

2006

*The Three-S Promise:
Superior Standards & Services!*



Measuring pin catalogue

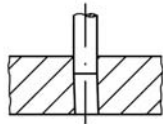
Measuring pins
Measuring pin sets
Storage cases
Test Certificates
Magnetic measuring pins



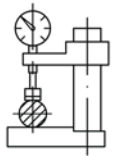
DREI-S-WERK

PRECISION STANDARD TOOLS
PINNING SYSTEMS
DREI-S-technologies

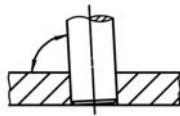
MEASURING PINS



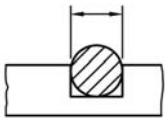
Linearity of bore holes



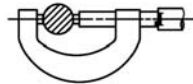
Adjustment of dial gauges



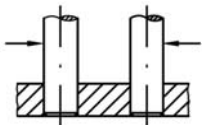
Angularity of bore holes and bore hole tolerances



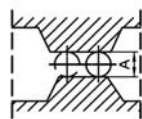
Groove measurements



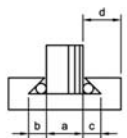
Micrometer divisions



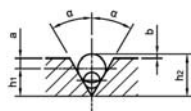
Distance between holes



Guide surfaces



Dovetail guides



Profile depths and angles

DREI-S measuring pins are high-precision testing instruments with a tolerance of $\pm 1\mu\text{m}$ in tolerance class I. Boasting excellent reliability and hard-wearing qualities, they are ideal for use in quality assurance, in stock receipt control and in manufacturing processes. They are simple to use and very suitable for measurement tests on work pieces in manufacture, e.g. for testing bore holes on jig boring machines and/or on jig milling machines.

Our many years of experience, continuous investment in complex manufacturing plants and high-precision, PC-networked quality control plants guarantee the quality of **DREI-S measuring pins**, which hold a leading position in the European market.

DREI-S measuring pins are particularly suitable for the measurement of even the smallest bore holes. In contrast to expensive internal measuring instruments, their length offers a significant advantage: deep bore holes can be measured not only for their dimensional accuracy but also for their linearity and angularity.

DREI-S measuring pins can also be used for the measurement of angularity, distances between holes, dovetail guides, profile depths, guide surfaces and groove measurements.

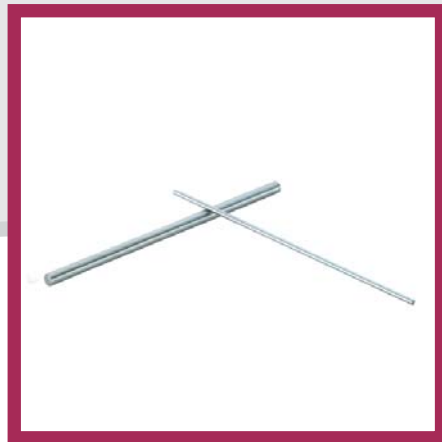
In addition, they are suitable as adjustment controllers for a wide variety of measuring instruments such as micrometers, dial gauges, as well as go / no-go gauges.

DREI-S measuring pins are manufactured from gauge steel, hardness 60 – 64 HRC in accordance with DIN 2269, and tested at a temperature of $20^\circ\text{C} \pm 1^\circ\text{C}$.

DREI-S measuring pin holders allow the straightforward creation of individual go / no-go gauges, whereby two measuring pins are placed in the holder to serve as the upper and lower limit of a given tolerance range.

Here you can see some illustrations of some of the applications already implemented.

MEASURING PINS



Nominal diameter
Accuracy in accordance with DIN 2269

Standard dimensions from
Ø 0.10 – 25.00 mm

Tolerance class I = ± 0.001 mm
Tolerance class II = ± 0.002 mm

Grading

As standards, increasing by 0.01 mm
Customised grading available on request
Pins with 1/1000 mm grading are only available
in tolerance class I (± 0.001 mm)

Material in accordance with DIN 2269

Calibrated steel with hardness of 60-64 HRC, aged

Longitudinal expansion coefficient

$(11.5 \pm 1) \times 10^{-6} \times K^{-1}$

Reference temperature in accordance
with DIN 102

20° C ± 1° C

Length including chamfer

from Ø 0.10 – 0.99 mm: 40 mm
from Ø 1.00 – 25.00 mm: 70 mm

Deviation

For pins between Ø 0.10 - 0.49 mm a 1/1000 mm grading is
also possible

Standard length $l = 30$ mm
Tolerance class 0 = ± 0.0005 mm

Chamfer (see following sketches)

from Ø 0.10 – 0.99 mm both ends plain
from Ø 1.00 – 10.00 mm one end bevelled
from Ø 10.01 – 25.00 mm both ends bevelled

Size and shape of bevelling in accordance with DIN 2269;
serves as protection against damage and makes insertion easier

Labelling

from Ø 0.10 – 1.49 mm unlabelled
from Ø 1.50 – 2.99 mm labelling on centre of testing surface *)
from Ø 3.00 – 10.00 mm labelling on sharp-edged front surface
from Ø 10.01 – 25.00 mm labelling on a front surface

The tolerance class is not specified

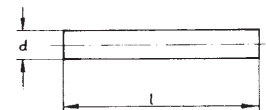
Roundness

Tolerance class I und II ≤ 1 µm

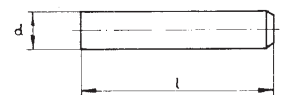
Surface roughness given in Rz, in
accordance with DIN 4768

Tolerance class I und II ≤ 1 µm
Other surfaces in accordance with DIN 2269

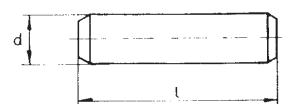
Chamfering:



d = 0.10 - 0.99 mm



d = 1.00 - 10.00 mm



d = 10.01 - 25.00 mm

*) CAUTION:

Because of possible enlargement in diameter, do not test above the marks!

MEASURING PIN SETS



DREI-S measuring pin sets are available in tolerance class I = ± 0.001 mm or II = ± 0.002 mm in the diameter range of 0.10 – 25.00 mm \varnothing , with a standard grading of 0.01 mm. The measuring pins are supplied in high-quality storage cases.

Each pin is positioned individually in a high-quality plastic plate by means of bore holes which are sized to fit the pin diameter and labelled appropriately.

We supply **30 standard sets** of measuring pins „**from stock**“. Each set is available in two tolerance classes.

The storage cases are available in 3 sizes. The appropriate size is determined by the content, i.e. according to the number of items and their diameter.

Customised gradings are also available by special order.

DREI-S STANDARD MEASURING PIN SETS

| Set No. | Sets | Storage cases | Size | Contents (pcs.) | Diameter size in mm | Grading in mm |
|---------|------|---------------|------|-----------------|---|---------------|
| 1 | 1 | 1 | B | 20 | 1.00 – 20.00 | 1.00 |
| 2 | 1 | 1 | B | 40 | 0.50 – 20.00 | 0.50 |
| 3 | 1 | 1 | A | 41 | 1.00 – 5.00 | 0.10 |
| 4 | 1 | 1 | A | 50 | 5.10 – 10.00 | 0.10 |
| 5 | 1 | 1 | B | 91 | 1.00 – 10.00 | 0.10 |
| 6 | 1 | 1 | B | 91 | 1.05 – 10.05 | 0.10 |
| 7 | 1 | 3 | B | 100 | 10.10 – 20.00 | 0.10 |
| 8 | 1 | 4 | B | 191 | 1.00 – 20.00 | 0.10 |
| 9 | 1 | 1 | B | 91 | 0.50 – 5.00 | 0.05 |
| 10 | 1 | 1 | B | 81 | 1.00 – 5.00 | 0.05 |
| 11 | 1 | 1 | B | 100 | 5.05 – 10.00 | 0.05 |
| 12 | 1 | 2 | B | 181 | 1.00 – 10.00 | 0.05 |
| 13 | 1 | 1 | B | 76 | 0.50 – 2.00 | 0.02 |
| 14 | 1 | 1 | B | 100 | 2.02 – 4.00 | 0.02 |
| 15 | 1 | 1 | B | 100 | 4.02 – 6.00 | 0.02 |
| 16 | 1 | 1 | B | 100 | 6.02 – 8.00 | 0.02 |
| 17 | 1 | 1 | B | 100 | 8.02 – 10.00 | 0.02 |
| 30 | 1 | 5 | B | 451 | 1.00 – 10.00 | 0.02 |
| 18 | 1 | 1 | A | 51 | 0.50 – 1.00 | 0.01 |
| 19 | 1 | 1 | B | 101 | 1.00 – 2.00 | 0.01 |
| 20 | 1 | 1 | B | 100 | 2.01 – 3.00 | 0.01 |
| 21 | 1 | 1 | B | 100 | 3.01 – 4.00 | 0.01 |
| 22 | 1 | 1 | B | 100 | 4.01 – 5.00 | 0.01 |
| 23 | 1 | 1 | B | 100 | 5.01 – 6.00 | 0.01 |
| 24 | 1 | 1 | B | 100 | 6.01 – 7.00 | 0.01 |
| 25 | 1 | 1 | B | 100 | 7.01 – 8.00 | 0.01 |
| 26 | 1 | 1 | B | 100 | 8.01 – 9.00 | 0.01 |
| 27 | 1 | 1 | B | 100 | 9.01 – 10.00 | 0.01 |
| 29* | 1 | 1 | C | 273 | 1.00 – 10.00 | 0.10* |
| | | | | | *in addition, for each nominal diameter, a test pin is included with + 0.01 overdimension and – 0.01 underdimension | |

STORAGE CASES

with bore holes for measuring pins



DREI-S storage cases protect the measuring pins and at the same time enable a clear storage system. They are available in 3 sizes with a bore hole depth corresponding to the length of DREI-S measuring pins.

Design:

Wooden frame in black enamel.

Black plastic retaining panel with bore holes.

Labelling on all bore holes to show diameter sizes.

Tolerance class is specified on the plate.

External dimensions/capacity

Size A

Small storage case

L approx. 175 mm, W approx. 155 mm, H approx. 84 mm

Capacity

| | |
|-------------------|-------------------|
| 55 measuring pins | 0.10 – 0.99 mm Ø |
| 50 measuring pins | 1.00 – 6.99 mm Ø |
| 25 measuring pins | 7.00 – 13.00 mm Ø |

Size B

Standard storage case

L approx. 325 mm, W approx. 155 mm, H approx. 84 mm

Capacity

| | |
|--------------------|--------------------|
| 100 measuring pins | 0.10 – 10.00 mm Ø |
| 55 measuring pins | 10.01 – 14.99 mm Ø |
| 36 measuring pins | 15.00 – 19.99 mm Ø |
| 21 measuring pins | 20.00 – 25.00 mm Ø |

Size C

Large storage case

With special dimensions, L approx. 415 mm, W approx. 325 mm, H approx. 84 mm

Capacity

according to diameter,
up to 300 measuring pins

Replaceable PLASTIC HANDLES and METAL HOLDERS for measuring pins



Metal pin holders made of zinc die casting

DREI-S measuring pin holders allow the straightforward creation of individual goods/spoilage calibres, whereby two measuring pins are placed in the holder to serve as the upper and lower limit of a given tolerance range. The measuring pin holders are available in **5 sizes**.

| Size of holder | Span range | Length of holder | Length of span |
|----------------|-------------|------------------|----------------|
| Size 1 | 1 - 2 mm Ø | approx. 60 mm | approx. 26 mm |
| Size 2 | 2 - 4 mm Ø | approx. 68 mm | approx. 30 mm |
| Size 3 | 4 - 6 mm Ø | approx. 76 mm | approx. 33 mm |
| Size 4 | 6 - 8 mm Ø | approx. 84 mm | approx. 35 mm |
| Size 5 | 8 - 10 mm Ø | approx. 92 mm | approx. 37 mm |

Plastic handles

The use of thin **measuring pins** may result in the pins heating up. Under these circumstances, the rated dimensions can no longer be guaranteed.

Measuring pins with a diameter range of Ø 0.40 to 5.30 mm maybe supplied with replaceable plastic handles

| Handle length | Span range | Diameter of handle | Length of handle |
|---------------|------------------|--------------------|------------------|
| Size 1 | 0.40 – 0.80 mm Ø | approx. 8 mm | approx. 14 mm |
| Size 2 | 0.80 – 1.30 mm Ø | approx. 8 mm | approx. 14 mm |
| Size 3 | 1.30 – 1.80 mm Ø | approx. 8 mm | approx. 14 mm |
| Size 4 | 1.80 – 2.30 mm Ø | approx. 8 mm | approx. 14 mm |
| Size 5 | 2.30 – 2.80 mm Ø | approx. 8 mm | approx. 14 mm |
| Size 6 | 2.80 – 3.30 mm Ø | approx. 8 mm | approx. 14 mm |
| Size 7 | 3.30 – 3.80 mm Ø | approx. 8 mm | approx. 14 mm |
| Size 8 | 3.80 – 4.30 mm Ø | approx. 8 mm | approx. 14 mm |
| Size 9 | 4.30 – 4.80 mm Ø | approx. 8 mm | approx. 14 mm |
| Size 10 | 4.80 – 5.30 mm Ø | approx. 8 mm | approx. 14 mm |

CERTIFICATES OF ACCURACY

The following certificates of accuracy can be issued for measuring pins

Certificate of accuracy no.1 (free of charge)

General confirmation that the diameters of the measuring pins are in accordance with tolerance class I or II of DIN 2269. Surface roughness and roundness $\leq 1 \mu\text{m}$.

Certificate of accuracy no. 2* (at extra charge)

Each measuring pin is listed and classified in a table showing rated and actual diameter.

e.g. rated \varnothing 2.30 act. \varnothing 2.2998 Tol. I
 rated \varnothing 2.35 act. \varnothing 2.3502 Tol. I

Surface roughness and roundness $\leq 1 \mu\text{m}$.

Certificate of accuracy no. 3* (at extra charge)

Each measuring pin is listed in a table showing both rated and actual diameter, and measured roughness and roundness.

e.g. rated \varnothing 2.30 act. \varnothing 2.2998 rgh. 0.65 rd. 0.75
 rated \varnothing 2.35 act. \varnothing 2.350 rgh. 0.50 rd. 0.60

Surface roughness and roundness $\leq 1 \mu\text{m}$

In all our certificates of accuracy you can find directions to DKD (German Calibration Laboratory) or PTB (Physical-Technical Institute of Germany) for the return of the measuring tools

e.g.:

| Certificate of accuracy | |
|--------------------------------|--|
| Issued on: | 20.08.03 |
| Certificate no.: | 3020/9/ „Year“ case no.: 037/02/„Year“ |
| Order no.: | 402008 |
| For: | Smith & Co KG 91126 Schwabach |
| Test item: | Measuring pin set rated 0.500 – 5.000 mm |
| Tolerance class: | II $\Rightarrow \pm 0.002 \text{ mm}$ Reference temperature according to DIN 102 $\Rightarrow 20^\circ \text{ C} \pm 1^\circ \text{ C}$ |
| Test instrument length: | KLM – 60.01 DKD Calibration no. 0526/01/03 and 0527/01/03 |
| Measuring deviation: | $(\pm 0.2 + 2 \times L/100) \mu\text{m}$, L given in mm |
| Reference pins: | No. 2989 PTB 99 |
| No.: | 0733 DKD-K-00303-04-03 |
| Roundness no.: | 87707 DKD 12653-99 |
| Roughness no.: | 0427 RNDH 2 n. EN 814 003 PTB 03 |

Certificate of accuracy no. 4 (price according to scope of test)

If required, all measuring pins can be certified by an external, DKD-approved test laboratory.

**) for measuring pins of less than 0.50 mm, only certificate no.1 can be issued.*

MAGNETIC MEASURING PINS



Magnetic measuring pins facilitate the testing procedures. Specially suitable for rational gear wheel measurement. Additional possible implementations include testing procedures on work items where conventional measuring pins either roll away or fall down due to position (e.g. measurement of diagonal surfaces).

In the case of steel work items, the pins are self-adhesive, thus facilitating the test procedure.

The magnetic strength of the magnetic measuring pins is both significantly higher than in the case of magnetic measuring pins made of steel, and does not deteriorate over time.

Nominal diameter

| | | | | |
|------|------|------|-------|------|
| 1.00 | 1.25 | 1.50 | 1.524 | 1.60 |
| 1.65 | 1.75 | 2.00 | 2.032 | 2.25 |
| 2.50 | 2.75 | 3.00 | 3.25 | 3.50 |
| 4.00 | 4.25 | 4.50 | 5.00 | 5.25 |
| 6.00 | 7.00 | 8.00 | 9.00 | |

Accuracy

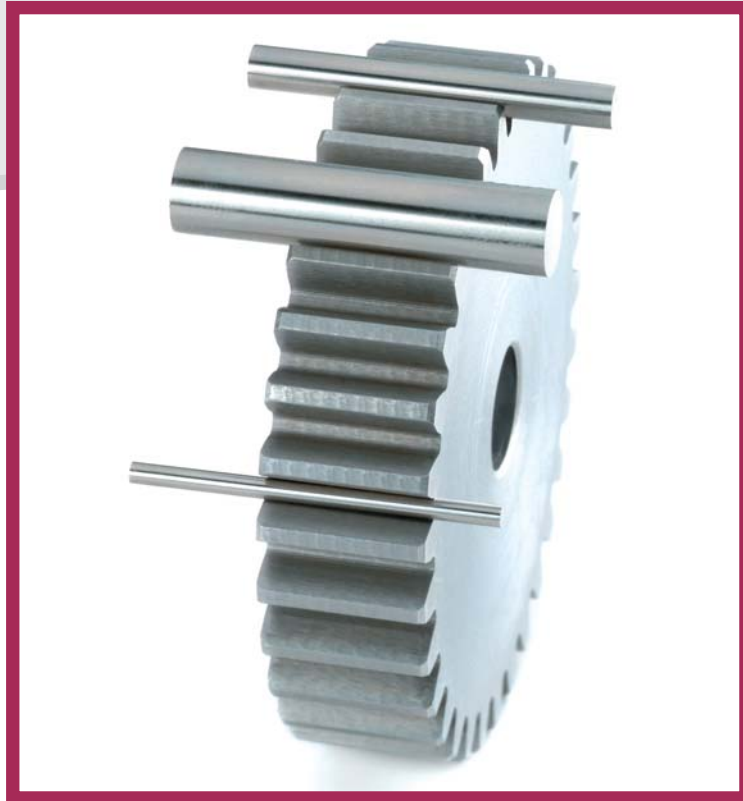
Tolerance $l = \pm 0.001$ mm

Length

35 mm

Customised items can also be supplied by special order.

Example:
Use of magnetic
measuring pins



Additional high-precision standard parts available from our product range:

- Ejector pins DIN ISO 6751 / DIN ISO 8694 / DIN ISO 8693 / DIN ISO 1530
- Ejector sleeves DIN ISO 8405
- Core pins / centre sleeves
- Ejector pins: customized models

- Piercing punches DIN 9861 / DIN 9840 / DIN 9844 / DIN 9843 / DIN ISO 8020
- Piercing punches with trombone neck
- Perforation pins
- Pull-through punches according to DIN 7952
- Rectangular and square piercing punches DIN 9846
- Piercing punches: customized models

- Preforge-/ upsetting ejector pins
- Hexagonal punches / extrusion punches
- Special punches

- Parts manufactured according to drawing
- Paid work

- Dowel pins DIN ISO 8734 (similar to previous std. DIN 6325)
- Dowel pins DIN ISO 8735 (similar to previous std. DIN 7979)

- Machining tools and equipment
- Cutting-off and surface grinding machine
- External grinding machine



DIN EN ISO 9001:2000

Certificate: 01 100 80420

Always one step ahead

DREI-S was the first manufacturer of ejector pins in Europe and a pioneer in the introduction of the previous DIN 1530 standard. We therefore have a long tradition of active involvement in DIN standards. DREI-S-WERK was also a pioneer in the implementation of new nitriding technologies, which are now standard on the market.

150 years of successful industrial manufacturing speaks for our experience and innovative approach. Initiative, responsibility, lateral thinking, and the desire to continually improve and extend our range with new products are the driving forces behind our company and its employees.

DREI-S-WERK Präzisionswerkzeuge GmbH & Co. Fertigungs KG

Postal address:

PO Box 20

D-91561 Neuendettelsau

Office location:

Schmauser-Str. 3

D-91564 Neuendettelsau

Phone +49 (0) 98 74/50 42 150

Fax +49 (0) 98 74/50 42 151

www.drei-s-werk.com

precision@drei-s-werk.de