



Air Gage Does Double Duty

Air gage offers adjustable magnification with single- or dual-master capability. **BY MARK ROBINS, SENIOR EDITOR**

Air gages have been around for a long time and 90% of what they do is measure holes, but they still play an important role in metrology. Based on the precision of its standard Dimensionair, Mahr Federal Inc.'s (Providence, RI) Universal Dimensionair is part of a new series of adjustable magnification air comparators. It combines the capabilities of a differential air system—stability, accuracy and fast response—with the ability to work both as a single-master or dual-master air gaging system.

In single-master systems, the gage is calibrated to zero or a reference measurement, and the operator relies on the gage system accuracy to determine tolerance limits. Dual-master systems use two masters to calibrate maximum and minimum. For go/no-go applications, the air gage is usually calibrated with both masters or setting gages set for both tolerances.

With the addition of built-in magnification and zeroing controls, the Universal Dimensionair is capable of acting as a dual-master air gage comparator. By

selecting the appropriate dial configuration, it can be adjusted for use with most dual-master air tooling or span masters.

The operator sets system sensitivity, or scale factor, by adjusting the air comparator span to correspond to the difference between minimum and maximum setting masters, thus setting the sensitivity of all the components of the gaging system. A zeroing control brings the span to a balanced position on the dial.

REGAINING POPULARITY

Air gaging has increased in popularity in

QUALITY SPECS

- ▶ Dual-master systems use two masters to calibrate maximum and minimum.
- ▶ Air gaging has increased in popularity in recent years as part tolerances have gotten tighter.
- ▶ The classic analog dial provides fast visual representation of size and degree of good or bad or approaching readings.

◀ The Universal Dimensionair can work both as a single-master or dual-master air gaging system. *Source: Mahr Federal Inc.*

recent years as part tolerances have gotten tighter. It is fast and accurate, readily used in production environments, and the gages even help clean parts by blowing dirt away. The adjustable balanced air system's flexibility provides stable, reliable results and allows for single-master or dual-master setup quickly and easily.

One important feature of air gaging is that operators can put air jets, which sense the measurement, close to each other, much closer than individual electronic probes. This opens the door for doing various types of geometric measurements including straightness, squareness, center-distance, hole or feature location, and concentricity.

Air gages—because of their nature—have limited measuring range but offer high resolutions. For larger tolerances, other fixed mechanical plug gaging should be considered.

CONFIGURATION

The new air gaging system is available with a range of interchangeable dials for selecting magnifications from 1,250:1 to 10,000:1, in inch or metric scales. Dials are exchanged by a snap-off bezel that allows for easy changing while protecting the gage from contamination from the shop environment.

The classic analog dial provides a quick visual representation of size and degree of good or bad or approaching tolerance readings. "Most mechanical comparators have been replaced by electronic columns, digital displays or combinations of electronic analog-digital displays," says George Schuetz, director of precision gages at Mahr Federal Inc. "But just as digital watches have not replaced all analog watches, a majority of gage operators prefer to see a true analog movement of the hand. The hand gives a faster indication of over or under and good or bad measurements and often makes interpretation faster by the operator."

The gage's configuration allows for air tooling to be mounted directly on the unit's front. Numerous adaptors are available that allow most brands of air tooling to be easily connected to the

gage. This allows the unit to act as a bench gage where the parts are brought to the air tooling. When the parts are too large for a bench-mounted gage, a hose and handle assembly provide portable measurement on the part.

EASE OF USE

“The beauty of using an air gage is its ease of use,” Schuetz says. “Because it is made to measure a specific size, the operator simply puts the air plug in the part and the measurement is made. There is no rocking, searching or trying to figure out where the measurement is. There is little opportunity for operator error.”

The choice of displays depends on the mode of operation. A single-master setup is easier to use. With a dedicated one-master system, the operator puts a zero master on the tool and with one control makes the display read zero. With a two-master setup, two limits, or masters, are used to set the span and its location on the dial. Therefore, two controls are needed: a zero control and a magnification adjust. Between the two controls, the operator adjusts the span



Air gaging is ideal for part inspection at the machine because it is fast and easy to use. Source: Mahr Federal Inc.



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and zero location to match his masters.

“Both methods are easy enough when used with an instruction manual as a reference,” Schuetz says.

Supplied with air filter, fixed regulator, air supply hose and one standard dial, the Universal Dimensionair can be connected to standard shop air, out on the shop floor or in an inspection area for air gage measurements.

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