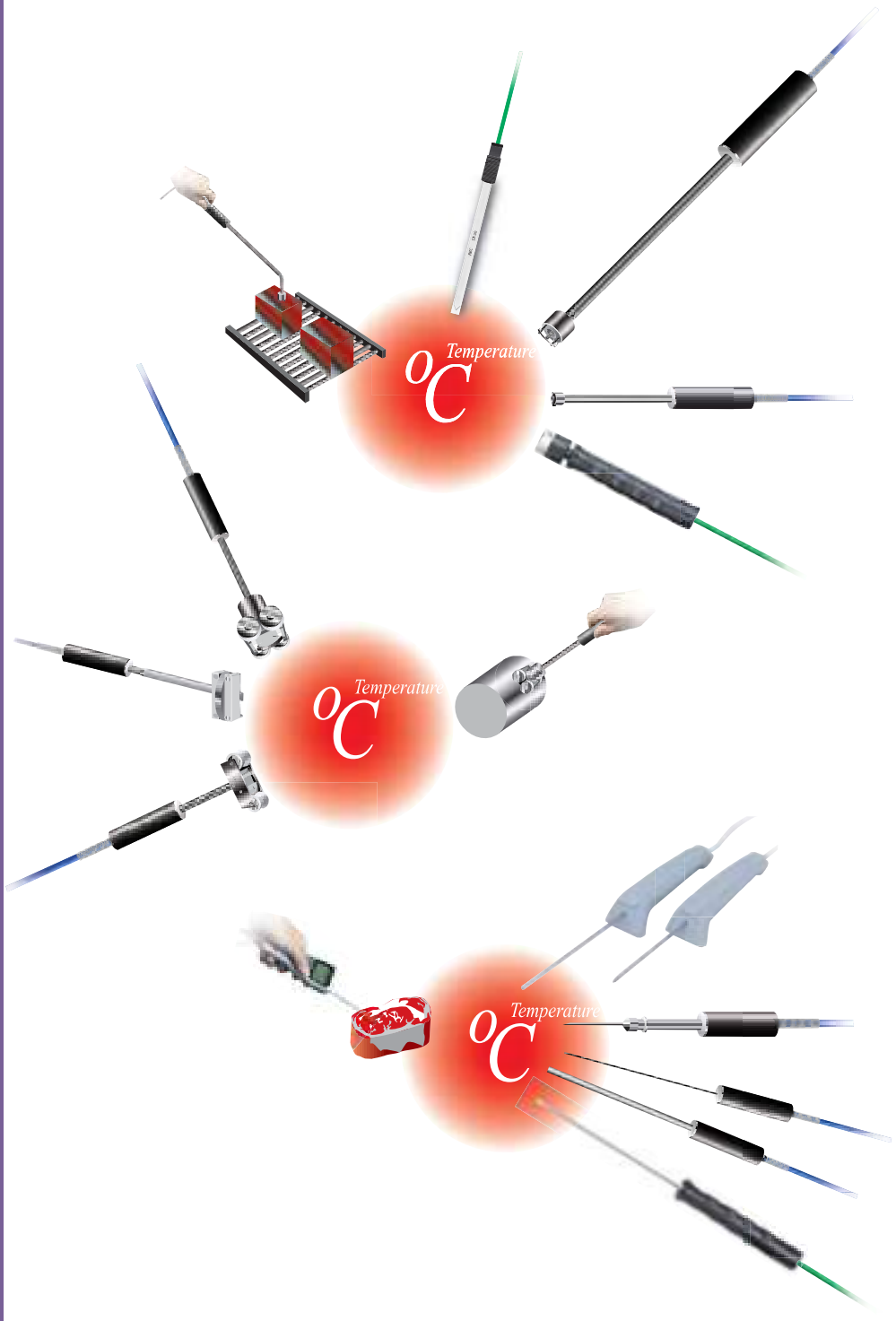
HANDHELD SENSORS

## For Handheld Thermometer

# Temperature Sensors




RKC INSTRUMENT INC.

# For Stationary Surfaces

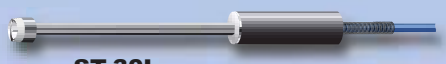
## For General Purpose
Maximum Operating Temperature : 300ºC

Page 6 to 7

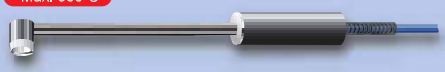
**ST-230L**
Max. 300ºC

Tilting Sensor Head Type **ST-230**
Max. 300ºC

**ST-30**
Max. 300ºC



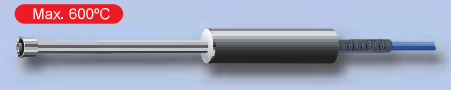
**ST-30L**
Max. 300ºC



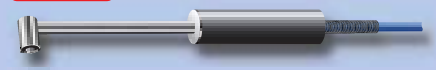
## For Middle/High Temperature
Maximum Operating Temperature : 600ºC

Page 8

**ST-32**
Max. 600ºC



**ST-32L**
Max. 600ºC



## For High Temperature
Maximum Operating Temperature : 1000ºC

Page 9

**ST-29**
Max. 800ºC

**ST-29H**
Max. 1000ºC

**ST-29L**
Max. 800ºC

**ST-29HL**
Max. 1000ºC

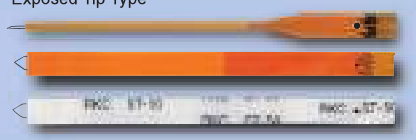
## Film Type Temperature Sensors

Page 10 to 11

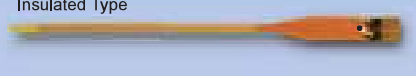
**ST-50/50B/51/51S/51SC/51SB/51B**
Max. 300ºC

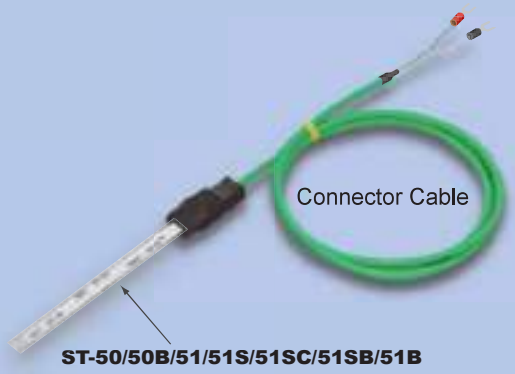
Adhesive Type

Exposed Tip Type



Insulated Type





# For Semi-solid, Viscous Material and Liquids

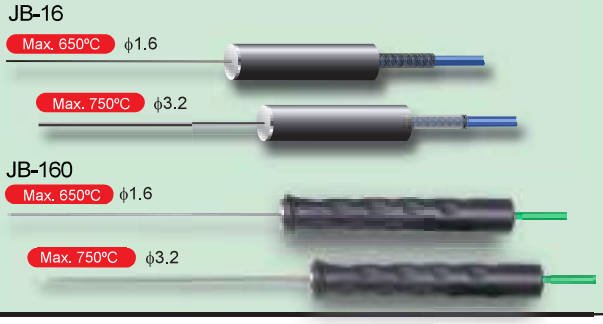
## For General Purpose

Page 12 to 13

**JB-150**
Max. 400ºC
(Tip Sharpened Form)

**JB-16**
Max. 650ºC ϕ1.6
Max. 750ºC ϕ3.2

**JB-160**
Max. 650ºC ϕ1.6
Max. 750ºC ϕ3.2



## For Foods

Page 14

**JB-703**
Max. 400ºC
IP67 Waterproof
(Tip Sharpened Form)
Polish Finishing

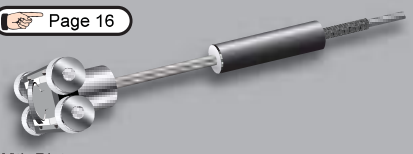
**JB-704**
Max. 400ºC
IP67 Waterproof
Polish Finishing

# For Rotating / Moving Surfaces

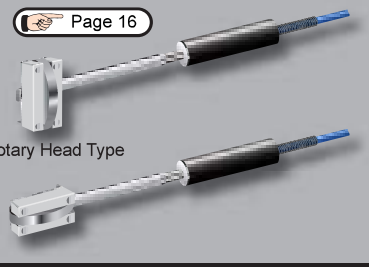
## For Roller and Moving Objects (Sheets)

Page 15

**ST-41**
Max. 300ºC
Page 16
With Distancer



**ST-44**
Max. 300ºC
Page 16
Rotary Head Type



## For Roller

Page 16

**ST-36**
Max. 300ºC

**ST-37**
Max. 300ºC

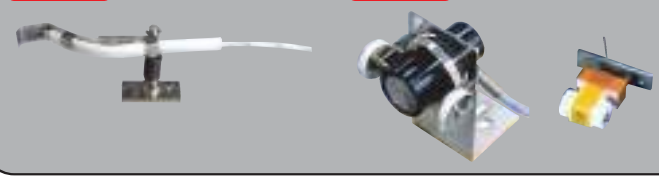
## For Roller and Moving Objects (Sheets)

Page 17

Contact / Non-Contact Type (Built-in type)

**JBS-3898**
Max. 300ºC

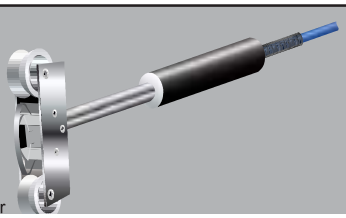
**ST-100/100K**
Max. 300ºC



## For Moving Wire

Page 18

**ST-43**
Max. 300ºC
With Distancer



# Model Code List

| | | |
|---|---|---|
| **JB-150** | Internal of Semi-solid, Viscous Material and Liquids (For General Purpose) • Tip Sharpened Form  | Page 12 |
| **JB-16** | Internal of Semi-solid, Viscous Material and Liquids (For General Purpose)  | Page 12 |
| **JB-160** | Internal of Semi-solid, Viscous Material and Liquids (For General Purpose)  | Page 13 |
| **JB-703** | Internal of Semi-solid, Viscous Material and Liquids (For Food) • Tip Sharpened Form  | Page 14 |
| **JB-704** | Internal of Semi-solid, Viscous Material and Liquids (For Food)  | Page 14 |
| **JBS-3898** | Moving / Rotating Surfaces (For roller, Built-in type)  | Page 17 |
| **ST-230** | Stationary Surfaces, Tilting Sensor Head Type (For General Purpose)  | Page 6 |
| **ST-230L** | Stationary Surfaces, Tilting Sensor Head Type (For General Purpose, L shaped head)  | Page 6 |
| **ST-29** | Stationary Surfaces (For High Temperature), Max.800ºC  | Page 9 |
| **ST-29H** | Stationary Surfaces (For High Temperature), Max.1000ºC  | Page 9 |
| **ST-29HL** | Stationary Surfaces (For High Temperature, L shaped head) Max.1000ºC  | Page 9 |
| **ST-29L** | Stationary Surfaces (For High Temperature, L shaped head) Max.800ºC  | Page 9 |
| **ST-30** | Stationary Surfaces (For General Purpose, Small head)  | Page 7 |
| **ST-30L** | Stationary Surfaces (For General Purpose, Small head, L shaped )  | Page 7 |
| **ST-32** | Stationary Surfaces (For Middle/High Temperature), Max.600ºC  | Page 8 |
| **ST-32L** | Stationary Surfaces (For Middle/High Temperature, L shaped head) Max.600ºC  | Page 8 |
| **ST-36** | Rotating / Moving Surfaces (For Roller)  | Page 16 |
| **ST-37** | Rotating / Moving Surfaces (For Roller)  | Page 16 |
| **ST-41** | Rotating / Moving Surfaces (For roller and moving objects [Sheets])  | Page 15 |
| **ST-43** | Rotating / Moving Surfaces (For moving wire)  | Page 18 |
| **ST-44** | Rotating / Moving Surfaces (For roller, Rotary head type )  | Page 15 |
| **ST-50** | Stationary Surfaces (Adhesive and Exposed Tip Type)  | Page 10 to 11 |
| **ST-100** | Rotating / Moving Surfaces (For Roller, Built-in Type) • Non-Contact Type, For Metal Surface  | Page 17 |
| **ST-100K** | Rotating / Moving Surfaces (For Roller, Built-in Type) • Non-Contact Type, For Insulator Surface  | Page 17 |

# How to read this catalog

Structure of sensor head and measuring part.

• Shape of sensor is provided only for surface measurement sensors.

Model code necessary to order sensors.

Model code of the sensor described on this page.

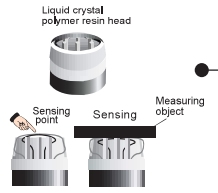
Applicable measured objects and major applications of the sensor.

**ST-230** Stationary Surfaces For General Purpose Maximum Operating Temperature : 300ºC

**ST-230□-K-1000-□□□**

- No symbol : No case
- *K : With case
- /A : Silicon rubber coated cable (Blue) Standard type
- /C : Spiral cable
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  • Please contact distributors regarding more than 1m.
- K : Thermocouple K
- No symbol : Straight type
- L : L shaped type

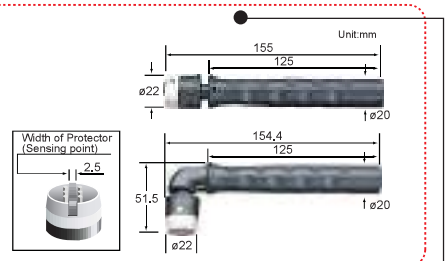
Products with traceability option.




• Tilting sensor head type with free movement head.
The temperature can be accurately measured by pressing the temperature sensor against the object under measurement.
• Dimpled processing for grip
Fitting feeling allows easy gripping with the bare hand or even when wearing gloves.
• Temperature sensor has a maximum operating temperature of 300ºC and is designed to measure the surface temperature of metals and insulators. (Temperature Range : -40 to 300ºC)
• The head is made of a liquid crystal polymer resin that does not scratch the measurement object and has little thermal effect.

| | Response Time Response of 99% | Response Time Response of 90% | Resistance value (With cable 1m) | Accuracy (*) |
|---|---|---|---|---|
| ST-230 ST-230L | 1.1 sec (Metal Surface) | 0.45 sec (Metal Surface) | 7.7Ω | ±1.3°C or ±1.3% of measured temperature (Whichever is larger) |

(*) : Accuracy when temperature on copper metal surface is 100°C.


External appearance and selectable connectors (connecting plugs) for the sensor.

External Dimensions

Overview of a sensor.

## Hardware specifications or optional services for a sensor.

- #400 — Protection tube with #400 buff finish for food application.
- Waterproof (Water washable)
- Products those which traceable documents are available

## Specifications

**Response Time (95% response)**
A time required to indicate 95 % of the temperature range after the sensor has in contact with a measured object.

**Time Constant (63% response)**
A time required to indicate 63 % of the temperature range after the sensor has in contactd with a measured object.

**Resistance value with cable 1m**
Total resistance including a sensor itself and lead wire.

**Accuracy**
Accuracy when temperature on copper metal surface is 100ºC .
• Measurement method depends on the sensor types.

# ST-230 Stationary Surfaces For General Purpose

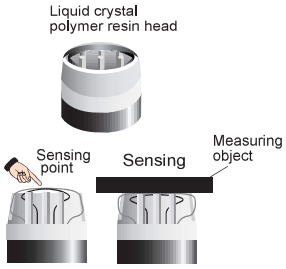
Maximum Operating Temperature : 300°C

## ST-230□- K-1000-□□□

- No symbol : No case
- *K : With case
- /F : Silicon rubber coated cable (Green) Standard type
- /C : Spiral cable
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  - Please contact distributors for cable length more than 1m.
- K : Thermocouple K
- No symbol : Straight type
- L : L shaped type

Products with traceability option.

• For silicon-coated cable of ST-230/230L, with a cable diameter of ø3.3mm.




- Tilting sensor head type with free movement head. The temperature can be accurately measured by pressing the temperature sensor against the object under measurement.
- Dimpled processing for grip. Designed for easy grip with or without gloves.
- Temperature sensor has a maximum operating temperature of 300°C and is designed to measure the surface temperature of metals and insulators. (Temperature Range : -40 to 300°C)
- The head is made of a liquid crystal polymer resin that does not scratch the measurement object and has little thermal effect.

| | Response Time Response of 99% | Response Time Response of 90% | Resistance value (With cable 1m) | Accuracy (*) |
|---|---|---|---|---|
| ST-230 ST-230L | 1.1 sec (Metal Surface) | 0.45 sec (Metal Surface) | 7.7Ω | ±1.3°C or ±1.3% of measured temperature (Whichever is larger) |

(*) : Accuracy when temperature on copper metal surface is 100°C.

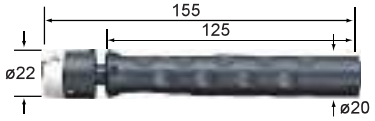
## ST-230L Max. 300°C


Connector for DP-700
Code : 6C
Connector for DP-350
Code : 3C

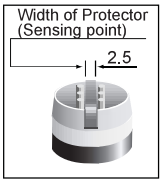
## ST-230 Max. 300°C




Unit:mm

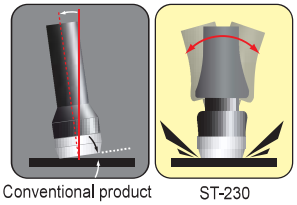



Width of Protector (Sensing point)



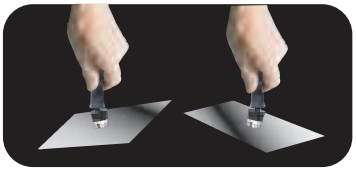


Case for ST-230/230L
Model Code:STJB-K





With a conventional sensor, a gap between the sensing element and the measured object caused by unintentional movement results in measurement error.
The ST-230 uses a tilting head structure which keeps a firm contact and minimizes the influence due to unintentional movement of the sensor.

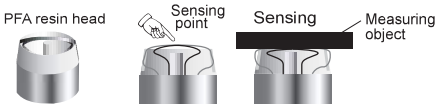


# ST-30□-K-1000-□□□

- No symbol : No case
- *L : With case
- /A : Silicon rubber coated cable (Blue) Standard type
- /C : Spiral cable
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  • Please contact distributors for cable length more than 1m.
- K : Thermocouple K
- No symbol : Straight type
- L : L shaped type

Products with traceability option.

• Standard temperature sensor for metallic and insulated objects, with a Teflon coated head, for measurement up to 300°C maximum.
• Compact head. Suitable for small area measurement.

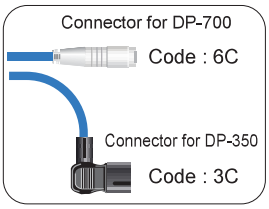



| | Response of 95% | Response of 63% (Time constant) | Resistance value (With cable 1m) | Accuracy (*) |
|---|---|---|---|---|
| ST-30<br>ST-30L | 0,6 sec (Metal Surface) | 0,2 sec (Metal Surface) | 8Ω | ±0.5%±1°C |

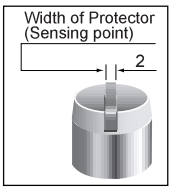
(*) : Accuracy when temperature on copper metal surface is 100°C.

## ST-30 Max. 300°C

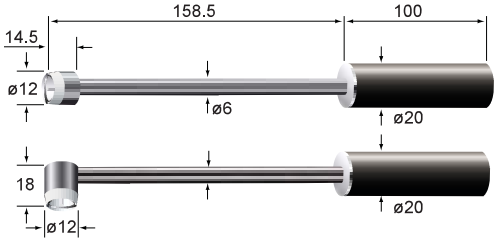

## ST-30L Max. 300°C






Unit:mm



# ST-32

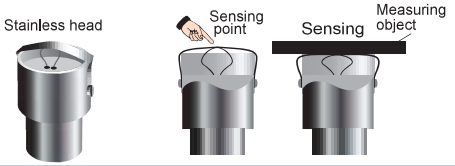
Stationary Surfaces **For Middle/High Temperature** Maximum Operating Temperature : 600°C

## ST-32□- K-1000-□□□

- No symbol : No case
- *L : With case
- /A : Silicon rubber coated cable (Blue) Standard type
- /C : Spiral cable
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  - Please contact distributors for cable length more than 1m.
- K : Thermocouple K
- No symbol : Straight type
- L : L shaped type

Products with traceability option.

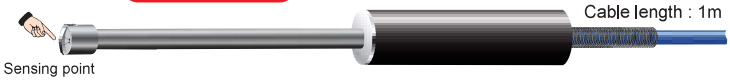
- Standard temperature sensor for metallic objects, for measurement up to 600°C maximum.
- Durable stainless steel head.



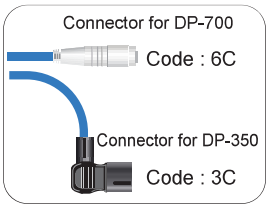

| | Response of 95% | Response of 63% (Time constant) | Resistance value (With cable 1m) | Accuracy (*) |
|---|---|---|---|---|
| ST-32 | 0.7 sec (Metal Surface) | 0.2 sec (Metal Surface) | 7.5Ω | ±0.5%±1°C |

(*) : Accuracy when temperature on copper metal surface is 100°C.

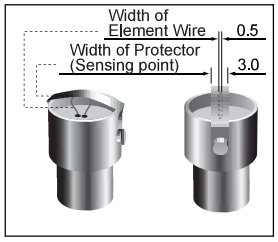
### ST-32 Max. 600°C



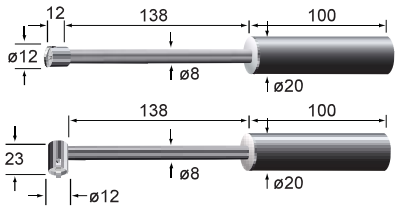

### ST-32L Max. 600°C



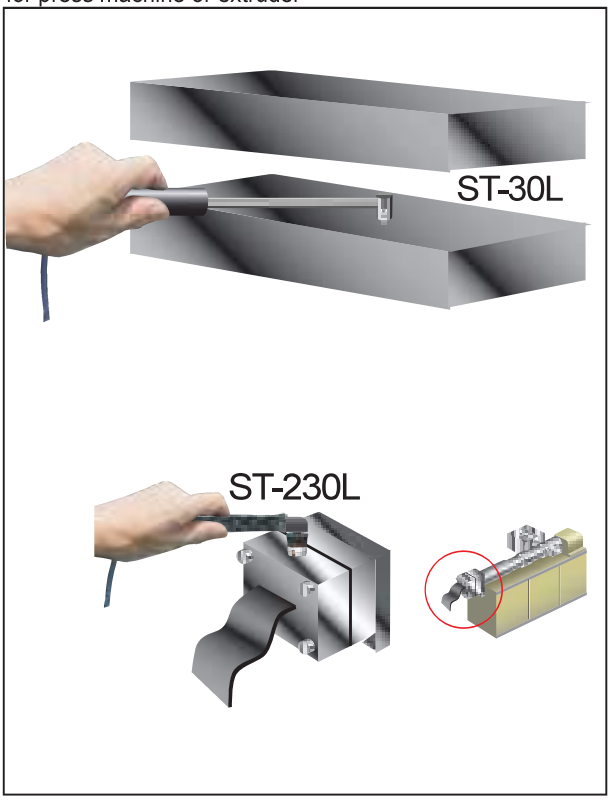



Unit:mm

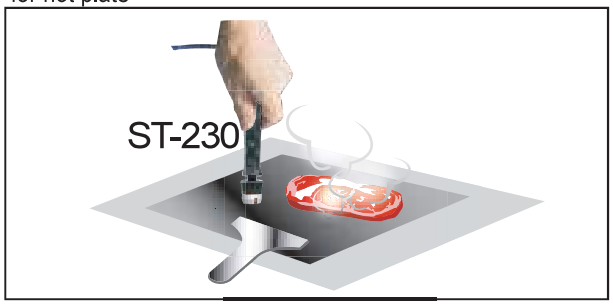



## ● Applications

Mold surface temperature measurement for press machine or extruder




Surface temperature measurement for hot plate




Steel surface temperature measurement

# ST-29□-K-1000-□□

- /A : Silicon rubber coated cable (Blue) Standard type
- /C : Spiral cable
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  - Please contact distributors for cable length more than 1m.
- K : Thermocouple K
- No symbol : Straight type
- L : L shaped type (Standard type)
- H : Straight type (For high temperature)
- HL : L shaped type (For high temperature)

Products with traceability option.

- Standard temperature sensor for metallic objects, for measurement up to 800°C maximum.
- Type H measures up to maximum of 1000°C. *

* The measuring part will deteriorate rapidly if used above 1000°C.

Stainless head

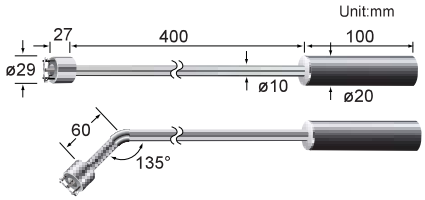

| | Response of 95% | Response of 63% (Time constant) | Resistance value (With cable 1m) | Accuracy (*) |
|---|---|---|---|---|
| ST-29 ST-29L | 0.5 sec (Metal Surface) | 0.1 sec (Metal Surface) | 10.0Ω | ±0.3%±1°C |
| ST-29H ST-29HL | 1.5 sec (Metal Surface) | 0.4 sec (Metal Surface) | 2.0Ω | ±0.5%±1°C |

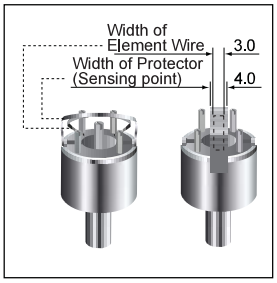
(*) : Accuracy when temperature on copper metal surface is 100°C.

## ST-29 Max. 800ºC
## ST-29H Max. 1000ºC
(For High Temperature)


## ST-29L Max. 800ºC
## ST-29HL Max. 1000ºC
(For High Temperature)

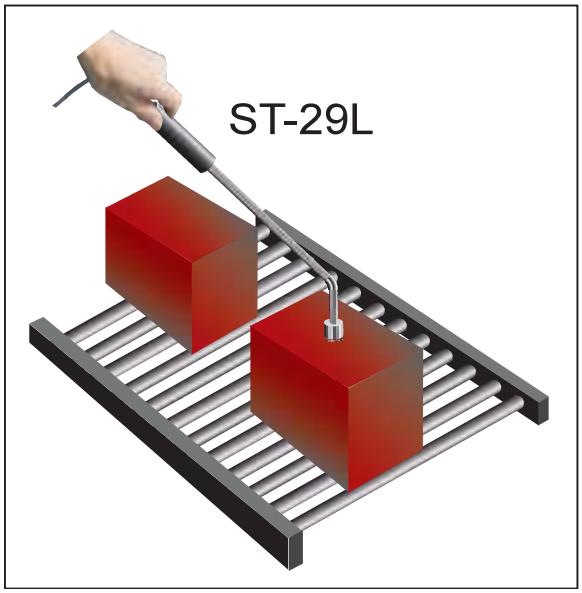

Unit:mm




## ● Applications

● Surface temperature measurement of a steel material after heat treatment



# ST-50 Stationary Surfaces For Extremely Small Surface (Adhesive and Exposed Tip Type)

• A dedicated connecting cable is required. (Sold separately).

## ■ <ST-50> Glass cloth base type

ST-50 (Adhesive type)

| Model Code | Contents |
|---|---|
| ST-50 | Length : 107mm, Element Wire Diameter 50μm, 5 pieces per set |
| ST-50-100-D | Length : 107mm, Element Wire Diameter 100μm, 5 pieces per set |
| ST-50-300 | Length : 307mm, Element Wire Diameter 100μm, 1 piece |
| ST-50-500 | Length : 507mm, Element Wire Diameter 100μm, 1 piece |

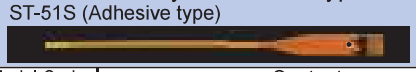
ST-50B (Exposed tip type)

| Model Code | Contents |
|---|---|
| ST-50B-100-04 | Length : 104mm, Element Wire Diameter 50μm, 5 pieces per set |
| ST-50B-100-04-D | Length : 104mm, Element Wire Diameter 100μm, 5 pieces per set |
| ST-50B-300-04 | Length : 304mm, Element Wire Diameter 100μm, 1 piece |
| ST-50B-500-04 | Length : 504mm, Element Wire Diameter 100μm, 1 piece |

• A dedicated connecting cable is required. (Sold separately).

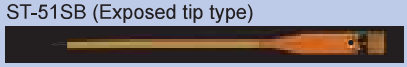
## ■ <ST-51> Polyimide sheet type

ST-51S (Adhesive type)



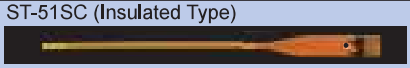
| Model Code | Contents |
|---|---|
| ST-51S-100-C | Length : 107mm, Element Wire Diameter 50μm, 5 pieces per set |

ST-51SB (Exposed tip type)



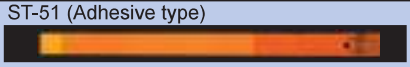
| Model Code | Contents |
|---|---|
| ST-51SB-100-04-C | Length : 107mm, Element Wire Diameter 50μm, 5 pieces per set |

ST-51SC (Insulated Type)



| Model Code | Contents |
|---|---|
| ST-51SC-100-C | Length : 107mm, Element Wire Diameter 50μm, 5 pieces per set |

ST-51 (Adhesive type)



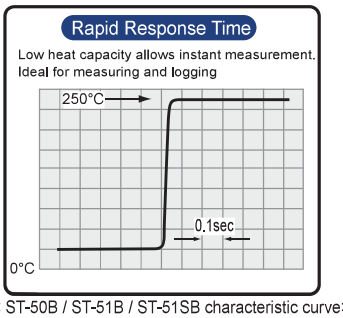
| Model Code | Contents |
|---|---|
| ST-51-100-C | Length : 107mm, Element Wire Diameter 50μm, 5 pieces per set |

ST-50B (Exposed tip type)

| Model Code | Contents |
|---|---|
| ST-51B-100-04-C | Length : 107mm, Element Wire Diameter 50μm, 5 pieces per set |

- Ideal for measuring hard-to-reach target with its thin film design.
- Compatible with all Type K Thermocouple Input instruments.
- Easily stick on target with Self-Adhesive Type or insert between two touching surfaces with Exposed Tip Type. Use Polyimide (PI) Insulated Type for applications where electrical insulation is needed.

<W-ST50A>
Connector Cable for ST-50/ST-51
(Connecting cable for DP-350 with a 3C plug)




< ST-50B / ST-51B / ST-51SB characteristic curve>

## ST-50/51

<Actual Size>


**ST-51S** Max. 300ºC Narrow Version, Adhesive type, Polyimide sheet type

<Actual Size>


**ST-51SB** Max. 300ºC Narrow Version Exposed tip type, Polyimide sheet type

<Actual Size>


**ST-51SC** Max. 300ºC Narrow Version Insulated Type, Polyimide sheet type

<Actual Size>


**ST-51** Max. 300ºC Adhesive type, Polyimide sheet type

<Actual Size>


**ST-51B** Max. 300ºC Exposed tip type, Polyimide sheet type

<Actual Size>


**ST-50** Max. 300ºC Adhesive type, Glass cloth base type

<Actual Size>

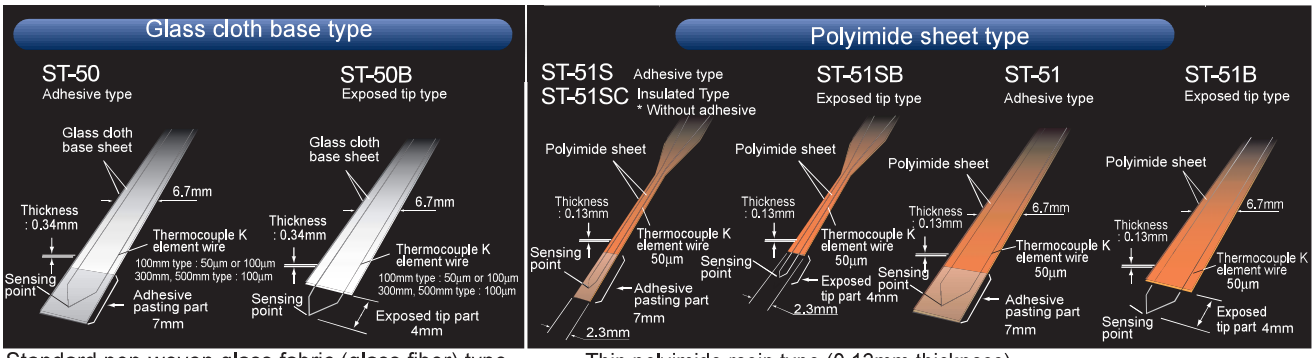

**ST-50B** Max. 300ºC Exposed tip type, Glass cloth base type

| | Response of 95.0% *1 | Resistance value (With cable 1m) | Accuracy |
|---|---|---|---|
| **ST-51S** (50μm element wire) | 0.08sec | 51Ω | ±1.2°C |
| **ST-51SB** (50μm element wire) | 0.03sec | 51Ω | ±1.2°C |
| **ST-51SC** (50μm element wire) | 0.5sec | 51Ω | ±1.2°C |
| **ST-51** (50μm element wire) | 0.08sec | 51Ω | ±1.3°C |
| **ST-51B** (50μm element wire) | 0.03sec | 51Ω | ±1.3°C |
| **ST-50** (50μm element wire) | 0.08sec | 51Ω | ±1.3°C |
| **ST-50-100-D** (100μm element wire) | 0.08sec | 17Ω | ±1.5°C |
| **ST-50-300** (100μm element wire) | 0.08sec | 41Ω | ±1.5°C |
| **ST-50-500** (100μm element wire) | 0.08sec | 66Ω | ±1.5°C |
| **ST-50B** (50μm element wire) | 0.03sec | 51Ω | ±1.3°C |
| **ST-50B-100-D** (100μm element wire) | 0.03sec | 17Ω | ±1.5°C |
| **ST-50B-300** (100μm element wire) | 0.03sec | 41Ω | ±1.5°C |
| **ST-50B-500** (100μm element wire) | 0.03sec | 66Ω | ±1.5°C |

*1 : Response when temperature of paraffin is 250°C (482°F).
*2 : Accuracy when temperature on metal surface is 100°C (212°F).

Response of Metal Surface (Adhesive type)

| |
|---|
| 50μm element wire type : 0.4sec |
| 100μm element wire type : 0.9sec |




Standard non-woven glass fabric (glass fiber) type.
100mm/300mm/500mm types are available.

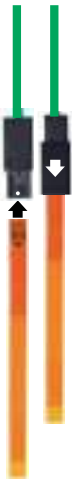
- For a 100mm long thermocouple wire type, available diameter is either 50µm or 100µm.
- For 300mm or 500mm long thermocouple wire types, available diameter is only 100µm.

Thin polyimide resin type (0.13mm thickness)
Low dust emission allows for a clean operating environment.

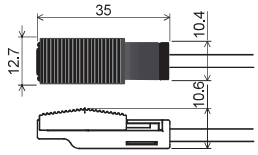
- Please consult with our local distributors for either 300mm or 500mm type requirement

## ■ Connector Cable Specifications

| | |
|---|---|
| Connector material | PPS resin |
| Connector Max. temperature | 230°C |
| Cable | ø3.3 Extended cable, Standard 1m |
| Cable material | Silicon rubber coated (Green) |
| Resistance value | 7.0Ω or less (1m) |
| Cable Max. temperature | 180°C |
| Weight | Approx 20g (Cable 1m, Y-sharped terminal lug type) |



## ● Connector External Dimension Unit : mm




## ■ Sensor Specifications

| | |
|---|---|
| Sheet Material | ST-50/50B : Glass cloth base sheet<br>ST-51/51S/51B : Polyimide sheet |
| Operating Temperature | ST-51S/51SC/51SB : -40 to 300°C (-40 to 577°F)<br>ST-50/50B/51S/51B : 0 to 300°C (32 to 577°F) |
| Adhesive Tape | • Up to 150°C:<br>Can be stuck and peeled off repeatedly.<br>• Up to 200°C:<br>Can be stuck and peeled off repeatedly under the condition that the temperature is not lowered below 150°C.<br>• Up to 250°C:<br>Can be stuck and peeled off repeatedly under the condition that the temperature is not lowered below 200°C.<br>• More than 250°C:<br>Adhesive will burn and harden. Depending upon the environment, the number of times the adhesive can be reused is limited. |
| Thermocouple | Type K |
| Sensor Length | ST-50/50B : 100/300/500mm Type<br>ST-51/51S/51B : 100mm Type |
| Sensor Thickness | ST-50/50B : 0.34mm<br>ST-51/51S/51SC/51SB/51B : 0.13mm |
| Element wire diameter | ST-50/50B : 50µm/100µm (100mm Type)<br>100µm (300/500mm Type)<br>ST-51/51S/51SC/51SB/51B : 50µm |
| Insulation resistance (ST-51SC) | More than 10MΩ at 500V DC |
| Dielectric voltage (ST-51SC) | 500V AC for one minute. |

## ■ Connector Cable Model Code

- A dedicated connecting cable is necessary for use with ST-50/51/50B/51B sensors. (Sold separately)

**ST-50/51/51S/50B/51B**

Connector Cable

Cable length : 1m (Standard)

- Please consult with our local distributors for cable length more than 1m.

W-ST50A-1000-3C — Connector for DP-350

W-ST50A-1000-6C — Connector for DP-700

Handheld Thermometer DP-350 DP-700

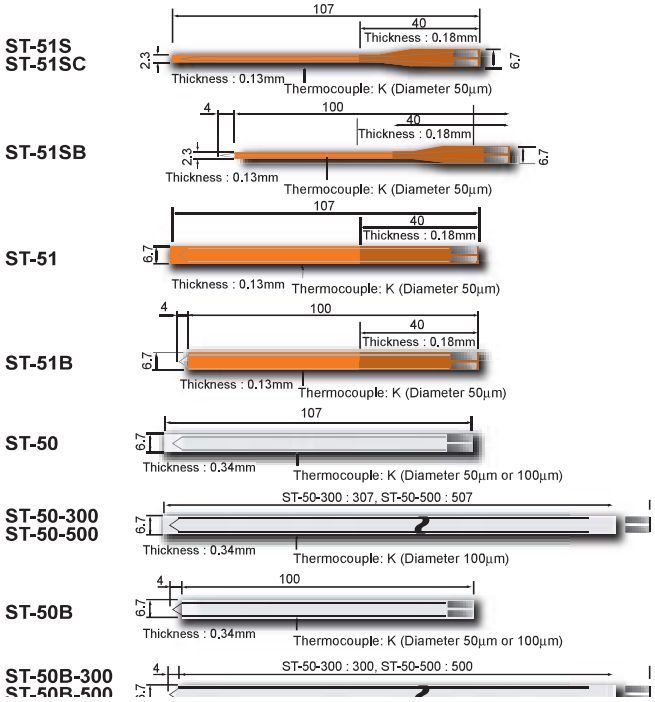
Indicator, Controller, Recorder

W-ST50A-1000-Y3 — Y-shaped terminal lug


- Cable termination: soldered or bare end, with a TC connector to order.

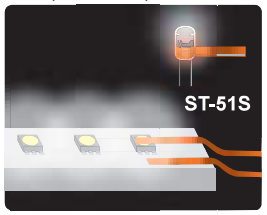
Temperature measuring instrument (Thermocouple K input type)

## ● Sensor External Dimension Unit : mm

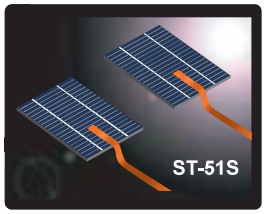



## ● Applications

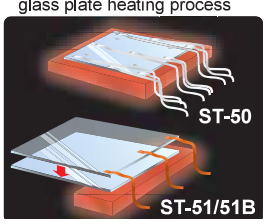
● Temperature inspection for LED



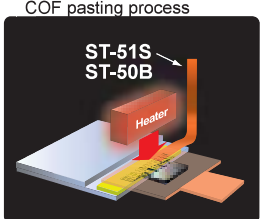

● Temperature distribution on the surface of solar cells.




● Temperature inspection for glass plate heating process




● Temperature inspection for COF pasting process



# JB-150 / JB-16

For Semi-solid, Viscous Material and Liquids

# For General Purpose

## JB-150-K-□-1000-□□□

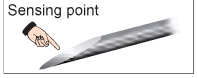
- No symbol : No case
- *L : With case
- /F : Silicon rubber coated cable (Green)
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  - Please contact distributors for cable length more than 1m.
- 50 : Protection tube 50mm
- K : Thermocouple K

Products with traceability option.

- A needle type temperature sensor. Its needle shaped protection tube tip can be stuck into a semi-solid object.

(Tip Sharpened Form)

Sensing point

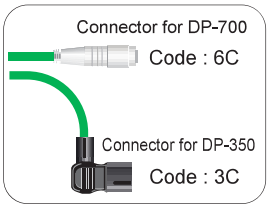


| | Response of 90% | Resistance value (With cable 1m) |
|---|---|---|
| JB-150 | 0.6 sec (Boiling Water) | 11Ω |

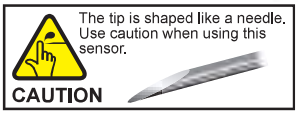
| Accuracy |
|---|
| Less than 333°C : ±2.5°C<br>More than 333°C : ±0.0075•\|t\|<br>(t=Measured temperature) |

## JB-150 Max. 400°C






Case for JB-15
Model Code:STJB-L




## JB-16-K-□-□-1000-□□□

- No symbol : No case
- *K : With case (Fits only for a sensor with 100mm protection tube and 1m lead wire.)
- /A : Silicon rubber coated cable (Blue) Standard type
- /C : Spiral cable
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  - Please contact distributors for cable length more than 1m.
- 100: Protection tube 100mm (Standard)
  - Please contact distributors for protection tube more than 100mm.
- 1.6 : Protection tube diameter : ø1.6 (*)
- 3.2 : Protection tube diameter : ø3.2 (*)
- K : Thermocouple K

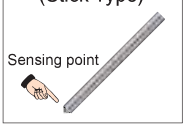
Products with traceability option.

(*) Available with sheath diameter of 1.0mm/2.3mm/4.8mm/6.4mm.

- This is a stick type temperature sensor for internal temperature measurement of the object. This sensor can be dipped into liquids or stuck into a semi-solid objects.

(Stick Type)

Sensing point



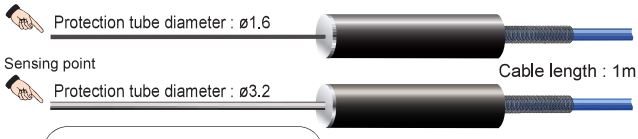
| JB-16 | Response of 95% | Response of 63% (Time constant) |
|---|---|---|
| ø1.6 | 1.00 sec (Boiling Water) | 0.15sec (Boiling Water) |
| ø3.2 | 2.50 sec (Boiling Water) | 0.50sec (Boiling Water) |

| JB-16 | Resistance value (With cable 1m) |
|---|---|
| ø1.6 | 3.9Ω |
| ø3.2 | 1.7Ω |

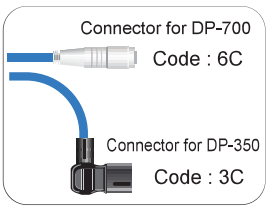
| Accuracy |
|---|
| Less than 333°C : ±2.5°C<br>More than 333°C : ±0.0075•\|t\| |

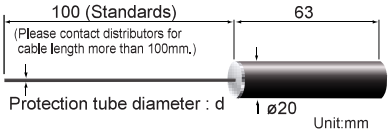
## JB-16 Max. 650°C : ø1.6 / Max. 750°C : ø3.2

Sensing point




Nicrobell sheathed type is also available. Recommended for frequent measurement of high temperature objects. Please consult with our local distributors.




Case for JB-16
(Fits only for a sensor with 100mm protection tube and 1m lead wire.)
Model Code:STJB-K

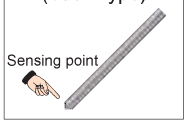
# JB-160- K-□-□ -1000-□□□

- No symbol : No case
  *L : With case
- /F : Silicon rubber coated cable (Green) Standard type
- 3C : Connector for DP-350
  6C : Connector for DP-700
- 1000 : Cable length 1m
  • Please contact distributors for cable length more than 1m.
- 100: Protection tube 100mm
  150: Protection tube 150mm
- 1.6 : Protection tube diameter : ø1.6
  3.2 : Protection tube diameter : ø3.2
- K : Thermocouple K

Products with traceability option.

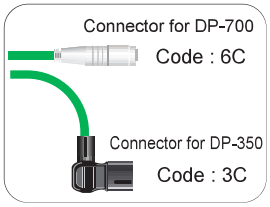
• Dimpled handle for easy grip with or without gloves.

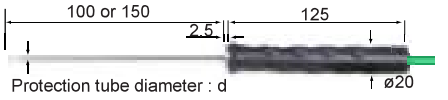
(Stick Type)




| JB-160 | Response of 90% | Resistance value (With cable 1m) | Accuracy |
|---|---|---|---|
| ø1.6 | 0.7 sec (Boiling Water) | 12Ω | Less than 333°C : ±2.5°C<br>More than 333°C : ±0.0075•\|t\| |
| ø3.2 | 1.4 sec (Boiling Water) | 9Ω | |

**JB-160** Max. 650°C : ø1.6
Max. 750°C : ø3.2

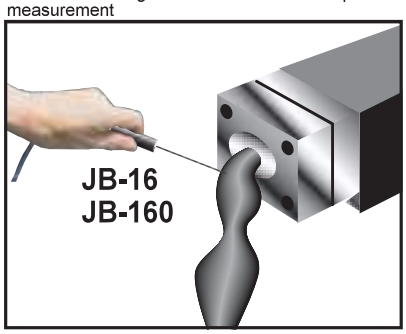



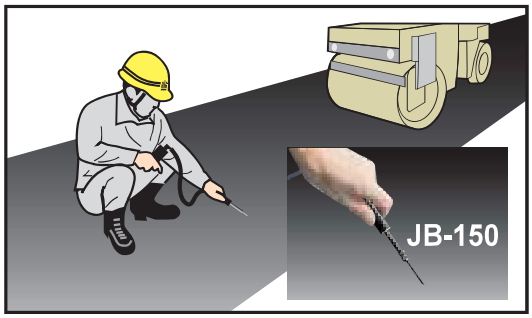

Unit:mm


## ● Applications

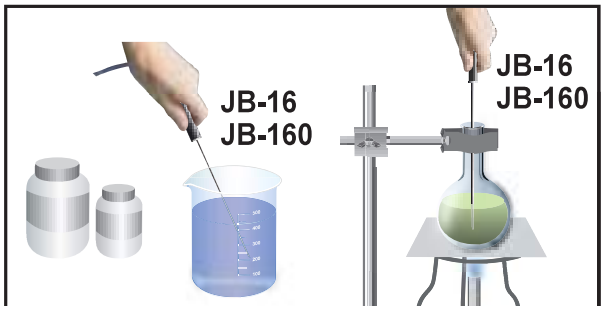
Extrusion molding machine outlet resin temperature measurement



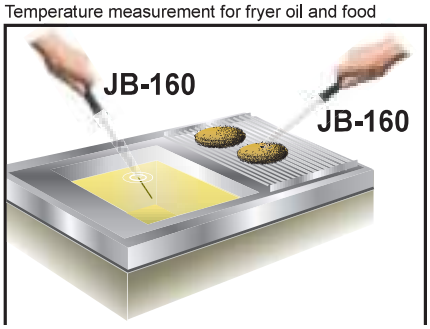

Internal temperature measurement of asphalt during road paving




Reaction temperature measurement of chemical solutions.
(Not available for corrosive liquids such as sulfuric acid.)




Temperature measurement for fryer oil and food



# JB-703 / JB-704

For Semi-solid, Viscous Material and Liquids

# For Producing Foods

## JB-703 A-K-1000-6C/E

For DP-700

(Tip Sharpened Form)

- /E : Silicon rubber coated cable (White)
- 6C : Connector for DP-700
- 1000 : Cable length 1m
- K : Thermocouple K
- A : Protection tube : #400 polish finishing, Waterproof

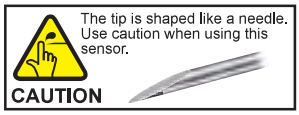
Waterproof

#400 polish finishing

Products with traceability option.


### JB-703 Max. 400°C


(Tip Sharpened Form, Polish Finishing)

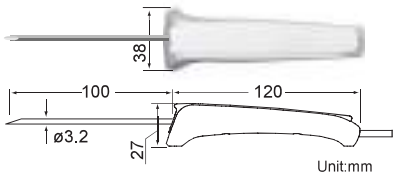



- A stick type temperature sensor for food and general use. Exclusively designed for use with our DP-700. Its protecting tube is buff finished.
- IP67 waterproof structure. The sensor and DP-700 when connected together can be washed with water.
- JB-703, having a needle shaped protection tube tip, allows for insertion into a relatively solid object.

| | Response of 90% | Resistance value (With cable 1m) |
|---|---|---|
| JB-703 | 1.1 sec (Boiling Water) | 7.6Ω |

Accuracy

Less than 333°C : ±2.5°C
More than 333°C : ±0.0075•|t|
(t=Measured temperature)




Unit:mm

## JB-704 A-K-3.2-100-1000-6C/E

For DP-700

- /E : Silicon rubber coated cable (White)
- 6C : Connector for DP-700
- 1000 : Cable length 1m
- 100: Protection tube 100mm
- 3.2 : Protection tube diameter : ø3.2
- K : Thermocouple K
- A : Protection tube : #400 polish finishing, Waterproof

Waterproof

#400 polish finishing

Products with traceability option.


### JB-704 Max. 400°C

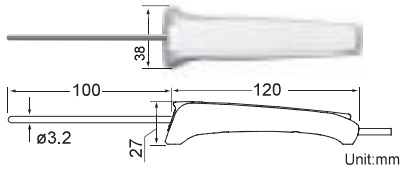

(Polish Finishing)

- A stick type temperature sensor for food and general use. Exclusively designed for use with our DP-700. Its protecting tube is buff finished.
- IP67 waterproof structure. The sensor and DP-700 when connected together can be washed with water.

| | Response of 90% | Resistance value (With cable 1m) |
|---|---|---|
| JB-704 | 1.9 sec (Boiling Water) | 18.5Ω |

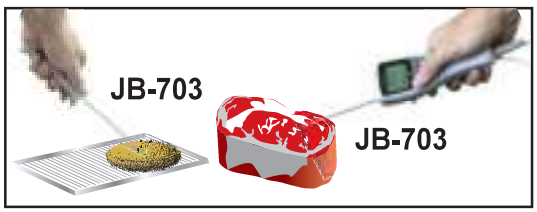
Accuracy

Less than 333°C : ±2.5°C
More than 333°C : ±0.0075•|t|
(t=Measured temperature)

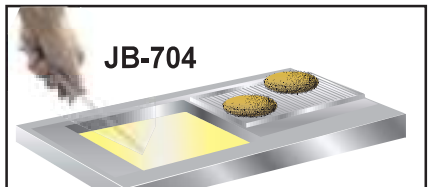



Unit:mm

## Applications




Internal temperature measurement of food. (Core temperature).




Internal temperature measurement for fryer oil and food.

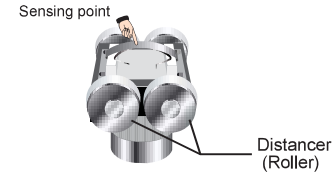
Attachable at the back of DP-700.
Measurement can be done with one hand.

# ST-41-K-1000-□□

- /A : Silicon rubber coated cable (Blue) Standard type
- /C : Spiral cable
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  - Please contact distributors for cable length more than 1m.
- K : Thermocouple K

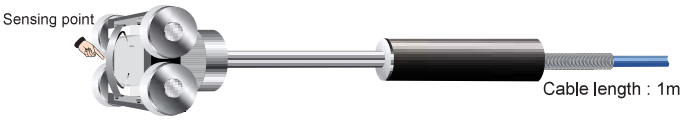
Products with traceability option.

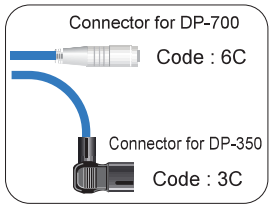
- Optimum contact pressure is obtained with the distancers for stable and accurate temperature measurement.
- The measuring part adjusts to fit the surface of the item to be measured.




| | Response of 95% | Response of 63% (Time constant) | Resistance value (With cable 1m) |
|---|---|---|---|
| ST-41 | 0.7 sec (Metal Surface) | 0.3 sec (Metal Surface) | 1.6Ω |

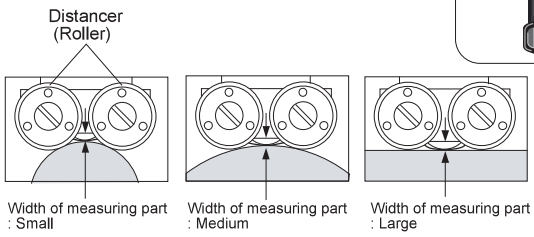
## ST-41 Max. 300°C



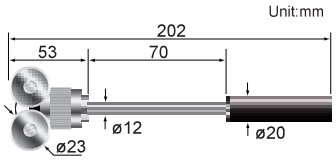



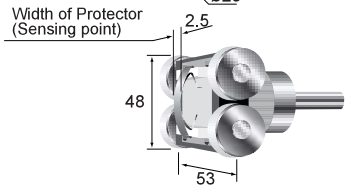

| Accuracy (*) | Error due to frictional heat |
|---|---|
| ±0.3%±1°C | Less than 1°C (Metal Roller Speed : 700mm/sec) |

(*) : Accuracy when temperature on copper metal surface is 100°C.




The measuring part is adjusts to fit the surface of the item to be measured.



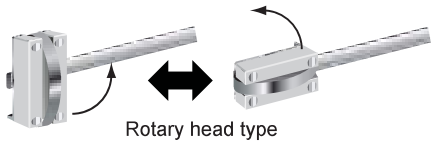

# ST-44-K-1000-□□

(Rotary head type)

- /A : Silicon rubber coated cable (Blue) Standard type
- /C : Spiral cable
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  - Please contact distributors for cable length more than 1m.
- K : Thermocouple K

Products with traceability option.

- Swivel head sensor to cope with roller movement at different directions.
- Teflon resin head is applied. This temperature sensor is for rolling and moving objects and gives minimal damage to the other parts of measured objects.

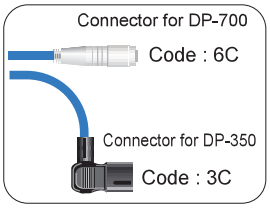


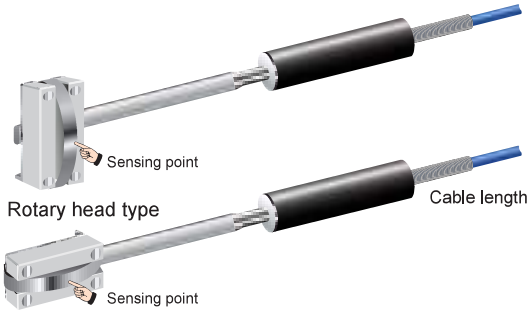

| | Response of 95% | Response of 63% (Time constant) | Resistance value (With cable 1m) |
|---|---|---|---|
| ST-44 | 0.7 sec (Metal Surface) | 0.2 sec (Metal Surface) | 23Ω |

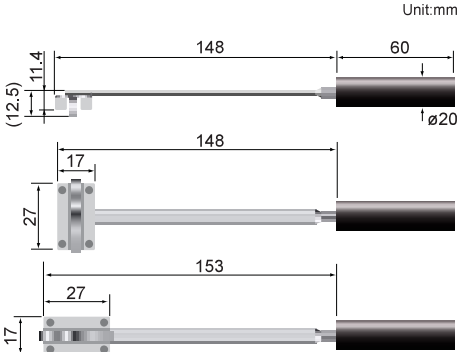
| Accuracy (*) | Error due to frictional heat |
|---|---|
| ±0.3%±1°C | Less than 2°C (Metal Roller Speed : 700mm/sec) |

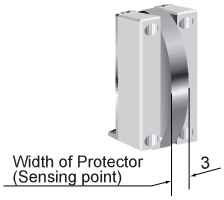
(*) : Accuracy when temperature on copper metal surface is 100°C.

## ST-44 Max. 300°C



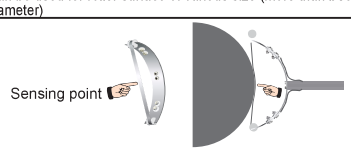



# ST-36-K-1000-□□

/A : Silicon rubber coated cable (Blue) Standard type
/C : Spiral cable
3C : Connector for DP-350
6C : Connector for DP-700
1000 : Cable length 1m
• Please contact distributors for cable length more than 1m.
K : Thermocouple K

Products with traceability option.

• An arc-shaped sensor is placed in contact with the roller surface of the object to measure surface temperature of the roller.
• Can be used for roller surface of various size (more than ø60mm diameter)

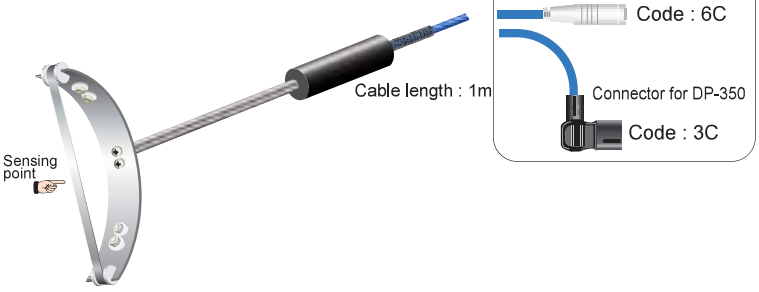


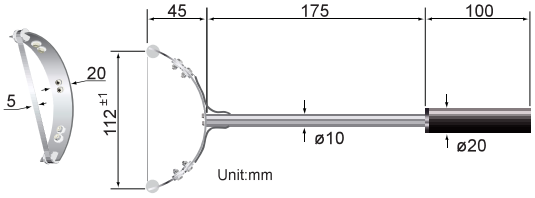

| | Response of 95% | Response of 63% (Time constant) | Resistance value (With cable 1m) |
|---|---|---|---|
| ST-36 | 1.7 sec (Metal Surface) | 0.4 sec (Metal Surface) | 1.9Ω |

| Accuracy (*) | Error due to frictional heat |
|---|---|
| ±0.5%±1°C | Less than 2°C (Metal Roller Speed : 700mm/sec) |

(*) : Accuracy when temperature on copper metal surface is 100°C.

## ST-36 Max. 300°C




# ST-37-K-1000-□□

/A : Silicon rubber coated cable (Blue) Standard type
/C : Spiral cable
3C : Connector for DP-350
6C : Connector for DP-700
1000 : Cable length 1m
• Please contact distributors for cable length more than 1m.
K : Thermocouple K

Products with traceability option.

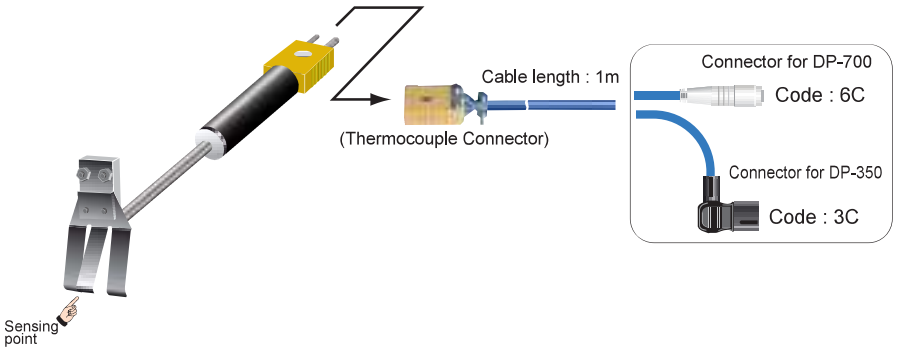
• Spring type temperature sensor of roller surface.
• Temperature measurement of moving and rolling objects.

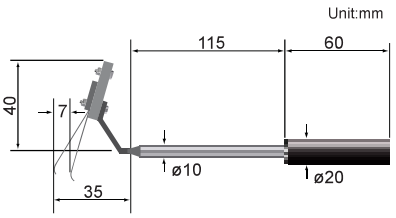

| | Response of 95% | Response of 63% (Time constant) | Resistance value (With cable 1m) |
|---|---|---|---|
| ST-37 | 2.2 sec (Metal Surface) | 0.4 sec (Metal Surface) | 4.0Ω |

| Accuracy (*) | Error due to frictional heat |
|---|---|
| ±2%±1°C | Less than 1°C (Metal Roller Speed : 700mm/sec) |

(*) : Accuracy when temperature on copper metal surface is 100°C.

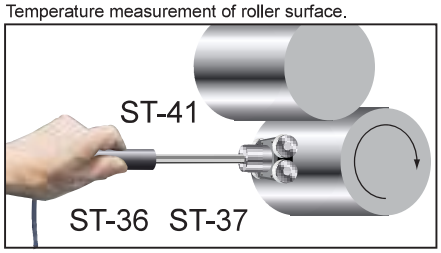
## ST-37 Max. 300°C



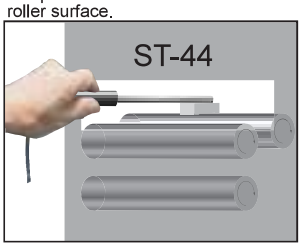




## Applications

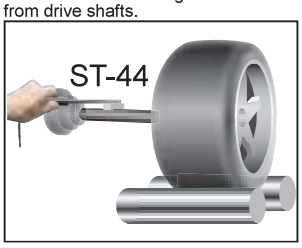
Temperature measurement of roller surface.



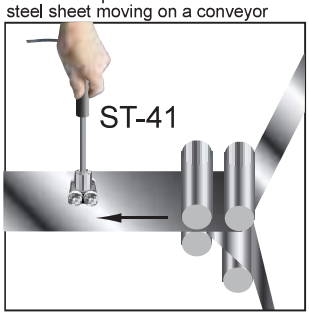

Temperature measurement of roller surface.




Measurement of heat generation from drive shafts.




Surface temperature measurement of steel sheet moving on a conveyor



# Contact / Non-Contact Type (Installation Type)

If the moving/rolling objects are too fast to measure with a handheld sensor, a fixed type surface temperature measurement sensor (JBS-3898) is recommended.
To reduce friction heat influence, ST-100 (for metallic surface) or ST-100K (for insulated surface) is recommended

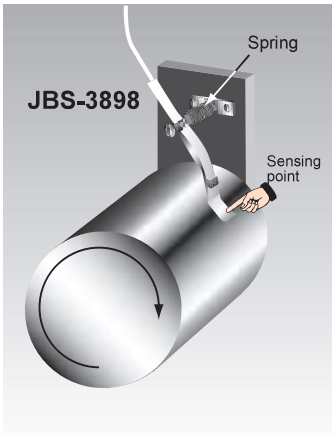
Only spade lug (Y-shaped lug) is available for lead wire terminal. Please use it with panel mount type indicators.

**Contact type**

Temperature Sensors
For Rotating / Moving Surface

**JBS-3898** Max. 300°C


• Right and left rolling types are available.




Panel Mounting Type Indicator

High Performance Indicator with Alarm
**AG500**
96×48×60mm (W×H×D)

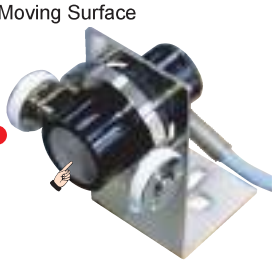
Indicator with Alarm
**AE500**
96×48×100mm (W×H×D)

A table-top box is also available.
This can be easily set up for use.

**For Metal Surface, Non-Contact Type**

Temperature Sensors
For Rotating / Moving Surface

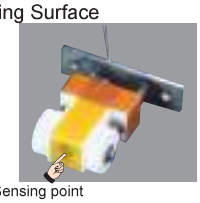
**ST-100**
Max. 300°C



**For Insulator surface, Non-Contact Type**

Temperature Sensors
For Rotating / Moving Surface

**ST-100K**
Max. 260°C



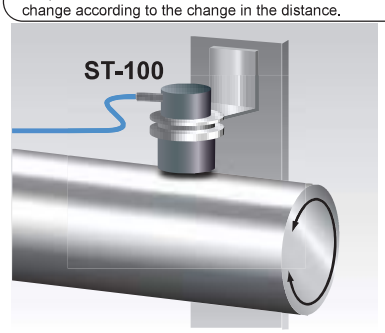

ST-100K is not designed for metal surface temperature measurement.

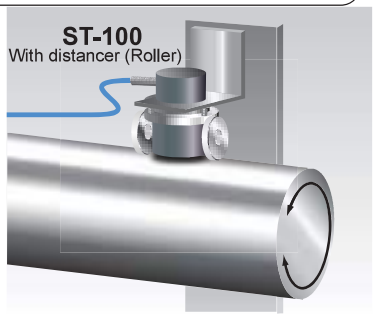
Measuring method : Non-contact
Measuring element : Thermocouple K
Element wire diameter : 0.08mm (ST-100)
0.076mm (ST-100K)
Measuring range : Ambient temperature to 300°C (ST-100)
Ambient temperature to 260°C (ST-100K)
Response time : Approx.30 sec (Response of 98%)
Measuring accuracy : a) ST-100
Within ±3°C (at 200°C)
* When output is adjusted in the middle of the measuring range.
b) ST-100K
Within ±2°C
(Ambient temperature to 150°C)
Within ±5°C (150 to 260°C)
Measuring distance : a) ST-100 0.5 to 1.5mm
Keep a certain distance when measuring.
(1mm when it is with distancer)
b) ST-100K 0.5mm (Fixed)
Output signal : Thermocouple K output
Lead wire : ST-100 : ϕ6 Silicone rubber protection lead (KX type, 3m)
ST-100K : Fiberglass
Output impedance : 50Ω (ST-100), 15.4Ω (ST-100K)

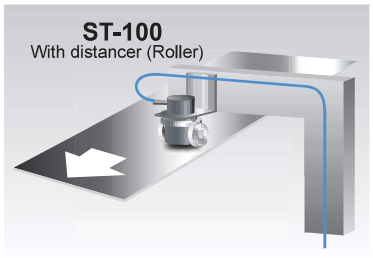
## Non-contact temperature measurement of a shiny object surface is also possible. (with ST100 only)

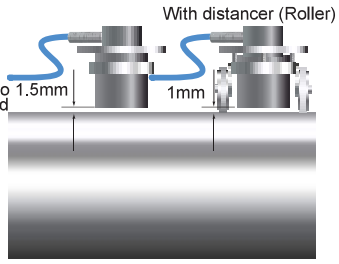
Interconnected triple temperature sensing elements enable surface temperature measurement of shiny metallic object, which was not possible with an infrared pyrometer.
Moreover, it can be connected to an indicator and a controller for K type thermocouple since output characteristics are similar to traditional contact-type thermocouple

Keep a constant distance between the sensor and the measured object. Otherwise, measured values will change according to the change in the distance.

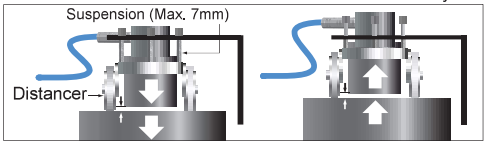



Please use a distancer if the surface of the measured object moves up and down.



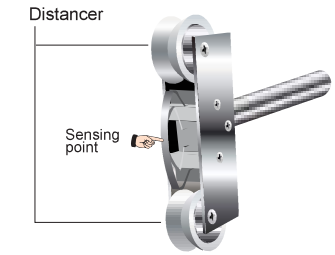

Please refer to a separate catalog for more details.

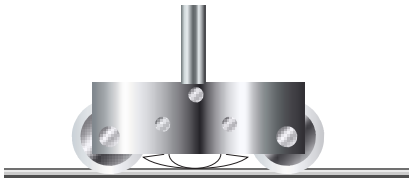
# ST-43-K-1000-□□*□

- P3 : Protector width 3mm
- P4 : Protector width 4mm
- /A : Silicon rubber coated cable (Blue) Standard type
- /C : Spiral cable
- 3C : Connector for DP-350
- 6C : Connector for DP-700
- 1000 : Cable length 1m
  - Please contact distributors for cable length more than 1m.
- K : Thermocouple K

Products with traceability option.

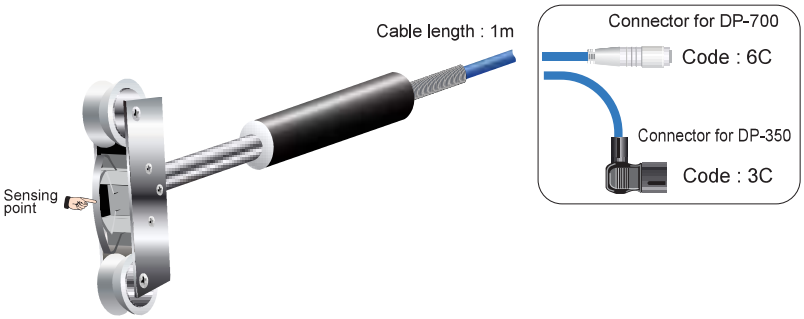
• Distancers are installed. They maintain appropriate distance between the sensors and the measured objects, and realize accurate and steady temperature measurement.



Measurable Wire Diameter : ø10 to ø30

## ST-43 Max. 300°C

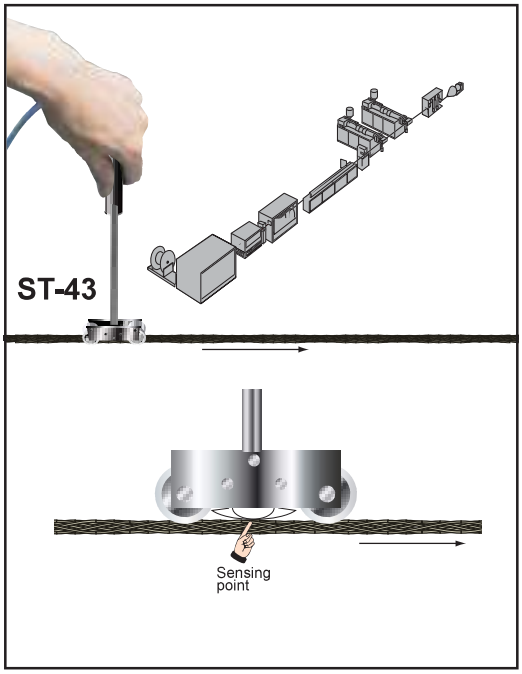


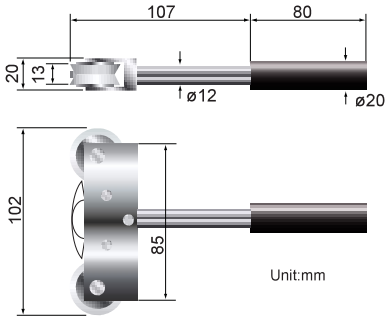

| | Response of 95% | Response of 63% (Time constant) | Resistance value (With cable 1m) |
|---|---|---|---|
| ST-43 | 1.0 sec (Metal Surface) | 0.3 sec (Metal Surface) | 1.6Ω |

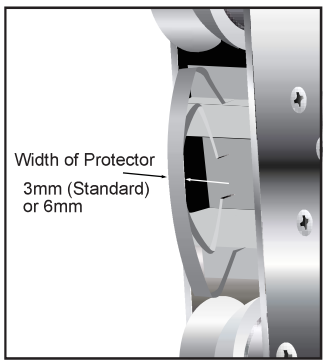
| Accuracy (*) | Error due to frictional heat |
|---|---|
| ±0.5%±1°C | Less than 1°C (Metal Roller Speed : 700mm/sec) |

(*) : Accuracy when temperature on copper metal surface is 100°C.

Preliminary heat measurement in the wire extrusion process



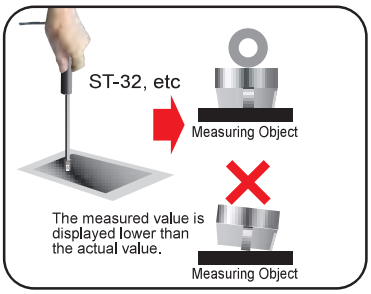



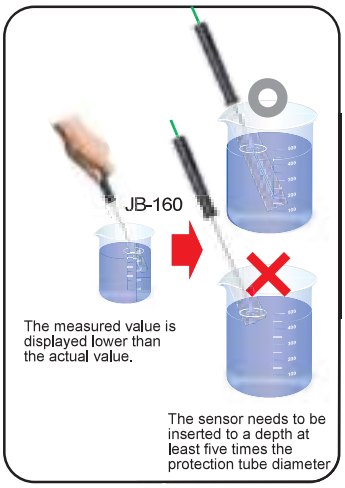
# Supplemental information

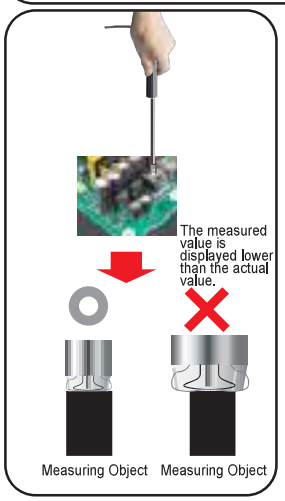
# Measurement error and response

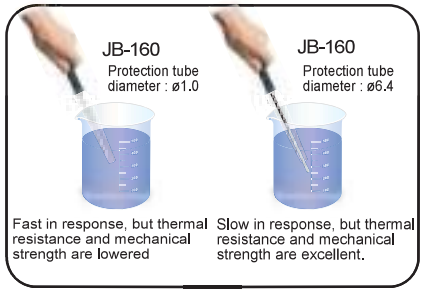
In the contact temperature measurement method, it is very important to keep the sensor in full contact with the object being measured. Read the values only after both temperatures equal each other. Occasionally you will find that the measured value is lower than the actual value or that the sensor response time is slow. In the case of the former, a lower measured value against the actual often occurs when the sensor and the measured object are loosely connected. Tightening the connection generally solves the problem.

With regard to response time, the sensor is usually the issue. The sensor can be replaced with another type that offers faster responses. This will often solve the problem. On the other hand, using sensors with faster response times can sometimes sacrifice mechanical strength and heat resistance capability which can cause a problem as well.
In order to measure temperature quickly and accurately, it is most important to select the proper sensor to fit the application.



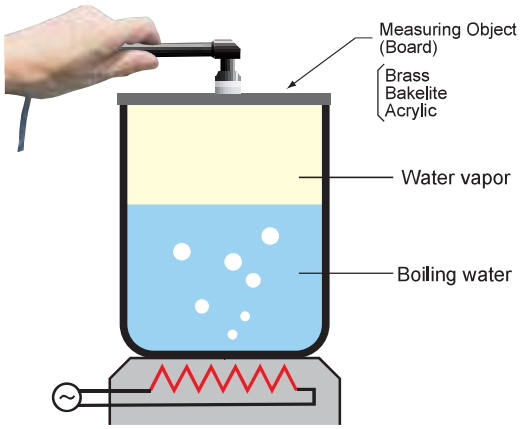




## ● Indication speed is largely affected by the material of the measured object

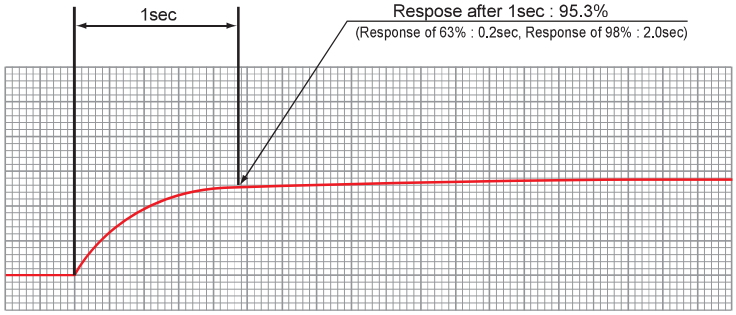
The response is determined by the material of the measured object. The higher the thermal conductivity, the faster the response.
The table shows test data on “the relation between the indication speed and the material of the measured object.

The test data was obtained as illustrated in the picture. In this test setup, water is boiled and the temperature of the object is measured as illustrated below.




| Material | Measuring time | Response (%) | Measuring time | Response (%) | Measuring time | Response (%) | Measuring time | Response (%) |
|---|---|---|---|---|---|---|---|---|
| Brass t=1 | 1sec | 95.3 | 2sec | 98.0 | 3sec | 98.5 | 10sec | 99.2 |
| Bakelite Primary color t=5 | 6sec | 92.7 | 10sec | 95.0 | 14sec | 95.7 | 16sec | 96.2 |
| Bakelite Black t=5 | 15sec | 91.9 | 30sec | 92.5 | 60sec | 93.6 | 180sec | 96.4 |
| Acrylic Transparency t=5 | 15sec | 90.3 | 30sec | 92.4 | 60sec | 93.8 | 180sec | 96.7 |

## ● Response

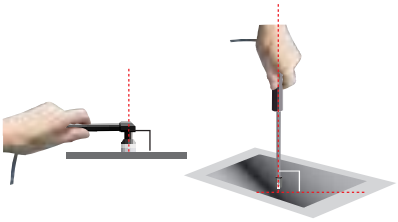


# Precautions for Temperature Sensor

| | |
|---|---|
| **High Temperature Caution** | Immediately after the temperature measurement, the measuring part of the sensor (head or tip) may be hot.<br>Do not touch the measuring part soon after the measurement.<br>Likewise, do not touch the measuring part soon after measuring low temperatures. If the surface is too cold and you may be injured..<br>Please wait until temperature returns to ambient temperature. |

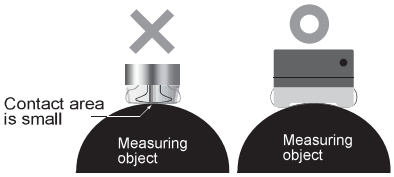
## ● Temperature Sensors for Stationary Surface

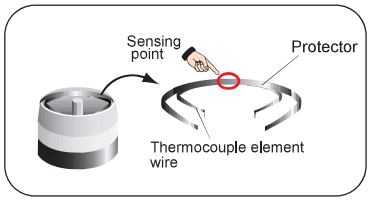
1. Measurement errors caused by position
Place the sensor head vertically in contact with the measured object or
Error may be observed.



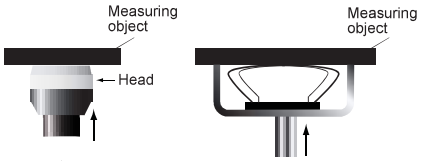
2. Stains on the surface of the measuring part
Stains or rusts on the measuring object may cause measurement errors.

3.Shape and size of the object
Basically, the measuring part should be bigger than the sensors' head. Objects smaller than the head may lose temperature to the protector and the head and measurement errors may occur.
If there is unevenness on the object surface, measurement errors may occur because of the gap between the object and the measuring point (protector) or the insufficient contact between them. To avoid such errors, please select a sensor for measuring tiny objects or a sensor for rotating/moving items.




4.Contact pressure
Each sensor has a stopper to prevent damage to the guide and measuring part.
Place the sensor on the measured surface so that the guide is firmly in contact with the measured objects.



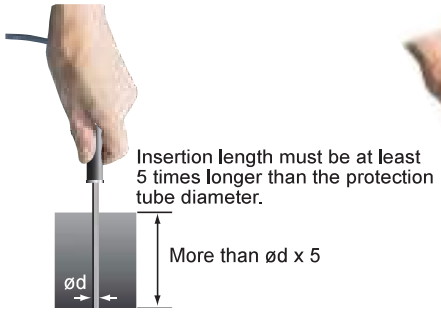

5.Other precautions
The sensor may be damage if shifted horizontally or rotated during measurement.
Sensors may be damaged if used above the maximum operating temperature.
If the sensor is kept in contact with an object over a long period of time, used on a curved surface such as a roller, or pressed with a load exceeding the normal load range, a mark may be left on the measurement surface.

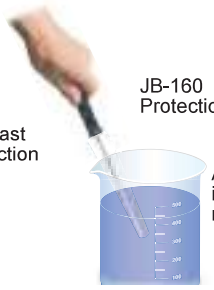
## ● Temperature Sensors for Rotating / Moving Surface

1. For curved and moving surface
Please choose a suitable sensor for measuring curved and moving surface. Use of unsuitable sensor may cause not only measurement errors but also damage to the sensor itself
2. For fast moving and rotating measured objects
Fixed type sensor for a moving and rotating object is available. (Model code:JBS-3898) If the surface of the measured object is rough, friction heat may affect the accuracy. Please try to use this sensor for an object with a smooth surface.
If frictional heat is critical, a non-contact type thermocouple (Model ST-100) is available.

## ● Temperature Sensors for Semi-solid and Liquid

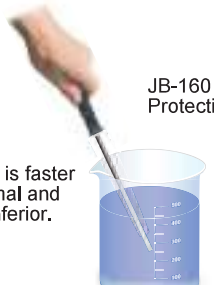
Sensors designed for measuring the internal temperature of liquid and semi-solid objects cannot be used for solid surface measurement.
Temperature is measured at the tip of the protection tube, which needs to be inserted at least five times deeper than the protection tube diameter.
A thinner protection tube is faster in response, but its thermal and mechanical strength is inferior. On the contrary, a thicker protection tube is slower in response, but its thermal and mechanical strength is superior.



JB-160
Protection tube diameter : ø1.0

A thinner protection tube is faster in response, but its thermal and mechanical strength is inferior.



JB-160
Protection tube diameter : ø6.4

A thicker protection tube is slower in response, but its thermal and mechanical strength is superior.

# Traceability

Traceability certifies that the calibration/measuring equipment used in manufacturing is also calibrated and meet national standards.

## ● Structure of traceability documents

Traceability documents consist of 1. Traceability system chart, 2. Test report of Reference standards equipment, 3.Test report of Intermediate standards equipment, 4.Test report of Working standards equipment, and 5.Test report of the product.
A set of traceability documents consists of all of the above documents (1-4) except for the test report of the product (5).

# Testing and Calibration

## ● Testing and calibration of temperature sensor or indicator

We will test and calibrate either a specified temperature sensor or a specified indicator.
Temperature sensors are tested and calibrated using our calibration system, water baths, hot plate, etc., in comparison to the actual temperature.
For a temperature indicator, the output from the reference standard is given to the indicator for test and measurement in comparison with the actual temperature value.

or

## ● Testing and Calibration for a set of sensor and indicator

We will test and calibrate a specified temperature sensor and a specified indicator together as a set.
Test and calibration methods are the same as the case for the sensor.
If you just need a certificate for the indicator only, we will prepare it as an option.

## ● A set of sensor and indicator received from a customer.

At our lab we can test and calibrate the temperature sensor and the indicator now in use at a customer's site.
Methods of testing and calibration for the above are similar to that of a set of a sensor and a indicator

- Repair and/or calibration fee(s) may be charged.
- We may be able to conduct testing and calibration for products other than ours. Please consult with us for availability.

## ● Documents

### Traceability documents

1. Traceability system chart
2. Test report of Reference standards equipment
3. Test report of Intermediate standards equipment
4. Test report of Working standards equipment (Attached if necessary)

■ Individual Documents
- Traceability system chart
- Test report of Reference standards equipment
- Calibration Certificate

### Indicator Test Report

DP-350 Calibration temperature points (ºC)
-190.0, 0.0, 600,1190ºC (4 points)

Calibration temperature points not on the below chart are available. (please specify when ordering.)

DP-700 Calibration temperature points (ºC)
-190.0, -100.0, 0.0, 400.0, 800.0, 1000, 1300 (7 points)

Calibration temperature points not on the below chart are available. (please specify when ordering.)

### Temperature Sensor Test Report

Calibration temperature points (ºC) : See page 23

### Test Report for a set of sensor and indicator

Calibration temperature points (ºC) : See page 23

# Traceability

## Calibration Temperature Range

| Model Code | Max. Operating Temperature | Calibration Temperature Range (°C) | Standard Calibration Temperature (3 points) *3 |
|---|---|---|---|
| **JB-150** *1 | 400 | - 40 to 400 | 100, 200, 300°C |
| **JB-16** *1, *2 | 750(ø3.2) | - 40 to 400 | 100, 200, 300°C |
| **JB-160** *1, *2 | 750(ø3.2) | - 40 to 400 | 100, 200, 300°C |
| **JB-703** *1 | 400 | - 40 to 400 | 100, 200, 300°C |
| **JB-704** *1 | 400 | - 40 to 400 | 100, 200, 300°C |
| **ST-23** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-23L** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-230** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-230L** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-29** | 800 | 30 to 500 | 100, 200, 300°C |
| **ST-29L** | 800 | 30 to 500 | 100, 200, 300°C |
| **ST-29H** | 1100 | 30 to 500 | 100, 200, 300°C |
| **ST-29HL** | 1100 | 30 to 500 | 100, 200, 300°C |
| **ST-30** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-30L** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-32** | 600 | 30 to 500 | 100, 200, 300°C |
| **ST-32L** | 600 | 30 to 500 | 100, 200, 300°C |
| **ST-36** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-37** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-41** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-43** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-44** | 300 | 30 to 300 | 100, 200, 300°C |
| **ST-45L** | 300 | 30 to 300 | 50, 100, 150°C |
| **ST-46** | 300 | 30 to 300 | 50, 100, 150°C |
| **ST-46L** | 300 | 30 to 300 | 50, 100, 150°C |

*3 : Calibration temperature points not on the below chart are available. (please specify when ordering.) (Without any specification, calibration temperature points are as on the chart.)

*1 : -70°C calibration temperature point is available.
*2 : Please note that burns may be caused on the protection pipe for 800°C calibration temperature point for a sensor with ø6mm protection pipe.

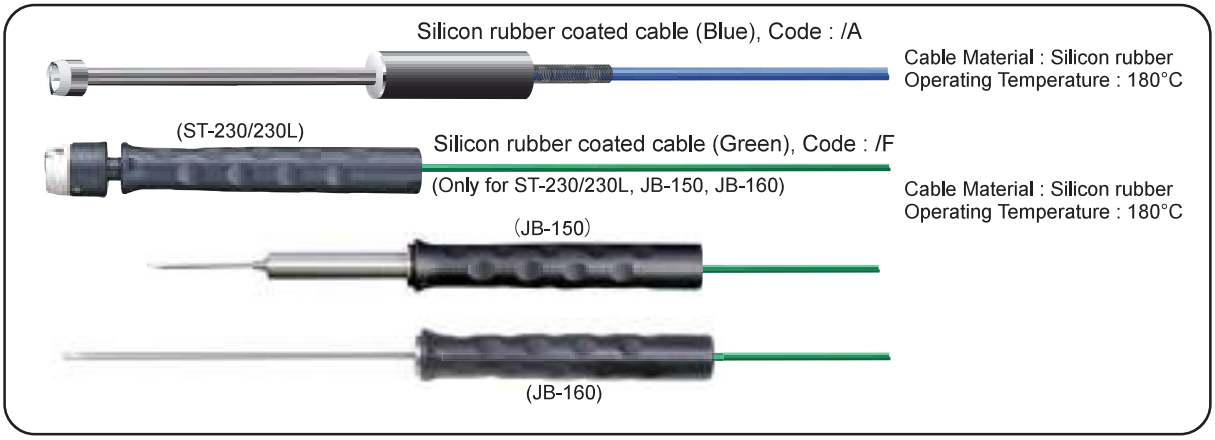
**Caution** For ST-50/ST-50B, and ST-51/ST-51S/ST-51B, traceability documents are is not available.

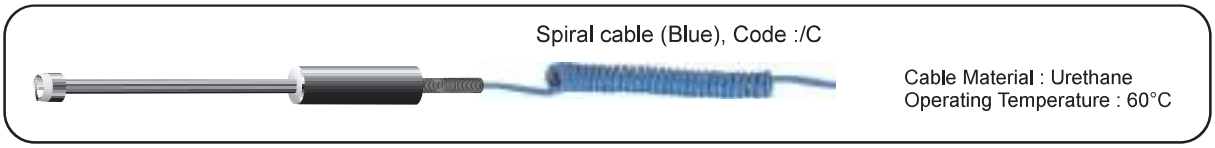
Tip Type Tempeature Sensors ST-50/50B ST-51/51S/51B

# Cable

## ● Shape and material

The standard sensor cable is straight, ø6mm, and blue silicon covered. (For ST-230/230L, JB-160 cable is straight, ø3.3mm, and green urethane covered.)
Spiral, φ3.5mm, and urethane covered type is also available.(Except some models)



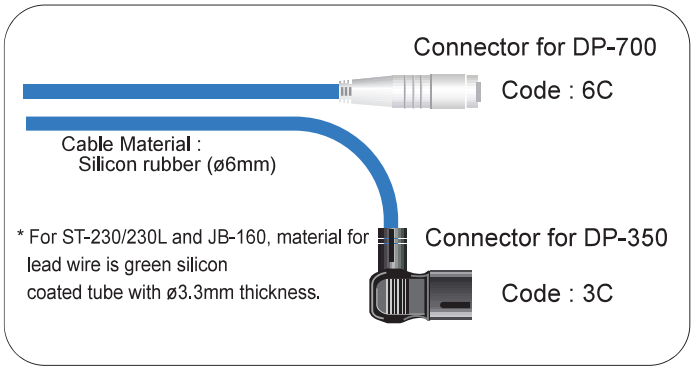




## ● Cable length

The standard cable length is 1 meter. If a cable longer than 1 meter is necessary, please contact with our local distributors.

# Connector and Terminal

Connecting plug for the handheld thermometer, 6C plug for DP-700 and 3C plug for DP-350, can be selected from the suffix code.



# Discontinued Models and Models

## Discontinued Models

### JB-15

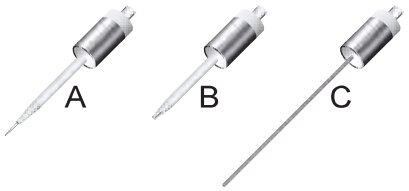
Final production date : MAR. 2019

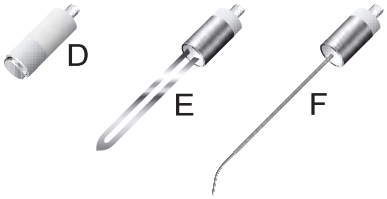
### ST-23

### ST-23L

Final production date : NOV. 2016

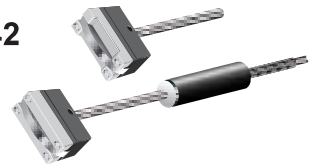
### ST-31



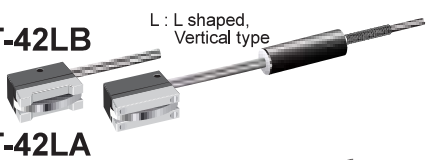

Final production date : MAY. 2011

### ST-42

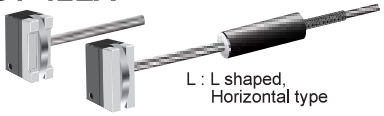


### ST-42LB

L : L shaped,
Vertical type



### ST-42LA



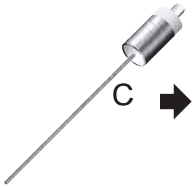
L : L shaped,
Horizontal type

Final production date : MAY. 2011

## Models

### JB-150

### ST-230
### ST-230L

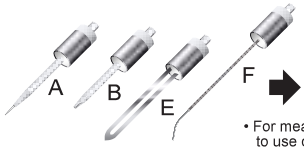



### JB-16

Protection Tube Diameter : ø1.6

### ST-230

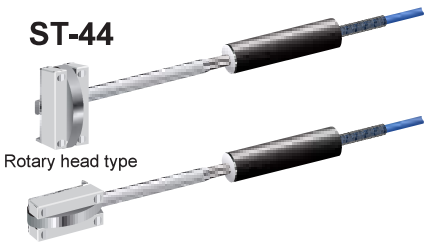

• Outer width of this head is 22mm.
Unavailable for the measurement of the objects with less than ø22mm.




No models

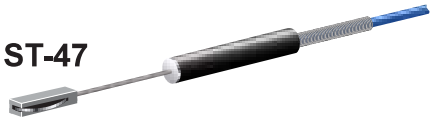
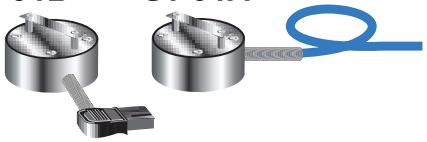
• For measurement of a tiny space, we recommend you to use our ST-50 and ST-55/56.

### ST-44



Rotary head type

# Discontinued Models and Models

| Discontinued Models | Models |
|---|---|
| **ST-47**<br>  <br>Final production date : MAY. 2011 | **ST-30L**<br>  <br>18mm<br>• Height of this head is 18mm.<br>Measurement is impossible when the gap is less than 20mm.<br><br>**ST-44**<br>Rotary head type<br>  <br>12.5mm<br>• Height of this head is 12.5mm.<br>Measurement is impossible when the gap is less than 14mm. |
| **ST-91B** **ST-91A**<br>  <br>Final production date : MAY. 2011 | No models |

# Handheld Thermometer

## Handheld Thermometer
## DP-700

• Temperature sensor is separate.

The DP-700 is a high accuracy thermometer with powerful functions, such as data logging, USB connection, peak high and low temperatures, burnout (broken sensor) display, remaining battery service display and automatic power off. The variety of functions supports managing temperature data efficiently.

Model Code :
**DP-700A/E**
No USB
- Data Logging : 99 logs
- Waterproof/Dustproof : IP67

Accessories : LR6 (IEC and JIS) Alkaline battery, Strap

Model Code :
**DP-700B/E**
With USB
- Data Logging : 9999 logs
- Waterproof/Dustproof : IP54

Accessories : LR6 (IEC and JIS) Alkaline battery, Strap, USB cable 1m

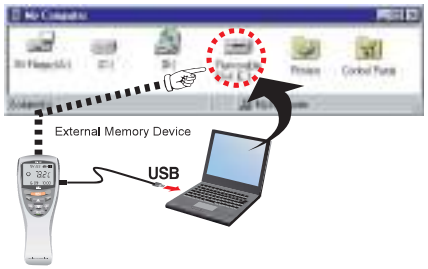
### Specifications

| | |
|---|---|
| Measuring Accuracy | : ±(0.1% of reading + 1digit) or ±0.3°C (±0.6°F) (Whichever is larger) |
| Sampling Time | : Approx. 0.5 sec. |
| Display | : Reflective FSTN LCD |
| External Dimensions | : 57 x 152 x 46mm (W x H x D) |
| Power Supply | : Type LR6 (based on IEC and JIS) alkaline battery, One battery |
| Weight | : Approx 150g |
| Major Functions | : Data logging (DP-700A : 99 logs, DP-700B : 9999 logs) Logging interval time : 0 (Manual log mode) 1 to 3600 sec. (Auto log mode) USB function (Only for DP-700B) Tag number / User name registration High/Low limit alarm, PV bias, PV digital filter Peak high and low temperature, Automatic Power OFF Battery alarm |

Cable Adapter (3C to 6C)
**A-DP700**

Sensor for DP-350

Easy to read and manage data with PC




By connecting DP-700B to USB port, a PC recognizes DP-700B as outside media.
* OS : Windows 7/8.1/10
Measured data can be stored in the file in the CSV format.

## Handheld Thermometer
## DP-350

• Temperature sensor is separate.

The DP-350 is an economical thermometer with a wide temperature range and useful functions, such as measured value and peak hold, sensor burnout, battery alarm, and automatic power off.

Model Code :
**DP-350C∗A**

Accessories : LR6 (IEC and JIS) Alkaline battery, Strap

### Specifications

| | |
|---|---|
| Measuring Accuracy | : ±(0.2% of indicated value + 1digit) or ±2°C (4°F) (Whichever is larger) |
| Sampling Time | : 0.3 sec. |
| Display | : Reflective TN LCD |
| External Dimensions | : 52 x 145 x 25mm (W x H x D) |
| Power Supply | : Type LR6 (based on IEC and JIS) alkaline battery, 2 pcs. |
| Weight | : Approx 140g |
| Major Functions | : Peak high and low temperature Automatic Power OFF, Battery alarm |

Panel Mounting Type Indicator

High Performance Indicator with Alarm
**AG500**
96×48×60mm (W×H×D)

Indicator with Alarm
**AE500**
96×48×100mm (W×H×D)

### ■ DP-350 Optional

**Anti-shock cover (Silicon jacket)**

**Hard carrying case**

**Soft case**

### ■ DP-350 Model Code

| Model Code | Accessory (Optional) |
|---|---|
| DP-350C*A | No option |
| DP-350C*A-1 | With anti-shock cover (Silicon jacket) * |
| DP-350C*A-2 | With hard carrying case * |
| DP-350C*A-3 | With soft case * |

* Purchase of each cover only is available.
Refer to the following part numbers:
350P-K01: Anti-shock cover (Silicon jacket)
350P-K02: Hard carrying case
350P-K03: Soft case