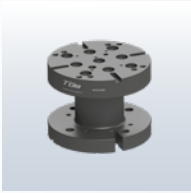


TDM
TORQUE DIE & MOLD



TDM 88
TORQUE DIE & MOLD
- TDM 88
- TDM 88 INDEX
- TDM 88 Adjustable

Page 0.2.6



TDM 88
Accessories
- Pins
- Rings
- Bushes
- Rises
- Spacers
- Tombstones

Page 0.2.8



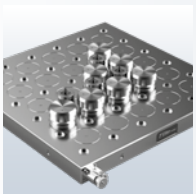
TDM 48
TORQUE DIE & MOLD
- TDM 48
- TDM 48 INDEX

Page 0.2.24



TDM 48
Accessories
- Pins
- Bushes
- Spacer

Page 0.2.28



TDM MAG
- Magnetic system
  for clamping pieces in milling

Page 0.2.32



TDM MAG
- Magnetic plane
- TDM MAG 48

Page 0.2.38



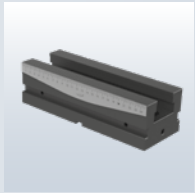
TDM MAG
Accessories
- Pins
- Bush
- Extensions
- Control unit

Page 0.2.39



TDM
Accessories
- Plates
- Minipallets
- Spacers
- Adaptor

Page 0.2.44



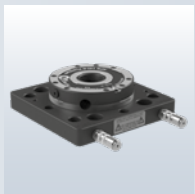
OP 10

Page 0.2.51



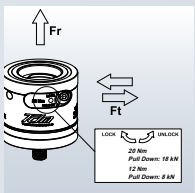
WPS-PPD
Workpiece preparation device

Page 0.2.54



TDM - APS
- APS 140
- Flanges

Page 0.2.63



TDM
Technical informations

Page 0.2.70

TORQUE DIE & MOLD



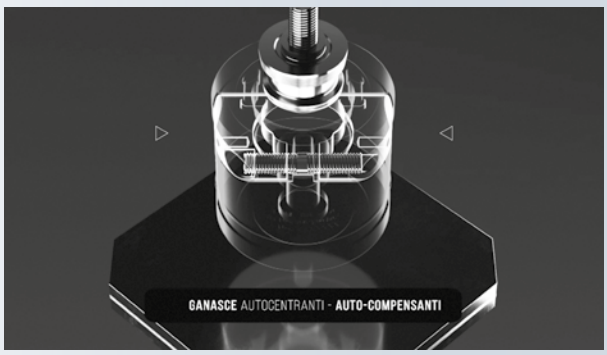
Benefits

PATENT PENDING

- **Only 3.5 rotation Lock-Unlock**
- **High jaws surface contact**
  (Pull down force 18 Kn at 20 Nm)
- **Repeatability <0,005 mm**
- **Holding force up to 100 Kn**



- **Self centered self compensating jaws**





WATCH THE VIDEO

A.T. swinging pin

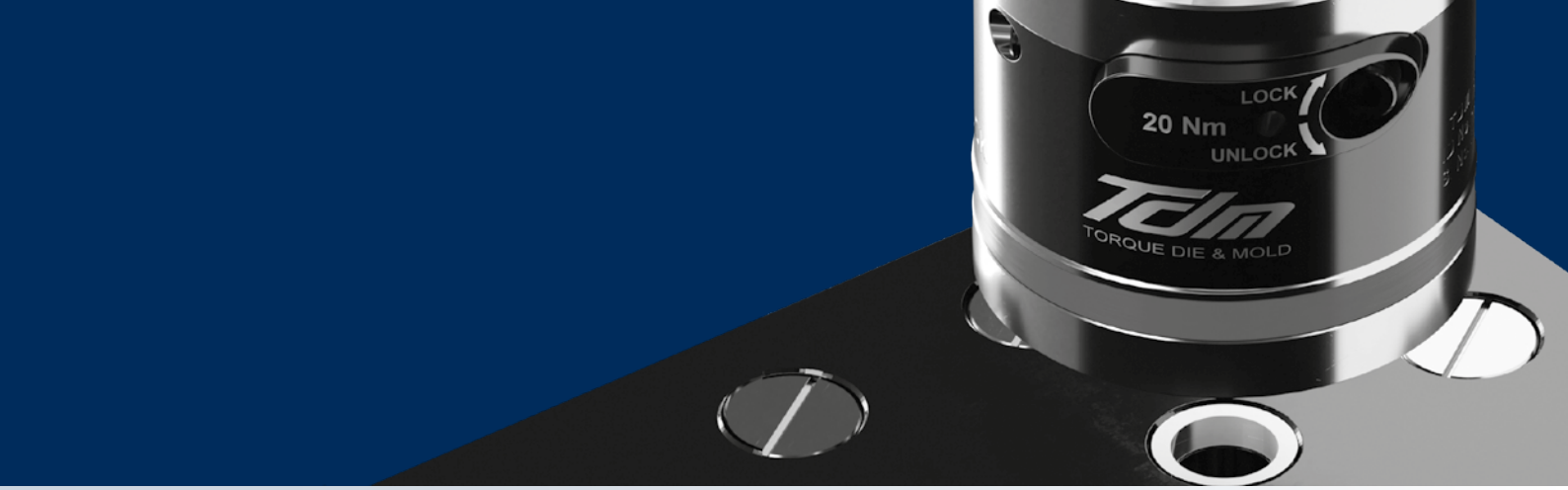
Benefits

NEW

- **Unique pin with twin swinging screw function and floating centering ring of X; Y**
  Ideal for pieces / molds after hardening







Working examples



Centering Ring

Clamping pin

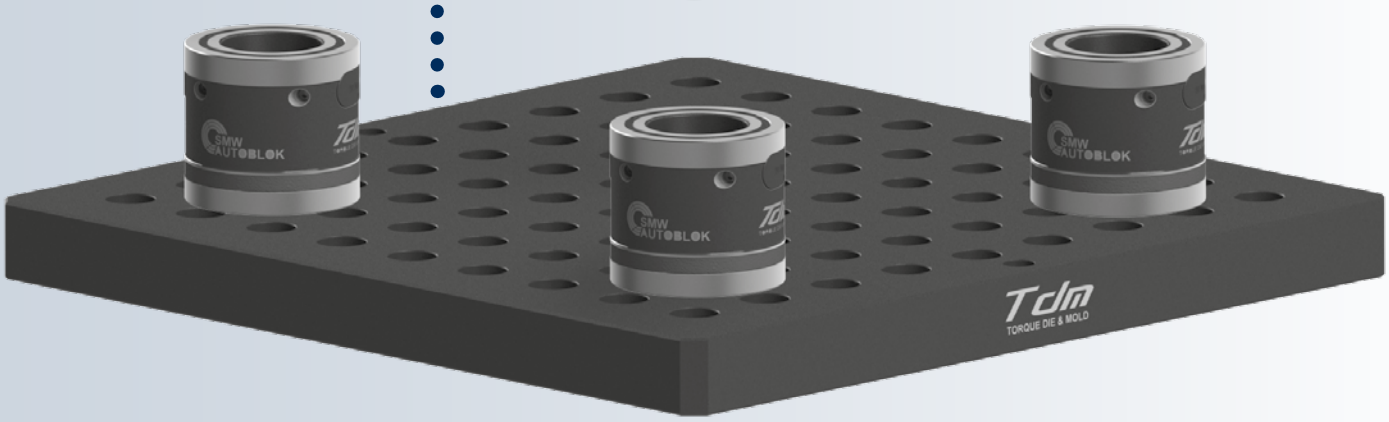
Screw M6 - M8 - M10 - M12 - M16

Screw M10 - M12 - M16

TDM module

Plate with grid

Centering bush



TORQUE DIE & MOLD

Index Working examples



Centering Ring

Clamping pin



Screw M6 - M8 - M10 - M12 - M16

TDM module



Centering Ring

Clamping pin



Screw M10 - M12 - M16

TDM module

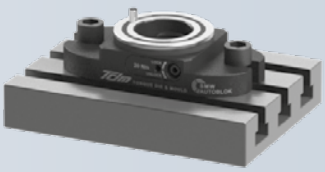


Centering Ring

Clamping pin



TDM INDEX module



TDM 88

Manual Zero Point Clamping System for the Workpiece Direct Clamping

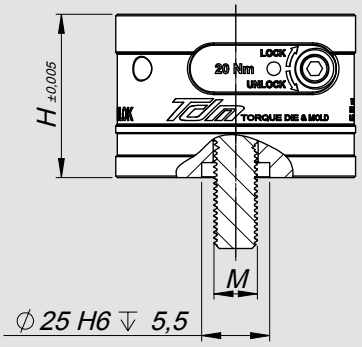


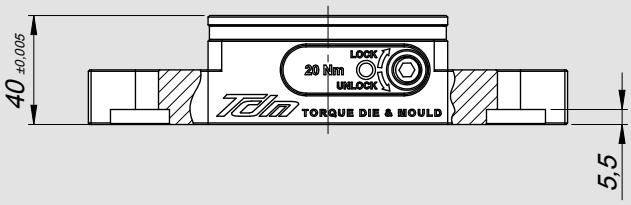
Application/customer benefits

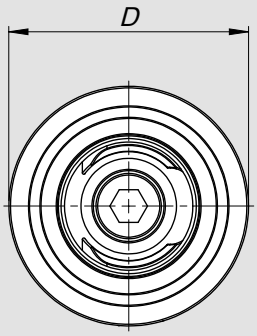
- Huge reduction of set-up times for highest efficiency
- Safe workpiece clamping with maximum holding forces and highest repeatability
- Ideal for mold making and 5-axis machining
- Single quick-actuation for the rapid opening and closing of the modules with only 3.5 rotations
- Flexible configurations for customized use
- Compatible to the proven zero point system APS

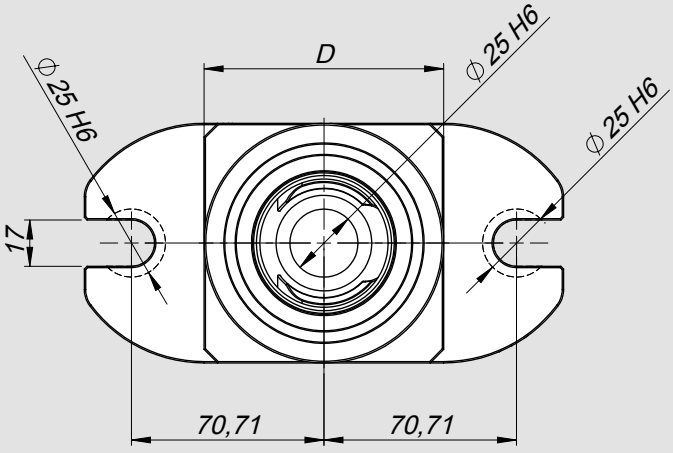
Technical features

- Diameter 88mm
- Pull down 18 kN
- Max. torque 20 Nm
- Repeatability < 0.005 mm
- Holding force up to 100Kn
- 2 clamping slides for maximum hold while clamping
- Fully sealed - low maintenance
- Complete with screw 12.9









Module	Id. No.	D	H	M*
TDM88 H40	46230101	88	40	-
TDM88 H60	46230102	88	60	M16 **
TDM88 H80	46230103	88	80	M16 ***
TDM88 H160	46230104	88	160	M16 ****

***** Complete with screw 12.9

** TCEI-BAS M16X40 UNI 9327 DIN 7984 (Thin head cap screw)
*** TCEI M16X50
**** TCEI M16X110

TDM 88 Index

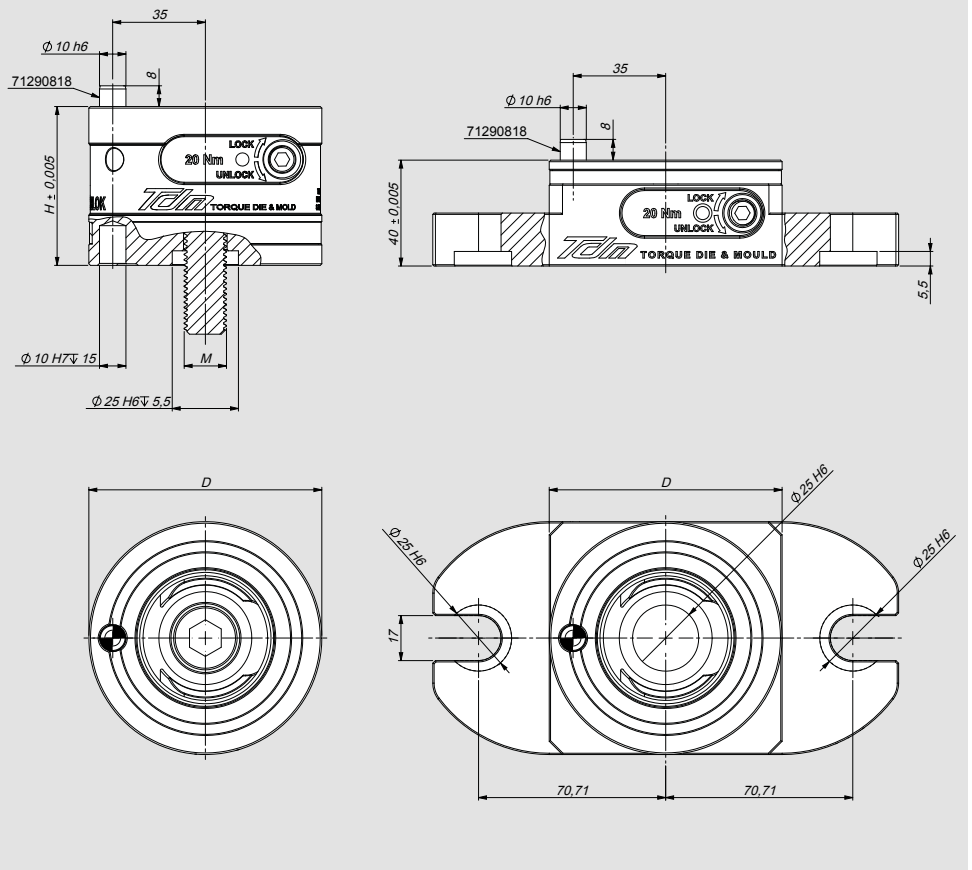


Application/customer benefits

- Huge reduction of set-up times for highest efficiency
- Safe workpiece clamping with maximum holding forces and highest repeatability
- Ideal for mold making and 5-axis machining
- Single quick-actuation for the rapid opening and closing of the modules with only 3.5 rotations
- Flexible configurations for customized use
- Compatible to the proven zero point system APS

Technical features

- Diameter 88mm
- Pull down force 18 kN
- Max. torque 20 Nm
- Repeatability < 0.005 mm
- Holding force up to 100Kn
- 2 clamping slides for maximum hold while clamping
- Fully sealed - low maintenance
- Complete with screw 12.9



Working example



Index Module	Id. No.	D	H	M*
TDM88 Index H40	46230111	88	40	-
TDM88 Index H60	46230112	88	60	M16 **
TDM88 Index H80	46230113	88	80	M16 ***
TDM88 Index H160	46230114	88	160	M16 ****

***** Complete with screw 12.9

** TCEI-BAS M16X40 UNI 9327 DIN 7984 (Thin head cap screw)
*** TCEI M16X50
**** TCEI M16X110

TLM

TDM LEVELLING MODULE



Often, some pieces may have two or more oblique locating surfaces to each other.
Therefore, by fixing one of the surfaces parallel to the machine table through a locking device, the same surfaces which are not parallel to it are oblique.

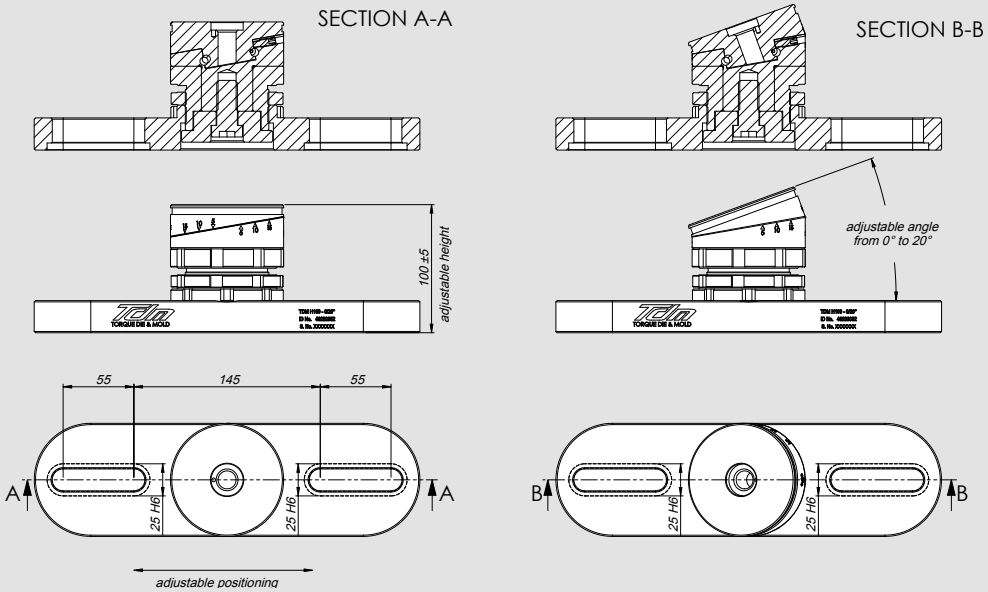
In these cases, a leveling device must be incorporated between the piece and the machine tool to compensate for the angular misalignment.
A normal leveling device compensates for this misalignment by utilizing a spherical coupling.

However, unlike the **TLM**, these leveling devices can have limited stability, are subject to play, and require frequent maintenance.
Therefore, the main function of **TLM** is to be a leveling device for clamping a piece having at least two mutually oblique fixing surfaces in a stable and safe way.

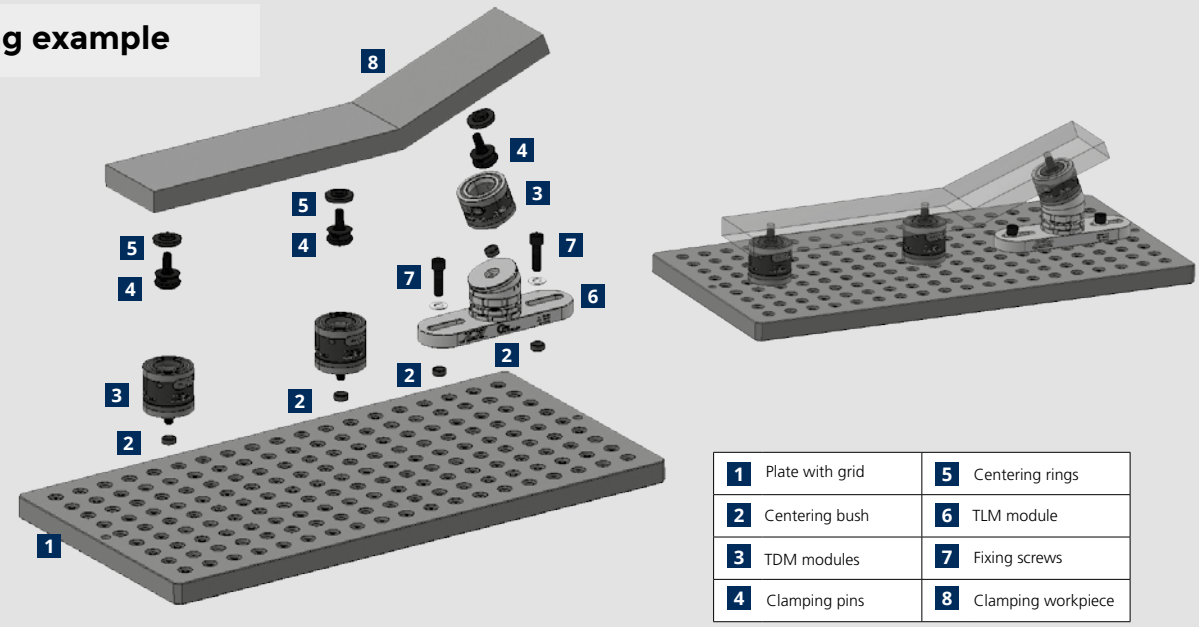
TLM is fully adjustable in height +/- 5mm and can achieve full compensation from 0 degrees up to 20 degrees.

Id. No.
46232050

WATCH THE VIDEO



Working example

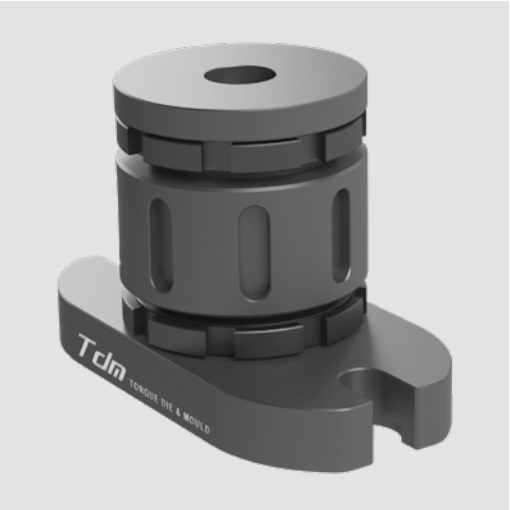


1	Plate with grid	5	Centering rings
2	Centering bush	6	TLM module
3	TDM modules	7	Fixing screws
4	Clamping pins	8	Clamping workpiece

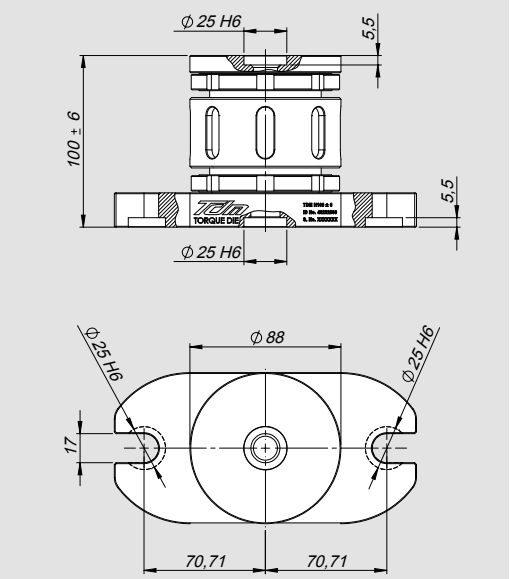
Adjustable riser ± 6mm

TDM 88

Adjustable ± 6mm

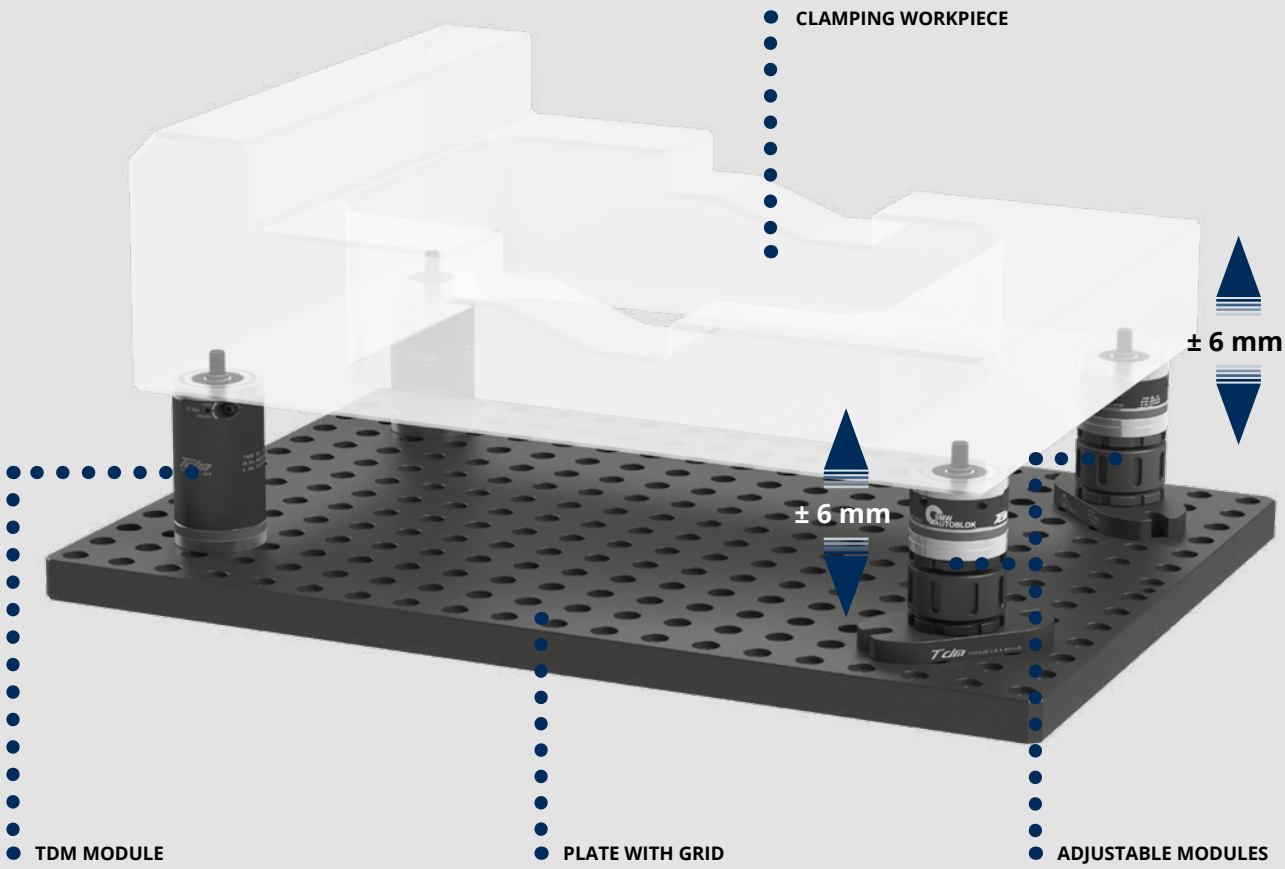


Complete with sector wrench



Id. No.
46232000

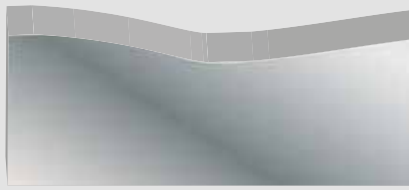
Working example with module

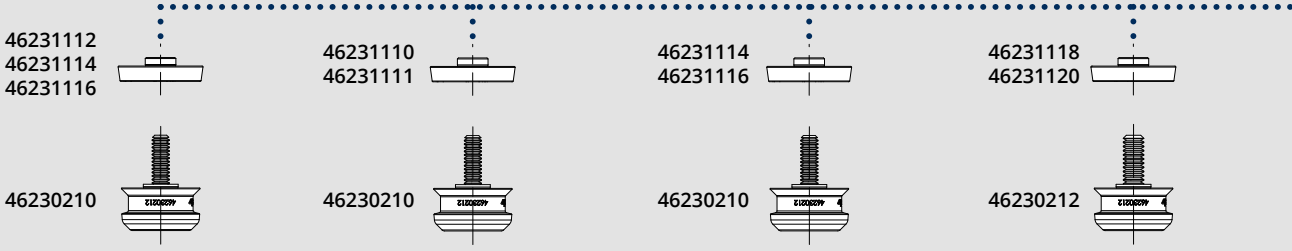


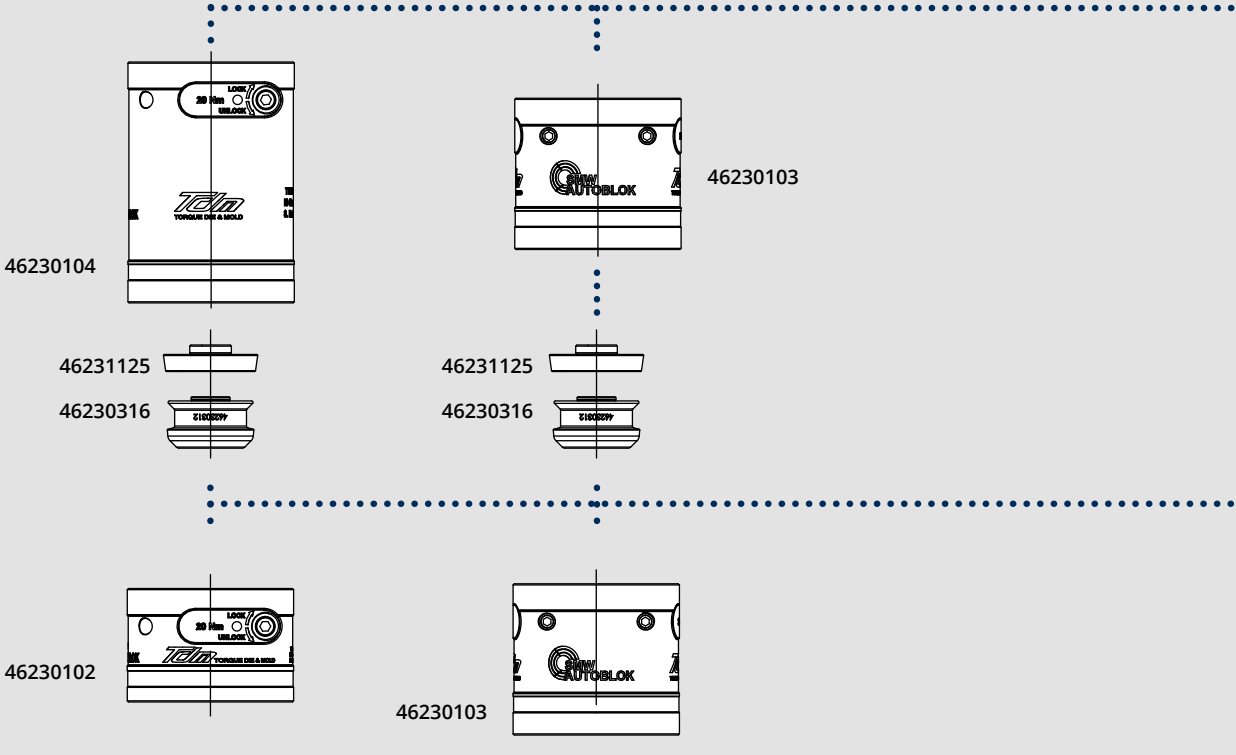


Working examples

Clamping Workpiece (only male)





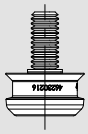


Pins

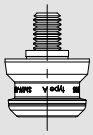




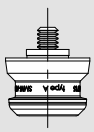
46231122
46231124
46231125



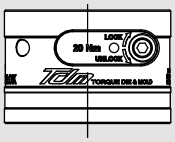
46230216



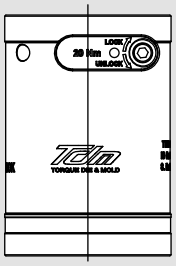
46165705
(APS160)
male



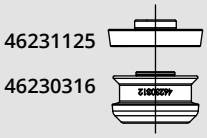
46165715 (APS160)
male (M12)
Female (M16)



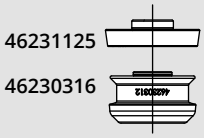
46230102



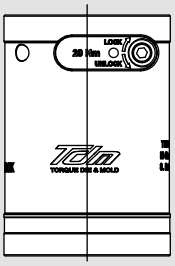
46230104



46231125
46230316



46231125
46230316



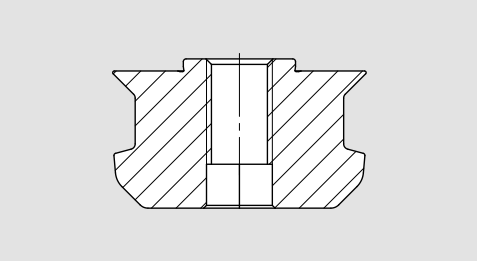
46230104



46230101

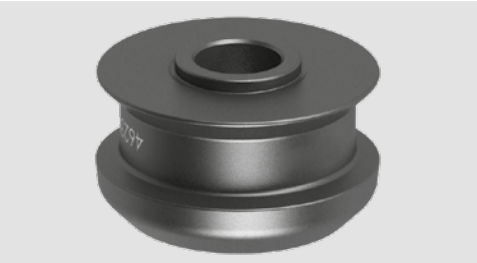
Female thread

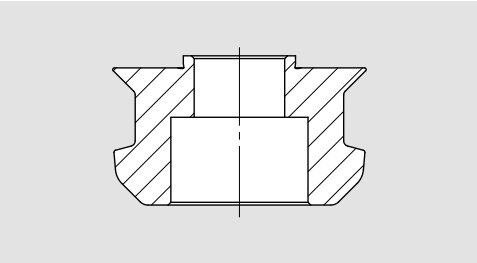




Id. No.	M
46230312	M12 F
46230316	M16 F

M16 male thread

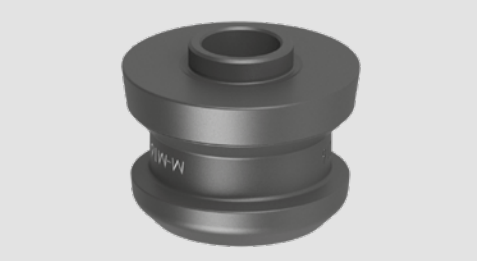


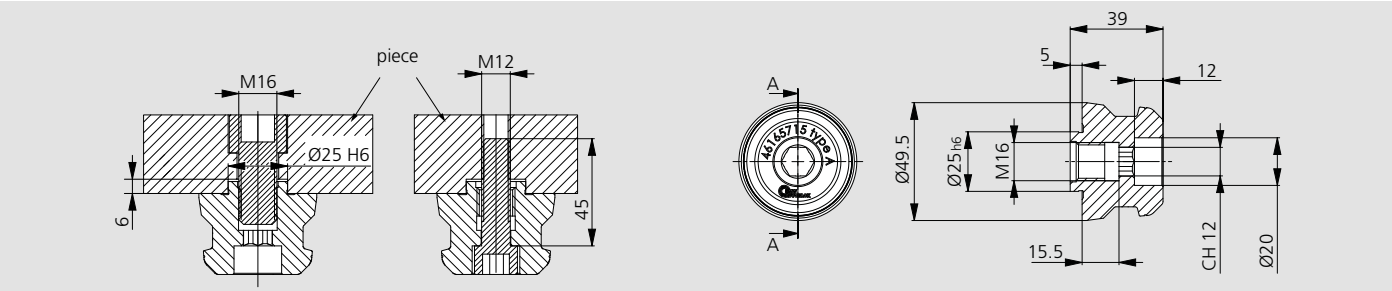


Id. No.	M
46230206 *	M6
46230208 *	M8
46230210 *	M10
46230212 *	M12
46230216 **	M16 M

* Complete with screw and reduction bush
** Complete with screw

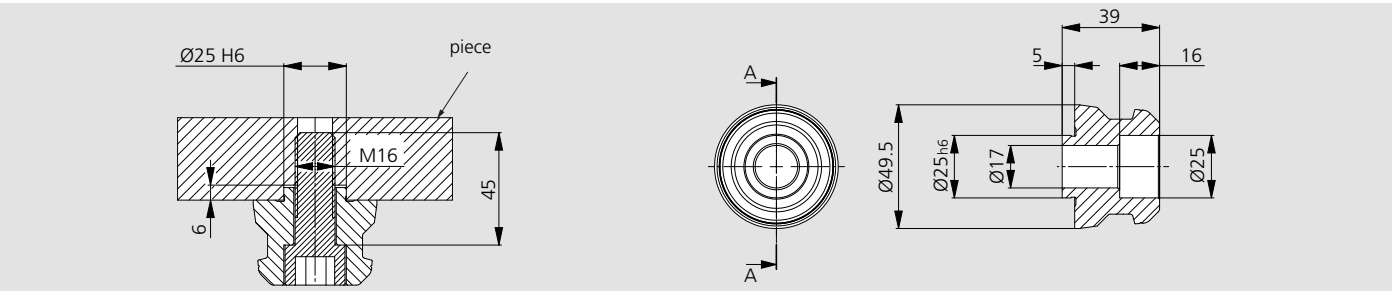
APS 160 M16 thread





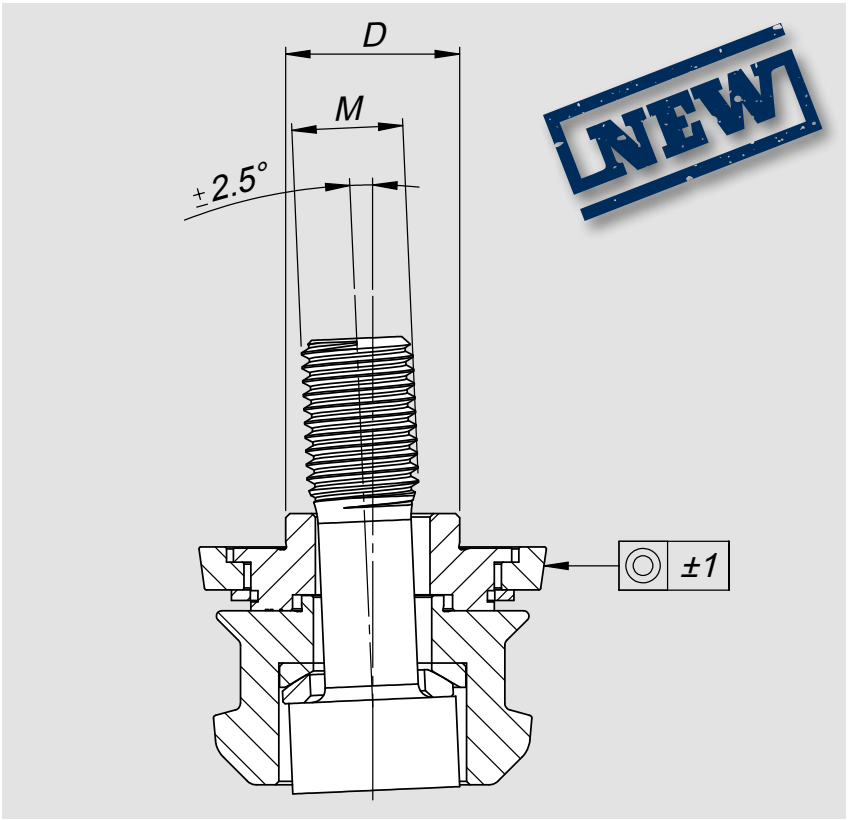
Id. No.			
46165715	A	M16	0.35
46165717	C	M16	0.35

APS 160 D17 for M16 screws 12.9



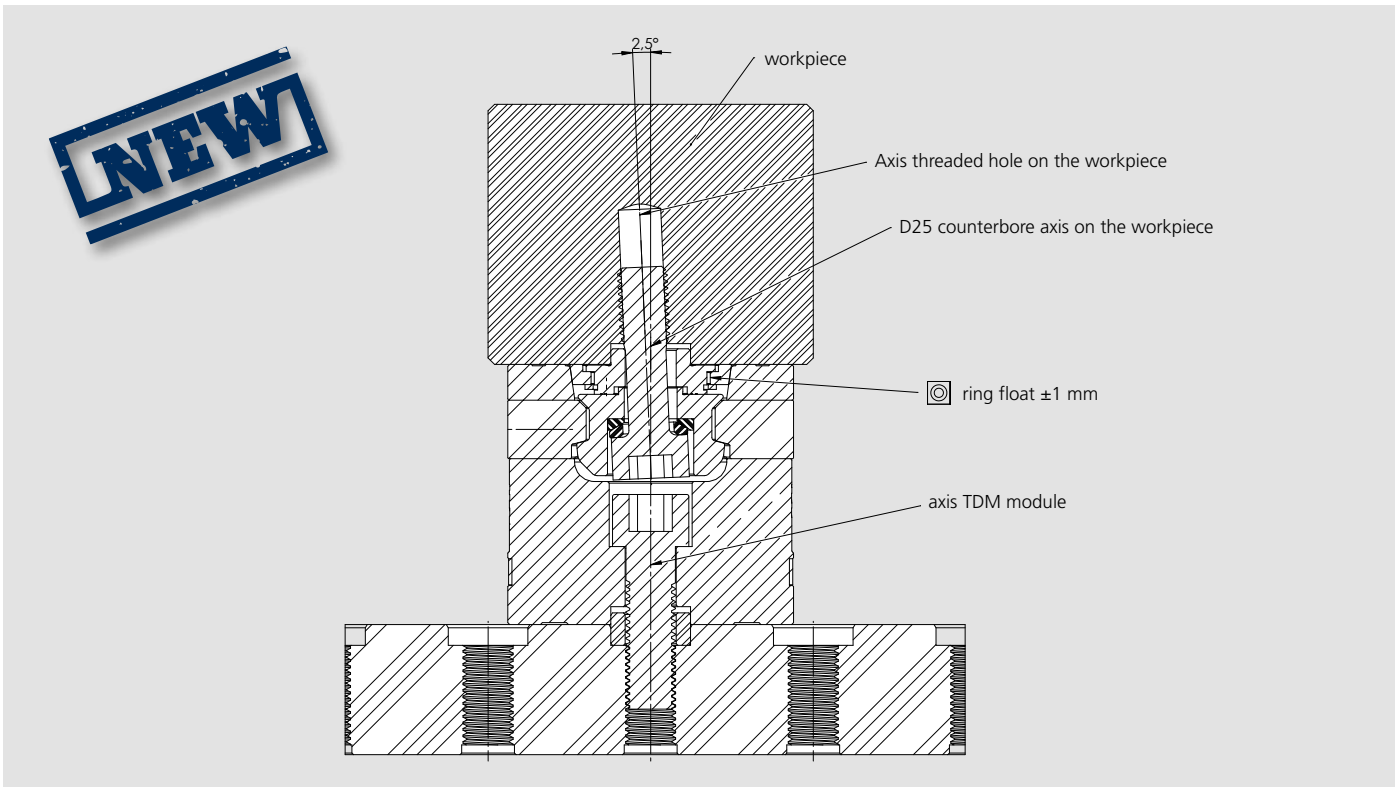
Id. No.			
46165705	A	D17	0.3
46165707	C	D17	0.3



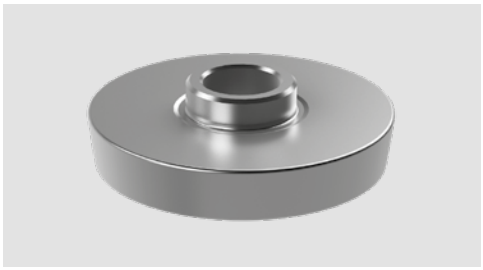


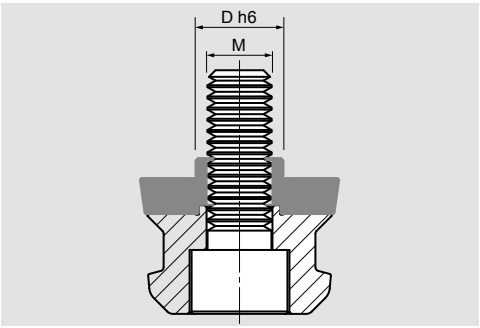
Id. No.	D	M
46231416	16 H6	M10
46231420	20 H6	M12
46231424	24 H6	M16
46231425	25 H6	M16

Working example



CENTERING RINGS

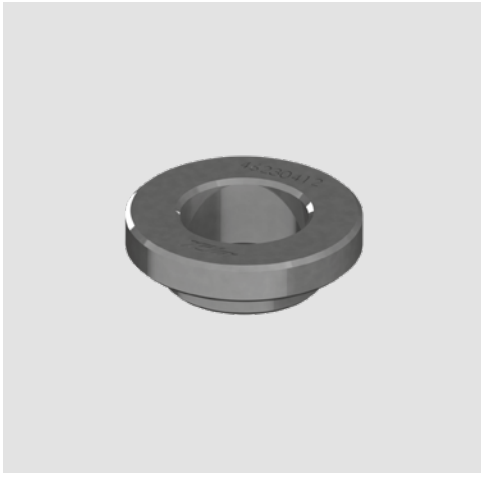


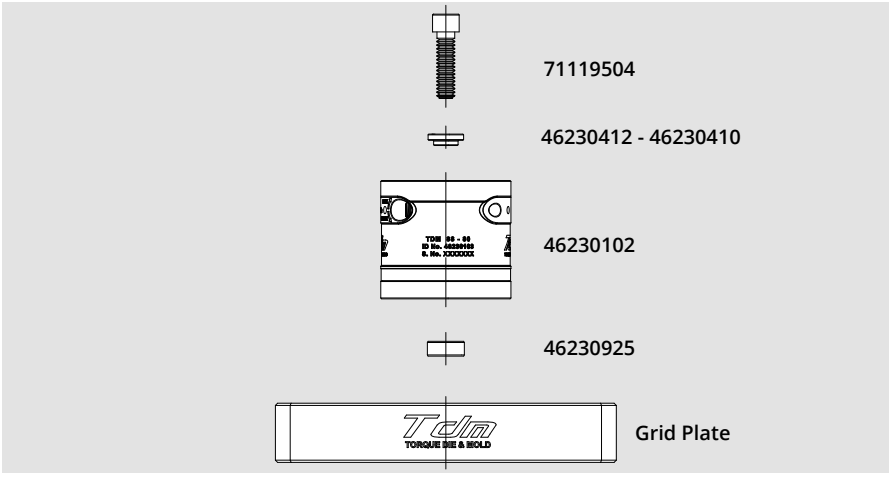


Id. No.	D	M	
46231110	10 h6	M6	A
46231111	11 h6	M6	A
46231112	12 h6	M8	A
46231114	14 h6	M8 / M10	A
46231116	16 h6	M8 / M10	A
46231118	18 h6	M10 / M12	A
46231120	20 h6	M10 / M12	A
46231122	22 h6	M10 / M12 / M16	A
46231124	24 h6	M10 / M12 / M16	A
46231125	25 h6	M10 / M12 / M16	A

Id. No.	D	M	
46231310	10 h6	M6	C
46231311	11 h6	M6	C
46231312	12 h6	M8	C
46231314	14 h6	M10	C
46231316	16 h6	M10	C
46231318	18 h6	M10 / M12	C
46231320	20 h6	M10 / M12	C
46231322	22 h6	M10 / M12 / M16	C
46231324	24 h6	M10 / M12 / M16	C
46231325	25 h6	M10 / M12 / M16	C

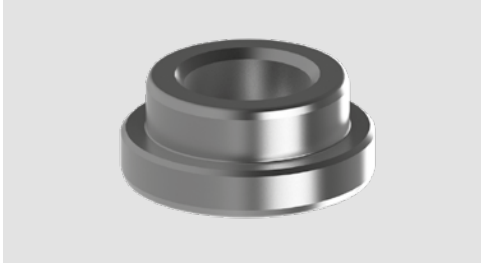
REDUCTION BUSH

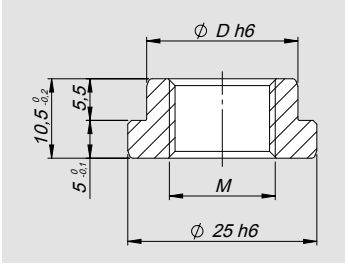




18- Assembling with reduction	M12			M10		
	Id. No. washer	Id. No. screw	screw length	Id. No. washer	Id. No. screw	screw length
TDM H 60 *	46230412	71119504	35	46230410	71119503	35
TDM H 80 *	46230412	71113107	45	46230410	71113087	45
TDM H 160 *	46230412	71119345	105	46230410	71119344	105

CENTERING BUSH





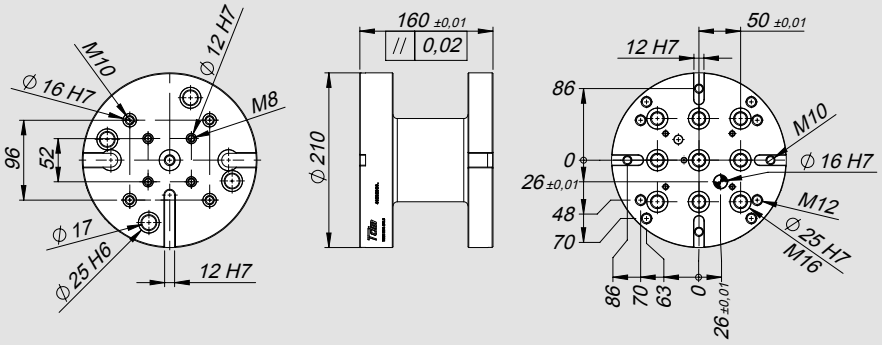
Id. No.	D	Thread for extraction * M
46230916	16	M14 x 1,5
46230918	18	M14 x 1,5
46230920	20	M14 x 1,5
46230922	22	M18 x 1.5
46230924	24	M18 x 1.5
46230925	25	M18 x 1.5

* Extractor page 0.1.46

UNIVERSAL RISER

(for TDM modules 48/88, vises IMG /V5 88-130, IMG 125-180-220, IMG 160-270 vises and PLUS 5 INDEX)

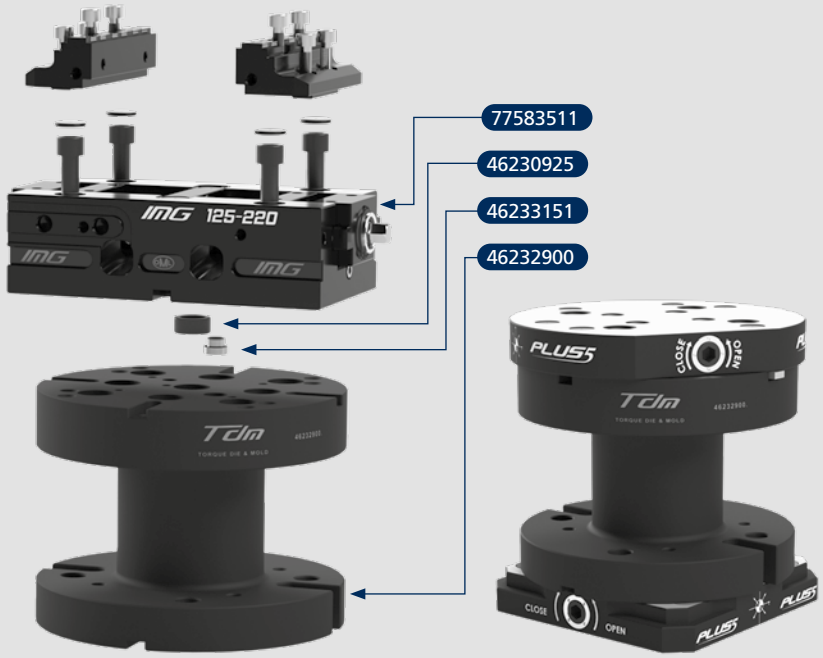




Id. No. 46232900

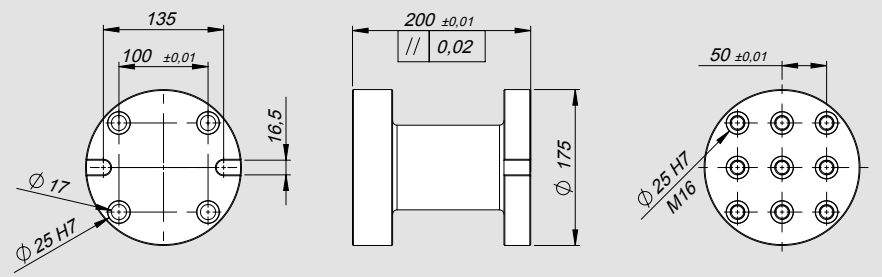
Working examples





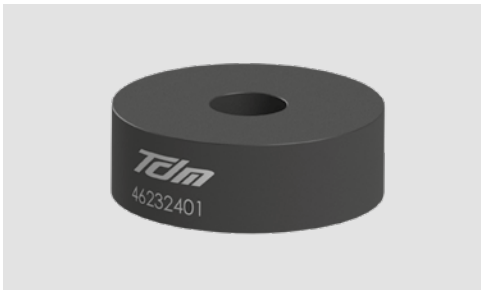
RISER WITH GRID

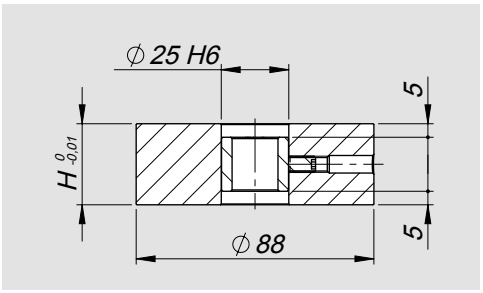




Id. No. 46232920

SPACERS with BUSH

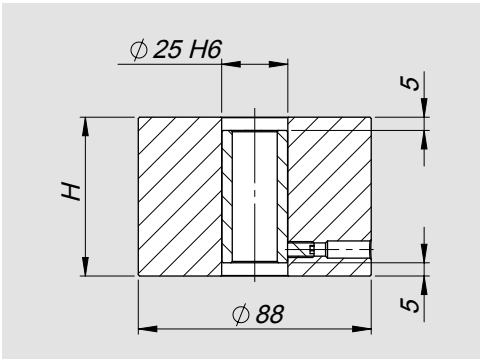




Id. No.	H
46232410	10
46232430	30

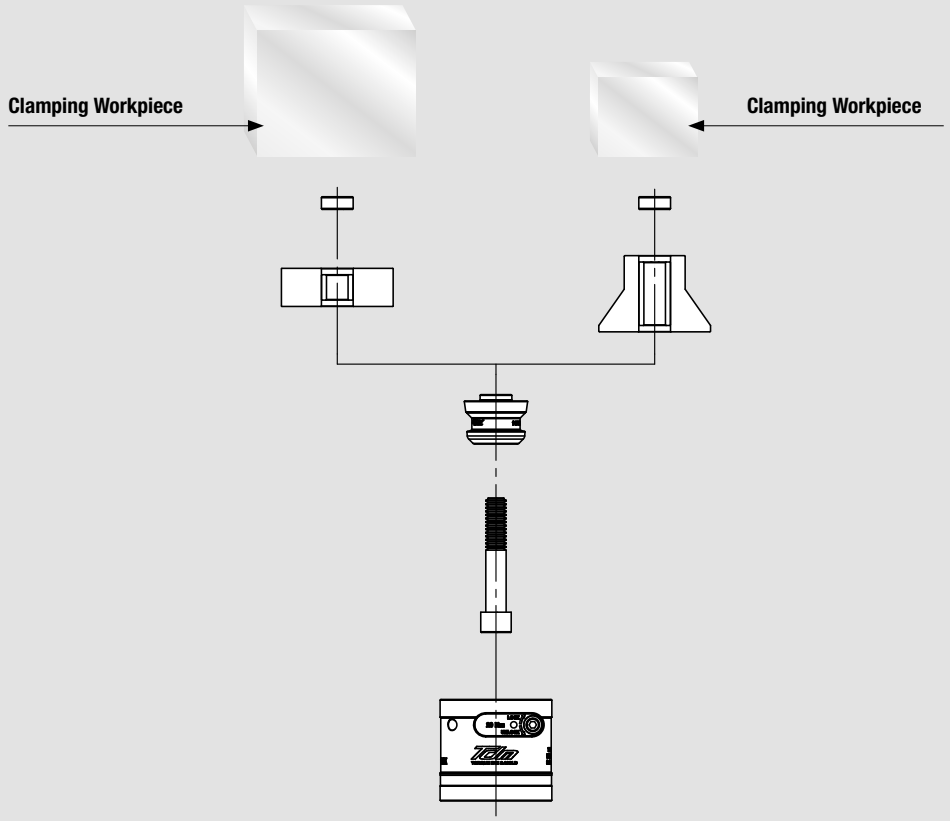
MACHINABLE SPACERS with BUSH





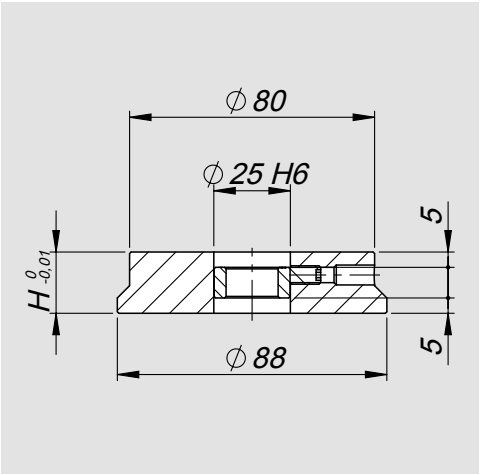
Id. No.	H
46232801	60
46232802	80

Spacer and Adaptor working examples



ADAPTOR from Ø88 to Ø80

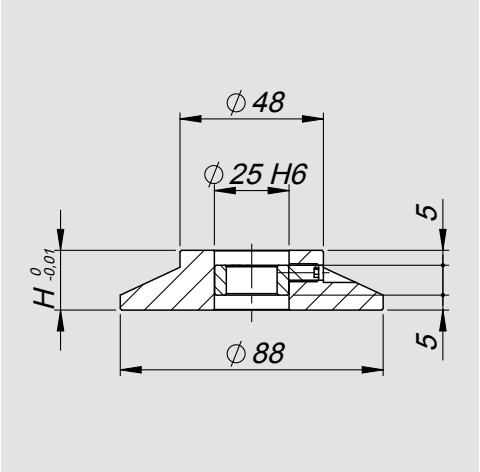




Id. No.	H
46232520	20
46232540	40
46232560	60

ADAPTOR from Ø88 to Ø48

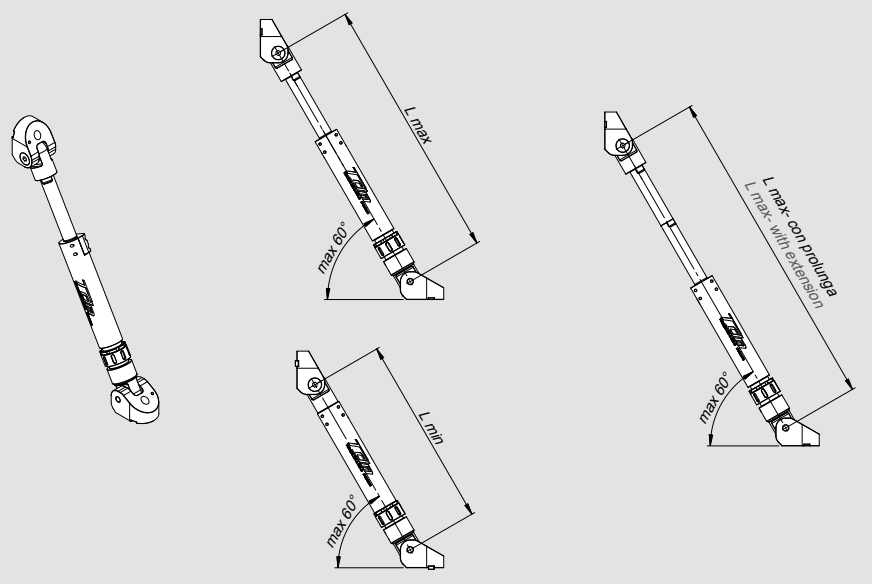




Id. No.	H
46232620	20
46232630	30
46232640	40
46232650	50
46232660	60

THIRD POINT

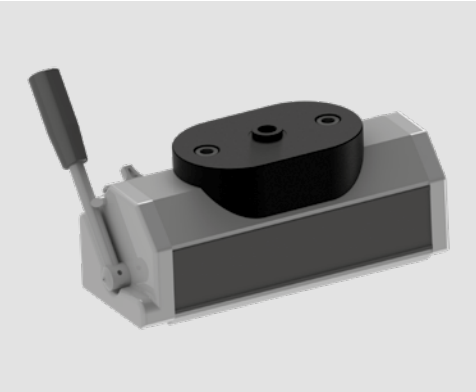




Id. No.	Lmin	Lmax	L max extension
46232110 *	614	850	1050

* Complete with sector wrench

MAGNET FOR THIRD POINT



Id. No.
46232130

Working examples

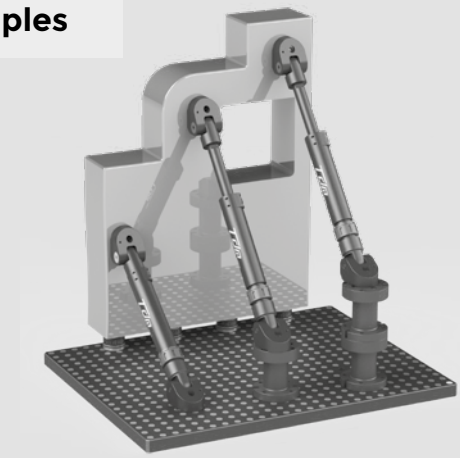


EXTENSION



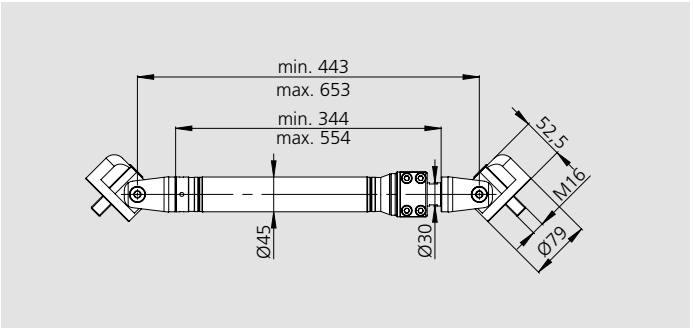
Id. No.
46232115

Working examples



THIRD POINT W210

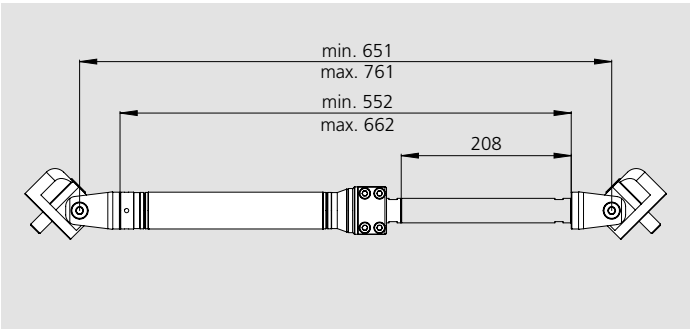




Id. No.	460395

EXTENSION ELEMENT WSE-208



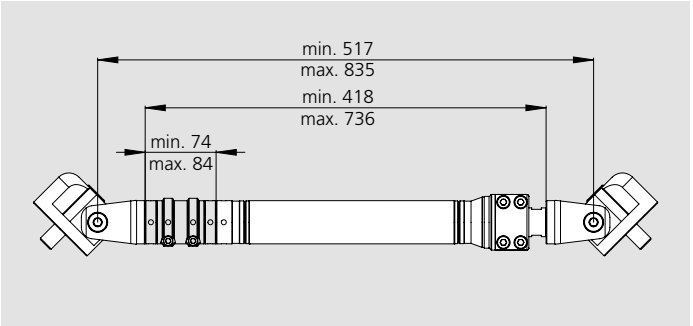


Note: max. 2-fold extendable

Id. No.	460354

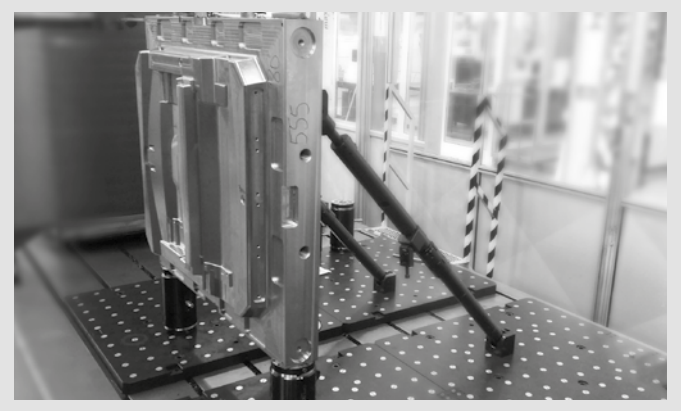
FINE ADJUSTMENT WSF-10

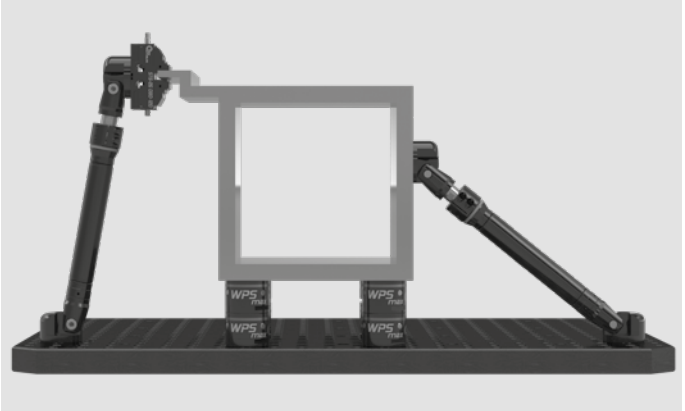




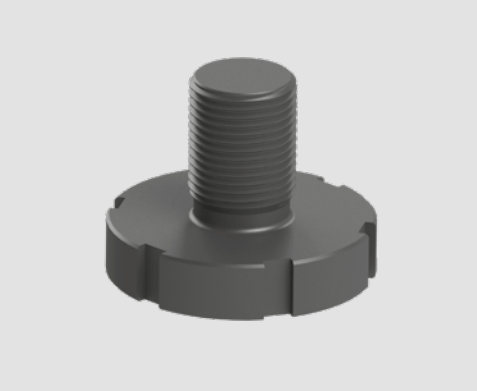
Id. No.	460336

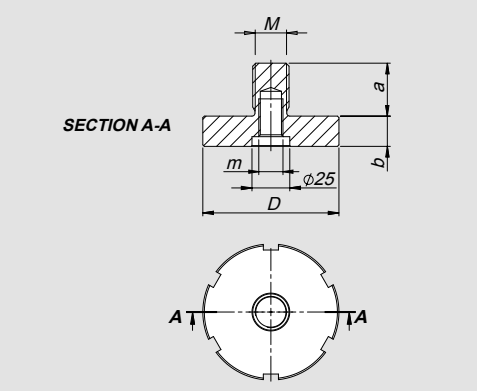
Working examples





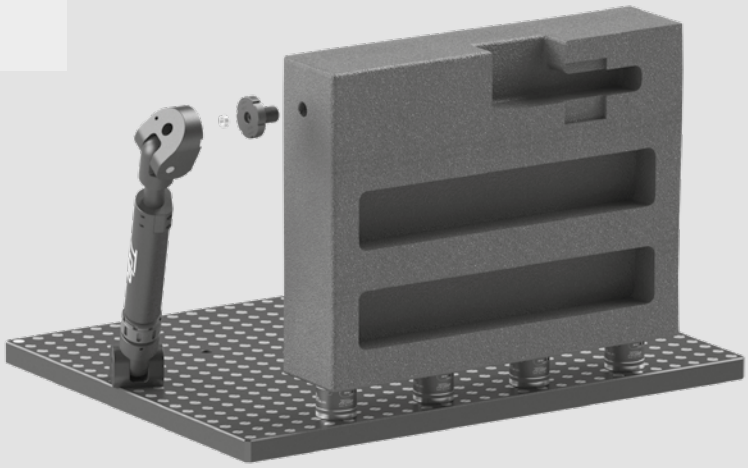
ADAPTER FOR THIRD POINT





Id. No.	D	M	a	b	m
46232311	90	M24 x 3	35	20	M16
46232312	90	M30 x 3,5	40	20	M16
46232313	90	M36 x 3	50	20	M16
46232314	90	M36 x 4	50	20	M16
46232315	90	M 42 x 3	60	20	M16
46232316	90	M42 x 4,5	60	20	M16
46232317	90	M48 x 3	70	20	M16
46232318	90	M48 x 5	70	20	M16
46232319	90	M56 x 5	80	20	M16
46232320	90	M64 x 6	90	20	M16

Working examples



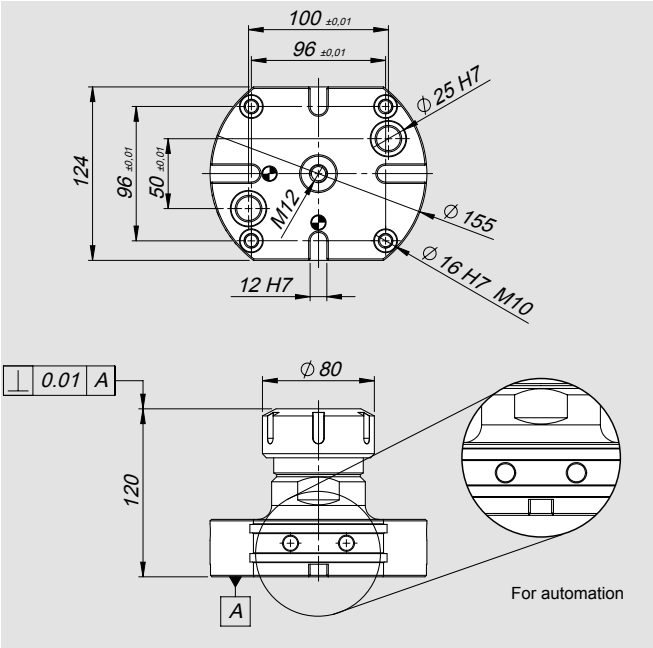
FIXING KIT FOR THIRD POINT FOR T-SLOTS



Code for T-slots				
	mm 18	mm 20	mm 22	mm 24
Id.No.	46232141	46232142	46232143	46232144

COLLECT CHUCK ER50





Id. No.
46233500

Working examples



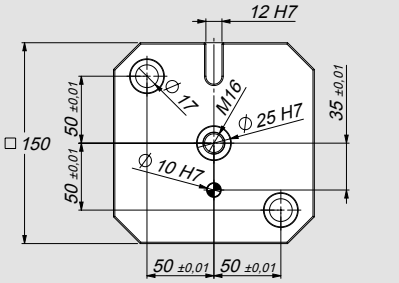


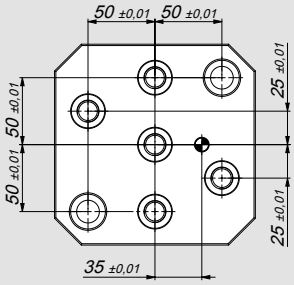
TDM 88

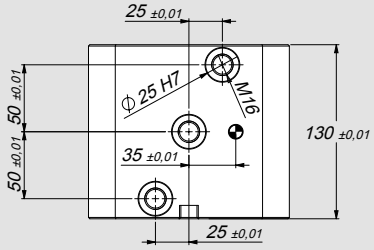
Accessories - Spare parts

MODULAR TOMBSTONE









Id. No.
46233700

PAIR OF JAWS WITH CLAMPING SCREW TDM 88



Type	Id. No.
TDM 88 H40	46231001
TDM 88 H60-80-160	46231002

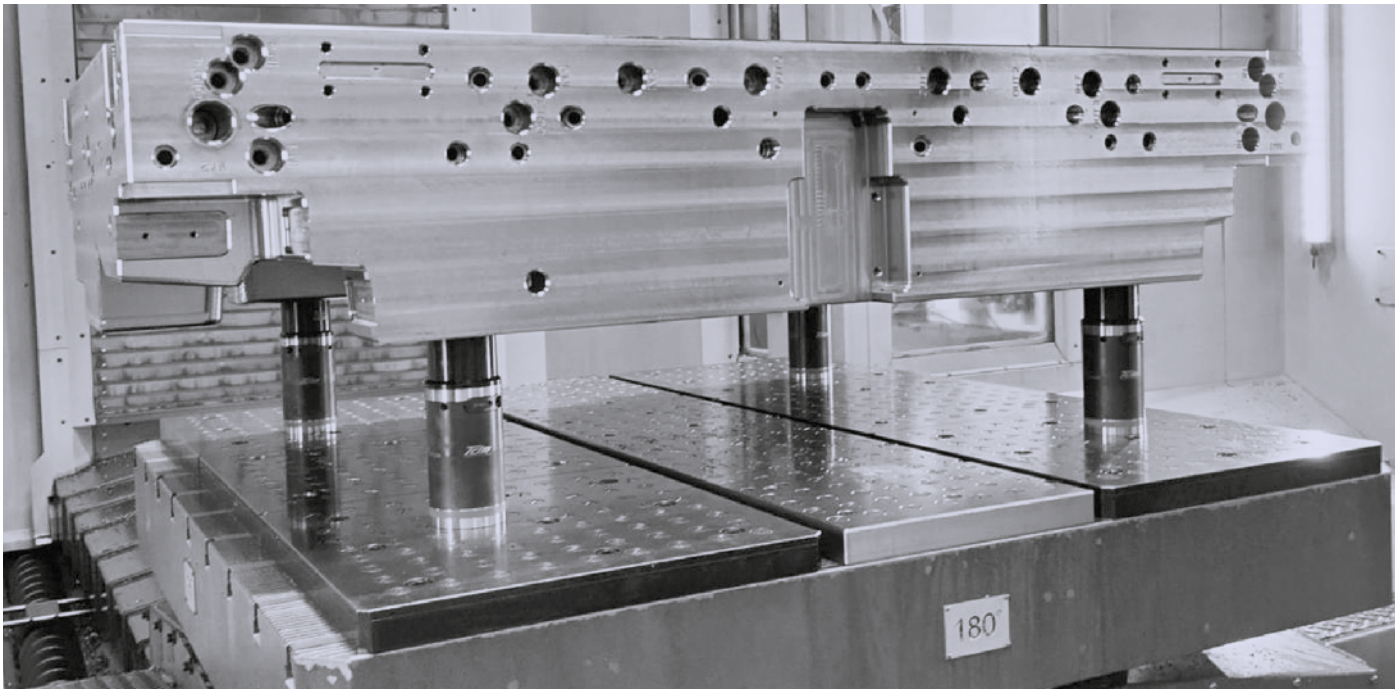
CLAMPING SCREW TDM 88

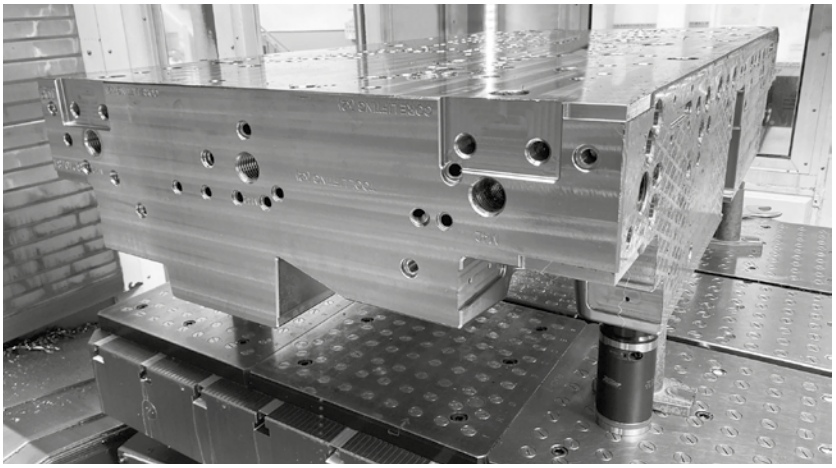


Type	Id. No.
TDM 88 H40	46230031
TDM 88 H60 - 80 - 160	46230032

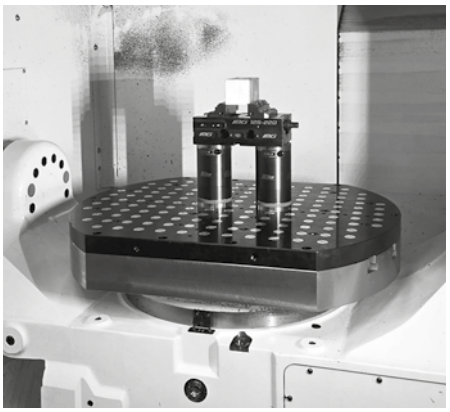


Working examples













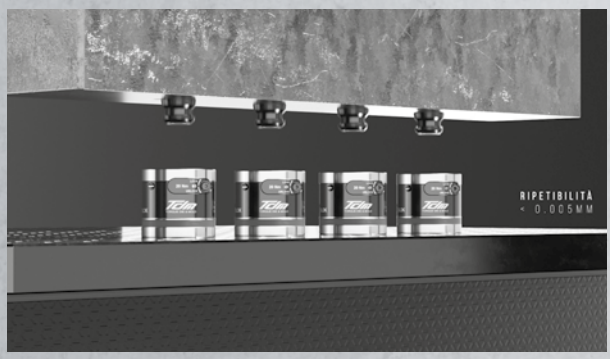
Tdm 48
TORQUE DIE & MOLD



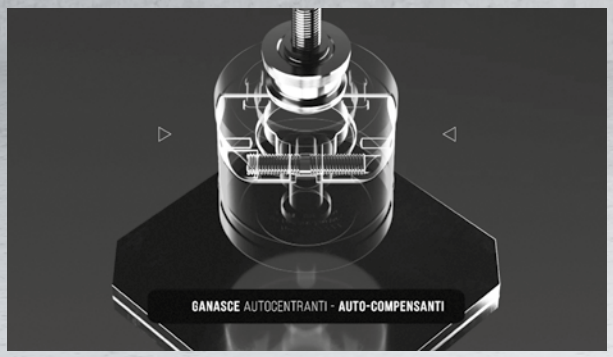
Benefits



- **Only 3.5 rotation Lock-Unlock**
- **High jaws surface contact**
  (Pull down force 8 Kn at 12 Nm)



- **Repeatability <0,005 mm**
- **Holding force up to 50 Kn**



- **Self centered self compensating jaws**

TDM 48

TORQUE DIE & MOLD

PATENT PENDING



TDM 48

Workpiece positioning system

Manual Zero Point Clamping System for the Workpiece Direct Clamping

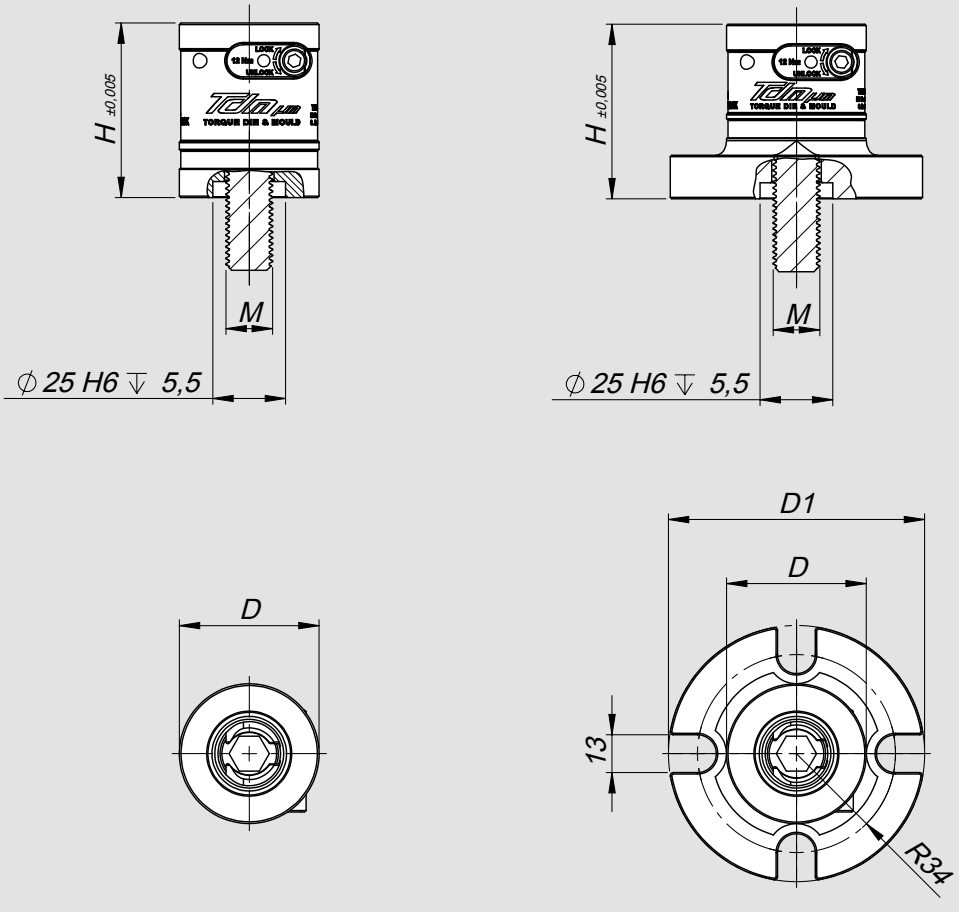


Application/Benefits

- Huge reduction of set-up times for highest efficiency
- Safe workpiece clamping with maximum holding forces and highest repeatability
- Ideal for 5-axis machining
- Single quick-actuation for the rapid opening and closing of the modules with only 3.5 rotations
- Flexible configurations for customized use
- Interchangeable to the proven zero point system APS

Technical features

- Diameter 48 mm
- Pull down force 8 kN
- Max. torque 12 Nm
- Repeatability < 0.005 mm
- Holding force up to 50 Kn
- 2 clamping slides for maximum hold while clamping
- Complete of special screw cod. 46230004
- Fully sealed - low maintenance



Module	Id. No.	D	D1	H	M
TDM 48	46230105	48	-	60	M16
TDM 48 flangiato 88/48	46230106	48	88	60	M16

TDM 48 Index

Workpiece positioning system

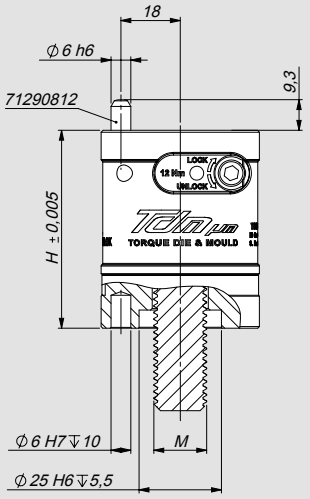


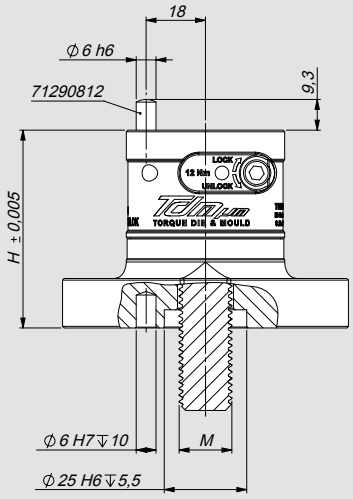
Application/Benefits

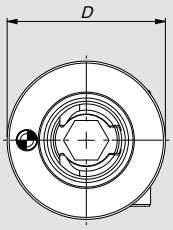
- Huge reduction of set-up times for highest efficiency
- Safe workpiece clamping with maximum holding forces and highest repeatability
- Ideal for 5-axis machining
- Single quick-actuation for the rapid opening and closing of the modules with only 3.5 rotations
- Flexible configurations for customized use
- Interchangeable to the proven zero point system APS

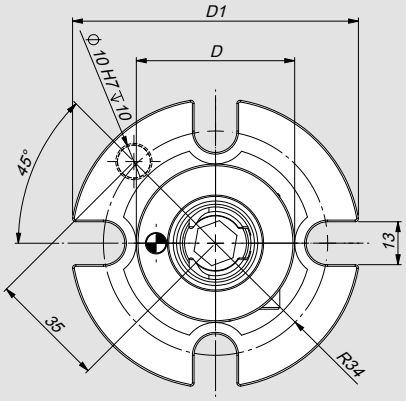
Technical features

- Diameter 48 mm
- Pull down force 8 kN
- Max. torque 12 Nm
- Repeatability < 0.005 mm
- Holding force up to 50 Kn
- 2 clamping slides for maximum hold while clamping
- Complete of special screw cod. 46230004
- Fully sealed - low maintenance





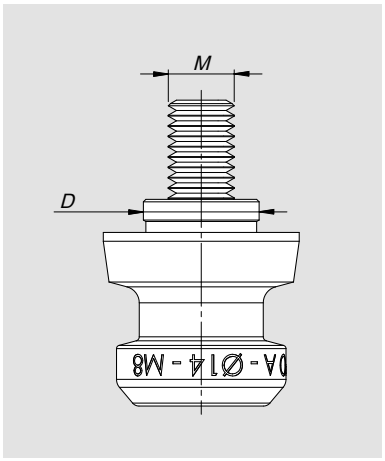




Module	Id. No.	D	D1	H	M
TDM 48 index	46230115	48	-	60	M16
TDM 48 index flangiato 88/48	46230116	48	88	60	M16

Pins for TDM Ø48 complete with grub screw UNI 5932

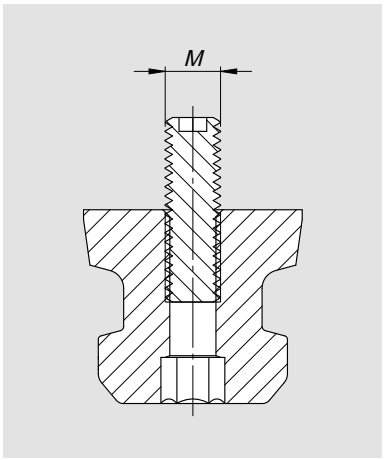




Id. No.	D	M - UNI 5932	Type
46231531	10 h4	M6	**A**
46231532	11 h4	M6	**A**
46231541	12 h4	M8	**A**
46231542	14 h4	M8	**A**
46231551	14 h4	M10	**A**
46231552	16 h4	M10	**A**
46231731	10 h4	M6	**C**
46231732	11 h4	M6	**C**
46231741	12 h4	M8	**C**
46231742	14 h4	M8	**C**
46231751	14 h4	M10	**C**
46231752	16 h4	M10	**C**

Pins for TDM Ø48 without centering complete with grub screw UNI 5932





Id. No.	M - UNI 5932
46231533	M6
46231543	M8
46231553	M10

Special M16 clamping screw on grid plate

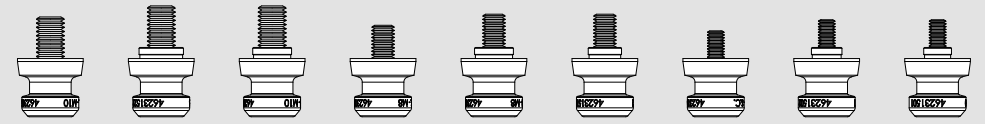


Id. No.
46230004

Working examples



Ex.: A TYPE



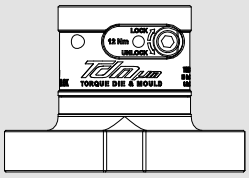
46231553 46231552 46231551 46231543 46231542 46231541 46231533 46231532 46231531

SC * SC * SC *

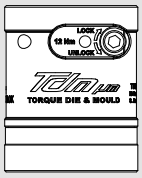
* without centering



46230004



46230105
46230115



46230106
46230116

PAIR OF JAWS WITH CLAMPING SCREW TDM 48



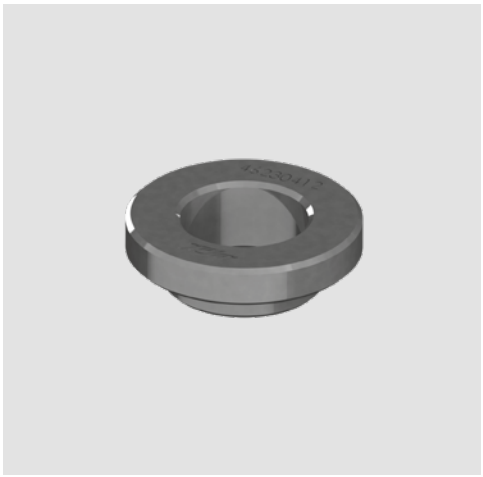
Type	Id. No.
TDM 48	46231003

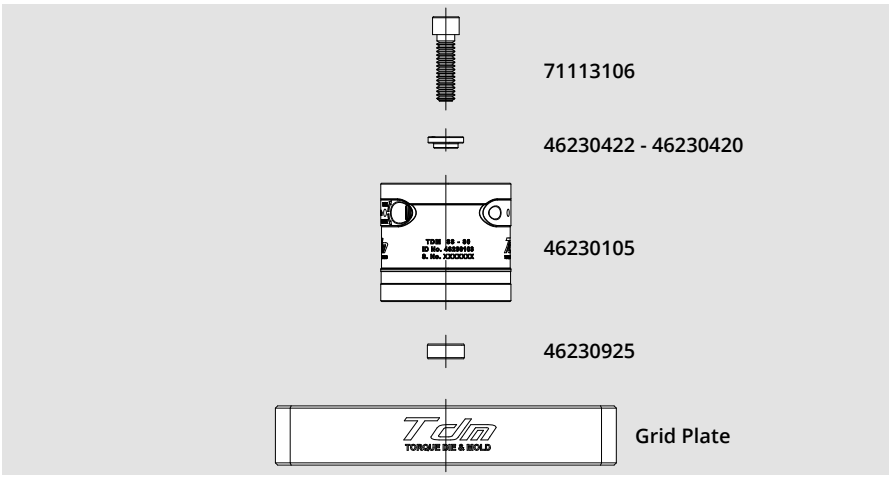
CLAMPING SCREW TDM 48



Type	Id. No.
TDM 48	46230033

REDUCTION BUSH for M12 / M10

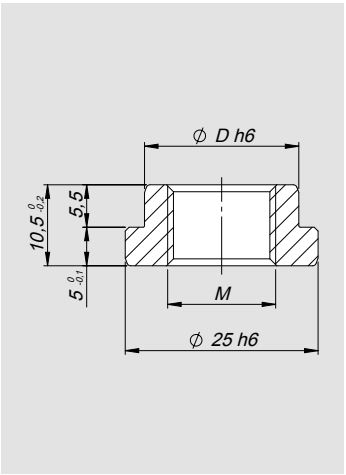




18- Reduction Mounting	M12			M10		
	Id. No. disk	Id. No. screw	screw length	Id. No. disk	Id. No. screw	screw length
TDM Ø48 H60	46230422	71113106	40	46230420	71113085	35

CENTERING BUSH



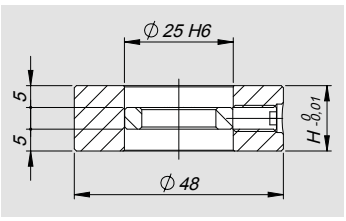


Id. No.	D	Thread for extraction * M
46230918	18	M14 x 1,5
46230920	20	M14 x 1,5
46230922	22	M18 x 1.5
46230924	24	M18 x 1.5
46230925	25	M18 x 1.5

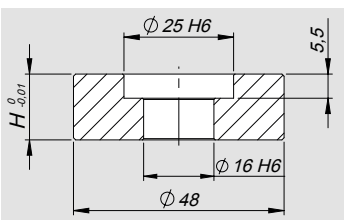
* Extractor page 0.2.44

SPACER for TDM Ø48





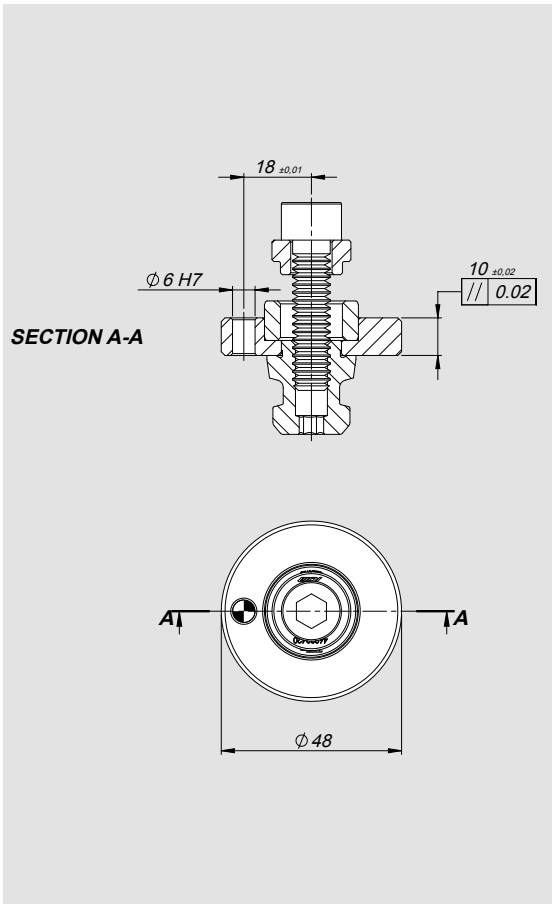
Id. No.	H
46232710	10
46232715	15
46232720	20
46232725	25
46232730	30
46232740	40
46232750	50



Id. No.	H
46232810	10
46232815	15
46232820	20
46232825	25
46232830	30
46232840	40
46232850	50

INTERFACE FLANGE for TDM 48/48



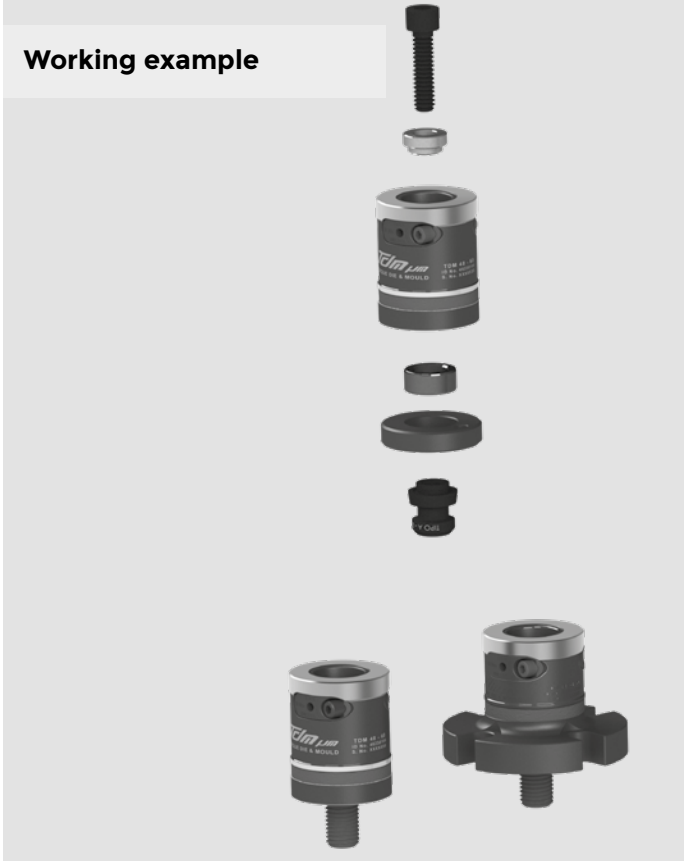


Id. No.
46234050

Index Working example



Working example



TdmMag

TORQUE DIE & MOLD



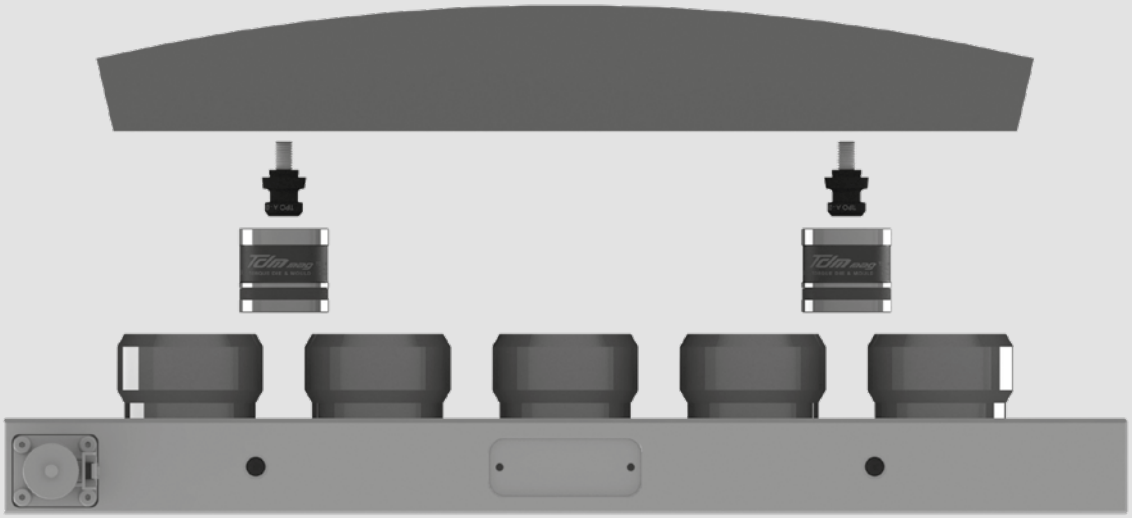
Magnetic system for clamping pieces in milling

Benefits

The **TDM MAG** system utilizes **MILLTEC AUTOBLOK MAG** technology in combination with the **TDM** system.

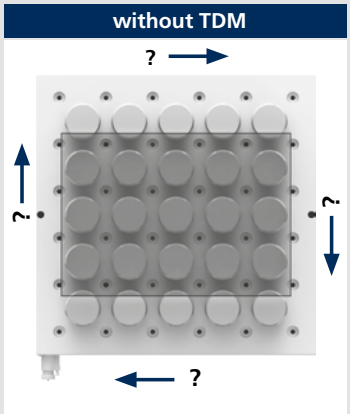
The clamping of the workpiece is carried out by means of the permanent electromagnetic system while the piece is centered through the **TDM MAG**.

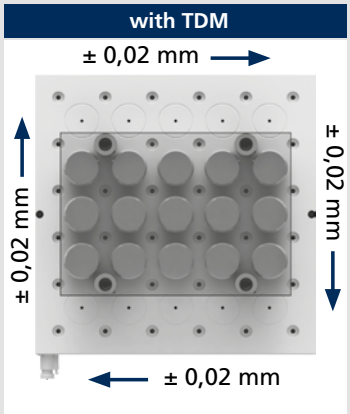
A series of calibrated holes are made on the magnetic chuck with hardened bushes pitch 100mm ±0.01mm
to which the **TDM MAG** elements are fixed.



Location.

With **TDM MAG** the problem of the workpiece's location is solved and with **TDM** the possibility of workpiece sliding is eliminated during the machining.





Magnetic system for clamping pieces in milling

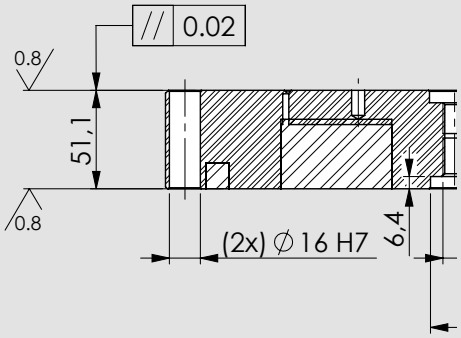
Benefits

Repeatability.

With **TDM MAG** the positioning repeatability of the workpiece is guaranteed ±0,01mm.

Precision.

The magnetic plates of the **TDM MAG** series are finely ground within the indicated parallelism tolerance



Roughness of the piece.

The magnetic clamping force of a workpiece is proportional to the contact surface and to the square of its magnetic flux density.
Consequently, to ensure a better clamping force, it is recommended to cover the largest number of North and South magnetic poles and above all to improve the quality of contact with the piece as much as possible through the use of suitable pole extensions and the choice of the correct magnetic generator.
Having carried out the first preparation phase of the piece (see point 2 of the cycle), **the best magnetic performance condition is consequently obtained**.

Factors Affecting Density of magnetic flux	Indicative values of performance reduction and application considerations
Roughness of the piece	▪ 100% = rectified ▪ **90 ÷ 80% = fine milled (TDM MAG)** ▪ 80 ÷ 70% = milled ▪ 70 ÷ 60% = raw
Type of material	▪ 100% mild steel ▪ 70% ÷ 80% alloy steel ▪ 40% cast iron ▪ 0% non-magnetic stainless steel, brass, aluminum
Thickness of work-piece	The clamping of pieces with a thickness less than the minimum recommendation reduces the level of magnetic performance
Correct set up of the work-piece on the magnetic surface	It is preferable to place the piece partially covering more magnetic poles rather than a smaller number of magnetic poles with full coverage

TdmMag

TORQUE DIE & MOLD



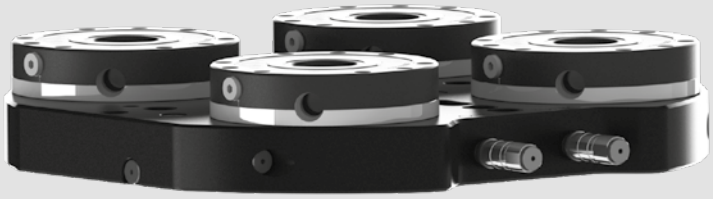
Magnetic system for clamping pieces in milling

Benefits

Zero Point

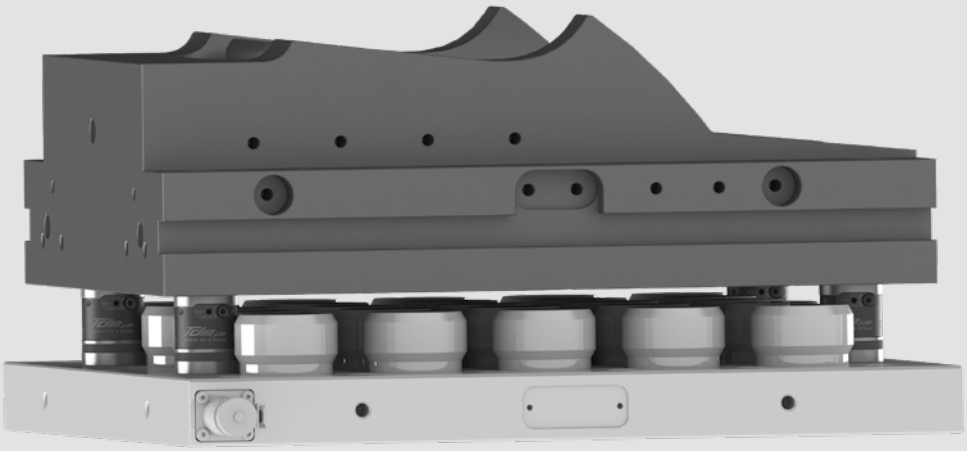
TDM MAG can be applied directly or via an interface plate (only for 400x400) to the **APS Zero Point system.**





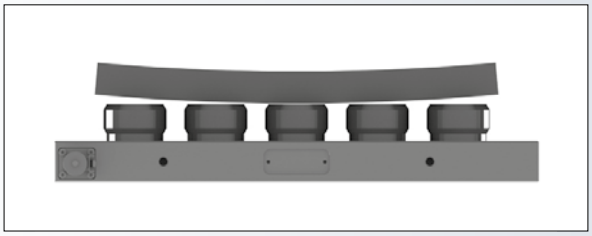
Non-magnetizable pieces

With **TDM MAG**, by replacing the centering modules (Id.No. 46233610) with the TDM 48 or 88 clamping modules, **NON-MAGNETIZABLE** pieces can be clamped with a considerable saving of set-up time.



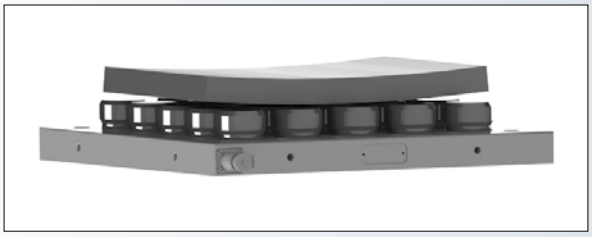
Polar extensions and automatic shimming

The use of polar extensions suitable for the application reduces the operating air gaps and improves the magnetic flux density. They can be used to elevate the piece and machine the 5 faces in a single placement, for contouring, chamfering, through drilling operations or to create mechanical, magnetic stops and dedicated jigs.
It is possible to carry out the automatic shimming of deformed pieces through the use of mobile extensions that avoid the tensioning of the piece during the work phase.



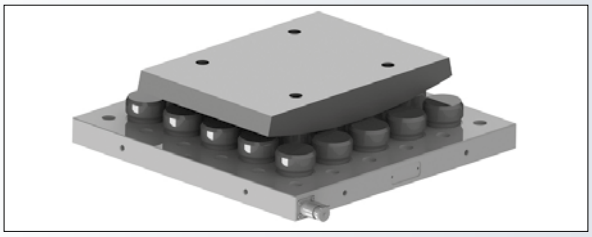
OP 1

Place the workpiece on 3 3 TDM centering elements (Id.No. 46233610) placed at the end to determine the work surface with the support of all the other mobile extensions.



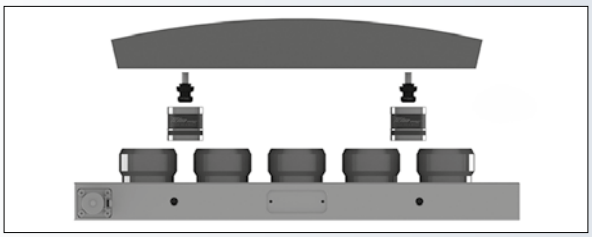
OP 2

By starting a magnetization cycle on the permanent-electro magnetic chuck, you will notice that the mobile pole extensions will adapt to the profile of the workpiece. At this point, start the first machining on the upper surface and drill the holes for the **TDM** pins (see page 38).



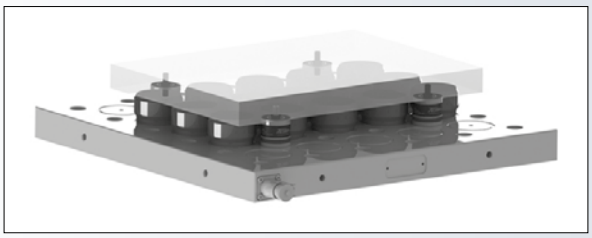
OP 3

Once the first machining is finished, start a Demagnetization cycle.



OP 4

Turn the workpiece upside down with the machined face on the bed of pole extensions. Start the magnetization cycle for the second machining operation.



OP 5

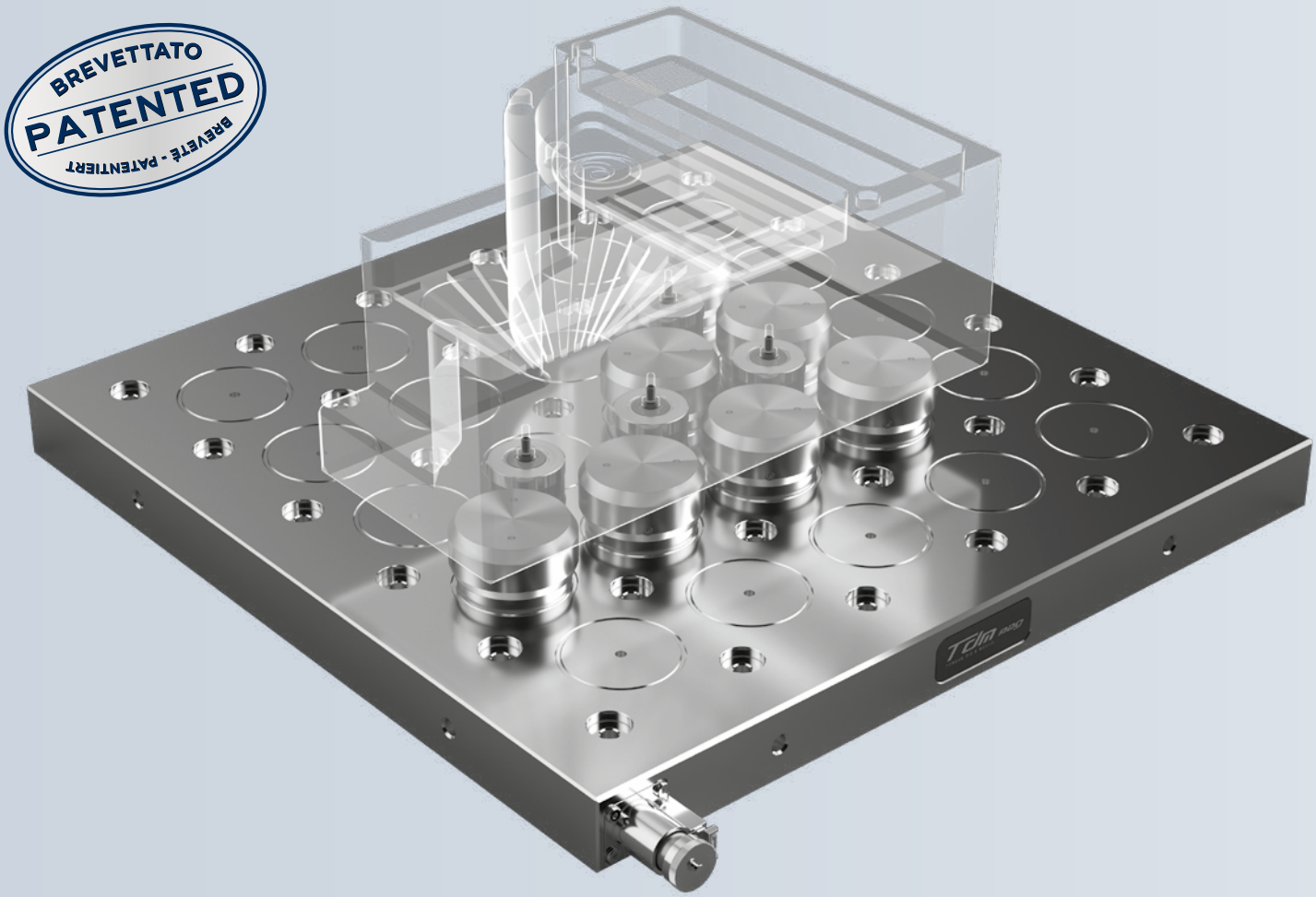
At the end of the second machining it is possible to proceed with a demagnetization cycle, then remove the perfectly planar machined piece with the two parallel faces.

TdmMag

TORQUE DIE & MOLD



Magnetic system for clamping pieces in milling



TDM system integrated with the technology of the subsidiary MAG AUTOBLOK

MillTEC is a MAG AUTOBLOK TECNOMAGNETE patent and represents the state of the art in the technological and constructive evolution of electro-permanent magnetic chucks for machining centers and milling machines.

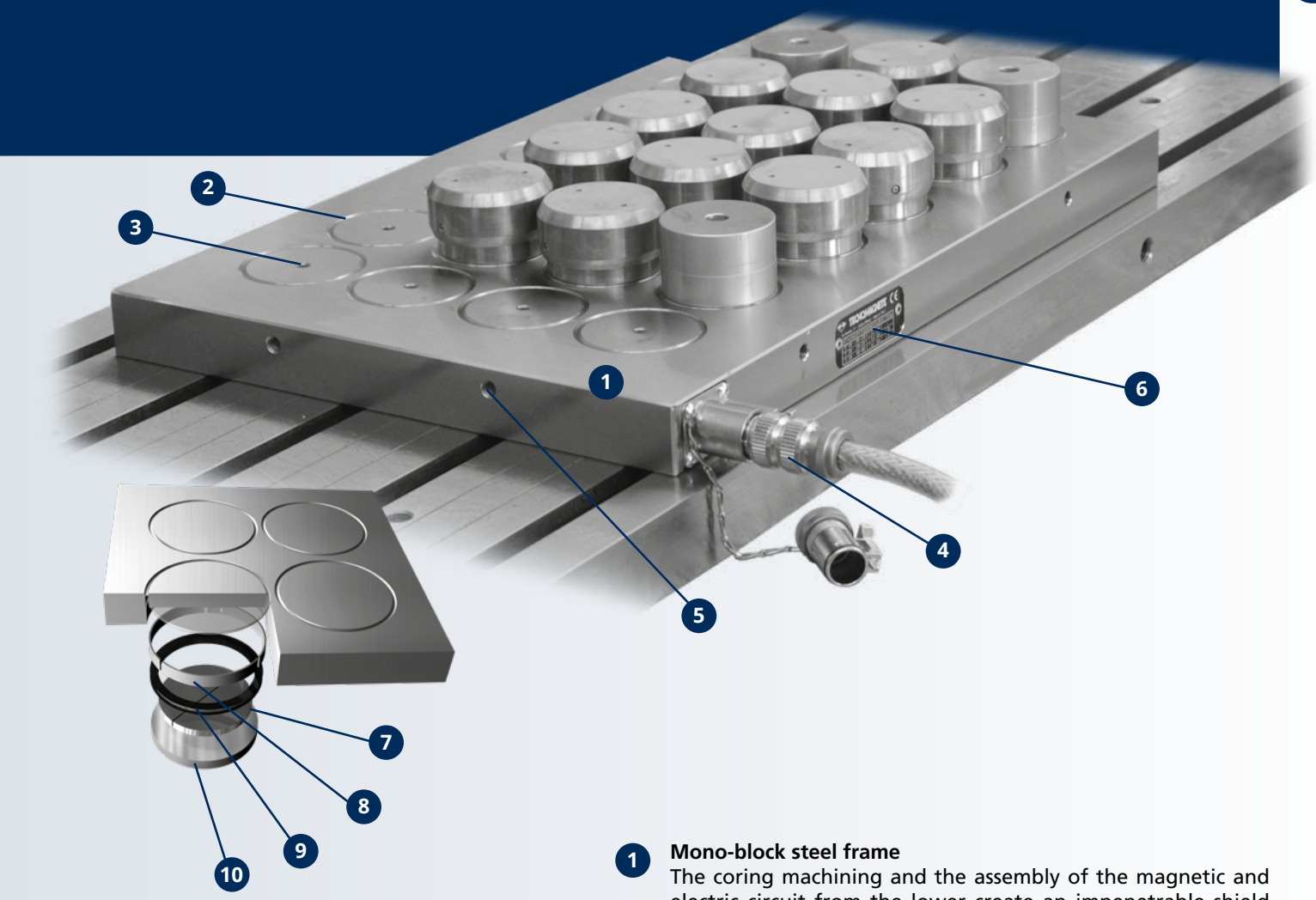
The frame is designed as a monolithic honeycomb structure and manufactured “from solid” with the same technology used for precision molds.

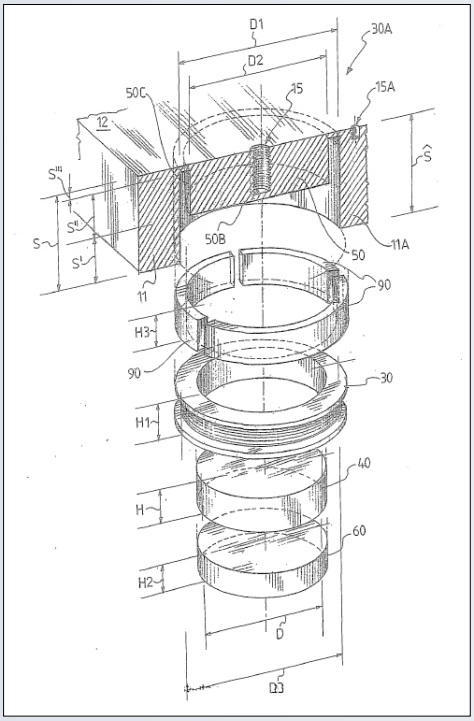
The entire surface can be machined for the insertion of precision bushings, dowel pins or mechanical and magnetic stops to be used as a reference or to enhance the clamping force.

All of the magnetic and electrical components are inserted inside the frame in a special housing becoming an integral and solid part of the system.

The magnetic poles are the result of a series of coring machining carried out from the lower side of the mono-block steel frame and highlighted on the upper working side by light circular engravings.

The working surface is totally metallic without any presence of epoxy resin, brass or aluminum inserts.





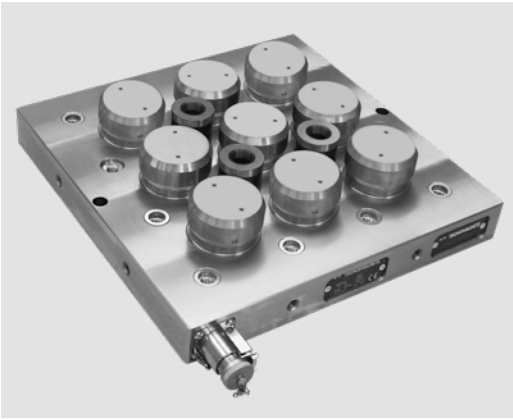
International patent **WO 2009/130721**

1. **Mono-block steel frame**
   The coring machining and the assembly of the magnetic and electric circuit from the lower create an impenetrable shield from any external agent.
2. **Light circular engravings**
   To highlight the position of the magnetic polarity while maintaining a totally solid and metal surface without resin, brass or aluminum inserts.
3. **M8 threaded holes**
   For the use of fixed / mobile extensions or special accessories tailored to the applicatio
4. **Quick fit connector**
   Precise, safe and watertight for quick connection with the control unit.
5. **M10 threaded holes**
   To use with mechanical stops for reference.
6. **Performance plate with technical data**
   Data on voltage, current absorption, serial number.
7. **Reversible permanent magnet AlNiCo**
8. **Static permanent magnet Neodymium**
9. **Encapsulated electric coil**
10. **Hermetic closing cap**

TDM MAG

Magnetic system for clamping pieces in milling

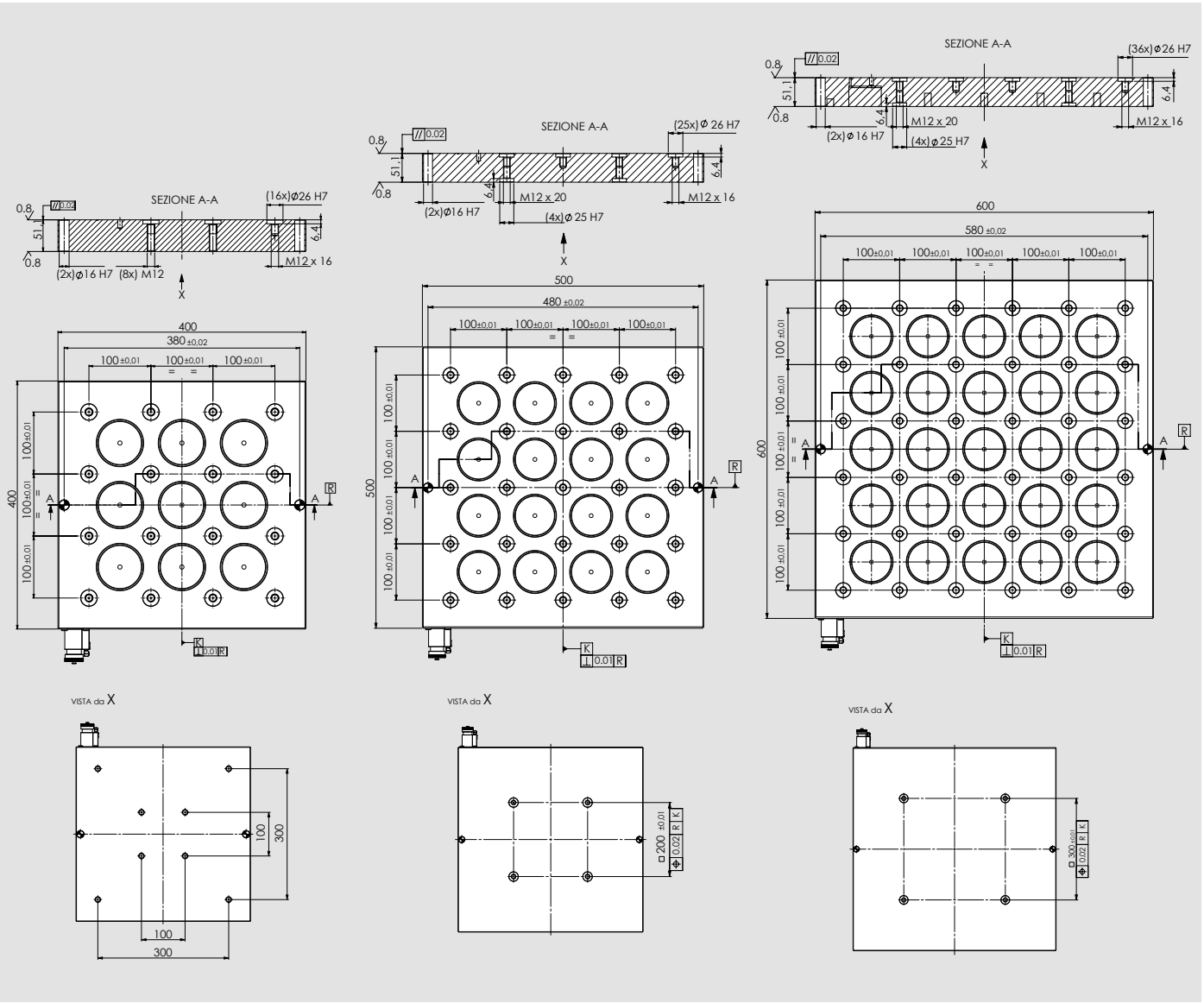
MAGNETIC PLATE



Complete with:

- Magnetic plane
- n. 9 moving extensions
- n. 3 TDM MAG (46233610)
- ST200FA control unit
- Cable

(Pins not included)



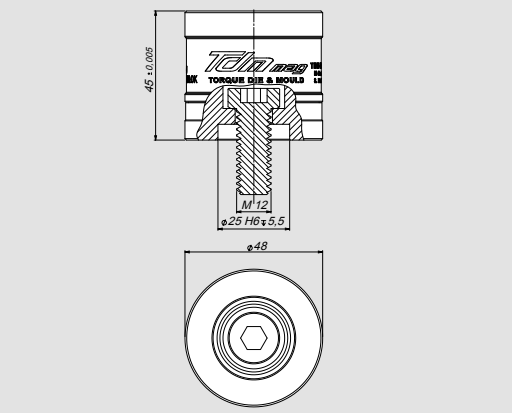
Id. No.	Dimensions	Weight	Poles	Min. thicks	Force/pole	Force
	mm	Kg	n.	mm	daN	Tons
46233640 *	400 x 400 x 51	90	9	17	615	5,8
46233650	500 x 500 x 51	120	16	17	615	10
46233660	600 x 600 x 51	155	25	17	615	16

***** Integration for Zero Point pins with interface plate

On request: magnetic plates of different dimensions

TDM MAG 48 - Centering module with screw

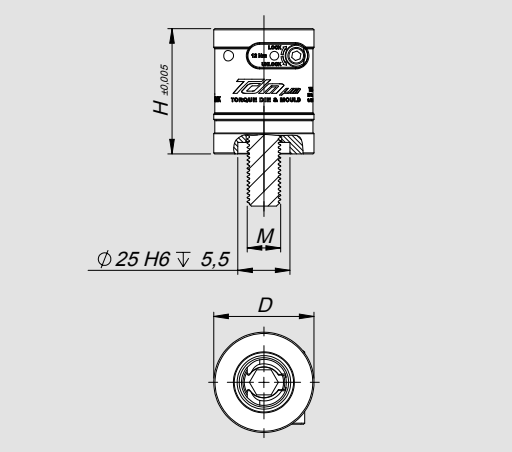




Id. No.
46233610

TDM 48 - For clamping non-magnetizable pieces





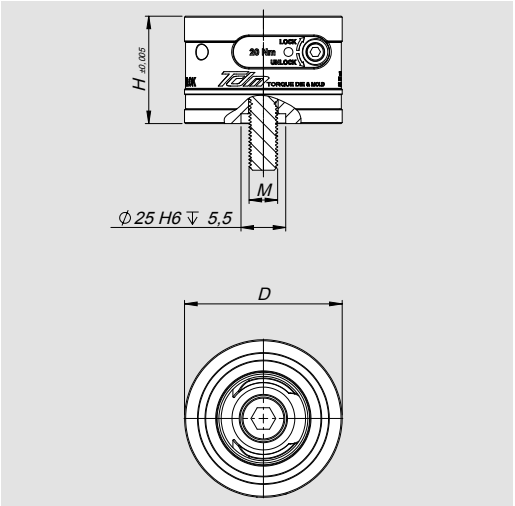
See page 0.2.26 for technical features

Module	Id. No.	D	H	M
TDM 48	46230105	48	60	M12 *

* see page 0.2.**28**

TDM 88 - For clamping non-magnetizable pieces





See page 0.2.6 for technical features

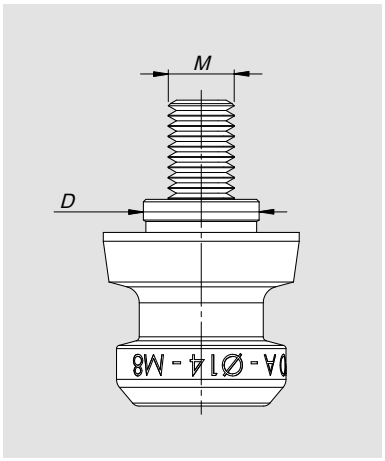
Module	Id. No.	D	H	M **
TDM88 H60	46230102	88	60	M12 *
TDM88 H80	46230103	88	80	M12 *
TDM88 H160	46230104	88	160	M12 *

**Complete with screw 12.9

* see page 0.2.**14**

Pins for TDM Ø48 complete with grub screw UNI 5932

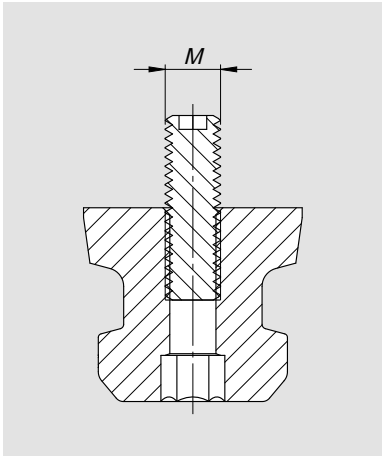




Id. No.	D	M - UNI 5932	Type
46231531	10 h4	M6	**A**
46231532	11 h4	M6	**A**
46231541	12 h4	M8	**A**
46231542	14 h4	M8	**A**
46231551	14 h4	M10	**A**
46231552	16 h4	M10	**A**
46231731	10 h4	M6	**C**
46231732	11 h4	M6	**C**
46231741	12 h4	M8	**C**
46231742	14 h4	M8	**C**
46231751	14 h4	M10	**C**
46231752	16 h4	M10	**C**

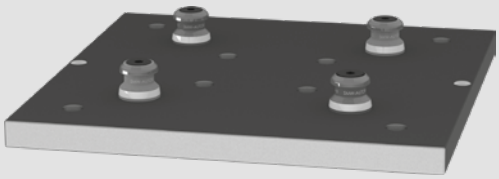
Pins for TDM Ø48 without centering complete with grub screw UNI 5932

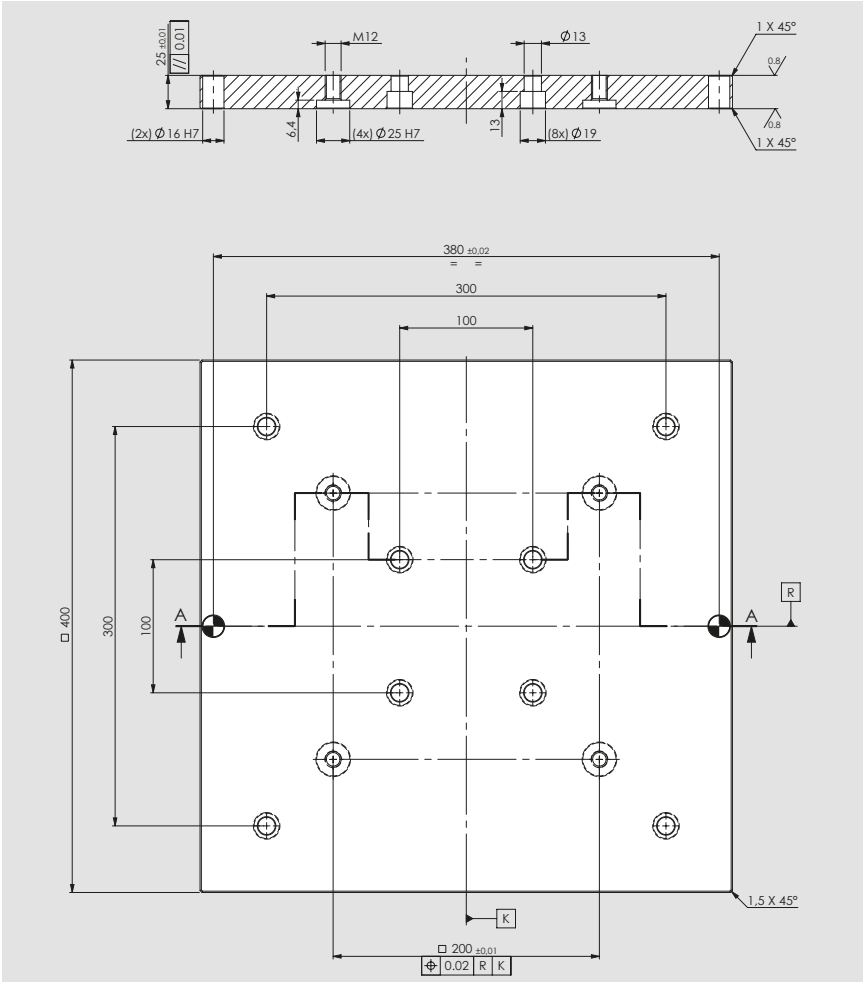




Id. No.	M - UNI 5932
46231533	M6
46231543	M8
46231553	M10

APS interface plate for magnetic plate 400x400

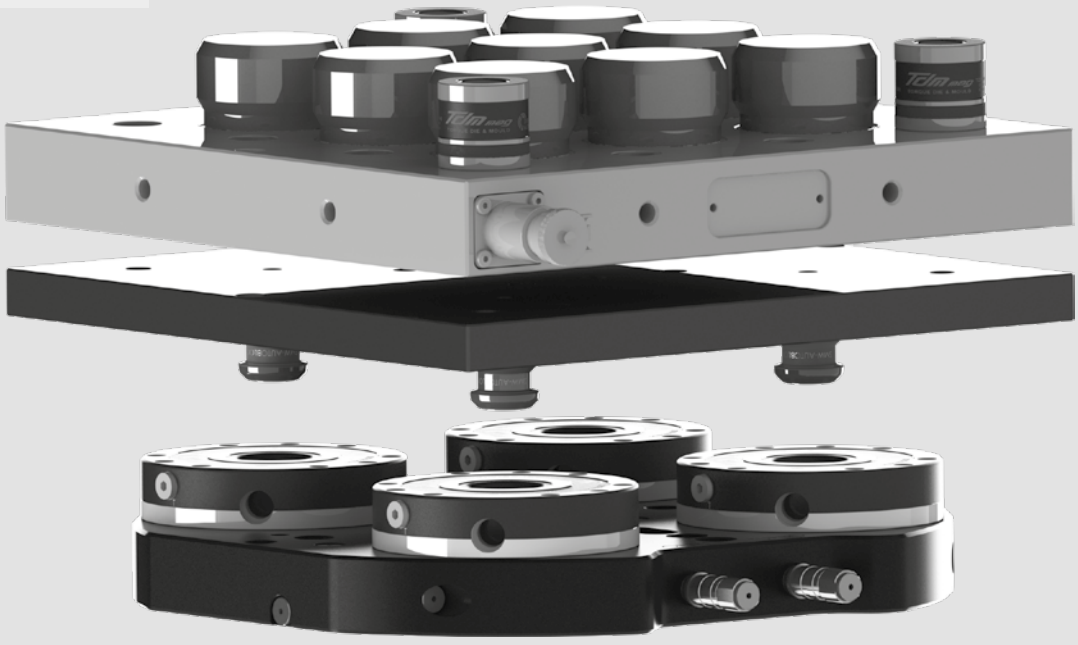




Integration interface plate for Zero Point pins complete with n. 1 pin A, n. 1 pin B, n. 2 pins C M12 for APS

Id. No.
46233645

Working example

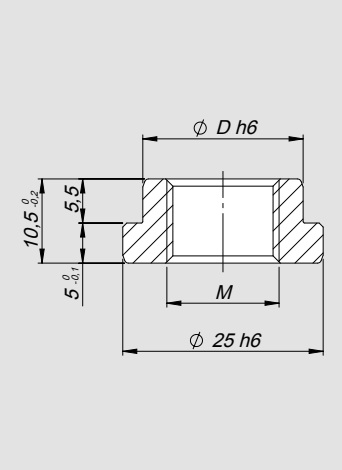


TDM MAG

Magnetic system for clamping pieces in milling

CENTERING BUSH





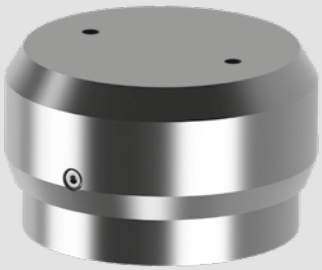
Id. No.	D	M
46230918	18	M14 x 1,5

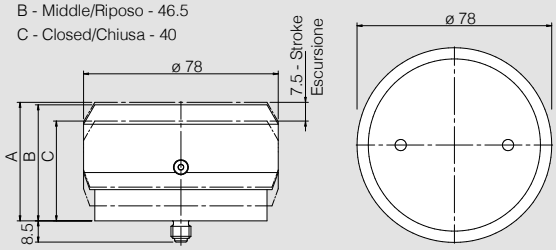
CONTROL UNITS ST200FA



The ST200FA series is characterized by compactness and lightness.
Designed to be positioned vertically on the machine cabinet, it is supplied pre-arranged with a rear hooking system.
ST200FA has an integrated push button with high intensity LEDs and is available with voltages from 360V to 480V.

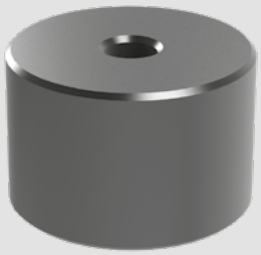
EXTENSION

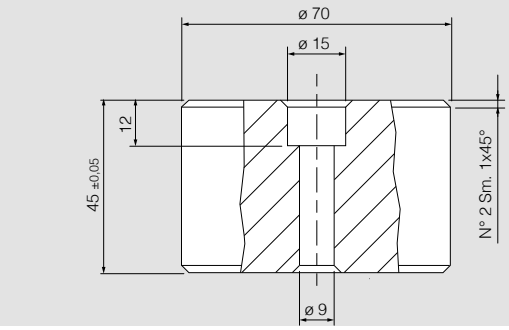




Id. No.
APRMP7045

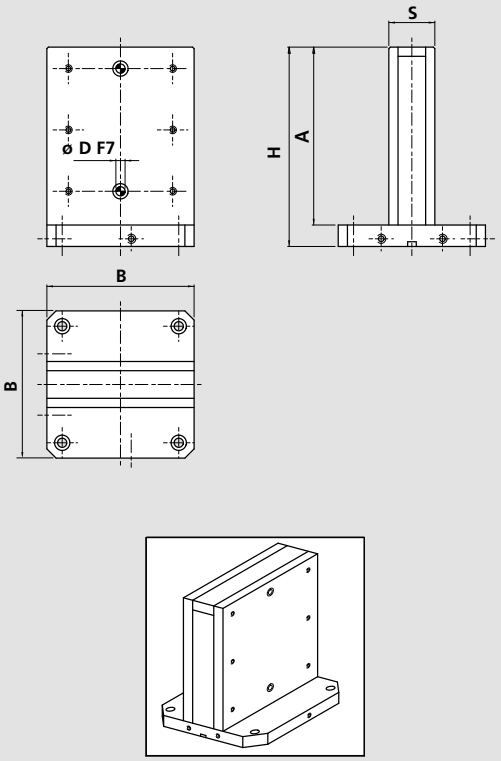
FIX EXTENSION



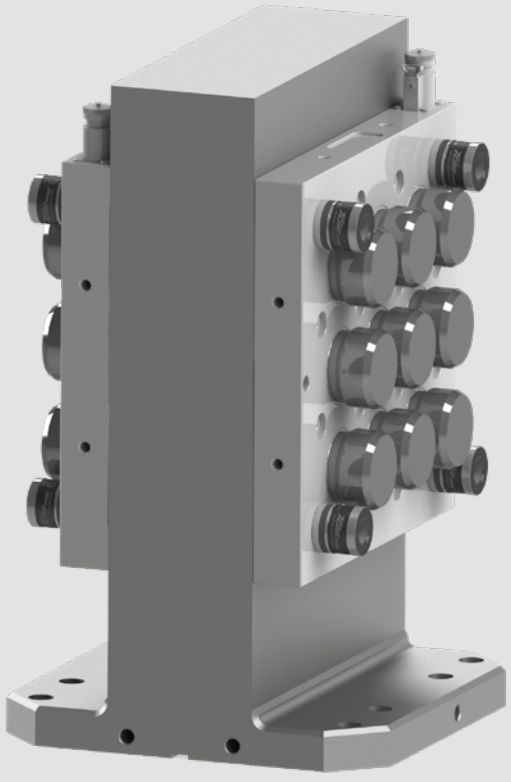


Id. No.
PFR70-45

CRANKWEBS



Working example

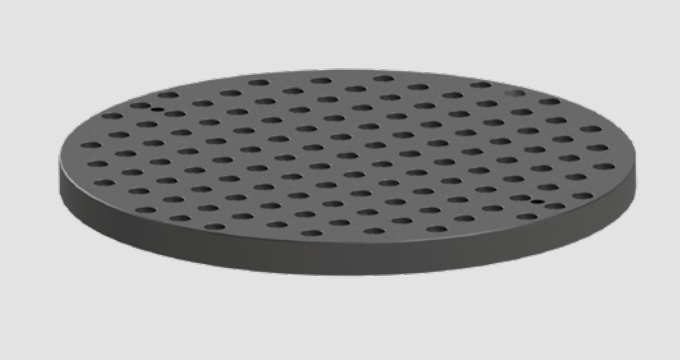


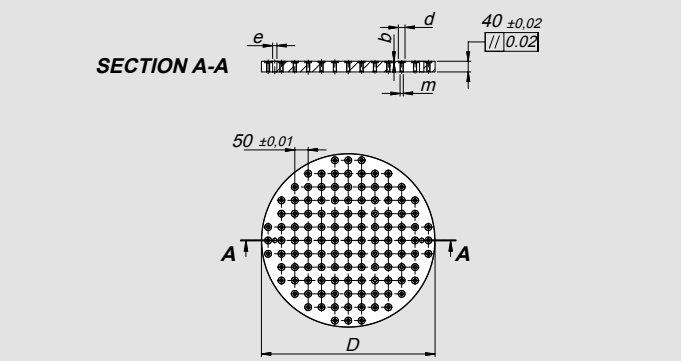
Note: Thanks to the cast aluminum alloy version, the total weight of the system complies with the maximum weight that can be supported by horizontal machine tools

Id.No.	A	B	H	Ø D	S	Weight
	mm	mm	mm	mm	mm	Kg
57328035	620	400	660	16	150	77
57328055	660	500	700	16	150	103

Special sizes on request.

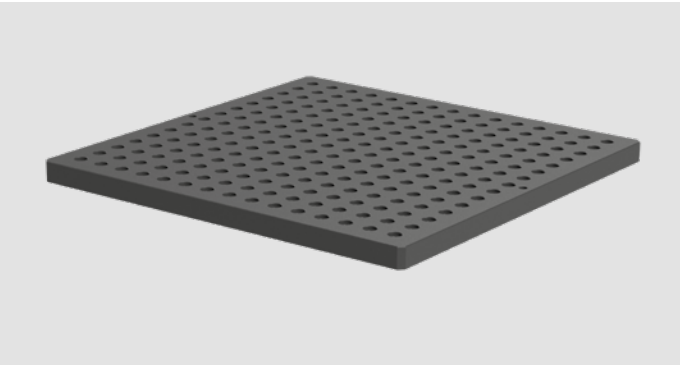
ROUNDED PLATES

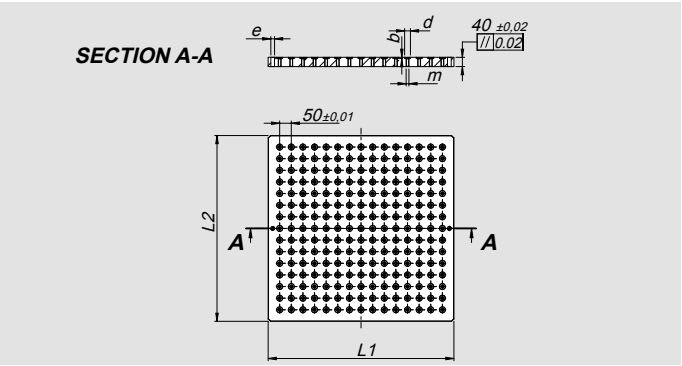




Id. No.	D	d	m	b	e	No. holes
46234122	Ø500	25 H7	M16	6,40	16H7	69
46234123	Ø650	25 H7	M16	6,40	16H7	121
46234124	Ø800	25 H7	M16	6,40	16H7	185

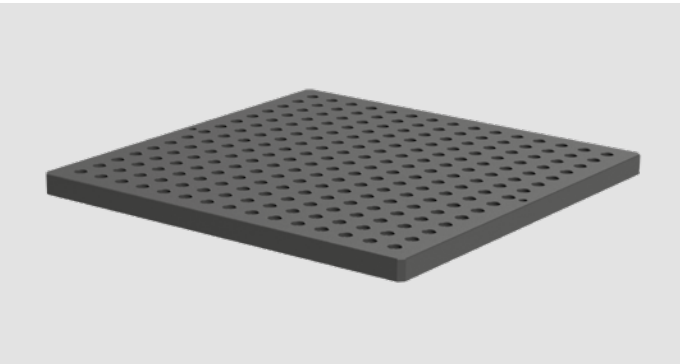
STANDARD PLATES WITH GRID

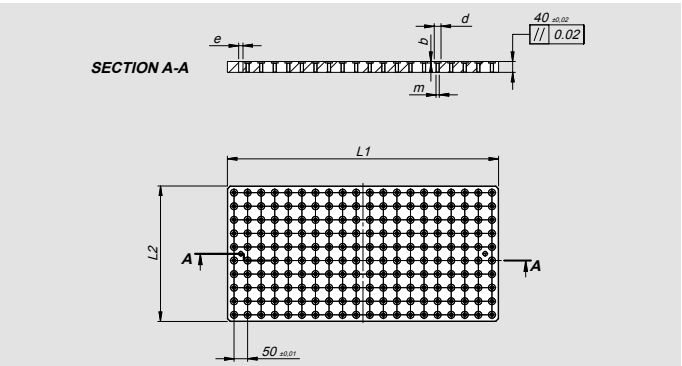




Id. No.	L1	L2	d	m	b	e	No. holes
46234102	499	499	25 H7	M16	6,40	16H7	81
46234103	599	599	25 H7	M16	6,40	16H7	121
46234104	799	799	25 H7	M16	6,40	16H7	225
46234105	999	499	25 H7	M16	6,40	16H7	171
46234106	999	999	25 H7	M16	6,40	16H7	361

MODULAR PLATES

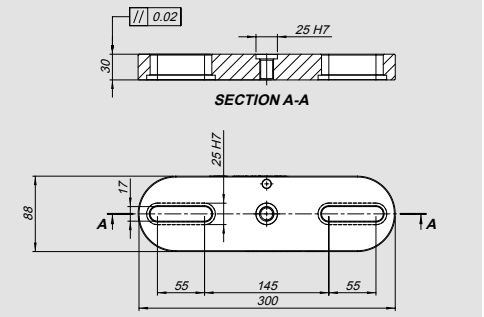




Id. No.	L1	L2	d	m	b	e	No. holes
46234112	499	499	25 H7	M16	6,40	16H7	100
46234113	599	599	25 H7	M16	6,40	16H7	144
46234114	799	799	25 H7	M16	6,40	16H7	256
46234115	999	499	25 H7	M16	6,40	16H7	200
46234116	999	999	25 H7	M16	6,40	16H7	400

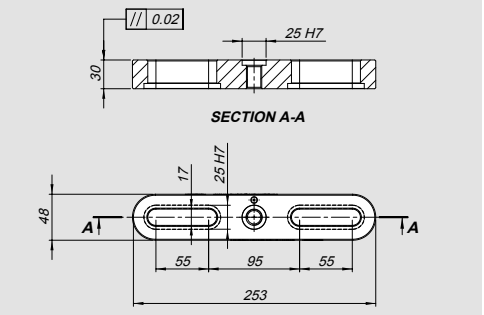
GUIDE PLATES





	Id.No.
for TDM 88	46232210

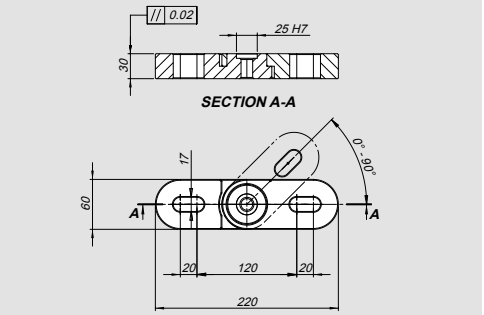




	Id.No.
for TDM 48	46232220

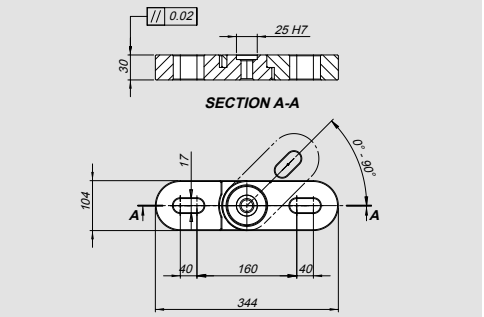
COMPASS PLATES





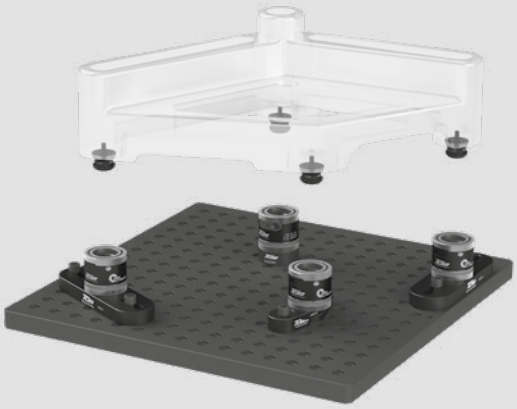
	Id.No.
for TDM 48	46232230





	Id.No.
for TDM 88	46232240

Working example

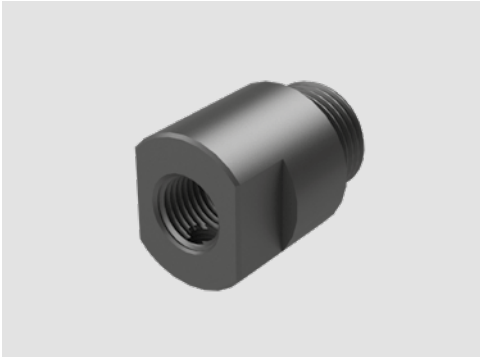


EXTRACTOR



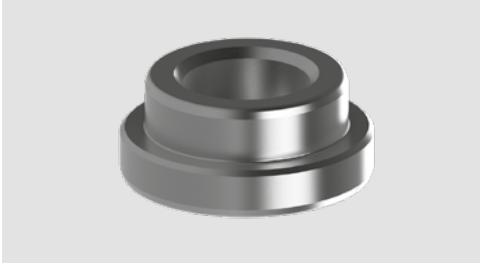
Id. No.
46232150

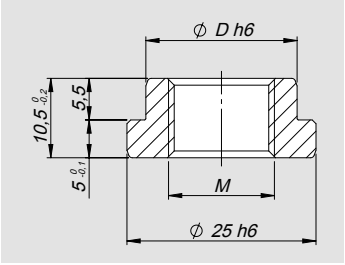
REDUCTION FOR EXTRACTOR



Id. No.	H
46232153	M18 x 1.5
46232154	M12 x 1.5
46232155	M12
46232156	M10
46232157	M8
46232158	M6

CENTERING BUSH

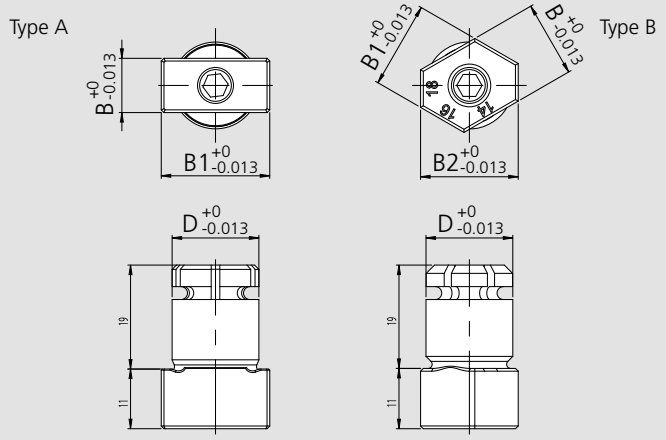


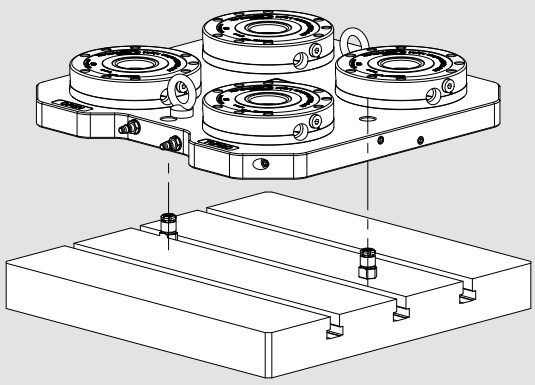


Id. No.	D	Thread for extraction * M
46230916	16	M14 x 1,5
46230918	18	M14 x 1,5
46230920	20	M14 x 1,5
46230922	22	M18 x 1.5
46230924	24	M18 x 1.5
46230925	25	M18 x 1.5

* Extractor Id.No. 46232150

MULTI-SLOT SCREW FOR THE POSITIONING OF CLAMPING UNITS





Type	Id. No.	D	B	B1	B2
A: Multi-slot	71290183	16	10	20	-
A: Multi-slot	71290181	16	12	22	-
B: Multi-slot	71290182	16	14	16	18
B: Multi-slot	71290184	20	24	28	32

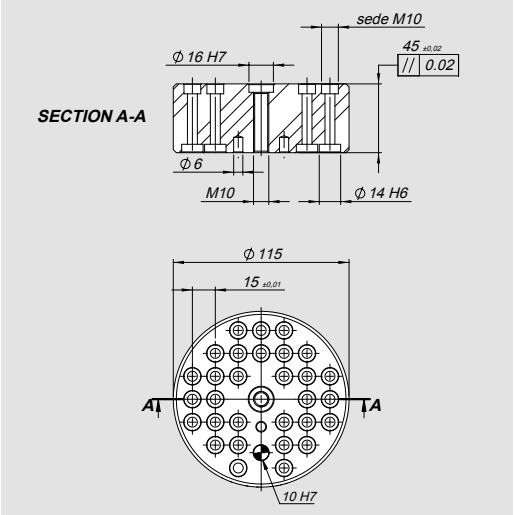
ALUMINIUM THREADED PLUG FOR GRID PLATES



Type	Id. No.
Aluminium threaded plug Ø 25 M16	57602397
Aluminium threaded plug Ø 24 M16	71290657

ROUNDED MINIPALLET

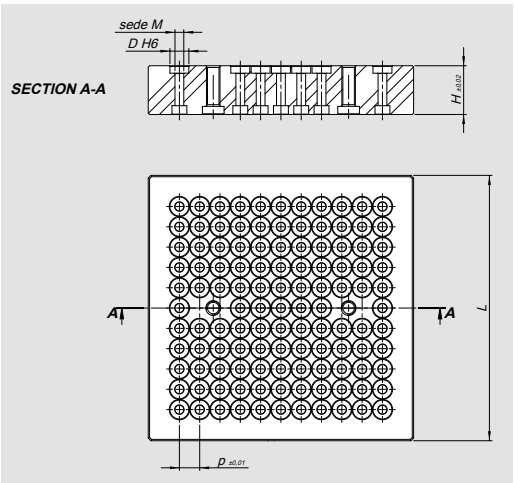




Id. No.
46233111

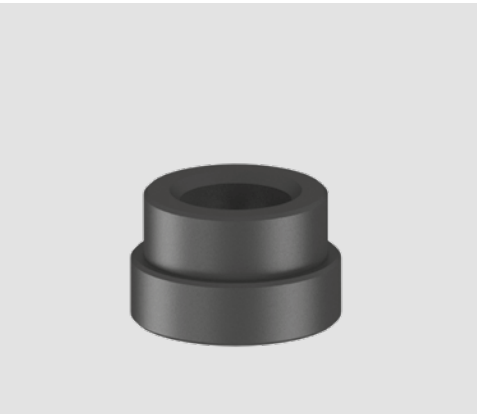
SQUARE MINIPALLET

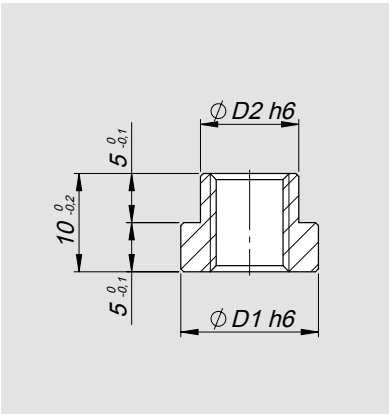




Id. No.	H	L	D	M	p
46233112	36	196	14	M6	15
46233113	36	246	14	M6	15
46233114	36	296	14	M6	15
46233121	36	246	16	M8	20
46233122	36	296	16	M8	20
46233131	46	246	18	M10	25
46233132	46	296	18	M10	25

PIN FOR MINIPALLET

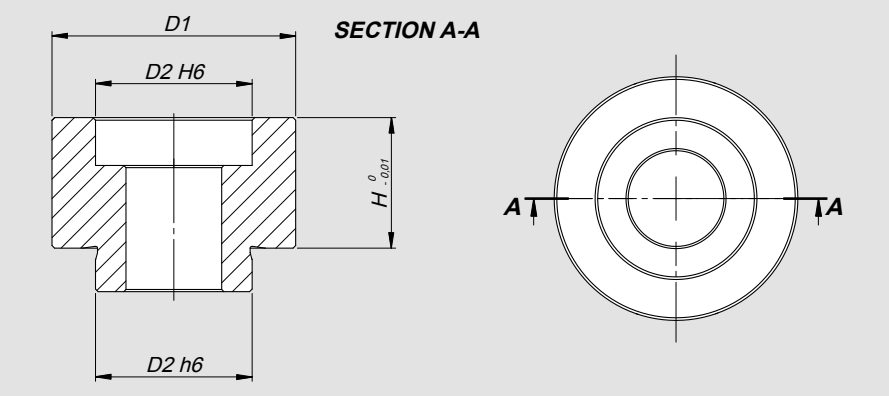




Id. No.	D1	D2	For screw
46233141	14 h6	10 h6	M6
46233142	14 h6	11 h6	M6
46233151	16 h6	12 h6	M8
46233152	16 h6	14 h6	M8
46233161	18 h6	14 h6	M10
46233162	18 h6	16 h6	M10

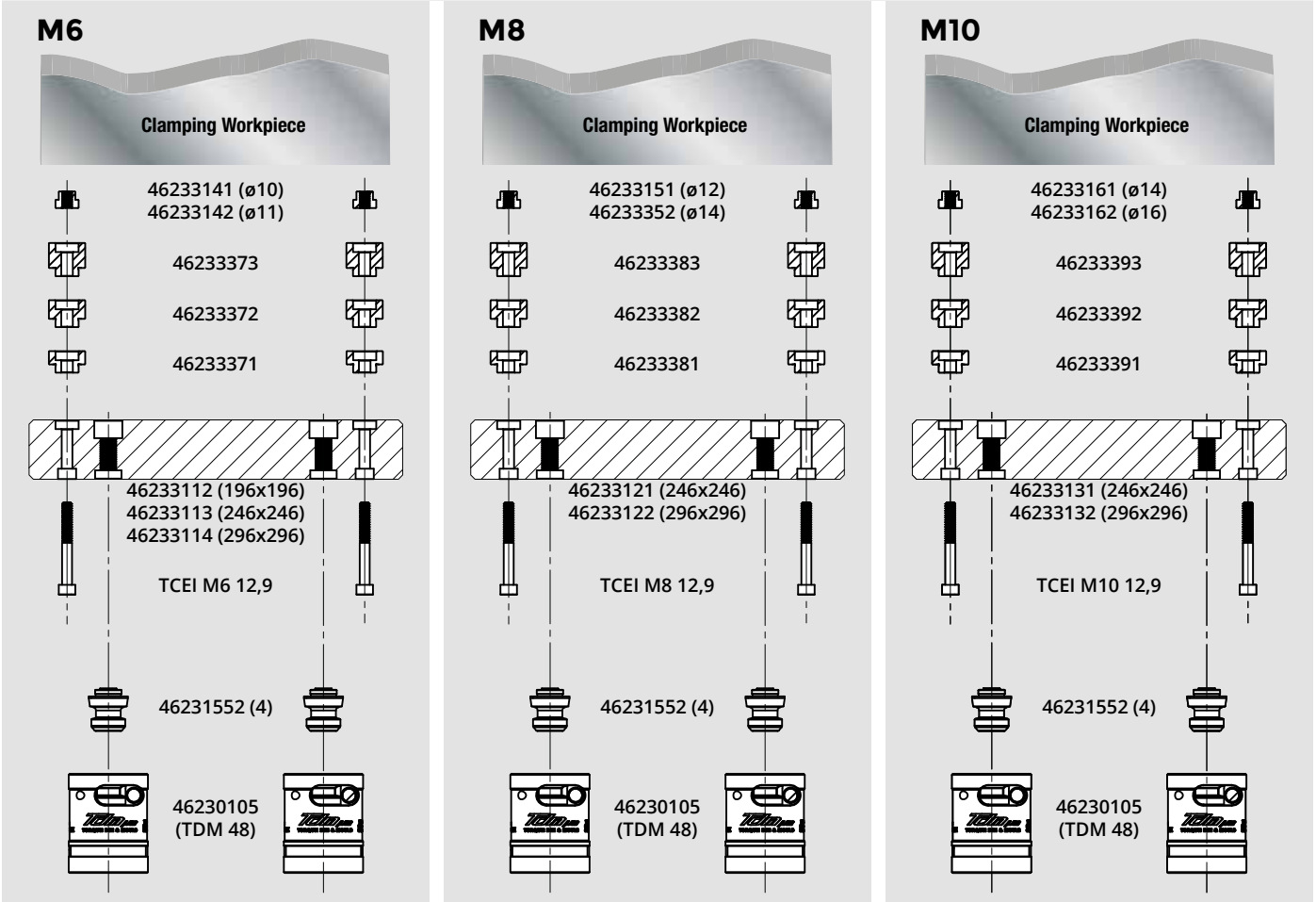
SPACER FOR MINIPALLET





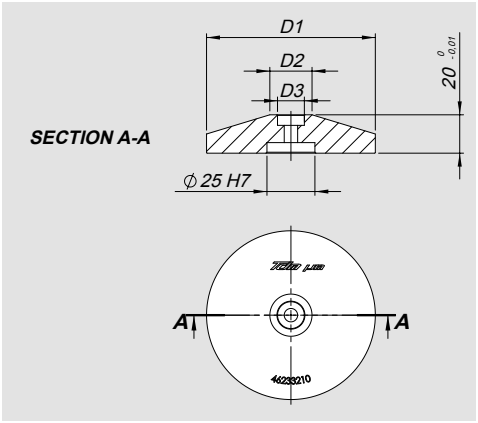
Id. No.	D1	D2	H	For screw
46233371	22	14	8	M6
46233372	22	14	12	M6
46233373	22	14	16	M6
46233381	25	16	10	M8
46233382	25	16	15	M8
46233383	25	16	20	M8
46233391	28	18	15	M10
46233392	28	18	25	M10
46233393	28	18	35	M10

Spacer and pin working example for minipallet



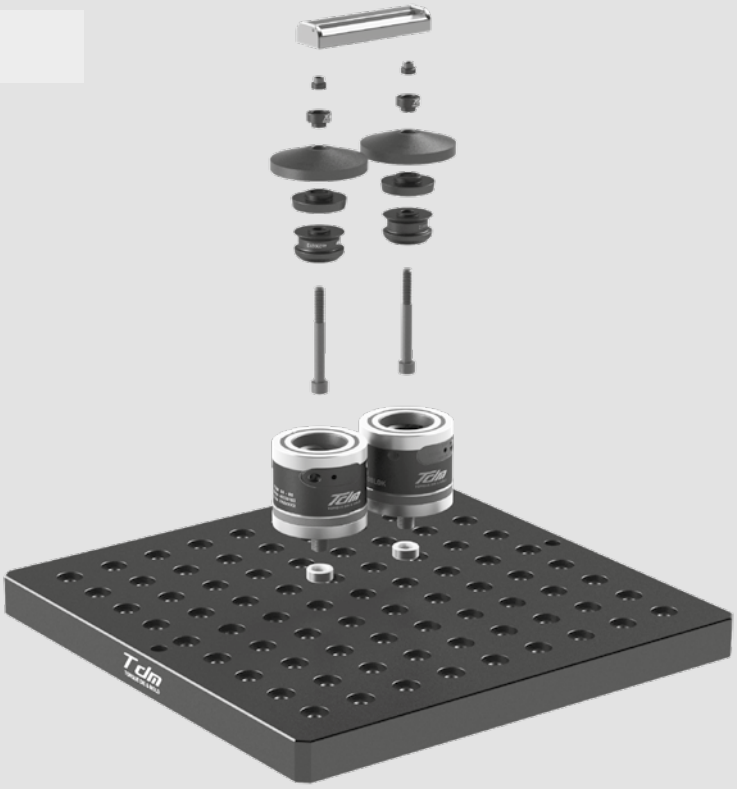
ADAPTOR BETWEEN TDM88, 48 and MINIPALLET



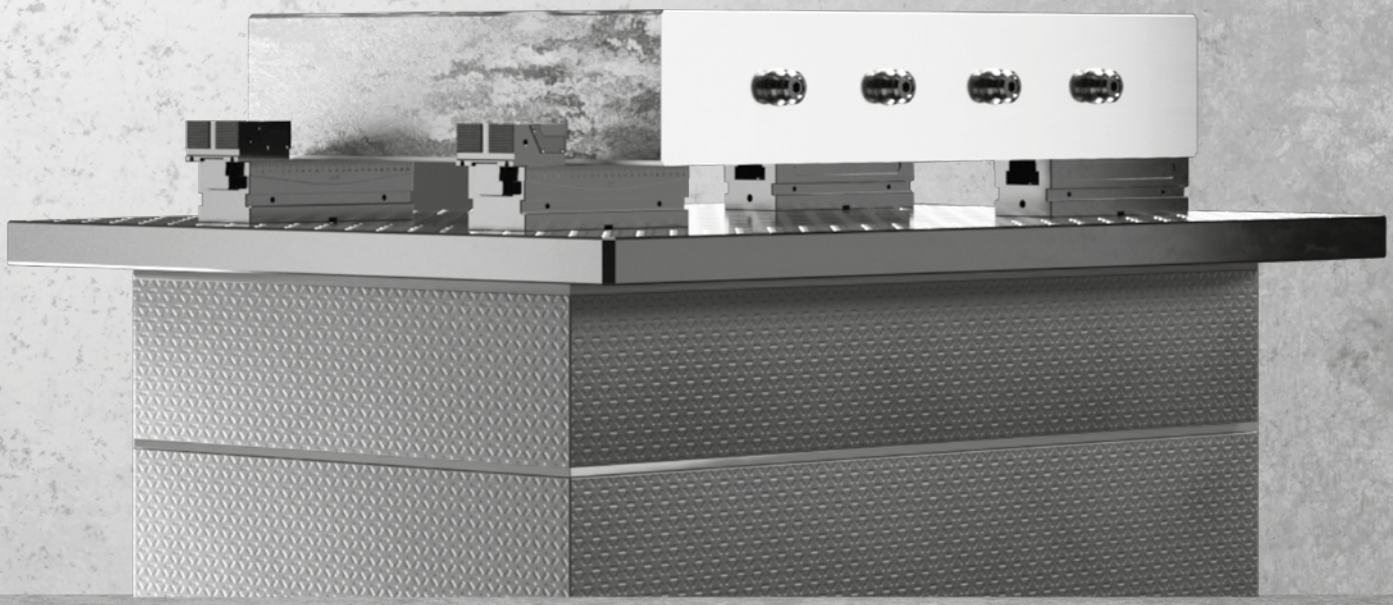


Id. No.	D1	D2	D3
46233210	88	22	14 H6
46233220	88	25	16 H6
46233230	88	28	18 H6
46233260	48	22	14 H6
46233270	48	25	16 H6
46233280	48	28	18 H6

Adaptor working example



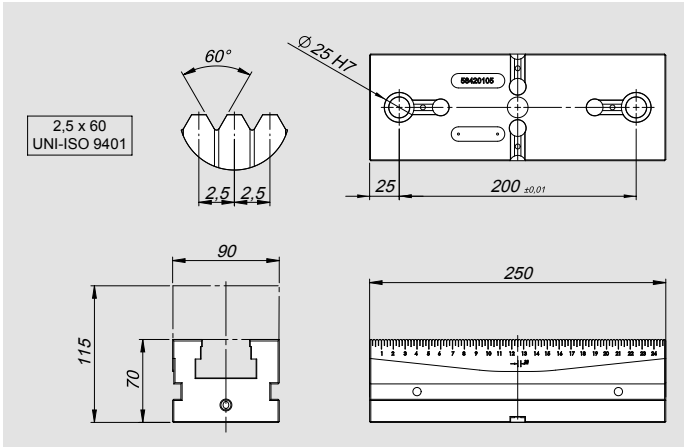
OP 10

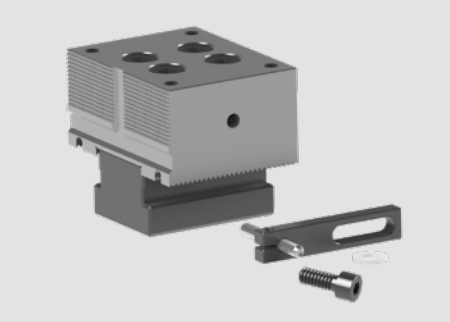


BASE CIVI 90/250

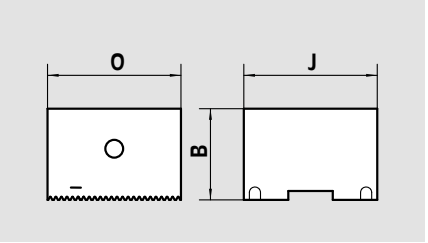


Codice - Id. No.
46233750





Complete fixed support J90 grooved

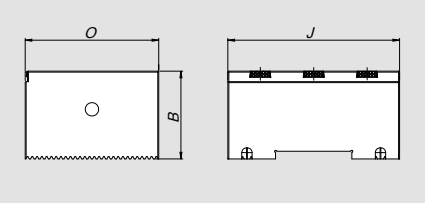


Id. No.	model	B	J	O	Weight
58427200	CIVI 2000/90	45	90	70	2,9



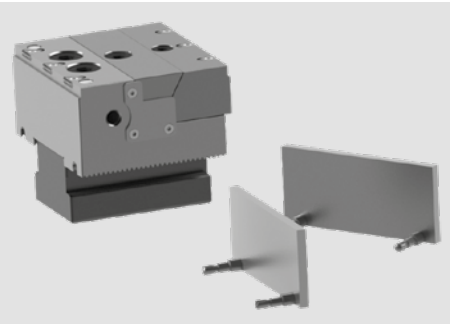
Fixed jaw set Sintergrip J90

complete with 1 work stop, n. 3 SinterGrip inserts STD for steel*



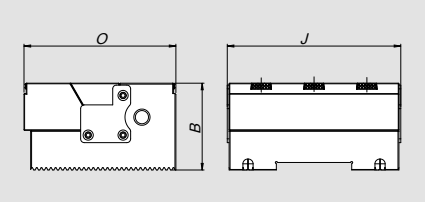
* A richiesta inserti per ALU o HRC
* On request inserts for ALU or HRC

Id. No.	model	B	J	O	Weight
58467290	CIVI 2000/90	45	90	70	2,9



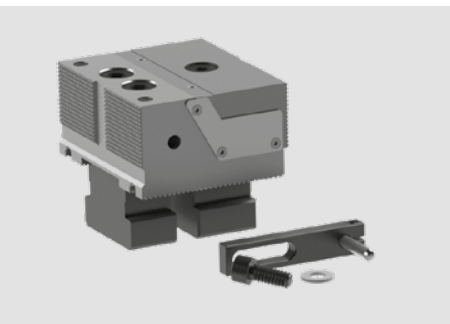
Movable jaw set J90

complete with 1 work stop, n. 6 SinterGrip inserts STD for steel*, n. 1 pair of parallels H42.



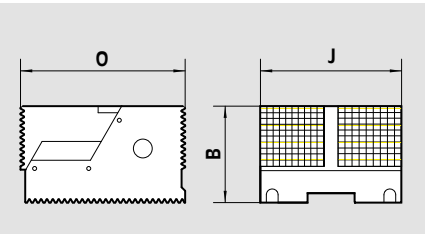
* A richiesta inserti per ALU o HRC
* On request inserts for ALU or HRC

Id. No.	model	B	J	O	Weight
77584690	CIVI 2000/90 x ...	45	90	80	2,9



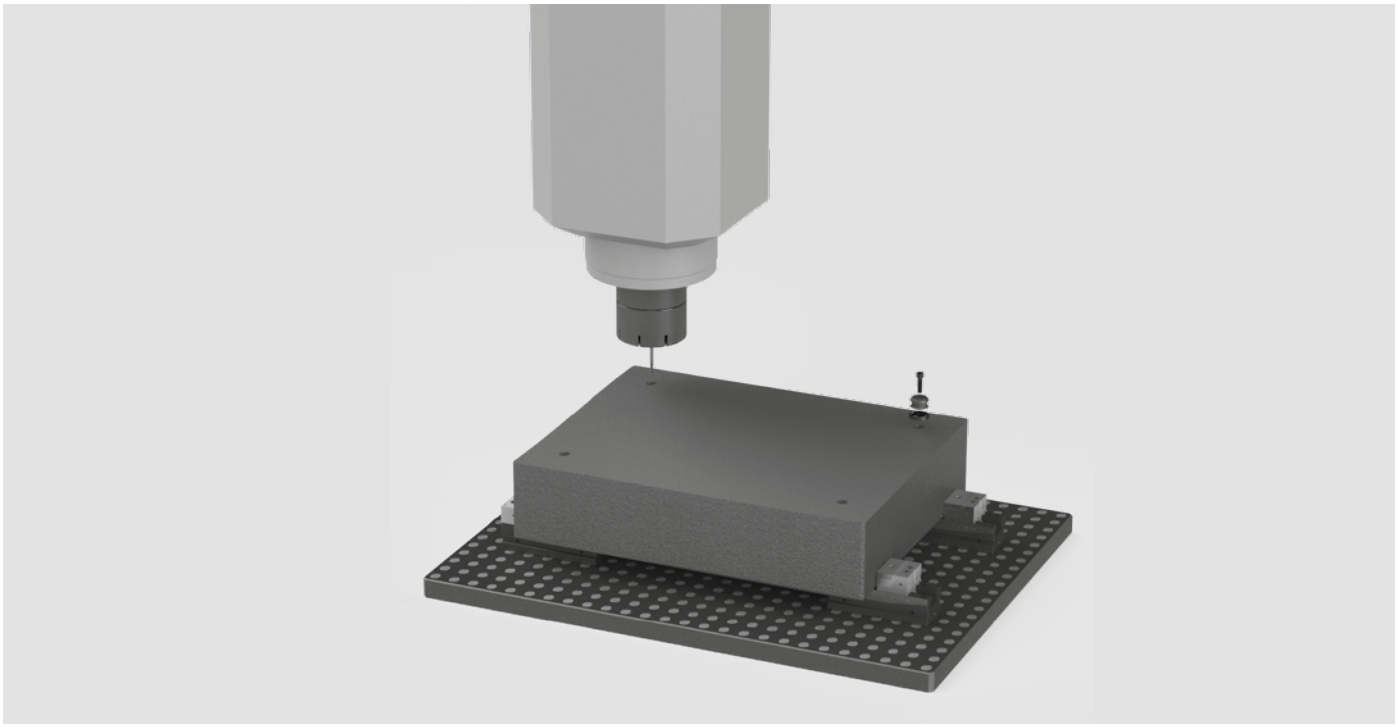
Movable jaw set J90 with grooved jaws

(for raw workpieces)

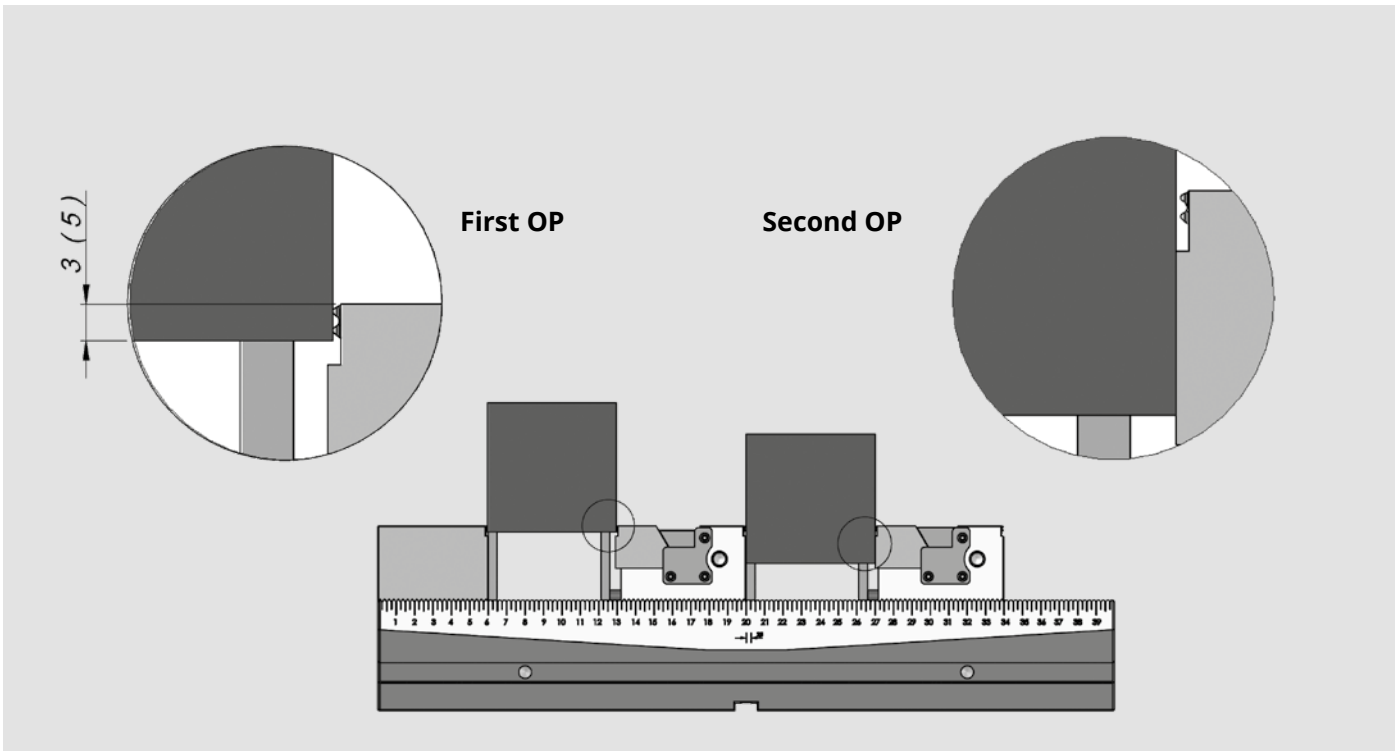


Id. No.	model	B	J	O	Weight
77584228	CIVI 2000/90	45	90	80	2,9

Working example



Working example with SinterGrip



WPS-PPD

Workpiece preparation device

WPS PPD modules for OP10



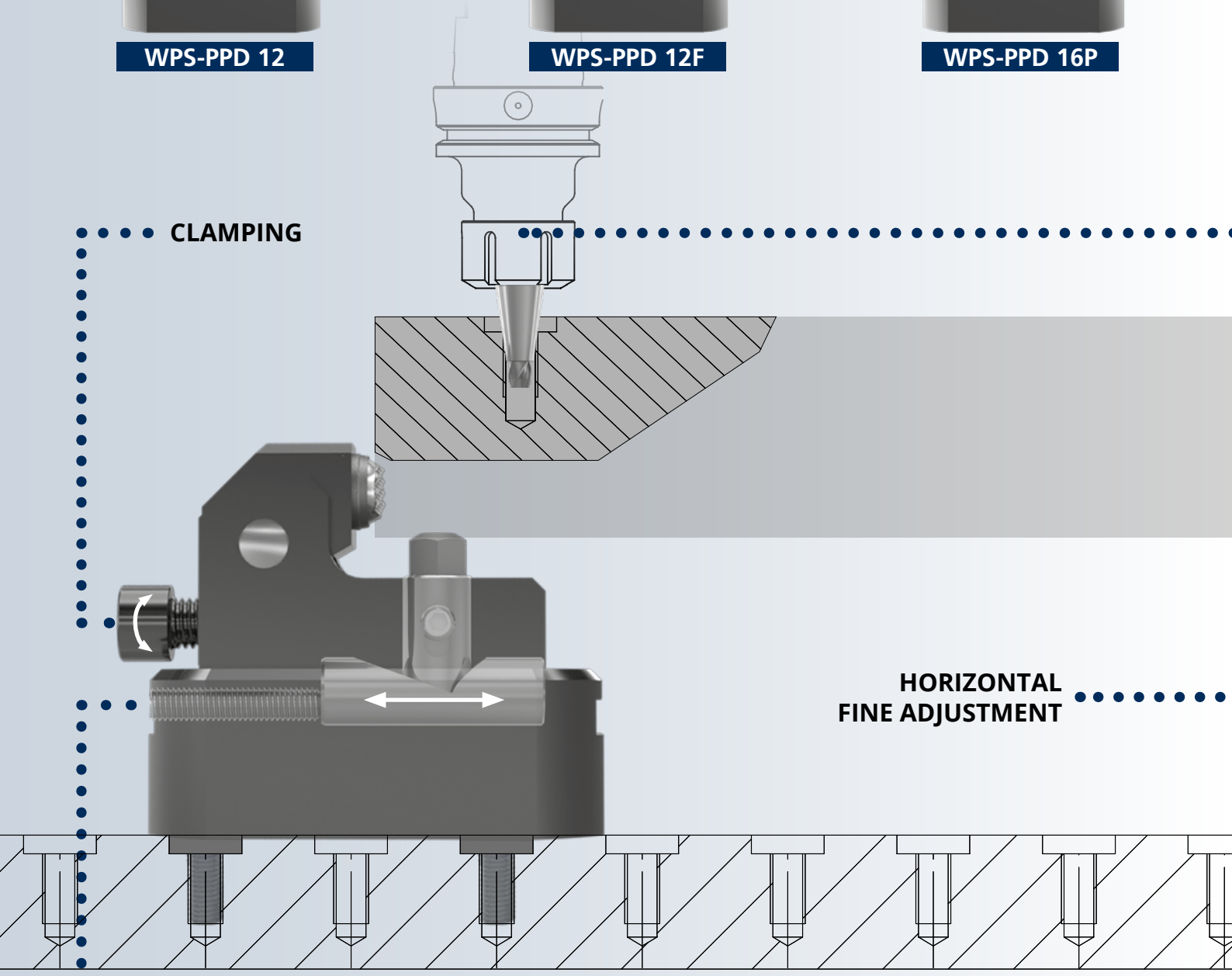
WPS-PPD 12



WPS-PPD 12F

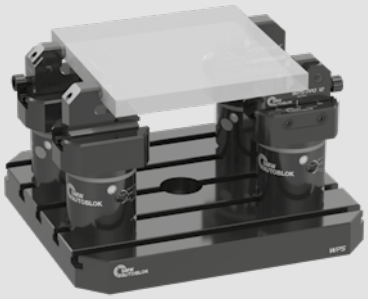


WPS-PPD 16P

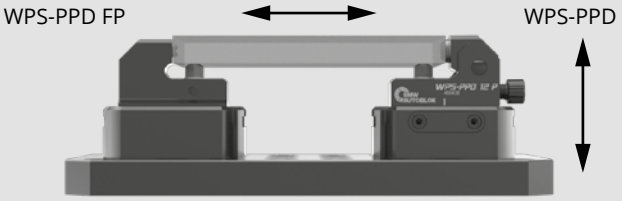


FINE ADJUSTMENT of the clamping height

Modularity

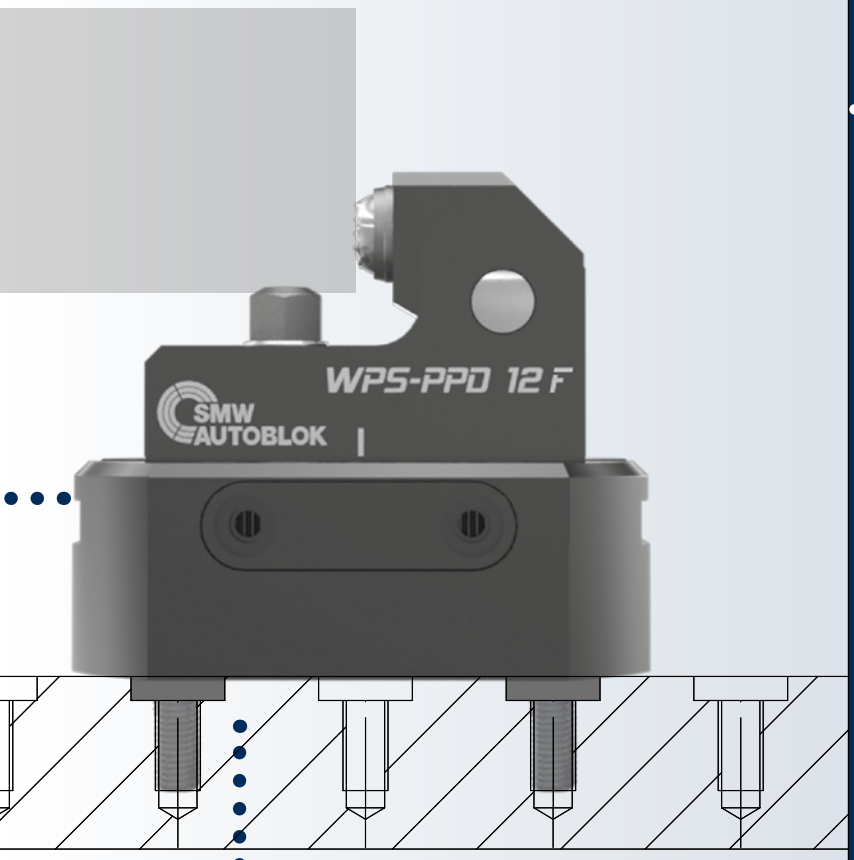


Clamping with/without pendulum
Clamping with/without fixed stop



Horizontal fine adjustment / fine adjustment - clamping height

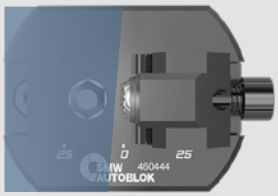
Pre-machining for clamping pins
for workpiece direct clamping with TDM



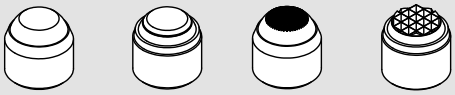
INSTALLATION ON GRID PLATE

Pendulum feature
WPS-PPD P and FP





- Due to the integrades pendulum mechanism, the clamping position adjusts itself to the workpiece geometry automatically.
- Therefore, also not angular workpiece areas can be clamped fast and safe.



- Thanks to 4 different pendulum inserts, the clamping devices are very flexible in use.

Workholding glossary

Modularity

Modular system with a wide range of accessories. Compatible with TDM through direct attachment of clamping pins.

Flexible in application

Option 1: Clamping centrically
Option 2: Clamping centrically with pendulum
Option 3: Clamping against fixed stop
Option 4 Clamping against fixed stop with pendulum

Increase in efficiency

Enormous reduction of setup costs by preparing for direct clamping with TDM clamping modules.

WPS-PPD

Workpiece preparation device

■ **Ideal for OP 10: preparation of the workpiece for WPS**



Application/Benefits

- Ideal for OP 10: preparation of the workpiece for WPS
- Very strong and compact design for best accessibility
- Clamping height of the workpiece adjustable
- Easy and flexible mounting
- Direct interface for grid dimension 40/50/80 mm and interface for zero point system APS / TDM

Technical features

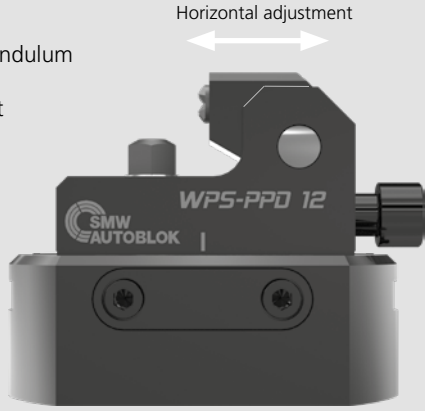
- Manual actuation
- Horizontal position adjustable
- Position lockable clamping
- Pull-down effect
- Different heights for the workpiece support by means of different stop pins
- Fine adjustment of the clamping height

Standard equipment

WPS-PPD with UGE grip insert - carbide without stop pin
WPS-PPD P without pendulum insert and stop pin

WPS-PPD

- Fixed stop without pendulum
- Size 12 and 16
- Horizontal adjustment



WPS-PPD P

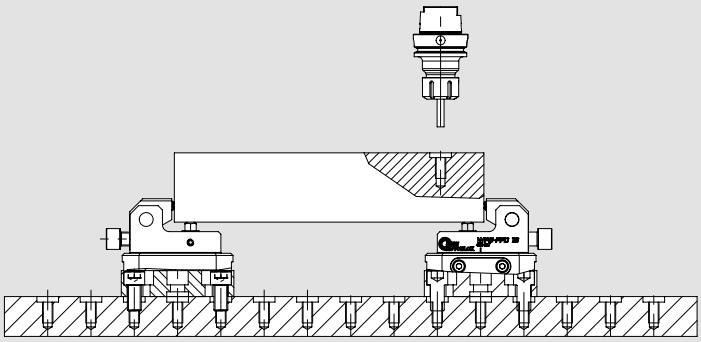
- P = Pendulum insert
- Size 12 and 16
- Horizontal adjustment



Application example

Clamping with 2 WPS-PPD with fixed grip insert

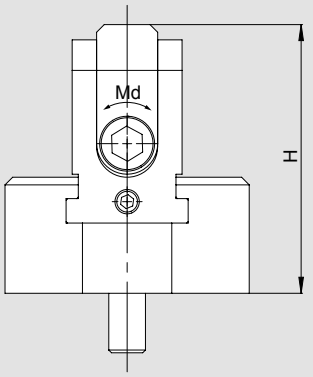
Required workpiece preparation device:
2x WPS-PPD 12



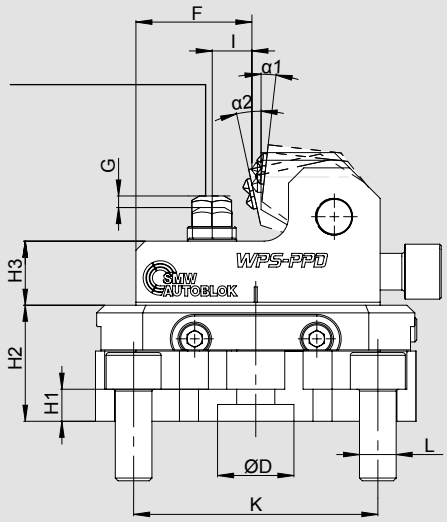
Type	Id. No.
Workpiece preparation device WPS-PPD 12	460346
Workpiece preparation device WPS-PPD 12 P	460430
Stop Pin ALB / X=5 mm (2x)	017603
Pendulum insert gripper	208939

WPS-PPD

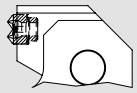
■ Dimensions and technical data



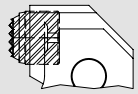
Stop pin not included



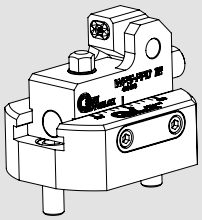
WPS-PPD



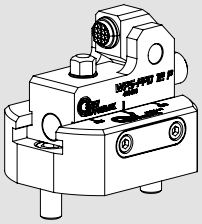
WPS-PPD P

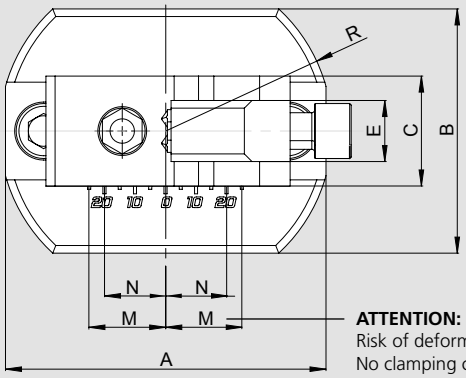


WPS-PPD



WPS-PPD P





ATTENTION:
Risk of deformation!
No clamping claw in this area!

SMW-AUTOBLOK WPS-PPD		WPS-PPD 12	WPS-PPD 12 P*	WPS-PPD 16	WPS-PPD 16 P*
Codice - Id. No.		**460346**	**460430**	**460400**	**460431**
	A	105	105	130	130
	B	80	80	100	100
Width base body	**C**	36	36	45	45
Fit	**D H7**	25	25	25	25
	E	20	20	25	25
	F	38	38	53.75	53.75
Stroke stop pin	**G**	5	5	7	7
Height	**H**	88	88	116	116
	H1	10.5	10.5	13.5	13.5
	H2	38	38	50	50
	H3	21	21	25	25
	I	13	13	18.75	18.75
Distance min. / max.	**K**	50 - 80	50 - 80	80 - 100	80 - 100
ISO4762-12.9	**L**	M12	M12	M16	M16
Stroke horizontal adjustment	**M**	± 25	± 25	± 33	± 33
	N	22.5	22.5	27.5	27.5
Swinging angle / stroke in mm	**α1°**	6.2	6.2	6.2	6.2
Swinging angle / stroke in mm	**α2°**	12	12	12	12
Angle pendulum	**β°**	-	± 9°	-	± 9°
Max. total clamping force	kN	20	20	30	30
Max. actuating torque Md	Nm	40	40	65	65

Pendulum inserts not included

WPS-PPD F/FP

Workpiece preparation device

■ **Ideal for OP 10: preparation of the workpiece for WPS**



Application/Benefits

- Ideal for OP 10: preparation of the workpiece for TDM
- Very strong and compact design for best accessibility
- Clamping height of the workpiece adjustable
- Easy and flexible mounting
- Direct interface for grid dimension 40/50 mm and interface for zero point system APS / TDM

Technical features

- Manual actuation (SW 10)
- Horizontal position adjustable (0-50 mm)
- Position lockable clamping
- Pull-down effect
- Different heights for the workpiece support by means of different stop pins
- Fine adjustment of the clamping height

Standard equipment

WPS-PPD with UGE grip insert - carbide without stop pin
WPS-PPD P without pendulum insert and stop pin

WPS-PPD F

- Fixed stop without pendulum
- Size 12 and 16
- Horizontal adjustment



WPS-PPD FP

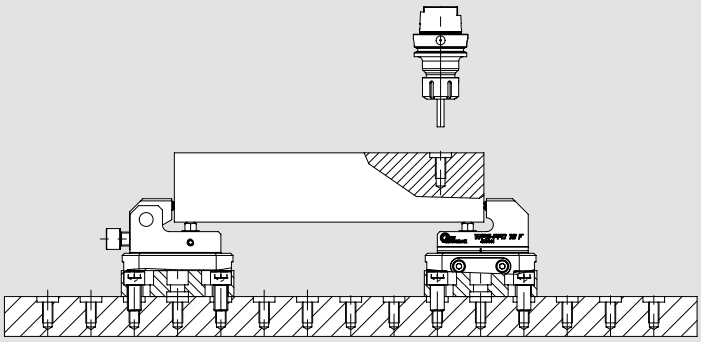
- P = Pendulum insert
- Size 12 and 16
- Horizontal adjustment



Application example

Clamping with 1 WPS-PPD with fixed grip insert against fixed stop WPS-PPD 12 F

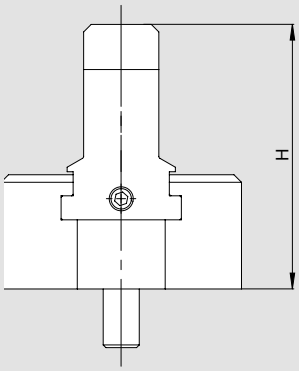
Required workpiece preparation device:
1x WPS-PPD 12 + 1× WPS-PPD 12 F



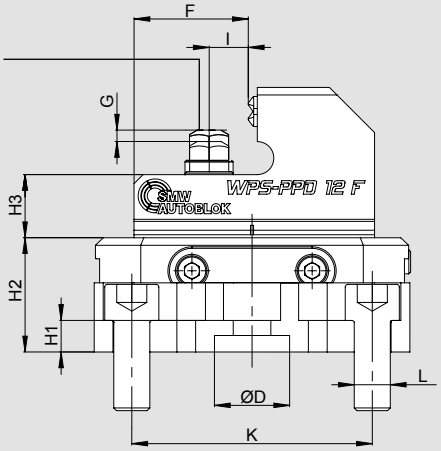
Type	Id. No.
Workpiece preparation device WPS-PPD 12	460346
Workpiece preparation device WPS-PPD 12 FP	460434
Stop Pin ALB / X=5 mm (2x)	017603
Pendulum insert gripper	208939

WPS-PPD F/FP

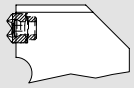
■ Dimensions and technical data



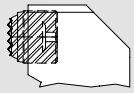
Stop pin not included



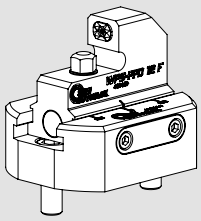
WPS-PPD



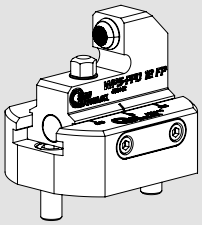
WPS-PPD P

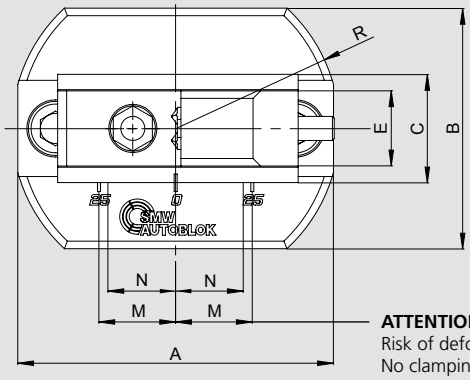


WPS-PPD F



WPS-PPD FP



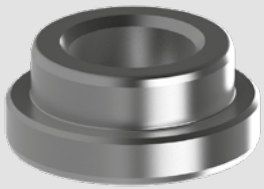


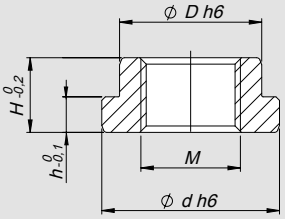
ATTENTION:
Risk of deformation!
No clamping claw in this area!

SMW-AUTOBLOK WPS-PPD		WPS-PPD 12 F	WPS-PPD 12 FP*	WPS-PPD 16 F	WPS-PPD 16 FP*
Id. No.		**460432**	**460434**	**460433**	**460435**
	A	105	105	130	130
	B	80	80	100	100
Width base body	**C**	36	36	45	45
Fit	**D H7**	25	25	25	25
	E	25	25	30	30
	F	38	38	53.75	53.75
Stroke stop pin	**G**	5	5	7	7
Height	**H**	88	88	116	116
	H1	10.5	10.5	13.5	13.5
	H2	38	38	50	50
	H3	21	21	25	25
	I	13	13	18.75	18.75
Distance min. / max.	**K**	50 - 80	50 - 80	80 - 100	80 - 100
ISO4762-12.9	**L**	M12	M12	M16	M16
Stroke horizontal adjustment	**M**	± 25	± 25	± 33	± 33
Angle pendulum	**β°**	-	± 9°	-	± 9°
Max. total clamping force	kN	20	20	30	30

* Pendulum inserts not included

CENTERING BUSH



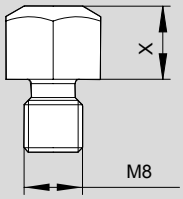


Id. No.	d	D	H	h	Thread for extraction * M
46230916	25	16	10,5	5	M14 x 1,5
46230918	25	18	10,5	5	M14 x 1,5
46230920	25	20	10,5	5	M14 x 1,5
46230922	25	22	10,5	5	M18 x 1.5
46230924	25	24	10,5	5	M18 x 1.5
46230925	25	25	10,5	5	M18 x 1.5

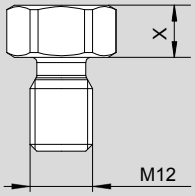
Extractor page 48

STOP PINS FOR WPS-PPD

For **WPS-PPD 12/16**



For **WPS-PPD 24**

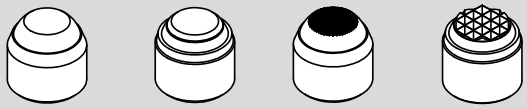


For WPS-PPD 12 / 16	Id. No.
Stop pin ALB / X=5 mm	017603
Stop pin ALB / X=10 mm	016514
Stop pin ALB / X=15 mm	016515
Stop pin ALB / X=20 mm	016516
Stop pin ALB / X=25 mm*	081191

For WPS-PPD 24	Id. No.
Stop pin ALB / X=10 mm	210058
Stop pin ALB / X=15 mm	210060
Stop pin ALB / X=20 mm	210061
Stop pin ALB / X=25 mm	210062
Stop pin ALB / X=30 mm	210063

* Only suitable for WPS-PPD 16P/16 FP

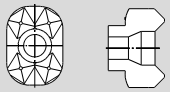
PENDULUM INSERT



For WPS-PPD 12 / 16	Id. No.
Pendulum insert smooth	208937
Pendulum insert Pom-Insert	208938
Pendulum insert gripper	208939
Pendulum insert HM-Gripper	208940

For WPS-PPD 24	Id. No.
Pendulum insert smooth	208937
Pendulum insert Pom-Insert	208938
Pendulum insert gripper	208939
Pendulum insert HM-Gripper	208940

UGE-10 GRIP INSERT FOR WPS-PPD

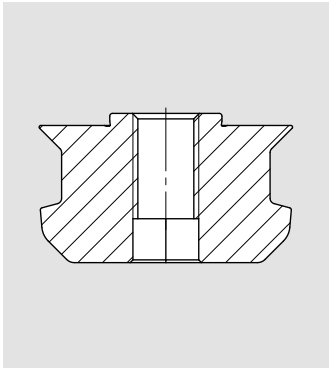


For WPS-PPD F	Id. No.
Fixed UGE-10 grip insert *	081845F

* Pendulum insert not included

FEMALE THREAD

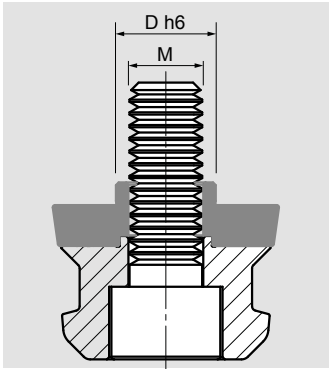




Id. No.	M
46230316	M16 F

CENTERING RINGS



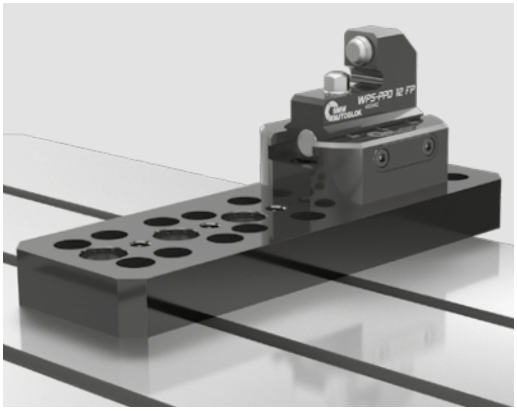


Id. No.	D	M	
46231125	25 h6	M10 / M12 / M16	A

WPS-PPD

Clamping bar for WPS-PPD

■ **Ideal for OP 10: preparation of the workpiece for WPS**



Application/Benefits

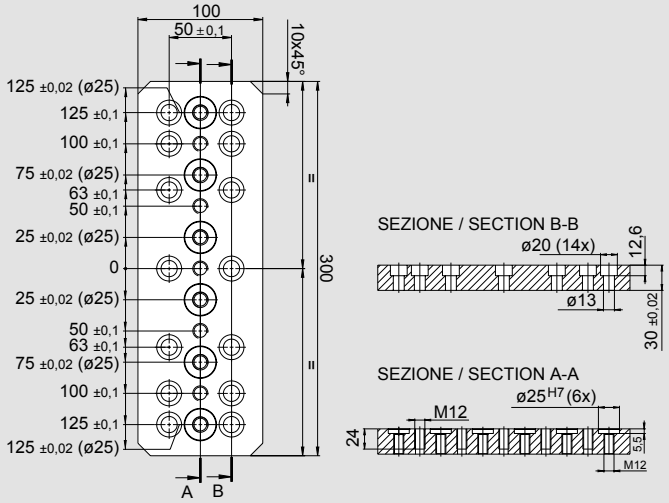
- Easy and flexible use of WPS-PPD direct clamping devices
- Fine adjustment on T-slot tables
- Mounting of WPS-PPD on grid plates between two row of holes possible
- Protected against corrosion
- Very strong version
- Undrilled version for customized finish machining

Standard equipment

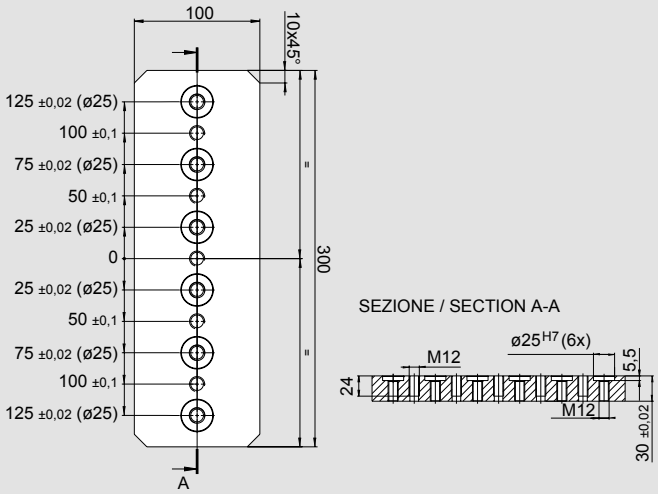
Clamping bar WPS-PPD

Options

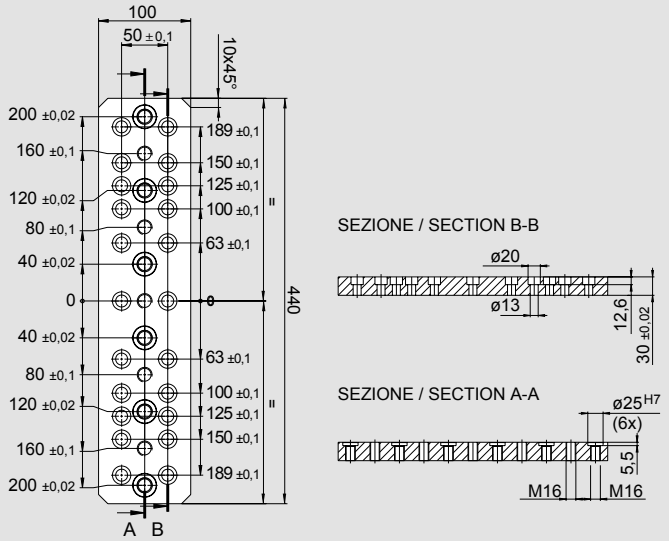
Clamping bar WPS-PPD 300 Id. No. 460447 (drilled)



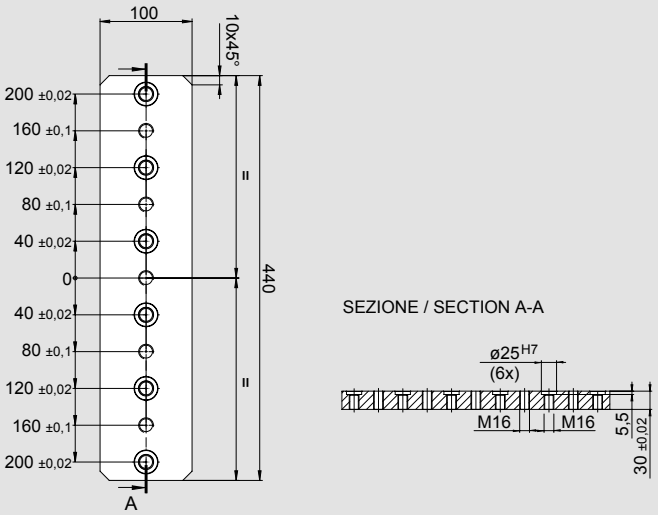
Clamping bar WPS-PPD 300 Id. No. 460448 (undrilled)



Clamping bar WPS-PPD 440 Id. No. 467174 (drilled)



Clamping bar WPS-PPD 440 Id. No. 467173 (undrilled)



	Clamping bar (drilled)		Clamping bar (undrilled)	
Type	**300**	**440**	**300**	**440**
Id. No.	460447	467174	460448	467173

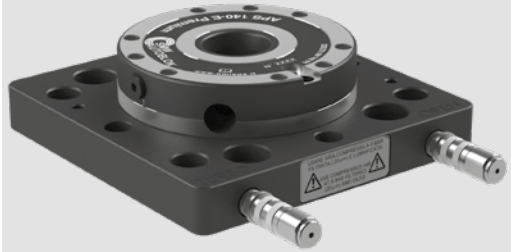
TdM APS





APS 140

Module height extension



Application/Benefits

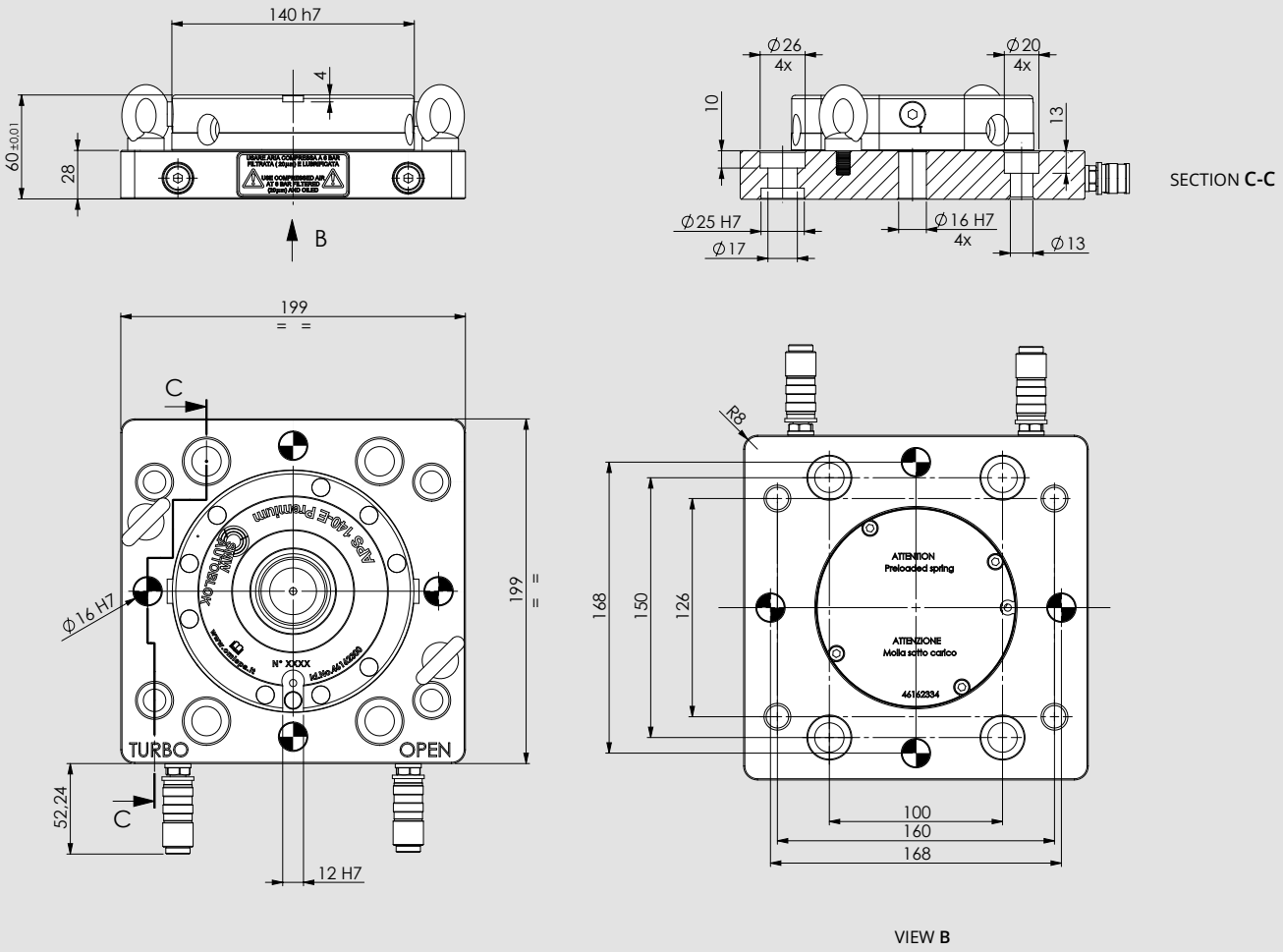
- Pre-assembled clamping unit with 1 piece APS 140 Premium
- Universal applicable
- Fast and easy set-up

Technical features

- 3 clamping slides
- Repeatability < 0.005 mm
- Turbo function to increase the pull-in forces (pull-in force without Turbo 7.5 kN)
- Anti rotating protection
- Air cleaning

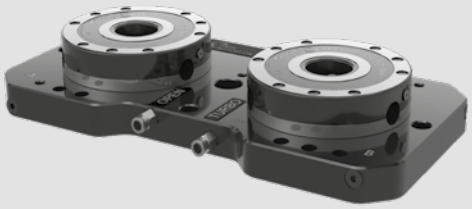
Standard equipment

Clamping unit with 1 piece APS 140 Premium



Type	Id. No.	Heigh mm	Weight kg
Module extention with 1 APS 140 Premium	46168410	60	11

APS 140



Application/Benefits

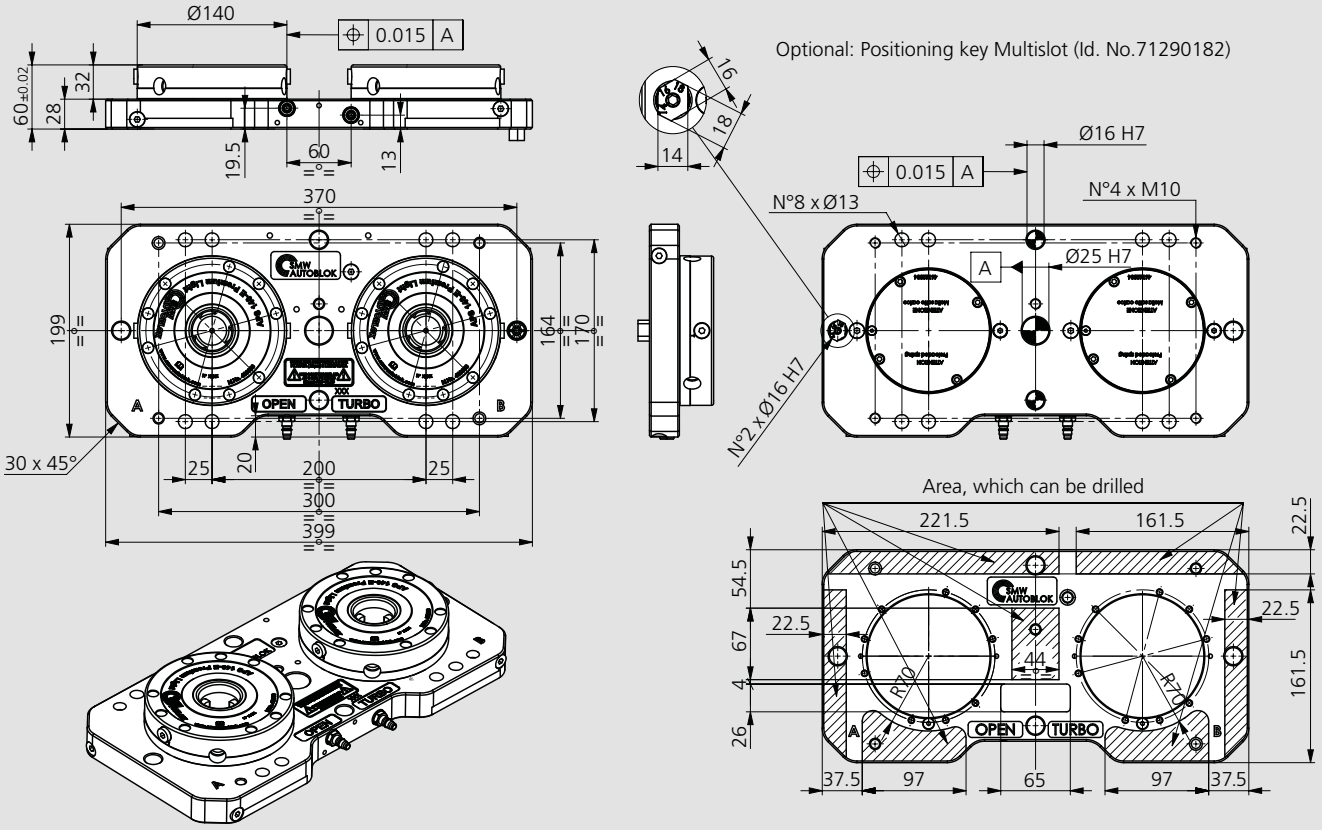
- Pre-assembled clamping unit with 2 pieces APS 140 Premium Light or Basic
- Universal applicable
- Fast and easy set-up

Technical features

- 3 clamping slides (Basic: 2 clamping slides)
- Repeatability < 0.005 mm
- Turbo function for increasing the pull-in forces (pull-in force without Turbo 7.5 kN)
- Air cleaning (only Premium Light)
- Grid dimension 200 mm

Standard equipment

Clamping unit with 2 pieces APS 140 Premium Light or Basic
Quick pneumatic connections

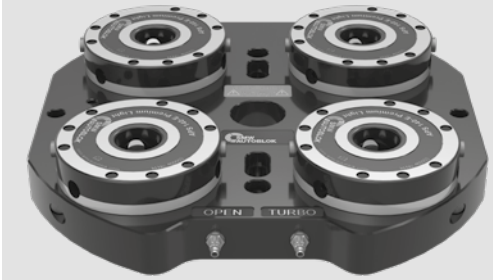


Type	Id. No.	Pull-in force with Turbo kN	Repeatability mm	Weight kg
Clamping unit with 2 APS 140-E Premium Light	460020	26*	< 0.005	21
Clamping unit with 2 APS 140-E Basic	460021	26*	< 0.005	21

* For each module.

APS 140

Module height extension



Application/Benefits

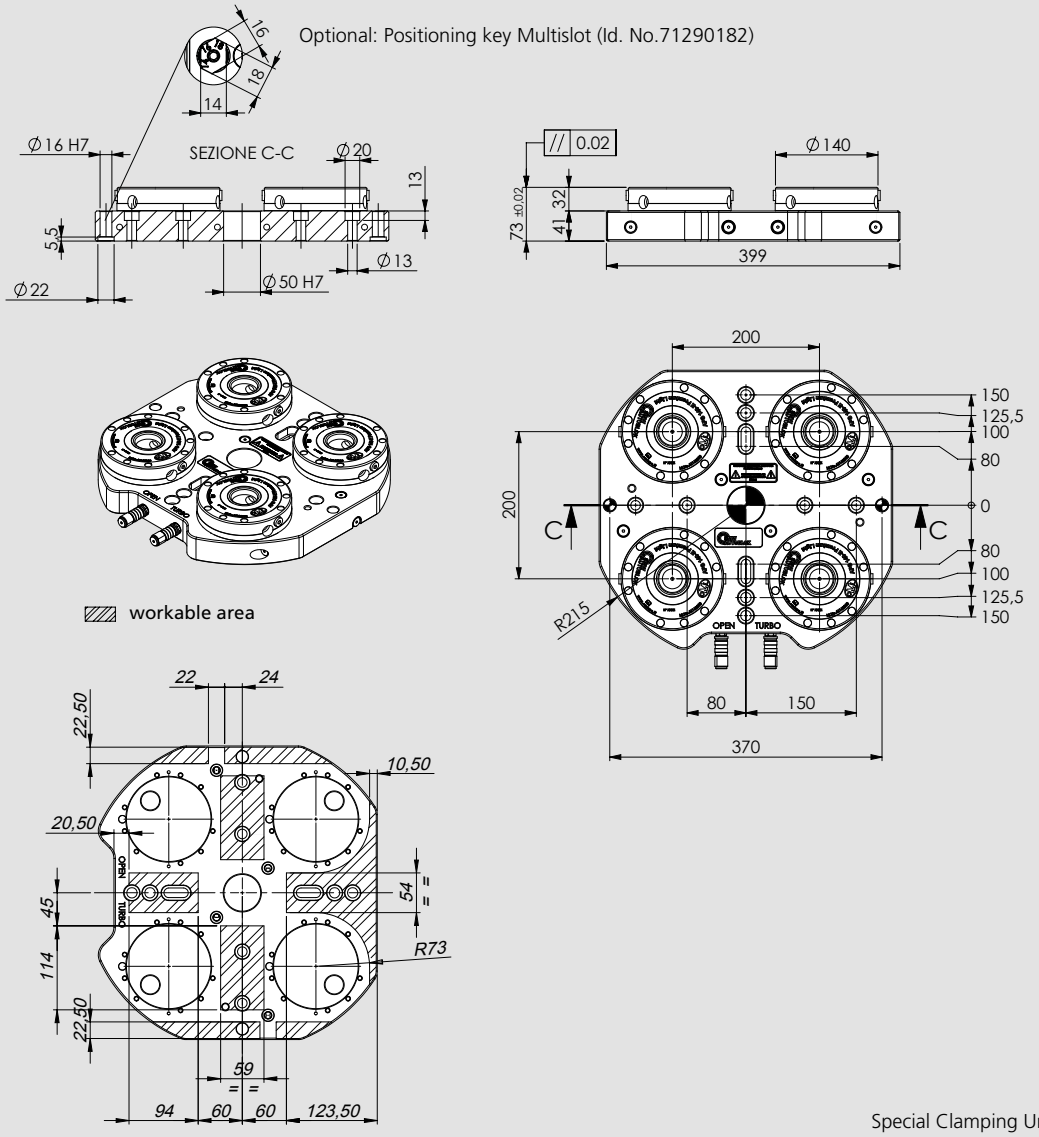
- Pre-assembled clamping unit with 4 pieces APS 140 Premium Light or Basic
- For 5-axis machining center
- Universal applicable
- Fast and easy set-up

Technical features

- 3 clamping slides (Basic: 2 clamping slides)
- Repeatability < 0.005 mm
- Turbo function to increase the pull-in forces (pull-in force without Turbo 7.5 kN)
- Air cleaning (only Premium Light)

Standard equipment

Clamping unit with 4 pieces APS 140 Premium Light or Basic
Quick pneumatic connections

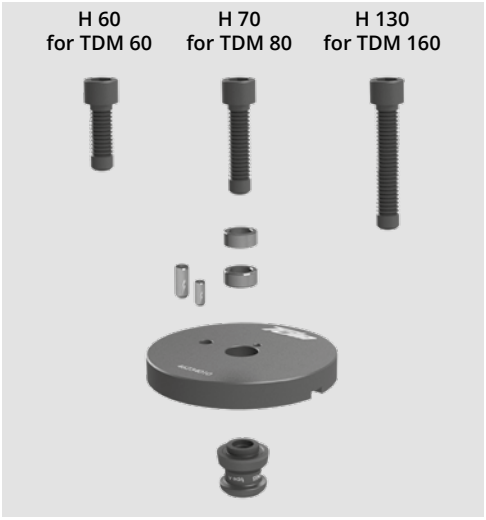


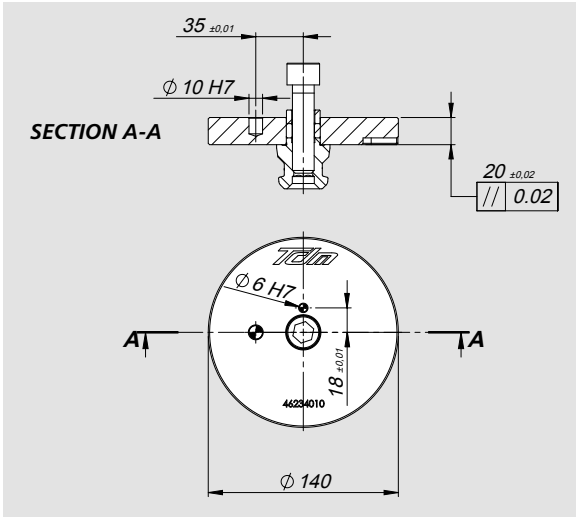
Special Clamping Unit on request

Type	Id. No.	Pull-in force with Turbo kN	Repeatability mm	Weight kg
Clamping unit with 4 APS 140 Premium Light	46168020	26*	< 0.005	45
Clamping unit with 4 APS 140 Basic	46168025	26*	< 0.005	45

* For each module.

INTERFACE FLANGE TDM 48-88 - APS 140/160 complete with screws (not single use)

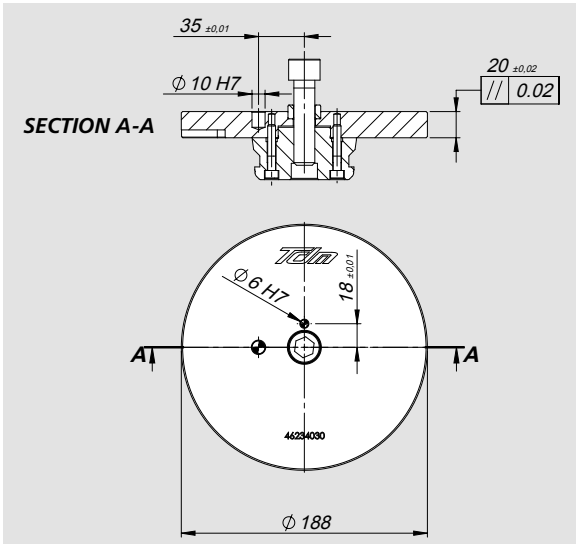




Type	Id. No.
APS140	46234010
APS160	46234020

INTERFACE FLANGE TDM88 - APS 190 complete with screws





Id. No.
46234030

Working examples



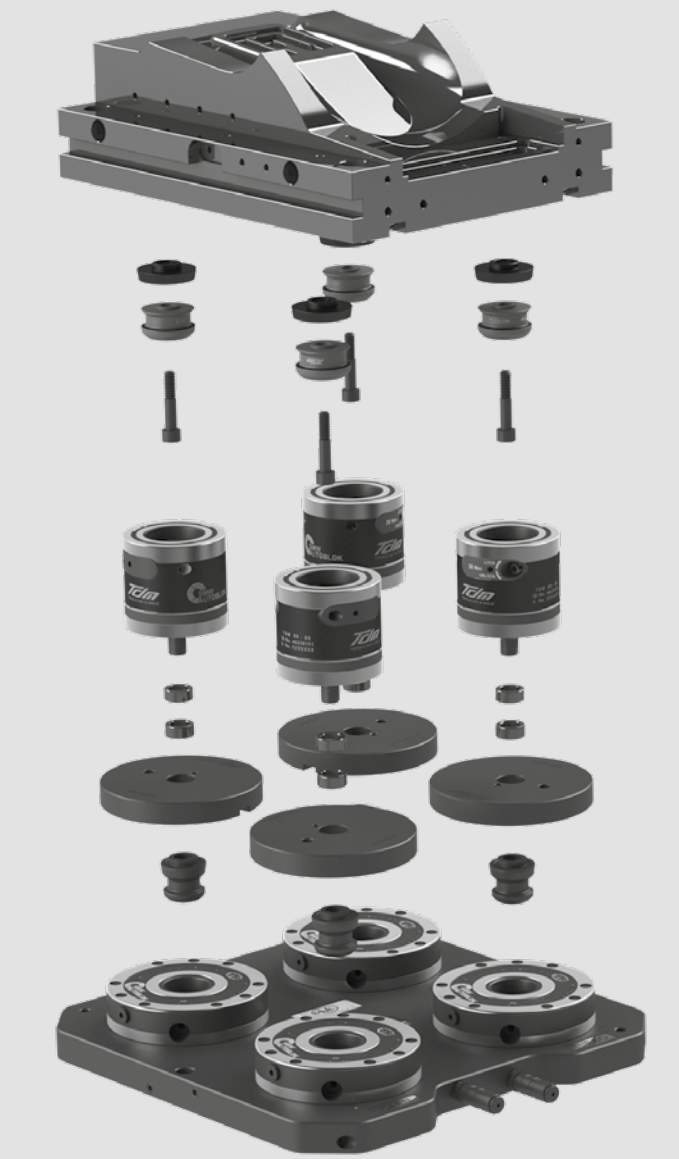
APS 140

Module height extension

Working examples

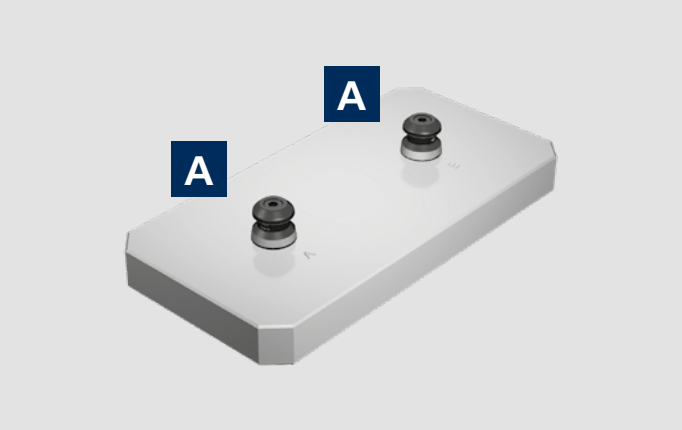


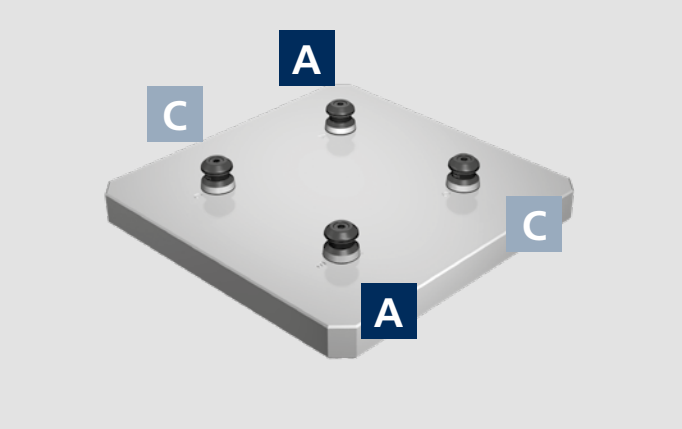


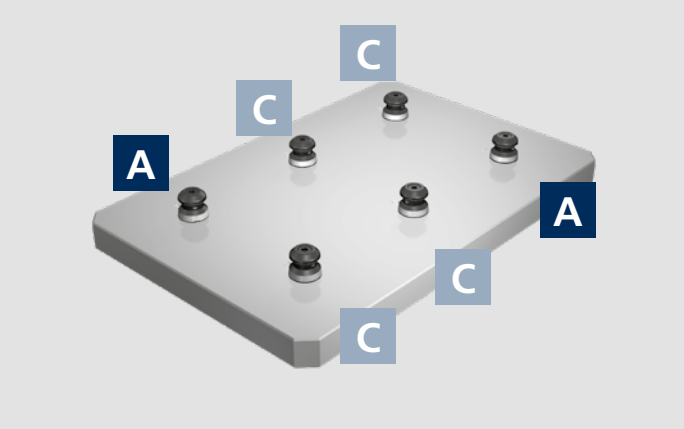


Positions of the clamping pins

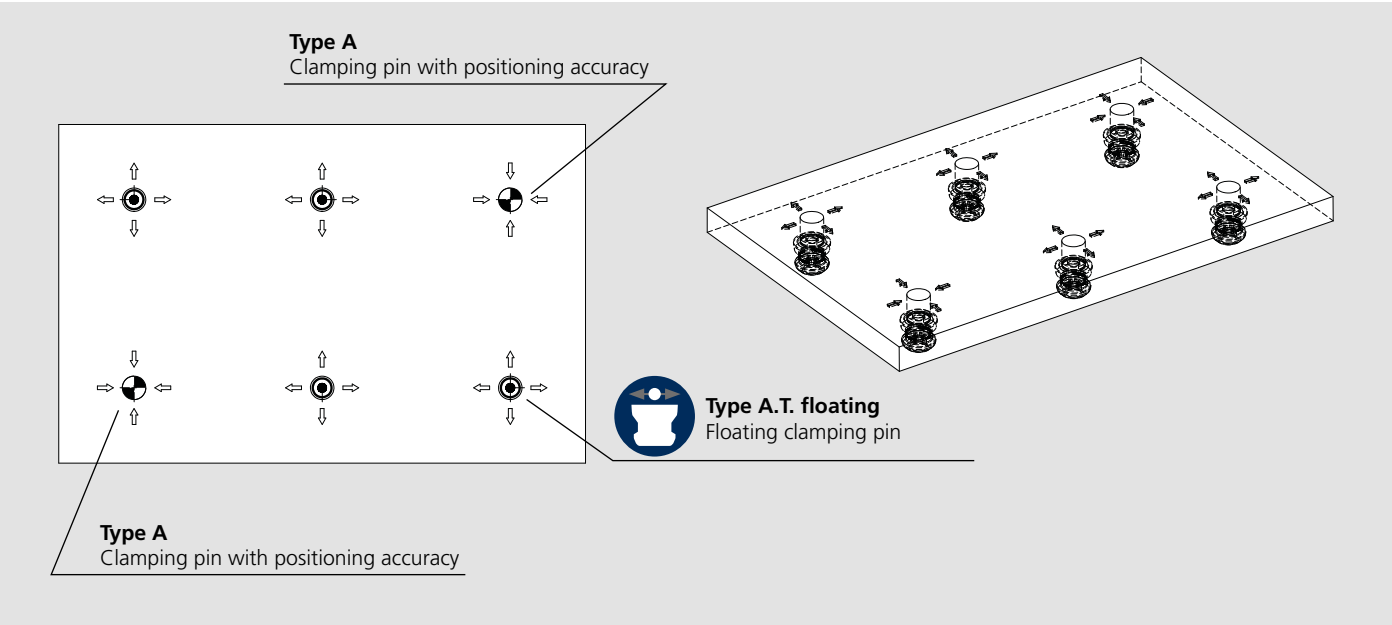








Posizionamento perni flottanti - Positions of the floating pins

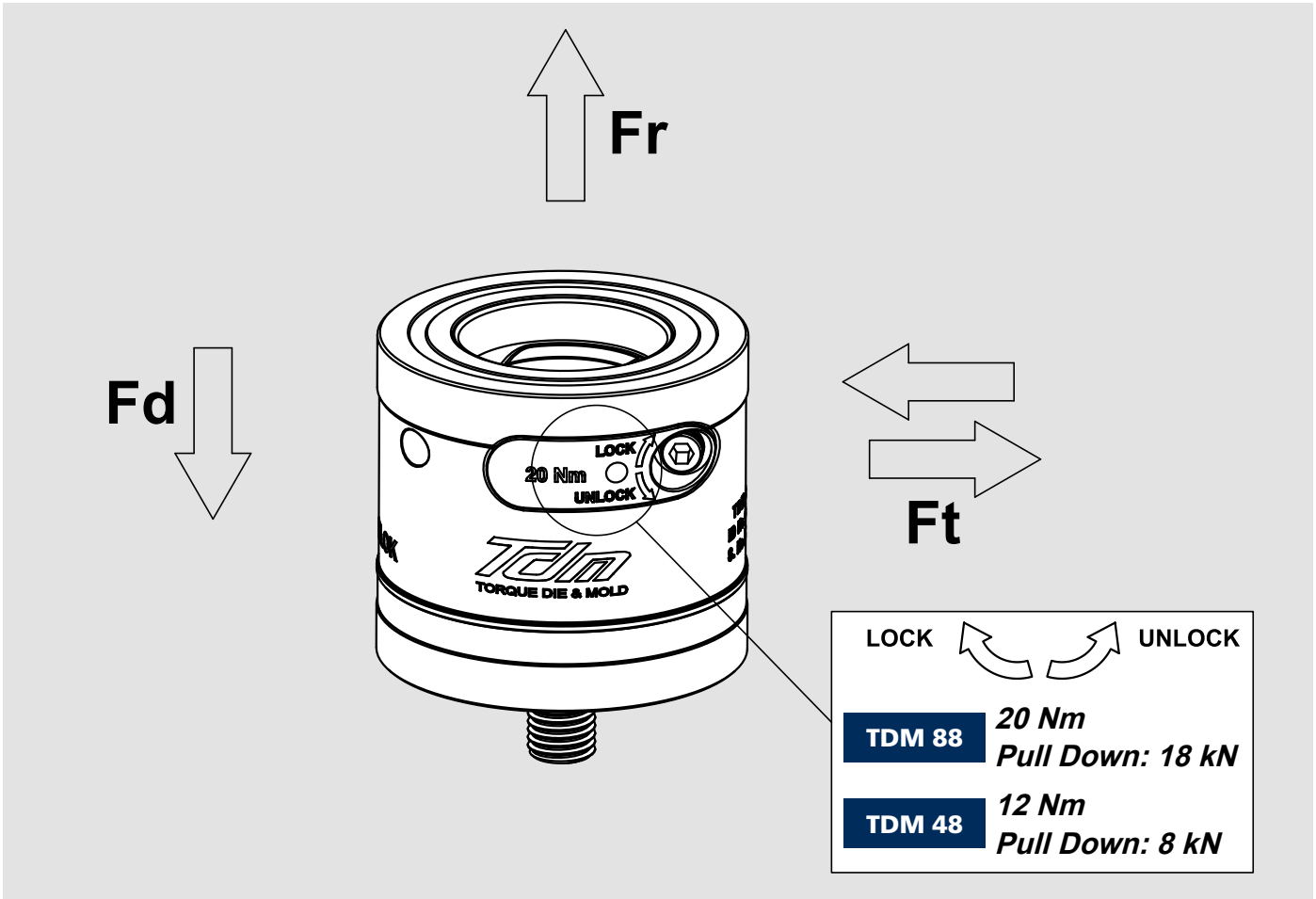


ISO METRIC PITCH

	Screw 12.9	Hex Wrench	Resistant Section rated mm²	Max torque Nm
TDM 88	M12 x 1.75	10	84,3	120
TDM 88	M16 x 2	14	157	300
TDM 48	M6	3	20,1	14
TDM 48	M8	4	36,6	34
TDM 48	M10	5	58	70

MAXIMUM USAGE LIMIT

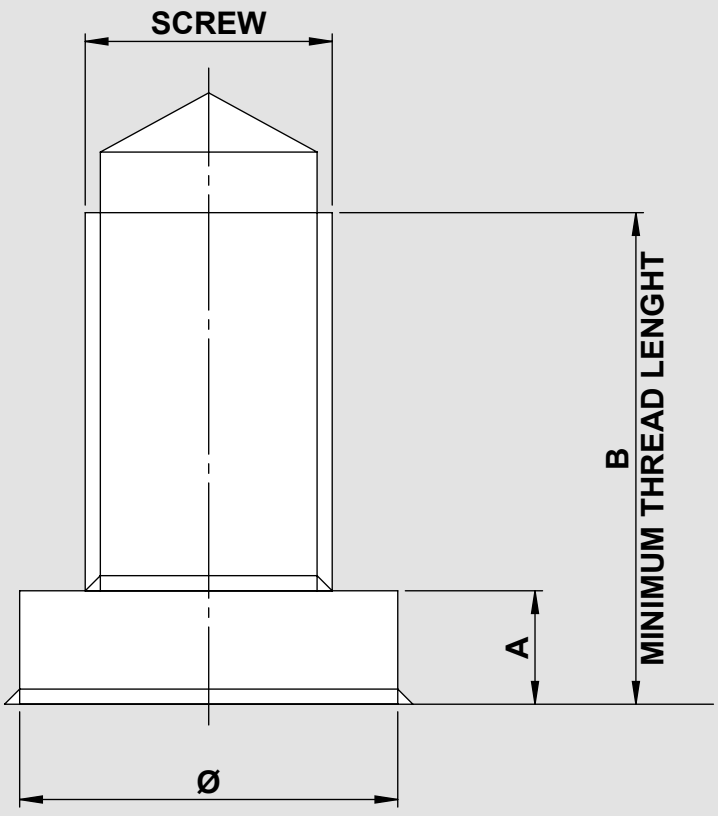
Screw 12.9		Maximum Usage Limit		
Thread on steel with Rm ≥ 950 N/mm²		Until to **Ft** Admissible lateral force	Until to **Fr** Admissible holding force	Until to **Fd** Admissible loading force
TDM 88	M12 x 1.75	30 kN	50 kN	100 kN
TDM 88	M16 x 2	30 kN	100 kN	100 kN
TDM 48	M6	10 kN	12 kN	75 kN
TDM 48	M8	10 kN	22 kN	75 kN
TDM 48	M10	10 kN	35 kN	75 kN



Standard and mini range workpiece preparation

Screw	Diameter Ø H6 (mm)	A	B (mm) Steel	B (mm) Cast Iron / Alloy
M6*	10 - 11	5	16	20
M6	10 - 11	6	16	20
M8*	12 - 14	5	20	27
M8	12 - 14 - 16	6	20	27
M10*	14 - 16	5	22	29
M10	14 - 16 - 18 - 20 - 22 - 24 - 25	6	22	29
M12	18 - 20 - 22 - 24 - 25	6	26	32
M16	22-24-25	6	32	40

* For TDM 48 range



NOTES