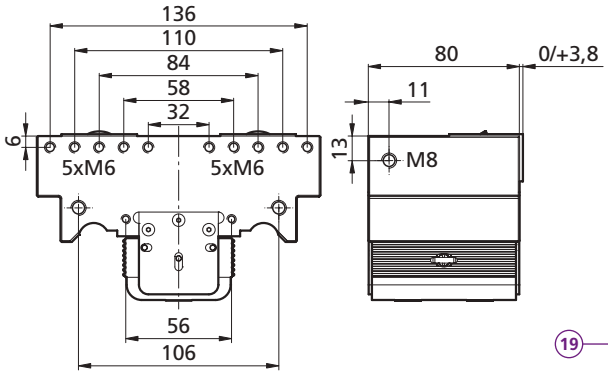
Separat bestellen / *Order separately*

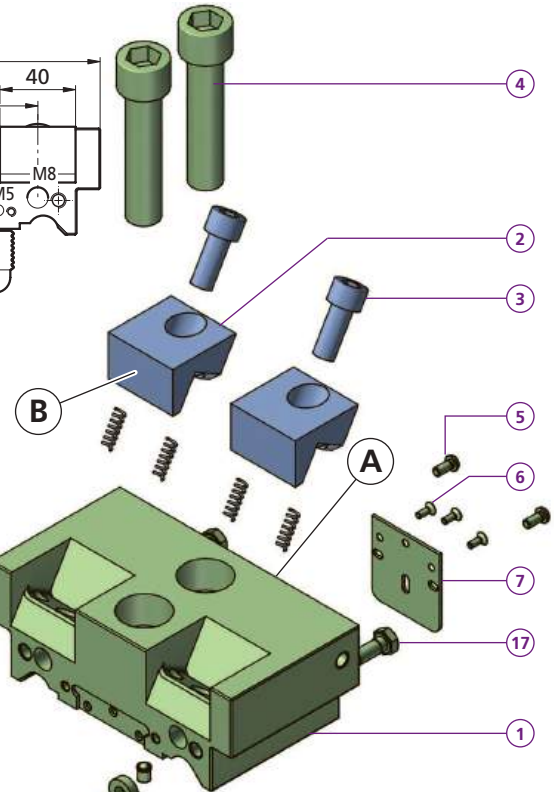
* = weich / *soft*

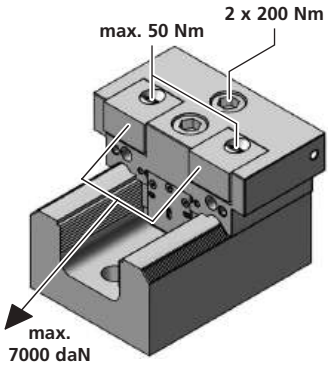
HM = Hartmetallbeschichtet / *Carbide coated*











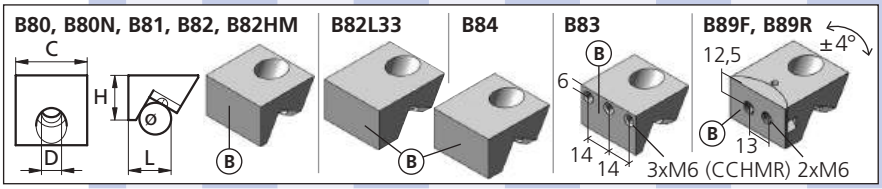
A

5axes	**AS25X150N50-80**	
1	1x	TF140687
4	1x	**M16X45ISO4762**
	1x	**M16X70ISO4762**
18	2x	M8X20ISO4017
19	2x	**ACD005**
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	ACSK7632M16
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

B

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

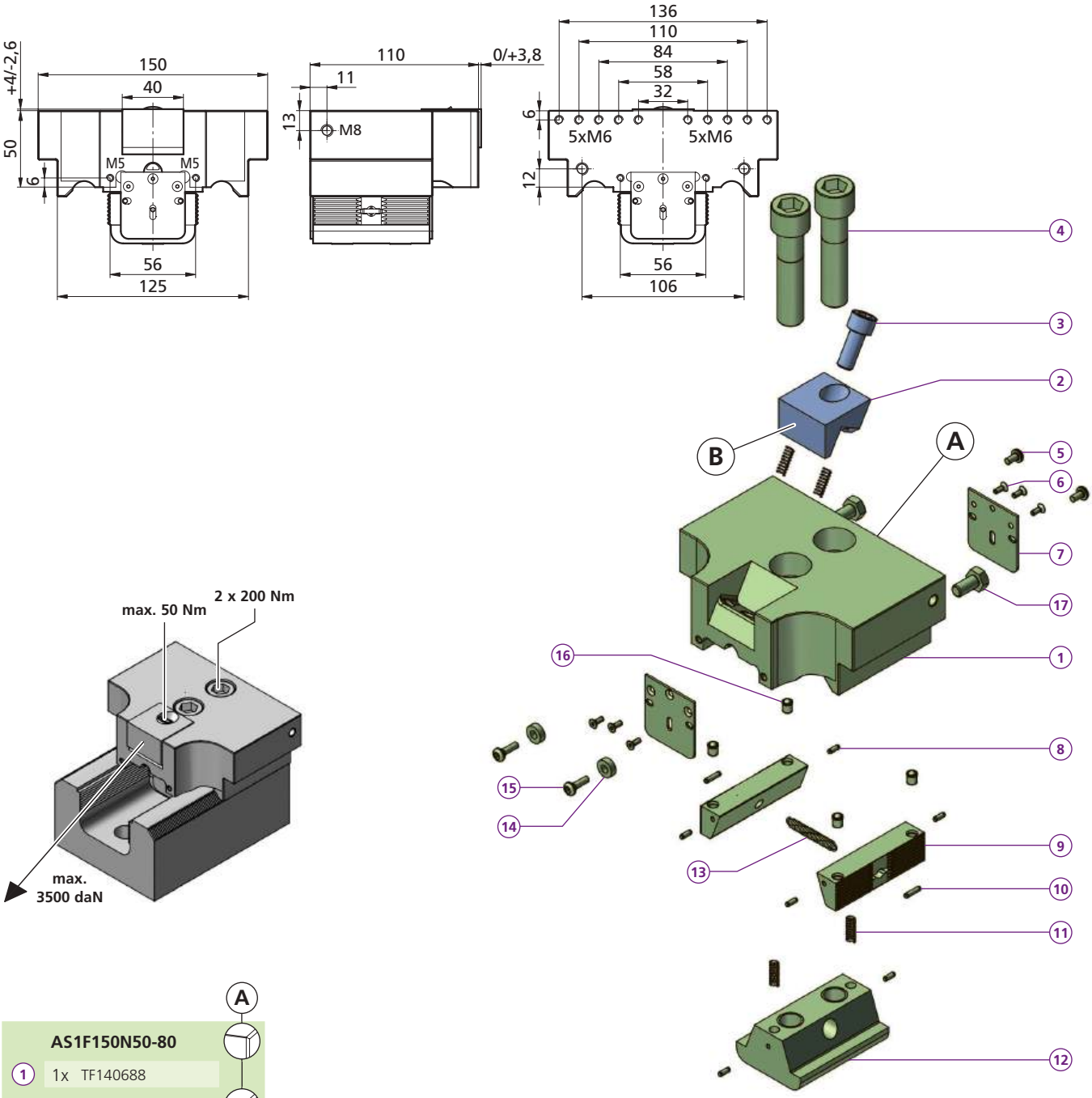
	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
ø	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2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



* = weich / *soft*

HM = Hartmetallbeschichtet / *Carbide coated*

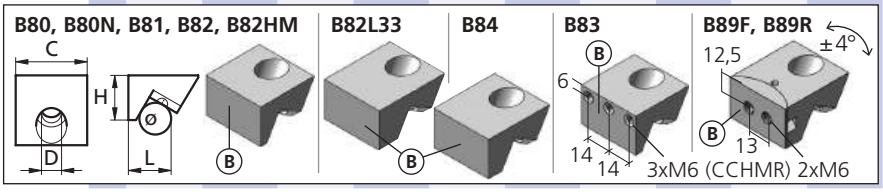
Separat bestellen / *Order separately*



	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**

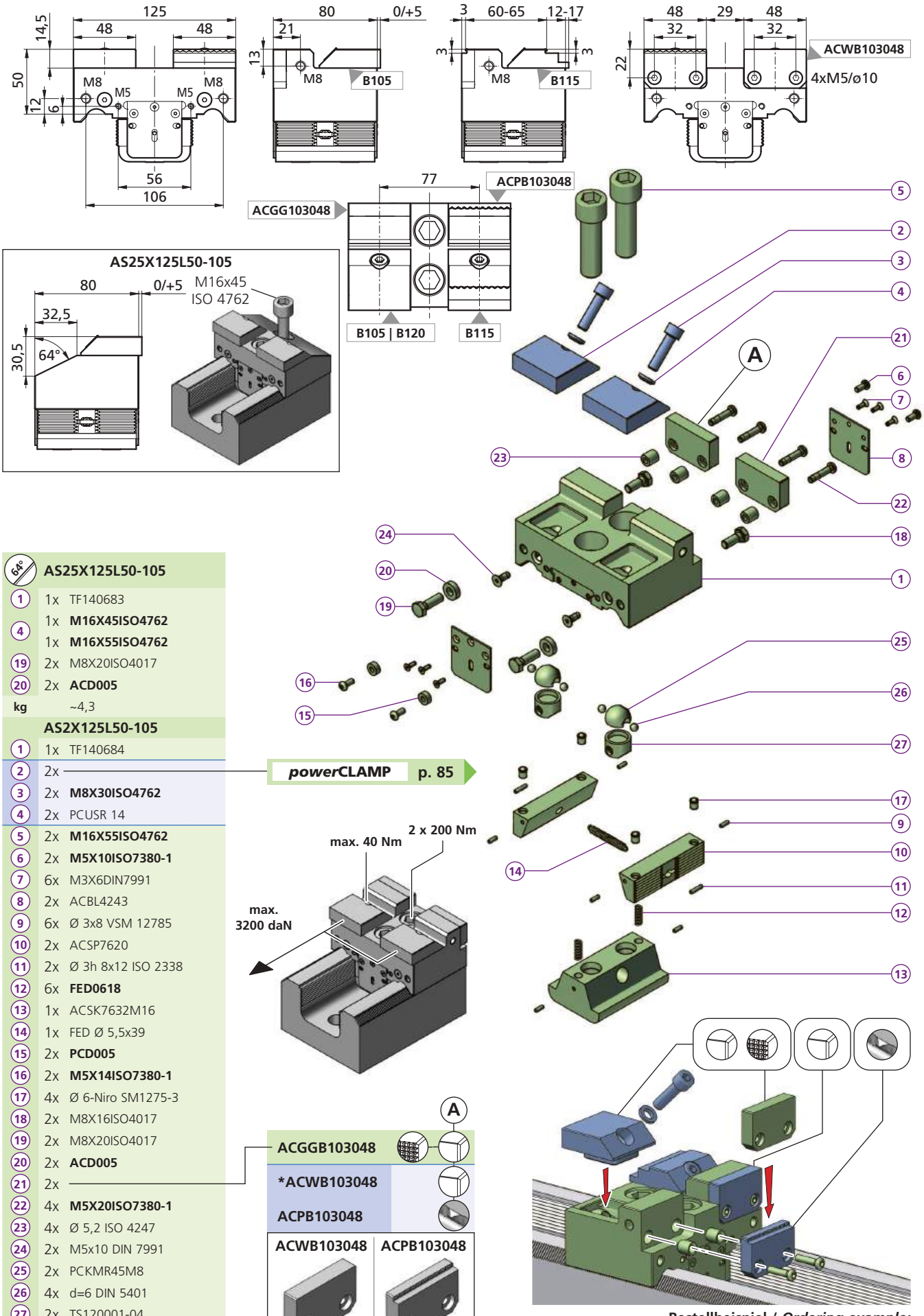
	B80	B80N	B81	B82	B82L33	B82HM	B83	B84	B89F	B89R
C	40	40	40	40	40	40	40	40	40	40
H	25	25	25	25	25	25	25	25	25	25
L	22	22	22	22,2	33	22,2	22	26,3	29	29
D	11	11	11	11	11	11	11	11	11	11
ø	15	15	15	15	15	15	15	15	15	15
i	56HRC	HV700 x0,2mm	56HRC	*	*	56HRC	HV700 x0,2mm	*	HV700 x0,2mm	HV700 x0,2mm
kg	~0,2	~0,2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



* = weich / *soft*

HM = Hartmetallbeschichtet / *Carbide coated*

Separat bestellen / *Order separately*



	AS25X125L50-105
1	1x TF140683
4	1x **M16X45ISO4762**
	1x **M16X55ISO4762**
19	2x M8X20ISO4017
20	2x **ACD005**
kg	~4,3
	AS2X125L50-105
1	1x TF140684
2	2x
3	2x **M8X30ISO4762**
4	2x PCUSR 14
5	2x **M16X55ISO4762**
6	2x **M5X10ISO7380-1**
7	6x M3X6DIN7991
8	2x ACBL4243
9	6x Ø 3x8 VSM 12785
10	2x ACSP7620
11	2x Ø 3h 8x12 ISO 2338
12	6x **FED0618**
13	1x ACSK7632M16
14	1x FED Ø 5,5x39
15	2x **PCD005**
16	2x **M5X14ISO7380-1**
17	4x Ø 6-Niro SM1275-3
18	2x M8X16ISO4017
19	2x M8X20ISO4017
20	2x **ACD005**
21	2x
22	4x **M5X20ISO7380-1**
23	4x Ø 5,2 ISO 4247
24	2x M5x10 DIN 7991
25	2x PCKMR45M8
26	4x d=6 DIN 5401
27	2x TS120001-04
kg	~4,5

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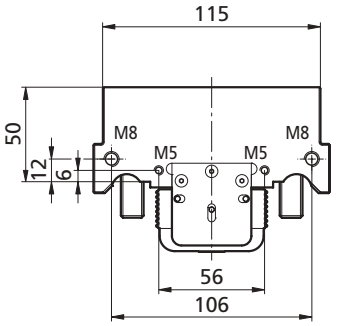
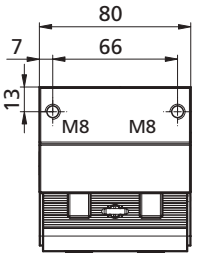
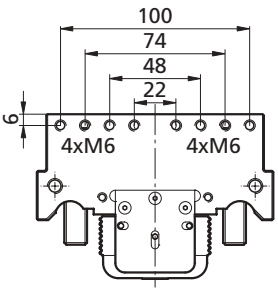
* = weich / *soft*

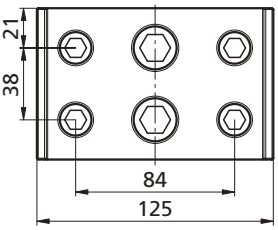
Bestellbeispiel / *Ordering example:*
1x AS2X125L50-150 & 2x B105 & 2x ACGGB103048

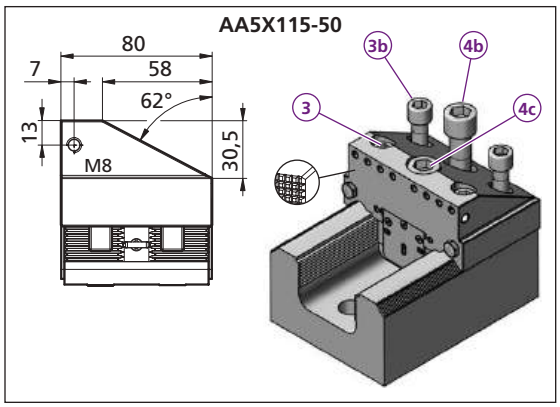
Separat bestellen / *Order separately*

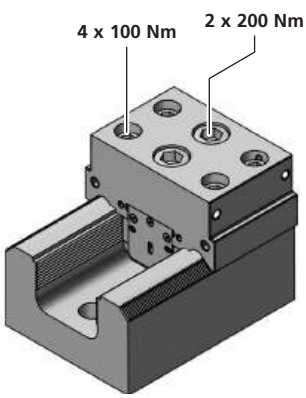








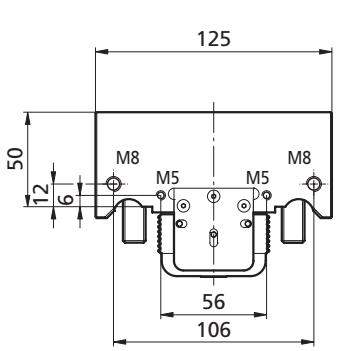


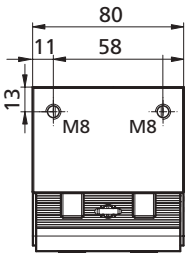


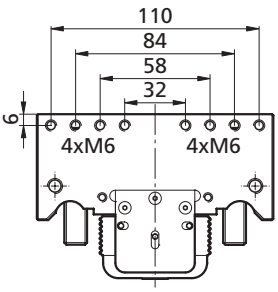
	A	B
AAND115-50		
1	1x	TF140690
3	4x	**M12X50ISO4762**
4	2x	**M16X70ISO4762**
5	4x	**M5X10ISO7380-1**
6	6x	M3X6DIN7991
7	2x	ACBL4243
8	6x	Ø 3x8 VSM 12785
9	2x	ACSP7620
10	2x	Ø 3h 8x12 ISO 2338
11	2x	**FED0618**
12	1x	ACSK7632M16
13	1x	FED Ø 5,5x39
16	4x	Ø 6-Niro SM1275-3
17	4x	M8X16ISO4017
kg		~4,7

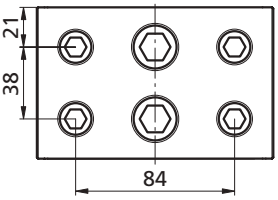
	A
AA5X115-50	
1	1x TF140691
3	2x **M12X50ISO4762**
3b	2x **M12X30ISO4762**
4c	1x **M16X65ISO4762**
4b	1x **M16X45ISO4762**
5	2x **M5X10ISO7380-1**
17	2x M8X16ISO4017
kg	~4,6

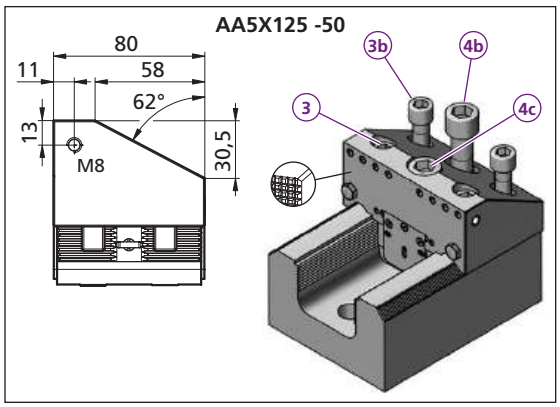
Bestellbeispiel / *Ordering example*: AAND115-50

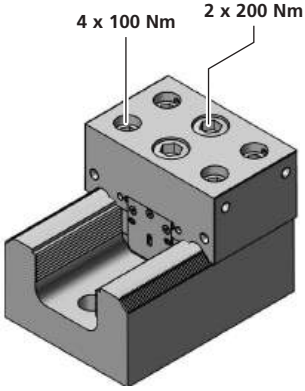








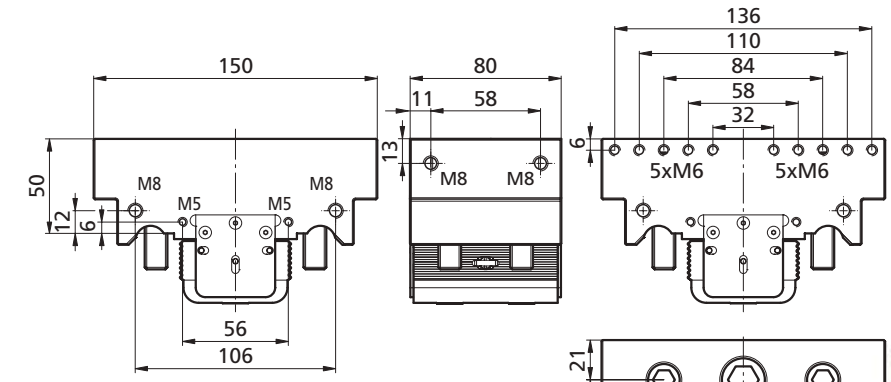


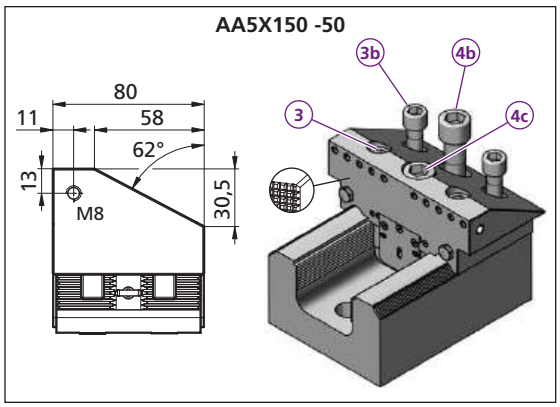


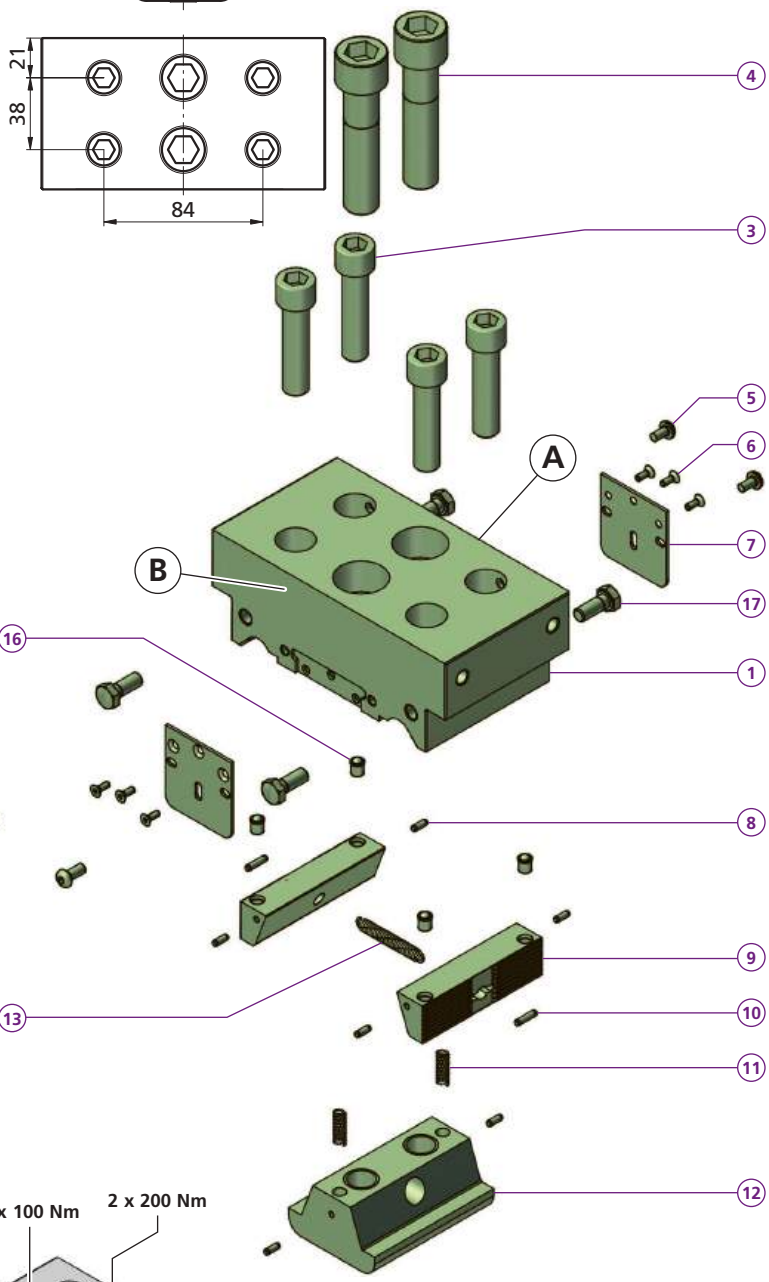
	A	B
AAND125-50		
1	1x TF140692	
3	4x **M12X50ISO4762**	
4	2x **M16X70ISO4762**	
5	4x **M5X10ISO7380-1**	
6	6x M3X6DIN7991	
7	2x ACBL4243	
8	6x Ø 3x8 VSM 12785	
9	2x ACSP7620	
10	2x Ø 3h 8x12 ISO 2338	
11	2x **FED0618**	
12	1x ACSK7632M16	
13	1x FED Ø 5,5x39	
16	4x Ø 6-Niro SM1275-3	
17	4x M8X16ISO4017	
kg	~4,8	

	A
62° **AA5X125-50**	
1	1x TF140693
3	2x **M12X50ISO4762**
3b	2x **M12X30ISO4762**
4c	1x **M16X65ISO4762**
4b	1x **M16X45ISO4762**
5	2x **M5X10ISO7380-1**
17	2x M8X16ISO4017
kg	~4,6

Bestellbeispiel / *Ordering example*: AAND125-50





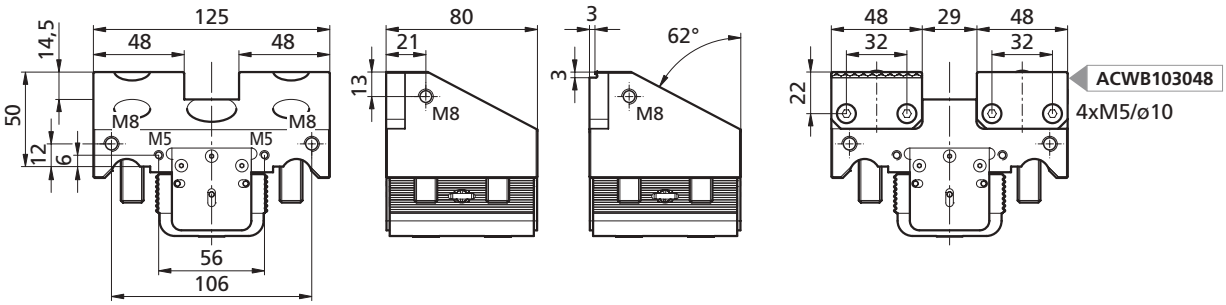


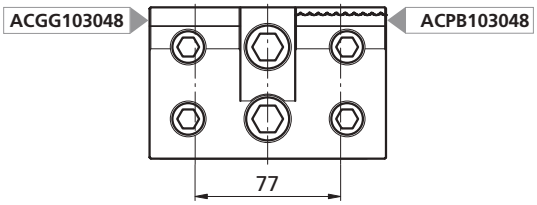
	AAND150-50	A	B
1	1x TF140695		
3	4x **M12X50ISO4762**		
4	2x **M16X70ISO4762**		
5	4x **M5X10ISO7380-1**		
6	6x M3X6DIN7991		
7	2x ACBL4243		
8	6x Ø 3x8 VSM 12785		
9	2x ACSP7620		
10	2x Ø 3h 8x12 ISO 2338		
11	2x **FED0618**		
12	1x ACSK7632M16		
13	1x FED Ø 5,5x39		
16	4x Ø 6-Niro SM1275-3		
17	4x M8X16ISO4017		
kg	~5,2		

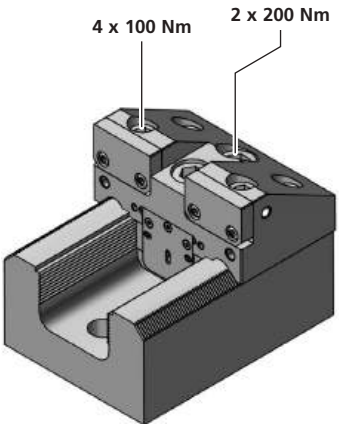
	AA5X150-50	A
1	1x TF140696	
3	2x **M12X50ISO4762**	
3b	2x **M12X30ISO4762**	
4c	1x **M16X65ISO4762**	
4b	1x **M16X45ISO4762**	
5	2x **M5X10ISO7380-1**	
17	2x M8X16ISO4017	
kg	~5,0	

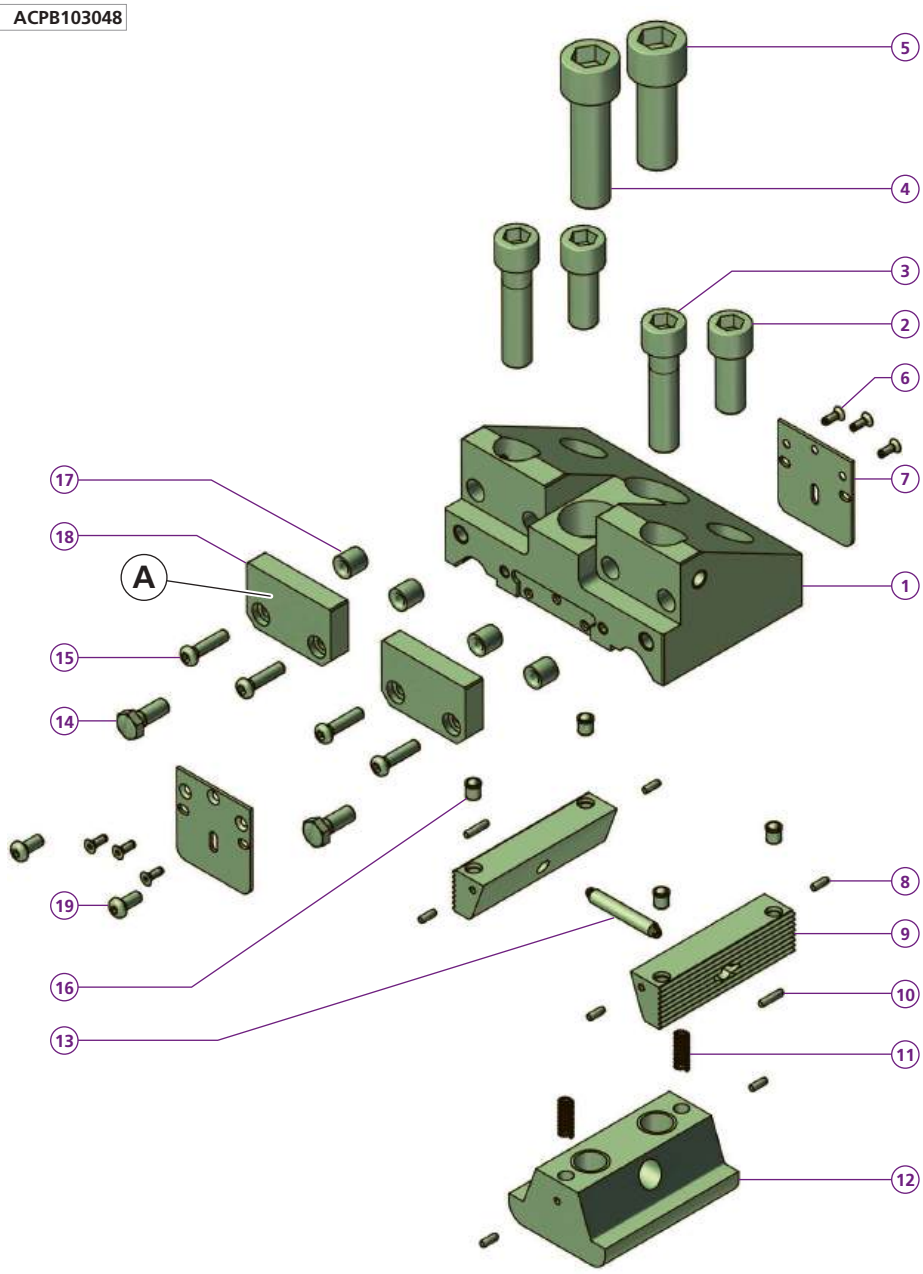
Bestellbeispiel / *Ordering example*: AAND150-50

AA5X125-50VB



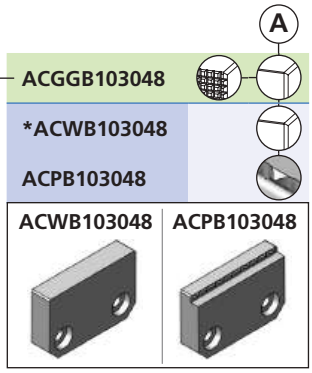






AA5X125-50VB	
1	1x TF140694
2	2x **M12X30ISO4762**
3	2x **M12X50ISO4762**
4	1x **M16X55ISO4762**
5	1x **M16X45ISO4762**
6	6x M3X6DIN7991
7	2x ACBL4243
8	6x Ø 3x8 VSM 12785
9	2x ACSP7620
10	2x Ø 3h 8x12 ISO 2338
11	2x **FED0618**
12	1x ACSK7632M16
13	1x FED Ø 5,5x39
14	2x M8X16ISO4017
15	4x **M5X20ISO7380-1**
16	4x Ø 6-Niro SM1275-3
17	4x 5,2x10x10 DIN179-A
18	2x
19	2x **M5X10ISO7380-1**
kg	~4,5

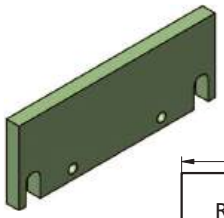
* = weich / *soft*



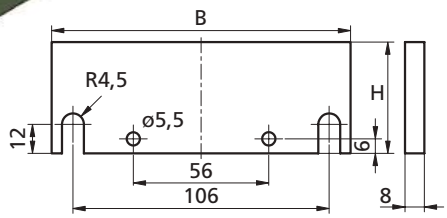
Bestellbeispiel / *Ordering example*:
1x AA5X125-50VB & 2x ACGGB103048

Separat bestellen / *Order separately*

Parallelunterlage
Steel parallels

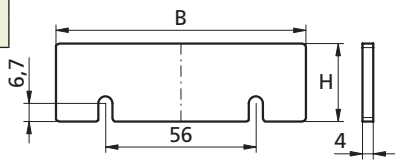


124mm	B	H	kg
ACU21124	124	21	~0,138
ACU36124	124	36	~0,250
ACU41124	124	41	~0,294
ACU46124	124	46	~0,328

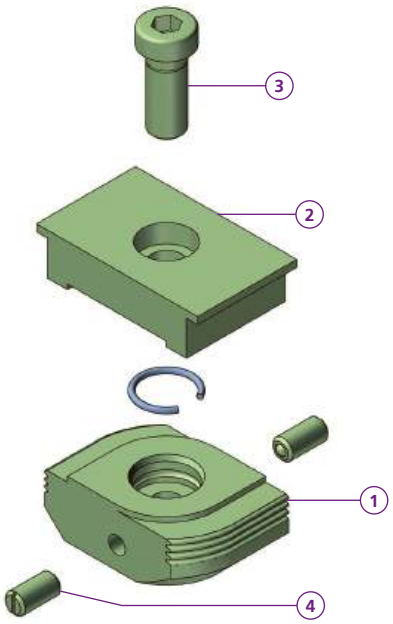


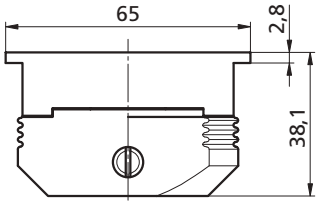
94mm	B	H	kg
PCU14093	93	14	~0,04
PCU20093	93	20	~0,06
PCU24093	93	24	~0,07
PCU29093	93	29	~0,09
PCU31093	93	31	~0,09
PCU34093	93	34	~0,10
PCU39093	93	39	~0,11
PCU44093	93	44	~0,12
PCU46093	93	46	~0,14

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

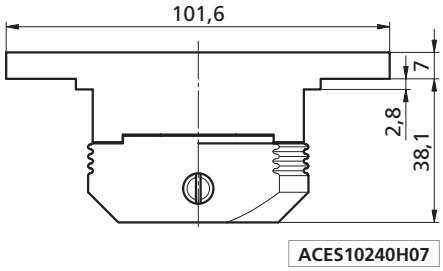


Universalnutenstein
Universal nut

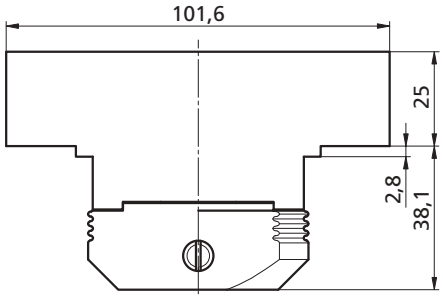




ACES6540

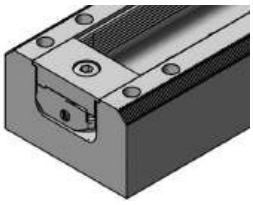


ACES10240H07

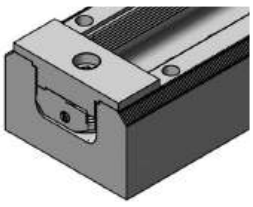


ACES10040H25W

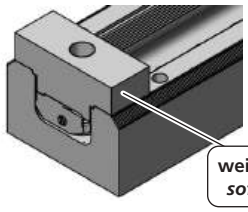
ACES6540		
1	1x	**ACZS6540**
2	1x	ACEL6540
3	1x	**M12X30DIN7984**
4	2x	SM1275-1KSM8
kg		~ 0,67



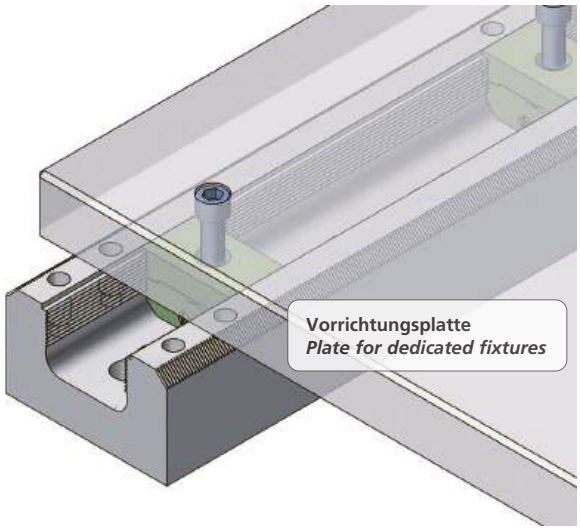
ACES10240H07		
1	1x	**ACZS6540**
2	1x	ACEL6540-07102
3	1x	**M12X30DIN7984**
4	2x	SM1275-1KSM8
kg		~ 0,88



ACES10040H25W		
1	1x	**ACZS6540**
2	1x	ACEL10040H25W
3	1x	**M12X30DIN7984**
4	2x	SM1275-1KSM8
kg		~ 1,42

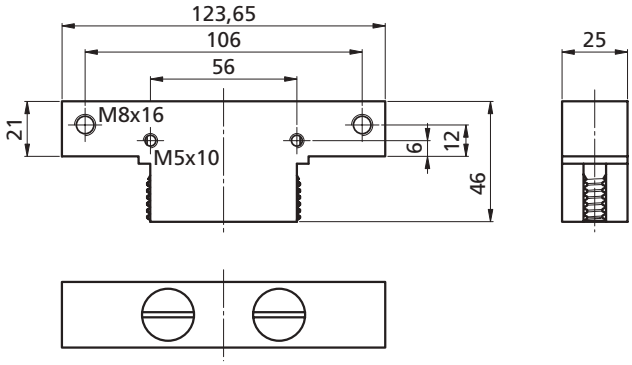


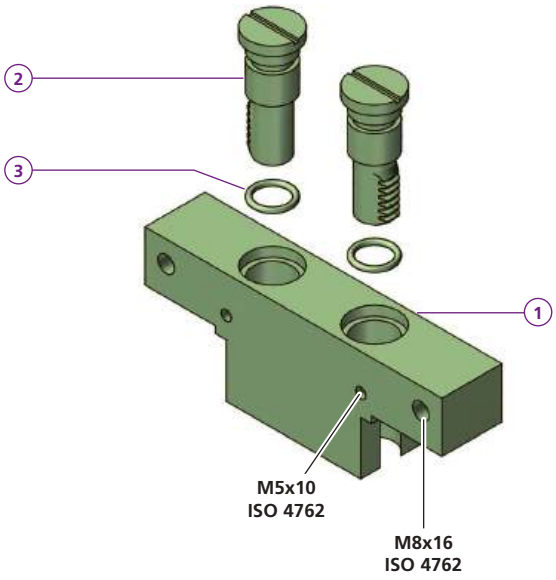
weich *soft*	1.2312

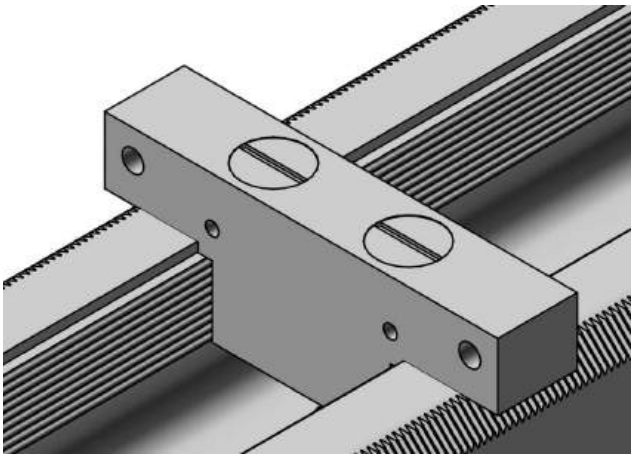


Bestellbeispiel / *Ordering example*: ACES6540

Separat bestellen / *Order separately*





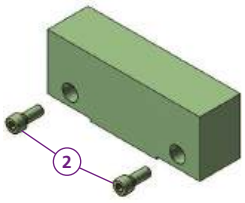


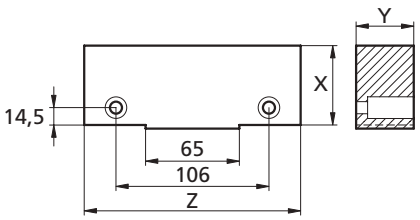
Bestellbeispiel / *Ordering example:* ACUH21-124

	ACUH21-124
1	1x TW090086-02
2	2x **ACBS1646**
3	2x OR Ø 12X2
kg	~ 0,74

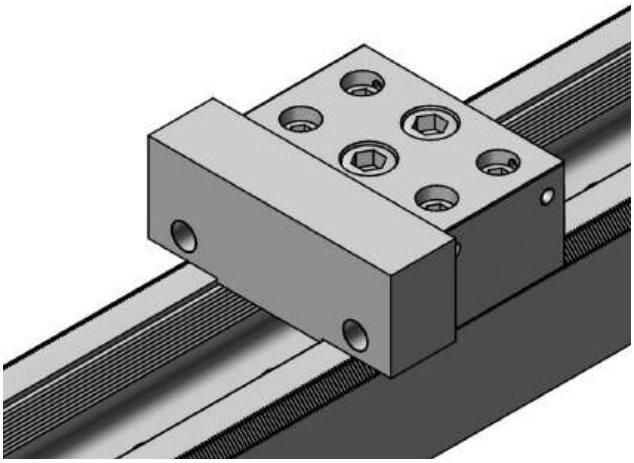
---

weiche Backe
soft jaw





		X	Y	Z	kg
AC1505520W	(2)	55	20	150	~ 1,28
AC1505540W	**M8X20ISO4762**	55	40	150	~ 2,55



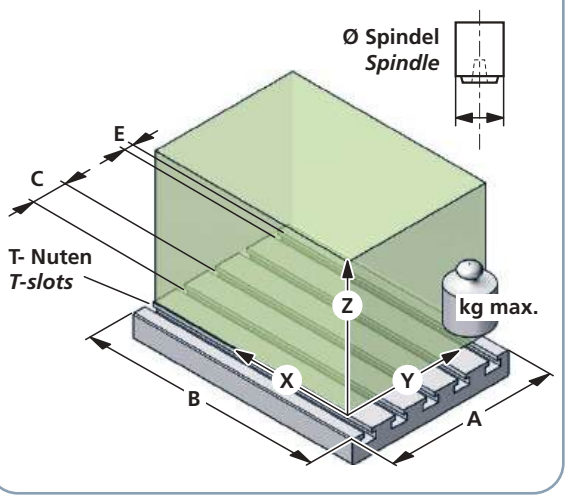
Bestellbeispiel / *Ordering example*: AC1505520W

Maschinenplan für Angebot
Machines plan for offer

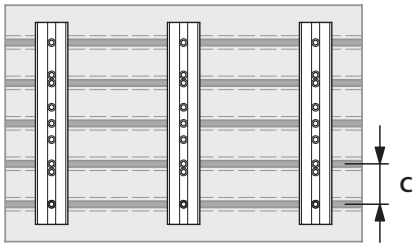
VERTICAL

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 *Thread & Precision Bohre*	Ø
	Anzahl Werkstücke pro Los *Number of workpieces per lot*			**Stück** *Pieces*

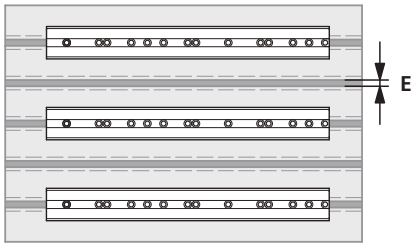
Maximal mögliche Bearbeitungsgrösse



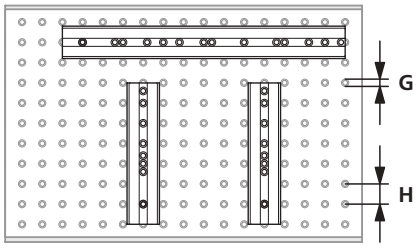
Montage der PC-Basisschiene auf dem Maschinentisch
Assembly of the PC base-rail on the machine table



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

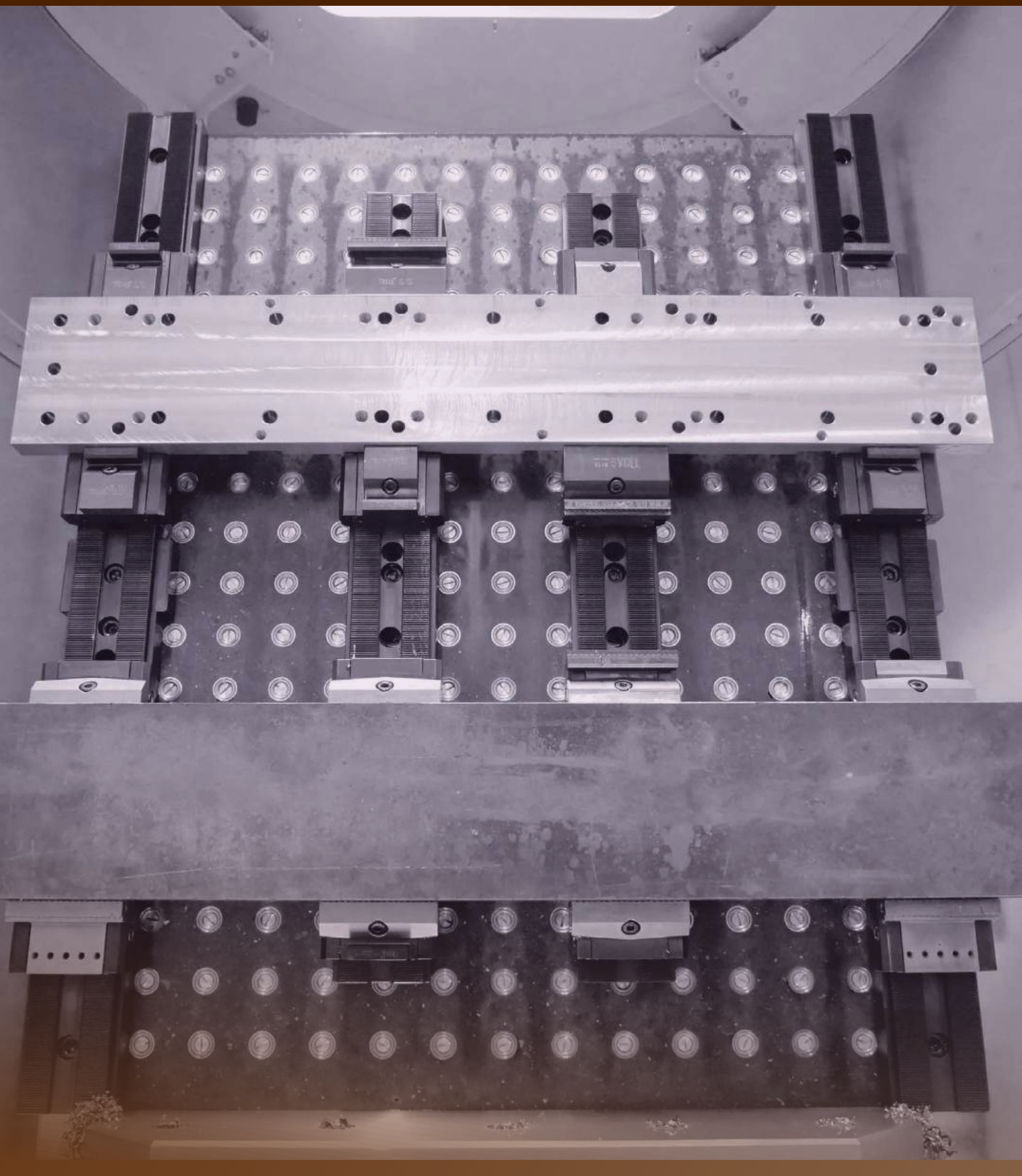


3
Positionierung der Basisschiene auf einer Rasterplatte
Positioning of the base-rail on a grid plate

Bitte Werkstückzeichnung beilegen und Bearbeitungsfolge markieren
Enclose drawing of workpiece and mark processing sequence, please

9
05.11.2024

tripoxyMINERAL



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Reparaturanleitung für Mineralguss | *How to repair epoxy mineral casting* 245

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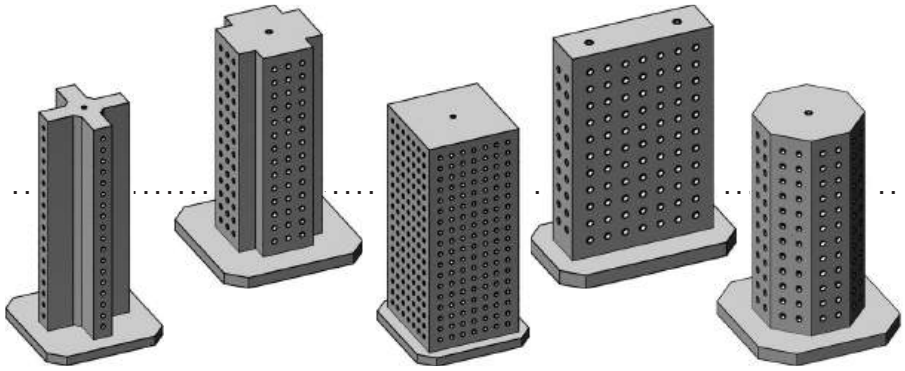

Mineralgusserhöhung für 5-Achsenmaschinen
Epoxy casting raises blocks for 5-axis machines 271



Stahl Mineralguss | *Steel epoxy mineral tombstones* ..... 272 - 273



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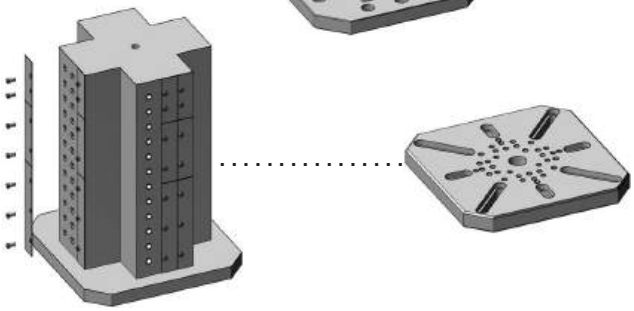
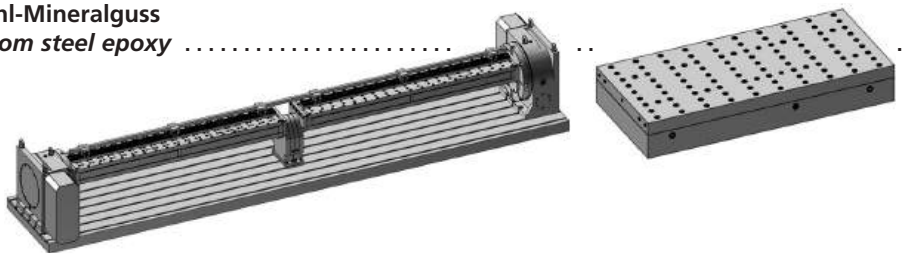
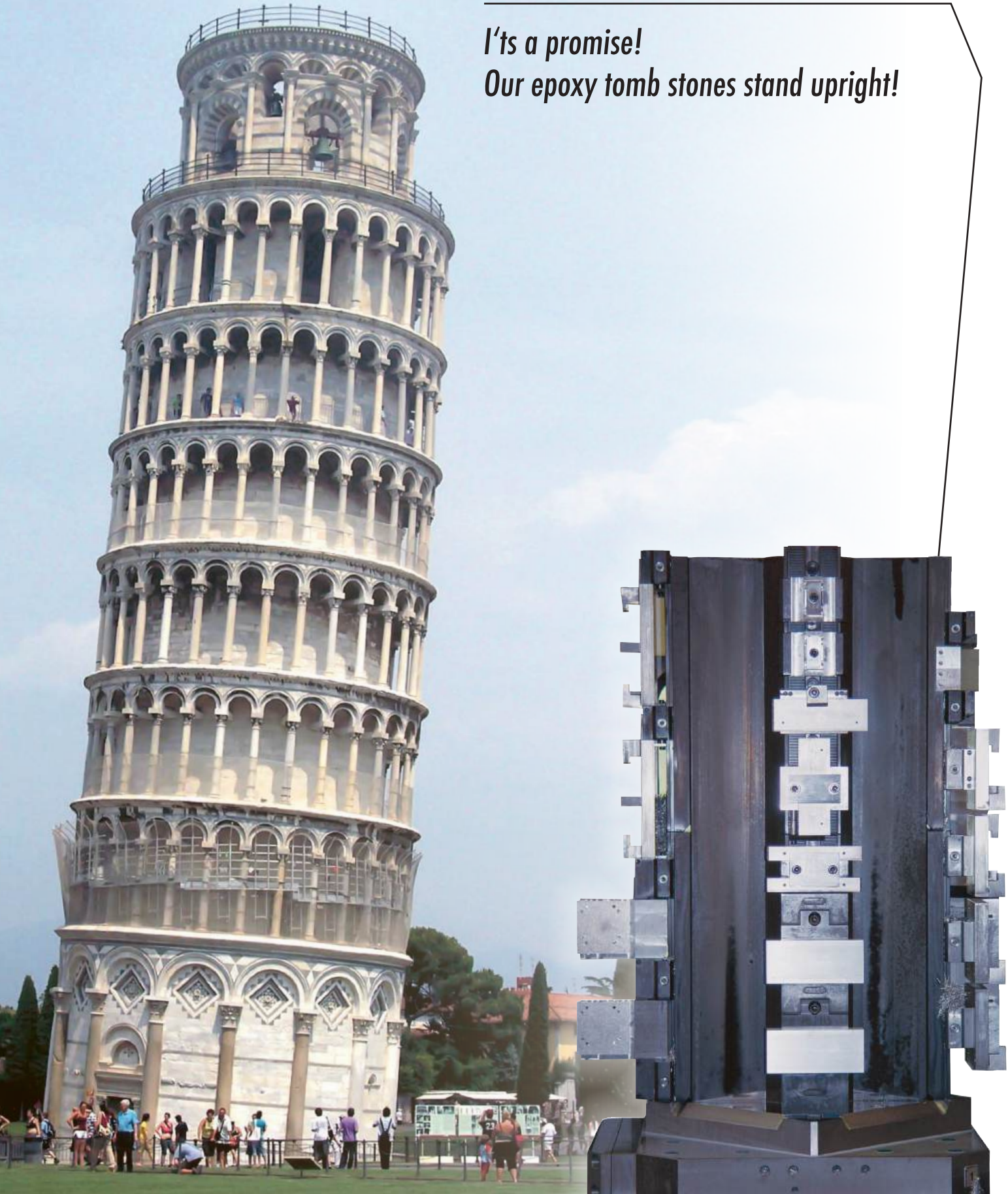


Stahl Mineralgusserhöhungen mit integriertem Vakuum Anschluss / *Steel-epoxy raises block with integrated vacuum*
Balken und Würfel aus Stahl-Mineralguss
Trunion and cubes made from steel epoxy 277



Es ist ein versprechen!
Unsere Mineralgusstürme stehen gerade!

I'ts 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 präzis 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 tumbstones 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 tumbstone 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 tumbstone 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 hochwertiger Epoxidharz. Das gemischte Material wird in Giessformen gefüllt.

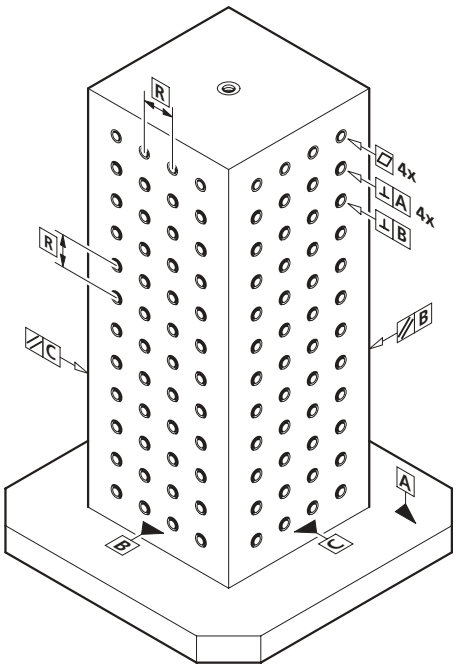
Mineral casting (also called polymer concrete) is a stone composed of quartz gravel, silica sand and crushed rock. The binder is a high quality epoxy resin. The mixed material is filled into molds.

Während dem Giessprozess wird die Form, mittels Vibrationstisch ständig vibriert, was zur Verdichtung und Entlüftung der Giessmasse führt. Das spezifische Gewicht ist mit 2,4 kg / dm 3 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.

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 / dm 3 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).

Das Material ist ausserdem chemisch beständig gegen Öle, Laugen, Säuren und die üblichen Kühlschmierstoffe. Im ausgegossenen Zustand sind die Türme «Umweltneutral».

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*	R	**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
- Maschinenständer 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-Basisschienen)
  Filling of mineral cast in metal shell constructions (eg, our steel rails with epoxy mineral cast base)

*tripoxy*MINERAL

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.

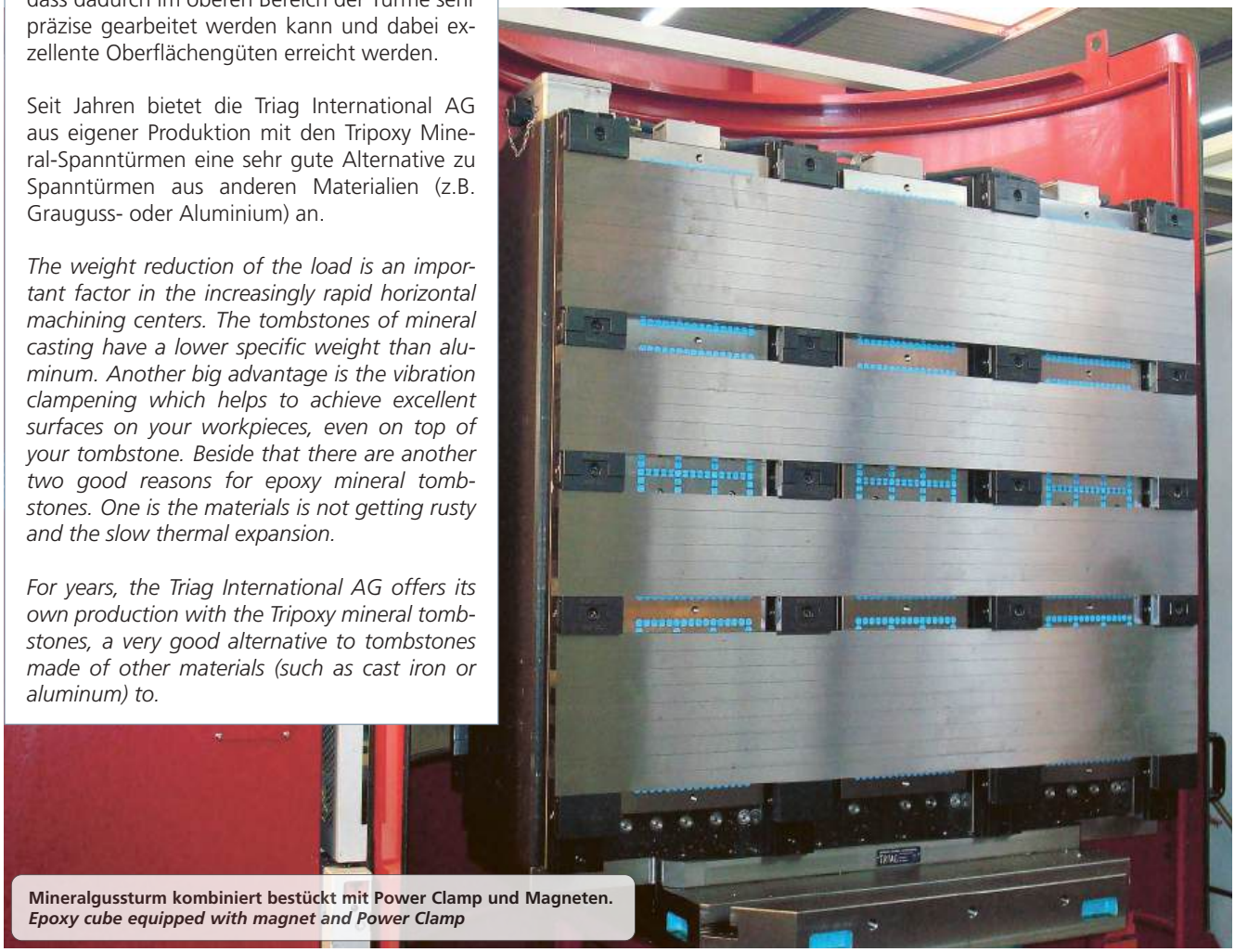
Seit Jahren bietet die Triag International AG aus eigener Produktion mit den Tripoxy Mineral-Spanntürmen eine sehr gute Alternative zu Spanntürmen aus anderen Materialien (z.B. Grauguss- oder Aluminium) an.

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 clampening 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!



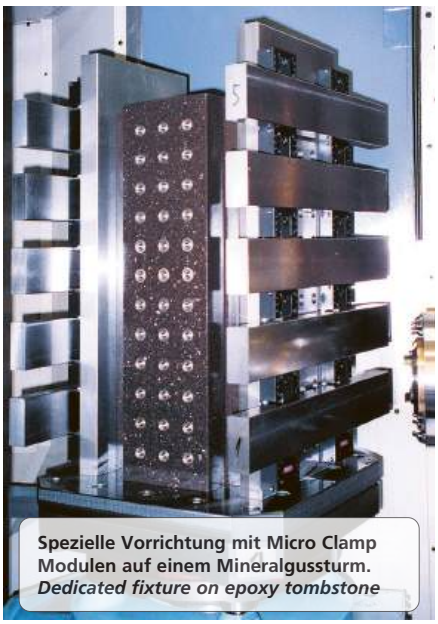
Mineralgussturm kombiniert bestückt mit Power Clamp und Magneten.
Epoxy cube equipped with magnet and Power Clamp



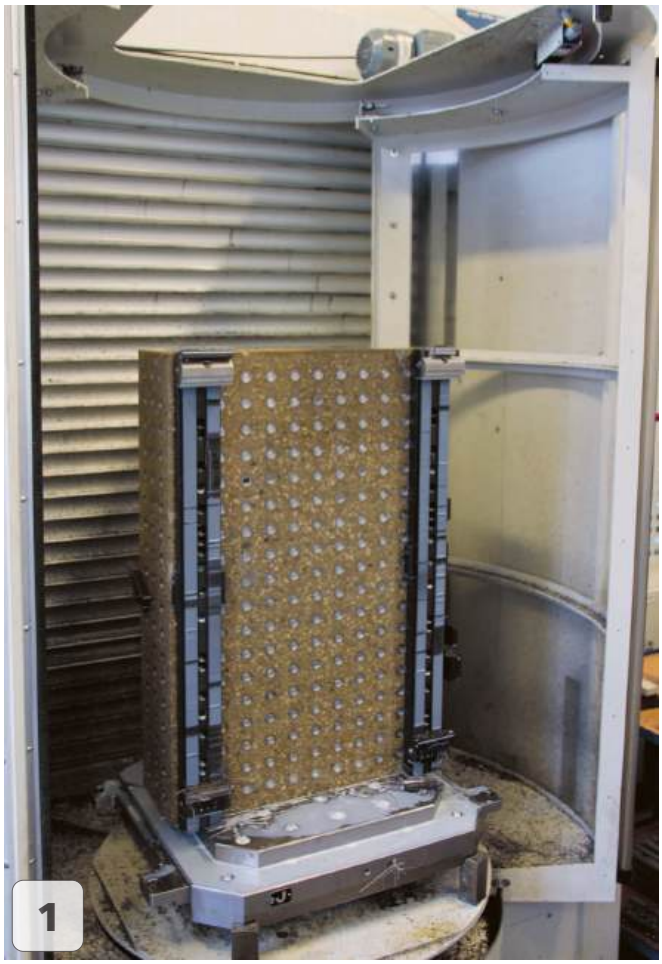
Grosse Platte auf einem rechteckigen Mineralgussturm.
Large plates on epoxy tombstone.



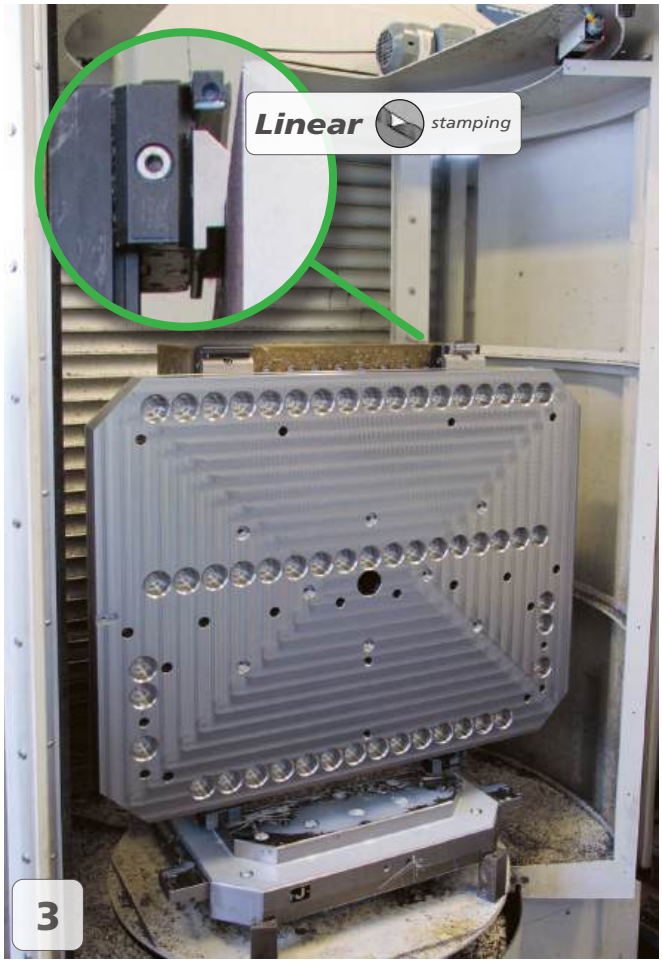
Chaotische Fertigung auf einem Mineralgussturm in Kreuzform.
Mixed set up on cross epoxy tombstone.

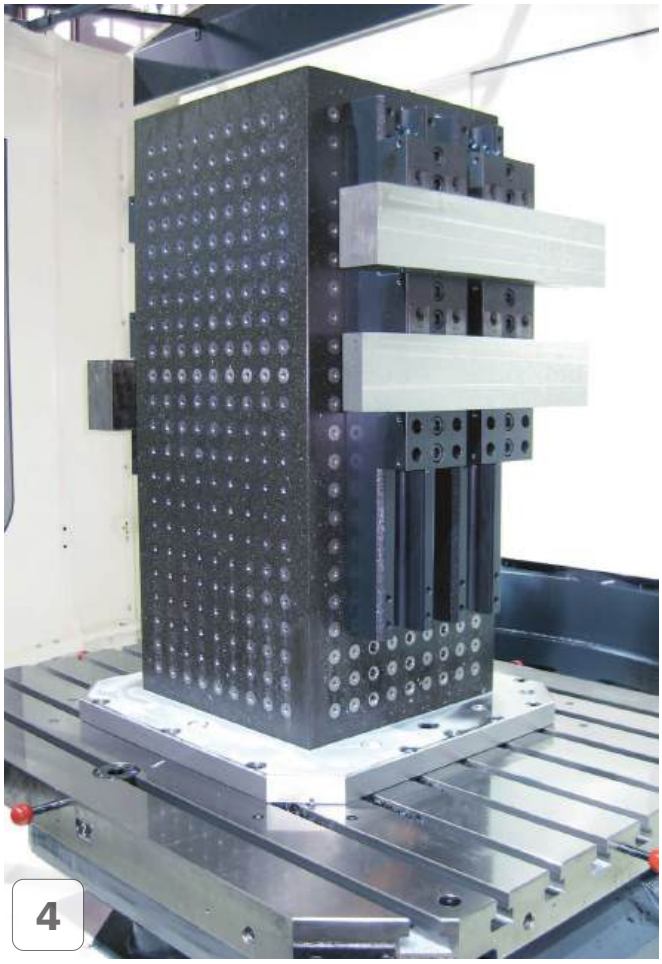


Spezielle Vorrichtung mit Micro Clamp Modulen auf einem Mineralgussturm.
Dedicated fixture on epoxy tombstone


1


„ Direktprägespannmodule im Einsatz“!
„Direct stamping module in operation“!
Material: CK 45
Plattengrösse: 1000 x 800 x 65 mm
Size of plate:
Gewicht ca. 400 kg
Weight approx.
Einspanntiefe 3 mm
Clamping depth
2 x Spannbacke mit 40 Nm anziehen!
Tighten 2 clamping jaws with 40 Nm!
2


Linear stamping
3


4

Stahl-Mineralguss seit 2004 - das ideale Material für Spanntürme

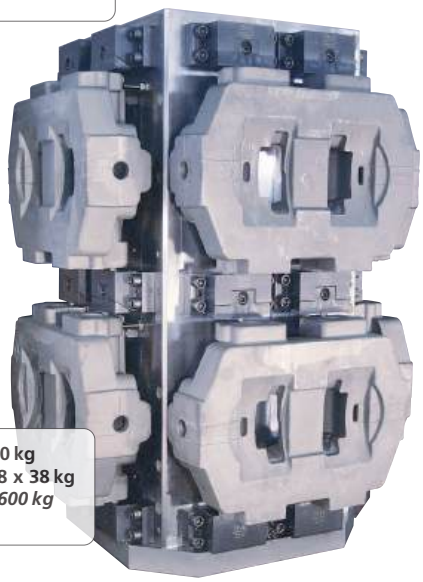
Die Firma Triag International AG hat seit 2004 diese stahlummantelten Türme mit sehr guten Ergebnissen bei Kunden im Einsatz. In den meisten Fällen können optimale Lösungen durch Standardangebote kostengünstig und modular eingerichtet werden.

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.

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

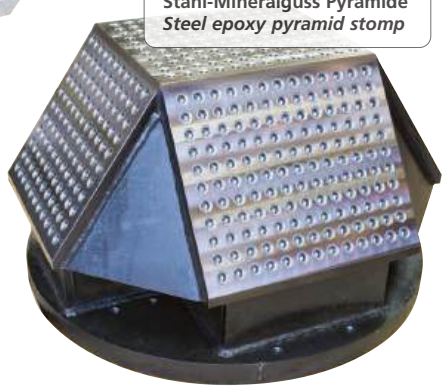


Stahlmineralguss-Säulen mit Power Clamp für die Fertigung von Flügelteilen.
Steel epoxy frames machining wing parts on a Makino machine



Stahl-Mineralguss Dreieck-Turm
Steel epoxy triangle cube

Stahl-Mineralguss Pyramide
Steel epoxy pyramid stomp

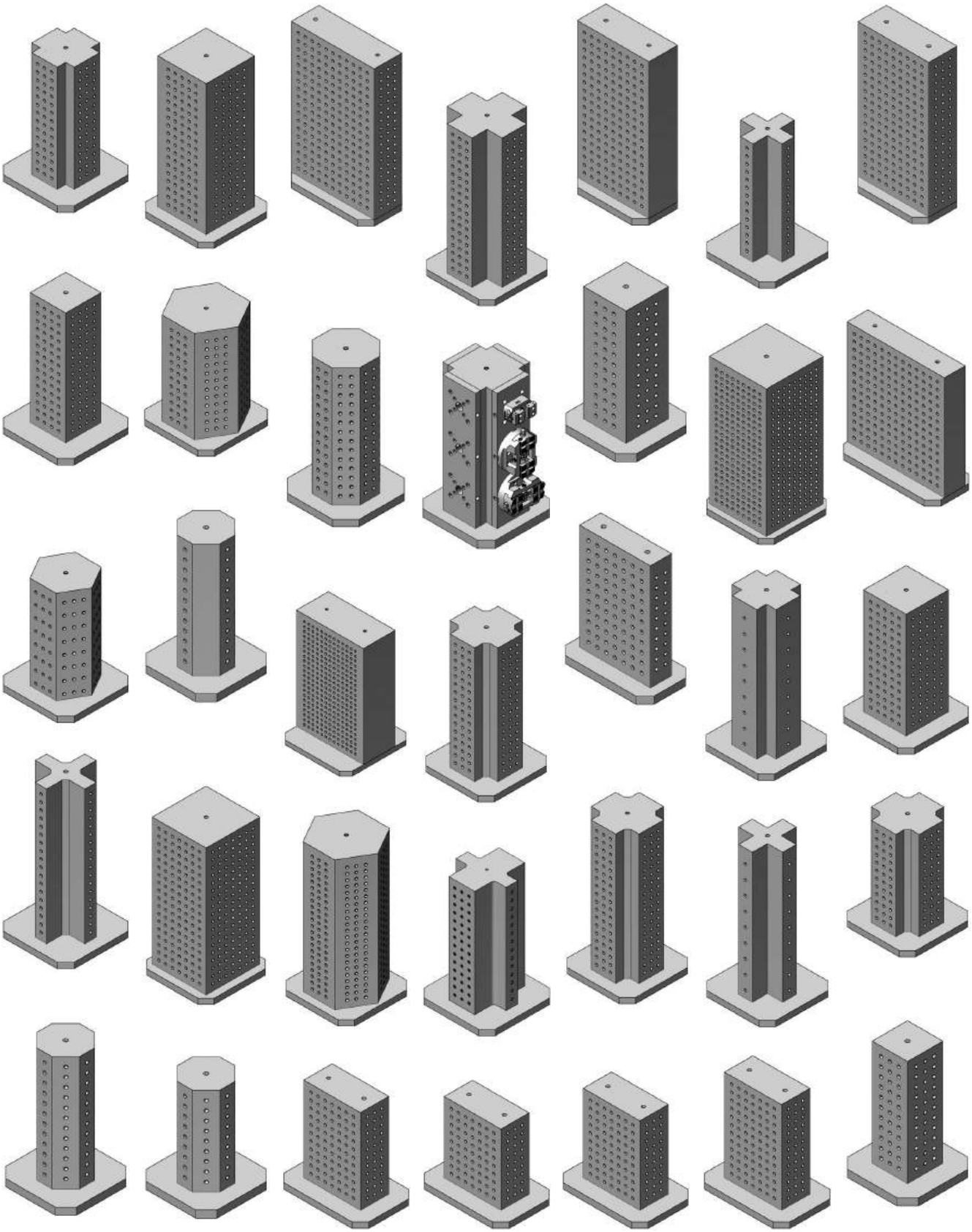




Stahlmineralgussturm mit Power Clamp zum Leistungsfräsen in Werkzeugstahl (unbemannt).
Steel epoxy tombstone with Power Clamp 10 pcs of tool steel are machined (running time 5,3 hours)

Die Mineralgusstürme können in fast allen Formen hergestellt werden.

The epoxy mineral tombstones can be manufactured in almost any shape.

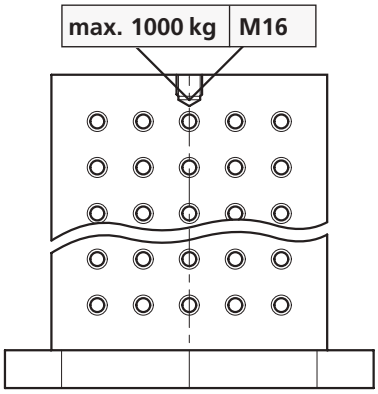


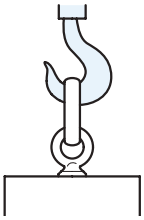
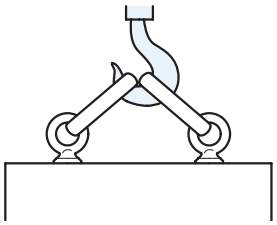
Andere Grössen, Formen und Raster, welche nicht im Katalog sind, können nach Kundenwunsch produziert werden.
Other sizes, forms and grid which are not in the catalogue can be produced on customer's request.

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!

Massnahmen:

Dort wo lange Späne oder auch kurze abrasive Späne auf den Turm schlagen, Abdeckbleche benutzen!
(Abdeckbleche siehe Seite 244)

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!

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!

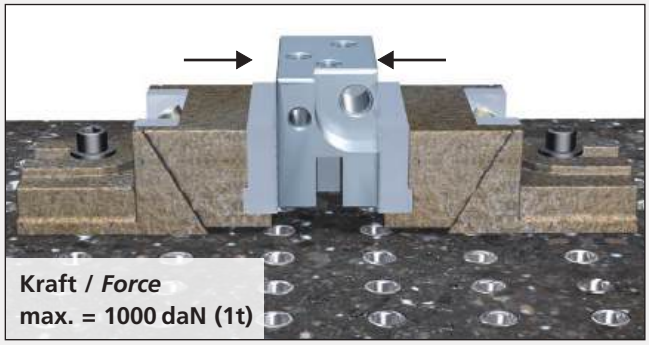
Max. Anzugsmomente beachten.

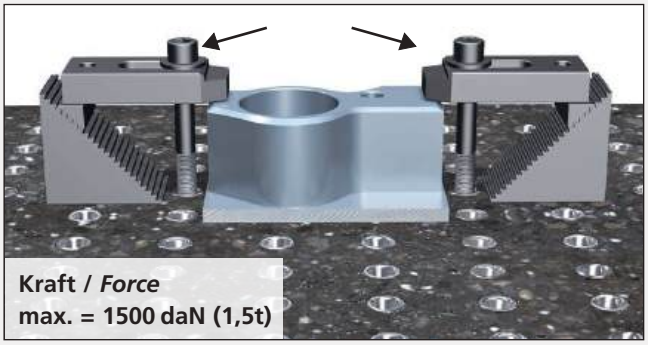
Attention, limited application

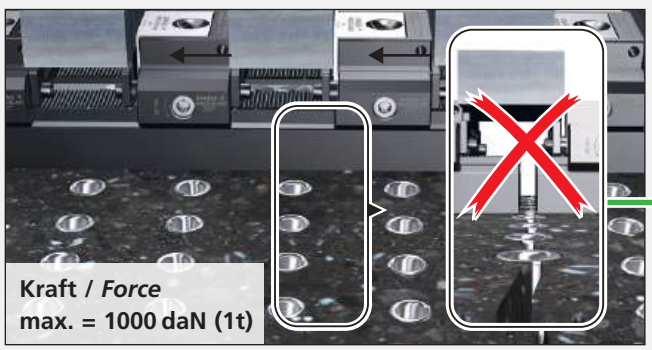
The following applications only have limited use as a single screw without a counterweight puts tremendous tension on the integral socket!

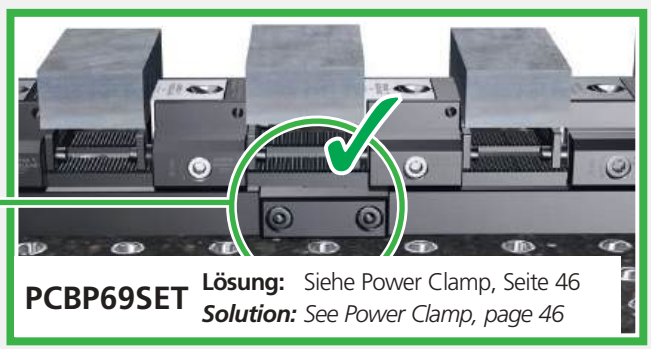
Note max. starting torques.

STOP
nicht empfohlen
not recommended









PCBP69SET **Lösung:** Siehe Power Clamp, Seite 46
Solution: *See Power Clamp, page 46*



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**)

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.

Das Verhältnis ist genau abgewogen. Wichtig ganze angelieferte Menge gebrauchen.

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.

Die flüssige Masse wird nun in die Bruchstelle eingegossen.

Das Aushärten der Reparaturmasse beträgt 24 Std.
Die Unebenheit der frisch eingegossenen Fläche, wird mit einem Schleifstein plangeschliffen.

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**)*

Repair kit for epoxy mineral castings *(picture **5**)*

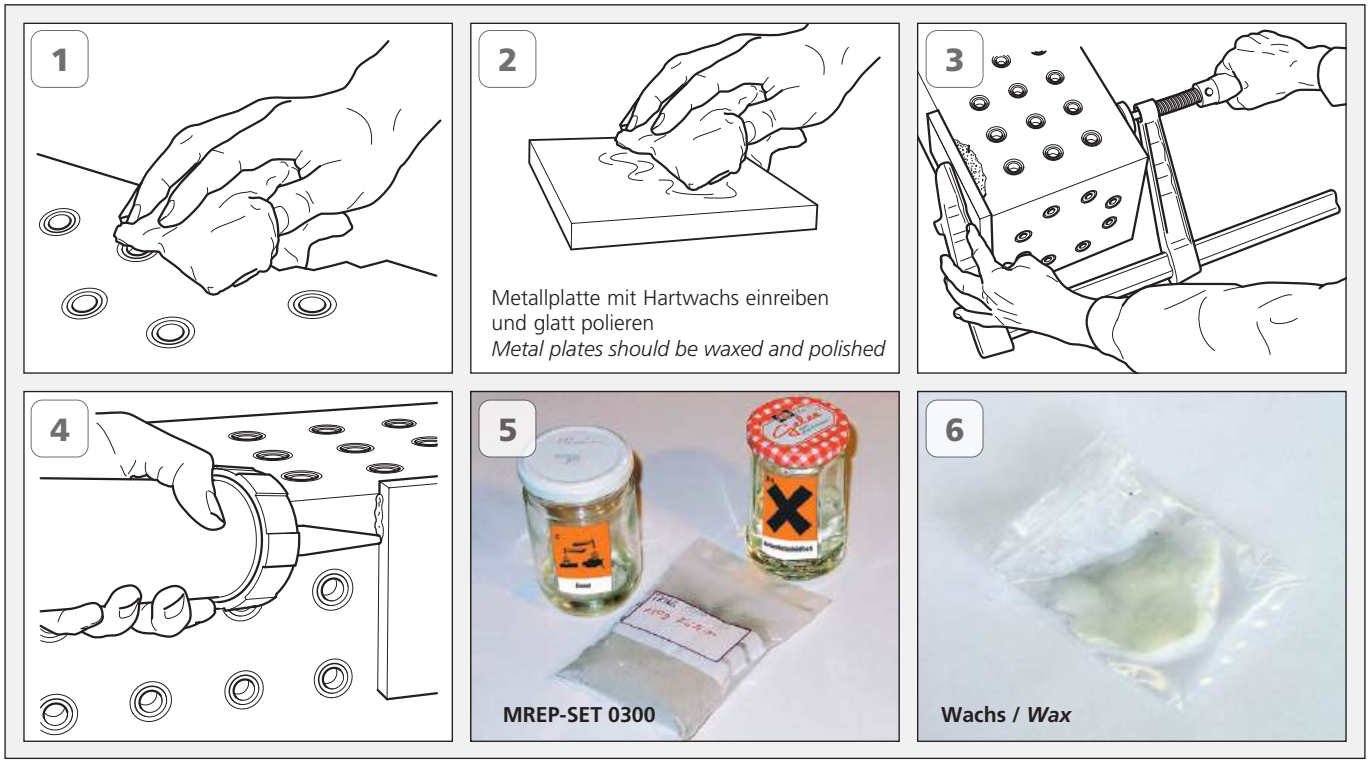
MREP-SET 0300 ~ 300 gr = ~ 2 dl
The repair kit consists of the resin, the hardener, and the filler. The mixture ratio is: 27 gr of hardener, 100 gr of resin and 150 gr of filler.

These components are exactly portioned in the kit and should be used up entirely.

*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.*

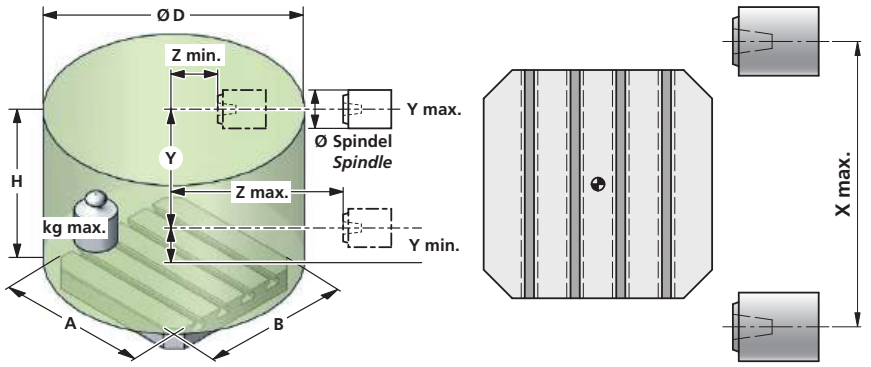
This mortar must be poured into the point of rupture.

The hardening process takes 24 houres.
Protruding material can be levelled with a grindstone.



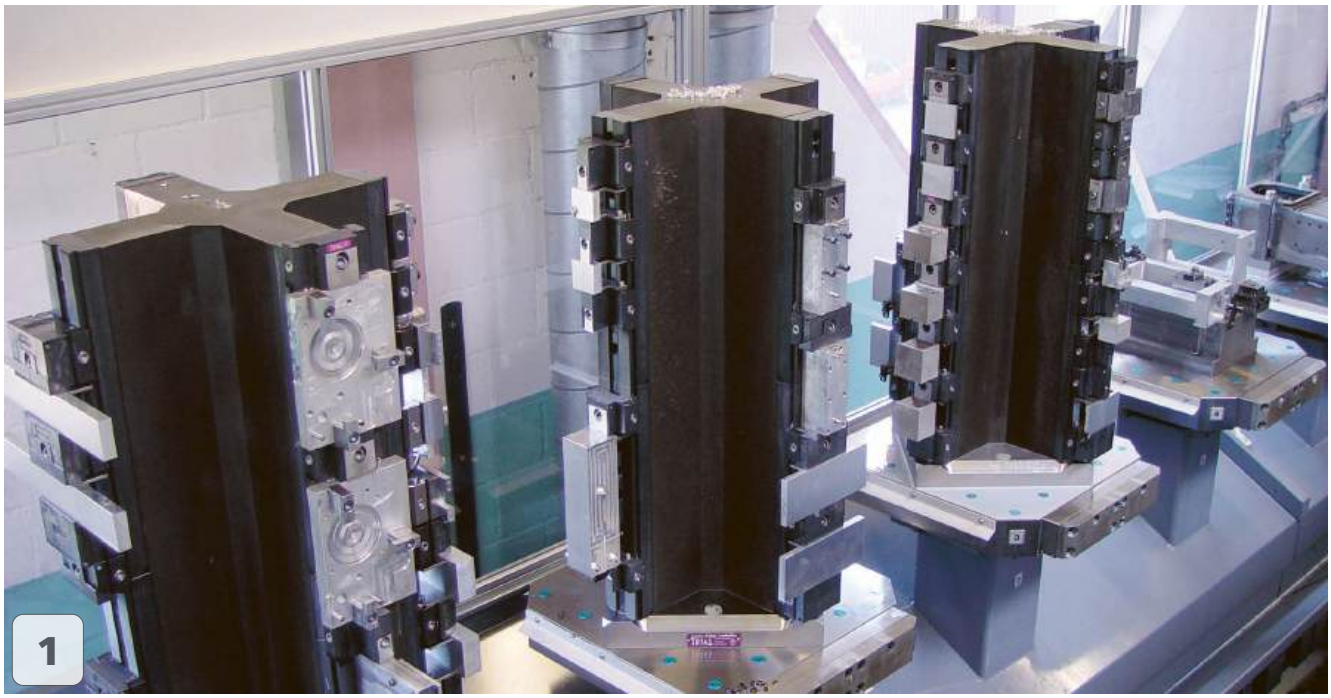
Kunde *Customer*			
Maschine *Machine*		Werkstoff, Halbzeug, Rohteil-Nr., Modell- oder Gesenk-Nr. *Raw material, blank or casting-Nr.*	
X max.	X Achse Hub *X axis stroke*		**mm**
Y min.	Kleinster Abstand von der Palettenoberseite zur Spindelachse *Smallest distance from pallet surface to spindle center*		**mm**
Y max.	Grösster Abstand von der Palettenoberseite zur Spindelachse *Greatest distance from pallet surface to spindle center*		**mm**
Z min.	Kleinster Abstand von der Palettenachse zur Spindelnase *Smallest distance from pallet center to spindle gauge line*		**mm**
Z max.	Grösster Abstand von der Palettenachse zur Spindelnase *Greatest distance from pallet center to spindle gauge line*		**mm**
Ø Spindel *Spindle*	Spindeldurchmesser *Spindle diameter*		**mm**
kg max.	Maximale Tischbelastung *Maximum loading capacity*		**kg**
øD max.	Maximaler Störkreis des Werkstücks *Maximum workpiece diameter*		**mm**
H max.	Maximale Beladehöhe des Werkstücks *Maximum workpiece height*		**mm**
A x B	Palettenabmessung *Size of pallet*		**mm**
	Anzahl Werkstücke pro Los *Number of workpieces per lot*		**Stück** *Piece*

Maximal mögliche Bearbeitungsgrösse / *Maximum possible machining size*



Bitte Werkstückzeichnung beilegen und Bearbeitungsfolge markieren

Enclose drawing of workpiece and mark processing sequence, please

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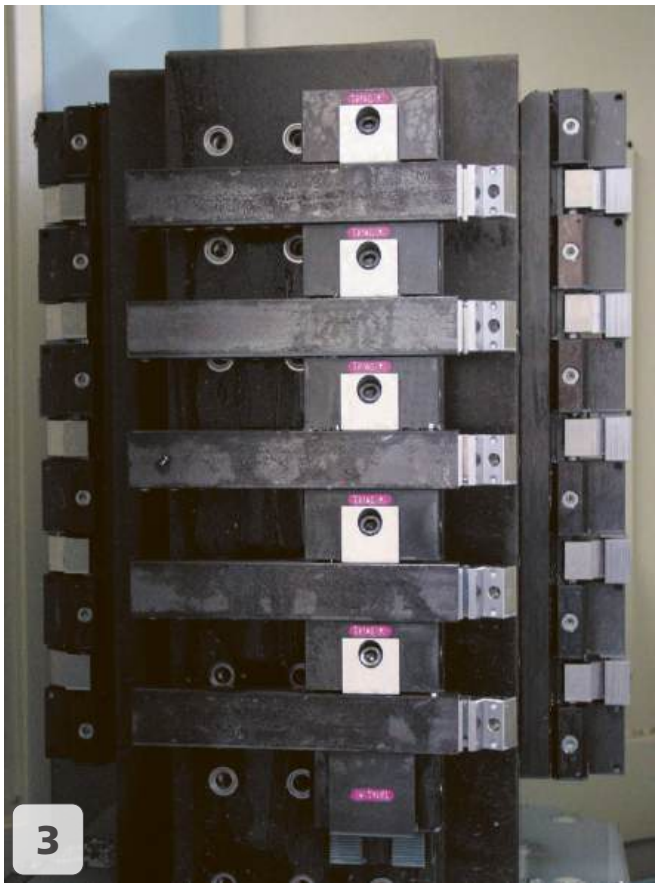
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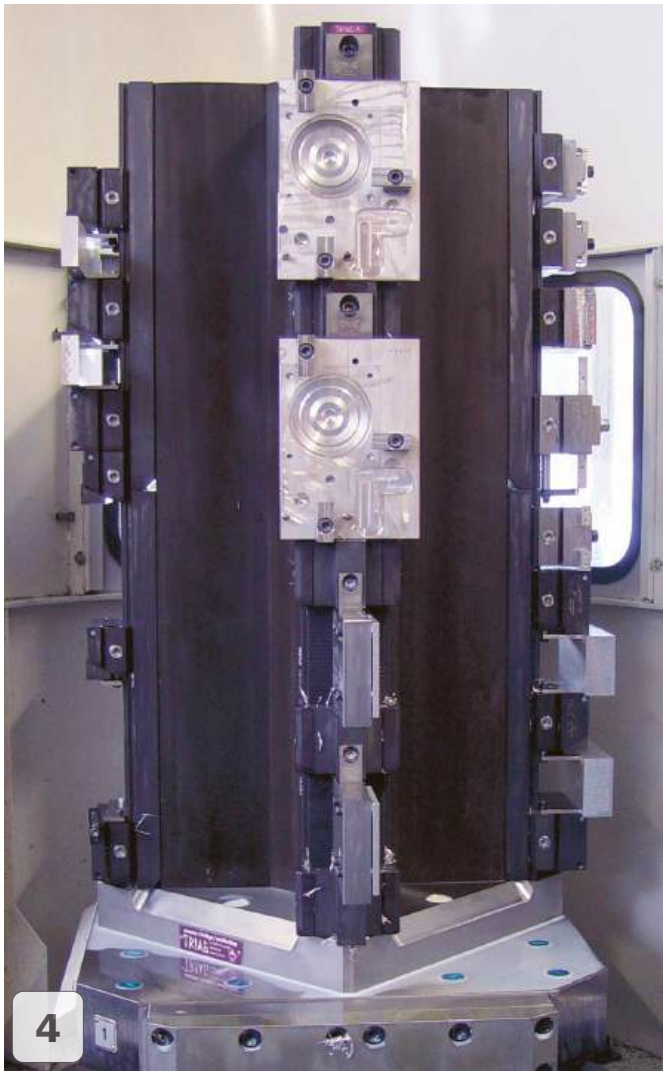
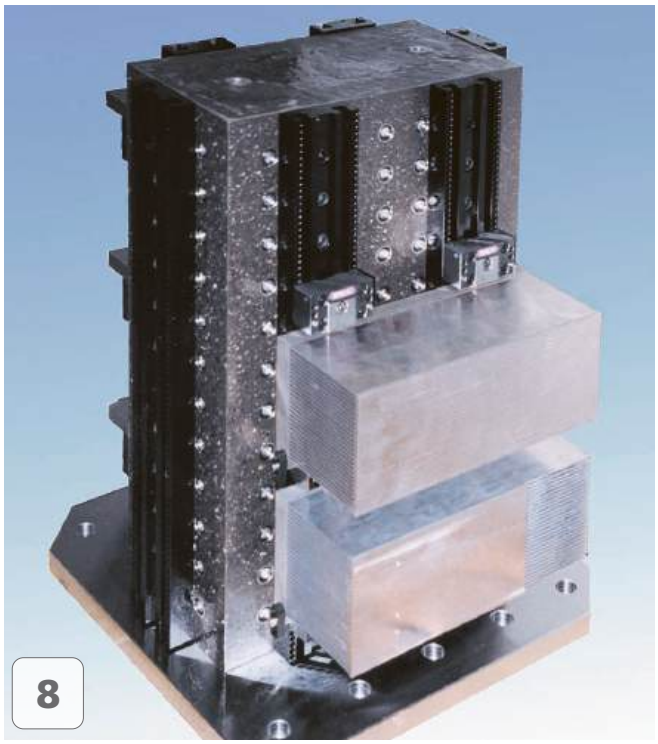
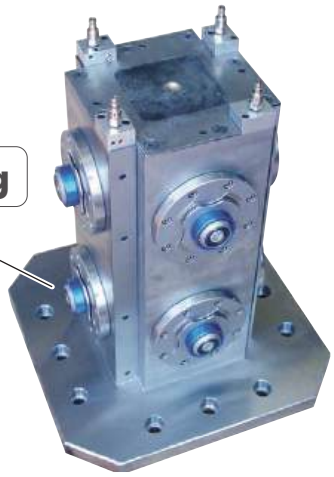

4


5
NR.2

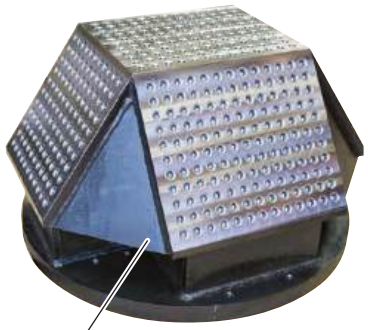




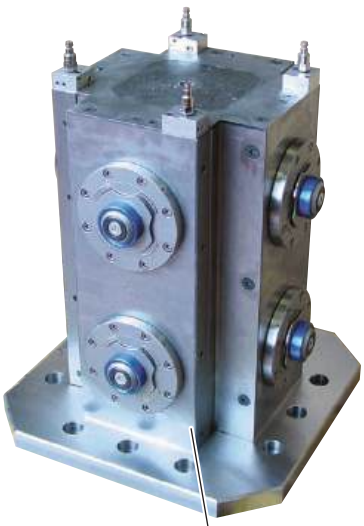
Stahl-Mineralguss Lösungen / *Steel epoxy mineral tombstones solutions*



SMK24-24-42 OPP200 | ~ 120 kg



Pyramidenstumpf
Truncated pyramid
~ 474 kg



SMK30-17-42 OPP200 | ~ 142 kg





Turm-Material *Tombstone material*	
M	Mineralguss mit Stahldübel *Epoxy mineral with steel anchor*
SM	Stahl Mineralguss *Steel epoxy mineral tombstones*
G	Grauguss *Cast iron*

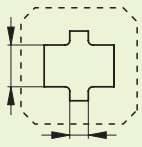
Grösste Schlüsselweite *Major width*	
12	120 mm
20	200 mm
24	240 mm
25	250 mm
30	300 mm
32	320 mm
35	350 mm
40	400 mm
42	420 mm
50	500 mm
60	600 mm
63	630 mm
70	700 mm

Höhe *Height*	
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

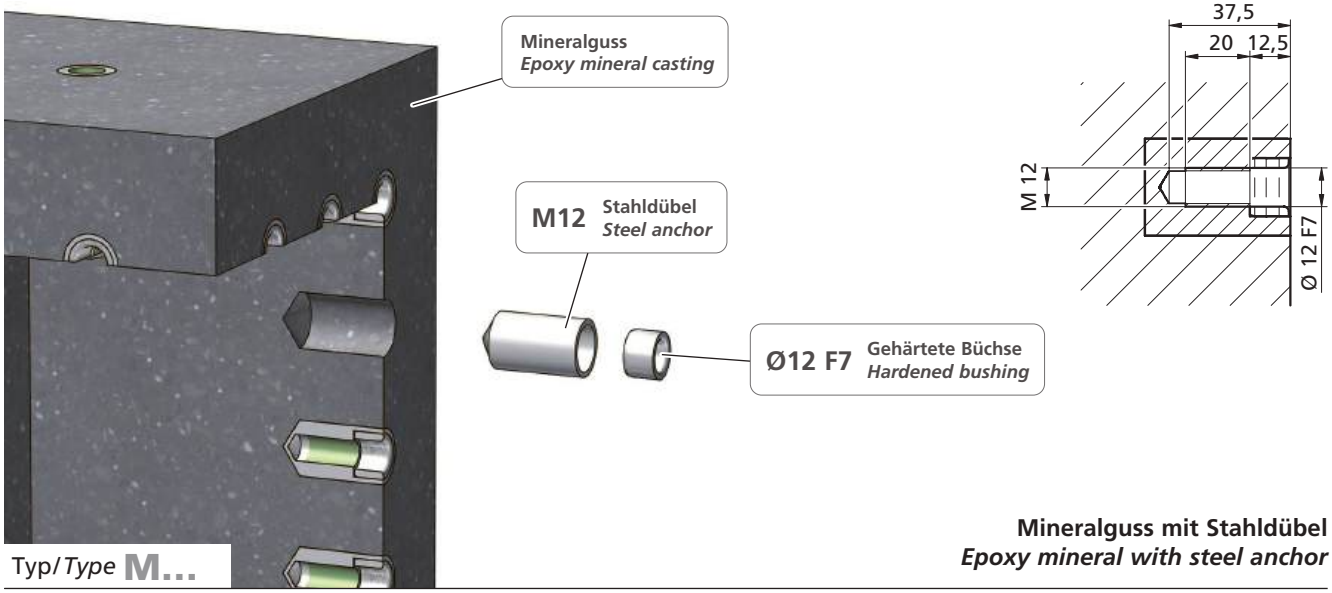
M **K** **35** **18** **95** **R50**

Modultyp *Type of module*	
K	Kreuz *Cross*
Q	Quadrat *Square*
R	Rechteck *Rectangular*
S	Sechseck *Hexagonal*
A	Achteck *Octagonal*
X	Spezialform *Special shape*

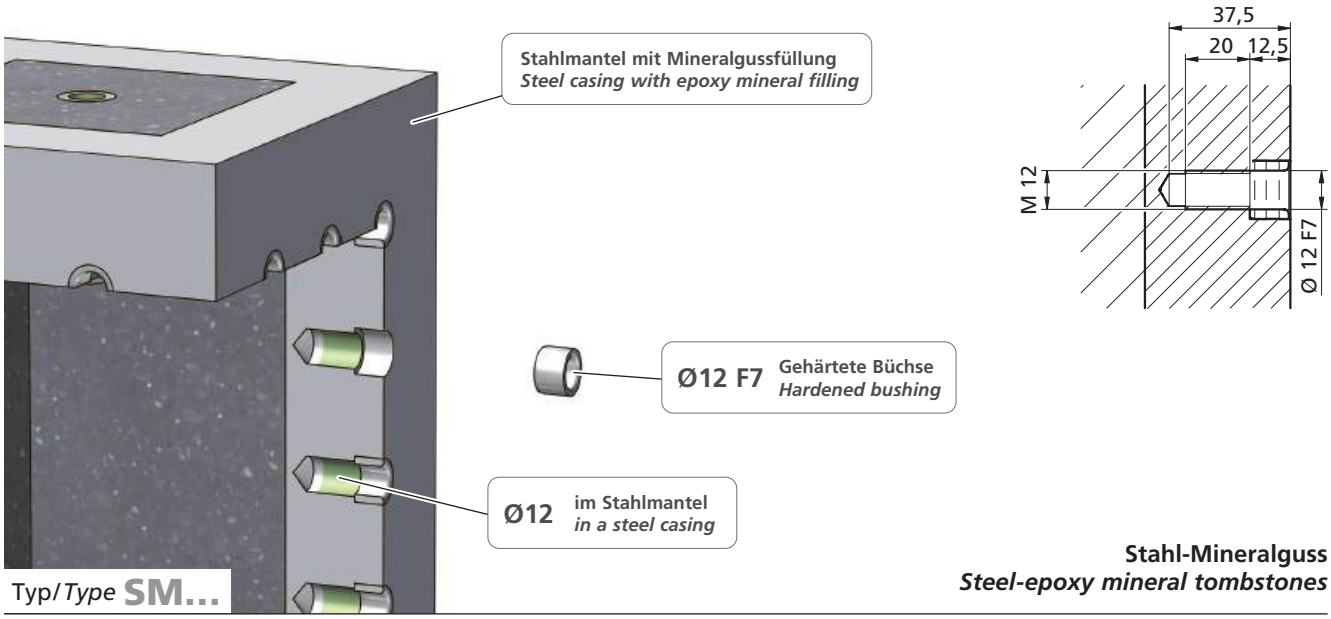
Aufspannbreite *Usable width*	
08	80 mm
09	90 mm
86	86 mm
10	100 mm
12	120 mm
15	150 mm
16	160 mm
18	180 mm
1808	180 / 80 mm
19	184 mm
20	200 mm
23	231 mm
24	240 mm
25	250 mm
30	300 mm
35	350 mm
40	400 mm
42	420 mm



Raster *Grid*	
R40	40 mm
R50	50 mm
R80	80 mm
R100	100 mm
OPP	200 mm

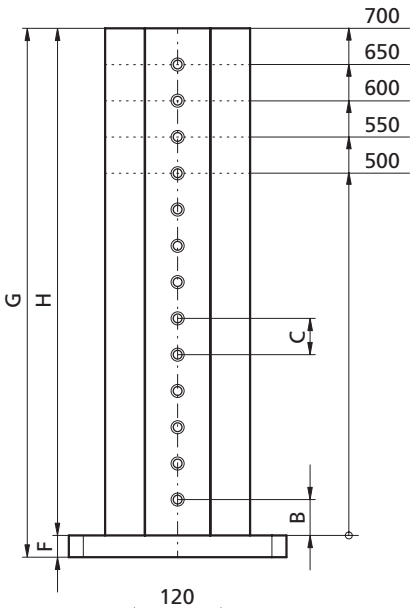


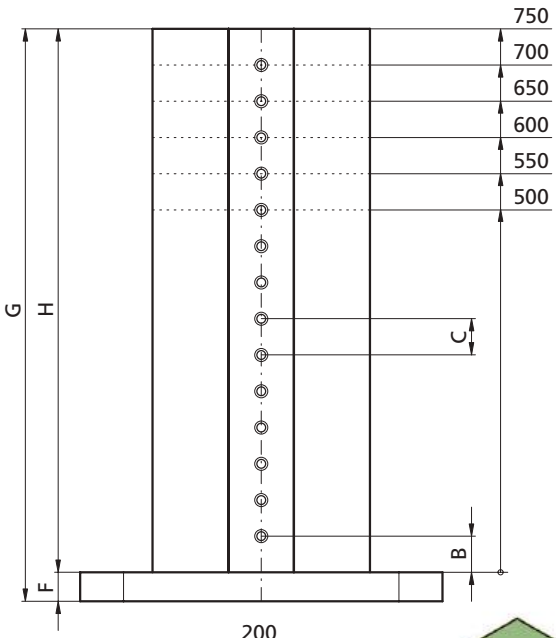
Mineralguss mit Stahldübel
Epoxy mineral with steel anchor

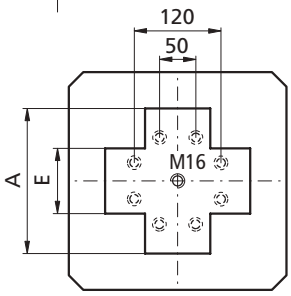


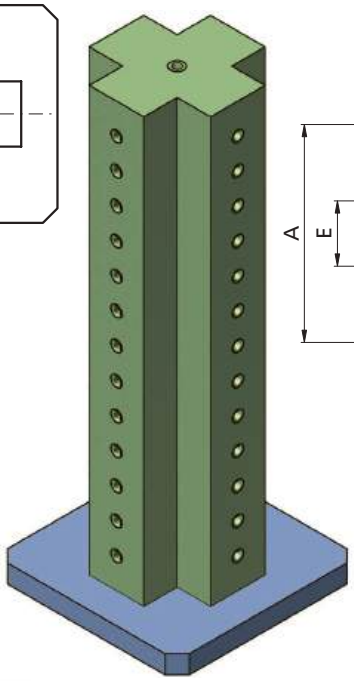
Stahl-Mineralguss
Steel-epoxy mineral tombstones

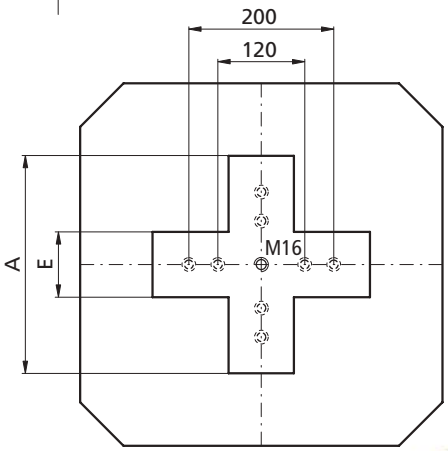


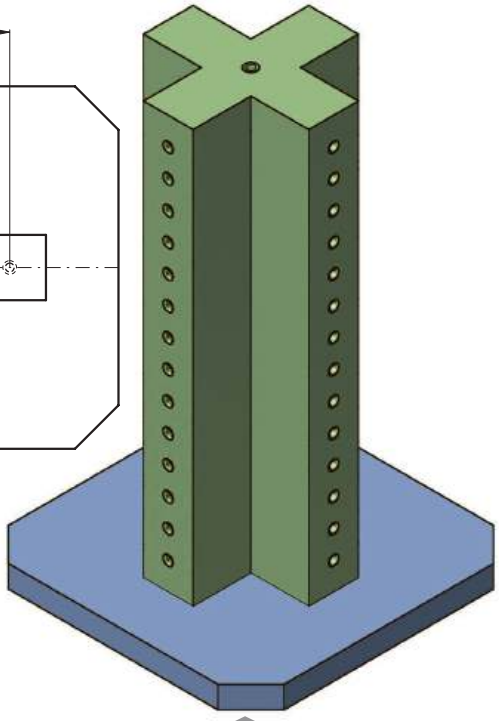






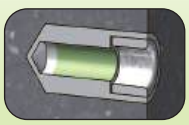






Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!
Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel
Epoxy Mineral with Steel Anchor



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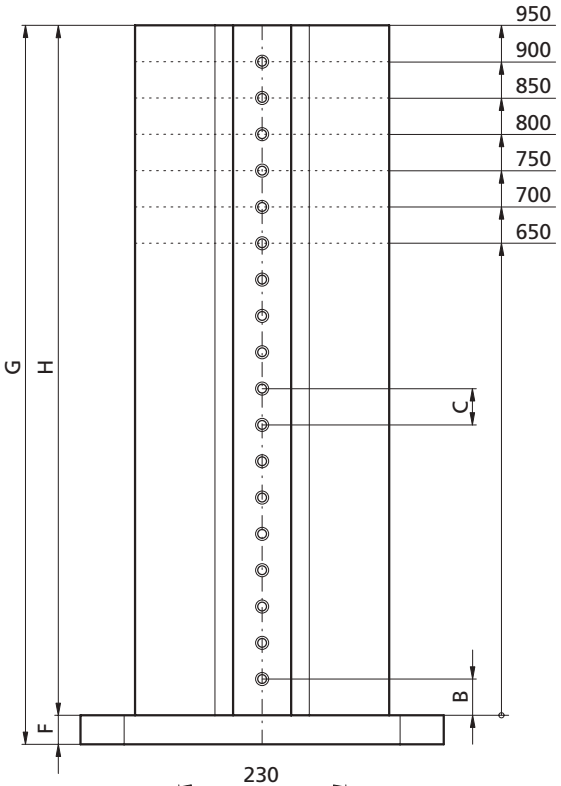
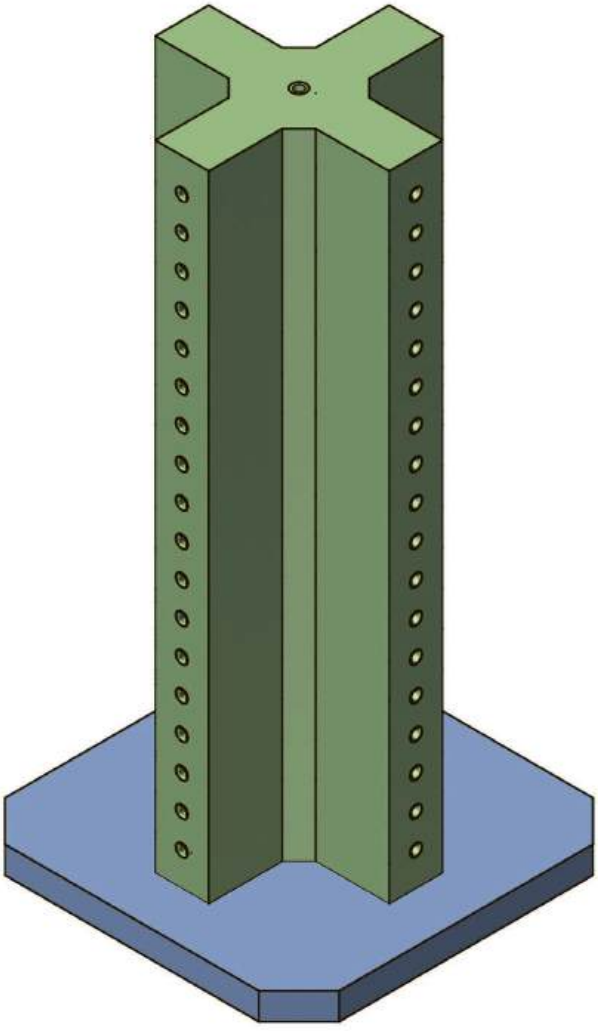
Bestellbeispiel
***Ordering example*: MK200965R50 &** **p. 274**

	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!***

Separat bestellen / *Order separately*



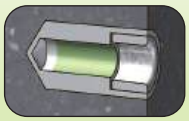


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel

Epoxy Mineral with Steel Anchor



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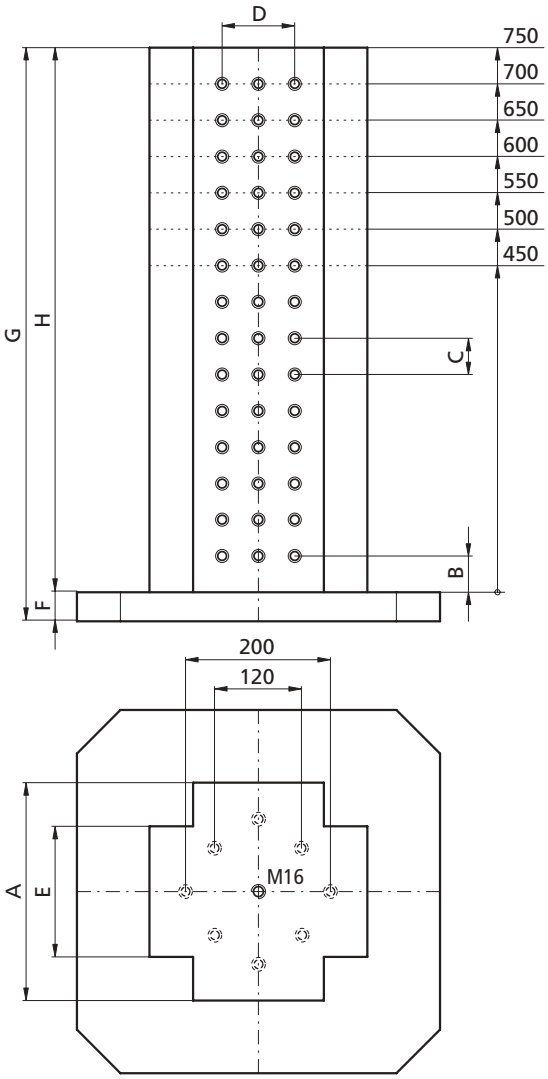
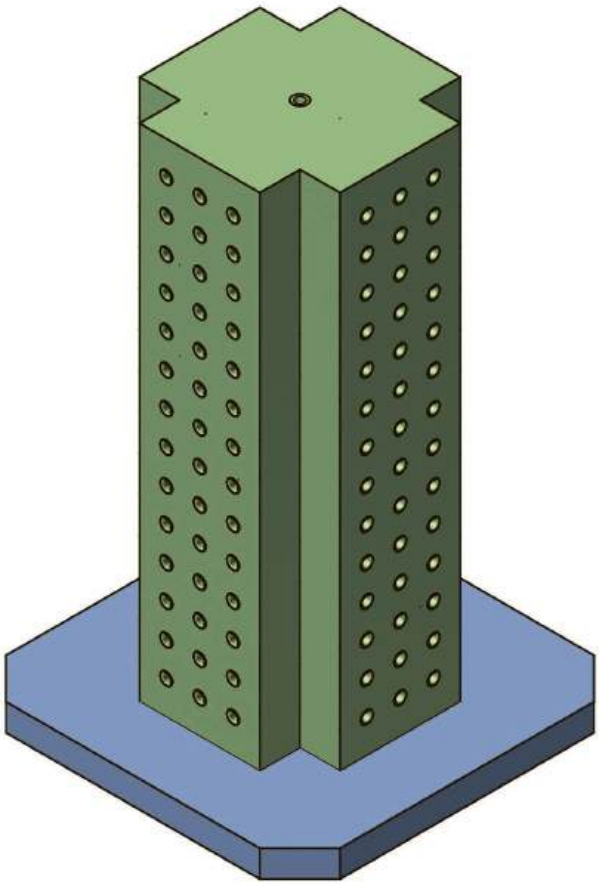
Bestellbeispiel
***Ordering example*: MK350865R50 &** **p. 274**

	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!***

Separat bestellen / *Order separately*



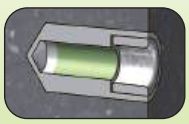


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

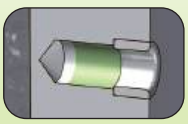
Base plate according to your machine configuration please order extra!

p. 274

Mineralgussturm mit Stahldübel
Epoxy Mineral with Steel Anchor



Stahl-Mineralguss
Steel-epoxy mineral tombstones



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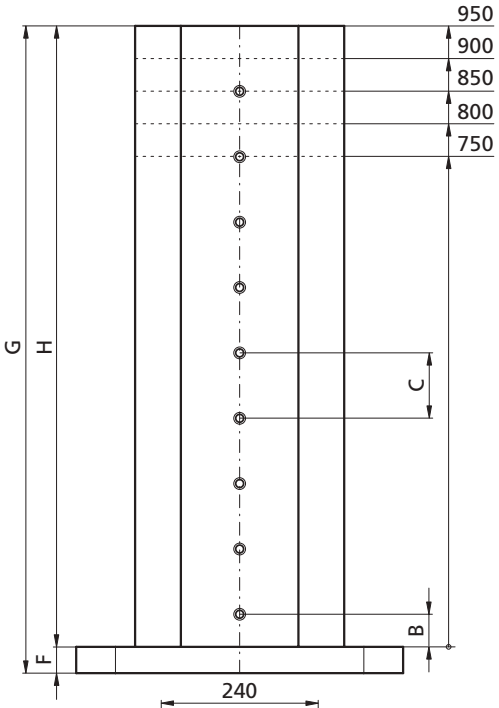
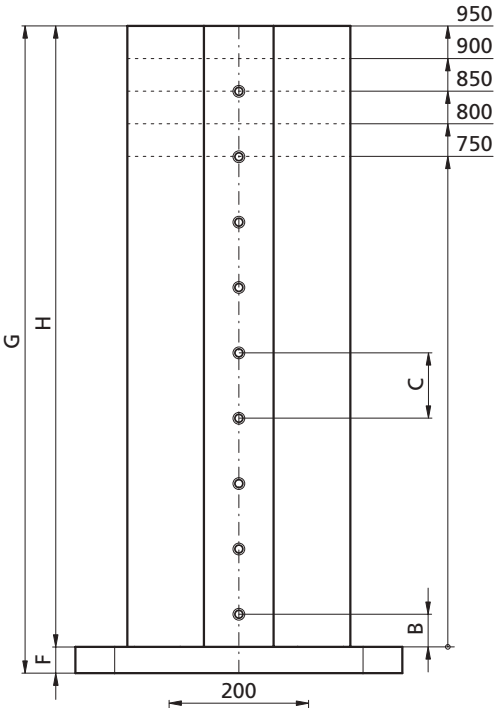
Bestellbeispiel
***Ordering example*: MK301850R50 &**

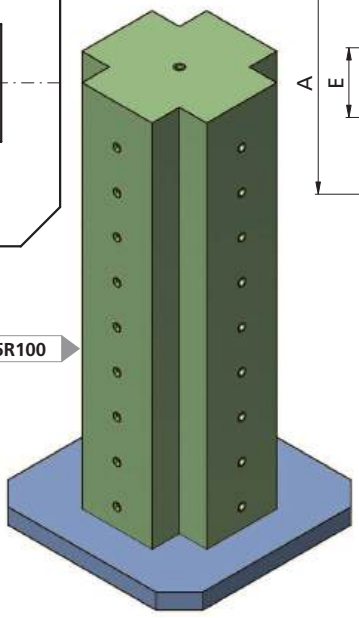
	kg*		kg*		A	B	C	D	E	F	G	H	Raster / *Grid*
MK301845R50	~77	**SMK301845R50**	~100		300	50	50	100	180	(40)	(440)	**450**	96xM12/12F7
MK301850R50	~86	**SMK301850R50**	~110		300	50	50	100	180	(40)	(540)	**500**	108xM12/12F7
MK301855R50	~94	**SMK301855R50**	~120		300	50	50	100	180	(40)	(590)	**550**	120xM12/12F7
MK301860R50	~102	**SMK301860R50**	~132		300	50	50	100	180	(40)	(640)	**600**	132xM12/12F7
MK301865R50	~110	**SMK301865R50**	~141		300	50	50	100	180	(40)	(690)	**650**	144xM12/12F7
MK301870R50	~117	**SMK301870R50**	~152		300	50	50	100	180	(40)	(740)	**700**	156xM12/12F7
MK301875R50	~125	**SMK301875R50**	~162		300	50	50	100	180	(40)	(790)	**750**	168xM12/12F7

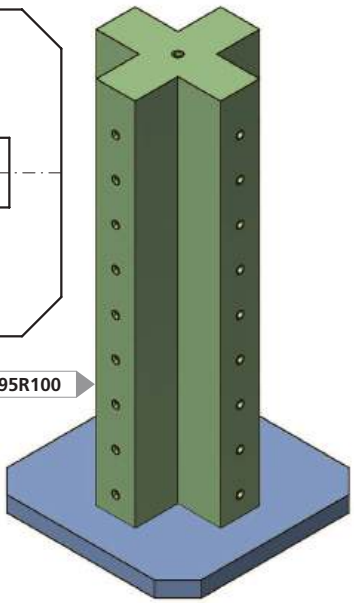
*** Gewicht ohne Grundplatte! / *Weight without baseplate!***

Separat bestellen / *Order separately*







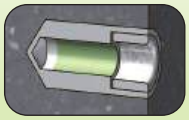


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel

Epoxy Mineral with Steel Anchor



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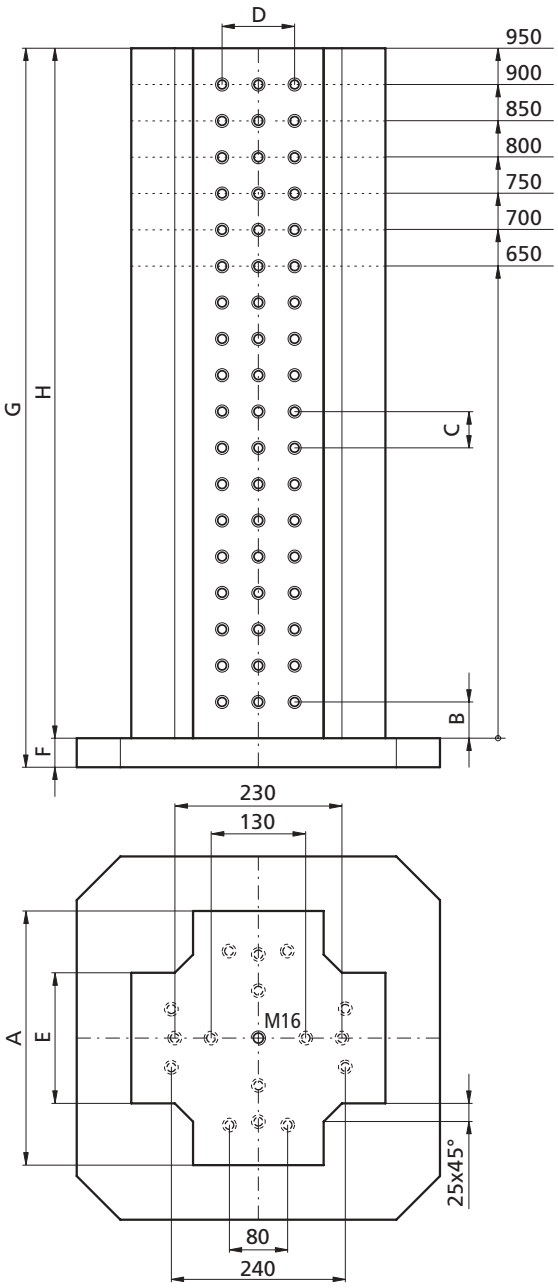
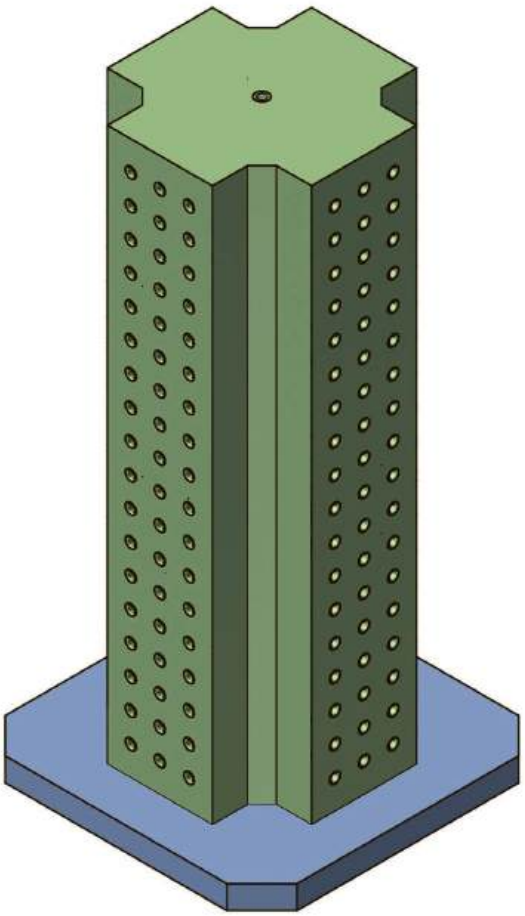
Bestellbeispiel
***Ordering example*: MK321075R100 &** **p. 274**

	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!***

Separat bestellen / *Order separately*





Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

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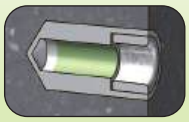
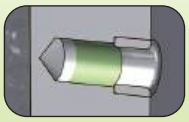
Mineralgussturm mit Stahldübel
Epoxy Mineral with Steel Anchor



Stahl-Mineralguss
Steel-epoxy mineral tombstones



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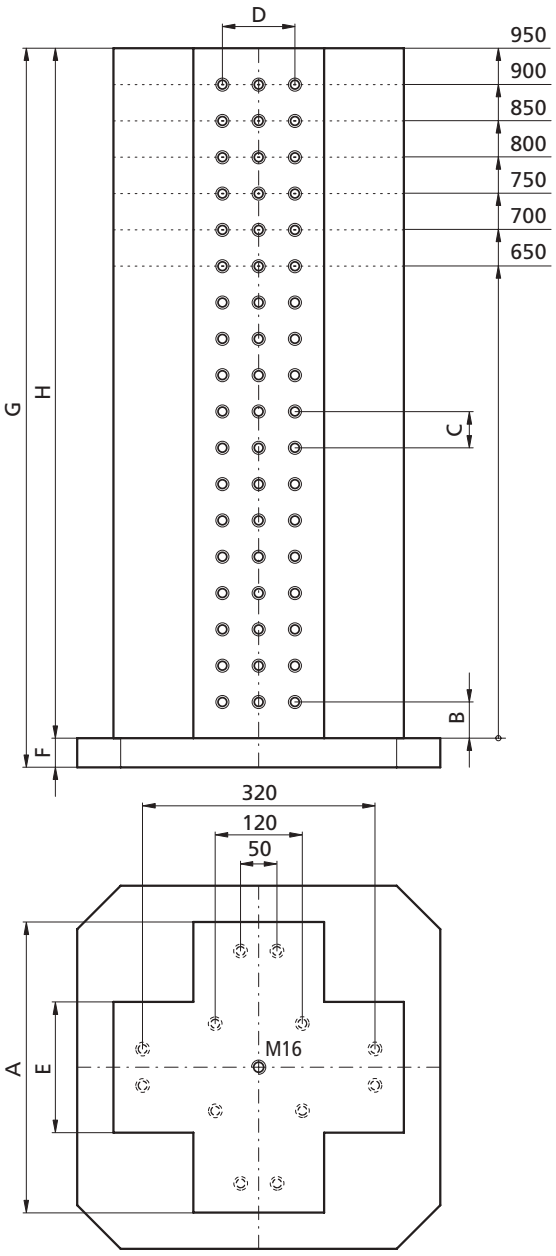
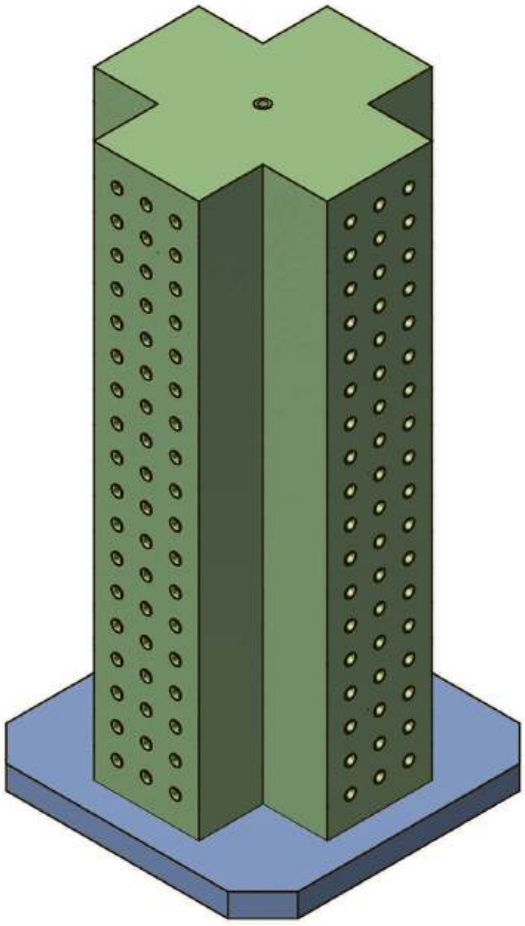
Bestellbeispiel
***Ordering example*: MK351865R50 &**

	kg*		kg*		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!***

Separat bestellen / *Order separately*





Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

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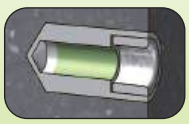
Mineralgussturm mit Stahldübel

Epoxy Mineral with Steel Anchor



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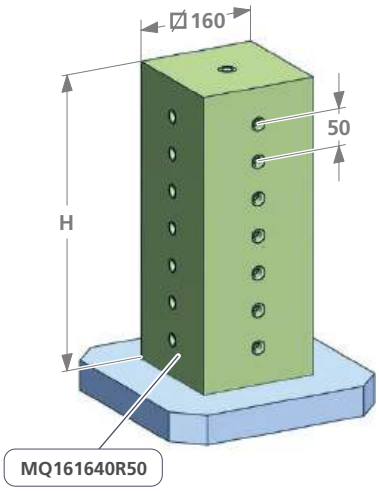
Bestellbeispiel
***Ordering example*: MK401865R50 &**

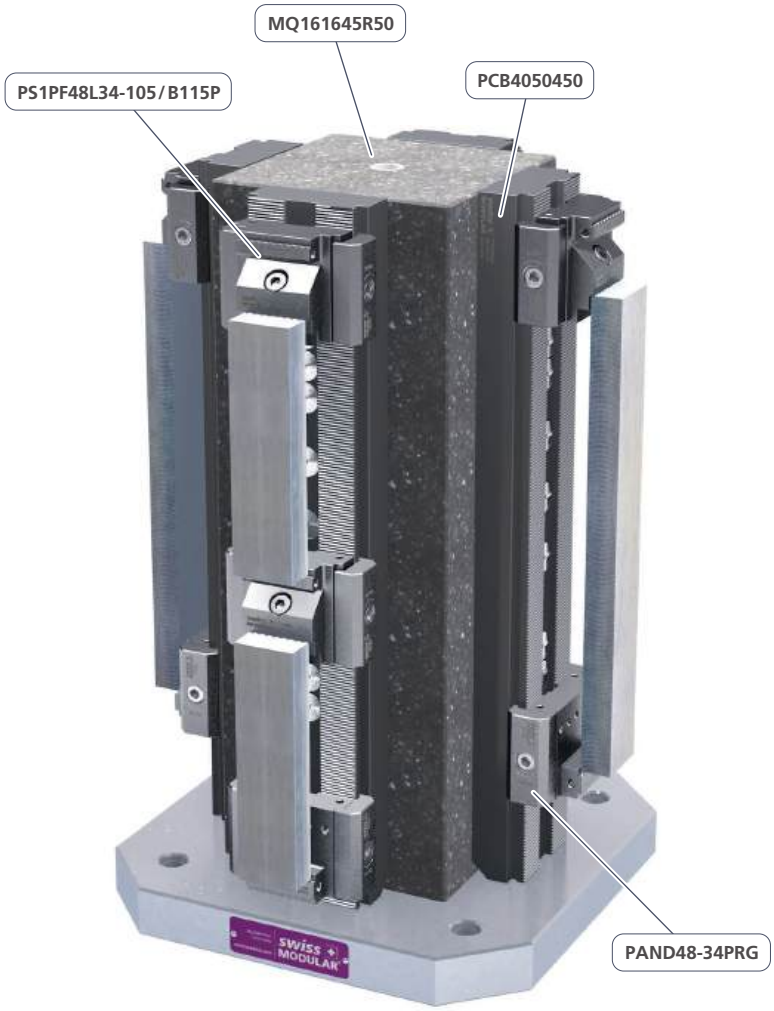
	kg*		A	B	C	D	E	F	G	H	Raster / *Grid*
MK401865R50	~161		400	50	50	100	180	(40)	(690)	**650**	144 x M12/12F7
MK401870R50	~172		400	50	50	100	180	(40)	(740)	**700**	156 x M12/12F7
MK401875R50	~184		400	50	50	100	180	(40)	(790)	**750**	168 x M12/12F7
MK401880R50	~195		400	50	50	100	180	(40)	(840)	**800**	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!***

Separat bestellen / *Order separately*

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

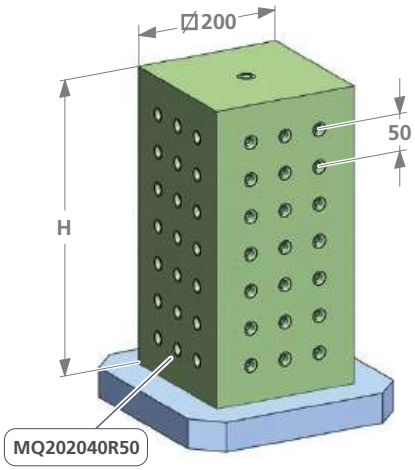


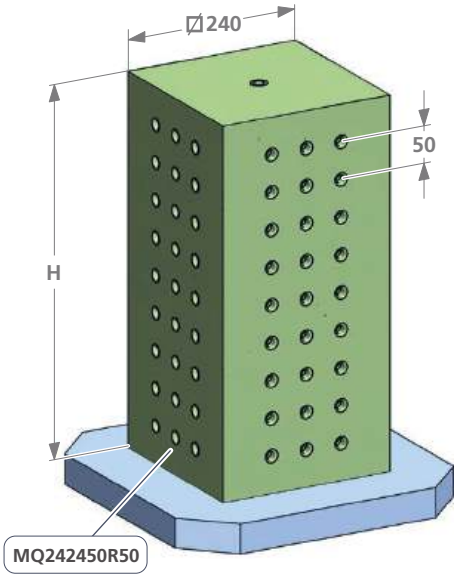


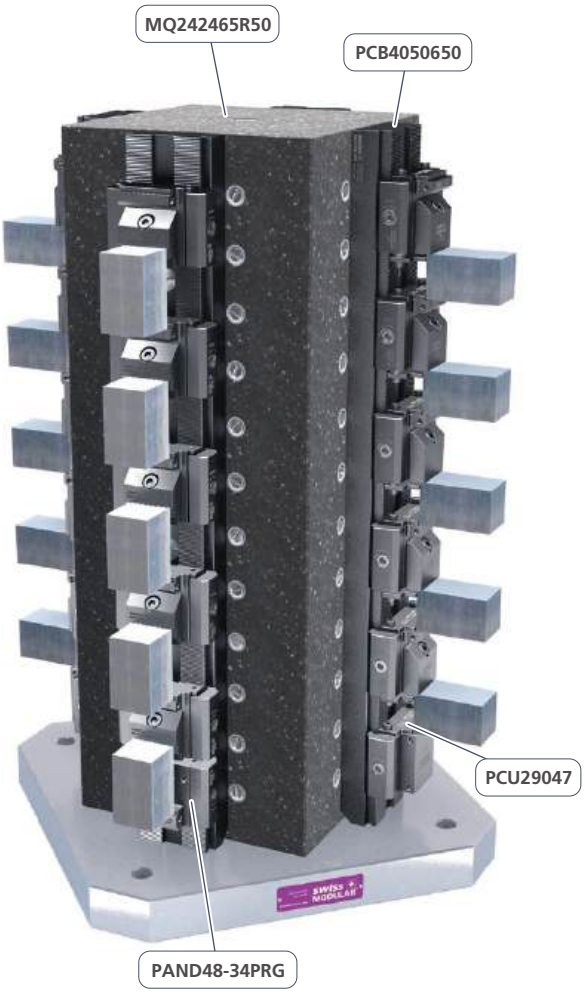
Maschienenschonend und leicht, fast in allen Formen herstellbar.

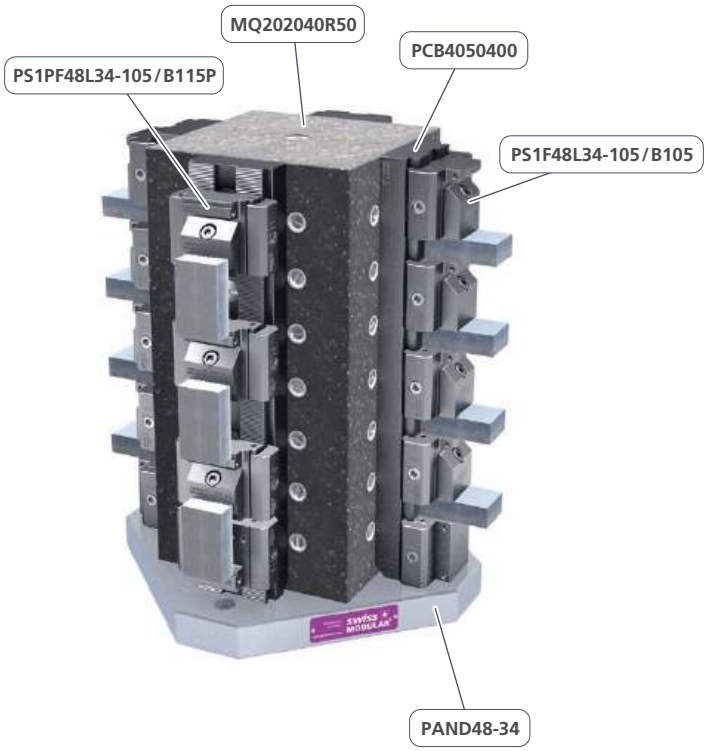
Reduces machine wear due to low specific weight - can be produced in all sorts of shapes.

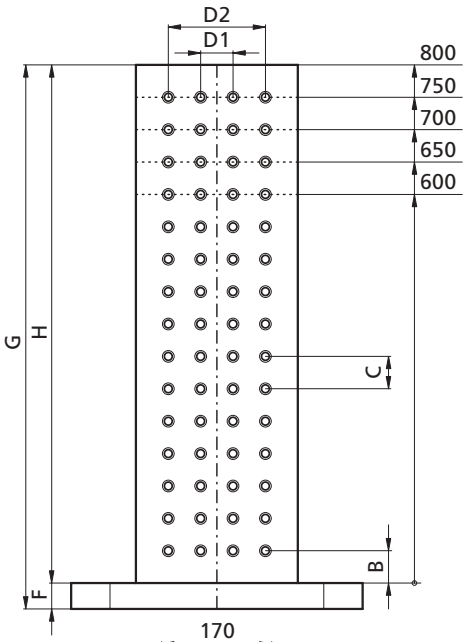
Art. Nr.	kg	Raster / *Grid*	H
MQ202040R50	~42	84 x M12/12F7	400
MQ202045R50	~53	96 x M12/12F7	450
MQ202050R50	~59	108 x M12/12F7	500
MQ202055R50	~64	120 x M12/12F7	550
MQ202060R50	~70	132 x M12/12F7	600
MQ202065R50	~76	144 x M12/12F7	650
MQ202070R50	~81	156 x M12/12F7	700
MQ242450R50	~81	108 x M12/12F7	500
MQ242455R50	~89	120 x M12/12F7	550
MQ242460R50	~97	132 x M12/12F7	600
MQ242465R50	~103	144 x M12/12F7	650

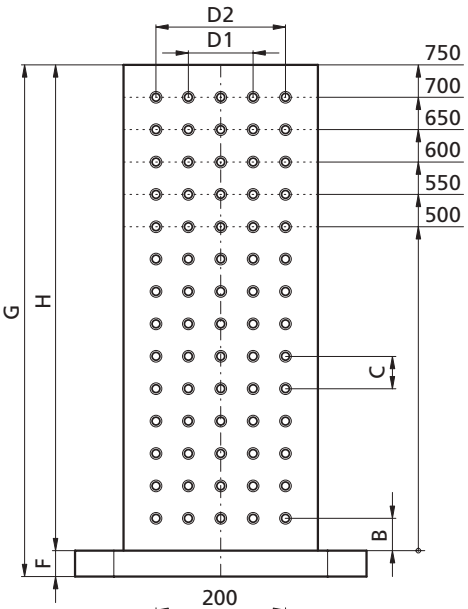


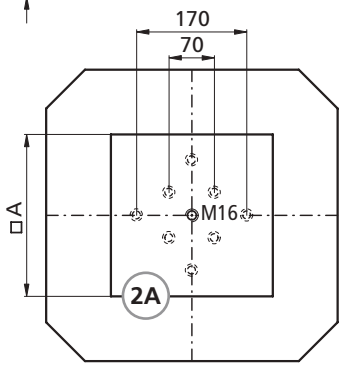


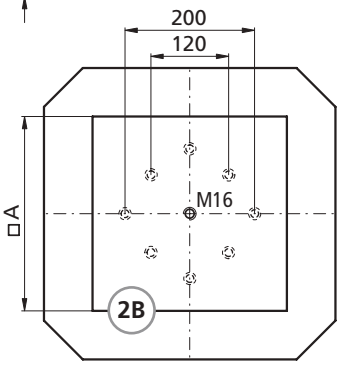


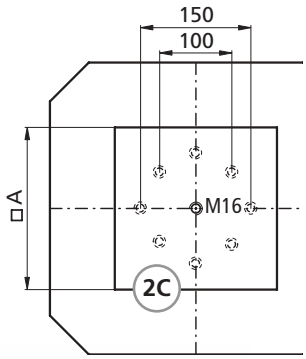


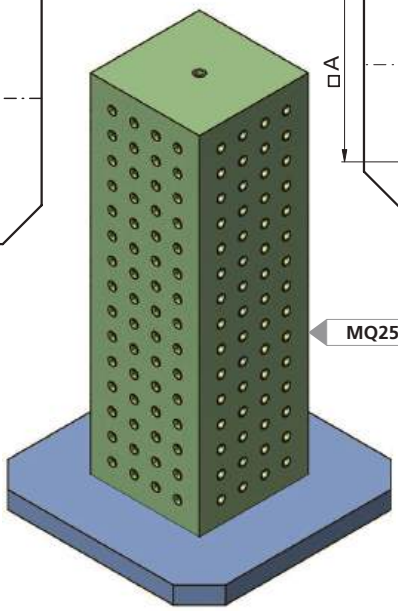






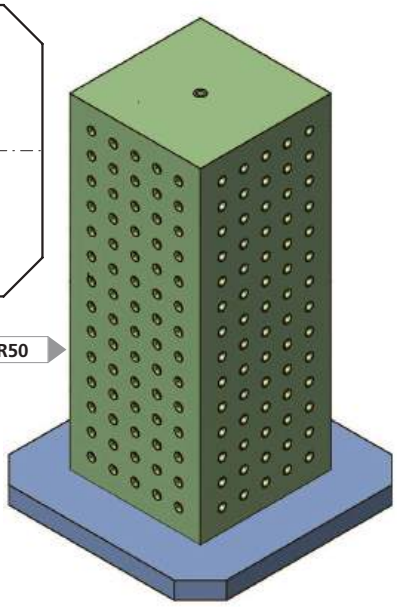






MQ252580R50

MQ303075R50

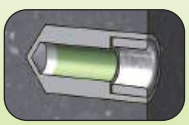


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel

Epoxy Mineral with Steel Anchor



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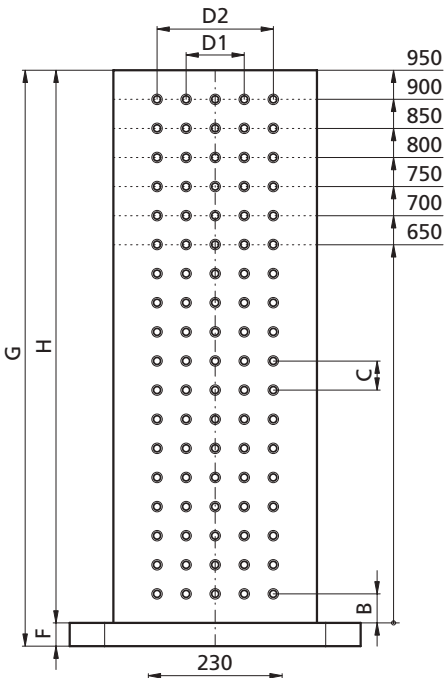
Bestellbeispiel
***Ordering example*: MQ252560R50 &**

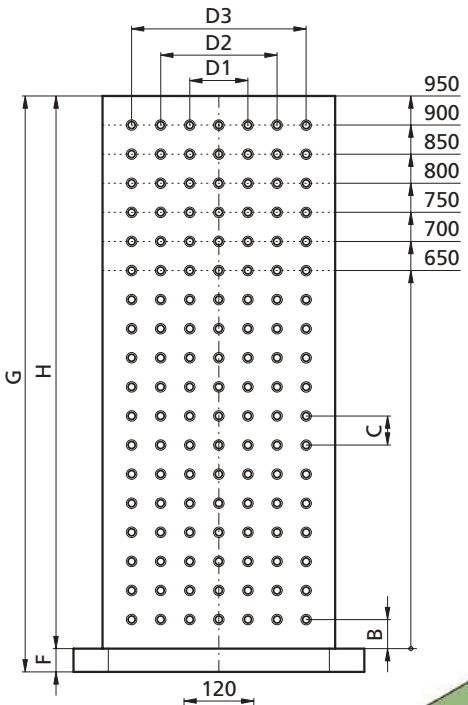
p. 274

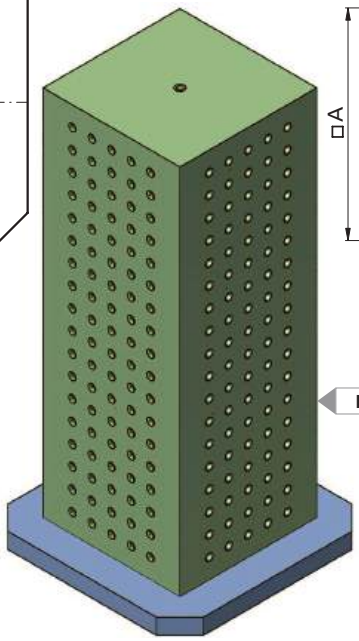
	kg*		Bohrbild *Hole pattern*	A	B	C	D1	D2	F	G	H	Raster / *Grid*
MQ252560R50	~107		**2A**	250	50	50	100	150	(40)	(640)	**600**	176 x M12/12F7
MQ252565R50	~116		**2A**	250	50	50	100	150	(40)	(690)	**650**	192 x M12/12F7
MQ252570R50	~125		**2A**	250	50	50	100	150	(40)	(740)	**700**	208 x M12/12F7
MQ252575R50	~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!***

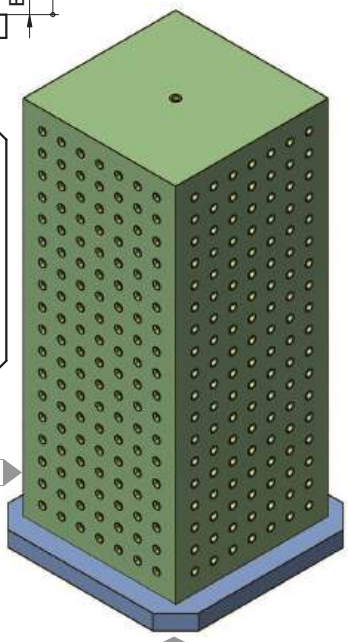
Separat bestellen / *Order separately*







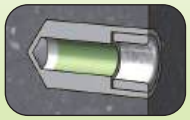
MQ353595R50



MQ404095R50

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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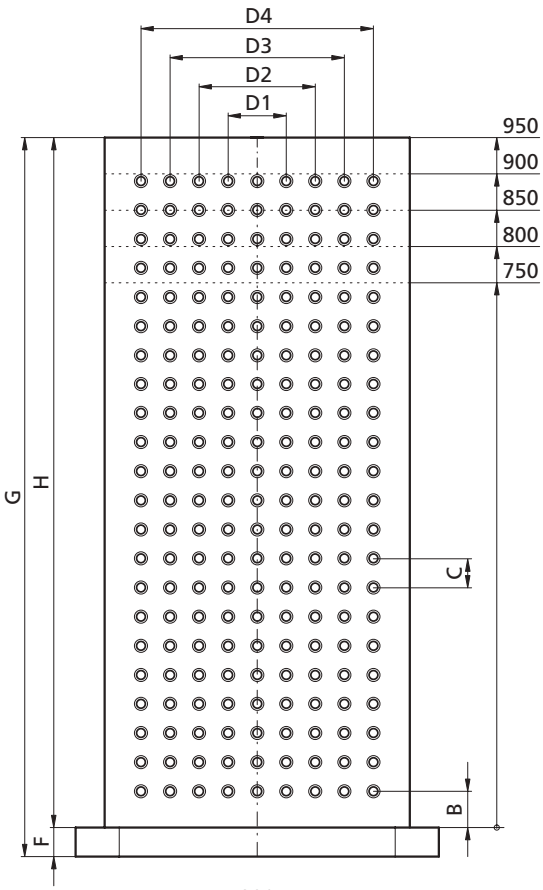
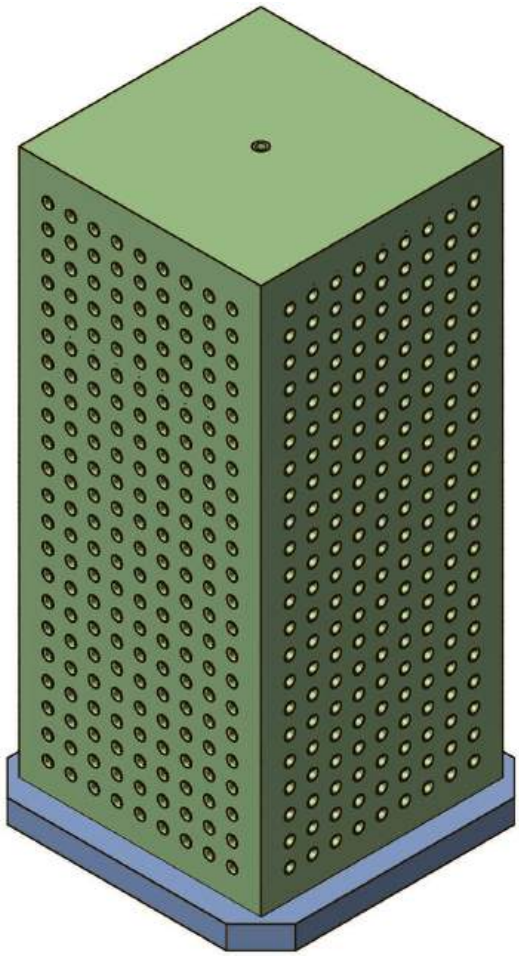
Bestellbeispiel
***Ordering example*: MQ353565R50 &** **p. 274**

	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

Separat bestellen / ***Order separately***

*** Gewicht ohne Grundplatte! / *Weight without baseplate!***



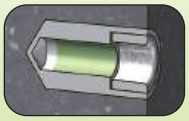


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel

Epoxy Mineral with Steel Anchor



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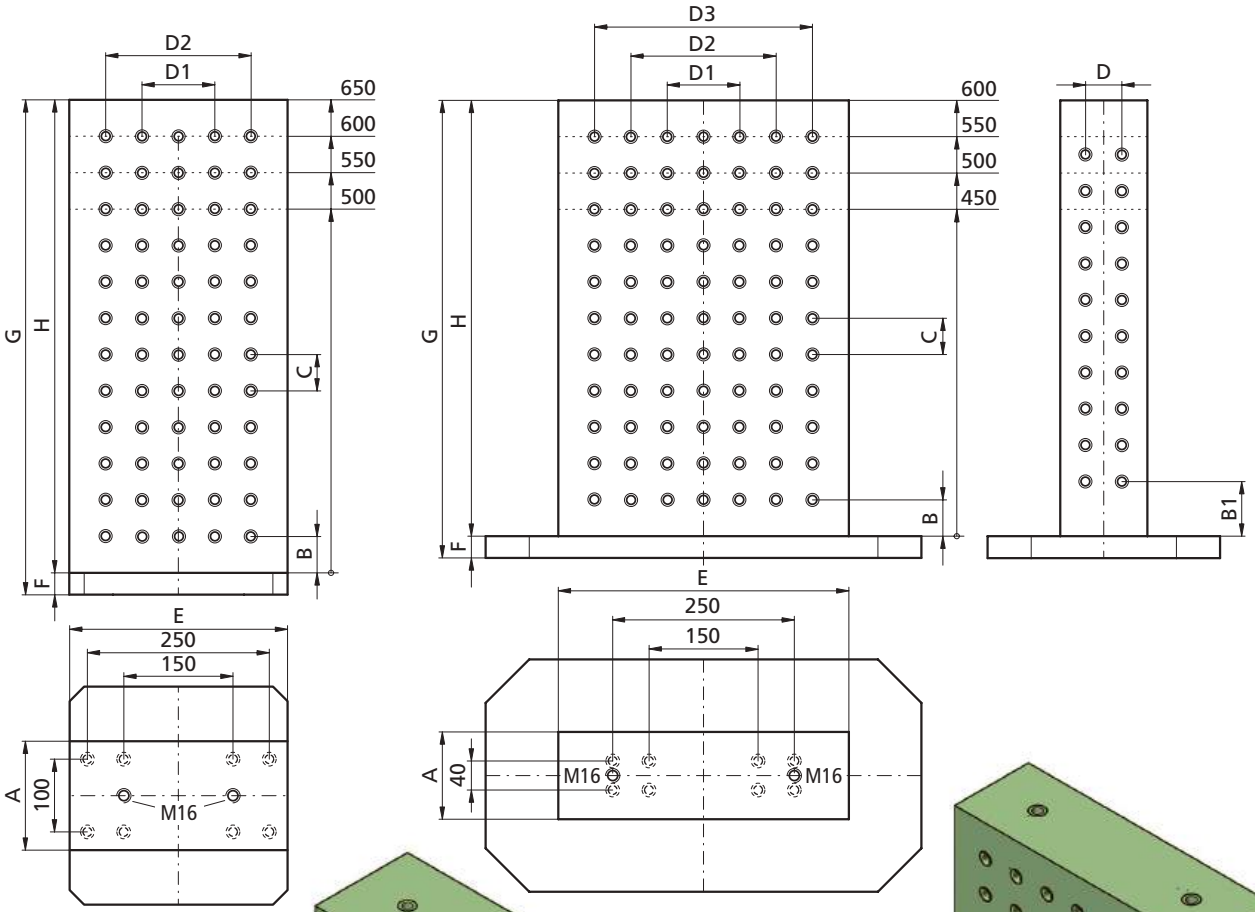
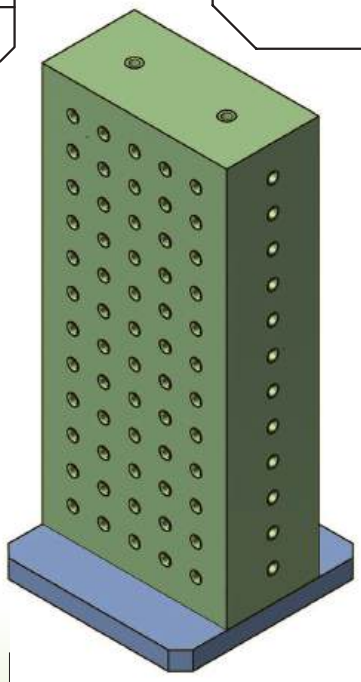
Bestellbeispiel
***Ordering example*: MQ424275R40 &** **p. 274**

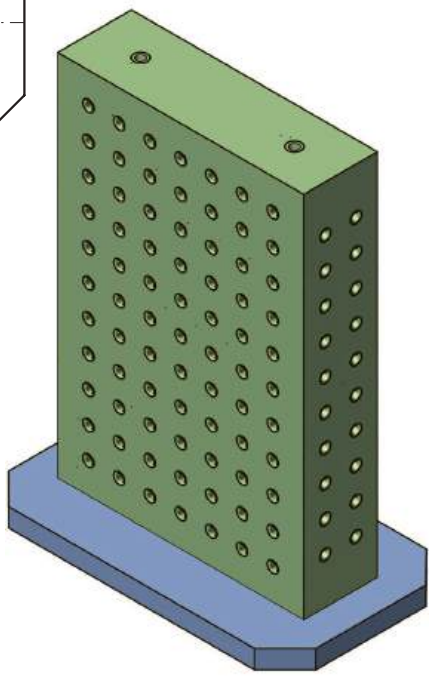
	kg*		A	B	C	D1	D2	D3	D4	F	G	H	Raster / *Grid*
MQ424275R40	~329		420	50	40	80	160	240	320	(40)	(790)	**750**	612 x M12/12F7
MQ424280R40	~349		420	50	40	80	160	240	320	(40)	(840)	**800**	648 x M12/12F7
MQ424285R40	~373		420	50	40	80	160	240	320	(40)	(890)	**850**	684 x M12/12F7
MQ424290R40	~393		420	50	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!***

Separat bestellen / *Order separately*





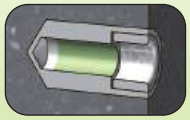


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel

Epoxy Mineral with Steel Anchor



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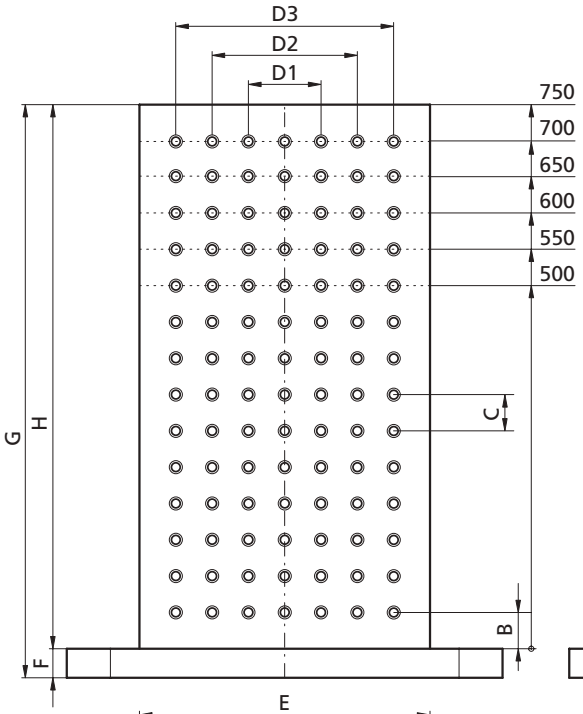
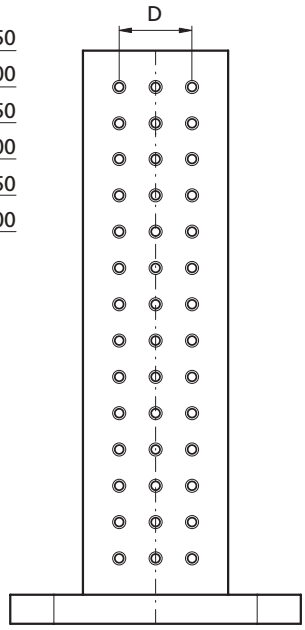
Bestellbeispiel
***Ordering example*: MR401245R50 &** **p. 274**

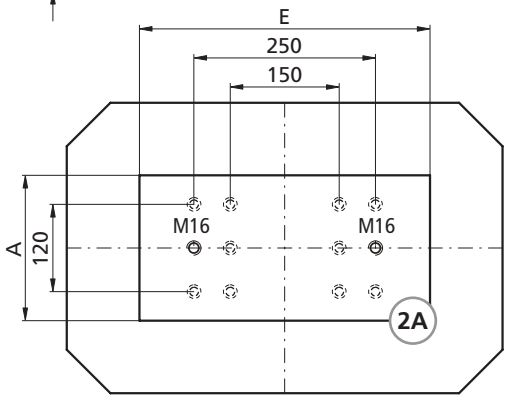
	kg*		A	B	B1	C	D	D1	D2	D3	E	F	G	H	Raster / *Grid*
MR301550R50	~65		150	50		50		100	200		300	(30)	(530)	**500**	63 x M12/12F7
MR301555R50	~72		150	50		50		100	200		300	(30)	(580)	**550**	70 x M12/12F7
MR301560R50	~78		150	50		50		100	200		300	(30)	(630)	**600**	77 x M12/12F7
MR301565R50	~85		150	50		50		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

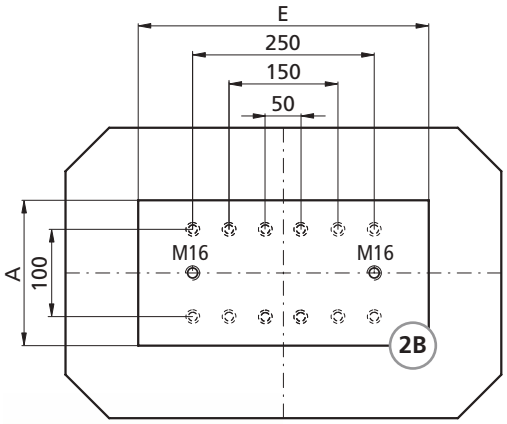
*** Gewicht ohne Grundplatte! / *Weight without baseplate!***

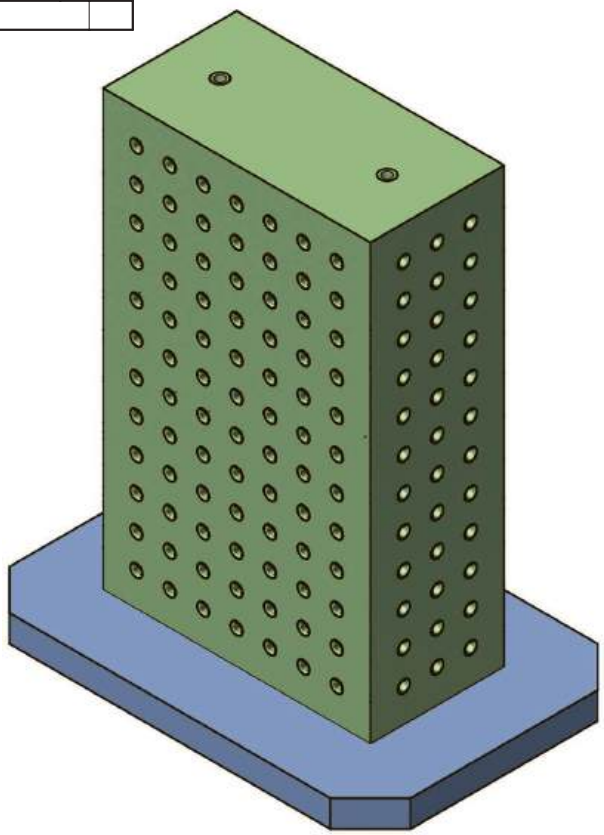
Separat bestellen / *Order separately*









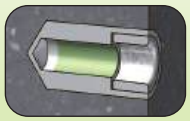


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel

Epoxy Mineral with Steel Anchor



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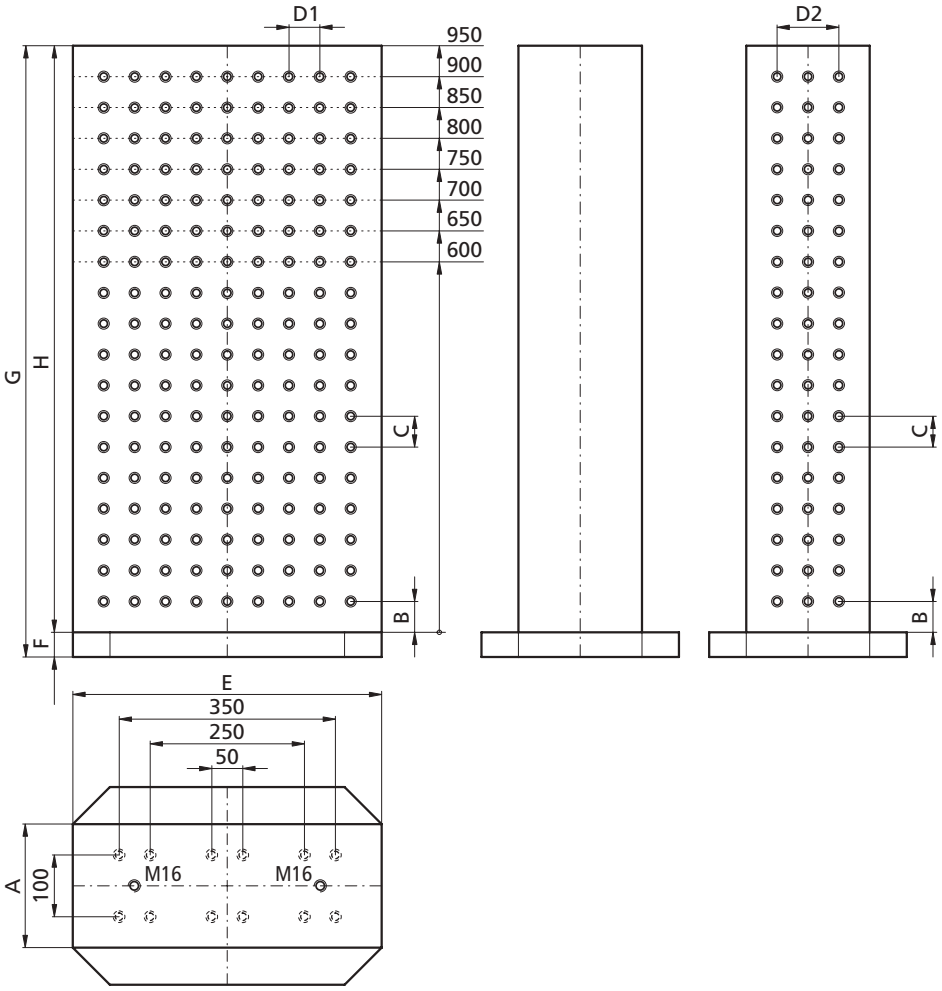
Bestellbeispiel
***Ordering example*: MR402050R50 &** **p. 274**

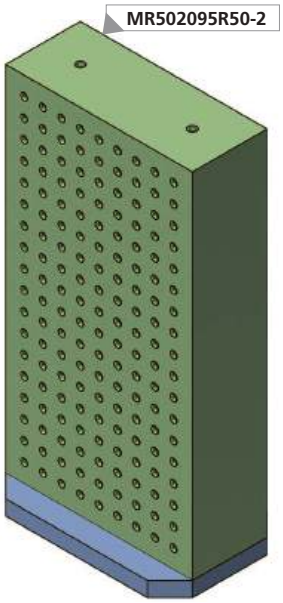
	kg*	Bohrbild / *Hole pattern*	A	B	C	D	D1	D2	D3	E	F	G	H	Raster / *Grid*
MR402050R50	~115	**2A**	200	50	50	100	100	200	300	400	(40)	(540)	**500**	180 x M12/12F7
MR402055R50	~126	**2A**	200	50	50	100	100	200	300	400	(40)	(590)	**550**	200 x M12/12F7
MR402060R50	~138	**2A**	200	50	50	100	100	200	300	400	(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!***

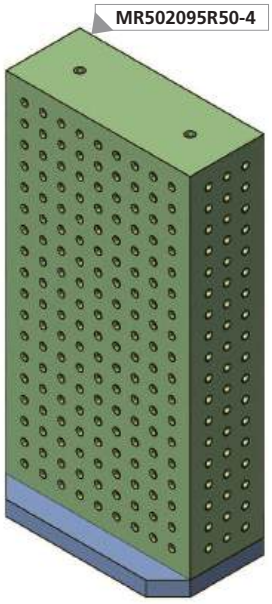
Separat bestellen / *Order separately*



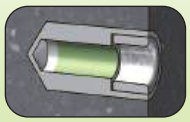
MR502095R50-2



MR502095R50-4



Mineralgussturm mit Stahldübel
Epoxy Mineral with Steel Anchor



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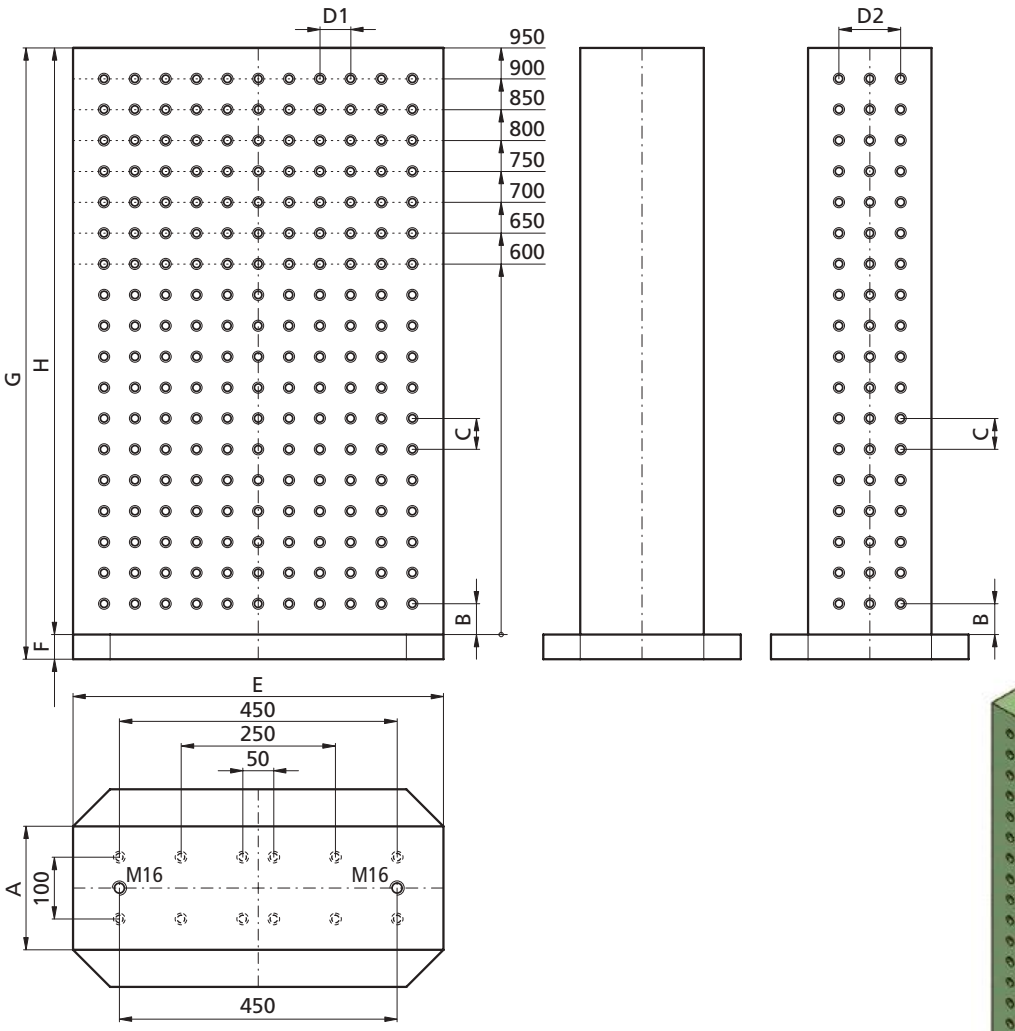
Bestellbeispiel
***Ordering example*: MR502060R50-2 &** p. 274

Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!
Base plate according to your machine configuration please order extra!

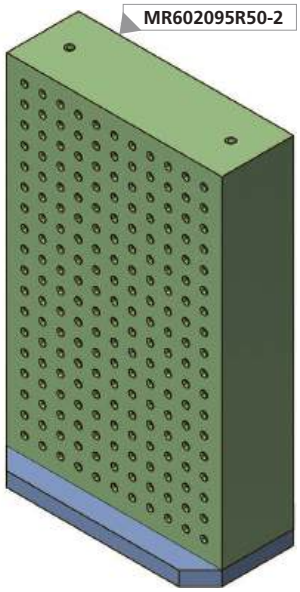
	kg*	A	B	C	D1	D2	E	F	G	H	Raster / *Grid*
MR502060R50-2	~165	200	50	50	50		500	(40)	(640)	**600**	198 x M12/12F7
MR502065R50-2	~179	200	50	50	50		500	(40)	(690)	**650**	216 x M12/12F7
MR502070R50-2	~193	200	50	50	50		500	(40)	(740)	**700**	234 x M12/12F7
MR502075R50-2	~208	200	50	50	50		500	(40)	(790)	**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

*** Gewicht ohne Grundplatte! / *Weight without baseplate!***

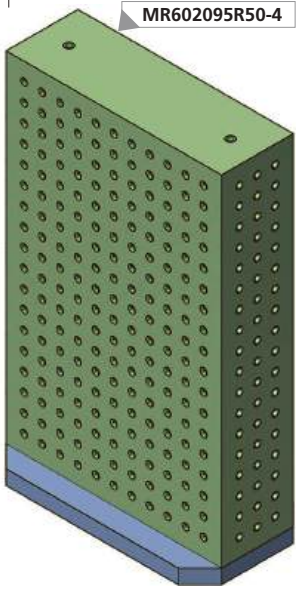
Separat bestellen / *Order separately*



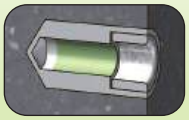
MR602095R50-2



MR602095R50-4



Mineralgussturm mit Stahldübel
Epoxy Mineral with Steel Anchor



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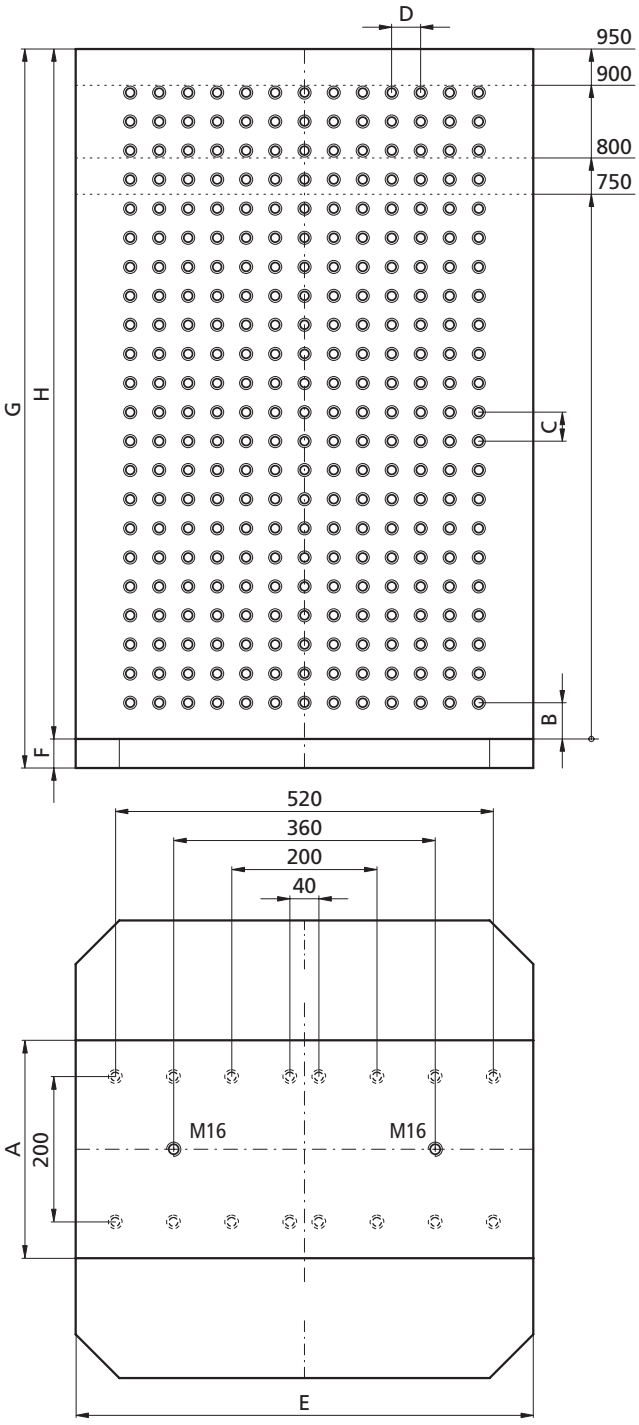
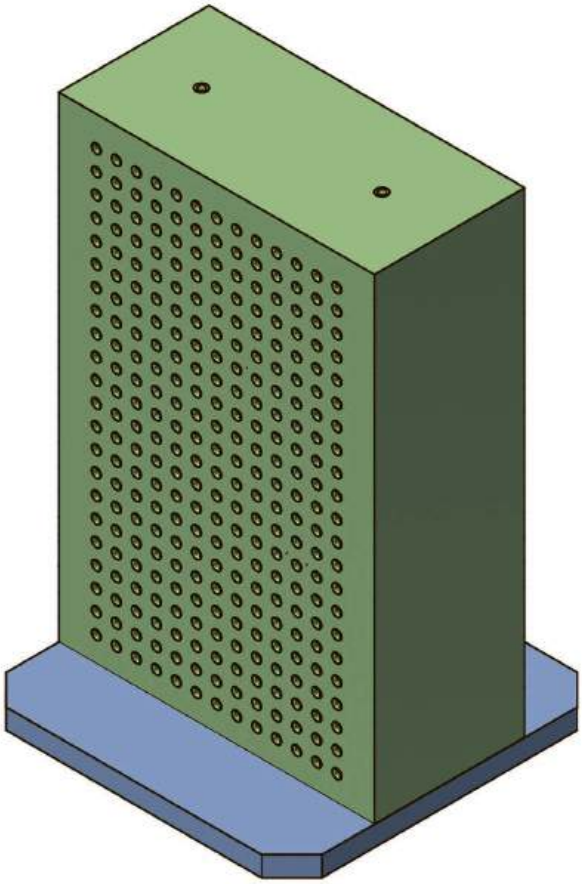
Bestellbeispiel
***Ordering example*: MR602060R50-2 &** **p. 274**

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!***



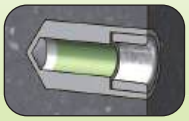


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel

Epoxy Mineral with Steel Anchor



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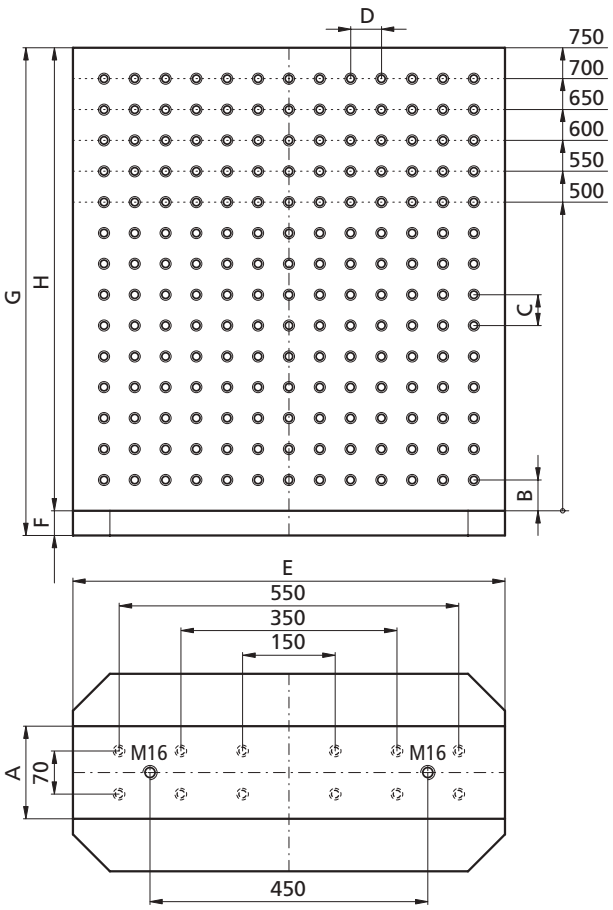
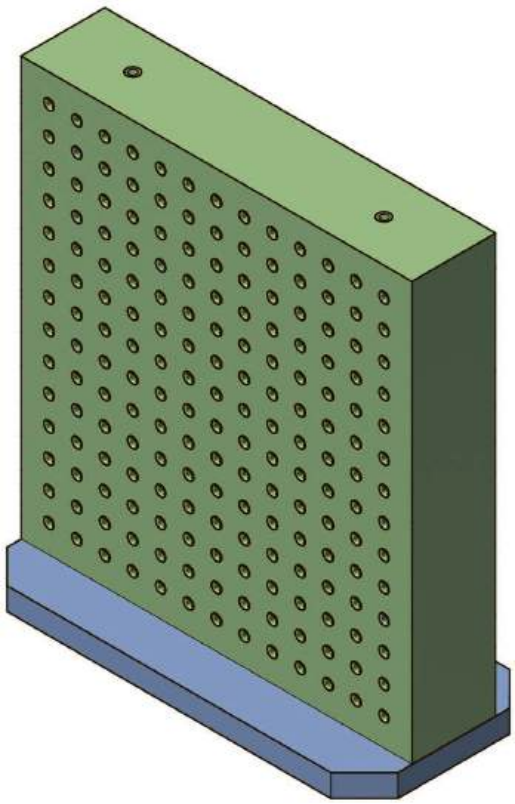
Bestellbeispiel
***Ordering example*: MR633075R40 &** **p. 274**

	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

*** Gewicht ohne Grundplatte! / *Weight without baseplate!***

Separat bestellen / *Order separately*



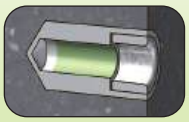


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel

Epoxy Mineral with Steel Anchor



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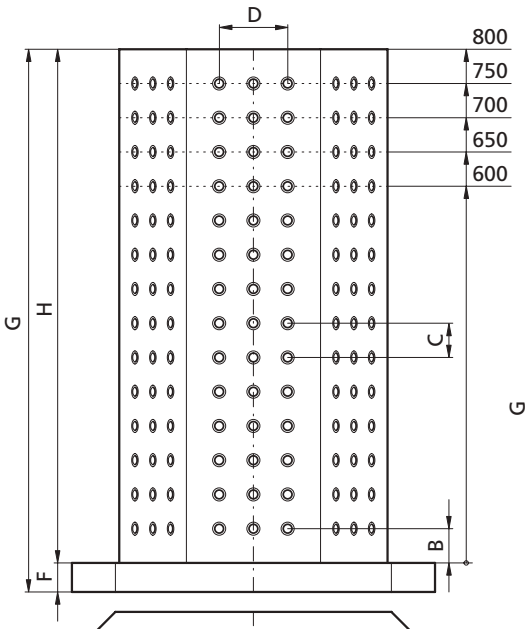
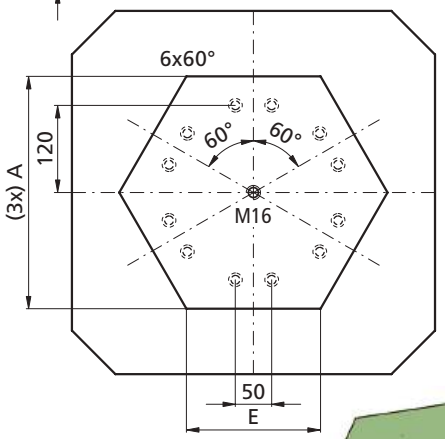
Bestellbeispiel
***Ordering example*: MR701550R50 &** **p. 274**

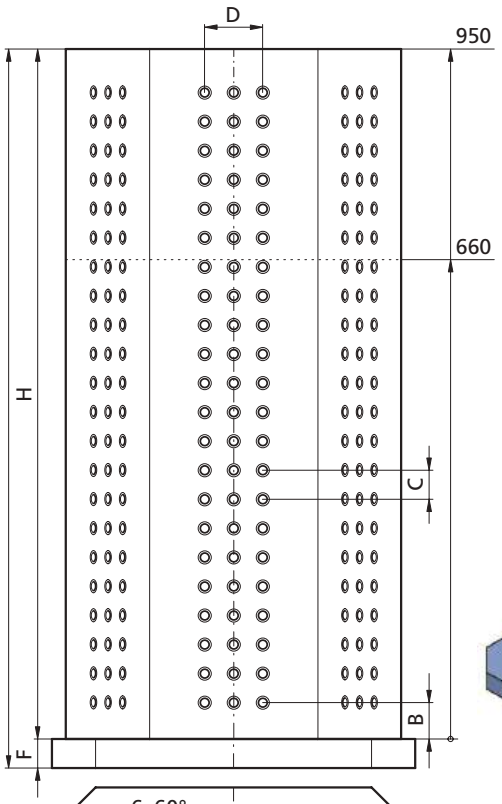
	kg*		A	B	C	D		E	F	G	H	Raster / *Grid*
MR701550R50	~153		150	50	50	50		700	(40)	(540)	**500**	234 x M12/12F7
MR701555R50	~168		150	50	50	50		700	(40)	(590)	**550**	260 x M12/12F7
MR701560R50	~183		150	50	50	50		700	(40)	(640)	**600**	286 x M12/12F7
MR701565R50	~199		150	50	50	50		700	(40)	(690)	**650**	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

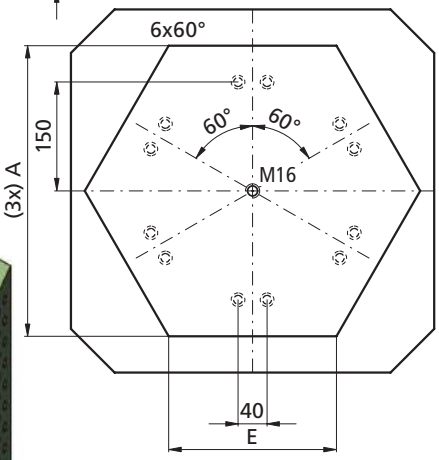
*** Gewicht ohne Grundplatte! / *Weight without baseplate!***

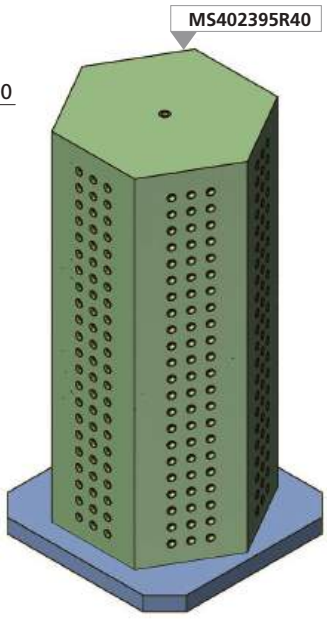
Separat bestellen / *Order separately*

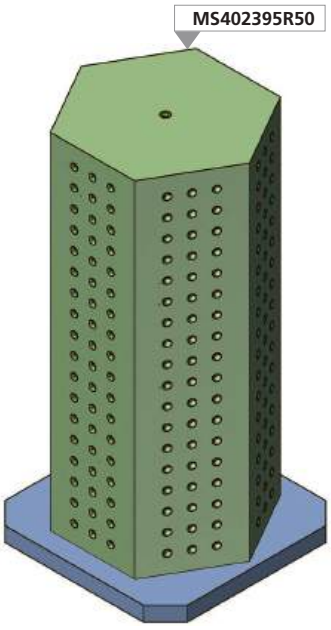


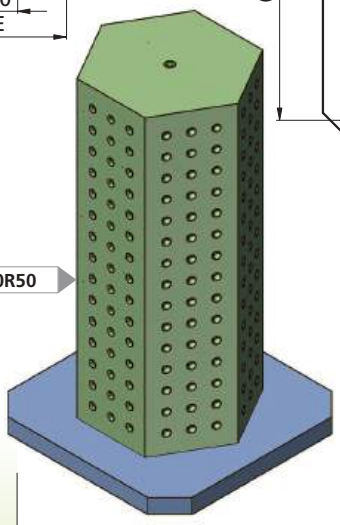




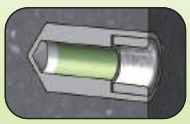








Mineralgussturm mit Stahldübel
Epoxy Mineral with Steel Anchor



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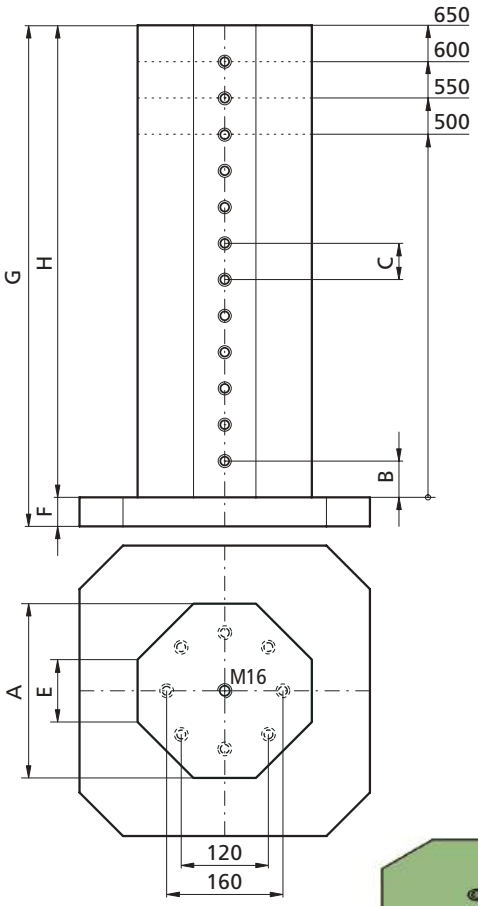
Bestellbeispiel
***Ordering example*: MS321966R80 &** **p. 274**

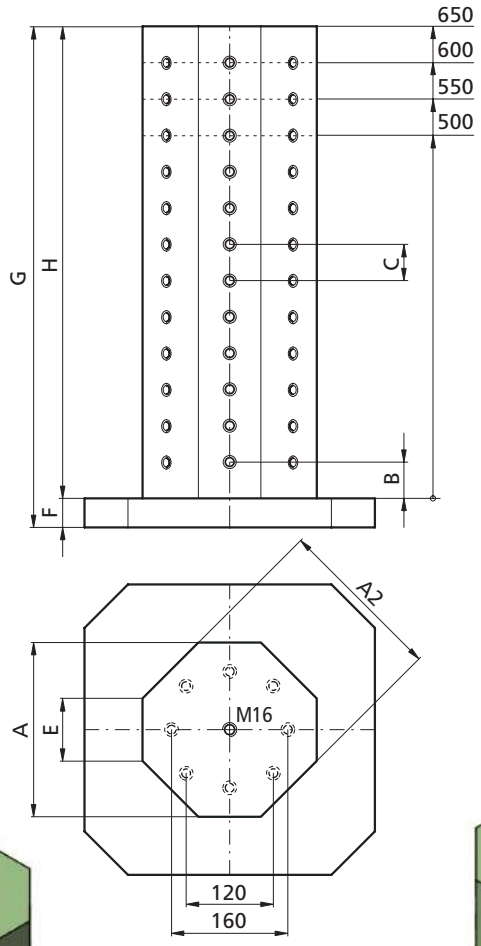
Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!
Base plate according to your machine configuration please order extra!

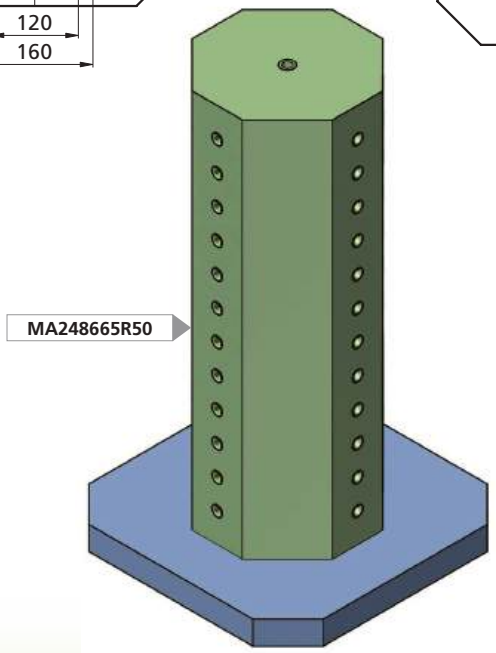
	kg*	A	B	C	D	E	F	G	H	Raster / *Grid*
MS321960R50	~120	320	50	50	100	184	(40)	(640)	**600**	198 x M12/12F7
MS321965R50	~131	320	50	50	100	184	(40)	(690)	**650**	216 x M12/12F7
MS321970R50	~142	320	50	50	100	184	(40)	(740)	**700**	234 x M12/12F7
MS321975R50	~154	320	50	50	100	184	(40)	(790)	**750**	252 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

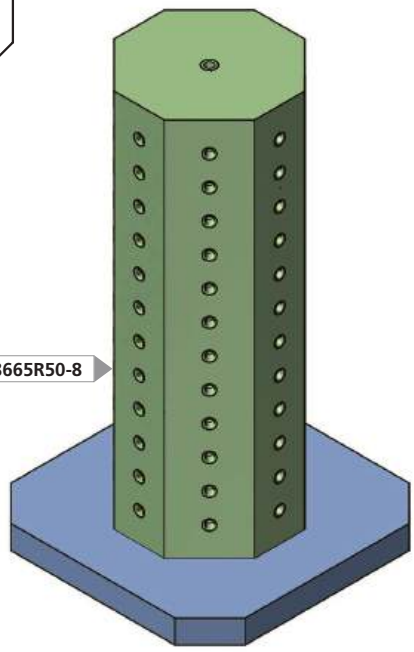
Separat bestellen / *Order separately*

*** Gewicht ohne Grundplatte! / *Weight without baseplate!***



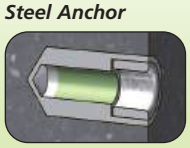






Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!
Base plate according to your machine configuration please order extra!

Mineralgussturm mit Stahldübel
Epoxy Mineral with Steel Anchor



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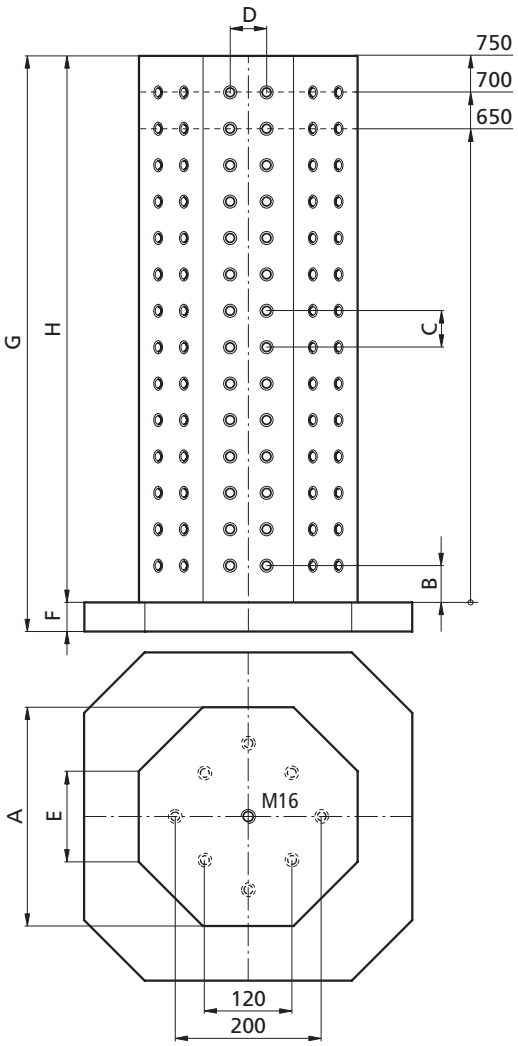
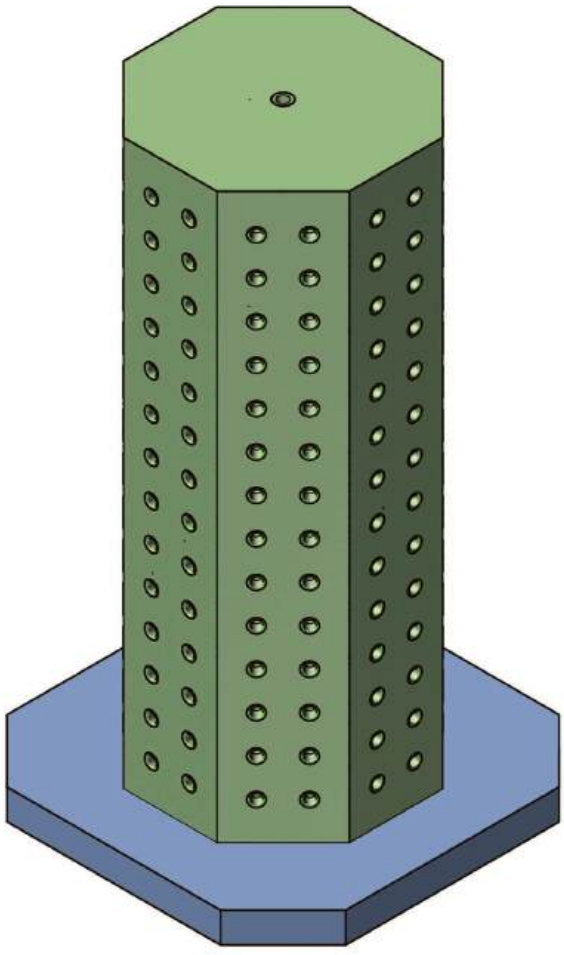
Bestellbeispiel
***Ordering example*: MR248650R50 &** **p. 274**

	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!***

Separat bestellen / *Order separately*



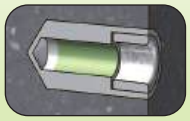


Grundplatte wird passend zu Ihrer Maschinenpalette hergestellt und muss separat bestellt werden!

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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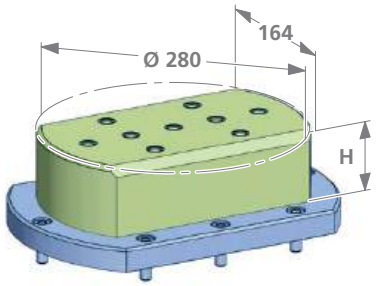
Bestellbeispiel
***Ordering example*: MA301265R50-8-2 &** **p. 274**

	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!***

Separat bestellen / *Order separately*

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.

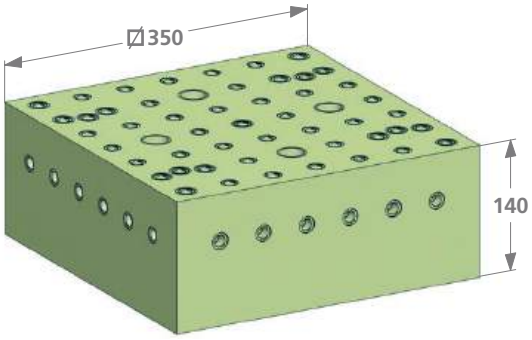


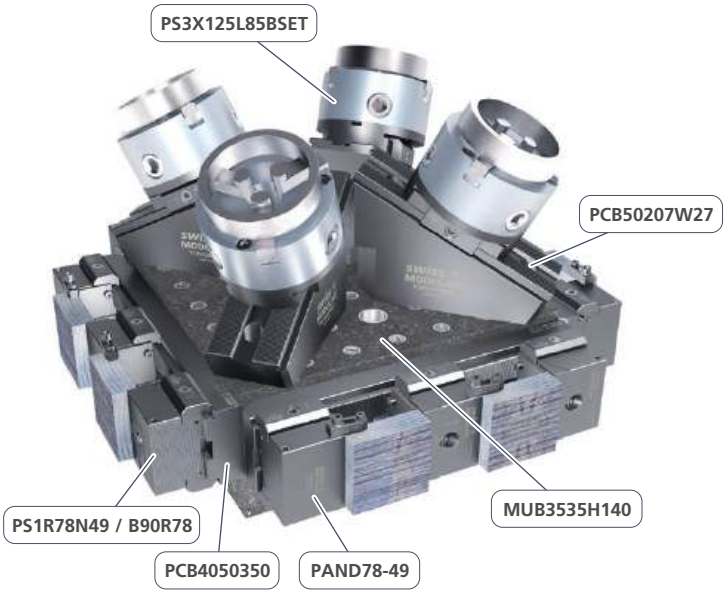


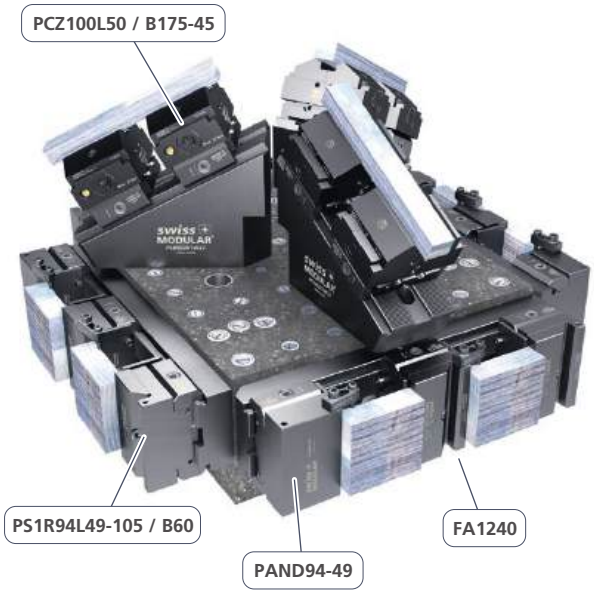
Art. Nr.	kg	Raster / *Grid* R50
MUB3535H140	~44,1	73 x M12/12F7

Diese Mineralgusserhöhung mit schrägen Basisschienen (PCB50207W27) und einer seitlichen Anordnung weiterer Spannstellen, bietet Ihnen eine Vielzahl an Spannmöglichkeiten.

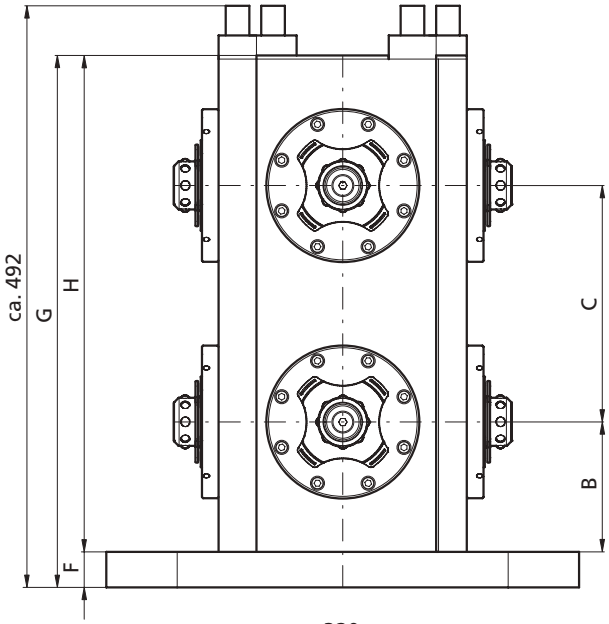
This mineral casting raises with inclined base rails (PCB50207W27) and a lateral arrangement of further clamping points offers you a wide range of clamping possibilities.



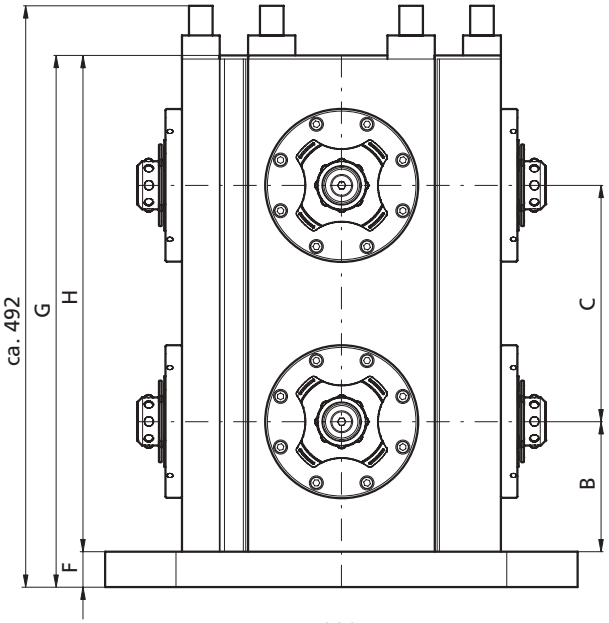


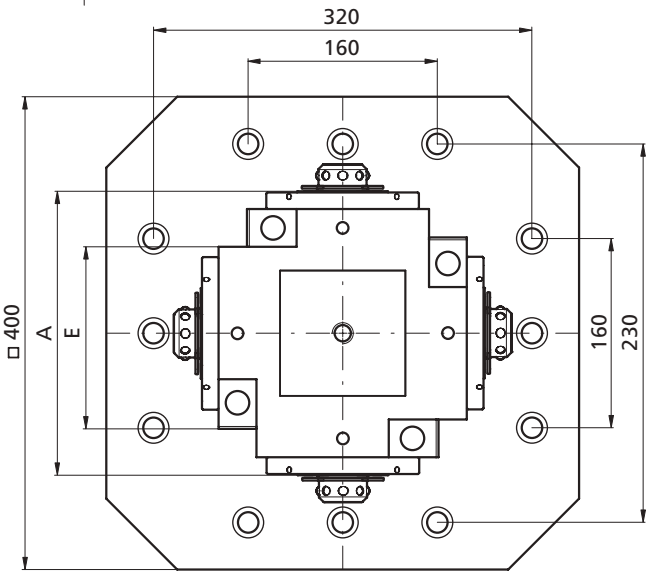


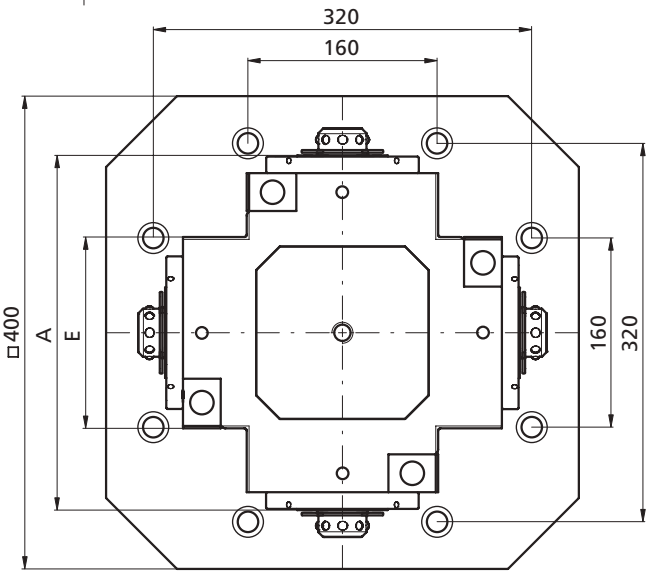
SMK24-24-42 OPP200

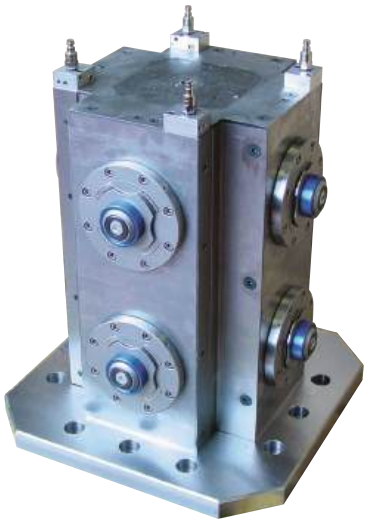


SMK30-17-42 OPP200



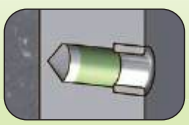






Stahl-Mineralguss

Steel-epoxy mineral tombstones

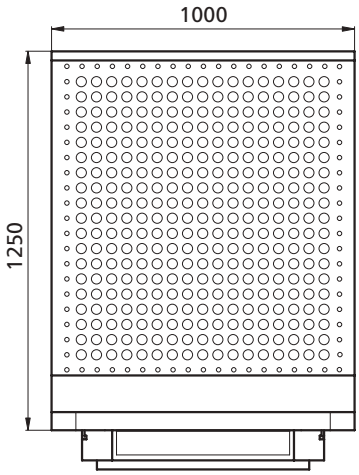


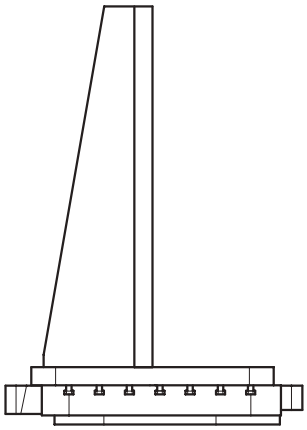
andere Höhen auf Anfrage
other heights on request

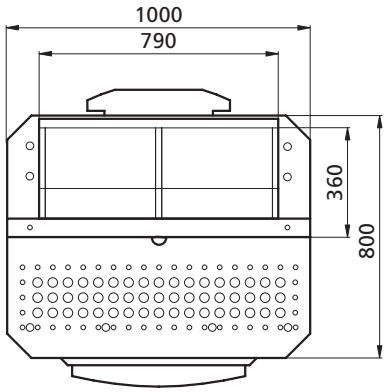
▶ Seite / *Page* 250

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

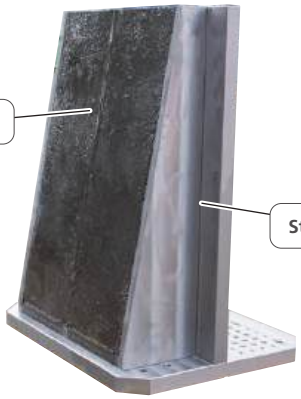






Gesamtgewicht *Total weight* **~1300 kg**





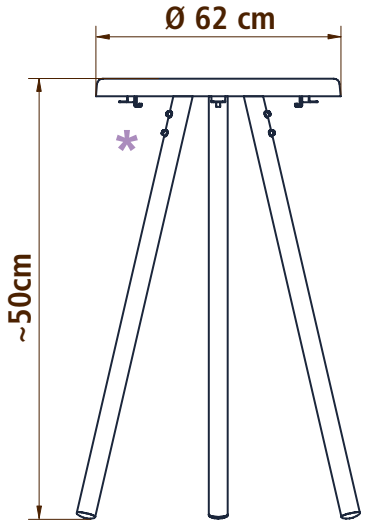


SPECIALS

Patent pending



Beine aus rostfreiem Stahl oder Holz
Legs made of stainless steel or wood





Ihr Logo hier
Your logo here



* Inkl. 3x Flaschenöffner / Kleiderhaken
Incl. 3x bottle opener / coat hook

Salontisch
Salon table

Jeder Tisch ist ein Unikat - Hergestellt aus Schweizer Stein-Granulat

Each table is unique - Made from Swiss stone granulate

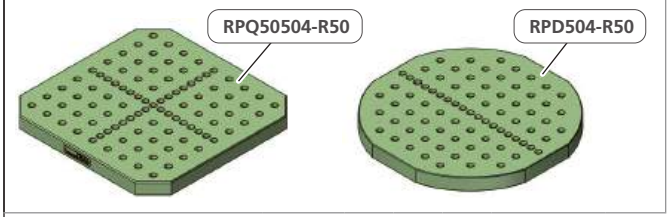
Art. Nr.
MST-TRI-600

Grundplatten für Mineralgusstürme
Base plate for epoxy mineral tombstone

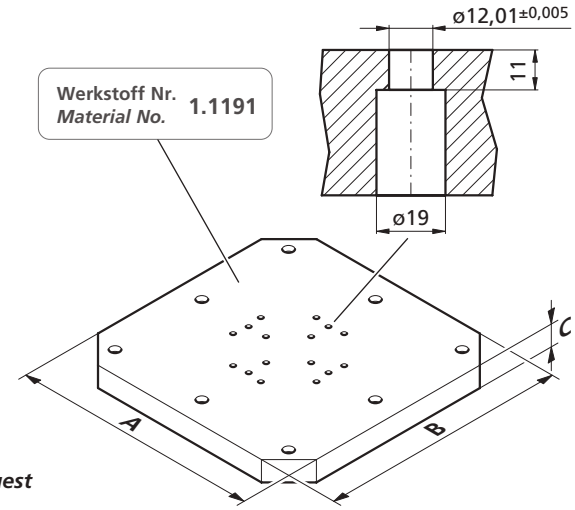
	A	B	C	kg
GPL30040	300	300	40	~27
GPL40040	400	400	40	~47
GPL50040	500	500	40	~74
GPL45040	450	450	40	~61
GPL50040040	500	400	40	~58
GPL63040	630	630	40	~120
GPL80040	800	800	40	~195

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



Bohrungen der Grundplatte / *Drill holes in the baseplate*:
Kundenspezifisch an die Maschine angepasst
Made up to customer's specifications

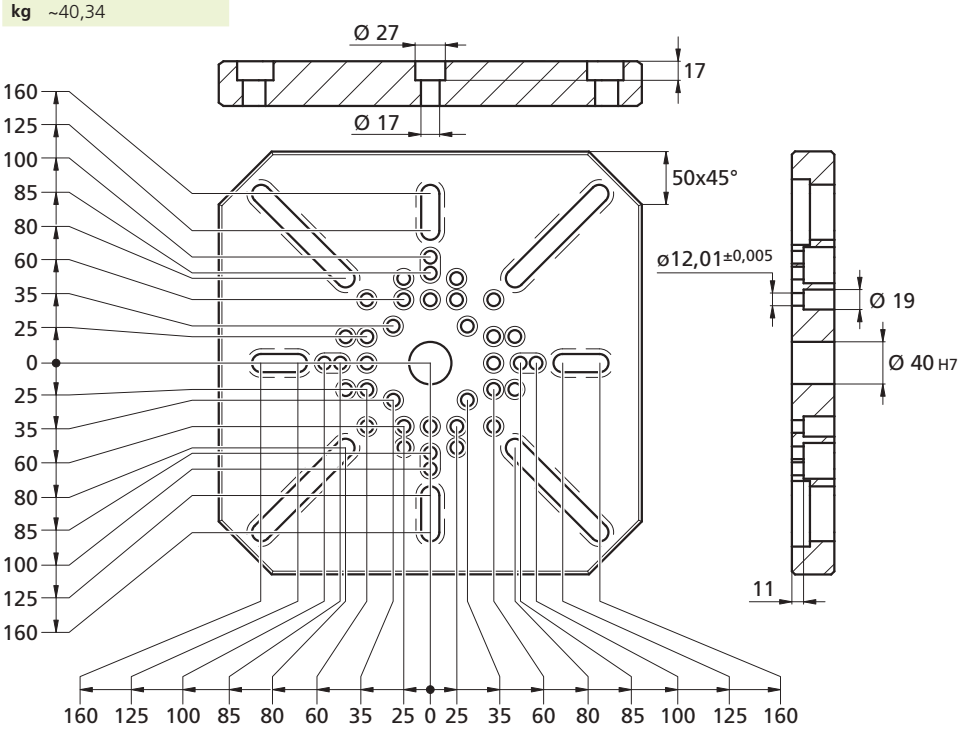


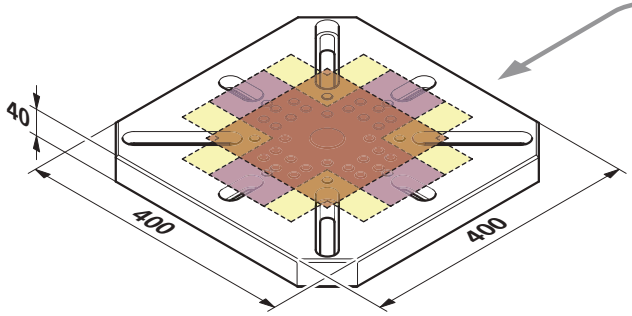
Andere Grössen auf Anfrage
Other dimensions available on request

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.*

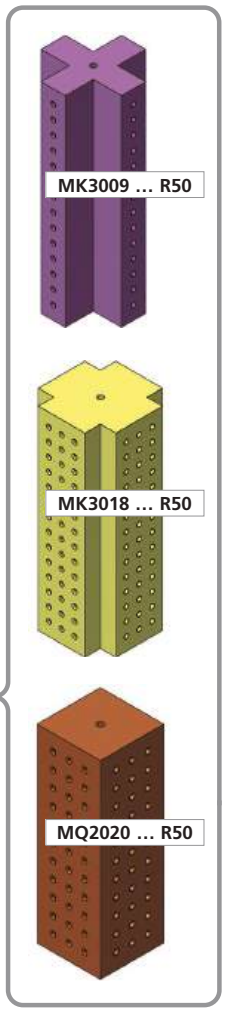
GPL40040-UV

kg ~40,34



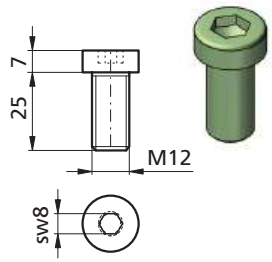


27 verschiedene Mineralgusstürme passend zu dieser Grundplatte.
27 *different Epoxy mineral tombstone are suitable for this base plate.*



Abdeckbleche zum Schutz der Oberfläche der Mineralgusstürme
Cover plates for surface protection of epoxy mineral tombstones

M12X25DIN7984



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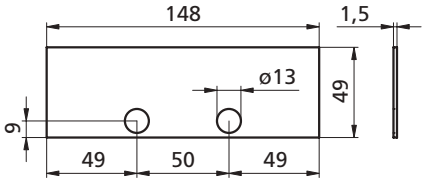
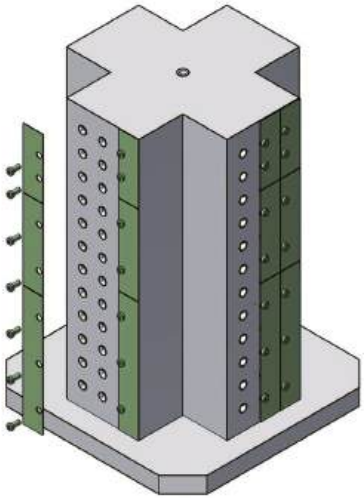
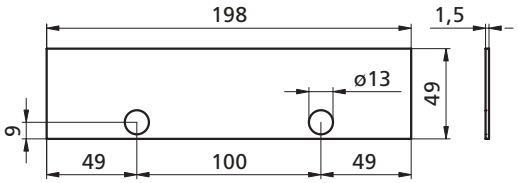




MABD502050



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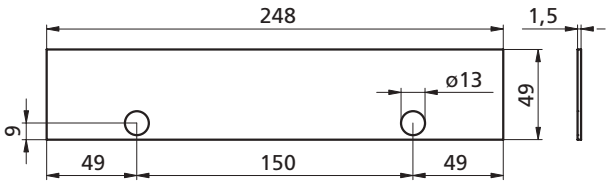
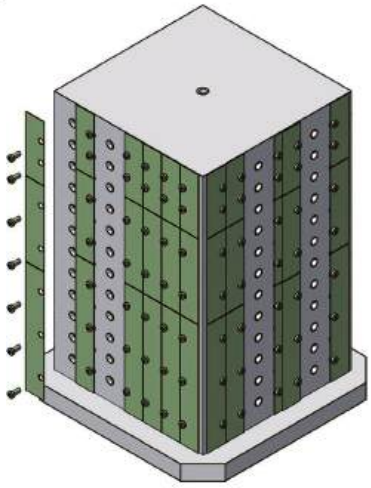
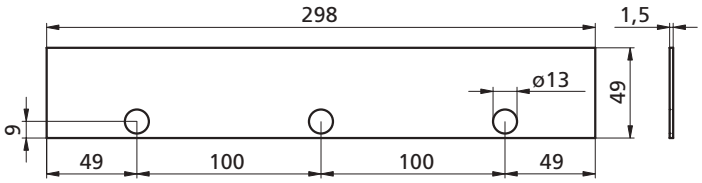
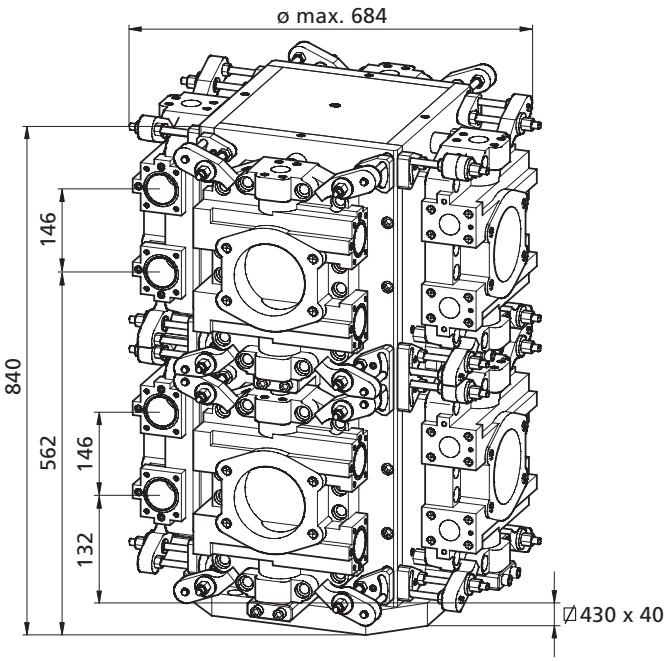




MABD503050



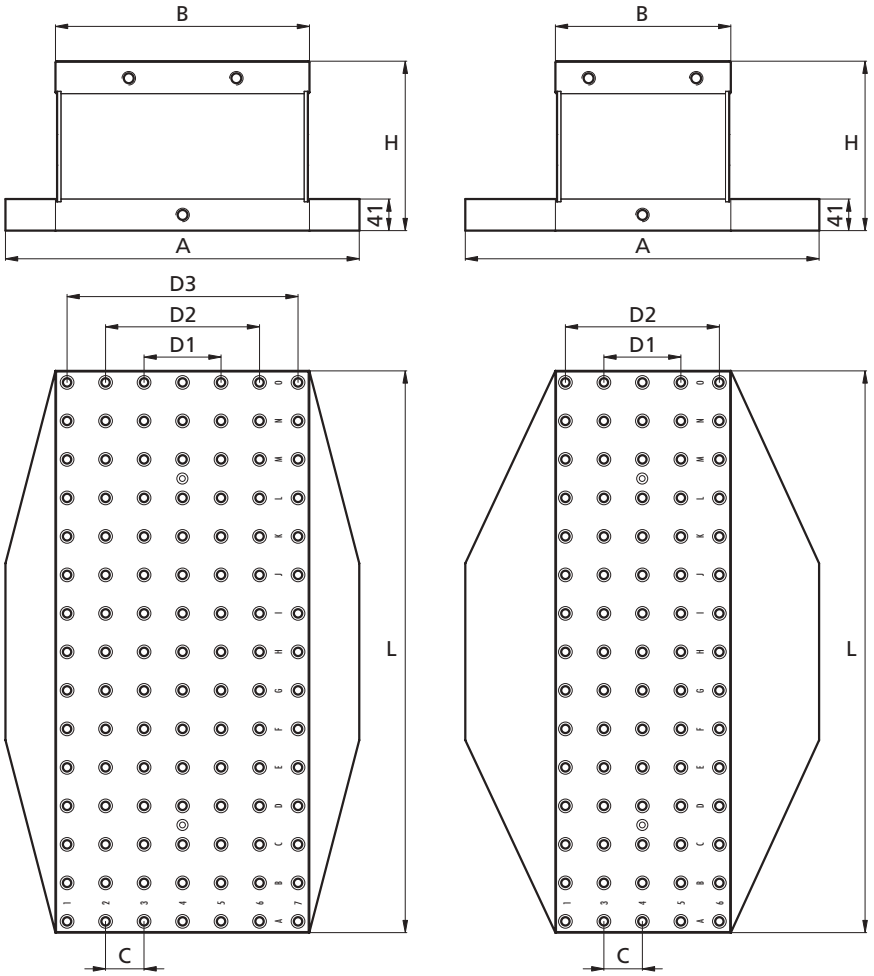
Stahl-Mineralguss
Steel-epoxy mineral tombstones



Gesamtgewicht
Total weight
~600 kg

~38 kg





Entwickelt für die Luftfahrt. Gewappnet für höchste Anforderungen.

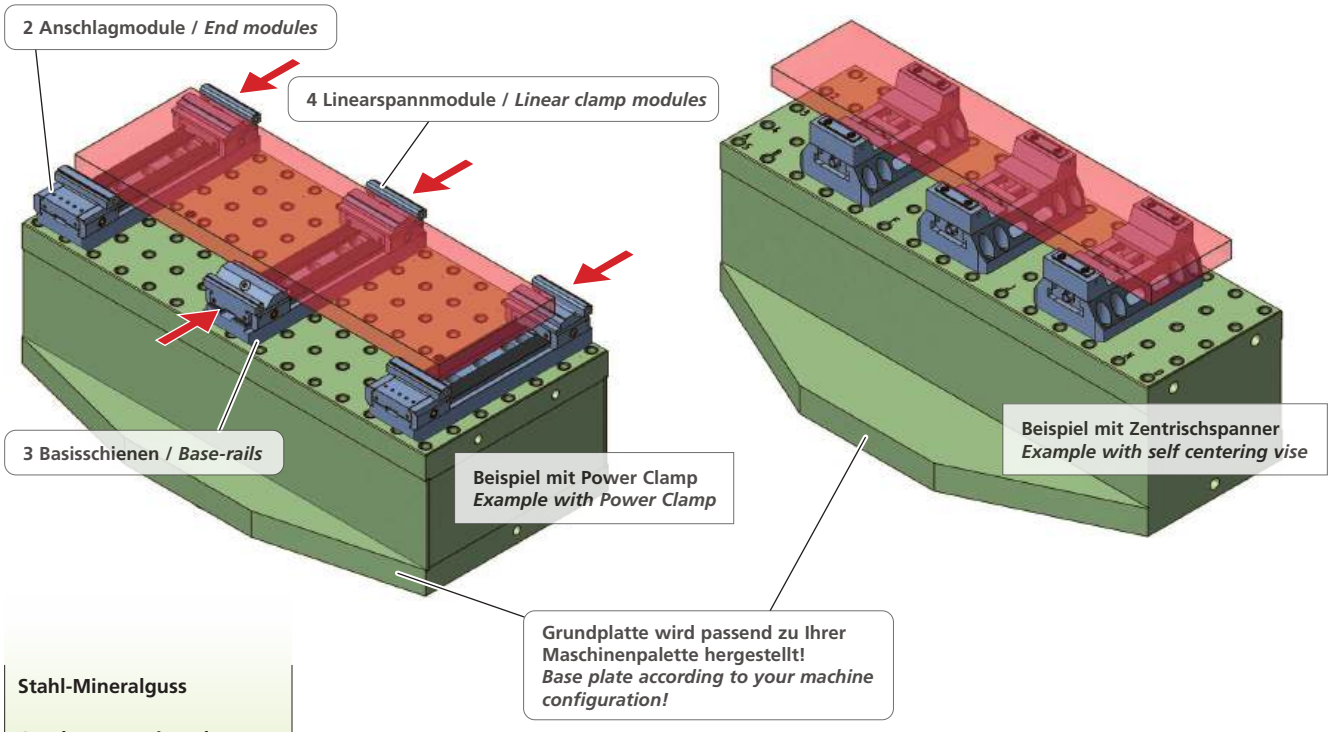
Sehr hohe Vibrationsdämpfung dank Kern aus Mineralguss. Hohe Festigkeit dank Ummantelung aus Stahl. Begünstigt die Gewichtsreduktion wodurch die Maschine geschont wird.

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

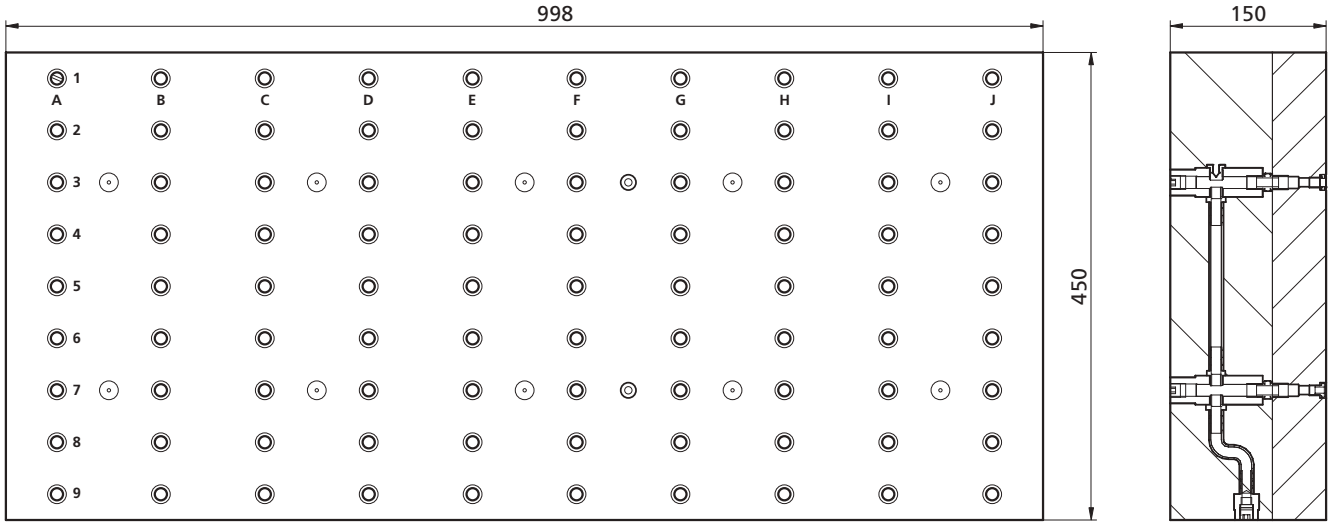
Steel-epoxy mineral tombstones

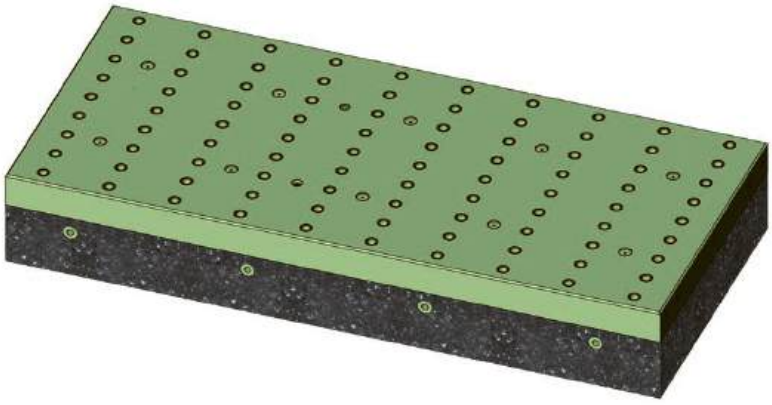


Bestellbeispiel
***Ordering example*: SMUB2373H220**

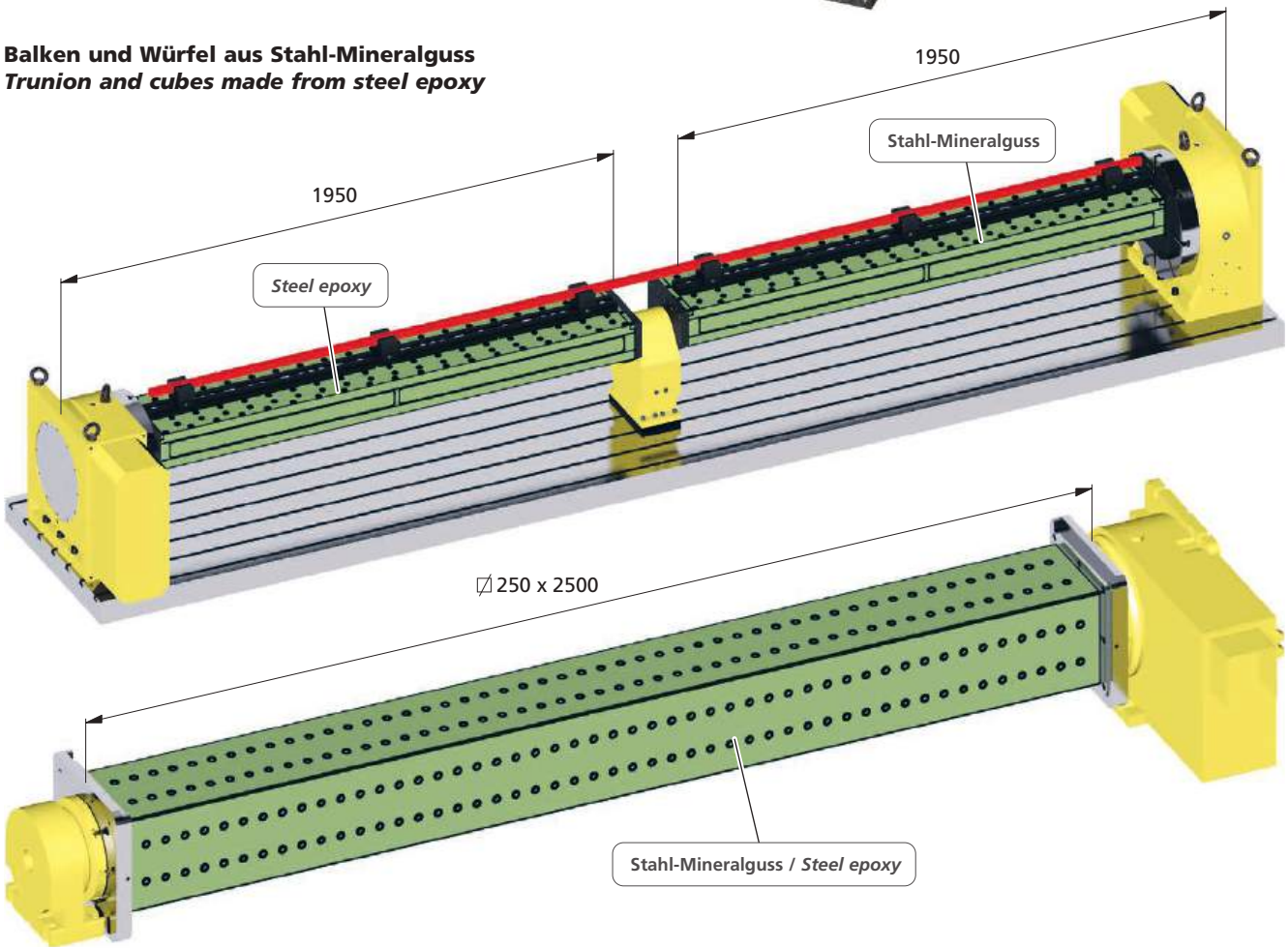
	kg		A	B	C	D1	D2	D3	H	L	Raster / *Grid*
SMUB2373H220	~168,0		460	230	50	100	200		220	**730**	75 x M12/12F7
SMUB3373H220	~214,4		460	330	50	100	200	300	220	**730**	105 x M12/12F7

Separat bestellen / *Order separately*

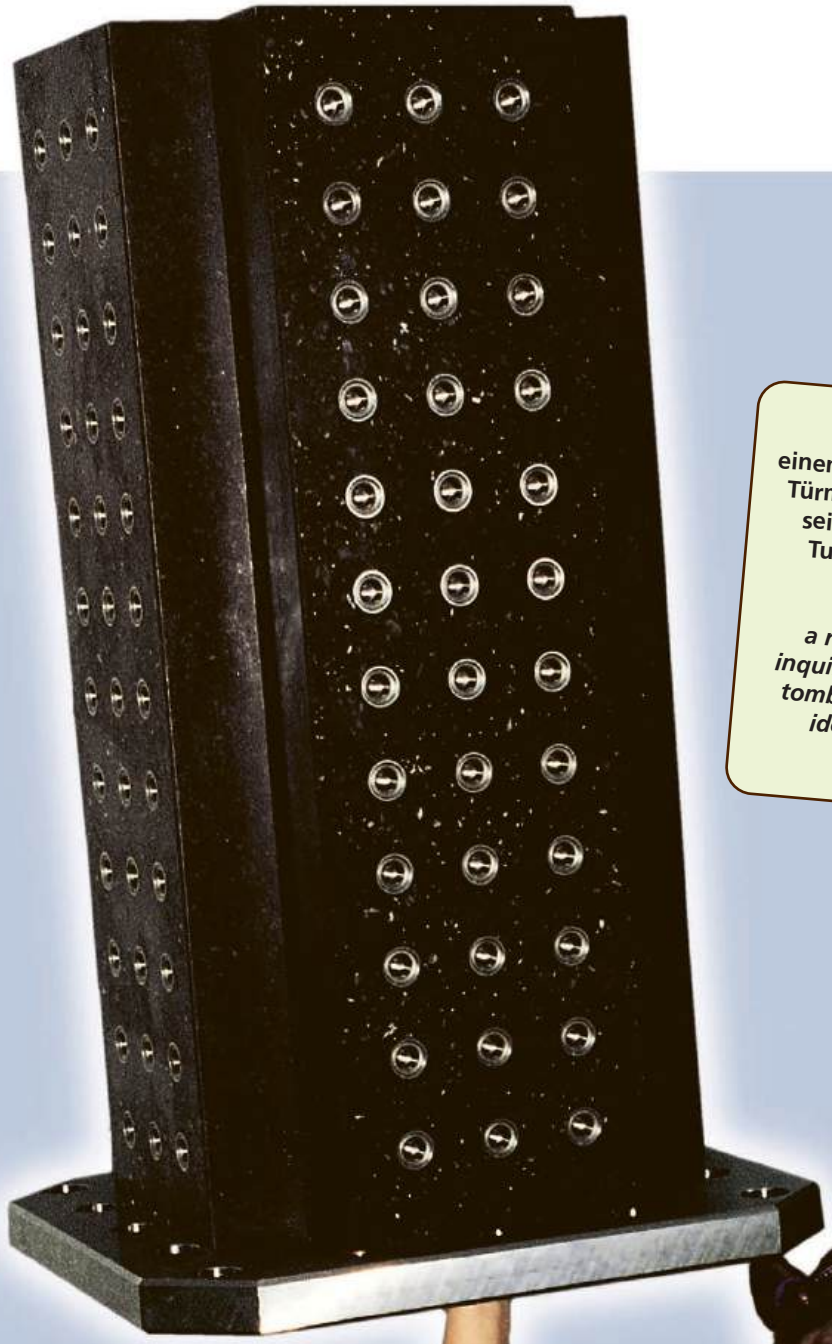




Balken und Würfel aus Stahl-Mineralguss
Trunion and cubes made from steel epoxy



Mineralgusstürme seit 1998
Epoxy tombstones since



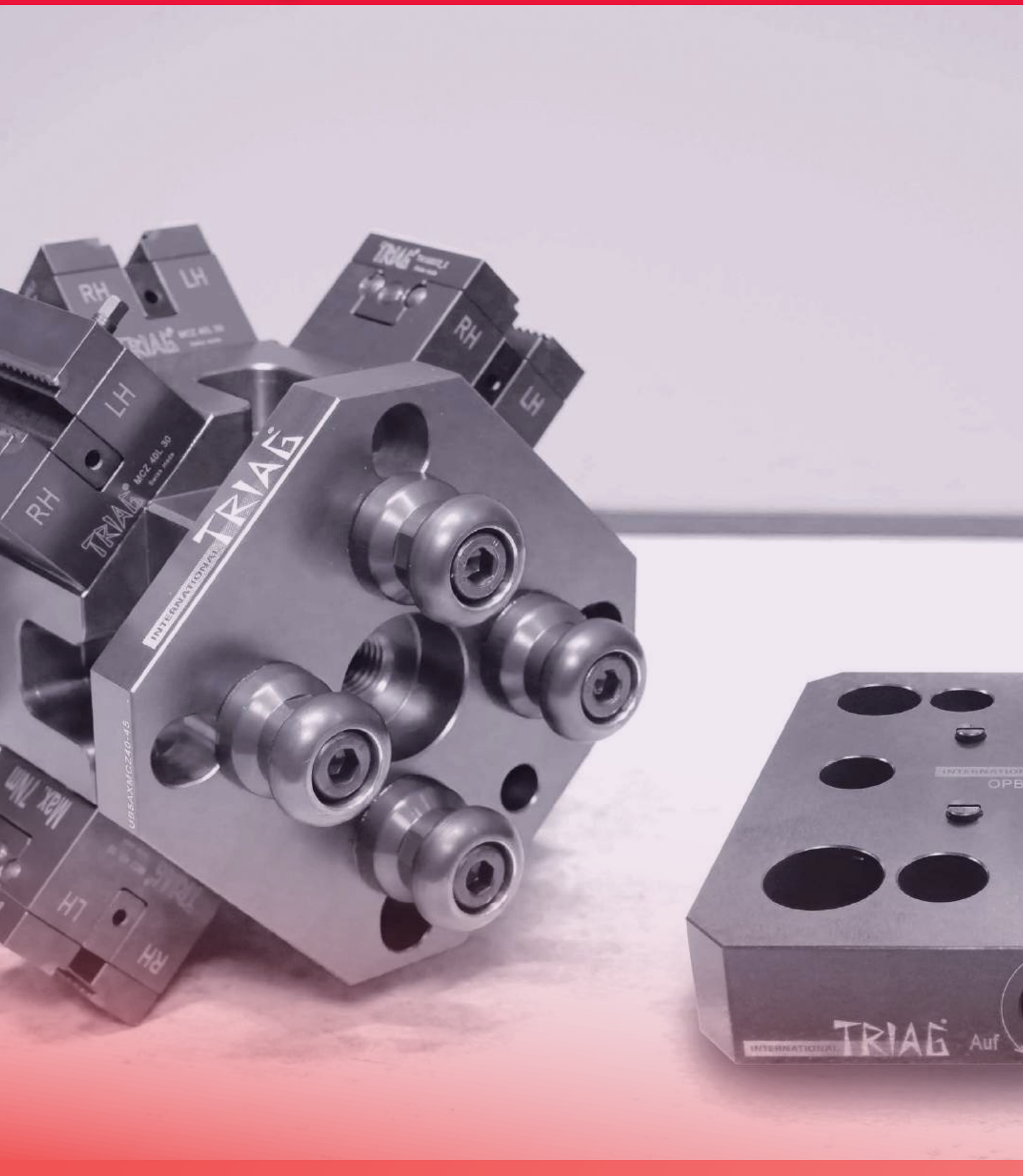
Beat Baumgartner erhält von einem Kunden eine Anfrage für leichte Türme, die aber nicht aus Aluminium sein dürfen. Er hat die Idee, einen Turm aus Mineralguss zu bauen.

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.



9
05.11.2024

*opp*SYSTEM & *5axes*



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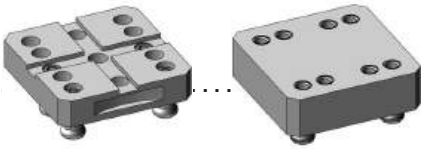

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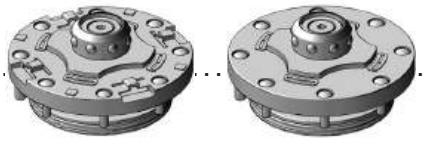
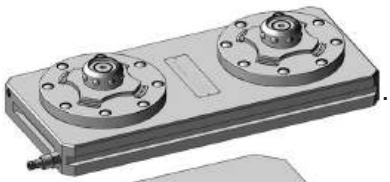


Palettenträger | *Receiver chuck with chucks* 293



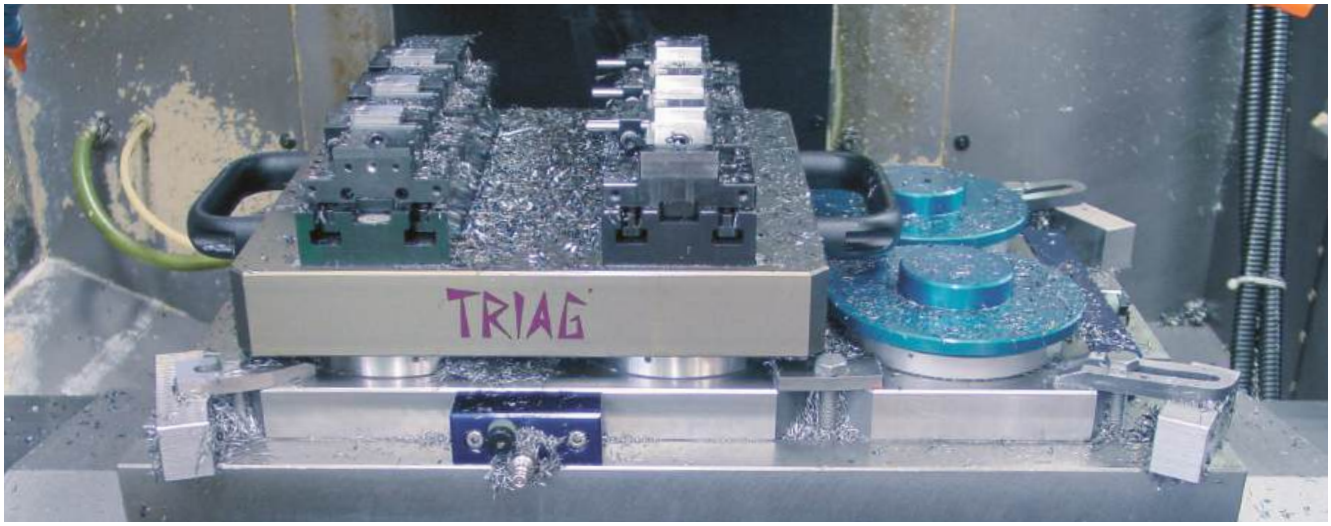
MTS Palettier-System | *MTS palleting system* ..... 297 - 300



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.

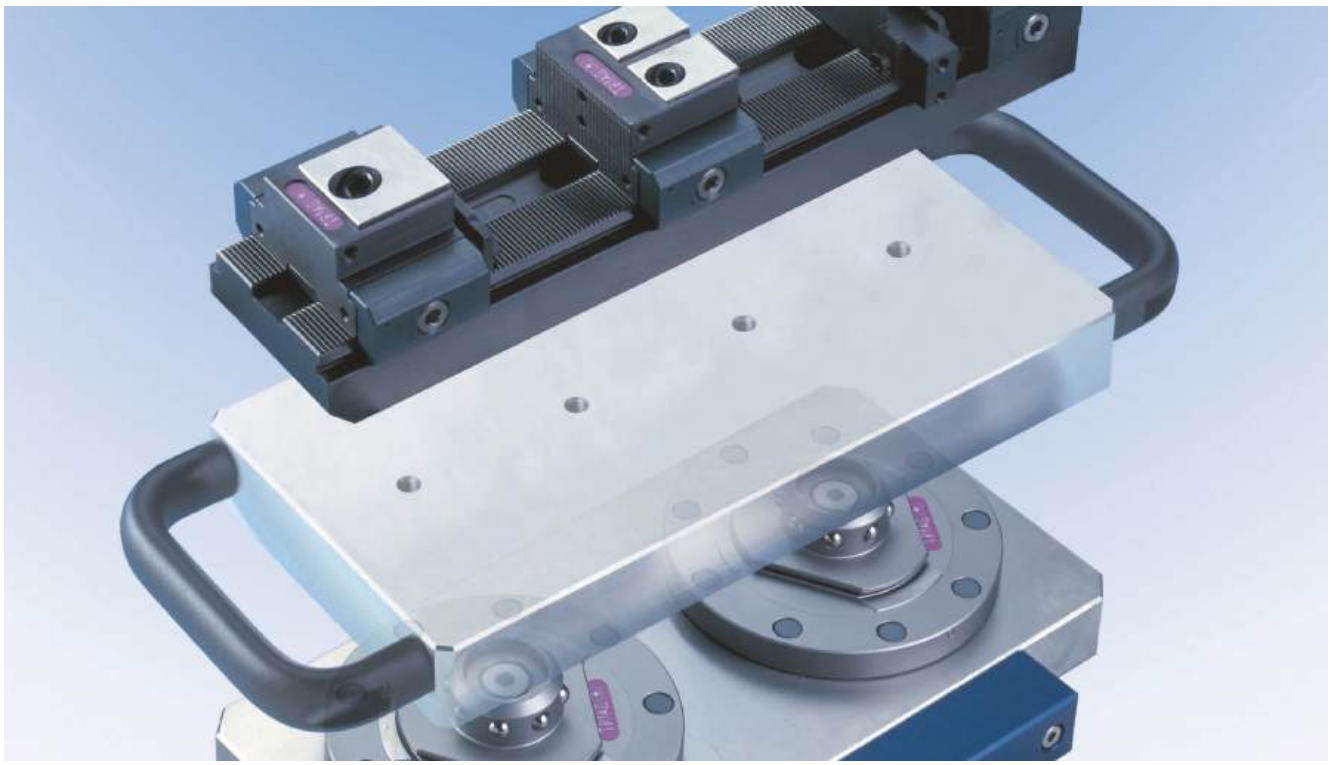
The productivity of modern machining centers has been drastically increased over the past years. Hence the time per workpiece is falling. On the contrary the batch sizes are getting smaller due to the increasing trend to „just in time" production.

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 ausgerüsteten Werkstückträgern. Die sehr präzis 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.

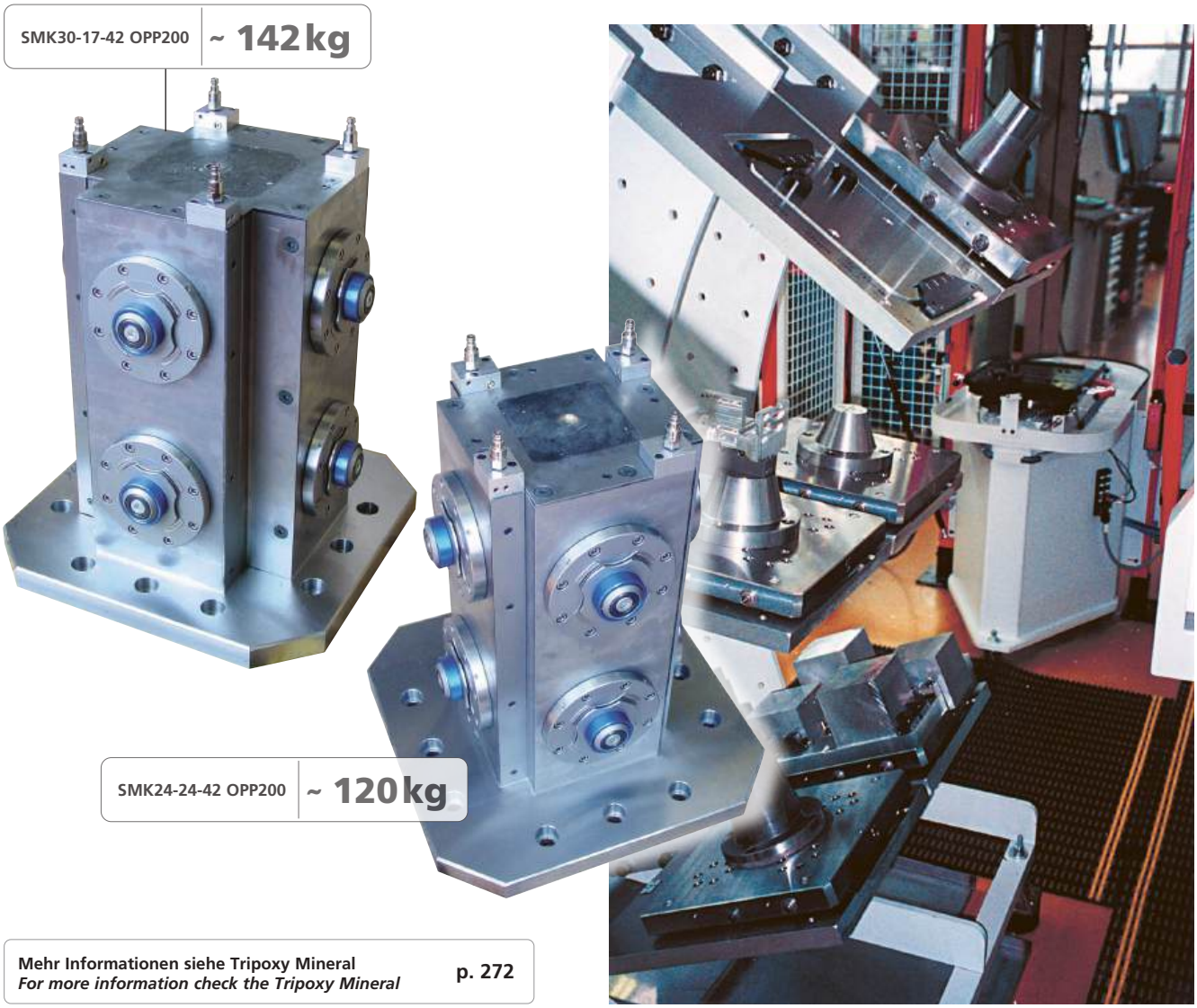
On the machine table the receiver chuck is installed. This chuck may consist of one, two, four, six or more receiver units. Onto these air operated receiver chucks a pallet, a fixture or a vice is mounted within a matter of seconds. On the bottom surface of the workholding devices centering rings are 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.

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.

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.

Mit dem oppSystem sind 750'000 Spannungen ohne Referenzverlust möglich, bei einer Repetiergenauigkeit von ±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.

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.



Mehr Informationen siehe Tripoxy Mineral **p. 272**
For more information check the Tripoxy Mineral

Nullpunkt-System OPP & Erowa MTS

In Verbindung mit dem Spannsystem powerCLAMP bilden die Nullpunkt-Paletten oppSysteme 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 Einzelteilbearbeitung 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

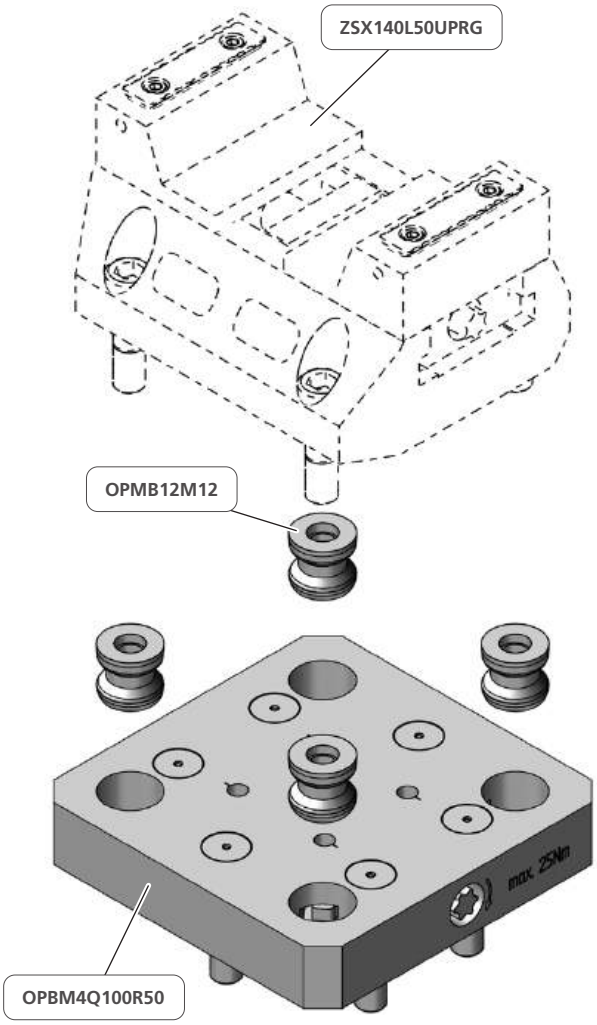
Together the modular system with zero point pallets, give a great performance! Fast changing and accurate!

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 paltet as you normally mount the vises!

The OPP system is a very accurate system reliable and durable! We guarantee 150´000 changes within ± 0,002mm






1

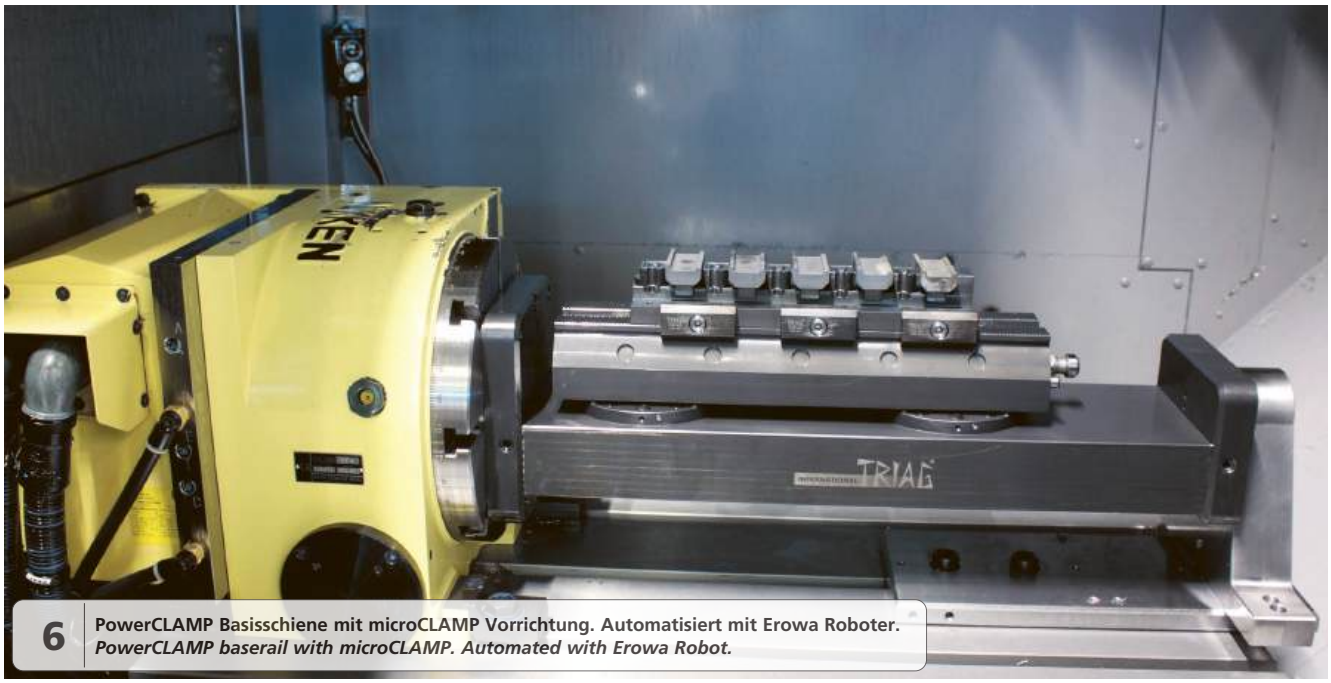

2

HORIZONTAL

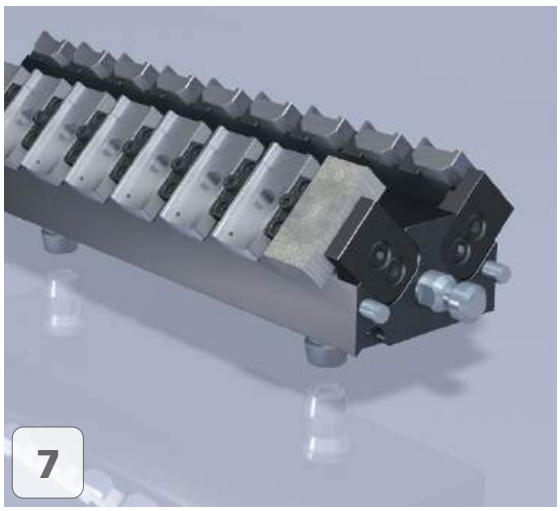

3


4


5



6 PowerCLAMP Basisschiene mit microCLAMP Vorrichtung. Automatisiert mit Erowa Roboter.
PowerCLAMP baserail with microCLAMP. Automated with Erowa Robot.



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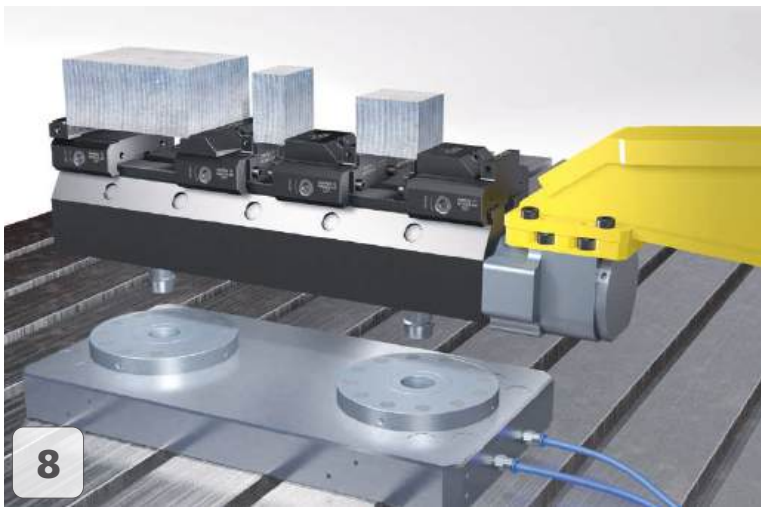

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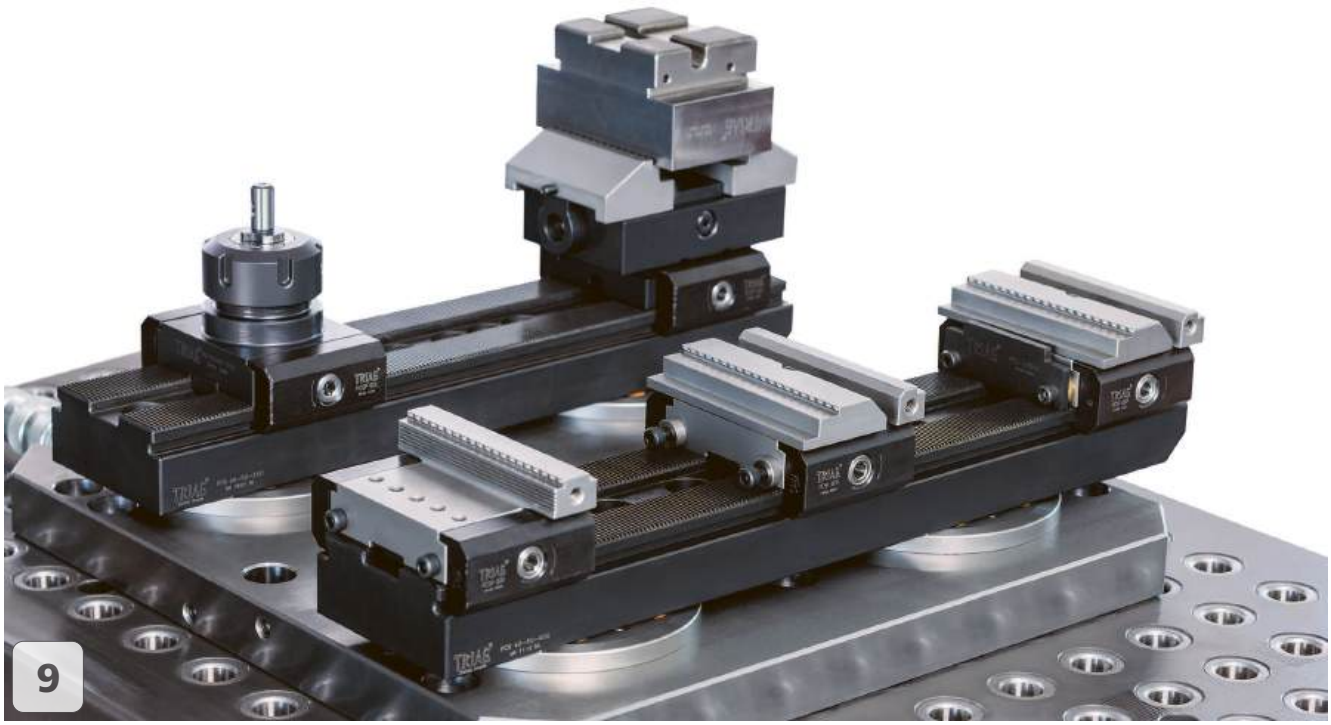


9

Mechanisches Nullpunktsystem mit diversen Spannlösungen
Mechanical zero point system with different workholding solutions

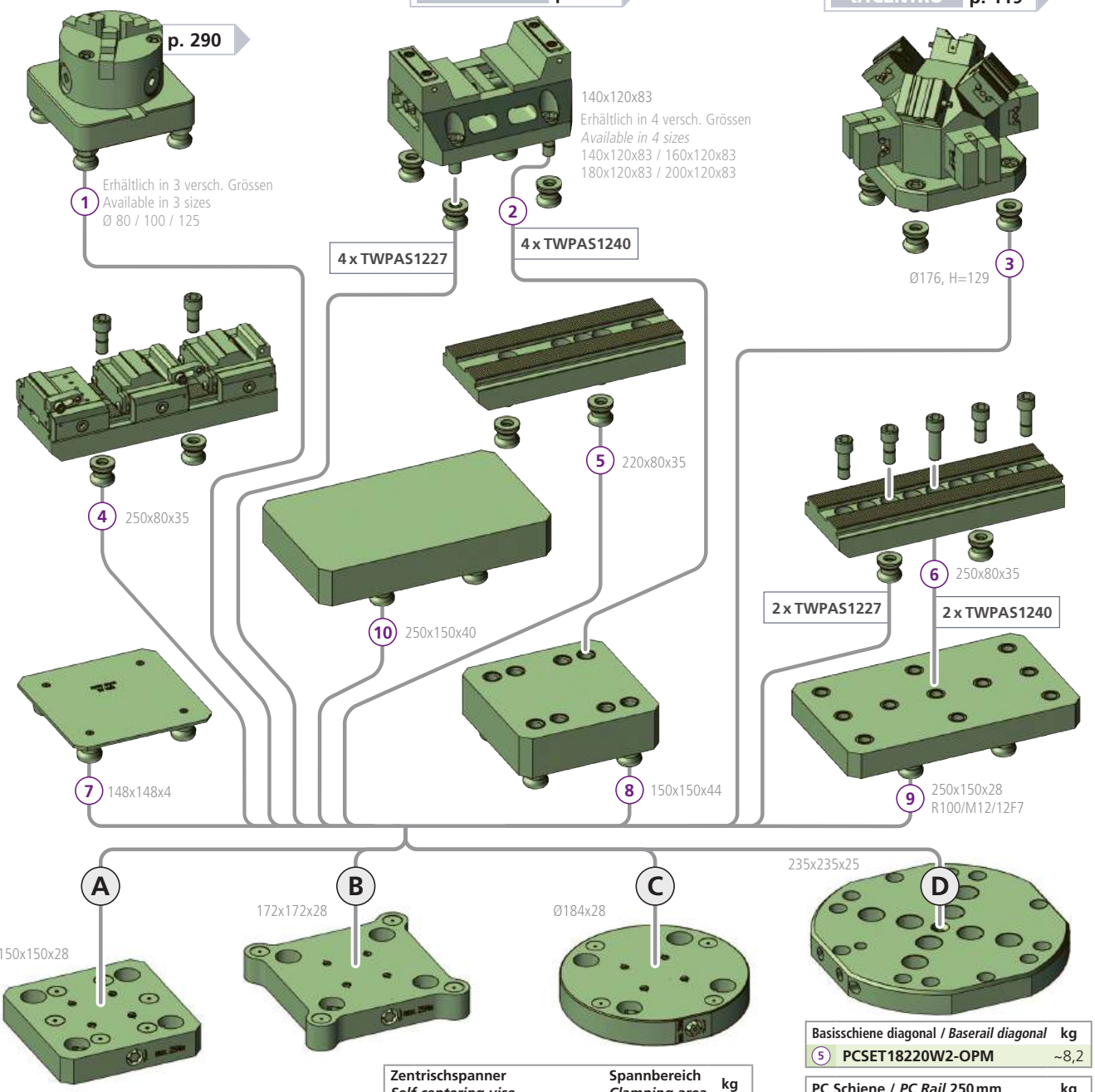
Da die Anforderungen an „just in time" Produktion in den letzten Jahren stetig gewachsen sind, ist ein modulares Nullpunkt Schnellwechselsystem der richtige Weg um lange Standzeiten der Werkzeugmaschine zu verhindern.

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)***

triCENTRO p. 141
triCENTRO p. 119
p. 290



0-Punkt Basis / *0-point base*		kg
A	OPBM4Q100R50	~3,8
B	OPBM4Q100R200	~7,6
C	OPBM4Q100D184	
D	ZF211785	~7,6

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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

spaceGRIP 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

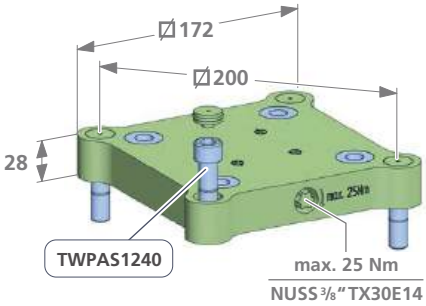
Abdeckung / *Cover*		kg
7	OPMAD	~0,8

Erhöhung / *Raiser block*		kg
8	OPUB150H44	~8,5

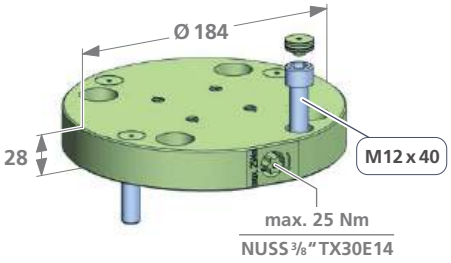
Rasterplatte / *Grid plate*		kg
9	OPM25-15R50H28	~7,7

Aluminiumplatte / *Aluminium plate*		kg
10	OPM25-15RH40	~4,3

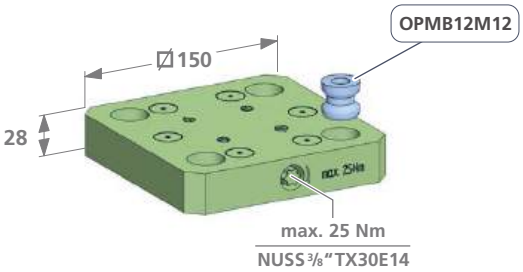
Art. Nr.	kg
OPBM4Q100R200	~4,3



Art. Nr.	kg
OPBM4Q100D184	~4,7

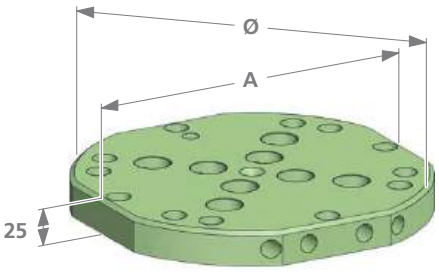


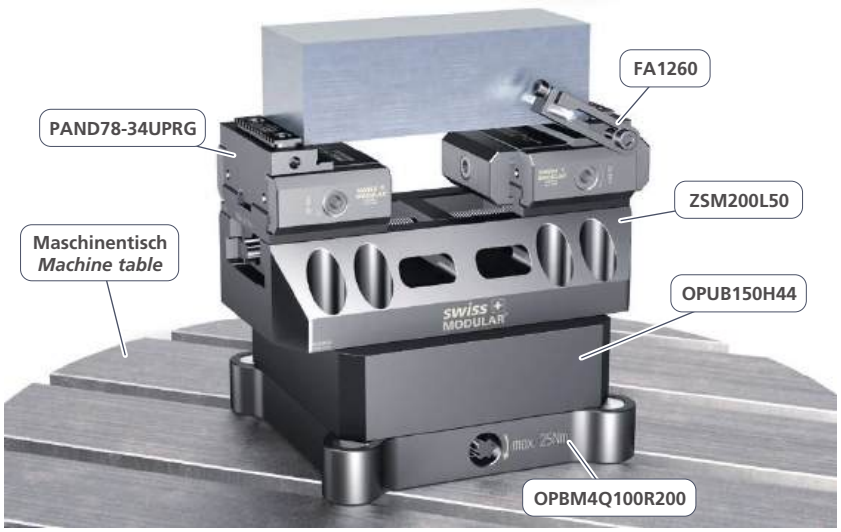
Art. Nr.	kg
OPBM4Q100R50	~3,8



Positionier-Flansch
Positioning-flange

Art. Nr.	A	Ø	kg
ZF211785	235	250	~7,6
ZF222333	172	180	~3,7



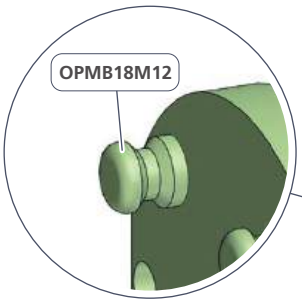


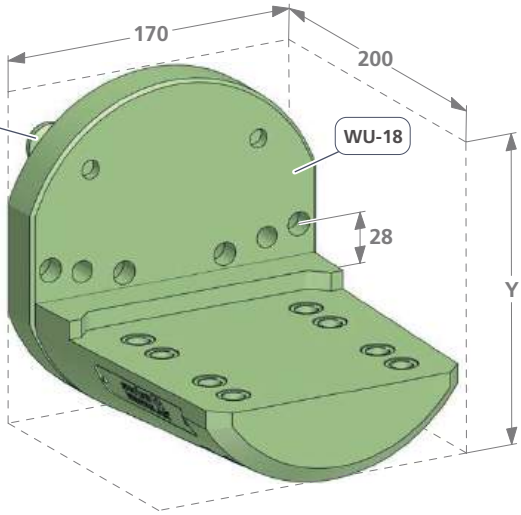
Die Verbindung zwischen Maschinentisch und dem opp-Schnellwechselsystem

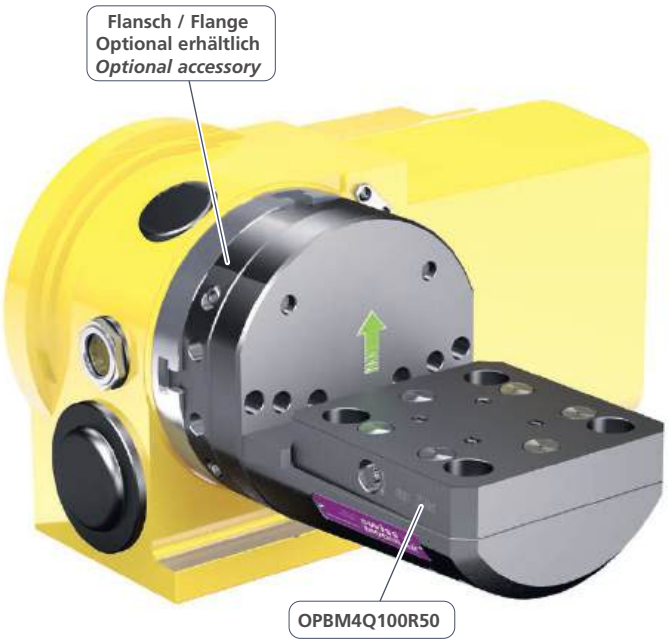
The connection between the machine table and the opp-quick-change system

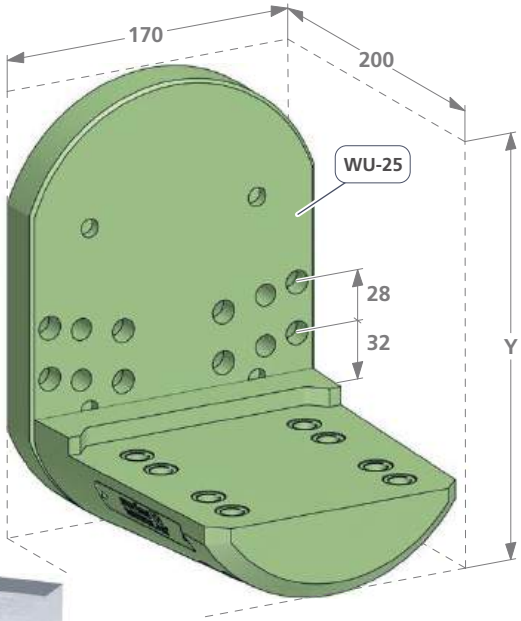
Winkel für die 4-Achse
Angle for the 4-axis

Art. Nr.	Y	kg
WU-18	180	~14,1
WU-25	244	~16











Bei diesen Winkeln kann die Brücke für die Aufnahme der Spannmittel inklusive Werkstücke in der Höhe angepasst werden.

With these angles, the bridge can be adjusted in height to accommodate the clamping devices including workpieces.

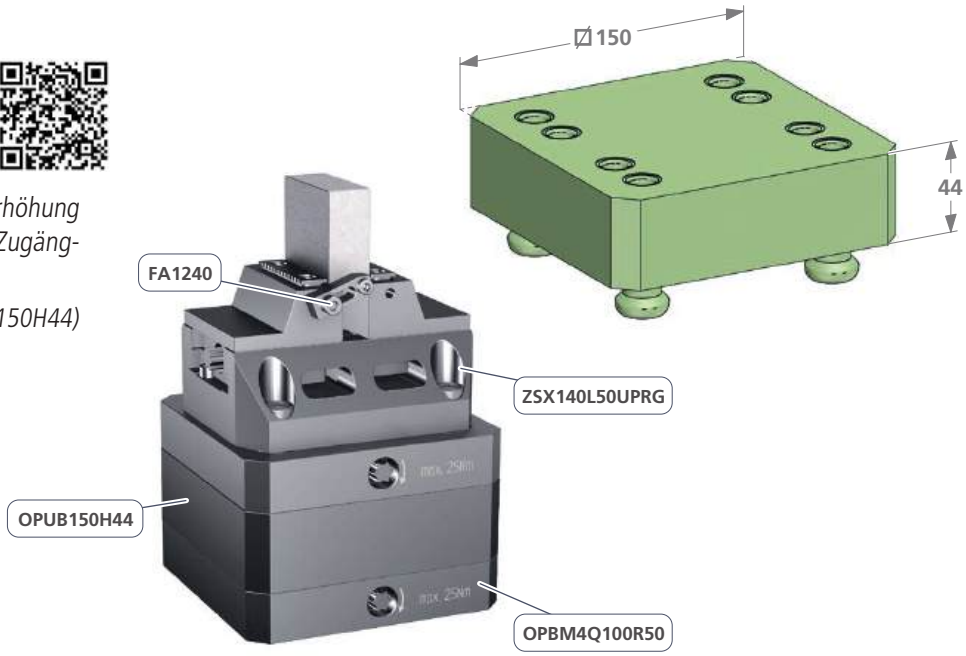
SCAN OR CLICK PDF STEP

0-Punkt Erhöhung
Zero point riser

Art. Nr.	kg
OPUB150H44	~8,5

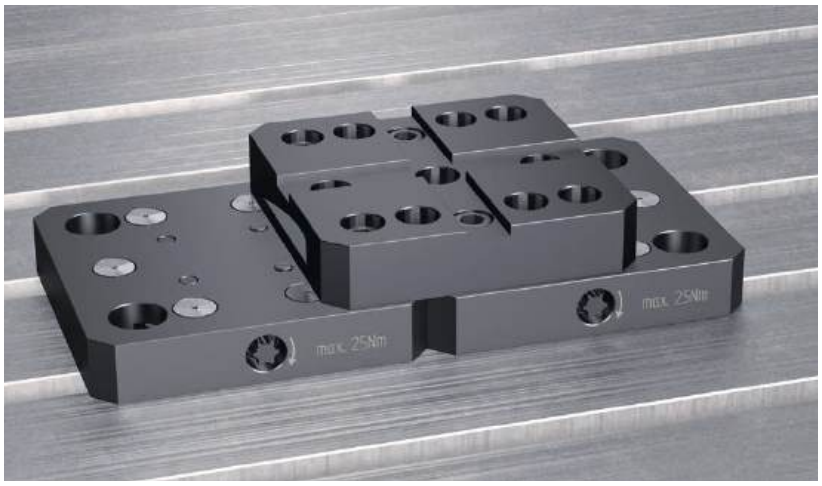
Optimal kombinierbar mit der Erhöhung (OPUB150H44) für eine bessere Zugänglichkeit zum Werkstück.

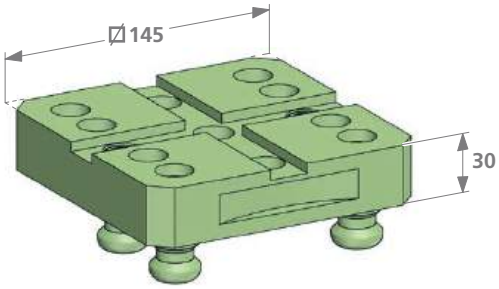
Ideally combined with the riser (OPUB150H44) for better access to work piece.



Ausrichtplatte
Alignment plate

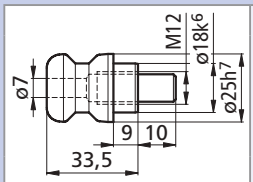
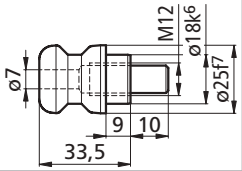
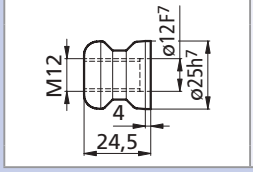
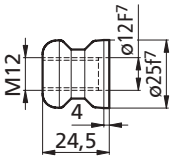
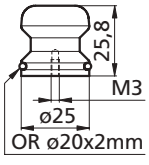
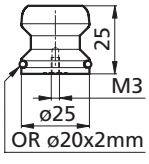
Art. Nr.	kg
OPMAW	~3,54

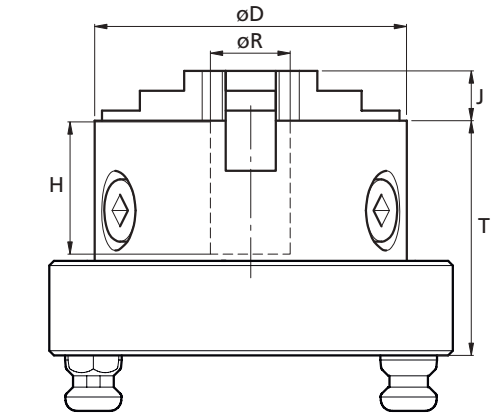


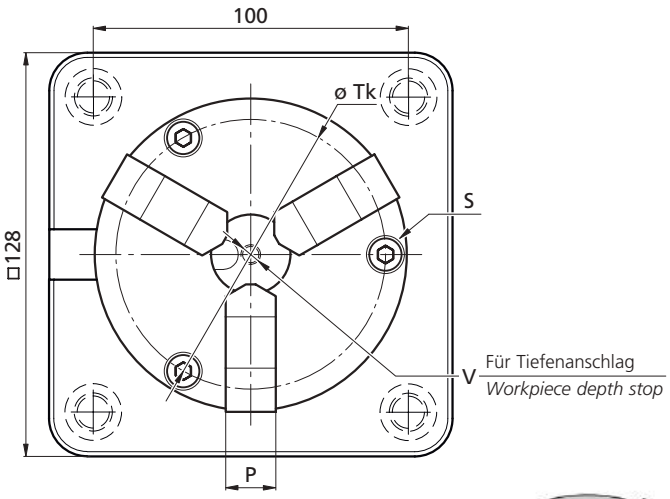


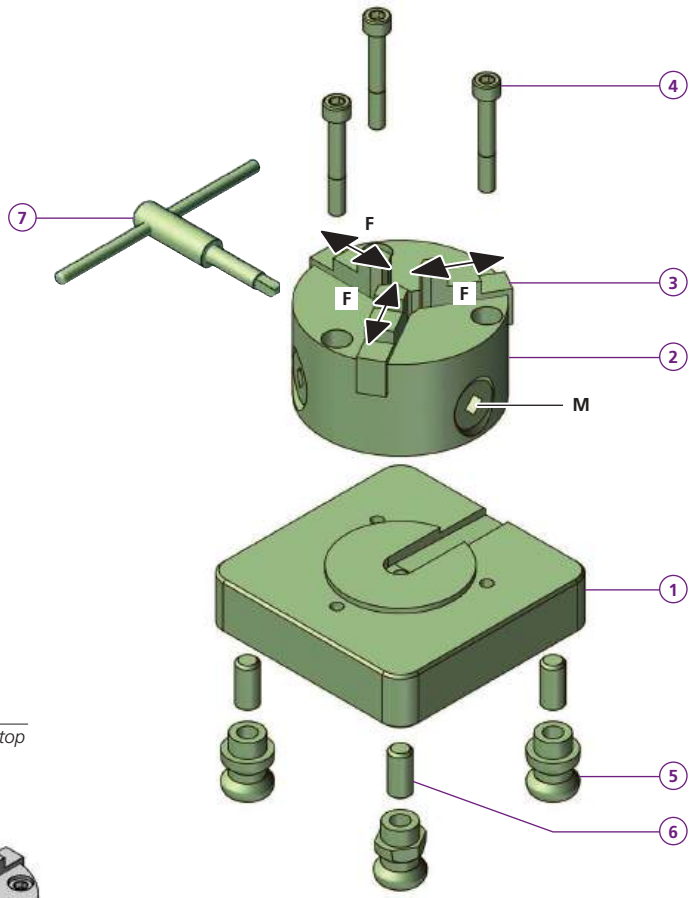
Diese Platte dient zum Ausrichten auf dem T-Nutentisch.

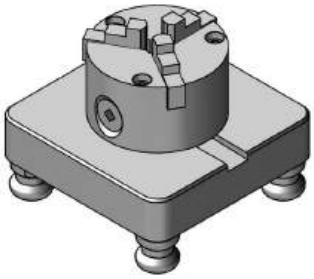
This plate is used to align on the T-slot table.

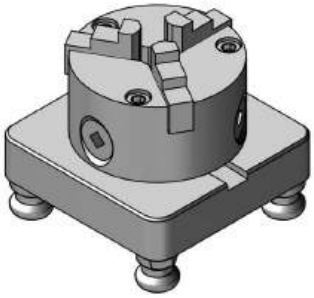
Nullpunkt Zentrier- und Klemmbolzen *Zero point pull studs*		Nullpunkt Schwertbolzen *Diamond pull studs*		Klemmbolzen mit Untermass *Pull studs with minus tolerance*		Schutzbolzen *Protection bolts*	
	kg ~0,1  OPMB18M12	kg ~0,1  OPMB18M12S			kg ~0,1  OPMB18M12U	kg ~0,08  OPMBL	kg ~0,07  OPMBL-25
	kg ~0,06  OPMB12M12	kg ~0,06  OPMB12M12S			kg ~0,06  OPMB12M12U		

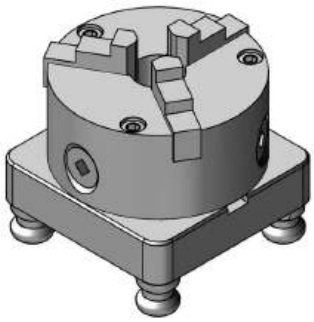


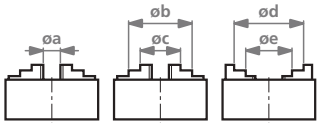




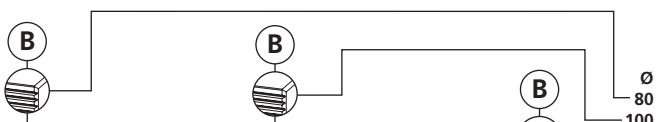








	D	J	T	R	H	P	V	a mm	b mm	c mm	d mm	e mm	M (max.)	F (max.)	ø Tk	S
OPM3X80L75	80	13	75	15	42,5	10	M6	3…27	48…73	23…48	52…76	27…51	28 Nm	1300 daN	67	M6
OPM3X100L82	100	17	82	20	49,5	14	M8	3…39	58…94	24…60	64…100	30…66	38 Nm	1600 daN	83	M8
OPM3X125L88	125	19	88	32	55	16	M8	3…49	70…116	30…75	83…125	38…84	55 Nm	2600 daN	108	M8

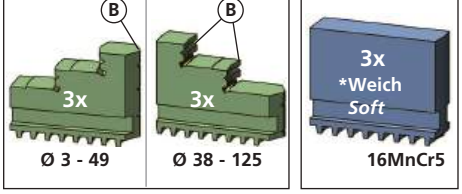


OPM3X80L75	
1	1x TB161207
2	1x 243809.0083220
3	2x 3 Stk. / pcs
4	3x TN100346
5	1x **OPMB18M12**
	2x **OPMB18M12U**
	1x **OPMB18M12S**
6	4x TN100067
7	1x 243864.0080000
kg	~ 5,8

OPM3X100L82	
1	1x TB161208
2	1x 243809.0103220
3	2x 3 Stk. / pcs
4	3x TN100360
5	1x **OPMB18M12**
	2x **OPMB18M12U**
	1x **OPMB18M12S**
6	4x TN1000067
7	1x 243864.0100000
kg	~ 7,3

OPM3X125L88	
1	1x TB161209
2	1x 243809.0123220
3	2x 3 Stk. / pcs
4	3x TN100361
5	1x **OPMB18M12**
	2x **OPMB18M12U**
	1x **OPMB18M12S**
6	4x TN100067
7	1x 243864.0120000
kg	~ 9,5

Ø	**Ø 3 - 49**	**Ø 38 - 125**	**16MnCr5**
80	243849.0083200	243850.0083200	***243834.0083300**
100	243849.0103200	243850.0103200	***243834.0103300**
125	243849.0123200	243850.0123200	***243834.0123300**

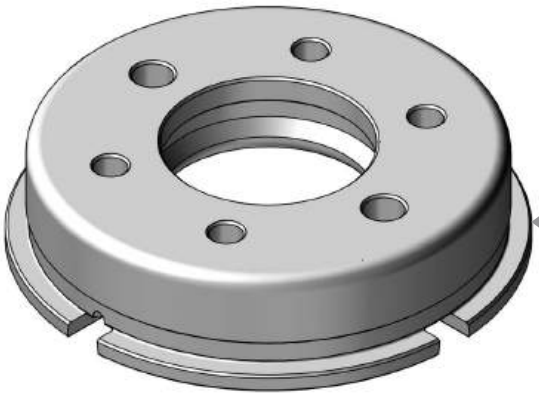


Bestellbeispiel / *Ordering example*: OPM3X80L75

Separat bestellen / Order separately



OP92BUE23

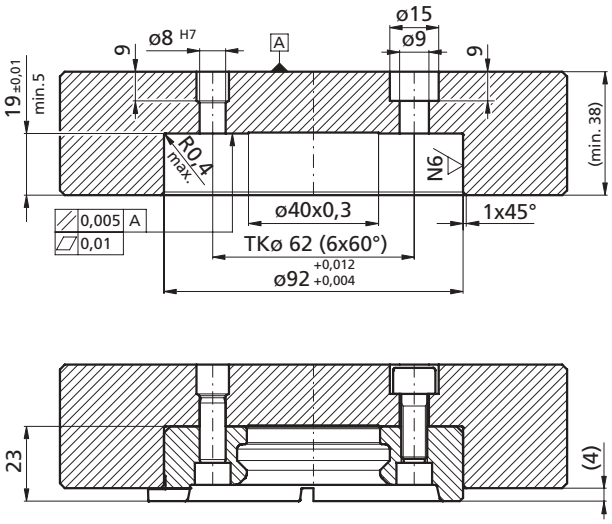


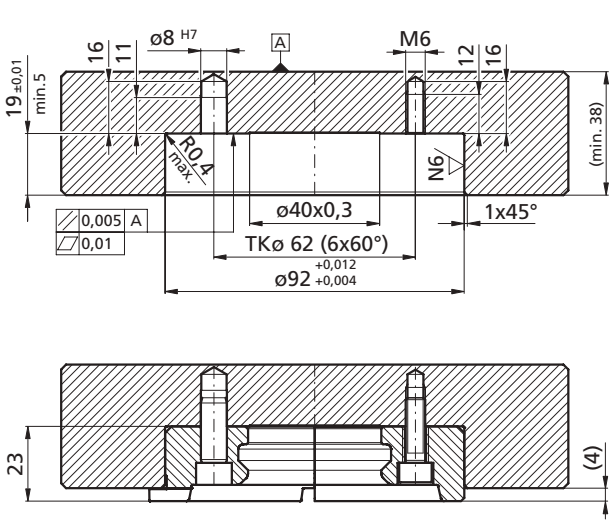
OP92BUE23ID

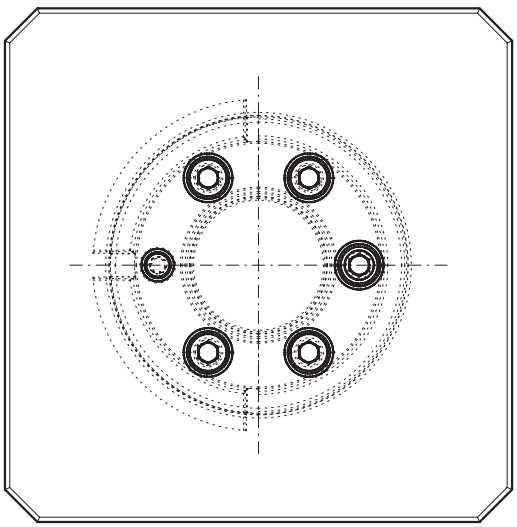
	kg
OP92BUE23	~0,75
OP92BUE23ID	~0,78

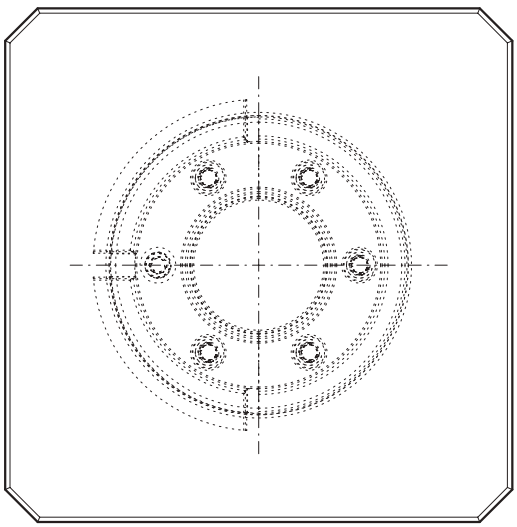
Bestellbeispiel / *Ordering example*: OP92BUE23

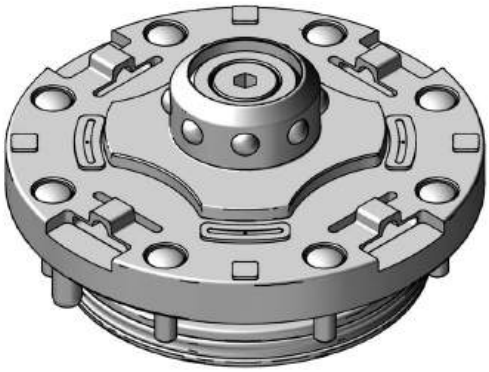
Einbauanleitung / *Assembling instructions*



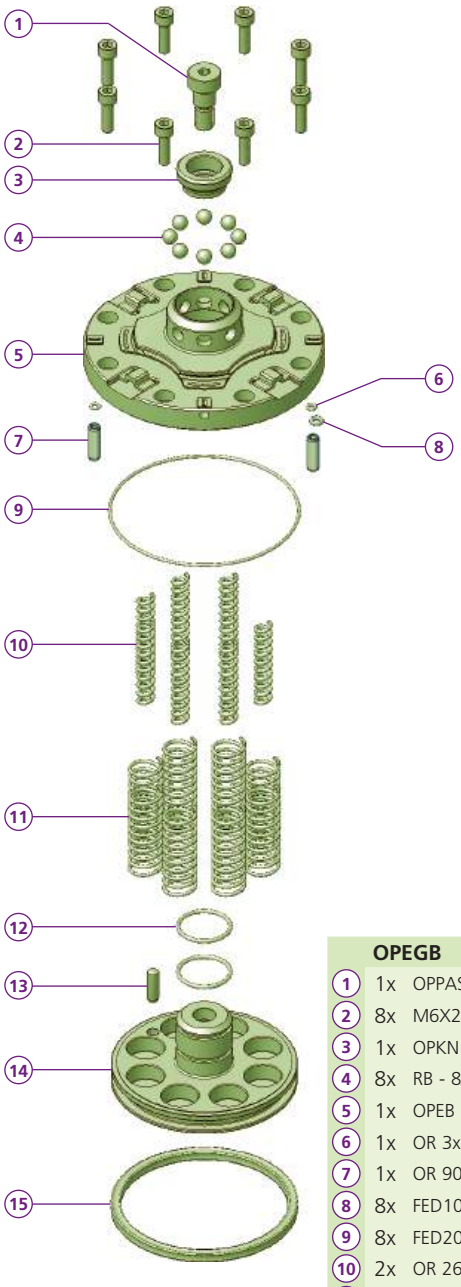




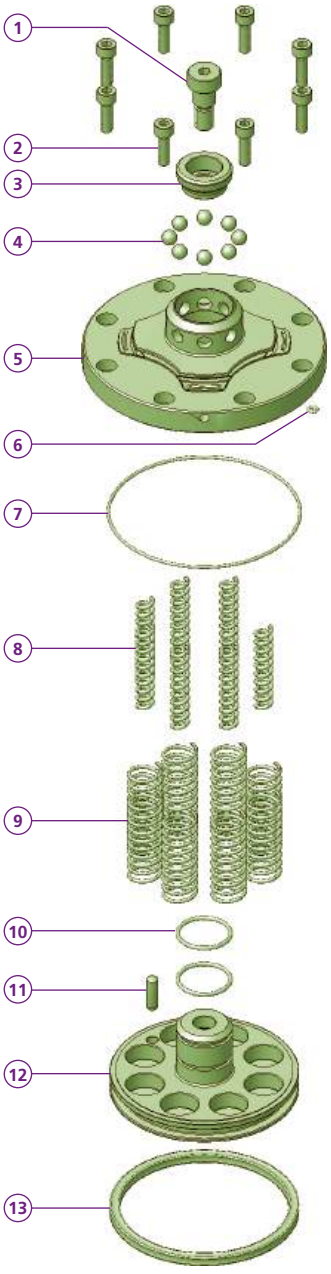






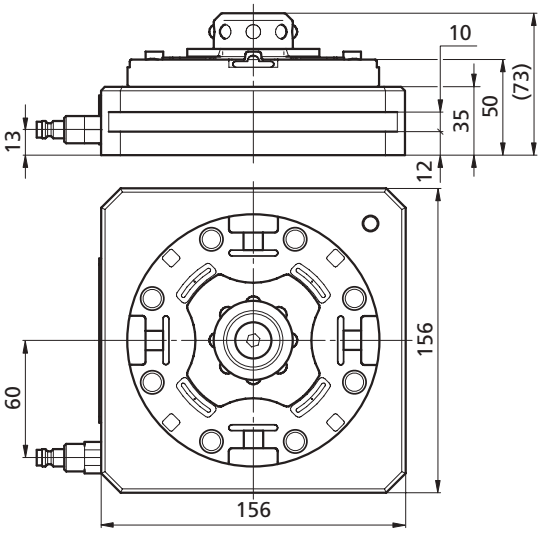


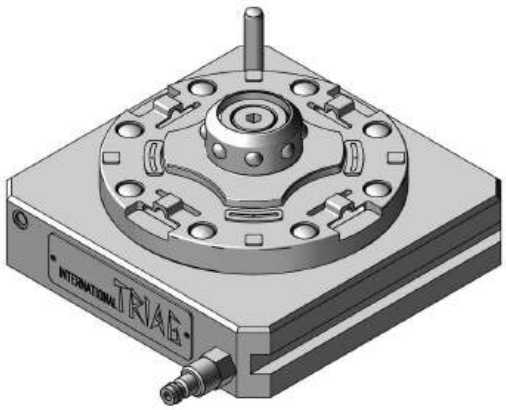
	OPEGBID (Index)	
1	1x	OPPAS M10x12
2	8x	M6X20 ST
3	1x	OPKN 30x13,5
4	8x	RB - 8/G20W
5	1x	OPEBID
6	1x	OR 3x1,5
7	2x	**CCBO0801**
8	1x	OR 5x1,5
9	1x	OR 90x1,5
10	8x	FED1044
11	8x	FED2051
12	2x	OR 26x2
13	1x	6m6x20 DIN 6325
14	1x	OPKLB100
15	1x	OPDR885
kg		~2,28



	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**

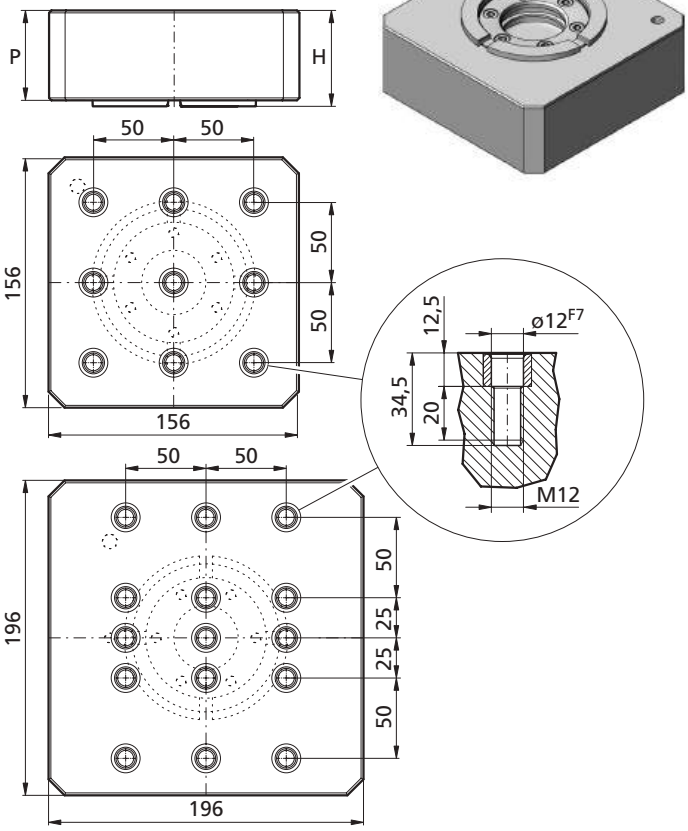


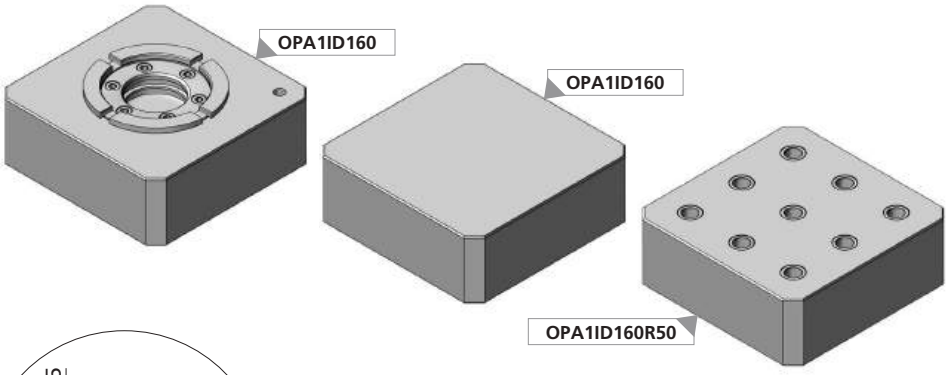


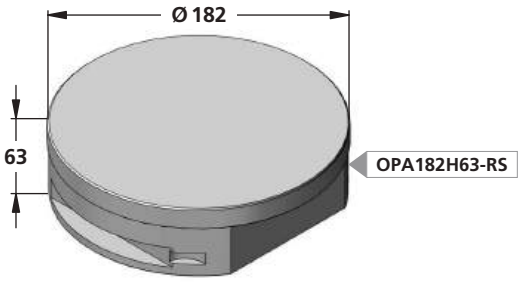
Bestellbeispiel / *Ordering example* : OPB1ID

	kg
OPB1ID (Index)	~7,6

1er Palette
Pallet with 1 clamping case



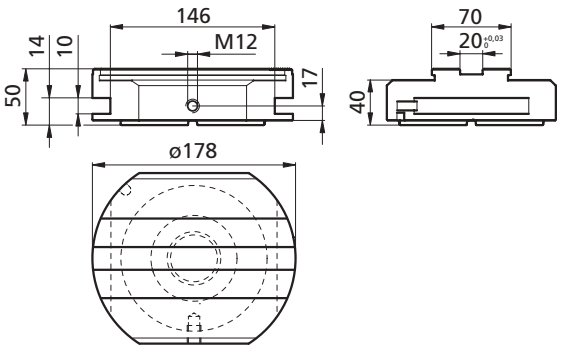




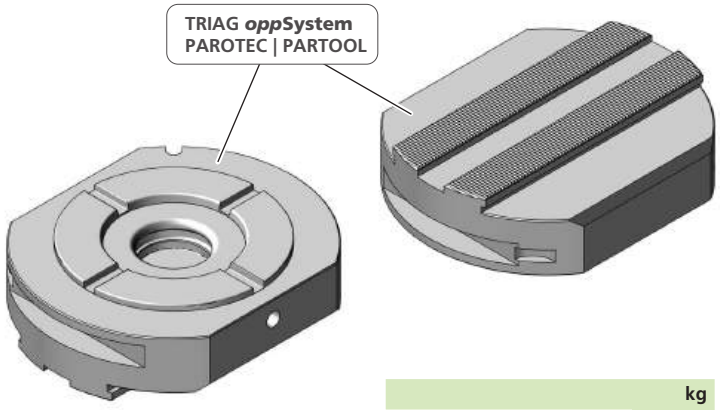
Bestellbeispiel / *Ordering example*: OPA1ID160

	H	P	kg
OPA1ID160	60,2	56,2	~4,20
OPA1ID200	60,2	56,2	~6,30
OPA1ID160R50	60	56	~4,10
OPA1ID200R50	60	56	~6,20
OPA182H63-RS	= weicher Stahl / *soft steel*		~11,03

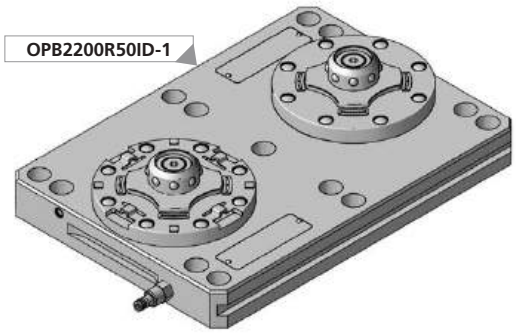
Basis mit integrierter 0-Punkt Index Aufnahme oppSystem
Base rail with integrated oppSystem index

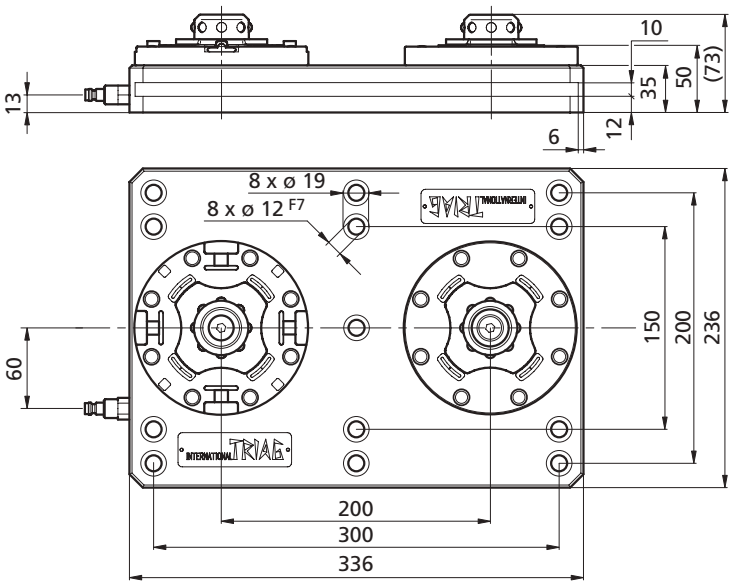


Bestellbeispiel / *Ordering example*: OPA1IDPCB178



	kg
OPA1IDPCBD178	~8,0

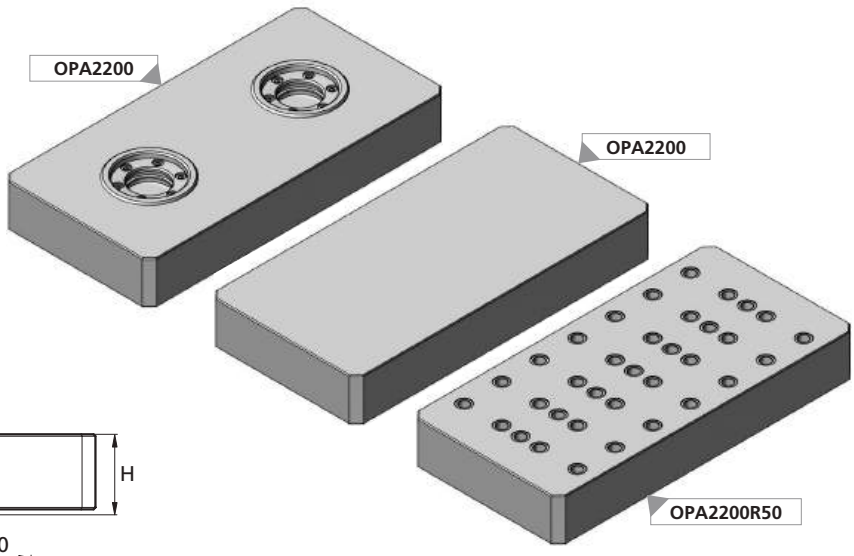


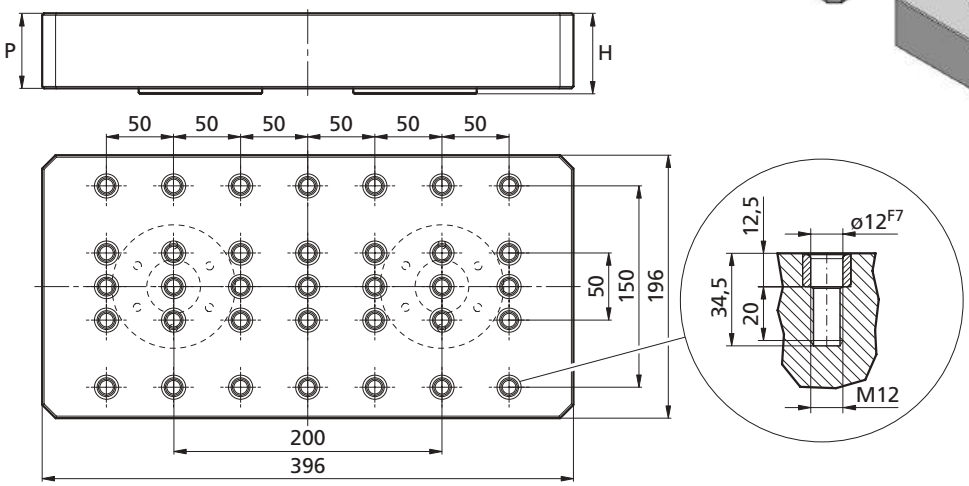


	kg
OPB2200R50	~27,60
OPB2200R50ID-1 (Index)	~30,00
OPB2200R50ID-2 (Index)	~30,00

Bestellbeispiel / *Ordering example*: OPB2200R50

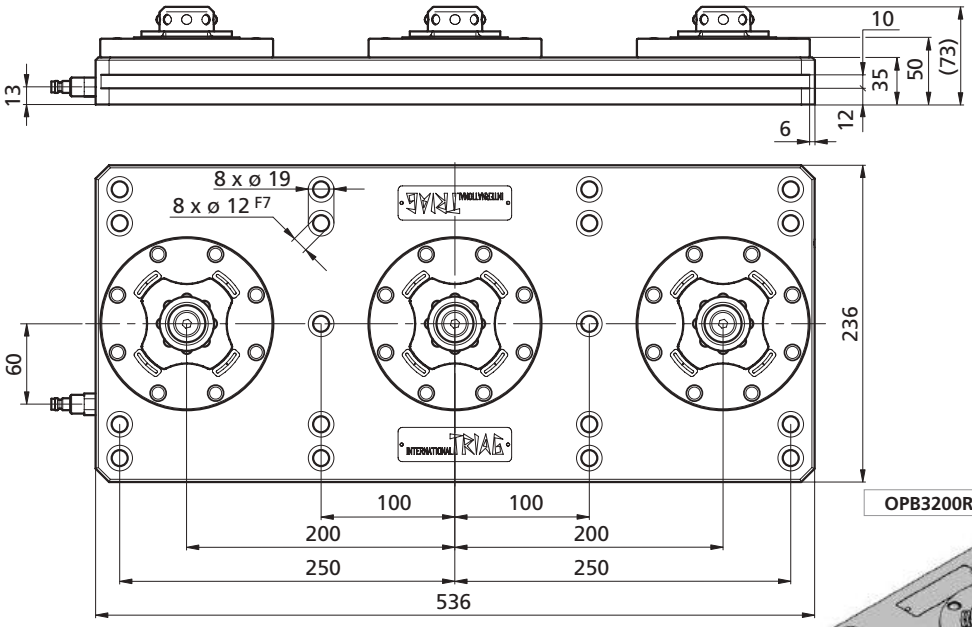
2er Palette
Pallet with 2 clamping case

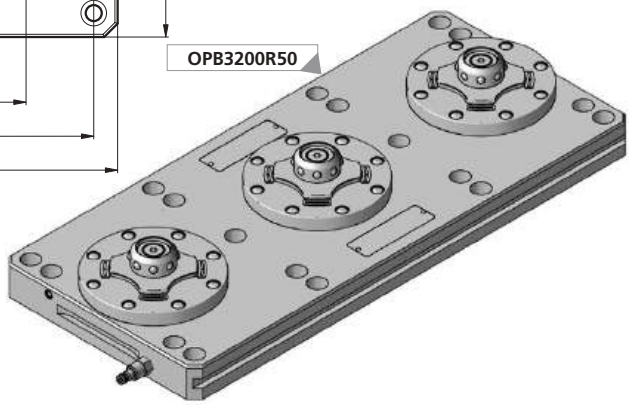




	H	P	kg
OPA2200	60,2	56,2	~12,18
OPA2200R50	60	56	~12,50

Bestellbeispiel / *Ordering example*: OPA2200R50

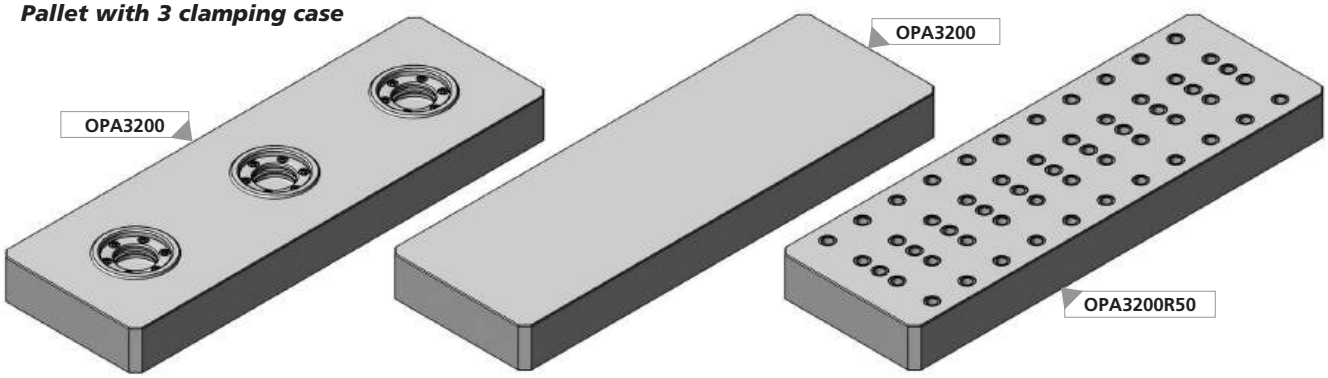


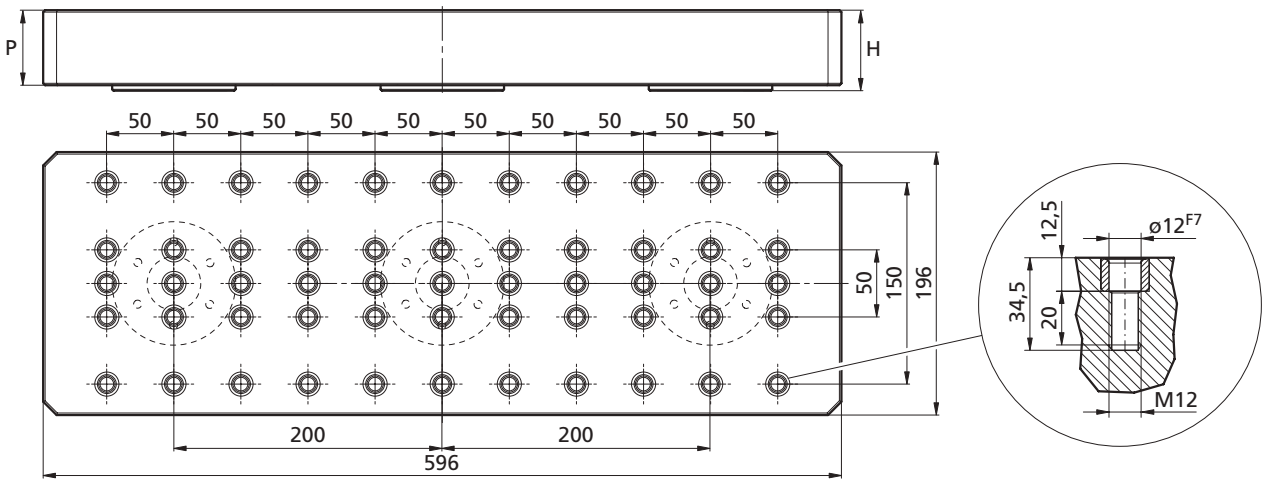


	kg
OPB3200R50	~36,10
OPB3200ID-1 (Index)	~36,00

Bestellbeispiel / *Ordering example*: OPB3200R50

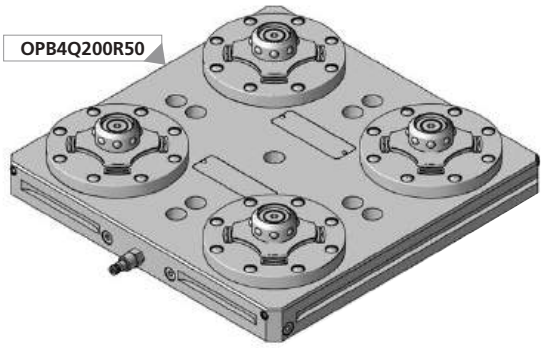
3er Palette
Pallet with 3 clamping case

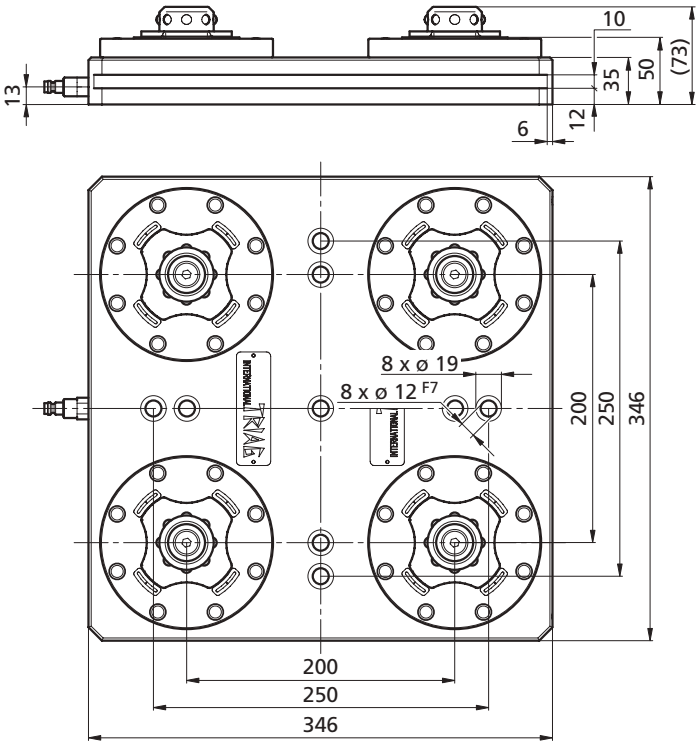




	H	P	kg
OPA3200	60,2	56,2	~18,90
OPA3200R50	60	56	~18,80

Bestellbeispiel / *Ordering example*: OPA3200

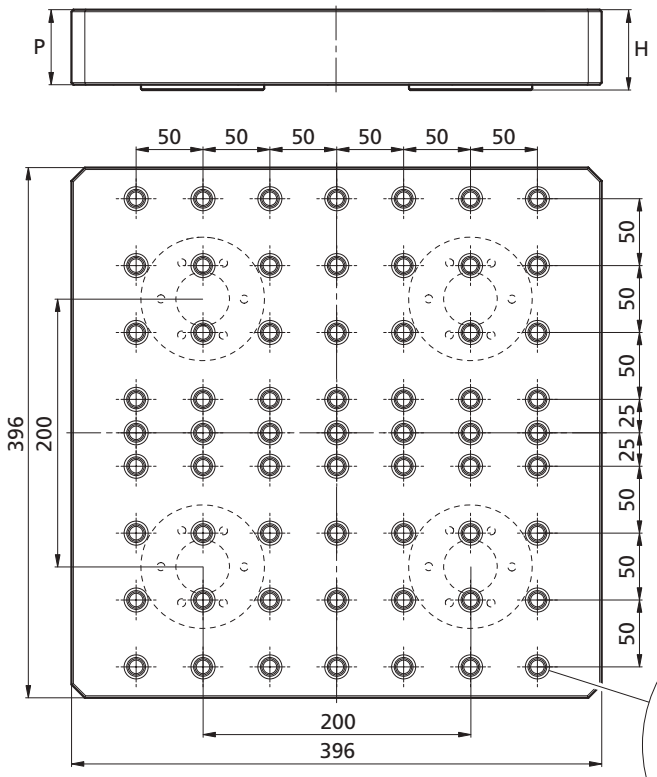


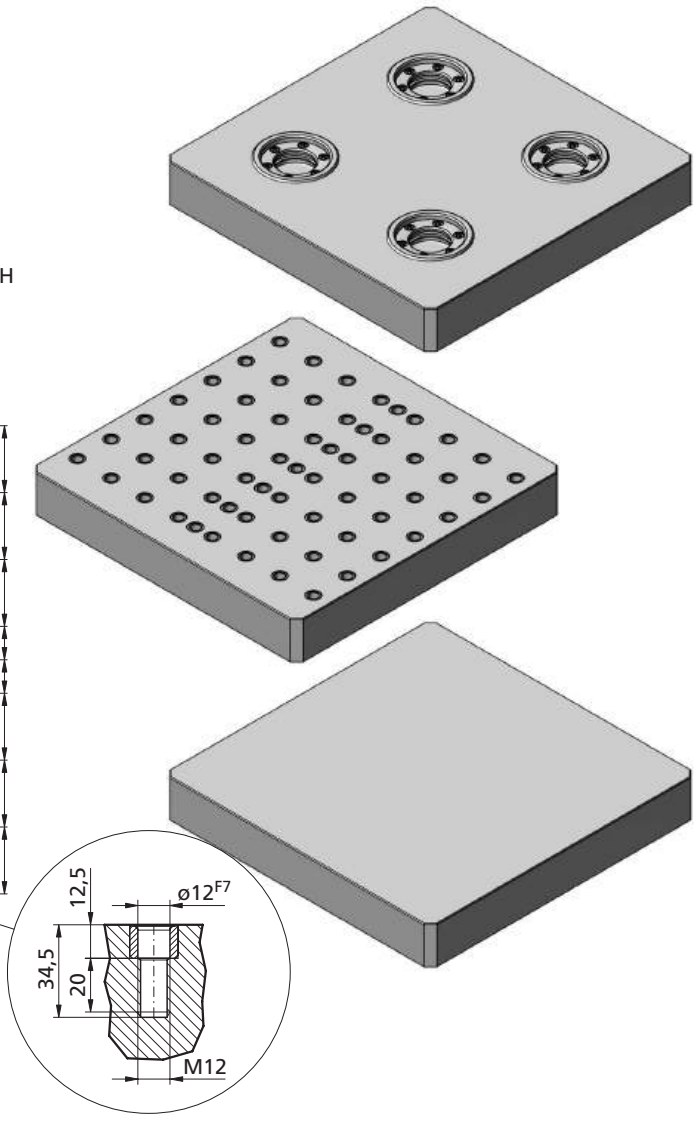


	kg
OPB4Q200R50	~35,80
OPB4Q200R50ID-4	~35,70

Bestellbeispiel / *Ordering example*: OPB4Q200R50

4er Palette
Pallet with 4 clamping case





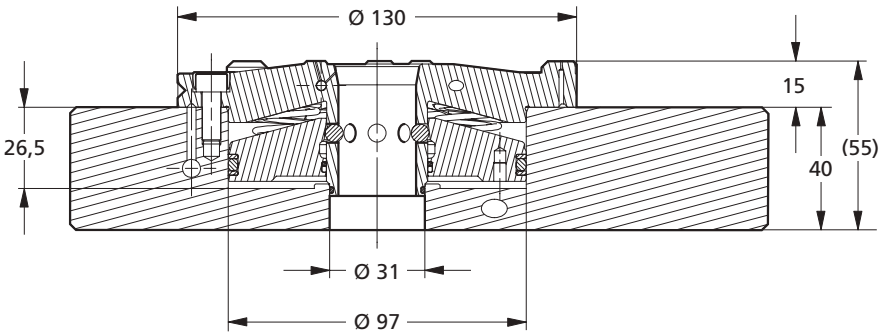
	H	P	kg
OPA4Q200	60,2	56,2	~25,32
OPA4Q200R50	60	56	~25,23

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

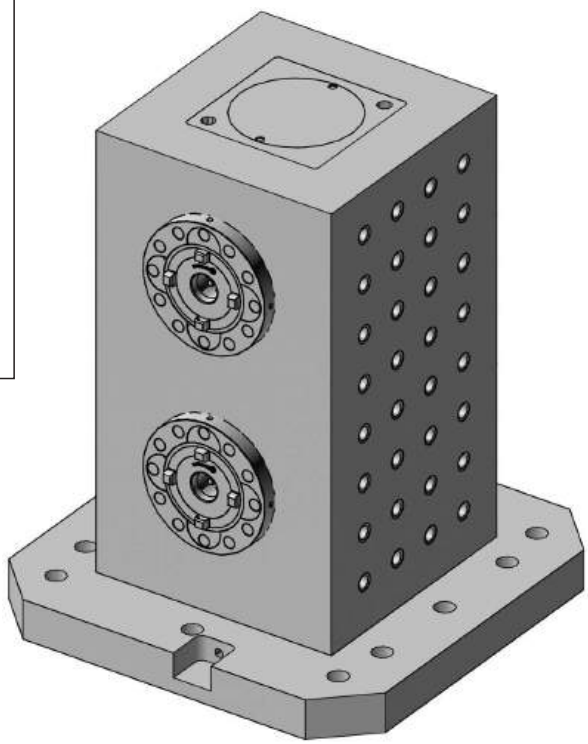
Geeignet zur Anwendung unter Flüssigkeit
Suited for submerged operation

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
Spielfreie Kurzkegel-Zentrierung.
Repetiergenauigkeit: < 0,005 mm.
Leichtes Einfahren der Paletten.

2 Spannmechanismus
Zuverlässiger Spannmechanismus durch selbsthemmenden Kugelverschluss.

3 Öffnen
MTS Spannfutter werden pneumatisch betätigt.

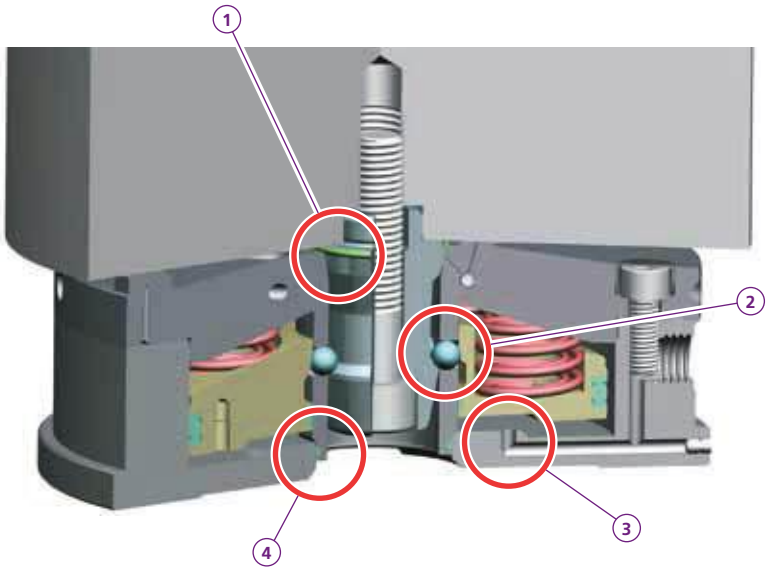
4 Sauberkeit
Flüssigkeit kann ablaufen, keine Schmutzecken.

1 Precise
Play-free round-cone centering.
Repeatability: <0.005 mm.
Easy insertion of the pallets.

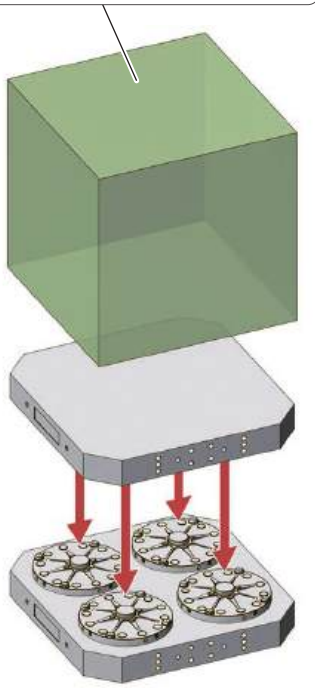
2 Clamping mechanism
Reliable clamping mechanism through self-locking ball lock.

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

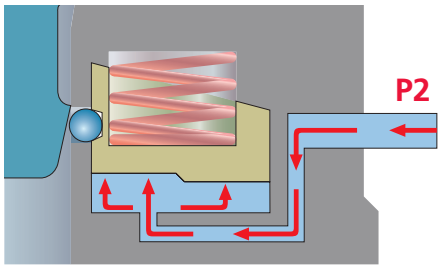
A mere 7 bar of opening pressure results in 12,000 N clamping power thanks to internal power boosting.

MTS Spannfutter, automatisierbar

Automatische Reinigung der Auflageflächen und des Zentrierzapfens beim Werkstückwechsel.

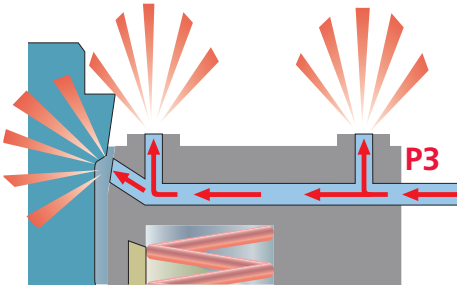
MTS chuck, automatable

Automatic cleaning of contact surfaces and of the centering spigot cone while the workpiece is changed.



Anschluss (P2)
Öffnen

Prise (P2)
Ouverture



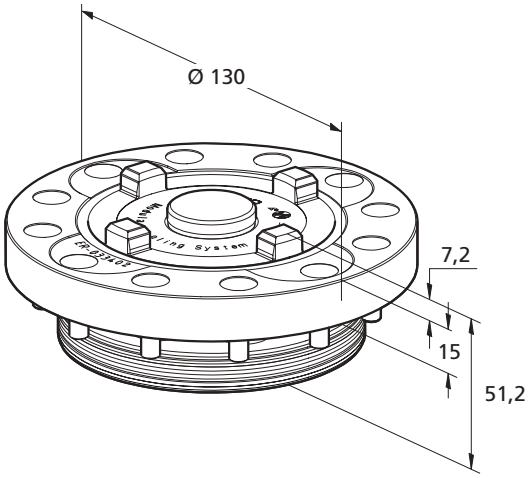
Anschluss (P3)
Reinigen

Prise (P3)
Cleaning

MTS IntegralChuck S-P (single + multiple /*manually*)

ER-033402

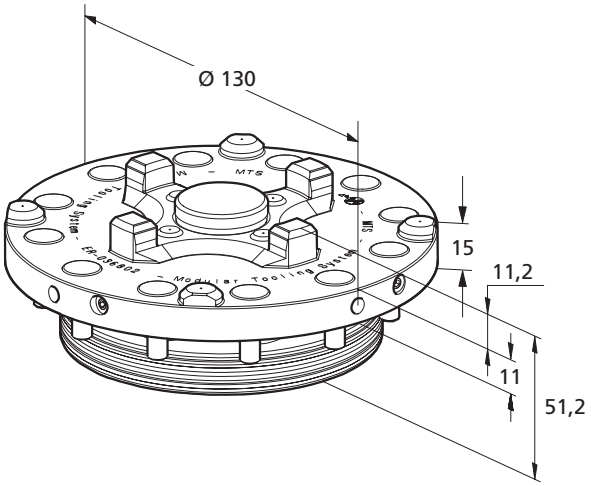
Ausführung	Für den direkten Einbau in Maschinentische, Platten, Spanntürme, Winkel oder Teilapparate.
Anschlüsse	Zum Öffnen: Pneumatisch.
Anwendung	Zur Aufnahme von Einzel– oder Mehrfachpaletten.
Version	*For direct integration in machine tables, plates, tombstones, squares or dividing heads.*
Connections	*To open: pneumatic or hydraulic.*
Application	*To accommodate single or multiple pallets.*



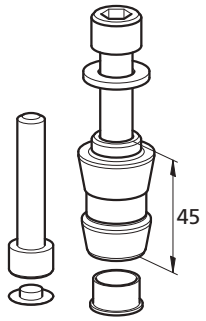
MTS IntegralChuck S-P/A (single + multiple /auto)

ER-036802

Ausführung	Für den direkten Einbau in Maschinentische, Platten, Spanntürme, Winkel oder Teilapparate.
Anschlüsse	Zum Öffnen: Pneumatisch. 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*	



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

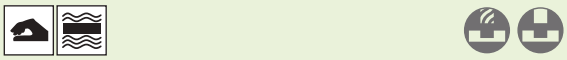
Geeignet für die automatische Anwendung
Suited for automatic operation

Für spanabhebende Bearbeitung
For chip-removing processes

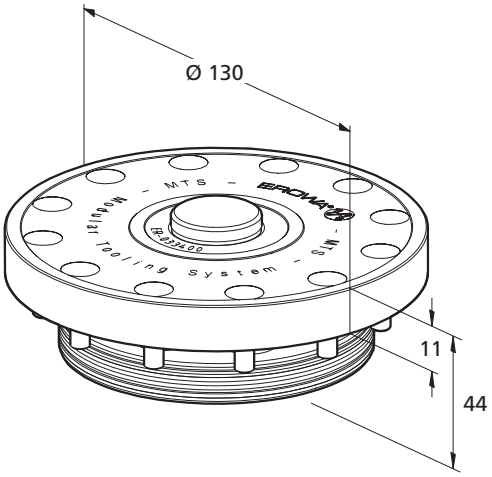
Zum Senkerodieren
For EDM sinking

MTS IntegralChuck M-P (multiple / *manually*)

ER-033400

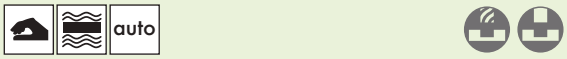


Ausführung	Für den direkten Einbau in Maschinentische, Platten, Spanntürme, Winkel oder Teilapparate.
Anschlüsse	Zum Öffnen: Pneumatisch.
Anwendung	Zur Aufnahme von Einzel– oder Mehrfachpaletten.
Version	*For direct integration in machine tables, plates, tombstones, squares or dividing heads.*
Connections	*To open: pneumatic or hydraulic.*
Application	*To accommodate single or multiple pallets.*

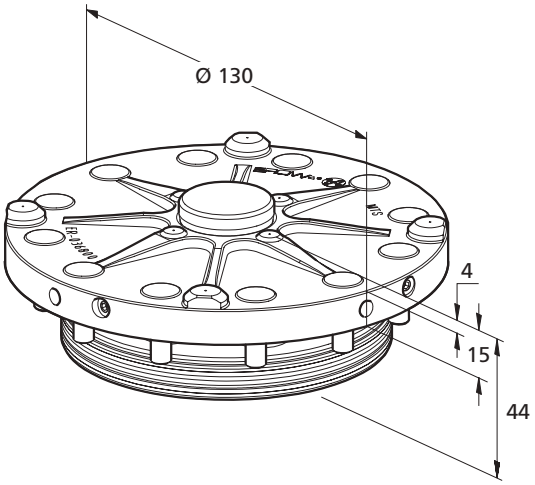


MTS IntegralChuck M-P/A (multiple /auto)

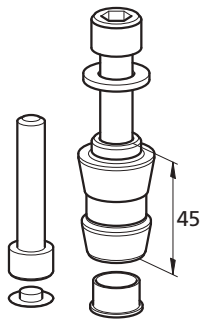
ER-036800



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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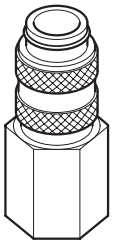
Für spanabhebende Bearbeitung
For chip-removing processes

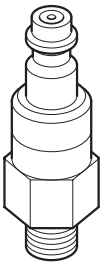
Zum Senkerodieren
For EDM sinking

OPSKU G1/4" Innengewinde *Internal thread*



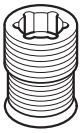
Schnellkupplung
Quick fitting coupling

OPST-NI G1/8" Aussengewinde *Male thread*



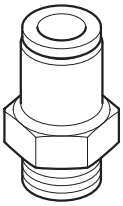
Stecknippel verschmutzungsgeschützt
Plug nipple protected against staining

OPRV G1/8" Aussengewinde *Male thread*



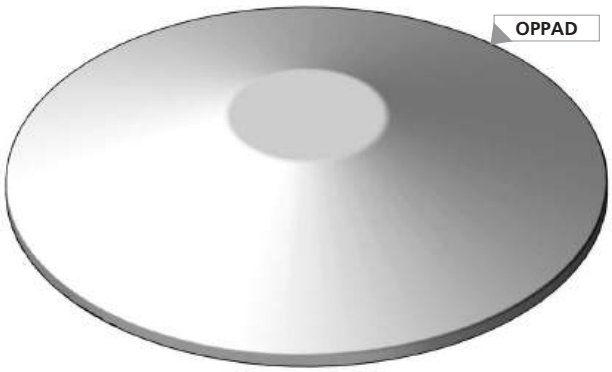
Rückschlagventil
Nonreturn valve

OPANS-8 G1/4" Aussengewinde *Male thread*

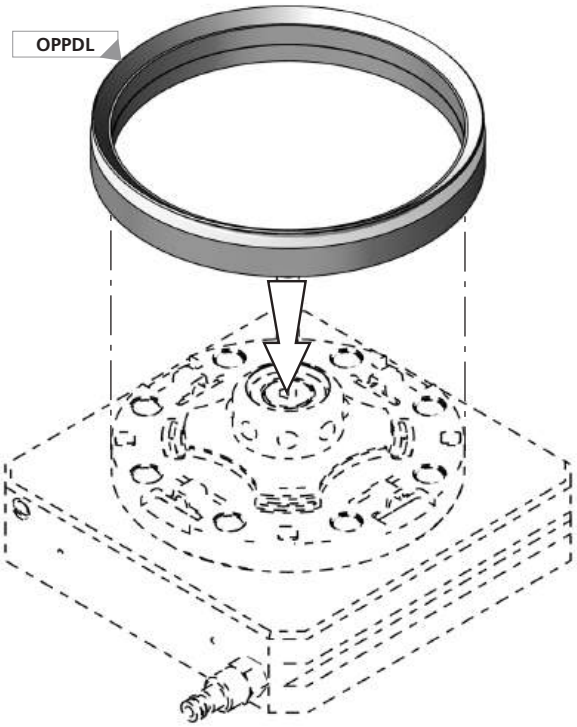


Für 8 mm Schlauch / *For hose*

Abdeckung
Cover

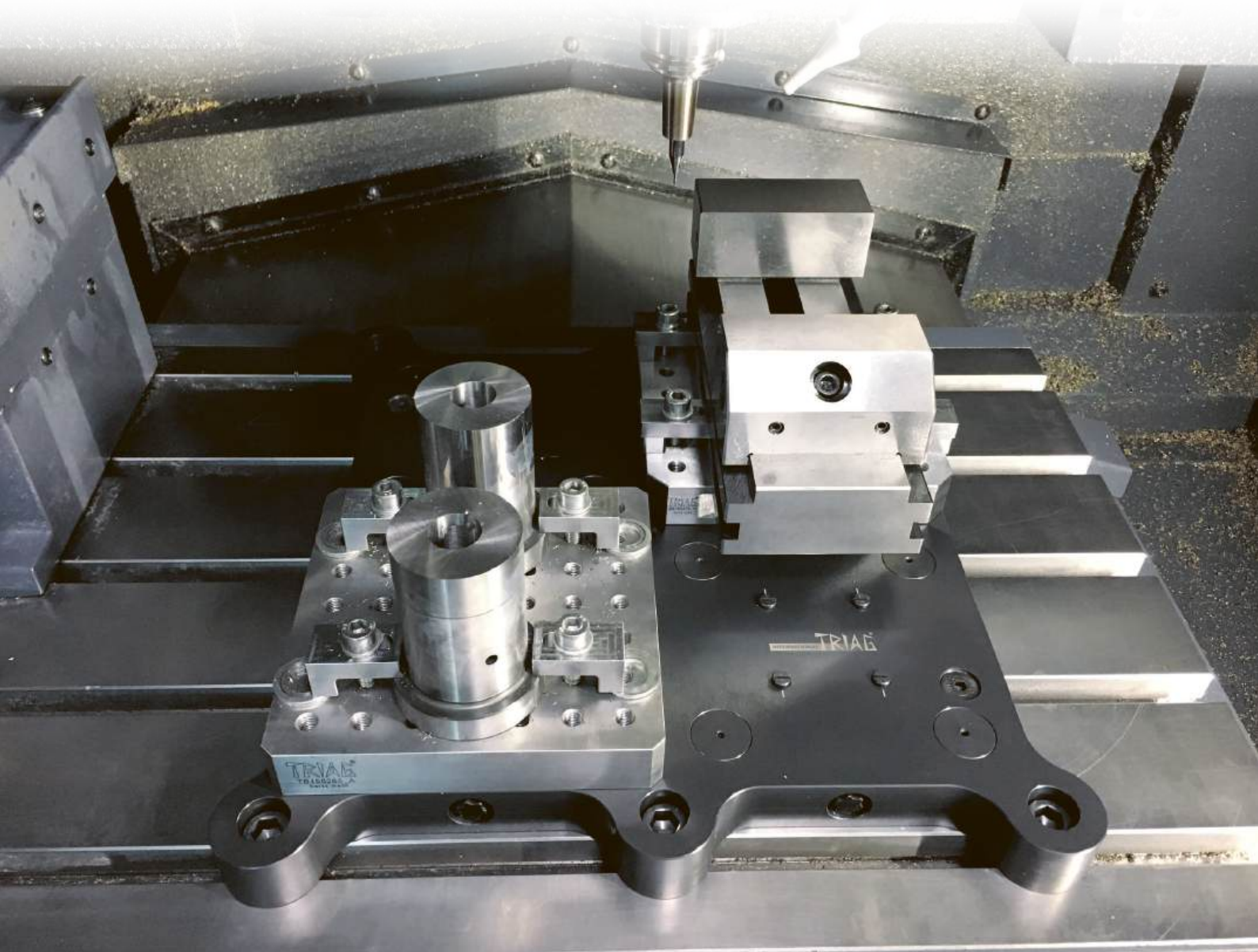


Dichtlippe
Leakproof cover



	kg
OPPAD	~0,525
OPPDL	~0,075

Bestellbeispiel / *Ordering example* : 1x OPPAD


TRIAG
TRIAG

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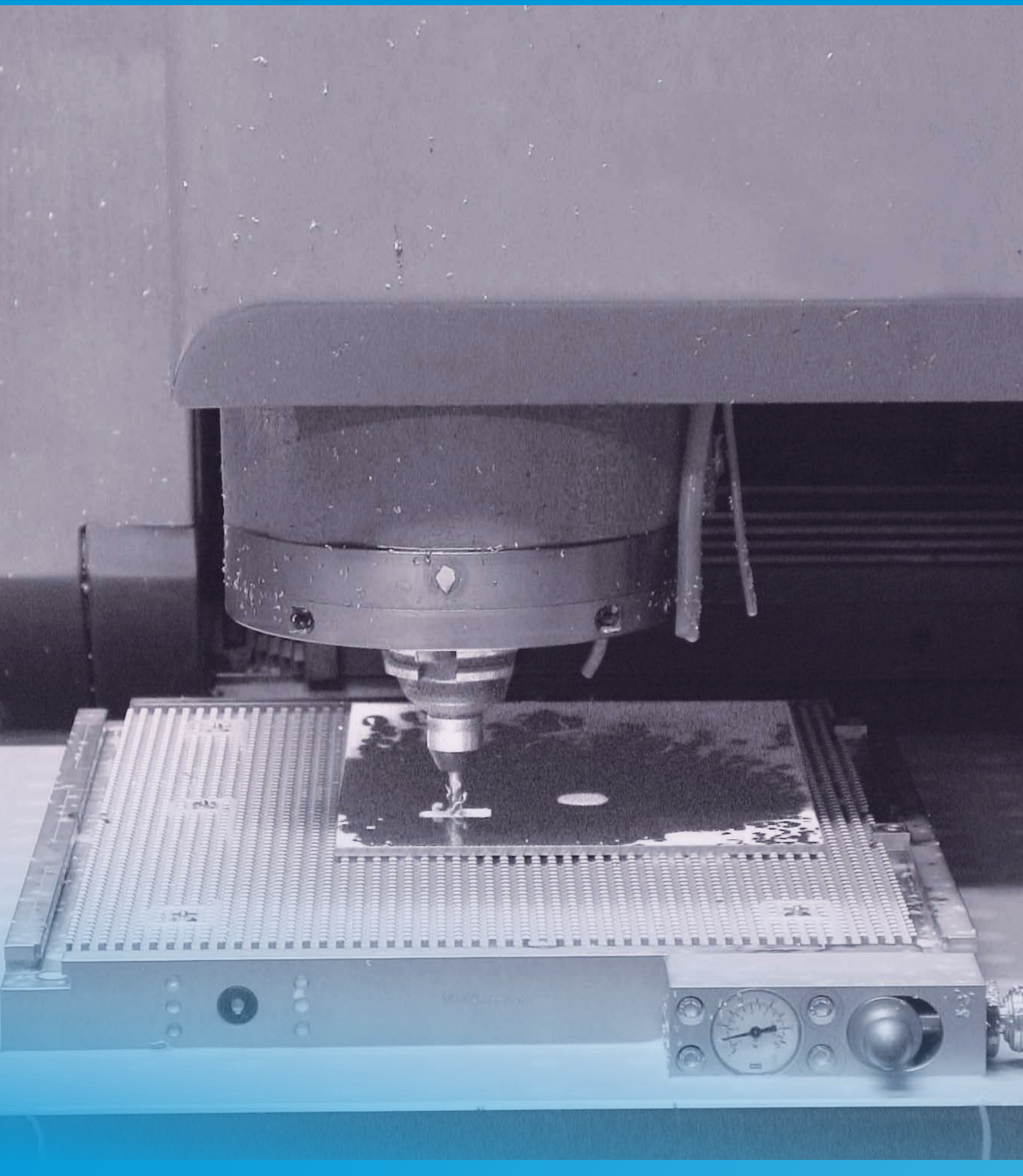
05.11.2024

trivaCLAMP



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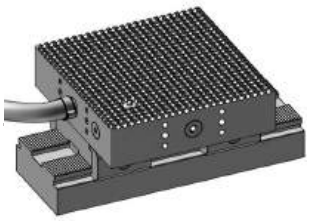
Vakuum-Modul für powerCLAMP | *Vacuum module for powerCLAMP* .....

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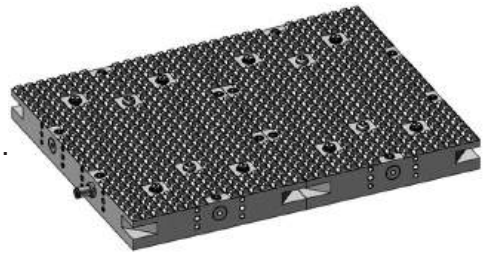
Kombinationsvarianten (Vakuumplatten)
Possible combination of vacuum plates .....

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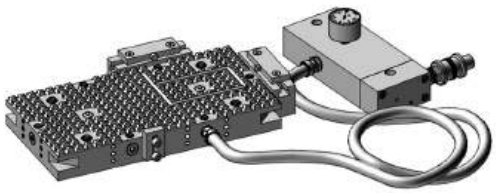
Startersets nach Ihrer Wahl | *Starter kit (Your choice)* .....

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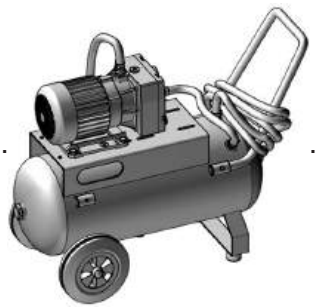
Vakuum erzeugen | *Generate vacuum* .....


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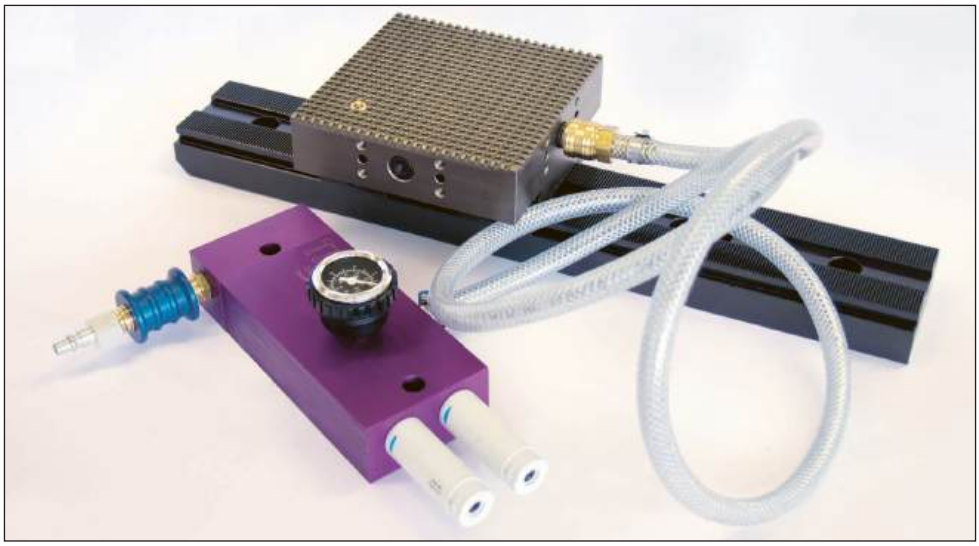
Vakuumspannen

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 Briden 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:

- **Vakuumplatten** 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.

- ***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.*

- **Rotations-Vakuumpumpe** mit Schaltventil und Druckwächter optional.
- **Injektorpumpe** mit Schaltventil.

- ***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.*

Haltekraft und Wirkungsgrad
Holding force and efficiency

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.

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.

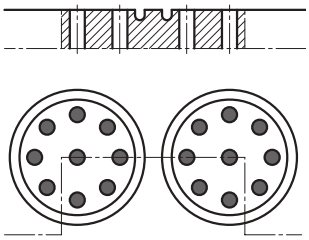
Effective holding force:
In other words: the larger the work piece supporting area, thus reducing the hollow space representing the holding area, the lesser the holding force.

Consequently, the effective holding force depends entirely upon the rate of efficiency of the vacuum system.

Vakuumspannsysteme im Vergleich:

Comparison of various vacuum systems:

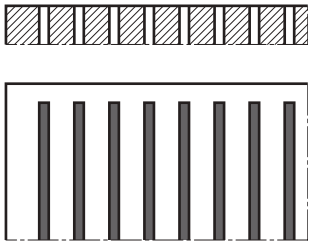
Lochplatte
Plate with suction holes



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

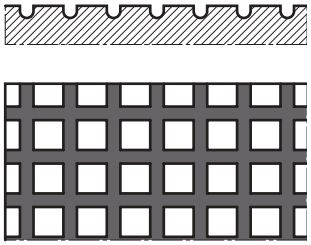


Steg 8 mm, Schlitz 2 mm

Slots 2 mm, bar 8 mm

Wirkungsgrad: 25%
Degree of efficiency: 25%

Nutenplatte
Plate with U-shaped grooves

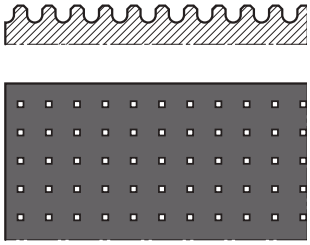


Raster 10x10 mm, Nute 3 mm

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 traversely with any holding plate to suit workpieces, limited by machine table size only.*

Die Spannunterschiede zwischen mechanisch und Vakuum
The differences between mechanical and vacuum

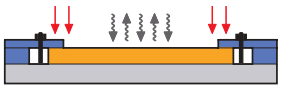
Mechanische Spannung = Druck auf das Werkstück, daraus resultieren:
- Belastung des Werkstücks
- Druckmarken in weichen Werkstoffen
- Verformung labiler Teile
- Risiko von Vibrationen

***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.



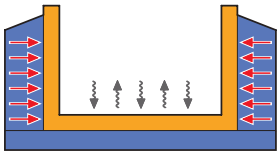
Spannen von Platten mit Tiefspannbacken
Haltekraft nur am Rand, Vibrationen in Werkstückmitte. Hoher Spanndruck erzeugt Spannung und Verformung.
Clamping of plates, using clamping jaws
Also high pressure applied to workpiece, holding effect at the edges - Risk of deformation and vibrations.



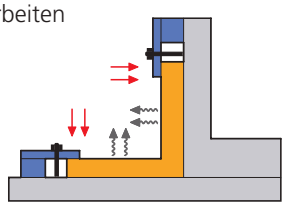
Kubus spannen im Schraubstock
Belastung des Werkstücks - Risiko von Druckmarken.
Clamping of cubic-shaped items, using vise
Stress applied - Risk of paressure marks in workpiece.



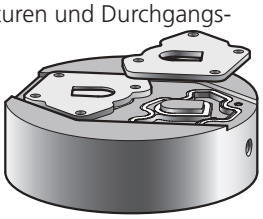
Spannen von U-Profilen im Schraubstock
Risiko von Deformationen und Vibrationen.
Clamping of U-profile, using vise
Risk of deformation and vibrations during processing.



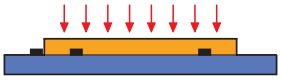
Spannen von Winkelprofil mit Briden
Umständliches Bestücken und Bearbeiten sowie grosse Vibrationen.
Clamping of angled workpiece, using clamps
Bothersome clamps, vibrations, subsequent operation.



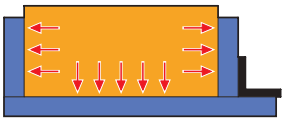
Spannen von unförmigen Werkstücken
Für Werkstücke mit unförmigen Konturen und Durchgangsbohrungen stellen wir Spezialvorrichtungen her.
Holding of bulky workpieces
We build special devices for workpieces with bulky outlines and through bore-holes.



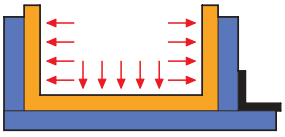
Spannen von Platten auf Vakuum-Platte
Haltekraft gleichmässig über ganze Auflagefläche verteilt. Keine Vibrationen - Freier Arbeitsraum.
Holding of plates, using vacuum-plate
Holding force equally spread all over the workpiece holding area - No vibrations - Free processing area.



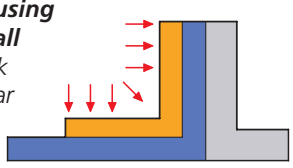
Kubisches Werkstück spannen mit Vakuum-Platte und Steilwänden
Werkstück an 3 (bis 5) Seiten ohne mechanischen Druck gehalten.
Holding of cubic-shaped item, using vacuum-plate and vertical walls
Workpiece held from 3 (up to 5) directions. No stress applied - No stress applied - No pressure marks.



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.



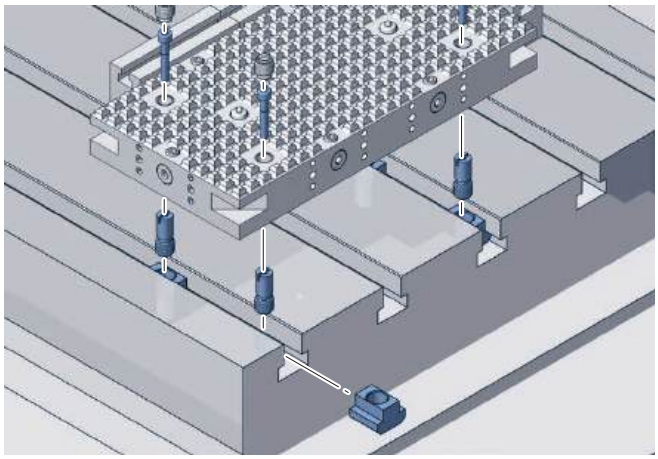
Spannen von Winkelprofil mit Vakuum-Platte und 1 Steilwand Gleichmässig verteilte Haltekraft. Leichtes Bestücken und freier Arbeitsraum. Keine Vibrationen, keine Nacharbeit notwendig.
Holding of angled workpiece, using vacuum-plate and 1 vertical wall
Uniform stressfree holding - No risk of vibrations - No clamps, free, clear work area for easier, faster loading and processing.



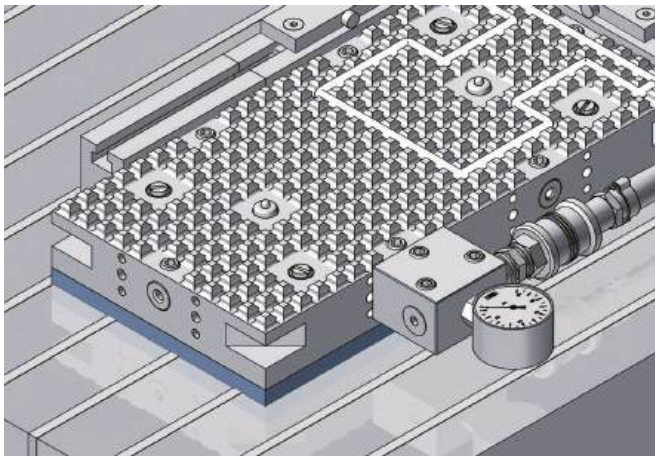
Rote Pfeile → zeigen die Spannrichtung, graue Pfeile ⇝ zeigen Vibrationskräfte

Red arrows → show the holding force direction, gray arrows ⇝ show vibration forces

Vakuumplatte auf Maschinentisch befestigen / *Mounting vacuum plate on machine table*

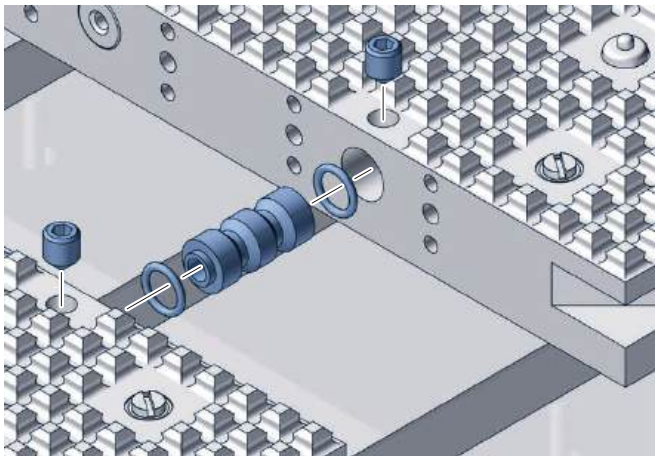


Mechanisch befestigt / *Mechanical mounting*

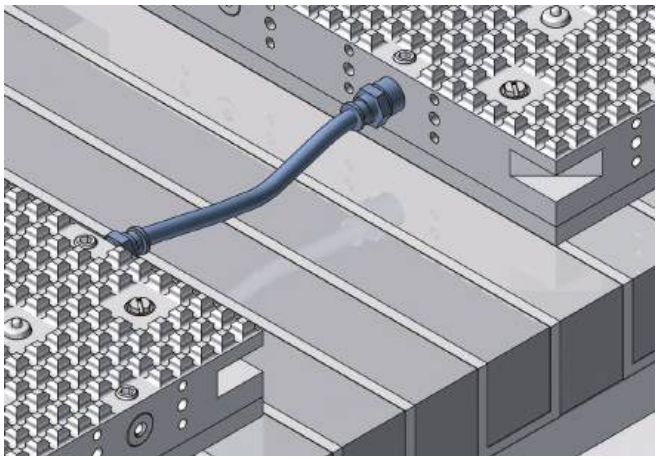


Magnetisch befestigt / *Magnetical mounting*

Platten koppeln / *Connect plates*

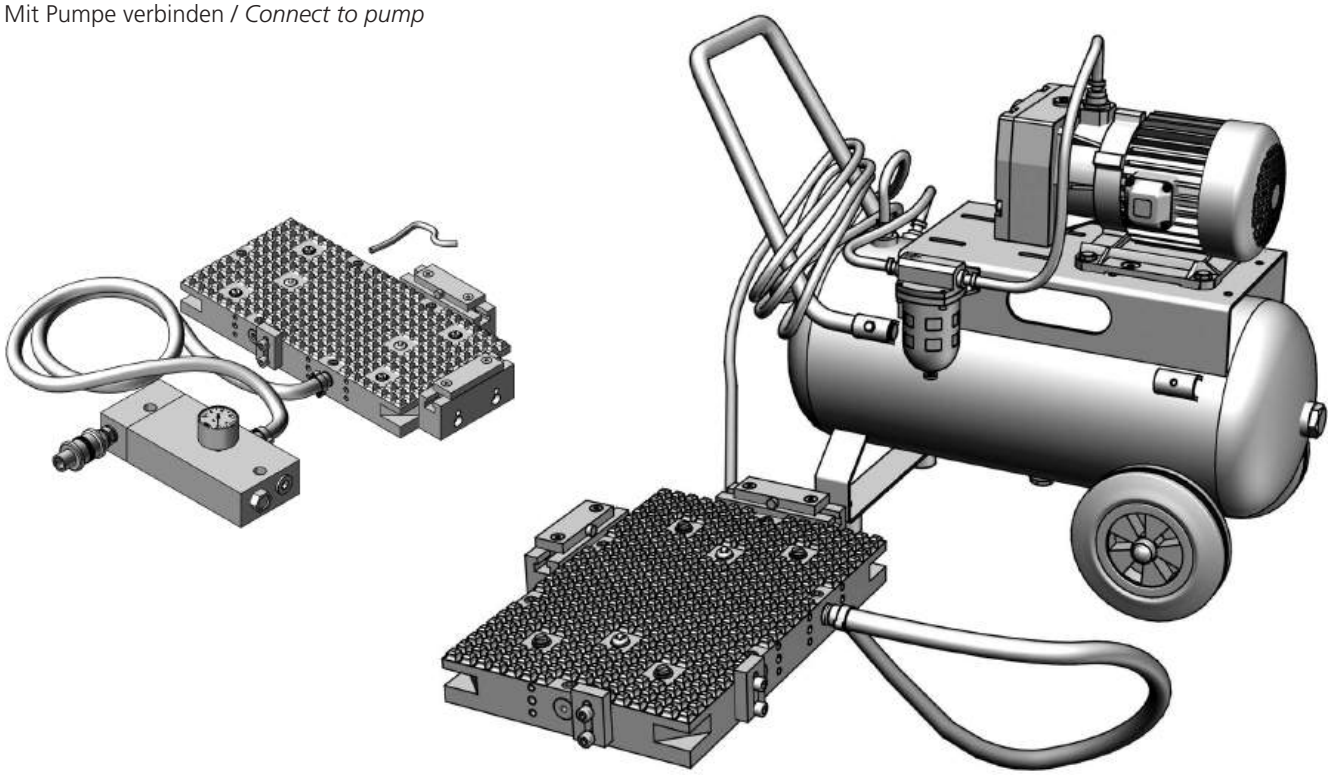


Mit Vakuumverbinder / *With vacuum circuit connector*

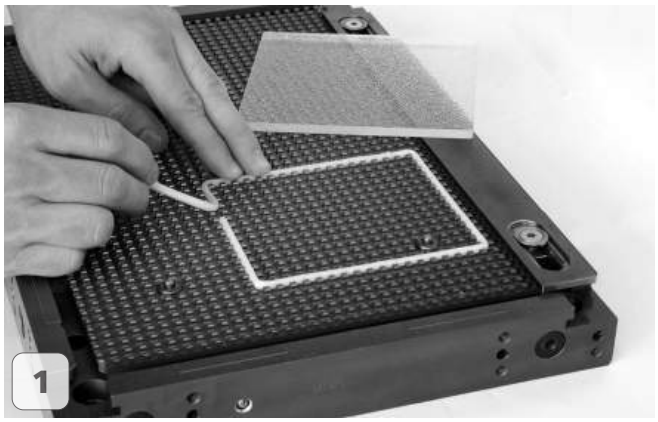


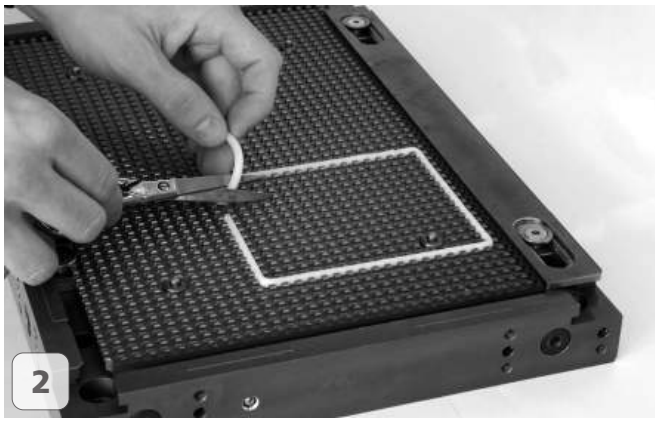
Mit Verbindungsschlauch / *With connector-tube*

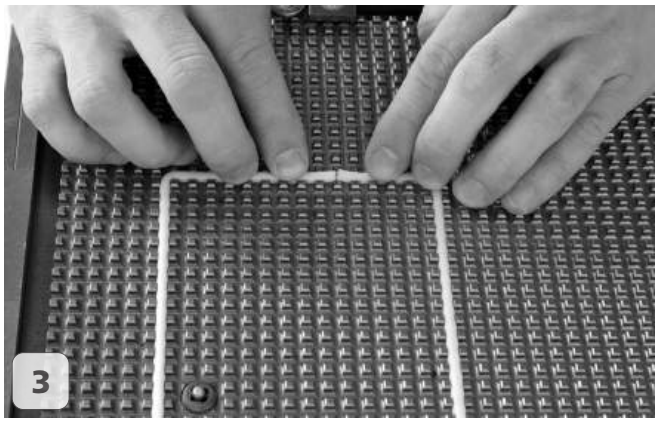
Mit Pumpe verbinden / *Connect to pump*

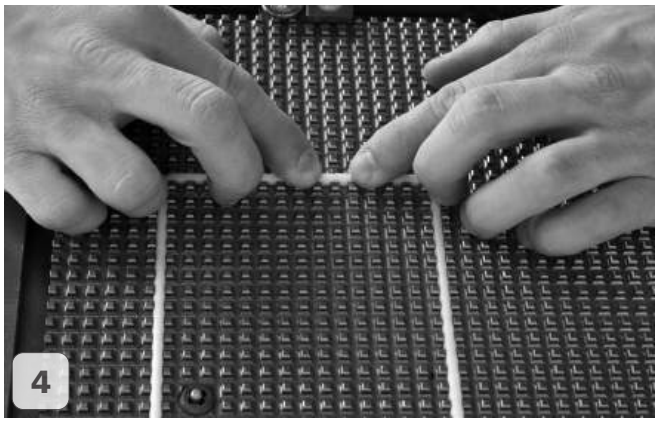


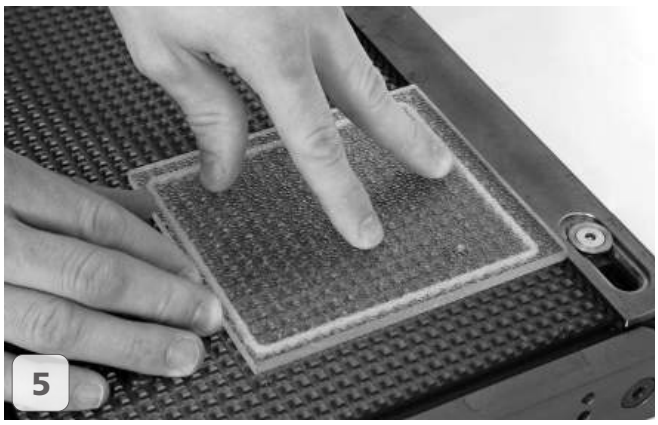
Dichtschnur und Werkstück einlegen / *Insert sealing cord and workpiece*

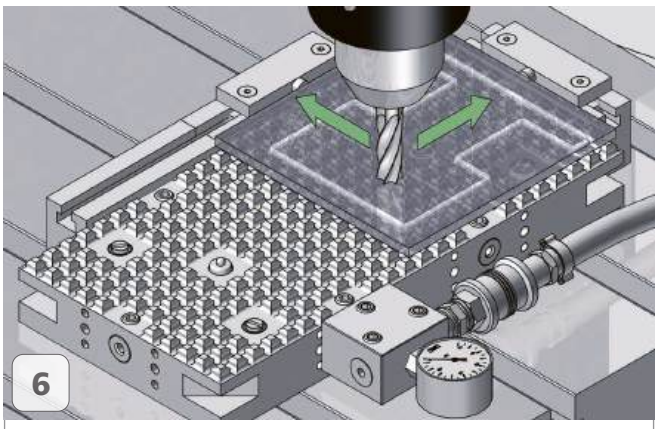




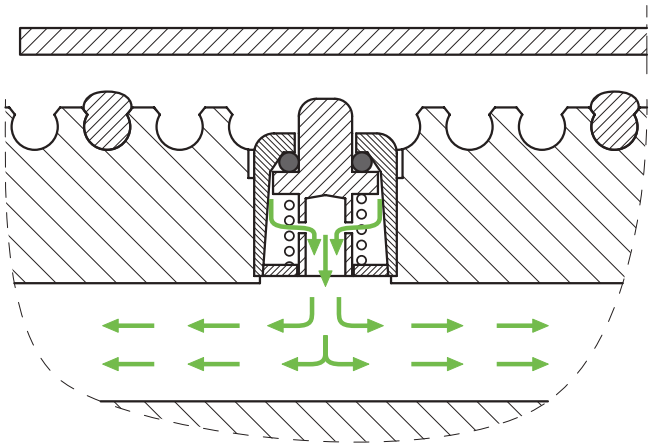




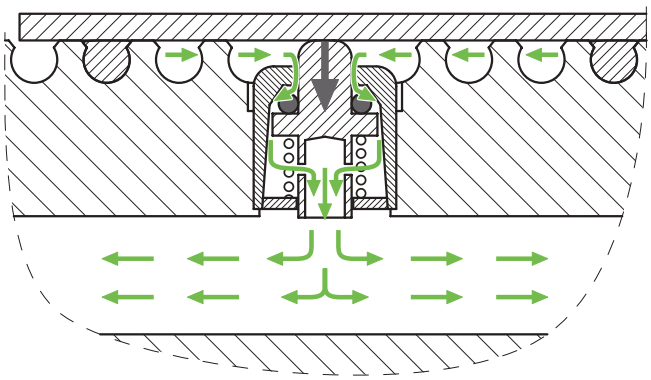




Fräsrichtung beachten:
wenn möglich, gegen Festanschläge fräsen.
Pay attention to machining direction:
if possible, toward stop gages milling.



Ventil geschlossen / *Valve sealed*



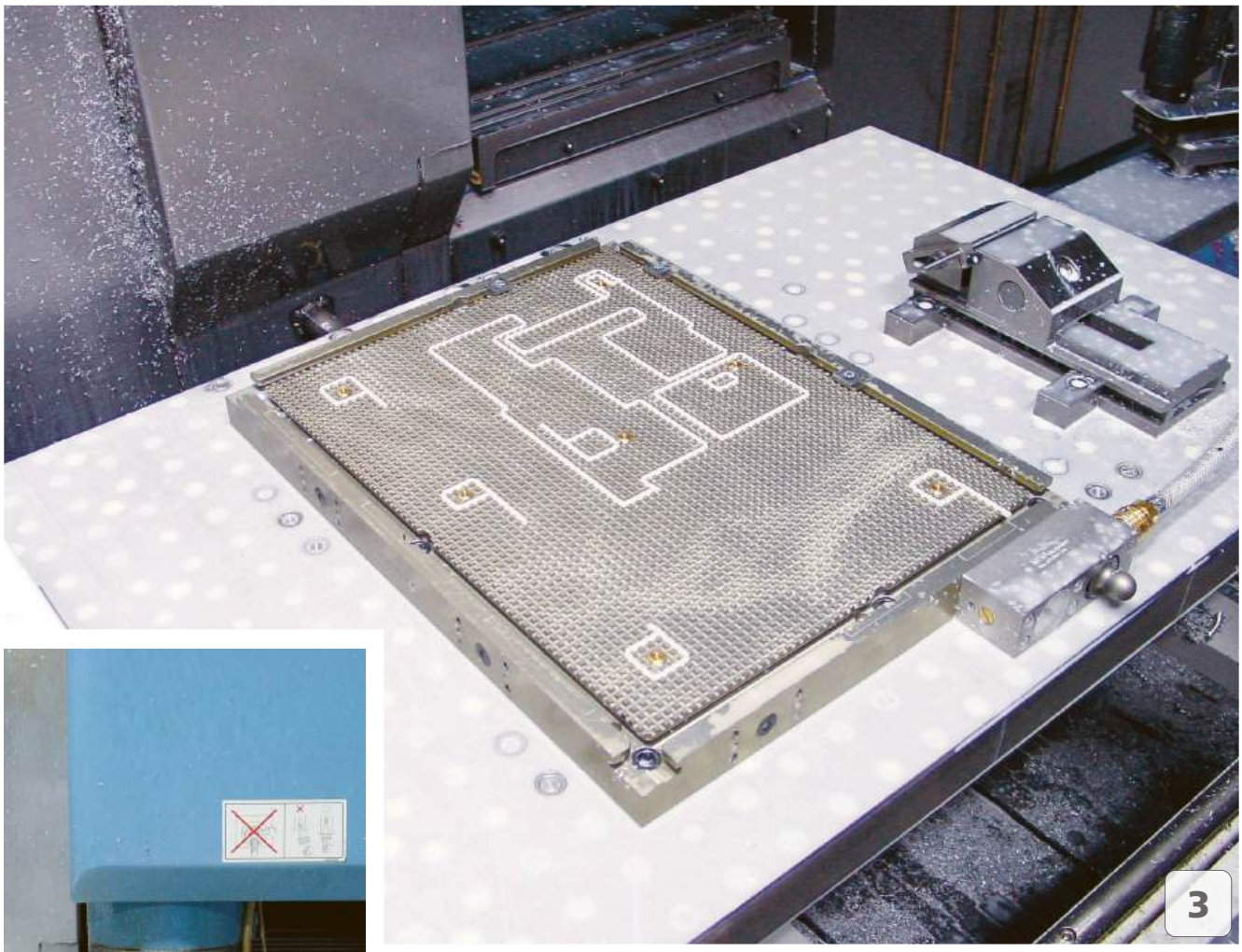
Werkstück eingelegt: Ventil offen
Workpiece inserted: Valve open



1



2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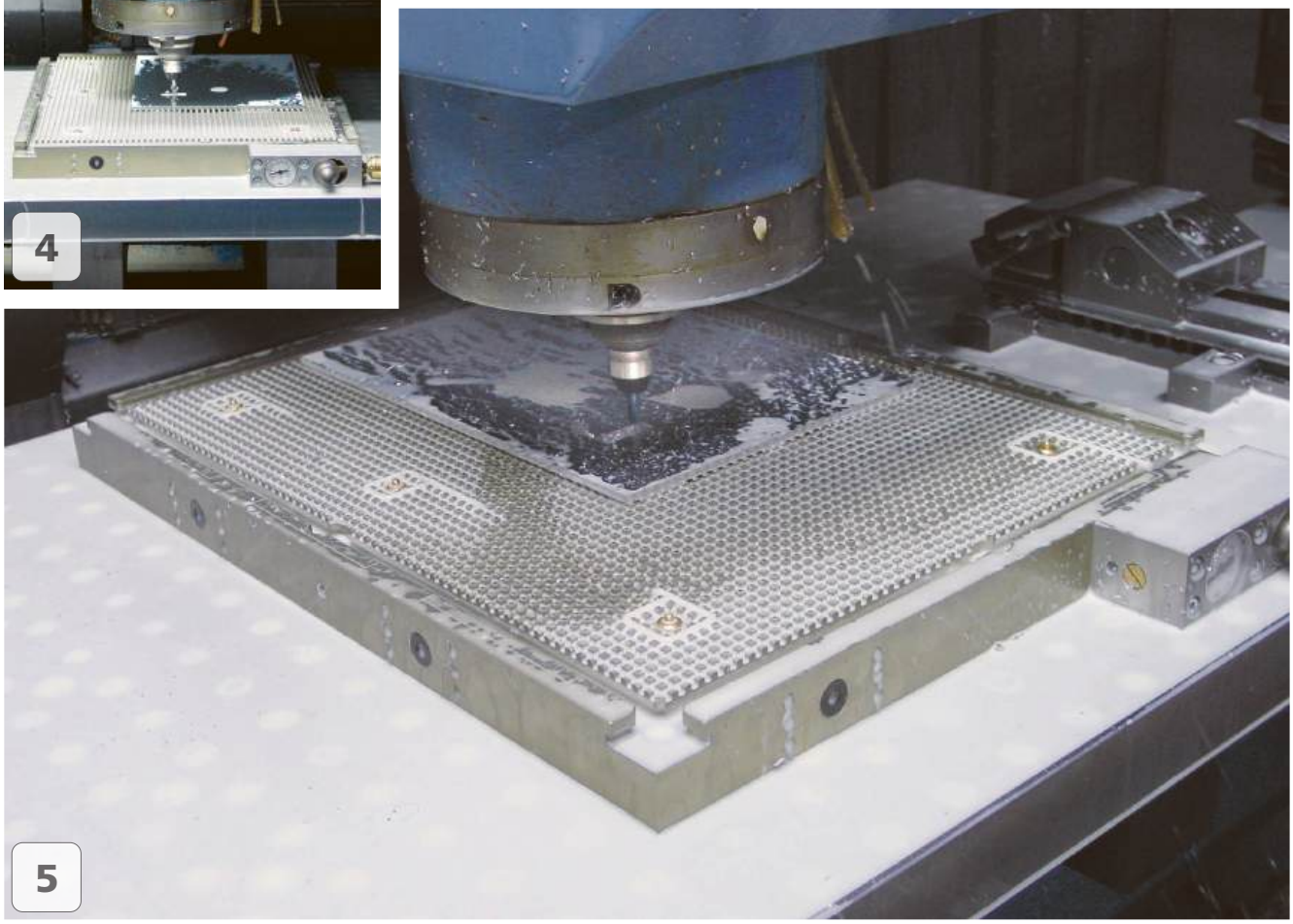
4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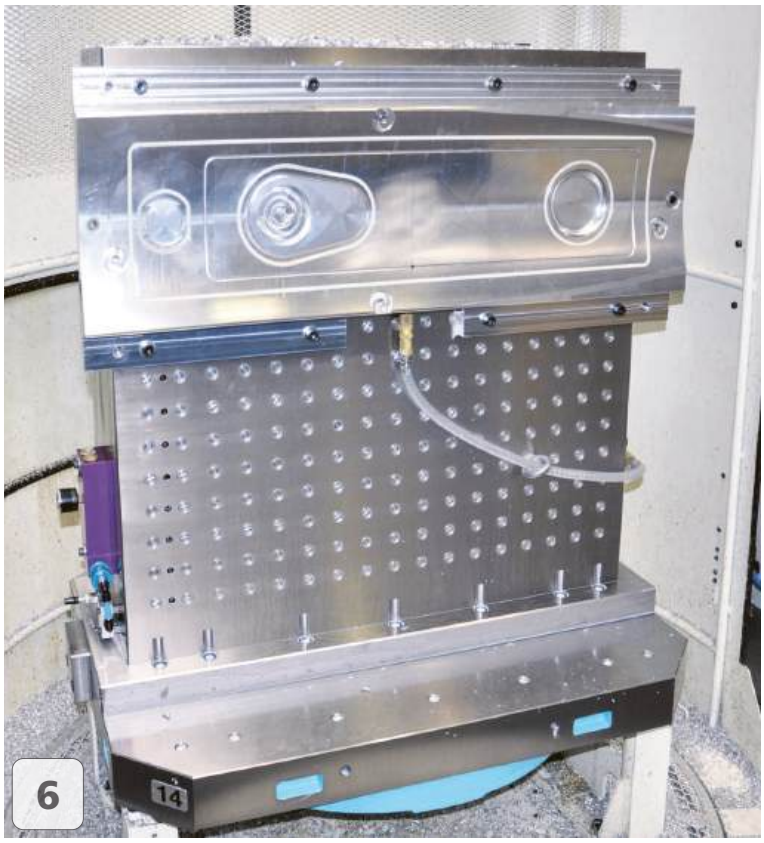

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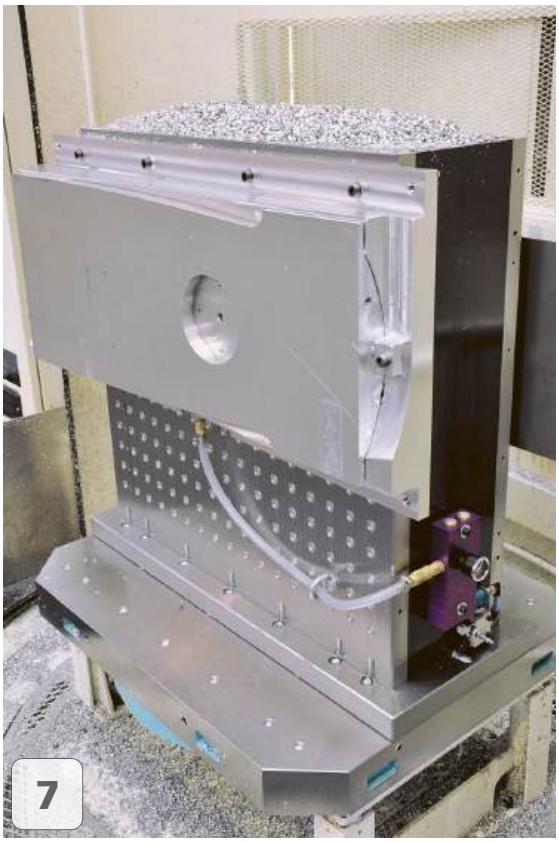

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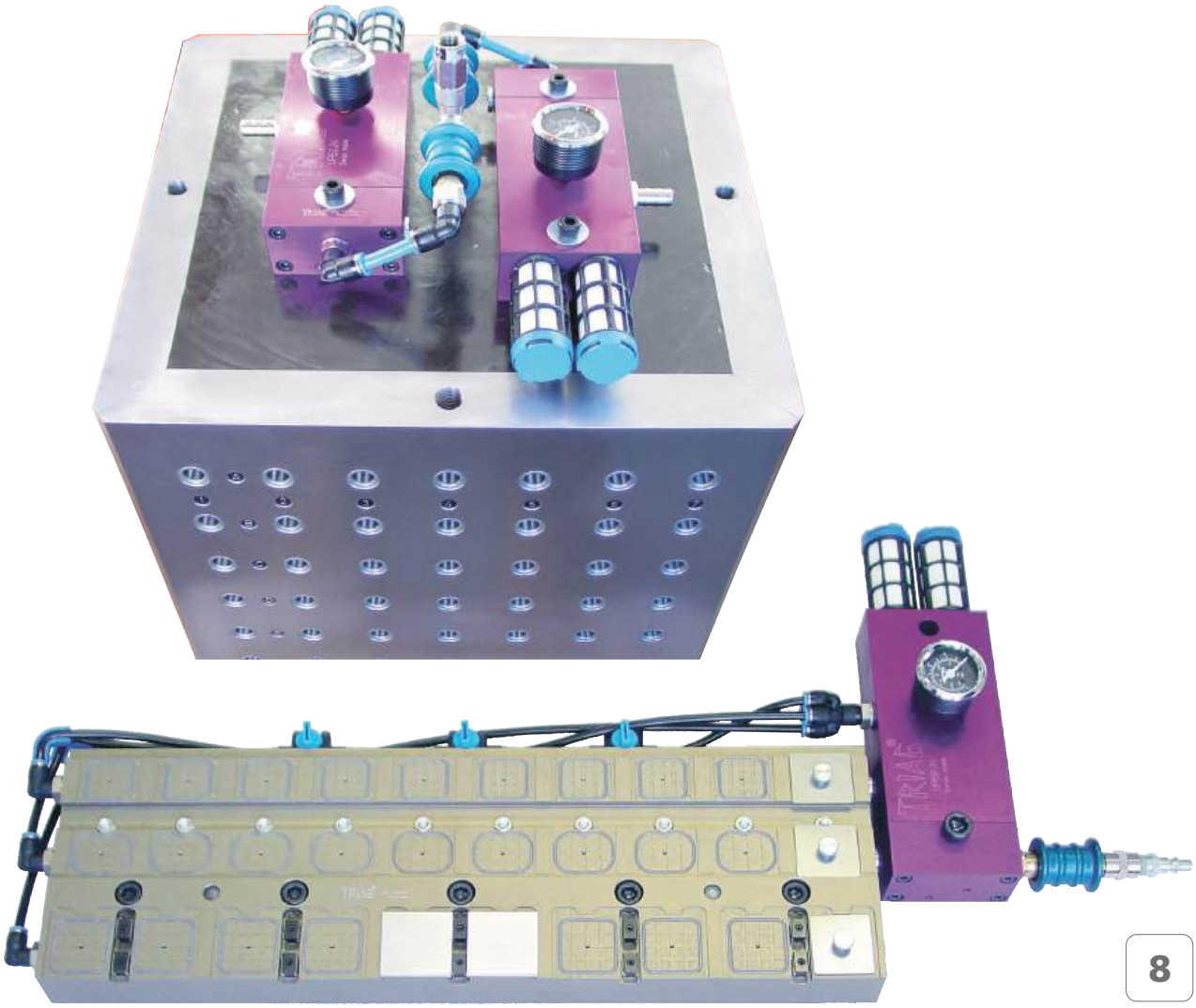

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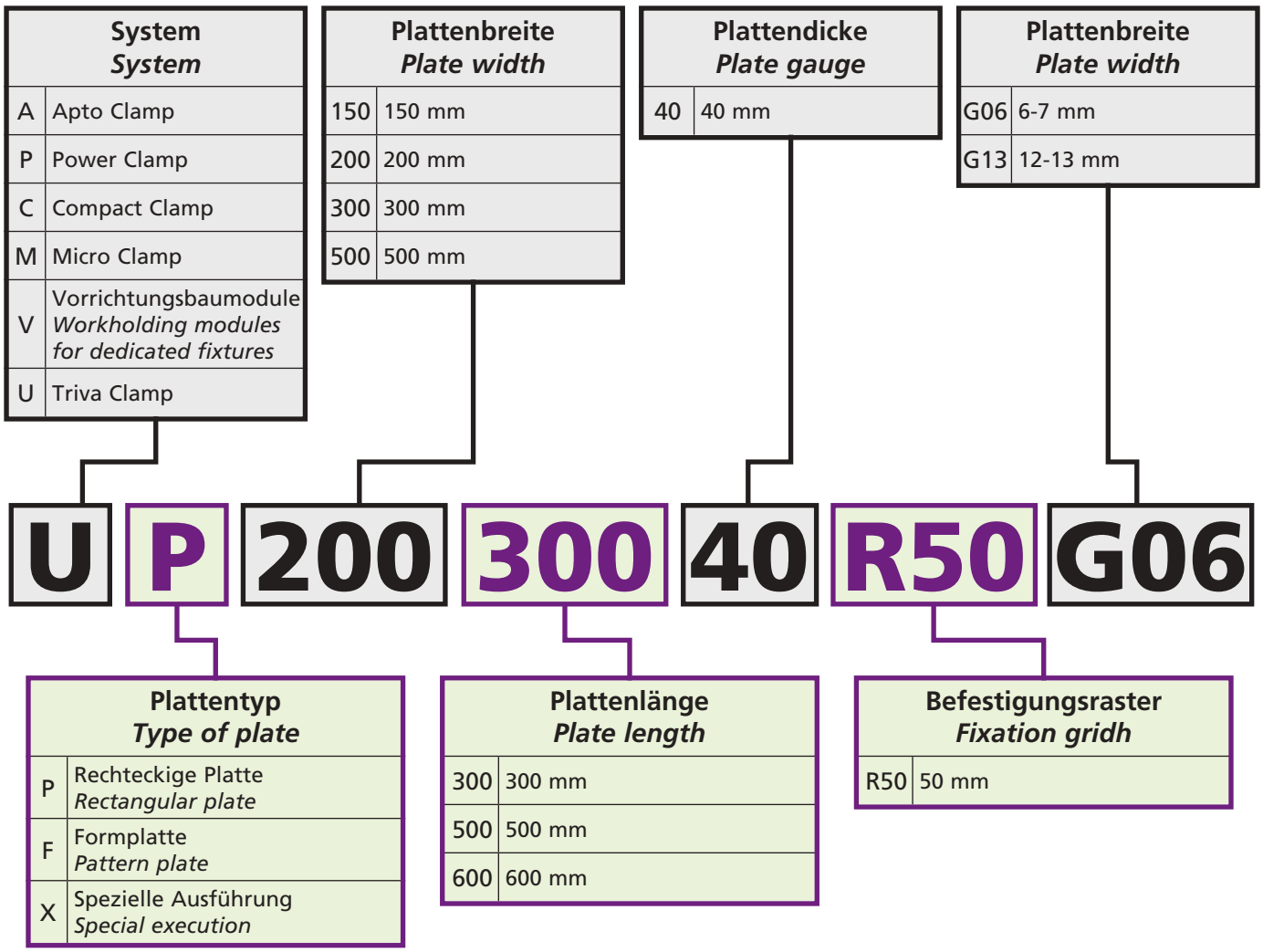
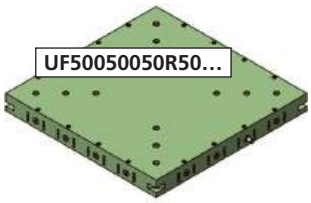

System
System
A Apto Clamp
P Power Clamp
C Compact Clamp
M Micro Clamp
V Vorrichtungsbaumodule
Workholding modules
for dedicated fixtures
U Triva Clamp
Plattenbreite
Plate width
150 150 mm
200 200 mm
300 300 mm
500 500 mm
Plattendicke
Plate gauge
40 40 mm
Plattenbreite
Plate width
G06 6-7 mm
G13 12-13 mm
U P 200 300 40 R50 G06
Plattentyp
Type of plate
P Rechteckige Platte
Rectangular plate
F Formplatte
Pattern plate
X Spezielle Ausführung
Special execution
Plattenlänge
Plate length
300 300 mm
500 500 mm
600 600 mm
Befestigungsraster
Fixation gridh
R50 50 mm



Formplatten
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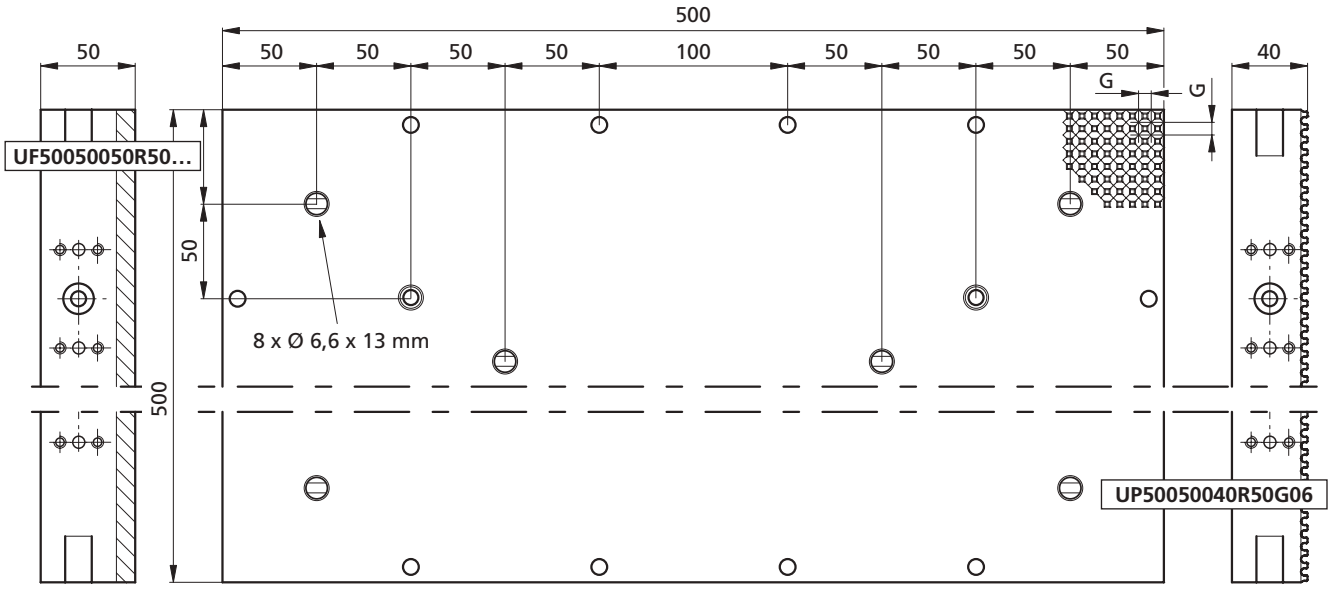
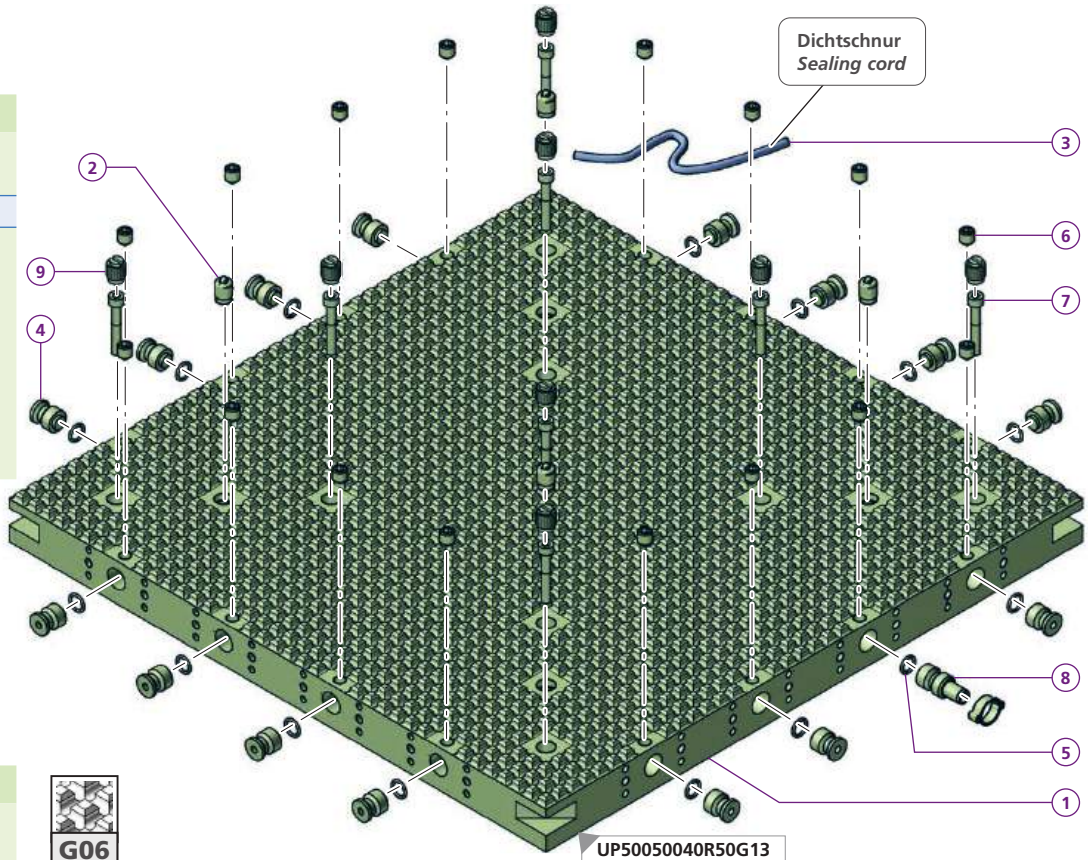


G13

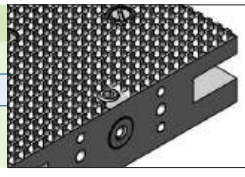
UP50050040R50G13		
1	1x	TH160150
2	4x	**0700100**
3	1x	**1110100**
4	15x	**0920000**
5	16x	**1111003**
6	16x	**M10X12ISO4027**
7	8x	**M6X45ISO4762**
8	1x	**0910001**
9	8x	**0700102**
G	=	12,5 mm
kg		~24



UF50050050R50...		
1	1x	TH160151
2	4x	**0700100**
3	1x	
4	15x	**0920000**
5	16x	**1111003**
6	16x	**M10X12ISO4027**
7	8x	**M6X45ISO4762**
8	1x	**0910001**
9	8x	**0700102**
kg		~32,5

G06

UP50050040R50G06		
1	1x	TB160159
3	1x	**1120100**
G	=	6,5 mm
kg		~26

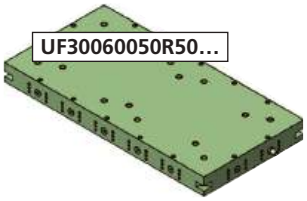


Profilfräser / *Carbide end mills* G13 / G06 p. 324

Dichtschnüre je nach Bedarf / *Sealing cords as needed*

Bestellbeispiel / *Ordering example*:
UP50050040R50G13 & 1x 1110100

Separat bestellen / *Order separately*



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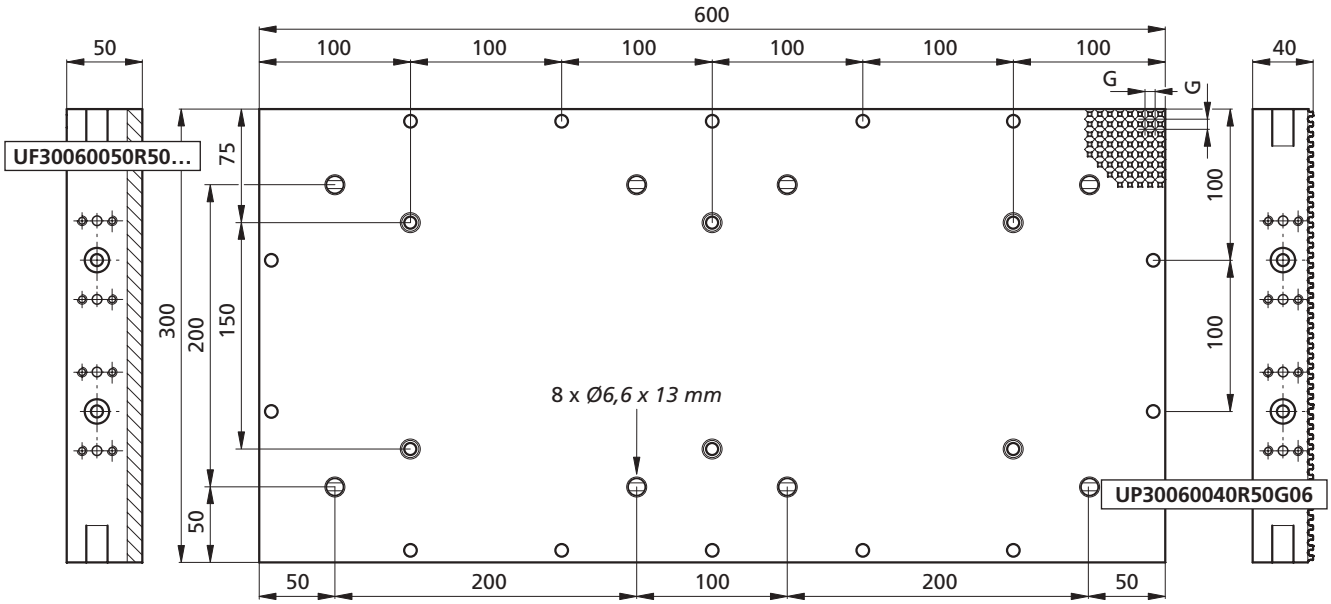
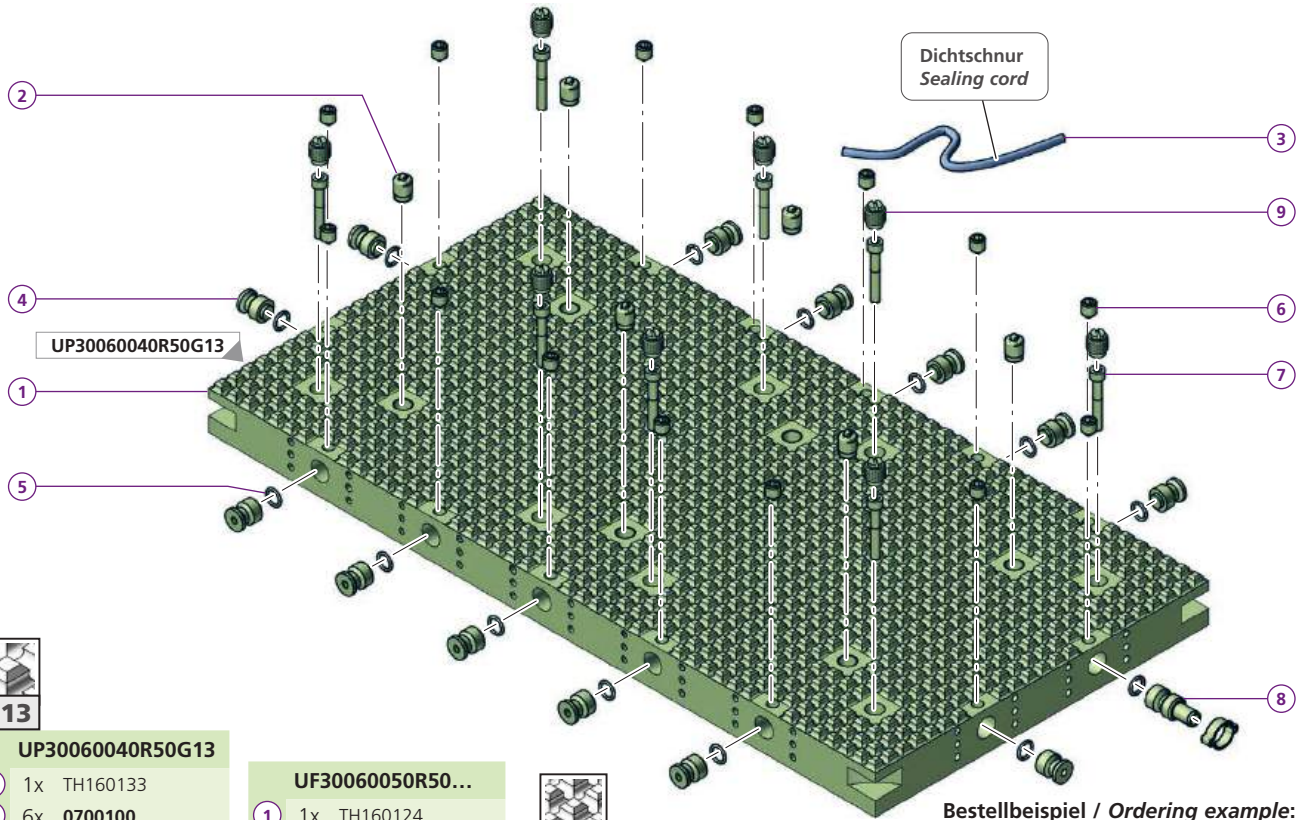




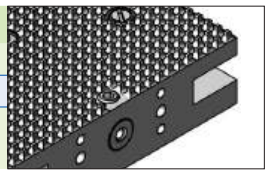
G13

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

G06

UP30060040R50G06		
1	1x	TH120176
3	1x	**1120100**
G	=	6,5 mm
kg		~18,5

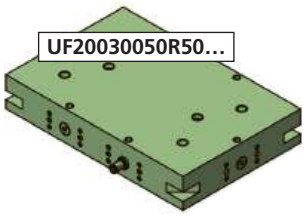


Bestellbeispiel / *Ordering example*:
UP30060040R50G13 & 1x 1110100

Profilfräser / *Carbide end mills* G13 / G06 p. 324

Dichtschnüre je nach Bedarf / *Sealing cords as needed*

Separat bestellen / *Order separately*



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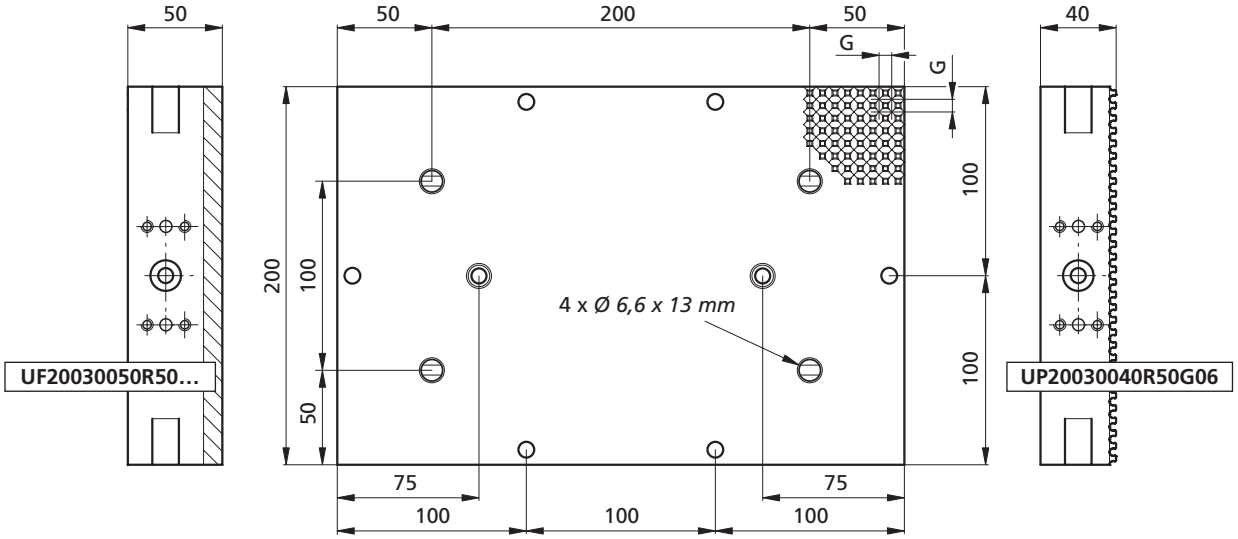
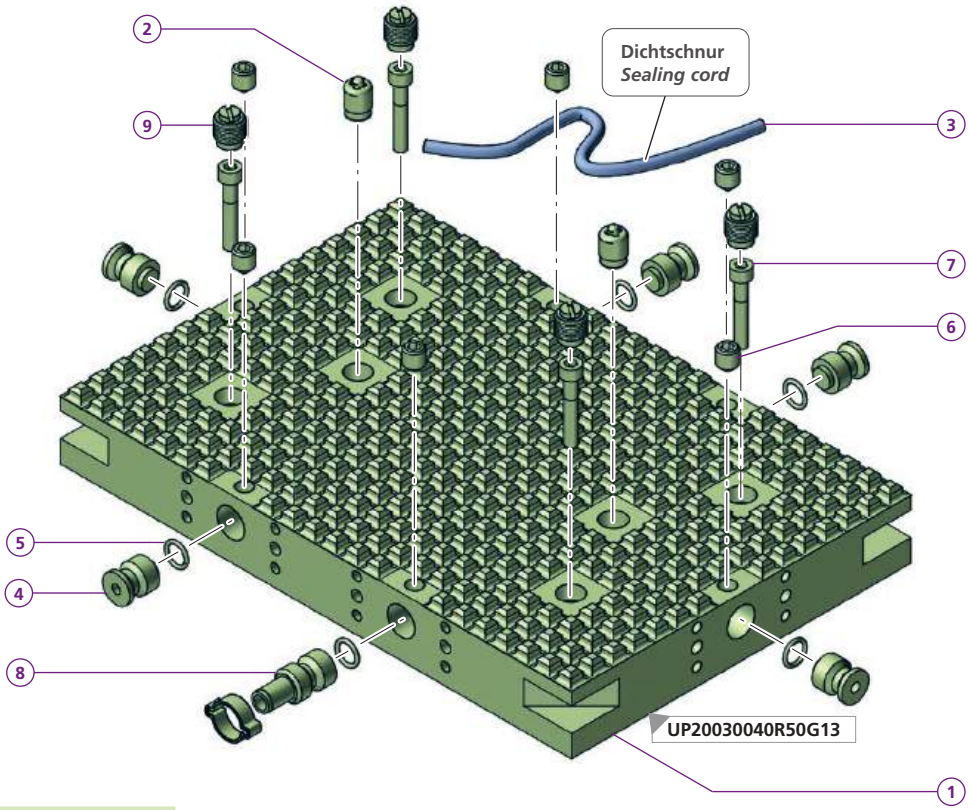


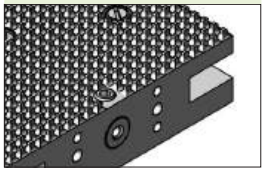




UP20030040R50G13		
1	1x	TH160135
2	2x	**0700100**
3	1x	**1110100**
4	5x	**0920000**
5	6x	**1111003**
6	6x	**M10X12ISO4027**
7	4x	**M6X45ISO4762**
8	1x	**0910001**
9	4x	**0700102**
G	=	12,5 mm
kg		~5,5



UP20030040R50G06		
1	1x	TH120175
3	1x	**1120100**
G	=	6,5 mm
kg		~6,0

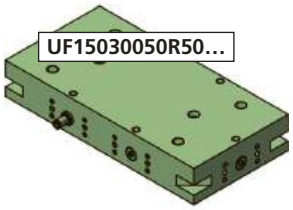


UF20030050R50...		
1	1x	TH160136
2	2x	**0700100**
3	1x	
4	5x	**0920000**
5	6x	**1111003**
6	6x	**M10X12ISO4027**
7	4x	**M6X45ISO4762**
8	1x	**0910001**
9	4x	**0700102**
kg		~8,09

Bestellbeispiel / *Ordering example*:
UP20030040R50G13 & 1x 1110100

Profilfräser / *Carbide end mills* G13 / G06 p. 324
Dichtschnüre je nach Bedarf / *Sealing cords as needed*

Separat bestellen / Order separately



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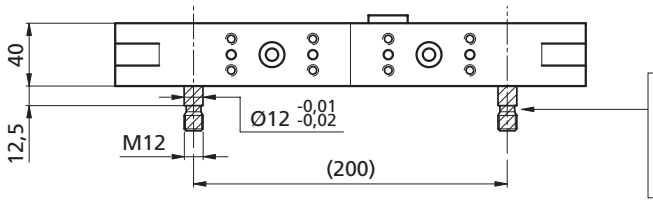
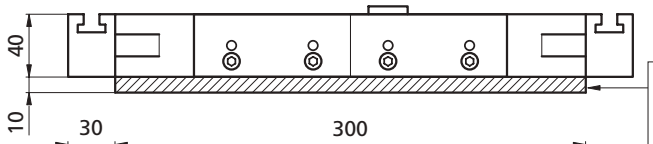
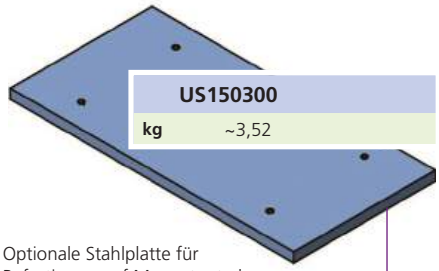


Variante / *Variant*:
Mechanische Befestigung auf Rasterplatte
Mechanical mounting on locking plate
R50 Ø12 M12

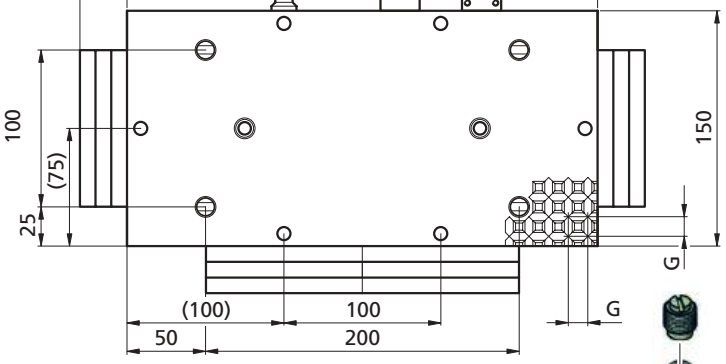


Variante / *Variant*:
Magnetische Befestigung auf Montageplatte
Magnetical fastening on mounting plate



US150300
kg ~3,52

Optionale Stahlplatte für Befestigung auf Magnetunterlage
Optional steel plate for fastening on magnetic basis

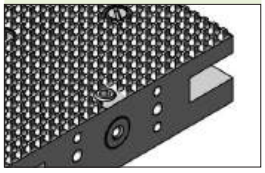




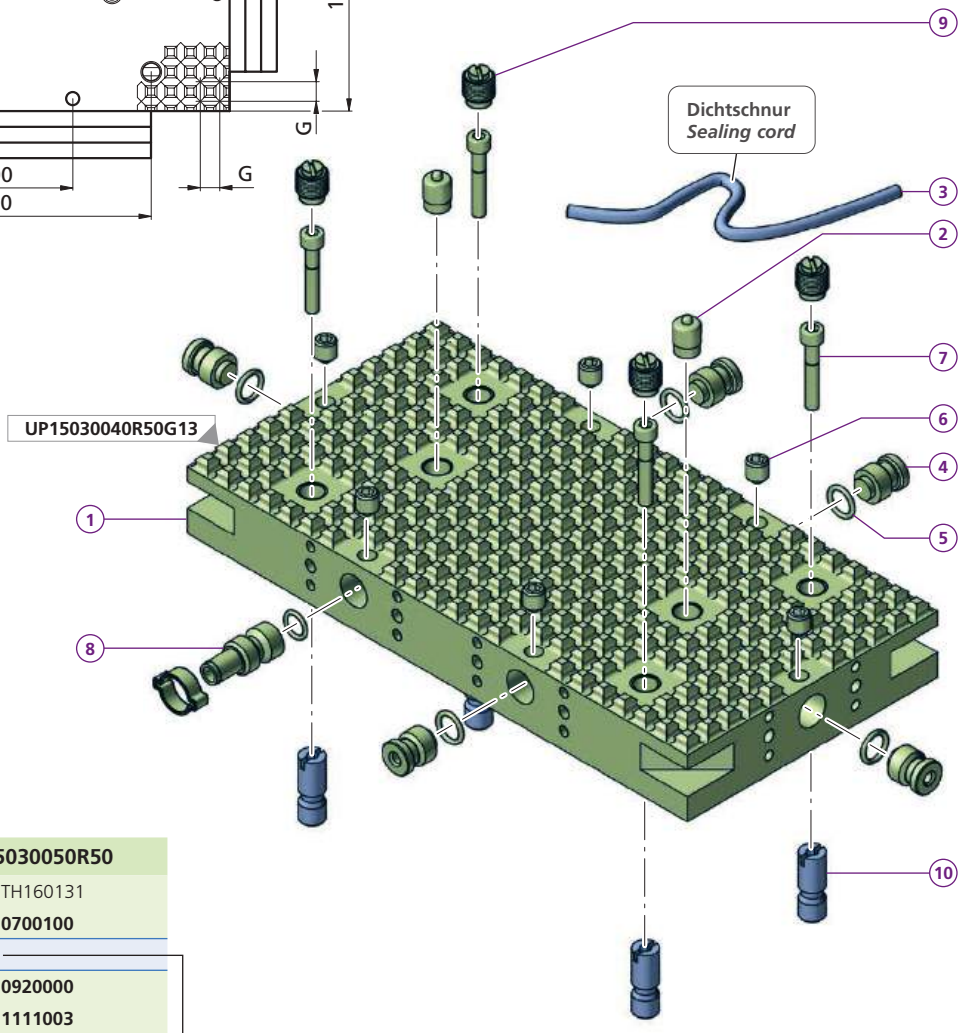
UP15030040R50G13		
1	1x	TH150942
2	2x	**0700100**
3	1x	**1110100**
4	5x	**0920000**
5	6x	**1111003**
6	6x	**M10X12ISO4027**
7	4x	**M6X35ISO4762**
8	1x	**0910001**
9	4x	**0700102**
10	4x	ADAPT6-12
G	=	12,5 mm
kg		~4,6



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

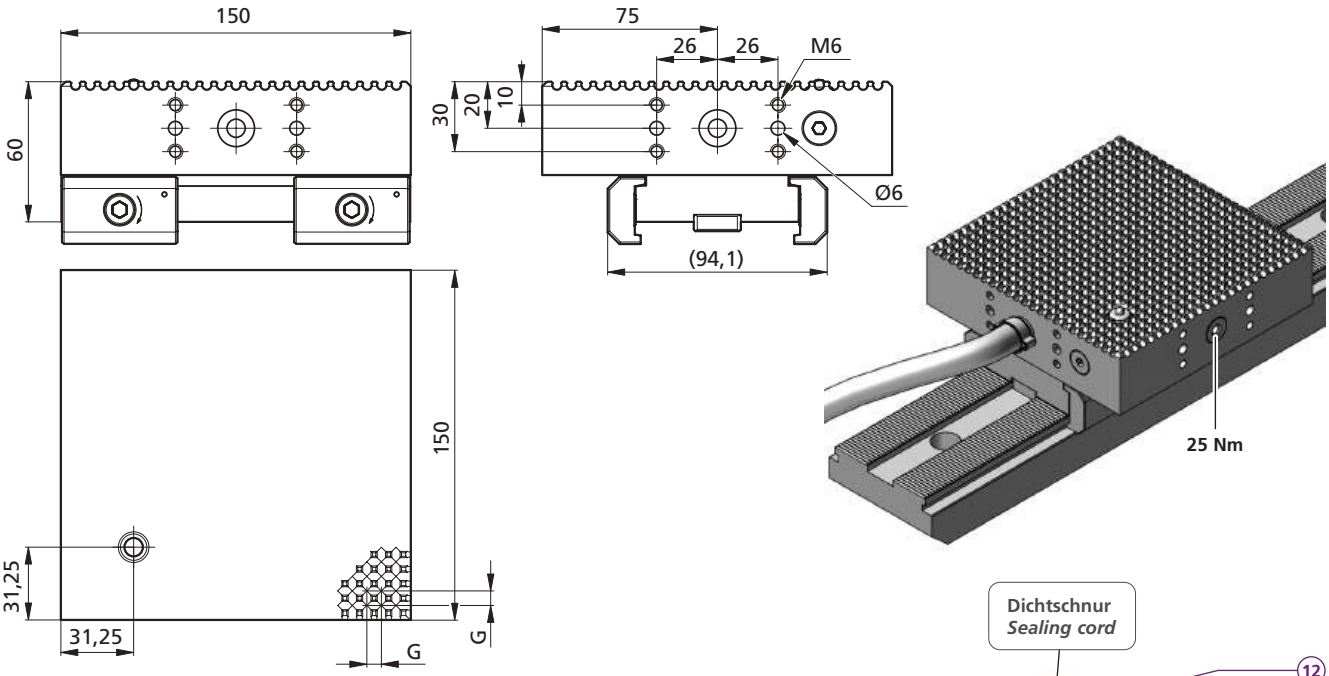


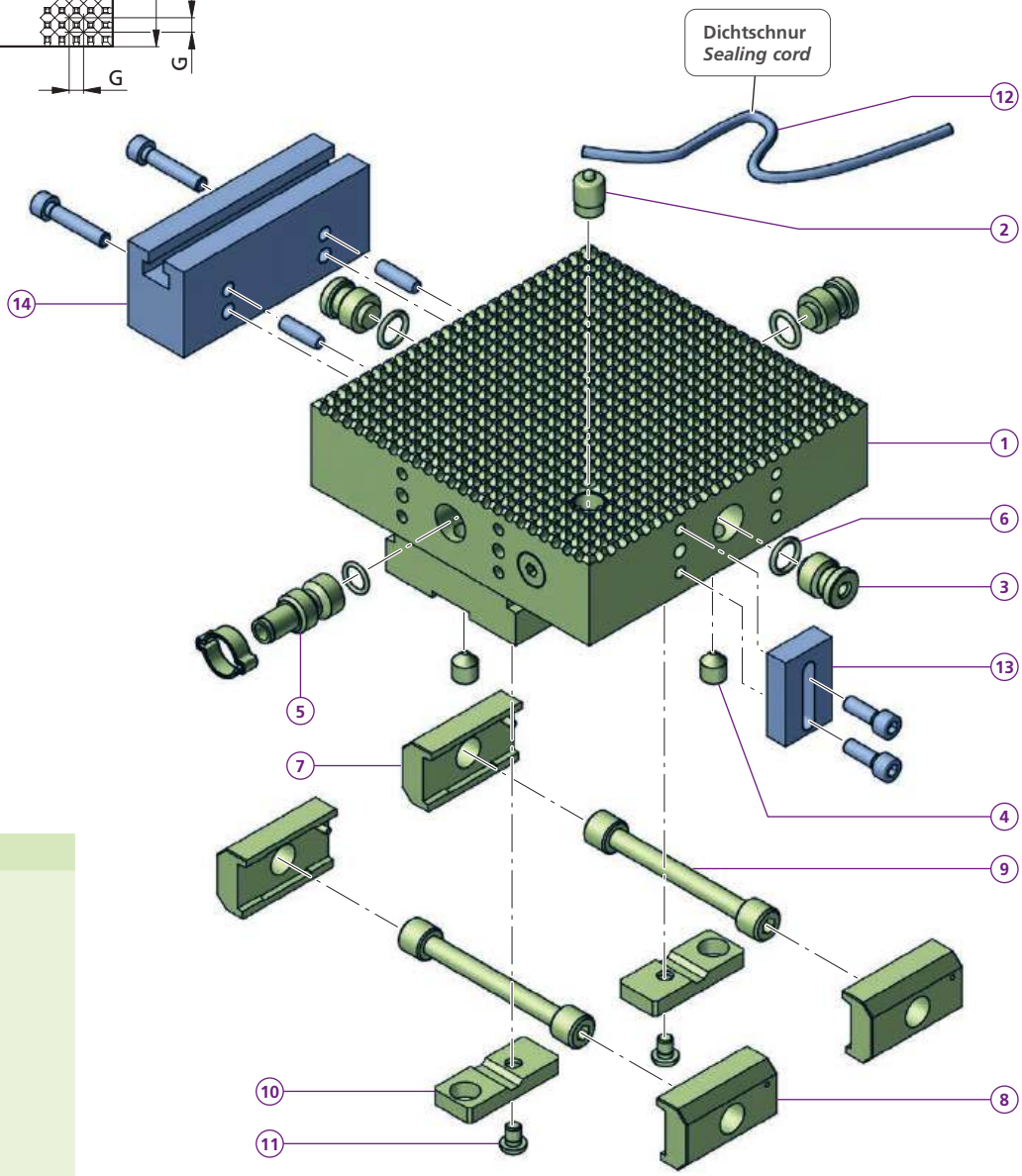
Bestellbeispiel / *Ordering example*:
UP15030040R50G13 & 1x ADAPT6-12 & 1x 1110100

Profilfräser / *Carbide end mills* G13 / G06 p. 324

Dichtschnüre je nach Bedarf / *Sealing cords as needed*

Separat bestellen / *Order separately*





G06

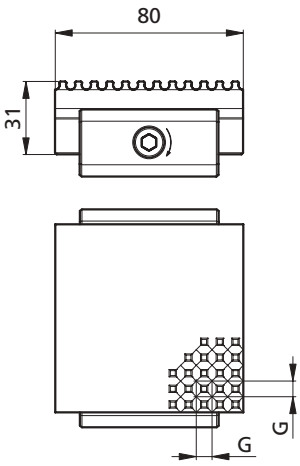
	PS1X150L60-VAC		
1	1x	TW090017-01	
2	1x	**0700100**	
3	3x	**0920000**	
4	4x	**M10X12ISO4027**	
5	1x	**0910001**	
6	5x	**1111003**	
7	2x	**PCSP50R**	
8	2x	**PCSP50L**	
9	2x	**PCS14**	
10	2x	**PCGU2049**	
11	2x	**M6X8ISO7380**	
12	1x	**1120100**	p. 324
13	1x	**UA182540**	p. 322
14	1x	**UT1003040**	
G	=	6,5 mm	
kg		~3,6	

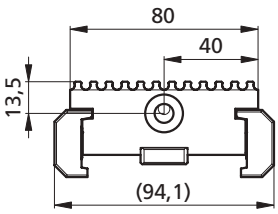
Bestellbeispiel / *Ordering example*:
PS1X150L60-VAC & 1x 1120100 & 1x UA182540 & 1x UT1003040

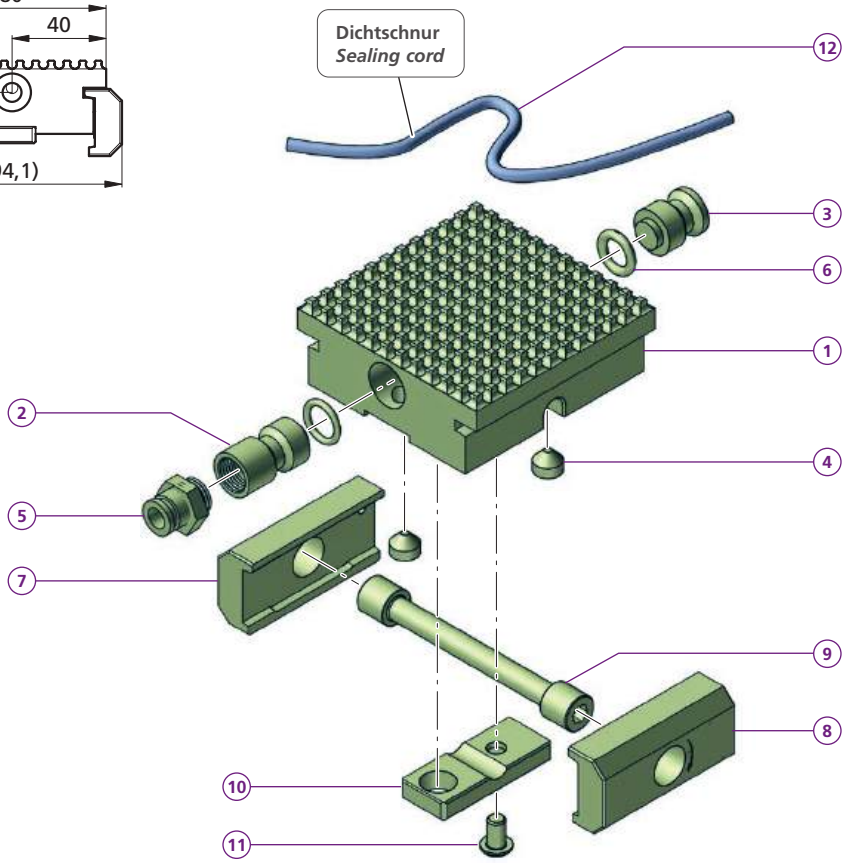
Separat bestellen / *Order separately*

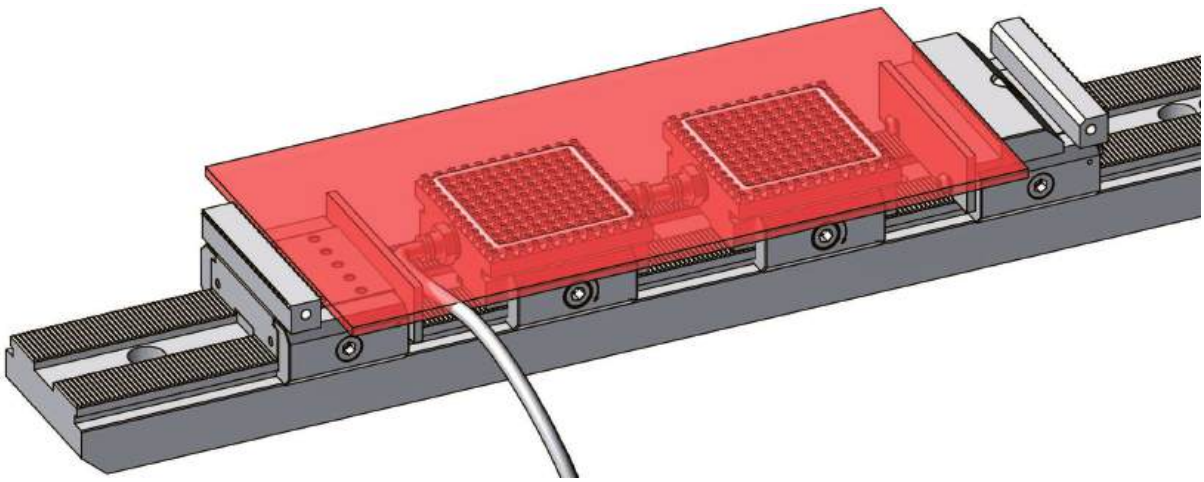
Vakuum-Modul für powerCLAMP
Vacuum module for powerCLAMP

PS1X80L31-VAC **trivaCLAMP**



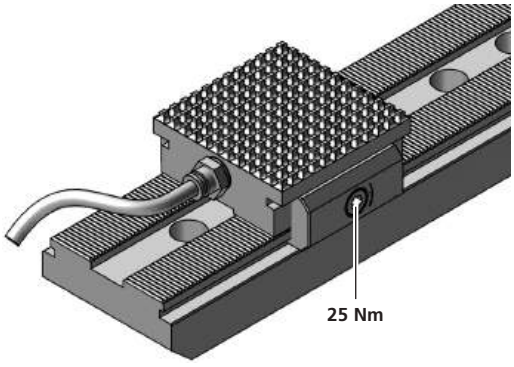






G06

PS1X80L31-VAC		
1	1x	TH140263
2	1x	UZV16301/4
3	1x	**0920000**
4	2x	M10X8DIN914
5	1x	**QSG1/4-8**
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

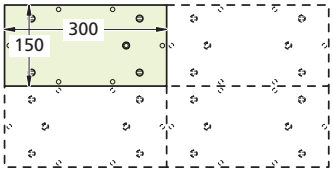


Bestellbeispiel / ***Ordering example***: PS1X80L31-VAC & 1x 1120100

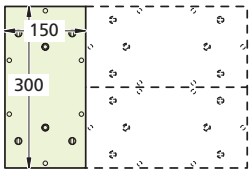
Separat bestellen / Order separately

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

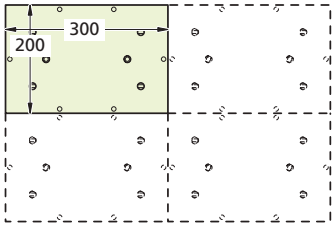


3 x = 300 x 450

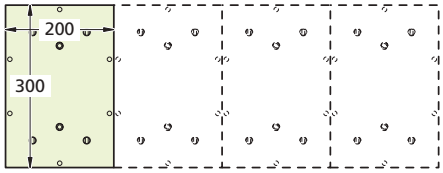


UP20030040R50 G06 / G13

Platte / *Plate*
1 x = 200 x 300
2 x = 200 x 600
4 x = 400 x 600

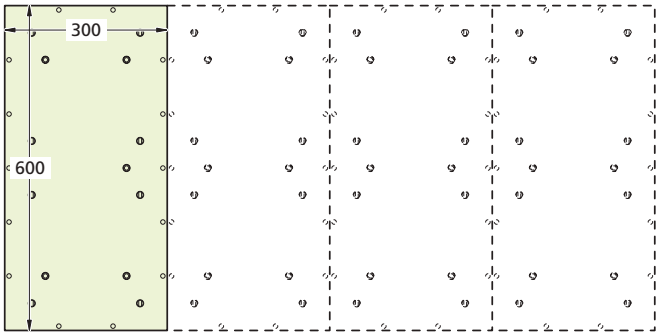


3 x = 300 x 600
4 x = 300 x 800



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



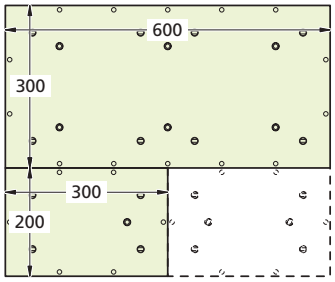
UP30060040R50 G06 / G13

Platte / *Plate*
1 x 300 x 600

UP20030040R50 G06 / G13

Platte / *Plate*
2 x 200 x 300

= 500 x 600



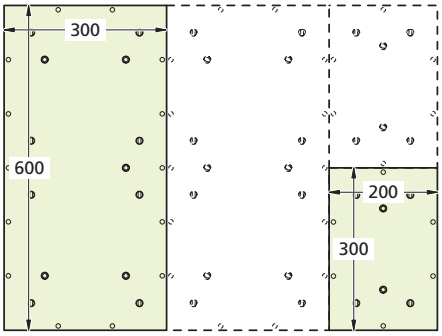
UP30060040R50 G06 / G13

Platte / *Plate*
2 x 300 x 600

UP20030040R50 G06 / G13

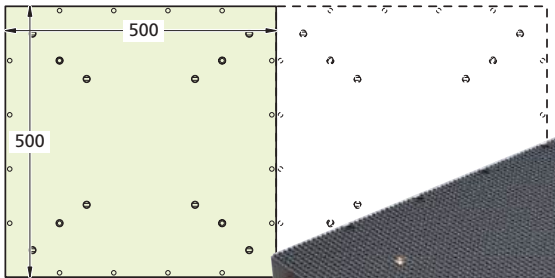
Platte / *Plate*
2 x 200 x 300

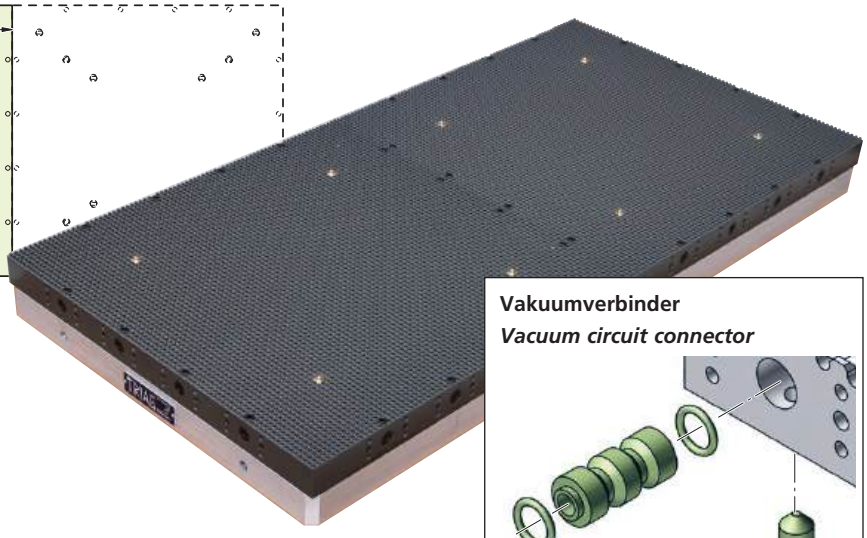
= 600 x 800



UP50050040R50 G06 / G13

Platte / *Plate*
2 x = 500 x 1000

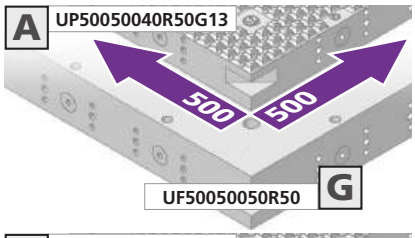




Vakuumverbinder
Vacuum circuit connector

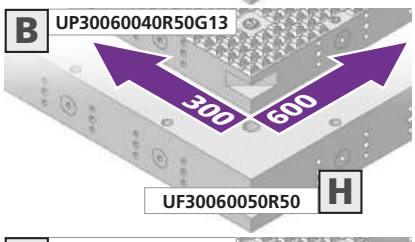
UPSET **D** **1** **V** **G...**

A UP50050040R50G13



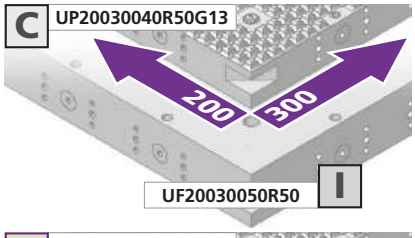
UF50050050R50 **G**

B UP30060040R50G13



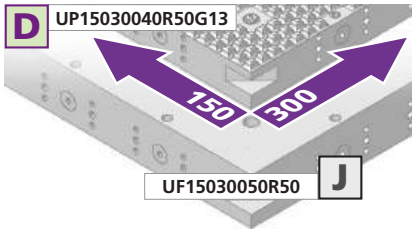
UF30060050R50 **H**

C UP20030040R50G13



UF20030050R50 **I**

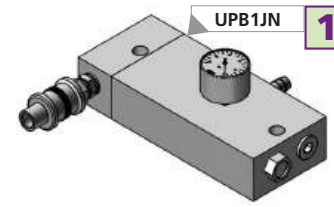
D UP15030040R50G13



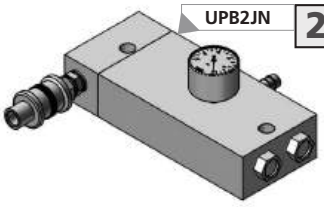
UF15030050R50 **J**

E PS1X150L60-VAC **G06**

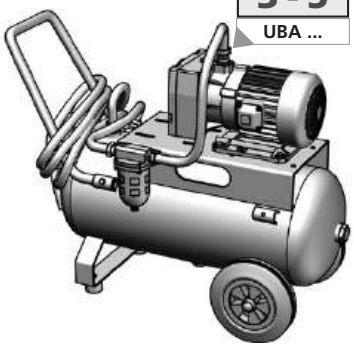
F PS1X80L31-VAC **G06**



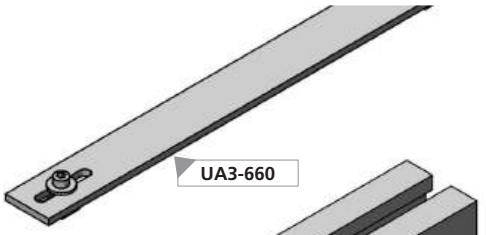
UPB1JN **1**



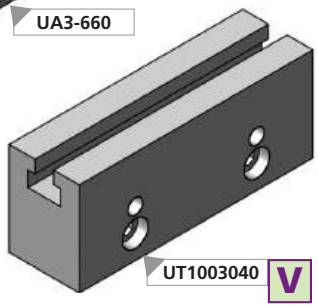
UPB2JN **2**



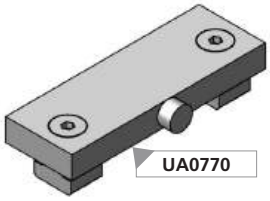
3 - 5 UBA ...



UA3-660

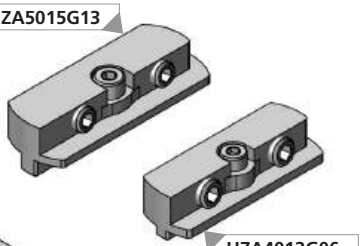


UT1003040 **V**

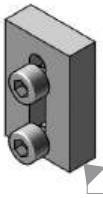


UA0770

UZA5015G13



UZA4012G06



UA182540

G13 **G06**

Vakuumplatte *Vacuum plate*

- **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)

Vakuum erzeugen *Generate vacuum*

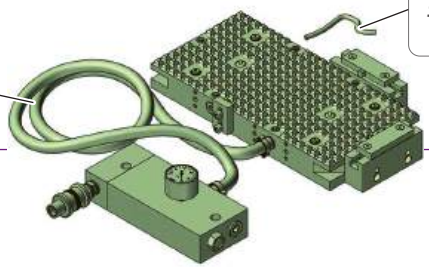
- **1** UPB1JN
- **2** UPB2JN
- **3** UBA106230300
- **4** UBA106110250
- **5** UBA318400550

Zubehör *Accessories*

- **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

Vakuumschlauch
Vacuum hose
3 m: 0941000

Dichtschnur
Sealing cord
25 m: 1120100

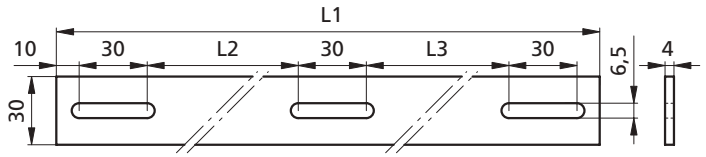


Zu jedem SET werden zusätzlich **3 m Vakuumschlauch** (**0941000**) und **25 m Dichtschnur** mitgeliefert (**1120100**) Ø 4 oder (**1110100**) 6 mm inkl. (2 x **10100024**).

*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**).*

Bestellbeispiel / *Ordering example*: UPSETD1VG13

Anschlagleisten
Stop rails

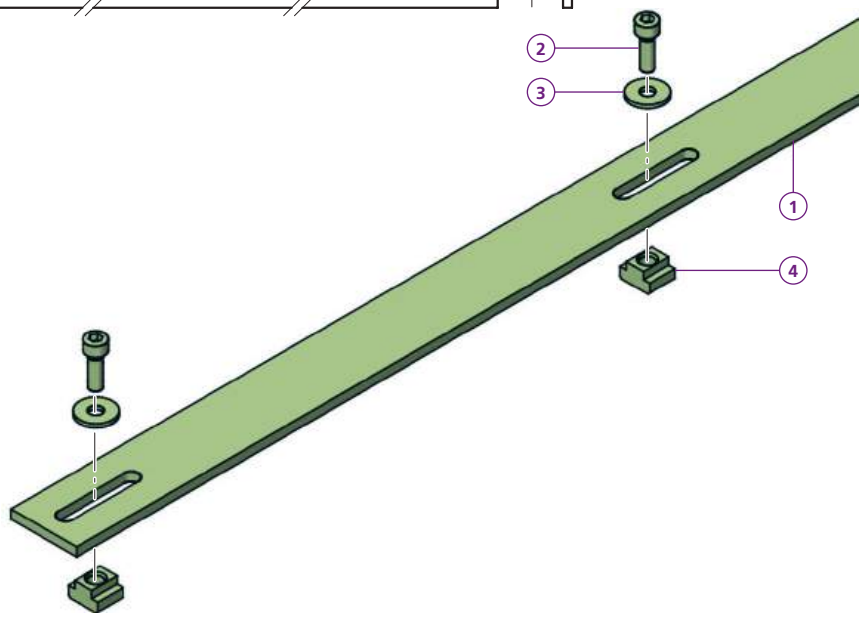


	UA3-660
1	1x TH160274
2	3x **M6X12ISO4762**
3	3x 6,4 DIN9021
4	3x **SM1135M6X8**
L1	= 660 mm
L2	= 270 mm
L3	= 280 mm
kg	~0,6

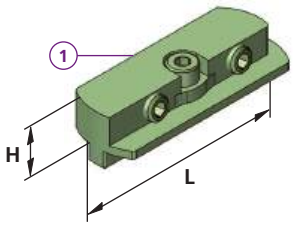
	UA3-560
	1x TH160275
	3x **M6X12ISO4762**
	3x 6,4 DIN9021
	3x **SM1135M6X8**
	= 560 mm
	= 225 mm
	= 225 mm
	~0,5

	UA3-360
1	1x TH160277
2	3x **M6X12ISO4762**
3	3x 6,4 DIN9021
4	3x **SM1135M6X8**
L1	= 360 mm
L2	= 120 mm
L3	= 130 mm
kg	~0,32

	UA2-260
	1x TH160278
	2x **M6X12ISO4762**
	2x 6,4 DIN9021
	2x **SM1135M6X8**
	= 260 mm
	= 180 mm
	~0,2

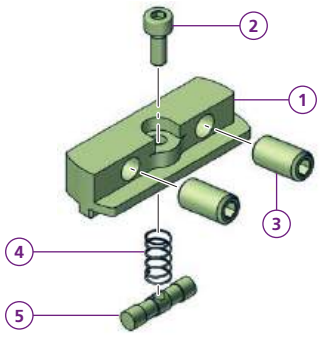


Anschlag
Stop rail



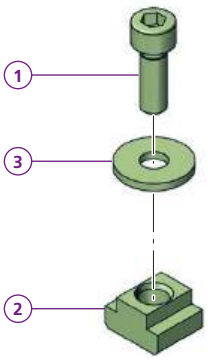
	UZA5015G13
1	1x TB170561
L	= 50 mm
H	= 9 mm
kg	~0,04

Bedienungsanleitung zu diesen zwei Anschlägen
Operating instructions for these two stops



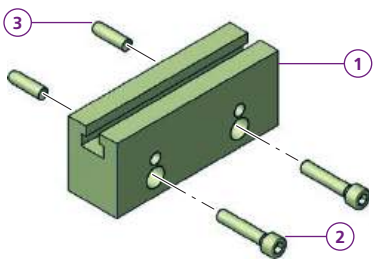
	UZA4012G06
1	1x TB170558
2	1x **M4X10ISO4762**
3	2x M6X16 DIN913
4	1x TN100535
5	1x TB170562
L	= 40 mm
H	= 8,5 mm
kg	~0,03

T-Nuten Stein
T-nuts



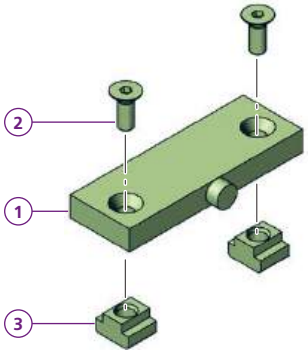
	0802000-SET
1	1x **M6X12ISO4762**
2	1x **SM1135M6X8**
3	1x 6,4 DIN9021
kg	~0,03

Ansetzbare T-Nuten
Attachable T-slots



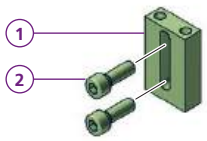
	UT1003040
1	1x TH160227
2	2x **M6X25ISO4762**
3	2x 6X20-B ISO8734
kg	~0,4

Seiten-/Wendeanschlag
Reversible stop gage



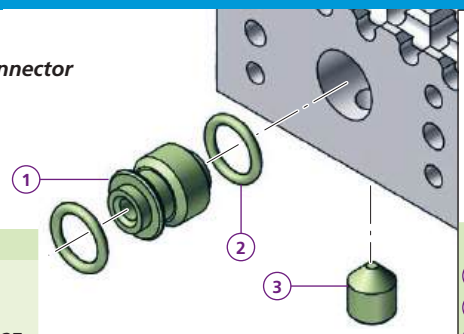
	UA0770
1	1x TH160259
2	2x TN100899
3	2x **SM1135M6X8**
kg	~0,14

Seitenanschlag
Side lay



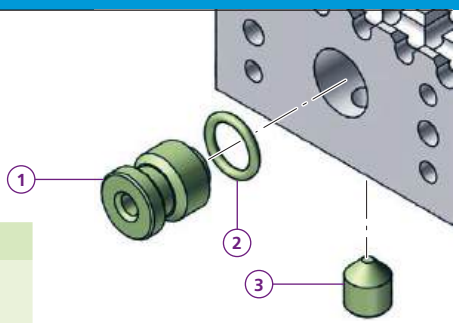
	UA182540
1	1x TH160098
2	2x **M6X18ISO4762**
kg	~0,1

Vakuumverbinder
Vacuum circuit connector



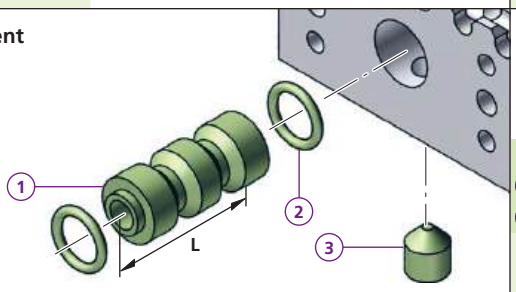
0930000	
1	1x TK110401
2	2x **1111003**
3	1x **M10X12ISO4027**
kg	~0,02

Blindstopfen
Blind plug



0920000	
1	1x TK110402
2	1x **1111003**
3	1x **M10X12ISO4027**
kg	~0,03

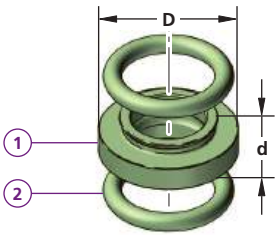
Koppelelement
Link-up plug



0910000	
1	1x TK110403
2	2x **1111003**
3	1x **M10X12ISO4027**
L	= 40 mm
kg	~0,03

0910080	
1	1x TK140763
2	2x **1111003**
3	1x **M10X12ISO4027**
L	= 80 mm
kg	~0,04

Vakuumverbinder
Vacuum circuit connector

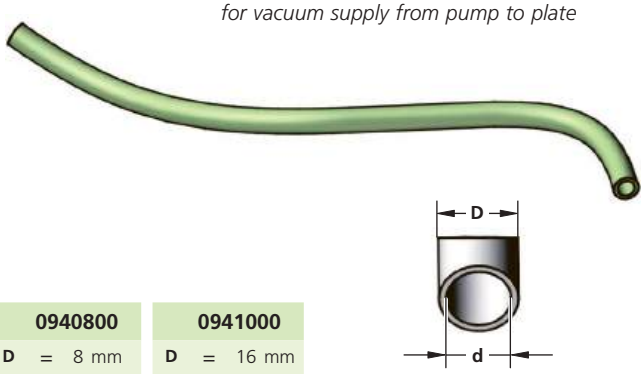


TS150487	
1	1x **TS150487**
2	2x **TN100682**
d	= 5,8 mm
D	= 15 mm

Vakuumschlauch (per Laufmeter)
Vacuum hose (per running meter)

D = 8 mm für Vakuumanbindung von Platte zu Platte
for vacuum supply from plates to accessories

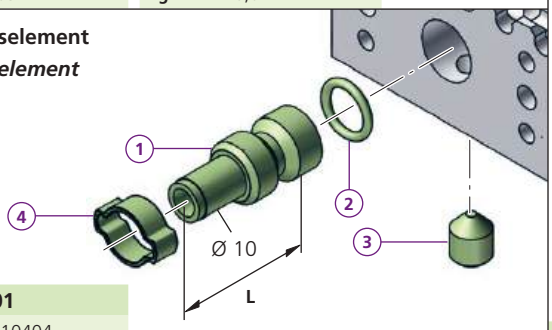
D = 16 mm für Vakuumverbindung von Pumpe zu Platten
for vacuum supply from pump to plate



0940800	
D	= 8 mm
d	= 5,5 mm

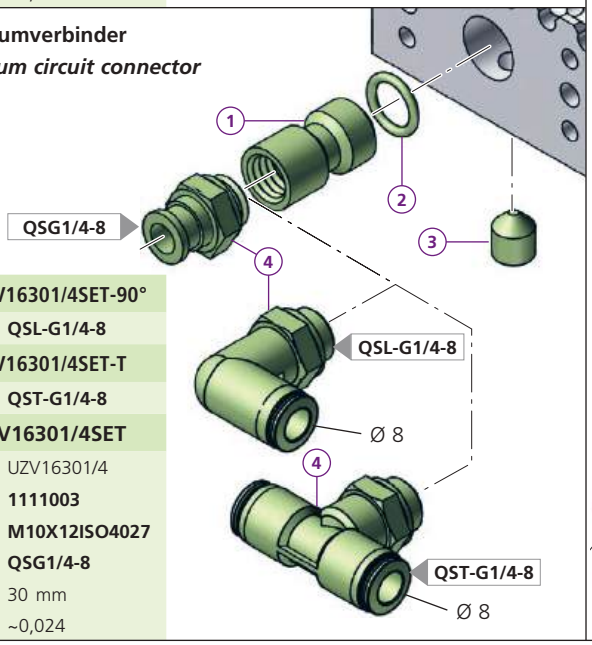
0941000	
D	= 16 mm
d	= 10 mm

Anschlusselement
Adapter element



0910001	
1	1x TK110404
2	1x **1111003**
3	1x **M10X12ISO4027**
4	1x **10100024**
L	= 40 mm
kg	~0,04

Vakuumverbinder
Vacuum circuit connector

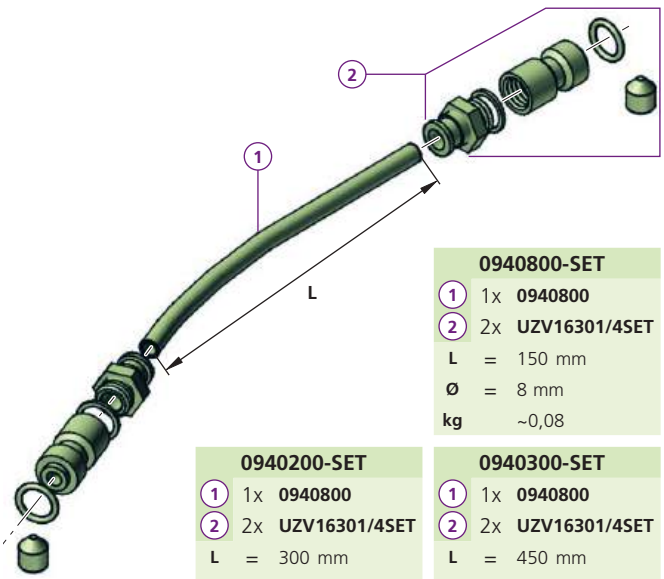


UZV16301/4SET-90°	
4	1x QSL-G1/4-8

UZV16301/4SET-T	
4	1x QST-G1/4-8

UZV16301/4SET	
1	1x UZV16301/4
2	1x **1111003**
3	1x **M10X12ISO4027**
4	1x **QSG1/4-8**
L	= 30 mm
kg	~0,024

Verbindungsschlauch mit Koppelelementen
Connector-tube with link-ups



0940800-SET	
1	1x **0940800**
2	2x **UZV16301/4SET**
L	= 150 mm
Ø	= 8 mm
kg	~0,08

0940200-SET	
1	1x **0940800**
2	2x **UZV16301/4SET**
L	= 300 mm
Ø	= 8 mm
kg	~0,08

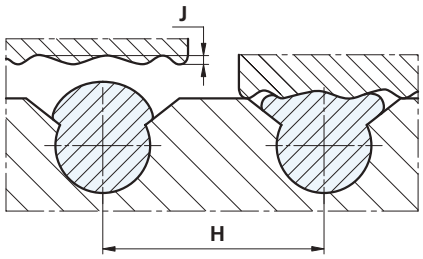
0940300-SET	
1	1x **0940800**
2	2x **UZV16301/4SET**
L	= 450 mm
Ø	= 8 mm
kg	~0,09

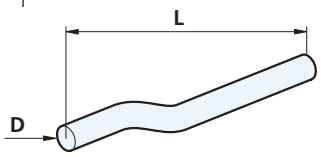
Dichtschnüre aus Silikon-Gummi
Beständig gegen Öle, Säuren, Emulsionen, Dielektrika, ionisiertes Wasser und Wärme bis 200°C

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 | weiss / *white*

1110100
L = 25 m
D = **6,5 mm** ±0,5
J = max. 0,6 mm
H = 12-13 mm

G06 | weiss / *white*

1120100	1120100M
L = 25 m	L = 25 m
D = **4 mm** (4,3-4,6 mm)	D = **4 mm** (4,0-4,3 mm)
J = max. 0,4 mm	J = max. 0,3 mm
H = 6-7 mm	H = 6-7 mm

1130000
L = 5 m
D = **3 mm**

G13 | schwarz / *black*

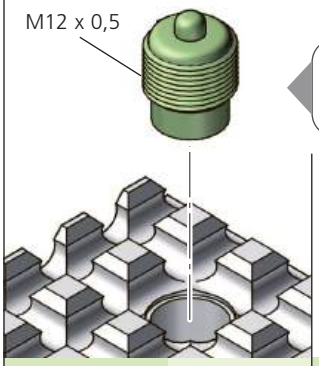
1110100S	1110100SP
L = 25 m	L = 25 m
D = **6,0 - 6,5 mm**	D = **6,6 - 7,0 mm**
J = max. 0,6 mm	J = max. 0,6 mm
H = 12-13 mm	H = 12-13 mm

weiss / *white*

0130001	0130002
L = 1 m	L = 1 m
D = **2,15 mm**	D = **1,65 mm**

Triva Clamp Ventil / ***Triva Clamp valve***

Montage von oben
Mounting from above



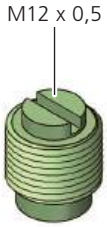
0700100 kg ~0,01

Spezialschlüssel zu
Special key for
0700100



Triva Bit kg ~0,14

Ventil-Blindstopfen
Valve blind plug



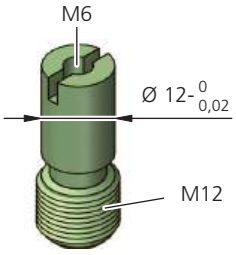
0700102 kg ~0,01

Montage von unten, für Spezialvorrichtungen
Mounting from bottom side, for special devices



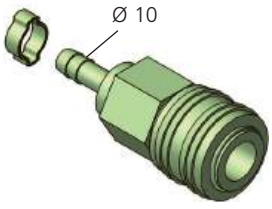
0700200 kg ~0,01

Reduktionstück für Rasterplatten M12/12^{f7} auf M6
Adapter piece for Gridplates from M12/12^{f7} to M6



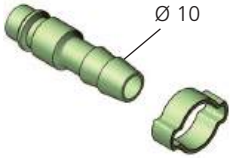
ADAPT6-12 kg ~0,02

Schnellkupplung mit Bride
Quick hose coupling including clip



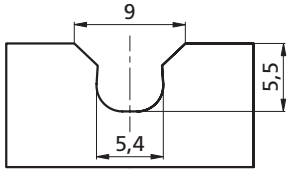
0520000 kg ~0,14

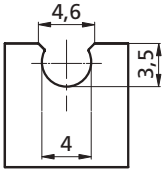
Schlauchnippel mit Bride
Hose nozzle including clip

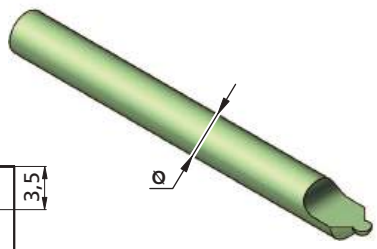


0941010 kg ~0,03

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
- Fahrbarem 40 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 40l (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 m³/h	**UBA306400250**
1-Phasen / *Single phase* 230 V ± 10%, 50 / 60 Hz, 300 / 360 W	6 / 7,2 m³/h	**UBA106230300**
1-Phasen / *Single phase* 110 V ± 10%, 60 Hz, 250 / 300 W	6 / 7,2 m³/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 m³/h	**UBA318400550**
1-Phasen / *Single phase* 230 V ± 10%, 50 / 60 Hz, 600 / 720 W	18 / 21 m³/h	**UBA118230600**

Separater Tank / *Separate tank*	
	UBT40
Vol.	40l

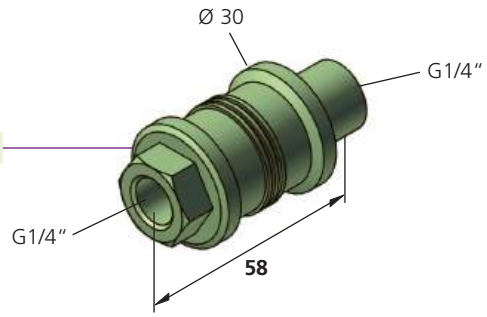
Öl für Vakuumpumpe / *Oil for vacuum pump*	
	UB1-OIL
Vol.	1l



Bedienungsanleitung zu diesem Vakuumpumpen
Operating instructions for this vacuum pump

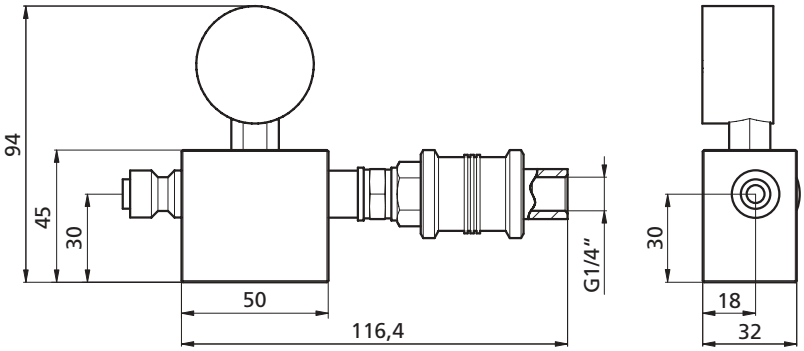
➥ **Grössere Pumpen auf Anfrage**
➥ ***Larger pumps on demand***

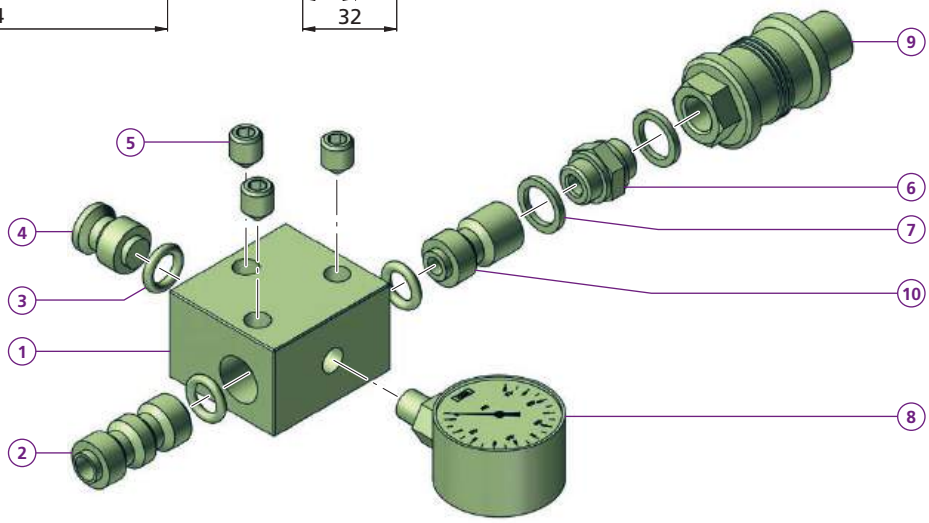
Schaltventil
Control unit



TN100668	**kg**	~0,096

Schaltventil mit Unterdruckanzeige
Control unit valve with vacuum indicator





UBS5045		
1	1x	**UBS5045-1**
2	1x	**0910000**
3	3x	TN100822
4	1x	**0920000**
5	3x	TN100086
6	1x	TN100671
7	2x	TN100642
8	1x	TN100925
9	1x	**TN100668**
10	1x	TH120180
kg		~0,74

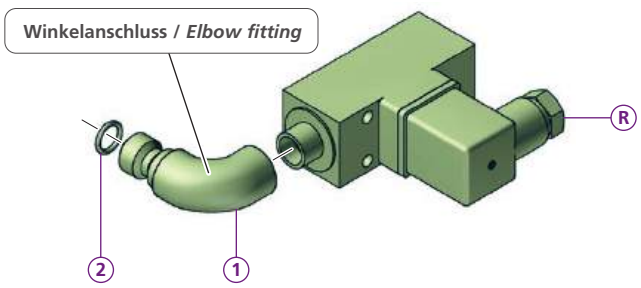
Druckwächter / *Pressure sensor switch*

Druck einstellbar; je nach Aufspannung einzustellen.

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).

With adjustable threshold value; to be adjusted according to clamping task.

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.



0500205		
1	1x	0940000
2	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.

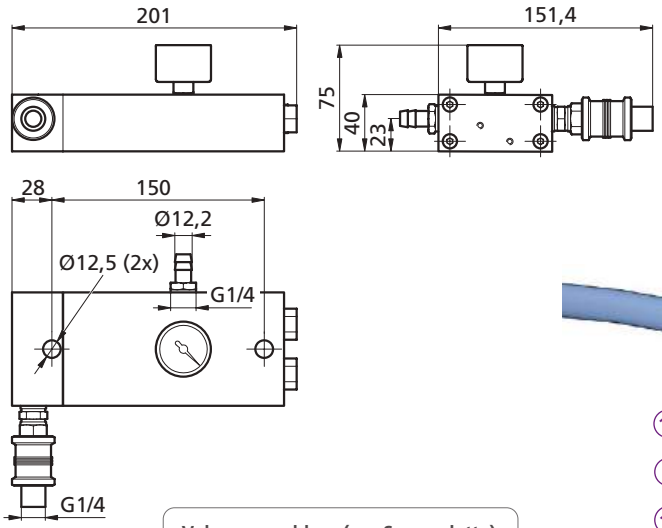
Maximaler zulässiger Speisedruck: 7 bar
Maximal erreichbares Vakuum: 0,92 bar

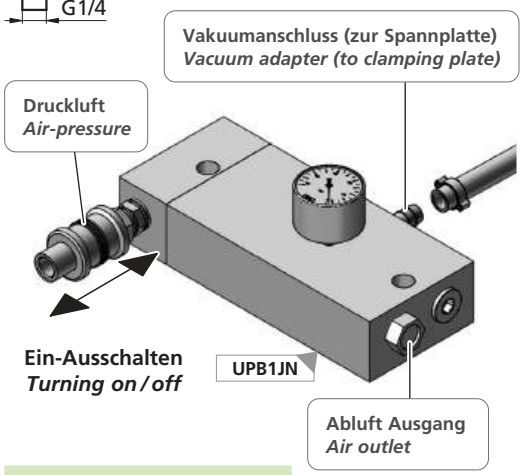
Der Normalliter (Nl) entspricht dem Volumen, das eine bestimmte Menge (Masse) Gas bei atmosphärischem Druck einnehmen würde. Die Durchflussmenge wird berechnet aus Volumen pro Zeit (Nl/s) unter Normalbedingungen (atmosphärischer Druck, 20°C).

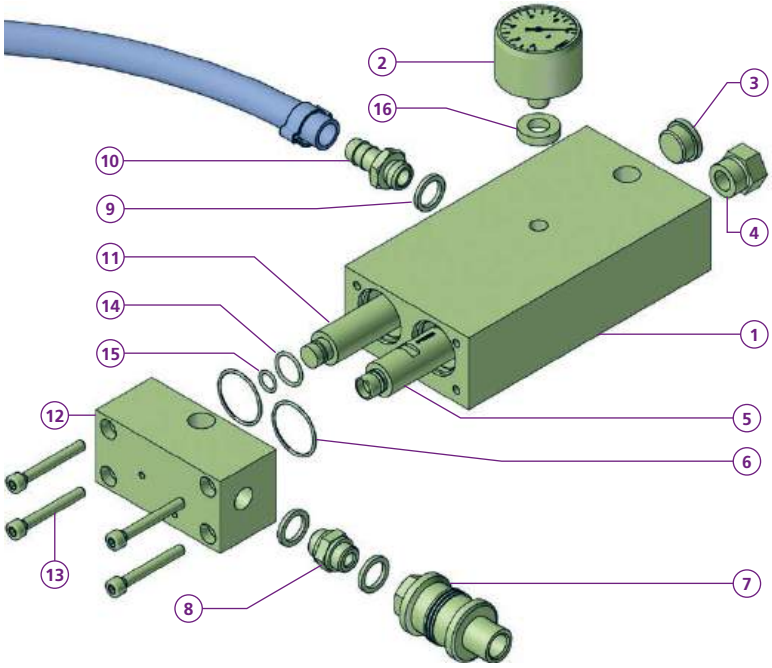
Maximum allowable supply pressure: 7 bar
Maximum attainable vacuum: 0,92 bar

The normal litres (Nl) is the volume that would take a certain amount (mass) of gas at atmospheric pressure. The flow rate is calculated as volume per time (Nl/s) under normal conditions (atmospheric pressure, 20° C).

Typ *Type*	Speisedruck *Feed pressure*	Luftverbrauch *Air consumption*	Saugleistung bei 50% Vakuum *Vacuum suction power at 50%*	Saugleistung bei 90% Vakuum *Vacuum suction power at 90%*
	bar	Nl/s	Nl/s	Nl/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

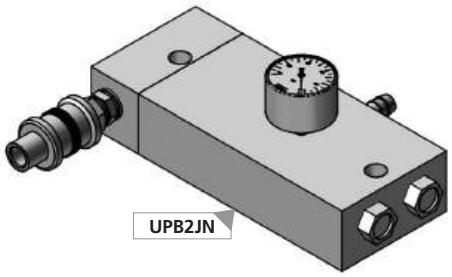






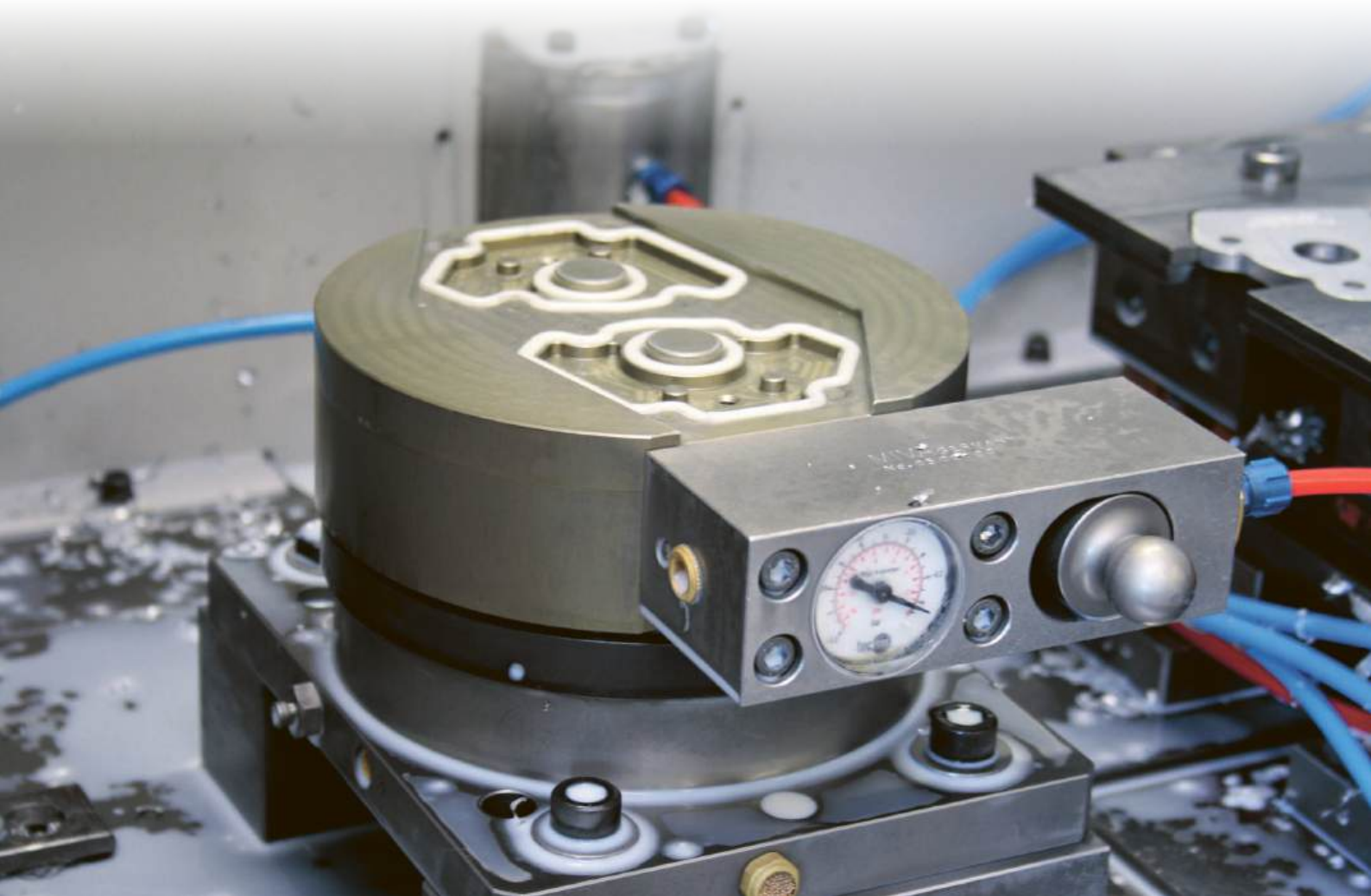
UPB1JN		
1	1x	TW090057
2	1x	TN100667
3	1x	TN100660
4	1x	TW100199
5	1x	TN100665
6	2x	TN100057
7	1x	**TN100668**
8	1x	TN100671
9	3x	TN100642
10	1x	TN100664
11	1x	TW090057
12	1x	TW90057-02
13	4x	TN100666
14	1x	TN100691
15	1x	TN100163
16	1x	TN100942
kg		~1,61

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	TN100942
kg		~1,67



Bestellbeispiel / *Ordering example*: UPB1JN

Separat bestellen / *Order separately*



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05.11.2024

customCLAMP



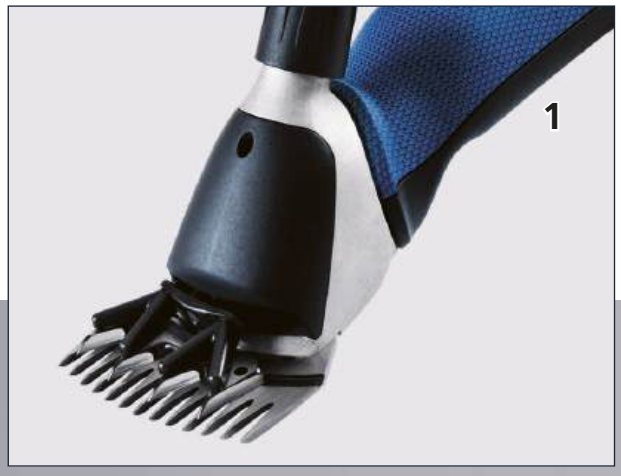
Fordern Sie uns heraus!
Challenge us!



Wir sind Ihr Spezialist für Sondervorrichtungen.
Nehmen Sie mit uns Kontakt auf.

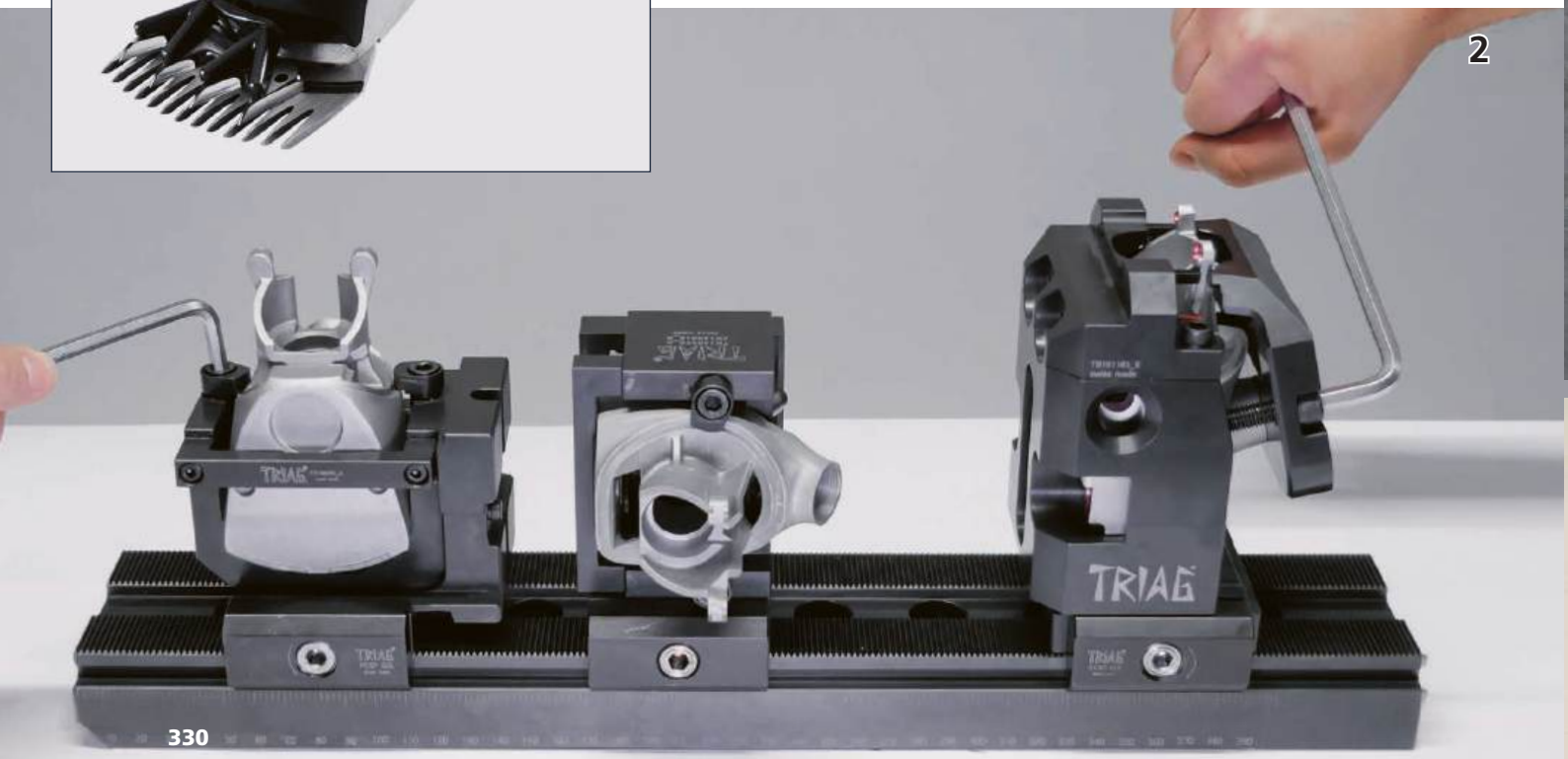
We are your specialist for custom made fixtures.
Feel free to contact us.

Komplexe Teile einfach gespannt
Complex parts simply clamped



Drei Sonderspannmodule mit powerCLAMP Schnittstelle für komplex geformte Aluminium Druckguss Teile.

Three customized clamping modules with powerCLAMP interface for complex shaped die cast aluminium pieces.



3


TRIAG
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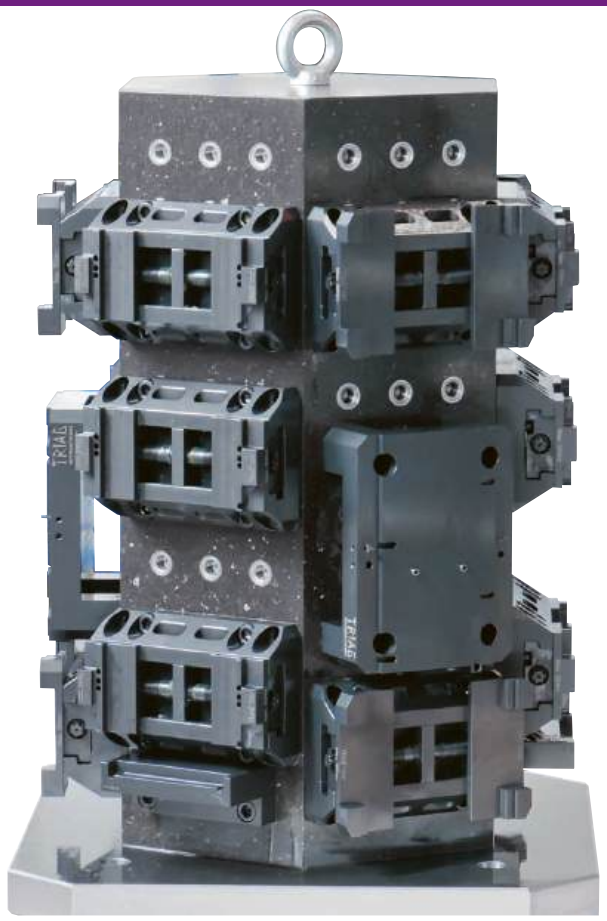
4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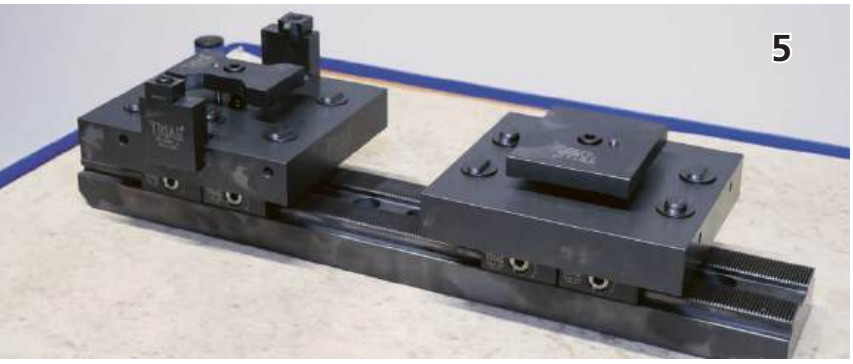
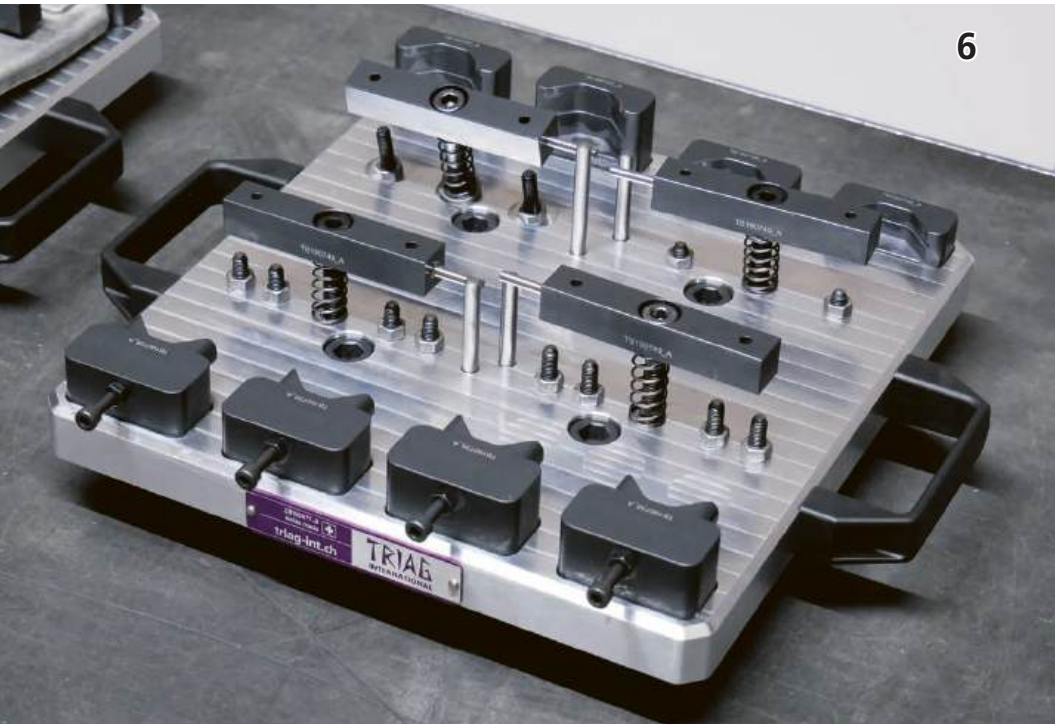
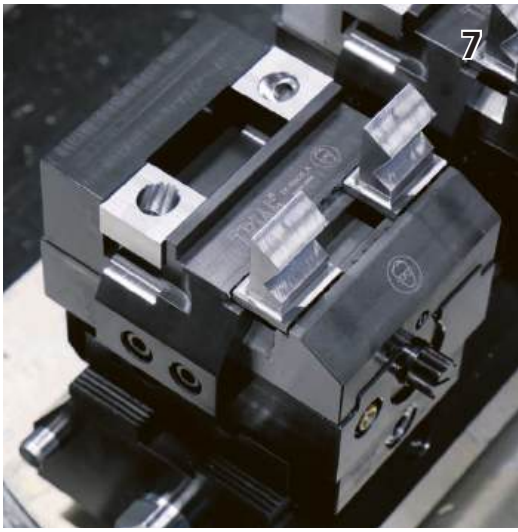
5



6


triag-int.ch
TRIAG
INTERNATIONAL

7



8


INTERNATIONAL
TRIAG

9


TRIAG

10





Zubehör
Accessories

Einstellmassstab | ***Measuring device*** .....  **335**

Magnetanschlag | ***Magnetic milling buffer*** .....  **336**

Fräsanschlag / Hartmetalldruckstück | ***Milling buffer / Carbide gripper*** .....  ....  **337**



Stopfen / Spannschrauben / Passschrauben / T-Nuten Steine
Plug / Clamping screw / Fitting screw / T-slot nuts .....  **338**



Triag Bitburr / Magnethalter / Pneumatikschrauber Set
Magnetic holder / Pneumatic screwdrivers set .....  ....  **339**

Drehmomentschlüssel / Spannschlüssel / Messingdrahtbürste
Torque wrenchs / Clamping wrench / Brass wire brush .....  **340**



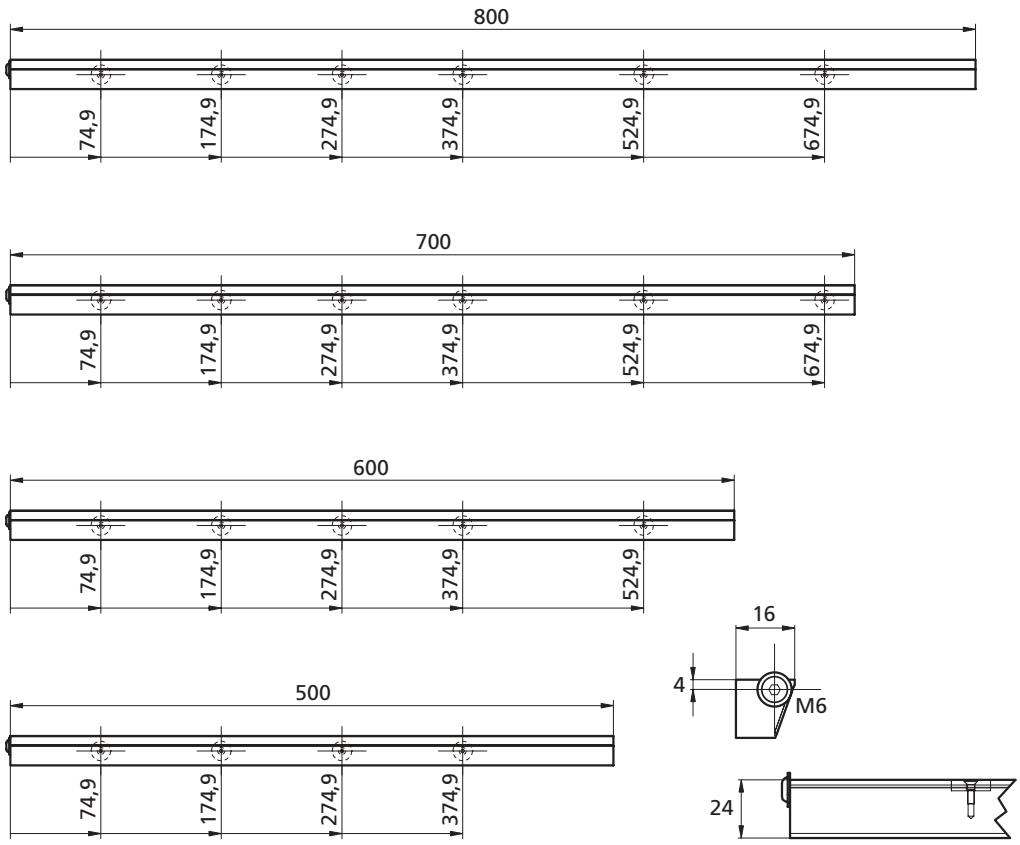
Massstab mit Magnetleiste
Scale with magnet profile

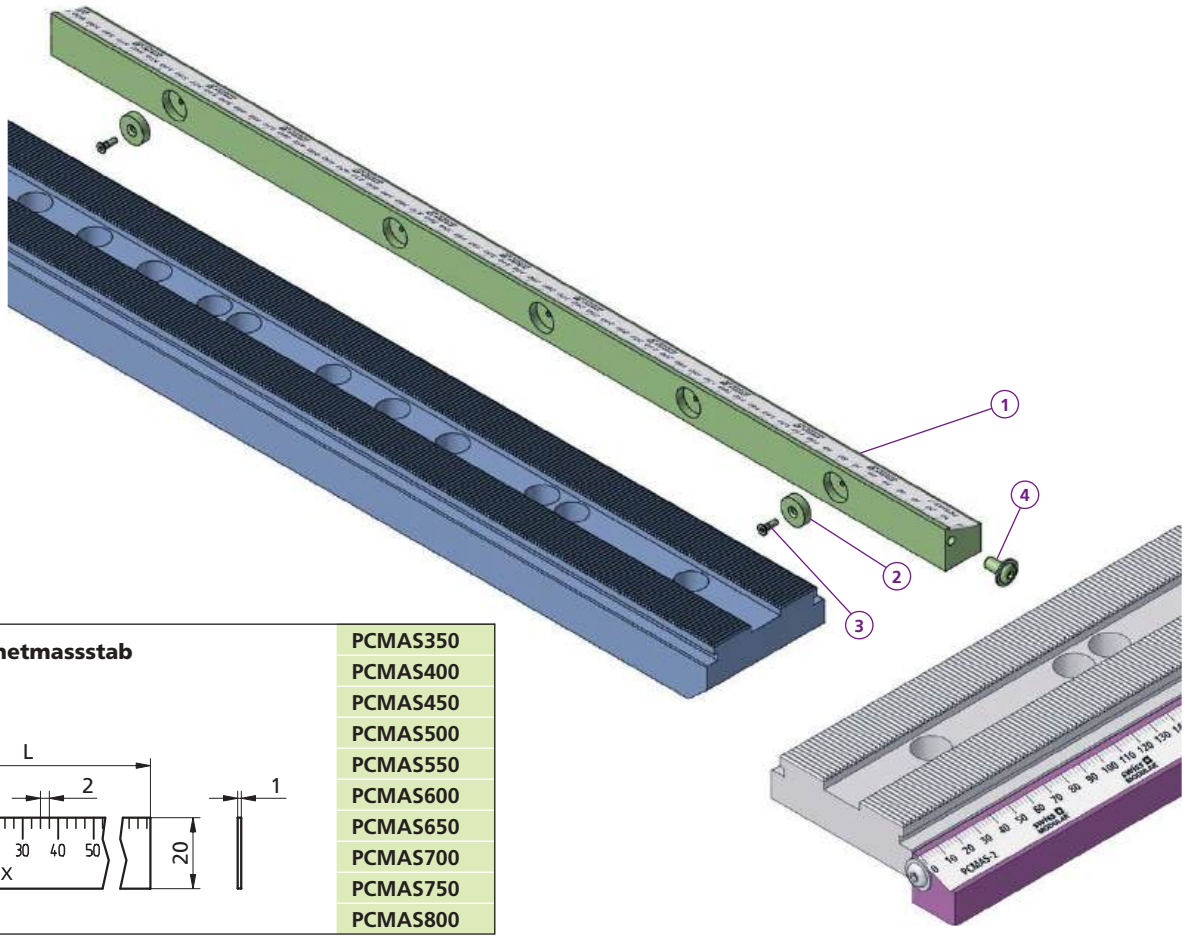
PCMAS800ML	
1	1x **PCMAS800ML**
2	2x MG1645
3	2x **M3X10ISO4762**
4	1x **M6X12BN5128**
kg	~1,0

PCMAS700ML	
1	1x **PCMAS700ML**
2	2x MG1645
3	2x **M3X10ISO4762**
4	1x **M6X12BN5128**
kg	~0,88

PCMAS600ML	
1	1x **PCMAS600ML**
2	2x MG1645
3	2x **M3X10ISO4762**
4	1x **M6X12BN5128**
kg	~0,75

PCMAS500ML	
1	1x **PCMAS500ML**
2	2x MG1645
3	2x **M3X10ISO4762**
4	1x **M6X12BN5128**
kg	~0,63



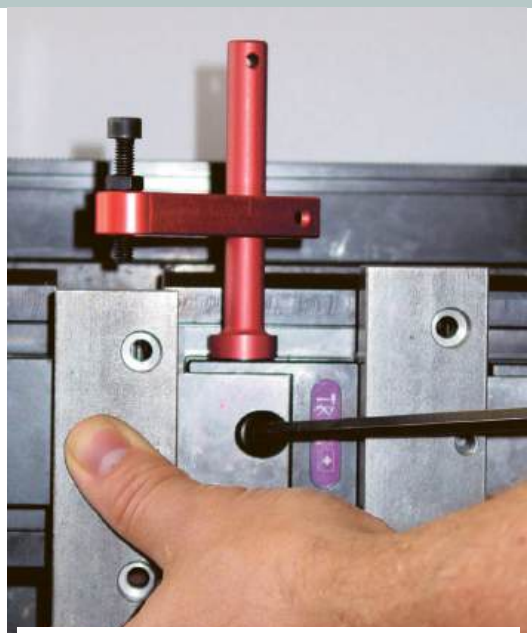


Alu - Magnetmassstab
Alu scale

PCMAS350
PCMAS400
PCMAS450
PCMAS500
PCMAS550
PCMAS600
PCMAS650
PCMAS700
PCMAS750
PCMAS800

Bestellbeispiel / *Ordering example* : PCMAS800ML

Separat bestellen / *Order separately*



Die einfache Plazierung ermöglicht schnelles Montieren und wieder Entfernen auch auf der 5-Achsen-Maschine!
Easy positioning makes quick mounting and lifting possible also on five axes machines!

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.

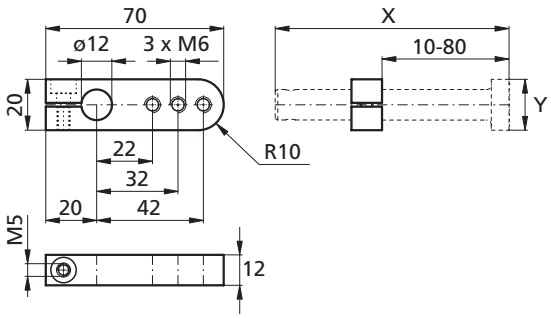
Dank dem **Magnet** ist der Anschlag auf allen magnetischen Materialien auf minimalem Platz einsetzbar, bei Kollision wird er weggedrückt. Es entstehen so keine teuren Werkzeugbrüche oder Maschinendefekte.

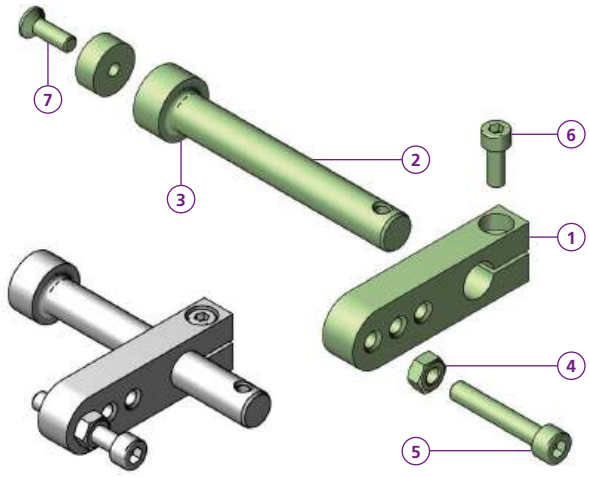
The 3 safety levels:

*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.*



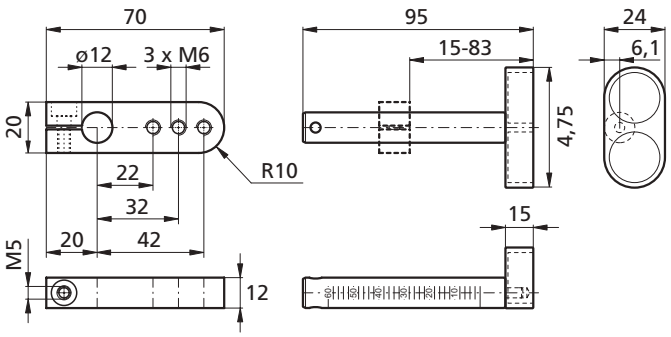


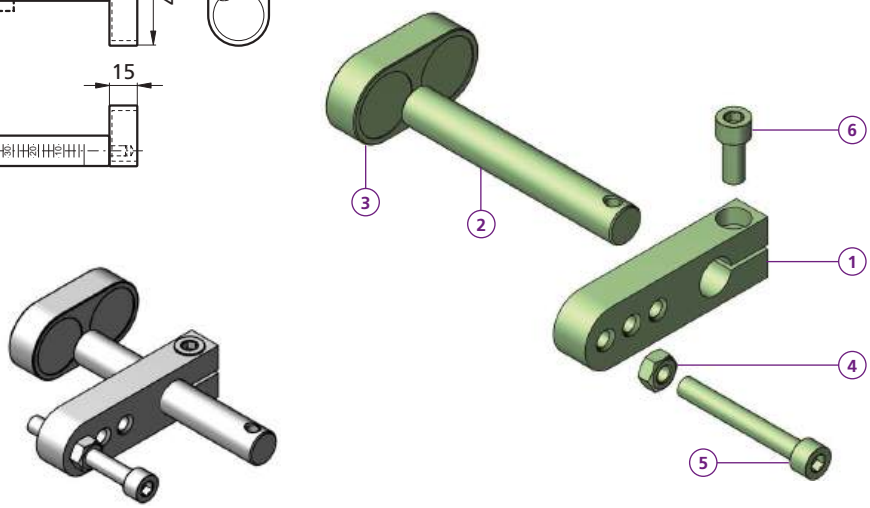
Haltekraft / *Holding force*
45N = 4,5daN (~4,5 kg)

	FAUM2070
1	1x FA2070
2	1x FAD2092
3	2x MG1645
4	2x M6ISO4032
5	1x **M6X35ISO4762**
6	1x **M5X14ISO4762**
7	1x M3X8ISO10642
X	= 92
Y	= ø 20
kg	~0,084

Haltekraft / *Holding force*
80N = 8daN (~8 kg)

	FAUM2070S
1	1x FA2070
2	1x FAD2092S
3	1x MG2570
4	1x M6ISO4032
5	1x **M6X35ISO4762**
6	1x **M5X14ISO4762**
7	1x M5X16ISO10642
X	= 95
Y	= ø 25
kg	~0,1



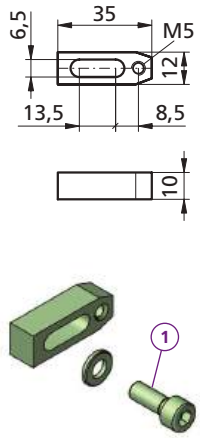


Haltekraft / *Holding force*
120N = 12daN (~12 kg)

	FAUM2070US
1	1x FA2070
2	1x FAD1280
3	1x FUSSUS
4	1x M6ISO4032
5	1x **M6X35ISO4762**
6	1x **M5X14ISO4762**
kg	~0,146

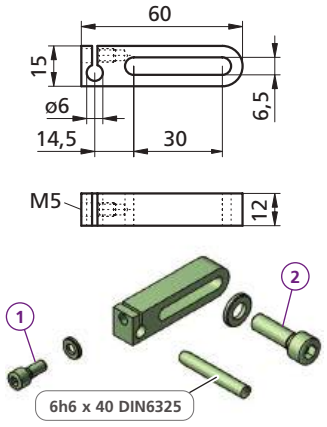
Bestellbeispiel *Ordering example* : FAUM2070US

Fräsanschlag / *Milling buffer*



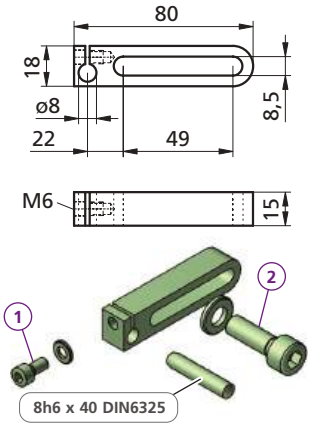
FA1240

1	1x	M6X18ISO4762
kg		~0,024



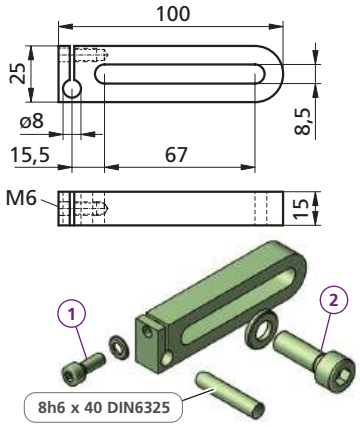
FA1260

1	1x	M5X12ISO4762
2	1x	M6X20ISO4762
kg		~0,07



FA1280

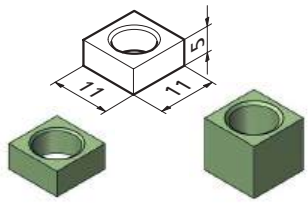
1	1x	M6X12ISO4762
2	1x	M8X25ISO4762
kg		~0,014



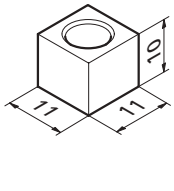
FA12100

1	1x	M6X16ISO4762
2	1x	M8X25ISO4762
kg		~0,022

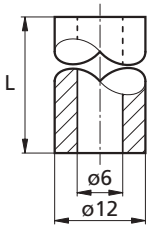
Distanzbüchse zu Fräsanschlag
Spacers for workpiece stop



CCD005



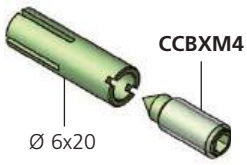
CCD010





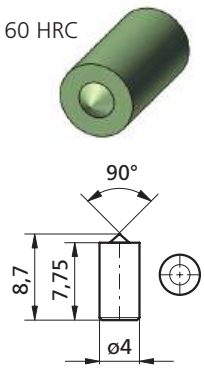
	L	kg
FAD12018	18	~0,012
FAD12023	23	~0,016
FAD12040	40	~0,026

Positionierstift (spreizbar)
Locating pin *(expandable)*

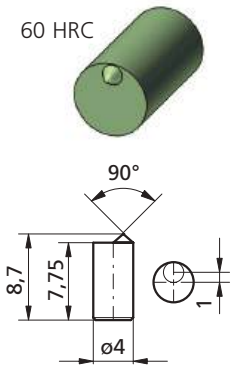


CCBX0802

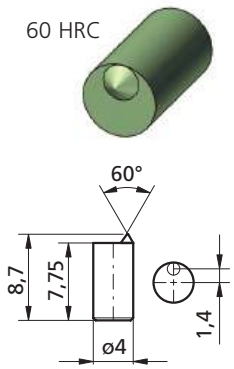
Druckstift / *Gripping pins*



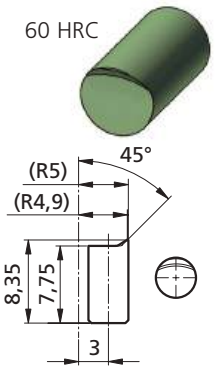
DS0402-90°



DSE0402-60°

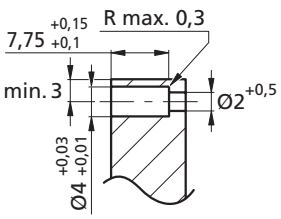


DSE0402-90°

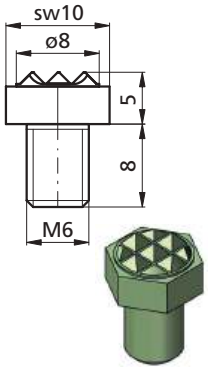


DSE0402-BS

Einbauanleitung
Installation guide
Bohrung vorbereiten
Preparation of drill-hole
Einkleben mit / *Glue with*
Loctite 641

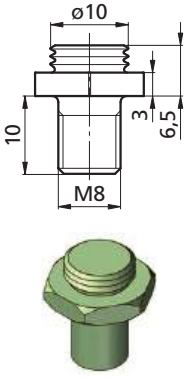


Hartmetalldruckstück
Carbide gripper

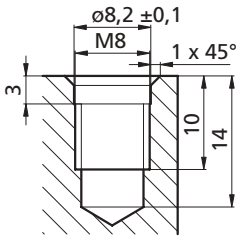


CCHMR

Prägespannschraube
Stamping roll screw

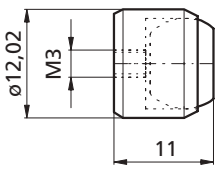


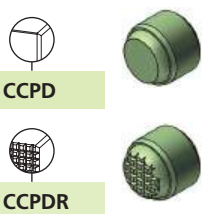
Bohrbild
Hole pattern



PRG1003M8

Kugeldruckstück
Gripper

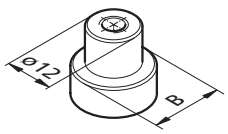




CCPD

CCPDR

Ausrichtzapfen für T-Nuten
Alignment-pins for t-slots



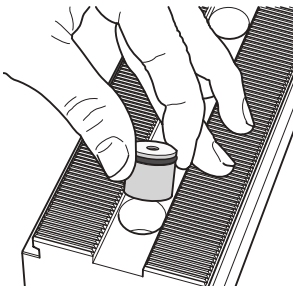
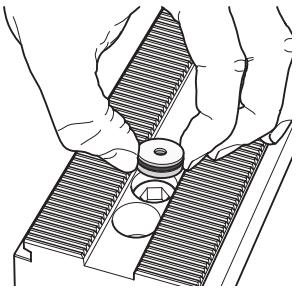
	B
TWADAPT10	10
TWADAPT12	12
TWADAPT14	14
TWADAPT16	16
TWADAPT18	18
TWADAPT20	20
TWADAPT22	22



Bestellbeispiel / ***Ordering example:*** FA1240

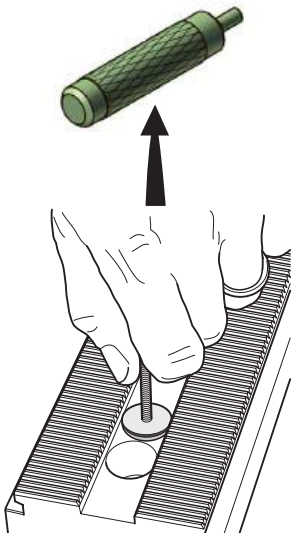
Stopfen *Plug* (Ø19 L18) (Ø19 L6)



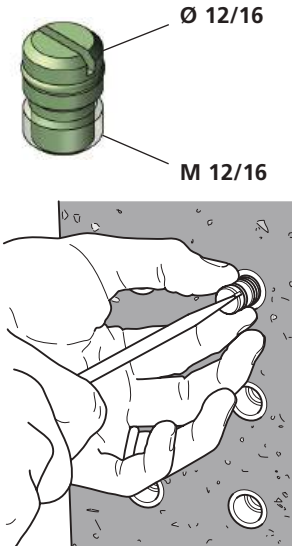
PCPF16L18 PCPF16L6

Auszieher *Extractor*



PCAZM3

Stopfen *Plug*



CCPF12ALU / CCPF16ALU

Spannschrauben (Nitriert)
Clamping screw *(Nitrided)*



	für/*for*	kg
M8x20ISO4762NQ	B60	~0,012
M10x25ISO4762NQ	B80	~0,024

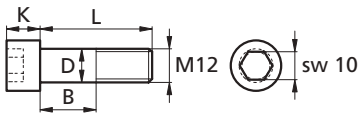
Reduktionshülsen für Rasterplatte ***Reduction sleeve for grid plate***





RD18M1612M12 RD16M1612M12 RD16M12

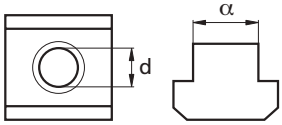
Passschrauben / ***Fitting screw*** **M5 / M6 / M12 / M16**





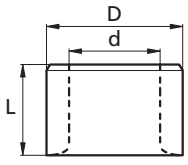
	D	G	L	B	K	sw	Nm	kg
MS50	5 f7	M5	17	9	5	4	4,5	~0,004
MS60	6 f7	M6	17	9	6	5	8	~0,006
TWPAS1227	12 g7	M12	27	14	12	10	60	~0,038
TWPAS1232	12 g7	M12	32	19	12	10	60	~0,042
TWPAS1240	12 g7	M12	40	20	12	10	60	~0,048
TWPAS1250	12 g7	M12	50	30	12	10	60	~0,058
TWPAS16055	16 f7	M16	55	30	15,8	14	150	~0,120

T-Nuten Steine / ***T-slot nuts***

d	α	kg
SM1135 M06X08		~0,012
SM1135 M06X10		~0,012
SM1135 M08X10		~0,012
SM1135 M08X12		~0,022
SM1135 M08X14		~0,04
SM1135 M10X12		~0,02
SM1135 M10X14		~0,038
SM1135 M12X14		~0,045
SM1135 M12X16		~0,045
SM1135 M12X18		~0,078
SM1135 M12X20		~0,13
SM1135 M12X22		~0,188
SM1135 M14X16		~0,188
SM1135 M14X18		~0,188
SM1135 M16X18		~0,068
SM1135 M16X20		~0,11
SM1135 M18X20		~0,11
SM1135 M18X22		~0,15
SM1135 M18X22		~0,15
SM1135 M20X22		~0,15
SM1135 M20X24		~0,23
SM1135 M24X28		~0,31

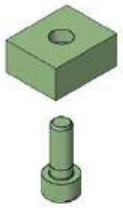
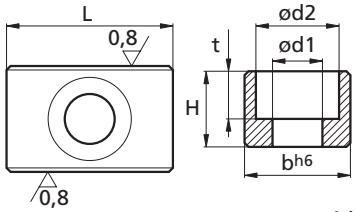
Bohrbüchsen ***Position case***

	L	D	d
CCBUE121812	12	18,0	12,0
CCBUE1218512	12	18,5	12,0
CCBUE121912	12	19,0	12,0
CCBUE162616	16	26,0	16,0

Nutensteine, flach
Low slot tenons

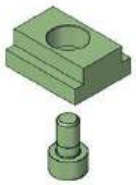
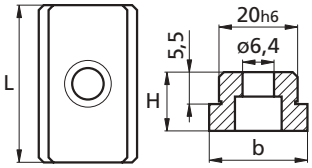
Einsatzgehärtet, brüniert, geschliffen
Case-hardened, blackened, ground

b	H	L	d1	d2	t	inkl. Schrauben *incl. screws*	kg
SM1136- 12	8	20	5,5	10	5,3	M5x12	~0,019
SM1136- 14	10	22	6,6	11	6,3	M6x16	~0,021
SM1136- 16						M6x16	~0,026
SM1136- 18						M6x16	~0,03
SM1136- 20						M6x16	~0,034

Nutensteine, fest
Fixed slot tenons

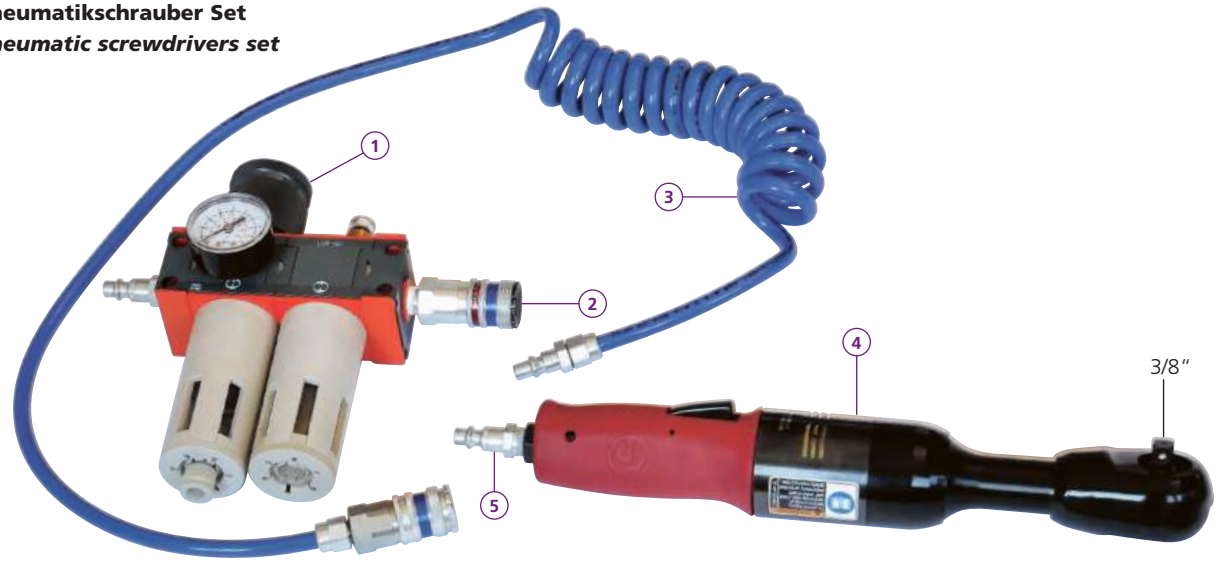
Einsatzgehärtet, brüniert, geschliffen
Case-hardened, blackened, ground

	H	L	b	Nutenmass *slot size*	inkl. Schrauben *incl. screws*	kg
NT2012	10	22	12	20	M6x10	~0,022
NT2014		25	14	20	M6x10	~0,026
NT2016			16	20	M6x10	~0,028
NT2018			18	20	M6x10	~0,03
NT2022	12	32	22	20	M6x12	~0,05
NT2024			24	20	M6x12	~0,055

Bestellbeispiel / ***Ordering example*****:** PCPF16L18Alu

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



Triag Bit

mit Feder gehalten, nicht magnetisch
spring locked, not magnetic



siehe Video
see video

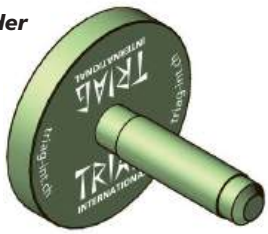
Triag Bitburr

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 Ø 6,3-90°



BIT-KH



BitF104 Ø 10,4-90°



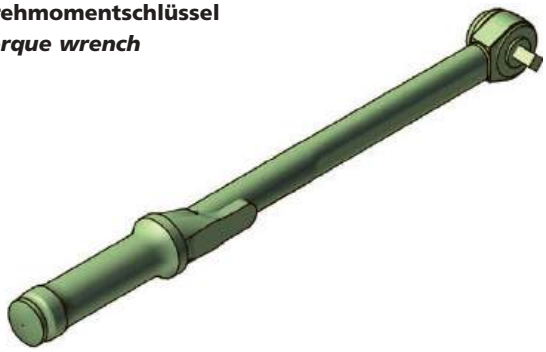
BIT-BF



BitF165 Ø 16,5-90°

Bestellbeispiel / *Ordering example*: RP9431SET

Drehmomentschlüssel
Torque wrench



SL3	**20-200 Nm (1/2")**

Steckschlüsseleinsatz
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*

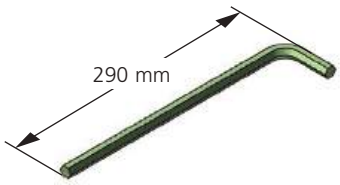
SL0	**4-20 Nm (1/4")**		
SL1	**10-50 Nm (3/8")**		
NUSS1/4"4MM	4 mm	**NUSS3/8"6MM**	
NUSS1/4"5MM	5 mm	**NUSS3/8"6MML**	6 mm
NUSS1/4"6MM	6 mm	**NUSS3/8"6MMLK**	
NUSS1/4"8MM	8 mm	**NUSS3/8"8MM**	
		NUSS3/8"8MML	8 mm
		NUSS3/8"8MMLK	
NUSS3/8"5MM		**NUSS3/8"10MM**	
NUSS3/8"5MML	5 mm	**NUSS3/8"10MML**	10 mm
NUSS3/8"5MMLK		**NUSS3/8"10MMLK**	

Spannschlüssel
Clamping wrench



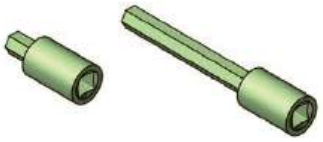
02613160	4 mm
02613164	5 mm
02613168	6 mm
02613172	8 mm
02613176	10 mm

Langer Spannschlüssel
Long clamping wrench



ISL10	**sw** = 10 mm
ISL14	**sw** = 14 mm

Sechskantstifteinsatz
Hexagonal socket wrench



NUSS1/2"8MM	**NUSS1/2"14MML**
NUSS1/2"10MM	
NUSS1/2"14MM	

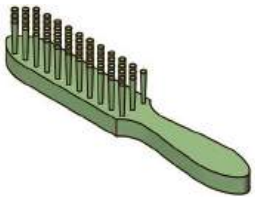


AD-BIT-1/4-1/4



AD-BIT-1/4-3/8

Messingdrahtbürste
Brass wire brush



PCMB4



Triag Ei

3D Mess-Gelenkstativ
Articulated indicator holders



	Aktionsradius / *Operating radius*
MGMS08130	130 mm
MGSS08130	130 mm
MGMS08280	280 mm

Bestellbeispiel / *Ordering example* : SL3

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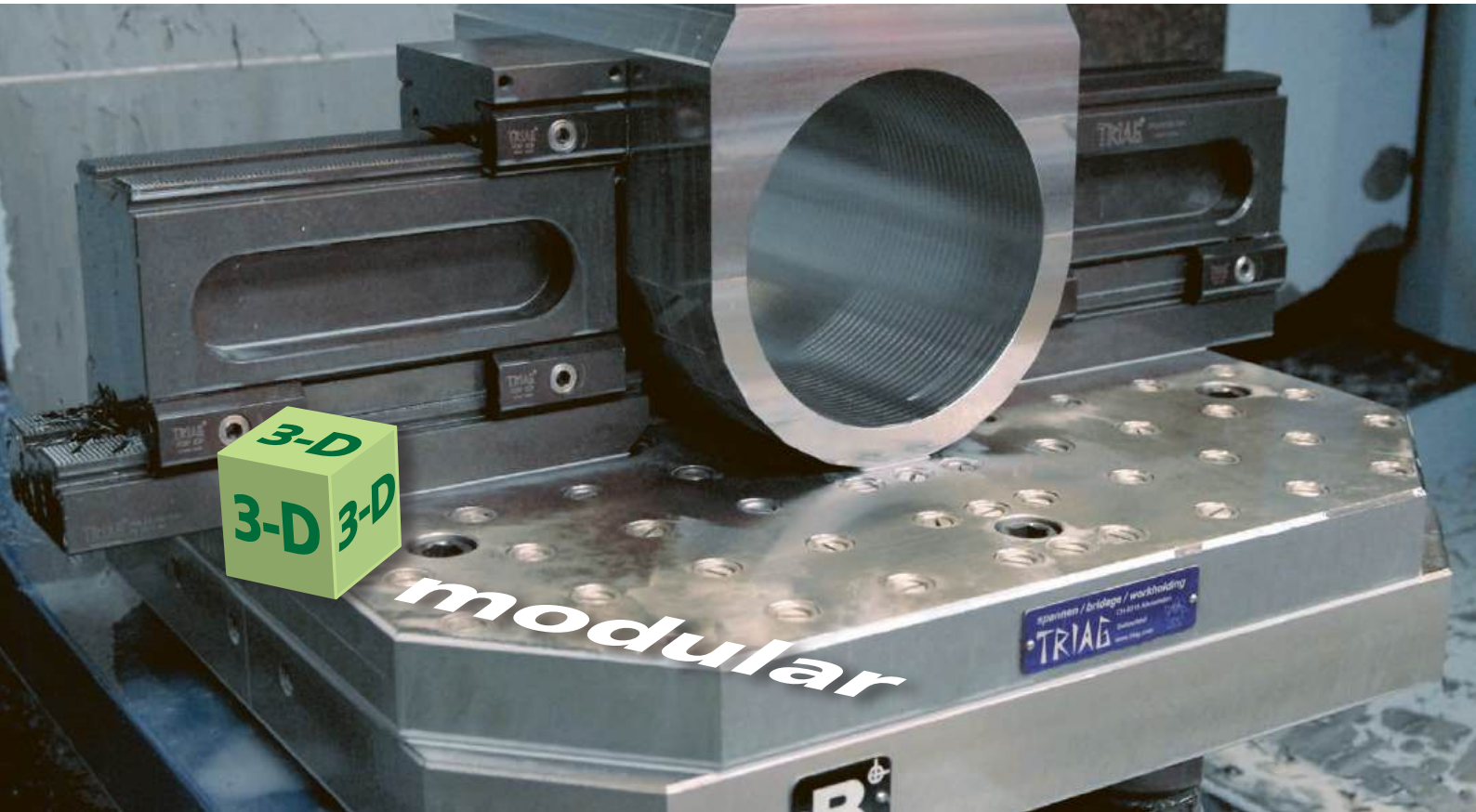


Produktion einer Werkstück Familie
Producing a complete workpiece family





*power*CLAMP & *5axes*

Das schnellstverstellbare Mehrfachspannsystem! Die Positionierung der Spannmodule erfolgt mittels einer Verzahnung auf der Schiene. Befestigung mit nur einer Schraube!

*power*CLAMP & *5axes*

The quickest multiple workholding system for easy set up! Positioning of the clamping modules by teeths on the base rail. Repositioning by opening only one single screw!



*tri*CENTRO

Kleine bis grosse, sowie modulare Zentrischspanner in verschiedenen Ausführungen.

*tri*CENTRO

Small to big modular self centering vises in different variations.

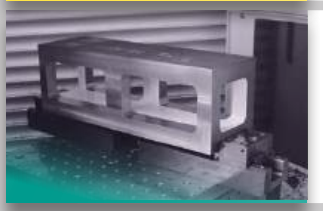


*micro*CLAMP

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.

*micro*CLAMP

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.

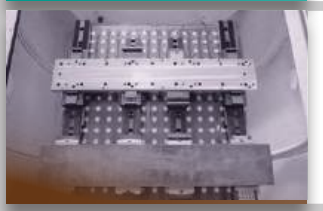


*apto*CLAMP & *5axes*

Die hohe Spannkraft dieses Systems ermöglicht den Einsatz für schwere Zerspanung.

*apto*CLAMP & *5axes*

The high clamping force of the aptoCLAMP enables heavy cuts.

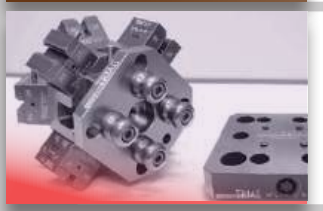


*tripoxy*MINERAL

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.

*tripoxy*MINERAL

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.

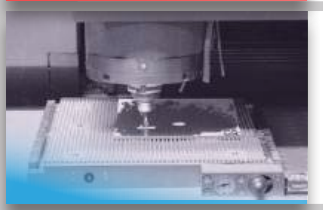


*opp*System & *5axes*

Unser Nullpunkt-Palettiersystem ermöglicht ein genaues Positionieren von Mehrfachspannsystemen, Schraubstöcken und Vorrichtungen auf Maschinentischen oder Spanntürmen.

*opp*System & *5axes*

Our zero-point palleting system allows exact positioning of multiple workholding systems, vices and dedicated fixtures on machining tables or tombstones.



*triva*CLAMP

Vakuumspannsystem: Bestens geeignet für plattenförmige Werkstücke (auch nicht magnetische). Es können sowohl Druckstellen als auch Deformationen an labilen Teilen vermieden werden.

*triva*CLAMP

Workholding by vacuum: Suited for plateshaped workpieces (also for non magnetical). Pressure marks as well as deformations on soft parts can be avoided.



*tri*GEL

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.

*tri*GEL

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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