



Certified to ISO 9001

**CIRCLE SEAL CONTROLS, INC.**



# Gauges of uncompromising quality



The name Circle Seal Controls has been synonymous with the word quality for over 50 years. During these years, engineering has been challenged to develop many sophisticated designs and provide unique solutions to a variety of aerospace/military applications.

Naturally, when Circle Seal had the opportunity to acquire the recognized Helical Bourdon Coil technology and offer a new and exceptional line of pressure gauges, they sized the opportunity. These gauges, first used in aerospace/military applications, offer some attractive benefits to industrial users in addition to the present commercial aviation, ships, land vehicles, missile and artillery uses.

The nature of the gauge design and the material used results in a phenomenal operating accuracy over an entire range of 0 to 15,000 psi. Other features which distinguish Circle Seal gauges are the following:

## **Quality:**

Each gauge is designed, assembled, and adjusted to meet the customer's specifications under rigid quality control standards.

## **Dependability:**

The Helical Bourdon coil is the only moving part, which greatly reduces the possibility of component failure.

## **Accuracy:**

Normally in the  $\pm 2-4\%$  range. Greater accuracy possible.

## **Maintenance Free:**

The gauge is designed to operate accurately without periodic adjustment or other normal maintenance.

## **Shock/Vibration Proof:**

Design construction (no linkages, gears, return springs) improves the ability of the gauge to withstand vibration and shock over extended periods of usage ■

## Helical Bourdon coil



A side view of Circle Seal Controls Multi-Layer Helical Coil enclosed in a standard restrictor sleeve.

The Circle Seal pressure gauges are designed using a multi-turn Helical Bourdon coil as a pressure sensing device. The Helical Bourdon coil has a nominal overpressure factor of  $1\frac{1}{2}$  times pressure range but extremes as high as  $7\frac{1}{2}$  times the attainable.

The reliability of performance of the Helix coil gauge will withstand the most severe environments. The gauge can be furnished in pressure ranges from 0 to 100 psi up to 15,000 psi. The gauge sizes vary from the smallest,  $\frac{3}{4}$  inch O.D., and larger. Pressure port, case and dial configuration can be custom-designed to the customer's specifications.

Some gauges are qualified to take 1500 g acceleration forces, 10 g vibration, 100 g shock, and 100,000 operating cycles.

## Charging valve with gauge



A line of gauges is available with a charging valve as an integral part of the gauge or as a separate attachment. These gauges allow constant read-out for accumulators, reservoirs or tanks, even under the most severe of conditions. When the single unit fill/charge valve with gauge is used, monitoring and filling can be accomplished from a single location. The single unit eliminates

a connection where space is limited. The gauges are available in ranges from 50 psi to 8,000 psi with dials to suit the application.

## Direct dial pressure gauges



The simplicity of design and inherent reliability of the Helix coil gauge makes it especially adaptable to the varied and stringent requirements of aerospace/military applications as well as industrial hydraulic and pneumatic applications.

Pressure ports and dial configurations can be designed to customer specifications. Normal pressure ranges are 0 to full scale. Suppressed scale gauges can be provided where the working pressure is abnormally high and expanded scale is desired for working pressure only. Back lighting can be provided when required.

## Tire fill valve gauges



The fill valve gauge is designed to meet the requirements of the airlines for a gauge that would function as both a fill valve and a tire pressure gauge. It can be mounted on an aircraft wheel without modification to the existing assembly.

Installed in most airlines' widebody aircraft, these gauges allow maintenance personnel to monitor tire pressure quickly and accurately, avoiding tire failure caused by improper inflation.

Although this gauge was designed for specific applications, similar gauges can be designed for systems requiring a combined fill valve/pressure gauge on accumulators and other pneumatic or hydraulic equipment.

### Advantages:

- Continuously monitors tire pressure
- No modification to the wheel assembly required
- Combination gauge and fill valve assembly replaces fill valve in existing wheel port
- Easily readable
- Tire inflation through the fill valve portion of assembly
- Assembly clears all existing aircraft structures when wheel retracted

### Specifications:

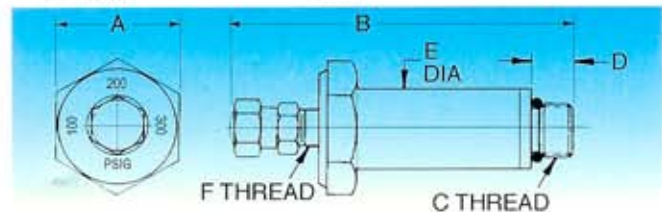
**Operating Temperature Range:** -65°F to +200°F; -54°C to +93°C

**Accuracy:** Individual specification requirements vary as to method of test and limits of accuracy. Check with factory for further information.

**Dial:** Black marking on white background. Color coding optional.

### Materials:

<b>Case and Stem:</b>	Stainless Steel
<b>Helical Bourdon Tube:</b>	Inconel
<b>Dial:</b>	Aluminum Alloy
<b>Crystal:</b>	Acrylic



PART NUMBER	DIMENSIONS (INCHES)						DIAL PRESSURE RANGE (PSIG)	OVER PRESSURE (PSIG)	WGT. OZS.	COMMENTS
	A HEX	B	C	D	E	F				
10-20-1	1.125								3.1	
10-20-2	1.062								2.9	
10-20-3	1.125	2.9	1/2-20	.37	.75	.482	0 to 400	600	3.1	(1)
10-20-4	1.062								2.9	
10-32-A	1.000								3.2	
10-32-B	1.062	2.81	1/2-20	.37	.75	.305	50 to 300	460	3.4	
10-36-2	1.000								1.7	
10-36-3	1.062	2.81	5/16-24	.43	.56	.305	50 to 300	460	1.9	
10-40	1.062	3.33	1/2-20	.37	.75	.482	100 to 300	460	3.5	(2)
10-44	1.125	2.81	1/2-20	.37	.75	.305	100 to 300	460	3.5	(3) No O-ring
10-57	1.125	3.33	1/2-20	.37	.75	.482	100 to 300	460	3.7	(3)
GP10-66	1.062	2.53	1/2-20	.37	.75	.302	50 to 300	460	3.0	(7)
GP10-72	1.000	2.37	1/2-20	.37	.75	.302	0 to 250	375	2.5	(8)
GP10-73	1.000	2.86	5/16-24	.37	.56	.302	100 to 300	460	2.0	(3)

### Notes:

(1) Color coded pressure graduations.

Check with factory for details.

(2) Qualified to McDonnell Douglas Spec. No. BRG 7006.

(3) Qualified to Boeing Co. Spec. No. 60B10055.

(4) All gauges provided with lockwire holes.

(5) All gauges have standard aircraft valve cores and caps.

(6) Wheel Port O-ring supplied unless otherwise noted.

(7) Approved by McDonnell Douglas for DC-9 nosewheel.

(8) For Fokker F-27 and F-28 aircraft.

## Special applications



The Circle Seal Controls Tire Fill Gauge 10-44 is used on the Boeing 767. This gauge is designed to withstand high shock and vibration. The Circle Seal gauge allows immediate pressure checks and minimizes maintenance time.



The Circle Seal Controls 12-59 Strut Gauge used on the F-15 is a combination of two gauges in a 1¼ inch diameter case. The gauges measure strut pressures with the normal fuel loads (100 to 250 psig) or with external fuel loads and/or ordnance (600 to 1200 psig).

The Circle Seal Controls 12-60 Strut Gauge designed for the F-18 Hornet has to be accurate, reliable and rugged. The gauge must withstand pressure spikes up to 750% over pressure (15,000 psig) with no loss of accuracy.

Circle Seal Controls developed Pressure Gauges for use on the aircraft struts and wheels of the U.S. Marine Corps newest VTOL the AV-8B Harrier. These gauges withstand sub-zero temperatures. In addition, these gauges can survive shock and acceleration forces created by flight operations including



vertical takeoffs.

A Circle Seal Controls Back-Lighted Gauge is used on U.S. tanks to monitor the hydraulic pressure in the turret operating system. The operating pressure in the particular applications is 0 to 3000 psi.

The gauges designed for industrial applications use the same quality materials and are basically the same designs as the aerospace/military versions. Larger dial sizes can be provided. The design is uniquely suited where hostile environment and severe service are anticipated and where long life is required.



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