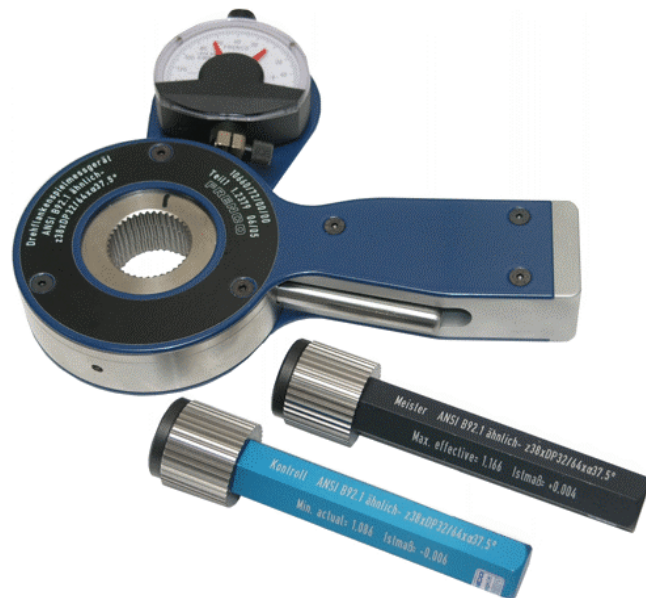
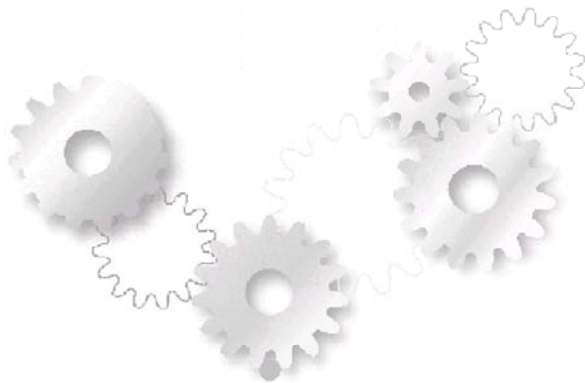




Variable 3-disc indicating gauges VD



**Determination of
true size effective**



**pure
perfection**

FRENCO

Principle of function



IVD



AVD

Variable 3-disc indicating gauges are go gauges for splines with variable tooth thickness. Whereas a go gauge consists of only one gage body, a variable 3-disc indicating gauge has got three profile discs of the same size. Only the disc in the middle can rotate. The two other discs are fixed.

If the teeth of the middle disc are at the same position as the teeth of the exterior discs, this instrument works nearly like a go gauge. Variable 3-disc indicating instruments have composite splines like go gauges. When the middle disc is rotated, the effective size of the tooth thickness of this go gauge will be varied.

During the measurement of a specimen, the middle disc can rotate only as far as the effective spline allows the rotation. Thus the maximum possible way of torsion describes the effective spline of the work piece, the limiting value effective. For internal splines this limiting value is the „minimum effective“ and for external splines the „maximum effective“.


**pure
perfection**

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A static go gauge only gives information if the work piece is inside the effective spline or not.

Variable 3-disc indicating gages indicate the real dimension of the effective spline.

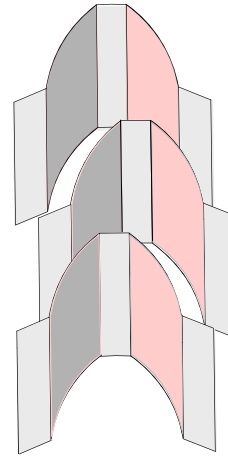
There to a dial indicator or a inductive transducer measures the torsion travel of the middle disc. An absolute measurement conclusion can be made, if the dial indicator was set to zero with an exact setting master before the measurement. This composite setting master is redundant exact at the allowed, effective limit dimension.

If the dial indicator amplitude would be zero by inspecting the work piece after setting to zero, this conforms the condition of a barely operating go gage.

Every further pointer amplitude greater than zero indicates the difference between the effective spline and the acceptable tolerance limit.

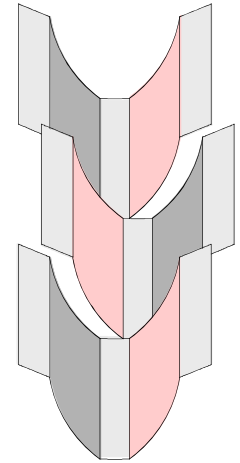
Because of the dial indicator measures this difference at the pitch circle diameter on a bend line, the indication refers to the tooth thickness / tooth space at the pitch circle. Indicates the dial indicator a value less than zero the acceptable effective limit is not kept and a go gage could not be coupled. Such work pieces are to be rejected. This situation certainly only appear when the tooth thickness of the backlash-measuring instrument is smaller than the go gage. Exactly so this measuring instruments are laid out.

teeth of the measuring instrument

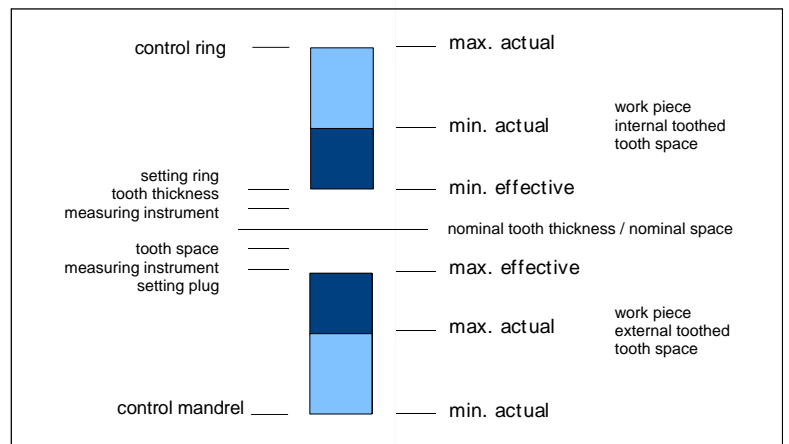


measured effective space width of internal

measured effective of tooth thickness of external splines



tooth spaces of the measuring instrument



Internal gears and splines

max. actual / min. actual: Limit of permitted space width at single measurement

min. effective: Limit of effective space width by accumulative measurement

External gears and splines

max. effective

Limit of effective tooth thickness by accumulative measurement

max. actual / min. actual:

Limit of permitted tooth thickness at single measurement

FRENCO Product Lines



Gear and spline high precision

Spline gages
Master gears, master wheels
Artefacts, masters
Profiled tools
Clamping systems
Gear and spline manufacturing



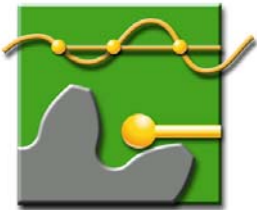
Instruments for size inspection series V

Ball inserts and pins VRK
Instruments for rocking VA
Instruments with face stop VP
Indicating gages VM
Variable 3-disc gages VD
Customized solutions VS



Rotation measuring systems

URM - K with balls and pins
URM - R with master wheels
EWP Single flank gear rolling
WS Gear rollscan
ZWP Double flank gear rolling



Gear and spline inspection

DKD gear calibration
Gage wear inspection
Part inspections
Deviation analysis



Know-how transfer

Software for gear and spline calculating
Training, seminars and workshops
Consulting and calculations
Literature and documents
National and international standards



FRENCO

Frenco GmbH gear + spline technology

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