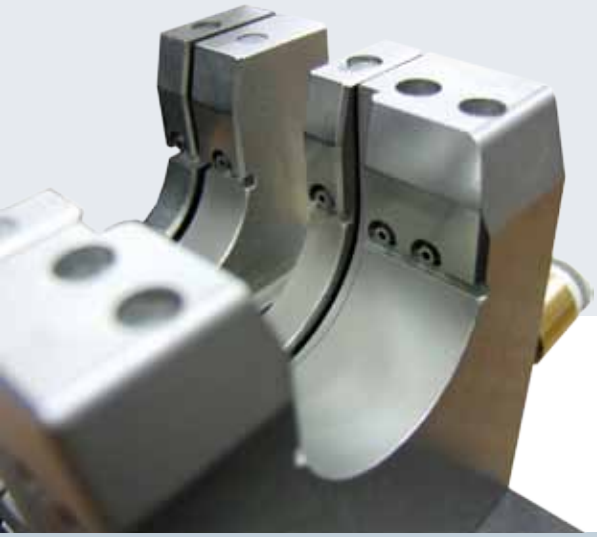
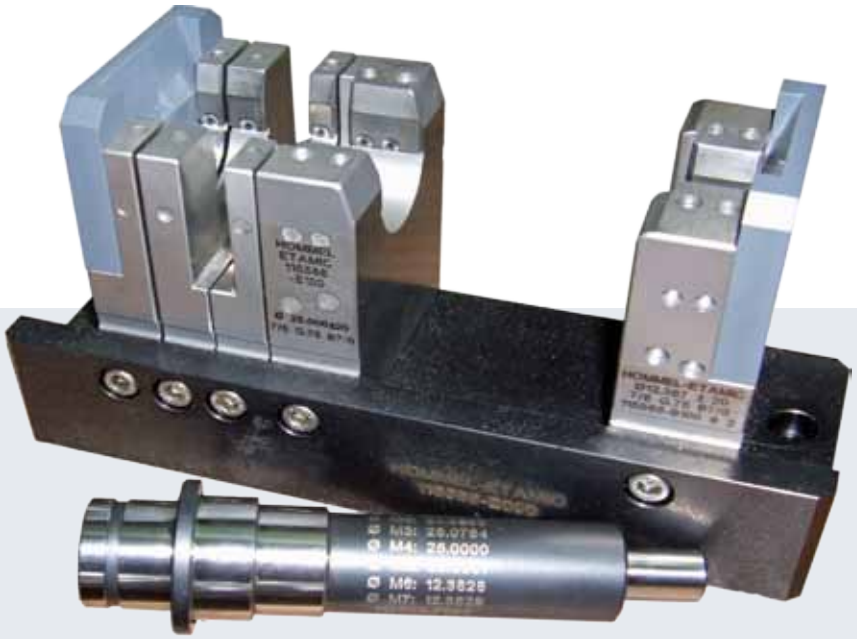
JENOPTIK

HOMMEL-ETAMIC AG300

Air snap gauges for shaft diameter measurement





Your partner in Industrial Metrology

We, the Industrial Metrology Division of the Jenoptik Group, are one of the leading international specialists in high-precision, tactile and non-tactile production metrology.

Our services range from complete solutions for different measuring tasks such as the inspection of surface and form as well as determining dimensions, throughout every phase of the production process including final inspection or in the metrology lab.

Our decades of experience in tactile, optical and pneumatic measurement combined with our global sales and service support network brings us close to you, our customers, enabling us to provide optimal support as a reliable partner.

Pneumatic precision – HOMMEL-ETAMIC AG300

Our air snap gauges are designed to measure continuous or shouldered pin diameters, thanks to more than 60 years of experience and thousand of devices sold worldwide.

Their robustness, recognised all over the world, enables measurements on machined parts in the most severe industrial environments (e.g. nuclear, automotive and other industries). Their maintenance is kept to a bare minimum: only cleaning is needed, since there are no moving mechanical parts.

We can adapt the number of measurement levels and the position of the standard air snap gauge air jets to your needs. We also design and manufacture special air snap gauges for manual or automatic applications.

Air snap gauges for shaft diameters

Reliability and quality

The gauges have outstanding reliability of measurement. Their precision and their repeatability are much greater than those of contact gauges (less than 0.25 µm), regardless of the ambient environment or the operator. The quality of development ensures their perfect interchangeability. Thanks to these benefits, it is easy to obtain gauge capability tests.

Extremely robust

AG300 gauges are recommended for measuring machined parts on centreless or plunge-in cylindrical grinding machines, belt grinding machines, etc. Thanks to their robustness, hundreds of thousands of parts can be checked without altering the quality of measurement. They are highly resistant and particularly suited to industrial environments.

Simple and easy handling

Thanks to their ease of use, snap gauges enable users without any special knowledge to make accurate and reliable measurements on the products of the manufacturing process.

Simple calibration

Snap gauges are calibrated with a master of known dimensions. The excellent linearity of the Jenoptik measuring units means that no max. and min. reference gauges are required.

Static or dynamic measurements

AG300 open jet air snap gauges can check continuous or shouldered pin diameters on one, two or three measurement levels. Diameter measurement may be static or dynamic. It is performed without contact by the two measuring nozzles, which are set back with respect to the snap body.

Universal use

The gauges can be used either fixed or stationary and have a large introduction clearance, which is calculated as a function of the measurement range. They are perfectly suited for manual shaft or pin measurements on production lines, at semi-automatic or automatic measuring stations and for metrology (frequency-based or 100% testing).

A wide variety of applications

Air snap gauges can be used, for example, to measure crank shaft main or pin journals, cam shaft journals or driveshaft journal seats.

Defect measurement

By rotation of the test part in the snap gauge, its roundness on each of the measurement levels is obtained. Versions with two measurement levels can check conicity, and versions with three levels measure cylindricity defects (barrel shape or hourglass shape).

Application examples

- Drive shaft
- Gear box shaft
- Reactor vane
- Cam shaft
- Cam shaft (main or pin journal) ...

Applications with indicators and gauges

Use with an air gauging indicator

Snap gauges can be directly connected to an indicator of the portamic, C61 or pneutamic type.

The no-handle gauges of the AG301 series with a single measurement level can only be used with the Portamic indicator, which is ideal for making precise, hand-held measurements next to the production line.

The other gauges with one or more measurement levels can be connected to pneumatic or C61 devices. In this case, an indicator must be associated with each measurement level.

Use with industrial PC measurement

During simultaneous measurements with several air snap gauges, it is recommended to use a central measurement unit of the ESZ800, ESZ400, CMZ200, CMZ250, sirius or vega type.

The measurement data obtained with the gauges are displayed and analysed on a Jenoptik or other measurement unit via a pneumoelectronic transducer like TPE99 or TPE70/3 type, which transforms the pneumatic signal into an electric signal.

Application example of hand-held gauges with three levels and a HOMMEL-ETAMIC CMZ250 central measuring unit : test station next to the production line for dynamic measurement of crank shafts.

A complete range of air snap gauges

Hand-held gauges, for mobile use next to production lines

Our range of hand-held air snap gauges is from 15 mm to 105 mm with one, two or three measurement levels.

The hand-held gauge has two interchangeable protective shoes, facilitating its placement on the test part, with no damage. Two min. contact zones form a 90° vee, thus ensuring optimal repeatability and accuracy.

The narrow anodised aluminium handle is standard for all hand-held gauges. They are delivered with their pneumatic connectors (air hoses not included).

Made from 55/57 HRC hardened steel with an anti-wear surface treatment (surface hardness of 3500 Hv and friction coefficient of 0.3), they have outstanding wear resistance.

In addition to their unique, engraved identification, the hand-held gauges are also marked with identification of their shoe width.

Stand-mounted gauges, for stationary use post-process or on automatic machines

Our range of stand-mounted gauges is from 9 to 45 mm, with one or two measurement levels and with or without a centring vee.

The version with vee is used when the air snap gauge supports the test part. As a general rule, two air snap gauges with vee support the test shaft, and the intermediate gauges are vee-less. In the case of a measurement between tips, there are no air snap gauges with vee.
The vee is made from two machinable carbide inserts. These gauges are made in such a way that their centring is done automatically by means of a reference ruler.

Stand-mounted gauges are made from pre-treated steel (40/42 HRC) and have carbide at the wear points.

Example:
Hand-held gauge with pneumatic fittings

Example:
Stand-mounted gauge with vee

Characteristics of standard snap gauges

Measurement range (standard gauges with two no. 2 air jet)

We recommend that the measurement range is at least twice the tolerance of the test shaft.

Gauge	Diameter (mm)	Min. range (mm)	Max. range (mm)
Manual	15 < ØN ≤ 105	0.040 (±0.020)	0.120 (±0.060)
Stand-mounted	9 < ØN ≤ 45	0.040 (±0.020)	0.120 (±0.060)

Precision and capabilities

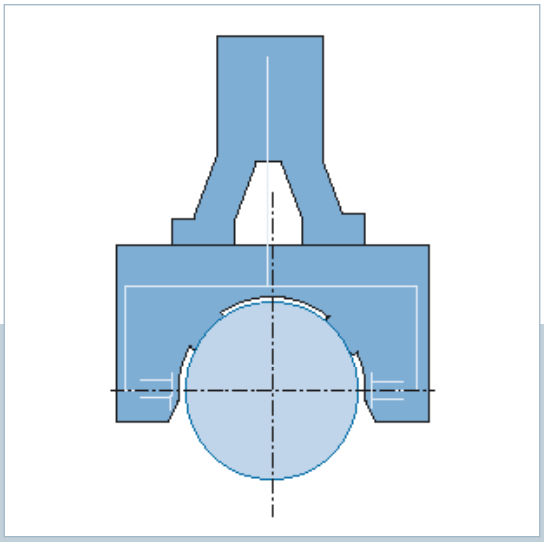
Excellent precision enables satisfaction of the strictest capability standards: CMC, GR&R, Cg, Cgk, ...

Measurement range (mm)	Precision (mm)	Capabilities	
		GR&R type 2	CMC
0.040 (±0.020)	< 0.0005	< 10%	4
0.080 (±0.040)	< 0.0010		
0.120 (±0.060)	< 0.0015		

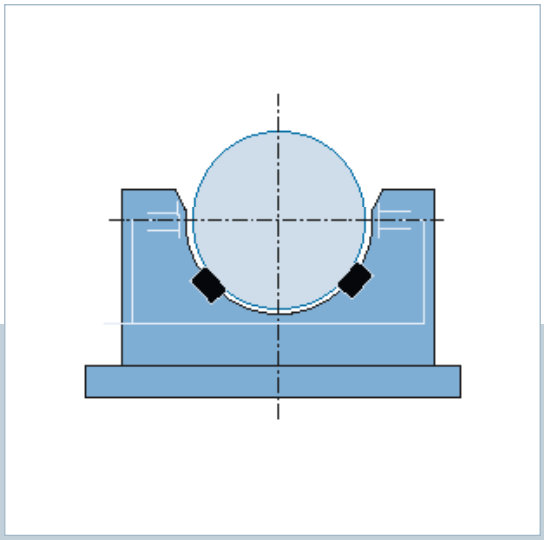
Guide diameter

The guide diameter is the real diameter of the snap gauge. It depends on the selected capacity and on the gauge type (hand-held, stand-mounted, with vee or without vee). For stand-mounted gauges with vee, the vee is made to the nominal diameter.

Measurement range (mm)	Guide diameter (mm)	Tolerance (mm)
0.040 (±0.020)	ØN + 0.035	±0.005
0.080 (±0.040)	ØN + 0.055	±0.005
0.120 (±0.060)	ØN + 0.075	±0.005



Hand-held gauge measuring principle



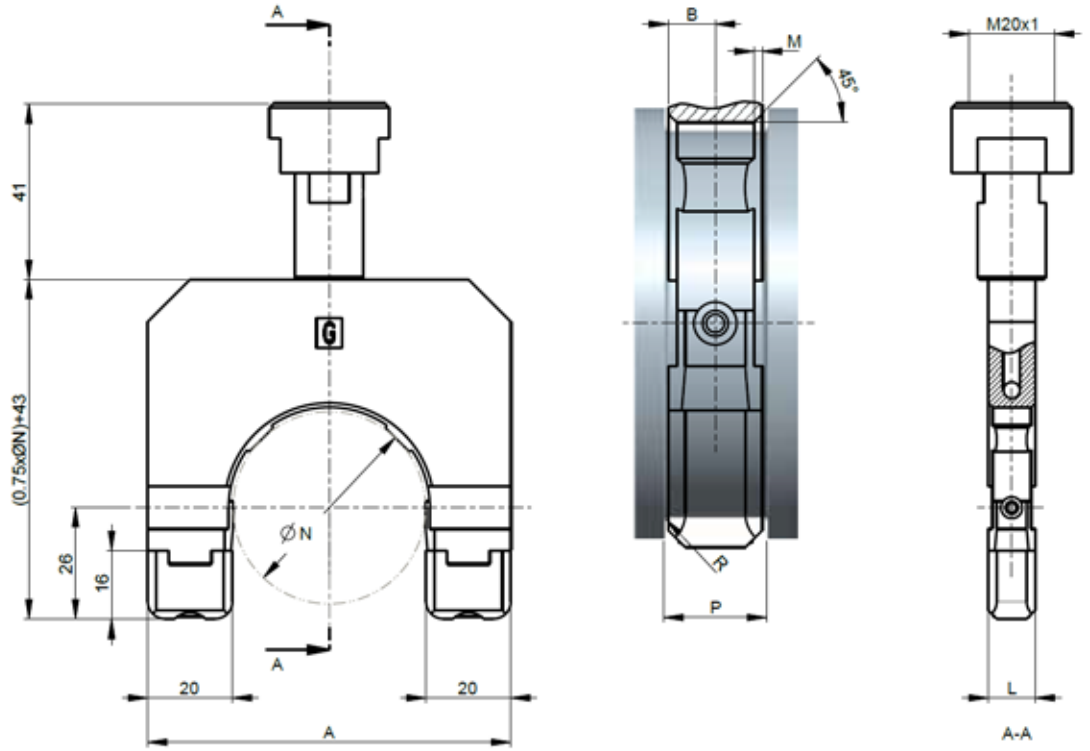
Stand-mounted gauge measuring

Hand-held gauges with one measurement level for portamic gauging indicators

Designation	Level	Nominal diameter ØN (mm)	A (mm)	Min. L (mm)	Max. L (mm)
AG301	1	15 < ØN ≤ 26	66	11	50
		26 < ØN ≤ 105	ØN + 40		

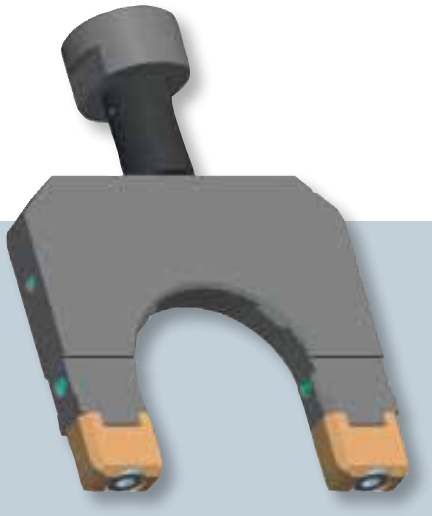
L = P - 0.2 mm; B min. ≥ M + 3; E min. = 6; M = R max. + 0.5

L, M, B and E shall be specified during ordering.



Test for:

- Diameter
- Roundness

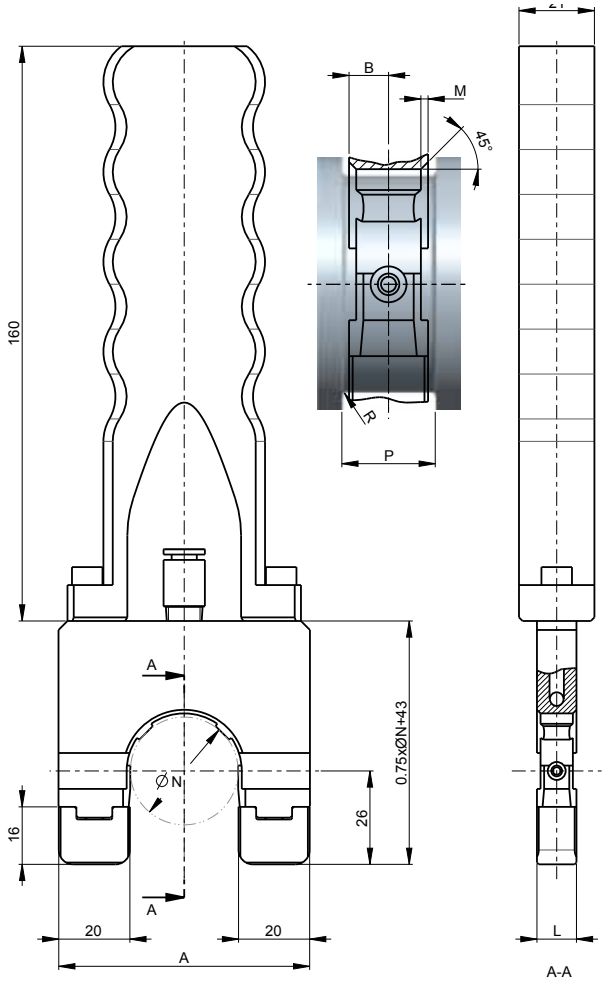


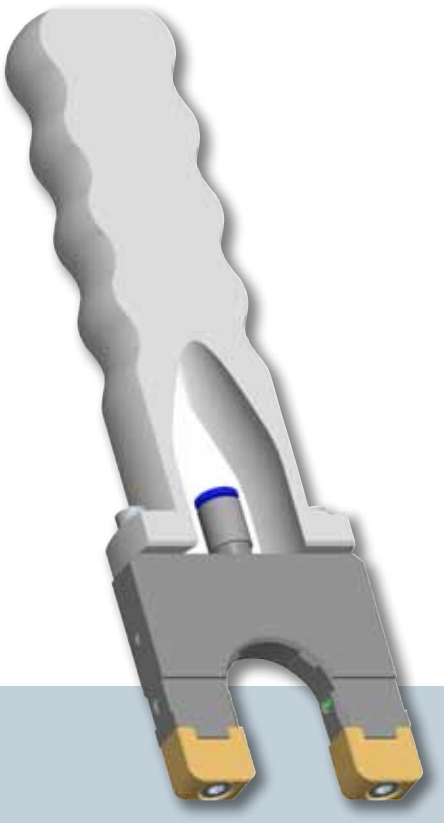
Hand-held gauges with one measurement level

Designation	Level	Nominal diameter ØN (mm)	A (mm)	Min. L (mm)	Max. L (mm)	Hose diameter
AG311	1	15 < ØN ≤ 26	66	11	80	6
		26 < ØN ≤ 105	ØN + 40			

L = P - 0.2 mm; B min. ≥ M + 3; E min. = 6; M = R max. + 0.5

L, M, B and E shall be specified during ordering.





Test for:

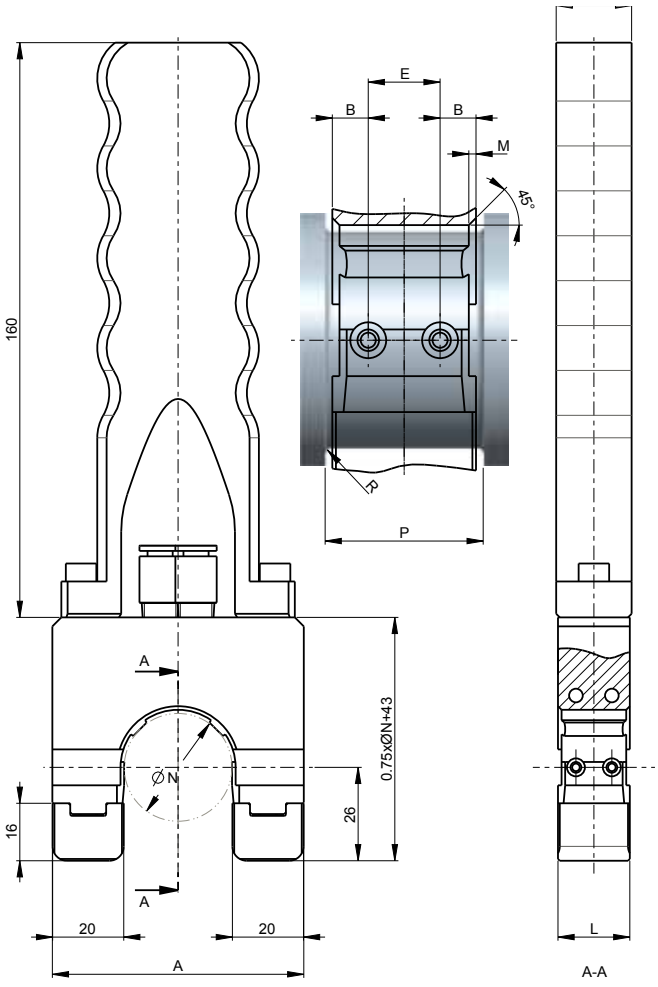
- Diameter
- Roundness

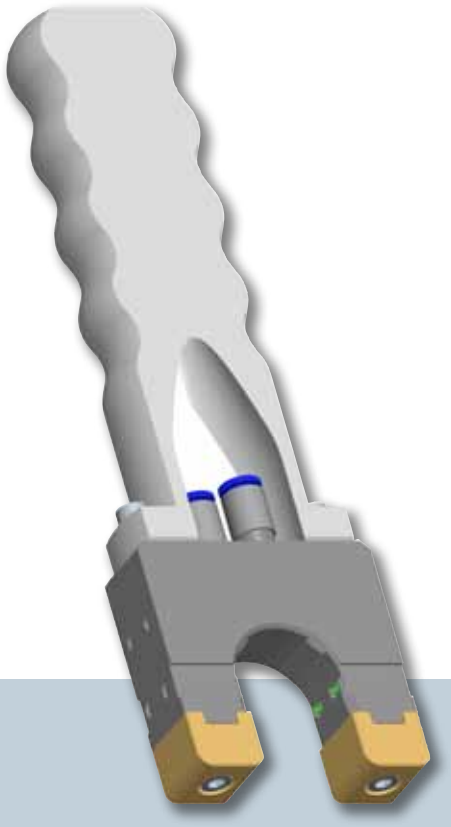
Handheld gauges with two measurement levels

Designation	Level	Nominal diameter ØN (mm)	A (mm)	Min. L (mm)	Max. L (mm)	Hose diameter
AG312	2	15 < ØN ≤ 26	66	20	80	6
		26 < ØN ≤ 105	ØN + 40			

L = P - 0.2 mm; B min. ≥ M + 3; E min. = 6; M = R max. + 0.5

L, M, B and E shall be specified during ordering.





Test for:

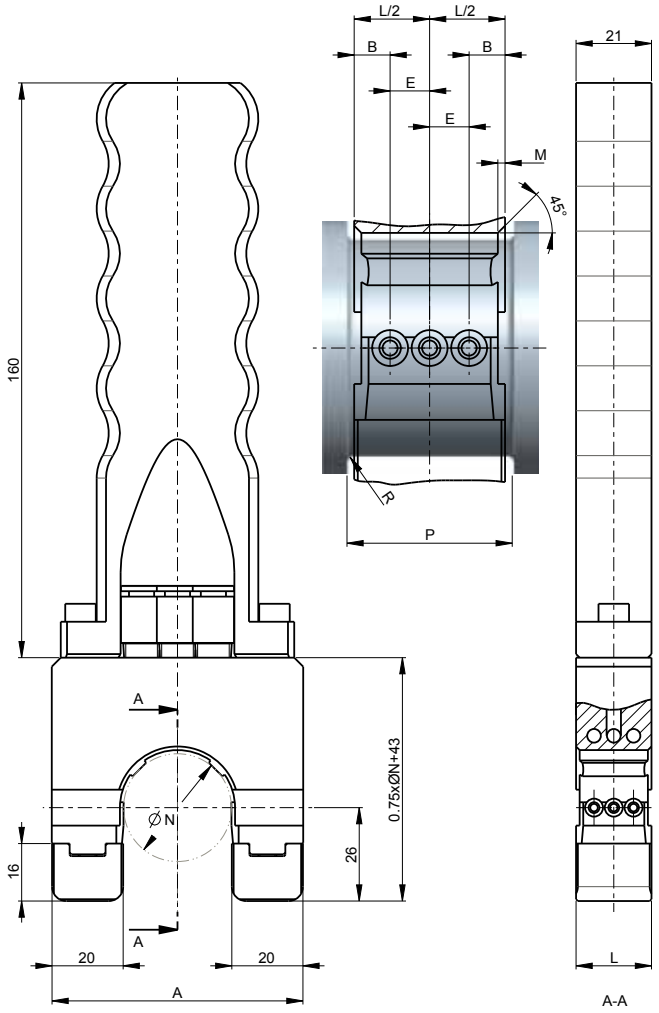
- Diameter
- Roundness
- Conicity

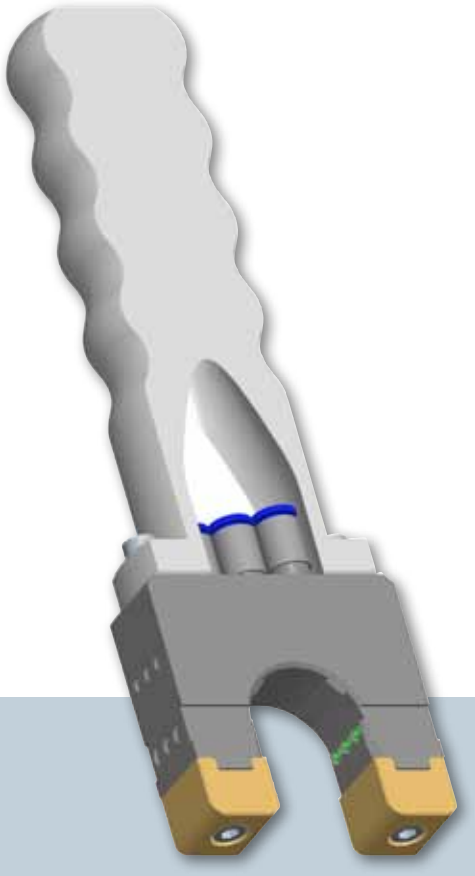
Handheld gauges with three measurement levels

Designation	Level	Nominal diameter ØN (mm)	A (mm)	Min. L (mm)	Max. L (mm)	Hose diameter
AG313	3	15 < ØN ≤ 26	66	21	100	6
		26 < ØN ≤ 105	ØN + 40			

L = P - 0.2 mm; B min. ≥ M + 3; E min. = 6; M = R max. + 0.5

L, M, B and E shall be specified during ordering.





Test for:

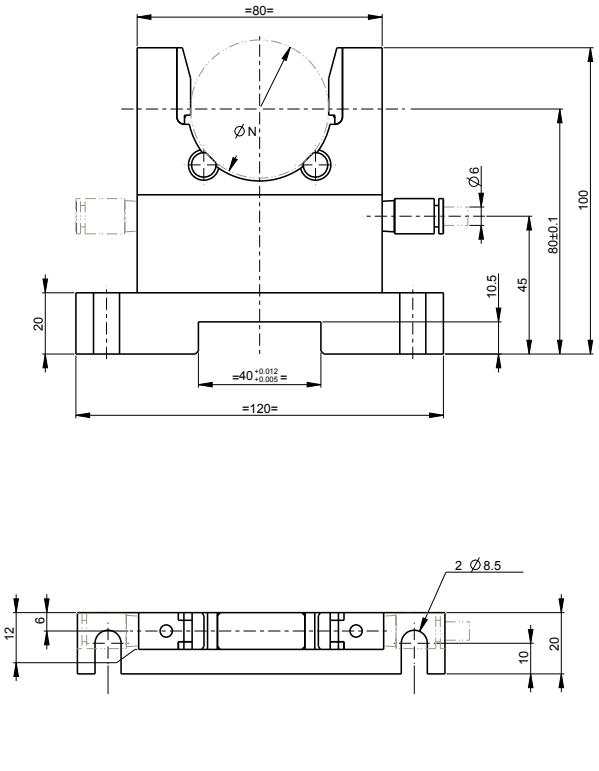
- Diameter
- Roundness
- Conicity
- Cylindricity

Stand-mounted gauges with one measurement level

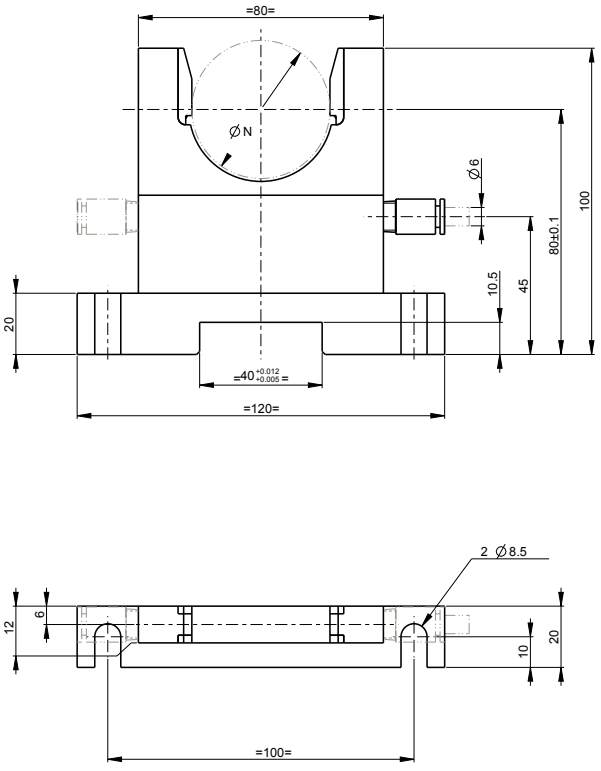
Designation	Level	Centring vee	Nominal diameter ØN (mm)	Dimensions (mm)	L (mm)	Hose diameter
AG351	1	yes	9 < ØN ≤ 45	120 x 100 x 23	12	1/8 BSP*
AG361	1	no	9 < ØN ≤ 45	120 x 100 x 23	12	1/8 BSP*

* Tap holes on both sides (a plug and a connector Ø6 ext. are supplied with the gauge).

HOMMEL-ETAMIC AG351
Air snap gauge with centring vee



HOMMEL-ETAMIC AG361
Air snap gauge without centring vee



Test for:

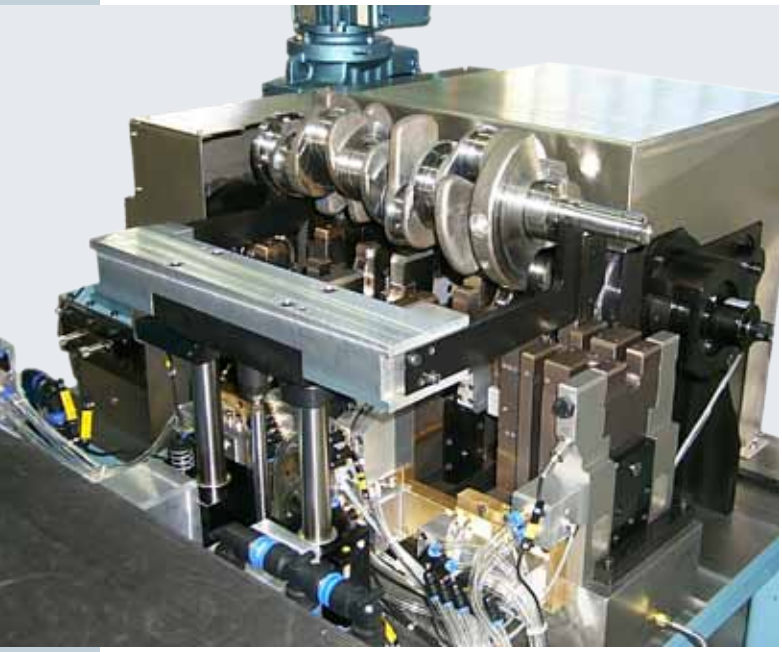
- Diameter
- Roundness

Example :
AG361 without centring vee
(non-contractual photo)

Special air snap gauges

As a complement to our range of standard air snap gauges, we design and manufacture special air snap gauges that are adapted to your gauging tasks. Gauges with two or three measurement levels are particularly recommended for the gauging of crank shaft main journals or pin journals, cam shafts or gearbox shafts. They provide diameter measurements, roundness and conicity values in a single measurement sequence.

Here are a few examples of our custom-built gauges:



Application example with three measurement levels by stand-mounted air snap gauge:
Measurement station with automatic loading for dynamic, post-process measurement of V6 engine crank shafts. Simultaneous gauging of main journals and pin journals. The width measurement of the main journal is made by the central snap gauge. The gauges are equipped with rollers to decrease friction during crank shaft rotation.

Application example with three stand-mounted air snap gauges:
Shouldered shaft test assembly with manual loading, placed next to the machining machine. This assembly is composed of three stand-mounted air snap gauges with one measurement level for simultaneous measurement of three diameters. Two of these air snap gauges are equipped with a vee to support the test shaft. Lateral guiding is provided by two adjustable thrusts. The graduated ruler provides help for quick manual campaign changeover.

Axis test assembly

Air snap gauge assembly with manual loading for measurement of a power steering restoring shaft with the reference part.

Sphere position test assembly

Sphere position test assembly using a special gauge with 4 slot nozzles

Truck crank shaft measuring station

This station is located next to the production line. It is used to measure main and pin journals on two types of crank shafts. The CMZ250 central measuring unit displays the measurement results and sends them to the statistical analysis software via the customer's network.

Hand-held air snap gauge for crank shaft gauging

Measurement of three diameters, three roundness values, two conicity values and one journal width.

Accessories for hand-held gauges

Handle adapter for dynamic gauging

This adapter is particularly recommended for dynamic measurements. Gripping of the part keeps the gauge in place on the test part during rotation. The reference depends on the diameter being checked.

Test diameter	Reference
15 < ØN ≤ 26	E501208-100
26 < ØN ≤ 35	E501208-200
35 < ØN ≤ 55	E501208-300
55 < ØN ≤ 85	E501208-400
85 < ØN ≤ 105	E501208-500

Hand-held gauge support box and reference part

This support is designed to receive air snap gauge on the right side and a reference part on the left side. It is equipped with a roller distributor to control air saving valve. Two holes, 7 mm in diameter, are used to attach it to the table next to the production line.

E501268-000

Protective shoe

It protects the test part during introduction of the gauge by the operator (specify width when ordering). Spare part only.

E500008-000

Ergonomic handle

The handle is always supplied with the hand-held snap gauge. Spare accessory only.

E500009-000

Application example with stand-mounted air snap gauges

Air snap gauge selection

To ensure the selection of the ideal air ring for your application, the following information is required:

- Drawing of the test part
- Diameter, tolerance, connection radius (R) and roughness of the test pin or shaft
- Desired measurement range (see Measurement Range table on page 6)
- Pneumatic formula in the case where the air snap gauge is connected to an existing pneumatic device
- Hand-held or stand-mounted gauge
- Number of measurement levels

Our specialist consultants will be happy to answer any questions you may have, to help you determine which air spindle is best suited for your application.

We look forward to hearing from you!

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