

Dehydrating Breather



Product Group : T01

The dehydrating breather is connected to conservator or Gas Oil Sealing Tank as one of oil conservation systems through long pipe .

The dehydrating breather is an apparatus to reduce effectively the thermal ageing of insulation oil by means of filtering off the particles of atmosphere in oil cup and absorbing the moisture of atmosphere in silica gel container when a transformer is under breathing in accordance with the variation of oil level caused by the change of ambient temperature and/or transformer load.

The dehydrating breather is located at a suitable height to check the breather at the standing point of operator and has a very simple construction for disconnecting it from the pipe line of transformer conservator during the transportation period of transformer and reconnecting it to the pipe line at transformer erection site after delivery.

We have various dehydrating breathers in size as well as in shape for all the transformers from pole transformers to ultra high voltage class power transformers because the dehydrating breather should be chosen in accordance with the kind and capacity of transformer.

The breathers have a good reputation in the world market because the breathers have a solid construction and a graceful shape as well.

We uses No Cobalt (Neo-Blue) of pro-environment as dehydrator to be filled in the container of all breathers.

Since the European Union had completely revised their regulations of EU Directive 98/98/EC on July 01, 2000 and also the regulations have been applied to all the products, Cobalt chloride prescribed as a potential carcinogenic material have been prohibited from using and all products manufactured by means of using it have been prohibited from selling, actually.

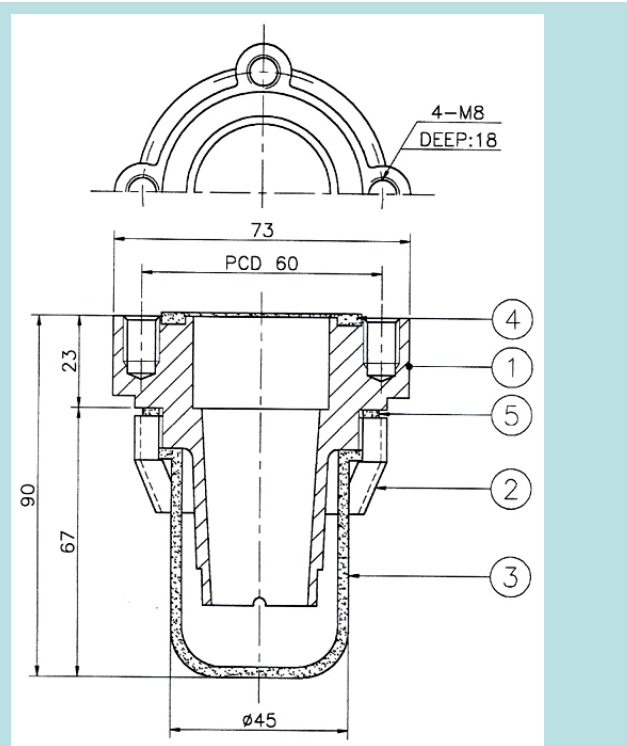
On the other hand, the Neo-Blue is made from another material of pro-environment definitely different from toxic material prescribed by their regulations of EC Legislation, our dehydrating breather can be used by transformer owners without any anxiety.

● Product Table		
Model	Transformer	Material / Capacity
T0101	Small	Al
T0142(T0102)	Medium	Al / 300cc
T0143(T0103)		Al / 500cc
T0145(T0105)	Medium or Large	Al / 1000cc
T0112		Steel / 1000cc
T0113G01(T0113)		Steel / 2000cc
T0113G02(T0114)		Steel / 3000cc
T0113G03(T0115)		Steel / 5000cc
T0116		Steel / 1000cc
T0118G01		Steel / 1000cc
T0118G02		Steel / 2000cc
T0118G03		Steel / 3000cc
T0118G04		Steel / 5000cc
T0120		Steel / 2000cc
T0121		Steel / 3000cc
T0122		Steel / 5000cc

■ Model No. : T0101



Application ; Small transformer
 Assembly ; Flange
 Material ; Aluminum
 Type ; T0101



- 1. Flange (Al)
- 2. Nut (Al)
- 3. Cup (Acryl)
- 4. Gasket (NBR)
- 5. Gasket (NBR)

Characteristic.

The small dehydrating breather is directly connected to transformer tank through pipe line and makes an air current caused by pressure difference between atmosphere and inside the transformer tank under condition that insulation oil is filled in the acryl cup of the breather. When atmosphere passes through insulation oil filled in the cup, the particles of atmosphere is filtered by the oil filled in the acryl cup and the moisture of atmosphere is absorbed by the silica gel filled in the container of the breather.

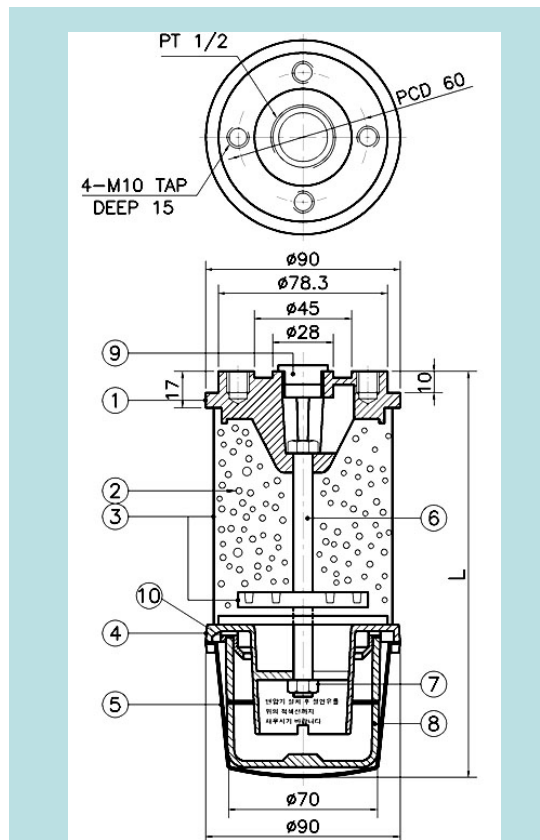
The breather is suitable for transformers such as pole transformers as well as small distribution transformers because the breather has a light weight and strong mechanical strength as well.

■ Model No. : T0142/T0143/T0145



Application ; Medium transformer
 Assembly ; Flange and pipe line
 Material ; Aluminum
 Type ;

Model	L (mm)	Vol (cc)
T0142 (T0102)	185	300
T0143 (T0103)	220	500
T0145 (T0105)	355	1000



- 1. Upper Plate
- 2. Silica Gel
- 3. Container & Wire Mesh
- 4. Bottom Plate
- 5. Oil Cup Holder
- 6. Stud Bolt
- 7. Nut
- 8. Oil Cup
- 9. Rubber Cover
- 10. Protector

Characteristic.

The medium dehydrating breather is connected to transformer tank or transformer conservator through pipe line and located at a suitable height to check the breather at the standing height of operator.

Since the Silica Gel volumes of 300cc, 500cc, and 1000cc are available, it is possible for customer to select the breather according to transformer capacity.

■ Model No. : T0112



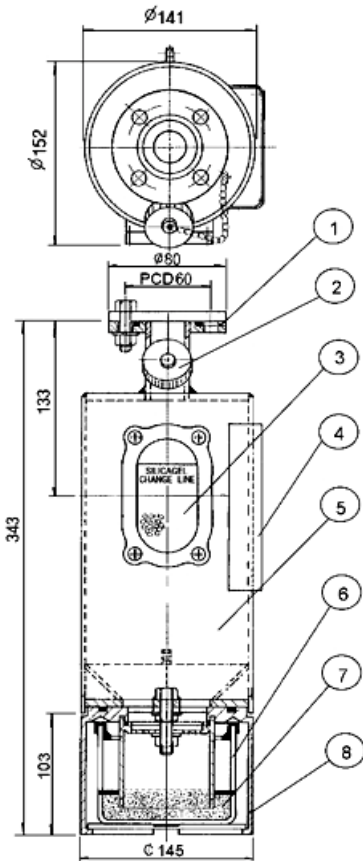
Application ; Medium transformer
 Assembly ; Flange
 Material ; Steel (SS400)
 Type ; T0112 (1000cc)
 T0116*(1000cc)
 * ; T0116 has 2-φ11 holes and others
 are same as those of T0112.

■ Model No. : T0113

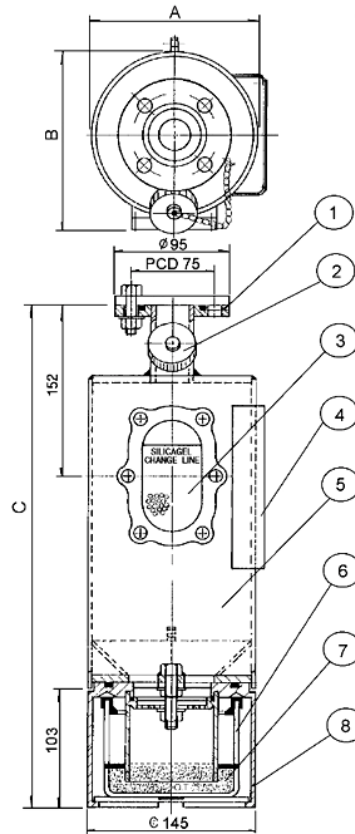


Application ; Medium transformer
 Assembly ; Flange
 Material ; Steel (SS400)
 Type ; T0113G01 (2000cc)
 T0113G02 (3000cc)
 T0113G03 (5000cc)
 T0118G01~4*
 T0120~2**

* ; T0118 has a tri-angle flange and
 others are same as those of
 T0113.
 ** ; In case T0120~2 have a Silica
 Gel outlet cap on the bottom side
 of the container to take out it from
 the container of the breather
 without disconnecting the
 breather from transformer tank or
 conservator and others are same
 as those of T0113.



- | No. | Description |
|-----|----------------------|
| 1. | Mounting flange |
| 2. | Silica Gel inlet cap |
| 3. | Inspection glass |
| 4. | Seat for name plate |
| 5. | Main body |
| 6. | Oil cup |
| 7. | Insulation oil |
| 8. | Support for oil cup |



- | No. | Description |
|-----|----------------------|
| 1. | Mounting flange |
| 2. | Silica Gel inlet cap |
| 3. | Inspection glass |
| 4. | Seat for name plate |
| 5. | Main body |
| 6. | Oil cup |
| 7. | Insulation oil |
| 8. | Support for oil cup |

Characteristic

The dehydrating breather is connected to transformer tank or conservator through pipe line and located at a suitable height to check the breather at the standing point of operator. Since the Silica Gel volumes of 1000cc, 2000cc, 3000cc, and 5000cc are available, it is possible for customer to select the breather according to transformer capacity.

The breathers have enough strength to withstand mechanical shock during transportation and permanent life because the Silica Gel container is made of mild steel. It is very easy to check the discoloration of silica gel and replace it with new one. It is possible for customer to substitute the breather for existing one easily because the breather has a various flange.

Group	Volume (cc)	Dimension (mm)		
		φA	B	C
G01	2000	141	153	374
G02	3000	141	153	466
G03	5000	168	180	519

Oil Level Gauges - Indicators



T0201/0285



T0217



T0203/4/5



T0214



T0206



T0208



T0271



T0276



T0212/0281



T0213/0215/0280

Product Group : T02

The Oil Level Gauge or Indicator is an apparatus to indicate the oil level of oil immersed transformer tank and/or transformer conservator. The gauge or indicator is normally assembled to transformer at a suitable position to observe the oil level from the grounding level, conveniently.

There are two kinds of oil level indicators. One is an oil level gauge directly welded to transformer tank to indicate the oil level of the tank. The other is an oil level indicator with alarm contact which indicate the oil level by a needle connected to a buoy.

Especially, in case magnetic type oil level indicator is suitable for transformer or a component concerned and is characteristic of weatherproof, waterproof, and shockproof. We have various oil level gauges or indicators in size as well as in shape chosen by customers according to the kind and characteristic of transformer and used for all the transformers from pole type to ultra high voltage class.

Our oil level gauges or indicators have a good reputation in the world market because the oil level gauges or indicators have a solid construction and a graceful shape as well.

Model No.	Application / Location	Shape	Contact
T0201	Small transformer / Tank Wall / Window : Acryl	Al Square	×
T0285	Silicon oil small transformer / Tank Wall / Window : Reinforced glass	Al Square	×
T0217	Medium transformer / Tank Wall	Square	×
T0203	Medium transformer / Tank Wall	Φ 50 Round	×
T0204	Medium transformer / Tank Wall	Φ 90 Round	×
T0205	Medium transformer / Tank Wall	Φ 110 Round	×
T0206	Medium transformer / Tank Wall	Φ 70	×
T0208	Medium, Large transformer / Tank. Conservator	Φ 120	○
T0212	Large transformer / Conservator for OLTC	Φ 210 (6")	○
T0213	Large transformer / Conservator (AP)	Φ 210 (Dia)	○
T0214	Small, Medium transformer / Tank cover	Cup type	×
T0215	Large transformer / Conservator (FN)	Φ 210 (Dia)	○
T0271	Small transformer / Tank Wall	Oil level & Temp.	×
T0276	Medium, Large transformer / Tank side wall	Φ 120(Gear Type)	○
T0280	Ultra high voltage class transformer / Conservator (FN)	Φ 250 (Dia)	○
T0281	Ultra high voltage class transformer / Conservator for OLTC	Φ 250 (6")	○

■ Model No. : T0201 / T0285

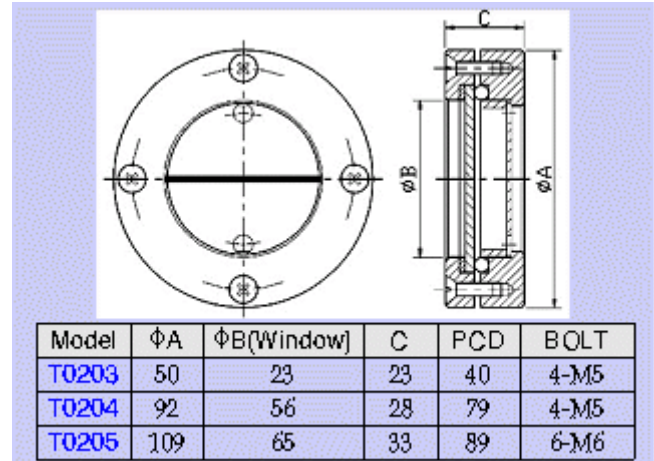
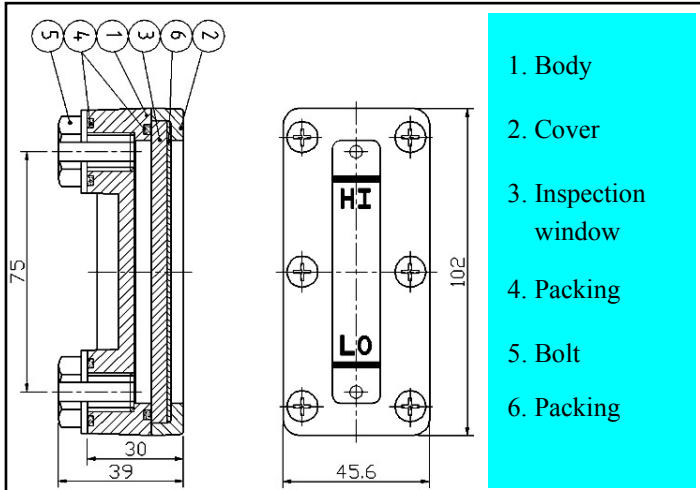


Application ; Small transformer
 Assembly ; Bolting
 Material ; Aluminum (ALDC)
 Type ; T0201 (Acryl)
 T0285 (Reinforce glass)
 In case of high temperature or Silicon oil immersed transformers, T0285 should be used.

■ Model No. : T0203/T0204/T0205



Application ; Small transformer
 Assembly ; Welding
 Material ; Aluminum (ALDC)
 Type ; T0203 (φ50)
 T0204 (φ90)
 T0205 (φ110)
 In case T0205 is made of SS400, not ALDC.



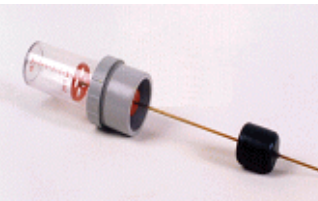
Characteristic.

The model is suitable for medium transformer. Since the models of φ23, φ56, and φ65mm are available, it is possible for customer to select the model according to transformer capacity and the model should be welded on the tank wall.

Characteristic.

The small oil level gauge has a light body consists of ALDC and an inspection window consists of acryl or reinforced glass.
 The gauge allows to check the oil level by means of assembling on the tank wall as a very simple apparatus

■ Model No. : T0214

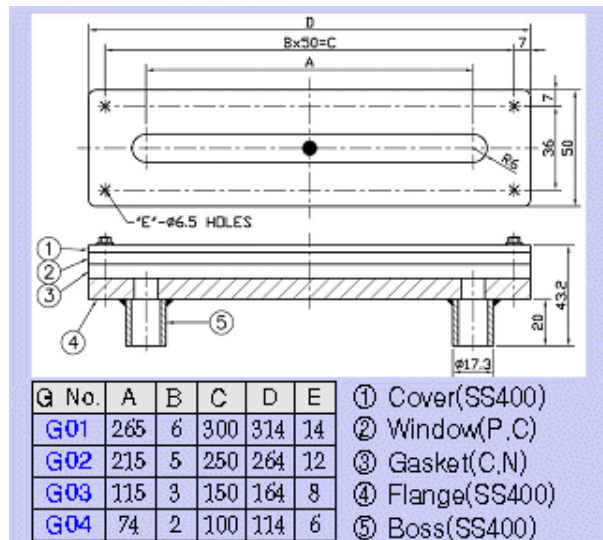
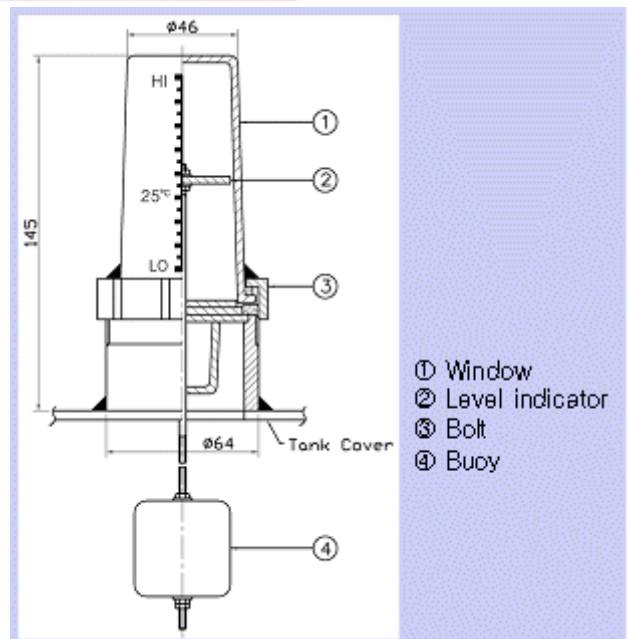


Application ; Oil level indication of small transformer
 Assembly ; Tank cover
 Type ; T0214

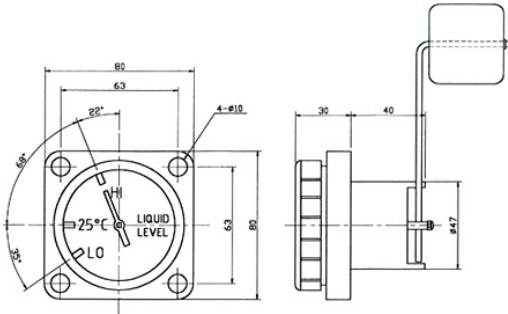
■ Model No. : T0217



The oil level gauge is made of SS400 and allows to check the variation of oil level inside transformer tank.



Model No. : T0206



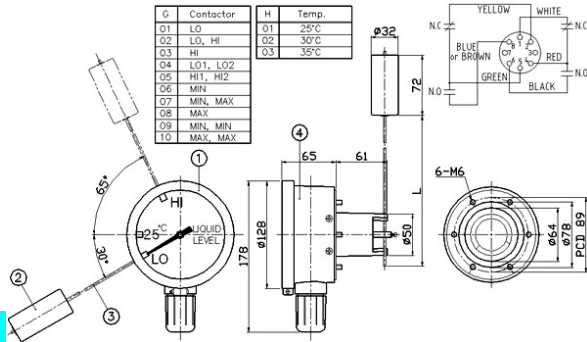
Application : Oil level indication of small transformer
Assembly : Bolting
Operation : Magnetic type
Material : Aluminum (ALDC)
Type : T0206 (φ70 / Without contact)

Characteristic.

The model is magnetic type oil level indicator for small transformer and assembled on transformer tank or conservator. The model, is characteristic of waterproof, and shockproof, can be used for all transformers filled with mineral or less flammable oil and check the variation of oil level inside the transformer including the nominal oil level of 25 °C. The needle of the model indicates the oil level by means of connecting it to a buoy.

Model No. : T0208

Application : Oil level indication of medium transformer
Assembly : Separate type flange
Operation : Magnetic type
Material : Aluminum (ALDC)
Type : T0206 (φ120 / 1, 2 contacts)



1. Front cover 2. Float 3. Arm 4. Body

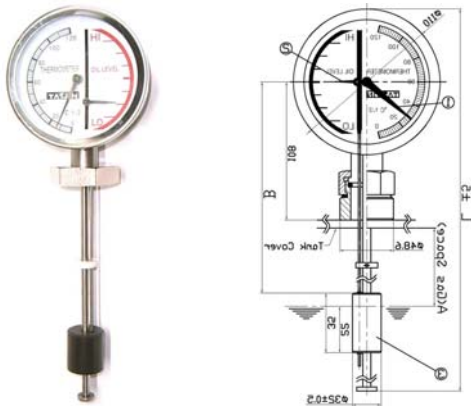
Characteristic.

The model, is characteristic of waterproof, and shockproof, can be used for all transformers filled with mineral or less flammable oil and check the variation of oil level inside the transformer including the nominal oil level of 25 °C. The needle of the model indicates the oil level by means of connecting it to a buoy and the model will make alarm signal when the oil level reaches a setting value such as lower level.

Option

The face mark of the model can be changed by the temperature of 25 / 30 or 35 °C as an option-H as well as contact mark-G such as high and/or low.

Model No. : T0271



Application : Oil level indication and temperature of small transformer
Assembly : Bolt.
Operation : Magnetic type
Material : SUS 304
Type : T0271 (φ110 / Without contact)

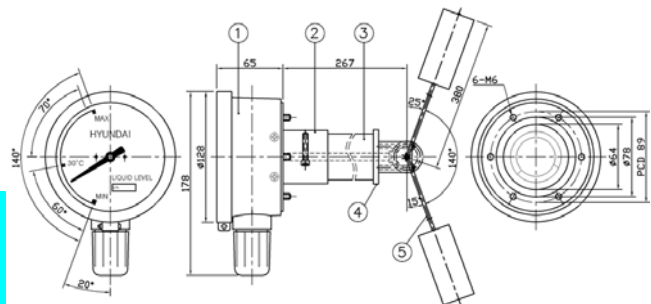
Characteristic.

As an economic type products, functions of both T0214Cup oil level indicator and T1101 bimetal temperature are combined into model No. T0271.

G. No.	L	A	B
G01	390	134	232
G02	340	84	182

Model No. : T0276

Application : Oil level indication of medium transformer
Assembly : Separate type flange
Operation : Magnetic type w/contact
Material : Aluminum (ALDC)
Type : T0276 (φ120 / 1, 1 contact)

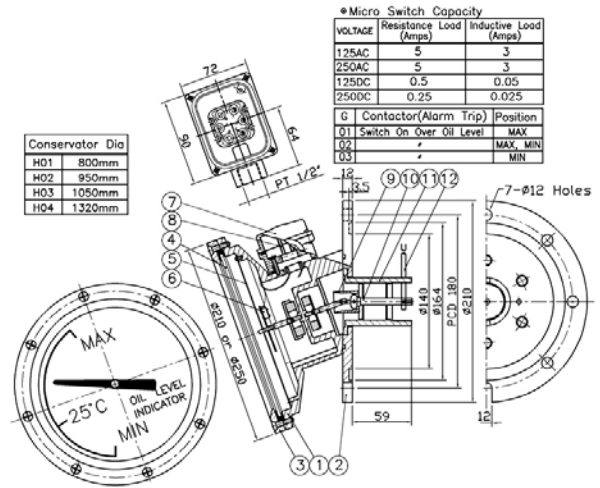


1. Body 2. Back flange 3. Extension pipe 4. Gear Ass'y 5. Float Ass'y.

Characteristic.

The Function of the model is same as that of Model No. T0208. When it is difficult to check the oil level due to fire wall between transformers, the model is suitable for checking the oil level in front of the conservator because the model is level up gear type even though conventional type oil level indicator is generally installed on the side wall of conservator.

Model No. : T0212/T0281



Application : Oil level indicator for medium and large transformer

Assembly : Bolting
 Operation : Magnetic type
 Material : Aluminum (ALDC)
 Type : T0212(∅210 / Contact)
 T0281(∅250 / Contact)

Characteristic.

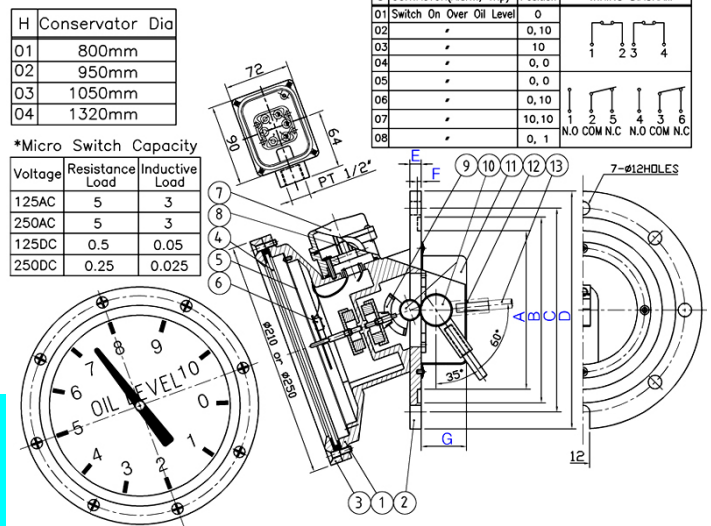
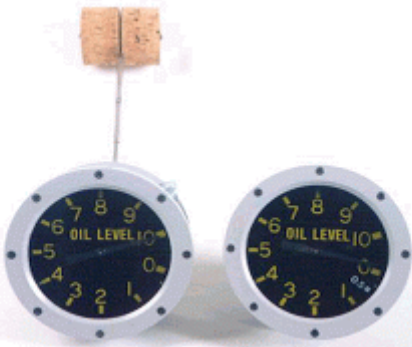
The Model is suitable for indicating the oil level of power transformer and is characteristic of waterproof, shockproof and has an alarm contact. The model is nearly maintenance free because of assembling it to the conservator during transportation.

※ Option : Face color/Angle/Contact

●Max. Angle : 70° ●Min. Angle : 70°

- ① Body ② Flange ③ Front cover ④ Glass
- ⑤ Marking plate ⑥ Micro switch ⑦ Terminal box
- ⑧ Terminal ⑨ Universal joint ⑩ Axial ⑪ Back cover
- ⑫ Buoy / Arm

Model No. : T0213/T0215/T0280



Application : Oil level indicator for medium and large transformer

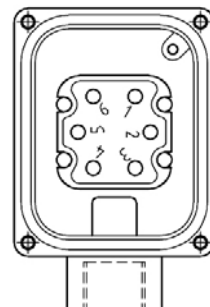
Assembly : Flange type
 Operation : Magnetic type including a contact
 Material : Aluminum (ALDC)
 Type : T0213 (∅210 / Contact, for AP type)
 T0215 (∅210 / Contact for FN type)
 T0280 (∅250 / Contact for FN type)

Characteristic.

The Model is suitable for indicating the oil level of power transformer filled with all kinds of oil and has the characteristic of waterproof, shockproof and alarm contacts. The needle of the model indicates the oil level by means of connecting it to a buoy and the model has an alarm contact.

※ Option : changeable Face color / addable Contact

- ① Body ② Flange ③ Front cover ④ Glass ⑤ Face mark
- ⑥ Micro switch ⑦ Terminal box ⑧ Terminal ⑨ Bevel gear
- ⑩ Spurt gear ⑪ Cover ⑫ Axial ⑬ Buoy / Arm



Terminal box

Model	∅A	∅B	PCD C	∅D	E	F	G	Packing home
T0213	140	164	180	210	12	3.5	40	Available
T0215	-	-	150	180	10	-	-	None
T0280	-	-	150	180	10	-	-	None

Oil Flow Indicator



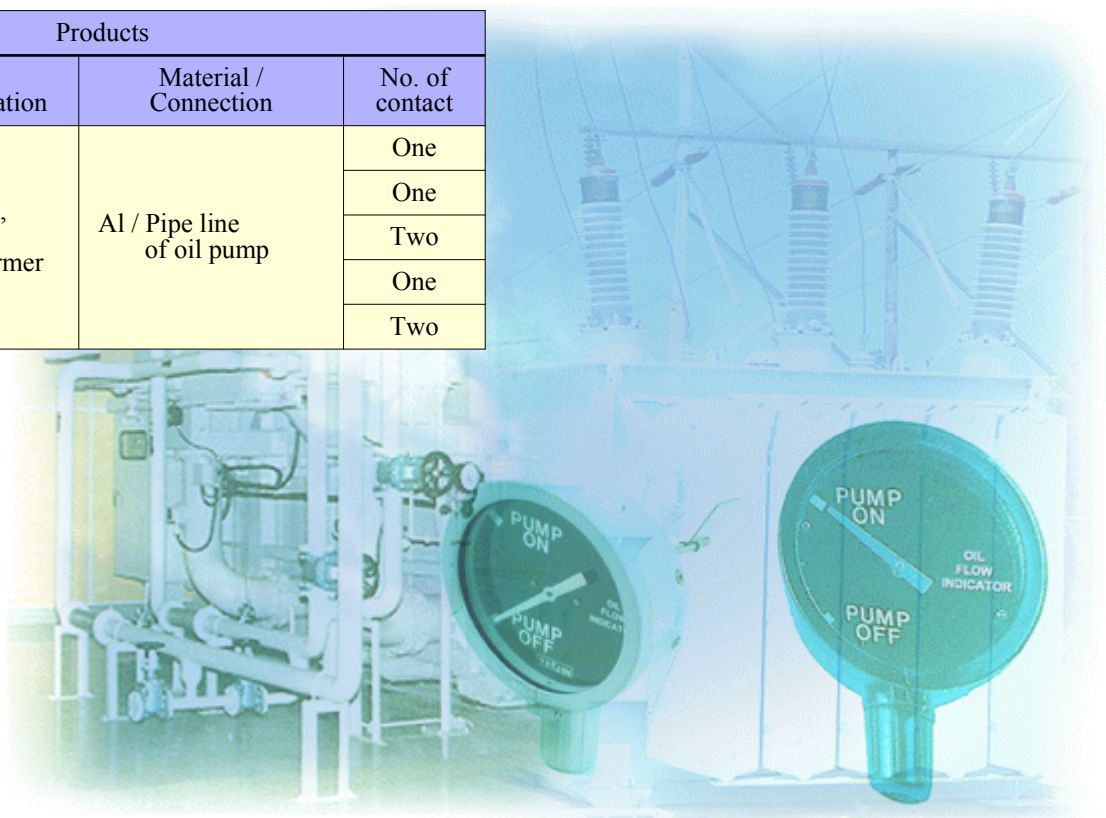
Product Group : T03

As an accessory of Forced Oil cooling type transformers, the oil flow indicator is connected to oil pump with the constant flow speed of about 1.5 m/sec in series and assembled at oil inlet or outlet pipe line. The needle of indicator is operated by vane connected to it according to the flow direction of transformer oil caused by pump operation. The indicator has a contact which makes an alarm signal when the oil does not flow.

The water flow indicator has characteristic same as those of the oil flow indicator in the construction and operation and is an accessory connected to the pipe line of water pump in series for indicating the flow direction of water.

Our oil flow indicator and water flow indicator are characteristic of stability as well as reliance. The body of both indicators has a light and solid aluminum construction as well as the characteristic of weatherproof, and waterproof as well.

Products			
Model No.	Application	Material / Connection	No. of contact
T0301	Medium, Large Transformer	Al / Pipe line of oil pump	One
T0306			One
T0310			Two
T0312			One
T0314			Two



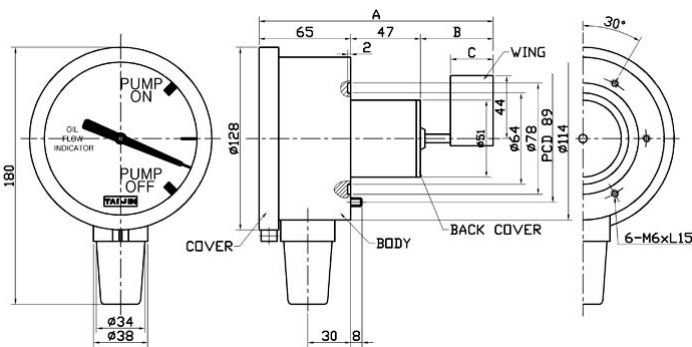
■ Model No. : T0301



"A" Type

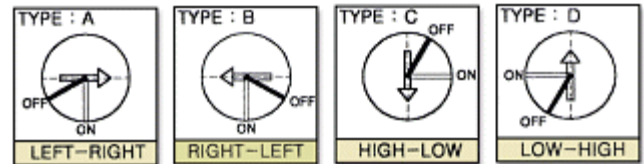
"B, C, D" Type

Application : The oil flow indicator of Forced Oil cooling type transformers
 Assembly : Flange type
 Material : Aluminum (ALDC)
 Type : T0301



Type and specification.

Type	No.	øA	B	C	Vane	Pipe	Pump	
HD	G01	183	71	40	A	6"	Spring torque ;2.4 kg.mm	
	G02				B			
	G03				C			
	G04				D			
	G05	163	51	40	A	4"		
	G06				B			
	G07				C			
	G08				D			
HS	G01	183	71	40	A	-	7.5HP 800 GPM Spring torque ;2.4 kg.mm	
	G02				B			
	G03				C			
	G04				D			
	G05	183	71	40	A		-	3.0HP 528 GPM Spring torque ;1.6 kg.mm
	G06				B			
	G07				C			
	G08				D			

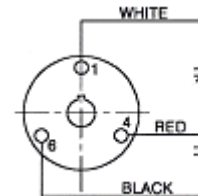


- ⇒ The flow direction of oil.
- ▭ Vane position when oil flows.
- ▬ Vane position when oil does not flow.

Characteristic.

The oil flow indicator consists of body and mechanical operating part.
 The body of indicator consists of a needle to indicate oil flow direction, a contact to make an alarm signal and signal words are marked with white color on black color face.
 The needle is coated with white color paint and connected to the front end of the indicator shaft and operated by a magnetic connected to the back end of the indicator shaft.
 The mechanical operation part of the indicator is sealed to prevent it from soaking in insulation oil and consists of a magnetic, a shaft, a torsion spring, and a vane. The vane is positioned inside the pipe line to indicate a signal word according to oil flow direction. The torsion spring is supporting the vane of the needle to indicate the signal word of pump off on the plate as below ;
 When pump is out of service.
 When oil does not flow.
 When oil route has been clogged.

Alarm circuit



When sufficient oil flows inside the pipe line according to the normal operation of oil pump, the vane is positioned inside the pipe line as shown in above figures of TYPE : A and TYPE : B for the needle to indicate the signal word marked on the face.
 When pump is in service, a normal close contact is opened and when pump is out of service, the contact is closed, again.

Specification for switch contact

Voltage	Load current in Ampere	
	Resistance Load	Inductive Load
AC 125 V	5	3
AC 250 V	5	3
DC 125 V	0.5	0.05
DC 250 V	0.25	0.025

※ Inductive load means that the ratio of L/R is less than 0.026.

Model No. : T0306/T0310



"A" Type

"B, C, D" Type

Application : The oil flow indicator of Forced Oil cooling type transformer

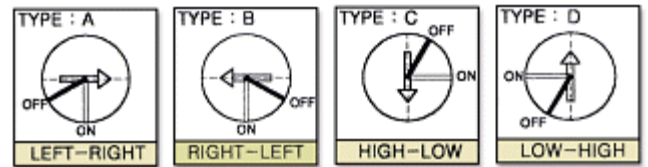
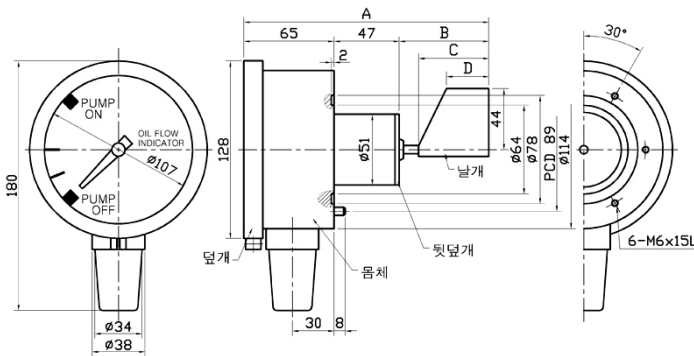
Assembly : Flange type

Material : Aluminum (ALDC)

Type : T0306 (One contact)
T0310 (Two contacts)

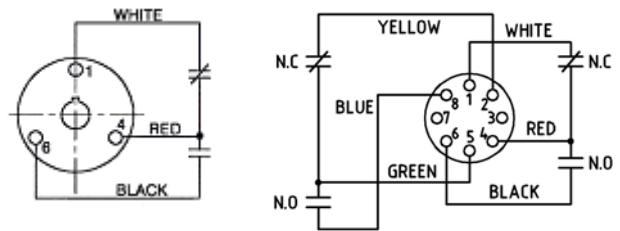
Type and specification.

No.	φA	B	C	D	Vane	Pipe	Pump
C01	212	100	86	66	A	6"	Spring torque :2.4 kg.mm
C02					B		
C03					C		
C04					D		
C05	227	115	86	66	A	10"	Spring torque :2.4 kg.mm
C06					B		
C07					C		
C08					D		
C09	163	51	30	0	A	4"	Spring torque :1.6 kg.mm
C10					B		
C11					C		
C12					D		



- The flow direction of oil.
- ▭ Vane position when oil flows.
- ▬ Vane position when oil does not flow.

Alarm circuit



- 1, 4, 6 : Pump ON
- 2, 5, 8 : Pump OFF

Characteristic.

The oil flow indicator consists of a body and a mechanical operating part.

The body of the indicator consists of a needle to indicate oil flow direction and a contact to make alarm signal and also the signal words are marked with white color on black color face.

The needle is coated with white color paint and connected to the front end of the indicator shaft and operated by a magnetic connected to the back end of the indicator shaft. The mechanical operation part of the indicator is sealed to prevent it from soaking in insulation oil and consists of a magnetic, a shaft, a torsion spring, and a vane. The vane is positioned inside the pipe line to operate it according to oil flow direction. The torsion spring is supporting the vane of the needle to indicate the signal word of pump off on the face as below ;

When pump is out of service.

When oil does not flow.

When oil route has been clogged.

When sufficient oil flows inside the pipe line according to the normal operation of oil pump, the vane is positioned inside the pipe line as shown in above figures of TYPE : A and TYPE : B for the needle to indicate the signal word marked on the face.

When pump is in service, a normal close contact is opened and when pump is out of service, the contact is closed, again.

Specification for switch contact

Voltage	Load current in Ampere	
	Resistance Load	Inductive Load
AC 125 V	5	3
AC 250 V	5	3
DC 125 V	0.5	0.05
DC 250 V	0.25	0.025

※ Inductive load means that the ratio of L/R is less than 0.026.

■ Model No. : T0312/T0314

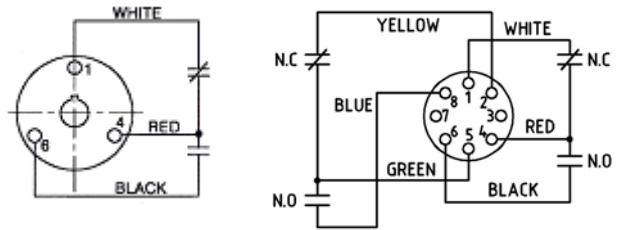


Type and specification.

No.	Pipe size	A	B	Vane			Flow rate	
				C	D	E	H01	H02
G01	100A	100	120	88.5	60	40	50	100
G02	125A	110	130	98.5	76	50	100 M ³ / H	150 M ³ / H
G03	150A	120	140	108.5	86	66		
G04	200A	150	170	138.5	86	66		

Application : The oil flow indicator of Forced Oil cooling type transformer
Assembly : Flange type
Material : Aluminum (ALDC)
Type : T0312 (One contact)
 T0314 (Two contacts)

Alarm circuit



- 1, 4, 6 : Pump ON
- 2, 5, 8 : Pump OFF

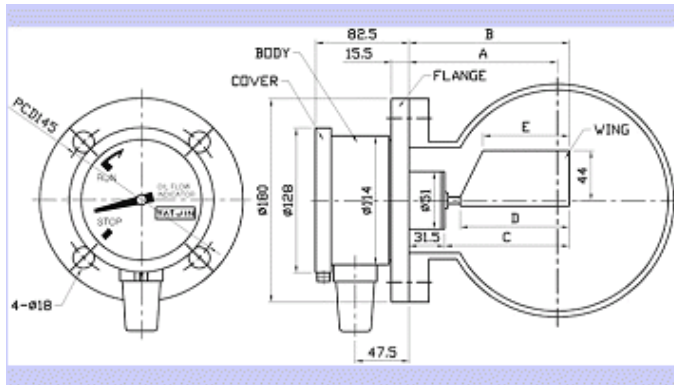
When sufficient oil flows inside the pipe line according to the normal operation of oil pump, the vane is positioned inside the pipe line as shown in above figures of TYPE : A and TYPE : B for the needle to indicate the signal word marked on the face.

When pump is in service, a normal close contact is opened and when pump is out of service, the contact is closed, again.

Specification for switch contact

Voltage	Load current in Ampere	
	Resistance Load	Inductive Load
AC 125 V	5	3
AC 250 V	5	3
DC 125 V	0.5	0.05
DC 250 V	0.25	0.025

※ Inductive load means that the ratio of L/R is less than 0.026.



Characteristic.

The oil flow indicator consists of a body and a mechanical operating part.
 The body of the indicator consists of a needle to indicate oil flow direction and a contact to make an alarm signal and also the signal words are marked with white color on black color face.
 The needle is coated with white color paint and connected to the front end of the indicator shaft and operated by a magnetic connected to the back end of the indicator shaft.
 The mechanical operation part of the indicator is sealed to prevent it from soaking in insulation oil and consists of a magnetic, a shaft, a torsion spring, and a vane. The vane is positioned inside the pipe line to operate it according to oil flow. The torsion spring is supporting the vane of the needle to indicate the signal word of pump off on the face as below ;
 When pump is out of service.
 When oil does not flow.
 When oil route has been clogged.

Pressure Relief Device



T0501(ø90)

T0502(ø90)

T0503(ø120)

T0504(ø120)

T0507(ø120)



T0506

T0510(Air Vent Type)



T0401



T0402



T0403

Product Group : T05, T04

Pressure Relief Device (PRD) or Pressure relief Valve (PRV) is assembled on transformer tank. The PRD or PRV is one of the essential apparatuses of transformer when an abnormal pressure caused by internal fault occur inside the tank or the pressure inside the tank is higher than the operation pressure of the PRD or PRV, the diaphragm of the PRD or PRV will be lifted up by the abnormal pressure to protect the tank from damage.

Our PRD and PRV are manufactured to withstand frequent operations and have a solid construction and a high reliability as a sealing apparatus.

We have various and wide PRD and PRV such as PRV (T0401 ~ T0403) for relieving an abnormal pressure from oil immersed small transformer tank, PRD (T0501 ~ T0505) for oil immersed medium transformer tank, and PRD (T0506) for oil immersed medium or large transformer tank.

The quality and excellence of our PRD and PRV have been proven by selling them to famous transformer manufacturers in the world market for about 20 years.

Product Table

Model No.	Application	Dia / Operation pressure	Contact	Remarks
T0501	Small, Medium transformer	ø90 / 0.7 ± 0.07kg/cm ²	X	Flange on both side
T0502		ø90 / 0.7 ± 0.07kg/cm ²	O	
T0503		ø120 / 0.7 ± 0.07kg/cm ²	X	
T0504		ø120 / 0.7 ± 0.07kg/cm ²	O	
T0507		ø120 / 0.7 ± 0.07kg/cm ²	O	
T0506	Medium, Large transformer	ø175 / 0.7 ± 0.07kg/cm ²	O	
T0510		ø175 / 0.7 ± 0.07kg/cm ²	O	Air vent type
T0401	Small transformer	ø9 / 0.7 ± 0.14kg/cm ²	X	
T0402		ø20 / 0.7 ± 0.14kg/cm ²	X	
T0403		ø32 / 0.7 ± 0.14kg/cm ²	X	

Pressure Relief Device

Model No. : T0501 ~ T0507



Contact and Material.

Model T0501 T0502 T0503 T0504 T0507

Contact X O X O

Material Aluminum SS400

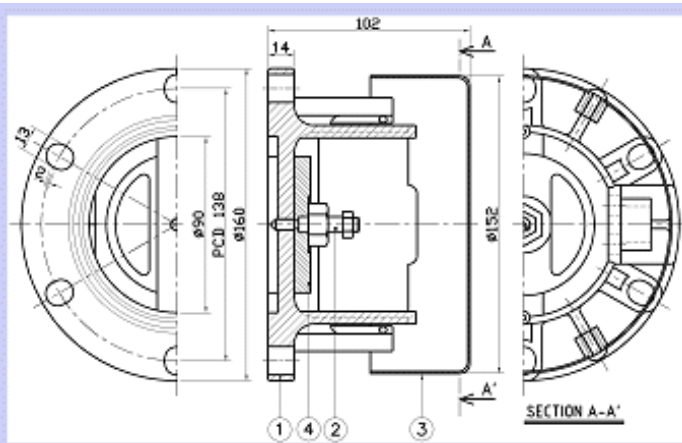
Specification for switch contact

Voltage Resistance Inductive Load
DC 125 V 0.5 A 0.05 A

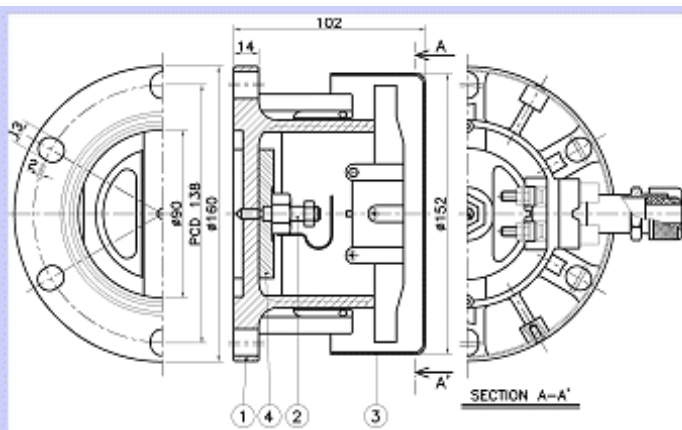
AC 250 V 5 A T0503 / T0504

1. Body 2. Cover 3. Diaphragm 4. Axle
5 / 6. Terminal block 7. Cap 8. Packing (NBR)

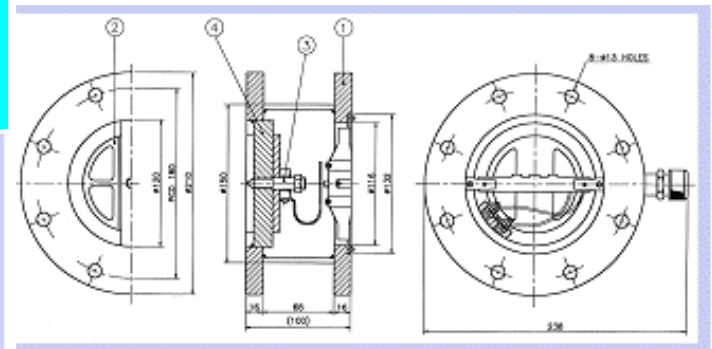
Application : Small, Medium transformer.
Assembly : Flange type.
Material : Aluminum (ALDC)
Type : T0501 (φ90) T0502 (φ90)
T0503 (φ120) T0504 (φ120)
T0507 (φ120)



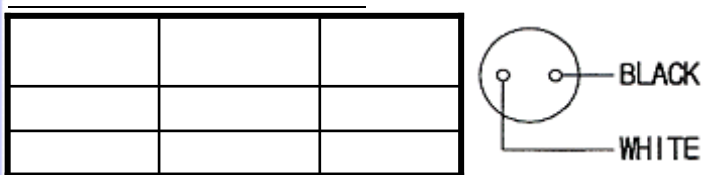
T0501
1. Body 2. Axle 3. Cover 4. Diaphragm



T0502
1. Body 2. Axle 3. Cover 4. Diaphragm



T0507 (Flange on both sides)
Operation Pressure 20Diaphragm/cm² as standard 4-Flange



Characteristic.

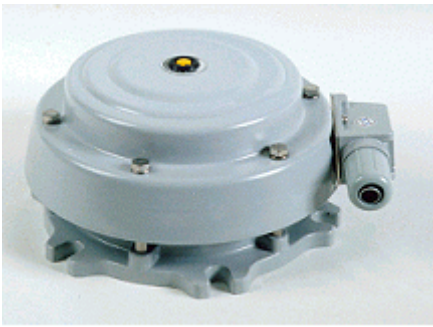
The models of Pressure Relief Devices for small, and medium transformers are usually assembled on transformer cover and are one of transformer devices which can be suitably operated under always leaving them outdoor and also are perfectly protected from oil leakage as well as moisture permeation.

We have prepared various Pressure Relief Devices for customers to select them according to their various requirements.

The devices have a certain operation characteristic and are not effected by any vibration because of the solid construction of devices.

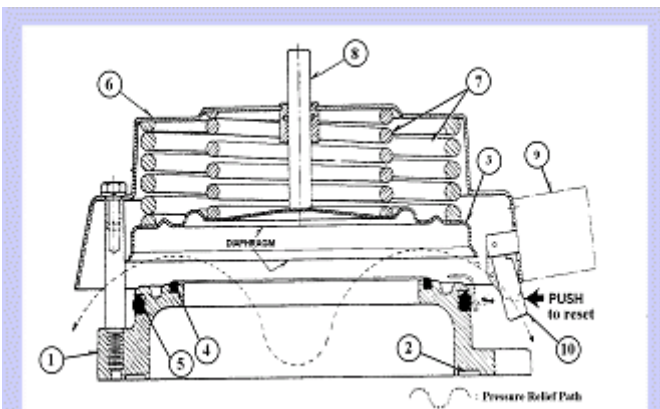
Pressure Relief Device

Model No. : T0506



Application : Large transformer
 Assembly : Flange type
 Material : Aluminum (ALDC)
 Type : T0506

Construction and name



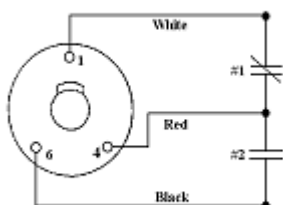
- | | | |
|---------------|-----------------------------------|---------------------|
| 1. Flange | 2. Gasket | 3. Operation disk |
| 4. Gasket | 5. Gasket | 6. Protection cover |
| 7. Springs | 8. Indicating pin | 9. Alarm device |
| 10. Reset arm | 11. Air vent hole system (Option) | |

Operation pressure

$0.7 \pm 0.07 \text{ kg/cm}^2$ (Standard)

If necessary, customer can choose one of the operation pressure of 4, 5, 8, 10, or 12 PSI.

Contact



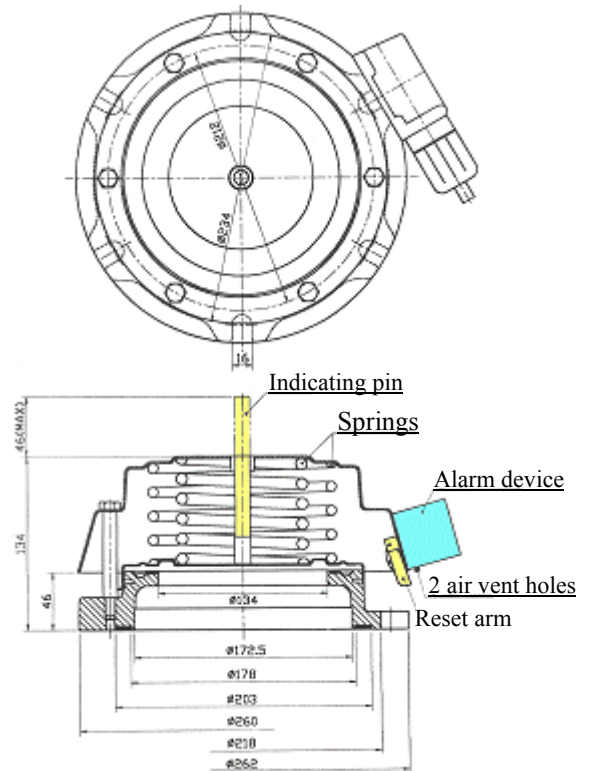
a) Contact #1 NC, #2 NO

◇ When operating
 Operation disk

b) Contact #2 NC, #1 NO

◇ When resetting

Construction and Dimension (unit : mm)



Characteristic.

The model of Pressure Relief Device for medium or large transformer is usually assembled on transformer cover and is one of transformer devices which can be suitably operated under always leaving it outdoor and also is perfectly protected from oil leakage as well as moisture permeation. Even though the model is subjected to frequent operations, the model withstands well because the model has a solid construction.

The operation part of the model consists of an operating disk, springs, a gasket, and a protection cover.

The indicating pin of the model is made of light aluminum and put on the top of operation disk.

When the operating disk is lifted up by an abnormal pressure, the indicating pin is also lifted up by the operating disk to give operator the operating signal of the model.

According to customer's requesting, an alarm device can be fitted to the cover side wall of the model and consists of a normal open contact and a normal close contact.

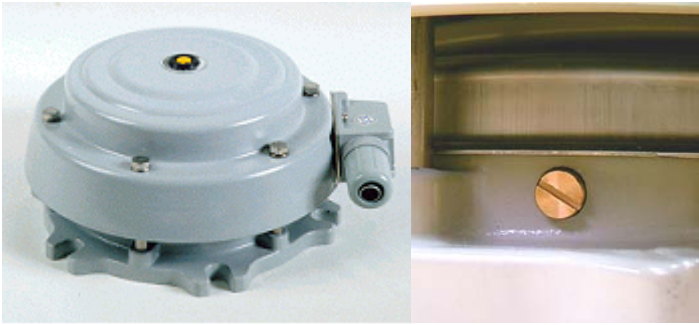
When the device is operated, the normal open contact will be opened and is generally used for a trip signal.

Specification for switch contact

Voltage	Resistance Load	Inductive Load
DC 125 V	0.5 A	0.05 A
AC 250 V	5 A	3 A

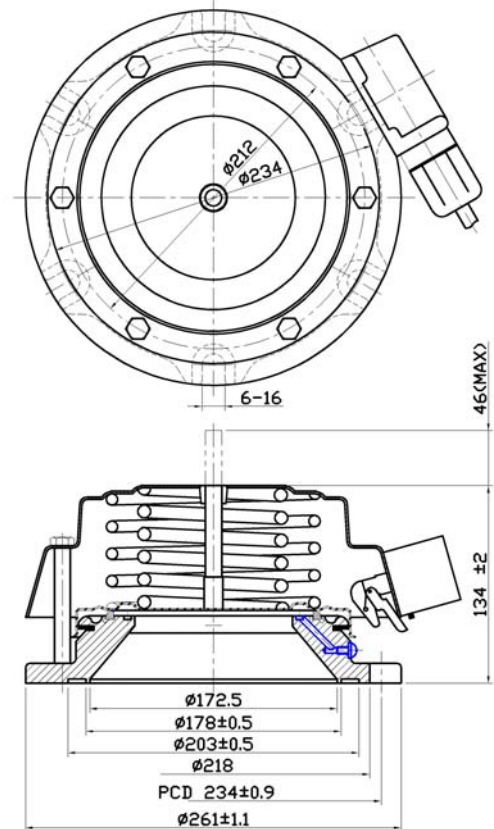
Pressure Relief Device

Model No. : T0510

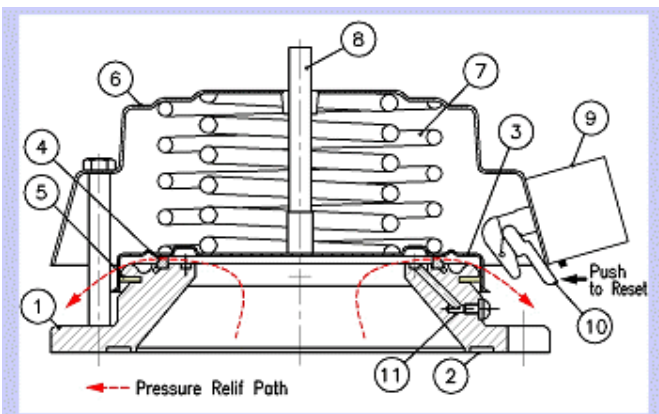


Application : Medium, and Large size transformers
 Assembly : Flange type
 Material : Aluminum (ALDC)
 Type : T0510 (Air Vent Hole)

Construction and Dimension (unit : mm)



Construction and name



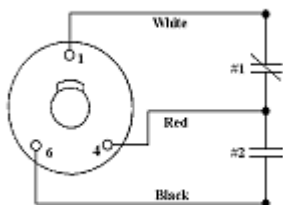
- | | | |
|---------------|-------------------|---------------------|
| 1. Flange | 2. Gasket | 3. Operation disk |
| 4. Gasket | 5. Gasket | 6. Protection cover |
| 7. Springs | 8. Indicating pin | 9. Alarm device |
| 10. Reset arm | 11. Air vent hole | |

Operation pressure

$0.7 \pm 0.07 \text{ kg/cm}^2$ (Standard)

If necessary, customer can choose one of the operation pressure of 4, 5, 8, 10, or 12 PSI.

Contact



a) Contact #1 NC, #2 NO

◇ When operating
 Operation disk

b) Contact #2 NC, #1 NO

◇ When resetting

Characteristic.

The up graded model is same as those of Model No. T0506 and has additionally an air vent hole to release residual air which can be accumulated under the operating disk of the model during filling inside the transformer with insulation oil.

Specification for switch contact

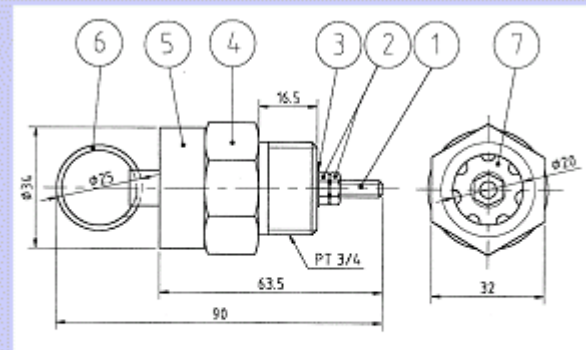
Voltage	Resistance Load	Inductive Load
DC 125 V	0.5 A	0.05 A
AC 250 V	5 A	3 A

Pressure Relief Device

Model No. : T0401



Application : Small transformer.
 Assembly : Screw type.
 Material : Brass (Bs).
 Type : T0401 ($\phi 9$).

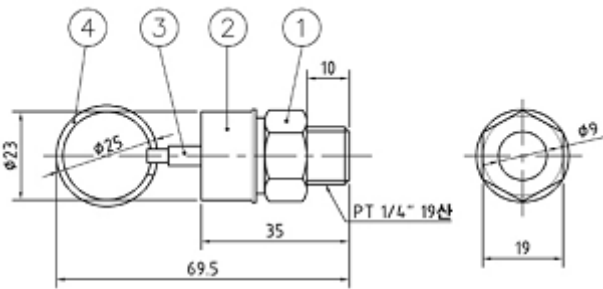


- ① Axle(Bs)
- ② Nut(Bs)
- ③ Plane washer(Bs)
- ④ Body(Bs)
- ⑤ Cover(Bs)
- ⑥ Handle (SUS)
- ⑦ Axle support (Bs)

Model No. : T0403



Application : Small transformer.
 Assembly : Screw type.
 Material : Brass (Bs).
 Type : T0403 ($\phi 32$).



- ① Body(Bs)
- ② Cover(Plastic)
- ③ Axle(Bs)
- ④ Handle(SUS)

Model No. : T0402



Application : Small transformer.
 Assembly : Screw type.
 Material : Brass (Bs).
 Type : T0402 ($\phi 20$).

Characteristic.

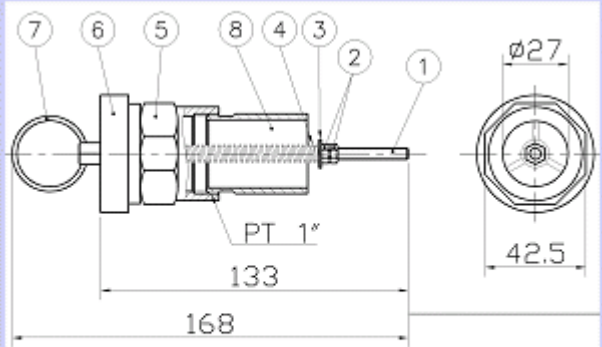
Pressure Relief Valve for small transformer is usually assembled on transformer cover.

When abnormal pressure inside the transformer occur, the pressure will be released through the valve and also when the pressure is normal, the valve returns to the original position. It means that the transformer is completely re-sealed from atmosphere.

The valve can be chosen by customers according to transformer capacity and easily assembled to transformer tank because the valve is screw type.

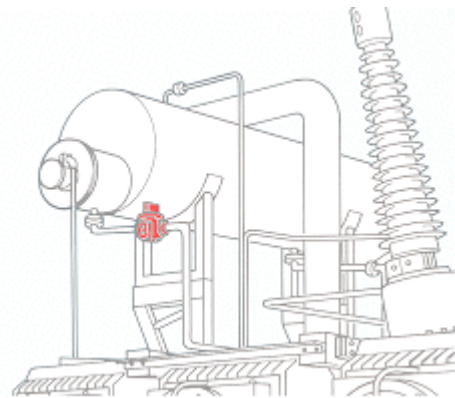
Operation pressure ; $0.7 \pm 0.07 \text{ kg/cm}^2$

(when the pressure is lower than 0.45 kg/cm^2 , the valve is automatically re-set).



- ① Axle(SUS)
- ② Nut(SUS)
- ③ Plane washer(SUS)
- ④ Spring(SUS)
- ⑤ Body(SUS)
- ⑥ Cover(SUS)
- ⑦ Handle (SUS)
- ⑧ Boss(SS400)

Buchholz Relay



Product Group : T06

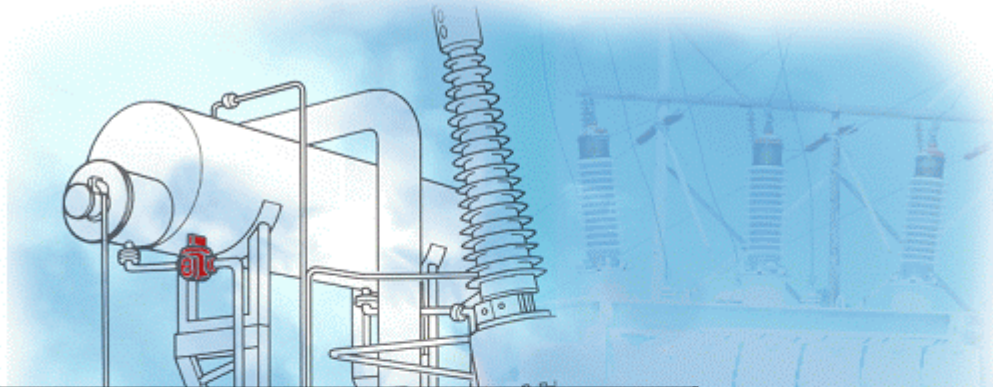
Buchholz relay is assembled between both the pipe lines connected to transformer tank and conservator, respectively and is one of the apparatuses of transformer which makes an alarm signal when the quantity of air bubble is more than a setting value and also makes a trip signal when the oil level is lower than 50% of the oil level of inside the relay. The relay is one of the apparatuses to prevent efficiently the proceed and enlargement of transformer accident by means of making a trip signal when the velocity of insulation oil in the pipe line is faster than a setting value.

If a fault occur inside the transformer, some dissolved gas is generally happened inside the transformer. In case of a negligible fault, the gas is very slowly produced in the oil in bubble form and the bubbles are finally accumulated in the relay after being first gathered at the upper part of inside the tank.

In case of a serious fault, the insulation oil will quickly flow into conservator or other escape space because of a rapid increase in oil volume.

When gas is very slowly produced in the oil in bubble form, the relay makes an alarm signal and when the insulation oil will quickly flow inside the pipe lines, the relay makes a trip signal.

Our Buchholz relays are classified into 2" Buchholz relay and 3" Buchholz relay in accordance with the hole diameter of the relay connected to pipe lines and widely used for high voltage class transformers because the relay is characteristic of a solid construction, a stylish shape, and a high reliability.



Products.

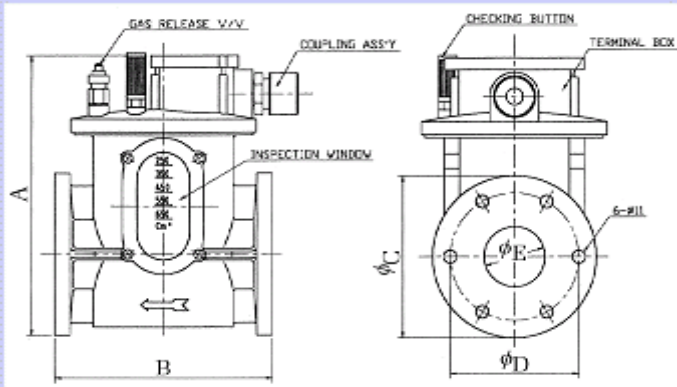
Model	Application	Size	Operation characteristic	
			Gas volume	Oil velocity
T0602	Medium, Large transformer	2"	300 cc	75 ~ 140 cm/sec
T0603		3"	350 cc	90 ~ 160 cm/sec
T0604		Gas Release Device		
T0605		Buchholz relay (2") with GRD		
T0606		Buchholz relay (3") with GRD		



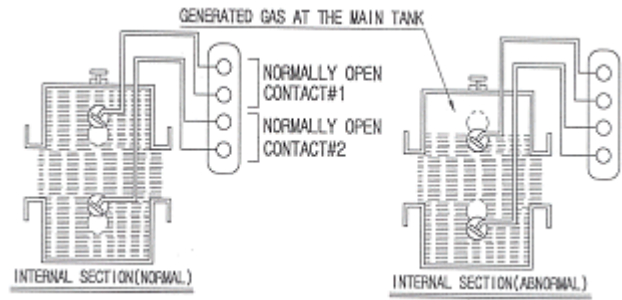
Model No. : T0602, T0603



Application : Medium, Large size transformers
 Assembly : Flange type
 Material : FCD45
 Type : T0602 (2"), T0603(3")



Operation mechanism.



Contact 1 (Alarm contact)

When gas is accumulated in the upper part of Buchholz relay after the gas is very slowly produced in the oil in bubble form and the oil level inside the relay is finally dropped to a setting level, the relay makes an alarm signal because the micro switch contact of the relay is closed due to the low position of the buoy of the relay caused by the gas accumulation.

Contact 2 (Trip contact)

When gas is very quickly produced in the oil in bubble form and the velocity of the oil flowed through the connection pipe line is very speedy, the relay makes a trip signal because the micro switch contact of the relay is closed due to the movement of the below buoy of the relay caused by the velocity. If the accumulation volume of gas or air is negligible and the gas is very slowly produced in the oil in bubble form, the gas or air enter inside the conservator through the connection pipe line and as a result of that, the below buoy of the relay will keep it's level without falling because the further oil level inside the Buchholz relay will not be dropped. But when oil level inside the relay is lower than the center line of the connection pipe line, the relay makes a trip signal because the below buoy of the relay is slightly dropped from the original level.

Return

If the oil level or the velocity inside the relay is return to a normal state, the micro switch contact will return to the original position and the buoy as well.

Specification for switch contacts

		Resistance Load (A)	Inductive Load (A)
AC	125 V	2	2
	250 V	1.5	1
DC	30 V	2	2
	125 V	2	1.5

Characteristic.

The relay consists of a cover, a mechanical part for operating a buoy, two micro switches, two buoys, a fixing apparatus, a body, a test button, an air vent hole, and miscellaneous. The relay is characteristic of having various auxiliary apparatus such as a micro switch protected from vibration, an apparatus for fixing the buoy during transportation , a test button to check if contacts are well operated and etc.

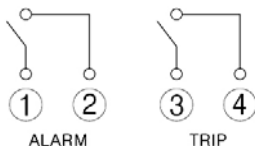
Model and specification

Model	Size	A	B	C	D	E	Gas volume (cc)	Oil velocity (cm /sec)
T0602	2"	242	186	140	110	52	250-350	75-140
T0603	3"	267	186	160	130	80	300-400	90-160

Operation condition

Alarm	when the quantity of air bubble is more than 250-400cc, the relay makes an alarm signal.
Trip	when the velocity of insulation oil in the pipe line is faster than 75-160 cm/sec or the oil level is lower than 50% of inside the relay, the relay makes a trip signal.

Contactor Diagram



Pressure Relief Device

Model No. : T0604/T0605

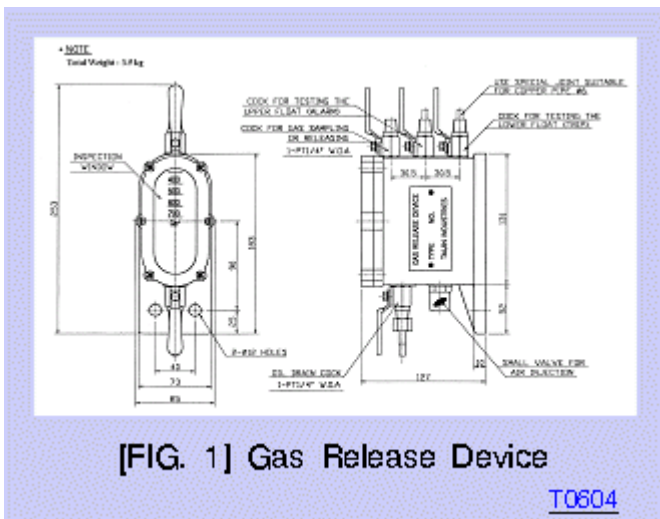
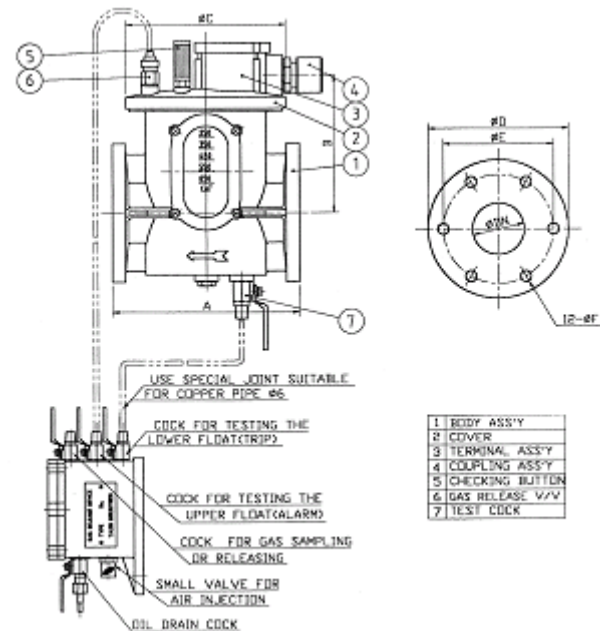


Application : Small or Large transformer.
 Assembly : Flange type.
 Material : SC37.
 Type : T0604 (Gas Release Device, GRD).
 T0605 (T0602 with GRD).
 T0606 (T0603 with GRD).

Type

- T0605 (2") with GRD (Gas Release Device)
- T0605 (3") with GRD (Gas Release Device)

Connection Diagram



Operation check point

Check an alarm contact.

After filling oil inside the relay as well as GRD and closing the gas sampling cock, oil sampling cock, and oil drain cock of GRD as well, open the gas releasing cock of the relay and the upper test cock of GRD.

And then check if alarm contact is normally operated by means of filling N₂ gas through small valve for releasing air attached on the bottom of GRD.

Gas sampling method

Drain oil inside the GRD through it's drain cock after closing the oil sampling cock of the GRD and opening the cock for testing the upper float of GRD as well .

If gas is accumulated inside the Buchholz relay, the gas will be gathered inside the GRD during above procedure. After gathering the gas inside the GRD, take gas sample from the GRD by opening the gas sampling cock of the GRD and close the cock.

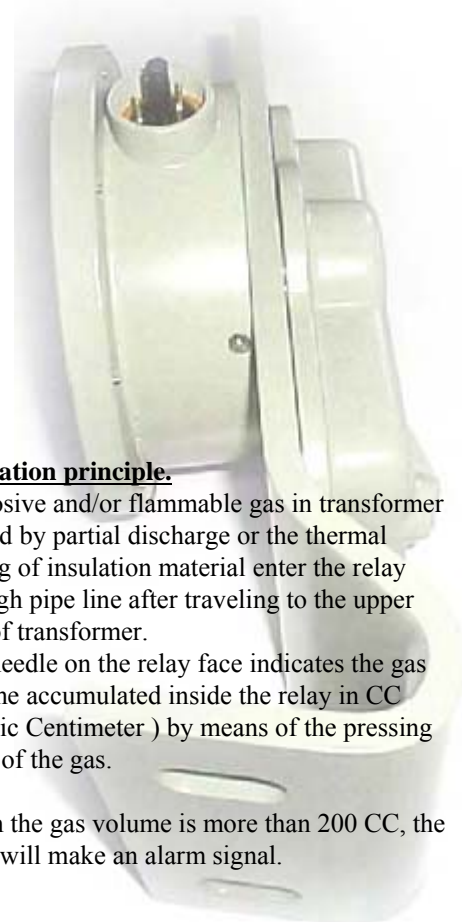
■ Model No. : T0607



T0607

Gas detect relay (or Gas Accumulation Indicator) is an apparatus to warn some faults inside the transformer in advance by means of indicating the volume of explosive and/or flammable gas in transformer caused by partial discharge or the thermal ageing of insulation material.

The relay should be assembled at the top edge of transformer filled with insulation oil, completely.

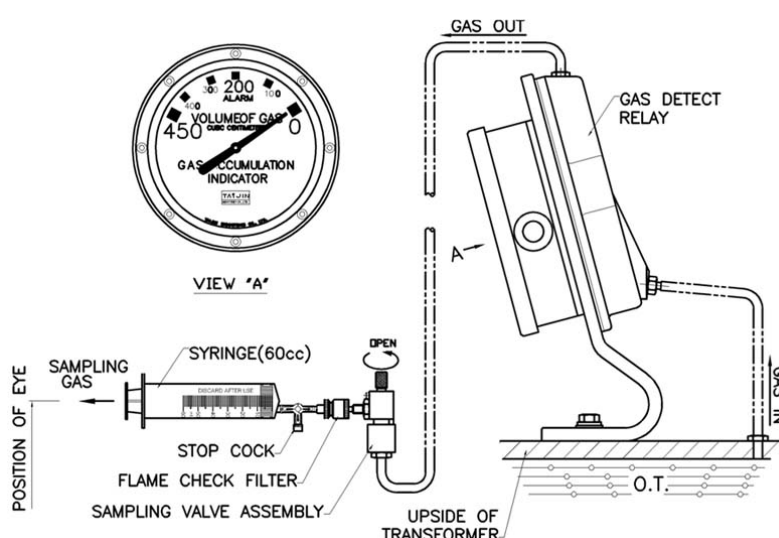


Operation principle.

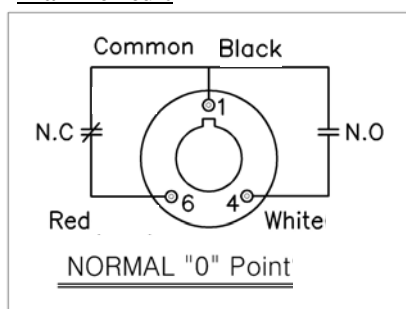
Explosive and/or flammable gas in transformer caused by partial discharge or the thermal ageing of insulation material enter the relay through pipe line after traveling to the upper part of transformer.

The needle on the relay face indicates the gas volume accumulated inside the relay in CC (Cubic Centimeter) by means of the pressing force of the gas.

When the gas volume is more than 200 CC, the relay will make an alarm signal.



Alarm circuit



Specification for switch contact

Voltage	Resistance Load	Inductive Load
DC 125 V	0.5 A	0.05 A
AC 250 V	5 A	3 A

< Relay Receptacle Pin Location and Alarm Switch Connection >

Switch operation.

- 1) At gas volume of 0 cc, common terminals of 1 and 4 are normal open, common terminals of 1 and 6 are normal close.
- 2) At gas volume of 200 cc, common terminals of 1 and 4 are normal close, common terminals of 1 and 6 are normal open (Gas volume mark of 200 cc has tolerance of $\pm 3^\circ$).
- 3) When gas volume decreases, common terminals of 1 and 4 are open within $\pm 35^\circ$ from the gas volume mark of 200 cc and common terminals of 1 and 6 are close within $\pm 35^\circ$ from the gas volume mark of 200 cc.

N2 Gas Equipments



T0901



T0902



T0903



T0904



T0906

Product Group : T09

N2 gas equipment (or N2 gas sealed equipment) is an apparatus to prevent insulation oil from oxidization by means of isolating insulation oil from atmosphere.

To attain this purpose, N2 gas is filled above insulation oil level inside the transformer by using the N2 gas equipment.

The variation of pressure level or vacuum level inside the transformer, caused by ambient temperature and / or the load change of transformer, can be automatically controlled by the equipment.

In addition to above, the equipment is generally used as an apparatus to supply N2 gas inside the transformer tank during its transportation instead of insulation oil.

Our N2 gas equipment can be selected and used in accordance with utilization purpose and place.

We have prepared various N2 gas equipments widely used for small power transformers to ultra high voltage class transformers.

Our N2 gas equipment has a good reputation in the world market because the relay is characteristic of a solid construction, a stylish shape, and a high reliability.

Product Table

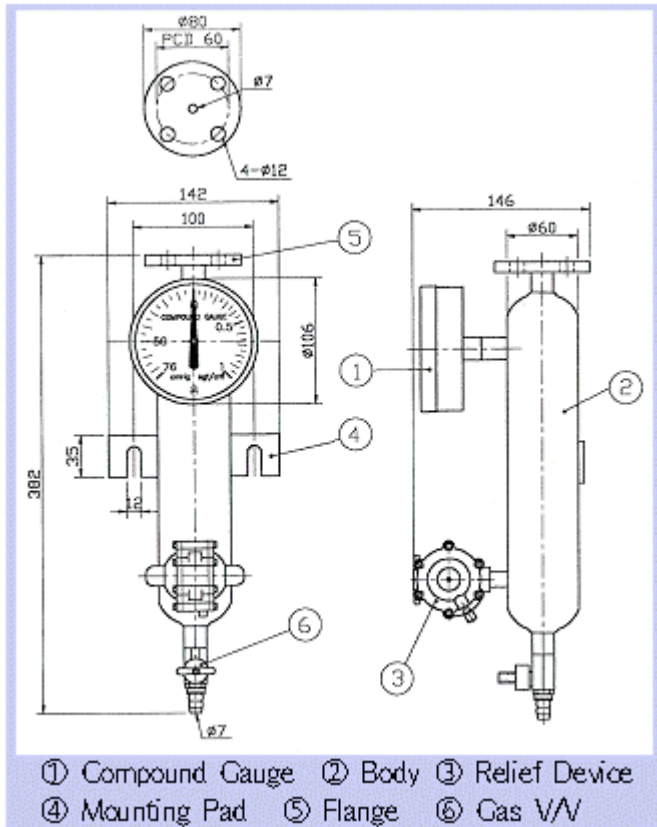
Model No.	Application
T0901	N2 gas supply apparatus (Compound gauge) for small transformer.
T0902	
T0903	N2 gas equipment for transporting transformer.
T0904	N2 gas equipment for medium, large transformer.
T0906	N2 gas supply apparatus (Compound gauge) for small transformer.

■ Model No. : T0901(Compound gauge)



Application : An apparatus to feed N2 gas inside the small transformer and adjust N2 gas pressure inside the transformer to prevent insulation oil from oxidization by means of isolating insulation oil from atmosphere.

Assembly : Bolting type.
Material : SS400.
Type : T0901 (φ100 / without contact).



Compound gauge range ; -76 cmHG ~ 1 kgf / cm²

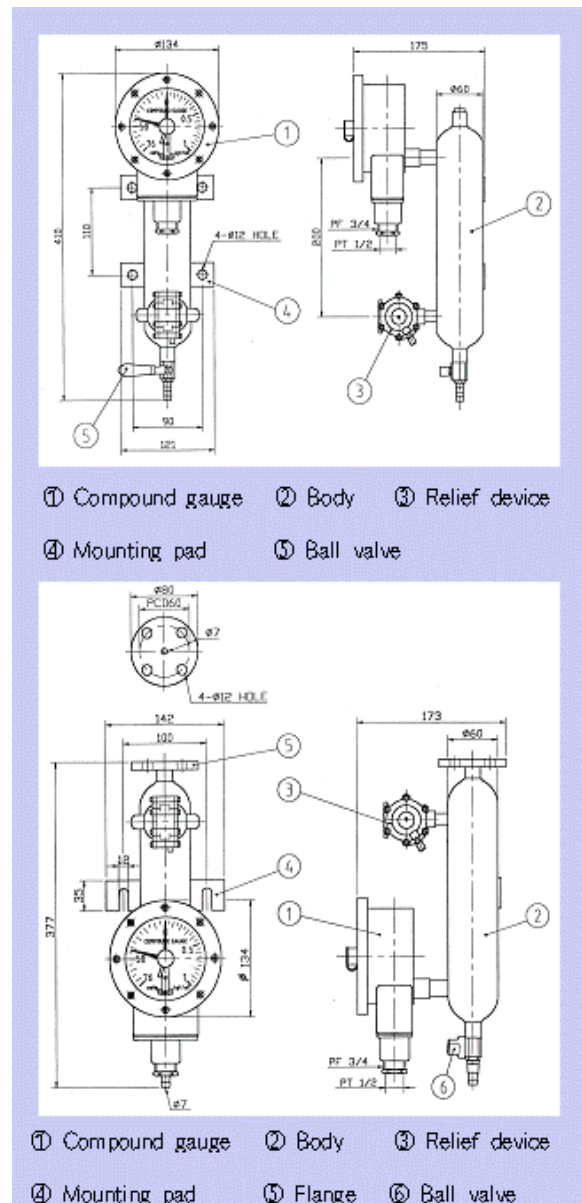
Operating range of Relief Device ; ± 0.35 kgf / cm²

■ Model No. : T0902/T0906 (Compound gauge)

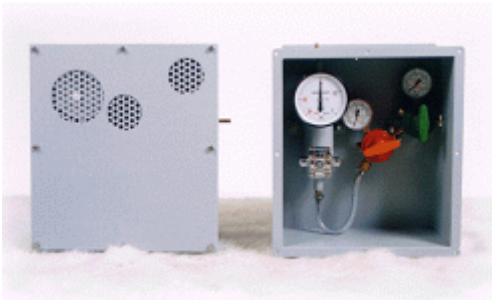


Application : An apparatus to feed N2 gas inside the medium, large transformer and adjust N2 gas pressure inside the transformer to prevent insulation oil from oxidization by means of isolating insulation oil from atmosphere.

Assembly : Bolting type.
Material : SS400.
Type : T0902 (φ100 / one contact for high pressure).
 T0906 (φ100 / one contact for low pressure).



■ Model No. : T0903

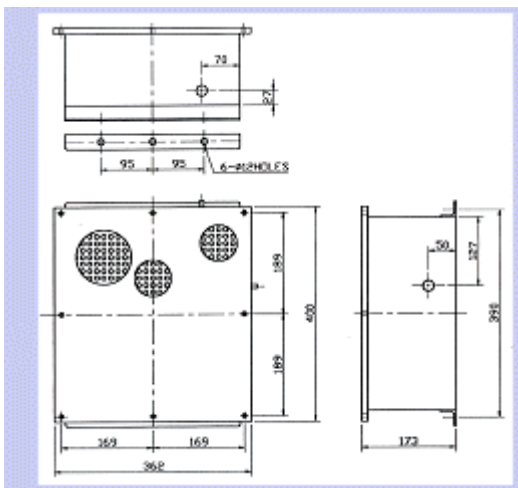
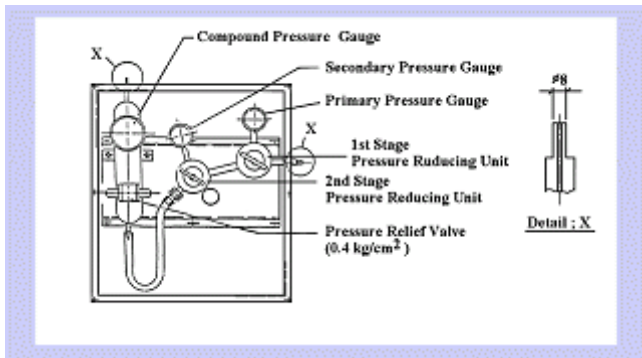


Application : An apparatus to feed N2 gas inside the medium, large transformer and adjust N2 gas pressure inside the transformer to prevent insulation oil from oxidization by means of isolating insulation oil from atmosphere.

Assembly : Bolting type.

Material : SS400.

Type : T0903.



Characteristic.

The equipment is an apparatus to feed N2 gas above insulation oil level inside the transformer according to the breathing process of transformer and the N2 gas is automatically supplied by gas bottle with internal pressure of 200 kg / cm² through 2 pressure reducing units.

When the N2 gas pressure of the second pressure reducing unit is within 0.03 to 0.35 kg / cm², the equipment keeps to maintain completely sealing state.

■ Model No. : T0904

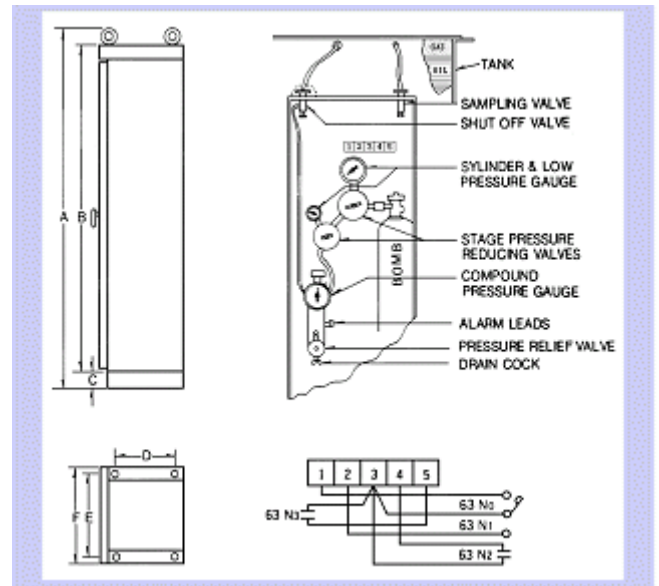


Application : An apparatus to feed N2 gas inside the oil immersed transformer and adjust N2 gas pressure inside the transformer to prevent insulation oil from oxidization by means of isolating insulation oil from atmosphere.

Assembly : Bolting type.

Material : SS400.

Type : T0904 (Standard type).



Characteristic.

The equipment is an apparatus to prevent insulation oil from oxidization by means of isolating insulation oil from atmosphere.

To attain this purpose, N2 gas is filled above insulation oil level inside the transformer by using the N2 gas equipment. The variation of pressure level or vacuum level inside the transformer, caused by ambient temperature and / or the load change of transformer, can be automatically controlled by the equipment.

(The equipment is installed inside the moisture proof type cabinet.)

Valves



Product group : T10, T12

Valve is an apparatus used for filling transformer tank with insulation oil, draining oil from transformer tank, or sampling oil and connecting the pipe line to oil immersed transformer.

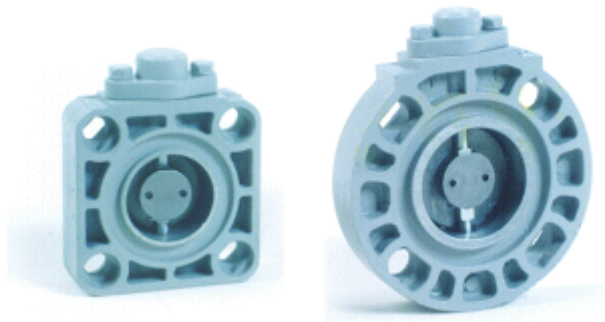
We have prepared various valves widely used for pole transformers to ultra high voltage class transformers because the size and application of valves are variable according to their use purpose and connection position.

Our valves have a good reputation in the world market because the valves are characteristic of an unique and solid construction, and a stylish shape.

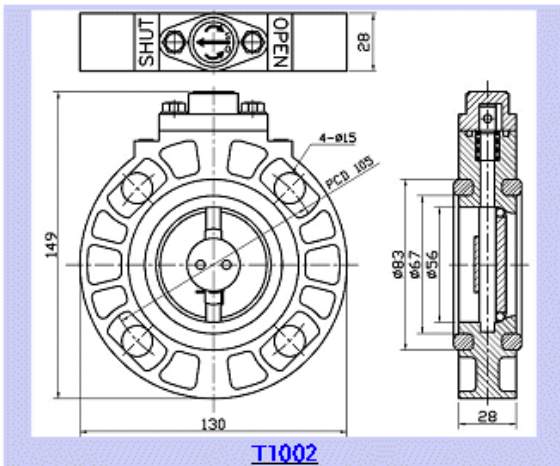
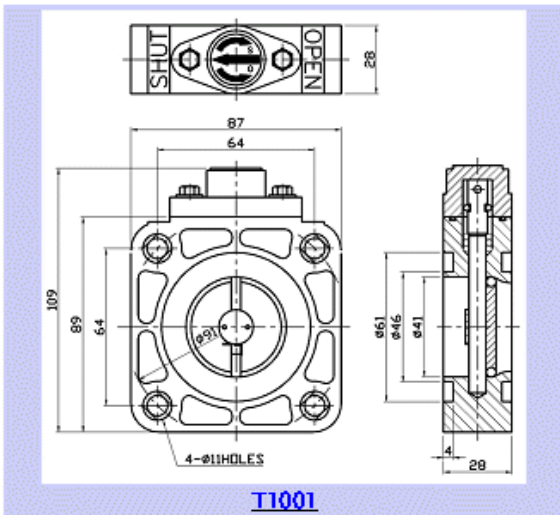
Product table

Model No.	Name	Material	Size	Remarks
T1001	Butterfly type	ALDC8	1.5"	
T1002	Butterfly type	ALDC8	2"	
T1003	Butterfly type	FC20	3"	
T1004	Butterfly type	FC20	4"	
T1005	Butterfly type	SS400	3"	Welding type
T1006	Butterfly type	SS400	4"	Welding type
T1009	Butterfly type	FC20	4"	
T1013	Butterfly type	FC20	6"	
T1014	Butterfly type	FC20	8"	
T1036	Butterfly type	FC20	10"	
T1032	Butterfly type	FC20	3"	
T1030	Butterfly type	FC20	2"	
T1033	Butterfly type	FC20	2"	
T1031	Butterfly type	FC20	4"	
T1044	Butterfly type	FC20	3"	
T1201	Oil sampling valve	BS	M16 X 1.5	φ4 for small TR.
T1205	Oil sampling valve	BS	M16 X 1.5	φ8 for large TR.
T1202	Oil filling cap	ALDC8	2"	

■ Model No. : T1001/T1002

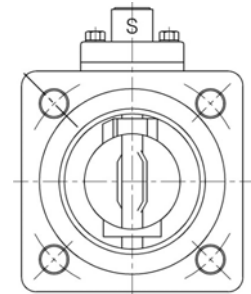


Application : Connection parts of pipe lines of oil immersed transformer.
 Assembly : Stud bolt type.
 Material : Aluminum.
 Type : T1001 (1.5"),
 T1002 (2").



Option ; Stud bolt

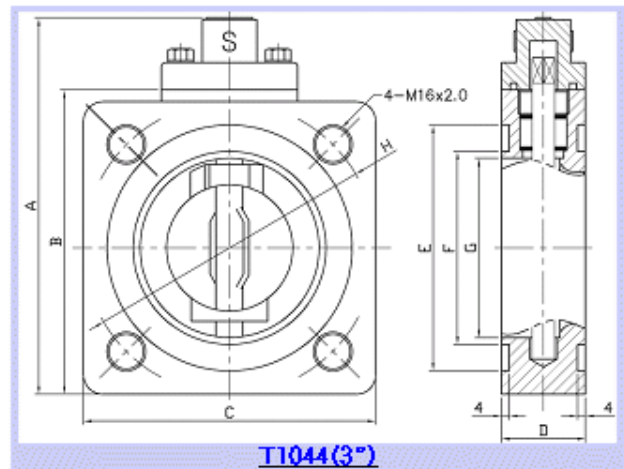
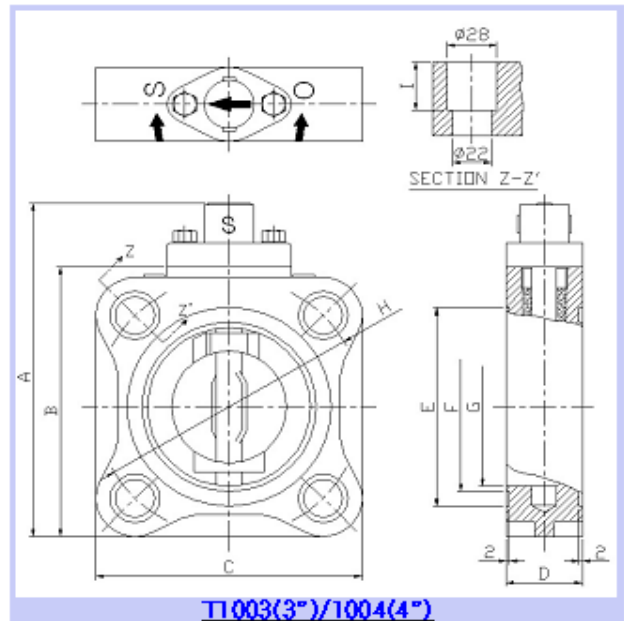
■ Model No. : T1003/T1004/T1044



T1003(3")/T1004(4")

T1044(3")

Application : Connection parts of pipe lines of oil immersed transformer.
 Assembly : Stud bolt type.
 Material : FC20.
 Type : T1003 (3"), T1004 (4"),
 T1044 (3").



Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
T1003 (3")	191	153	150	43	115	98	92	150	28
T1044 (4")	194.5	155	150	42	126	99	92	160	-
T1004 (4")	217	179	174	45	146	122	111	190	26

■ Model No. : T1009

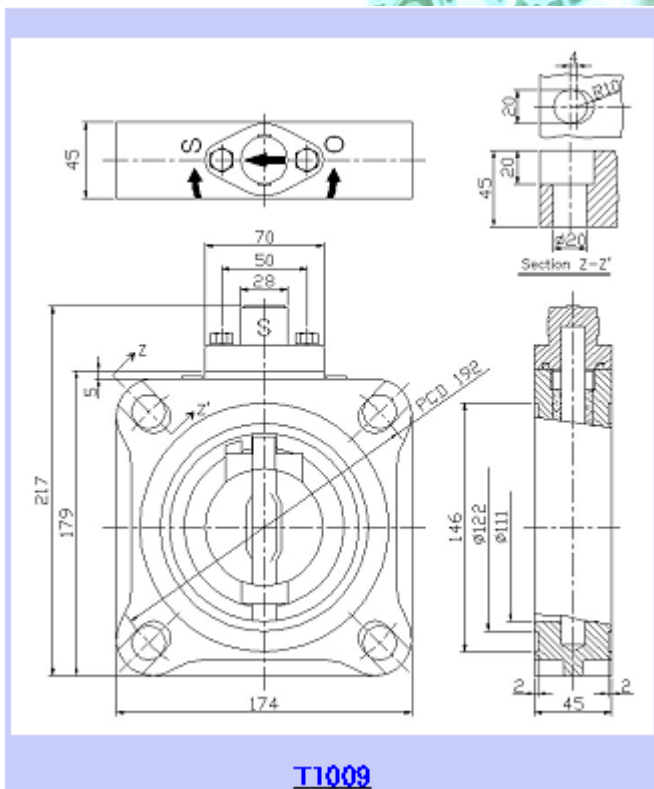


Application : Connection parts of pipe lines of oil immersed transformer.
 Assembly : Stud bolt type.
 Material : FC20.
 Type : T1004 (4").

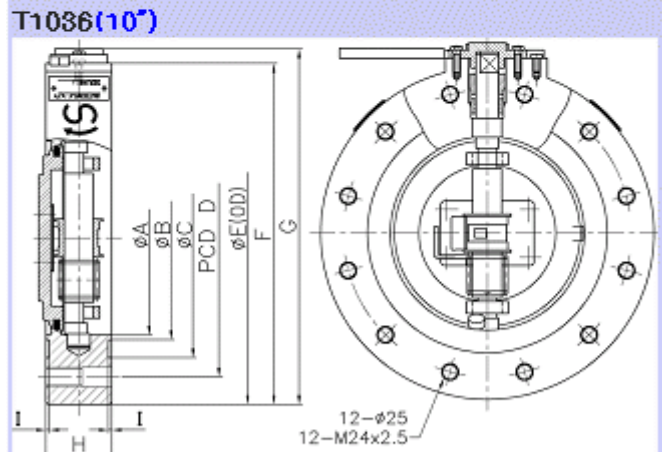
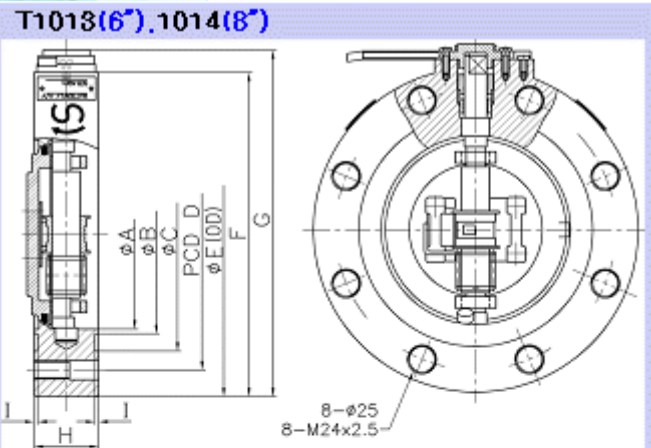
■ Model No. : T1013/T1014/T1036



Application : Connection parts of pipe lines of oil immersed medium, large transformer.
 Assembly : Stud bolt type.
 Material : FC20.
 Type : T1013 (6"), T1014 (8"), T1036 (10").



Option ; Stud bolt.



TYPE	øA	øB	øC	D	øE	F	G	H	I
T1013/6"	159	170	200	240	280	285	298	55	3
T1014/8"	206	225	250	280	320	327	340	60	4
T1036/10"	254	285	312	345	385	392	405	60	4

Option ; Stud bolt.

Characteristic.

The butterfly valves are mainly used for connecting the radiator head pipe, oil pump, or the pipe lines of unit cooler to transformer tank.

The unique structure of our valves is characteristic of a complete oil leakage proof at the protection cap, body, gate and etc of the valves during the oil leakage test with test pressure of 1.5 kg / cm² and below.

Model No. : T1005/T1006

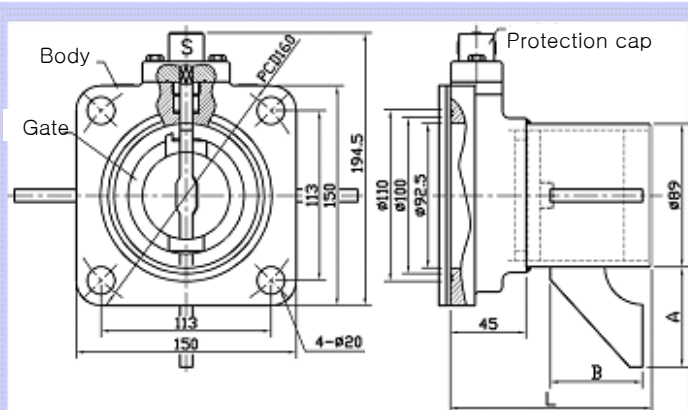
T1005(3")



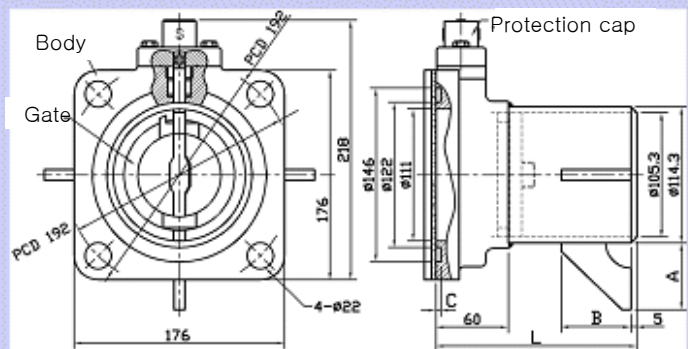
T1006(4")



Application : Radiator for oil immersed transformer.
 Assembly : Stud bolt type.
 Material : SS400.
 Type : T1005 (3"), T1006 (4").



T1005 (3")



T1006 (4")

I No.	C
I 01	2
I 02	3

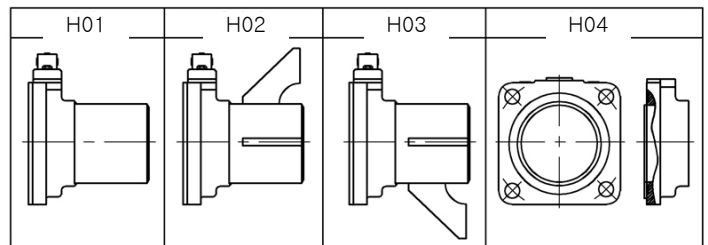
Characteristic.

Butterfly type radiator valves are welded to transformer tank and characteristic of disassembling radiator from the transformer tank without draining insulation oil from the tank. Prior to transporting transformer tank, the protection cover of the radiator valve should be assembled on the top of radiator valve body to protect the shaft from damage during transportation after closing the gate of valve, draining oil inside the radiator and then disassembling the radiator from the tank.

The sealing O-ring fitted in the protection cap of the valve, prevents the valve from the leakage of forging part, casting body, protection cap, gate and also protect them from moisture entrance.

Dimension of reinforcing pipe

T1005 (3")				
H No.	L	A	B	Remarks
H01	150	100	60	W200
H02	200	100	100	W250
H03	250	100	150	W300
H04	300	120	200	W350
H05	350	120	250	W400
H06	400	150	300	W450
H07	100	-	-	P150
H08	450	-	-	P450
H09	-	-	-	Elbow



T1006 (4")			
H No.	L	A	B
H01	70	-	-
H02	120	-	-
H03	150	-	-
H04	170	-	-
H05	200	100	115
H06	250	100	165
H07	300	100	215
H08	100	-	-
H09	95	-	-
H10	125	-	-

■ Model No. : T1030/1031/1032/1033

T1033(2")

T1030(2")



T1032(3'')/T1031(4'')

Application.

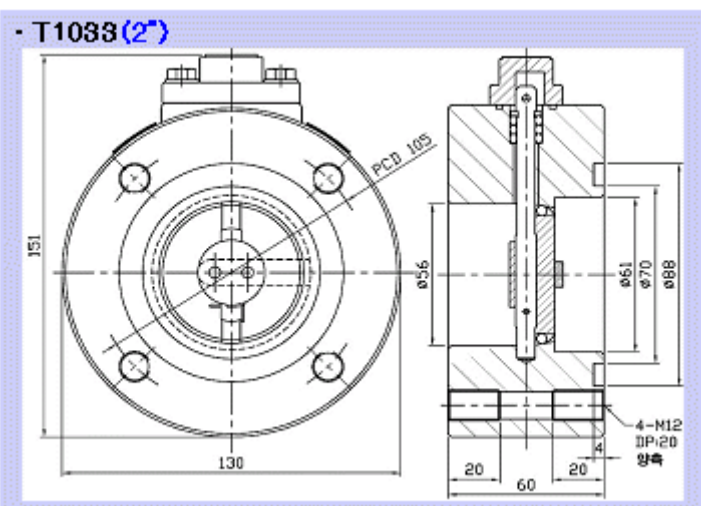
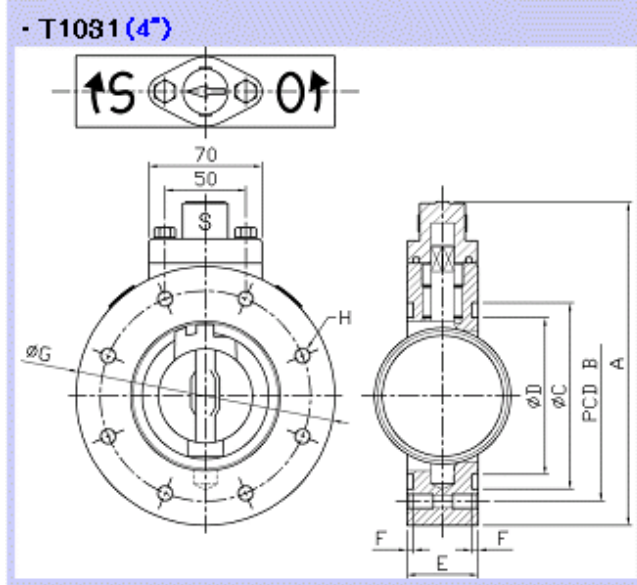
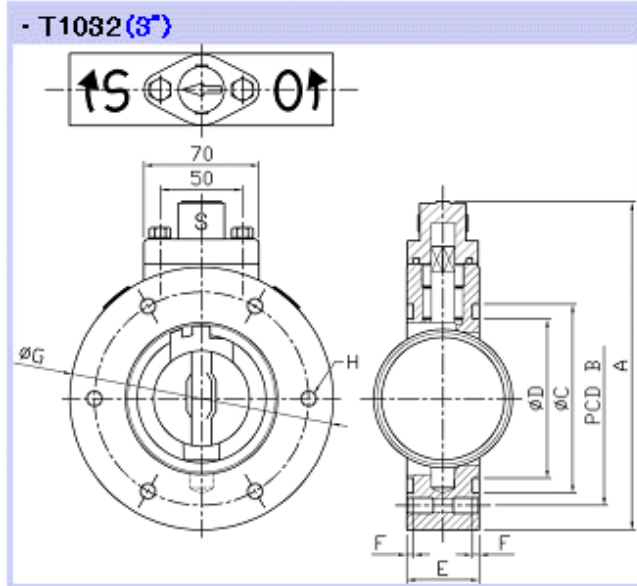
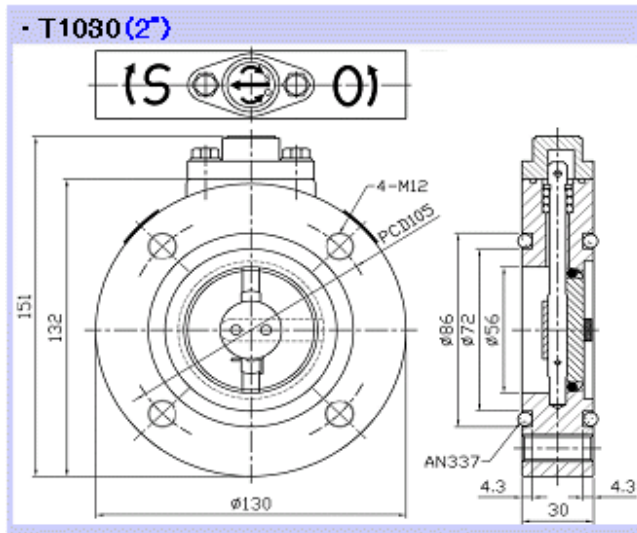
- T1033 (2'') ; For the pipe line of Sudden Pressure Relay, mainly.
- T1030 (2'') ; For the pipe line of oil immersed transformer and Buchholz relay as well.
- T1032 (3'') ; For the pipe line of radiator, oil pump, and unit cooler of large size power transformer, mainly and our 3'' Buchholz relay
- T1031 (4'') ; For the pipe line of radiator, oil pump, and unit cooler of large size power transformer, mainly.

Assembly ; Bolt type.

Material ; FC20.

Characteristic ; complete oil leakage proof at the protection cap, body, gate.

Option ; SUS bolts for assembling them.



Model	A	B	C	D	E	F	G	H
T1032(3'')	G01	200	130	115	98	42	4.3	180 8-M10
	G02	200	130	-	-	42	-	180 8-M10
T1031(4'')	250	175	141	120	45	4	210 8-M18	

Sampling valve

■ Model No. : T1201 / 1205



T1201



T1205

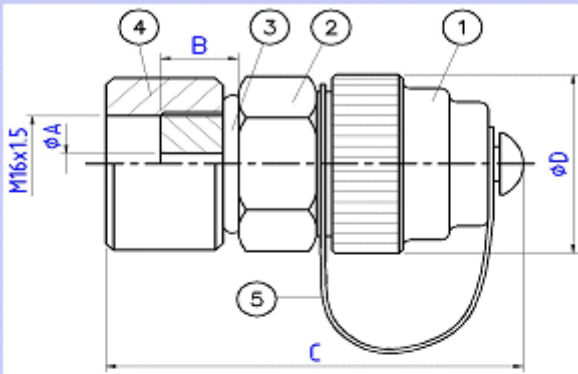
Application : For sampling and draining oil.
 Assembly : Screw type.
 Material : BS.
 Type : T1201 (φ4) for small volume oil.
 T1205 (φ8) for large volume oil.

Oil inlet cap

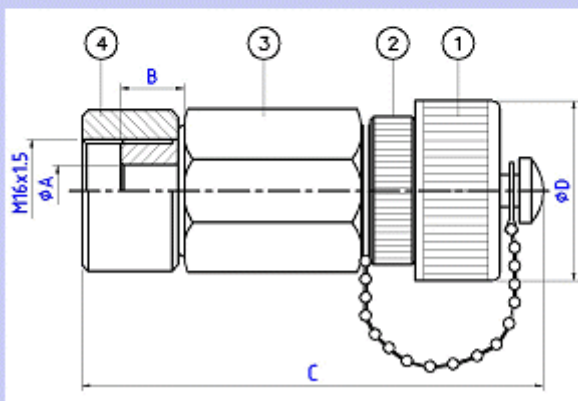
■ Model No. : T1204



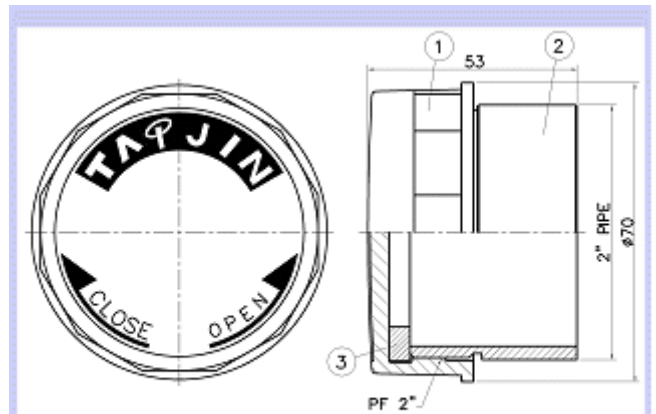
Application : Oil inlet cap.
 Assembly : Screw type.
 Material : ALDC8.
 Type : T1204.



- ① Cover(Bs) ② Body(Bs)
- ③ O-Ring(NBR) ④ Boss(SS400)
- ⑤ Rubber Hanger(EDPM)



- ① Cover(AL) ② Bolt(Bs)
- ③ Body(Bs) ④ Boss(SS400)



- ① Oil inlet cap ② 2" pipe ③ Packing

(Unit ; mm)

Model	Item	φA	B	C	φD
T1201	Body	4	10	53	28
T1205	Body	8	10	69	28

Temperature Indicator



Product Group : T11

Thermometer is an apparatus to measure the oil temperature of transformer and the winding temperature of mold type transformer. The thermometer is mostly waterproof, shockproof, dial type and indicates transformer temperature as a state of assembling the relay on transformer. The thermometer is classified into bimetal type or bourdon tube pressure gauge type in accordance with the assembly position or service of the thermometer on transformer and has an alarm contact and a trip contact to protect the transformer from a fault.

The thermometer can be used for outdoor in the temperate regions as well as tropical regions because the thermometer is made of anticorrosive material.

Thermometer body is made from aluminum alloy and has a tempered glass on thermometer face to check the needle indication of thermometer. Some of weatherproof thermometer bodies have a ventilation hole at the bottom of the thermometer. We have various thermometers in size as well as in shape for all the transformers from pole transformers to ultra high voltage class power transformers.

Our thermometers have a good reputation in the world market because the thermometers have a solid construction and a graceful shape as well.

Product Table

Model No.	Specification	
T1101	φ75, Bimetal	With pocket
T1102A	φ75, Bimetal (Max. indicator)	With pocket (φ14)
T1102B	φ75, Bimetal	With pocket (φ10)
T1102C	φ75, Bimetal	With pocket (S/L ; 50 mm)
T1102D	φ75, Bimetal	With pocket (S/L ; 50 mm)
T1103	φ128, Bimetal – 1 Contact	75°, 85° With pocket
T1104	φ128, Bimetal – 2 Contacts	75°, 95° With pocket
T1105	φ128, Bimetal – 2 Contacts	95°, 115° Without pocket
T1106A	φ96, Bourdon – 1 Contact	C/L – 2000 mm
T1106B	φ96, Bourdon – 2 Contacts	C/L – 2000 mm
T1106C	φ96, Bourdon – 2 Contacts	C/L – 3000 mm
T1106D	φ96, Bourdon – 1 Contact	C/L – 2000 mm ~ 5000 mm
T1106E	φ96, Bourdon – 2 Contacts	C/L – 2000 mm, 5000 mm
T1107	φ185, Bourdon type	C/L – 2000 mm ~ 5000 mm
T1110	φ50, Bimetal	S/L - 85 mm, Total length 125 mm
T1111	φ108, Bimetal 3/8"	
T1112	φ108, Bimetal 7/8"	

Temperature Indicator

■ Model No. : T1101

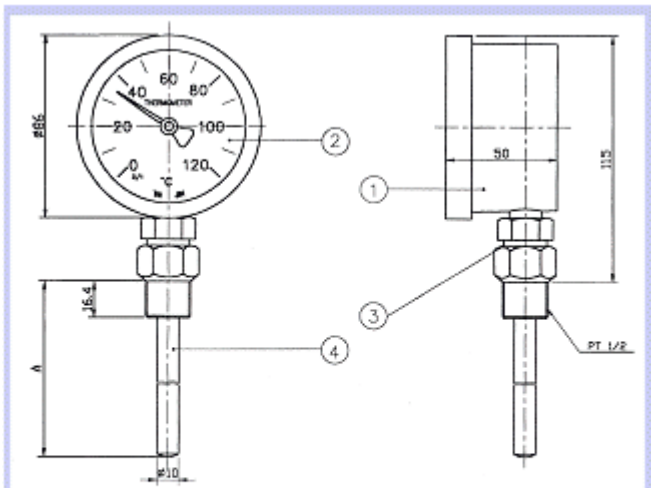


Application : For measuring the oil temperature of small oil immersed transformers.
Assembly : Fitting thermometer sensor in a well welded to the transformer tank.
Construction : Bimetal.
Type : T1101.

■ Model No. : T1102

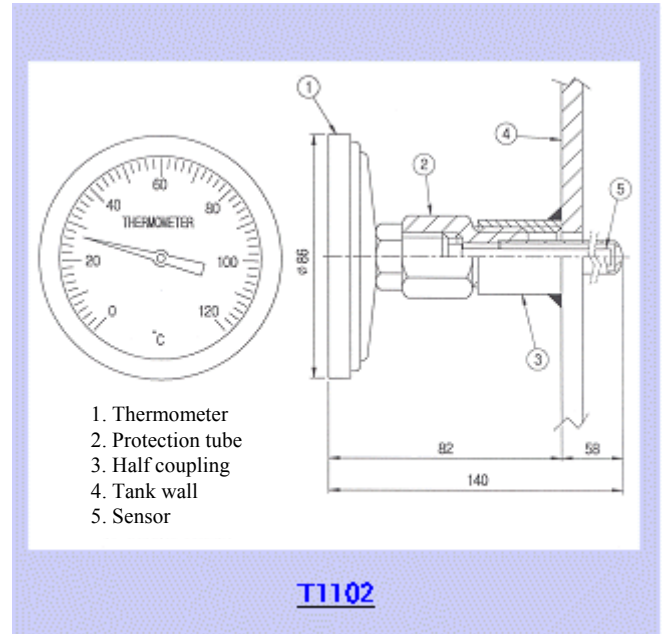


Application : For measuring the oil temperature of small oil immersed transformers.
Assembly : Fitting thermometer sensor in a well welded to the transformer tank side wall.
Construction : Bimetal.
Type : T1102A ~ T1102D.



T1101

- ① Body
- ② Inspection glass
- ③ Nut
- ④ Sensor



T1102

Model and specification.

Model	Item	A
T1101	H01	170 mm
	H02	240 mm
	H03	200 mm

Model and specification.

Model	Type	φ	Max. indic.	Pocket	Sensor	assembly
T1102A	Bimetal	75	O	O (φ14)	80	PT 1/2"
T1102B	Bimetal	75	X	O (φ10)	75	PT 3/8"
T1102C	Bimetal	75	X	X	50	PT 1/2"
T1102D	Bimetal	75	X	X	86	PT 1/2"

※Temperature indication range - A-C: 0~120°, D: 0~150°

Characteristic.

The waterproof, and shockproof type thermometers for small transformer indicates oil temperature as a dial type instrument assembled on transformer tank cover or side wall. The needle of thermometer directly connected to bimetal is separated from the body, protection tube.

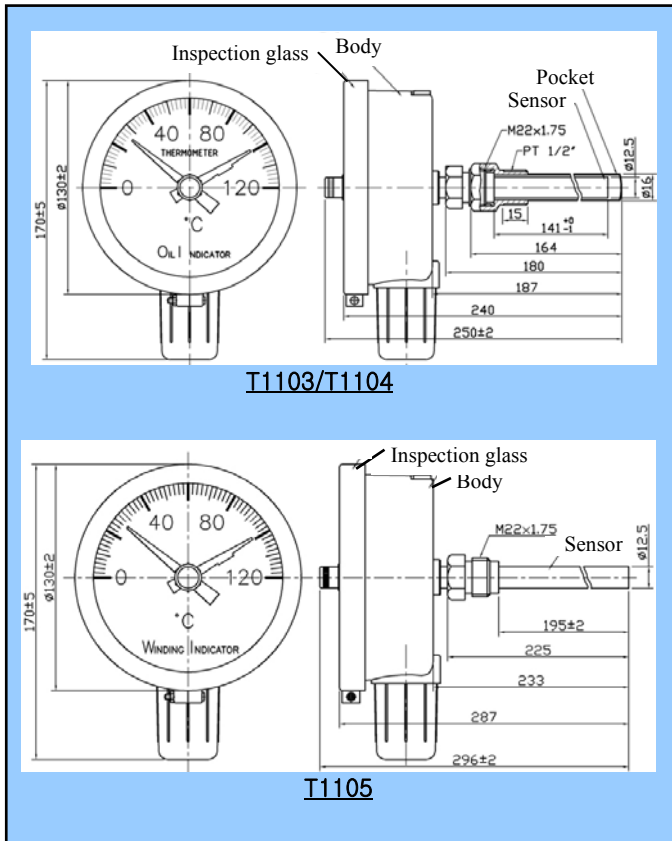
Transformer tank is perfectly separated from the sensor because the sensor is fitted in a well welded on transformer tank. The temperature indication range is 0 ~ 120 °C.

Temperature Indicator

■ Model No. : T1103/T1104/T1105



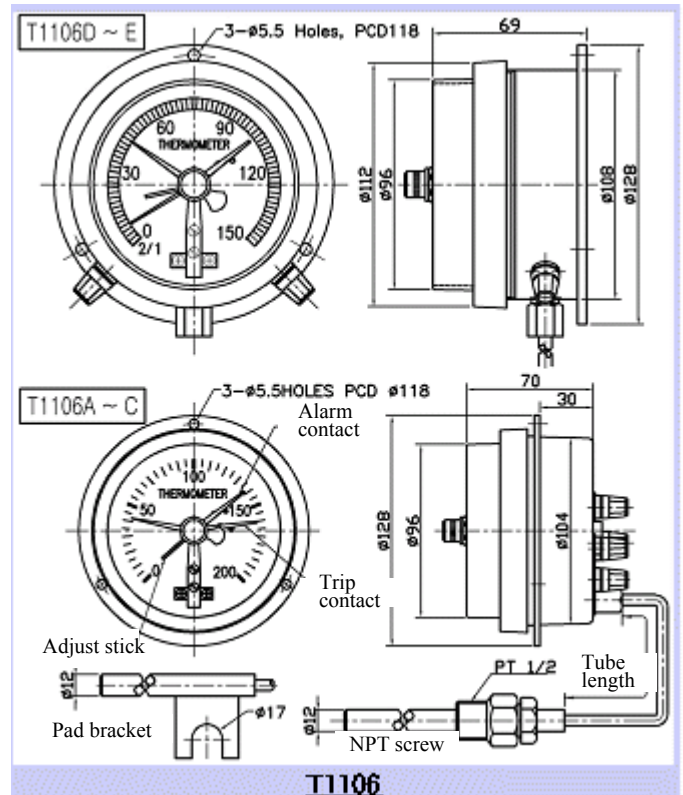
Application : For measuring the oil temperature of oil immersed small transformers.
Assembly : Fitting thermometer sensor in a well welded to the transformer tank.
Construction : Bimetal, Contact, Maximum indicator.
Type : T1103 / T1104 / T1105.



■ Model No. : T1106



Application : For measuring the temperature of dry, mold type transformers.
Assembly : Fitting thermometer sensor in a well welded to the transformer tank.
Construction : Bourdon tube pressure gauge type, Contact.
Type : T1106A ~ / T1106E.



Model and specification.

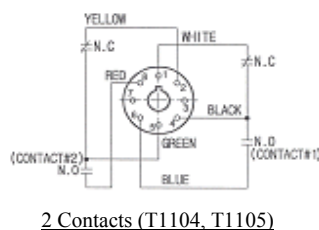
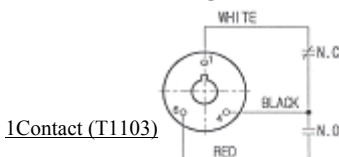
(Unit ; mm)

Model	ø	Pocket	Application	Cont.	Setting
T1103	128	O	Oil	1	H01-75°C, H02-85°C
T1104	128	O	Oil	2	75°C, 95°C.
T1105	128	X	Winding	2	95°C, 115°C.

Option ; Temp. range / Cable length (more than 1.2 m) / Operation Temp. / Pocket length and Flange length (ø98, PCDø73-T1104).

Temp. range ; 0 ~ 120°C.

Contact connection diagram.



Model	Type	ø	Cont	Tube (m)	Assembly
T1106A	F2A	96	1	2	Pad bracket
T1106B	F1B	96	2	2	Pad bracket
T1106C	HD	96	2	3	NPT 1/2 screw
T1106D	1C	96	1	2 to 5	NPT 1/2 screw
T1106E	2C	96	2	2/5	NPT 1/2 screw

Option ; Temp. range / Tube / No. of contact / Temp. setting (adjustable from outside).

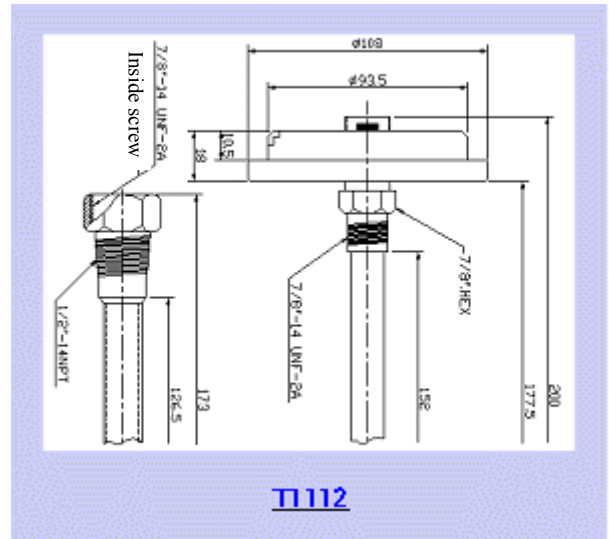
Temp. range ; 0 ~ 200°C (T1106 A / B / C).
 0 ~ 150°C (T1106 D / E).

Temperature Indicator

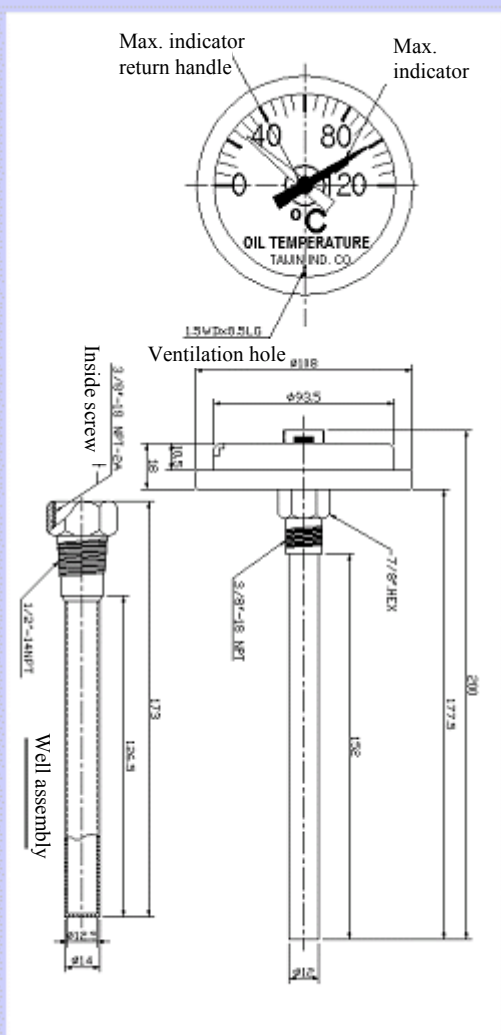
Model No. : T1111/T1112



Application : For measuring the oil temperature of oil immersed medium transformer.
 Assembly : Screw type.
 Construction : Bimetal.
 Type : T1111 / T1112.



T1112



T1111

Model and specification.

(Unit ; mm)

Dimensions of thermometer and well							
Model	A	B	C	D	E	Range	
T1111	G01	3/8" NPT	126.5	O	173	1/2" NPT	0-120°C
	G02	3/8" NPT	126.5	X	173	1/2" NPT	0-120°C
	G03	3/8" NPT	126.5	O	173	1/2" NPT	0-160°C
	G04	3/8" NPT	126.5	X	173	1/2" NPT	0-160°C
T1112	G01	7/8" NPT	126.5	O	173	1/2" NPT	0-120°C
	G02	7/8" NPT	126.5	X	173	1/2" NPT	0-120°C
	G03	7/8" NPT	126.5	O	173	1/2" NPT	0-160°C
	G04	7/8" NPT	126.5	X	173	1/2" NPT	0-160°C

A. Thermometer thread. B. Stem length.
 C. Well (O ; included, X ; excluded).
 D. Well length in mm. E ; Well thread.

Temperature indicating range ; 0 ~ 120°C, 160°C.

Characteristic.

Stem and case ; Stainless Steel.
 Well ; Brass.
 Accuracy ; ± 2%.
 Lens ; Poly arbor Nate.
 Dial ; Aluminum, Black color letter.
 Needle ; Aluminum, Black color paint (changeable).



Cooling Fan



T2106,2142,2143



T2125



T2127,2128,2129,2133
2136,2137



T2126



T2151

Product Group : T21

Cooling fan is an apparatus used for cooling down the insulation oil heated by the losses of transformer with the cooling systems of forced air cooling, forced oil cooling.

Our cooling fans are characteristic of high efficient, lower sound level. The fans blow air among radiator pins as a state of attaching on the radiator and are solidly manufactured to use them outdoor during long period.

Especially fan blades to supply radiator with much air are made from anticorrosive aluminum and net shape fan guide is made of a thick wire and also the guide takes consideration into operator's safety and air flow resistance.

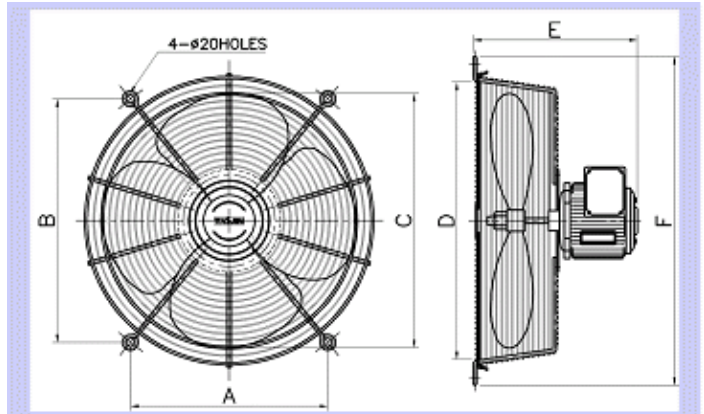
In case F class fan motors are character of waterproof, total abolition as a perfect sealing construction, therefore the motor efficiency does not deteriorate even though the motors are in service during long period.

We have various cooling fans to meet many kinds of specifications and standards to satisfy customer's requirements such as high efficiency, lower noise level, a solid construction as well as a graceful shape, therefore our cooling fans have a good reputation in the world market.

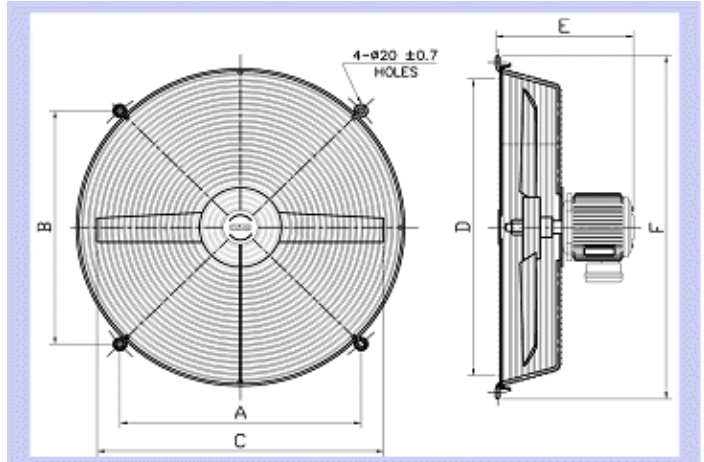
MODEL	Pole	Hz	RPM	m ³ /sec	dBA	Ins.	L X W (mm)	kg	HP	IP	Volt.	PH		HZ			
												1	3	60	50		
T2106A~T	8	60	840	2.7	59	F	470 584	26				V	V				
		50	700	2.2	56							V	V				
T2125A~T	4	60	1725	4.2	69	F	584 584	22				V	V				
		50	1425	3.5	67							V	V				
T2127A~T	6	60	1150	3.7	63	F	584 584	23				V		V			
		50	960	2.9	57							V		V			
T2128A~T	8	60	840	2.5	56	F	470 584	23				V		V			
		50	700	2.0	53							V		V			
T2129A~T	6	60	1150	3.7	63	F	584 584	23				V		V			
		50	960	2.9	57							V	V				
T2133A~T	6	60	1150	2.6	62	F	470 584	23				V		V			
		50	960	2.1	57							V		V			
T2136A~T	6	60	1150	3.3	62	F	470 584	23				V		V	V		
		50	960	2.7	57							V	V				
T2137A~T	6	60	1150	3.7	63	F	584 584	23				V	V	V			
		50	960	2.9	57							V		V			
T2142A~T	8	60	820	2.7	58	F	470 584	21				V		V			
		50	690	2.2	55							V	V				
T2143A~T	8	60	820	2.7	58	F	470 584	21				V	V	V			
		50	690	2.2	55							V	V				
T2151A~T	8	60	820	2.5	50	F	584 584	23.5	1/8			V		V	V		
		50	690	2.2	47							V		V			
T2126 G01~G05	6	60	1150	1.9	64	E	392 392	20				V	V	V	V		
I. Noise measurement distance : 1.83m (6')																	
2. Air volume measurement method : K S B 6311.																	

Cooling Fan

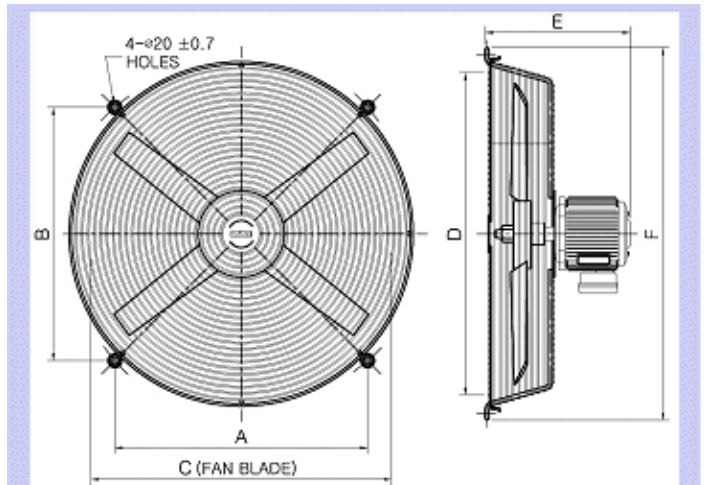
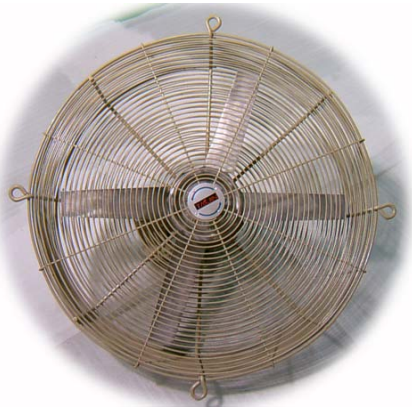
■ Model No. : T2106,2142,2143



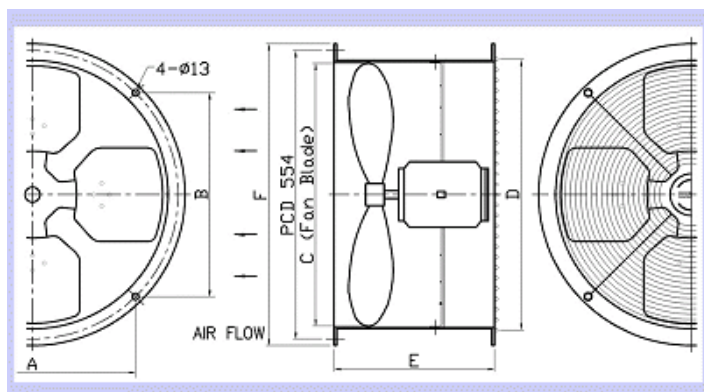
■ Model No. : T2125



■ Model No. : T2127,28,29,33,36,37

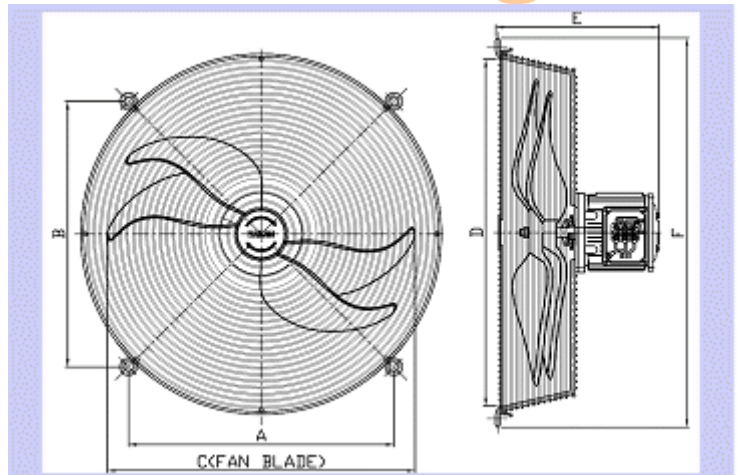
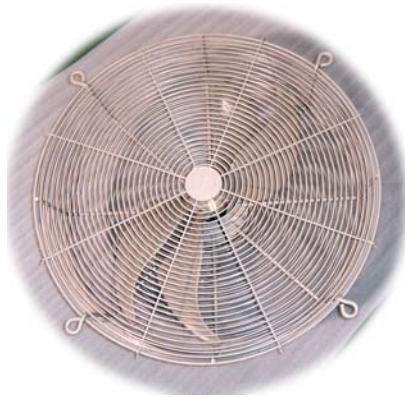


■ Model No. : T2126



Cooling Fan

■ Model No. : T2151



Construction.

Cooling fan consists of two pieces of fan guards, a fan motor, four blades.

1. Fan guard.

The fan guard made of a thick wire takes the shape of circle and consists of motor support and blade protection net. Since the guard perfectly protects the blade from damage and minimize flow resistance, cooling fan can be operated on lower noise and high efficiency.

2. Motor.

Since the motor is characteristic of waterproof, total abolition as a perfect sealing construction as well as F class insulation class, the motor can be operated on high efficiency even though the motors are in outdoor service during long period.

3. Blade.

The blade is designed to provide sufficient airflow, efficiently. Since the blade is made of aluminum plate or made from aluminum die casting, it is light, anticorrosive and also can withstand high temperature. Therefore, the blade can be operated under various ambient conditions including tropical climates. Especially, the blade exactly balanced by machine has characteristic to minimize it's noise level.

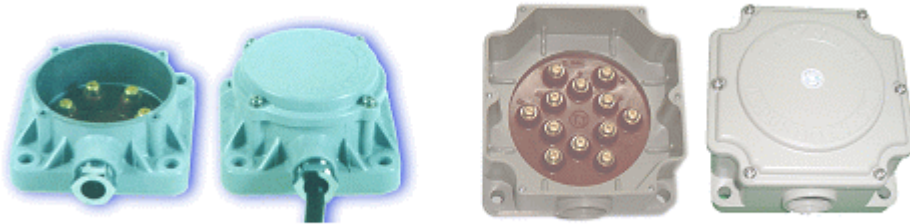
4. The surface treatment of fan guard.

The guard is hot-dipped galvanized, and is coated by wash primer and final paint (5Y 7/1).

	A	B	ΦC (Blade)	PITCH D (Fan guard)	E	ΦF	Blade Type	Notes
T2106	470	584	610	12.5	410	788	Propeller (4EA)	Standard, Motor(90Fr.)
T2142	470	584	610	12.5	384	788		Economic Type Standard→Motor(80Fr.)+Fan guard(2 Part Paint only)
T2143	470	584	610	12.5	384	788		Standard→Motor(80Fr.)
T2144	430	430	450	12.5	364	646		Standard→Motor(80Fr.) →Size ↓+Noise ↓+Air volume ↓
T2125	584	584	665	12.5	373	864	Axial(2EA)	Large Air volume
T2127	584	584	665	12.5	373	864	Axial(4EA)	Standard, High efficiency
T2128	470	584	615	12.5	373	788		Noise ↓+Air volume ↓+TP(Thermal Protection)
T2129	584	584	665	12.5	373	864		T2127+Blade(Hard coat anodized)+Motor Shaft(SUS416) +Service Factor(1.15)
T2133	470	584	555	12.5	373	788		T2127+Blade(Hard coat anodized) →Noise ↓+Air volume ↓
T2136	470	584	615	12.5	373	788		T2127→Noise ↓+Air volume ↓
T2137	584	584	665	12.5	373	864	T2127+TP(Thermal Protection)	
T2151	584	584	675	12.5	360	864	Propeller (4EA)	Low Noise, 1/8HP

Option ; Input Voltage (AC, V), Phase, frequency(50Hz/60Hz), Horse power, Poles, Insulation class (B/F), T.P (Thermal Protection), Motor shaft material, Noise, Air volume and Service factor etc.

BCT Terminal Box



T9001/T9002/T9003/T9004/T9005/T9015

Product Group : T90

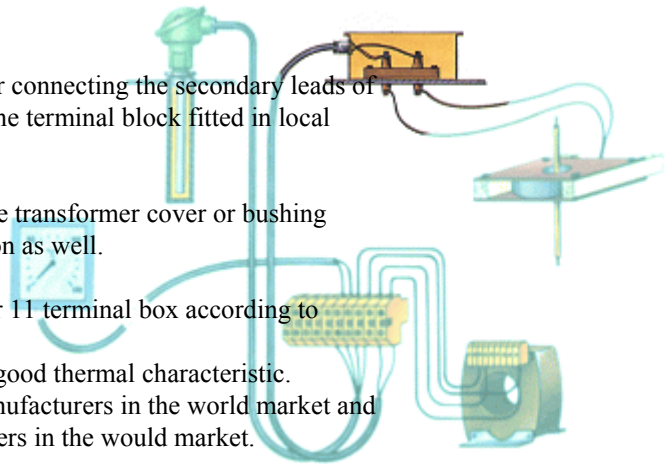
Bushing Current Transformer Terminal Box is an apparatus for connecting the secondary leads of Bushing Current Transformer of oil immersed transformer to the terminal block fitted in local control panel.

The terminal box is usually attached on a nearby position of the transformer cover or bushing housing and has a solid construction and an airtight construction as well.

The terminal boxes are classified into 4 terminal, 6 terminal, or 11 terminal box according to terminal number of the box.

The terminal box has a solid, good electrical construction and good thermal characteristic.

Therefore, the box is supplying to well known transformer manufacturers in the world market and the excellencies of the box is recognized by all the manufacturers in the would market.



Product Table

Model No.	Application	Material / specification
T9001	Medium, large transformer	Al / 6 pin (PF3/4")
T9002	Medium, large transformer	Al / 4pin (PF1/2")
T9003	Medium, large transformer	Al / 4pin (PF3/4")
T9004	Medium, large transformer	Al / 6pin (PF3/4")
T9005	Medium, large transformer	Al / 6pin (PF3/4")
T9015	Medium, large transformer	Al / 12pin (PF1")



BCT Terminal Box

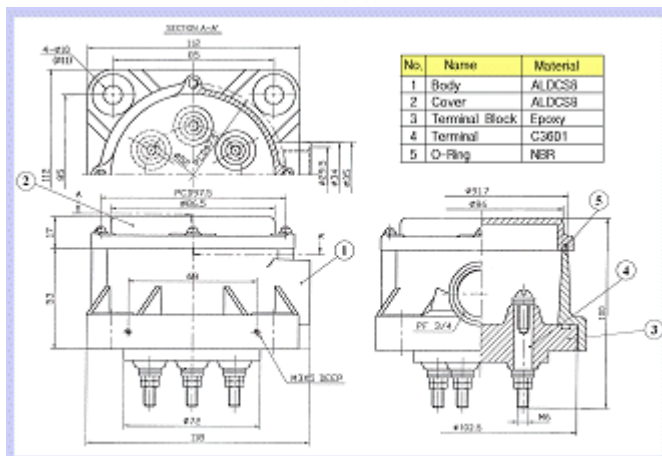
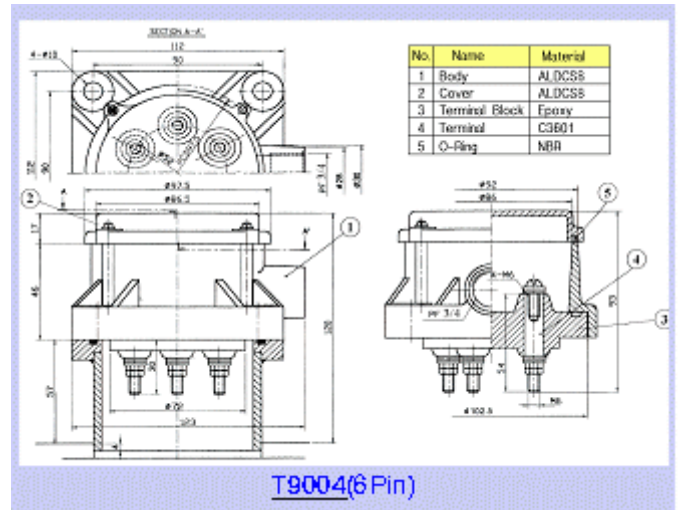
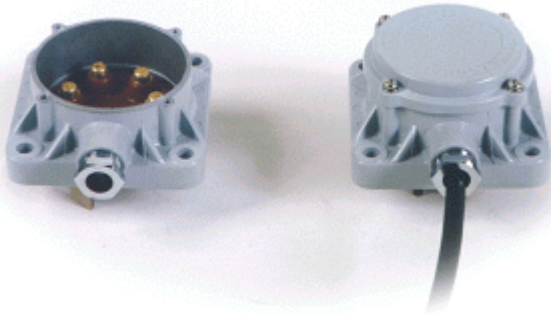
Application : For connecting the secondary lead of Bushing Current Transformer of oil immersed transformer to the terminal blocks in local control panel.

Assembly : Bolt type.

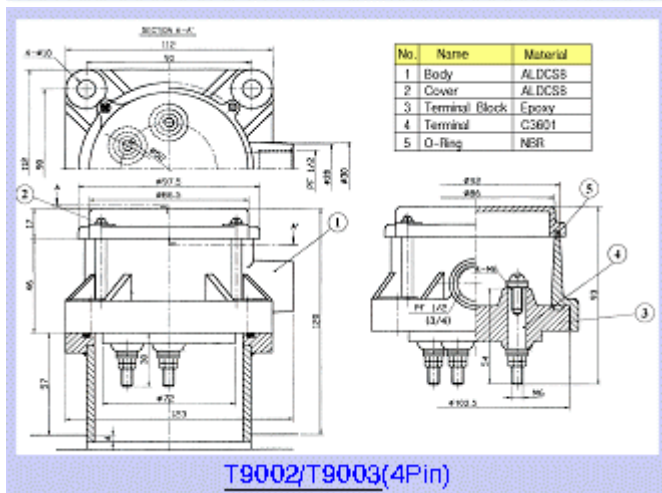
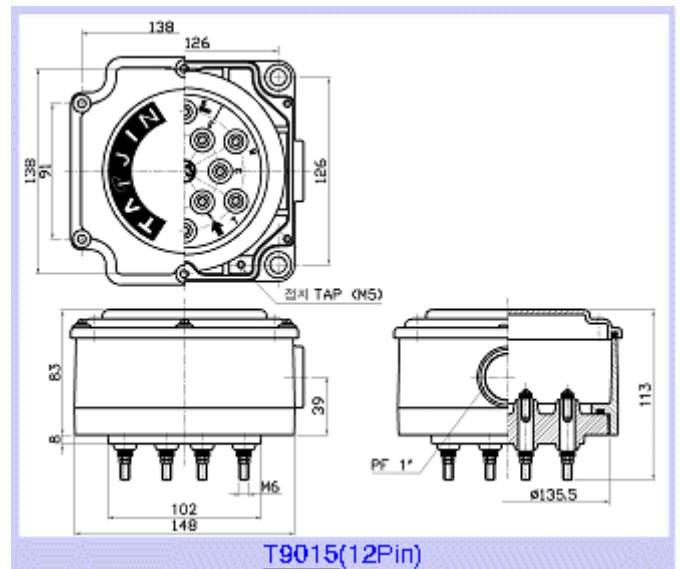
Body : Aluminum.

Type : T9001 ~ T9015.

■ Model No. : T9001 ~ T9005



■ Model No. : T9015



Model and specification.

Model	Pin	Type	Flexible Cable Inlet size	Body Hole Size
T9001	6	HD	PF 3/4"	4 - ϕ 10
T9002	4	HS	PF 1/2"	4 - ϕ 10
T9003	4	HS	PF 3/4"	4 - ϕ 10
T9004	6	HS	PF 3/4"	4 - ϕ 10
T9005	6	HD	PF 3/4"	4 - ϕ 11
T9015	12	-	PF 1"	4 - ϕ 11

Characteristic.

Bushing Current Transformer (BCT) terminal box is an apparatus for oil immersed transformers and is characteristic of electrical, thermal ability as well as sealing capability proven through the tests of an authorized institute.

1. Airtight test

; proven under test pressure of 2 kg / cm² and high temperature by using water soluble liquid and insulation oil.

2. Power frequency withstand voltage test.

; Test voltage of 2.5 KV is applied to among terminals as well as between each terminal and box flange for 1 minute.

