

# HEIDENHAIN-CERTO Length Gauges

Accuracy  $\pm 0.1 \mu\text{m}$



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HEIDENHAIN-CERTO length gauges feature a large measuring range, provide high linear accuracy and offer resolution in the nanometer range. They are used predominantly for production quality control of high-precision parts and for the monitoring and calibration of reference standards. Length gauges reduce the number of working standards required to calibrate gauge blocks.

## Accuracy

The total error of HEIDENHAIN-CERTO length gauges lies within  $\pm 0.1 \mu\text{m}$ . After linear length error compensation in the evaluation electronics of the ND 28x, for example, HEIDENHAIN guarantees accuracy of  $\pm 0.03 \mu\text{m}$  for the CT 2500 and  $\pm 0.05 \mu\text{m}$  for the CT 6000. These accuracy grades apply over the entire measuring range at ambient temperatures between  $19^\circ\text{C}$  and  $21^\circ\text{C}$  and with a temperature variation of  $\pm 0.1 \text{K}$  during measurements using the CS 200 gauge stand for HEIDENHAIN-CERTO.

## Plunger actuation

The plungers of the **CT 2501** and **CT 6001** are extended and retracted by an integral motor. It can be actuated by the associated switch box, which can also be controlled by external signal.

**CT 2502** and **CT 6002** have no plunger drive. The freely movable plunger is connected by a separate coupling with the moving machine element.

## Mounting

The CT 2500 length gauge is fastened by its 16-mm diameter clamping shank. The CT 6000 is fastened with two screws on a plane surface.



	Incremental			
	CT 2501	CT 2502	CT 6001	CT 6002
<b>Measuring standard</b>	DIADUR phase grating on Zerodur glass ceramic Coefficient of linear expansion: $\alpha_{\text{therm}} \approx 0 \pm 0.1 \times 10^{-6} \text{K}^{-1}$			
<b>Incremental signals</b>	$\sim 11 \mu\text{APP}$			
Signal period	2 $\mu\text{s}$			
<b>System accuracy<sup>1)</sup></b>	$\pm 0.1 \mu\text{m}$ $\pm 0.03 \mu\text{m}^2$		$\pm 0.1 \mu\text{m}$ $\pm 0.05 \mu\text{m}^2$	
<b>Recommended measuring step</b>	0.01 $\mu\text{m}$ and 0.005 $\mu\text{m}$ with ND 28x display unit			
<b>Measuring path</b>	25 mm		60 mm	
<b>Plunger actuation</b>	Motor driven	Via coupling	Motor driven	Via coupling
<b>Reference mark</b>	One			

<sup>1)</sup> At  $19^\circ\text{C}$  to  $21^\circ\text{C}$ ; permissible temperature fluctuation during measurement:  $\pm 0.1 \text{K}$

<sup>2)</sup> With linear length-error compensation in the evaluation electronics



# Gage-Chek®

The Gage-Chek is a multi-axis metrology display that accepts up to eight discrete inputs. It features intuitive visual displays, helpful audio cues and user-defined formulas. It also reports dynamic Min/Max measurements, provides SPC analyses from an integrated database and includes connectivity to PCs and other peripherals.



## Specifications

LCD	5.9" Color
Resolution down to	0.000004" or 0.0001 mm
Operating temperature	0°C to 45°C
Enclosure (W x H x D)	11.5" x 7.5" x 2.75"
Base (W x H x D)	10" x 2" x 7.5"
Enclosure weight	3.5 lbs
Base weight	7 lbs
Power Voltage range	85 Vac to 264 Vac
Power frequency range	43 Hz to 63 Hz

## Inputs

1, 4, 8 or 16 input measurement channels

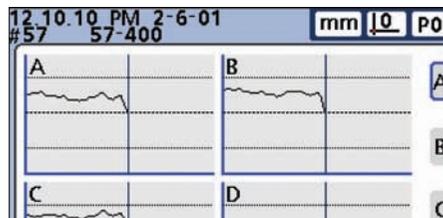
External connections:  
Footswitch  
Remote keypad  
Touch probe  
RS-232C serial port  
USB port  
Parallel data port

## Outputs

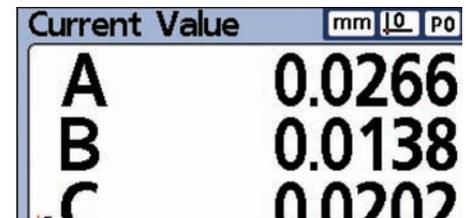
2 relay outputs  
Parallel data port  
RS-232C serial port  
USB port



**Visual feedback** A highly visible, intuitive and familiar interface with standard color cues. Instantly informs operators of pass/fail performance details for critical part dimensions.



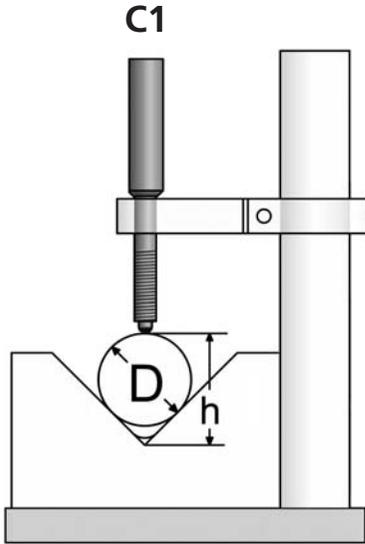
**Integrated SPC database** Store, retrieve and manage enormous amounts of measurement data on the shop floor. Check quality control of each gage. Share information locally and globally.



**Formulas** Up to 16 output channels apply mathematical formulas to measurement data for on-the-spot part analysis.

**Powerful formulas**

Create Gage-Chek formulas that transform simple measurements into the specific data you need for your unique applications; as shown in this example of a pin gage application.



**Formulas** mm | 0 | P0

About  
Dimensions  
Formats  
**Formulas**  
Tolerances  
SPC  
Header  
Memory

Channels

Dimension D  
(visible)  
 $2 * C1 / (\sqrt{2} + 1)$

**Current Value** mm | 0 | P0

**D** **14.745**

View... in/mm Master Menu...

Encoder measurement (C1) → transformed by the formula → displays pin diameter (D)

$$Pin\ Diameter\ D = \frac{2(h)}{(\sqrt{2} + 1)}$$

**Flexible data views**

Change Gage-Chek data presentations at the touch of a button.

Display simple numeric digital readouts, dial gages, bar graphs, database tables or statistical analyses.

**Current Value** mm | 0 | P0

A 1.8627  
B 2.3480  
C -1.2127  
D -1.3721

View... in/mm Master Menu...

**B** mm | 0 | P0

Nominal 2.3400  
Low Limit 2.3300 High Limit 2.3500

**2.3480**

View... r... Dial... Data... DRO...

**Current Value** mm | 0 | P0

A 1.8627 A  
B 2.3480 B  
C -1.2127 C  
D -1.3721 D

View... r... Dial... Data... DRO...

**Digital readouts, dials and bar graphs**

Display numeric and graphical current value, nominal, limit and warning information.

9:29:42 AM 3-12-05 #210 1.8627 mm | 0 | P0

A	B	C	D
1.8627	2.3480	-1.2127	-1.3721
1.8627	2.3480	-1.2127	-1.3721
1.8608	2.3471	-1.2103	-1.3705
1.8608	2.3471	-1.2103	-1.3705
1.8616	2.3465	-1.2094	-1.3710
1.8616	2.3465	-1.2094	-1.3710
1.8616	2.3465	-1.2094	-1.3710
1.8613	2.3460	-1.2098	-1.3714
1.8613	2.3460	-1.2098	-1.3714
1.8600	2.3450	-1.2100	-1.3716

View... r... Dial... Data... DRO...

9:29:42 AM 3-12-05 #210 2.3480 mm | 0 | P0

B 2.3480

Mean 2.3422  
Max 2.3480  
Min 2.3396  
r 0.0084  
σ(p) 0.0026  
6 σ 0.0156  
Pp 1.2792  
Ppk 1.0123

View... r... Dial... Data... DRO...

9:29:42 AM 3-12-05 #210 2.3480 mm | 0 | P0

B

Ucl 0.0010  
Lcl 0.0000

View... r... Dial... Data... DRO...

**Database tables and graphs**

Display raw measurement data, results of statistical analyses and data trends.

