Transformer Breathers

Enviro-Tronics
Unit 3, 175 Briens Rd. Northmead NSW 2152
Ph: 02 9630 5277.
www.envirotronics.com.au
Email: info@envirotronics.com.au
“R” Series Transformer Breathers

Protecting Distribution Transformers from the ingress of moisture laden air as the system cools and the pressure drops is critical. Moisture entering the unit will reduce the insulating quality of the Cooling Oil in the conservator tank and weaken the dielectric strength of the winding insulation material, eventually leading to arc-over followed by a complete failure and shutdown of the system. It is essential, therefore, that a very low level of humidity is maintained in the air space in the top of the conservator tank.

Transformer Breathers provide an economic and efficient means of controlling the level of moisture entering the conservator tank during the change in volume of the cooling medium and/or airspace caused by temperature gradients.

All of our Transformer Breathers are filled with Envirogel, (early warning moisture level indicator) which is a self-indicating silica gel desiccant. Two colour indicators are available: Orange to Green or Blue to Pink at saturation. All of the “R” Series Breathers are made from tough Polycarbonate material UV Stabilised and can be used repeatedly throughout the life of the Transformer. They are equipped with an integrated two way low pressure relief valve which is maintenance free for the life of the Breather. No more messy “Oil Bowl” valves. No more contamination of the Desiccant. Just unscrew the Breather, remove the filter and O-ring seal, empty the saturated Desiccant and refill it. End of story!

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Selection Table

<table>
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Selection Guide

The following data should be used for the basic selection of a transformer breather.

In order to assess the size of the breather the air volume above the oil in the conservator tank is the most important factor. The quantity of oil and the transformer rating is of secondary importance.

The daily breathing rate is based on the assumption that there are two temperature drops of 8°C per 24 hours. The breathing volume change which occurs during the pump start-up is not taken into consideration.

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Installation
The unit is mounted from a ¾" female pipe thread connection at the top of the breather. This connection point is also used for filling and emptying the desiccant within the breather. Two-way, low pressure valves are fitted in the base of the breather to ensure that the atmospheric air enters the desiccant when a negative pressure differential occurs within the equipment being protected.

The breather is supplied with a threaded sealing plug screwed into the top moulding to prevent any water vapour ingress whilst in store. This plug should be removed immediately prior to the unit being fitted to the air vent pipe of the transformer reservoir tank. Fit the breather and tighten using the spanner flats provided at the top of the unit. Maximum torque on threads is 9Nm/80lbfin.

NOTE: DO NOT ATTEMPT TO SCREW OR UNSCREW THE BREATHER BY HOLDING THE BODY WITH YOUR HANDS, USE A SPANNER ON THE FLATS PROVIDED.

Connection: 3/4" Female Pipe Thread conforming to BS21 and ISO7-1.

Maintenance
If the breather is not routinely replaced when the desiccant becomes saturated, the only maintenance necessary is to replace the spent desiccant as detailed below.

1. Unscrew the breather from the vent pipe.
2. Remove the perforated cover in the top moulding and empty the expired desiccant from the container. This material may be disposed of in a normal landfill site.
3. Fill the container with active Orange or Blue desiccant, lightly tap the container to settle the desiccant and top up if necessary. Desiccant refills are available from Envirotronics.
4. Replace the perforated cover and screw the recharged breather back onto the vent pipe.

Desiccant Refills

<table>
<thead>
<tr>
<th>Breather Model</th>
<th>Blue Silica Gel</th>
<th>Orange Silica gel</th>
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<tbody>
<tr>
<td>Size R (0.6kg)</td>
<td>BLD6586RFB</td>
<td>BLD6586RFO</td>
</tr>
<tr>
<td>Size R1 (1.2kg)</td>
<td>BLD6942/01RFB</td>
<td>BLD6942/01RFO</td>
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<tr>
<td>Size R2 (1.9kg)</td>
<td>BLD6942/02RFB</td>
<td>BLD6942/02RFO</td>
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<table>
<thead>
<tr>
<th>Part No</th>
<th>Size</th>
<th>Overall Length</th>
<th>Overall Diameter</th>
<th>Weight of Desiccant</th>
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<td>158mm</td>
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<td>BL/D6942/02</td>
<td>R2</td>
<td>362mm</td>
<td>108mm</td>
<td>1.90 kg</td>
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Desiccant type: Envirogel – self indicating beaded silica gel.
This range of Transformer Breathers provides protection against moisture for large capacity tanks. With the larger amounts of desiccant required to maintain protection, the breathers are more robustly constructed.

The Transformer Breathers have a removable desiccant container which allows the desiccant to be changed without breaking the breather pipe connection. The desiccant container is clamped between the top and bottom end plates by four metal tie rods with threaded nuts. By releasing the nuts, the desiccant container can be easily removed and refilled as required.

The removable desiccant container is fabricated from mild steel which is protected with a phosphate and powder coated finish. The container has a UV stabilised polycarbonate clear window which allows for clear visibility of the desiccant charge. Top and bottom end plates are painted aluminium castings.

The unit is connected either by a flange or pipe thread connection. Mounting brackets on the top plate provides additional support for the breather. Two-way, low pressure valves are fitted in the base plate of the breather to ensure that the atmospheric air enters the desiccant when a negative press-
Selection Guide
The following data should be used for the basic selection of a transformer breather.
In order to assess the size of the breather the air volume above the oil in the conservator tank is the most important factor. The quantity of oil and the transformer rating is of secondary importance. The daily breathing rate is based on the assumption that there are two temperature drops of 8°C per 24 hours. The breathing volume change which occurs during the pump start-up is not taken into consideration. Double & triple units are available upon request.

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Installation
The breather is supplied with a sealing plug in the top casting. This plug is either screwed or pressed into position to prevent any water vapour ingress whilst in store. This plug should be removed immediately prior to the unit being fitted to the air vent pipe of the transformer reservoir tank. The units can be connected to the vent pipe either by flange or pipe thread connection. Mounting brackets on top casting provide additional support for the breather.

Full installation and maintenance instructions are supplied with each Transformer Breather.

Operation
Periodic inspection should be carried out to monitor the condition of the desiccant charge. The breathers are filled with beaded Envirogel desiccant. This material changes colour as it becomes saturated with water vapour. When the colour change reaches the indicator line on the desiccant container it should be recharged with fresh desiccant.

Maintenance
The only maintenance necessary to keep the breather in a fully active condition is the replacement of the expired desiccant as detailed below.

1. Loosen the nuts and remove the two tie rods, which are fitted in the slots in the top and bottom castings. Loosen the nuts on the fixed tie rods until the desiccant container can be removed from between the top and bottom castings.

2. Remove the top perforated cover and empty the expired desiccant from the container. This material may be disposed of in a normal landfill site.

3. Fill the container with active Orange or Blue desiccant, lightly tap the container to settle the desiccant and top up if necessary. Desiccant refills are available from Envirotronics.

4. Replace the perforated cover and refit the desiccant container between the top and bottom casting ensuring that it is correctly fitted between the sealing gaskets.

5. Refit the two tie rods and tighten all the nuts, being careful not to over tighten.
Enviro-Tronics

Refills for Size V, W, X, Y & Z Breathers

To order refills for the large breathers simply add the suffix—RFO or RFB to the breather part number. Example for Blue Gel refill for a size V refill—BLD6290/01RFB

Desiccant Guide
When ordering Breathers you can specify—with or without Silica gel.
You have a choice of two Colour Indicators—Blue or Orange.
When the Gel takes on moisture the colour begins to change at approximately 12% of the desiccant weight.
Blue changes to Pink and Orange changes to Green indicating that the Gel has expired (saturated) and needs to be changed.
It is possible to remove the moisture from the Desiccant by heating the material in a Fan Forced oven at approximately 130 Deg.C for 1 hour for small quantities. This can be labour intensive and time consuming and although the colour may return there is a risk of the “micro pores” burring over thus reducing the capacity of the Silica gel. Given the low price of replacement refills the economics of recycling is questionable.
A cost effective approach for refilling the larger breathers is to purchase the standard 25kg Drum. Please call us on Ph: 02 96305277 or email: info@envirotronics.com.au for a quote on any of the items in this brochure.

Envirotronics have been supplying industrial desiccants to the Electrical industry for over 25 years and our on-going Lab. tests of all imported products ensure consistent quality across the range.

Bulk desiccant can be supplied in 25kg and 140/150kg Drums. Please contact us if you have a special requirement.

Please call or email us for a quote.
SF6 Circuit Breaker Desiccant bags

Envirotronics has been supplying major utilities and power circuit breaker manufacturers in the development and production of SF6 Circuit Breaker Desiccant Bags for over 15 years. These bags are designed to be suspended in the breaker housings to adsorb water vapour and other contaminants which reduce the purity of Sulphur Hexafluoride (SF6) arc arresting gas.

Our SF6 Switch Gear Bags are made from TYVEK which has an extremely low dust transfer rate minimising the risk of air borne particles. The desiccant most suited for this application is Molecular Sieve Type 4A as it has the correct size Micro-pores to adsorb moisture and other contaminants excluding SF6 resulting in a much higher purity level of the Sulphur Hexafluoride Gas.

Circuit Breaker Desiccants are critical to ensure the dehydration of SF6 in HV switch gear and are a mandatory maintenance item. The 4A Molecular Sieve is a synthetically reconstituted alumina silicate which is generated and processed under tightly controlled conditions to establish exact pore dimensions within the lattice of the molecules crystalline structure. These pores are created by removing the water of crystallization from the compound. In its dehydrated state, the Molecular Sieve exhibits a tremendous affinity for water and smaller hydrocarbons, adsorbing over twenty percent of its weight of such contaminates. The incorporation of Type 4A into the static drying system essentially eliminates the danger of arcing caused by gas contamination in the breaker housing.

Envirotronics also offers a full range of desiccants for use as a bulk moisture drying bed in the circuit breaker door. These desiccants include Activated Alumina and Silica Gel. All bags are heat sealed in metal foil barrier bags for a shelf life of 2 years from date of manufacture.

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**SF6 Desiccant Bag**
250 Gram Mol Sieve Type 4A
P/N MS250G4A

- Non-conductive eyelet
- For suspending bag
- Heat sealed in metal foil
- Moisture barrier bag
- 2 year shelf life
- Bag made from TYVEK
- Low dust transmission

**Note:** Other sizes made to order

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**Range of general purpose Bags with Windows:**

- 1,000 Gram
- 500 Gram
- 250 Gram
- 100 Gram
- 50 Gram

**Colour Change Indicator**
- Blue or Orange gel

**Note:** All Bags are made to Order in our Northmead Facility
Model # ET-06OV

Specifications:
Desiccant: 6kg Silica Gel
T/F. Rating: 10MVA
Oil Conservator: 12,000 Litres
Connection: 3/4" BSP plus Flange DN25
Flange PCD: 85mm
Flange Dia: 115mm
Flange Hole Dia: 15mm
Breather Length: 400mm
Diameter: 220mm
Gross Weight: 10.168kg

Fabricated from high grade Aluminium alloy, powder coated for corrosion resistance.
Cylinder is made from special grade UV Stabilised toughened Acrylic, resistant to Transformer Oils, Corrosive Atmospheres and Tropical/marine climate.
Connecting Rods & Wing nuts are Grade 316 Stainless Steel

Silica Gel (Orange to Green) or (Blue to Pink) 6 kg

NEW

Flange DN25 and 3/4" Pipe thread connection

Standard Oil Bowl pressure relief valve systems