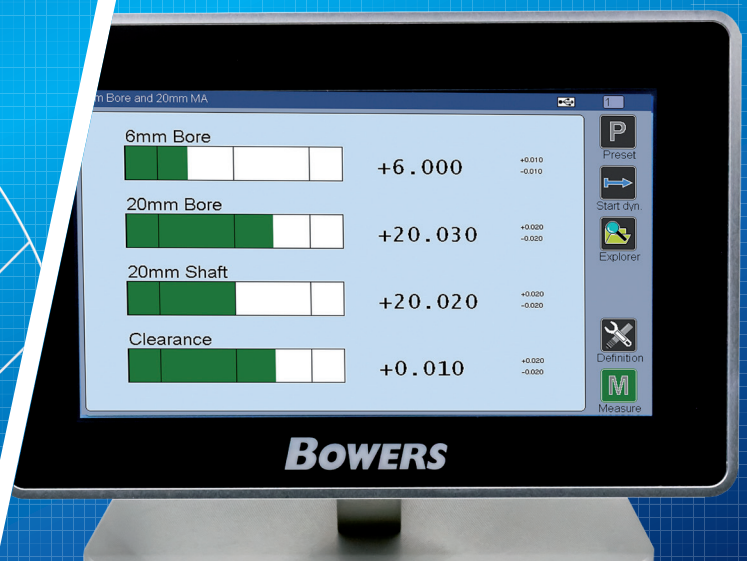




BOWERS GROUP
PARTNERS IN PRECISION



AIR GAUGING



Air Gauging A New Approach

Bowers Air1/2 Features*

- TFT colour touch screen display 4,3", resolution 480x272
- Static or dynamic measurements (Max, Min, Max-Min, Average, Median)
- Analogue or digital display
- 1 or 2 measurement configurations (2 characteristics)
- Possibility to automatically select the characteristic by using the air gauge or by touching the screen
- Relative or absolute display
- Display resolution (up to 0.1µm)
- Metric (mm or µm) or Imperial (Inches) measurement or DMS
- Classification/Grading: Up to 16 classes with colour representation
- RS232 port for communication with a PC
- USB port for communication and/or power supply
- USB Stick for data saving on a CSV file
- Optional connection of M-Bus modules
- Measurement transfer by pressing a key, footswitch input or retro- command on the RS232 port
- Operating temperature: +15°C to +30°C
- Power supply from 85 to 265 VAC by using the supplied main transformer (or by connecting it directly on your PC USB port, or through the 24 VDC screw terminal)
- Relative humidity : maximum 80%
- Dimensions : width 130 mm, height 111 mm, depth 105 mm
- Mass : 600 grams (700g with the power supply)
- Working parameters set by QR Code Scanner
- No additional hardware required other than QR scanner
- Footpedal to make measurements quicker and easier

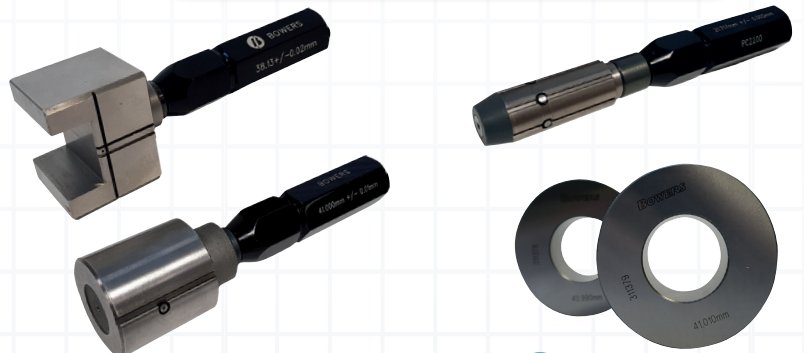
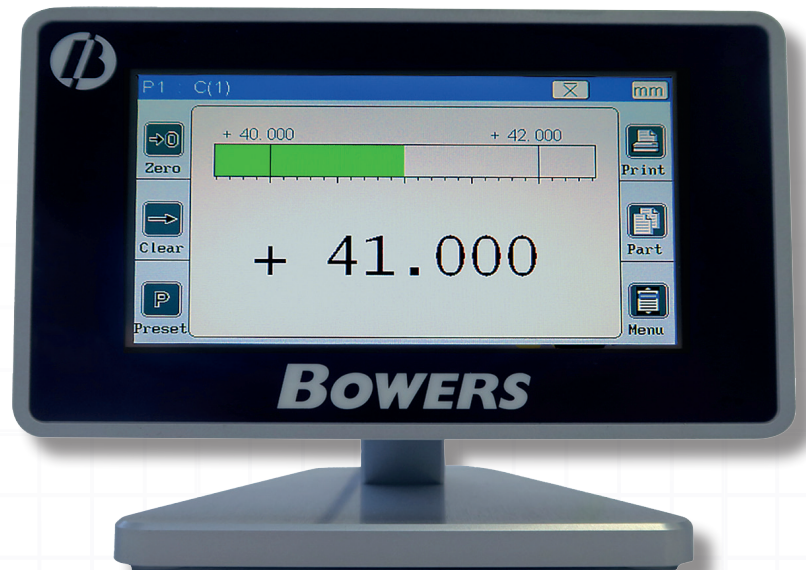
* Based on firmware 1.2 or later

Air Gauging is a fast, user friendly method of providing high precision results in even the most challenging of shop-floor environments. Using air flow volumes and pressures to measure parts, Air Gauging is a reliable, repeatable technology well suited for applications that demand sub-micron precision tolerancing. Air Gauging technology is flexible; enabling measurement of not only dimensions, but geometric and relational characteristics, such as squareness, parallelism, ovality, taper and straightness.

The working range of our standard air gauge tooling is 0.08mm. Working range can be extended by the addition of a third master. For optimum accuracy, Bowers produce the Setting Masters at the Upper and Lower product limits.

Please contact your local Bowers representative to discuss your application in greater detail or arrange a product demonstration.

Different organisations may prefer differing methods of air gauging, Bowers Group offers air gauging with a multi-function touchscreen Air Gauge Display, the Bowers Air1/2, As well as the multi function multi channel Air3. The Air3 is expandable, handling up to 99 connected devices.



Visit our Website

For more information please go to our website using the QR code.



ECLIPSE
TOOLS NORTH AMERICA INC

BOWERS GROUP

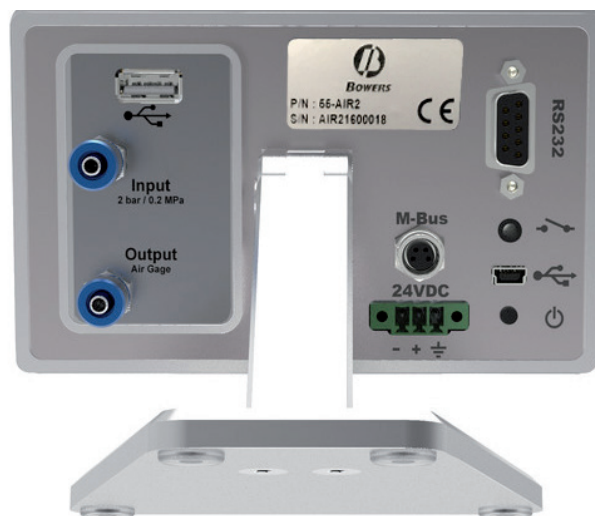
Bowers Air1 (Single Channel) Air2 (Twin Channel)

The user friendly modern design of the Bowers Air1/2 Gauge has a touch screen for ease of use and readability

For improved accuracy the Bowers Air1/2 benefits from two or three points of calibration, the minimum, the maximum and the mid: this offers greater linearity. Air gauging on the shop floor is a simple yet robust method of measurement that offers a myriad of measurement capability but with the smallest of footprint in a busy crowded factory floor. With no moving parts the toughened glass touch screen requires no special maintenance making this device suitable for harsh working environments. It does have a number of connectivity options, all designed to make the measuring process more user friendly.

- Simplicity with USB connectors for laptops and keyboards
- Data output from this device is exceptionally straightforward
- Fast reaction time of measurement, reduces the cycle times on machines
- QR Code Configuration (contact us for recommended QR reader model)
- Foot pedal for preset-clear-part characteristic-hold-data transfer

Configuration is always important. By using the Bowers Air1/2 you can set up the defined working parameters with speed, accuracy and ease by using nothing more complicated than a QR code, which is pre-loaded with the correct measurements and tolerances. The QR scanner plugs straight into the device and does not require any external hardware other than the QR code scanner.



Bowers Air1 Single Channel



Bowers Air2 Twin Channel



QR Code Scanner



Printer

Bowers Air3 Multifunctional/ Multichannel

Features

- 7" touchscreen display and customizable display interface
- Bench stand or panel mount
- Aluminium body
- 12VDC/30VDC Power supply
- RJ-45 Ethernet TCP4 for Network Interface
- USB host (for usb key) and USB device (virtual keyboard)
- Up to 99 device connection
- Footswitch
- M-BUS Module Connection
- RS232
- Static and dynamic (Mini, Maxi, Maxi-mini, Average, Median)
- Trigonometrical measurements
- Analogical and digital display
- Manage up to 32 fixtures with automatic fixture detection by probe motion
- Up to 32 characteristics by fixture
- Displays resolution up to 5 decimals
- SPC functions
- Upgradeable, Non Windows Firmware
- Measurement transfer by USB or RS232
- PLC programming
- QR Reader Compatible
- ECO Mode Compatible with energy saving, Air Bypass Filtration Kit
- On board measurement storage of up to 30,000 measurements

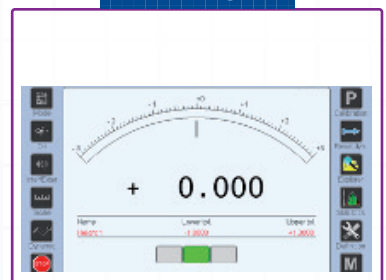
The Air3 allows users to display readings simultaneously from multigauging applications. All of which offers readings for each dimension, the MIN, MAX and DELTA etc.

The AIR 3 is a **NEW** addition to the Bowers Air Gauge range of displays

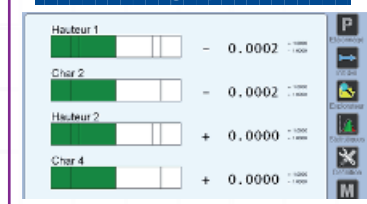


Display types preview:

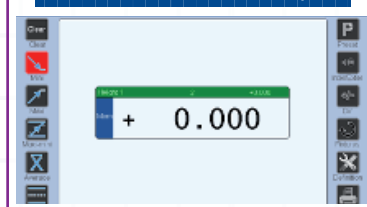
Analog



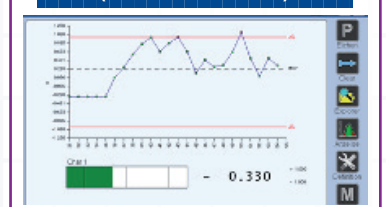
Multiple: (up to 32 bargraphs)



Digital: (= without tolerance indication)



Live SPC (advanced mode)



Visit our Website

For more information please go to our website using the QR code.



Sylcom Data Processing Software

The Sylcom Software can be used with the MB-AG air gauge modules in conjunction with the MB-RS module. The MB-RS Module also allows the air gauge modules to be connected to a PLC or Network via USB or RS232.

- BlueTooth compatible, export data to Microsoft Excel
- Software compatible with Windows 7, 8.1 and 10
- Display values in different modes
- Upload parts drawing in the background
- Classify results from tolerances
- Multigauges and sequence mode
- Sylcom Advanced Package allowing to connect many probes and instruments through M-BUS modules, including Air Gauge modules
- Free Sylcom Lite version with 1 instrument connection, free 30 days trial for Sylcom Standard, not compatible with MB-AG modules



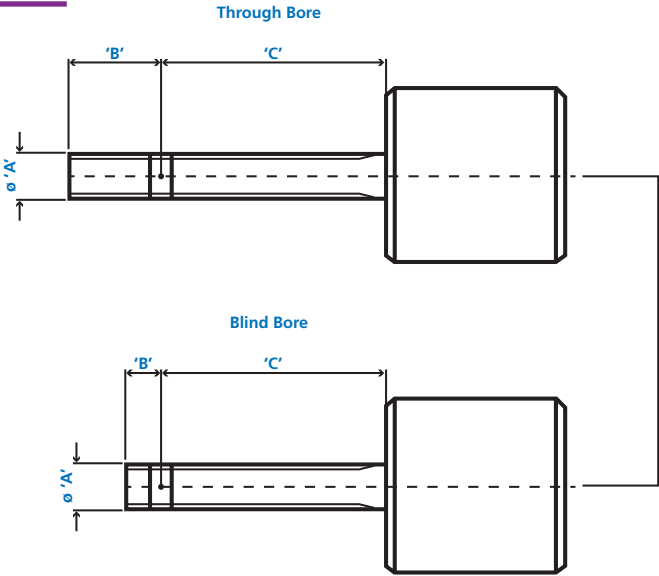
Sylcom Software Specifications		
Specification	Sylcom Standard	Sylcom Advanced
Max Number of Instruments	16 (max 8 Bluetooth)	254
Software Requirements	Windows 7 / 8.1 / 10 (64-bit)	Windows 7 / 8.1 / 10 (64-bit)
Minimum Hardware Requirements	Intel i5, 4GB RAM (8GB recommended)	Intel i5, 4GB RAM (8GB recommended)
Compatible M-BUS	No	Yes
Export to Microsoft Excel	Yes	Yes
Data Export by Timer	Yes	Yes
Tolerances and Control Limits	Yes	Yes
Selectable Display Modes	Yes	Yes
Multigage Mode	Yes	Yes
Sequence Mode	Yes	Yes
User Management	Yes	Yes
Configuration of Digital Indicator Menu	Yes	Yes

Standard Air Gauge Tooling

Standard: 3.00 - 14.10mm

ø'A' Range	'B'	'C'
ø3.00 - 4.70	4.76	20.65
ø4.70 - 6.30	12.70	22.30
ø6.30 - 14.10	12.70	25.40

ø'A' Range	'B'	'C'
ø3.00 - 4.70	3.97	21.45
ø4.70 - 6.30	3.97	31.05
ø6.30 - 14.10	3.97	34.15



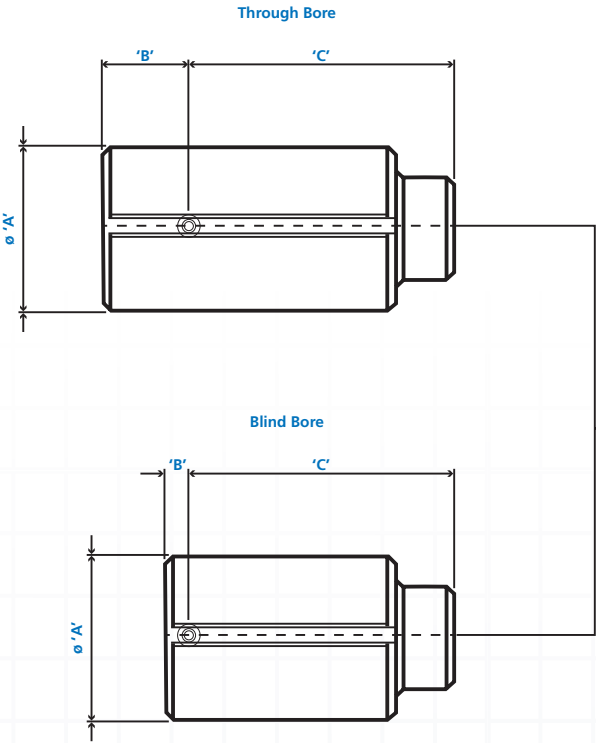
Connection Options

- Bowers System Hexagonal Handle (included)
- 3/8" - 32 NS Internal Thread
- Bayonet Adapter (included)

Standard: 14.10 - 76.45mm

ø'A' Range	'B'	'C'
ø14.10 - 37.85	15.90	35.20
ø37.85 - 76.45	19.05	34.95

ø'A' Range	'B'	'C'
ø14.10 - 37.85	3.97	47.15
ø37.85 - 76.45	3.97	50.00



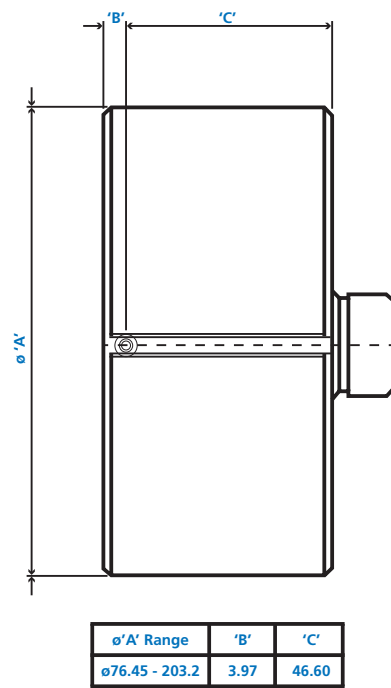
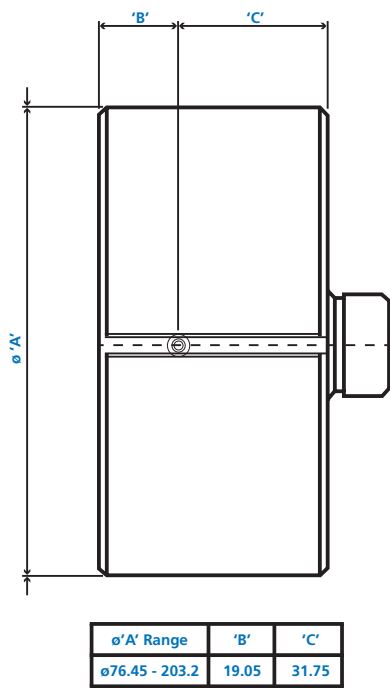
Connection Options

- Bowers System Hexagonal Handle (included)
- 3/8" - 32 NS Internal Thread
- Bayonet Adapter (included)

Note: For more information about connections please contact our sales team.

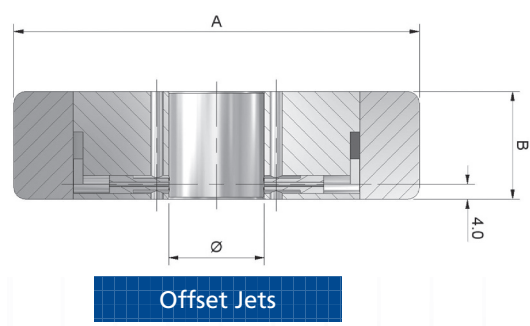
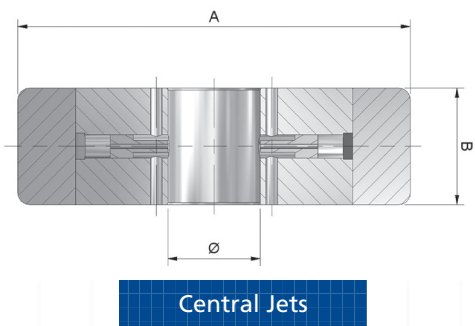
Standard Air Gauge Tooling

Standard:
76.45 - 203.20mm



Standard Air Rings

Air Rings are supplied with jets in central position as standard, see diagram. Air rings are designed to be hand held, bench mounted versions are available on request.



Air Rings Specifications					
Size Range (mm)	Size Range (in)	Dim A (mm)	Dim A (in)	Dim B (mm)	Dim B (in)
3.17-6.35	1/8 - 1/4	63.50	2.5	19.05	3/4
6.35-25.4	1/4 - 1	82.55	3 1/4	25.40	1
25.4-38.10	1 - 1.5	107.95	4 1/4	28.58	1 1/8
38.10-50.80	1.5 - 2	120.65	4 3/4	28.58	1 1/8
50.80-63.50	2 - 2.5	133.35	5 1/4	28.58	1 1/8

Note: All Bowers Air tooling is cutomisable to suit your application. Please contact our sales team for more information.

Bowers Air3 Multifunctional / Multichannel Display Applications

Application example:

Display several characteristics for each dimension e.g. (MIN, MAX and DELTA).

The AIR 3 is an exciting new addition to the **Bowers Air Gauge** range of displays. With its versatile and easy to use touchscreen display, the AIR 3 can be used in conjunction with the M-BUS MB-AG modules as a simple display or as a fully networked, **integrated measuring station** capable of machine tool control. With on board measurement storage of up to 30,000 measurements, collected data can be used locally on the display or via network for SPC analysis.



4 dimensions measured, 16 Values displayed



Visit our Website

For more information
please go to our website
using the QR code.



Bowers Air3 Multifunctional /Multichannel Display Applications



Bowers Air 3. Optional Rear Mount Kit for modules. (Modules not included)

Smartphone style user interface

Part	M-BUS	Clock	COM port
Configuration	Explorer	Keylock	Measure

Mathematical functions menu allowing instruments and channel combinations

Hauteur 1l

sin	asn	cos	acs	tan	atn	=	7	8	9
sqr	exp	dr	rd	abs	pi	-	4	5	6
*	/	#	:	C(+		1	2	3
Abc	()	<	>	←		0	.	↓

Example: Taper calculation

• Taper: $\tan \alpha = \frac{D_1 - D_2}{2L}$

D= larger diameter of taper in mm
d= smaller diameter of tapered in mm
L= length of tapered part in mm
2α= full taper angle
α=angle of taper or half taper angle

The modern digital display allows any operator to see if the component is correct, just by looking at the colour.

Addmore Engineering Ltd

Statistics menu

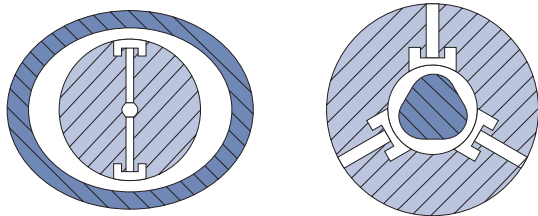
06 : Diametre

Air Gauge

Tooling Applications

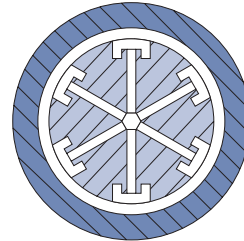
The following are some examples of how Air Gauge tooling can be configured.

Out-of-Roundness



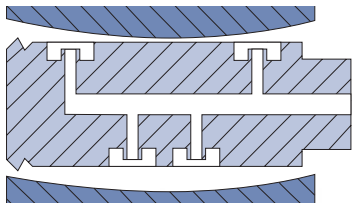
Air tools can gauge a part for roundness. For two-point out-of-round conditions, a standard two-nozzle air tool can be used. If lobing exists in the part, an odd number of nozzles must be used, depending on the number of lobes.

Averaging



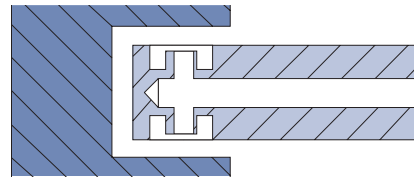
Multiple nozzles are equally located about the circumference of the air tool to allow for average size measurement. Commonly used for thin-walled or out-of-round parts — four, six, or more nozzles are utilised, depending on the tool size.

Straightness



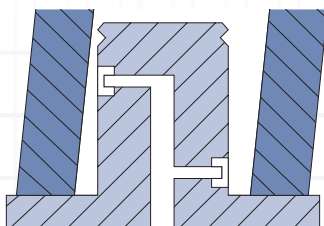
A common application of Air Gauging is to dynamically measure the straightness or "bow" of an inside or outside diameter. In this case, a custom designed air plug makes verifying a part's straightness simple and fast. (A straightness air plug cannot be used to measure diameter).

Groove Width



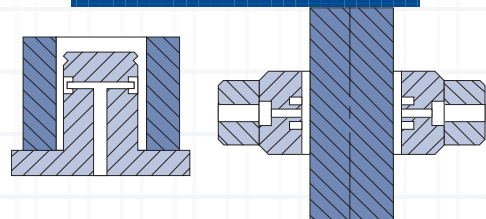
The measurement of grooves is conveniently achieved with flat, blade-type air tools. Air Gauging not only determines groove size, but with exploration around the workpiece, parallelism of the groove faces can also be determined.

Squareness



To determine squareness of a part, for example a bore to a face, air nozzles configured as a "z" are used with dynamic measurement to change the back-pressure from square to out of square conditions.

Inside & Outside Diameters

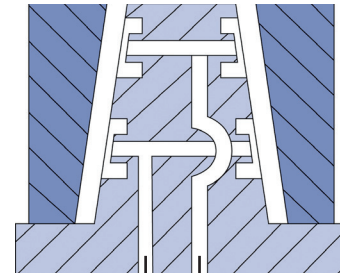
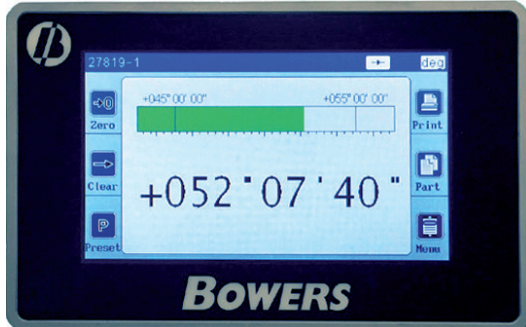


Air Gauges are most commonly used for measuring the size and form of inside diameters and outside diameters. Two-nozzle air plugs, with nozzles diametrically opposed, are used for internal measuring, and two-nozzle air rings are used for external dimensions.

Air Gauge

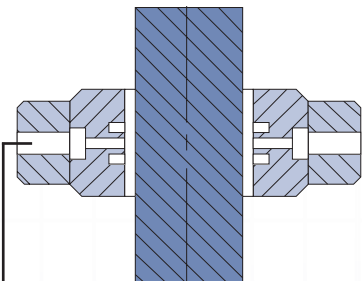
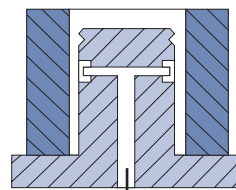
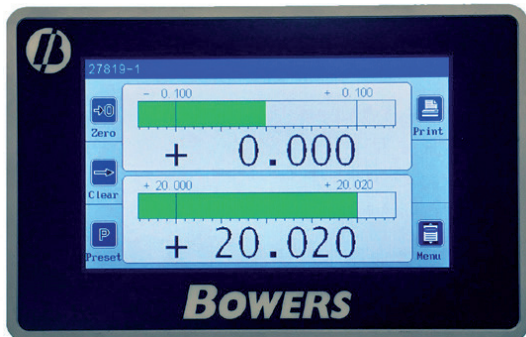
Tooling Applications

Taper



Angle variation of tapered surfaces is commonly checked with air gauging as the difference of two diameters. The Bowers Air2 (Firmware 1.2 or later) has DMS (Degree-Minute-Second) capability build in.

Matching



A specified clearance between two mating parts is often required to assure proper part operation. The Bowers Air2 allows for the individual display of the bore size, or shaft size and the clearance between the two parts. Operators need only observe the clearance display to determine if the two components have the required match dimension.

The Bowers Air2

Allows for the individual display of the bore size, or shaft size and the clearance between the two parts.



Bypass Air Preparation Kit



At a Glance

\$\$\$

Super Savings!



Eco Mode

The **Bowers Air Gauging** system ensures that every component can be checked with guaranteed high precision results in a matter of seconds.

Addmore Engineering Ltd

With ever increasing energy costs, Bowers have introduced an Air Preparation Kit that incorporates a built in air bypass valve. This works in conjunction with the **Eco Mode** within the Air3.

When the **Eco Mode** is active, the bypass valve reduces the air flowing through the tooling. This greatly reduces the consumption of air whilst maintaining a small flow of air. This ensures the tooling temperature is held constant ready for immediate use when required. **Please contact Bowers for more information.**



Visit our Website

For more information please go to our website using the QR code.



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Website: www.bowersgroup.co.uk/ca

