



HEIDENHAIN



Product Information

QUADRA-CHEK 2000

Evaluation Electronics for
Metrology Applications

QUADRA-CHEK 2000

– Evaluation unit for easy and reliable 2-D measurement

The QUADRA-CHEK 2000 evaluation unit is well suited for mounting on measuring machines, profile projectors, and measuring microscopes with up to three axes. You can measure two-dimensional contour features quickly, simply, and precisely using innovative measuring tools.

Design

Thanks to its industrial design, the QUADRA-CHEK 2000 is ideal for applications both in the measuring room and in a harsh production environment. Its flat aluminum housing with integrated power pack and fanless passive cooling is extremely sturdy and tolerant to negative influences. The intuitive touchscreen made of specially hardened glass supports multi-touch gesture control and can be operated with gloves.

Functions

Predefined geometries (e.g., point, line, circle, slot, and rectangle) are available for the measurement of two-dimensional features. The “Measure Magic” function makes measurement especially easy. This function uses the acquired measuring points to automatically select the appropriate geometry. In addition to the measuring functions, you can also use functions for construction and definition—for example, in order to create relationships (distances, angles) between two or more contour features.

You can save your results in a measurement report individually formatted as a PDF or CSV file, or you can print them out from a connected printer. The measuring program can automatically record repetitive parts and then execute them again.

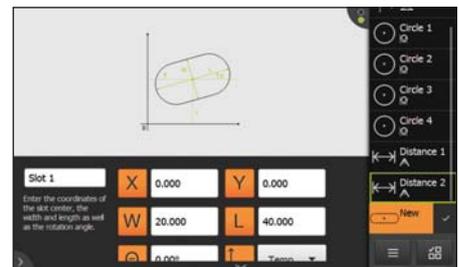


Software options

The QUADRA-CHEK 2000's range of functions can be adapted to specific requirements via software options. You can enable the software options by entering a license key. Please contact HEIDENHAIN for more information.

Intuitive display

The high-resolution, 7-inch color flat-panel display presents all needed information in a quickly understandable and clearly structured format. The screen content is context sensitive, showing only the functions available in the actual operating situation. The self-explanatory operating controls provide intuitive user guidance.





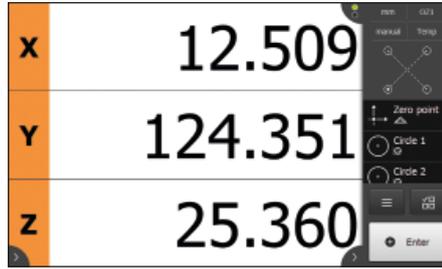
	QUADRA-CHEK 2013	QUADRA-CHEK 2023	QUADRA-CHEK 2093
Axes	3 (XYZ) or (XYQ), one of which can be enabled as a software option		
Encoder interface Input frequency	$\sim 1 V_{PP} \leq 400 \text{ kHz}$	$\square \text{TTL} \leq 5 \text{ MHz}$	$2 \times \sim 1 V_{PP} \leq 400 \text{ kHz}$ $1 \times \square \text{TTL} \leq 5 \text{ MHz}$
Subdivision factor	4096-fold (only with 1 V _{PP})		
Display step	Adjustable, max. 8 digits Linear axes XYZ: to 0.00001 mm; angular axis Q: to 0.00001° (00° 00' 00.1'')		
Display	7" color wide screen (15:9 multi-touch screen); resolution: WVGA 800 x 480 pixels for dialogs, inputs, position values, and graphics functions		
Functions	<ul style="list-style-type: none"> • Acquisition of 2-D geometry features through measurement, design, and definition of geometries • Measuring point acquisition via crosshairs • Creation of measuring programs (teach-in) • Tolerance input and graphic display of measurement results • Creation and output of measurement reports • User management • Measure Magic: automatic recognition of geometries 		
Additional encoder input (AEI1 software option)	One additional encoder input		
Optical edge detection (OED software option)	Automatic measuring point acquisition via optical edge detection		
Error compensation	<ul style="list-style-type: none"> • Linear (LEC) and segmented linear (SLEC) using up to 200 points • Squareness calibration; matrix compensation (NLEC) using up to 99 x 99 points 		
Data interface	1x Ethernet 100 Mbit/1 Gbit (RJ45); 1x USB 2.0 Hi-Speed (Type A)		
Other connections	Foot switch for two functions		
Accessories	Multi-Pos and Duo-Pos stand, Multi-Pos holder, power cable, measuring standard, 2-D demo part, adapter connector, foot switch, holder, fiber-optic cables		
Power connection	AC 100 V to 240 V (±10 %), 50 Hz to 60 Hz (±5 %), ≤ 38 W		
Operating temperature	0 °C to +45 °C (storage temperature -20 °C to +70 °C)		
Protection EN 60 529	IP 65, back panel IP 40		
Mounting	Multi-Pos or Duo-Pos stand; Multi-Pos holder; mounting systems with 50 mm x 50 mm hole pattern		
Mass	Unit with Multi-Pos stand: ≈ 2.0 kg; with Duo-Pos stand: ≈ 1.5 kg; Unit with Multi-Pos holder: ≈ 1.7 kg; unit: ≈ 1.3 kg		

QUADRA-CHEK 2000

– Functions

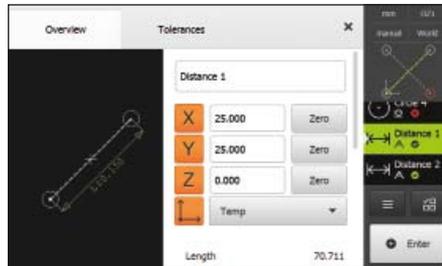
Recording measuring points

The QUADRA-CHEK 2000 allows you to acquire measuring points on flat 2-D contours either manually with crosshairs or automatically, depending on the option installed. A particular advantage is the unit's integrated measuring point acquisition via optical edge detection (OED software option)



Optical edge detection

The OED software option provides you with various tools for detecting edges and defining measuring points. You can acquire measuring points either manually or automatically. With optical edge detection (OED), you can traverse any edge of a contour, and the currently active tool will detect the actual measuring point on its own.



Functional features view

The QUADRA-CHEK 2000 offers you a comprehensive graphic features view. In this view, you can use previously measured geometries to design new geometry features.

You can also certainly enlarge and reduce this view, as well as zoom into features, in order to keep a good overview of all the measured geometry features. The features view also makes it possible to add annotations to each feature (e.g., measurement information or informational texts).



Generating geometry features

The QUADRA-CHEK 2000 gives you several possibilities for determining geometries:

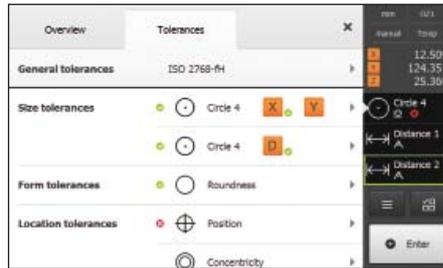
- Measuring geometry features
- Constructing features from previously measured features (e.g., distance between two circle centers; angle between lines)
- Defining unmeasurable geometry features

You can also run your created geometry features through a tolerance check.

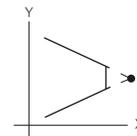


Tolerancing

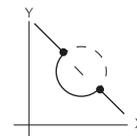
With the tolerance-adapting function, you can define geometric tolerances for measured or constructed features. Dimensional, positional, and form tolerances can be specified depending on the selected feature. You can also use general tolerancing as per ISO 2768 or decimal tolerancing.



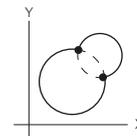
Examples of design capabilities:



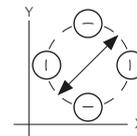
Intersection of two lines



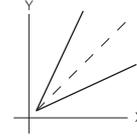
Intersection of line and circle



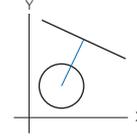
Intersection of two circles



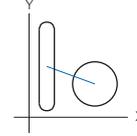
Bolt hole circle formed from three or more circles



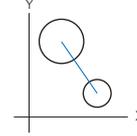
Bisector of two lines



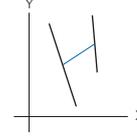
Line constructed from line and circle



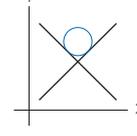
Line constructed from circle and oblong hole



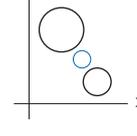
Distance constructed from two circles



Distance constructed from two lines



Circle constructed from two lines



Circle constructed from two circles

Creating a measuring program

For difficult or repetitive measuring tasks, you can automatically record all of the work steps as a measuring program. The QUADRA-CHEK 2000 learns the presets, sequence of measurements, tolerances, and data-output commands. When the program is run, the QUADRA-CHEK visually leads you to the features to be probed. The program view always provides you with an optimum overview of the process.



Creating measurement reports

Directly after the measurement, the integrated measurement report function lets you create a report containing the measurement and tolerance results along with other information. Using the demo software, you can also create customized measurement report templates and import them into the unit via the file management, you either select a standard template and alter it as you see fit, or you can create entirely new templates. You can then save the created reports in the QUADRA-CHEK unit using the report file format, or as a PDF or CSV file. Alternatively, you can print reports from a connected printer.



Data interfaces

You can use the data interfaces to output reports as well as to read and transmit settings and measuring programs. The Ethernet interface enables communication with a PC. You can also connect printers or memory media to the USB port. Network drives and printers can be connected via Ethernet as well. A list of possible printers is available on the Internet at www.heidenhain.de



Mounting the QUADRA-CHEK 2000

The QUADRA-CHEK 2000 can be mounted flexibly at various angles by means of the Multi-Pos or Duo-Pos stand. For mounting on the machine, the Multi-Pos holder and mounting systems with a hole pattern of 50 mm x 50 mm are suitable.

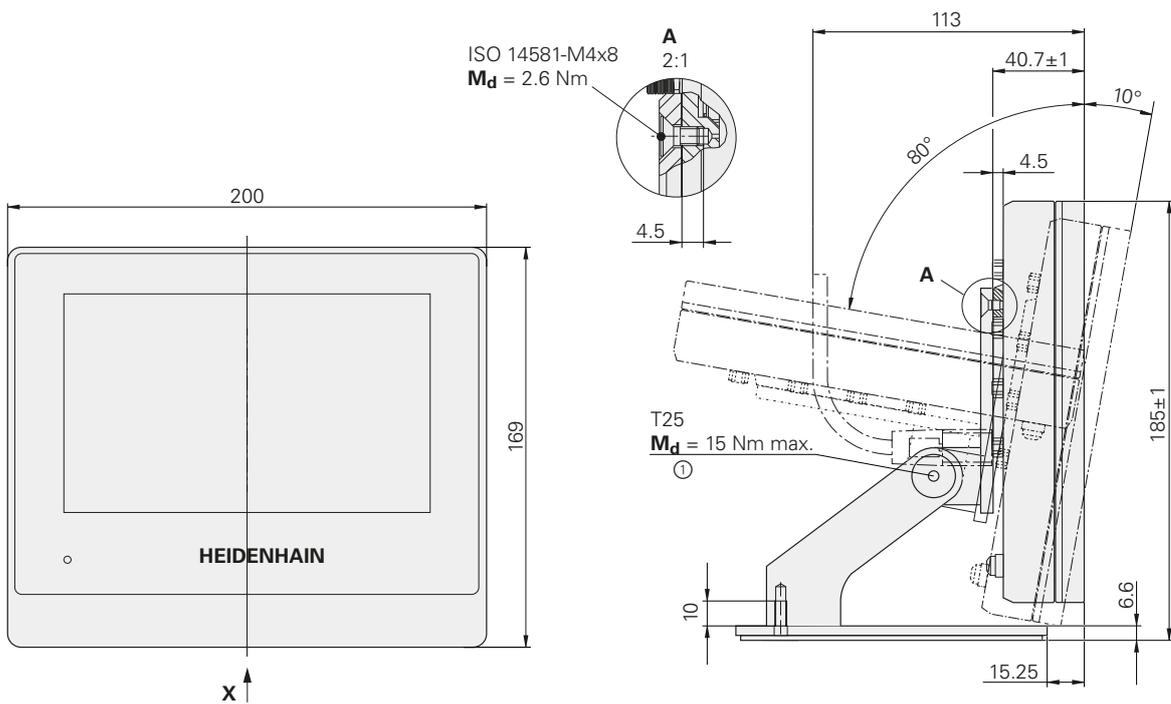
Multi-Pos base

For mounting and fastening to a surface, freely tiltable within an angle of 90°

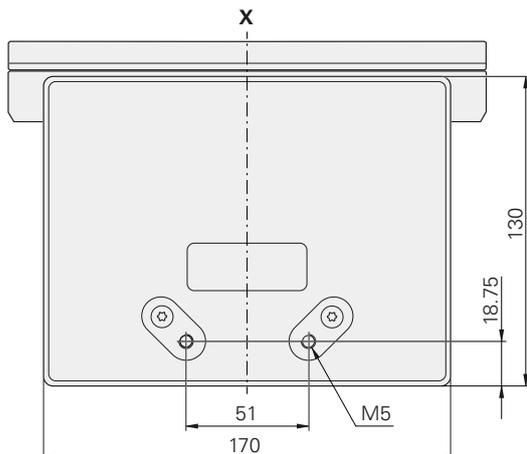
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**QUADRA-CHEK 2000
with Multi-Pos base**



1 = Recommended tightening torque: $M_d = 6.8 \text{ Nm}$



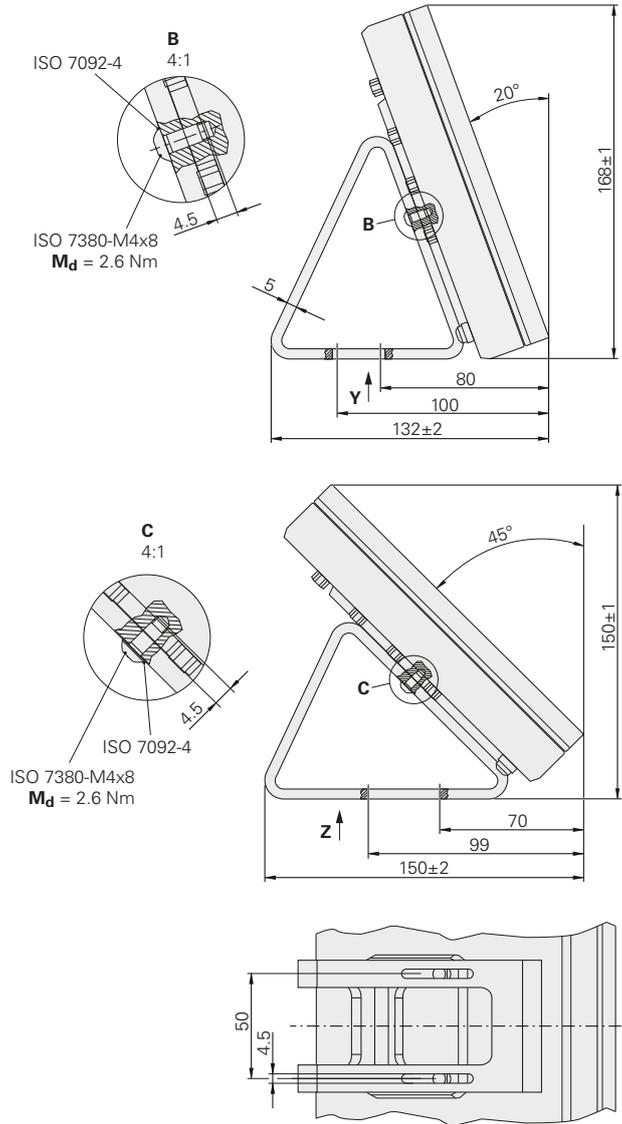
mm

 Tolerancing ISO 8015
 ISO 2768 - m H
 ≤ 6 mm: ±0.2 mm

Duo-Pos stand

For setup and mounting on a surface in two positions (20° or 45° tilt)

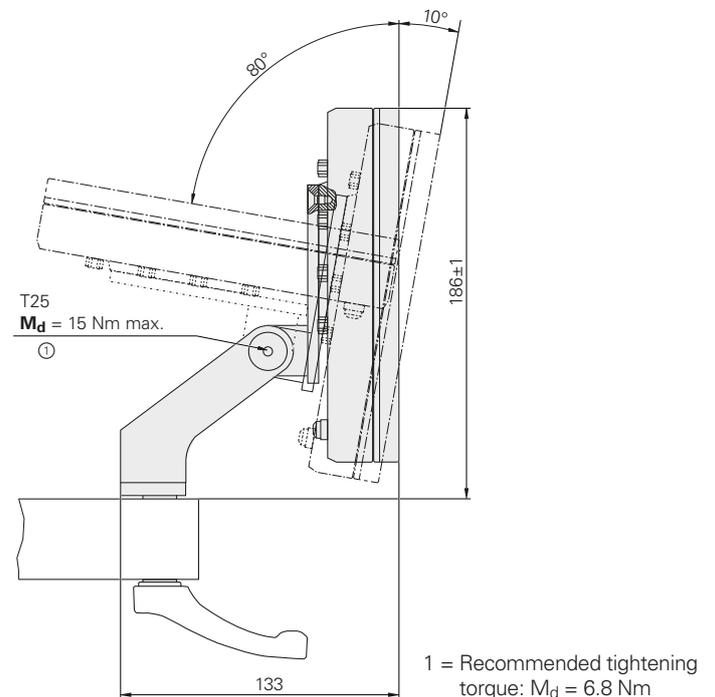
ID 1089230-06



Multi-Pos holder

For mounting to an arm, continuously tiltable within an angle of 90°

ID 1089230-08



Accessories

Calibration standard

For the calibration of video measuring machines, measuring microscopes, and profile projectors. It can be traced back to national or international standards.
ID 681047-01



2-D demo part

The 2-D demo part is included with the QUADRA-CHEK 2000. The application examples in the User's Manuals are based on this part. It can be reordered if a replacement is necessary.
ID 681047-02



Adapter connector for QUADRA-CHEK 2000

For conversion of the pin layout from HEIDENHAIN TTL to RSF and Renishaw TTL.
ID 1089210-01



For connection of HEIDENHAIN 11 μ APP pin layout to HEIDENHAIN 11 μ APP
ID 1089213-01



Optical fiber

With one right-angle end and an SMA connector (subminiature A) for ND or IK.
Bend radius ≥ 25 mm
Temperature ≤ 100 °C
Lengths 2 m, 3 m, 5 m
ID 681049-xx



Fiber-optic cable connection

Two SMA (subminiature A) connectors for connecting an integrated edge detector.
Bend radius ≥ 25 mm
Temperature ≤ 100 °C
Lengths 2 m, 3 m, 5 m
ID 681049-xx



For connection of HEIDENHAIN 1 V_{PP} pin layout to HEIDENHAIN 1 V_{PP}
ID 1089214-01



Holder

With a hole for accepting the right-angle end of fiber-optic cables. Transparent design so that it can be attached to the projection screen.
Lengths: 350 mm, 600 mm, 760 mm
ID 681050-xx



Foot switch

Cable length 2.4 m
With two freely assignable keys
ID 681041-04



For conversion of HEIDENHAIN 1 V_{PP} pin layout to Mitutoyo 2 V_{PP}
ID 1089216-01



HEIDENHAIN

DR. JOHANNES HEIDENHAIN GmbH

Dr.-Johannes-Heidenhain-Straße 5

83301 Traunreut, Germany

☎ +49 8669 31-0

FAX +49 8669 32-5061

E-mail: info@heidenhain.de

www.heidenhain.de

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For further information, please refer to the

Evaluation Electronics brochure

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