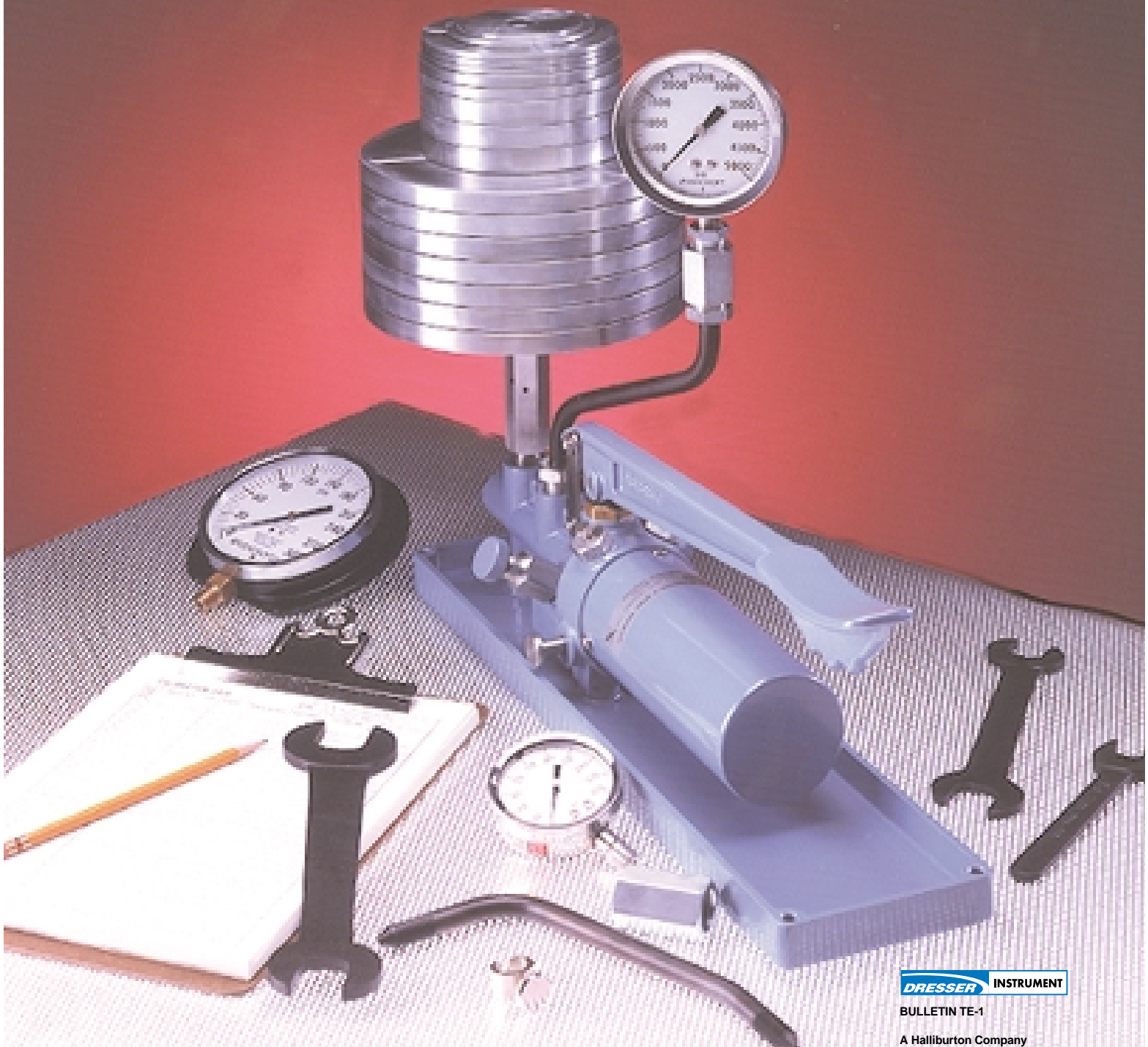


# ASHCROFT®

## Pressure Instrument Testing Equipment



**DRESSER** INSTRUMENT

BULLETIN TE-1

A Halliburton Company

# A Durable, Portable Primary Standard...

## Model 1305D Deadweight Tester

The Ashcroft 1305D Deadweight Tester is an affordable, portable primary pressure standard, specifically designed for the precise calibration of industrial service gauges and transducers. Accurate to 0.1% of reading, each deadweight tester is carefully calibrated and certified traceable to the National Institute of Standards and Technology (NIST).

The 1305D is a "dual-range" system which provides a "high" and a "low" pressure piston assembly and a complete set of weights labeled with corresponding high and low pressure values. Each system includes a "2 speed" lever action hydraulic pressure pump capable of achieving pressures up to 10,000 psi. By repositioning a shuttle valve, the operator can select between 2 different rates of pressure generation, thereby reducing the effort necessary to develop higher pressures. To "fine tune" the pressure output to a specific calibration point, the pump is equipped with a secondary micro-adjust vernier displacement valve.

The standard 1305D pump is designed to operate with 20 weight petroleum based motor or machine oil. For applications requiring the use of glycol or phosphate ester based "hydraulic" fluids, the pump is optionally available with special seals suitable for these media.

In addition, each set includes the tools, adapters and accessories necessary to accommodate most field or lab calibration requirements. All of the components are conveniently stored in a metal "tool box" for maximum protection and portability. Weight sets are also protected in separate metal storage boxes.

The 1305D offers a rugged field ready primary standard, certified to yield consistent, accurate results.

### SPECIFICATIONS – 1305D

**Accuracy:**

Within 0.1% of produced pressure (adjusted for standard gravity conditions; compensation for local gravity effects may be required)

**Operating Pressure:**

15 psi to 10,000 psi maximum  
(100 kPa to 70,000 kPa)

**Reservoir Volume:**

Approximately 1.5 pints (0.7 liter)

**Pump Body Material:**

Aluminum alloy

**Piston and Cylinder Material:**

Piston: 440C Stainless Steel  
Cylinder: 416 Stainless Steel

**Operating Fluid:**

1305D – SAE 20 automotive or machine oil  
1305DH – Phosphate or glycol base hydraulic fluids,  
(Monsanto Skydrol 500B-4 or equal)

Note: Not for use with water medium. For oxygen service applications, refer to models 1327DO or 1327CMO.

**Weight Material:**

Non-magnetic die cast zinc alloy,  
ASTM AC41A

**O-Ring Seals:**

Standard (1305D) – Buna-N  
Optional (1305DH) – Ethylene Propylene

**Accessories:**

Metal carrying and storage boxes  
Lower connection offset pipe assembly  
Back connection pipe  
¼ & ½ NPT Female adapters  
Wrenches (1" x 1½"), (¾" x 1"), (½")  
Pointer puller set  
Installation and Operation Manual  
Spare O-ring kit

**Certification:**

Standard: NIST traceability document provided with each unit.

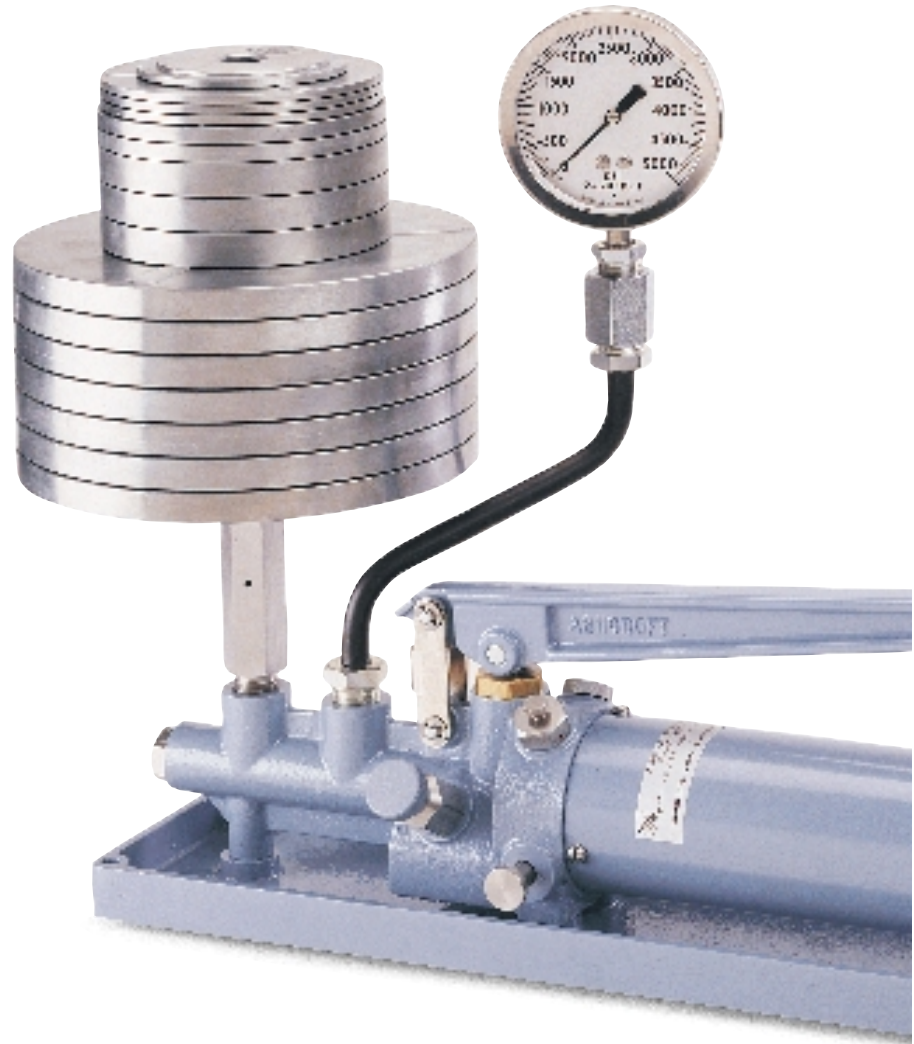
**Carrying Case Dimensions**

10 x 10 x 22 (inches)

**Weight Box Dimensions\***

9 x 9 x 8.5 (inches)

\*Two boxes required for type 1305D-100, 1305DM-700, 1305DB-700, 1305DA-70,000. All others require one box.

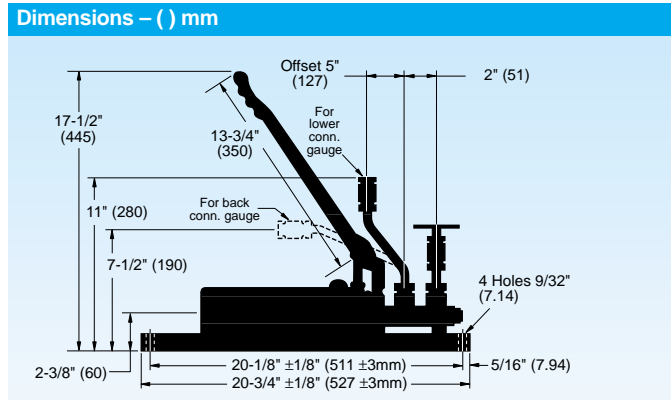


MODEL NUMBER	PISTON ASSEMBLY PRESSURE RANGE		PISTON VALUE		NUMBER OF WEIGHTS BY VALUE					APPROX NET WEIGHT	
	Low	High	Low	High	L-5 H-25	L-10 H-50	L-20 H-100	L-40 H-200	L-100 H-500	lbs.	kg.
<b>psi Type</b>											
1305D-10	15/200	75/1000	5	25	1	3	2	3	–	60	27
1305D-20	15/400	75/2000	5	25	1	3	2	3	2	70	32
1305D-30	15/600	75/3000	5	25	1	3	2	3	4	85	39
1305D-50	15/1000	75/5000	5	25	1	3	2	3	8	105	48
1305D-100	15/2000	75/10,000	5	25	1	3	2	3	18	175	80
<b>kg/cm<sup>2</sup> Type</b>					L-.5 H-2.5	L-1 H-5	L-2 H-10	L-4 H-20	L-5 H-25	lbs.	kg.
1305DM-20	1/20	–	.5	2.5	1	1	2	1	2	63	29
1305DM-100	1/20	5/100	.5	2.5	1	1	2	1	2	65	30
1305DM-150	1/30	5/150	.5	2.5	1	1	2	1	4	75	34
1305DM-350	1/70	5/350	.5	2.5	1	1	2	1	12	105	48
1305DM-700	1/140	5/700	.5	2.5	2	1	2	1	26	175	80
<b>bar Type</b>					L-.5 H-2.5	L-1 H-5	L-2 H-10	L-4 H-20	L-5 H-25	lbs.	kg.
1305DB-20	1/20	–	.5	2.5	1	1	2	1	2	63	29
1305DB-100	1/20	5/100	.5	2.5	1	1	2	1	2	65	30
1305DB-150	1/30	5/150	.5	2.5	1	1	2	1	4	75	34
1305DB-350	1/70	5/350	.5	2.5	1	1	2	1	12	105	48
1305DB-700	1/140	5/700	.5	2.5	2	1	2	1	26	175	80
<b>kPa Type</b>					L-50 H-250	L-100 H-500	L-200 H-1000	L-400 H-2000	L-500 H-2500	lbs.	kg.
1305DA-2000	100/2000	–	50	250	1	1	2	1	2	63	29
1305DA-10000	100/2000	500/2000	50	250	1	1	2	1	2	65	30
1305DA-15000	100/3000	500/15,000	50	250	1	1	2	1	4	75	34
1305DA-35000	100/7000	500/35,000	50	250	1	1	2	1	12	105	48
1305DA-70000	100/14,000	500/70,000	50	250	2	1	2	1	26	175	80

Add suffix "H" for hydraulic (phosphate ester or glycol based) fluid applications.

**How to order:**

Select the appropriate model number based on full scale range and unit of measure requirements. For hydraulic fluid service applications, insert the letter "H" after the base model designation. For example, a deadweight tester capable of 700 kg/cm<sup>2</sup> for hydraulic fluid service would be designated 1305DMH-700.



# A Fast Convenient Comparator...

## Model 1327D Pressure Gauge Comparator

Many calibration applications require only a quick comparison to a master gauge, without the need for a primary deadweight standard. In these applications the Ashcroft 1327D offers the ideal combination of a reliable pressure source and a proven secondary standard.

The 1327D utilizes the same pump, tools, box and accessories that are used in the 1305D deadweight tester. However, instead of weights and pistons, the 1327D employs from 1 to 4 Ashcroft model 1082 test gauges as comparison masters. These gauges have a dial size of 4½ inches and are accurate to 0.25% of span in compliance with the requirements of ASME (formerly ANSI) B40.1, grade 3A. The Ashcroft 1082 Test Gauge makes the 1327D the perfect choice for the calibration of 1% F.S. industrial service gauges where a 4:1 accuracy ratio must be maintained.

Like the 1305D, the 1327D is available in versions to accommodate either petroleum based oils or glycol and phosphate ester based "hydraulic fluids". In addition, the 1327D can be configured to operate with distilled water for the calibration of oxygen service gauges.

Lightweight and fully portable, the 1327D offers maximum utility in one simple, compact and complete test set.

### How to order:

Select the appropriate number based on full scale range and unit of measure requirements. For hydraulic fluid service applications, insert the letter "H" after the base model designation. For oxygen (distilled water) service, insert the letter "O". For example, a comparator for use up to 10,000 psi for distilled water service would be designated 1327DGO-100.

### SPECIFICATIONS – 1327D

#### Accuracy:

0.25% of gauge span

#### Gauges:

Ashcroft Model 1082(XAZ), 4½", ASME B40.1, Grade 3A, temperature compensated.  
Bourdon tube materials – Bronze, 316SS or "K" Monel (depending on range)  
Gauge ranges – (see table)

#### Operating Pressure:

0 to 10,000 psi maximum (0 to 70,000 kPa)

#### Reservoir Volume:

Approximately 1.5 pints (0.7 liter)

#### Pump Body Material:

Aluminum alloy

#### Operating Fluid:

1327D – SAE 20 automotive or machine oil  
1327DH – Phosphate or glycol base hydraulic fluids  
1327DO – Distilled water (with sodium molybdate and phosphoric acid additives recommended as corrosion inhibitors)

### O-Ring Seals:

Standard (1327D and 1327DO) – Buna-N  
Optional (1327DH) – Ethylene Propylene

### Accessories:

Metal carrying and storage box  
Lower connection offset pipe assembly  
Back connection pipe  
Gauge pipe extension assembly  
¼ & ½ NPT Female adapters  
Wrench (1" x 1½")  
Wrench (¾" x 1")  
Wrench (¾")  
Pointer puller set  
Installation and Operation Manual  
Spare O-ring kit

### Certification:

Standard – No documentation provided  
Optional – NIST traceability document provided for each gauge only upon request of "CD-4" certification documents.

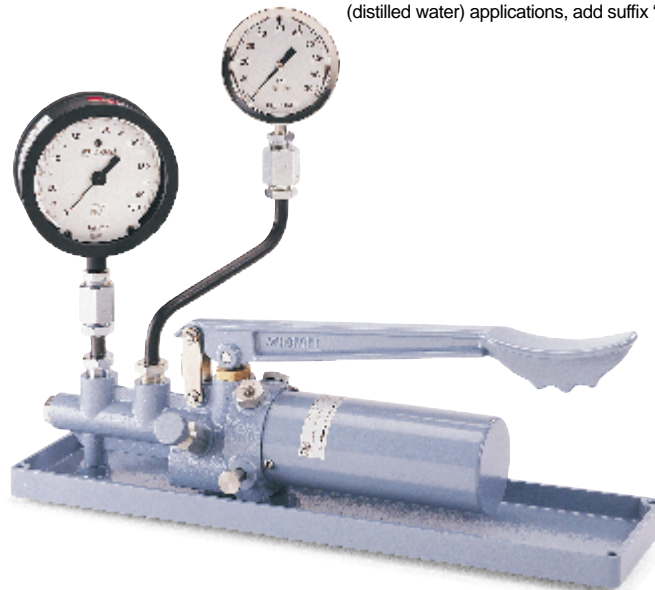
### Carrying Case Dimensions

10 x 10 x 22 (inches)

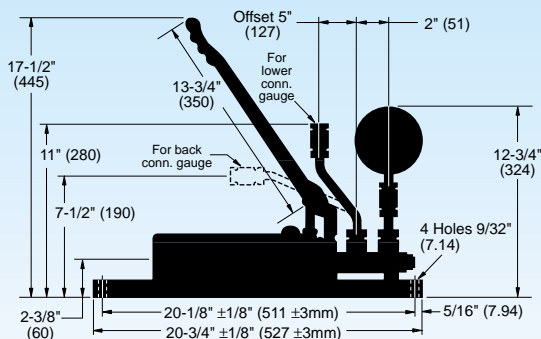


UNIT OF MEASURE	MODEL NUMBER	GAUGE RANGES INCLUDED				NET WEIGHT	
		lbs.	kg.				
psig	1327DG-2	0/150	-	-	-	36	16
	1327DG-6	0/150	0/600	-	-	38	17
	1327DG-50	0/150	0/600	0/5000	-	40	18
	1327DG-100	0/150	0/600	0/5000	0/10,000	42	19
kg/cm²	1327DMG-10	0/10	-	-	-	36	16
	1327DMG-40	0/10	0/40	-	-	38	17
	1327DMG-250	0/10	0/40	0/250	-	40	18
	1327DMG-600	0/10	0/40	0/250	0/600	42	19
bar	1327DBG-10	0/10	-	-	-	36	16
	1327DBG-40	0/10	0/40	-	-	38	17
	1327DBG-250	0/10	0/40	0/250	-	40	18
	1327DBG-600	0/10	0/40	0/250	0/600	42	19
kPa	1327DAG-1000	0/1000	-	-	-	36	16
	1327DAG-4000	0/1000	0/4000	-	-	38	17
	1327DAG-25,000	0/1000	0/4000	0/25,000	-	40	18
	1327DAG-60,000	0/1000	0/4000	0/25,000	0/60,000	42	19

Add suffix "H" for hydraulic (phosphate ester or glycol based) fluid applications. For oxygen service (distilled water) applications, add suffix "O".



### Dimensions – ( ) mm



# A "Precision" Comparator for Demanding Applications...

## Model 1327CM Precision Pressure Gauge Comparator

When greater accuracy is required but the convenience of a comparator is preferred, the 1327CM affords the best of both worlds in one complete set. Similar to the 1327D, the 1327CM provides the same pump, tools and accessories. However, to achieve greater accuracy the Ashcroft  $\frac{1}{4}\%$  Test Gauges are replaced with from 1 to 3 Ashcroft Model A4A precision pressure gauges with a dial size of 6 inches.

Often regarded as the "ultimate master gauge," the Ashcroft A4A precision pressure gauge yields consistent 0.1% of span accuracy in compliance with ASME B40.1, grade 4A. Each gauge is temperature compensated from -25 to +125 degrees F and is provided with a Certificate of Calibration traceable to the NIST.

Since the quality of any calibration is dependent upon the integrity of the comparison standard, high accuracy comparator applications demand the best available master gauge. The 1327CM combines the proven accuracy of the Ashcroft precision pressure gauge with the established reliability of the Ashcroft Test Pump to produce one of the most accurate and versatile portable calibration systems available.

### How to order:

Select the appropriate model number and alpha designations from each column of the product selection chart. For example, a model 1327CM for oil service with two gauges in the ranges 0-30 and 0-500 psi will read: 1327CMS-AC.

### SPECIFICATIONS – 1327CM

#### Accuracy:

0.1% of gauge span

#### Gauges:

Ashcroft Model A4A, 6", ASME B40.1, Grade 4A, temperature compensated  
Bourdon tube material – 403SS or Beryllium Copper (depending on range) Gauge ranges – (see table)

#### Operating Pressure:

0 to 10,000 psi maximum (0 to 70,000 kPa)

#### Reservoir Volume:

Approximately 1.5 pints (0.7 liter)

#### Pump Body Material:

Aluminum alloy

#### Operating Fluid:

1327CMS – SAE 20 automotive or machine oil  
1327CMH – Phosphate or glycol base hydraulic fluids  
1327CMO – Distilled water (with sodium molybdate and phosphoric acid additives recommended as corrosion inhibitors)

### O-Ring Seals:

Standard (1327CMS and 1327CMO) – Buna-N  
Optional (1327CMH) – Ethylene Propylene

### Accessories:

Metal carrying and storage box  
Lower connection offset pipe assembly  
Back connection pipe  
Gauge pipe extension assembly  
 $\frac{1}{4}$  &  $\frac{1}{2}$  NPT Female adapters  
Wrench (1" x  $1\frac{1}{2}$ ")  
Wrench ( $\frac{7}{8}$ " x 1")  
Wrench ( $\frac{5}{8}$ " )  
Pointer puller set  
Installation and Operation Manual  
Spare O-ring kit

### Certification:

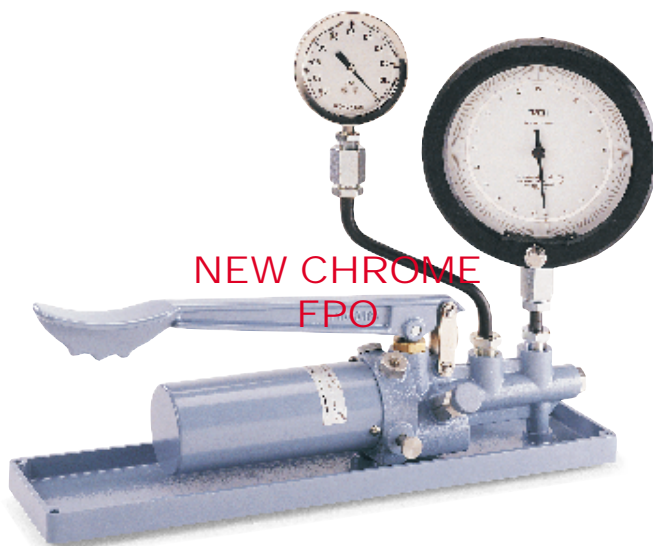
Standard – NIST traceability document provided for each gauge

### Carrying Case Dimensions

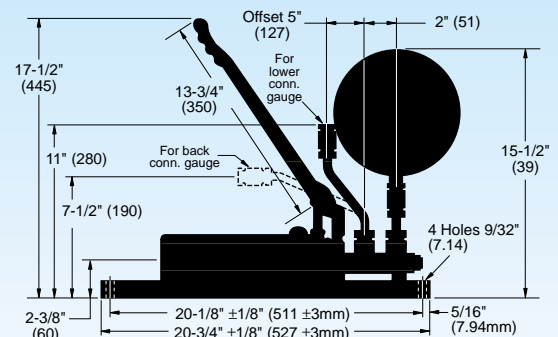
10 x  $10\frac{1}{4}$  x  $22\frac{1}{2}$  (inches)



PRODUCT SELECTION CHART			
MODEL	MEDIA DESIGNATION (choose one)	AVAILABLE RANGES (choose one, two or three)	
1327CM	Standard Oil Services (S) Hydraulic Oil Services (H) Oxygen Service (O)	No Gauges (X)	
		psi 0-30 (A)	
		0-100 (B)	
		0-500 (C)	
		0-1000 (D)	
		0-5000 (E) 0-10,000 (F)	
1327MCM	Standard Oil Services (S) Hydraulic Oil Services (H) Oxygen Service (O)	bar 0-2 (G)	kPa 0-200 (N)
		0-10 (H)	0-1000 (P)
		0-30 (J)	0-3000 (R)
		0-100 (K)	MPa 0-10 (S)
		0-250 (L)	0-25 (T)
		0-600 (M)	0-60 (U)



### Dimensions – ( ) mm



# For "Pinpoint" Setting of Pneumatic Pressures...

## Model AVC Precision Pressure Volume Controller

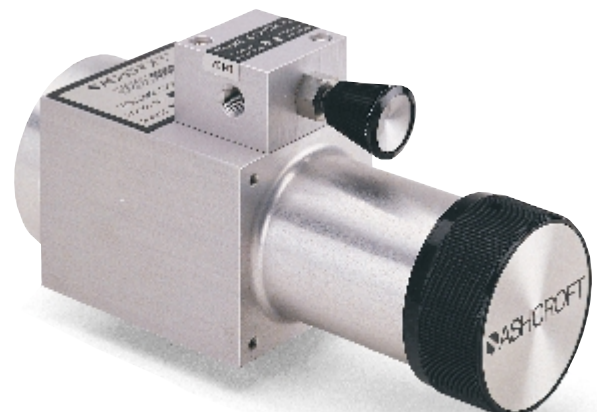
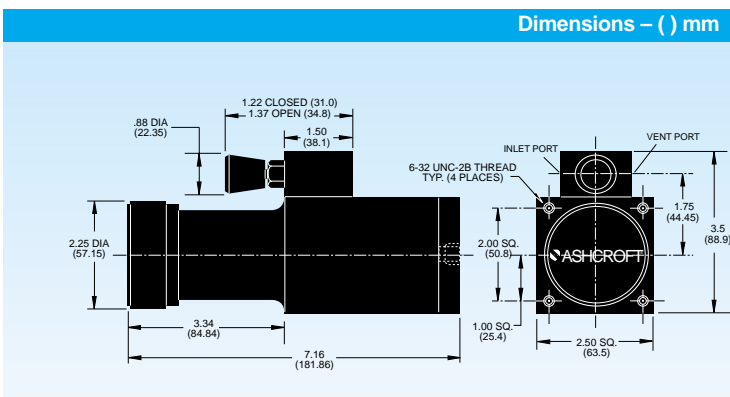
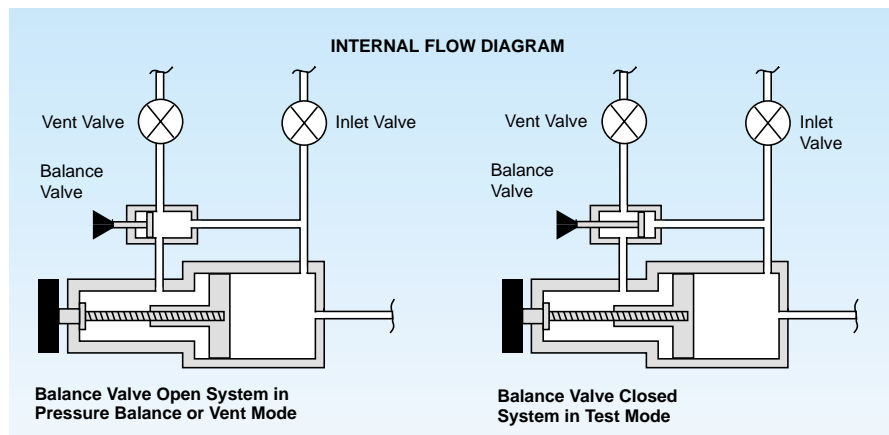
The Ashcroft Pressure Volume Controller is a manually operated device which provides a simple and accurate method for setting specific pressures within a closed pneumatic system. Used with an external pressure source, AVC models are available to set pressures from vacuum through 3000 psi. When used in a small volume system, the AVC is also capable of moderate vacuum or pressure generation without an external source.

The AVC consists of a pressure chamber, adjustable piston and a two position "balance valve". The theory of operation is simple; the pressure chamber becomes a part of the total volume of the closed pneumatic system. By rotating the external knob, the piston is driven in or out of the pressure chamber to either increase or decrease the volume of the chamber. Since the system is closed, changes in this volume will result in corresponding changes in the pressure within the system. The total change in pressure resulting from one rotation of the knob is a function of the ratio of the volume of the AVC pressure chamber and the total volume of the closed system.

The balance valve allows the user to equalize the pressure on both sides of the piston prior to setting the desired pressure. This minimizes the resistance caused by the potential pressure differential across the piston. In addition, the balance valve serves as a relief valve assuring that the internal differential pressure does not reach unsafe levels. The Ashcroft Volume Controller has been engineered to provide superior performance, safety and dependability. It is ideal for any pneumatic test stand application, offering an easy means to quickly and precisely control and set pneumatic pressure.

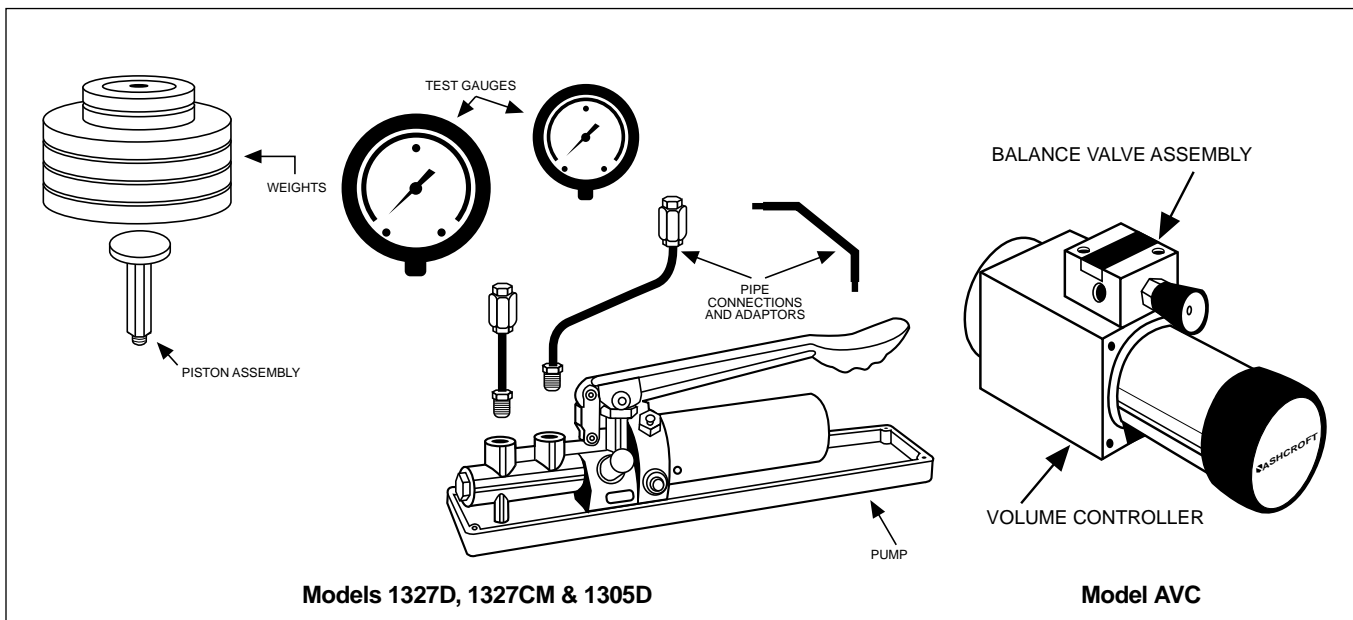
### SPECIFICATIONS – AVC

MODEL	AVC-1000	AVC-3000
Range (psi)	Vacuum-1000	Vacuum-3000
Proof (psi)	2000	6000
Burst (psi)	6000 min.	12000 min.
Resolution (psi)	0.00025	0.0005
Volume Change	3.5 (cu. in.)	2.5 (cu. in.)
Mechanical Rotation (total turns)	31	61
Connection	1/8 NPT Female	1/8 NPT Female
Operating Temp. Range	20-120°F	20-120°F
Construction	Aluminium body, Stainless Steel, Brass, Teflon, Delrin and Buna-N	
To Order	Please specify model number, panel or optional bench mounting.	



## Product Selection Information...

For Ashcroft® Test Equipment



**Warning:** Pressure gauge test equipment should be selected considering media, ambient operating conditions and maximum operating pressure. Weights, piston assemblies and test gauges should be periodically checked for compliance to the appropriate accuracy specifications. Improper application or failure to observe the following guidelines could be detrimental to the products identified in this bulletin and result in product failure, possibly causing personal injury or property damage. The information contained in this catalog is offered as a guide to assist in making the proper selection of a pressure test or control device. Additional information is available from the Dresser Instrument Division.

**Pressure Ranges** – Deadweight pistons, test gauges and volume controllers should be selected so that the maximum applied pressure will never exceed the full scale rating. Failure to do so may result in product malfunction or failure.

**Operating Conditions** – The operating conditions to which pressure gauge testing devices are subjected must be considered. Extremes in ambient temperature or vibration can affect the accuracy of a gauge or deadweight piston assembly. Temperature extremes can also affect fluid or lubricant viscosities resulting in malfunction of the pressure pump.

**Handling** – Test equipment should be handled with extreme care. Mishandling

of weights, piston assemblies, test gauges, pumps or volume controllers could cause damage to these devices resulting in loss of accuracy, malfunction or failure.

**Test Pump** – The Ashcroft test pump is intended for use only with the accessories provided. Overfilling or extending the fluid capacity in any way could result in failure of the pump. Selection of operating fluids should be based on the compatibility of the fluid with the wetted materials, including the pump seals. Information regarding compatibility can be obtained from Ashcroft Manual No. 250-1526C or by consulting the factory. This pump is intended for use only up to 10,000 psig. Pumps and accessories intended for use with oxygen service gauges should be operated with a medium of clean distilled water and should be maintained free of oil. Failure to observe proper fluid capacity, use of compatible fluids or to operate the pump within the specified pressure limitations could result in malfunction or failure.

**Gauges** – Test gauges should be selected so that the maximum applied pressure will never exceed the full scale rating. Consult ASME B40.1 for more information regarding pressure gauge application. Overpressure of any pressure gauge could cause damage to the movement and sensing element (Bourdon tube) and result in loss of accuracy and

gauge failure. Gauge movements should not be adjusted or tampered with in any way unless performed by a qualified calibration technician with proper calibration standards. Ashcroft and Heise movements should be kept clean and should never be lubricated. Gauges intended for use in oxygen service applications should be cleaned free of oil and tested with clean distilled water solutions only. Failure to observe these guidelines could cause loss of accuracy or gauge failure. For more information regarding Heise and Ashcroft test gauges consult Ashcroft Bulletins TG-2 and A4A.

**Weights and Piston Assemblies** – Loss of material (mass) from pistons or weights could cause loss of accuracy. Wearing of piston and cylinder dynamic surfaces or damage to the piston could cause loss of accuracy or malfunction. Extreme care should be taken when handling these components.

**Volume Controller** – The Ashcroft Volume Controller is intended for use only with clean dry non-corrosive gases which are compatible with the wetted materials. Do not exceed the operating pressure limit of the volume controller. Failure to properly install and operate this device could result in malfunction or failure. Consult Form 250-2974 for installation and operating instructions.

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www.dresser.com/instruments](http://www.dresser.com/instruments)

The Instrument Division is represented in other locations by factory trained distributors and representatives. Please contact Domestic and International Headquarters for your nearest representative. All product specifications subject to change without notice.



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