

# GUHRING



**GM 300  
CHECK- AND MEASURING  
INSTRUMENTS FOR  
OPTIMAL TOOL CLAMPING  
AND LUBRICATION**



# CHECK- AND MEASURING INSTRUMENTS FOR OPTIMAL TOOL CLAMPING AND LUBRICATION

Pre-requisite for perfect machining results is not only the right choice of machine, tool holder, chuck and tool. Just as important is a constant check of tool clamping and lubrication. Optimal tool clamping and lubrication ensures long tool life, highest cutting performance as well as excellent quality and prevents tool breakage, chip congestion or inferior machining quality.

As a full-range supplier of tools, tool holders and chucks for all matters machining, Guhring has also developed a comprehensive program of instruments for measuring and checking the tool clamping and lubrication that are available as special solutions in the GM 300 program.

All measuring and inspection instruments are suitable for measuring or checking the tool clamping and the coolant supply directly on site on the machine in production. This allows a quick, simple and accurate measurement or inspection under actual machining conditions at any time.

**The Guhring check- and measuring instruments:**

- **Clamping force measuring instrument HSK/SK** for accurate measuring of HSK/SK clamping systems (page 3)
- **SENSO 3000** for accurate measuring of the clamping force for hydraulic chucks (page 4)
- **SENSO-SHRINK** for accurate measuring of the clamping force for shrink fit chucks (page 6)
- **PQ 3000** for checking of pressure and volume of coolant flow with conventional lubrication (page 8)
- **CC 3000** for checking of the filtering efficiency of the coolant system (page 9)
- **MQL-CHECK 3000** for measuring of the coolant volume and the reaction time with the minimal quantity lubrication MQL (page 10)



From the holder to the tool, Guhring supplies measuring and inspection instruments for clamping and lubrication including minimal quantity lubrication.

# CLAMPING FORCE MEASURING INSTRUMENT HSK + SK

Accurate measuring of the clamping force for HSK/SK clamping systems

The accuracy of the HSK connection does not only depend on the geometry but also on the drawing force of the HSK clamping system which plays an important part in ensuring a powerful and dimensionally accurate connection. To ensure operational safety, a regular clamping force check of the HSK interface is recommended.

An entirely mechanical clamping force measuring instrument is now available from Guhring. Its operation is based on components, which are linear adjustable in length and positioned proportional to the force. A force is associated with the alteration in length which is displayed via an analogue dial gauge.

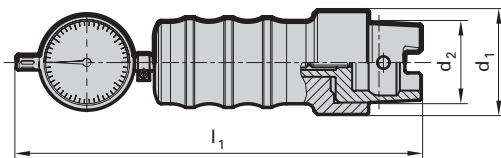
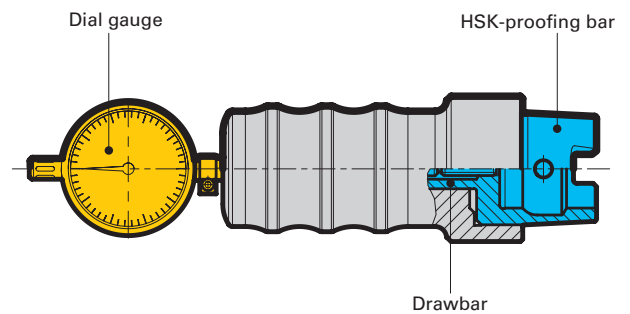
## Specifications:

- few components, therefore cost-efficient
- robust design
- battery or mains connection not required
- patented operating principle which is also adaptable to other spindle designs

We deliver the clamping force measuring instrument Guhring no. 4974 in a wooden case, calibrated, with inspection protocol and measuring instructions.

## Minimum required pull forces for clamping systems

taper size HSK32	5 kN
taper size HSK40	6,8 kN
taper size HSK50	11 kN
taper size HSK63	18 kN
taper size HSK80	28 kN
taper size HSK100	45 kN
taper size SK30	6 kN
taper size SK40	12 kN
taper size SK50	25 kN



for HSK-A/C d <sub>1</sub>	SK	d <sub>2</sub> mm	l <sub>1</sub> mm	Guhring no. 4973		Guhring no. 4974	
				Code no.	Availability	Code no.	Availability
-	40	30	260	40,000	•		
-	50	38	300	50,000	•		
25	-	19	196			19,000	•
32	-	24	201			24,000	•
40	-	30	205			30,000	•
50	-	38	213			38,000	•
63	-	48	246			48,000	•
80	-	60	260			60,000	•
100	-	75	271			75,000	•



# SENSO 3000

## Accurate measuring of the clamping force for hydraulic chucks

The hydraulic clamping technology is a well-known, proven and reliable method for the clamping of tools. Thanks to its completely closed design the system is sealed and impervious, requires extremely low maintenance and guarantees longevity. Following many years of general use, however, thermal and mechanical influences can lead to a reduction in clamping force. The result can be a poor tool life and a diminished surface quality including expensive tool breakages during machining operations.

Determining the loss of clamping force was until now extremely costly and inaccurate. It involved either determining the number of clamping screw rotations or the torque with the assistance of a proofing bar and a torque key or the expansion rate applying an accurate internal measuring instrument.

The new Guhring SENSO 3000 measuring instrument offers a precise, quick and simple as well as consistent method of measuring the clamping force. An added advantage is the mobility of the system, i.e. for measuring within machines and fixtures.

SENSO 3000 determines the clamping force of the hydraulic chuck via a pressure sensitive plug gauge. The entire length of the plug gauge is clamped in the hydraulic chuck so that when tightening the clamping screw the clamping pressure of the chuck is optimally applied. The clamping force measuring instrument displays the clamping force as an absolute measurement value on the one hand and as a percentage clamping force in relation to a reference value that can be set individually on the other. This way, SENSO 3000 can be adapted to customer specific application conditions and requirements

The clamping force measuring instrument is supplied with a plug gauge for the respective clamping diameter as well as a carbide proofing bar for calibration purposes and a CR 2430 type battery – all in a sturdy and handy case.



Clamping diameter mm	Guhring no. 4038	
	Code no.	Availability
6.0	6,000	●
8.0	8,000	●
10.0	10,000	●
12.0	12,000	●
14.0	14,000	●
16.0	16,000	●
18.0	18,000	●
20.0	20,000	●
25.0	25,000	●
32.0	32,000	●

# GUHRING REPAIR SERVICE FOR HYDRAULIC CHUCKS

## Save through maintenance! Costings prove: inspection and repair is profitable!

Insufficient clamping force of hydraulic chucks can have disastrous consequences: poor cutting rates and tool life of the clamped tools, reduced surface quality of the machined workpiece and breakage of tool, holder and workpiece. Our test measurements show: one in 10 chucks displays a loss in clamping force!

Regular hydraulic chuck clamping force inspections can protect against such unwelcome and expensive consequences. Therefore, we provide a new service to ensure optimum performance of your hydraulic chucks - from any manufacturer:

### 1. Professional clamping force inspection

The measurement is taken quickly, without exertion of force and in the machine or equipment at your premises for your production with Guhring's SENSO 3000 clamping force measuring instrument.

### 2. Our repair service

If the existing clamping force is insufficient, we check the cause of the loss in clamping force, replace the necessary components, re-fill the hydraulic system and carry out a final inspection.

### 3. New hydraulic chucks

If the hydraulic chuck is irreparable, we will offer you a new hydraulic chuck from our current Guhring GM 300-program!

For further information regarding Guhring's hydraulic chuck repair service please contact your regional Guhring representative.



# SENSO-SHRINK 3000

Accurate measuring of the clamping force for shrink fit chucks

With SENSO-SHRINK 3000 Guhring offers a clamping force measuring instrument for shrink fit chucks. SENSO-SHRINK 3000 simply, quickly and accurately determines the clamping force of the shrink fit chuck by measuring the bore volume on your premises. The measuring result displayed by SENSO SHRINK 3000 is the deviation percentage from the nominal value of a reference chuck. Measuring results in a range between 95 % and 105 % indicate optimal clamping of the tool.





**90 %**

< 95 %:  
bore worn  
or widened,  
therefore clamping force too small

**100 %**

95 % ... 105 %:  
optimal clamping force

**110 %**

> 105 %:  
bore too small,  
shrink fit ability endangered, i.e.  
through overheating during shrink fitting or deformation

**SENSO-SHRINK 3000 offers the user the following benefits:**

- simple, quick and accurate measuring of the shrink fit chuck clamping force directly on your premises
- early recognition of wear and incorrect handling of shrink fit chucks
- considerable increase of process reliability during use
- quality assurance of overall system: tool, chuck and tool holder
- wireless system, providing reproduceable measuring data at any time

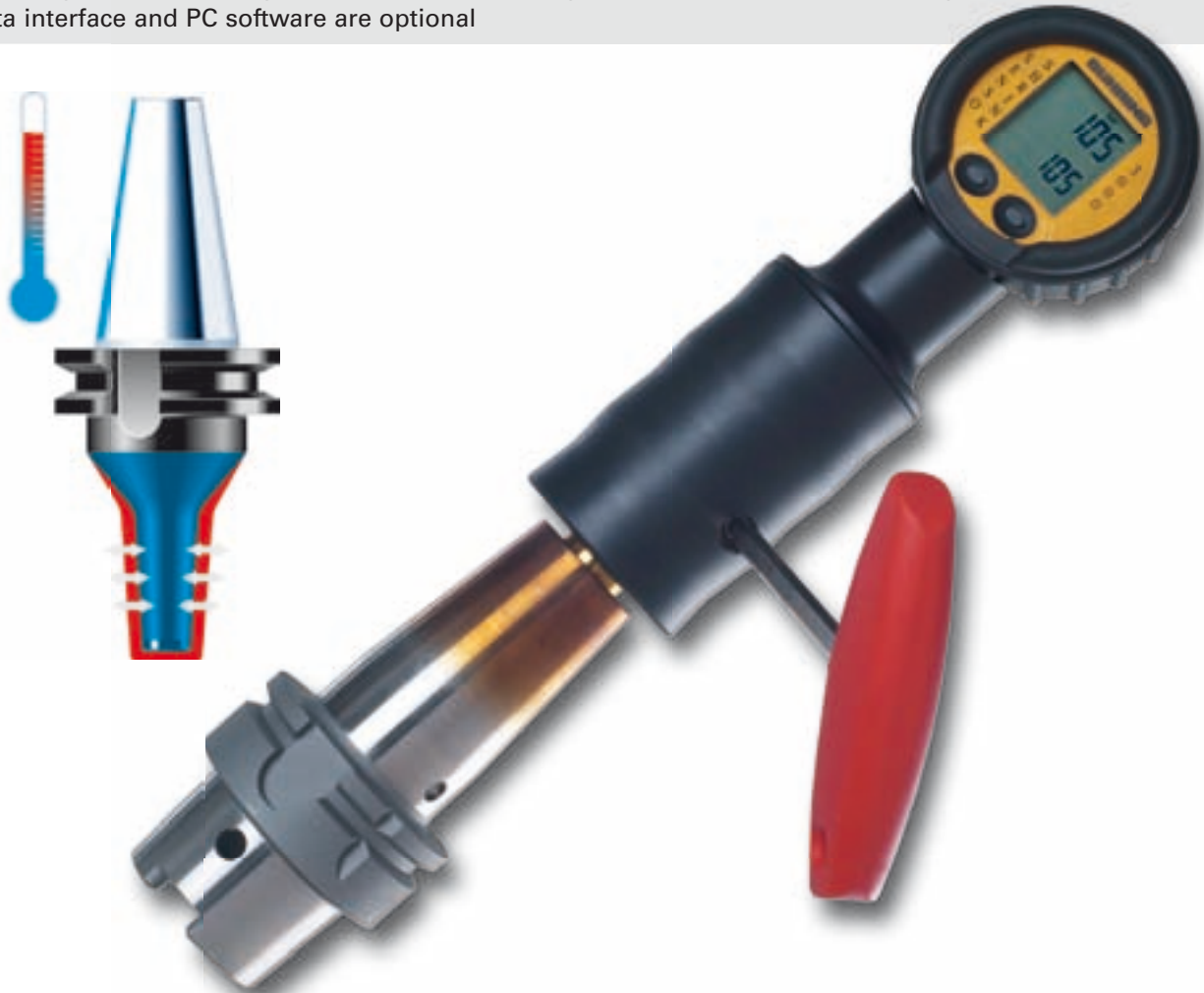
An optional data interface enables the documentation of measuring results and further evaluations on a PC.

**Technical Data:**

Measuring range: 70 % to 130 %  
Tool diameter range: 6, 8, 10, 12, 14, 16, 18, 20, 25, 32 mm  
Power supply: battery

**SENSO-SHRINK 3000 consists of:**

- clamping force measuring instrument with proofing bar for the respective clamping diameters
- data interface and PC software are optional



# PQ 3000

## Accurate check of pressure and volume of coolant flow with conventional lubrication

**Guhring's PQ 3000 enables quick and simple checking of pressure and volume of coolant flow directly in the machine using the actual tool applied.**

PQ 3000 enables the checking of pressure and rate of flow of coolant when the actual tool is clamped directly in the stationary tool spindle. This way, it is possible to establish the real conditions of the relevant machine and tool configuration and check the resulting actual rate of flow.

**PQ 3000 provides the following information:**

- pressure and volume flow of the coolant pump, the so-called P/Q characteristic curve,
- possible pump or seal wear as well as rotary transmission losses,
- possible narrowed cross sections in the line through machine, spindle and tool holder,
- possible blocked filters,
- possible narrowed cross sections resulting from deposits on the surface of the coolant ducts in the tool,
- the coolant duct layout in the tool.

To identify and rectify possible weak points in the overall system, this way, the tool life of the applied tool can be optimised preventing tool breakage as well as chip congestion and jamming!

PQ 3000 provides data of sensors and indicates the checking results on the display fixture. A data interface enables an evaluation via software on your PC (interface and software are available on request).



**Technical Data**

Pressure checking range:	1 to 120 bar
Rate of flow checking range:	2 to 40 l/min (0.1 to 2 l/min on request)
Diameter holder shank:	16 mm
Diameter range of tool holder:	ER 32 / 6 to 20 mm
Anzeigen für:	<ul style="list-style-type: none"> <li>• existing pressure P in bar</li> <li>• rate of flow volume Q in l/min</li> </ul>

		Guhring no. 4068
	Code no.	Availability
Set in case, includes: <ul style="list-style-type: none"> <li>• clamping fixture and checking instrument</li> <li>• display fixture with grip and connection socket</li> <li>• checking data cable with connector plug, length 3 m</li> <li>• ER 32 collet holder and sealing washer set for standard shanks with collets from 6 to 20 mm dia.</li> <li>• clamping key for tensioning nut</li> </ul>	10,000	●
Data interface and PC software		on request



# CC 3000

## Accurate check of the filtering efficiency of the coolant system

**With Guhring's CC 3000 you can quickly and simply check the filtering efficiency of the coolant system.**

Thanks to replaceable stainless steel filters, the user can adapt the instrument specifically to the filtering of the coolant system. CC 3000 establishes the present condition of the individual system and displays the actual filter efficiency.

**In order to analyse and rectify possible weak points of the filter system, the following information is provided:**

- perfect operation of the coolant filtering system,
- defective filters,
- insufficient filtering for the applied tool.

In addition, it is possible to determine the oil concentration of the applied soluble oil with the included refractometer.

Thus, it is possible to optimise the tool life of the applied tool, to prevent tool breakage and subsequent production stoppage!



### Technical Data

- Range of application:
- 50 - 500 min<sup>-1</sup>
  - suitable for coolant pressure up to 80 bar

		Guhring no. 4076	Guhring no. 4077
	Code no.	Availability	Availability
Set in case, includes:			
• Inspection instrument with HSK 63-A interface			
• Stainless steel filters size 100, 200 and 300 µm			
• Refractometer including accessories			
• Magnifying glass, 8-fold magnification			
• Coolant delivery set, Guhring no. 4949, code no. 18,063			
Stainless steel filter, size 60	60,000		•
Stainless steel filter, size 100	100,000		•
Stainless steel filter, size 200	200,000		•
Stainless steel filter, size 300	300,000		•

# MQL-CHECK 3000

Accurate measuring of the coolant volume and the reaction time with minimal quantity lubrication MQL

The development of Guhring's new MQL-Check 3000 allows simple and quick measuring of the coolant volume and the reaction time with minimal quantity lubrication (MQL) directly at the tool point. For the user, the result is a considerable increase in process reliability with MQL machining.

Especially with minimal quantity lubrication, an optimal delivery of the minimal coolant volume to the cutting edge is paramount. An insufficient delivery or a delayed response time respectively can lead to fatal results such as premature wear, a deterioration in machining quality or even tool breakage. In contrast, an excessive coolant volume results in increased costs through unnecessary coolant consumption and additional cleaning expense for components or machines as well as an unnecessary impact on the environment and personnel.

Until now, measuring the coolant volume exiting at the tool point was practically impossible. With the MQL-Check 3000, Guhring is for the first time offering a simple to operate measuring instrument for quickly checking the coolant volume directly at the tool point. MQL-Check 3000 is simply installed in the machine, the tool point is passed into the measuring opening of the measuring unit and the coolant delivery switched on. The measuring unit of the MQL-Check 3000 sends the recorded data wireless to the associated display equipment, on which the resulting values are displayed in ml/h. Furthermore, the data interface on the display facility allows the transfer of the data to a PC as an option, making further evaluations and above all the documentation of the measurements possible.

#### Subsequently, the user benefits from:

- simple, quick measuring of the coolant volume directly at the tool point
- ascertaining the actual response time, i.e. the time from starting the system to the coolant exiting at the tool point
- reproduceable and at any time comparable measuring data
- a workshop suitable system, wireless operation - in terms of power supply as well as data transfer
- comparative measuring regarding function of MQL equipment, machine, spindle, tool holder and tool



#### Technical Data

Measuring range:	5 to 60 ml/h
Tool diameter range:	3 to 20 mm
Measuring position:	0 to 90° (vertical and horizontal machining)
Power supply:	battery

#### MQL-Check 3000 consists of:

- measuring unit incl. sender and magnetic base for installation with horizontal machining
- display facility with receiver
- measuring filter for measuring range up to 12 ml/h, up to 30 ml/h and up to 60 ml/h

Data interface and PC software are available as an option.



# GUHRING

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## OUR PRODUCT RANGE:

### 1. DRILLING TOOLS

#### in High Speed Steel and Carbide

Twist drills  
Ratio drills  
Micro-precision drills  
Oil feed drills  
Subland drills  
Centre drills  
Core drills  
Gun drills  
Drilling systems with interchangeable inserts

### 2. THREAD CUTTING TOOLS

#### in High Speed Steel and Carbide

Machine taps and fluteless taps  
Oil feed taps and oil feed fluteless taps  
Hand taps  
Thread milling cutters  
Dies

### 3. MILLING CUTTERS

#### in High Speed Steel and Carbide

Ratio end mills  
Slot drills  
End mills  
Radius profile cutters  
Hard profile cutters  
Diesinking cutters

### 4. REAMING TOOLS

#### in High Speed Steel and Carbide

NC machine chucking reamers  
Machine and machine chucking reamers  
Taper pin reamers  
Hand reamers

### 5. COUNTERSINKING TOOLS

#### in High Speed Steel and Carbide

Countersinks, counterbores and spot facers  
Short counterbores, back spot facers  
De-burring tools

### 6. CUTTING TOOLS

#### in ultra-hard materials

Face milling cutter PF 1000  
Cermet and ceramic tools  
PCD- and PCB-tipped tools

### 7. COATED TOOLS

A-tools, TiAlN-coated  
SuperA-tools, AlTiN-coated  
C-tools, TiCN-coated  
F-tools, FIRE-coated (allround)  
P-tools, AlCrNN-coated  
S-tools, TiN-coated (allround)  
M-tools, MolyGlide-coated

### 8. MODULAR TOOLING SYSTEMS

#### Tooling system GM 300

Tool holders, clamping systems and accessories to ISO 12164, DIN 69893 and DIN 69871 for transfer lines, machining and turning centres

#### Flexible tooling system GE 100

a tooling system for the combined machining operations facing, chamfering, boring, centering etc.

#### ISO indexable inserts, short clamping holders and KV 400 cartridges

### 9. SPECIAL TOOLS

to sketch or drawing, the more complex, the better

### 10. CARBIDES

#### for precision cutting tools

### 11. CARBIDE SPECIAL PARTS

#### for the forming, machining and wear protection industry

Cold heading dies, ribbed rolls, dies, mandrels, drawing dies, gear cutters, etc.

### 12. TOOL RESTORATION SERVICE

Re-grinding, re-coating, tool management

No liability can be accepted for printing errors or technical changes of any kind.  
Our Conditions of Sale and Terms of Payment apply. Available on request.