

**S.C.A.M.I.**

SINTERED SOLUTION

**TSA**  
System



**ALVAN<sup>®</sup>**

**Diameter range:** 11,80÷40,60 mm

**Type:** Hard Metal or Cermet coated or uncoated

## About SCAMI

S.C.A.M.I. company was founded in 1973 as a firm specialized in generic mechanical production. Thanks of its experience in manufacturing components for the Aerospace and Automotive industries, along with the deployment of high technology machines and cutting tools, it passed from subcontract production to the design and manufacture of its own product range of tooling.

Today the company exports its products worldwide:


SCAMI<sup>®</sup> Roller Burnishing tools and ALVAN<sup>®</sup> Reamers.

These two established lines are improved even more today by the launch of TSA System: the optimum completion of a range of products already wide.

The combination of the two products lines is one of the most advanced technologies in the finishing of holes.

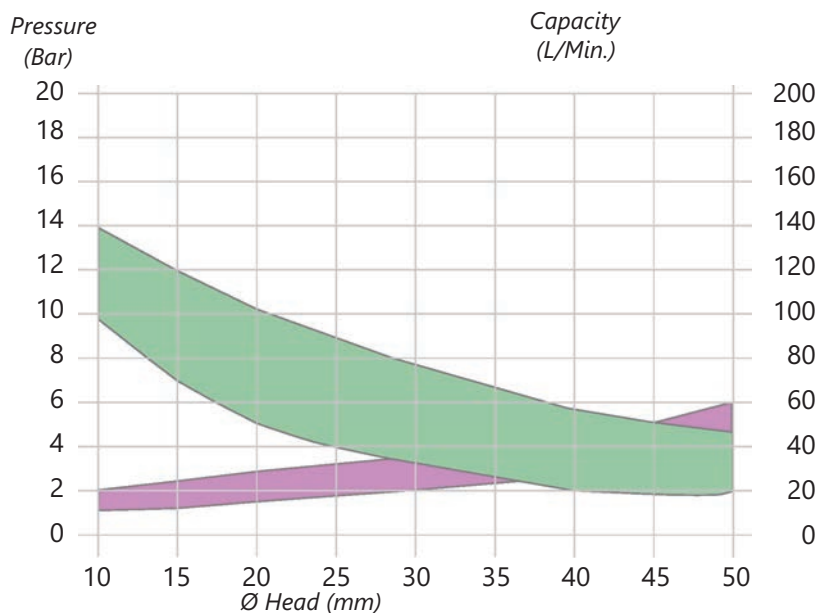


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RECOMMENDED VALUES FOR LUBRICANTS

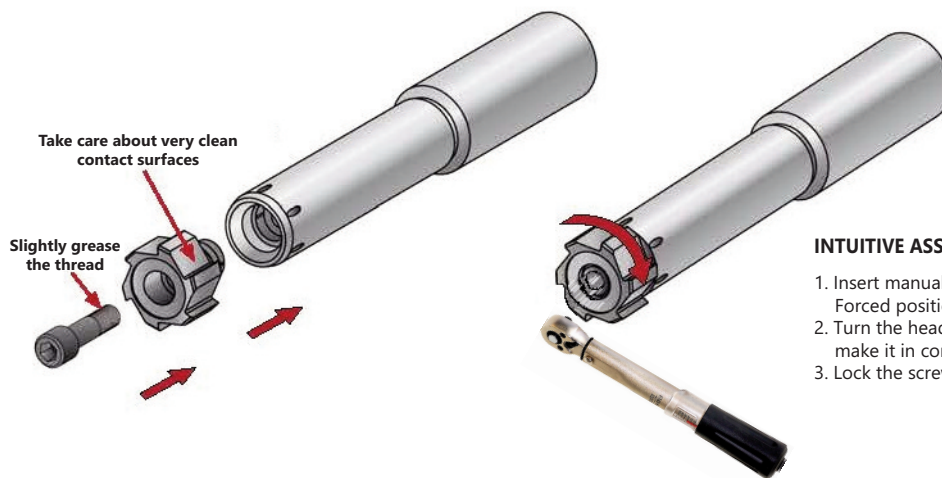


It is important to use a good quality lubricant.

LOCKING SCREW TORQUES

Diameter	Nm
11,80 ÷ 14,60	2.5
14,61 ÷ 17,60	3.5
17,61 ÷ 21,60	4.5
21,61 ÷ 26,60	6
26,61 ÷ 32,60	10
32,61 ÷ 40,60	12

INSTRUCTIONS TO ASSEMBLY

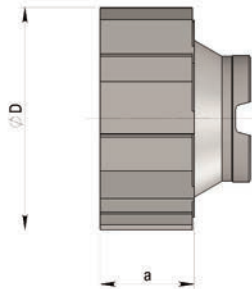


INTUITIVE ASSEMBLY

1. Insert manually the head in the slot.  
Forced position allows to make it easy
2. Turn the head clockwise few degrees to make it in contact with mandrel surface.
3. Lock the screw handling a dynamometric key.

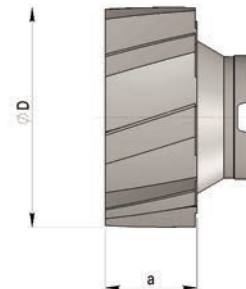
## SERIES 9400

### STRAIGHT FLUTES

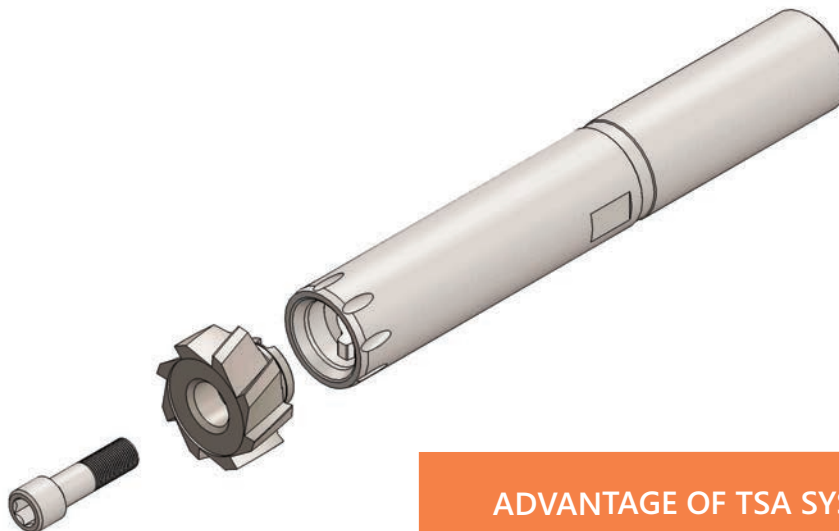


## SERIES 9700

### LEFT HAND HELICAL FLUTES

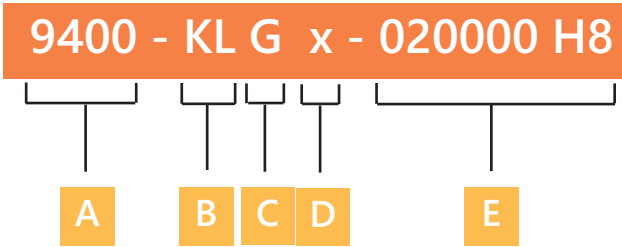


Ø D (mm)	a (mm)	number of teeth
11,80 ÷ 14,60	10	6
14,61 ÷ 17,60	10	6
17,61 ÷ 21,60	10	6
21,61 ÷ 26,60	10	8
26,60 ÷ 32,60	10	8
32,61 ÷ 40,60	10	10



### ADVANTAGE OF TSA SYSTEM

The opportunity to replace the heads directly in the machine, without disassembly the mandrel from the basic shank, permits a reduction of dead times.



**A** A= Series     9400 Straight flutes  
                          9700 Left hand helical flutes

**B** B= Cutting material and coating

Code	Description
KL	Hard Metal cutting edges
KN	Hard Metal cutting edges N coated
KC	Hard Metal cutting edges C coated
KA	Hard Metal cutting edges A coated
KP	Hard Metal cutting edges P coated
KH	Hard Metal cutting edges H coated
KW*	Hard Metal cutting edges W coated
AV	Cermet cutting edges
AN	Cermet cutting edges N coated
AC	Cermet cutting edges C coated
AA	Cermet cutting edges A coated
AP	Cermet cutting edges P coated
AH	Cermet cutting edges H coated

\* W is a new type of coat, ideal for working Inox Steel

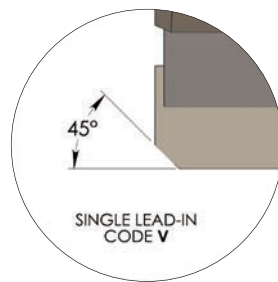
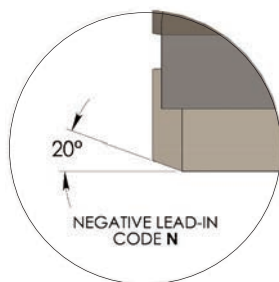
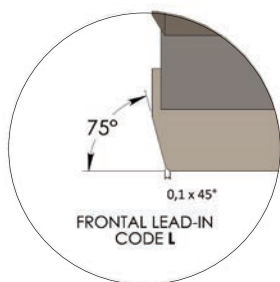
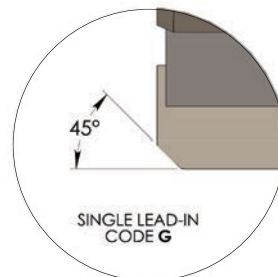
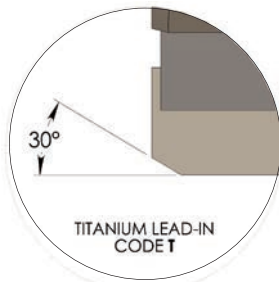
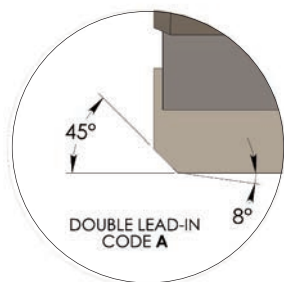
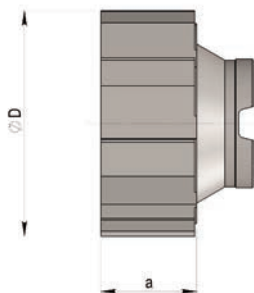
**C** C= Lead in (see pag. 7)

**D** D= Optional demand:  
           R= chip-breaker  
           Z= oversized tapering  
           H= half circular face

**E** E= Diameter and tolerance

**STRAIGHT FLUTES**

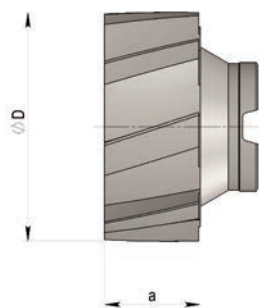
*Suggested to ream through and blind holes*



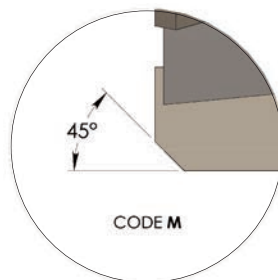
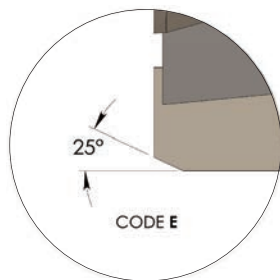
"V" Lead-in is recommended for high cutting speed

**HELICAL FLUTES**

*Suggested only to ream through holes*



"E" Lead-in is suitable to work most of materials as cast iron, steel and aluminium

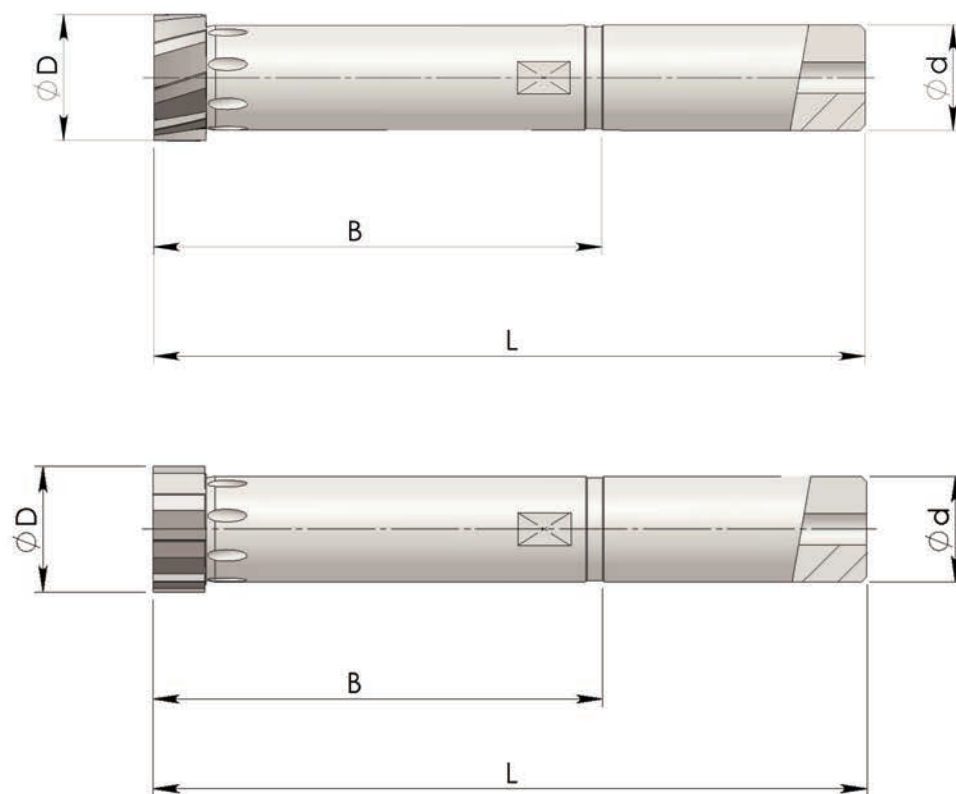


"M" Lead-in allows an easier depth penetration in steels with surface hardness greater than 200 HB

Hard metal or Cermet carbide uncoated  
 Hard metal or Cermet carbide N - C - A - P - H - W coated

MATERIAL TO WORK	N/mm <sup>2</sup>	HEAD Ø mm	STOCK ALLOWANCE Ø mm	SURFACE SPEED m/min	HARD METAL UNCOATED	HARD METAL COATED						SURFACE SPEED m/min	FEED mm/rev	FEED mm/rev
					N	C	A	P	H	W	CERMET COATED UNCOATED			
Mild Steel Unalloyed	Up to 600	11,80 - 21,60	0,15 - 0,25	10 - 20	60 - 80							90 - 300	0,25 - 0,60 0,30 - 0,80 0,60 - 1,00	0,50 - 1,00 0,60 - 1,20 0,70 - 1,50
Low alloyed		21,61 - 39,60	0,20 - 0,40											
Structural steel Fused Metal	Greater than 600	11,80 - 21,60	0,15 - 0,25	7 - 15			40 - 70					80 - 200	0,30 - 0,60 0,40 - 0,80 0,50 - 0,90	0,40 - 0,80 0,50 - 1,00 0,60 - 1,20
		21,61 - 39,60	0,20 - 0,40											
Alloy steel Stainless steel	400- 1000	11,80 - 21,60	0,15 - 0,25	6 - 10						30 - 50		60 - 150	0,30 - 0,60 0,40 - 0,80 0,50 - 0,90	0,40 - 0,80 0,50 - 1,00 0,60 - 1,20
Strongly alloy steel Steel with manganese	800- 1500	11,80 - 21,60	0,15 - 0,25	4 - 8								60 - 120	0,25 - 0,50 0,30 - 0,60 0,40 - 0,70	0,30 - 0,60 0,40 - 0,80 0,50 - 1,00
Grey cast iron Spheroidal cast iron (pearlitic) Malleable cast iron	Up to 200 HB Greater than 200 HB	11,80 - 21,60	0,15 - 0,25	≤200 HB 20 - 40 ≥200 HB 15 - 30			120 - 200						0,20 - 0,60 0,30 - 0,70 0,40 - 0,80	0,50 - 1,00 0,60 - 1,20 0,80 - 1,60
Spheroidal cast iron (ferritic)	300- 700	11,80 - 21,60	0,15 - 0,25	10 - 15			90 - 140		90 - 140			90 - 140	0,20 - 0,60 0,30 - 0,70 0,40 - 0,80	0,50 - 1,00 0,60 - 1,20 0,80 - 1,60
Copper and alloys Brass	Up to 500	11,80 - 21,60	0,15 - 0,25	60 - 200	100 - 200								0,20 - 0,40 0,30 - 0,60 0,40 - 0,80	
Bronze Bronze phosphorous	Up to 600	11,80 - 21,60	0,15 - 0,25	20 - 40	80 - 160							100 - 300	0,30 - 0,60	0,40 - 1,00 0,50 - 1,20 0,60 - 1,50
Alluminium and light alloys	Up to 500	11,80 - 21,60	0,15 - 0,25	20 - 200									0,30 - 0,60 0,40 - 1,00 0,40 - 1,00	
Titanium and alloys		11,80 - 21,60	0,15 - 0,25	6 - 15		20 - 60							0,20 - 0,40 0,30 - 0,50 0,40 - 0,60	





## Head Mandrel - Short Series 9000-MC

Mandrel Code*	Ø D (mm)	B (mm)	L (mm)	Ød h6 (mm)	Locking screw through holes	Locking screw blind hole
9000-MC-001	11,80 ÷ 14,60	50	95	12	9000-VI-001	9001-VI-001
9000-MC-002	14,61 ÷ 17,60	65	113	16	9000-VI-002	9001-VI-002
9000-MC-003	17,61 ÷ 21,60	75	125	20	9000-VI-003	9001-VI-003
9000-MC-004	21,61 ÷ 26,60	85	135	20	9000-VI-004	9001-VI-004
9000-MC-005	26,61 ÷ 32,60	105	161	25	9000-VI-005	9001-VI-005
9000-MC-006	32,61 ÷ 36,60	120	180	32	9000-VI-006	9001-VI-006
9000-MC-007	36,61 ÷ 40,60	120	180	32	9000-VI-006	9001-VI-006

## Head Mandrel - Long Series 9000-ML

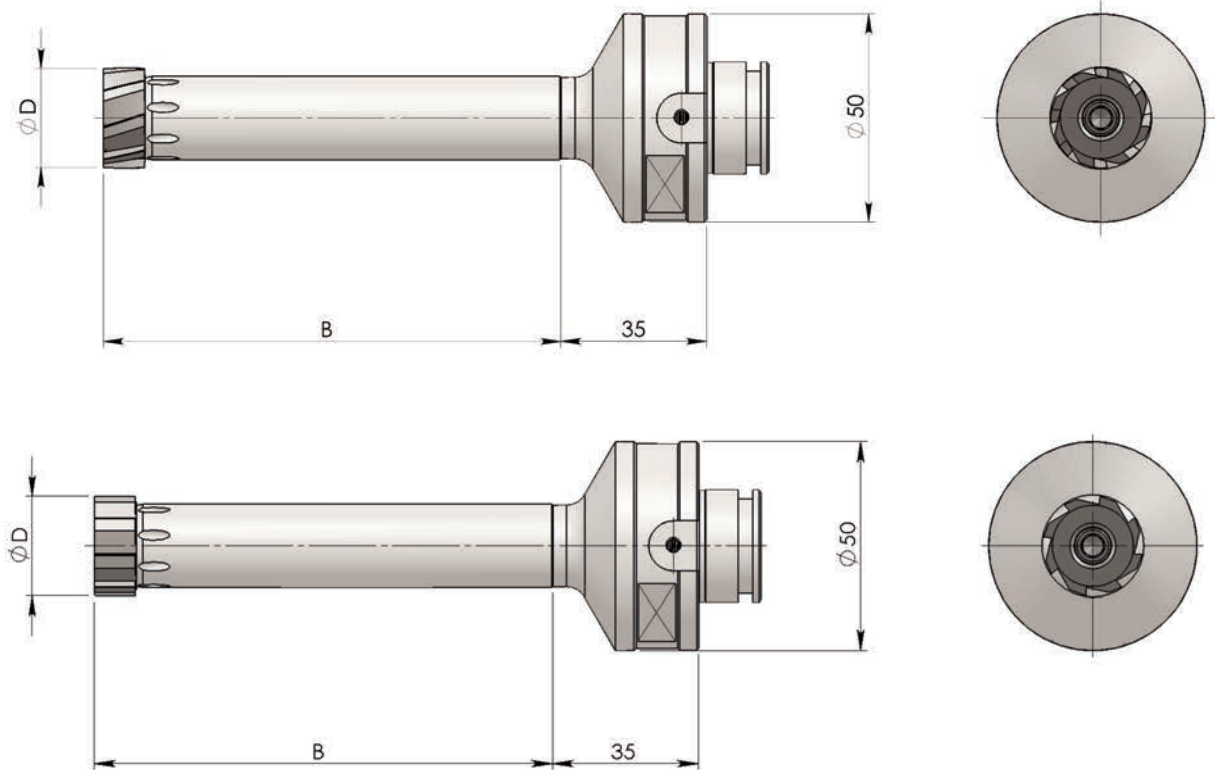
Mandrel Code*	Ø D (mm)	B (mm)	L (mm)	Ød h6 (mm)	Locking screw through holes	Locking screw blind hole
9000-ML-001	11,80 ÷ 14,60	95	140	12	9000-VI-001	9001-VI-001
9000-ML-002	14,61 ÷ 17,60	105	153	16	9000-VI-002	9001-VI-002
9000-ML-003	17,61 ÷ 21,60	125	175	20	9000-VI-003	9001-VI-003
9000-ML-004	21,61 ÷ 26,60	145	195	20	9000-VI-004	9001-VI-004
9000-ML-005	26,61 ÷ 32,60	165	221	25	9000-VI-005	9001-VI-005
9000-ML-006	32,61 ÷ 36,60	185	245	32	9000-VI-006	9001-VI-006
9000-MC-007	36,61 ÷ 40,60	185	245	32	9000-VI-006	9001-VI-006

\* Mandrel code without head and locking screw, they must be ordered separately.

**Note:**

- All mandrels are provided with radial tool coolant, suitable for working through holes.
- To ream blind holes is recommended to order their respective drilled screw that allows only axial coolant flow.
- Both types of screw do not protrude the head.
- Therefore, also the screw for through holes allows to ream counterborings.

# HEADS MANDRELS - COMPOSIT SHANK



## Short Series 9000-MM

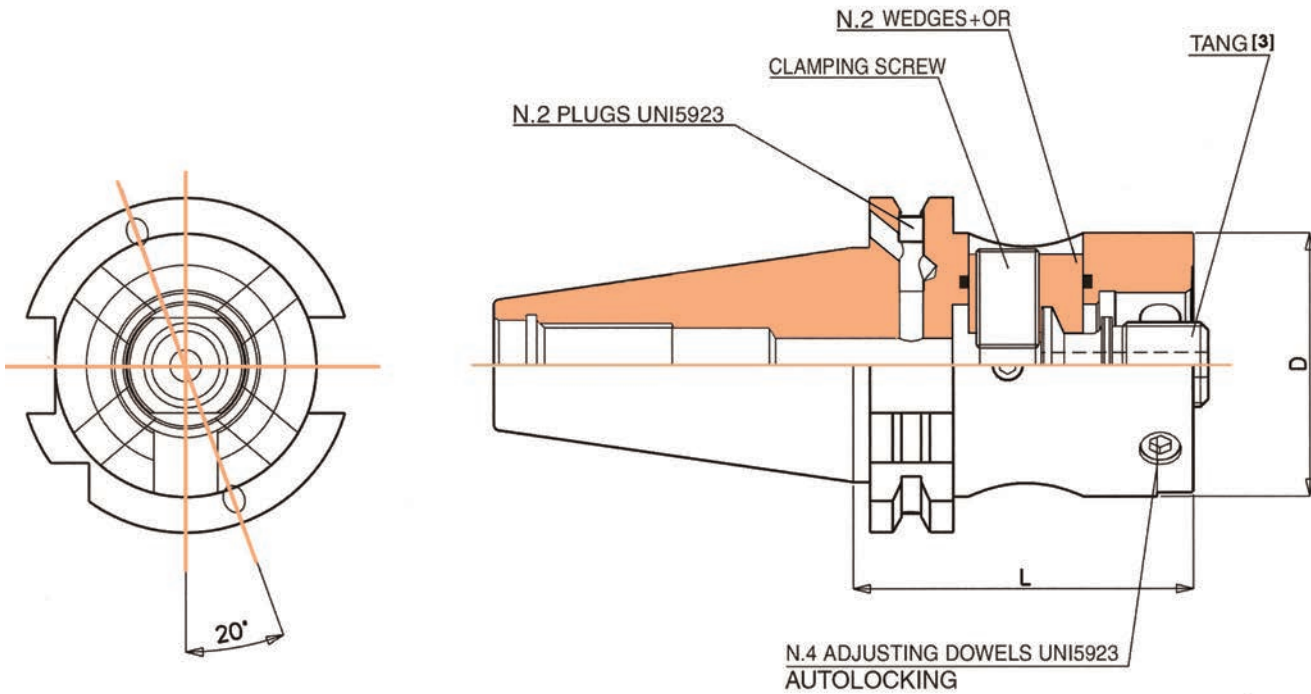
Mandrel Code*	Ø D (mm)	B (mm)	Locking screw through holes	Locking screw blind hole
9000-MM-001	11,80 ÷ 14,60	65	9000-VI-001	9001-VI-001
9000-MM-002	14,61 ÷ 17,60	80	9000-VI-002	9001-VI-002
9000-MM-003	17,61 ÷ 21,60	100	9000-VI-003	9001-VI-003
9000-MM-004	21,61 ÷ 26,60	110	9000-VI-004	9001-VI-004
9000-MM-005	26,61 ÷ 32,60	120	9000-VI-005	9001-VI-005
9000-MM-006	32,61 ÷ 36,60	120	9000-VI-006	9001-VI-006
9000-MM-007	36,61 ÷ 40,60	120	9000-VI-006	9001-VI-006

\* Mandrel code without head and locking screw, they have to be ordered separately.

**Note:**

- All mandrels are provided with radial tool coolant, suitable for working through holes.
- To ream blind holes is recommended to order their respective drilled screw that allows only axial coolant flow.
- Both types of screw do not protrude the head.
- Therefore, also the screw for through holes allows to ream counterborings.

# BASIC SHANKS DIN 69871/1 B+A <sup>[1]</sup> MODULAR WITH LATERAL CLAMPING <sup>[2]</sup> AND RADIAL ADJUSTMENT



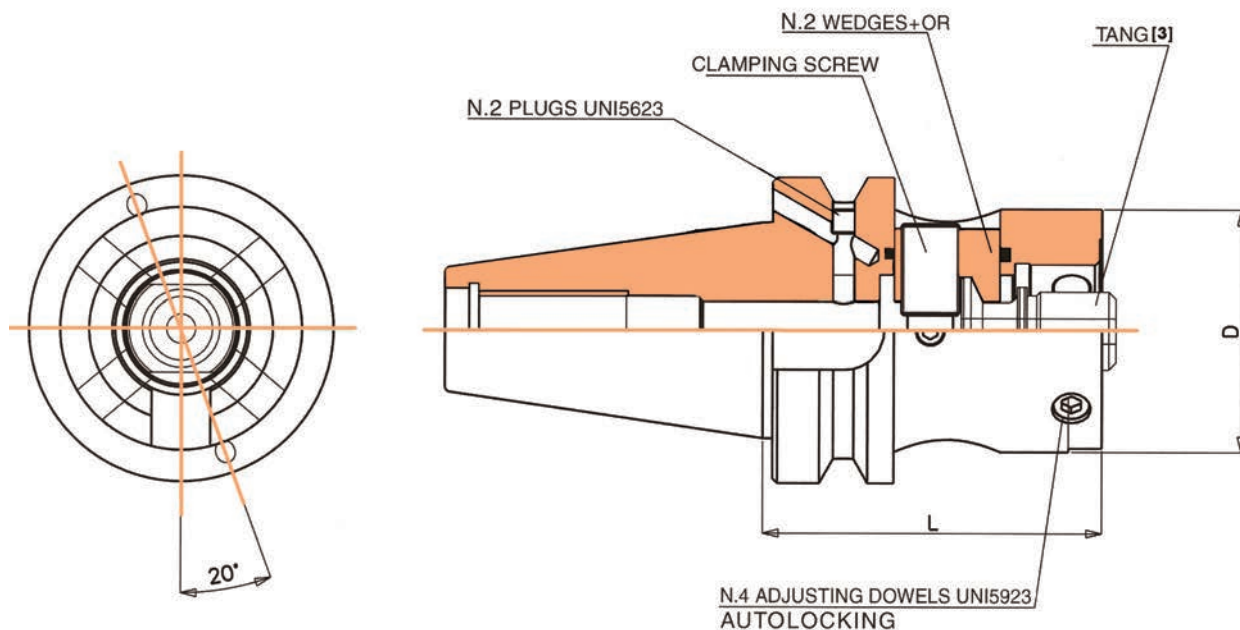
CERIT® BASIC SHANKS

ORDER CODE	ISO	MODULAR REDUCER D	L	STANDARD EQUIPMENT					ACCESSORIES	
				wedges + OR	clamping screw	adjusting dowels	plugs	TANG <sup>[3]</sup>	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 configuration fastening two plugs clockwise to the end of their stroke.  
 [2] "Lateral clamping" modular system allows an easier tool clamp and release ensuring light clamping torques and high axial forces which provide stiffness to all the system.  
 [3] All kind of modular standard central positioning adaptors can be assembled with all the shanks. In case of radial adjustment it is necessary to set up with reduced modular central positioning.  
 [4] All kind of modular shanks and adaptors, which have to be mounted on a "lateral fixing" system, need their respective tangs, supplied separately, on request.

MODULAR SYSTEM courtesy of CERIT

**BASIC SHANKS JMTBA MAS-403BT B+BT <sup>[1]</sup>  
 MODULAR WITH LATERAL CLAMPING <sup>[2]</sup>  
 AND RADIAL ADJUSTMENT**



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

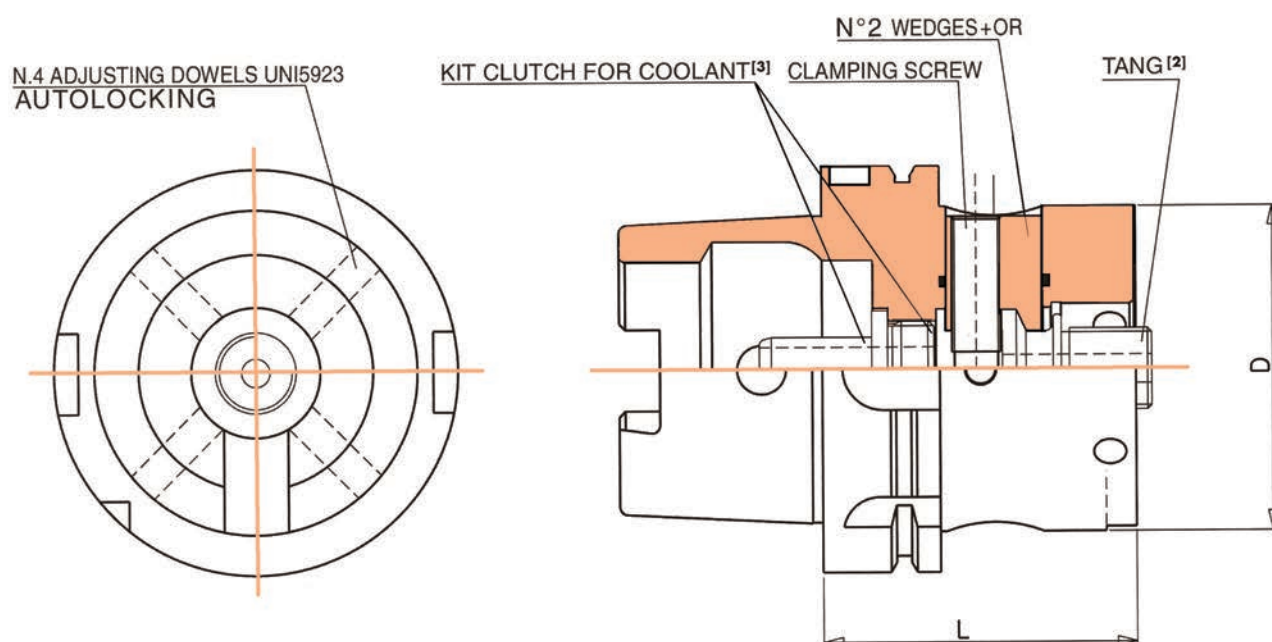
ORDER CODE	BT	MODULAR REDUCER D	L	STANDARD EQUIPMENT					ACCESSORIES	
				wedges + OR	clamping screw	adjusting dowels	plugs	TANG <sup>[3]</sup>	clamping screw key	tang key
BTB.40.50L.70	40	50	70	ATR14102.2.3	ATR14102.1	M8x1x10G	M5x5TG	ATT14103	hexagon 6	fixed 18
BTB.40.63L.80	40	63	80	ATR14108.2.3	ATR14108.1	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 configuration fastening two plugs clockwise to the end of their stroke.

[2] "Lateral clamping" modular system allows an easier tool clamp and release ensuring light clamping torques and high axial forces which provide stiffness to all the system.

[3] All kind of modular shanks and adaptors, which have to be mounted on a "lateral fixing" system, need their respective tangs, supplied separately, on request.

# BASIC SHANKS HSK-A DIN 69893/1 MODULAR WITH LATERAL CLAMPING <sup>[1]</sup> 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 <sup>[2]</sup>	key kit clutch for coolant	kit dutch for coolant <sup>[4]</sup>
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

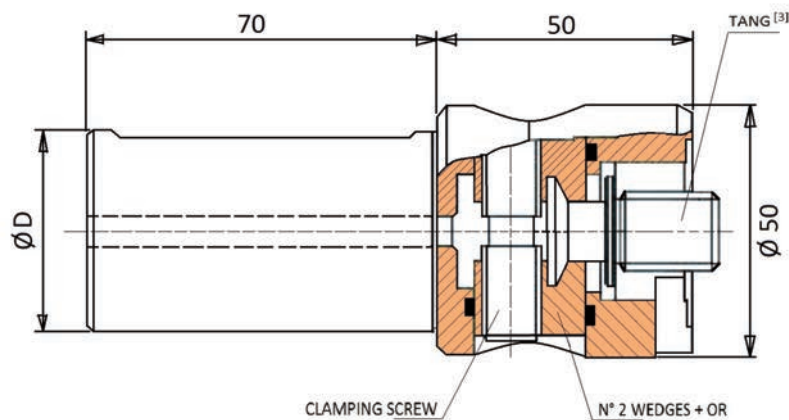
[1] "Lateral clamping" modular system allows an easier tool clamp and release ensuring light clamping torques and high axial forces which provide stiffness to all the system.

[2] All kind of modular standard central positioning adaptors can be assembled with all the shanks. In case of radial adjustment it is necessary to set up with reduced modular central positioning.

[3] All kind of modular shanks and adaptors, which have to be mounted on a "lateral fixing" system, need their respective tangs, supplied separately, on request.

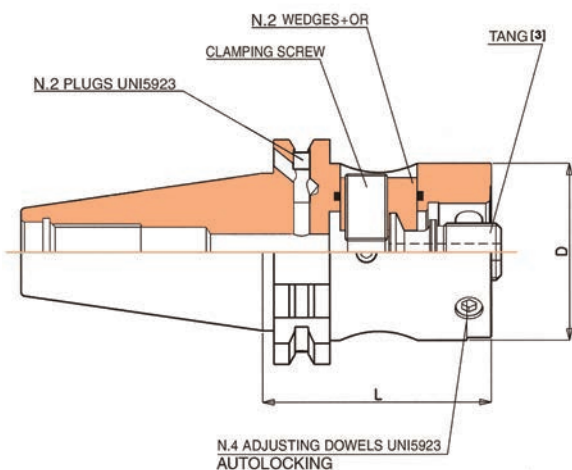
[4] Coolant clutch kits are available separately on request.

CYLINDRICAL BASIC SHANKS



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

OPERATING INSTRUCTIONS FOR LATERAL MODULAR SHANK



- Remove the tang from the lateral modular shank loosening the clamping screw.
- Build up the tang on the adaptor centering which is requested to assembly the modular shank.
- Insert the tang into the modular shank socket.
- Fasten the screw to hold the adaptor.

ASSEMBLY FOR RADIAL ADJUSTING

Note: Only reduced adaptor centering are needed for radial adjustment.

- Complete the operations above mentioned, after proceed as follows:
- Lightly fasten the clamping screw to allow the tang to move in a radial direction.
  - Fasten 4 set plugs to the end of their strokes to adjust the concentricity.
  - Fasten again the clamping screw and recheck the concentricity before to lock the tang.
  - Eventually fix the adaptor, fastening strongly the clamping screw.

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

Mod.	Nm
50	70
63	110
80	110

**- Remedies to possible difficulties -**

DEFECT	CAUSE	REMEDY
1) HOLE TOO LARGE	<ul style="list-style-type: none"> <li>a) Concentricity error of the reamer in the spindle</li> <li>b) Excessive misalignment (reamer cuts at the back end)</li> <li>c) Material build up on cutting edges</li> <li>d) The reamer diameter is too large</li> </ul>	<ul style="list-style-type: none"> <li>a) Use the adjusted mandrel</li> <li>b) Rectify misalignment or use the adjusted mandrel</li> <li>c) Replace the coolant or modify the cutting speed parameters</li> <li>d) Use smaller reamer or regrind existing one</li> </ul>
2) HOLE TOO SMALL	<ul style="list-style-type: none"> <li>a) The reamer diameter is too small</li> <li>b) The reamer diameter is worn</li> <li>c) The coolant is not suitable</li> <li>d) Stock allowance too small</li> <li>e) The cutting speed is too low</li> </ul>	<ul style="list-style-type: none"> <li>a) Use a bigger reamer diameter</li> <li>b) Expand, regrind or replace the reamer</li> <li>c) Replace the coolant</li> <li>d) Increase the stock allowance</li> <li>e) Increase the cutting speed parameters</li> </ul>
3) TAPERED HOLE smaller in entrance than in exit	<ul style="list-style-type: none"> <li>a) Misalignment of the reamer respect to the holder</li> </ul>	<ul style="list-style-type: none"> <li>a) Correct misalignment or use the adjusted mandrel</li> </ul>
4) LIPPED HOLE larger in entrance than in exit	<ul style="list-style-type: none"> <li>a) Misalignment of the reamer respect to hole</li> </ul>	<ul style="list-style-type: none"> <li>a) Correct misalignment</li> </ul>
5) THE HOLE IS NOT STRAIGHT	<ul style="list-style-type: none"> <li>a) Concentricity and alignment error between the workpiece and the tool</li> <li>b) Asymmetrical cutting or angled surfaces.</li> <li>c) Deformation through clamping the workpiece</li> <li>d) Feed too high</li> </ul>	<ul style="list-style-type: none"> <li>a) Correct misalignment or use the adjusted mandrel</li> <li>b) Create a chamfer on the workpiece</li> <li>c) Correct clamping of the workpiece</li> <li>d) Reduce feed parameters</li> </ul>
6) QUALITY OF THE WORK SURFACE UNSATISFACTORY	<ul style="list-style-type: none"> <li>a) One cutting edge is build-up</li> <li>b) Cutterd worn</li> <li>c) Excessive misalignment</li> <li>d) Cutting data not correct</li> <li>e) Poor chip evacuation</li> </ul>	<ul style="list-style-type: none"> <li>a) Reduce cutting speed - increase oil content in the coolant</li> <li>b) Replace the reamer</li> <li>c) Correct misalignment or use the adjusted mandrel</li> <li>d) Verify cutting data</li> <li>e) Verify coolant volume and pressure or use internal through tool coolant</li> </ul>
7) THE REAMER CREATES EXCESSIVE TORQUE LOADING	<ul style="list-style-type: none"> <li>a) Reamer is allowed to travel too far out of the hole</li> <li>b) Material springs back</li> </ul>	<ul style="list-style-type: none"> <li>a) To allow the reamer to travel out of the hole 2 mm more than the cutting length at the most</li> <li>b) Retraction not a high speed, but with increased (2-3 times) feed speed</li> </ul>

**Our technical department is available to assist in:**

- 1) *Establishing optimum cutting data.*
- 2) *Verifying alignment problems.*
- 3) *Supply of correct regrinding data.*

## OTHER PRODUCTS LITERATURE



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