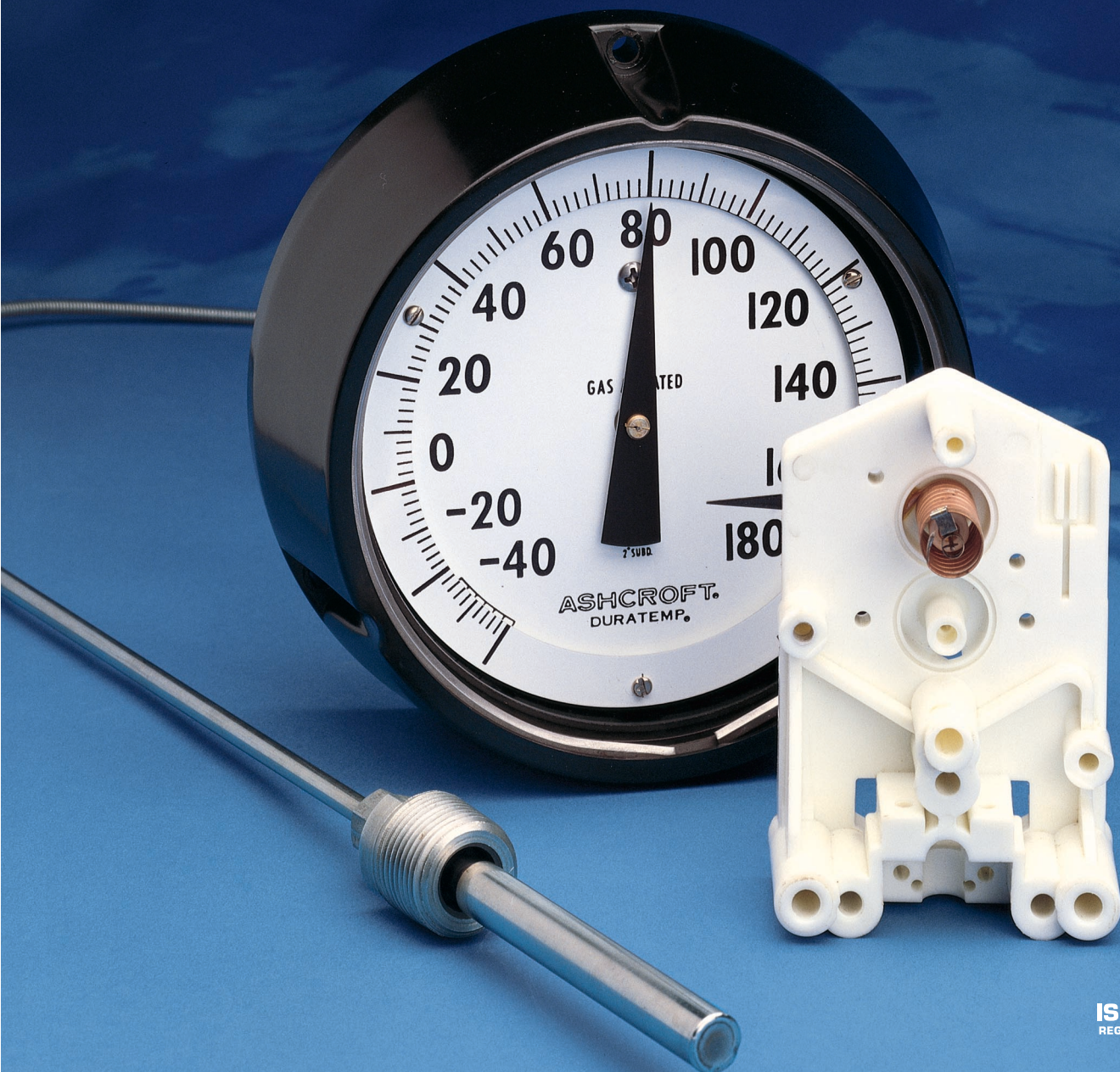


ASHCROFT®

Duratemp® Thermometers



ISO 9001
REGISTERED FIRM

DRESSER

Measurement

BULLETIN DT-1

5 YEAR
WARRANTY

Introduction *Duratemp Thermometers*

The Duratemp® thermometer offers the same outstanding quality and craftsmanship which has characterized all Ashcroft products since the introduction of the Bourdon tube to American industry in 1852.

Uncompromising standards have been established for materials and workmanship. The finished product assures the user of superior durability and dependability.

All Duratemp thermometers use and actuation concept unique to the field of temperature measurement, called a "molecular sieve." This design represents a technical advancement over conventional gas and mercury thermometers.

Research and development of a molecular sieve thermometer began in 1964 when the US Navy asked thermometer manufacturers to develop a remote thermometer that was both linear and mercury free. In 1970 Dresser received Navy approval on the molecular sieve thermometer and for over a decade was the only manufacturer to comply with the Navy's rugged requirements. Today's Duratemp is a direct offshoot of the Navy thermometer, and incorporates in its design all the features found in the original Navy design.

The superiority of a Duratemp thermometer is revealed by comparison to conventional thermometry. Conventional gas thermometers operate on the principle that the absolute

pressure is proportional to the absolute temperature. To obtain a usable temperature span, elevated working pressures must be used which frequently produce high stresses in the Bourdon tube. These high stresses reduce instrument life and may be hazardous.

The Duratemp thermometer on the other hand utilizes a combination of inert gas and activated carbon called a molecular sieve. This combination produces much lower internal pressures than conventional thermometers for the same temperature span. These lower pressures are transmitted to a compact helical Bourdon tube. The Bourdon tube connects directly to the pointer shaft thus eliminating the traditional movement assembly.

With this advantage the Duratemp thermometer is able to provide long life and sustained accuracy under the most adverse shock and vibration conditions.

The molecular sieve concept, utilized by Dresser in its Duratemp thermometer, offers a host of features, functions and benefits that make it superior to any conventional mechanical thermometer on the market today.

Duratemp thermometers are available through our extensive distributor network and our manufacturing plant in Stratford, CT.

Ashcroft Duratemp Thermometers – Best Total Value!

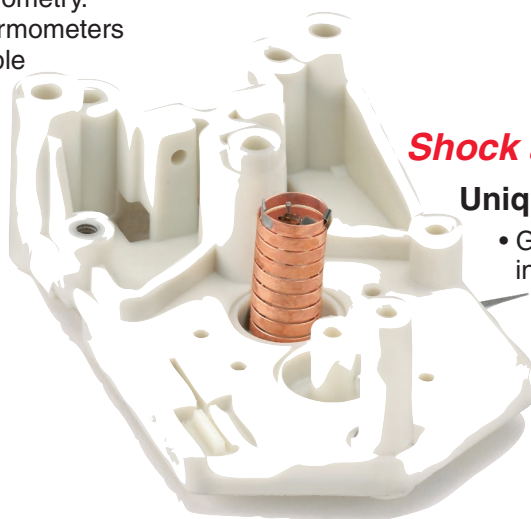
Mercury Free

Gas Filled

- NIOSH and OSHA compliance for mercury contamination hazards. Protects personnel and processes from accidental contamination.

No Head or Elevation Error

- Accurate readings are ensured even if the bulb is mounted above or below the case.



Shock and Vibration Resistance

Unique Direct Drive Bourdon Tube

- Gear and pinion movements are eliminated, resulting in increased instrument life and reduced replacement costs.
- Silicone damped Bourdon tube eliminates damage from shock and vibration.



Duratemp Product Specifications

Accuracy:

$\pm 1\%$ of range span.

Bulb Size:

3" long by $\frac{3}{8}$ " O.D. bulb.

Bulb Material:

316SS

Ambient Error:

Ambient error is a function of line length, ambient temperature and other system parameters. The error at mid-scale will be $\pm 1\frac{1}{2}\%$ of range span for a $\pm 25^\circ\text{F}$ change in ambient temperature, for a typical thermometer. Consult factory for details.

Vibration and Shock Resistance:

Extreme resistance similar to that required by MIL-T-19646.

Actuation:

Gas/activated carbon. Pointer driven directly by lightweight helical Bourdon tube which is silicone damped.

Field Zero Adjustment:

Adjustable pointer.

Over-range:

Minimum 25% of span beyond top of range. If greater over-range is anticipated, consult Stratford Customer Service.

Head Error:

None. No correction required for any mounting configuration.

Capillary Material:

300 series stainless steel.

Line Length:

5-80 ft in standard increments.

Armor:

AISI 302 Spring Armor as standard.

Dial Sizes:

Maxivision® anti-parallax two piece dial design $4\frac{1}{2}$ " and 6" sizes – Celsius or Fahrenheit. Single plane design for all dual scales and $8\frac{1}{2}$ " size.

Ranges:

Standard Fahrenheit ranges available from -320°F to 1200°F . Celsius and dual scale also available.

Cases:

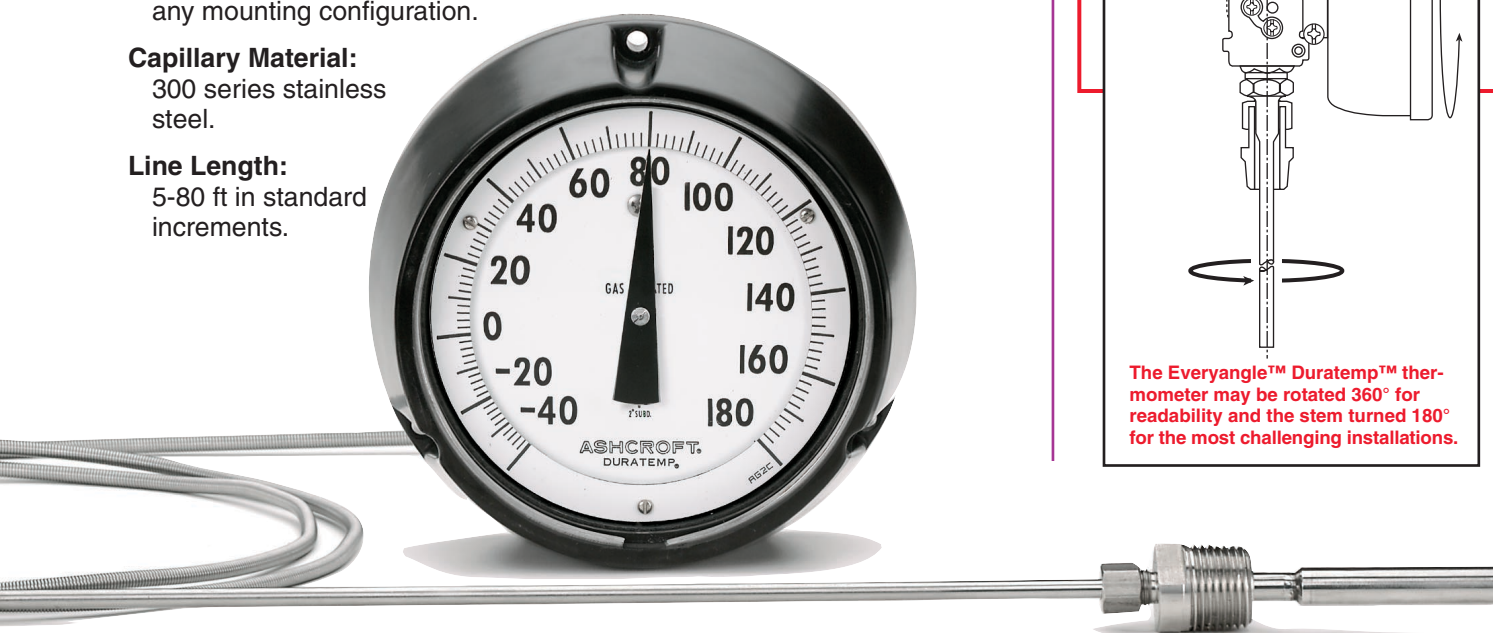
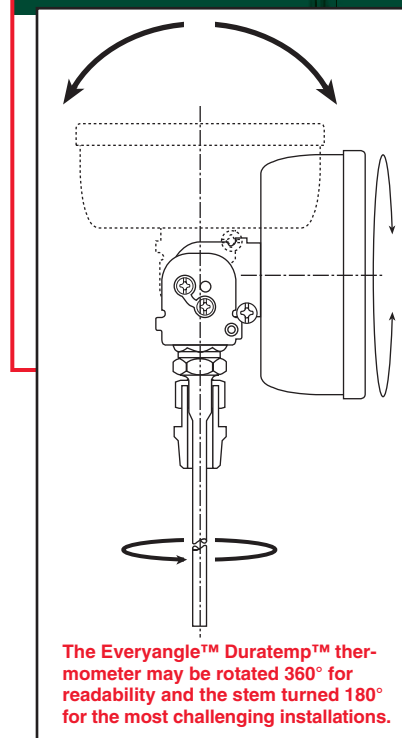
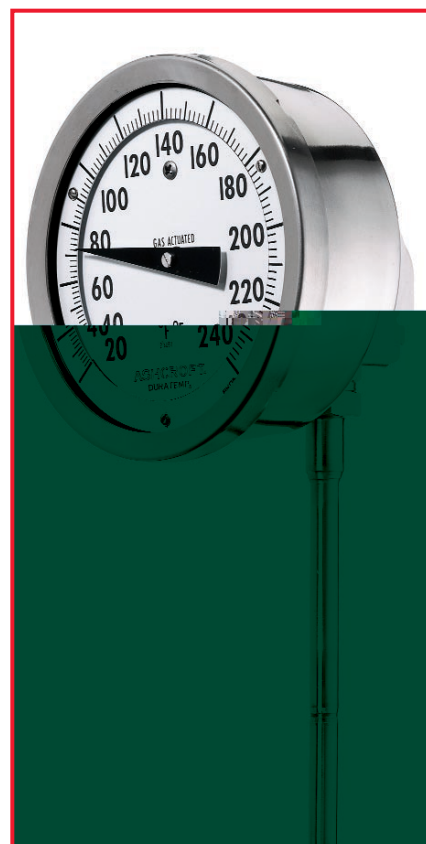
5 basic cases with lower or back connections, surface or flush mounted in stainless steel, phenolic or aluminum. All remote mount cases are field interchangeable, within the same range. Direct mount units available $4\frac{1}{2}$ " stainless steel case only. (Everyangle)

Direct Mount Stem Lengths:

Four standard increment of semi-rigid stainless steel from 6 inches to 15 inches. (Consult factory for longer stem lengths.)

Direct Mount Union:

$\frac{1}{2}$ NPT union connection fixed at the top of the stem.



Case Styles *Remote and Direct Mounted*

600A—Remote Mounted Duratemp

01—Stainless Steel Case—A high-impact resistant polished stainless steel case. A bayonet ring facilitates easy removal for glass replacement and pointer adjustment. A versatile case that enables surface or flush mounting. Available in 4½" size.

02—Aluminum Hinged Ring—An aluminum case with a durable epoxy finish. Designed specifically for panel mounting. A hinged ring permits glass replacement and pointer adjustment. Available in 4½", 6" and 8½" sizes.

03—Aluminum Threaded Ring—A black epoxy coated aluminum case, with excellent impact resistance. Threaded ring permits pointer adjustment. Available in 4½" and 6" sizes.

04—Phenolic, Snap Ring—The phenolic case construction is ideal for most ambient conditions. Flush or surface mounting. Snap ring permits pointer adjustment. Available in 4½", 6" and 8½" sizes.

600H-45—Hermetically Sealed Case—This case is designed for moisture and dust applications. Available in a 4½" solid front phenolic turret case, lower connection.

600B—Stainless Steel Direct Mounted—The direct reading thermometer (stainless steel case only) offers the same unique features of the Duratemp remote reading thermometer for those critical applications where only a direct connected instrument can be used. Available in 4½" dial size, the direct reading thermometer unit features a linear, anti-parallax dial for excellent readability. The thermometer's Everyangle har-

ness allows for a 360° rotation and stem turn of 180°, ensuring readability in any installation. Ideal for low or high temperature service or shock and vibration conditions where a bimetal may not be suitable.



600A-01



600A-02



600A-03



600A-04



600H-45



600B

BULB & ARMOR STYLES *REMOTE MOUNTED*

Styles B01, B17 and B18 are bendable extensions with union connections. B01 (12" bendable extension) is the standard Duratemp bulb style and is suitable for a variety of insertion lengths and lagging requirements. B17 is a 18" bendable extension, B18 is a 24" bendable extension. The union connection on all three styles is pressure tight and can be freely moved the entire length of the bendable portion. After installation, the bendable extension may be formed to suit the application.

Style B03

13" plain bulb for applications used in open tanks where pressures and velocities are negligible.

Style B08

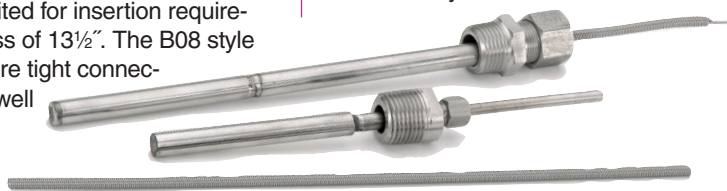
The compression fitting fastens anywhere along the armored line. This bulb style is well suited for insertion requirements in excess of 13½". The B08 style is not a pressure tight connection. A thermowell

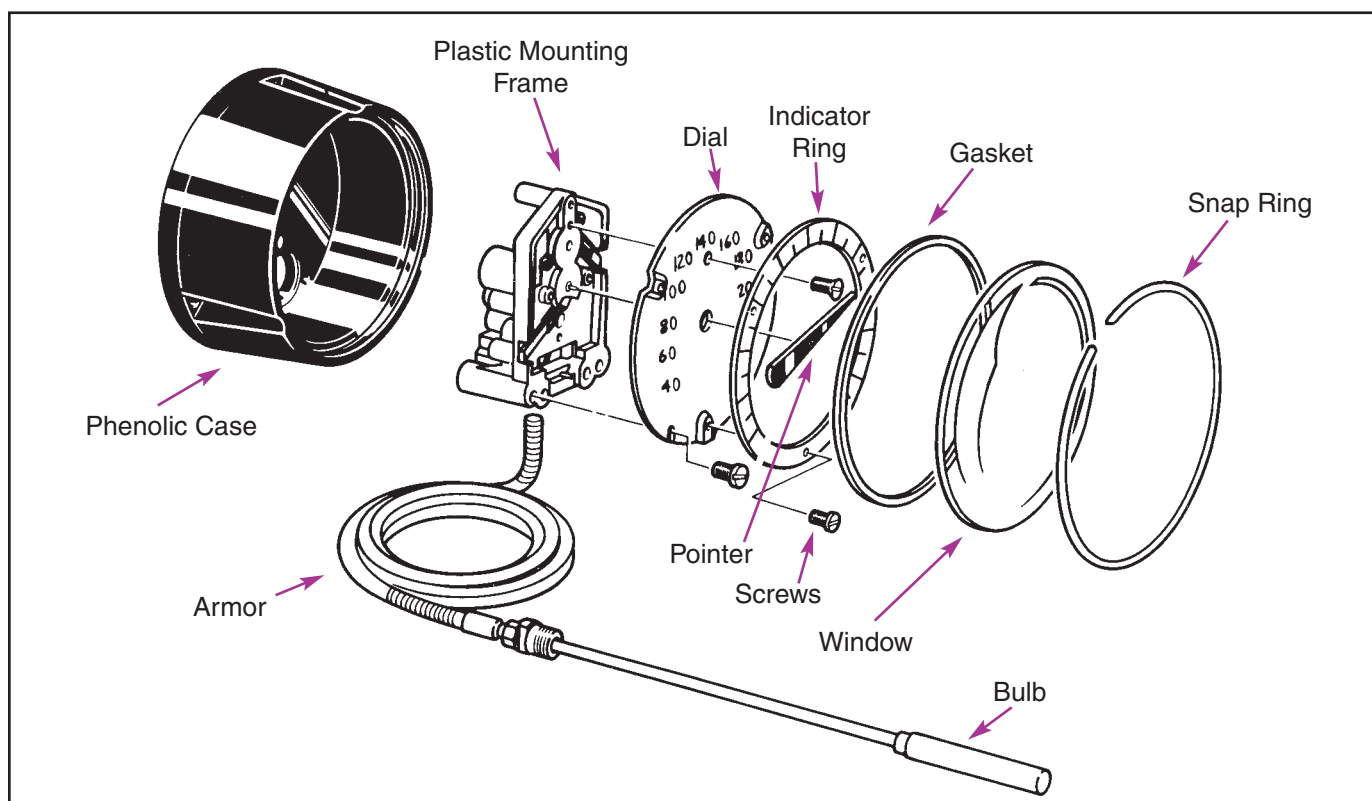
is recommended for this style and for all bulb styles.

ARMOR STYLE

Style A1

AISI 302 stainless steel spring armor is supplied as standard. Originally designed for U.S. Navy Hi Shock thermometers.





Warning

Duratemp thermometers should be selected considering the media and the ambient operating conditions. Improper application can be detrimental to the thermometer, cause failure and possible injury or property damage.

The information contained in this bulletin is offered as a guide in making the proper selection of an industrial thermometer. Additional information is available from Dresser Industries, Instrument Division.

Temperature Ranges

Standard Fahrenheit and Celsius ranges have been established to encompass all normal temperature measurement requirements.

Operating Conditions

The maximum case temperature should not exceed 160°F (71°C). The line should be laid so that it will not be exposed to extreme temperatures such as alongside of steam pipes, ovens or other heated surfaces.

Thermowells

Thermowells must be used on any application where the bulb of the thermometer may be

exposed to pressure, corrosive fluids or high velocity. Additionally, the use of a thermowell permits instrument interchangeability or recalibration without shutting down the process.

Cases

Five case styles and three different materials are offered: aluminum alloy, stainless steel and phenolic. Each is designed with a removable ring.

Bulbs

The bulb is manufactured of AISI 316 stainless steel. The sensing portion for all ranges is $\frac{3}{8}$ " diameter by 3."

Dials

Aluminum dials have highly legible black markings on a white background. The Maxivision dial is a linear anti-parallax dial for excellent readability in the $4\frac{1}{2}$ " and 6" sizes. The divisions and the pointer are in the same plane which allows readability from any angle without parallax error.

Windows

The standard window for the Duratemp thermometer is glass. Shatterproof glass and plastic disc windows are optional.

How To Order

Type				Case Style Size and Mounting							Bulb Styles and Lengths*		
6	0	0	A	-	0	1	-	C	0	1	-	B	0
6	0	0	B	-	-	-	-	-	-	-	-	0	

Type

CODE	DESCRIPTION
600A	Remote Mounted Duratemp Thermometer
600B	Direct Mounted Duratemp Thermometer
600H	Remote Mounted, Hermetically Sealed Duratemp Thermometer

Case Style, Size and Mounting

	CODE	CASE STYLE DESCRIPTION	CASE SIZE		MOUNTING			
			CODE	SIZE	MOUNTING		CONNECTION	
600A	01	St.St. Bayonet Ring	C01	4½	•		•	
			C11	4½		•		•
	02	Aluminum Hinged Ring	C12	4½		•		•
			C27	6		•		•
			C35	8½		•		•
	03	Aluminum Threaded Ring	C02	4½	•		•	
			C07	4½	•			•
			C37	4½		•		•
			C15	6	•		•	
			C21	6	•			•
			C41	6		•		•
	04	Phenolic Snap Ring	C03	4½	•		•	
			C08	4½	•			•
			C38	4½		•		•
			C16	6	•		•	
			C22	6	•			•
			C42	6		•		•
			C31	8½	•		•	
			C33	8½	•			•
			C45	8½		•		•
600B		St.St. Bayonet Ring		4½	•		•	
600H	45	Phenolic Hermetically Sealed	C60	4½	•		•	

*Minimum recommended insertion length in liquids is 4 inches and in gases is 6 inches.

Shorter insertions may result in reading errors.

SPECIAL NOTE:

Lead time is 3 weeks. Shaded model numbers available on expedited delivery 9 working days or less.
Consult factory for details.

Bulb Styles & Lengths*

600A & 600H	
CODE	DESCRIPTION
B01	12" bendable extension with ½ NPT union connection
B03	Plain bulb with rigid extension, no union
B08	Plain bulb with rigid extension, ½ NPT union on armor
B17	18" bendable extension with ½ NPT union connection
B18	24" bendable extension with ½ NPT union connection
600B	
01	Direct mount 6 inches
02	Direct mount 9 inches
03	Direct mount 12 inches
04	Direct mount 15 inches

Armor Style

600A & 600H	
CODE	DESCRIPTION
A1	Stainless steel spring
600B	
Not Available	

Line Length

600A & 600H	
CODE	DESCRIPTION
L01	5'
L03	10'
L07	20'
L09	30'
L13	50'
L19	80'
600B	
Not Applicable	

	Armor Style	Line Length	Ranges	Options
1	A 1	L 0 7	A K	X P D
1	- -	- - -	A K	X P D

Ranges

	CODE	SINGLE RANGES	°/DIV.	FIGURE INTERVAL
ALL MODELS	AB	-320/200°F	5	50
	AE	-100/100°F	2	20
	AG	-40/180°F	2	20
	AK	20/240°F	2	20
	AL	50/300°F	2	50
	AN	50/550°F	5	50
	AR ¹	50/750°F	10	100
	AT ¹	400/1200°F	10	100
	AY	-200/100°C	5	50
	BL	-80/40°C	2	20
	BN	-40/80°C	2	20
	BS	0/120°C	2	20
	BT	10/150°C	2	20
	BU	0/300°C	5	50
	BW	0/400°C	5	50
	BJ	200/650°C	5	50
	DUAL RANGES			
	CE	20/240°F	2	20
		0/120°C	2	20
	CF	50/550°F	5	50
		0/300°C	5	50
	DR	50/300°F	2	50
		10/150°C	2	20
	DT	-40/180°F	2	20
		-40/80°C	1	10

Options

	CODE	DESCRIPTION
600A and 600B*	XDM	Dial markings
	XED	High and low electric contacts closures
	XEE	Double high electric contacts
	XEF	Double low electric contacts
	XEG	Electric contacts off at low and high and on in between
	XEO	Externally adjustable red set hand
	XEP	Externally adjustable maximum pointer
	XEQ	Externally adjustable minimum pointer
	XNG	Non-glare glass
	XNN	Paper tag
	XNH	Stainless steel tag
	XPD	Plastic window
	XSG	Shatterproof glass
	XSH	Stationery red set hand
	XTK	Tank car thermometer

*600B thermometers require a minimum stem length of 9 inches. This removes case from exposure to high temperature which may damage the instrument.

Accessories and Optional Features

Electric Warning Contacts

The Ashcroft 2265 electric contact is an ideal accessory to turn on a signal light, sound an alarm, or operate a pump or valve. The contacts can easily be set so that a circuit can be closed or opened at a desired temperature.

The Ashcroft 2265 electric contact is easily adjusted in the field. The adjustment is made externally, with a removable key to make the unit virtually tamper proof. The contacts are available on the 4½" and 6" – 600A-02, 600A-03 and 600A-04 Duratemp thermometers only.

The contact assembly, which is encased in a special plastic dome, increases the total overall depth of the instrument case approximately 2 inches.

SWITCHING CAPACITY	CONTACT ARRANGEMENTS	
	CODE	SYMBOL DESCRIPTION
380V Maximum Voltage	XED	High and Low Contact
30W dc Maximum Switching Power	XEE	Double High Contact
50VA ac Maximum Switching Power	XEF	Double Low Contact
1A Maximum Current	XEG	"Off" at Low and High, and "On" in Between



Red Set Hand

Code XSH

Used to indicate a specific temperature. Ring must be removed to reset hand.



Thermowells

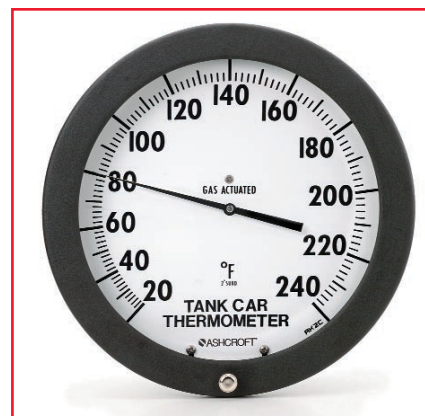
Thermowells must be used whenever an Ashcroft Duratemp thermometer is installed on a pressurized application or where fluid velocity or corrosive media is present.



External Adjustable Set Hand

Code XEO

Indicates a specific temperature. A reset knob is included on the outside of the window.



Tank Car Thermometer

Code XTK

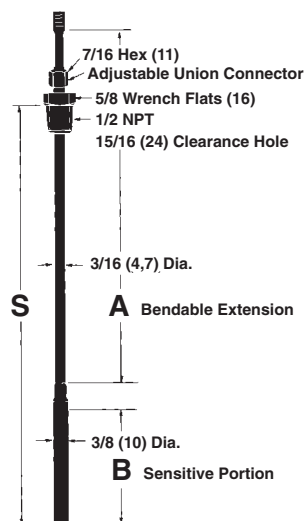
Ashcroft's Duratemp movementless design is well suited for severe vibration and shock applications as seen in railroad tank cars or other rolling stock applications, such as milk, chemical and produce transportation.

The option XTK is available in a 8½" case with a large adjustable pointer and a maximum indicating pointer. The range available is 20/240°F and the dial is marked "Tank Car Thermometer". The maximum indicating pointer illustrates the highest temperature sensed by the thermometer. Case size and pointer size makes the Duratemp easily read from a distance.

Bulb and Armor Dimensions

Style B01, B17 and B18

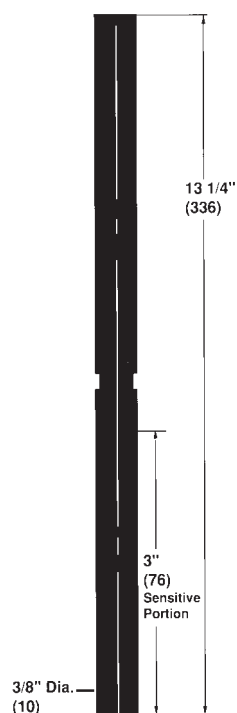
Bendable Extension,
Union Connection



Bulb Code	Bulb Size "B"	"A"	"S" Max.	"S" Min.
B01	3 (76)	12 (305)	15 (381)	4 (102)
B17	3 (76)	18 (457)	21 (533)	4 (102)
B18	3 (76)	24 (610)	27 (686)	4 (102)

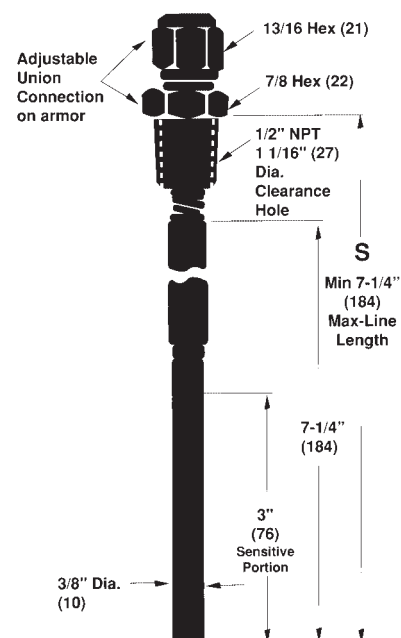
Style B03

Plain

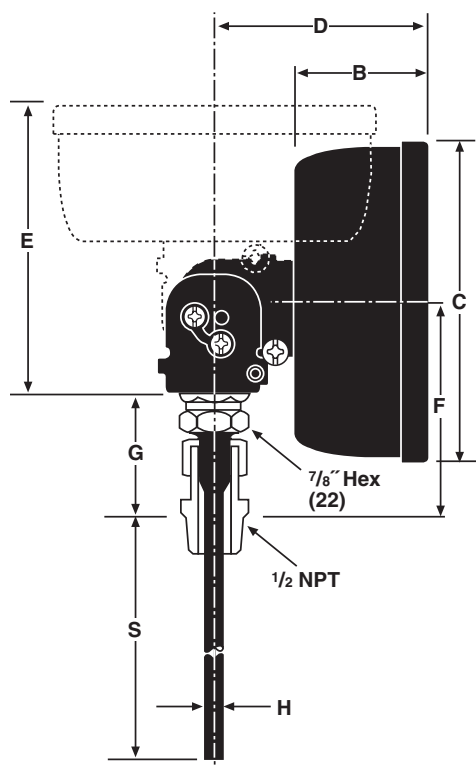


Style B08

Long Extension, Locking Fitting



600B Everyangle



FOR TEMPERATURES BELOW 750°F	
S	U-Dimension (Insertion Length)
6 (152)	4 1/2 (114)
9 (229)	7 1/2 (191)
12 (305)	10 1/2 (268)

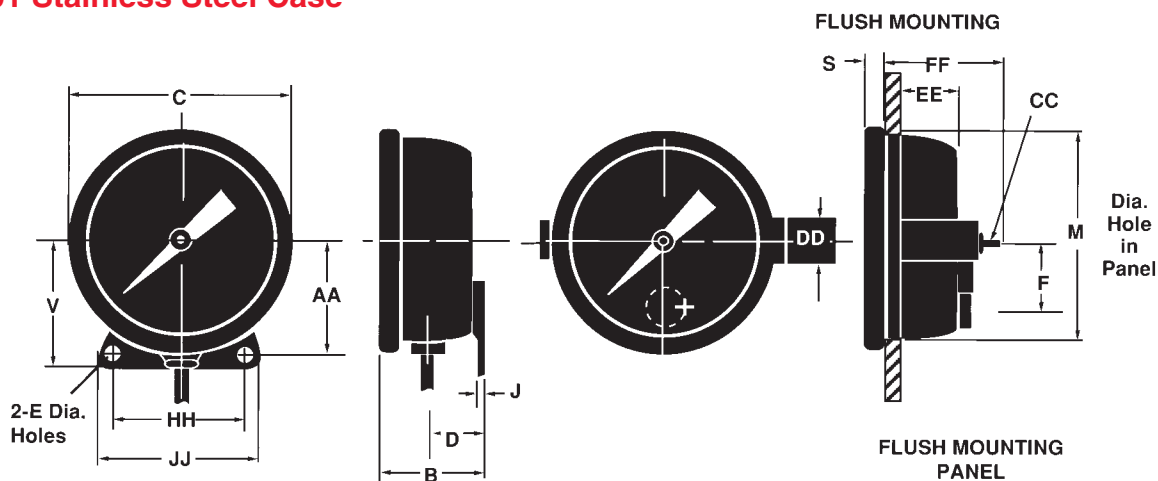
FOR TEMPERATURES 750°F AND ABOVE USE WELL WITH 3" LAG		
S	Well Lag	U-Dimension (Insertion Length)
9 (229)	3	4 1/2 (114)
12 (305)	3	7 1/2 (191)
15 (381)	3	10 1/2 (268)

Dial Size Inches	B	C	D	E	F	G	H
4 1/2	2 1/16 (52)	5 1/32 (128)	3 11/64 (81)	4 13/16 (122)	3 (76)	1 (25)	3/8 (10)

NOTE: Dimensions in inches, () are millimeters.

Case Dimensions

600A-01 Stainless Steel Case



Dial Size Inches	B	C	D	E	F	J	M	S	T	U	V	AA	CC	DD	FF	EE	HH	JJ
4 1/2	2 3/16 (56)	5 1/8 (130)	1 1/16 (27)	7/32 (6)	1 5/8 (141)	1/16 (2)	4 25/32 (121)	7/16 (11)	5/8 (16)	1 7/16 (37)	2 7/8 (73)	2 5/8 (67)	#10-32	1 (25)	2 1/4 (57)	1 5/8 (41)	3 (76)	3 1/2 (89)

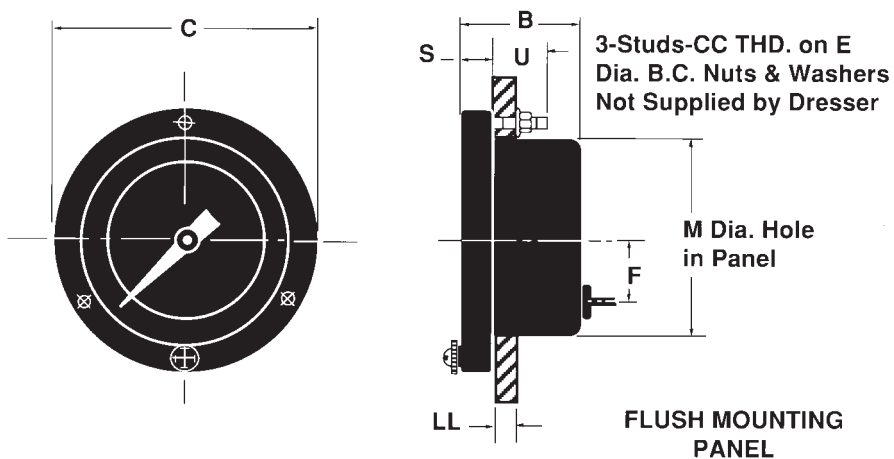
APPROXIMATE WEIGHT (LBS.)

Line Length	Case Size		
	4 1/2"	6"	8 1/2"
5'	1.75	2.55	3.40
10'	2.05	2.85	3.70
20'	2.65	3.45	4.30
30'	3.25	4.05	4.90
50'	4.45	5.25	6.10
80'	6.25	7.05	7.90

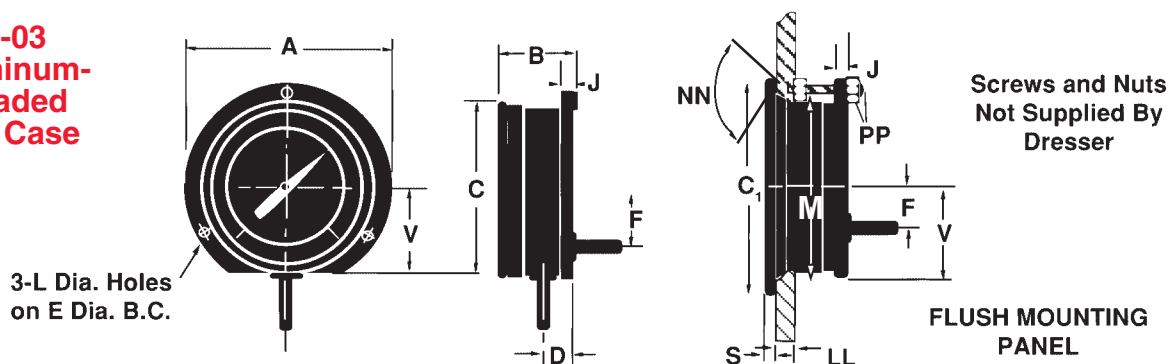
600A-02 Hinged Ring Case

Case Size Inches	B	C	CC	E	M	S	U	LL	F
4 1/2	2 3/16 (56)	6 1/4 (159)	10-24	5 3/8 (137)	4 7/8 (124)	5/8 (16)	3/4 (19)	1/8 1/2 (3) (13)	1 5/8 (41)
6	2 1/4 (57)	7 9/16 (192)	1/4-20	7 (178)	6 1/2 (165)	5/8 (16)	3/4 (19)	1/8 1/2 (3) (13)	2 1/8 (54)
8 1/2	2 1/4 (57)	10 1/16 (256)	1/4-20	9 5/8 (244)	9 (229)	5/8 (16)	3/4 (19)	1/8 1/2 (3) (13)	2 1/8 (54)

NOTE: Dimensions in inches, () are millimeters.



600A-03 Aluminum- Threaded Ring Case



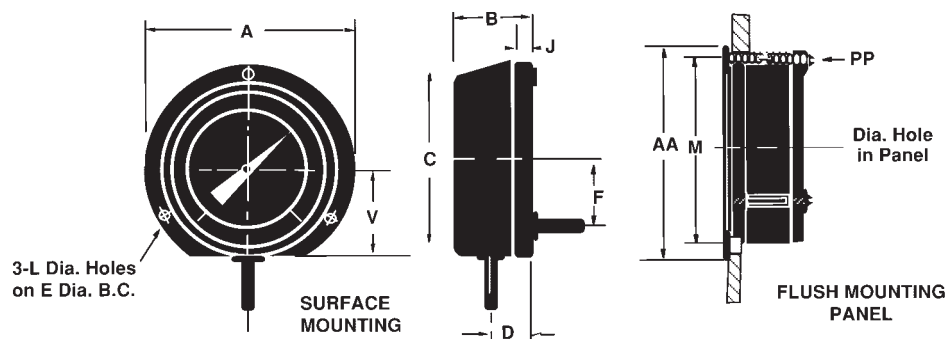
Flanged Ring for Flush Mounting

Case Size Inches	C1	V	B	J	F	M	E	L	LL	S	PP	NN
4½	5⅞ (149)	2⅜ (60)	2¼ (57)	⅜ (10)	1⅝ (41)	4⅛⅙ (125)	5⅜ (137)	7/32 (5,5)	1/16 ½ (2) (13)	3/16 (5)	#10-24	C Sink 7/16 x 82° incl. angle (11) x 82°
6	7⅝ (194)	3⅜ (79)	2¼ (57)	7/16 (11)	2⅝ (54)	67/16 (164)	7 (178)	9/32 (7)	1/16 ½ (2) (13)	3/16 (5)	#10-24	C Sink 9/16 x 82° incl. angle (14) x 82°

Beaded Ring for Surface Mounting

Case Size Inches	A	B	C	D	E	F	J	L	V
4½	5⅛⅙ (148)	2¼ (57)	4⅜⅓⅒ (126)	15/16 (24)	5⅜ (137)	1⅝ (41)	⅜ (10)	7/32 (5,5)	2⅜ (60)
6	7⅝ (194)	2¼ (57)	6½ (165)	15/16 (24)	7 (178)	2⅝ (54)	7/16 (11)	9/32 (7)	3⅜ (79)

600A-04, 600H-45 Phenolic Case



Model	Case Size Inches	A	B	C	D	E	F	J	L	V	AA	M	PP
600A-04	4½	5⅛⅙ (148)	25/16 (59)	51/16 (129)	1 (25)	5⅜ (137)	1⅝ (41)	9/16 (14)	7/32 (5,5)	2⅝ (67)	6 (154)	537/64 (148)	#10-24 x 7/8
	6	7⅝ (194)	2⅜ (60)	65/8 (168)	11/16 (27)	7 (178)	2⅝ (54)	5/8 (16)	9/32 (7)	3½ (89)	7¾ (197)	717/64 (185)	#1¼-20 x 7/8
	8½	10¼ (260)	2⅜ (60)	9 (229)	11/16 (27)	95/8 (244)	2⅝ (54)	5/8 (16)	9/32 (7)	411/16 (119)	107/16 (266)	957/64 (254)	#1¼-20 x 7/8
600H-45	4½	5⅛⅙ (148)	3⅜ (86)	51/16 (129)	1⅝ (41)	5⅜ (137)	—	1 (25)	7/32 (5,5)	2⅝ (67)	6 (154)	537/64 (148)	#10-24 x 7/8

NOTE: Dimensions in inches, () are millimeters.

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