

Table of Contents

Connectable in accordance with **BLUECOMPETENCE** » mimatic mi » PolyMILL » TriMILL » PolyREAM

DIN 69871

Selection by Clearance Diameter E and Milling Depth L₁

Angle Head 90°

Double Angle Head 90°

Angle Head 90° Offset Type

Angle Head 90° Offset Slim Type

Angle Head, Adjustable 0-98°



SK 40				SW			DW			ZW			ZWS			WS		
Size		Tool holder	Coolant	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page
0		ER 11											50	67,5				
1		ER 16		80	65	104			105			106			107			108
			✓	96	65													
3		ER 20				104			105			106	75	80	107	-	100	108
			✓															
5		ER 25		110	80	104	125	80	105	103	80	106	82	80	107	-	100	108
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				126	80		160	80		118	80		110	80		-	100	
			✓	135	80		160	80		118	80		110	80		-	100	
7		ER 32		145	80	104	152	80	105	128	100	106			107			108
			✓	155	80		152	80		128	100							
				159	80		180	80		137	100							
			✓	163	80		180	80		137	100							

SK 50				SW			DW			ZW			ZWS			WS		
Size		Tool holder	Coolant	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page
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			✓	135	75		160	70		118	79		110	80		-	100	
7		ER 32		145	70	109	152	70	110	128	70	111	102	100	112	-	100	113
			✓	155	70		152	70		128	70		102	100		-	100	
				159	70		180	70		137	70		120	100		-	100	
			✓	163	70		180	70		137	70		120	100		-	100	
9		ER 40		190	105	109	210	105	110	140	105	111			112			113
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				215	105		240	105		150	105							
			✓	215	105		240	105		150	105							

Table of Contents

Connectable in accordance with **BLUECOMPETENCE** » mimatic mi » PolyMILL » TriMILL » PolyREAM

DIN 69893 A

Selection by Clearance Diameter E and Milling Depth L₁

Angle Head 90°

Double Angle Head 90°

Angle Head 90° Offset Type

Angle Head 90° Offset Slim Type

Angle Head, Adjustable 0-98°



HSK 63				SW			DW			ZW			ZWS			WS						
Size		Tool holder	Coolant	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page				
0		ER 11											50	67,5								
1		ER 16		80	65	114			115			116			117			118				
			✓	96	65																	
3		ER 20															75		80		-	100
			✓																		-	100
5		ER 25		110	80			125		80			103	80			82		80		-	100
			✓	120	80			125		80			103	80			82		80		-	100
				126	80			160		80			118	80			110		80		-	100
			mi	✓	135		80			160	80			118		80			110	80		-
7		ER 32		145	80			152		80			128	100								
			✓	155	80			152		80			128	100								
				159	80			180		80			137	100								
			mi	✓	163	80		180	80		137	100										

HSK 100				SW			DW			ZW			ZWS			WS					
Size		Tool holder	Coolant	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page			
0		ER 11											50	76							
5		ER 25		110	75	119	125	70	120	103	79	121	82	80	122	-	100				
			✓	120	75		125	70		103	79		82	80		-	100				
				126	75		160	70		118	79		110	80		-	100				
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7		ER 32		145	70			152		70			128	70			102	100		-	109
			✓	155	70			152		70			128	70			102	100		-	109
				159	70			180		70			137	70			120	100		-	109
			mi	✓	163		70			180	70			137		70		120	100		-
9		ER 40		190	109			210		109			140	100							
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				215	109			240		109			150	100							
			mi	✓	215	109		240	109		150	100									

Table of Contents

Connectable in accordance with **BLUECOMPETENCE** » mimatic mi » PolyMILL » TriMILL » PolyREAM

MAS-BT JIS 6339

Selection by Clearance Diameter E and Milling Depth L₁

Angle Head 90°

Double Angle Head 90°

Angle Head 90° Offset Type

Angle Head 90° Offset Slim Type

Angle Head, Adjustable 0-98°



MAS-BT 40				SW			DW			ZW			ZWS			WS		
Size		Tool holder	Coolant	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page
0		ER 11											50	67,5				
1		ER 16		80	65													
			✓	96	65													
3		ER 20											75	80		-	100	
			✓													-	100	
5		ER 25		110	80	124	125	80	125	103	80	126	82	80	127	-	100	128
			✓	120	80		125	80		103	80		82	80		-	100	
				126	80		160	80		118	80		110	80		-	100	
			✓	135	80		160	80		118	80		110	80		-	100	
7		ER 32		145	80		152	80		128	100							
			✓	155	80	152	80	128	100									
				159	80	180	80	137	100									
			✓	163	80	180	80	137	100									

MAS-BT 50				SW			DW			ZW			ZWS			WS		
Size		Tool holder	Coolant	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page
0		ER 11											50	76				
5		ER 25		110	75		125	70		103	79		82	80		-	100	
			✓	120	75	125	70	103	79	82	80	-	100					
				126	75	160	70	118	79	110	80	-	100					
			✓	135	75	160	70	118	79	110	80	-	100					
7		ER 32		145	70	129	152	70	130	128	70	131	102	100	132	-	109	133
			✓	155	70		152	70		128	70		102	100		-	109	
				159	70		180	70		137	70		120	100		-	109	
			✓	163	70		180	70		137	70		120	100		-	109	
9		ER 40		190	109		210	109		140	110							
			✓	190	109	210	109	140	110									
				215	109	240	109	150	110									
			✓	215	109	240	109	150	110									

Table of Contents

Connectable in accordance with
BLUECOMPETENCE » mimatic mi
» PolyMILL » TriMILL » PolyREAM

ANSI-CAT

**Selection by
Clearance Diameter E
and
Milling Depth L₁**

Angle Head 90°

**Double
Angle Head 90°**

**Angle Head 90°
Offset Type**

**Angle Head 90°
Offset Slim Type**

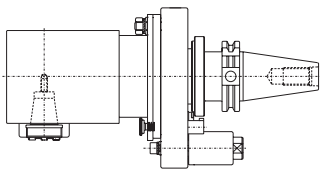
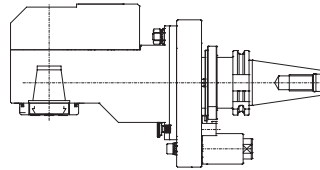
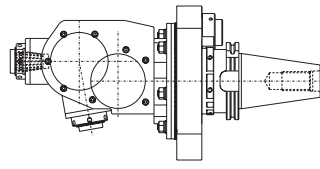
**Angle Head,
Adjustable 0-98°**



ANSI-CAT 40				SW			DW			ZW			ZWS			WS		
Size		Tool holder	Coolant	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page
0		ER 11											50	67,5				
1		ER 16		80	65													
			✓	96	65													
3		ER 20											75	80		-	100	
			✓													-	100	
5		mi											100	80		-	100	
			✓													-	100	
		ER 25		110	80	134	125	80	135	103	80	136	82	80	137	-	100	138
			✓	120	80		125	80		103	80		82	80		-	100	
	mi		126	80	160		80	118		80	110		80	-		100		
		✓	135	80	160		80	118		80	110		80	-		100		
7		ER 32		145	80		152	80		128	100							
			✓	155	80		152	80		128	100							
		mi		159	80		180	80		137	100							
			✓	163	80		180	80		137	100							

ANSI-CAT 50				SW			DW			ZW			ZWS			WS		
Size		Tool holder	Coolant	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page	E Ø mm	L ₁ mm	Page
0		ER 11											50	76				
5		ER 25		110	75		125	70		103	79		82	80		-	100	
			✓	120	75		125	70		103	79		82	80		-	100	
		mi		126	75		160	70		118	79		110	80		-	100	
			✓	135	75		160	70		118	79		110	80		-	100	
7		ER 32		145	70	139	152	70	140	128	70	141	102	100	142	-	109	143
			✓	155	70		152	70		128	70		102	100		-	109	
		mi		159	70		180	70		137	70		120	100		-	109	
			✓	163	70		180	70		137	70		120	100		-	109	
9		ER 40		190	100		210	105		140	105							
			✓	190	100		210	105		140	105							
		mi		215	100		240	105		150	105							
			✓	215	100		240	105		150	105							

Table of Contents

	Type	DIN	Shank	Page
SW Angle Head 90° Gear Ratio $i = 1:1$ Coolant supply: without / external / internal		DIN 69871	SK 40	104
			SK 50	109
		DIN 69893 A	HKS 63	114
			HSK 100	119
		MAS-BT JIS 6339	BT 40	124
	BT 50	129		
	ANSI-CAT	CAT 40	134	
		CAT 50	139	
DW Double Angle Head 90° Gear Ratio $i = 1:1$ Coolant supply: without / external		DIN 69871	SK 40	105
			SK 50	110
		DIN 69893 A	HKS 63	115
			HSK 100	120
		MAS-BT JIS 6339	BT 40	125
	BT 50	130		
	ANSI-CAT	CAT 40	135	
		CAT 50	140	
ZW Angle Head 90° Offset type Gear Ratio $i = 1:1$ Coolant supply: without / external / internal		DIN 69871	SK 40	106
			SK 50	111
		DIN 69893 A	HKS 63	116
			HSK 100	121
		MAS-BT JIS 6339	BT 40	126
	BT 50	131		
	ANSI-CAT	CAT 40	136	
		CAT 50	141	
ZWS Angle Head 90° Offset Slim type Gear Ratio $i = 1:1$ Coolant supply: without / external		DIN 69871	SK 40	107
			SK 50	112
		DIN 69893 A	HKS 63	117
			HSK 100	122
		MAS-BT JIS 6339	BT 40	127
	BT 50	132		
	ANSI-CAT	CAT 40	137	
		CAT 50	142	
WS Angle Head, adjustable 0-98° Gear Ratio $i = 1:1$ or $1:2,25$ Coolant supply: internal		DIN 69871	SK 40	108
			SK 50	113
		DIN 69893 A	HKS 63	118
			HSK 100	123
		MAS-BT JIS 6339	BT 40	128
	BT 50	133		
	ANSI-CAT	CAT 40	138	
		CAT 50	143	
Angle Head with fixed angle		FW	Available on request.	

Angle Drilling Heads and Cutter Heads

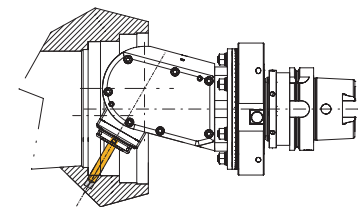
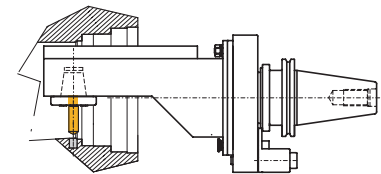
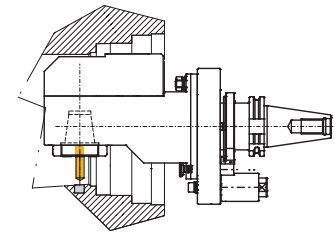
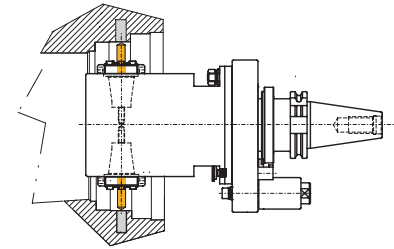
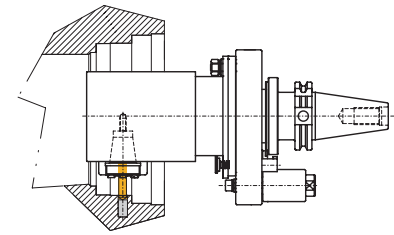
mimatic® has been a reliable partner in project planning and the supply of precision tools worldwide for many years in the field of chip removing production.

In addition to toolholding systems and cutting tools, the company also provides driven tools for both CNC lathes and CNC machining centers to solve customer-specific problems with chip removal.

The company has provided many special purpose solutions for **angle heads and cutter heads** since its foundation in 1974. In doing so, mimatic has always placed special emphasis on **maximum precision, power transmission, operating safety and quality.**

We ensure close cooperation with our customers worldwide, providing advice on all machining problems – even on-site. We realize and implement our solutions on the basis of our **comprehensive standard program or by means of customer-specific special developments and designs.**

Our new standard program of **angle head tools** provides our customers with the means for complete, integrated machining. It is now no longer necessary to repeatedly relocate tools, which means a considerable reduction in production costs, rationalization and the increase in flexibility over the entire production process.



Features of the mimatic® Angle Heads

mimatic® angle heads increase the efficiency of your production. They allow you to work on inaccessible areas within housings or bores.

The angle heads can be used in all popular machine concepts, such as CNC machining centers with automatic or manual tool change and special-purpose machines with fixed insert. They are optimally designed for the respective machining task.

We use ground bevel gears with helical profile as well as hardened and ground spur gears to ensure smooth operation and high power transmission.

Versions

- mimatic® angle heads are available in all European and international shank variants:
 - **SK per DIN 69871, ANSI-CAT, MAS-BT and**
 - **HSK to DIN 69893 – Form A**
 other standards and sizes are also available on request
- With **standard torque support according to ISO 9524** (to be adapted by the customer)
- Available on request with 3-point support adapted to the machine and stop block
- Tool changing manual or automatic
- For drilling, reaming, countersinking, threading and milling
- Allows the machining of sections of the workpiece which are otherwise inaccessible (e.g. internal machining)
- A large number of special, customized designs for complex machining problems
- Single, dual or multi-spindle variants are available
- Fixed angles can be made, as opposed to using Adjustables or standard 90 Degree Heads
- Available on request with internal coolant supply via the spindle (70 bar)
- High torque transmission
- Available as standard with **collet chuck model „ER“ according to DIN 6499 or with our modular „mi“ quick-change tool system** – compatible with all popular tool fittings (collet chucks, Weldon, Whistle-Notch, hydraulic chucks, shrink fit chucks, combi milling arbors, etc.)
- with mimatic® „SYNTAX“ thread quick-change chuck

mimatic „mi“

Modular quick-change tool system



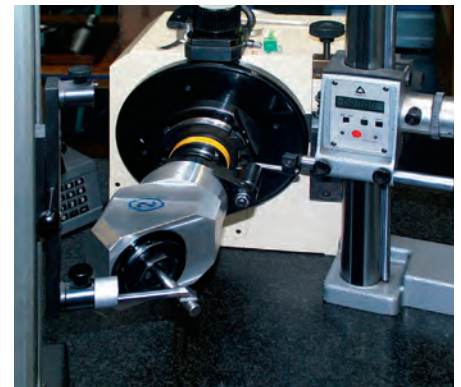
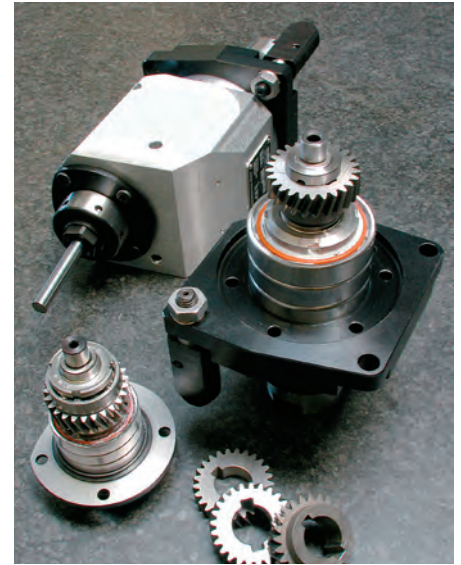
mimatic „SYNTAX“

Tapping quick-change holder



Design of the Angle Heads

- **High-precision spindle bearing, P4 quality** with medium bias voltage (lifelong lubrication of bearing), suitable for high speeds (up to 15,000 rpm)
- **Stabilized spindle bearing** (inside tool holding spindle, i.e. point of load incidence within the housing, therefore low leverage)
- **Bevel gear sets with helical profile**
- **Permanent lubrication** of the gear with heavy-duty lubricant (low-maintenance)
- Possibilities for **coolant supply**:
 - **without**
 - **external** via coolant pipe
 - **internal** via the tool holding spindle („i.K.“ – package with packing sleeves, hardened upthrust washer, friction-optimized seals and various O-rings)
- Use of **friction-optimized** seals with PTFE sealing lips, for higher speeds, high temperature resistance
- **Output orientation is fully adjustable** (0–360° via the 6 setscrews on the adjusting ring)
- **Angle head can be rotated through 360° and is infinitely variable** – additional 6 x 15° indexations for adjustable angle units
- High speeds up to 15,000 rpm and high torques up to 150 Nm
- The **torque support is designed according to ISO 9524 as standard**. This can be adapted by the customer
- Different **standard stop block** versions are available. If necessary, these are to be adapted and fitted to the machine tool by the customer.



Performance Values

The torques M_{\max} specified in the tables below refer to shock-free processing (e.g. threaded cutting). For processes involving major shock loads (e.g. milling or multi-edge knocking), a value reduction of up to 50 % and more needs to be taken into account. The values n_{\max} and P_{\max} rendered are guideline values for short-time operation.

The permissible relative operating duration depends

- on the version of the spindle unit (with or without gear)
- on the presence of a cooling system and the type of cooling (external or internal through the tool spindle)
- on the processing torque

At a charge of about 60 % of the maximum values the working life calculated amounts to approx. 2.000 hours. Spindle units with gears produce more noise at higher speeds!

Operating Instructions

Initial Start-up: To ensure long tool life it is important to properly "run-in" the tools. This procedure serves to reduce the internal friction in the driven unit and to evenly distribute the grease in the precision bearings.

- **Max. RPM in the first operation hour should not exceed 70 % of the maximum permissible RPM.**
- **Never run the tool above the maximum permissible torque rate and/or maximum permissible RPM (see also the drawing of the unit).**

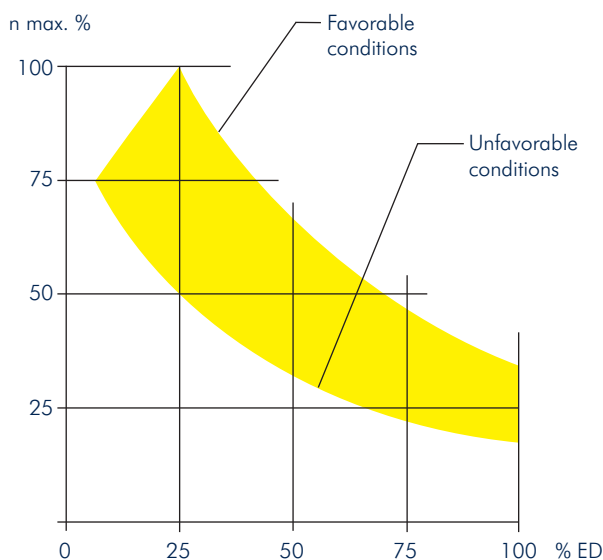
Tools with internal coolant through the spindle (i.C.): To avoid premature wear and damage to the seal system we recommend to filter the coolant to 40 μm minimum.

Filter grades of 40 μm worked in operation with very good results. The maximum permissible coolant pressure can be taken from the technical data of the driven toolholder.

Driven Toolholders with internal coolant through the spindle (i.C.) should **never run without coolant**. The coolant should flow through the tool, before the tool drive is switched on. Running in dry condition damages the internal seals.

Service interval: The tool life of the driven toolholder depends strongly on the application. Wear parts such as bearings and seals should be exchanged. We recommend to send the tools at least once annually to our service center for cleaning and regreasing. Tools with internal coolant through the spindle should be serviced every 6 months.

Optimum relative cycle times (guideline values)



Determination of the maximum permissible cycle times per minute ED_{\max}

The maximum permissible cycle times per minute may not be under any circumstances exceeded.

CT max: maximum permissible cycle times in percent per minute (%/min.)

Features of the Standard Angle Heads

- **Extremely precise Bearing Technology**
- **High Concentricity**
- **High Rigidity**

mimatic® angle heads are designed in such a way that they increase the quality of your workpieces and the service life of your tools.

