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Operating Instructions For CNC Insert Tooling

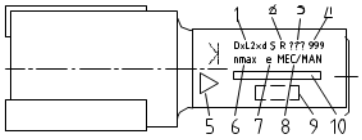
Please read the operating instructions carefully before using the tool.

CNC Router Tool with interchangeable solid carbide insert knives.

CNC Cutter set mounted in an HSK Arbor adapter.

1. General

This router tool complies with the requirements of EN847 (European Norm for Safety, Accident Prevention, Dimensional Tolerances, Balance and more).
Schematic diagram of tool engraving:



1. Dimensions
2. Direction of rotation
3. Cutting Edge Material
4. Date of Manufacture
5. Min. Clamping Length
6. Maximum speed
7. Eccentricity
8. Type of feed (man. Or mech.)
9. Manufacturer/Supplier Name
10. Other mfg. markings

1.1 Cutting Material and Ordering Information

1.1.1 Cutting Edge Material

WS = Unalloyed Tool Steel
SP = Alloyed Tool Steel
HS = High Speed Steel
ST = Stellite
HC = Coated Tungsten Carbide
HW = Tungsten Carbide
DP = Polycrystalline Diamond
DM = Monocrystalline Diamond

1.1.2 Ordering Information

Order Number
Dimensions (Diameter/Cut Length/Shank/Overall Length)
Spindle Speed and feed type (manual or mechanical)

1.2 Use As Intended

1.2.1 Speed (R.P.M.)

n — The speed range “n” indicated on the tool must be observed.

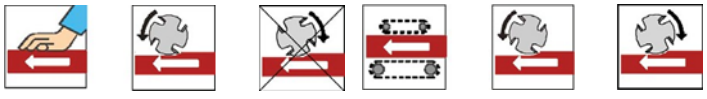
n max — The indicated maximum speed “n max” may not be exceeded!

The minimum clamping length must be observed!

1.2.2 Application and method of operation.

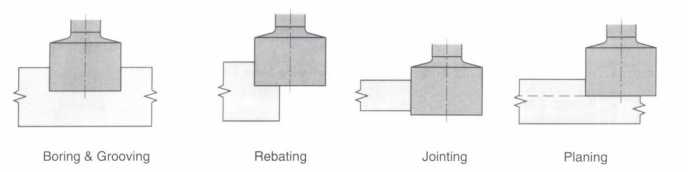
To be used on woodworking machines only. The tool may only be used with the type of feed indicated on the tool body.

MAN Conv.Cut Climb Cut MEC Conv. Cut Climb Cut



Tools marked with “MEC” may only be used on machines with mechanical (power) feed.
Please observe the specifications of the machine manufacturer regarding the suitability of the tool.

1.2.3 Types of Machining



1.2.4 Materials to be machined
Wood, wood composites and materials of comparable cutting qualities. When in doubt, please contact the tool manufacturer for clarification!

1.3 Safe Handling

1.3.1 Use

All European safety standards must be met during operation to include EN847. This tool may only be used as described in Section 1 “intended use”.

1.3.2 Transport

Transportation of cutting tools should only take place in properly protected packaging and protection of the cutting edge to avoid damage to the tool or injury to the handler.
Always use gloves to protect from sharp edges and cuts.

1.3.3 Tool Assembly and Installation

Before using the tool, check the cutting tips, the clamping screws and clamping elements to ensure correct installation, position and tightness. Cutting tip, seat and screws must remain free of resins, dust and oil grime. Risk of injury due to parts being flung out of the tool body if not properly secured.

Always mount all components as failure to do so can result in a tool imbalance.

Clamping screws and nuts must be tightened to proper clamping torque with a suitable torque wrench. It is prohibited to extend wrenches or use power tools.

Screw heads must be cleaned of dust and debris to ensure accurate contact and firm grip of the wrench to avoid stripping or otherwise damaging the screws.

The tool must be mounted, secured and operated according to the machine manufacturer’s instructions.

Check machine settings and direction of rotation.

Make sure there is NO CHANCE of the machine starting up during tool installation (see machine operating instructions/manual). Risk of severe injury or death!

During tool assembly, make sure the tool is properly clamped and the clamping surfaces are clean and free from debris, dust and grease/fluid. Cutting tips should be protected during the installation to prevent tool damage.

When using stacked tooling, make sure they are interlocking correctly and knives are not touching. Never touch a tool body when it is rotating, even if it has almost come to a standstill.

1.3.4 Protective Measures

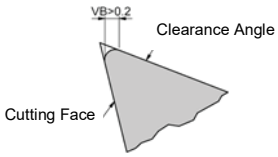
Check the tool body, insert knives, screws, wedges (gibs) and all components of the cutting tool on a regular basis to identify any possible damage, especially after a collision with the table/vacuum hold down or other unintended incident. If in doubt, have the tool checked by the tool manufacturer or other expert.

Damaged inserts, clamping elements or screws must be replaced in sets with original spare parts. Tools with cracked or bent tool bodies must be retired immediately. Such tools are deemed unsafe and may not be repaired.

2.0 Tool specific parts

2.1 Care

For safety reasons, tools should be sent for service when the wear width (VB) on the cutting edge is greater than 0.2mm. Closely observe the primary wear zones where breakouts from the cutting edge are visible.



To prevent rusting, tools should be protected from humidity. Regular cleaning of tips and removal of glue and resin buildup increases tool life and operational safety.

Corrosive cleaning agents can damage skin and eyes. Wear protection gloves and safety glasses and only select products recommended for tool cleaning.

2.2 Repair, modification and sharpening.

2.2.1 General Requirements

Tool sharpening may only be carried out by professional experts and in accordance with the manufacturers instructions.

Repairs and modifications may only be carried out by the manufacturer. Any modifications made to the tool by anyone else will nullify any warranty.

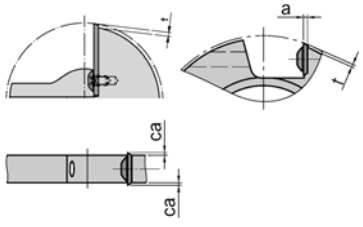
Only use spare parts which conform to the original specifications and spare parts of the manufacturer.

Tolerances to ensure accurate clamping must be adhered to. Change collets every 500 machine hours to prevent runout and loss of finish quality and tool life.

Since North America does not have a norm that provides performance and safety standards for routing tools, Europe's comprehensive Safety and Production Standards and regulations are adhered to for all cutting tools we sell worldwide.

After each repair or modification, it must be ensured that the tool conforms to all requirements of European Standard EN847, in particular as it pertains to:

Balancing Quality
Knife Thickness
Knife Protrusion "ca" or "t"



• Protrustion of the spur

2.2.2 Sharpening Instructions

Obtain the sharpening instructions from the tool manufacturer.

2.3 Cleaning Agent

The appropriate cleaning agent can be recommended by the tool manufacturer.

2.4 Replacing mounting parts

See Section 1.3 Safe Handling

2.4.1 Screw Tightening torques

2.4.1 Screw tightening torques

Table 1 Screws with inner Torx and hex-sockets

Thread	Torque	Wrench
M3	2,3 Nm	T9
M3,5	3,0 Nm	T10
M4	4,2 Nm	T15
M5	5,0 Nm	SW4
M6	8,4 Nm	SW5
M8	15,0 Nm	SW6

Table 2 Hex-socket set screws

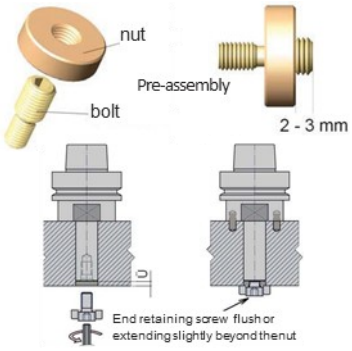
M4	2,0 Nm	SW2
M5	3,5 Nm	SW2,5
M6	5,5 Nm	SW3
M8	9,5 Nm	SW4

Table 3 Retaining screws with hex-socket

M10	60 Nm	SW6
M12	80 Nm	SW8
M16	100 Nm	SW10
M20	100 Nm	SW12

2.4.2 Arbor with double treaded retaining screw

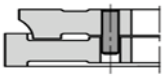
2.4.2 Arbor with double threaded retaining screw



Observe the projection of the tool hub with respect to the end of the arbor. Check the tightness of the screws before use!

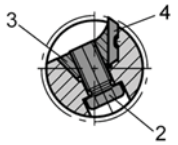
2.4.3 Tool set (if applicable)

A tool set consists of several individual tools. Tool sets with positive locking must retain positive locking.

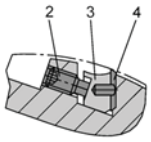


If a tool is adjustable, only spacers may be used that conform to the original parts from the manufacturer. (see Section "Assembling the Tool Set") The individual tool bodies that are part of a tool set may not be used independently without permission from the tool manufacturer.

2.4.4 Replacing the main inserts

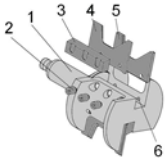


Release the clamping screw (2) and unscrew it from the clamping wedge (3) until the insert (4) is released and can be pushed out. Replace sharp insert into correct knife position and tighten the clamping screw (2) to the specified clamping torque (see Table 2.4.1)



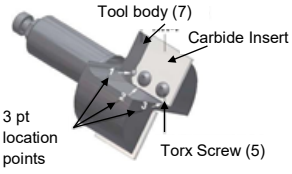
Release the clamping screw (2) and unscrew it from the clamping wedge (3) until the cuting tip (4) can be pushed out sideways. Replace the insert knife (4) by pushing it with the clamping wedge (3) sideways into proper position and then tightening it down with the proper clamping torque (see table 2)

For Multi-Profile tools:



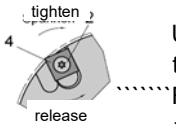
Release the clamping screw (2) and remove clamping wedge (3), with insert knife (4) remove backer plate (5) from the positioning pins. To replace, mount the backer plate (5) on pins (6). Place the new insert knife (4) on to the clamping wedge pins (3) and align them so that the pin in the knife seat of the tool body (1) fits into the hole on the under side of the clamping wedge (3)

2.4.6 "Customize-It" Router Bit



Direct blade to body connection with 3 position reference points. Loosen the torx clamping screws (5) and remove the carbide insert knife from the tool body (7). Replace the new insert in the 3 reference point seat and tighten down with the torx screw.

2.4.7 Replacing spurs



Unscrew the spur screw using the proper torque wrench. Remove spur (4) and screw (2) Rotate the spur by 90 degrees and re-insert the spur (4) with the new edge facing the working direction and tighten the screw (2) to the correct torque (Table 1)

2.5 Application range

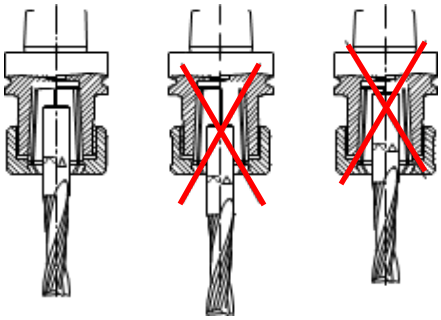
See catalog and order specifications. When in doubt, check with the manufacturer.

2.6 Spare Parts

Please contact us for all spare parts.

2.7 Proper Clamping, maximum rpm and Eccentricity

2.7.1 The minimum clamping length "min" is marked on the tool shank (see section 1.2.1) The tool shank should be clamped in as far as it goes, but at least up to the minimum clamping depth. The shank portion of the tool protruding from the collet should be minimal, but never clamp the area where balancing holes are located or uppermost part of the flute.

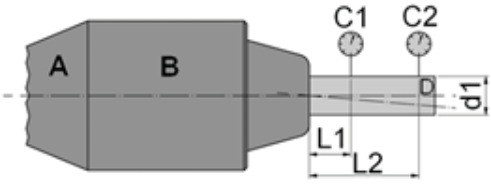


Maximum permissible speed

The tool shank is marked with the maximum permissible speed and clamping eccentricity (in mm) Example: n max 18000 e 0.06. Shank type cutters may only be used for up to the maximum eccentricity. Failure to adhere presents a danger of tool breakage.

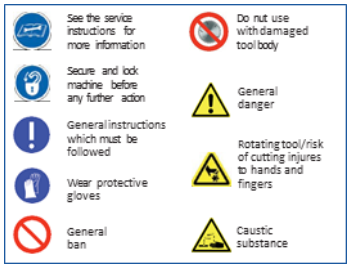
2.7.2 Eccentricity (see EN 847-2) Clamp tool (D) in clamping device (B) Test shank diameter (d1) = nominal diameter. Check runout according to the diagram below.

D = Tool body
B = Clamping Device
C1 = Test Point 1
C2 = Test Point 2 (see EN841-2)
d1 = Test body diameter
em = Measured eccentricity
esp= Eccentricity in clamping device
t1 = runout at test point C1
t2 = runout at test point C2



If this condition is not satisfied, the setup (clamping device and tool) must be checked. Danger of Tool breakage!

To guarantee highest possible performance, tool life and quality of finish, we highly recommend putting every insert tool body into a heat shrink tool holder since accuracy is guaranteed (max. runout .003mm / .0002") Elimination of collet nut and collet tolerances achieves this accuracy and collet replacement becomes unnecessary so saves time and money!



For more information, please contact us or visit our website. The safe and proper use of cutting tools and clamping systems will help reduce your tooling expense and improve finish qualty. Remember, the ultimate performance of a cutting tool lies in the synergy between machine, clamping system, tool design and accuracy, proper chip load and material being machined.

For chip load calculation assistance, please visit our website at www.guhdo.com/chipload-calculator. It will assist you in finding the starting point which you can fine-tune from there.

You can also direct any technical questions you may have to tech@guhdo.com.