



**D'ANDREA®**  
TECHNOLOGY FOR HIGH PRECISION

# TOOLS HEADS 2022



Golden Compass  
award for industrial design



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# PRECISION IS OUR STRENGTH

D'ANDREA S.p.A. is an Italian company and world leader in the production of high precision accessories for machine tools, founded in 1951 by Marino D'Andrea, who started the business with the introduction of the first facing and boring head (TA).

The D'Andrea brand is internationally recognised for the quality and reliability of its products and boasts a distribution network that is present in over 40 countries.



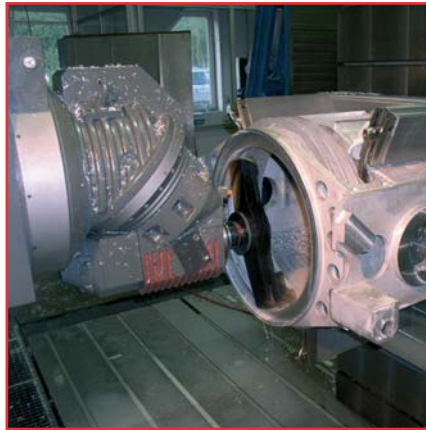
Production is divided between the headquarters in Lainate, on the outskirts of Milan, with its 7,000 square meters of workshop and management offices, and the plant in Castel Del Giudice (Isernia) where D'ANDREA MOLISE produces, most of the semi-finished components that are subsequently finished, assembled and tested at the main site.



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Most of the profit is reinvested in the Research and Development of new products which, through advanced technological solutions, satisfy a highly specific demand. Furthermore, a dedicated technical-commercial team ensures rapid execution of special projects based on customer specifications. Over the years, the boring range has been developed to cover from the smallest diameters (2 mm) to large diameters (up to 3 meters).



A 70-year tradition in the manufacturing sector and an intense passion for mechanics that has now been inherited by the third generation, with the aim of responding to the increasingly stringent demands of the world of precision mechanics.

In the picture above Ermanno with his sons Amedeo, Maria Pina and Marino.



# TOOLHOLDERS

p.10

*modulhard'andrea* MHD' *testarossad'andrea*



Modular Toolholders MHD'

p.64

## PSC Linea



Modular Toolholders PSC

p.70

## MONOforce



High Clamping Power Chucks

## MONOd'

p.74



Monobloc Toolholders

# HEADS

p.100

## U-TRONIC



## UT-SPECIALS



Medium and large NC heads for boring machines and special units

p.110

## TA-CENTER



NC Heads for machining centers

p.118

## TA-TRONIC



NC Heads for milling machines

p.124

## U-COMAX



Axial drive NC heads for transfer machines and special units

p.130

## AUTORADIAL



Automatic Heads for machining centers and milling machines

# TOOLHOLDERS MODULAR

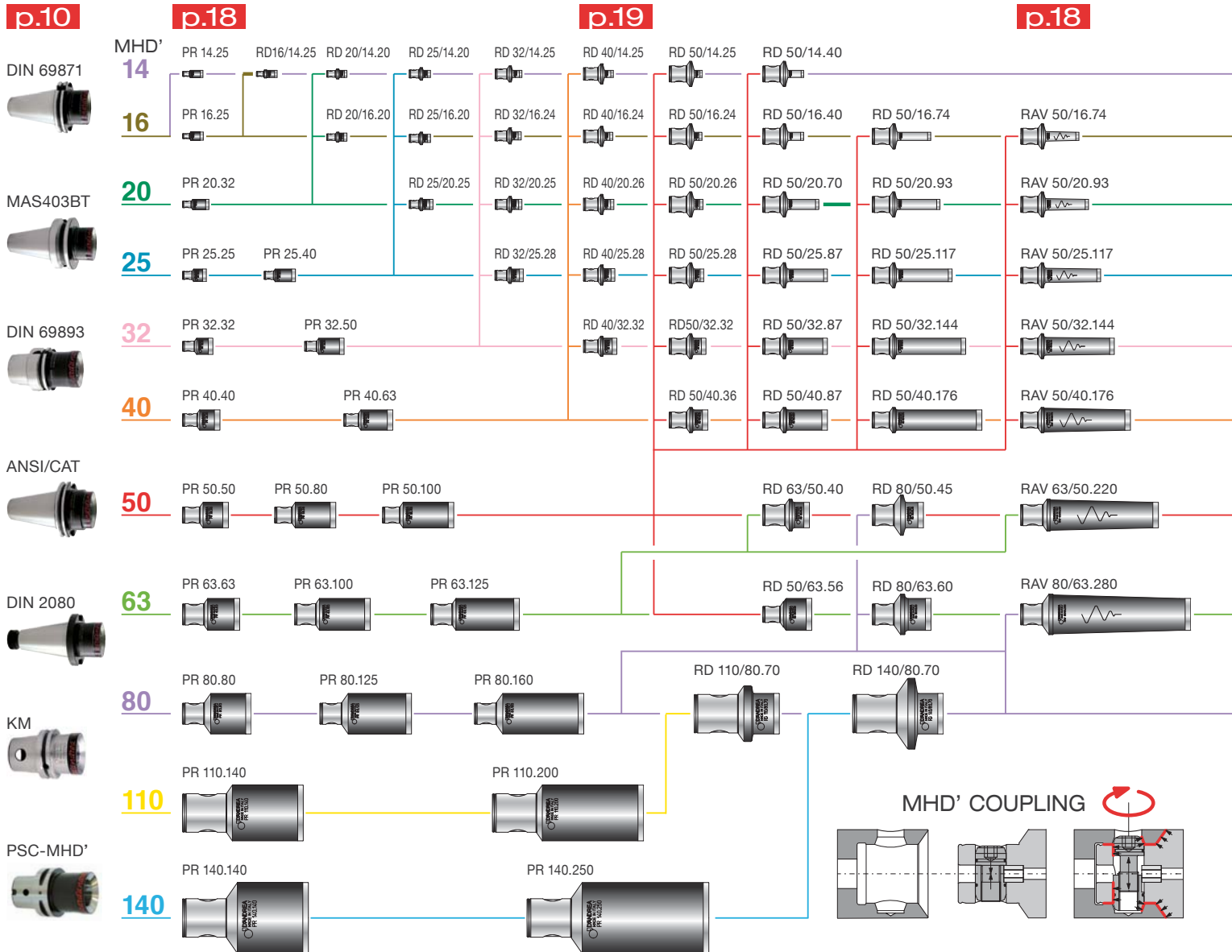
*modulhard'andrea* MHD'

ARBORS

PR  
Extensions

RD  
Reductions

RAV  
Vibration-damping  
reductions



## Modular PSC Linea

ARBORS

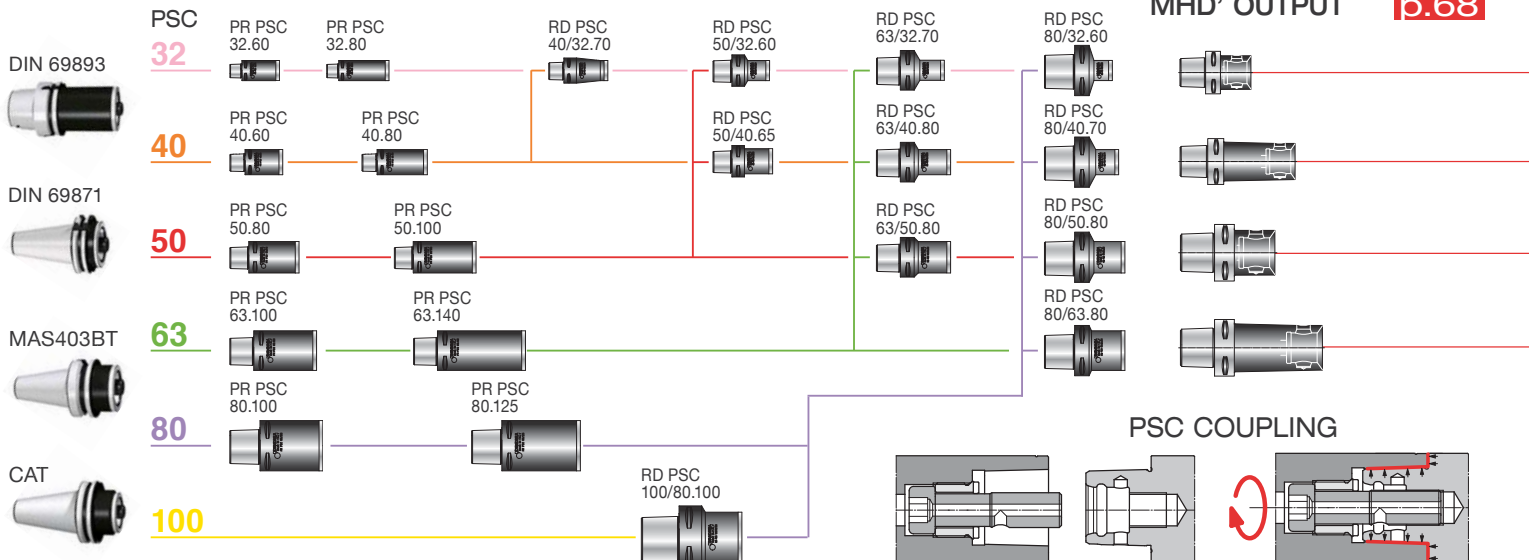
**p.66**

ARBORS EXTENSIONS AND REDUCTIONS

**p.68**

PSC ARBORS WITH  
MHD' OUTPUT

**p.68**



# testarossa d'andrea

**TS**  
Roughing  
Heads

**p.20**

**TRD**  
Double-Bit  
Heads

**p.26**

**TRM**  
Micrometric  
Heads

**p.28**

**2µm**

**TRC**  
Centesimal  
Heads

**p.38**

TRC 14  
Ø 14.5 - 18

**TRM HSB**  
High Speed  
Balanceable Heads

**p.46**

**TRC HS**  
High Speed  
Heads

**p.46**

**2µm**

**TRE**  
Digital  
Heads

**p.48**

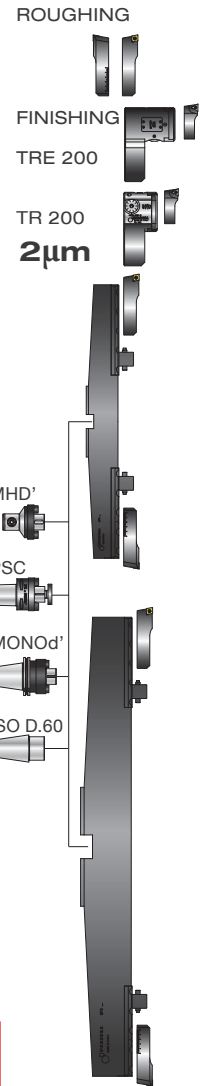
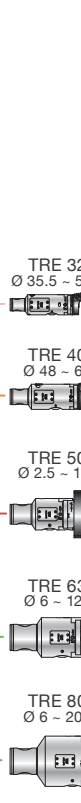
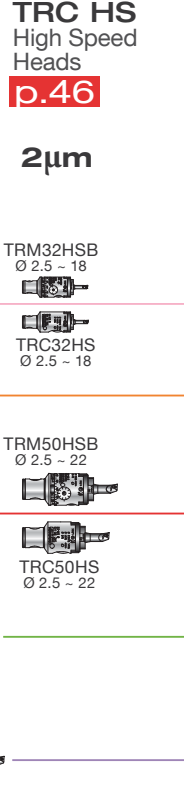
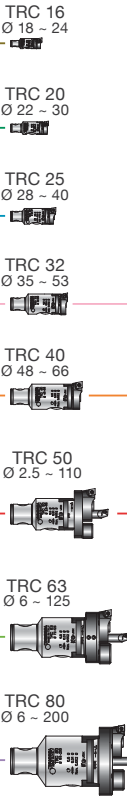
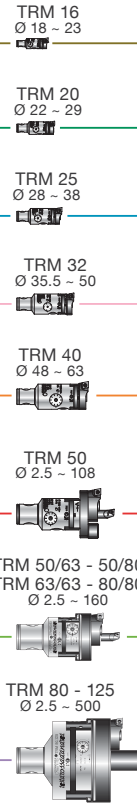
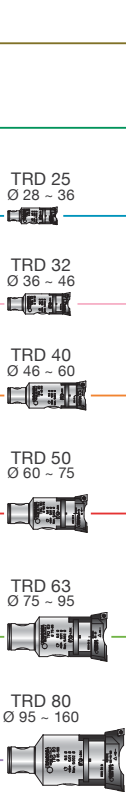
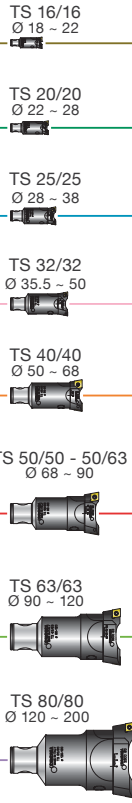
**2µm**

**BPS**  
Double-Bit Cross bars  
Ø 200 ~ 1200

**p.56**

**CHUCKING  
TOOLS**

**p.60**



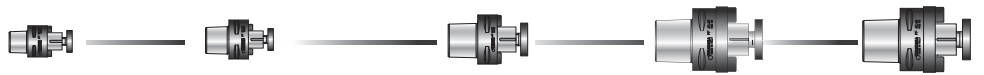
**KIT**  
Testarossa



## PSC ARBORS FOR MILLING - DRILLING - TURNING

**SHELL MILL  
HOLDERS**

**p.69**



**PSC NS-H.28-42**

**p.69**

Semifinished Chuck Holders



**MONOforce**

**p.69**

High Clamping Power



**INSERTS**

**p.62**

**ACCESSORIES**

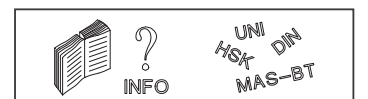
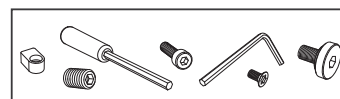
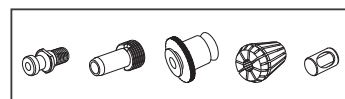
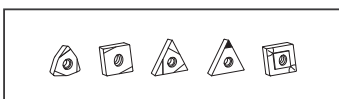
**p.80**

**SPARE PARTS**

**p.84**

**TECHNICAL DATA**

**p.92**



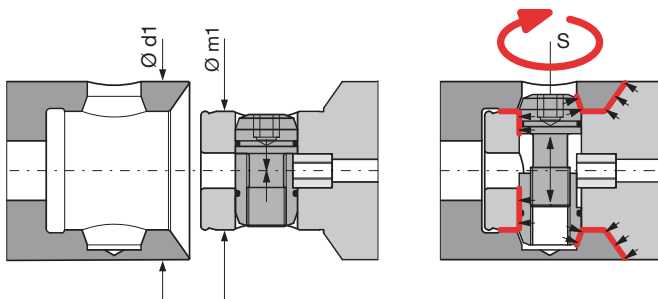


# modulhard'andrea MHD'

It is a line of high precision modular tool-holders used to perform with extreme flexibility and rigidity operations of boring, milling, drilling and tapping.

The **MHD' coupling** is the strength of the Modulhard'andrea: it is available in eleven sizes; it guarantees the interchangeability of all system elements, which includes arbors, extensions, reductions and tool-holder adapters.





MHD'	Ø d1	Ø m1	S	⊞ N·m
MHD' 14	14	10	2,5	2 - 2,5
MHD' 16	16	10	2,5	2 - 2,5
MHD' 20	20	13	3	4 - 4,5
MHD' 25	25	16	3	6,5 - 7,5
MHD' 32	32	20	4	7 - 8
MHD' 40	40	25	5	16 - 18
MHD' 50	50	32	6	30 - 35
MHD' 63	63	42	8	70 - 80
MHD' 80	80	42	8	70 - 80
MHD' 110	110	76	14	200 - 220
MHD' 140	140	76	14	200 - 220



The broad **boring program** completes the MHD line with a wide range of double-bit roughing heads and digital, micrometric and centesimal finishing heads.

**BASE CONNECTIONS** Made according to the DIN 69871, MAS 403 BT, DIN 2080, ANSI-CAT, DIN 69893 and ISO 26623-1 standards and built in carburized, hardened and ground steel 8000 RPM **BALANCING**.

**PR** For each MHD size there are extensions of different lengths that can be used to achieve the desired machining depths.

**RD** The reductions allow the use of MHD components of a smaller size thereby optimising the composition of the tool according to the overall dimensions.

**RAV** Anti-vibration reductions for deep or heavy-duty machining.

**TS** Simple and extremely rigid roughing heads thanks to the serrated surfaces between the head body and the bit holders. The constant distance between the bit holder clamping screw and the cutting edge guarantees the stability of the system.

**TRD** Double-bit heads that allow the combined high precision machining of roughing and finishing thanks to the centesimal adjustment, readable on the vernier scale and which can also be performed on the machine.

**TRM** Micrometric heads for high precision machining with **IT6** tolerance grade. The adjustment is easily readable on the vernier scale and can also be performed on the machine.

**TRC** Centesimal heads for high precision machining with **IT7** tolerance grade. The adjustment is easily readable on the vernier and can also be performed on the machine.

**TRC HS e TRM HSB** Centesimal (HS) and micrometric (HSB) heads for high-speed machining.

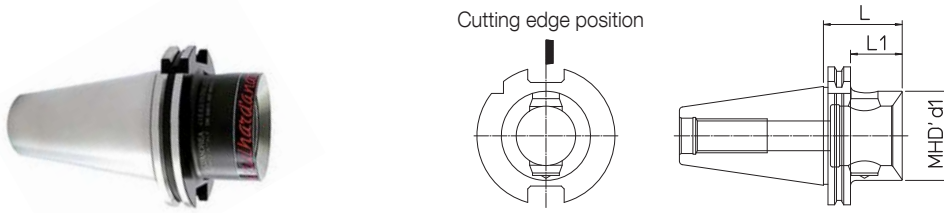
**TRE** Digital micrometric finishing heads for high precision machining with **IT6** tolerance grade. Showing of the adjustment on the integrated display is fast and accurate and the TRE are protected from the liquids contamination according to the **IP69K** grade of protection.

**BPS** Aluminium bars for large diameter machining. Usable for both roughing and finishing, they cover a working range from 200 to 1200 mm.

**CHUCKING TOOLS** The complete program of D'Andrea modular adapters with MHD coupling, which satisfies a variety of machining needs for milling, drilling and tapping.

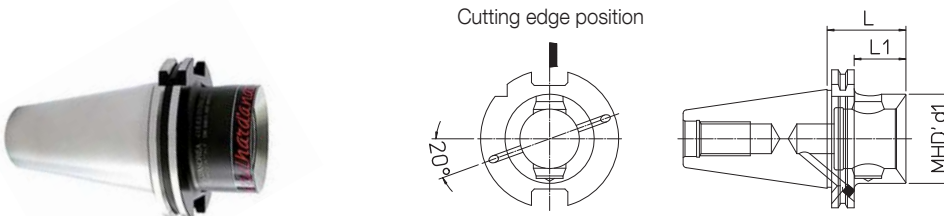


**DIN 69871 AD**



DIN	REF.	CODE	MHD' d1	L	L1	kg	• Subject to stock availability
30	DIN69871-A30 MHD'32.30	416320103020 •	32	30	11	0.4	
30	DIN69871-A30 MHD'40.45.5	416400103020 •	40	45.5	26.5	0.5	
30	DIN69871-A30 MHD'50.60	416500103020	50	60		0.6	
40	DIN69871-A40 MHD'40.45	416400104020	40	45	26	0.5	
40	DIN69871-A40 MHD'50.48	416500104020	50	48	29	0.9	
40	DIN69871-A40 MHD'50.56	416500104070	50	56	37	1.1	
40	DIN69871-A40 MHD'63.80	416630104020	63	80		1.5	
45	DIN69871-A45 MHD'50.48	416500104520	50	48	29	1.7	
50	DIN69871-A50 MHD'50.48	416500105020	50	48	29	2.5	
50	DIN69871-A50 MHD'63.48	416630105029	63	48	29	2.6	
50	DIN69871-A50 MHD'63.56	416630105020	63	56	37	2.8	
50	DIN69871-A50 MHD'80.48	416800105029	80	48	29	3	
50	DIN69871-A50 MHD'80.62	416800105020	80	62	43	3.4	
50	DIN69871-A50 MHD'110.150	416910105020	110	150		7.6	
50	DIN69871-A50 MHD'140.160	416940105020 •	140	160		10	
60	DIN69871-A60 MHD'50.50	416500106020 •	50	50	31	8.3	
60	DIN69871-A60 MHD'63.60	416630106020 •	63	60	41	9.3	
60	DIN69871-A60 MHD'80.65	416800106020 •	80	65	46	10.3	
60	DIN69871-A60 MHD'110.100	416910106020 •	110	100	81	10.5	
60	DIN69871-A60 MHD'110.200	416910106028 •	110	200	181	18	
60	DIN69871-A60 MHD'140.100	416940106020 •	140	100	81	12.8	
60	DIN69871-A60 MHD'140.250	416940106028 •	140	250	231	30	

**DIN 69871 B**

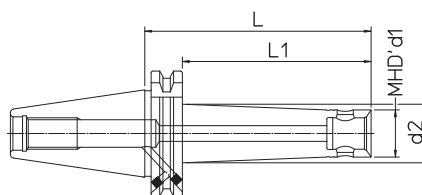
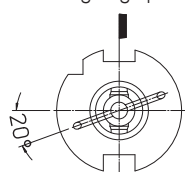


DIN	REF.	CODE	MHD' d1	L	L1	kg	• Subject to stock availability
40	DIN69871-B40 MHD'50.48	416500104021	50	48	29	0.9	
40	DIN69871-B40 MHD'63.80	416630104021 •	63	80		1.5	
45	DIN69871-B45 MHD'50.48	416500104521 •	50	48	29	1.7	
50	DIN69871-B50 MHD'50.48	416500105021	50	48	29	2.7	
50	DIN69871-B50 MHD'63.56	416630105021	63	56	37	2.8	
50	DIN69871-B50 MHD'80.62	416800105021	80	62	43	3.4	

**DIN 69871 AD+B**



Cutting edge position

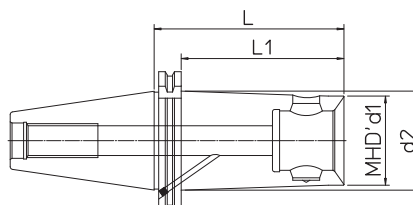
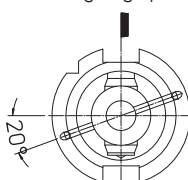


DIN	REF.	CODE	MHD' d1	d2	L	L1	kg	• Subject to stock availability
40	DIN69871-AD+B40 MHD'16.40	416160414021 •	16		40	21	0.7	
40	DIN69871-AD+B40 MHD'16.63	416160614021	16	17.5	63	44	0.8	
40	DIN69871-AD+B40 MHD'16.100	416161014021	16	20	100	81	0.9	
40	DIN69871-AD+B40 MHD'20.50	416200514021	20		50	31	0.8	
40	DIN69871-AD+B40 MHD'20.80	416200814021	20	22.5	80	61	0.9	
40	DIN69871-AD+B40 MHD'20.125	416201214021	20	25.5	125	106	1	
40	DIN69871-AD+B40 MHD'25.50	416250514021	25		50	31	0.9	
40	DIN69871-AD+B40 MHD'25.80	416250814021	25	27	80	61	1	
40	DIN69871-AD+B40 MHD'25.125	416251214021	25	30	125	106	1.1	
40	DIN69871-AD+B40 MHD'32.50	416320514021	32		50	31	1	
40	DIN69871-AD+B40 MHD'32.80	416320814021	32	33.5	80	61	1.1	
40	DIN69871-AD+B40 MHD'32.125	416321214021	32	36.5	125	106	1.2	

**DIN 69871 AD+B**

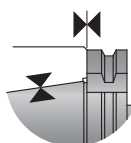


Cutting edge position

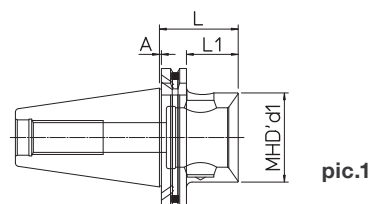
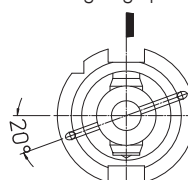


DIN	REF.	CODE	MHD' d1	d2	L	L1	kg
40	DIN69871-AD+B40 MHD'40.120	416400104028	40	44.5	120	101	1.4
40	DIN69871-AD+B40 MHD'50.120	416500104028	50		120	101	1.7
50	DIN69871-AD+B50 MHD'50.120	416500105028	50	60	120	101	3.5
50	DIN69871-AD+B50 MHD'63.150	416630105028	63	70	150	131	5
50	DIN69871-AD+B50 MHD'80.180	416800105028	80		180	161	7.6

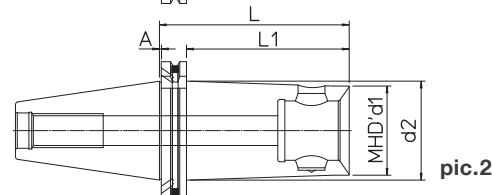
**DIN 69871 FC AD+B FACE CONTACT**



Cutting edge position



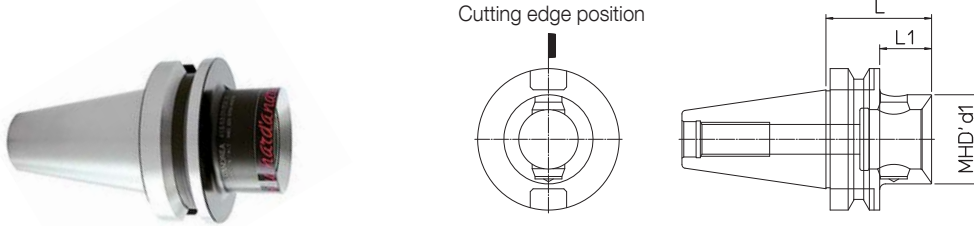
pic.1



pic.2

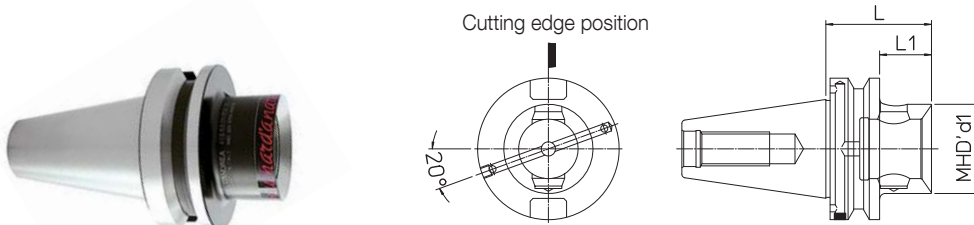
DIN	REF.	CODE	MHD' d1	d2	A	L	L1	kg	pic.	• Subject to stock availability
40	DIN69871-AD+B40 FC MHD'50.48	416500104021F	50	1	48	29	0.9	1		
40	DIN69871-AD+B40 FC MHD'50.120	416500104028F •	50	1	120	101	1.7	1		
40	DIN69871-AD+B40 FC MHD'63.80	416630104021F	63	1	80		1.5	1		
50	DIN69871-AD+B50 FC MHD'50.48	416500105021F	50	1.5	48	29	2.5	1		
50	DIN69871-AD+B50 FC MHD'50.120	416500105028F	50	59	1.5	120	101	3.5	2	
50	DIN69871-AD+B50 FC MHD'50.200	416500105027F	50	68	1.5	200	181	6.1	2	
50	DIN69871-AD+B50 FC MHD'63.56	416630105021F	63	1.5	56	37	2.8	1		
50	DIN69871-AD+B50 FC MHD'63.150	416630105028F	63	75.5	1.5	150	131	5.2	2	
50	DIN69871-AD+B50 FC MHD'63.250	416630105027F	63	80	1.5	250	231	7.1	2	
50	DIN69871-AD+B50 FC MHD'80.62	416800105021F	80	1.5	62	43	3.4	1		
50	DIN69871-AD+B50 FC MHD'80.180	416800105028F	80	1.5	180	161	6.9	1		
50	DIN69871-AD+B50 FC MHD'80.300	416800105027F	80	1.5	300	281	9.2	1		
50	DIN69871-AD+B50 FC MHD'110.150	416910105021F •	110	1.5	150		8	1		
50	DIN69871-AD+B50 FC MHD'110.250	416910105028F •	110	1.5	250		15	1		

MAS 403 BT AD



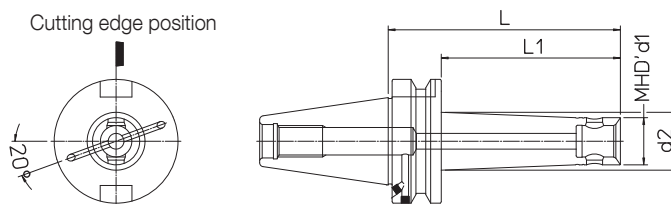
BT	REF.	CODE	MHD' d <sub>1</sub>	L	L <sub>1</sub>	kg	• Subject to stock availability
30	MAS403 BT30 MHD'32.32	416320103030	32	32	10.5	0.5	
30	MAS403 BT30 MHD'40.35.5	416400103030 •	40	35.5	14	0.6	
30	MAS403 BT30 MHD'50.60	416500103030	50	60		0.7	
40	MAS403 BT40 MHD'40.45	416400104030	40	45	18	0.6	
40	MAS403 BT40 MHD'50.38.5	416500104039	50	38.5	11.5	0.8	
40	MAS403 BT40 MHD'50.48	416500104030	50	48	21	0.9	
40	MAS403 BT40 MHD'50.56	416500104080	50	56	29	1.1	
40	MAS403 BT40 MHD'63.66	416630104030	63	66		1.2	
45	MAS403 BT45 MHD'50.62	416500104530 •	50	62	29	1.7	
50	MAS403 BT50 MHD'50.66	416500105030	50	66	28	3.3	
50	MAS403 BT50 MHD'63.50	416630105039	63	50	12	3.4	
50	MAS403 BT50 MHD'63.75	416630105030	63	75	37	3.7	
50	MAS403 BT50 MHD'80.50	416800105039	80	50	12	3.8	
50	MAS403 BT50 MHD'80.75	416800105030	80	75	37	4	
50	MAS403 BT50 MHD'110.140	416910105030 •	110	140		6.8	
50	MAS403 BT50 MHD'140.150	416940105030 •	140	150		9.2	
60	MAS403 BT60 MHD'110.110	416910106030 •	110	110	63	11.5	
60	MAS403 BT60 MHD'110.200	416910106038 •	110	200	152	18.1	
60	MAS403 BT60 MHD'140.100	416940106030 •	140	100	52	12.9	
60	MAS403 BT60 MHD'140.250	416940106038 •	140	250	202	30.1	

MAS 403 BT B



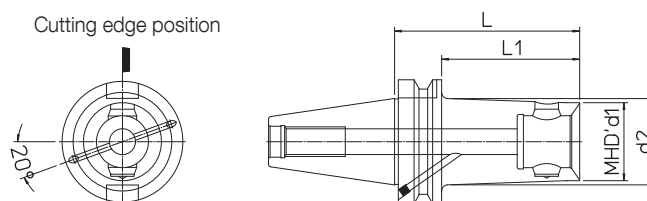
DIN	REF.	CODE	MHD' d <sub>1</sub>	L	L <sub>1</sub>	kg	• Subject to stock availability
40	MAS403 BT40B MHD'50.48	416500104031	50	48	21	0.9	
40	MAS403 BT40B MHD'63.66	416630104031	63	66		1.2	
50	MAS403 BT50B MHD'50.66	416500105031	50	66	28	3.5	
50	MAS403 BT50B MHD'63.75	416630105031 •	63	75	37	3.7	
50	MAS403 BT50B MHD'80.75	416800105031 •	80	75	37	4	

MAS 403 BT AD+B



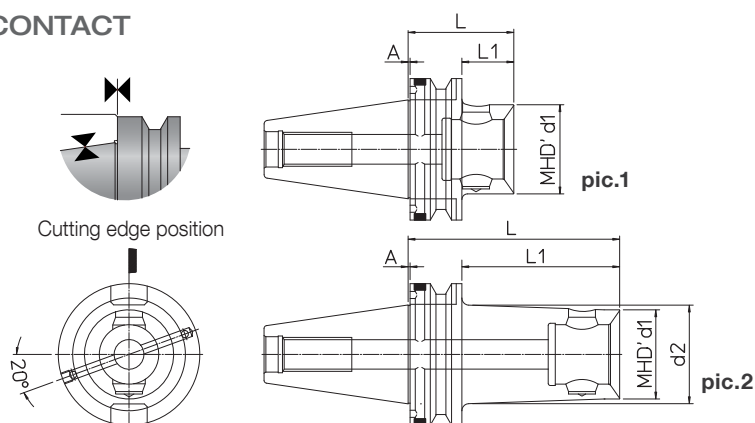
BT	REF.	CODE	MHD' d1	d2	L	L1	kg
40	MAS403 BT40-AD+B MHD'16.45	416160414031	16		45	18	0.8
40	MAS403 BT40-AD+B MHD'16.63	416160614031	16	17	63	36	0.9
40	MAS403 BT40-AD+B MHD'16.100	416161014031	16	19.5	100	73	1
40	MAS403 BT40-AD+B MHD'20.50	416200514031	20		50	23	0.9
40	MAS403 BT40-AD+B MHD'20.80	416200814031	20	22	80	53	1
40	MAS403 BT40-AD+B MHD'20.125	416201214031	20	25	125	98	1.1
40	MAS403 BT40-AD+B MHD'25.50	416250514031	25		50	23	1
40	MAS403 BT40-AD+B MHD'25.80	416250814031	25	26.5	80	53	1.1
40	MAS403 BT40-AD+B MHD'25.125	416251214031	25	29.5	125	98	1.2
40	MAS403 BT40-AD+B MHD'32.50	416320514031	32			23	1.1
40	MAS403 BT40-AD+B MHD'32.80	416320814031	32	33	80	53	1.2
40	MAS403 BT40-AD+B MHD'32.125	416321214031	32	36	125	98	1.4

MAS 403 BT AD+B



BT	REF.	CODE	MHD' d1	d2	L	L1	kg
40	MAS403 BT40-AD+B MHD'40.120	416400104038	40	44.5	120	93	0.9
40	MAS403 BT40-AD+B MHD'50.120	416500104038	50		120	93	1.9
50	MAS403 BT50-AD+B MHD'50.120	416500105038	50	60	120	82	4.2
50	MAS403 BT50-AD+B MHD'63.150	416630105038	63	70	150	112	5.8
50	MAS403 BT50-AD+B MHD'80.180	416800105038	80		180	142	7.5

MAS 403 BT FC AD+B FACE CONTACT

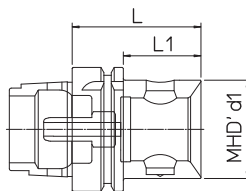
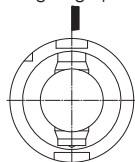


BT	REF.	CODE	MHD' d1	d2	A	L	L1	kg	pic.	• Subject to stock availability
40	MAS403 BT40 FC AD+B MHD'50.48	416500104031F	50	1	48	21	0.9	1		
40	MAS403 BT40 FC AD+B MHD'50.120	416500104038F •	50	1	120	93	1.9	1		
40	MAS403 BT40 FC AD+B MHD'63.66	416630104031F	63	1	66		1.2	1		
50	MAS403 BT50 FC AD+B MHD'50.66	416500105031F	50	1.5	66	28	3.2	1		
50	MAS403 BT50 FC AD+B MHD'63.75	416630105031F	63	1.5	75	37	3.7	1		
50	MAS403 BT50 FC AD+B MHD'50.120	416500105038F	50	57.5	1.5	120	82	4.2	2	
50	MAS403 BT50 FC AD+B MHD'50.200	416500105037F	50	66	1.5	200	162	4.5	2	
50	MAS403 BT50 FC AD+B MHD'63.150	416630105038F	63	73.5	1.5	150	112	5.8	2	
50	MAS403 BT50 FC AD+B MHD'63.250	416630105037F	63	84	1.5	250	212	6.1	2	
50	MAS403 BT50 FC AD+B MHD'80.75	416800105031F	80	1.5	75	37	4	1		
50	MAS403 BT50 FC AD+B MHD'80.180	416800105038F	80	1.5	180	142	7.5	1		
50	MAS403 BT50 FC AD+B MHD'80.300	416800105037F	80	1.5	300	262	9.2	1		
50	MAS403 BT50 FC AD+B MHD'110.150	416910105031F •	110	1.5	150		8.1	1		
50	MAS403 BT50 FC AD+B MHD'110.250	416910105038F •	110	1.5	250		15.3	1		

**DIN 69893 HSK-A**



Cutting edge position



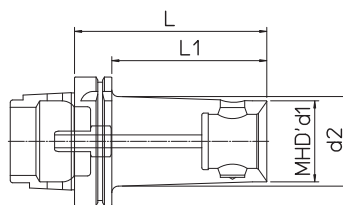
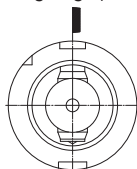
Supplied with coolant tube  
 ♦ Version available on request HSK-T  
 • Subject to stock availability

HSK-A	REF.	CODE	MHD' d1	L	L1	kg	
40	HSK-A40 MHD'32.48	416321504020 •	32	48	28	0.4	Supplied without hole
50	HSK-A50 MHD'50.66	416501505020	50	66		0.6	
63	HSK-A63 MHD'40.60	416401506320 ♦	40	60	34	0.7	
63	HSK-A63 MHD'50.66	416501506320 ♦	50	66	40	0.9	
63	HSK-A63 MHD'63.75	416631506320 ♦	63	75		1.1	
80	HSK-A80 MHD'50.70	416501508020	50	70	44	1.5	
80	HSK-A80 MHD'63.80	416631508020	63	80	54	1.8	
80	HSK-A80 MHD'80.86	416801508020 •	80	86		2.1	
100	HSK-A100 MHD'50.72	416501510020 ♦	50	72	43	2.4	
100	HSK-A100 MHD'63.82	416631510020 ♦	63	82	53	2.7	
100	HSK-A100 MHD'80.88	416801510020	80	88	59	3	

**DIN 69893 HSK-A**



Cutting edge position



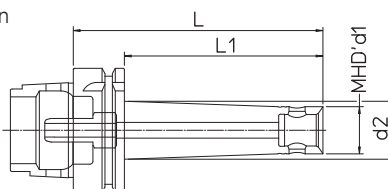
Supplied with coolant tube

HSK-A	REF.	CODE	MHD' d1	d2	L	L1	kg	
63	HSK-A63 MHD'40.120	416401506328	40	46	120	94	1.4	
63	HSK-A63 MHD'50.120	416501506328	50		120	94	1.7	
100	HSK-A100 MHD'50.120	416501510028	50	60	120	91	3.2	
100	HSK-A100 MHD'63.150	416631510028	63	70	150	121	4.5	
100	HSK-A100 MHD'80.180	416801510028	80		180	151	6.5	

**DIN 69893 HSK-A**



Cutting edge position



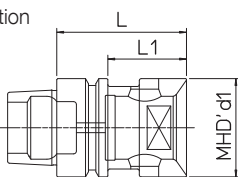
Supplied with coolant tube  
 • Subject to stock availability

HSK-A	REF.	CODE	MHD' d1	d2	L	L1	kg	
63	HSK-A63 MHD'16.63	416160656320	16	17	63	37	0.7	
63	HSK-A63 MHD'16.100	416161056320	16	19.5	100	74	0.8	
63	HSK-A63 MHD'20.63	416200656320 •	20		63	37	0.6	
63	HSK-A63 MHD'20.90	416200956320	20	22.5	90	64	0.8	
63	HSK-A63 MHD'20.125	416201256320 •	20	25	125	99	0.9	
63	HSK-A63 MHD'25.63	416250656320	25		63	37	0.7	
63	HSK-A63 MHD'25.90	416250956320	25	27	90	64	0.9	
63	HSK-A63 MHD'25.125	416251256320	25	29.5	125	99	1	
63	HSK-A63 MHD'32.90	416320956320	32	33.5	90	64	1	
63	HSK-A63 MHD'32.125	416321256320	32	36	125	99	1.2	

**DIN 69893 HSK-E**



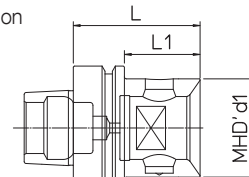
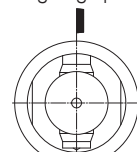
Cutting edge position



**DIN 69893 HSK-F**



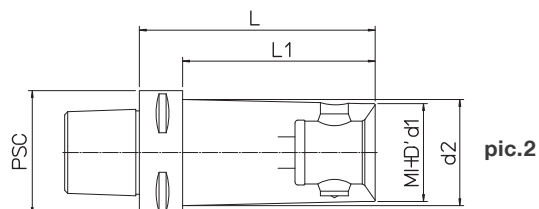
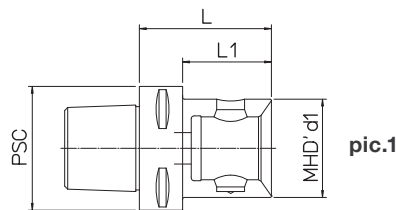
Cutting edge position



• Subject to stock availability

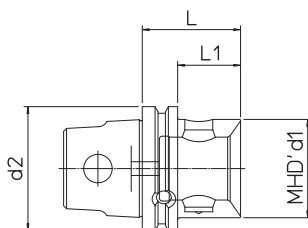
HSK	REF.	CODE	MHD' d1	L	L1	kg	
40	HSK-E40 MHD'32.42	416321504025	32	42	22	0.5	
50	HSK-E50 MHD'50.66	416501505025 •	50	66		0.6	
63	HSK-E63 MHD'50.66	416501506325	50	66	40	0.9	
63	HSK-F63 MHD'50.65	416501506326	50	65	39	0.8	

**PSC-MHD' ISO 26623-1**



PSC	REF.	CODE	MHD' d1	d2	L	L1	kg	pic.
40	PSC 40 - MHD' 32.42	416322604004	32	42	22	0.3	1	
40	PSC 40 - MHD' 40.45	416402604004	40	45		0.4	1	
50	PSC 50 - MHD' 50.55	416502605005	50	55		0.8	1	
63	PSC 63 - MHD' 40.50	416402606305	40	50	28	0.9	1	
63	PSC 63 - MHD' 40.120	416402606312	40	44	120	98	1.5	2
63	PSC 63 - MHD' 50.55	416502606305	50	55	33	0.8	1	
63	PSC 63 - MHD' 50.67	416502606306	50	67	45	1.1	1	
63	PSC 63 - MHD' 50.120	416502606312	50	54	120	98	1.9	2
63	PSC 63 - MHD' 63.77	416632606307	63	77		1.8	1	
80	PSC 80 - MHD' 50.60	416502608006	50	60	30	2	1	
80	PSC 80 - MHD' 50.120	416502608012	50	54	120	90	2.8	2
80	PSC 80 - MHD' 63.70	416632608007	63	70	40	2.3	1	
80	PSC 80 - MHD' 63.150	416632608015	63	67	150	120	4	2
80	PSC 80 - MHD' 80.75	416802608007	80	75		2.6	1	
80	PSC 80 - MHD' 80.120	416802608012	80	120		4.3	1	
100	PSC 100 - MHD' 80.80	416802610008	110	80	44	3.5	1	
100	PSC 100 - MHD' 110.120	416912610012	110	120	84	5	1	

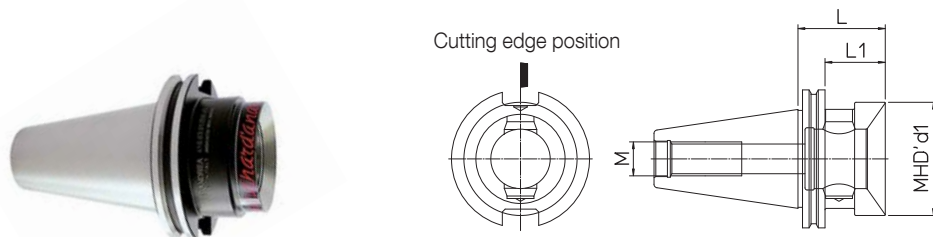
**KM XMZ ISO 26622-1**



KM XMZ	REF.	CODE	MHD' d1	d2	L	L1	kg	
63	RD KM - MHD' 50.50	657095005063	50	63	50	32	0.8	• Subject to stock availability
63	RD KM - MHD' 63.70	657096305063 •	63	63	70		1.2	

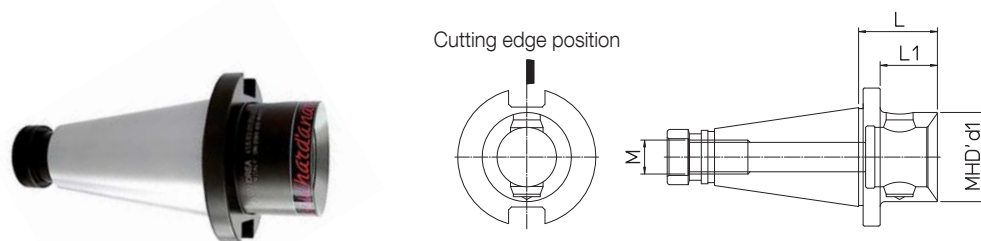


## ANSI/CAT AD



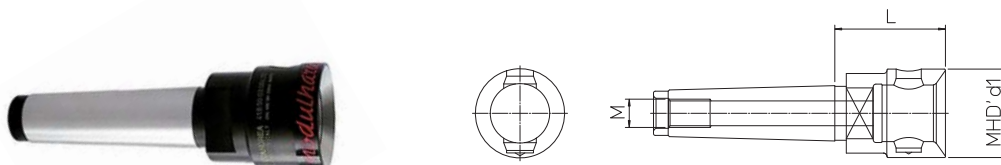
ANSI/CAT	REF.	CODE	MHD' d1	L	L1	M	kg	• Subject to stock availability
40	ANSI/CAT40 MHD'50.66	416500104040	50	66	47	M16	1.1	
40	ANSI/CAT40 MHD'63.100	416630104040 •	63	100		M16	1.9	
45	ANSI/CAT45 MHD'50.48	416500104540 •	50	48	29	M20	1.7	
50	ANSI/CAT50 MHD'50.48	416500105040	50	48	29	M24	2.4	
50	ANSI/CAT50 MHD'63.56	416630105040 •	63	56	37	M24	2.9	
50	ANSI/CAT50 MHD'80.62	416800105040	80	62	43	M24	3.2	

## DIN 2080-A 'OTT'



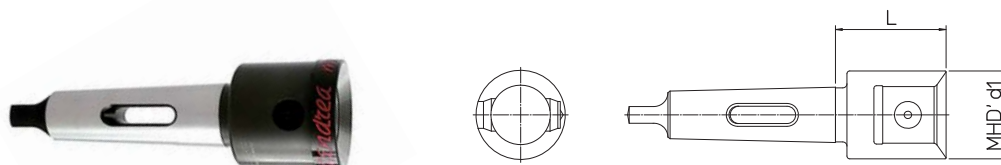
DIN	REF.	CODE	MHD' d1	L	L1	M	kg	• Subject to stock availability
30	DIN2080-A30 MHD'50.58	416500103000	50	58		M12	0.6	
40	DIN2080-A40 MHD'50.48	416500104000	50	48	36.5	M16	0.9	
40	DIN2080-A40 MHD'63.60	416630104000	63	60		M16	1.2	
45	DIN2080-A45 MHD'50.48	416500104500 •	50	48	33	M20	1.6	
50	DIN2080-A50 MHD'50.48	416500105000	50	48	33	M24	2.6	
50	DIN2080-A50 MHD'63.56	416630105000	63	56	41	M24	2.7	
50	DIN2080-A50 MHD'80.60	416800105000	80	60	45	M24	3.2	

## DIN 228/A 2207



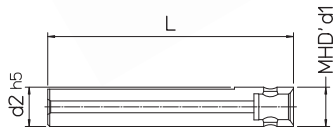
MORSE	REF.	CODE	MHD' d1	L	M	kg
4	MORSE4-A MHD'50.63	416500300400	50	63	M16	0.9
4 SIP	MORSE4-A SIP MHD'50.63	416500300401	50	63	M14	0.9

## DIN 228/B 1806

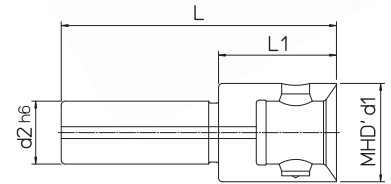


MORSE	REF.	CODE	MHD' d1	L	kg
4	MORSE4-B MHD'50.56	416500200400	50	56	0.9
5	MORSE5-B MHD'63.65	416630200500	63	65	1.5

**BR STEEL BAR**



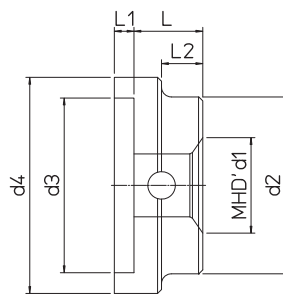
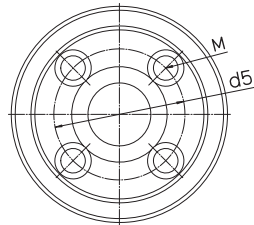
pic.1



pic.2

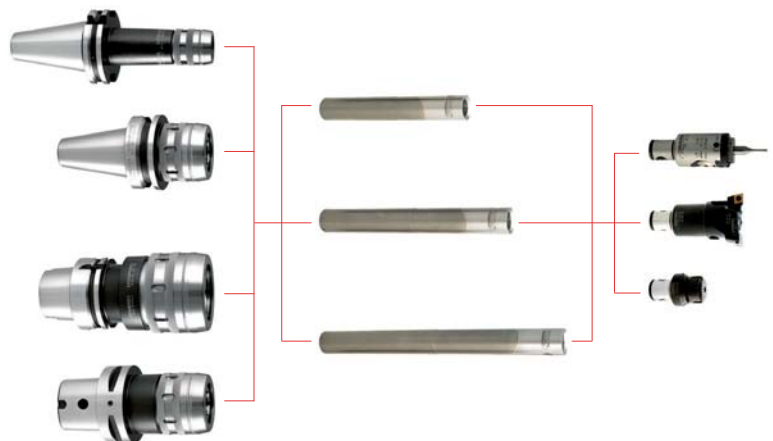
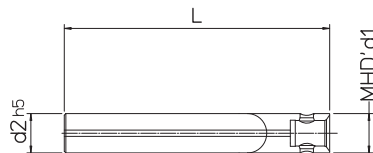
REF.	CODE	MHD' d1	L	L1	d2	kg	pic.
BR 16/16.100	657081601001	16	100		16	0.15	1
BR 20/20.125	657082001251	20	125		20	0.3	1
BR 25/32.35	416320802500	32	100	35	25	0.7	2
BR 32/50.60	416500803200	50	140	60	32	1	2

**DIN 2079**



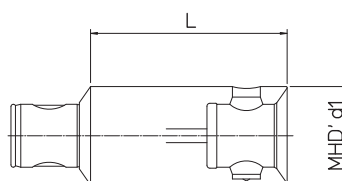
REF.	CODE	MHD' d1	d2	d3	d4	d5	L	L1	L2	M	kg	
DIN 2079-40.50	416502004000 •	50	90	88.89	110	66.7	35	10	21	M12	1.8	• Subject to stock availability
DIN 2079-40.63	416632004000 •	63	90	88.89	110	66.7	47	10	31	M12	2	
DIN 2079-50.63	416632005000 •	63	135	128.57	150	101.6	45	12	31	M16	5.4	
DIN 2079-50.80	416802005000 •	80	135	128.57	150	101.6	50	12	36	M16	5.3	
DIN 2079-50.110	416912005000 •	110	135	128.57	150	101.6	112	12	98	M16	8.4	
DIN 2079-50.140	416942005000 •	140	140	128.57	150	101.6	122	12	108	M16	9.5	

**BMD CARBIDE BARS**



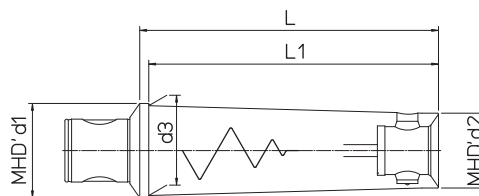
REF.	CODE	MHD' d1	d2	L	kg
BMD 16/16.110	657081601105	16	16	110	0.3
BMD 16/16.140	657081601405	16	16	140	0.4
BMD 16/16.170	657081601705	16	16	170	0.5
BMD 20/20.135	657082001355	20	20	135	0.6
BMD 20/20.170	657082001705	20	20	170	0.75
BMD 20/20.210	657082002105	20	20	210	0.9
BMD 25/25.160	657082501605	25	25	160	1
BMD 25/25.205	657082502055	25	25	205	1.3
BMD 25/25.255	657082502555	25	25	255	1.6
BMD 32/32.195	657083201955	32	32	195	2.1
BMD 32/32.250	657083202505	32	32	250	2.8
BMD 32/32.315	657083203155	32	32	315	3.5

PR



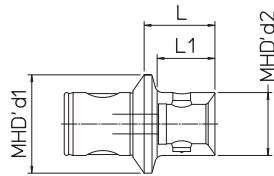
REF.	CODE	MHD' d1	L	kg	
PR 14.25	656901400250	14	25	0.02	• Subject to stock availability
PR 16.25	656901600250	16	25	0.04	
PR 20.32	656902000320	20	32	0.07	
PR 25.25	656902500250	25	25	0.09	
PR 25.40	656902500400	25	40	0.15	
PR 32.32	656903200320	32	32	0.2	
PR 32.50	656903200500	32	50	0.3	
PR 40.40	656904000400	40	40	0.4	
PR 40.63	656904000630	40	63	0.6	
PR 50.50	656905000500	50	50	0.7	
PR 50.80	656905000800	50	80	1.1	
PR 50.100	656905001000	50	100	1.5	
PR 63.63	656906300630	63	63	1.4	
PR 63.100	656906301000	63	100	2.2	
PR 63.125	656906301250	63	125	2.9	
PR 80.80	656908000800	80	80	3	
PR 80.125	656908001250	80	125	4.6	
PR 80.160	656908001600	80	160	6.1	
PR 110.140	656911001400	110	140	13.5	
PR 110.200	656911002000	110	200	14.3	
PR 140.140	656914001400 •	140	140	24	
PR 140.250	656914002500 •	140	250	28.5	

RAV VIBRATION-DAMPING



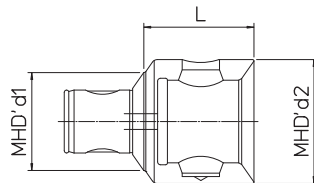
REF.	CODE	MHD' d1	MHD' d2	d3	L	L1	kg
RAV 50/16.74	657005000165	50	16	17.5	74	65	0.4
RAV 50/20.93	657005000205	50	20	21.5	93	85	0.5
RAV 50/25.117	657005000255	50	25	27	117	110	0.8
RAV 50/32.144	657005000325	50	32	35	144	138	1.4
RAV 50/40.176	657005000405	50	40	47	176	170	2.5
RAV 63/50.220	657006300505	63	50	60	220	214	5.6
RAV 80/63.280	657008000635	80	63	77	280	272	10.6

## RD



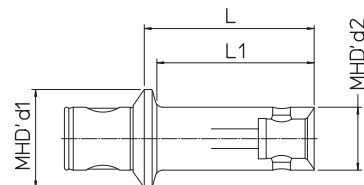
REF.	CODE	MHD' d1	MHD' d2	L	L1	kg	
RD 16/14.25	657001600140	16	14	25	19.5	0.02	• Subject to stock availability
RD 20/14.20	657002000140 •	20	14	20	14.5	0.03	
RD 20/16.20	657002000160	20	16	20	16	0.05	
RD 25/14.20	657002500140 •	25	14	20	13.5	0.06	
RD 25/16.20	657002500160	25	16	20	15	0.07	
RD 25/20.25	657002500200	25	20	25	20	0.08	
RD 32/14.25	657003200140 •	32	14	25	17.5	0.08	
RD 32/16.24	657003200160	32	16	24	18	0.10	
RD 32/20.25	657003200200	32	20	25	20	0.12	
RD 32/25.28	657003200250	32	25	28	23	0.14	
RD 40/14.25	657004000140 •	40	14	25	16.5	0.10	
RD 40/16.24	657004000160	40	16	24	17	0.18	
RD 40/20.26	657004000200	40	20	26	20	0.2	
RD 40/25.28	657004000250	40	25	28	22	0.25	
RD 40/32.32	657004000320	40	32	32	27	0.3	
RD 50/14.25	657005000140 •	50	14	25	14.5	0.25	
RD 50/14.40	657005000142	50	14	40	29.5	0.1	
RD 50/16.24	657005000160	50	16	24	15	0.34	
RD 50/20.26	657005000200	50	20	26	18	0.37	
RD 50/25.28	657005000250	50	25	28	21	0.4	
RD 50/32.32	657005000320	50	32	32	25	0.45	
RD 50/40.36	657005000400	50	40	36	30	0.5	
RD 63/50.40	657006300500	63	50	40	34	0.9	
RD 80/50.45	657008000500	80	50	45	36	1.2	
RD 80/63.60	657008000630	80	63	60	52	1.7	
RD 110/80.70	657011000800	110	80	70	52	6	
RD 140/80.70	657014000800 •	140	80	70	49	7.8	

## RD



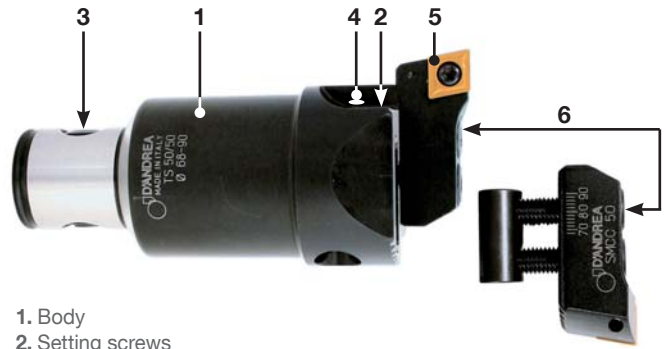
REF.	CODE	MHD' d1	MHD' d2	L	L1	kg
RD 50/63.56	657005000630	50	63	56	1.1	

## RD



REF.	CODE	MHD' d1	MHD' d2	L	L1	kg
RD 50/16.40	657005000162	50	16	40	32	0.2
RD 50/16.74	657005000163	50	16	74	65	0.25
RD 50/20.70	657005000202	50	20	70	62	0.3
RD 50/20.93	657005000203	50	20	93	85	0.35
RD 50/25.87	657005000252	50	25	87	80	0.6
RD 50/25.117	657005000253	50	25	117	110	0.65
RD 50/32.87	657005000322	50	32	87	80	0.75
RD 50/32.144	657005000323	50	32	144	137	1
RD 50/40.87	657005000402	50	40	87	80	0.9
RD 50/40.176	657005000403	50	40	176	170	1.8

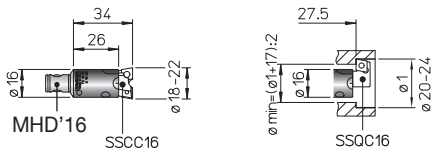
## TS 16 ~ 80 Ø 18 ~ 200



1. Body
2. Setting screws
3. Expanding pin
4. Coolant outlets **Max BAR 40**
5. Bit holders
6. Tools clamp screws

**TS** Simple and extremely rigid roughing heads thanks to the serrated surfaces between the head body and the bit holders. The constant distance between the bit holder clamping screw and the cutting edge guarantees the stability of the system.

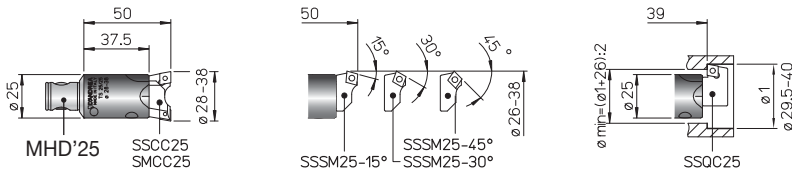
## TS 16/16 Ø 18 ~ 22



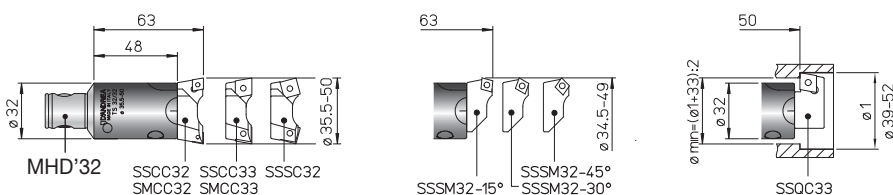
## TS 20/20 Ø 22 ~ 28



## TS 25/25 Ø 28 ~ 38

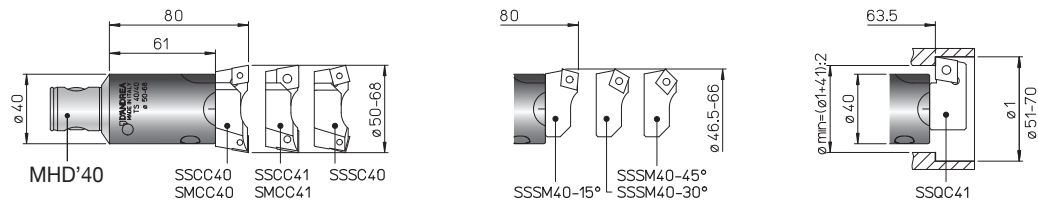


## TS 32/32 Ø 35.5 ~ 50

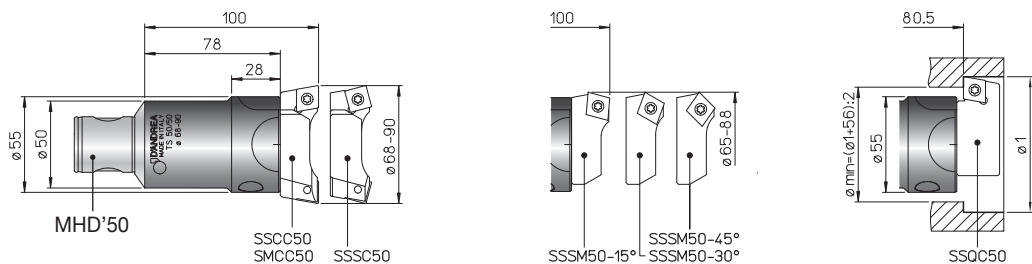


REF.	CODE	Ø	kg
TS 16/16	455501600340	18 ~ 22	0.05
TS 20/20	455502000400	22 ~ 28	0.09
TS 25/25	455502500500	28 ~ 38	0.2
TS 32/32	455503200630	35.5 ~ 50	0.35
TS 40/40	455504000800	50 ~ 68	0.7
TS 50/50	455305001000	68 ~ 90	1.5
TS 50/63	455306300800	90 ~ 120	2
TS 63/63	455406301250	90 ~ 120	3
TS 80/80	455408001400	120 ~ 160	5.3

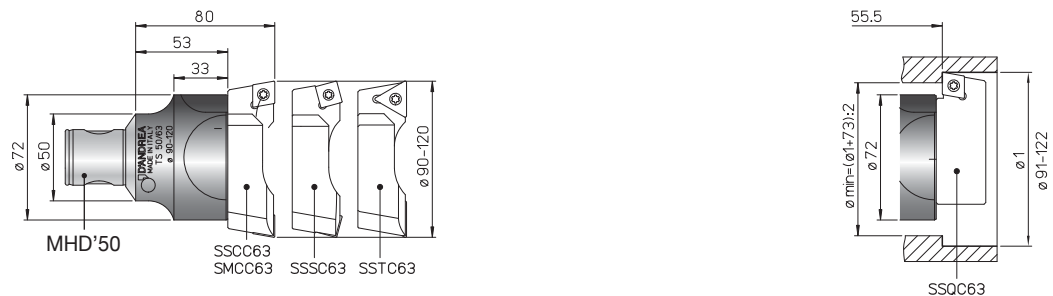
## TS 40/40 $\varnothing 50 \sim 68$



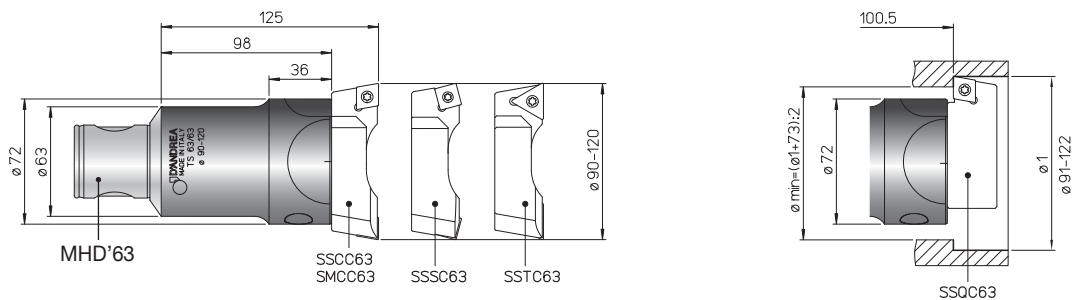
## TS 50/50 $\varnothing 68 \sim 90$



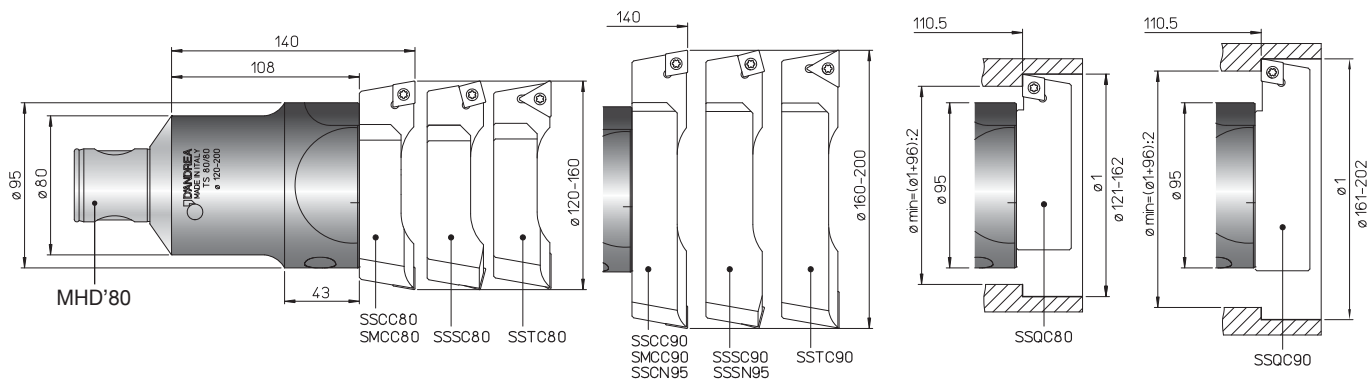
## TS 50/63 $\varnothing 90 \sim 120$



## TS 63/63 $\varnothing 90 \sim 120$



## TS 80/80 $\varnothing 120 \sim 200$

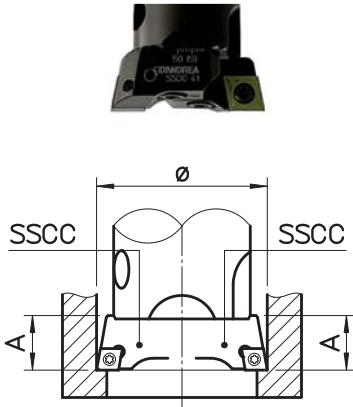


## USE

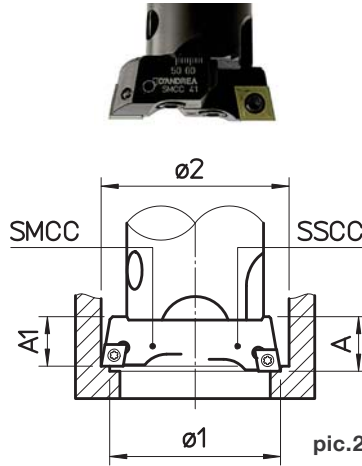
Roughing and semi-finishing operations. Cutting edges might be adjusted on a pre-setting bench and TS heads can be used in three different configurations.

## ATTENTION

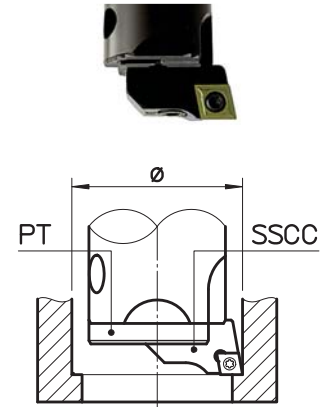
To work with a single cutting edge or with different cutting diameters, halve the feed indicated in the table, see page 92.



pic.1



pic.2

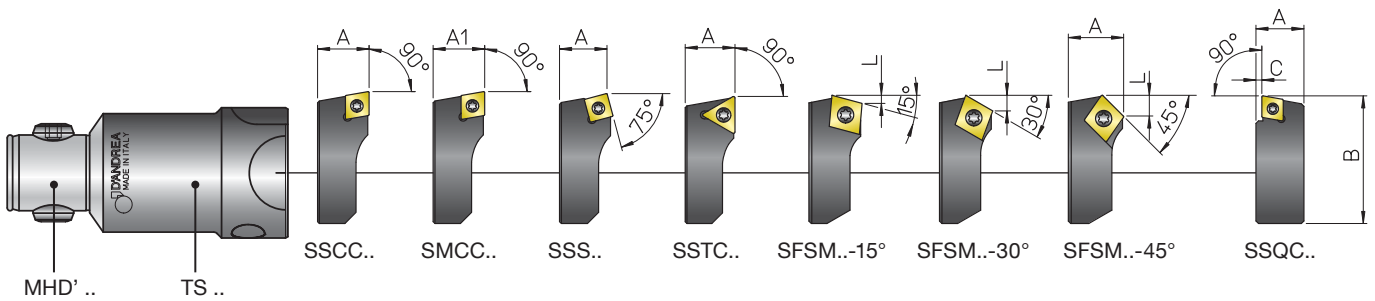


pic.3

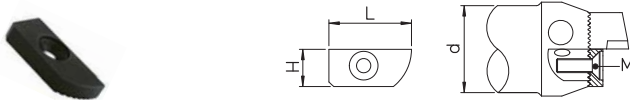
**pic.1** with two SSCC bit holders aligned and on the same diameter for roughing operations with high feedrate.

**pic.2** with one SSCC bit holder and one SMCC bit holder staggered and on a different diameter for roughing operations with high depth of cut.

**pic.3** with only one bit holder for light roughing or semi-finishing operations. PT plate assembly required to protect the coupling surface.



## PT COVER PLATES



REF.	CODE	d	H	L	M
PT 16	384765000160	16	7	14	M 3x12
PT 20	384765000200	20	8.5	17	M 4x14
PT 25	384765000250	25	10.2	21	M 4x16
PT 32	384765000320	32	13.9	28	M 5x20
PT 40	384765000400	40	17.4	35	M 6x25
PT 50	384765000500	50	21.4	47.5	M 8x25
PT 63	384765000630	63	26.4	62	M 10x30
PT 80	384765000800	80	33.9	82.5	M 12x35

# TS ROUGHING HEADS

## BIT-HOLDERS SSCC.. - SSCN.. - SMCC.. - SSSC.. - SSSN.. - SSTC.. - SSSM.. - SSQC..



SSCC.. - SSCN / SMCC..



SSSC.. / SSSN..



SSTC..



SSSM..



SSQC..

REF.	CODE	A	A1	B	C	L						kg
SSCC 16	470500516201	8		15				CCMT 0602..		TS 25	TORX T08	0.003
SSCC 20	470500520201	9.5		19				CCMT 0602..		TS 25	TORX T08	0.006
SSCC 25	470500525201	12.5		23				CCMT 0602..		TS 25	TORX T08	0.01
SSCC 32	470500532201	15		32				CCMT 0602..		TS 25	TORX T08	0.02
SSCC 33	470500532204	15		32				CCMT 09T3..		TS 4	TORX T15	0.025
SSCC 40	470500540201	19		40				CCMT 09T3..		TS 4	TORX T15	0.06
SSCC 41	470500540204	19		40				CCMT 1204..		TS5	TORX T25	0.06
SSCC 50	470500550204	22		54				CCMT 1204..		TS5	TORX T25	0.1
SSCC 63	470500563201	27		70.5				CCMT 1204..		TS5	TORX T25	0.2
SSCC 80	470500580201	32		94.5				CCMT 1204..		TS5	TORX T25	0.5
SSCC 90	470500590201	32		130				CCMT 1204..		TS5	TORX T25	0.7
SSCN 95	470500595201	40		130				CNM. 1906..		p. 89	p. 89	0.9
SMCC 25	470500525203	12.3		23				CCMT 0602..		TS 25	TORX T08	0.01
SMCC 32	470500532203	14.8		32				CCMT 0602..		TS 25	TORX T08	0.02
SMCC 33	470500532205	14.8		32				CCMT 09T3..		TS 4	TORX T15	0.025
SMCC 40	470500540203	18.7		40				CCMT 09T3..		TS 4	TORX T15	0.06
SMCC 41	470500540205	18.7		40				CCMT 1204..		TS 5	TORX T25	0.06
SMCC 50	470500550205	21.7		54				CCMT 1204..		TS 5	TORX T25	0.1
SMCC 63	470500563203	26.7		70.5				CCMT 1204..		TS 5	TORX T25	0.2
SMCC 80	470500580203	31.7		94.5				CCMT 1204..		TS 5	TORX T25	0.5
SMCC 90	470500590203	31.7		130				CCMT 0602..		TS 25	TORX T08	0.7
SSSC 32	470500532202	15		32					SCMT 09T3..	TS 4	TORX T15	0.02
SSSC 40	470500540202	19		40					SCMT 09T3..	TS 4	TORX T15	0.06
SSSC 50	470500550202	20.5		54					SCMT 1204..	TS 5	TORX T25	0.1
SSSC 63	470500563202	27		70.5					SCMT 1204..	TS 5	TORX T25	0.2
SSSC 80	470500580202	32		94.5					SCMT 1204..	TS 5	TORX T25	0.5
SSSC 90	470500590202	32		130					SCMT 1204..	TS 5	TORX T25	0.7
SSSN 95	470500595202	40		130					SNM. 1906..	p. 89	p. 89	0.9
SSTC 63	470500563206	27		70.5			TCMT 2204..			TS 5	TORX T25	0.2
SSTC 80	470500580206	32		94.5			TCMT 2204..			TS 5	TORX T25	0.5
SSTC 90	470500590206	32		130			TCMT 2204..			TS 5	TORX T25	0.7
SSSM 25-15°	470500525211	12.5		23	1.6			CCMT 0602..		TS 25	TORX T08	0.01
SSSM 25-30°	470500525213	12.5		23	3			CCMT 0602..		TS 25	TORX T08	0.01
SSSM 25-45°	470500525215	12.5		23	4.3			CCMT 0602..		TS 25	TORX T08	0.01
SSSM 32-15°	470500532211	15		31	1.6			CCMT 0602..		TS 25	TORX T08	0.025
SSSM 32-30°	470500532213	15		31	3			CCMT 0602..		TS 25	TORX T08	0.025
SSSM 32-45°	470500532215	15		31	4.3			CCMT 0602..		TS 25	TORX T08	0.025
SSSM 40-15°	470500540211	19		39	2.4			CCMT 09T3..		TS 4	TORX T15	0.06
SSSM 40-30°	470500540213	19		39	4.6			CCMT 09T3..		TS 4	TORX T15	0.06
SSSM 40-45°	470500540215	19		39	6.5			CCMT 09T3..		TS 4	TORX T15	0.06
SSSM 50-15°	470500550211	22		53	3.2			CCMT 1204..		TS 5	TORX T25	0.1
SSSM 50-30°	470500550213	22		53	6.2			CCMT 1204..		TS 5	TORX T25	0.1
SSSM 50-45°	470500550215	22		53	8.8			CCMT 1204..		TS 5	TORX T25	0.1
SSQC 16	470500516261	10		16	2			CCMT 0602..		TS 25	TORX T08	0.005
SSQC 20	470500520261	11		19.5	1.5			CCMT 0602..		TS 25	TORX T08	0.008
SSQC 25	470500525261	14.5		24	2.5			CCMT 0602..		TS 25	TORX T08	0.02
SSQC 33	470500533261	17		32	3			CCMT 09T3..		TS 4	TORX T15	0.03
SSQC 41	470500541261	21		42	3.5			CCMT 1204..		TS 5	TORX T25	0.08
SSQC 50	470500550261	24.5		57	3.5			CCMT 1204..		TS 5	TORX T25	0.15
SSQC 63	470500563261	28.5		76	3.5			CCMT 1204..		TS 5	TORX T25	0.3
SSQC 80	470500580261	31.5		101	3.5			CCMT 1204..		TS 5	TORX T25	0.6
SSQC 90	470500590261	31.5		122	3.5			CCMT 1204..		TS 5	TORX T25	0.8

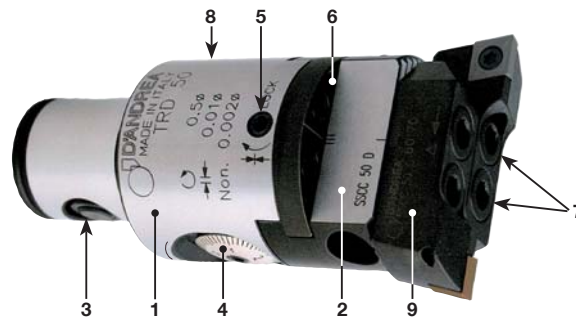


## TRD 25-80 Ø 28 ~ 160

TRD 25 - 32	RPM 10.000
TRD 40 - 50	RPM 8.000
TRD 63	RPM 6.000
TRD 80	RPM 5.000

## CENTESIMAL

10 µm



1. Body
2. Slide toolholder
3. Expanding radial pin
4. Vernier scale
5. Slide clamp screw
6. Coolant outlet **Max BAR 40**
7. Tools clamp screws
8. Oiler
9. Bit holder

The **TRD** double-bit heads allow combined roughing and finishing machining with **IT7** precision.

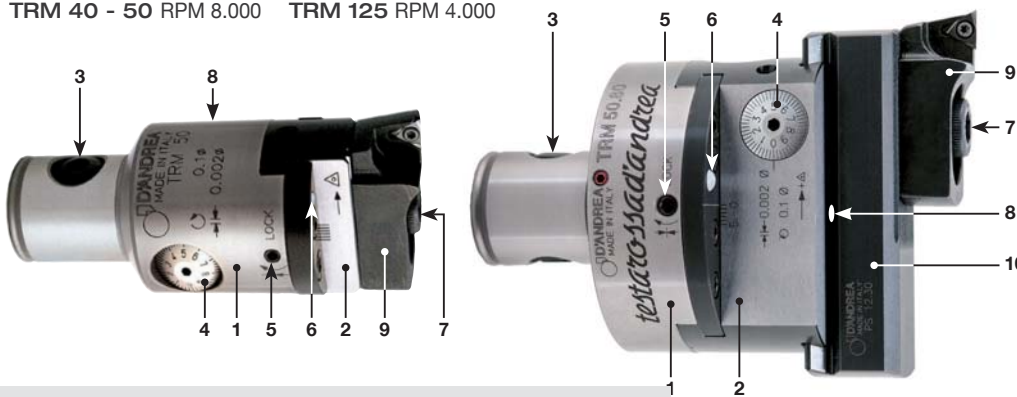
The serrated surfaces between the bit holders and the tool holder slide guarantee rigidity and the adjustment sensitivity of 5 microns on the radius is easily readable on the vernier scale and can also be performed on the machine.

## TRM 16-125 Ø 2.5 ~ 500

TRM 16 - 20	RPM 12.000	TRM 63	RPM 6.000
TRM 25 - 32	RPM 10.000	TRM 80	RPM 5.000
TRM 40 - 50	RPM 8.000	TRM 125	RPM 4.000

## MICROMETRIC

2 µm



1. Body
2. Slide toolholder
3. Expanding radial pin
4. Micrometric vernier scale
5. Slide clamp screw
6. Coolant outlet **Max BAR 40**
7. Tools clamp screws
8. Oiler
9. Bit holder
10. Tool holder

The **TRM** heads allow high precision machining and excellent surface finish in **IT6** grade of tolerance.

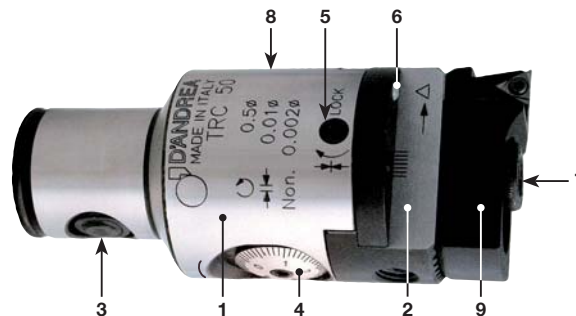
The adjustment sensitivity of 1 micron on the radius is easily readable on the vernier scale and can also be performed in the machine. The **TRM** are coated with an anticorrosive surface protection.

## TRC 14-80 Ø 2.5 ~ 200

TRC 14 - 20	RPM 12.000
TRC 25 - 32	RPM 10.000
TRC 40 - 50	RPM 8.000
TRC 80	RPM 6.000
TRC 80	RPM 5.000

## CENTESIMAL

10 µm



1. Body
2. Slide toolholder
3. Expanding radial pin
4. Vernier scale
5. Slide clamp screw
6. Coolant outlet **Max BAR 40**
7. Tools clamp screws
8. Oiler
9. Bit holder

The **TRC** heads allow high precision machining and excellent surface finish in **IT7** grade of tolerance.

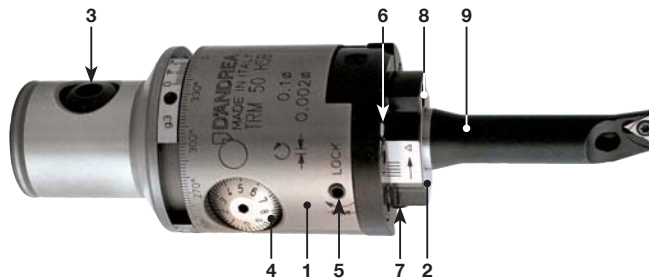
The adjustment sensitivity of 5 micron on the radius is easily readable on the vernier scale and can also be performed on the machine.

## TRM HSB Ø 2.5 ~ 22

TRM 32 HSB RPM 20.000  
TRM 50 HSB RPM 20.000

## MICROMETRIC

2 μm



1. Body
2. Slide toolholder
3. Expanding radial pin
4. Micrometric vernier scale
5. Slide clamp screw
6. Coolant outlet **Max BAR 40**
7. Tools clamp screws
8. Oiler
9. Tool

The **TRM HSB** heads can be balanced and are suited to high-speed machining. They allow high precision machining and excellent surface finish in **IT6** grade of tolerance.

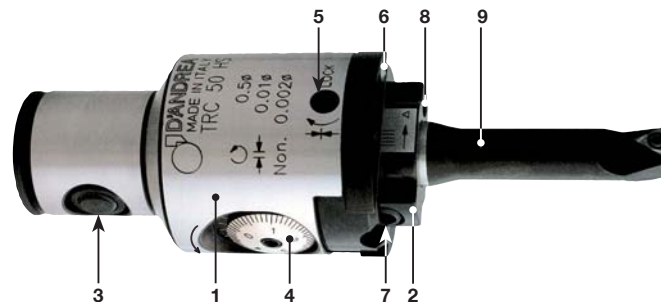
The adjustment sensitivity of 1 micron on the radius is easily readable on the vernier scale and can also be performed on the machine. The **TRM HSB** are coated with an anticorrosive surface protection.

## TRC HS Ø 2.5 ~ 22

TRC 32 HS RPM 12.000  
TRC 50 HS RPM 12.000

## CENTESIMAL

10 μm



1. Body
2. Slide toolholder
3. Expanding radial pin
4. Vernier scale
5. Slide clamp screw
6. Coolant outlet **Max BAR 40**
7. Tools clamp screws
8. Oiler
9. Tool

The **TRC HS** heads are balanced and are suited to high-speed machining. They allow high precision machining and excellent surface finish in **IT7** grade of tolerance.

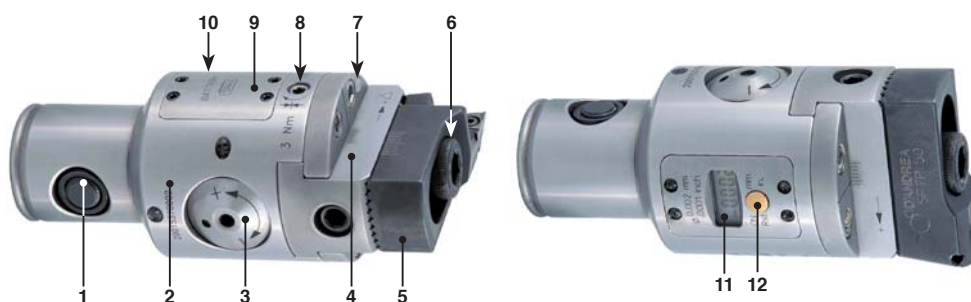
The adjustment sensitivity of 5 micron on the radius is easily readable on the vernier scale and can also be performed on the machine.

## TRE 32-80 69K Ø 2.5 ~ 200

TRE 32 - 50 RPM 20.000  
TRE 63 - 80 RPM 12.000

## MICROMETRIC

2 μm



1. Expanding radial pin
2. Body
3. Set screw
4. Slide toolholder
5. Bit holder
6. Tools clamp screws
7. Coolant outlet **Max BAR 40**
8. Slide clamp screw
9. Battery compartment cover
10. Oiler
11. Digital display
12. Selection button

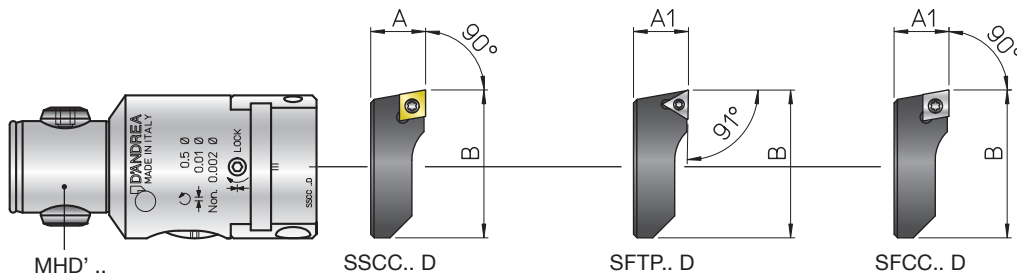
The **TRE** heads allow high precision machining and excellent surface finish in **IT6** grade of tolerance. The adjustment sensitivity of 1 micron on the radius is fast, accurate and is easily readable on the integrated display.

The **TRE** are coated with an anticorrosive surface protection and are resistant to liquid contamination according to the **IP69K** grade of protection.

## TRD 25 ~ 80 Ø 28 ~ 160



REF.	CODE	Ø	kg
TRD 25	455022500571	28 ~ 36	0.2
TRD 32	455023200711	36 ~ 46	0.35
TRD 40	455024000901	46 ~ 60	0.7
TRD 50	455025000861	60 ~ 75	1.5
TRD 63	455026301081	75 ~ 95	2.7
TRD 80	455028001291	95 ~ 160	4.8

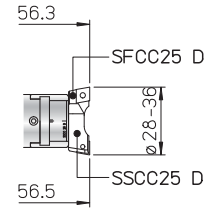
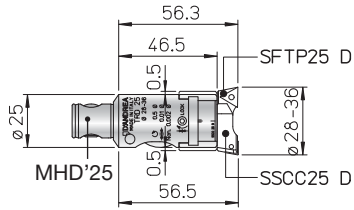


## BIT-HOLDERS SSCC .. D - SFTP .. D - SFCC .. D

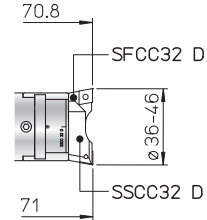
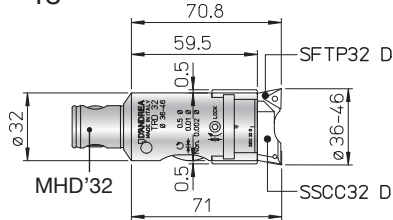


REF.	CODE	A	A1	B					kg
SSCC 25 D	470500525220	10		24			CCMT 0602..	TS 25 TORX T08	0.008
SSCC 32 D	470500532220	11.5		30			CCMT 0602..	TS 25 TORX T08	0.015
SSCC 40 D	470500540220	14		40			CCMT 09T3..	TS 4 TORX T15	0.03
SSCC 50 D	470500550220	19		54			CCMT 09T3..	TS 4 TORX T15	0.06
SSCC 63 D	470500563220	24.5		68			CCMT 09T3..	TS 4 TORX T15	0.15
SSCC 80 D	470500580220	29.5		87			CCMT 09T3..	TS 4 TORX T15	0.3
SSCC 85 D	470500585221	29.5		107.4			CCMT 09T3..	TS 4 TORX T15	0.4
SFTP 25 D	470500525030		9.8	24			TPGX 0902..	CS 250T TORX T08	0.008
SFTP 32 D	470500532030		11.3	30			TPGX 0902..	CS 250T TORX T08	0.015
SFTP 40 D	470500540030		13.8	40			TPGX 1103..	CS 300890T TORX T08	0.03
SFTP 50 D	470500550030		18.8	54			TPGX 1103..	CS 300890T TORX T08	0.06
SFTP 63 D	470500563030		24.3	68			TPGX 1103..	CS 300890T TORX T08	0.15
SFTP 80 D	470500580030		29.3	87			TPGX 1103..	CS 300890T TORX T08	0.3
SFTP 85 D	470500585031		29.3	107.4			TPGX 1103..	CS 300890T TORX T08	0.4
SFCC 25 D	470500525020		9.8	24			CCGT 0602..	TS 25 TORX T08	0.008
SFCC 32 D	470500532020		11.3	30			CCGT 0602..	TS 25 TORX T08	0.015
SFCC 40 D	470500540020		13.8	40			CCGT 09T3..	TS 4 TORX T15	0.03
SFCC 50 D	470500550020		18.8	54			CCGT 09T3..	TS 4 TORX T15	0.06
SFCC 63 D	470500563020		24.3	68			CCGT 09T3..	TS 4 TORX T15	0.15
SFCC 80 D	470500580020		29.3	87			CCGT 09T3..	TS 4 TORX T15	0.3
SFCC 85 D	470500585021		29.3	107.4			CCGT 09T3..	TS 4 TORX T15	0.4

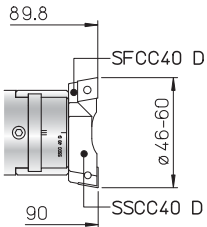
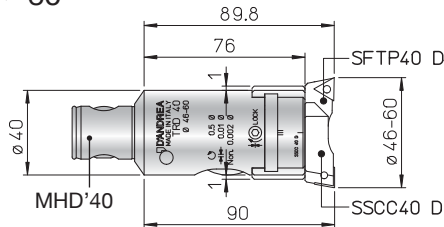
## TRD 25 $\varnothing 28 \sim 36$



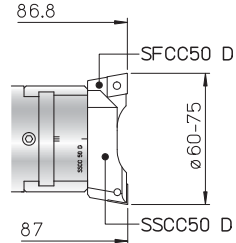
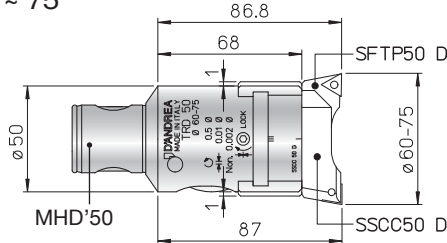
## TRD 32 $\varnothing 36 \sim 46$



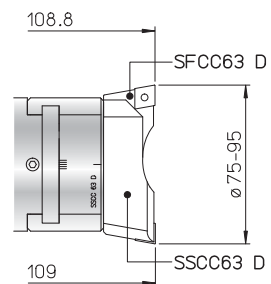
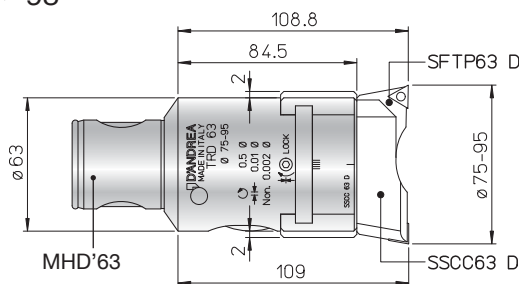
## TRD 40 $\varnothing 46 \sim 60$



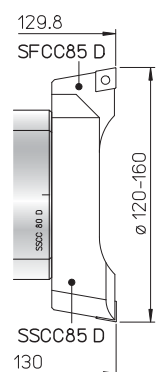
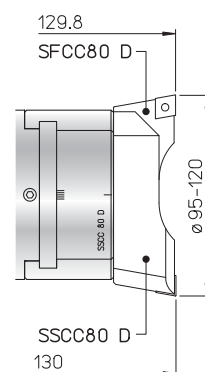
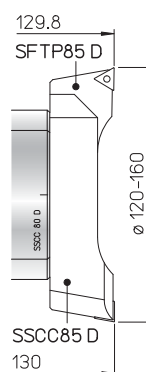
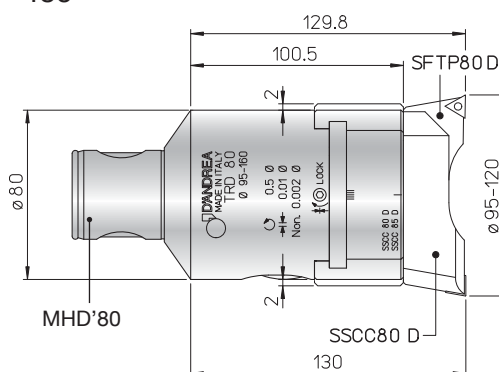
## TRD 50 $\varnothing 60 \sim 75$



## TRD 63 $\varnothing 75 \sim 95$



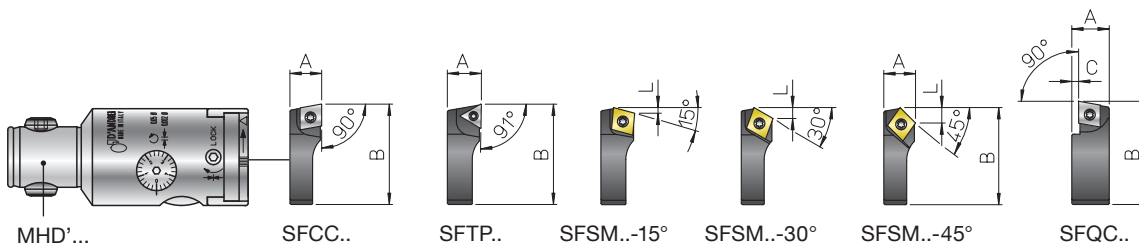
## TRD 80 $\varnothing 95 \sim 160$



## TRM 16 ~ 40 Ø 18 ~ 63



REF.	CODE	Ø	kg
TRM 16	455001600341	18 ~ 23	0.05
TRM 20	455002000401	22 ~ 29	0.1
TRM 25	455002500500	28 ~ 38	0.2
TRM 32	455003200630	35.5 ~ 51.5	0.35
TRM 40	455004000800	48 ~ 63	0.7

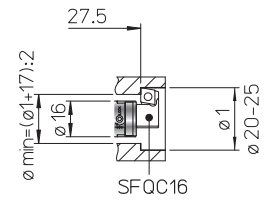
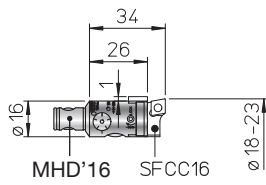


## BIT-HOLDERS SFCC .. - SFTP .. - SFSM .. - SFQC ..

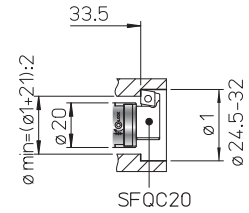
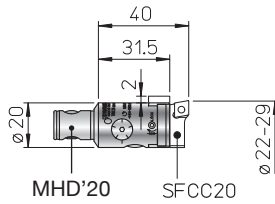


REF.	CODE	A	B	C	L					kg
SFCC 16	470500516002	8	17			CCGT 0602..		TS 25	TORX T08	0.003
SFCC 20	470500520002	8.5	21			CCGT 0602..		TS 25	TORX T08	0.005
SFCC 25	470500525002	10	26.5			CCGT 0602..		TS 25	TORX T08	0.01
SFCC 32	470500532002	11.5	34.5			CCGT 0602..		TS 25	TORX T08	0.02
SFCC 40	470500540002	14	44			CCGT 09T3..		TS 4	TORX T15	0.04
SFTP 25	470500525001	10	26.5				TPGX 0902..	CS 250T	TORX T08	0.01
SFTP 32	470500532001	11.5	34.5				TPGX 0902..	CS 250T	TORX T08	0.02
SFTP 40	470500540001	14	44				TPGX 1103..	CS 300890T	TORX T08	0.04
SFQC 16	470500516062	10	18	2		CCMT 0602..		TS 25	TORX T08	0.005
SFQC 20	470500520062	10.5	22.5	2		CCMT 0602..		TS 25	TORX T08	0.008
SFQC 25	470500525062	12	28.5	2.5		CCMT 0602..		TS 25	TORX T08	0.01
SFQC 32	470500532062	13.5	35.5	2.5		CCMT 0602..		TS 25	TORX T08	0.03
SFQC 40	470500540062	16.5	46	3		CCMT 09T3..		TS 4	TORXT15	0.06
SFSM 25-15°	470500525011	10	25.5		1.6	CCMT 0602..		TS 25	TORX T08	0.01
SFSM 25-30°	470500525013	10	25.5		3	CCMT 0602..		TS 25	TORX T08	0.01
SFSM 25-45°	470500525015	10	25.5		4.3	CCMT 0602..		TS 25	TORX T08	0.01
SFSM 32-15°	470500532011	11.5	33.5		1.6	CCMT 0602..		TS 25	TORX T08	0.02
SFSM 32-30°	470500532013	11.5	33.5		3	CCMT 0602..		TS 25	TORX T08	0.02
SFSM 32-45°	470500532015	11.5	33.5		4.3	CCMT 0602..		TS 25	TORX T08	0.02
SFSM 40-15°	470500540011	14	42.5		2.4	CCMT 09T3..		TS 4	TORXT15	0.03
SFSM 40-30°	470500540013	14	42.5		4.6	CCMT 09T3..		TS 4	TORXT15	0.03
SFSM 40-45°	470500540015	14	42.5		6.6	CCMT 09T3..		TS 4	TORXT15	0.03

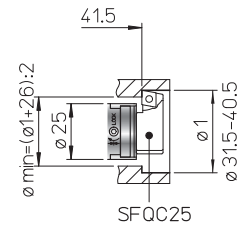
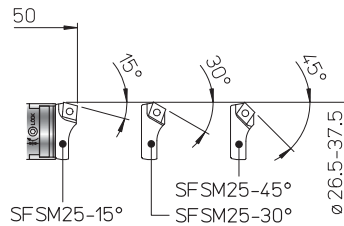
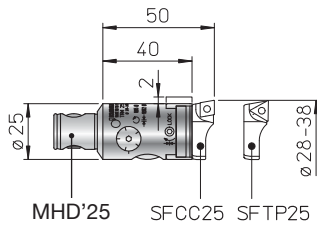
## TRM 16 $\varnothing 18 \sim 23$



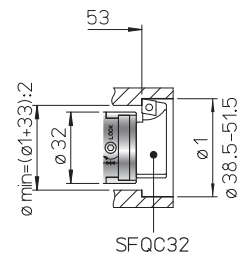
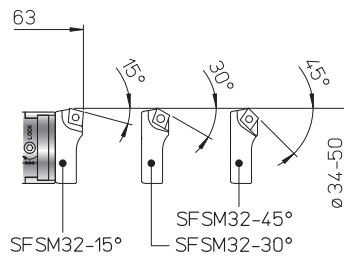
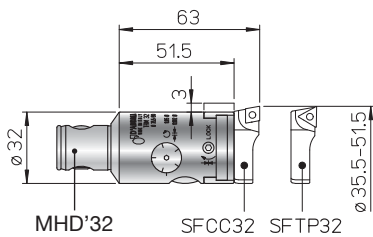
## TRM 20 $\varnothing 22 \sim 29$



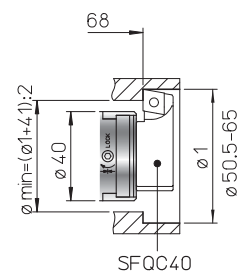
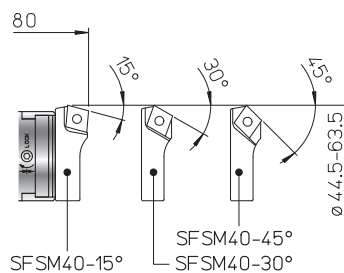
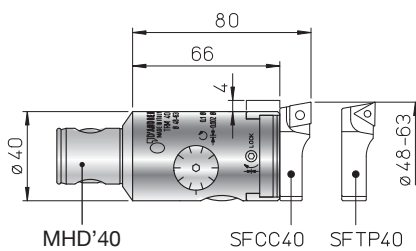
## TRM 25 $\varnothing 28 \sim 38$



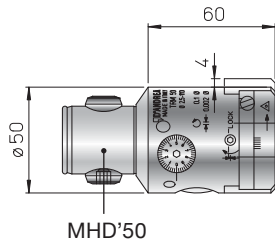
## TRM 32 $\varnothing 35.5 \sim 51.5$



## TRM 40 $\varnothing 48 \sim 63$

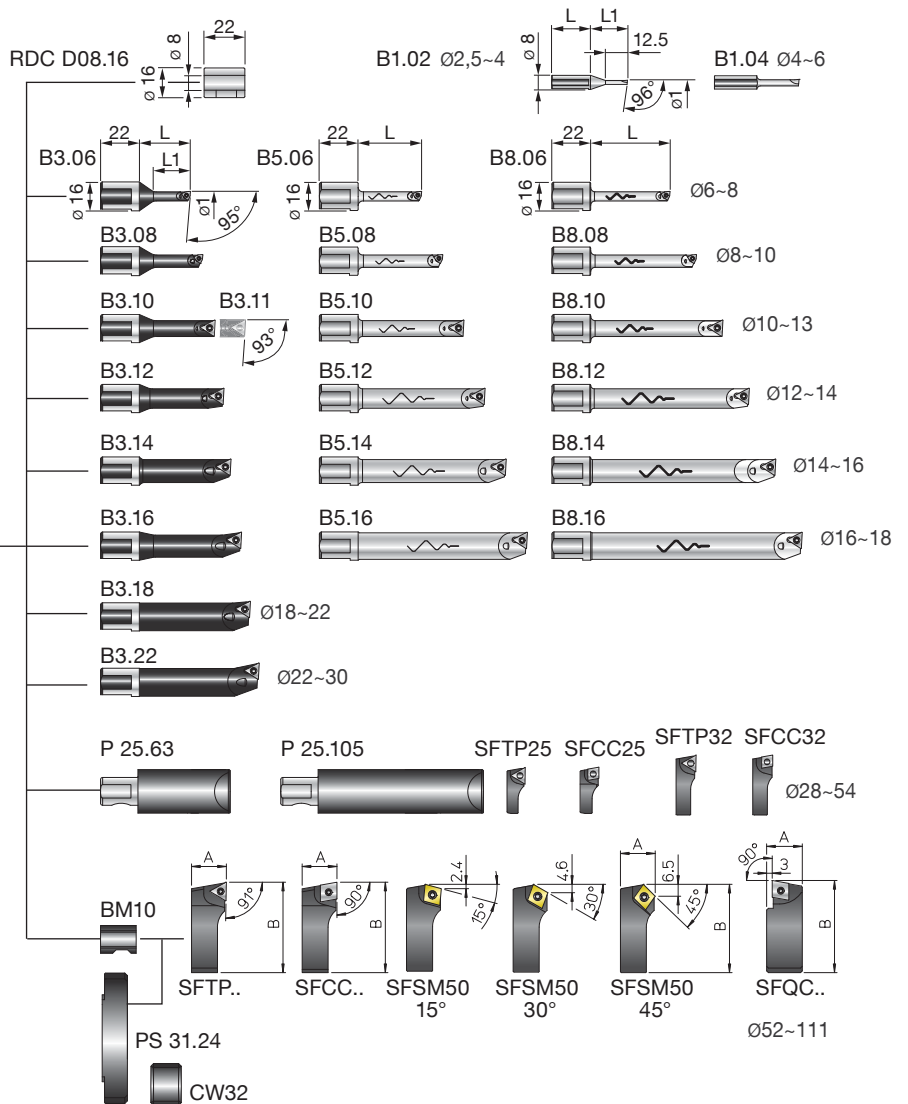


## TRM 50 Ø 2.5 ~ 108

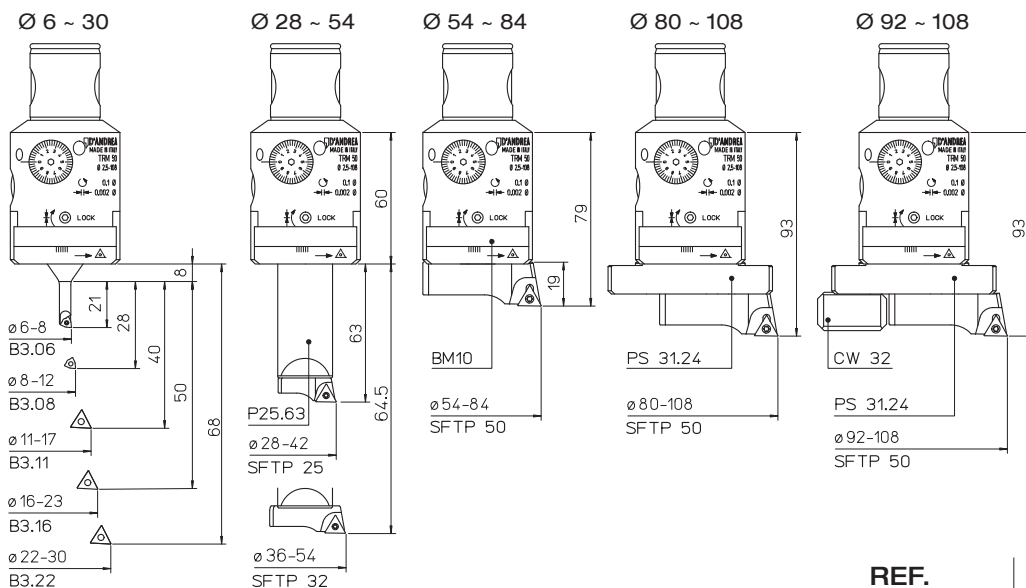


REF.	CODE	kg
TRM 50	455005000500	1
RDC D08.16	200560116082	0.02
P25.63 TR..	435116250631	0.5
P25.105 TR..	435116251051	0.8
PS 31.24 TR..50	433024140751	0.19
CW 32	392011003201	0.07

Tools      Vibration-damping tools      Carbide tools



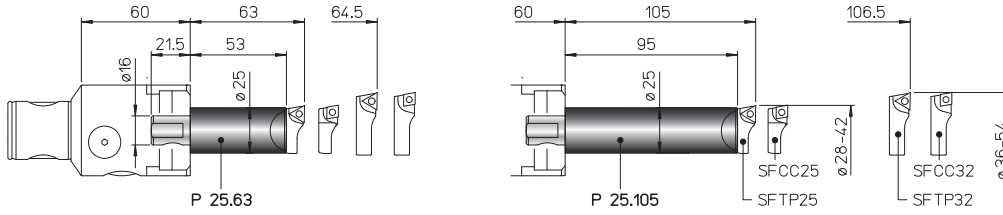
## KIT K01 Ø 6 ~ 108



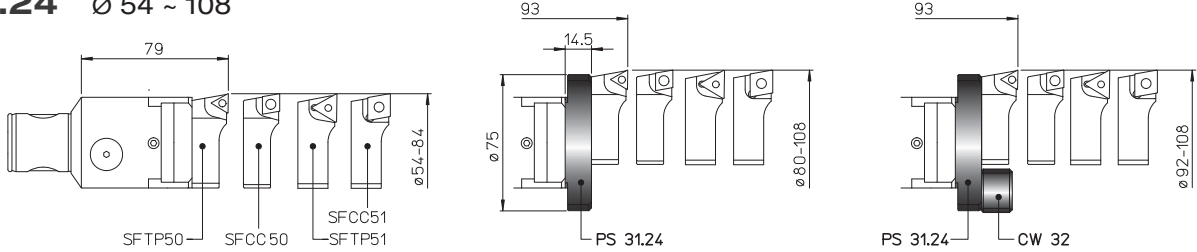
- 1 TRM 50
- 1 BM10
- 1 P25.63
- 1 PS 31.24
- 1 CW 32
- 1 B3.06
- 1 B3.08
- 1 B3.11
- 1 B3.16
- 1 B3.22
- 1 SFTP25
- 1 SFTP32
- 1 SFTP50
- 5 TPGX 090202L DC100
- 1 TPGX 110302L DC100
- 2 WCGT 020102L DC100

REF.	CODE	Ø	kg
KIT K01 TRM50	655005010501	6 ~ 108	3.1

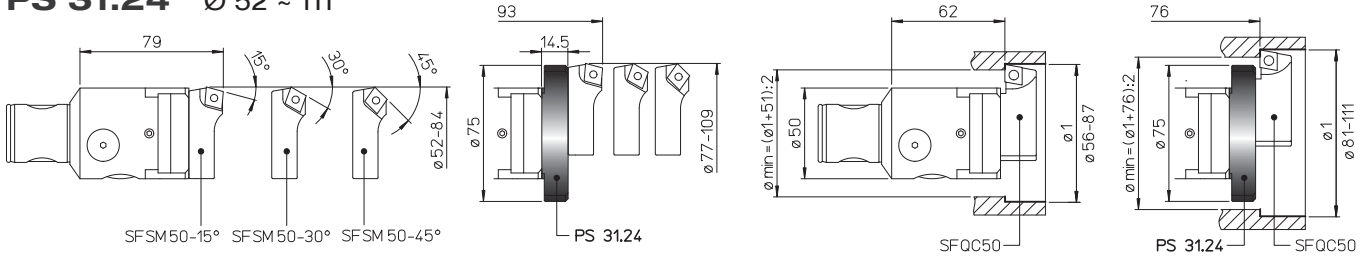
## P 25 Ø 28 ~ 54



## PS 31.24 Ø 54 ~ 108



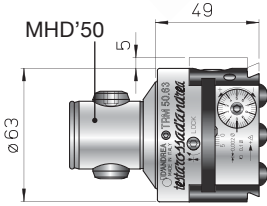
## PS 31.24 Ø 52 ~ 111



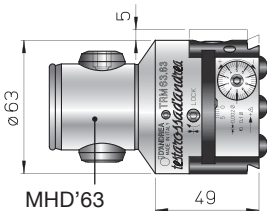
REF.	CODE	Ø1	L	L1	A	B	△	△	□	□	□	kg
SFTP 25	470500525001				10	26.5		TPGX 0902..		CS 250T	TORX T08	0.01
SFTP 32	470500532001				11.5	34.5		TPGX 0902..		CS 250T	TORX T08	0.02
SFTP 50	470500550001				19	52		TPGX 1103..		CS 300890T	TORX T08	0.08
SFTP 51	470500550003				21	52		TCMT 16T3..		TS 4	TORX T15	0.09
SFCC 25	470500525002				10	26.5		CCGT 0602..		TS 25	TORX T08	0.01
SFCC 32	470500532002				11.5	34.5		CCGT 0602..		TS 25	TORX T08	0.02
SFCC 50	470500550002				19	52		CCGT 09T3..		TS 4	TORX T15	0.08
SFCC 51	470500550004				21	52		CCMT 1204..		TS 5	TORX T25	0.09
SFQC 50	470500550062				20.5	53		CCMT 09T3..		TS 4	TORXT15	0.1
SFSM 50-15°	470500550011				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-30°	470500550013				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-45°	470500550015				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
B1.02	572010502001	2.5 ~ 4	22	21								0.02
B1.04	572010504001	4 ~ 6	24	24								0.02
B3.06	572010506001	6 ~ 8	29	21			WCGT 0201..			TS 21	TORX T06	0.035
B3.08	572010508001	8 ~ 10	36	28			WCGT 0201..			TS 211	TORX T06	0.04
B3.10	572010510001	10 ~ 12	43	35			TPGX 0902..			CS 250 T	TORX T08	0.05
B3.11	572010511001	11 ~ 13	48	40			TPGX 0902..			CS 250 T	TORX T08	0.055
B3.12	572010512001	12 ~ 14	48	42			TPGX 0902..			CS 250 T	TORX T08	0.06
B3.14	572010514001	14 ~ 16	52	50			TPGX 0902..			CS 250 T	TORX T08	0.07
B3.16	572010516001	16 ~ 18	58	50			TPGX 0902..			CS 250 T	TORX T08	0.07
B3.18	572010518001	18 ~ 22	63				TPGX 0902..			CS 250 T	TORX T08	0.1
B3.22	572010522001	22 ~ 30	68				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.06	572010506105	6 ~ 8	36				WCGT 0201..			TS 21	TORX T06	0.075
B5.08	572010508105	8 ~ 10	48				WCGT 0201..			TS 211	TORX T06	0.09
B5.10	572010510105	10 ~ 12	60				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.12	572010512105	12 ~ 14	72				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.14	572010514105	14 ~ 16	84				TPGX 0902..			CS 250 T	TORX T08	0.2
B5.16	572010516105	16 ~ 18	96				TPGX 0902..			CS 250 T	TORX T08	0.3
B8.06	572010506108	6 ~ 8	45				WCGT 0201..			TS 21	TORX T06	0.065
B8.08	572010508108	8 ~ 10	60				WCGT 0201..			TS 211	TORX T06	0.08
B8.10	572010510108	10 ~ 12	75				TPGX 0902..			CS 250 T	TORX T08	0.1
B8.12	572010512108	12 ~ 14	90				TPGX 0902..			CS 250 T	TORX T08	0.2
B8.14	572010514108	14 ~ 16	105				TPGX 0902..			CS 250 T	TORX T08	0.2
B8.16	572010516108	16 ~ 18	120				TPGX 0902..			CS 250 T	TORX T08	0.3



## TRM 50/63 - TRM 63/63 Ø 2.5 ~ 125



**TRM 50/63**  
Ø 2.5 ~ 125



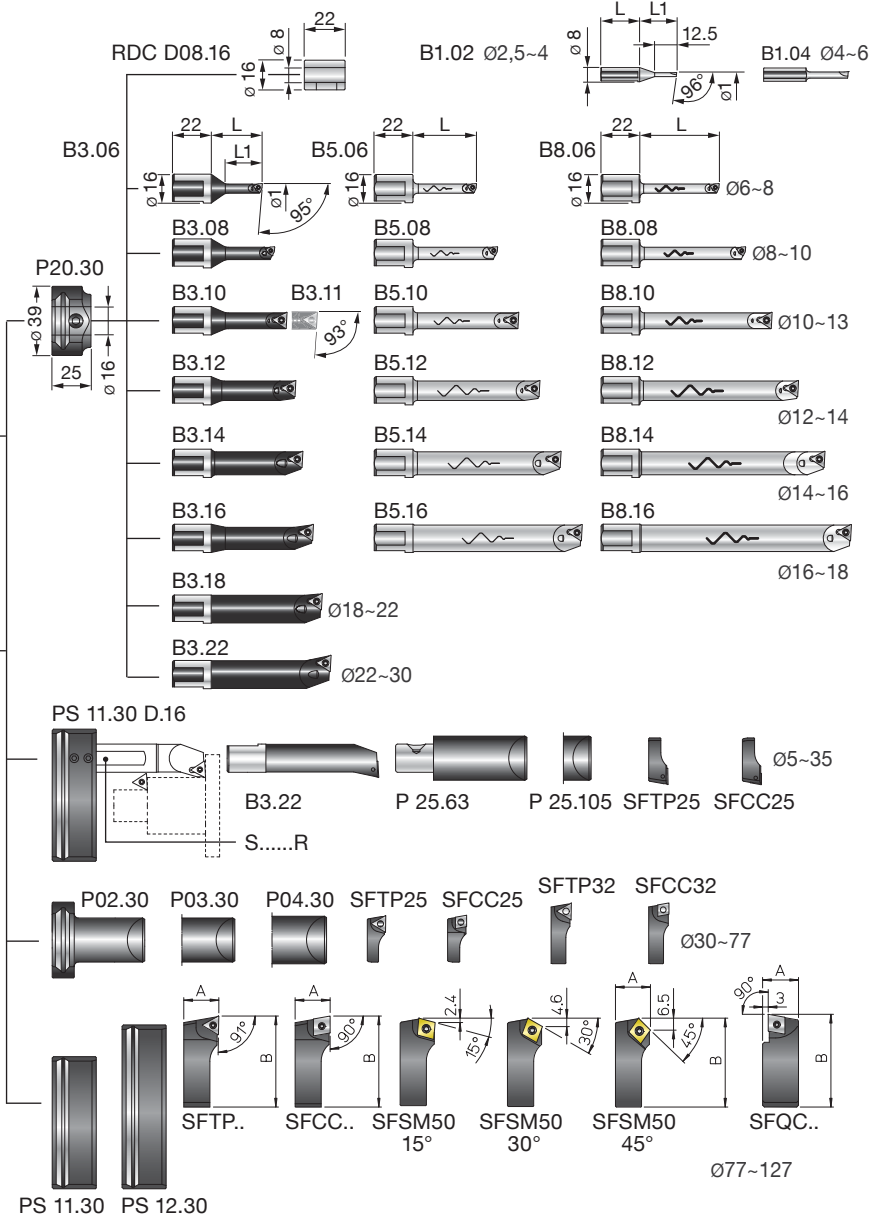
**TRM 63/63**  
Ø 2.5 ~ 125

REF.	CODE	kg
TRM 50/63	455005000631	1.1
TRM 63/63	455006300631	1.5
RDC D08.16	200560116082	0.02
P20.30	431030160300	0.2
PS 11.30 D.16	433030260755	0.4
P25.63 TR..	435116250631	0.5
P25.105 TR..	435116251051	0.8
P02.30	431030250400	0.3
P03.30	431030250700	0.4
P04.30	431030251150	0.7
PS 11.30	433030260750	0.4
PS 12.30	433030260950	0.5

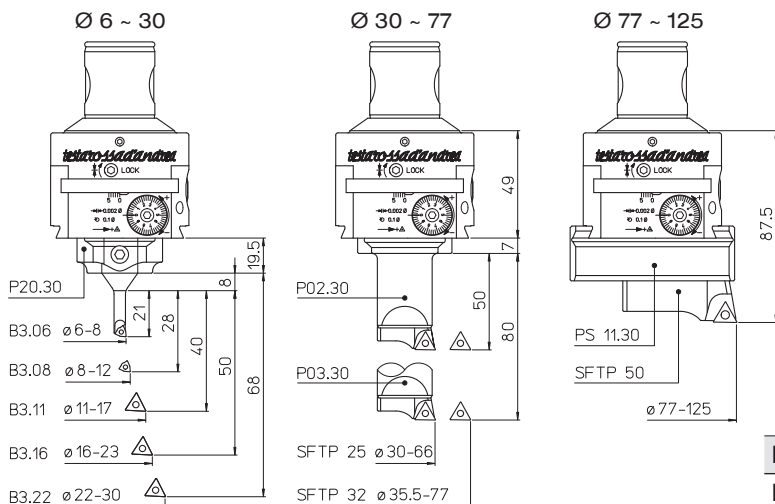
### Tools

### Vibration-damping tools

### Carbide tools



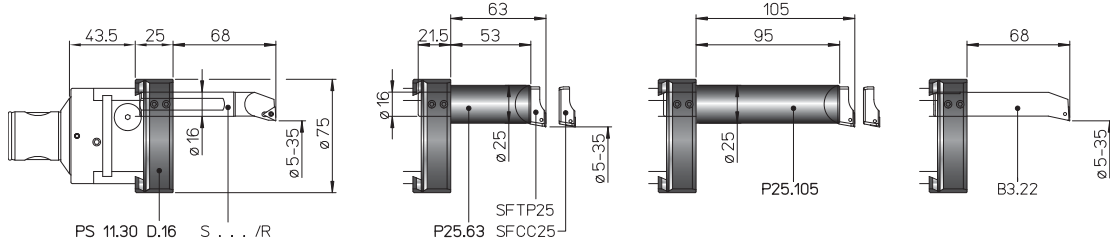
## KIT K01 Ø 6 ~ 125



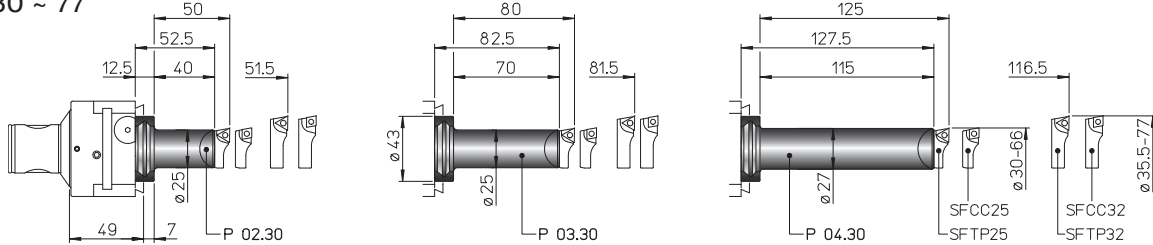
- 1 TRM../63
- 1 P20.30
- 1 PS11.30
- 1 P02.30
- 1 P03.30
- 1 B3.06
- 1 B3.08
- 1 B3.11
- 1 B3.16
- 1 B3.22
- 1 SFTP25
- 1 SFTP32
- 1 SFTP50
- 5 TPGX 090202L DC100
- 1 TPGX 110302L DC100
- 2 WCGT 020102L DC100

REF.	CODE	Ø	kg
KIT K01 TRM50/63	655005010632	6 ~ 125	3.9
KIT K01 TRM63/63	655006310632	6 ~ 125	4.2

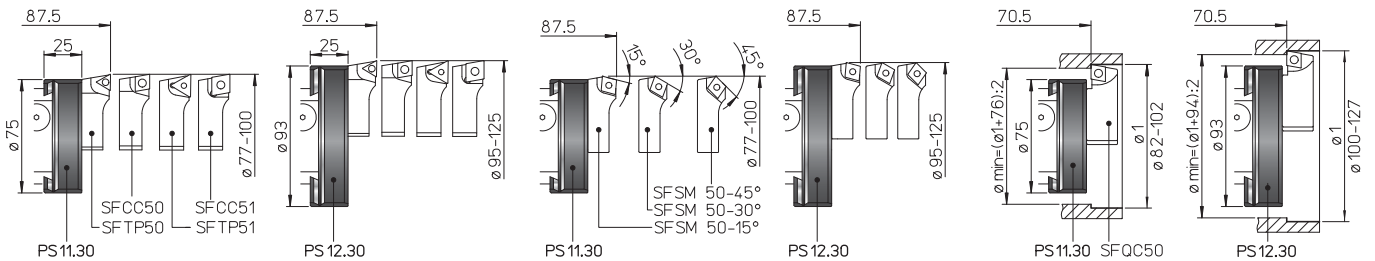
## PS + P25 Ø 5 ~ 35



## P Ø 30 ~ 77

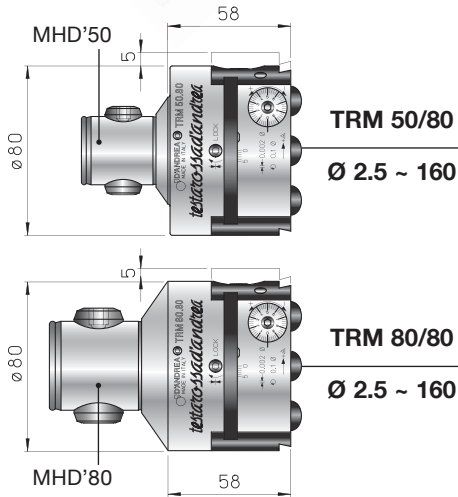


## PS Ø 77 ~ 127

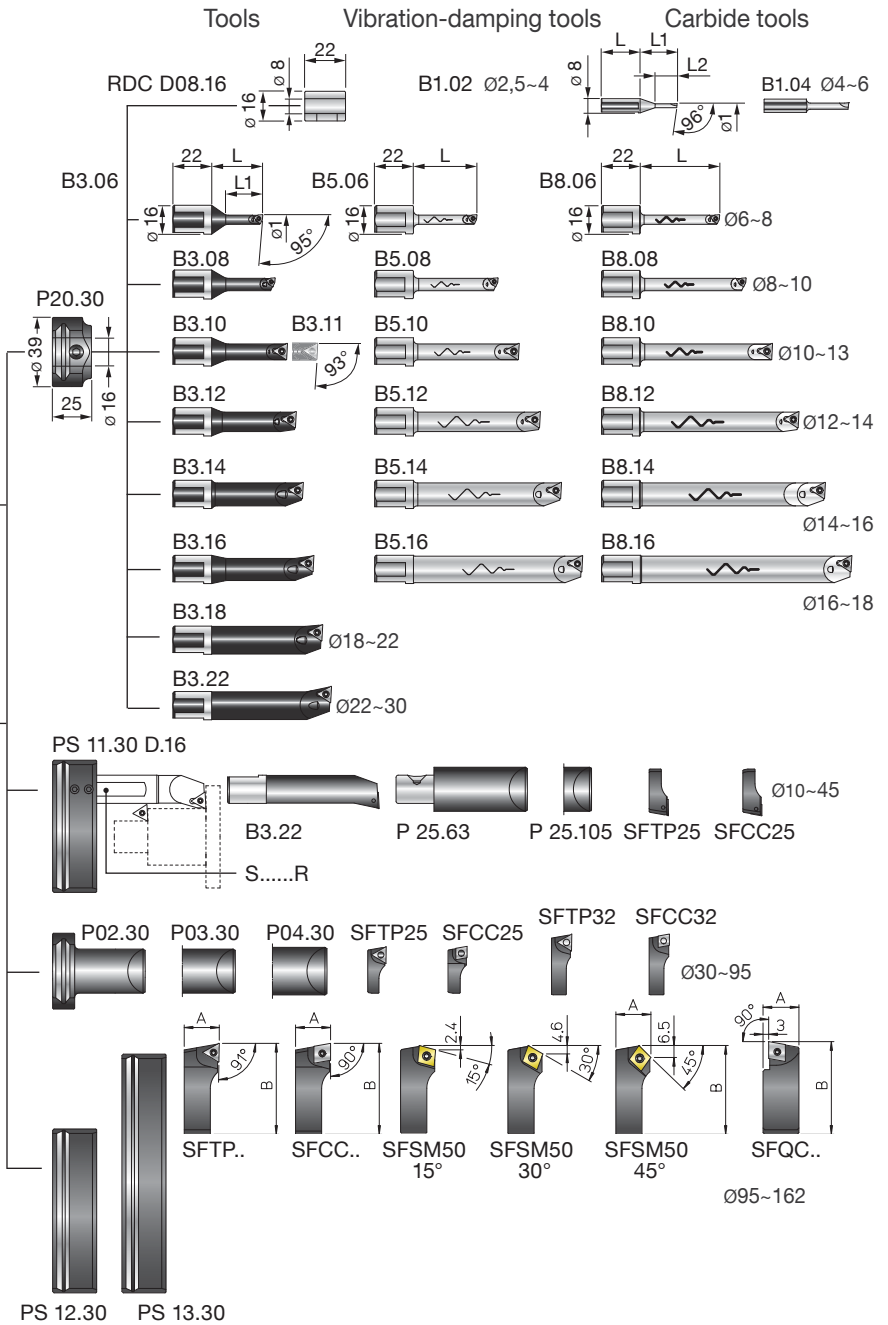


REF.	CODE	Ø1	L	L1	A	B						kg
SFTP 25	470500525001				10	26.5		TPGX 0902..		CS 250T	TORX T08	0.01
SFTP 32	470500532001				11.5	34.5		TPGX 0902..		CS 250T	TORX T08	0.02
SFTP 50	470500550001				19	52		TPGX 1103..		CS 300890T	TORX T08	0.08
SFTP 51	470500550003				21	52		TCMT 16T3..		TS 4	TORX T15	0.09
SFCC 25	470500525002				10	26.5			CCGT 0602..	TS 25	TORX T08	0.01
SFCC 32	470500532002				11.5	34.5			CCGT 0602..	TS 25	TORX T08	0.02
SFCC 50	470500550002				19	52			CCGT 09T3..	TS 4	TORX T15	0.08
SFCC 51	470500550004				21	52			CCMT 1204..	TS 5	TORX T25	0.09
SFQC 50	470500550062				20.5	53			CCMT 09T3..	TS 4	TORXT15	0.1
SFSM 50-15°	470500550011				19	50.5			CCMT 09T3..	TS 4	TORXT15	0.07
SFSM 50-30°	470500550013				19	50.5			CCMT 09T3..	TS 4	TORXT15	0.07
SFSM 50-45°	470500550015				19	50.5			CCMT 09T3..	TS 4	TORXT15	0.07
B1.02	572010502001	2.5 ~ 4	22	21								0.02
B1.04	572010504001	4 ~ 6	24	24								0.02
B3.06	572010506001	6 ~ 8	29	21			WCGT 0201..			TS 21	TORX T06	0.035
B3.08	572010508001	8 ~ 10	36	28			WCGT 0201..			TS 211	TORX T06	0.04
B3.10	572010510001	10 ~ 12	43	35				TPGX 0902..		CS 250 T	TORX T08	0.05
B3.11	572010511001	11 ~ 13	48	40				TPGX 0902..		CS 250 T	TORX T08	0.055
B3.12	572010512001	12 ~ 14	48	42				TPGX 0902..		CS 250 T	TORX T08	0.06
B3.14	572010514001	14 ~ 16	52	50				TPGX 0902..		CS 250 T	TORX T08	0.07
B3.16	572010516001	16 ~ 18	58	50				TPGX 0902..		CS 250 T	TORX T08	0.07
B3.18	572010518001	18 ~ 22	63					TPGX 0902..		CS 250 T	TORX T08	0.1
B3.22	572010522001	22 ~ 30	68					TPGX 0902..		CS 250 T	TORX T08	0.1
B5.06	572010506105	6 ~ 8	36				WCGT 0201..			TS 21	TORX T06	0.075
B5.08	572010508105	8 ~ 10	48				WCGT 0201..			TS 211	TORX T06	0.09
B5.10	572010510105	10 ~ 12	60					TPGX 0902..		CS 250 T	TORX T08	0.1
B5.12	572010512105	12 ~ 14	72					TPGX 0902..		CS 250 T	TORX T08	0.1
B5.14	572010514105	14 ~ 16	84					TPGX 0902..		CS 250 T	TORX T08	0.2
B5.16	572010516105	16 ~ 18	96					TPGX 0902..		CS 250 T	TORX T08	0.3
B8.06	572010506108	6 ~ 8	45				WCGT 0201..			TS 21	TORX T06	0.065
B8.08	572010508108	8 ~ 10	60				WCGT 0201..			TS 211	TORX T06	0.08
B8.10	572010510108	10 ~ 12	75					TPGX 0902..		CS 250 T	TORX T08	0.1
B8.12	572010512108	12 ~ 14	90					TPGX 0902..		CS 250 T	TORX T08	0.2
B8.14	572010514108	14 ~ 16	105					TPGX 0902..		CS 250 T	TORX T08	0.2
B8.16	572010516108	16 ~ 18	120					TPGX 0902..		CS 250 T	TORX T08	0.3

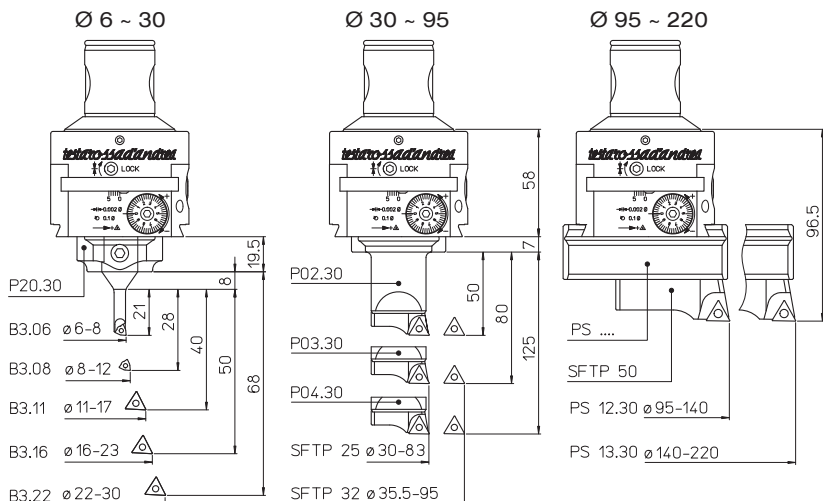
## TRM 50/80 - TRM 80/80 Ø 2.5 ~ 160



REF.	CODE	kg
TRM 50/80	455005000801	2
TRM 80/80	455008000801	2.5
RDC D08.16	200560116082	0.02
P20.30	431030160300	0.2
PS 11.30 D.16	433030260755	0.4
P25.63 TR..	435116250631	0.5
P25.105 TR..	435116251051	0.8
P02.30	431030250400	0.3
P03.30	431030250700	0.4
P04.30	431030251150	0.7
PS 12.30	433030260950	0.5
PS 13.30	433030261400	0.7



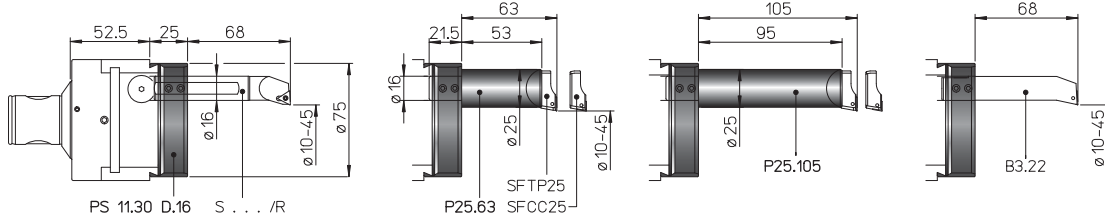
## KIT K01 Ø 6 ~ 220



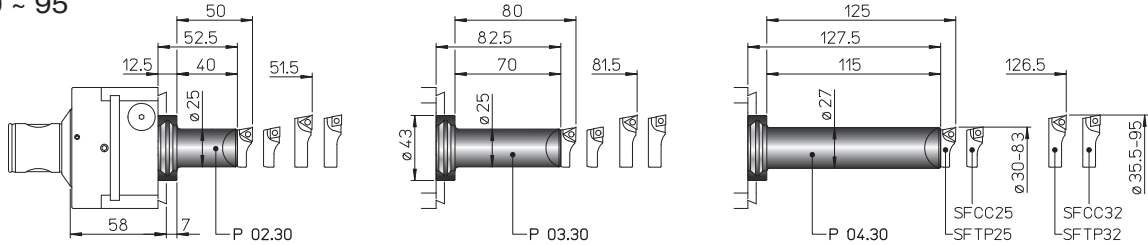
- 1 TRM../80
- 1 P20.30
- 1 PS12.30
- 1 PS13.30
- 1 P03.30
- 1 P04.30
- 1 B3.06
- 1 B3.08
- 1 B3.11
- 1 B3.16
- 1 B3.22
- 1 SFTP25
- 1 SFTP32
- 1 SFTP50
- 5 TPGX 090202L DC100
- 1 TPGX 110302L DC100
- 2 WCGT 020102L DC100

REF.	CODE	Ø	kg
KIT K01 TRM50/80	655005010802	6 ~ 220	6.2
KIT K01 TRM80/80	655008010802	6 ~ 220	6.6

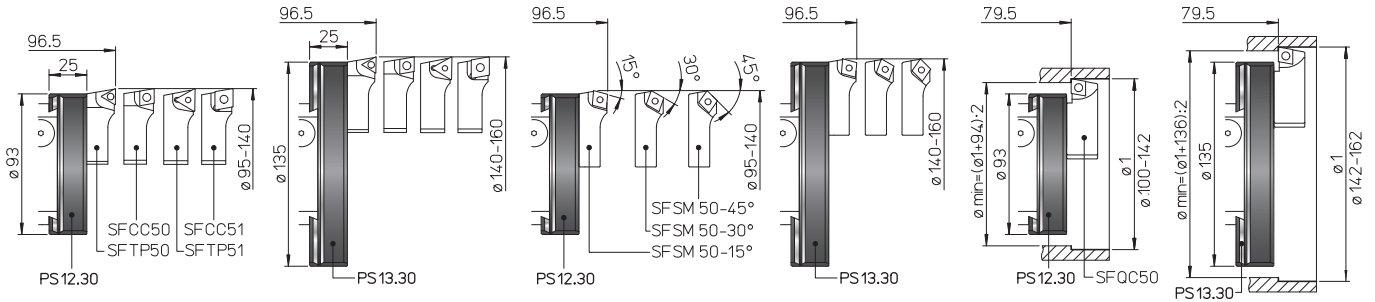
## PS + P25 Ø 10 ~ 45



## P Ø 30 ~ 95



## PS Ø 95 ~ 162



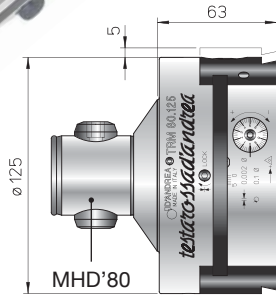
REF.	CODE	Ø1	L	L1	A	B	⊖	⊕	⊖	⊕	kg
SFTP 25	470500525001		10	26.5			TPGX 0902..		CS 250T	TORX T08	0.01
SFTP 32	470500532001		11.5	34.5			TPGX 0902..		CS 250T	TORX T08	0.02
SFTP 50	470500550001		19	52			TPGX 1103..		CS 300890T	TORX T08	0.08
SFTP 51	470500550003		21	52			TCMT 16T3..		TS 4	TORX T15	0.09
SFCC 25	470500525002		10	26.5			CCGT 0602..		TS 25	TORX T08	0.01
SFCC 32	470500532002		11.5	34.5			CCGT 0602..		TS 25	TORX T08	0.02
SFCC 50	470500550002		19	52			CCGT 09T3..		TS 4	TORX T15	0.08
SFCC 51	470500550004		21	52			CCMT 1204..		TS 5	TORX T25	0.09
SFQC 50	470500550062		20.5	53			CCMT 09T3..		TS 4	TORX T15	0.1
SFSM 50-15°	470500550011		19	50.5			CCMT 09T3..		TS 4	TORX T15	0.07
SFSM 50-30°	470500550013		19	50.5			CCMT 09T3..		TS 4	TORX T15	0.07
SFSM 50-45°	470500550015		19	50.5			CCMT 09T3..		TS 4	TORX T15	0.07

B1.02	572010502001	2.5 ~ 4	22	21							0.02
B1.04	572010504001	4 ~ 6	24	24							0.02
B3.06	572010506001	6 ~ 8	29	21		WCGT 0201..			TS 21	TORX T06	0.035
B3.08	572010508001	8 ~ 10	36	28		WCGT 0201..			TS 211	TORX T06	0.04
B3.10	572010510001	10 ~ 12	43	35			TPGX 0902..		CS 250 T	TORX T08	0.05
B3.11	572010511001	11 ~ 13	48	40			TPGX 0902..		CS 250 T	TORX T08	0.055
B3.12	572010512001	12 ~ 14	48	42			TPGX 0902..		CS 250 T	TORX T08	0.06
B3.14	572010514001	14 ~ 16	52	50			TPGX 0902..		CS 250 T	TORX T08	0.07
B3.16	572010516001	16 ~ 18	58	50			TPGX 0902..		CS 250 T	TORX T08	0.07
B3.18	572010518001	18 ~ 22	63				TPGX 0902..		CS 250 T	TORX T08	0.1
B3.22	572010522001	22 ~ 30	68				TPGX 0902..		CS 250 T	TORX T08	0.1
B5.06	572010506105	6 ~ 8	36			WCGT 0201..			TS 21	TORX T06	0.075
B5.08	572010508105	8 ~ 10	48			WCGT 0201..			TS 211	TORX T06	0.09
B5.10	572010510105	10 ~ 12	60				TPGX 0902..		CS 250 T	TORX T08	0.1
B5.12	572010512105	12 ~ 14	72				TPGX 0902..		CS 250 T	TORX T08	0.1
B5.14	572010514105	14 ~ 16	84				TPGX 0902..		CS 250 T	TORX T08	0.2
B5.16	572010516105	16 ~ 18	96				TPGX 0902..		CS 250 T	TORX T08	0.3
B8.06	572010506108	6 ~ 8	45			WCGT 0201..			TS 21	TORX T06	0.065
B8.08	572010508108	8 ~ 10	60			WCGT 0201..			TS 211	TORX T06	0.08
B8.10	572010510108	10 ~ 12	75				TPGX 0902..		CS 250 T	TORX T08	0.1
B8.12	572010512108	12 ~ 14	90				TPGX 0902..		CS 250 T	TORX T08	0.2
B8.14	572010514108	14 ~ 16	105				TPGX 0902..		CS 250 T	TORX T08	0.2
B8.16	572010516108	16 ~ 18	120				TPGX 0902..		CS 250 T	TORX T08	0.3

## TRM 80/125 Ø 36 ~ 500



2  $\mu$ m



**P02.40** **P03.40** **P04.40** **SFTP25** **SFCC25** **SFTP32** **SFCC32**  $\text{Ø } 36 \sim 138$   
**PS14.40** **PS13.40** **PS12.40** **PS11.40**  
**SFTP..** **SFCC..** **SFSM50 15°** **SFSM50 30°** **SFSM50 45°** **SFQC..**  $\text{Ø } 135 \sim 502$

REF.	CODE	kg
<b>TRM 80/125</b>	455008001251	5.5
<b>P02.40</b>	431040320700	0.7
<b>P03.40</b>	431040321150	1
<b>P04.40</b>	431040321900	2
<b>PS 11.40</b>	433040351500	1.5
<b>PS 12.40</b>	433040352300	2.4
<b>PS 13.40</b>	433040353300	3.5
<b>PS 14.40</b>	433040354000	4.6

## KIT K03 Ø 36 ~ 410

$\text{Ø } 36 \sim 138$   $\text{Ø } 135 \sim 410$   
**P02.40** **P03.40** **P04.40** **SFTP 32**  $\text{Ø } 36-125$  **SFTP 40**  $\text{Ø } 50-138$   
**PS 11.40** **PS 12.40** **PS 13.40**  
**SFTP 50**  $\text{Ø } 135-210$  **SFTP 50**  $\text{Ø } 205-310$  **SFTP 50**  $\text{Ø } 305-410$



- 1 P02.40 1 PS11.40 1 SFTP32
- 1 P03.40 1 PS12.40 1 SFTP40
- 1 P04.40 1 PS13.40 1 SFTP50

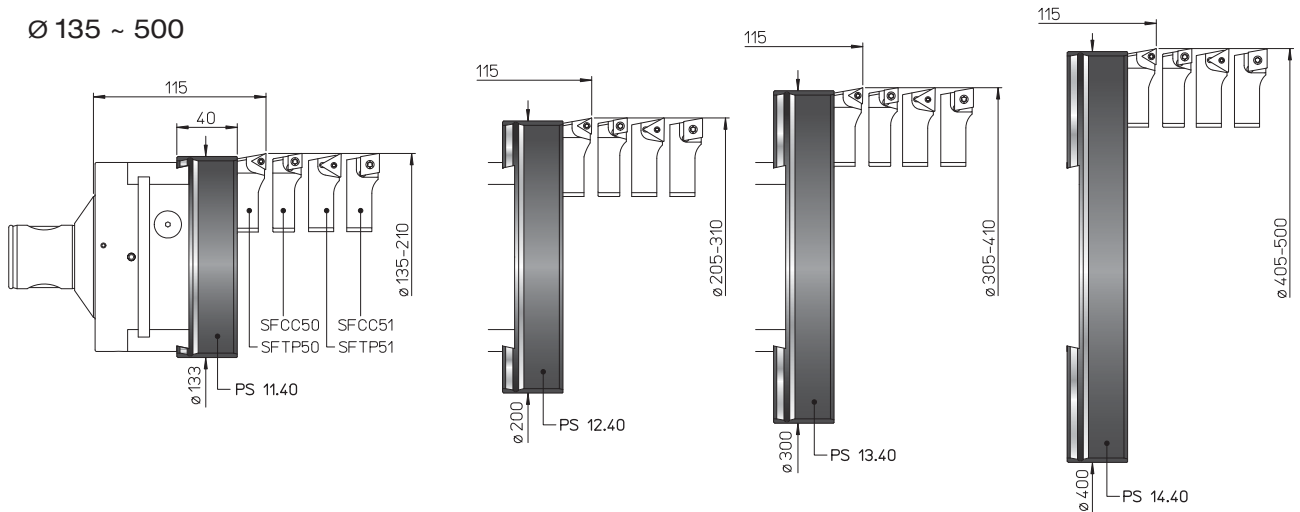
**TRM 80/125 NOT INCLUDED**

REF.	CODE	Ø	kg
<b>KIT K03 TRM 80/125</b>	655012500030	36 ~ 410	11.2

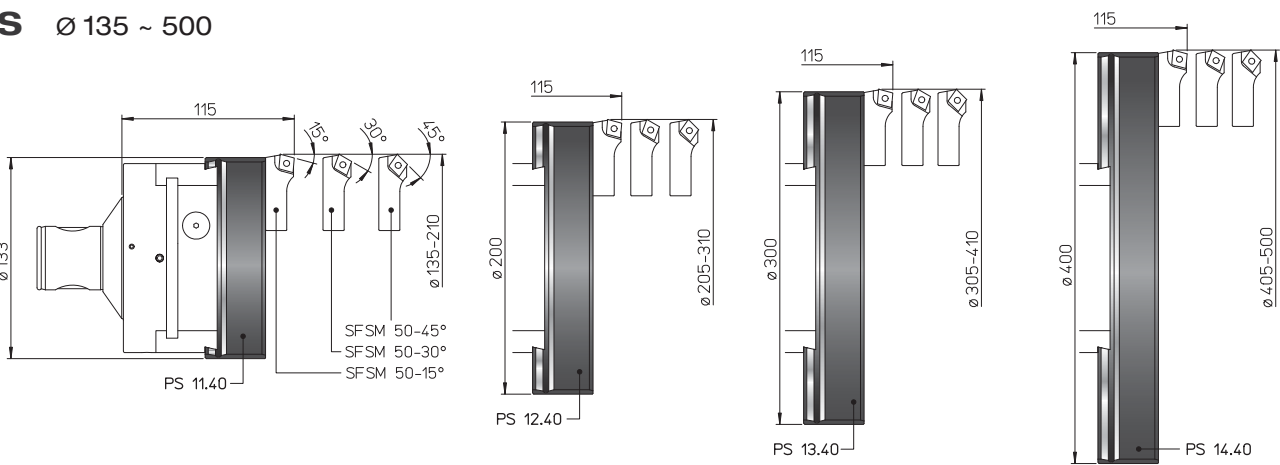
## P Ø 36 ~ 138

**P 02.40** **P 03.40** **P 04.40** **SFTP32** **SFTP40** **SFCC32** **SFCC40**

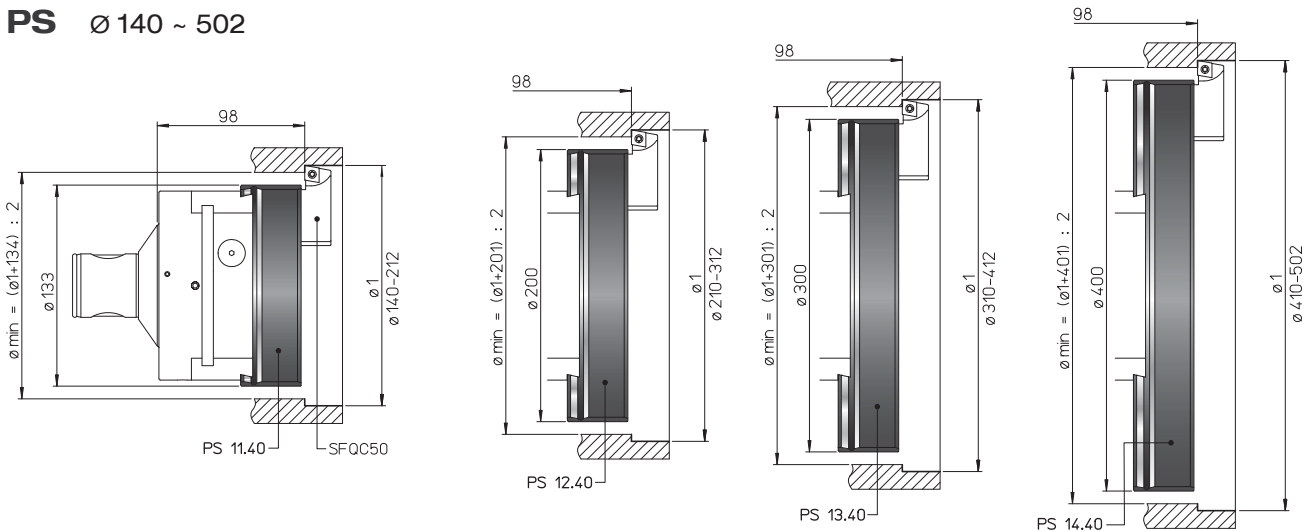
## PS Ø 135 ~ 500



## PS Ø 135 ~ 500



## PS Ø 140 ~ 502



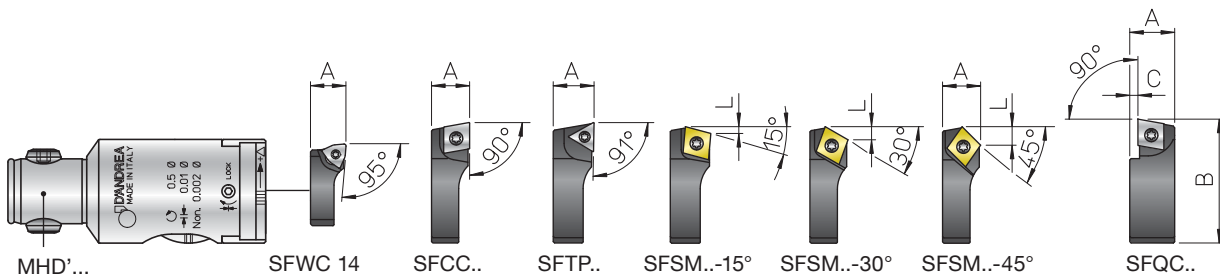
REF.	CODE	A	B					kg
SFTP 32	470500532001	11.5	34.5	TPGX 0902..		CS 250T	TORX T08	0.02
SFTP 40	470500540001	14	44	TPGX 1103..		CS 300890T	TORX T08	0.04
SFTP 50	470500550001	19	52	TPGX 1103..		CS 300890T	TORX T08	0.08
SFTP 51	470500550003	21	52	TCMT 16T3..		TS 4	TORX T15	0.09
SFCC 32	470500532002	11.5	34.5	CCGT 0602..		TS 25	TORX T08	0.02
SFCC 40	470500540002	14	44	CCGT 09T3..		TS 4	TORX T15	0.04
SFCC 50	470500550002	19	52	CCGT 09T3..		TS 4	TORX T15	0.08
SFCC 51	470500550004	21	52	CCMT 1204..		TS 5	TORX T25	0.09
SFQC 50	470500550062	20.5	53	CCMT 09T3..		TS 4	TORXT15	0.1
SFSM 50-15°	470500550011	19	50.5	CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-30°	470500550013	19	50.5	CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-45°	470500550015	19	50.5	CCMT 09T3..		TS 4	TORXT15	0.07

## TRC 14 ~ 40 Ø 14.5 ~ 66



**10 µm**  
nonio  
vernier **2 µm**

REF.	CODE	Ø	kg
TRC 14	455011400301	14.5 ~ 18	0.02
TRC 16	455011600341	18 ~ 24	0.05
TRC 20	455012000401	22 ~ 30	0.1
TRC 25	455012500501	28 ~ 40	0.2
TRC 32	455013200631	35.5 ~ 53.5	0.35
TRC 40	455014000801	48 ~ 66	0.7

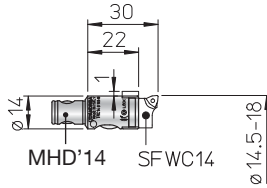


## BIT-HOLDERS SFWC.. - SFCC .. - SFTP .. - SFSM .. - SFQC ..

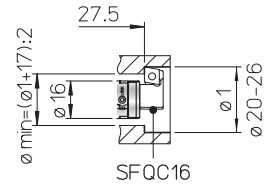
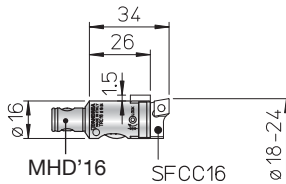


REF.	CODE	A	B	C	L						kg
SFWC 14	470500514002	8	14			WCGT 0201..			TS 211	TORX T06	0.003
SFCC 16	470500516002	8	17				CCGT 0602..		TS 25	TORX T08	0.003
SFCC 20	470500520002	8.5	21				CCGT 0602..		TS 25	TORX T08	0.005
SFCC 25	470500525002	10	26.5				CCGT 0602..		TS 25	TORX T08	0.01
SFCC 32	470500532002	11.5	34.5				CCGT 0602..		TS 25	TORX T08	0.02
SFCC 40	470500540002	14	44				CCGT 09T3..		TS 4	TORX T15	0.04
SFTP 25	470500525001	10	26.5					TPGX 0902..	CS 250T	TORX T08	0.01
SFTP 32	470500532001	11.5	34.5					TPGX 0902..	CS 250T	TORX T08	0.02
SFTP 40	470500540001	14	44					TPGX 1103..	CS 300890T	TORX T08	0.04
SFQC 16	470500516062	10	18	2			CCMT 0602..		TS 25	TORX T08	0.005
SFQC 20	470500520062	10.5	22.5	2			CCMT 0602..		TS 25	TORX T08	0.008
SFQC 25	470500525062	12	28.5	2.5			CCMT 0602..		TS 25	TORX T08	0.01
SFQC 32	470500532062	13.5	35.5	2.5			CCMT 0602..		TS 25	TORX T08	0.03
SFQC 40	470500540062	16.5	46	3			CCMT 09T3..		TS 4	TORXT15	0.06
SFSM 25-15°	470500525011	10	25.5		1.6		CCMT 0602..		TS 25	TORX T08	0.01
SFSM 25-30°	470500525013	10	25.5		3		CCMT 0602..		TS 25	TORX T08	0.01
SFSM 25-45°	470500525015	10	25.5		4.3		CCMT 0602..		TS 25	TORX T08	0.01
SFSM 32-15°	470500532011	11.5	33.5		1.6		CCMT 0602..		TS 25	TORX T08	0.02
SFSM 32-30°	470500532013	11.5	33.5		3		CCMT 0602..		TS 25	TORX T08	0.02
SFSM 32-45°	470500532015	11.5	33.5		4.3		CCMT 0602..		TS 25	TORX T08	0.02
SFSM 40-15°	470500540011	14	42.5		2.4		CCMT 09T3..		TS 4	TORXT15	0.03
SFSM 40-30°	470500540013	14	42.5		4.6		CCMT 09T3..		TS 4	TORXT15	0.03
SFSM 40-45°	470500540015	14	42.5		6.5		CCMT 09T3..		TS 4	TORXT15	0.03

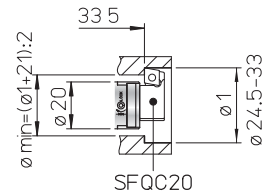
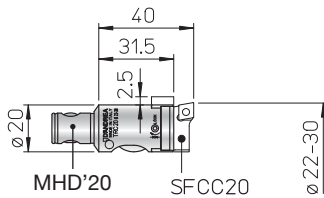
## TRC 14 $\varnothing 14.5 \sim 18$



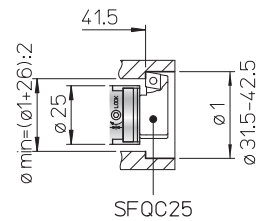
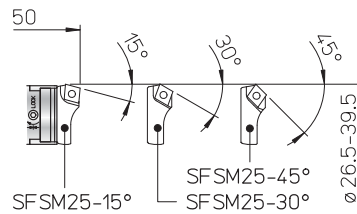
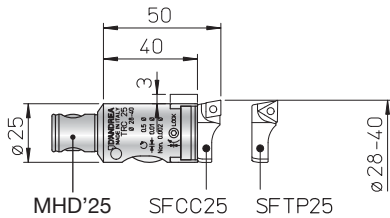
## TRC 16 $\varnothing 18 \sim 24$



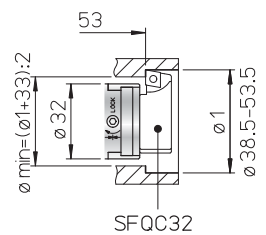
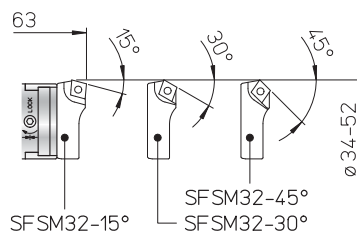
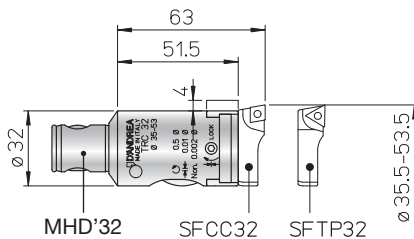
## TRC 20 $\varnothing 22 \sim 30$



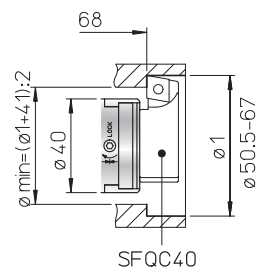
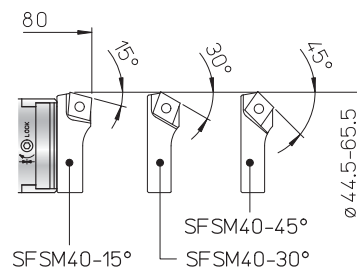
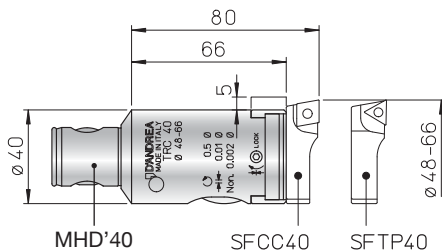
## TRC 25 $\varnothing 28 \sim 40$



## TRC 32 $\varnothing 35.5 \sim 53.5$

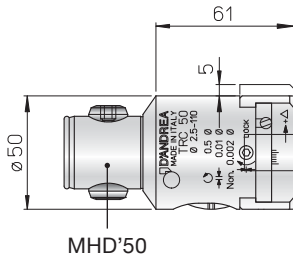


## TRC 40 $\varnothing 48 \sim 66$

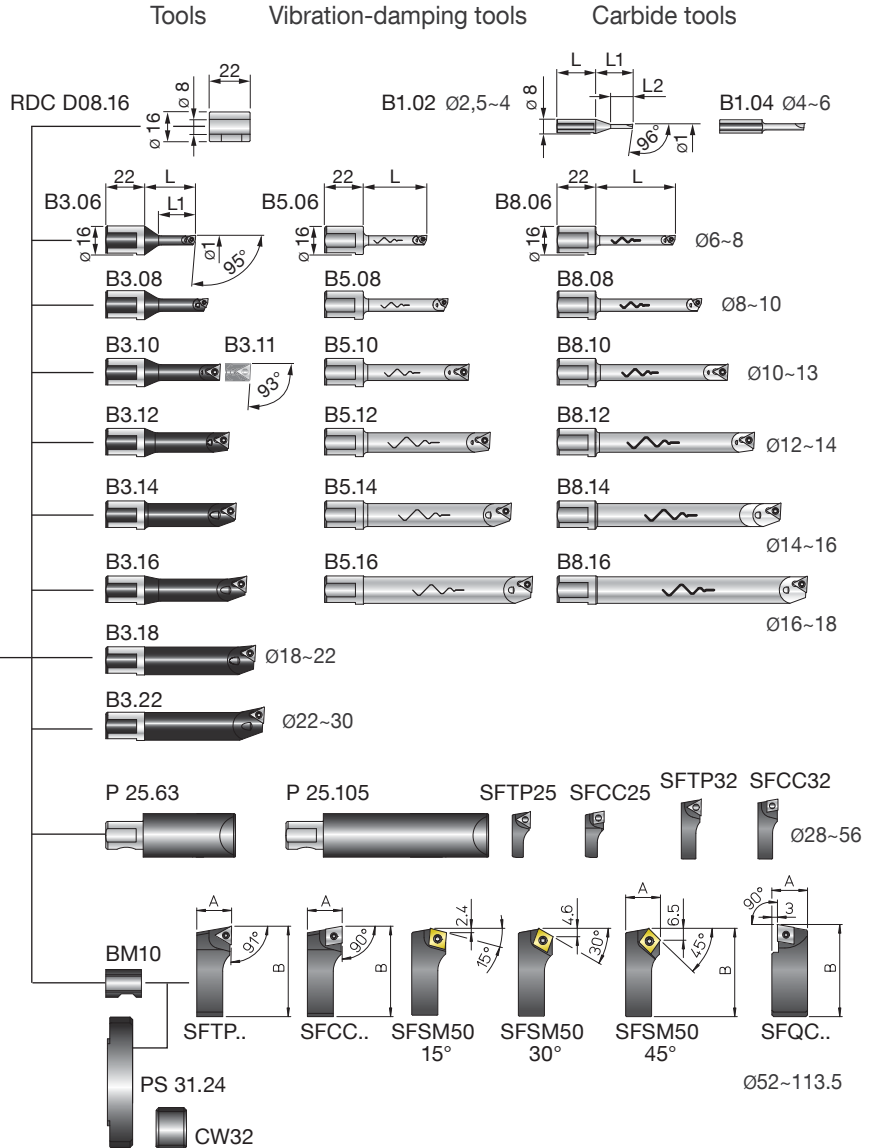




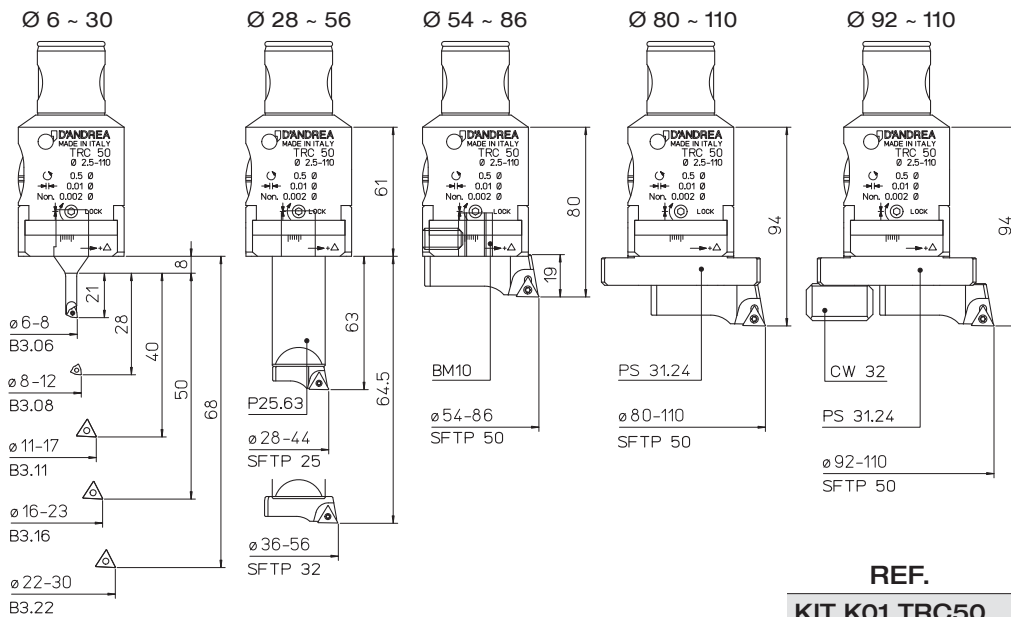
## TRC 50 Ø 2.5 ~ 110



REF.	CODE	kg
TRC 50	455015000801	1
RDC D08.16	200560116082	0.02
P25.63 TR..	435116250631	0.5
P25.105 TR..	435116251051	0.8
PS 31.24 TR..	433024140751	0.19
CW 32	392011003201	0.07



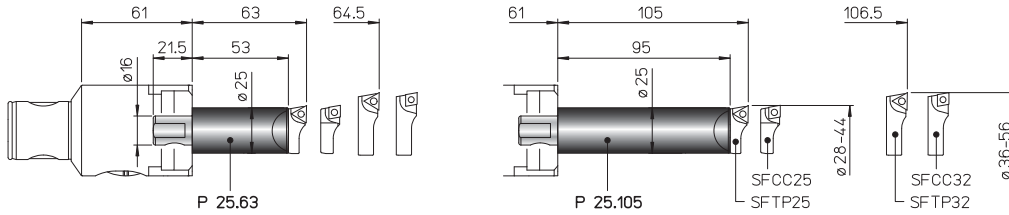
## KIT K01 Ø 6 ~ 110



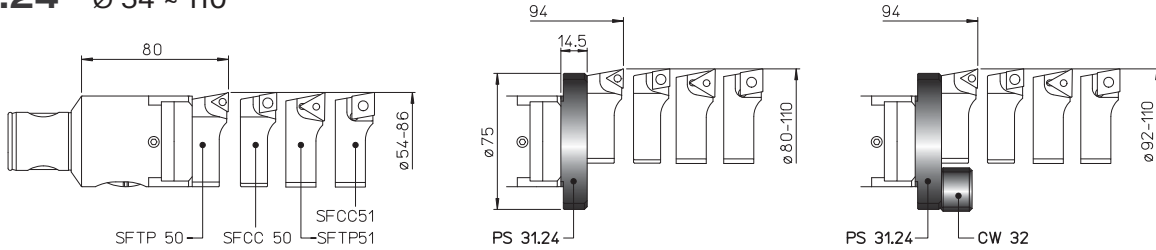
- 1 TRC 50
- 1 BM10
- 1 P25.63
- 1 PS 31.24
- 1 CW 32
- 1 B3.06
- 1 B3.08
- 1 B3.11
- 1 B3.16
- 1 B3.22
- 1 SFTP25
- 1 SFTP32
- 1 SFTP50
- 5 TPGX 090202L DC100
- 1 TPGX 110302L DC100
- 2 WCGT 020102L DC100

REF.	CODE	Ø	kg
KIT K01 TRC50	655015010502	6 ~ 110	3.1

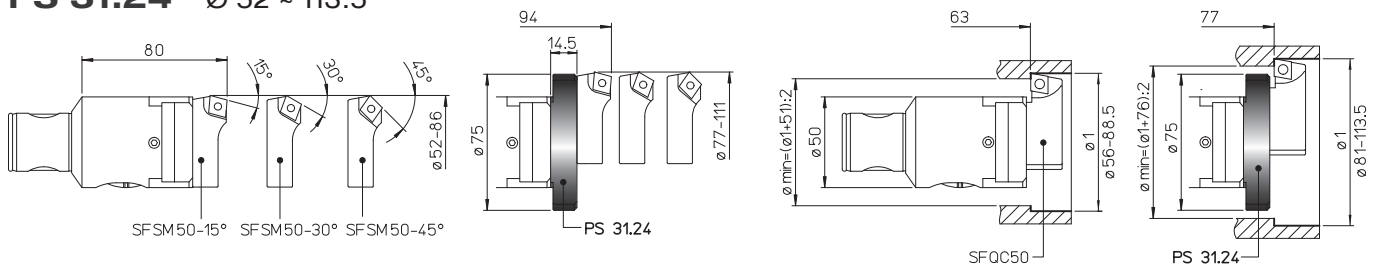
## P 25 Ø 28 ~ 56



## PS 31.24 Ø 54 ~ 110



## PS 31.24 Ø 52 ~ 113.5

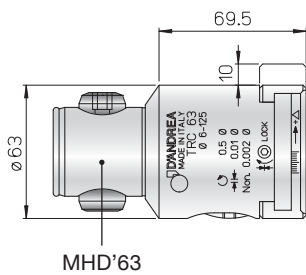


REF.	CODE	Ø1	L	L1	A	B						kg
SFTP 25	470500525001				10	26.5		TPGX 0902..		CS 250T	TORX T08	0.01
SFTP 32	470500532001				11.5	34.5		TPGX 0902..		CS 250T	TORX T08	0.02
SFTP 50	470500550001				19	52		TPGX 1103..		CS 300890T	TORX T08	0.08
SFTP 51	470500550003				21	52		TCMT 16T3..		TS 4	TORX T15	0.09
SFCC 25	470500525002				10	26.5		CCGT 0602..		TS 25	TORX T08	0.01
SFCC 32	470500532002				11.5	34.5		CCGT 0602..		TS 25	TORX T08	0.02
SFCC 50	470500550002				19	52		CCGT 09T3..		TS 4	TORX T15	0.08
SFCC 51	470500550004				21	52		CCMT 1204..		TS 5	TORX T25	0.09
SFQC 50	470500550062				20.5	53		CCMT 09T3..		TS 4	TORXT15	0.1
SFSM 50-15°	470500550011				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-30°	470500550013				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-45°	470500550015				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
B1.02	572010502001	2.5 ~ 4	22	21								0.02
B1.04	572010504001	4 ~ 6	24	24								0.02
B3.06	572010506001	6 ~ 8	29	21		WCGT 0201..				TS 21	TORX T06	0.035
B3.08	572010508001	8 ~ 10	36	28		WCGT 0201..				TS 211	TORX T06	0.04
B3.10	572010510001	10 ~ 12	43	35			TPGX 0902..			CS 250 T	TORX T08	0.05
B3.11	572010511001	11 ~ 13	48	40			TPGX 0902..			CS 250 T	TORX T08	0.055
B3.12	572010512001	12 ~ 14	48	42			TPGX 0902..			CS 250 T	TORX T08	0.06
B3.14	572010514001	14 ~ 16	52	50			TPGX 0902..			CS 250 T	TORX T08	0.07
B3.16	572010516001	16 ~ 18	58	50			TPGX 0902..			CS 250 T	TORX T08	0.07
B3.18	572010518001	18 ~ 22	63				TPGX 0902..			CS 250 T	TORX T08	0.1
B3.22	572010522001	22 ~ 30	68				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.06	572010506105	6 ~ 8	36			WCGT 0201..				TS 21	TORX T06	0.075
B5.08	572010508105	8 ~ 10	48			WCGT 0201..				TS 211	TORX T06	0.09
B5.10	572010510105	10 ~ 12	60				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.12	572010512105	12 ~ 14	72				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.14	572010514105	14 ~ 16	84				TPGX 0902..			CS 250 T	TORX T08	0.2
B5.16	572010516105	16 ~ 18	96				TPGX 0902..			CS 250 T	TORX T08	0.3
B8.06	572010506108	6 ~ 8	45			WCGT 0201..				TS 21	TORX T06	0.065
B8.08	572010508108	8 ~ 10	60			WCGT 0201..				TS 211	TORX T06	0.08
B8.10	572010510108	10 ~ 12	75				TPGX 0902..			CS 250 T	TORX T08	0.1
B8.12	572010512108	12 ~ 14	90				TPGX 0902..			CS 250 T	TORX T08	0.2
B8.14	572010514108	14 ~ 16	105				TPGX 0902..			CS 250 T	TORX T08	0.2
B8.16	572010516108	16 ~ 18	120				TPGX 0902..			CS 250 T	TORX T08	0.3

## TRC 63 Ø 6 ~ 125

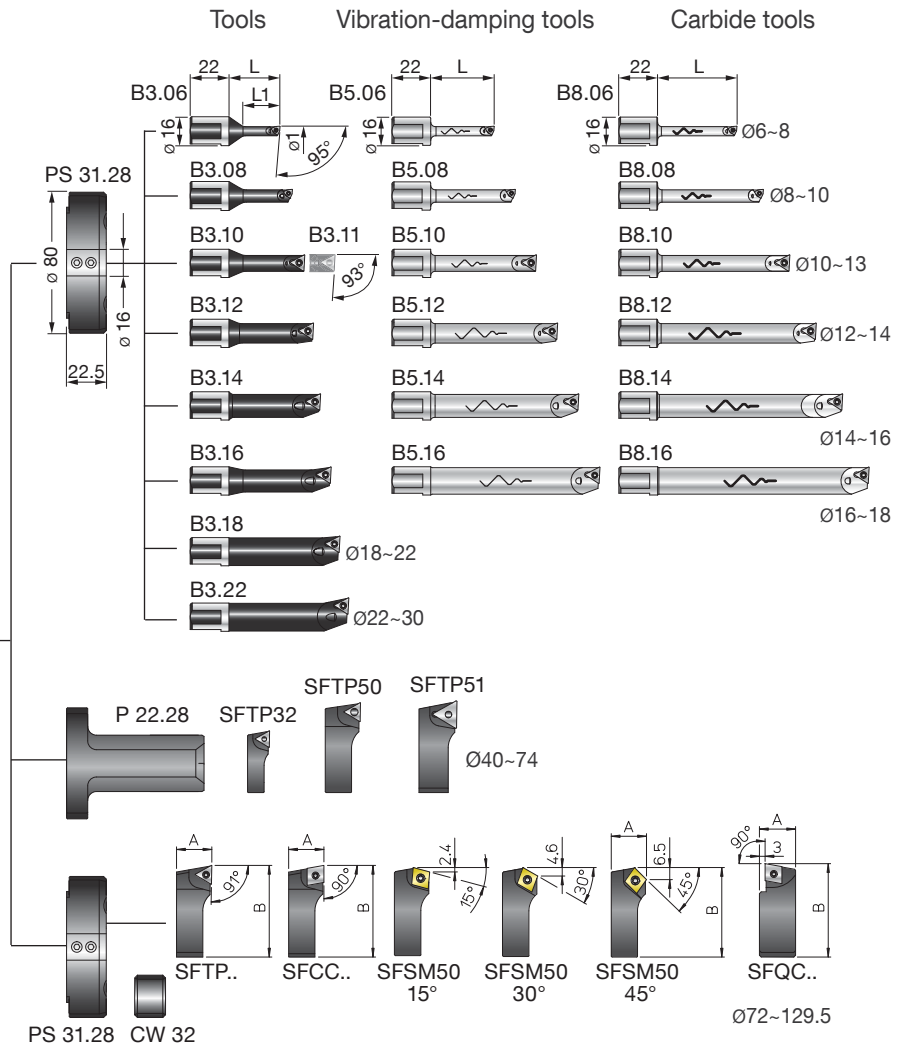


**10 μm**  
nonio vernier **2 μm**

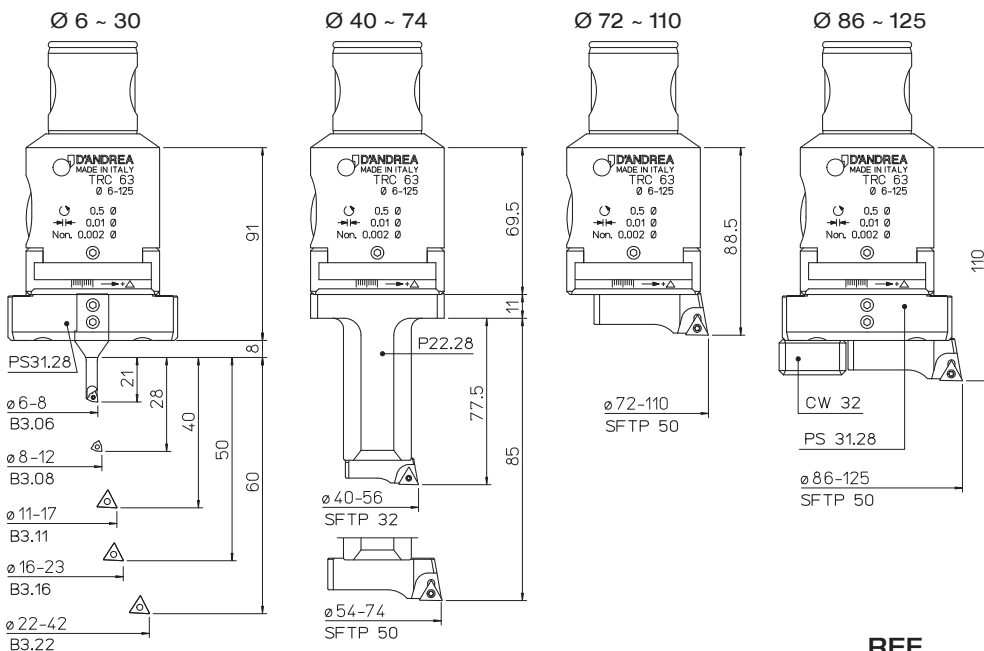


MHD'63

REF.	CODE	kg
TRC 63	455016301001	2
P 22.28	433028220631	0.45
PS 31.28 TRC 63	433028220801	0.3
CW 32	392011003201	0.07



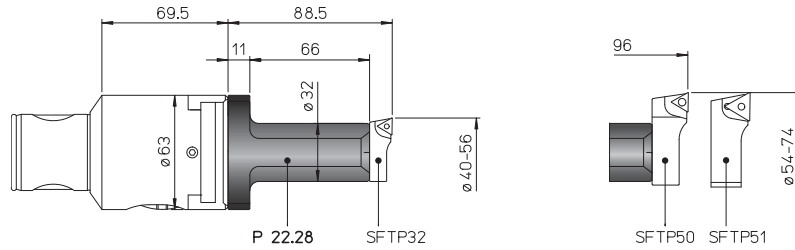
## KIT K01 Ø 6 ~ 125



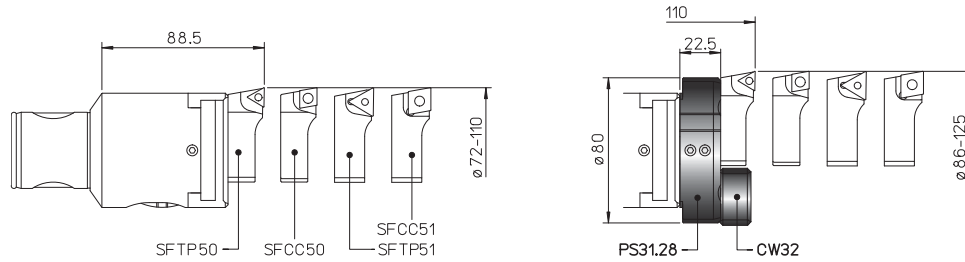
- 1 TRC 63
- 1 B3.16
- 1 PS31.28
- 1 B3.22
- 1 CW 32
- 1 SFTP32
- 1 P22.28
- 1 SFTP50
- 1 B3.06
- 5 TPGX 090202L DC100
- 1 B3.08
- 1 TPGX 110302L DC100
- 1 B3.11
- 2 WCGT 020102L DC100

REF.	CODE	Ø	kg
KIT K01 TRC 63	655016310632	6 ~ 125	4.5

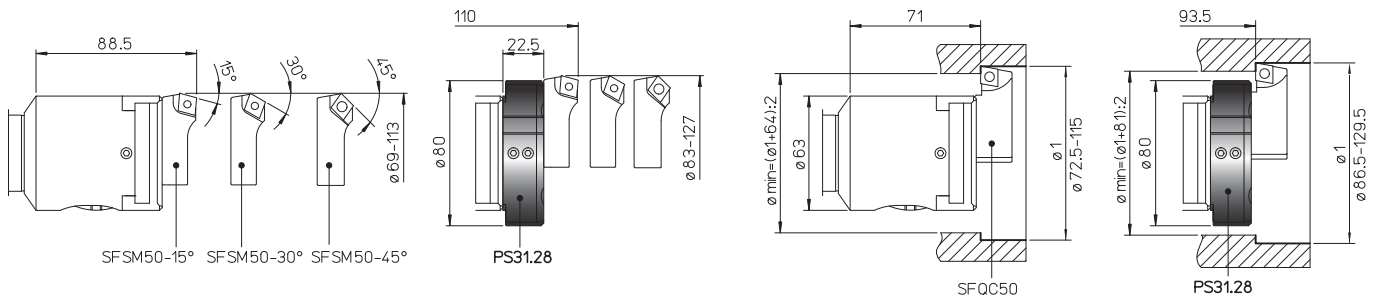
## P 22 Ø 40 ~ 74



## PS 31.28 Ø 72 ~ 125



## PS 31.28 Ø 69 ~ 129.5

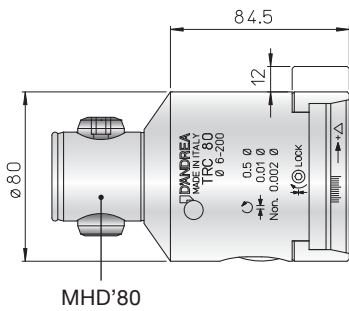


REF.	CODE	Ø1	L	L1	A	B	⚠	⚠	⚠	⚠	⚠	kg
<b>SFTP 32</b>	470500532001				11.5	34.5			TPGX 0902..	CS 250T	TORX T08	0.02
<b>SFTP 50</b>	470500550001				19	52			TPGX 1103..	CS 300890T	TORX T08	0.08
<b>SFTP 51</b>	470500550003				21	52			TCMT 16T3..	TS 4	TORX T15	0.09
<b>SFCC 50</b>	470500550002				19	52			CCGT 09T3..	TS 4	TORX T15	0.08
<b>SFCC 51</b>	470500550004				21	52			CCMT 1204..	TS 5	TORX T25	0.09
<b>SFQC 50</b>	470500550062				20.5	53			CCMT 09T3..	TS 4	TORXT15	0.1
<b>SFSM 50-15°</b>	470500550011				19	50.5			CCMT 09T3..	TS 4	TORXT15	0.07
<b>SFSM 50-30°</b>	470500550013				19	50.5			CCMT 09T3..	TS 4	TORXT15	0.07
<b>SFSM 50-45°</b>	470500550015				19	50.5			CCMT 09T3..	TS 4	TORXT15	0.07
<b>B3.06</b>	572010506001	6 ~ 8	29	21			WC	WC	TPGX 0902..	TS 21	TORX T06	0.035
<b>B3.08</b>	572010508001	8 ~ 10	36	28			WC	WC	TPGX 0902..	TS 211	TORX T06	0.04
<b>B3.10</b>	572010510001	10 ~ 12	43	35					TPGX 0902..	CS 250 T	TORX T08	0.05
<b>B3.11</b>	572010511001	11 ~ 13	48	40					TPGX 0902..	CS 250 T	TORX T08	0.055
<b>B3.12</b>	572010512001	12 ~ 14	48	42					TPGX 0902..	CS 250 T	TORX T08	0.06
<b>B3.14</b>	572010514001	14 ~ 16	52	50					TPGX 0902..	CS 250 T	TORX T08	0.07
<b>B3.16</b>	572010516001	16 ~ 18	58	50					TPGX 0902..	CS 250 T	TORX T08	0.07
<b>B3.18</b>	572010518001	18 ~ 22	63						TPGX 0902..	CS 250 T	TORX T08	0.1
<b>B3.22</b>	572010522001	22 ~ 30	68						TPGX 0902..	CS 250 T	TORX T08	0.1
<b>B5.06</b>	572010506105	6 ~ 8	36				WC	WC	TPGX 0902..	TS 21	TORX T06	0.075
<b>B5.08</b>	572010508105	8 ~ 10	48				WC	WC	TPGX 0902..	TS 211	TORX T06	0.09
<b>B5.10</b>	572010510105	10 ~ 12	60						TPGX 0902..	CS 250 T	TORX T08	0.1
<b>B5.12</b>	572010512105	12 ~ 14	72						TPGX 0902..	CS 250 T	TORX T08	0.1
<b>B5.14</b>	572010514105	14 ~ 16	84						TPGX 0902..	CS 250 T	TORX T08	0.2
<b>B5.16</b>	572010516105	16 ~ 18	96						TPGX 0902..	CS 250 T	TORX T08	0.3
<b>B8.06</b>	572010506108	6 ~ 8	45				WC	WC	TPGX 0902..	TS 21	TORX T06	0.065
<b>B8.08</b>	572010508108	8 ~ 10	60				WC	WC	TPGX 0902..	TS 211	TORX T06	0.08
<b>B8.10</b>	572010510108	10 ~ 12	75						TPGX 0902..	CS 250 T	TORX T08	0.1
<b>B8.12</b>	572010512108	12 ~ 14	90						TPGX 0902..	CS 250 T	TORX T08	0.2
<b>B8.14</b>	572010514108	14 ~ 16	105						TPGX 0902..	CS 250 T	TORX T08	0.2
<b>B8.16</b>	572010516108	16 ~ 18	120						TPGX 0902..	CS 250 T	TORX T08	0.3

## TRC 80 Ø 6 ~ 200

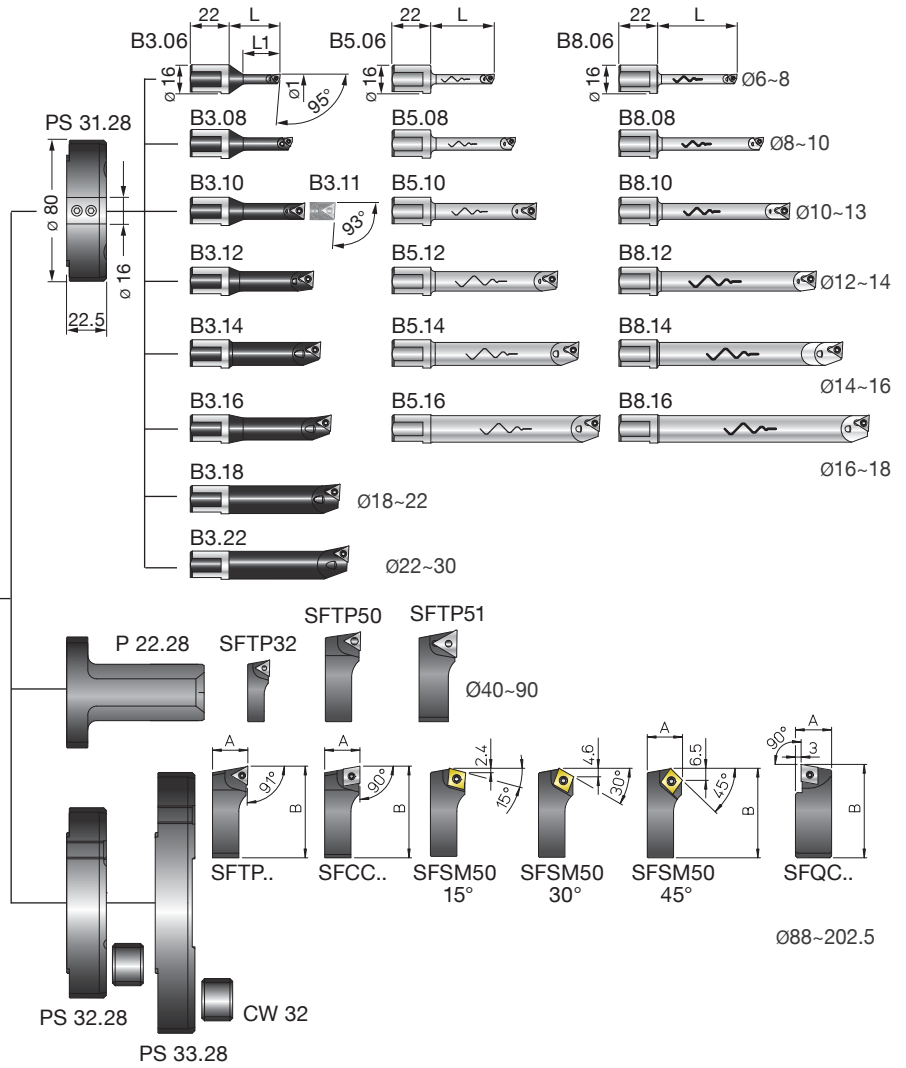


10 µm  
nonio  
vernier 2 µm

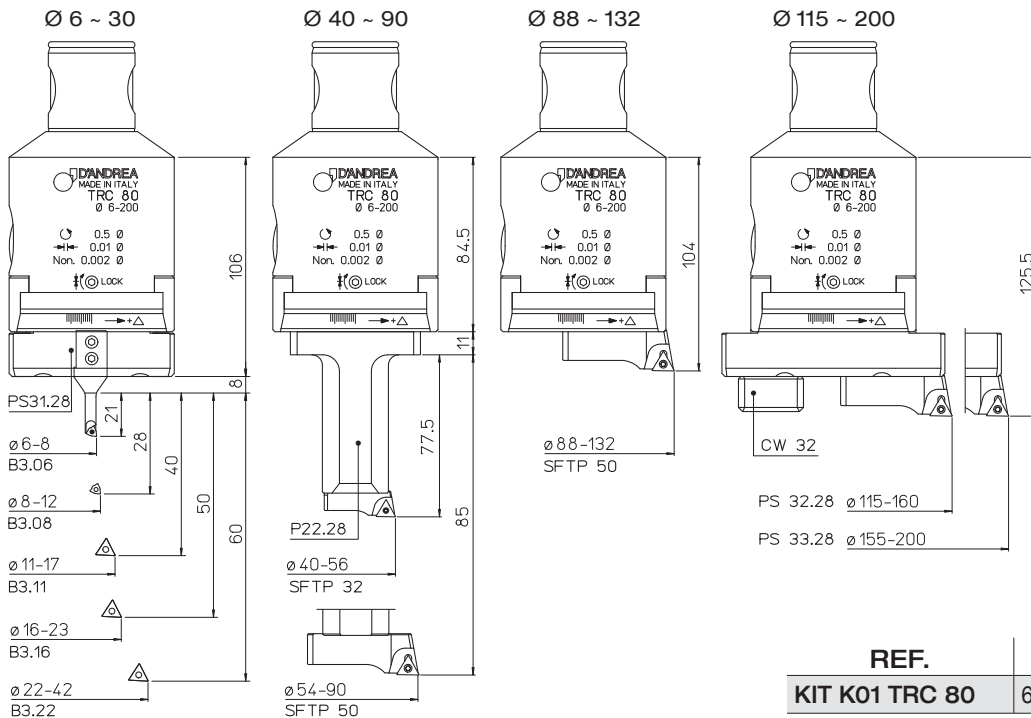


REF.	CODE	kg
TRC 80	455018001201	3.8
P 22.28	433028220631	0.45
PS 31.28 TRC 80	433028220801	0.3
PS 32.28 TRC 80	433028221081	0.5
PS 33.28 TRC 80	433028221481	0.6
CW 32	392011003201	0.07

Tools      Vibration-damping tools      Carbide tools



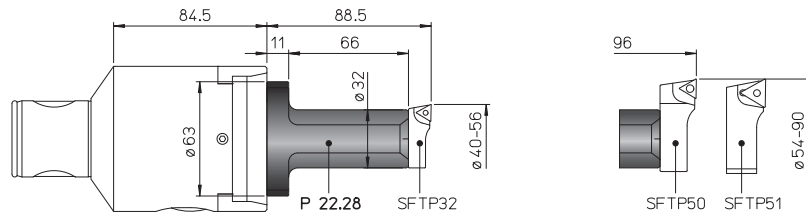
## KIT K01 Ø 6 ~ 200



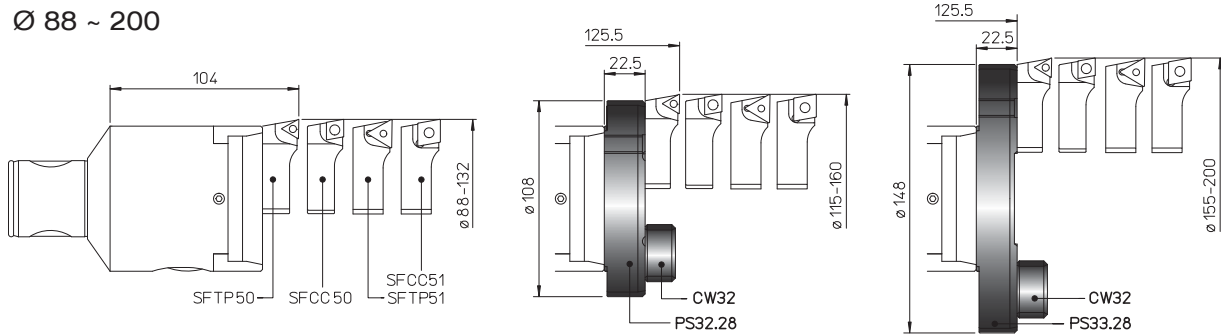
- 1 TRC 80
- 1 PS31.28
- 1 PS32.28
- 1 PS33.28
- 1 CW 32
- 1 P22.28
- 1 B3.06
- 1 B3.08
- 1 B3.11
- 1 B3.16
- 1 B3.22
- 1 SFTP32
- 1 SFTP50
- 5 TPGX 090202L DC100
- 1 TPGX 110302L DC100
- 2 WCGT 020102L DC100

REF.	CODE	Ø	kg
KIT K01 TRC 80	655018010802	6 ~ 200	7.3

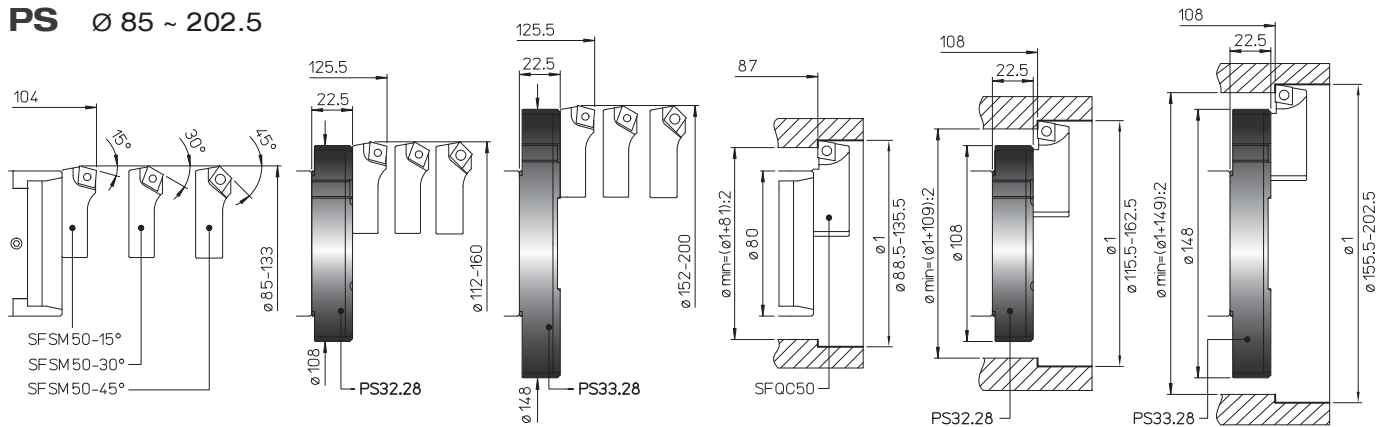
## P 22 Ø 40 ~ 90



## PS Ø 88 ~ 200



## PS Ø 85 ~ 202.5

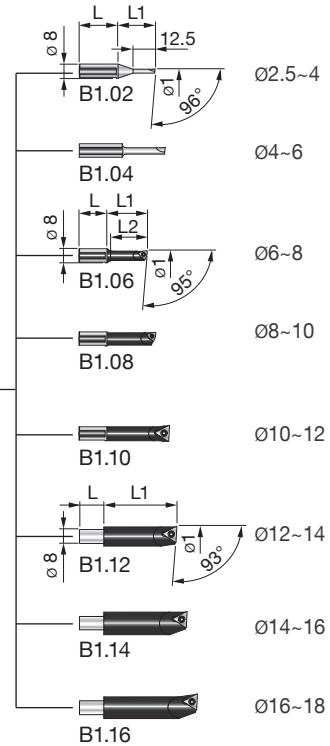
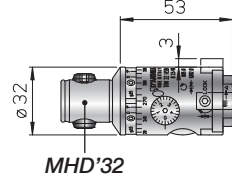
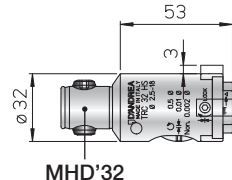


REF.	CODE	Ø1	L	L1	A	B					kg	
SFTP 32	470500532001				11.5	34.5		TPGX 0902..		CS 250T	TORX T08	0.02
SFTP 50	470500550001				19	52		TPGX 1103..		CS 300890T	TORX T08	0.08
SFTP 51	470500550003				21	52		TCMT 16T3..		TS 4	TORX T15	0.09
SFCC 50	470500550002				19	52		CCGT 09T3..		TS 4	TORX T15	0.08
SFCC 51	470500550004				21	52		CCMT 1204..		TS 5	TORX T25	0.09
SFQC 50	470500550062				20.5	53		CCMT 09T3..		TS 4	TORXT15	0.1
SFSM 50-15°	470500550011				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-30°	470500550013				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-45°	470500550015				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07

B3.06	572010506001	6 ~ 8	29	21			WCGT 0201..			TS 21	TORX T06	0.035
B3.08	572010508001	8 ~ 10	36	28			WCGT 0201..			TS 211	TORX T06	0.04
B3.10	572010510001	10 ~ 12	43	35			TPGX 0902..			CS 250 T	TORX T08	0.05
B3.11	572010511001	11 ~ 13	48	40			TPGX 0902..			CS 250 T	TORX T08	0.055
B3.12	572010512001	12 ~ 14	48	42			TPGX 0902..			CS 250 T	TORX T08	0.06
B3.14	572010514001	14 ~ 16	52	50			TPGX 0902..			CS 250 T	TORX T08	0.07
B3.16	572010516001	16 ~ 18	58	50			TPGX 0902..			CS 250 T	TORX T08	0.07
B3.18	572010518001	18 ~ 22	63				TPGX 0902..			CS 250 T	TORX T08	0.1
B3.22	572010522001	22 ~ 30	68				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.06	572010506105	6 ~ 8	36				WCGT 0201..			TS 21	TORX T06	0.075
B5.08	572010508105	8 ~ 10	48				WCGT 0201..			TS 211	TORX T06	0.09
B5.10	572010510105	10 ~ 12	60				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.12	572010512105	12 ~ 14	72				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.14	572010514105	14 ~ 16	84				TPGX 0902..			CS 250 T	TORX T08	0.2
B5.16	572010516105	16 ~ 18	96				TPGX 0902..			CS 250 T	TORX T08	0.3
B8.06	572010506108	6 ~ 8	45				WCGT 0201..			TS 21	TORX T06	0.065
B8.08	572010508108	8 ~ 10	60				WCGT 0201..			TS 211	TORX T06	0.08
B8.10	572010510108	10 ~ 12	75				TPGX 0902..			CS 250 T	TORX T08	0.1
B8.12	572010512108	12 ~ 14	90				TPGX 0902..			CS 250 T	TORX T08	0.2
B8.14	572010514108	14 ~ 16	105				TPGX 0902..			CS 250 T	TORX T08	0.2
B8.16	572010516108	16 ~ 18	120				TPGX 0902..			CS 250 T	TORX T08	0.3

## TRC 32 HS

TRM 32 HSB Ø 2.5 ~ 18



REF.	CODE	Ø	kg
TRC 32 HS	455033200531	2.5 ~ 18	0.35
TRM 32 HSB	455103200531	2.5 ~ 18	0.35

## KIT K01 TRC 32 HS Ø 2.5 ~ 12

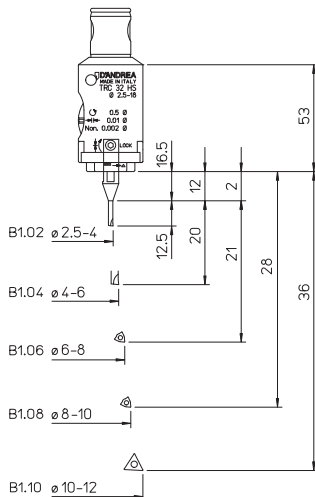
REF.	CODE	Ø	kg
KIT K01 TRC 32 HS	655033230322	2.5 ~ 12	1

## KIT K01 TRM 32 HSB Ø 2.5 ~ 12

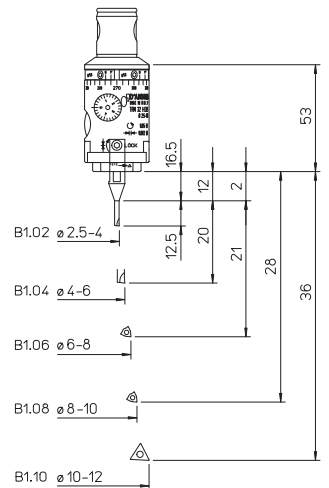
REF.	CODE	Ø	kg
KIT K01 TRM 32 HSB	655003230321	2.5 ~ 12	1



- 1 TRC 32 HS
- 1 B1.02
- 1 B1.04
- 1 B1.06
- 1 B1.08
- 1 B1.10
- 5 TPGX 090202L DC100
- 2 WCGT 020102L DC100



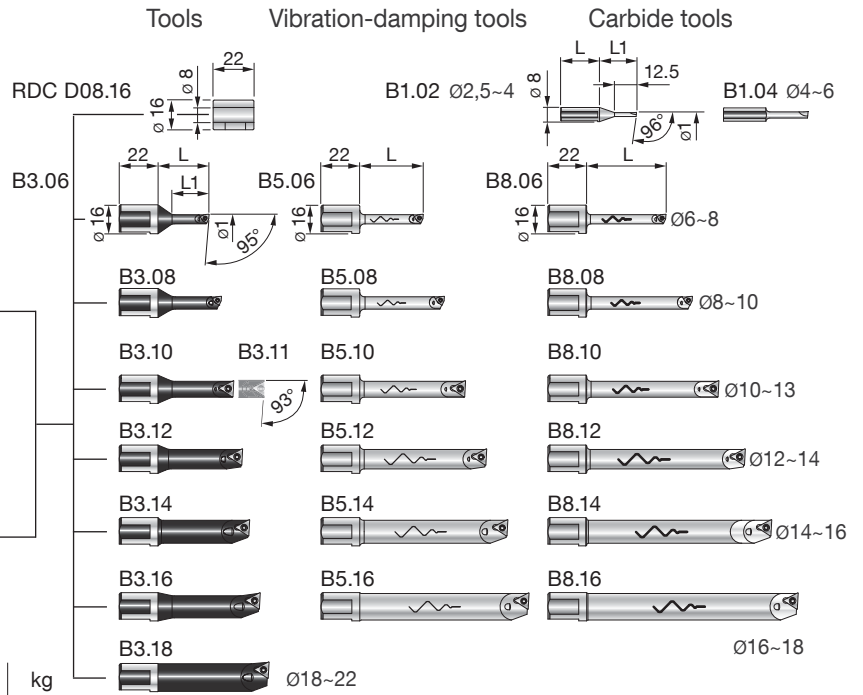
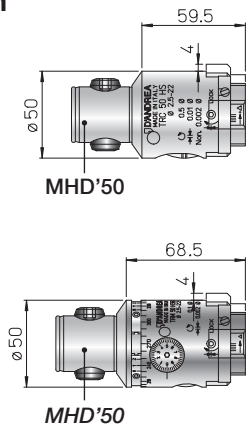
- 1 TRM 32 HSB
- 1 B1.02
- 1 B1.04
- 1 B1.06
- 1 B1.08
- 1 B1.10
- 5 TPGX 090202L DC100
- 2 WCGT 020102L DC100



REF.	CODE	Ø1	L	L1	⊕	⊖	⌢	⌘	kg
B1.02	572010502001	2.5 ~ 4	22	21					0.02
B1.04	572010504001	4 ~ 6	24	24					0.02
B1.06	572010506000	6 ~ 8	16	23	WCGT 0201..		TS 21	TORX T06	0.01
B1.08	572010508000	8 ~ 10	16	28	WCGT 0201..		TS 211	TORX T06	0.015
B1.10	572010510000	10 ~ 12	16	36		TPGX 0902..	CS 250 T	TORX T08	0.02
B1.12	572010512000	12 ~ 14	14	42		TPGX 0902..	CS 250 T	TORX T08	0.03
B1.14	572010514000	14 ~ 16	14	48		TPGX 0902..	CS 250 T	TORX T08	0.04
B1.16	572010516000	16 ~ 18	14	54		TPGX 0902..	CS 250 T	TORX T08	0.05

# TRC HS HIGH SPEED - TRM HSB BALANCEABLE *testarossa*

## TRC 50 HS TRM 50 HSB Ø 2.5 ~ 22



REF.	CODE	Ø	kg
TRC 50 HS	455035000601	2.5 ~ 22	1
TRM 50 HSB	455105000701	2.5 ~ 22	1.4

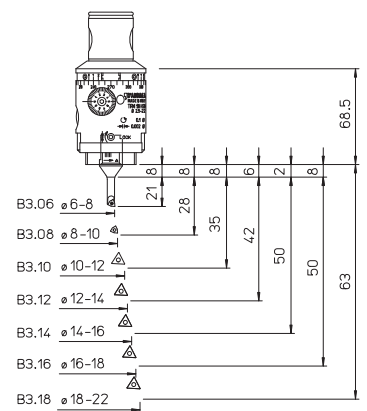
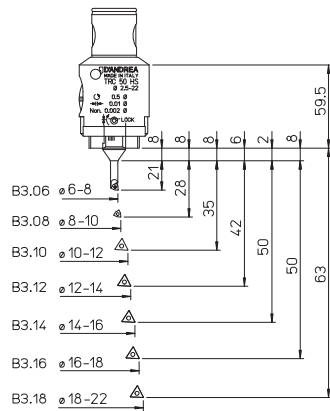
REF.	CODE	kg
RDC D08.16	200560116082	0.02

## KIT K01 TRC 50 HS Ø 6 ~ 22

REF.	CODE	Ø	kg
KIT K01 TRC 50 HS	655035030502	6 ~ 22	1.8

## KIT K01 TRM 50 HSB Ø 6 ~ 22

REF.	CODE	Ø	kg
KIT K01 TRM 50 HSB	655005030501	6 ~ 22	2.1



REF.	CODE	Ø1	L	L1	⚠	⚠	🔧	🔧	kg
B1.02	572010502001	2.5 - 4	22	21					0.02
B1.04	572010504001	4 - 6	24	24					0.02
B3.06	572010506001	6 - 8	29	21	WCGT 0201..		TS 21	TORX T06	0.035
B3.08	572010508001	8 ~ 10	36	28	WCGT 0201..		TS 211	TORX T06	0.04
B3.10	572010510001	10 ~ 12	43	35		TPGX 0902..	CS 250 T	TORX T08	0.05
B3.11	572010511001	11 ~ 13	48	40		TPGX 0902..	CS 250 T	TORX T08	0.055
B3.12	572010512001	12 ~ 14	48	42		TPGX 0902..	CS 250 T	TORX T08	0.06
B3.14	572010514001	14 ~ 16	52	50		TPGX 0902..	CS 250 T	TORX T08	0.07
B3.16	572010516001	16 ~ 18	58	50		TPGX 0902..	CS 250 T	TORX T08	0.07
B3.18	572010518001	18 ~ 22	63			TPGX 0902..	CS 250 T	TORX T08	0.1
B5.06	572010506105	6 - 8	36		WCGT 0201..		TS 21	TORX T06	0.075
B5.08	572010508105	8 ~ 10	48		WCGT 0201..		TS 211	TORX T06	0.09
B5.10	572010510105	10 ~ 12	60			TPGX 0902..	CS 250 T	TORX T08	0.1
B5.12	572010512105	12 ~ 14	72			TPGX 0902..	CS 250 T	TORX T08	0.1
B5.14	572010514105	14 ~ 16	84			TPGX 0902..	CS 250 T	TORX T08	0.2
B5.16	572010516105	16 ~ 18	96			TPGX 0902..	CS 250 T	TORX T08	0.3
B8.06	572010506108	6 - 8	45		WCGT 0201..		TS 21	TORX T06	0.065
B8.08	572010508108	8 ~ 10	60		WCGT 0201..		TS 211	TORX T06	0.08
B8.10	572010510108	10 ~ 12	75			TPGX 0902..	CS 250 T	TORX T08	0.1
B8.12	572010512108	12 ~ 14	90			TPGX 0902..	CS 250 T	TORX T08	0.2
B8.14	572010514108	14 ~ 16	105			TPGX 0902..	CS 250 T	TORX T08	0.2
B8.16	572010516108	16 ~ 18	120			TPGX 0902..	CS 250 T	TORX T08	0.3



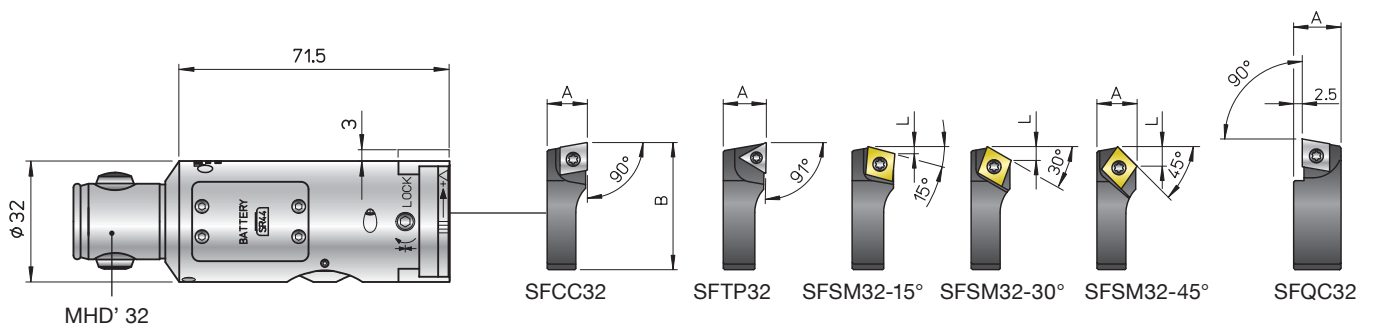
## TRE 32 MHD' Ø 35.5 ~ 51.5



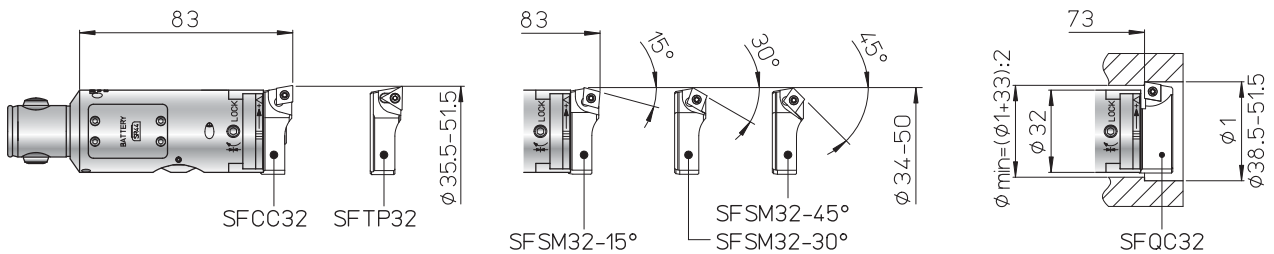
2 µm

REF.	CODE	Ø	kg
TRE 32 MHD'32 69K	455200320321 •	35.5 ~ 51.5	0.4

• Subject to stock availability



REF.	CODE	A	B	L					kg
SFCC 32	470500532002	11.5	34.5		CCGT 0602..		TS 25	TORX T08	0.02
SFTP 32	470500532001	11.5	34.5			TPGX 0902..	CS 250T	TORX T08	0.02
SFQC 32	470500532062	13.5	35.5		CCMT 0602..		TS 25	TORX T08	0.03
SFSM 32-15°	470500532011	11.5	33.5	1.6	CCMT 0602..		TS 25	TORX T08	0.02
SFSM 32-30°	470500532013	11.5	33.5	3	CCMT 0602..		TS 25	TORX T08	0.02
SFSM 32-45°	470500532015	11.5	33.5	4.3	CCMT 0602..		TS 25	TORX T08	0.02



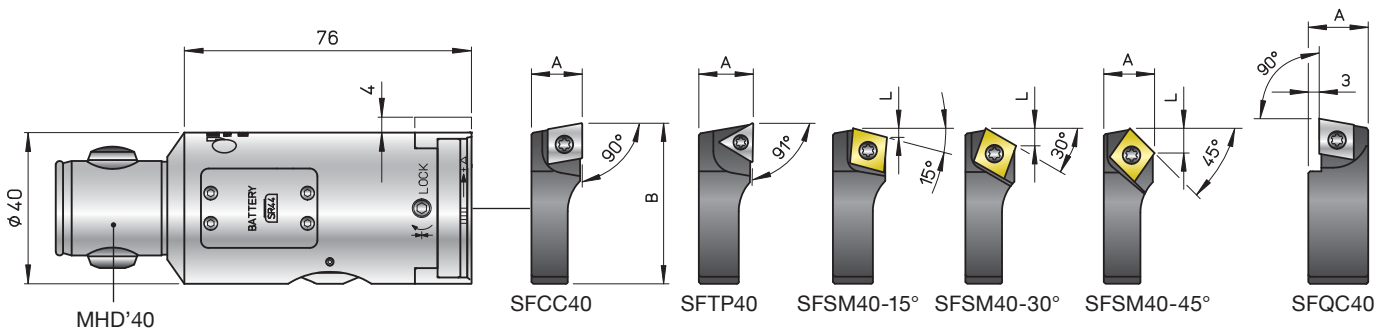
TRE 40 MHD' Ø 48 ~ 64



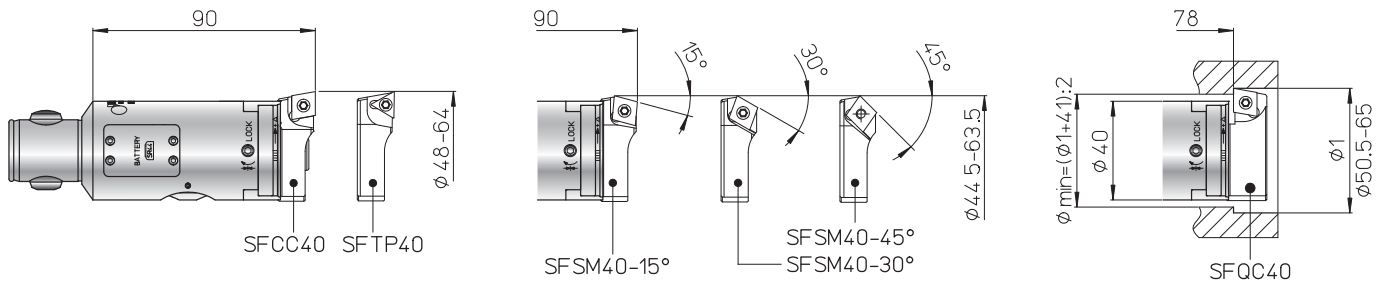
2 µm

REF.	CODE	Ø	kg
TRE 40 MHD'40 69K	455200400401 •	48 ~ 64	0.7

• Subject to stock availability



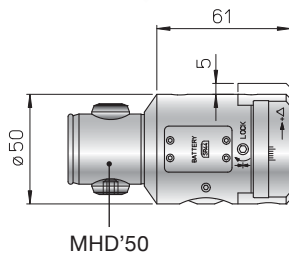
REF.	CODE	A	B	L					kg
SFCC 40	470500540002	14	44		CCGT 09T3..		TS 4	TORX T15	0.04
SFTP 40	470500540001	14	44			TPGX 1103..	CS 300890T	TORX T08	0.04
SFQC 40	470500540062	16.5	46		CCMT 09T3..		TS 4	TORXT15	0.06
SFSM 40-15°	470500540011	14	42.5	2.4	CCMT 09T3..		TS 4	TORXT15	0.03
SFSM 40-30°	470500540013	14	42.5	4.6	CCMT 09T3..		TS 4	TORXT15	0.03
SFSM 40-45°	470500540015	14	42.5	6.6	CCMT 09T3..		TS 4	TORXT15	0.03



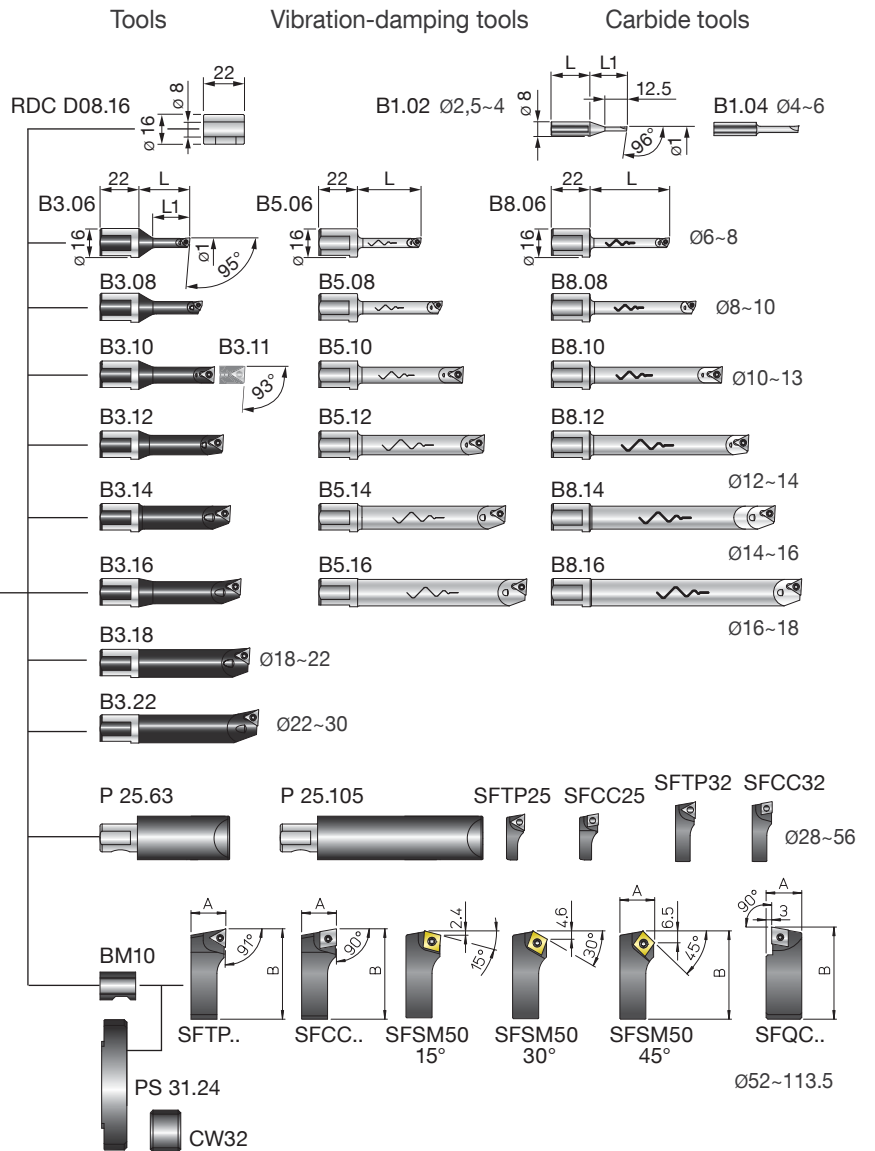
## TRE 50 MHD' Ø 2.5 ~ 110



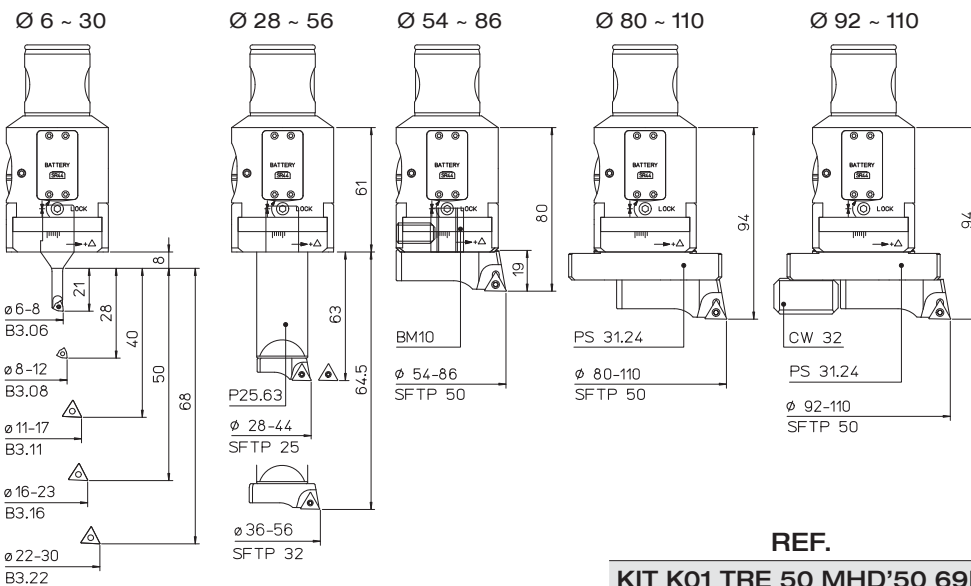
2 µm



REF.	CODE	kg
TRE 50 MHD'50 69K	455200500501	1.1
RDC D08.16	200560116082	0.02
P25.63 TR..	435116250631	0.5
P25.105 TR..	435116251051	0.8
PS 31.24 TR..50	433024140751	0.19
CW 32	392011003201	0.07



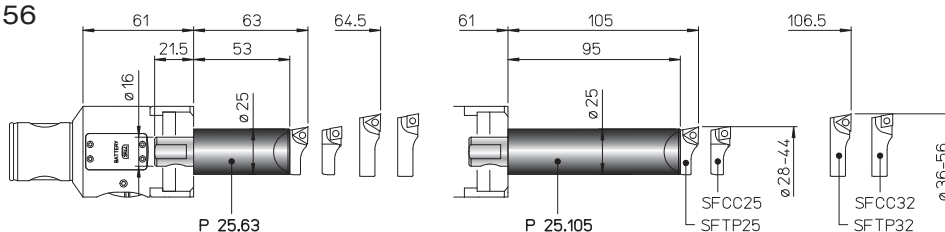
## KIT K01 Ø 6 ~ 110



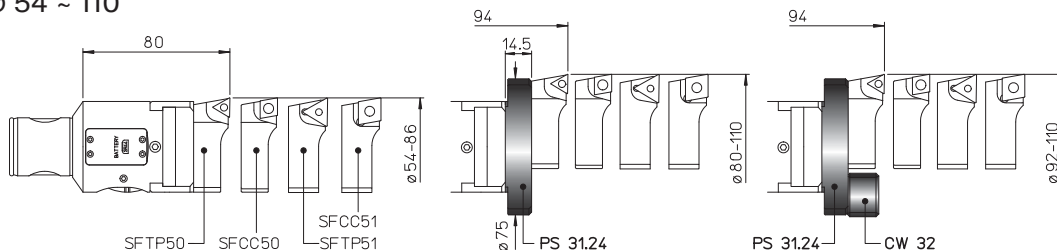
- 1 TRE 50 MHD'50
- 1 BM10
- 1 P25.63
- 1 PS 31.24
- 1 CW 32
- 1 B3.06
- 1 B3.08
- 1 B3.11
- 1 B3.16
- 1 B3.22
- 1 SFTP25
- 1 SFTP32
- 1 SFTP50
- 5 TPGX 090202L DC100
- 1 TPGX 110302L DC100
- 2 WCGT 020102L DC100

REF.	CODE	Ø	kg
KIT K01 TRE 50 MHD'50 69K	655200500502	6 ~ 110	3.1

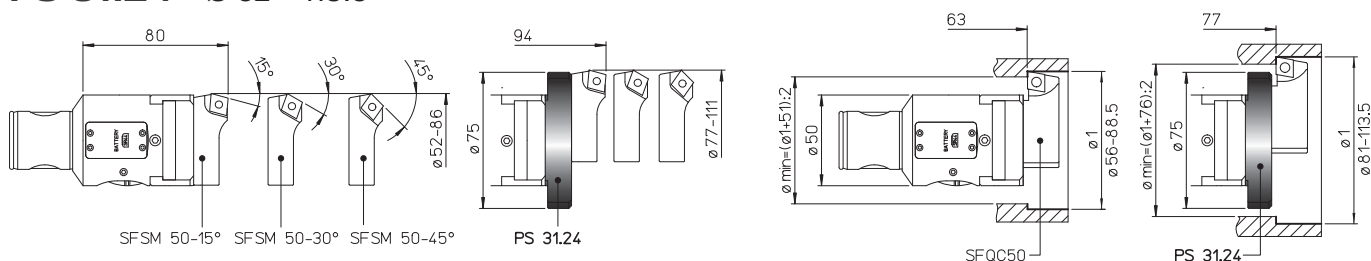
## P 25 Ø 28 ~ 56



## PS 31.24 Ø 54 ~ 110



## PS 31.24 Ø 52 ~ 113.5



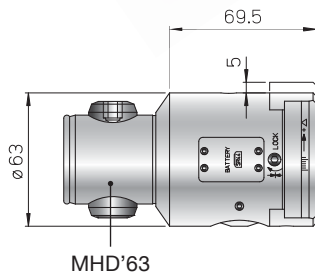
REF.	CODE	Ø1	L	L1	A	B	⊖	⊖	⊖	⊖	⊖	kg
SFTP 25	470500525001				10	26.5		TPGX 0902..		CS 250T	TORX T08	0.01
SFTP 32	470500532001				11.5	34.5		TPGX 0902..		CS 250T	TORX T08	0.02
SFTP 50	470500550001				19	52		TPGX 1103..		CS 300890T	TORX T08	0.08
SFTP 51	470500550003				21	52		TCMT 16T3..		TS 4	TORX T15	0.09
SFCC 25	470500525002				10	26.5		CCGT 0602..		TS 25	TORX T08	0.01
SFCC 32	470500532002				11.5	34.5		CCGT 0602..		TS 25	TORX T08	0.02
SFCC 50	470500550002				19	52		CCGT 09T3..		TS 4	TORX T15	0.08
SFCC 51	470500550004				21	52		CCMT 1204..		TS 5	TORX T25	0.09
SFQC 50	470500550062				20.5	53		CCMT 09T3..		TS 4	TORXT15	0.1
SFSM 50-15°	470500550011				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-30°	470500550013				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07
SFSM 50-45°	470500550015				19	50.5		CCMT 09T3..		TS 4	TORXT15	0.07

B1.02	572010502001	2.5 ~ 4	22	21								0.02
B1.04	572010504001	4 ~ 6	24	24								0.02
B3.06	572010506001	6 ~ 8	29	21		WCGT 0201..				TS 21	TORX T06	0.035
B3.08	572010508001	8 ~ 10	36	28		WCGT 0201..				TS 211	TORX T06	0.04
B3.10	572010510001	10 ~ 12	43	35			TPGX 0902..			CS 250 T	TORX T08	0.05
B3.11	572010511001	11 ~ 13	48	40			TPGX 0902..			CS 250 T	TORX T08	0.055
B3.12	572010512001	12 ~ 14	48	42			TPGX 0902..			CS 250 T	TORX T08	0.06
B3.14	572010514001	14 ~ 16	52	50			TPGX 0902..			CS 250 T	TORX T08	0.07
B3.16	572010516001	16 ~ 18	58	50			TPGX 0902..			CS 250 T	TORX T08	0.07
B3.18	572010518001	18 ~ 22	63				TPGX 0902..			CS 250 T	TORX T08	0.1
B3.22	572010522001	22 ~ 30	68				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.06	572010506105	6 ~ 8	36			WCGT 0201..				TS 21	TORX T06	0.075
B5.08	572010508105	8 ~ 10	48			WCGT 0201..				TS 211	TORX T06	0.09
B5.10	572010510105	10 ~ 12	60				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.12	572010512105	12 ~ 14	72				TPGX 0902..			CS 250 T	TORX T08	0.1
B5.14	572010514105	14 ~ 16	84				TPGX 0902..			CS 250 T	TORX T08	0.2
B5.16	572010516105	16 ~ 18	96				TPGX 0902..			CS 250 T	TORX T08	0.3
B8.06	572010506108	6 ~ 8	45			WCGT 0201..				TS 21	TORX T06	0.065
B8.08	572010508108	8 ~ 10	60			WCGT 0201..				TS 211	TORX T06	0.08
B8.10	572010510108	10 ~ 12	75				TPGX 0902..			CS 250 T	TORX T08	0.1
B8.12	572010512108	12 ~ 14	90				TPGX 0902..			CS 250 T	TORX T08	0.2
B8.14	572010514108	14 ~ 16	105				TPGX 0902..			CS 250 T	TORX T08	0.2
B8.16	572010516108	16 ~ 18	120				TPGX 0902..			CS 250 T	TORX T08	0.3

## TRE 63 MHD' Ø 6 ~ 125

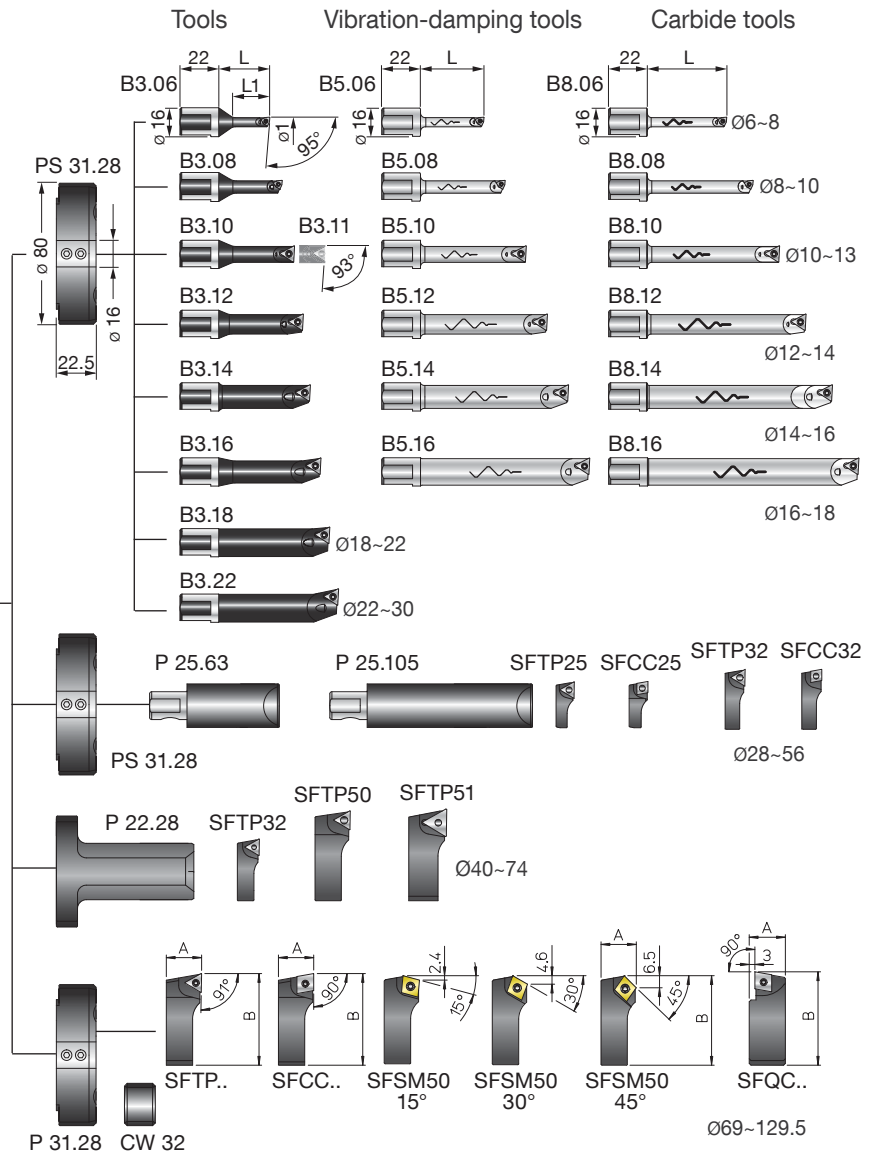


2 μm

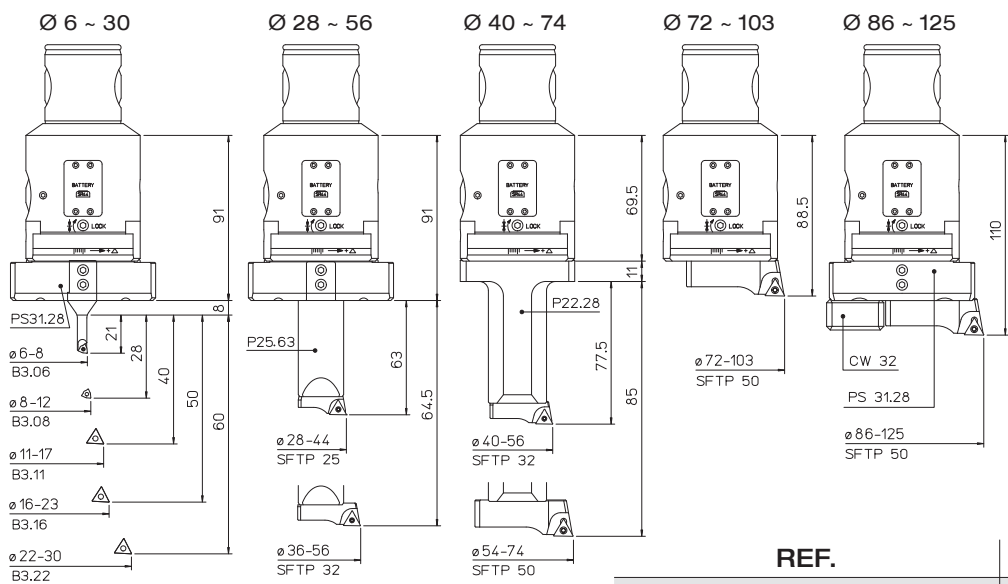


MHD'63

REF.	CODE	kg
TRE 63 MHD'63 69K	455200630631	2.2
P 22.28	433028220631	0.45
P25.63 TR..	435116250631	0.5
P25.105 TR..	435116251051	0.8
PS 31.28 TRE 63	433028220802	0.3
CW 32	392011003201	0.07



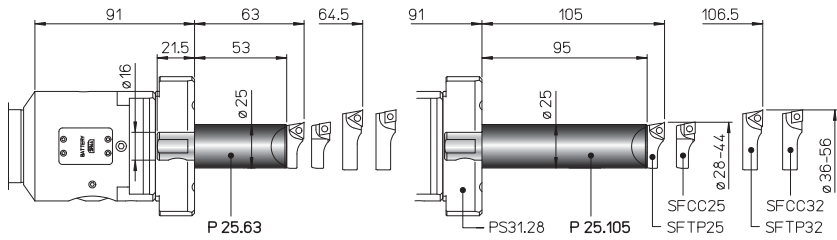
## KIT K01 Ø 6 ~ 125



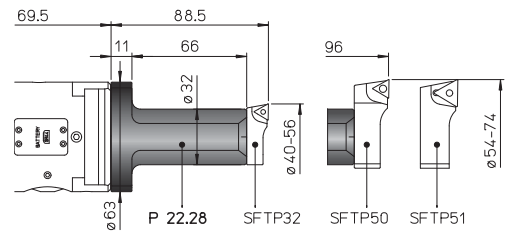
- 1 TRE 63 MHD'63
- 1 P25.63
- 1 P22.28
- 1 PS31.28
- 1 CW 32
- 1 B3.06
- 1 B3.08
- 1 B3.11
- 1 B3.16
- 1 B3.22
- 1 SFTP32
- 1 SFTP50
- 5 TPGX 090202L DC100
- 1 TPGX 110302L DC100
- 2 WCGT 020102L DC100

REF.	CODE	Ø	kg
KIT K01 TRE 63 MHD'63 69K	655200500631	6 ~ 125	4.7

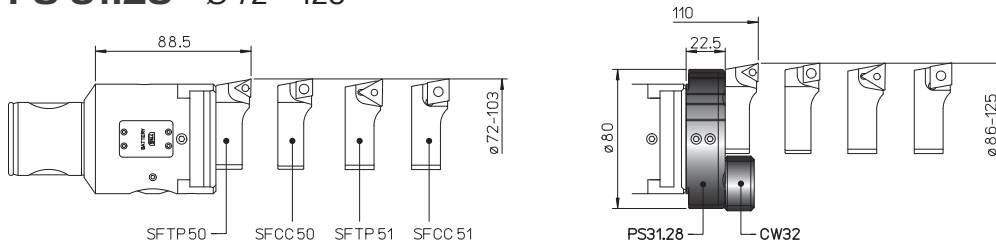
**P 25** Ø 28 ~ 56



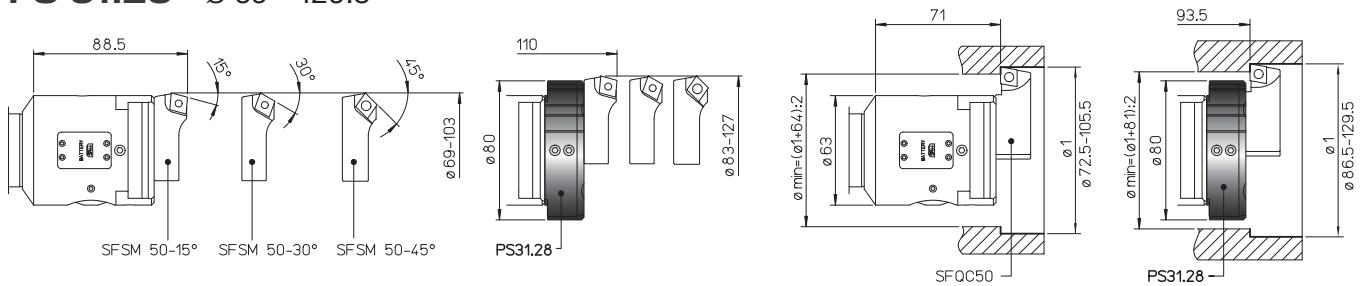
**P 22.28** Ø 40 ~ 74



**PS 31.28** Ø 72 ~ 125

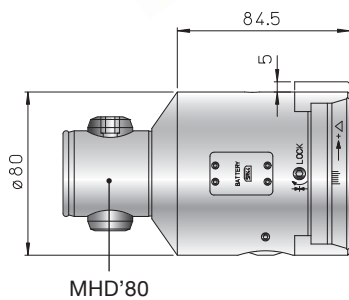


**PS 31.28** Ø 69 ~ 129.5



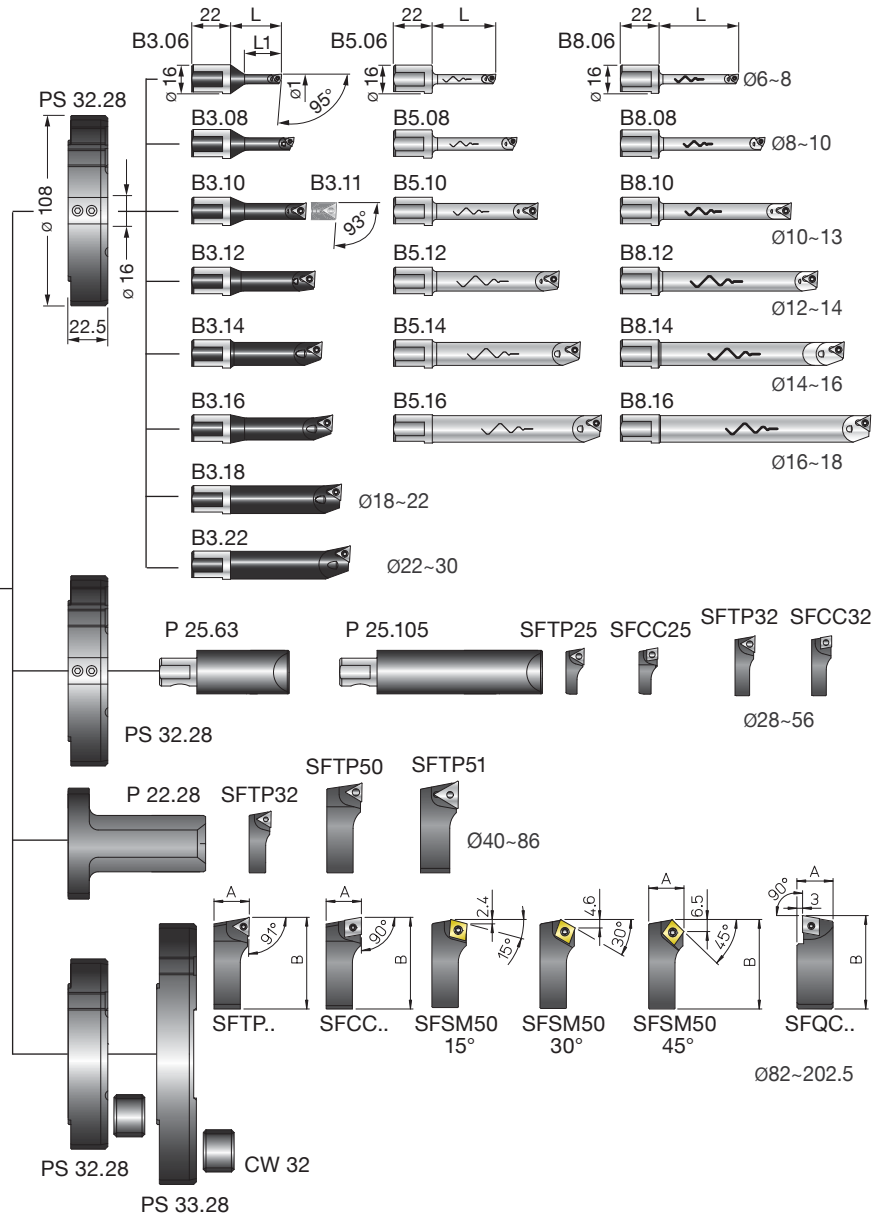
REF.	CODE	Ø1	L	L1	A	B						kg
SFTP 25	470500525001				10	26.5	TPGX 0902..		CS 250T	TORX T08		0.01
SFTP 32	470500532001				11.5	34.5	TPGX 0902..		CS 250T	TORX T08		0.02
SFTP 50	470500550001				19	52	TPGX 1103..		CS 300890T	TORX T08		0.08
SFTP 51	470500550003				21	52	TCMT 16T3..		TS 4	TORX T15		0.09
SFCC 25	470500525002				10	26.5	CCGT 0602..		TS 25	TORX T08		0.01
SFCC 32	470500532002				11.5	34.5	CCGT 0602..		TS 25	TORX T08		0.02
SFCC 50	470500550002				19	52	CCGT 09T3..		TS 4	TORX T15		0.08
SFCC 51	470500550004				21	52	CCMT 1204..		TS 5	TORX T25		0.09
SFQC 50	470500550062				20.5	53	CCMT 09T3..		TS 4	TORXT15		0.1
SFSM 50-15°	470500550011				19	50.5	CCMT 09T3..		TS 4	TORXT15		0.07
SFSM 50-30°	470500550013				19	50.5	CCMT 09T3..		TS 4	TORXT15		0.07
SFSM 50-45°	470500550015				19	50.5	CCMT 09T3..		TS 4	TORXT15		0.07
B3.06	572010506001	6 ~ 8	29	21			WCGT 0201..		TS 21	TORX T06		0.035
B3.08	572010508001	8 ~ 10	36	28			WCGT 0201..		TS 211	TORX T06		0.04
B3.10	572010510001	10 ~ 12	43	35			TPGX 0902..		CS 250 T	TORX T08		0.05
B3.11	572010511001	11 ~ 13	48	40			TPGX 0902..		CS 250 T	TORX T08		0.055
B3.12	572010512001	12 ~ 14	48	42			TPGX 0902..		CS 250 T	TORX T08		0.06
B3.14	572010514001	14 ~ 16	52	50			TPGX 0902..		CS 250 T	TORX T08		0.07
B3.16	572010516001	16 ~ 18	58	50			TPGX 0902..		CS 250 T	TORX T08		0.07
B3.18	572010518001	18 ~ 22	63				TPGX 0902..		CS 250 T	TORX T08		0.1
B3.22	572010522001	22 ~ 30	68				TPGX 0902..		CS 250 T	TORX T08		0.1
B5.06	572010506105	6 ~ 8	36				WCGT 0201..		TS 21	TORX T06		0.075
B5.08	572010508105	8 ~ 10	48				WCGT 0201..		TS 211	TORX T06		0.09
B5.10	572010510105	10 ~ 12	60				TPGX 0902..		CS 250 T	TORX T08		0.1
B5.12	572010512105	12 ~ 14	72				TPGX 0902..		CS 250 T	TORX T08		0.1
B5.14	572010514105	14 ~ 16	84				TPGX 0902..		CS 250 T	TORX T08		0.2
B5.16	572010516105	16 ~ 18	96				TPGX 0902..		CS 250 T	TORX T08		0.3
B8.06	572010506108	6 ~ 8	45				WCGT 0201..		TS 21	TORX T06		0.065
B8.08	572010508108	8 ~ 10	60				WCGT 0201..		TS 211	TORX T06		0.08
B8.10	572010510108	10 ~ 12	75				TPGX 0902..		CS 250 T	TORX T08		0.1
B8.12	572010512108	12 ~ 14	90				TPGX 0902..		CS 250 T	TORX T08		0.2
B8.14	572010514108	14 ~ 16	105				TPGX 0902..		CS 250 T	TORX T08		0.2
B8.16	572010516108	16 ~ 18	120				TPGX 0902..		CS 250 T	TORX T08		0.3

## TRE 80 MHD' Ø 6 ~ 200



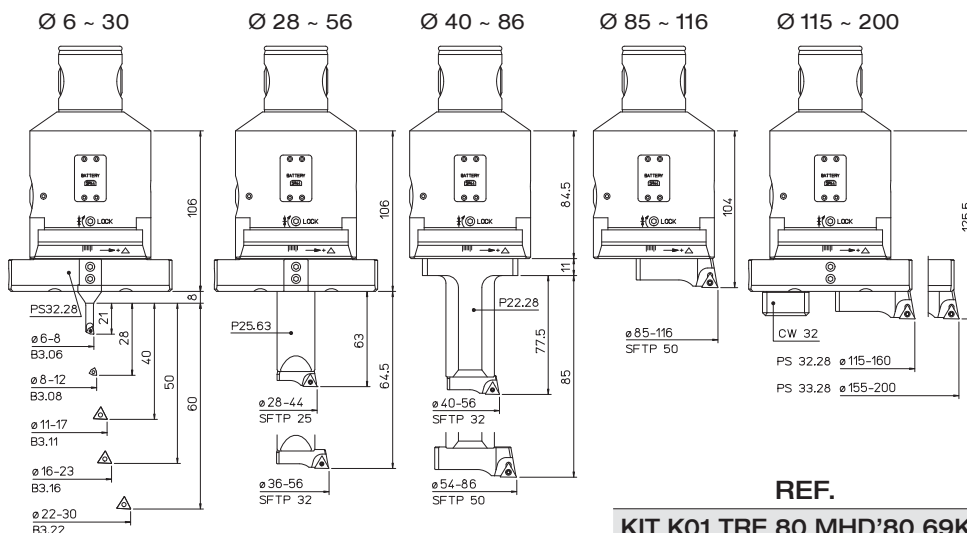
MHD'80

Tools      Vibration-damping tools      Carbide tools



REF.	CODE	kg
TRE80 MHD'80 69K	455200800801	3.9
P 22.28	433028220631	0.45
P25.63 TR..	435116250631	0.5
P25.105 TR..	435116251051	0.8
PS 32.28 TRE 80	433028221082	0.5
PS 33.28 TRE 80	433028221482	0.6
CW 32	392011003201	0.07

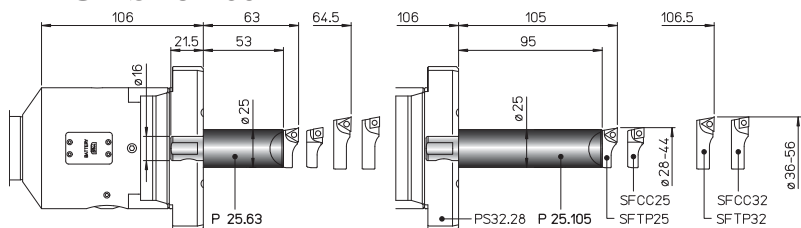
## KIT K01 Ø 6 ~ 200



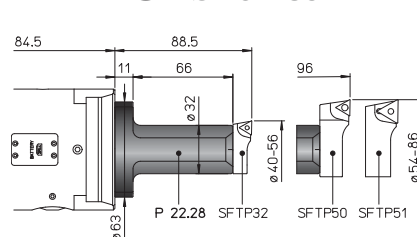
- 1 TRE 80 MHD'80
- 1 PS25.63
- 1 PS32.28
- 1 PS33.28
- 1 CW 32
- 1 P22.28
- 1 B3.06
- 1 B3.08
- 1 B3.11
- 1 B3.16
- 1 B3.22
- 1 SFTP32
- 1 SFTP50
- 5 TPGX 090202L DC100
- 1 TPGX 110302L DC100
- 2 WCGT 020102L DC100

REF.	CODE	Ø	kg
KIT K01 TRE 80 MHD'80 69K	655200500801	6 ~ 200	7.1

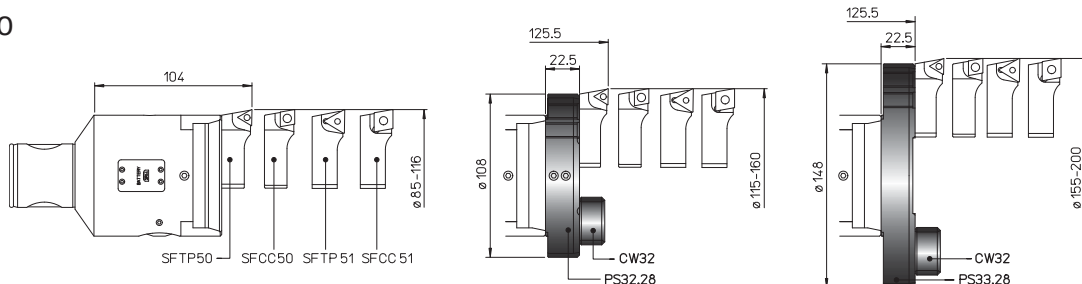
## P 25 Ø 28 ~ 56



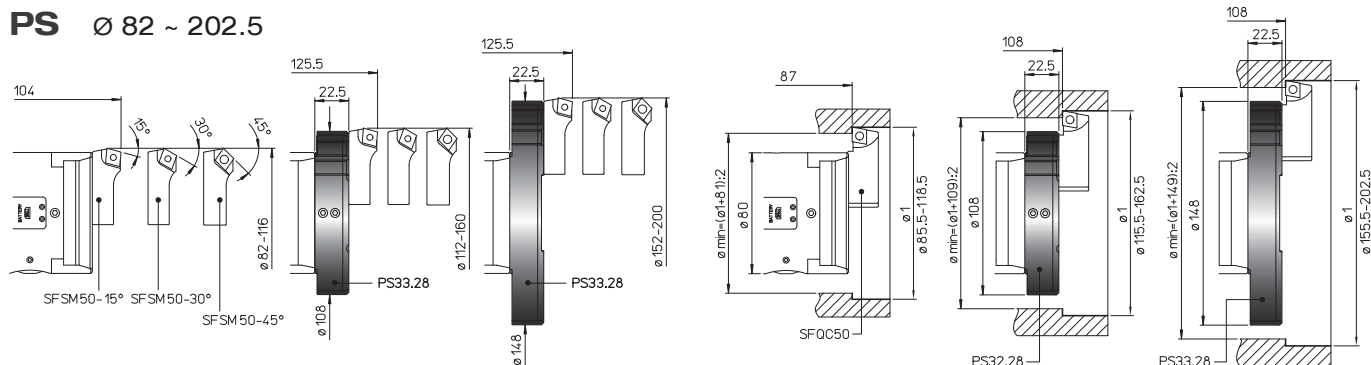
## P 22.28 Ø 40 ~ 86



## PS Ø 85 ~ 200



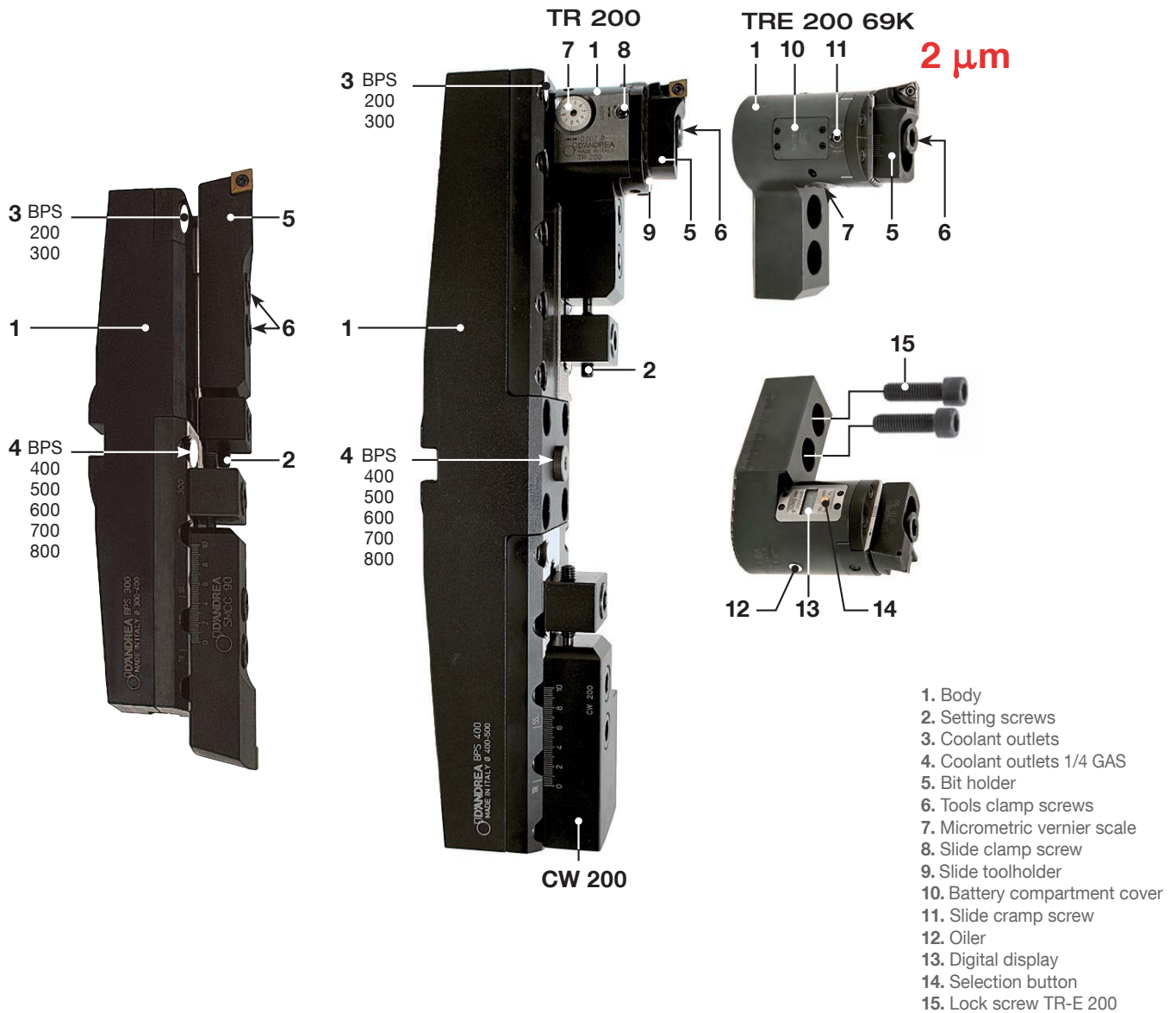
## PS Ø 82 ~ 202.5



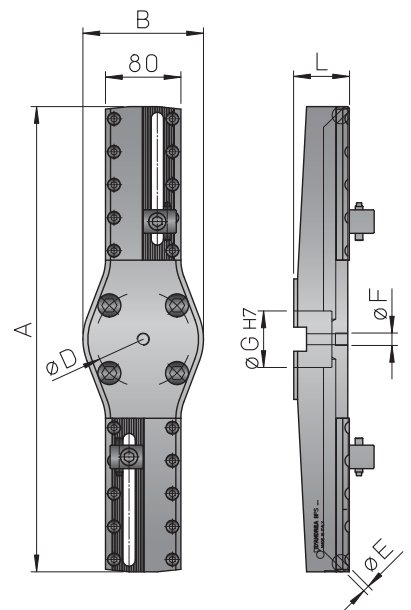
REF.	CODE	Ø1	L	L1	A	B						kg
SFTP 25	470500525001				10	26.5			TPGX 0902..	CS 250T	TORX T08	0.01
SFTP 32	470500532001				11.5	34.5			TPGX 0902..	CS 250T	TORX T08	0.02
SFTP 50	470500550001				19	52			TPGX 1103..	CS 300890T	TORX T08	0.08
SFTP 51	470500550003				21	52			TCMT 16T3..	TS 4	TORX T15	0.09
SFCC 25	470500525002				10	26.5			CCGT 0602..	TS 25	TORX T08	0.01
SFCC 32	470500532002				11.5	34.5			CCGT 0602..	TS 25	TORX T08	0.02
SFCC 50	470500550002				19	52			CCGT 09T3..	TS 4	TORX T15	0.08
SFCC 51	470500550004				21	52			CCMT 1204..	TS 5	TORX T25	0.09
SFQC 50	470500550062				20.5	53			CCMT 09T3..	TS 4	TORXT15	0.1
SFSM 50-15°	470500550011				19	50.5			CCMT 09T3..	TS 4	TORXT15	0.07
SFSM 50-30°	470500550013				19	50.5			CCMT 09T3..	TS 4	TORXT15	0.07
SFSM 50-45°	470500550015				19	50.5			CCMT 09T3..	TS 4	TORXT15	0.07
B3.06	572010506001	6 ~ 8	29	21					WCGT 0201..	TS 21	TORX T06	0.035
B3.08	572010508001	8 ~ 10	36	28					WCGT 0201..	TS 211	TORX T06	0.04
B3.10	572010510001	10 ~ 12	43	35					TPGX 0902..	CS 250 T	TORX T08	0.05
B3.11	572010511001	11 ~ 13	48	40					TPGX 0902..	CS 250 T	TORX T08	0.055
B3.12	572010512001	12 ~ 14	48	42					TPGX 0902..	CS 250 T	TORX T08	0.06
B3.14	572010514001	14 ~ 16	52	50					TPGX 0902..	CS 250 T	TORX T08	0.07
B3.16	572010516001	16 ~ 18	58	50					TPGX 0902..	CS 250 T	TORX T08	0.07
B3.18	572010518001	18 ~ 22	63						TPGX 0902..	CS 250 T	TORX T08	0.1
B3.22	572010522001	22 ~ 30	68						TPGX 0902..	CS 250 T	TORX T08	0.1
B5.06	572010506105	6 ~ 8	36						WCGT 0201..	TS 21	TORX T06	0.075
B5.08	572010508105	8 ~ 10	48						WCGT 0201..	TS 211	TORX T06	0.09
B5.10	572010510105	10 ~ 12	60						TPGX 0902..	CS 250 T	TORX T08	0.1
B5.12	572010512105	12 ~ 14	72						TPGX 0902..	CS 250 T	TORX T08	0.1
B5.14	572010514105	14 ~ 16	84						TPGX 0902..	CS 250 T	TORX T08	0.2
B5.16	572010516105	16 ~ 18	96						TPGX 0902..	CS 250 T	TORX T08	0.3
B8.06	572010506108	6 ~ 8	45						WCGT 0201..	TS 21	TORX T06	0.065
B8.08	572010508108	8 ~ 10	60						WCGT 0201..	TS 211	TORX T06	0.08
B8.10	572010510108	10 ~ 12	75						TPGX 0902..	CS 250 T	TORX T08	0.1
B8.12	572010512108	12 ~ 14	90						TPGX 0902..	CS 250 T	TORX T08	0.2
B8.14	572010514108	14 ~ 16	105						TPGX 0902..	CS 250 T	TORX T08	0.2
B8.16	572010516108	16 ~ 18	120						TPGX 0902..	CS 250 T	TORX T08	0.3



## BPS Ø 200 ~ 1200



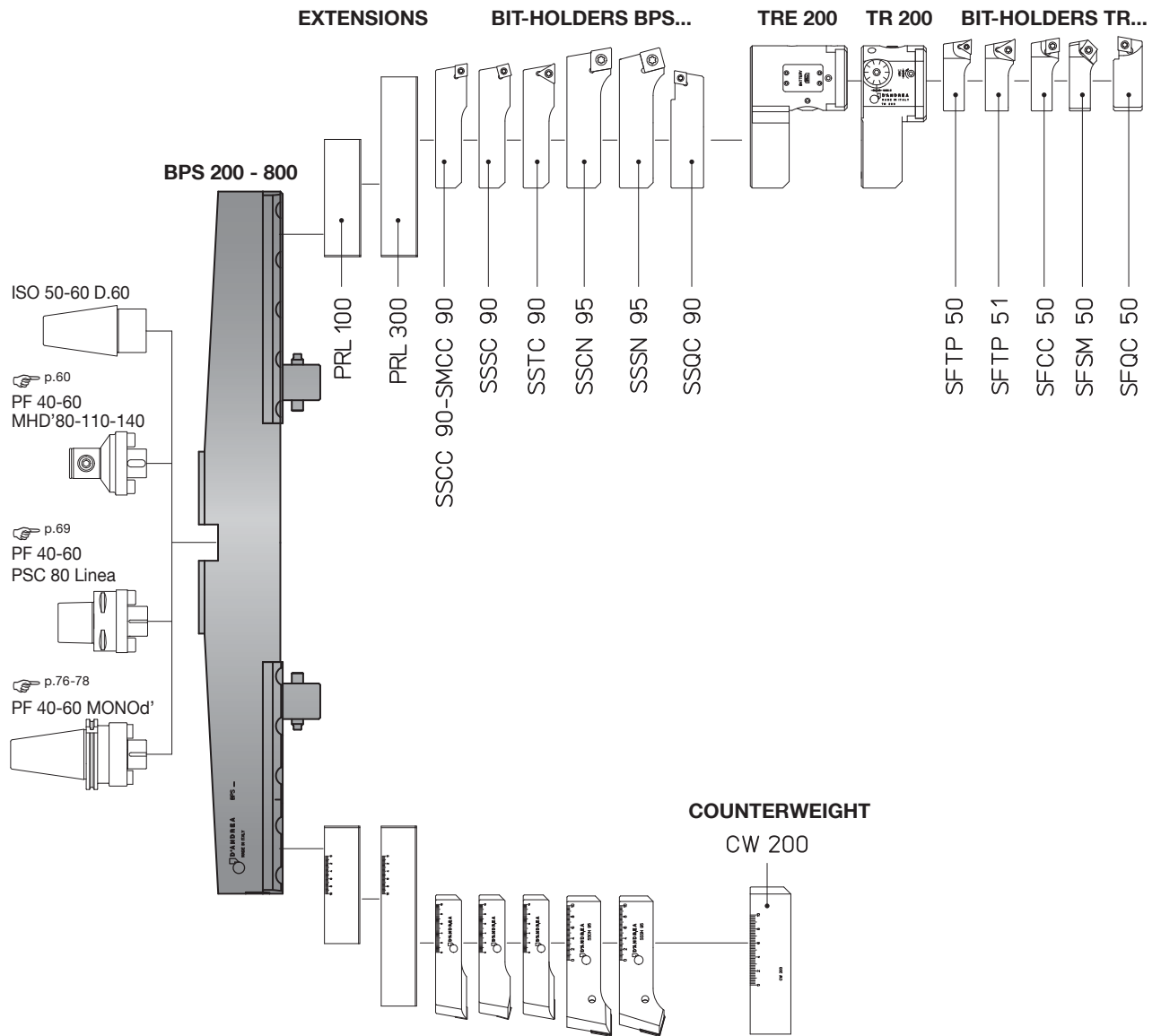
The **BPS** bars cover a working range from Ø 200 to Ø 1200 mm, both in roughing and in finishing.  
The wide range of accessories includes both roughing bit holders and micrometric finishing heads capable of performing boring, chamfering and back-facing operations.  
The main body of the **BPS** bars is made of aluminium on which the bit holder plates are fixed.



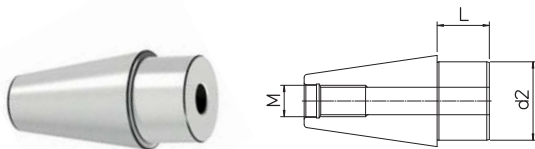
REF.	CODE	Ø	A	B	Ø D	Ø E	Ø F	Ø G	L	kg
<b>BPS 200</b>	435540881980	200 ~ 600	194	(4xM12)	66.7	2.5		40	54	3.2
<b>BPS 300</b>	435540882980	300 ~ 700	288	(4xM12)	66.7	2.5		40	54	3.9
<b>BPS 400</b>	435540883980	400 ~ 800	394	(4xM12)	66.7	1/4 GAS		40	61	6.9
<b>BPS 500</b>	435560884940	500 ~ 900	494	128 (4xM16)	101.6	1/4 GAS		60	69	9.4
<b>BPS 600</b>	435560885940	600 ~ 1000	594	128 (4xM16)	101.6	1/4 GAS		60	71	9.9
<b>BPS 700</b>	435560886940 •	700 ~ 1100	694	128 (4xM16)	101.6	1/4 GAS		60	74	11.2
<b>BPS 800</b>	435560887940 •	800 ~ 1200	794	128 (4xM16)	101.6	1/4 GAS		60	80	15.2

• Subject to stock availability

BPS Ø 200 ~ 1200



## ISO 50-60 D.60

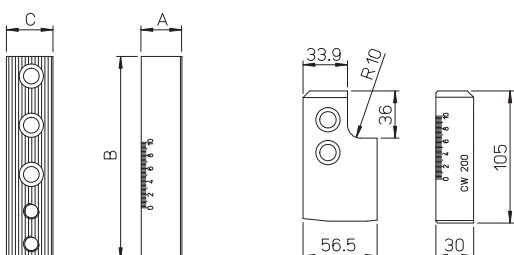


REF.	CODE	d2	L	M	kg
ISO 50 D.60	71ISO-50-DC6040 •	60	40	24	4.8
ISO 60 D.60	71ISO-60-DC6040 •	60	40	30	9.7

• Subject to stock availability

## PRL EXTENSIONS

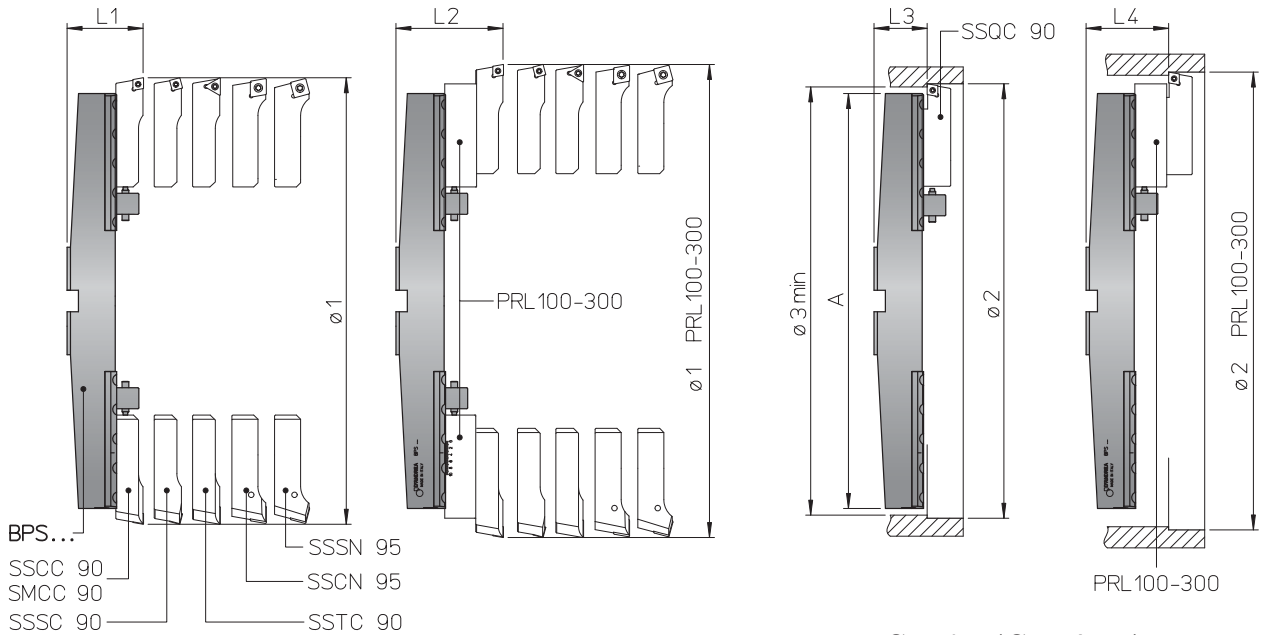
## CW COUNTERWEIGHT



REF.	CODE	A	B	C	kg
PRL 100	392011015501	31	155	33.5	1.1
PRL 300	392011030001	41	255	35.5	2.8
CW 200	392011010501				1.3

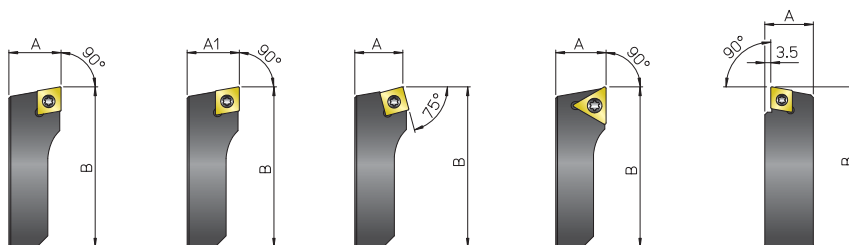
BPS Ø 200 ~ 1200

ROUGHING



	BPS 200	BPS 300	BPS 400	BPS 500	BPS 600	BPS 700	BPS 800
A	194	298	394	494	594	694	794
Ø 1	200 ~ 300	300 ~ 400	400 ~ 500	500 ~ 600	600 ~ 700	700 ~ 800	800 ~ 900
Ø 1 PRL 100	300 ~ 400	400 ~ 500	500 ~ 600	600 ~ 700	700 ~ 800	800 ~ 900	900 ~ 1000
Ø 1 PRL 300	400 ~ 600	500 ~ 700	600 ~ 800	700 ~ 900	800 ~ 1000	900 ~ 1100	1000 ~ 1200
Ø 2	202 ~ 302	302 ~ 402	402 ~ 502	502 ~ 602	602 ~ 702	702 ~ 802	802 ~ 902
Ø 2 PRL 100	302 ~ 402	402 ~ 502	502 ~ 602	602 ~ 702	702 ~ 802	802 ~ 902	902 ~ 1002
Ø 2 PRL 300	402 ~ 602	502 ~ 702	602 ~ 802	702 ~ 902	802 ~ 1002	902 ~ 1102	1002 ~ 1202
L1 S... 90	86	86	93	101	103	106	112
L1 S... 95	94	94	101	109	111	114	120
L2 PRL 100 S... 90	116	116	123	131	133	136	142
L2 PRL 300 S... 90	126	126	133	141	143	146	152
L2 PRL 100 S... 95	124	124	131	139	141	144	150
L2 PRL 300 S... 95	134	134	141	149	151	154	160
L3 SSQC 90	56.5	56.5	63.5	71.5	73.5	76.5	82.5
L4 PRL 100 SSQC 90	86.5	86.5	93.5	101.5	103.5	106.5	112.5
L4 PRL 300 SSQC 90	96.5	96.5	103.5	111.5	113.5	116.5	122.5

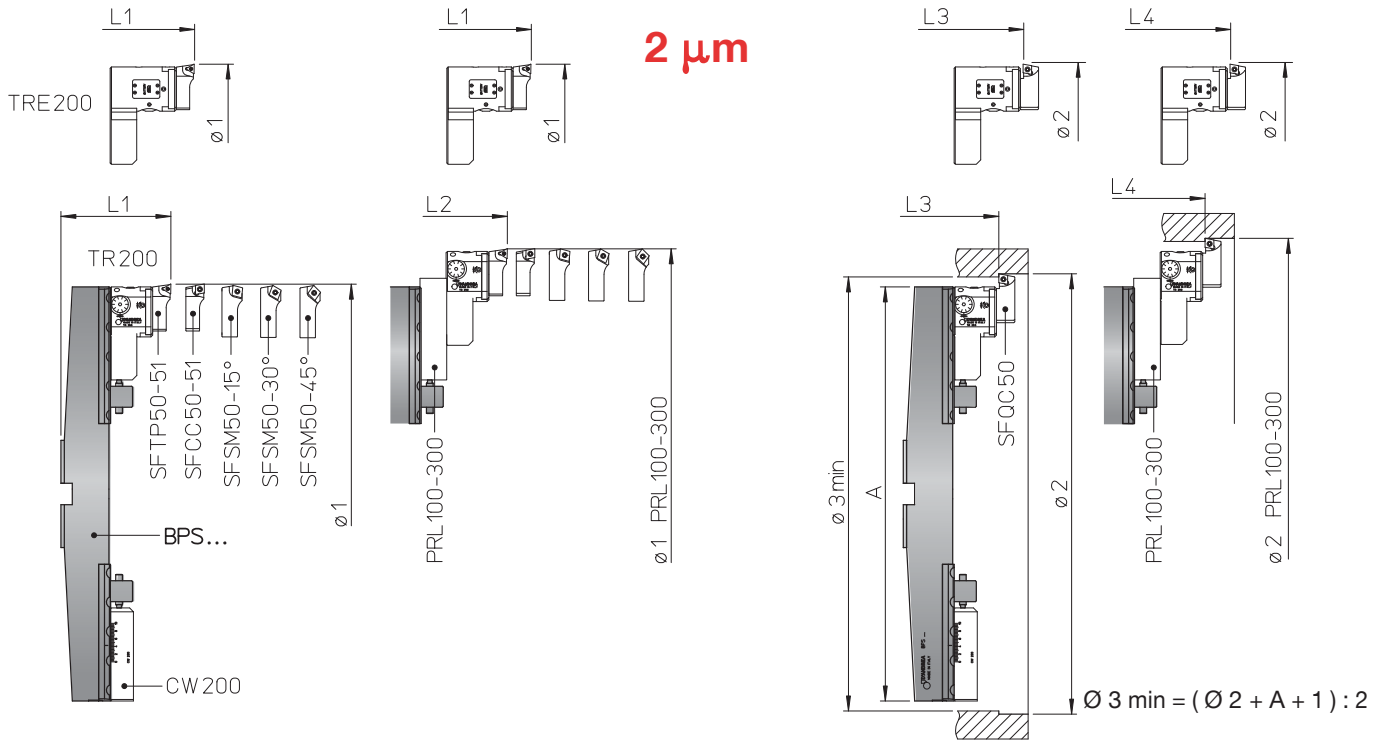
## BIT-HOLDERS SSC.. - SMCC .. - SSS .. - SSTC .. - SSQC ..



REF.	CODE	A	A1	B						kg
SSCC 90	470500590201	32		130	CCMT 1204..			TS 5	TORX T25	0.7
SSCN 95	470500595201	40		130	CNM. 1906..				<b>p. 89</b>	0.9
SMCC 90	470500590203		31.7	130	CCMT 1204..			TS 5	TORX T25	0.7
SSSC 90	470500590202	32		130		SCMT 1204..		TS 5	TORX T25	0.7
SSSN 95	470500595202	40		130		SNM . 1906..			<b>p. 89</b>	0.9
SSTC 90	470500590206	32		130			TCMT 2204..	TS 5	TORX T25	0.7

## BPS Ø 200 ~ 1200

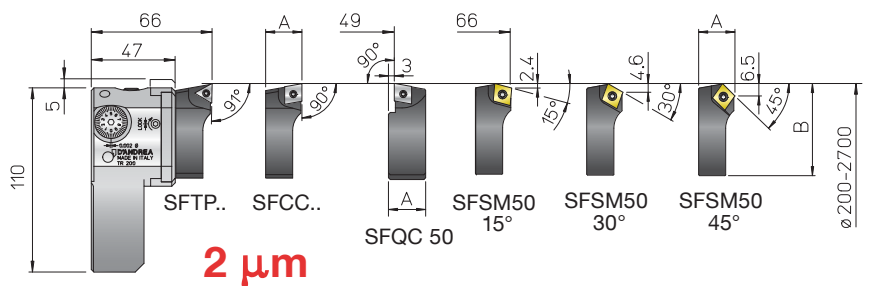
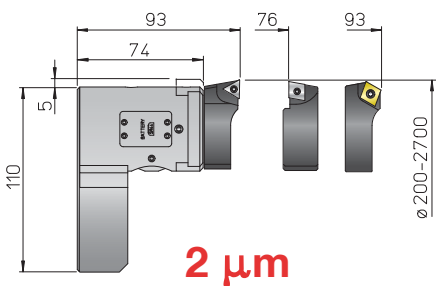
## FINISHING



	BPS 200		BPS 300		BPS 400		BPS 500		BPS 600		BPS 700		BPS 800	
<b>A</b>	194		298		394		494		594		694		794	
<b>Ø 1</b>	200 ~ 300		300 ~ 400		400 ~ 500		500 ~ 600		600 ~ 700		700 ~ 800		800 ~ 900	
<b>Ø 1 PRL 100</b>	300 ~ 400		400 ~ 500		500 ~ 600		600 ~ 700		700 ~ 800		800 ~ 900		900 ~ 1000	
<b>Ø 1 PRL 300</b>	400 ~ 600		500 ~ 700		600 ~ 800		700 ~ 900		800 ~ 1000		900 ~ 1100		1000 ~ 1200	
<b>Ø 2</b>	202 ~ 302		302 ~ 402		402 ~ 502		502 ~ 602		602 ~ 702		702 ~ 802		802 ~ 902	
<b>Ø 2 PRL 100</b>	302 ~ 402		402 ~ 502		502 ~ 602		602 ~ 702		702 ~ 802		802 ~ 902		902 ~ 1002	
<b>Ø 2 PRL 300</b>	402 ~ 602		502 ~ 702		602 ~ 802		702 ~ 902		802 ~ 1002		902 ~ 1102		1002 ~ 1202	
<b>L</b>	TR200	TRE200	TR200	TRE200	TR200	TRE200	TR200	TRE200	TR200	TRE200	TR200	TRE200	TR200	TRE200
<b>L1</b>	120	147	120	147	127	154	135	162	137	164	140	167	146	173
<b>L2 PRL 100</b>	150	177	150	177	157	184	165	192	167	194	170	197	176	203
<b>L2 PRL 300</b>	160	187	160	187	167	194	175	202	177	204	180	207	186	213
<b>L3</b>	103	130	103	130	110	137	118	145	120	147	123	150	129	156
<b>L4 PRL 100</b>	133	160	133	160	140	167	148	175	150	177	153	180	159	186
<b>L4 PRL 300</b>	143	170	143	170	150	177	158	185	160	187	163	190	169	196

## TRE 200

## TR 200

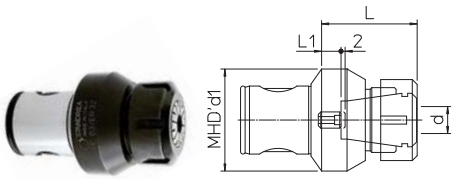


REF.	CODE	Ø	kg
TRE 200 69K	455220002001	200 ~ 2700	1.7

REF.	CODE	Ø	kg
TR 200	455020002000	200 ~ 2700	1.3

REF.	CODE	A	B	△	□	⊥	⌘	kg
SFTP 50	470500550001	19	52	TPGX 1103..		CS 300890T	TORX T08	0.08
SFTP 51	470500550003	21	52	TCMT 16T3..			TS 4 TORX T15	0.09
SFCC 50	470500550002	19	52	CCGT 09T3..			TS 4 TORX T15	0.08
SFCC 51	470500550004	21	52	CCMT 1204..			TS 5 TORX T25	0.09
SFQC 50	470500550062	20.5	53	CCMT 09T3..			TS 4 TORX T15	0.1
SFSM 50-15°	470500550011	19	50.5	CCMT 09T3..			TS 4 TORX T15	0.07
SFSM 50-30°	470500550013	19	50.5	CCMT 09T3..			TS 4 TORX T15	0.07
SFSM 50-45°	470500550015	19	50.5	CCMT 09T3..			TS 4 TORX T15	0.07

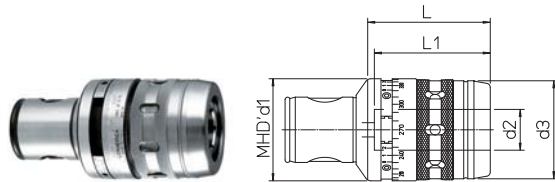
## PE COLLETS CHUCKING TOOLS



Supplied without collets and clamping wrenches

REF.	CODE	MHD' d1	d	L	L1	kg			N-m
PE 16 / ER11M	655701600110	16	0.5 ~ 7	25	2.5	0.03	ER-11M	E11M	30
PE 20 / ER16M	655702000160	20	0.5 ~ 10	32	1	0.06	ER-16M	E16M	40
PE 25 / ER20M	655702500200	25	1 ~ 13	40	2.5	0.15	ER-20M	E20M	80
PE 32 / ER25M	655703200250	32	1 ~ 16	42	1.5	0.25	ER-25M	E25M	160
PE 40 / ER25	655704000250	40	1 ~ 16	45	5	0.4	UM/ER25	E25	200
PE 50 / ER25	655705000250	50	1 ~ 16	48	7	0.7	UM/ER25	E25	200
PE 50 / ER32	655705000320	50	2 ~ 20	55	8	1	UM/ER32	E32	220
PE 63 / ER32	655706300320	63	2 ~ 20	59	12	1.3	UM/ER32	E32	220
PE 63 / ER40	655706300400	63	3 ~ 26	64	12	1.5	UM/ER40	E40	250

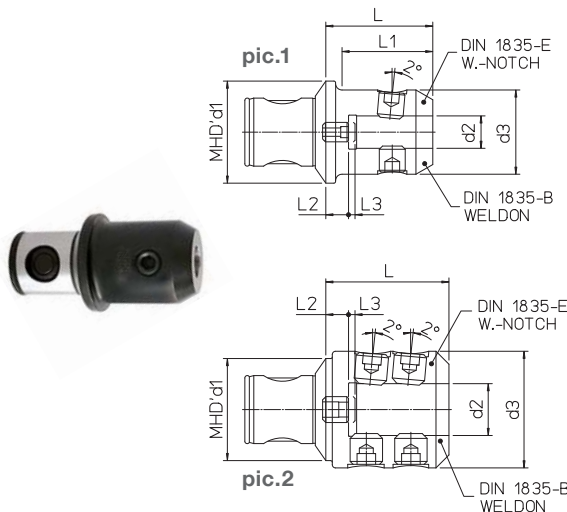
## MHD' FORCE ULTRA-TIGHT TOOLHOLDER FORCE



Supplied without collets and clamping wrenches

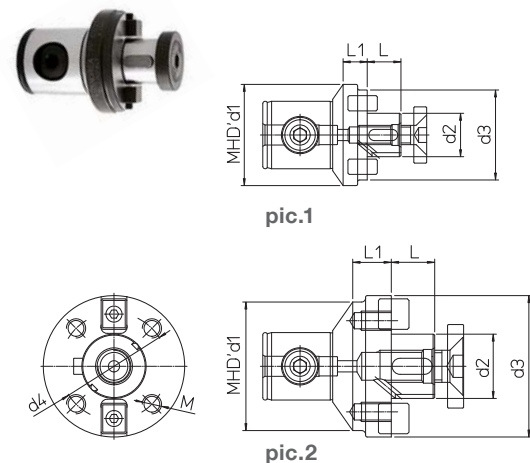
REF.	CODE	MHD' d1	d2	d3	L	L1	kg
FORCE 50/20 HS	656305000205	50	20	48	60	60	1
FORCE 63/32 HS	656306300325	63	32	66	80	80	2

## AW WELDON WHISTLE NOTCH CHUCKING TOOLS



REF.	CODE	MHD' d1	d2 <sup>H5</sup>	d3	L	L1	L2	L3	kg	pic.
AW 50/6	655805000060	50	6	25	44	32.5	7	2	0.5	1
AW 50/8	655805000080	50	8	28	44	33	7	2	0.5	1
AW 50/10	655805000100	50	10	35	52	42	11	3	0.7	1
AW 50/12	655805000120	50	12	42	57	48	11	3	0.8	1
AW 50/14	655805000140	50	14	42	57	48	11	3	0.8	1
AW 50/16	655805000160	50	16	48	67	61	17	4	1.1	1
AW 50/20	655805000200	50	20	51	67		16	4	1.2	1
AW 50/25	655805000250	50	25	63	80		22	4	1.8	2
AW 63/16	655806300160	63	16	48	64	53	14	4	1.4	1
AW 63/20	655806300200	63	20	52	66	56	14	4	1.5	1
AW 63/25	655806300250	63	25	64	74		16	4	2.1	2
AW 63/32	655806300320	63	32	72	76		14	4	2.5	2
AW 80/40	655808000400	80	40	80	83		12	4	3.2	2

## PF DISC AND FACING CUTTER HOLDERS

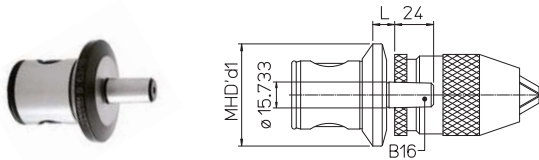


REF.	CODE	MHD' d1	d2	d3	d4	M	L	L1	kg	pic.
PF 40/16	655904020165	40	16	32			17	15	0.3	1
PF 40/22	655904020225	40	22	40			19	13	0.4	1
PF 50/16	655905000160	50	16	32			17	15	0.5	1
PF 50/22	655905000220	50	22	40			19	15	0.5	1
PF 50/27	655905000270	50	27	50			21	15	0.6	1
PF 50/32	655905000320	50	32	60			24	15	0.7	1
PF 63/22	655906300220	63	22	60			19	15	0.9	1
PF 63/27	655906300270	63	27	60			21	15	1.1	1
PF 63/32	655906300320	63	32	63			24	15	1.2	1
PF 80/32	655908000320	80	32	80			24	24	1.7	1
PF 80/40	655908000400	80	40	84	66.7	M12	27	24	1.9	2
PF 80/50	655908000500	80	50	90			30	24	2.0	2
PF 80/60	655908000600	80	60	128.5	101.6	M16	40	31.5	3.5	2
PF 110/40	655911000400	110	40	88	66.7	M12	27	20	4.2	2
PF 110/60	655911000600	110	60	128.5	101.6	M16	40	36	6	2
PF 140/40	655914000400	140	40	88	66.7	M12	27	26	6.2	2
PF 140/60	655914000600	140	60	140	101.6	M16	40	26	7.8	2

PF.. /40-60 BPS p.57

• Subject to stock availability

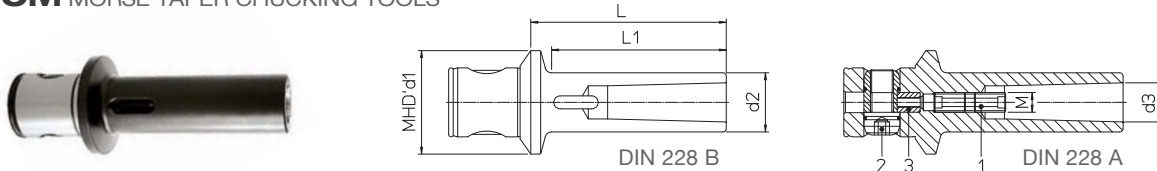
## B16 DRILLING CHUCK HOLDERS B16 D238



Drilling chuck holders with B16 DIN 238 thread

REF.	CODE	MHD' d1	L	kg
<b>B 50/16</b>	656105000160	50	10	0.4
<b>B 63/16</b>	656106300160	63	13.5	0.8

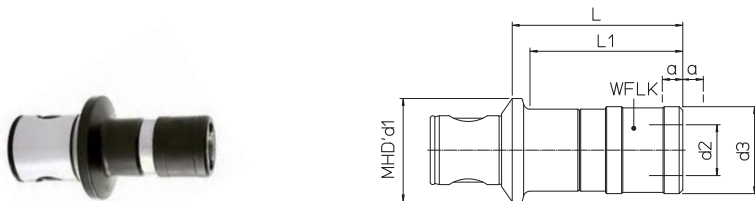
## CM MORSE TAPER CHUCKING TOOLS



**MT DIN 228-A.** To chuck a morse taper tool with thread proceed as follows: a. Drive in screw 1; b. Remove expanding pin 2 and sleeve 3 to allow the Allen wrench to be introduced from the rear; c. Fit the tool and tighten screw 1 clockwise; d. Reassemble expanding pin 2 and sleeve 3.  
**MT DIN 228-B.** To chuck a morse taper tool with tang remove screw. 1. Combi-chucking tools for morse taper with DIN 228-A thread bore and with DIN 228-B tooth.

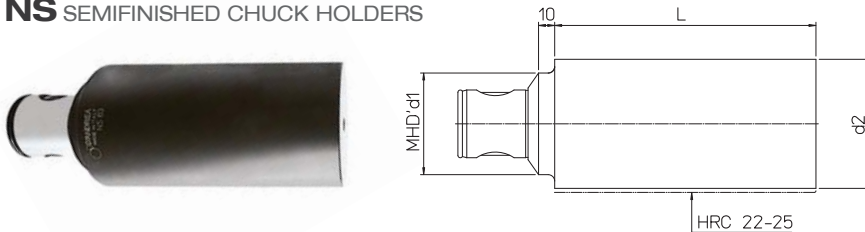
REF.	CODE	MHD' d1	MORSE	d2	d3	L	L1	M	kg
<b>CM 50/1</b>	656005000010	50	1 20	12.065	80	68	M6	0.6	
<b>CM 50/2</b>	656005000020	50	2 30	17.780	100	86	M10	0.7	
<b>CM 50/3</b>	656005000030	50	3 36	23.825	120	110	M12	1	
<b>CM 63/3</b>	656006300030	63	3 36	23.825	120	108	M12	1.3	
<b>CM 63/4</b>	656006300040	63	4 48	31.267	150	133	M16	2	

## AM TAPPING ADAPTERS WITH DOUBLE COMPENSATION



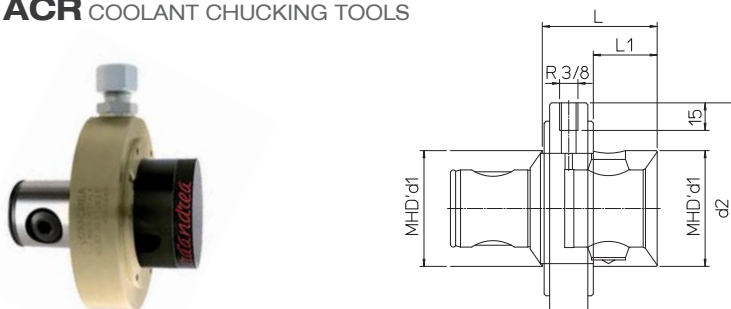
REF.	CODE	MHD' d1	WFLK	Capacity	L	L1	d2	d3	a	kg
<b>AM 50/M3-12</b>	656505000100	50	WFLK 115B/A 308	M 3 ~ 12	72	60	19	36	7.5	0.9
<b>AM 50/M8-20</b>	656505000200	50	WFLK 225B/A 308	M 8 ~ 20	106	31	53	12.5	1.2	
<b>AM 63/M3-12</b>	656506300100	63	WFLK 115B/A 308	M 3 ~ 12	70	58	19	36	7.5	1
<b>AM 63/M8-20</b>	656506300200	63	WFLK 225B/A 308	M 8 ~ 20	104	93	31	53	12.5	1.3

## NS SEMIFINISHED CHUCK HOLDERS



REF.	CODE	MHD' d1	d2	L	kg	ON REQUEST
<b>NS 50</b>	657205001600	50	63	160	4.2	
<b>NS 63</b>	657206302000	63	80	200	8.7	
<b>NS 80</b>	657208002500	80	100	250	16	
<b>NS 110</b>	657211002500	110	130	250	18	
<b>NS 140</b>	657214002500	140	150	250	30	

## ACR COOLANT CHUCKING TOOLS



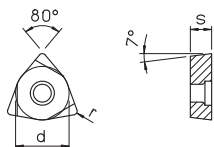
REF.	CODE	MHD' d1	d2	L	L1	RPM MAX	BAR	kg
<b>ACR 63/63</b>	656706310630	63	115	63	35	<b>3500</b>	<b>max 10</b>	2.9

**Important note.** Activate the coolant before the chuck rotation not to damage internal gaskets.



# INSERTS

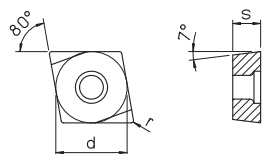
## WCGT ○○○○○○L



REF.	d	s	r	T	Screw	CARBIDE		CERMET	COATED CERMET
						DP300	DK100	DC100	DC100T
WCGT 020102 L	3.97	1.59	0.2	TS 21*-TS 211*	TORX T06	•	•	•	•
WCGT 020104 L	3.97	1.59	0.4	TS 21*-TS 211*	TORX T06	•	•	•	•

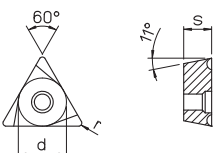
\* TS21 : B...06 / \* TS211 : B...08

## CCGT ○○○○○○L



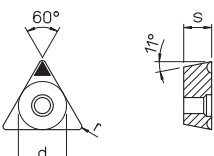
REF.	d	s	r	T	Screw	CARBIDE		CERMET	COATED CERMET
						DP300	DK100	DC100	DC100T
CCGT 060200 L10°	6.35	2.38	0	TS 25	TORX T08	•	•	•	•
CCGT 060202 L	6.35	2.38	0.2	TS 25	TORX T08	•	•	•	•
CCGT 060204 L	6.35	2.38	0.4	TS 25	TORX T08	•	•	•	•
CCGT 09T302 L	9.525	3.97	0.2	TS 4	TORX T15	•	•	•	•
CCGT 09T304 L	9.525	3.97	0.4	TS 4	TORX T15	•	•	•	•

## TPGX ○○○○○○L



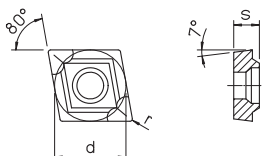
REF.	d	s	r	T	Screw	CARBIDE		CERMET	COATED CERMET
						DP300	DK100	DC100	DC100T
TPGX 090200 L10°	5.56	2.38	0	CS250T	TORX T08	•	•	•	•
TPGX 090202 L	5.56	2.38	0.2	CS250T	TORX T08	•	•	•	•
TPGX 090204 L	5.56	2.38	0.4	CS250T	TORX T08	•	•	•	•
TPGX 110300 L10°	6.35	3.18	0	CS300890T	TORX T08	•	•	•	•
TPGX 110302 L	6.35	3.18	0.2	CS300890T	TORX T08	•	•	•	•
TPGX 110304 L	6.35	3.18	0.4	CS300890T	TORX T08	•	•	•	•

## TPGX ○○○○○○

















REF.	d	s	r	T	Screw	SINTERED DIAMOND	CUBIC BORON NITRIDE	
						D20 MDC	D20 CBN	D25 CBN
TPGX 090202	5.56	2.38	0.2	CS250T	TORX T08	•	•	•
TPGX 090204	5.56	2.38	0.4	CS250T	TORX T08	•	•	•
TPGX 110302	6.35	3.18	0.2	CS300890T	TORX T08	•	•	•
TPGX 110304	6.35	3.18	0.4	CS300890T	TORX T08	•	•	•

## CCMT ○○○○○○



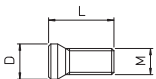
REF.	d	s	r	T	Screw	CARBIDE	CVD COATED CARBIDE
						DP300	DP100 R
CCMT 060202	6.35	2.38	0.2	TS 25	TORX T08	•	•
CCMT 060204	6.35	2.38	0.4	TS 25	TORX T08	•	•
CCMT 09T304	9.525	3.97	0.4	TS 4	TORX T15	•	•
CCMT 09T308	9.525	3.97	0.8	TS 4	TORX T15	•	•
CCMT 120404	12.7	4.76	0.4	TS 5	TORX T25	•	•
CCMT 120408	12.7	4.76	0.8	TS 5	TORX T25	•	•



# BORING GRADE

ISO	CARBIDE	CERMET	COATED CERMET	CVD COATED CARBIDE
P01				
P10		 DC100	 DC100T	 DP100R
P20				
P30	 DP300			
P40				
K01				
K10	 DK100	 DC100	 DC100T	 DP100R
K20	 DP300			
K30				

DP300	Roughing and finishing. Low carbon steel - stainless steels
DK100	Roughing and finishing. Aluminium alloy Cast iron
DP100R	Roughing. Steels, alloy steels and cast iron
DC100	Finishing. Alloy steels and cast iron
DC100T	Finishing. Alloy steels, stainless steels and cast iron
D20MDC	Finishing. Aluminium alloys, non-ferrous materials and non-metals
D20CBN	Finishing. High hardness steels (over 50 HRC) (it may replace the grinding)
D25CBN	Finishing. High hardness steel (over 50 HRC) and interrupted cutting (it may replace the grinding)

TORX



REF.		CODE	M	L	D	N-m	REF.		CODE
TS 21		494010002034	M 2x0.4	3.7	2.7	0,5	TORX TO6		10 150 09 0 0600
TS 211		494010002040	M 2x0.4	4	2.7	0,5	TORX TO6		10 150 09 0 0600
CS 250 T		494010002565	M 2.5x0.45	6	3.7	1,0	TORX TO8		10 150 09 0 0800
CS 300890 T		494010003008	M 3x0.5	8	4.1	1,0	TORX TO8		10 150 09 0 0800
TS 25		494010002555	M 2.5x0.45	5.7	3.45	1,0	TORX TO8		10 150 09 0 0800
TS 4		494010004008	M 4x0.7	10	5.5	3,0	TORX T15		10 150 09 0 1500
TS 5		494010005009	M 5x0.8	11.5	7	7,5	TORX T25		10 150 09 0 2500



# PSC Linea

It is a line of high-precision modular tool-holders used to perform boring, milling and drilling operations with extreme flexibility and rigidity.



## BASE CONNECTIONS

**DIN-AD / PSC**  
DIN 69871 / ISO 26623-2



**MAS BT / PSC**  
MAS 403 BT / ISO 26623-2



**HSK-A / PSC**  
DIN 69893 / ISO 26623-2



**CAT-AD+B / PSC**  
ANSI B5.50 / ISO 26623-2



## EXTENSIONS REDUCTIONS

**PR / PSC**  
ISO 26623-1 / 2



**RD / PSC**  
ISO 26623-1 / 2



## REDUCTIONS TO MODULAR

**PSC - MHD<sup>1</sup>**  
ISO 26623-1



## MILL HOLDER

**PSC-PF**  
ISO 26623-1



## HIGH CLAMPING POWER

**PSC-MF**  
ISO 26623-1



## SEMIFINISHED CHUCK HOLDERS

**PSC NS-H.28-42**  
ISO 26623-1



## ON REQUEST TRE PSC - TR PSC



**TRE 50 PSC50 69K**  
Ø 2.5-110

**TRE 63 PSC63 69K**  
Ø 6 ~ 125

**TRE 80 PSC80 69K**  
Ø 6 ~ 200



**TR 50 PSC 40**  
**TR 50 PSC 50**  
**TR 50 PSC 63**  
Ø 2.5 ~ 108

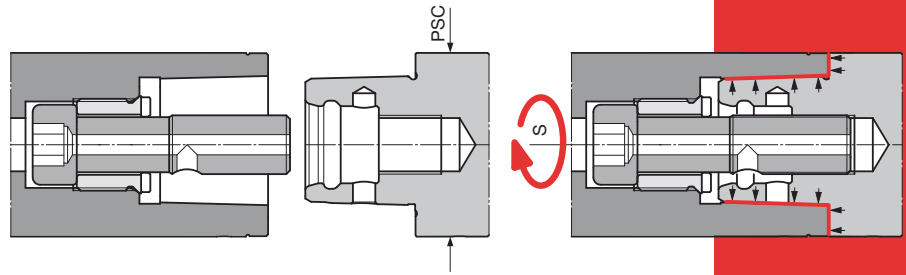
**TR 63 PSC 63**  
Ø 2.5 ~ 125

**TR 80 PSC 80**  
Ø 2.5 ~ 160

## ON REQUEST OTHERS ARBORS

The **PSC coupling** complies with the ISO 26623 standard and is available in six sizes. It guarantees the interchangeability of all elements of the system, which includes arbors, extensions, reductions and tool-holder adapters.

## Coupling PSC ISO 26623-1/2



The program integrates with the **MHD boring line** which completes the PSC line with a wide range of roughing and finishing heads, the latter both analog and digital.

PSC	S	⊠N·m
PSC 32	8	45
PSC 40	8	55
PSC 50	10	95
PSC 63	14	170
PSC 80	14	170
PSC 100	17	380

The **BASE CONNECTIONS** are made according to the DIN 69871, MAS 403 BT, ANSI-CAT, DIN 69893 standards and are built in carburized, hardened and ground steel.

**PR and RD** For each PSC size there are extensions and reductions of different lengths that are used to achieve the desired machining depths.

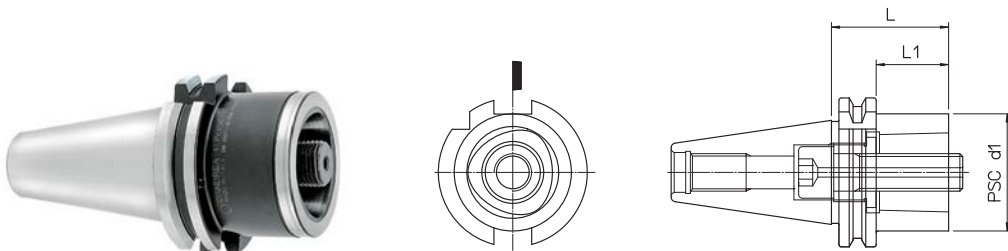
**RD MHD'** The MHD' reductions allow the MHD boring line to be integrated into the PSC Linea program.

**PF** Universal milling cutter-holder adapters which, among other benefits, allow use of the BPS line for large diameters.

**MONOforce** A line of high clamping force tool-holders ideal for machining where precision and the need for clamping tools subjected to high torsional loads are required.

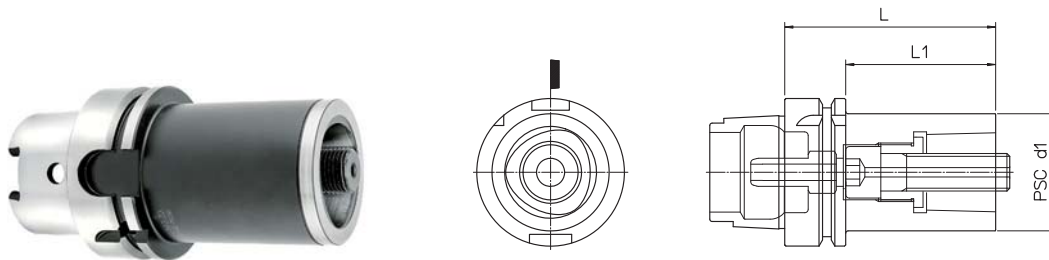


## DIN-AD / PSC DIN 69871 / ISO 26623-2



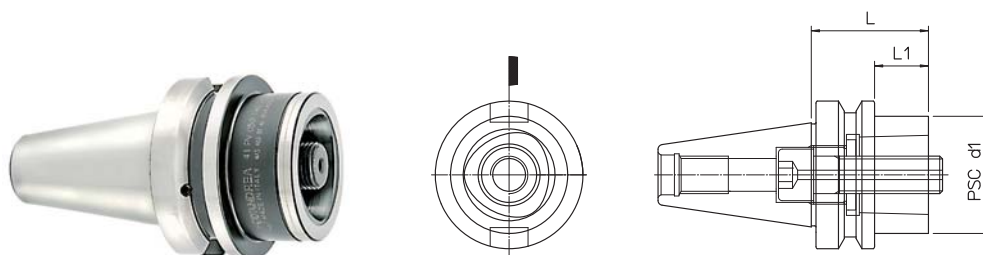
DIN	REF.	CODE	PSC d1	L	L1	kg
40	DIN69871-AD40 PSC 40.30	41PS04014020	40	30	11	0.8
40	DIN69871-AD40 PSC 50.40	41PS05014028	50	40	21	0.9
40	DIN69871-AD40 PSC 50.50	41PS05014022	50	50	31	1.1
50	DIN69871-AD50 PSC 50.30	41PS05015020	50	30	11	2.7
50	DIN69871-AD50 PSC 63.30	41PS06315028	63	30	11	2.8
50	DIN69871-AD50 PSC 63.50	41PS06315022	63	50	31	3
50	DIN69871-AD50 PSC 80.70	41PS08015020	80	70	51	3.7

## HSK-A / PSC DIN 69893 / ISO 26623-2



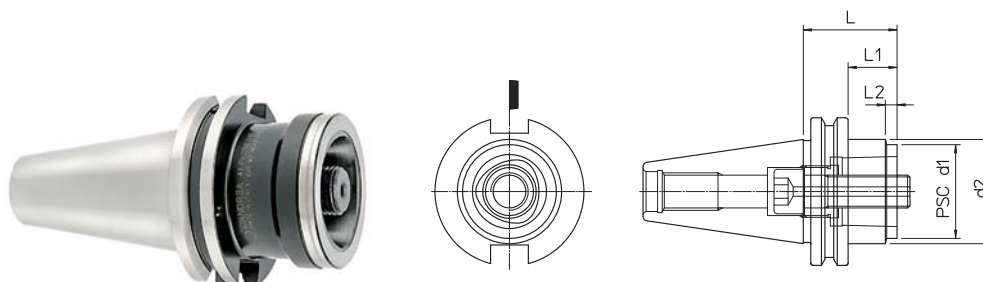
HSK-A	REF.	CODE	PSC d1	L	L1	kg	Supplied with coolant tube
63	HSK-A63 PSC 40.80	41PS04056320	40	80	54	1.1	
63	HSK-A63 PSC 50.90	41PS05056320	50	90	64	1.5	
100	HSK-A100 PSC 50.100	41PS05059920	50	100	71	3	
100	HSK-A100 PSC 63.110	41PS06359920	63	110	81	3.6	
100	HSK-A100 PSC 80.120	41PS08059920	80	120	91	4.7	
125	HSK-A125 PSC 80.130	41PS08059520	80	130	101	6.5	

**MAS BT-AD / PSC** MAS 403 BT / ISO 26623-2



BT	REF.	CODE	PSC d1	L	L1	kg
40	MAS403 BT40-AD PSC 40.30	41PS04014030	40	30	3	0.9
40	MAS403 BT40-AD PSC 50.50	41PS05014032	50	50	23	1.2
50	MAS403 BT50-AD PSC 50.40	41PS05015030	50	40	2	3.4
50	MAS403 BT50-AD PSC 63.50	41PS06315032	63	50	12	3.5
50	MAS403 BT50-AD PSC 80.70	41PS08015030	80	70	32	4

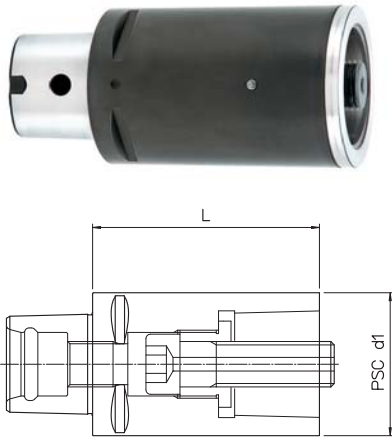
**CAT-AD / PSC** ANSI B5.50 / ISO 26623-2



CAT	REF.	CODE	PSC d1	d2	L	L1	L2	M	kg
40	CAT40 AD PSC 40.40	41PS04014045	40	44.5	40	21	5	UNC 5/8-11	0.95
40	CAT40 AD PSC 50.50	41PS05014045	50		50	31		UNC 5/8-11	1
50	CAT50 AD PSC 50.40	41PS05015045	50	69.9	40	21	5	UNC 1/8	2.5
50	CAT50 AD PSC 63.50	41PS06315045	63	70	50	31	12.5	UNC 1/8	3
50	CAT50 AD PSC 80.100	41PS08015045	80		100	81		UNC 1/8	4.6

### PR PSC ISO 26623-1 / 2

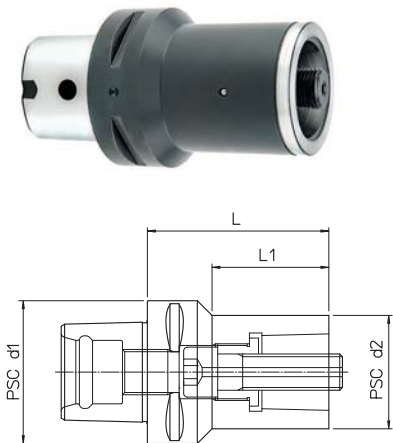
#### EXTENSIONS



REF.	CODE	PSC d1	L	kg
PR PSC 32.60	656PS03206000	32	60	0.35
PR PSC 32.80	656PS03208000	32	80	0.45
PR PSC 40.60	656PS04006000	40	60	0.55
PR PSC 40.80	656PS04008000	40	80	0.7
PR PSC 40.100	656PS04010000	40	100	0.9
PR PSC 50.80	656PS05008000	50	80	1.1
PR PSC 50.100	656PS05010000	50	100	1.4
PR PSC 63.100	656PS06310000	63	100	2.2
PR PSC 63.140	656PS06314000	63	140	3.2
PR PSC 80.100	656PS08010000	80	100	3.6
PR PSC 80.125	656PS08012500	80	125	4.5

### RD PSC ISO 26623-1 / 2

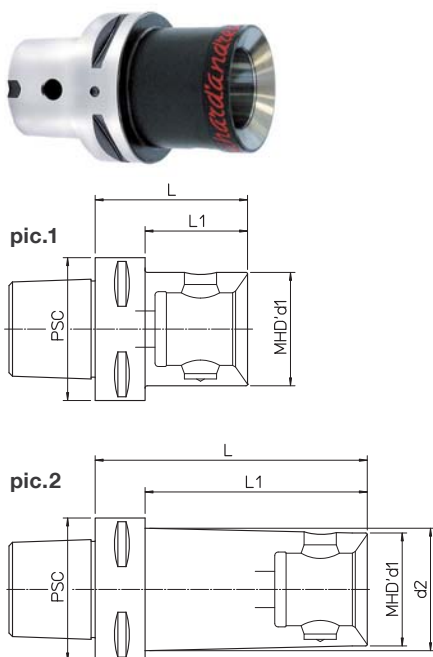
#### REDUCTIONS



REF.	CODE	PSC d1	PSC d2	L	L1	kg
RD PSC 40/32.70	657PS04003200	40	32	70	12	0.6
RD PSC 50/32.60	657PS05003200	50	32	60	34.8	0.65
RD PSC 50/40.65	657PS05004000	50	40	65	45	0.7
RD PSC 50/40.85	657PS05004001	50	40	85	12	1
RD PSC 63/32.70	657PS06303200	63	32	70	39	1.1
RD PSC 63/40.80	657PS06304000	63	40	80	51.4	1.3
RD PSC 63/50.80	657PS06305000	63	50	80	51.5	1.5
RD PSC 63/50.110	657PS06305001	63	50	110	12	3.4
RD PSC 80/32.60	657PS08003200	80	32	60	29.3	1.8
RD PSC 80/40.70	657PS08004000	80	40	70	36.5	1.9
RD PSC 80/50.80	657PS08005000	80	50	80	49.3	2.2
RD PSC 80/63.80	657PS08006300	80	63	80	53.1	2.5
RD PSC 80/63.120	657PS08006301	80	63	120	12	3.9
RD PSC 100/80.100	657PS10008000	100	80	100	58.2	5

### PSC-MHD' ISO 26623-1

#### REDUCTIONS TO MODULAR

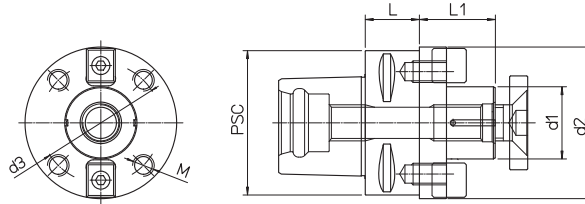


PSC	REF.	CODE	MHD' d1	d2	L	L1	kg	pic.
40	PSC 40 - MHD' 32.42	416322604004	32	42	22	0.3	1	
40	PSC 40 - MHD' 40.45	416402604004	40	45		0.4	1	
50	PSC 50 - MHD' 50.55	416502605005	50	55		0.8	1	
63	PSC 63 - MHD' 40.50	416402606305	40	50	28	0.9	1	
63	PSC 63 - MHD' 40.120	416402606312	40	44	120	98	1.5	2
63	PSC 63 - MHD' 50.55	416502606305	50	55	33	0.8	1	
63	PSC 63 - MHD' 50.67	416502606306	50	67	45	1.1	1	
63	PSC 63 - MHD' 50.120	416502606312	50	54	120	98	1.9	2
63	PSC 63 - MHD' 63.77	416632606307	63	77		1.8	1	
80	PSC 80 - MHD' 50.60	416502608006	50	60	30	2	1	
80	PSC 80 - MHD' 50.120	416502608012	50	54	120	90	2.8	2
80	PSC 80 - MHD' 63.70	416632608007	63	70	40	2.3	1	
80	PSC 80 - MHD' 63.150	416632608015	63	67	150	120	4	2
80	PSC 80 - MHD' 80.75	416802608007	80	75		2.6	1	
80	PSC 80 - MHD' 80.120	416802608012	80	120		4.3	1	
100	PSC 100 - MHD' 80.80	416802610008	110	80	44	3.5	1	
100	PSC 100 - MHD' 110.120	416912610012	110	120	84	5	1	

# MILL HOLDER - HIGH CLAMPING POWER - SEMIFINISHED CHUCK HOLDERS

## PSC-PF ISO 26623-1

MILL HOLDER



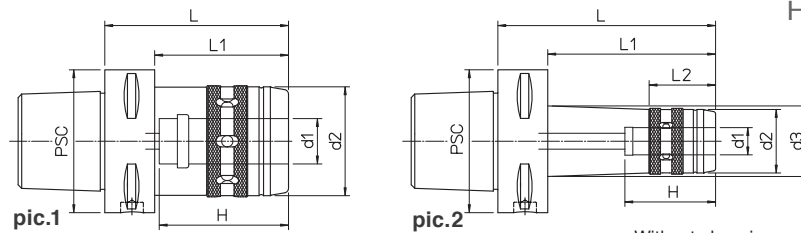
• Subject to stock availability

PSC	REF.	CODE	d1	d2	d3	M	L	L1	kg
40	<b>PSC 40 PF22.25</b>	71PSC-040PF2202 •	22				25	19	0.3
50	<b>PSC 50 PF22.25</b>	71PSC-050PF2202	22				25	19	0.5
50	<b>PSC 50 PF27.25</b>	71PSC-050PF2702 •	27				25	21	0.6
63	<b>PSC 63 PF27.25</b>	71PSC-063PF2702	27				25	21	0.8
63	<b>PSC 63 PF32.25</b>	71PSC-063PF3202 •	32				25	24	0.9
80	<b>PSC 80 PF32.30</b>	71PSC-080PF3203 •	32				30	24	1.8
80	<b>PSC 80 PF40.45</b>	71PSC-080PF4004 •	40	84	66.7	M12	45	27	2.4
80	<b>PSC 80 PF60.60</b>	71PSC-080PF6006 •	60	128.5	101.6	M16	60	40	5.2

PSC 80  
PF 40 - 60 BPS p.57

## ISO 26623-1 PSC

HIGH CLAMPING POWER

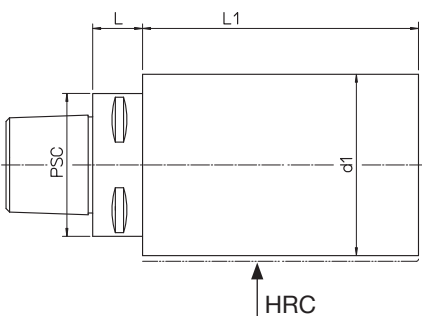


Without clamping wrench - Chip prearrangement

PSC	REF.	CODE	d1	d2	d3	H	L	L1	L2	kg	pic.
63	<b>PSC 63 - MF 12.70</b>	71PSC-063MF1207	12	28		46	70	48		0.9	1
63	<b>PSC 63 - MF 12.100</b>	71PSC-063MF1210	12	28	31.5	46	100	78	29.5	1.4	2
63	<b>PSC 63 - MF 20.80</b>	71PSC-063MF2008	20	48		60	80	58		1.3	1
63	<b>PSC 63 - MF 20.120</b>	71PSC-063MF2012	20	48		60	120	98		1.9	2
63	<b>PSC 63 - MF 32.100</b>	71PSC-063MF3210	32	66		80	100			2.1	1
63	<b>PSC 63 - MF 32.140</b>	71PSC-063MF3214	32	66		80	140			3.1	2
80	<b>PSC 80 - MF 20.80</b>	71PSC-080MF2008	20	48		60	80	50		3.7	1
80	<b>PSC 80 - MF 20.125</b>	71PSC-080MF2012	20	48		60	125	95		4.1	2
80	<b>PSC 80 - MF 32.100</b>	71PSC-080MF3210	32	66		80	100	70		4.4	1
80	<b>PSC 80 - MF 32.160</b>	71PSC-080MF3216	32	66		80	160	130		4.9	2

## PSC NS-H.28-42 ISO 26623-1

SEMIFINISHED CHUCK HOLDERS



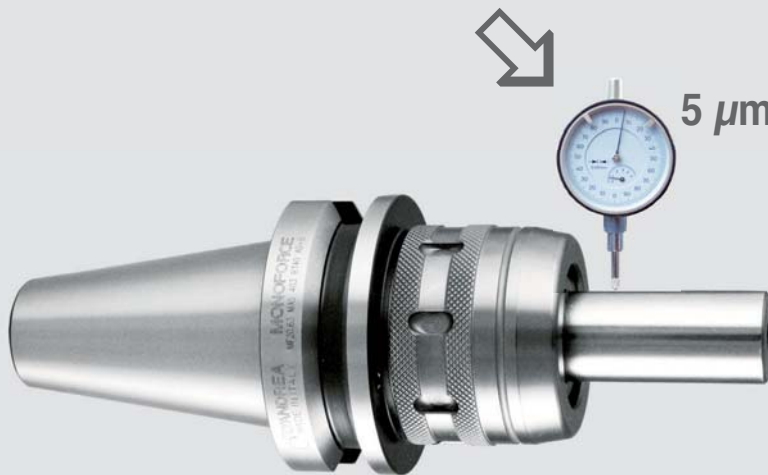
PSC	REF.	CODE	d1	L	L1	kg	HRC
40	<b>PSC 40 - NS 50.160/140 H.28</b>	71PSC040Z205014	50	20	140	2.4	28
40	<b>PSC 40 - NS 50.160/140 H.42</b>	71PSC040Z405014	50	20	140	2.4	42
40	<b>PSC 40 - NS 63.160/140 H.28</b>	71PSC040Z206314	63	20	140	3.6	28
40	<b>PSC 40 - NS 63.160/140 H.42</b>	71PSC040Z406314	63	20	140	3.6	42
40	<b>PSC 40 - NS 80.160/140 H.28</b>	71PSC040Z208014	80	20	140	5.7	28
40	<b>PSC 40 - NS 80.160/140 H.42</b>	71PSC040Z408014	80	20	140	5.7	42
50	<b>PSC 50 - NS 63.160/140 H.28</b>	71PSC050Z206314	63	20	140	3.8	28
50	<b>PSC 50 - NS 63.160/140 H.42</b>	71PSC050Z406314	63	20	140	3.8	42
50	<b>PSC 50 - NS 80.160/140 H.28</b>	71PSC050Z208014	80	20	140	10.2	28
50	<b>PSC 50 - NS 80.160/140 H.42</b>	71PSC050Z408014	80	20	140	10.2	42
50	<b>PSC 50 - NS 100.180/160 H.28</b>	71PSC050Z210016	100	20	160	5.9	28
50	<b>PSC 50 - NS 100.180/160 H.42</b>	71PSC050Z410016	100	22	160	5.9	42
63	<b>PSC 63 - NS 80.162/140 H.28</b>	71PSC063Z208014	80	22	140	6.2	28
63	<b>PSC 63 - NS 80.162/140 H.42</b>	71PSC063Z408014	80	22	140	6.2	42
63	<b>PSC 63 - NS 100.182/160 H.28</b>	71PSC063Z210016	100	22	160	10.4	28
63	<b>PSC 63 - NS 100.182/160 H.42</b>	71PSC063Z410016	100	22	160	10.4	42
63	<b>PSC 63 - NS 120.202/180 H.28</b>	71PSC063Z212018	120	22	180	17	28
63	<b>PSC 63 - NS 120.202/180 H.42</b>	71PSC063Z412018	120	22	180	17	42
80	<b>PSC 80 - NS 100.190/160 H.28</b>	71PSC080Z210016	100	30	160	11.5	28
80	<b>PSC 80 - NS 100.190/160 H.42</b>	71PSC080Z410016	100	30	160	11.5	42
80	<b>PSC 80 - NS 140.210/180 H.28</b>	71PSC080Z214018	140	30	180	23.4	28
80	<b>PSC 80 - NS 140.210/180 H.42</b>	71PSC080Z414018	140	30	180	23.4	42

# MONOforce

**MONOforce** represents the ideal and economical solution for the equipment of all machine tools, in particular where there is a need for precision and for clamping tools subjected to high torsional loads.



Built in the version for machine spindles HSK 63 and 100, ISO 26623-1 PSC 63 and 80, as well as DIN 69871 and MAS BT 40 and 50, it allows the use of reduction bushings of  $\varnothing$  12 mm,  $\varnothing$  20 mm and  $\varnothing$  32 mm. It is available in the entire diametral range compatible with these housing diameters for clamping from  $\varnothing$  3 mm to  $\varnothing$  25 mm, also SEALED.



**DIN 69871 AD**

**MAS 403 BT AD**

**DIN 69893 HSK**

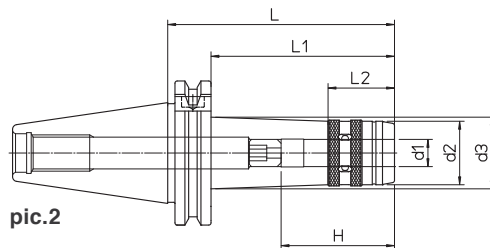
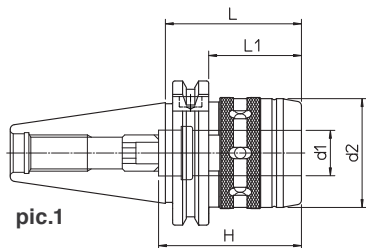
**ISO 26623-1 PSC**

MAX.	RPM 15.000
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MAX.	40 BAR
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# HIGH CLAMPING POWER CHUCKS

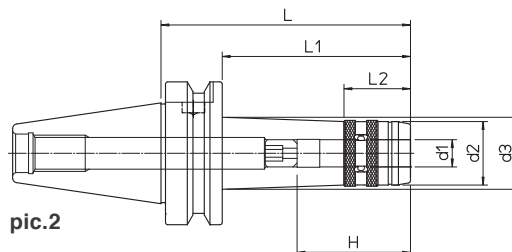
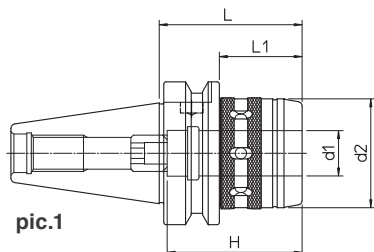
## DIN 69871 AD



Without clamping wrench - Chip prearrangement

DIN	REF.	CODE	d1	d2	d3	H	L	L1	L2	kg	pic.
40	DIN69871-AD40 MF12.50	71DIN-A40MF1205	12	28		46	50	31		0.8	1
40	DIN69871-AD40 MF12.100	71DIN-A40MF1210	12	28	32	46	100	81	29.5	1.2	2
40	DIN69871-AD40 MF20.60	71DIN-A40MF2006	20	48		63	60	41		1.1	1
40	DIN69871-AD40 MF20.100	71DIN-A40MF2010	20	48		63	100	81		1.4	2
40	DIN69871-AD40 MF32.95	71DIN-A40MF3209	32	66		80	95			1.6	1
40	DIN69871-AD40 MF32.140	71DIN-A40MF3214	32	66		80	140			2.0	2
50	DIN69871-AD50 MF20.80	71DIN-A50MF2008	20	48		63	80	61		2.3	1
50	DIN69871-AD50 MF20.125	71DIN-A50MF2012	20	48		63	125	106		2.7	2
50	DIN69871-AD50 MF32.75	71DIN-A50MF3207	32	66		90	75	56		2.8	1
50	DIN69871-AD50 MF32.160	71DIN-A50MF3216	32	66		90	160	141		3.2	2

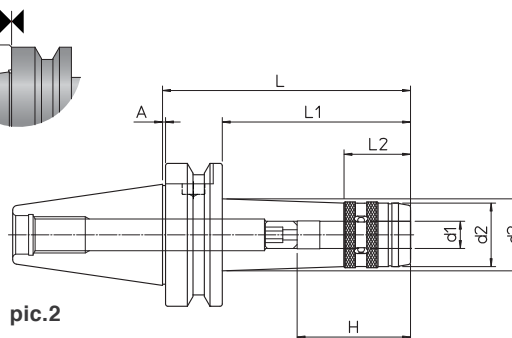
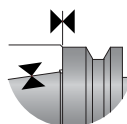
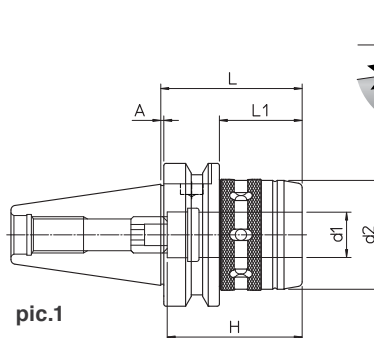
## MAS 403 BT AD



Without clamping wrench - Chip prearrangement

BT	REF.	CODE	d1	d2	d3	H	L	L1	L2	kg	pic.
40	MAS403 BT40-AD MF12.60	71MBT-A40MF1206	12	28		46	60	33		0.9	1
40	MAS403 BT40-AD MF12.100	71MBT-A40MF1210	12	28	32	46	100	73	29.5	1.4	2
40	MAS403 BT40-AD MF20.65	71MBT-A40MF2007	20	48		63	65	38		1.3	1
40	MAS403 BT40-AD MF20.100	71MBT-A40MF2010	20	48		63	100	73		1.9	2
40	MAS403 BT40-AD MF32.90	71MBT-A40MF3209	32	66		80	90			2.1	1
40	MAS403 BT40-AD MF32.140	71MBT-A40MF3214	32	66		80	140			3.1	2
50	MAS403 BT50-AD MF20.85	71MBT-A50MF2008	20	48		63	85	47		3.7	1
50	MAS403 BT50-AD MF20.125	71MBT-A50MF2012	20	48		63	125	87		4.1	2
50	MAS403 BT50-AD MF32.95	71MBT-A50MF3209	32	66		90	95	57		4.4	1
50	MAS403 BT50-AD MF32.160	71MBT-A50MF3216	32	66		90	160	122		4.9	2

## MAS 403 BT AD FACE CONTACT

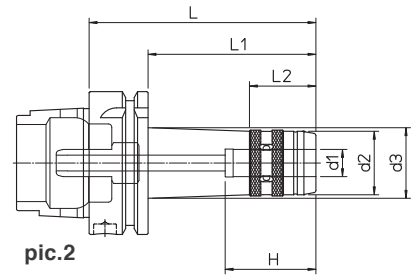
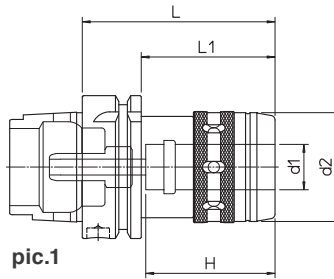


Without clamping wrench - Chip prearrangement

BT	REF.	CODE	d1	d2	d3	H	A	L	L1	L2	kg	pic.
40	MAS403 BT40-AD FC MF12.100	71MBF-A40MF1210	12	28	32	46	1	100	73	29.5	1.4	2
40	MAS403 BT40-AD FC MF20.65	71MBF-A40MF2007	20	48		63	1	65	38		1.3	1
40	MAS403 BT40-AD FC MF32.90	71MBF-A40MF3209	32	66		80	1	90			2.1	1
50	MAS403 BT50-AD FC MF20.85	71MBF-A50MF2008	20	48		63	1.5	85	47		3.7	1
50	MAS403 BT50-AD FC MF32.95	71MBF-A50MF3209	32	66		90	1.5	95	57		4.4	1



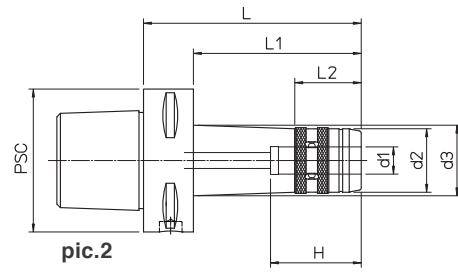
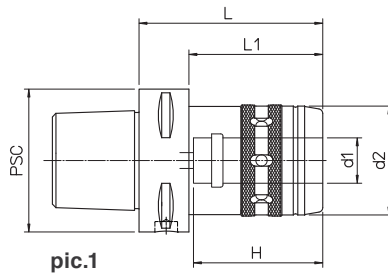
### DIN 69893 HSK-A



Supplied with coolant tube - Without clamping wrench - Chip prearrangement

HSK-A	REF.	CODE	d1	d2	d3	H	L	L1	L2	kg	pic.
63	HSK-A63 MF12.70	71HSK-A63MF1207	12	28		46	70	44		0.8	1
63	HSK-A63 MF12.100	71HSK-A63MF1210	12	28	32	46	100	74	29.5	1.1	2
63	HSK-A63 MF20.85	71HSK-A63MF2008	20	48		60	85	59		1.2	1
63	HSK-A63 MF20.125	71HSK-A63MF2012	20	48		60	125	99		1.7	2
63	HSK-A63 MF32.105	71HSK-A63MF3210	32	66		80	105			2	1
63	HSK-A63 MF32.140	71HSK-A63MF3214	32	66		80	140			2.6	2
100	HSK-A100 MF20.95	71HSKA100MF2009	20	48		60	95	66		2.8	1
100	HSK-A100 MF32.110	71HSKA100MF3211	32	66		80	110	81		3.1	1
100	HSK-A100 MF32.160	71HSKA100MF3216	32	66		80	160	131		3.6	1
125	HSK-A125 MF32.120	71HSKA125MF3212	32	66		80	120	91		5.3	1

### ISO 26623-1 PSC



Without clamping wrench - Chip prearrangement

PSC	REF.	CODE	d1	d2	d3	H	L	L1	L2	kg	pic.
63	PSC 63 - MF 12.70	71PSC-063MF1207	12	28		46	70	48		0.9	1
63	PSC 63 - MF 12.100	71PSC-063MF1210	12	28	31.5	46	100	78	29.5	1.4	2
63	PSC 63 - MF 20.80	71PSC-063MF2008	20	48		60	80	58		1.3	1
63	PSC 63 - MF 20.120	71PSC-063MF2012	20	48		60	120	98		1.9	2
63	PSC 63 - MF 32.100	71PSC-063MF3210	32	66		80	100			2.1	1
63	PSC 63 - MF 32.140	71PSC-063MF3214	32	66		80	140			3.1	2
80	PSC 80 - MF 20.80	71PSC-080MF2008	20	48		60	80	50		3.7	1
80	PSC 80 - MF 20.125	71PSC-080MF2012	20	48		60	125	95		4.1	2
80	PSC 80 - MF 32.100	71PSC-080MF3210	32	66		80	100	70		4.4	1
80	PSC 80 - MF 32.160	71PSC-080MF3216	32	66		80	160	130		4.9	2

#### KIT K01 MONOforce 12



1 RC 12.04  
1 RC 12.06  
1 RC 12.08  
1 RC 12.10  
1 CHV 28

#### KIT K01 MONOforce 20



1 RC 20.06  
1 RC 20.08  
1 RC 20.10  
1 RC 20.12  
1 RC 20.16  
1 CHV 50

#### KIT K01 MONOforce 32



1 RC 32.06  
1 RC 32.08  
1 RC 32.10  
1 RC 32.12  
1 RC 32.16  
1 RC 32.20  
1 RC 32.25  
1 CHV 75

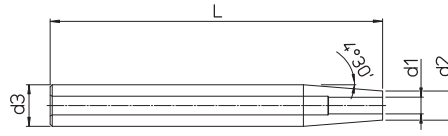
ON REQUEST KIT K01 FACE CONTACT

DIN	REF.	CODE	kg
40	KIT K01 MONOFORCE 12.50 DIN40AD	7KDIN-A40MF1205	1.5
40	KIT K01 MONOFORCE 20.60 DIN40AD	7KDIN-A40MF2006	2
40	KIT K01 MONOFORCE 32.95 DIN40AD	7KDIN-A40MF3209	4.4
50	KIT K01 MONOFORCE 20.80 DIN50AD	7KDIN-A50MF2008	4.6
50	KIT K01 MONOFORCE 32.75 DIN50AD	7KDIN-A50MF3207	6.2

BT	REF.	CODE	Kg.
40	KIT K01 MONOFORCE 12.60 BT40AD	7KMBT-A40MF1206	1.5
40	KIT K01 MONOFORCE 20.65 BT40AD	7KMBT-A40MF2007	2.3
40	KIT K01 MONOFORCE 32.90 BT40AD	7KMBT-A40MF3209	4.6
50	KIT K01 MONOFORCE 20.85 BT50AD	7KMBT-A50MF2008	5.4
50	KIT K01 MONOFORCE 32.95 BT50AD	7KMBT-A50MF3209	7.5

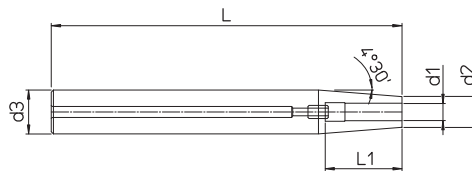
HSK-A	REF.	CODE	Kg.
63	KIT K01 MONOFORCE 12.70 HSK63	7KHSA-A63MF1207	1.5
63	KIT K01 MONOFORCE 20.85 HSK63	7KHSA-A63MF2008	2.3
63	KIT K01 MONOFORCE 32.105 HSK63	7KHSA-A63MF3210	4.5
100	KIT K01 MONOFORCE 32.110 HSK100	7KHSA100MF3211	6.7

## PR CT N SHRINK FIT EXTENSIONS



REF.	CODE	d1	d2	d3	L	kg
PR.CT.N D12.03.160	49DC11612030	3	8	12	160	0.09
PR.CT.N D12.04.160	49DC11612040	4	8	12	160	0.09
PR.CT.N D16.03.160	49DC11616030	3	10	16	160	0.14
PR.CT.N D16.04.160	49DC11616040	4	10	16	160	0.14
PR.CT.N D16.05.160	49DC11616050	5	10	16	160	0.15
PR.CT.N D16.06.160	49DC11616060	6	12	16	160	0.16
PR.CT.N D16.08.160	49DC11616080	8	14	16	160	0.16
PR.CT.N D20.05.160	49DC11620050	5	14	20	160	0.27
PR.CT.N D20.06.160	49DC11620060	6	14	20	160	0.26
PR.CT.N D20.08.160	49DC11620080	8	14	20	160	0.26
PR.CT.N D20.10.160	49DC11620100	10	16	20	160	0.21
PR.CT.N D20.12.160	49DC11620120	12	18	20	160	0.22

## PR CT R SHRINK FIT EXTENSIONS WITH AXIAL ADJUSTMENT



Supplied with the axial setting screw

REF.	CODE	d1	d2	d3	L	L1	kg
PR.CT.R D16.06.130	49DC21316060	6	10	16	130	22 / 36	0.18
PR.CT.R D16.06.160	49DC21616060	6	10	16	160	22 / 36	0.17
PR.CT.R D20.06.130	49DC21320060	6	14	20	130	22 / 36	0.20
PR.CT.R D20.08.130	49DC21320080	8	14	20	130	22 / 36	0.25
PR.CT.R D20.06.160	49DC21620060	6	14	20	160	22 / 32	0.33
PR.CT.R D20.08.160	49DC21620080	8	14	20	160	26 / 36	0.32
PR.CT.R D25.10.130	49DC21325100	10	20	25	130	31 / 41	0.40
PR.CT.R D25.12.130	49DC21325120	12	20	25	130	36 / 46	0.37
PR.CT.R D25.16.130	49DC21325160	16	22	25	130	39 / 49	0.32
PR.CT.R D25.08.160	49DC21625080	8	19	25	160	26 / 36	0.53
PR.CT.R D25.10.160	49DC21625100	10	20	25	160	31 / 41	0.51
PR.CT.R D25.12.160	49DC21625120	12	20	25	160	36 / 46	0.48
PR.CT.R D25.14.160	49DC21625140	14	22	25	160	36 / 46	0.47
PR.CT.R D25.16.160	49DC21625160	16	22	25	160	39 / 49	0.43
PR.CT.R D25.08.200	49DC22025080	8	19	25	200	26 / 36	0.67
PR.CT.R D25.10.200	49DC22025100	10	20	25	200	31 / 41	0.64
PR.CT.R D25.12.200	49DC22025120	12	20	25	200	36 / 46	0.60
PR.CT.R D25.16.200	49DC22025160	16	22	25	200	39 / 49	0.52
PR.CT.R D32.16.160	49DC21632160	16	27	32	160	39 / 49	0.78
PR.CT.R D32.18.160	49DC21632180	18	27	32	160	39 / 49	0.77
PR.CT.R D32.20.160	49DC21632200	20	27	32	160	41 / 51	0.67
PR.CT.R D32.16.200	49DC22032160	16	27	32	200	39 / 49	1.81
PR.CT.R D32.20.200	49DC22032200	20	27	32	200	41 / 51	0.87

# MONOd'


Monolithic tool-holders are the ideal solution to equip any type of machine tool with HSK 63 and 100, DIN 69871 and MAS BT 40 and 50 spindle, guaranteeing the advantages of high quality and precision, at a highly competitive market price.



The MONOd' program includes ER collet chucks, Weldon, shell-mill holders, morse taper.

All the tool-holders are balanced by design, G 6.3 at 8,000 rpm. MONOd' ER G 6.3 at 15,000 rpm.



 0.003

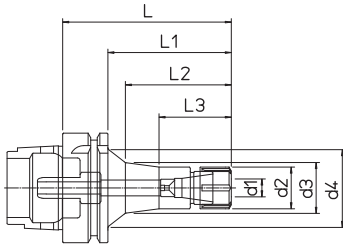
MAX. RPM 15.000

DIN 69893 HSK

DIN 69871

MAS 403 BT

## DIN 69893 HSK-A COLLET CHUCK HOLDER - ER DIN 6499

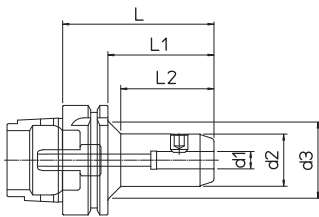


Supplied with coolant tube

HSK-A	REF.	CODE	TYPE	d1	d2	d3	d4	L	L1	L2	L3	kg
63	HSK-A63 ER16.80	71HSKA063ER1608	ER 16 M	0.5 ~ 10	22	32	80	54	41			1.1
63	HSK-A63 ER16.120	71HSKA063ER1612	ER 16 M	0.5 ~ 10	22	31	120	94				1.9
63	HSK-A63 ER25.80	71HSKA063ER2508	ER 25	1 ~ 16	42		80	54				1.3
63	HSK-A63 ER25.140	71HSKA063ER2514	ER 25	1 ~ 16	42	47.5	140	114	46			1.7
63	HSK-A63 ER32.90	71HSKA063ER3209	ER 32	2 ~ 20	50		90	64				1.6
63	HSK-A63 ER32.160	71HSKA063ER3216	ER 32	2 ~ 20	50		160	134				2.2
100	HSK-A100 ER16.100	71HSKA100ER1610	ER 16 M	0.5 ~ 10	22	25	45	100	71	61	41.5	2.3
100	HSK-A100 ER16.160	71HSKA100ER1616	ER 16 M	0.5 ~ 10	22	34.5	44	160	131	126		2.5
100	HSK-A100 ER25.100	71HSKA100ER2510	ER 25	1 ~ 16	42	45.5	100	71	47			2.6
100	HSK-A100 ER25.160	71HSKA100ER2516	ER 25	1 ~ 16	42	49.5	160	131	47			3.2
100	HSK-A100 ER32.120	71HSKA100ER3212	ER 32	2 ~ 20	50	55	120	91	52			3.1
100	HSK-A100 ER32.160	71HSKA100ER3216	ER 32	2 ~ 20	50	56.5	160	131	52			3.7
100	HSK-A100 ER40.120	71HSKA100ER4012	ER 40	3 ~ 26	63	71.5	120	91	60			3.5

Supplied without collets and clamping wrenches

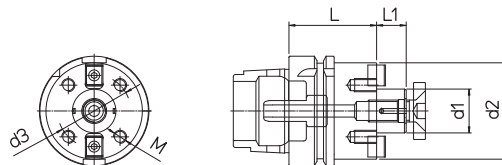
## DIN 69893 HSK-A WELDON - WD DIN 1835-B



Supplied with coolant tube

HSK-A	REF.	CODE	d1 <sup>H5</sup>	d2	d3	L	L1	L2	kg
63	HSK-A63 WD06.60	71HSKA063WD0606	6	23		60	34		0.8
63	HSK-A63 WD08.65	71HSKA063WD0806	8	26		65	39		0.9
63	HSK-A63 WD10.70	71HSKA063WD1007	10	30		70	44		1.1
63	HSK-A63 WD12.70	71HSKA063WD1207	12	34		70	44		1.2
63	HSK-A63 WD16.80	71HSKA063WD1608	16	42		80	54		1.4
63	HSK-A63 WD20.80	71HSKA063WD2008	20	50		80	54		1.5
63	HSK-A63 WD25.110	71HSKA063WD2511	25	63		110			2.3
63	HSK-A63 WD32.110	71HSKA063WD3211	32	70		110			2.5
100	HSK-A100 WD10.90	71HSKA100WD1009	10	30	45	90	61	53.5	2.3
100	HSK-A100 WD12.100	71HSKA100WD1210	12	34	45	100	71	65.5	2.4
100	HSK-A100 WD16.100	71HSKA100WD1610	16	42		100	71		2.6
100	HSK-A100 WD20.110	71HSKA100WD2011	20	50		110	81		3.1
100	HSK-A100 WD25.120	71HSKA100WD2512	25	63		120	91		3.9
100	HSK-A100 WD32.120	71HSKA100WD3212	32	70		120	91		4.3
100	HSK-A100 WD40.120	71HSKA100WD4012	40	80		120	91		4.8

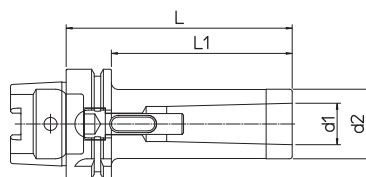
## DIN 69893 HSK-A MILL HOLDERS - PF



Supplied with coolant tube

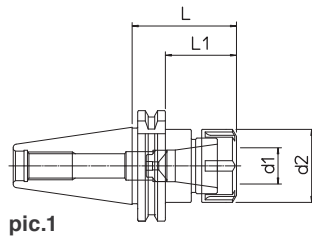
HSK-A	REF.	CODE	d1	d2	d3	M	L	L1	kg
63	HSK-A63 PF16.50	71HSKA063PF1605	16	32			50	17	1.1
63	HSK-A63 PF22.50	71HSKA063PF2205	22	40			50	19	1.2
63	HSK-A63 PF27.55	71HSKA063PF2705	27	50			55	21	1.4
63	HSK-A63 PF32.60	71HSKA063PF3206	32	60			60	24	1.8
100	HSK-A100 PF22.65	71HSKA100PF2265	22	40			65	19	2.3
100	HSK-A100 PF27.65	71HSKA100PF2765	27	50			65	21	2.5
100	HSK-A100 PF32.70	71HSKA100PF3270	32	60			70	24	2.9
100	HSK-A100 PF40.70	71HSKA100PF4070	40	88	66.7	M12	70	27	3.3
100	HSK-A100 PF60.75	71HSKA100PF6075	60	128.5	101.6	M16	75	40	4.2

## DIN 69893 HSK-A MORSE - CM DIN 228 AB

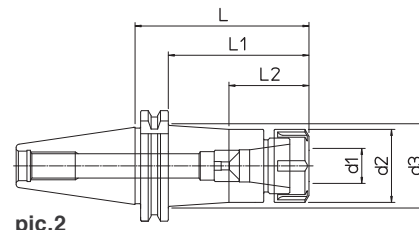


HSK-A	REF.	CODE	MORSE	d1	d2	L	L1	kg
63	HSK-A63 CM2.110 A-B	71HSKA063CMB211	2	17.780	32	110	84	2
63	HSK-A63 CM3.130 A-B	71HSKA063CMB313	3	23.825	40	130	104	2.2
63	HSK-A63 CM4.155 A-B	71HSKA063CMB415	4	31.267	48	155	129	2.6

## DIN 69871 AD COLLET CHUCK HOLDER - ER DIN 6499



pic.1

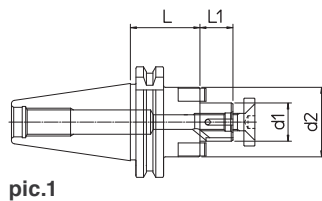


pic.2

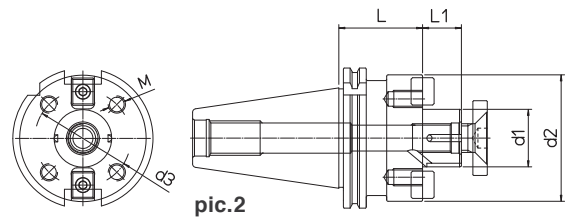
Supplied without collets and clamping wrenches

DIN	REF.	CODE	TYPE	d1	d2	d3	L	L1	L2	kg	pic.
40	DIN69871-AD40 ER16.60	71DIN-A40ER1606	ER 16 M	0.5 ~ 10	22		60	41		0.9	1
40	DIN69871-AD40 ER16.100	71DIN-A40ER1610	ER 16 M	0.5 ~ 10	22	29.5	100	81	41	1	2
40	DIN69871-AD40 ER16.160	71DIN-A40ER1616	ER 16 M	0.5 ~ 10	22	38	160	141	41	2	2
40	DIN69871-AD40 ER25.60	71DIN-A40ER2506	ER 25	1 ~ 16	42		60	41		1.1	1
40	DIN69871-AD40 ER25.100	71DIN-A40ER2510	ER 25	1 ~ 16	42	47	100	81	46	1.6	2
40	DIN69871-AD40 ER25.160	71DIN-A40ER2516	ER 25	1 ~ 16	42	50	160	141	46	2.1	2
40	DIN69871-AD40 ER32.70	71DIN-A40ER3207	ER 32	2 ~ 20	50		70	51		1.2	1
40	DIN69871-AD40 ER32.110	71DIN-A40ER3211	ER 32	2 ~ 20	50		110	91		1.7	1
40	DIN69871-AD40 ER32.160	71DIN-A40ER3216	ER 32	2 ~ 20	50		160	141		2.7	1
40	DIN69871-AD40 ER40.80	71DIN-A40ER4008	ER 40	3 ~ 26	63		80	61		1.3	1
40	DIN69871-AD40 ER40.120	71DIN-A40ER4012	ER 40	3 ~ 26	63		120	101		2.3	1
50	DIN69871-AD50 ER16.100	71DIN-A50ER1610	ER 16 M	0.5 ~ 10	22	29.5	100	81	41	2.5	2
50	DIN69871-AD50 ER16.160	71DIN-A50ER1616	ER 16 M	0.5 ~ 10	22	32.5	160	141	41	3.3	2
50	DIN69871-AD50 ER25.110	71DIN-A50ER2511	ER 25	1 ~ 16	42	48	110	91	46	2.8	2
50	DIN69871-AD50 ER25.160	71DIN-A50ER2516	ER 25	1 ~ 16	42	50	160	141	46	3.6	2
50	DIN69871-AD50 ER32.70	71DIN-A50ER3207	ER 32	2 ~ 20	50		70	51		2.9	1
50	DIN69871-AD50 ER32.110	71DIN-A50ER3211	ER 32	2 ~ 20	50	55	110	91	52	3.4	2
50	DIN69871-AD50 ER32.160	71DIN-A50ER3216	ER 32	2 ~ 20	50	57.5	160	141	52	4	2
50	DIN69871-AD50 ER40.100	71DIN-A50ER4010	ER 40	3 ~ 26	63	65	100	81	55	3.8	2
50	DIN69871-AD50 ER40.160	71DIN-A50ER4016	ER 40	3 ~ 26	63	70	160	141	55	4.3	2

## DIN 69871 AD MILL HOLDERS - PF



pic.1



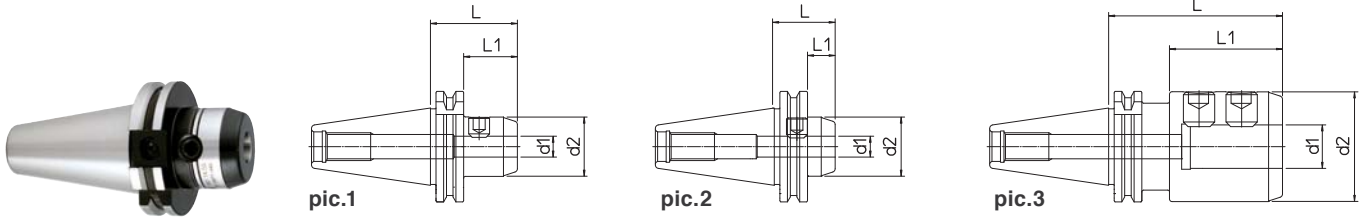
pic.2

DIN	REF.	CODE	d1	d2	d3	M	L	L1	kg	pic.
40	DIN69871-AD40 PF16.35	71DIN-A40PF1603	16	32			35	17	0.9	1
40	DIN69871-AD40 PF22.40	71DIN-A40PF2204	22	40			40	19	1	1
40	DIN69871-AD40 PF27.45	71DIN-A40PF2704	27	50			45	21	1.2	1
40	DIN69871-AD40 PF32.50	71DIN-A40PF3205	32	60			50	24	1.7	1
40	DIN69871-AD40 PF40.55	71DIN-A40PF4005	40	70			55	27	2.1	1
50	DIN69871-AD50 PF16.40	71DIN-A50PF1604	16	32			40	17	2.4	1
50	DIN69871-AD50 PF16.110	71DIN-A50PF1611	16	32			110	17	2.8	1
50	DIN69871-AD50 PF22.45	71DIN-A50PF2204	22	40			45	19	2.6	1
50	DIN69871-AD50 PF27.50	71DIN-A50PF2705	27	50			50	21	2.7	1
50	DIN69871-AD50 PF32.55	71DIN-A50PF3205	32	60			55	24	3.2	1
50	DIN69871-AD50 PF40.60	71DIN-A50PF4006	40	88	66.7	M12	60	27	4.3	2
50	DIN69871-AD50 PF60.70	71DIN-A50PF6007	60	128.5	101.6	M16	70	40	6.6	2

PF.. /40-60 BPS p.57

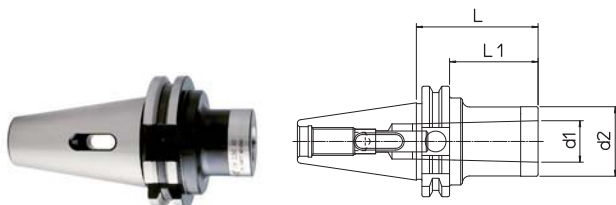
# MONOBLOC TOOLHOLDERS

## DIN 69871 AD WELDON - WD DIN 1835-B



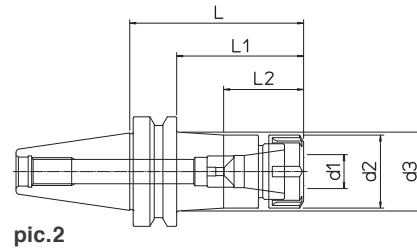
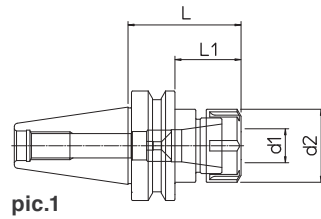
DIN	REF.	CODE	d1 <sup>H5</sup>	d2	L	L1	kg	pic.
40	DIN69871-AD40 WD06.50	71DIN-A40WD0605	6	23	50	31	0.8	1
40	DIN69871-AD40 WD08.50	71DIN-A40WD0805	8	26	50	31	0.9	1
40	DIN69871-AD40 WD10.50	71DIN-A40WD1005	10	30	50	31	1	1
40	DIN69871-AD40 WD12.35	71DIN-A40WD1203	12	34	35	16	1	2
40	DIN69871-AD40 WD12.110	71DIN-A40WD1211	12	34	110	91	1.4	1
40	DIN69871-AD40 WD16.35	71DIN-A40WD1603	16	42	35	16	1.1	2
40	DIN69871-AD40 WD16.110	71DIN-A40WD1611	16	42	110	91	1.7	1
40	DIN69871-AD40 WD16.160	71DIN-A40WD1616	16	42	160	141	2.2	1
40	DIN69871-AD40 WD20.35	71DIN-A40WD2003	20	44	35	16	1.2	2
40	DIN69871-AD40 WD20.110	71DIN-A40WD2011	20	50	110	91	2.1	1
40	DIN69871-AD40 WD20.160	71DIN-A40WD2016	20	50	160	141	2.6	1
40	DIN69871-AD40 WD25.35	71DIN-A40WD2503	25	44	35	16	1.3	2
40	DIN69871-AD40 WD25.100	71DIN-A40WD2510	25	63	100	65	2	3
40	DIN69871-AD40 WD25.160	71DIN-A40WD2516	25	63	160	125	3.2	3
40	DIN69871-AD40 WD32.100	71DIN-A40WD3210	32	70	100	65	2.5	3
40	DIN69871-AD40 WD32.160	71DIN-A40WD3216	32	70	160	125	3.9	3
50	DIN69871-AD50 WD10.63	71DIN-A50WD1006	10	30	63	44	2.5	1
50	DIN69871-AD50 WD10.160	71DIN-A50WD1016	10	30	160	141	2.9	1
50	DIN69871-AD50 WD12.63	71DIN-A50WD1206	12	34	63	44	2.6	1
50	DIN69871-AD50 WD12.160	71DIN-A50WD1216	12	34	160	141	3.2	1
50	DIN69871-AD50 WD16.110	71DIN-A50WD1611	16	42	110	91	3.2	1
50	DIN69871-AD50 WD16.160	71DIN-A50WD1616	16	42	160	141	3.7	1
50	DIN69871-AD50 WD20.110	71DIN-A50WD2011	20	50	110	91	3.6	1
50	DIN69871-AD50 WD20.160	71DIN-A50WD2016	20	50	160	141	4.2	1
50	DIN69871-AD50 WD25.80	71DIN-A50WD2508	25	63	80	61	3.5	1
50	DIN69871-AD50 WD25.110	71DIN-A50WD2511	25	63	110	91	4.1	2
50	DIN69871-AD50 WD25.160	71DIN-A50WD2516	25	63	160	141	5.1	2
50	DIN69871-AD50 WD32.100	71DIN-A50WD3210	32	70	100	81	4.6	2
50	DIN69871-AD50 WD32.160	71DIN-A50WD3216	32	70	160	141	6	2
50	DIN69871-AD50 WD40.100	71DIN-A50WD4010	40	80	100	81	4.8	2

## DIN 69871 A MORSE - CM DIN 228 AB



DIN	REF.	CODE	MORSE	d1	d2	L	L1	kg
40	DIN69871-A40 CM2.50 A-B	71DIN-40-CMB205	2	17.780	32	50	31	1
40	DIN69871-A40 CM3.70 A-B	71DIN-40-CMB307	3	23.825	40	70	51	1.1
50	DIN69871-A50 CM2.60 A-B	71DIN-50-CMB206	2	17.780	32	60	41	2.6
50	DIN69871-A50 CM3.60 A-B	71DIN-50-CMB306	3	23.825	40	60	41	2.7
50	DIN69871-A50 CM4.80 A-B	71DIN-50-CMB408	4	31.267	48	80	61	2.9

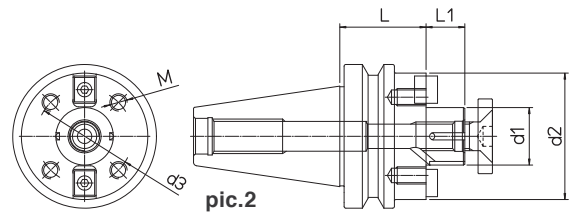
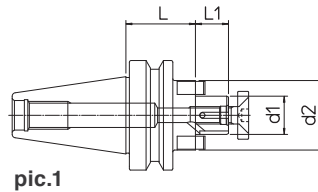
## MAS 403 BT40 AD COLLET CHUCK HOLDER - ER DIN 6499



Supplied without collets and clamping wrenches

BT	REF.	CODE	TYPE	d1	d2	d3	L	L1	L2	kg	pic.
40	MAS403 BT40-AD ER16.60	71MBT-A40ER1606	ER 16 M	0.5 ~ 10	22	60	33	1	1		
40	MAS403 BT40-AD ER16.100	71MBT-A40ER1610	ER 16 M	0.5 ~ 10	22	28	100	73	41	1.1	2
40	MAS403 BT40-AD ER16.160	71MBT-A40ER1616	ER 16 M	0.5 ~ 10	22	36.5	160	133	41	2.1	2
40	MAS403 BT40-AD ER25.65	71MBT-A40ER2506	ER 25	1 ~ 16	42	65	38	1.2	1		
40	MAS403 BT40-AD ER25.100	71MBT-A40ER2510	ER 25	1 ~ 16	42	45.5	100	73	46	1.7	2
40	MAS403 BT40-AD ER25.160	71MBT-A40ER2516	ER 25	1 ~ 16	42	49.5	160	133	46	2.2	2
40	MAS403 BT40-AD ER32.70	71MBT-A40ER3207	ER 32	2 ~ 20	50	70	43	1.3	1		
40	MAS403 BT40-AD ER32.110	71MBT-A40ER3211	ER 32	2 ~ 20	50	110	83	1.8	1		
40	MAS403 BT40-AD ER32.160	71MBT-A40ER3216	ER 32	2 ~ 20	50	160	133	2.8	1		
40	MAS403 BT40-AD ER40.80	71MBT-A40ER4008	ER 40	3 ~ 26	63	80	53	1.4	1		
40	MAS403 BT40-AD ER40.120	71MBT-A40ER4012	ER 40	3 ~ 26	63	120	93	2.4	1		
50	MAS403 BT50-AD ER16.100	71MBT-A50ER1610	ER 16 M	0.5 ~ 10	22	26.5	100	62	41	3.6	2
50	MAS403 BT50-AD ER16.160	71MBT-A50ER1616	ER 16 M	0.5 ~ 10	22	31	160	122	41	4.3	2
50	MAS403 BT50-AD ER25.110	71MBT-A50ER2511	ER 25	1 ~ 16	42	45.5	110	72	46	3.8	2
50	MAS403 BT50-AD ER25.160	71MBT-A50ER2516	ER 25	1 ~ 16	42	48.5	160	122	46	4.6	2
50	MAS403 BT50-AD ER32.80	71MBT-A50ER3208	ER 32	2 ~ 20	50	80	42	3.9	1		
50	MAS403 BT50-AD ER32.110	71MBT-A50ER3211	ER 32	2 ~ 20	50	52.5	110	72	52	4.4	2
50	MAS403 BT50-AD ER32.160	71MBT-A50ER3216	ER 32	2 ~ 20	50	56	160	122	52	5	2
50	MAS403 BT50-AD ER40.100	71MBT-A50ER4010	ER 40	3 ~ 26	63	100	62	4.8	1		
50	MAS403 BT50-AD ER40.160	71MBT-A50ER4016	ER 40	3 ~ 26	63	68.5	160	122	55	5.3	2

## MAS 403 BT40 AD MILL HOLDERS - PF

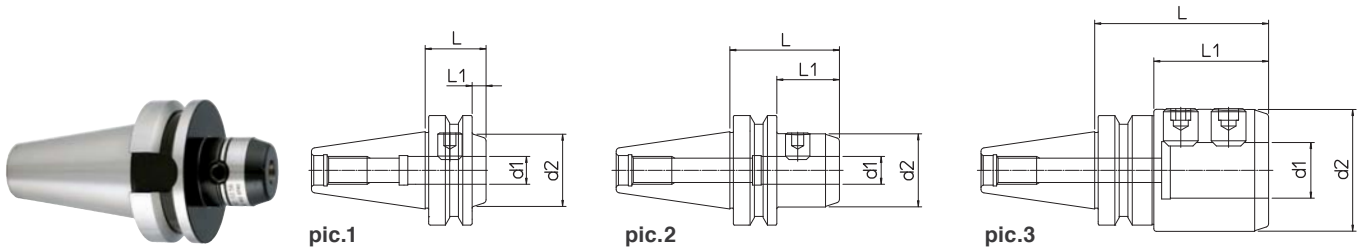


BT	REF.	CODE	d1	d2	d3	M	L	L1	kg	pic.
40	MAS403 BT40-AD PF16.40	71MBT-A40PF1604	16	32			40	17	0.9	1
40	MAS403 BT40-AD PF22.40	71MBT-A40PF2204	22	40			40	19	1	1
40	MAS403 BT40-AD PF27.45	71MBT-A40PF2704	27	50			45	21	1.2	1
40	MAS403 BT40-AD PF32.50	71MBT-A40PF3205	32	60			50	24	1.7	1
40	MAS403 BT40-AD PF40.55	71MBT-A40PF4005	40	70			55	27	2.1	1
50	MAS403 BT50-AD PF16.50	71MBT-A50PF1605	16	32			50	17	2.4	1
50	MAS403 BT50-AD PF22.50	71MBT-A50PF2205	22	40			50	19	2.6	1
50	MAS403 BT50-AD PF27.55	71MBT-A50PF2705	27	50			55	21	2.7	1
50	MAS403 BT50-AD PF32.55	71MBT-A50PF3205	32	60			55	24	3.2	1
50	MAS403 BT50-AD PF40.60	71MBT-A50PF4006	40	88	66.7	M12	60	27	4.3	2
50	MAS403 BT50-AD PF60.80	71MBT-A50PF6008	60	128.5	101.6	M16	80	40	6.8	2

PF.. /40-60 BPS p.57

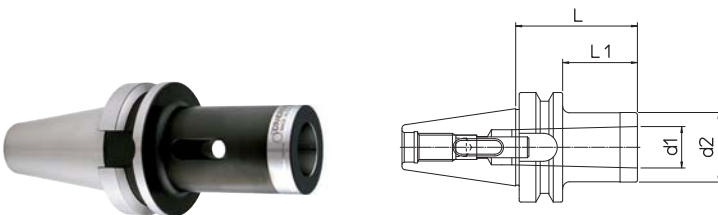
# MONOBLOC TOOLHOLDERS

## MAS 403 BT40 AD WELDON - WD DIN 1835-B



BT	REF.	CODE	d1 <sup>H5</sup>	d2	L	L1	kg	pic.
40	MAS403 BT40-AD WD06.50	71MBT-A40WD0605	6	23	50	23	0.8	1
40	MAS403 BT40-AD WD08.50	71MBT-A40WD0805	8	26	50	23	0.9	1
40	MAS403 BT40-AD WD10.56	71MBT-A40WD1005	10	30	56	29	1	1
40	MAS403 BT40-AD WD12.35	71MBT-A40WD1203	12	34	35	8	0.9	2
40	MAS403 BT40-AD WD12.110	71MBT-A40WD1211	12	34	110	83	1.4	1
40	MAS403 BT40-AD WD16.35	71MBT-A40WD1603	16	42	35	8	1	2
40	MAS403 BT40-AD WD16.110	71MBT-A40WD1611	16	42	110	83	1.7	1
40	MAS403 BT40-AD WD20.35	71MBT-A40WD2003	20	50	35	8	1.1	2
40	MAS403 BT40-AD WD20.110	71MBT-A40WD2011	20	50	110	83	2.1	1
40	MAS403 BT40-AD WD25.35	71MBT-A40WD2503	25	63	35	8	1	2
40	MAS403 BT40-AD WD25.100	71MBT-A40WD2510	25	63	100	73	2	3
40	MAS403 BT40-AD WD32.100	71MBT-A40WD3210	32	70	100	67	2.5	3
50	MAS403 BT50-AD WD10.70	71MBT-A50WD1007	10	30	70	32	3	1
50	MAS403 BT50-AD WD10.160	71MBT-A50WD1016	10	30	160	122	3.4	1
50	MAS403 BT50-AD WD12.70	71MBT-A50WD1207	12	34	70	32	3.1	1
50	MAS403 BT50-AD WD12.160	71MBT-A50WD1216	12	34	160	122	3.6	1
50	MAS403 BT50-AD WD16.80	71MBT-A50WD1608	16	42	80	42	3.3	1
50	MAS403 BT50-AD WD16.110	71MBT-A50WD1611	16	42	110	72	3.5	1
50	MAS403 BT50-AD WD20.80	71MBT-A50WD2008	20	50	80	42	3.5	1
50	MAS403 BT50-AD WD20.110	71MBT-A50WD2011	20	50	110	72	3.8	1
50	MAS403 BT50-AD WD25.100	71MBT-A50WD2510	25	63	100	62	4.5	2
50	MAS403 BT50-AD WD25.125	71MBT-A50WD2512	25	63	125	87	5	2
50	MAS403 BT50-AD WD32.100	71MBT-A50WD3210	32	70	100	62	5.6	2
50	MAS403 BT50-AD WD40.110	71MBT-A50WD4011	40	80	110	72	5.8	2

## MAS 403 BT40 A MORSE - CM DIN 228 AB

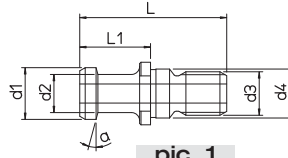


BT	REF.	CODE	MORSE	d1	d2	L	L1	kg
40	MAS403 BT40-A CM2.50 A-B	71MBT-40-CMB205	2	17.780	32	50	23	1
40	MAS403 BT40-A CM3.70 A-B	71MBT-40-CMB307	3	23.825	40	70	43	1.1
50	MAS403 BT50-A CM2.60 A-B	71MBT-50-CMB206	2	17.780	32	60	22	2.6
50	MAS403 BT50-A CM3.60 A-B	71MBT-50-CMB306	3	23.825	40	60	22	2.7
50	MAS403 BT50-A CM4.80 A-B	71MBT-50-CMB408	4	31.267	48	80	42	2.9

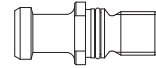




## ISO 7388/2 A - DIN 69872



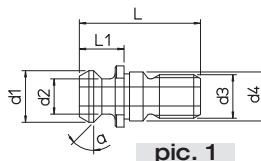
pic. 1



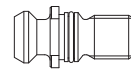
pic. 2

REF.	CODE	ISO	d1	d2	d3	d4	L	L1	a	pic.
ISO 7388/2 A DIN 69872	201430250401	40	19	14	M16	17	54	26	15°	1
ISO 7388/2 A DIN 69872	201430250451	45	23	17	M20	21	65	30	15°	1
ISO 7388/2 A DIN 69872	201430250501	50	28	21	M24	25	74	34	15°	1
ISO 7388/2 A DIN 69872	201430250400	40	19	14	M16	17	54	26	15°	2
ISO 7388/2 A DIN 69872	201430250500	50	28	21	M24	25	74	34	15°	2
ISO 7388/2 A DIN 69872	201430250600	60	40	30	M30	32	90	40	15°	2

## ISO 7388/2 B - ANSI B.5 50



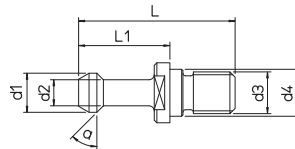
pic. 1



pic. 2

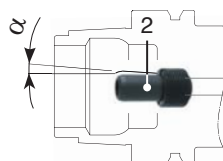
REF.	CODE	ISO	d1	d2	d3	d4	L	L1	a	pic.
ISO 7388/2 B ANSI B.5 50	201430251401	40	18.95	12.95	M16	17	44.50	16.40	45°	1
ISO 7388/2 B ANSI B.5 50	201430251451	45	24.05	16.30	M20	21	56	20.95	45°	1
ISO 7388/2 B ANSI B.5 50	201430251501	50	29.10	19.60	M24	25	65.50	25.55	45°	1
ISO 7388/2 B ANSI B.5 50	201430251400	40	18.95	12.95	M16	17	44.50	16.40	45°	2
ISO 7388/2 B ANSI B.5 50	201430251500	50	29.10	19.60	M24	25	65.50	25.55	45°	2

## MAS 403 BT - 30° - 45°



REF.	CODE	ISO	d1	d2	d3	d4	L	L1	a
MAS 403 BT 30°	201430252301	30	11	7	M12	12.5	43	23	30°
MAS 403 BT 30°	201430252401	40	15	10	M16	17	60	35	30°
MAS 403 BT 30°	201430252451	45	19	14	M20	21	70	40	30°
MAS 403 BT 30°	201430252501	50	23	17	M24	25	85	45	30°
MAS 403 BT 30°	201430252601	60	32	24	M30	31	115	65	30°
MAS 403 BT 45°	201430252302	30	11	7	M12	12.5	43	23	45°
MAS 403 BT 45°	201430252402	40	15	10	M16	17	60	35	45°
MAS 403 BT 45°	201430252452	45	19	14	M20	21	70	40	45°
MAS 403 BT 45°	201430252502	50	23	17	M24	25	85	45	45°
MAS 403 BT 45°	201430252602	60	32	24	M30	31	115	65	45°

## HSK



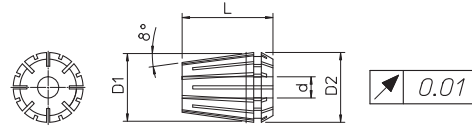
REF.	CODE 1	CODE 2	α
HSK-A40	101501101000	382019008001	± 1°
HSK-A50	101501101400	382019010001	± 1°
HSK-A63	101501101600	382019012001	± 1°
HSK-A80	101501101800	382019014001	± 1°
HSK-A100	101501102200	382019016001	± 1°
HSK-A125	101501102800	382019018000	± 1°





# ACCESSORIES ER COLLET

## ER DIN 6499-B



REF.	d	D1	D2	L
<b>ER 11</b>	0.5 ~ 7	11	11.5	18
<b>ER 16</b>	0.5 ~ 10	16	17	27.5
<b>ER 20</b>	1 ~ 13	20	21	31.5
<b>ER 25</b>	1 ~ 16	25	26	34
<b>ER 32</b>	2 ~ 20	32	33	40
<b>ER 40</b>	3 ~ 26	40	41	46

RANGE	CODE ER11	CODE ER16	CODE ER20	CODE ER25	CODE ER32	CODE ER40
1 - 0.5	496080111010	496080116010				
1.5 - 1	496080111015	496080116015				
2 - 1			496080120020			
2 - 1.5	496080111020	496080116021		496080125021		
2.5 - 2	496080111025	496080116025				
3 - 2		496080116030	496080120030	496080125030	496080132030	
3 - 2.5	496080111030					
3.5 - 3	496080111035					
4 - 3		496080116040	496080120040	496080125040	496080132040	496080140040
4 - 3.5	496080111040					
4.5 - 4	496080111045					
5 - 4		496080116050	496080120050	496080125050	496080132050	496080140050
5 - 4.5	496080111050					
5.5 - 5	496080111055					
6 - 5		496080116060	496080120060	496080125060	496080132060	496080140060
6 - 5.5	496080111060					
6.5 - 6	496080111065					
7 - 6		496080116070	496080120070	496080125070	496080132070	496080140070
7 - 6.5	496080111070					
8 - 7		496080116080	496080120080	496080125080	496080132080	496080140080
9 - 8		496080116090	496080120090	496080125090	496080132090	496080140090
10 - 9		496080116100	496080120100	496080125100	496080132100	496080140100
11 - 10			496080120110	496080125110	496080132110	496080140110
12 - 11			496080120120	496080125120	496080132120	496080140120
13 - 12			496080120130	496080125130	496080132130	496080140130
14 - 13				496080125140	496080132140	496080140140
15 - 14				496080125150	496080132150	496080140150
16 - 15				496080125160	496080132160	496080140160
17 - 16					496080132170	496080140170
18 - 17					496080132180	496080140180
19 - 18					496080132190	496080140190
20 - 19					496080132200	496080140200
21 - 20						496080140210
22 - 21						496080140220
23 - 22						496080140230
24 - 23						496080140240
25 - 24						496080140250
26 - 25						496080140260

ER collet SEALED supplied upon request

### SET ER

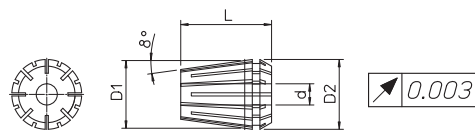


REF.	Ø	CODE
<b>SET ER11/13</b>	0.5 ~ 7	496080111000
<b>SET ER16/10</b>	0.5 ~ 10	496080116000
<b>SET ER20/12</b>	1 ~ 13	496080120000
<b>SET ER25/15</b>	1 ~ 16	496080125000
<b>SET ER32/18</b>	2 ~ 20	496080132000
<b>SET ER40/23</b>	3 ~ 26	496080140000

# ACCESSORIES

## ER ULTRA-PRECISE COLLET

ER DIN 6499-B



REF.	d	D1	D2	L
<b>ER 16</b>	0.5 ~ 10	16	17	27.5
<b>ER 25</b>	1 ~ 16	25	26	34
<b>ER 32</b>	2 ~ 20	32	33	40
<b>ER 40</b>	3 ~ 26	40	41	46

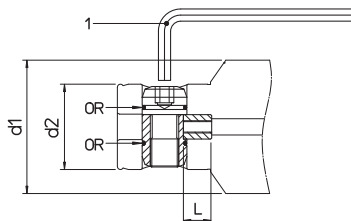
RANGE	CODE ER16	CODE ER25	CODE ER32	CODE ER40
1 - 0.5	496080016010			
1.5 - 1 •	496080016015			
2 - 1.5	496080016020	496080025020		
2.5 - 2 •	496080016025	496080025025	496080032025	
3 - 2.5	496080016030	496080025030	496080032030	
3.5 - 3 •	496080016035	496080025035	496080032035	
4 - 3.5	496080016040	496080025040	496080032040	496080040040
4.5 - 4 •	496080016045	496080025045	496080032045	496080040045
5 - 4.5	496080016050	496080025050	496080032050	496080040050
5.5 - 5 •	496080016055	496080025055	496080032055	496080040055
6 - 5.5	496080016060	496080025060	496080032060	496080040060
6.5 - 6 •	496080016065	496080025065	496080032065	496080040065
7 - 6.5	496080016070	496080025070	496080032070	496080040070
7.5 - 7 •	496080016075	496080025075	496080032075	496080040075
8 - 7.5	496080016080	496080025080	496080032080	496080040080
8.5 - 8 •	496080016085	496080025085	496080032085	496080040085
9 - 8.5	496080016090	496080025090	496080032090	496080040090
9.5 - 9 •	496080016095	496080025095	496080032095	496080040095
10 - 9.5	496080016100	496080025100	496080032100	496080040100
10.5 - 10 •		496080025105	496080032105	496080040105
11 - 10.5		496080025110	496080032110	496080040110
11.5 - 11 •		496080025115	496080032115	496080040115
12 - 11.5		496080025120	496080032120	496080040120
12.5 - 12 •		496080025125	496080032125	496080040125
13 - 12.5		496080025130	496080032130	496080040130
13.5 - 13 •		496080025135	496080032135	496080040135
14 - 13.5		496080025140	496080032140	496080040140
14.5 - 14 •		496080025145	496080032145	496080040145
15 - 14.5		496080025150	496080032150	496080040150
15.5 - 15 •		496080025155	496080032155	496080040155
16 - 15.5		496080025160	496080032160	496080040160
16.5 - 16 •			496080032165	496080040165
17 - 16.5			496080032170	496080040170
17.5 - 17 •			496080032175	496080040175
18 - 17.5			496080032180	496080040180
18.5 - 18 •			496080032185	496080040185
19 - 18.5			496080032190	496080040190
19.5 - 19 •			496080032195	496080040195
20 - 19.5			496080032200	496080040200
20.5 - 20 •				496080040205
21 - 20.5				496080040210
21.5 - 21 •				496080040215
22 - 21.5				496080040220
22.5 - 22 •				496080040225
23 - 22.5				496080040230
23.5 - 23 •				496080040235
24 - 23.5				496080040240
24.5 - 24 •				496080040245
25 - 24.5				496080040250
25.5 - 25 •				496080040255
26 - 25.5				496080040260

• On request

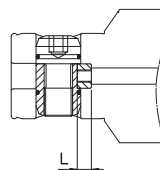
ER collet SEALED supplied upon request



**SYSTEM MHD'**



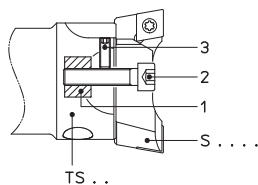
**pic. 1**



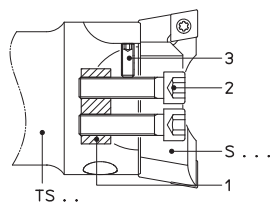
**pic. 2**

REF.	CODE	d1	d2	CODE 1	CODE OR	L	pic.
MHD' 14	381725001161	14	10	101500100250		2	2
MHD' 16	381725001161	16	10	101500100250		2	2
MHD' 20	381725001201	20	13	101500100300		2.5	2
MHD' 25	381725001251	25	16	101500100300		3	2
MHD' 32	381725001321	32	20	101500100400	101254007510	3.55	2
MHD' 40	381725001401	40	25	101500100500	101254010010	4	2
MHD' 50 RD 50 / .. TRD - TRM - TRC - TR-E	381725001501	50	32	101500100600	101254013010	4.2	2
MHD' 50	381725001001	50	32	101500100600	101254013010	12.2	1
MHD' 63-80	381725001002	63-80	42	101500100800	101251002075	13.85	1
MHD' 110 - 140	381725001003	110-140	76	101500101400	101251003112	10	1

**TS**



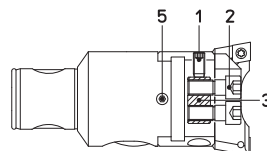
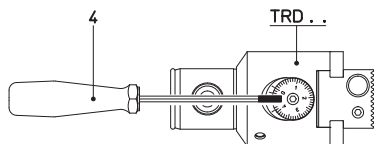
**pic. 1**



**pic. 2**

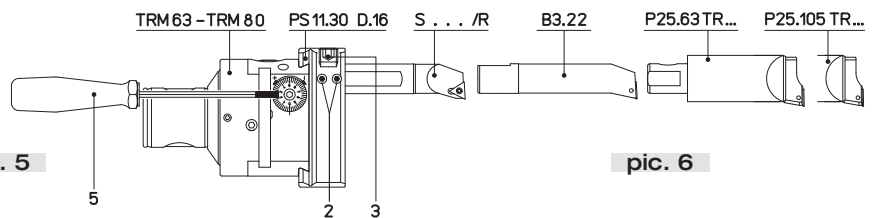
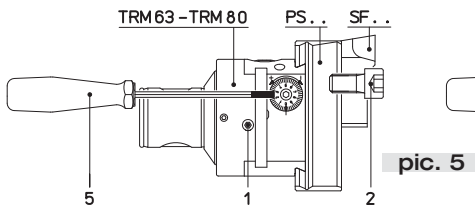
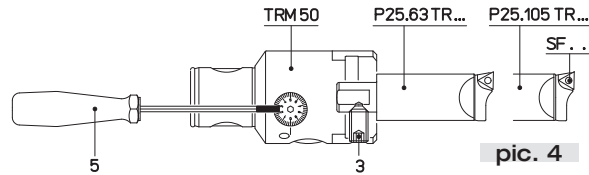
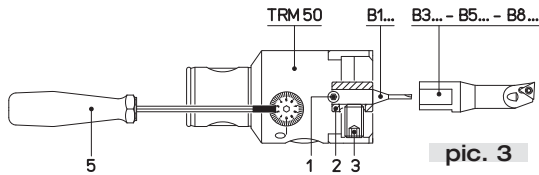
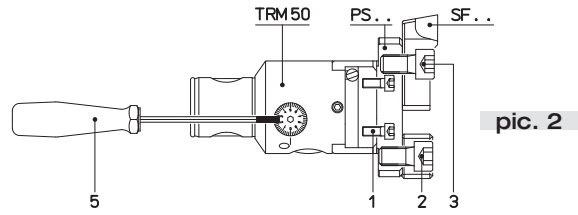
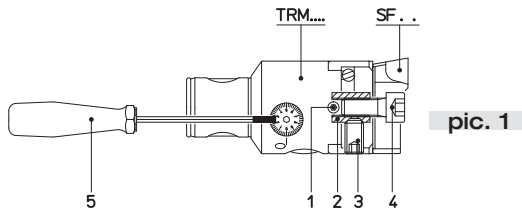
REF.	CODE 1	CODE 2	CODE 3	pic.
TS 16/16	201430110008	100051030014	100231030004	1
TS 20/20	201430110009	100051040015	100231030005	1
TS 25/25	201430110010	100051040020	100231030008	1
TS 32/32	201430110011	100051050025	100231040012	1
TS 40/40	201430110012	100051060030	100231050014	1
TS 50/50	201430110013	100051080035	100231050012	2
TS 50/63	201430110014	100051100040	100231060016	2
TS 63/63	201430110014	100051100040	100231060016	2
TS 80/80	201430110015	100051120045	100231080025	2

**TRD**



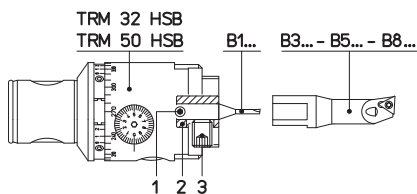
REF.	CODE 1	CODE 2	CODE 3	CODE 4	CODE 5
TRD 25	100231040008	200100150411	201430110024	101500800200	100271040004
TRD 32	100231050010	200100150512	201430110023	101500800250	100271050006
TRD 40	100231060012	200100150616	201430170001	101500800300	100271060006
TRD 50	100231060014	200100150820	201430110021	101500800300	100271060008
TRD 63	100231060016	200100151026	201430110026	101500800300	100271060008
TRD 80	100231060020	200100151230	201430110022	101500800300	100271060012

## TRM



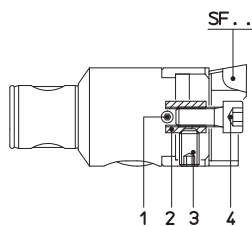
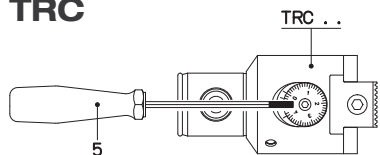
REF.	CODE 1	CODE 2	CODE 3	CODE 4	CODE 5	pic.
TRM 16	200100190301			100051030006	101500800150	1
TRM 20	200100190301			100051040008	101500800150	1
TRM 25	100271040004			100051050010	101500800200	1
TRM 32	100231040006			100051060012	101500800200	1
TRM 40	100271050006			100051080014	101500800250	1
TRM 50	100271050008	201041015002	100231100016	100051100025	101500800250	1
TRM 50	200100150501	100051100020	100051100025		101500800250	2
TRM 50	100271050008	200560116082	100231100016		101500800250	3-4
TRM 63	100251060010	100051100018			101500800300	5
TRM 80	100251060014	100051100018			101500800300	5
TRM 125	100251060020	100051100025			101500800300	5
TRM 63	100251060010	100231050006	100231100010		101500800300	6
TRM 80	100251060014	100231050006	100231100010		101500800300	6

## TRM 32 - 50 HSB

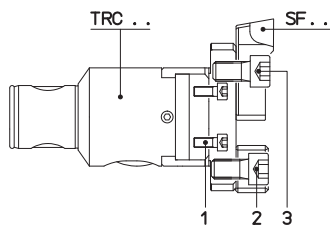


REF.	CODE 1	CODE 2	CODE 3
TRM 32 HSB	100271040005		100231050008 - 100231050012
TRM 50 HSB	100271050008	200560116082	100231100010

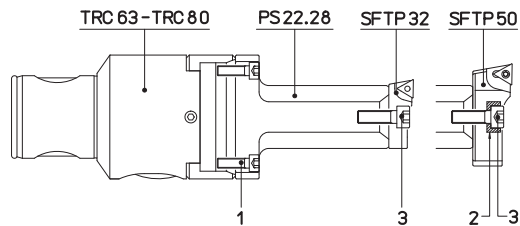
## TRC



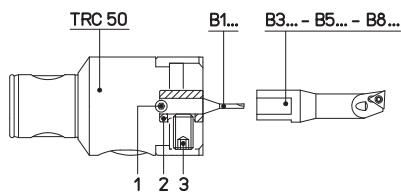
pic. 1



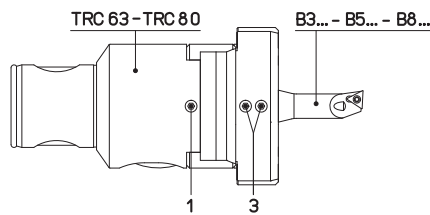
pic. 2



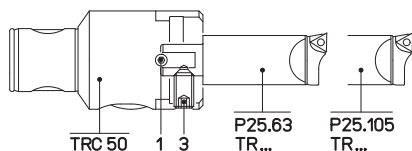
pic. 3



pic. 4



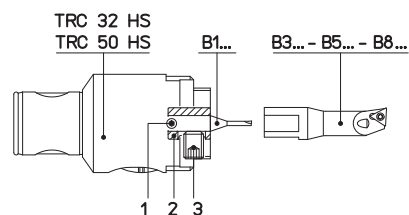
pic. 4



pic. 4

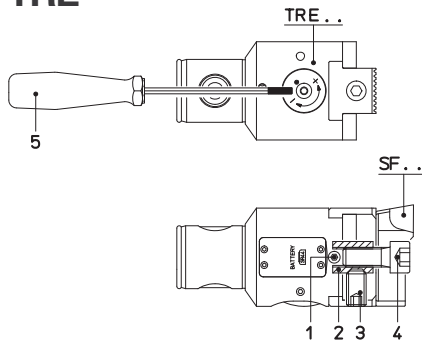
REF.	CODE 1	CODE 2	CODE 3	CODE 4	CODE 5	pic.
TRC 14	200100190302			100051030006	101500800150	1
TRC 16	200100190301			100051030006	101500800150	1
TRC 20	200100190301			100051040008	101500800150	1
TRC 25	100271040004			100051050010	101500800150	1
TRC 32	100271050005			100051060012	101500800250	1
TRC 40	100271060006			100051080014	101500800300	1
TRC 50	100271060008	201041015002	100231100016	100051100025	101500800300	1
TRC 63	100271060008			100051100020	101500800300	1
TRC 80	100271060012			100051100025	101500800300	1
TRC 50	200100150501	100051100020	100051100025			2
TRC 63	100051050025	100051100020	100051100025			2
TRC 80	100051050025	100051100020	100051100025			2
TRC 63	100051050016	201040607001	100051006020			3
TRC 80	100051050016	201040607001	100051006020			3
TRC 50	100271060008	200560116082	100231100010			4
TRC 63	100271060008		100231060006			4
TRC 80	100271060012		100231060006			4

## TRC 32 - 50 HS

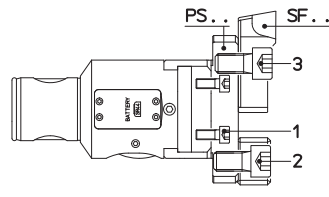


REF.	CODE 1	CODE 2	CODE 3
TRC 32 HS	100271050006		100231050008 - 100231050012
TRC 50 HS	100271060008	200560116082	100231100010

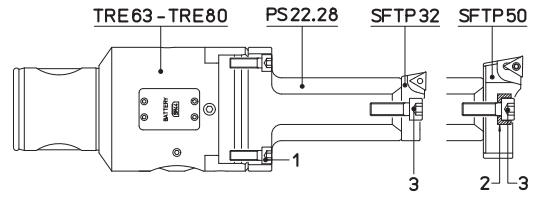
## TRE



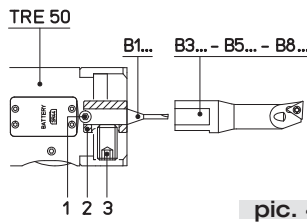
pic. 1



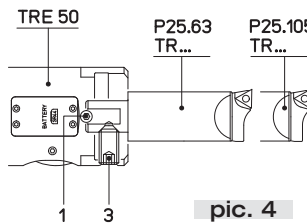
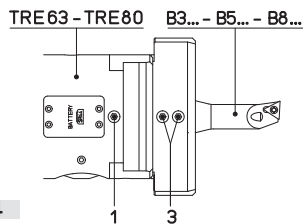
pic. 2



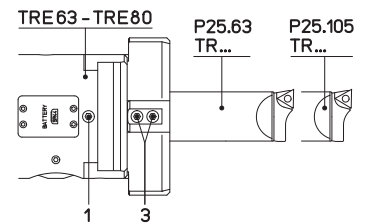
pic. 3



pic. 4

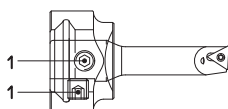


pic. 4

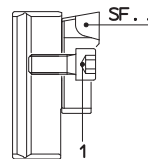


REF.	CODE 1	CODE 2	CODE 3	CODE 4	CODE 5	pic.
TRE 32	100238050007			100051060012	101500800250	1
TRE 40	100238050007			100051080014	101500800300	1
TRE 50	100238060010	201041015002	100231100016	100051100025	101500800250	1
TRE 63	100238060010			100051100020	101500800250	1
TRE 80	200100150614			100051100025	101500800250	1
TRE 50	200100150501	100051100020	100051100025			2
TRE 63	100051050025	100051100020	100051100025			2
TRE 80	100051050025	100051100020	100051100025			2
TRE 63	100051050016	201040607001	100051060020			3
TRE 80	100051050016	201040607001	100051060020			3
TRE 50	100238060010	200560116082	100231100016			4
TRE 63	100238060010		100231060006			4
TRE 80	200100150614		100231060006			4

## P 20.30



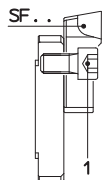
REF.	CODE 1
P20.30	100251080008



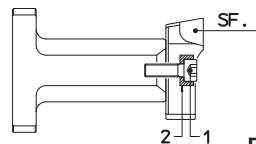
## PS

REF.	CODE 1
PS 11.30	100051100018
PS 12.30	100051100018
PS 13.30	100051100018
PS 11.40	100051100025
PS 12.40	100051100025
PS 13.40	100051100025
PS 14.40	100051100025

## PS



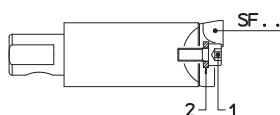
REF.	CODE 1
PS31.24	100051100020
PS31.28	100051100025
PS32.28	100051100025
PS33.28	100051100025



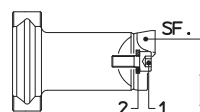
## P 22.28

REF.	CODE 1	CODE 2
P22.28	100051060020	201040607001

## P 25



REF.	CODE 1	CODE 2
P25.63	100051050012	100800100530
P25.105	100051050012	100800100530

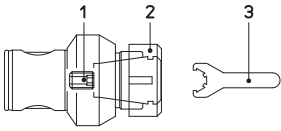


## P

REF.	CODE 1	CODE 2
P 02.30	100051050012	100800100530
P 03.30	100051050012	100800100530
P 04.30	100051050012	100800100530
P 02.40	100051060018	100800100640
P 03.40	100051060018	100800100640
P 04.40	100051060018	100800100640

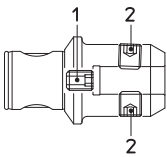


## PF ER DIN 6499



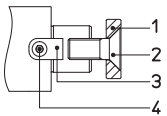
REF.	CODE 1	CODE 2	CODE 3
PE 16 / ER11M	200100190403	100451011100	101501001100
PE 20 / ER16M	200100190403	100451011600	101501001600
PE 25 / ER20M	200100190506	100451012000	101501002000
PE 32 / ER25M	200100190608	100451012500	101501002500
PE 40 / ER25	200100190808	100451032500	101501002501
PE 50 / ER25	200100190808	100451032500	101501002501
PE 50 / ER32	200100190808	100451033200	101501003201
PE 63 / ER32	200100191014	100451033200	101501003201
PE 63 / ER40	200100191214	100451034000	101501004001

## AW DIN 1835 B-E



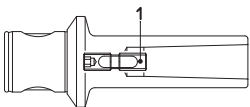
REF.	CODE 1	CODE 2
AW 50/6	200100190808	200100190610
AW 50/8	200100190808	200100190810
AW 50/10	200100190809	200100191012
AW 50/12	200100190809	200100191216
AW 50/14	200100190809	200100191216
AW 50/16	200100191215	200100191416
AW 50/20	200100191215	200100191616
AW 50/25	200100191615	200100191820
AW 63/16	200100191215	200100191416
AW 63/20	200100191215	200100191616
AW 63/25	200100191615	200100191820
AW 63/32	200100191615	200100192020
AW 80/40	200100192019	200100192020

## PF



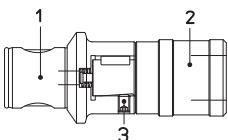
REF.	CODE 1	CODE 2	CODE 3	CODE 4	CODE 5
PF 50/16 PF 40/16	201010085010	201101800801	101001040014	100101080025	100051030008
PF 50/22 PF 40/22	201010105030	201101801002	101001060016	100101100025	100051040010
PF 50/27	201010125030	201101801202	101001070018	100101120030	100051050012
PF 50/32	201010165020	201101801402	101001080020	100101160035	100051060016
PF 63/22	201010105030	201101801002	101001060016	100101100025	100051040010
PF 63/27	201010125030	201101801202	101001070018	100101120030	100051050012
PF 63/32	201010165020	201101801402	101001080020	100101160035	100051060016
PF 80/32	201010165020	201101801402	101001080020	100101160035	100051060016
PF 80/40	201010210010	201101801603	101001100025	100101200045	100051060018
PF 80/50	201010260330	201101801802	101001120028	100101240050	100051060020
PF 80/60		201101802510	101001140036		100051120025
PF 110/40	201010210010	201101801603	101001100025	100101200045	100051060018
PF 110/60		201101802510	101001140036		100051120025
PF 140/40	201010210010	201101801603	101001100025	100101200045	100051060018
PF 140/60		201101802510			100051120025

## CM DIN 228 A



REF.	CODE 1
CM 50/1	201081506003
CM 50/2	201081510002
CM 50/3	201081512004
CM 63/3	201081512004
CM 63/4	201081516001

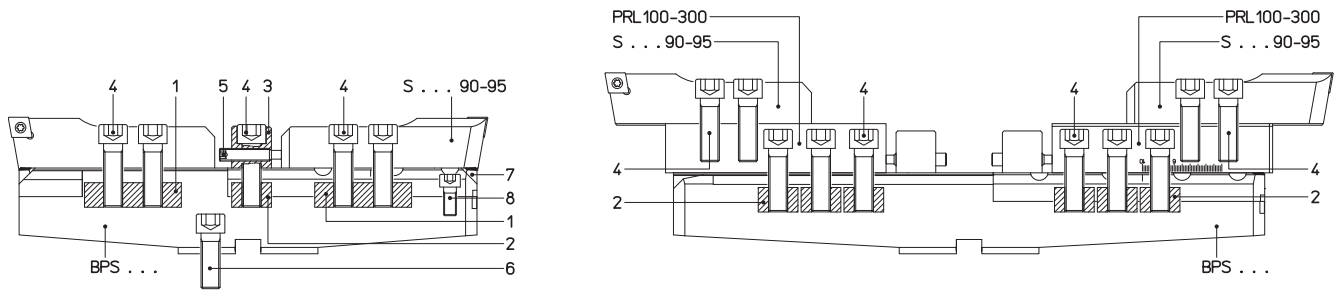
## AM



REF.	REF. 1	CODE 1	REF. 2	CODE 2	CODE 3
AM 50/M3-12	RAM 50/M3-12	456505000100	WFLK 115B/A 308	495090010312	100231060008
AM 50/M8-20	RAM 50/M8-20	456505000200	WFLK 225B/A 308	495090020820	100231080012
AM 63/M3-12	RAM 63/M3-12	456506300100	WFLK 115B/A 308	495090010312	100231060008
AM 63/M8-20	RAM 63/M8-20	456506300200	WFLK 225B/A 308	495090020820	100231080012

## BPS

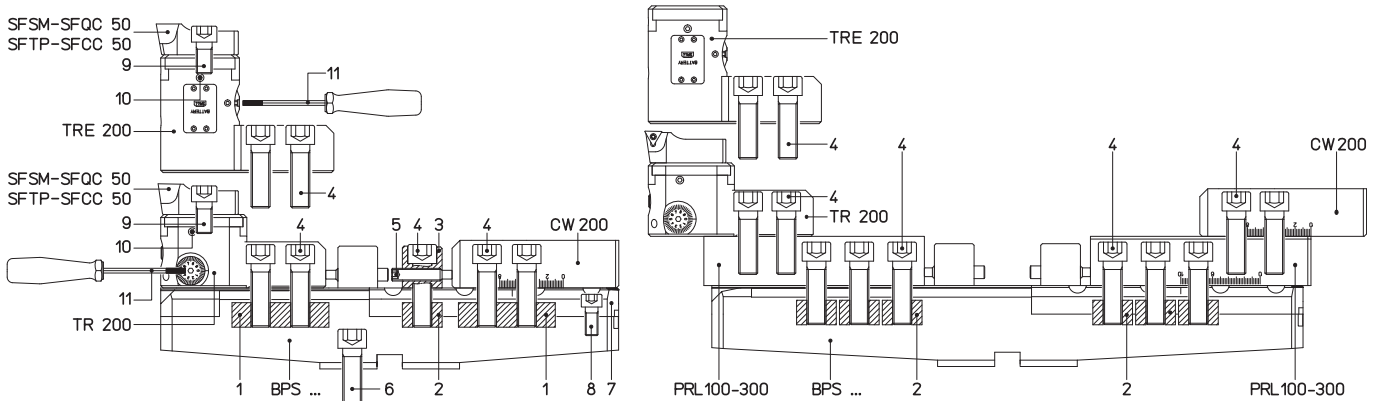
## ROUGHING



REF.	CODE 1	CODE 2	CODE 3	CODE 4	CODE 5	CODE 6	CODE 7	CODE 8
<b>BPS 200</b>	201430110017	201430110016	201100502601	100051120040	100251080040	100051120035	200655015707	100051080025
<b>BPS 300</b>	201430110017	201430110016	201100502601	100051120040	100251080040	100051120035	200655015708	100051080025
<b>BPS 400</b>	201430110017	201430110016	201100502601	100051120040	100251080040	100051120035	200655016301	100051080020
<b>BPS 500</b>	201430110017	201430110016	201100502601	100051120040	100251080040	100051160050	200655016301	100051080025
<b>BPS 600</b>	201430110017	201430110016	201100502601	100051120040	100251080040	100051160050	200655016301	100051080025
<b>BPS 700</b>	201430110017	201430110016	201100502601	100051120040	100251080040	100051160050	200655016301	100051080025
<b>BPS 800</b>	201430110017	201430110016	201100502601	100051120040	100251080040	100051160050	200655016301	100051080025

## BPS

## FINISHING

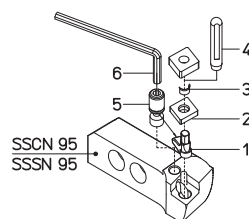


REF.	CODE 1	CODE 2	CODE 3	CODE 4	CODE 5	CODE 6
<b>BPS 200-300-400</b>	201430110017	201430110016	201100502601	100051120040	100251080040	100051120035
<b>BPS 500-600-700-800</b>	201430110017	201430110016	201100502601	100051120040	100251080040	100051160050

REF.	CODE 7	CODE 8	CODE 9	CODE 10	CODE 11
<b>BPS 200</b>	200655015707	100051080025	100051100020	100251060008	101500800300
<b>BPS 300</b>	200655015708	100051080025	100051100020	100251060008	101500800300
<b>BPS 400</b>	200655016301	100051080020	100051100020	100251060008	101500800300
<b>BPS 500-600-700-800</b>	200655016301	100051080025	100051100020	100251060008	101500800300

## SS.. 95

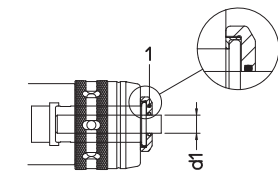


REF.	CODE 1	CODE 2	CODE 3	CODE 4	CODE 5	CODE 6
<b>SSCN 95</b>	491111190600	492031190600	100655095112	101501301408	494311190600	101500100400
<b>SSSN 95</b>	491111190600	492035190600	100655095112	101501301408	494311190600	101500100400

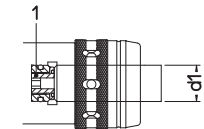


# SPARE PARTS MONOforce

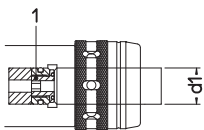
## FORCE GH - VT SEALING DEVICE FOR HIGH PRESSURE COOLANT SUPPLY



pic. 1

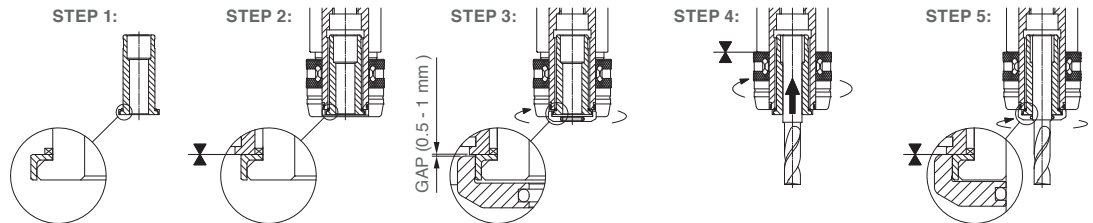


pic. 2

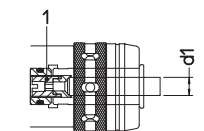


pic. 3

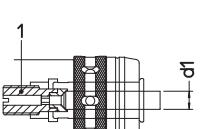
pic.	REF.	CODE 1	d1
1	GH 20 MONOforce 20 HSK63 MHD'50 / DIN/BT-40-50 PSC 63 - 80	382042020061	6
		382042020081	8
		382042020101	10
		382042020121	12
		382042020141	14
		382042020161	16
2	VT 20.20 MONOforce 20 DIN/BT-40-50 HSK63-100 PSC 63-80	382042020201	20
1	GH 32 MONOforce 32 DIN/BT-40-50 / HSK63-100 MHD'63 PSC 63-80	382042032061	6
		382042032081	8
		382042032101	10
		382042032121	12
		382042032141	14
		382042032161	16
		382042032181	18
		382042032201	20
		382042032251	25
2	VT 32.32 MONOforce 32 DIN/BT-40 HSK63-100 PSC 63-80	382042032321	32
3	VT 32.32.100 MONOforce 32 DIN/BT-50	382042032322	32



## FORCE VCR SETTING SCREW FOR INTERNAL COOLANT SUPPLY



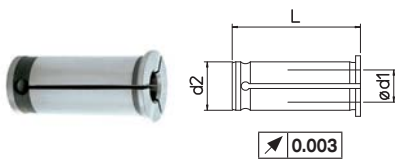
pic. 1



pic. 2

pic.	REF.	CODE 1	d1
1	VCR 20 MONOforce 20 HSK63-100 MHD'50 PSC 63-80	382041020032	3 ~ 5
		382041020062	6 ~ 12
		382041020142	14 ~ 20
1	VCR 32 MONOforce 32 HSK63-100 MHD'63 PSC 63-80	382041032033	3 ~ 5
		382041032063	6 ~ 12
		382041032143	14 ~ 20
		382041032253	25 ~ 32
		382041020031	3 ~ 5
2	VCR 20 MONOforce 20 DIN/BT-40-50	382041020061	6 ~ 12
		382041020141	14 ~ 20
		382041032031	3 ~ 5
2	VCR 32 MONOforce 32 DIN/BT-40	382041032061	6 ~ 12
		382041032141	14 ~ 20
		382041032251	25 ~ 32
		382041032032	3 ~ 5
		382041032062	6 ~ 12
2	VCR 32 MONOforce 32 DIN/BT-50	382041032142	14 ~ 20
		382041032252	25 ~ 32

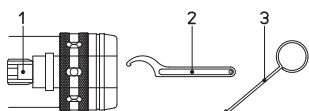
## RC BUSHES ULTRA-TIGHT SPINDLE



FORCE (d2)	REF.	CODE	d1	L
12	RC 12.03	497080012030	3	44
12	RC 12.04	497080012040	4	44
12	RC 12.06	497080012060	6	44
12	RC 12.08	497080012080	8	44
12	RC 12.10	497080012100	10	44
20	RC 20.03	497080020030	3	50
20	RC 20.04	497080020040	4	50
20	RC 20.05	497080020050	5	50
20	RC 20.06	497080020060	6	50
20	RC 20.08	497080020080	8	50
20	RC 20.10	497080020100	10	50
20	RC 20.12	497080020120	12	50
20	RC 20.14	497080020140	14	50
20	RC 20.16	497080020160	16	50
32	RC 32.03	497080032030	3	63
32	RC 32.04	497080032040	4	63
32	RC 32.05	497080032050	5	63
32	RC 32.06	497080032060	6	63
32	RC 32.08	497080032080	8	63
32	RC 32.10	497080032100	10	63
32	RC 32.12	497080032120	12	63
32	RC 32.14	497080032140	14	63
32	RC 32.16	497080032160	16	63
32	RC 32.18	497080032180	18	63
32	RC 32.20	497080032200	20	63
32	RC 32.25	497080032250	25	63

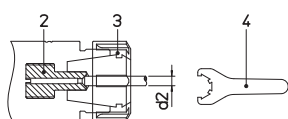
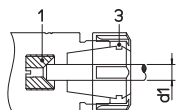
RC SEALED bushes supplied up on request

### FORCE



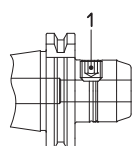
REF	CODE 1	CODE 2	CODE 3
<b>FORCE 12</b>	200100191014	101500400028	201271600400
<b>FORCE 20</b>	200100191615	101500400050	201271600400
<b>FORCE 32</b>	200100191615	101500400075	201271600400

### MONOd'

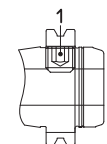


REF.	CODE 1	d1	CODE 2	d2	CODE 3	CODE 4
<b>ER 16 M</b>	201082010001	5 ~ 10	201082010002	1 ~ 4	100451011600	101501001600
<b>ER 25</b>	201082018001	8 ~ 16	201082018002	2 ~ 7	100451032500	101501002501
<b>ER 32</b>	201082022001	8 ~ 20	201082022002	3 ~ 7	100451033200	101501003201
<b>ER 40</b>	201082028001	9 ~ 26	201082028002	4 ~ 8	100451034000	101501004001

### MONOd' - WD



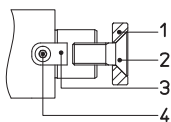
pic. 1



pic. 2

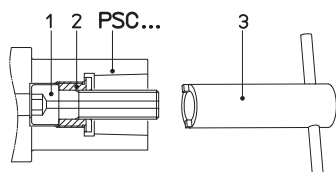
pic.	REF.	CODE 1
1	<b>WD 06</b>	200100190610
1	<b>WD 08</b>	200100190810
1	<b>WD 10</b>	200100191010
1	<b>WD 12</b>	200100191212
1	<b>WD 14</b>	200100191212
1	<b>WD 16</b>	200100191414
1	<b>WD 18</b>	200100191414
1	<b>WD 20</b>	200100191616
2	<b>WD 20</b>	200100191613
1	<b>WD 25</b>	200100191820
2	<b>WD 25</b>	200100191821
1	<b>WD 32</b>	200100192020
1	<b>WD 40</b>	200100192020

### MONOd' - PSC PF



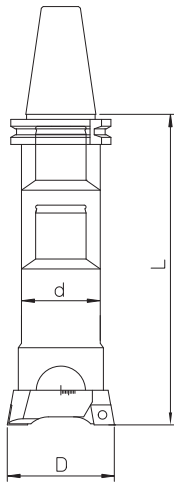
REF.	CODE 1	CODE 2	CODE 3	CODE 4
<b>PF 16</b>	201010085010	100101080025	201101800801	100051030008
<b>PF 22</b>	201010105030	100101100025	201101801002	100051040010
<b>PF 27</b>	201010125030	100101120030	201101801202	100051050012
<b>PF 32</b>	201010165020	100101160035	201101801402	100051060016
<b>PF 40</b>	201010210010	100101200045	201101801603	100051060018
<b>PF 60</b>			201101802510	100051120025

### PSC



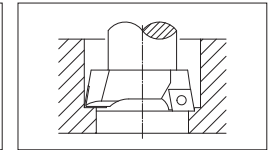
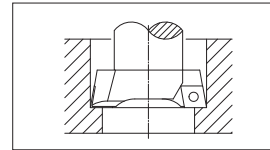
PSC	CODE 1	CODE 2	CODE 3
<b>32</b>	200101151240	201031815001	101501401800
<b>40</b>	200101151448	201032215005	101501402101
<b>50</b>	200101151658	201032515005	101501402401
<b>63</b>	200101152071	201033015021	101501403001
<b>80</b>	200101152071	201033015021	101501403001

### RECOMMENDED CUTTING CONDITIONS FOR ROUGHING OPERATIONS WITH DOUBLE-BIT HEADS TS



material	boring bar dimensions	working conditions	cutting speed Vc = m/min. diameter			feed fn = mm/rev (twin cutters) insert radius		
			D < 38	D = 38-120	D > 120	R = 0.2	R = 0.4	R = 0.8
carbon steel HB ≤ 200	L / d = 2.5	good	120 - 180	140 - 200	160 - 250		0.2 - 0.4	0.3 - 0.5
	L / d = 4	normal	100 - 160	120 - 180	140 - 200		0.2 - 0.4	0.3 - 0.5
	L / d = 6.3	difficult	70 - 100	70 - 100	70 - 100	0.15 - 0.3	0.2 - 0.4	
carbon steel HB > 200	L / d = 2.5	good	100 - 160	120 - 180	140 - 200		0.2 - 0.4	0.3 - 0.5
	L / d = 4	normal	80 - 140	100 - 160	120 - 180		0.2 - 0.4	0.3 - 0.5
	L / d = 6.3	difficult	60 - 90	70 - 100	70 - 100	0.15 - 0.3	0.2 - 0.4	
stainless steel AISI 304 - 316	L / d = 2.5	good	80 - 110	90 - 120	100 - 140		0.2 - 0.4	0.3 - 0.5
	L / d = 4	normal	70 - 100	80 - 110	90 - 120		0.2 - 0.4	0.3 - 0.5
	L / d = 6.3	difficult	60 - 90	60 - 90	60 - 90	0.15 - 0.3	0.2 - 0.4	
cast iron	L / d = 2.5	good	90 - 120	100 - 140	120 - 160		0.2 - 0.4	0.3 - 0.5
	L / d = 4	normal	70 - 100	90 - 120	100 - 140		0.2 - 0.4	0.3 - 0.5
	L / d = 6.3	difficult	60 - 90	60 - 90	60 - 90	0.15 - 0.3	0.2 - 0.4	
aluminium	L / d = 2.5	good	160 - 250	200 - 300	250 - 350		0.3 - 0.5	0.4 - 0.6
	L / d = 4	normal	140 - 200	160 - 250	200 - 300		0.3 - 0.5	0.4 - 0.6
	L / d = 6.3	difficult	100 - 150	100 - 150	100 - 150	0.2 - 0.4	0.3 - 0.5	

cutting depth ap = mm	working range Ø = mm	max. cutting depth	
		steel	cast iron, aluminium
18 - 28	1.5 - 2	2 - 2.5	
28 - 50	2 - 3	2.5 - 3.5	
50 - 68	3 - 4	3.5 - 5	
68 - 200	4 - 5	5 - 7	
200 - 500	5 - 6	6 - 8	

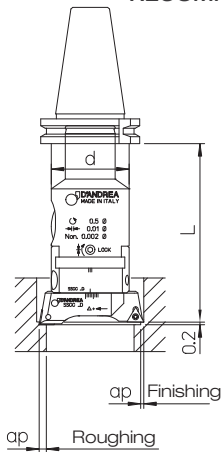


Twin cutters at the same cutting diameter Twin cutters at different cutting diameters

It's advisable to start with B hole ≥ the boring bar diameter d.

**ATTENTION:** For boring operations at different diameters, reduce to a half the feed indicated on the above table.

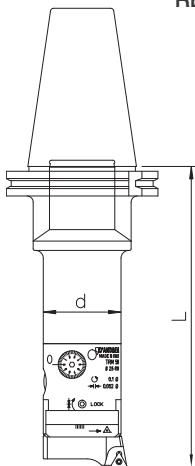
### RECOMMENDED CUTTING CONDITIONS FOR BORING OPERATIONS WITH DOUBLE-BIT TESTAROSSA TRD



material	boring bar dimensions	working conditions	cutting speed Vc = m/min.	feed fn = mm/rev insert radius		quality insert		cutting depth			
				R = 0.2	R = 0.4	roughing	finishing	ap finishing	ap roughing ø28 ø46	ap roughing ø46 ø75	ap roughing ø75 ø160
carbon steel HB ≤ 200	L / d = 2.5	good	160 - 250	0.1 - 0.2	0.1 - 0.2	DC100 DP300	DP300 DP100R	0.15 - 0.3	1.5	2	2.5
	L / d = 4	normal	120 - 180	0.1 - 0.2	0.1 - 0.2						
	L / d = 6.3	difficult	70 - 100	*0.1 - 0.15	0.1 - 0.2						
carbon steel HB > 200	L / d = 2.5	good	140 - 200	0.1 - 0.2	0.1 - 0.2	DC100	DP300 DP100R	0.15 - 0.3	1.5	2	2.5
	L / d = 4	normal	100 - 160	0.1 - 0.2	0.1 - 0.2						
	L / d = 6.3	difficult	70 - 100	*0.1 - 0.15	0.1 - 0.2						
stainless steel AISI 304-316	L / d = 2.5	good	100 - 140	0.1 - 0.2	0.1 - 0.2	DP300	DP300	0.15 - 0.3	1.5	2	2.5
	L / d = 4	normal	80 - 110	0.1 - 0.2	0.1 - 0.2						
	L / d = 6.3	difficult	60 - 90	*0.1 - 0.15	0.1 - 0.2						
cast iron	L / d = 2.5	good	120 - 160	0.1 - 0.2	0.1 - 0.2	DK100 DC300	DP100R	0.15 - 0.3	2	2.5	3
	L / d = 4	normal	90 - 120	0.1 - 0.2	0.1 - 0.2						
	L / d = 6.3	difficult	60 - 90	*0.1 - 0.15	0.1 - 0.2						
aluminium	L / d = 2.5	good	250 - 350	0.1 - 0.2	0.1 - 0.2	DK100	DK100	0.15 - 0.3	2	2.5	3
	L / d = 4	normal	160 - 250	0.1 - 0.2	0.1 - 0.2						
	L / d = 6.3	difficult	100 - 150	*0.1 - 0.15	0.1 - 0.2						

\* Only for finishing inserts

### RECOMMENDED CUTTING CONDITIONS FOR BORING OPERATIONS WITH TESTAROSSA TRM / TRC / TR-E



material	boring bar dimensions	working conditions	cutting speed Vc = m/min.	feed fn = mm/rev insert radius			quality insert	cutting depth
				R = 0.0	R = 0.2	R = 0.4		
carbon steel HB ≤ 200	L / d = 2.5	good	200 - 300		0.05 - 0.08	0.07 - 0.1	DC100 DP300	
	L / d = 4	normal	160 - 250		0.05 - 0.08	0.07 - 0.1		
	L / d = 6.3	difficult	70 - 100	0.05 - 0.08	0.05 - 0.08			
carbon steel HB > 200	L / d = 2.5	good	160 - 250		0.05 - 0.08	0.07 - 0.1	DC100	
	L / d = 4	normal	150 - 200		0.05 - 0.08	0.07 - 0.1		
	L / d = 6.3	difficult	70 - 100	0.05 - 0.08	0.05 - 0.08			
stainless steel AISI 304-316	L / d = 2.5	good	120 - 160		0.05 - 0.08	0.07 - 0.1	DP300	
	L / d = 4	normal	100 - 140		0.05 - 0.08	0.07 - 0.1		
	L / d = 6.3	difficult	70 - 100	0.05 - 0.08	0.05 - 0.08			
cast iron	L / d = 2.5	good	120 - 160		0.05 - 0.08	0.07 - 0.1	DK100 DP100	
	L / d = 4	normal	100 - 140		0.05 - 0.08	0.07 - 0.1		
	L / d = 6.3	difficult	70 - 100	0.05 - 0.08	0.05 - 0.08			
aluminium	L / d = 2.5	good	300 - 400		0.05 - 0.08	0.07 - 0.1	DK100	
	L / d = 4	normal	250 - 350		0.05 - 0.08	0.07 - 0.1		
	L / d = 6.3	difficult	100 - 150	0.05 - 0.08	0.05 - 0.08			
steel HB > 200	L / d = 2.5	good	80 - 100		0.04 - 0.06	0.05 - 0.07	D20CBN	
	L / d = 4	normal	80 - 100		0.04 - 0.06	0.05 - 0.07		

### CALCULATION FORMULAS FOR BORING

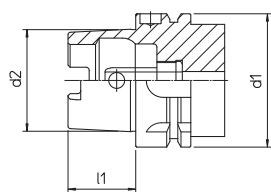
**Vc** cutting speed (m/min.)  
**D** diameter of workpiece (mm)  
**n** number of revolutions / min' (rev./min)  
**Vf** feed rate (mm/min.)  
**fn** feed / rev. (mm/rev)  
 $\pi$  3.14

$$Vc = \frac{\pi \cdot D \cdot n}{1000}$$

$$n = \frac{Vc \cdot 1000}{\pi \cdot D}$$

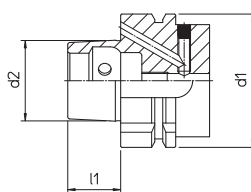
$$Vf = n \cdot fn$$

## HSK-A



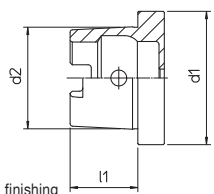
HSK-A	d1	d2	l1
32	32	24	16
40	40	30	20
50	50	38	25
63	63	48	32
80	80	60	40
100	100	75	50

## HSK-B



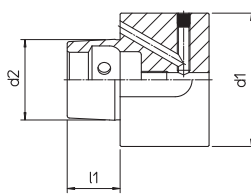
HSK-B	d1	d2	l1
-	-	-	-
40	40	24	16
50	50	30	20
63	63	38	25
80	80	48	32
100	100	60	40

## HSK-C



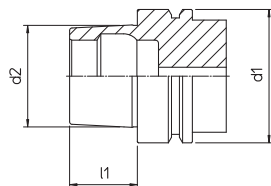
HSK-C	d1	d2	l1
32	32	24	16
40	40	30	20
50	50	38	25
63	63	48	32
80	80	60	40
100	100	75	50

## HSK-D



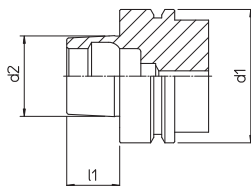
HSK-D	d1	d2	l1
-	-	-	-
40	40	24	16
50	50	30	20
63	63	38	25
80	80	48	32
100	100	60	40

## HSK-E

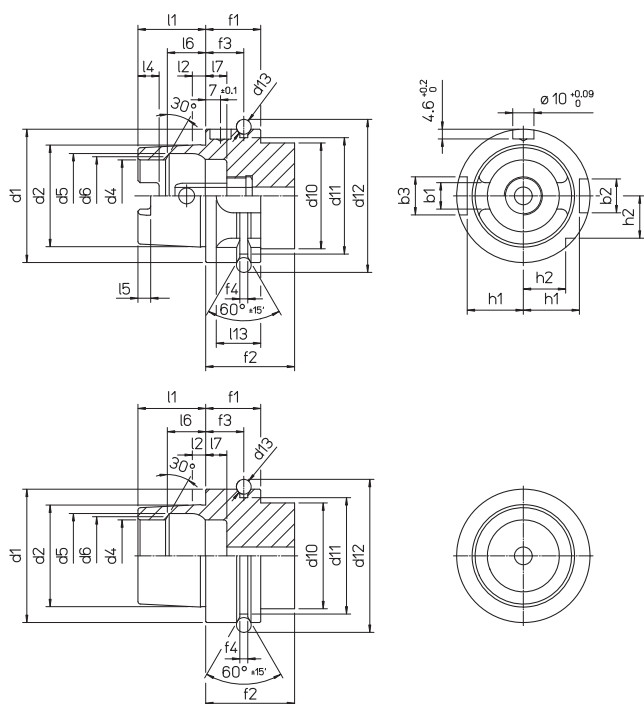


HSK-E	d1	d2	l1
32	32	24	16
40	40	30	20
50	50	38	25
63	63	48	32
-	-	-	-

## HSK-F

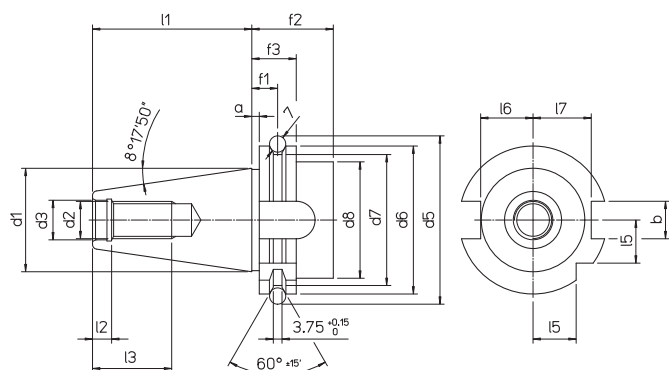


HSK-F	d1	d2	l1
-	-	-	-
-	-	-	-
50	50	30	20
63	63	38	25
80	80	48	32

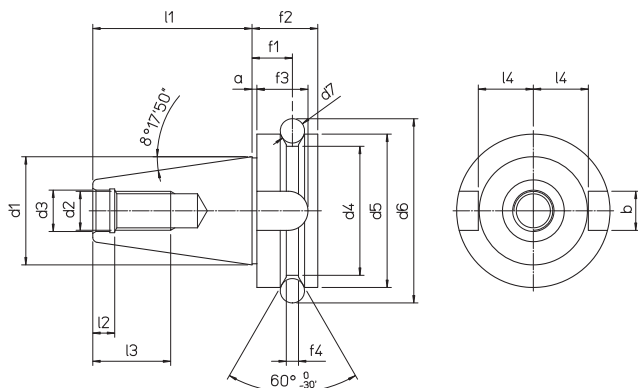


## HSK-A HSK-E

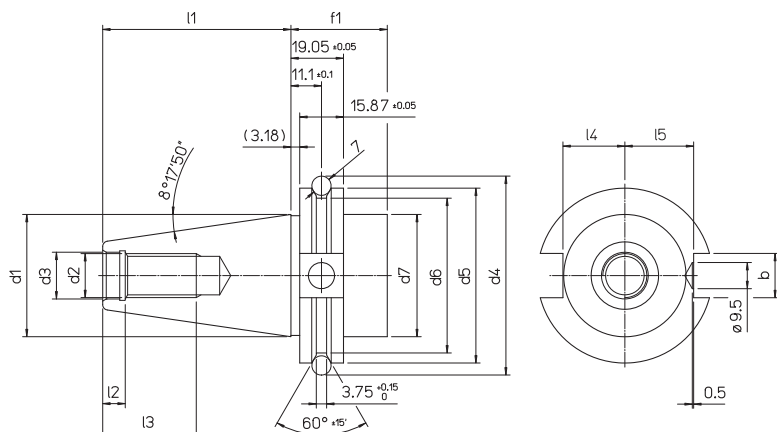
HSK	32	40	50	63	80	100
b1 $\pm 0.04$	7.05	8.05	10.54	12.54	16.04	20.02
b2 H10	7	9	12	16	18	20
b3 H10	9	11	14	18	20	22
d1 h10	32	40	50	63	80	100
d2	24.007	30.007	38.009	48.010	60.012	75.013
d4 H10	17	21	26	34	42	53
d5 H11	20.5	25.5	32	40	50	63
d6	19	23	29	37	46	58
d10 max.	26	34	42	53	68	88
d11 $0_{-0.1}$	26.5	34.8	43	55	70	92
d12 $0_{-0.1}$	37	45	59.3	72.3	88.8	109.75
d13	4		7			
f1 $0_{-0.1}$	20		26		29	
f2 min.	35		42		45	
f3 $\pm 0.1$	16		18		20	
f4 $0_{+0.15}$	2		3.75			
h1 $0_{-0.2}$	13	17	21	26.5	34	44
h2 $0_{-0.3}$	9.5	12	15.5	20	25	31.5
l1 $0_{-0.2}$	16	20	25	32	40	50
l2	3.2	4	5	6.3	8	10
l4 $0_{+0.2}$	5	6	7.5	10	12	15
l5 $0_{+0.2}$	3	3.5	4.5	6	8	10
l6 JS10	8.92	11.42	14.13	18.13	22.85	28.56
l7 $0_{-0.1}$	8		10	10	12.5	12.5
l13	12		19	21	22	24

**DIN 69871 A**  
**( ISO 7388-1 )**


ISO	30	40	45	50	60
a ±0.1	3.2				
b $^{+0.5}_0$	16.1		19.3	25.7	
d1	31.75	44.45	57.15	69.85	107.95
d2 6H	M12	M16	M20	M24	M30
d3 H7	13	17	21	25	32
d5 ±0.05	59.3	72.3	91.35	107.25	164.75
d6 $^0_{-0.1}$	50	63.55	82.55	97.50	155
d7 $^0_{-0.5}$	44.3	56.25	75.25	91.25	147.70
d8 max.	45	50	63	80	130
f1 ±0.1	11.1				
f2 min.	35				38
f3 $^0_{-0.1}$	19.1				
l1 $^0_{-0.3}$	47.8	68.4	82.7	101.75	161.90
l2 $^{+0.5}_0$	5.5	8.2	10	11.5	14
l3 min.	24	32	40	47	59
l5 $^0_{-0.3}$	15	18.5	24	30	49
l6 $^0_{-0.3}$	16.4	22.8	29.1	35.5	54.5
l7 $^0_{-0.3}$	19	25	31.3	37.7	59.3

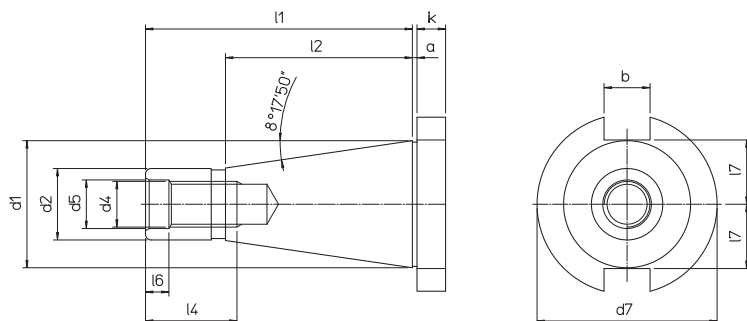
**MAS 403 BT A**


ISO	30	35	40	45	50	60
a ±0.4	2		3			
b $^{+0.2}_0$	16.1		19.3	25.7	25.7	
d1	31.75	38.10	44.45	57.15	69.85	107.95
d2 6H	M 12		M 16	M 20	M 24	M30
d3 H8	12.5		17	21	25	31
d4 $^0_{-0.5}$	38	43	53	73	85	135
d5 h8	46	53	63	85	100	155
d6 ±0.05	56.03	65.68	75.56	100.09	118.89	180.22
d7	8	10		12	15	20
f1 ±0.1	13.6	14.6	16.6	21.2	23.2	28.2
f2	22	24	27	33	38	48
f3 min.	17	20	21	26	31	34
f4	4	5		6	7	11
l1 ±0.2	48.4	56.4	65.4	82.8	101.8	161.8
l2 $^{+0.5}_0$	7		9	11	13	16
l3 min.	24		30	36	45	56
l4 $^0_{-0.3}$	16.3	19.6	22.6	29.1	35.4	60.1

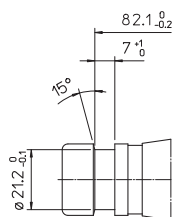


ISO	40	45	50
b $\begin{smallmatrix} +0.2 \\ 0 \end{smallmatrix}$	16.1	19.3	25.7
d1 6H	44.45	57.15	69.85
d2	M 16	M 20	M 24
d3 H7	17	21	25
d4 $\pm 0.05$	72.3	91.35	108.25
d5 $\begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$	63.55	82.55	98.5
d6 $\begin{smallmatrix} 0 \\ -0.5 \end{smallmatrix}$	56.25	75.25	91.25
d7 $\pm 0.15$	44.45	57.15	69.95
f1 min	35		38
l1 $\begin{smallmatrix} 0 \\ -0.3 \end{smallmatrix}$	68.4	82.7	101.75
l2 $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$	8.2	10	11.5
l3 min.	32	40	47
l4 $\begin{smallmatrix} 0 \\ -0.3 \end{smallmatrix}$	22.8	29.10	35.50
l5 $\begin{smallmatrix} 0 \\ -0.3 \end{smallmatrix}$	25	31.3	37.7

## DIN 2080

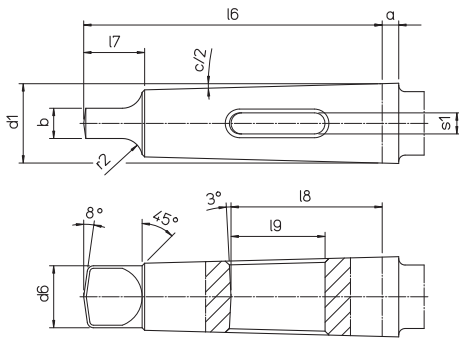


ISO	30	40	45	50
a $\pm 0.2$	1.6		3.2	
b H12	16.1		19.3	25.7
d1	31.75	44.45	57.15	69.85
d2 a10	17.4	25.3	32.4	39.6
d4 $\pm 0.05$	M 12	M 16	M 20	M 24
d5	13	17	21	26
d7 $\begin{smallmatrix} 0 \\ -0.4 \end{smallmatrix}$	50	63	80	97.5
k $\pm 0.15$	8	10	12	12
l1	68.4	93.4	106.8	126.8
l2	48.4	65.4	82.8	101.8
l4	24	32	40	47
l6 $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$	5.5	8.2	10	11.5
l7 max.	16.2	22.5	29	35.3

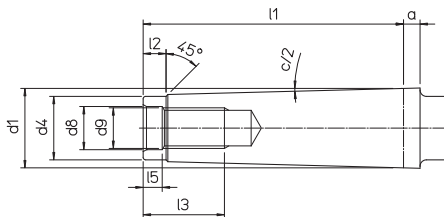


ISO 40 OTT

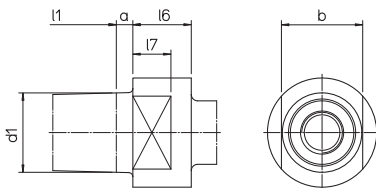
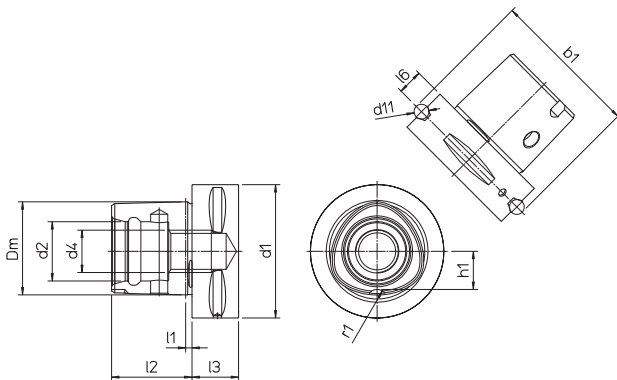


**DIN 228/B DIN 1806**


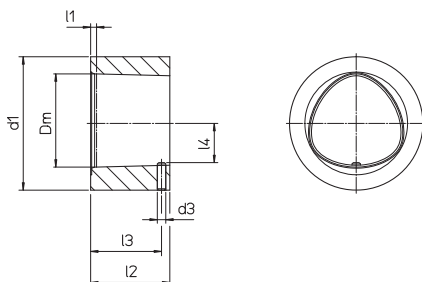
MORSE	4	5
a	6.5	
b H13	11.9	15.9
c/2	1°29'15"	1°30'26"
d1	31.267	44.399
d6 max.	24.5	35.7
l6 $\begin{smallmatrix} 0 \\ -1 \end{smallmatrix}$	117.5	149.5
l7 max.	24	29
l8	59.5	64
l9	37	42
r2	8	10
s1	8.3	12.4

**DIN 228/A**


MORSE	4	4 SIP
a	6.5	
b d9	32	
c/2	1°29'15"	
d1	31.267	
d4 max.	25	
d8	17	
d9	M 16	M 14
l1 max.	102.5	
l2	9	
l3	32	
l5 $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$	8.2	
l6	15	
l7	23	

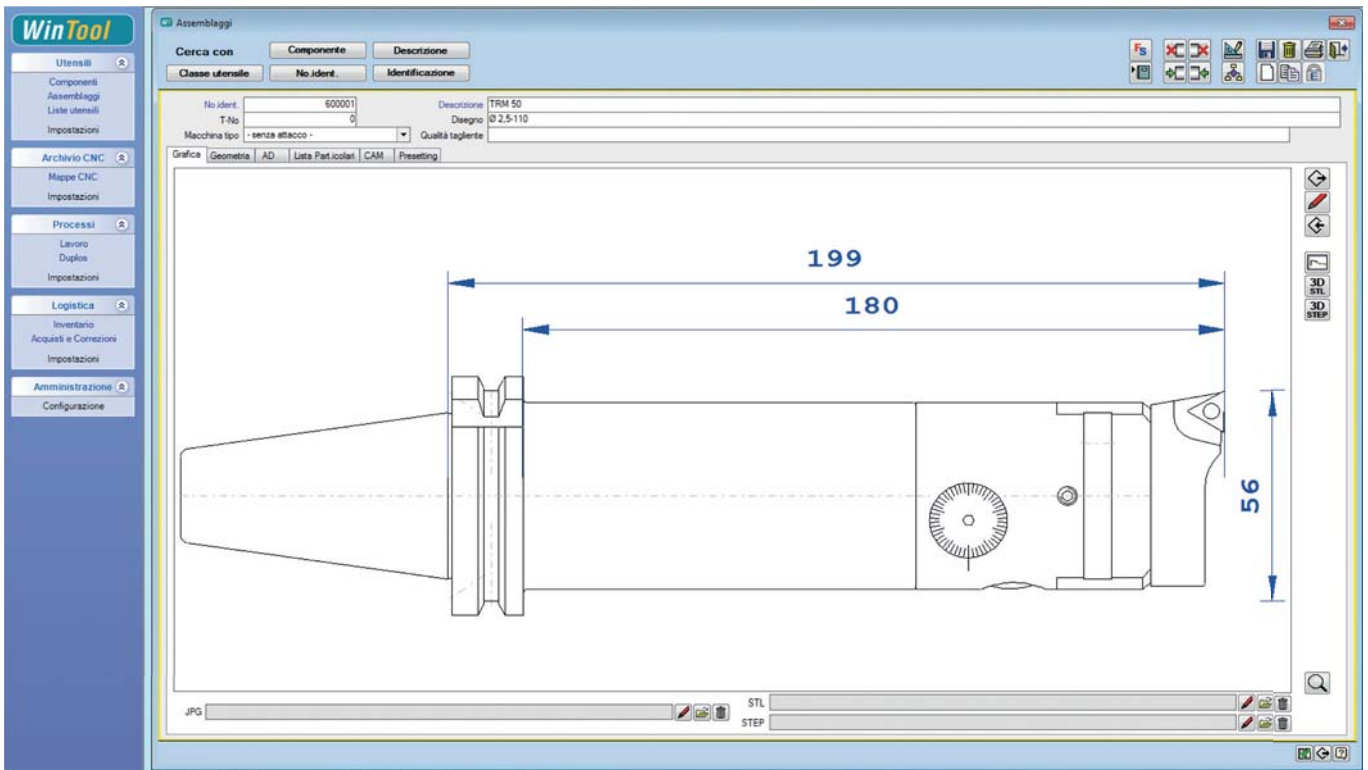
**DIN 2207**

**ISO 26623-1**


PSC	32	40	50	63	80	100
b1 ±0.1	39	46	59.3	70.7	86	110
Dm	22	28	35	44	55	72
d1 ±0.1	32	40	50	63	80	100
d2 $\begin{smallmatrix} +0.1 \\ -0.05 \end{smallmatrix}$	15	18	21	28	32	43
d4	M12x1.5	M14x1.5	M16x1.5	M20x2		M24x2
d11	5		7			10
l1	2.5		3			
l2 ±0.1	19	24	30	38	48	60
l3 min	15	20		22	30	36
l6 ±0.15	6	8	10	12		16
h1 ±0.1	9	11	14	18	22.2	29
r1 ±0.3	4	4	5	6	7	8

**ISO 26623-2**


PSC	32	40	50	63	80	100
Dm	22	28	35	44	55	72
d1 min	32	40	50	63	80	100
d3	2	2.5	3	4	5	6
l1	2.3	2.3	2.8	2.8	2.8	2.8
l2 ±0.1	18.4	23.4	29.4	37.4	47.4	59.4
l3 ±0.2	16.5	21	26	33.5	43	52.5
l4	9.4±0.1	11.5±0.2	14.5±0.2	18.5±0.2	22.8±0.2	29.6

It allows to be graphically constructed in a short period of time, showing the complete composition of the MODULHARD'ANDREA tools, including dimensions, weight and the list of components.



**Scheda Utensile**

TRM 50      600001      Diametro parte pezzo 56,00  
 Ø 2,5-110

Descrizione / Tipo	Design / Item No. / Product Code / Storage Location	Peso	
1	DIN69871-AD+B40 FC MHD50.120	MHD 50 41.8.50.01.040.28F	1,70
1	TRM 50	Ø 2,5-110 45.50.050.0050.0	1,00
1	SFTP 50	TPGX 1103...L 47.050.05.50.001	0,06
1	TPGX 110300L-10	DC 100T TPGX 110300L C10T	0,00
		<b>2,760</b>	

# HEADS BORING - FACING -

## U-TRONIC p.100

### SINGLE SLIDE

UT 3-360 S  
Ø max 800

UT 5-500 S  
Ø max 1000

UT 5-630 S  
Ø max 1250

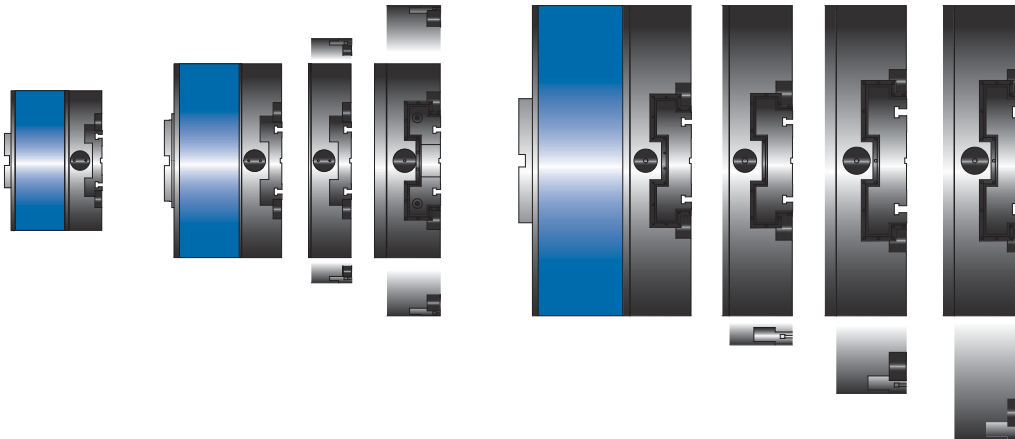
UT 5-800 S  
Ø max 1400

UT 8-800 S  
Ø max 1600

UT 8-1250 S  
Ø max 2700

UT 8-1000 S  
Ø max 2000

UT 8-1600 S  
Ø max 3200

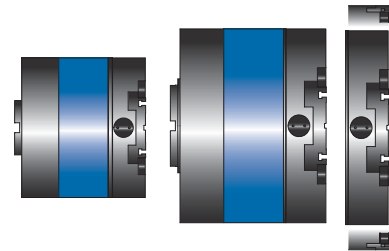


### GEARBOX

UT 3-360 S+R  
Ø max 800

UT 5-500 S+R  
Ø max 1000

UT 5-630 S+R  
Ø max 1250



## UT-Specials

**U-TRONIC** medium and large NC heads, that can be applied to boring machines, machining centers and special purpose machines. The movement of the slide is managed by a built-in servomotor directly connected to the NC and the application provides a connecting flange that can be manual, automatic, extended and angular. In addition to the standard range, a version with a built-in gearbox is also available as well as, on request, special versions with hole, sizes up to Ø 1600 mm, double-slide, with counterweights for self-balancing and Synchro.®



Extend

## TA-CENTER p.110

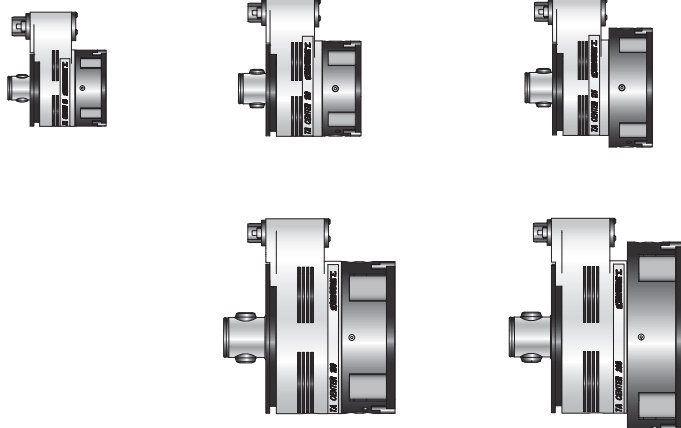
TA-C 80  
Ø max 160

TA-C 100  
Ø max 200

TA-C 160  
Ø max 320

TA-C 125  
Ø max 250

TA-C 200  
Ø max 400



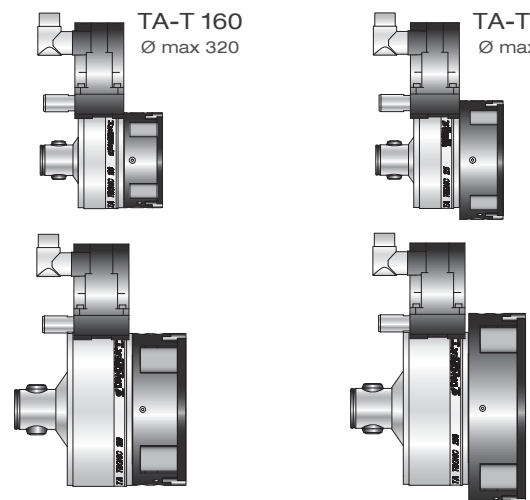
## TA-TRONIC p.118

TA-T 100  
Ø max 200

TA-T 160  
Ø max 320

TA-T 125  
Ø max 250

TA-T 200  
Ø max 400



**TA-CENTER** heads designed for machines with automatic tool change and which can be applied to any machining center. The movement of the toolholder slide is managed by an external U-DRIVE unit mounted onto the machine tool spindle.

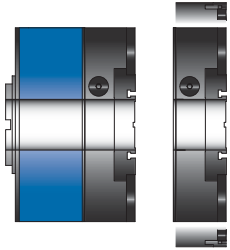
**TA-TRONIC** heads designed to be manually applied to small boring machines, machining centers and special purpose machines. The built-in motor is connected to the NC and drives the movement of the toolholder slide. The fixed body is supported by a flange or, for light operations, by a simple anti-rotation pin.

# RADIUSING - THREADING

## HOLE

UT 5-500 HOLE  
Ø max 1000

UT 5-630 HOLE  
Ø max 1200

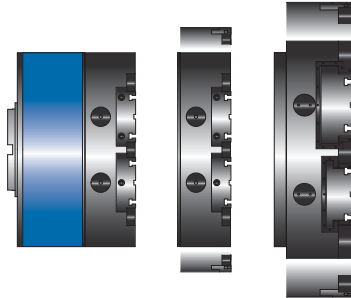


## DOUBLE SLIDE

UT 5-500 D  
Ø max 1000

UT 5-630 D  
Ø max 1200

UT 5-800 D  
Ø max 1400



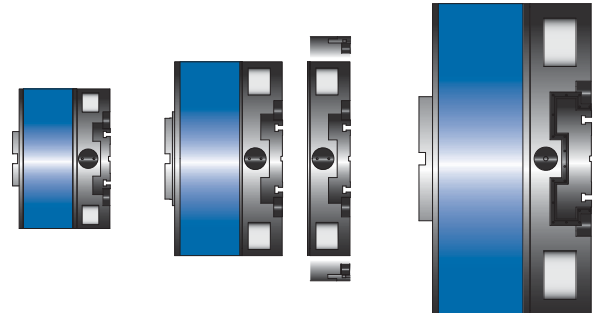
## HIGH SPEED

UT 3-360BH  
Ø max 600

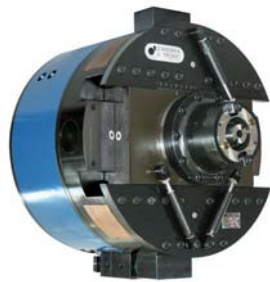
UT 5-500 BH  
Ø max 900

UT 5-630 BH  
Ø max 1100

UT 8-800 BH  
Ø max 1400



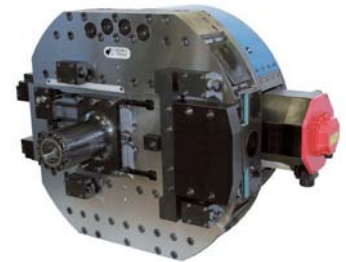
Angular  
Heads



High Speed



Double Slide



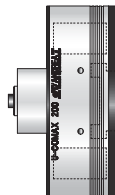
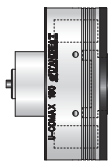
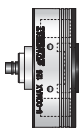
Synchro<sup>®</sup>

## U-COMAX p.124

CMX 125  
Ø max 200

CMX 160  
Ø max 250

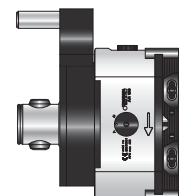
CMX 200  
Ø max 320



## AUTORADIAL p.130

AR 125  
Ø max 320

AR 160  
Ø max 400

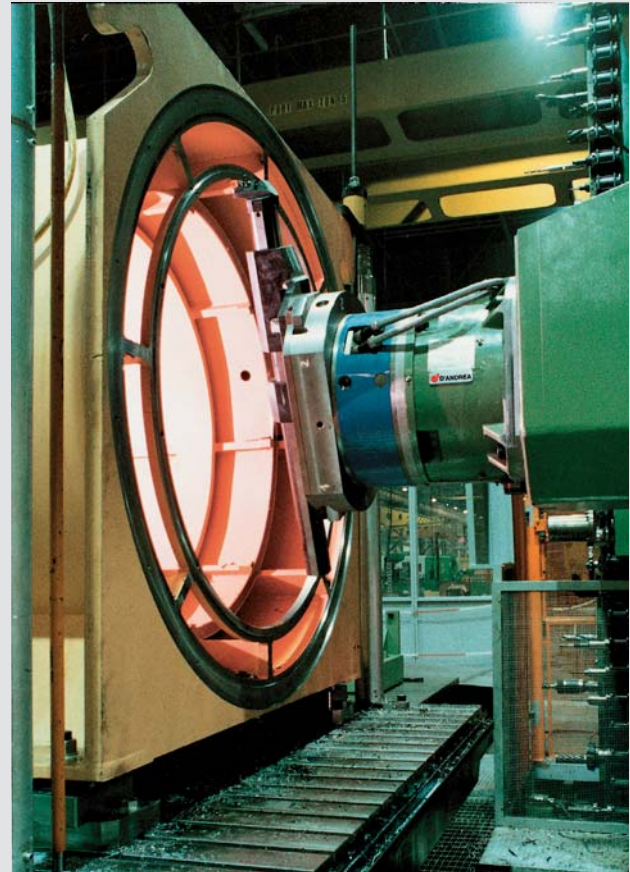
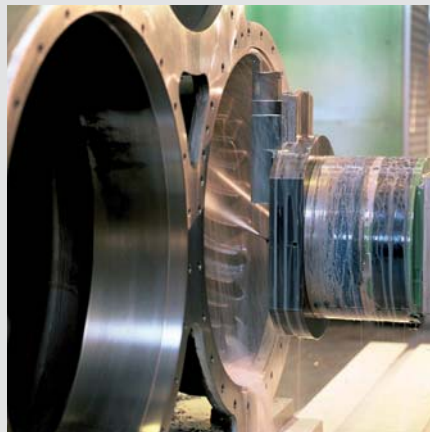
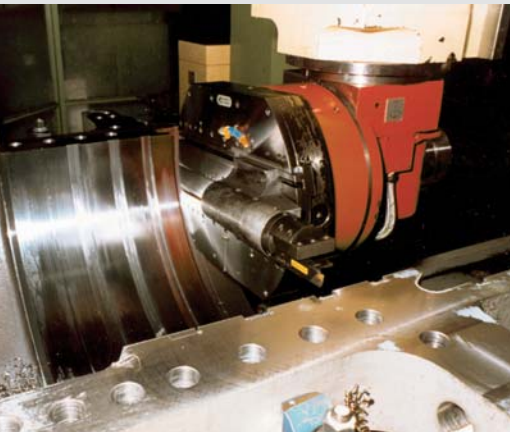
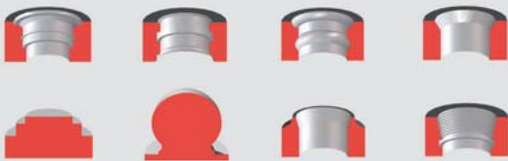
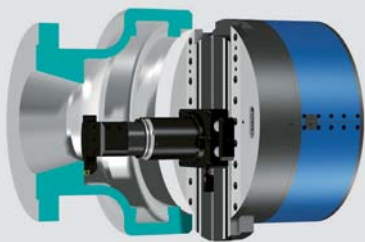


**U-COMAX** axial drive heads designed for transfer machines or special units. The movement of the slide is driven by a U-DRIVE unit mounted on the back side of the spindle unit and managed by the NC. **Synchro<sup>®</sup>** option available.

**AUTORADIAL** automatic facing heads that can be applied to machining centers and NC machines without any electronic interface. They perform a work cycle automatically without ever stopping the rotation of the spindle. They are particularly suitable to execute seats for elastic rings, serrated faces and phonographic finish.

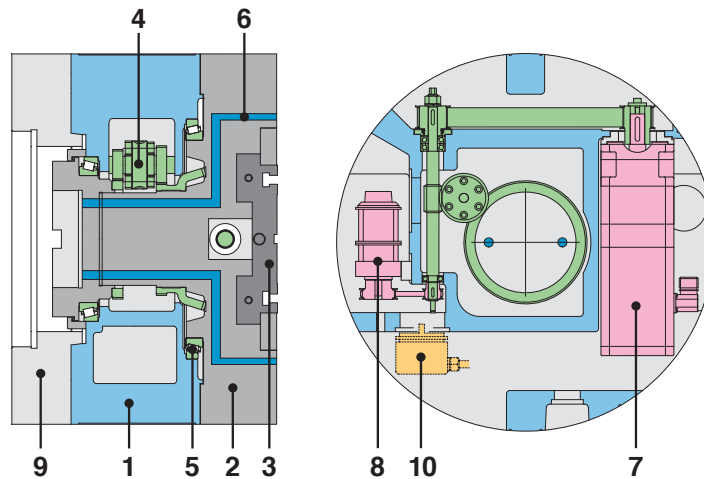
# U-TRONIC

**U-TRONIC** medium and large CN heads, that can be applied on boring machines, machining centers and special machines. The movement of the slide is managed by a built-in servomotor directly connected to the CN and the application provides an intermediate flange that can be manual, automatic, extended and angular. In addition to the standard range, the version with integrated reducer is available and, on request, special versions with hole, up to  $\varnothing$  1600 mm, with two slides, with counterweights for self-balancing and **Synchro**.<sup>®</sup>



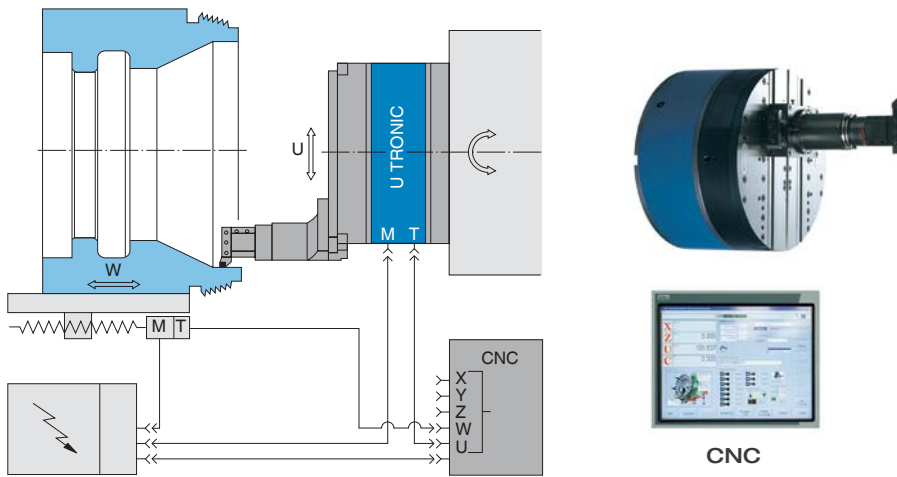
## COMPONENTS

1. Stationary body
2. Rotating body
3. Tool slide
4. Gears
5. Bearings
6. Coolant way
7. Servomotor
8. Limit switches
9. Flange
10. Encoder on request

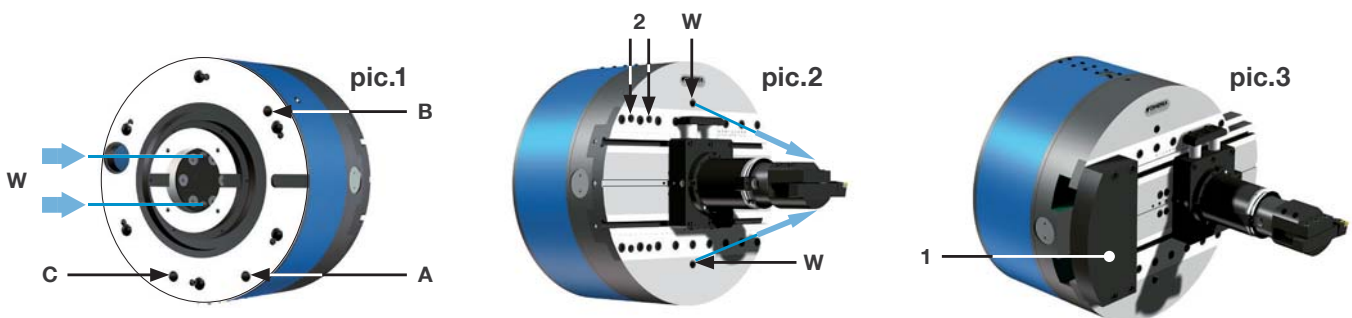


## COMMAND

The control of the U-Tronic heads takes place through the direct connection to the "U" axis of the numerical control of the machine tool and is used to perform any type of turning, boring, internal and external facing, threading, radius machining and spherical operations.



## PREARRANGEMENTS



### A-Internal pressurization pic.1

To prevent liquid and dust from getting into the motor, transducer, and limit switch areas, an  $\varnothing$  8,5 (A) hole is provided for internal pressurization of the fixed body with an air inlet at 0.5-1 BAR.

### B-Automatic greaser pic.1

A  $\varnothing$  8,5 (B) hole is provided on the head so that grease can be automatically put in the U-TRONIC.

### C-Atomized lubrication pic.1

To automatically lubricate the movement guides and the mother screw for dragging the toolholder slide located in the rotating body of the U-TRONIC, the head can be arranged, on request, for the introduction of a constant minimum flow of 10g/h of atomized oil at a pressure of 0,5 BAR in the  $\varnothing$  8,5 (C) hole.

### Coolant supply pic.1-2

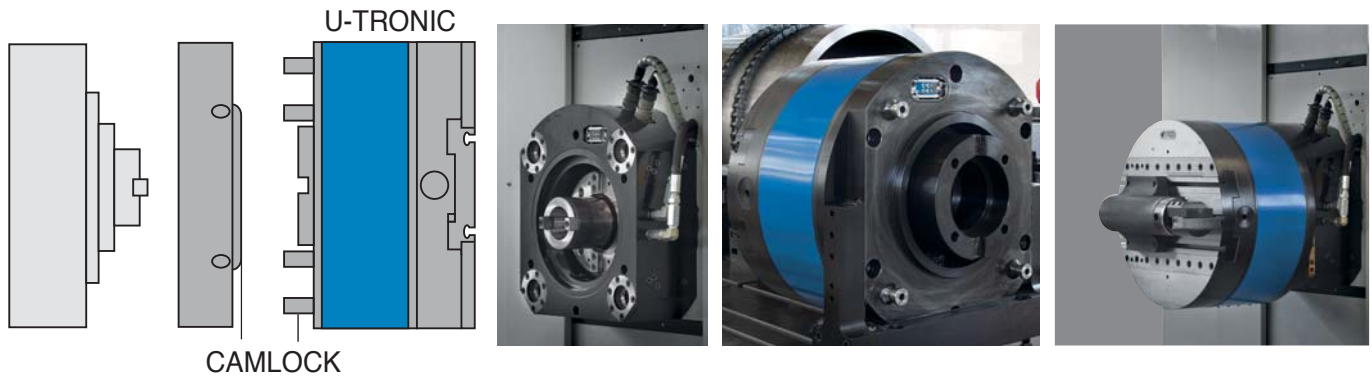
Internal grooves (W) are provided inside the U-TRONIC head that allow coolants to pass through from the machine spindle until the two threaded holes located next to the slide (W). Hoses can be screwed on these holes to bring coolant directly to the tool.  
**Max pressure BAR 40.**

### Balancing pic.3

To improve working conditions and balance the position of the tool when it appears shifted in relation to the U-TRONIC axis, counterweights (1) can be applied using the threaded holes (2) located on the rotating body.

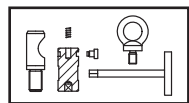
U-TRONIC is applied manually or automatically using a flange for fastening to the machine tool and a plate for the rotation of the rotating body.

It is applied manually using a flange for fastening with a cam lock quick coupling, or automatically with a palletized system and special connectors.



The following layout shows the basic information for the construction of the flange with cam lock rapid coupling.

The U-TRONIC UT 8-800 S and UT 8-1000 S do not include the fastening with a cam lock quick coupling.



### 394200136000

n°6 100051080012

n°1 100541100100

n°6 101601020600

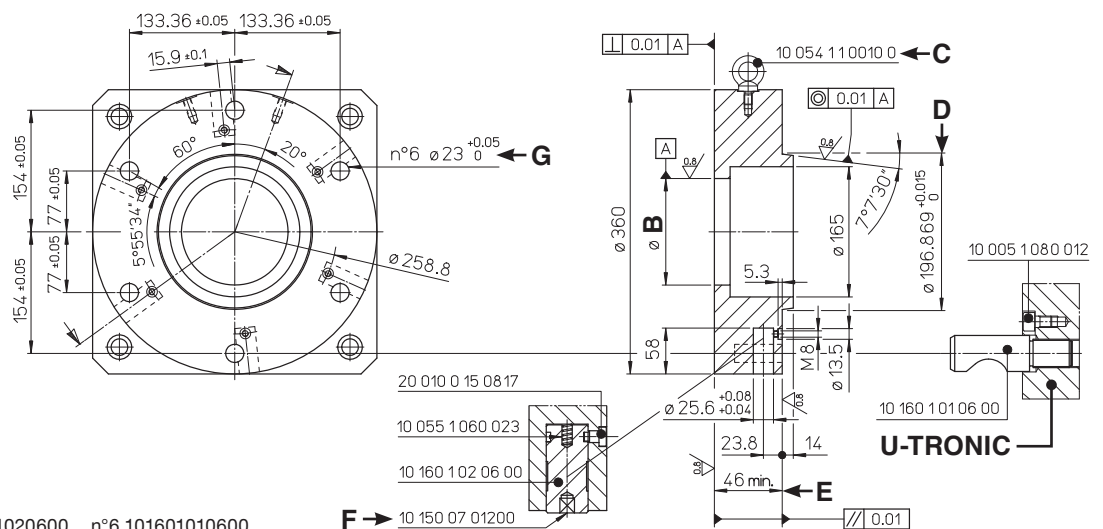
n°6 101601010600

n°1 101500701200

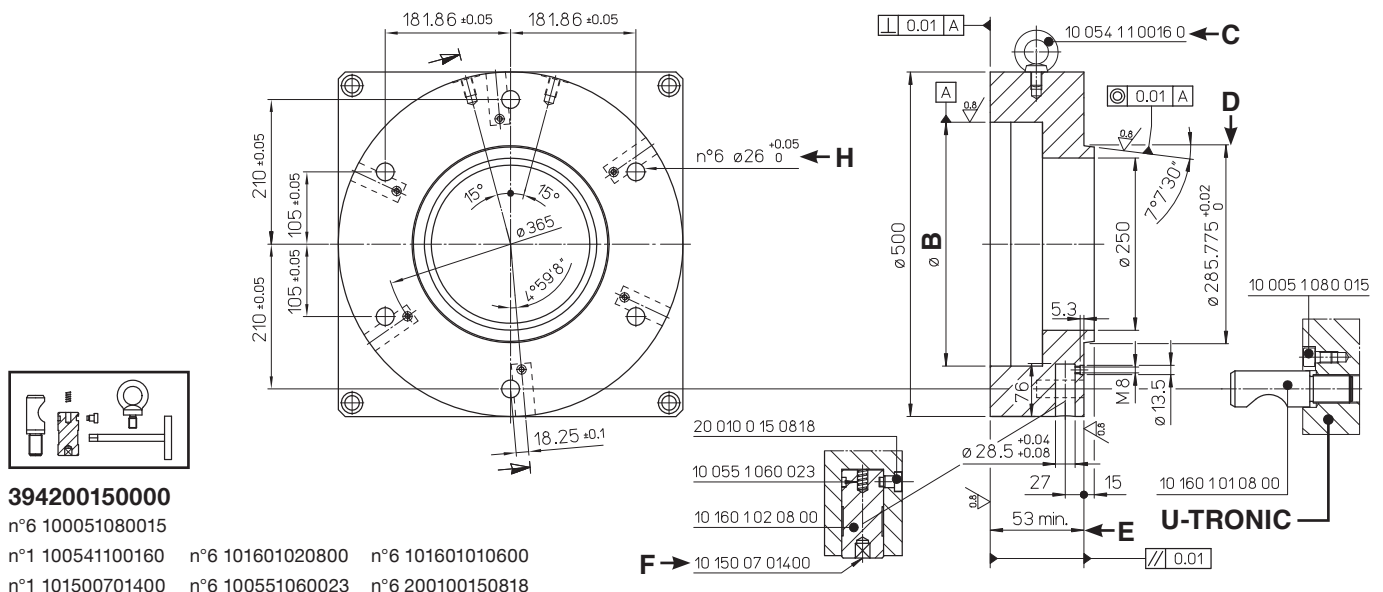
n°6 100551060023

n°6 200100150817

### U-TRONIC 3-360 S



### U-TRONIC 5-500 / 5-630 / 5-800 S



### 394200150000

n°6 100051080015

n°1 100541100160

n°6 101601020800

n°6 101601010600

n°1 101500701400

n°6 100551060023

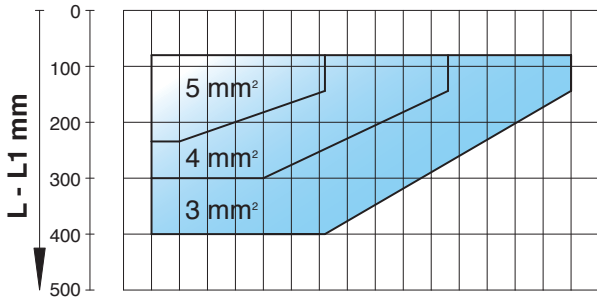
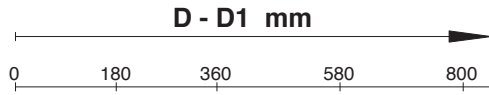
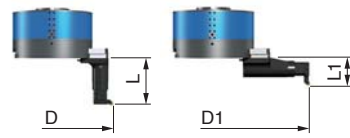
n°6 200100150818

**B** Spindle centering **C** Eyebolt **D** Control with gauge **E** Measurement to control depending on spindle protrusion  
**F** Spanner **G** Bores min. depth 46 **H** Bores min. depth 53

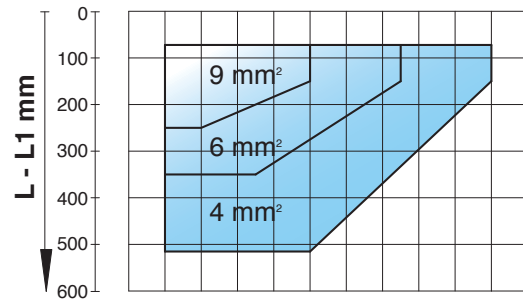
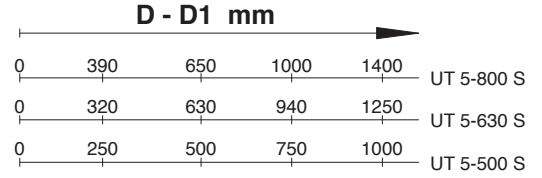
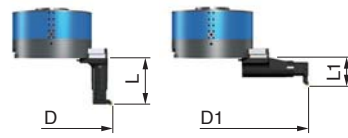
# CHIP REMOVAL CAPACITY

The chip removals are indicative for normal working conditions on steels with hardness 160-200 HB, (average  $K_s = 2000 \text{ N/mm}^2$ ) recommended  $V_t 120/160 \text{ m/min}$ .  
**The optimal values and working times must be determined with trials.**

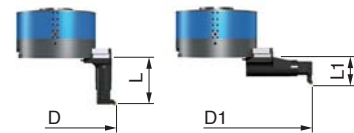
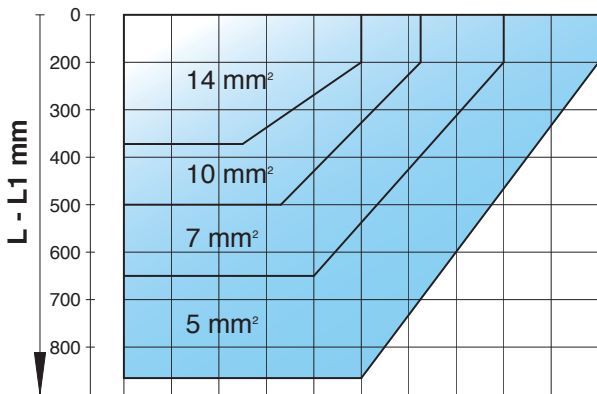
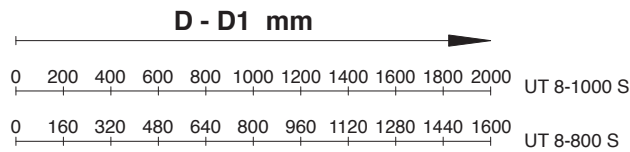
## U-TRONIC 3-360 S



## U-TRONIC 5-500 S 5-630 S 5-800 S

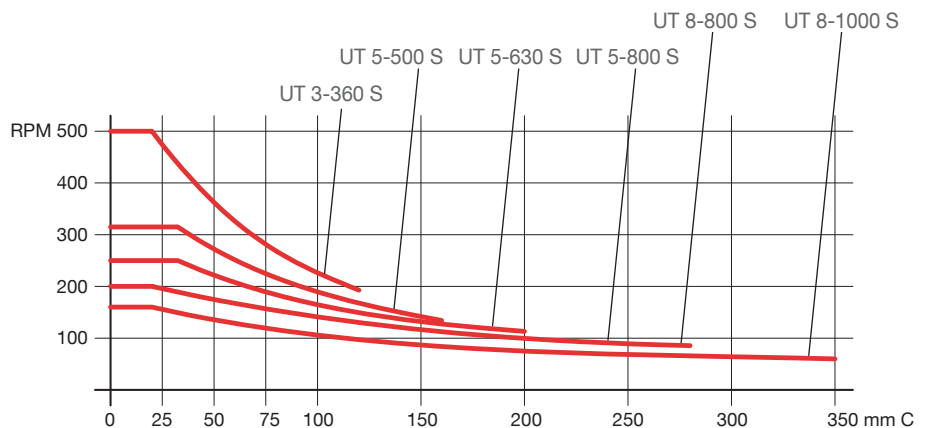


## U-TRONIC 8-800 S 8-1000 S

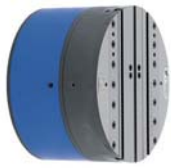


For good U-TRONIC head operations and to protect it from damages, it is advisable to follow the chart below that indicates the **maximum rpm**, based on the travel of the slide.

# MAX ROTATION SPEED







UT 3-360 S



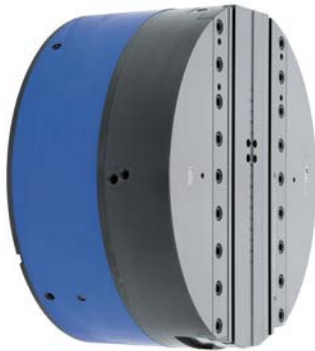
UT 5-500 S



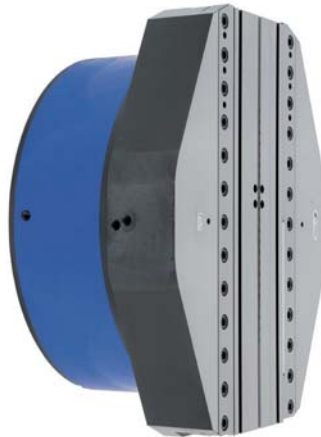
UT 5-630 S



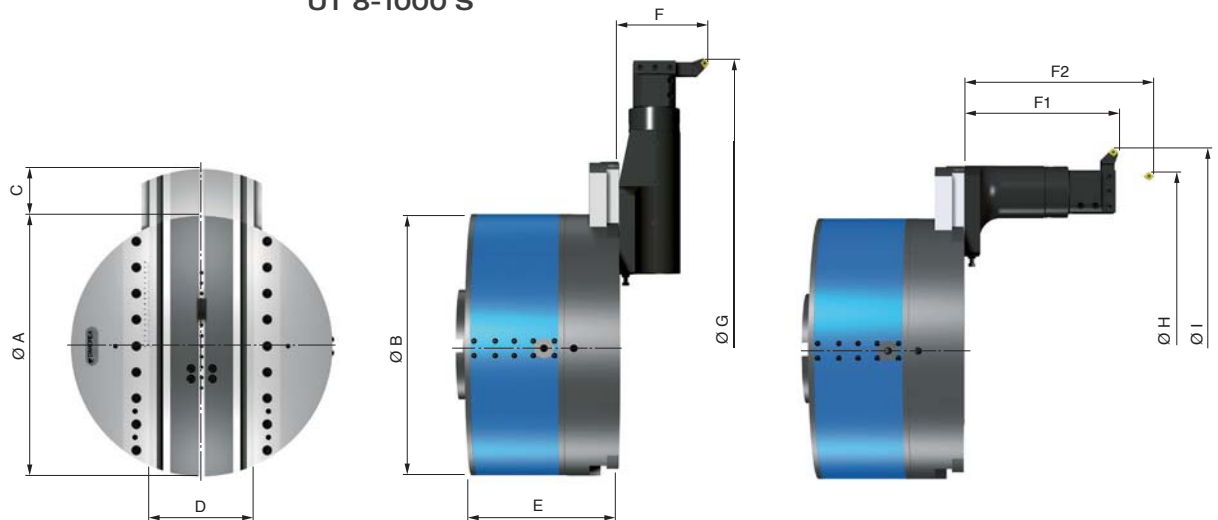
UT 5-800 S



UT 8-800 S



UT 8-1000 S



TECHNICAL DATA		UT 3-360 S	UT 5-500 S	UT 5-630 S	UT 5-800 S	UT 8-800 S	UT 8-1000 S
Ø A	mm	360	500	630	800		1000
Ø B	mm	360	500		800		
C radial traverse	mm	120	160	200	250	280	350
D	mm	154.6	199.6		230	250	260
E	mm	235	278.5	282	370	410	415
Ø G x F	mm	800 x 140	1000 x 150	1250 x 150	1400 x 150	1600 x 160	2000 x 160
Ø H x F2	mm	400 x 400	560 x 540	700 x 540	830 x 540	850 x 860	1050 x 860
Ø I x F1	mm	670 x 240	850 x 295	1050 x 295	1300 x 295	1250 x 370	1600 x 370
Max. mm/min	mm/min	1 ÷ 400				1 ÷ 500	
Max. $\omega$ /min	RPM	500	315	250	200		160
Weight	Kg	130	230	310	530	1000	1200
Radial force	daN	400	500		1000		
Torque	daNm	400	800		1000		
Boring accuracy		H7					
Max chip removal	mm <sup>2</sup> C40	5	9		14		
Rapid trasverse	mm/min	400				500	
Roughness	Ra	0,8 ~ 1,2					

# U-TRONIC S+R

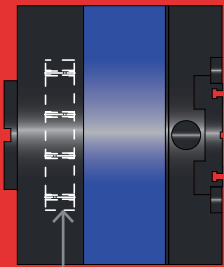
The U-TRONIC S+R, unlike the standard U-TRONIC S version, come with an integrated gearbox with a 1:4 ratio that increases the working torque and therefore chip removal.

They are therefore particularly suitable for applications with high power / speed electro-spindles that have limited torque curves at low rpm.

They are built in 3 models from  $\varnothing 360$  to  $\varnothing 630$  mm all with coolant through option.

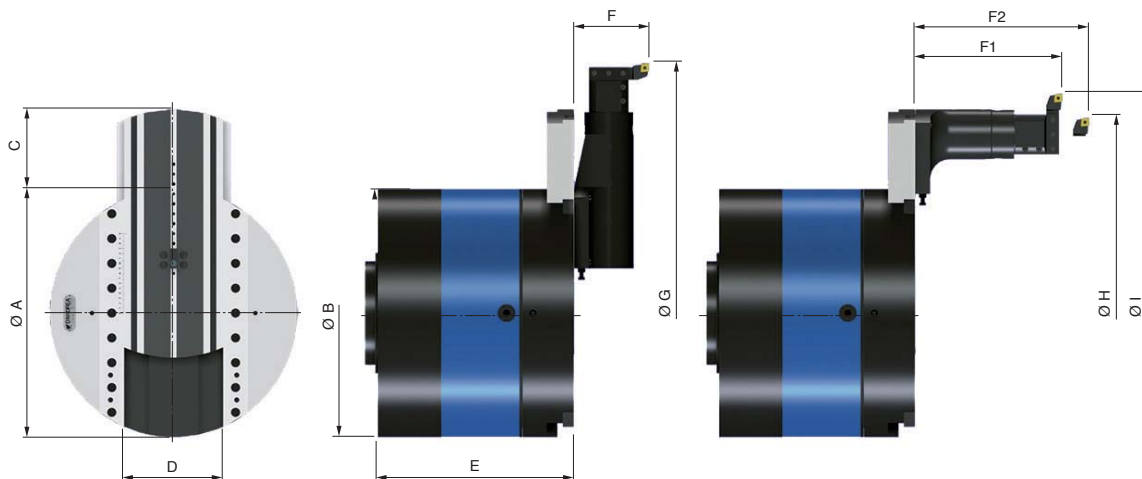
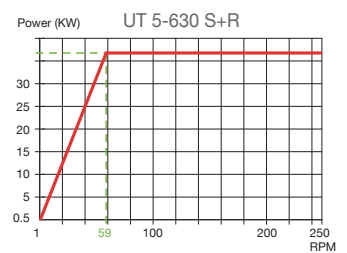
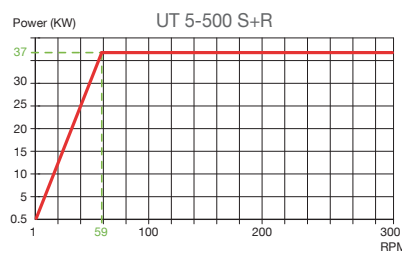
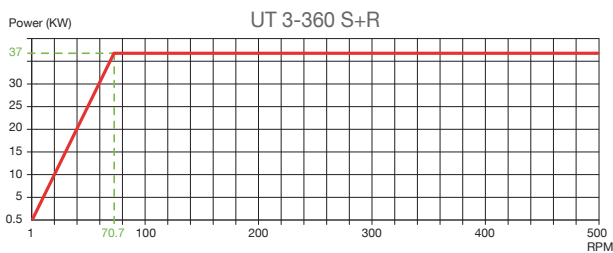


U-TRONIC S+R

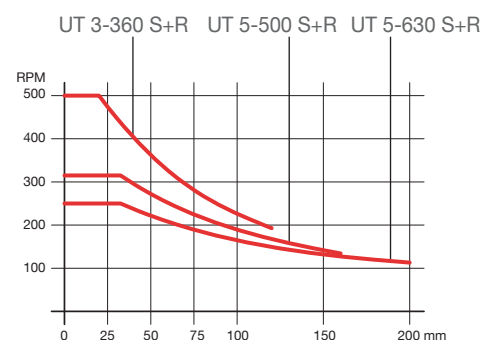


GEARBOX

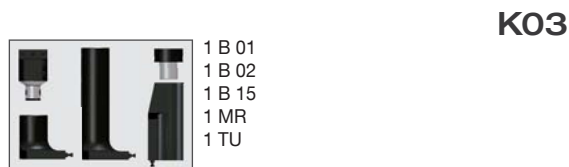
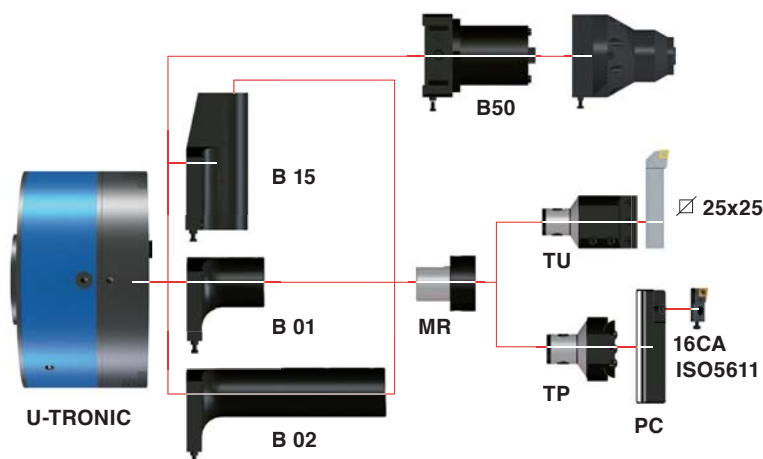
GEARBOX		UT3-360 S+R	UT5-500 S+R	UT5-630 S+R
Transmission ratio		1:4		
Outbound nominal torque	N·m	4000	6000	
Outbound max torque	N·m	5000	8000	
Max RPM	RPM	2000	1000	1260
Outbound max RPM	RPM	500	315	250



TECHNICAL DATA		UT 3-360 S+R	UT 5-500 S+R	UT 5-630 S+R
Ø A	mm	360	500	630
Ø B	mm	360	500	500
C radial traverse	mm	120	160	200
D	mm	154.6	199.6	
E	mm	335	396.5	400
Ø G x F	mm	800 x 140	1000 x 150	1250 x 150
Ø H x F2	mm	400 x 400	560 x 540	700 x 540
Ø I x F1	mm	670 x 240	850 x 295	1050 x 295
Max. mm/min	mm/min	1 ÷ 400		
Weight	Kg	150	370	450
Radial force	N	4000	5000	
Boring accuracy		H7		
Max chip removal	mm <sup>2</sup> C40	5	9	



UT 3-360 / 5-500 / 5-630 / 5-800 / 8-800 / 8-1000 S  
 UT 3-360 / 5-500 / 5-630 S + R



REF.	CODE
KIT K03 UT 3-360 S	501703259300
KIT K03 UT 5-500 / 5-630 / 5-800 S	501705009300
KIT K03 UT 8-800 / 8-1000 S	501708009300

U-TRONIC	REF.	CODE	ØH7	B01/B02					kg
				A	B	C	D	E	
UT 3-360 S	B01	443005001150	50	80	23	100	135	150	5.5
	B02	443005002750	50	80	23	260	135	150	8.5
UT 5-500 / 5-630 / 5-800 S	B01	443006301550	63	100	30	155	170	200	11
	B02	443006303650	63	100	30	400	170	200	19
UT 8-800 / 8-1000 S	B01	443008002300	80	130	30	230	200	250	25
	B02	443008007200	80	130	30	720	250	250	60

U-TRONIC	REF.	CODE	ØH7	B15					kg	
				A	B	C	D	D1		E
UT 3-360 S	B15	445005001900	50	80	23	60	190	135	150	3.7
UT 5-500 / 5-630 / 5-800 S	B15	445006302500	63	100	30	70	270	170	200	7.5
UT 8-800 / 8-1000 S	B15	445008003001	80	130	30	85	300	200	250	34

U-TRONIC	REF.	CODE	MHD'	ØH7	Ø1	MR			kg
						L	L1	L2	
UT 3-360 S	MR 50/80.80	450208001060	80	50	80	95	50	45	1.6
UT 5-500 / 5-630 / 5-800 S	MR 63/98.80	450209801060	80	63	98	105	60	45	3
UT 8-800 / 8-1000 S	MR 80/130.80	450213001240	80	80	130	125	80	45	6
	MR 80/130.110	450213001340	110	80	130	185	80	105	9

U-TRONIC	REF.	CODE	MHD'	Ø1	L	L1	L2	L3	kg
UT 3 / 5 / 8 ... S ♦	TU 63/75.20	460506320001	63	75	75	55	20	20	4
UT 3 / 5 / 8 ... S	TU 80/95.25	460508025001	80	95	90	65	25	25	3.6
UT 8-800 / 8-1000 S	TU 110/110.32	460511032001	110	130	110	78	32	32	11.2

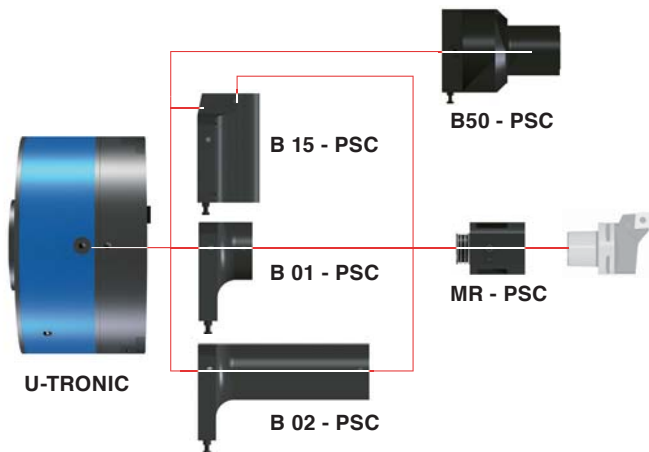
♦ Use with RD 80/ ....

U-TRONIC	REF.	CODE	Ø	kg
UT 5-500 / 5-630 / 5-800 S	TP 80/90.50	460408050001	90	2.3
UT 8-800 / 8-1000 S	TP 80/125.50	460408050002	125	3.2

U-TRONIC	REF.	CODE	Ø	kg
UT 5-500 / 5-630 / 5-800 S	PC 12.50	433050161350	135	2
	PC 13.50	433050162000	200	3.2
UT 8-800 / 8-1000 S	PC 14.50	433050163000	300	5

	<b>PTGNL16CA-16</b>		<b>PCLNL16CA-12</b>		<b>PSSNL16CA-12</b>		<b>PSRNL16CA-12</b>
CODE	483010161001	CODE	483010161002	CODE	483010161003	CODE	483010161004

## UT 3-360 / 5-500 / 5-630 / 5-800 / 8-800 / 8-1000 S UT 3-360 / 5-500 / 5-630 S + R



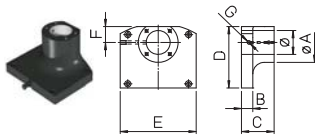
### K03 - PSC



1 B 01 - PSC  
1 B 02 - PSC  
1 B 15 - PSC  
1 MR - PSC

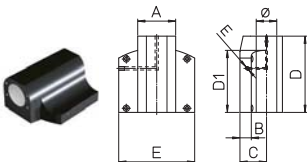
REF.	CODE
<b>KIT K03 PSC 63 UT 3-360 S</b>	501703259304
<b>KIT K03 PSC 63 UT 5-500 / 5-630 / 5-800 S</b>	501705009310
<b>KIT K03 PSC 80 UT 5-500 / 5-630 / 5-800 S</b>	501705009302
<b>KIT K03 PSC 80 UT 8-800 / 8-1000 S</b>	501708009301

### B01 / B02 - PSC



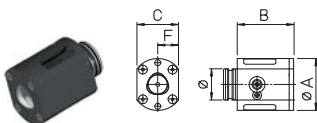
U-TRONIC	REF.	CODE	ØH7	A	B	C	D	E	F	G	kg
UT 3-360 S	<b>B01 - PSC 63</b>	443005000310	63	105	23	31	137	150	42	G1/8'	3.5
	<b>B02 - PSC 63</b>	443005001610	63	105	23	161	137	150	42	G1/8'	10
UT 5-500 / 5-630 / 5-800 S	<b>B01 - PSC 63</b>	443006302002	63	105	30	86	162	200	42	G1/8'	11
	<b>B02 - PSC 63</b>	443006304452	63	105	30	331	162	200	42	G1/8'	20
UT 8-800 / 8-1000 S	<b>B01 - PSC 80</b>	443006302001	75	130	30	71	185	180	50	G1/8'	10.5
	<b>B02 - PSC 80</b>	443006304451	75	130	30	316	235	180	50	G1/8'	30

### B15 - PSC



U-TRONIC	REF.	CODE	ØH7	A	B	C	D	D1	E	F	G	kg
UT 3-360 S	<b>B15 - PSC 63</b>	445005001210	63	100	23	60	121		150	42	G1/8'	8
UT 5-500 / 5-630 / 5-800 S	<b>B15 - PSC 63</b>	445006303152	63	100	30	70	201	170	200	42	G1/8'	6.5
	<b>B15 - PSC 80</b>	445006303911	75	130	39	85	262	200	180	50	G1/8'	27.5
UT 8-800 / 8-1000 S	<b>B15 - PSC 80</b>	445008003005	75	130	30		300	200	250	50	G1/4'	33

### MR - PSC



U-TRONIC	REF.	CODE	Øg6	A	B	C	F	kg
UT 3-360 S	<b>MR - PSC 63</b>	450206000630	63	105	114	84	42	6.5
UT 5-500 / 5-630 / 5-800 S	<b>MR - PSC 63</b>	450206000630	63	105	114	84	42	6.5
UT 5-500 / 5-630 / 5-800 S	<b>MR - PSC 80</b>	450208000800	75	130	129	100	50	11
UT 8-800 / 8-1000 S	<b>MR - PSC 80</b>	450208000800	75	130	129	100	50	11

## TOOLHOLDER WITH AUTOMATIC TOOL CHANGE B50 MHD' - PSC



pic.1



pic.1

U-TRONIC	REF.
UT 3-360 S	<b>B50 MHD' HSK - A63 -A100</b>
UT 5-500 / 5-630 / 5-800 S	<b>B50 MHD' DIN69871-A-B 50</b>
UT 8-800 / 8-1000 S	<b>B50 MHD' MAS BT50</b>

U-TRONIC	REF.
UT 3-360 S	<b>B50 PSC 63-80</b>
UT 5-500 / UT 5-630 / 5-800 S	<b>B50 PSC 63-80</b>
UT 8-800 / 8-1000 S	<b>B50 PSC 63-80</b>

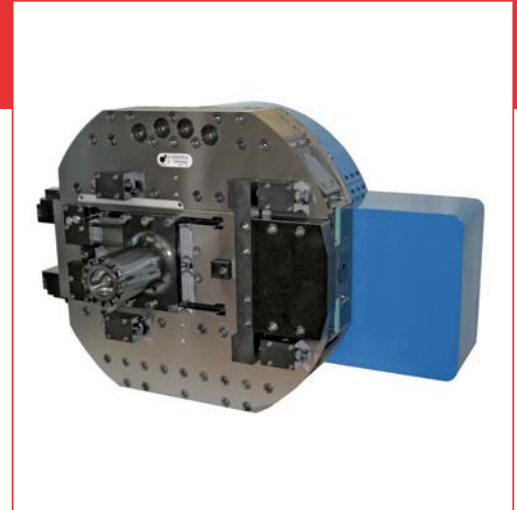
Special and HYDRAULICS B50 (pic.1) toolholders for automatic tool change, can be provided on request.

# U-TRONIC SYNCHRO

The new patented D'Andrea **SYNCHRO** system refers to the application on a head of the concept of synchronisation between the axes. The displacement of the tool-holder slide is performed by synchronising the motor that allows rotation of the machine spindle with the servomotor dedicated to the tool-holder slide movement.

Synchronisation between the axes is managed by the numerical control of the machine. The solution is used to increase the general performance of the head, in particular the feed rate of the slide.

Synchro <sup>®</sup>



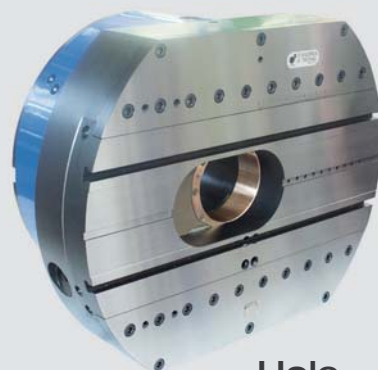
## SPECIAL SOLUTIONS



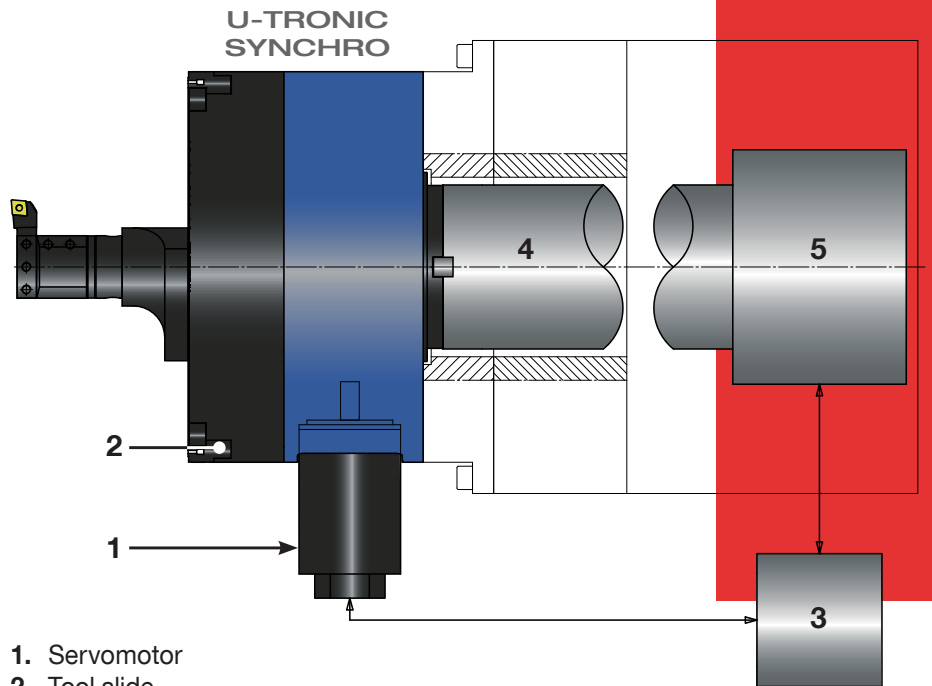
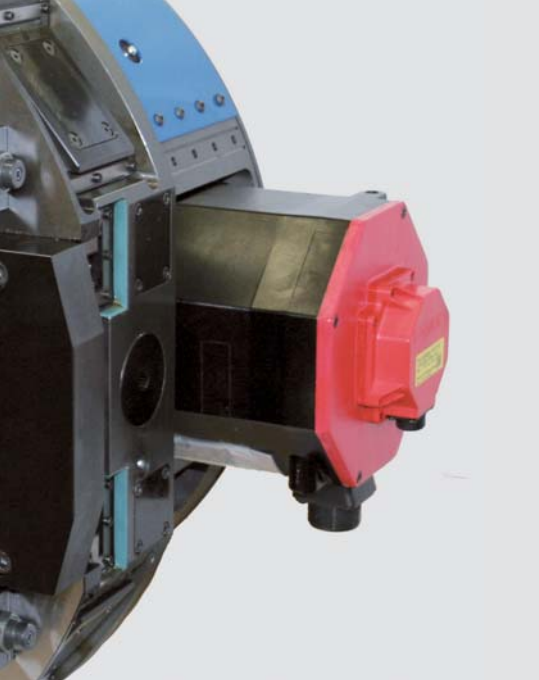
Extend



Double Slide



Hole



## APPLICATION OF D'ANDREA SYNCHRO SYSTEM ON U-TRONIC HEADS

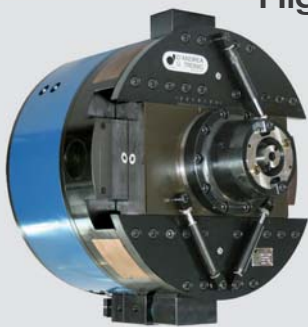
1. Servomotor
2. Tool slide
3. Machine Tool C.N.C.
4. Machine Tool Spindle
5. Machine Tool Spindle Servomotor

In the schematic figure the U-TRONIC head, equipped with the **SYNCHRO** D'Andrea system, controls the tool-holder slide movement (2) by means of the servomotor (1). The servomotor (1) is fitted on the fixed body of the head and transmits motion, through bevel gears and a satellite roller screw, to the tool-holder

slide (2) which is located on the rotating body driven by the machine spindle (4). To control the displacement of the slide (2), it is necessary to synchronise the rotation of the servomotor (1) with the servomotor of the machine spindle (5), and this is obtained by making the two motors rotate at the same number of revolutions (condition with

the slide stationary). The difference between the rotation speed of the motor (1) and the spindle motor (5) generates radial movement of the tool-holder slide (2). The correct synchronisation between two rotating parts is obtained by suitably programming the numerical control of the machine tool

High Speed



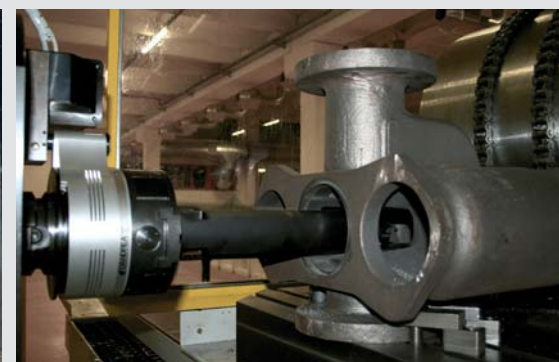
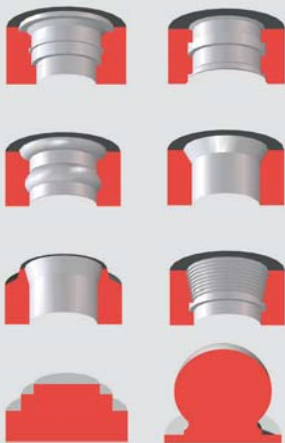
High Speed



Angular Heads

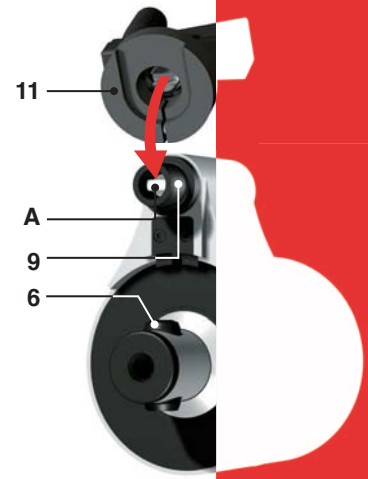
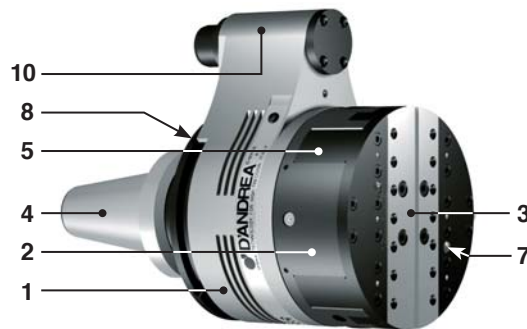
# TA-CENTER

**TA-CENTER** heads designed for machines with automatic tool change and which can be used on any machining center. The movement of the tool-holder slide is managed by an external U-DRIVE unit mounted onto the machine spindle.

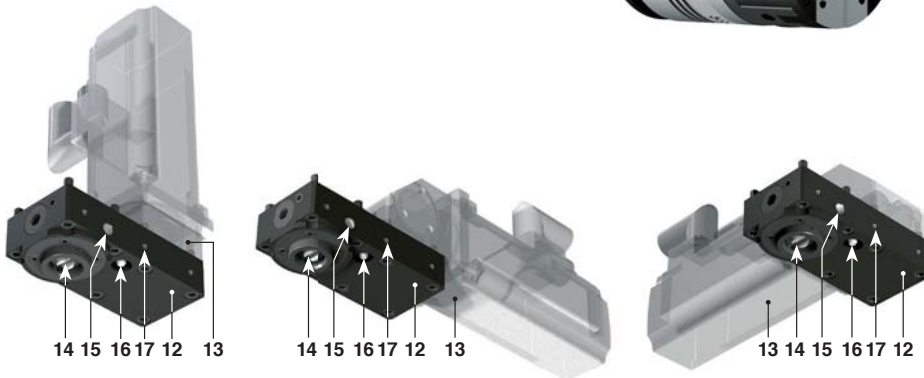


## COMPONENTS

1. Fixed body
2. Rotating body
3. Toolholder slide
4. Interchangeable taper
5. Balancing counter-weights
6. MHD' expanding pin
7. Coolant liquid outlet nozzle
8. Orientation ring
9. Retaining pin
10. "A" drive
11. Manual rotation device



12. Base element
13. Servomotor
14. Mechanical unit for automatic hook-up to the TA-CENTER drive
15. The unit comes with air inlet connection for cleaning the drive
16. Manual lubrication
17. n°6 M5x8 holes to be used for securing a possible protective casing



## COMMAND

The TA-CENTER boring and facing heads are designed to be used on machines with automatic tool change, therefore essentially on all machining centers. The control of the feed, the tool-holder slide and the tool position, also during rotation, is controlled by a **U-DRIVE** gearbox unit. This group is managed directly by an axis called "U" of the numerical control of the machining center. A machining center set up in this way allows to hit several different features such as internal and external turning, grooves, taper bores, concave and convex radius machining, cylindrical and conical threads and facing for serration.



## PREARRANGEMENTS



### Coolant supply pic.1

Coolant exits from the two adjustable nozzles in the TA-CENTER located next to the slide after crossing the taper and the rotating body of the head. This noteworthy advantage ensures longer duration of the insert, quicker cutting speed and for obtaining good surface finishes. The centralized supply of coolant does not harm the TA-CENTER of which the internal labyrinth protected by an O-ring. It is advisable to not exceed **40 BAR** of pressure.



### Balancing pic.2

TA-CENTER heads are designed with two counter-weights (5) for automatic balancing, that move opposite to the slide (3) allowing to machine at a higher number of rpms without noticeable oscillations.

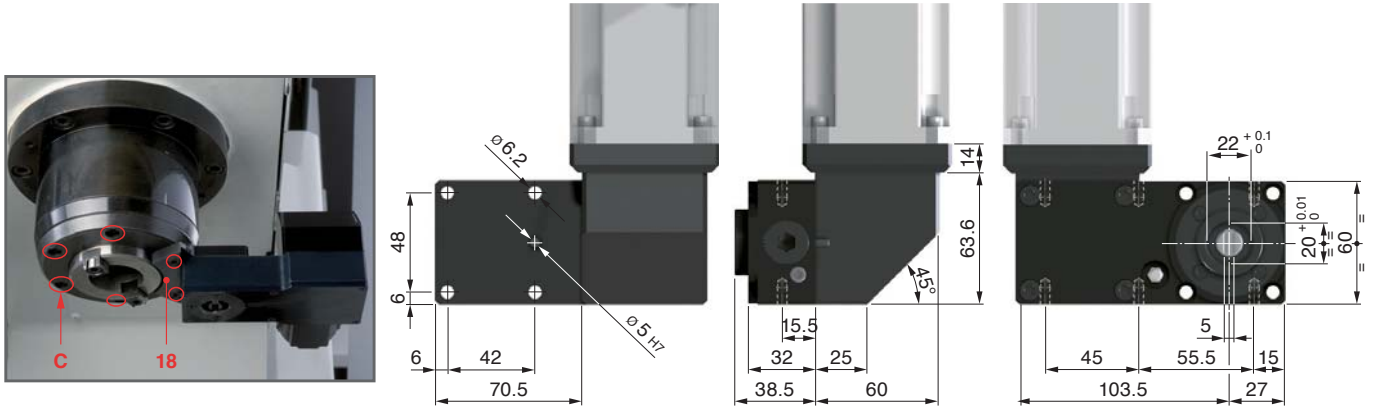


### U-Drive

D'ANDREA has developed a standard U-DRIVE drive unit (horizontal and at 90°), on which different types of motors can be fitted.

The U-DRIVE can be easily positioned on the machine (see photo) with a support (18) plate adaptor to the machine connected and fastened to the holes (C) on the front of the spindle.

Other special configurations can be provided on request.



### U-DRIVE assembly TA-CENTER

For a correct installation of the U-DRIVE and TA-CENTER, carefully follow these instructions:

1. Mount the cone on the TA-CENTER, detect the B distance between the gauge limit of the cone (4) and the retaining pin plane (9). Calculate X height with the formula  $X=B+4$  mm. Warning, if more heads are employed on the same machine, calculate the X height by using the lower B value.

2. Mount the plate (18) and the U-DRIVE on the machine according to the Layout and detect the F distance between the spindle gauge limit and the U-DRIVE plane.

The F distance must be equal to the X height.

The plate (18) is thicker than indicated in the layout, to get the F and X distances alike, the plate thickness must be trimmed (18). After adjusting the F height, remount the U-DRIVE by paying attention to its alignment, the position of the drive shaft (22) and distance (23) between the drive shaft axis (22) and the machine spindle centre.

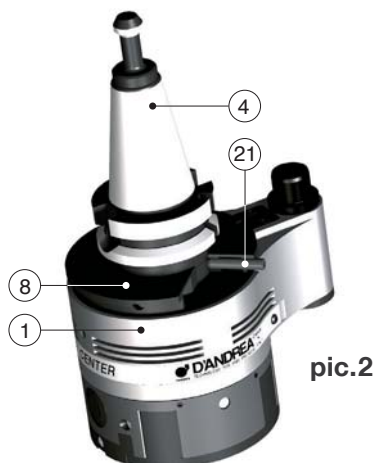
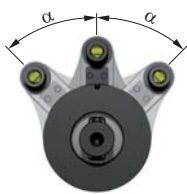
**⚠ The driving flange (24) must point towards the centre of the spindle.**

3. To align the TA-CENTER to the U-DRIVE, remove the two locking dowels (21) of the orientation ring (8) to the left and right of the white reference point, and replace them temporarily with two longer dowels, integrating the ring to the fixed body. Screw the 4 ring dowels until they lay slightly to the cone (4) (pic.1-2).

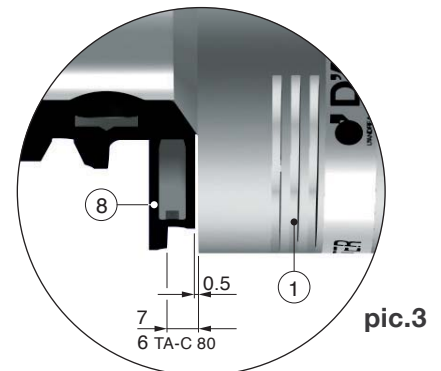
After checking that the head is in the HOME POSITION, that the slide stroke is 0 and that the transmission shaft (22) of the U-DRIVE is aligned with the retaining pin (9) of the head, spindle orientation (M19), manually mount the head in the machine. Insert the cone (4) in the spindle by rotating the fixed body (1) up to the U-DRIVE, once the TA-CENTER and U-DRIVE are aligned, lock the TA-CENTER in the machine and tighten all dowels (21) putting the two original dowels one at a time. During this operation, pay attention to the height between the ring (8) and the fixed body (1) (pic.3). Load and unload the TA-CENTER manually a few times to check the alignment.



pic.1



pic.2



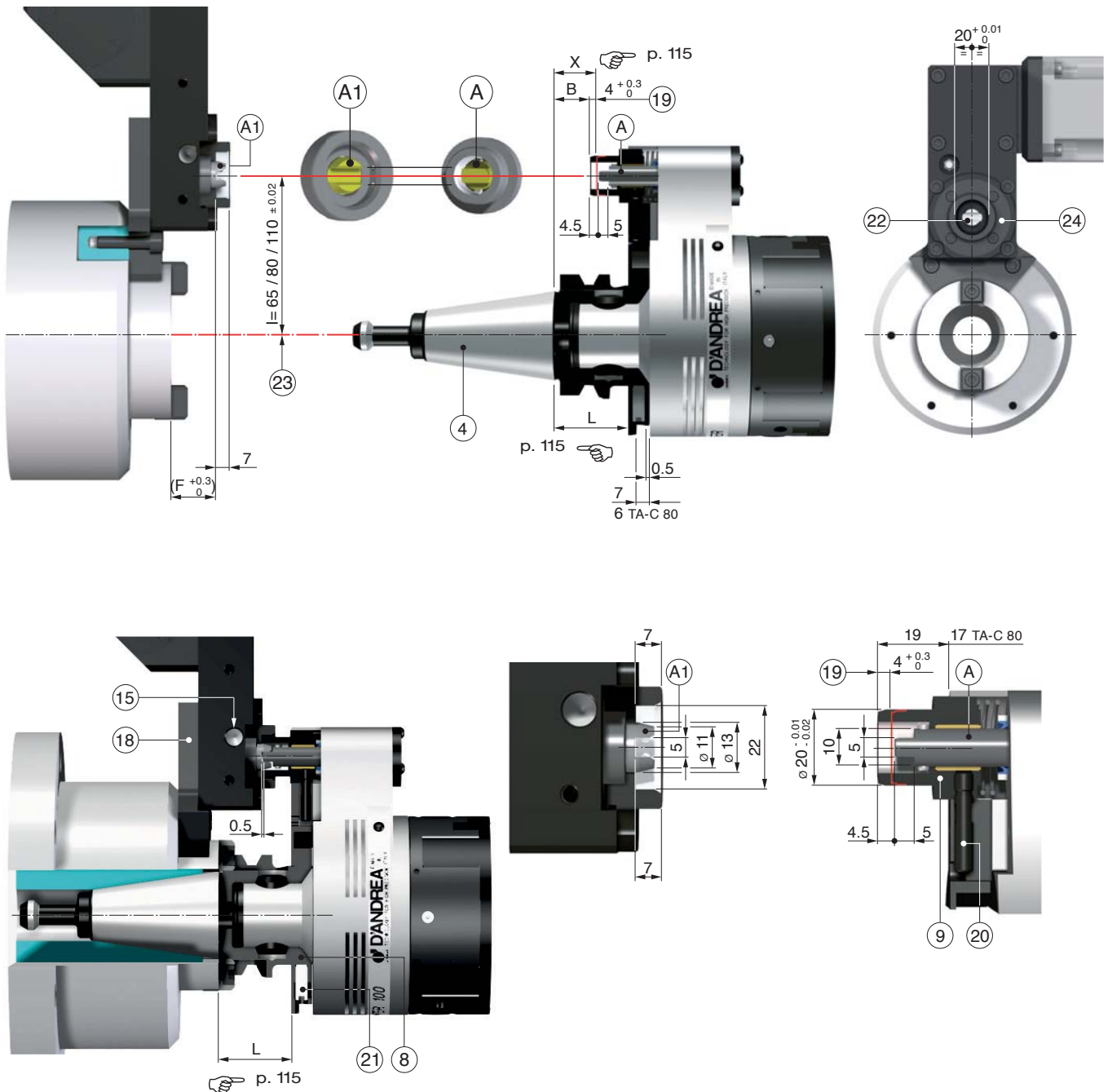
pic.3

## U-DRIVE assembly TA-CENTER

### ⚠ WARNING

During tool changes the “A” shafts of the TA-CENTER and “A1” U-DRIVE must comply with the correct “HOME POSITION” position, must be run always in unidirectional way to allow :

- the perfect coupling tooth “A” to “A1”.
- can be properly attached, the rotating body can be properly coupled to the fixed body
- Recognition of the “0” position of the tool slide should occur, otherwise it is likely to pass the limit and cause damage inside the head.



15. Air inlet connection for cleaning the drive 1/8 GAS.

18. Support plate for blocking and adapting the X dimension of the U-DRIVE ( $X^{+0.3}_0$ ) mm.

19. Release rotation lock travel.

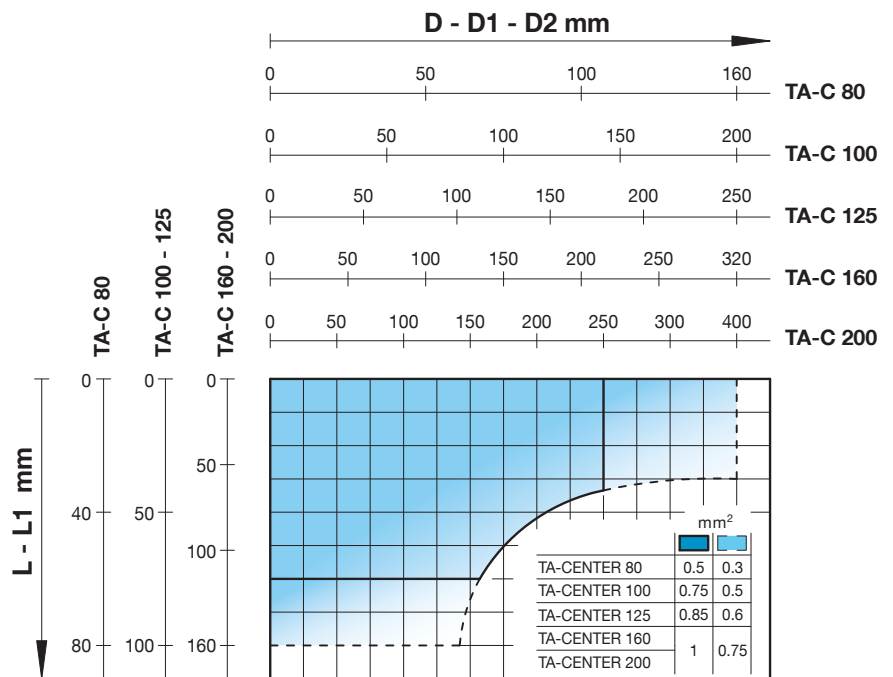
20. Locking-unlocking lever.

The chip removals are indicative for normal working conditions on steels with hardness 160-200 HB, (average Ks = 2000 N/mm<sup>2</sup>) recommended Vt 120/160 m/min.

The optimal values and working times must be determined with trials.

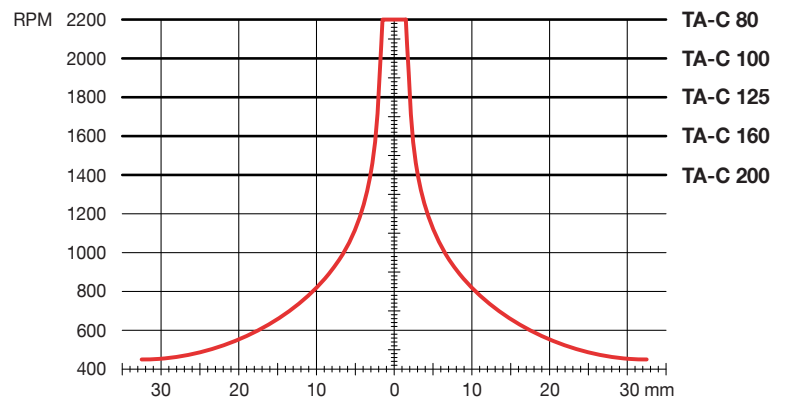


	TA-C 80	TA-C 100	TA-C 125	TA-C 160	TA-C 200
<b>D</b>	8 ~ 62	10 ~ 72	10 ~ 81	20 ~ 109	20 ~ 124
<b>L</b>	60	75	75	125	125
<b>D1</b>	62 ~ 102	72 ~ 122	63 ~ 131	103 ~ 203	88 ~ 218
<b>L1</b>	80	100	100	160	160
<b>D2</b>	112 ~ 160	122 ~ 200	131 ~ 250	203 ~ 320	218 ~ 400
<b>L2</b>	20.5	25.5	25.5	38.5	38.5



For good TA-CENTER head operations and to protect it from damages, it is advisable to follow the chart below that indicates the **maximum rpm**, based on the travel of the slide.

## MAX ROTATION SPEED



K02



REF.	CODE
K02 TA-C 80 I.65	501250800650
K02 TA-C 80 I.80	501250800800
K02 TA-C 100 I.80	501251000800
K02 TA-C 100 I.110	501251001100
K02 TA-C 125 I.80	501251250800
K02 TA-C 125 I.110	501251251100
K02 TA-C 160 I.110	501251601100
K02 TA-C 200 I.110	501252001100

K03



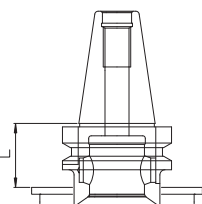
1 P120 1 P130

REF.	CODE
KIT K03 TA-C 80	501200300801
KIT K03 TA-C 100-125	501200301001
KIT K03 TA-C 160-200	501200301601

MHD'



REF.	MHD'	TA-C 80		
		CODE	L	X
DIN 69871-A30 MHD'40.45.5	40	41 6 40 01 030 20	35	22
DIN 69871-A40 MHD'40.45	40	41 6 40 01 040 20	34.5	21.5
MAS403 BT30 MHD'40.35.5	40	41 6 40 01 030 30	25	12
MAS403 BT40 MHD'40.45	40	41 6 40 01 040 30	34.5	21.5

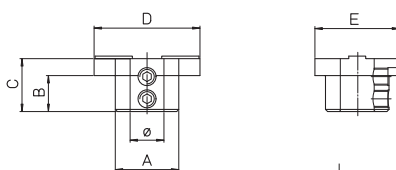


REF.	MHD'	TA-C 100		TA-C 125			
		CODE	L	X	CODE	L	X
DIN69871-A40 MHD'50.48	50	41 6 50 01 040 20	36.5	21.5	41 6 50 01 040 20	36.5	21.5
DIN69871-A40 MHD'50.56	50	41 6 50 01 040 70	44.5	29.5	41 6 50 01 040 70	44.5	29.5
MAS403 BT40 MHD'50.38.5	50	41 6 50 01 040 39	27	12	41 6 50 01 040 39	27	12
MAS403 BT40 MHD'50.48	50	41 6 50 01 040 30	36.5	21.5	41 6 50 01 040 30	36.5	21.5
MAS403 BT40 MHD'50.56	50	41 6 50 01 040 80	44.5	29.5	41 6 50 01 040 80	44.5	29.5
HSK-A63 MHD'50.66	50	41 6 50 15 063 20	54.5	39.5	41 6 50 15 063 20	54.5	39.5
ANSI/CAT40 MHD'50.66	50	41 6 50 01 040 40	54.5	39.5	41 6 50 01 040 40	54.5	39.5

REF.	MHD'	TA-C 160		TA-C 200			
		CODE	L	X	CODE	L	X
DIN69871-A50 MHD'80.48	80	41 6 80 01 050 29	36.5	21.5	41 6 80 01 050 29	36.5	21.5
MAS403 BT50 MHD'80.50	80	41 6 80 01 050 39	38.5	23.5	41 6 80 01 050 39	38.5	23.5
HSK-A100 MHD'80.88	80	41 6 80 15 100 20	76.5	61.5	41 6 80 15 100 20	76.5	61.5
ANSI/CAT50 MHD'80.62	80	41 6 80 01 050 40	50.5	35.5	41 6 80 01 050 40	50.5	35.5

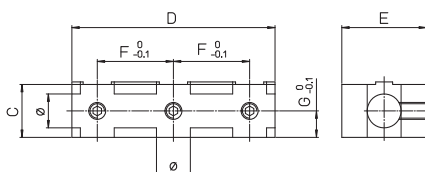
Complete range of arbors on page 10

P120

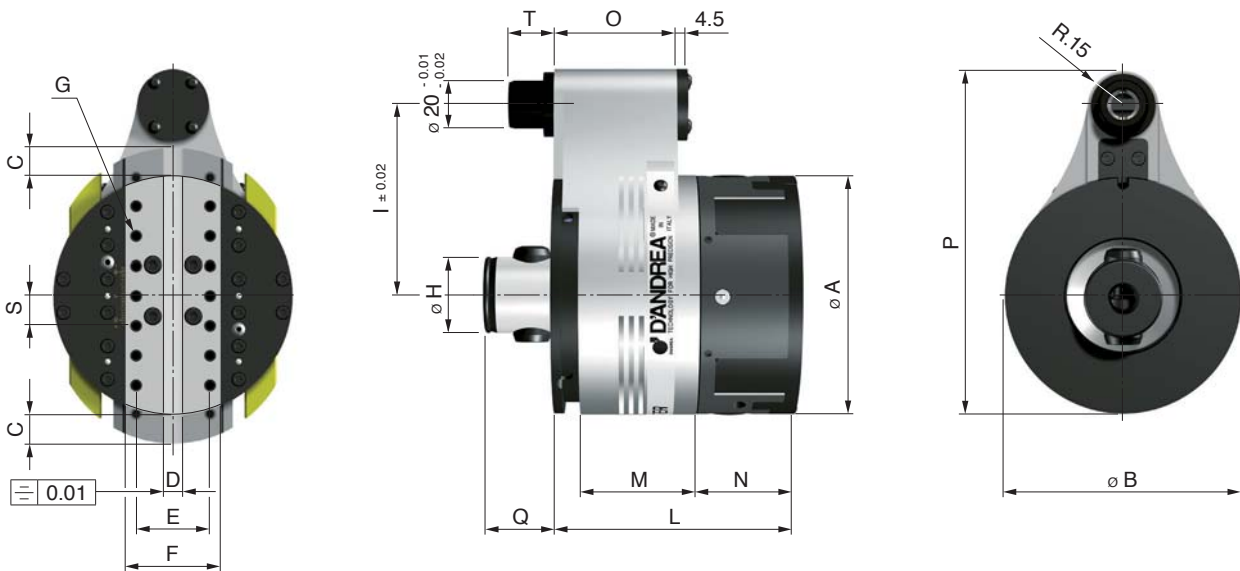


	REF.	CODE	ØH7	A	B	C	D	E	Kg.
TA-C 80	P120	431550160200	16	30	14	20	40	32	0.1
TA-C 100-125	P120	431550160250	16	30	17	25	50	40	0.2
TA-C 160-200	P120	431550250380	25	47	27.5	38	76	54	0.55

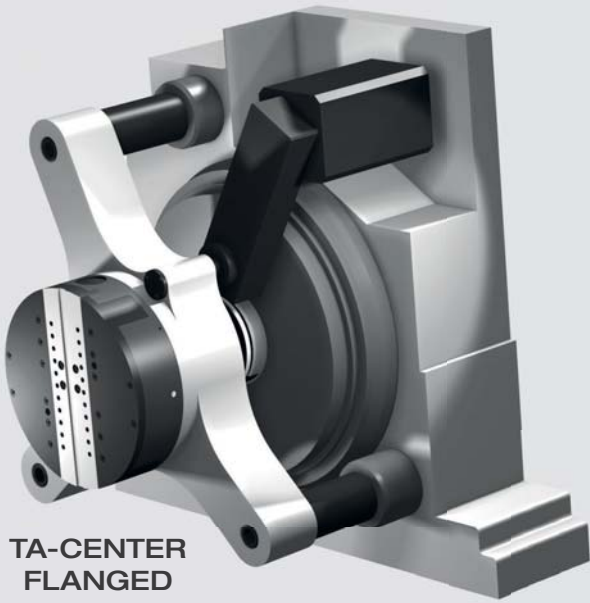
P130



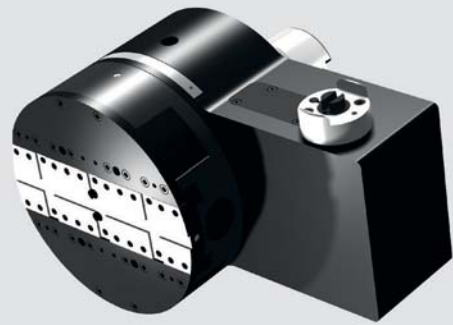
	REF.	CODE	ØH7	C	D	E	F	G	Kg.
TA-C 80	P130	433032200800	16	20	80	32	30	10.5	0.3
TA-C 100-125	P130	433040250950	16	25	95	40	37	10.5	0.5
TA-C 160-200	P130	433054381520	25	38	152	54	59.5	16.5	1.6



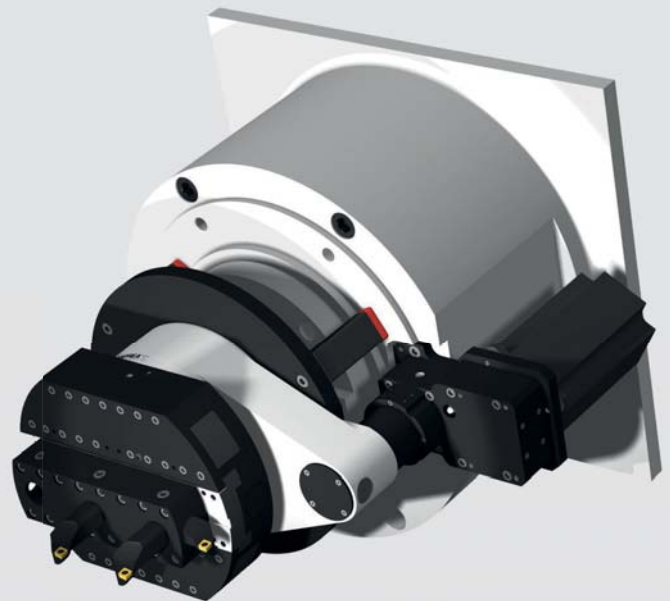
TECHNICAL DATA		TA-C 80	TA-C 100	TA-C 125	TA-C 160	TA-C 200
Ø A	mm	80	100	125	160	200
Ø B	mm	80.5	100.5	125	160.5	200
C radial traverse	mm	± 10	± 12	± 17	± 25	± 32.5
D	mm	6 <sup>+0.04</sup> <sub>+0.02</sub>	8 <sup>+0.04</sup> <sub>+0.02</sub>	10 <sup>+0.04</sup> <sub>+0.02</sub>	14 <sup>+0.04</sup> <sub>+0.02</sub>	18 <sup>+0.04</sup> <sub>+0.02</sub>
E	mm	25	31	40	50	60
F	mm	32	40	45	56	63
G	mm	M 3	M 4	M 5	M 6	M 8
Ø H	mm	(MHD'40) 25 <sup>-0.004</sup> <sub>-0.006</sub>	32 <sup>-0.005</sup> <sub>-0.008</sub> (MHD'50)	40 <sup>-0.005</sup> <sub>-0.008</sub> (MHD'50)	50 <sup>-0.005</sup> <sub>-0.008</sub> (MHD'80)	60 <sup>-0.005</sup> <sub>-0.008</sub> (MHD'80)
I	mm	65/80	80/110	110	140	170
L	mm	80	100	104	136	160
M	mm	37.5	48.5	56	69	81
N	mm	32.5	40.5	44.5	56	63
O	mm	43	51	61.5	71.5	81.5
P	mm	120 / 135	145 / 175	175	205	235
Q	mm	23.5	29	35	44.5	53.5
S	mm	10	12.5	15	17.5	20
T	mm	17	19	21	25	29
Feed	mm/min	1 ÷ 500				
Radial force	daN	100	150	200	250	300
Maximum speed	RPM	2200	2000	1800	1600	1400
Torque	Nm	200	400	600	800	1000
Weight without the cone	Kg	2.9	4.8	6.5	16.8	21.4
Boring accuracy		H7				
Max workable ø	mm	160	200	250	320	400
Max chip removal on C40 steel	mm <sup>2</sup>	0,5	0,75	0,85	1	1
Roughness	Ra	0.8 - 1.2				



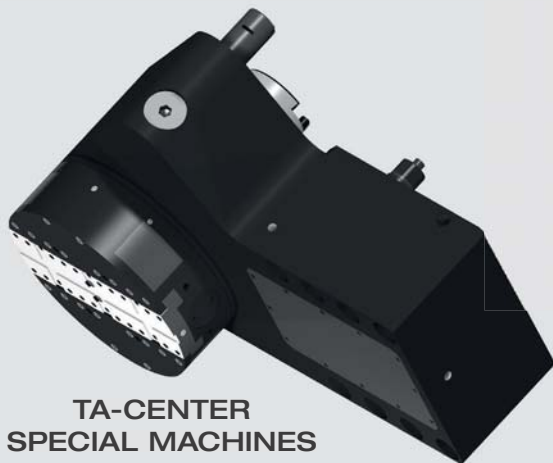
TA-CENTER  
FLANGED



TA-CENTER  
90°



TA-CENTER  
SPECIAL DIMENSIONS



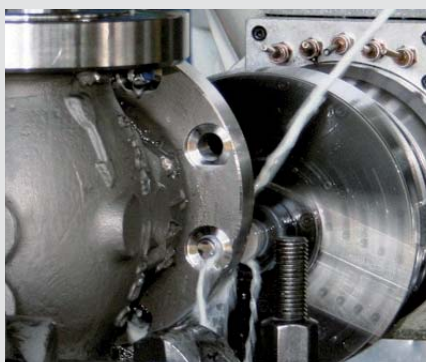
TA-CENTER  
SPECIAL MACHINES



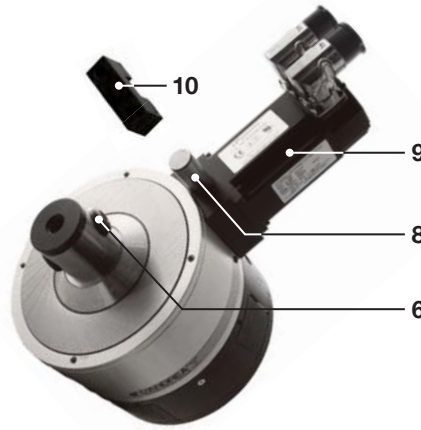
# TA-TRONIC

**TA-TRONIC** Heads designed to be manually attached on small boring machines, machining centers and special machines.

The built-in motor is connected to the NC and manages the movement of the tool-holder slide. The fixed body is supported by a flange or, for light operations, by a simple anti-rotation pin.



## COMPONENTS



- |                              |                                 |
|------------------------------|---------------------------------|
| 1. Fixed body                | 6. MHD' coupling                |
| 2. Rotating body             | 7. Coolant liquid outlet nozzle |
| 3. Toolholder slide          | 8. Anti-rotation pin            |
| 4. Interchangeable taper     | 9. Motor                        |
| 5. Balancing counter-weights | 10. Anti-rotation Small block   |

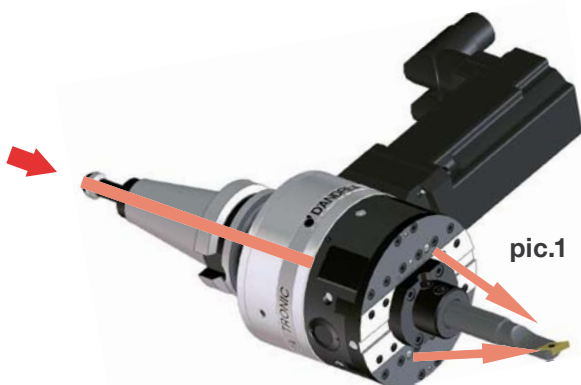
## COMMAND



CNC

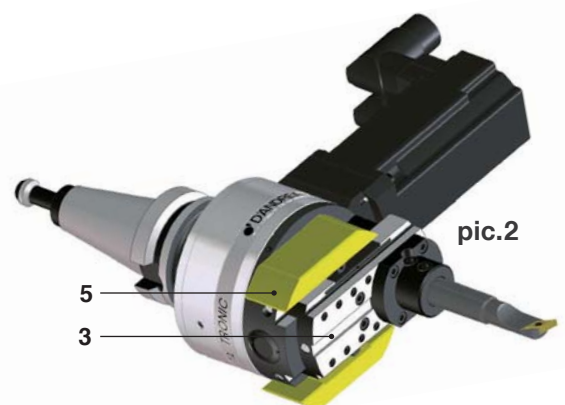
The control of the TA-Tronic heads takes place through the direct connection to the "U" axis of the numerical control of the machine tool that allows boring, internal, external and back facing, internal and external turning, grooves, facing for serration, threads and taper bores, as well as concave and convex radius machining through interpolation with the other axes.

## PREARRANGEMENTS



### Coolant supply pic.1

Coolant exits from the two adjustable nozzles in the TA-TRONIC located next to the slide after crossing the taper and the rotating body of the head. This noteworthy advantage ensures longer duration of the insert, quicker cutting speed and for obtaining good surface finishes. The centralized supply of coolant does not harm the TA-TRONIC of which the internal labyrinth protected by an O-ring. It is advisable to not exceed **40 BAR** of pressure.



### Balancing pic.2

TA-TRONIC heads are designed with two counter-weights (5) for automatic balancing, that move opposite to the slide (3) allowing to machine at a higher number of rpms without noticeable oscillations.



### WITHOUT FLANGE

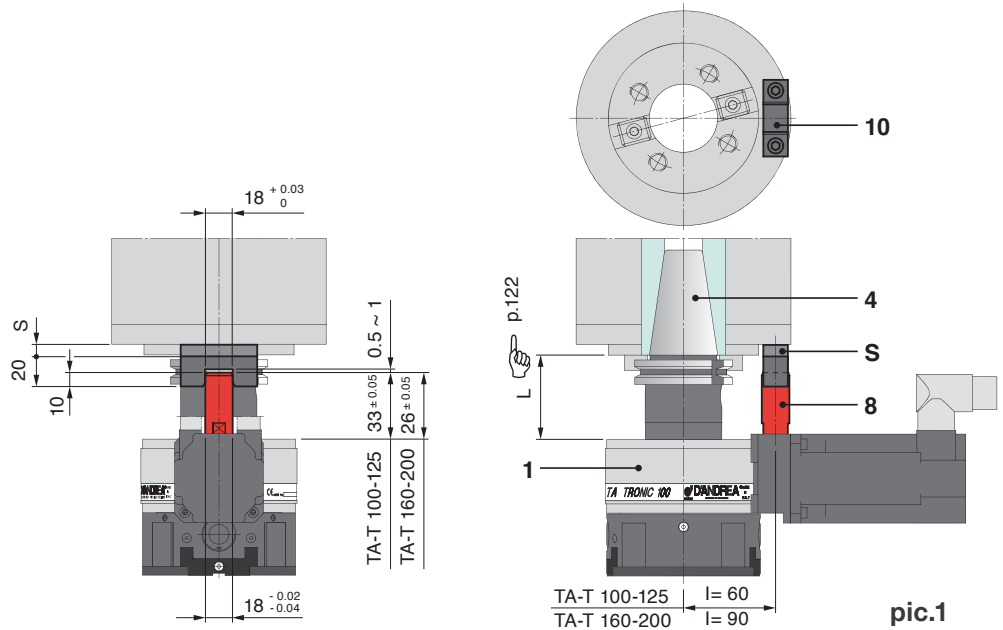
TA-TRONIC is mounted on the machine using a taper (4). The anti-rotation pin (8) inserted in the dowel (10) locked on the head of the machine tool, preventing the fixed body of TA-TRONIC to rotate.

The dowel (10) is applied on a fixed part around the spindle in relation to the dimensions of **pic.1**, adjusting the height indicated by way of a thickness **S**.

For heavy machining it is advisable to apply a flange (11) to make the TA-TRONIC solidly connected with the head of the machine tool (**pic.2-3**).

It is always advisable to use a flange with TA-TRONIC 160 and 200.

The type of flange to use depends on the model of the machine and may be easily built by the Customer or supplied by D'Andrea.



pic.1

### WITH FLANGE

#### Application on a machine with threaded holes pic.2

Properly detect the **X** dimension mounting the TA-TRONIC without the flange.

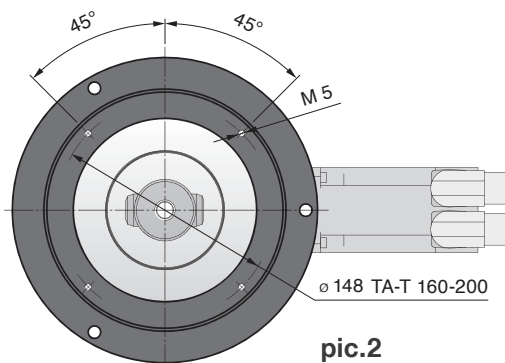
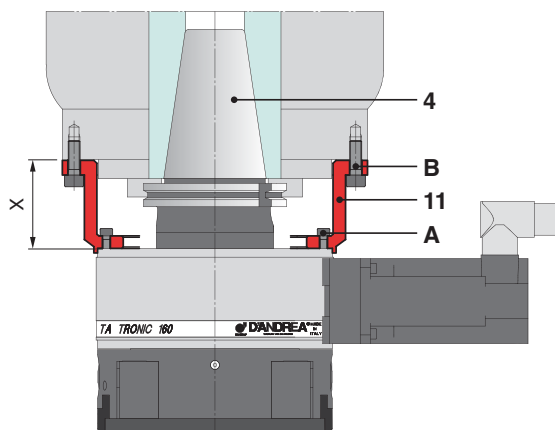
Build the flange (11) with a dimension **X** in tolerance  $\pm 0.005$  mm.

Mount the flange on the TA-TRONIC tightening the screws **A**.

Apply TA-TRONIC on the machine using a taper (4).

Check that the fixed body and flange rotate freely.

Fix the flange to the machine using the screws **B**.



pic.2

#### Application on a machine without threaded holes pic.3

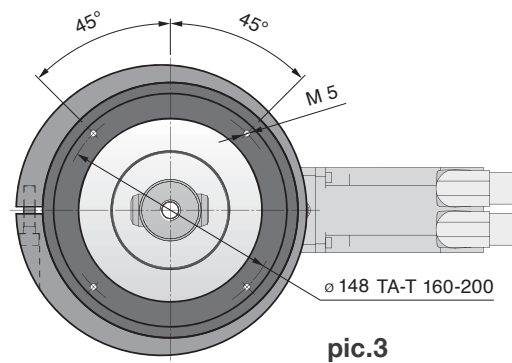
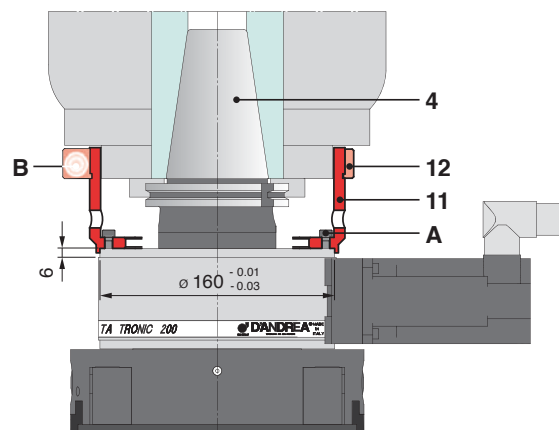
Mount the flange on the TA-TRONIC without tightening the screws **A**.

Apply TA-TRONIC on the machine using a taper (4).

Lightly tighten the screws **B** of the collar (12) of the flange (11).

Start up the machine and check that the spindle with TA-TRONIC rotates freely.

Fully tighten the screws **B** and **A**.



pic.3

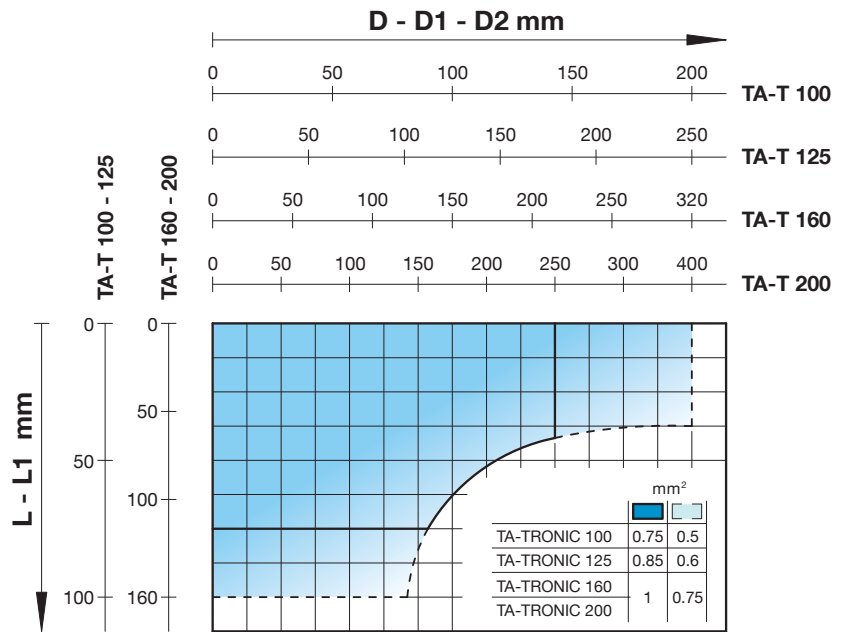
# CHIP REMOVAL CAPACITY

The chip removals are indicative for normal working conditions on steels with hardness 160-200 HB, (average Ks = 2000 N/mm<sup>2</sup>) recommended Vt 120/160 m/min.

The optimal values and working times must be determined with trials.

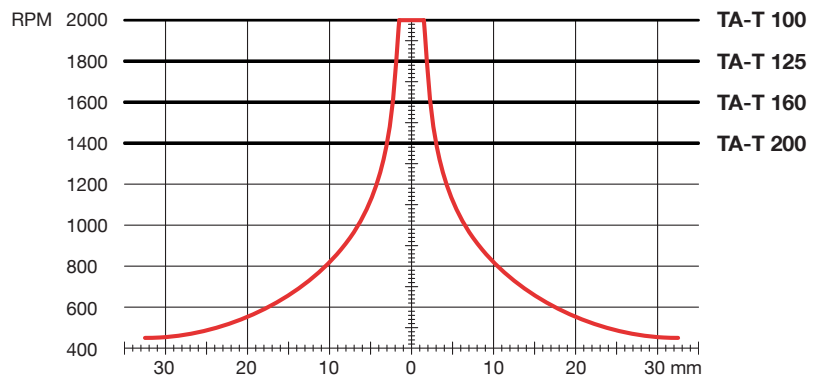


	TA-T 100	TA-T 125	TA-T 160	TA-T 200
D	10 ~ 72	10 ~ 81	20 ~ 109	20 ~ 124
L	75	75	125	125
D1	72 ~ 122	63 ~ 131	103 ~ 203	88 ~ 218
L1	100	100	160	160
D2	122 ~ 200	131 ~ 250	203 ~ 320	218 ~ 400
L2	25.5	25.5	38.5	38.5



For good TA-CENTER head operations and to protect it from damages, it is advisable to follow the chart below that indicates the **maximum rpm**, based on the travel of the slide.

## MAX ROTATION SPEED



### K02



REF.	CODE
K02 TA-T 100 1FK7022-5AK74-1HA5	501201000400
K02 TA-T 100 FANUC bis 1/6000	501201000800
K02 TA-T 125 1FK7022-5AK74-1HA5	501201250400
K02 TA-T 125 FANUC bis 1/6000	501201250800
K02 TA-T 160 1FK7032-2AK74-1EA2	501201600400
K02 TA-T 160 FANUC bis 1/6000	501201600800
K02 TA-T 200 1FK7032-2AK74-1EA2	501202000400
K02 TA-T 200 FANUC bis 1/6000	501202000800

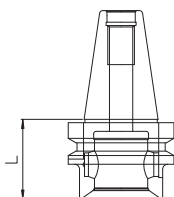
### K03



1 P120      1 P130

REF.	CODE
KIT K03 TA-T 100-125	501200301001
KIT K03 TA-T 160-200	501200301601

### MHD'

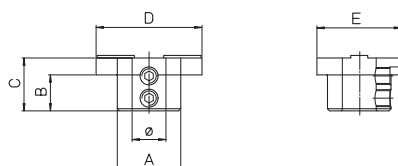


REF.	MHD'	TA-T 100		TA-T 125	
		CODE	L	CODE	L
DIN69871-A40 MHD'50.48	50	41 6 50 01 040 20	36.5	41 6 50 01 040 20	36.5
DIN69871-A40 MHD'50.56	50	41 6 50 01 040 70	44.5	41 6 50 01 040 70	44.5
MAS403 BT40 MHD'50.38.5	50	41 6 50 01 040 39	27	41 6 50 01 040 39	27
MAS403 BT40 MHD'50.48	50	41 6 50 01 040 30	36.5	41 6 50 01 040 30	36.5
MAS403 BT40 MHD'50.56	50	41 6 50 01 040 80	44.5	41 6 50 01 040 80	44.5
HSK-A63 MHD'50.66	50	41 6 50 15 063 20	54.5	41 6 50 15 063 20	54.5
ANSI/CAT40 MHD'50.66	50	41 6 50 01 040 40	54.5	41 6 50 01 040 40	54.5

REF.	MHD'	TA-T 160		TA-T 200	
		CODE	L	CODE	L
DIN69871-A50 MHD'80.48	80	41 6 80 01 050 29	36.5	41 6 80 01 050 29	36.5
MAS403 BT50 MHD'80.50	80	41 6 80 01 050 39	38.5	41 6 80 01 050 39	38.5
HSK-A100 MHD'80.88	80	41 6 80 15 100 20	76.5	41 6 80 15 100 20	76.5
ANSI/CAT50 MHD'80.62	80	41 6 80 01 050 40	50.5	41 6 80 01 050 40	50.5

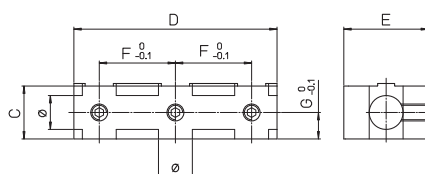
Complete range of arbors on page 10

### P120

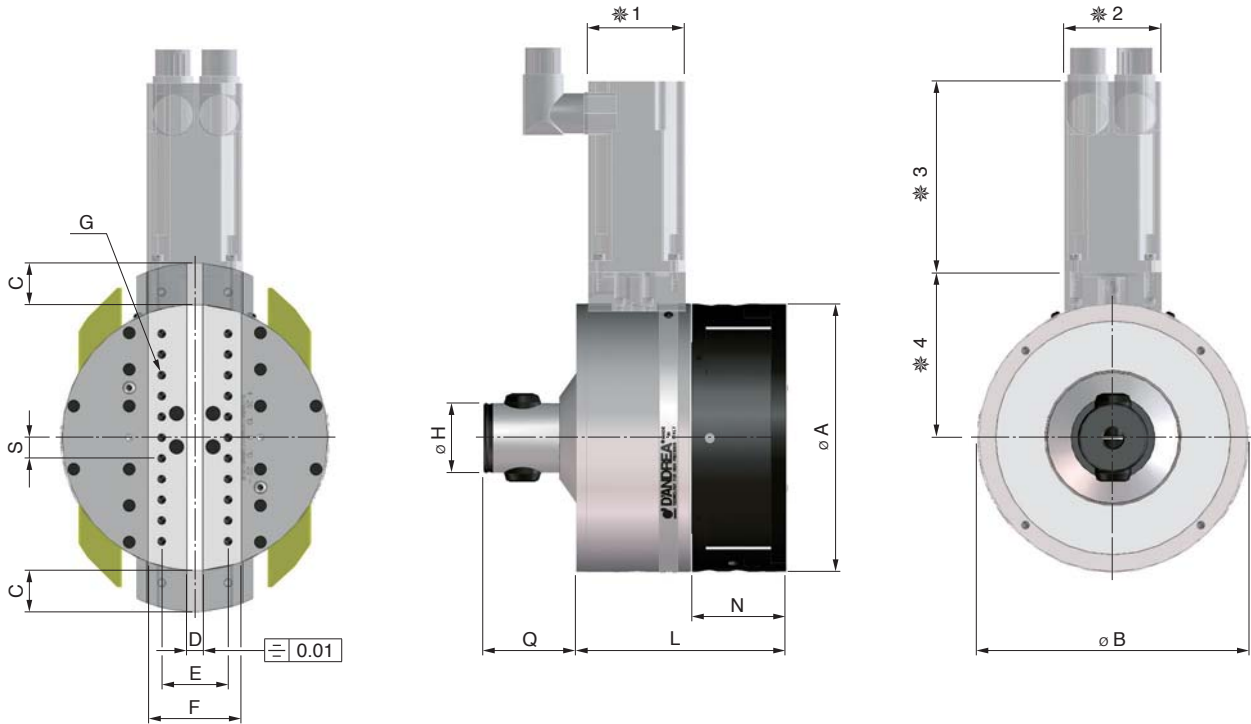
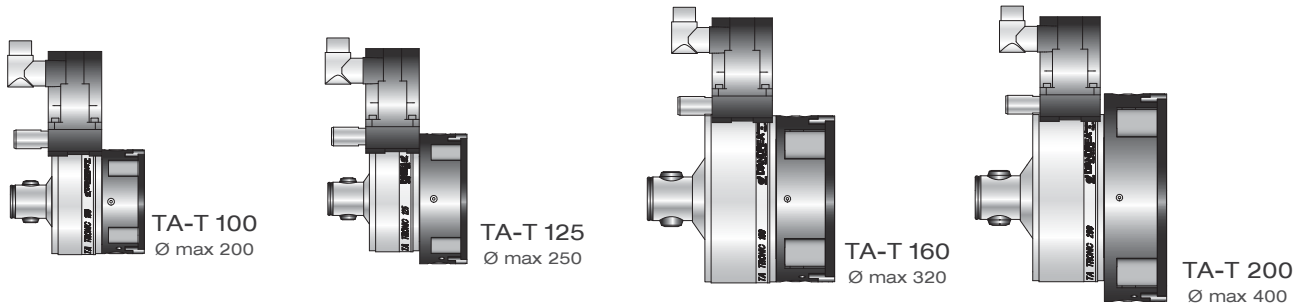


	REF.	CODE	ØH7	A	B	C	D	E	Kg.
TA-T 100-125	P120	431550160250	16	30	17	25	50	40	0.2
TA-T 160-200	P120	431550250380	25	47	27.5	38	76	54	0.55

### P130



	REF.	CODE	ØH7	C	D	E	F	G	Kg.
TA-T 100-125	P130	433040250950	16	25	95	40	37	10.5	0.5
TA-T 160-200	P130	433054381520	25	38	152	54	59.5	16.5	1.6



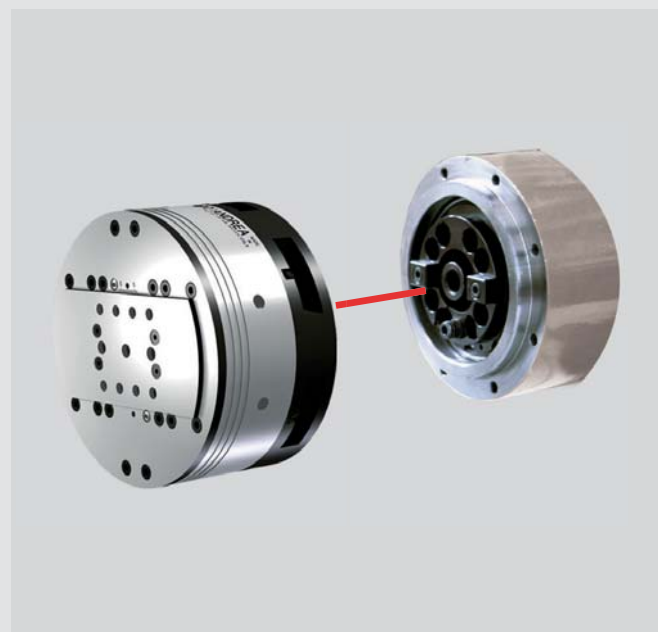
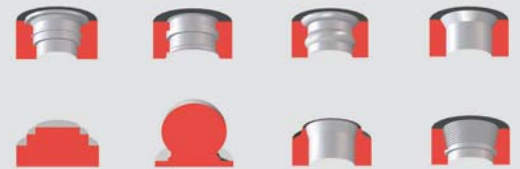
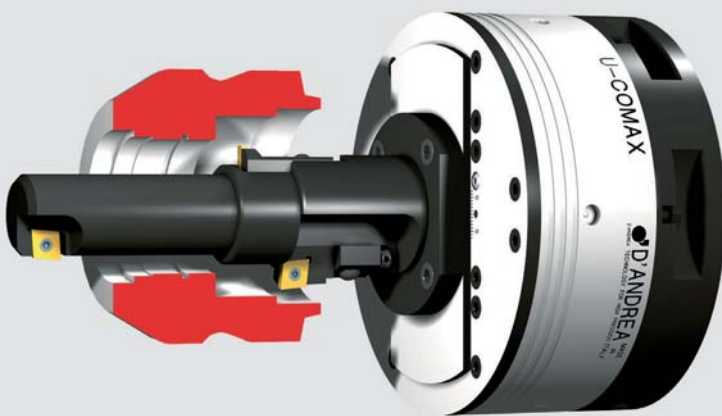
TECHNICAL DATA		TA-T 100	TA-T 125	TA-T 160	TA-T 200
Ø A	mm	100	125	160	200
Ø B	mm	100.5		160.5	
C radial traverse	mm	± 12	± 17	± 25	± 32.5
D	mm	8 <sup>+0.04</sup> / <sub>+0.02</sub>		10 <sup>+0.04</sup> / <sub>+0.02</sub>	
E	mm	31		40	
F	mm	40	45	56	63
G	mm	M 4		M5	
Ø H	mm	32 <sup>-0.005</sup> / <sub>-0.008</sub> (MHD'50)		42 <sup>-0.005</sup> / <sub>-0.008</sub> (MHD'80)	
L	mm	89	93	125	125
N	mm	40.5	44.5	56	56
Q	mm	29		55.45	
S	mm	12.5			
Feed	mm/min	1 ÷ 500			
Radial force	daN	150		250	
Maximum speed	RPM	2000	1800	1600	1400
Torque	Nm	400		800	
Weight without the cone	Kg	4.8	6.5	16.8	21.4
Boring accuracy		H7			
Max workable ø	mm	200	250	320	400
Max chip removal on C40 steel	mm <sup>2</sup>	0,75	0,85	1	
Roughness	Ra	0.8 - 1.2			

SIEMENS / FANUC Motors Dimensions	TA-T 100 / TA-T 125		TA-T 160 / TA-T 200	
	Siemens 1FK7022	FANUC βis 1/6000	Siemens 1FK7032	FANUC βis 1/6000
* 1	55	60	72	60
* 2	55	60	72	60
* 3	178	111.5	173	111.5
* 4	92		118,5	

\* Rough measures that may vary on changing the motor

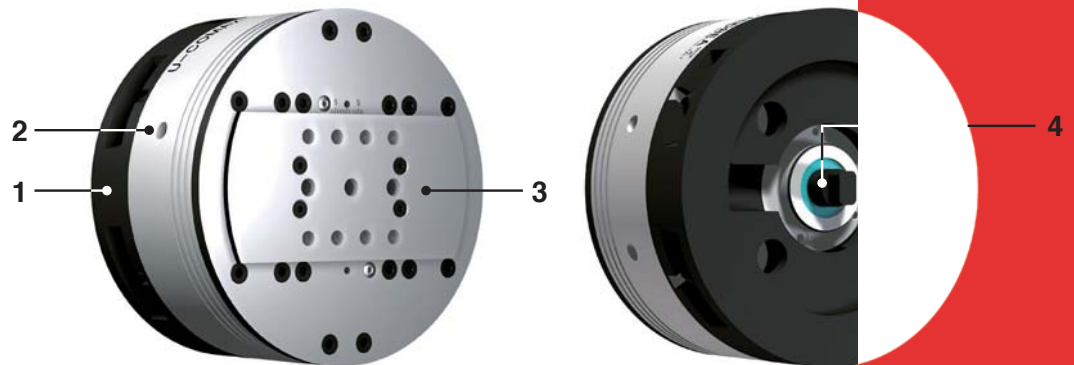
# U-COMAX

**U-COMAX** axial control heads designed to be used on transfer machines or special units.  
The movement of the slide is managed by a U-DRIVE gearbox unit mounted at the back of the spindle unit and managed by the NC.  
Synchro<sup>®</sup> option available



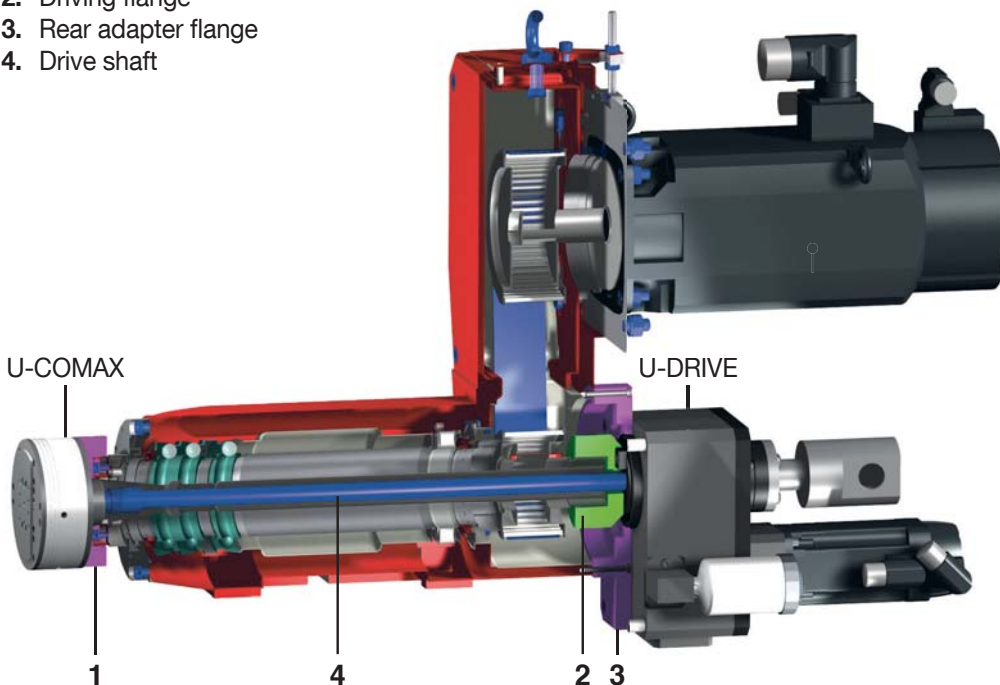
## COMPONENTS

1. Adapter flange to the machine
2. Rotating body
3. Toolholder slide
4. Drive shaft



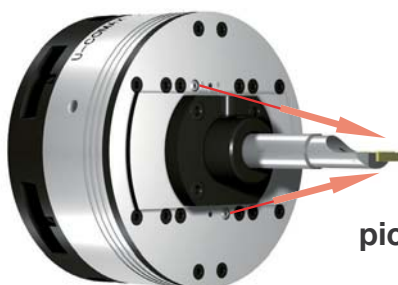
1. Front adapter flange
2. Driving flange
3. Rear adapter flange
4. Drive shaft

## MECHANICAL CONTROL ( U-DRIVE )



The U-Drive drive unit for U-Comax heads is mounted behind the spindle of the machine. It is controlled by an axis of the numerical control and mechanically connected to the U-Comax head drive with a transmission shaft that crosses the spindle of the machine. The U-Drive drive unit can be configured in various ways depending on the required application and the design of the machine.

## PREARRANGEMENTS



pic.1

### Coolant supply pic.1

In the U-COMAX, the coolant comes out of two adjustable nozzles located next to the slide after passing through the transmission shaft and the rotating body of the head. This considerable advantage ensures a longer life of the insert, a higher cutting speed and the achievement of good surface finishes.

The centralised supply of the coolant does not damage the U-COMAX whose internal labyrinths are protected by sealing rings. It is advisable not to exceed **40 BAR** of pressure.



pic.2

### Balancing pic.2

U-COMAX heads are designed with two counter-weights (5) for automatic balancing, that move opposite to the slide (3) allowing to machine at a higher number of rpms without noticeable oscillations.

The U-COMAX are mounted on the machine by means of an adapter flange.  
There are two types of flanges.

### STANDARD FLANGE

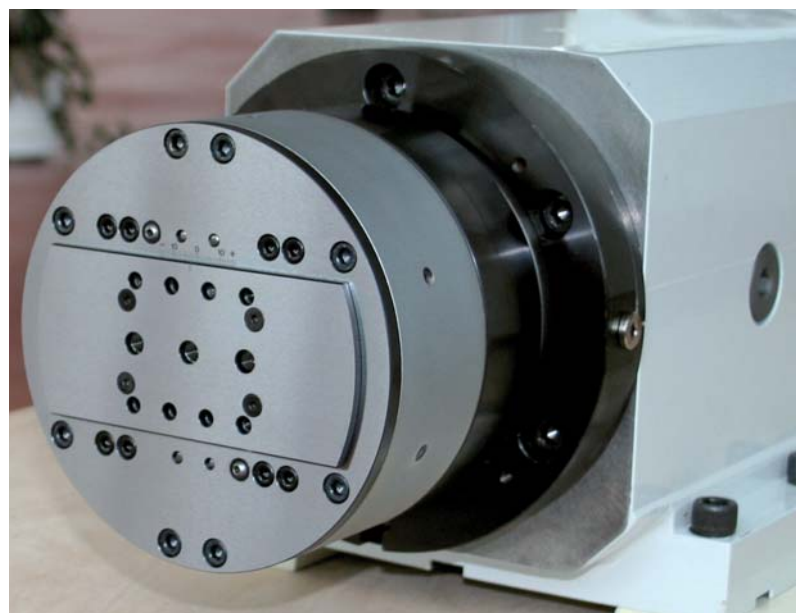
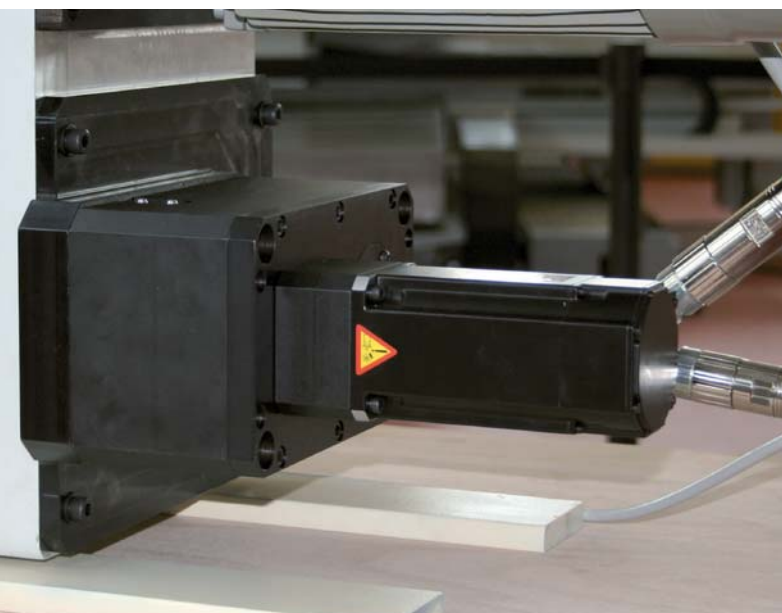
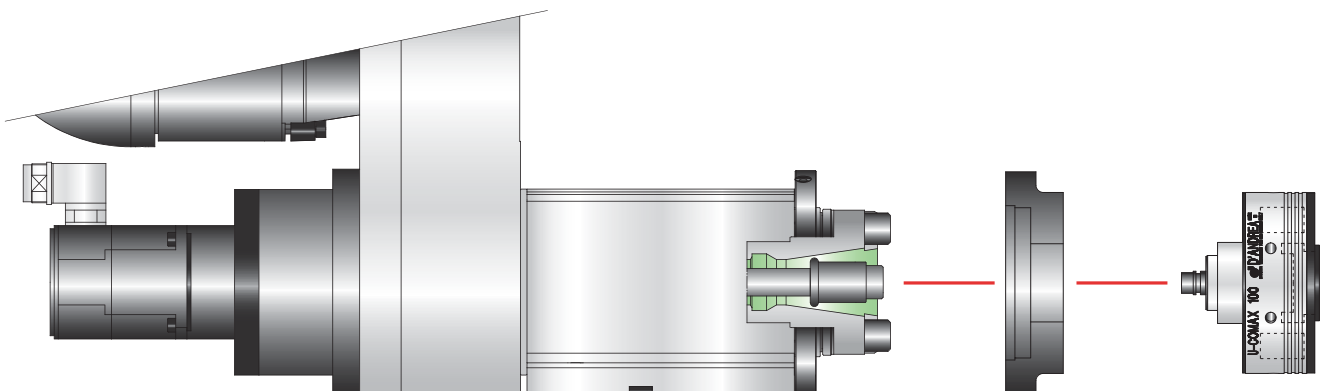
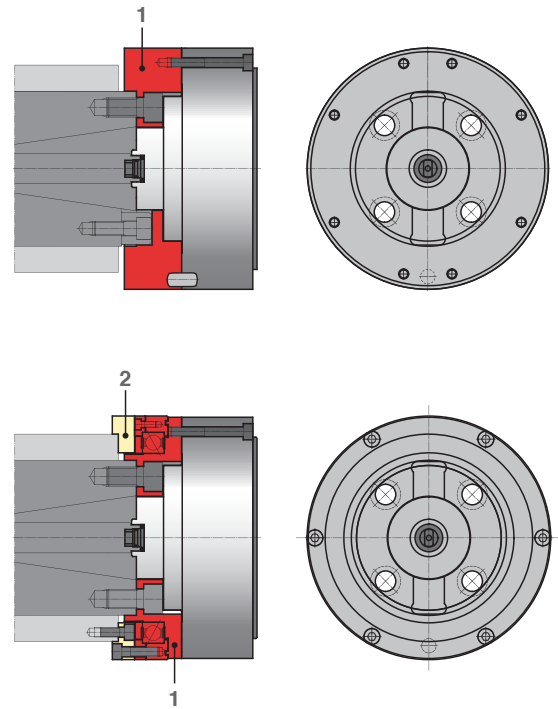
It is designed according to the type of machine on which the U-COMAX is mounted and can be easily built by the customer or supplied by D'ANDREA.

### FLANGE WITH BEARING:

It is a variant of the standard flange that is stiffened with an angular contact bearing: this system acts as an aid in case of particularly heavy machining. This variant is only available for the U-COMAX 160 and 200.

### ASSEMBLY

The adapter flange **(1)** is mounted on the spindle. In the case of the version with bearings, a connecting ring **(2)** will also be required, and then the U COMAX will be fixed to the flange.



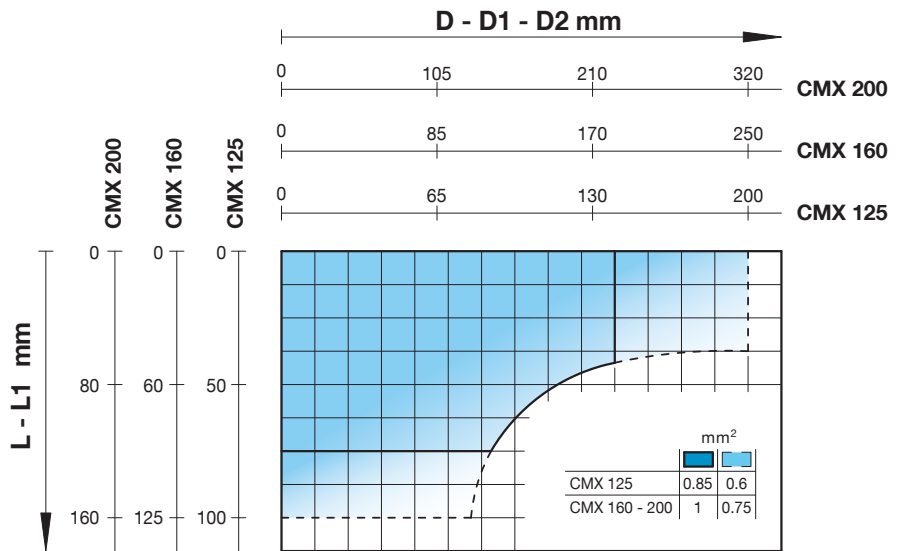
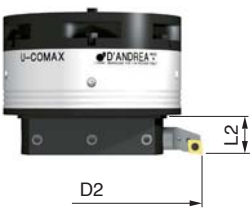
# CHIP REMOVAL CAPACITY

The chip removals are indicative for normal working conditions on steels with hardness 160-200 HB, (average  $K_s = 2000 \text{ N/mm}^2$ ) recommended  $V_t 120/160 \text{ m/min}$ .

The optimal values and working times must be determined with trials.

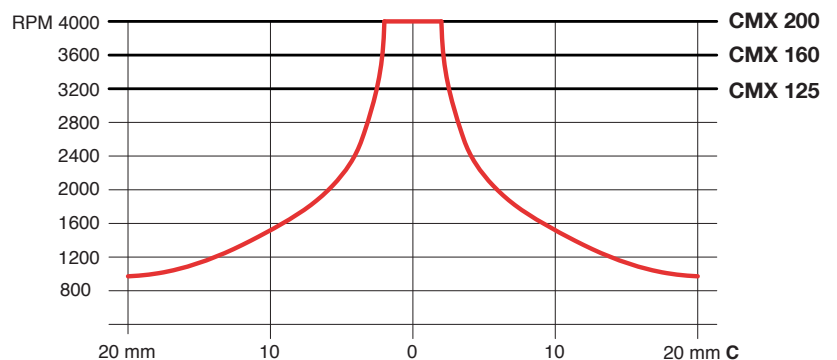


	CMX 125	CMX 160	CMX 200
<b>D</b>	10 ~ 72	20 ~ 81	20 ~ 200
<b>L</b>	75	100	125
<b>D1</b>	72 ~ 122	81 ~ 131	103 ~ 203
<b>L1</b>	100	125	160
<b>D2</b>	122 ~ 200	131 ~ 250	203 ~ 320
<b>L2</b>	25.5	38.5	38.5



For good U-COMAX head operations and to protect it from damages, it is advisable to follow the chart below that indicates the **maximum rpm**, based on the travel of the slide.

## MAX ROTATION SPEED



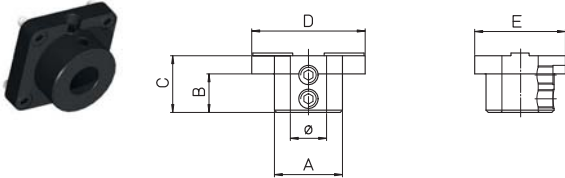




### K02 ON REQUEST U-COMAX SPECIALS

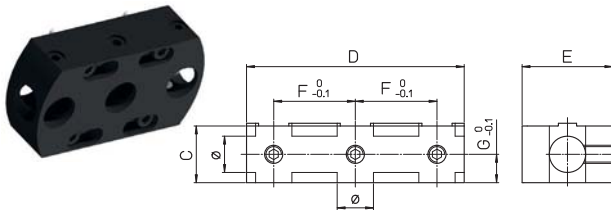
REF.	CODE
K02 CMX 125	500512510001
K02 CMX 160	500516010001
K02 CMX 200	500520010001

### P120



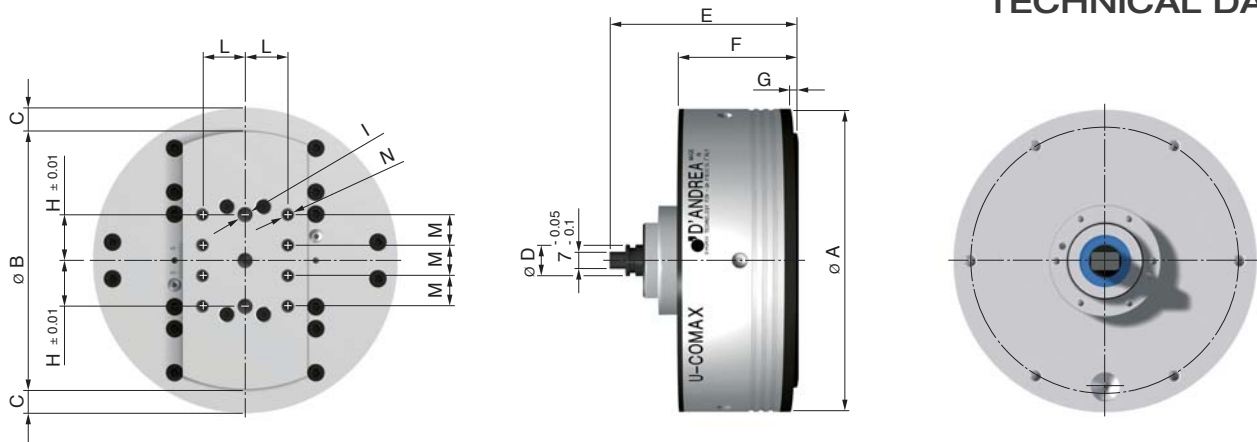
	REF.	CODE	ØH7	A	B	C	D	E	Kg.
CMX 125	P120	431550160261	16	30	16	25	48.5	46	0.2
CMX 160	P120	431550250390	25	47	26	38	61	58	0.55
CMX 200	P120	431550250391	25	56	24	38	76	72	0.9

### P130



	REF.	CODE	ØH7	C	Ø D	E	F	G	Kg.
CMX 125	P130	433046250810	16	25	81	46	30	10.5	0.45
CMX 160	P130	433058381030	25	38	103	58	35	16.5	0.9
CMX 200	P130	433072381330	25	38	133	72	50	16.5	1.7

## TECHNICAL DATA



TECHNICAL DATA		CMX 125	CMX 160	CMX 200
Ø A	mm	125	160	200
Ø B	mm	105	128	167
C radial traverse	mm	± 12	± 16	± 20
D	mm	13 <sup>-0.01</sup> <sub>-0.02</sub>		15 <sup>-0.01</sup> <sub>-0.02</sub>
E	mm	86.5		109.5
F	mm	52.5	69	68
G	mm	2.5		3.5
H	mm	18.75	24	30
Ø I	mm	6	8	10
L	mm	17.5	22.5	28
M	mm	12.5	16	20
Ø N	mm	M5	M6	M8
Feed	mm/min		1 ÷ 500	
Radial force	daN	150		250
Maximum speed	RPM	3600	3200	2800
Torque	Nm	400		800
Weight without the cone	Kg	3.2	9.8	11.5

# U-COMAX - Synchro

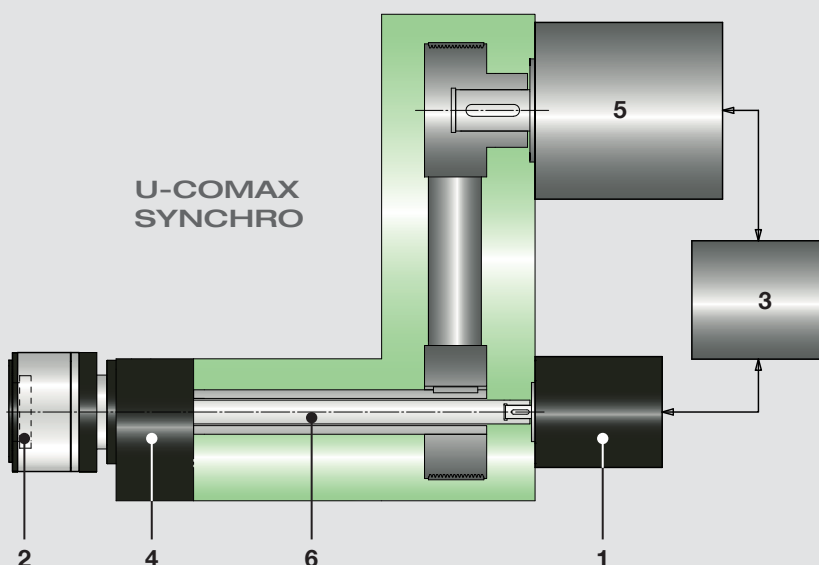
The new patented D'Andrea **Synchro**<sup>®</sup> System refers to the application of synchronization between the axes on a CN head. The toolholder slide movement is carried out synchronizing the servomotor that allows the machine tool spindle rotation with the servomotor dedicated to the movement of the slide. The synchronization between the axes is managed by the machine tool NC system. This solution allows to increase generally the performances of the head, especially the feedrate of the toolholder slide.

## Synchro<sup>®</sup>



### APPLICATION OF D'ANDREA SYNCHRO SYSTEM ON U-COMAX HEADS

1. Servomotor
2. Tool slide
3. Machine Tool C.N.C.
4. Machine Tool Spindle
5. Machine Tool Spindle Servomotor
6. Transmission shaft



The schematic figure represents a U-COMAX axial control head, equipped with the **SYNCHRO** D'Andrea system, mounted directly to the spindle unit of the machine tool.

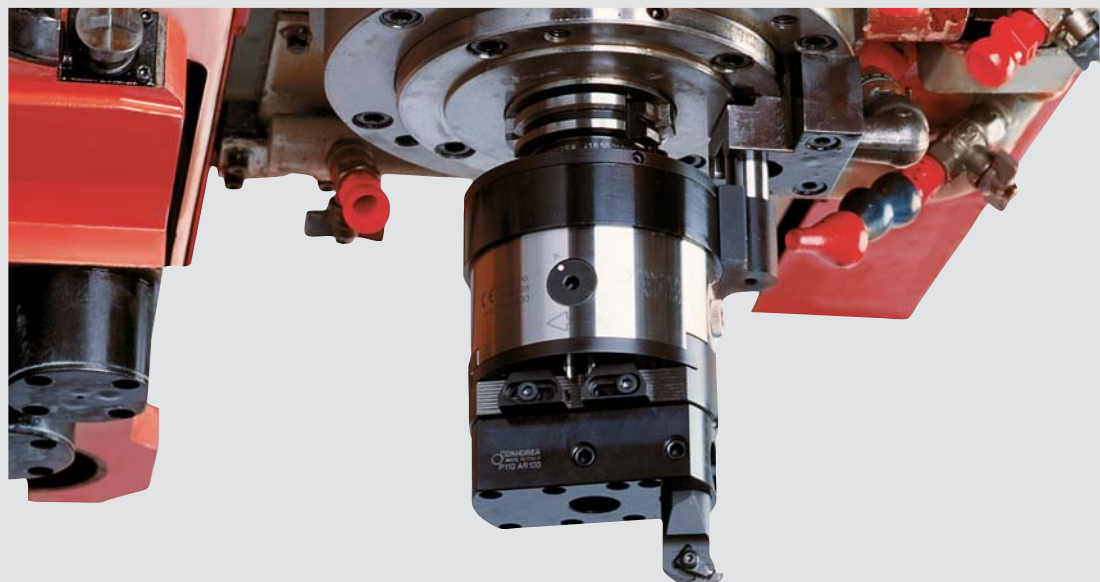
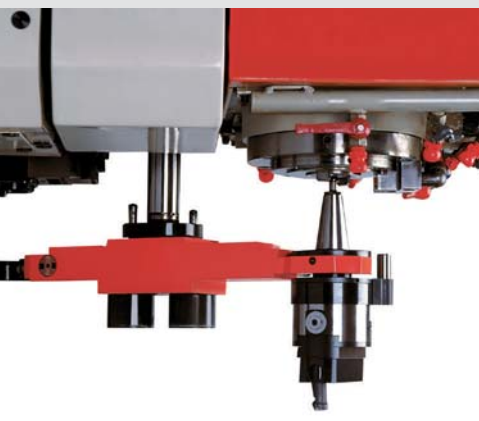
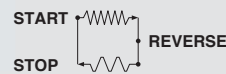
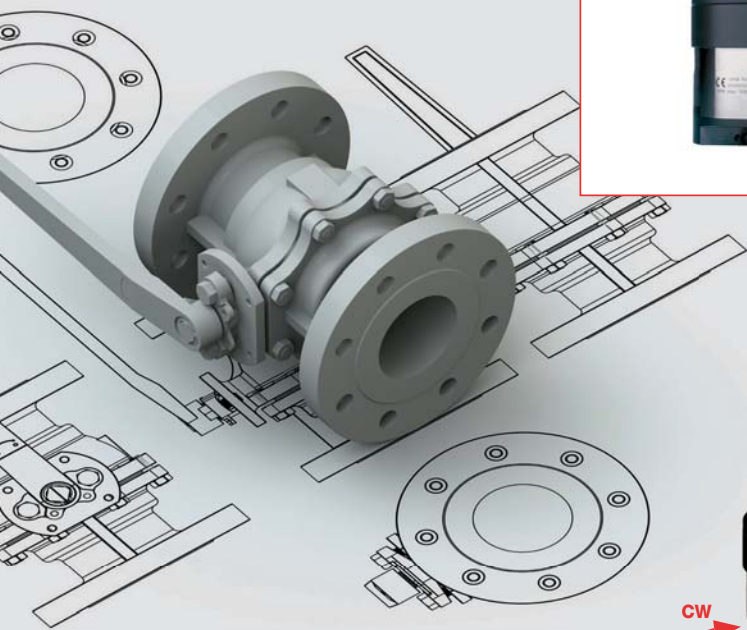
The displacement of the tool-holder slide takes place via the servomotor (1) mounted on the rear of the spindle unit and mechanically connected to the U-COMAX head with a transmission shaft that crosses the spindle of the machine itself.

The servomotor (1) by rotating transmits motion to the tool-holder slide located on the rotating body driven by the machine spindle (5); therefore to control the displacement of the slide it is necessary to synchronise the rotation of the servomotor (1) with the spindle motor (5). For the synchronization of the U-COMAX to the machine unit, the transmission shaft (6) must perform the same number of revolutions as the machine spindle (condition with the slide stationary). The difference between the rotation speed of the motor (1) and the spindle motor (5) generates radial movement of the tool-holder slide. The correct synchronisation between two rotating parts is obtained by suitably programming the numerical control of the machine tool.

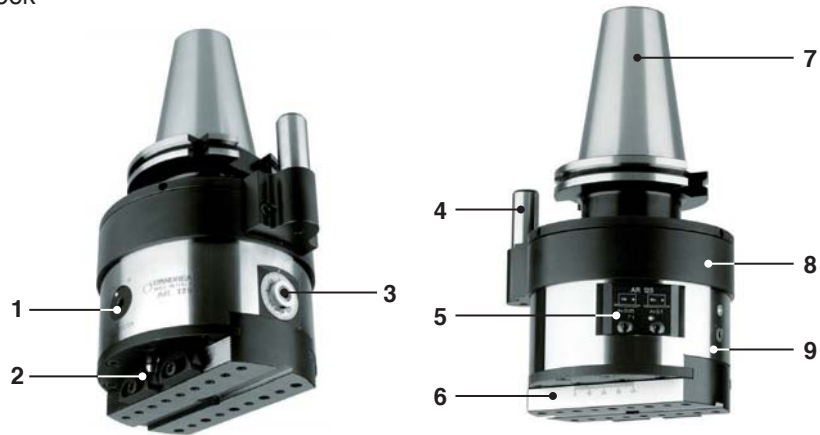
# AUTORADIAL

**AUTORADIAL** automatic facing heads that can be applied on machining centers and on NC machines without the need for an electronic interface or interlock.

They perform a work cycle automatically without ever stopping the rotation of the spindle. They are particularly suitable for machining seats for elastic rings and facing for serration.



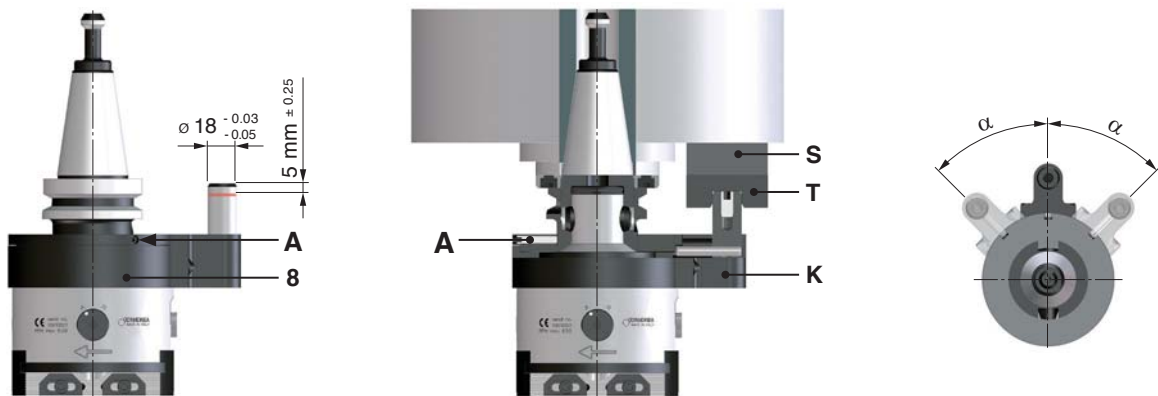
1. Override (A), return (R)
2. Limit blocks
3. Control screw
4. Check pin
5. Interchangeable feed block
6. Tool slide
7. Interchangeable arbor
8. Drive flange
9. Rotating body



## ASSEMBLY

In the AUTORADIAL the slide is moved forward by holding back the drive flange **(8)** while the spindle is rotating. The **T**-block supplied with the K-NC KIT **(K)** is to be applied to a fixed part around the spindle, observing the measurements indicated.

If the stroke of the check pin is not  $5 \text{ mm} \pm 0.25$ , you must adjust the position of the **T**-block using the spacer **S**. The angle  $\alpha$  is freely adjustable by loosening the 3 screws **(A)**, turning the flange **(8)** to the desired angle and tightening the screws **(A)**.



## INSTRUCTIONS TO REPLACE THE FEED BLOCK

- a. Loosen the screw 1
- b. Extract block 5
- c. Insert new block 5 lubricated with ISO-UNI XM2 grease
- d. Lock screw 1



### K02

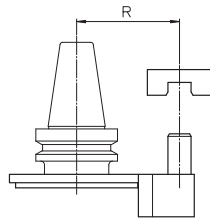
SPECIAL AUTORADIALS ON REQUEST



REF.	Fmm/°	K02 AR 125 CODE	K02 AR 160 CODE
K02 AR...- F.0.05 ± 0.005	0.05	500612520050	500616020050
K02 AR...- F.0.1 ± 0.005	0.1	500612520100	500616020100
K02 AR...- F.0.2 ± 0.01	0.2	500612520200	500616020200
K02 AR...- F.0.3 ± 0.01	0.3	500612520300	500616020300
K02 AR...- F.0.4 ± 0.02	0.4	500612520400	500616020400
K02 AR...- F.0.5 ± 0.02	0.5	500612520500	500616020500
K02 AR...- F.0.6 ± 0.02	0.6	500612520600	500616020600

### K-NC

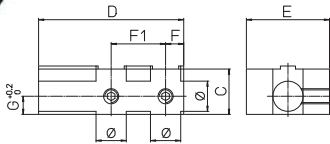
### MHD'



REF.	R.80 CODE	R.110 CODE
K-NC R... - AR 125	394112508002	394112511002
K-NC R... - AR 160	394116008002	394116011003

REF.	MHD'	Complete range of arbors on page 10
AR 125	63	
AR 160	80	

### P110



REF.	CODE	ØH7	C	D	E	F	F1	G	Kg.
AR 125 - P 110	433056381200	25	39	121	56	15	45.5	16	1.3
AR 160 - P 110	433063481600	32	49	164	63	19	63	21	2.5

### INTERCHANGEABLE FEEDS

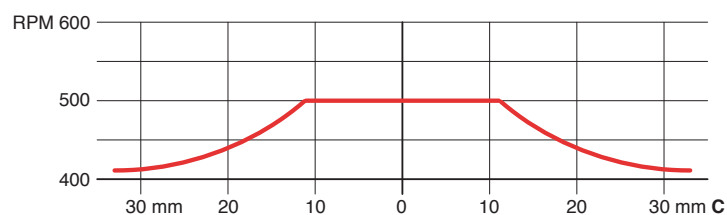
### F ...



REF.	Fmm/°	K02 AR 125 CODE	K02 AR 160 CODE
F. 0.05-AR... ± 0.005	0.05	382006105001	382006205001
F. 0.1 - AR... ± 0.005	0.1	382006110001	382006210001
F. 0.2 - AR... ± 0.01	0.2	382006120001	382006220001
F. 0.3 - AR... ± 0.01	0.3	382006130001	382006230001
F. 0.4 - AR... ± 0.02	0.4	382006140001	382006240001
F. 0.5 - AR... ± 0.02	0.5	382006150001	382006250001
F. 0.6 - AR... ± 0.02	0.6	382006160001	382006260001

For good AUTORADIAL head operations and to protect it from damages, it is advisable to follow the chart below that indicates the **maximum rpm**, based on the travel of the slide.

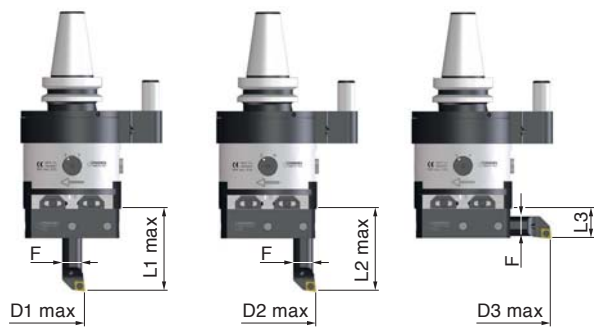
### MAX ROTATION SPEED



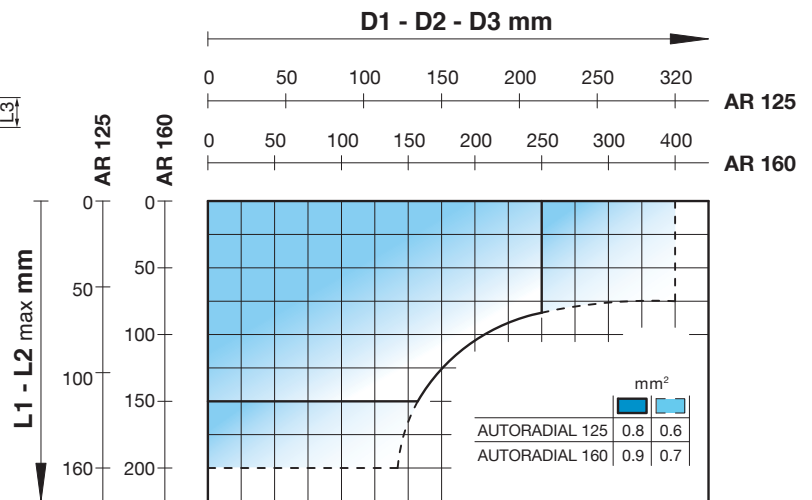
# CHIP REMOVAL CAPACITY

The chip removals are indicative for normal working conditions on steels with hardness 160-200 HB, (average Ks = 2000 N/mm<sup>2</sup>) recommended Vt 120/160 m/min.

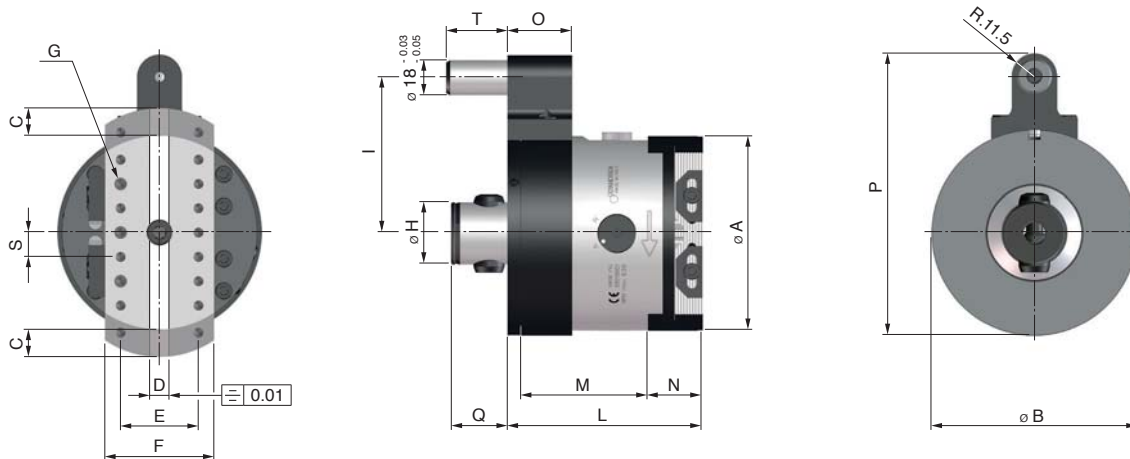
The optimal values and working times must be determined with trials.



	AR 125	AR 160
F	25	32
D1 max	99	144
L1	160	200
D2 max	190	270
L2	160	200
D3 max	320	400
L3	40	50



## TECHNICAL DATA



TECHNICAL DATA		AR 125	AR 160
Ø A	mm	125	160
Ø B	mm	130	130
C radial traverse	mm	± 20	± 35
D	mm	10 <sup>+0.03</sup> <sub>0</sub>	12 <sup>+0.03</sup> <sub>0</sub>
E	mm	40	50
F	mm	63 <sup>-0.003</sup> <sub>-0.007</sub>	80 <sup>-0.003</sup> <sub>-0.007</sub>
G	mm	M5	M6
Ø H	mm	(MHD'63) 42 <sup>-0.005</sup> <sub>0.008</sub>	(MHD'63) 42 <sup>-0.005</sup> <sub>-0.008</sub>
I	mm	80/110	80/110
L	mm	110	125
M	mm	75	83
N	mm	28	35
O	mm	35	35
P	mm	156.5 / 186.5	171.5 / 201.5
Q	mm	38.5	44.5
S	mm	12.5	15
T	mm	39.5	45.5
Interchangeable feeds	mm/°	pag. 140	pag. 140
Maximum speed	RPM	500	400
Weight without the cone	Kg	9	14
Quick return	mm/°	0.8	0.8

# D'ANDREA IN ITALY AND WORLDWIDE

350.000  
HEADS SOLD



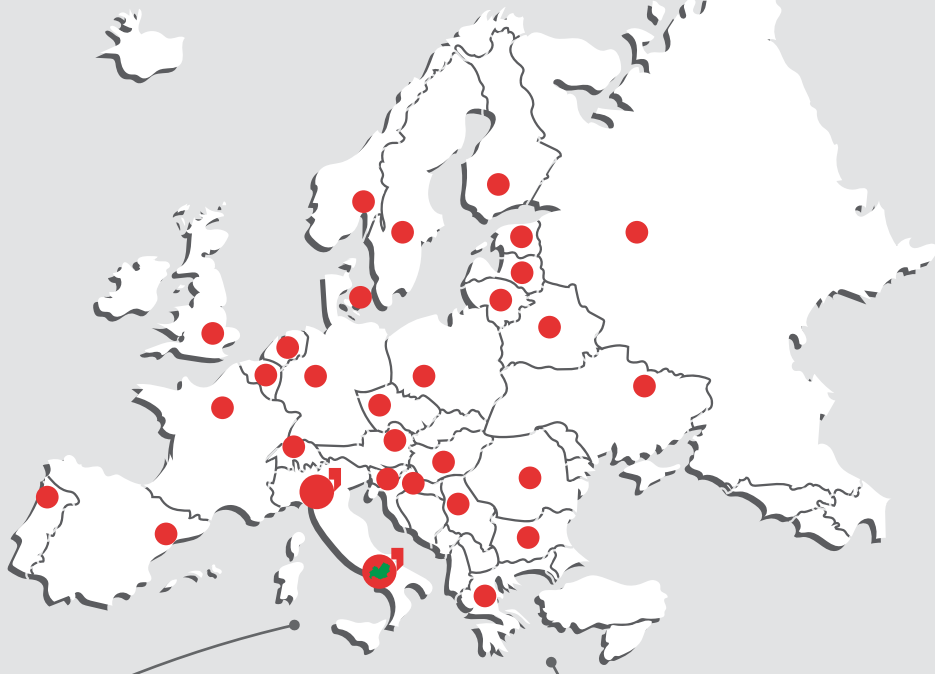
*made in italy*



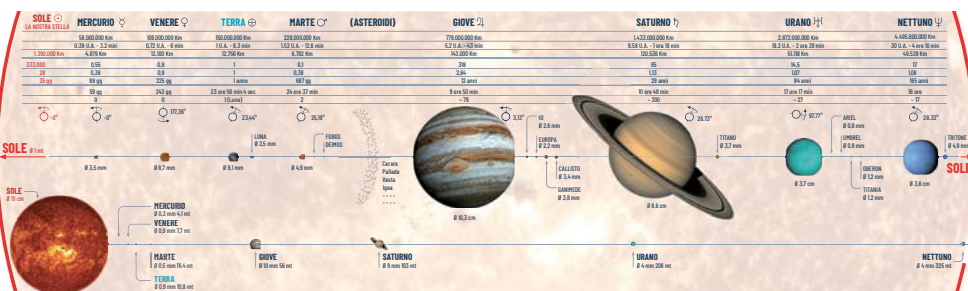
D'Andrea headquarters in Lainate (Milan)



The manufacturing plant in Castel Del Giudice (Isernia)



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