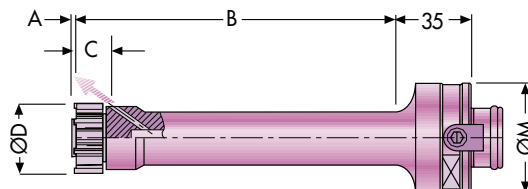
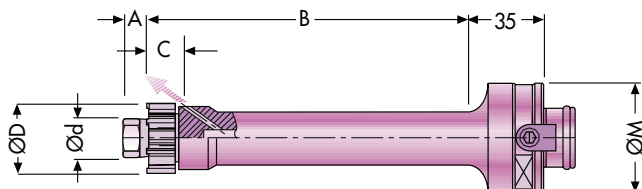


EXPANDING REAMERS WITH CUTTING RING "COMPOSIT" MODULAR SYSTEM

Modular Composit shank — LONG SERIES Brazed carbide (from diam. 17,60 to 60,59 mm)

Series 4300 - through holes with radial through tool coolant

Series 4305 - blind holes with radial through tool coolant

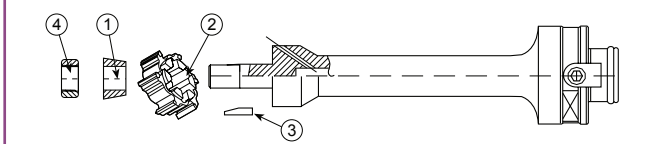


Expanding reamers with adjustment in front of the cutting ring

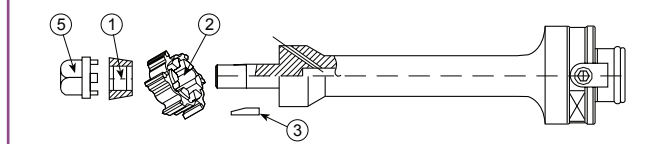
Ø D mm	series 4305		series 4300		B mm	C mm	Mod. shank ØM	Number of teeth
	A mm	Ød mm	A mm					
17,60 - 21,59	1	12	11		121	11	50	6
21,60 - 25,59	1	12	11		121	12	50	6
25,60 - 32,59	1	15,6	11		153	14	50	6
32,60 - 40,59	1	22	14		179	16	50	6
40,60 - 45,59	1	25,4	15		201	16	50	6
45,60 - 60,59	1,5	30	20,5		214	18,5	50	6

SPARE PARTS

Series 4300



Series 4305



Ø D mm	series 4300			series 4305					series 4300 4305	
	Complete mandrel without cutting ring	Conical ring 1	Ring nut or nut 4	Complete mandrel without cutting ring	key 5	Conical ring 1	Conical ring second expansion	Conical ring third expansion	Drive pin 2000 - CO 3	
17,60 - 21,59	4300-MC-010	2010-AC-010	2000-DA-010	4305-MC-010	4001-CH-015	4001-AC-115	4001-AC-215	-	010	010
21,60 - 25,59	4300-MC-020	2010-AC-010	2000-DA-010	4305-MC-020	4001-CH-015	4001-AC-115	4001-AC-215	-	020	020
25,60 - 29,59	4300-MC-030	2010-AC-020	2000-DA-020	4305-MC-030	4001-CH-025	4001-AC-125	4001-AC-225	4001-AC-325	030	030
29,60 - 32,59	4300-MC-030	2010-AC-020	2000-DA-020	4305-MC-035	4001-CH-025	4001-AC-125	4001-AC-225	4001-AC-325	030	040
32,60 - 36,59	4300-MC-040	2010-AC-030	2000-DA-060	4305-MC-040	4001-CH-035	4001-AC-135	4001-AC-235	4001-AC-335	040	040
36,60 - 40,59	4300-MC-040	2010-AC-030	2000-DA-060	4305-MC-045	4001-CH-035	4001-AC-135	4001-AC-235	4001-AC-335	040	050
40,60 - 45,59	4300-MC-050	2010-AC-040	2000-DA-090	4305-MC-050	4001-CH-045	4001-AC-145	4001-AC-245	4001-AC-345	060	060
45,60 - 49,59	4300-MC-060	2010-AC-050	2000-GH-880	4305-MC-060	4001-CH-055	4001-AC-155	4001-AC-255	4001-AC-355	060	060
49,60 - 55,59	4300-MC-070	2010-AC-050	2000-GH-880	4305-MC-070	4001-CH-055	4001-AC-155	4001-AC-255	4001-AC-355	070	070
55,60 - 60,59	4300-MC-070	2010-AC-050	2000-GH-880	4305-MC-075	4001-CH-055	4001-AC-155	4001-AC-255	4001-AC-355	070	080

② Cutting ring

Hard metal brazed carbide (our ref. H.M.)

MATERIAL TO WORK	N / mm ²	Reamer Ø mm	STOCK ALLOWANCE Ø mm	SURFACE SPEED m / min	FEED mm / rev	LUBRICANT
Mild Steel Unalloyed Low alloyed	Up to 600	Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100	0,10 - 0,20 0,15 - 0,25 0,20 - 0,40 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50	7 - 15	0,15 - 0,30 0,25 - 0,50 0,30 - 0,80 0,60 - 1,00 0,60 - 1,20 0,80 - 1,50	Emulsible oil Cutting oil
Structural steel Fused Metal		Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100	0,10 - 0,20 0,15 - 0,25 0,20 - 0,30 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50		6 - 10	
Alloy steel Stainless steel	400 - 1000	Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100	0,10 - 0,20 0,15 - 0,25 0,20 - 0,30 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50	4 - 8		0,10 - 0,30 0,20 - 0,40 0,30 - 0,60 0,40 - 0,80 0,50 - 0,90 0,60 - 1,20
Strongly alloy steel Steel with manganese		800 - 1500	Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100		0,10 - 0,20 0,15 - 0,25 0,20 - 0,30 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50	3 - 6
Grey cast iron Spheroidal cast iron (pearlitic) Malleable cast iron	Up to 200HB Greater than 200 HB		Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100	0,10 - 0,20 0,15 - 0,30 0,30 - 0,40 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50	≤ 200 HB 15 - 30 > 200 HB 10 - 20	
Spheroidal cast iron (ferritic)	300 - 700	Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100	0,10 - 0,20 0,15 - 0,25 0,20 - 0,30 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50	8 - 12	0,15 - 0,30 0,40 - 0,60 0,50 - 1,00 0,75 - 1,50 0,80 - 1,60 1,00 - 1,80	Emulsible oil Cutting oil
Copper and alloys Brass	Up to 500	Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100	0,10 - 0,25 0,15 - 0,25 0,25 - 0,40 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50	10 - 18	0,15 - 0,40 0,20 - 0,60 0,25 - 0,90 0,40 - 1,10 0,50 - 1,20 0,60 - 1,50	Emulsible oil
Bronze Bronze phosphorous		Up to 600	Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100		0,10 - 0,25 0,15 - 0,25 0,25 - 0,40 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50	
Aluminium and light alloys	Up to 500	Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100	0,10 - 0,2 0,15 - 0,3 0,20 - 0,4 0,30 - 0,4 0,35 - 0,5 0,40 - 0,5	15 - 30	0,20 - 0,40 0,30 - 0,60 0,40 - 1,00 0,75 - 1,50 0,80 - 1,60 0,90 - 1,80	Emulsible oil Oil Cutting oil
Titanium and alloys		Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100	0,10 - 0,20 0,15 - 0,25 0,20 - 0,30 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50		5 - 8	
Syntetic materials		Up to 10 10 - 22 22 - 40 40 - 50 50 - 70 70 - 100	0,10 - 0,20 0,15 - 0,25 0,20 - 0,30 0,30 - 0,40 0,35 - 0,50 0,40 - 0,50	15 - 30		0,20 - 0,50 0,40 - 0,80 0,50 - 1,40 0,80 - 1,50 0,90 - 1,60 1,00 - 1,80

TECHNICAL INFORMATION AND CUTTING PARAMETERS HIGH SPEED & HIGH FEED REAMING

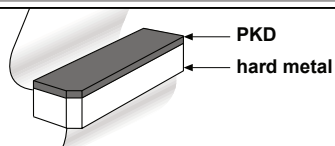
Hard metal brazed carbide coated TiN - TiCN - TiAlN (our ref. TIN - TIC - TIA)
Cermet brazed carbide (our ref. AVC)

*AVC reamers are available coated TiN, TiCN or TiAlN

MATERIAL TO WORK	N / mm ²	Reamer Ø mm	STOCK ALLOWANCE Ø mm	H.M. coated TiN - TiCN TiAlN	CERMET AVC *	Lead-in A,G	Lead-in E,N,M
				SURFACE SPEED m / min	SURFACE SPEED m / min	FEED mm / rev	FEED mm / rev
Mild Steel Unalloyed Low alloyed	Up to 600	up to 10	0,08 - 0,15	60 - 80	90 - 300	0,20 - 0,40	0,30 - 0,60
		10 - 18	0,15 - 0,25			0,40 - 0,60	0,40 - 1,00
Structural steel Fused Metal	Greater than 600	18 - 40	0,15 - 0,30	40 - 70	80 - 200	0,50 - 0,80	0,60 - 1,20
		40 - 80	0,20 - 0,40			0,50 - 1,00	0,80 - 1,60
Alloy steel Stainless steel	400 - 1000	over 80	0,25 - 0,50	30 - 50	60 - 150	0,80 - 1,50	1,00 - 2,20
		up to 10	0,08 - 0,15			up to 10	0,20 - 0,40
Strongly alloy steel Steel with manganese	800 - 1500	10 - 18	0,15 - 0,25	15 - 30	60 - 120	0,30 - 0,60	0,30 - 0,80
		18 - 40	0,15 - 0,30			0,40 - 0,70	0,40 - 1,00
Grey cast iron Spheroidal cast iron (pearlitic) Malleable cast iron	Up to 200HB Greater than 200 HB	40 - 80	0,20 - 0,40	50 - 70		0,50 - 0,80	0,60 - 1,40
		over 80	0,25 - 0,50			0,80 - 1,20	1,00 - 2,00
Spheroidal cast iron (ferritic)	300 - 700	up to 10	0,08 - 0,15	30 - 50	60 - 120	0,20 - 0,40	0,30 - 0,60
		10 - 18	0,15 - 0,25			0,35 - 0,60	0,50 - 0,80
Copper and alloys Brass	Up to 500	18 - 40	0,15 - 0,30	100 - 200		0,40 - 1,00	0,60 - 1,50
		40 - 80	0,20 - 0,40			0,60 - 1,30	0,80 - 1,60
Bronze Bronze phosphorous	Up to 600	over 80	0,25 - 0,50	80 - 160	100 - 300	0,80 - 1,70	1,00 - 2,25
		up to 10	0,08 - 0,15			up to 10	0,20 - 0,40
Alluminium and light alloys	Up to 500	10 - 18	0,15 - 0,25	100 - 200		0,40 - 0,70	
		18 - 40	0,15 - 0,30			0,50 - 0,80	
Titanium and alloys		40 - 80	0,20 - 0,40	20-60		0,60 - 1,00	
		over 80	0,30 - 0,50			0,80 - 1,40	

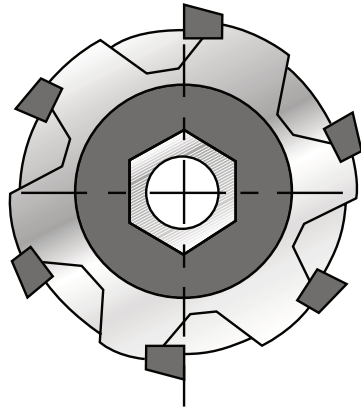
HIGH SPEED FOR ALUMINIUM REAMING

Aluminium with silicon greater than 10% - brazed carbide with PKD

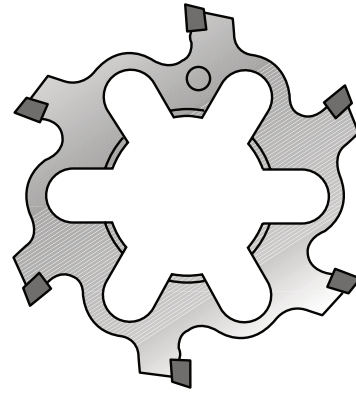


- Surface speed up to 1500 m/min.
- When using PKD reamers a machine tool with high rigidity and absolute precision is a minimum requirement.
- Each application must be assessed by our technical department.

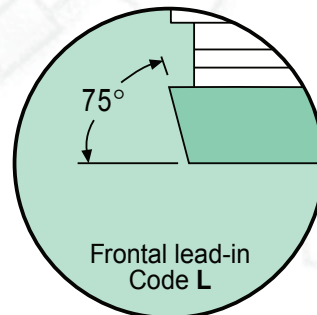
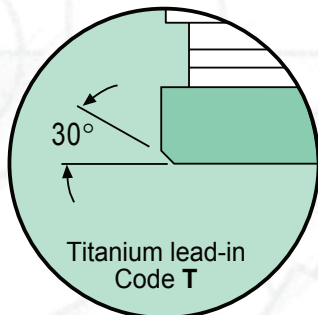
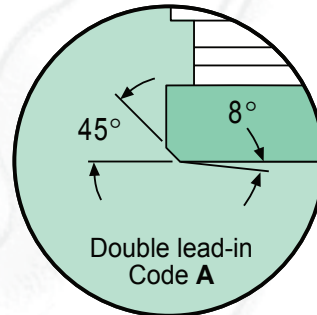
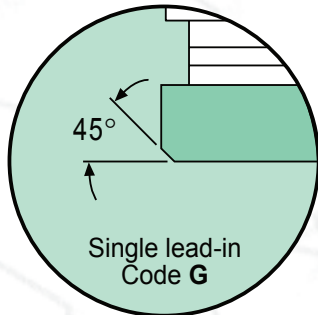
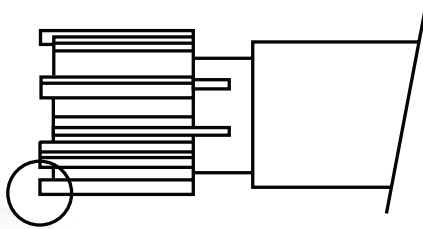
EXPANDING REAMERS CUTTING GEOMETRY



Integral expanding reamer

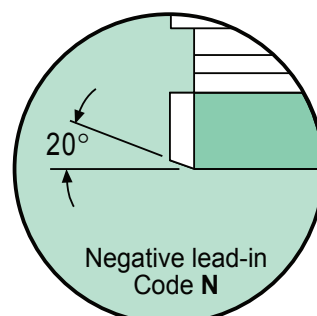
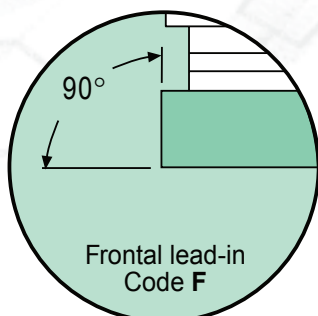


Cutting ring



"L" lead-in to reduce the feed of 40% compared with the values on pages 6-7

"F" lead-in to reduce the feed of 40% compared with the values on pages 6-7



"N" lead-in ideal for through hole. It is possible to increase the feed up to 100% of the values indicated on pages 6-7

Approach angles

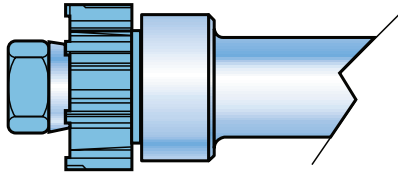
MATERIAL TO WORK	TENSILE STRENGTH	APPROACH ANGLE*
Iron and mild steel (C < 0,2%)	50 Kg / mm ²	G - A - E
Mild steel (C 0,2 < 0,3%)	60 Kg / mm ²	N - A - E
Mild steel (C 0,3 < 0,4%)	70 Kg / mm ²	N - A - E
Mild steel (C 0,4 < 0,5%)	80 Kg / mm ²	N - A - E
Alloy steel	≤ 80 Kg / mm ²	G - N - A - E
Alloy steel	90 Kg / mm ²	G - N - E
Alloy steel	100 Kg / mm ²	G - N - M
Alloy steel	> 100 Kg / mm ²	G - N - M
Stainless and refractory steel	from 50 Kg / mm ² to 90 Kg / mm ²	G - N - M
Grey, spheroidal and malleable cast iron	from 150 HB to 320 HB	G - N - E
Titanium and titanium alloy		T - E
Tempered steel	48 - 64 HRc	G - N - M
Pure copper		G - N - E
Electrolytic copper		G - N - E
Brass / Bronze		G - N - E
Aluminium alloy < 10% Si		G - A - E
Aluminium alloy > 11% Si		G - E
Magnesium alloy		G - A - E
Thermoplastic material		G - E
Thermosetting resins		G - E
Stiffened synthetic material		G - E

* Do not use negative lead-in on blind holes

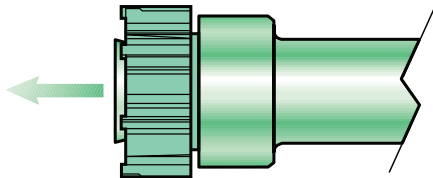
Negative lead-in "N" can be used on large range of materials: please apply to our technical department.

Usually ex-stock: - single lead-in G

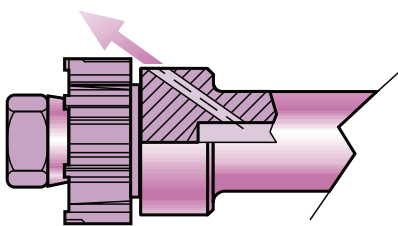
EXPANDING REAMERS WITH CUTTING RING



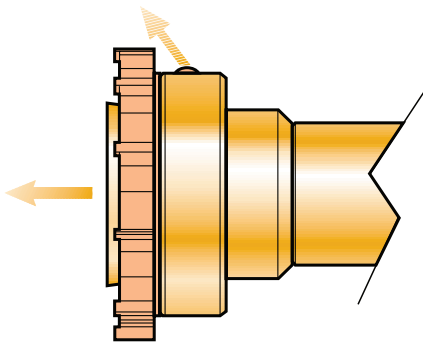
Expanding reamers without coolant



Expanding reamers with central through tool coolant (ideal application for blind holes)

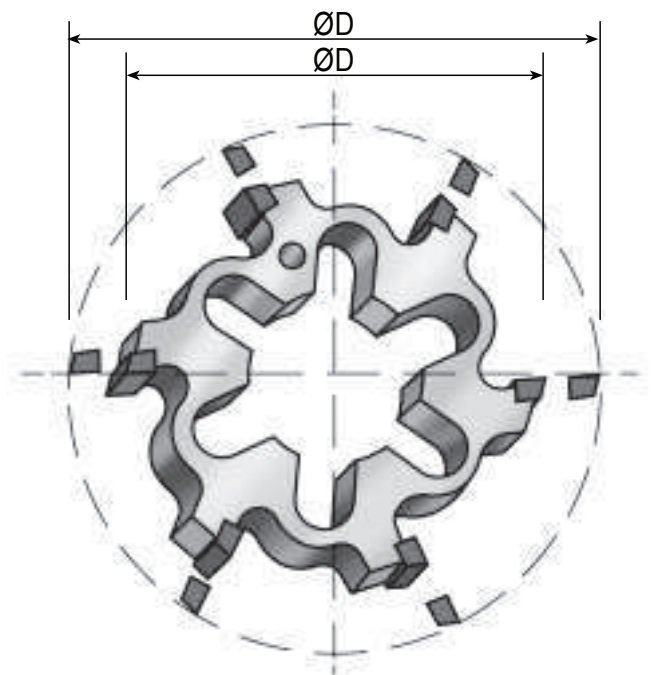
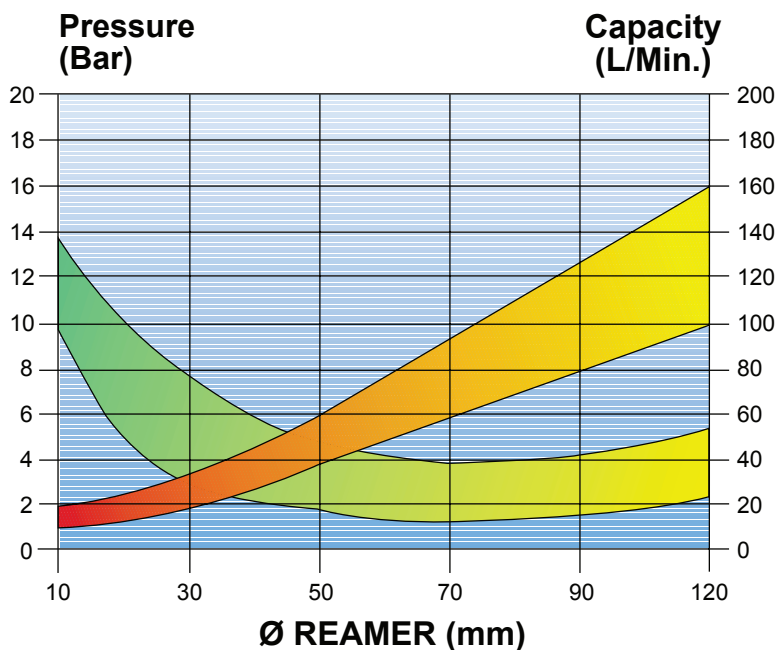


Expanding reamers with radial through tool coolant (ideal application for through holes)



Expanding reamers with central and radial through tool coolant

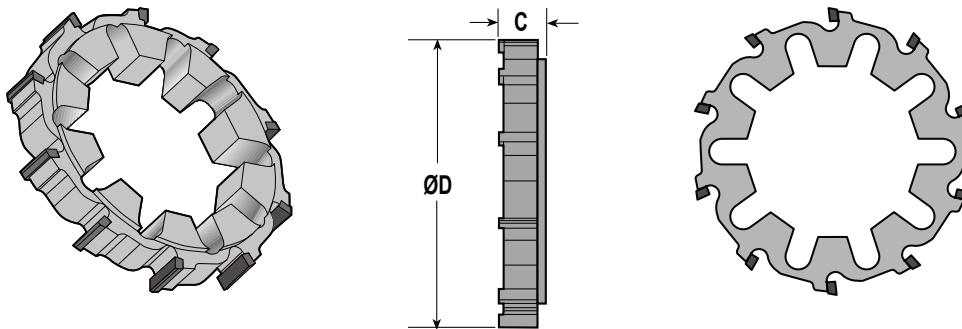
Recommended values for lubricants



The cutting rings can be expanded for recovering the starting diameter.

CUTTING RINGS

from diameter 17,60 to 200,59 mm



Ø D mm	C mm	Number of teeth
17,60 - 21,59	11	6
21,60 - 25,59	12	6
25,60 - 32,59	14	6
32,60 - 45,59	16	6
45,60 - 79,59	18,5	6
79,60 - 100,59	18,5	8
100,60 - 110,59	18,5	10
110,60 - 200,59	18,5	12

- The ALVAN® cutting rings are modular and compatible with all the reamers indicated on page 36 to 58.
- We guarantee a regrinding and re-brazing rapid service of the damaged cutting edges (consult our technical department).
- The cutting edges are in an asymmetric way to assure the best roundness of the hole (see page 74).
- Holes with restricted tolerances (ISO 5 and 6) can be supplied and the expansion assures a perfect holding of the reaming diameter.
- Lead-in: cutting rings with G lead-in are usually available from stock (see page 11-12-13).
- Diameters and tolerances: cutting rings of integer metric diameters with H7 tolerances are usually available from stock.
- The ALVAN® cutting rings are manufactured to the middle of the hole tolerance so they must be assembled and adjusted to the same diameter. It is important to comply with this direction in order to have a good working and life of the tool.
- LEFT HAND HELICAL FLUTES CUTTING RINGS from diameter 32,60 to 200,59 mm. ON REQUEST.

EXPANDING & FIXED REAMERS INSTRUCTIONS

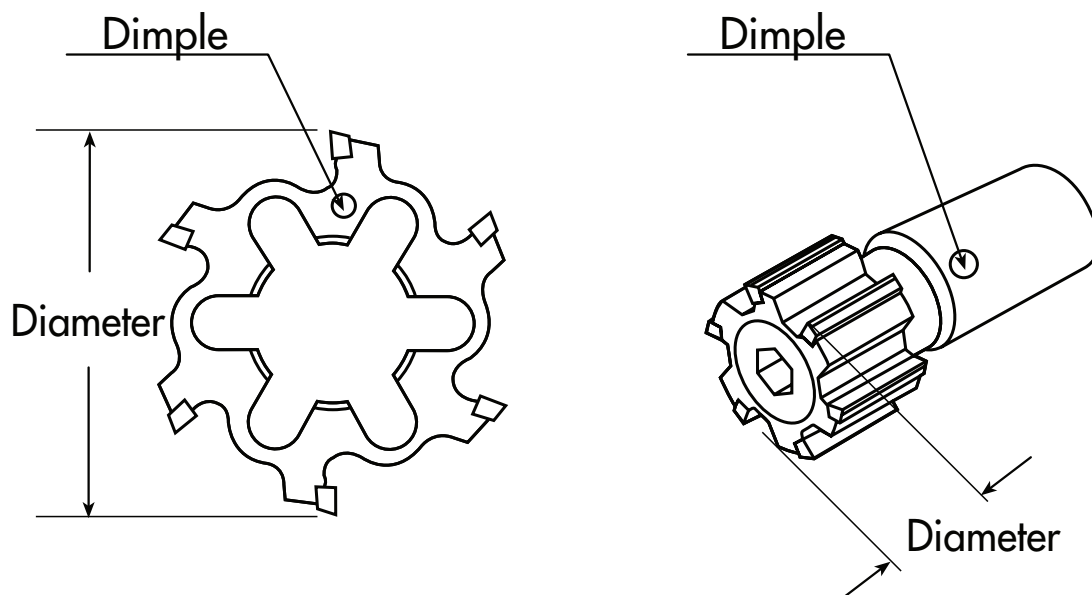
1) Diameter measurement

The diameter of the reamers and of the cutting rings is measured with a micrometer. We recommend the use of a comparator style micrometer with at least a $2\mu\text{m}$ resolution to avoid micro chipping of the cutting edges.

To allow setting of the reamer, two cutting edges are exactly 180° opposed. These are marked with a coloured dimple (see diagram below).

Measurement must be taken from the front of the cutting edges only.

The red dimple indicates that the tool has been ground with a single lead-in angle (code G), the blue dimple indicates a double lead-in angle (code A).



2) Tolerance

All the reamers are ground to the requested diameter and set to nominal tolerance for expanding reamers and $3/4$ of minimum tolerance for fixed reamers.

3) Expanding reamers adjustment

The adjustment must be made to compensate for wear to the cutting edges when the size reaches its lower tolerance.

This operation can be repeated several times until the surface finish of the hole deteriorates to an unacceptable level, then the reamer must be reground. The maximum expansion is about 1% of the diameter for the integral reamers and about 4% of the diameter for the cutting rings.

EXPANDING REAMERS INSTRUCTIONS

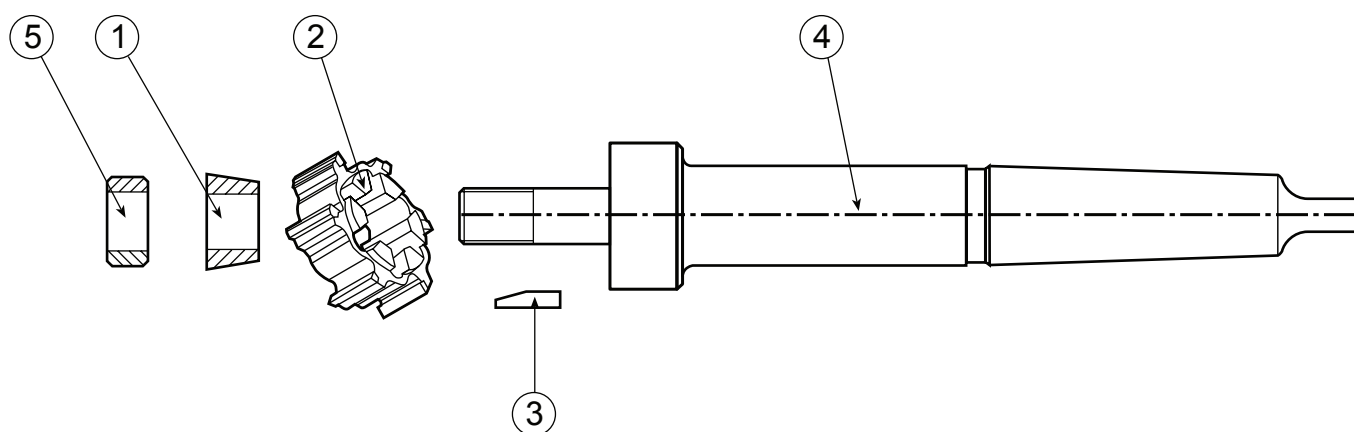
Assembly - Adjustment - Disassembly EXPANDING REAMERS WITH CUTTING RING with assembly and adjustment in the front

Series 2000-2010-2050 from diam. 17,60 to 100,59 mm

Series 4550-4500-4330 from diam. 17,60 to 100,59 mm

Series 4200-4250-4350 from diam. 17,60 to 200,59 mm

Series 4300 from diam. 17,60 to 60,59 mm



1) Assembly

Insert the cutting ring (item 2) on the mandrel (item 4) with the drive pins (item 3) assembled. Insert the conical ring (item 1). Screw the nut (item 5) and lock it manually: **the thread is left handed.**

We recommend lubricating the thread and the conical surface of contact between the cutting ring and the conical ring with antifriction Molycote grease.

2) Adjustment procedure

Turn the nut slowly, checking the diameter setting of the cutting ring with a micrometer, paying attention that the drive pins are in traction in the opposite direction to the cutting action of the reamer.

When the required diameter is achieved, the tool is ready for use.

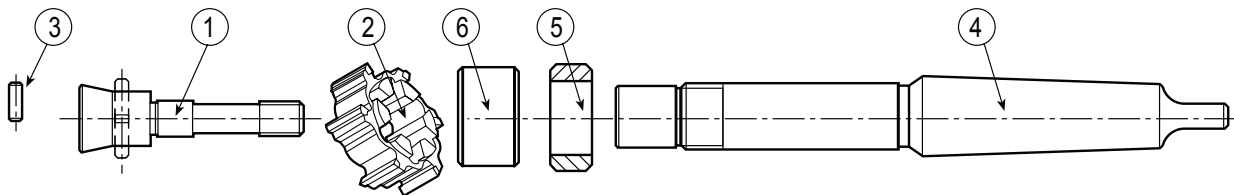
3) Disassembly

Unscrew the nut. Remove the components from the mandrel.

EXPANDING REAMERS INSTRUCTIONS

Assembly - Adjustment - Disassembly EXPANDING REAMERS WITH CUTTING RING with assembly and adjustment on the rear

**Series 2500 - 2505 - 2530 - 2535 - 2550 - 2555
from diam. 17,60 to 45,59 mm**



1) Assembly

Screw the nut (item 5) on the mandrel (item 4): **the thread is right handed**.
Insert the bush (item 6) on the mandrel.

Mount the cutting ring (item 2) onto the conical screw (item 1) and over the drive pins (item 3). Tighten the conical screw onto the mandrel, taking care that the contact surfaces are very clean. Look the screw to the torque setting stated in table 1. We recommend lubricating the thread and the conical surface of contact between the cutting ring and the conical ring with antifriction Molycote grease.

2) Adjustment procedure

Turn the nut slowly, checking the diameter setting of the cutting ring with a micrometer, paying attention that the drive pins are in tranction, in the opposite direction to the cutting action of the reamer. When the required diameter is achived, the tool is ready for use.

3) Disassembly

Loosen the nut and remove the screw. Remove the components from the mandrel.

**Use a dynamometric key to avoid
breaking the conical screw**

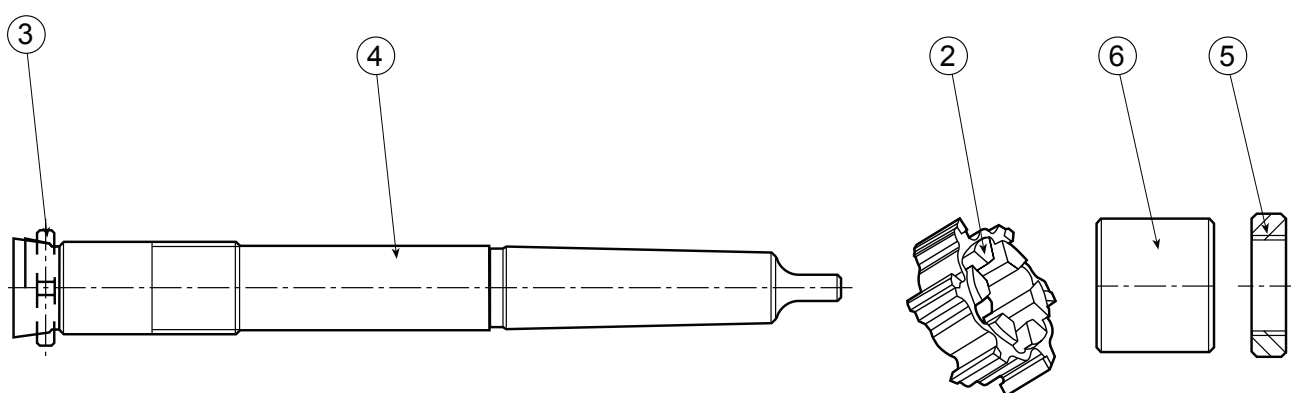
Diameter mm	Torque settings Kgm
18 - 25	1,4 - 1,6
26 - 32	2,2 - 2,5
33 - 40	3,6 - 4
41 - 45	4,6 - 5

table 1

EXPANDING REAMERS INSTRUCTIONS

Assembly - Adjustment - Disassembly EXPANDING REAMERS WITH CUTTING RING with assembly and adjustment on the rear

**Series 2500 - 2505 - 2530 - 2535 - 2550 - 2555
from diam. 45,60 to 100,59 mm**



1) Assembly

Mount the cutting ring (item 2) and the bush (item 6) onto the mandrel (item 4). Screw the ring nut (item 5) onto the mandrel and lock it manually: **the thread is right handed.**

We recommend lubricating the thread and the conical surface of contact between the cutting ring and the mandrel with antifriction Molycote grease.

2) Adjustment procedure

Turn the ring nut slowly, checking the diameter setting of the cutting ring with a micrometer, paying attention that the drive pins (item 3) are in traction in the opposite direction to the cutting action of the reamer.

When the required diameter is achieved, the tool is ready for use.

3) Disassembly

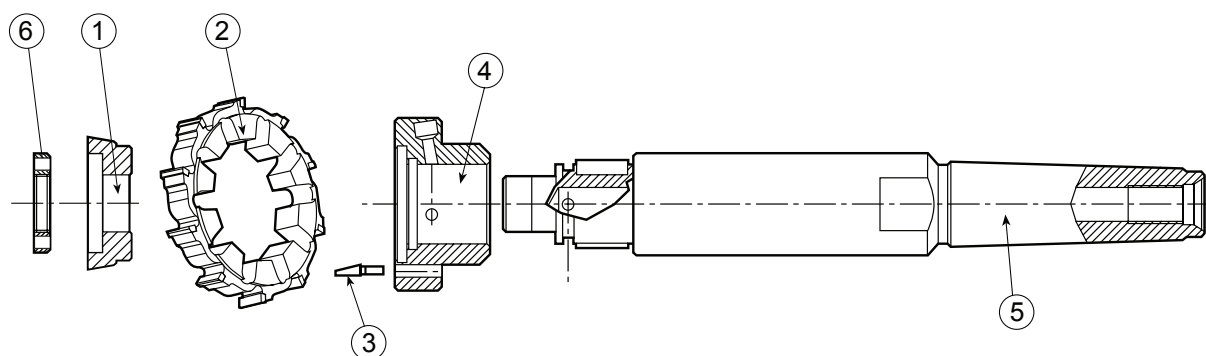
Unscrew the ring nut. Remove the components from the mandrel.

EXPANDING REAMERS INSTRUCTIONS

Assembly - Adjustment - Disassembly EXPANDING REAMERS WITH CUTTING RING with assembly and adjustment in the front

Series 4000 - 4050
from diam. 79,60 to 200,59 mm

Series 4100 - 4150
from diam. 79,60 to 200,59 mm



1) Assembly

With the drive pins (item 3) assembled, mount the flange (item 4) onto the mandrel (item 5). Assemble the cutting ring (item 2) so that the slot on the left side of the dimple is mounted onto the drive pins. Insert the conical ring (item 1). Screw the ring nut (item 6) onto the mandrel and tighten manually, so that the conical ring makes contact with the cutting ring: **the thread is left handed**. We recommend lubricating the thread and the conical surface of contact between the cutting ring and the conical ring with antifriction Molycote grease.

2) Adjustment procedure

Turn the ring nut slowly (using a pin spanner) checking the diameter setting of the cutting ring with a micrometer, paying attention that the drive pins are in traction, in the opposite direction to the cutting action of reamer. When the required diameter is achieved, the tool is ready for use.

3) Disassembly

Unscrew the ring nut. Remove the components from the mandrel.

EXPANDING REAMERS INSTRUCTIONS

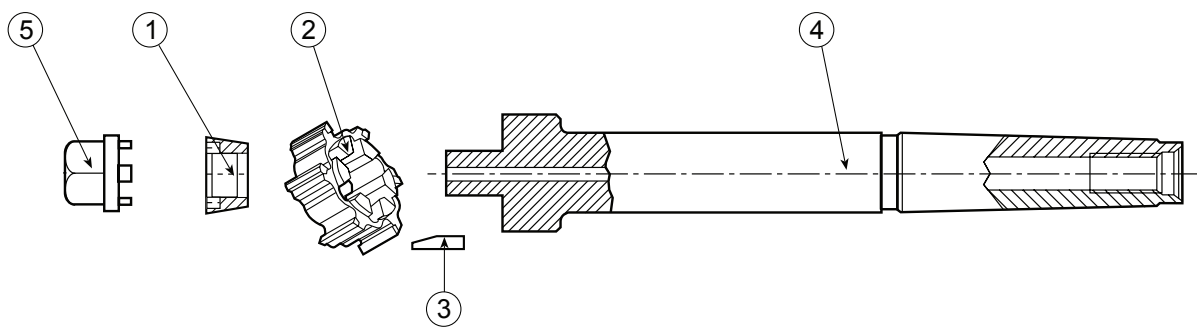
Assembly - Adjustment - Disassembly EXPANDING REAMERS WITH CUTTING RING with assembly and adjustment in the front

Series 2015 from diam. 17,60 to 100,59 mm

Series 4000 - 4050 from diam. 17,60 to 79,59 mm

Series 4355-4505-4555 from diam. 17,60 to 100,59 mm

Series 4305 from diam. 17,60 to 60,59 mm



1) Assembly

Mount the cutting ring (item 2) onto the mandrel (item 4) with the drive pins (item 3) assembled. Screw the conical ring nut onto the mandrel and lock it manually: **the thread is left handed.**

Lubricate the thread and the conical surface of contact between the cutting ring and the conical ring with antifriction Molycote grease.

2) Adjustment procedure

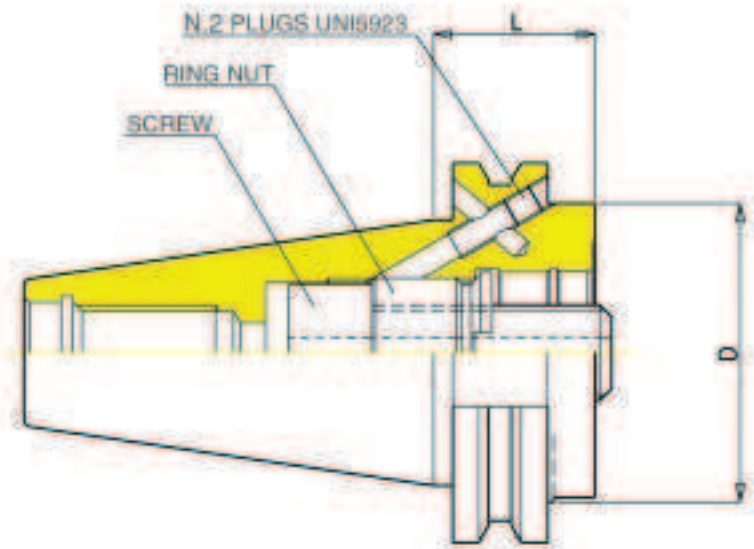
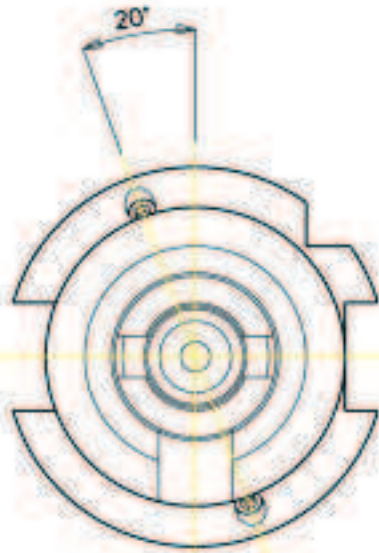
Turn the conical ring nut slowly using a pin spanner (item 5) supplied with reamers from diameter 17,60 to 40,59 mm, checking the diameter setting of the cutting ring with a micrometer. When the required diameter is achieved unscrew the conical ring until there is a click and the drive pins are in traction in the opposite direction to the cutting action of the reamer.

The reamer is ready for use.

3) Disassembly

Unscrew the conical ring nut. Remove the components from the mandrel.

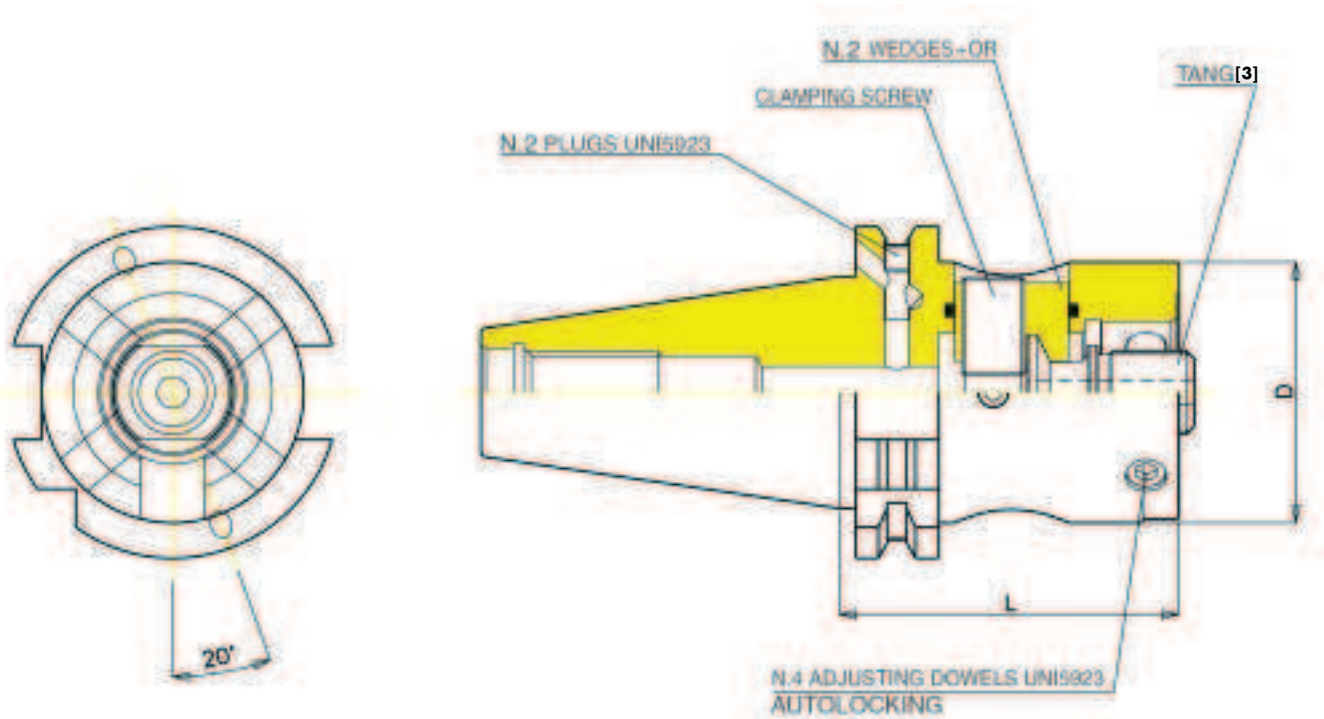
BASIC SHANKS DIN 69871/1 B + A^[1]



ORDER CODE	ISO	MODULAR REDUCER D	L	STANDARD EQUIPMENT			ACCESSORIES	
				screw	ring nut	plugs	modular screw key	modular ring nut key
02B.40.50.27	40	50	27	TAB2808	TAB2809	M5x5TG	hexagon 10	ATR8851
02B.40.63.50	40	63	50	TAB9038	TAB2793	M5x5TG	hexagon 12	ATR8851
02B.40.80.50	40	80	50	TAB9038	TAB2793	M5x5TG	hexagon 12	ATR8851
02B.45.50.27	45	50	27	TAB2808	TAB2809	M5x5TG	hexagon 10	ATR8851
02B.45.63.27	45	63	27	TAB2795	TAB2793	M5x5TG	hexagon 14	ATR8851
02B.45.63.50	45	63	50	TAB2795	TAB2793	M5x5TG	hexagon 14	ATR8851
02B.45.80.50	45	80	50	TAB2795	TAB2793	M5x5TG	hexagon 14	ATR8851
02B.50.50.27	50	50	27	TAB2808	TAB2809	M5x5TG	hexagon 10	ATR8851
02B.50.50.50	50	50	50	TAB2808	TAB2809	M5x5TG	hexagon 10	ATR8851
02B.50.63.27	50	63	27	TAB2795	TAB2793	M5x5TG	hexagon 14	ATR8851
02B.50.63.50	50	63	50	TAB2795	TAB2793	M5x5TG	hexagon 14	ATR8851
02B.50.80.27	50	80	27	TAB2795	TAB2793	M5x5TG	hexagon 14	ATR8851
02B.50.80.50	50	80	50	TAB2795	TAB2793	M5x5TG	hexagon 14	ATR8851

[1] Basic shanks can be converted into DIN 69871/1A coolant by screwing the two plugs clockwise to the end of their stroke

BASIC SHANKS DIN 69871/1 B + A^[1] MODULAR WITH LATERAL CLAMPING^[2] AND RADIAL ADJUSTMENT



ORDER CODE	ISO	MODULAR REDUCER D	L	STANDARD EQUIPMENT					ACCESSORIES	
				wedges+OR	clamping screw	adjusting dowels	plugs	TANG	clamping screw key	tang key
02B.40.50L.65	40	50	65	ATR14102.2.3	ATR14102.1	M8x1x10G	M5x5TG	ATT14103	hexagon 6	fixed 18
02B.40.63L.85	40	63	85	ATR14108.2.3	ATR14108.1	M8x1x14G	M5x5TG	ATT14104	hexagon 6	fixed 24
02B.45.50L.70	45	50	70	ATR14102.2.3	ATR14102.1	M8x1x10G	M5x5TG	ATT14103	hexagon 6	fixed 18
02B.45.63L.70	45	63	70	ATR14108.2.3	ATR14108.1	M8x1x14G	M5x5TG	ATT14104	hexagon 6	fixed 24
02B.50.50L.70	50	50	70	ATR14102.2.3	ATR14102.1	M8x1x10G	M5x5TG	ATT14103	hexagon 6	fixed 18
02B.50.63L.70	50	63	70	ATR14108.2.3	ATR14108.1	M8x1x14G	M5x5TG	ATT14104	hexagon 6	fixed 24
02B.50.80L.70	50	80	70	ATR18775.2.3	ATR18775.1	M8x1x20G	M5x5TG	ATT14104	hexagon 6	fixed 24

[1] Basic shanks can be converted into DIN 69871/1A coolant by screwing the two plugs clockwise to the end of their stroke.

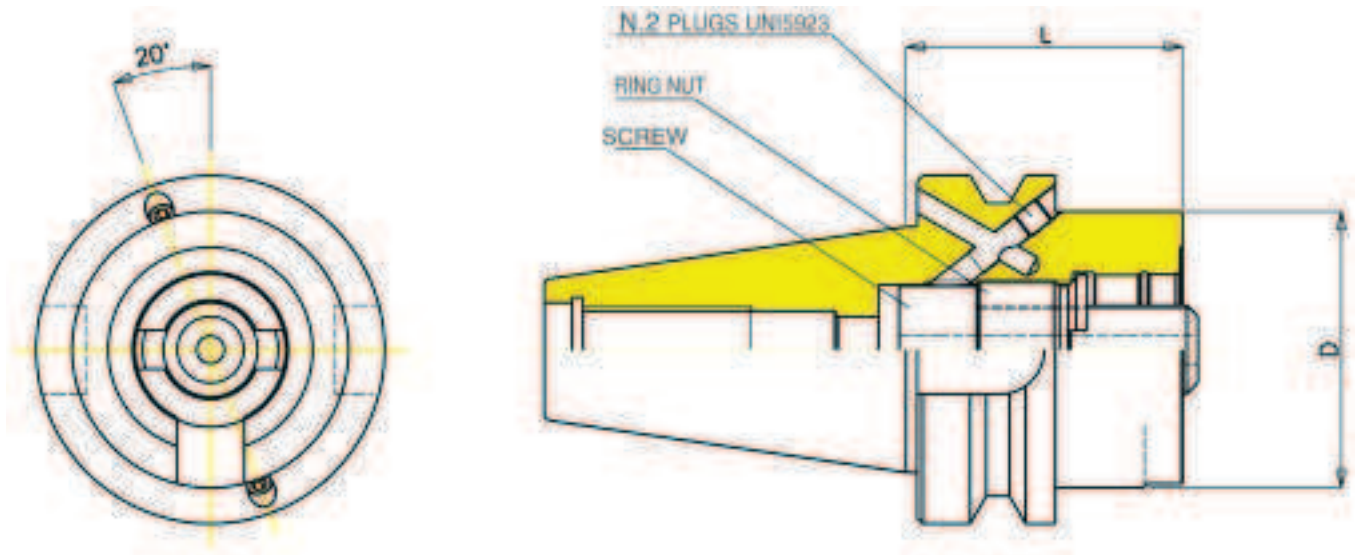
[2] The modular system has lateral clamping which enables efficient quick release of the tools.

Light torque exerted on the clamping screw transmits high axial forces which provide stiffness and extreme accuracy to the assembly.

[3] All adaptors and tools with modular shanks require their respective tang fitted before assembly to the system with lateral clamping.

BASIC SHANKS

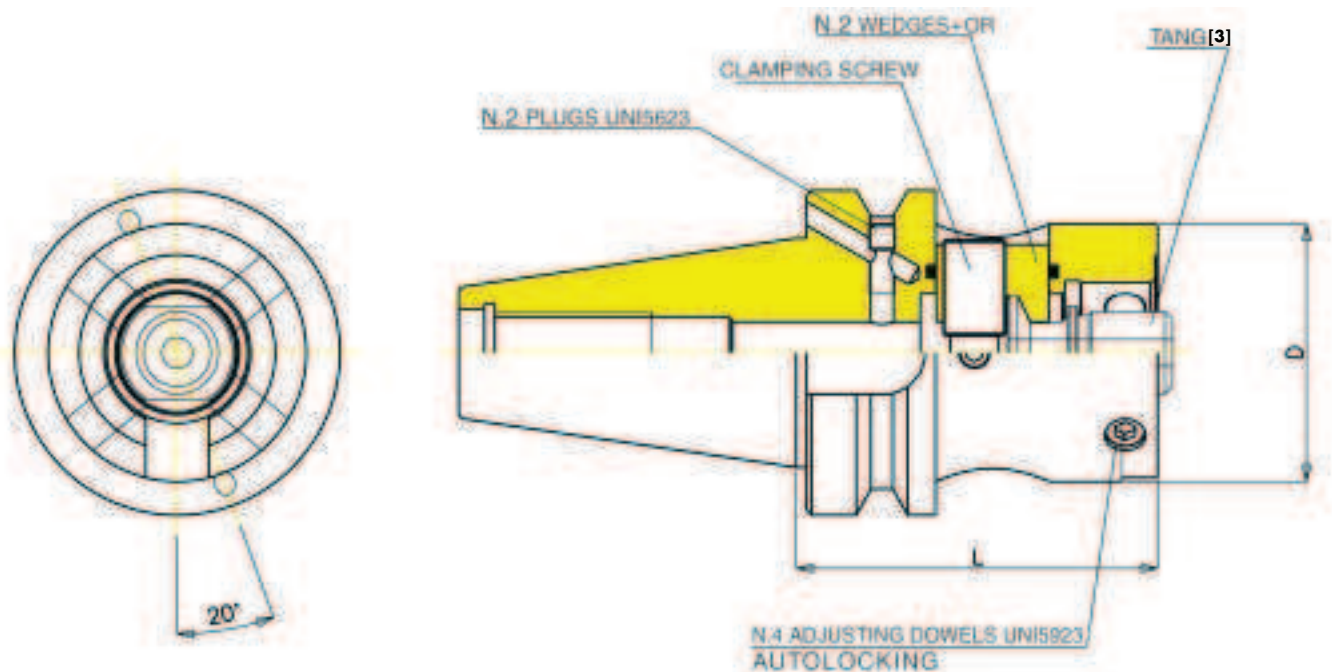
JMTBA MAS-403 BT B+BT^[1]



ORDER CODE	BT	MODULAR REDUCER D	L	STANDARD EQUIPMENT			ACCESSORIES	
				screw	ring nut	plugs	modular screw key	modular ring nut key
BTB.40.50.50	40	50	50	TAB2808	TAB2809	M5x5TG	hexagon 10	ATR8851
BTB.40.63.50	40	63	50	TAB9038	TAB2793	M5x5TG	hexagon 12	ATR8851
BTB.50.50.50	50	50	50	TAB2808	TAB2809	M5x5TG	hexagon 10	ATR8851
BTB.50.63.50	50	63	50	TAB2795	TAB2793	M5x5TG	hexagon 14	ATR8851
BTB.50.80.50	50	80	50	TAB2795	TAB2793	M5x5TG	hexagon 14	ATR8851

[1] Basic shanks can be converted into MAS-403 BT coolant by screwing the two plugs clockwise to the end of their stroke.

BASIC SHANKS JMTBA MAS-403 BT B+BT^[1] MODULAR WITH LATERAL CLAMPING^[2] AND RADIAL ADJUSTMENT



Max radial adjustment: $\pm 0,2$ mm on \varnothing

ORDER CODE	BT	MODULAR REDUCER D	L	STANDARD EQUIPMENT					ACCESSORIES	
				wedges+OR	clamping screw	adjusting dowels	plugs	TANG ^[3]	clamping screw key	tang key
BTB.40.50L.70	40	50	70	ATR14102.2.3	ATR14102.1	M8x1x10G	M5x5TG	ATT14103	hexagon 6	fixed 18
BTB.40.63L.80	40	63	80	ATR14108.2.3	ATR14108.1	M8x1x14G	M5x5TG	ATT14104	hexagon 6	fixed 24
BTB.50.50L.90	50	50	90	ATR14102.2.3	ATR14102.1	M8x1x10G	M5x5TG	ATT14103	hexagon 6	fixed 18
BTB.50.63L.90	50	63	90	ATR14108.2.3	ATR14108.1	M8x1x14G	M5x5TG	ATT14104	hexagon 6	fixed 24
BTB.50.80L.90	50	80	90	ATR18775.2.3	ATR18775.1	M8x1x20G	M5x5TG	ATT14104	hexagon 6	fixed 24

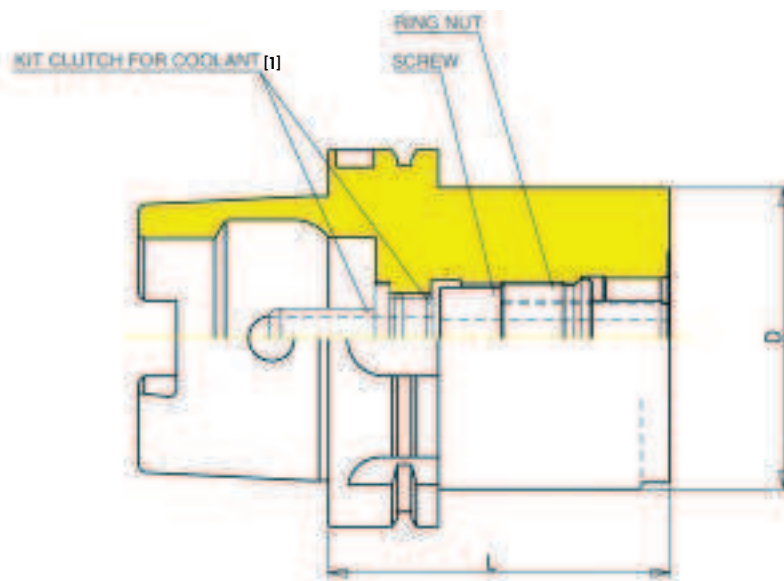
[1] Basic shanks can be converted into MAS-403 BT coolant by screwing the two plugs clockwise to the end of their stroke.

[2] The modular system has lateral clamping which enables efficient quick release of the tools.

Light torque exerted on the clamping screw transmits high axial forces which provide stiffness and extreme accuracy to the assembly.

[3] All adaptors and tools with modular shanks require their respective tang fitted before assembly to the system with lateral clamping.

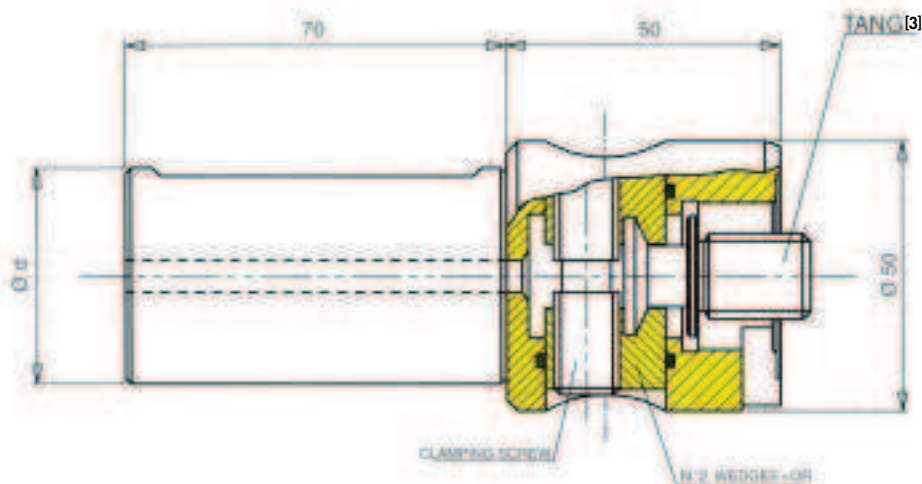
BASIC SHANKS HSK-A DIN 69893/1



ORDER CODE	HSK	MODULAR REDUCER D	L	STANDARD EQUIPMENT		ACCESSORIES			
				screw	ring nut	modular screw key	modular ring nut key	key kit clutch for coolant	kit clutch for coolant ^[1]
HSK-A.63.50.75	63	50	75	TAB2808	TAB2809	hexagon 10	ATR8851	ATR23856	ATT23728
HSK-A.63.63.85	63	63	85	TAB2795	TAB2793	hexagon 14	ATR8851	ATR23856	ATT23728
HSK-A.100.50.80	100	50	80	TAB2808	TAB2809	hexagon 10	ATR8851	ATR23856	ATT23656
HSK-A.100.63.90	100	63	90	TAB2795	TAB2793	hexagon 14	ATR8851	ATR23856	ATT23656
HSK-A.100.80.90	100	80	90	TAB2795	TAB2793	hexagon 14	ATR8851	ATR23856	ATT23656

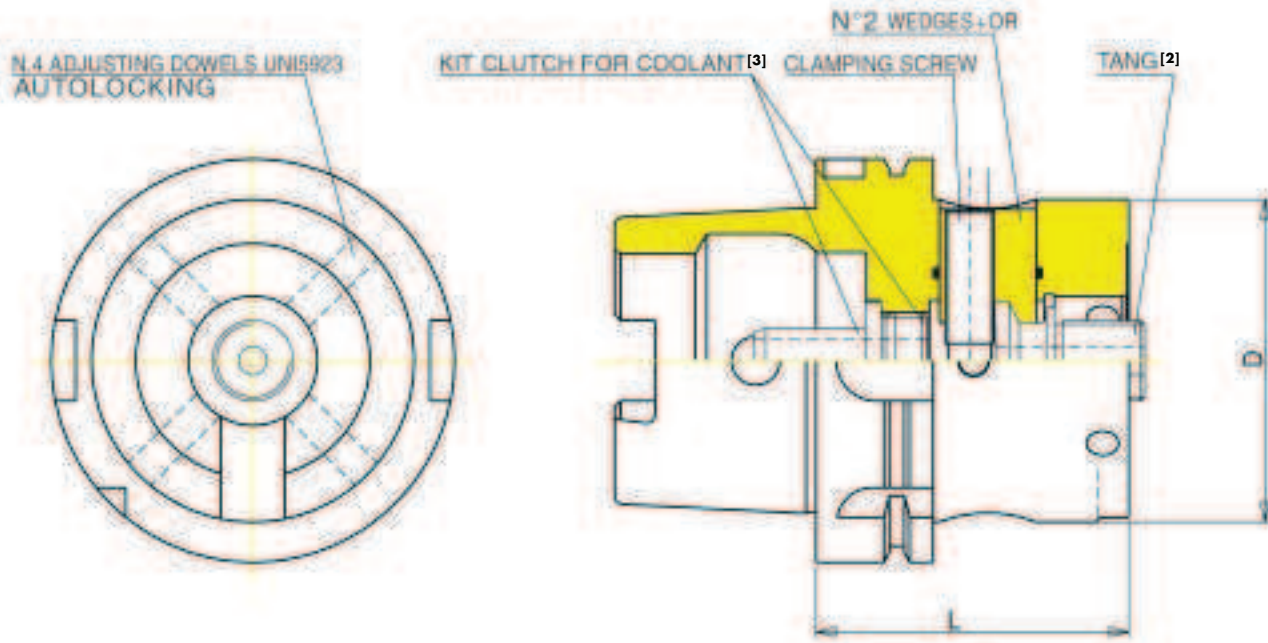
[1] coolant clutch kits are supplied separately on request.

CYLINDRICAL BASIC SHANKS



ORDER CODE	D	STANDARD EQUIPMENT				ACCESSORIES	
		wedges+OR	clamping screw	adjusting dowels	TANG ^[3]	tang key	clamping screw key
CIL.25.50.50	25	ATR14102.2.3	ATR14102.1	M8x1x10G	ATT14103	fixed 18	hexagon 6
CIL.32.50.50	32	ATR14102.2.3	ATR14102.1	M8x1x10G	ATT14103	fixed 18	hexagon 6
CIL.40.50.50	40	ATR14102.2.3	ATR14102.1	M8x1x10G	ATT14103	fixed 18	hexagon 6

BASIC SHANKS HSK-A DIN 69893/1 MODULAR WITH LATERAL CLAMPING^[1] AND RADIAL ADJUSTMENT

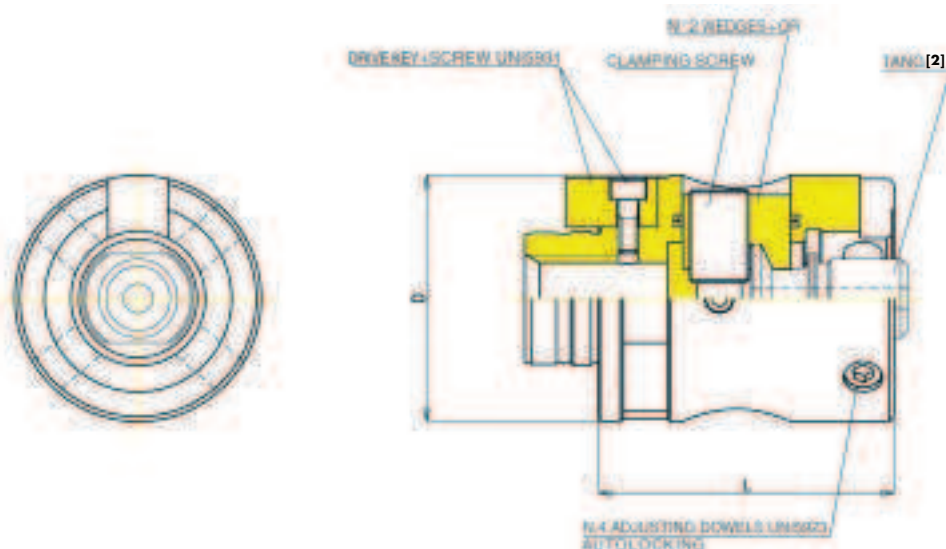


Max radial adjustment $\pm 0,2$ mm on \varnothing

ORDER CODE	HSK	MODULAR REDUCER D	L	STANDARD EQUIPMENT			ACCESSORIES			
				wedges+OR	clamping screw	adjusting dowels	clamping screw key	tang key ^[2]	key kit clutch for coolant	kit clutch for coolant ^[3]
HSK-A.63.50L.70	63	50	70	ATR14102.2.3	ATR14102.1	M8x1x10G	hexagon 6	fixed 18 ATT14103	ATR23856	ATT23728
HSK-A.63.63L.75	63	63	75	ATR41613.4	ATR14108.1	M8x1x14G	hexagon 6	fixed 24 ATT14104	ATR23856	ATT23728
HSK-A.100.50L.80	100	50	80	ATR14102.2.3	ATR14102.1	M8x1x10G	hexagon 6	fixed 18 ATT14103	ATR23856	ATT23656
HSK-A.100.63L.80	100	63	80	ATR14108.2.3	ATR14108.1	M8x1x14G	hexagon 6	fixed 24 ATT14104	ATR23856	ATT23656
HSK-A.100.80L.80	100	80	80	ATR18775.2.3	ATR18775.1	M8x1x20G	hexagon 6	fixed 24 ATT14104	ATR23856	ATT23656

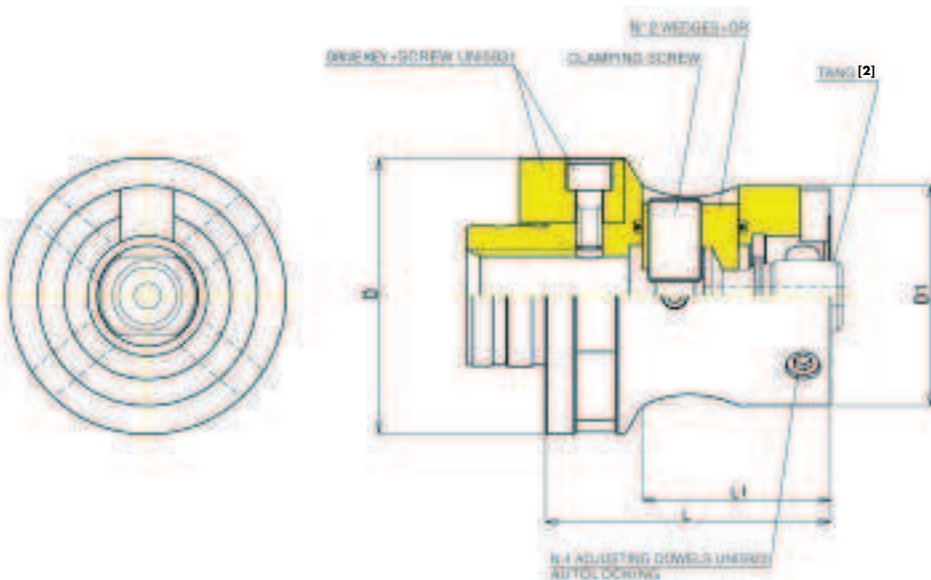
- [1]** The modular system has lateral clamping which enables efficient quick release of the tools.
Light torque exerted on the clamping screw transmits high axial forces which provide stiffness and extreme accuracy to the assembly.
- [2]** All adaptors and tools with modular shanks require their respective tang fitted before assembly to the system with lateral clamping.
- [3]** Coolant clutch kits are supplied separately on request.

MODULAR EXTENSIONS WITH LATERAL CLAMPING^[1] AND RADIAL ADJUSTMENT



Max radial adjustment $\pm 0,2$ mm on \varnothing

ORDER CODE	MODULAR SHANK D	L	STANDARD EQUIPMENT						ACCESSORIES	
			drive key	screw	wedges+OR	clamping screw	adjusting dowels	TANG ^[2]	clamping screw key	tang key
10.50.50L.60	50	60	TAB3924	M4x8V	ATR14102.2.3	ATR14102.1	M8x1x10G	ATT14103	hexagon 6	fixed 18
10.63.63L.80	63	80	TAB3923.1	M6x12V	ATR14108.2.3	ATR14108.1	M8x1x14G	ATT14104	hexagon 6	fixed 24
10.80.80L.80	80	80	TAB3923.2	M6x16V	ATR18775.2.3	ATR18775.1	M8x1x20G	ATT14104	hexagon 6	fixed 24



Max radial adjustment $\pm 0,2$ mm on \varnothing

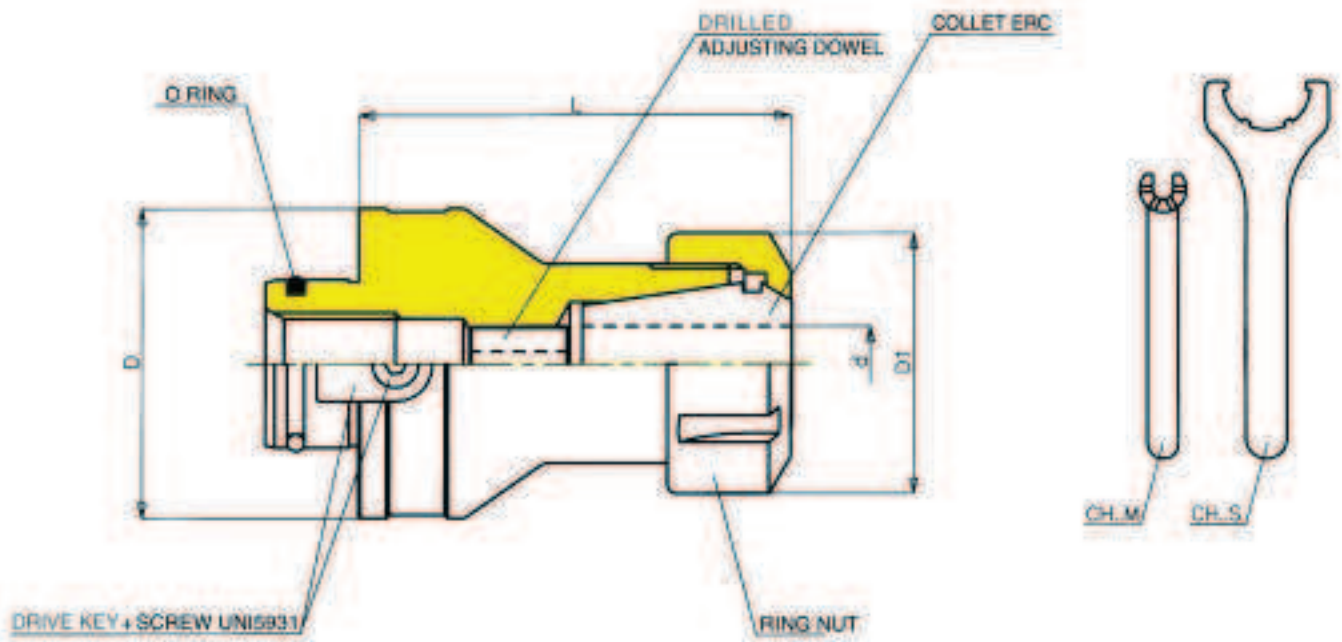
ORDER CODE	MOD. SHANK D	MOD. RED. D1	L	L1	STANDARD EQUIPMENT						ACCESSORIES	
					drive key	screw	wedges+OR	clamping screw	adjusting dowels	TANG ^[2]	clamping screw key	tang key
15.63.50L.65	63	50	65	43	TAB3923.1	M6x12V	ATR14102.2.3	ATR14102.1	M8x1x10G	ATT14103	hexagon 6	fixed 18

[1] The modular system has lateral clamping which enables efficient quick release of the tools.

Light torque exerted on the clamping screw transmits high axial forces which provide stiffness and extreme accuracy to the assembly.

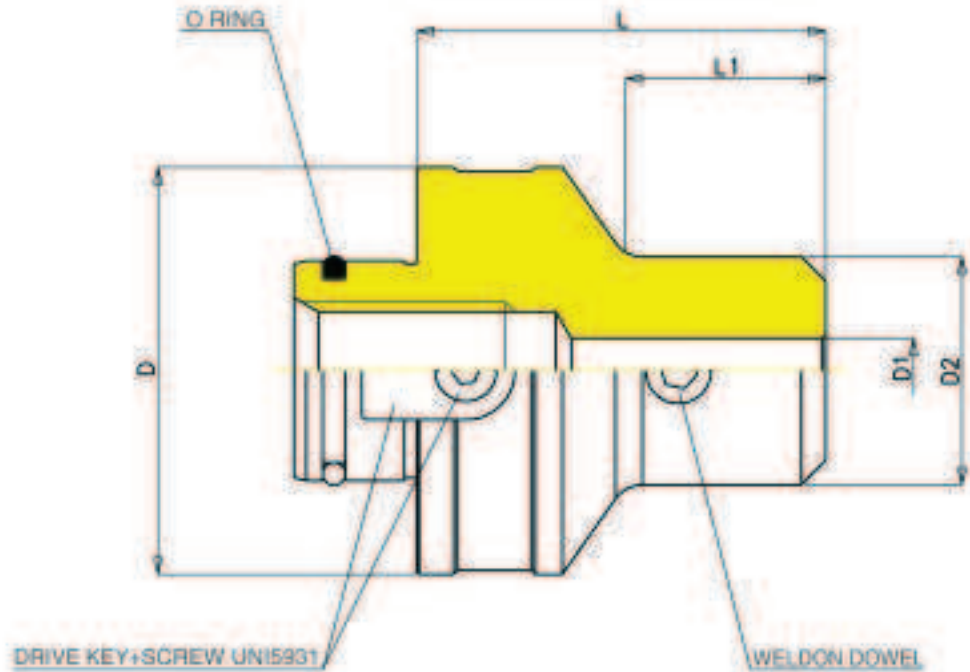
[2] All adaptors and tools with modular shanks require their respective tang fitted before assembly to the system with lateral clamping.

COLLET CHUCK ADAPTORS ERC DIN 6499-B FOR SHANKS WITH RADIAL ADJUSTMENT



ORDER CODE	MODULAR SHANK D	COLLET REDUCER	D	D1	L	STANDARD EQUIPMENT					ACCESSORIES	
						ring nut	drive key	screw	dowel	O ring	ring nut key	adjusting dowel key
30.50R.25.70	50	ERC25	0.5÷16	42	70	G25S	TAB3924	M4x8V	M12x16GF	130	CH25S	hexagon 6
30.50R.32.70	50	ERC32	1÷20	50	70	G32S	TAB3924	M4x8V	M16x15x18GF	130	CH32S	hexagon 8
30.63R.32.90	63	ERC32	1÷20	50	90	G32S	TAB3923.1	M6x12V	M12x16GF	1400	CH32S	hexagon 6
30.63R.40.90	63	ERC40	2÷30	63	90	G40S	TAB3923.1	M6x12V	M20x2x20GF	1400	CH40S	hexagon 10
30.80R.32.90	80	ERC32	1÷20	50	90	G32S	TAB3923.2	M6x16V	M12x16GF	1400	CH32S	hexagon 6
30.80R.40.90	80	ERC40	2÷30	63	90	G40S	TAB3923.2	M6x16V	M20x2x20GF	1400	CH40S	hexagon 10

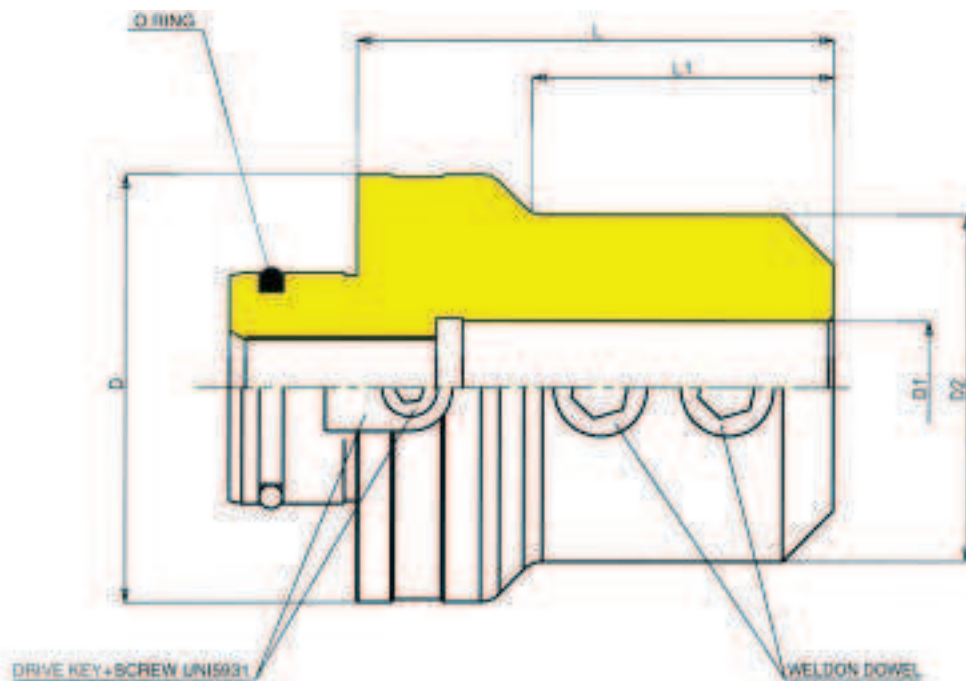
WELDON ADAPTORS [D1=6÷20] FOR SHANKS WITH RADIAL ADJUSTMENT



Max radial adjustment $\pm 0,2$ mm on \emptyset

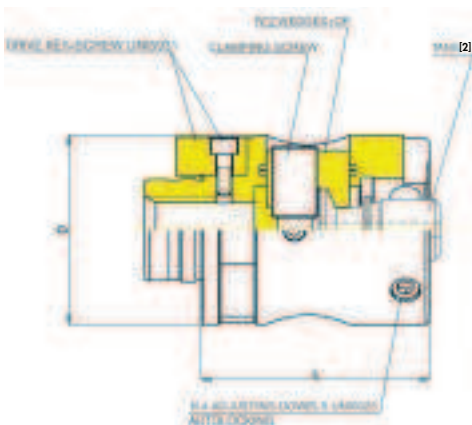
ORDER CODE	MODULAR SHANK D	D1	D2	L	L1	STANDARD EQUIPMENT				ACCESSORIES
						drive key	screw	dowel	O ring	adjusting dowel key
35.50R.06.50	50	6	25	50	22.5	TAB3924	M4x8V	M6x8G	130	hexagon 3
35.50R.08.50	50	8	28	50	24.5	TAB3924	M4x8V	M8x8G	130	hexagon 4
35.50R.10.50	50	10	35	50	26.5	TAB3924	M4x8V	M10x10G	130	hexagon 5
35.50R.12.60	50	12	42	60	38.5	TAB3924	M4x8V	M12x12G	130	hexagon 6
35.50R.14.60	50	14	44	60	42	TAB3924	M4x8V	M12x12G	130	hexagon 6
35.50R.16.60	50	16	48	60	40	TAB3924	M4x8V	M14x14G	130	hexagon 6
35.50R.18.60	50	18	50	60	-	TAB3924	M4x8V	M14x14G	130	hexagon 6
35.50R.20.60	50	20	52	60	41	TAB3924	M4x8V	M16x2x14G	130	hexagon 8
35.63R.08.60	63	8	28	60	28	TAB3923.1	M6x12V	M8x8G	1400	hexagon 4
35.63R.10.70	63	10	35	70	40	TAB3923.1	M6x12V	M10x10G	1400	hexagon 5
35.63R.12.70	63	12	42	70	42	TAB3923.1	M6x12V	M12x12G	1400	hexagon 6
35.63R.14.60	63	14	44	60	32	TAB3923.1	M6x12V	M12x12G	1400	hexagon 6
35.63R.16.70	63	16	48	70	44	TAB3923.1	M6x12V	M14x14G	1400	hexagon 6
35.63R.18.70	63	18	50	70	40	TAB3923.1	M6x12V	M14x14G	1400	hexagon 6
35.63R.20.70	63	20	52	70	45	TAB3923.1	M6x12V	M16x2x14G	1400	hexagon 8

WELDON ADAPTORS [D1=25÷32] FOR SHANKS WITH RADIAL ADJUSTMENT



ORDER CODE	MODULAR SHANK D	D1	D2	L	L1	STANDARD EQUIPMENT				ACCESSORIES
						drive key	screw	dowel	O ring	weldon dowel
40.50R.06.50	50	25	65	80	61	TAB3924	M4x8V	M18x2x18G	130	hexagon 8
40.50R.08.50	50	32	72	80	65	TAB3924	M4x8V	M20x2x18G	130	hexagon 10
40.63R.10.50	63	25	65	80	58	TAB3923.1	M6x12V	M18x2x18G	1400	hexagon 8
40.63R.12.60	63	32	72	80	-	TAB3923.1	M6x12V	M20x2x18G	1400	hexagon 10
40.80R.14.60	80	25	65	80	50.5	TAB3923.2	M6x16V	M18x2x18G	1400	hexagon 8
40.80R.16.60	80	32	72	80	54	TAB3923.2	M6x16V	M20x2x18G	1400	hexagon 10

OPERATING INSTRUCTIONS FOR LATERAL MODULAR SHANK



- Remove the tang from the lateral modular shank by loosening the clamping screw.
- Assemble the tang to the adaptor spigot which matches the lateral modular shank.
- Insert the adaptor with its tang into the reducer bore of the lateral modular shank.
- Lock the adaptor by tightening the clamping screw.

ASSEMBLY FOR RADIAL ADJUSTING

Note: Only adaptors with modular reducer spigot are suitable for radial adjustment

Complete the operations mentioned above then proceed as follows:

- Lightly tighten the clamping screw so that the tang is still able to move in a radial direction.
- Correct eccentricity with the 4 adjusting dowels by bringing them into contact with the tang.
- Tighten the clamping screw to lock the tang.
- Re-check for eccentricity, if required use the 4 adjusting dowels to correct and restore the value.
- Tighten the clamping screw to lock the adaptor.

N.B. do not operate on items marked with red paint.