

## BUCHHOLZ RELAY

**MODELS : EE3-MA/MG/ML/MD, EE2-MA/MG/ML/MD**

**SUITABLE FOR 80 MM (3") & 50 MM (2")**

### 1.0 APPLICATION :

The Buchholz Relay (BR) is a safety device which detects abnormal functioning inside a transformer. The working of the relay is based on the fact that any failure of the active part of an oil filled transformer produces gas inside the tank which may cause a surge in oil.

### 2.0 CONSTRUCTION :

The main body and the cover of BR are made of leak proof aluminium die casting. The design is very compact. The BR can be installed easily due to integral flanges provided as per IS-3637 on main body. The volume of the gas collected inside the relay can be seen through graduated inspection toughened glass windows provided on both sides of the main body. The cover of BR holds two floats & one flap to sense the oil surge. Two magnetic Reed Switches are linked to the swing of two floats. The connection from both switches is brought in the terminal box. A gas release cock with cap and chain & electric circuit test device with cap for manual checking of Switches is provided on the cover of BR. Air injection test device with cap is provided on the cover for checking functioning of switches by pumping air into BR. A drain cock with cap and chain is provided at the bottom of the main body.

### 3.0 WORKING :

The BR has a chamber in which gas generated in the tank due to fault gets collected. When the collected gas, exceeds the predetermined volume, the top float goes down thereby operating switch for Alarm. Similarly, the switch for Trip gets operated when gas continues to accumulate further. The switch for Trip also gets operated when surge in oil flow travels from tank to conservator. These switches can be used for initiating safety system to protect / trip the transformer.

### 4.0 FEATURES :

- 4.1 Light weight. Easy to handle.
- 4.2 Easy to read the volume of gas in BR.
- 4.3 Reliable operation of floats & switches.
- 4.4 Withstands seismic vibrations.
- 4.5 Use of hermetically sealed Reed Switches.
- 4.6 Taking sample of gas for analysis is easy.
- 4.7 Weather proof terminal box & easy to connect terminals.
- 4.8 Two entries in terminal box for incoming cable. Any one can be used to suit site condition.

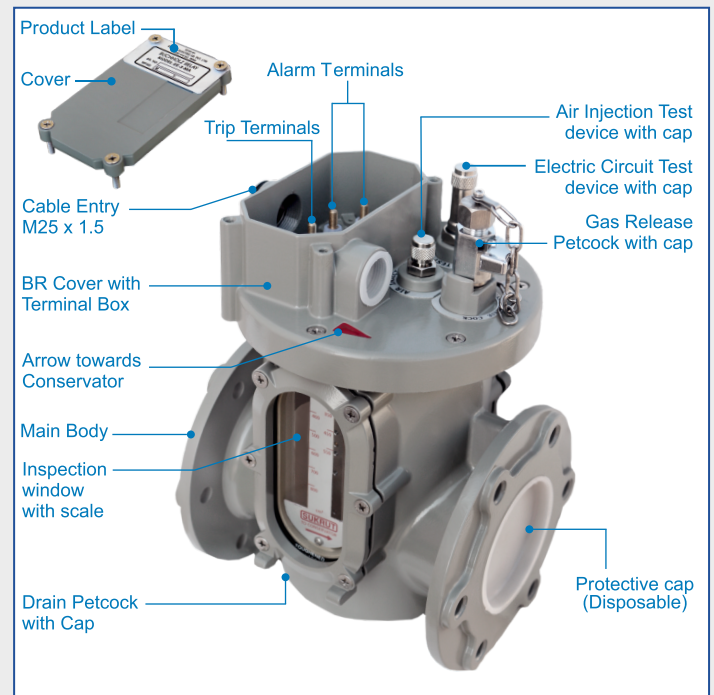
### 5.0 CALIBRATION :

5.1 Alarm switch: Gas Volume Range as per IS-3637

EE-3	200 to 300 cc
EE-2	175 to 225 cc

5.2 Trip Switch : Rate of Steady Flow of Oil as per IS-3637

EE-3	90 to 160 cm / sec
EE-2	75 to 140 cm / sec



### 6.0 SPECIFICATIONS :

6.1 Liquid	: Transformer Oil - IS-335
6.2 Working Temperature	: -10° to +115°C
6.3 Working Pressure	: 0 to 1 kg/cm <sup>2</sup>
6.4 Environment	: Indoor or Outdoor
6.5 Ingress Protection	: IP-67
6.6 Corrosion resistance	: C4-M

### 7.0 MOUNTING :

Depending on pipe line, proper model should be selected. BR should be installed in 80 mm (3") or 50 mm (2") size of pipe line at an inclination as per customer's suitability between 1° to 9°. Maintain the direction of oil flow as per marked arrow on the cover of the BR. Wiring should be done to suite selected model (See Wiring Diagrams)

### 8.0 ROUTINE TESTS :

- 8.1 Switch operation for Alarm for gas volume.
- 8.2 Switch operation for Trip for loss of oil.
- 8.3 Switch operation for Trip during surge in oil
- 8.4 Static Pr. Test for BR assembly at 2.5 kg/cm<sup>2</sup> for 24hrs.
- 8.5 2 kV Test between terminals & body for 1 Min.

### 9.0 TYPE TESTS :

- 9.1 IP-67 Test carried out at IDEMI Mumbai
  - 9.2 All Type Tests as per IS-3637 carried out at ERDA, Vadodara.
  - 9.3 Seismic Vibration Test at ARAI, Pune.
- Type test reports are available on request.

### 10.0 HOW TO ORDER :

Select the suitable pipe size and model from following table & send RFQ / Purchase Order. Eg: EE-3-MA or EE-2-MA

MA	1 Alarm + 1 Trip
MG	1 Alarm + 2 Trip
ML	1 Alarm + 1 Trip with Changeover Contacts
MD	1 Alarm + 1 Trip (Normally Closed)

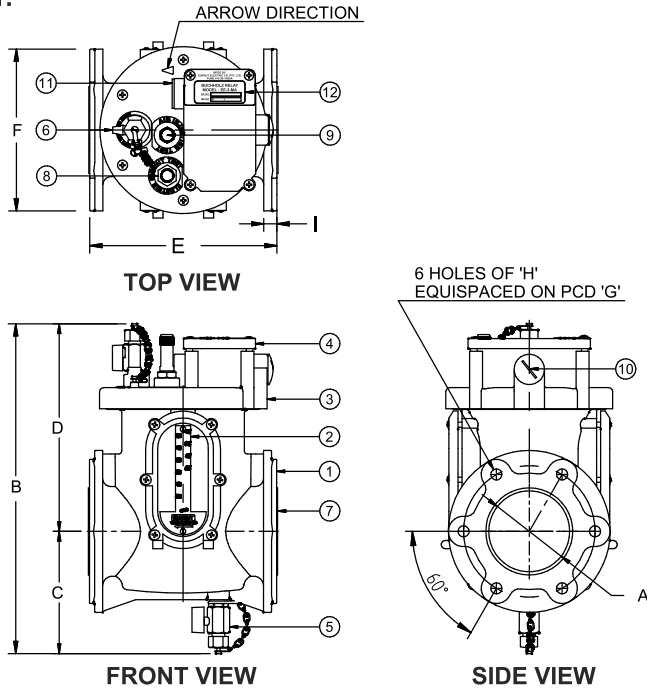


# BUCHHOLZ RELAY (WITH MAGNETIC REED SWITCH)

MODELS FOR 80 NB PIPE : EE-3-MA, EE-3-MG, EE-3-ML, EE-3-MD

MODELS FOR 50 NB PIPE : EE-2-MA, EE-2-MG, EE-2-ML, EE-2-MD

FIG 1.



PART LIST FOR FIG. 1

SR NO.	DESCRIPTION	MATERIAL	QTY
1.	RELAY BODY	ALUMINIUM	1
2.	INSPECTION WINDOW WITH SCALE COVER FOR BR	GLASS	2
3.	COVER FOR BR	ALUMINIUM	1
4.	TERMINAL BOX COVER	ALUMINIUM	1
5.	DRAIN COCK 1/4" BSP WITH CAP & CHAIN	BRASS	1
6.	GAS RELEASE COCK 1/4" BSP WITH CAP & CHAIN	BRASS	1
7.	PROTECTIVE CAP	PLASTIC	2
8.	ELECTRIC CIRCUIT TEST DEVICE WITH CAP	BRASS	1
9.	AIR INJECTION TEST DEVICE WITH CAP	BRASS	1
10.	CABLE ENTRY PLUG - M25 X 1.5	BRASS	1
11.	PLAIN PLUG FOR CABLE ENTRY	PLASTIC	1
12.	LABEL - SR.NO. & MODEL PLATE	ALUMINIUM	1

HARDWARE AND GASKETS ARE NOT SUPPLIED BY SUKRUT

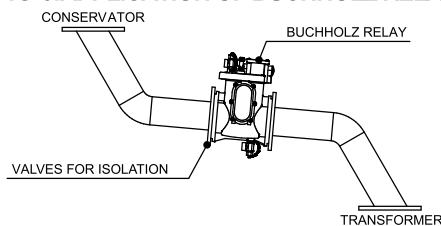
## MOUNTING DIMENSIONS

REFERENCE	SUITABLE PIPE SIZE : A	B	C	D	E	F	G	H	I
1	50NB	301	110	191	185	140	110	11	15
2	80NB	326	121	205	185	160	130	11	13

## STANDARD WIRING DIAGRAM FOR BR MODELS

<b>FIG 2. MODEL - MA</b> CONTACT POSITION IN HEALTHY CONDITION TERMINAL NOS. → 1 2 3 4  2 MAGNETIC REED SWITCHES RATED CURRENT : A.C. • 240V, 2Amps   D.C. • 240V, 2Amps BREAKING CAPACITY : 400 W A.C. OR 250V A D.C.	<b>FIG. 3. MODEL - MG</b> CONTACT POSITION IN HEALTHY CONDITION TERMINAL NOS. → 1 2 5 6 3 4  3 MAGNETIC REED SWITCHES RATED CURRENT : A.C. • 240V, 2Amps   D.C. • 240V, 2Amps BREAKING CAPACITY : 400 W A.C. OR 250V A D.C.	<b>FIG. 4. MODEL - ML</b> CONTACT POSITION IN HEALTHY CONDITION TERMINAL NOS. → 5 1 2 6 3 4  2 MAGNETIC REED SWITCHES (CHANGE OVER CONTACT) RATED CURRENT : A.C. • 240V, 1Amps   D.C. • 240V, 1Amps BREAKING CAPACITY : 400 W A.C. OR 250V A D.C.	<b>FIG. 5. MODEL - MD</b> CONTACT POSITION IN HEALTHY CONDITION TERMINAL NOS. → 1 2 3 4  2 MAGNETIC REED SWITCHES (NORMALLY CLOSED) RATED CURRENT : A.C. • 240V, 2Amps   D.C. • 240V, 2Amps BREAKING CAPACITY : 400 W A.C. OR 250V A D.C.
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FIG 6.APPLICATION OF BUCHHOLZ RELAY



## CONNECTIONS

On two vertical walls of the Terminal Box, holes with M25 threads are provided for fitting cable gland. One entry is closed by brass plug & the other by a dispensable plastic plug. Entry of connecting cable can be made from suitable side & remaining hole can be kept closed by using the brass plug. Suitable cable gland is to be provided by buyer of BR. The wiring should be made as per respective model (See Wiring Diagrams). Mounting inclination angle should be between 1° to 9°.

## GENERAL NOTES :

1. Every Buchholz Relay is factory set. Setting cannot be altered at site.
2. If any specific values of Alarm and Trip contact within the limits are required, they must be specified in the Purchase Order.
3. For any Assistance, correspondence must be made by giving reference of Sr. No. of BR.
4. Except mounting dimensions & PCD, other dimensions given in this catalogue are for guidance only. They will not be part of Inspection Schedule.



## SUKRUT ELECTRIC CO. PVT. LTD.

Plot No. Pap-B-63, MIDC Chakan Industrial Area Phase - II, Village Bhamboli, Taluka Khed District Pune 410 501, Maharashtra, India.

Mobile : +91 75077 78841 / 75077 78842

Email : marketing@sukrutelectric.com

Web : www.sukrutelectric.com



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