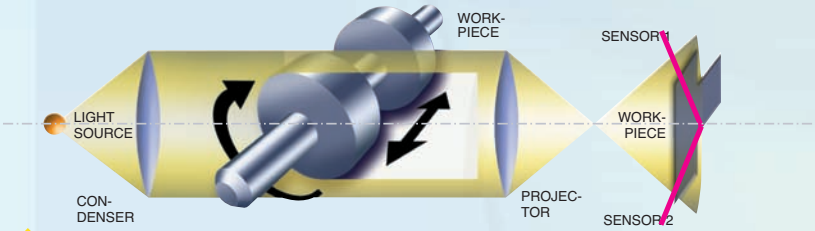
TESASCAN™ 25

The optimum solution for measuring small cylindrical parts

TESASCAN 25 is a dedicated system that provides the optimum solution for measuring small cylindrical parts with diameters up to 25 mm and lengths up to 200 mm. This high speed non-contact measuring machine features an opto-electronic projection system with high-resolution linear CCD sensors. TESASCAN 25 is a fully automatic, flexible measuring system with comprehensive measurement capabilities designed to meet the requirements of round part inspection.



Operating principle

TESASCAN 25 uses high-resolution linear CCD sensors. Each sensor is sub-divided into thousands of light sensitive pixels. When the part image is projected, these sensors, which act as a light sensitive ruler, can detect the slightest changes at sub-pixel level.

The workpiece is illuminated with parallel white light and its image is projected onto the linear CCD sensors, which are orientated to 7.5∞. They provide the information obtained from the image, which allows exact analysis of the geometry of the workpiece features.

Automatic measurement

TESASCAN 25 offers the small round part manufacturer a more capable, CNC alternative to traditional hand tools and other manually-operated equipment and profile projectors.

Dynamic measurement

Rotation is a standard function of TESASCAN 25. This permits rotary scanning of the workpiece for the measurement of all external geometric part features with a combination of high speed and high accuracy. True 3D alignment allows a datum axis of the part to be defined.

Flexible programming

TESASCAN 25 can accept data from other measuring instruments (e.g., when inspecting internal dimensions), which are then included in a single report. Operator "prompts" can be included in the part program to indicate the need for data input from an external measuring instrument, at the beginning or the end of a measurement cycle.

Direct use in the workshop

With high measurement speed and short programming times, TESASCAN 25 can easily be integrated within the overall manufacturing process and is suitable for one-off, sample and 100% inspection.

Part program creation within minutes

The industrial strength software ProMeasure™/ProComposer™ further enhances the overall flexibility and speed of TESASCAN 25. This highly intuitive programming module simplifies each stage of the manufacturing process. In most cases, simple and complex part programming is completed in a matter of minutes.

Compact system design

The TESASCAN 25 comes complete with all CNC – everything needed to begin measuring. There are no external cables other than those used to link the measuring system to host computer. TESASCAN 25 is supplied with computer, video card and peripheral devices (17" monitor, keyboard and mouse), as well as ProMeasure/ProComposer software.

ProMeasure
ProComposer

Measurement capability

Static:

- *Diameters, Lengths, Intersections, Gage Diameters, Radii, Angles, etc.*
- *2D workpiece alignment – creation of a workpiece axis based on two reference diameters.*

Dynamic:

- *Concentricity – parallel, max. form and gage diameters, interrupted diameters, tapers and parallel thread profile.*
- *Radial runout – plain and interrupted diameters.*
- *Face runout.*
- *Roundness, Cylindricity, Straightness.*
- *Diameters with rotation – ovality, max./min. and average diameters of plain or interrupted diameters.*
- *Hexagon – across flats dimension, symmetry of flats relative to an axis, max. dimension across corners.*
- *Section analysis with rotation – max./min. section radius and angular position.*
- *Offset diameters – eccentricity and symmetry.*
- *3D workpiece alignment – creation of a workpiece axis with reference to plain diameters or a thread profile.*

Thread measurement (with no mechanical tilting):

- *Parallel, vee-shaped threads – major and pitch diameters, angle and flank diameters.*
- *Taper threads – major and pitch diameters at any location, taper, flank angles, gage length, useable thread length.*

Image cleaning:

- *The software includes a number of filters which can be selected at various levels to reduce the effect of contaminated workpieces.*

Technical Data – TESASCAN™ 25

Measuring capacity	diameter	1.0 in		25 mm
	length	8.0 in		200 mm
Component capacity	diameter	2.3 in		59 mm
	length	10.6 in		270 mm
	weight	4.4 lbs		2 kg
Accuracy* *(20±1°C)*	diameter	(0.06+0.01D) / 1000 in		1.5+(0.01D) µm
	length	(0.24+0.01L) / 1000 in		6+(0.01L) µm
Resolution	diameter	0.00001 in		0.0002 mm
	length	0.00004 in		0.001 mm
Repeatability *±2s=95%*	diameter	±0.00004 in		±0.001 mm
	length	±0.0001 in		±0.0025 mm
Speed *static measurement*	diameter		0.2 sec	
	edge		0.2 sec	
Weight	measuring unit	121 lbs		55 kg
Dimensions *(h x w x d)*	system	33 x 25 x 18 in		840 x 640 x 460 mm
Operating conditions	temperature	50 - 95°F		10 - 35°C
	relative humidity		10 - 80%	
Operating voltage	100/110 - 220/240 VAC 50/60 Hz			

**D in in/mm L in in/mm*

Performance data is based on results from clean, ground components at 20°C and may be affected by component shape and surface.

TESASCAN™ 50
TESASCAN™ 50 Plus

Measures all common round part geometry, including small intricate forms like radii and angles

If you're in the business of manufacturing round parts, then TESASCAN 50 and TESASCAN 50 Plus are the ultimate measurement solutions. Developed by the world's leading metrology company, Brown & Sharpe, TESASCAN 50 belongs to a new generation of fully automatic and easy to program machines, developed specifically for the measurement of round and turned components.

The system uses opto-electronic projection which enables the measurement of all common round part geometry, including small intricate forms like radii and angles. The major benefit of non-contact technology is the ability to perform such measurements with a combination of speed, flexibility and accuracy not previously possible.

Measurement capability

Static:

- *Diameters, Lengths, Intersections, Gage Diameters, Radii, Angles, etc.*
- *2D workpiece alignment – creation of workpiece reference axis from two diameters.*

Dynamic:

- *Concentricity – parallel, max. form and gage diameters, interrupted diameters, taper and parallel thread profile axis.*
- *Runout – plain, interrupted diameters and face runout.*
- *Straightness.*
- *Diameter with rotation – ovality, max./min. average diameter of plain or interrupted diameters.*
- *Hexagon – across flats dimension, symmetry of flats to axis, max. dimension across corners.*
- *Section analysis with rotation – max. and min. section radius and angular locations.*
- *Offset diameters – eccentricity and symmetry.*
- *3D workpiece alignment – creation of workpiece reference axis from plain diameters and thread profiles.*

Thread measurement (with slewing mechanism):

- *Parallel vee-form – major, minor and pitch diameters, pitch, flank angles. Additional features with safety critical option – major, minor, pitch and functional diameters, pitch, flank angles, root radius, taper, lead error, runout and circularity.*
- *Taper threads – major, minor and pitch diameters at any location, pitch, taper, flank angles, gage length, useable thread length, crest and root profiles.*

Image cleaning:

- *A software filter which can be set at different levels to reduce the effect of contamination on the workpiece.*

Technical Data – TESASCAN™ 50/TESASCAN™ 50 Plus

		TESASCAN 50	TESASCAN 50 Plus
Measuring capacity	diameter	1.96 in / 50 mm	
	length	10.8 in / 275 mm	19.7 in / 500 mm
Component capacity	diameter	3.9 in / 100 mm	
	length	11.4 in / 290 mm	20.3 in / 515 mm
	weight	8.8 lbs / 4 kg	13.2 in / 6 kg
Tilting for thread measurement	diameter		Max. helix angle 15°
Accuracy *(20±1°C)*	diameter	(0.08+0.01D)/1000 in / 2+(0.01D) µm	
	length	(0.28+0.01L)/1000 in / 7+(0.01L) µm	
Resolution	diameter	0.00001 in / 0.0003 mm	
	length	0.00004 in / 0.001 mm	
Repeatability *±2s=95%*	diameter	±0.00004 in / ±0.001 mm	
	length	±0.0001 in / ±0.0025 mm	
Speed *static measurement*	diameter	0.5 sec	
	edge	0.5 sec	
Weight	measuring unit	250 lbs / 115 kg	
	complete system	350 lbs approx. / 160 kg approx.	
Dimensions *(h x w x d)*	measuring unit	41 x 32 x 23 in / 1050 x 800 x 580 mm	
	controller	7 x 19 x 21 in / 180 x 480 x 540 mm	
Operating conditions	temperature	50 - 95°F / 10 - 35°C	
	relative humidity	10 - 80%	
Electrical service		90 - 255 VAC and 50/60 Hz	

Performance data is based on results from clean, ground components at 20°C and may be affected by component shape and surface.

TESASCAN™ 80 and 80 PLUS

The new TESASCAN 80 from TESA has all the advantages of a dedicated machine for non-contact measurement in a shopfloor environment. Due to its dual-optics, the machine remains as accurate as the smaller TESASCAN 25 machine. The optical configuration allows components with diameters from 0.25 mm to 80 mm to be inspected with a resolution of 0.00025 mm throughout the measuring range. The machine is fully enclosed, thus avoiding direct access to the mobile parts of the system. The enclosure has an interlocked sliding door for operator safety. The computer is installed in a safe compartment located right under the machine.

Significant shortening of inspection cycles

Like any other machine within the TESASCAN family, the servomotor drive used for the vertical slide allows the high measurement speed of 150 mm/s with accelerations of 800 mm/s. This high speed performance reduces the inspection cycle significantly. Common cases where dimensional inspection time could be reduced from 40 minutes down to less than one minute using our machine are not unusual.

Powerful, user-friendly inspection software

TESASCAN 80 is used in conjunction with PRO-MEASURE/PRO-COMPOSER™, Windows 2000 / XP compliant software. This proven software, which is continuously updated to meet the market requirements, lets non-experienced staff expertly perform optical measuring.

TESASCAN™ 80 and 80 PLUS

TESASCAN 80 is available in 2 versions:

TESASCAN 80 02430050
*Measuring machine with rugged enclosure, DELL GX 280 computer, 15" TFT flat screen, keyboard and mouse.**

TESASCAN 80 PLUS 02430060
*Measuring machine with slew mechanism for thread and worm thread analysis, DELL GX 280 computer, TFT 15" flat screen, keyboard and mouse.**

**Note: Hardware is supplied with a three-year warranty on site. Additional information available on request.*

Maintenance and calibration
TESASCAN 80 is calibrated at our factory using masters officially recognized by the Swiss Service of Calibration (SCS). TESA recommends annual checking of the machine accuracy (or twice a year in case of shift work). This is carried out by our qualified maintenance engineers. TESA offers a periodical servicing on a contract basis, which also includes a machine conformance testing.

Specifications to TESASCAN 80 02430050

Measuring capacity		diameter	3.1 in	80 mm
		length	13.8 in (19.7 for TESASCAN PLUS)	350 mm (500 mm for TESASCAN PLUS)
Component capacity		diameter	3.9 in	100 mm
		length	14.5 in (20.3 for TESASCAN PLUS)	370 mm (515 mm for TESASCAN PLUS)
Accuracy	< 30mm	diameter	(0.06+0.01D) / 1000 in	1.5+(0.01D) µm
		length	(0.28+0.01L) / 1000 in	7+(0.01L) µm
	> 30mm	diameter	(0.08+0.01D) / 1000 in	2+(0.01D) µm
		length	(0.32+0.01L) / 1000 in	8+(0.01L) µm
Resolution		diameter	0.00001 in	0.0002 mm
		length	0.00004 in	0.001 mm
Repeatability ±2s=95%		diameter	±0.00004 in	±0.001 mm
		length	±0.00012 in	±0.003 mm
Air supply		pressure	4 - 6 Bar	60 - 90 PSI
Max. component weight			6 kg	13.2 lbs

Specifications to TESASCAN 80 Plus 02430060

Same as TESASCAN 80, but with slew mechanism.
Tilting for thread measurment.
Max. helix angle 10°

Profile 130

The Profile 130 from Brown & Sharpe has been designed to give the optimum solution for the measurement of large diameter cylindrical components on the shop floor. The Profile 130 is based on the proven technology of the smaller TESASCAN™ 50 machine and brings great flexibility for dimensional measurement to manufacturers of round and shaft-shaped components up to 5.1 in / 130 mm in diameter.

The Profile 130 consists of an optical measuring head mounted on a vertical slide that allows it to traverse along the axis of the workpiece supported between headstock and tailstock. The measuring head incorporates three optical systems and is moved vertically by means of a toothed belt drive. The drive system is equipped with an anti-backlash mechanism to give a positional accuracy of about 0.01 µm.

The system

- *Optical measurement system utilizing light sensitive linear CCD arrays.*
- *Fast, easy to use programming software.*
- *CNC-motorized optical measuring head.*
- *Quick release adjustable tailstock.*
- *Headstock with CNC-motorized rotation.*
- *Industry standard Morse 2 quick change tooling at head and tailstock.*
- *Full range of workholding options.*
- *Interlocked for operator safety.*
- *Shop-hardened for use in harsh environments.*
- *SPC/SQC options.*
- *Traceability to international standards.*

Measurement capability

Static:

- *Diameters, Lengths, Intersections, Gage Diameters, Radii, Angles, etc.*
- *Threads - major, minor and effective diameters, pitch, flank angles.(Without slewing)*
- *2D alignment.*

Dynamic:

- *Concentricity - plain and max. form diameters, diameters on a taper, thread profile axis.*
- *Radial run-out.*
- *Straightness.*
- *Diameter with rotation, ovality, max. and min.*
- *Hexagon - across flats dimension and symmetry, max. dimension across corners.*
- *Profile analysis with rotation - max. and min. Section radius size and angular location.*
- *3D alignment - creation of a dynamic reference axis from two diameters.*

ProMeasure
ProComposer

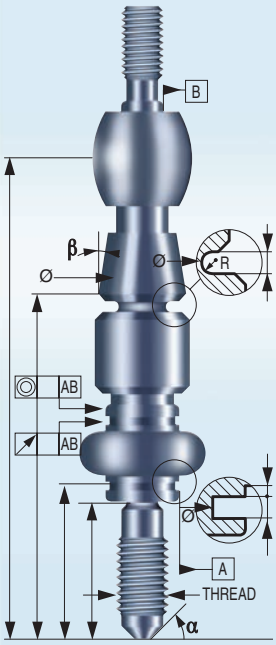
Technical Data – Profile 130

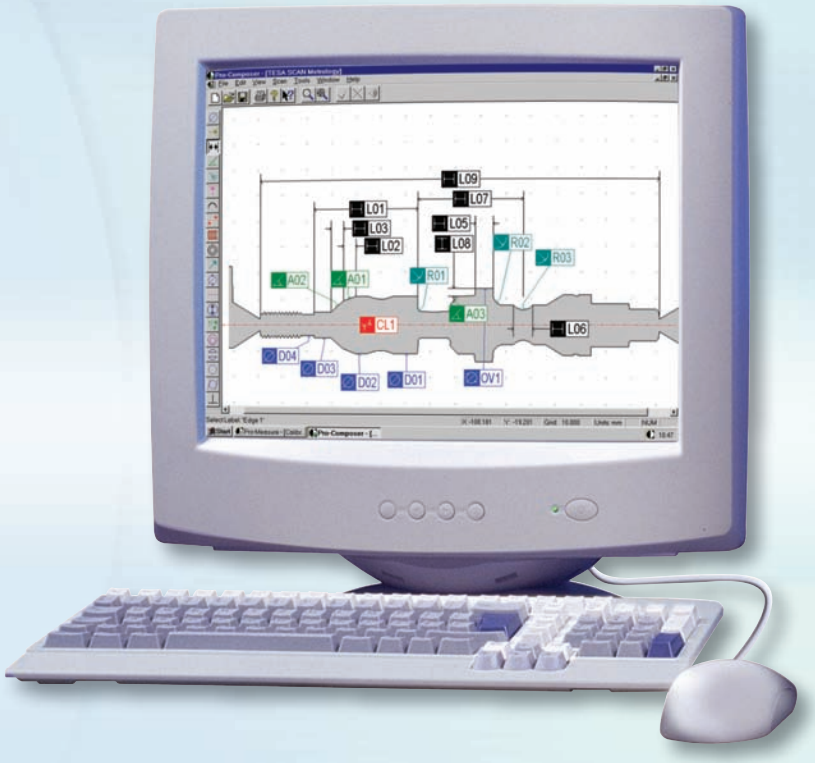
Measuring capacity	diameter	5.1 in		130 mm
	length	39 in		1000 mm
Component capacity	diameter	9.76 in		248 mm
	length	41.3 in		1050 mm
	weight	66 lbs		30 kg
Accuracy *(20±1°C)*	diameter	(0.1+0.02D) / 1000 in		2.5+(0.02D) µm
	length	(0.3+0.01L) / 1000 in		8+(0.01L) µm
Resolution	diameter	0.00001 in		0.0003 mm
	length	0.00004 in		0.001 mm
Repeatability *±2s=95%*	diameter	±0.00006 in		±0.0015 mm
	length	±0.0002 in		±0.005 mm
Speed *static measurement*	diameter		1.5 sec	
	edge		1.5 sec	
Operating conditions	temperature	50 - 95°F		10 - 35°C
	humidity		10 - 80%	
Electrical service			100 / 110 220 / 240 VAC 50/60 Hz	

Performance data is based on results from clean, ground components at 20°C and may be affected by component shape and surface.

ProMeasure™/ProComposer™ Software

ProMeasure/ProComposer software for Windows provides a powerful industrial strength solution for each stage of the inspection process. The ProComposer component of the software simplifies the task of creating measurement programs, while ProMeasure handles the physical and data gatherings of the measurement device. The software is specially designed for use in a shop environment. The user-friendly interface makes it possible to use the software with minimum training and a comprehensive on-line help feature makes it easy to get assistance anytime.





Graphic programming interface

ProMeasure/ProComposer software is simple to use and can either be installed directly on the TESASCAN™ 25, TESASCAN™ 50, Profile 80, Profile 130 workstation or networked to the workstation enabling a part program to be prepared off-line. It uses a graphic representation of the part profile, created by scanning the workpiece or importing from a CAD file. A library of icons, each representing a geometric function, guide the user in the part programming sequence. Nominal and tolerance values of certain measurement types can easily be set by retrieving them from databases of international standards.

Graphic analysis

ProMeasure can be used to perform a visual inspection of the actual shape of lines and radii by comparing part data to nominal data, making it easy to analyze manufacturing problems.

ProMeasure
ProComposer

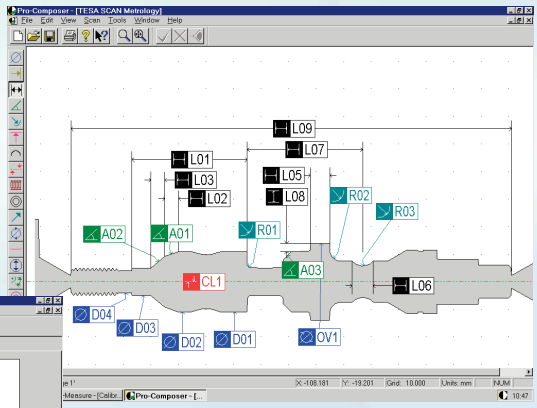
Key features

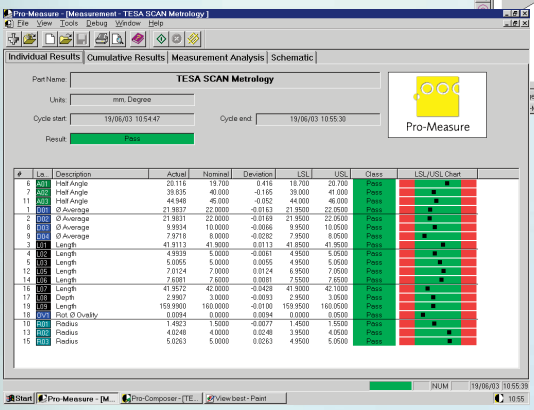
The ProMeasure™ measurement analysis option allows viewing of the actual measurement points collected by the machine for each measurement feature. This is particularly valuable for the analysis of out of tolerance features. It also provides a graphic representation of geometry and form for functions such as roundness and radius form deviation.

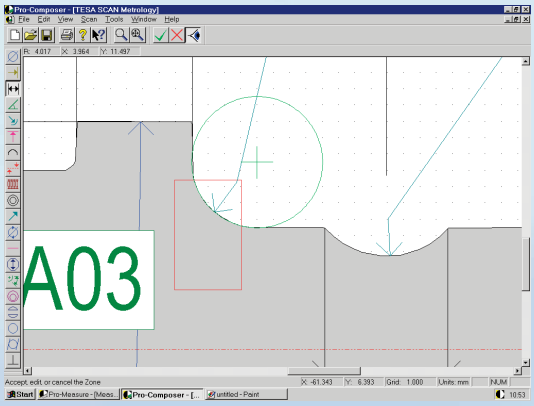
ProComposer™ provides a complete overview of the program indicating the interdependency of measurement features. This allows quick changes to be made to the program without editing individual features. It also permits the sequence of displayed results to be set and measurement features can be switched on and off allowing instant creation of shorter part programs from more complex ones.

Flexible reporting and data transfer

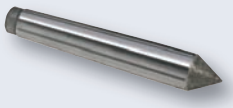
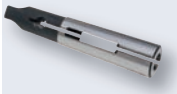
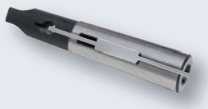
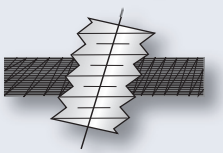
ProMeasure permits the user to show the measurement results in a variety of formats. The editing functions allow text, logos and bitmap images to be included in the reports. Measurement results can be configured by the user in any chosen sequence. The e-mail type commands add to the flexibility of this software as they allow the operator to click the parameter header, to choose the display sequence (e.g., ascending or descending value order) or to highlight the values that are beyond tolerances. ProMeasure can be easily networked or linked to an existing workshop data collection interface. SPC is available as a standard option.



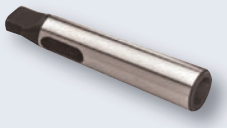




Options

		TESASCAN™/Profile			
		25	50	80	130
	**TL02-0003 - 10 mm MALE DRIVE CENTER** 0 - 10 mm diameter friction-coated male center to rotate components via their centers.	●			
	**TL01-0002 - 6 mm CENTER ADAPTOR** Adaptor to fit Morse no.1 taper providing a 6 mm diameter collet bore. This allows standard tooling Z173-0920/0921, or any special tooling with a plain 6 mm shank to be fitted at head and tailstock.	●			
	**TL01-0026 - 6 mm CENTER ADAPTOR** Adaptor to fit Morse no. 2 taper providing a 6 mm diameter collet bore. This allows standard tooling Z173-0920/0921, or any special tooling with a plain 6 mm shank to be fitted at head and tailstock.		●	●	●
	**Z173-0920 - 10 mm FEMALE CENTER - (requires TL01-0002)** Two jawed 90 degree internal cone center with 6 mm shank to suit adaptor TL01-0002. Suitable for components without centers with outside diameters of 2.5 - 10 mm.	●			
	Z173-0920 - 10 mm FEMALE CENTER - (requires TL01-0026) Two jawed 90 degree internal cone center with 6 mm shank to suit adaptor TL01-0026. Suitable for components without centers with outside diameters of 2.5 - 10 mm.		●	●	
	**Z173-0921 - 20 mm FEMALE CENTER - (requires TL01-0002)** Two jawed 90 degree internal cone center with 6 mm shank to suit adaptor TL01-0002. Suitable for components without centers with outside diameters of 4 - 20 mm.	●			
	Z173-0921 - 20 mm FEMALE CENTER - (requires TL01-0026) Two jawed 90 degree internal cone center with 6 mm shank to suit adaptor TL01-0026. Suitable for components without centers with outside diameters of 4 - 20 mm.		●	●	
	**Z173-0961 - 30 mm PLATTEN** Provides a flat surface of 30 mm diameter on which disc-shaped components (short but relatively large diameter) can be rested. Has a Morse no. 1 taper for use at head or tailstock, and is marked with concentric rings to aid component centering.	●			
	**Z173-2020 - 1-15 mm CHUCK** Three jawed chuck with reversible jaws for internal and external workholding. Fitted with a Morse no.1 taper spindle for use in static and dynamic headstock. ** Can also be used with the TESASCAN 50 and Profile 80, when used in conjunction with a Morse 2 to 1 reducer (listed on next page).*	●			
	**Z178-3021 - THREAD MEASUREMENT MECHANISM** A computer-controlled slew mechanism for automatic alignment of the thread profile to the machine optical system. Includes software for the inspection of parallel, taper and worm threads.		●	●	
	Maximum 6°		●		
	Maximum 15°			●	
	**Z178-2021 - 40 mm FEMALE CENTER** Two jawed 90 degree internal cone center with Morse no. 2 spindle. Suitable for components without centers, with outside diameters of 15 - 40 mm.		●	●	

Options

		TESASCAN™/Profile			
		25	50	80	130
	**TL01-0027 - MORSE 2 TO 1 REDUCER** A reducing sleeve to allow the use of workholding options from smaller Profile machines which have a Morse no. 1 taper.		●	●	
	**Z178-0607 - 40 mm FEMALE CENTER** Two jawed 90 degree internal cone center with Morse no. 2 spindle. Suitable for components without centers, with outside diameters of 15 - 40 mm.		●	●	
	**Z178-2025 - 80 mm PLATTEN** Provides a flat surface of 80 mm diameter on which disc-shaped components (short but relatively large diameter) can be rested. Has a Morse no. 2 taper for use at head or tailstock, and is marked with concentric rings to aid component centering.		●	●	
	**Z178-2026 - 40 mm MALE DRIVE CENTER** 0 - 40 mm diameter friction-coated male center to rotate components via their centers. Fitted with a Morse no. 2 taper.		●	●	
	**Z178-0610 - 40 mm MALE CENTER** 60 degree plain center with Morse no. 2 taper to hold components with centers or bore diameters from 15 to 40 mm.		●	●	
	**Z178-2020 - 1-50 mm CHUCK** Three jawed chuck with reversible jaws for internal and workholding. Fitted with a Morse no. 2 taper for use in static and dynamic headstocks.		●	●	
	**Z178-2009 - GRIPPER MECHANISM** A drive mechanism with soft rubber jaws to transmit positive but floating drive from the headstock to components held between dead centers. Needed when dynamic functions are to be measured with reference to centers. Holding diameter 0 - 68 mm.		●	●	
	**TWO JAW FIXTURE** A precision workholding system designed specifically for small parts and parts without centers. Both external and internal versions are available together with a range of interchangeable jaws to suit different component sizes. ** Can also be used with the TESASCAN 50 and Profile 80, when used in conjunction with a Morse 2 to 1 reducer (listed above).*		●	●	
	**GAGEPORT INTERFACE** An interface for the connection of any brand of instrument to Profile and TESASCAN via the RS-232 port. Connection to Profile and TESASCAN is made with a cable which incorporates a separate power supply for the Gageport. Available for digital instruments and inductive probes. NOTE: Special cables may be needed between the instrument and interface.	●	●	●	●

TESAVISIO® 300 and 300 DCC

The new way of checking complex parts visually

The innovative TESAVISIO 300 vision measuring system is available in three models, two manual and one DCC. Each systems measurement range is 300 mm x 200 mm in (X-Y) x 150 mm range in the Z-axis.

Manual Machine Versions:

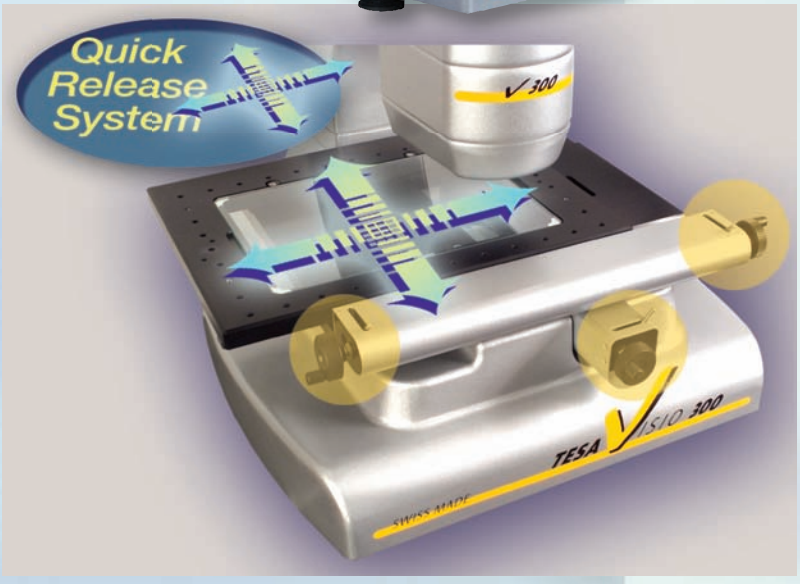
These two versions have a coordinate stage fitted with a quick release system in both the X and Y axes. This system enables fast system displacements for locating the geometric features to be measured. Disengageable wheel drives are used for quick motion in the Z-axis as well as fine setting for focusing the system.

TESAVISIO 300 manual models are available with either TESA-VISTA software or PC-DMIS VISION software.

DCC Machine Version:

On this system, the coordinate stages along with the vertical axis are displaced by means of DC servomotors and are user controlled by a joystick. This allows the user to easily locate geometric features and provides for automatic motor driven execution of software driven part application programs.

The tables of both manual versions of the TEAVISIO 300 are fitted with a quick release system in the X and Y axes to allow fast locating of part features. Disengageable wheel drives provide fast movement in the Z axis and fine setting of the focal length.



TESAVISIO 300 DCC Multi-Sensor

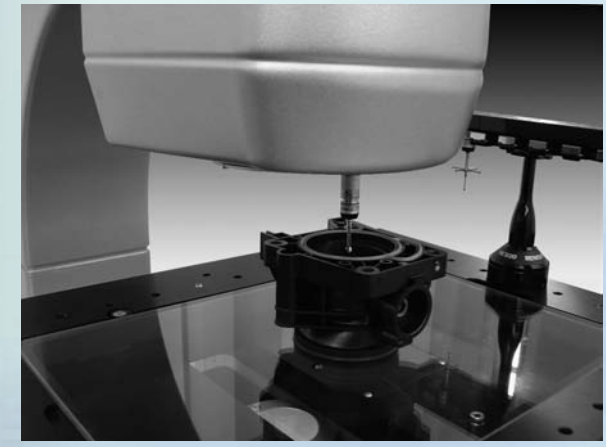
The introduction of multi-sensor technology brings greater flexibility and capability to the TESAVISIO 300 DCC by combining the features of the vision system with those of a tactile measurement system. The result…feature geometry that is not suited to vision measurement techniques can, in most cases, be inspected using a touch trigger probe.

Controlled by PCDMIS Software for both the tactile and the vision measurements, the TESAVISIO 300 DCC becomes a very powerful and versatile system. Multi-sensor technology simplifies the inspection process by reducing the number of systems required to inspect a component. With the new multi-sensor VISIO 300 DCC a single system can be used to inspect a complete part with seamless switching between video and contact measurement in a fully automatic cycle. To fully automate the measurement process, the Probe Change rack is an essential tool. Probe heads can be changed automatically within the measurement cycle, without the need for operator intervention.

Multi-sensor system offers the following main features:
– High accuracy cross probe correlation and calibration
– Multiple probing offsets all linked to a single "tree calibration"
– Full 3D geometry capability
– Ability now to measure the "non viewable" component geometry
– Scanning (option)

Touch Probe Interface, including:
– Required hardware fitted in the machine
– Ring gauge set for optics/touch probe calibration
– Reference Sphere

PCDMIS Tactile for vision software, touch trigger probes, modules, styli, tips and change rack sold separately.

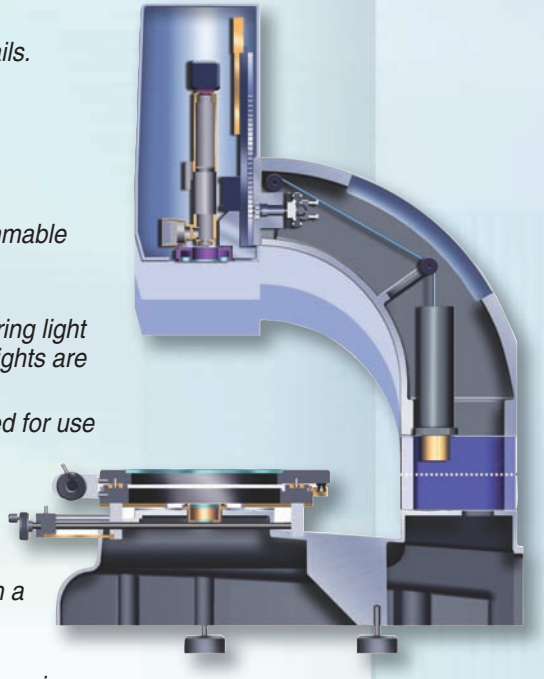


TESAVISIO® 300 and 300 DCC

The new way of checking complex parts visually

Features

- Pre-stressed carriages mounted on ultra-precise monorails.
- Linear encoders mounted an each axis.
- Encoder resolution (X/Y/Z) 0.05 µm.
- Red laser pointer- helps locating features to be checked.
- Long lasting LED light sources.
- Transmitted light produced by a green LED with programmable light intensity.
- Reflected light (ring light) created by Fresnel lens consisting of a dual line of 24 white LEDs. An additional ring light fragmented into 4 segments is also available. Both ring lights are programmable.
- A programmable coaxial light (white LED) can be supplied for use in conjunction with the motorized zoom.
- High resolution color camera.
- Optional 75 mm or 150 mm height extensions allow easy inspection of large workpieces.
- Both manual and DCC VISION models are available with a 0.7X to 4.5X motorized zoom.
  The software includes a zoom calibration routine.
- The TESA-VISTA manual model with TESA-VISTA software is available with a 2X telecentric fixed objective.



TESA-VISTA software provides easy-to-use software designed for basic shop floor applications.

PC-DMIS VISION software provides users with a powerful tool for measurement in two and three dimensions including many programming capabilities. PC-DMIS provides a long-term solution in an ever evolving manufacturing environment as it can be continuously updated to the latest technology level. All inspection reports issued in a variety of formats can be custom-made to suit the operator's specific needs.

TESA-VISTA Software

- Viewing in X, Y or Z-axis with a resolution to 0.05 µm.
- Zero setting of displayed axis by just a click.
- Metric/inch conversion.
- Cartesian and polar coordinates.
- Creation and execution of part programs.
- Video image storage.
- Measured feature drawing shown in the active window.
- Automatic edge detection.
- Z measurement with on-screen help and guidance.
- Point, radius, diameter, arc of circle, angle, line, distance (X/Y), slot, Z measurement.
- Alignment, perpendicularity, parallelism, theoretical point, theoretical diameter, translation of X/Y origin points.
- Features and Functions: Point, radius, diameter, arc of circle, angle, line, slot, distance (X/Y, and Z Measurement). Provides for alignment, perpendicularity, parallelism, theoretical point, theoretical diameter and translation of X/Y origin points.

PC-DMIS VISION Software

- PC-DMIS software has a 20,000 installed base for a single software solution across multiple products.
- Automatic edge detection.
- Acquisition of a higher number of points to make the measurement of shape and form deviation more accurate.
- CAD file import (various formats).
- User-friendly point and click programming.
- Off-line program sequences.
- Reverse engineering with CAD file export option.
- Automatic recognition of used magnification without the need to recalibrate the objective inside an application program.
- Automatic or manual control of the tools.
- Z axis measurement made easier through computer aided focusing in graph mode.
- On-screen viewing of the measured values, including those related to the position of geometric elements and edge capture.

...Plus all the features included with TESA-VISTA Software.

SPECIFICATIONS

Video machine	TESA-VISIO 300	TESA-VISIO 300	TESA-VISIO 300 DCC
Software	TESA-VISTA	PCDmis	PCDmis
Machine version	Manual	Manual	Motorized
Measuring spans X/Y (mm)	300 x 200	300 x 200	300 x 200
Measuring span Z (mm)	150	150	150
DC servomotors X/Y/Z	–	–	•
X and Y quick release system	•	•	–
Manual focus, coarse and fine settings	•	•	–
Profile illumination with 1 green LED	•	•	•
X/Y-Accuracy at 20°C	3+10•L/1000	3+10•L/1000	2,4+4•L/1000
Z-Accuracy at 20°C	3+2•L/100*	3+2•L/100*	3+1•L/100*
Encoder resolution (X/Y/Z)	0.05 µm	0.05 µm	0.05 µm
High-resolution color camera	•	•	•
Red laser pointer	•	•	•
Max. perm. load (in the middle of the stage)	16 kg	16 kg	16 kg
Size (monitor and PC not included) (LxHxD in mm)	680 x 990 x 800	680 x 990 x 800	680 x 990 x 800
Weight (monitor and PC not included)	78 kg	78 kg	78 kg
Operating temperature range	20°± 2°C	20°± 2°C	20°± 2°C
Power supply	115 to 220 Vac ±10%	115 to 220 V ±10%	115 to 220 V ±10%
	50 to 60 Hz	50 to 60 Hz	50 to 60 Hz
Z height extension, 75 mm (Z)	•	•	•
Z height extension, 150 mm (Z)	•	•	•
DELL Computer GX 280, 512 MB, 2,53 GHz, 40 GB HD	•	•	•
DELL Monitor TFT, 15"	•	–	–
Touch screen monitor, 15"	•	–	–
DELL Monitor TFT, 17"	•	•	•
Keyboard according to language (FR, CH, DE, IT, ES, GB, USA, NO, SE, FI, DK)	•	•	•

*Accuracy obtained with use of the motorized zoom at highest magnification on a textured surface

SOFTWARE COMPONENTS

PC-DMIS-Vision PRO (manual software)	–	•	–
PC-DMIS-Vision CAD (manual software)	–	•	–
PC-DMIS DCC PRO (motorized version)	–	–	•
PC-DMIS DCC CAD(motorized version)	–	–	•
Upgrade PC-DMIS PRO / CAD (manual software)	–	•	–
Updrade PC-DMIS DCC PRO / DCC CAD	–	–	•
QC CALC from Prolink software	•	•	•
Data Page from SPC software	•	•	•
SPC software QC CALC from Prolink software for the analysis of collected data and the creation of SPC charts.	•	•	•

OPTICS

Video machine	TESA-VISIO 300	TESA-VISIO 300	TESA-VISIO 300 DCC
Software	TESA-VISTA	PC-DMIS	PC-DMIS
Machine version	Manual	Manual	Motorized
Motorized zoom	•	•	•
Motorized zoom with coaxial light (white LED)	•	•	•
Telecentric fixed objective, 2x	•	–	–
Lens, 0.5x	•	•	•
Lens, 0.75x	•	•	•
Lens, 1.5x**	•	•	•
Lens, 2x**	•	•	

ILLUMINATION

Ring light (48 white LEDs)	•	•	•
Fragmented ring light (4 x 90° programmable segments)	•	•	•

**Lens with magnifications 1.5x and 2x require the use of the zoom with coaxial light.

• Available

– Not Available

TESASCOPE® II 355H

For measurement of round and complex parts

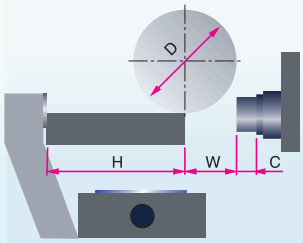
These dedicated modular systems are made to measure round and complex parts on the shop floor, as well as in the metrology laboratory. They are provided with a TS-100, TS-300 or TS-300E calculating and readout box.

Measured parts

Round and complex parts of all kinds that need to be regularly inspected.

Features:

- *14" (355 mm) diameter rotary screen with chart clips, cross line 30°, 60°, 90°*
- *Solid steel construction*
- *Profile illumination with green filter*
- *fiber-optic surface illumination*
- *"Save Lamp" system (lamps switch off automatically if there is no stage movement during several minutes, increasing the life of the bulb)*
- *Quick change bayonet lens mount (lenses not included)*
- *RS-232C output for data transfer*
- *Drawings side mount*
- *Hard anodized stabilized stage with clamping slot for tooling, equipped with linear glass scales with 0.0001 in/0.001 mm resolution*
- *Focus travel: 3.15" (80 mm)*
- *Maximum weight on stage: 40 lbs (20 kg)*
- *Built-in angular readout (degrees/minutes)*
- *Calibration certificate according to VDI- VDE 2617 – B89 4.1.1997*
- *Dimensions: 36" x 43" x 51" (L x H x D)/500 x 912 x 1093 mm*
- *Weight: 240 lbs (110 kg)*
- *Power supply: 110 Vac – 50 Hz/230 Vac*



TESA-Scope II 355H

Order No.	EDP NO.	Description	Meas. table ***8x4 in***/200x100 mm	TS-100	TS-300	TS-300E
06830051	24792	TESA-Scope II 355H	✓	✓		
06830052	24793	TESA-Scope II 355H	✓		✓	
06830053	24794	TESA-Scope II 355H E	✓			✓

TESA-Scope II PLUS 355H

Order No.	EDP NO.	Description	Meas. table ***12x4 in***/200x100 mm	TS-100	TS-300	TS-300E
06830054	24795	TESA-Scope II PLUS 355H	✓	✓		
06830055	24796	TESA-Scope II PLUS 355H	✓		✓	
06830056	24797	TESA-Scope II PLUS 355H	✓			✓

Magnification	10 x	20 x	50 x
Lens length and lens body length	1.18 in/30 mm	1.26 in/32 mm	2.48 in/63 mm
Working distance	3.15 in/80 mm	3.23 in/82 mm	2.09 in/53 mm
Maximum height	3.94 in/100 mm	3.94 in/100 mm	3.94 in/100 mm
Maximum diameter	7.87 in/200 mm	7.87 in/200 mm	7.87 in/200 mm

TESASCOPE® II 300V

Reliable and dependable

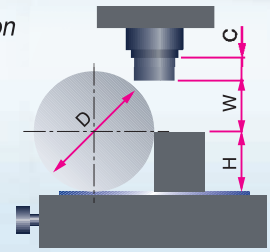
The high quality of the projected image provides the operator with reliability and dependability for accurate measurements. A wide choice of accessories adds to the remarkable flexibility of these optical systems with modular design. The multiple configurations allow any geometric part feature to be easily measured.

Measured parts

These profile projectors are ideally suited for non-contact measurement of components that require a magnification up to 100x – whatever their material or their shape.

Features:

- *12" (300 mm) diameter rotary screen with chart clips, cross line 30°, 60°, 90°*
- *Solid steel construction*
- *Profile illumination with green filter*
- *fiber-optic surface illumination*
- *"Save Lamp" system (lamps switch off automatically if there is no stage movement during several minutes, increasing the life of the bulb)*
- *Quick change bayonet lens mount (lenses not included)*
- *RS232C output for data transfer*
- *Drawings side mount*
- *Hard anodized stabilized stage with clamping slot for tooling, equipped with linear glass scales with 0.0001 in/0.001 mm resolution*
- *Focus travel: 4" (100 mm)*
- *Maximum weight on stage: 40 lbs (20 kg)*
- *Built-in angular readout (degrees/minutes)*
- *Calibration certificate according to VDI- VDE 2617 – B89 4.1.1997*
- *Dimensions: 20" x 41" x 31" (L x H x D)/508 x 1042 x 788 mm*
- *Weight: 240 lbs (110 kg)*
- *Power supply: 110 Vac – 50 Hz/230 Vac*



TESA-Scope II 300V PLUS

Order No.	EDP NO.	Description	***12 x 4 in*** / Meas. table 300x100 mm	TS 100	TS 300	TS 300E
06830044	23116	TESA-Scope II 300V PLUS	✓	✓		
06830045	23170	TESA-Scope II 300V PLUS	✓		✓	
06830046	23171	TESA-Scope II 300V PLUS	✓			✓

Magnification	10 x	20 x	50 x
Lens length and lens body length	1.18 in/30 mm	1.26 in/32 mm	2.48 in/63 mm
Working distance	3.15 in/80 mm	3.23 in/82 mm	2.09 in/53 mm
Maximum height	3.94 in/100 mm	3.94 in/100 mm	3.94 in/100 mm
Maximum diameter	7.87 in/200 mm	7.87 in/200 mm	7.87 in/200 mm

TESASCOPE® 500V

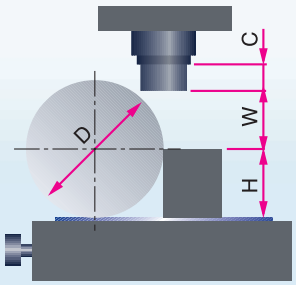
Excellent Price/Performance Ratio — Complete with a wide number of standard accessories

Measured parts

Large to mid-sized parts with flat surfaces that require a magnification up to 100x as well as soft and cutting components up to 12" (300 mm).

Features:

- *500 mm (20") diameter rotary screen with chart clips, cross line 30°, 60°, 90°*
- *Solid steel construction*
- *Profile illumination with green filter*
- *fiber-optic surface illumination*
- *Quick change lens mount*
- *"Save Lamp" system (lamps switch off automatically if there is no stage movement during several minutes, increasing the life of the bulb)*
- *RS-232C output for data transfer*
- *Drawings side mount*
- *Hard anodized stabilized stage with clamping slot for tooling, equipped with linear glass scales with 0.0001 in/0.001 mm resolution*
- *Focus travel: 3" (70 mm)*
- *Measure travel: X = 9"/Y = 4" (X = 200/Y = 100 mm) (quick release with fine adjustment)*
- *Maximum weight on stage: 40 lbs (20 kg)*
- *Hood and curtain*
- *Built-in angular readout (degrees/minutes)*
- *Calibration certificate according to VDI- VDE 2617 – B89 4.1.1997*
- *Dimensions: 39" x 78" x 52" (L x H x D)/1000 x 1996 x 1318 mm*
- *Weight: 450 lbs (200 kg)*
- *Power supply: 110 Vac – 50 Hz/230 Vac*



TESA-Scope 500V fitted with a system that enables the user to choose between 2 objectives

Order No.	EDP NO.	Description	***8x4 in*** / Meas. table 200x100 mm	TS 100	TS 300	TS 300E
06830064	24801	TESA-Scope II 500V – TS100	✓	✓		
06830065	24802	TESA-Scope II 500V – TS300	✓		✓	
06830066	24803	TESA-Scope II 500V – TS300E	✓			✓

Magnification	10 x	20 x	50 x
Lens length and lens body length	3.43 in/87 mm	3.23 in/82 mm	2.4 in/61 mm
Working distance	3.15 in/80 mm	3.15 in/80 mm	3.15 in/80 mm
Maximum height	4.33 in/110 mm	4.33 in/110 mm	4.33 in/110 mm
Maximum diameter	6.3 in/160 mm	6.3 in/160 mm	6.3 in/160 mm

TS-100

- X/Y readout
- 0.0001 in/0.001 mm resolution
- Inch/Metric switchable
- Independent zero reset (X/Y)
- Absolute and incremental measurement
- X/Y Linear compensation
- Illumination control – profile and surface
- RS-232 output (SPC Printer)
- Diameter: 3 to 10 entered points
- Radius: 3 to 10 entered points
- Distances from the last datum radius or diameter
- Auto Enter function
- RS-232 and Parallel Options

TS300E with edge detector

TS-300 and TS-300 E

TS-300 Control Panel with TESA Reflex Software –

- Allows operators to perform 1D and 2D measurement routines quickly and easily without the need for keyboard entry routines
- Identifies geometric elements, automatically draws the workpiece, and calculates their dimensions and relationships
- Geometric features: Point - Line - Circle
- Measured functions: Alignment - Measurement with references, translation, rotation
- Construction features: Intersection - Bolt Hole Circles - Lines
- LCD Screen
- 0.00005"/0.001mm Resolution
- Inch/Metric Switchable
- Cartesian and Polar coordinates
- Programming functions
- X/Y Linear Compensation
- Part View Printing
- RS-232 and Parallel Options
- Edge Detection (Optional TS-300E)

- Skew
- Point
- Radius
- Diameter
- Arc
- Angle
- Line
- Distance
- Slot
- Perpendicularity
- Parallelism
- Given point
- Given diameter
- Auto Enter function

Accessories

Telecentric lenses for TESASCOPE® 300V - 355H

06860001	300V-355H	10 x Telecentric lens
06860002	300V-355H	20 x Telecentric lens
06860005	300V-355H	50 x Telecentric lens

Telecentric lenses for TESASCOPE® 500V

06860008	500V	10 x Telecentric lens
06860009	500V	20 x Telecentric lens
06860012	500V	50 x Telecentric lens

Accessories for all TESASCOPE®

06860015	200 x 100 mm glass stage/300V
06860016	300 x 150 mm glass stage/300V PLUS
06860017	300V screen with 4 chart clips
06860018	355H screen with 4 chart clips
06860019	500V screen with 4 chart clips
06860020	Profile lamp (24 V-150 W)
06860021	Surface lamp (24 V-150 W)
06860023	Remote foot switch
06860025	Vise stage/300V – 500V – 355H
06860026	Vise stage with fixture base/355H
06860027	TESA demo part

ETALON® TCM 50 Measuring Microscope

Provides simplicity and user comfort – 4 x 2 in / 100 x 50 mm measuring span – 0.0001 in or 0.001 mm numerical interval – High-precision – Built-in transmitted and oblique incident light – Eyepiece with angle device – RS-232 digital output – In-house calibration certificate.

06839000 **ETALON TCM 50 measuring microscope**

Consisting of the following components:

1 TCM 50 measuring microscope, complete.
Measuring table (4 x 2 in / 100 x 50 mm measuring span) with opto-electronic system and cable for the transmission of the measurement signal. Height adjustable optics holder. Monocular viewing tube. Objective for 30x magnification. Eyepiece with angle device. Built-in transmitted light and oblique incident light with continuous brightness setting.

1 A 50 Computing counter.
Up/down counter with a two-line numerical display (X and Y, 7-digit display). Numerical interval 0.001 or 0.0001 in. RS-232 digital output.

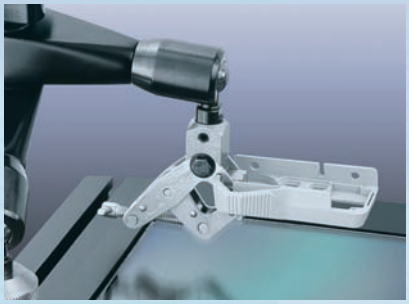
Supplied with:

1 Mains adapter, 100 to 240 Vac, 47 to 63 Hz, 11 to 13 Vdc, 30 W.

1 Dust cover.

Optional accessories

06869027 Set of clamping components (listed individually on page N-9).



Main instrument with measuring table

4 x 2 in
100 x 50 mm

Ball-bearing measuring table. Moves freely or over the threaded spindle with quick action drive.

Workpiece attachment with two M8 threads. Max. perm. load: 11 lbs.

Optics holder with adjustable height by means of the wide knurled collars mounted on each side.

Opto-electronic measuring system with incremental steel scale

.0001 in
0.001 mm

Valid for one coordinate direction plus working temperature range:
10 µm + 0.04 · L µm
(L = mm)

Optics

Upright, laterally correct image

30x

Monocular eyepiece with dioptric compensation. Rotating graticule.

Built-in device for angle measurement: angle scale value 1°, readout 12' (assessment)

Objective 2 : 1
Object-field diameter .256 in / 6.5 mm
Numerical aperture 0.05
Free working distance 4 in / 100 mm
(see drawing)

Integrated transmitted light and oblique incident light with continuous brightness setting, 5 W each

ETALON® TCM 50 Measuring Microscope

TCM 50 counter

Two-line LC display (coordinates X/Y)

7 digits and 7 segments per sign

0.0001 in or 0.001 mm

.354 in 9 mm

Keyboard protected against the penetration of liquids

RS-232

TCM 50 General Information

Main instrument with counter: mains adapter 100 to 240V, 47 to 63 Hz, 11 to 13 Vdc, max. 30 W

32 °F to 122 °F

68 °F ± 32.9 °F

- 4.0 °F to 158 °F

Counter protection: IP52 (IEC 60529)

EN 50081-1, EN 50082-2, EN 61000-3-2, EN 61000-3-3

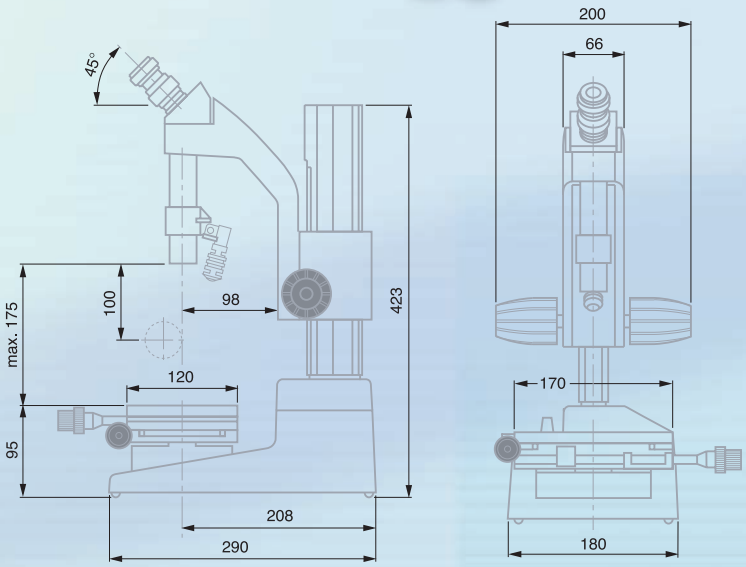
18 lbs. (microscope) 1 lb. (counter)

Transport packing

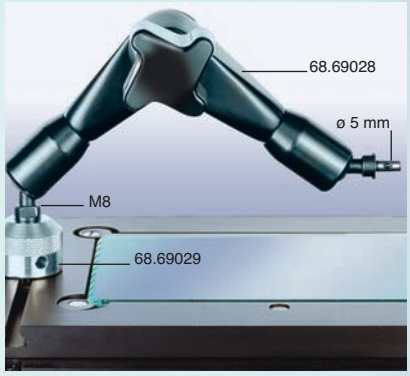
Identification number

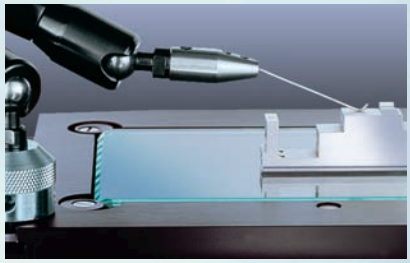
In-house calibration certificate

Declaration of conformity

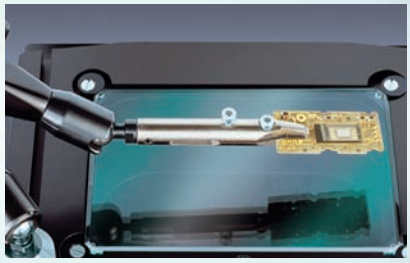


68.69027

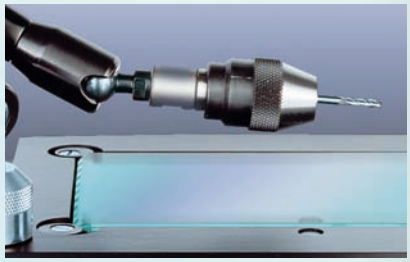




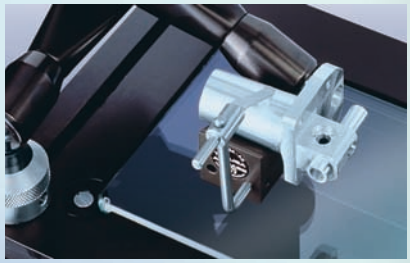
68.69031



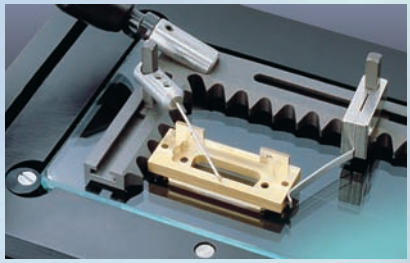
68.69033



68.69035



68.69037



68.69038 – 68.69039 – 68.69040 – 68.69042

Swiss Made ✓

Wooden case

Declaration of conformity

06869027	**Set of clamping components** Suitable for ETALON microscopes TCM 50, TCM 100 and TCM 200 as well as ETALON profile projector PP 300.
Consisting of:	
68.69028	**1 SU articulated support** Dual-arm support with central clamp through the star grip. Total length 7.7 in / 195 mm. With 1 socket joint and 2 ball joints. M8 fixing thread on the table side and .197 in / 5 mm dia. fixing hole on the workpiece side. Max. perm. load: 14 oz. / 400 g.
Clamps for attaching the SU support on the measuring table	
	T-slot blocks, type ETALON / LEICA. **T-slot blocks** with M8 fixing thread for articulation.
68.69029	1 Item, type V for vertical position.
68.69030	1 Item, type H for horizontal position.
Workpiece-oriented clamps for use with the SU support	
	With a .197 in / 5 mm dia. fixing hole. **Spring clamp** to hold workpieces down.
68.69031	1 Item, 1.34 in / 34 mm long.
68.69032	1 Item, 1.97 in / 50 mm long.
68.69033	**1 P clamp for small parts**, max. clamp capacity. ≤ .071 in / 1.8 mm, resting width .118 in / 3 mm, depth stop at .060 in / 1.5 mm.
68.69034	**1 M clamp for small parts**, max. clamp capacity. ≤ .197 in / 5.0 mm, resting width .19 in / 4.8 mm, depth stop at .060 in / 1.5 mm.
68.69035	**1 Clamping chuck,** ≤ .118 in / 3 mm dia.
68.69036	**1 Toggle clamp**, clamping capacity ≤ .98 in / 25 mm
68.69037	**1 V-block with spring clamp** covering a range from .080 to .98 in / 2 to 25 mm. Vee angle 120°. Vee length .98 in / 25 mm.
68.69038	**1 Try square**, beam length 4.73 x 3.15 in / 120 x 80 mm. Accommodates 2 T-grooves for both columns No 68.69039.
68.69039	**2 Columns** used with the try square for attaching the spring clamps listed below. **Spring clamp** to hold the workpieces down.
68.69040	1 Item, 1.34 in / 34 mm long.
68.69041	1 Item, 1.97 in / 50 mm long.
	Leaf spring clamp to press the workpiece against the try square.
68.69042	1 Item, 1.34 in / 34 mm long.
68.69043	1 Item, 1.97 in / 50 mm long.
68.69044	**1 Adapter** rotating through 4 x 90° with lock-in positions.
	1 Socket head key (2, 2.5 and 3 mm). 1 Clamping bolt for holes with a 5 mm dia.

ETALON TCM 200
Measuring Microscope

Modular concept – Custom built configurations for optical applications from length measurement through metallographic examination – Selectable telecentric objectives of superior quality – Optimum object illumination – Ball-bearing measuring tables having a 150 x 100 mm or 250 x 150 mm measuring span – Opto-electronic measuring systems with incremental steel scales – Computer based data processing – RS-232 digital output – In-house calibration certificate.

- *Non-contact measurement in 1, 2 or 3 coordinate directions.*
- *Numerical interval to 0.0005 mm or 0.00002 in.*
- *High accuracy guaranteed by a very low maximum permissible error –2.6 µm only over a 150 mm measured length, for instance.*
- *High load capacity and long free working distances for the inspection of tall test pieces.*
- *Bright images for surface structure examination with magnifications up to 1000 x.*
- *Video camera for further image analysis.*

Main instrument with measuring table

150 x 100 mm
250 x 150 mm

Main part in cast iron.
Optics holder guided on a ball-bearing, height adjustable using the feed knobs for fast and fine focusing, max. travel 150 mm.
Steel ball-bearing measuring tables equipped with opto-electronic systems having incremental steel scales.

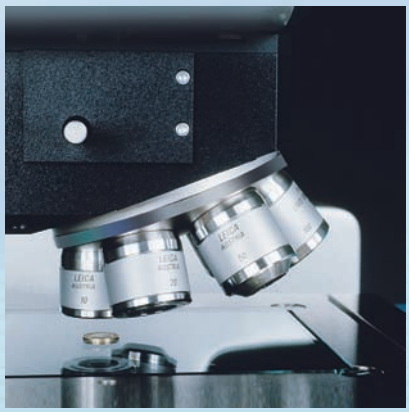
Valid for one coordinate direction as well as the working temperature range:
1.8 µm + 0.005 · L µm
for the table 150 x 100
2.5 µm + 0.01 · L µm
(L in mm)
for the table 250 x 150

Illumination system

Coaxial reflected light and transmitted light with knurled wheel used for setting the diaphragm aperture.
Light units with remote continuous brightness setting.
fiber-optic illumination

Optical system

Binocular viewing tube with dioptric compensation for each eyepiece.
Eyepiece cups 10 x magnification.
20 mm dia. free opening
25° viewing angle.
Upright, laterally correct image.
For interchangeable objectives and micro-objectives with bayonet mount.

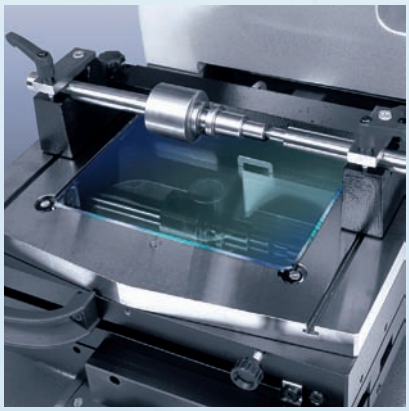


ETALON TCM 200 made ready-for-use – Ordering Variations

Equipped with binocular viewing tube for metrology oriented applications (for 230 V).
Additional technical data and ordering information as listed below.

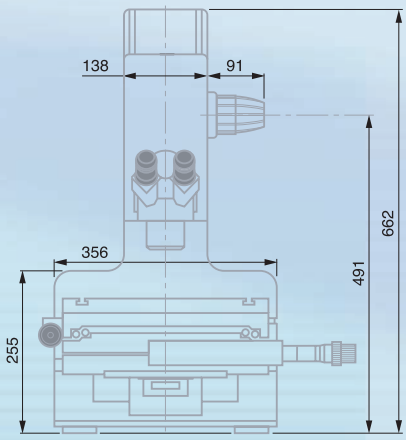
No.	Variations	Main instrument with binocular viewing tube	Cold light unit transmitted light 35 W	Cold light unit reflected light 90 W	Meas. table Meas. span 150 x 100 mm	Meas. table Meas. span 250 x 150 mm	Coordinate direction Z	QUADRA-CHEK 220	QUADRA-CHEK 230*	QUADRA-CHEK 4000
06839006	1	●	●	●	●		●		●	
06839007	2	●	●	●		●	●		●	
06839008	3	●	●	●	●			●		
06839009	4	●	●	●		●		●		
06819006	5	●	●	●	●		●			❍
06819007	6	●	●	●		●	●			❍
06819008	7	●	●	●	●					❍
06819009	8	●	●	●		●				❍

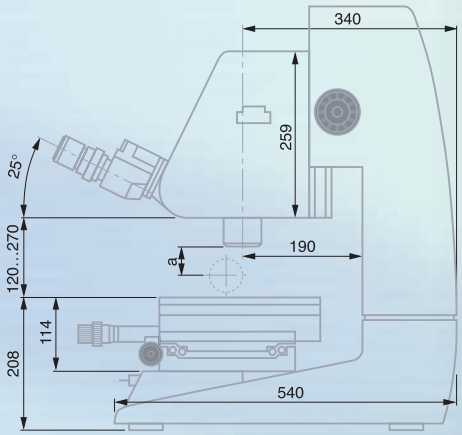
* Execution for X, Y and Z coordinate directions: ETALON No. 06839014.
❍ Not part of the sales program. Must be ordered on the spot.



Highly significant features

- *Table freely moved by hand or fine displacement over the threaded spindle allowing quick positioning in each direction.*
- *Objectives with bayonet mount for easy exchange with just one hand.*
- *Inserts with crossline graticules and concentric circles.*
- *Patented angle device with digital measuring system (as pictured opposite)*
- *Center support for use in conjunction with the insert fitted with both aperture diaphragm and interference slit used to check diameters on cylinders (as pictured opposite).*
- *Fiber-optic illumination to eliminate all heat lighting.*
- *Image viewing in transmitted light, coaxial reflected light, oblique incident light and ring light as well as brightfield/darkfield. Also with or without polarized light or interference contrast (DIC).*
- *Dedicated compact counter for 2 and 3 coordinate directions.*
- *Software for value processing using a computer unit.*





General

- 10 °C to 40 °C
- 20 ± 0.5 °C
- –10 °C to 60 °C
- 120 to 230 Vac 50 to 60 Hz
- Protection IP40 (IEC 60529)
- EN 50081-1, EN 50082-1, EN 61000-4, EN 61010-1
- 70 kg net (main instrument No. 06819010)

45 kg (table 150 x 100)
70 kg (table 250 x 150)

- Setting key and dust cover
- Shipping packaging
- Identification number
- In-house calibration certificate
- Declaration of conformity

ETALON TCM 200 Key Components

TCM 200 Main Instruments – General Overview

Important: In order to let you work with your microscope efficiently, at least the following components must be added to all main instruments:

- *Measuring table*
- *Cold light source for transmitted and reflected illumination*
- *Computing counter for value processing*

06819010	**Main instrument with binocular viewing tube**					●
06819011	**Main instrument binocular viewing tube and measuring system (Z)**				●	
06819012	**Main instrument video viewing tube**			●		
06819013	**Main instrument video viewing tube and measuring system (Z)**	●				
Consisting of:						
	1 TCM 200 main body	●	●	●	●	
	1 Optics holder with both mechanically operated fast and fine displacement	●	●	●	●	
	1 Digital measuring system in the Z direction	●		●		
	1 Binocular viewing tube			●	●	
	1 Video viewing tube	●	●			
	2 Eyepieces with a 10 x magnification (order number for 1 item)			●	●	
	1 Measuring objective 2 : 1	●	●	●	●	
	1 Insert with aperture diaphragm	●	●	●	●	

Components and Use of Accessories – General Overview

To be used with:	**Binocular Viewing Tube**										●
	Video Viewing Tube									●	
	Measuring System in the Z Direction								●		
To be used for:	**Length Measurements**							●			
	Surface Examination in polarized light						●				
	Surface Examination with Interference Contrast DIC					●					
No.											
06869061	150 x 100 measuring table					●	●	●	●	●	●
06869062	250 x 150 measuring table					●	●	●	●	●	●
06869063	CLS 50 cold light source for transmitted light	12 V	35 W for 230 Vac			●	●	●	●	●	●
06869064			120 Vac			●	●	●	●	●	●
06869003	CLS 100 for reflected light and oblique incident light	14.5 V	90 W for 230 Vac			●		●	●	●	●
06869006			120 Vac			●		●	●	●	●
06869065	CLS 150 for reflected light and oblique incident light	15 V	150 W for 230 Vac			●	●				
06869066			120 Vac			●	●				
06869069	Insert with crosslines graticule							●	●		●
06869070	Insert with crosslines graticule and concentric circles							●	●		●
06869071	Angle device with measuring system (Q)							●	●		●
	LEICA Plan Achromat telecentric measuring objectives										
06869008	Lateral amplification	1 : 1	Total magnification	10x				●	●	●	●
06869009		5 : 1		50x				●	●	●	●
06869010		10 : 1		100x				●	●	●	●
06869011		20 : 1		200x				●	●	●	●
06869072	Center support (for use with the 150 x 100 measuring table only)							●	●	●	●
06869073	Insert with aperture diaphragm and interference slit							●	●	●	●
06869002	Illumination unit with oblique incident light (objectives 1 : 1 to 10 : 1)							●	●	●	●
06869074	Illumination unit with ring light							●	●	●	●
06869075	Micro-optical head for 6 micro-objectives					●	●	◗	◗	◗	◗
06869076	Micro-optical head for 6 micro-objectives and polarized light					●	●	◗	◗	◗	◗
06869019	Single bayonet mount					●	●	◗	◗	◗	◗
	LEICA Plan Fluor micro-objectives for image viewing in polarized light (optional)										
06869012	Objective	2.5 : 1	Total magnification	25x		●	●	◗	◗	◗	◗
06869013		5 : 1		50x		●	●	◗	◗	◗	◗
06869014		10 : 1		100x		●	●	◗	◗	◗	◗
06869015		20 : 1		200x		●	●	◗	●	◗	◗
06869016		40 : 1		400x		●	●	◗	●	◗	◗
06869017		50 : 1		500x		●	●	◗	●	◗	◗
06869018		100 : 1		1000x		●	●	◗	●	◗	◗
06869077	Micro-optical head for 6 micro-objectives and image viewing in polarised light with interference contrast DIC					●	●	◗	◗	◗	◗
	LEICA Plan Fluor micro-objectives for image viewing in polarised light or not, but with interference contrast DIC										
06869078	Objective	10 : 1	Total magnification	100 x		●	●	◗	◗	◗	◗
06869079		20 : 1		200 x		●	●		●		
06869080		40 : 1		400 x		●	●		●		
06869081		50 : 1		500 x		●	●		●		
06869082		100 : 1		1000 x		●	●		●		
06839013	QUADRA-CHEK 220 for 2 coordinate directions (X and Y)							●		●	●
06839014	QUADRA-CHEK 230 for 3 coordinate directions (X, Y and Z)							●	●	●	●
06839015	QUADRA-CHEK 231 for 3 coordinate directions (X, Y and Z) plus angle (Q)							●		●	●
	QUADRA-CHEK 4000 software (available on request)							●	●	●	●
	Video system (available on request)					●	●	●	●	●	●
06869083	C-mount adapter with 1.2 x magnification					●	●	●	●		●
06869084	C-mount adapter with built-in magnification changer (0.4 x and 1.2 x)					●	●	●	●		●
06869020	KAPPA FK1/F electronic graticule							●		●	●
06869027	Set of clamping components					●	●	●	●	●	●

Main Instruments

06819010 **Main instrument with binocular viewing tube for ETALON TCM 200**
(measuring table and computing counter excluded)

Consisting of the following components:

1 TCM 200 main body, cast iron, varnished. Vertical columm with guide adjusted to the optiques holder No. 06869086 (max. displacement 150 mm). fiber-optic transmitted light illumination.

1 Optics holder
With mechanically operated knurled collars for fast and fine focusing. Accommodates an attachement for the viewing tube.

1 Binocular viewing tube
Provided with dioptric compensation for each eyepiece, single bayonet mount for LEICA Plan Achromat and Plan Fluor objectives or the micro-optical head, ocular accommodated attachment, video camera adapter (C-mount) and angle device. Coaxial reflected illumination via fiber-optic.

2 Eyepieces
With a 10x magnification and cups (order number for 1 item only)

1 Measuring objective 2 : 1
Free working distance a = 85 mm

1 Insert with aperture diaphragm
For use in transmitted light.
With setting knurled wheel.

06819012 **Main instrument with video viewing tube for ETALON TCM 200**
(measuring table and computing counter excluded)

Consisting of the following components:

1 TCM 200 main body
Cast iron body, varnished. Vertical column with guide adjusted to optics holder No. 06869086 (max. displacement 150 mm). fiber-optic transmitted illumination.

1 Optics holder
With mechanical fast and fine focusing. Accommodates the attachment for the viewing tube.

1 Video viewing tube
Provided with single bayonet mount for LEICA Plan Achromat and Plan Fluor objectives or the micro-optical head. Also with C-mount adapter for the video camera. Coaxial reflected illumination via fiber-optic.

1 Measuring objective 2 : 1
Free working distance a = 85 mm

1 Insert with aperture diaphragm
For use in transmitted light.
With setting knurled wheel.

06819011 **Main instrument with binocular viewing tube and digital measuring system in the Z direction**
(measuring table and computing counter excluded)

Identical to the model No. 06819010 described above, but with the following added option:

06869090 1 Opto-electronic measuring system
Mounted in the coordinate direction Z with incremental steel scales, 0.0001 mm resolution.

06819013 **Main instrument with video viewing tube and digital measuring system in the Z direction**
(measuring table and computing counter excluded)

Identical to the model No. 06819012 described above, but with the following added option:

06869090 1 Opto-electronic measuring system
Mounted in the coordinate direction Z with incremental steel scales, 0.0001 mm resolution.

Measuring Tables

No	=	
06869061	**150 x 100 measuring table**	150 x 100 mm measuring span (X/Y directions). Rotary stage (320 x 240 mm surface area) through ± 5° for manual workpiece alignment. With cable for transmission of the measurement signal.
06869062	**250 x 150 measuring table**	150 x 100 mm measuring span (X/Y directions). Surface area 420 x 256 mm. With cable for transmission of the measurement signal.

Note:
Executions with motorized displacement in the two coordinate directions X and Y also available upon request.

✓

Ball-bearing guiding.
Free move or fine displacement over the threaded spindle.
With 2 T-slots for tightening the workpiece.
Max. load capacity
30 kg (table 150 x 100)
20 kg (table 250 x 150)

Opto-electronic system with incremental steel scale.
TTL signal form.

0.0001 mm

Cold light sources

No	=	
	Cold light sources for transmitted illum. 35 W	Includes both a 12V reflective halogen lamp (No. 06869067) and continuous brightness setting.
06869063	**CLS 50 for 230 Vac**, 50 to 60 Hz	
06869064	**CLS 50 for 120 Vac**, 50 to 60 Hz	
	Cold light sources for reflected illum. 90 W	Includes a 14.5 V reflective halogen lamp (No. 06869004) and continuous brightness setting.
06869003	**CLS 100 for 230 Vac**, 50 to 60 Hz	
06869006	**CLS 100 for 120 Vac**, 50 to 60 Hz	

✓

Shipping packaging

Declaration of conformity

Systems for Value Processing

No	=	
	QUADRA-CHEK 200 Computing Counter	Up/down computing counter with alpha-numeric LC display and color background. Languages available: English, French, German, Italian and Spanish.Computerized workpiece alignment. Also with functions to calculate for geometric combinations, programmable measurement cycles, memory as well as parallel, digital RS-232 and infra-red outputs.
06839013	**QUADRA-CHEK 220**	For **2 coordinate directions** (X and Y)
06839014	**QUADRA-CHEK 230**	For **3 coordinate directions** (X, Y and Z)
06839015	**QUADRA-CHEK 231**	For **3 coordinate directions** (X, Y and Z) **and Q** (Angle device No. 06869071)

QUADRA-CHEK 200 Computing Counter

✓

Black/white LC display

0.0005 mm or 0.00002 in

Parallel and RS 232

85 to 264 Vac, 43 to 63 Hz

EN 61326: 1998
EN 61010

0 °C to 45 °C

292 x 190 x 250 mm (W x D x H)

4,8 kg without cable

Shipping packaging

Declaration of conformity

QUADRA-CHEK 4000 – Software program for value processing
For value processing and output using a PC.
Permits the user to observe the image through the binocular viewing tube or using a video camera linked to an additional viewing screen.

For QUADRA-CHEK 4000 running under WINDOWS, the option enabling automatic edge detection can also be provided for further image analysis.

The computing cards necessary for connecting the microscope to the computer can be quoted as follows:

- **Dual-input computing card for both X and Y coordinate directions**
- **Dual-input computing card for the three coordinate directions X, Y and Z**
- **2 Dual-input computing cards for both X and Y coordinate directions as well as angle device (Q)**
- **2 Dual-input computing cards for the three X, Y and Z coordinate directions as well as angle device (Q)**

For more information, contact TESA USA customer service at 1-800-283-3600.

✓ Shipping packaging

Declaration of conformity

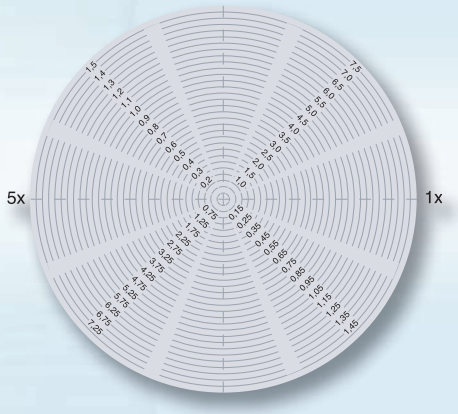
Accessories for Metrology based Applications using TCM 200

No.	
06869069	**Insert with crosslines graticule** 90° crosslines graticule with 2 additional index lines to ± 60°. To be used in conjunction with the binocular viewing tube No. 06869087.
06869070	**Insert with crosslines graticule and concentric circles** 90° crosslines graticule with 2 additional index lines to ± 60° as well as 2 sets of 30 concentric lines each.

Magnification	Diameter	Stepping
10 x	0.25 to 7.5 mm	0.25 mm
20 x	0.25 to 3.75 mm	0.125 mm
50 x	0.05 to 1.5 mm	0.05 mm
100 x	0.05 to 0.75 mm	0.025 mm

Usable with the binocular viewing tube No. 06869087

06869071	**Insert with protractor and digital measuring system** Crosslines graticule combined with opto-electronic measuring system, which is based on incremental scale divisions. Both features can be rotated. Sinusoidal output signal ± 11 μA_{pp}. To be used with the binocular viewing tube No. 06869087
	LEICA Plan Achromat measuring objectives High-quality telecentric measuring objectives producing a perfect erect image, thus allowing a definite Long working distances, e.g. for the inspection of test pieces having awkward edges or for bore measurements. Easily and quickly exchanged. Safely attached through the bayonet mount.

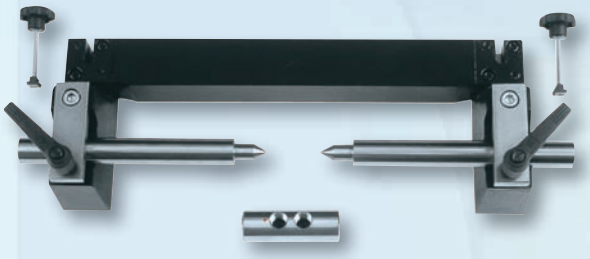


LEICA Plan Achromat measuring objectives

	Objectives	Total magnification	Object-field	Numerical aperture	Free working distance a
06869008	1 : 1	10x	20 mm	0.03	88 mm
06869022*	2 : 1	20x	10 mm	0.06	85 mm
06869009	5 : 1	50x	4 mm	0.13	62 mm
06869010	10 : 1	100x	2 mm	0.20	52 mm
06869011	20 : 1	200x	1 mm	0.35	30 mm

* The measuring objective 2:1 is a full part of the ETALON TCM 200 main equipment

✓ Shipping packaging Declaration of conformity



Note:
Mounting the measuring device for diameter inspection according to the interference method requires a specific knowledge. Therefore, allowances should be made for this feature at the date of purchase of your microscope. This device includes the center support along with the insert as listed opposite.

06869072 Center support
Serves to measure parts with symmetrical rotation. Max. width of points 190 mm. Max. diameter 50 mm. Usable solely with the 150 x 100 measuring table (No. 06869061).

Supplied with a setting piece designed for inspecting diameters on cylinders according to the method that uses interference fringes. This support requires the use of the insert No. 06869073.

✓ Shipping packaging Declaration of conformity

06869073 Insert with aperture diaphragm and interference slit
For diameter inspection on cylinders in transmitted light on the basis of the interference method. Used with the center support No. 06869072. Includes a knurled wheel to set both the aperture diaphragm and interference contrast.

06869002 Oblique incident light unit
Suitable for the measuring objectives 1 : 1 to 10 : 1. Dual-arm fiber-optic cable with holder rotating through ± 45° in the optical axis.

For use in conjunction with the cold light unit CLS 100 (90 W, No. 06869003 or 06869006) or CLS 150 (150 W, No. 06869065 or 06869066).

06869074 Ring light unit
Suitable for all measuring objectives. Includes one fiber-optic cable.

For use with the CLS 100 cold light unit (90 W, No. 06869003 or 06869006).

Accessories for Surface Structure Examination

06869019 **Single bayonet mount for micro-objectives**
With threads for micro-objectives 2.5:1 to 100:1.
For transmitted and coaxial reflected illumination.

✓
Micro-optical heads furnished in a carrier packing with aerated foam that can be inserted into a drawer for further use
Declaration of conformity

06869075 **Micro-optical head suited for 6 micro-objectives**

Consisting of:

1 Main body
With changer for 6 LEICA Plan Fluor micro-objectives 2.5 : 1 to 100 : 1 and 1 fiber-optic cable (light unit No. 06869003 or 06869006 not included).
1 Triple-module illumination
Mounted in the main body with coaxial reflected light (darkfield/brightfield).

06869076 **Micro-optical head suited for 6 micro-objectives as well as image viewing in polarized light**

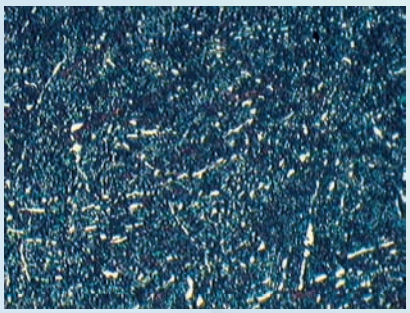
Includes the same components as No. 06869075 above plus the following additional option:

1 Polarized
Mounted in the main body.

LEICA Plan Fluor micro-objectives for image viewing with or without polarized light
Convenient for illumination in transmitted and coaxial reflected light. To be used with the single bayonet mount No. 68.69019 or the micro-optical head No. 06869075 or 06869076, without interference contrast DIC.

✓
Shipping packaging
Declaration of conformity

	Objectives	Total magnification	Object-field	Numerical aperture	Free working distance a
06869012	2.5 : 1	25x	8 mm	0.075	5.5 mm
06869013	5 : 1	50x	4 mm	0.10	10.5 mm
06869014	10 : 1	100x	2 mm	0.20	10.5 mm
06869015	20 : 1	200x	1 mm	0.40	10.5 mm
06869016	40 : 1	400x	0.5 mm	0.50	10.5 mm
06869017	50 : 1	500x	0.4 mm	0.60	3.6 mm
06869018	100 : 1	1000x	0.2 mm	0.70	3.6 mm



06869077 **Micro-optical head suited for 6 micro-objectives and image viewing in polarized light with interference contrast (DIC)**

Consisting of the same components as No. 06869075, but provided with the following added options:

1 Polarizer
Mounted in the main body

1 DIC drawer.
With adjustable Wollaston prism

✓

Micro-optical heads in a carrier packing with aerated foam that can be inserted in a drawer for further use

Declaration of conformity

LEICA Plan Fluor micro-objectives for image viewing with or without polarized light, with interference contrast DIC

Convenient for illumination in transmitted and coaxial reflected light. To be used with the single bayonet mount No. 06869019 or the micro-optical head No. 06869076 or 06869077. These objectives are marked with “IK” for “Interference Contrast”.

	Objectives	Total magnification	Object-field	Numerical aperture	Free working distance a
06869078	10 : 1	100x	2 mm	0.20	10.5 mm
06869079	20 : 1	200x	1 mm	0.40	10.5 mm
06869080	40 : 1	400x	0.5 mm	0.50	10.5 mm
06869081	50 : 1	500x	0.4 mm	0.60	3.6 mm
06869082	100 : 1	1000x	0.2 mm	0.70	3.6 mm

✓

Shipping packaging

Declaration of conformity

Cold light sources with reflected light used for image viewing with interference contrast and polarization,150W

With a 15V reflective halogen lamp (No. 06869068) as well as continuous brightness setting.

06869065 CLS 150 for 230 Vac, 50 to 60 Hz

06869066 CLS 150 for 120 Vac, 50 to 60 Hz

✓

Shipping packaging

Declaration of conformity

✓ Shipping packaging
Declaration of conformity

Video Systems for ETALON TCM 200

Measuring microscope with binocular viewing tube

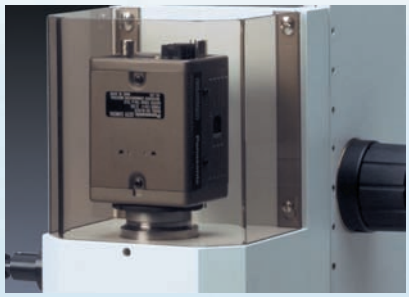
All adapters listed hereafter allow the microscope to accommodate a video camera with a C-mount.

No		
06869083	**C-mount adapter with a 1.2 x magnification**	
	consisting of:	
	1 Adapter with a 1.2 x magnification factor	
	1 C-mount attachment for the camera	
06869084	**C-mount adapter with integrated magnification changer**	
	consisting of:	
	1 Adapter with integrated magnification changer, magnification factors of 0.4 x/1.2 x. Convenient only for a 0.5 in camera	
	1 C-mount attachment for the camera	

Measuring microscope with a video viewing tube

The electronic graticule shown below is intended for use with any QUADRA-CHEK 200 computing counter. However, this feature is unnecessary with QUADRA-CHEK 4000.

✓ 100 to 240 Vac 50 to 60 Hz
Connecting cable
Shipping packaging
Declaration of conformity



No		
06869020	**KAPPA FK1/F electronic crosslines graticule**	
	To be connected to the video screen. The graticule (white or black) overlaps the camera's image	

Workpiece Attachments

✓ Wooden case
Declaration of conformity

No		
06869027	**Set of campling components**	
	For safe positioning of workpieces to be measured and parts to be observed. Equally suited for ETALON measuring microscopes and ETALON profile projector PP 300.	
	Single components as listed on page N-29.	

PLASTIFORM

Non-Destructive Control by Print Molding

The products "PLASTIFORM Soft" allow print molding of complex internal machined parts, which can then be viewed and checked using optical, non-contact measuring equipment.

The products "PLASTIFORM with Additives" consist of two components, which have to be mixed in equal proportion to ensure a proper polymerization.

The test object to be reproduced by print molding must be perfectly clean as well as non-greasy before applying Plastiform.

06869100 Complete DS case

Provided with the following standard accessories:

1 DS50 injection handle
1 Cutter, special with two parallel blades
1 PLASTIN (200 g)
25 Mixer-Injectors, color pink
25 Mixer-Injectors, color turquoise
10 Injector end pieces
1 DN1 spot remover, 400 ml
21 Rings for mould removal
3 BAD PLASTIFORM S50
3 DAV PLASTIFORM S50
2 SOFT PLASTIFORM S50

✓

Components with additives free from chlorine, fluorine or sulfur. Being non-toxic and non-polluting can be used with no special restriction

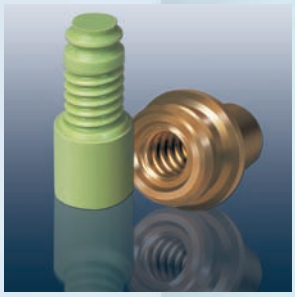
20 °C

Polymerization will not occur below 10 °C

Shrinking: less than 1 µm/mm after removal of the mould
Stability: physical properties allow to produce prints which do not deteriorate with time. They will neither be affected by surroundings – hence usable as master standards.

Characteristics

	BAD ●	DAV ●	SOFT ●	JAD ●	KVAD ●
Two components	Blue+White	Green+White	Orange+White	Turquoise+White	Green+White
Consistency	Fluid	Fluid	Pasty	Pasty	Mastic
Color	Blue	Green	Orange	Turquoise	Green
Smell	None	None	None	None	None
Polymerize time at 20 °C	8 minutes	8 minutes	8 minutes	8 minutes	8 minutes
SHORE A hardness	50/55	25/30	50/55	25/30	70/75
Elasticity	Elastic	Very elastic	Elastic	Very elastic	Hardly elastic
Density	1.3	1.3	1.3	1.3	1.6



BAD ●

Fluid consistency best suited for moulding internal and full prints of small and medium sizes. Medium elasticity (10% of the core) allows prints to be removed in most cases. Reproduces the finest details and can be used for indirect inspection of the surface finish by sight comparison with use of master roughness specimens. Easily cut with the special cutter.

DAV ●

Fluid consistency best suited for internal moulding and full prints of small and medium sizes. High elasticity (20% of the core) allows hard prints to be removed such as large re-entrant angle, groove, complex internal shape. Reproduces fine details. Not easily cut — print will preferably be checked as a whole.

SOFT ●

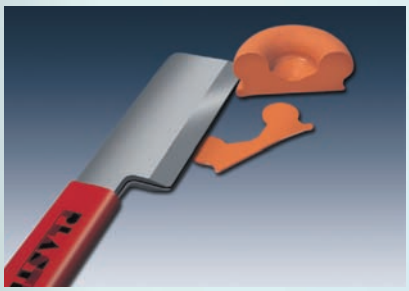
Pasty consistency best suited for internal moulding, external and sectorial prints of small and medium sizes. Medium elasticity (10% of the core) allows prints to be removed in most cases. Able to reproduce small details. Easily cut with the special cutter.

JAD ●

Pasty consistency best suited for moulding internal, external and sectorial prints of small and medium sizes. High elasticity (20% of the core) allows hard prints High elasticity (20% of the core) allows hard prints to be removed such as large re-entrant angle, groove, complex internal shape. Not easily cut — print will preferably be checked as a whole.

KVAD ●

Mastic consistency best suited for moulding internal, external and sectorial prints of small and medium sizes. Applied by hand. Low elasticity (from 1 to 2% of the core) makes it convenient for moulding prints that are removed with ease. Also appropriate for prints held mechanically if desired. Easily cut with the cutter.



Accessories

Nº	
06869101	BAD PLASTIFORM S50, 8 double cartridges, 50 ml
06869102	DAV PLASTIFORM S50, 8 double cartridges, 50 ml
06869103	SOFT PLASTIFORM S50, 8 double cartridges, 50 ml
06869104	JAD PLASTIFORM S50, 8 double cartridges, 50 ml
06869105	KVAD PLASTIFORM in packs of 2 boxes (A + B), 800 g each
06869106	Mixer-injectors in packs of 50, color pink
06869107	Mixer-injectors in packs of 100, color pink
06869108	Mixer-injectors in packs of 200, color pink
06869109	Injector nozzles in packs of 20
06869110	PLASTIN (200 g). Malleable under normal conditions. Used to make «stops» or «retainers» when executing sectorial prints. Reusable.
06869111	Cutter, special with two parallel blades spaced 1 mm apart over a usable length of 60 mm.
06869112	DS 50 injection handle
06869113	DN1 spot remover, aerosol can, 400 ml
06869114	Mixer-injectors in packs of 50, color turquoise
06869115	Mixer-injectors in packs for 100, color turquoise
06869116	Mixer-injectors in packs of 200, color turquoise