

BUCHHOLZ RELAY (Gas & Oil Operated)

With patent pending Xternal micro switch (mercury free)
25mm, 50mm, 80mm, OSR



GOR 1Xm



GOR 2Xm



GOR 3Xm



OSR 1Xm

FEATURES

- Micro switches placed in terminal box and not inside oil- and are protected from oil inside the transformer and water outside the relay
- Same mounting, function or wiring method as other IS style relays.
- Time tested bucket float for Indian conditions
- Mounting to Indian practices
- Patent pending design that is more reliable and durable than alternatives at its price range
- CI body for best possible economy
- Each relay tested for all parameters including gas volume, oil surge and loss of oil. Individual test certificates

VIAT

INSTRUMENTS

AT03R1

ATVUS®

GENERAL

Power Transformers are considered to be a highly reliable type of equipment, yet, in order to ensure the continuity of service that modern conditions demand, protective devices are required. The purpose of such devices is to disconnect faulty apparatus before large-scale damage is caused by a fault to the apparatus or to other connected apparatus. Such devices generally respond to a change in the current or pressure arising from the faults and are used for either signaling or tripping the circuits.

Protective devices in the ideal case must be sensitive to all faults, simple in operation, robust for service and economically feasible. Considering liquid immersed transformers, a near-ideal 'protective device' is available in the form of Gas and Oil relay described here. The relay operates on the well-known fact that almost every type of electric fault in a 'liquid immersed transformer' gives rise to gas. This gas is collected in the body of the relay and is used in some way or other to cause the alarm or the tripping circuit to operate.

The principle of the Gas and Oil relay was first successfully demonstrated and utilized by 'Buchholz' many years back. In a series of experiments carried out extensively in Germany it was proved that the Relay is capable of bringing to light incipient fault thereby preventing further spreading of the fault and extensive damage and thus saving expensive and protracted repairs. So successful is the principle of this Relay that despite the continued search for better protective devices in other electrical fields the Gas-and-Oil Relay is still on its own in providing protection against a variety of faults.

APPLICATIONS

Double element relays can be used in detecting minor or major faults in a transformer. The alarm element will operate, after a specified volume of gas has collected to give an alarm indication. Examples of incipient faults are

- (a) Broken-down core bolt insulation
- (b) Shorted laminations
- (c) Bad contacts
- (d) Overheating of part of windings

The alarm element will also operate in the event of oil leakage, or if air gets into the oil system.

The trip element will be operated by an oil surge in the event of more serious faults such as

- (a) Earth faults
- (b) Winding short circuits
- (c) Puncture of bushings
- (d) Short circuit between phases

The trip element will also be operated if a rapid loss of oil occurs. Single element relays can be used to detect either incipient or major faults in oil filled potential transformers, reactors, capacitors etc. A special single element relay is available for the protection of on load tap-change equipment

BASIC CHARACTERISTICS

The Gas and Oil Relay provides protection against a number of internal faults and is also able to indicate in several cases the type of fault. This is possible because the gas collected in relay can, from its colour, odour and composition, indicate where the fault may be and what its nature is. By examining the gases collected it is possible to infer the nature of fault.

Thus:

- (a) If the gas is colourless and odourless or with only a faint odour of oil, the gas is air trapped in the oil or the insulation.
- (b) If the gas is Greyish white with sharp and penetrating odour and non-inflammable it is due to overheated or faulty insulation (fuller board etc.)
- (c) If the gas is Yellowish in colour and inflammable it may be due to surface leakage on material like wood.
- (d) If the gas is dark Grey and inflammable it may be due to a flashover in oil or due to excessive overheating of the oil caused by a fault in the winding or the core.

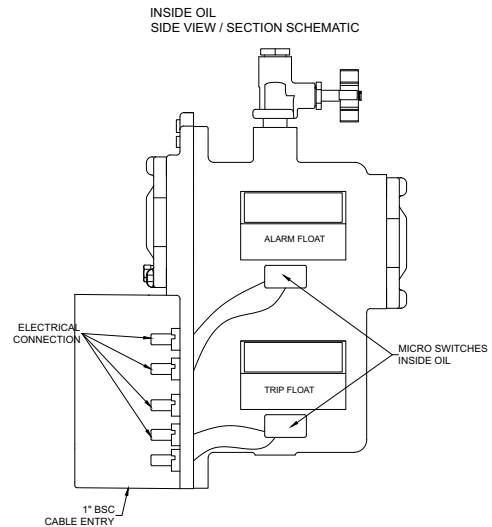
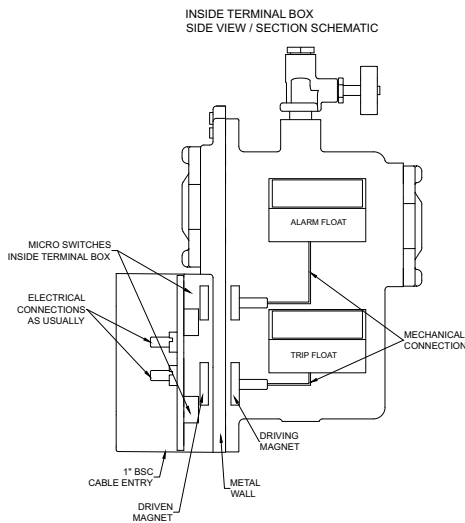
On the operation of the alarm if investigation of the collected gas does not indicate a serious fault it is possible to leave the transformer in service till it is convenient to carry out a thorough inspection. This occurrence is possible on a newly commissioned transformer due to air trapped in the oil or the insulation. On repeated and frequent alarm signals the transformer should be taken out of service for thorough checkup.

Xternal Micro switch- Working

The Viat Patent Pending Xternal micro switch type relays translate the movement of the floats through a magnetic coupling across the Aluminium wall of the relay. The driven magnets inside the terminal box then trigger a set of micro switches that are also present in the terminal box. (Refer schematic 1, Viat Xternal microswitch)




Each float is calibrated with the magnetic coupling and micro switch assembly such that when the float is in a position to detect a fault, the micro switch is triggered, providing alarm/trip contacts to connected circuits.

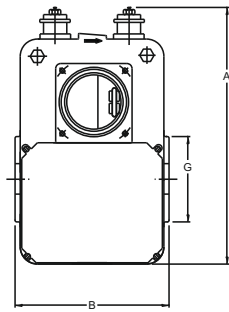
The end user electrical connections from the Viat Xternal micro switch type relays are identical to outgoing mercury switch type relays for convenience.



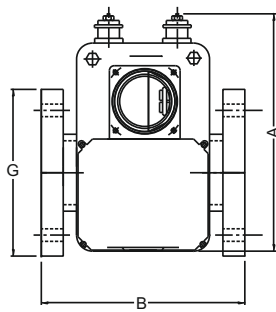
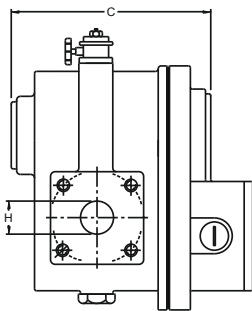
SCHEMATIC 1: VIAT Xternal Microswitch

SCHEMATIC 2: Other manufacturer microswitch in oil

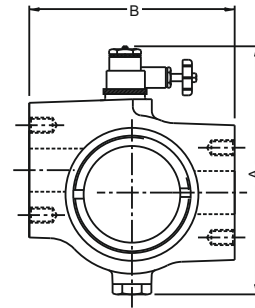
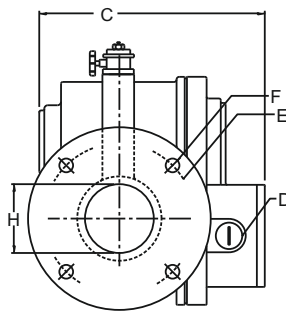
	Viat Xternal microswitch relays  REFER SCHEMATIC 1	Other manufacturer internal microswitch  REFER SCHEMATIC 2	Mercury switch 
Type of switch	Micro switch (Zero ingress protection on switch)	Micro switch (Zero ingress protection of switch)	Mercury switch (moulded glass-complete ingress protection upto 3Kg/cm ²)
Position of switch	In air inside the terminal box, not visible to end user	Inside oil at pressure and temperature	Inside oil at pressure and temperature
Method of switch actuation	Magnetic coupling driven by float presses switch placed in terminal box	Micro switch in oil pressed directly by float	Orientation of mercury switch
Potential leakage points	Four fewer potential leakage points	Regular no. of potential leakage points	Regular no. of potential leakage points
Sensitivity to mounting orientation	Lower	Lower	Higher
Expected lifetime	Transformer lifetime	Switch could fail anytime under hot pressurised liquid	Transformer lifetime
Environmental friendliness	No potentially dangerous materials	No potentially dangerous materials	Mercury in glass encapsulation. Not used by MNCs and being phased out



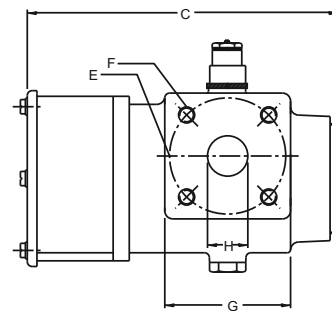
**RELAY TYPE
GOR 1Xm**



**RELAY TYPE
GOR 2Xm & 3Xm**



**RELAY TYPE
OSR 1Xm**



RELAYTYPE		GOR 1Xm	GOR 2Xm	GOR 3Xm	OSR 1Xm
Transformer Rating (MVA)		below 1	1 to 10	above 10	OLTC
Main Dimensions (mm) Aprox	A	230	250	230	155
	B	128	184 or 215	215	119
	C	200	200	225	200
	D	1" BSC Conduit	1" BSC Conduit	1" BSC Conduit	3/4" BSC Conduit
Flange Dimensions (mm)	E	72	115	145	72
	F	M 10	18	18	M10 THREAD
	G	78 square	150	185	78 square
Pipe Bore (mm)		H 25	50	80	25
Surge Test (TRIP)(cm/s)	IS 3637	70 to 130	75 to 140	90 to 160	45 to 60
Gas Volume(ALARM)(cc)	IS 3637	90 to 165	175 to 225	200 to 300	N.A.

High Voltage Test	IS 3637		2000 VAC at 50 Hz for 1 minute
Insulation Resistance Test	IS 3637		Greater than 10 megaohms with 500 V meggar
Enclosure Protection	EN 60529		IP 67/X7
Current Rating of Switch	IS 3637		5A 240 VAC, 2A 110 VDC, 0.5A 240 VDC
Paint Shade			IS 5 - 631

Due to our policy of continuous product improvement, dimensions and designs are subject to change.

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