Mechanical Pressure-Relief Device

GENERAL

The Mechanical Pressure-Relief Device relieves sudden or accumulated internal pressure at a predetermined value. The device uses combinations of one or two springs for different pressure settings. It may be used for oil- or askarel-filled transformers and compartments with the application of suitable gasket materials.

Although unusual, it is always possible that an internal fault may result in a primary explosion. The abnormal pressure resulting from a fault is often great enough to rupture tank or compartment walls, if no effective relief device is povided.

OPERATION

The pressure-relief setting of the device and the type of insulating liquid with which it is to be used is marked on a rating nameplate on the cover. When this pressure is exceeded, the spring force acting on the diaphragm is overcome and the pressure, initially confined to the small "primary" area of the relief diaphragm escapes to the larger "secondary" area and lifts the diaphragm, from its outer sealing gasket to relieve the excess pressure. This moves the indicator rod to the exposed, tripped position.

Upon completing its operation, the device will reseal at a fraction of the relief pressure and will require no manual resetting or replacement of parts for subsequent pressure-relief operations, except that the indicator rod must be returned to its original position.

The space between the inside gasket and the outside gasket is vented to the atmosphere by a slot around the outside gasket. This allows the diaphragm to seat positively on the inside gasket without gas entrapment between the gaskets.

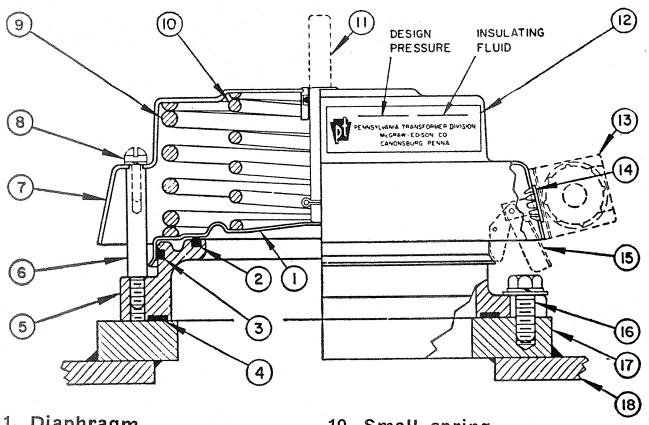
When an alarm switch is also provided, the indicator rod and alarm switch reset lever must be reset individually.

PRESSURE-RELIEF ALARM

The pressure-relief device has a colored indicator rod. It may also be supplied with an alarm switch, if requested. In the cocked position, the indicator rod is depressed inside the cover and the alarm switch operating lever rests against the edge of the diaphragm. During operation of the relief device, the upward movement of the diaphragm forces the indicator rod to an exposed position where it is visible from ground level and simultaneously activates the alarm switch. Both the indicator rod and alarm switch may be reset using a hot stick.

The alarm switch is SPDT with the N.C. contacts held open in the normal position of the pressure-relief device. These contacts close when the pressure-relief device operates and remains closed until the switch is manually reset to the normal position. Switch ratings include:

Voltage	Amperes	Type of Load
125, 250 ac	10	Non-inductive
125, 250 ac	10	Inductive
125 dc	0.5	Non-inductive
250 dc	0.25	Non-inductive



1. Diaphragm
2. Inside gasket
3. Outside gasket
4. Mounting gasket
5. Base
6. Cover support stud
7. Cover
8. Cover bolt
9. Large spring
10. Small spring
11. Indicator - tripped position
12. Rating nameplate
13. Alarm switch (optional)
14. Plug for switch mounting
15. Switch reset lever
16. Mounting bolt
17. Mounting flange
18. Tank Cover

FIGURE 1
Cross Section of Mechanical Pressure-Relief Device

RECEIVING AND INSTALLATION

The mechanical pressure-relief device and alarm switch are usually shipped completely installed and ready for operation. Should the transformer have experienced rough handling in transit, it is possible that the indicator rod or the alarm switch may have been forced to the tripped position. Reset by pushing the indicator rod in the cover

back to its original retracted position and pushing the switch reset lever inward.

When the device is shipped detached, a temporary blanking plate is placed on the mounting flange. In order to install the device, remove the blanking plate and bolt the assembly to the flange, using the same gasket that sealed the blanking plate.

It is not necessary to remove the mechanical relief device from the transformer or oil-filled compartment during vacuum treatment, as this device will withstand full vacuum.

When a deflector shield is used, it is mounted on one side of the mechanical pressure-relief device to direct the flow of any liquid or gas that may be ejected when the device operates. This shield is held in place by tapped-in bolts in the side of the mounting flange.

CAUTION: The pressure-relief devices supplied must be used for the intended application only. Some transformers will have one pressure-relief device setting for the main transformer and another for an auxiliary compartment. The gaskets for use with oil and Askarel are also different. However, pressure-relief devices with the same rating and for the same insulating liquid are interchangeable.

MAINTENANCE

The only maintenance normally required is resetting the indicator rod and alarm switch after operation of the device.

SERVICE

This device is designed for minimum maintenance and is completely tested for leaks before it leaves the factory. If the operator suspects a leak, the Service Department of Pennsylvania Transformer Division at Canonsburg, Pennsylvania, should be consulted. Instructions will be promptly given.

REPLACEMENT PARTS

The component parts of the pressure-relief device are designed to provide long life service and will not normally require replacement. However, should renewal parts be required, identify the parts on Figure 1 and include all pertinent information contained on the nameplate attached to the transformer. Address all correspondence to the nearest Pennsylvania Transformer District Office or representative or write directly to the factory.