Configuration Manual for the Heads

v. 1.2 - September 2005

Cod. 0000571406D

SCM GROUP

WARNING: THE INFORMATION GIVEN IN THIS SECTION MAY NOT BE VALID FOR SOME TYPES OF MACHINES / MACHINING UNITS: BEFORE USING A HEAD AND RELATIVE PARAMETERS AND MACROS, CONSULT THE MANUFACTURER TO VERIFY COMPATIBILITY WITH THE MACHINE OR MACHINING UNIT ON WHICH THEY ARE TO BE USED.

This manual has been designed to provide information relative to the use of Bore-Milling machines manufactured by the SCM Group.

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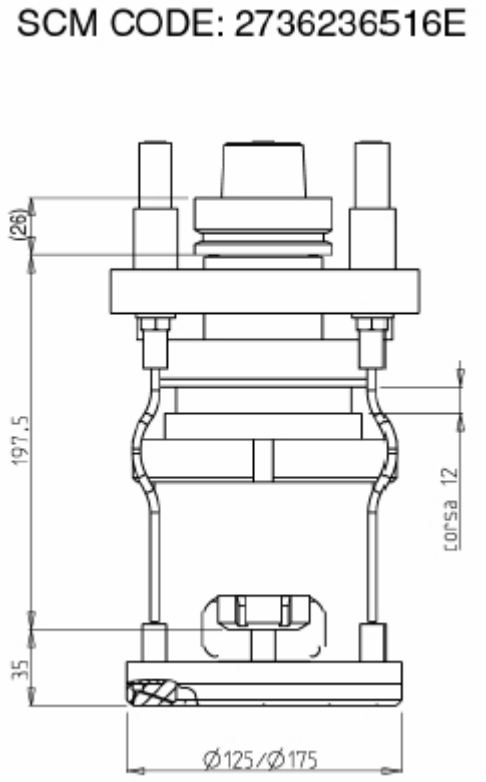
Contents

Head 2736236516E - SCM

Floating co-axle head with HSK F63 cone coupler for feeling the surface of the piece using a ring concentric with the tool.



Characteristics

- Maximum input rotation speed 18000 rpm
- Transmission ratio R=1:1
- Weight 8kg
- Right and left rotation
- Clamp coupler ER 32 for millers with cylindrical shaft (3-20 mm)
- **Requires pre-set for electric spindle**

Configuration of the miller tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	F	**Length (L)**	0 - 80
Max. speed (Vmax)	> 0	**Diameter (D)**	0 - 120
Standard speed	0 - Vmax	**Working length (Lu)**	0 - L
Max. rotation (Rmax)	0 - 18000	**Working diameter (Du)**	0 - D
Standard rotation	0 - Rmax	**Type tip**	L, P, S
Transmission ratio	1	**Height countersink**	0 - L
Direction of rotation	+, -	**Tool counter position in X**	>= E1
Speed G0/B	0 - Vmax	**Tool counter position in Y**	>= E1

Overall dimensions (I)	>= 0	**Machining surface**	0 - 5
Distance Z	223.5	**Offset R**	>= 0
Angle A	0	**Distance D (DD)**	85.5

Configuration of the blade tool

The unlisted data is not significant and may remain set with the pre-defined value.

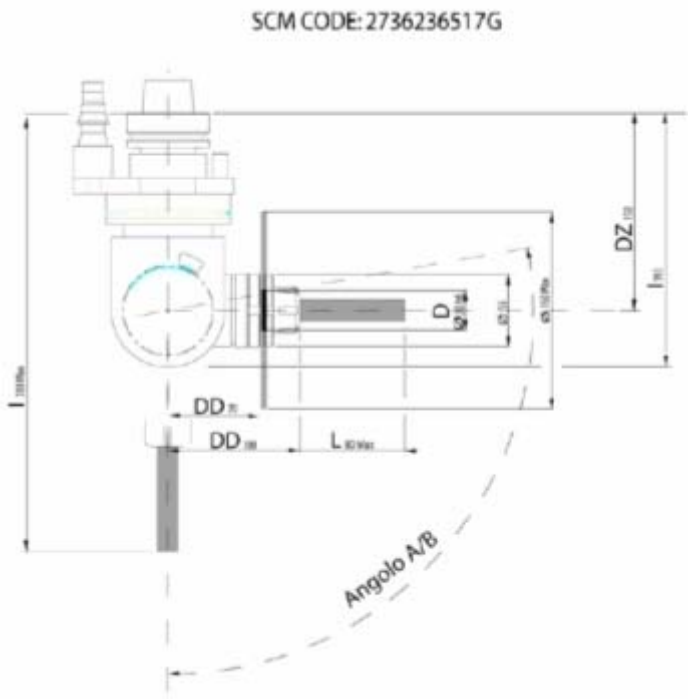
	Permitted values		*Permitted values*
Disc radius (R)	0 - 80	**Machining surface**	1
Working crown (Cu)	0 - R	**Offset R**	>= 0
Blade thickness (Sl)	>= 0	**Distance D (DD)**	52

Programming

This head comes with a blower tool. To enable this function, the blower activation must be programmed using the XBLOWER macro (see: User and Programming Manual for the Xilog Plus Editor).

Head 2736236517G - SCM

Angle transmission head with HSK F63 cone coupler and 1 output with adjustable inclination for millers or blades.



Characteristics:

- Maximum input rotation speed 12000 rpm
- Transmission ratio 1:1
- Weight 6 kg
- Right and left rotation
- Clamp coupler ER 25 mini, for millers with cylindrical shaft (2-16mm)
- Maximum length millers L=80mm
- Coupler for blades, diameter 160mm max. with hole diameter 30mm
- Manual graduated orientation over 190° on vertical table.
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the parameters common to the miller, bit and blade tools

	Permitted values		*Permitted values*
Type	F, P, D	**Direction of rotation**	+, -
Max. speed (Vmax)	> 0	**Speed G0/B**	0 - Vmax
Standard speed	0 - Vmax	**Overall dimensions (I)**	>= 0
Max. rotation (Rmax)	0 - 12000	**Distance Z**	150
Standard rotation	0 - Rmax	**Angle A**	>=0
Transmission ratio	1	**Number total**	0-32767

Configuration of the miller or bit tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Length (L)	0 - 80	**Tool counter position in X**	>= E1
Diameter (D)	0 - 160	**Tool counter position in Y**	>= E1
Working length (Lu)	0 - L	**Machining surface**	0 - 5
Working diameter (Du)	0 - D	**Offset R**	>= 0
Type tip	L, P, S	**Distance D (DD)**	100
Height countersink	0 - L		

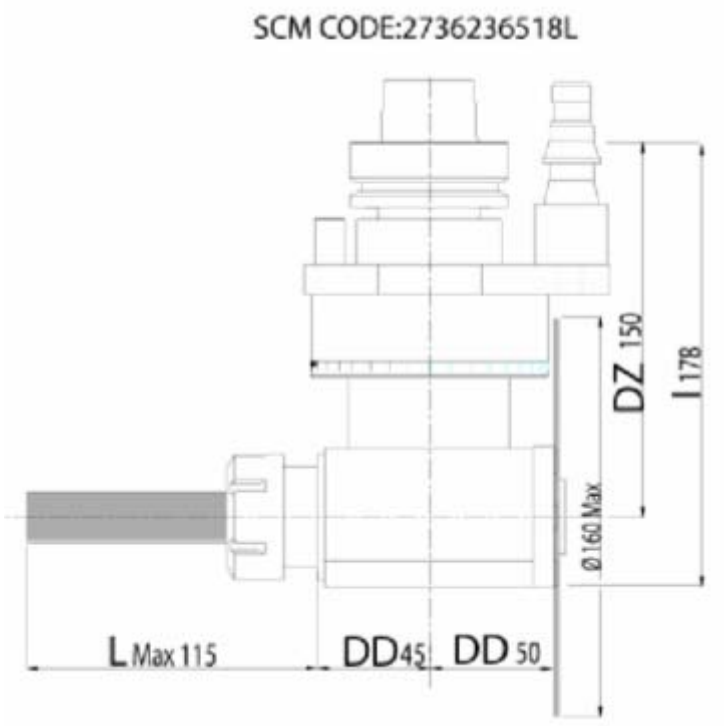
Configuration of the blade tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Disc radius (R)	0 - 80	**Machining surface**	1
Working crown (Cu)	0 - R	**Offset R**	>= 0
Blade thickness (Sl)	>= 0	**Distance D (DD)**	70

Head 2736236518L - SCM

Angle transmission head with HSK F63 cone coupler with two horizontal outputs for millers or blades.



Characteristics

- Maximum input rotation speed 10000 rpm
- Maximum output rotation speed 15000 rpm
- Transmission ratio 1:1,5
- Weight 5 kg
- Right and left rotation
- Clamp coupler ER 32 for millers with cylindrical shaft (3-20mm)
- Maximum length millers L=115 mm
- Coupler for blades, diameter 160mm max. with hole diameter 30mm
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the parameters common to the miller, bit and blade tools

	Permitted values		*Permitted values*
Type	F, P, D	**Direction of rotation**	+, -
Max. speed (Vmax)	> 0	**Speed G0/B**	0 - Vmax
Standard speed	0 - Vmax	**Overall dimensions (I)**	>= 0
Max. rotation (Rmax)	0 - 15000	**Distance Z**	150
Standard rotation	0 - Rmax	**Angle A**	90
Transmission ratio	1.5	**Number total**	0-32767

Configuration of the miller or bit tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Length (L)	0 - 115	**Tool counter position in X**	>= E1
Diameter (D)	0 - 160	**Tool counter position in Y**	>= E1
Working length (Lu)	0 - L	**Machining surface**	0 - 5
Working diameter (Du)	0 - D	**Offset R**	>= 0
Type tip	L, P, S	**Distance D (DD)**	45
Height countersink	0 - L		

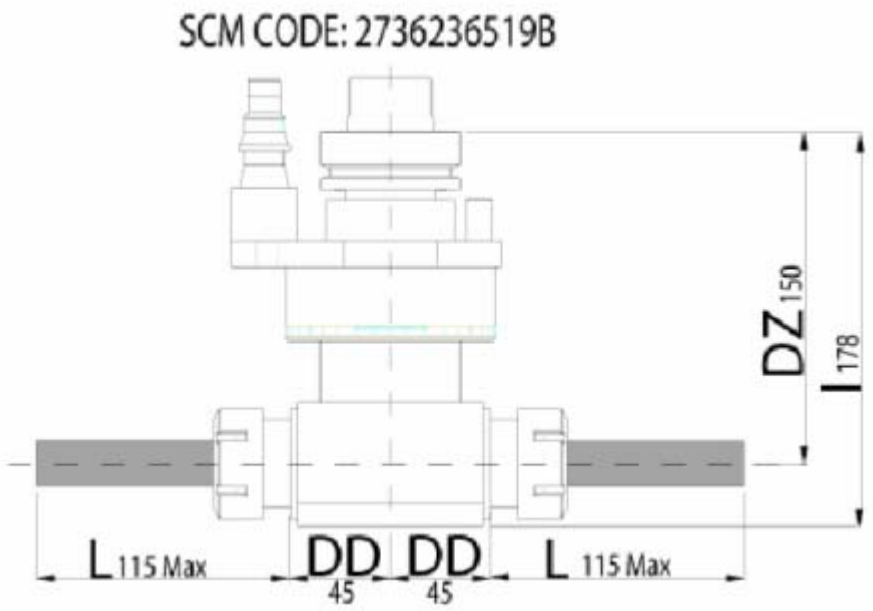
Configuration of the blade tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Disc radius (R)	0 - 80	**Machining surface**	1
Working crown (Cu)	0 - R	**Offset R**	>= 0
Blade thickness (Sl)	>= 0	**Distance D (DD)**	50

Head 2736236519B - SCM

Angle transmission head with HSK F63 cone coupler with two horizontal outputs for millers.



Characteristics

- Maximum input rotation speed 10000 rpm
- Maximum output rotation speed 15000 rpm
- Transmission ratio 1:1,5
- Weight 5 kg
- Right and left rotation
- Clamp coupler ER 32 for millers with cylindrical shaft (3-20mm)
- Maximum length millers L=115 mm
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the miller tool

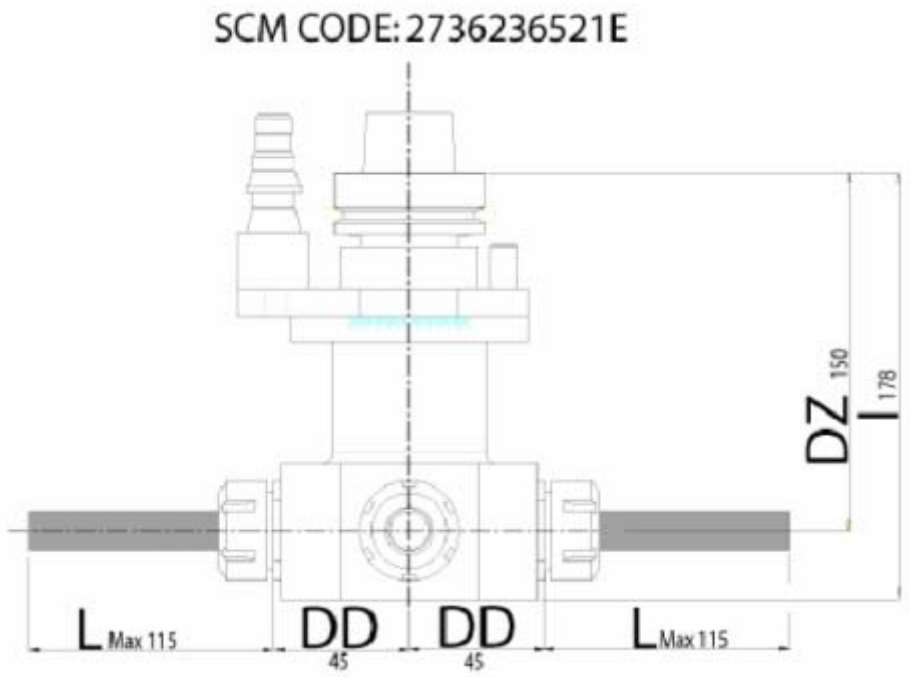
The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	F	**Number total**	0-32767
Max. speed (Vmax)	> 0	**Length (L)**	0 - 80
Standard speed	0 - Vmax	**Diameter (D)**	0 - 120
Max. rotation (Rmax)	0 - 15000	**Working length (Lu)**	0 - L
Standard rotation	0 - Rmax	**Working diameter (Du)**	0 - D
Transmission ratio	1.5	**Tool counter position in X**	>= E1
Direction of rotation	+, -	**Tool counter position in Y**	>= E1
Speed G0/B	0 - Vmax	**Machining surface**	0 - 5
Overall dimensions (I)	>= 0	**Offset R**	>= 0
Distance Z	150	**Distance D (DD)**	45

Angle A	90		

Head 2736236521E - SCM

Angle transmission head with HSK F63 cone coupler with four horizontal outputs for drilling tips.



Characteristics

- Maximum input rotation speed 10000 rpm
- Maximum output rotation speed 15000 rpm
- Transmission ratio 1:1,5
- Weight 5 kg
- Right and left rotation
- Clamp coupler ER 25 for bits with cylindrical shaft (2-16 mm)
- Maximum length millers L=115 mm
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the bit tool

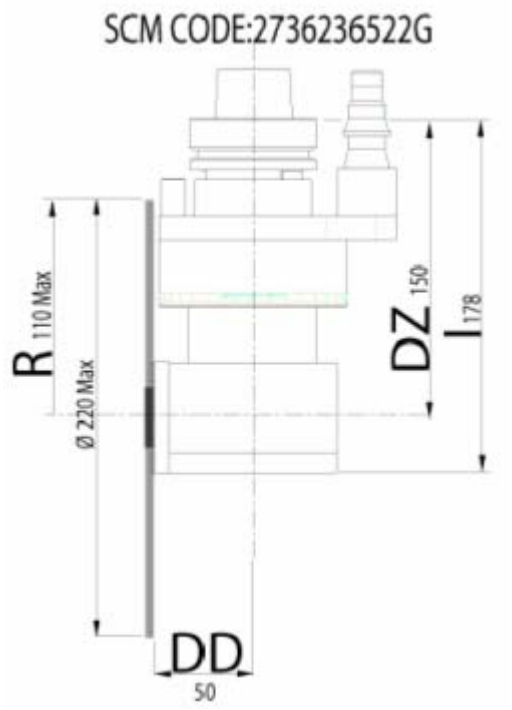
The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	P	**Length (L)**	0 - 115
Max. speed (Vmax)	> 0	**Diameter (D)**	0 - 160
Standard speed	0 - Vmax	**Working length (Lu)**	0 - L
Max. rotation (Rmax)	0 - 15000	**Working diameter (Du)**	0 - D
Standard rotation	0 - Rmax	**Type tip**	L, P, S
Transmission ratio	1.5	**Height countersink**	0 - L
Direction of rotation	+, -	**Tool counter position in X**	>= E1
Speed G0/B	0 - Vmax	**Tool counter position in Y**	>= E1
Overall dimensions (I)	>= 0	**Machining surface**	0 - 5

Distance Z	150	**Offset R**	>= 0
Angle A	90	**Distance D (DD)**	45
Number total	0-32767		

Head 2736236522G - SCM

Angle transmission head with HSK F63 cone coupler with one horizontal output 220 mm diameter blades for cuts on 80 mm thicknesses.



Characteristics

- Maximum input rotation speed 10000 rpm
- Maximum output rotation speed 15000 rpm
- Transmission ratio R=1:1.5
- Weight 5kg
- Right and left rotation
- Coupler for blades, diameter 220mm max. with hole diameter 30mm
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the blade tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	D	**Distance Z**	150
Max. speed (Vmax)	> 0	**Angle A**	90
Standard speed	0 - Vmax	**Number total**	0-32767
Max. rotation (Rmax)	0 - 15000	**Disc radius (R)**	0 - 110
Standard rotation	0 - Rmax	**Working crown (Cu)**	0 - R
Transmission ratio	1.5	**Blade thickness (Sl)**	>= 0
Direction of rotation	+, -	**Machining surface**	1
Speed G0/B	0 - Vmax	**Offset R**	>= 0

Overall dimensions (I)	>= 0	**Distance D (DD)**	50

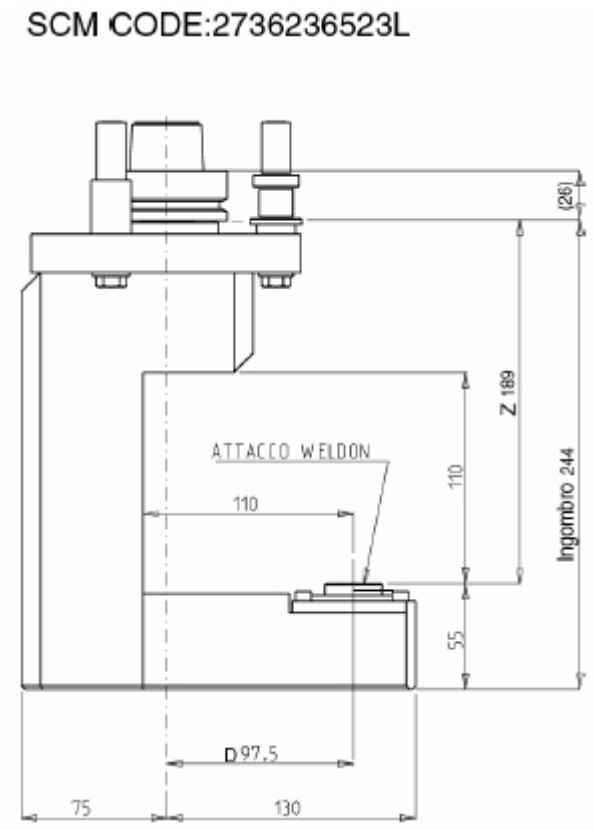
Programming

Given the elevated dimensions of the blade tool mounted on this angle transmission, it is obligatory to program the high position of the suction casing on the spindle. This condition is obtained by programming the parameter E, present in all of the Xilog instructions, to 0.
For ex.:

XG0 X=… Y=… T=… **E=0**

Head 2736236523L - SCM

Angle transmission head with HSK F63 cone coupler with 1 vertical output for milling the lower surfaces of the piece.



Characteristics

- Maximum input rotation speed 12000 rpm
- Transmission ratio 1:1
- Weight 8kg
- Right and left rotation
- Weldon coupler, diameter 12 mm
- Manual graduated orientation over 360° on X-Y table
- **Requires pre-set for electric spindle**

Configuration of the miller or bit tool

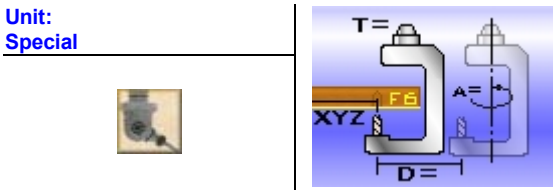
The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	F, P	**Diameter (D)**	0 - 12
Max. speed (Vmax)	> 0	**Working length (Lu)**	0 - L
Standard speed	0 - Vmax	**Working diameter (Du)**	0 - D
Max. rotation (Rmax)	0 - 12000	**Type tip**	L, P, S
Standard rotation	0 - Rmax	**Height countersink**	0 - L
Transmission ratio	1	**Tool counter position in X**	>= E1
Direction of rotation	+, -	**Tool counter position in Y**	>= E1

Speed G0/B	0 - Vmax	**Machining surface**	0
Overall dimensions (I)	244	**Offset X**	0
Distance Z	215	**Offset Y**	97.5
Angle A	180	**Offset R**	>= 0
Length (L)	0 - 80	**Distance D (DD)**	0

Programming

The programming of the machining operations on the lower face is performed by using the standard Xilog Plus instructions and after having programmed the XBOTTOM macro which implements the in/out cycle under the panel.



In cycle under the lower part of the panel

1. Loading tool on spindle.
2. Spindle start-up.
3. XY positioning and tool orientation to safety position under panel; approach to distance **D** from the point programmed with X and Y.
4. Input at programmed speed along the tool orientation.

Parametri:

X Position X of the first machining operation after input.
Y Position Y of the first machining operation after input.
a Tool orientation angle for input.
D Approach distance from the point programmed with X and Y.
V Advance speed in input.
S Tool rotation speed for the first next machining operation.
T Tool to be used for machining operations under the panel.

Output cycle from the lower part of the panel

1. Tool orientation for output (if necessary).
2. XY positioning along the tool orientation for exiting from the lower part of the panel.
3. Rise in Z to safety position over the upper face of the panel.

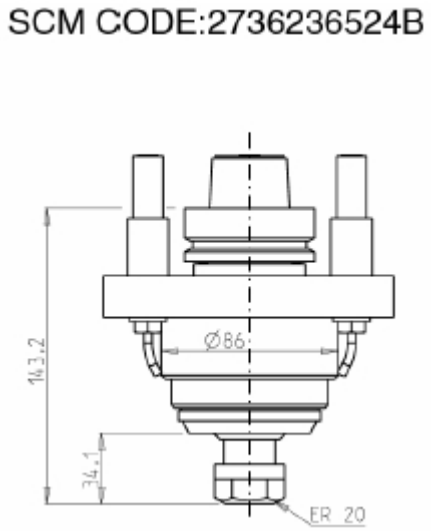
Parameters:

a Tool orientation angle for output (if necessary). If not otherwise specified, Xilog Plus uses the current angle of the Vector axis.
D Retroaction distance for output from the lower part of the panel. If not otherwise specified, Xilog Plus uses the same distance D programmed for the input.

V Advance speed in output.

Head 2736236524B - SCM

Head with HSK F63 cone coupler with 1 vertical output for non intensive milling at high speed.



Characteristics

- Maximum input rotation speed 5700 rpm
- Maximum output rotation speed 40000 rpm
- Transmission ratio 1:7.5
- Weight 7kg
- Right and left rotation
- Clamp coupler ER 20 for millers with cylindrical shaft (2-13 mm)
- **Requires pre-set for electric spindle**

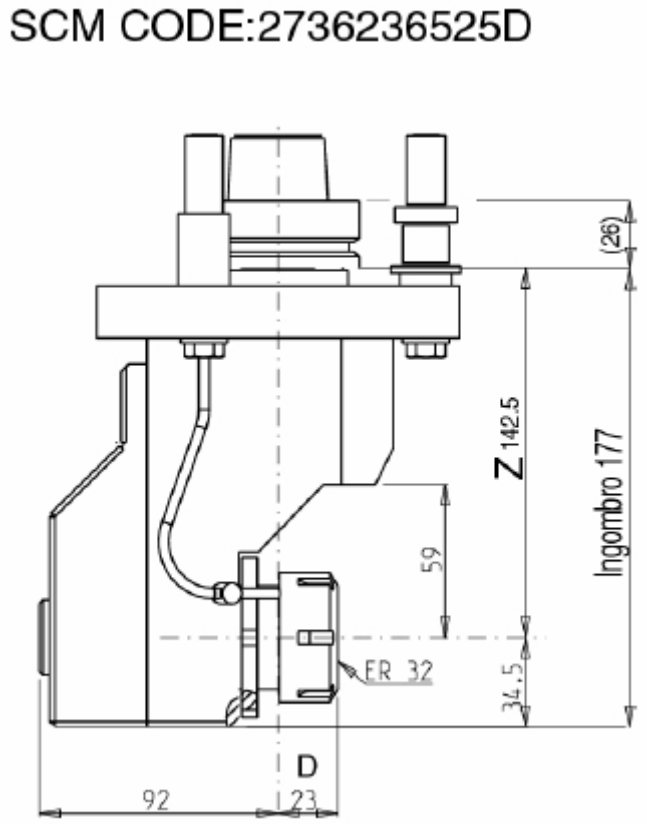
Configuration of the miller tool or bit tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	F	**Distance Z**	143.2
Max. speed (Vmax)	> 0	**Angle A**	0
Standard speed	0 - Vmax	**Length (L)**	>=0
Max. rotation (Rmax)	0 - 40000	**Diameter (D)**	0 - 20
Standard rotation	0 - Rmax	**Working length (Lu)**	0 - L
Transmission ratio	7.5	**Working diameter (Du)**	0 - D
Direction of rotation	+, -	**Type tip**	L, P, S
Speed G0/B	0 - Vmax	**Height countersink**	0 - L
Overall dimensions (I)	>=0	**Machining surface**	1

Head 2736236525D - SCM

Angle transmission head with HSK F63 cone coupler with 1 horizontal output for millers.



Characteristics

- Maximum input rotation speed 8330 rpm
- Maximum output rotation speed 10000 rpm
- Transmission ratio 1:1,2
- Weight 7 kg
- Right and left rotation
- Clamp coupler ER 32 for millers with cylindrical shaft (3-20mm)
- Maximum length millers L=120mm

Configuration of the miller or bit tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	F, P	**Number total**	0 - 32767
Max. speed (Vmax)	> 0	**Length (L)**	0 - 120
Standard speed	0 - Vmax	**Diameter (D)**	0 - 110
Max. rotation (Rmax)	0 - 10000	**Working length (Lu)**	0 - L
Standard rotation	0 - Rmax	**Working diameter (Du)**	0 - D
Transmission ratio	1.2	**Type tip**	L, P, S
Direction of rotation	+, -	**Height countersink**	0 - L

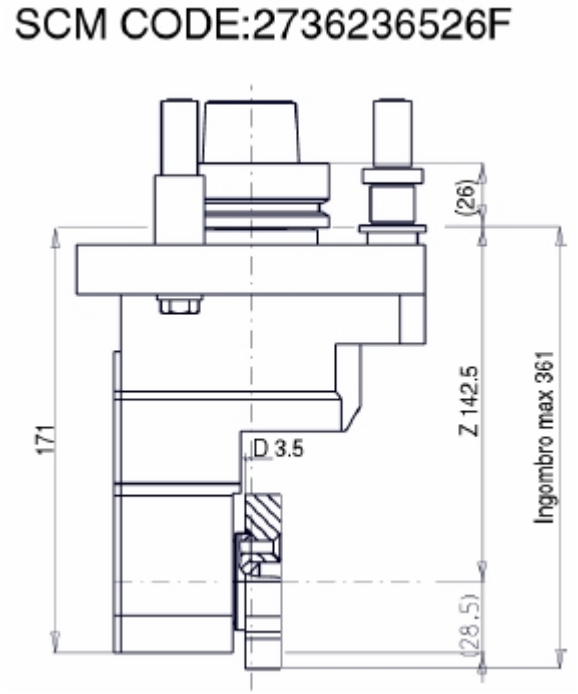
Speed G0/B	0 - Vmax	**Machining surface**	0 - 5
Overall dimensions (I)	>=0	**Offset R**	>=0
Distance Z	168.5	**Distance D (DD)**	23
Angle A	90		

Programming

This head comes with a blower tool. To enable this function, the blower activation must be programmed using the XBLOWER macro (see: User and Programming Guide for the Xilog Plus Editor).

Head 2736236526F - SCM

Angle transmission head with HSK F63 cone coupler with 1 horizontal output with miller for through machining of sharp corners.



Characteristics

- Maximum input rotation speed 12000 rpm
- Maximum output rotation speed 10000 rpm
- Transmission ratio R=1.2:1
- Weight 7kg
- Right and left rotation
- Coupler for blades, diameter 100mm max. with hole diameter 16mm
- Manual graduated orientation over 360° on X-Y table
- **Requires Vector rotating axis**

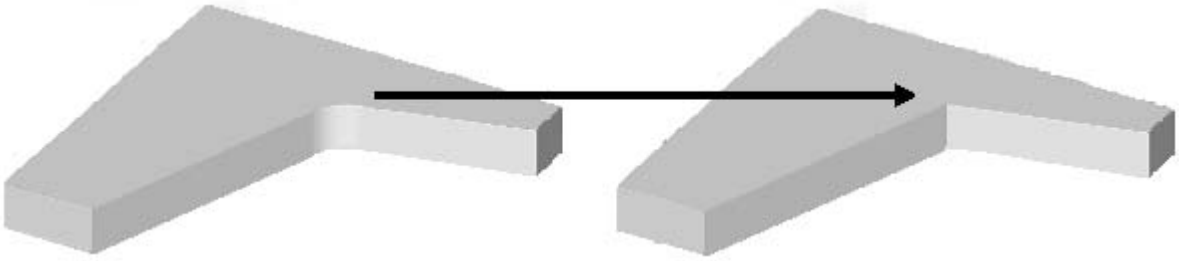
Configuration of the tool

The unlisted data is not significant and may remain set with the pre-defined value.

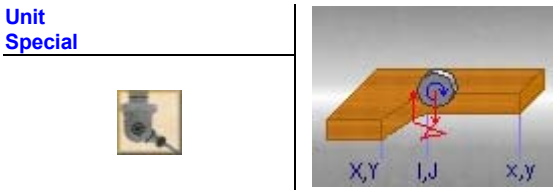
	Permitted values		*Permitted values*
Type	F	**Angle A**	90
Max. speed (Vmax)	> 0	**Length (L)**	>=0
Standard speed	0 - Vmax	**Diameter (D)**	0 - 20
Max. rotation (Rmax)	0 - 10000	**Working length (Lu)**	0 - L
Standard rotation	0 - Rmax	**Working diameter (Du)**	0 - D
Transmission ratio	0.83	**Type tip**	L, P, S
Direction of rotation	+, -	**Height countersink**	0 - L
Speed G0/B	0 - Vmax	**Machining surface**	1
Overall dimensions (I)	197	**Offset R**	>=0

Distance Z	168.5	**Distance D (DD)**	3.5

Programming



The XGLEAN macro is used to program the cleaning of the corners using this tool.



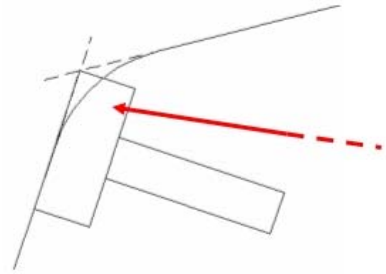
Parameters

I X co-ordinate of the corner.
J Y co-ordinate of the corner.
X X co-ordinate of the first side.
Y Y co-ordinate of the first side.
x X co-ordinate of the second side.
y Y co-ordinate of the second side.
Z Distance in Z over the lower table for the first descent
H Distance in Z under the lower table for the second descent
D Retroaction distance along the bisector.
V Advance speed during machining.
S Tool rotation speed.
T Tool.

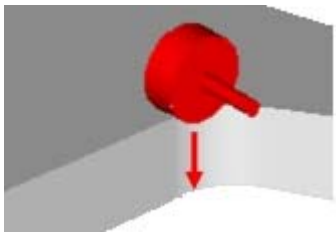
Machining cycle:

PHASE 1. Cleaning of the corner on the first side.

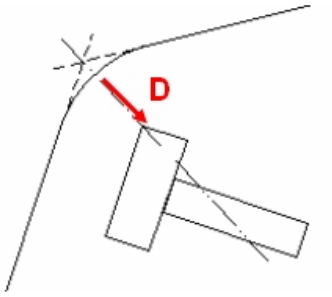
1. XYZ safety position on the first side.



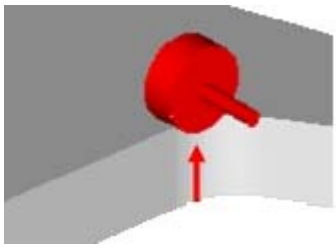
2. Descent while machining **over** the loser table (position of parameter Z).



3. Output in XY along the bisector of the angle.

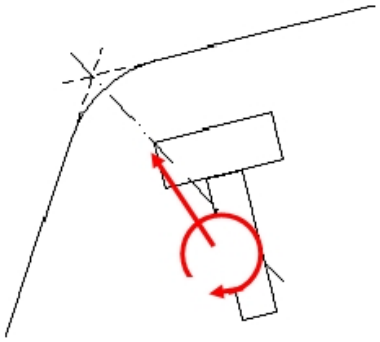


4. Ascent to safety position.

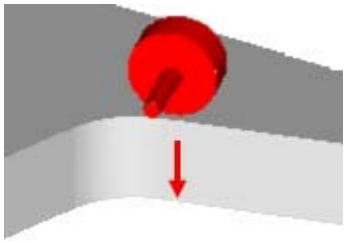


PHASE 2. Cleaning the corner on the second side.

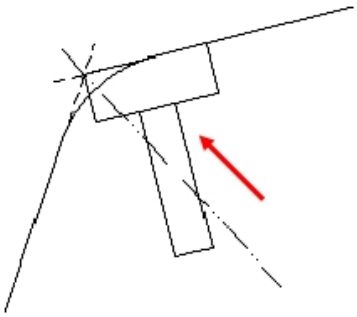
5. XY position and tool rotation while machining along the angle bisector.



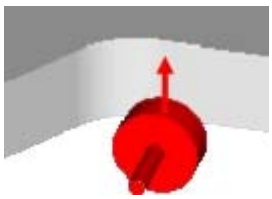
6. Descent **under** the lower table (position of parameter H).



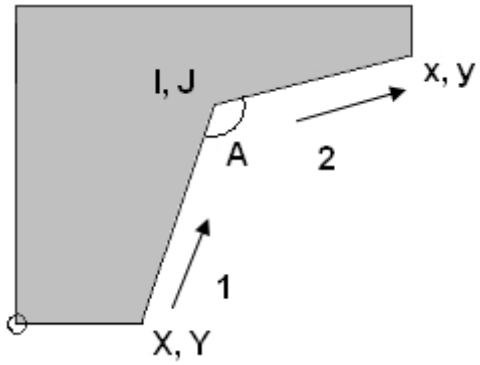
7. XY positioning on the second side with tool corner along the angle bisector.



8. Ascent while machining (position of parameter Z + 2mm), then rapid ascent to the safety position.

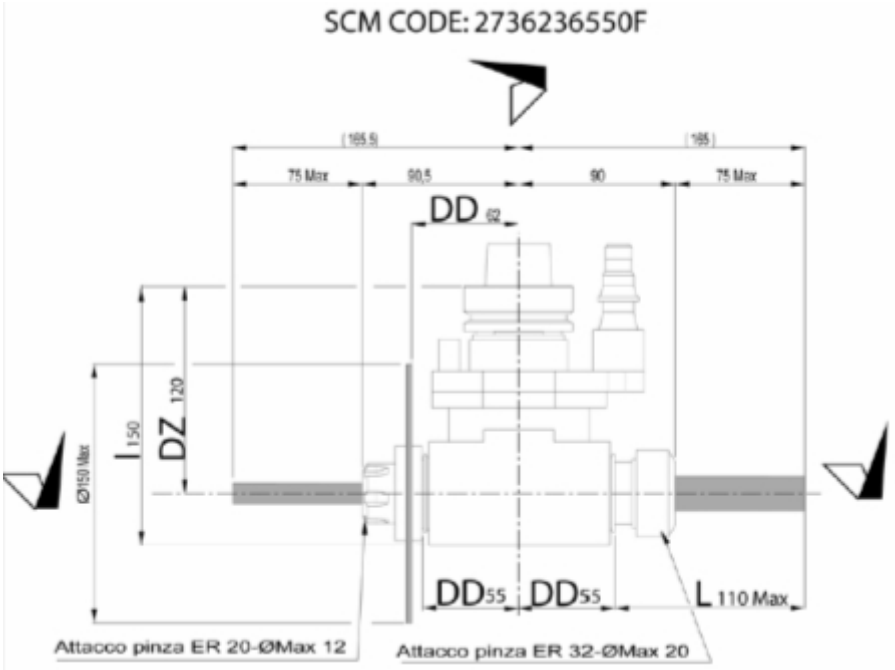


Note. Angle A between the first (1) and the second (2) side must be equal to or greater than 90° and less than 180°.



Head 2736236550F - SCM

Angle transmission head with HKS F63 cone coupler with 2 horizontal outputs for millers or blades.



Characteristics

- Maximum input rotation speed 9000 rpm
- Maximum output rotation speed 9000 rpm
- Transmission ratio 1:1
- Max. power 2.9kW
- Weight 4kg
- Right and left rotation
- Clamp coupler ER 32 for millers with cylindrical shaft (3-20mm)
- Coupler for blades, diameter 160mm max. with hole diameter 30mm
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the parameters common to the miller, bit and blade tools

	Permitted values		*Permitted values*
Type	F, P, D	**Direction of rotation**	+, -
Max. speed (Vmax)	> 0	**Speed G0/B**	0 - Vmax
Standard speed	0 - Vmax	**Overall dimensions (I)**	>= 0
Max. rotation (Rmax)	0 - 9000	**Distance Z**	120
Standard rotation	0 - Rmax	**Angle A**	90
Transmission ratio	1	**Number total**	0-32767

Configuration of the miller or bit tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Length (L)	0 - 110	**Tool counter position in X**	>= E1
Diameter (D)	0 - 160	**Tool counter position in Y**	>= E1
Working length (Lu)	0 - L	**Machining surface**	0 - 5
Working diameter (Du)	0 - D	**Offset R**	>= 0
Type tip	L, P, S	**Distance D (DD)**	55
Height countersink	0 - L		

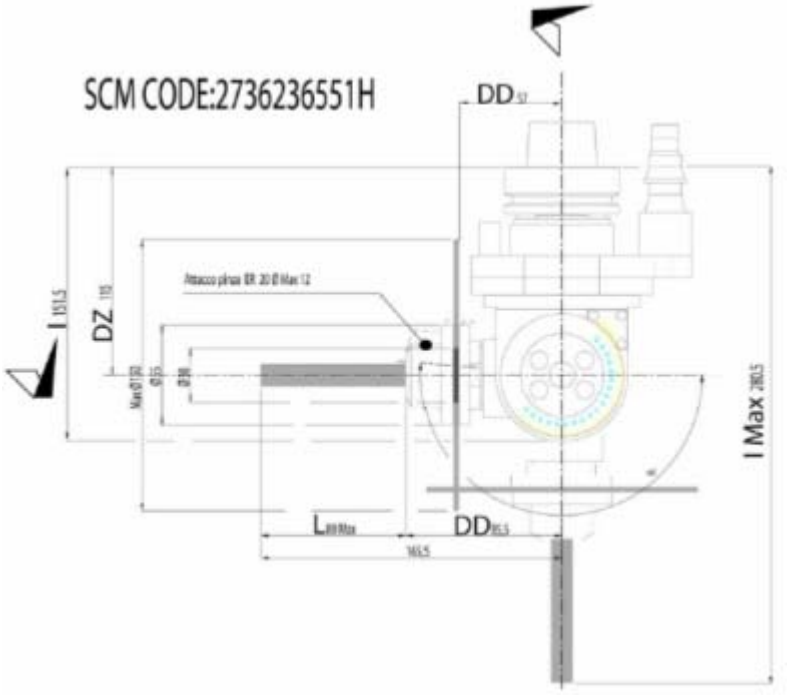
Configuration of the blade tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Disc radius (R)	0 - 80	**Machining surface**	1
Working crown (Cu)	0 - R	**Offset R**	>= 0
Blade thickness (Sl)	>= 0	**Distance D (DD)**	62

Head 2736236551H - SCM

Angle transmission head with HSK F63 cone coupler with 1 output with adjustable inclination for millers or blades.



Characteristics

- Maximum input rotation speed 12000 rpm
- Maximum output rotation speed 12000 rpm
- Transmission ratio 1:1
- Max. power 2.6kW
- Weight 4kg
- Right and left rotation
- Clamp coupler ER 32 for millers with cylindrical shaft (2-13mm)
- Maximum length millers L=80 mm
- Coupler for blades, diameter 160mm max. with hole diameter 30mm
- Manual graduated orientation over 185° on vertical table
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the parameters common to the miller, bit and blade tools

	Permitted values		*Permitted values*
Type	F, P, D	**Direction of rotation**	+, -
Max. speed (Vmax)	> 0	**Speed G0/B**	0 - Vmax
Standard speed	0 - Vmax	**Overall dimensions (I)**	>= 0
Max. rotation (Rmax)	0 - 12000	**Distance Z**	115
Standard rotation	0 - Rmax	**Angle A**	>= 0
Transmission ratio	1	**Number total**	0-32767

Configuration of the miller or bit tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Length (L)	0 - 80	**Tool counter position in X**	>= E1
Diameter (D)	0 - 160	**Tool counter position in Y**	>= E1
Working length (Lu)	0 - L	**Machining surface**	0 - 5
Working diameter (Du)	0 - D	**Offset R**	>= 0
Type tip	L, P, S	**Distance D (DD)**	85.5
Height countersink	0 - L		

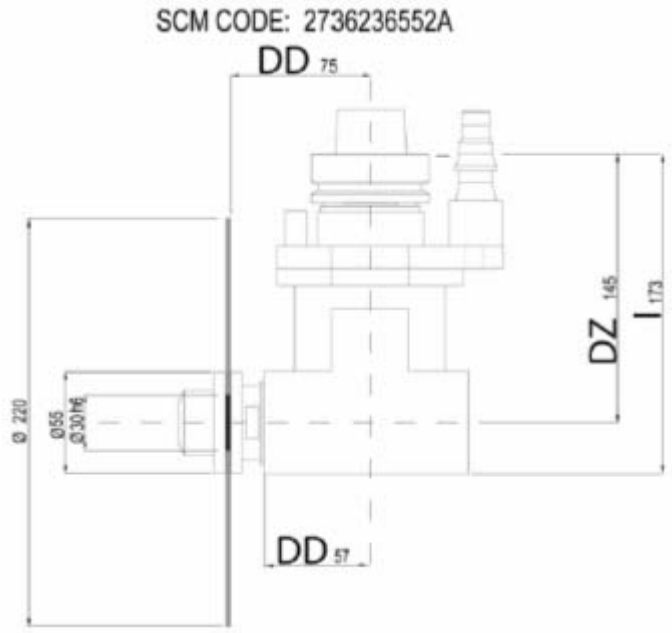
Configuration of the blade tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Disc radius (R)	0 - 80	**Machining surface**	1
Working crown (Cu)	0 - R	**Offset R**	>= 0
Blade thickness (Sl)	>= 0	**Distance D (DD)**	52

Head 2736236552A - SCM

Angle transmission head with HSK cone coupler with 1 output for 220mm diameter blade for cuts on 80 mm thicknesses.



Characteristics

- Maximum input rotation speed 5000 rpm
- Maximum output rotation speed 6000 rpm
- Transmission ratio 1:1.2
- Max. power 2.6kW
- Weight 3.5kg
- Right and left rotation
- Coupler for blades, diameter 220mm max. with hole diameter 30mm
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the blade tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	D	**Distance Z**	145
Max. speed (Vmax)	> 0	**Angle A**	90
Standard speed	0 - Vmax	**Disc radius (R)**	0 - 110
Max. rotation (Rmax)	0 - 6000	**Working crown (Cu)**	0 - R
Standard rotation	0 - Rmax	**Blade thickness (Sl)**	>= 0
Transmission ratio	1.2	**Machining surface**	1
Direction of rotation	+, -	**Offset R**	>= 0
Speed G0/B	0 - Vmax	**Distance D (DD)**	75
Overall dimensions (I)	>= 0		

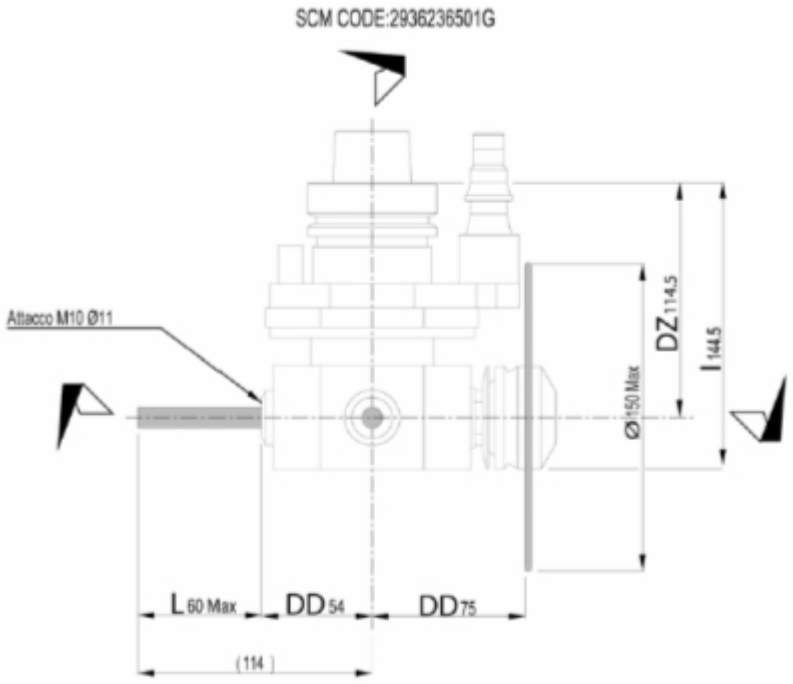
Programming

Given the elevated dimensions of the blade tool mounted on this angle transmission, it is obligatory to program the high position of the suction casing on the spindle. This condition is obtained by programming the parameter E, present in all of the Xilog instructions, to 0.
For ex.:

XG0 X=… Y=… T=… **E=0**

Head 2936236501G - SCM

Angle transmission head with HSK F63 cone coupler with 4 horizontal outputs for drilling bits, one also for blades.



Characteristics

- Maximum input rotation speed 5000 rpm
- Maximum output rotation speed 6000 rpm
- Transmission ratio 1:1.2
- Power 2.9kW
- Weight 3.5kg
- Right and left rotation
- Coupler bits M10/diameter 11 mm (right rotation)
- Coupler for blades, diameter 180mm max. with hole diameter 30mm
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the parameters common to the bit and blade tools

	Permitted values		*Permitted values*
Type	P, D	**Direction of rotation**	+, -
Max. speed (Vmax)	> 0	**Speed G0/B**	0 - Vmax
Standard speed	0 - Vmax	**Overall dimensions (I)**	>= 0
Max. rotation (Rmax)	0 - 6000	**Distance Z**	114.5
Standard rotation	0 - Rmax	**Angle A**	90
Transmission ratio	1.2	**Number total**	0-32767

Configuration of the miller or bit tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Length (L)	0 - 110	**Tool counter position in X**	>= E1
Diameter (D)	0 - 160	**Tool counter position in Y**	>= E1
Working length (Lu)	0 - L	**Machining surface**	0 - 5
Working diameter (Du)	0 - D	**Offset R**	>= 0
Type tip	L, P, S	**Distance D (DD)**	54
Height countersink	0 - L		

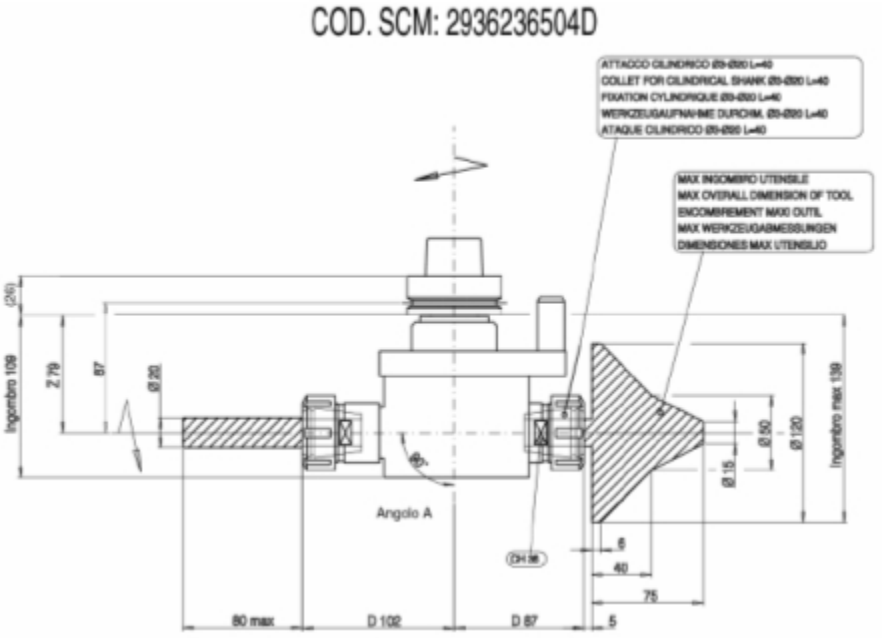
Configuration of the blade tool

The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Disc radius (R)	0 - 90	**Machining surface**	1
Working crown (Cu)	0 - R	**Offset R**	>= 0
Blade thickness (Sl)	>= 0	**Distance D (DD)**	75

Head 2936236504D - SCM

Angle transmission head with HSK F63 cone coupler with 2 horizontal outputs for millers.



Characteristics

- Maximum input rotation speed 9000 rpm
- Maximum output rotation speed 9000 rpm
- Transmission ratio 1:1
- Max. power 2.9kW
- Weight 4kg
- Right and left rotation
- Clamp coupler ER 20 for millers with cylindrical shaft (2-13 mm)
- Maximum length tools L=80mm
- Manual graduated orientation over 360° on X-Y table
- Necessary rest time = Operation time

Configuration of the miller tool

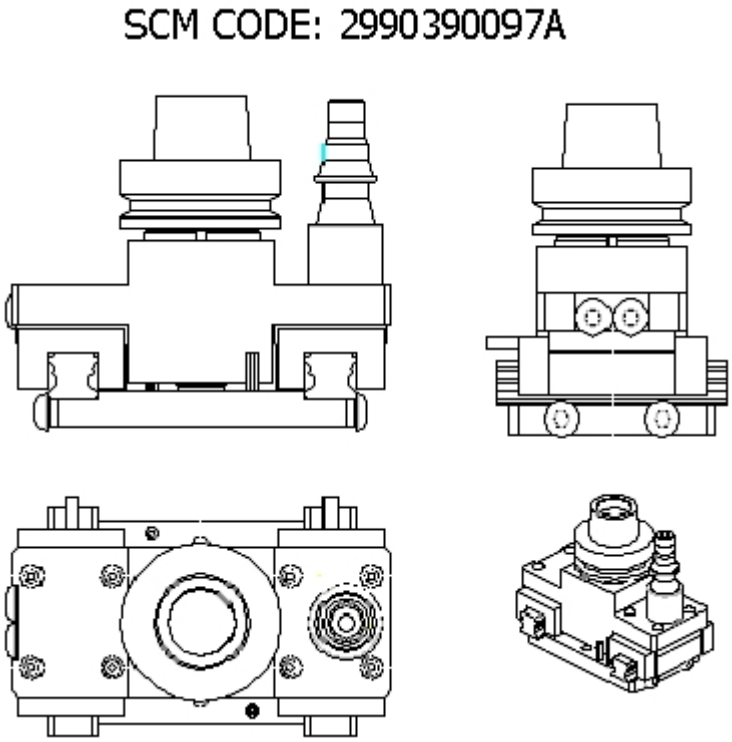
The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	F	**Number total**	0 - 32767
Max. speed (Vmax)	> 0	**Length (L)**	0 - 80
Standard speed	0 - Vmax	**Diameter (D)**	0 - 120
Max. rotation (Rmax)	0 - 9000	**Working length (Lu)**	0 - L
Standard rotation	0 - Rmax	**Working diameter (Du)**	0 - D
Transmission ratio	1	**Tool counter position in X**	>=E1
Direction of rotation	+, -	**Tool counter position in Y**	>=E1
Speed G0/B	0 - Vmax	**Machining surface**	0 - 5
Overall dimensions (I)	>=0	**Offset R**	>=0

Distance Z	79	**Distance D (DD)**	Output n. 1: 102 Output n. 2: 87
Angle A	90		

Head 2990390097A - SCM/Morbidelli

Angle transmission head with HSK F63 cone coupler with 1 horizontal output with alternating movement for mounting a chisel tool.



Characteristics

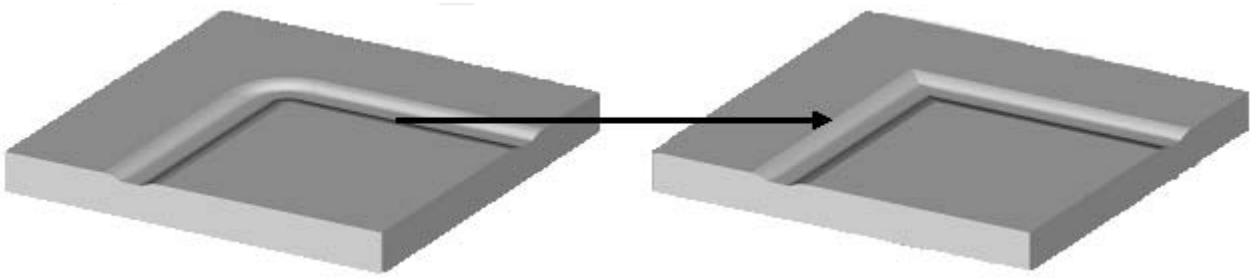
- Right and left rotation
- Coupler for chisel
- **Requires Vector rotating axis**

Configuration of the tool

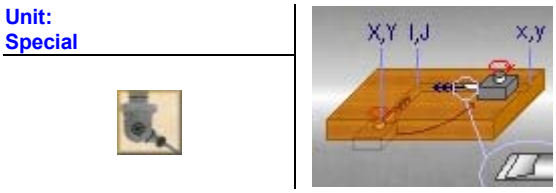
The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	F	**Angle A**	90
Max. speed (Vmax)	> 0	**Length (L)**	>= 0
Standard speed	0 - Vmax	**Diameter (D)**	> 0
Max. rotation (Rmax)	0 - …	**Working length (Lu)**	0 - L
Standard rotation	0 - Rmax	**Working diameter (Du)**	0 - D
Transmission ratio	1	**Machining surface**	0
Direction of rotation	+, -	**Offset X**	>= 0
Speed G0/B	0 - Vmax	**Offset Y**	>= 0
Overall dimensions (I)	>= 0	**Offset R**	>= 0
Distance Z	…	**Distance D (DD)**	>= 0

Programming



The XCHISEL macro is used to program the cleaning of the corners with this tool.



Parameters:

I X co-ordinate of the corner.
J Y co-ordinate of the corner.
X X co-ordinate of the first side.
Y Y co-ordinate of the first side.
x X co-ordinate of the second side.
y Y co-ordinate of the second side.
Z Z working position.
H Z approach position.
D Corner approach distance.

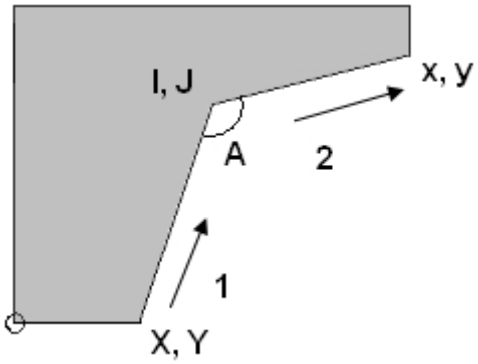
If D>0 the first side is machined.
If D<0 the second side is machined.

V Machining advance speed.
S Tool rotation speed.
T Tool (The tool must be chosen based on the side to be machined).

Machining cycle:

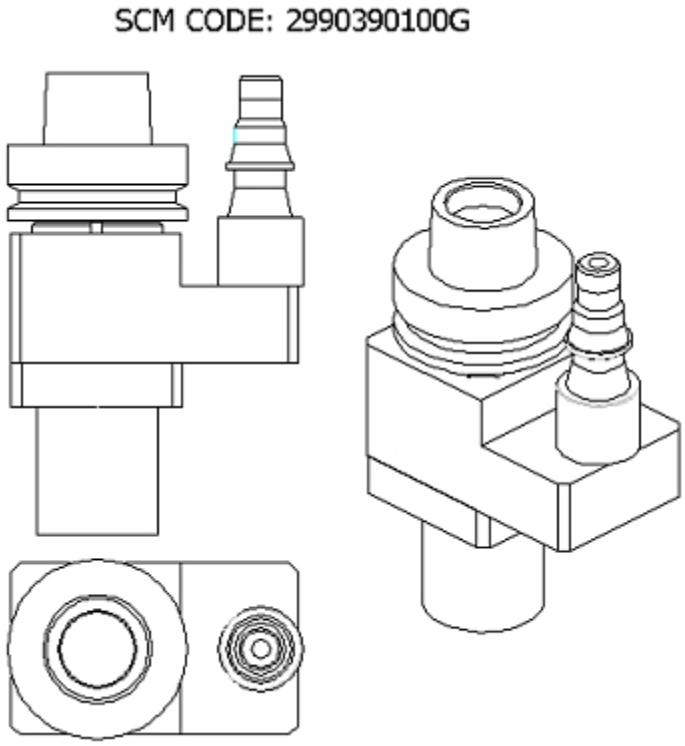
1. XY position and tool rotation at safety position and approach from distance D from the corner along the side.
2. Descent in Z at machining position.
3. XY movement along the side being machined.
4. Rapid return to distance D from the corner.
5. Ascent in Z to safety position.

Note. Angle A between the first (1) and the second (2) side must be equal to double the cutting angle of the blade mounted on the tool.


I, J
x, y
A
2
1
X, Y

Head 2990390100G - SCM/Morbidelli

Angle transmission head with HSK F63 cone coupler with one vertical output for mounting a chisel tool.



Characteristics

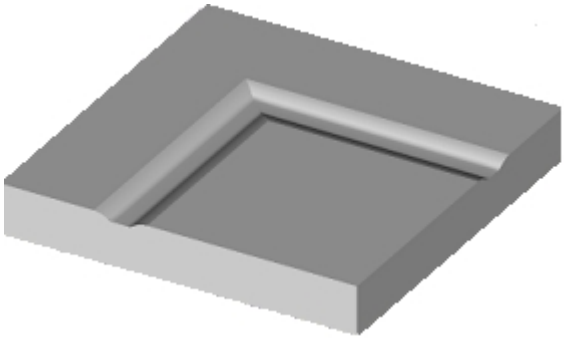
- Coupler for chisel
- **Requires Vector rotating axis**
- **Does not require the spindle to be on**

Configuration of the tool

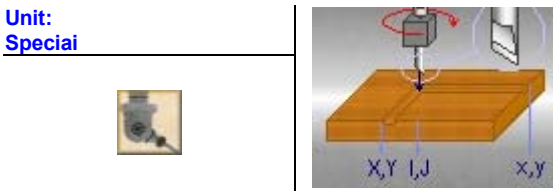
The unlisted data is not significant and may remain set with the pre-defined value.

	Permitted values		*Permitted values*
Type	F	**Length (L)**	>= 0
Max. speed (Vmax)	> 0	**Diameter (D)**	> 0
Standard speed	0 - Vmax	**Working length (Lu)**	0 - L
Max. rotation (Rmax)	0	**Working diameter (Du)**	0 - D
Standard rotation	0	**Machining surface**	0
Transmission ratio	0	**Offset X**	>= 0
Speed G0/B	0 - Vmax	**Offset Y**	>= 0
Overall dimensions (I)	>= 0	**Offset R**	>= 0
Angle A	0	**Distance D (DD)**	0

Programming



The XCLEAVE macro is used to program the cleaning of the corners with this tool.



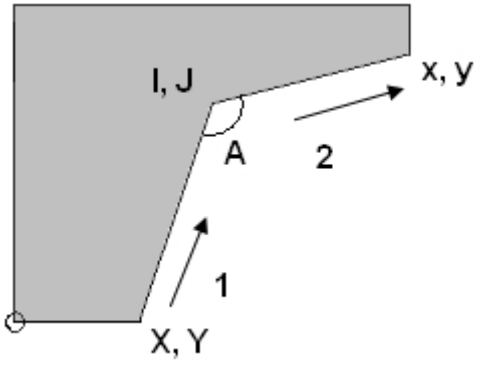
Parameters:

I X co-ordinate of the corner.
J Y co-ordinate of the corner.
X X co-ordinate of the first side.
Y Y co-ordinate of the first side.
x X co-ordinate of the second side.
y Y co-ordinate of the second side.
Z Working position Z.
H Approach position Z.
V Machining advance speed.
S Tool rotation speed.
T Tools to be used (two tools are required).

Machining cycle:

1. XY position and tool blade orientation at safety Z position.
2. Descent in Z to working position.
3. Ascent in Z to safety distance.

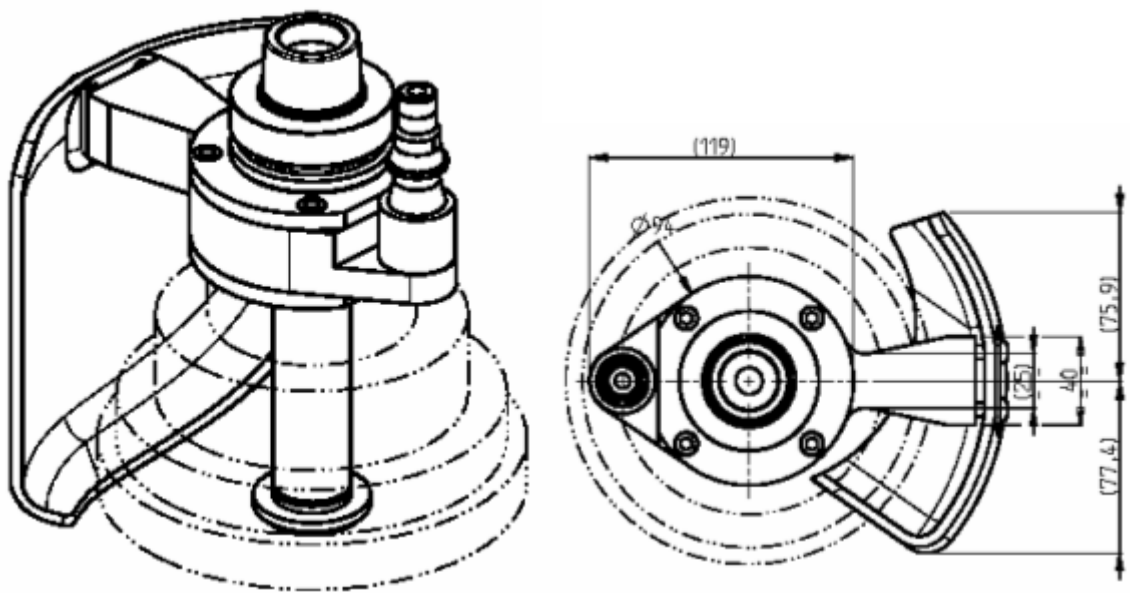
Note. Angle A between the first (1) and the second (2) side is not limited by any parameters.



Special Heads Benz

Head with Shavings Conveyor Flight (9036236561B)

Head with HSK F63 taper for moulding workpiece surface using collector which can be angled with Vector rotary axis.

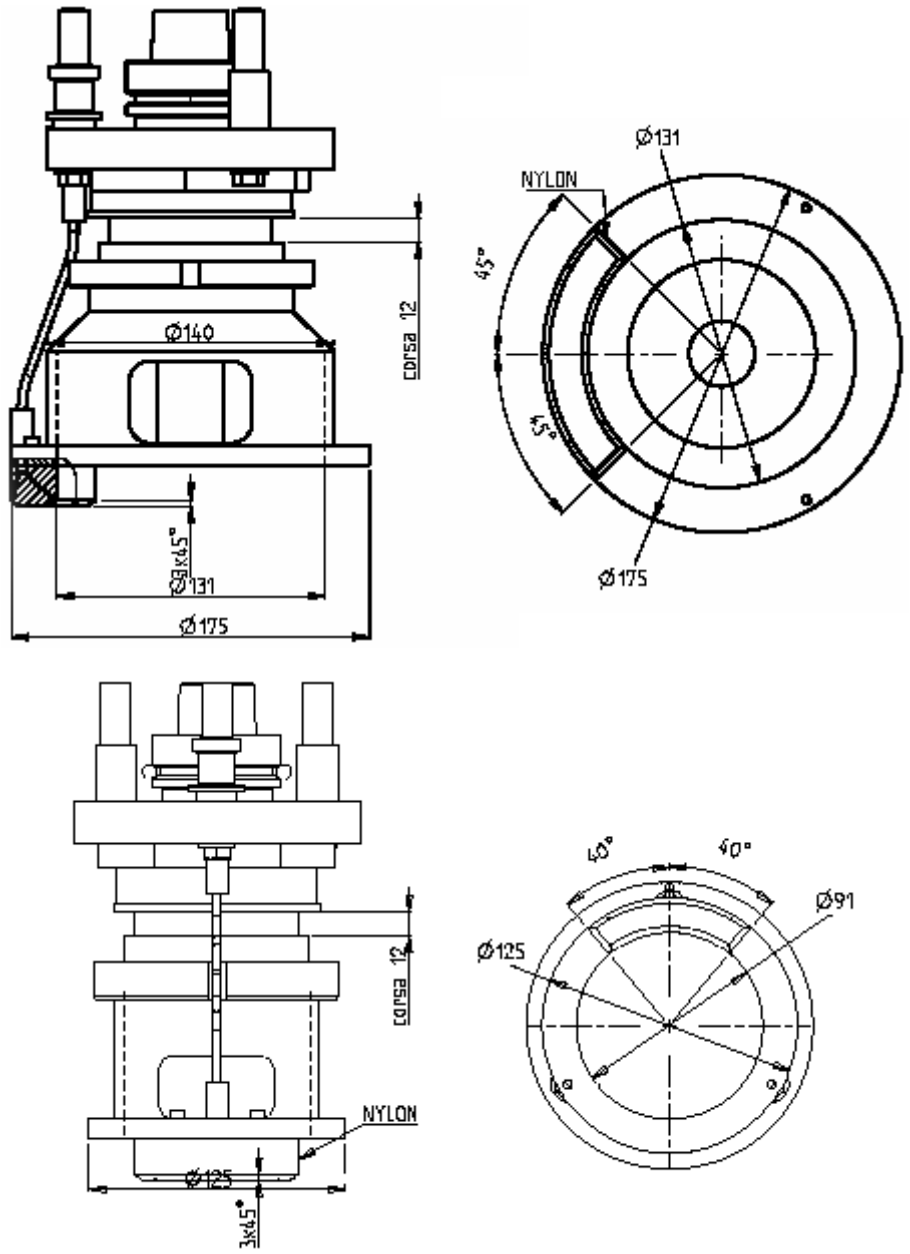


Characteristics

- Rotation speed max 10000 rpm
- Right and left rotation
- **Requires pre-set for electric spindle**
- **Requires Vector rotating axis**
- **Vertical tool tooling configuration (tool must not be part of angled tools family).**

Radial Floating Head (2736236528A)

Head with HSK F63 taper for tracing workpiece surface using sensor which can be angled with Vector rotary axis.

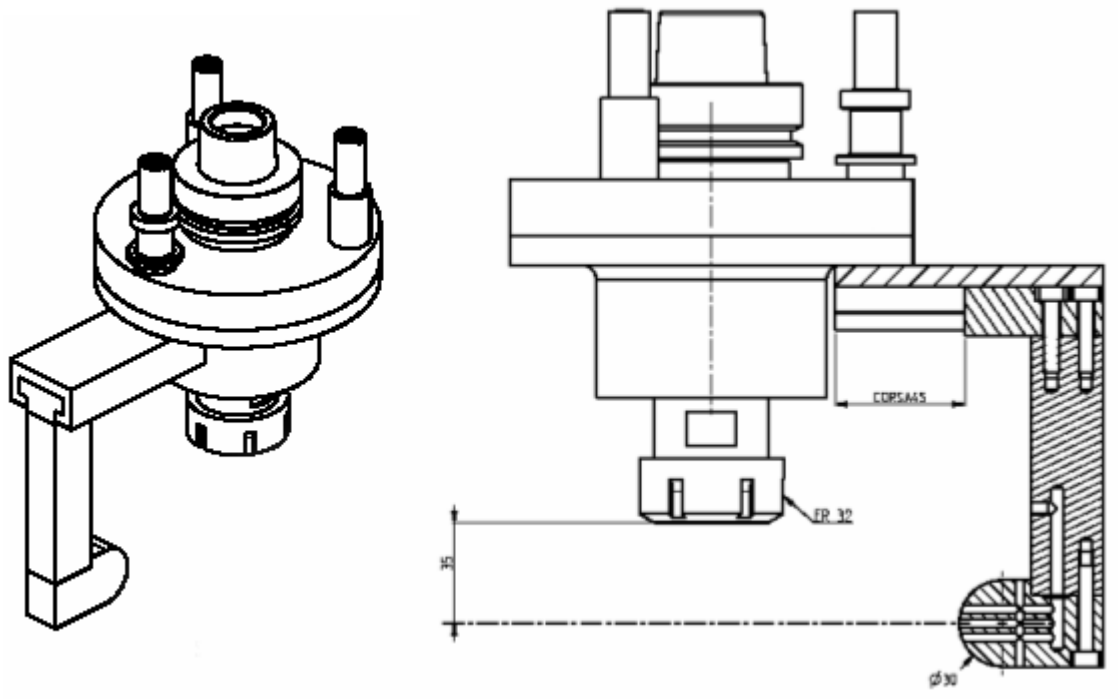


Characteristics

- Maximum input rotation speed 18000 rpm
- Maximum output rotation speed 18000 rpm
- Transmission ratio 1:1
- Weight 8 kg
- Clamp coupler ER 32
- Right and left rotation
- **Requires pre-set for electric spindle**
- **Requires Vector rotating axis**
- **Vertical tool tooling configuration (tool must not be part of angled tools family)**

Head with Air Blower (2736236527H)

Head with HSK F63 taper with air blower for cleaning tool during machining, which can be angled using the Vector rotary axis to follow the different changes of tool direction.



Characteristics

- Maximum input rotation speed 15000 rpm
- Maximum output rotation speed 15000 rpm
- Transmission ratio 1:1
- Clamp coupler ER 32
- Right and left rotation
- **Requires pre-set for electric spindle**
- **Requires Vector rotating axis**
- **Vertical tool tooling configuration (tool must not be part of angled tools family)**

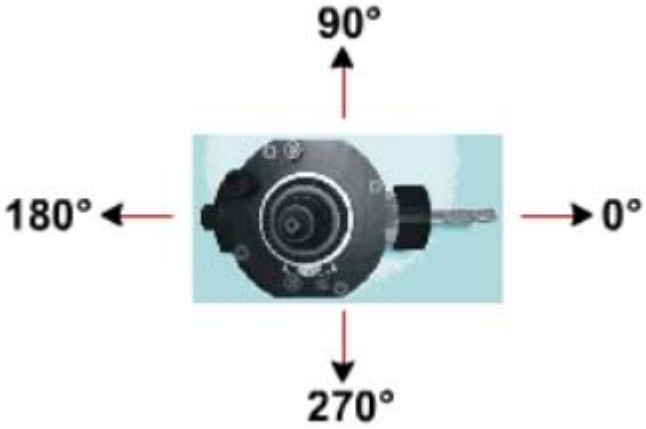
Special Heads Configuration

The special heads incorporate the tool (which must be able to operate perpendicular to the face of the panel and must not be part of the angled tools family) and are configured as a router, with the following special features:

- type is customised (M=head with flight; N=radial floating head; O=head with air blower);
- the "Offset R" parameter represents the angular offset for mechanical calibration of the head arm, and is configured as an angle drive with router;
- the "Angle A (B for type 'D')" parameter represents the tool angle and must be set to 0.

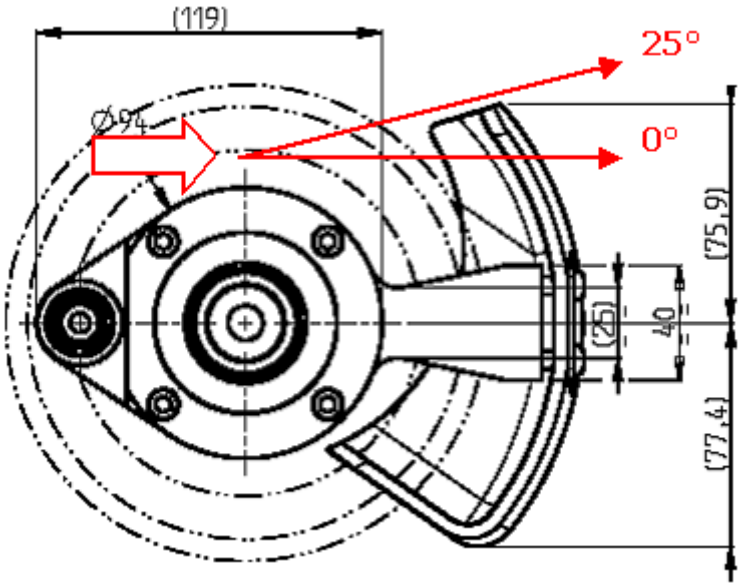
Examples of configuration of offset R.

The technique in the machine to rotate the head and calculate the value of the offset R angle is the same as in an angle drive with router, according to the angular references illustrated.

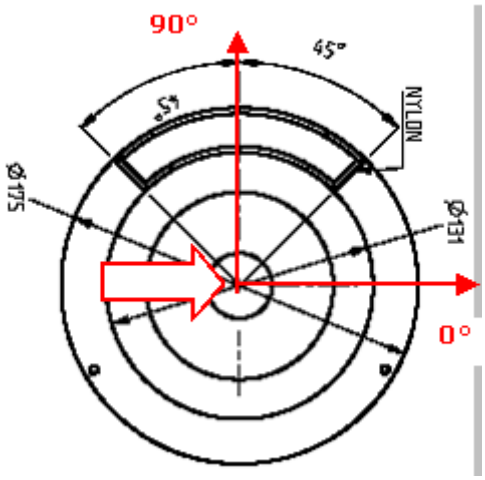


Head with shavings conveyor flight.

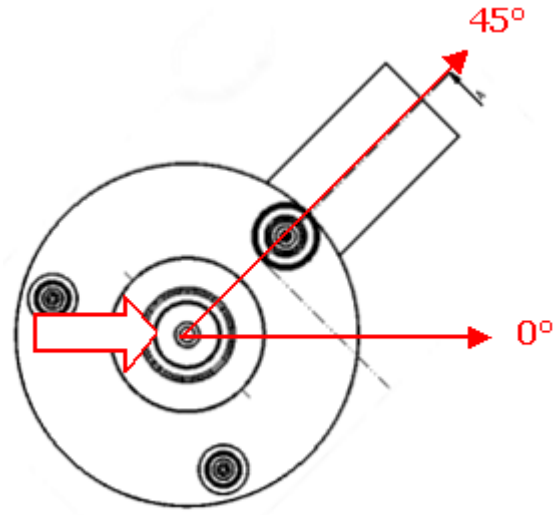
The tool in the example is for machining for a frame. The fulcrum of the angle for the calculation of the offset R is on the point of contact on the wood, indicated by the arrow.



Radial floating head.



Head with air blower.

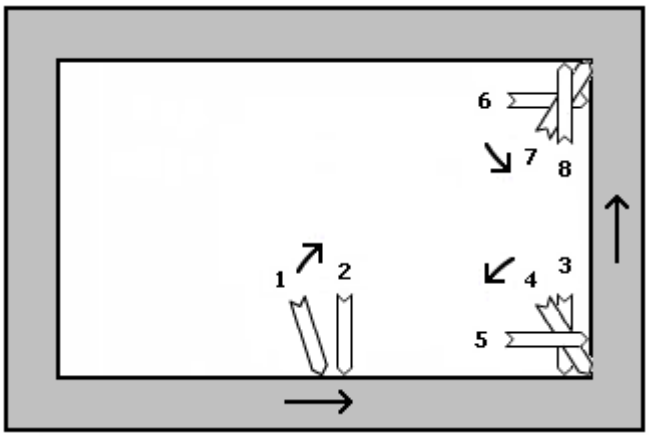


Programming with special heads

To programme machining with the special heads use the R type instructions: G0R/XG0R, G1R/XG1R, G2R/XG2R, G3R/XG3R, G5R/XG5R. These instructions allow Vector entry and interpolation on the entire profile, in particular with the use of parameter IC/I (lead in side) and parameter A (angle of rotation, whose use is linked to the type of IC/I set).
For special heads, you can also use parameter Q, which represents an angular offset relative to angle A. The tool lead in on the workpiece with the special heads therefore occurs with an access typical of F1 with the extension of the hardware established by angle A+Q. Angle Q causes interpolation on the current section of the profile.
Like angle A, angle Q is modal. It can be reset in the subsequent type R instruction.
Use of the vertical tool and setting value 0 in the "Angle A (B for type 'D')" parameter in the special heads configuration also allows use of the tool correction instructions C=1 and C=2.

Example: machining on inside of panel with tool installed on special head.

```
H DX=600 DY=400 DZ=20 -AB C=0 T=0 R=1 *MM / "prisma"
;
L SB=50   ; thickness of edge
L PRF=40   ; prefetch value per Vector cycle
;
G0R X=DX/2 Y=SB Z=-5 A=0 Q=15 V=2 IC=2 B=0# T=201          see: 1
G1R X=DX/2+PRF V=5 Q=0                                     see: 2
G1R X=DX-SB-PRF                                            see: 3
G1R X=DX-SB Q=30                                           see: 4
G1R Y=SB+PRF Q=0                                           see: 5
G1R Y=DY-SB-PRF                                            see: 6
G1R Y=DY-SB Q=30                                           see: 7
G1R X=DX-SB-PRF Q=0                                        see: 8
...
```



As can be seen, the main profile defined on the inner edges of the rectangle is broken, to allow the special tool to follow the trajectory defined without colliding with the panel.

APPENDIX

APPENDIX A - Description of the parameters

Parameter	*Description*
Angle A	Angle value which expresses, in degrees, the orientation of the tool on table Z with respect to the vertical (0°).
Blade thickness (blade)	Dimension in mm which defines the width of the cutting edge.
Diameter (miller, drilling bit)	Dimension expressed in mm which defines the maximum diameter dimension of the tool mounted on the transmission.
Direction of rotation	Defines the rotation direction (+ = clockwise, - = counter clockwise) necessary in input to obtain the correct rotation direction of the tool in output.
Disc radius (blade)	Dimension expressed in mm which defines the radius of the blade.
Distance D	(Blade) Value expressed in mm which defines the distance on the XY table between the vertical rotation axis of the HKS cone and the blade support flange. (Miller, drilling bit) Value which expresses in mm the distance on the XY table between the vertical rotation axis of the HSK cone and a known point on the angle transmission previously used to configure the "Miller Length" parameter.
Distance Z	Value expressed in mm which defines the distance Z between the horizontal tool rotation axis and the upper table of the HSK cone.
Height countersink (hole tip with countersink)	Dimension expressed in mm which defines the distance between the tool bit and the countersink.
Length (miller, drilling bit)	Dimension expressed in mm which defines the distance between the point of the tool to be checked and a known point on the body of the angle transmission.
Machining surface	Defines the Xilog table which the tool is capable of machining. For millers and drilling bits, in the case of an inclined table in absence of Vector axis, this parameter is configured to 1; in the case where there is a Vector axis, this parameter is left at 0.
Max. rotation	Value in rpm which defines the maximum rotation speed permitted for the tool.
Max. speed	Value which defines the maximum advance speed permitted for the tool.
Number total	Numeric value which indicates the association of this tool with the tool mounted on the second output. It is advisable to set this parameter with the number of the tool with the lowest label value. Ex. E10 + E11 Number total = 10. When the tools are being loaded into the table, the transmission will be represented by the label value A10.
Offset R	(Miller, drilling bit). Angle value which expresses, in degrees, the orientation of the

	tool on the XY table with reference to the X+ axis. In the case of a Vector Axis, consider the position of the latter to be 0°. (Blade). Angle value which expresses, in degrees, the orientation of the tool on the XY table with reference to the Y-axis. In the case of a Vector axis, consider the position of the latter to be 0°.
Offset X **(miller, drilling bit)**	Angle value which expresses, in mm, the distance along the X axis between the vertical rotation axis of the HSK cone and the tool rotation axis. In the presence of a Vector axis, consider the 0° position of the latter.
Offset Y **(miller, drilling bit)**	Angle value which expresses, in mm, the distance along the Y axis between the vertical rotation axis of the HSK cone and the tool rotation axis. In the presence of a Vector axis, consider the 0° position of the latter.
Overall dimensions	Volume in mm which expresses the dimension in Z of the maximum tool volume referred to the upper table of the HSK cone.
Speed G0/B	Value which defines the predefined advance speed for input in machining the piece.
Standard rotation	Value in rpm which defines the predefined rotation speed for the tool.
Standard speed	Value which defines the predefined advance speed for the tool.
Tool counter position in X **(miller, drilling bit)**	In the absence of a Vector axis and tool orientation along the X axis, it defines the label of the twin tool mounted on the second output directed along the X axis.
Tool counter position in Y **(miller, drilling bit)**	In the absence of a Vector axis tool orientation along the Y axis, it defines the label of the twin tool mounted on the second output directed along the Y axis.
Transmission ratio	Numeric value which expresses the conversion ratio between the rotation speed applied at input and the speed obtained upon output.
Type	Type of tool mounted: F = miller, P = bit, D = disk.
Type tip **(drilling bit)**	Defines the typology of a drilling bit: L = lance, P = flat, S = countersunk.
Working crown **(blade)**	Dimension expressed in mm which defines the length of the cutting edge and the maximum limit of depth the tool can attain.
Working diameter **(miller, drilling bit)**	Dimension expressed in mm which defines the diameter of the tool to be checked in the tool side machining operations.
Working length **(miller, drilling bit)**	Dimension expressed in mm which defines the length of the cutting edge and the maximum limit of depth which the tool can attain.