



BOWERS GROUP

Air Gauging "a new approach"





Air Gauging "a new approach"

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. 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.

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, multi channel Sylvac D400 or the Traditional Air / Electronic Columns.

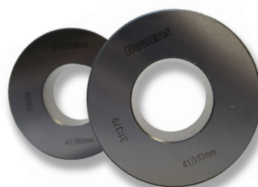
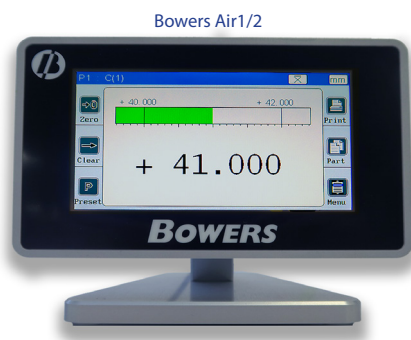
Bowers Air1 (Single Channel) Air2 (Twin Channel)

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 really 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 - see page 2.

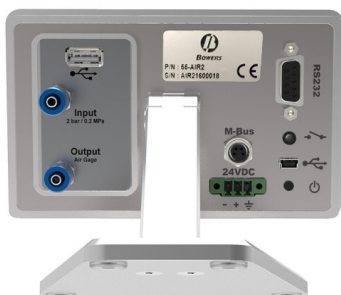




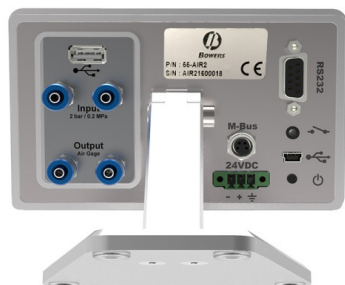
Bowers Air1/2 Features*

- 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 select automatically 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)

* Based on Firmware 1.2 or later



Bowers Air1
Single Channel



Bowers Air2
Twin Channel



WORKING PARAMETERS
SET BY QR CODE SCANNER

NO ADDITIONAL
HARDWARE REQUIRED
OTHER THAN QR SCANNER

FOOT PEDAL TO MAKE
MEASUREMENTS QUICKER
AND EASIER



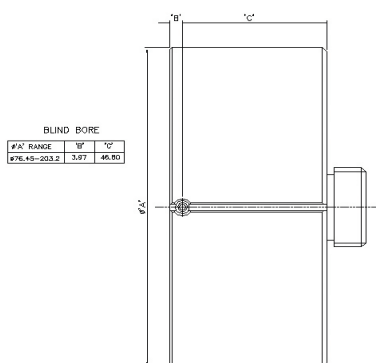
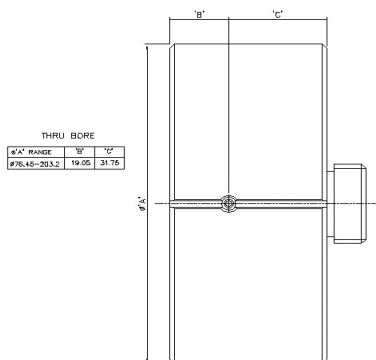
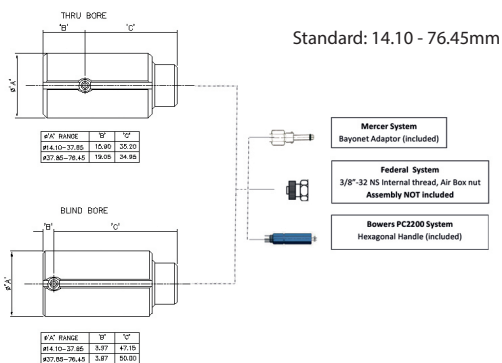
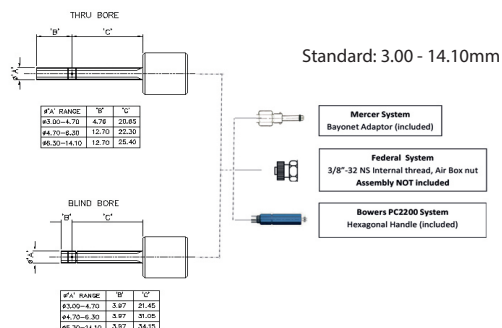
QR Code Scanner



Printer

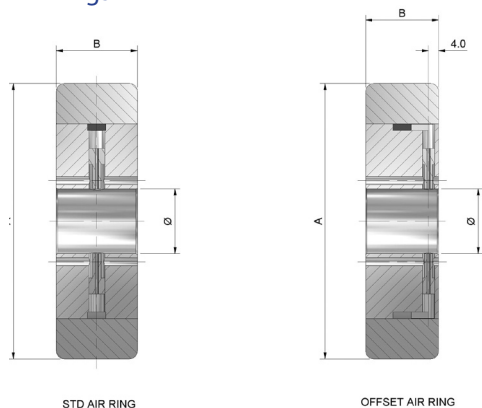


Air Gauge Tooling



Standard: 76.45 - 203.20mm

Air Rings



AIR RINGS - SPECIFICATION

Size Range (mm)	Size Range (inch)	Dia A (mm)	Dia A (inch)	Dia B (mm)	Dia B (inch)
3.17-6.35	1/8-1/4	63.50	2.5	19.05	3/4
6.35-25.40	1/4-1	82.55	3 1/4	25.40	1
25.40-38.10	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
50.80-63.5	2-2.5	133.35	5 1/4	28.58	1 1/8



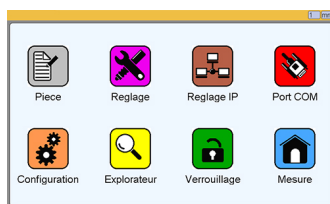
D400S Multifunction/Multichannel Display



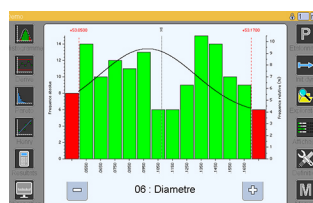
Application example: Display several channels for each dimension (MIN, MAX and DELTA)



4 dimensions measured, 12 valves displayed



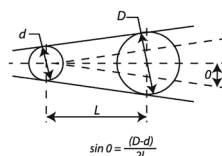
Smartphone style user interface



Statistics menu



Mathematical functions menu allowing instruments and channels combinations



Example: Taper calculation

D400S – Multifunctional Multichannel Features

The D400S from Sylvac allows users to display readings simultaneously from multigauging applications. All of which offers readings for each dimension, the MIN, MAX and DELTA.

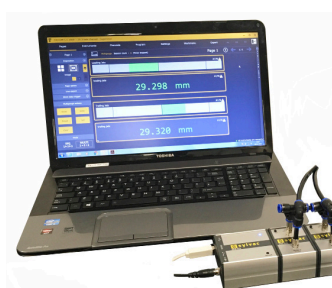
- 7" touchscreen display and customizable display interface
- Aluminium body
- 12VDC/30VDC Power supply
- RJ-45 Ethernet TCP4
- USB host (for usb key) and USB device (virtual keyboard)
- Footswitch
- M-BUS
- RS232
- Static and dynamic (Mini, Maxi, Maxi-mini, Average, Median)
- Trigonometrical measurements
- Analogical and digital display
- Manage up to 32 fixtures with automatic fixture detection by probe motion
- Up to 32 characteristic by fixture
- Up to 128 part references
- Calibration mode
- Individual probe display
- Displays resolution up to 5 decimals E 7
- SPC functions
- Measurement transfer by USB or RS232
- PLC programming



SYLCOM SOFTWARE

The output of this can be displayed using the Sylcom software, standard and advanced.

- 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 modes
- 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



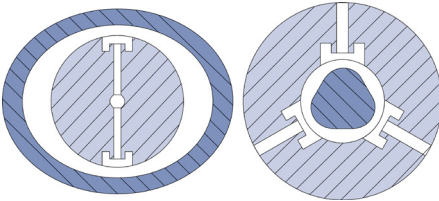
SYLCOM SOFTWARE

Specification	Sylcom Standard	Sylcom Advanced
Max Number of Instruments	16 (max 8 Bluetooth)	254
Software Requirements	Windows 7 / 8.1 / 10 64-bit processor	
Hardware Requirements	From 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
Multigauging Mode	Yes	Yes
Sequence Mode	Yes	Yes
User Management	Yes	Yes
Configuration of Digital Indicator Menu	Yes	Yes

Air Gauge Tooling Applications

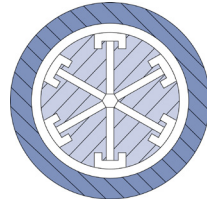
The following are some examples of how Air Gauge tooling can be configured.

OUT-OF-ROUNDNESS



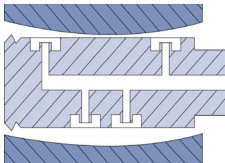
Air tools can gauge a part for roundness. For two-point out-of-round conditions, a standard two-nozzle air tool can be used. If lobing exists in the part, an odd number of nozzles must be used, depending on the number of lobes.

AVERAGING



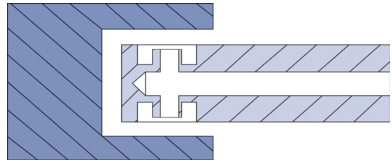
Multiple nozzles are equally located about the circumference of the air tool to allow for average size measurement. Commonly used for thin-walled or out-of-round parts — four, six, or more nozzles are utilised, depending on the tool size.

STRAIGHTNESS



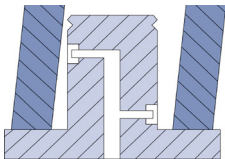
A common application of Air Gauging is to dynamically measure the straightness or "bow" of an inside or outside diameter. In this case, a custom designed air plug makes verifying a part's straightness simple and fast. (A straightness air plug cannot measure diameter).

GROOVE WIDTH



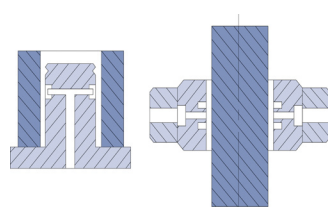
The measurement of grooves is conveniently achieved with flat, blade-type air tools. Air Gauging not only determines groove size, but with exploration around the workpiece, parallelism of the groove faces can also be determined.

SQUARENESS

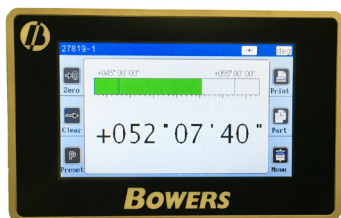


To determine squareness of a part, for example a bore to a face, air nozzles configured as a "z" are used with dynamic measurement to change the back-pressure from square to out of square conditions.

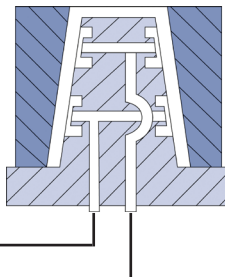
INSIDE & OUTSIDE DIAMETERS



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.

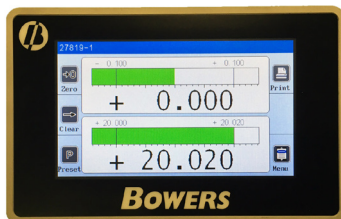


TAPER

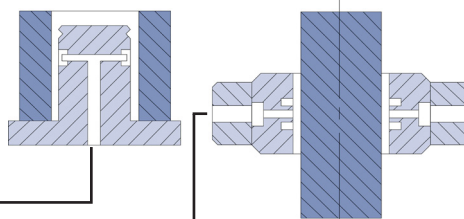


Angle variation of tapered surfaces is commonly checked with air gauging as the difference of two diameters.

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.



Master Setting Rings

RING CODES					
		From mm	To mm	From inch	To inch
R1X	RING GAUGE (CLASS X)	1.50	3.00	0.059	0.118
R3X	RING GAUGE (CLASS X)	3.00	6.10	0.118	0.240
R6X	RING GAUGE (CLASS X)	6.10	9.27	0.240	0.365
R9X	RING GAUGE (CLASS X)	9.27	12.95	0.365	0.510
R12X	RING GAUGE (CLASS X)	12.95	20.96	0.510	0.825
R20X	RING GAUGE (CLASS X)	20.96	28.83	0.825	1.135
R28X	RING GAUGE (CLASS X)	28.83	38.35	1.135	1.510
R38X	RING GAUGE (CLASS X)	38.35	51.05	1.510	2.010
R51X	RING GAUGE (CLASS X)	51.05	63.75	2.010	2.510
R63X	RING GAUGE (CLASS X)	63.75	76.45	2.510	3.010
R76X	RING GAUGE (CLASS X)	76.45	89.15	3.010	3.510
R89X	RING GAUGE (CLASS X)	89.15	101.85	3.510	4.010
R101X	RING GAUGE (CLASS X)	101.85	120.90	4.010	4.760
R120X	RING GAUGE (CLASS X)	120.90	139.95	4.760	5.510
R139X	RING GAUGE (CLASS X)	139.95	159.00	5.510	6.260
R159X	RING GAUGE (CLASS X)	159.00	178.05	6.260	7.010
R178X	RING GAUGE (CLASS X)	178.05	197.10	7.010	7.760
R197X	RING GAUGE (CLASS X)	197.10	203.20	7.760	8.000
R1XX	RING GAUGE (CLASS XX)	1.50	3.00	0.059	0.118
R3XX	RING GAUGE (CLASS XX)	3.00	6.10	0.118	0.240
R6XX	RING GAUGE (CLASS XX)	6.10	9.27	0.240	0.365
R9XX	RING GAUGE (CLASS XX)	9.27	12.95	0.365	0.510
R12XX	RING GAUGE (CLASS XX)	12.95	20.96	0.510	0.825
R20XX	RING GAUGE (CLASS XX)	20.96	28.83	0.825	1.135
R28XX	RING GAUGE (CLASS XX)	28.83	38.35	1.135	1.510
R38XX	RING GAUGE (CLASS XX)	38.35	51.05	1.510	2.010
R51XX	RING GAUGE (CLASS XX)	51.05	63.75	2.010	2.510
R63XX	RING GAUGE (CLASS XX)	63.75	76.45	2.510	3.010
R76XX	RING GAUGE (CLASS XX)	76.45	89.15	3.010	3.510
R89XX	RING GAUGE (CLASS XX)	89.15	101.85	3.510	4.010
R101XX	RING GAUGE (CLASS XX)	101.85	120.90	4.010	4.760
R120XX	RING GAUGE (CLASS XX)	120.90	139.95	4.760	5.510
R139XX	RING GAUGE (CLASS XX)	139.95	159.00	5.510	6.260
R159XX	RING GAUGE (CLASS XX)	159.00	178.05	6.260	7.010
R178XX	RING GAUGE (CLASS XX)	178.05	197.10	7.010	7.760
R197XX	RING GAUGE (CLASS XX)	197.10	203.20	7.760	8.000

CLASS X OR XX TO ANSI/ASME B89.1.6M

All Setting Rings are supplied with UKAS Certificates

Air / Electronics Columns

For the more traditional methods of Air Gauging Bowers offers a variety of display options e.g. air/electronic, which is capable of measuring functions including static and dynamic gauging, classification grading, probe mixing, ie (A+B) , (A-B).

FEATURES OF AIR/ELECTRONIC COLUMNS

AEP 2045



PC2200



Display Type	Tri-colour bar / Digital numeric	Tri-colour bar / Digital numeric
User Interface	Keypad	Keypad or remote program (1)
Channels	1	1 or 2 depending on model
Memory Capability	16 Tooling Characteristics	4 Tooling Characteristics
Resolution	Up to 0.0001mm	Up to 0.0001mm
Relative/Absolute	REL/ABS	REL/ABS
Measuring Mode	Static/Dynamic/TIR	Static/Dynamic/TIR
Units	mm or inch	mm or inch
Direct RS232	Yes	Yes
Data Collection	On board (2)	External
Connectivity	USB	RS232
Display Options	Tri-colour bar / Digital Numeric Tolerance + Approach	Tri-colour bar / Digital Numeric Tolerance + Approach
Auto Channel Recognition	No	No
Grading	Yes	Yes
Dimension (mm) (HxWxD)	500x60x200	450x57x215
Weight Approx (kg)	4.7	5.0
Power Requirements	230 VAC 50Hz	110/220 VAC 50Hz

(1) Additional parts / software required.

(2) 1000 measurements. Download to Flash Drive via USB.



NOTES



BOWERS GROUP

Bowers Group
Unit 3, Albany Court, Albany Park, Camberley, Surrey
GU16 7QR

Tel: 08708 50 90 50 Fax: 08708 50 90 60

Email: sales@bowersgroup.co.uk

Web: www.bowersgroup.co.uk

