



Thermometers with Electric Contact

OUTLINE

This thermometer with an electric contact is an indicating thermometer in which an electric contact is installed. The contact can be set at any positions. A pressure type thermometer, in which liquid is charged and its expansion and contraction due to temperature change is applied, is used as a temperature element. This thermometer is classified into the non-mercury organic liquid filled type and mercury filled type. Additionally, this catalog is formed by classifying this thermometer into the type with a microswitch and the type with a contact point according to the type of applied contact, and into the drip-proof type and the pressure resistant explosion-protected type according to the construction of a case.

* When selecting a thermometer, select a thermometer which is normally applied to a temperature range of 30% to 60% of full span. Check to confirm that the material of the wetted parts is appropriate to measuring gas or liquid.

SPECIFICATION 1

Manufacturing temperature range:

- Liquid filled type • -70°C ~ 600°C
- Mercury filled type • -50°C ~ 650°C

Electric contact type:

- With micro switch
- With contact switch

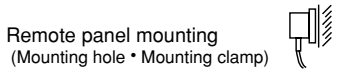
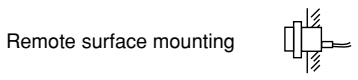
Construction:

- Indoor use (With contact switch)
- Drip-proof type (With micro switch)
- Explosion-protected type (d2G4)
- Water-proof (Application for transformer)

Dial Size:

- 100 DIA., 150 DIA.
- * 75 DIA. of thermometers with contact switch is available.
- Contact NKS for details.

Mounting:



Bulb • Connection material:

304st.st.

Bulb material:

- Capillary 304st.st. or 316st.st.
- Armored tube 430st.st. or 430st.st. +PVC

Connection:

- R¹/₂ (PT) , R³/₄ (PT) , ¹/₂NPT, G¹/₂B (PF) ,
- G³/₄B (PF)
- JIS10K20ARF, JIS10K25ARF,
- ANSI1B150RF, ANSI1B300RF

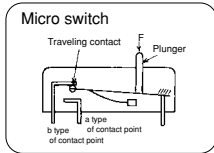
* For other connections, please contact us.

Accuracy:

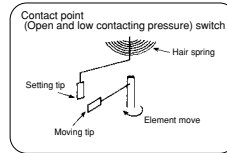
- Indicator accuracy Within ±2%F.S.
- Reproductibility Within 2%F.S.

SELECTION GUIDE OF THERMOMETERS WITH ELECTRIC CONTACT

1. Features of switch



Micro switch is able to take electricity rating greatly, and is available for various control other than dispatch of warning with safety from vibration.



The contact point is mainly applied to warning including a buzzer and a slashing lamp. However, it can be applied to switching large capacity electricity on and off through a relay. A contacting tip is made of high melting point alloy of platinum and osmium. A contact point should be applied under the normal open mode.

Mounting Type	Mercury filled type		Liquid filled type		Mercury filled type		Liquid filled type	
	Micro switch				Contact switch			
Characteristic	Resistance load		Inductive load*		Resistance load			
	125V AC	5A	125V AC	4A	100V AC	0.5A	200V AC	0.25A
	250V AC	5A	250V AC	4A	100V DC	0.05A	200V DC	0.025A
	30V DC	5A	30V DC	4A				
	125V DC	0.4A	125V DC	0.4A				
	* AC: Power factor more than DC: Time-contact 7ms or less.							
Withstand voltage	1500V AC 1 minute				1000 V AC 1 minute			

The insulation resistance (with microcontact) should be 100MΩ or larger by a 500V DC megger.

* The minimum load of the microcontact is 800mW and that of the contact point 1W. In the case of the microcontact, minute load application can be specified.

2. Explosion-protected temperature switch

The electric appliance, which is used at hazardous areas where inflammable gas or liquid causing ignition explosion exists, is imposed use of the the explosion protected products which passed national official approval.

Thermometers with electric contact used at each place of the factory, indoor storage, outdoor tank storage, indoor tank storage, general handling place, passage handling place of dangerous materials is available for pressure-proof and explosion-proof type.

3. Compensation system by installation place

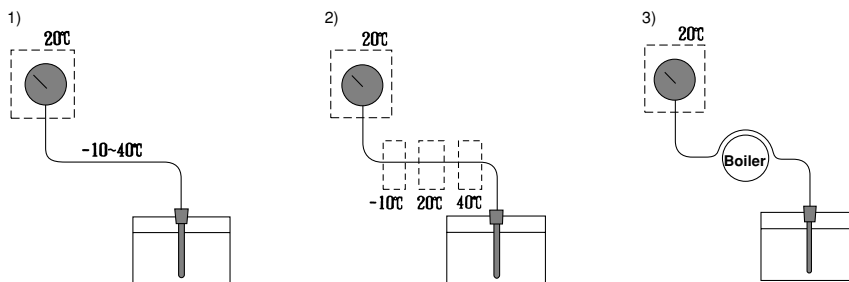
When the ambient temperature around temperature gauge changes, the filled liquid in the indicator and capillary tube also changes to expand or shrink and this cause the indication error. To compensate this error, following compensations are provided.

(1) Bimetal compensation

- When the ambient temperature around indicator and lead parts changes at a same time.

(2) Lead compensation

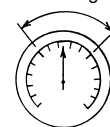
- When the ambient temperature around indicator and lead parts changes independently.
 - 1) When the temperature change around indicator is small and big for lead parts or it's opposite case.
 - 2) When the lead parts is under various ambient temperature condition.
 - 3) When a part of lead parts is heated.



4. Temperature range (Scale range)

- Scale range should be selected to use normally between 30 to 60% of full span.
- When the temperature exceeds the temperature range, it may cause to break the temperature gauge. For example, if there will be a case that the gauges pass the right on the equator or cold district during transportation, or store them at cold district, it needs careful attention.

Normal using range.

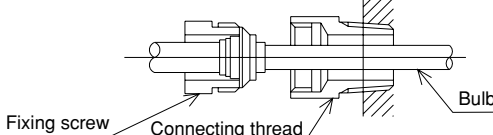


SELECTION GUIDE OF THERMOMETERS WITH ELECTRIC CONTACT2

4. Bulb type

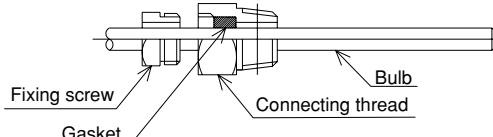
Union type

- Standard spec.

	<p>By tightening the fixing screw, it fixed to the connecting thread so that position of bulb does not change.</p>	<p>Maximum allowable working pressure of union type is Less than 200°C → 2MPa Over 200°C → 1MPa (If the pressure is higher than above, thermowell should be provided.)</p>
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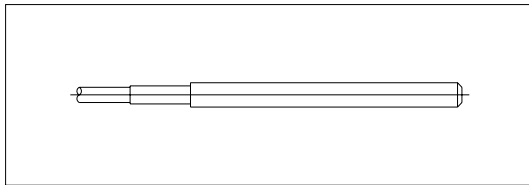
Slide type

- At the time when it needs to adjust the bulb position by the changing the position of fluid to be measured in a tank or other vessel.
- At the time when it needs to insert the bulb up to the bottom of thermowell.

	<p>By tightening the gasket with fixing screw, bulb can be fixed at any position.</p>	<p>Maximum allowable working pressure of slide type is 0.3MPa (If the pressure is higher than above, thermowell should be provided.)</p>
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Plain type

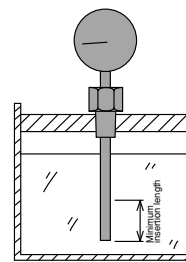
- In case the bulb to be casted into the fluid.



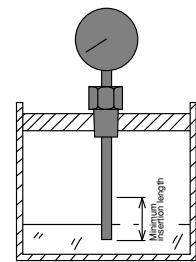
5. Bulb minimum insertion length

According to type, temperature range and bulb diameter, minimum insertion length is decided.

When placing order or decide the specifications, select a suitable length which is longer than the minimum insertion length to keep the performance.



A good example



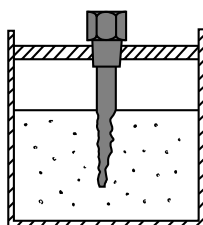
A bad example

6. Thermowell

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

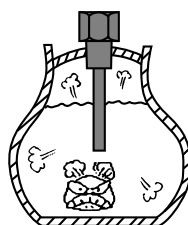
- (1) In case of corrosion fluid, thermowell with suitable material is necessary.
- (2) In case of high pressure, necessary to use thermowell suitable for operating pressure.
- (3) In case of fluid with flow, necessary to use thermowell suitable for flow and viscosity.
- (4) In case of fluid leaking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

(1)



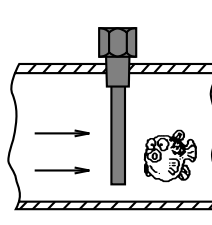
Corrosion

(2)



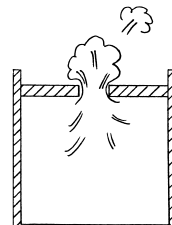
High pressure

(3)



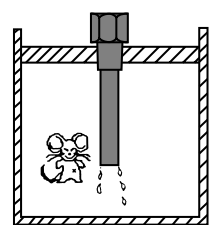
Flow

(4)



Taking off thermometer

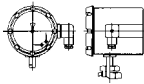
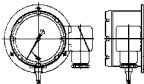
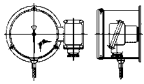
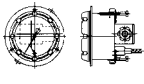
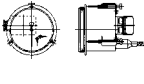
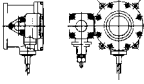
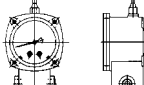
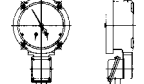
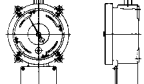
(5)



Leakage of filled liquid

THERMOMETERS WITH ELECTRIC CONTACT1

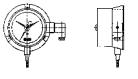
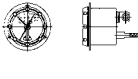





1. With micro switch thermometer

Mounting		Sensing method	Manufacturing range	Compensation	Max. lead length	Dial size (mm)	Model
Drip-proof type (Non-explosion protected)	 I stem type	Liquid filled type	-70°C ~ 150°C	Lead compensation	—	100	TF14
	 100 DIA. surface mounting	Liquid filled type	-70°C ~ 300°C	Lead compensation	15m	100	TF54
		Mercury filled type	-50°C ~ 650°C	Bimetal compensation	10m		TE54
	 150 DIA. surface mounting	Liquid filled type	-70°C ~ 300°C	Lead compensation	20m	150	TF56
		Mercury filled type	-50°C ~ 650°C	Bimetal compensation	10m		TE56
	 100 DIA. panel mounting	Liquid filled type	-70°C ~ 300°C	Lead compensation	20m	Hole mounting	TF64
						Clamp mounting	TF74
		Mercury filled type	-50°C ~ 650°C	Bimetal compensation	10m	Hole mounting	TE64
						Clamp mounting	TE74
	 150 DIA. panel mounting	Liquid filled type	-70°C ~ 300°C	Lead compensation	20m	Hole mounting	TF66
						Clamp mounting	TF76
		Mercury filled type	-50°C ~ 650°C	Bimetal compensation	10m	Hole mounting	TE66
					Clamp mounting	TE76	
Explosion-protected type		Liquid filled type	-70°C ~ 300°C	Lead compensation	20m	—	TD25
		Mercury filled type	-50°C ~ 650°C	Bimetal compensation	10m	—	TD21
* For transformer (Waterproof and moisture protected type)	 Surface mounting	Mercury filled type	-30°C ~ 650°C	Bimetal compensation	5m	100	TX54
	 Surface mounting	Mercury filled type	-30°C ~ 650°C	Bimetal compensation	5m	150	TX56
	 Surface mounting	Liquid filled type	-70°C ~ 300°C	Lead compensation	20m	150	TX81

* Specifications in accordance with JEM standard.

THERMOMETERS WITH ELECTRIC CONTACT2

2. With contact switch thermometer

Mounting		Sensing method	Manufacturing range	Compensation	Max. lead length	Dial size (mm)	Model
Drip-proof type (Non-explosion protected)	 Surface mounting	Liquid filled type	-70°C ~ 500°C	Lead compensation →20m Bimetal compensation →5m		100	TK54
						150	TK56
	 Panel mounting (Hole mounting)	Mercury filled type	-50°C ~ 650°C	Lead compensation →50m Bimetal compensation →20m		100	TJ54
						150	TJ56
	 Panel mounting (clamp mounting)	Liquid filled type	-70°C ~ 500°C	Lead compensation →20m Bimetal compensation →5m		100	TK64
						150	TK66
 Panel mounting (clamp mounting)	Mercury filled type	-50°C ~ 650°C	Lead compensation →50m Bimetal compensation →20m		100	TJ64	
					150	TJ66	
Explosion-protected type		Liquid filled type	-70°C ~ 500°C	Bimetal compensation	5m	—	TD10
		Mercury filled type	-50°C ~ 650°C	Bimetal compensation	20m	—	TD11
* For transformer (Waterproof and moisture protected type)	 Indoor use	Liquid filled type	-70°C ~ 500°C	Bimetal compensation	5m	100	TW84
	 Water-proof type	Liquid filled type	-70°C ~ 500°C	Bimetal compensation	5m	100	TW54

* Specifications in accordance with JEM standard.

CONNECTION • BULB SPECIFICATION

1. Without thermowell

	Connection		Bulb out dia. d DIA.	Note
	Screw type	Flange type		
Union type			8 DIA.	• Not available to direct type and slide type.
			10 DIA.	_____
			12 DIA.	_____
Slide type			13 DIA.	_____
			16 DIA.	• T=1/2 is not available. • Slide type is not available.

2. With thermowell

	Connection		Thermowell out dia. d1 DIA.	Bulb out dia. d DIA.	Note	
	Screw type	Flange type				
Standard type	Union type			12 DIA.	8 DIA.	_____
	Slide type			15 DIA.	10 DIA.	_____
Double socket type	Union type			19 DIA.	13 DIA.	• T=1/2 is not available.
	Slide type			23 DIA.	13 DIA.	• T=1/2 is not available. • Welding type well is not available.
				Taper 19 / 23	13 DIA.	• T=1/2 is not available. • Welding type well is not available.

	Connecting screw	Flange rating	Note
Standard connection	R ¹ / ₂ (PT) , ¹ / ₂ NPT G ¹ / ₂ B (PF) R ³ / ₄ (PT) , G ³ / ₄ B (PF) (Fixing screw only=W22 thread14)	JIS10K20ARF JIS10K25ARF ANSI1B150RF ANSI1B300RF	Other connections except shown left are available. Contact NKS for details.

3. Plain type

	Bulb	Note
Plain type	<p>d DIA.=8 DIA., 10 DIA., 12 DIA., 13DIA., 16 DIA.</p>	Remote type only. Not available to direct type.

GRADUATIONS

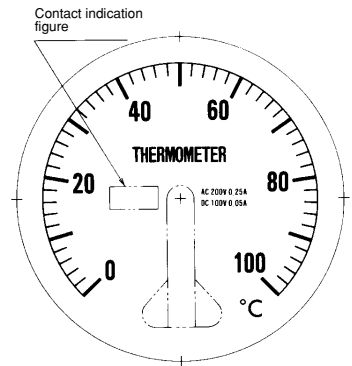
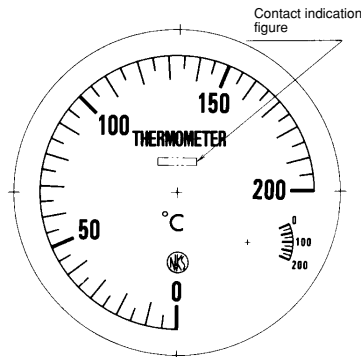
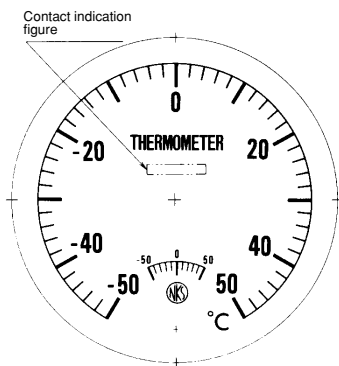
Refer to the manufacturing specifications of respective models regarding the graduations of respective models.

range °C	Scale division and number entry position
0 ~ 50	
0 ~ 100	
0 ~ 500	
0 ~ 60	
0 ~ 120	
0 ~ 600	
0 ~ 80	
0 ~ 400	
0 ~ 150	
0 ~ 200	
0 ~ 250	
0 ~ 300	
0 ~ 650	
-10 ~ 50	
-20 ~ 100	
-10 ~ 100	
-30 ~ 50	
-30 ~ 120	
-50 ~ 50	
-70 ~ 50	
-70 ~ 100	

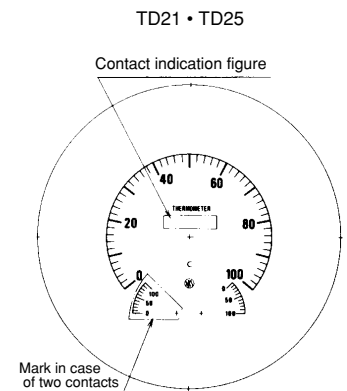
TE 5 • 6 • 7 (100 DIA.)
(With micro switch)

TE 5 • 6 • 7 (150 DIA.)
TF 5 • 6 • 7 (150 DIA.)
(With micro switch)

TJ 5 • 6 • 7 (100 DIA., 150 DIA.)
TK 5 • 6 • 7 (100 DIA., 150 DIA.)
(With contact switch)
TD10 • TD11



Contact point type	Mark	Contact indication figure
Upper limit type	H	<input type="checkbox"/> OFF <input type="checkbox"/> ON
Lower limit type	L	<input type="checkbox"/> ON <input type="checkbox"/> OFF
Upper & Lower limit type	HL	<input type="checkbox"/> ON <input type="checkbox"/> OFF <input type="checkbox"/> OFF <input type="checkbox"/> ON



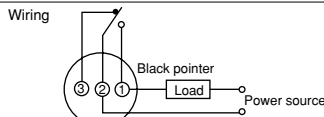
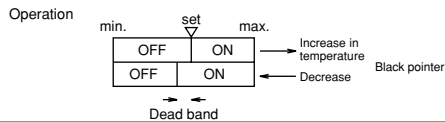
Ground: white
Entry: Black color, red for graduation line and figure of minus parts.

TYPE OF CONTACT AND WIRING SYSTEM

With micro switch

1. Upper limit type with one contact • H (Connecting 1) - 2))

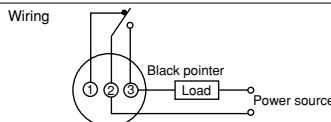
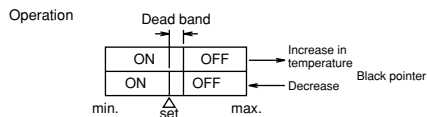
When the temperature rises to a set value, contact points work to turn a circuit ON.



Wiring 1) and 2) reverses ON and OFF at the set point.
Note: If this type is applied as the lower limit type, setting should be corrected by the dead band.

2. Lower limit type with one contact • L (Connecting 2) - 3))

When the temperature decreases to a set value, contact points work to turn a circuit ON.

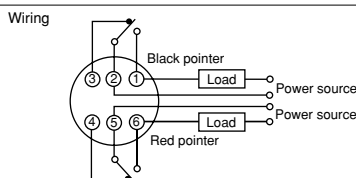


Wiring 1) and 2) reverses ON and OFF at the set point.
Note: If this type is applied as the upper limit type, setting should be corrected by the dead band.

3. Upper & lower limit type with two contact • HL (1) - 2) Connecting, 5) - 6) Connecting)

This is the combination of the upper limit type and the lower limit type and each works independently.

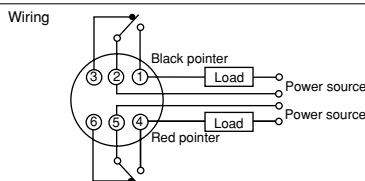
Refer to the previous 1 and 2 for the functioning figure.



4. Upper limit type with two contact • 2H (Connecting 1) - 2), Connecting 4) - 5))

This is the combination of two upper limit types and each works independently.

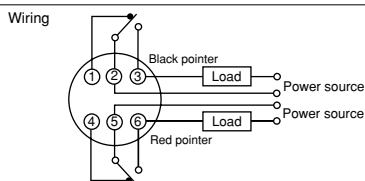
Refer to the previous 1 for the functioning figure.



5. Lower limit type with two contact • 2L (Connecting 2) - 3), Connecting 5) - 6))

This is the combination of two lower limit type and each works independently.

Refer to the previous 2 for the functioning figure.

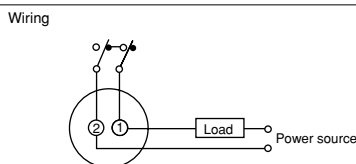
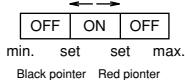


6. Center parts setting type with two contact • HLR

This is the series combination of the upper limit type and lower limit type.

When both contact points are ON, the circuit turns ON.

Operation

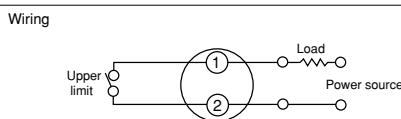
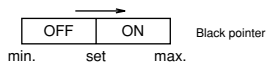


With contact switch

1. Upper limit type with one contact • H

When the temperature rises to a set value, contact points work to turn a circuit ON.

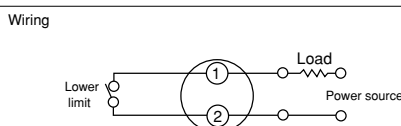
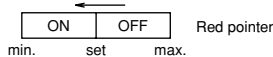
Operation



2. Lower limit type with one contact • L

When the temperature decreases to a set value, contact points work to turn a circuit ON.

Operation

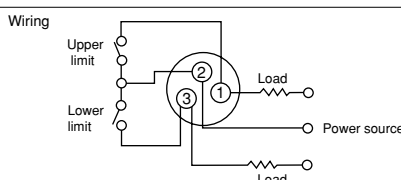
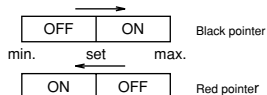


3. Upper & lower limit type with two contact • HL

This is the combination of the upper limit type and the lower limit type.

Because of the common pole, each circuit doesn't work independently.

Operation



EXPLOSION-PROOF

Explosion-protected construction

Explosion-protected construction is a totally enclosed construction such that even if the explosive gas explodes inside the container, the container withstands the force of the explosion and there is no danger of ignition of external explosive gases.

Application range: d2G4

- 1) Explosion-protected construction: d
- 2) Explosion class : 2
- 3) Ignitability : G4
- 4) Hazardous areas : Zone 1 or zone 2
- 5) Objective industries: Petrochemical, chemical fiber, synthetic resin, ethylene, methanol, dielectric products manufacturing, liquefied gas, electric furnace, pharmaceuticals, paints, ammonium sulfate, soda, other measurement medium or industries in which there is the danger of ignition and explosion.

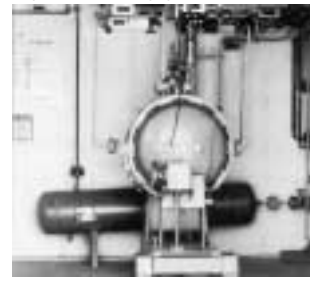
Classification of hazardous areas:

Hazardous area	Contents
Zone 0	A place where hazardous atmosphere is continuously present or present for a long period under ordinary circumstances.
Zone 1	A place where hazardous atmosphere is likely to occur under ordinary circumstances.
Zone 2	A place where hazardous atmosphere is likely to occur under abnormal circumstances.

Classification of explosion:

Explosion class	Minimum gap with a 25mm length of patch which permits the flame propagation.
1	Over 0.6mm
2	0.4mm to 0.6mm
3	Up to 0.4mm

Explosion test equipment



Classification of ignition groups:

Ignition class	Ignition point	Limits of temperature rise (deg)
G1	Over 450°C	320
G2	300°C to 450°C	200
G3	200°C to 300°C	200
G4	135°C to 200°C	200
G5	100°C to 135°C	200
G6	85°C to 100°C	200

The standard ambient temperature range limit of the electrical instrument in the normal using shall be 40°C

Example of classification of typical explosive gases:

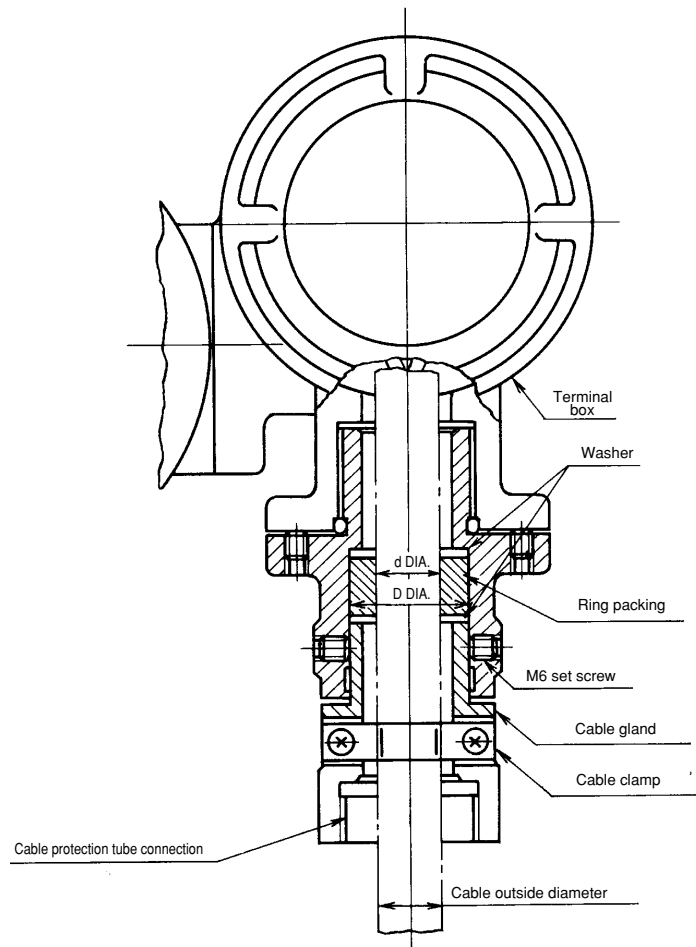
Ignition class Explosion class	G1	G2	G3	G4	G5	G6
1	Acetone	Ethanol	Gasoline	Acetadehyde		
	Ammonia	Amylacetate-iso	Hexane	Etyhl ether		
	Carbon monoxide	1-Butanol				
	Ethane	Butane				
	Acetic acid	Butric anhydride				
	Ethyl acetate					
	Toulene					
	Propane					
	Benzene					
	Methanol					
	Methane					
2	Carbon gas	Ethylene Ethylenoxide				
	Water gas Hydrogen	Acetylene			Carbon dioxide	

EXPLOSION-PROOF 2

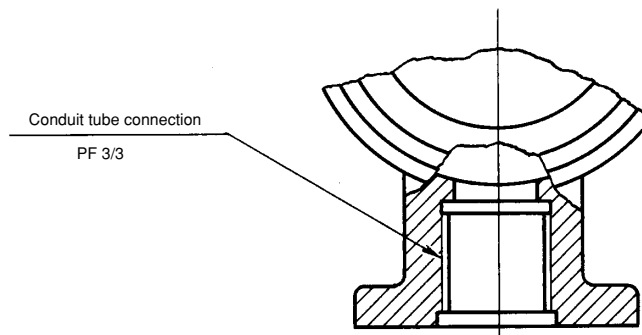
Method of leading external conductors and cable to a terminal box

1) Flame-proof packing type

Ring packing		Cable out side DIA.	Cable Protection tube Connection
Out dia.	Inner dia.		
23	10.5	9.4	PF ^{1/2} PF ^{3/4}
		9.9	
		10.1	
	12	10.5	
		11.0	
		11.5	
29.5	14	11.9	PF ^{3/4} PF1
		12.0	
		12.5	
	15.5	12.6	
		13.1	
		13.5	
		13.6	
		14.5	
		16.5	



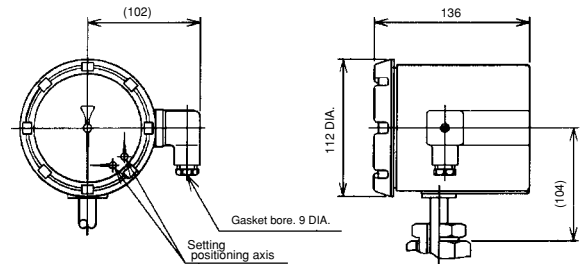
2) Conduit type



THERMOMETERS WITH MICRO SWITCH / DRIP-PROOF • DIRECT TYPE

TF14 Liquid filled dial thermometer

Dimension



I stem type

Specification

Manufacturing range	-70 ~ 150°C			
Case	Construction: Drip-proof • equivalent to IP33, Material: AC7A, Finishing: Black			
Wetted parts material	Bulb: 304st.st., Connection • Flange: 304st.st.			
Use switch	JIS C 4505 Industrial switch	Accuracy	Indication Within ±2% F.S.. (No load to contactor)	
Number of contacts	One contact • Two contact			Reproducibility Within 2% F.S.
Setting	Internal adjustment			Setting Within ±3% F.S.
Compensation	Lead compensation		Electric rating	
Dead band	Within 6% F.S.			
Ambient temperature error	Within ±2% F.S./15deg		Resistance load 125V AC5A 250V AC5A 30V DC5A 125V DC0.4A	
Connection	R ¹ / ₂ (PT), R ³ / ₄ (PT), ¹ / ₂ NPT, G ¹ / ₂ B (PF), G ³ / ₄ B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.			
Flange	JIS10K20ARF, JIS10K25ARF, 0ANS11B150RF, ANS11B300RF			
Connection	Without thermowell	Union type, Slide type	Slide type is not available with 8 Dia. and 16 Dia. bulb.	
	With thermowell	Double socket union type: R ¹ / ₂ , ¹ / ₂ NPT (Connection) Double socket slide type: R ¹ / ₂ , ¹ / ₂ NPT (Connection)		

Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	standard Bulb Dia. × Length d (d1) × L (L)	Bulb length (L) mm					Max.
			Minimum insertion length					
			d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	
-70 ~ 50	2	10 × 150 (15) (200)	160 (185)	130 (155)	100	90 (115)	75 (100)	500
-70 ~ 100	5	× 150 (150)	125 (150)	105 (130)	85	75 (100)	65 (90)	
-50 ~ 50	2	× 150 (200)	180 (205)	145 (170)	110	100 (125)	80 (105)	
-30 ~ 50	2	× 200 (200)	215 (240)	170 (195)	130	115 (140)	95 (120)	
-20 ~ 100	2	× 150 (200)	160 (185)	130 (155)	100	90 (115)	75 (100)	
-10 ~ 100	2	× 150 (200)	170 (195)	135 (160)	105	95 (120)	80 (105)	
-10 ~ 50	1	× 300 (300)	265 (290)	210 (235)	155	135 (160)	105 (130)	
0 ~ 50	1	× 300 (300)	355 (380)	270 (295)	195	170 (195)	135 (160)	
~ 60	1	× 300 (300)	315 (340)	245 (270)	180	155 (180)	120 (145)	
~ 80	2	× 200 (300)	245 (270)	195 (220)	145	125 (150)	100 (125)	
~ 100	2	× 200 (200)	205 (230)	165 (190)	125	110 (135)	90 (115)	
~ 120	2	× 150 (200)	180 (205)	145 (170)	110	100 (125)	80 (105)	
~ 150	2	× 150 (150)	155 (180)	125 (150)	100	90 (115)	75 (100)	

- Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.
- Bulb length should be over the above length and specify 5mm steps.
- In case of plain type of bulb, minimum length to be added 40mm to the above length.

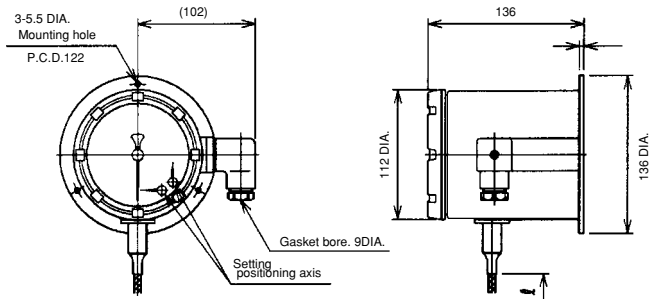
THERMOMETERS WITH MICRO SWITCH/DRIP-PROOF • REMOTE TYPE1

Liquid filled dial thermometer

TF 54 • 100 DIA. • Surface mounting



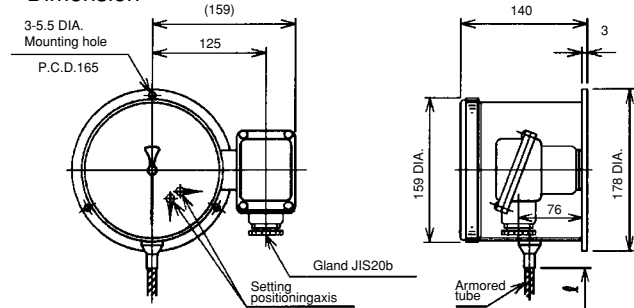
■ Dimension



TF 56 • 150 DIA. • Surface mounting



■ Dimension

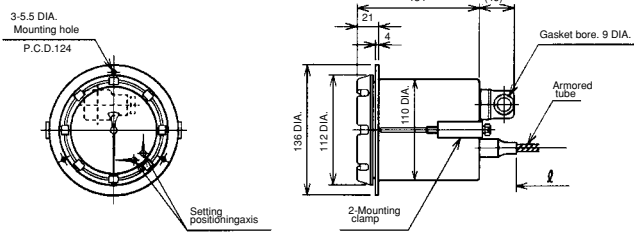


TF 64 • 74 • 100 DIA. • Panel mounting



Model	Mounting
TF64	Mounting hole
TF74	Mounting clamp

■ Dimension

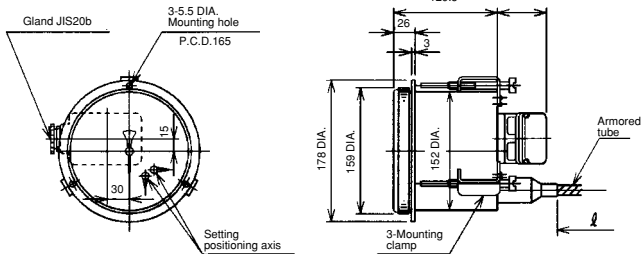


TF 66 • 76 • 150 DIA. • Panel mounting



Model	Mounting
TF66	Mounting hole
TF76	Mounting clamp

■ Dimension



THERMOMETERS WITH MICRO SWITCH/DRIP-PROOF • REMOTE TYPE 2

TF54 • 56 • 64 • 74 • 66 • 76 Liquid filled type

■ Specification

Manufacturing range	-70 ~ 300°C				
Case	Construction: Drip-proof • equivalent to IP43, Material: TF54 • 64 • 74: AC7A, TF56 • 66 • 76: ADC12, Finishing: Black				
Wetted parts material	Bulb: 304st.st., Connection • Flange: 304st.st.				
Use switch	JIS C 4505 Industrial switch	Accuracy	Indication	Within ±2% F.S.	Electric rating Resistance load 125V AC5A Inductive load 125V AC4A 250V AC5A 250V AC4A 30V DC5A 30V DC4A 125V DC0.4A 125V DC0.4A * AC: Power factor more than 0.4 DC: Time-contact 7ms or less
Number of contacts	One contact • Two contact		Reproducibility	Within 2% F.S.	
Setting	Internal adjustment		Setting	Within ±3% F.S.	
Lead length	1 • 2 • 3 • 4 • 5 • 8 • 10 • 15 • 20(m) Standard 3m Max. 20m	Dread band	Within 4% F.S.		
Compensation	Lead compensation	Ambient temperature error	Within ±2% F.S. 15deg		
Connection	R1/2 (PT) , R3/4 (PT) , 1/2NPT, G1/2B (PF) , G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.				
Flange	JIS10K20ARF, JIS10K25ARF, ANS11B150RF, ANS11B300RF				
Connection	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.
	With thermowell	Double socket union type: R1/2, 1/2NPT (Connection)			
		Double socket slide type: R1/2, 1/2NPT (Connection)			

* For other connections, please contact us.

■ Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Standard Bulb Dia. × Length d (d1) × L (L)	Bulb length (L) mm					Max.
			Minimum insertion length					
			d=8 DIA. (d=12 DIA.)	d=DIA.10 (d=150 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	
-70 ~ 50	2	10 × 150 (19) (200)	160 (185)	130 (155)	100	90 (115)	75 (100)	500
-70 ~ 100	5	× 150 (150)	125 (150)	105 (130)	85	75 (100)	65 (90)	
-50 ~ 50	2	× 150 (200)	180 (205)	145 (170)	110	100 (125)	80 (105)	
-30 ~ 50	2	× 200 (200)	215 (240)	170 (195)	130	115 (140)	95 (120)	
-20 ~ 100	2	× 150 (200)	160 (185)	130 (155)	100	90 (115)	75 (100)	
-10 ~ 100	2	× 150 (300)	170 (195)	135 (160)	105	95 (120)	80 (105)	
-10 ~ 50	1	× 300 (300)	265 (290)	210 (235)	155	135 (160)	105 (130)	
0 ~ 50	1	× 300 (300)	355 (380)	270 (295)	195	170 (195)	135 (160)	
~ 60	1	× 300 (300)	315 (340)	245 (270)	180	155 (180)	120 (145)	
~ 80	2	× 200 (300)	245 (270)	195 (220)	145	125 (150)	100 (125)	
~ 100	2	× 200 (200)	205 (230)	165 (190)	125	110 (135)	90 (115)	
~ 120	2	× 150 (200)	180 (205)	145 (170)	110	100 (125)	80 (105)	
~ 150	2	× 150 (150)	155 (180)	125 (150)	100	90 (115)	75 (100)	
~ 200	5	× 100 (150)	110 (135)	95 (120)	75	70 (95)	60 (85)	
~ 250	5	× 100 (150)	100 (125)	85 (110)	70	65 (90)	60 (85)	
~ 300	5	× 100 (150)	90 (115)	80 (105)	65	60 (85)	55 (80)	

Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.
 • Bulb length should be over the above length and specify 5mm steps.
 • In case of plain type of bulb, minimum length to be added 40mm to the above length.

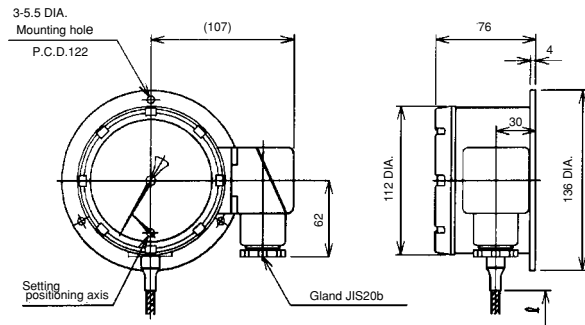
THERMOMETERS WITH MICRO SWITCH/DRIP-PROOF • REMOTE TYPE3

Mercury filled dial thermometer

TE 54 • 100 DIA. • Surface mounting



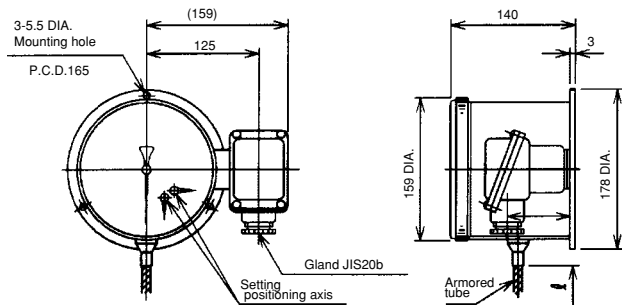
■ Dimension



TE 56 • 150 DIA. • Surface mounting



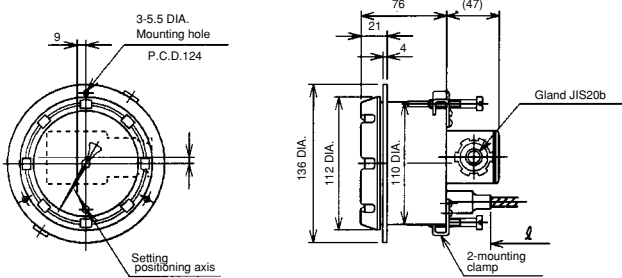
■ Dimension



TE 64 • 74 • 100 DIA. • Panel mounting

Model	Mounting
TE64	Mounting hole
TE74	Mounting clamp

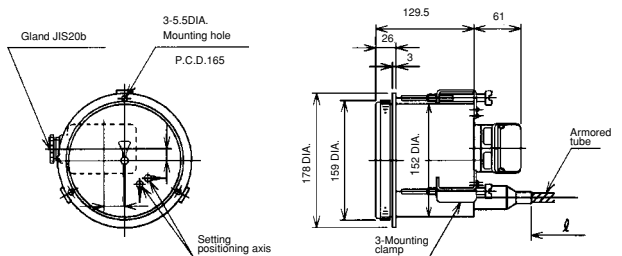
■ Dimension



TE 66 • 76 • 150 DIA. • Panel mounting

Model	Mounting
TE66	Mounting hole
TE76	Mounting clamp

■ Dimension



THERMOMETERS WITH MICRO SWITCH/DRIP-PROOF • REMOTE TYPE 4

TE 54 • 56 • 64 • 74 • 66 • 76 Mercury filled dial thermometer

■ Specification

Manufacturing range	-50 ~ 650°C						
Case	Construction: Drip-proof • equivalent to IP43, Material: TE54 • 64 • 74: AC7A, TE56 • 66 • 76: ADC12, Finishing: Black						
Wetted parts material	Bulb: 304st.st., Connection • Flange: 304st.st.						
Use switch	JIS C 4505 Industrial switch	Accuracy	Indication	Within ±2% F.S.	Electric rating		
Number of contacts	100 DIA. One contact, 150 DIA. One contact • Two contact		Reproducibility	Within 2% F.S.		Resistance load 125V AC5A 250V AC5A 30V DC5A 125V DC0.4A	Inductive load* 125V AC4A 250V AC4A 30V DC4A 125V DC0.4A
Setting	Internal adjustment		Setting	Within ±4% F.S.			
Lead length	1 • 2 • 3 • 4 • 5 • 8 • 10 (m) Standard 3m Max. 10m		Dead band	Within 8% F.S.			
Compensation	Bimetal compensation	Ambient temperature error	Within ±2% F.S./5deg		* AC: Power factor more than 0.4 DC: Time-contact 7ms or less		
Connection	R1/2 (PT) , R3/4 (PT) , 1 /2NPT, G1/2B (PF) , G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.						
Flange	JIS10K20ARF, JIS10K25ARF, ANS11B150RF, ANS11B300RF						
Connection	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.		
	With thermowell	Double socket union type: R1/2, 1/2NPT (Connection)					
		Double socket slide type: R1/2, 1/2NPT (Connection)					

* For other connections, please contact us.

■ Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Standard Bulb Dia. × Length d × L (d1) × (L)		Bulb length (L) mm										Max.
				Minimum insertion length										
				With one contact			With the contact (Not available to 100mm Dia.)							
		With one contact	With two contact	d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	
-30 ~ 50	2	10 × 400 (19 × (400))	10 × 500 (19 × (500))	410 (430)	305 (325)	215	180 (200)	135 (155)	—	430 (450)	295	250 (270)	185 (205)	d=8 DIA., 16 DIA. 1000
-30 ~ 120	2	× 200 (200)	× 300 (300)	210 (230)	160 (180)	115	100 (120)	75 (95)	320 (340)	240 (260)	170	145 (165)	110 (130)	
-20 ~ 100	2	× 200 (300)	× 400 (400)	265 (285)	200 (220)	145	120 (140)	90 (110)	410 (430)	305 (325)	215	180 (200)	135 (155)	
-10 ~ 50	1	× 400 (500)	—	—	390 (410)	270	225 (245)	170 (190)	—	—	390	330 (350)	240 (260)	
0 ~ 50	1	—	—	—	—	335	285 (305)	210 (230)	—	—	—	—	340 (360)	
~ 60	1	10 × 400 (19 × (500))	—	—	390 (410)	270	225 (245)	170 (190)	—	—	390	330 (350)	240 (260)	
~ 80	2	× 400 (400)	10 × 500 (19 × (500))	410 (430)	305 (325)	215	180 (200)	135 (155)	—	430 (450)	295	250 (270)	185 (205)	
~ 100	2	× 300 (300)	× 400 (400)	320 (340)	240 (260)	170	145 (165)	110 (130)	—	355 (375)	250	210 (230)	155 (175)	
~ 120	2	× 200 (300)	× 400 (400)	265 (285)	200 (220)	145	120 (140)	90 (110)	410 (430)	305 (325)	215	180 (200)	135 (155)	
~ 150	2	× 200 (200)	× 300 (300)	210 (230)	160 (180)	115	100 (120)	75 (95)	320 (340)	240 (260)	170	145 (165)	110 (130)	
~ 200	5	× 150 (150)	× 200 (300)	170 (190)	130 (150)	95	85 (105)	65 (85)	245 (265)	185 (205)	130	115 (135)	85 (105)	
~ 250	5	× 150 (150)	× 150 (200)	135 (155)	105 (125)	80	70 (90)	55 (75)	200 (220)	150 (170)	110	95 (115)	70 (90)	
~ 300	5	× 100 (150)	× 150 (150)	120 (140)	95 (115)	70	60 (80)	50 (70)	155 (175)	120 (140)	85	75 (95)	60 (80)	
~ 400	10	× 100 (100)	× 100 (150)	90 (110)	75 (95)	55	50 (70)	40 (60)	125 (145)	100 (120)	75	65 (85)	50 (70)	
~ 500	10	× 100 (100)	× 100 (100)	75 (95)	60 (80)	50	45 (65)	40 (60)	105 (125)	80 (100)	60	55 (75)	45 (65)	
~ 600	10	× 100 (100)	× 100 (100)	65 (85)	55 (75)	45	40 (60)	40 (60)	90 (110)	75 (95)	55	50 (70)	40 (60)	
~ 650	20	× 100 (100)	× 100 (100)	65 (85)	55 (75)	40	40 (60)	40 (60)	85 (105)	70 (90)	50	45 (65)	40 (60)	

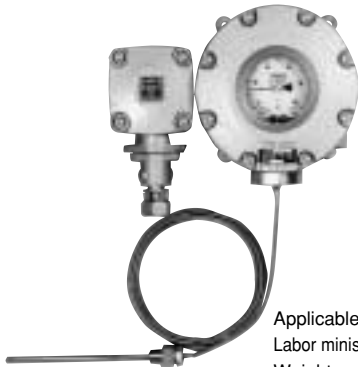
Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.

• Bulb length should be over the above length and specify 5mm steps.

• In case of plain type of bulb, minimum length to be added 40mm to the above length.

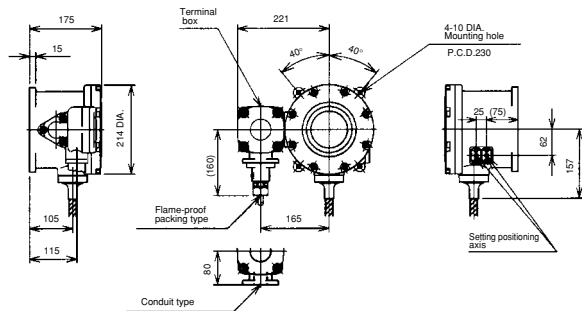
EXPLOSION-PROOF THERMOMETER WITH MICRO SWITCH 1

TD 25 Liquid filled dial thermometer



Applicable model d2G4
 Labor ministry inspection No. No.24201
 Weight Approx.12kg (Indicator part)

Dimension



Specification

Manufacturing range	-70 ~ 300°C	Accuracy	Indication	Within ±2% F.S.	Electric rating	
Indication dial	With local indicator		Reproducibility	Within 2% F.S.	Resistance load	Inductive load
Use switch	JIS C 4505 Industrial switch		Setting	Within ±3% F.S.	125V AC5A	(Power factor 0.75) Time contact 7ms or less
Number of contacts	One contact, Two contact	Dead band	Within 4% F.S.	250V AC5A		
Setting	External adjustment	Ambient temperature error	Within ±2% F.S./15deg	30V DC5A		
Lead length	1 · 2 · 3 · 4 · 5 · 8 · 10 · 15 · 20 (m) Standard 3m Max. 20m			125V DC0.4A	250V AC4A	
Case	Construction: Drip-proof • equivalent to IP54, Material: AC7A, Finishing : Gray					
Wetted parts	Bulb: 304st.st., Connection • Flange: 304st.st.					
Compensation	Lead compensation					
Connection	R1/2 (PT) , R3/4 (PT) , 1/2NPT, G1/2B (PF) , G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.					
Flange	JIS10K20ARF, JIS10K25ARF, ANSI1B150RF, ANSI1B300RF					
Connection	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.	
	With thermowell	Double socket union type: R1/2, 1/2NPT (Connection)				
		Double socket slide type: R1/2, 1/2NPT (Connection)				

Range • Bulb DIA. • Bulb length

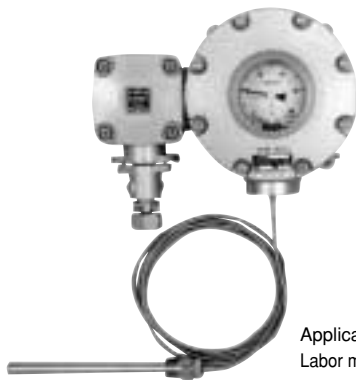
Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Standard Bulb Dia. × Length d (d1) × L (L)	Bulb length (L) mm					Max.
			Minimum insertion length					
			d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	
-70 ~ 50	2	10 × 150 (19) × (200)	160 (185)	130 (155)	100	90 (115)	75 (100)	500
-70 ~ 100	5	150 × 150 (150) × (150)	125 (130)	105 (130)	85	75 (100)	65 (90)	
-50 ~ 50	2	150 × 200 (200) × (200)	180 (205)	145 (170)	110	100 (125)	80 (105)	
-30 ~ 50	2	200 × 200 (200) × (240)	215 (240)	170 (195)	130	115 (140)	95 (120)	
-20 ~ 100	2	150 × 200 (200) × (195)	160 (185)	130 (155)	100	90 (115)	75 (100)	
-10 ~ 100	2	150 × 200 (200) × (195)	170 (195)	135 (160)	105	95 (120)	80 (105)	
-10 ~ 50	1	300 × 300 (300) × (290)	265 (290)	210 (235)	155	135 (160)	105 (130)	
0 ~ 50	1	300 × 300 (300) × (380)	355 (380)	270 (295)	195	170 (195)	135 (160)	
~ 60	1	300 × 300 (300) × (340)	315 (340)	245 (270)	180	155 (180)	120 (145)	
~ 80	2	200 × 300 (300) × (270)	245 (270)	195 (220)	145	125 (150)	100 (125)	
~ 100	2	200 × 200 (200) × (230)	205 (230)	165 (190)	125	110 (135)	90 (115)	
~ 120	2	150 × 200 (200) × (205)	180 (205)	145 (170)	110	100 (125)	80 (105)	
~ 150	2	150 × 150 (150) × (180)	155 (180)	125 (150)	100	90 (115)	75 (100)	
~ 200	5	100 × 100 (150) × (135)	110 (135)	95 (120)	75	70 (95)	60 (85)	
~ 250	5	100 × 100 (150) × (125)	100 (125)	85 (110)	70	65 (90)	60 (85)	
~ 300	5	100 × 100 (150) × (115)	90 (115)	80 (105)	65	60 (85)	55 (80)	

Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.
 • Bulb length should be over the above length and specify 5mm steps.
 • In case of plain type of bulb, minimum length to be added 40mm to the above length.

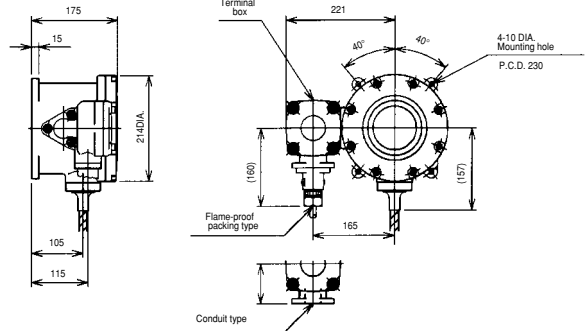
EXPLOSION-PROOF THERMOMETER WITH MICRO SWITCH 2

TD 21 Mercury filled dial thermometer



Applicable model d2G4
 Labor ministry inspection No. No.24200
 Weight Approx 11.5kg (Indicator part)

Dimension



Specification

Manufacturing range	-50 ~ 650°C	Accuracy	Indication	Within ±2%F.S.	Electric rating	
Indication dial	With local indicator		Reproducibility	Within 2%F.S.	Resistance load	Inductive load
Use switch	JIS C 4505 Industrial switch		Setting	Within ±4%F.S.	125V AC5A	(Power factor 0.75 Time contact 7ms or less)
Number of contacts	One contact, Two contact	Dead band	Within 8%F.S.	250V AC5A	125V AC4A	
Setting	Internal adjustment	Ambient temperature error		30V DC5A	250V AC4A	
Lead length	1 • 2 • 3 • 4 • 5 • 8 • 10 (m) standard 3m Max. 10m			Within ±2%F.S./15deg	125V DC0.4A	30V DC4A 125V DC0.4A
case	Construction: Drip-proof • equivalent to IP54, Material: AC7A, Finishing : Gray					
Wetted parts	Bulb: 304st.st., Connection • Flange: 304st.st.					
Compensation	Bimetal compensation					
Connection	R1/2 (PT) , R3/4 (PT) , 1/2NPT, G1/2B (PF) , G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.					
Flange	JIS10K20ARF, JIS10K25ARF, ANSI1B150RF, ANSI1B300RF					
Connection	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.	
	With thermowell	Double socket union type: R1/2, 1/2NPT (Connection)				
		Double socket slide type: R1/2, 1/2NPT (Connection)				

Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

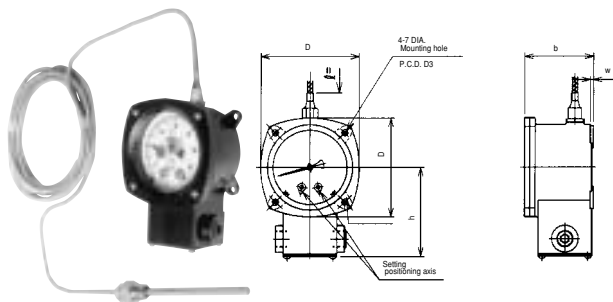
Range °C	Minimum graduation °C	standard Bulb Dia. × Length d × L (d1) × (L)		Bulb length (L) mm										Max.
				Minimum insertion length										
				With one contact					With the contact					
		With one contact	With two contact	d=8 DIA. (d=12 DIA)	d=10 DIA. (d=15 DIA)	d=12 DIA.	d=13 DIA. (d=19 DIA)	d=16 DIA. (d=23 DIA)	d=8 DIA. (d=12 DIA)	d=10 DIA. (d=15 DIA)	d=12 DIA.	d=13 DIA. (d=19 DIA)	d=16 DIA. (d=23 DIA)	
-30 ~ 50	2	10 × 400 (19 × (400))	10 × 500 (19 × (500))	410 (430)	305 (325)	215	180 (200)	135 (155)	-	430 (450)	295	250 (270)	185 (205)	d=8 DIA., 16 DIA., 1000
-30 ~ 120	2	× 200 (200)	× 300 (300)	210 (230)	160 (180)	115	100 (120)	75 (95)	320 (340)	240 (260)	170	145 (165)	110 (130)	
-20 ~ 100	2	× 200 (300)	× 400 (400)	265 (285)	200 (220)	145	120 (140)	90 (110)	410 (430)	305 (325)	215	180 (200)	135 (155)	
-10 ~ 50	1	× 400 (500)	-	-	390 (410)	270	225 (245)	170 (190)	-	-	390	330 (350)	240 (260)	
0 ~ 50	1	-	-	-	-	335	285 (305)	210 (230)	-	-	-	-	340 (360)	
~ 60	1	10 × 400 (19 × (500))	-	-	390 (410)	270	225 (245)	170 (190)	-	-	390	330 (350)	240 (260)	
~ 80	2	× 400 (400)	10 × 500 (19 × (500))	410 (430)	305 (325)	215	180 (200)	135 (155)	-	430 (450)	295	250 (270)	185 (205)	
~ 100	2	× 300 (300)	× 400 (400)	320 (340)	240 (260)	170	145 (165)	110 (130)	-	355 (375)	250	210 (230)	155 (175)	
~ 120	2	× 200 (300)	× 400 (400)	265 (285)	200 (220)	145	120 (140)	90 (110)	410 (430)	305 (325)	215	180 (200)	135 (155)	
~ 150	2	× 200 (200)	× 300 (300)	210 (230)	160 (180)	115	100 (120)	75 (95)	320 (340)	240 (260)	170	145 (165)	110 (130)	
~ 200	5	× 150 (150)	× 200 (300)	170 (190)	130 (150)	95	85 (105)	65 (85)	245 (265)	185 (205)	130	115 (135)	85 (105)	
~ 250	5	× 150 (150)	× 200 (200)	135 (155)	105 (125)	80	70 (90)	55 (75)	200 (220)	150 (170)	110	95 (115)	70 (90)	
~ 300	5	× 100 (100)	× 150 (150)	120 (140)	95 (115)	70	60 (80)	50 (70)	155 (175)	120 (140)	85	75 (95)	60 (80)	
~ 400	10	× 100 (100)	× 150 (150)	90 (110)	75 (95)	55	50 (70)	40 (60)	125 (145)	100 (120)	75	65 (85)	50 (70)	
~ 500	10	× 150 (150)	× 100 (100)	75 (95)	60 (80)	50	45 (65)	40 (60)	105 (125)	80 (100)	60	55 (75)	45 (65)	
~ 600	10	× 150 (150)	× 100 (100)	65 (85)	55 (75)	45	40 (60)	40 (60)	90 (110)	75 (95)	55	50 (70)	40 (60)	
~ 650	20	× 150 (150)	× 100 (100)	65 (85)	55 (75)	40	40 (60)	40 (60)	85 (105)	70 (90)	50	45 (65)	40 (60)	

Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.
 • Bulb length should be over the above length and specify 5mm steps.
 • In case of plain type of bulb, minimum length to be added 40mm to the above length.

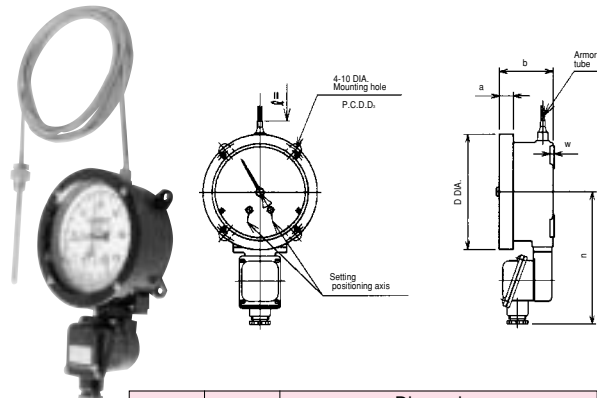
THRMOMETER WITH MICRO SWITCH FOR TRANSFORMER 1

TX 54 • 56 Mercury filled dial thermometer • Waterproof and moisture resistance type

TX54 • 100 DIA.



TX56 • 150 DIA.



Model	Dial size	Dimension				
		D	D ₃	b	W	h
TX54	100	125	126	87.5	4	112.5

Model	Dial size	Dimension					
		D	D ₃	a	b	W	h
TX56	150	188	180	23	90	7	215

■ Specification

Manufacturing range	-30 ~ 650°C		Accuracy	Indication	Within ±2% F.S.	Electric rating	
Use switch	JIS C 4505 Industrial switch			Reproducibility	Within 2% F.S.		Resistance load 250V AC3A 125V DC0.4A
Number of contacts	One contact, Two contact			Setting	Within ±4% F.S.		
Setting	Internal adjustment		Dead band	Within 8% F.S.	Inductive load 2000V AC1 minute Insulation resistance It is more than 500V DC 100MΩ with megger		
Max. pointer	Option					Ambient temperature error	Within ±2% F.S./15deg
Max.lead length	5m (standard 3m)		Construction: Water-proof • equivalent to IP65 , Material: Aluminium alloy, Finishing: Black				
case	Construction: Water-proof • equivalent to IP65 , Material: Aluminium alloy, Finishing: Black						
Wetted parts	Bulb: 304st.st., Connection • Flange: 304st.st.						
Compensation	Bimetal compensation						
Connection	R1/2 (PT) , R3/4 (PT) , 1 /2NPT, G1/2B (PF) , G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.						
Flange	JIS10K20ARF, JIS10K25ARF, ANSI1B150RF, ANSI1B300RF						
Connection	Without thermowell	Union type, Slide type				Slide type is not available with 16 Dia. bulb.	
	With thermowell	Double socket union type: R1/2, 1/2NPT (Connection)					
		Double socket slide type: R1/2, 1/2NPT (Connection)					

■ Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Bulb length (L) mm					Max.
		Minimum insertion length					
		d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	
-30 ~ 120	2	120 (140)	95 (115)	70	60 (80)	50 (70)	d=8 DIA., 16 DIA. 1000
-20 ~ 100	2	150 (170)	120 (140)	85	75 (95)	60 (80)	
0 ~ 100	2	180 (200)	140 (160)	100	85 (105)	65 (85)	
~ 120	2	150 (170)	120 (140)	85	75 (95)	60 (80)	
~ 150	2	120 (140)	95 (115)	70	60 (80)	50 (70)	
~ 200	5	100 (120)	80 (100)	60	55 (75)	45 (65)	d=10 DIA., 12 DIA., 13 DIA., 3000
~ 300	5	70 (90)	60 (80)	45	40 (60)	40 (60)	
~ 500	10	55 (75)	45 (65)	40	40 (60)	40 (60)	
~ 650	20	45 (65)	40 (60)	40	40 (60)	40 (60)	

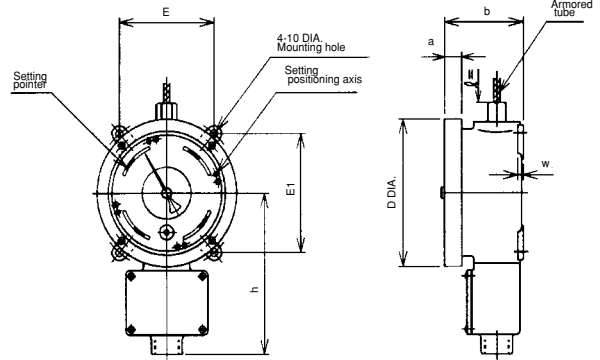
- Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.
 • Bulb length should be over the above length and specify 5mm steps.
 • In case of plain type of bulb, minimum length to be added 40mm to the above length.

THERMOMETER WITH MICRO SWITCH FOR TRANSFORMER2

TX 81 Liquid filled dial thermometer • Waterproof and moisture resistance type



Dimension



Model	Dial size	Dimension						
		D	E	E ₁	a	b	W	h
TX81	150	188	127	152	23	105	7	206

Specification

Manufacturing range	-70 ~ 300°C	Accuracy	Indication	Within ±2% F.S.	Electric rating	
Use switch	JIS C 4505 Industrial switch		Reproducibility	Within 2% F.S.		Resistance load 250V AC10A 125V DC0.6A
Number of contacts	One contact ~ Four contact		Setting	Within ±4% F.S.		
Setting	Internal adjustment		Dead band	Within 7% F.S.		
Max. pointer	Standard	Ambient temperature error	Within ±2% F.S./ 15deg	2000v AC 1minute Insulation resistance It is more than 500V DC 100MΩ with megger		
Max.lead length	20m (standard 3m)					
Case	Construction: Water-proof • equivalent to IP65, Material: Aluminium alloy, Finishing: Black					
Wetted parts	Bulb: 304st.st., Connection • Flange: 304st.st.					
Compensation	Lead compensation					
Connection	R1/2 (PT) , R3/4 (PT) , 1/2NPT, G1/2B (PF) , G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.					
Flange	JIS10K20ARF, JIS10K25ARF, ANSI1B150R, ANSI1B300RF					
Connection	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.	
	With thermowell	Double socket union type: R1/2, 1/2NPT (Connection)				
		Double socket slide type: R1/2, 1/2NPT (Connection)				

Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Bulb length (L) mm						Max.
		Minimum insertion length						
		d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)		
-70 ~ 100	5	125 (150)	105 (130)	85	75 (100)	65 (90)	500	
-50 ~ 50	2	180 (205)	145 (170)	110	100 (125)	80 (105)		
-20 ~ 100	2	160 (185)	130 (155)	100	90 (115)	75 (100)		
0 ~ 50	1	355 (380)	270 (295)	195	170 (195)	135 (160)		
~ 100	2	205 (230)	165 (190)	125	110 (135)	90 (115)		
~ 120	2	180 (205)	145 (170)	110	100 (125)	80 (105)		
~ 150	2	155 (180)	125 (150)	100	90 (115)	75 (100)		
~ 200	5	110 (135)	95 (120)	75	70 (95)	60 (85)		
~ 300	5	90 (115)	80 (105)	65	60 (85)	55 (80)		

- Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.
 • Bulb length should be over the above length and specify 5mm steps.
 • In case of plain type of bulb, minimum length to be added 40mm to the above length.

THERMOMETER WITH CONTACT SWITCH /INDOOR • REMOTE TYPE1

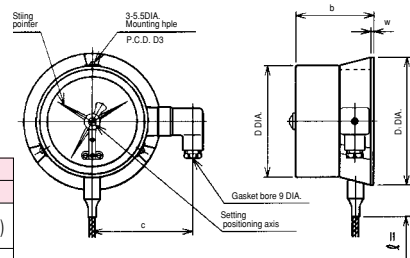
TK 54 • 56 Liquid filled dial thermometer • TJ 54 • 56 Mercury filled dial thermometer

Surface mounting

■ Dimension



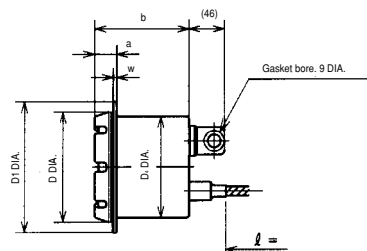
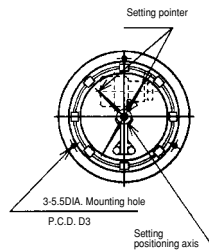
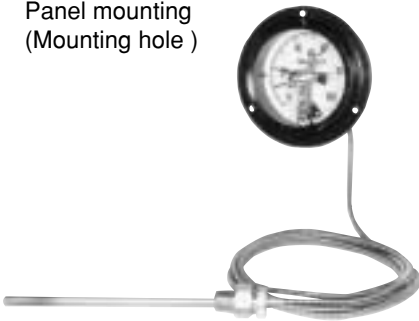
Model	Dial size	Dimension					
		D	D ₁	D ₃	b	W	C
TJ54 TK54	100	112	128	115	78	3	(111)
TJ56 TK56	150	165	178	165	85	4	(137)



TK 64 • 66 Liquid filled dial thermometer • TJ 64 • 66 Mercury filled dial thermometer

Panel mounting
(Mounting hole)

■ Dimension



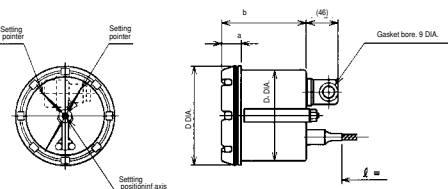
TK 74 • 76 Liquid filled dial thermometer • TJ 74 • 76 Mercury filled dial thermometer

Panel mounting
(Mounting clamp)

■ Dimension



Model	Dial size	Dimension						
		D	D ₁	D ₃	D ₄	a	b	W
TJ64 • TJ74 TK64 • TK74	100	112	136	122	104	19	79	3
TJ66 • TJ76 TK66 • TK76	150	165	192	178	158	21	85	4



■ Specification

Manufacturing range	TK 5□ • 70 ~ 500g TJ 5□ • ~ 650g	Accuracy	Indication	Within ±2% F.S.	Electric rating	
Use switch	Contact switch (Open type low contact)		Reproducibility	Within 2% F.S.		Resistance load 100V AC0.5A 200V AC0.25A 100V DC0.05A 200V DC0.025A
Number of contacts	One contact, Two contact		Setting	Within ±3% F.S.		
Setting	External adjustment	Dead band	Within ±4% F.S.			
Lead length	TK□□	1 • 2 • 3 • 4 • 5 • 8 • 10 • 15 • 20 (m) Standard 3m Bimetal compensation 5m max. (350°C or over 30m) Lead compensation 20m max.	Ambient temperature error	Within ±2% F.S./ 15deg		
	TJ□□	1 • 2 • 3 • 4 • 5 • 8 • 10 • 15 • 20 (m) Standard 3m Bimetal compensation 20 m max. Lead compensation 50 m max.	Compensation	TJ□4, TK□4	Bimetal compensation	
Case	Construction: Indoor use • equivalent to IP32, T□54: ADC12, Others: AC7A, Finishing: Black					
Wetted parts	Bulb: 304st.st., Connection • Flange: 304st.st.					
Connection	R1/2 (PT), R3/4 (PT), 1/2NPT, G1/2B (PF), G3/4B (IF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.					
Flange	JIS10K20ARF, JIS10K25ARF, ANSI1B150RF, ANSI1B300RF					
Connection	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.	
	With thermowell	Double socket union type: R1/2, 1/2NPT (Connection)				
		Double socket slide type: R1/2, 1/2NPT (Connection)				

THERMOMETER WITH CONTACT SWITCH/INDOOR • REMOTE TYPE2

■ Range • Bulb DIA. • Bulb length

TK 5 • 6 • 7 (Liquid filled dial thermometer • With contact switch)

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Standard Bulb Dia. × Length d (d1) × L (L)	Bulb length (L) mm					Max.	
			Minimum insertion length						
			d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)		
-70 ~ 50	2	10 (15) × 100 (100)	50 (75)	45 (70)	40	40 (65)	50 (75)	500	
-70 ~ 100	5	100 (100)	40 (65)	40 (65)	40	40 (65)	40 (65)		
-50 ~ 50	2	100 (100)	55 (80)	45 (70)	40	40 (65)	55 (80)		
-30 ~ 50	2	100 (100)	65 (90)	55 (80)	45	40 (65)	40 (65)		
-20 ~ 100	2	100 (100)	50 (75)	45 (70)	40	40 (65)	50 (75)		
-10 ~ 50	1	100 (100)	70 (95)	60 (85)	50	45 (70)	40 (65)		
0 ~ 50	1	100 (100)	95 (120)	75 (100)	60	50 (75)	45 (70)		
~ 60	1	100 (100)	70 (95)	60 (85)	50	45 (70)	40 (65)		
~ 80	2	100 (100)	65 (90)	55 (80)	45	40 (65)	40 (65)		
~ 100	2	100 (100)	55 (80)	45 (70)	40	40 (65)	55 (80)		
~ 120	2	100 (100)	50 (75)	45 (70)	40	40 (65)	50 (75)		
~ 150	2	100 (100)	40 (65)	40 (65)	40	40 (65)	40 (65)		
~ 200	5	100 (100)	40 (65)	40 (65)	40	40 (65)	40 (65)		
~ 250	5	100 (100)	40 (65)	40 (65)	40	40 (65)	40 (65)		
~ 300	5	100 (100)	40 (65)	40 (65)	40	40 (65)	40 (65)		
~ 400	10	200 (200)	230 (255)	170 (195)	120	100 (125)	80 (105)		d=8 DIA, 16 DIA. 1000 d=10 DIA, 12 DIA, 13 DIA. 3000
~ 500	10	200 (200)	230 (255)	170 (195)	120	100 (125)	80 (105)		

TJ 5 • 6 • 7 (Mercury filled dial thermometer • With contact switch)

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Standard Bulb Dia. × Length d (d1) × L (L)	Bulb length (L) mm					Max.
			Minimum insertion length					
			d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	
-30 ~ 50	2	10 (15) × 200 (200)	210 (230)	160 (180)	115	100 (120)	75 (95)	d=8 DIA, 16 DIA. 1000 d=10 DIA, 12 DIA, 13 DIA. 3000
-30 ~ 120	2	100 (150)	120 (140)	95 (115)	70	60 (80)	50 (70)	
-20 ~ 100	2	200 (200)	145 (165)	110 (130)	80	70 (90)	55 (75)	
-10 ~ 50	1	300 (300)	290 (310)	220 (240)	155	130 (150)	100 (120)	
0 ~ 50	1	300 (300)	360 (380)	270 (290)	190	160 (180)	120 (140)	
~ 60	1	300 (300)	290 (310)	220 (240)	155	130 (150)	100 (120)	
~ 80	2	200 (200)	210 (230)	160 (180)	115	100 (120)	75 (95)	
~ 100	2	200 (200)	170 (190)	130 (150)	95	85 (105)	65 (85)	
~ 120	2	200 (200)	145 (165)	110 (130)	80	70 (90)	55 (75)	
~ 150	2	100 (150)	120 (140)	95 (115)	70	60 (80)	50 (70)	
~ 200	5	100 (100)	90 (110)	75 (95)	55	50 (70)	40 (60)	
~ 250	5	100 (100)	75 (95)	60 (80)	50	45 (65)	40 (60)	
~ 300	5	100 (100)	70 (90)	60 (80)	45	40 (60)	40 (60)	
~ 400	10	100 (100)	60 (80)	50 (70)	40	40 (60)	40 (60)	
~ 500	10	100 (100)	50 (70)	40 (60)	40	40 (60)	40 (60)	
~ 600	10	100 (100)	45 (65)	40 (60)	40	40 (60)	40 (60)	
~ 650	20	100 (100)	45 (65)	40 (60)	40	40 (60)	40 (60)	

- Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.
 • Bulb length should be over the above length and specify 5mm steps.
 • In case of plain type of bulb, minimum length to be added 40mm to the above length.

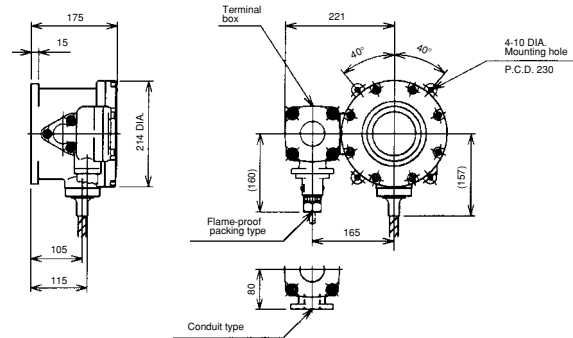
EXPLOSION-PROOF THERMOMETER WITH CONTACT SWITCH 1

TD 10 Liquid filled dial thermometer



Applicable model d2G4
 Labor ministry inspection No. No.24199
 (TD11 Model applied product)
 Weight Approx.11kg (Indicator part)

Dimension



Specification

Manufacturing range	-70 ~ 500°C	Accuracy	Indication	Within ±2% F.S.	Electric rating	
Indication dial	With local indicator		Reproducibility	Within 2% F.S.		Resistance load
Use switch	Contact switch (Open type low contact)		Setting	Within ±3% F.S.		
Number of contacts	One contact, Two contact		Dead band	Within 4% F.S.		200V AC0.25A
Setting	Internal adjustment	Ambient temperature error	Within ±2% F.S./15deg	100V DC0.05A		
Lead length	1 • 2 • 3 • 4 • 5 (m) Standard 3m Max. 5m, 350°C or over. 30m			200V DC0.025A		
Case	Construction : Drip-proof • equivalent to IP54, Material:AC7A, Finishing :Glaz					
Wetted parts	Bulb:304st.st., Connection • Flange:304st.st.					
Compensation	Bimetal compensation					
Connection	R1/2 (PT), R3/4 (PT), 1/2NPT, G1/2B (PF), G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.					
Flange	JIS10K20ARF, JIS10K25ARF, ANSI1B150RF, ANSI1B300RF					
Connection	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.	
	With thermowell	Double socket union type:R1/2,1/2NPT (Connection)				
		Double socket slide type:R1/2,1/2NPT (Connection)				

Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Standard Bulb Dia. × Length d (d1) × L (L)	Bulb length (L)mm					Max.
			Minimum insertion length					
			d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	
-70 ~ 50	2	10 (15) × 100 (100)	50 (79)	45 (70)	40	40 (69)	50 (79)	500
-70 ~ 100	5	× 100 (100)	40 (69)	40 (69)	40	40 (69)	40 (69)	
-50 ~ 50	2	× 100 (100)	55 (80)	45 (70)	40	40 (65)	55 (80)	
-30 ~ 50	2	× 100 (100)	65 (90)	55 (80)	45	40 (65)	40 (65)	
-20 ~ 100	2	× 100 (100)	50 (75)	45 (70)	40	40 (65)	50 (75)	
-10 ~ 50	1	× 100 (100)	70 (95)	60 (85)	50	45 (70)	40 (65)	
0 ~ 50	1	× 100 (100)	95 (120)	75 (100)	60	50 (75)	45 (70)	
~ 60	1	× 100 (100)	70 (95)	60 (85)	50	45 (70)	40 (65)	
~ 80	2	× 100 (100)	65 (90)	55 (80)	45	40 (65)	40 (65)	
~ 100	2	× 100 (100)	55 (80)	45 (70)	40	40 (65)	55 (80)	
~ 120	2	× 100 (100)	50 (75)	45 (70)	40	40 (65)	50 (75)	
~ 150	2	× 100 (100)	40 (65)	40 (65)	40	40 (69)	40 (69)	
~ 200	5	× 100 (100)	40 (65)	40 (65)	40	40 (65)	40 (69)	
~ 250	5	× 100 (100)	40 (65)	40 (65)	40	40 (65)	40 (69)	
~ 300	5	× 100 (100)	40 (65)	40 (65)	40	40 (65)	40 (69)	
~ 400	10	× 200 (200)	230 (255)	170 (195)	120	100 (125)	80 (105)	
~ 500	10	× 200 (200)	230 (255)	170 (195)	120	100 (125)	80 (105)	

Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.
 • Bulb length should be over the above length and specify 5mm steps.
 • In case of plain type of bulb, minimum length to be added 40mm to the above length.

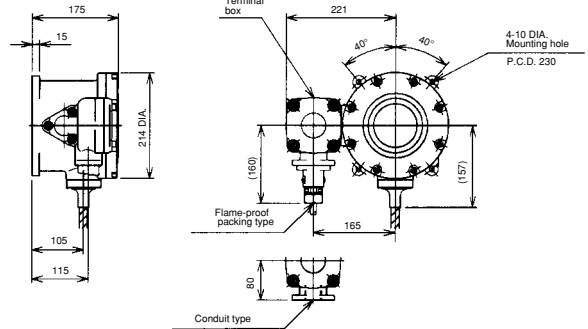
EXPLOSION-PROOF THERMOMETER WITH CONTACT SWITCH 2

TD 11 Mercury filled dial thermometer



Applicable modeld2G4
 Labor ministry inspection No.No.24199
 WeightApprox.11kg (Indicator part)

Dimension



Specification

Manufacturing range	-50 ~ 650°C		Accuracy	Indication	Within ±2% F.S.	Electric rating
Indication dial	With local indicator			Reproducibility	Within 2% F.S.	
Use switch	Contact switch (Open type low contact)		Dead band	Setting	Within ±3% F.S.	
Number of contacts	One contact, Two contact			Ambient temperature error	Within 4% F.S.	Within ±2% F.S./15deg
Setting	Internal adjustment		Lead length		Standard 3m Max. 20m	
Case	Construction: Drip-proof • equivalent to IP54 , Material: AC7A, Finishing: Gray					
Wetted parts	Bulb: 304st.st., Connection • Flange: 304st.st.					
Compensation	Bimetal compensation					
Connection	R1/2 (PT), R3/4 (PT), 1/2NPT, G1/2B (PF), G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.					
Flange	JIS10K20ARF, JIS10K25ARF, ANSI1B150RF, ANSI1B300RF					
Connection	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.	
	With thermowell	Double socket union type:R1/2, 1/2NPT (Connection) Double socket slide type:R1/2, 1/2NPT (Connection)				

Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Standard Bulb Dia. × Length d (d1) × L (L)	Bulb length (L)mm					Max.
			Minimum insertion length					
			d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	
-30 ~ 50	2	10 (15) × 200 (200)	210 (230)	160 (180)	115	100 (120)	75 (95)	d=8 DIA., 16 DIA, 1000
-30 ~ 120	2	× 100 (150)	120 (140)	95 (115)	70	60 (80)	50 (70)	
-20 ~ 100	2	× 200 (200)	145 (165)	110 (130)	80	70 (90)	55 (75)	
-10 ~ 50	1	× 300 (300)	290 (310)	220 (240)	155	130 (150)	100 (120)	
0 ~ 50	1	× 300 (300)	360 (380)	270 (290)	190	160 (180)	120 (140)	
~ 60	1	× 300 (300)	290 (310)	220 (240)	155	130 (150)	100 (120)	
~ 80	2	× 200 (200)	210 (230)	160 (180)	115	100 (120)	75 (95)	
~ 100	2	× 200 (200)	170 (190)	130 (150)	95	85 (105)	65 (85)	
~ 120	2	× 200 (200)	145 (165)	110 (130)	80	70 (90)	55 (75)	
~ 150	2	× 100 (150)	120 (140)	95 (115)	70	60 (80)	50 (70)	
~ 200	5	× 100 (100)	90 (110)	75 (95)	55	50 (70)	40 (60)	d=10 DIA, 12 DIA, 13 DIA, 3000
~ 250	5	× 100 (100)	75 (95)	60 (80)	50	45 (65)	40 (60)	
~ 300	5	× 100 (100)	70 (90)	60 (80)	45	40 (60)	40 (60)	
~ 400	10	× 100 (100)	60 (80)	50 (70)	40	40 (60)	40 (60)	
~ 500	10	× 100 (100)	50 (70)	40 (60)	40	40 (60)	40 (60)	
~ 600	10	× 100 (100)	45 (65)	40 (60)	40	40 (60)	40 (60)	
~ 650	20	× 100 (100)	45 (65)	40 (60)	40	40 (60)	40 (60)	

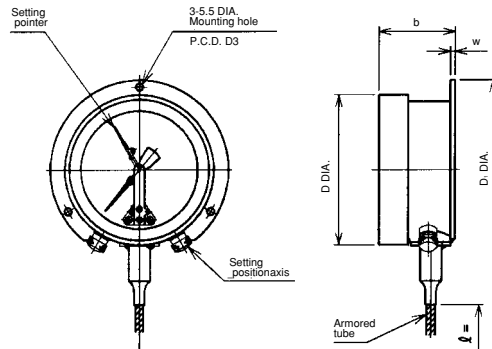
Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.
 • Bulb length should be over the above length and specify 5mm steps.
 • In case of plain type of bulb, minimum length to be added 40mm to the above length.

THRMOMETER WITH CONTACT SWITCH FOR TRANSFORMER 1

TW 84 Liquid filled dial thermometer • Indoor use



Dimension



Model	Dial size	Dimension				
		D	D ₁	D ₃	b	W
TW84	100	112	134	124	78	3.5

Specification

Manufacturing range	-70 ~ 500°C	Accuracy	Indication	Within ±2% F.S.	Electric rating	
Use switch	Contact switch (Open type low contact)		Reproducibility	Within 2% F.S.		Resistance load 200V AC 0.25A 200V DC 0.025A
Number of contacts	One contact		Setting	Within ±4% F.S.		
Setting	Internal adjustment	Dead band	Within 7% F.S.	Withstand voltage * 1000V AC 1 minute Insulation resistance It is more than 500V DC 100MΩ with megger		
Max. pointer	Option		Ambient temperature error		Within ±2% F.S./15deg	
Max. lead length	5m (Standard 3m)	Construction: Indoor use • equivalent to IP43, Material: Aluminium alloy, Finishing: Black				
Case	Bulb: 304st.st., Connection • Flange: 304st.st.					
Wetted parts	Bimetal compensation					
Compensation	R1/2 (PT), R3/4 (PT), 1/2NPT, G1/2B (PF), G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.					
Connection	JIS10K20ARF, JIS10K25ARF, ANSI1B150RF, ANSI1B300RF					
Flange	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.	
	With thermowell	Double socket union type: R1/2, 1/2NPT (Connection)				
		Double socket slide type: R1/2, 1/2NPT (Connection)				

• Apply the contact contactor in normal open condition.

• 2000V AC 1 minute for transformer application.

• In the case of 2 contact point type, as a common pole exists, independent 2 circuits are not obtained.

Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Bulb length (L) mm					Max.
		Minimum insertion length					
		d=8 DIA. (d ₁ =12 DIA.)	d=10 DIA. (d ₁ =15 DIA.)	d=12 DIA.	d=13 DIA. (d ₁ =19 DIA.)	d=16 DIA. (d ₁ =23 DIA.)	
-70 ~ 100	5	40 (65)	40 (65)	40	40 (65)	40 (65)	500
-20 ~ 100	2	50 (75)	45 (70)	40	40 (65)	50 (75)	
0 ~ 50	1	95 (120)	75 (100)	60	50 (75)	45 (70)	
~ 100	2	55 (80)	45 (70)	40	40 (65)	55 (80)	
~ 120	2	50 (75)	45 (70)	40	40 (65)	50 (75)	
~ 150	2	40 (65)	40 (65)	40	40 (65)	40 (65)	
~ 200	5	40 (65)	40 (65)	40	40 (65)	40 (65)	
~ 300	5	40 (65)	40 (65)	40	40 (65)	40 (65)	
~ 500	10	230 (255)	170 (195)	120	100 (125)	80 (105)	
		d=8 DIA., 16 DIA., 1000 d=10 DIA., 12 DIA., 13 DIA., 3000					

Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.

• Bulb length should be over the above length and specify 5mm steps.

• In case of plain type of bulb, minimum length to be added 40mm to the above length.

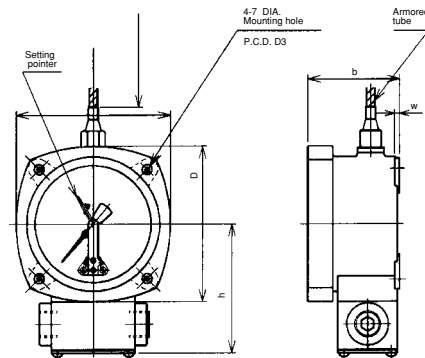
• Models of which temperature sensing portion is partially flat can be manufactured.

TEMPERATURE THERMOMETER WITH CONTACT SWITCH FOR TRANSFORMER 2

TW 54 Liquid filled dial thermometer • Waterproof and moisture resistance type



Dimension



Model	Dial size	Dimension				
		D	D ₃	b	W	h
TW 54	100	125	126	87.5	4	112.5

Specification

Manufacturing range	-70 ~ 500°C	Accuracy	Indication	Within ±2% F.S.	Electric rating	
Use switch	Contact switch (Open type low contact)		Reproducibility	Within 2% F.S.		Resistance load 200V AC 0.25A 200V DC 0.025A Withstand voltage * 1000V AC 1minute Insulation resistance It is more than 500V DC 100MΩ with megger
Number of contacts	One contact • Two contact		Setting	Within ±4% F.S.		
Setting	Internal adjustment		Dead band	Within 7% F.S.		
Max. pointer	Option		Ambient temperature error	Within ±2% F.S./15deg		
Max. lead length	5m (Standard 3m)					
Case	Construction: Water-proof • equivalent to IP65, Material: Aluminium alloy, Finishing: Black					
Wetted parts	Bulb: 304st.st., Connection • Flange: 304st.st.					
Compensation	Bimetal compensation					
Connection	R1/2 (PT), R3/4 (PT), 1/2NPT, G1/2B (PF), G3/4B (PF) 1/2 is not available with 16 Dia. bulb and 19 Dia., 23 Dia. thermowell.					
Flange	JIS10K20ARF, JIS10K25ARF, ANSI1B150RF, ANSI1B300RF					
Connection	Without thermowell	Union type, Slide type			Slide type is not available with 16 Dia. bulb.	
	With thermowell	Double socket union type:R1/2, 1/2NPT (Connection)				
		Double socket slide type:R1/2, 1/2NPT (Connection)				

• Apply the contact contactor in normal open condition.

• 2000V AC 1minute for transformer application.

• In the case of 2 contact point type, as a common pole exists, independent 2 circuits are not obtained.

Range • Bulb DIA. • Bulb length

Value in parenthesis is the case with thermowell.

Range °C	Minimum graduation °C	Bulb length (L)mm					Max.
		Minimum insertion length					
		d=8 DIA. (d=12 DIA.)	d=10 DIA. (d=15 DIA.)	d=12 DIA.	d=13 DIA. (d=19 DIA.)	d=16 DIA. (d=23 DIA.)	
-70 ~ 100	5	40 (65)	40 (65)	40	40 (65)	40 (65)	500
-20 ~ 100	2	50 (75)	45 (70)	40	40 (65)	50 (75)	
0 ~ 50	1	95 (120)	75 (100)	60	50 (75)	45 (70)	
~ 100	2	55 (80)	45 (70)	40	40 (65)	55 (80)	
~ 120	2	50 (75)	45 (70)	40	40 (65)	50 (75)	
~ 150	2	40 (65)	40 (65)	40	40 (65)	40 (65)	
~ 200	5	40 (65)	40 (65)	40	40 (65)	40 (65)	
~ 300	5	40 (65)	40 (65)	40	40 (65)	40 (65)	
~ 500	10	230 (255)	170 (195)	120	100 (125)	80 (105)	

Note • Above length is the minimum necessary length of bulb to be inserted into the fluid to be measured.

• Bulb length should be over the above length and specify 5mm steps.

• In case of plain type of bulb, minimum length to be added 40mm to the above length.

Type No. Constituton 1 Please specify Type No., each spcification and temperature range when ordering.

(Note: For this Model, there is no applicable item for the figures X, but please specify X when ordering.)

- TF** With micro switch • Liquid filled dial thermometer
- TE** With micro switch • Mercury filled dial thermometer
- TK** With contact switch • Liquid filled dial thermometer
- TJ** With contact switch • Mercury filled dial thermometer

Mounting

1	Direct/I stem type (100 DIA.)
5	Remote/Surface nounting
6	Remote/Panel (Mounting hole)
7	Remote/Panel (Mounting clamp)

I stem type 150 Dia. and others direct type is available. Contact NKS for details.

Mounting • Size

4	100
6	150

75 Dia. is available with electric contact. Contact NKS for details.

2 Connecting form

0	Union type
1	Slide type
4	Plain type

Bulb dend type is available.

1 Thermowell • Inner connection

0	Without thermowell
1	With thermowell:W22 thread14 (Standard)
2	With thermowell:R ¹ / ₂ Double socket
3	With thermowell:1/2NPT Double socket
4	With thermowell:G ¹ / ₂ Double socket
5	With thermowell:R ³ / ₄ Double socket

Please refer to other page for thermowell. (SW□□)

3 Connection

0	R ¹ / ₂
1	R ³ / ₄
2	1/2NPT
3	G ¹ / ₂ B
4	G ³ / ₄ B
5	JIS10K20ARF
6	JIS10K25ARF
7	ANSI1B150RF
8	ANSI1B300RF
A	Fixing screw (W22 thread 14)union type only
Z	Plain type

15 Document

0	Nil
1	Please specify your requirement. Drawing one sheet, Instruction manual, Inspection procedure, Mill sheet, Test report.

14 Other additional spec.

0	Nil
1	Please specify your requirement. Case finishing • Dual scale with (°F) Connection 316st.st. option.

12 Outlet for electric wire

0	DIN 9 DIA.
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With contact switch.

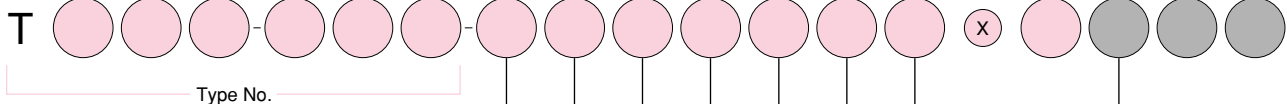
12 Outlet for electric wire conduit type

3	PF ³ / ₄ Female (Standard)
2	PF ¹ / ₂ Female
A	Rc ¹ / ₂
B	1/2NPT Female

With micro switch.

Selection spec.

Additional Spec. (Option)



4 Range (°C)

1	0 ~ 50, 60, 80, 100, 120, 150
2	0 ~ 200, 250, 300 (Liquid filled type TF14 is not available)
3	0 ~ 400, 500 (Liquid filled type is not available)
4	0 ~ 600, 650 (Liquid filled type is not available)
5	-10 ~ 50, -30 ~ 50, -50 ~ 50, -10 ~ 100
6	-70 ~ 50, -70 ~ 100 (Mercury filled type is not available)
7	-30 ~ 120, -20 ~ 100

Please specify range & unit.

5 Bulb Dia.

1	d=8 Dia.
2	d=10 Dia.
3	d=12 Dia.
4	d=13 Dia.
5	d=16 Dia.

6 Bulb length

1	From min. insertion length to ~ 500mm Liquid filled type Max. 500mm
2	505 mm ~ 1000 (8 DIA., 16 DIA.) 3000 (Others) Mercury filled type only

Please specify bulb length.

7 Lead kind

0	Nil (Direct type)
1	Capillary: 304st.st., Armored tube: 430st.st.
2	Capillary: 316st.st., Armored tube: 430st.st.
3	Capillary: 304st.st., Armored tube: 430st.st.+PVC (Max. 100°C)
4	Capillary: 316st.st., Armored tube: 430st.st.+PVC (Max.100°C)

9 Lead length

0	Nil (Direct type)
1	Less than 3m
2	Over 3m

Please specify lead length.

10 Contact point type

1	H: Upper limit type with one contact
2	L: Lower limit type with one contact
3	HL: Upper & lower limit type with two contact
4	2H: Upper type with two contact (Contact type is not available.)
5	2L: Lower limit type with two contact (Contact type is not available.)

9 Compensation

1	Bimetal compensation (Micro liquid filled type is not available.)
2	Lead compensation (Micro mercury filled type is not available. Contact 100 DIA. is not available. Contact more than 350deg. impossibility.)

13 Treatment

0	Nil
1	Use no oil
2	Use no water
3	Use no oil • water

* When placing an order, check to confirm the specifications including a model, range, bulb, a lead parts, etc. and then select a model number.

Type No. Constitution 2 Please specify Type No., each specification and temperature range when ordering.

(Note: For this Model, there is no applicable item for the figures X, but please specify X when ordering.)

TD Explotion-proof thermometer

Mounting

25	With micro switch • Liquid filled dial thermometer
21	With micro switch • Mercury filled dial thermometer
10	With contact switch • Liquid filled dial thermometer
11	With contact switch • Mercury filled dial thermometer

1 Thermowell • Inner connection

0	Without thermowell
1	With thermowell: W22 thread 14 (Standard)
2	With thermowell: R ¹ / ₂ Double socket
3	With thermowell: 1/2 NPT Double socket
4	With thermowell: G ¹ / ₂ Double socket
5	With thermowell: R ³ / ₄ Double socket

Please refer to other page for thermowell. (SW□□)

2 Connecting form

0	Union type
1	Slide type
4	Plain type

Bulb bend type is available.

3 Connection

0	R ¹ / ₂
1	R ³ / ₄
2	1/2 NPT
3	G ¹ / ₂ B
4	G ³ / ₄ B
5	JIS10K20ARF
6	JIS10K25ARF
7	ANSI1B150RF
8	ANSI1B300RF
A	Fixing screw (W22 thread 14) union type only
Z	Plain type

15 Document

0	Nil
1	Please specify your requirement. Drawing one sheet, Instruction manual, Inspection procedure, Mill sheet, Test report.

14 Other additional spec.

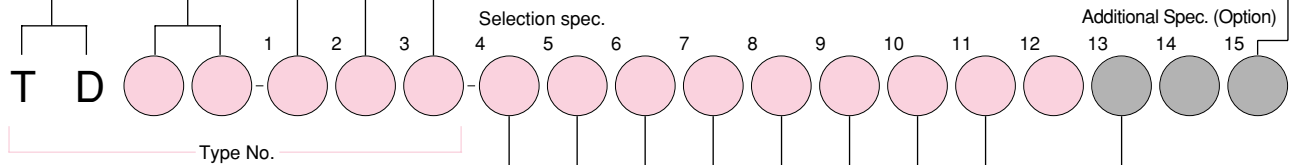
0	Nil
1	Please specify your requirement. Case finishing • Dual scale with (°F) Connection 316st.st. option.

12 Outlet for electric wire In case of conduit type

3	PF ³ / ₄ Female (Standard)
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12 Outlet for electric wire In case of flame-proof packing type

0	PF ¹ / ₂ Female × 10.5
1	PF ¹ / ₂ Female × 12
2	PF ³ / ₄ Female × 10.5
3	PF ³ / ₄ Female × 12
4	PF ³ / ₄ Female × 14
5	PF ³ / ₄ Female × 15.5
6	PF ³ / ₄ Female × 16.5
7	PF1 Female × 14
8	PF1 Female × 15.5
9	PF1 Female × 16.5



4 Range (°C)

1	0 ~ 50, 60, 80, 100, 120, 150, 200, 250, 300
2	0 ~ 400, 500, 600, 650 (TD25 is not available, TD10 650°C is not available)
2	-10 ~ 50, -10 ~ 100, -20 ~ 100, -30 ~ 50, -50 ~ 50, -70 ~ 50, -70 ~ 100 (TD25 • 10 only)
4	-10 ~ 50, -20 ~ 100, -30 ~ 50, -30 ~ 120 (TD21 • 11 only)

Please specify range & unit.

5 Bulb Dia.

1	d=8 Dia.
2	d=10 Dia.
3	d=12 Dia.
4	d=13 Dia.
5	d=16 Dia.

6 Bulb length

1	From min. insertion length to ~ 500mm Liquid filled type Max. 500mm
2	505 mm ~ 1000 (8 DIA., 16 DIA.) 3000 (Others) Mercury filled type only

Please specify bulb length.

7 Lead kind

1	Capillary: 304st.st., Armored tube: 430st.st.
2	Capillary: 316st.st., Armored tube: 430st.st.
3	Capillary: 304st.st., Armored tube: 430st.st.+PVC (Max. 100°C)
4	Capillary: 316st.st., Armored tube: 430st.st.+PVC (Max. 100°C)

8 Lead length

1	Less than 3m
2	Over 3m

Please specify lead length.

9 Lead length

1	Bimetal compensation (TD21 • 10 • 11)
2	Lead compensation (TD25)

13 Treatment

0	Nil
1	Use no oil
2	Use no water
3	Use no oil • water

11 Type of outlet

1	Conduit type
3	Flame-proof packing type

10 Contact point type

1	H: Upper limit type with one contact
2	L: Lower limit type with one contact
3	HL: Upper & lower limit type with two contact
4	2H: Upper limit type with two contact (TD10 • 11 is not available)
5	2L: Lower limit type with two contact (TD10 • 11 is not available)

* When placing an order, check to confirm the specifications including a model, range, bulb, a lead parts, etc. and then select a model number.

Type No. Constituton 3 Please specify Type No., each spcification and temperature range when ordering.

(Note:For this Model, there is no applicable item for the figures X, but please specify X when ordering.)

- TX54** For transformer • With micro switch • Waterproof and moisture resistance type • Mercury filled dial thermometer, 100 DIA.
- TX56** For transformer • With micro switch • Waterproof and moisture resistance type • Mercury filled dial thermometer, 150 DIA.
- TX81** For transformer • With micro switch • Waterproof and moisture resistance type • Liquid filled dial thermometer, 150 DIA.
- TW54** For transformer • With contact switch • Waterproof and moisture resistance type • Liquid filled dial thermometer, 100 DIA.
- TW84** For transformer • With contact switch • Indoor type • Liquid filled dial thermometer, 100 DIA.

1 Thermowell • Inner connection

0	Without thermowell
1	With thermowell: W22 thread14 (Standard)
2	With thermowell: R ¹ / ₂ Double socket
3	With thermowell: 1/2 NPT Double socket
4	With thermowell: G ¹ / ₂ B Double socket
5	With thermowell: R ³ / ₄ Double socket

Please refer to other page for thermowell. (SW□□)

2 Connecting form

0	Union type
1	Slide type
4	Plain type

Bulb dend type is available.

3 Connection

0	R ¹ / ₂
1	R ³ / ₄
2	1/2NPT
3	G ¹ / ₂ B
4	G ³ / ₄ B
5	JIS10K20ARF
6	JIS10K25ARF
7	ANSI1B150RF
8	ANSI1B300RF
A	Fixing screw (W22 thread 14)union type only
Z	Plain type

15 Document

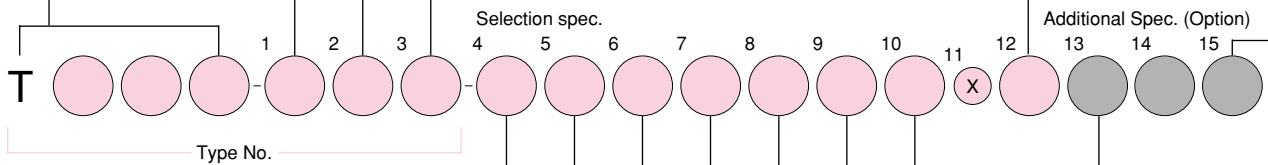
0	Nil
1	Please specify your requirement. Drawing one sheet, Instruction manual, Inspection procedure, Mill sheet, Test report.

14 Other additional spec.

0	Nil
1	Please specify your requirement. Case finishing • Dual scale with (°F) Connection 316st.st. option.

12 Outlet for electric wire

2	PF ¹ / ₂ (TX54 • TW54)
3	PF ³ / ₄ (TX56)
4	PF ¹ / ₄ (TX81)
0	Terminal for communication (TW84)



4 Range (°C)

1	0 ~ 50, 100, 120, 150, 200, 300
2	0 ~ 400, 500 (TW54 • 84)
3	0 ~ 500, 650 (TX54 • 56)
4	-10 ~ 50, -20 ~ 100, -30 ~ 50, -50 ~ 50, -70 ~ 50, -70 ~ 100 (TW54 • 84)
5	-30 ~ 120, -20 ~ 100 (TX54 • 56)
6	-20 ~ 100, -50 ~ 50, -70 ~ 100 (TX81)

Please specify range & unit.

5 Bulb Dia.

1	d=8 Dia.
2	d=10 Dia.
3	d=12 Dia.
4	d=13 Dia.
5	d=16 Dia.

6 Bulb length

1	From min. insertion length to ~ 500mm Liquid filled type Max. 500mm
2	505 mm ~ 1000 (8 DIA., 16 DIA.) 3000 (Others) Mercury filled type only

Please specify bulb length.

7 Lead kind

1	Capillary: 304st.st., Armored tube: 430st.st.
2	Capillary: 316st.st., Armored tube: 430st.st.
3	Capillary: 304st.st., Armored tube: 430st.st.+PVC (Max. 100°C)
4	Capillary: 316st.st., Armored tube: 430st.st.+PVC (Max.100°C)

8 Lead length

1	Less than 3m
2	Over 3m

Please specify lead length.

10 Contact point type

1	H: Upper limit type with one contact
2	L: Lower limit type with one contact
3	HL: Upper & lower limit type with two contact (TW84 is not available.)
4	2H: Upper limit type with two contact (TW54 • 84 is not available.)
5	2L: Lower limit type with two contact (TW54 • 84 is not available.)

9 Cmpensation

1	Bimetal compensation (TX54 • 56, TW54 • 84)
2	Lead compensation (TX81)

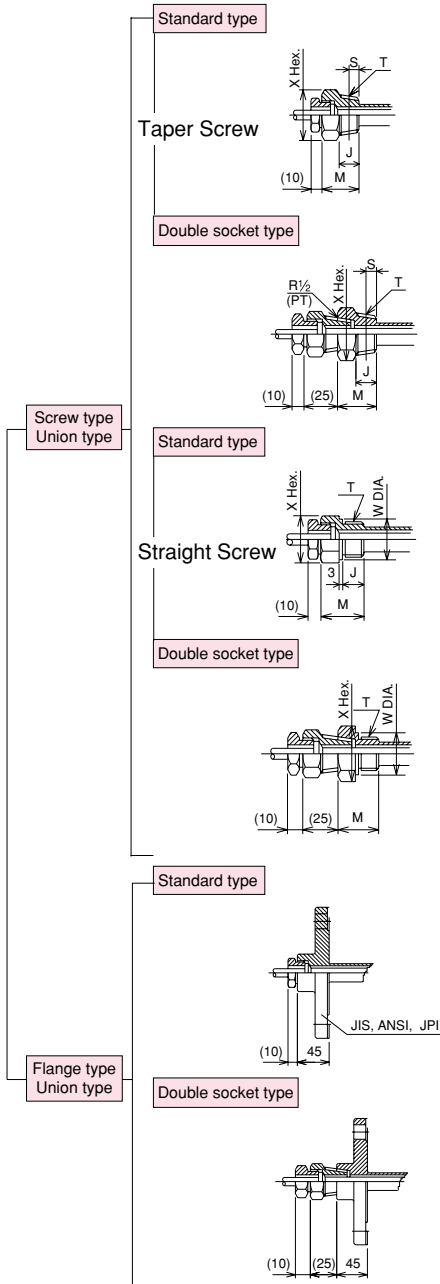
13 Treatment

0	Nil
1	Use no oil
2	Use no water
3	Use no oil • water

* When placing an order, check to confirm the specifications including a model, range, bulb, a lead parts, etc. and then select a model number.

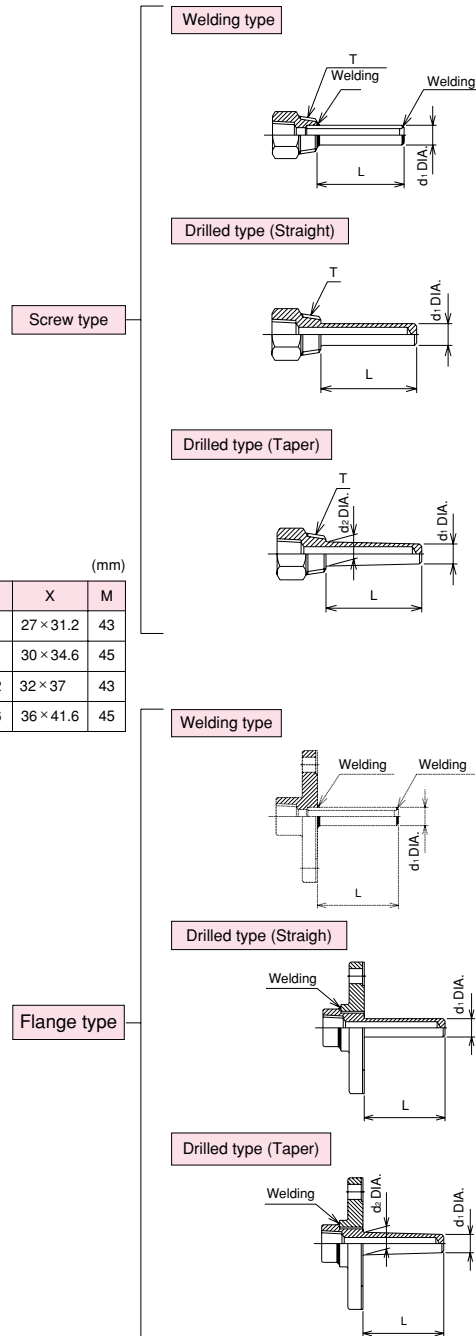
THERMOWELL SPECIFICATION

■ Connection parts and dimension



Note) Please refer to JIS, ANSI, JPI standard for flange size.

■ Thermowell type, Size



(mm)

T	J	S	W	X	M
R ₁ ²	18	8	-	27 × 31.2	43
R ₂ ²	20	9.5	-	30 × 34.6	45
G ¹ / ₂ B	18	-	32	32 × 37	43
G ³ / ₄ B	20	-	36	36 × 41.6	45

■ Relation of Thermowell and bulb.

Thermo-well	Out dia (d. DIA.)	12		15		19		23, 19/23 (Taper)
		Drilled type	Welding type	Drilled type	Welding type	Drilled type	Welding type	Welding type
Inner dia (d.DIA.)		8.5	8.5	10.5	11	13.5	13.5	13.5
Bulb d DIA.		8	8	10	10	13	13	13

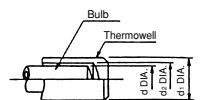
■ Thermowell material 1

304 st.st., 316 st.st., 316 L st.st., Titanium, Hastelloy-B, and Monel-metal are available. Coating is available with followings. Rubber, Kel-F, Teflon, Lead or Glass Thermowell with coating is flange type only.

■ Relation of Thermowell DIA. and connection

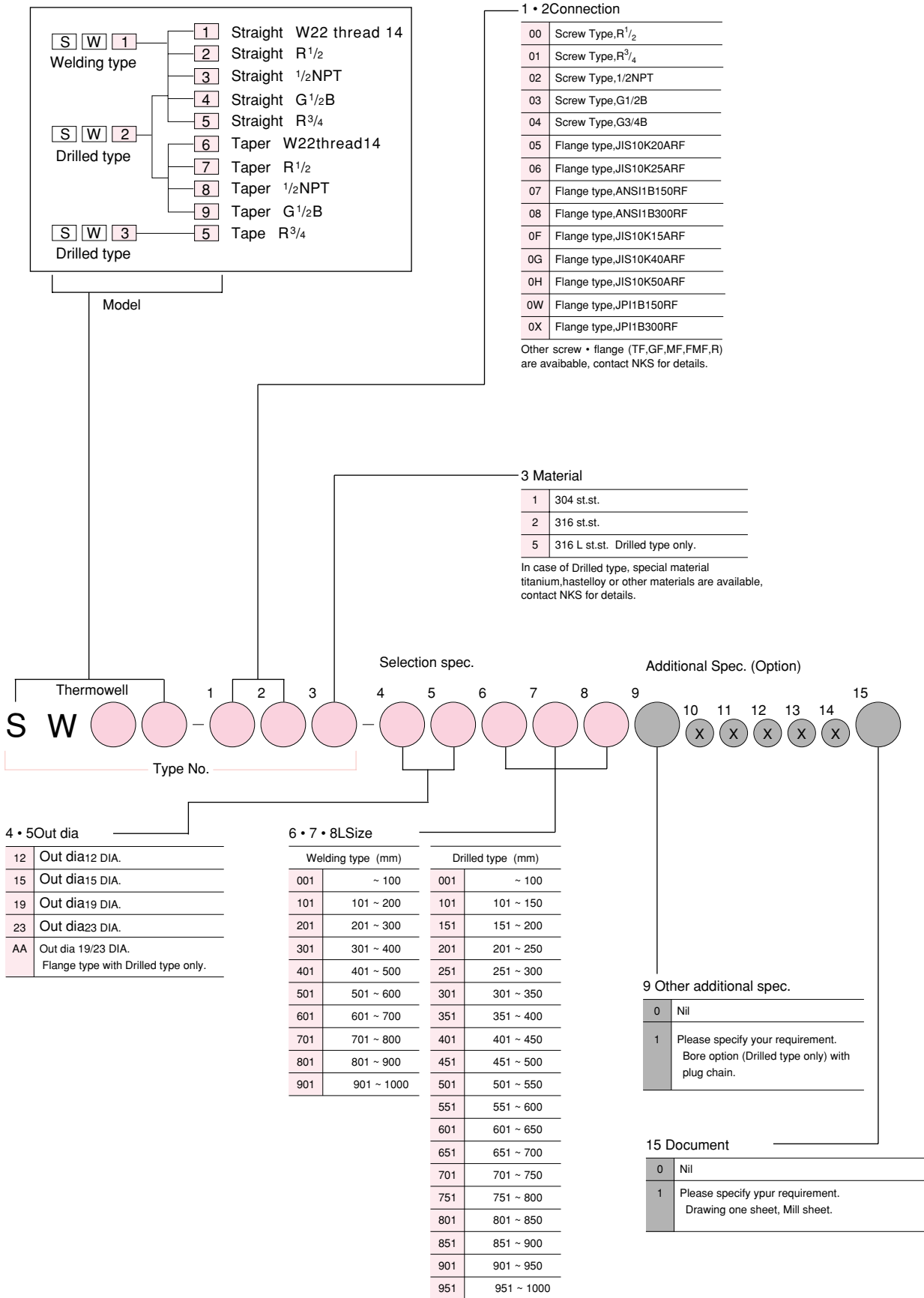
Out dia (d.)	Mounting	Thermowell		
		Screw (T)		Flange JIS, ANSI, JPI
		1/2	3/4	
12 DIA.	Drilled type	○	○	○
	Welding type	○	○	○
15 DIA.	Drilled type	○	○	○
	Welding type	○	○	○
19 DIA.	Drilled type	—	○	○
	Welding type	—	○	○
23 DIA.	Drilled type	—	○	○
	19 DIA./23 DIA. (Taper)	—	○	○

Standard Inner connection (connection with thermometer) is W22 thread 14 or Rc1/2



Type No. Constitution Please specify Type No., each specification and temperature range when ordering.

(Note: For this Model, there is no applicable item for the figures X, but please specify X when ordering.)



• Please specify L size.
• When required over 1000mm, please specify with 100mm steps.