Holistic solutions for efficient tool logistics

SETTING | MEASURING | DISPENSING

When there's something more between you and us: That's the MAPAL effect.

Aerospace

Automotive

Machine and plant engineering

You

are looking for a technology expert who thinks the way you think?

Partner-ship

We

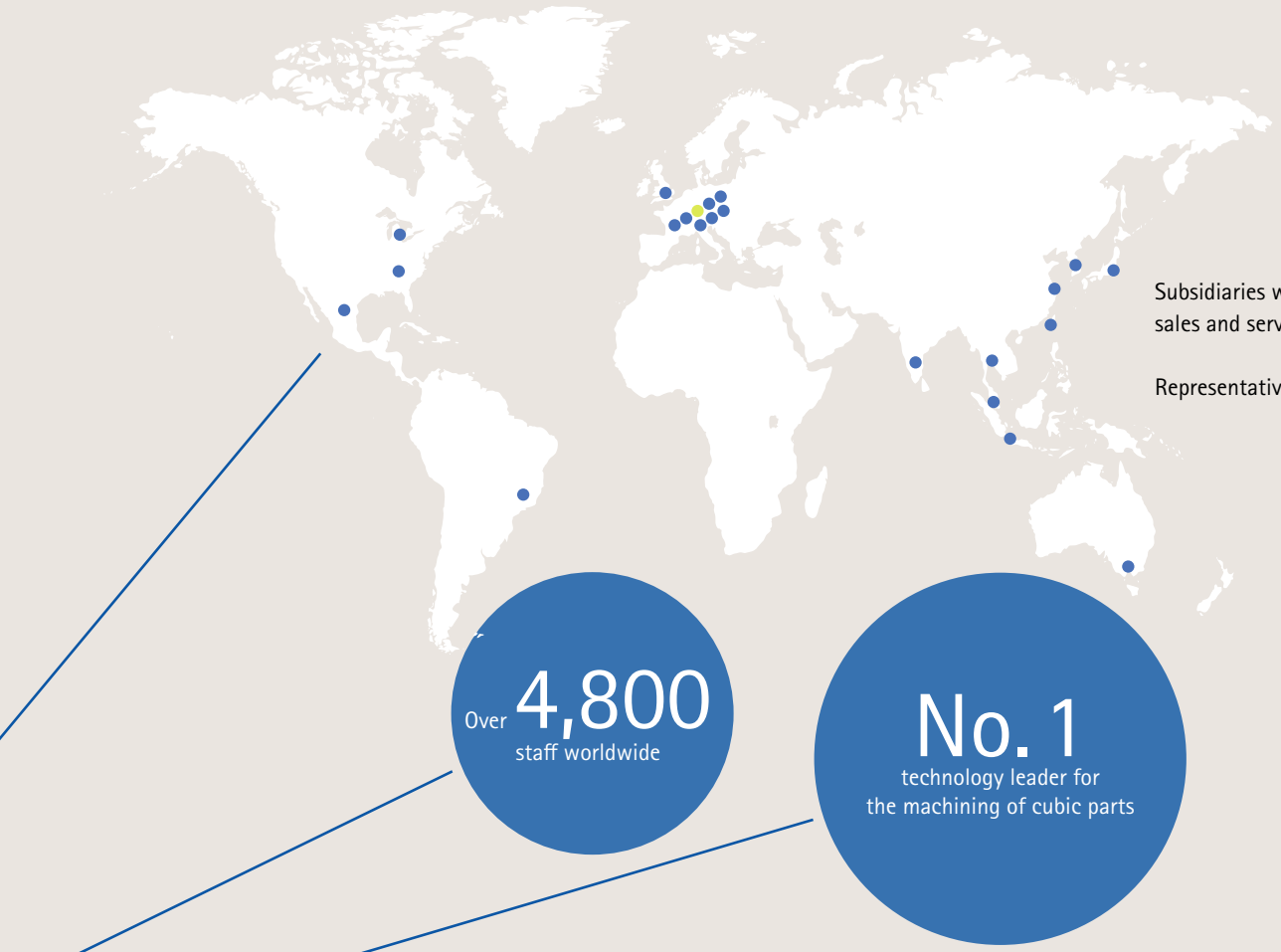
employ all our resources for the solution of your tasks.

Shipbuilding

Rail transport

Power generation

Medical technology



Subsidiaries with production, sales and service in 21 countries

Representatives in 25 countries

Over 4,800
staff worldwide

No. 1
technology leader for the machining of cubic parts

Tool and process solutions combined with comprehensive services

We see ourselves as a technology partner, supporting you with the development of efficient and resource-saving manufacturing processes using standard tools, individual tool concepts and the optimisation of tool details. Our tools satisfy all the requirements on process reliability, precision and simple handling. How? Using advanced development and design methods as well as production using the latest manufacturing facilities.

You do not just need the optimal tool for your task, you are also looking for a partner who takes over the entire planning and management of your process? We are also there for you in this situation. We support you during all production phases and keep your manufacturing at the top level: highly productive, cost-effective and reliable. We also offer you complete networked solutions for all peripheral tasks related to the actual machining process.

Reaming and fine boring

Drilling from the solid, boring and countersinking

Milling

Turning

Actuating

Clamping

Setting, measuring and dispensing

Services

CONTENTS

HISTORY

MAPAL setting fixtures – a success story from the start

MAPAL is the recognised specialist for fine boring using adjustable tools. The exact setting and measurement of these tools is a prerequisite for high part quality. The lack of suitable equipment for setting tools with guide pads led MAPAL to become involved in the development and manufacture of mechanical and electronic setting fixtures over 30 years ago. MAPAL always places very high value on meeting the tightest of tolerances of < 2 µm and on the extraordinary precision and longevity of the devices.

The high precision of the MAPAL setting fixtures is due to the combination of an exact basic mechanical set-up and a tactile measuring method. Among other aspects, measuring errors due to vibration or oscillations are completely eliminated by the solid mechanical construction with a granite slab and the vibration-damped adjustable feet. Errors due to temperature fluctuations are excluded by the usage of high-quality materials.

MAPAL guide pad technology

At that time there were no suitable setting fixtures available for reamers and fine boring tools with guide pads and inserts. To be able to tackle a setting process with high precision, MAPAL decided to develop its own high-quality setting fixtures.

1978

70er

1983

First setting fixture
The centre cradle is the first manual setting fixture from MAPAL for setting tools with guide pads with high-precision.

MN 500
The first electronic setting fixture from MAPAL with the horizontal arrangement of the tool.

1988

MN 510
The first electronic setting fixture from MAPAL with the vertical arrangement of the tool.

1991

MN 520
The vertical setting fixture MN 520 has an additional guide tower for even more stability and accuracy during the setting process.

2016

MN 540
The vertical setting fixture MN 540 is equipped with a solid low-vibration granite slab that benefits precision during the setting process.
A camera system for optical setting is also fitted to this device for the first time.

2009

CNC and optical measuring method
From 2009 the first setting fixtures were equipped with CNC control. In parallel, it is also possible to set tools using an optical measuring method.

2008

Administering and dispensing articles
The first version of the tool dispensing system UNIBASE-M reaches market maturity. The overview and control of all articles in store is simplified intuitively.

2001

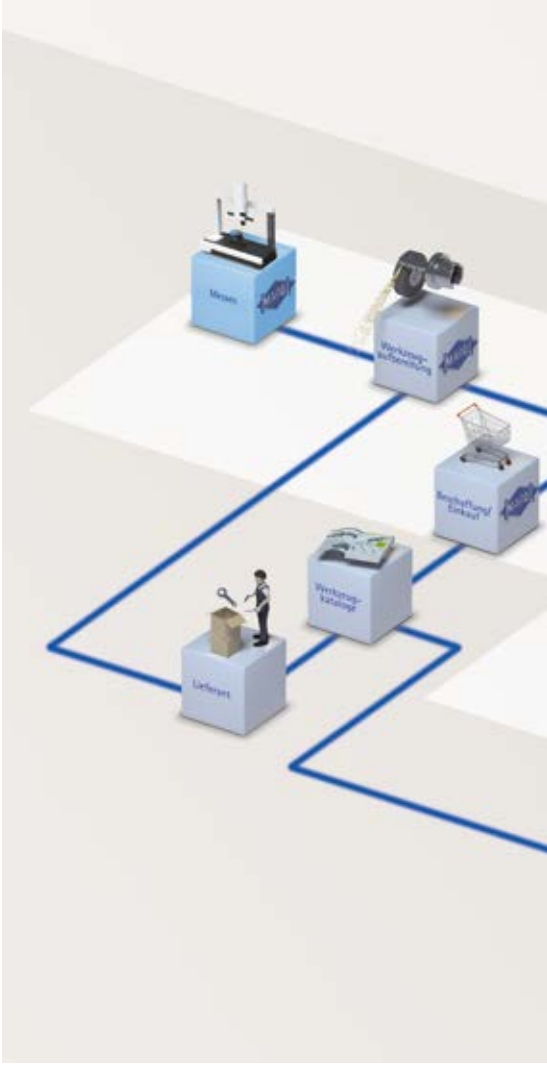
MN 530
Compared to its predecessor in the series, the MN 530 has even larger measuring ranges and a revised measuring unit.

From necessity to strategic business area
With the market launch of MAPAL setting fixtures, it became possible to set tools with guide pads with high precision.

HOLISTIC SOLUTIONS FOR EFFICIENT TOOL LOGISTICS

MAPAL setting room – analysing, conceptualising, implementing

EFFICIENT TOOL LOGISTICS IN THE SETTING ROOM



Holistic solutions for efficient tool logistics

In modern production there are components such as setting fixtures and storage systems for the technical and logistical processing of tools. The crucial factor for efficiency is an appropriate data structure in conjunction with devices that are reliable and intuitive to operate. Holistic solutions are available here with the products and services from MAPAL.

All the essential elements for the setting and logistic area are available for planning the setting room and equipping it with tool management software and hardware components related to setting, measuring and dispensing. These can also form the basis for the implementation of tool management.

Services provided

Analysing

- Data preparation
- Individual process analysis based on the customer environment

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Conceptualising

- Planning
- Turn-key solutions for the setting room including software and hardware

Page 14

Implementing

- Planning and project management
- Installation
- Telephone support and maintenance

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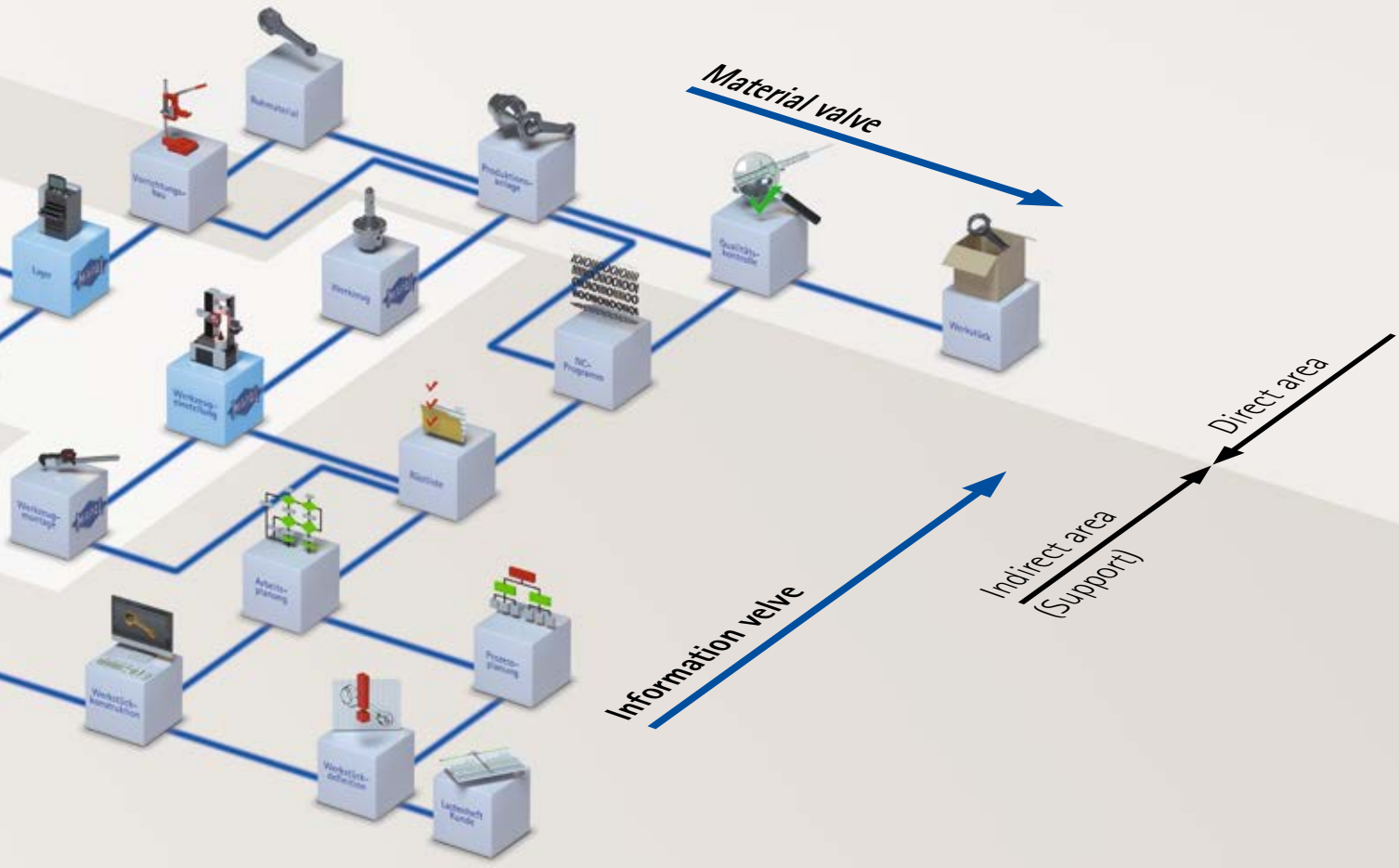

Products

Setting

- Mechanical and electronic setting fixtures
- Setting with µ-precision
- The right setting fixture is available for every tool and every setting requirement

Page 18

Measuring

- Measuring devices for every type of drill, milling cutter or reamer
- Test cycle for tools with minimum quantity lubrication
- Suitable for goods receipt inspection, intermediate inspection in production and final inspection

Page 74

Dispensing

- Flexibly configurable tool dispensing system to suit requirements
- Day-to-day work is optimised by continuous tool availability and an overview of the tools
- Possibility of integrating in existing cabinet system and material management system

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Services

Services

- Customizing
- Installation
- Training
- Maintenance

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ANALYSING

Preparation and analysis of processes and data structures

Tools and, above all, devices for their handling must operate as efficiently as possible and be as easy as possible to operate. Particularly on the usage of setting and measuring devices as well as dispensing systems, the specific process sequence and the data to be processed and forwarded play a very important role. In networked processes the demonstration of the efficient usage of these peripheral products or the identification of potential improvements in efficiency is an important task.

Without comprehensive studies and their documentation, this task can only be tackled to a limited degree.

The MAPAL analysis phase picks up on these thoughts in the form of a service. With the recording and documentation of existing data structures and process structures on-site and in the customer environment, the foundation is laid for a long-term, efficiency-improving solution.

ADVANTAGES

- Self-contained range of services
- Creation of transparency for decision-making
- Independent, neutral assessment

Customer-specific process analysis

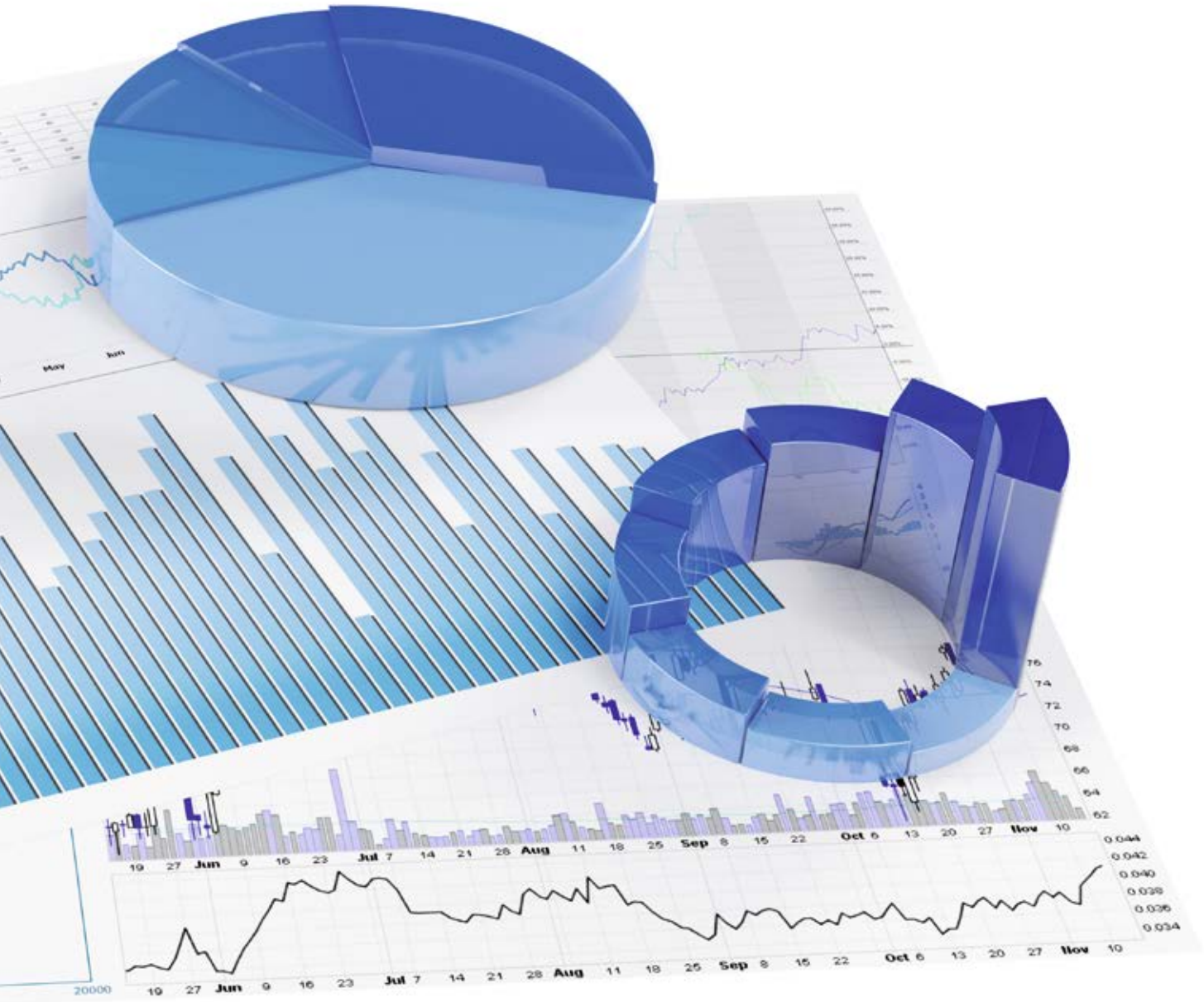
- Acquisition of inventory and movement data
- Checking and documenting process-related data and item flows (for example picking lists, setting data, the handling of re-grinding)

Data preparation

- Preparation of inventory data for transfer to required systems (for example master data, existing setting programs)

Cost-effectiveness assessment

- Cost and benefit analysis in detail
- Software and hardware investment compared to savings in time and costs



CONCEPTUALISING

Efficient equipping of setting and logistic areas

Tools can be handled in various ways in relation to their logistic processing. For this purpose there are centralised setting and storage areas, or also decentralised buffer stores. Here the physical situation plays a major role. The physical and organisational planning has a significant effect on the subsequent efficiency and capability of the tool organisation.

However, it is not only the material planning that is important, but above all the data logistics and the embedding in existing customer systems. Based on MAPAL's analysis phase or already existing analyses, an overall concept can be prepared using the conceptualisation module. This includes a complete functional specification with spatial planning of the logistics area and equipping with tool management software.

ADVANTAGES

- Self-contained range of commercial and technical services
- Transparent quotation preparation
- Embedding in existing systems

Software solutions and embedding in existing systems

- Independence in relation to existing or planned tool management software solutions
- Co-operation with renowned manufacturers for central software solutions, for example:
  - Tool management
  - CAM data management
  - Machine simulation
- Adaptation and preparation of customer-specific software solutions

Customer-specific planning of setting and logistic areas

- Equipping production areas and production-related areas with facilities, setting and storage systems
- Turn-key solutions for complete areas from a single source

IMPLEMENTING

Introduction and implementation of the new solution

The implementation of new logistics concepts and software solutions ties up capacity that is normally used for day-to-day business. The introduction of the overall concept can therefore not be tackled alongside everyday tasks, but instead must be co-ordinated and tackled in steps. For the areas of the organisation affected, there are often permanent changes. Only if demonstrable success is obtained in collaboration with the technical departments affected and with the involvement of the staff can a lasting change be produced.

MAPAL assists the customer with planning, co-ordination and control during the project phase for the implementation. In a defined project framework, staff are available worldwide on-site to support the start-up phase. Also after the completion of the implementation, MAPAL is always available for support and further development on-site.

ADVANTAGES

- External support during long-term change management projects
- Defined project framework both in terms of schedule and commercially

Project planning and project management

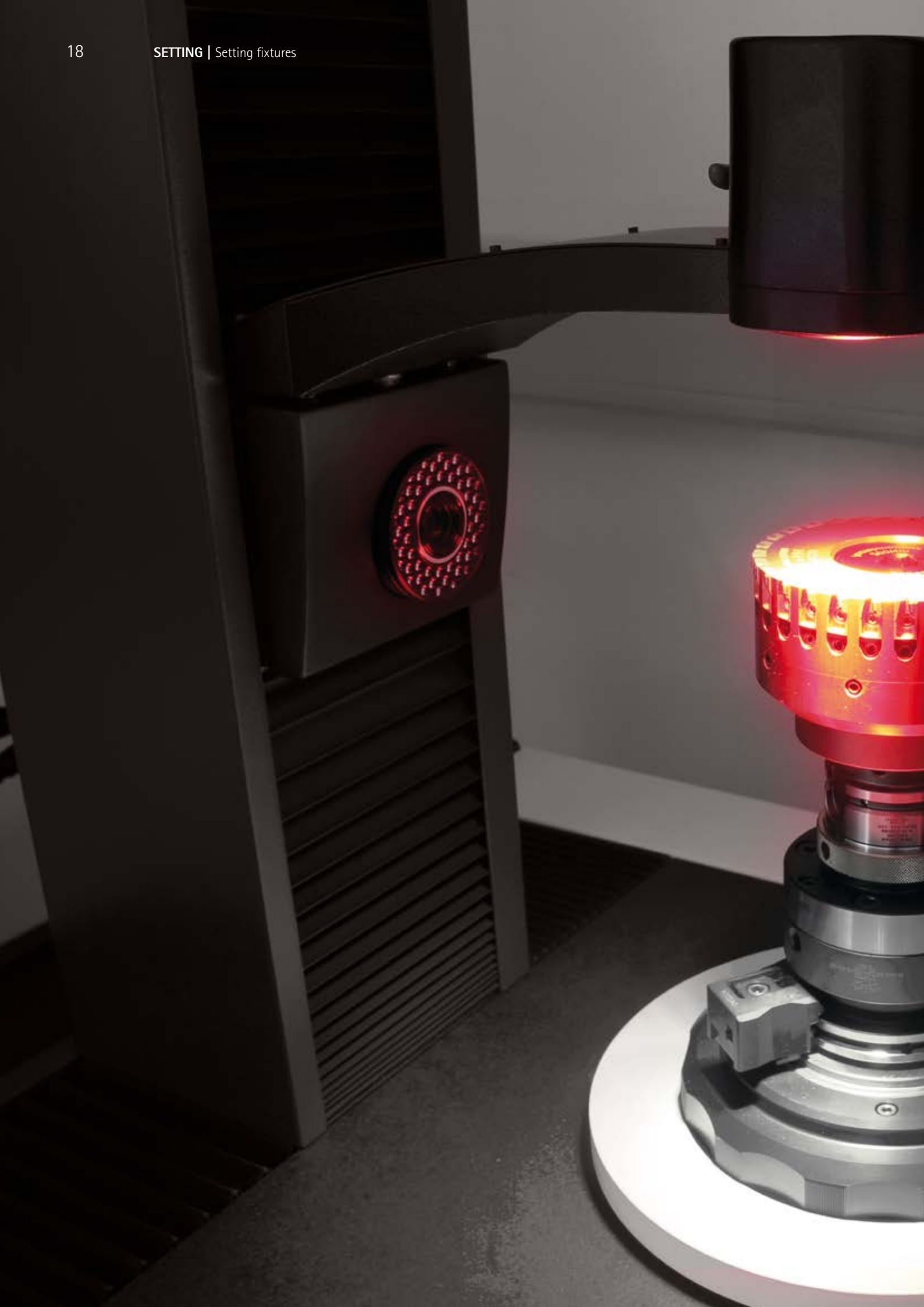
- Schedule planning and monitoring by MAPAL project manager on-site
- Continuous project controlling for successful implementation
- Cost monitoring

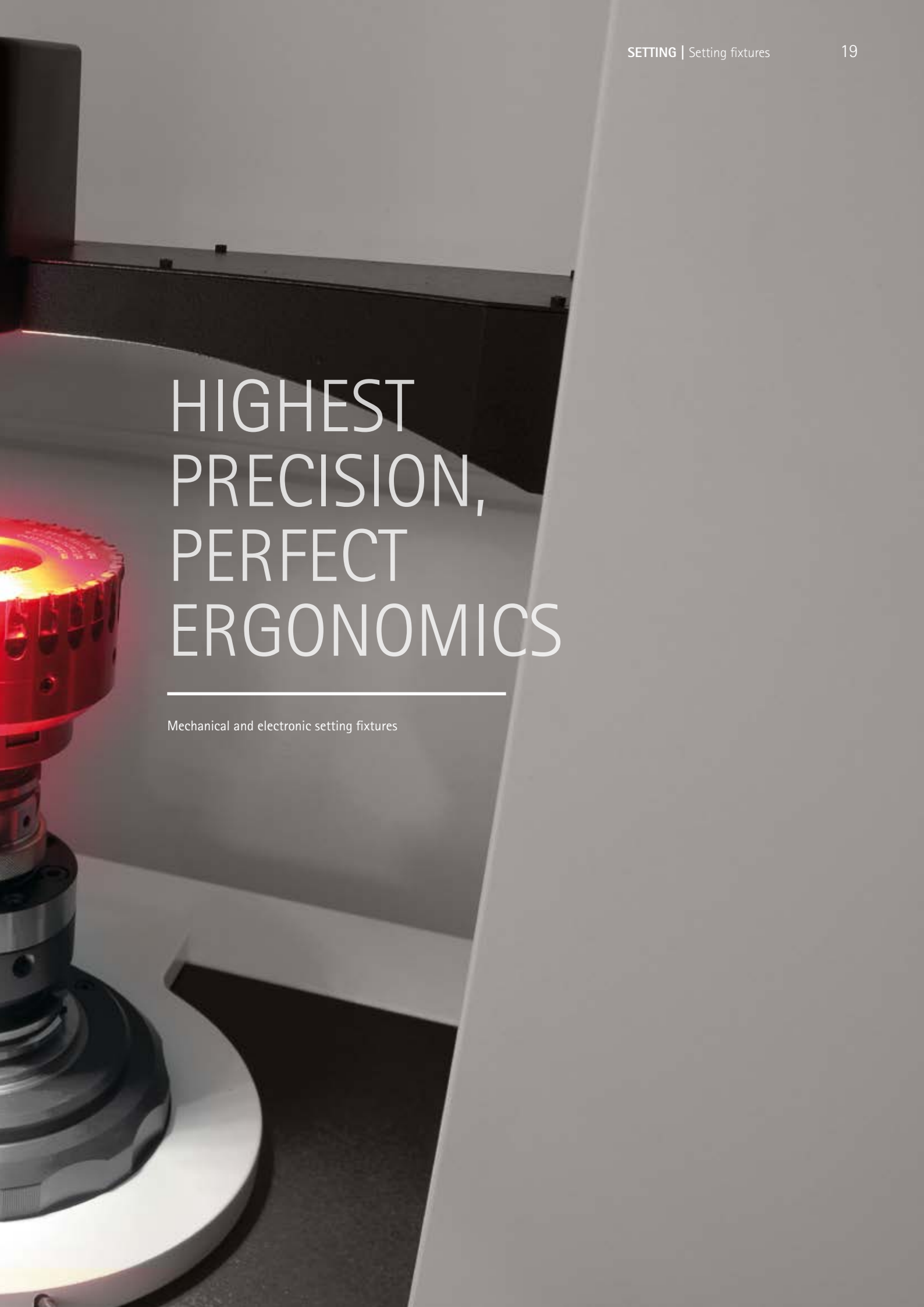
Installation of software and hardware solutions on-site

- System integration at the highest technical level checked in advance
- Commissioning and training packages in national language
- Defined acceptance test certificates to safeguard quality

Telephone support and maintenance worldwide

- Technical support also beyond the project phase
- Regular maintenance and fast service on-site
- Telephone support and remote maintenance





HIGHEST PRECISION, PERFECT ERGONOMICS

Mechanical and electronic setting fixtures

MAPAL SETTING FIXTURES

Reliable setting of the tools through accuracy and ease of use

During the design of tools for complete machining, fine machining tools play a crucial role. As the tools are often used for the last manufacturing step, all tolerance requirements on the part in relation to surface finish, dimensional, contour and positional accuracy must be reliably met. Production on modern high-performance machines requires tools that guarantee these tolerances over a long service life, tolerances that can always be achieved with every tool.

Due to the setting features on the tool, it is possible to address flexibly any special aspects related to the workpiece material or the machine. The exact measurement and setting of these tools is a prerequisite for high process reliability and part quality. These tasks are successfully undertaken using a precise setting fixture. To address as far as possible all requirements, MAPAL offers a broad portfolio of setting fixtures. While the designs of the setting fixtures may vary widely, in one area the setting fixtures are all the same: in their precision.

Mechanical

Caliper gauges

- Manual setting
- Modular system
- Setting custom tools

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MASTERSET

- Manual setting
- Horizontal and vertical tool position
- Suitable for tools with guide pads

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UNISET-V basic

- Manual setting
- Tactile measurement
- Modular system
- Robust design

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Electronic

UNISET-H

- Setting at constant working height
- Electronic measuring sensor
- Optical measurement
- Graphical user interface
- Suitable for long tools with guide pads
- Tool chip for reading and writing measurement values individually

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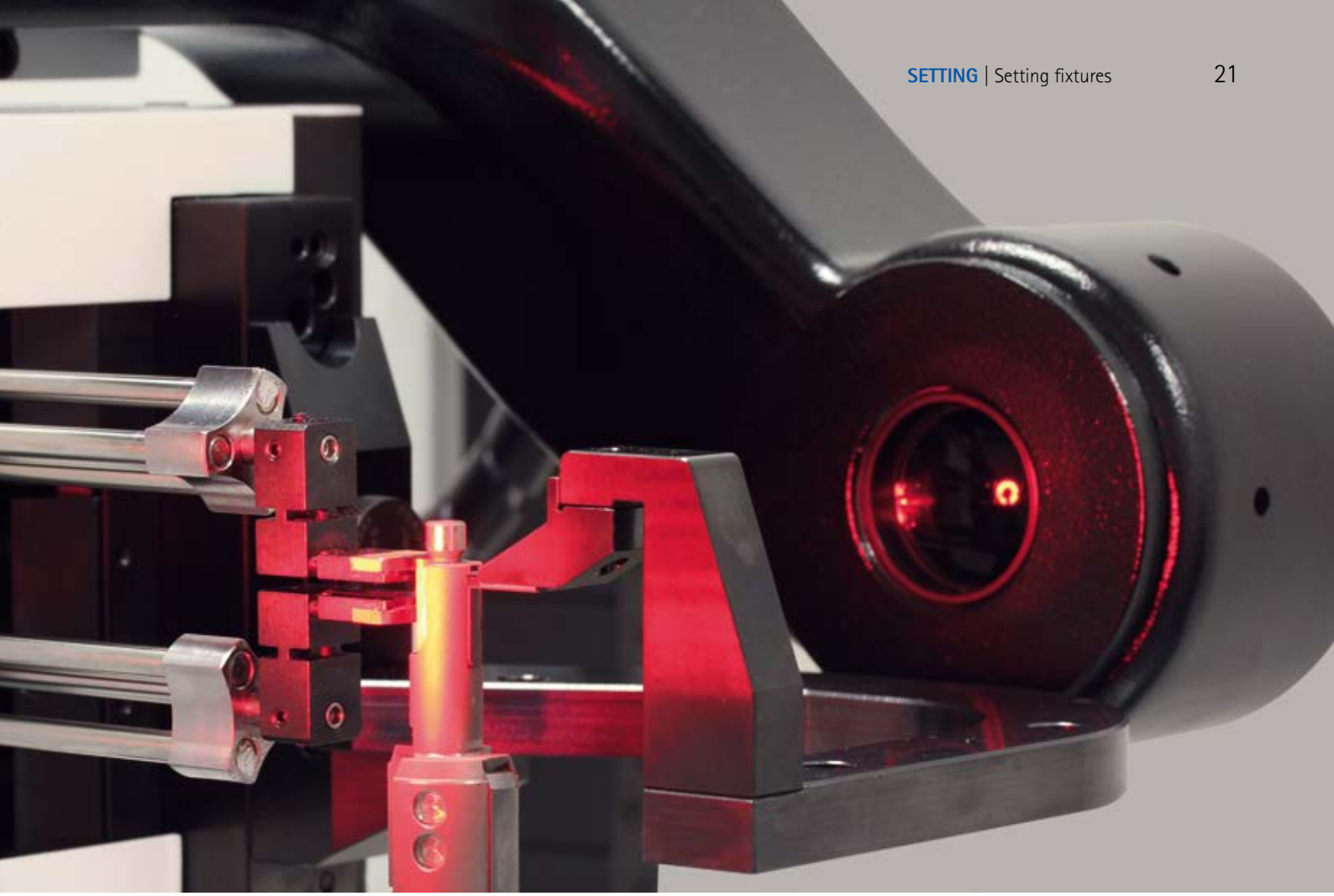

UNISET-V standard

- CNC controller
- Optical or tactile measurement
- Graphical user interface
- Additional light for cutting edge inspection
- Tool management
- Tool chip for reading and writing measurement values individually

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UNISET-V vision

- Universal, automated setting
- CNC controller
- Optical or tactile measurement
- Graphical user interface
- Additional light for cutting edge inspection
- Tool management
- Heel
- Tool chip for reading and writing measurement values individually

Page 54

UNISET-P

- Particularly ergonomic setting
- CNC controller
- Optical measurement
- Graphical user interface
- Additional light for cutting edge inspection
- Suitable for tools up to diameter 500 mm
- Tool chip for reading and writing measurement values individually
- Cross-member for attaching optional second camera system or additional axial measuring sensor

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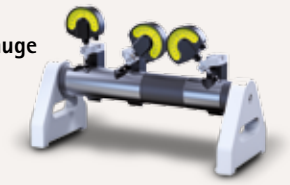
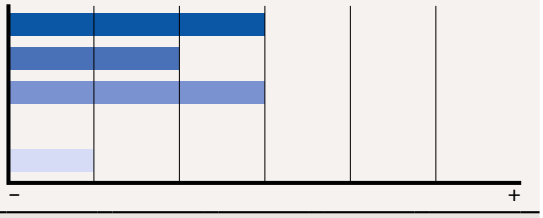
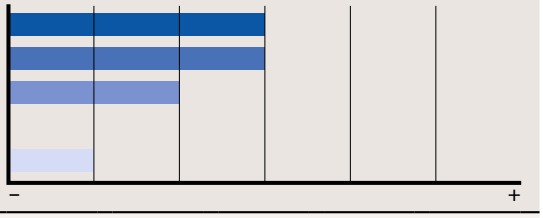
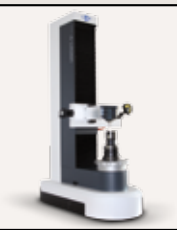
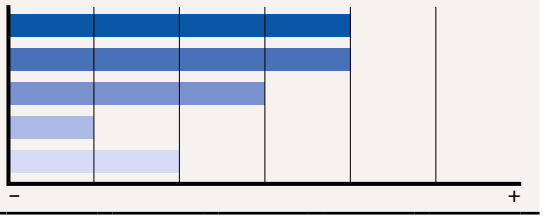
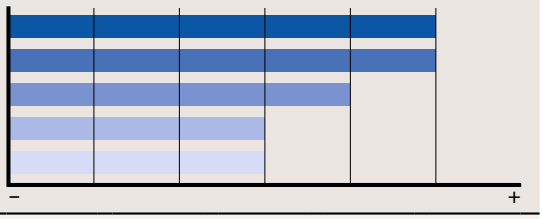
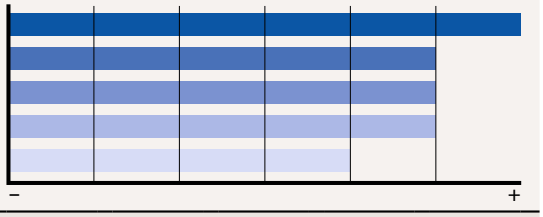
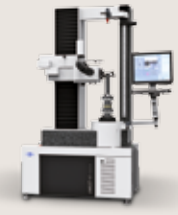
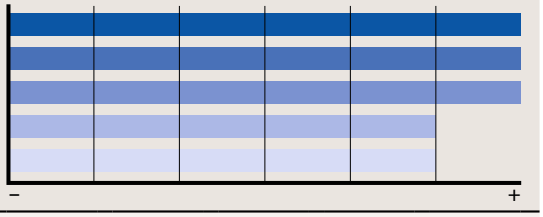
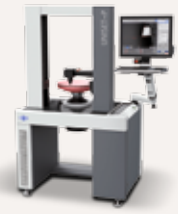
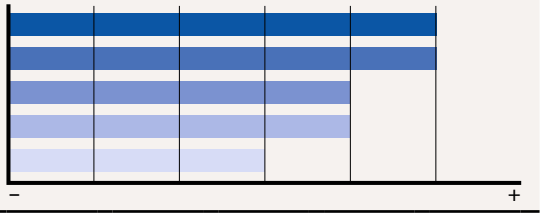
SETTING FIXTURES SELECTION AID

Example tools and parts		
Features machined: - Camshaft bearing bore - Crankshaft bearing bore		- Boring bars
Features machined: - Valve bore - Spool bore - Cylinder bore - Gearbox housing bore		- Guided tools - Valve guide tools
Features machined: - Valve bore - Spool bore - Cylinder bore - Gearbox housing bore - Axle journal		- Guided tools - Valve guide tools - External reamers
Features machined: - Camshaft bearing bore - Crankshaft bearing bore - Cylinder bore		- Slender and long guided tools
Features machined: - Compressor housing rotor bore - Cylinder bore - Face milling/finishing		- Guided tools - Multi-stage fine boring tools - Small to medium-sized face milling cutters - Cylinder boring tool
Features machined: - Gearbox housing transducer bore - Face milling/finishing		- Heavy guided tools - Large multi-stage fine boring tools - Small to medium-sized face milling cutters
Features machined: - Cylinder bore - Roughing and semi-machining - Face milling/finishing - Boring		- Measuring fixed tools (solid carbide/PCD tools) - Small to large face milling cutters - Turning tools

	Possible applications	Setting fixture		Characteristics
				Process reliability/handling · Tool flexibility · Setting · Measuring and inspecting · Investment
MECHANICAL	Setting and re-adjusting on machining centres and special machines	**Caliper gauge** 	MECHANICAL	
MECHANICAL	Setting and correcting close to the machine	**MASTERSET** 	MECHANICAL	
MECHANICAL	Setting and correcting close to the machine	**UNISET-V basic** 	MECHANICAL	
ELECTRONIC	Series production manufacture for engine and gearbox	**UNISET-H** 	ELECTRONIC	
ELECTRONIC	Series production manufacture for engine and gearbox	**UNISET-V standard** 	ELECTRONIC	
ELECTRONIC	Series production manufacture for engine and gearbox	**UNISET-V vision** 	ELECTRONIC	
ELECTRONIC	Manufacturing in general	**UNISET-P** 	ELECTRONIC	


0
10
20
30
40
50

CALIPER GAUGES

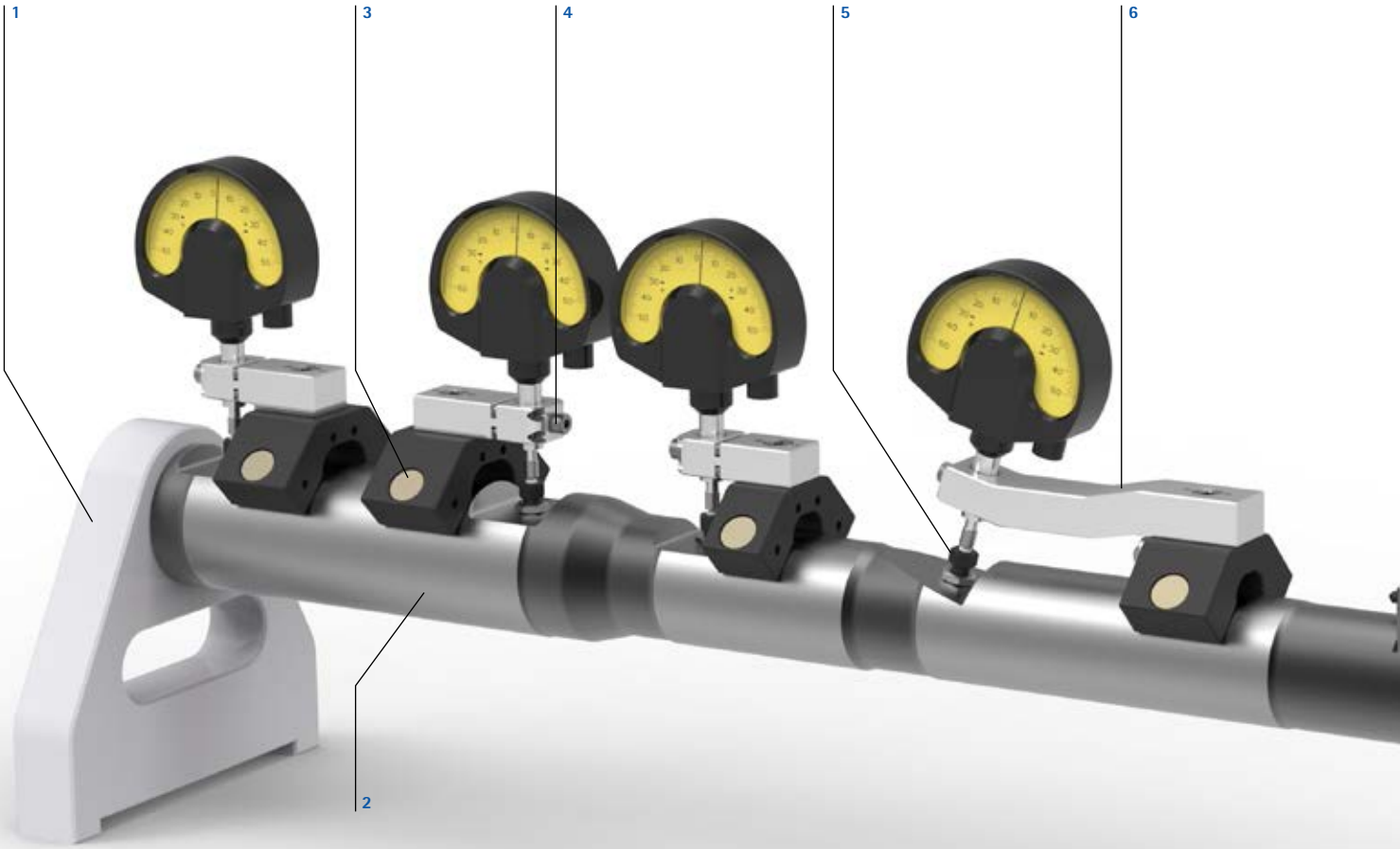
Variable setting of custom tools

It should be possible to set tools as quickly and easily as possible. Above all custom tools, for example line boring bars or cylinder boring tools, take a long time to set if they need to be removed from the machine tool first.

To set the tool precisely without removal and therefore without increased effort and additional down time, caliper gauges in various designs are used. The appropriate caliper gauge for the related application is designed depending on the characteristics of the tool and setting to be made, for example the diameter, length or angle.

Caliper gauges

Technical features of caliper gauges



1 Foot
The master shaft is clamped between the feet.

2 Master shaft
The caliper gauges are stored and set precisely without wear on the hardened, ground master shaft.

3 Adjustable magnets
The caliper gauge can be adjusted so it is easy or difficult to move.

4 Diameter gauge
These standard gauges are used to set the diameter of the cutting edge.

5 Setting pin
The required dimension is set using the setting pin.

6 Chamfer gauge
Chamfer gauges are used for inserts for machining chamfers.

7 Length gauge
Length gauges are used to set inserts axially.

Caliper gauge variants

Differentiation based on tool body

A differentiation is made between magnetic caliper gauges and caliper gauges with an arm for non-magnetic tool bodies. The caliper gauges are attached either from above or from the side. 90° calipers are often used for line boring bars, as it is not possible to fit a caliper gauge.

Magnetic caliper gauge also called standard caliper gauge.

Caliper gauge with arm for heavy metal tools.

Line boring bar with magnetic 90° caliper gauge.

Dial gauges

Dial gauges with reduced measuring force are used for delicate cutting materials such as PCD to prevent chipping of the cutting edges.

Dial gauge with an accuracy of 1/100 mm.

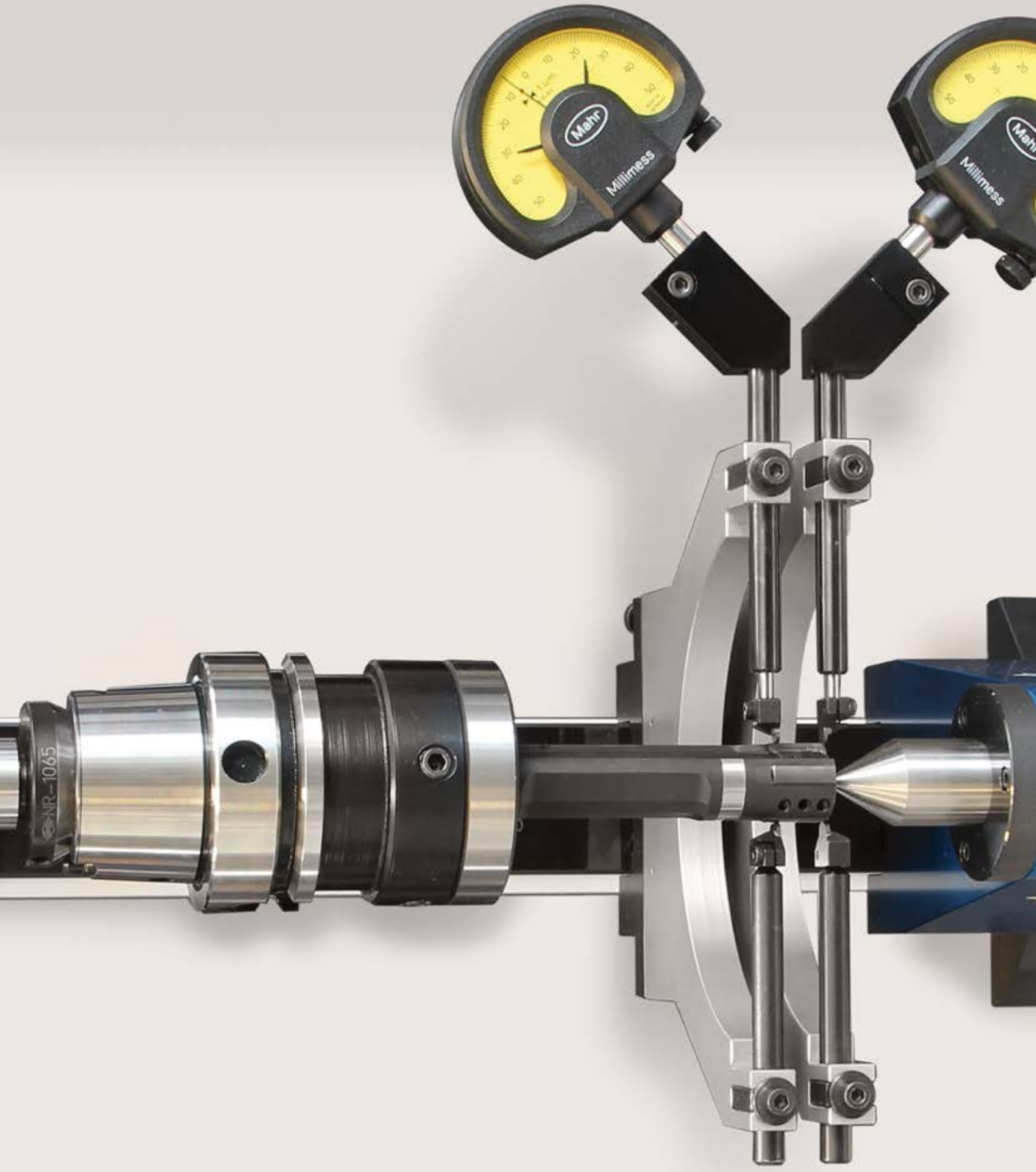
Dial gauge accurate to the µm (1/1000 mm) with reduced measuring force.

FEATURES

- Individual design of every caliper gauge to suit the requirements of the tool
- It is not possible to mix up the caliper gauges, as caliper gauges and caliper gauge positions on the master shaft are clearly marked

ADVANTAGES

- Time saving: tools do not need to be removed from the machine for setting
- Several examples of a tool can be set using one caliper gauge set
- If they are worn, inserts can be re-adjusted using caliper gauges
- Quick setting is possible when changing inserts


Mahr
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Mahr
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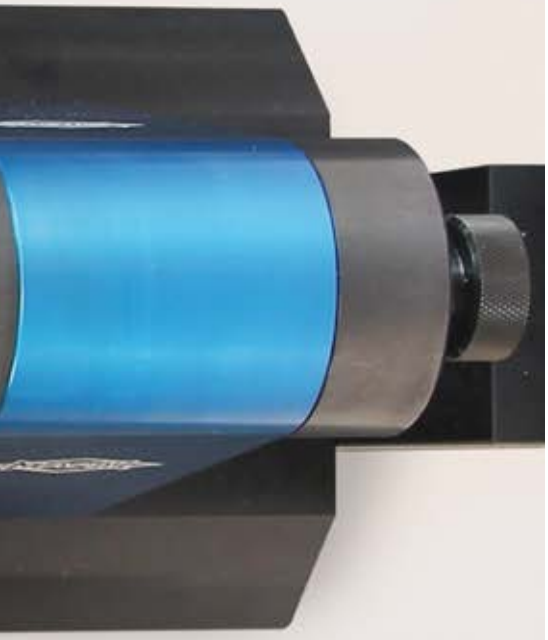


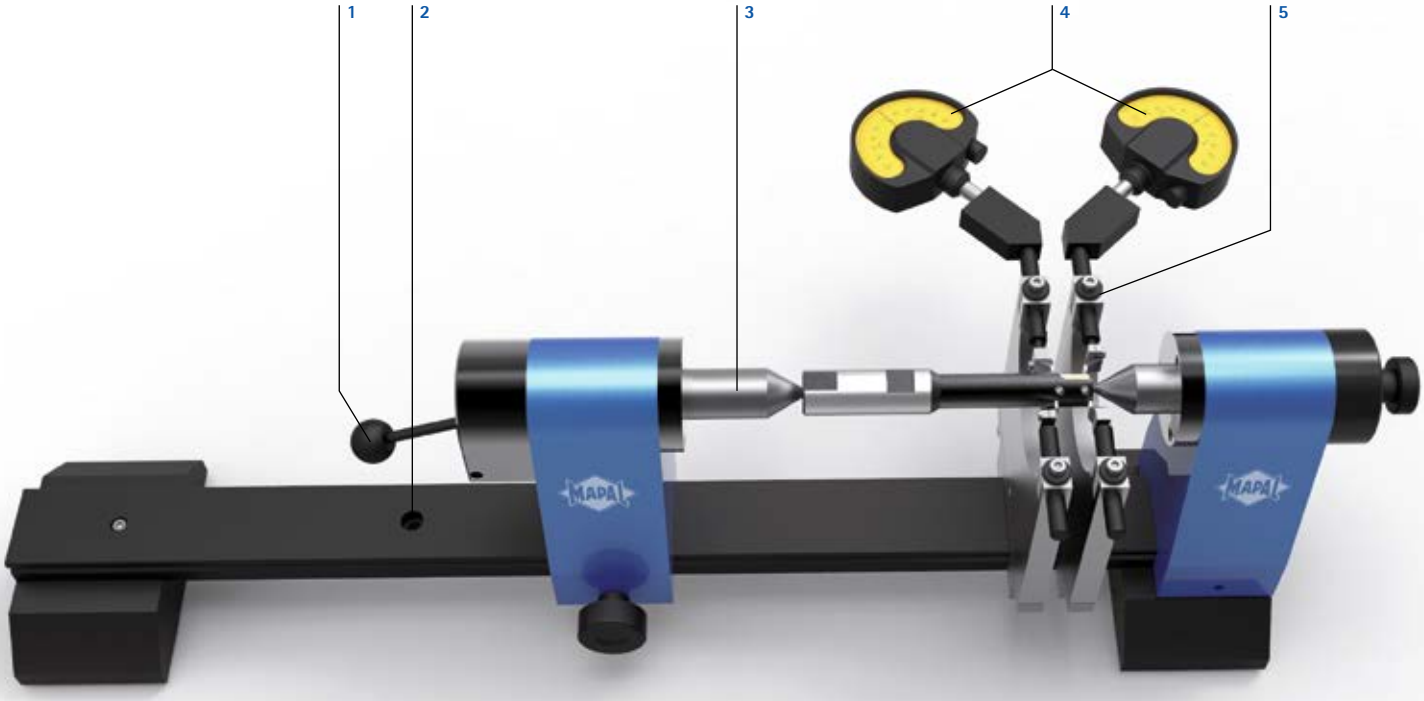
MASTERSET

Manual setting, horizontally or vertically

The MASTERSET is designed for setting tools with guide pads. Due to the modular layout, the basic unit can be equipped with a large number of optional assemblies. In a few steps the MASTERSET can be changed to an upright device in a vertical stand. The advantages are then in the fitting of heavy, long tools as well as in the possibility of clamping tools directly in the HSK adapter.

MASTERSET

Technical features MASTERSET



1 Hand lever retraction
Easy clamping of the tools using hand lever retraction of the sleeve.

2 Fastening screw for vertical stand
If set up vertically, the MASTERSET is connected to the vertical stand using the fastening screw.

3 Sleeve
Sleeve for replaceable elements for mounting different centre points, for example for HSK shanks.

4 Double measuring position
Fast axial positioning of the measuring position on multi-stage tools with identical indexable inserts.

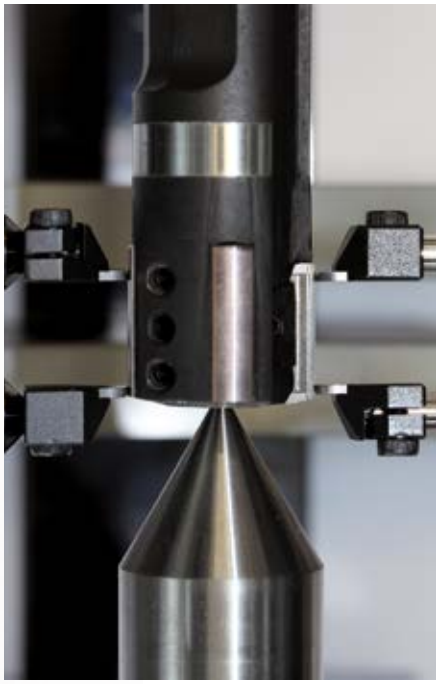
5 Lockable swinging lever
The lockable swinging lever is suitable for the "caliper gauge" and "protrusion" measuring principle.

Vertical stand for MASTERSET

For long or heavy tools with guide pads, the MASTERSET is changed from the horizontal position to the vertical position. The horizontal variant can be changed to the vertical stand with only a few steps. The vertical stand supports the MASTERSET stably, without vibration, and ensures precise setting of the tools.

Detailed view of swinging lever measurement

The measuring sensors are against the cutting edge and the opposing guide pad.



FEATURES

- Tool weight up to 7 kg (horizontally arranged)
- Tool weight up to 15 kg (with vertical stand)
- Measuring lengths up to max. 750 mm
- Diameter up to 200 mm with protrusion measurement
- Diameter up to 150 mm with swinging lever measurement
- Mounting between centres (customer-specific elements possible)
- Rotating centre point for setting heavy tools easily (see accessories)

ADVANTAGES

- Easy clamping of the tools using hand lever and withdrawal of the sleeve
- Lockable swinging lever for "caliper gauge" and "protrusion" measuring principle
- Vertical stand compatible with all MASTERSET variants
- Double measuring position – fast axial positioning of the measuring position on multi-step tools with adjustable inserts
- MASTERSET variant with sleeve for replaceable elements for mounting different centre points, for example for HSK shanks
- Fine axial adjustment for setting the highest axial cutting point

MASTERSET configuration

Procedure during configuration

1 Tool length

The length of the tool defines the clamping length.

Clamping length variants:

MS250
(0-250 mm)

MS350
(0-350 mm)

MS550
(0-550 mm)

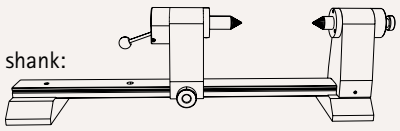
MS750
(0-750 mm)

2 Tool connection

The tool connection defines the device design.

Device design variants:

-1
For tools with cylindrical shank:
two centre points



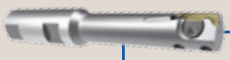
-2
For large tools with HSK shank:
one sleeve and one
centre point

Selection of centre insert:
- HSK32/40, 50/63, 80/100, 125
- Pointed ø 25 mm, ø 40 mm

Configuration example

Step 1

Tool length



Tool data:

- Tool length: 250 mm
- Connection with cylindrical shank
- Tool with opposed guide pad (swinging lever measurement)
- Diameter = 20 mm

MS250
(0-250 mm)

MS350
(0-350 mm)

MS550
(0-550 mm)

MS750
(0-750 mm)

Step 2

Tool with cylindrical shank or HSK shank

-1

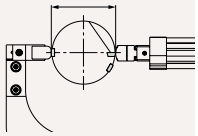
-2

3 Measuring method

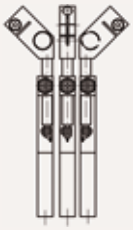
The position of the guide pad on the tool defines the measuring method. Dial gauges and setting gauge must be ordered separately.

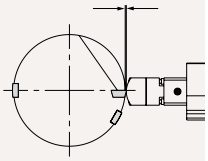
MN347
Swinging lever:
For tools with guide pad opposite the insert.

Measuring example:

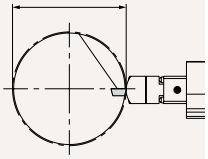


MN348
Taper reamers:
For tools with guide pads opposite or behind the insert. For more than three adjustments, a measuring arm and dial gauge must be ordered for each additional adjustment.





MN349
Protrusion:
For tools with guide pad in any position.



4 Tool diameter

The size of the tool diameter defines the diameter range.

Diameter range variants:

-0
(0-55 mm)

-1
(55-110 mm)

-2
(0-110 mm)

-3
(15-150 mm)

Step 3

Measuring method

- **MN347** Swinging lever
- **MN348** Taper reamer
- **MN349** Protrusion

Step 4

Tool diameter

- **-0** (0-55 mm)
- **-1** (55-110 mm)
- **-2** (0-110 mm)
- **-3** (15-150 mm)

Specification:
MS250-1/MN347-0

MASTERSET accessories

Measuring arms

Measuring position

Diameter	Measuring arm position	Order No.
0 - 55 mm	Centred	MN347-0M-01
0 - 55 mm	Right	MN347-0R-02
0 - 55 mm	Left	MN347-0L-02
55 - 110 mm	Centred	MN347-1M-01
55 - 110 mm	Right	MN347-1R-02
55 - 110 mm	Left	MN347-1L-02
0 - 110 mm	Centred	MN347-2M-01
0 - 110 mm	Right	MN347-2R-02
0 - 110 mm	Left	MN347-2L-02
10 - 150 mm	Centred	MN347-3M-01
10 - 150 mm	Right	MN347-3R-02
10 - 150 mm	Left	MN347-3L-02

Double measuring arms

Diameter	Order No.
0 - 55 mm	MN349-0D
55 - 110 mm	MN349-1D
0 - 110 mm	MN349-2D
10 - 150 mm	MN349-3D
For HX128 0 - 110 mm	MN349-2D-HX128
For HX138 0 - 110 mm	MN349-2D-HX138

Fixed measuring position

Diameter	Measuring arm position	Order No.
0 - 55 mm	Centred	MN349-0M-01
0 - 55 mm	Right	MN349-0R-02
0 - 55 mm	Left	MN349-0L-02
55 - 110 mm	Centred	MN349-1M-01
55 - 110 mm	Right	MN349-1R-02
55 - 110 mm	Left	MN349-1L-02
0 - 110 mm	Centred	MN349-2M-01
0 - 110 mm	Right	MN349-2R-02
0 - 110 mm	Left	MN349-2L-02
10 - 150 mm	Centred	MN349-3M-01
10 - 150 mm	Right	MN349-3R-02
10 - 150 mm	Left	MN349-3L-02

Angle

Diameter	Angle position	Order No.
0 - 110 mm	Left	NR-1192-1
0 - 110 mm	Centred	NR-1192-2
0 - 110 mm	Right	NR-1192-3

Clock holder

	With 30°	With 45°	With 60°	With 90°
Variant	Order No.	Order No.	Order No.	Order No.
Right 15 mm	30018339	30018369	30018375	30018385
Right 25 mm	30018360	30018370	30018376	30018386
Right 50 mm	30018361	10024882	30018377	30018387
Right 75 mm	30018362	10024884	30018378	30018388
Right 100 mm	30018363	30018371	30018379	30018389
Left 15 mm	30018364	30018372	30018380	30018390
Left 25 mm	30018365	30018373	30018381	30018391
Left 50 mm	30018366	10024890	30018382	30018392
Left 75 mm	30018367	10024891	30018383	30018393
Left 100 mm	30018368	30018374	30018384	30018394

Sleeves

Variant	Order No.
Centre point	K12449-013
Sleeve for inserts	K12450-033
Fine adjustment centre cradle	K12449-003
Lever clamping centre cradle	K12450-003
Centre cradle with lever clamping	K12448-003L
Centre cradle with fine adjustment	K12448-003R

Face insert measuring point

Variant	Order No.
1 measuring position T-slot rail 100 mm	K13761-003-1
1 measuring position T-slot rail 150 mm	K13761-003-2
1 measuring position T-slot rail 200 mm	K13761-003-3
2 measuring positions T-slot rail 100 mm	K13762-003-1
2 measuring positions T-slot rail 150 mm	K13762-003-2
2 measuring positions T-slot rail 200 mm	K13762-003-3

Measuring shoes

Variant	Order No.
Centred	NR-1151
Centred, carbide 2 mm wide	NR-1151-1
2.5 mm offset	NR-1161
2.5 mm offset, carbide 2 mm wide	NR-1161-1
7.5 mm offset	NR-1164
7.5 mm offset, carbide 2 mm wide	NR-1164-1
5 mm offset	NR-1165
5 mm offset, carbide 2 mm wide	NR-1165-1
10 mm offset	NR-1166
10 mm offset, carbide 2 mm wide	NR-1166-1
15 mm offset	NR-1167
15 mm offset, carbide 2 mm wide	NR-1167-1
20 mm offset	NR-1168

Dial gauges

Dial gauges for	Order No.
Carbide	NR-1181
PCD, PcBN	10102791

Centre point inserts

Centre insert for	Order No.
HSK32 / 40	NR-1064
HSK50 / 63	NR-1065
HSK80 / 100	NR-1066
HSK125	NR-1067
D25 / carbide point	K2140-24
D40 / steel point	K2140-34
HSK50 / 63 carbide version	30622623

Clamps

Variant	Order No.
Short design 50 mm	NR-1121
Long design 80 mm	NR-1122
Long design 100 mm	NR-1123

Linear tracks

Measuring length	Order No.
250 mm	K12448-073
350 mm	K12448-083
550 mm	K12448-093
750 mm	K12448-103

Vertical stand

	Order No.
Vertical stand	K13757-001

UNISET-V basic

Compact construction and robust design

The UNISET-V basic makes possible the tactile setting and measurement of tools. Due to the vertical design and the sturdy mechanical basic set-up, long and heavy tools can be easily set with µ precision. A high-precision SK50 spindle and the matched linear tracks guarantee a radial run-out accuracy of ≤ 5 µm with a projection length of 300 mm. Thanks to the modular construction it is possible to configure a suitable setting fixture for almost every application.

The robust design and the usage of high-quality components permit use directly in the workshop. The compact construction also permits comfortable working even when seated. Tactile absolute measurements, protrusion measurements and also swinging lever measurements can be undertaken on one device variant with the large selection of different measuring sensors. Using the quick-change system, measuring positions can be changed or the fixture can be set up for external machining tools quickly and easily.

UNISET-V basic

Technical features
UNISET-V basic

1 Vertical main tower
The vertical main tower is equipped with a high-precision linear roller guide that is protected by a bellows cover.

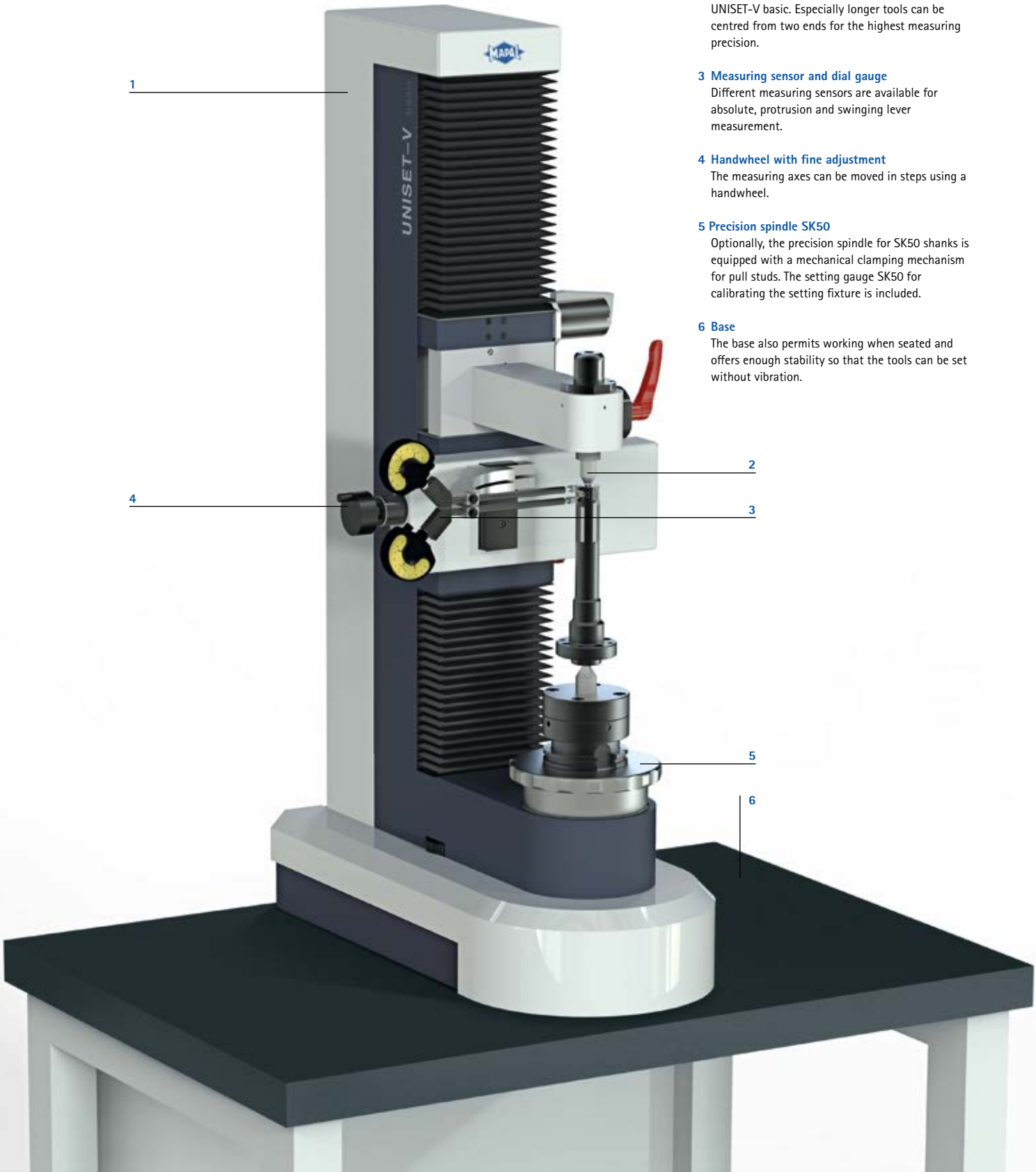
2 Heel
Optionally, a heel can be used on the tactile UNISET-V basic. Especially longer tools can be centred from two ends for the highest measuring precision.

3 Measuring sensor and dial gauge
Different measuring sensors are available for absolute, protrusion and swinging lever measurement.

4 Handwheel with fine adjustment
The measuring axes can be moved in steps using a handwheel.

5 Precision spindle SK50
Optionally, the precision spindle for SK50 shanks is equipped with a mechanical clamping mechanism for pull studs. The setting gauge SK50 for calibrating the setting fixture is included.

6 Base
The base also permits working when seated and offers enough stability so that the tools can be set without vibration.



Application example

Tactile setting

A multi-stepped guided fine boring tool is set using the measuring sensors and dial gauges on the UNISET-V basic by means of protrusion measurement.

1 The tool is clamped between mounting spindle and heel. The measuring sensors are placed against the guide pad and the dial gauges zeroed. Then the insert is placed in position and a search made for the highest diameter point.

2 The protrusion of the insert in relation to the guide pad and the back taper on the insert are set with µ-precision. The tolerance range on the protrusion is checked and set using the dial gauges.

Tactile setting – external reamer

A tool for external machining is set on the UNISET-V basic using an optional additional measuring sensor. The additional measuring sensor is integrated in a few steps.

1 The additional measuring sensor is positioned axially against the guide pad on the external machining tool. The dial gauge is zeroed. Then the spindle with the tool is rotated until the insert is in position.

2 A search is made for the highest diameter point on the insert. Now the protrusion of the insert in relation to the guide pad and the back taper on the insert can be set with µ-precision. The tolerance range on the protrusion is checked and set using the dial gauge.

FEATURES

- Tool weight up to 50 kg
- Tools up to diameter 400 mm and length 700 mm can be set
- Setting precision < 2 µm
- Radial run-out accuracy ≤ 5 µm
- Accuracy of repetition 2 µm
- Manual tool clamping on base or using adapter
- Footprint maximum 600 x 300 mm
- Arm diameter 250 mm or 400 mm

ADVANTAGES

- Tactile absolute measurement, protrusion measurement and swinging lever measurement using various measuring arms and measuring sensors
- Quick-change system for time-saving, straightforward interchange of the measuring positions
- Optional heel for measurements on long tools between centres
- Space-saving due to compact design
- Possible to work seated

Options for individual configuration

Base

- The robust base provides the necessary stability and is optimally designed for the UNISET-V basic and for working seated.

Mounting point

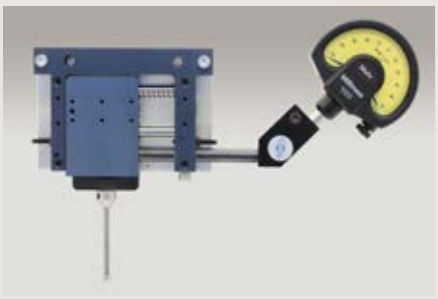
- The mounting point is the economical alternative to spindle mounting. Particularly suitable for short tools and tools with a small diameter.

Heel

- The heel centres the tool and is particularly suitable for long, heavy tools.

Additional measuring sensor

- For external machining tools an additional measuring sensor can be integrated quickly and easily.



UNISET-V basic accessories

Measuring arms
Swinging levers

Diameter	Measuring arm position	Order No.
0 - 280 mm	Left	MN349-4L-02
0 - 280 mm	Right	MN349-4R-02
0 - 400 mm	Double measuring position	30636689

Additional measuring point for external machining tools

	Order No.
Additional measuring point	30591960

Face inserts

Variant	Order No.
1 measuring position T-slot rail 100 mm	K13761-003-1
1 measuring position T-slot rail 150 mm	K13761-003-2
1 measuring position T-slot rail 200 mm	K13761-003-3
2 measuring positions T-slot rail 100 mm	K13762-003-1
2 measuring positions T-slot rail 150 mm	K13762-003-2
2 measuring positions T-slot rail 200 mm	K13762-003-3

Measuring shoes

Variant	Order No.
Centred	NR-1151
Centred, carbide 2 mm wide	NR-1151-1
2.5 mm offset	NR-1161
2.5 mm offset, carbide 2 mm wide	NR-1161-1
7.5 mm offset	NR-1164
7.5 mm offset, carbide 2 mm wide	NR-1164-1
5 mm offset	NR-1165
5 mm offset, carbide 2 mm wide	NR-1165-1
10 mm offset	NR-1166
10 mm offset, carbide 2 mm wide	NR-1166-1
15 mm offset	NR-1167
15 mm offset, carbide 2 mm wide	NR-1167-1
20 mm offset	NR-1168

Centre point holder and centre point inserts
Centre point holder is required for centre point inserts.

Centre point holder	K3033-34
Centre insert for	Order No.
HSK32 / 40	NR-1064
HSK50 / 63	NR-1065
HSK80 / 100	NR-1066
HSK125	NR-1067
D25 / carbide point	K2140-24
D40 / steel point	K2140-34
HSK50 / 63 carbide version	30622623

Clock holder

	With 30°	With 45°	With 60°	With 90°
Variant	Order No.	Order No.	Order No.	Order No.
Right 15 mm	30018369	30018375	30018385	30018339
Right 25 mm	30018370	30018376	30018386	30018360
Right 50 mm	10024882	30018377	30018387	30018361
Right 75 mm	10024884	30018378	30018388	30018362
Right 100 mm	30018371	30018379	30018389	30018363
Left 15 mm	30018372	30018380	30018390	30018364
Left 25 mm	30018373	30018381	30018391	30018365
Left 50 mm	10024890	30018382	30018392	30018366
Left 75 mm	10024891	30018383	30018393	30018367
Left 100 mm	30018374	30018384	30018394	30018368

Dial gauges

Dial gauges for	Order No.
Carbide	NR-1181
PCD, PcBN	10102791


B
A

UNISET-H

Optimal setting in horizontal direction

The electronic setting fixture UNISET-H has a horizontal layout. In this way ergonomic setting processes are possible at a constant working height. Both slender and long guided tools are particularly suitable for a setting process using the UNISET-H. Along with the tactile method for setting tools with high precision, optical setting using an optional camera is also possible. With this expansion it is also possible to undertake cutting edge inspections quickly and straightforwardly.

UNISET-H

Technical features UNISET-H

1 Software
The MAPAL software permits menu-based measuring and setting including database function. Operation is very easy by means of optional touchscreen operation on the 19" TFT flat screen monitor. If Internet access is allowed, it is possible to undertake remote maintenance.

2 Precision spindle SK50
The precision spindle with roller bearings for SK50 shanks is equipped with a pneumatic clamping mechanism for pull studs. The setting gauge SK50 for calibrating the setting fixture is included.

3 Optional camera
Using the optional camera the tool can also be set optically or the camera can be used for insert inspection.

4 Measuring sensors
The measuring sensors make it possible to set with µ precision and, due to measuring forces ≤ 150 mN, are also highly suitable for PCD-tipped inserts.

5 Heel
The tool is clamped between the spindle and the heel. The heel can be moved along the axis and as such can be flexibly adjusted to the tool length.

6 Base
The optional base is optimally adapted to the size of the UNISET-H and supports low-vibration setting. Accessories and tools can be housed in the integrated tool cabinet.

Application example

Tactile setting

A guided fine boring tool for machining the camshaft bearing way in cylinder heads is set with µ-precision using the measuring sensors on the UNISET-H by means of protrusion measurement.

1 The tool is clamped between the spindle with HSK adapter and a heel. The heel is moved along the axis and adjusted to the length of the tool.

2 The measuring sensors A and B move separately and automatically against the guide pad when the related button is pressed on the control panel. Here the measuring sensor spacing can be adjusted flexibly and continuously to the insert to be measured. The measuring range is then zeroed at this position.

3 The insert is placed in position and a search made for the highest diameter point on the insert. The operator sets the protrusion of the insert in relation to the guide pad and the back taper on the insert with µ-precision. During this process the operator always has the actual value for the protrusion in view, live on the display.

FEATURES

- Economical entry-level variants for setting guided tools in particular
- Tools up to diameter 190 mm and length 600 or rather 900 mm can be set
- Precision spindle with roller bearings
- Spindle with SK50 and heel (optional HSK adapter)
- Continuously adjustable measuring sensor spacing from 4-20 mm
- Measuring sensors have collision protection system
- Optional measuring method with swinging lever
- Accuracy of repetition 2 µm

ADVANTAGES

- Tool insert is always at one level
- Constant working height for optimal ease of use
- Guide slides for fast, finely adjustable positioning of the measuring units in the axial and radial direction with pneumatic clamping
- Optional camera system for purely optical measurement of tools and insert inspection

Options for individual configuration

Base

- The base is optimally designed for the UNISET-H and provides the necessary stability.
- A small tool cabinet is integrated.

Custom spindle

- Spindle with HSK connection and pneumatic clamping.
- Precision spindle SK50 is replaced with HSK spindle.
- Including setting gauge HSK for calibrating the setting fixture:
  - HSK63
  - HSK100

Optical measuring method

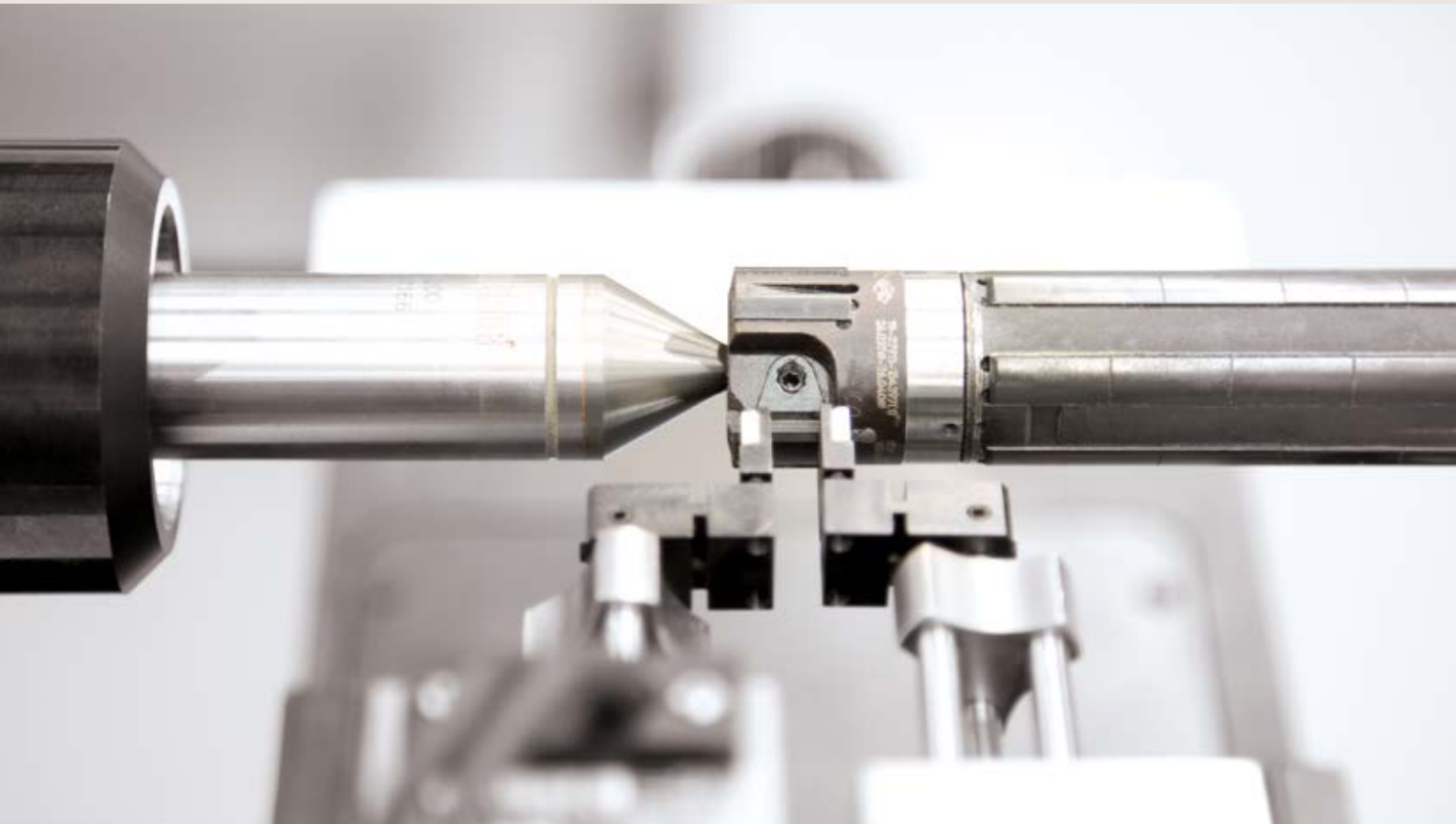
- Image processing system on bracket comprising of electronic measuring equipment and PC system.
- Regulated transmitted light for insert inspection.

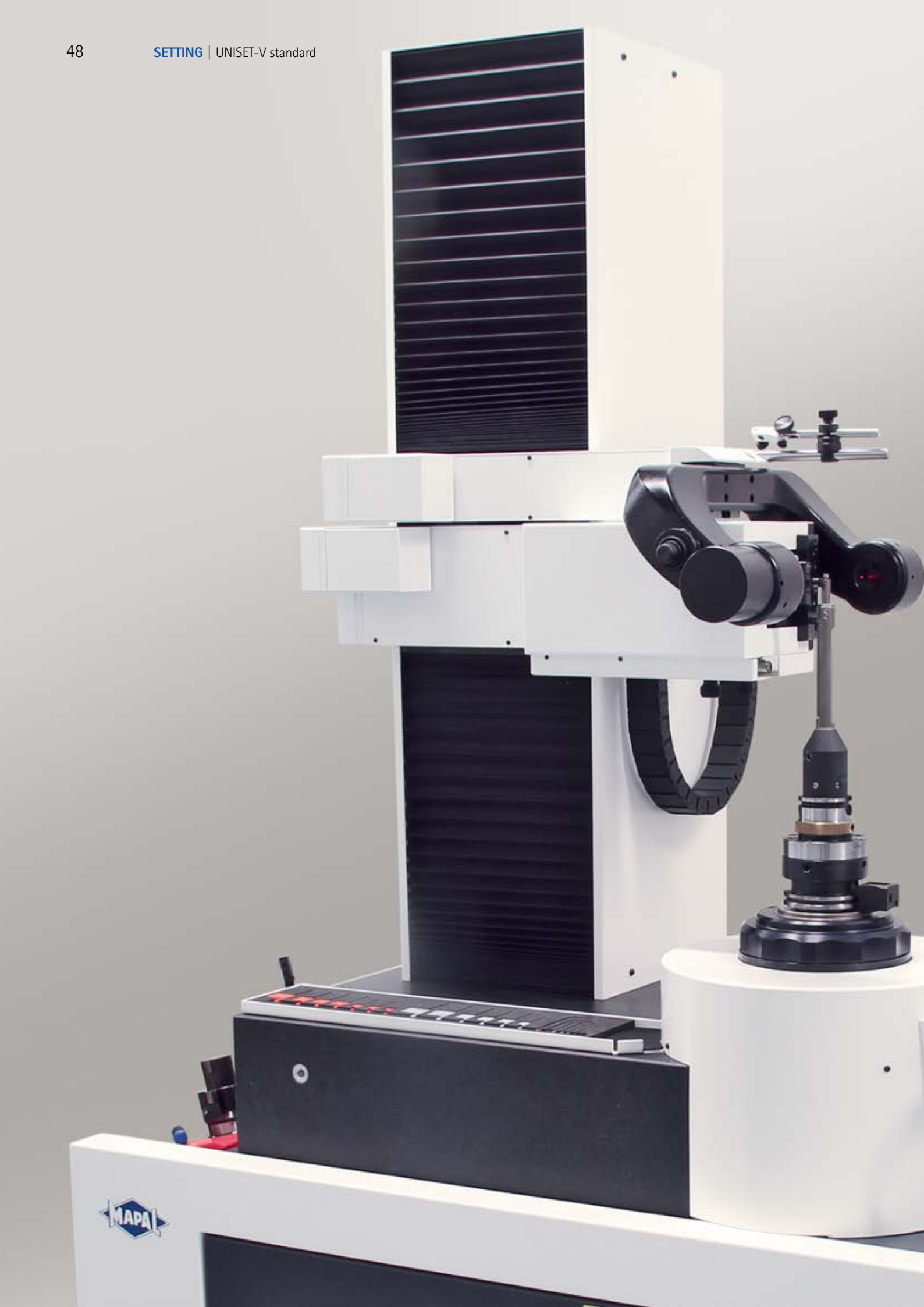
Balluff tool identification system

- Tool identification software for reading the actual measurement values and for writing the measurement values to the Balluff code carrier.
- Including provision of a data format.
- BIS handheld reader for reading the data from the tool chip.
- Saving of manual data entry prior to each setting process.

Label printer

- Printer on the basic device for editable data output via the MAPAL software.




MAPAL

UNISET-V standard

Efficient, reliable setting

The UNISET-V standard is designed for setting tools with a length of up to 800 mm and a diameter of 400 mm. Due to the generous, spacious access to the mounting spindle, clear access is provided to the tool and all controls. As such even heavy tools can be placed in the fixture with the aid of a crane.

The UNISET-V standard makes it possible to use two different measuring methods. On the one hand tools can be set reliably, quickly, easily and conveniently using an optical measuring method with an accuracy as is usual for comparable setting fixtures.

On the other hand the setting fixture also provides a tactile measuring method. With the aid of the measuring sensors used during this process it is possible to set guided tools to a very high accuracy. A setting precision of < 2 µm is achieved in this way.

UNISET-V standard

Technical features
UNISET-V standard

1 Vertical main tower
The vertical main tower is equipped with a high-precision linear roller guide that is protected by a bellows cover.

2 Measuring sensors
The measuring sensors make it possible to set with µ precision and, due to measuring forces ≤ 150 mN, are also highly suitable for PCD-tipped inserts.

3 Precision spindle SK50
The precision spindle with roller bearings for SK50 shanks is equipped with a pneumatic clamping mechanism for pull studs. The setting gauge SK50 for calibrating the setting fixture is included.

4 Software
The MAPAL software permits menu-based measuring and setting including database function. Operation on the 19" TFT flat screen monitor is convenient and straightforward using the touchscreen function. If Internet access is allowed, it is possible to undertake remote maintenance.

5 Manual control unit/rotary switch
The measuring axes can be moved in steps by motors using a handwheel. The feed and the axes can be selected via the rotary switch.

6 Granite portal
The granite design permits stable, vibration-free setting.

Application example

Tactile setting

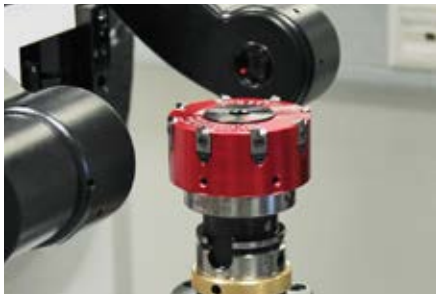
A multi-stage guided fine boring tool is set using the high-precision measuring sensors on the UNISET-V standard by means of protrusion measurement.

1 First the measuring sensors are moved to the guide pad and the indication is zeroed. Then the insert is placed in position. An automatic search is made for the highest diameter point on the insert.

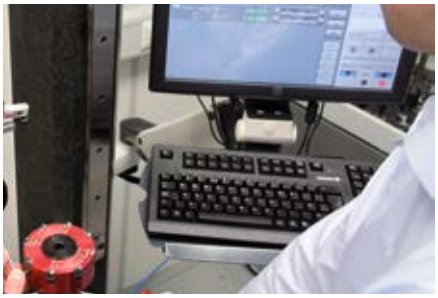
2 The operator now sets the protrusion of the insert in relation to the guide pad and the back taper on the insert with µ precision. The protrusion is shown clearly on the display. Once the insert is set in the pre-defined tolerance range, the protrusion is indicated on the display in green.

Optical setting

A PCD face cutter head for finishing is set optically using a camera system.



1 After the entry of the basic information, such as number of inserts, length or diameter, the milling cutter is automatically measured optically. If the milling cutter is already registered in the tool database, the basic information can be read conveniently from the tool chip.



2 The operator sets the axial run-out at the adjusting elements on the milling cutter. During this process the operator always has the setting dimensions in view, live on the monitor.

SOFTWARE FEATURES

- Automatic radial run-out measurement (optical or tactile)
- Swinging lever measurements can be programmed
- Setting or measuring mode per tool stage (with tolerance check)

More software features from page 68.

FEATURES

- Measuring processes can be undertaken fully automatically by integrating the CNC controller
- Tools with measuring lengths up to 800 mm and weight up to 50 kg can be measured
- Optical measuring range:
  Maximum diameter 400 mm
- Tactile measuring range:
  Maximum diameter 400 mm
  Maximum diameter caliper gauge 95 mm
- Measuring sensor suitable for contact with very delicate inserts such as PcBN or PCD

ADVANTAGES

- Open, clear access to the mounting spindle permits ergonomic working
- Accuracy independent of external factors due to solid mechanical construction
- Modularity permits configuration to suit customer requirements
- High measuring accuracy through the moving measuring sensor

Options for individual configuration

Measuring method

Optical

- Image processing system on carbon bracket comprising of electronic measuring equipment and PC system.
- Regulated transmitted light for insert inspection.
- Additional joystick operation for quick, user-friendly edge selection.

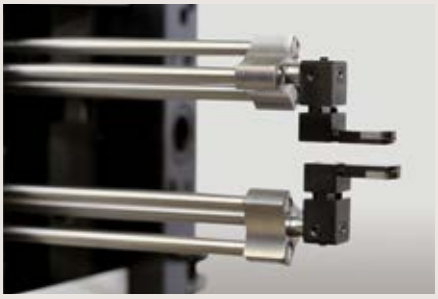
Measuring range:
Maximum diameter:
400 mm
Maximum length:
800 mm

Tactile

1

- Two electronic measuring units with reduced measuring force, especially for contact with very delicate cutting edge materials.
- Measuring sensor spacing continuously adjustable from 4 to 20 mm.
- Additional swinging lever measuring method, can be mounted on measuring unit.

Measuring range:
Maximum diameter:
400 mm
Maximum length:
800 mm



2

- For length measurement an additional measuring sensor can be integrated quickly and straightforwardly.
- Face milling cutters, for example, can be set with high precision using the additional measuring sensor.

3

- For external machining tools an additional measuring sensor can be integrated quickly and easily.

CNC controller

- Fully automatic measuring processes without operator intervention.
- Mechanics, hardware and software for CNC-controlled adjustment of all six axes.
- Positioning accuracy ± 1 µm.
- Autofocus integrated.

Balluff tool identification system

- Tool identification software for reading the actual measurement values and for writing the measurement values to the Balluff code carrier.
- Including provision of a data format.
- BIS handheld reader for reading the data from the tool chip.
- Saving of manual data entry prior to each setting process.

Second camera system (SCM)

- Additional SCM module for optical measurement in plan view, especially of turning tools.
- Can be positioned manually.
- Suitable for general inspection tasks on tools.

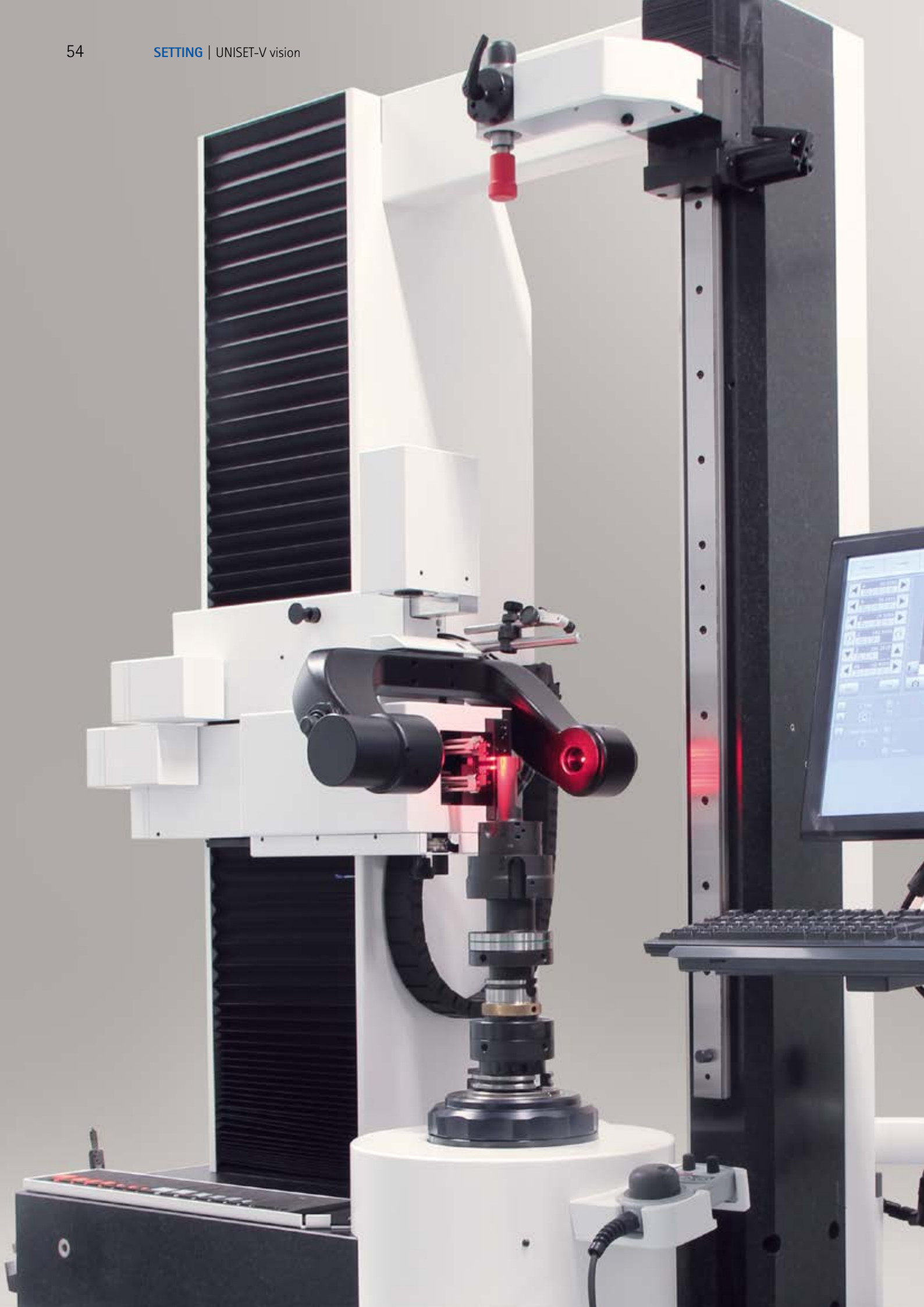
Custom spindle

Attention!
Custom spindle HSK63 not available with "CNC controller" option.

- Spindle with HSK connection and pneumatic clamping.
- Precision spindle SK50 is replaced with HSK spindle.
- Including setting gauge HSK for calibrating the setting fixture:
  - HSK63
  - HSK100

Label printer

- Printer on the basic device for editable data output via MAPAL software.



UNISET-V vision

High degree of flexibility while setting tools

The UNISET-V vision is used, among other tasks, for fitting, setting and measuring inserts in MAPAL tools, and also boring bars and fine boring heads with carbide, PCD, PcBN and cermet inserts etc.

For setting tools with µ precision, the CNC-controlled UNISET-V vision with a combination of tactile and optical measuring methods is perfectly designed for the requirements of the various tools. In particular in the case of tools for complete machining, the UNISET-V vision ensures real productivity advantages are obtained due to its high degree of flexibility and ease of use; it is therefore an important element in the overall process chain.

UNISET-V vision

Technical features of UNISET-V vision

1 Vertical main tower
The vertical main tower is equipped with a high-precision linear roller guide that is protected by a bellows cover.

2 Heel
The heel helps to provide stability for long tools and as a consequence results in highly precise setting processes.

3 Additional guide tower
A continuously adjustable heel is integrated into the additional guide tower. The stability required is ensured by the granite design of the additional guide tower.

4 Measuring sensors
The measuring sensors make it possible to set with µ precision and, due to measuring forces ≤ 150 mN, are also highly suitable for PCD-tipped inserts.

5 Software
The MAPAL software permits menu-based measuring and setting including database function. Operation on the 19" TFT flat screen monitor is convenient and straightforward using the touchscreen function. If Internet access is allowed, it is possible to undertake remote maintenance.

6 Manual control unit/rotary switch
The measuring axes can be moved in steps by motors using a handwheel. The feed and the axis can be selected via the rotary switch.

7 Precision spindle SK50
The precision spindle with roller bearings for SK50 shanks is equipped with a pneumatic clamping mechanism for pull studs. The setting gauge SK50 for calibrating the setting fixture is included.

8 Granite portal
The closed granite portal permits stable, vibration-free setting.

Application example

Tactile setting
A multi-stepped guided fine boring tool with guide pads for gearbox housing machining is set with µ-precision using the measuring sensors on the UNISET-V vision by means of protrusion measurement.

1 The tool is clamped between the adapter and heel. The heel helps provides the greatest possible tool stability and exact setting results during the setting processes.

2 The measuring sensors automatically move to the guide pad on the tool at a simple press of a button on the display. The measuring range is zeroed at this position.

3 The insert is placed in position and a search made for the highest diameter point on the insert. The operator now sets the protrusion of the insert in relation to the guide pad and the back taper on the insert with µ-precision. During this process the operator always has the value for the protrusion in view, live on the display. Once the insert is set in the pre-defined tolerance range, the protrusion is indicated on the display in green. The program saved for this tool can be retrieved quickly for future setting processes.

SOFTWARE FEATURES

- Programming protrusion measurements and automatic back taper
- "Tool search" in three directions (for example shank tools)
- Optional tool chip; reader for writing and reading tool information.

More software features from page 68.

FEATURES

- Tools with measuring lengths of up to 1,000 mm and a weight up to 50 kg can be measured
- Optical measuring range:
  Maximum diameter 400 mm
- Tactile measuring range:
  Maximum diameter 400 mm
  Maximum diameter caliper gauge 95 mm
- Measuring sensor suitable for contact with very delicate inserts such as PcBN or PCD
- Ultramodern camera with CNC controller and optical measurement

ADVANTAGES

- Versatile – practically all tool types can be set
- Long and short tools with a small diameter are additionally stabilised by the heel
- Resilient to vibration and oscillations due to portal layout
- Modular construction with easy to maintain individual components
- High measuring accuracy due to moving measuring sensor

Options for individual configuration

Measuring method

Optical

- Image processing system on carbon bracket comprising of electronic measuring equipment and PC system.
- Regulated transmitted light for insert inspection.
- Additional joystick operation for quick, user-friendly edge selection.

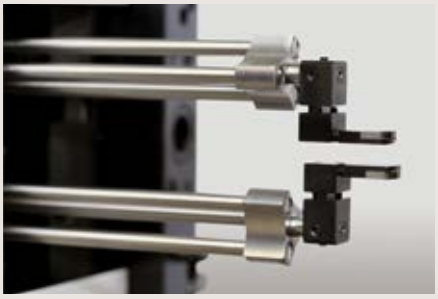
Measuring range:
Maximum diameter:
400 mm
Maximum length:
800 mm

Tactile

1

- Two electronic measuring units with reduced measuring force, especially for contact with very delicate cutting edge materials.
- Measuring sensor spacing continuously adjustable from 4 to 20 mm.
- Additional swinging lever measuring method, can be mounted on measuring unit.

Measuring range:
Maximum diameter:
400 mm
Maximum length:
800 mm



2

- For length measurement an additional measuring sensor can be integrated quickly and easily.
- Face milling cutters, for example, can set with high precision using the additional measuring sensor.

3

- For external machining tools an additional measuring sensor can be integrated quickly and easily.

CNC controller

- Fully automatic measuring processes without operator intervention.
- Mechanics, hardware and software for CNC-controlled adjustment of all six axes.
- Positioning accuracy ± 1 µm.
- Autofocus integrated.

Balluff tool identification system

- Tool identification software for reading the actual measurement values and for writing the measurement values to the Balluff code carrier.
- Including provision of a data format.
- BIS handheld reader for reading the data from the tool chip.
- Saving of manual data entry prior to each setting process.

Second camera system (SCM)

- Additional SCM module for optical measurement in plan view, especially of turning tools. Can be positioned manually.
- Suitable for general inspection tasks on tools.

Custom spindle

Attention!
Custom spindle HSK63 not available with "CNC controller" option.

- Spindle with HSK connection and pneumatic clamping.
- Precision spindle SK50 is replaced with HSK spindle.
- Including setting gauge HSK for calibrating the setting fixture:
  - HSK63
  - HSK100

Label printer

- Printer on the basic device for editable data output via MAPAL software.

UNISET-P

Setting tools ergonomically and straightforwardly

For the UNISET-P, development was focussed on ergonomics. The greatest benefit compared with conventional setting fixtures is the very good accessibility to the tool. The portal construction creates the space necessary to allow optimum access to the setting systems on the tools. Measuring camera and back-light source are integrated into the pillars of the portal. Furthermore, this construction ensures high accuracy and is both mechanically and thermally very stable. The UNISET-P has an extremely compact design, but nevertheless practically all tools up to a diameter of 500 mm and a length of 600 mm can be measured and set optimally.

As standard it offers the additional light and transmitted light measurement of tools of all types. Optionally the UNISET-P can be equipped with an additional cross-member in the portal; this cross-member can be coupled to the drive for the measuring optics. An optional second camera can be attached to this cross-member to undertake a rotation centre measurement or insert inspection from above. An axial measuring sensor, also available as an option, allows axial run-outs to be measured and set with µ precision.

UNISET-P

Technical features of UNISET-P

1 Vertical portal
The vertical portal is equipped with a high-precision linear roller guide that is protected by a bellows cover.

2 Touch monitor
The MAPAL software permits menu-based measuring and setting including database function. Operation is straightforward and convenient by means of optional touchscreen operation on the 19" TFT flat screen monitor. If Internet access is allowed, it is possible to undertake remote maintenance.

3 Cross-member
The cross-member has a two-camera system (SCM) for the plan view and can be positioned and pivoted manually. Optionally, the cross-member is also available in a version with measuring sensor.

4 Optical image processing system
Image processing system comprising electronic measuring equipment, camera and PC system. Regulated transmitted light is used for insert inspection.

5 Precision spindle SK50
The precision spindle with roller bearings for SK50 shanks is equipped with a pneumatic clamping mechanism for pull studs. The setting gauge SK50 is included.

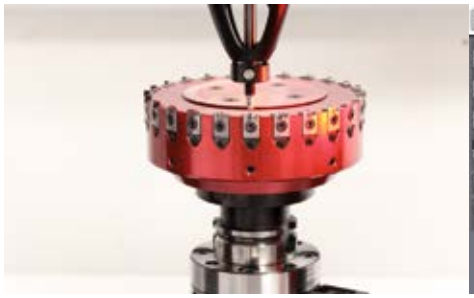
6 Manual control unit
Movement of the three axes using joystick for quick, user-friendly edge selection.

7 Workplace
Ergonomic working is also possible seated due to generous space.

Application example

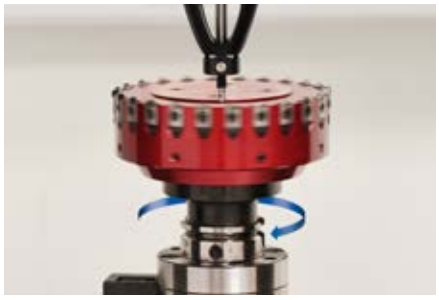
Setting using measuring sensor

A new face milling cutter is set with tactile measurement using the additional axial measuring sensor.



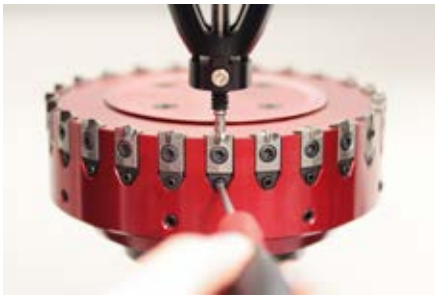
1 The measuring sensor is initially positioned above the first blade on the face milling cutter such that the measuring sensor and the blade are visible on the camera image.

2 The face milling cutter is now added to the software as a new tool and the tactile measuring method selected. With a further button press, the measuring sensor is moved automatically to the blade and applies the axis co-ordinates.



3 The nominal dimensions and measurement values or the number of inserts can be entered and saved for future measurements. Then the measuring sensor moves automatically to all inserts and undertakes a measurement. The measurement results for the inserts are then displayed as a bar chart.

4 Green bars are within the measurement value tolerance defined, the red bars are outside. Clicking the red bar automatically moves to the related insert.



5 The insert is then set again. During the setting process the measurement value for the insert is always displayed live on the monitor.

SOFTWARE FEATURES

- Automatic radial run-out inspection
- Straightforward, insert configuration (radius, angle, maxima)
- Straightforward setting of the measuring range
- User-friendly programming for individual program runs

More software features from page 68.

FEATURES

- Tools up to diameter 500 mm and length 600 mm can be set
- Small footprint: 1,050 x 770 mm
- Transmitted light measurement and additional light measurement
- Pivoting control unit
- Image processing system comprising of electronic measuring equipment and camera
- Spindle mounting SK50 as standard

Optional:

- Second camera system from above for rotation centre measurement or insert inspection
- Axial measuring sensor for measuring and setting axial run-out

ADVANTAGES

- Optimal ergonomic access and easier working while seated possible
- Cross-member with pivoting unit for the connection of further optical and tactile measuring options
- Compact design with large working area
- Straightforward operation with intuitive software
- Flexible interfaces to higher-level corporate software systems (for example ERP)

Options for individual configuration

CNC controller

- Fully automatic measuring processes without operator intervention.
- Mechanics, hardware and software for CNC-controlled adjustment of all six axes.
- Positioning accuracy ± 1 µm.
- Autofocus integrated.

Balluff tool identification system

- Tool identification software for reading the actual measurement values and for writing the measurement values to the Balluff code carrier.
- Including provision of a data format.
- BIS handheld reader for reading the data from the tool chip.
- Saving of manual data entry prior to each setting process.

Label printer

- Printer on the basic device for editable data output via MAPAL software.

Cross-member

The cross-member can be pivoted manually and in this way makes axial and radial measurements possible.
Three different variants are available:

1
- Cross-member with second camera system (SCM).
- Additional module for optical measurement in plan view, especially of turning tools.
- Can be positioned and pivoted and is particularly suitable for general inspection tasks on tools.

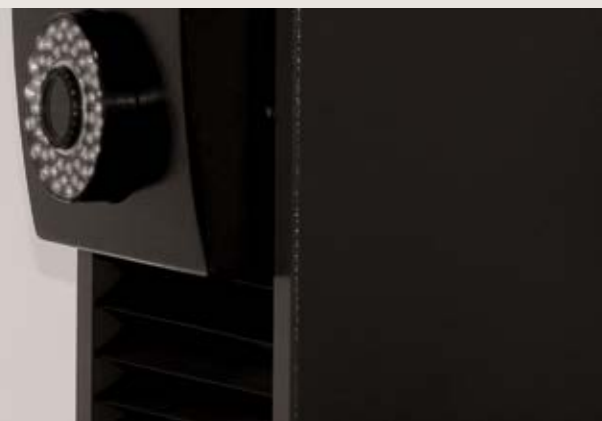
2
- Cross-member with additional axial measuring sensor.
- Face milling cutters, for example, can be set with high precision.

3
- Cross-member with second camera system (SCM) and additional measuring sensor.
- Both additional modules are combined in the cross-member and can be used alternately using a manual pivoting function.

Custom spindle

Attention!
Custom spindle HSK63 not available with "CNC controller" option.

- Spindle with HSK connection and pneumatic clamping.
- Precision spindle SK50 is replaced with HSK spindle.
- Including setting gauge HSK for calibrating the setting fixture:
  - HSK63
  - HSK100



Accessories for setting fixtures

Accessories for UNISET-V-basic, UNISET-H, UNISET-P, UNISET-V standard and UNISET-V vision

Reducing adapters incl. taper wiper, suitable for headstock SK50
Adapter can be aligned axially and radially.*

Adapters	Measuring length reduction	Order No.
SK50 / HSK32	76 mm	30479379
SK50 / HSK40	80 mm	30479380
SK50 / HSK50	85 mm	30479381
SK50 / HSK63	103 mm	30479383
SK50 / HSK80	110 mm	30479384
SK50 / HSK100	130 mm	30479386

Reducing adapters, suitable for headstock SK50
Adapter cannot be aligned.*

Reducing adapters	Measuring length reduction	Order No.
SK50 / PSK40	Eccentric clamping	30614556
SK50 / PSK50	80 mm	30525299
SK50 / PSK63	90 mm	30610883
SK50 / PSK80	105 mm	30640859

Reducing adapters incl. taper wiper, suitable for headstock SK50
With automatic clamping, adapter can be aligned axially and radially. *

Adapter HSK	Measuring length reduction	Order No.
SK50 / HSK32	51 mm	30396033
SK50 / HSK40	51 mm	30396029
SK50 / HSK50	51 mm	30396019
SK50 / HSK63	51 mm	30369855
SK50 / HSK80	101 mm	30523963
SK50 / HSK100	111 mm	30471329

Reducing adapters, suitable for headstock SK50*

Reducing adapters	Measuring length reduction	Order No.
Reducer SK50 / SK30	16 mm	30429933
Reducer SK50 / SK40	16 mm	10096796
Reducer SK50 / VDI30	80 mm	30372833
Reducer SK50 / VDI40	80 mm	30372834
Reducer SK50 / VDI50	80 mm	30416485
Reducer SK50 / VDI60	–	
Reducer SK50 / KM50	–	
Reducer SK50 / KM60	–	

Reducing adapters incl. taper wiper, suitable for headstock HSK63*

Nominal size HSK63	Measuring length reduction	Order No.
Reducer HSK63 / HSK32	70 mm	30479358
Reducer HSK63 / HSK40	80 mm	30479359
Reducer HSK63 / HSK50	80 mm	30479361

Reducing adapters incl. taper wiper, suitable for headstock HSK100*

Nominal size HSK100	Measuring length reduction	Order No.
Reducer HSK100 / HSK32	81 mm	30479388
Reducer HSK100 / HSK40	85 mm	30479389
Reducer HSK100 / HSK50	90 mm	30479394
Reducer HSK100 / HSK63	108 mm	30479437
Reducer HSK100 / HSK80	115 mm	30120549

Adapters with centre point
Clamping tools between centres.*

Connection	Measuring length reduction	Order No.
SK50 with sleeve	variable	30222475
SK50 with centre Ø 24 mm	109 mm	10008175
HSK63 with centre Ø 24 mm	102 mm	30504212
HSK100 with centre Ø 24 mm	103.5 mm	30402344

Torque wrenches and bits
For clamping KS clamping cartridges.

Torque wrenches and bits	Order No.
Torque wrench for HSK32-40	10040125
Torque wrench for HSK50-80	10040126
Torque wrench for HSK100	10074788
Hex bit for HSK32-40	10040122
Hex bit for HSK50	10040123
Torx bit for HSK63	MN5215-17
Torx bit for HSK80	MN5215-18
Torx bit for HSK100	MN5215-19

* The measuring range is limited by these accessories.

Taper wipers
For cleaning and protecting adapter shanks.

Taper wiper for	Order No.
HSK32	30325980
HSK40	30325981
HSK50	30325982
HSK63	30325983
HSK80	30325984
HSK100	30325985

Setting gauge with straightedge fitted for calibration

Setting gauge for	Order No.
HSK32	30610432
HSK40	30610431
HSK50	30610430
HSK63	30610428
HSK80	30610426
HSK100	30524631
SK30	30459723
SK40	30459725
SK50	30459727
PSK32	30641033
PSK40	30640923
PSK50	30538282
PSK63	30641097
PSK80	30641099

PSK test arbors

Test arbor for	Diameter	Measuring length reduction	Order No.
PSK32	25 mm	175 mm	30640878
PSK40	25 mm	180 mm	30640879
PSK50	32 mm	235 mm	30525297
PSK63	40 mm	322 mm	30640880
PSK80	40 mm	330 mm	30640881

Tool trolley
Defined intermediate storage of tools and systematic storage of accessories, such as torque wrenches, hex-wrenches, Torx wrenches, swinging levers and calibrating mandrels.

	Order No.
Tool trolley	30433276

Cutting edge cleaner
For removing fine particles of dirt on the cutting edge.

	Order No.
Cutting edge cleaner	10074844

Touch pen
Touch pen for operating the touch monitor.

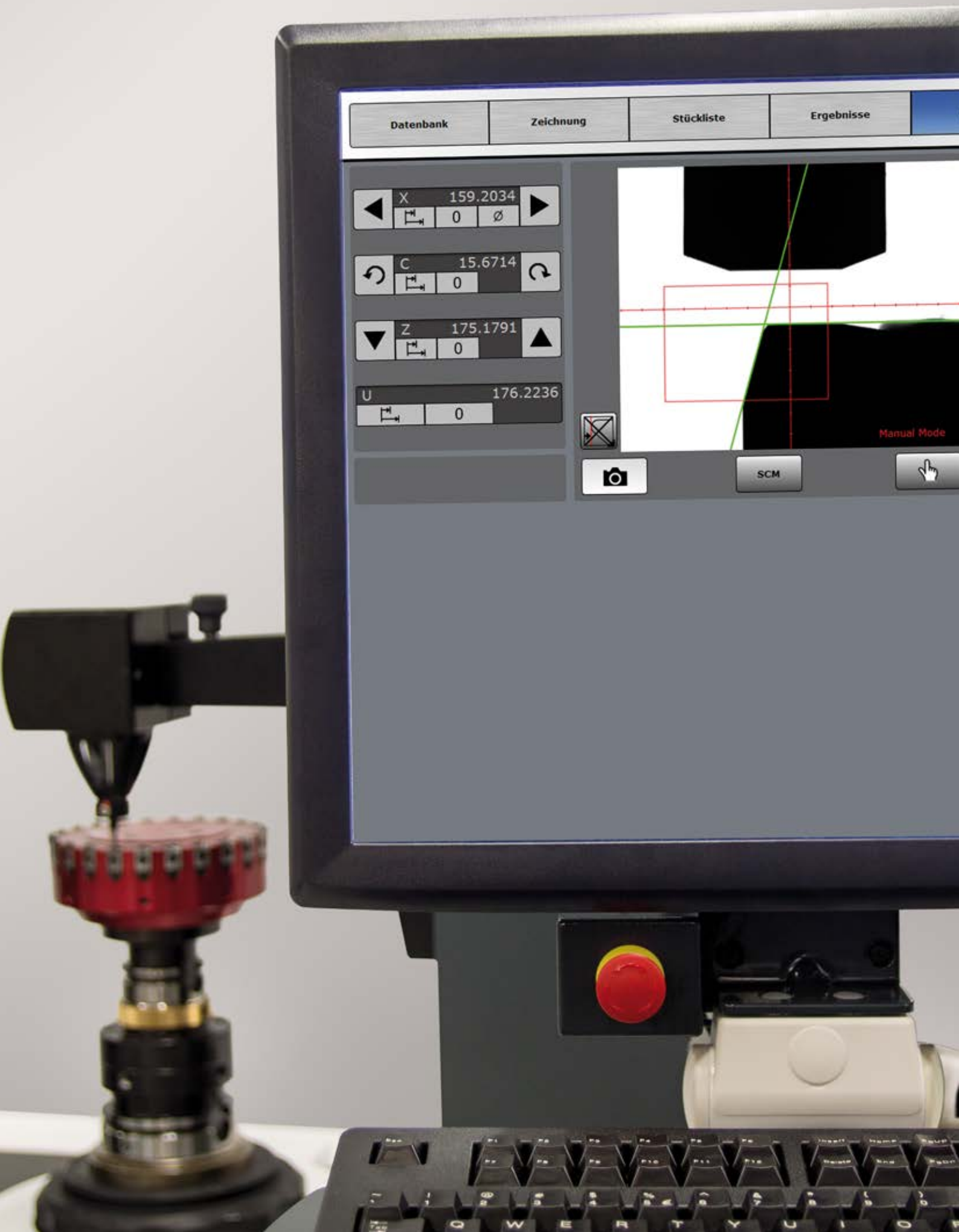
	Order No.
Touch pen	30554609

Cleaning paper
Paper for cleaning the tool adapter and the spindle.

	Order No.
Cleaning paper	30563007

Labels for label printer
- One roll contains 3,315 labels
- Label dimensions: 57x19 mm

	Order No.
Labels for label printer	10097457


Datenbank
Zeichnung
Stückliste
Ergebnisse
X 159.2034
0
Ø
C 15.6714
0
Z 175.1791
0
U 176.2236
0
Manual Mode
SCM

Software UNISET

The software application for all measuring and setting requirements

The electronic setting fixtures in the UNISET series are equipped with the user-friendly software application UNISET. For the different requirements for measuring and setting a tool, the software provides appropriate measuring functions and the possibility of connection to existing peripherals. The comprehensive software not only provides the customer with intuitive features, it is also possible to make individual modifications to the features in advance. Along with this flexibility in the application content, the software application UNISET is extremely user-friendly.

Software UNISET

Software UNISET

Measuring and setting

The software package contains numerous standardised measuring functions. If further functions are required, an individual solution can be prepared with MAPAL as your partner.

Some of the software features in detail

Insert configuration by means of geometric elements

In total there are five basic geometries. Using a basic geometry or the combination of two basic geometries, every cutting edge shape can be clearly represented. In the figure, as an example, the insert is measured using the basic geometries "diameter" and "length" and supplemented with a radius measurement and an angle measurement. The measuring range (ROI) can also be configured as required for each cutting edge shape.

"Teach In" programming

Due to the intuitive operation of the software, a complete tool program can be prepared with a few clicks. For example, by clicking a new tool stage all axis positions can be saved automatically and then moved to in the program (see figure).
The insert configurations are assigned to these measuring stages.

Measuring and setting features

- Straightforward, intuitive insert configuration by means of geometric elements (diameter, length, angle)
- Measurement of small circle sectors
- Measurement of inner contours
- Straightforward setting of the measuring range
- Combined image for display of the actual contour of the tool in rotation
- Beam measurement for measurement of a defined point on the contour
- User-friendly programming for individual program runs ("Teach In" programming)
- Programming of protrusion measurements including back taper
- Automatic radial run-out measurement (optical or tactile)
- Swinging lever measurements can be programmed
- Setting or measuring mode per tool stage (with tolerance check)

Re-measuring inserts without risk of mix-ups

After a measuring process, the measurement values are displayed graphically on the monitor as a bar chart (see figure). Individual inserts may vary from the setpoint, either because they are damaged or set incorrectly (red bar in the figure). Re-adjustment is necessary for the inserts with a red bar.
Clicking the insert in the bar chart automatically moves to the selected insert. As such it is not possible to mix up the inserts.

Programming protrusion measurements and automatic back taper

Using the functional elements for the tactile measurement, automatic measuring functions for protrusion measurements and swinging lever measurements can be quickly and straightforwardly integrated into a tool program. Depending on the measuring function, the software automatically outputs the protrusion, back taper or absolute dimension as the result, and that with µ precision.

Software UNISET

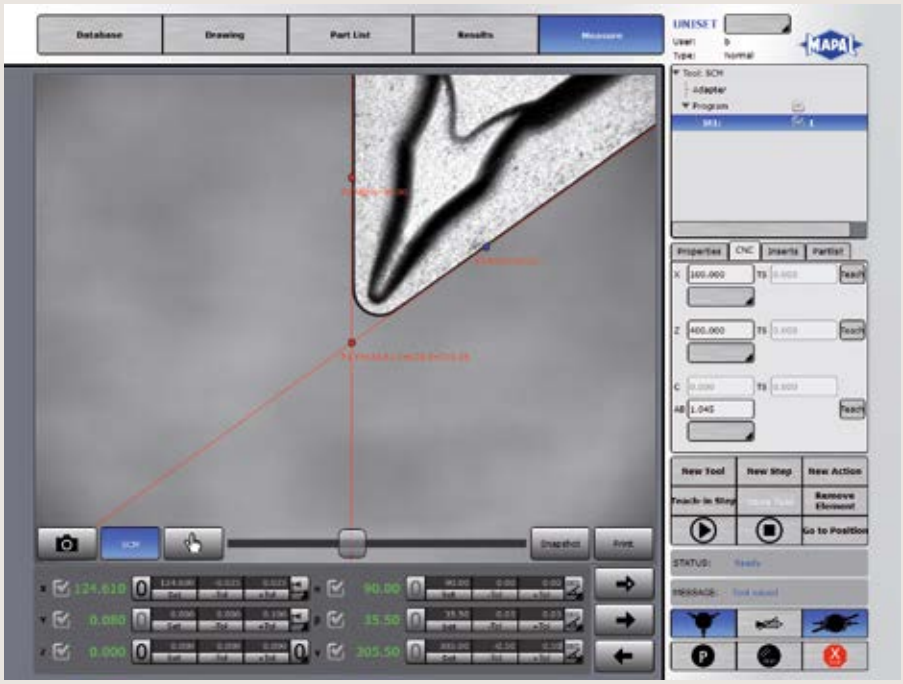
Environment and additional options

Along with the measuring functions, the software application UNISET also provides additional features for connecting to existing peripherals at the customer or additional measurement and management tasks. Measurements and settings are optimally supported and simplified by these features.

Some of the software features in detail

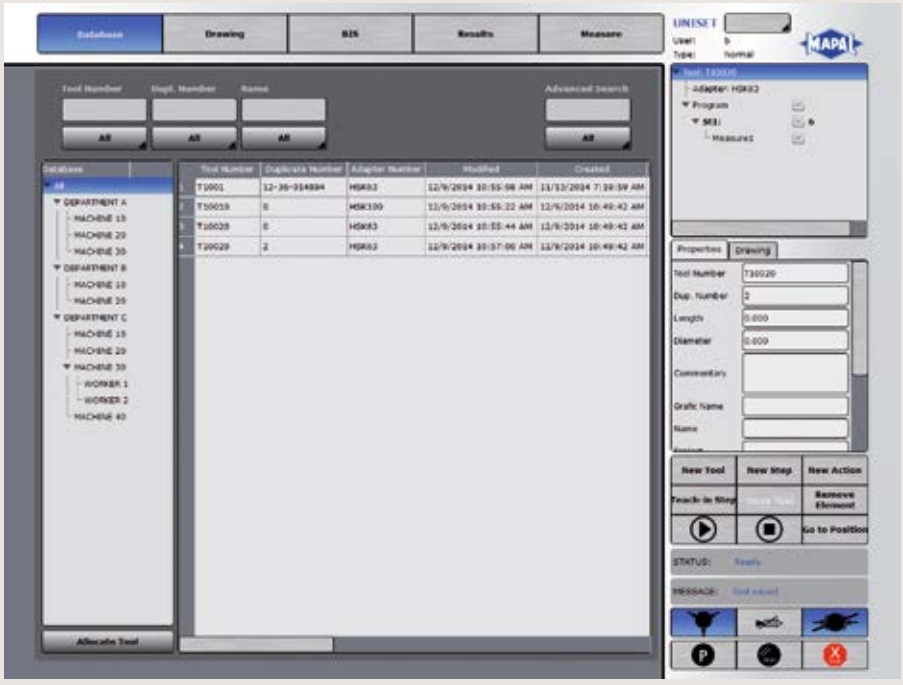
Second camera system (SCM)

Using the second camera, various measurements can be made from the plan view. The main function of the second camera is a rotation centre measurement. This measurement is very practical for turning tools for precisely setting the insert height. Insert inspection can also be undertaken on any tool.



Database

Tool data sets are managed straightforwardly and clearly in a central database. The folder structure in the database can be defined to suit your requirements. All data added and modified are stored with the date and can be clearly assigned to different departments or machines.
Due to the modular structure, it is also possible to integrate existing databases or interfaces to higher-level systems for the specific customer.

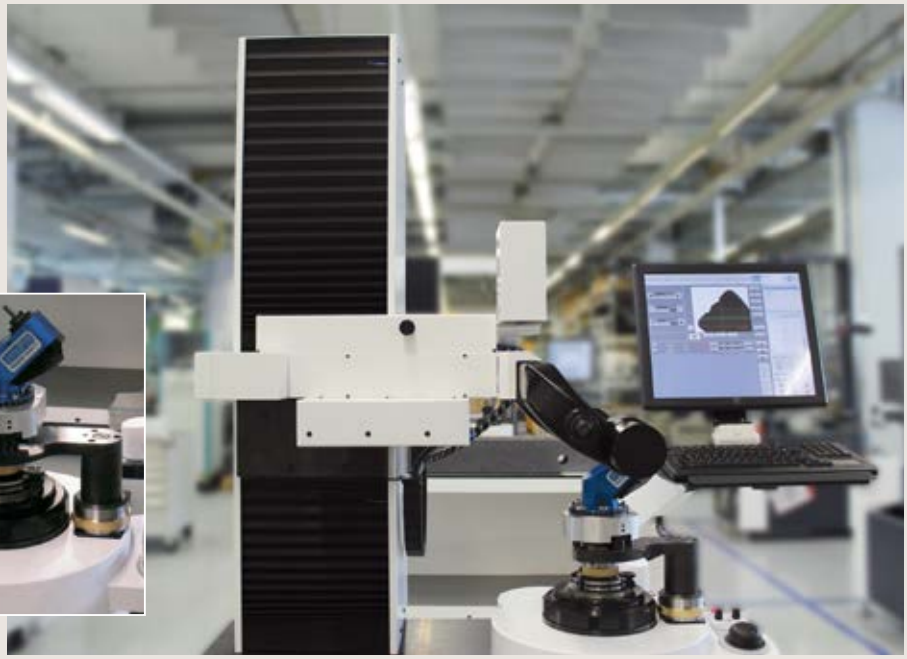


Environment and additional options, features

- Flexible user management and user rights (for example with RFID chip)
- "Tool search" in three directions for connections with an undefined cutting edge position or re-adjustable insert position
- Freely configurable label and report templates
- Flexible results management (CSV, PDF, label printing)
- Individual settings in relation to customer requirements on the machine (translation, software parameters)
- Machine-specific adapter management

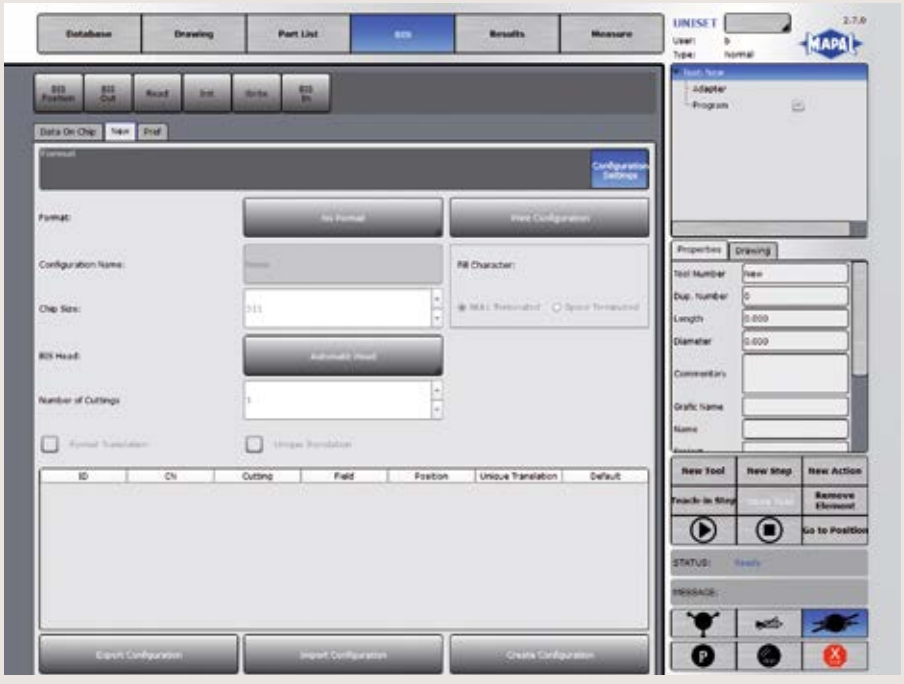
Individual settings

Individual settings cover, for example, the customer-specific editing of label and report templates. Among other issues, here the customer's logo can be incorporated in the report. A further special feature is the flexible measurement results management or the measurement of special tools, for example angular milling heads. These and other custom solutions can be realised individually using the software.



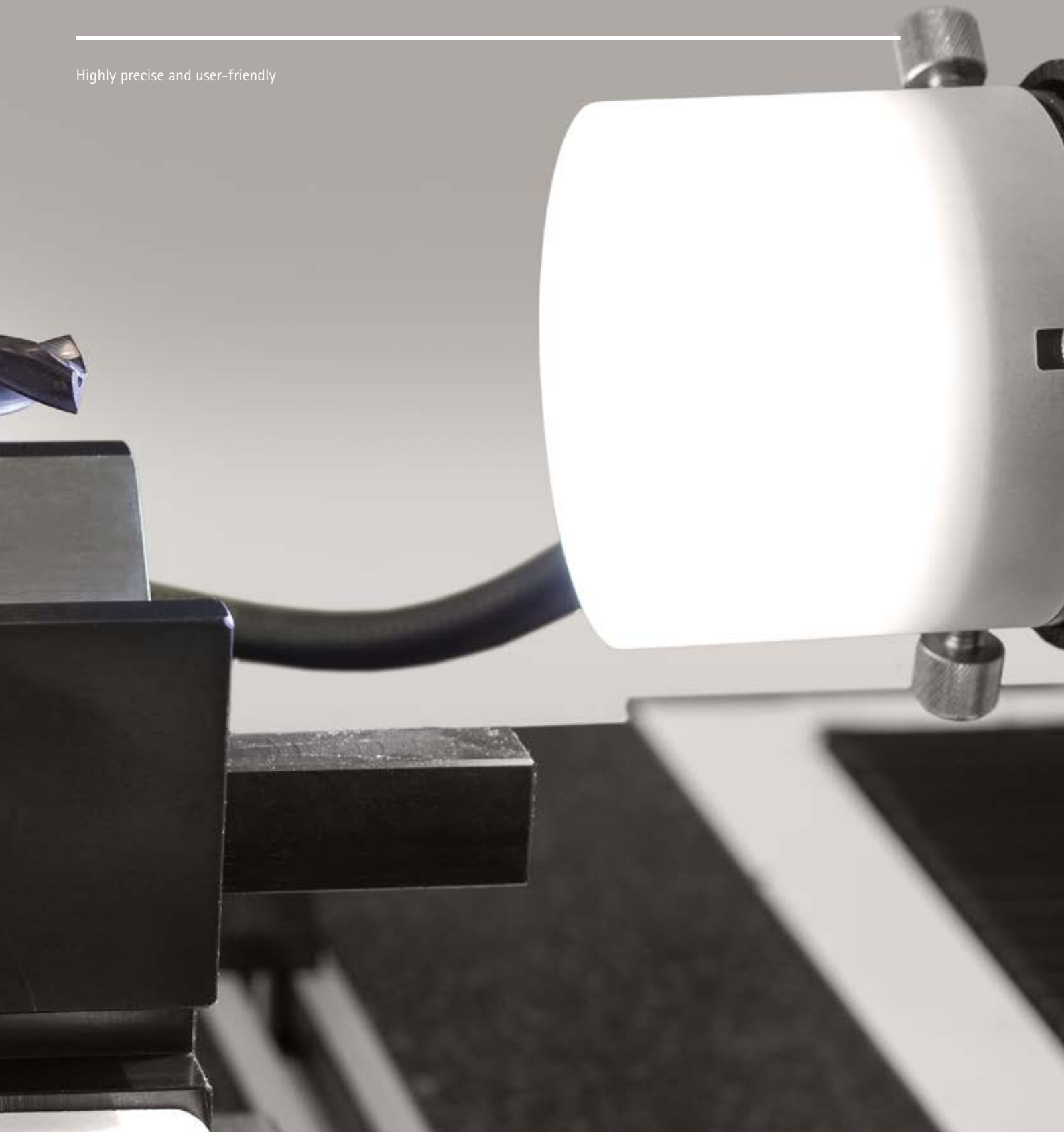
Tool chip (BIS)

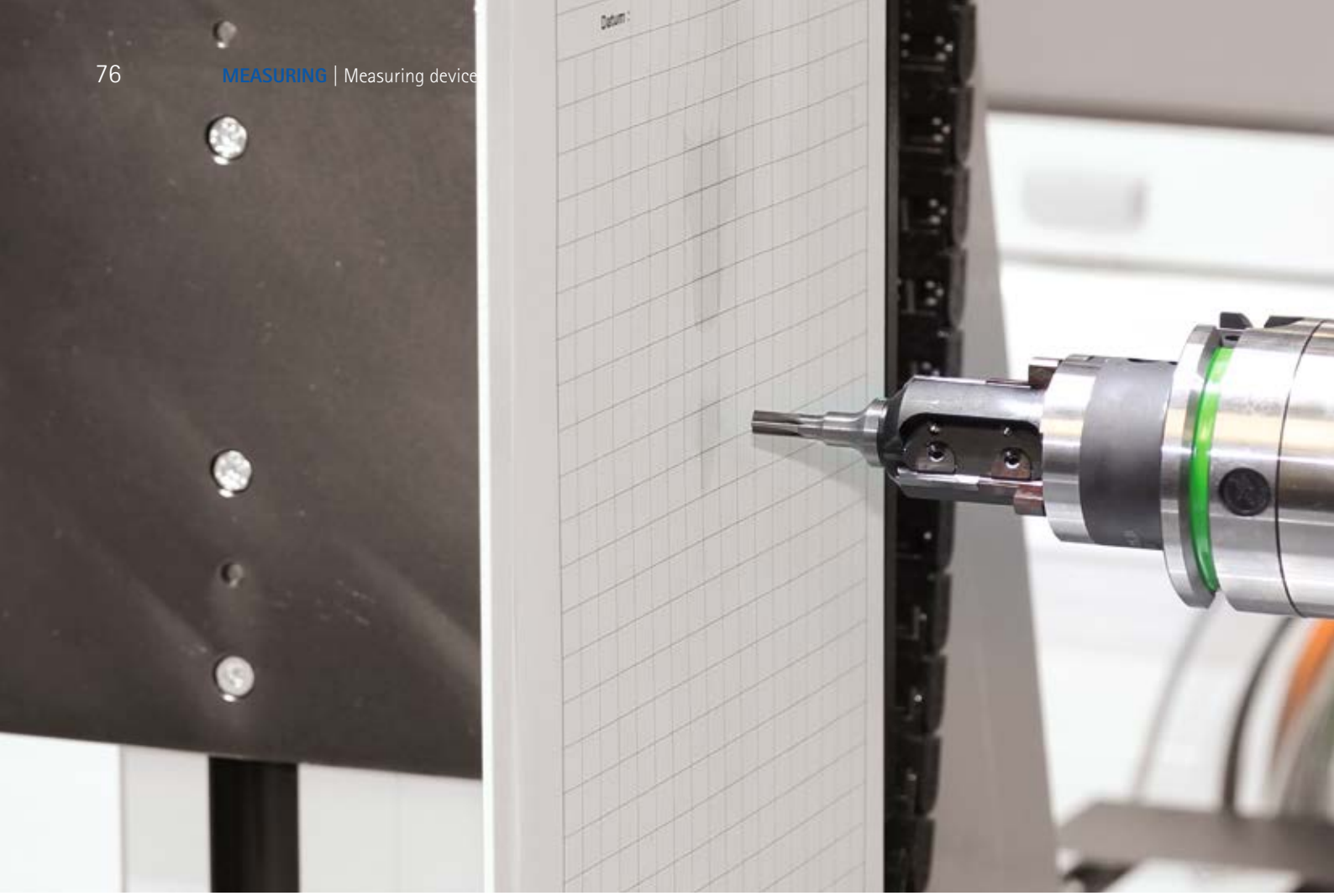
Tool information on a tool chip can be read automatically and written again at the end of a program.
The tool chip (BIS) can be configured as required for several, different machines. The chip is embedded directly in the tool and in this way ensures unmistakeable allocation of the tool data, for example:
- Tool identification number
- Geometric length
- Wear length
- Wear radius



EXACT MEASURING AND CHECKING, AUTOMATED INSPECTION CYCLES

Highly precise and user-friendly





MAPAL MEASURING DEVICES

Process reliability and high part quality due to exact measuring and inspecting

The highly precise measurement of tools is a prerequisite for a correct machining result, above all with guided fine boring tools that can be set with µ-precision. The measuring devices from MAPAL support the user with user-friendly software and a camera system that displays detailed views of the tool in high resolution on the monitor. Numerous measuring methods make it possible to measure all tool geometries on the monitor and then to log the measurement results with one click.

For minimum quantity lubricated tools (MQL tools), MAPAL offers a specially developed test stand. This test stand makes possible automated test cycles on the MQL tool in relation to its machining quality.

Measuring

UNISCALE-M

- Measuring lengths, angles and radii
- Measuring cutting edges and wear
- Measuring using horizontal camera system and software

Page 80

UNISCALE-P

- Measuring lengths, angles and radii
- Measuring cutting edges and wear
- Measuring using vertical camera system and software

Page 82

UNITEST-MQL

- Checking and inspecting MQL tools
- Fully automatic test cycle
- Inspection outside the machine tool

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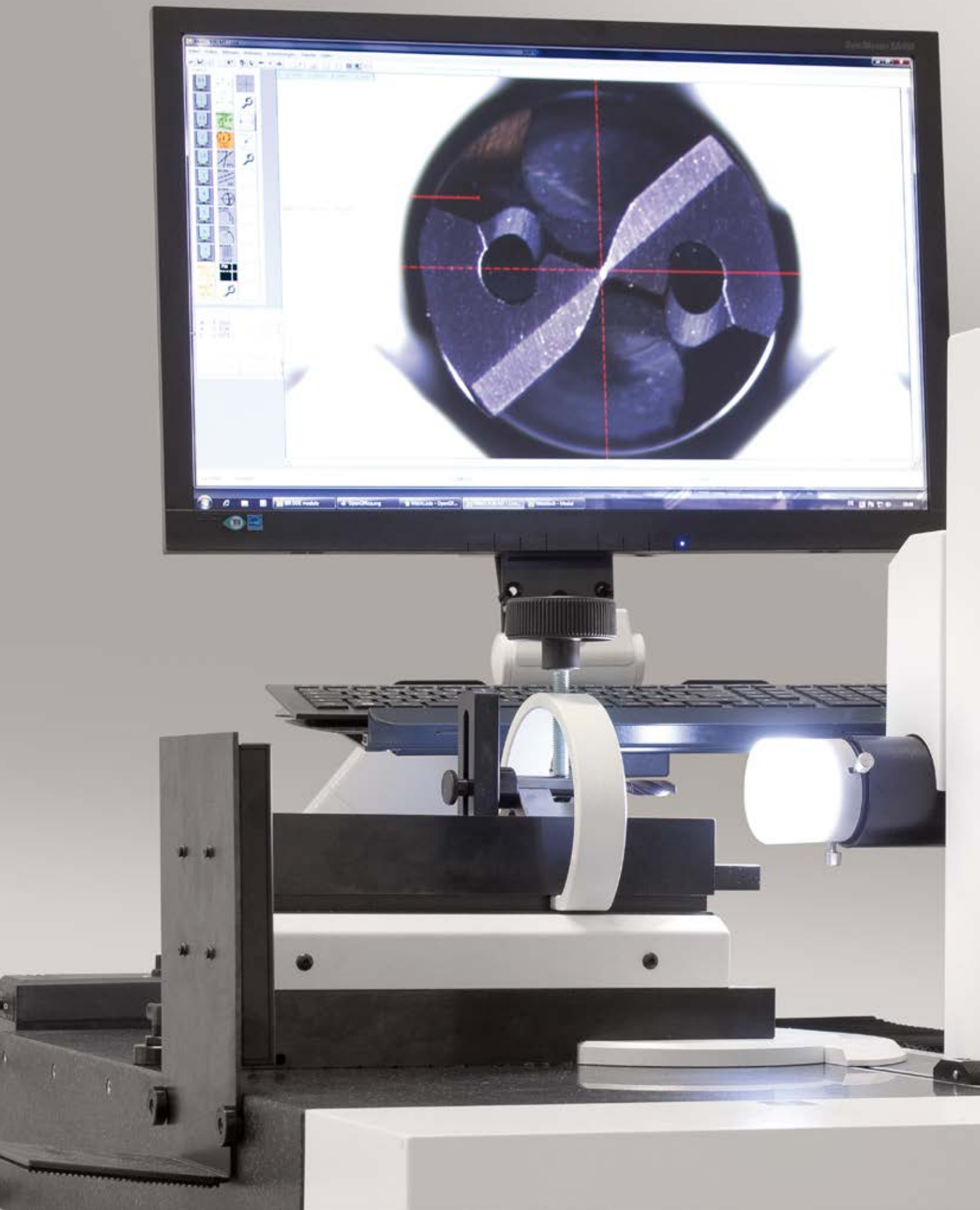


UNISCALE-M
UNISCALE-P

Measuring and checking drills, milling cutters and reamers

Lengths, angles and radii on all drills, milling cutters and reamers can be measured and checked horizontally using the UNISCALE-M. The UNISCALE-P provides these features from the plan view.

Using the high-resolution camera, for example face geometries, peripheral geometries or step lengths on solid carbide drills, milling cutters or reamers are measured with the aid of user-friendly software. Coating thicknesses or surface details on the tool can also be quickly and conveniently analysed. As a result tool wear is reliably and economically identified.

Both measuring devices are excellently suited to use in the areas of goods receipt inspection as well as final inspection. With the aid of the UNISCALE-M and UNISCALE-P, faulty tools are prevented from entering the value chain and the delivery of faulty tools prevented. The UNISCALE-M and UNISCALE-P can also be used in a tool re-grinding service.

UNISCALE-M

UNISCALE-P

Technical features of UNISCALE-M

1 Main tower
The raster zoom system including the high-resolution camera is integrated into the main tower. The main tower can be moved in both the x and y direction.

2 Raster zoom system
Due to the high-resolution camera in the raster zoom system, the image can be increased or reduced in size in several zoom steps and perfectly adapted to the related view.

3 V-block mounting
During the measuring process the v-block mounting provides optimal seating for the different v-blocks and the tools placed there. So that the tool can be checked from different viewing angles, the v-block mounting can be pivoted by up to 180°.

4 Software
The tool measurements are made on a 24" monitor using the software application "Metric". The camera displays the tool to be inspected in high resolution and permits comprehensive, exact measurement results due to numerous measuring methods.

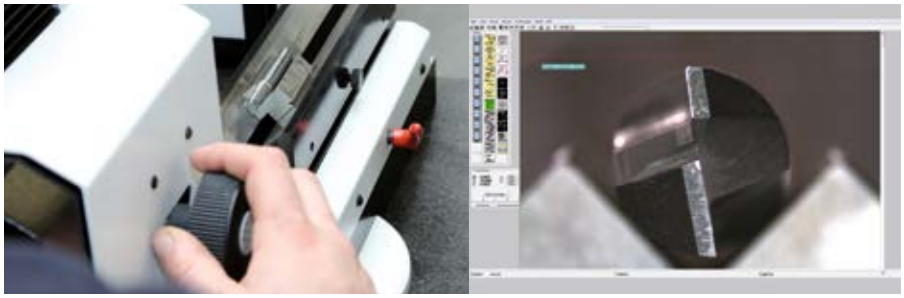
5 LED cold light source
The LED cold light source is responsible for the camera lighting. The intensity of the light can be regulated and flexibly adjusted to the working environment using the goose-necks, diffuser and ring light included.

6 Cabinet
Contains the PC for camera and software.

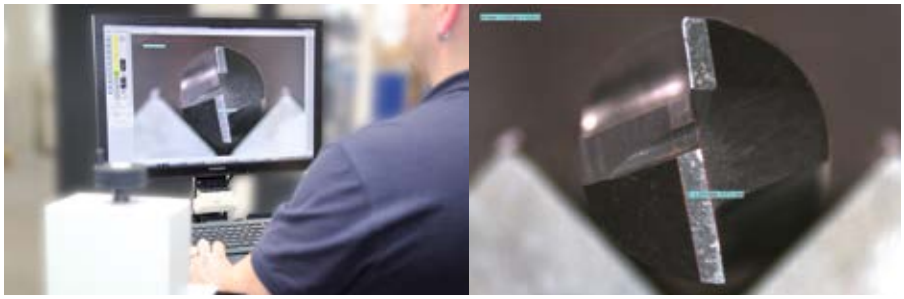
7 Granite portal
The granite portal permits stable, vibration-free measuring.

Application example

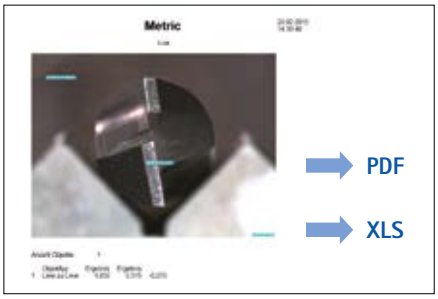
Checking tool geometry
A double edge milling cutter is inspected by the re-grinding service after return.



1 The milling cutter is placed on the v-block, and the main tower with camera is positioned at the height of the milling head. For optimal depiction of the milling head on the monitor, fine settings are then made on the zoom handwheel and focus handwheel.



2 The required measurement is selected on the monitor, for example "width of clearance surface". Then the measuring lines are placed at the measuring positions on the insert using the mouse. The dimension of the clearance surface to be measured is then displayed automatically.



3 So that measurement results can also be compared after future measurements on the tool, a measurement report can be prepared for each measurement and saved as a PDF or Excel file.

SOFTWARE FEATURES

- Pre-installed software application "Metric" for the menu-based measurement and inspection of lengths, angles and radii
- Frequently required measuring methods are already pre-configured as software buttons
- Flexible configuration of additional measuring methods upon customer request
- Automatic preparation of a measurement report as PDF or Excel file

FEATURES

- Measurement of monolithic tools and different workpieces, for example inserts
- Large travel distances for the measuring range
  X axis: ± 425 mm
  y axis: ± 60 mm
- Optical measuring unit with ten zoom settings
- LED cold light source including diffuser, ring light and goose-neck light for different lighting scenarios
- Optional moveable base
- Configuration option for the zoom variant
  - Motorised zoom
  - Manual zoom

ADVANTAGES

- Ergonomics and easy handling ensure high usability
- Resilient to vibration and oscillations
- Convenient data transfer and documentation of the data for the management of measurement reports
- Adapter can be pivoted by up to 180° with clamped tool

Technical features of UNISCALE-P

1 Main tower
The raster zoom system including the high-resolution camera is integrated into the main tower. The main tower can be moved in the y direction.

2 LED cold light source
The LED cold light source is responsible for the camera lighting. The intensity of the light can be regulated and flexibly adjusted to the working environment using the goose-necks, diffuser and ring light included.

3 Software
The tool measurements are made on a 24" monitor using the software application "Metric". The camera displays the tool to be inspected in high resolution and permits comprehensive, exact measurement results due to numerous measuring methods.

4 Base
The base makes it possible to work with ideal ergonomics while seated.

5 Granite portal
The granite portal permits stable, vibration-free measuring.

6 Rotating pivoting fixture with chuck
The tool is clamped in the chuck and can be checked from different viewing angles using the rotating pivoting fixture.

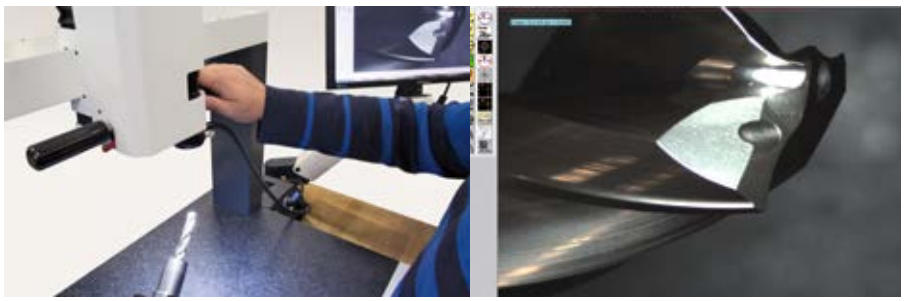
7 Raster zoom system
Due to the high-resolution camera in the raster zoom system, the image can be increased or reduced in size in several zoom steps and perfectly adapted to the related view.

Application example

Checking tool geometry
A tripled edged drill (MAPAL Tritan-Drill) is checked for wear before or after the machining process.

1 The solid carbide Tritan-Drill is clamped in a quick-release clamp with rotating pivoting fixture and positioned underneath the camera.

2 For optimal depiction of the drill head on the monitor, fine settings are then made on the zoom handwheel and focus handwheel.



3 It is possible to straightforwardly and conveniently check the drill head for wear or damage on the monitor. Numerous measurements can be selected for further checks on the Tritan-Drill. For example the radius of the insert can be measured. During this process several measuring points are set on the insert using the mouse. The "Metric" measuring software automatically interpolates the radius to be checked based on the measuring points selected.

SOFTWARE FEATURES

- Pre-installed software application "Metric" for the menu-based measurement and inspection of lengths, angles and radii
- Frequently required measuring methods are already pre-configured as software buttons
- Flexible configuration of additional measuring methods upon customer request
- Automatic preparation of a measurement report as PDF or Excel file

FEATURES

- Measurement of monolithic tools and different workpieces, for example inserts from the plan view
- Optical measuring unit with ten zoom settings
- LED cold light source including diffuser, ring light and goose-neck light for different lighting options
- Configuration option for the zoom variant
  - Motorised zoom
  - Manual zoom

ADVANTAGES

- Ergonomics and easy handling ensure high usability
- Resilient to vibration and oscillations
- Convenient data transfer and documentation of the data for the management of measurement reports
- Rotating pivoting fixture can be pivoted by up to 90° with clamped tool

Options for individual configuration

UNISCALE-M

Base with monitor bracket

The bench-top device is rigidly fastened to the mobile base. In this way a robust, vibration-damped construction is ensured. An adjustable monitor bracket is included.

Optical measuring unit with automatic zoom settings

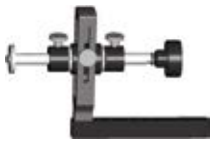
The zoom settings can be selected automatically via the software.

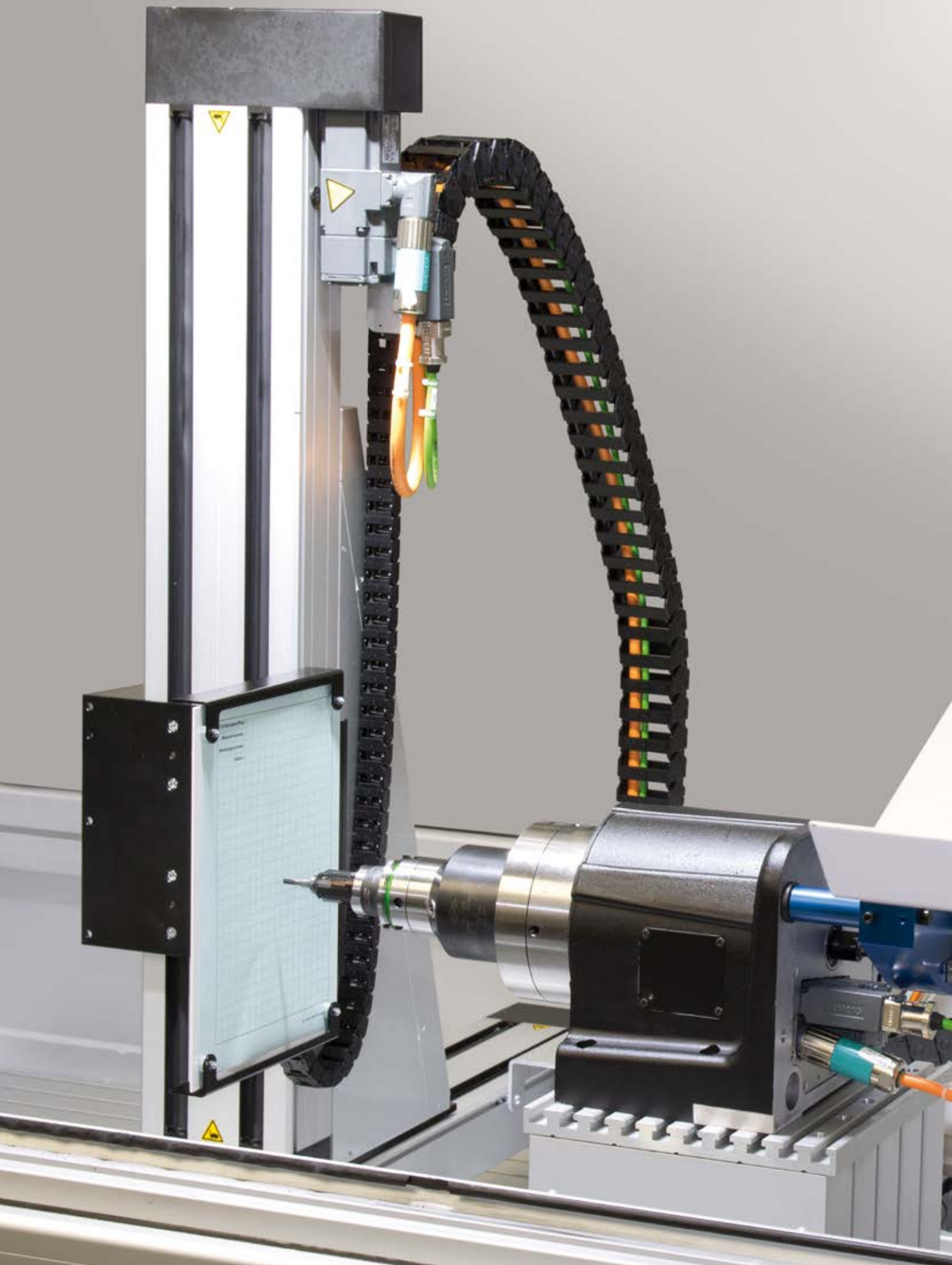
UNISCALE-P

Base

With the appropriate base, the UNISCALE-P can be operated while seated. The necessary stability and adequate storage space are provided.

Accessories

Mounting for indexable inserts	Order No.	
Cylindrical magnetic tool holder for mounting tools and workpieces, especially also for indexable inserts.	K71140-25-010	
V-block 90°	Order No.	
V-block for stably mounting tools and workpieces offset by 90°.	30458919	
Square v-block	Order No.	
Square v-block for mounting tools and workpieces. Different sizes can be fitted by turning the v-block.	K71140-25-020	
Pair of v-blocks	Order No.	
The pair of v-blocks is positioned one in front of the other and provides the necessary stability for long tools.	K71140-053-1	
Clamping fixture	Order No.	
The tool can be very quickly fixed in the clamping fixture so it cannot slip.	30513158	
Rotating fixture	Order No.	
With this fixture the tool can be continuously rotated in the v-block.	30525824	
Adjustable stop	Order No.	
The adjustable stop is suitable for different length tools.	30468273	
Rotating pivoting fixture	Order No.	
For the rotation and pivoting of tools and workpieces from 0°-90° as required. The fixture can be mounted on the baseplate and can be equipped with a HSK63 adapter or chuck.	30460763	
Chuck	Order No.	
Tools such as drills or milling cutters can be clamped quickly and straightforwardly.	30460771	
Quick-release clamp for HSK63 connection	Order No.	
Tools with HSK63 connection can be clamped quickly and straightforwardly.	30331776	
Additional monitor bracket	Order No.	
An additional monitor for viewing drawings or for viewing the measurement report can be integrated using the additional monitor bracket.	30560131	



UNITEST-MQL

Testing MQL tools

The subject of energy efficiency is on everybody's lips. Along with the end products – such as vehicles – the production facilities in the metal-machining industry must also be optimised in relation to energy efficiency.

A proven means to this end is to change the machining to minimum quantity lubrication (MQL). Energy savings of 20-30 % can be achieved, as the units necessary to supply the cooling lubricant are not required. To check fully automatically in advance for the optimal functionality of the MQL tools, MAPAL offers the UNITEST-MQL.

Many customers check their MQL tools directly on the machine tool. To be able to save this time during machining, the MAPAL UNITEST-MQL allows the check to be carried out away from the machine. During the fully automatic test cycle, an oil and air mixture suitable for the intended machining process is sprayed onto a test surface for predetermined spraying times and the result documented. The spray pattern for each cooling channel bore is assessed and compared with evaluation criteria defined by MAPAL. If the individual spray patterns differ, the tool can be cleaned, adjusted or immediately withdrawn from the production process.

UNITEST-MQL

Technical features of UNISET-MQL

1 Extraction system
The optional extraction system prevents the oil mist spreading all over the interior of the test stand. In this way the ambient air for the machine operator is cleaner, while the effect on the measurement results is minimal.

2 Housing
The housing for the test stand has an aluminium profile. The windows including the sliding window are made of Plexiglas.

3 Control panel
The automatic test cycle is initiated via the control panel.

4 Tool adapter
The MQL tool is clamped in the tool adapter and supplied with an oil-air mixture via the adapter for the test cycle. Optionally, the tool adapter is available in different HSK designs.

5 Angle bracket
The test sheet is fastened to the angle bracket and sprayed with an oil-air mixture for the test cycle. The angle bracket can be pivoted by 90°.

Application example

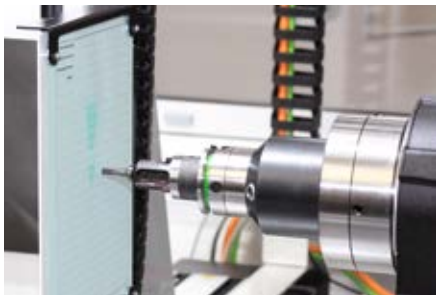
Preparing a spray pattern

An MQL tool for valve seat machining is checked to ensure the cooling channel bore is clear. During fixed test cycles, a spray pattern for each cooling channel bore is prepared based on defined evaluation criteria.

1 In the first step it is checked in the tool drawing whether the tool has axial or radial cooling channel bores. As in this example, the cooling channel bore is arranged axially, the operator selects the axial spraying option on the control panel for the UNITEST-MQL.

The system also prompts for the key data on the tool, for example the diameter, the amount of oil for the tool, the spraying time or the number of cooling channel bores.

2 Then the tool is clamped in the tool adapter in the UNITEST-MQL. Here the features and function of the adapter are similar to the adapters in the machine tools.



3 In this case the test sheet is aligned with the axial MQL tool and moved into place. The fully automatic test cycle now starts. During this cycle, for example, a linear movement is made to circumvent the delay on the emission of the oil-air mixture from the tool.

4 After the completion of the spraying process, the spray pattern is evaluated. If the spray pattern lies within the defined tolerance, the tool can be used until the next test cycle. For a required/actual comparison, the actual spray pattern is compared with the standard pattern for the tool. In this way spray results can be checked and evaluated more easily.

FEATURES

- Fully automatic test cycle with four machine axes
- Testing of MQL tools with 1-channel or 2-channel systems
- Tools with axial and radial cooling channel bores can be tested
- Test results in the form of a spray pattern
- Different tool adapters possible (HSK connections)
- Machine controller Siemens 840D sl

ADVANTAGES

- Testing MQL tools under conditions similar to those on the machine
- Time and cost saving: no downtimes due to checking the MQL tools on the machine tool
- Early detection of tools with reduced quality of the cooling channel bore
- Tool can be cleaned or replaced in good time
- Prevention of damage to the tool and part
- Determination of the time taken for the oil-air mixture to reach the insert

Options for individual configuration

The UNITEST-MQL requires an MQL system. This generates the necessary pressure to be able to spray the test sheet with the oil mist. Along with the existing standard versions, the MQL system can be adapted to individual customer requirements.

MQL 1-channel system

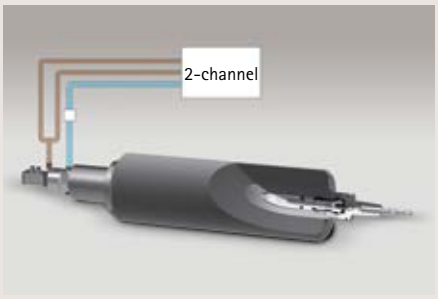
NOTE:
At least one hydraulic system must be selected, combinations are possible.

- MQL unit tank capacity of ten litres for one oil type
- Pneumatic unit
- Control device
- Rotary feed-through
- Shut-off valve

MQL 2-channel system

NOTE:
At least one hydraulic system must be selected, combinations are possible.

- MQL unit tank capacity of ten litres for one oil type
- Pneumatic unit
- Control device
- Rotary feed-through
- Lance
- Shut-off valve



Extraction system

The extraction system ensures the ambient air is pure and the interior is not soiled.

MQL pressure booster

The pressure booster makes it possible to discharge the oil mist at a higher velocity. If a higher pressure is used in machine applications, the pressure booster can be used to create comparable conditions for testing the MQL tool.

Accessories

Tool clamping

NOTE:
At least one clamping system must be selected. Clamping systems are interchangeable.

Automatic tool change
Diagonal clamp for manually clamping tools:
- For automatic tool change
- For tools with HSK-A coolant tube

Diagonal clamps	Order No.
Diagonal clamp HSK50 incl. flange	30405275
Diagonal clamp HSK63 incl. flange	30288568
Diagonal clamp HSK80 incl. flange	30288566
Diagonal clamp HSK100 incl. flange	30288564

Manual tool change
MQL clamping cartridge for manually clamping tools:
- For manual tool change
- For tools without HSK-A coolant tube

MQL clamping cartridges	Order No.
MQL clamping cartridge HSK50 incl. flange	30405277
MQL clamping cartridge HSK63 incl. flange	30403416
MQL clamping cartridge HSK80 incl. flange	30403418
MQL clamping cartridge HSK100 incl. flange	30403419

Range of test pins

For checking the diameter of the cooling channel on the tool.

Variant	Order No.
0.5 - 1 mm (0.1 mm steps)	30497715
1.2 - 1.8 mm (0.2 mm steps)	30497716

Oil measuring kit

For checking the amount of oil for MQL 2-channel systems
- Set with case and accessories
- Horizontal version
- Digital version
- Measuring kit including HSK-A63 adapter

	Order No.
Oil measuring kit	30478451

Tool holders for oil measuring kit

Adapters	Order No.
HSK-A80 adapter	On request
HSK-A100 adapter	30345906

UNIBASE-M

CONTROLLED TOOL DISPENSING, CONTINUOUS INVENTORY MONITORING

Dispensing and managing using UNIBASE-M


MAPAL

UNIBASE-M

Controlled dispensing and managing

The UNIBASE-M automatic tool dispensing system stands for optimal storage and management of tools, components and accessories. The UNIBASE-M ensures quick, efficient and controlled article dispensing and has many innovative, user-friendly characteristics. With the dispensing limit it is possible to ensure even greater security in relation to stock differences and incorrect withdrawals. Starting from a basic module with a computer unit, the so-called master cabinet, UNIBASE-M can be individually configured to suit the requirement profile.

UNIBASE-M

Technical features of UNIBASE-M

1 Monitor
Using the 22" touchscreen monitor and the tool software, article management can be undertaken clearly and directly.

2 Master cabinet
The master cabinet is the basic module of the UNIBASE-M and includes the monitor and the computer unit for automatic tool dispensing.

3 Barcode scanner
For quick, straightforward searching or stocking, the tools can be read conveniently using a barcode scanner. Alternatively, system logon by barcode is also possible.

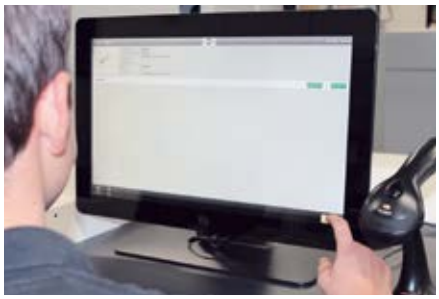
4 Expansion cabinet (slave unit)
The expansion cabinet is part of the UNIBASE-M. The drawer divisions can be configured as required so that different articles can be stored. Up to 30 expansion cabinets can be added.

Application example

Dispensing articles
A tool stored in UNIBASE-M is dispensed by a user with withdrawal and return rights.

1 First the user logs onto the system securely using his RFID chip. In this way all withdrawals and returns are automatically logged to the user's name.

2 As a barcode for the tool is already saved in the article master in the system, the barcode for the related tool can be read conveniently using the barcode scanner. The tool is then found directly in the system, displayed on the monitor and selected.



3 The tool quantity required is entered on the monitor. The situation is the same with other defined withdrawal information, such as the cost centre for the user making the withdrawal. Immediately after that the tool is dispensed at the press of a button.

4 The drawer for the tool required opens automatically avoiding tedious searching among the drawers. The related drawer number and the compartment number are indicated graphically on the monitor for quick orientation. The user can now open the drawer fully and remove the tool.

SOFTWARE FEATURES

- Automatic, continuous inventory monitoring
- Connection to customer network or ERP systems
- Cost centre management (part, machine)
- Graphical display of drawer division

More software features from page 102.

FEATURES

- Simple commissioning and robust design
- Practical withdrawal by ejecting the appropriate drawer; software provides graphical display
- Dispensing limit for selective withdrawal of individual parts
- Integrated evaluation features for effective procurement management
- Compatible with existing storage systems
- Communication with tool management and ERP systems, tool pre-setting devices and storage systems

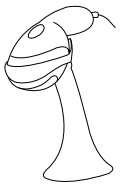
ADVANTAGES

- 24-hour tool availability
- Automatic tool dispensing
- Simple and intuitive to use
- Continuous inventory monitoring
- Cost transparency due to cost control and cost reduction
- Individual customer assessments are automatically sent to defined groups of persons
- Multiple supplier support
- Process optimisation (procurement effort/order processing)
- Easy to maintain due to electronic units

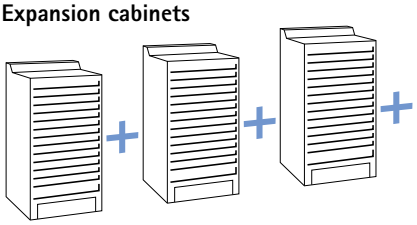
Options for individual configuration

The configuration options for the UNIBASE-M offer enough freedom for completely individual system configuration or system expansion. Expansion cabinets, software and interfaces are available for selection in various basic versions. So that the individual components in a system environment are perfectly matched to each other, an individual system configuration is recommended.

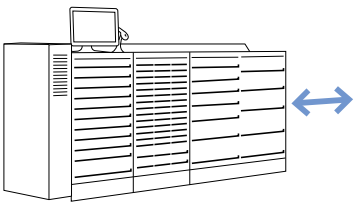
Barcode scanner



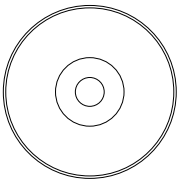
Expansion cabinets



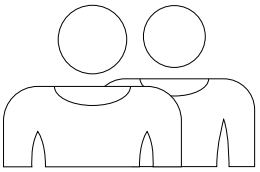
Interfaces



Software



User logon



Expansion cabinets

MAPAL offers not only a standard programme of expansion cabinets, but also the possibility to configure the cabinets exactly as required.

The number of drawers and drawer height can be configured to suit individual requirements. Later expansion at the customer is also easy to implement.

Standard designs:

Cabinet features	Expansion cabinet with 13 drawers	Expansion cabinet with 54 drawers	Expansion cabinet with 90 drawers
			
Number of drawers x drawer height	12 x 75 mm	48 x 50 mm	80 x 50 mm
	1 x 150 mm	6 x 100 mm	10 x 100 mm
Housing dimensions (WxDxH)	717 x 750 x 1,390 mm	717 x 750 x 1,390 mm	1,159 x 750 x 1,390 mm
Load-bearing capacity per drawer	75 kg	25 kg	25 kg
Useful height	1,050 mm	1,000 mm	1,000 mm
Storage area	4.68 m^2	4.63 m^2	7.72 m^2
Dispensing limit	–	✓	✓

Individual drawers for master cabinet and expansion cabinet

	Drawer width	Drawer height	Drawer steps	Useful height
	612 mm (wide)	75 - 300 mm (variable)	25 mm	1,050 mm
	153 mm (narrow)	50 - 200 mm (variable)	25 mm	1,000 mm

Software and interfaces

UNIBASE-M includes a tool management software application. It is possible to expand the software or the interfaces at any time, also retrospectively. In this way the tool dispensing system can also be integrated into existing working environments.

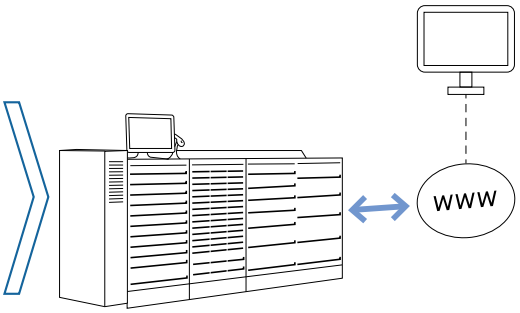
A wide range of interfaces ensures the smooth integration of the UNIBASE-M into the system environment – with other UNIBASE-M, existing facilities and ERP systems.

Examples for software and interfaces

Software for external administration

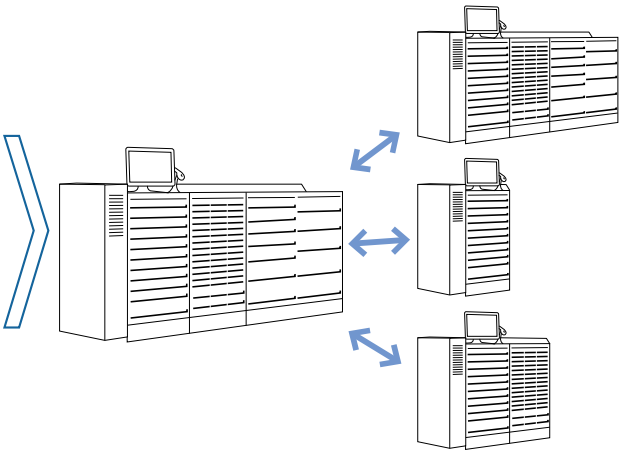
The software for the UNIBASE-M makes it possible to maintain the master data via a web interface. All settings on the system can be made from the user's own workplace. One software licence is required per user.

Advantages and possibilities of external administration:
- Several users can access the system at the same time.
- Articles can still be withdrawn and stocked on the UNIBASE-M while external administration is in progress.
- No additional software is required for external administration.



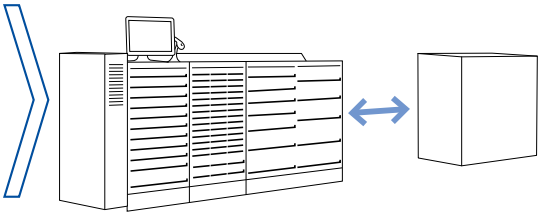
Interface to other UNIBASE-M

If there are several UNIBASE-M, the interface ensures the cabinets are networked without problems. In this way the article master data are maintained only once in a master system and automatically transferred to the other UNIBASE-M. User-defined configurations of the interfaces can be realised with the aid of a requirement profile.



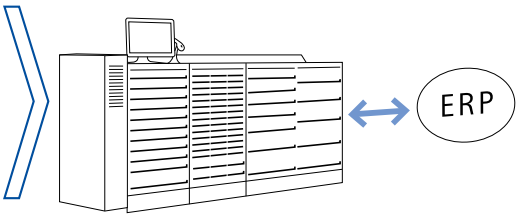
Interface to existing systems

Existing devices from other manufacturers, for example paternosters, are connected to the UNIBASE-M cabinet system. The existing master data from the old system are adopted during this process.



ERP interfaces

Numerous variants are available for connection to an ERP system. Here, above all, the inventory synchronisation and the transmission of master data play an important role so that two systems do not need to be maintained separately.



Accessories

1D barcode scanner
For scanning barcodes.

	Order No.
1D barcode scanner	30551669

2D barcode scanner
For scanning barcodes and 2D codes, for example QR codes.

	Order No.
2D barcode scanner	30607281

User logon – readers
The user can log on to UNIBASE-M using an RFID chip or a fingerprint system. All common RFID standards are supported.

	Order No.
RFID reader 1 - Admitto 1200	30599972
RFID reader 2 - Admitto 3100	30604647
RFID reader 3 - Admitto 2000	30604649
USB fingerprint reader	30606059

Additional cables
Additional cables for adding cabinets on both sides of the master unit or for installing cabinets variably. For this purpose cables are available for the supply of power and data transmission.

Cables for supply of power

Cable length	Order No.
3 metres	30610211
5 metres	30610212
7 metres	30610213

Cables for data transmission

Cable length	Order No.
3 metres	30610214
5 metres	30610215
7 metres	30610216

Monitor
Monitor permanently fastened to the housing.

	Order No.
Monitor	30619253

Arrangement material for large drawers
Standard arrangement material for large drawers for dividing the drawers into nine compartments.

Drawer height	Order No.
50 mm	30638414
75 mm	30638416
100 mm / 125 mm	30638420
150 mm / 175 mm	30638422
200 mm	30638426
250 mm	30638428
300 mm / 400 mm	30638429

Licence for external administration
A licence is valid for one user.
An additional installation is not necessary.

	Order No.
Licence for external administration	30600938

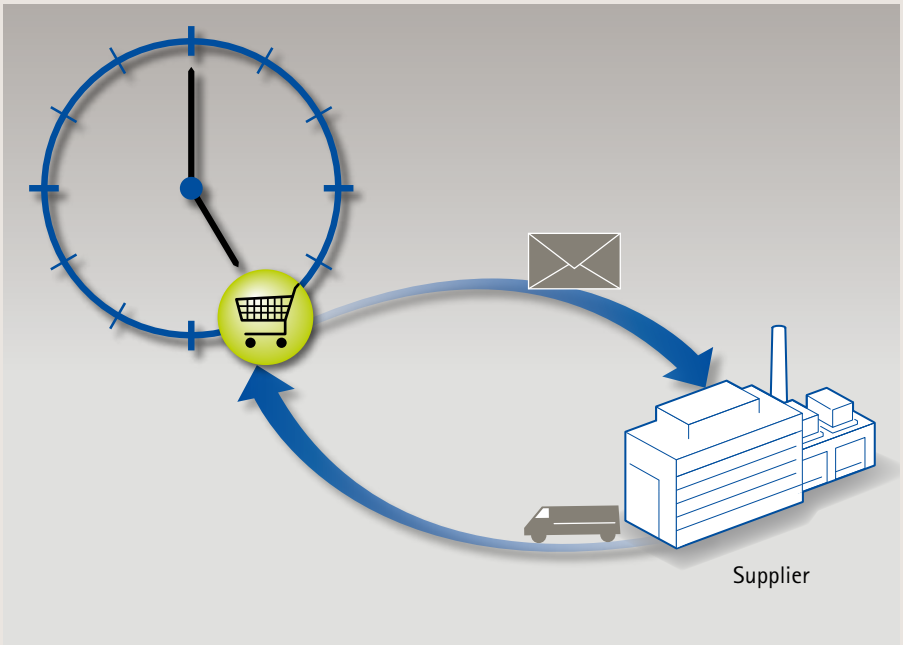
Interface licence to other UNIBASE-M
One licence is valid for one controller.

	Order No.
Interface licence to other UNIBASE-M	30604686

Software UNIBASE

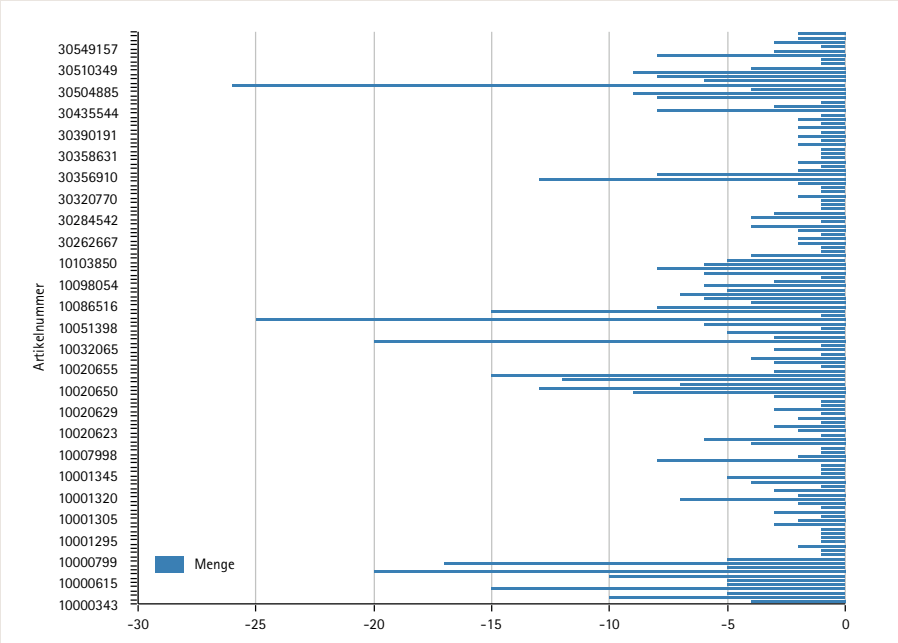
For day-to-day work on the management of the storage of articles, the software application UNIBASE offers a particularly high degree of ease of use. The management of the master data is ensured around the clock. The master data can be viewed and edited very clearly on an external PC via a network connection. It is possible for another person to stock the UNIBASE-M with articles or for the UNIBASE-M to dispense articles at the same time. Changes and modifications to the software can be realised flexibly to suit the specific application.

Some of the software features in detail



Automatic and continuous inventory monitoring

Depending on the article, a re-order level can be saved that, if the stock drops below this level, an order is automatically triggered. The order e-mail is sent daily at a configurable time either to the procurement department, or directly to allocated suppliers.



User-specific and comprehensive evaluation features

The system user can configure individual evaluations. Here the user can make use of comprehensive internal database tables. In this way lists on the inventory, user lists and bookings can be outputed as tables sorted, grouped by user-defined criteria, among other ways. For an improved overview these evaluations can be supplemented with diagrams. The reports can be prepared as CSV, PDF or Excel files.

If required, the evaluations are generated automatically at freely configurable intervals and can be saved or sent by e-mail.

Software Features

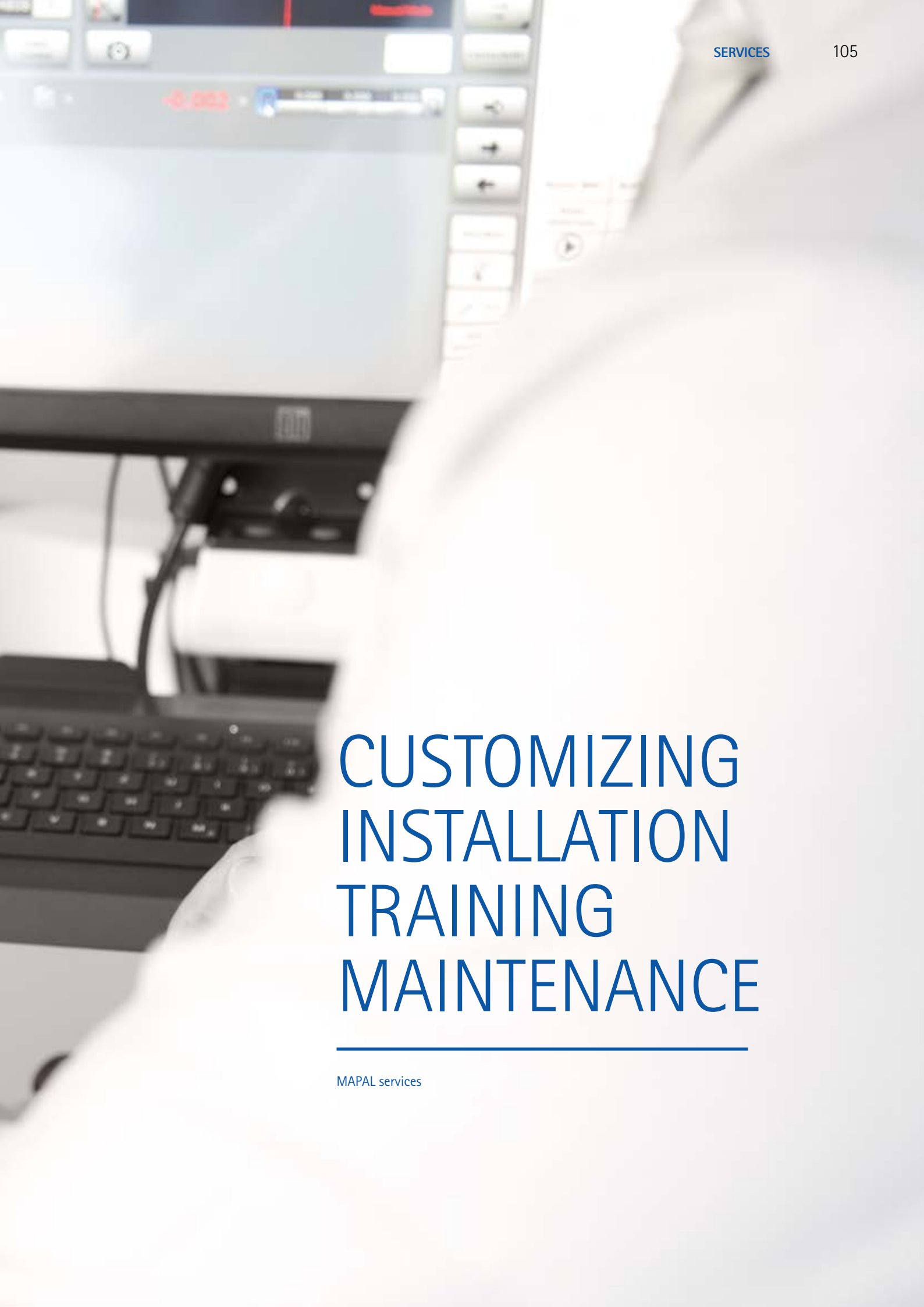
- Multi-lingual user prompts as well as multiple supplier support
- User-defined article selection and limiting of the article withdrawals
- Connection to the customer network or ERP system
- Management by customer or supplier
- Documentation of the articles (for example from PDF or JPG file)
- Tool life tracking
- Management of equipment on loan and measuring equipment
- Option for re-grinding management or key management
- Parts list management and shopping basket functionality
- Stock management for manual storage
- Serial number management with tool life and reason for changing
- Display of the article as picture or graphic
- Graphical display of drawer division

Barcode article identification

After the selection of one of the functions, for example stocking, removing stock, or return, a list of possible articles is displayed to the operator. This list can be searched manually and the related article selected. However, this search is quicker and more accurate using a barcode. If a barcode is scanned when the list appears, the article for which this barcode number is saved is displayed and can be selected directly. All standard barcodes are read.

Convenient addition of re-ordered articles using replenishment job

Optionally a replenishment job can be prepared for each order. On goods receipt, completeness can be checked and the UNIBASE-M filled quickly by a member of the service staff. The complete process aims for continuous article availability.

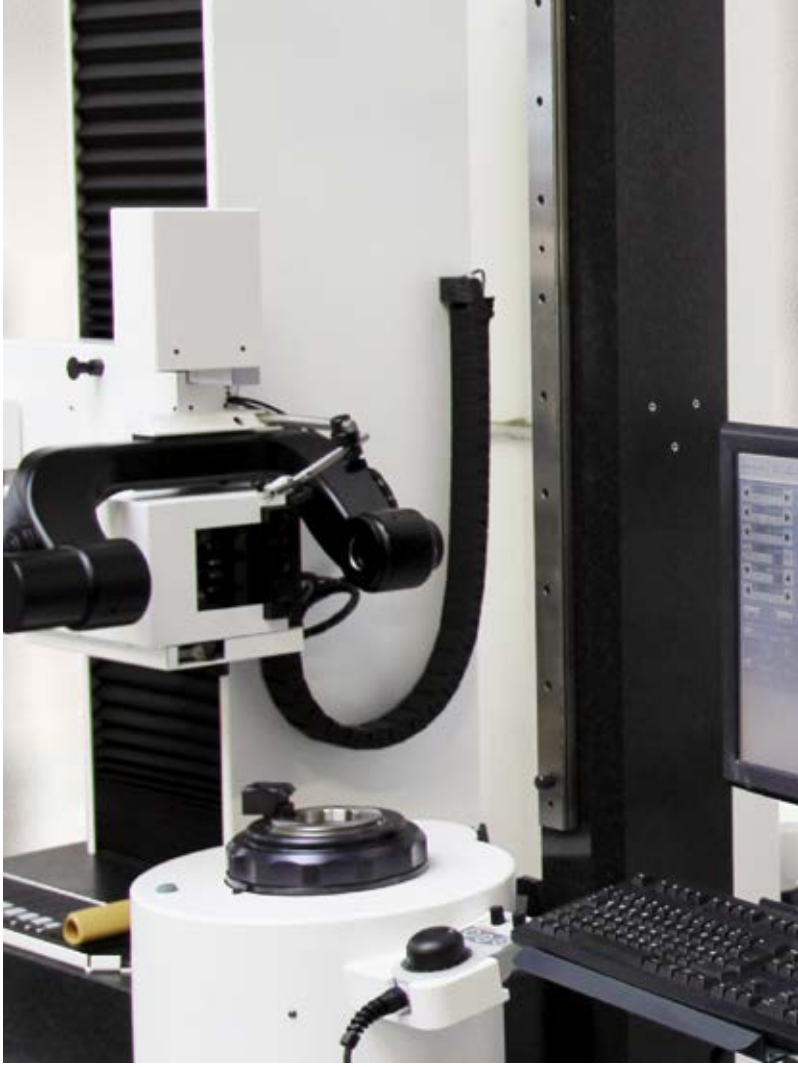


CUSTOMIZING
INSTALLATION
TRAINING
MAINTENANCE

MAPAL services

SERVICES

MAPAL offers comprehensive services for all devices from the areas of setting, measuring and dispensing. Starting with advice on the selection of the device, through installation and training on-site, to regular preventive maintenance and servicing - MAPAL is always ready to provide support with service solutions.



Customizing

In the areas of setting, measuring and dispensing, MAPAL offers comprehensive advice on the complete product portfolio. During initial conversations, requirements and wishes are recorded so that a product that suits the specific needs can be offered. In this way the customer can implement his continuously growing requirements to a consistently high quality standard.

- Modular design of the devices permits individual product configuration.
- Customer-specific manufacture and modifications.
- Measuring tasks for setting fixtures can also be expanded retrospectively in the areas of "hardware" and "software".

Installation

Qualified service personnel undertake the comprehensive installation of the hardware and software components on-site. During this process specific settings are tailored to the customer. For example, during the installation of setting fixtures, measuring data from other fixtures can be transferred to the software application UNISET.

- Reporting and definition of measuring, setting or order data during device commissioning.
- Possibility of measuring equipment capability check using the Cg/Cgk, CMR or R&R methods to demonstrate whether tools can be measured to the required tolerance.

Training

With its "training" service, MAPAL offers comprehensive training courses and further training courses for the efficient usage of MAPAL products. Training courses can be held on-site or at MAPAL as required.

- Defined training course packages for
  - Programmers
  - Specialist personnel for tool setting
  - Administrators

Maintenance

To plan servicing and maintenance dates to suit the customer and to keep the service costs as low as possible, an individually adaptable maintenance contract can be concluded. The service team checks the devices at a defined inspection interval. Free software updates are also installed during the annual maintenance or remote maintenance.

- Software expansions
- New developments and rectification of problems

- Service hotline
  (Mo.–Fr. 7:00-17:00)
  Tel. +49 7361 585 3636
  E-mail: service-ms@de.mapal.com

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