

Transformer Moisture Control and Prevention



Brownell Transformer Breathers

Specialising in parts for power generation, oil and gas installations, and the mining industry.

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181A Star Street Carlisle WA 6101 P.O Box 685 Cloverdale WA 6985
TEL: +61 (08) 9361 2772 FAX: +61 (08) 9361 2761
EMAIL: info@armstrongenergy.com.au WEB: www.armstrongenergy.com.au

Transformer Breathers

The failure or malfunction of many transformers or similar equipments can be directly attributed to the lack of proper control of the level of water vapour entering the equipment. It is essential, therefore, that a very low level of humidity is maintained in the air space in the top of the conservator tank to avoid deterioration of the insulating properties of the cooling medium.

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 our Transformer Breathers are filled with Envirogel, which is a self-indicating silica gel desiccant. This desiccant is orange/yellow in colour when active, but turns green when saturated.

Choose a sub-category of products from the **Transformer Breathers** category:



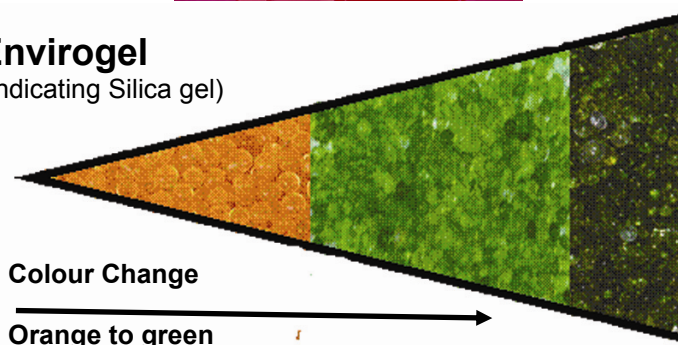
"R" Series Breathers

"V,W,X,Y&Z" Series Breathers



"S,T&U" Series Breathers

Envirogel
(Indicating Silica gel)



Colour Change

Orange to green

Dark Green = 80% saturation

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Products in R' Series Transformer Breathers.

The 'R' Series Transformer Breathers from Brownell Ltd UK. are manufactured from UV stabilised polycarbonate and are available in three different sizes. The clear polycarbonate body allows for clear visibility of the desiccant charge and enables users to check desiccant condition with ease.

The unit is mounted from a 3/4" 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.

"R" Series Breathers



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

Desiccant type: Envirogel – self indicating beaded silica gel.

Part No	Size	Overall Length	Overall Diameter	Weight of Desiccant
BL/D6586	R	158mm	108mm	0.60 kg
BL/D6942/01	R1	260mm	108mm	1.20 kg
BL/D6942/02	R2	362mm	108mm	1.90 kg

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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Selection Table

Size	Max. Oil Contents (Litres)	Approx. Transformer Rating (MVA)	Max. Air Space Volume (Litres)	Approx. Daily Breathing Rate (Litres)	Max. Air Volume before Recharge (Litres)	Approx. Charge Life (Days)
R	1500	<1.25	230	15	6000	400
R1	3000	3	500	30	12000	400
R2	4750	6	1100	55	20000	400

Installation

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/80lbf.in.

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

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 from orange to green 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 or the complete assembly should be replaced.

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 spent desiccant from the container. This material may be disposed of in a normal landfill site.
3. Fill the container with active orange desiccant, lightly tap the container to settle the desiccant and top up if necessary. Desiccant refills are available from Brownell.
4. Replace the perforated cover and screw the recharged breather back onto the vent pipe.

Desiccant Refills

EnviroGel refills - Part No. BL/D6331 offers capacities ranging from 0.5 to 50Kg.

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Products in S,T & U' Transformer Breathers

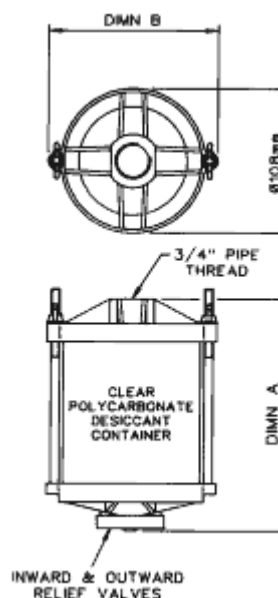
These Transformer Breathers have a removable desiccant container which allows the desiccant to be changed without breaking the breather pipe connection. The desiccant container is clamped between the top and bottom end mouldings by two metal tie rods with threaded wing nuts. By releasing the wing nuts,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

The Transformer Breathers are manufactured from UV stabilised polycarbonate. The clear polycarbonate body of the desiccant container allows for clear visibility of the desiccant charge.

The unit is mounted from a 3/4" female pipe thread connection at the top of 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.



"S,T&U" Series Breathers



Connection: 3/4" Female Pipe Thread conforming to BS21 and ISO7-1.
Desiccant type: Envirogel – self indicating beaded silica gel.

Part No	Size	Dim 'A'	Dimn 'B'	Weight of Desiccant
BL/D1140/01	S	174mm	127mm	0.45 kg
BL/D1140/02	T	274mm	127mm	1.20 kg
BL/D1140/03	U	474mm	127mm	1.80 kg

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Selection Guide

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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.

Size	Max. Oil Contents (Litres)	Approx. Transformer Rating (MVA)	Max. Air Space Volume (Litres)	Approx. Daily Breathing Rate (Litres)	Max. Air Volume before Recharge (Litres)	Approx. Charge Life (Days)
S	1130	1.5	285	17.5	7100	400
T	2250	3	570	35	14200	400
U	4500	6	1220	70	28400	400

Installation

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.

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 Envirolgel desiccant. This material changes colour from orange to green 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 spent desiccant as detailed below.

1. Loosen the wing nuts on the tie rods until the desiccant container can be removed from between the top and bottom mouldings.
2. Remove the top perforated cover and empty the spent desiccant from the container. This material may be disposed of in a normal landfill site.
3. Fill the container with active orange desiccant, lightly tap the container to settle the desiccant and top up if necessary. Desiccant refills are available from Brownell.
4. Replace the perforated cover and refit the desiccant container between the top and bottom mouldings ensuring that it is fitted between the sealing gaskets.
5. Tighten the wing nuts but be careful not to over tighten as this can distort the mouldings.

NOTE: If it is necessary to replace the complete desiccant container instead of recharging the existing unit, ensure that the self-adhesive aluminium foil vapour barriers are removed from the top and bottom of the container before installation.

Desiccant Refills

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Products in V,W,X,Y & Z' Transformer Breathers

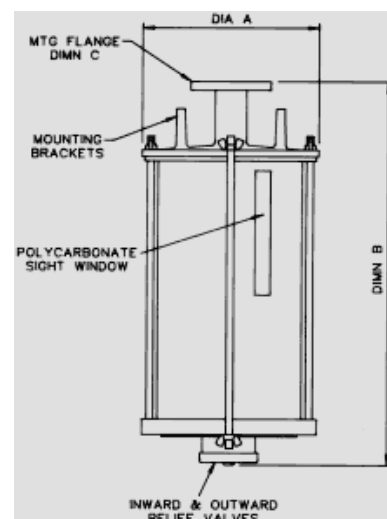
This range of Transformer Breathers provides protection against moisture for large capacity tanks. With the larger amounts of desiccant required to maintain protection, the breathers are more robustly constructed.

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 coat 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 pressure differential occurs within the equipment being protected.

"V,W,X,Y&Z" Series Breathers



Mounting flange conforms to BS10 Table D.

Alternative pipe connections:

Size 'V, W & X': 3/4" Female Pipe Thread.

Size 'Y & Z': 1" Female Pipe Thread.

All threads conform to BS21 and ISO7-1

Desiccant type: Envirogel – self indicating beaded silica gel.

Part No	Size	Dia 'A'	Dimn 'B'	Dimn 'C'	Weight of Desiccant
BL/D6290/01	V	255mm	375mm	1"B.S.T.D.	5.0 Kg
BL/D6290/02	W	255mm	555mm	1"B.S.T.D.	10 Kg
BL/D6290/03	X	255mm	735mm	1"B.S.T.D.	14.5 Kg
BL/D6290/04	Y	355mm	485mm	1"B.S.T.D.	17.5 Kg
BL/D6290/05	Z	355mm	645mm	1"B.S.T.D.	27.3 Kg

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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.

Size	Max. Oil Contents (Litres)	Approx. Transformer Rating (MVA)	Max. Air Space Volume (Litres)	Approx. Daily Breathing Rate (Litres)	Max. Air Volume before Recharge (Litres)	Approx. Charge Life (Days)
V	11350	9	2400	140	45450	320
W	22700	30	4800	280	90900	320
X	34050	60	7250	420	136500	320
Y	45450	100	9685	570	181800	320
Z	68150	180	14500	840	272700	320
XX	68100	180	14500	840	272700	320
YY	90900	240	19300	1140	363500	320
ZZ	136300	500	29000	1680	545400	320
ZZZ Installation	204450	750	38750	2280	818100	320

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 from orange to green 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 spent 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 spent desiccant from the container. This material may be disposed of in a normal landfill site.
3. Fill the container with active orange desiccant, lightly tap the container to settle the desiccant and top up if necessary. Desiccant refills are available from Brownell.
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.

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