



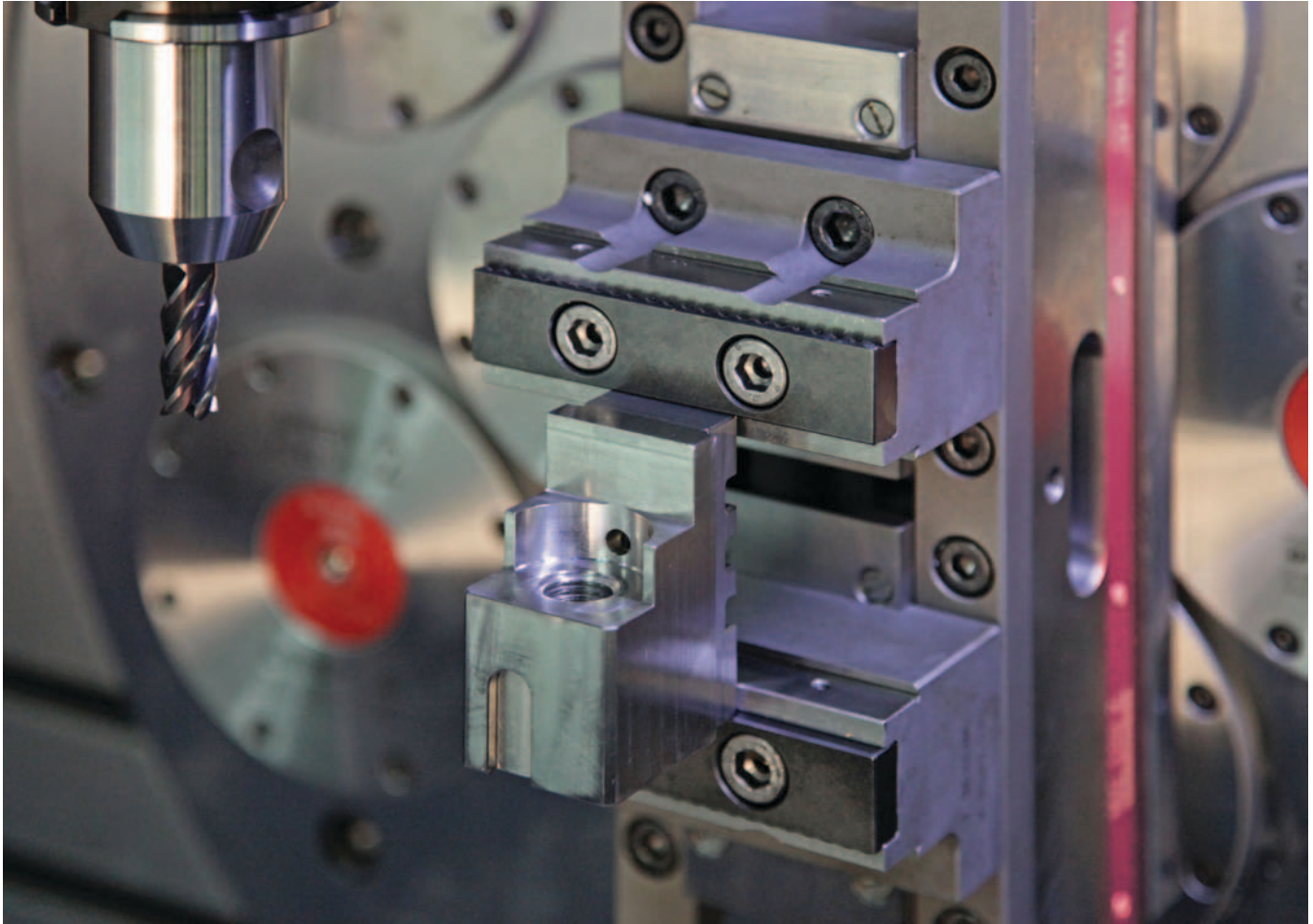
## Workholding Systems

# MC

for 5-axis machining



## 5-axis machining requires 5-axis clamping systems



### Your benefits at a glance:

■ **Ideal for use on 5-axis machining centres and pallet systems**

The compact design enables machining of the workpiece from all sides and ensures collision-free tool paths. This fulfils the basic requirements for dependable 5-axis machining.

■ **Can be used for clamping both unmachined and machined parts**

Jaws with interchangeable jaw inserts manage every clamping task with minimum set-up effort. First and second clamping with a single clamping system – without having to change jaws.

■ **Concentric or clamping against the fixed jaw, mechanical or hydraulic**

The wide selection of systems in the MC series ensures you always have the perfect clamping system for your individual machining tasks.

The hydraulic systems are particularly suited to applications in automated production processes.

■ **Reduction of tool costs through the use of standard tools**







The compact design enables the use of standard tools which means that investment in this special clamping technology pays off quickly.

■ **Very good protection against swarf thanks to closed lead screw area**

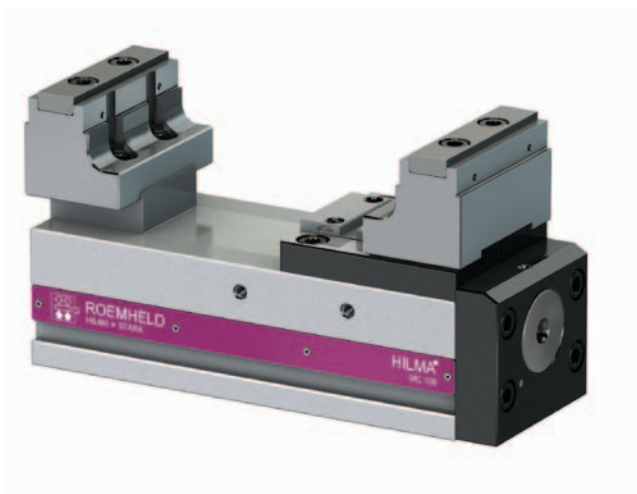
Durability and low cleaning effort are further characteristics which distinguish HILMA's 5-axis clamping systems.



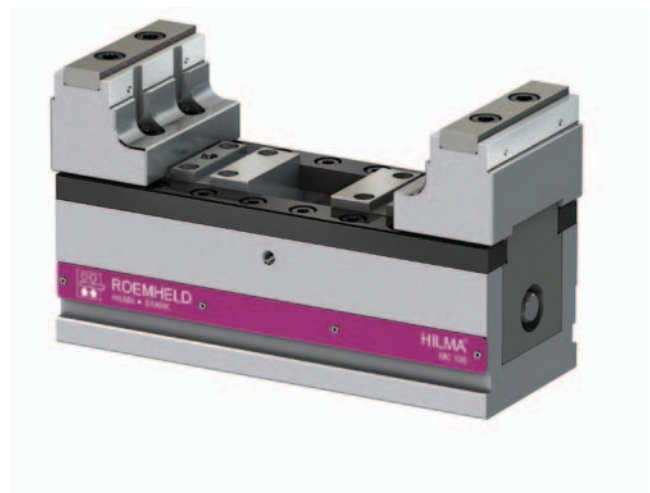
## Designs and accessories

	 Fixed jaw	 mechanical	 hydraulic	 Concentric	 mechanical	 hydraulic	Page
MC 40	•	•		•	•		4
MC 60	•	•	•	•	•		5
MC 100	•	•		•	•	•	6
MC 125				•	•		7
Clamping jaws/jaw inserts							8 – 10
Rapid change block Quintus							11 – 13
Fixation and positioning, operation							14

### Series MC Fixed jaw



### Series MC Concentric



■ **Stability:**

Long inside guideways

■ **Durability:**

Lead screw area encapsulated

■ **Usability:**

Wide range of jaws

■ **Flexibility:**

Foundation for STARK zero point clamping systems from series MC60




■ **Precision:**

Steel base

■ **Accessibility:**

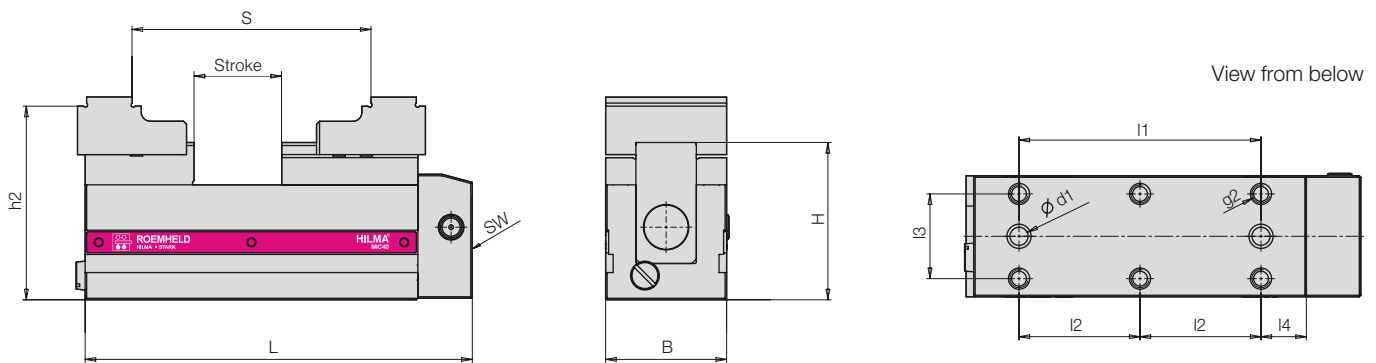
Compact design



<b>Design:</b>	 Fixed jaw  Concentric	<b>Application:</b> In micromachining and in pallet systems
<b>Operation:</b>	 mechanical	<b>Features:</b> Good protection against swarf and high stability, base made from steel, concentric clamping systems, clamping possible from outside to inside and from inside to outside.

**Series MC 40**

**Fixed jaw** (Figure 9.3581.1102 with clamping jaw 9.3581.6901)



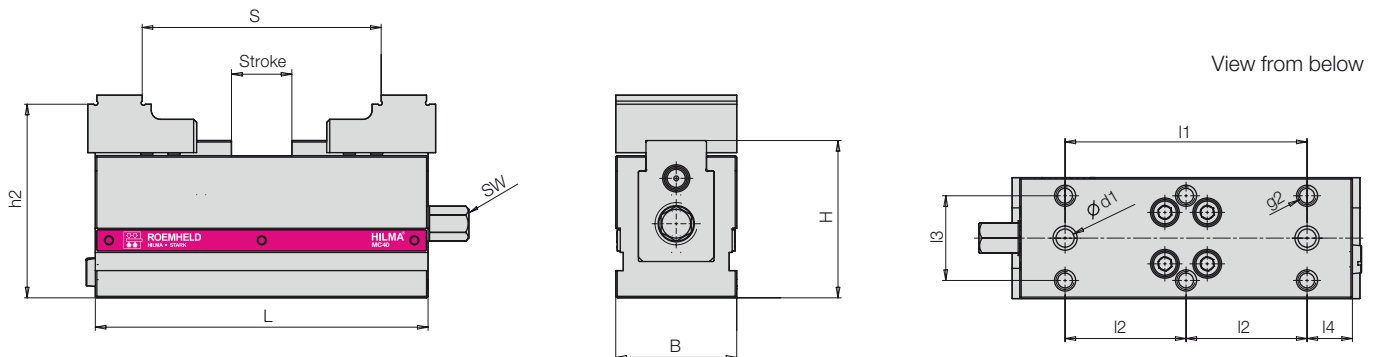
Type	Part no. without jaws	Part no. with jaws	Clamping force [kN/Nm]	Operation	Jaw opening S max. [mm]	Stroke [mm]	Weight without jaws [kg]
<b>MC40</b>							
<b>Fixed jaw</b>	<b>9.3581.0102</b>	<b>9.3581.1102</b>	8/15	mechanical	6 – 79	29	1.8

L [mm]	B [mm]	H [mm]	d1	g on both sides	g1	g2	h2 [mm]	I1 [mm]	I2 [mm]	I3 [mm]	I4 [mm]	SW
128	40	52**	6H7			M6x7	64**	80**	40	28	15	6

Tolerances: \*±0.01 mm \*\* ±0.02 mm

**Series MC 40**

**Concentric** (Figure 9.3581.1302 with clamping jaw 9.3581.6901)



Type	Part no. without jaws	Part no. with jaws	Clamping force [kN/Nm]	Operation	Jaw opening S max. [mm]	Stroke [mm]	Weight without jaws [kg]
<b>MC40</b>							
<b>Concentric</b>	<b>9.3581.0302</b>	<b>9.3581.1302</b>	8/23	mechanical	6 – 79	20	1.4

L [mm]	B [mm]	H [mm]	d1	g on both sides	g1	g2	h2 [mm]	I1 [mm]	I2 [mm]	I3 [mm]	I4 [mm]	SW
110	40	52**	6H7			M6x7	64**	80**	40	28	15	10

Tolerances: \*±0.01 mm \*\* ±0.02 mm



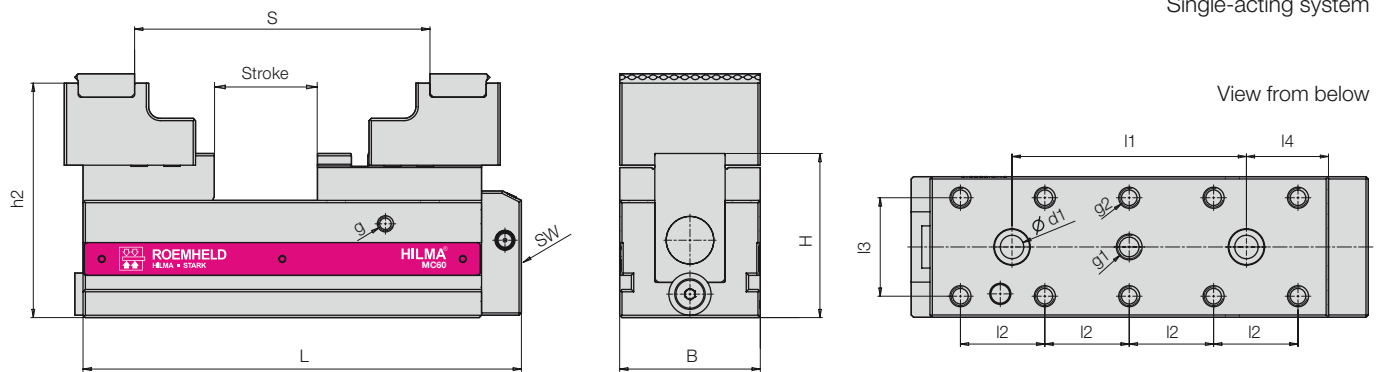
<b>Design:</b>	 Fixed jaw	 Concentric	<b>Application:</b> In pallet systems and 5-axis machining centres with small working areas
<b>Operation:</b>	 mechanical	 hydraulic (only fixed jaw)	<b>Features:</b> Good protection against swarf and high stability, base made from steel, concentric clamping systems, clamping possible from outside to inside and from inside to outside.

## Series MC 60

### Fixed jaw (Figure 9.3583.1112 with clamping jaw 9.3583.6906)

#### Hydraulic ports:

1 x G ¼ at the side  
1 x plug-type connector Ø 10 from below  
Single-acting system



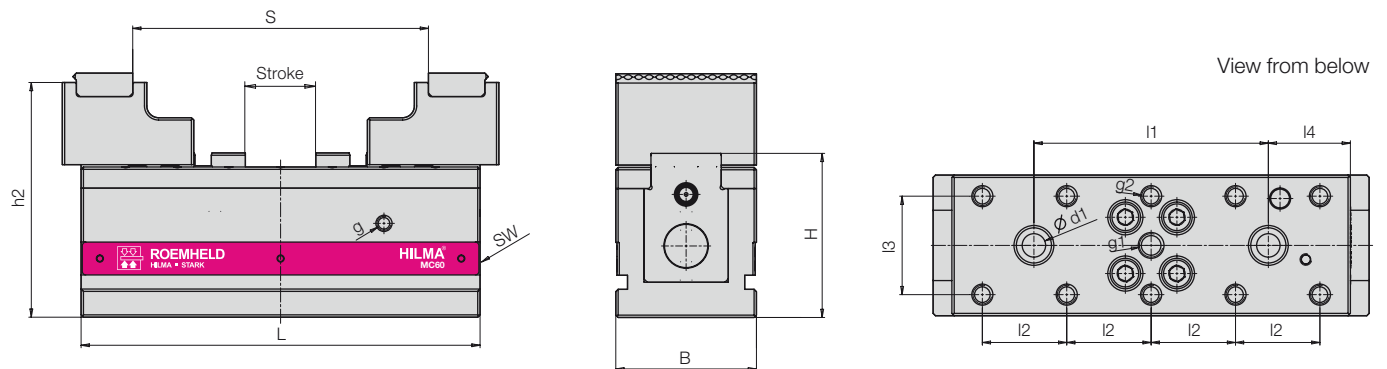
Type	Part no. without jaws	Part no. with jaws	Clamping force [kN]	Operation	Jaw opening S max. [mm]	Stroke [mm]	Weight without jaws [kg]
<b>MC60</b>							
<b>Fixed jaw</b>	<b>9.3583.0112</b>	<b>9.3583.1112</b>	15/25 Nm	mechanical	12 – 126	44	5.0
<b>Fixed jaw</b>	<b>9.3583.0212</b>	<b>9.3583.1212</b>	15/260 bar	hydraulic	12 – 126	4	5.0

L [mm]	B [mm]	H [mm]	d1	g on both sides	g1	g2	h2 [mm]	I1 [mm]	I2 [mm]	I3 [mm]	I4 [mm]	SW
187	60	70**	10F7	M6x10	M10x11	M8x12	100**	100**	36	42	35	8
204	60	70**	10F7	M6x10	M10x11	M8x12	100**	100**	36	42	35	8

Tolerances: \* ±0.01 mm \*\* ±0.02 mm

## Series MC 60

### Concentric (Figure 9.3583.1301 with clamping jaw 9.3583.6906)



Type	Part no. without jaws	Part no. with jaws	Clamping force [kN/Nm]	Operation	Jaw opening S max. [mm]	Stroke [mm]	Weight without jaws [kg]
<b>MC60</b>							
<b>Concentric</b>	<b>9.3583.0301</b>	<b>9.3583.1301</b>	15/50	mechanical	12 – 126	30	6.0

L [mm]	B [mm]	H [mm]	d1	g on both sides	g1	g2	h2 [mm]	I1 [mm]	I2 [mm]	I3 [mm]	I4 [mm]	SW
170	60	70**	10F7	M6x10	M10x11	M8x12	100**	100**	36	42	35	12

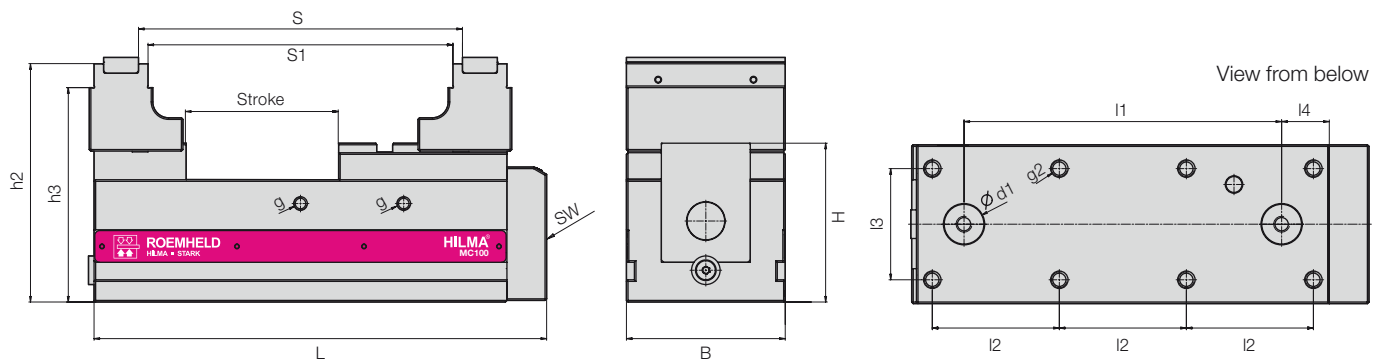
Tolerances: \* ±0.01 mm \*\* ±0.02 mm



<b>Design:</b>	Fixed jaw	Concentric	<b>Application:</b> In pallet systems and 5-axis machining centres
<b>Actuation:</b>	mechanical	hydraulic (only concentric)	<b>Features:</b> Good protection against swarf and high stability, base made from steel, concentric clamping systems, clamping possible from outside to inside and from inside to outside.

**Series MC 100**

**Fixed jaw** (Figure 9.3585.1113 with clamping jaw 9.3585.6910)



Type	Part no. without jaws	Part no. with jaws	Clamping force [kN]	Operation	Jaw opening S max. [mm]	S1 [mm]	Stroke [mm]	Weight without jaws [kg]
<b>MC 100</b>								
<b>Fixed jaw</b>	<b>9.3585.0113</b>	<b>9.3585.1113</b>	25/60 Nm	mechanical	15–204	6–192	96	20

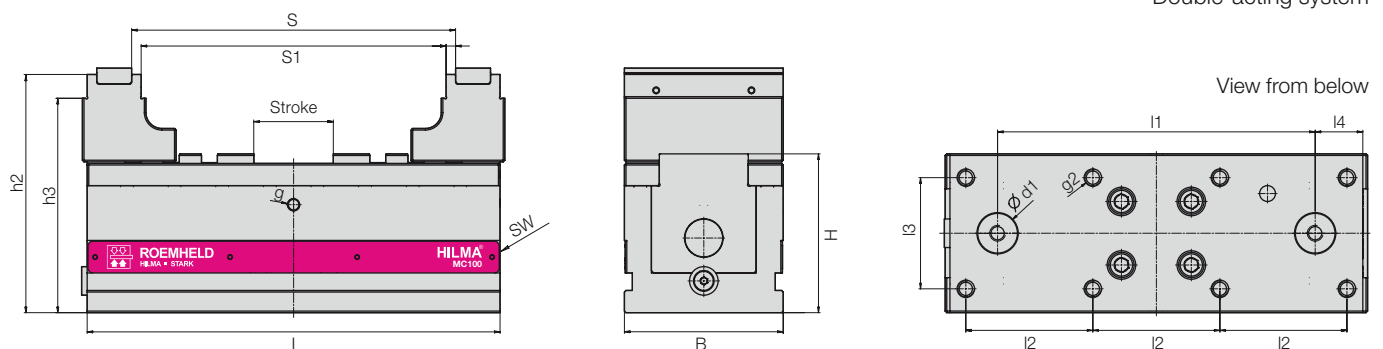
L [mm]	B [mm]	H [mm]	d1	g on both sides	g2	h2 [mm]	h3 [mm]	I1 [mm]	I2 [mm]	I3 [mm]	I4 [mm]	SW
285	100	100**	25+0.01 x5 /M10x14	M8x11	M10x15	150**	135**	200**	80	70	30	12

Tolerances: \* ±0.01 mm \*\* ±0.02 mm

**Series MC 100**

**Concentric** (Figure 9.3585.1303 with clamping jaw 9.3585.6910)

**Hydraulic ports:**  
2 x G¼ at the side  
2 x plug-type connector Ø 10 from below  
Double-acting system



Type	Part no. without jaws	Part no. with jaws	Clamping force [kN]	Operation	Jaw opening S max. [mm]	S1 [mm]	Stroke [mm]	Weight without jaws [kg]
<b>MC 100</b>								
<b>Concentric</b>	<b>9.3585.0303</b>	<b>9.3585.1303</b>	25/80 Nm	mechanical	15 – 204	6–192	50	18
<b>Concentric</b>	<b>9.3585.0403</b>	<b>9.3585.1403</b>	20/200 bar	hydraulic	15 – 204	6–192	50	18



L [mm]	B [mm]	H [mm]	d1	g on both sides	g2	h2 [mm]	h3 [mm]	I1 [mm]	I2 [mm]	I3 [mm]	I4 [mm]	SW
260	100	100**	25+0.01 /M10x14	M8x11	M10x14	150**	135**	200**	80	70	30	14
291	100	100**	25+0.01 /M10x14	M8x11	M10x14	150**	135**	200**	80	70	30	14

Tolerances: \* ±0.01 mm \*\* ±0.02 mm

# MC 125 Technical Data

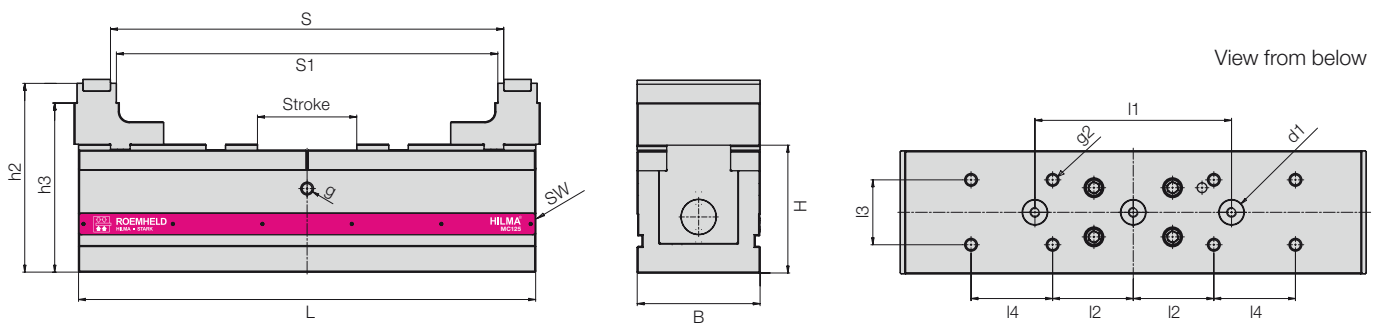


**ROEMHELD**  
HILMA ■ STARK

<b>Design:</b>	 Concentric	<b>Application:</b> In pallet systems and 5-axis machining centres
<b>Actuation:</b>	 mechanical	<b>Features:</b> Good protection against swarf and high stability, base made from steel, concentric clamping systems, clamping possible from outside to inside. From inside to outside only 9.3586.0304 and 9.3586.1304

## Series MC 125

Concentric (Figure 9.3586.1304 with clamping jaw 9.3586.6910)



Type	Part no. without jaws	Part no. with jaws	Clamping force [kN]	Operation	Jaw opening S max. [mm]	S1 [mm]	Stroke [mm]	Weight without jaws [kg]
<b>MC 125</b>								
<span style="color: #e91e63;">Concentric</span>	<b>9.3586.0304</b>	<b>9.3586.1304</b>	35/200 Nm	mechanical	15–400	6–388	100	50

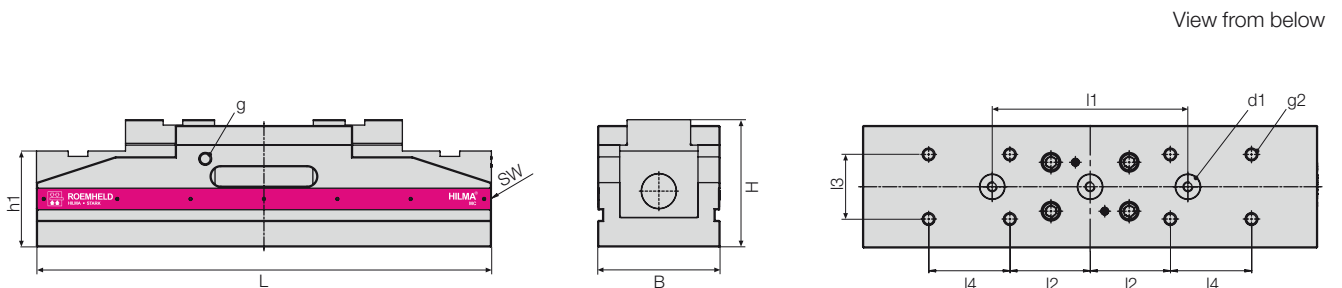
L [mm]	B [mm]	H [mm]	d1	g on both sides	g2	h1 [mm]	h2 [mm]	h3 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	l4 [mm]	SW
465	125	130*	25+0.01/M10x14	M12x18	M12x16	98**	192**	172**	200**	82	66	83	19

Tolerances: \* ±0.01 mm \*\* ±0.02 mm

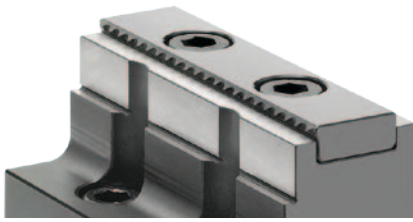
## Series MC 125

Concentric

Optional design with chamfered base (Part no. 9.3586.0303)



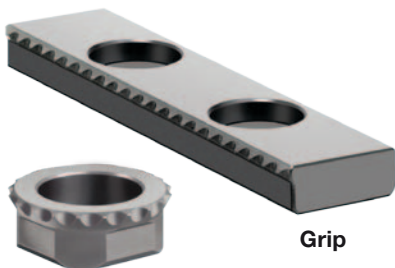
Customized base design for positioning and mounting on request.



The basis is formed by stable clamping systems with flexible base jaws to accommodate various jaw inserts. Unmachined and machined parts clamped in the same clamping system without additional set-up effort.

The use of jaw inserts significantly reduces the required investment in clamping devices. In many applications, the additional "punching" operation is no longer required.

## Jaw inserts with grip serrated



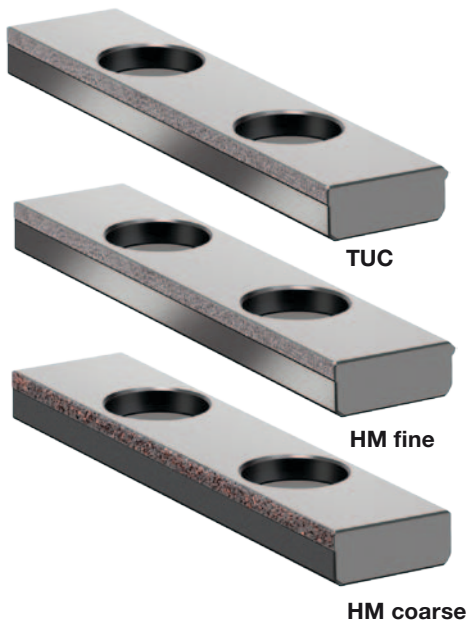
Grip

Particularly suited to first clamping of unmachined parts. Used on saw cuts or casting surfaces with major angular misalignments (0.3 mm)

The "round" jaw inserts are particularly suited to clamping non-cubic workpieces or forgings and castings.

In combination with pendulum jaws, angular misalignments of up to several millimetres can be rectified.

## Jaw inserts with coating



TUC

HM fine

HM coarse

Suitable for first clamping of drawn materials or saw cuts with minor angular misalignments (0.1 mm). The type and coarseness of the coating enables a specific selection in accordance with the machining task and material. Retention forces can be increased by a factor of 2.

The inserts can also be used without any problems for clamping (2nd clamping) on machined surfaces. Coating can also be applied subsequently to contour jaws or the existing clamping jaws.

Jaw inserts with coating can also be used without hesitation on clamping systems with power amplifier.

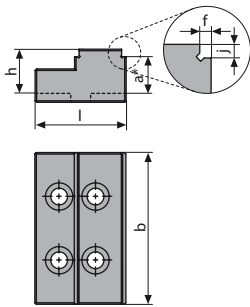
## Characteristics of jaw clamping areas

Insert	Workpiece	Damage on the workpiece surface	Rectification of angular misalignments/100 mm
TUC		very low (Ra10)	very low
HM fine		low (grain size of 0.1 mm)	0.1 mm
HM coarse		medium (grain size of 0.3 mm)	0.2 mm
Grip		high	0.5 mm

## Increase of retention forces

Workpiece material	Workpiece surface	rolled/cast/forged	drawn	sawn	milled	ground
	Steel, e.g. C45, 20MnCr5, 31 CrMo4V9		HM coarse, grip	HM fine, TUC	HM coarse, grip	HM fine, TUC
Heat-treated steel, e.g. C45 induction-hardened, 20 MnCr5 case-hardened, 31 CrMoV9 nitrided					HM fine, TUC	TUC
Cast e.g. GG, red bronze		HM coarse, grip			HM fine, TUC	TUC
Titanium		HM fine	HM fine, TUC	HM fine	HM fine, TUC	HM fine, TUC
Aluminium		HM coarse, grip		HM fine, grip	HM fine	TIC / TUC
NE metals				HM fine, grip	HM fine	TUC



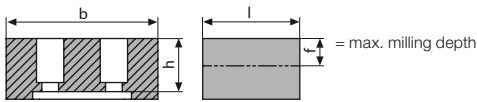


## Reversible step jaw with 2 steps, hardened

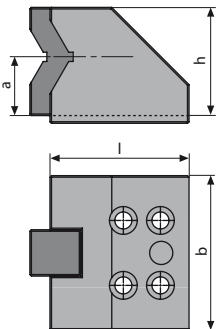
Type	Part no.	Dimensions [mm]									Clamping range min/max
		l	b	h	a	e	f	i	j	k	
<b>MC 40</b>	<b>9.3581.6901</b>	36	40	15	12*		3		3		6-79
<b>MC 60</b>	<b>9.3583.6901</b>	49	60	23	18*		3		5		6-150
<b>MC 100</b>	<b>9.3585.6901</b>	60	100	30	25*		3		5		6-204
<b>MC 125</b>	<b>9.3586.6911</b>	80	125	35	30*		5		5		10-400

\* Tolerance ±0.01 mm

## Block jaw, soft for milling machine of workpiece contours



Type	Part no.	Dimensions [mm]									Clamping range min/max
		l	b	h	a	e	f	i	j	k	
<b>MC 40</b>	<b>9.3581.6902</b>	36	40	21			6				
<b>MC 60</b>	<b>9.3583.6902</b>	42	60	25			8				
<b>MC 100</b>	<b>9.3585.6902</b>	64	100	35			18				
<b>MC 125</b>	<b>9.3586.6902</b>	88	125	55			32				

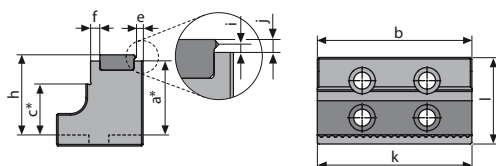


## Vee jaw with jaw inserts, hardened

Type	Part no.	Dimensions [mm]									Clamping range min/max
		l	b	h	a	e	f	i	j	k	
<b>MC 60</b>	<b>9.3583.6905</b>	60	60	70	40						D 10-76 <sup>(1)</sup>
<b>MC 100</b>	<b>9.3585.6905</b>	90	100	70	38						D 12-86 <sup>(2)</sup>

<sup>(1)</sup> D 10-20 mm, D 20-58 mm, D 58-76 mm  
<sup>(2)</sup> D 12-26 mm, D 25-54 mm, D 53-86 mm

## Step jaw with jaw insert, grip/smooth, hardened

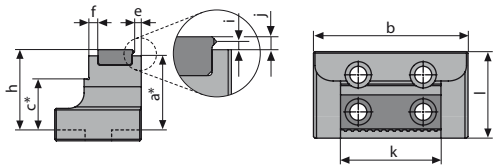


Type	Part no.	Dimensions [mm]									Clamping range min/max	
		l	b	h	a	c	e	f	i	j		k
<b>MC 60</b>	<b>9.3583.6906</b>	56	60	34	30*		4.5	6	2.5	4	60	12-126
<b>Jaw insert</b>	<b>5.5050.0543</b>											
<b>MC 100</b>	<b>9.3585.6906</b>	56	100	54	50*	35*	4.5	6	2.5	4	100	15-204
<b>Jaw insert</b>	<b>5.5050.0542</b>											
<b>MC 125</b>	<b>9.3586.6906</b>	88	125	66	62*	42*	4.5	6	2.5	4	125	15-400
<b>Jaw insert</b>	<b>5.5050.0509</b>											

\* Tolerance ±0.01 mm



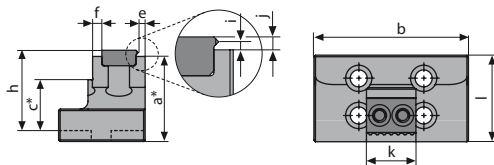
### Step jaw with jaw insert, grip/smooth, hardened, various widths



Type	Part no.	Dimensions [mm]										Clamping range min/max
		l	b	h	a	c	e	f	i	j	k	
<b>MC60</b>	9.3583.6907	56	60	34	30*		4.5	6	2.5	4	35	12-126
<b>Jaw insert</b>	5.5050.0545											
<b>MC100</b>	9.3585.6907	56	100	54	50*	35*	4.5	6	2.5	4	65	15-204
<b>Jaw insert</b>	5.5050.0471											
<b>MC125</b>	9.3586.6907	88	125	66	62*	42*	4.5	6	2.5	4	80	15-400
<b>Jaw insert</b>	5.5050.0547											

\* Tolerance ±0.01 mm

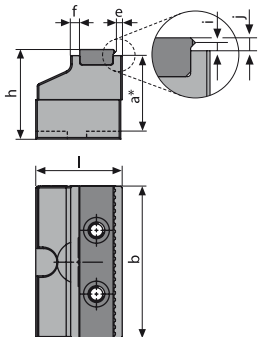
### Step jaw with jaw insert, grip/smooth, hardened, various widths



Type	Part no.	Dimensions [mm]										Clamping range min/max
		l	b	h	a	c	e	f	i	j	k	
<b>MC100</b>	9.3585.6908	56	100	54	50*	35*	4.5	6	2.5	4	32	15-204
<b>Jaw insert</b>	5.5050.0470											

\* Tolerance ±0.01 mm

### Pendulum jaw with jaw insert, grip/smooth, hardened

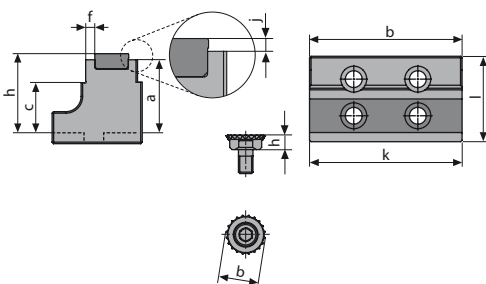


Type	Part no.	Dimensions [mm]										Clamping range min/max
		l	b	h	a	e	f	i	j	k		
<b>MC100</b>	9.3585.6904	56	100	54	50*	4.5	6	2.5	4		15-204	
<b>Jaw insert</b>	5.5050.0542											
<b>MC125</b>	9.3586.6904	88	125	66	62*	4.5	6	2.5	4	125	15-400	
<b>Jaw insert</b>	5.5050.0509											

\* Tolerance ±0.01 mm

\*\* Tolerance ±0.02 mm

### Step jaw with jaw insert, HM coating coarse / smooth, hardened and 2 off insert round with grip



Type	Part no.	Dimensions [mm]										Clamping range min/max
		l	b	h	a	c	e	f	i	j	k	
<b>MC100</b>	9.3585.6910	59	100	54	50*	35*		6		4	100	6-192
<b>Jaw insert</b>	5.5050.0523											
<b>Round insert</b>	5.5050.0464		25	10								
<b>MC125</b>	9.3586.6910	91	125	66	62*	42*		6		4	125	18-400
<b>Jaw insert</b>	5.5050.0660											
<b>Round insert</b>	5.5050.0486		31	12								

\* Tolerance ±0.01 mm

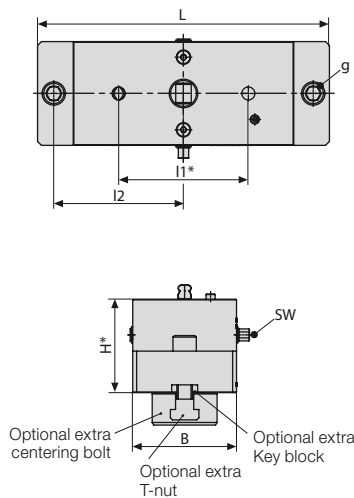


# Accessories **Quintus 1**

## Rapid change block Quintus 1 for MC 60

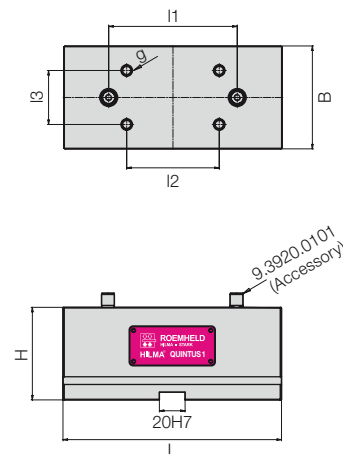
The QUINTUS rapid change block provides the optimum interface for your machine tool. A mechanical zero point clamping system allows rapid and precise changing of different clamping systems taking account of the zero point. This means that machining tasks can be prepared externally and can then be changed without long machine downtimes. Handling is made easier and set-up and production costs are reduced.

**Figure with mechanical clamping lock 9.6153.0101**



View from above

**Figure without mechanical clamping lock 9.6153.0102**



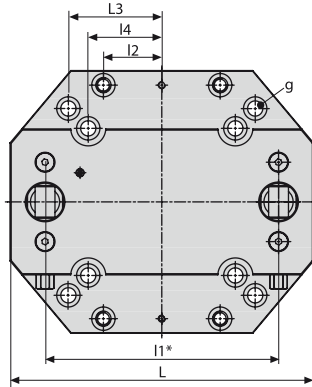
Type <b>Quintus 1</b>	Part no.	Dimensions [mm]							SW	Insertion force [kN/Nm]	Weight [kg]
		L	B	H	g	I1	I2	I3			
<b>with mechanical clamping lock</b>	<b>9.6153.0101</b>	225	80	72*	KM12	100**	100		8	12/60	9
<b>without mechanical clamping lock</b>	<b>9.6153.0102</b>	170	80	72*	KM8	100**	72	42			7.5

\* Tolerance  $\pm 0.01$  mm  
\*\* Tolerance  $\pm 0.02$  mm



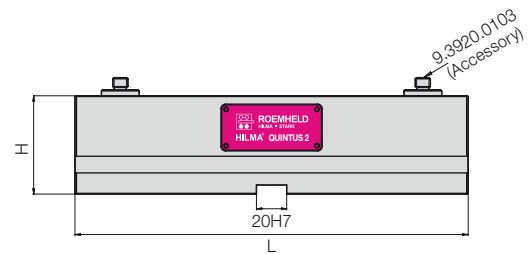
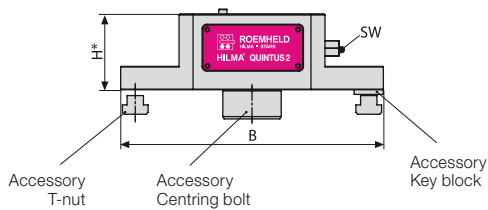
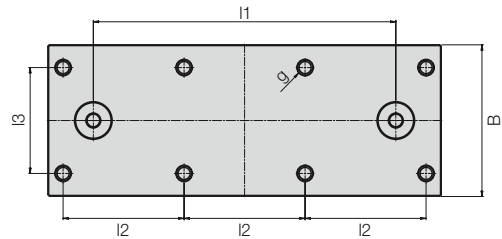
## Rapid change block Quintus 2 for MC 100

Figure with mechanical clamping lock 9.6155.0102



View from above

Figure without mechanical clamping lock 9.6155.0103



Type	Part no.	Dimensions [mm]									Insertion force [kN/Nm]	Weight [kg]
		L	B	H	g	I1	I2	I3	I4	SW		
<b>Quintus 2</b> with mechanical clamping lock	<b>9.6155.0102</b>	260	225	65*	KM 12	200**	50	63	80	13	2x20/80	18
without mechanical clamping lock	<b>9.6155.0103</b>	260	100	65*	KM 10	200**	80	70				13

\* Tolerance ±0.01 mm  
\*\* Tolerance ±0.02 mm



# Accessories **Quintus 3**

## Rapid change block Quintus 3 for MC 125

Figure with mechanical clamping lock 9.6156.0102

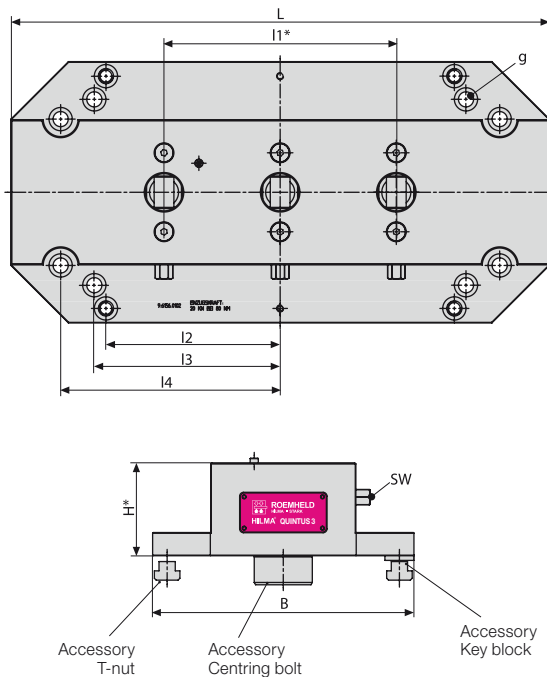
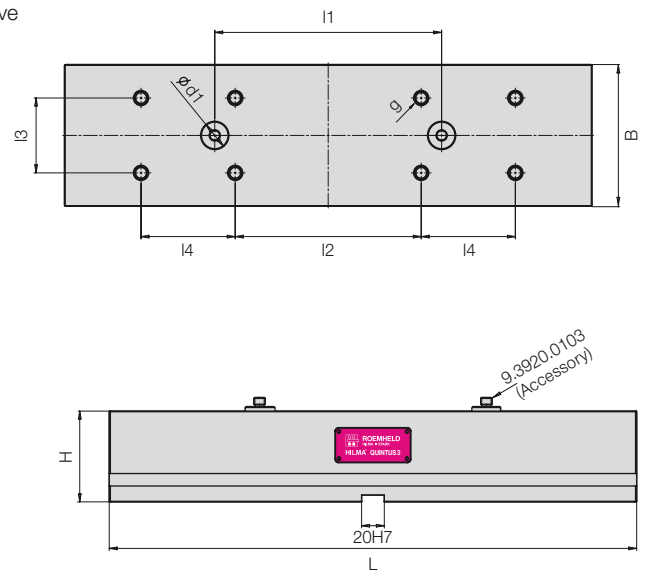


Figure without mechanical clamping lock 9.6156.0103

View from above



Type <b>Quintus 3</b>	Part no.	Dimensions [mm]									Insertion force [kN/Nm]	Weight [kg]
		L	B	H	g	l1	l2	l3	l4	SW		
<b>with mechanical clamping lock</b>	<b>9.6156.0102</b>	464	225	80*	KM 12	200**	150	160	189	13	3x20/80	42
<b>without mechanical clamping lock</b>	<b>9.6156.0103</b>	465	125	80*	KM 12	200**	164	66	83			35

\* Tolerance ±0.01 mm  
\*\* Tolerance ±0.02 mm



## Fixation and positioning

### Centring bolt

for hub centring on machine table

Type	Part no.	Ø [mm]	L [mm]
<b>Quintus 1/2/3</b>	<b>9.6153.5001</b>	D30 g6	15/38
	<b>9.6153.5002</b>	D32 g6	15/38
	<b>9.6153.5003</b>	D50 g6	25/48
	<b>9.6153.5009</b>	D50 g6	18/41

### Pull-in bolt,

mounting on clamping system

Type	Part no.	Quantity
<b>Quintus1/ MC 60</b>	<b>9.3920.0201</b>	1 off
<b>Quintus2/ MC 100</b>	<b>9.3920.0202</b>	1 set = 2 off
<b>Quintus3/ MC 125</b>	<b>9.3920.0203</b>	1 set = 3 off

**Positioning pins, various diameters, for grid plate and Quintus,** 1 set = 2 off

Type	Part no.	Ø [mm]
<b>MC 60</b>	<b>9.3920.0101</b>	10/12
<b>MC 100</b>	<b>9.3920.0103</b>	25/12
<b>MC 125</b>	<b>9.3920.0103</b>	25/12

**Clamping claws,** 1 set = 4 off, incl. screws

Type	Part no.	Thread
<b>MC 40</b>	<b>9.3583.7001</b>	M10
<b>MC 60</b>	<b>9.3583.7001</b>	M10
<b>MC 60</b>	<b>9.3583.7002</b>	M12
<b>MC 100</b>	<b>9.3585.7001</b>	M12
<b>MC 125</b>	<b>9.3777.3011</b>	M12
<b>MC 125</b>	<b>9.3777.3021</b>	M16

**Key block with screw for Quintus 1,2,3**

Part no.		Slot [mm]
<b>9.6153.5004</b>	DIN 6322, 1 off	14

**T-nut with screw for Quintus 1,2,3**

Part no.		Slot [mm]
<b>9.6153.5005</b>	DIN 508, 4 off	14

## Operation

### Socket

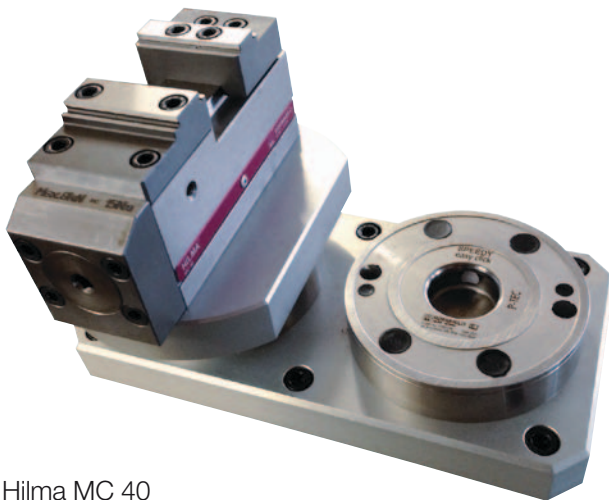
Type	Part no.	SW
<b>MC40 Fixed jaw</b>	<b>1.3124.0103</b>	6
<b>MC40 Concentric</b>	<b>1.3124.0025</b>	10
<b>MC60 Fixed jaw</b>	<b>1.3124.0104</b>	8
<b>MC60 Concentric</b>	<b>1.3124.0021</b>	12
<b>MC100 Fixed jaw</b>	<b>1.3124.0024</b>	12
<b>MC100 Concentric</b>	<b>1.3124.0020</b>	14
<b>MC 125</b>	<b>1.3124.0019</b>	19

### Torque wrench

Type	Part no.	Torque [Nm]
<b>MC 40 / 60</b>	<b>9.3583.7010</b>	5– 60
<b>MC 100 Fixed jaw</b>	<b>9.3583.7010</b>	5– 60
<b>MC 100 Concentric</b>	<b>9.3792.6610</b>	20–120
<b>MC 125</b>	<b>9.3792.6620</b>	40–200



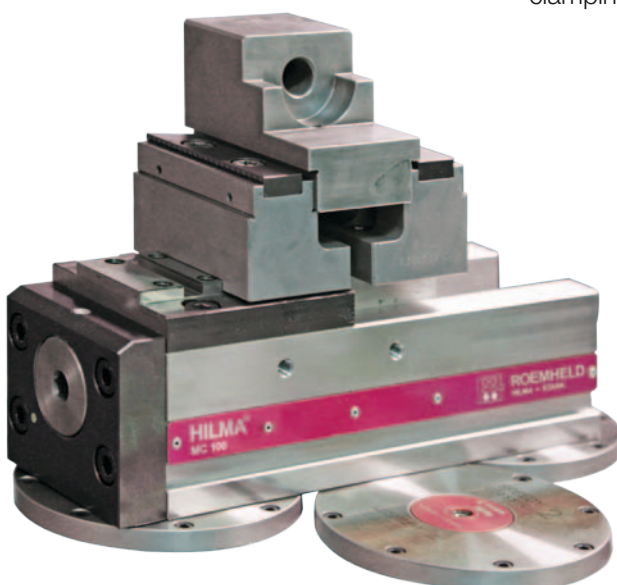
## MC Application examples



Hilma MC 40  
and STARK Easy Click zero point clamping system



Two clamping systems MC 60 H on reversible  
clamping device. Use with special clamping jaws



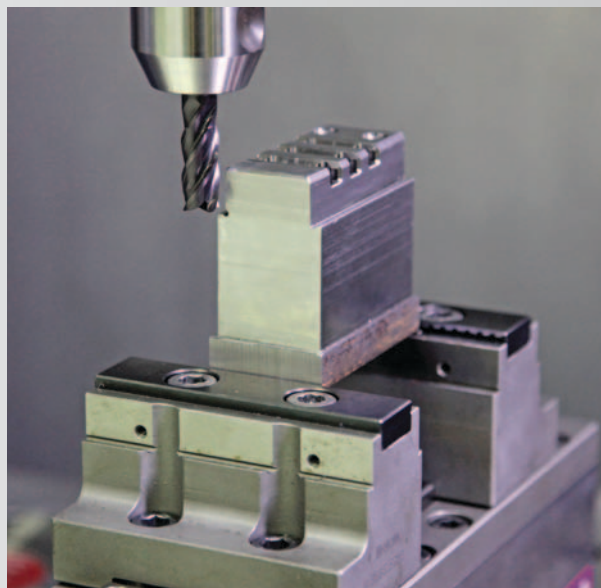
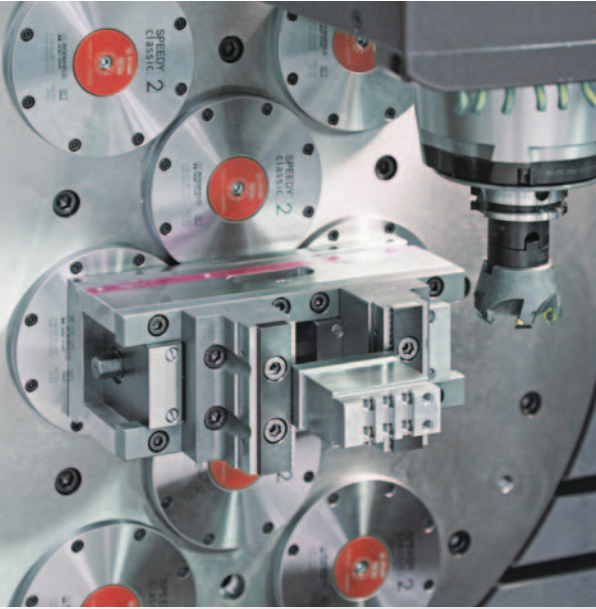
MC 100 on the  
STARK zero point clamping system



**ROEMHELD**  
HILMA ■ STARK

Hilma MC 100 Z and STARK zero point clamping system – combined for maximum flexibility and precision

MC 100 with grip jaw



Three SCS 120 H as a specific set-up in a pallet station. The clamping pressure is controlled by the machine hydraulics.

Grip jaw with steps for first and second clamping

**Hilma-Röhheld GmbH**

Schützenstraße 74 · 57271 Hilchenbach, Germany  
Phone: +49 27 33 / 281-0 · Fax: +49 27 33 / 281-169  
E-mail: info@hilma.de · www.hilma.de