TESA UPC – for Comparative Measurement

TESA UPC Gauge Block Comparator for Comparative Measurement

- Measures gauge blocks of same nominal length by comparison.
- Comes with the new template system for positioning the gauge blocks.
- Single or dual template system for optimum ease of gauge handling.
- Features TESA high-precision inductive probes.
- Allows ultra-precise temperature measurement, integrated.
- Transfers on-line all measured length and temperature values.
- Executes computer-aided data processing with all required correction values included.
- Performs calibrations that meet the requirements of both ISO standards and EA guidelines (EAL – European cooperation for Accreditation of Laboratories).
- Includes an execution for greater accuracy along with a calibration certificate (optional).

TESA UPC is specially designed for the calibration – or dimensional inspection – of gauge blocks with nominal lenghts ranging from 0,5 to 100 mm. The configuration, which consists of two probes aligned opposite one another, associated with both the concept and quality of the measuring system provides full guarantee for an extra low uncertainty of measurement. Although TESA UPC is mainly intended for manufacturers and end-users of gauge blocks, this comparator is also widely used in nationally accredited laboratories.

If specified, TESA can also provide the temperature device available as an option. This device has 4 PT100 platinum resistances, each capturing the temperature of the two gauge blocks along with that of both the measuring table and the support. Computer-aided data processing lets you carry out any calibration most reliably and rationally – for sure.

EN ISO 3650

For gauge blocks ranging from 0,5 mm to 100 mm or 0.02 in to 4 in (0,5 to 500 mm on request)

Comparative measurement procedure with transference of the length of a reference gauge block to the gauge block being measured.

Measuring configuration
2 probes connected in sum measurement (function +A+B) with mechanical contact with the measuring face.

Measuring points
On the reference gauge block: at the centre of the measuring face (point R). On the gauge block to be measured: at the centre (point 1) as well as the 4 corners of the measuring face, each lying 2 mm away from the adjacent faces (points 2 to 5).

Central length l_c is defined by probing both points R and 1.

Establishing lengths at any point requires measurements to be taken at points R plus 1 to 5.

Variation in length v is the result of measurements taken at points 1 to 5.

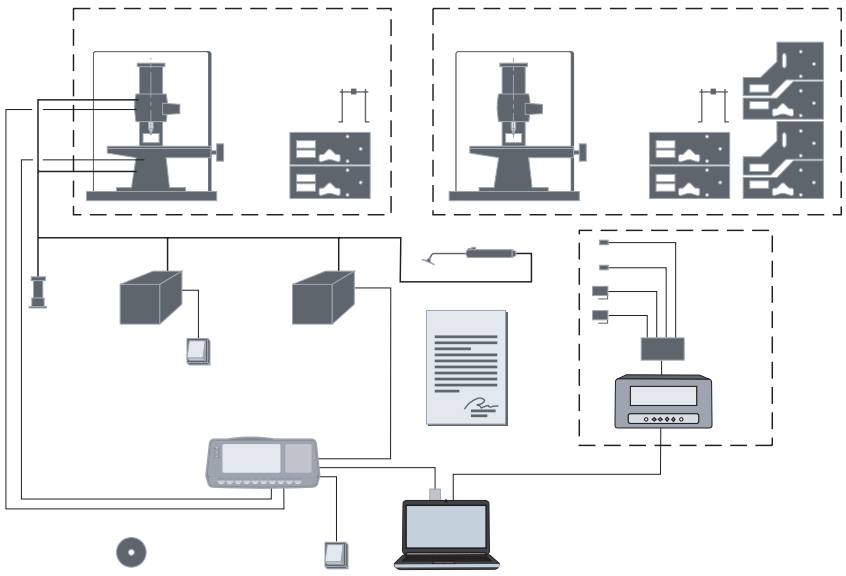
≈ 23 kg (comparator complete, but without computer).
≈ 4 kg (temperature device)

All instruments with the option for greater accuracy are delivered with serial numbers

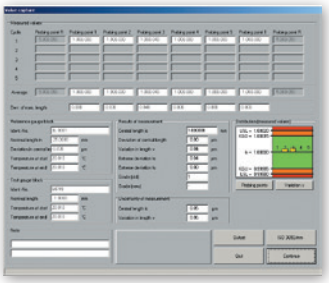
In-house calibration certificate for the version with greater accuracy or declaration of conformity for the standard version. Temperature device with SCS certificate.

NO					
TESA UPC GAUGE BLOCK COMPARATOR EQUIPPED WITH SINGLE TEMPLATE SYSTEM					
05930000	Standard execution without computer application				●
05930003	Execution for greater accuracy, with computer application			●	
TESA UPC GAUGE BLOCK COMPARATOR EQUIPPED WITH SINGLE AND DUAL TEMPLATE SYSTEM					
05930013	Execution for greater accuracy without computer application		●		
05930015	Execution for greater accuracy, with computer application	●			
EACH VERSION CONSISTS OF:					
01610401	TESA UPC mechanical part equipped with the single template system			●	●
05960030	TESA UPC mechanical part equipped with both single and dual template system	●	●		
03260401	Pneumatic retraction of the measuring bolt, manually operated				●
03260432	Electric vacuum pump with foot switch		●		
03260433	Electric vacuum pump with external control	●		●	
01660011	Pneumatic suction loader	●	●	●	
04430012	TESATRONIC electronic unit TT90	●	●	●	●
05960039	Set of TESA UPC accessories, including the components 04761049, 04760087 and 04761070				
04761049	Opto-RS cable, bidirectional	●		●	
04760087	Opto-RS interface	●		●	
04761070	Connecting cable TESATRONIC TT90 to vacuum pump	●		●	
04768000	Hand switch	●		●	
01690021	Option for greater accuracy with calibration certificate	●	●	●	

Error of Measurement	
Provided all the metrological conditions are met, the reliability of the two standard executions No. 05930000 and 05930002 is expressed as follows:	Provided all the metrological conditions are met, the reliability of both executions No. 05930001 and 05930003 along with the option for greater accuracy (No. 01690021) is expressed as follows:
Repeatability limit (with no effect due to external temperature): 0,025 µm	Repeatability limit (with no effect due to external temperature): 0,015 µm
Measurement uncertainty* $U = \pm (0{,}10 + 1{,}0 \cdot L)$ µm (L in m)	Measurement uncertainty* $U = \pm (0{,}05 + 0{,}5 \cdot L)$ µm (L in m)
Condition involves the use of reference standards (see page L-14 and L-15) whose uncertainty is as follows: $U \leq \pm 0{,}030$ µm when calibrating the comparator $U \leq \pm (0{,}05 + 0{,}5 \cdot L)$ µm (L in m) when calibrating the gauge blocks	Condition involves the use of reference standards (see page L-14 and L-15) whose uncertainty is as follows: $U \leq \pm 0{,}015$ µm when calibrating the comparator $U \leq \pm (0{,}02 + 0{,}2 \cdot L)$ µm (L in m) when calibrating the gauge blocks
* Applicable to steel gauge blocks	



TESA UP – Software Programme for Value Processing



TESA UP programme for processing measured values suitable for both TESA gauge block comparators UPD and UPC as well as for comparators from other manufacturers.

- Choice of 10 languages.
- On-line processing of length and temperature values as transferred.
- Measurement cycles and result outputs according to EN ISO 3650.
- Flexible architecture for optimum adaptation to specific user's needs.
- Possible entry of limit values and accuracy grades peculiar to users.
- Surveillance of value dispersion or value drift throughout length and temperature measurements.
- Automatic execution of all relevant corrections. The programme makes allowances for actual sizes of the reference standards, flattening due to different materials used (steel, tungsten carbide, ceramic), compensation of temperature variations with reference to 20°C according to the varying coefficients of linear expansion – as typical examples.
- Assignment of gauge blocks to their relevant grade.
- Possible storage of gauge block set related data.
- Inch or metric value processing.
- Calibration certificate in several formats.

EN ISO 3650

Minimum profile requirements for the computer needed to run the TESA UP software programme Personal Computer
- Configuration without heat source to avoid disturbing the ambient temperature at the measurement spot
- Operating system: Windows 7 or earlier versions (32 bits)
- Processor: 650 MHz
- 1 Hard disc (6 GB)
- RAM capacity: 64 MB
- CD-ROM drive (24x)
- RS232 serial port 1 for length values 1 for temperature values
- 3 USB ports

NO		
05960025	TESA UP software programme for gauge block calibration	1 CD-ROM plus 1 USB key of protection

Gauge Blocks for the Calibration of Comparators

To calibrate both TESA gauge block comparators UPD and UPC, we recommend the use of the gauge block set described hereafter. The 9-piece set is alsoy required for calibrating TESA UPD.

Set composition including 11 steel gauge blocks, class K

Each pair is in full compliance with:

- EAL-G21 – Calibration of gauge block comparators – European cooperation for Accreditation of Laboratories
- DKD-R 4-1 – Guidelines of the German Calibration Service (DKD) for the calibration of gauge block comparators.

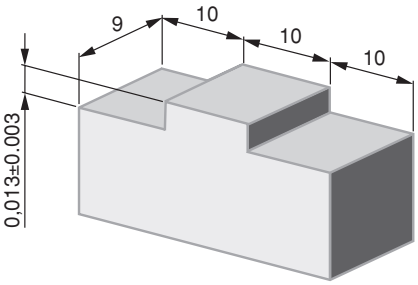
EN ISO 3650

Special high-alloy steel, wear resistant and stable.Exception: 6 mm special carbide gauge blocks.

The given expanded uncertainty k = 3 refers to the difference of central length of both gauge blocks A and B forming the pairs 1 to 5 as well as to the deviations f_o and f_u from the central length of gauge blocks forming both pairs 2 and 3. No need to calibrate those of pair No. 6.

NO		µm
S59110152	Set of 11 gauge blocks with PTB (Physikalisch Technische Budesanstalt) certificate	± 0,015
S59110489	Set of 11 gauge blocks with DAkkS certificate	± 0,030

Full tungsten carbide set also available on request



NO		
Pairs N°	Nominal length A mm	B mm
1	0,5	0,5
2	1,0	1,005
3	1,0	1,01
4	4,5	4,5
5	100,0	100,0
6	6,0	6,0 *

* Special bridge-shaped gauge blocks (see drawing) used for establishing the measuring deviations of lower probe B.