

Catch All You Need



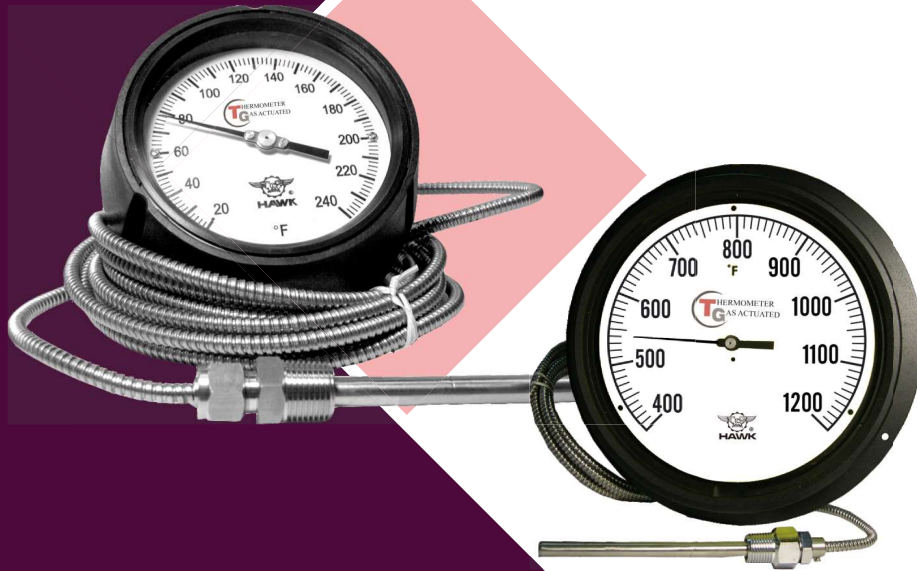
Catch All You Need



Catch All You Need



Gas Actuation



HAWK GAUGE CO., LTD

Tel:+886-2-26792233 Fax:+886-2-26703594
Web: www.hawkgauge.com.tw E-mail: sales@hawkgauge.com.tw

BOURDON TUBE

● Dial Thermometers

Brochure No:
MKBP3B01A1

Introduction

Temperature measurement is a vital part of most industrial operations. The method of using the characteristics of thermal expansion of objects including solid, liquid and air for temperature sensing has long been used by humans. The devices belonging to this category can be roughly divided into three types including bimetal thermometers, bourdon tube dial thermometers and glass tube thermometers.

A constant volume gas thermometer works on the principle of Charles's Law. It is the most commonly used for the type of gas-actuated dial thermometer. It works on a slightly different principle. This type of thermometer is designed like a pressure gauge. It uses the Bourdon tube as the sensing element. If the Bourdon tube is pressurized, it changes its shape. This pressure type thermometer is generally composed of three parts: a temperature-sensing bulb, a capillary and an elastic element. When measuring the temperature

of the medium, insert the temperature-sensing bulb into the medium. It will be affected by the temperature of the medium, and the volume or pressure of the working substance in the temperature-sensing bulb will change, and the capillary will transmit this change to the filling elastic element, resulting in the elastic element is slightly deformed, and the free end produces a corresponding displacement. With the help of the connecting rod, the transmission shaft and the gear amplification mechanism drive the pointer to deflect, and the corresponding temperature value is indicated on the dial. A liquid expansion thermometer as it is known operates much like a gas-actuated thermometer. The difference is that the gas actuation is replaced by the liquid. According to the different working substances used, the pressure thermometers can be divided into three types:

1. The working substance is liquid, which is called a liquid actuated dial thermometer.
2. The working substance is a low-boiling

liquid saturated vapor, which is called a vapor actuated dial thermometer.

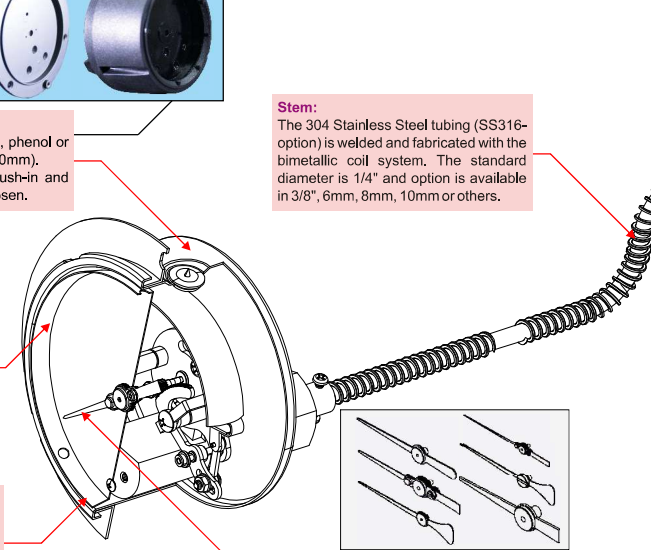
The HAWK bourdon tube dial thermometer is an instrument designed to measure and indicate the temperature of a specific application. This dial thermometer is a filled thermal pressure type system which is composed of an indicator, capillary tube and a thermal sensing bulb. HAWK bourdon tube dial thermometers are available in gas or liquid system actuation fills. The fill is charged within the sealed thermal system and connected to a pressure sensitive device. When the liquid inside the sensing bulb expands or contracts due to temperature change, this change is sensed by a special bourdon tube, and transmitted to the indicator to indicate temperature through a mechanical movement and a pointer.



Case&Ring:
Cases are made from stainless steel, aluminum, phenol or polypropylene, in size from 3" (75mm) to 12" (300mm). Ring styles include bayonet, thread, friction, push-in and hinged ring depending on the case type you chosen.

Window:
The plain glass window with gasket is the standard offer in weather tight condition. A plastic or shatterproof glass (tempered/laminated safety glass) window is available as an option, where breakage is a concern. Plastic window is not recommended to the application where the environment temperature is exceeding 150°F(65°C).

Dial:
The standard dial thermometer is built with a highly legible black markings on a white background aluminum dial to minimize reading errors. The anti-parallax dial for excellent readability is available on request.



Stem:
The 304 Stainless Steel tubing (SS316-option) is welded and fabricated with the bimetallic coil system. The standard diameter is 1/4" and option is available in 3/8", 6mm, 8mm, 10mm or others.

Pointer:
A wide variety of pointer styles and lengths are designed for different size thermometers (3" to 12"). The pointer is lightweight aluminum with black or red finish.

Principle

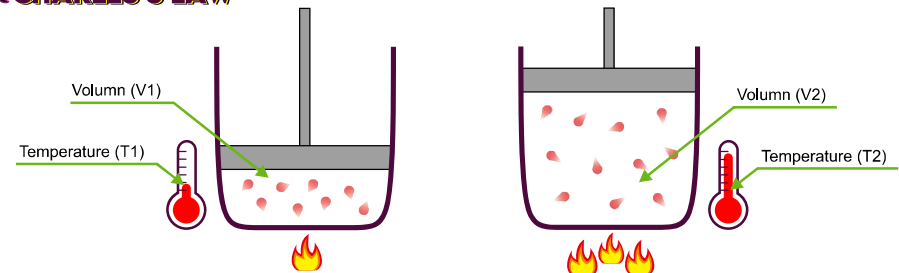


Operating Temperature:
The temperature of the case should not be allowed to be exposed to continuous temperature in excess of 200°F (95°C). Stem and bulb should not be contact with sustained process temperature exceeding 50% over-range or 800°F (425°C). The remote reading dial thermometer is recommend for such applications.

Process Connector:
The process connector is available in different styles including thread, flange, clamp and so on. A wide variety of connector materials and styles are offered including Fixed/Rigid, Swivel Nut, Union, Sliding or Plain type to different applications.

Temperature Range:
The appropriate operating range falls in the middle half of the gauge (25% to 75% of full range). The max operating range should not exceed the 75% of the full range.

CHARLES'S LAW



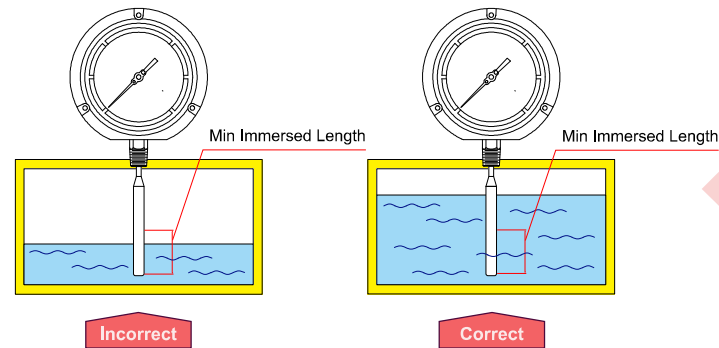
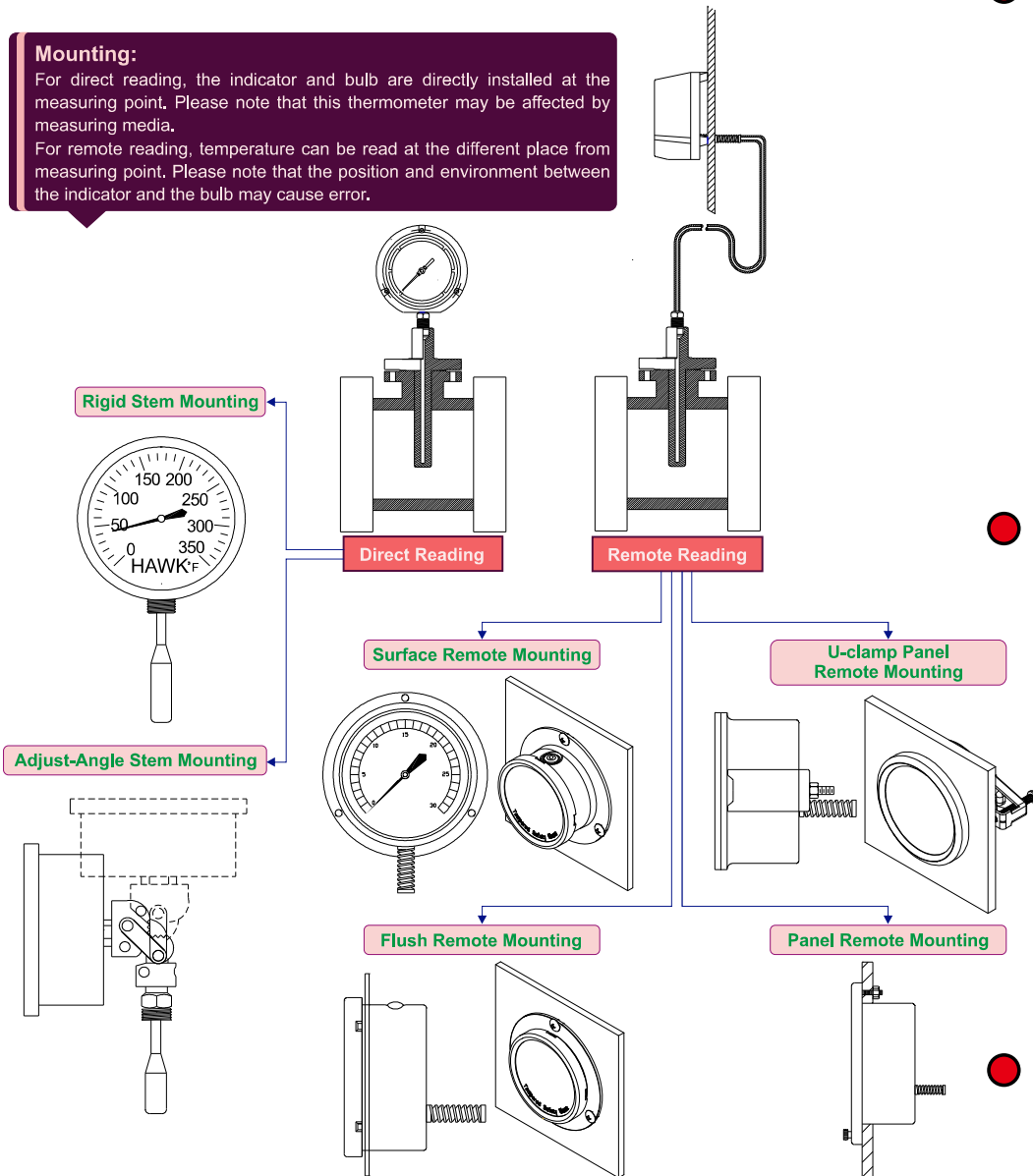
Installation

Guidance

Mounting:

For direct reading, the indicator and bulb are directly installed at the measuring point. Please note that this thermometer may be affected by measuring media.

For remote reading, temperature can be read at the different place from measuring point. Please note that the position and environment between the indicator and the bulb may cause error.



Immersion:

The minimum insertion length is decided by the type, temperature range and bulb diameter. For getting the correct temperature readings, this minimum insertion length must be fully immersed into the medium (2" deep in liquid, and 4" deep in gas except for 0/50°C (32/122°F) which require 3" deep in liquid, and 4" deep in gas). Kindly select a suitable length which is longer than the minimum insertion length in order to keep the performance.

Compensation System:

For the remote measurement, the ambient system parameters are the factors which may lead the reading error between the indicator and measuring point especially for the long distance thermal system. HAWK offer the dual bourdon tubes to make the lead compensation of the reading error. Kindly consult the factory for details.

Bulb:

HAWK bourdon tube dial thermometers are available in several style and material bulbs for the differential applications.

Sliding Type



Swivel Nut Type



Plain Type



Capillary & Armour:

The capillary and armor are in stainless steel to resist the rugged environment for you applications.

Operating Pressure:

Use of a thermowell is recommended when stem or bulb would be exposed to pressure media.

Application

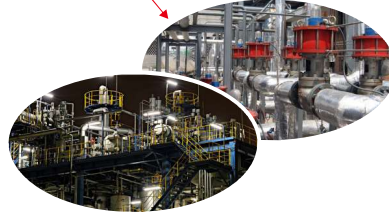
Application

► DA Series - Aluminum Case with Threaded Ring

- A back flange aluminum case with black paint for surface mounting.
- The threaded ring permits to open front to make the pointer adjustment.
- Available in 8", 10" and 12" large sizes.
- Remote measurement with back or bottom connection.



Petrochemical, oil and gas processing



Pulp and paper mills

► DP Series - Phenolic Case with Threaded Ring

- The hermetically sealed 4 1/2" case to resist moisture and dust environment.
- Solid front construction for better safety.
- A threaded ring allows user to open front for the pointer adjustment.
- Remote measurement with back or bottom connection.
- Directly local measurement with rigid or adjust-angle connection.



► DS Series - Stainless Steel Case with Bayonet Ring

- The high-impact resistant stainless steel case and polished ring.
- Available in 3", 3 1/2", 4", 4 1/2" and 6" sizes.
- A bayonet ring facilitates easy removal for glass replacement and pointer adjustment.
- Remote measurement with back or bottom connection.
- Directly local measurement with rigid or adjust-angle connection.
- Flush, panel or surface mounting.



Diary processing

► DB Series - Aluminum Hinged Ring Case

- An aluminum case with the black paint.
- Designed specifically for panel mounting.
- A hinged ring allows user to open front for the pointer adjustment.
- Available in 4 1/2" and 6" sizes.
- Remote measurement with back connection.



Refrigeration and HVAC systems



Food and beverage processing



Marine industries



Waste water treatment



► DF Series - Polypropylene Case with Snap Ring

- The chemical resistance 4 1/2" case to resist the rugged ambient conditions.
- Flush or surface mounting.
- The snap ring allows user to open front for the pointer adjustment.
- Remote measurement with back or bottom connection.
- Directly local measurement with rigid or adjust-angle connection.



Offshore oil platforms

Militaries



► DT Series- Square Stainless Steel Case with Snap Ring

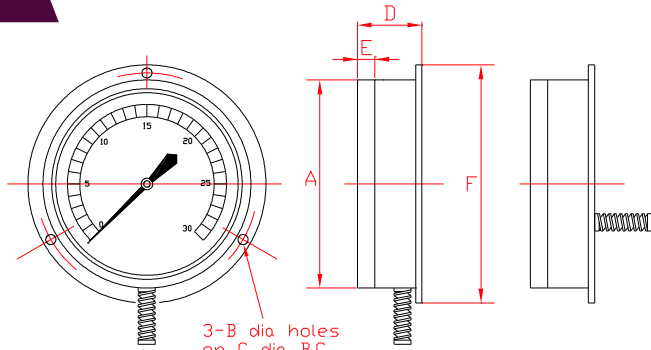
- 48, 57, 72, 96, 120, 144, 160, 192 square stainless steel case.
- The snap ring allows user to open front for the pointer adjustment.
- Remote measurement with u-clamp for flush mounting.



Specification

Dimension

Model DA Series



Size:
8"(200mm), 10"(250mm), 12"(300mm)

Case&Ring:
Aluminum case with back flange.

Mounting:
-DAL...back flange (surface, bottom)
-DAB...back flange (surface, back)

Weatherproof:
NEMA 3 or IP54 enclosure.

Window:
Tempered safety glass.

Dial Face:
Aluminum, white background with black graduations and figures, anti-parallax to minimize the reading error available.

Pointer:
Anodized aluminum with black finish.

Scale:
°C, °F (single or dual scale)

Accuracy:
±1.0% of span (Grade A to ASME B40.3)

Capillary and Armor:
304SS capillary and armor.
(316SS on request)

Connection Style:
-Fixed Rigid Male/Female
-Sliding Compression Male/Female

-Union Rotatable Male/Nut Female
-Swivel nut Male/Female Rotatable
-Plain

Connection Size:
1/2", 3/8", 1/4"NPT standard, JIS, DIN, M14*1.0, M20*1.5 and others available.

Thermal Bulb:
304 Stainless Steel, 10mm diameter-Standard, 3/8" or others dia available.

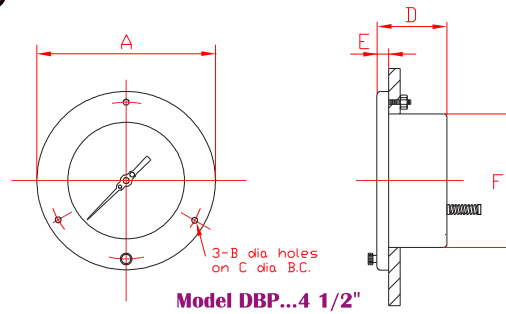
Bulb Length:
2 1/2", 4", 6", 9", 12", 15", 18", 24" standard lengths, available in stem lengths up to 72" long.

Sensing Element:
Bourdon Tube.

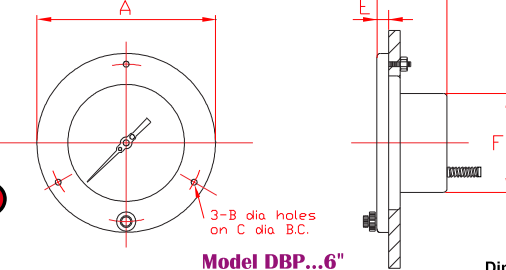
External Adjustment:
Micro-Adjustable Pointer on request.

Dimensions, in.(mm)

Dial Size	A	B	C	D	E	F
8"(200mm)	7.874" (200mm)	0.217" (5.5mm)	8.661" (220mm)	1.398" (35.5mm)	0.512" (13mm)	9.133" (232mm)
10"(250mm)	9.843" (250mm)	0.217" (5.5mm)	10.55" (268mm)	1.398" (35.5mm)	0.512" (13mm)	11.26" (286mm)
12"(300mm)	11.81" (300mm)	0.217" (5.5mm)	12.72" (323mm)	1.398" (35.5mm)	0.512" (13mm)	13.39" (340mm)



Model DBP...4 1/2"



Model DBP...6"

Dimensions, in.(mm)

Dial Size	A	B	C	D	E	F
4 1/2"(115mm)	6.181" (157mm)	0.236" (6mm)	5.354" (136mm)	2.283" (58mm)	0.512" (13mm)	4.764" (121mm)
6"(150mm)	7.563" (192mm)	1/4"- 20UNC	7.008" (178mm)	2.756" (70mm)	0.669" (17mm)	4.764" (121mm)

Size:
4 1/2"(115mm) or 6"(150mm)

Case&Ring:
Hinged front aluminum case and ring.

Mounting:
DBP...Hinged Ring (flush panel, back)

Weatherproof:
NEMA 3 or IP54 enclosure.

Window:
Polycarbonate-standard
Tempered safety glass or
Laminated safety glass-optional.

Dial Face:
Aluminum, white background with black graduations and figures.

Model DB Series



Pointer:
Anodized aluminum with black finish, adjust-pointer on request.

Scale:
°C, °F (single or dual scale)
Colorful Scale available.

Accuracy:
±1.0% of span
(Grade A to ASME B40.3)

Capillary and Armor:
304SS capillary and armor.
(316SS on request)

Connection Style:
-Fixed Rigid Male/Female
-Sliding Compression Male/Female
-Union Rotatable Male/Nut Female
-Swivel nut Male/Female Rotatable
-Plain

Connection Size:
1/2", 3/8", 1/4"NPT standard, JIS, DIN, M14*1.0, M20*1.5 and others available.

Thermal Bulb:
304 Stainless Steel, 10mm diameter-Standard, 3/8" or others dia available.

Bulb Length:
2 1/2", 4", 6", 9", 12", 15", 18", 24" standard lengths, available in stem lengths up to 72" long.

Sensing Element:
Bourdon Tube.

External Adjustment:
Micro-Adjustable Pointer on request.

Specification

Dimension

Model DF Series



Dimensions, in.(mm)

Dial Size	A	B	C	D	E	F
4 1/2"(115mm)	5.813" (148mm)	0.197" (5mm)	5.375" (137mm)	2.632" (67mm)	0.118" (3mm)	2.283" (58mm)

Size:
4 1/2"(115mm)

Case&Ring:
Polypropylene with fiberglass case and ring.

Mounting:
-DFL...back flange (surface, bottom)
-DFB...back flange (surface, back)
-DFR...rigid (stem, local)
-DFE...adjust-angle (stem, local)

Weatherproof:
NEMA 3 or IP54 enclosure.

Window:
Plain glass-standard
Tempered safety glass, Polycarbonate or Laminated safety glass-optional.

Dial Face:
Aluminum, white background with black graduations and figures.

Pointer:
Anodized aluminum with black finish.

Scale:
°C, °F (single or dual scale)

Accuracy:
±1.0% of span
(Grade A to ASME B40.3)

Capillary and Armor:
304SS capillary and armor.
(316SS on request)

Connection Style:
-Fixed Rigid Male/Female
-Sliding Compression Male/Female
-Union Rotatable Male/Nut Female
-Swivel nut Male/Female Rotatable
-Plain

Connection Size:
1/2", 3/8", 1/4"NPT standard, JIS, DIN, M14*1.0, M20*1.5 and others available.

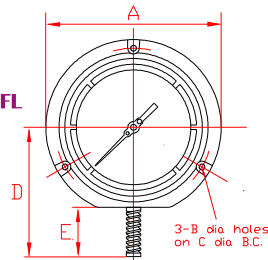
Thermal Bulb:
304 Stainless Steel, 10mm diameter-Standard, 3/8" or others dia available.

Bulb Length:
2 1/2", 4", 6", 9", 12", 15", 18", 24" standard lengths, available in stem lengths up to 72" long.

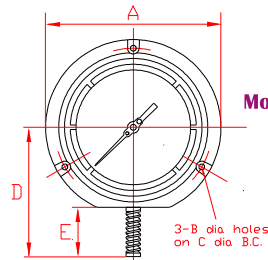
Sensing Element:
Bourdon Tube.

External Adjustment:
Micro-Adjustable Pointer on request.

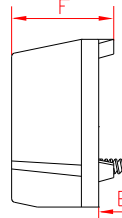
Model DFL



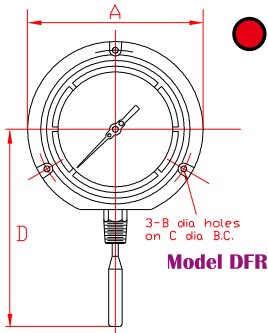
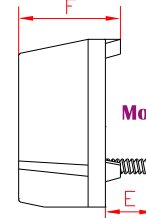
Model DPL



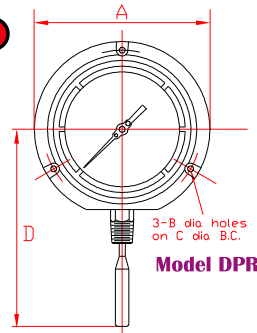
Model DFB



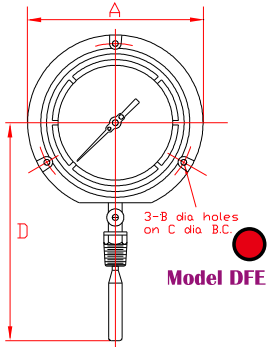
Model DPB



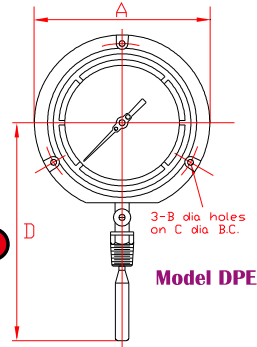
Model DFR



Model DPR



Model DFE



Model DPE

Size:
4 1/2"(115mm)

Case&Ring:
Phenol case and screw ring.

Mounting:
-DPL...back flange (surface, bottom)
-DPB...back flange (surface, back)
-DPR...rigid (stem, local)
-DPE...adjust-angle (stem, local)

Weatherproof:
NEMA 4/4X or IP65 enclosure.

Window:
Tempered safety glass-standard, Polycarbonate or Laminated safety glass-optional.

Dial Face:
Aluminum, white background with black graduations and figures.

Pointer:
Anodized aluminum with black finish.

Scale:
°C, °F (single or dual scale)

Accuracy:
±1.0% of span
(Grade A to ASME B40.3)

Model DP Series



Dimensions, in.(mm)

Dial Size	A	B	C	D	E	F
4 1/2"(115mm)	5.813" (148mm)	0.236" (6mm)	5.375" (137mm)	2.632" (67mm)	0.589" (15mm)	3.378" (86mm)

Capillary and Armor:
304SS capillary and armor.
(316SS on request)

Connection Style:
-Fixed Rigid Male/Female
-Sliding Compression Male/Female
-Union Rotatable Male/Nut Female
-Swivel nut Male/Female Rotatable
-Plain

Connection Size:
1/2", 3/8", 1/4"NPT standard, JIS, DIN, M14*1.0, M20*1.5 and others available.

Thermal Bulb:
304 Stainless Steel, 10mm diameter-Standard, 3/8" or others dia available.

Bulb Length:
2 1/2", 4", 6", 9", 12", 15", 18", 24" standard lengths, available in stem lengths up to 72" long.

Sensing Element:
Bourdon Tube.

External Adjustment:
Micro-Adjustable Pointer on request.

Specification

Dimension

Model DS Series



Size:
3"(75mm), 3 1/2"(90mm),
4"(100mm), 4 1/2"(115mm)
or 6"(150mm)

Case&Ring:
Stainless steel 304 (SS316-
option), polished bayonet ring.

Mounting:
-DSL...back flange
(surface, bottom)
-DSB...back flange
(surface, back)
-DSP...front flange
(flush panel, back)
-DSU...U-clamp
(flush panel, back)
-DSR...rigid (stem, local)
-DSE...adjust-angle (stem, local)

Weatherproof:
NEMA 4/4X or IP65 enclosure.

Window:
Plain glass-standard,
Tempered safety, Polycarbonate
or Laminated safety glass-
optional.

Dial Face:
Aluminum, white background
with black graduations and
figures.

Pointer:
Anodized aluminum with black
finish.

Scale:
°C, °F (single or dual
scale)

Accuracy:
±1.0% of span
(Grade A to ASME B40.3)

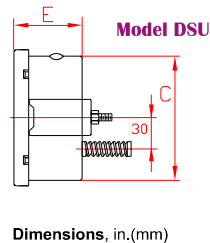
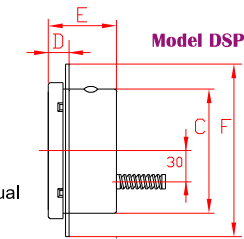
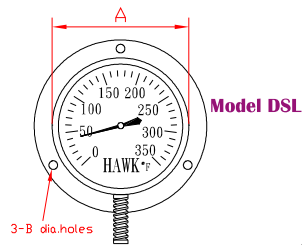
Capillary and Armor:
304SS capillary and
armor (316SS on request)

Connection Style:
-Fixed Rigid Male/Female
-Sliding Compression
Male/Female
-Union Rotatable
Male/Nut Female
-Swivel nut Male/
Female Rotatable
-Plain

Connection Size:
1/2", 3/8", 1/4"NPT
standard, JIS, DIN,
M14*1.0, M20*1.5
and others
available.

Thermal Bulb:
304 Stainless Steel,
10mm diameter-
Standard, 3/8" or others dia available.

Bulb Length:
2 1/2", 4", 6", 9", 12", 15", 18", 24" standard lengths,
available in stem lengths up to 72" long.

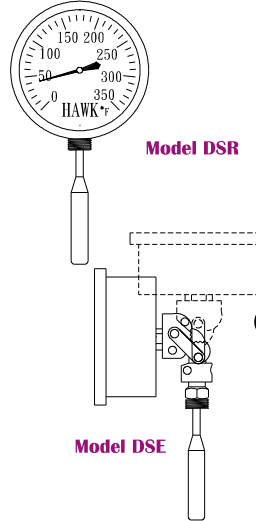
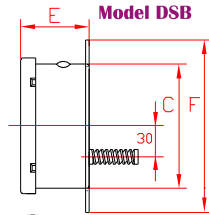


Dimensions, in.(mm)

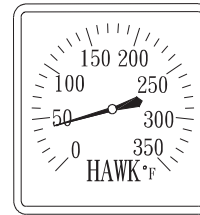
Dial Size	A	B	C	D	E	F
3"(75mm)	3.31" (84mm)	0.24" (6mm)	2.95" (75mm)	0.63" (16mm)	1.85" (47mm)	3.94" (100mm)
3 1/2"(90mm)	3.98" (101mm)	0.24" (6mm)	3.60" (91.5mm)	0.47" (12mm)	1.85" (47mm)	5.16" (131mm)
4"(100mm)	4.65" (118mm)	0.24" (6mm)	4.25" (108mm)	0.87" (22mm)	1.77" (45mm)	5.47" (139mm)
4 1/2"(115mm)	5" (127mm)	0.24" (6mm)	4.61" (117mm)	0.98" (25mm)	2.09" (53mm)	5.71" (145mm)
6"(150mm)	6.26" (159mm)	0.24" (6mm)	5.91" (150mm)	0.71" (18mm)	1.77" (45mm)	7.72" (196mm)

Sensing Element:
Bourdon Tube.

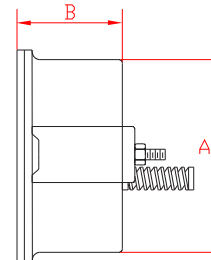
External Adjustment:
Micro-Adjustable Pointer on
request.



Model DSE



Model DTS



Size:
48mm*48mm, 57mm*57mm, 72mm*72mm, 96mm*96mm,
120mm*120mm, 144mm*144mm, 160mm*160mm, 192mm*192mm

Case&Ring:
Stainless steel 304 (SS316-option),
Polyamide fiberglass reinforced or aluminum case.

Mounting:
DTS...U-clamp (flush panel, back)

Weatherproof:
NEMA 3 or IP54 enclosure.

Window:
Plain glass-standard,
Tempered safety, Polycarbonate or Laminated safety glass-optional.

Dial Face:
Aluminum, white background with black graduations and figures.

Pointer:
Anodized aluminum with black finish.

Scale:
°C, °F (single or dual scale)

Accuracy:
±1.0% of span
(Grade A to ASME B40.3)

Model DT Series



Dimensions, in.(mm)

Dial Size	A	B
48mm*48mm	1.89" (48mm)	1.77" (45mm)
57mm*57mm	2.24" (57mm)	1.77" (45mm)
72mm*72mm	2.83" (72mm)	1.77" (45mm)
96mm*96mm	3.78" (96mm)	1.77" (45mm)

Dial Size	A	B
120mm*120mm	4.72" (120mm)	1.77" (45mm)
144mm*144mm	5.67" (144mm)	1.77" (45mm)
160mm*160mm	6.30" (160mm)	1.77" (45mm)
192mm*192mm	7.56" (192mm)	1.77" (45mm)

Capillary and Armor:
304SS capillary and armor.
(316SS on request)

Connection Style:
-Fixed Rigid Male/Female
-Sliding Compression Male/Female
-Union Rotatable Male/Nut Female
-Swivel nut Male/Female Rotatable
-Plain

Connection Size:
1/2", 3/8", 1/4"NPT standard, JIS, DIN, M14*1.0,
M20*1.5 and others available.

Thermal Bulb:
304 Stainless Steel, 10mm diameter-Standard, 3/8" or
others dia available.

Bulb Length:
2 1/2", 4", 6", 9", 12", 15", 18", 24" standard lengths,
available in stem lengths up to 72" long.

Sensing Element:
Bourdon Tube.

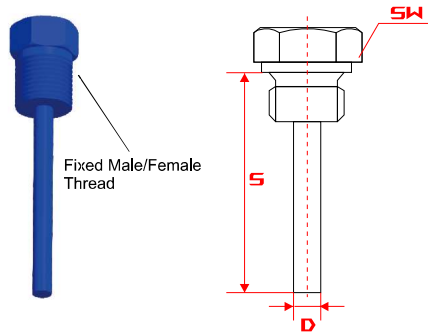
External Adjustment:
Micro-Adjustable Pointer on request..

Connection

Range Table

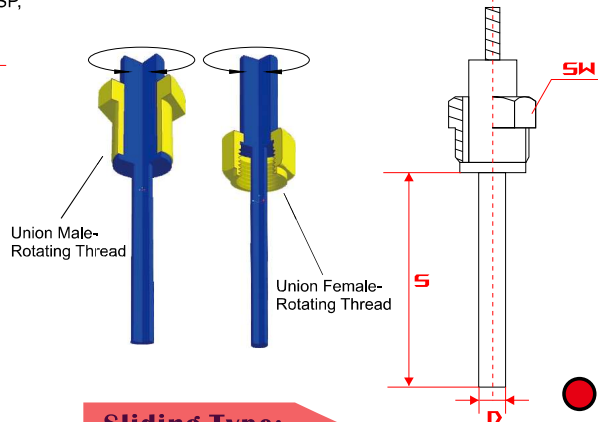
Fixed/Rigid Type:

The fixed/rigid type is the most common connection. This threaded type connection is directly attached to the process by means of a male or female NPT, BSP, BSPT or other threads.



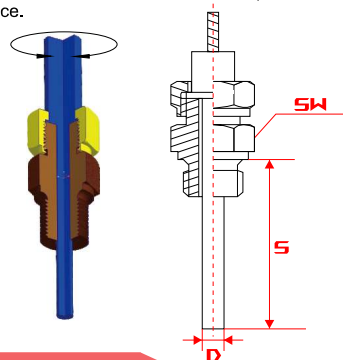
Union Type:

The Union type allows to tighten the rotating thread to fix the process connecting and turn the position of gauge face.



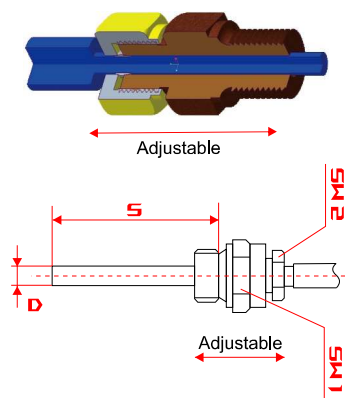
Swivel Nut:

The swivel connector is a double male adapter. It allows you to move around to turn the position of the gauge face.



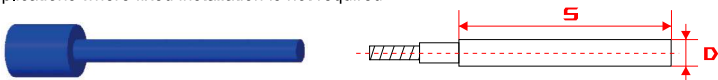
Sliding Type:

The sliding type allows to adjust the variable inserted length of bulb for best performance.



Plain Type:

The plain bulbs are suitable for open tank applications without any pressure or combine with thermowell for the applications where fixed installation is not required.



- The other scales and ranges (DIN) are available in request.
- Not all listed ranges and scales are in stock, consult your distributors for available.

Temperature Ranges					
SINGLE SCALE				DUAL SCALE	
°C		°F		°C & °F	
Code	Range	Code	Range	Code	Range
C3A	-30/30	F7A	-40/70	D3A	-30/30
C4A	-20/40	F10	0/100	D4A	-20/40
C4C	-80/40	F10A	-100/100	D4C	-80/40
C5	0/50	F12A	-20/120	D5	0/50
C5A	-50/50	F12C	-40/120	D5A	-50/50
C5E	-30/50	F12D	-80/120	D5E	-30/50
C6	0/60	F12G	25/125	D6	0/60
C6B	-20/60	F14	0/140	D6B	-20/60
C7A	-40/70	F15	0/150	D7A	-40/70
C7B	-70/70	F15A	-70/150	D7B	-70/70
C7C	-10/70	F16A	-40/160	D7C	-10/70
C8	0/80	F16B	20/160	D8	0/80
C8C	-40/80	F18B	-40/180	D8C	-40/80
C10	0/100	F20	0/200	D10	0/100
C10A	-50/100	F20B	-320/200	D10A	-50/100
C10C	-200/100	F20C	-100/200	D10C	-200/100
C11A	-10/110	F22	0/220	D11A	-10/110
C11B	-10/115	F24A	20/240	D11B	-10/115
C12	0/120	F25	0/250	D12	0/120
C12A	-20/120	F30	0/300	D12A	-20/120
C12C	-60/120	F30A	-50/300	D12C	-60/120
C15	0/150	F30C	50/300	D15	0/150
C15B	50/150	F30D	200/300	D15B	50/150
C15C	10/150	F40A	50/400	D15C	10/150
C16	0/160	F50	0/500	D16	0/160
C16A	-40/160	F50A	50/500	D16A	-40/160
C20	0/200	F55A	50/550	D20	0/200
C20A	-50/200	F60	0/600	D20A	-50/200
C22A	-20/220	F75A	50/750	D22A	-20/220
C22B	-80/220	F75C	150/750	D22B	-80/220
C25	0/250	F80A	100/800	D25	0/250
C30	0/300	F100A	200/1000	D30	0/300
C40	0/400	F120	0/1200	D40	0/400
C40A	50/400	F120A	400/1200	D40A	50/400
C45	0/450			D45	0/450
C50	0/500			D50	0/500
C50A	100/500			D50A	100/500
C60	0/600			D60	0/600
C65	0/650			D65	0/650

Thermowell

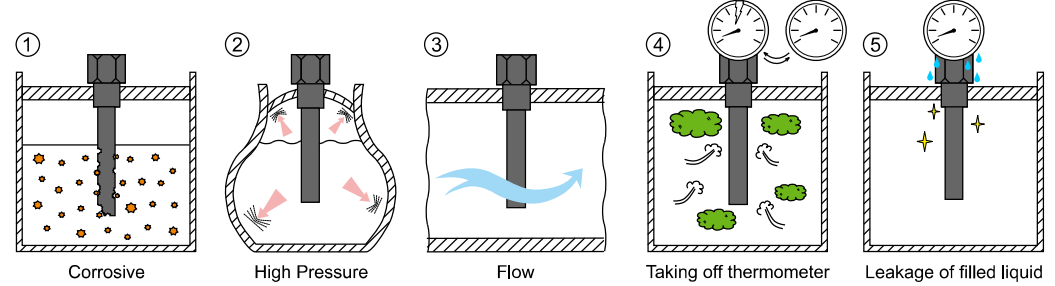
Thermowell

A thermowell is a critical accessory for the successful operation of temperature measurement in industrial processes. It is recommended for the applications where the stem and bulb would be exposed to pressure, velocity, corrosive fluid, or viscous and abrasive media. It protects the sensing element and ensure that the temperature of the process is passed to the sensor. Furthermore, use of a thermowell permits calibration check without interrupting or shutting the process. To make a proper selection of a thermowell one must also take into account the thermal lag (response time), the sensing accuracy as well as the service condition, i.e. pressure, temperature, velocity, corrosiveness etc. In the following list is highlighted for correct thermowell selection:

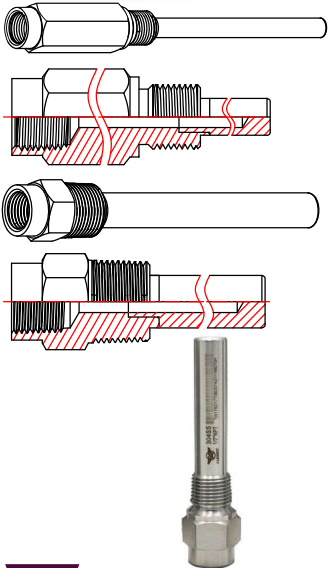
- A catastrophic failure due to improper welding practices that affects the process.
- Improper selection of specifications causes shortened equipment service life and increased maintenance costs.
- Poor compatibility with the temperature and media of the process leading to premature failure.
- Inadequate temperature transfer to the sensor element, thus providing an inaccurate reading.
- Incompatibility with the process velocity leading to catastrophic failure due to vibration.

In the case of following conditions, thermowell should be provide to protect bulb.

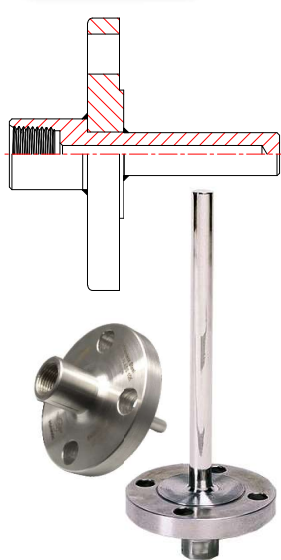
- 1) In case of corrosive fluid, thermowell with suitable material is necessary.
- 2) In case of high pressure, necessary to use thermowell suitable for operating pressure.
- 3) In case of fluid with flow, necessary to use thermowell suitable for flow and viscosity.
- 4) In case of fluid leaking out when taking off the thermometer, necessary to use thermowell.
- 5) In case of filled liquid in thermometer is leak out from bulb and it is harmful, necessary to use thermowell.



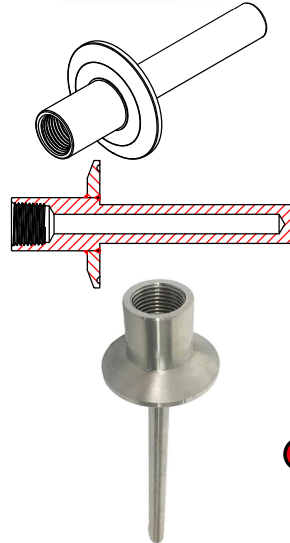
Model T Threaded Configuration



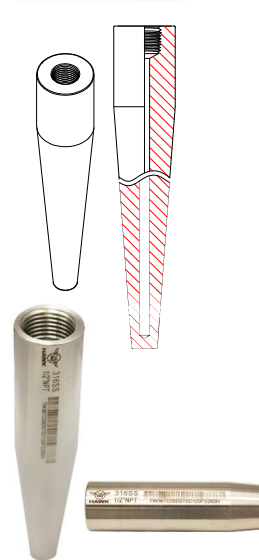
Model F Flanged Configuration



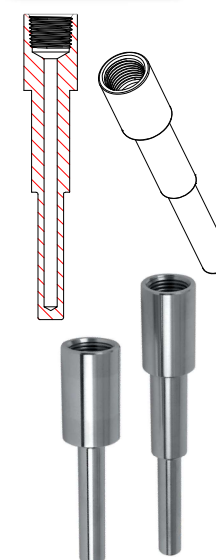
Model S Sanitary Configuration



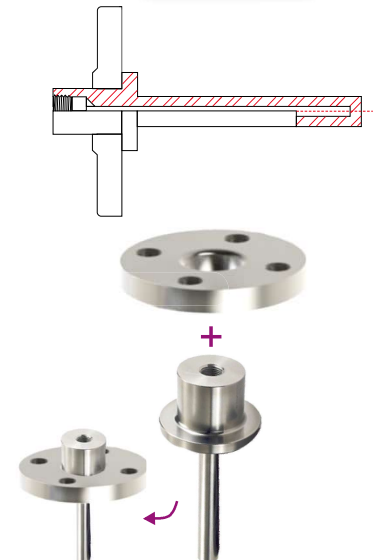
Model W Weld-In Configuration



Model K Socket Weld Configuration



Model V Van Stone Configuration



Order Information

Electrical Warning Contract

Example	Series	Type	Actuation	Dial Size	Process Connection	Stem Diameter	Stem Length	Capillary Length	Range	Option													
	P-3B	DA	L	G	08	M 2	008	2C5	04F	C15	XX												
DA -Aluminum Case DP -Phenol Case DB -Aluminum Case DS -Square Case DF -Polypropylene Case DT -SS Case		L -Back Flange, Surface Mount, Bottom Connection B -Back Flange, Surface Mount, Back Connection P -Front Flange, Flushing Panel Mount, Back Connection U -U-clamp, Flushing Panel Mount, Back Connection R -Rigid, Stem local Mount, Bottom Connection E -Adjust-Angle, Stem local Mount, Bottom Connection S -U-clamp, Flushing Panel Mount, Back Connection		L -Liquid M -Mercury G -Gas		08 -8"(200mm) 10 -10"(250mm) 12 -12"(300mm) 30 -3"(75mm) 35 -3 1/2"(90mm) 40 -4"(100mm) 45 -4 1/2"(115mm) 60 -6"(150mm) 48 -48mm*48mm 57 -57mm*57mm 72 -72mm*72mm 16 -160mm*160mm 96 -96mm*96mm 12 -120mm*120mm 14 -144mm*144mm 19 -192mm*192mm		M -Fixed Rigid Male X -Swivel Nut Male Rotatable F -Fixed Rigid Female Z -Swivel Nut Female Rotatable U -Union Rotatable Male T -Sliding Compression Male K -Union Nut Female Y -Sliding Compression Female		1 -1"NPT 5 -3/4"NPT 2 -1/2"NPT 3 -3/8"NPT 4 -1/4"NPT U -1"PT(R) T -3/4"PT(R) A -1/2"PT(R) G -3/8"PT(R) B -1/4"PT(R) I -1"PF(G) Q -3/4"PF(G) D -1/2"PF(G) H -3/8"PF(G) E -1/4"PF(G) J -M20*1.5 K -M14*1.0		0P -Plain 0L -Other		C25 -1/4" C32 -5/16" C38 -3/8" 006 -6mm 008 -8mm 010 -10mm 012 -12mm 013 -13mm 016 -16mm 		2C5 -2 1/2" 04C -4" 06C -6" 09C -9" 12C -12" 16C -16" 24C -24" 075 -75mm 100 -100mm 150 -150mm 200 -200mm 250 -250mm ...and so on		2F5 -2 1/2 Feet 04F -4 Feet 06F -6 Feet 09F -9 Feet 12F -12 Feet 15F -15 Feet 18F -18 Feet 24F -24 Feet 01M -1m 03M -3m 05M -5m 10M -10m 		Please refer to the range table and write down the code you need. Celsius Fahrenheit		ZP -Polycarbonate Lens ZL -Laminated Safety Glass Lens ZT -Tempered Safety Glass Lens ZW -Electrical Alarm Contact TR -Anti-Parallax Dial TQ -Gray Background Dial TS -Anti-Parallax with Gray Background Dial	

HAWK electrical warning contact dial thermometer is designed for opening or closing electric and pneumatic circuits in relation to the position of the pointer on the thermometer. The contact can be set at any position through a removable knob to make the unit virtually tamper proof. The contacts are available on the 3", 4", 4 1/2" and 6" HAWK Bourdon tube dial thermometer. Contacts are usually used to activate alarms and relays.

Features:

- ▶ Magnetic Snap-action contact.
- ▶ Accuracy 2% F.S. (add to instrument).
- ▶ Two functions(local display and switching).
- ▶ Quick installation and easy linked to the control system.

Switch function
On/Off for your system



Gland Cable



DIN Connector



Terminal

Contact Functions

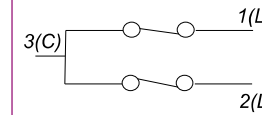
Contact Functions

SINGLE CONTACT (2 Wire)

Wiring Scheme	Electrical Scheme	Description (Clockwise)	Code
		NO-Normal Open, Hi(Max) Contact, Contact makes (closes) when pointer reaches set point	2HI
		NC-Normal Close, Lo(Min) Contact, Contact breaks (opens) when pointer reaches set point	2LO

DOUBLE CONTACT (3 Wire)

Wiring Scheme	Electrical Scheme	Description (Clockwise)	Code
		First contact breaks(opens) and second contact makes (closes) when pointer reaches set point, Lo(Min) and Hi(Max) contact	3LH
		First contact makes(closed) and second contact breaks (opens) when pointer reaches set point, Hi(Max) and Lo(Min) contact	3HL
		First contact and second contact makes(closes) when pointer reaches set point, Hi(Max) and Hi(Max) contact	3HH



First contact and second contact breaks(opens) when pointer reaches set point, Lo(Min) and Lo(Min) contact

3LL

INDEPENDENT DOUBLE CONTACT (4 Wire)


Wiring Scheme	Electrical Scheme	Description (Clockwise)	Code
		First contact breaks(opens) and second contact makes (closes) when pointer reaches set point, Lo(Min) and Hi(Max) contact	4LH
		First contact makes(closed) and second contact breaks (opens) when pointer reaches set point, Hi(Max) and Lo(Min) contact	4HL
		First contact and second contact makes(closes) when pointer reaches set point, Hi(Max) and Hi(Max) contact	4HH
		First contact and second contact breaks(opens) when pointer reaches set point, Lo(Min) and Lo(Min) contact	4LL


Option


Option


Certificate of Accuracy (NIST) **ZI**  Certificate of Accuracy (Factory) **ZC**

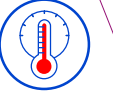
Improved Accuracy 0.5%-mid Point (Grade 2A-ASME B40.3) **Z1**  Certificate of Accuracy (TAF) **ZE**

Halocarbon Filled **ZH**  Glycerine Filled **ZG**

Fluorolube Filled **ZO**  Silicone Filled **ZS**


ZM Dampened Movement 


ZX Oxygen Cleaning 


NACE-MR0175-2002 Heat Treatment **ZN** 


Tempered Safety Glass Lens **ZT**  Laminated Safety Glass Lens **ZL**


ZP Polycarbonate Lens 


PFA Lining Stem **TC** 


316SS Stem **TB** 


Pointed Stem **TA** 


Titanium Coating Stem **TE** 


PTFE Coating Stem **TD** 


Red Pointer **0A** 

Electrical Alarm Contact **ZW** 

Stainless Steel Tag Plate **ZY** 

Max/Min Registering Pointer **ZJ** 

Anti Parallax with Gray Background Dial **TS** 

Gray Background Dial **TQ** 

Anti Parallax Dial **TR** 