



## Measuring Instruments Rocking Type

Size Inspection of small batches

  
*pure  
perfection*

**FRENCO**

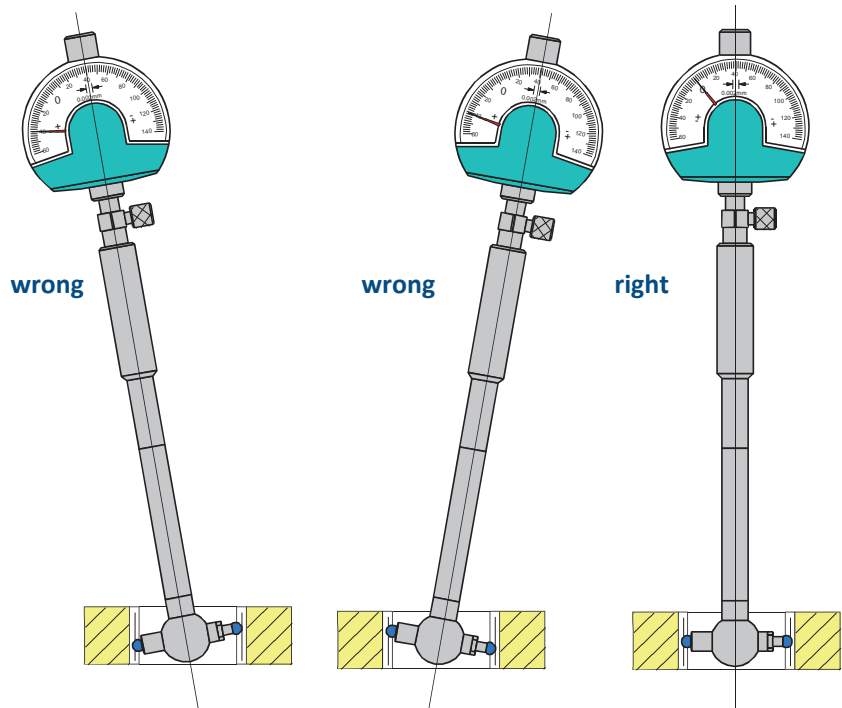
# Measuring - Rocking Type

There are a number of methods to inspect the true size over or between balls and pins of gears and splines. The most simple methods by use of pins or balls depend on the operator and his experience and require rocking the instrument to find the correct size. These rocking methods prevent the use of electronic readouts and are a cost-efficient solution for individual items and small batches. The instruments are not suitable for helical gears and splines with odd number of teeth.

A needle deflection to the left when measuring internal sizes, means a larger dimension.

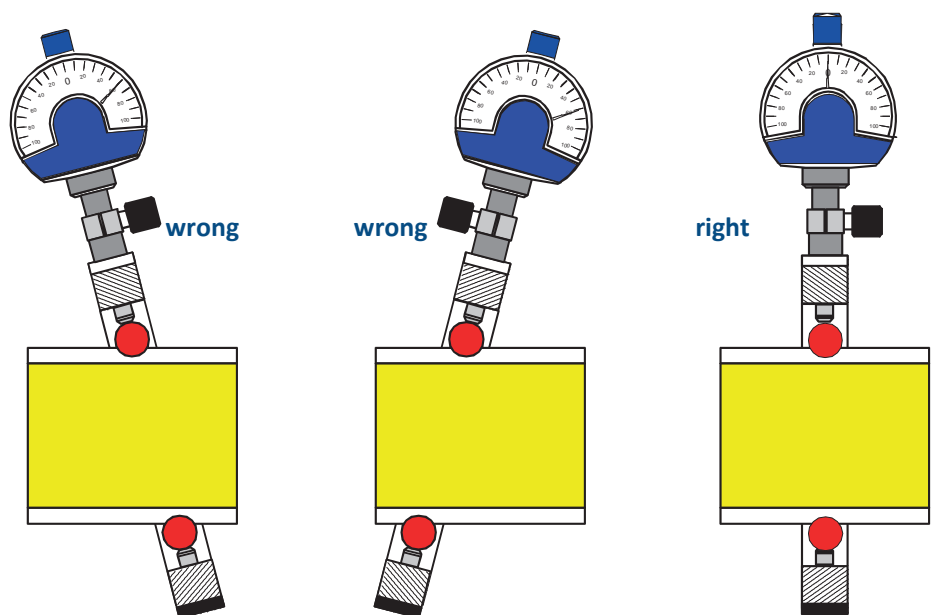
Proof of a sufficiently small measurement uncertainty is given via a UPM certificate issued by Frenco.

To be ordered separately!




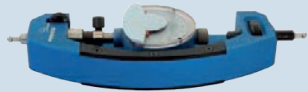
A needle deflection to the left when measuring external sizes, means a smaller dimension.

A sufficiently small measurement uncertainty of these instruments (VA) is only guaranteed, in most applications, if a profiled setting master is used for adjustments.




# Product Overview

## IVA

Type	Pitch circle diameter	Picture
IVA 0	4 - 15 mm	
IVA 1	15 - 28 mm	
IVA 2	28 - 130 mm	
IVA 3	50 - 330 mm	
IVA 4	greater than 190 mm	

## AVA

Type	Pitch circle diameter	Picture
AVAL 1	0 - 35 mm	
AVAL 2	35 - 70 mm	
AVAL 3	70 - 135 mm	
AVAL 4	135 - 180 mm	

# Internal Tooth Profile Gauges - Rocking Type IVA

The internal tooth profile gauges IVA 0 to IVA 3 consist of the following components: measuring head with ball inserts, extensions (if necessary), handle and indicating gauge. The measuring head can **only be used for a specific size and a specific measuring ball diameter**, not universally. The indicator gauge has a special clock face for gear tolerance dimensions.

The use of a profiled setting master and an inspection certificate VDA5 is highly recommended.

## IVA 0

For PCD 4 – 15 mm



Measuring head with needle and soldered measuring balls

## IVA 1

For PCD 15 – 28 mm



Measuring head with needle and ball inserts

# Internal Tooth Profile Gauges - Rocking Type IVA

## IVA 2 and 3

IVA 2: For PCD 28 – 130 mm

IVA 3: For PCD 50 – 330 mm



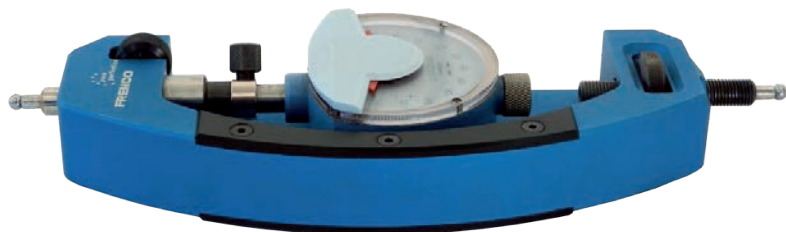
Measuring head with ball probes

## IVA 4

The internal tooth profile gauges IVA 4 are measuring instruments with measuring force retraction. The set screw at the opposite end ensures that the instrument can be adjusted and universally used.

The ball inserts are standard components with M2.5.

For PCD from 190 mm



# External Tooth Profile Gauges – Rocking Type AVAL

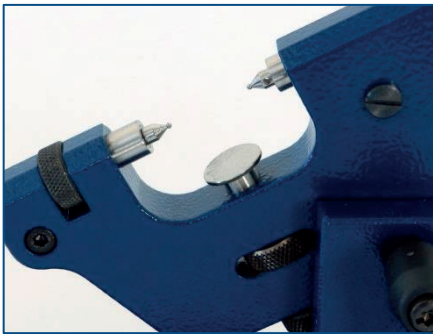
## AVAL

AVAL 1: For PCD 0 - 35 mm

AVAL 2: For PCD 35 - 70 mm

AVAL 3: For PCD 70 - 135 mm

AVAL 4: For PCD 135 - 180 mm



Measuring ball inserts  
(exchangeable)



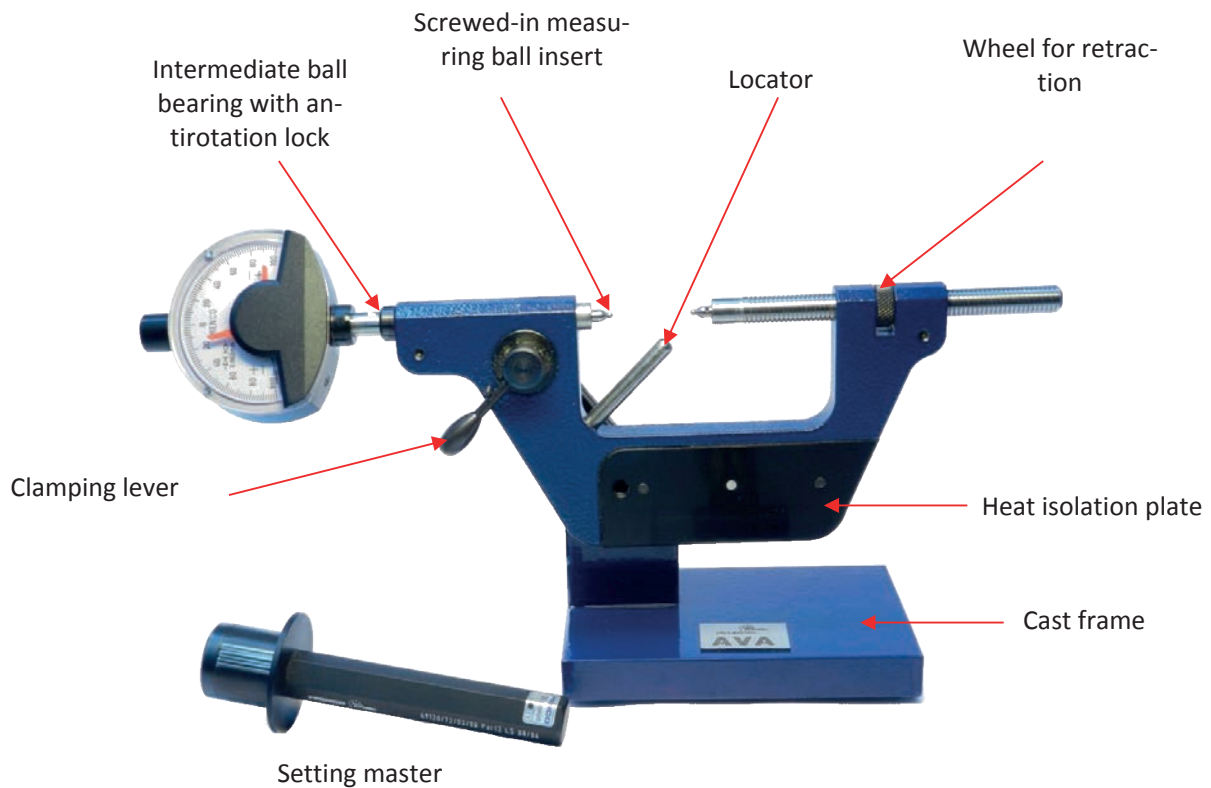
Measuring pin insert  
(not exchangeable)

# AVA Design

The external tooth profile gauges AVA are very robust. A ball track between indicator gauge and measuring ball insert stabilizes the lateral forces when looking for the reversal point. At the same time, a lifting arm ensures a simple search for the tooth positions.

Two **heat isolation plates** prevent heat transfer from the operator's hands. The measuring ball insert on the right can be quickly and safely adjusted and clamped. The relevant **setting plug** has a sectored gear profile and is made of aged and hardened steel. The actual size is shown by the marking.

It is recommended to also order an inspection certificate UPM. This will ensure a sufficiently small measurement uncertainty of the instrument with regards to the tolerance to be measured. The **dial indicator** is accurately adjusted for the measurement of gears and splines and has a measuring force of 1 N. The measuring range of the dial indicator is  $-0.060$  (left) to  $+0.140 \mu\text{m}$  (right). The calibration is carried out with the setting plug.





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