YOGYA ENTERPRISES

(AN ISO 9001 : 2000 CERTIFIED COMPANY)

GAS & OIL OPERATED
BUCHHOLZ RELAY

AS PER INDIAN STANDARD : 3637-1966

FOR TRANSFORMER

GOR-1

GOR-2

GOR-3

The Buchholz Relay was invented by Mr. Max Buchholz of Germany in 1921. Since the day of invention and as on today there has been no alternative to a Buchholz Relay because the principle on which it works is very reliable

CARE WHILE MOUNTING

When a Buchholz is taken for use it has to be ensured that you have the relay of correct size i.e. 1", 2" or 3". The distance between flanges 184 or 215 for GOR-2 & GOR-3 may also be confirmed. All protective packing may be withdrawn. Use proper size gasket and hardwares to mount the Buchholz. Proper tightening of bolts to be done.

WORKING

Electrical Faults in a transformer produces gases on the disintegration of the chemicals of oil or other materials. The gases produced tends to rise higher and hence travels from the tank to the conservator pipe from where it reaches the Buchholz. Some trapped gases are also released on accumulation. Thus it may be confirmed that air or gas are the agents for operation of a Buchholz.

Now the air while travelling through the conservator pipe collect inside the Buchholz and accumulates there due to the constructional design of it. The gas accumulation may be slow or very fast depending on the fault.

Whenever gas is produced it accumulates in the relay chamber, the float lowers with lowering of oil level. On reaching a pre-determined value (volume) of air (depending on the size of the pipe) the float lowers to this level and activates the alarm. On further accumulations of air the oil further recedes lowering the bottom float and thus activating the trip signal. But, also the float and its mechanism is designed such that when there is a sudden upward flow of air / oil at a certain velocity the air / oil strikes the float and it operates the trip switch. This is known as surge velocity.

CONSTRUCTION

A Buchholz Relay is designed keeping in view the various aspects of IS-3637. The cast body must be robust to withstand 8 Kg/Cm2 pressure for one minute and when a complete assembled relay is tested at 1.5 Kg/Cm2 pressure it must show no sign of leakage. High voltage and insulation resistance tests are also conducted. The Relay has a housing in which two floats one over the other are present. These floats may be bucket type, hollow pipe type or plastic foam type. Each of these floats have one switch (Mercury, Micro Or Reed Switch) mounted in such a way that the lowering of float activates the switch. The switch leads are brought out on the terminal box.

CHECKS WHILE COMMISSIONING

Please ensure that the direction of arrow on a Buchholz is facing towards the conservator. The alarm and trip contacts are connected properly inside the terminal box. The Buchholz is supplied in locked position. In this condition both the alarm & trip would give indication as "ON". If supplied in fitted condition on a transformer then check for transport or service condition. If the Buchholz is available in service condition then check that both Alarm & Trip are in "OFF" Condition. Trip device is also checked by draining complete oil from the Buchholz. The alarm and trip device may be checked a few times by operating the special locking slotted screw in the desired directions. This would further confirm the healthiness of the mechanism and the circuits.

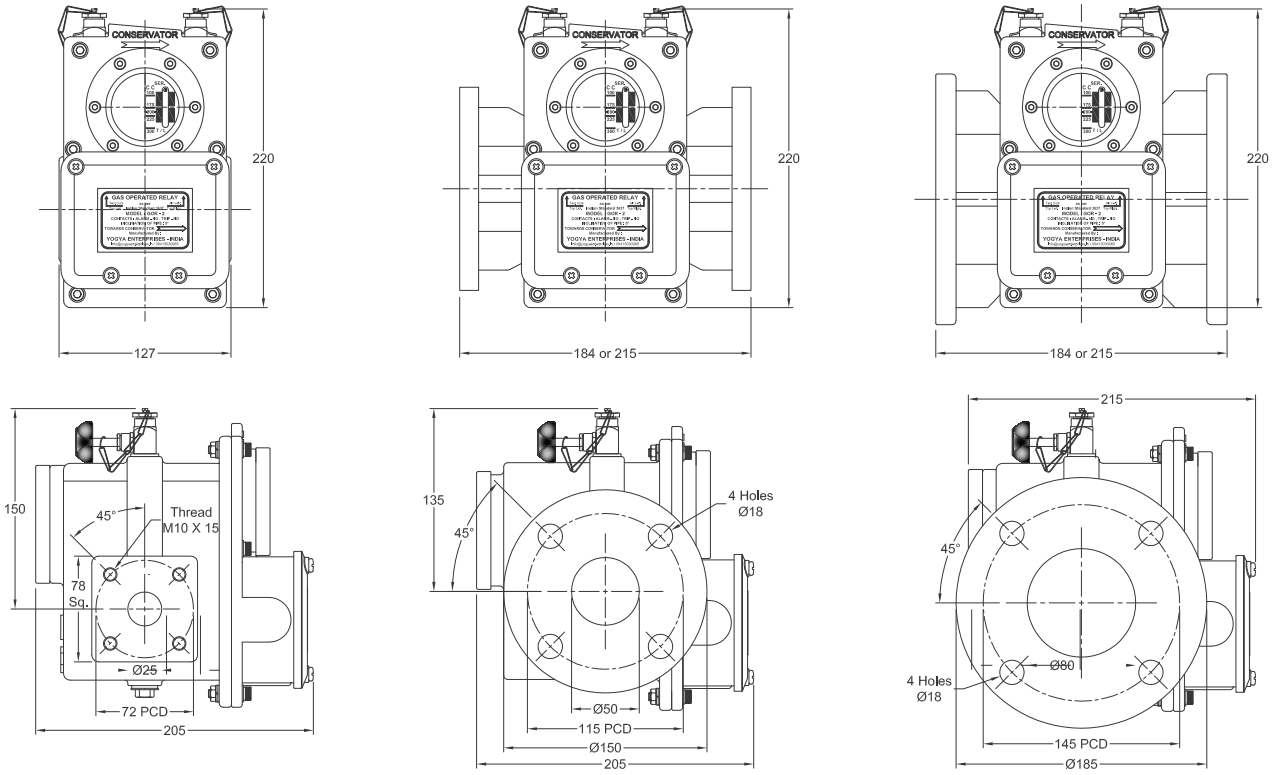
DURING SERVICE

In case of gas formation during service the type of fault can be detected by the colour of the gas accumulated. Below is given a table of the colour of the gas and the probable fault. The gas colour may be checked from the glass window in a Buchholz, or it may be collected in a inverted jar by releasing through pet cork. The gas can also be brought down on a on line gas collection device which later can be diagnosed on a gas chromotograph for probable fault.

TEST CERTIFICATES

Other testing conducted on Buchholz Relay are IP-55 test on the terminal box.

A test certificate issued for each Buchholz Relay contains the routine tests conducted on it which are specified in IS-3637. Type Test Reports are available on request. Our Buchholz Relays are Type tested at ERDA – Vadodara.



GOR-1 GOR-2 GOR-3

TECHNICAL PARAMETERS AS PER IS-3637

Relay Size	Flange Size	Flange Mounting Details	Flange to Flange Distance	Oil Velocity For Tip Contact Operations	Gas Volume For Alarm Contact	Suitable For Transformer Rating
25 NB GOR-1	Square Flange 78 X 78	4 tapped holes M10 on 72 PCD	127	70 - 130	90 - 165	Upto 1 MVA
50 NB GOR-2	Round Flange 150 DIA	4 holes DIA 18 on 115 PCD	184 Or 215	75 - 140	175 - 225	2 to 10 MVA
80 NB GOR-3	Round Flange 185 DIA	4 holes DIA 18 on 145 PCD	184 Or 215	90 - 160	200 - 300	Above 10 MVA

NATURE OF GAS	PROBABLE FAULT
Colourless & Odorless	Air trapped
Greyish white with pungent smell Non-inflammable	Overheating of insulation, board etc.
Yellowish Inflammable	Decomposing of wood insulation.
Dark Grey Inflammable	Flash over in oil, excessive overheating due to faults of major nature.

ON SITE TESTS

Each buchholz is checked and inspected individually for the various tests as required in IS. During factory assembly the buchholz are tested by mounting it on a test fixture in which the inclination of pipe is kept 5°. It is necessary that if testing is being conducted at site this angle be maintained. Switches would not operate if this angle is not maintained or testing is conducted on a plain table.

During site testing for alarm switch operation – If relay is fitted on oil filled transformer pump in air into the air inlet-outlet valve. This would operate the alarm switch on reaching the preset air volume. If oil is not present in the relay the pumping of air would operate the switch and indicate a healthy operation. Draining of oil introduces air into the relay which operates the switches.

OIL SURGE RELAYS

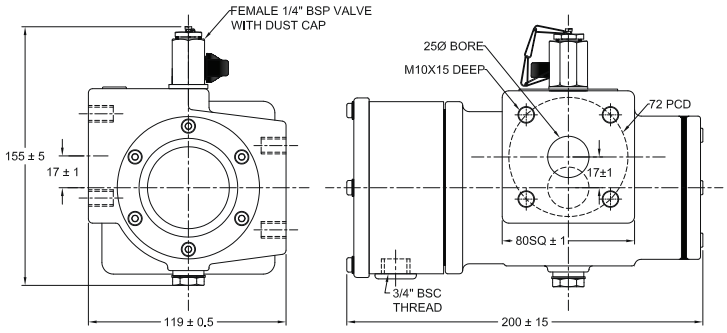
All transformers fitted with on-load or off load tap changers are generally equipped with a surge relay to protect it from surge generated during malfunctioning or any mechanical / electrical fault.

The relays are connected between the OLTC and conservator.

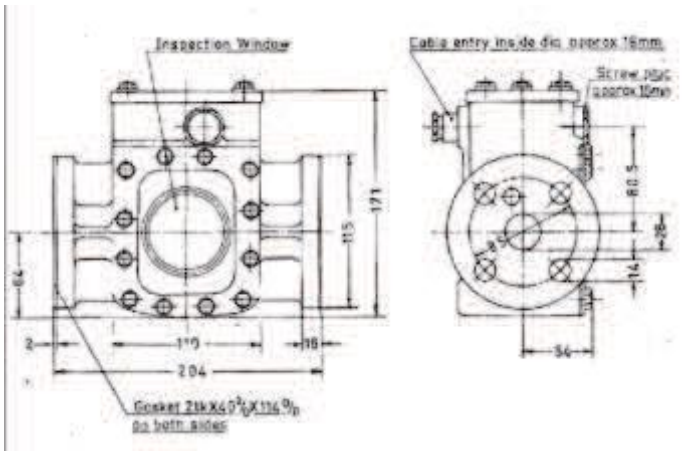
Some surge relays have Reed Switches while others may have Micro Switch. Generally two types of surge relays are in usage.

MR Tap changer manufacturers BHEL and MR Easun use special type MR surge relays (RS 2001) whereas Onload Gears, CGL and CTR Tap Changers any many others may use VR design surge relays.

VR TYPE SURGE RELAY
CODE NO. 600-111



MR TYPE SURGE RELAY
CODE NO. 600-112



OUR OTHER PRODUCTS :

- SILICA GEL BREATHER
- GAS COLLECTING DEVICE
- OIL LEVEL INDICATOR
- MAGNETIC OIL LEVEL GAUGES
- PRESSURE RELIEF VALVE
- OIL SURGE RELAY

CODES FOR ORDERING OF BUCHHOLZ RELAY				
Sr.No.	Nom.Bore	Nom.	Description	Code
1	25	GOR-1	Buchholz With Micro Switch	600-101
2	25	GOR-1	Buchholz With Reed Switch	600-102
3	50 (184 F.D.)	GOR-2	Buchholz With Micro Switch	600-103
4	50 (184 F.D.)	GOR-2	Buchholz With Reed Switch	600-104
5	50 (215 F.D.)	GOR-2	Buchholz With Micro Switch	600-105
6	50 (215 F.D.)	GOR-2	Buchholz With Reed Switch	600-106
7	80 (184 F.D.)	GOR-3	Buchholz With Micro Switch	600-107
8	80 (184 F.D.)	GOR-3	Buchholz With Reed Switch	600-108
9	80 (215 F.D.)	GOR-3	Buchholz With Micro Switch	600-109
10	80 (215 F.D.)	GOR-3	Buchholz With Reed Switch	600-110
CODES FOR ORDERING OF OIL SURGE RELAY				
1	25	OSR	VR Type Surge Relay	600-111
2	25	OSR	MR Type Surge Relay	600-112

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