Temperature Gauges
Bimetal Dial Thermometer

The Bimetal thermometer employs a bimetal strip in the form of helix (it works on the principle of thermal expansion - two metals having different coefficient of expansions are joined to form a bimetal. The resultant expansion of bimetal is proportional to temperature). Bimetal dial thermometers are simple in construction, yet rugged. They are used for measurement of temperature in most of the industrial applications. They are offered in the range of (-) 50°C to 600°C. With rigid stem having bottom or back entry. It can also be offered in every angle rotatable construction.

Features

- Rugged construction
- Bottom/Back entry, every angle construction
- Fast response
- Protection class IP-67
- Accuracy ± 1% FSD
- High repeatability, low hysteresis
- Hermetically sealed case

Specifications

Reference standard: ASME B 40.3, EN 13190

Dial: 63 mm, 100 mm or 150 mm in aluminium white background, black markings

Case: Die cast aluminium with screwed bezel
- SS304 with bayonet bezel

Protection: Weatherproof to IP - 67 (IS : 13947)

Window: Shatterproof glass

Pointer: Aluminium, black

Stem: SS304 or SS316 in 6 mm, 8 mm, 9.5 mm, 10 mm, 12 mm, 12.7 mm, 14 mm, 16 mm dia and length from 100 mm to 1000 mm as standard

Connection: ½” NPT (M) as standard in SS304 or SS316 adjustable three piece compression fitting

Range: (-) 50°C to 600°C with a minimum span of 80°C

Accuracy: ± 1% FSD (± 2% FSD for 63 mm dial size)
- (In accordance with EN 13190)

Overrange: 125% FSD
- (130% on request upto 500°C)

Reset: External

Contact: Single SPST, normally open, closed on rise in temperature (specify action required) adjustable over the entire range, rating 30 VA @ 230 V AC (100 mm dial back entry model in SS case only)

Note:
1) For minimum insertion length essential for proper sensing, contact our design department
2) Three point calibration certificate accompanies each thermometer.
Bimetal Dial Thermometer

How to Order

**TYPE : TB**

**MOUNTING**
- V - Bottom Entry, Local Mounting
- C - Back Entry, Local Mounting
- E - Every Angle, Local Mounting

**DIAL**
- 63 - 63 mm
- 15 - 150 mm

**CASE**
- AL - Die-cast Aluminium
- S4 - SS304
- S6 - SS316

**STEM-OD**
- A - 6 mm
- B - 8 mm
- C - 9.5 mm
- D - 10 mm
- E - 12 mm
- F - 12.7 mm
- G - 14 mm
- H - 16 mm

**STEM LENGTH**
Specify in mm

**STEM MATERIAL**
- S4 - SS304
- S6 - SS316

**CONNECTION**

<table>
<thead>
<tr>
<th>Size</th>
<th>Type</th>
<th>Male / Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 1/4&quot;</td>
<td>NT-NPT</td>
<td>M - Male F - Female</td>
</tr>
<tr>
<td>10 - 3/8&quot;</td>
<td>BP-BSP</td>
<td>M - Male F - Female</td>
</tr>
<tr>
<td>15 - 1/2&quot;</td>
<td>BT-BSPT</td>
<td>M - Male F - Female</td>
</tr>
<tr>
<td>20 - 3/4&quot;</td>
<td>PF-PF</td>
<td>M - Male F - Female</td>
</tr>
<tr>
<td>25 - 1&quot;</td>
<td>GS-Gas</td>
<td>M - Male F - Female</td>
</tr>
<tr>
<td>32 - 1.1/4&quot;</td>
<td>NS-NPSM</td>
<td>M - Male F - Female</td>
</tr>
<tr>
<td>40 - 1.1/2&quot;</td>
<td></td>
<td>M - Male F - Female</td>
</tr>
</tbody>
</table>

**OPTION**
- A - Thermowell
- S - Liquid Filled
- C - Colour Band Case *
- D - Dual Scale
- E - 1 SPST # Electrical contact

**UNIT**
- C - Deg C
- F - Deg F

**RANGE**
- (-) 50 to (+) 30 0 to 200
- (-) 30 to (+) 50 0 to 250
- (-) 20 to (+) 60 0 to 300
- 0 to 80 0 to 350
- 0 to 100 0 to 400
- 0 to 120 0 to 500
- 0 to 160 0 to 600

* Suitable up to maximum temperature 339°C.

# In 100 mm dial size, back entry, SS case.
Mercury in Steel Dial Thermometer

Mercury filled system based on mercury expansion principle is used for measuring temperature ranging from (-) 40°C to 600°C. It has faster response and the same is available in rigid stem as well as capillary type for remote sensing. Every angle type can be offered in all SS construction. Manufactured in accordance with BS:5235. System is case compensated as standard (SAMA CI VB). Fully compensated (capillary compensation) system is offered wherever essential.

Features

- Rugged construction
- Rigid stem or capillary type
- Fast response
- Protection class IP- 67
- Accuracy ± 1% FSD (0.5% FSD on request)
- High repeatability, low hysteresis
- Case compensated system
- Micrometer Pointer

Specifications

Ref Standard : BS 5235
System : Mercury filled, case compensated in accordance with SAMA CI. V B
Dial : 100 mm or 150 mm in aluminium, white background, black markings
Case : Die cast aluminium with screwed bezel, SS304 / SS316 with bayonet bezel
Protection : Weather proof to IP - 67 (IS : 13947 Part I)
Window : Shatterproof glass
Pointer : Aluminium, black
Stem : SS304 or SS316 in 6 mm, 8 mm, 9.5 mm, 10 mm, 12 mm, 12.7 mm, 14 mm, 16 mm dia and length from 100 mm to 1000 mm (longer lengths available on request)
Capillary : SS covered / SS covered + PVC / SS armoured (up to 15 M).
Connection : ½” NPT (M) as standard in SS304 or SS316 three piece adjustable compression fitting.
Range : (-) 40°C to 600°C with a minimum span of 50°C
Accuracy : ± 1% FSD / ± 0.5% FSD
Overrange : 130% FSD as standard
Zero reset : Micrometer Pointer
Optional : 1) Glycerine filled SS304 / SS316 case
           2) Fully compensated double bourdon system in accordance with SAMA CI. V A
           3) SS solid drawn capillary for better performance

Note : 1) For minimum immersion length essential for proper sensing, contact our design department.
        2) Three point calibration certificate accompanies each thermometer.

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Mercury in Steel
Dial Thermometer

How to Order

TYPE
TM-R - Rigid Stem
TM-C - Capillary Type

MOUNTING
V - Bottom Entry, Local Mounting
C - Back Entry, Local Mounting
E - Every Angle, Local Mounting
S - Bottom Entry, Surface Mounting
P - Back Entry, Panel Mounting

DIAL
10 - 100 mm 15 - 150 mm

CASE
AL - Die-cast Aluminium
S4 - SS304 S6 - SS316

STEM-OD
A - 6 mm  B - 8 mm  C - 9.5 mm  D - 10 mm
E - 12 mm  F - 12.7 mm  G - 14 mm  H - 16 mm

STEM LENGTH
Specify in mm

STEM MATERIAL
S4 - SS304 S6 - SS316

CAPILLARY TYPE
SC - SS Covered
SP - SS Covered + PVC
SA - SS Covered + SS Armoured
SAP - SS Covered + SS Armoured + PVC

LENGTH
Specify in metre

OPTION
A - Thermowell
G - Glycerine Filled Case
C - Colour Band
D - Dual Scale
L - NIL
S - Silicone oil filled case

UNIT
C - Deg C  F - Deg F

RANGE
(-) 30 to (+) 30 0 to 160
(-) 20 to (+) 20 0 to 200
(-) 20 to (+) 40 0 to 250
(-) 40 to (+) 20 0 to 300
0 to 50 0 to 350
0 to 80 0 to 400
0 to 100 0 to 500
0 to 120 0 to 600

CONNECTION
Size  Type  Male / Female
6 - 1/4"  NT - NPT  M - Male
10 - 3/8"  BP - BSP
15 - 1/2"  BT - BSPT
20 - 3/4"  PF - PF
25 - 1"  GS - Gas
32 - 1.1/4"  NS - NPSM
40 - 1.1/2"  

Metric Threads
18 M - M 18 x 1.5
20 M - M 20 x 1.5
24 M - M 24 x 1.5
27 M - M 27 x 2
33 M - M 33 x 2
X X - Any other
Liquid Filled Dial Thermometer

Liquid filled system based on liquid (other than mercury) expansion principle is used for measuring temperature ranging from (-) 30°C to 250°C.

It has faster response and the same is available in rigid stem as well as capillary type for remote sensing. Every angle type can be offered in all SS construction. Generally used where mercury type thermometer is not used in industries such as Food, Pharmaceutical, etc. The main advantage is its minimum immersion length required for sensing (as low as 30mm suffices for proper sensing thereby making it ideal for installing in lower line sizes).

**Features**

- Rugged construction
- Rigid stem or capillary type
- Suitable for pharmaceutical, food, biotechnology industry.
- Protection class IP-67
- Accuracy ± 1% FSD
- Minimum immersion length (as low as 30 mm suitable for lower line sizes) possible.
- Case compensated system (SAMA Cl. IB)

**Specifications**

<table>
<thead>
<tr>
<th>System</th>
<th>Liquid filled, case compensated in accordance with SAMA Cl. IB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dial</td>
<td>100 mm or 150 mm in aluminium, white background, black markings</td>
</tr>
<tr>
<td>Case</td>
<td>Die cast aluminum with screwed bezel, SS304 / SS316 with bayonet bezel</td>
</tr>
<tr>
<td>Protection</td>
<td>Weather proof to IP - 67 (IS : 13947 Part I)</td>
</tr>
<tr>
<td>Window</td>
<td>Shatterproof glass</td>
</tr>
<tr>
<td>Pointer</td>
<td>Aluminium, black</td>
</tr>
<tr>
<td>Stem</td>
<td>SS304 or SS316 in 6 mm, 8 mm, 9.5 mm,10 mm, 12 mm, 12.7 mm, 14 mm,</td>
</tr>
<tr>
<td></td>
<td>16 mm dia (immersion length as small as 30 mm possible).</td>
</tr>
<tr>
<td>Capillary</td>
<td>SS covered / SS covered + PVC / SS armoured (up to 5 Mtr.).</td>
</tr>
<tr>
<td>Connection</td>
<td>½&quot; NPT (M) as standard in SS304 or SS316 three piece adjustable</td>
</tr>
<tr>
<td></td>
<td>compression fitting.</td>
</tr>
<tr>
<td>Range</td>
<td>(-) 30°C to 250°C with a minimum span of 50°C</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 1% FSD</td>
</tr>
<tr>
<td>Overrange</td>
<td>125% FSD as standard</td>
</tr>
<tr>
<td>Zero reset</td>
<td>Micrometer Pointer</td>
</tr>
<tr>
<td>Optional</td>
<td>Glycerine filled SS304 case</td>
</tr>
</tbody>
</table>
Liquid Filled Dial Thermometer

How to Order

**TYPE**

**TDL-R** - Rigid Stem

**TDL-C** - Capillary Type

**MOUNTING**

V - Bottom Entry, Local Mounting
C - Back Entry, Local Mounting
E - Every Angle, Local Mounting
S - Bottom Entry, Surface Mounting
P - Back Entry, Panel Mounting

**DIAL**

10 - 100 mm
15 - 150 mm

**CASE**

AL - Die-cast
S4 - SS304
ALuminium
S6 - SS316

**STEM-OD**

A - 6 mm
B - 8 mm
C - 9.5 mm
D - 10 mm
E - 12 mm
F - 12.7 mm
G - 14 mm
H - 16 mm

**STEM LENGTH**

Specify in mm

**STEM MATERIAL**

S4 - SS304
S6 - SS316

**CAPILLARY TYPE**

SC - SS Covered
SP - SS Covered + PVC
SA - SS Covered + SS Armoured
SAP - SS Covered + SS Armoured + PVC
N - Not Applicable for LDT-R type.

**LENGTH**

Specify in metre
(Max upto 5 metre)

**OPTION**

A - Thermowell
G - Glycerine Filled Case
C - Colour Band
D - Dual Scale
L - NIL

**UNIT**

C - Deg C
F - Deg F

**RANGE**

(-) 30 to (+) 30
(-) 20 to (+) 40
0 to 50
0 to 80
0 to 100
0 to 120
0 to 160
0 to 200
0 to 250
0 to 250

**CONNECTION**

6 - 1/4"
10 - 3/8"
15 - 1/2"
20 - 3/4"
25 - 1"
32 - 1.1/4"
40 - 1.1/2"

**METRIC THREADS**

18 M - M 18 x 1.5
20 M - M 20 x 1.5
24 M - M 24 x 1.5
27 M - M 27 x 2
33 M - M 33 x 2
X X - Any other

**How to Order**

Specify in metre
(Max upto 5 metre)
Specify in mm

**www.prisma-instruments.com**
Gas Filled Dial Thermometer

Gas filled temperature gauge overcomes most of the limitations of other members of family. It is offered in a very wide temperature range i.e. (-)200 to 800°C. Practically any stem length can be offered and capillary length as long as 25 mtr, without any loss of accuracy. Inert, non hazardous, non toxic nature of the filled system makes it virtually ideal choice of cross section of industries.

Features

- Use of inert gas - N₂
- Suitable for sanitary application
- All SS construction
- Rigid stem or capillary type
- Fast response
- Non-polluting, environment friendly
- Non-hazardous for the service
- High reliability
- IP-67 protection
- Accuracy ± 1% FSD

Specifications

System: Gas (N₂) filled, case compensated in accordance with SAMA Cl. III B
Dial: 100 mm or 150 mm in aluminium, white background, black marking
Case: SS304 / SS316 with bayonet bezel
Protection: Weatherproof to IP-67 (IS:13947 Part i)
Window: Shatterproof glass
Pointer: Aluminium, black with micrometer adjustment
Stem: SS316 in 8 mm, 10 mm, 12 mm dia as standard
Capillary: SS solid drawn or SS armoured or SS + PVC covered up to 25 M
Connection: 1/2"N PT (M) adjustable three piece compression fitting in SS304 or SS316
Range: (-) 200°C to 800°C with minimum span of 80°C
Accuracy: ± 1% FSD in accordance with EN 13190
Overrange: 130% FSD
Zero Reset: Micrometer pointer

Note: For minimum immersion length (excluding thread length) for proper sensing, contact our design department.
Gas Filled Dial Thermometer

How to Order

**TYPE**

**TDG-R** - Rigid Stem

**TDG-C** - Capillary Type

---

| MOUNTING | V - Bottom Entry, Local Mounting  
C - Back Entry, Local Mounting  
E - Every Angle, Local Mounting  
S - Bottom Entry, Surface Mounting  
P - Back Entry, Panel Mounting |
|----------|------------------------------------------------------------------|

| DIAL | 10 - 100 mm  
15 - 150 mm |
|-------|---------------|

| CASE | AL - Die-cast  
S4 - SS304  
Aluminium  
S6 - SS316 |
|------|----------------|

| STEM-OD | A - 6 mm  
B - 8 mm  
C - 9.5 mm  
D - 10 mm  
E - 12 mm  
F - 12.7 mm  
G - 14 mm  
H - 16 mm |
|---------|----------------|

<table>
<thead>
<tr>
<th>STEM LENGTH</th>
<th>Specify in mm</th>
</tr>
</thead>
</table>

| STEM MATERIAL | S4 - SS304  
S6 - SS316 |
|---------------|----------------|

| CAPILLARY TYPE | SC - SS Covered  
SP - SS Covered + PVC  
SA - SS Covered + SS Armoured  
SAP - SS Covered + SS Armoured + PVC  
N - Not Applicable for GDT-R type |
|----------------|----------------|

<table>
<thead>
<tr>
<th>CAPILLARY LENGTH</th>
<th>Specify in metre</th>
</tr>
</thead>
</table>

| OPTION | A - Thermowell  
C - Colour Band  
D - Dual Scale  
G - Liquid filled case  
L - Nil |
|--------|----------------|

| UNIT | C - Deg C  
F - Deg F |
|------|-----------|

| RANGE | (-) 30 to (+) 50  
(-) 20 to (+) 80  
(-) 50 to (+) 30  
0 to 80  
0 to 100  
0 to 100  
0 to 120  
0 to 160  
0 to 200  
0 to 250  
0 to 300  
0 to 350  
0 to 400  
0 to 500  
0 to 600  
0 to 150  
0 to 120  
0 to 100  
0 to 100 |
|-------|----------------|

<table>
<thead>
<tr>
<th>CONNECTION</th>
<th>Size</th>
<th>Type</th>
<th>Male / Female</th>
</tr>
</thead>
</table>
| 6 - 1/4"  
10 - 3/8"  
15 - 1/2"  
20 - 3/4"  
25 - 1"  
32 - 1.1/4"  
40 - 1.1/2"  
18 M - M 18 x 1.5  
20 M - M 20 x 1.5  
24 M - M 24 x 1.5  
27 M - M 27 x 2  
33 M - M 33 x 2  
X X - Any other | NT - NPT  
BP - BSP  
BT - BSPT  
PF - PF  
GS - Gas  
NS - NPSM | M - Male  
F - Female |

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Metric Threads

18 M - M 18 x 1.5
20 M - M 20 x 1.5
24 M - M 24 x 1.5
27 M - M 27 x 2
33 M - M 33 x 2
X X - Any other
Indicating temperature switch combines indication with switching (in order to make or break the associated electrical circuit). Can be offered with contact assembly as well as microswitch (as a combination of switch and movement)

**Features**
- Combination of indication and switch
- Fast response
- Choice of contact assembly or microswitch
- Switching accuracy ± 2% FSD
- High repeatability and low hysteresis
- Flameproof version available
- Case compensated system

**Specifications**

<table>
<thead>
<tr>
<th>System</th>
<th>Mercury filled, G as (N₂) filled case compensated in accordance with SAMA C1. V B/IIIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dial</td>
<td>100 mm or 150 mm, white anodised, black markings</td>
</tr>
<tr>
<td>Case</td>
<td>SS304 / SS316 with bayonet bezel (Flameproof case in Al only)</td>
</tr>
<tr>
<td>Protection</td>
<td>Weatherproof to IP-67 (IS : 13947)</td>
</tr>
<tr>
<td></td>
<td>Flameproof to IIA IIIB (Equivalent to NEC C1. I Div 2 gr. C&amp;D)</td>
</tr>
<tr>
<td>Stem</td>
<td>SS304 or SS316, 6 mm, 8 mm, 10 mm, 12 mm</td>
</tr>
<tr>
<td>Connection</td>
<td>1/2&quot; NPT (M) adjustable three piece compression fitting as standard</td>
</tr>
<tr>
<td>Capillary</td>
<td>SS covered or SS armoured or SS covered with PVC up to 15 M.</td>
</tr>
<tr>
<td>Range</td>
<td>(-) 40°C to 600°C with a minimum span 50°C for mercury filled temperature switch / (-) 100 to 600°C for gas filled temperature switch (minimum span 80°C)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 1% FSD for indication, ± 2% FSD for switching</td>
</tr>
<tr>
<td>Overrange</td>
<td>125% FSD as standard (130% FSD on request up to 500°C)</td>
</tr>
<tr>
<td>Contacts</td>
<td>1) 1 SPST, single, normally open, closed on rise in temperature or vice versa,</td>
</tr>
<tr>
<td></td>
<td>rated 30 VA @ 230 V AC</td>
</tr>
<tr>
<td></td>
<td>2) 2 SPST, two contacts, independently adjustable,</td>
</tr>
<tr>
<td></td>
<td>one normally open other normally closed or both normally</td>
</tr>
<tr>
<td></td>
<td>open or both normally closed, rated 30 VA @ 230 V AC</td>
</tr>
<tr>
<td></td>
<td>3) ISPDT, single microswitch, adjustable over entire range, rated 5 amp @ 230 V AC (3A @ 28 VDC)</td>
</tr>
<tr>
<td></td>
<td>4) 2 SPDT, double microswitch, adjustable over entire range, rated 5 amp @ 230 V AC (3A @ 28 VDC)</td>
</tr>
<tr>
<td>Accessory</td>
<td>Relay for the contact assembly to suit 5 amp @ 230 V AC, separately mounted.</td>
</tr>
<tr>
<td>Note</td>
<td>1) SPDT microswitch is offered in flameproof housing, 100mm dial and diecast Al case.</td>
</tr>
<tr>
<td></td>
<td>2) Surface mounted flameproof housing is available with capillary.</td>
</tr>
<tr>
<td></td>
<td>3) Flameproof (conforming to IIIC) version also available with microswitch.</td>
</tr>
<tr>
<td></td>
<td>4) 2 SPDT only in 150 mm dial size.</td>
</tr>
</tbody>
</table>

**Advantages of Microswitch Type Models**
- Microswitch is rated 5 amp @ 230 V AC (3A @ 28 VDC). No relay is required.
- Microswitch is imported from reputed international supplier as combination of movement and switch.
- Microswitch assembly gives better switching accuracy. Compact design.
- Note: For minimum immersion length essential for proper sensing, contact our design department.
Indicating Temperature Switch

How to Order

**TYPE**
- TM-SW-R - Rigid Stem (Mercury Filled)
- TM-SW-C - Capillary Type (Mercury Filled)
- TDG-SW-R - Rigid Stem (Gas Filled)
- TDG-SW-C - Capillary Type (Gas Filled)

**MOUNTING**
- V - Bottom Entry, Local Mounting
- C - Back Entry, Local Mounting
- E - Every Angle, Local Mounting
- S - Bottom Entry, Surface Mounting
- P - Back Entry, Panel Mounting

**DIAL**
- 10 - 100 mm
- 15 - 150 mm

**CASE**
- AL - Die-cast aluminium
- S4 - SS304
- S6 - SS316

**STEM-OD**
- A - 6 mm
- B - 8 mm
- C - 9.5 mm
- D - 10 mm
- E - 12 mm
- F - 12.7 mm
- G - 14 mm
- H - 16 mm

**STEM LENGTH**
- Specify in mm

**STEM MATERIAL**
- S4 - SS304
- S6 - SS316

**CAPILLARY**
- SC - SS Covered
- SP - SS Covered + PVC
- SA - SS Covered + SS Armoured
- SAP - SS Covered + SS Armoured + PVC
- N - Not Applicable for MIS-SW-R, GDT-SW-R type.

**LENGTH**
- Specify in metre

**OPTION**
- A - Thermowell
- B - 1 SPDT
- C - 2 SPDT
- D - 1 SPST
- E - 2 SPST
- L - NIL
- R - Relay
- FA - Flame Proof Case (IIB)
- FC - Flame Proof Case (IIC)

**UNIT**
- C - Deg C
- F - Deg F

**RANGE**
- (-) 30 to (+) 30
- (-) 20 to (+) 40
- 0 to 50
- 0 to 100
- 0 to 200
- 14 - Any other

**CONNECTION**
- Size
- Type
- Male / Female

**Metric Threads**
- 18 M - M 18 x 1.5
- 20 M - M 20 x 1.5
- 24 M - M 24 x 1.5
- 27 M - M 27 x 2
- 33 M - M 33 x 2
- X X - Any other
<table>
<thead>
<tr>
<th>°C</th>
<th>°F</th>
<th>°C</th>
<th>°F</th>
<th>°C</th>
<th>°F</th>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>-129</td>
<td>-200</td>
<td>-328</td>
<td>-13.3</td>
<td>8</td>
<td>46.4</td>
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<td>220</td>
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<td>48.2</td>
<td>110</td>
<td>230</td>
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<td>-107</td>
<td>-160</td>
<td>-256</td>
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<td>-140</td>
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<td>10</td>
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<td>290</td>
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<td>-80</td>
<td>-112</td>
<td>21.1</td>
<td>70</td>
<td>158</td>
<td>149</td>
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In-House Testing facilities for Temperature Gauges

For the manufacturing & testing of temperature gauges, we strictly follow EN : 13190-2001 and DIN 16203, 16204, 16205 and 16206 standard. Following tests are carried out to ensure the quality of temperature gauges. We have facilities to carry out following tests in-house at our manufacturing plant.

1. Accuracy test
2. Overrange test
3. Hysteresis test
4. Response time test
5. Repeatability test
6. Vibration test (rattling test)
7. Load test
8. Mounting position test
9. Ambient temperature test
10. Capillary compensation test
11. Hermeticity test (for Bimetal temperature gauges)
12. Thermal stability test
13. Bimetal test (for Bimetal temperature gauges)
14. Hose down test (water spray test)
15. Switching accuracy test (for contact assembly)
16. High voltage test (for contact assembly)
17. Insulation test
18. Contact resistance test
19. Altitude test
20. Dial printing stability test
21. Life test for SPDT movement
22. Cyclic test
23. Friction test

The recommendations made in this catalogue are to be used as intended guide. No guarantee of material can be undertaken since other factors may affect the performance. We reserve the right to change the specifications mentioned in this catalogue without any notice as improvements & development is a continuous process. Responsibility of typographical errors is specifically disclaimed.
### Consultants
- Chemtex Engineering of India Ltd.
- Dai Al Consultants & Engineers Ltd.
- Desiln Indure Ltd.
- Development Consultants Ltd.
- Enginre India Ltd.
- Fact Engineering & Design Organisation
- Fichtner Consulting Engineers Pvt. Ltd.
- Jacobs H&G Limited
- Kvaerner Powergas India Ltd.
- Lurgi (I) Ltd.
- Mehtalia Associates
- Metallurgical & Engineering Consultants Pvt. Ltd.
- M.N. Dasbhar
- Picocon Consultants
- Projects & Development India Ltd.
- Tata Consulting Engineers
- Technimont ICB Ltd.
- Toyo Engineering (I) Ltd.

### Original Equipment Manufacturers
- Alfa-Laval (India) Ltd.
- Bharat Heavy Electricals Ltd.
- Bharat Heavy Plates & Vessels Ltd.
- Daelim Engineering
- Greensol Power Systems Private Limited.
- Hindustan Dorr-O liver Ltd.
- Hyundai Heavy Engineering
- Ion Exchange (India) Ltd.
- Kirloskar Pneumatic Co. Ltd.
- Larsen & Toubro Ltd.
- Mazaqan Dock Ltd.
- Neela Group of Companies
- Nishotech Engineers Pvt. Ltd.
- Pall Pharmalab
- Praj Industries Ltd.
- Thermax Ltd.
- Thermax Babcock & Wilcox Ltd.
- Triveni Engineering

### Pharmaceutical
- Cadila Healthcare Ltd.
- Ciba Specialty Chemicals (India) Ltd.
- Core Parental
- Johnson & Johnson Ltd.
- Max - GB Ltd.
- O rchid Chemicals & Pharmaceuticals Ltd.
- Pfizer Ltd.
- Ranbaxy Laboratories Ltd.
- Sandoz (India) Ltd.
- Torrent Pharmaceuticals Ltd.
- Unichem Laboratories
- Wockhardt Ltd.

### Oil Exploration / Refineries / Petrochemicals
- Bharat Petroleum Corporation Ltd.
- Bongaigaon Refinery & Petrochemical Ltd.
- Chennai Petroleum Corporation Ltd.
- Cochin Refineries Ltd.
- Deepak Fertilisers & Petrochemicals Corporation Ltd.
- Gas Authority of India Ltd.
- Hindustan Petroleum Corporation Ltd.
- Indian Oil Corporation Ltd.
- Indian Petrochemicals Corporation Ltd.
- M anali Petrochemical Ltd.
- M ysores Petrochemicals Ltd.
- N alagarh Refinery
- O il 
- O il & Natural Gas Corporation India Ltd.
- SPIC - SMO
- Reliance Industries Ltd.
- The Andhra Petrochemicals Limited

### Chemical
- Alkyl Amines Chemicals Ltd.
- DCW Ltd.
- Gharda Chemicals Ltd.
- Hindustan Lever Ltd.
- Hindustan Organic Chemicals Ltd.
- India Glycols Ltd.
- Lubrizol India Ltd.
- Maharashtra Aldehydes & Chemicals Ltd.
- National Organic Chemicals Inks Ltd.
- National Peroxide Ltd.
- Punjab Alkalies & Chemicals Ltd.
- United Phosphorus Ltd.

### Fertiliser
- Chambal Fertilisers & Chemicals Ltd.
- Coromandal Fertilisers Ltd.
- Deepak Fertilisers & Petrochemicals Corporation Ltd.
- Godavari Fertilisers & Chemicals Ltd.
- Gujarat Narmada Valley Fertiliser Co. Ltd.
- Indian Farmers Fertilisers Co-op. Ltd.
- Indo-Gulf Fertilisers & Chemicals Corporation Ltd.
- Krishak Bharati Co-op. Ltd.
- M adras Fertilisers Ltd.
- National Fertilisers Ltd.
- O swal Chemicals & Fertilisers Ltd.
- Rashtriya Chemicals & Fertilisers Ltd.
- Tata Chemicals Ltd.
- The Fertilisers & Chemicals Travancore Ltd.
- Zuari Agro Chemicals Ltd.

### Pulp & Paper
- Andhra Pradesh Paper Mills Ltd.
- Ballarpur Industries Ltd.
- ITDC Bhadrachalam Paperboards Ltd.
- Mysores Paper Mills Ltd.
- Orient Paper Mills.
- Tamilnadu Newsprint and Papers Ltd.

### Power Generation
- Ahmedabad Electricity Co. Ltd.
- A. P. State Electricity Board
- Ase Brown Boveri
- Damodar Valley Corporation
- Gujarat Industries Power Co. Ltd.
- Haryana State Electricity Board
- Madhya Pradesh Electricity Board
- Maharashtra State Electricity Board
- National Thermal Power Corporation Ltd.
- Punjab State Electricity Board
- Reliance Energy Ltd.
- Siemens Ltd.
- T. N. Electricity Board
- U. P. State Electricity Board

### Metallurgy
- Bharat Aluminium Co. Ltd.
- Bhushan steel
- Birla Copper
- Essar Steel
- Godavari Power & Ispat Ltd.
- Hindalco Ltd.
- Hindustan Copper Ltd.
- Hindustan Zinc Ltd.
- Ispat Industries Ltd.
- Jindal Vijaynagar Steel Ltd.
- Kerala Minerals & Metals Ltd.
- Kudremukh Iron Ore Co. Ltd.
- NALCO
- Neo Metalliks Ltd.
- Neyveli Lignite Corp. Ltd.
- O rissa Sponge Iron Ltd.
- Steel Authority of India Ltd.
- Sunflag Iron & Steel Ltd.
- Tata Iron & Steel Co. Ltd.
- Tata Metaliks Limited.
- Sesa Goa Limited.

### Synthetic Fibre
- Apollo Fibers
- Bombay Dyeing & Mfg. Co. Ltd.
- Century Enka Ltd.
- Central India Polyster Ltd.
- Garden Silk Mills Ltd.
- Indo-Rama Synthetics India Ltd.
- JCT Ltd.
- J.K. Synthetics Ltd.
- Parasrampuria Synthetics Ltd.
- Raymond Synthetics Ltd.
- SRF Ltd.