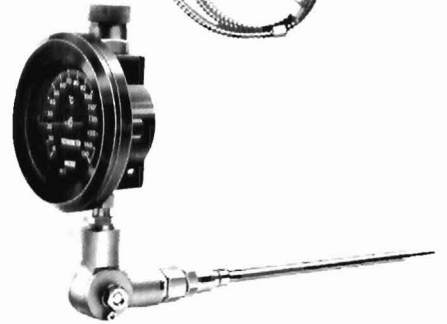


NESS

*Direct Drive NON-MERCURY
FILLED TYPE TEMPERATURE*

**-GAUGES
-SWITCHES**



HIGH

**QUALITY.
REPEATABILITY.
DUABILITY.**

NESSTECH INC.

THE **NESS** GEARLESS THERMOMETER



The **NESS** thermometer is superior to other systems because it provides an evenly graduated scale without the use of a multiplying mechanism or delicate geared segments, pinions or hair springs. The pointer action is direct drive with no multiplying mechanism. This results in a most rugged instrument suitable for installations which, by necessity, have severe vibration and shock.

The mechanical difference between the **NESS** thermometer and a conventional type thermometer is shown in Fig. 1.

Because of its "gearless" mechanism, the "**NESS**" thermometer has the following advantages as compared with conventional type thermometers.

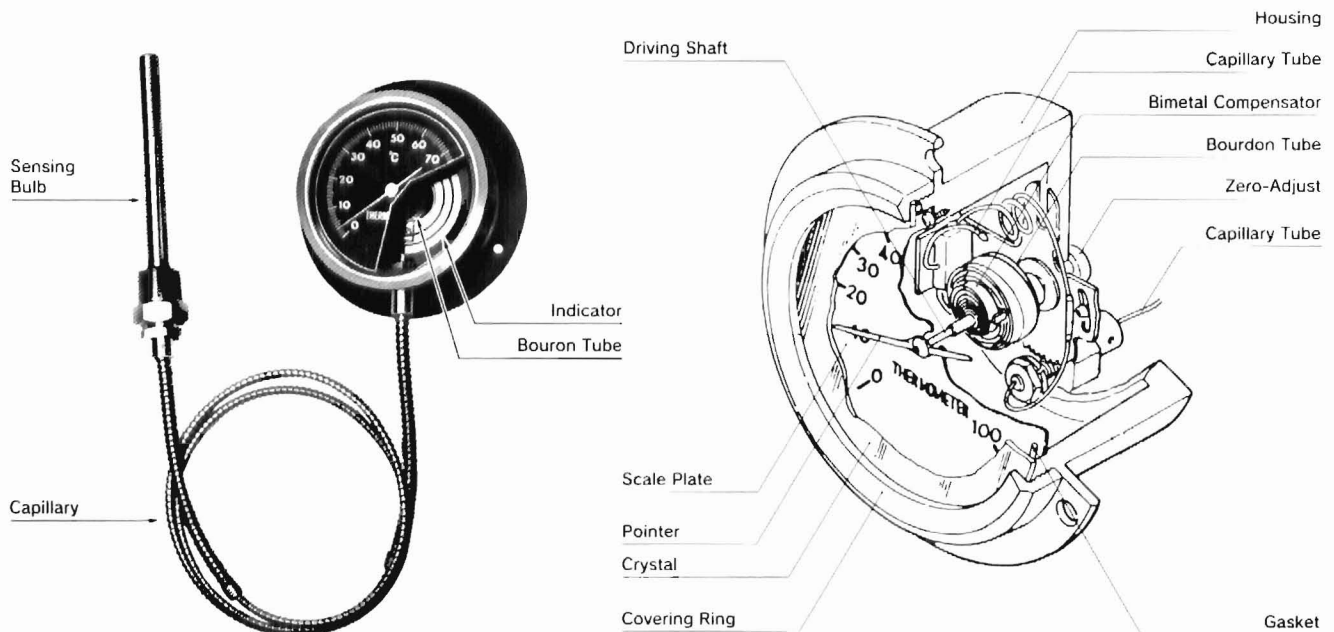
1. Excellent stability.
2. Less trouble because of its simple mechanism.
3. More durability against vibration and shock.
4. Smoother movement of pointer action.
5. Greater sensitivity and faster response to changes in temperatures.
6. Better accuracies.

Compensations Bimetal compensator for head and line as unit, corrects for ambient temperature change.

Double lead compensator (consists of two bourdon tubes and capillary tubes) available if specified.

INTERIOR MECHANISM

THERMOMETER

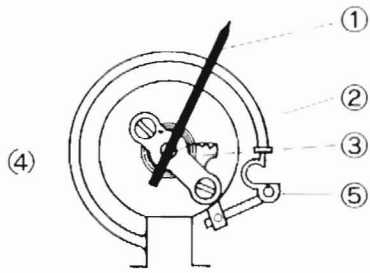


THE **NESS** GEARLESS THERMOMETER

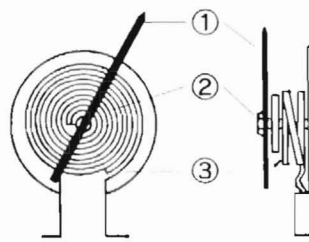
* CONVENTIONAL TYPE MECHANISM

NESS THERMOMETER MECHANISM

SIDE VIEW of N-type Bourdon Tube



- ① Pointer
- ② C-type Bourdon
- ③ Gear Mechanism
- ④ Hairspring
- ⑤ Adjustment



- ① Pointer
- ② Compensator (standard)
- ③ N-type Bourdon Tube



NESS THERMOMETER



Conventional-type THERMOMETER

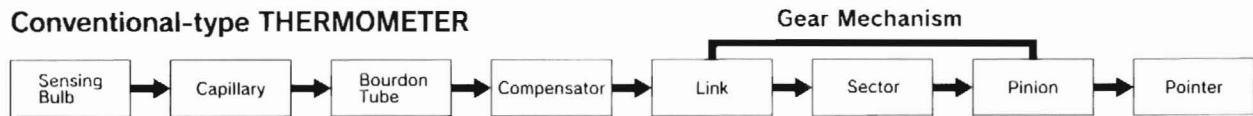


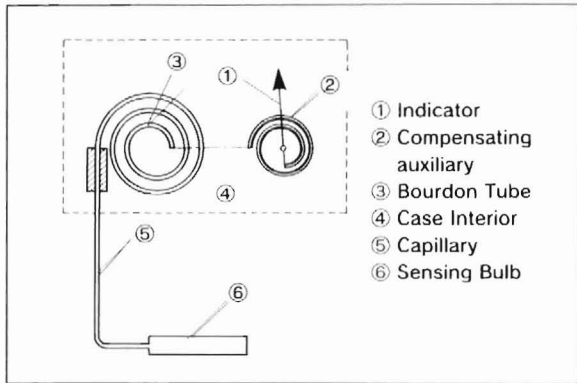
Fig. 1

STANDARD SPECIFICATIONS (applicable on all models except "AGNESS", Compact type & Eccentric type)

- CASE** Case are black enameled cast aluminum, glass crystal and "O" ring seal. Standard model is case compensated. Double capillary, case and line compensated, are also available. 304 stainless steel cases are available as an option. 316 stainless steel case is available for 6" dial size only.
- DIAL** Black numbers on White dial. White on Black is available as well. Three dial sizes 3" (75mm), 4" (100mm), 6" (150mm) nominal.
- CAPILLARY** 3m (10feet) 304 stainless steel tube in 304 stainless steel flexible armor is standard. Maximum length for liquid filled gauges is 10m (33feet), 30m (98feet) for gas filled gauges and 50m (160feet) for double capillary line compensated type.
- SENSING BULBS** Low temperature gauges have 10mm diameter × 100mm length standard bulbs with 1/2" NPT sliding union connection. High temperature gauges, those above 400°C, have 12mm × 100mm length bulbs with 1/2" NPT sliding union connection. Available solid union, w/unions, plain bulbs, and bulbs with thermowells. Standard bulbs are 304 stainless steel. 3/4" unions are available as an option. Please refer to page 19 for details.
- MOUNTING** Select back flange surface mount, front flange panel mount, or bracket mount. Please refer to page 5~18 for details.
- DEGREE OF PROTECTION (ENCLOSURE)** IP66 (Deck Watertight - IEC) Certified
- ACCURACY** ±2% Full scale.
- OPTIONS**
- 316 stainless steel capillary and armor.
 - Bulb diameter and bulb length, consult representative.
 - Thermowells.
 - Connecting thread size or flange size.
 - Changing setting point inner or external set.
 - External junction box.
 - Accuracy of ±1% of Full scale (for liquid filled type indicators only)

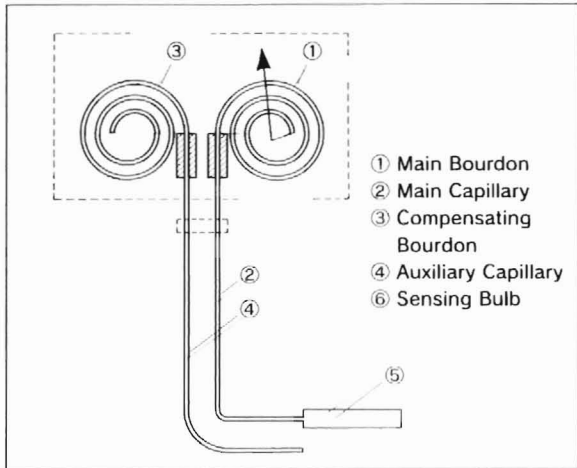
COMPENSATOR

The indicator, capillary, and sensing bulb are a single unit filled with liquid or gas. These liquids or gases will respond properly in spite of any peripheral temperature changes. The compensator exists in order to automatically control any changes owing to temperature fluctuations in these liquids and gases, which are highly susceptible to temperature changes under normal circumstances.



For Single Capillary Types

Because the compensator is housed within the case, it is necessary to keep the capillary at the same temperature as the case. This type of compensator is called a "Case Compensator" or a "Bi-metallic Compensator". Our gauges having this type compensator have "S" at the end of their model number.

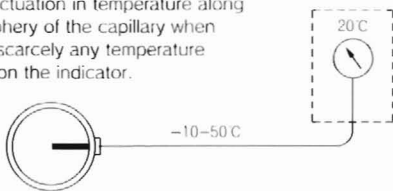


For Double Capillary Types

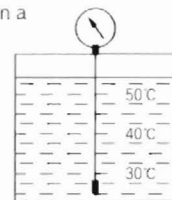
In each gauge the bourdon tubes and the capillaries are grouped into two sets. One set is for temperature measurement, while the other set is for temperature compensation. This gauge will compensate reliably even under local temperature fluctuation. This feature is called "Full Compensation" and places this gauge a grade above gauges with so-called "Case Compensation". Our products having full compensation have "D" at the end of their model number, those with case compensation are likewise coded "S".

Examples of when "Full Compensator" is necessary

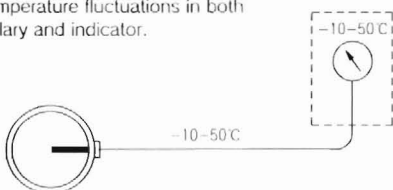
EX. 1 Great fluctuation in temperature along the periphery of the capillary when there is scarcely any temperature change on the indicator.



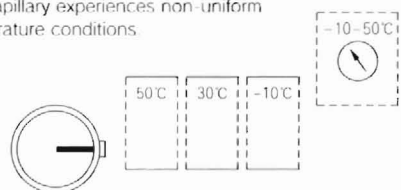
EX. 3 Liquid temperature measurement in a tank with varied temperature distribution.



EX. 2 Great temperature fluctuations in both the capillary and indicator.



EX. 4 The capillary experiences non-uniform temperature conditions.



The temperature conditions illustrated above are for reference purposes only, the possible conditions are not limited to these.

SCALE RANGE TABLE

SCALE RANGE TABLE

Mod.No.	Range in °C	3"	4"	6"	Mod.No.	Range in °F	Mod.No.	Range dual in °C °F
00	* -200~+50		5	5				
01	-100~+50	2	2			* -100~+200		
02	-50~+50	2	1	1				
03	-50~+100	2	2	2				
04	-30~+50	1	1	1				
05	-30~+70	1	1	1				
06	-20~+80	1	1	1	61	0~120	80	-30~ 50°C -20~120°F
07	-20~+120	2	2	2	62	0~150		
08	-10~+60	1	1	1				
09	0~50	1	1	1				
10	0~70		1	1				
12	** 0~100	2	2	1	63	32~210	81	0~100°C 32~210°F
13	0~120	2	2	2				
14	0~150	2	2	2	64	32~300	82	0~150°C 32~300°F
15	0~200	2	2	2	65	32~400	83	0~200°C 32~400°F
16	0~250		5	5	66	32~500		
					67	32~600		
17	0~300	5	5	5				
18	0~350		5	5				
19	* 0~400	10	10	10				
20	* 0~500	10	10	10	68	* 32~800		
21	* 0~600	10	10	10	69	* 32~1112	84	* 0~ 600°C * 32~1112°F

* Gas Filled

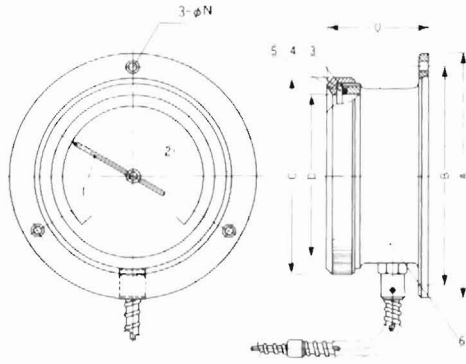
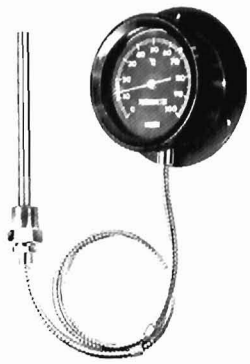
** 1°C graduation is available as an option(for 4" dial size only).

· Ranges listed above are most frequently specified. Consult factory for special ranges.

· Standard: Black lettering on White background.

· If your application is of a special nature, let us know your exact requirements and our proven design and engineering experience will be placed at your disposal.

REMOTE READING

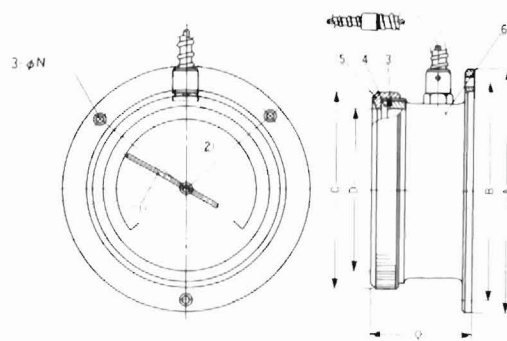


MODEL TUS-2S (FLUSH MOUNTING)

Model No A01

Dia	A	B	C	D	Q	N
3"	110	100	92	70	60	5
4"	140	125	112	93	60	7
6"	206	190	168	140	60	7

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy

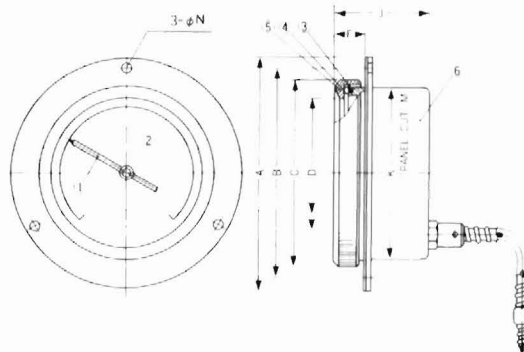
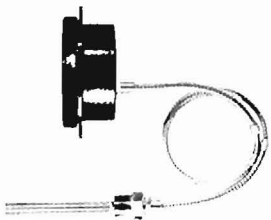


MODEL TOS-2S (FLUSH MOUNTING)

Model No A02

Dia	A	B	C	D	Q	N
3"	110	100	92	70	60	5
4"	140	125	112	93	60	7
6"	206	190	168	140	60	7

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy

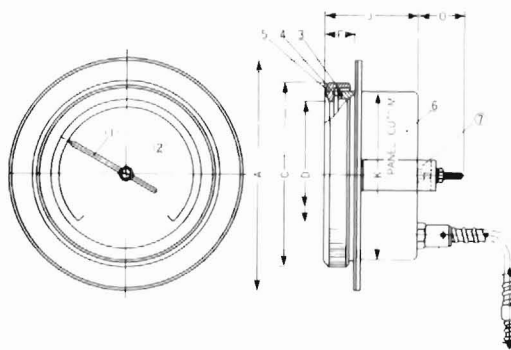
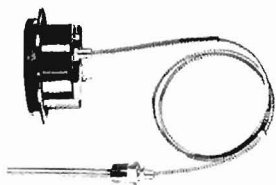


MODEL TBP-2 (PANEL MOUNTING)

Model No A03

Dia	A	B	C	D	F	K	M	N
3"	110	100	92	70	18	80	87	5
4"	140	125	112	93	18	102	106	7
6"	206	190	168	140	18	154	158	7

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy



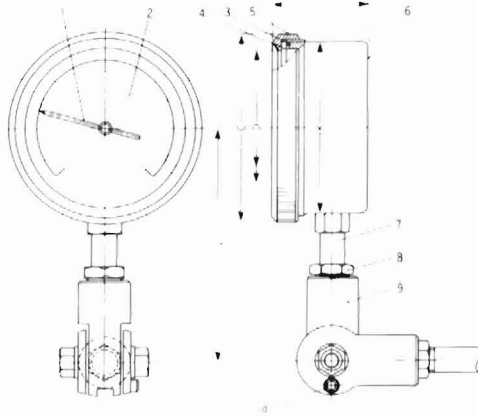
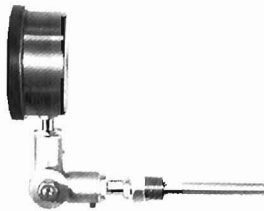
MODEL TBP-3 (PANEL MOUNTING)

Model No A05

Dia	A	C	D	F	J	K	M	O
3"	110	92	70	18	60	80	87	20
4"	140	112	93	18	60	102	106	20
6"	206	168	140	18	60	154	158	20

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy
7	Mounting Kit	304SS

RIGID STEM



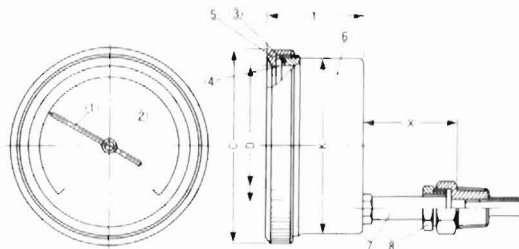
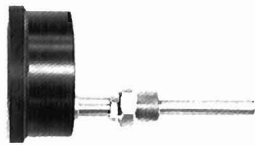
MODEL SU-AD-2 (EVERY ANGLE)

Model No B05

Dia	C	D	T	K	Zo
4"	112	93	60	102	120±5
6"	168	140	60	154	146±5

3" available

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum
7	Stem	304SS
8	Locking Nut	304SS
9	Adjustable Elbow Joint	Aluminum Alloy
10	Locking Pin	304SS



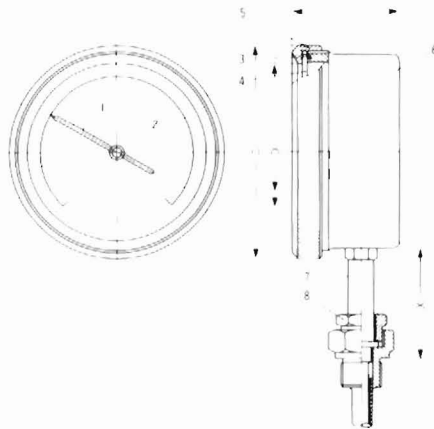
MODEL SBS-2 (BACK CONNECTION)

Model No B02

Dia	C	D	T	K	X
3"	92	70	60	80	54±5
4"	112	93	60	102	54±5
6"	168	140	60	154	54±5

* Add 4 inches for high temp Range Over 300°C

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum
7	Rigid Stem	304SS
8	Fixed Screw	304SS



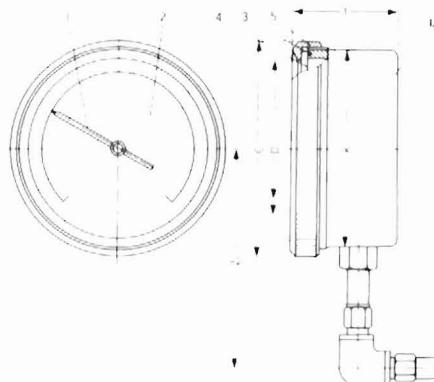
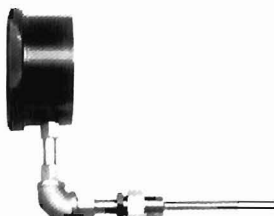
MODEL SUS-2 (STAND TYPE)

Model No B01

Dia	C	D	T	X
3"	92	70	60	54±5
4"	112	93	60	54±5
6"	168	140	60	54±5

* Add 4 inches for high temp Range Over 300°C

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum
7	Rigid Stem	304SS
8	Fixed Screw	304SS



MODEL SUL-3 (L STYLE)

Model No B06

Dia	C	D	T	K	*Zo
3"	92	70	60	80	120±5
4"	112	93	60	102	131±5
6"	168	140	60	154	157±5

* Add 4 inches for high temp Range Over 300°C

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum

STAINLESS STEEL HOUSING (WEATER PROOF)

AGNESS-II THERMOMETER SPECIFICATIONS


■SCALE (Standard) (Fig.-1)

Dial Size: 4 inch (Nominal)

CODE No.	RANGE	Min. Grad.
005	-30~ 70°C	2°C
008	0~ 50°C	1°C
010	0~100°C	2°C
012	0~150°C	2°C
013	0~200°C	5°C
015	0~300°C	5°C

If your application is of a special nature, let us know your exact requirements and put "X" at the end of Part Number

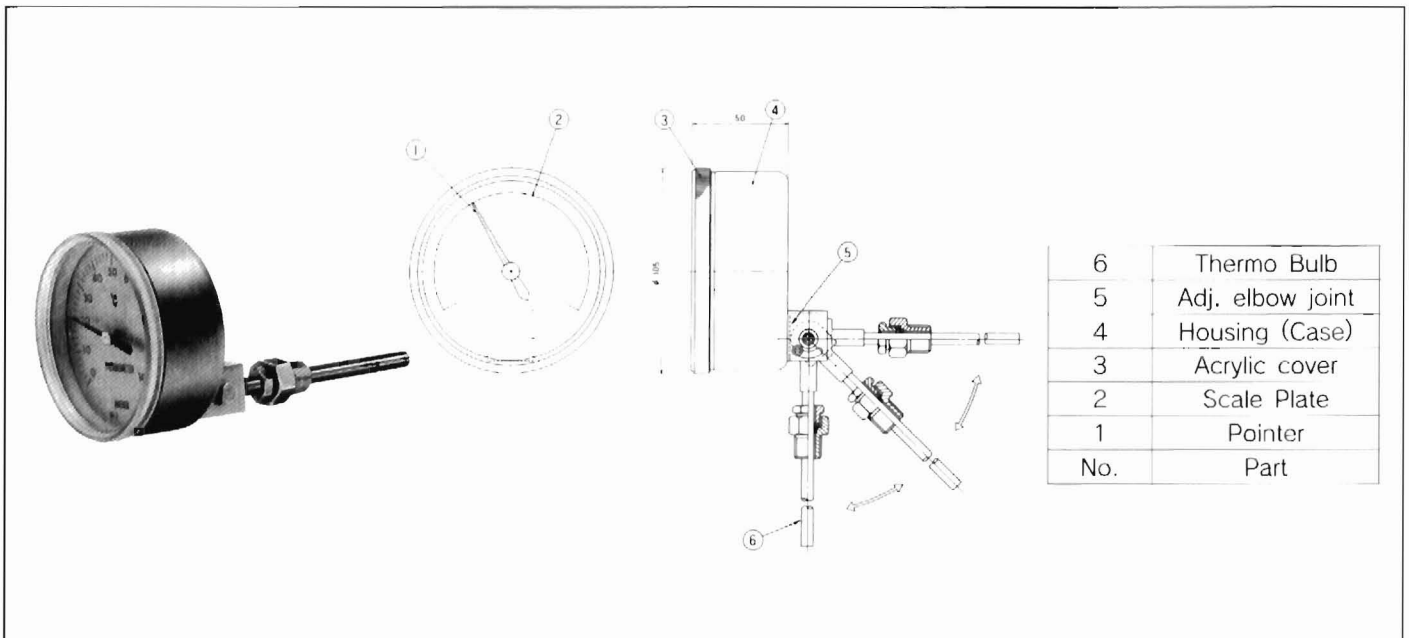
■BULB

TYPE	CODE	1/2"NPT Thread Std.
Sliding union type (Std.)	C	

Please note that sliding union-type bulbs have no effect against pressure. If you put the bulb on pressurized vessel, please use thermowell for your safety.

Outside diameter 6m/m 8m/m 10m/m (Std.)

Code of Material S4 : SUS304 S6 : SUS316



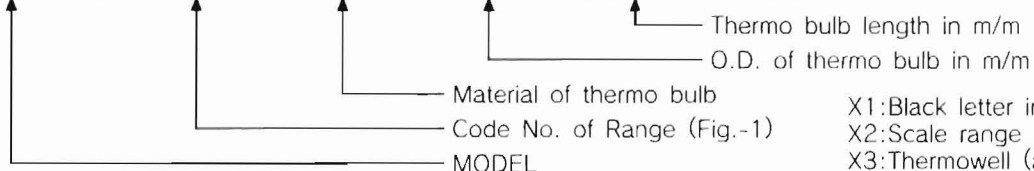
PART NUMBERING SYSTEM

In case of Std. Spec.

Ex.-1 AGNESS-II - 010 - S4 - 10 - 150

Optional Order

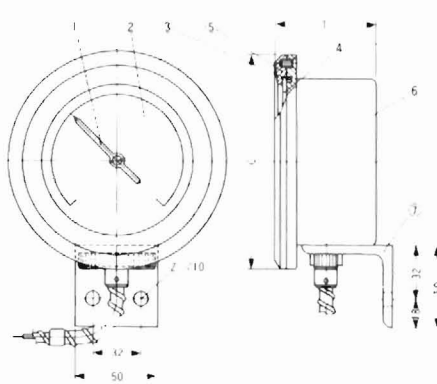
Ex.-2 AGNESS-II - X - S6 - 8 - 100 - X3



Ex.)
X1:Black letter in White
X2:Scale range 32-210F
X3:Thermowell (as per another drawings)

*Previous Model AGNESS is still available. (100mm, 150mm)
Please consult your sales agent for details.

REMOTE READING

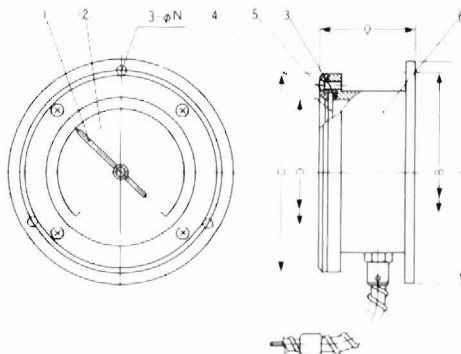
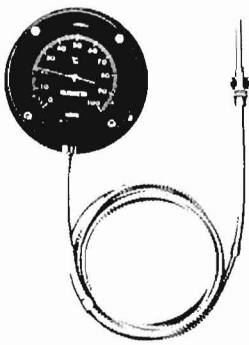


MODEL TUL-20 (FLUSH MOUNTING)

Model No A09

Dia	C	T
4"	133	63

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy



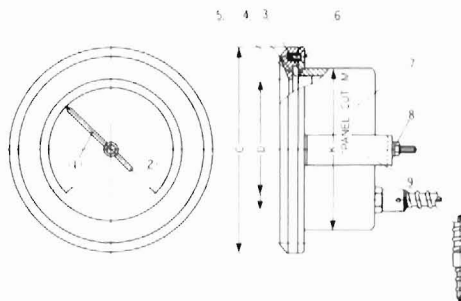
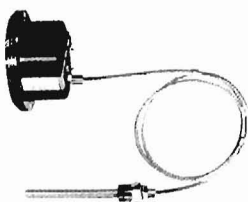
MODEL TUS-2S-O (FLUSH MOUNTING)

Model No A07

Dia	A	B	C	D	Q	N
4"	140	125	125	93	60	7

6" available

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy



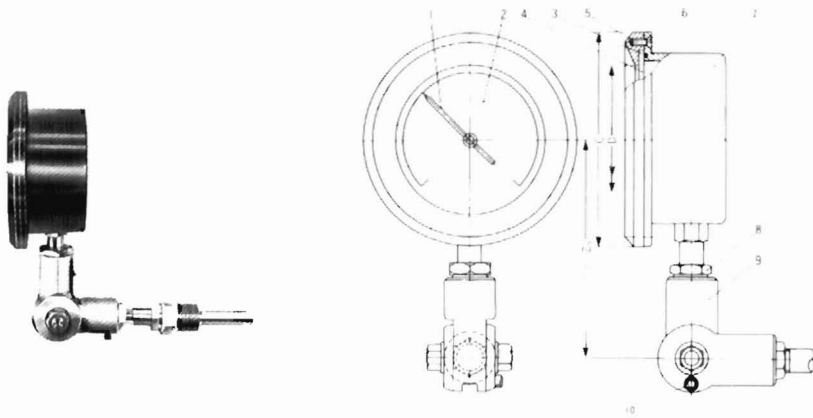
MODEL TBP-30 (PANEL MOUNTING)

Model No A08

Dia	C	D	K	M
4"	133	93	102	106

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Screw	304SS
7	Housing	Aluminum Alloy
8	Fixing Nut	304SS
9	Panel Mounting Kit	304SS

RIGID STEM

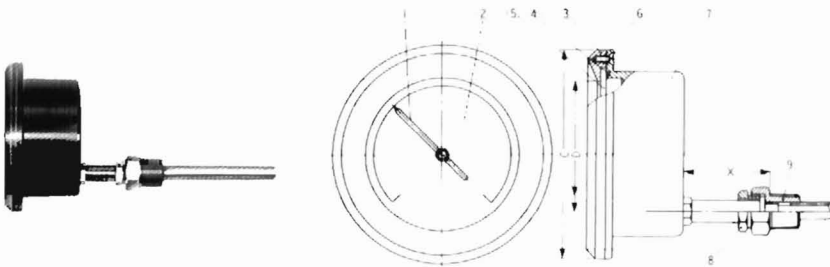


MODEL SU-AD-20 (EVERY ANGLE)

Model No B09

Dia	C	T	Zo
4"	133	93	APPROX \approx 120

No	PART NAME	Material
1	Pointer	P Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Screw	304SS
7	Housing	Aluminum Alloy
8	Locking Nut	304SS
9	Adjustable Elbow joint	Aluminum Alloy
10	Locking Pin	304SS

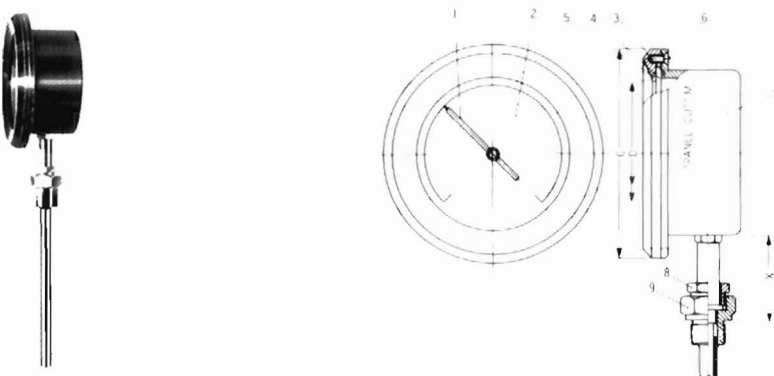


MODEL SBS-20 (BACK CONNECTION)

Model No B08

Dia	C	D	*X	*
4"	133	93	54 \pm 5	Add 4 inches for high temp Range Over 300C

No	PART NAME	Material
1	Pointer	P Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Screw	304SS
7	Housing	Aluminum Alloy
8	Union Nut	304SS
9	Mounting Screw	304SS



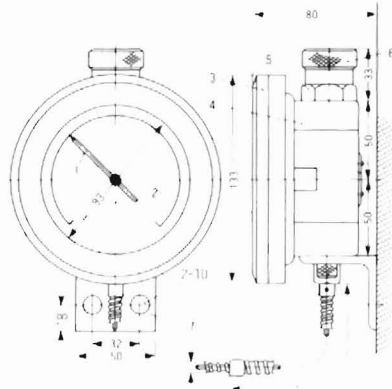
MODEL SUS-20 (STAND TYPE)

Model No B07

Dia	C	D	*X	*
4"	133	93	54 \pm 5	Add 4 inches for high temp Range Over 300C

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	NBR
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Screw	304SS
7	Housing	Aluminum Alloy
8	Union Nut	304SS
9	Mounting Screw	304SS

OIL FILLED (Vibration and Corrosion resistant)

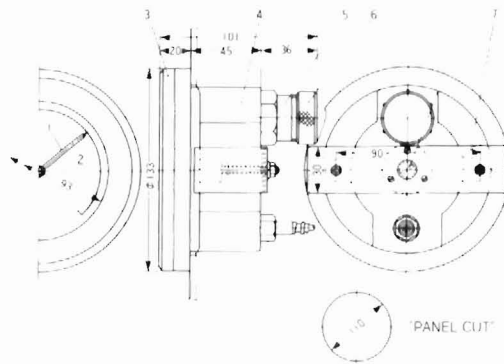


MODEL TUL-HSP (FLUSH MOUNTING)

Model No A10

4" standard.
6" available

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Convering Ring	Aluminum Alloy
4	Housing	Aluminum Alloy
5	Oil Inlet	Aluminum Alloy
6	Oil Inlet Cap	Aluminum Alloy
7	Mounting Kit	304SS or Steel

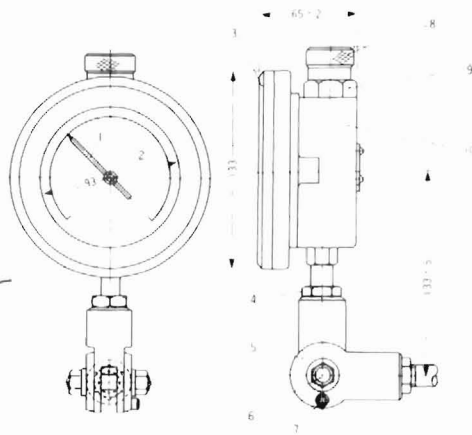
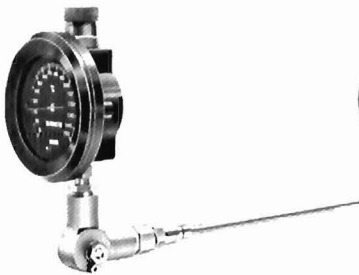


MODEL TBP-HSP (PANEL MOUNTING)

Model No A28

4" only.

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Covering Ring	Aluminum Alloy
4	Housing	Aluminum Alloy
5	Oil Inlet	Aluminum Alloy
6	Oil Inlet Cap	Aluminum Alloy
7	Mounting Kit	304SS or Steel

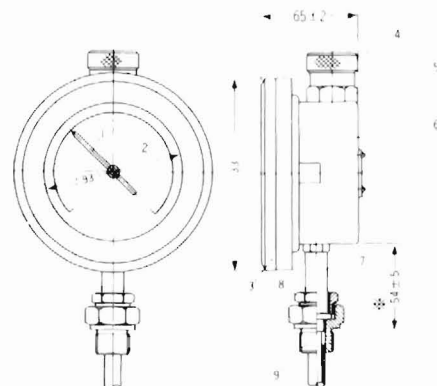


MODEL SU-AD-HSP (EVERY ANGLE)

Model No B12

4" only.

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Covering Ring	Aluminum Alloy
4	Locking Nut	304SS
5	Adjustable Elbow Joint	Aluminum Alloy
6	Shaft	304SS
7	Locking Pin	304SS
8	Oil Inlet Cap	Aluminum Alloy
9	Oil Inlet	Aluminum Alloy
10	Housing	Aluminum Alloy



MODEL SUS-HSP (STAND TYPE)

Model No B16

4" only.

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Covering Ring	Aluminum Alloy
4	Oil Inlet Cap	Aluminum Alloy
5	Oil Inlet	Aluminum Alloy
6	Housing	Aluminum Alloy
7	Rigid Stem	304SS
8	Union Nut	304SS
9	Mounting Screw	304SS

*
Add 4 inches
for high temp
Range Over
300°C

ELECTRICAL CONTACT TYPE

The following thermometers are especially designed to signal or control when temperatures go beyond predetermined high or low limits, and at the same time give accurate temperature indications.

Up to 2 circuits can be controlled by one instrument with one or two switches installed as specified.

Mod code	Set point Nos		▼ Set point	● Normal Use Temp			
-3	1					increase ON.	
-5	1					increase OFF.	
-4	1					Decrease ON.	
-6	1					Decrease OFF.	
-43	2					Red pointer increase ON.	Yellow pointer Decrease ON.
-65	2					Increase OFF.	Decrease OFF.
-33	2					Increase ON.	Increase ON.
-55	2					Increase OFF.	Increase OFF.
-44	2					Decrease ON.	Decrease ON.
-66	2					Decrease OFF.	Decrease OFF.

	Micro Switch
MOD CODE (one set point),(two set points)	-ME, -MEE
Contact Capacity	5A 125V AC <small>non-inductive</small>
Max Voltage Used	200V AC
Withstand Voltage <small>Housing and Terminal</small>	2000V AC 1 min.
Number of contacts available	1 S.P.D.T/ Set Point

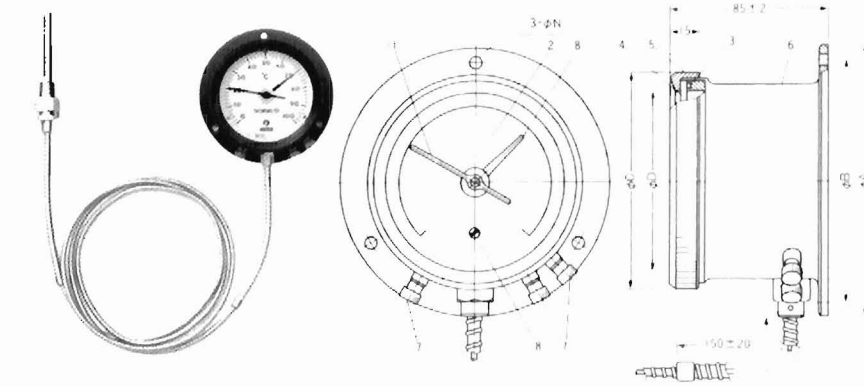
REMOTE READING with ELECTRICAL CONTACT(S)

MODEL TUS-2S-ME

Model No C01

Dia	A	B	C	D	N
3"	110	100	92	70	5
4"	140	125	112	93	7
6"	206	190	168	140	7

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	Neoprene
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy
7	Terminal	Phenol resin
8	Set Point Indicator	Brass Coated
9	Set Screw	Brass Coated

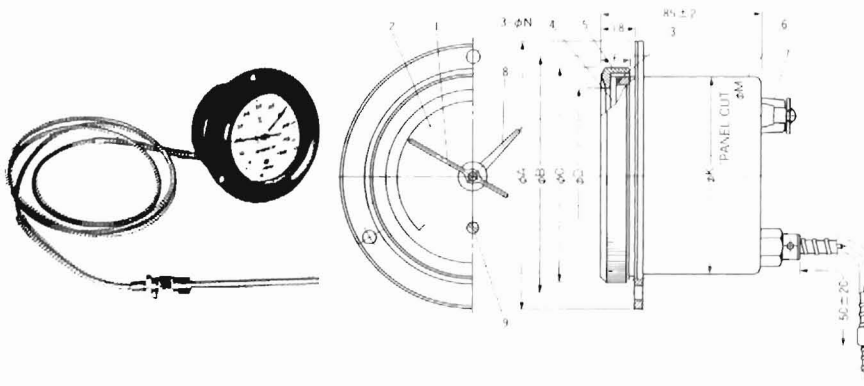


MODEL TBP-2-ME

Model No C03

Dia	A	B	C	D	F	K	M	N
3"	110	100	92	70	18	80	87	5
4"	140	125	112	93	18	102	106	7
6"	206	190	168	140	18	154	158	7

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	Neoprene
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy
7	Terminal	Phenol resin
8	Set Point Indicator	Brass Coated

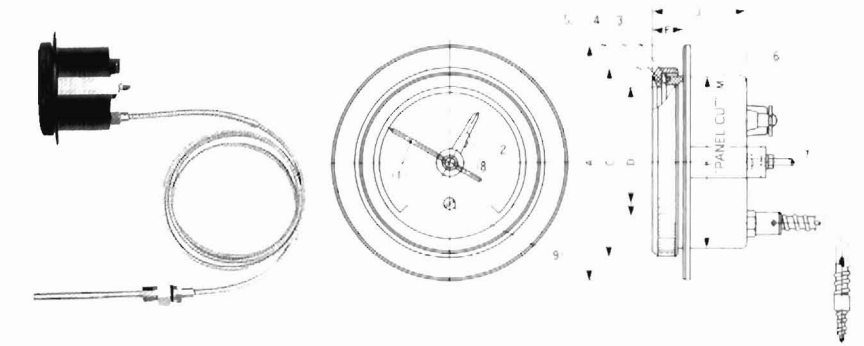


MODEL TBP-3-ME

Model No C05

Dia	A	C	D	F	J	K	M
4"	140	112	93	18	85	102	106
6"	206	168	140	18	85	154	158

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	Neoprene
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy
7	Terminal	Phenol resin
8	Set Point Indicator	Brass Coated
9	Set Screw	Brass Coated

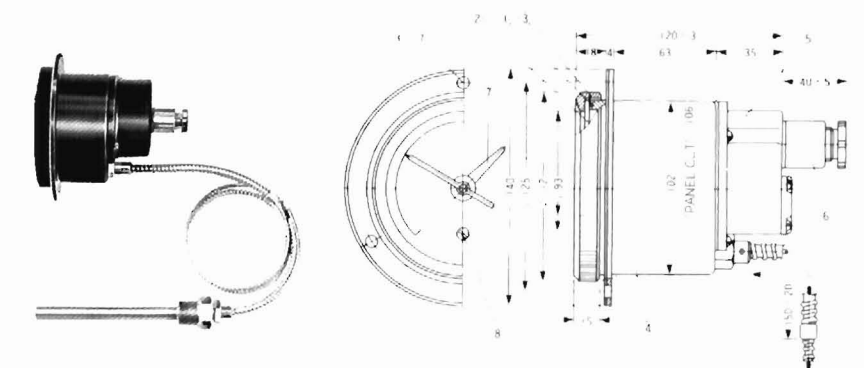


MODEL TBP-40-ME

Model No C09

4" only.

No	PART NAME	Material
1	Gasket	Neoprene
2	Glass Disk	Glass
3	Covering Ring	Aluminum Alloy
4	Housing	Aluminum Alloy
5	Terminal Box	Aluminum Alloy
6	Cable Wire outlet	Brass Coated
7	Set Point Indicator	Brass Coated
8	Set Screw	Brass Coated



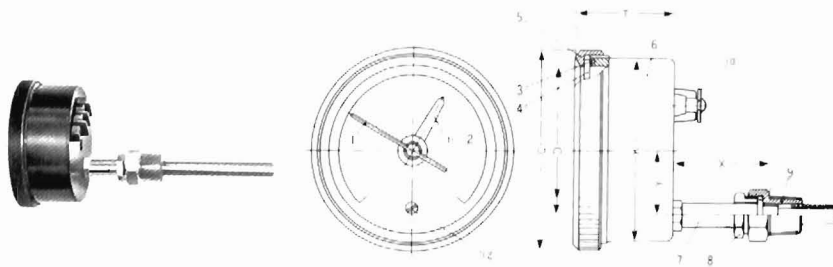
RIGID STEM with ELECTRICAL CONTACT(S)

MODEL SBS-2-ME

Model No C14

Dia	C	D	*T	Y	K	*X	*
3"	92	70	85	25	80	54±5	Add 4 inches for high temp
4"	112	93	85	25	102	54±5	Range Over
6"	168	140	85	38	154	54±5	300°C

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	Neoprene
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum
7	Rigid Stem	304SS
8	Union Nut	304SS
9	Mounting Screw	304SS
10	Terminal	Phenol resin
11	Set Point Indicator	Brass Coated
12	Set Screw	Brass Coated



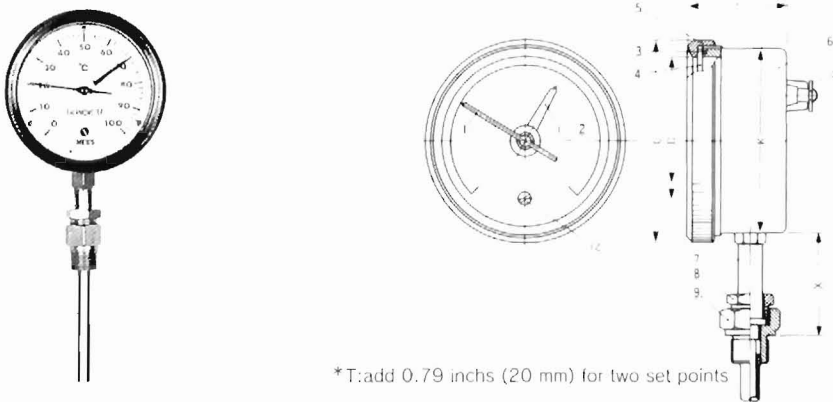
*T: add 0.79 inches (20 mm) for two set points

MODEL SUS-2-ME

(SPECIAL)

Dia	C	D	*T	K	*X	*
3"	92	70	85	80	54±5	Add 4 inches for high temp
4"	112	93	85	102	54±5	Range Over
6"	168	140	85	154	54±5	300°C

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	Neoprene
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy
7	Rigid Stem	304SS
8	Union Nut	304SS
9	Mounting Screw	304SS
10	Terminal	Phenol resin
11	Set Point Indicator	Brass Coated
12	Set Screw	Brass Coated



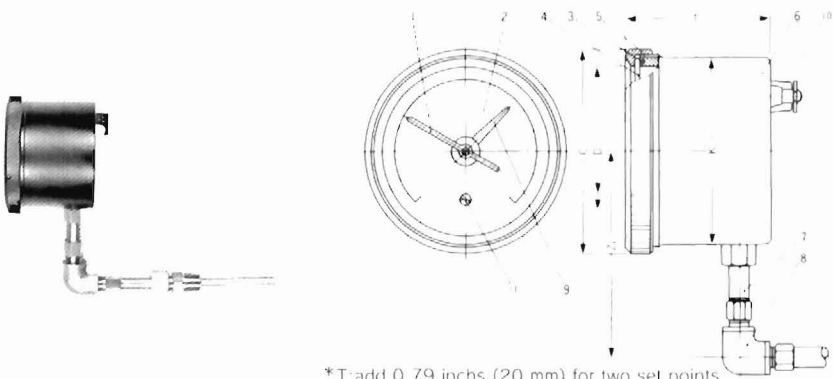
*T: add 0.79 inches (20 mm) for two set points

MODEL SUL-3-ME

(SPECIAL)

Dia	C	D	*T	K	*Zo	*
3"	92	70	84	80	120±5	Add 4 inches for high temp
4"	112	93	84	102	131±5	Range Over
6"	168	140	84	154	157±5	300°C

No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Gasket	Neoprene
4	Glass Disk	Glass
5	Covering Ring	Aluminum Alloy
6	Housing	Aluminum Alloy
7	Rigid Stem	304SS
8	Elbow Joint	Cast Iron or 304SS
9	Set Point Indicator	Brass Coated
10	Terminal	Phenol resin
11	Set Screw	Brass Coated



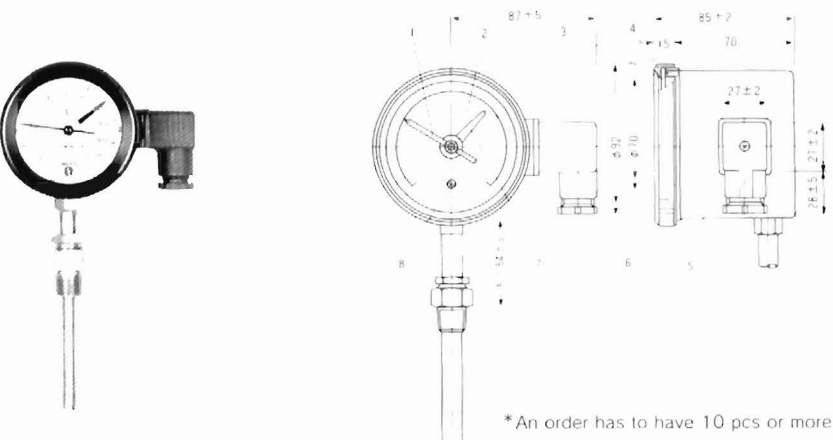
*T: add 0.79 inches (20 mm) for two set points

MODEL SUS-50-ME

(SPECIAL)

Dial size 3" only

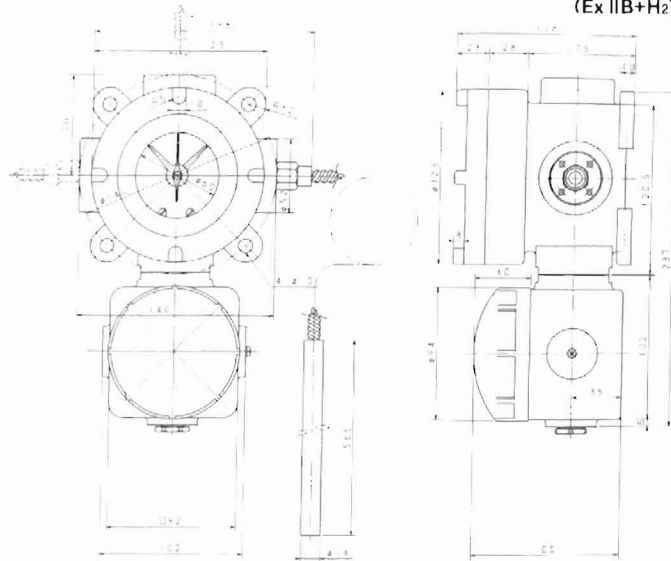
No	PART NAME	Material
1	Pointer	P-Bronze
2	Scale Plate	Aluminum
3	Glass Disk	Glass
4	Covering Ring	Aluminum Alloy
5	Housing	Aluminum Alloy
6	Terminal Box	Synthetic resin
7	Set Point Indicator	Brass Coated
8	Set Screw	Brass Coated



*An order has to have 10 pcs or more

REMOTE READING with ELECTRICAL CONTACT(S)

MODEL TE03-ME Explosion Proof
(Ex IIB+H₂T4) Model No C14



(1) Electrical contact

Microswitch One set point or Two set points
(1-S.P.D.T) (2-S.P.D.T)

Electrical rating AC250V 3A (Non inductive)
AC125V 5A (Non inductive)
DC125V 0.4A (Non inductive)

(2) Scale range

Range	Min. Scale
-30~ 70°C	2°C
0~ 50°C	1°C
0~100°C	2°C

Range	Min. Scale
0~150°C	2°C
0~200°C	2°C
0~300°C	5°C

* Range in deg.F is also available

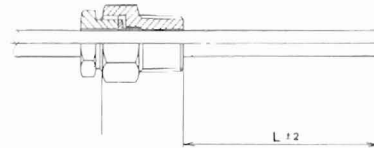
* Other ranges in -200 -600 deg. C is also available as specials.

(3) Capillary

3m (Std.), 10m (Single capillary) Max., 50m (Double capillary) Max.

(4) Thermobulb
Thread
PT 1/2 (Std.)

* Sliding union type only



Material S4:SUS304 (Standard)
S6:SUS316 (Available upon request)

Outside diameter: 8mm, 10mm, 12mm (6m/m as a special order)

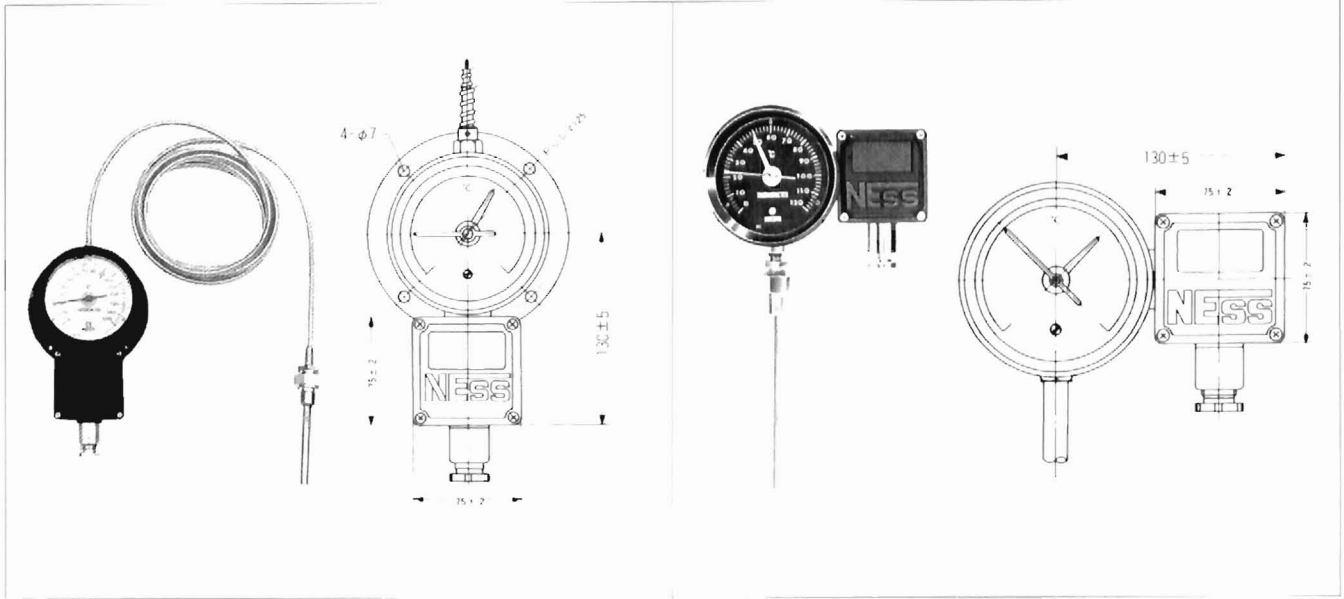
(b) Ordering

Please specify the following items.

Items	Example	Description
Model	TE03-ME-S	Single capillary with one set point
Range	0~100°C	Scale range of 0~100 deg. C.
Capillary	3m	Capillary length of 3m (Standard)
Bulb dia	φ 10	Thermobulb diameter of φ 10 (10mm)
Style of thermowell	Yes	If not required, please specify so.
Size of thermowell	1B JIS 10KRF	Standard inner thread 1/2" PT
Material of thermoell	φ 15 × 200	Out. dia. 10mm Length 200mm
Rating	S4	S4=SUS304 S6=SUS316
	AC100V 3A	Please specify your needs

Please contact us for further assistance for ordering.

ELECTRICAL CONTACT TYPE (TEMPERATURE SWITCH) (UNIT TYPE)



MODEL TOS-M1UU-S

MODEL SUO-M1RU-S

Unit Type

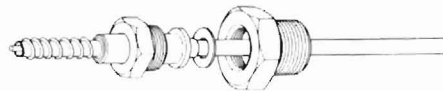
Adaptive to installation condition, more than several standard model numbers are available, please select the proper one by capillary's outlet, terminal box's and cable ground locations.

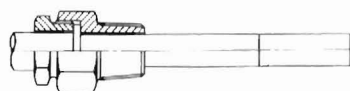
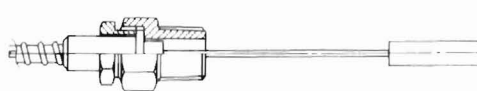
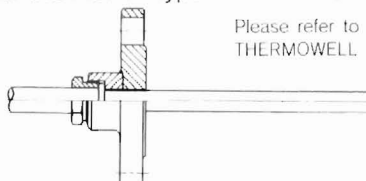
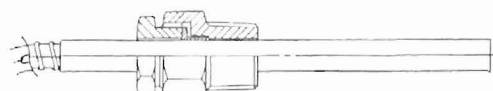


EX: T O S - M 1 U U - S

Description	C/N	Instruction
Ambient Temp. Compensation	S	Single Capillary
	D	Double Capillary
Conduit Location	U	Underneath
	L	Left hand side
	R	Right hand side
Terminal Box Location	T	Top
	U	Underneath
	L	Left hand side
No. of Switch	R	Right hand side
	1	1 Set Point
Switch Type	2	2 Set Points
	M	Microswitch
Mounting Method	O	Without Mounting Flange
	S	Surface Mounting
Capillary or Stem Outlet Location	O	Top
	U	Underneath
	B	Backside (Rigid stem only)
Indicating Method	T	Remote Reading
	S	Rigid Stem

THERMOBULB

Please note that sliding union-type bulbs have no effect against pressure. If you put the bulb on pressurized vessel, a thermowell will be needed.



<p>(1) Fixed Screw Type Max. static pressure 0.5MPa</p> 	<p>(4) Fixed Union Capillary Type Max. static pressure 0.5MPa</p> 
<p>(2) With thermowell type Max. static pressure 1MPa Please refer to page 20 THERMOWELL</p> 	<p>(5) Sliding Union Type for remote reading only</p> 
<p>(3) Plain Bulb Type</p> 	<p>(6) Sliding Union type for rigid stem type only</p> 

VOLUME of the Thermobulb compared to mercury filled type.

	Out dia 8φ		Out dia 10φ		Out dia 12φ	
	NESS	MF	NESS	MF	NESS	MF
0~ 50°C	140mm	404	75mm	250	50mm	180
0~100°C	70	202	40	122	30	90
0~150°C	45	135	30	84	20	60
0~200°C	40	-	25	63	20	45
0~300°C	25	-	20	60	15	50

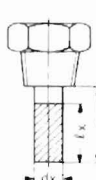
MF: Mercury filled conventional type

Standard Out Dia Size of Thermobulb. () option

	Liquid filled	Gas filled
Single Capillary	8 10 12 14 φ	10 12 14 φ
Double Capillary	(8) 10 12 14 φ	not available

Minimum Size of Thermobulb.

The Volume of the Thermobulb depends on the Scale Range
Single Capillary Type (-S) mm

R = $\frac{\ell x}{\phi} = 0.8$	Range	dx	mm				
			8	10	12	14	(16)
	0~ 50°C	140	75	50	35	30	
	0~100	70	40	30	25	20	
	0~200	40	25	20	15	15	
	0~350	25	20	15	15	15	
	*0~400	-	195	120	80		
	*0~500						
	*0~600						
*-200~50	455	235	150	110	80		

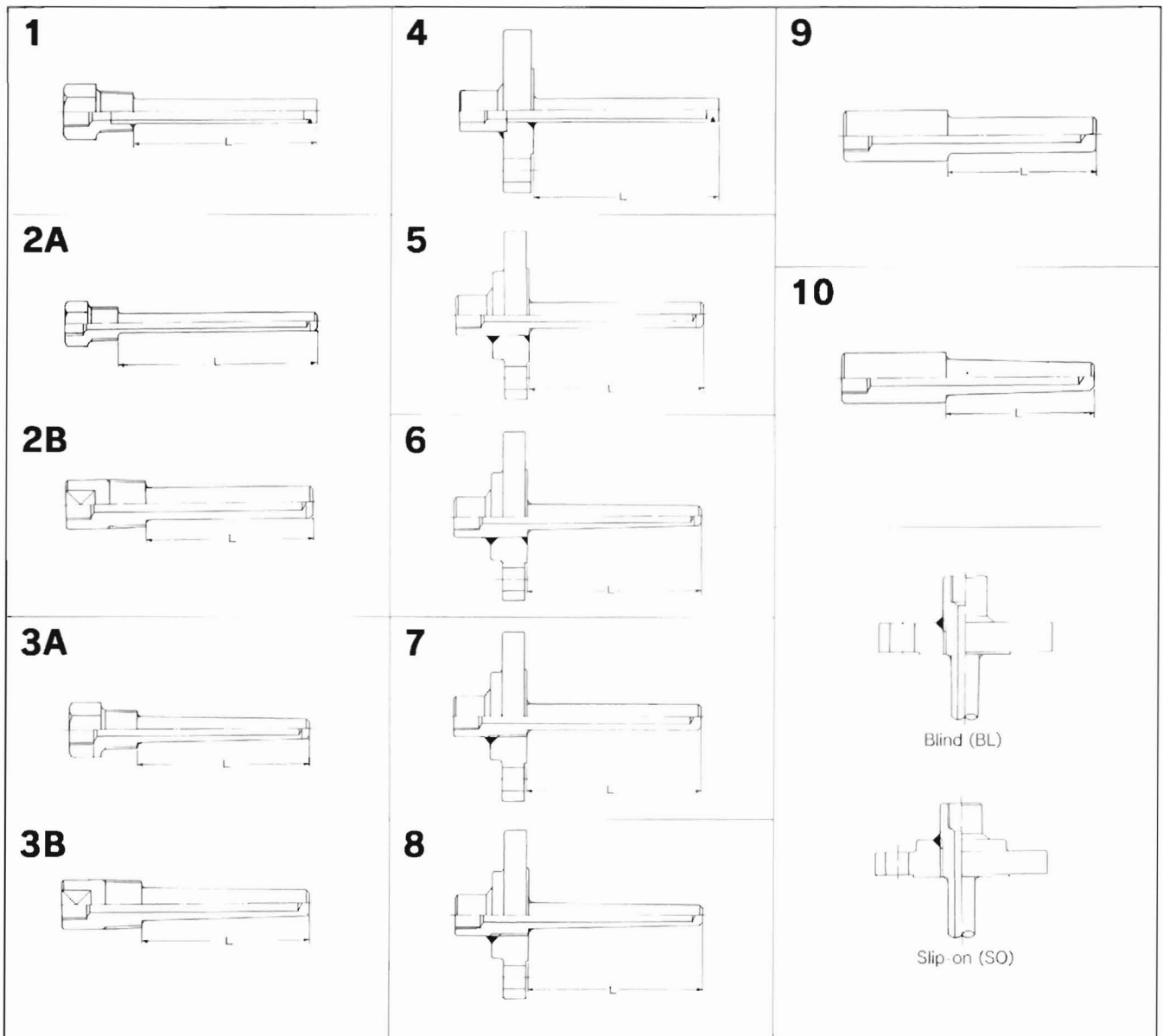
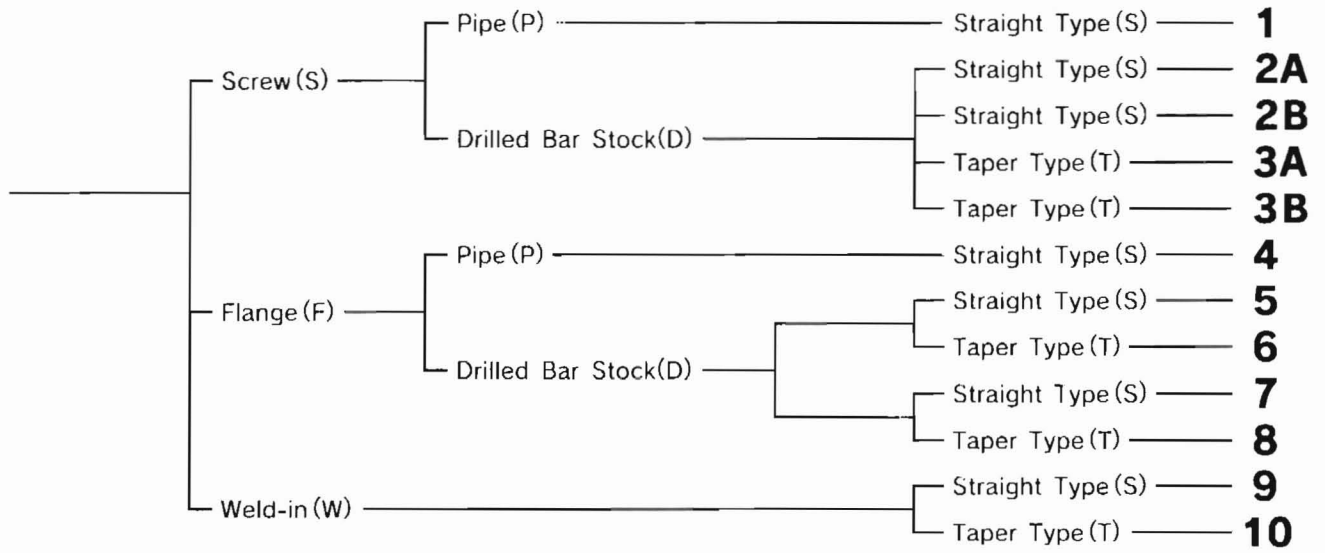
Double Capillary Type (-D) mm

Range	Out dia	mm				
		8	10	12	14	16
0~ 50°C	-	180	115	80	60	
0~100	-	90	60	45	35	
0~200	80	45	35	-	-	
0~350	45	30	25	-	-	

Please add 25mm or more in case of plain bulb type

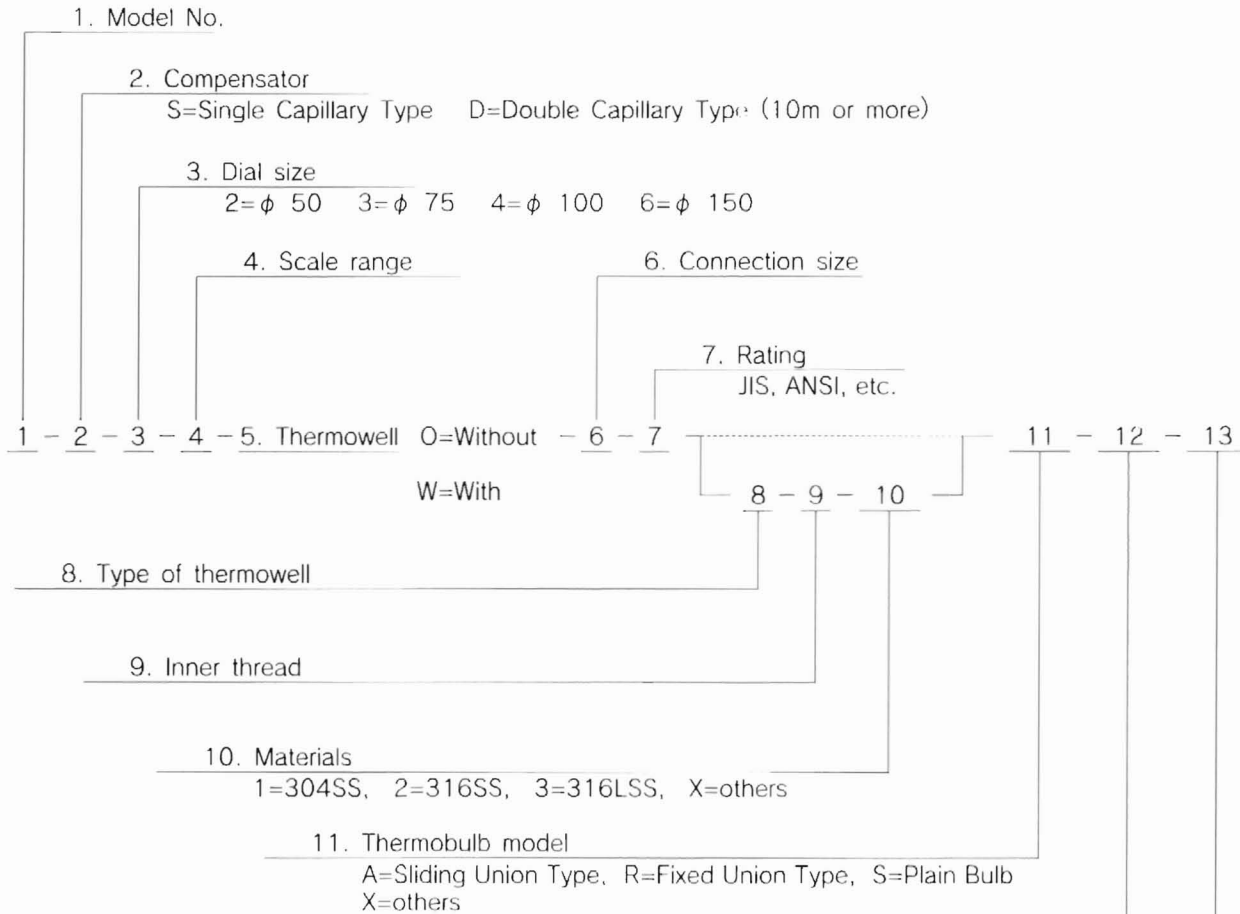
*Gas Filled

THERMOWELL

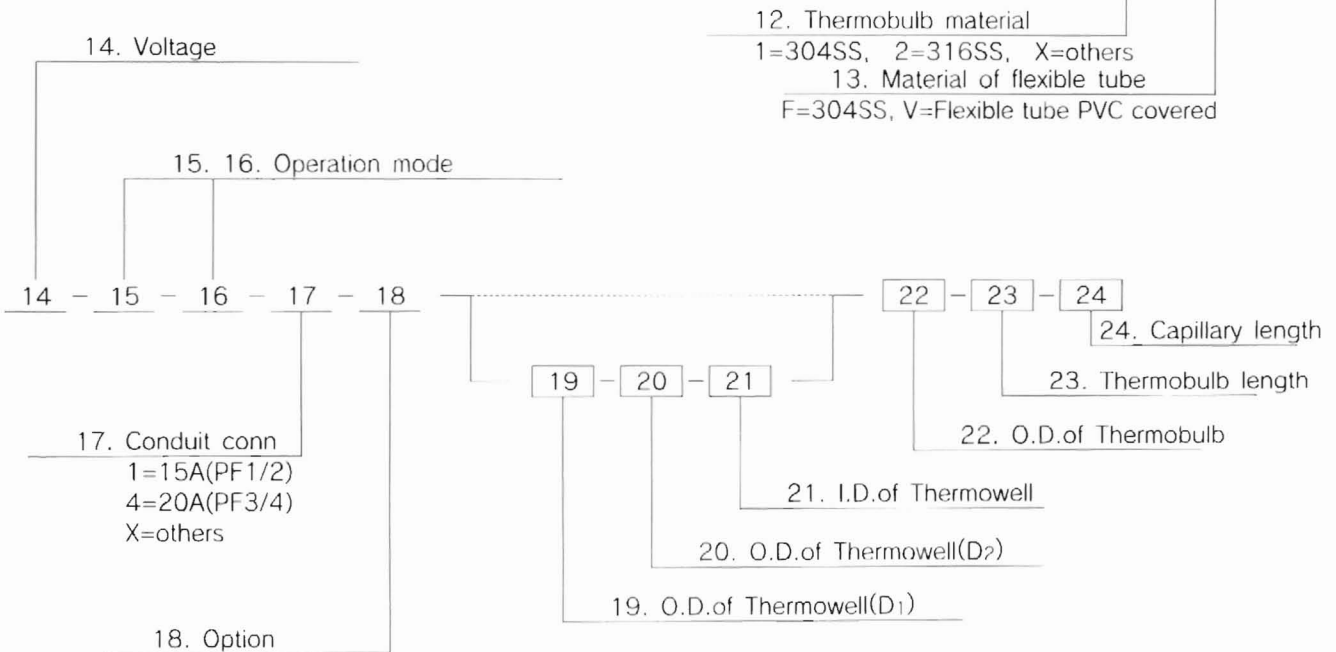


HOW TO ORDER FOR (NESSTECH) TEMPERATURE GAUGES AND SWITCHES

<Indicator>

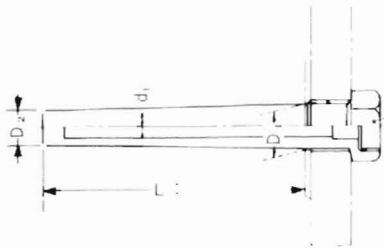
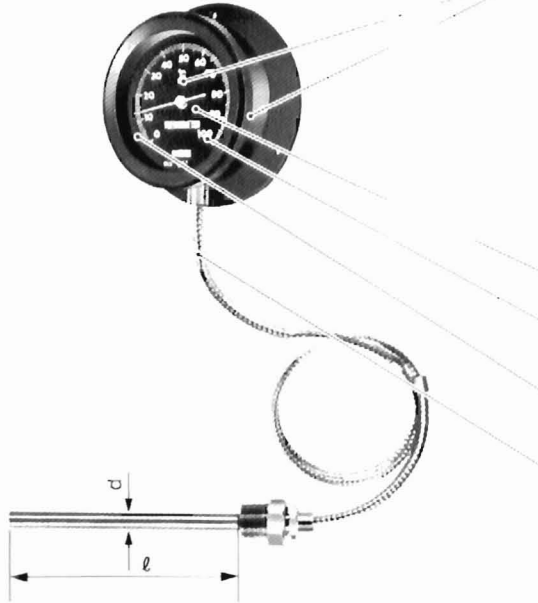


<Contact>



HOW TO PREPARE SPECIFICATION FOR TEMPERATURE GAUGE AND SWITCH

For eliminating the missing specification or mis-understanding for the technical confirmation, the complete specification is a vital one. Please copy the specification sheet on page 22 and fill out. It will be a big help to manufacture the requested products accurately and swiftly.



ITEM NO.	DESCRIPTION	CAT. PAGE #
Please enter date prepared, your company and section names, as well as Telephone No., Order No. and File No.		
1.	Instrument Location name if necessary to express on the instrument. If not, leave it blank.	
2.	Specify Tag No. if it is required. If not, leave it blank.	
3.	Select and mark Tag No. indicating location. If not, leave it blank.	
4.	Select and mark Tag No. indicating method. If not, leave it blank.	
5.	Select and mark the ambient temperature compensation method	3
6.	Refer the CAT. and indicate Model	5-17
7.	Indicate nominal dial size. Ex) Dia 100mm	5-17
8.	Select and mark case color: Std. is Munsell N1.2 (black)	
9.	Select and mark scale plate color: Std. is white letter on black.	2
10.	Select and indicate scale range; Ex) 0-100°C or 32~210°F	4
11.	Select and mark scale division; please refer the CAT. for standard spec.	4
12.	Enter capillary length (in unit of meter)	2
13.	specify material names for capillary and flexible armor. Leave it blank, if not specified.	2
14.	Mark the thermobulb style.	18
15.	Mark when Well is required. If not, leave it blank.	19
16.	When Well is required, specify the Model No. by the table on page 19. When Well is not required, leave it blank.	
17.	Specify the material when Well is required. Leave it blank, if not required.	
18.	Indicate tank material for thermobulb. If not, leave it blank.	
19.	Specify thread of flange size for thermobulb. In case of with well, specify installation dimensions of well.	
20.	Specify proof pressure for thermobulb. No need to specify in case of standard spec.	
21.	Specify various dimensions of thermobulb.	
22.	Specify Well's inside thread; in case of standard thread (M22 × P1.5) is required, no need to specify	---
23.	Specify the setting method of Set Points.	12
24.	Specify the required no. of Set Points.	12
25.	Specify the voltage rating of the Set Points.	12
26.	Specify the action type; Ex : INC. ON	12
27.	Please specify anything other than above.	---
28.	Please specify the quantity.	---

NOTE:

A) In case the entry is same as left side column, may use → mark.

B) Abbreviations for material are as follows:

SUS304 S4
 SUS316 S6
 Others X

EXAMPLE FOR TEMPERATURE GAUGE SWITCH SPECIFICATIONS

Company Name:				
Person to contact:		Date prepared		
File No.:		No.:	No.:	
No.	1	2	3	
1	Location Name			
2	IAG No.			
3	TAG No. Indicating Location			
4	Tag No. Indicating Method			
5	Temp. Compensation Method			
6	Model No.			
7	Dial size			
8	Case color			
9	Scale Color			
10	Scale Range			
11	Min. Division on Scale			
12	Capillary Length			
13	Capillary Mat'l / Flex. Armor Mat'l			
14	Thermobulb Model			
15	Well Mtg. Method			
16	Well Model			
17	Well Mat'l			
18	Thermobulb Mat'l			
19	Thd. / Flange Dim.			
20	Thermobulb Proof-Press			
21	Well	O.D. D1:	O.D. D1:	
		O.D. D2:	O.D. D2:	
		I.D. d1:	I.D. d1:	
		Lg. L:	Lg. L:	
		Bulb	O.D. d:	O.D. d:
			Lg. l:	Lg. l:
22	Well Inner Thread			
23	Set point Adjustment			
24	No. of set points			
25	Rating			
26	Operation Mode			
27	Remarks			
28	Qty			

PRIMARY USES OF **NESS** THERMOMETERS

Oil Refinery Plant

Pump Inlet
 Outlet
 Oil Cooler Inlet
 Outlet
 Compressor Air Outlet
 Air Inlet
 Boiler Steam Temp
 Heavy Oil Temp

Oil rig Plant

Gas Plant
 Heavy Oil Temp
 Cooling Water Temp
 Gas Temp

Electric Power Plant

Nuclear Power Plant

Pump Inlet
 Outlet
 Evaporator Inlet
 Outlet
 Heater Inlet
 Outlet

Pure Water
 Drain Water
 High Pressure Water
 Turbin Oil
 Thrust Metal Temp
 Bearing Lubricant Oil
 Steam Supply
 Return
 Control Oil
 Air Ejector Water
 Boiler Feed Water
 Oil Cooler Supply
 Cooling Water
 Air Cooler Water
 Turbin Outlet Steam
 Exhaust Steam Temp
 Gland Seal Steam
 Condensation Tank
 Condensation Pump

LPG Plant

LNG Plant
 Diesel Engine
 Oil Temp
 Fuel Oil Temp
 Cooling Water Temp
 Exhaust Gas Temp
 Turbin Bearing

Coupling Side

Shaft End
 Gear Box
 Bearing Temp

Pump

Casing
 Coupling
 Stuffing Box Gland
 Gear Box
 Bearing Temp

Submarine

Sea Water Temp
 Heavy Oil Temp
 Pure Air Temp
 Ship Build Co.,
 Oil Service Tank
 Oil Set Tank
 Blend Oil Inlet
 Fuel Oil Purifier Inlet
 Lubricant Oil Purifier
 Exhaust Gas Temp
 Pinion Shaft Bearing Temp
 Diesel Air Temp
 Bear Shaft Bearing Temp
 Oil Reservoir Oil Temp
 Accumulator
 Sea Oil Temp
 LPG Tank

Chemical Plant

Fertilizer Plant
 Food Plant
 Sugar Plant
 Milk Plant
 Oil Tank
 Powder Tank
 Cement Plant
 Ice Freezer
 Milk Evaporator
 Condensor
 Baking Powder Mixer
 Chocolate Mixer
 Beer Plant
 Soap Plant
 Mayonaise Plant
 Film Plant
 Rayon Plant
 Tire Plant
 Injection Machine
 Pulp Plant
 Paper Plant
 Water Plant
 Desalination Plant
 Shaft Temp of Heavy Machinery
 Bearing Temp of Motor
 Air Conditioning Plant
 Water supply
 return
 Air supply
 return
Steel Company
 Shaft Temp of Mill
 Lubricant Oil Temp

*All information and specifications in this catalog are current at the time of printing: Changes in product design and specifications may occur without notice. Contact your area factory representative or the factory for the current revision of this catalog.
 Our local representative is :*

