



# The Miniature Family

for clamping, positioning and gripping



**TÜNKERS**<sup>®</sup>  
Ingenuity in series.

## The Miniature Family

Size is not always of advantage – in particular, not in fixture construction where space is very limited due to the functions.

Here, more free space is provided by our new miniature clamps, which as a complete product family now include toggle-joint clamps, linear cylinders, hook clamps and swivel clamps – smaller than any conventional solution, more compact and powerful than comparable manual clamps, and above all fully encapsulated to withstand the rough working conditions in welding, gluing and joining fixtures; tested within BIW manufacturing conditions with up to 1 million load cycles, for a safe automation process in your installations.



# Our Family Members



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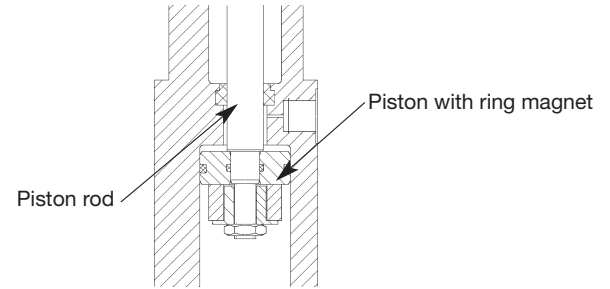


**The Expansion Mandrel**  
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# Technical Characteristics:

## 1. End position sensing

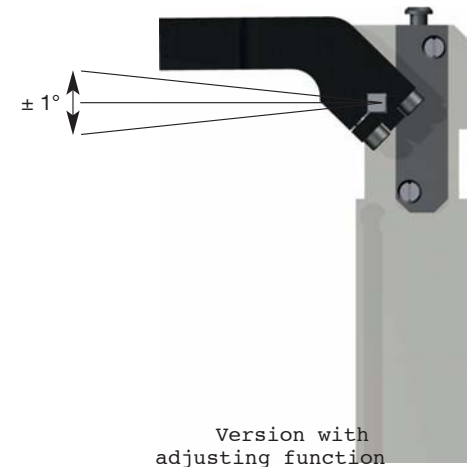
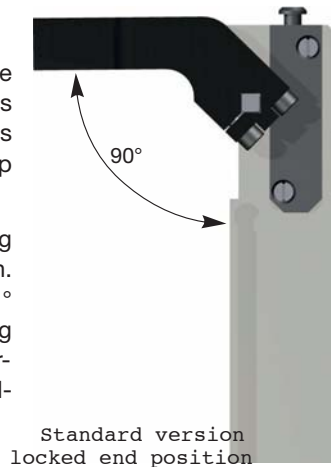
The cylinders of all TÜNKERS miniature clamps are principally equipped with a piston magnet and standardised dovetail slots on the housings for attaching proximity switches. The proximity switches are optionally available quoting the order number AFS T03.



## 2. Locking or adjusting

In the standard version, the toggle-joint mechanism of the Clamp is designed in such a way that the end position is locked. The position beyond dead centre of the joint is overridden. Even in the event of pressure loss, the clamp remains closed in this position.

This toggle lock does not feature in version N (adjusting function) lock for the benefit of a defined clamping path. The clamp force is applied in a working range of  $\pm 1^\circ$  around the zero axis and therefore allows for the clamping of irregular parts, e.g. cast parts, and compensates tolerances. In addition, the clamp path reserve provides for adjusting if the reference points shift due to wear and tear.



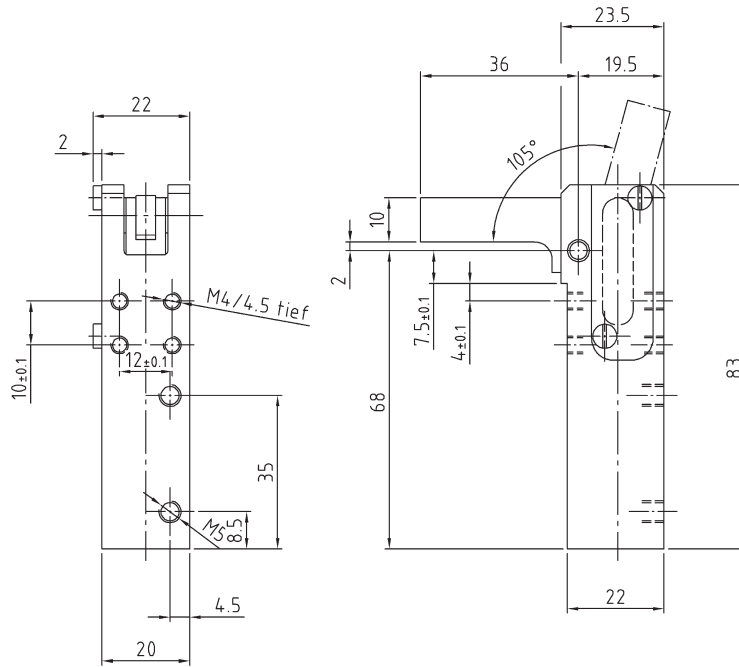


## Our Smallest

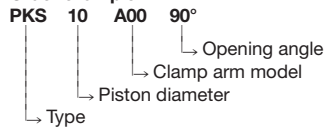
Miniature clamp in mono block design combining pneumatic cylinder and toggle-joint mechanism in one housing. Robust clamping system with very compact dimensions suitable for serial production.

### Further characteristics:

- Toggle lock
- Hole pattern on the front and back for mounting



### Order example:



Type	Clamping torque at 5 bar (Nm)	Max. holding torque (Nm)	Operating pressure with oil-free air (bar)	Maximal pressure with oil-free air (bar)	Connection (G)	Opening and closing time (ca. seconds)	Weight (kg)
PKS 10	8	25	5	6	M5	1	0.3

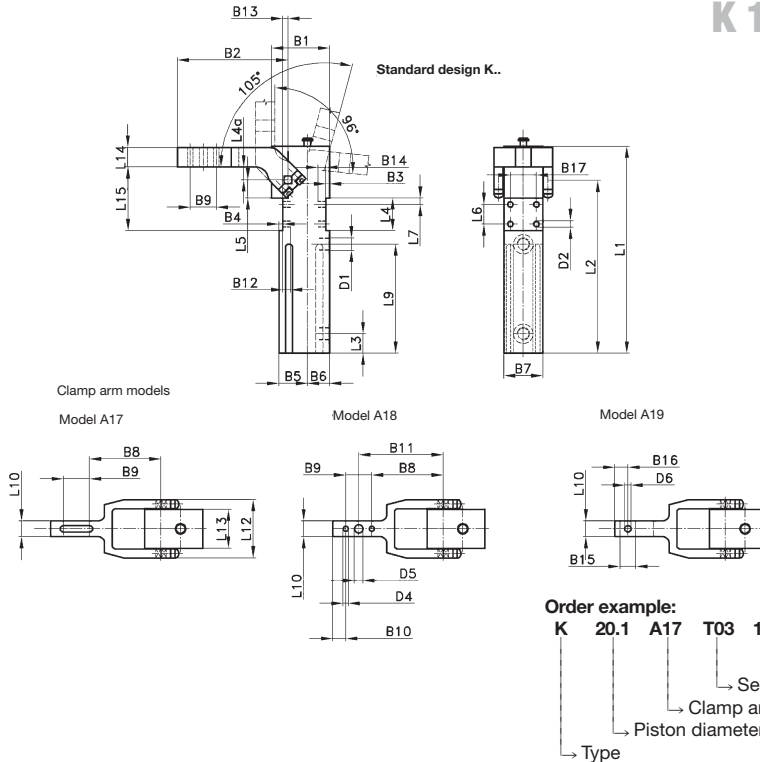


## The Toggle-Joint Clamp

Pneumatic clamp, where the small pneumatic cylinder with a diameter of 25 mm affects a toggle joint and therefore reaches a clamping torque of xx in the end position, the position beyond dead centre. As a special feature, the mechanism drives the fork-shaped arm via an encapsulated square shaft, so that toggle-joint system and cylinder are safely accommodated in the housing.

### Further characteristics:

- Toggle lock
- Housing in mono block design made of high-strength aluminium material
- Hole pattern for mounting on the front and back
- Types: standard, round, threaded lug, cartridge version
- Option: opened and closed position sensing



Type	Clamping torque at 5 bar (Nm)	Max. holding torque (Nm)	Operating pressure with oil-free air (bar)	Maximal-pressure with oil-free air (bar)	Connection (G)	Opening and closing time (ca. seconds)	Weight (kg)
K 16.1	8	25	5	6	M5	1	0.40
K 20.1	15	54	5	6	G1/8	1	0.60
K 25.1	25	75	5	6	G1/8	1	0.90

\*additional sizes see page 7

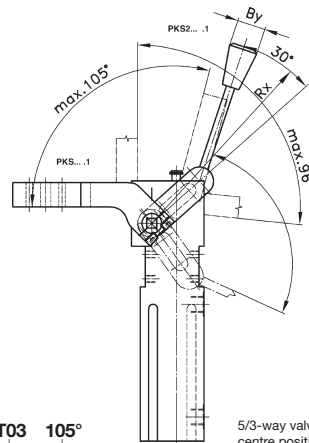


## The Manual Clamp

... really is also a pneumatic toggle-joint clamp, which is additionally fitted with a lever for manual operation. As the lever engages directly into the toggle-joint mechanism, the clamp can also be moved beyond dead centre position manually, e.g. to pre-locate parts in the fixture after loading.

### Further characteristics:

- manual closing and opening
- pneumatic opening and closing
- Attention: 5/3-way valve required, centre position vented, otherwise manual operation would be impossible.

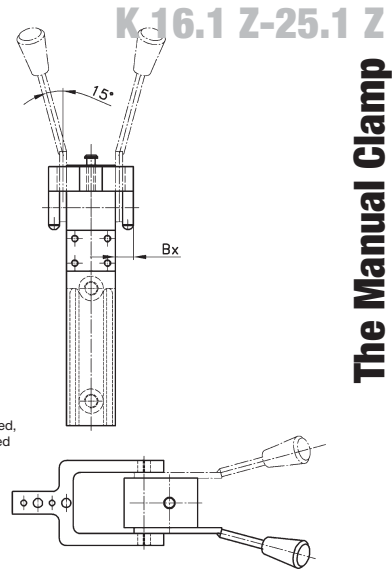


Order example:

K 20.1 Z A17 T03 105°

↓ Type  
 ↓ Piston diameter  
 ↓ Clamp arm model  
 ↓ Sensing system  
 ↓ Opening angle

5/3-way valve required, centre position vented



K 16.1 Z-25.1 Z

The Manual Clamp

Type	L1	L2	L3	L4	L4a	L5	L6	L7	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	B1	B2	B3
K 16.1	126	103.5	12	20	10	7.5	10	5	69	10	5.5	40	26	15	37.5	61	5.5	16.5	39	38	62	2.5
K 20.1	159.5	133.5	15	25	10	14	15	5	84	12	6.5	45	30	18	49	83	11	22	50	45.5	76	3
K 25.1	185	152.5	17.5	28	10	17	18	5	80	16	8.5	52	35	20	55	95	12	22	61	52	93	4

Type	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	B15	B16	B17	D1	D2	D3 <sub>reg</sub>	D3a	D4 <sub>H7</sub>	D5	D6
K 16.1	2,5	18	14	26	40	16	6	48	7	3,5	5	12	9	16	M5	M5	25	M25x1,5	4	5,5	6,5
K 20.1	3	22	17	30	50	20	6	60	8	4	6	12	9	20	G1/8	M5	30	M30x1,5	5	6,5	6,5
K 25.1	4	25	20	35	60	25	8	72,5	6	3	8	12	9	25	G1/8	M5	34	M35x1,5	6	8,5	6,5

Type	Bx	By	Rx	Weight (kg)
K 16.1 Z	12.5	20	135	0.45
K 20.1 Z	12.5	20	135	0.80
K 25.1 Z	12.5	20	135	1.02

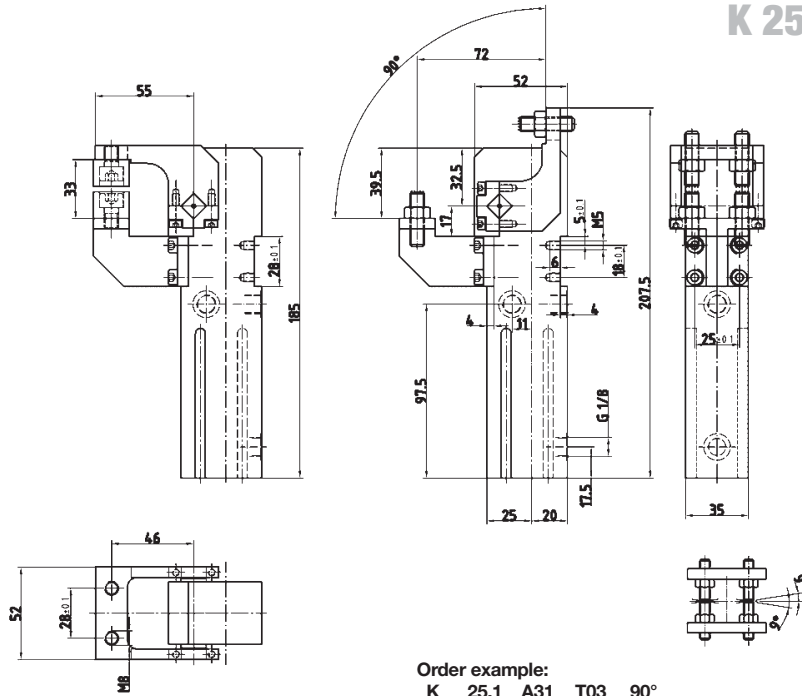


## The Gripper-Clamp

Toggle-joint clamp equipped with adjustable clamping screws and a matching jaw, thus ideally conceived for gripper applications. The toggle lock function mechanically secures the clamped position even in the event of pressure loss.

### Further characteristics:

- Hole pattern for mounting on the back
- Types: standard, round, threaded lug, cartridge version
- Option: Opened and closed position sensing



K 25.1 A31

The Gripper-Clamp

Type	Clamping torque at 5 bar (Nm)	Max. holding torque (Nm)	Operating pressure with oil-free air (bar)	Maximal pressure with oil-free air (bar)	Connection (G)	Opening and closing time (ca. seconds)	Weight (kg)
K 25.1 A31	25	75	5	6	G1/8	1	0.90

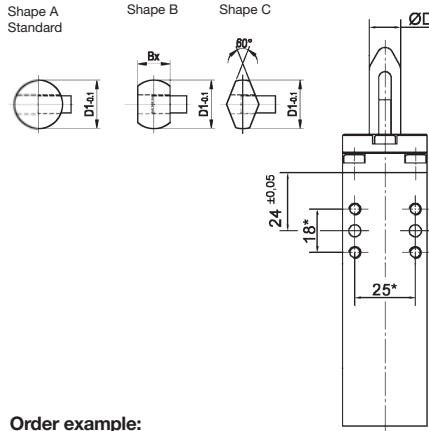




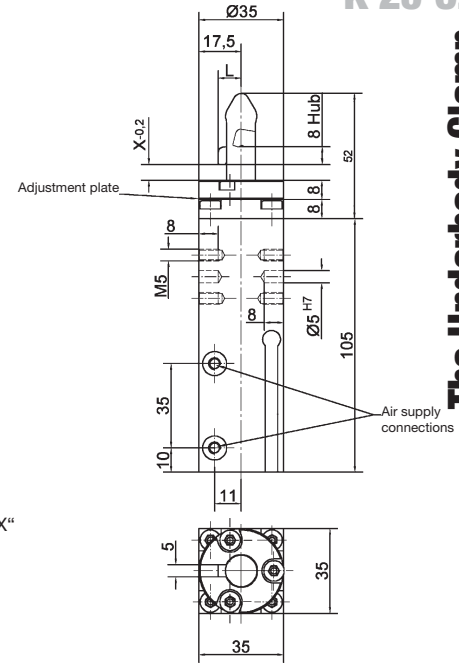
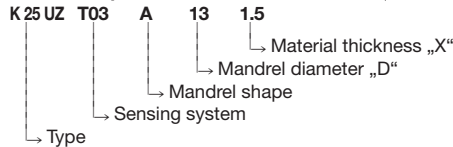
## The Underbody Clamp

. . . or hook clamp is applied when clamping operations are intended (or need) to be carried out below component level, e.g. in openings or centrings. A compact hook clamp is used instead of a clamp arm, which moves into a protective mandrel in opened position. The protective mandrel is optionally tempered, made to measure the diameter and therefore centres the components. Through this, the underbody clamp simultaneously carries out the centring and clamping function at one point, resulting in an extremely space-saving mounting technology.

Geometric shapes of the centring pins



Order example:



### Further characteristics:

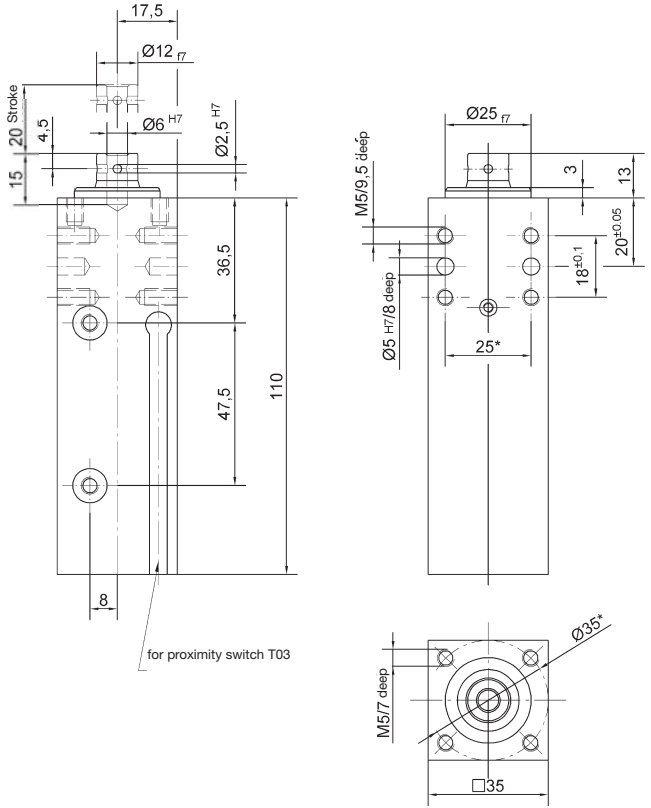
- Next to standardised mandrel diameters, also manufacture of customised sizes and mounting bases according to specification
- Special model without mandrel
- Optional opened and closed position sensing

Type	Clamping torque at 6 bar (daN)	Max. torque (daN)	Maximal pressure with oil-free air (bar)	Mandrel diameter D (f7)	Clamping position (L)	Weight (kg)
K 25 UZ	16	16	8	10-13/14-16	9.5/11.5	0.9



# The Linear Cylinder

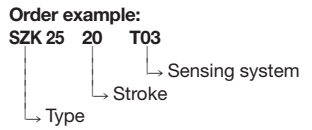
...also retractable locating pin cylinder, is not a simple “air cylinder”. Exactly like the other family members, this product features a mono block design, so that next to the cylinder with piston magnet an anti-rotating device and a piston rod precision guide are combined in one housing. The end of the piston rod is equipped with an adapter for contour blocks or centring pins which, subject to the functional process, are either retracted or extended. A typical application is the retracting of centring pins after the processing step, in order to allow for an easier, damage-free unloading of the parts.



for proximity switch T03

**Further characteristics:**

- Optional opened and closed position sensing



Type	Stroke	Piston diameter	Tensile force at 5 bar	Thrust at 5 bar	Weight ~kg
SZK 25	20	25	170 N	220 N	~0.4

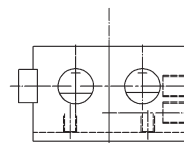
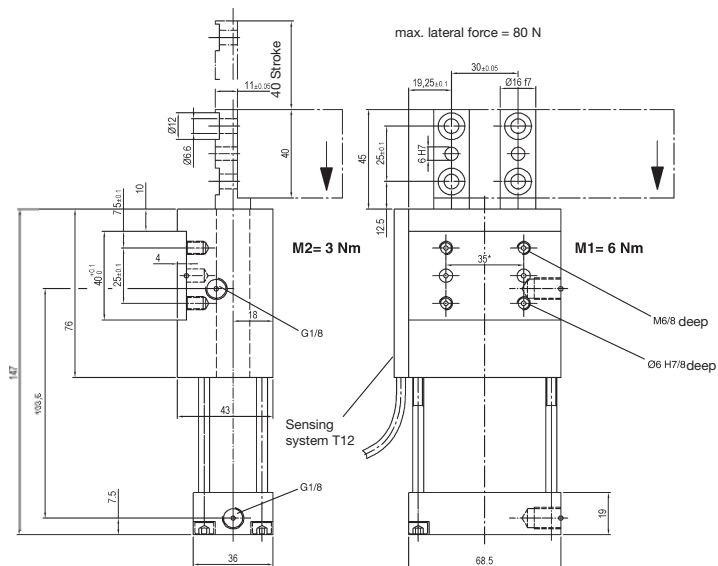


## The Dual Cylinder

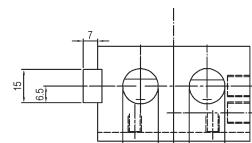
Linear cylinder with dual piston rod for feeding contour blocks, end stops or centring pins. Defined anti-rotating position due to dual guide rod.

### Further characteristics:

- Optional closed and opened position sensing

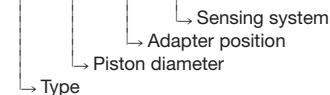


Adapter position A23



Adapter position A13

Order example:  
SZKD 40 A13 T12



Type	Tensile force (KN)	Thrust (KN)	Operating pressure with oil-free air (max. bar)	Connection (G)	Weight (kg)
SZKD 40	0.4	0.6	6	1/8	1.4

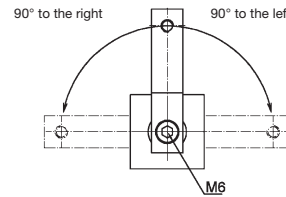
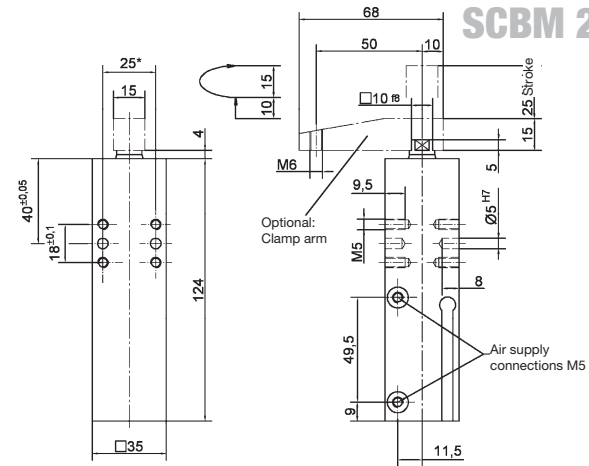


## The Swivel Clamp

. . . clamps the component in a similar way to the toggle-joint clamp, with the arm not swivelling upwards but to the side – an advantage if access to the component from the top is blocked. The clamp arm is directly driven by the piston rod of the cylinder. Therefore, the clamping force is identical to the cylinder force. However, the end position is not mechanically locked, as is the case with the toggle-joint clamp.

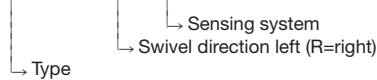
### Further characteristics:

- Piston rod guide in robust design to absorb lateral forces during the clamping operation.
- Swivel direction right / left
- Also available without clamp arm



### Order example:

SCBM 25-25 90° L T03



Type	Clamping force at 5 bar rod extended (N)	Clamping force at 5 bar rod retracted (N)	Weight incl. clamp arm (kg)
SCBM 25-25	220	170	0.6

SCBM 25-25

The Swivel Clamp

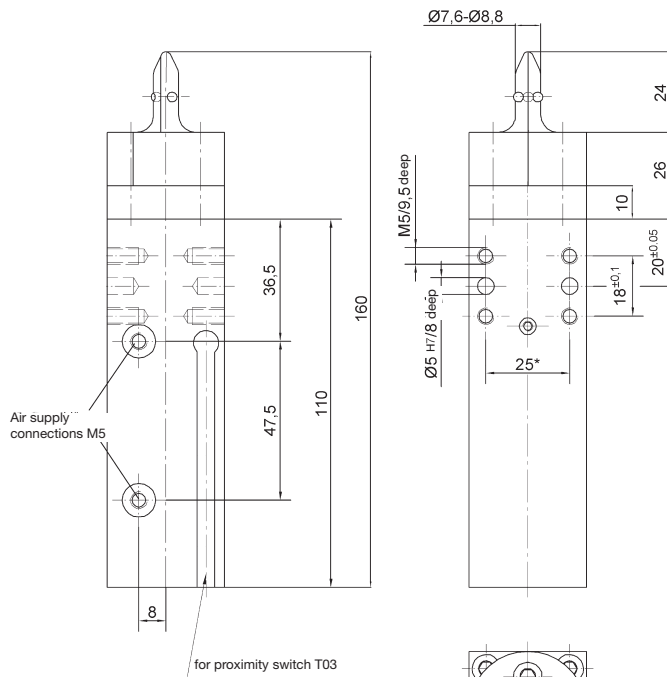


## The Expansion Mandrel

. . . positions components in centrings or adapters by means of ball elements, being expanded by a cylinder-driven wedge mechanism. Centring alternatively with two or three expanding elements, each adjusted to the diameter of the workpiece.

### Further characteristics:

- Centring diameter according to customer specification
- Optional closed or an opened position sensing



Order example:

SD 25 T03



Type	Clamping force at 5 bar (N)	Weight (kg)
SD 25	170	ca. 0.7

SD 25

The Expansion Mandrel

## Proximity Switches

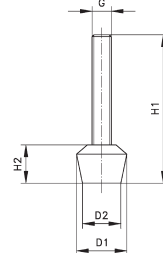


Description	for clamp type	ID No.
<b>AFS T03</b>	PKS 16-25.1	221918
<b>AFS T03</b>	K 16-25.1	221918

N/O contact, 3-pole, LED, 24 V,  
0.3 m cable length

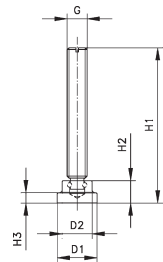
## Pressure screws fitting the product series PKS../K.. .1

**Elastic pressure piece**



Type	ID No.	Size G	H1	H2	D1	D2	Weight g
<b>T2-AS 6x35</b>	221658	M6x35	45	13	16	12	12
<b>T2-AS 8x35</b>	221661	M8x35	48	16	21	16	25
<b>T2-AS 8x45</b>	250078	M8x45	58	16	21	16	28
<b>T2-AS 8x50</b>	221659	M8x50	63	16	21	16	30
<b>T2-AS 8x65</b>	221660	M8x65	78	16	21	16	35

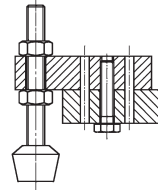
**Steel joint head**



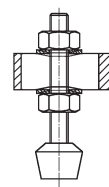
Type	ID No.	Size G	Nut for T-Slot	H1	H2	D1	D2	Weight g
<b>T2-AG 6x50</b>	237130	M6x50	-	52	13	16	12	20
<b>T2-AG 8x75</b>	237131	M8x75	-	48	16	21	16	47
<b>T2-AG 8x75</b>	237134	M8x75	M8x10	58	16	21	16	62

**Assembly examples**

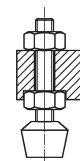
with arm type "A18"



with arm type "A17"

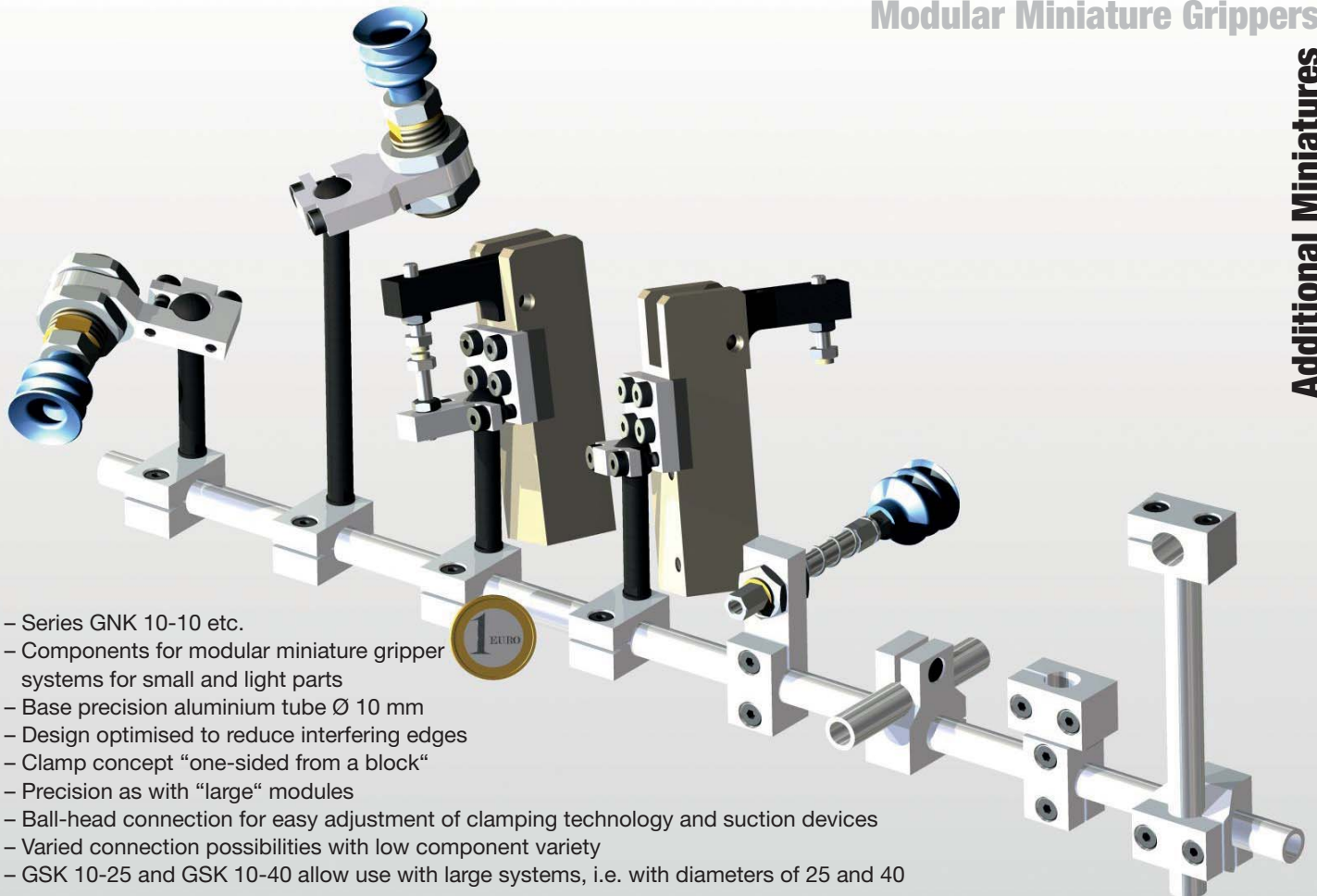


with arm type "A19"



## Modular Miniature Grippers

Additional Miniatures



- Series GNK 10-10 etc.
- Components for modular miniature gripper systems for small and light parts
- Base precision aluminium tube Ø 10 mm
- Design optimised to reduce interfering edges
- Clamp concept “one-sided from a block”
- Precision as with “large” modules
- Ball-head connection for easy adjustment of clamping technology and suction devices
- Varied connection possibilities with low component variety
- GSK 10-25 and GSK 10-40 allow use with large systems, i.e. with diameters of 25 and 40

# Further Applications from our Product Family:



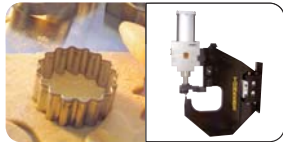
## Clamping

Tools with pneumatic and electric drives for clamping, positioning, pin retracting and locating



## Moving

Operational systems for pushing, lifting, swivelling and turning of fixture components



## Forming

Clamps as X and C frames for punching, clinching, nut piercing, marking and stamping



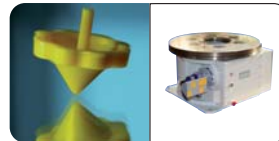
## Welding

Toggle-joint welding tongs for spot welding applications as stationary, bracket or manual clamps



## Gripping

Robotic grippers in modular design for handling car body components for transporting tasks, welding functions and complete geometry stations



## Rotating

Expert round indexing tables and trunnions for Dynamic indexing of high loads



QS pursuant to VDA 6, part 4 + DIN EN ISO9001:2000

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