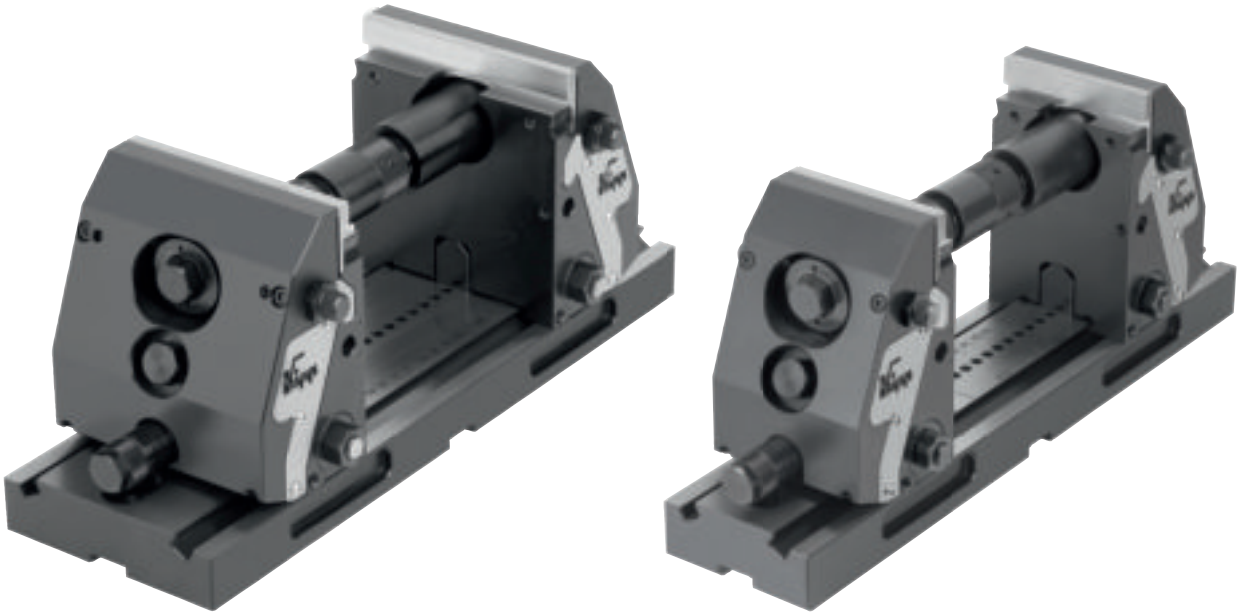
5-axis clamping system compact



5-axis clamping system compact

Function

We are setting standards with the new “KIPP 5-axis clamping system compact” in this field. The system was specifically designed for the optimal machining of complex workpieces on modern 5-axis machines.

The intelligent clamping technology increases clamping rigidity for the highest cutting and feed forces. The optimal accessibility to the workpiece allows short, standard tooling to be used. Tooling costs are significantly reduced.

1 Positioning unit with jaw plate
2 Clamping element
3 Fine adjustment with knurled screw
4 Clamping screw
5 Extension shafts
6 Base plate

ADVANTAGES:

- Very high tractive force
- High stiffness in the system
- Pull-down function of the jaw plates on both sides
- Optimum fine adjustment of the jaw plates on the workpiece
- Increased tool service life
- The workpiece is always centred due to the systematic construction
- Large clamping width, 20 mm to 320 mm, freely extendable
- Clamping depth adjustable from 3 to 20 mm using seating ledges
- Best tool accessibility from all sides
- Easy to clean

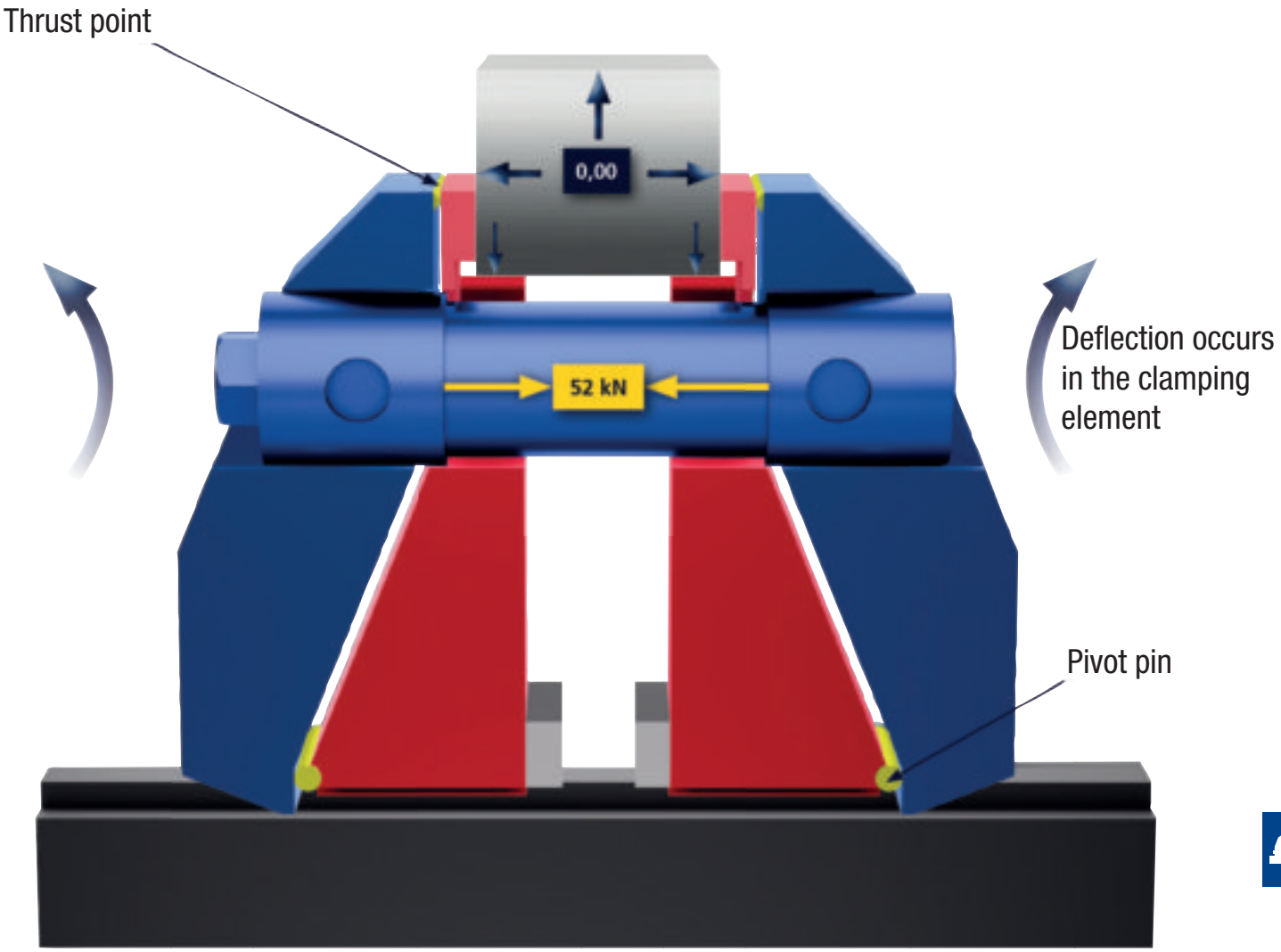
Forces

The new clamping technology ensures force flow separation and workpiece positioning. The intelligent force distribution in the system allows only weak forces to be transferred to the machine table.

NEW CLAMPING TECHNOLOGY

PATENT PENDING

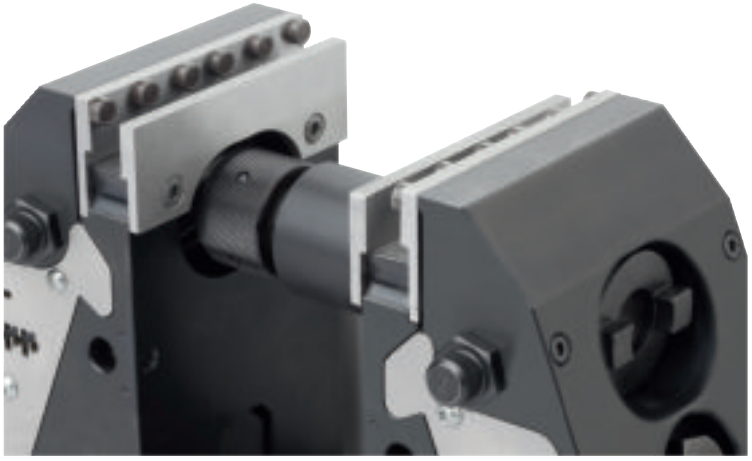
- Division of force flow and positioning
- Highest clamping force on the workpiece
- Maximum stiffness
- Centric tension



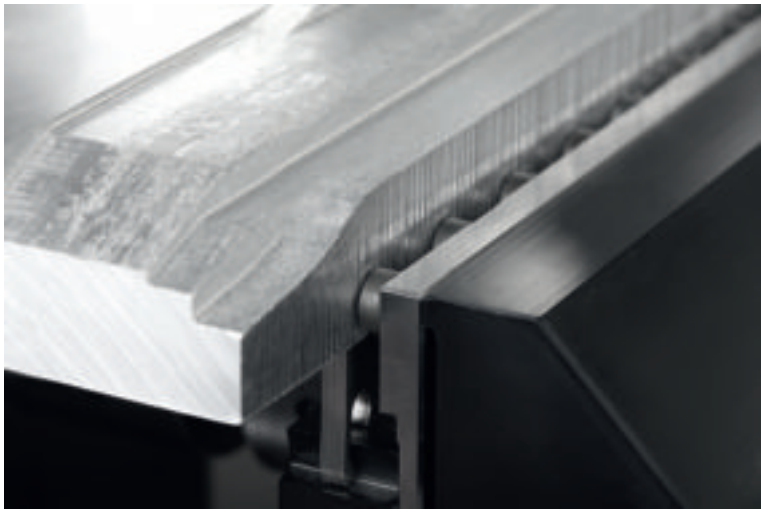
- Clamping elements
- Locators

Applications

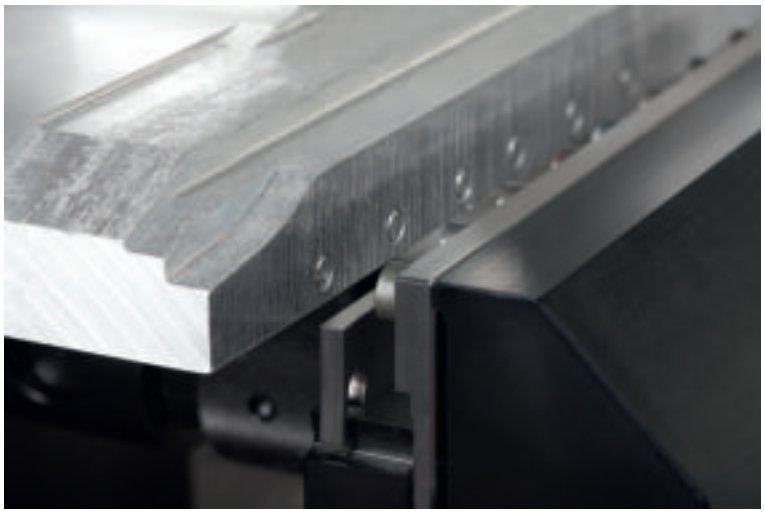
5-axis compact clamping system incl. clamping jaw with pins for clamping unmachined parts, and screwed-on seating ledges. The clamping depth can be determined by milling a seat.



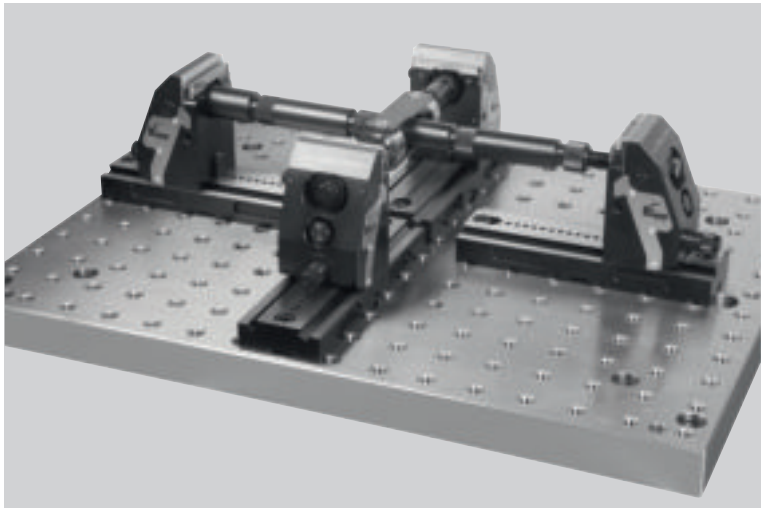
Clamped blank. Sure set-up through positive clamping pins.



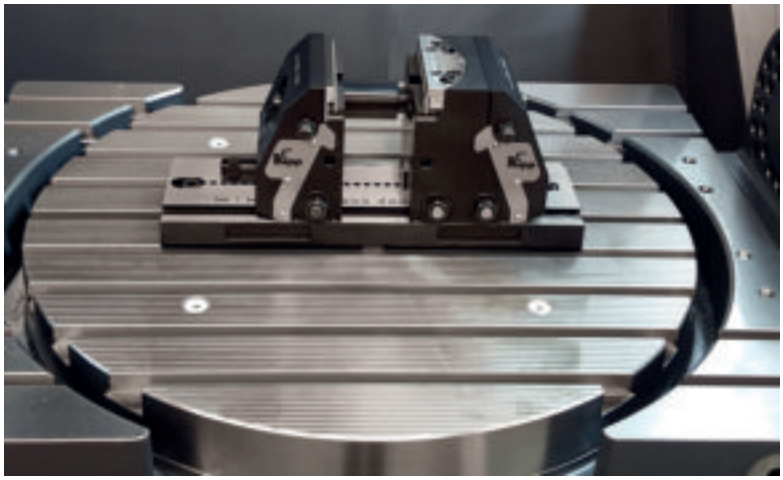
Blank after clamping. Clamping pin imprint is visible on the edge of the workpiece.



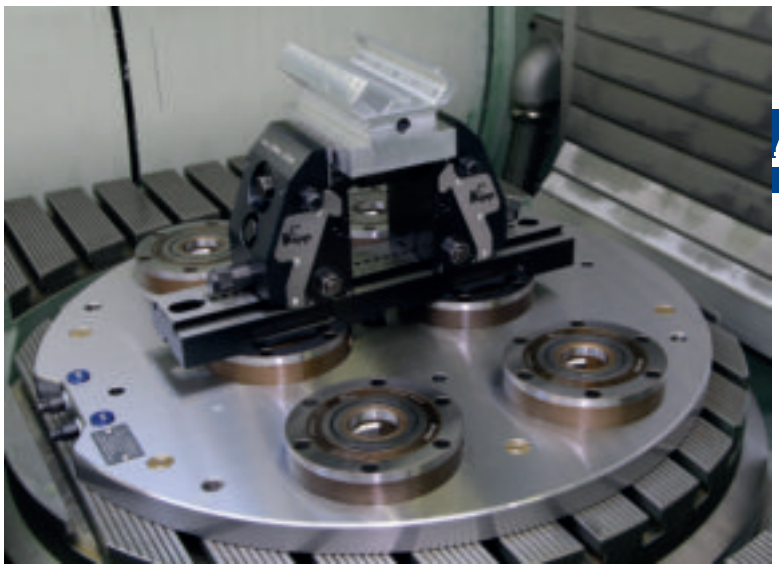
With the coupling for cross-clamping, two 5-axis clamping systems can be compactly connected with each other offset by 90 degrees. Setups for workpieces with different dimensions of 4 sides are possible.



5-axis compact clamping system positioned directly on the machine table.
Use of pendulum jaws which also act as fixed jaws.
Workpiece clamping with smooth jaws.

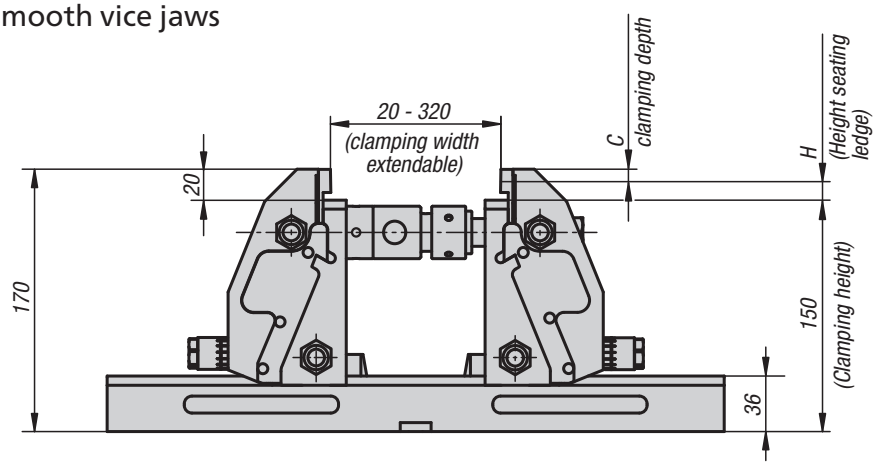


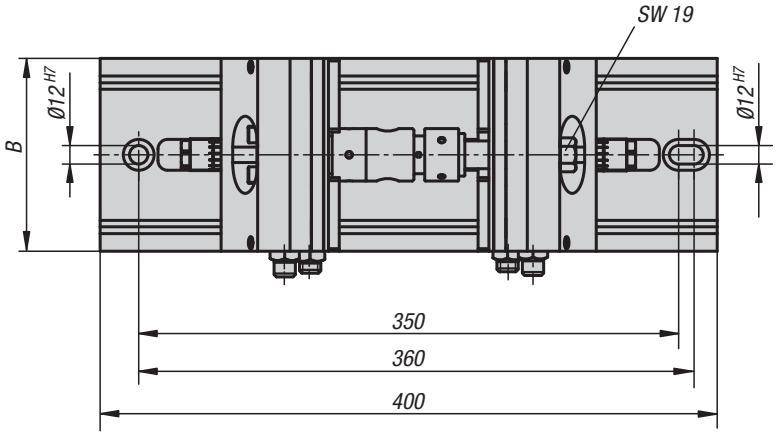
Mounted directly on a KIPP zero-point clamping system over the integrated clamping bolts in the vice base plate.

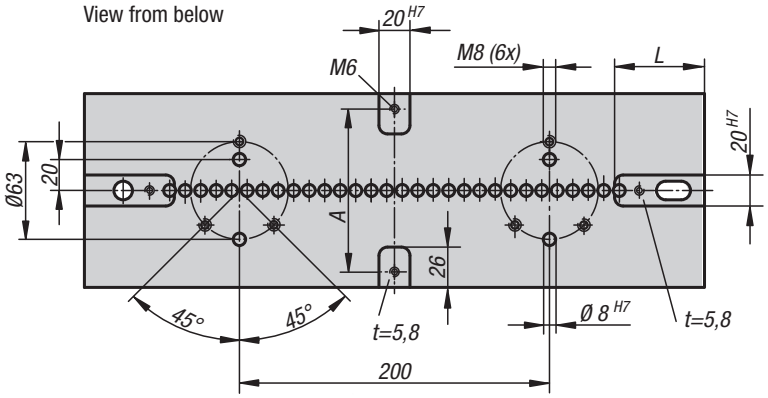


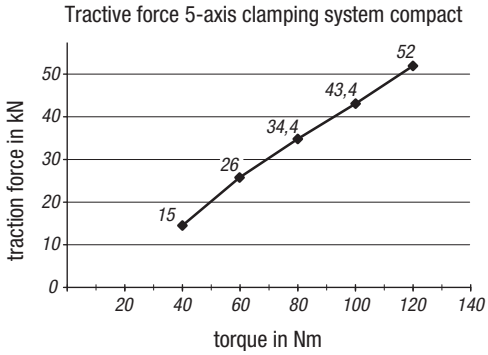
5-axis clamping system compact

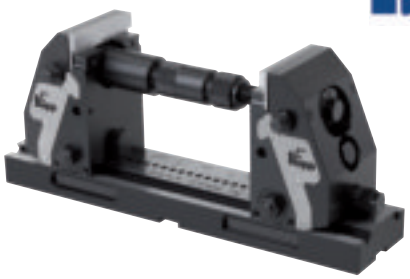
smooth vice jaws











Material:
Base plate and jaw hardened steel.
Vice jaws tool steel.

Version:
Jaws black oxidised.
Jaw plates bright.

Sample order:
K0973.124000901500

Note:
The clamping jaws can be re-adjusted to new workpieces rapidly and securely thanks to ease of use and quick adjustment by means of a scale. The workpiece always centres itself due to the symmetrical structure of the 5-axis clamping system. Short standard tools can be used thanks to optimum accessibility to the workpiece This reduces tooling costs significantly. Clamping widths from 20 mm to 320 mm are possible.

Assembly:
The 5-axis clamping system compact can be mounted on T-slot tables, grid systems or, using an adapter flange on conventional zero-point clamping systems.

Scope of delivery:

Accessories:
Seating ledges K0974
Jaw plates K0975
Pendulum jaws K0988
Centre jaws K0987
Coupling for cross-clamping K0992

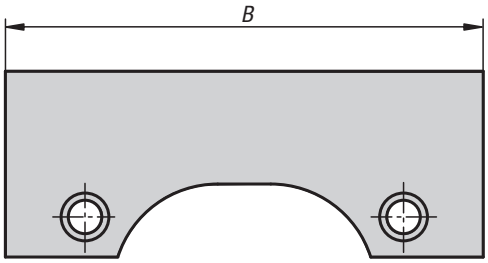
Order the seating ledges and jaw plates with pins separately.

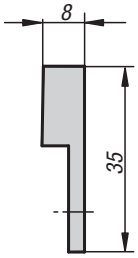
KIPP 5-axis clamping system compact, smooth vice jaws

Order No.	A	B	C	H	L	Tractive force max. kN	Suitable shoulder screw	weight kg
K0973.124000901500	70	90	8/3	12/17	57,5	52	K0815.12055	21.96
K0973.124001251500	105	125	8/3	12/17	58	52	K0815.12055	30.16

K0975

Jaw plates smooth





Material:
Tool steel.

Version:
Hardened, bright.

Sample order:
K0975.0900

Note:
For clamping pre-machined workpieces and for final machining.

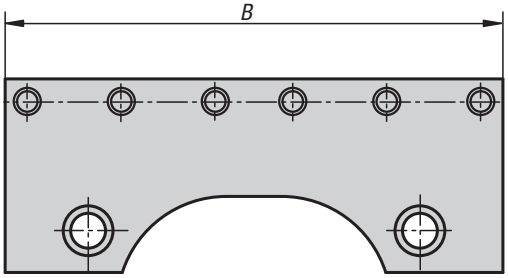
Supplied singly.

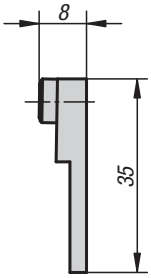
KIPP Jaw plates smooth

Order No.	B
K0975.0900	90
K0975.1250	125

K0975

Jaw plates with pins





Material:
Tool steel.

Version:
Plate hardened, bright.
Pins hardened, black oxidised.

Sample order:
K0975.0901

Note:
For positive clamping without preforming, e.g. rough pieces, heavy cutting, castings etc.

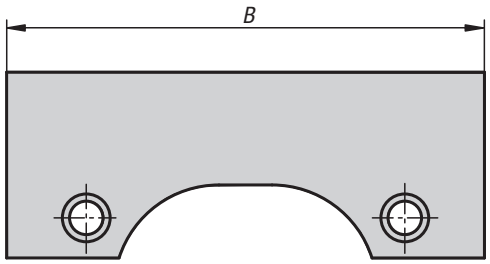
Supplied singly.

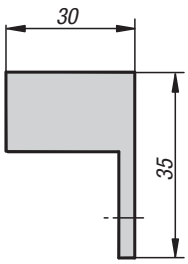
KIPP Jaw plates with pins

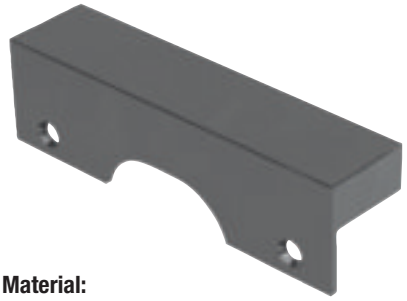
Order No.	B	No. of pins
K0975.0901	90	6
K0975.1251	125	8

Jaw plates

machinable







Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
K0975.0902

Note for ordering:
Supplied singly.

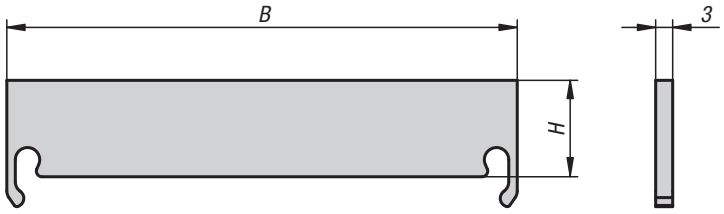
Note:
Machinable jaw plates are ideal for gripping on workpiece contours and machining in steps.

KIPP Machinable jaw plates

Order No.	B
K0975.0902	90
K0975.1252	125

Notes

Seating ledges



Material:
Hardened steel

Version:
Bright.

Sample order:
K0974.0900312

Note:
The seating ledges are suitable for adjusting the clamping depth of the workpiece on the compact 5-axis clamping system.
The 12 mm version does not interfere with the positive-down effect.
By the 17 mm version, the positive-down force is reduced but causes less edge deformation.

Supplied in pairs.

Accessories:
for K0973

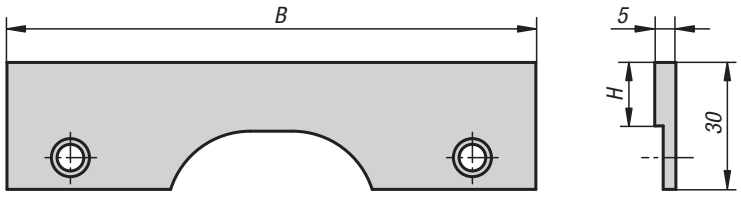
KIPP Seating ledges

Order No.	B	H
K0974.0900312	90	12
K0974.0900317	90	17
K0974.1250312	125	12
K0974.1250317	125	17

K0974

Seating ledges

screw-on



Material:
Steel.

Version:
Bright.

Sample order:
K0974.0900515

Note:
Screw-on seating ledges are used to set the seating height of the workpiece. The desired seating height is achieved by milling over the screwed on ledges. A very high accuracy of the height to the machine table can be achieved.

Supplied in pairs.

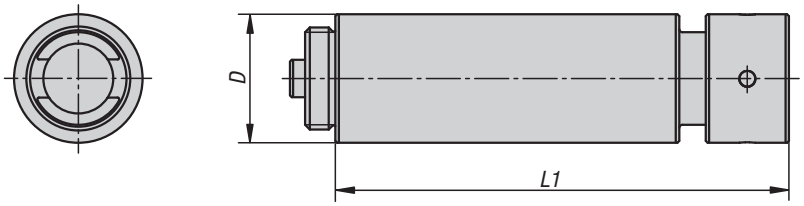
Accessories:
for K0973

KIPP Seating ledges, screw-on

Order No.	B	H
K0974.0900515	90	15
K0974.1250515	125	15

K0990

Extension shafts



Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
K0990.060

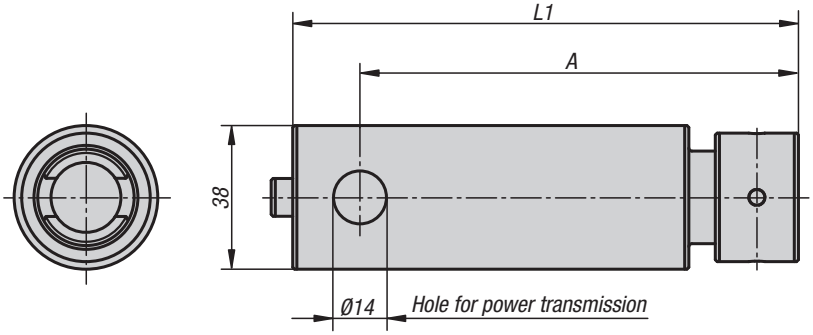
Note:
For setting the clamping width.
Supplied with union nut.
The extension shafts can be combined as required.

KIPP Extension shafts

Order No.	D	L1
K0990.060	34	60
K0990.120	34	120
K0990.240	34	240
K0990.480	34	480

K0991

Adapter shafts



Material:
Carbon steel.

Version:
Black oxidised.

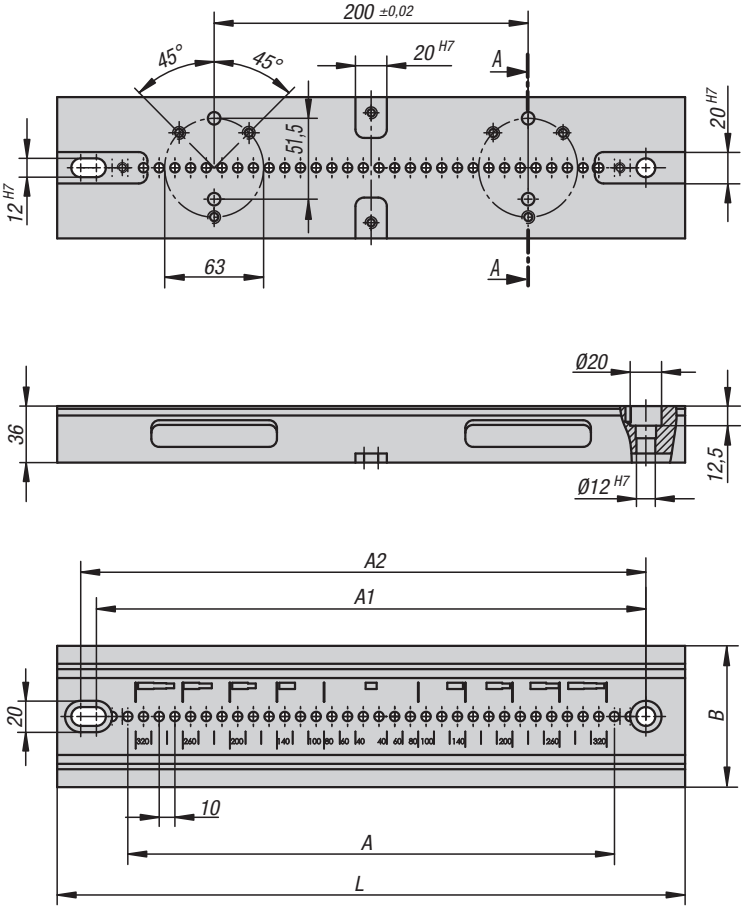
Sample order:
K0991.060

Note:
For setting the clamping width.
Supplied with union nut.
The adapter shafts are linked to the vice jaws by the lateral holes.
An adapter shaft must be mounted in every compact 5-axis clamp.

KIPP Adapter shafts

Order No.	D	L
K0991.060	38	60
K0991.120	38	120

Base plates



Material:
Steel.

Version:
Black oxidised.
Function faces ground.

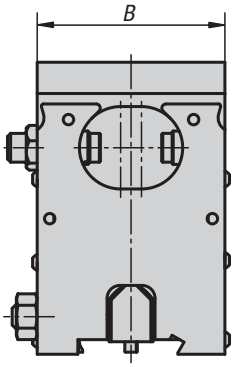
Sample order:
K0994.090280

Note:
Base plates with locating slots on the underside for easy alignment of the plate on the machine table.
Securing via grid holes 12F7 for 40 mm and 50 mm grid spacing possible.
Lateral recesses provided for separate clamping means.

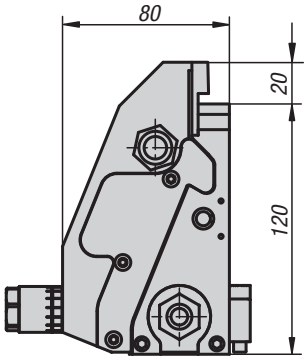
KIPP Base plates

Order No.	A	A1	A2	B	L	Suitable shoulder screw	weight kg
K0994.090280	20x10	240	250	90	280	K0815.12055	5.74
K0994.125280	20x10	240	250	125	280	K0815.12055	8.52
K0994.090400	31x10	350	360	90	400	K0815.12055	8.33
K0994.125400	31x10	350	360	125	400	K0815.12055	12.25

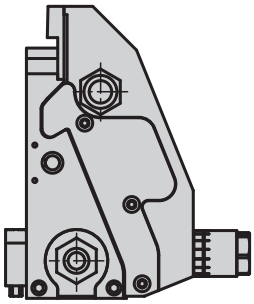
Vice jaws complete



left



right

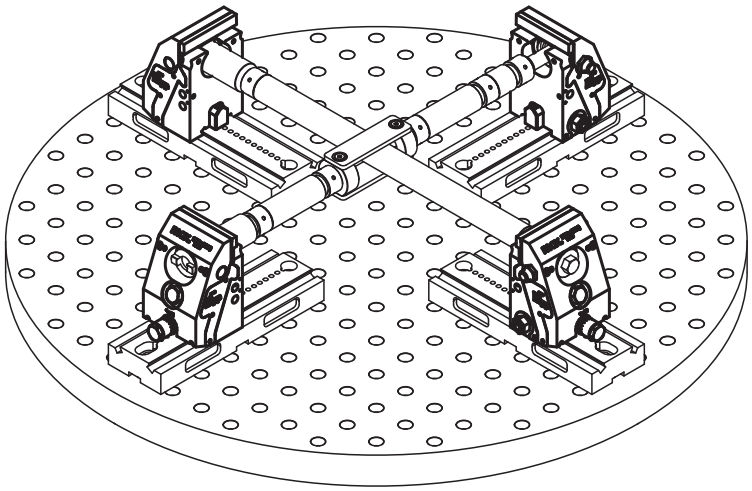


Material:
Jaws mild steel.
Jaw plates tool steel.

Version:
Jaws black oxidised.
Vice jaws bright.

Sample order:
K0976.09015010

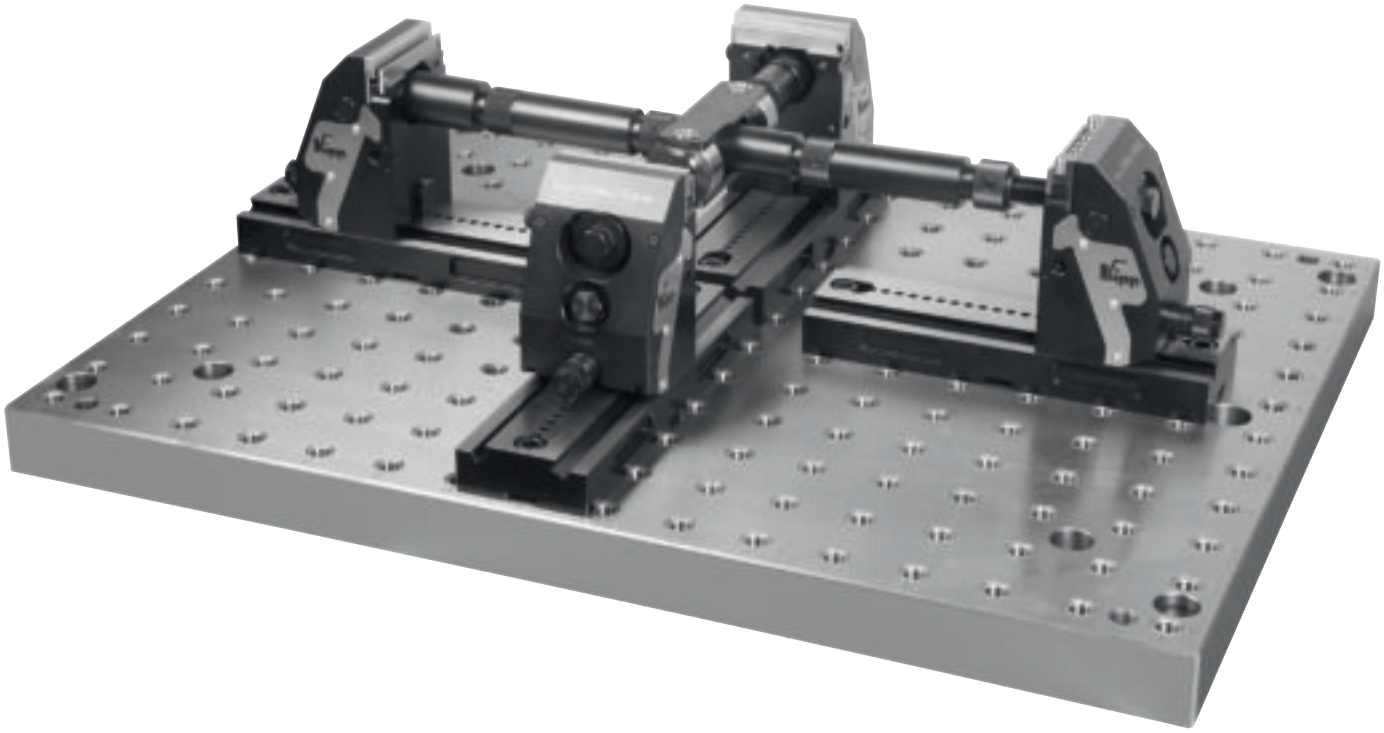
Note:
These vice jaws are for expanding the 5-axis clamping system compact.
With these vice jaws large workpieces can be held on all four sides by cross clamping. Base plates, extension shafts and the coupling for cross-clamping are also needed for this set up.



KIPP Vice jaws, complete

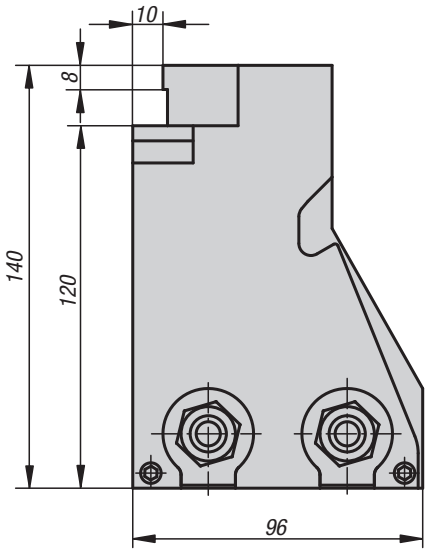
Order No.	Version	B	weight kg
K0976.09015010	right	90	5.18
K0976.09015020	left	90	5.18
K0976.12515010	right	125	7.416
K0976.12515020	left	125	7.416

Application example



Notes

Pendulum jaws

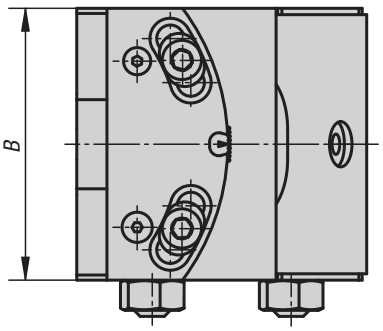


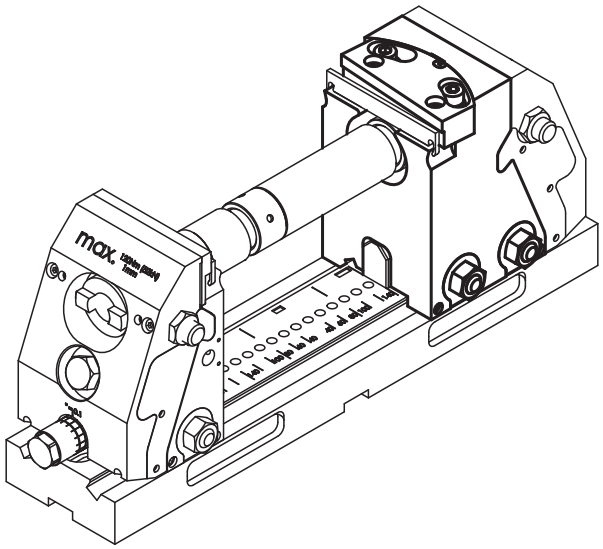
Material:
Body mild steel.
Jaw plates tool steel.

Version:
Body black oxidised.
Vice jaws hardened, bright.

Sample order:
K0988.09015010

Note:
Pendulum jaws are used to hold oblique workpieces.
The jaw plates of the pendulum jaws can be swivelled by ± 4°.
Pendulum jaws can also be used as fixed jaws.
Rigid design with 2 fastening screws.



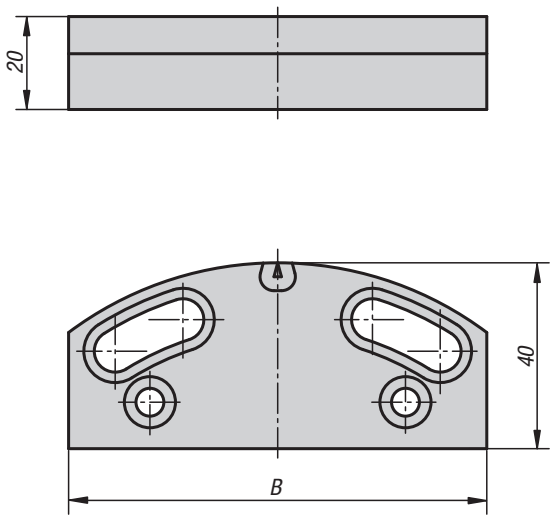


KIPP Pendulum jaws

Order No.	B	weight kg
K0988.09015010	90	6
K0988.12515010	125	8.77

Jaw plates smooth

for pendulum jaws



Material:
Tool steel.

Version:
Hardened, bright.

Sample order:
K1001.0900

Note:
For clamping pre-machined and ground workpieces.

Supplied singly.

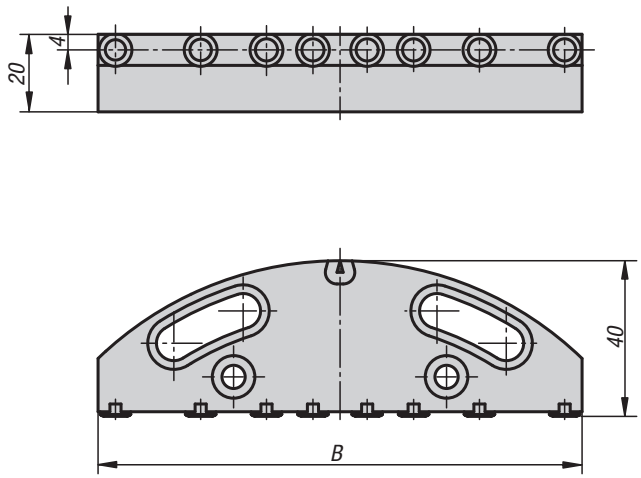
KIPP Jaw plates smooth for pendulum jaws

Order No.	B
K1001.0900	90
K1001.1250	125

K1001

Jaw plates with pins

for pendulum jaws



Material:
Tool steel.

Version:
Vice jaw hardened, bright.
Pins hardened, black oxidised.

Sample order:
K1001.0901

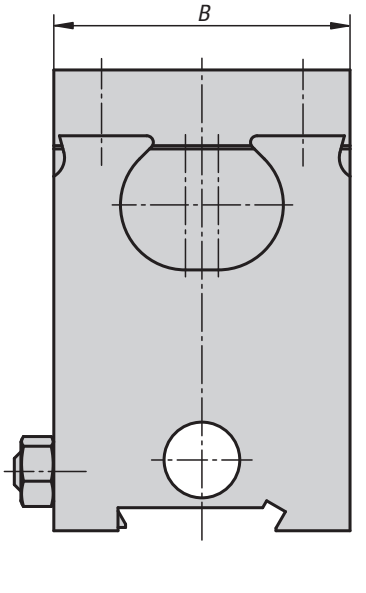
Note:
For positive clamping without preforming, e.g. rough pieces, heavy cutting, castings etc.

Supplied singly.

KIPP Jaw plates with pins for pendulum jaws

Order No.	B	No. of pins
K1001.0901	90	6
K1001.1251	125	8

Centre jaws

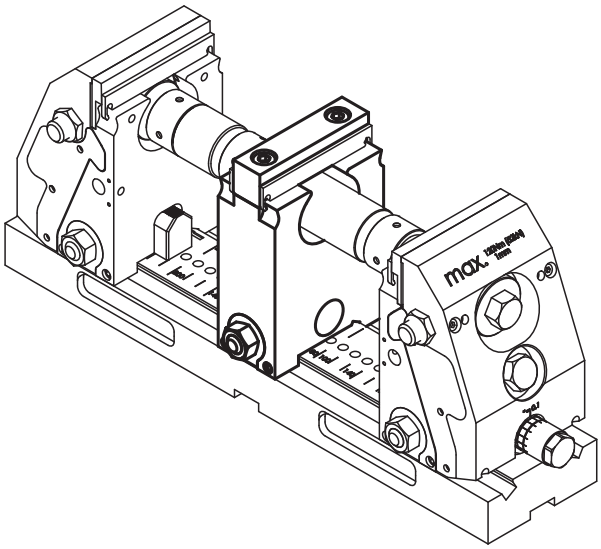


Material:
Body mild steel.
Jaw plates tool steel.

Version:
Body black oxidised.
Vice jaws hardened, bright.

Sample order:
K0987.0901500

Note:
Centre jaws are used to clamp 2 workpieces simultaneously.
The centre jaws can be moved to suit the size of the workpiece. 2 different sized workpiece can be clamped.

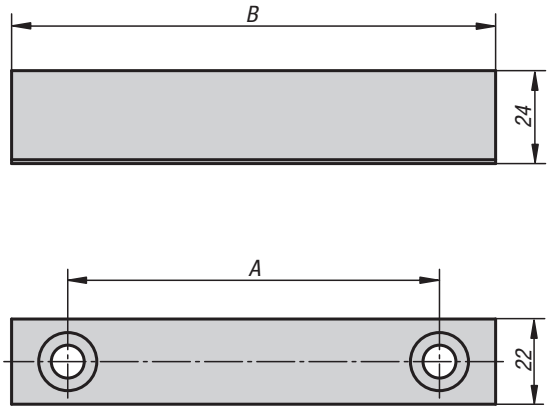


KIPP Centre jaws

Order No.	B	weight kg
K0987.0901500	90	3.38
K0987.1251500	125	4.94

Jaw plates smooth

for centre jaws



Material:
Tool steel.

Version:
Hardened, bright.

Sample order:
K1002.0900

Note:
For clamping pre-machined and ground workpieces.

Supplied singly.

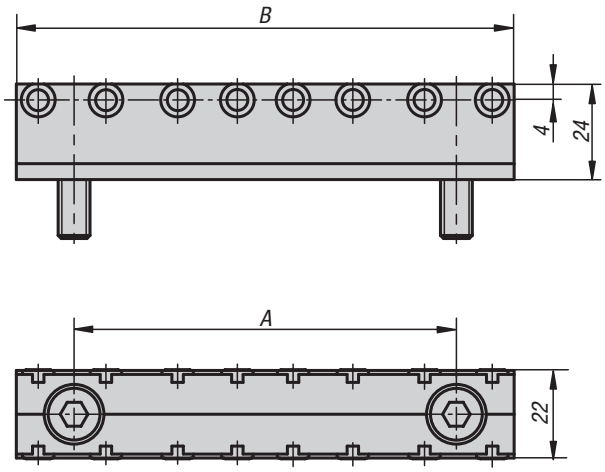
KIPP Jaw plates smooth for centre jaws

Order No.	A	B
K1002.0900	61	90
K1002.1250	96	125

K1002

Jaw plates with pins

for centre jaws



Material:
Tool steel.

Version:
Vice jaw hardened, bright.
Pins hardened, black oxidised.

Sample order:
K1002.0901

Note:
For positive clamping without preforming, e.g. rough pieces, heavy cutting, castings etc.

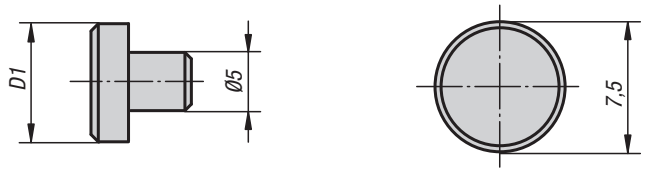
Supplied singly.

KIPP Jaw plates with pins for centre jaws

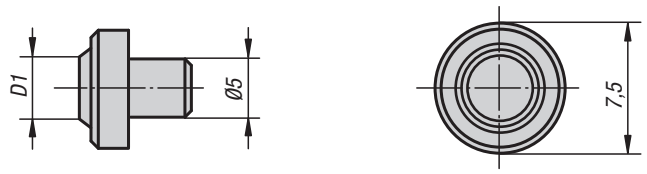
Order No.	A	B	No. of pins
K1002.0901	61	90	6
K1002.1251	96	125	8

Jaw pins

flattened



cup point



Material, version:
Tool steel, hardened.

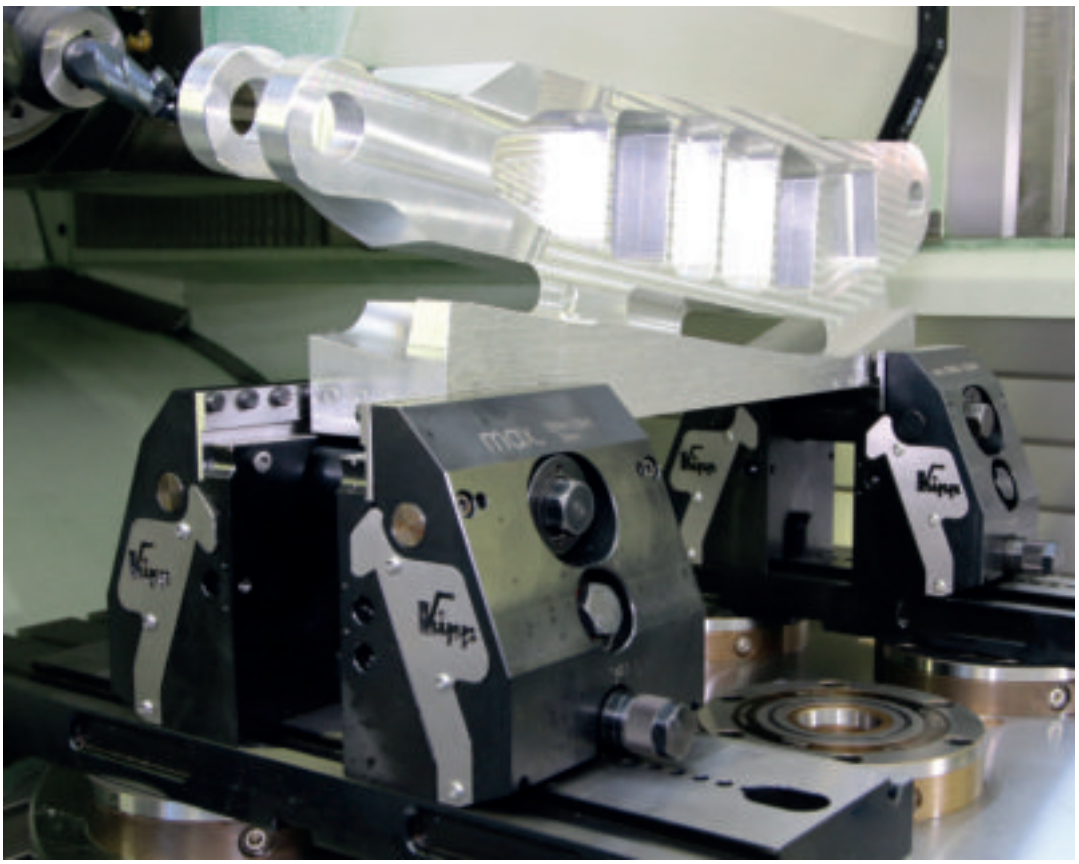
Sample order:
K0946.05600

Note:
Suitable for standard jaw plates and jaw adapters of round workpieces.
Installed by pressing in.

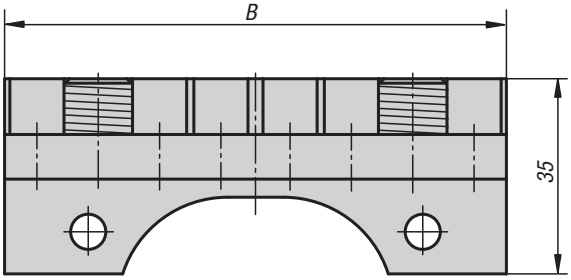
KIPP Jaw pins

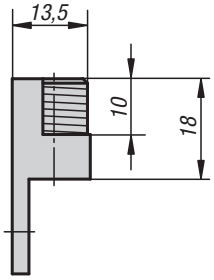
Order No.	Version	D1	Application
K0946.05000	flattened	7,5	Material over 1000 N/mm² tensile strength
K0946.05400	cup point	4	Material up to ca. 1000 N/mm² tensile strength
K0946.05600	cup point	6	Material up to ca. 1000 N/mm² tensile strength

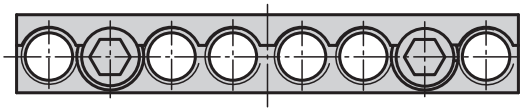
Application example



Cylinder clamping sets







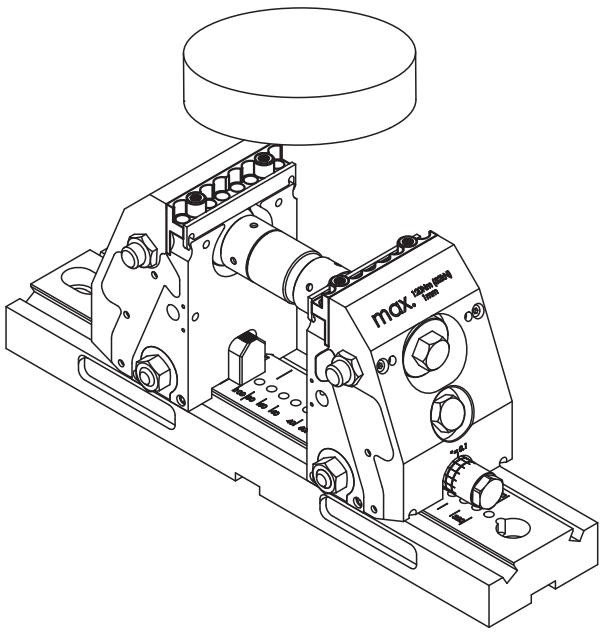
Material:
Tool steel.

Version:
Vice jaw hardened, bright.
Pins hardened, black oxidised.

Sample order:
K0989.09035

Note:
For holding round workpieces.

Supplied in pairs.

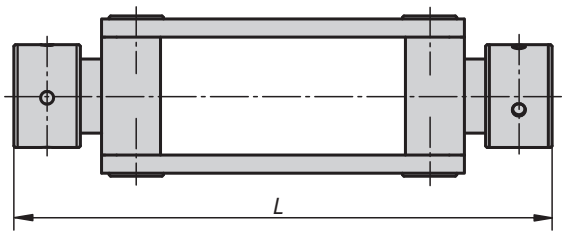


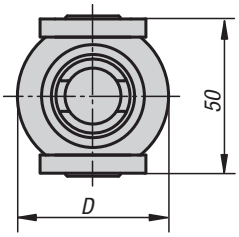
KIPP Cylinder clamping sets

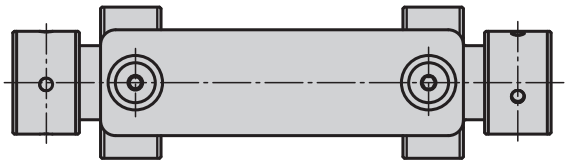
Order No.	B	Clamping range min. - max.
K0989.09035	90	20 mm - 250 mm
K0989.12535	125	20 mm - 320 mm

Couplings

for cross-clamping





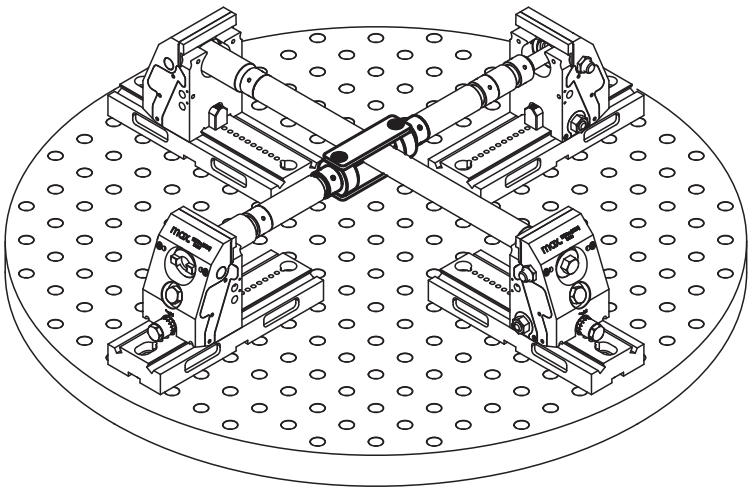


Material:
Carbon steel.

Version:
Black oxidised.

Sample order:
K0992.178

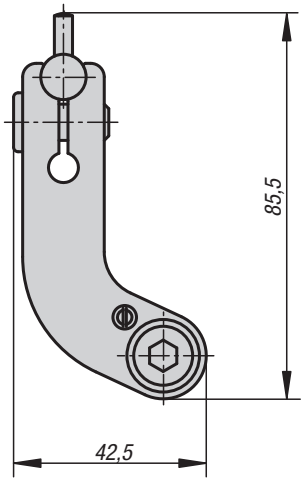
Note:
Two 5-axis clamping systems can be connected using a coupling for cross-clamping, allowing a workpiece to be held on four sides.



KIPP Couplings for cross-clamping

Order No.	D	L
K0992.178	50	178

Stop sets



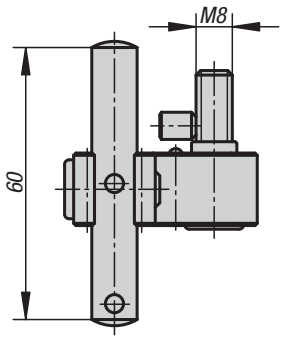
Material:
Steel.

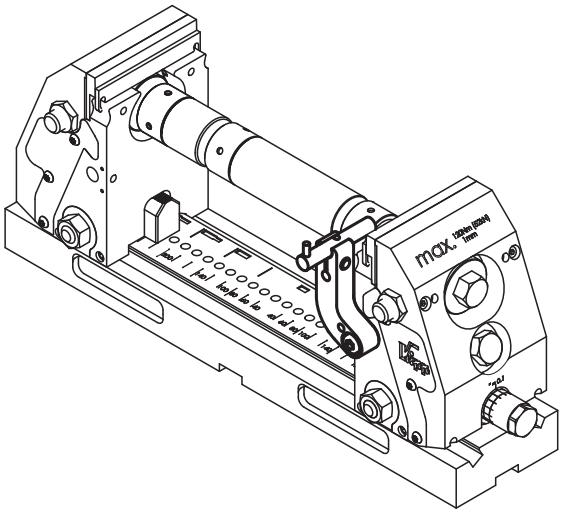
Version:
Swivel arm, black oxidised.
Stop pin bright.

Sample order:
K0993.150

Note:
Stop set for direct fastening to jaws.The stop can be swivelled aside for machining the workpiece without losing the stop dimension.

Supplied complete with attachment parts.



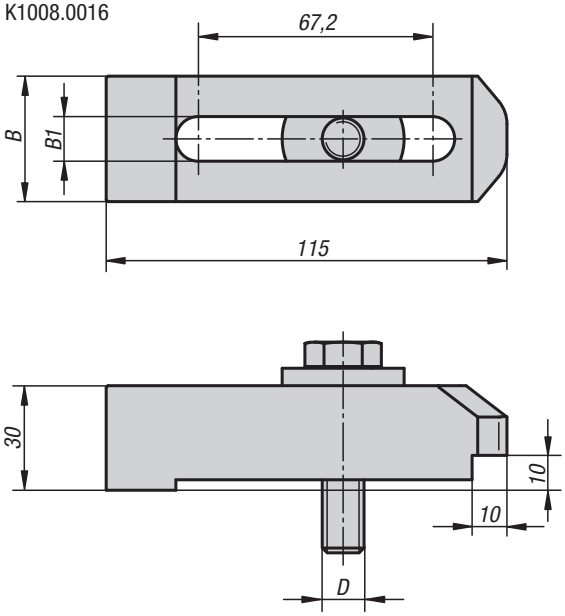


KIPP Stop sets

Order No.	Suitable for
K0993.150	5-axis compact clamping system

Clamping claw sets

K1008.0012
K1008.0016



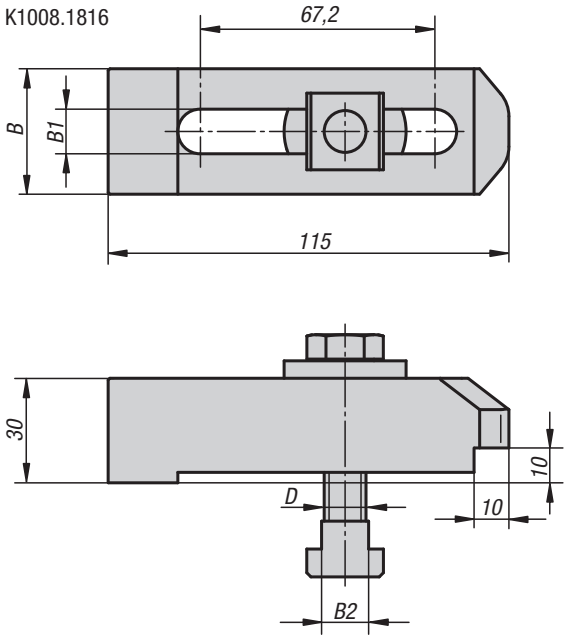
Material:
Carbon steel.

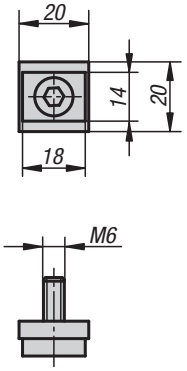
Version:
Black oxidised.

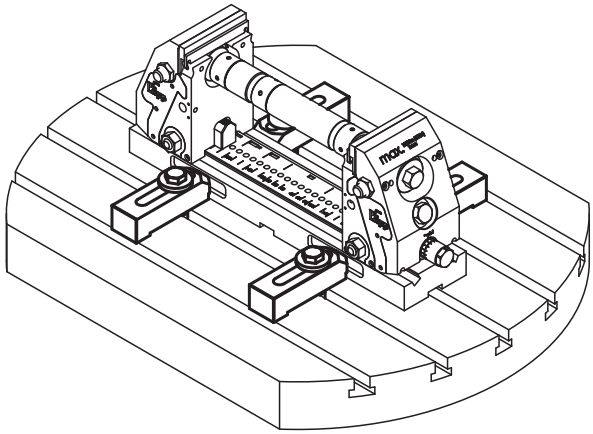
Sample order:
K1008.0012

Note:
Clamping claw set for compact 5-axis clamping system.
All common T-slots, grid and fastening hole spacings can be covered.

K1008.1412
K1008.1816



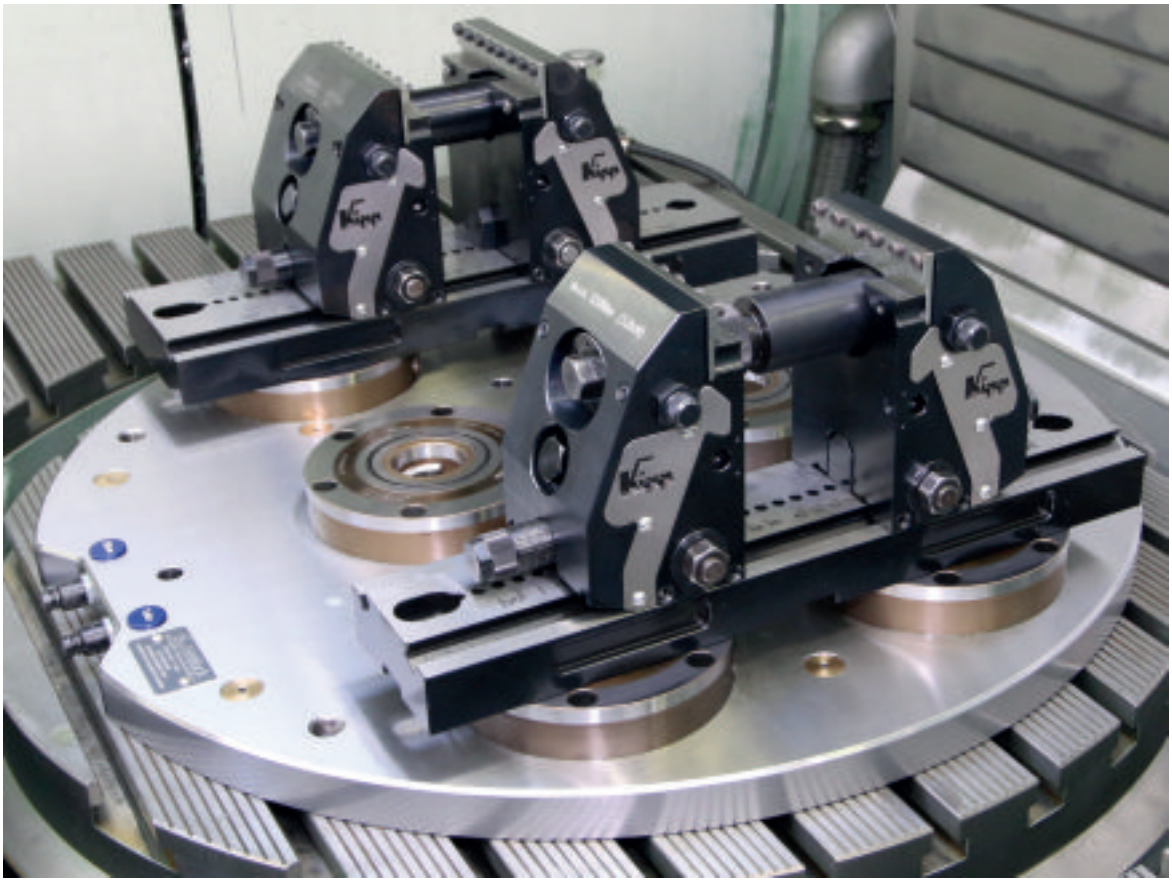




KIPP Clamping claw sets

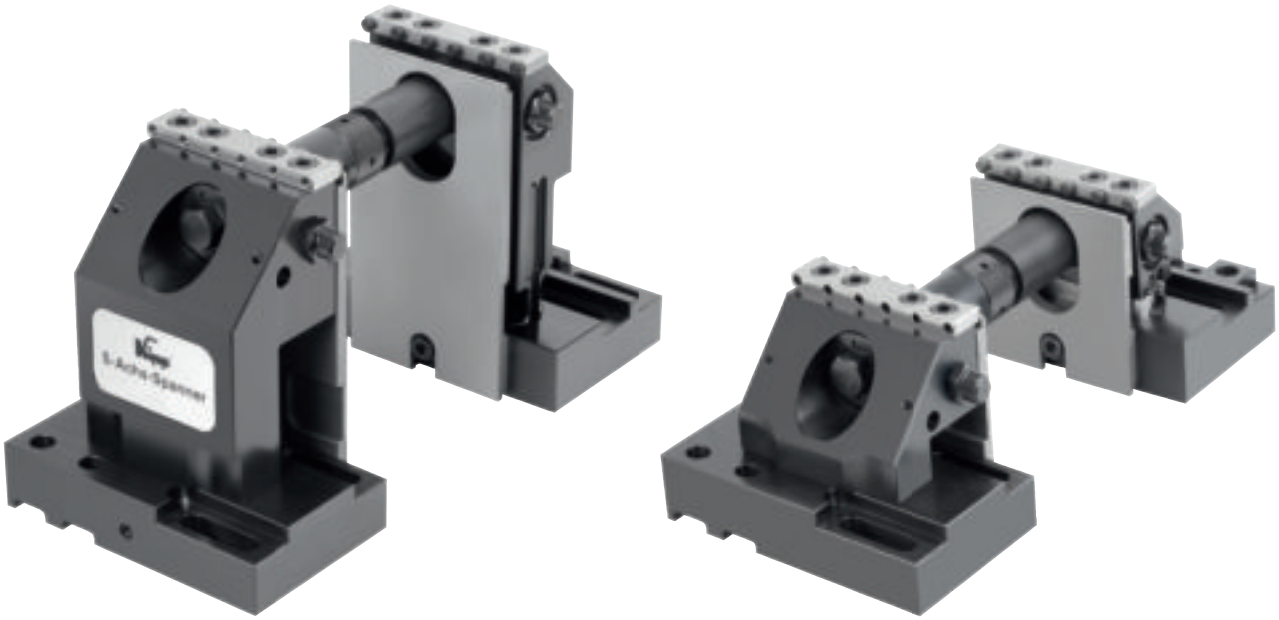
Order No.	B	B1	B2	D
K1008.0012	40	12,8	-	M12
K1008.0016	40	16,8	-	M16
K1008.1412	40	12,8	13,5	M12
K1008.1816	40	16,8	17,5	M16

Application example



Notes

3-axis clamping system
5-axis clamping system



5 Axis clamping system

Trend-setting clamping concept for 5-sided machining

The 5-axis clamping system complements modern milling centres to produce an unbeatable overall concept.

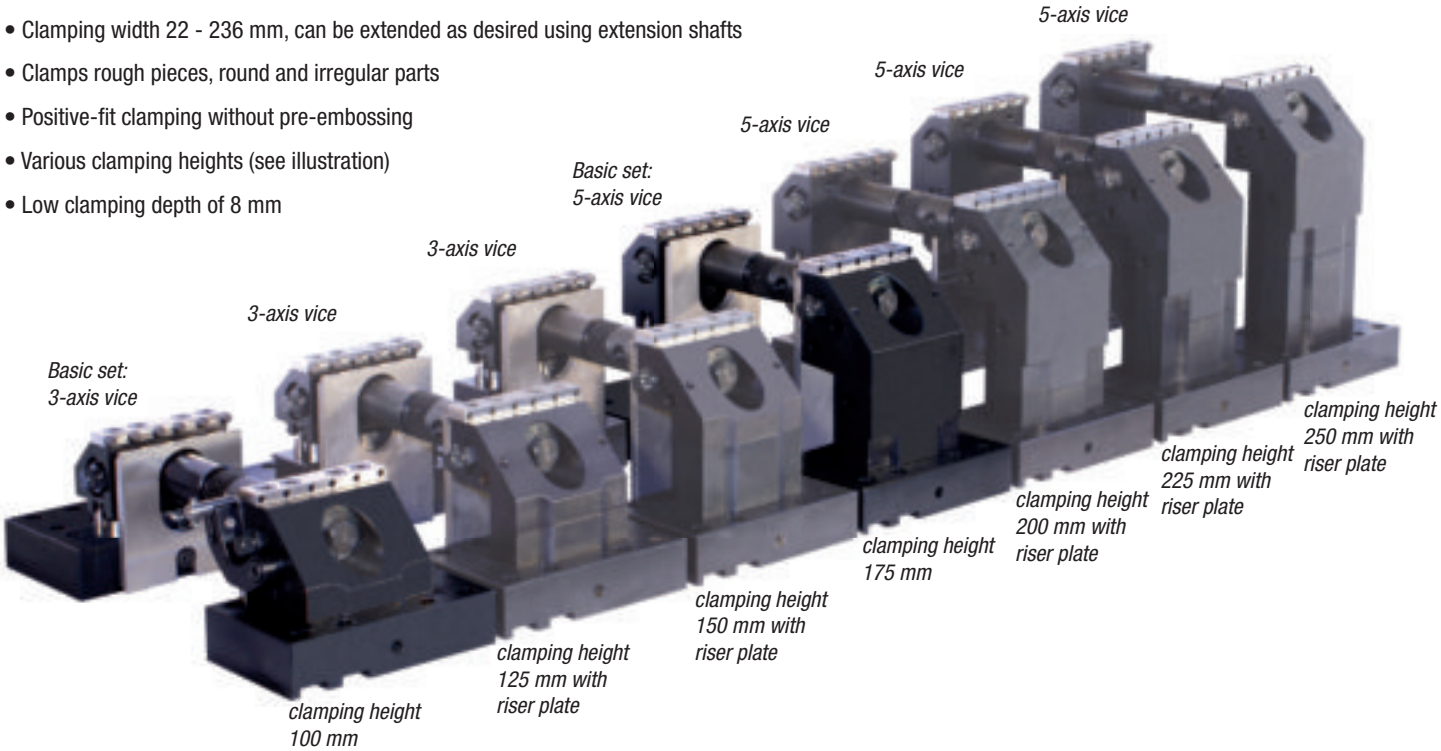
Many products are becoming more complicated than ever, and also have to be produced in an extremely short time and with maximum precision. To satisfy these criteria workpieces must more often be completely machined in one set-up. Modern manufacturing technology adopted by machine tool manufacturers is the developement of 5-axis machining. Complete machining of workpieces on 5-axis centres transfers the entire high precision to the workpiece.

Due the greater configuration options for workpieces provided by 5-axis machining, a high-performance clamping system is an essential precondition for the efficient use of these machines. Among other things, an optimised clamping system helps guarantee that the machine's complex travel can produce a high-precision workpiece.

The 5-axis clamping systems allow machining free of interfering edges and vibration, with extremely high cutting and feed forces. They enable the application of extremely short tools in order to guarantee the required tolerances and surfaces.

5 and 3 axis vices for trouble-free 5-sided machining with a single setup

- Can be set up on grid hole plates, on T-slot plates and on your own fixtures
- Clamping force up to 42 kN by installing a tension spindle immediately under the workpiece
- Clamping width 22 - 236 mm, can be extended as desired using extension shafts
- Clamps rough pieces, round and irregular parts
- Positive-fit clamping without pre-embossing
- Various clamping heights (see illustration)
- Low clamping depth of 8 mm



5 Axis clamping system

Special technical features - clamping process

before clamping

The clamping process involves the penetration of hardened, exchangeable clamping pins in to the workpiece. This guarantees positive-fit clamping without pre-embossing. Optionally, flattened clamping pins are available for

clamping workpieces with sensitive surfaces. Additional flexible applications are possible using accessories, including clamping jaws for specific clamping tasks and round clamping elements for clamping round parts.

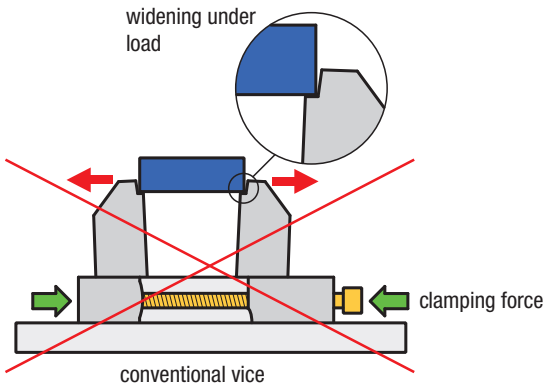
The 5 axis clamping systems provides you with a universal clamping element that is able to clamp workpieces with a clamping width of 22 - 236 mm. The clamping width can be extended as desired through the use of extension shafts.

after clamping

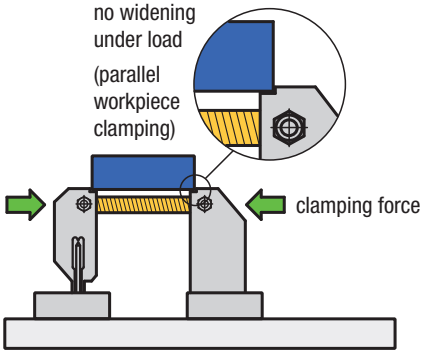
High clamping forces up to 42 kN that are not lost due to flexing

By installing a tension spindle directly under the workpiece support the clamping force is generated where it is required.

- no widening the jaws under load
- no distortion of the machine table
- extreme rigidity allows highest cutting forces



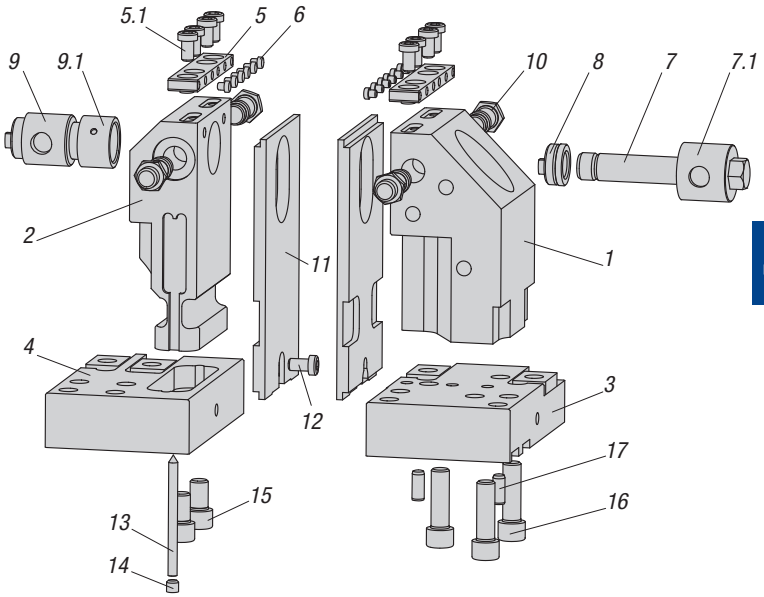
conventional vice



5-axis vice

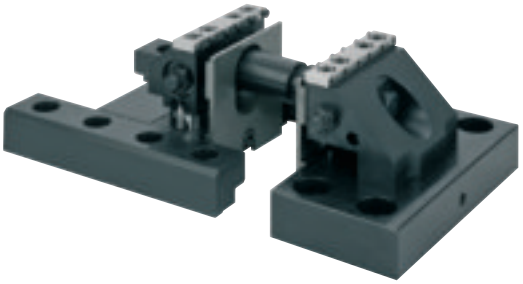
5-axis vice - system design

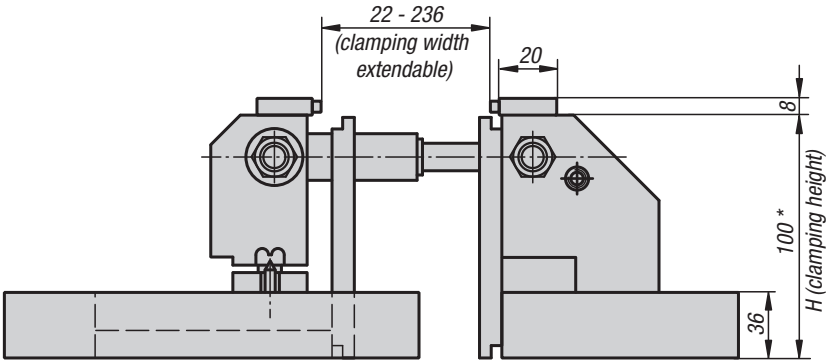
pos.	description	pcs.
1	fixed jaws	1
2	moveable jaws	1
3	base plate for fixed jaws	1
4	base plate for movable jaws	1
5	standard jaw pads with cap screws (5.1)	2
6	clamping pin	12
7	threaded spindle (7) with tension housing (7.1)	1
8	spindle nut	1
9	extension shaft (9) with union nut (9.1)	1
10	fastening screw	4
11	seating ledge	2
12	DIN 6912 M8x12 cap screw	2
13	pointer	1
14	DIN 913 M8x8 grub screw	1
15	DIN 912 M12x20 cap screw	2
16	DIN 912 M12x40 cap screw	3
17	DIN 7979 8x20 dowel pin	2

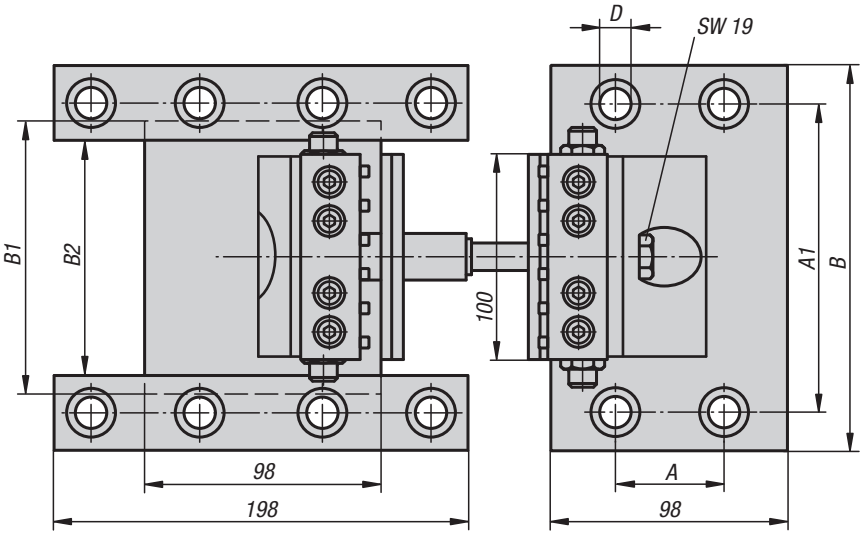


3-axis clamping system

for grid plates







Material:
Base plates and jaws low-carbon steel.
Seating ledges steel.
Jaw plates special steel.
Clamping pins tool steel.

Version:
Base plates and jaws black oxidised.
Seating ledges hardened, bright.
Jaw plates bright.
Clamping pins hardened, bright.

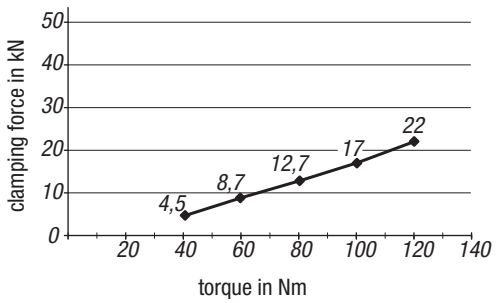
Sample order:
K0939.4012100

Note:
3-axis vices for mounting on grid plates.
These vices enable 3-sided machining free of interfering edges with a clamping depth of only 8 mm. With this clamping system, clamping widths of 22 - 236 mm are possible, and can be extended as desired using the optionally available K0947 extension shafts.
By installing a tension spindle immediately under the workpiece support, a force of up to 22 kN is applied to the workpiece; this is not lost due to flexing. The use of clamping pins with a 4 mm cup point allows positive-fit clamping without pre-embossing.
The shoulder screws K0815 are recommended for mounting the vices on grid hole plates.
The set includes one extension shaft with L = 60 mm and one with L = 120 mm.

* The clamping height can be extended with the riser plates K0941 and seating ledges K0942.

Accessories:
Stop set K0948
Shoulder screws K0815

clamping force 3 axis clamping system

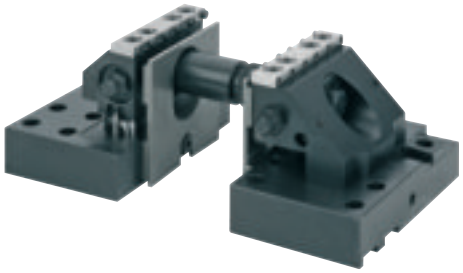


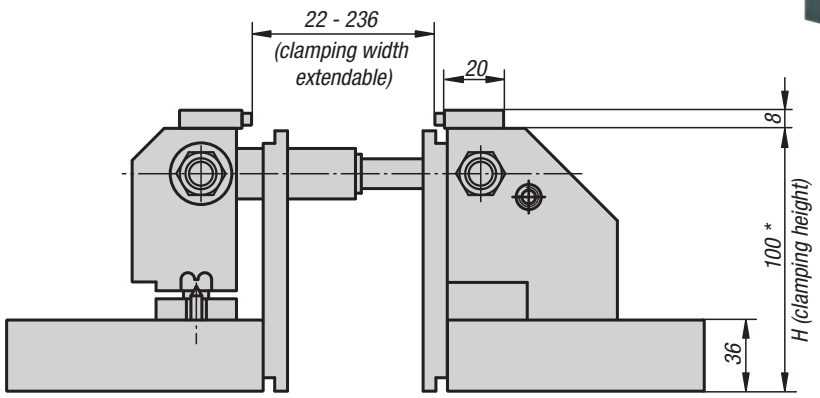
KIPP 3 Axis clamping system for grid plates

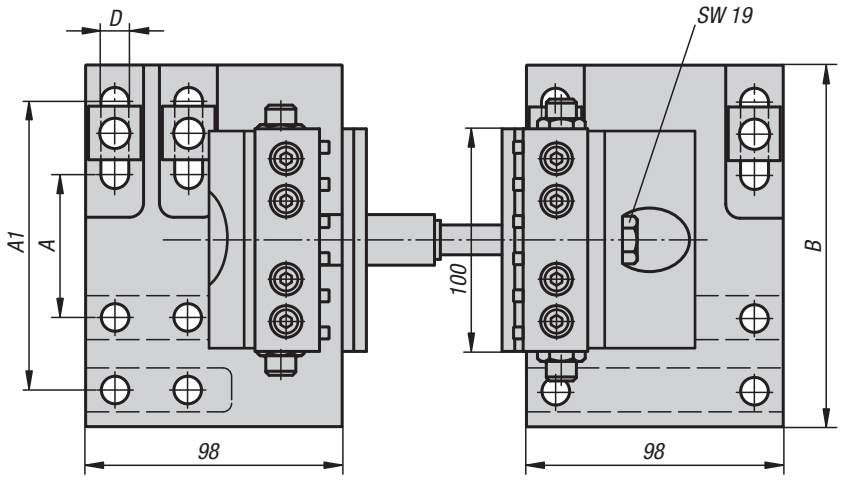
Order No.	Grid spacing	A	A1	B	B1	B2	D	H	Clamping force max. kN	weight kg
K0939.4012100	40x40 (M12)	40	160	190	148	124	12	100 *	22	18.88
K0939.5012100	50x50 (M12)	50	150	190	138	114	12	100 *	22	19.445
K0939.5016100	50x50 (M16)	50	150	190	134	110	16	100 *	22	18.74

3-axis clamping system

for T-slots







Material:
Base plates and jaws low-carbon steel.
Seating ledges steel.
Jaw plates special steel.
Clamping pins tool steel.

Version:
Base plates and jaws black oxidised.
Seating ledges hardened, bright.
Jaw plates bright.
Clamping pins hardened, bright.

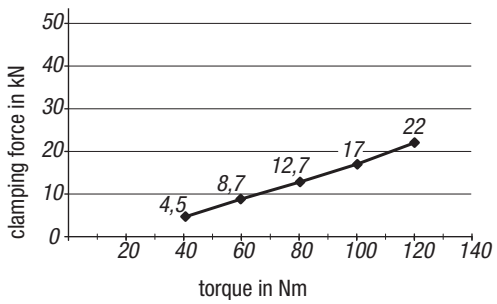
Sample order:
K0940.063100

Note:
3-axis vices for mounting on machine tables with T-slots. These vices enable 3-sided machining free of interfering edges with a clamping depth of only 8 mm. With this clamping system, clamping widths of 22 - 236 mm are possible, and can be extended as desired using the optionally available K0947 extension shafts. By installing a tension spindle immediately under the workpiece support, a force of up to 22 kN is applied to the workpiece, this is not lost due to flexing.
The use of clamping pins with a 4 mm cup point allows positive-fit clamping without pre-embossing.
The fastening set K0951 is recommended for mounting the vices on T-slot tables.
The set includes one extension shaft with L = 60 mm and one with L = 120 mm.

* The clamping height can be extended with the riser plates K0941 and seating ledges K0942.

Accessories:
Stop set K0948
Fastening set K0951

clamping force 3 axis clamping system

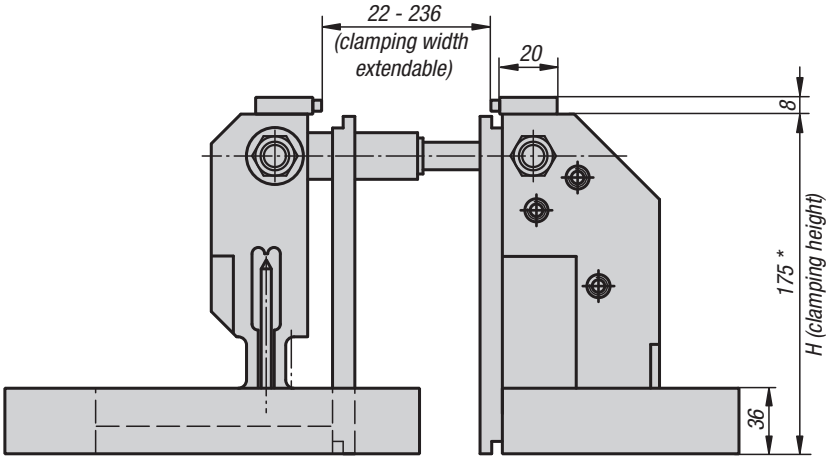


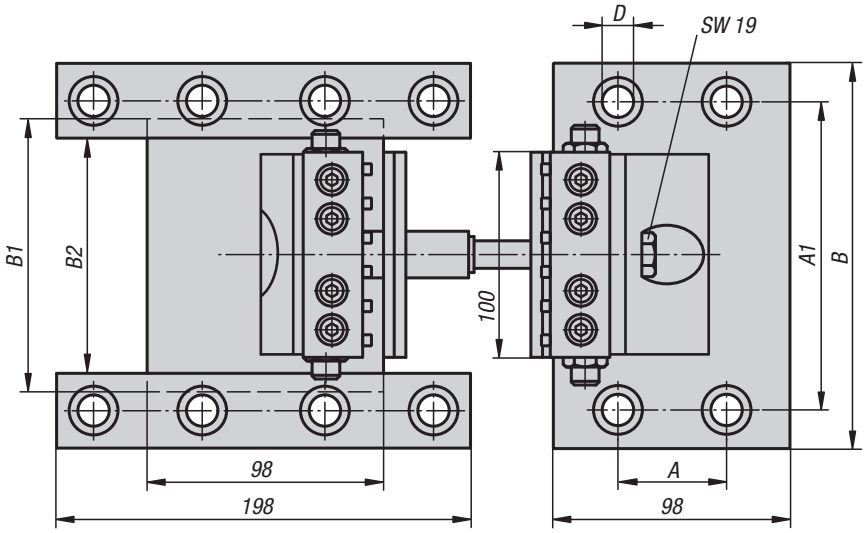
KIPP 3 Axis clamping system for T-slots

Order No.	Suitable for	A	A1	B	D	H	Clamping force max. kN	weight kg
K0940.063100	Slot spacing 63 - 126	63	126	158	12,5	100 *	22	14.8

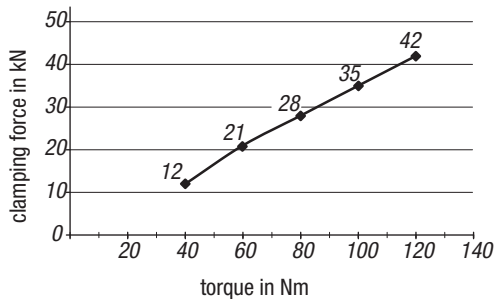
5-axis clamping system

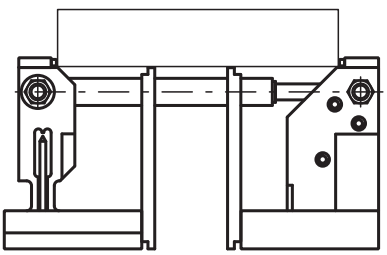
for grid plates

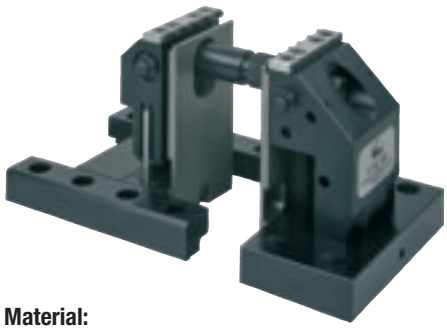




clamping force 5 axis clamping system







Material:
Base plates and jaws low-carbon steel.
Seating ledges steel.
Jaw plates special steel.
Clamping pins tool steel.

Version:
Base plates and jaws black oxidised.
Seating ledges hardened, bright.
Jaw plates bright.
Clamping pins hardened, bright.

Sample order:
K0939.4012175

Note:
5-axis vices for mounting on grid plates.
These vices enable 5-sided machining free of interfering edges with a clamping depth of only 8 mm. With this clamping system, clamping widths of 22 - 236 mm are possible, and can be extended as desired using the optionally available K0947 extension shafts. By installing a tension spindle immediately under the workpiece support, a force of up to 42 kN is applied to the workpiece; this is not lost due to bending. The use of clamping pins with a 4 mm cup point allows positive-fit clamping without pre-embossing.
The shoulder screws K0815 are recommended for mounting the vices on grid hole plates.
The set includes one extension shaft with L = 60 mm and one with L = 120 mm.

* The clamping height can be extended with the riser plates K0941 and seating ledges K0942.

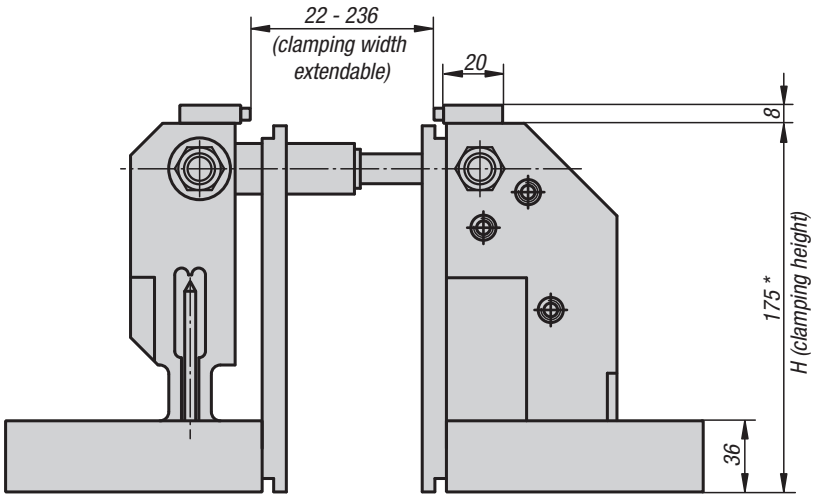
Accessories:
Stop set K0948
Locating bolts K0815

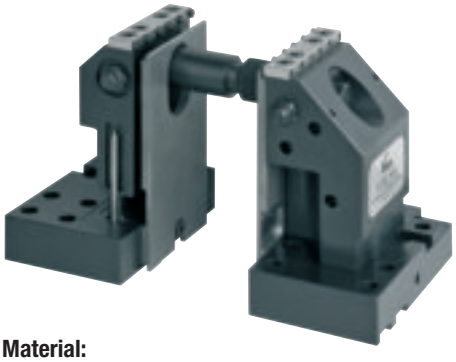
KIPP 5 Axis clamping system for grid plates

Order No.	Grid spacing	A	A1	B	B1	B2	D	H	Clamping force max. kN	weight kg
K0939.4012175	40x40 (M12)	40	160	190	148	124	12	175 *	42	25.095
K0939.5012175	50x50 (M12)	50	150	190	138	114	12	175 *	42	25.232
K0939.5016175	50x50 (M16)	50	150	190	134	110	16	175 *	42	25.265

5-axis clamping system

for T-slots



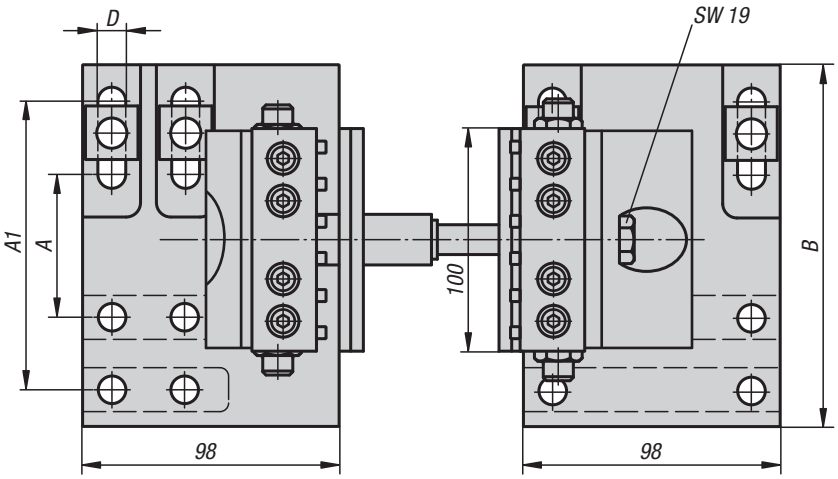


Material:
Base plates and jaws low-carbon steel.
Seating ledges steel.
Jaw plates special steel.
Clamping pins tool steel.

Version:
Base plates and jaws black oxidised.
Seating ledges hardened, bright.
Jaw plates bright.
Clamping pins hardened, bright.

Sample order:
K0940.063175

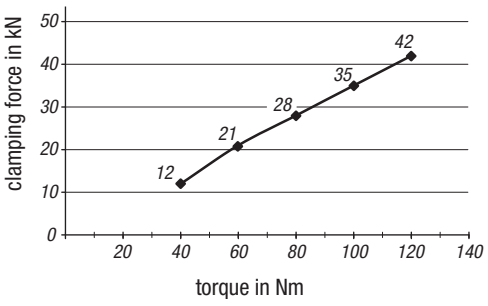
Note:
5-axis vices for mounting on machine tables with T-slots. These vices enable 5-sided machining free of interfering edges with a clamping depth of only 8 mm. With this clamping system, clamping widths of 22 - 236 mm are possible, and can be extended as desired using the optionally available K0947 extension shafts. By installing a tension spindle immediately under the workpiece support, a force of up to 42 kN is applied to the workpiece, this is not lost due to flexing. The use of clamping pins with a 4 mm cup point allows positive-fit clamping without pre-embossing.
The fastening set K0951 is recommended for mounting the vices on T-slot tables.
The set includes one extension shaft with L = 60 mm and one with L = 120 mm.



* The clamping height can be extended with the riser plates K0941 and seating ledges K0942.

Accessories:
Stop set K0948
Fastening set K0951

clamping force 5 axis clamping system

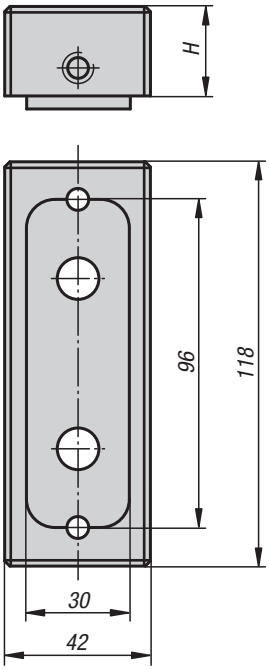


KIPP 5 Axis clamping system for T-slots

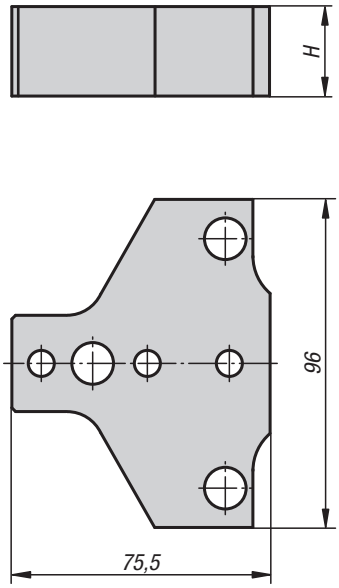
Order No.	Suitable for	A	A1	B	D	H	Clamping force max. kN	weight kg
K0940.063175	Slot spacing 63 - 126	63	126	158	12,5	175 *	42	21.32

Riser plates

risers for
moveable side



risers for
fixed side

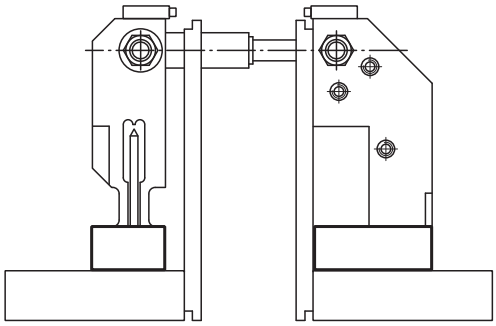


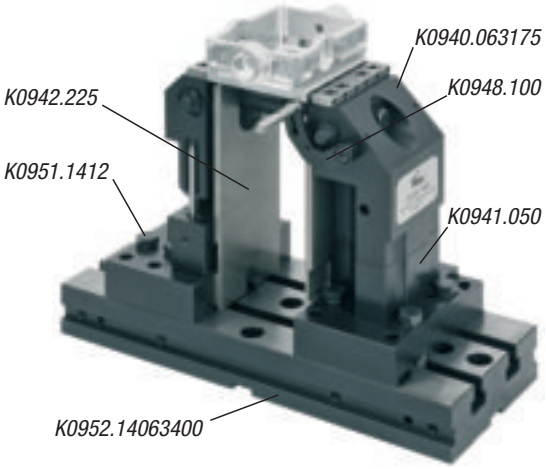
Material, version:
Steel, black oxidised.

Sample order:
K0941.025
(supplied in pairs)

Note:
The riser plates are mounted between the base plate and the jaw body, raising the 3-axis vices to 125 or 150 mm. The 5-axis vices can be raised to 200, 225 or 250 mm. When using the riser plates the matching seating ledges K0942 must also be installed.

Supplied with fastening screws and cylindrical pins.

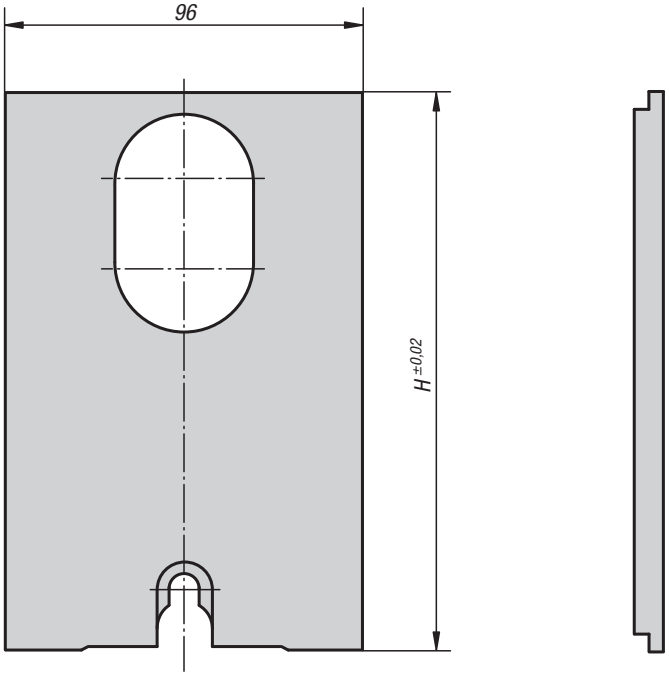




KIPP Riser plates

Order No.	H	weight kg
K0941.025	25	1.861
K0941.050	50	3.701
K0941.075	75 (25 + 50)	5.271

Seating ledges

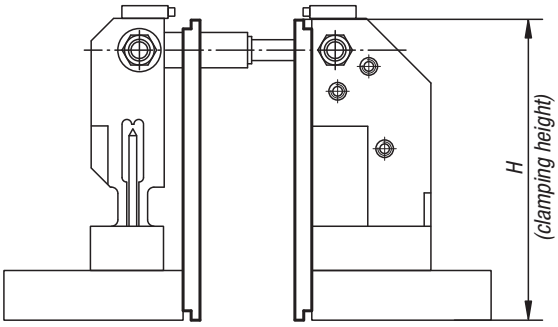


Material, version:
Steel hardened, bright.

Sample order:
K0942.100
(supplied in pairs)

Note:
If the riser plates K0941 are used to raise the height, the seating ledges must be changed to suit.

*Including 12 jaw pins K0946.05600.

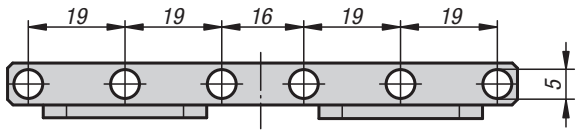


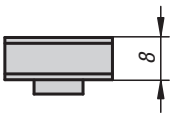
KIPP Seating ledges

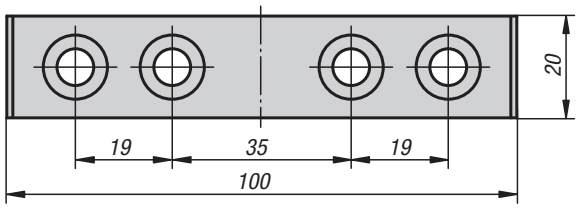
Order No.	H	Suitable for
K0942.100	100	3-axis vice basic set
K0942.105*	105	3-axis vice basic set
K0942.125	125	3-axis vice with 25 mm riser plate
K0942.150	150	3-axis vice with 50 mm riser plate
K0942.175	175	5-axis vice basic set
K0942.180*	180	5-axis vice basic set
K0942.200	200	5-axis vice with 25 mm riser plate
K0942.225	225	5-axis vice with 50 mm riser plate
K0942.250	250	5-axis vice with 75 mm riser plate (25 + 50)

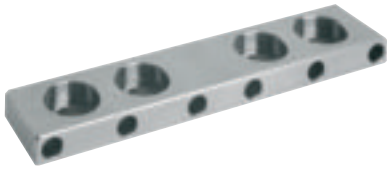
K0943

Jaw plates standard









Material, version:
Special steel, bright.

Sample order:
K0943.110008

Note:
Jaw plates with holes to press the jaw pins into. Suitable for all 3-axis and 5-axis vices.

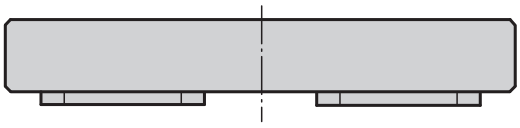
Accessories:
Jaw pins K0946

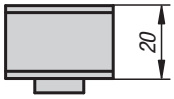
KIPP Jaw plates, standard

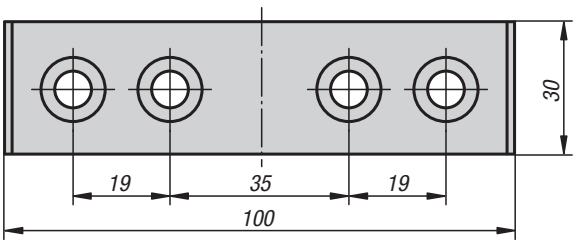
Order No.	Suitable for
K0943.110008	all 3-axis and 5-axis vices

K0944

Jaw plates machinable







Material, version:
Steel 1.0503, bright.

Sample order:
K0944.210020

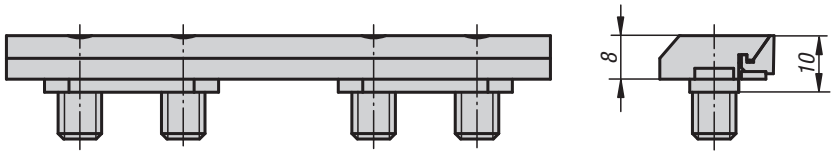
Note:
Machinable jaw plates can be machined to suit specific workpieces. Suitable for all 3-axis and 5-axis vices.

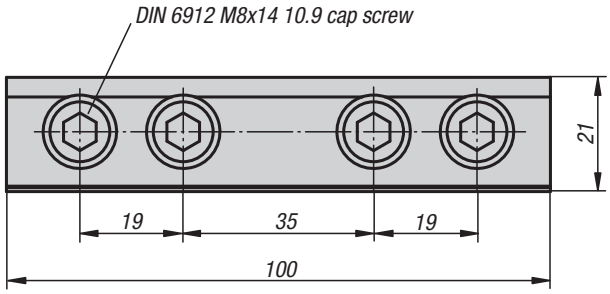
KIPP Jaw plates machinable

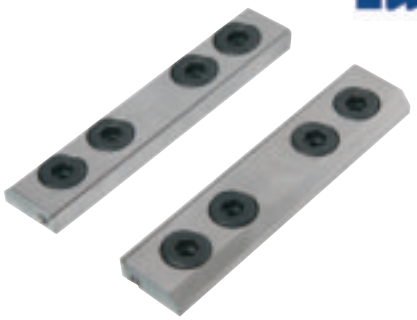
Order No.	Suitable for
K0944.210020	all 3-axis and 5-axis vices

K0953

Draw-down jaws







Material, version:
Special steel, bright.

Sample order:
K0953.110008

Note:
Positive down jaw plates for clamping pre-machined workpieces.
Suitable for all 3-axis and 5-axis vices.

Supplied in pairs.

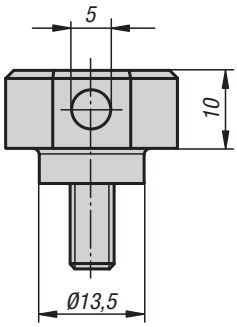
KIPP Draw-down jaws

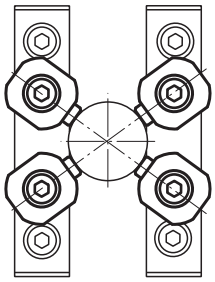
Order No.	Suitable for
K0953.110008	all 3-axis and 5-axis vices

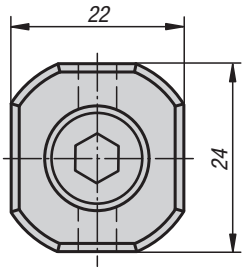
K0945

Jaw adapters

for round workpieces







Material, version:
Adapter blocks carbon steel, black oxidised.
Cap screw, grade 10.9.

Sample order:
K0945.135010
(supplied in sets of 4)

Note:
For clamping round workpieces with a diameter of 30 - 200 mm. Screwed directly into the standard or machinable jaw plates.

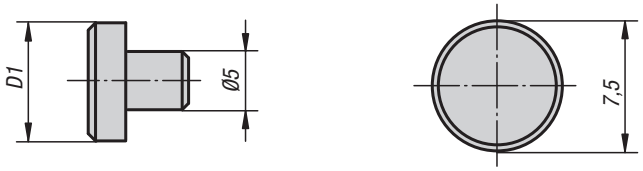
Accessories:
Jaw pins K0946

KIPP Jaw adapters for round workpieces

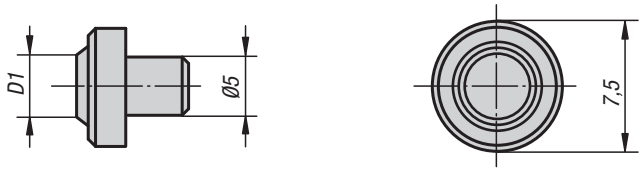
Order No.	Suitable for
K0945.135010	all 3-axis and 5-axis vices

Jaw pins

flattened



cup point



Material, version:
Tool steel, hardened.

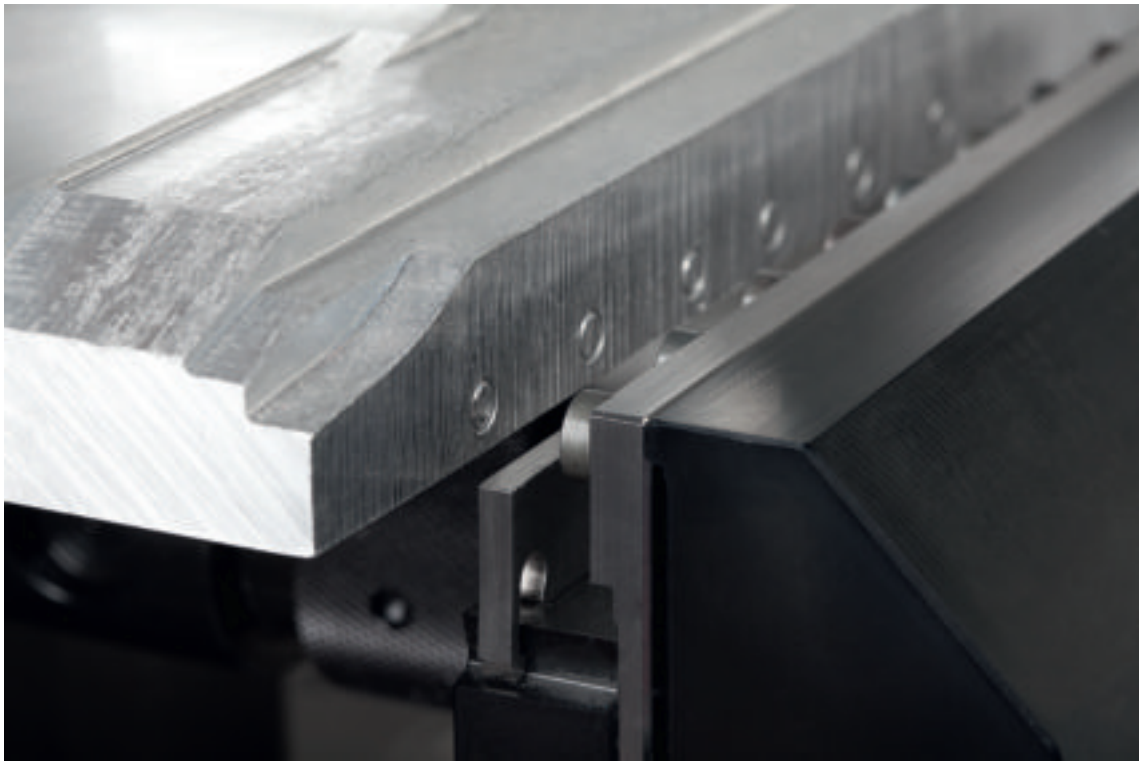
Sample order:
K0946.05600

Note:
Suitable for standard jaw plates and jaw adapters of round workpieces.
Installed by pressing in.

KIPP Jaw pins

Order No.	Version	D1	Application
K0946.05000	flattened	7,5	Material over 1000 N/mm² tensile strength
K0946.05400	cup point	4	Material up to ca. 1000 N/mm² tensile strength
K0946.05600	cup point	6	Material up to ca. 1000 N/mm² tensile strength

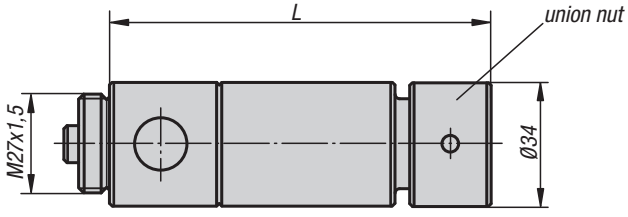
Application example

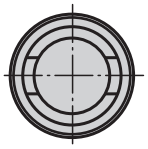


K0947

Extension shafts

with union nut





Material, version:
Carbon steel, black oxidised.

Sample order:
K0947.060

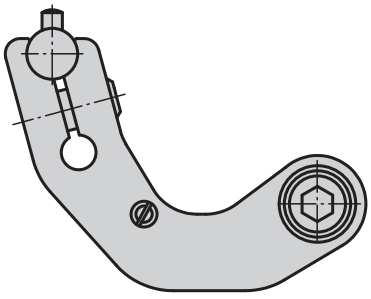
Note:
To extend the clamping width.
Supplied with union nut. The extension shafts can be combined as desired.

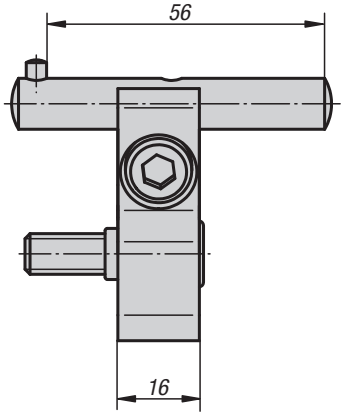
KIPP Extension shafts with union nut

Order No.	L	Clamp range
K0947.060	60	22 - 86
K0947.120	120	80 - 146
K0947.240	240	extended by 240 mm
K0947.480	480	extended by 480 mm

K0948

Stop set





Material:
Steel.

Version:
Swivel arm, black oxidised.
Stop pin bright.

Sample order:
K0948.100

Note:
Stop set for direct fastening to fixed jaws. The stop can be swivelled aside for machining of the workpiece without losing the stop dimension. Supplied complete with attaching parts.

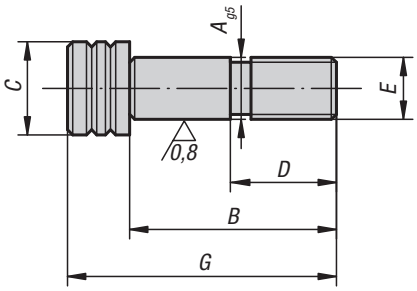
KIPP Stop set

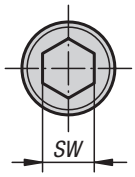
Order No.	Suitable for
K0948.100	all 3-axis and 5-axis vices

K0815

Shoulder screws

Form B





Material:
Carbon steel.

Version:
Tempered, black oxidised.
Precision diameters ground.

Sample order:
K0815.12055

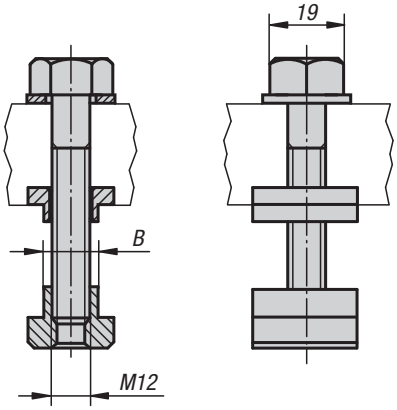
KIPP Shoulder screws Form B

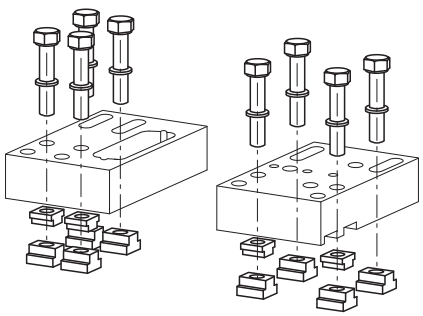
Order No.	A	B	C	D	E	G	SW
K0815.12055	12	55	18	22	M12	67	10
K0815.16055	16	55	24	25	M16	71	14

K0951

Fastening set

for T-slots





Material, version:
Carbon steel, black oxidised.

Sample order:
K0951.1412

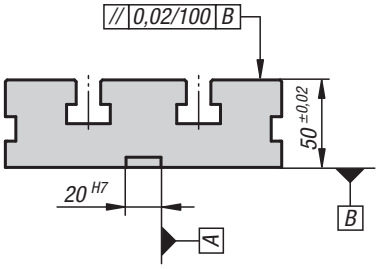
Note:
Fastening sets for aligning and securing 3 and 5 axis vices on tables with T-slots sizes 14 or 18.
Sets consisting of:
8x ISO 4014 M 12x60 12.9 hex head bolts
8x DIN 508 T-slot nuts
8x washers
4x slot keys

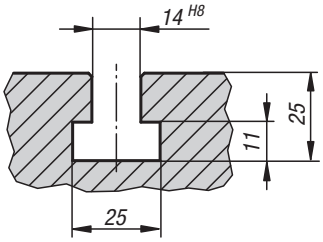
KIPP Fastening set for T-slots

Order No.	Version	B
K0951.1412	Slot width 14	14
K0951.1812	Slot width 18	18

K0952

T-slot plate

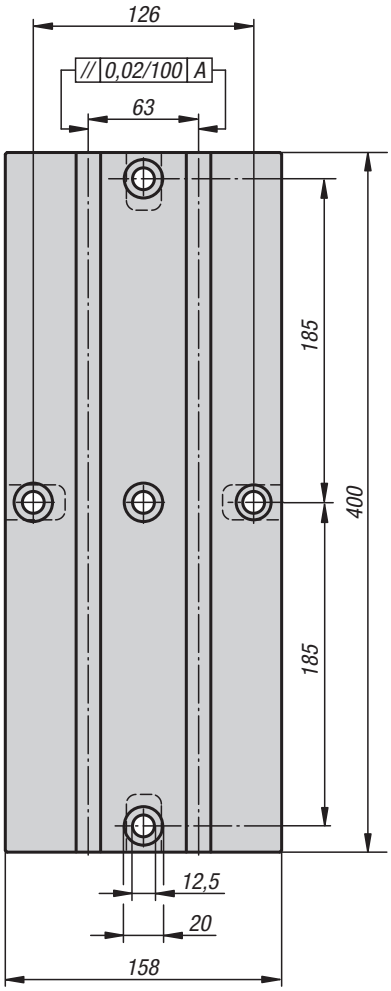


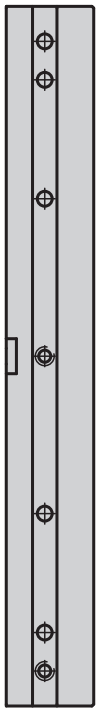


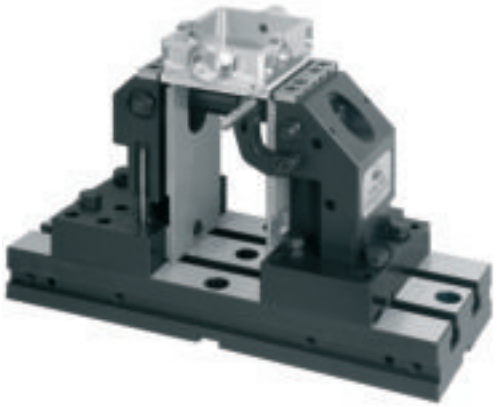
Material, version:
Carbon steel, black oxidised.
Contact faces ground.

Sample order:
K0952.14063400

Note:
T-slot plates with locating slots on the underside for easy alignment of the plate on the machine table.



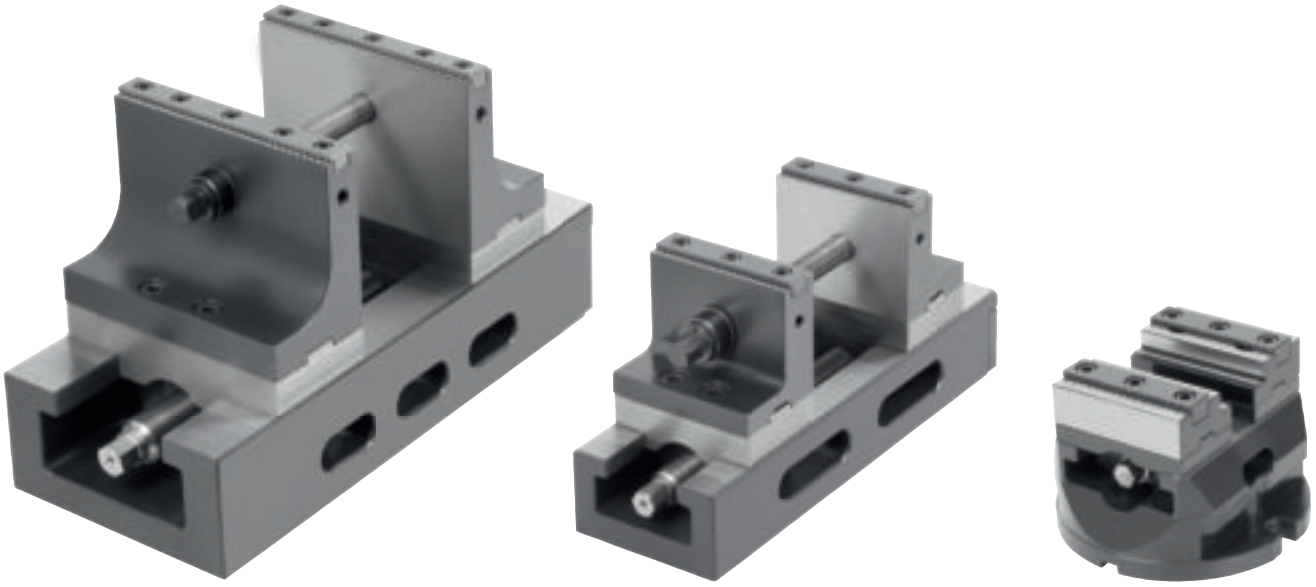




KIPP T-slot plate

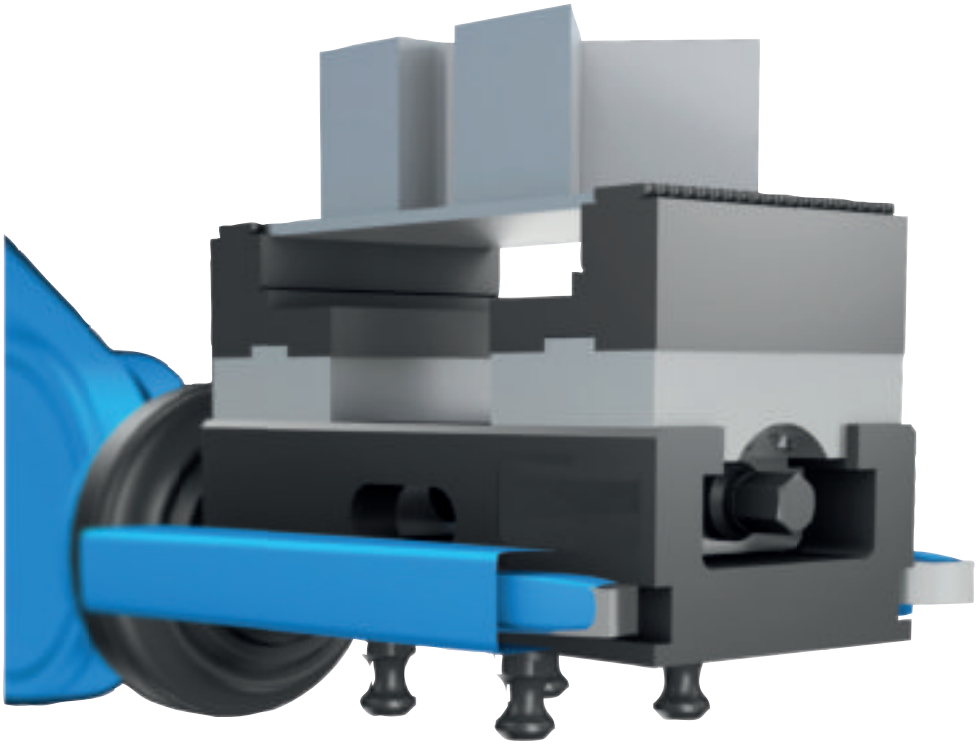
Order No.	Version	weight kg
K0952.14063400	Slot width 14 / slot spacing 63	21.135

Centric vices



Technical information for centric vices

Mechanically actuated centric vice
Centring precision +/- 0.02 mm across the entire clamping range.
We recommend using a torque wrench for controlling the clamping force.

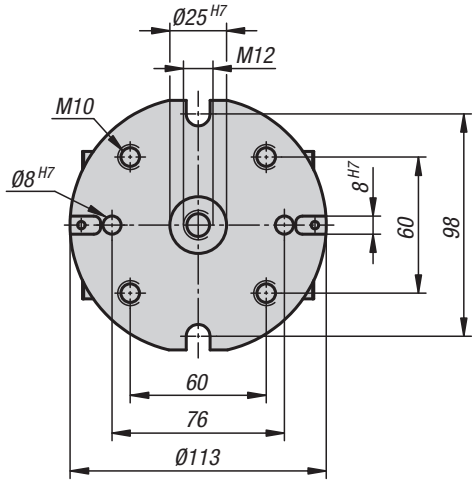


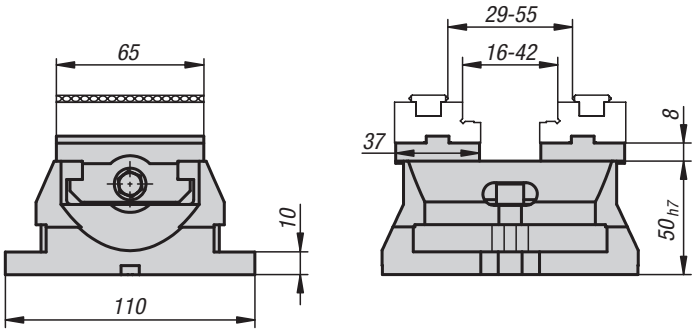
Flexible connection options:

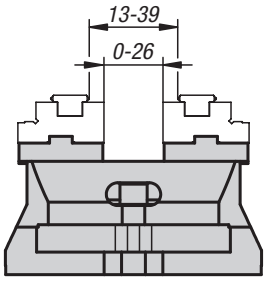
1. Support for the zero point clamping system. Fitting 25H6/M12.
   Reamed and tapped holes for fixing clamping pins for zero point clamping systems are integrated into each centric vice. These vices can therefore be used on conventional zero point clamping systems.
2. Support for handling systems / suitable for automation.
   There is also the option of transporting the centric vice using handling systems.
3. Support with adapter plate for grid system M12/Ø12F7, grid spacing 50 mm.
   Assembly with an adapter plate suitable for grid systems M12/Ø12F7 ensures flexible positioning on basic elements with a grid system.
4. Support directly on the machine table.
   Using the lateral fastening slots, the centric vices can also be fixed to the machine table as required.

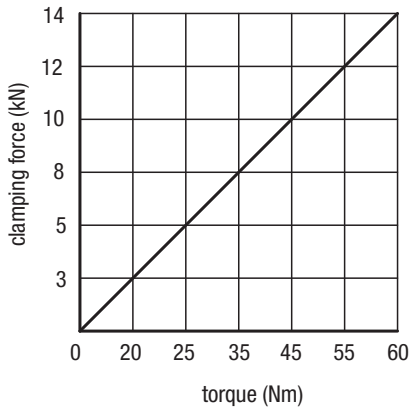
Centric vices

jaw width 65 mm









Material:
Body and jaw holder mild steel.
Spindle high-strength special steel.

Version:
Body and jaw holder hardened and ground.

Sample order:
K1236.065100

Note for ordering:
Supplied with hexagon crank handle.
Order jaw plates separately.

Note:
Mechanically operated centric vice.
Suitable for automation: prepared with gripper slot for handling systems.
Flexible mounting: suitable for zero-point systems, mounting on machine tables or on custom systems via a baseplate.
Centring precision: +/- 0.02 mm.

The use of a torque wrench is recommended to achieve a controlled clamping force.

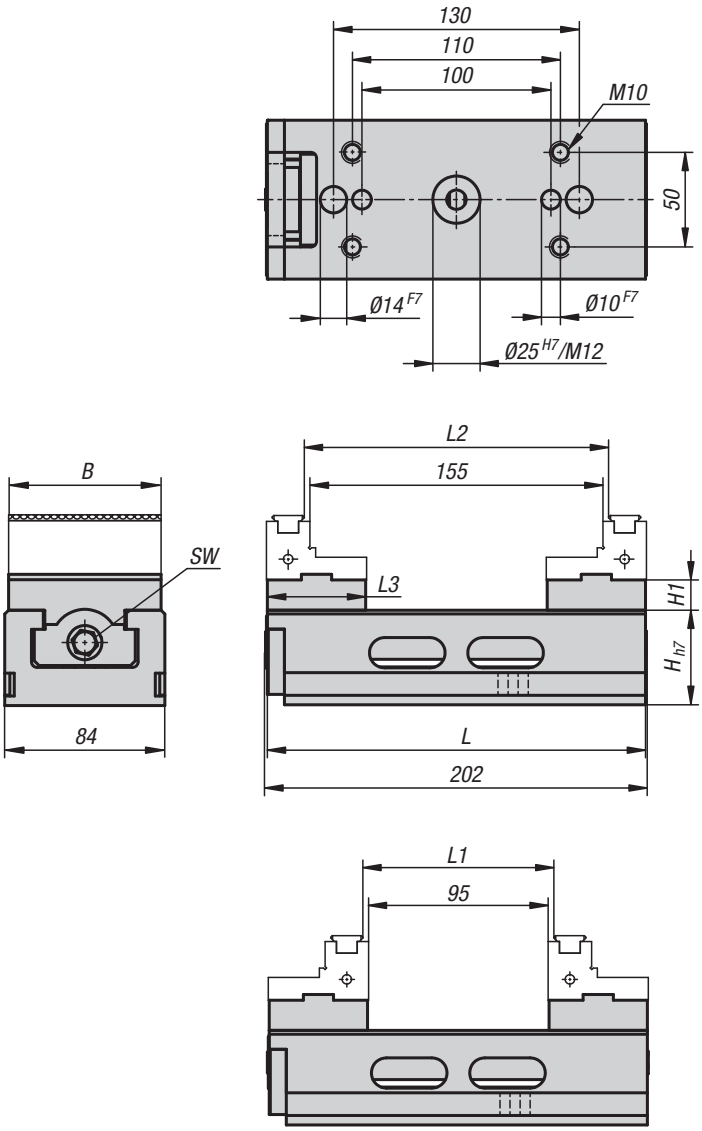
Features:
- Clamping slide and spindle nut in one piece
- Slots and fastening threads for mounting attachment jaws
- Reversible jaws (accessories) with lateral thread for workpiece stop enables a wider clamping range
- Good swarf and coolant removal

KIPP Centric vice jaw width 65 mm

Order No.	Dimensions	weight kg
K1236.065100	see drawing	3.2

Centric vices

jaw width 80–125 mm



Material:
Body and jaw holder mild steel.
Spindle high-strength special steel.

Version:
Body and jaw holder hardened and ground.

Sample order:
K1237.080200

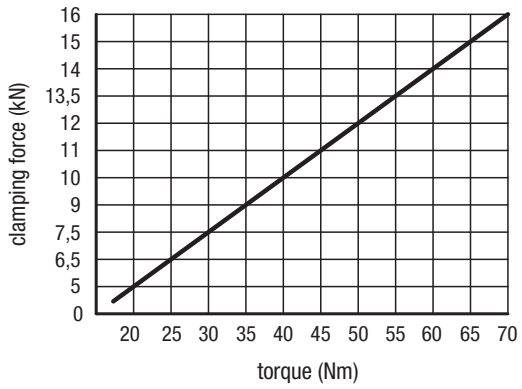
Note for ordering:
Supplied with hexagon crank handle.
Order jaw plates separately.

Note:
Mechanically operated centric vice.
Suitable for automation: prepared with gripper slot for handling systems.
Flexible mounting: suitable for zero-point systems, mounting on machine tables or on custom systems via a baseplate.
Centring precision: +/- 0.02 mm.

The use of a torque wrench is recommended to achieve a controlled clamping force.

Features:
- Clamping slide and spindle nut in one piece
- Slots and fastening threads for mounting attachment jaws
- Reversible jaws (accessories) with lateral thread for workpiece stop enables a wider clamping range
- Good swarf and coolant removal

B = 80 mm

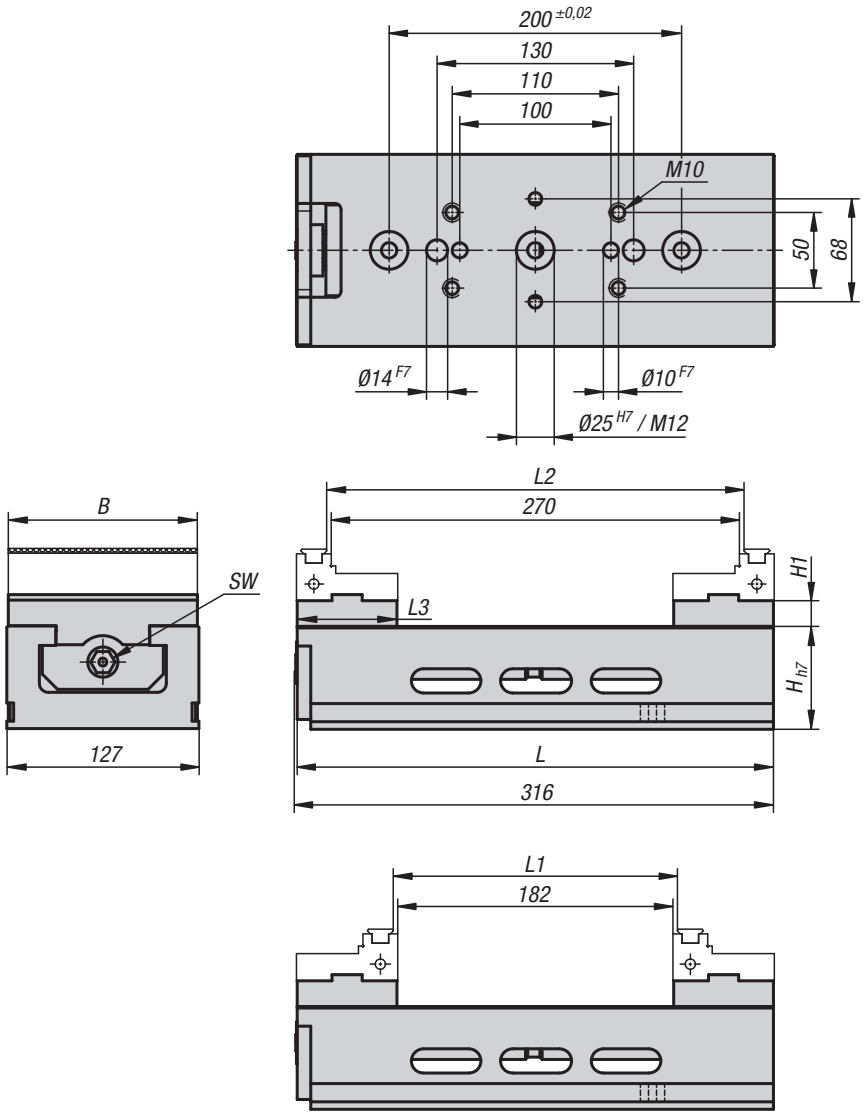


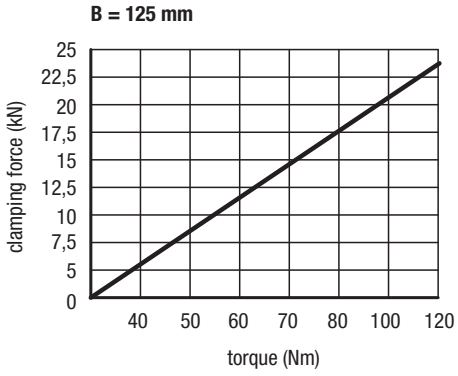
KIPP Centric vice, jaw width 80 mm

Order No.	B	H	H1	L	L1	L2	L3	SW	weight kg
K1237.080200	80	50h7	16	200	6-101	66-161	52	12	6.7

Centric vices

jaw width 80–125 mm



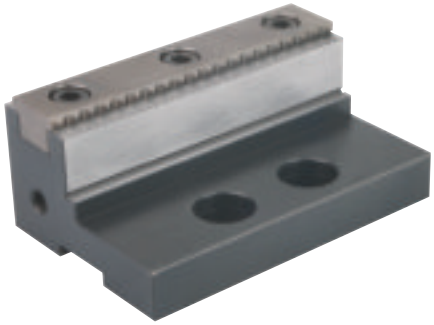


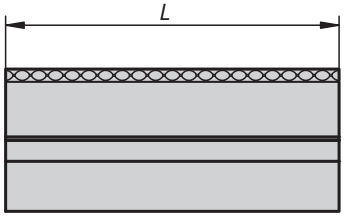
KIPP Centric vice, jaw width 125 mm

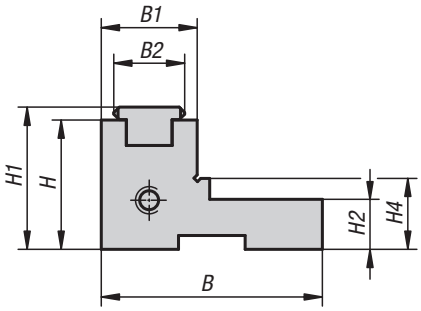
Order No.	B	H	H1	L	L1	L2	L3	SW	weight kg
K1237.125315	125	62h7	17	315	6-188	94-276	66	14	15.5

Attachment jaws

stepped, with grip rail







Material, version:
Step jaw steel, hardened, clamping surfaces ground.
Grip rail steel, hardened

Sample order:
K0587.0801

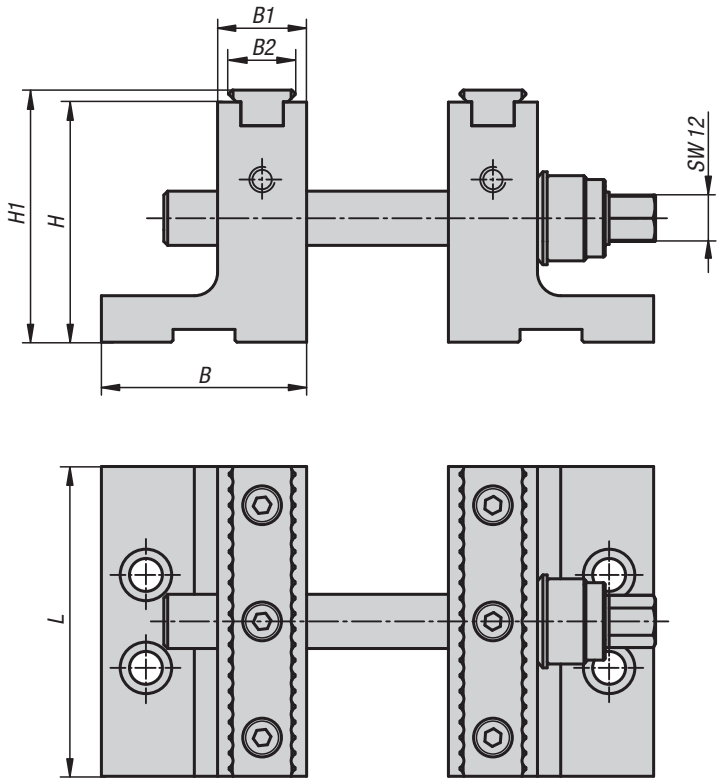
Note:
These attachment step jaws are suitable for centric vices. The clamping width can be increased or decreased by reversing the jaws. The gripper jaw pads can also be exchanged for smooth jaw pads.

KIPP Attachment jaws, stepped, with grip rail

Order No.	B	B1	B2	H	H1	H2	H4	L	weight kg
K0587.0651	38	30	17	18	21	9	9,5	65	0.3
K0587.0801	53	23	17	31	34	12	17	80	0.5
K0587.1251	67	23	17	31	34	18	23	125	0.7

Step jaw attachment

for 5-axis machining



Material, version:
Step jaw steel, hardened, clamping surfaces ground.
Grip rail steel, hardened

Sample order:
K1115.0801

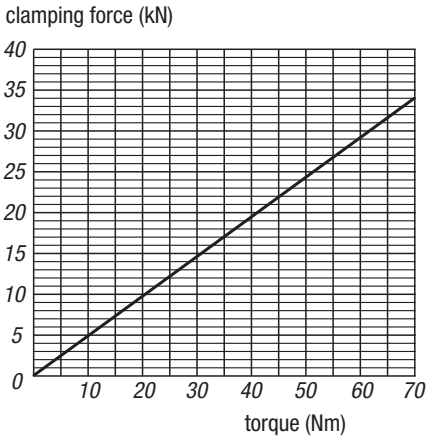
Note for ordering:
High attachment step jaws in pairs with two gripper inserts and three different lengths of clamping spindle.

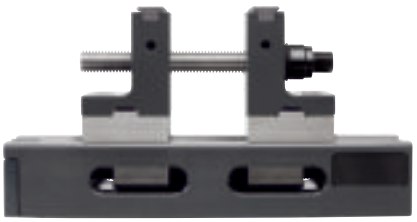
Note:
The workpiece is first centred using the lower centring spindle, then finally clamped using the upper clamping spindle.

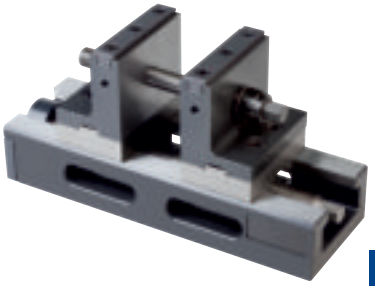
Basic set:
Supplied with a pair of high add-on step jaws with 2 gripper inserts and 3 clamping spindles in various lengths.
1. length 80 mm clamping range 6 mm - 35 mm.
2. length 140 mm clamping range 6 mm - 95 mm.
3. length 200 mm clamping range 6 mm - 155 mm.

Advantages:
Ideal for 5-side machining. High setup on the machine table for 5-axis machines. Clamping force directly under the workpiece. The attachment jaws can be retrofitted for the 80 mm and 125 mm centric vices. The workpiece is first centred using the lower centring spindle, then finally clamped using the upper clamping spindle.

clamping force diagram







KIPP Step jaw attachment for 5-axis machining

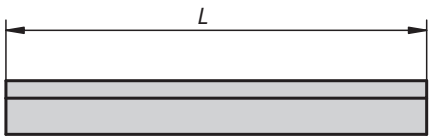
Order No.	Version	B	B1	B2	H	H1	L	weight kg
K1115.0801	for 5-axis machining	53	23	17	62	65,1	80	2.689
K1115.1251	for 5-axis machining	53	23	17	90	93,1	125	2.5

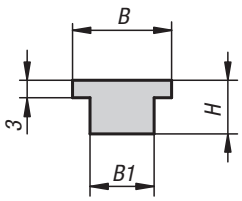
K0591

Inserts

for stepped jaws

Ⓐ





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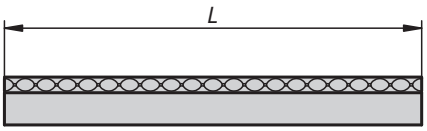
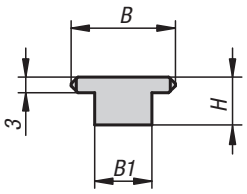




Material:
Steel.

Version:
Hardened and ground.

Sample order:
K0591.080117

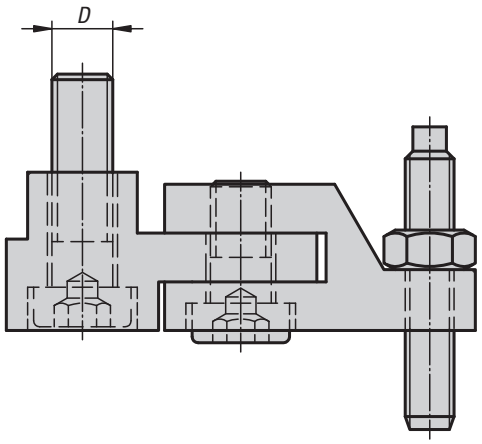
Note:
Inserts Form A with smooth face Form B serrated face for maximum holding force.

KIPP Inserts for stepped jaws

Order No. Form A	Order No. Form B	B	B1	H	L
K0591.065117	**K0591.065217**	17	11	9,2	65
K0591.080117	**K0591.080217**	17	11	9,2	80
K0591.125117	**K0591.125217**	17	11	9,2	125

K0607

Hinged stops



Material, version:
Steel, black oxidised.

Sample order:
K0607.080

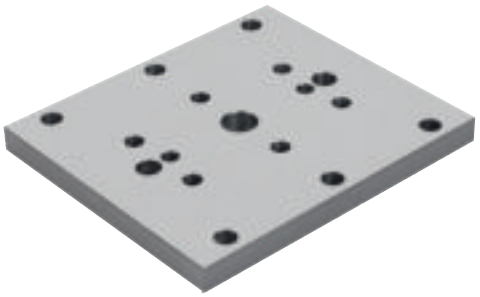
Note:
Hinged stop for fastening directly to the sliding or middle jaw.

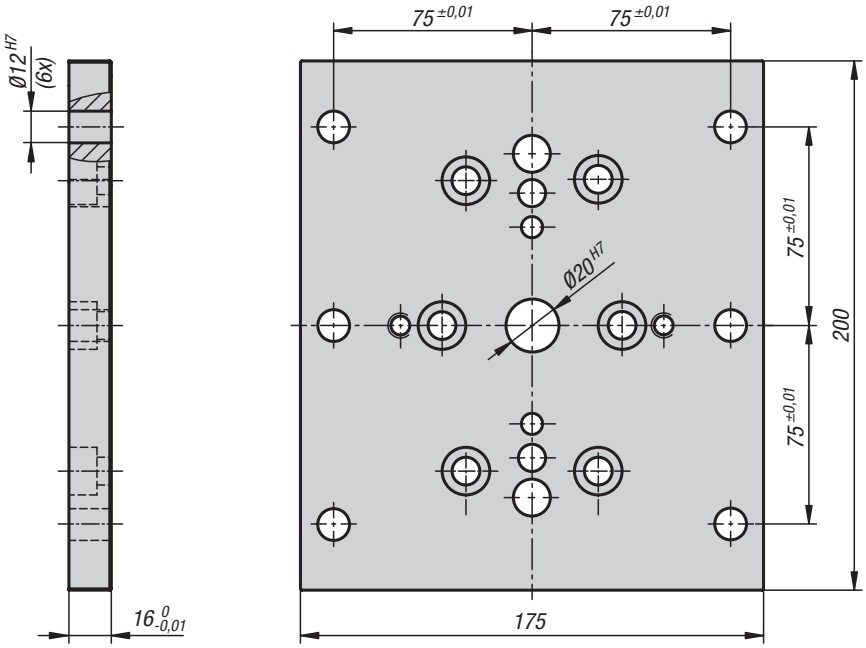
KIPP Hinged stops

Order No.	D	Suitable for
K0607.080	M6	ZS 80-200
K0607.100	M8	ZS 100-350

Baseplate

for centric vice





Material:
Steel.

Version:
Hardened and ground.

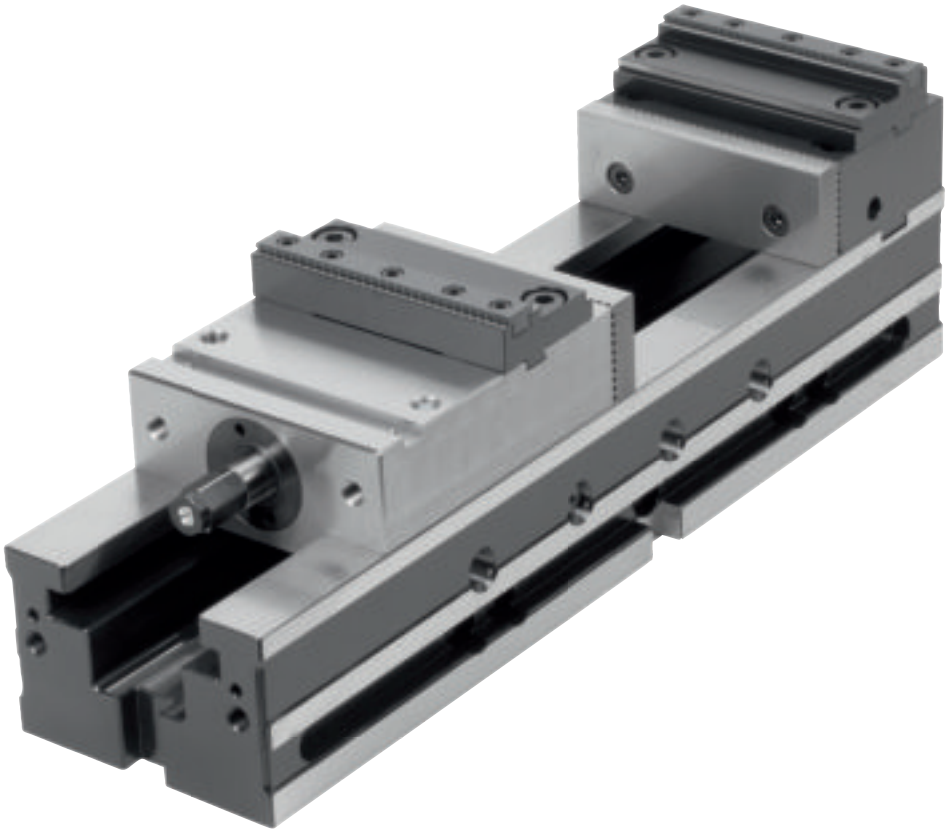
Sample order:
K1274.12175200

Note:
The base plate enables the centric vices (65 - 80 - 125) to be mounted on M12/12F7 grid systems with a grid spacing of 50 mm.

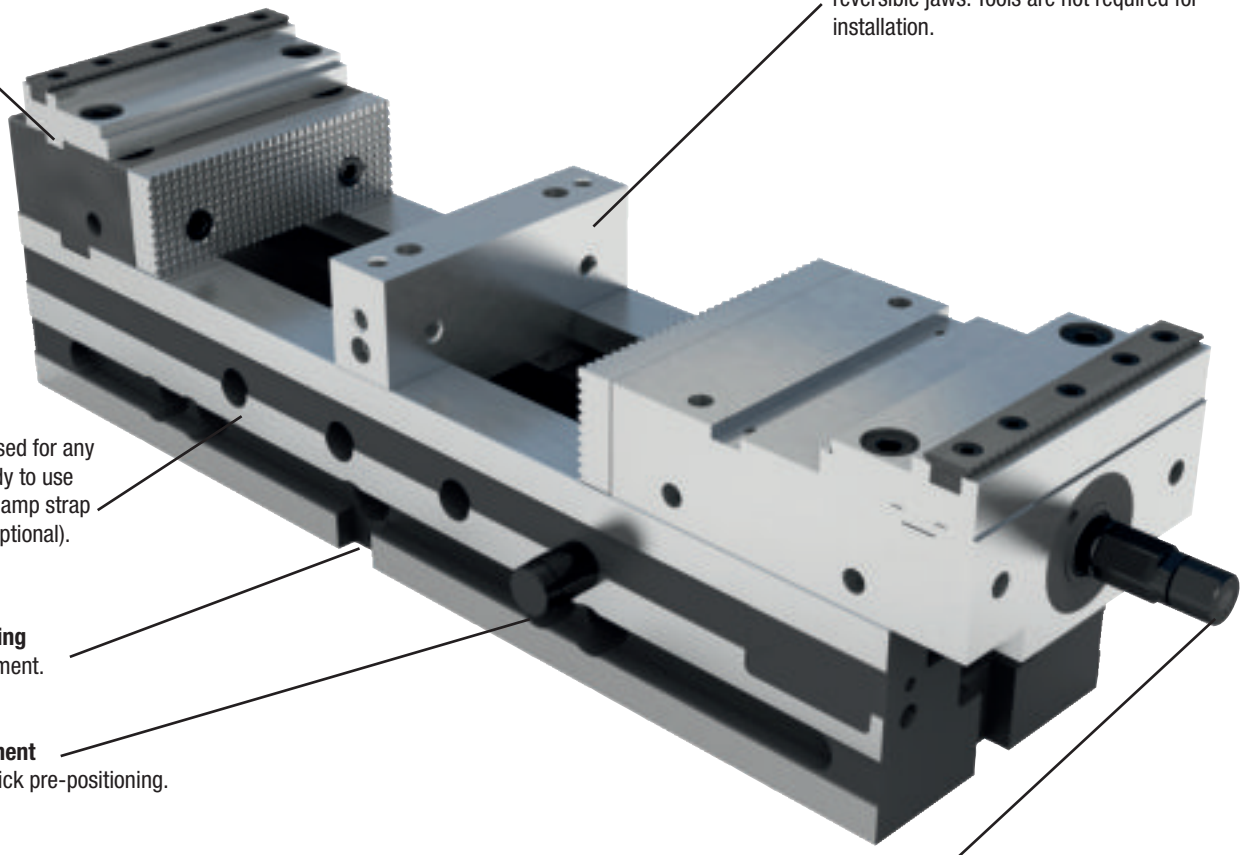
KIPP Baseplate for centric vice

Order No.	Suitable for	weight kg
K1274.12175200	centric vices 65, 80, 125	5

NC Vices



Technical information for NC vices



Adaptable
Slot and thread for attachment jaws and gripper inserts.

Optional
Multiple clamping
Several workpieces can be clamped using reversible jaws. Tools are not required for installation.

Individual
Flexible – can be used for any machine table, ready to use immediately with clamp strap set and slot keys (optional).

Optimum positioning
Cross slot for alignment.

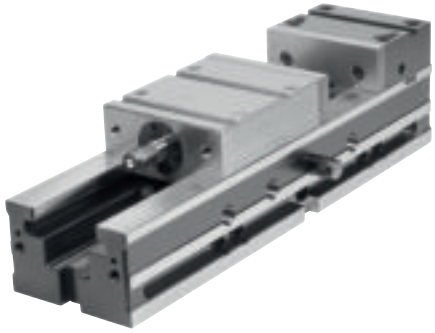
Quick pre-adjustment
Locking pins for quick pre-positioning.

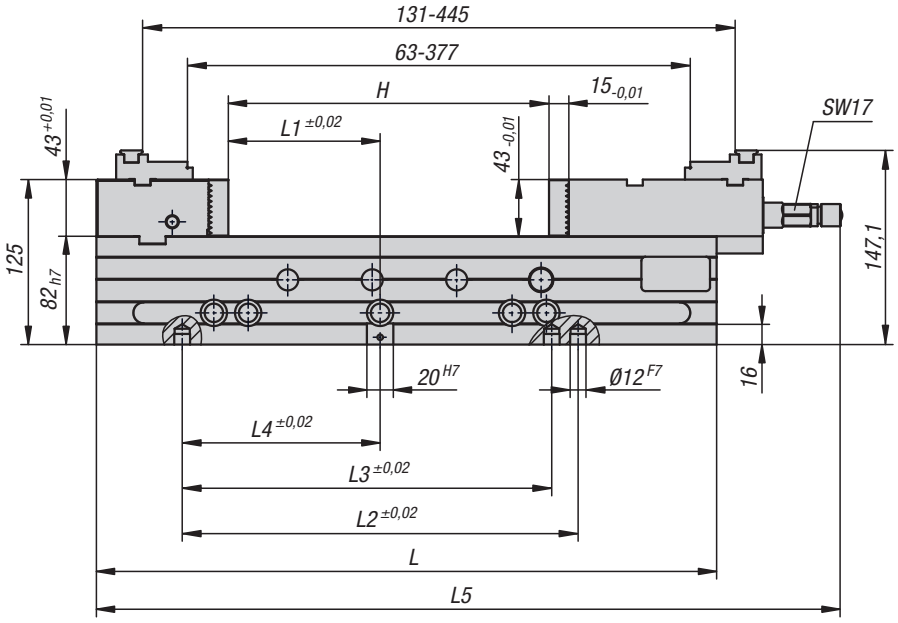
Spindle drive
Mechanical-hydraulic version up to 40 kN or purely mechanical clamping up to 10 kN.

Impressive advantages:
· Repeat accuracy ≤ 0.01 mm
· Fixed jaw fixed in all directions (X,Y,Z)
· Wide clamping range due to use of attachment step jaws
· Basic equipment: 2 rotating screw-in jaws and 1 crank handle
· Can be inclined sideways, with fastening holes for slot spacing of 63 mm and 100 mm.

NC vice

jaw width 125 mm



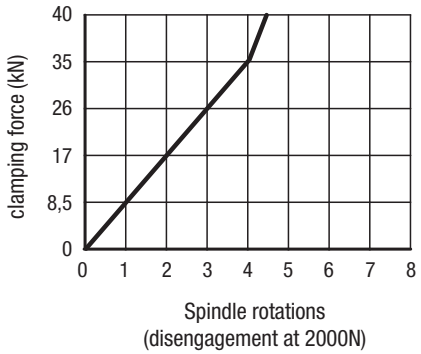


Material:
Body and jaw holder mild steel.

Version:
Hardened and ground all sides.

Sample order:
K1238.125470

Features:
NC vices can be used for a wide range of clamping tasks:
- Repeat accuracy ≤0.01 mm
- Fixed jaw locked in all axis (X,Y,Z)
- Vertical use directly on the machine table
- Wide clamping range by using attachment step jaws
- Can be laid on the side, with fastening holes for slot spacing of 63 mm and 10 mm
- Quick pre-adjustment of the clamping range using locking pins
- Basic equipment includes two reversible screw-on jaws and one crank handle

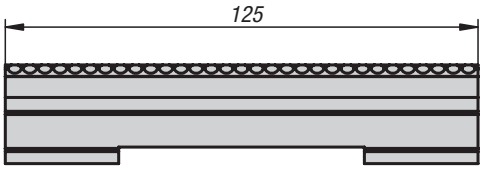


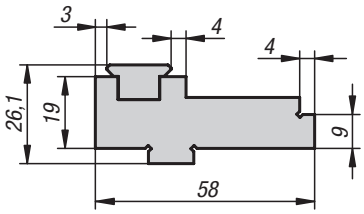
KIPP NC vice jaw width 125 mm

Order No.	B	L	L1	L2	L3	L4	L5	H clamping range	weight kg
K1238.125470	125	470	115	300	280	150	564	0-239	37.6

Attachment step jaw

with gripper for NC vice





Material:
Steel.

Version:
Hardened and ground.

Sample order:
K1273.1251

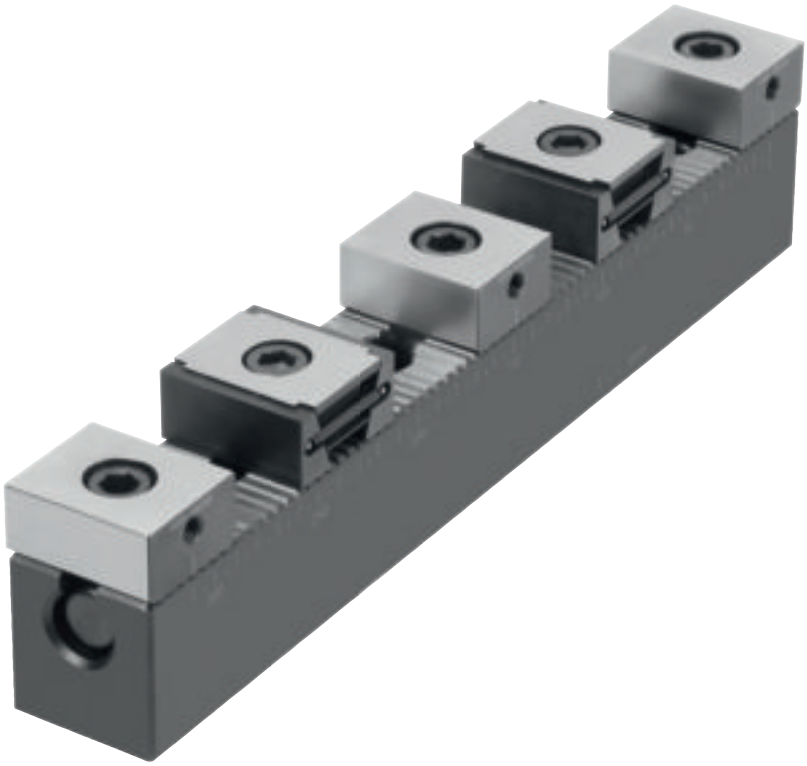
Note:
The attachment step jaws are for expanding the NC vice clamping width. The gripper jaw pads can be exchanged for smooth jaw pads.

KIPP Attachment step jaw with gripper jaw pad for NC vice

Order No.	Suitable for
K1273.1251	NC vice 125

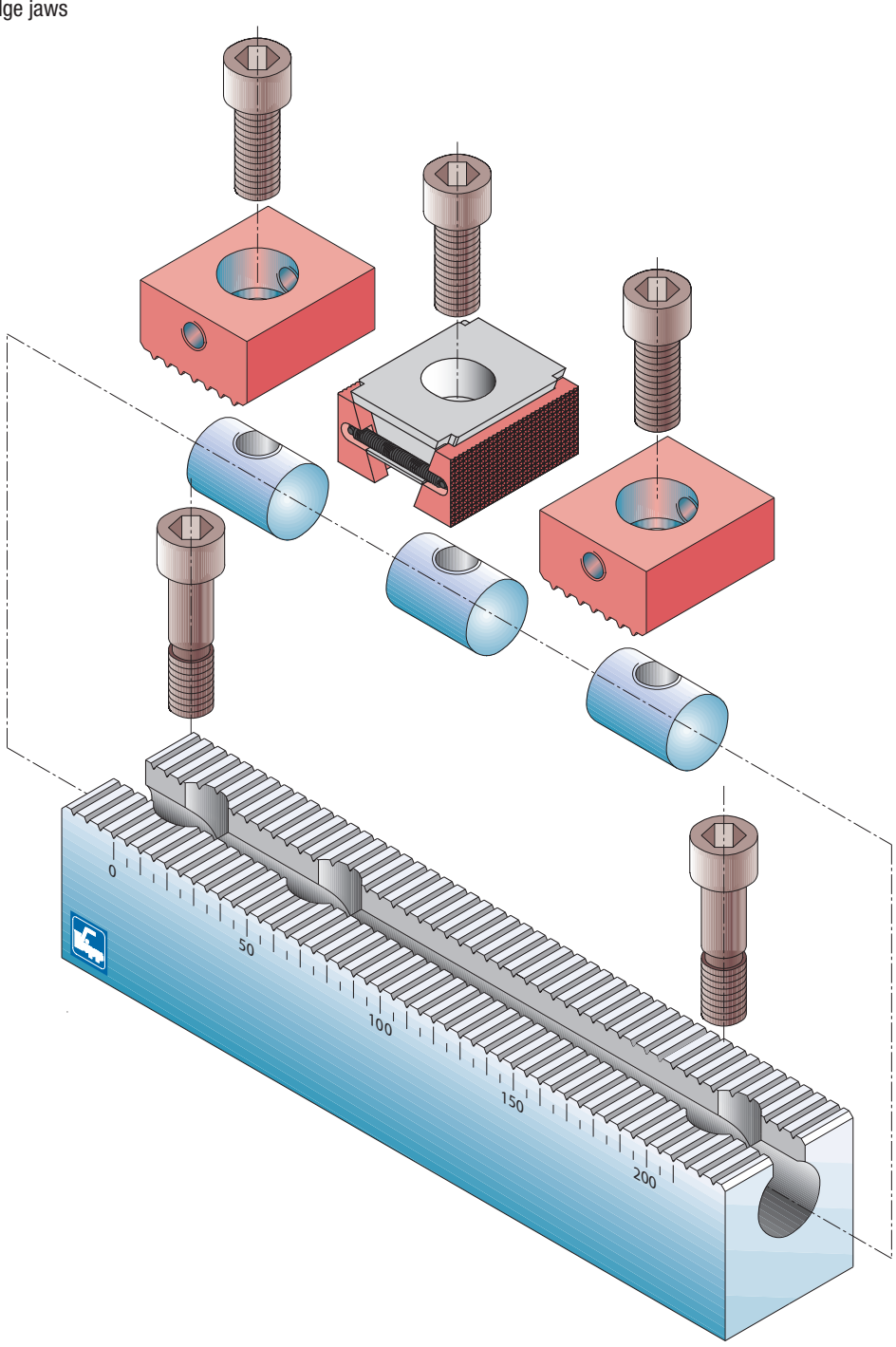
Notes

Multi-clamping system

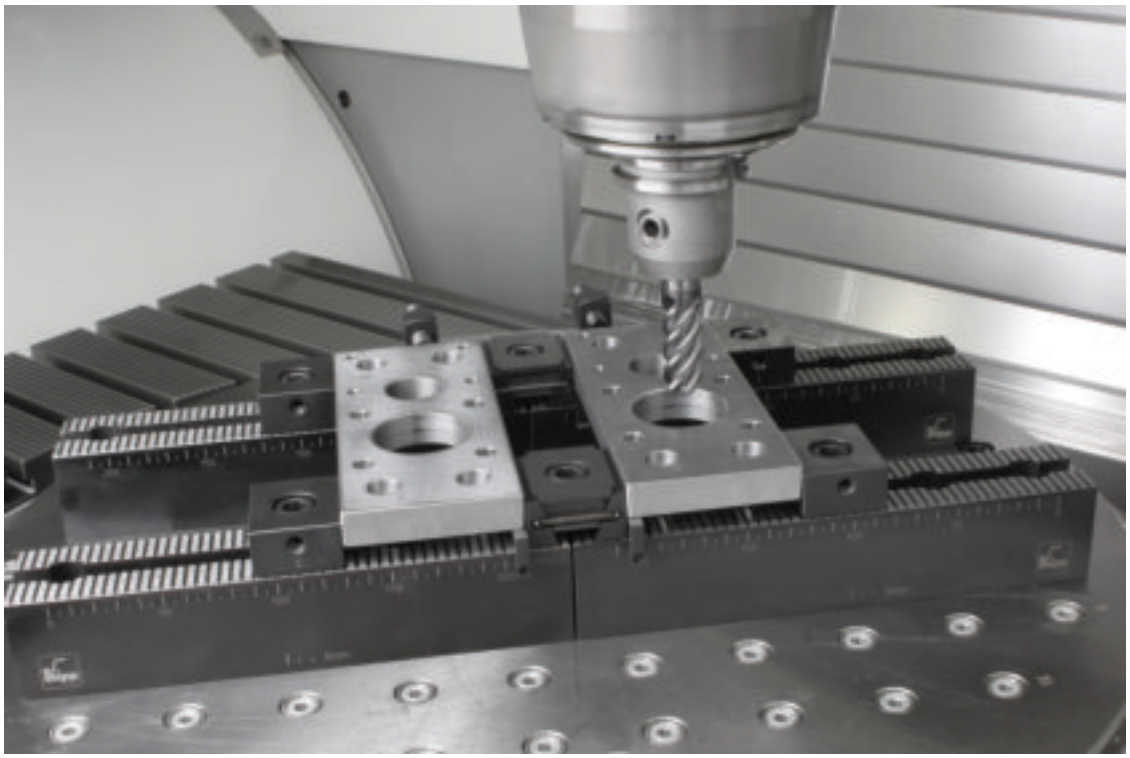


Multi-clamping system

The multi-clamping system is used to clamp diverse workpieces on a base plate or directly on a machine table. The various elements of the multi-clamping system (base rails, stops and wedge clamps) allow workpieces of varied sizes to be held without difficulty. The serrations on the base rail guarantee a secure and exact fastening of the stops. The working area of a machine can be more effectively used by mounting a number of base rails along and across the work surface. The wedge clamps allow two workpieces to be held simultaneously from one clamping point. The transverse wedge design works in the vertical and horizontal plane, guaranteeing a secure hold in all directions. As the clamp is tightened the wedge jaws expand pressing the workpiece against the stops.

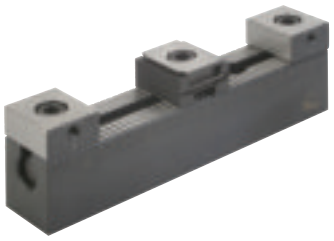


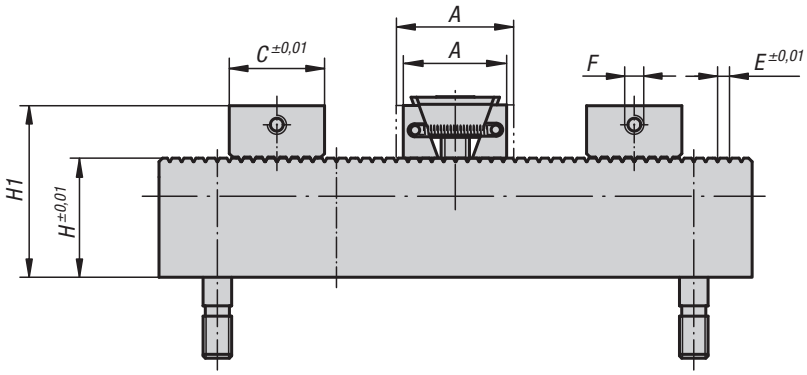
Example of a multi-clamping system

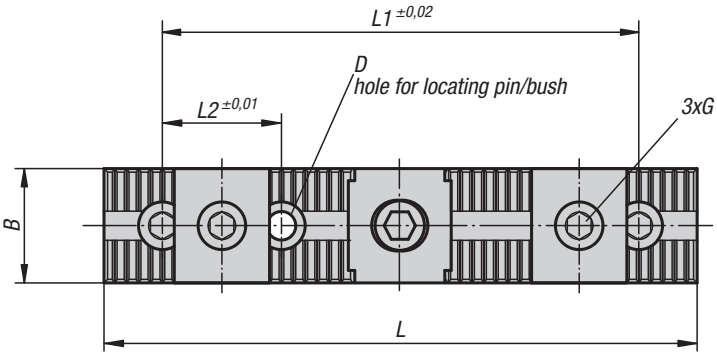


Multi-clamping system

hard stops







Material:
Base rail, stops and wedge clamp carbon steel.

Version:
Serrations case hardened and ground.
Stops tempered.
Clamping jaws hardened and black oxidised.

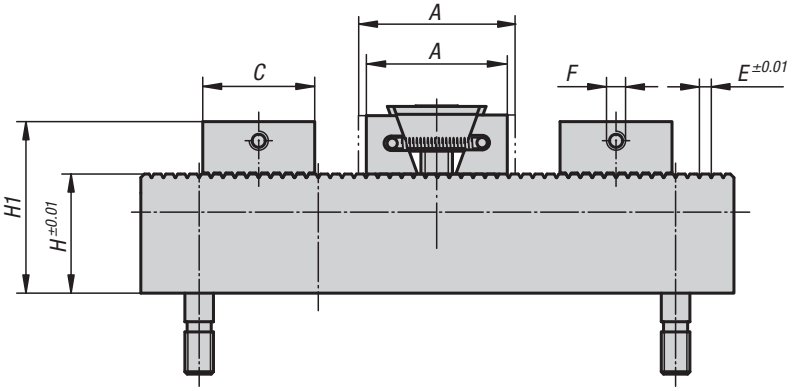
Sample order:
K0902.12

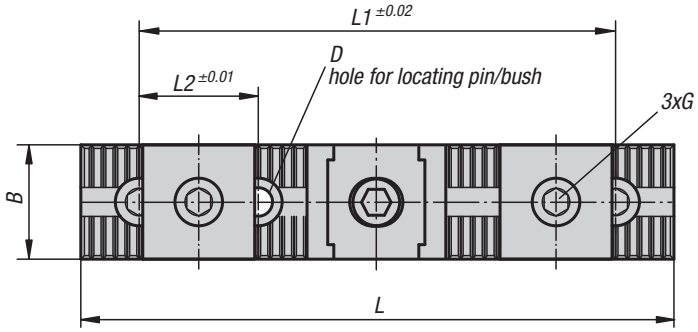
KIPP Multi-clamping system hard stops

Order No.	A min.	A max.	B	C	D	E	F	G cap screw DIN 912	H	H1	L	L1	L2	Clamping force ca. kN	weight kg
K0902.08	30,5	33,5	24	25	12 H6	2,5	M5	M8x25	40	55	199	150	50	15	1.35
K0902.12	44	49,5	48	40	12 F7	5	M8	M12x30	50	72	249	200	50	30	4.961
K0902.16	55	62	48	40	16 F7	5	M8	M16x40	63	92	249	200	50	50	6.016

Multi-clamping system

soft stops





Material:
Base rail, stops and wedge clamp carbon steel.

Version:
Serrations case hardened and ground.
Clamping jaws hardened and black oxidised.

Sample order:
K0903.12

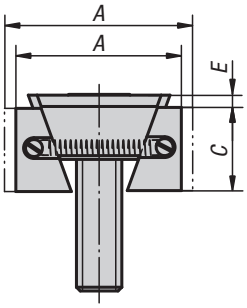
Note:
Depending on the size the clamping jaws have 3 mm (K0903.08) or 5 mm (K0903.12, K0903.16) machining allowance per jaw.

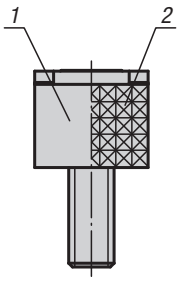
KIPP Multi-clamping system, soft stops

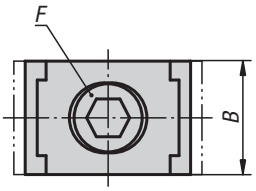
Order No.	A min.	A max.	B	C	D	E	F	G cap screw DIN 912	H	H1	L	L1	L2	Clamping force ca. kN	weight kg
K0903.08	36,5	39,5	24	31	12 H6	2,5	M5	M8x25	40	55	199	150	50	11	1.397
K0903.12	54	59,5	48	50	12 F7	5	M8	M12x30	50	72	249	200	50	23	4.9
K0903.16	65	72	48	50	16 F7	5	M8	M16x40	63	92	249	200	50	38	6.522

Wedge clamps

jaw face smooth or serrated







Material:
Wedge and jaw segments carbon steel.

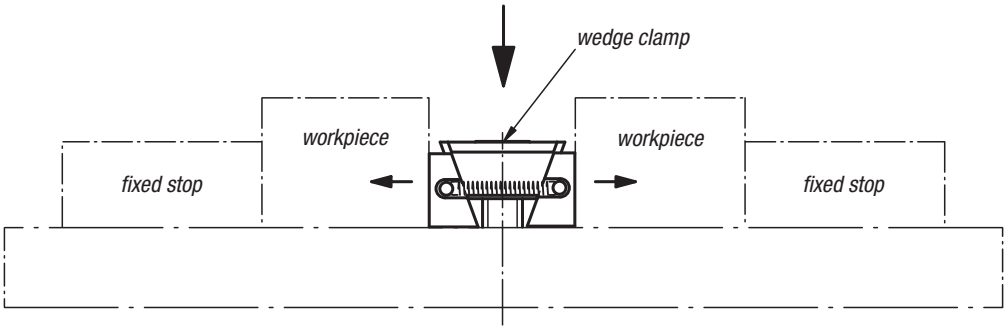
Version:
Wedge and jaw segments hardened, black.

Sample order:
K0039.2208

Note:
The functioning principle make the wedge clamps ideal for series clamping. The wedge form can exert high clamping forces.
These wedge clamps can be mounted in grid holes or T-slots. Tightening the socket screw moves the wedge down and the jaws out pressing the workpieces against the fixtures fixed stops.
The wedge has a slightly elongated hole allowing for movement to compensate for tolerances.

Spread width:
M8 = ±0.5 mm
M10 = ±1.0 mm
M12 = ±1.0 mm
M16 = ±1.5 mm

Drawing reference:
1) Jaw face smooth
2) Jaw face serrated



KIPP Wedge clamps, narrow version

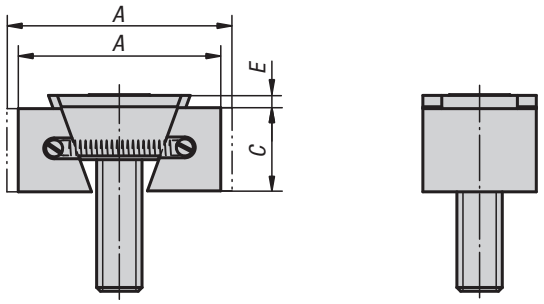
Order No. smooth	Order No. serrated	A min.	A max.	B	C	E	F DIN 6912 cap screw	Clamping force kN	Tightening torque Nm
K0039.1108	K0039.2108	30,5	33,5	24	15	2	M8x25	15	25
K0039.1110	K0039.2110	32	37	28	19	3,5	M10x25	20	49
K0039.1112	K0039.2112	44	49,5	30	22	3,5	M12x40	30	85
K0039.1116	K0039.2116	55	62	40	29	4	M16x60	50	210

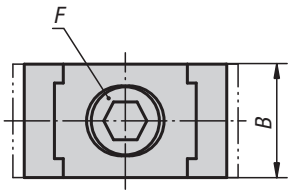
KIPP Wedge clamps, wide version

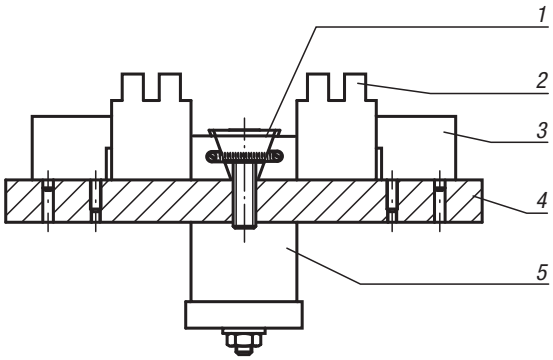
Order No. smooth	Order No. serrated	A min.	A max.	B	C	E	F DIN 6912 cap screw	Clamping force kN	Tightening torque Nm
K0039.1208	K0039.2208	30,5	33,5	30	15	2	M8x25	15	25
K0039.1210	K0039.2210	32	37	38	19	3,5	M10x25	20	49
K0039.1212	K0039.2212	44	49,5	48	22	3,5	M12x40	30	85
K0039.1216	K0039.2216	55	62	48	29	4	M16x60	50	210

Wedge clamps

machinable







Material:
Wedge and jaw segments carbon steel.

Version:
Wedge and jaw segments hardened, black.

Sample order:
K0649.3110

Note:
These wedge clamps have extra long jaws. This extra material allows the jaws to machined to suit the form of the workpiece.
The functioning principle make the wedge clamps ideal for series clamping. The wedge form can exert high clamping forces.
These wedge clamps can be mounted in grid holes or T-slots. Tightening the socket screw moves the wedge down and the jaws out pressing the workpieces against the fixtures fixed stops.
The wedge has a slightly elongated hole allowing for movement to compensate for tolerances.

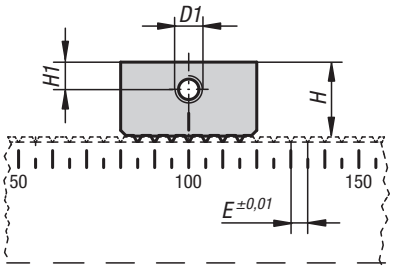
Spread width:
M8 = ±0.5 mm
M10 = ±1.0 mm
M12 = ±1.0 mm
M16 = ±1.5 mm

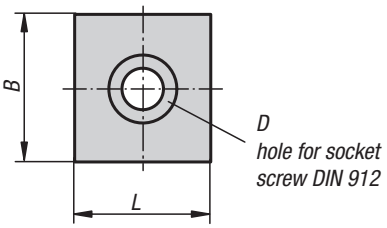
Drawing reference:
1) wedge clamps
2) workpiece
3) fixed stop
4) base plate
5) hydraulic/pneumatic cylinder

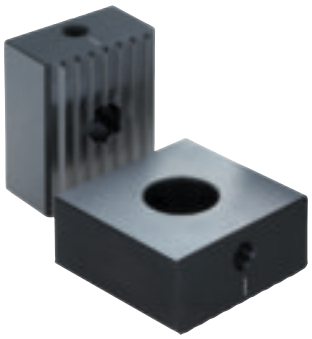
KIPP Wedge clamps machinable

Order No.	Version	A min.	A max.	B	C	E	F DIN 6912 cap screw	Clamping force kN	Tightening torque Nm
K0649.3108	narrow	36,5	39,5	24	15	2	M8x25	11	19
K0649.3110	narrow	42	47	28	19	3,5	M10x25	15	37
K0649.3112	narrow	54	59,5	30	22	3,5	M12x40	23	65
K0649.3116	narrow	65	72	40	29	4	M16x60	38	160
K0649.3208	wide	36,5	39,5	30	15	2	M8x25	11	19
K0649.3210	wide	42	47	38	19	3,5	M10x25	15	37
K0649.3212	wide	54	59,5	48	22	3,5	M12x40	23	65
K0649.3216	wide	65	72	48	29	4	M16x60	38	160

Stops







Material:
Carbon steel 1.0503.

Version:
Hard stop:
Tempered to 1200-1400 N/mm², black oxidised.
Serrations and stop faces ground, bright.

Soft stop:
Hardness HRC 30, black oxidised. Serrations case hardened and ground, bright.

Sample order:
K0905.5000802

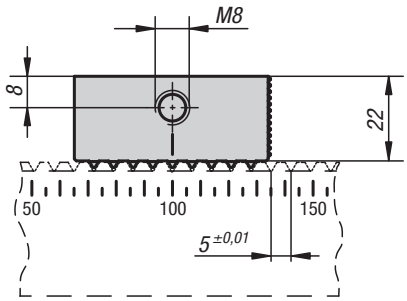
KIPP Stops

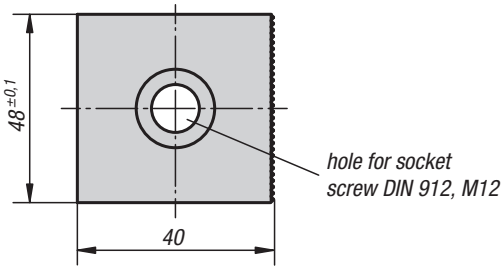
Order No.	Version	B	D	D1	E	H	H1	L
K0905.5000802	hard	24	M8x25	M5	2,5	15	6	25 ±0,01
K0905.5001202	hard	48	M12x30	M8	5	22	8	40 ±0,01
K0905.5001602	hard	48	M16x40	M8	5	29	12,5	40 ±0,01
K0905.5100802	soft	24	M8x25	M5	2,5	15	6	31 ±0,1
K0905.5101202	soft	48	M12x30	M8	5	22	8	50 ±0,1
K0905.5101602	soft	48	M16x40	M8	5	29	12,5	50 ±0,1

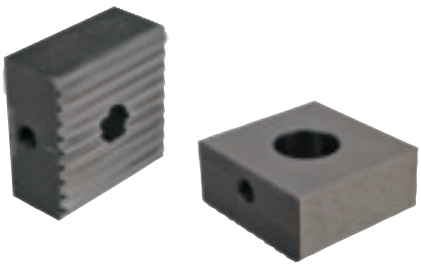
K0905

Stop

carbide-coated and serrated







Material:
Carbon steel 1.0503.

Version:
Hard stop.
Hardened to 58 +/2 HRC.
Serrations ground, bright.

Sample order:
K0905.5201202

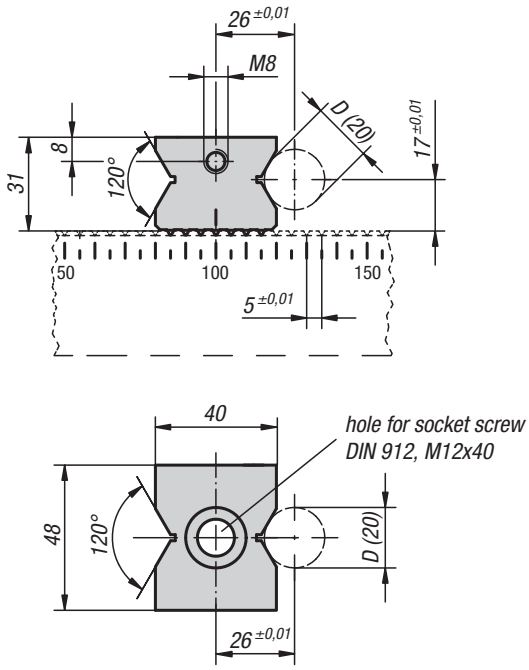
Note:
One stop face is serrated, the other side is carbide-coated.

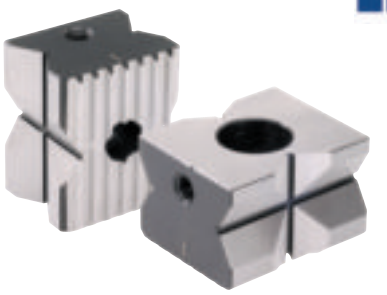
KIPP Stop, carbide-coated and serrated

Order No.	Dimensions
K0905.5201202	see drawing

K0906

Stop prism





Material:
Carbon steel 1.0503.

Version:
Prism tempered to 1200-1400 N/mm², black oxidised.
Serrations and prism ground, bright.

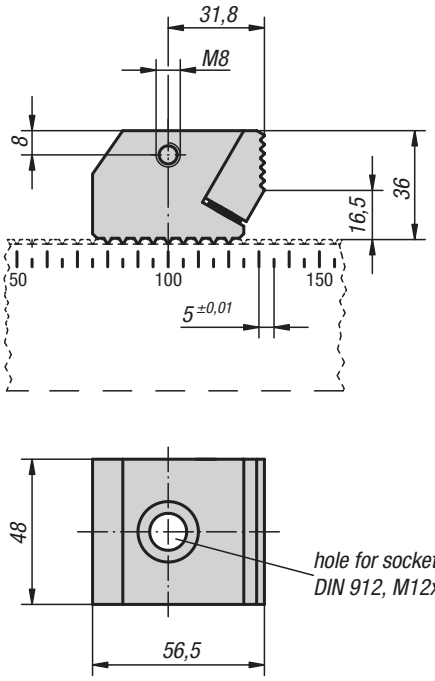
Sample order:
K0906.5001265

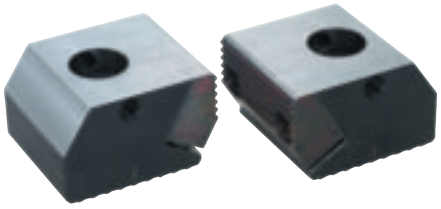
KIPP Stop prism

Order No.	D min. - max.
K0906.5001265	5 - 33

K0907

Stop with positive down force





Material:
Stop and jaw carbon steel 1.0503

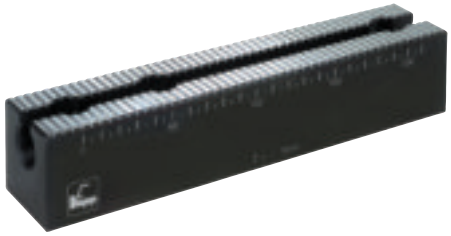
Version:
Stop and jaw tempered to 1200-1400 N/mm², black oxidised.
Serrations ground, bright.

Sample order:
K0907.5001273

KIPP Stop with positive down force

Order No.	Dimensions
K0907.5001273	see drawing

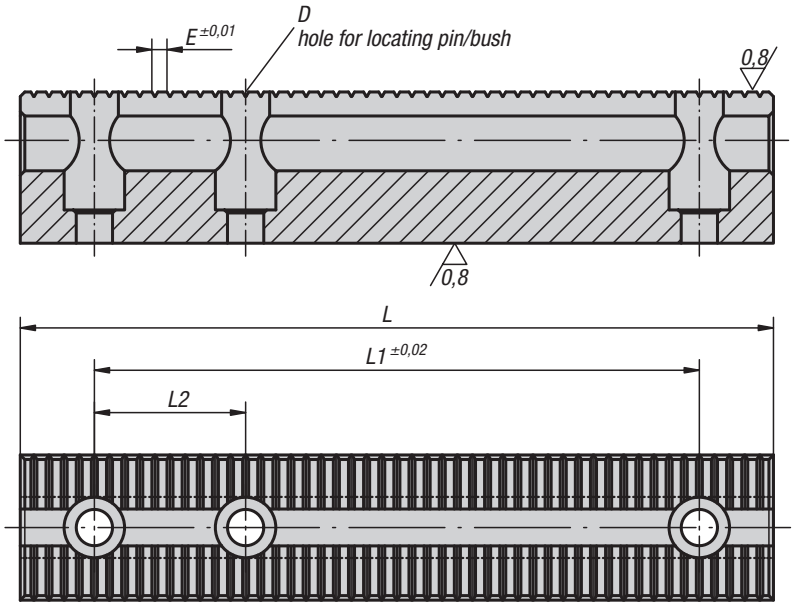
Base rails

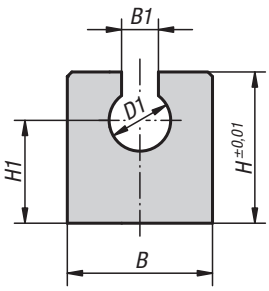


Material:
Carbon steel 1.0503.

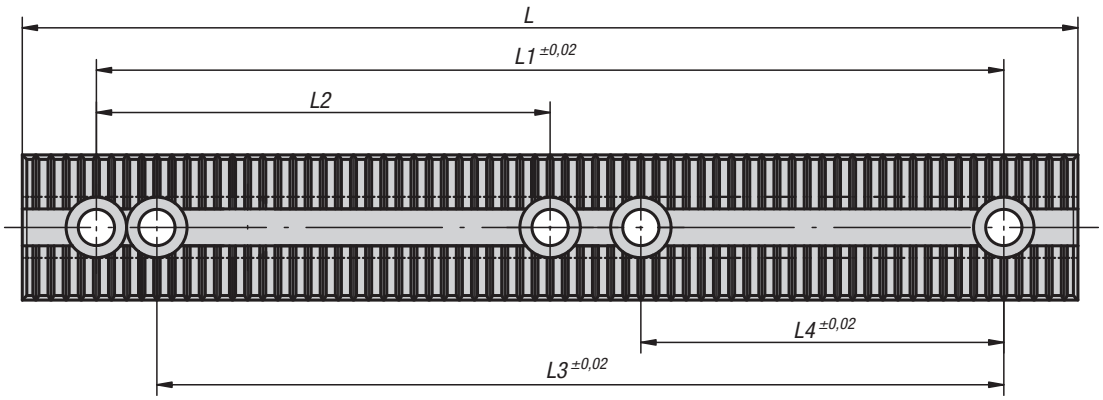
Version:
Black oxidised.
Serrations case hardened and ground.

Sample order:
K0904.5000801





K0904.5021201

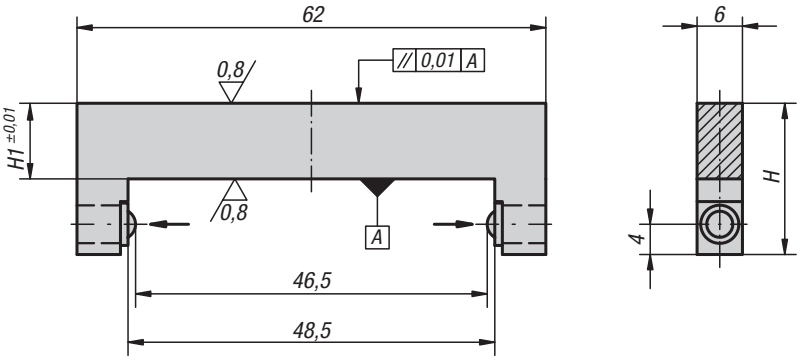


KIPP Base rails

Order No.	B	B1	D	D1	E	H	H1	L	L1	L2	L3	L4	weight kg
K0904.5000801	24	8,2	12 H6	14,2	2,5	40	25	199	150	50 ±0,01	-	-	1.1
K0904.5001201	48	12,2	12 F7	20,2	5	50	34	249	200	50 ±0,01	-	-	3.7
K0904.5021201	48	12,2	12 F7	20,2	5	50	34	349	300	150 ±0,02	280	120	5
K0904.5001601	48	16,2	16 F7	24,2	5	63	43	249	200	50 ±0,01	-	-	4.4

K0908

Seating ledges



Material:
Steel.

Version:
Ledges hardened, black oxidised.
Contact faces ground, bright.

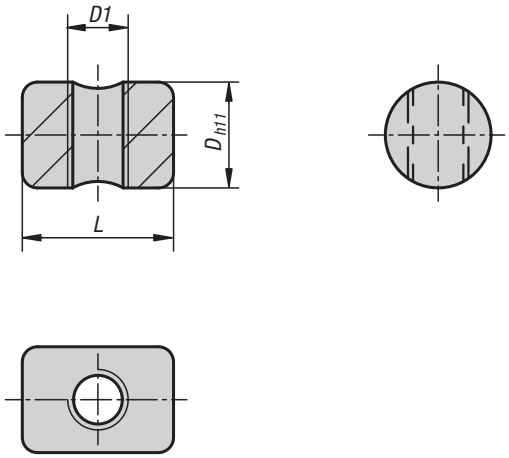
Sample order:
K0908.5001295

KIPP Seating ledges

Order No.	H	H1
K0908.5001295	20	10
K0908.5001298	27	17

K0909

Keyway nuts round



Material:
Steel.

Version:
Black oxidised.

Sample order:
K0909.0802

KIPP Keyway nuts round

Order No.	D	D1	L
K0909.0802	14	M8	20
K0909.1202	20	M12	30
K0909.1602	24	M16	35