



MORA

measuring
technology



ENGLISH

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Innovative, quality-conscious and customer-orientated: This is **MORA** and this for more than 100 years.

MORA, founded in 1909 by Stefan Morhard and Franz Freund, has now been contributing to the maintenance and improvement of the quality standards of products for more than hundred years. From its beginnings with the production of simple measuring instruments, such as height gages and scribing tools, MORA has become established as one of the leading innovators in measuring technology.

MORA possesses modern fabrication facilities, which enable us to produce ourselves the essential components of our measuring machines and so we can guarantee uncompromisingly their quality.

MORA measuring machines characterize themselves by their robust construction and high-precision performance and are equally suitable for use in both workshops and laboratories.



Fully hardened, chromium-protected guide rails ensure long-term measuring accuracy. The electronic measuring scale systems are of non-contact type and are therefore wear-free. An anti-fall securing system for the Z motion, implemented by means of a patented cable-breakage safety system, protects both man and machine.

Already in the eighties MORA developed its own software in trying to offer to the customer a complete package and in 1999 the company founded its own software subsidiary company Inspect3D.

In the nineties MORA concentrated on developing layout measuring machines to milling machines. With the Studio Mill and Gantry Mill marks were set worldwide. The future belongs to the innovative measuring methods multisensor and optical measuring. With the FOCUS and QUANTUS series the complete range of the newest measuring technology can be offered to the customers.

In November 2009 out of MORA Fabrik für Messgeräte H. Freund GmbH resulted MORA-AEH Metrology GmbH. The production of measuring and milling machines continues unchanged at the location at Aschaffenburg.

We feel strong for the challenges of the future and are glad to assist to our customers with customized measuring systems.

MμTos

MμTos is a premium class column type measuring machine which was designed for large measuring volumes of industrial metrology. Due to the powerful drive technology, MμTos both possesses a maximum performance and provides highly precise measuring results. In combination with big objects to be measured, an optimum of accessibility is reached due to installation at ground floor level with covers accessible for cars. Measuring machines can be delivered in duplex version to enlarge the volume to be measured. The completely encapsulated guideways permit use in production without any problems.

measuring ranges and accuracy

	X / length	Y / width	Z / height
from	2.200	1.200	1.600
to	9.200	2.500	3.500
accuracy	$20 + L / 100 \leq 60 \text{ *)}$		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.



Layout measuring machines

Profi

MORA Profi indeed is a professional measuring instrument if you have to cope with universal and precise measuring tasks. Whether it is laterally mounted at the measuring plate or whether it is running on the measuring beam as base machine, you can apply the type Profi with its different X-axes-guide way systems everywhere you want. Guide way systems on roller bearings provide precise movement in all axes. Most precise measuring results and always repeatable measuring cycles will be reached by the innovative drive and CNC-technology in combination with the evaluation software INCA 3D.



measuring ranges and accuracy			
	X / length	Y / width	Z / height
from	1.000	800	1.000
to	any	2.500	3.000
accuracy	16 + L / 100 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.

Assistant

Due to its lightweight construction and its ergonomic operation, our type Assistant is the ideal companion for workshop operation, where it is a matter of manual measuring or marking out. The precise guide way systems on roller bearings will always guarantee accurate measuring results or the exact marking out. There is no problem to upgrade the Assistant from marking out machine with serial digital readout to universal measuring machine with evaluation software INCA 3D.



measuring ranges and accuracy			
	X / length	Y / width	Z / height
from	1.000	600	800
to	any	2.500	3.000
accuracy	30 + L / 50 = 100 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.

Bridge type measuring machines

Primus

Our new bridge type measuring machine Primus is the result of intensive development efforts on the basis of most modern engineering technology. A completely new machine conception in lightweight construction with improved highly dynamic engines is enabling a technically innovative measuring machine of the newest generation.

Primus is connecting higher accuracy with improved dynamic engines in a contemporary design. The enclosed guide way components guarantee dirt-resistance together with a compact machine construction. Depending on the required measurement, the machine type Primus is applied in standard or higher accuracy.



measuring ranges and accuracy

	X / width	Y / length	Z / height
from	500	600	400
to	1.500	8.000	1.500
accuracy	2,2 + L / 300 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.

Primus HA

The Primus-HA series stands for high-precision measuring technology produced by MORA measuring machine. Precise measuring results will be guaranteed due to high inherent rigidity and robust cross sections. The machine conception of the Primus-HA series with automotive measuring table and rigid construction of the bridge type portal is eliminating even minimal kinematical interfering influences. Powerful engines provide maximum dynamics between measuring points and during the measuring cycle.



measuring ranges and accuracy

	X / width	Y / length	Z / height
from	700	800	600
to	1.200	1.500	1.000
accuracy	1,2 + L / 400 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.

Primus M

Primus M is standing for manual measuring in connection with ergonomics and usability. This series for small and middle-size workpieces enables the customer the entrance into the coordinate measuring technique to an excellent cost/performance ratio.



measuring ranges and accuracy

	X / width	Y / length	Z / height
from	500	600	400
to	800	1.000	700
accuracy	3,0 + L / 250 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.

Bridge type measuring machines



Primus L/XL/GT

A technically mature guiding system, based on air cushion and including optimal guide way characteristics, distinguishes the large type series of the Primus family produced by MORA. Consistent materials out of granite are ensuring a steady thermal behavior of all 3 guide way axes.

The demand of highest possible accuracy at maximum dynamic requires an optimum stability/moved mass-ratio. It is the basis of the different bridge type construction of the machine types Primus-L/-XL and -GT. The experience gained at a great number of realized big projects was playing a decisive role at the new development of this machine conception.

measuring ranges and accuracy Primus L

	X / width	Y / length	Z / height
from	1.200	1.500	1.000
to	1.500	3.500	1.200
accuracy	3,0 + L / 250 *)		

measuring ranges and accuracy Primus XL

	X / width	Y / length	Z / height
from	1.500	2.000	1.500
to	2.500	8.000	2.000
accuracy	5,0 + L / 200 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.



measuring ranges and accuracy Primus GT

	X / width	Y / length	Z / height
from	2.500	3.000	1.800
to	3.500	10.000	3.000
accuracy	5,5 + L / 1.000 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.

Pico

Pico – for Productive Measuring

A highly precise linear guide way system combined with highly dynamical engines make Pico the ideal measuring place in the production area. The complete housing of guiding elements as well as a compensation of thermal fluctuations provide maximum protection against detrimental effects due to production. An air-conditioned room won't be required. Due to its compact construction, there will be a room for Pico nearly everywhere.

measuring ranges and accuracy

	X / width	Y / length	Z / height
	600 – 1.000	500	400
accuracy	3,0 + L / 350 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.

Production measuring machine



Quantus

The multi-sensor machine Quantus is the result of intensive development work. It provides the possibility to measure your objects with most different measuring systems. Tactile, scanning, optical or via laser scanner – the multi-sensor machine Quantus can solve any measuring task due to most modern control technology and innovative measuring software.

measuring ranges and accuracy

	X / width	Y / length	Z / height
from	300	200	150
to	500	500	300
accuracy	1,0 + L / 300 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.

Multisensor measuring machine



Focus

The common feature of the optical measuring instruments of the Focus series is a highly-precise working measuring system in compact construction. The type Focus is an effective 2D measuring device for picture measuring due to its optics in high quality and easily comprehensible operation.

measuring ranges and accuracy			
	X / width	Y / length	Z / height
from	200	100	100
to	300	200	150
accuracy	1,0 + L / 100 *)		

*) The mentioned accuracy is valid for the smallest measuring range and if the following specification is met: an ambient temperature of 18 - 22° C.

Optical measuring machine



Rotarus

In gearing technology, high precision and effective measuring software are especially required. The gear measuring center Rotarus will meet highest requirements with regard to accuracy and user-friendly operation. No matter whether you have spur gears, bevel gears, worm gears, etc. — Rotarus together with the upgradable software package AC Gear will cope with your needs in gearing technology.

Gear measuring machine



MORA Milling Technology

MORA Milling Technology combines the possibility to measure, digitize and later on parallel process your 3D-model in one single device. MORA Milling machines have been especially developed for processing soft materials such as clay, hard and soft foams, polystyrene and similar materials. MORA Mill conception distinguishes itself by a solid machine con-

struction combined with high flexibility of milling resp. measuring systems as well as maximum insensibility against dirt. Different versions of boring and milling heads as well as efficient software packages for digitizing or measuring make your MORA Mill a universal center in design or model making.

Studio Mill-3

- Up to average model size
- 3-axes milling technology
- CNC or manual operation



working ranges and accuracy

	X / length	Y / width	Z / height
from	any	600	800
to		1.900	3.000
accuracy	on request		

Studio Mill-5

- Big model sizes
- 3-axes and 5-axes milling technology
- 3-in-one: measuring-digitizing-milling in one system
- Complete housing of the machine



working ranges and accuracy

	X / length	Y / width	Z / height
from	any	1.400	1.000
to		1.900	3.000
accuracy	on request		

Gantry Mill

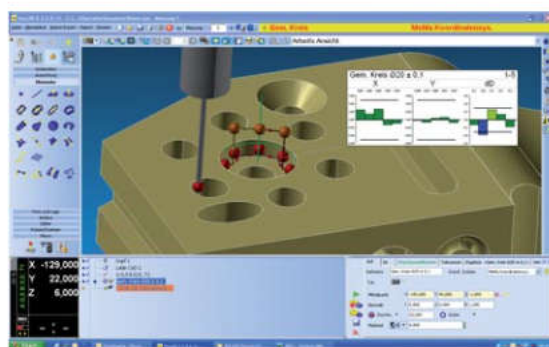
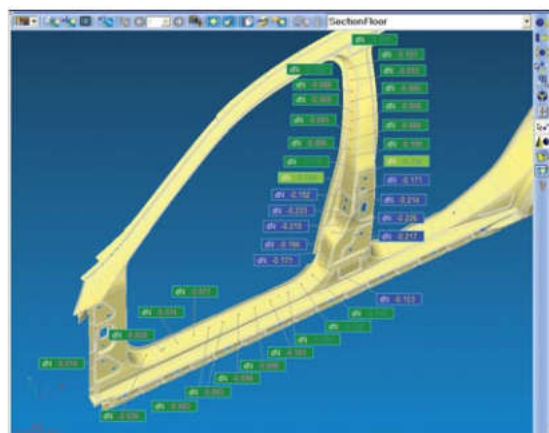
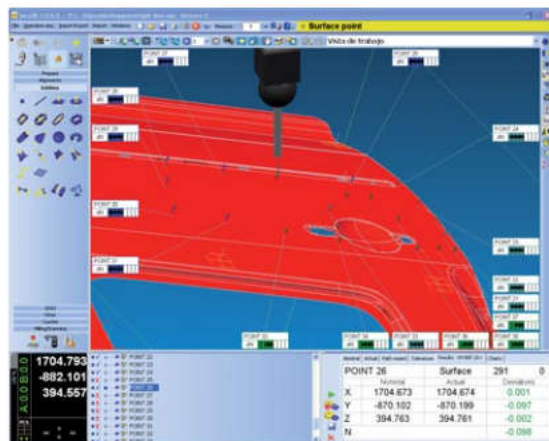
- Gantry design for maximum model sizes
- 3-axes and 5-axes milling technology
- 3-in-one: milling-scanning-measuring in one system



working ranges and accuracy

	X / length	Y / width	Z / height
from	any	2.500	1.600
to		3.500	2.500
accuracy	on request		

Clever Measuring



AC-DMIS™

Modern measuring technology makes a considerable contribution to reduce costs and increase quality. The efficiency of these attributes is even improved by software which is easy to operate and which, at the same time, is able to solve any measuring tasks.

Therefore, the conception of our software is as follows:

- User friendly desktop with modular structure
- Measuring of geometry and free formed surfaces in one measuring program
- Manual, CNC, Online, Offline, N-Plex
- Graphical programming and display of the different measuring steps
- Direct CAD interface (IGES, VDA, CATIA, PRO-E.....)
- Label and report editor for customized reports
- Statistical evaluation and form and position
- Great number of output formats which can be created individually
- Tactile, scanning optical probe systems
- Changer magazines, continuously adjustable pivoting and swiveling units, rotary tables
- Connection with measuring devices (measuring machines, measuring arms, laser tracker, ...)
- DMIS I++
- Milling, boring, marking out, digitizing
- Special functions : pallet measuring, programming functions, pipe measuring program



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