

POLY[©]turn

Polygon turning





PEOPLE

Cooperate in fair partnership



AMBITION

Question yesterday to provide new solutions for today and tomorrow



SYNERGY

Share our strength

Corporate philosophy

PEOPLE – AMBITION – SYNERGY

These 3 components are the foundation for the success of MAS GmbH.

Trust the experts with more than 40 years of experience in cutting technologies. The specialists with the most modern equipment for the development, design and manufacture of tools. The partners who discover synergies between man and technology and who are able to harness them for your success.

The utmost objective of every project is our customers' and partners' success. Our own success goes hand in hand.

This is and will remain our guide for the future!





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POLY[®]turn

Benefits and features

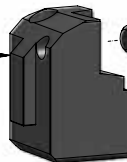
- Polygon turning method to produce two-, four-, six-, and eight-sided wrench flats on turned parts.
- For use on single-spindle or multiple-spindle lathes in plain turning or in grooving with driven tools.
- Modular tool concept.
- The base bodies are made of heavy metal, and reduce stress on the machine drive with the help of a large flywheel mass and vibration dampening.
- Adjustable cartridge types for different indexable insert geometries and shapes.
- Base bodies are designed for left-hand and right-hand cartridge types. The cartridge diameter is adjustable for producing precise wrench flats.
- Compatible with ISO indexable inserts. Cartridges can be fitted with either MAS-SPHT inserts (preferable) or with ISO indexable inserts, thus offering a large selection of types.
- Can be used in steels, stainless steel grades or non-ferrous metals.
- Shorter cycle times with improved surface finishes and prolonged tool service life.

Schematic structure

Cutting insert
see page 23



Cartridge
see page 20
clamping screw incl.



WSP clamping screw



Cartridge



Set screw

Toolholder
clamping screw + clamping wedge incl.

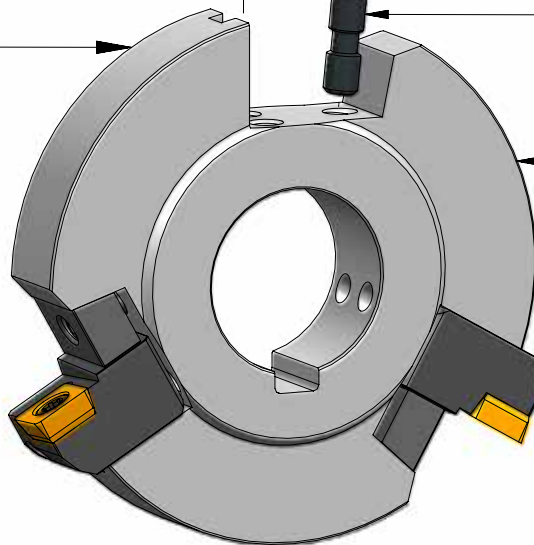


Clamping wedge



Clamping screw

Toolholder



POLY[®]turn base bodies

Overview

Machine	Type	Order number	Tool holding fixture / hole	Z	Material	Adapter	Stock	P.
Universal	-----	PT22-D90H-Z3	Ø22	3	Heavy metal	-	●	8
		PT22-D90H-Z4	Ø22	4	Heavy metal	-	○	8
		PT27-D90H-Z2	Ø27	2	Heavy metal	-	●	8
		PT27-D90H-Z3	Ø27	3	Heavy metal	-	●	8
		PT27-D90H-Z4	Ø27	4	Heavy metal	-	●	8
		PT27-D90S-Z2	Ø27	2	Steel	-	●	8
		PT27-D90S-Z3	Ø27	3	Steel	-	●	8
		PT27-D90S-Z4	Ø27	4	Steel	-	○	8
Universal/ GND	-----	PT27-D90S-Z3-GND-3	Ø27	3	Steel	-	●	10
		PT27-D90S-Z3-GND-4	Ø27	3	Steel	-	●	10
		PT27-D90S-Z3-GND-5	Ø27	3	Steel	-	●	10
NEW Index	MS25	PT16-D70H-Z3	Ø16	3	Heavy metal	-	●	8
		PT16-D70S-Z3	Ø16	3	Steel	-	○	8
	MS16	PTIX-D70S-Z2-KK32	KK32	2	Steel	-	●	12
		PTIX-D70S-Z3-KK32	KK32	3	Steel	-	●	12
	MS16/MS16 PLUS grooving slide	PT27P-D90H-Z3	Ø27	3	Heavy metal	-	●	13
		PT27P-D90H-Z4	Ø27	4	Heavy metal	-	●	13
	MS18/22/32/40	PTIX-D90H-Z3-KK32	KK32	3	Heavy metal	-	●	12
		PTIX-D90H-Z4-KK32	KK32	4	Heavy metal	-	●	12
		PTIX-D90S-Z4-KK32	KK32	4	Steel	-	○	12
	MS52	PTIX-D90H-Z3-D32	Ø32	3	Heavy metal	✓	●	11
PTIX-D90H-Z4-D32		Ø32	4	Heavy metal	✓	●	11	
Schütte	SG18 S36PC SF26,-S,-L SE18 AF26,32	PTSC-D98H-Z3L	α 5°42'38"	3	Heavy metal	-	●	17
		PTSC-D98H-Z4L	α 5°42'38"	4	Heavy metal	-	○	17
		PTSC-D98S-Z3L	α 5°42'38"	3	Steel	-	●	17
		PTSC-D98S-Z4L	α 5°42'38"	4	Steel	-	○	17
		PTSC-D98H-Z6L	α 5°42'38"	6	Heavy metal	-	○	17
	SCx-32, SCx-46 S36PC, A36PC S51PC, SF26SD SF32/-42/-51/-67, AF42	PTSC-D118H-Z3L	α 5°42'38"	3	Heavy metal	-	●	17
		PTSC-D118H-Z4L	α 5°42'38"	4	Heavy metal	-	●	17
		PTSC-D118S-Z3L	α 5°42'38"	3	Steel	-	○	17
Gildemeister	GM20-6 GM35-6 GM35-8 GMC35 GM42-6	PTGI-D98H-Z3L	α 8°32'	3	Heavy metal	-	●	18
		PTGI-D98H-Z4L	α 8°32'	4	Heavy metal	-	○	18
		PTGI-D98S-Z3L	α 8°32'	3	Steel	-	●	18
		PTGI-D98S-Z4L	α 8°32'	4	Steel	-	○	18
		PTTO-D86S-Z3L	α 8°16'33"	3	Steel	-	●	18
		PTTO-D86S-Z4L	α 8°16'33"	4	Steel	-	●	18
		PTTO-D86H-Z3L	α 8°16'33"	3	Heavy metal	-	●	19
Tornos	MultiDeco Multisigma 8/24 Multisigma 8/28	PTTO-D86H-Z4L	α 8°16'33"	4	Heavy metal	-	○	19
		PTTO-D86S-Z3L	α 8°16'33"	3	Steel	-	●	19
		PTTO-D86S-Z4L	α 8°16'33"	4	Steel	-	●	19
		PTTO-D86H-Z4L	α 8°16'33"	4	Steel	-	●	19

● Also available on request for other machine manufacturers

● in stock

○ on request

POLY[®]turn adapters

Universal to INDEX

Machine	Type	Order number	Tool holding fixture / hole	Shank	Material	Stock	Page
Index	MS18/22/32/40	PTIX-A-KK32-D22	KK32	Ø22	Steel	●	14
		PTIX-A-KK32-D27		Ø27		●	14
	MS52	PTIX-A-C3-D27	Capto C3	Ø27		●	15
		PTIX-A-C3-D32		Ø32		●	16

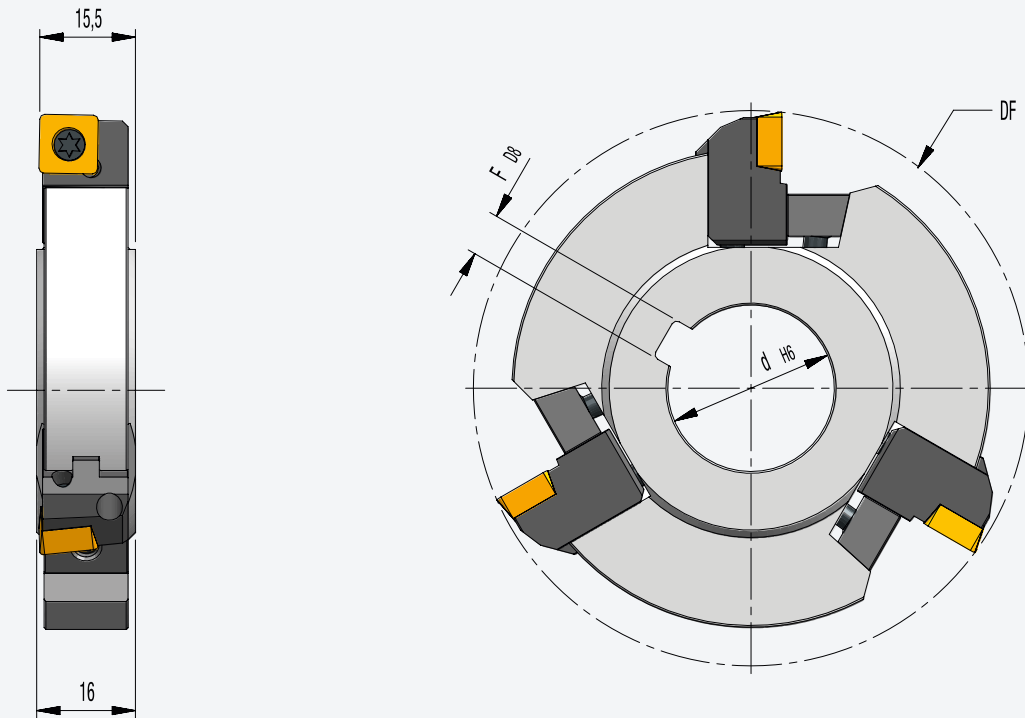
● in stock ○ on request



POLY[®]turn base bodies

Universal

With cylindrical locating hole



Cartridges are shown for illustration only and are not included in the scope of supply.

Order number	D_F	d_{H6}	F_{D8}	Edge number	Machine type	Stock
PT16-D70H-Z3 *	70	16	4	3	INDEX MS25	●
PT16-D70S-Z3	70	16	4	3	Universal	○
PT22-D90H-Z3	90	22	6	3	INDEX MS22/ 32/40/42/ABC Universal	●
PT22-D90H-Z4	90	22	6	4		○
PT27-D90H-Z2	90	27	7	2		●
PT27-D90H-Z3	90	27	7	3		●
PT27-D90H-Z4	90	27	7	4		●
PT27-D90S-Z2	90	27	7	2		●
PT27-D90S-Z3	90	27	7	3		●
PT27-D90S-Z4	90	27	7	4		●

* can only be used with cartridge L-24 and L-25

● in stock ○ on request

Order number	Spare parts
100-203	Clamping screw
3-20-0754-202	Clamping wedge

- Dimensions in mm
- Other dimensions on request
- Cartridge types on page 20
- Cartridges not included in scope of supply

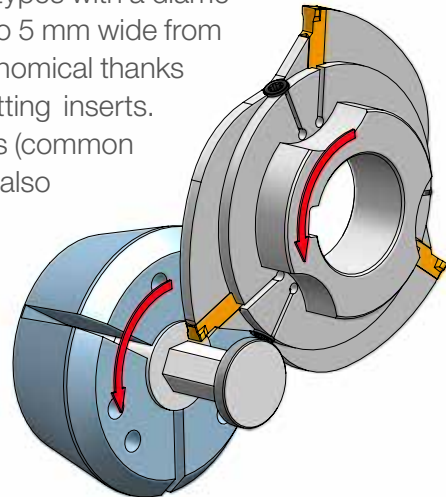
POLY[®]turn base bodies

Universal

Explanation of the GND grooving system

Economic POLY[®]turn turning tools with standard grooving and turning inserts

Our POLY[®]turn polygon turning tools are now available as types with a diameter of 90 mm with standard grooving and turning inserts 3 to 5 mm wide from the Sumitomo GND series. These tools are particularly economical thanks to the two useful cutting edges of the carbide metal cutting inserts. They are especially suitable for grooving standard hexagons (common spanner sizes) at grooving depths up to 12 mm. They can also be widely used for plain and copy turning of different polygons and for machining behind a collar. This provides a wide range of carbide metal grades and cutting geometries in the Sumitomo standard program in a cost-efficient manner and within the shortest possible time.



Insert selection: Sumitomo grooving and turning inserts

Insert type GCM

Grooving/turning	Series/ shape	Designation	Coated carbide metal				Dimensions (mm)					Pcs./ pack.
			AC830P	AC425K	AC520U	AC530K	W		r_e	ℓ	S	
							Grooving width	Tolerance				
	MG General type 	GCM N3004 MG	●	●	○	●	3.0	±0.03	0.4	21.1	3.8	5
		GCM N4008 MG	●	●	○	●	4.0	±0.03	0.8	26.4	4.0	
		GCM N5008 MG	●	●	○	●	5.0	±0.03	0.8	26.4	4.1	
	ML Low feed type w = 4.0mm w = 5.0mm 	GCM N3002 ML	●	●	○	●	3.0	±0.03	0.2	21.1	3.8	5
		GCM N4004 ML	●	●	○	●	4.0	±0.03	0.4	26.4	4.0	
		GCM N5004 ML	●	●	○	●	5.0	±0.03	0.4	26.4	4.1	

● Euro stock ○ Japan stock

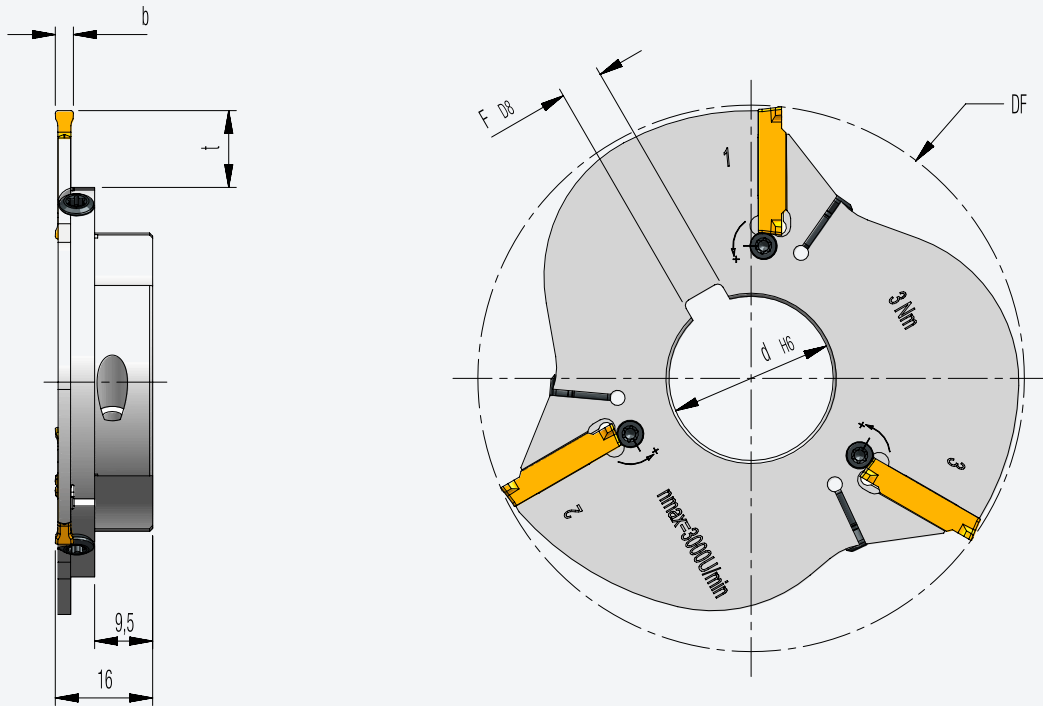
- For further grooving inserts, please refer to the Sumitomo general catalog
- Please contact MAS regarding these tools and check of tolerance

POLY[®]turn base bodies

Universal/ GND grooving

NEW

With cylindrical locating hole



Anti-clockwise rotation!

● Adjustable via excenter

Order number	b	f	D _F	d _{H6}	F _{D8}	Edge number	Machine type	Stock
PT27-D90S-Z3-GND-3	3	12	90	27	7	3	INDEX MS22/	●
PT27-D90S-Z3-GND-4	4	12	90	27	7	3	32/40/42/ABC	●
PT27-D90S-Z3-GND-5	5	12	90	27	7	3	Universal	●

● in stock ○ on request

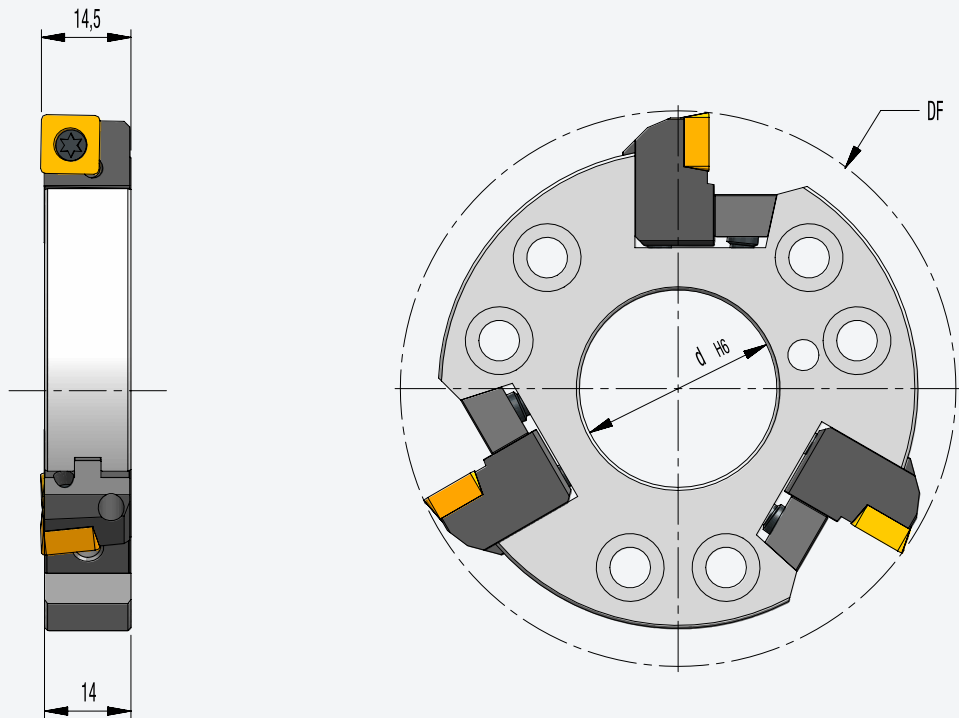
Order number	Spare parts
24444	WSP clamping screw M4x10 Tx 15/3,5 Nm
EXZ-E18764	Eccentric pin Ø4,2g6 with TORX TX10

- Dimensions in mm
- Other dimensions on request

POLY[®]turn base bodies

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For MS 52 with CAPTO C3 drive



Cartridges are shown for illustration only and are not included in the scope of supply.

Order number	DF	d _{H6}	Edge number	Machine type	Stock
PTIX-D90H-Z3-D32	90	32	3	MS52	●
PTIX-D90H-Z4-D32	90	32	4		●

● in stock ○ on request

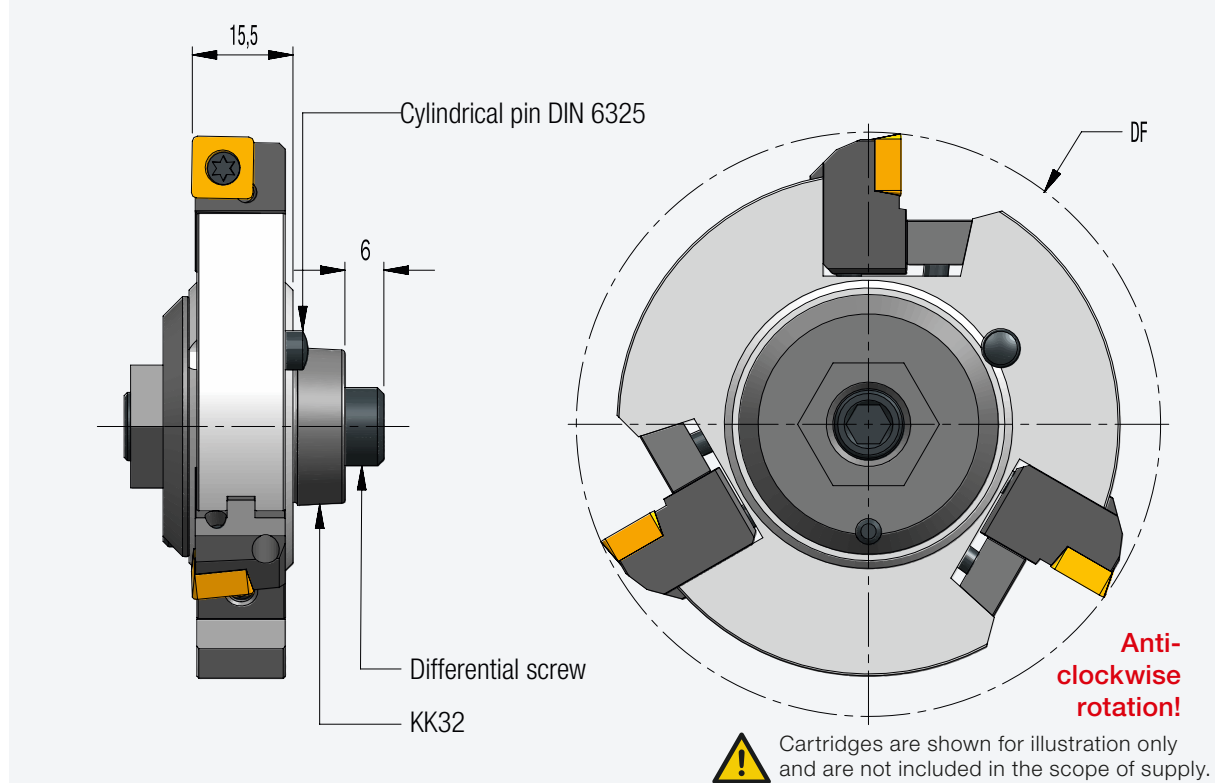
Order number	Spare parts
100-203	Clamping screw
3-20-0754-202	Clamping wedge

- Dimensions in mm
- Other dimensions on request
- Capto adapter on page 15 and 16
- Cartridge types on page 20
- Cartridges not included in scope of supply

POLY[®]turn base bodies

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With short-taper holder



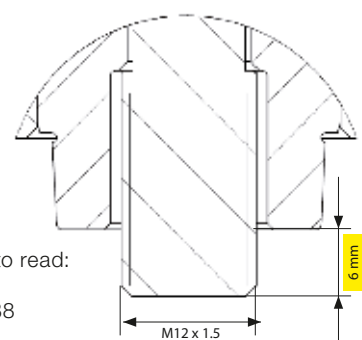
Order number	DF	d _{H6}	Edge number	Machine type	Stock
PTIX-D70S-Z2-KK32	70	KK32	2	MS16	●
PTIX-D70S-Z3-KK32	70	KK32	3	MS16	●
PTIX-D90H-Z3-KK32	90	KK32	3	MS18,22,32,40	●
PTIX-D90H-Z4-KK32	90	KK32	4		●
PTIX-D90S-Z4-KK32	90	KK32	4		○

● in stock ○ on request

Order number	Spare parts for Ø70	Order number	Spare parts for Ø90
100-203	Clamping screw	100-203	Clamping screw
3-20-0754-202	Clamping wedge	3-20-0754-202	Clamping wedge
E5735 M12 x1-M12 x1,5	Differential screw	F21939 M12 x1-M12 x1,5	Differential screw

- Dimensions in mm
- Other dimensions on request
- Cartridge types see page 20
- Cartridges not included in scope of supply

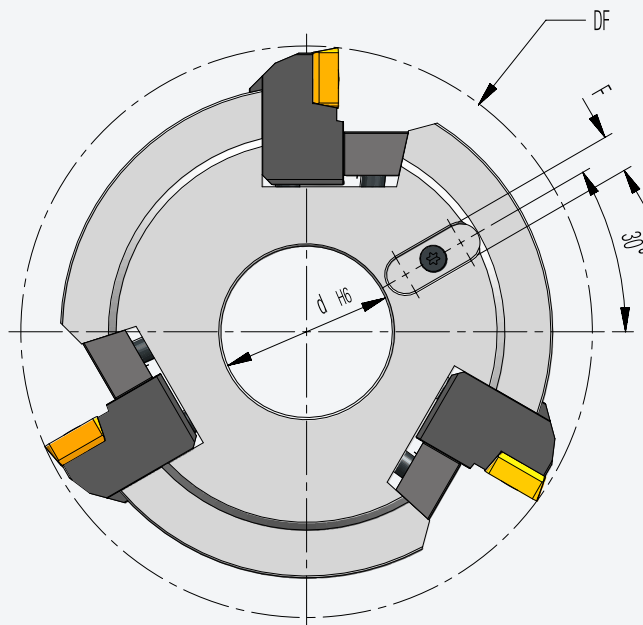
⚠ Please be sure to read:
Mounting instructions S588



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With cylindrical locating hole



Cartridges are shown for illustration only and are not included in the scope of supply.

Order number	DF	d _{H6}	Edge number	Machine type	Stock
PT27P-D90H-Z3	90	Ø27	3	MS16/MS16 PLUS	●
PT27P-D90H-Z4	90	Ø27	4	grooving slide	●

● with feather key flat side for polygon turning unit 10697466

● in stock ○ on request

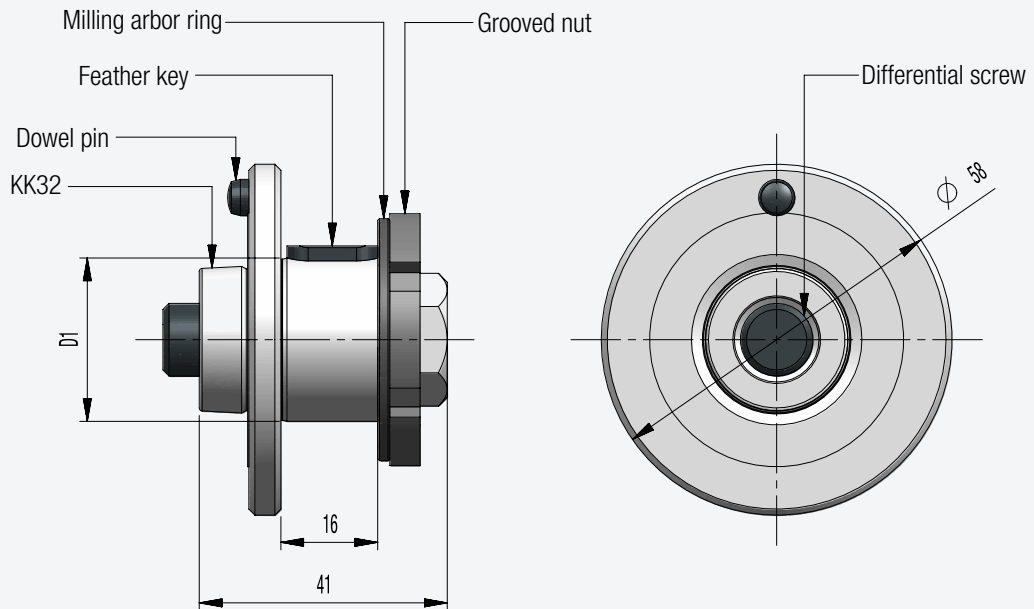
Order number	Spare parts for Ø27
3-20-0754-202	Clamping wedge (4x)
100-203	Clamping screw
PSF-S1509 with screw	Parallel key

- Dimensions in mm
- Other dimensions on request
- Cartridge types see page 20
- Cartridges not included in scope of supply

Short-taper adapter

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For cylindrical fixture $\varnothing 22$ and $\varnothing 27$



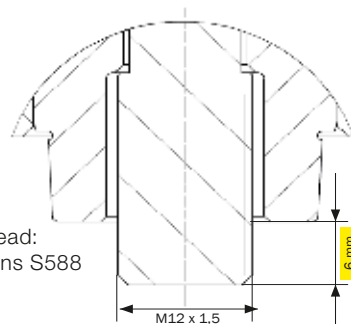
Adapter	Cylindrical fixture D1	Machine type	Stock
PTIX-A-KK32-D22	$\varnothing 22$ h6	MS 18, 22, 32, 40	●
PTIX-A-KK32-D27	$\varnothing 27$ h6		●

● in stock ○ on request

Order number	Spare parts $\varnothing 22$	Order number	Spare parts $\varnothing 27$
5-40-04167-202	Dowel pin	5-40-04167-202	Dowel pin
F21939M12x1-M12x1,5	Differential screw	F21939 M12x1-M12x1,5	Differential screw
S00001591	Milling arbor ring $\varnothing 22 \times 2$	S00001086	Milling arbor ring $\varnothing 27 \times 2$
NTM-M20x1-DIN981	Grooved nut	NTM-M24x1-DIN981	Grooved nut
PSF-S1496	Feather key	PSF-S1037	Feather key



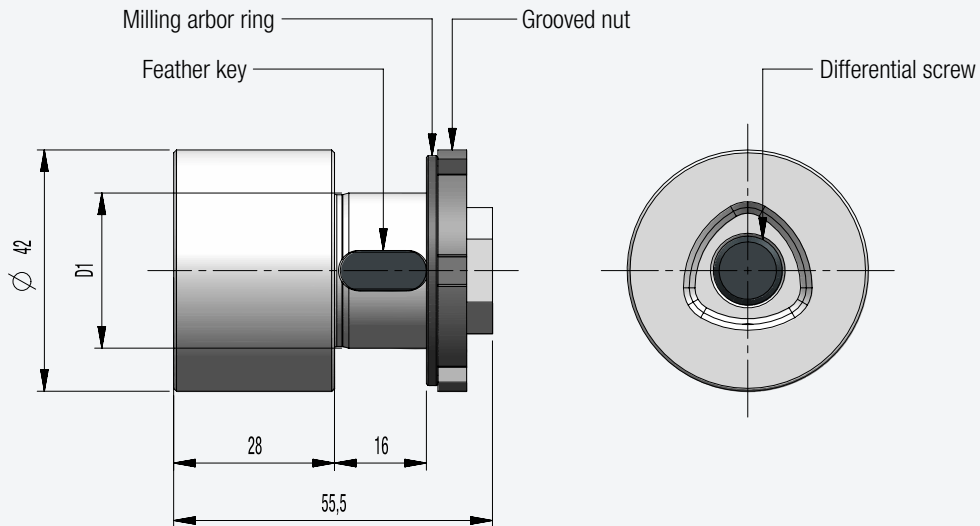
Please be sure to read:
Mounting instructions S588



CAPTO C3 adapter

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For cylindrical fixture $\varnothing 27$



Adapter	Cylindrical fixture D1	Machine type	Stock
PTIX-A-C3-D27	$\varnothing 27$ h6	MS52	<input checked="" type="radio"/>

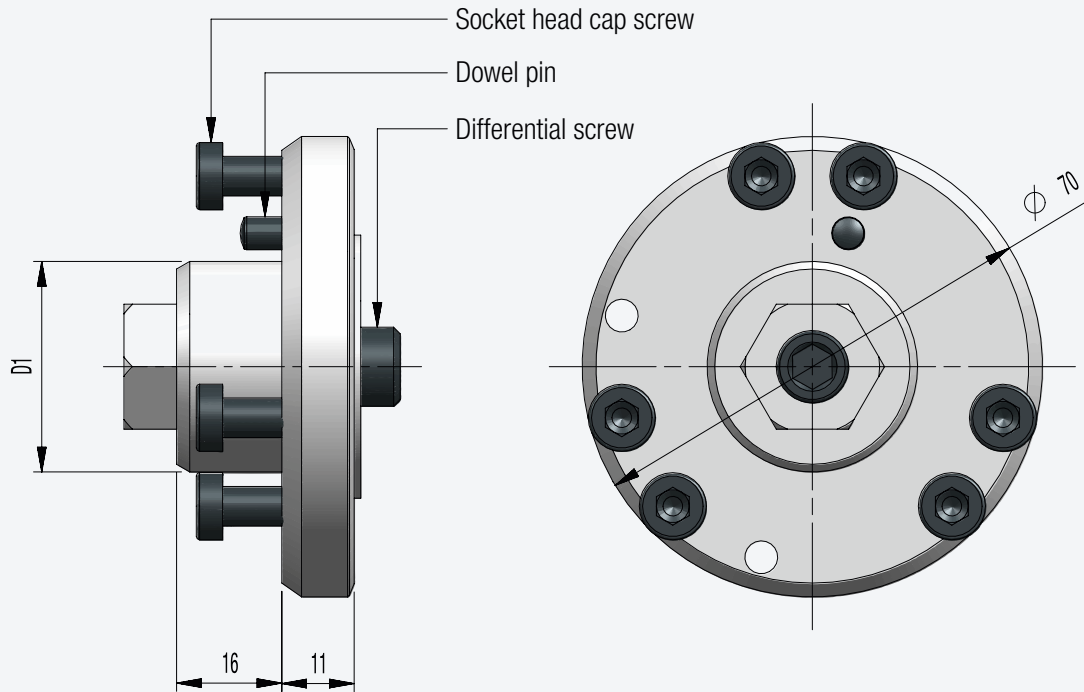
in stock on request

Order number	Spare parts
S00001084	Differential screw
PSF-S1037	Feather key
S00001086	Milling arbor ring $\varnothing 27 \times 2$
NTM-M24x1-DIN981	Grooved nut

CAPTO C3 adapter

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For cylindrical fixture $\varnothing 32$



Adapter	Cylindrical fixture D1	Machine type	Stock
PTIX-A-C3-D32	$\varnothing 32$ h6	MS52	<input checked="" type="radio"/>

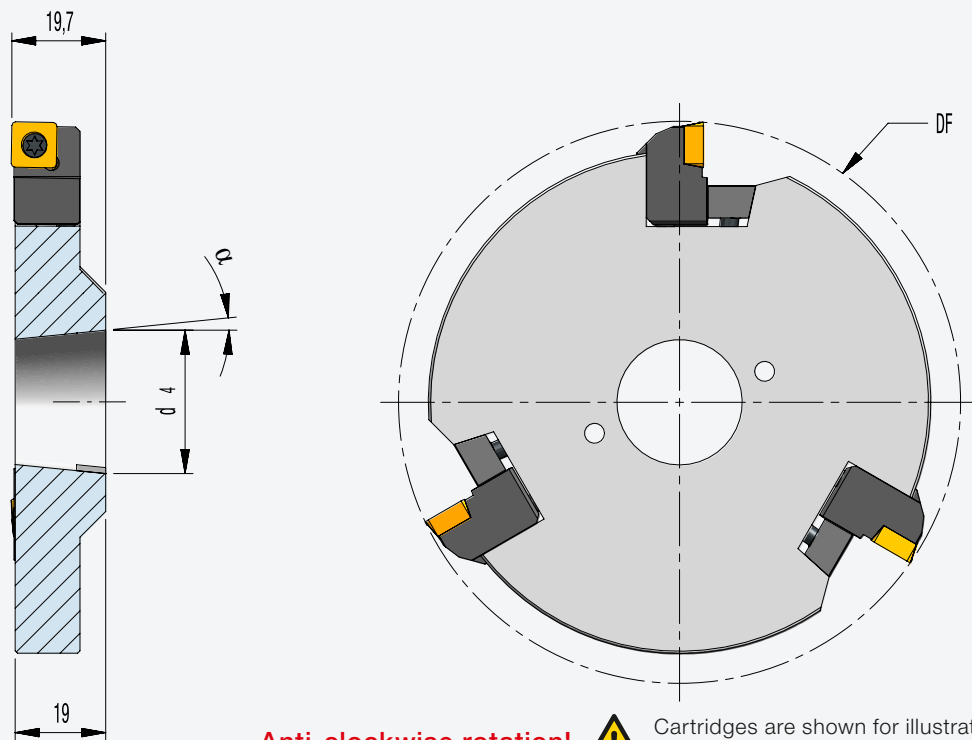
in stock on request

Order number	Spare parts
S00001084	Differential screw
5M6x12 Dowel pin DIN6325	Dowel pin
M6x20 Socket head bolt DIN6912	Socket head bolt

POLY[®]turn base bodies

SCHÜTTE

With taper holder



Anti-clockwise rotation!



Cartridges are shown for illustration only and are not included in the scope of supply.

Order number	DF	d4	α	Edge number	Machine type	Stock
PTSC-D98H-Z3L	98	30.1	5°42'38"	3	SG18 S36PC	●
PTSC-D98H-Z4L	98	30.1	5°42'38"	4		○
PTSC-D98H-Z6L	98	30.1	5°42'38"	6	SF26,-S,-L	○
PTSC-D98S-Z3L	98	30.1	5°42'38"	3	SE18	●
PTSC-D98S-Z4L	98	30.1	5°42'38"	4	AF26-/32	○
PTSC-D118H-Z3L	118	30.1	5°42'38"	3	SCx-32, SCx-46, S36PC, A36PC, S51PC, SF26SD	●
PTSC-D118H-Z4L	118	30.1	5°42'38"	4		●
PTSC-D118S-Z3L	118	30.1	5°42'38"	3		●

● in stock ○ on request

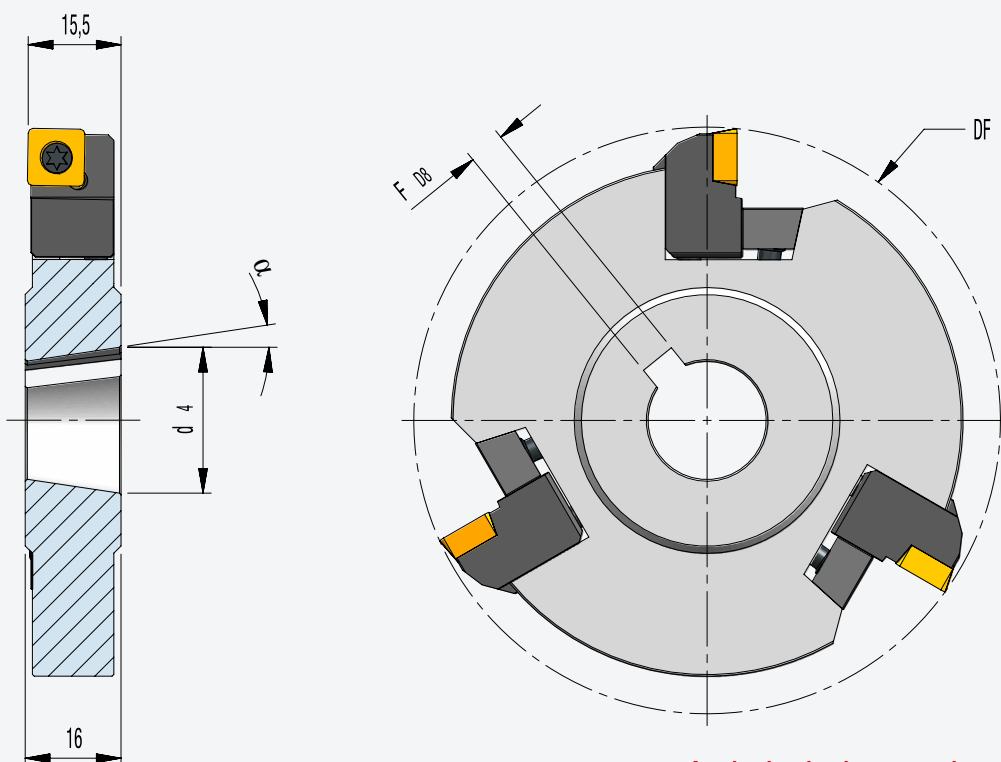
Order number	Spare parts
100-203	Clamping screw
3-20-0754-202	Clamping wedge

- Dimensions in mm
- Other dimensions on request
- Cartridge types on page 20
- Cartridges not included in scope of supply

POLY[®]turn base bodies

GILDEMEISTER

With taper holder



Anti-clockwise rotation



Cartridges are shown for illustration only and are not included in the scope of supply.

Order number	DF	F ₀₈	d4	α	Edge number	Machine type	Stock
PTGI-D98H-Z3L	98	6	24.1	8°32'	3		●
PTGI-D98H-Z4L	98	6	24.1	8°32'	4	GM20-6	○
PTGI-D98S-Z3L	98	6	24.1	8°32'	3	GM35-6	●
PTGI-D98S-Z4L	98	6	24.1	8°32'	4	GM35-8	○
PTTO-D86S-Z3L	86	6	24.1	8°16'33"	3	GMC35	●
PTTO-D86S-Z4L	86	6	24.1	8°16'33"	4	GM42-6	●

● in stock ○ on request

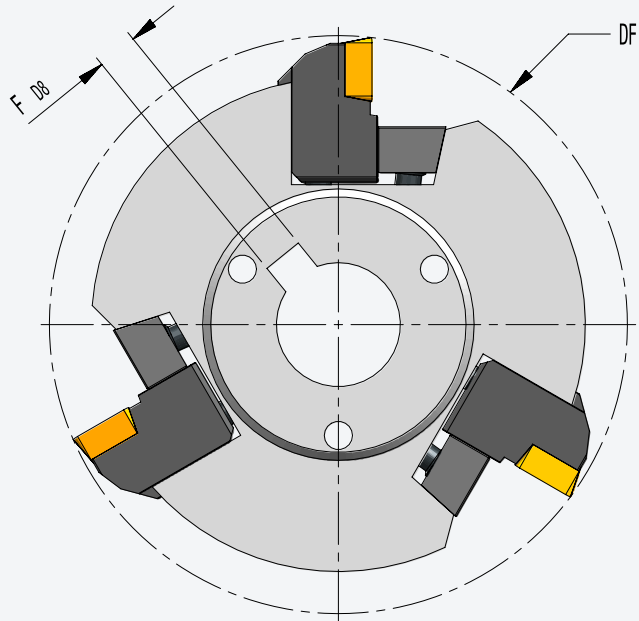
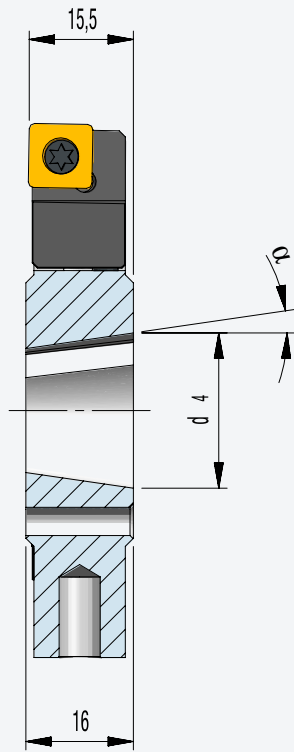
Order number	Spare parts
100-203	Clamping screw
3-20-0754-202	Clamping wedge

- Dimensions in mm
- Other dimensions on request
- Cartridge types on page 20
- Cartridges not included in scope of supply

POLY[®]turn base bodies

TORNOS

With taper holder



Anti-clockwise rotation



Cartridges are shown for illustration only and are not included in the scope of supply.

Order number	DF	F ₀₈	α	Edge number	Machine type	Stock
PTTO-D86H-Z3L	86	6	8°16'33"	3	Tornos Multi-Deco Multisigma 8/24 Multisigma 8/28	●
PTTO-D86H-Z4L	86	6	8°16'33"	4		○
PTTO-D86S-Z3L	86	6	8°16'33"	3		●
PTTO-D86S-Z4L	86	6	8°16'33"	4		●

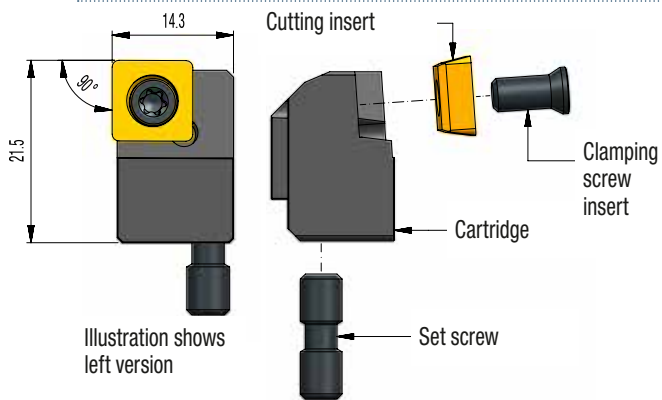
● in stock ○ on request

Order number	Spare parts
100-203	Clamping screw
3-20-0754-202	Clamping wedge

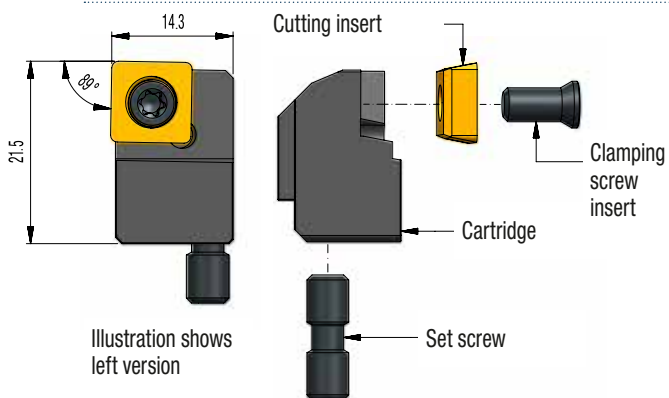
- Dimensions in mm
- Other dimensions on request
- Cartridge types on page 20
- Cartridges not included in scope of supply

Accessories and information

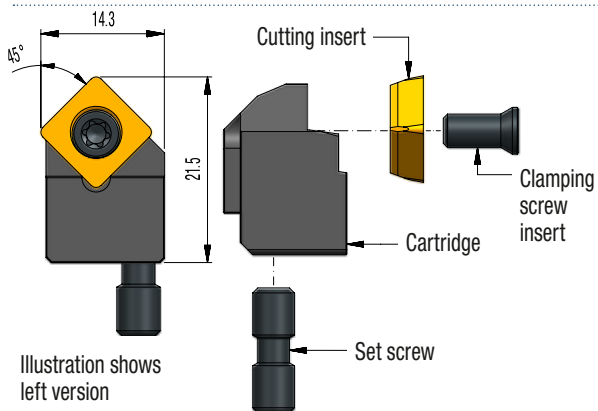
POLY[®]turn cartridge types



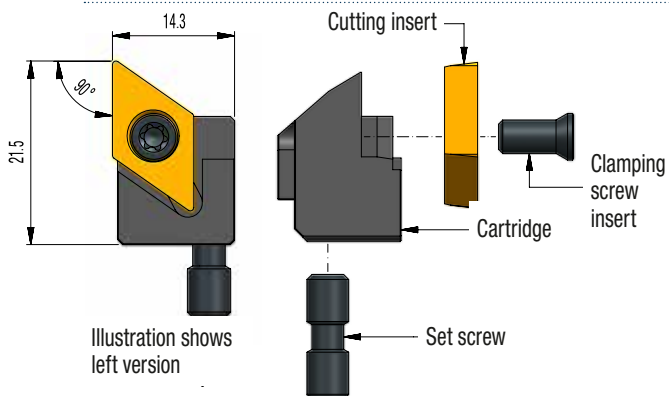
L-23 / R-23	
Order number	L-23 / R-23
Indexable insert	SPHT09T3...
Adjusting screw	100-203
Indexable insert clamping screw	(24444) Torx15/3.5 Nm M4x10



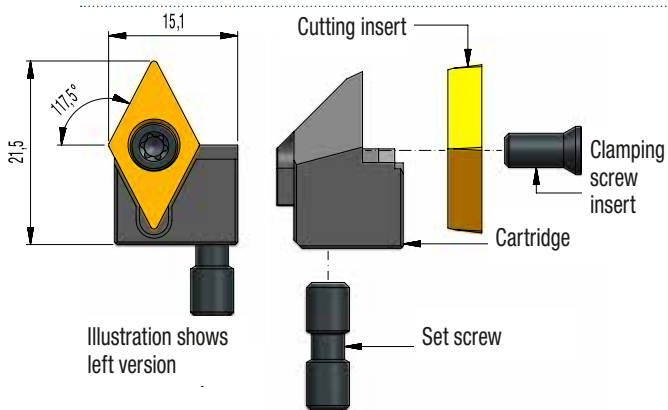
L-21 / R-21	
Order number	L-21 / R-21
Indexable insert	SPHT09T3...
Adjusting screw	100-203
Indexable insert clamping screw	(24444) Torx15/3.5 Nm M4x10



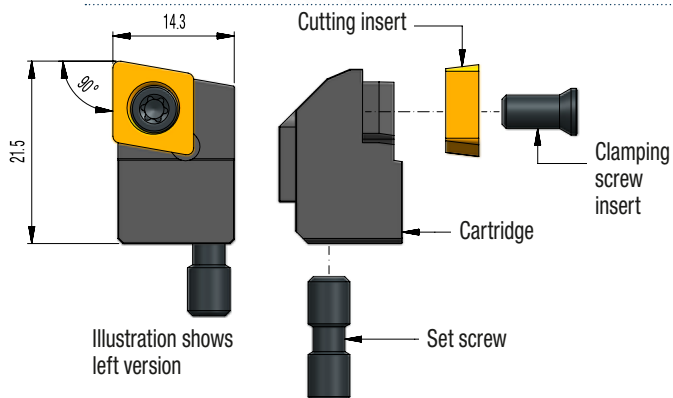
L-05	
Order number	L-05
Indexable insert	SPHT09T3...
Adjusting screw	100-203
Indexable insert clamping screw	(24444) Torx15/3.5 Nm M4x10



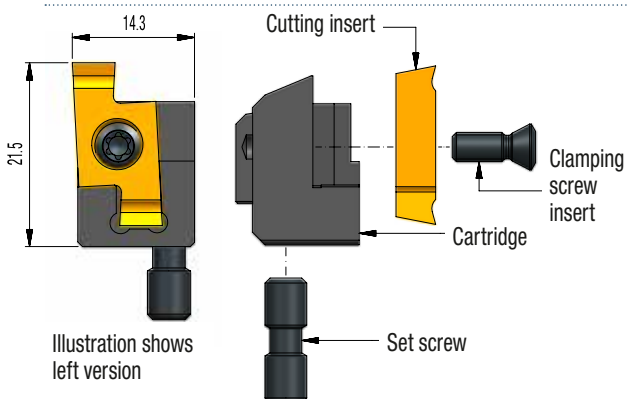
L-01 / R-01	
Order number	L-01 / R-01
Indexable insert	DC..11T3...
Adjusting screw	100-203
Indexable insert clamping screw	(24444) Torx15/3.5 Nm M4x10



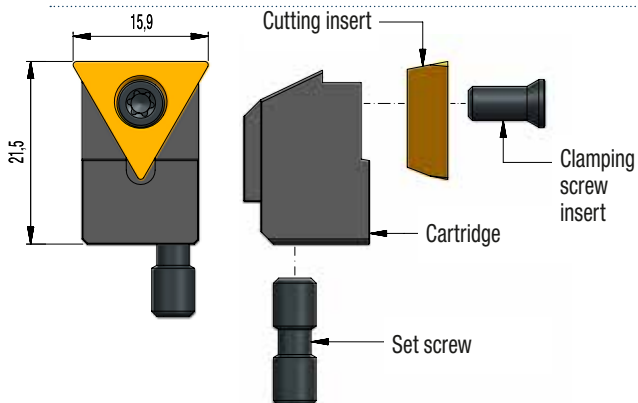
L-12 / R-12	
Order number	L-12 / R-12
Indexable insert	DC..11T3...
Adjusting screw	100-203
Indexable insert clamping screw	(24444) Torx15/3.5 Nm M4x10



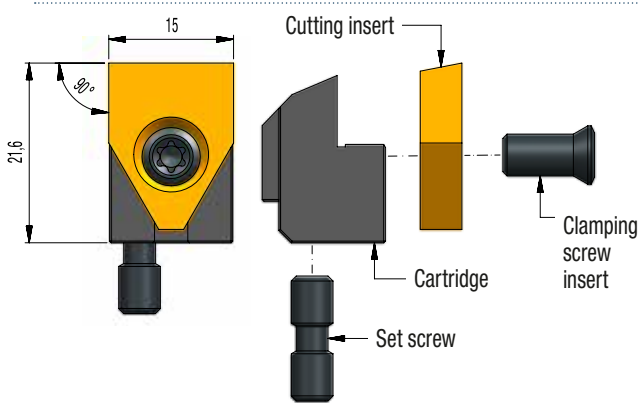
L-06 / R-06	
Order number	L-06 / R-06
Indexable insert	CC...09T3...
Adjusting screw	100-203
Indexable insert clamping screw	(24444) Torx15/3.5 Nm M4x10



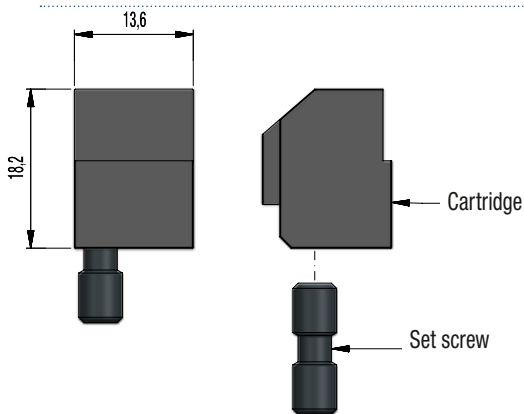
L-02 / R-02	
Order number	L-02 / R-02
Indexable insert for L-02:	LAEX1904E 5.0 R
Indexable insert for R-02:	LAEX1904E 5.0 L
Adjusting screw	100-203
Indexable insert clamping screw	KT00003-M035010 Torx15/3.5 Nm M3.5x10



N-03	
Order number	N-03
Indexable insert	TPGW160404HM20-P-E17723
Adjusting screw	100-203
Indexable insert clamping screw	(24444) Torx15/3.5 Nm M4x10



N-10	
Order number	N-10
Indexable insert	113070B15K20M
Adjusting screw	100-203
Indexable insert clamping screw	BFTX0511N

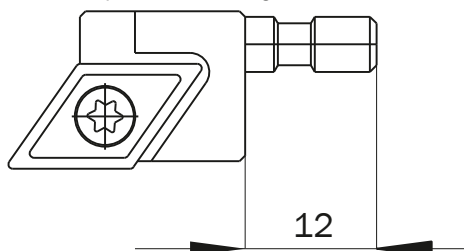


B-01 dummy cartridge	
(for balancing)	
Order number	B-01
Adjusting screw	100-203

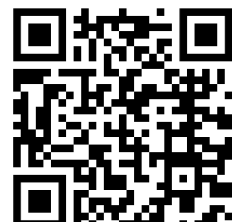
• Other cartridge types on request



When the cartridges are mounted, the adjusting screw has to be preset to the length of 12 mm



Please see our video tutorial on YouTube:
www.youtube.com/watch?v=a9slcVWDymc



Accessories and information

POLY[®]turn cutting inserts

Order number	r	Carbide metal coated					ZX-coated		TiAlN-coated		HM
		ACP200 P	ACP300 P	ACZ330 M	ACM300 M	ACZ310 K	AC530U P/M	C38 P	C38 M	N	
SPHT 09T3 0401	0.4	●	●		●	●	●	●			
SPHT 09T3 0801	0.8	●	●	●	●	●	●	●			
DCGT 11T30 2 MNSC	0.2						●	●			
DCGT 11T30 4 MNSC	0.4						●	●			
DCGT 11T30 8 MNSC	0.8						●	●			
DCMT 11T30 2 NSU	0.2						●	●			
DCMT 11T30 4 NSU	0.4						●	●			
DCMT 11T30 8 NSU	0.8						●	●			
CCGT 09T30 2 MNSC	0.2						●	●			
CCGT 09T30 4 MNSC	0.4						●	●			
CCGT 09T30 8 MNSC	0.8						●	●			
CCMT 09T30 2 NSU	0.2						●	●			
CCMT 09T30 4 NSU	0.4						●	●			
CCMT 09T30 8 NSU	0.8						●	●			
LAEX 1904 E5.0L C38	0.0								●	●	
LAEX 1904 E5.0R C38	0.0								●	●	
LAEX 1904 04E5.0L C38	0.4								●	●	
LAEX 1904 04E5.0R C38	0.4								●	●	
LAEX 1904 E5.0L	0.0										●
LAEX 1904 E5.0R	0.0										●

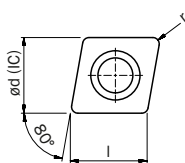
● For further indexable inserts, please refer to the Sumitomo general catalog 2018/2019

P Steel **M** Stainless Steel **K** Gray cast iron **N** Non-ferrous metals

● preferable

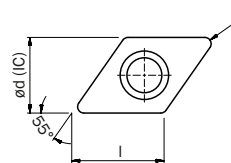
● in stock

○ on request



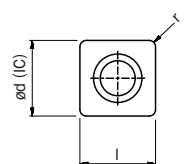
CC_T Dimensions (mm)				
CC..	l	Ød (IC)	S	d1
09T3--	9.7	9.525	3.97	4.4

- 80° rhomboid shape
- 7° clearance angle
- Hole mounting



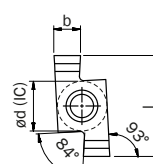
DC_T Dimensions (mm)				
DC..	l	Ød (IC)	S	d1
11T3--	11.6	9.525	3.97	4.4

- 55° rhomboid shape
- 7° clearance angle
- Hole mounting



SPHT Dimensions (mm)				
SPHT	l	Ød (IC)	S	d1
0603	6.35	6.35	3.18	2.8
09T3	9.525	9.525	3.97	4.4

- 90° square shape
- 11° clearance angle
- Hole mounting
- H tolerance



LAEX Dimensions (mm)					
LAEX	l	Ød (IC)	S	d1	b
1904	19.05	9.52	4.76	4.2	5.0

- Special shape
- 11° clearance angle
- Hole mounting

Cutting data

Recommended indexable inserts Maximum widths across flats Recommended cutting data	Non-ferrous metals	Low-strength steels (9SMnPb28K)	High-strength steels (42CrMoS4V)
Vc in m/min	500 – 1000	200 – 500	150 – 250
Rate of feed f in mm per rev. ⁽²⁾	0.08 – 0.2	0.08 – 0.2	0.08 – 0.15
Recommended indexable insert for adapter L-23/R-23	SPHT09T30401 AC530U	SPHT09T30401 AC530U	SPHT09T30401 AC530U
Recommended indexable insert for adapter L-02/R-02	LAEX 1904 E 5.0 R/L K20 ⁽²⁾	LAEX 1904 E 5.0 R/L C38	LAEX 1904 E 5.0 R/L C38
Recommended indexable insert for adapter N-03	TPGW 160404 G10E ⁽²⁾	Unsuitable for parting and grooving	Unsuitable for parting and grooving
Maximum width across flats with POLY©turn Ø90mm	Hexagon; A/F 36 Square; A/F 20	Hexagon; A/F 36 Square; A/F 20	Hexagon; A/F 36 Square; A/F 20
Maximum width across flats with L-02/R-02 and POLY©turn Ø90mm	Hexagon; A/F 60 Square; A/F 32	Hexagon; A/F 60 Square; A/F 32	Hexagon; A/F 60 Square; A/F 32 ⁽¹⁾

⁽¹⁾ Due to the large change of angle at the indexable insert in combination with high-strength steels, the width across flats is reduced, since otherwise the tool life of the indexable inserts and the quality of the workpieces would be impaired.

⁽²⁾ For groove turning of polygons, the rate of feed should be reduced by about 50% as a function of the width of the flats.

User example

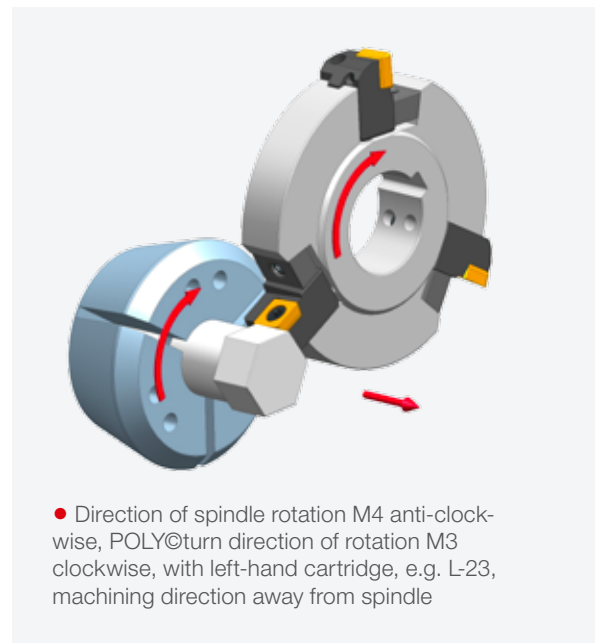
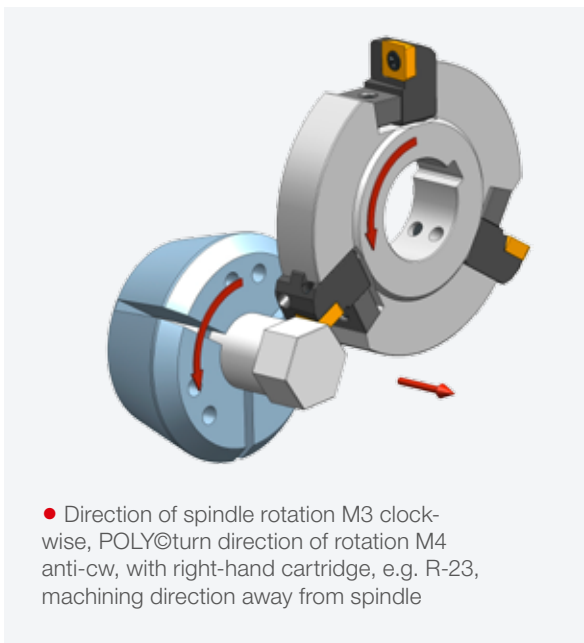
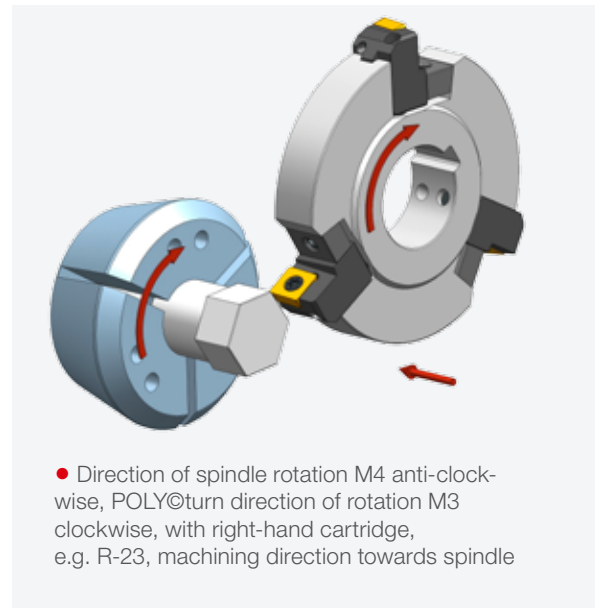
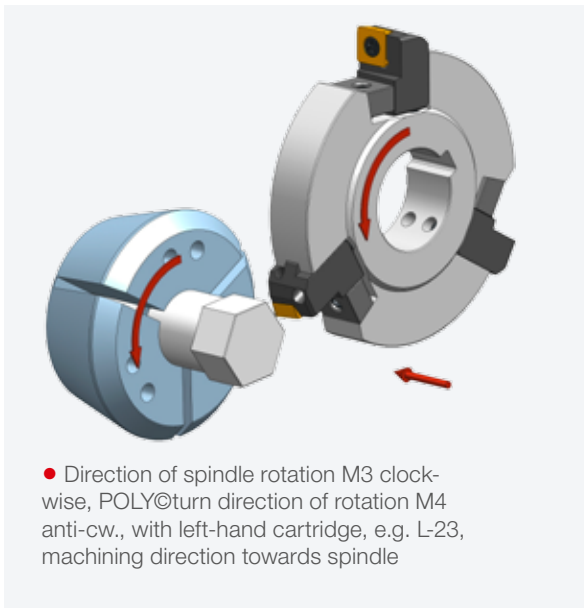
Example		
Component: flange	A/F30x9.5 - hexagon	
Machine	Index MS32C	
Material	16MnCr5	
Tensile strength	960-1100 N/mm ²	
Tool	PT27-D90H-Z3	
Cartridge	L-23	
Indexable insert	SPHT09T30801AC530U	
Cutting velocity	vc = 237 m/min	
Workpiece speed	n1 = 360 rpm	
Tool speed	n2 = 720 rpm	
Feed rate	f = 0.5 mm per rev.	

Benefits of using indexable insert SPHT instead of DCMT

- + 60 % tool life
- – 10 % machining time
- Surface finish improved from Rz36 to Rz8
- Gentler cutting and reduced stress on drive

Accessories and information

Guide for selection

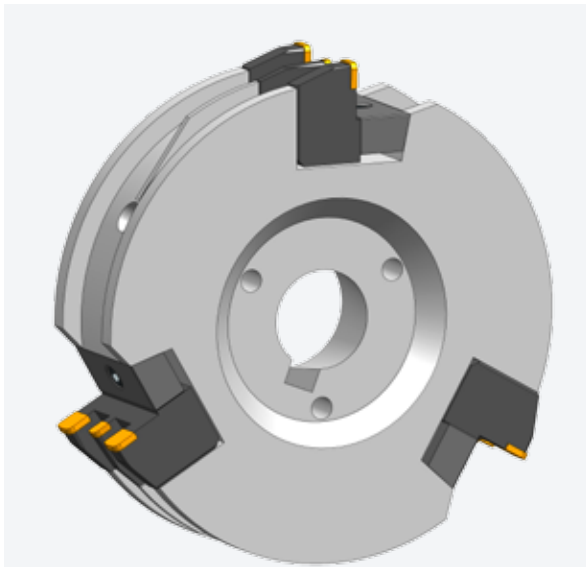


Example of calculation to determine the drive speed

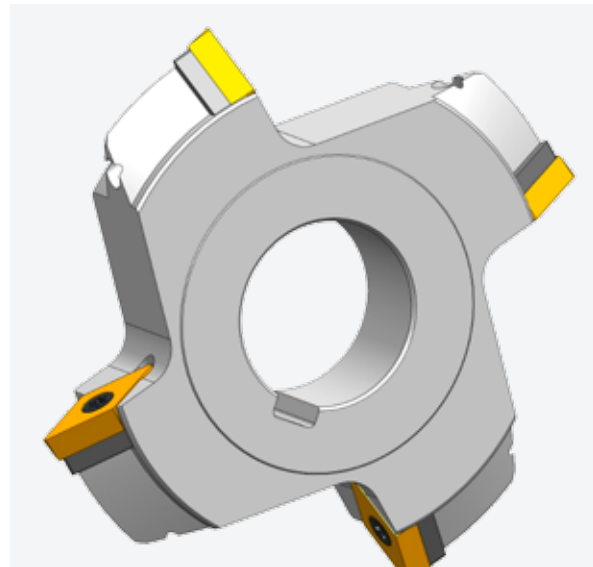
POLYturn diameter [MD]	90 mm
Width across flats [A/F]	30 mm
Cutting velocity [Vc]	237 m/min
Workpiece rotational speed [n1] HS to be calculated	360 rpm
360 cutter head speed [n2] to be calculated n1 x2	720 rpm
Formulas for speed calculation	Formulas for cutting speed calculation
$n1 = \frac{Vc \cdot 1000}{(MD \cdot 2 + A/F) \cdot \pi}$	$vc = \frac{n1 \cdot (A/F + MD \cdot 2) \cdot \pi}{1000}$
$n1 = \frac{237 \cdot 1000}{(90 \cdot 2 + 30) \cdot \pi} = 360 \text{ rpm}$	$vc = \frac{360 \cdot (30 + 90 \cdot 2) \cdot \pi}{1000} = 237 \text{ m/min}$

Accessories and information

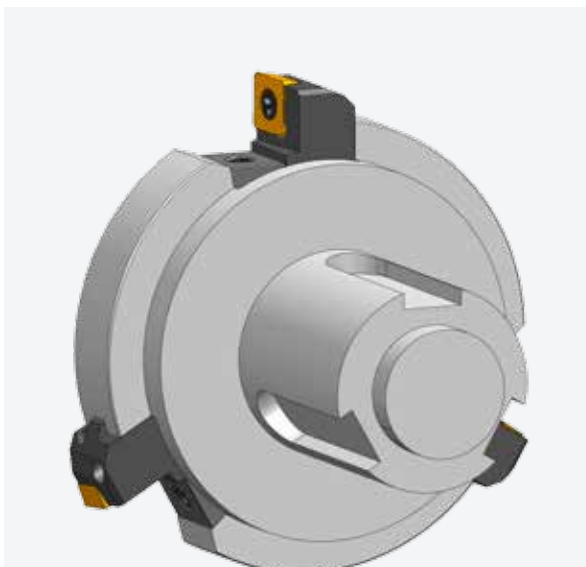
POLY[®]turn special solutions



- POLY[®]turn for inside radius cutting with PCD inserts (replaceable), for Mori-Say ZPS machine.

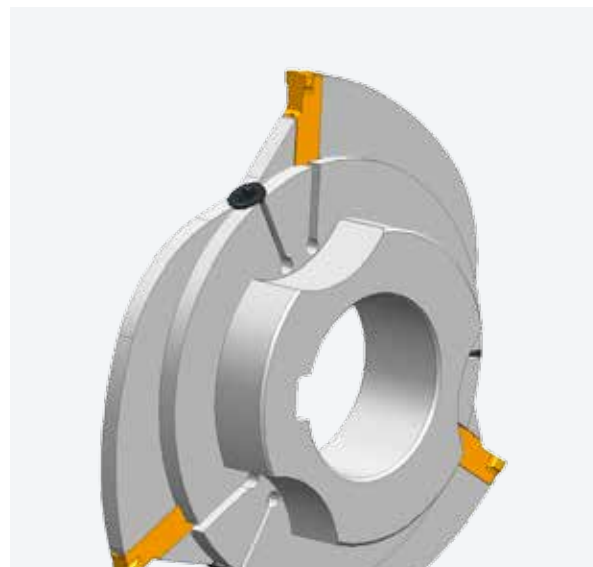


- POLY[®]turn monobloc with cylindrical fixture Z4 for inserts DCGT11T304 with carbide metal support.



- PTVX4-D90S-Z3
EWS Varia VX4

EWS
Tool Technologies



- Other grooving widths and grooving depths available.
- Grooving available.

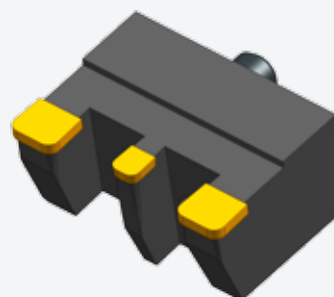
- Other special solutions available on request.

Accessories and information

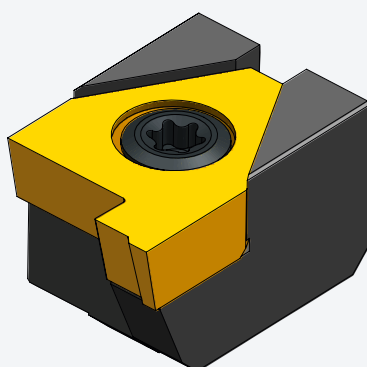
POLY[®]turn special cartridges and special inserts



- R-02 S422 cartridge
- LAEX indexable insert



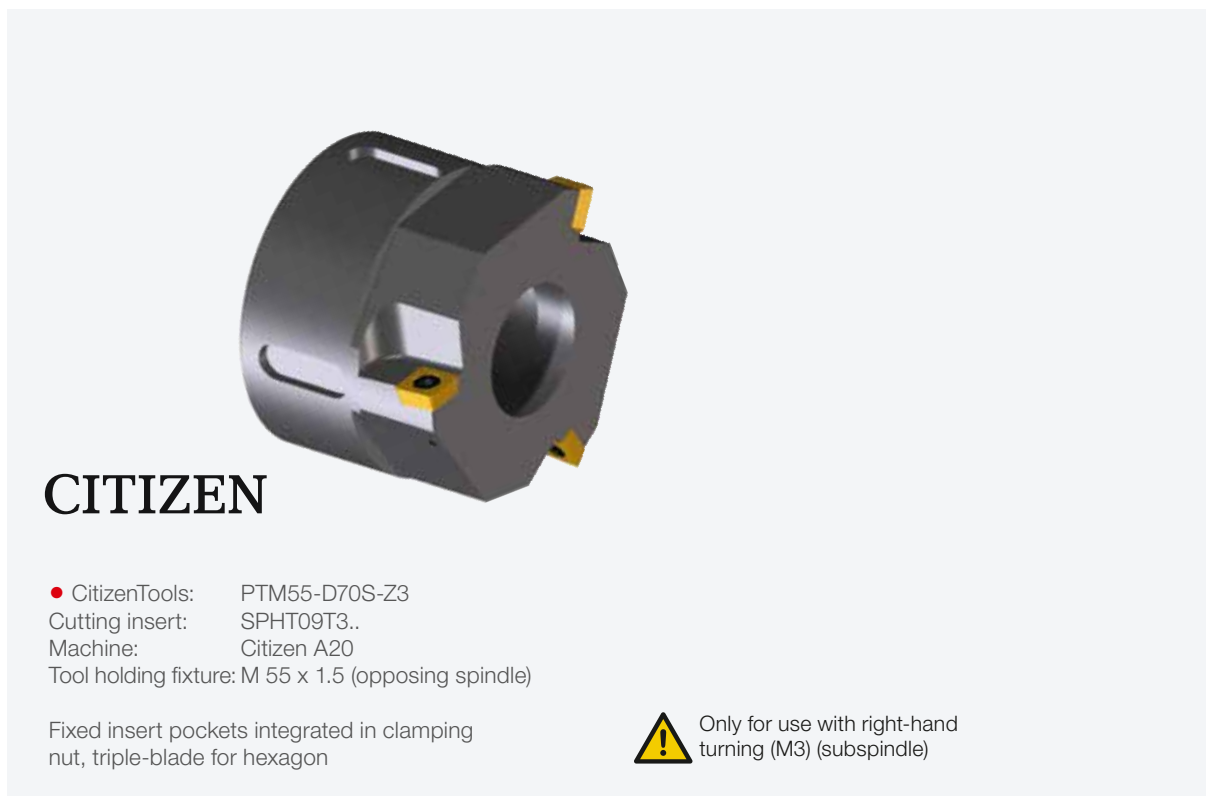
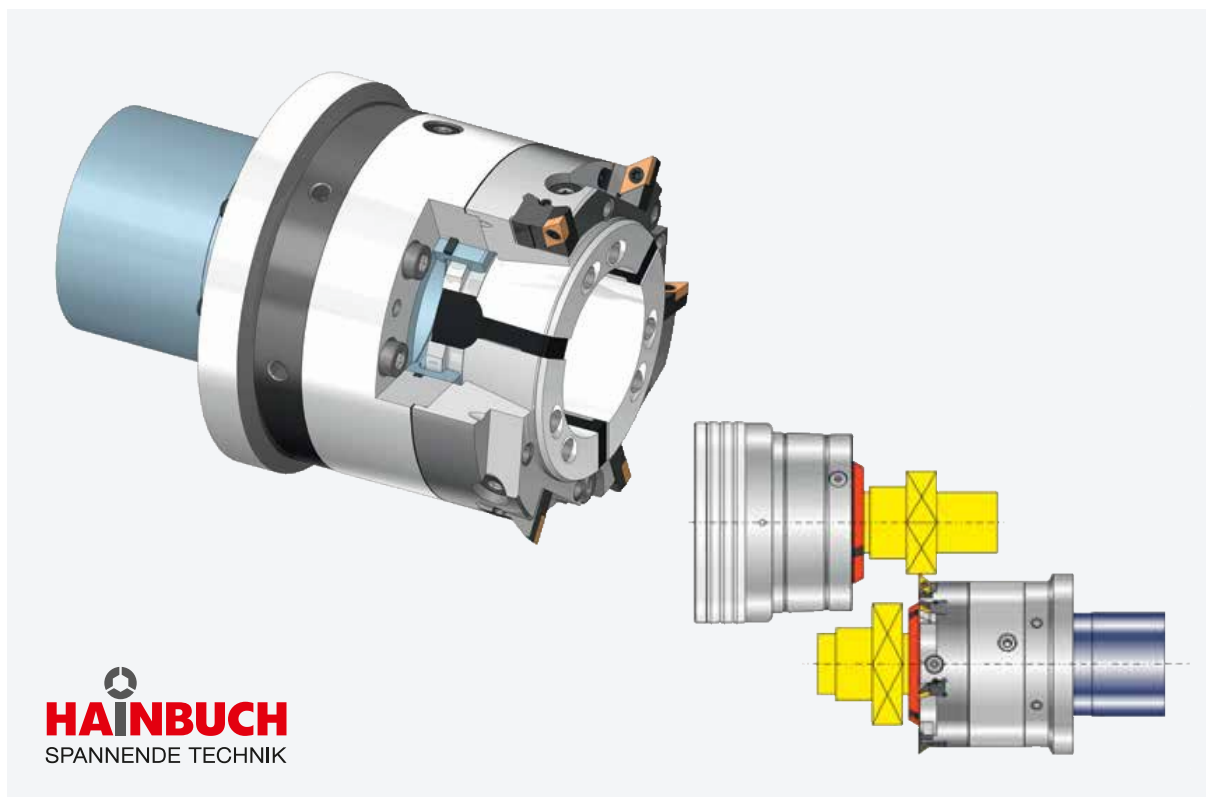
- PCD cartridge



- N10 Special cartridge
- HT15 Special cutting plate

- Other special solutions available on request.

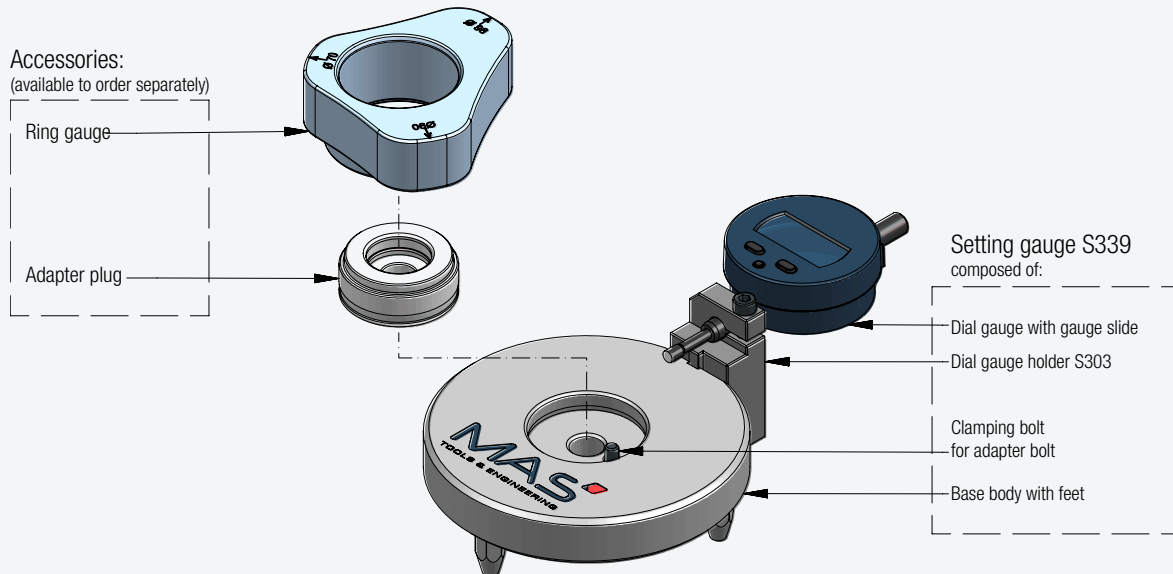
POLY[®]turn special chucks



Accessories and information

Setting gauge

Schematic structure



- Adjusting ring and adapter plug are **not** included in the scope of delivery.
- Analog dial gauge included in the scope of delivery.

Order number	Mounting parts		Stock
S304	Adapter plug PSK 3	Index	●
S305	Adapter plug zyl.Ø 32	Universal	●
S306	Adapter plug zyl. Ø 27	Universal	●
S307	Adapter plug zyl. Ø 22	Universal	●
S308	Adapter plug KK32	Index	●
S371	Adapter plug 5°42'38"	Schütte	●
S521	Adapter plug zyl.Ø 16	Universal	●
S593	Adapter plug 8°16'30"	Tornos	●
S594	Adapter plug zyl. Ø 13	Citizen	●
S339	Setting gauge	—	●
NEW MUH-Z691	Dial gauge holder Ø98 / Ø118	Universal	●
PT44-D98-90-70	Adjusting ring Ø98 / Ø90 / Ø70	Universal	●
Dial gauge extension-10mm		Universal	○

● in stock ○ on request

- Other inserts available on request.
- For PT-Ø70 tools, the measuring insert extension for the dial gauge is required for adjustment.

POLY[®]turn technology and function

POLY[®]turn polygon turning – Operating principle

In polygon turning on lathes and multi-spindle machines, peripheral surfaces (shell surfaces) are produced with a fly cutter on the parts to be turned. The workpiece (on main spindle) and the tool (rotating) have to run at an absolutely synchronous transmission ratio.

 Polygon turning is done by up-cut milling only.

The number of surfaces produced on the workpiece is a function of the transmission ratio between the workpiece and the tool, and of the number of cutting edges on the tool. A transmission ratio of 2:1 produces a slightly convex surface. This slight deviation of shape is acceptable for second-order surfaces (wrench flats). With a transmission ratio of 1:1, strongly convex surfaces result, which are not advisable for wrench flats. With a transmission ratio of 3:1, strongly concave surfaces result, which are also not advisable for wrench flats. **Consequently, the transmission ratio of 2:1 is used in most cases.** Fly cutters with $Z=2$ produce 4 surfaces on the workpiece. The following factors are important for calculating the convexity of the surfaces produced:

- Cutting circle diameter of fly cutter
- Width across flats to be produced
- Cutting circle diameter of pre-turned workpiece diameter
- Number of flats
- Workpiece-to-tool transmission ratio

The flats can be produced either by grooving or by plain turning. This can also be used for copying a chamfer (deburring of surface).

- For the precise calculation of camber, please contact our MAS technicians.
- Due to the complexity of this subject, please submit your component drawing of the workpiece to our MAS technicians.
- Applications for a POLY[®]turn range from standard CNC lathes and multiple-spindle lathes with driven tools to sophisticated turn-mill centers.

FOCUS ON TOOLS

Polygon cylindrical and groove turning

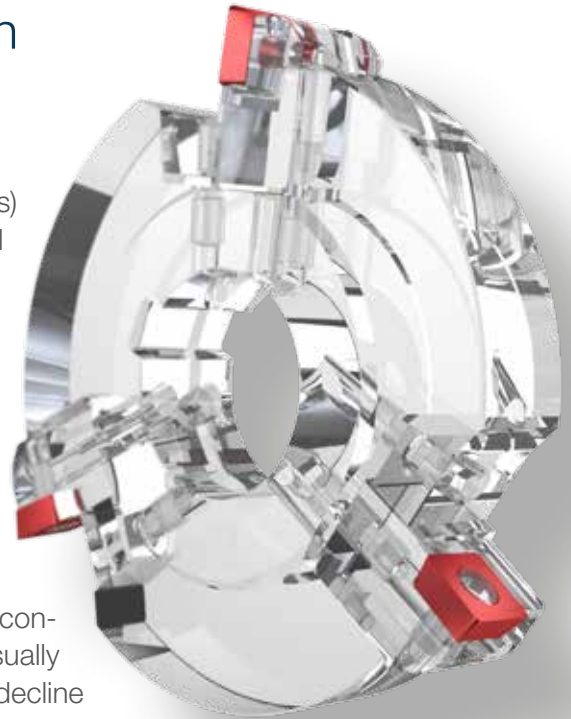
Mature, modular turning tool allows for precise and cost-effective polygon machining

For machining two-, four- and six-sided tools (wrench flats) on turning centers without a Y-axis and without vertical milling units, we offer our POLYturn turning tool. It allows for the fast and reliable cutting of multiple sides using cylindrical and groove turning methods, and only requires a powered tool station in the direction of the turning machine's main axis.

A particular advantage of these tools is the base unit made of heavy metal, which offers a level of inertia and maximum shock absorption. When producing polygon workpieces in several cuts, this reduces the load on the controllers of the directly powered tool stations, which usually only offer little in the way of torque. This minimizes the decline in machine speed and the resultant drop in cutting speed, allowing the polygon tool POLYturn to also work reliably and cost-effectively on low-performance, low-torque powered tool stations.

The tools are available as standard in double-blade and triple-blade types, optionally also in four-blade types. Cost savings are achieved with the use of standardized groove turning inserts or round, square, triangular and rhombic standard indexable inserts. The user can choose the best type for their machining application in terms of cutting geometry, cutting material and coating from a wide range of low-cost indexable inserts. Another advantage is the use of cassettes to hold the inserts, allowing the inserts to be adjusted quickly and easily to non-changing blade diameters, ensuring that all flats have exactly the same dimensions with four- and six-sided tools. The cassettes are securely and reliably locked in place with a wedge and a clamping screw.

The standard polygon tool with a diameter of 90 mm can be used to produce four-sided tools with a width across flats of up to 20 mm and six-sided tools with a width across flats of up to 36 mm in non-ferrous and light metals, but also in higher-strength steels. On request, our tool experts will also produce application-specific polygon tools with adapted dimensions and cut surfaces.



A fast and cost-effective turning solution for large-scale serial production of multi-sided tools – the POLYturn multi-sided turning tools with cassette support for standard indexable inserts are suitable for groove turning and cylindrical turning



PEOPLE



AMBITION



SYNERGY



MAS GmbH
Schmigalla Str. 1
71229 Leonberg
Germany
Tel. +49 7152-6065-0
Fax +49 7152-6065-65
zentrale@mas-tools.de
www.mas-tools.de

MAS US Inc.
11 Freedom Ct.
Greer, SC 29650
USA
Phone +(864) 365-9583
office@mastools.com
www.mastools.com