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RUPTURE, PROOF AND OVERPRESSURE OF ASHCROFT BOURDON TUBES

PIP #: ASH-PI-42

Applicable to:
Pressure Gauges

Ashcroft pressure gauges are designed to maintain accuracy and pressure boundary integrity while withstanding vibration, pulsation, and other conditions encountered in the field. Frequently, customers asked for Bourdon tube rupture (burst) pressures, over pressures or proof pressures for specific ranges of Ashcroft® pressure gauges. Rupture or burst pressure should not be confused with over pressure or proof pressure. For that reason, see the ASME B40.100 Bourdon tube ratings definitions below.

ASME B40.100 Bourdon Tube Ratings Definitions

Rupture Pressure/ burst pressure – Is the maximum pressure above which the pressure assembly may no longer hold pressure.

Proof Pressure – Is the maximum pressure a gauge can withstand without evidence of change in accuracy. Proof pressure may be a semi-destructive test and should not be conducted repeatedly on the same gauge. It may be expressed as a pressure or as a percentage of full scale.

Over Pressure – Is the application of pressure beyond full scale.

Proof pressures

- Proof pressure for gauges with 4½" dial size and larger, open or solid front cases. Proof pressures per ASME B40.100(except retard and differential pressure gauges) ranges up to 1000psi have a proof pressure of 130% of span. For pressure ranges above 1000 psi to 15,000 psi, the proof pressure is 110% of span. The proof pressure increases an additional 20% if option XOS overload stop is selected. When an overload stop is specified, ranges up to 1000psi have a proof pressure of 150% of span. For ranges above 1000 psi to 10,000 psi proof pressure is 130% of span. An overload stop is not available for ranges above 10,000 psi. Vacuum stop option XVS is available to prevent disengagement of the segment/pinion gearing when there is a sudden increase in vacuum that may tend to create inertia in the pointer motion, causing it to go beyond the maximum vacuum point.
- Industrial pressure gauges 2½", 3½" 1009S and 63mm 1008S with ranges up to 600 psi have a proof pressure of 125% of span. For ranges above 600psi, the proof pressure is 110% of span.
- 100 mm and larger open or solid front Bourdon tube pressure gauges per EN 837-1: have a proof pressure of 130% of span. When an overload stop is specified, proof pressure is 150% of span.
- Pressure gauges should not operate continuously at the proof pressure limits stated. The maximum continuous pressure a gauge should be subjected to is 75% of the gauge span per ASME B40.100.

Rupture Pressures

Table 1 below outlines the rupture pressures for 2 ½" and 3 ½" dials industrial pressure ranges and table 2 outlines the rupture pressures for process gauges 4 ½" dial and larger pressure gauges.

ashcroft.com
info@ ashcroft.com
1.800.328.8258

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Range (psi)	Rupture Pressure
15	700
30	1800
60	2600
100	2400
160	2000
200	3600
300	4300
400	6500
600	8500
800	18000
1000	18000
1500	19000
2000	19000
3000	20000
4000	20000
5000	21000
6000	21000
7500	25000
10000	25000
15000	29000

Table 1 - Rupture Pressures in PSI Per ASME B40.100 for 2½", 3½" 1009, 63mm and 100mm 1008s Pressure Gauges

Range (psi)	Bronze Tube Brass Socket (A)	316L Tube Steel Socket (R)	316L Tube 316L Socket (S)	K Monel 500 Tube Monel 400 Socket (P)	Inconel 718 Tube 316L Socket (WW)
12	750	1900	1900	450	-
15	800	2000	2000	500	-
30	1300	2050	2050	1600	-
45	1600	2100	2100	3600	-
60	2400	4700	4700	1800	-
75	2500	4800	4800	4100	-
100	2600	4900	4900	4300	-
160	3400	2500	2500	1900	-
200	3900	7500	7500	4500	-
300	4000	8000	8000	7500	-
400	4600	8500	8500	7800	-
600	6000	12000	12000	8000	-
1000	6200	7500	7500	8200	-
1500	-	15000	15000	16500	-
2000	-	17000	17000	17800	-
3000	-	18000	18000	21000	-
4000	-	20000	20000	22000	-
5000	-	22000	22000	23500	-
6000	-	23000	23000	30000	-
10000	-	28000	28000	33000	-
15000	-	30000	30000	35000	-
23000	-	37000	37000	37000	-
30000	-	40000	40000	40000	-
50000	-	-	-	-	135000 Minimum
80000	-	-	-	-	135000 Minimum
100000	-	-	-	-	135000 Minimum

Table 2 - Rupture Pressures in PSI Per ASME B40.100 for 4½" and Larger Pressure Gauges Rupture Pressure

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