

## Dimensionair® Air Gages – Air Plugs

### Calibrated I.D. tooling for the Dimensionair® Air Gaging Systems

#### Features

- Tooling is interchangeable without adjusting system magnification.
- Federal Air Plugs have large clearance (see table below), allowing easy entrance into the hole being measured and greater measuring range.
- Long life - wide clearance and hard chrome (optional) body extends useful life of the Air Plug.
- Deep, recessed jets - Air jets are recessed into the plug body which protects them from damage.
- Large jet size eliminates clogging from dirt and oils.

#### Plug Identification



Air Plugs are marked with an identification number which identifies its size, number of jets, plug style, and the Dimensionair® Model the plug should be used with.

For example: **DP50-T2-1.000** is the identification number of an Air Plug for a **2095184** or a standard magnification 832 Dimensionair (DP50), through-hole style with two jets (-T2), and 25mm/1.000in nominal size (-1.000).

The number (50) which identifies the Dimensionair intended is marked on the plug and also appears on the dial of the Dimensionair to help in matching the tooling to its corresponding Dimensionair Model.

#### Total Clearance from Nominal Size

Plug Identification	Nominal Size from mm/in	To & include mm/in	Clearance from Nominal Size mm/in
DP100*, DP60	3/.123"	3.5/.140"	0.030/.0012"
	3.5/.140"	4.7/.185"	0.045/.0018"
	4.7/.185"	6.3/.248"	0.061/.0024"
	6.3/.248"	76.3/ 3.004"	0.081/.0032"
	76.3/ 3.004"		0.089/.0035"
	Above 127/ 5.000"		0.107/.0042"
DP50	3/.123"	3.5/.140"	0.015/.0006"
	3.5/.140"	4.7/.185"	0.027/.0011"
	4.7/.185"	6.3/.248"	0.030/.0012"
	6.3/.248"	76.3/ 3.004"	0.045/.0018"
	127/ 5"		0.071/.0032"
	Above 127/ 5.000"		0.081/.0032"
DP20	3/.123"	3.5/.140"	0.009/.00035"
	3.5/.140"	4.7/.185"	0.013/.0005"
	4.7/.185"	6.3/.248"	0.015/.0006"
	6.3/.248"	76.3/ 3.004"	0.023/.0009"
	76.3/ 3.004"		0.071/.0028"
	Above 127/ 5.000"		0.081/.0032"
DP10	All sizes to 44.5/1.750"		0.009/.00035"
DP5	All sizes 1.750" to 1"		0.00055/.000175"

*DP-100 not available below 9.525mm/.375in*

#### Ordering Information

##### When ordering Air Plugs please specify:

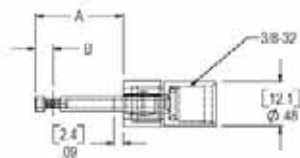
1. Nominal I.D. Size and Tolerance.
2. Dimensionair Model to be used.
3. Air Plug style (Through Hole, Blind Hole, or Counterbore).
4. Air Plug finish (Chrome-plated or Hardened Steel).
5. Order Master SettingRing at same time.

*Unless otherwise specified, Mahr Federal will furnish a 2-jet, Through Hole, High Chrome Air Plug for a 2500:1 Dimensionair.*



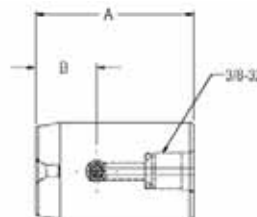
## Through Hole Plugs (DP50 – DP20 & 60)

3-4.7mm/ .123-.185"



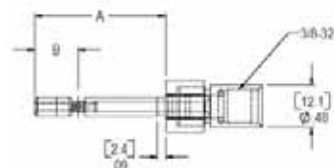
Minimum recommended hole length:  
4.8mm/ .187in

14.1-37.8mm/ .588-1.484"



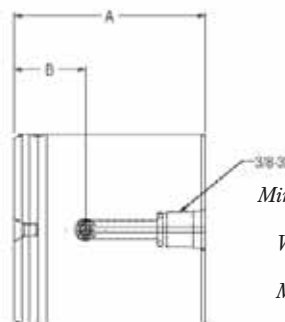
Minimum recommended hole length:  
6.35mm/ .250in  
With guide sleeve or stop collar:  
1.77mm/ .070in  
May be used with AHA-4 or -5  
Extensions for deep holes.

4.7-6.3mm/ .185-.248"



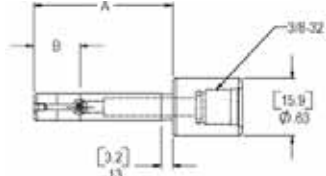
Minimum recommended hole length:  
4.8mm/ .187in

37.8-76.5mm/ 1.484-3.004"



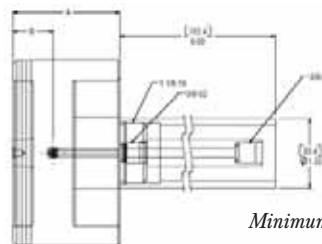
Minimum recommended hole length:  
6.35mm/ .250in  
With guide sleeve or stop collar:  
1.77mm/ .070in  
May be used with AHA-4 or -5  
Extensions for deep holes.

6.3-9.5mm/ .248-.3735"



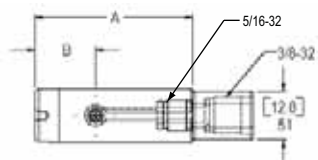
Minimum recommended hole length:  
6.35mm/ .250in  
With guide sleeve or stop collar:  
1.8mm/ .070in

76.5-114.3mm/ 3.004-4.50"



Minimum recommended hole length:  
6.35mm/ .250in  
With guide sleeve or stop collar:  
1.8mm/ .070in

9.5-14.1mm/ .3735-.588"



Minimum recommended hole length:  
6.35mm/ .250in  
With guide sleeve or stop collar:  
1.77mm/ .070in  
May be used with  
AEX-1 or -2 Extensions  
for deep holes.

### Through Hole Plugs

#### Measured Size mm/inch

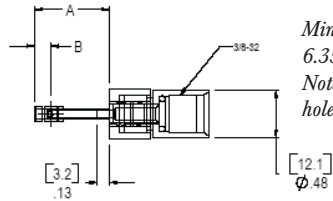
Above	To & include			Minimum Hole Length*	Measuring Range		
		"A"	"B"		DP50	DP20	DP60
3/ .123"	3.5/ .140"	23.8/ .9375"	4.8/ .1875"	4.7/ .187"	0.025/ .001"	0.013/ .0005"	.051/.002"
3.5/ .140"	4.7/ .185"	23.8/ .9375"	4.8/ .1875"	4.7/ .187"	0.038/ .0015"	0.020/ .00075"	.076/.003"
4.7/ .185"	6.3/ .248"	38/ 1.5"	12.7/ .500"	4.7/ .187"	0.051/ .002"	0.025/ .001"	.102/.004"
6.3/ .248"	9.5/ .3735"	38/ 1.5"	12.7/ .500"	6.4/ .250"	0.076/ .003"	0.038/ .0015"	.152/.006"
9.5/ .3735"	14.1/ .556"	38/ 1.5"	12.7/ .500"	6.4/ .250"	0.076/ .003"	0.038/ .0015"	.152/.006"
14.1/ .556"	37.8/ 1.490"	41.3/ 1.625"	15.9/ .625"	6.4/ .250"	0.076/ .003"	0.038/ .0015"	.152/.006"
37.8/ 1.484"	76.5/ 3.004"	50/ 2"	19/ .750"	6.4/ .250"	0.076/ .003"	0.038/ .0015"	.152/.006"
76.5/ 3.004"	114.3/ 4.5"	50/ 2"	19/ .750"	6.4/ .250"	0.076/ .003"	0.038/ .0015"	.152/.006"

\*If a guide sleeve or stop collar is used, minimum hole length can be as small as 1.8mm/.070in for holes larger than 6.3mm/.248in.

\*\*A handle 152mm/6in long and 33.3mm/1.31in diameter is supplied with plugs over 76.5mm/3.010in.

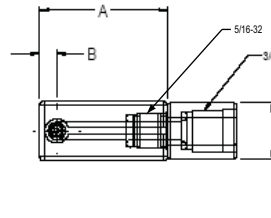
## Blind Hole/Counterbore Plug (DP50 – DP20 &amp; 60)

3.9-4.7mm/.155-.185"



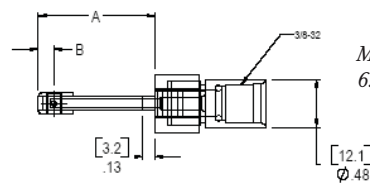
Minimum recommended hole length:  
6.35mm/.250in.  
Note: Masters must simulate workpiece for  
holes of this size.

11.8-14.1mm/.467-.556"



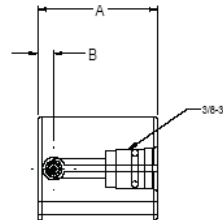
Minimum recommended hole length:  
6.35mm/.250in.  
Shorter bores can be checked. Consult  
Mahr Federal Customer Resource Center.  
May be used with Extensions AEX-1 or -2  
for deep holes.

4.7-6.3mm/.185-.248"



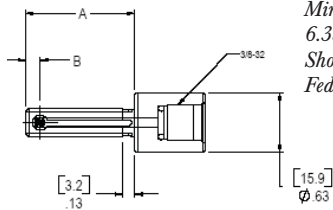
Minimum recommended hole length:  
6.35mm/.250in.

14.1-37.8mm/.588-1.484"



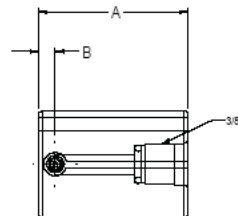
Minimum recommended hole length: 6.35mm/  
.250in. Shorter bores can be checked. Consult  
Mahr Federal Customer Resource Center. May be  
used with AHA-4 or -5 Extensions for deep holes.

6.3-9.47mm/.248-.373"



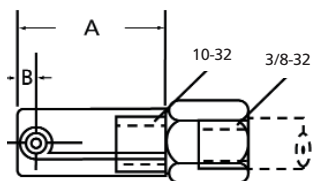
Minimum recommended hole length:  
6.35mm/.250in  
Shorter bores can be checked. Consult Mahr  
Federal Customer Resource Center.

37.8-76.5mm/ 1.484-3.004"



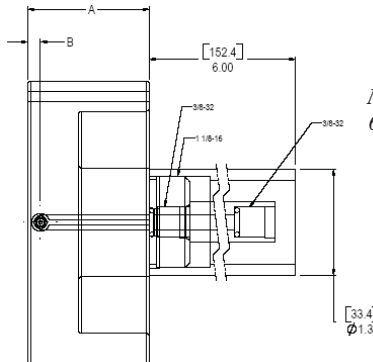
Minimum recommended hole length: 6.35mm/  
.250in. Shorter bores can be checked. Consult  
Mahr Federal Customer Resource Center. May  
be used with AHA-4 or -5 Extensions  
for deep holes.

9.47-11.8mm/.373-.467"



Minimum recommended hole length:  
.250in. Shorter bores can be checked.  
Consult Mahr Federal Customer Resource  
Center.  
May be used with extension AHA-28 for  
deep holes.

76.5-108.2mm/ 3.004-4.50"



Minimum recommended hole length:  
6.35mm/.250in.

## Blind Hole/Counterbore Plugs

## Measured Size mm/inch

Above

To &  
Include

"A"

"B"

Minimum  
Hole  
Length\*

## Measuring Range

DP50

DP20

DP60

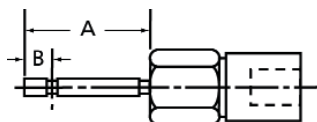
3.9/.155"	4.7/.185"	19/.750"	4/.156"	6.4/.250"	0.038/.0015"	0.01905/.00075"	.076/.003
4.7/.185"	6.3/.248"	29.4/1.156"	4/.156"	6.4/.250"	0.051/.002"	0.025/.001"	.012/.004
6.3/.248"	11.8/.467"	29.4/1.156"	4/.156"	6.4/.250"	0.076/.003"	0.038/.0015"	.152/.006
11.8/.467"	14.1/.588"	29.4/1.156"	4/.156"	6.4/.250"	0.076/.003"	0.038/.0015"	.152/.006
14.1/.588"	37.8/1.484"	29.4/1.156"	4/.156"	6.4/.250"	0.076/.003"	0.038/.0015"	.152/.006
37.8/1.484"	76.5/3.004"	35.7/1.406"	4/.156"	6.4/.250"	0.076/.003"	0.038/.0015"	.152/.006
76.5/3.004"	114.3/4.5"	38/1.5"*/**	4/.156"	6.4/.250"	0.076/.003"	0.038/.0015"	.152/.006

\*If a guide sleeve or stop collar is used, minimum hole length can be as small as 1.8mm/.070in for holes larger than 6.3mm/.248in.

\*\*A handle 152mm/6in long and 33.3mm/1.31in diameter is supplied with plugs over 76.5mm/3.010in.

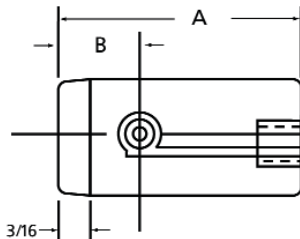
## Through Hole Plug (DP10 – DP5)

1.6-6.4mm/ .062-.250"



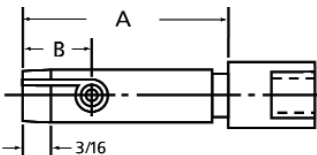
Minimum recommended hole length: 3.18mm/ .125in.

11.1-44.5mm/ .437-1.750"



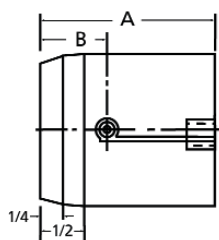
Minimum recommended hole length: 3.18mm/ .125in with proper support min. is 1.14mm/ .045in. May be used with AHA-23 or -24 Extensions for deep holes.

6.4-9.5mm/ .250-.3735"



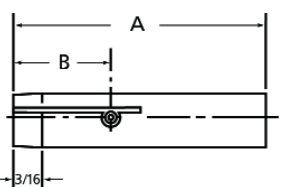
Minimum recommended hole length: 3.18mm/ .125in.  
With guide sleeve or stop collar: 1.14mm/ .045in.

44.5mm & Up/ 1.750" & Up



Minimum recommended hole length: 3.18mm/ .125in. With guide sleeve or stop collar: 1.14mm/ .045in. May be used with AHA-23 or -24 Extensions for deep holes.

9.5-11.1mm/ .3735-.437"



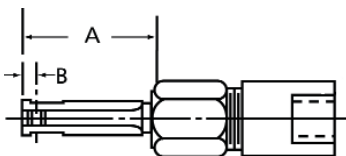
Minimum recommended hole length: 3.8mm/ .125in. With guide sleeve or stop collar: 1.14mm/ .045in. May be used with AHA-23 or -24 Extensions for deep holes.

### Through Hole Plugs

Measured Size mm/inch				Minimum Hole Length*	Measuring Range	
Above	To & Including	"A"	"B"		DP10	DP5
1.6/.062"	6.4/.250"	23.8/.9375"	4.8/.1875"	3.2/.125"	0.015/.0006"	0.008/.0003"
6.4/.250"	9.5/.3735"	38/1.5"	12.7/.500"	3.2/.125"	0.015/.0006"	0.008/.0003"
9.5/.3735"	11.1/.437"	41.3/1.625"	15.9/.625"	3.2/.125"	0.015/.0006"	0.008/.0003"
11.1/.437"	44.5/1.750"	41.3/1.625"	15.9/.625"	3.2/.125"	0.015/.0006"	0.008/.0003"
44.5/1.75"	76.5/3.010"	50/2"	19/.750"	3.2/.125"	0.015/.0006"	0.008/.0003"

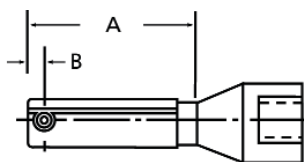
## Blind Hole Plugs (DP10 - DP5)

3.2-6.4mm/ .125-.250"



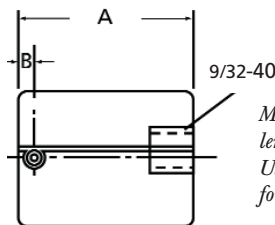
Minimum recommended hole length: 3.96mm/ .156in.

6.4-11.1mm/ .250-.437"



Minimum recommended hole length: 3.18mm/ .125in.

11.1mm & Up/ .437" & Up



Minimum recommended hole length: 3.18mm/ .125".  
Use AHA-23 or -24 Extensions for deep hole applications.

### Blind Hole/Counterbore Plugs

Measured Size mm/inch				Minimum Hole Length*	Measuring Range	
From	To & Include	"A"	"B"		DP10	DP5
3.2/.125"	6.4/.250"	21.4/.844"	2.4/.094"	3.9/.156"	0.015/.0006"	0.008/.0003"
6.4/.250"	11.1/.437"	27.8/1.094"	2.4/.094"	3/.120"	0.015/.0006"	0.008/.0003"
11.1/.437"	76.5/3.010"	27.8/1.094"	2.4/.094"	3/.120"	0.015/.0006"	0.008/.0003"

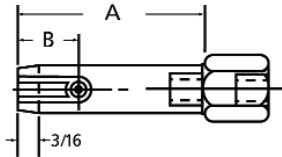
### Super-blind Plugs

Blind Hole Air Plugs can be furnished to check shorter holes than listed above, and can be furnished to check closer to the bottom of a hole. Holes must be at least 1.9mm/.075in long, and the distance from the end of the plug to the center-line of the jets can be as short as 1.4mm/.055in for plugs below 6.4mm/.250in or 1.1mm/.045in for plugs above 6.4mm/.250in.

\*If a guide sleeve or stop collar is used, minimum hole length can be as small as 1.1mm/ .045in for holes larger than 6.4mm/.250".

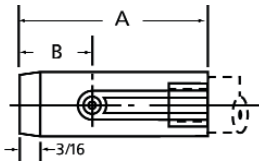
## Through Hole Plug (DP100)

## 9.525-12.7mm/ .375-.500"



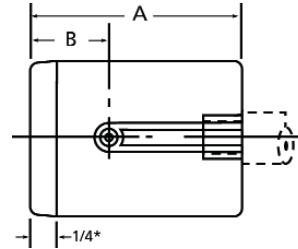
Minimum recommended hole length: 6.35mm/ .250in, with proper support min. is 3.18mm/ .125in. May be used with AEX-1 or -2 Extensions for deep holes.

## 12.7-37.8mm/ .500-1.490"



Minimum recommended hole length: 6.35mm/ .250in, with proper support min. is 1.14mm/ .125in. May be used with AHA-4 or -5 Extensions for deep holes.

## 37.8-76.5mm/1.490-3.004"

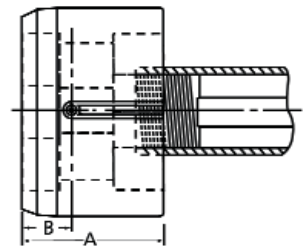


Minimum recommended hole length: 6.35mm/ .250in.

May be used with AHA-4 or -5 Extensions for deep holes.

## 76.5mm &amp; Up/ 3.004" &amp; Up

Minimum recommended hole length: 6.35mm/ .250in.



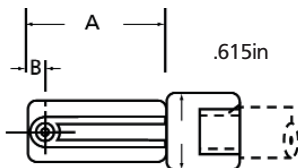
## Through Hole Plugs

## Measured Size mm/inch

Above	To & Include	"A"	"B"	Minimum Hole Length*	Measuring Range
9.525/.375"	12.7/.500"	38/1.5"	12.7/.500"	6.4/.250"	0.152/.006"
12.7/.500"	37.8/1.490"	41.3/1.626"	15.9/.625"	6.4/.250"	0.152/.006"
37.8/1.490"	76.5/3.004"	50/2"	19/.750"	6.4/.250"	0.152/.006"
76.5/3.004"	114*/4.5"***	50/2"	19/.750"	6.4/.250"	0.152/.006"

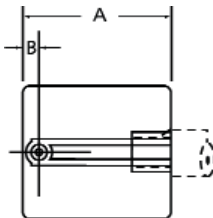
## Blind Hole/Counterbore Plugs

## 9.525-14.25mm/ .375-.561"



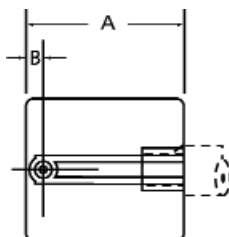
Minimum recommended hole length: 7.9mm/ .312in.

## 14.25-37.8mm/ .561-1.490"



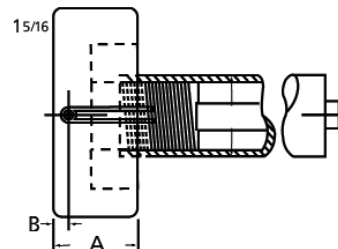
Minimum recommended hole length: 7.9mm/ .312in. Use with AHA-4 or -5 handles for deep hole applications.

## 37.8-76.3mm/ 1.490-3.004"



Minimum recommended hole length: 7.9mm/ .312in. Use with AHA-4 or -5 handles for deep hole applications.

## 76.3-114.3mm/ 3.004-4.500"



## Blind Hole Plugs

## Measured Size mm/inch

Above	To & Include	"A"	"B"	Minimum Hole Length*	Measuring Range
9.525/.375"	14.1/.561"	30/1.187"	4.2/.187"	7.9/.312"	0.152/.006"
41.5/.561"	37.8/1.490"	30/1.187"	4.2/.187"	7.9/.312"	0.152/.006"
37.8/1.490"	76.3/3.004"	36.5/1.438"	4.2/.187"	7.9/.312"	0.152/.006"
76.3/3.004"	114/4.500"***	36.5/1.438"	4.2/.187"	7.9/.312"	0.152/.006"

Notes: \*If a guide sleeve or stop collar is used, minimum hole length can be as small as 1.8mm/.070in for holes larger than 6.3mm/.248in.

\*\*A handle 152mm/6in long and 33.3mm/1.31in diameter is supplied with plugs over 76.5mm/3.010in

For smaller or larger plugs than those shown above, or for any modification to the specifications shown, contact Mahr Federal Customer Resource Center.

## Measuring Deep Holes with Air Plugs

### Non-Relieved Air Plugs

When precise plug alignment must be maintained through the entire length of a deep hole, Non-Relieved Air Plugs can be provided. The entire length of these plugs is held to the clearances of Air Plugs described on page 4. Extra lengths of up to 101.85mm/4.010in can be provided for plugs from 6.3mm/.248in to 63.75mm/2.510in diameter. Contact Mahr Federal Customer Resource Center to specify Non-Relieved Air Plugs.

**Small:** 4.75mm/.187in to 9.4mm/.370in (Through Hole Plugs) and 4.75mm/.187in to 11.86mm/.467in (Blind Hole Plugs). Plugs are provided as a solid piece, with the "A" dimensions held to Air Plug clearances, and the remainder machined to a slightly smaller diameter.

Contact Mahr Federal Customer Resource Center to specify Air Plugs in these sizes.

### Relieved Air Plugs

When only the "A" length dimensions (see pages 10 thru 13) need to be held to Air Plug clearances, several options exist, depending on the size of the hole being measured:

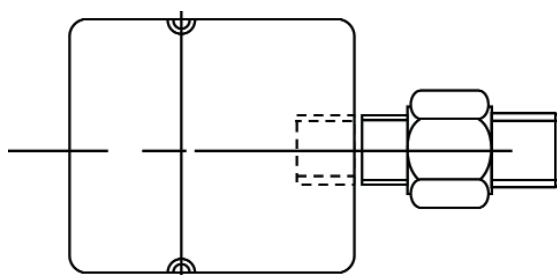
**Larger Bores:** Both Through Hole and Blind Hole Plugs larger than 9.53mm/.375in have no shoulder to prevent deep hole gaging, and require using either handles or extensions to facilitate gaging.

## Extended Range Air Plugs – Oil Industry

Air tooling is available for measuring long bores, such as pump barrels used in the oil field industry. The tooling is modified to have up to a 0.254mm/.010in total range. It carries a DPS model number and is basically 2500:1 tooling with extra clearance, a 1/4in polished, trailing and leading edge radius, as well as a full .006in thickness on diameter of hard chrome plate for increased wear life.

The tooling is designed for use on model DA-SPEC-190 Dimensionair® with a choice of three available ranges:

5-0-5:	$\pm 0.127\text{mm}/\pm 0.005\text{in}$ ,
8-0-2:	$+0.200/-0.050\text{mm}$ $+0.008/-0.002\text{in}$
9-0-1:	$+0.225/-0.025\text{mm}$ $\pm 0.009/-0.001\text{in}$ .



The plugs are typically used with a 30ft long hose. AHO-SPEC-102 is a rubber hose and AHO-SPEC-175 is a heavy duty hydraulic hose. The system is ideal for accurately measuring size within  $\pm 0.005\text{in}$  of zero, but also when extended range is needed for approach and over or to monitoring bore wear typical for pump barrels.

## Contact Style Air Gages

Mahr Federal's Dimentron® Plugs can be used with 2500:1 Dimensionair systems as a 2-point contact type Air Plug.

AirProbe® and Handle Assemblies for these Plugs are available in three ranges:



Model	AirProbe (included)	Range mm/in	Matching Dial for Dimensionair Amplifier	
			Metric	Inch
AAT-192	AA-2-3	0.076/.003"	ADL-28	ADL-95
AAT-194	AA-2-6	0.152/.006"	ADL-16	ADL-96
AAT-193	AA-2-15	0.381/.015"	ADL-20	ADL-97

Assembly includes AirProbe, AD-140 Adaptor, HA-88 Handle, AL-1737 Flat Contact Point, and AHO-1 Hose. Order Dial separately.



## Dimensionair® Air Gages

### Accessories

#### Handles and Extensions

When an Air Plug is used with a hose, it should be equipped with a Handle to avoid excessive strain on the air connection and corrosion on the polished plug body. Handles may be combined for gaging deep holes.

Selection of a handle or extension is determined by the bore itself and whether or not it is preceded by a larger C-bored diameter. Corresponding thread sizes of the handle or extension must also be considered.

If no portion of the handle or extension enters the part, only thread sizes must be considered. If the plug does enter the part, then both O.D. and thread size must be considered.

AHA-4 and AHA-5 Extensions — accept AHO-1 Hose on one end and the following plug sizes on the opposite end: all 1250:1 thru 8000:1 plugs up to 76.45mm/3.010in (except 2500:1 thru 8000:1 blind hole plugs with 9.53mm/.375in – 11.86mm/.467in diameters).

AHA-6 Handle — accepts AHO-1 Hose on one end and the following plug sizes on the opposite end: all 1250:1 thru 8000:1 plugs up to 76.45mm/3.010in (except 2500:1 thru 8000:1 blind hole plugs with 9.53mm/.375in – 11.86mm/.467in diameters). Has Bakelite insulating cover. Recommended for 37.85mm/1.490in up to 76.45mm/3.010in diameters.

2237666 — High impact and coolant resistant, light weight composite handle — normally furnished with uDimensionair and air snaps.

AHA-66 and 2236070 — light weight aluminum handles without or with air shutoff valve.

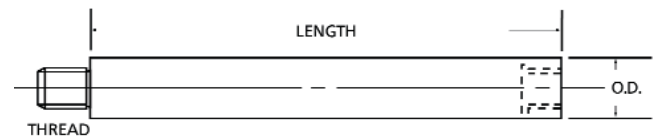
AHA-15 Handle — Used and furnished with 1250:1 thru 8000:1 through or blind hole plugs over 3.004" diameter.

AHA-23 and AHA-24 Handles — Used with 10000:1 thru 32000:1 plugs.

AHA-28 Handle — Used with 2500:1 thru 8000:1 Blind hole plugs in the 9.47mm/.373in to 11.86mm/.467in range, using an AAD-315 Adaptor.

AEX-1 and AEX-2 Extensions — Used with 2500:1 thru 8000:1 Through hole air plugs in the 9.5mm/.373in to 14.1mm/.556in range and with 11.86mm/.467in to 14.1mm/.556in range blind hole plugs, using an AAD-55 Adaptor.

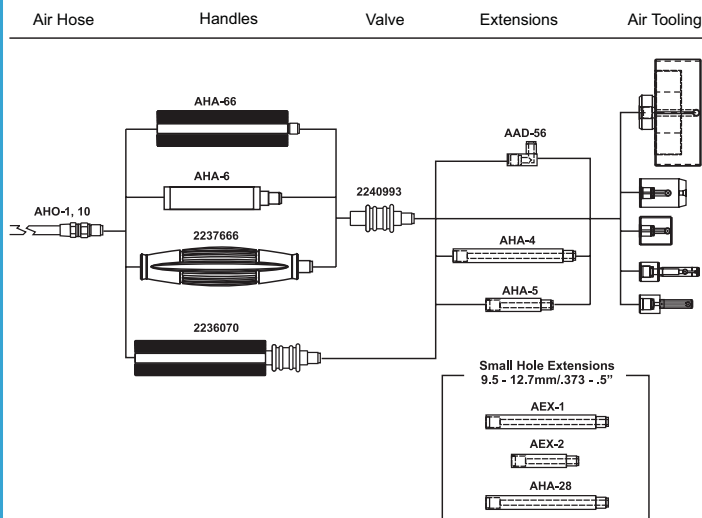
2201975 — extension used with BA-100 adjustable base. Provides easily configured base for bench-mounted air tooling.



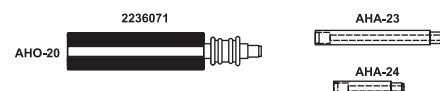
Order no.	Thread	O.D. mm/in	Length mm/in
AHA-4	3/8-32	12.07/.475"	102/4"
AHA-5	3/8-32	12.07/.475"	51/2"
AHA-6	3/8-32	25/1.0"	102/4"
AHA-15	1-1/8-18	33.4/1.315"	152/6"
AHA-20	3/8-32	12.7/.500"	133.35/5.25"
AHA-23	9/32-40	9.14/.360"	51/2"
AHA-24	9/32-40	9.14/.360"	102/4"
AHA-28	10-32	9.14/.3603"	102/4"
AEX-1	5/16-32	9.02/.355"	51/2"
AEX-2	5/16-32	9.02/.355"	102/4"
2201975*	3/8-32	9.5/.374"	61.7/2.43"

\* Use on BA-100

Accessory Configuration for DP60/DP50/DP20 Systems — Low Magnification



Accessories for High Magnification Systems — DP10/DP5



## Dimensionair® Air Gages

### Options for Air Plugs

#### Materials:

Air plugs are normally furnished in High Chrome content stainless steel or can be flashed chromed for extra protection. Mahr Federal can manufacture air plugs in other materials for extreme use applications. Materials

can include CPM-10V, Ferritec, Tungsten carbide wearstrips and others are available to get the most from your air gage tooling.

#### Non-relieved air plugs

Normally when using an air plug in a deep hole extensions are combined with the plug to reach the bottom of the bore. In some cases lands and interruptions can interfere with plug movement. In these case a non-

relieved plug can be specified. Here the plug is made to a specific length ( in 1 inch increments) so the the land will help guide the plug through the part.

#### Special Jet locations/multiple bore diameter

For certain blind hole applications the location of the jets are critical to measuring the diameter at precisely the location as called out on the part print. Special jet locations can be called out as part of the plug requirements. Or, requirements may call of multiple diameters (the same or different) To be measured simultaneously. Special plugs have multiple jets at different diameter positions can speed up the gaging process.



#### Special shapes

Air tooling for precision bores are by far the most common air gaging application. However, air tooling can be configured to meet virtually any gaging requirements. These may include square plugs, plugs for measuring partial chords in a ball socket or "mouse gages" designed to measure and explore slot widths in parts.



#### Guide pins

For rifle bores or specific part orientation grooves may be incorporated into the part. Guide pins can be attached to the plug to guide the plug and orient the

jets to assure fast easy plug alignment to the surface to be gaged.

#### Marking and kit bundling

Often tooling is purchased as a package for specific applications. Kits can be created that include the air plug and master all contained in a storage box and all individual items marked to include the specific kit number, operation to be used and serial numbers.



#### Special front ends

The leading edge of the air plug is critical for either making entry into the part easy or aligning the part to the bore - as in the case of a shallow bore. Normally an easy entry nose cut out is provided for standard

through hole applications. There are times when a straight entry lead is required. Prints provided at the time of requesting the quote will help in configuring these applications.

#### Stop Collars

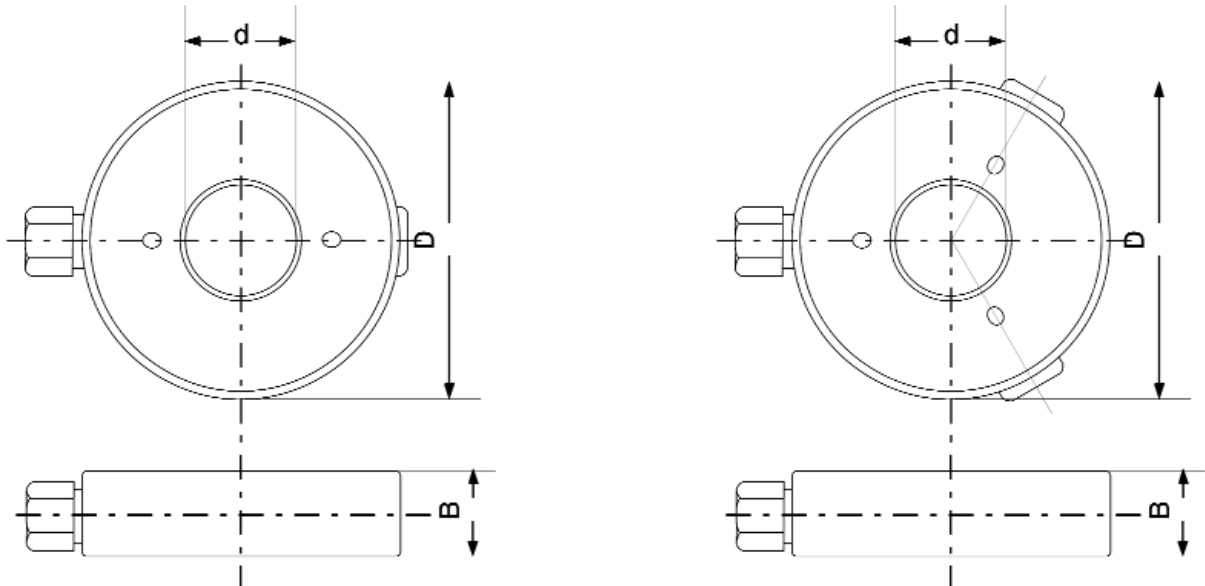
For precisely positioning the plug at specified depths a stop collar is the effective solution. These inexpensive options are a must for short bores. They position the measuring jets at the proper location while assuring the plug is square to the bore. See page 46 for selecting a Stop Collar.



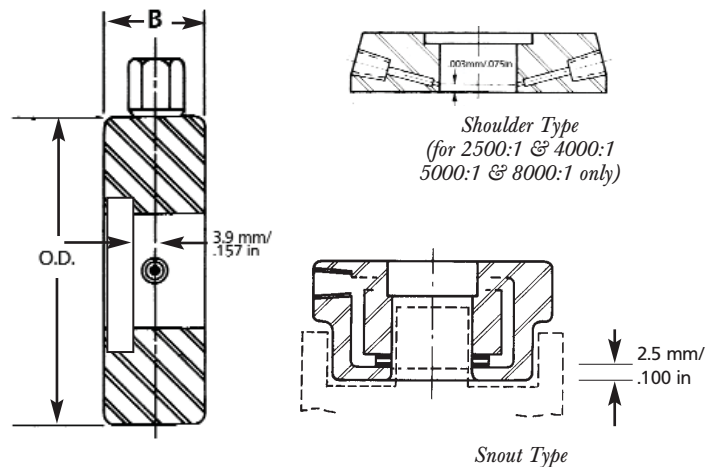


## Dimensionair® Air Gages – Air Rings

Air rings are supplied in several styles for external measuring. Two and three jet rings are most common, used for checking outside diameters for sizes out of round conditions from 6.3mm/.248in to 63.5mm/2.500in. Four and six jet rings are also available for special applications. All Air Rings have chrome-plated wear surfaces unless otherwise specified.



For applications where O.D.'s need to be checked near a shoulder, or where part length is restricted, contact Mahr Federal for technical assistance about shoulder and Snout Type Air Rings.



Diameter d mm/in	Diameter D mm/in	Width B mm/in
6.3-7.6/ .248-.299"	76.2/ 3.00"	25.4/ 1.00"
7.6-9.3/ .299-.366"	76.2/ 3.00"	25.4/ 1.00"
9.3-13.0/ .366-.512"	76.2/ 3.00"	25.4/ 1.00"
13.0-21.0/ .512-.827"	76.2/ 3.00"	25.4/ 1.00"
21.0-25.4/ .827-1.00"	76.2/ 3.00"	25.4/ 1.00"
25.4-38.4/ 1.00-1.51"	101.6/ 4.00"	25.4/ 1.00"
38.4-44.5/ 1.41-1.75"	101.6/ 4.00"	25.4/ 1.00"
44.5-50.8/ 1.75-2.00"	127.0/ 5.00"	25.4/ 1.00"
50.8-63.5/ 2.00-2.50"	127.0/ 5.00"	25.4/ 1.00"
63.5-76.2/ 2.50-3.00"	139.7/ 5.50"	25.4/ 1.00"

When ordering ring gages, please specify the following:

- Nominal workpiece dimensions
- Tolerance
- Desired magnification
- Instrument used
- Setting plug to be supplied?

Air Rings may be attached directly to a Dimensionair or used on a base and connected to the gage with a plastic hose. Vee type Guide Chutes can be furnished on one or both sides if Air Rings from 6.3mm/.248in through 44.5mm/1.750in. Tube type guide can be furnished on sizes from 6.3mm/.248in through 63.5mm/2.500in.

## Dimensionair® Air Gages

### Options for Air Rings

#### Carbide Wear strips

Air plugs are normally furnished chromed for long life. Other materials can be provided to improve the life of the ring when high volume or grinding grit

may still remain on the part. Materials such as Ferro-Tic and addition of carbide strips can be provided.

#### Bases for air rings

Depending on the application there are many ways to hold an air ring. They may be hand held and placed over the part if the part is still on the machine. They may be front mounted, horizontally or vertically on the Dimensionair or for larger parts the can be

mounted to a base and held vertically or horizontally. Special bases are available the mount the ring horizontally and incorporate a part lifting mechanism to aid in part removal.

#### Guide chutes

Guide chutes and vees are available in a host of options to improve the inspection process. Vee type guide chutes can be furnished on one or both sides of an air ring from 6.3mm/ .248" through 44.5mm/ 1.75". Other options include tube type guide chutes for sizes 6.3mm/ .248" through 63.5mm/ 2.5". Standard length of the guide chutes are 63.5mm/ 2.5"

and affix to the side of the air ring. Other options including heavy duty out riggers and universal vee stands can be provided.



### Options for Air Snaps

Since side clearances can present gaging problems with crankshaft diameters or similar applications, Mahr Federal designed a new line of air snaps that make the tough measurements easier and affordable.

We based our new air snap design on our own proven air tooling techniques, known for providing long life and high-resolution in tough shop environments. Now you can measure fixed sizes from 12.5mm/ .49" through 184mm/ 7.25" using D-2500 and D-5000 systems. Widths are typically 19mm/ .75" but can be customized to reach diameters having tight clearances.

Jet locations can be located central in the snap or positioned close to either side for exploring close to a shoulder.

Multiple circuit air snaps are available for speeding the process while checking the journal for size variation, taper, barrel or hourglass shape.

