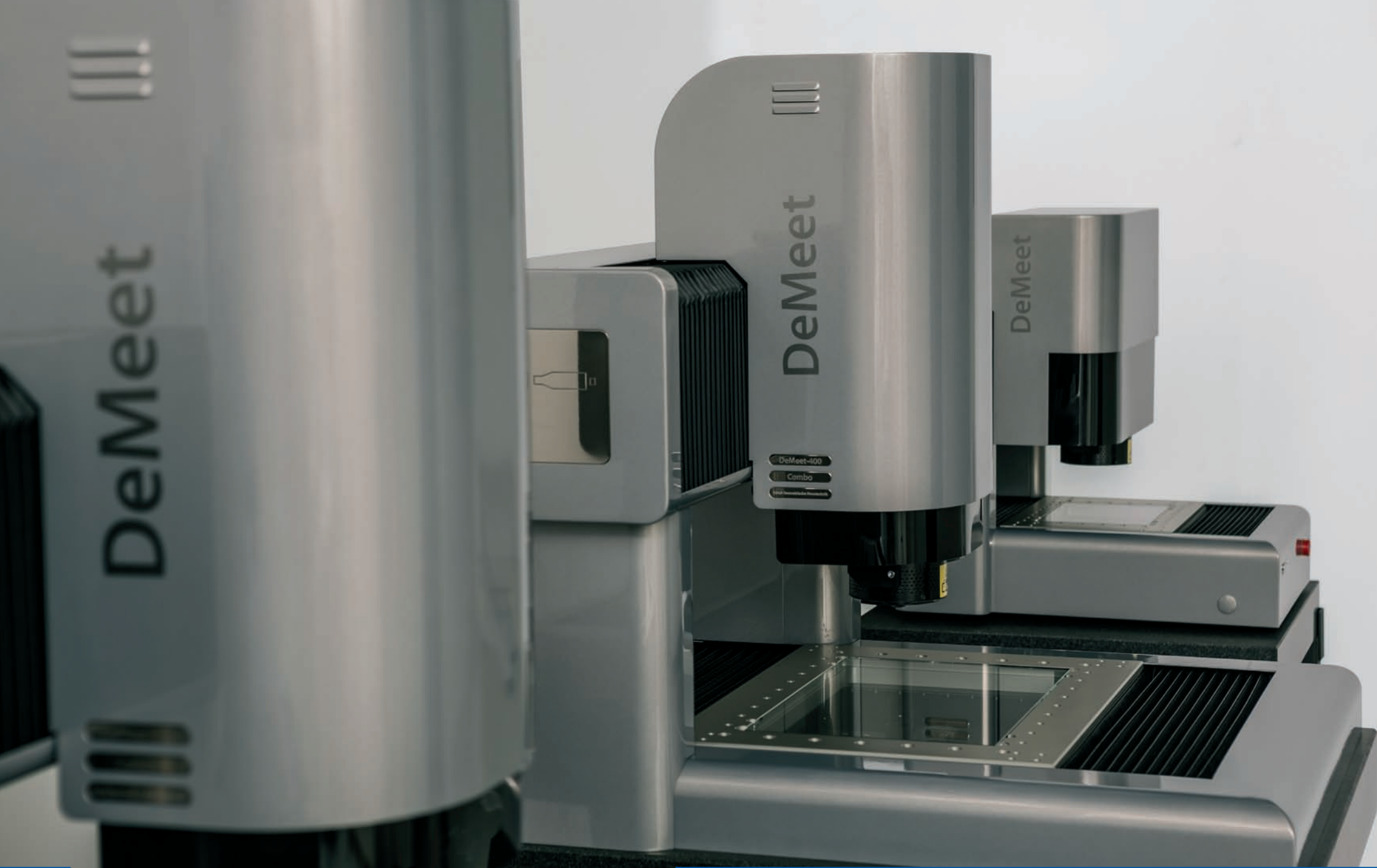




DeMeet

3D CNC Coordinate Measuring Machines

SCHUT.COM





DeMeet coordinate measuring machines

The DeMeet 3D CNC coordinate measuring machines provide automatic, user-independent quality control with measuring results traceable to the international length standard. The DeMeet measuring machines are available in Video (optical) and Combo model (multi-sensor for combined video and touch probe measurements).

The DeMeet multi-sensor measuring machines are an excellent all-in-one alternative to other measuring devices for example a measuring microscope, profile projector and height gauge. With an excellent price-performance ratio the DeMeet measuring machines enable high precision quality control in measuring laboratories as well as on the production floor. Applications of optical and multi-sensor measuring are among others in the precision engineering, medical, plastics and electronics industry.



Measuring range

Video and Combo measuring machines for general quality control with a market-matched measuring range. The DeMeet-220 is developed as a personal measuring machine with a desktop design. For the inspection of larger products or for batch measurements the DeMeet-400 series are allround measuring machines, with the DeMeet-705 at the top of the range.

Design and quality

The application of quality components made by Schut and by well-known, specialized manufacturers ensures excellent performance and high accurate measurements.

With the new design of the DeMeet measuring machine series no concessions have been made to accuracy and reliability. The new visually screwless cover design provides a better protection in the production environment and is highlighted with nickel-plated aluminum details which can be personalized. The open design of the DeMeet allows for easy operation and loading of the machine from all sides.

The accuracy of the DeMeet measuring machines is guaranteed by a CAA 3D correction model (Computer-Aided Accuracy, error compensation).



Machine construction

The DeMeet 3D CNC coordinate measuring machines are designed with a proven fixed bridge construction and moveable measuring table for high accuracy and accessibility. The completely covered drive system and integrated damping make the DeMeet machines very suitable for inline measuring on the production floor.



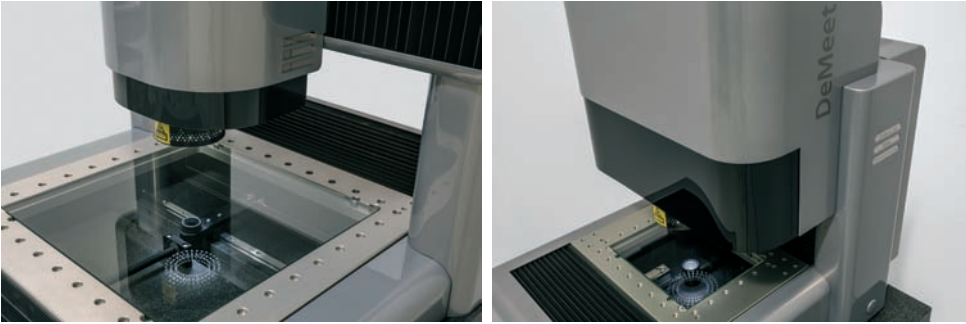
The construction is a granite base plate with accuracy grade according to DIN 876/00, placed on well positioned shock absorbing points and resting on a welded base frame (for the DeMeet-220 the base plate is flat grinded cast iron). The XYZ base structure for the THK precision preloaded caged ball linear guides is made from extremely tension relieved, flat grinded cast iron, as the basis for a mechanical accurate construction. The axis drive system consists of Faulhaber high torque DC servo motors, TFE coated Kerk lead screws and Renishaw TONIC optical linear encoders with low sub-divisional error. The measuring table is made of tension relieved, wear-resistant, nickel-plated steel, with a mounting hole pattern for product fixtures and a flat aligned glass plate. The video model consists of a DeMeet camera with a Sony sensor and a telecentric optical system. In addition to the optical system the Combo model is equipped with a Renishaw touch probe system.



Optical measurements

Optical measurements are performed using the camera system, optics and adjustable illumination. Due to the non-contact nature of the measurements there is no risk of product deformation. Optical measuring is very suitable for products with fine structures and contact sensitive products.

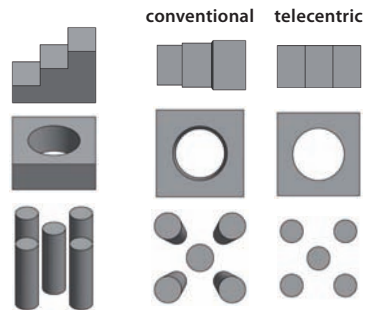
Another advantage of optical measurements is that edge information can be defined directly with high density of measuring points. Within the field of view of the DeMeet a very high accuracy can be achieved.



Optical system

A combination of high quality telecentric optics and DeMeet Sony sensor camera is integrated for a clear image with an excellent contrast and a high resolution. In combination with the image processing functionality of the DeMeet, this results in highly accurate measurements.

Telecentric optics are supplied as a standard to avoid perspective image distortion around the center of the field of view. The DeMeet is either equipped with Nikon, Leica-Design or Mitutoyo optics with a large working distance for a brilliant image with high contrast providing optimal edge detection. The lenses with various magnifications from 1x to 10x are available and can be exchanged during a measuring run, generating a range in display magnification from 40x to 400x.



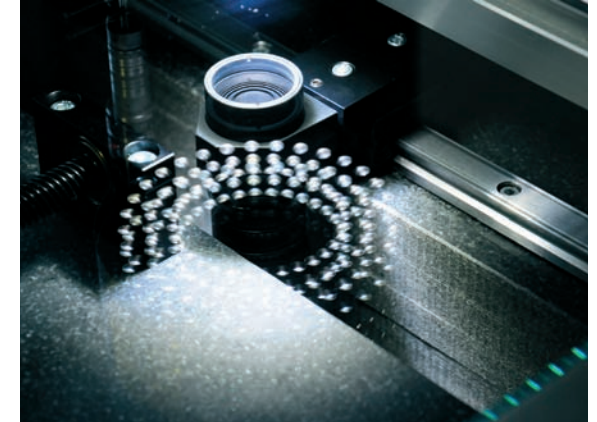
Illumination

Illumination is essential for accurate measurements. The DeMeet is standard equipped with LED based illumination (backlight, coaxial light and segmented ring light).

A ring light consisting of a 3 rings, 16 segments and 48 cells LED pattern, that can be controlled per individual ring, segment and cell, is standard supplied for optimal light configuration. The ring light can be set in intensity and angle to achieve the best contrast with clearly defined edges.

The backlight is transmitted from below and is used to highlight the profile of the edges. Coaxial lighting can be used for illumination inside deep located structures. The LED based backlight and coaxial light can be adjusted in intensity.

The configuration of the illumination is automatically controlled during a CNC measuring run. A coaxial laser pointer assists navigation during creation of a measuring program.



Combo preparation

With the option "prepared for Combo" a Video machine can be upgraded on a later date to a multi-sensor measuring machine for combined video (optical) and touch probe (contact) measurements. For upgrading of a Combo prepared machine on a later date a Combo upgrade pack can be ordered.



Optical qualification

The machine is supplied with a position offset qualifier and field of view qualifier, required for field of view (optical) calibration. This glass accuracy standard can also be used as training object.



Multi-sensor measurements

The increasing miniaturization and complexity of product features results in more difficult measuring and inspection procedures. Measuring systems equipped for only optical or contact measurements are often no longer sufficient, in which case multi-sensor measuring machines are required for optimal geometrical quality control.

When measuring certain features encounters the physical limits of non-contact measurement, the DeMeet video machines can be additionally equipped with a touch probe system (contact measuring system).

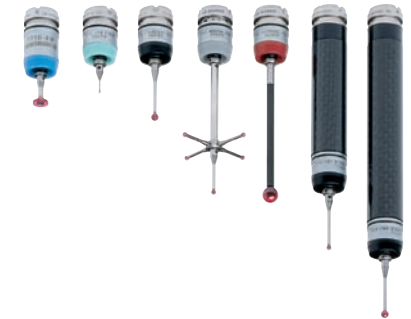
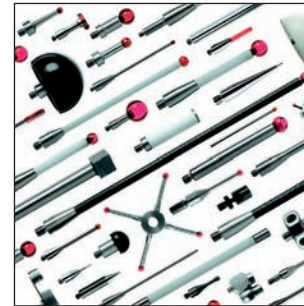
With the DeMeet Combo model both optical and contact measuring principles are seamlessly integrated and measurements can be performed by the optical and the probing system within one measuring run and even within one feature. Touch probe measurements can also be useful to create a complex 3D product alignment.



Probe modules and styli

Standard a Renishaw TP20 system with a 5-way stylus configuration is supplied. On request various probe modules, systems and stylus configurations are available. Multiple probe modules can be used to leave the stylus configuration on the module to achieve a shorter set-up time for measurements requiring other stylus configurations.

In addition to the standard touch probe system, an optional stylus change rack (automatic probe configuration change) can be utilized. With the stylus change rack probe modules can automatically be exchanged within one measuring run.



Touch probe qualification

The machine is supplied with a position offset qualifier, required for determining optics/touch probe offset, field of view qualifier required for field of view (optical) calibration and qualification sphere including calibration report required for touch probe (stylus) qualification (position and size determination).

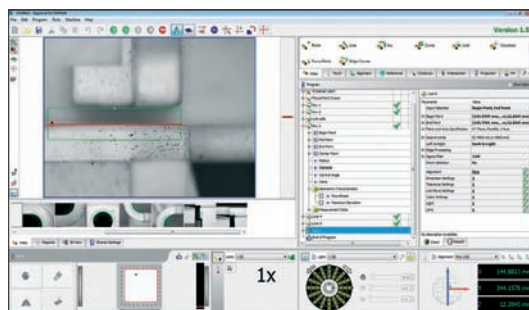


Approve for DeMeet multi-sensor measuring software

Approve for DeMeet is a true multi-sensor software package, where the difference in sensor origin of the measuring input is limited to only the necessary.

All the measuring results of video and touch probe can be displayed, reported, exported and used in constructs together, and are dynamically updated. The measuring results can also be displayed together in a 3D view.

Approve for DeMeet is designed to be a user-friendly software package, but is flexible and very elaborate to measure many products.



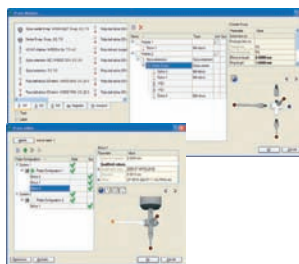
3D Movements

The 3D motor controller in *Approve for DeMeet* makes blended, smooth moves which makes the DeMeet run more fluent and faster. The DeMeet also moves during video image processing and other calculations, shortening the measuring time considerably. To eliminate hysteresis, and therefore improving accuracy, an approach direction and distance can be set for video measurements. Pretouch and average touch can be set for touch measurements.

Measurements

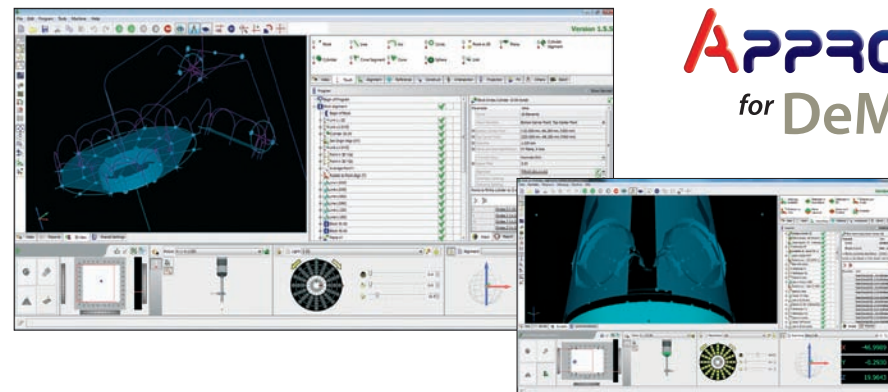
For video measurements our proprietary image processing algorithms were developed, which are completely different from algorithms used by competing products. The edge find algorithm finds complete curves instead of separate points, the interpolation of the pixels is virtually infinite and very accurate. Video targets larger than one field of view can be measured in one program step, and are automatically split into more images and combined for the fitted result. The illumination for video measurements can be set and changed using a graphical control for backlight, coaxial light and ring light.

For touch measurements it is normal that the targets are defined in 3D, but now this is also the case for video measurements. Features (like a circle) can be measured properly even if they are not parallel to the camera (optical) plane. The graphical touch probe configuration editor allows for building a custom configuration for a specific measurement by using an extensive touch probe library. Settings can be defined and shared between measuring steps which greatly reduces the complexity of a measuring program.



Measuring Program

A measuring program in *Approve for DeMeet* is a graphical program consisting of simple program steps. Program steps can be changed, added, copied, moved and removed very easily, inputs of a program step can be easily changed or linked to other results by using drag-and-drop. A program can be verified by running it step by step, even a single program step can be run for verification. After running a program step an icon appears behind it to indicate its status.



APPROVE
for DeMeet

Results, Report and Export

Results from measurements and calculations (constructs, fits, etc.) as well as from other program steps can be added to an export or report and saved or printed as PDF or CSV file for further analysis. If tolerances are used for a result a graphical tolerance bar is shown. Results and reports can be automatically printed or exported at the end of a measuring program run.



PTB software evaluation

Evaluation software for coordinate measuring machines.

The accuracy of the *Approve for DeMeet* software was verified by comparing the results obtained from the software with reference results supplied by the PTB (Physikalisch-Technische Bundesanstalt, Braunschweig, Germany).

The *Approve for DeMeet* software has been placed in the class of the smallest deviations.



Measuring software

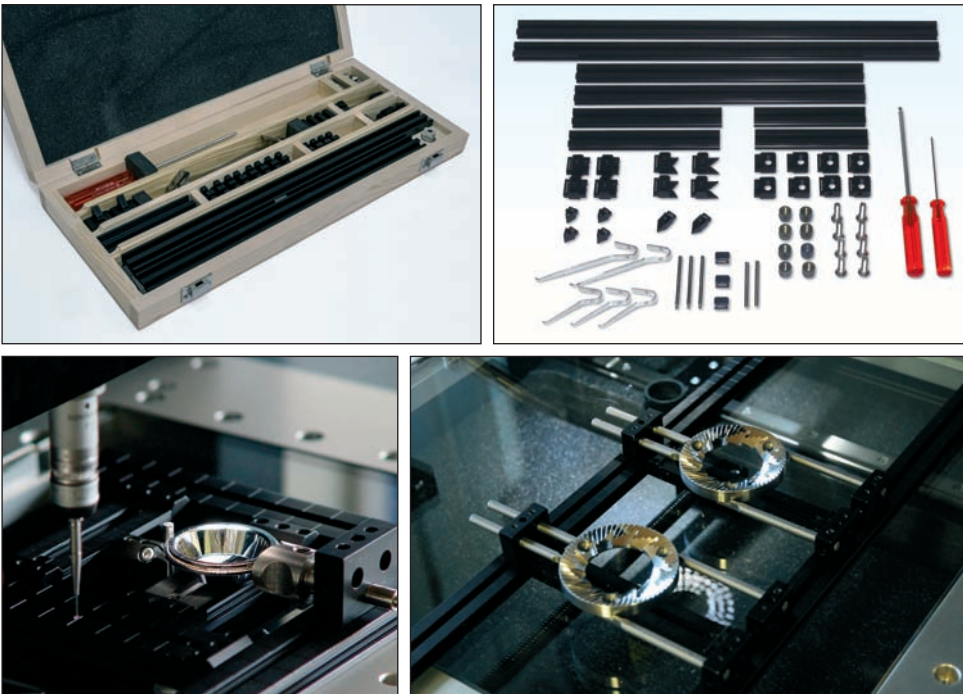
Fixture systems

Solid positioning of a measuring object with a fixture system is essential for accurate measurements and the fixing pattern can also be used for batch measurements.

DF product fixture system

DF-System is a fixture system developed and produced by Schut and designed for constructing 3D product fixtures, particularly for optical measurements, and is fully compatible with the measuring table of the DeMeet measuring machines. The DF-system is an easy to mount measurement fixture system and especially developed to use the most of the illumination possibilities for optical measurements. Easy to mount with single-screw couplings to build fixtures with a high repeatability and to realize a short set-up time for measuring tasks.

DF-System consists of a full range of fixture components: bars, connection components and fixing components. Produced from extruded or machined aluminum with either a black or silver anodized finishing. Technically the difference is only applicable for optical measurements in relation to (un)desirable light reflection.



Alufix fixture system

Alufix is a flexible fixture system made of high-tensile aluminum. Alufix is a uniquely designed modular fixture system to prepare a product-fixture in a short time and is easy to mount and specially suitable for fixtures for heavier measuring objects. A wide range of components is available that can be combined to complete your measuring fixture such as base plates, bars, chucks, rotary plates, centers, magnetic holders, v-blocks, vises and optical targets.



Custom fixture systems for the DeMeet measuring machines

When products need to be measured in a batch and a standard fixture system does not provide the right solution for example caused by the extraordinary shape or small dimensions of the product, a custom made fixture can provide the solution. This is especially the case for products that need to be measured optically.

A certain repeatability of product positioning in the fixture is important for a quick set-up time in for example the production environment. We can assist you in the development and manufacturing of a custom fixture. There is a range of possibilities, from machined fixturing positions in acryl glass to magnet and vacuum fixture systems.



Quality and innovation

Our reliable service and excellent technical advice assist you in determining your optimal quality strategy, and our incoming and outgoing checks assure you quality products.

Development and improvement of the DeMeet measuring machines is a continuous process. New developments and innovations increase performance and functionality of the DeMeet and can always be equipped on previously delivered machines. Machine and part traceability ensures availability of machine components for upgrading your DeMeet measuring machine.



Support

Requirements with regard to measuring projects depend on individual needs and specific circumstances. Our qualified and experienced hardware and software application support specialists can provide you with:

- advice on all aspects of your DeMeet
- training
- online support for the DeMeet measuring machines
- custom applications and measuring fixtures
- software updates

The Hotline Support service offers telephone, e-mail or remote desktop support regarding general operation of the DeMeet, measuring applications and specific settings. Direct contact with our support department, dedicated advice and short response time realize optimal deployment of the DeMeet for your measuring assignments.

Measuring services

In case of insufficient measuring capacity we can provide you with support to perform your measuring tasks. Based on sample products and technical drawings a measuring program can be created by our application support specialists. All measuring steps and results are well documented and measuring reports are created.

Service

For optimal performance of your system we can provide maintenance and calibration services. Service and calibration packages are performed by our engineers at your location or in our facility. Cleaning, general maintenance and verification with a traceable accuracy standard is performed and small errors are mathematically 3D compensated using CAA (Computer-Aided Accuracy), after which a new calibration certificate is issued.

Service and calibration provide you with a machine optimally prepared for high accuracy measurements and maximized reliability. Your machine can be calibrated after installation, and the planning of periodical machine service and calibration can be provided. In case the machine needs to be relocated or moved to another location, it is important that the machine is securely transported. We can provide assistance with packing, transport and re-installation of the machine at the new location.



ISO 9001 certification

Schut Geometrical Metrology is ISO 9001-2015 certified. We have established a quality management system that meets the demands of the international quality standards. Our quality management ensures that all activities are comprehensively planned, managed and controlled.

The management of Schut Geometrische Meettechniek bv commits itself to conducting all activities in accordance with the defined requirements in the scope of the ISO-9001 declaration.



Specifications

specifications	Video model	Combo model
General		
Video system	DeMeet Sony sensor camera	
Nikon telecentric lenses	3.0x (1.0x, 5.0x and 10.0x optional)	
Leica-Design telecentric lenses	2.0x (1.0x, 5.0x and 10.0x optional)	
Mitutoyo telecentric lenses	3.0x (1.0x, 5.0x and 10.0x optional)	
Ring light ¹	3 rings, 16 segments and 48 cells (adjustable)	
Backlight and coaxial light	adjustable	
Probe system ²	-	Renishaw TP20
Construction ³	fixed bridge with granite base plate DIN 876/00	
Structure	extremely tension relieved, flat grinded cast iron	
Measuring table ⁴	tension relieved, nickel-plated steel	
Linear guides	THK linear guides	
Linear encoders	Renishaw TONIC linear encoders	
Drive system	Faulhaber DC servo motors	
Operating mode	motorized joystick / CNC	
Measuring specifications		
Resolution (µm)	0.1	
Accuracy standard ⁵ (µm)	X/Y/Z 3.9 + L/150	
(L in mm)	XY 4.5 + L/150	XYZ 4.9 + L/150
Accuracy high ⁵ (µm)	X/Y/Z 2.9 + L/200	
(L in mm)	XY 3.5 + L/200	XYZ 3.9 + L/200
Accuracy optional ⁵ (µm)	X/Y/Z 1.9 + L/250	
(L in mm)	XY 2.5 + L/250	XYZ 2.9 + L/250
Travel speed max. (mm/s)	X/Y 250, Z 55	
Acceleration max. (mm/s ²)	X/Y/Z 500	
Power requirements		
Voltage (V)	90 - 120, 210 - 240 (50 - 60 Hz)	
Power (VA)	400	
Environmental conditions		
Operating temperature (°C)	15 - 35	
Measuring temperature (°C)	20 ± 0.5	
Humidity (%)	40 - 70 (no condensation)	

¹ For video models (except DeMeet-220) a ring light with 4 rings, 16 segments and 64 cells can be supplied as an option.

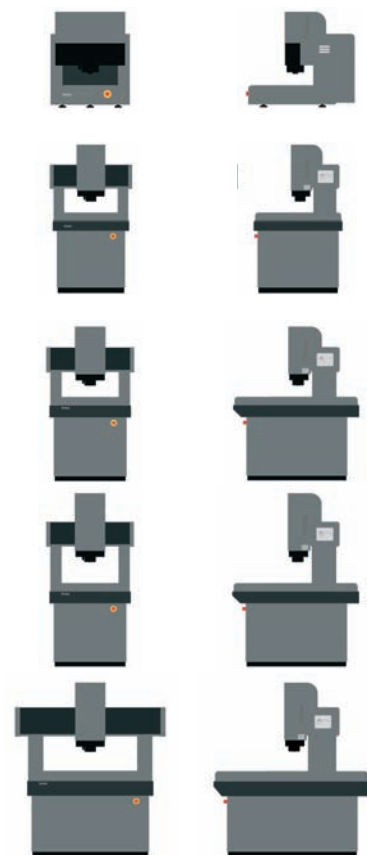
² Other probe systems can be supplied as an option.

³ The base plate of the DeMeet-220 is made of flat grinded cast iron.

⁴ The measuring table of the DeMeet-220 is made of tension relieved, hard anodized aluminum.

⁵ The accuracy of the multi-sensor measuring system should be taken into account.

Specifications apply to all DeMeet models, unless otherwise specified.
Machines with higher specifications and/or modifications are available on request.
Specifications are subject to change without prior notice.
For more specifications refer to our website Schut.com.



DeMeet-220		
Measuring range (mm)	X 220, Y 150, Z 100	
Dimensions (mm)	W 520, L 700, H 615	
Weight (kg)	110	
Measuring table (mm)	X 357, Y 264	
Max. load (kg)	20	
DeMeet-400		
Measuring range (mm)	X 400, Y 250, Z 200	
Dimensions (mm)	W 870, L 930, H 1570	
Weight (kg)	530	
Measuring table (mm)	X 560, Y 426	
Max. load (kg)	50	
DeMeet-404		
Measuring range (mm)	X 400, Y 400, Z 200	
Dimensions (mm)	W 870, L 1245, H 1580	
Weight (kg)	700	
Measuring table (mm)	X 560, Y 584	
Max. load (kg)	50	
DeMeet-443		
Measuring range (mm)	X 400, Y 400, Z 300	
Dimensions (mm)	W 870, L 1245, H 1785	
Weight (kg)	720	
Measuring table (mm)	X 560, Y 584	
Max. load (kg)	50	
DeMeet-705		
Measuring range (mm)	X 700, Y 500, Z 300	
Dimensions (mm)	W 1520, L 1550, H 1820	
Weight (kg)	1400	
Measuring table (mm)	X 930, Y 704	
Max. load (kg)	60	

CE The DeMeet measuring machines are in compliance with EC Machine Directive 2006/42/EC, Electromagnetic Compatibility (EMC) directive 2014/30/EU and Low Voltage Directive (LVD) 2014/35/EU.

All trademarks, trade names, brand names, or logos mentioned or used are the property of their respective owners.

Schut Geometrical Metrology (Schut Geometrische Meettechniek bv) is an international organization, founded in 1949, with five offices throughout Europe, specialized in the development, production and sales of precision measuring instruments and systems.

Schut Geometrical Metrology is ISO 9001 certified.

Products developed and produced by Schut Geometrical Metrology are the 3D CNC coordinate measuring machines DeMeet (video, touch probe and multi-sensor model) and product fixture systems.

Service and sales activities are performed by our company group or through an international network of experienced distributors.



Regional coverage



Schut Geometrische Meettechniek bv
Netherlands



SGM
Schut Geometrische Messtechnik GmbH
Germany



Schut België bv
Belgium



SGM AG
Schut Geometrische Messtechnik
Switzerland



Schut France sarl
France



Schut Geometrische Meettechniek bv
Duinkerkenstraat 21
9723 BN Groningen
The Netherlands
Tel +31 (0)50 5 877 877
SchutNL@Schut.com

Schut België bv
Wouter Haecklaan 4/002
2100 Deurne (Antwerp)
Belgium
Tel +32 (0)3-366.59.59
SchutB@Schut.com

Schut France sarl
105, Rue de l'Arve
74300 Cluses
France
Tel +33 (0)4.50.98.10.17
SchutF@Schut.com

SGM
Schut Geometrische Messtechnik GmbH
Gutenbergstraße 5
D-78647 Trossingen
Germany
Tel +49 (0)7425 - 312 66
SGMD@Schut.com

SGM AG
Schut Geometrische Messtechnik
Badstrasse 5
8212 Neuhausen am Rheinfall
Switzerland
Tel +41 (0)52 624 00 37
SGMCH@Schut.com