

## Diaphragm Seal Refurbishment Program

Giving pressure instruments a second life



### Refurbishment:

- ▶ NOT TRANSMITTER BRAND SPECIFIC
- ▶ SIGNIFICANT COST SAVING VERSUS BUYING NEW
- ▶ SHORTER LEAD-TIME VERSUS BUYING NEW
- ▶ LOCAL PICKUP OR YOU SHIP TO US

THE  
**SPiRiT**®  
TO WALK AN EXTRA  
**MiLE**

## Introduction

Diaphragm Seals are used to separate the pressure instrument from the process fluid to protect the vulnerable measuring element. This protection significantly enhances the lifecycle of the measuring instrument; however, over time and dependent on operating conditions, the Diaphragm Seal can fail. One of the main benefits of a Diaphragm Seal is that it can be replaced or refurbished whilst reusing the pressure instrument. A refurbishment will bring the instrument back to an “as new” condition at a significantly lower cost and shorter lead-time than purchasing new. Bliss Americas has been providing this service to the industry for over 25 years and can replace the Diaphragm Seal on any brand of transmitter. In addition to shorter lead-times than purchasing a new instrument Bliss Americas offers an expedited repair turnaround option (within 48 hours) and, when requested, will analyze the defective instrument to determine cause of failure and provide recommendations for improved future lifecycle benefits.

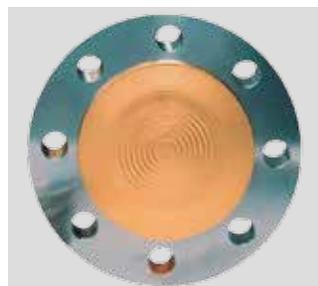
## Benefits of Refurbishment Diaphragm Seals

- ▶ All brands of pressure transmitters are accepted and new Diaphragm Seals can be mounted to them. Consequently, there is only one central point of contact.
- ▶ Refurbishment is executed within 3 weeks of receipt of the instrument, but a 48 hours service is also available. Ideal in case of sudden plant-stops or other unplanned and urgent situations when the only alternative is a new instrument on a long delivery and with extra costs.
- ▶ Significantly more economic than ordering a complete new instrument again, because the pressure instrument is being reused.
- ▶ No surprises as a clear and written quotation is provided before work is undertaken.
- ▶ The transmitter is tested for functionality, prior to refurbishment.
- ▶ Bliss Americas offers advice with measurement challenges for Diaphragm Seals. Refurbishment often provides valuable information regarding to the process and offers the opportunity of a better solution for increased lifetime and/or higher accuracy of the equipment.



## Refurbishment Process

- ▶ Ship transmitter to our facility & inform us at [sales@blissamericas.com](mailto:sales@blissamericas.com). A quotation will be sent to you within 40 hours of receipt of transmitter.
- ▶ Only after approval of the quotation, and order placement will the Refurbishment be executed.
- ▶ The Diaphragm Seal is carefully dismantled and the pressure instrument tested for correct (electronic) function.
- ▶ In most situations all parts are renewed. However, instances such as exotic flanges materials, parts can be reused after approval from customer.
- ▶ Parts are always cleaned and when required machined. The gaskets are always checked and/or replaced. Surface facings are always cleaned and reformed.
- ▶ The instrument will be rebuilt, filled and tested on static pressure and measuring range (documented in a test report which is always included). The complete instrument will conform to the original specifications. Material certificates according to EN10204 will be supplied when requested on the order.
- ▶ The instrument can be shipped or delivered to any location.



## Local pickup - get a Seal Refurbishment Bin!

Bliss Americas offers a special service for plants that have multiple Pressure Transmitter.

Contact our local office (see the back of this brochure or check our website) and ask for your own Seal Refurbishment Bin.

We will deliver the Bin to your plant and once you replace a damaged transmitter assembly with your stock, place the damaged assembly in the Refurbishment Bin with its datasheet.

At the end of every month, or as required, we will contact you to arrange for the Seal Refurbishment Bin to be collected.

A quotation will be sent to you and after approval, The refurbishment will be undertaken.

The quotation is not approved, the transmitter will be returned to you along with the Refurbishment Bin.



## The Influence of Temperature

A pressure instrument with Diaphragm Seals is filled under high vacuum at a temperature of +/- 20 °C. When the instrument with Diaphragm Seals is being used at an operating temperature different to this, a measurement error will occur. When the process and/or ambient temperature increase, the filling fluid will expand resulting in a pressure build up, that will be measured by the pressure retainer on top of the actual process pressure. On request, Bliss Americas can determine the expected additional measurement error of an application, so it can be compensated in the system. It is also possible to get a reliable measurement, where the pressure instrument will be set at a given operating process temperature.



## Examples of Damaged Diaphragm Seals



### Diaphragm is bulged

It happens frequently that the diaphragm is bulged. A possible cause could be that the process temperature has been too high and the filling fluid has cooked, resulting in a bulged diaphragm. Check the temperature specifications on the datasheet with the process.

Another possible cause is the presence of hydrogen diffusion. This means that very small hydrogen ions (H+) have permeated the diaphragm and joined together again behind the diaphragm, resulting in a bulged diaphragm. Of course, the measurement is no longer correct. The solution preventing hydrogen permeation is a gold plated diaphragm. Bliss Americas offers a unique 40 µm layer, ensuring a longer lifetime.



### Diaphragm is "blown up"

Sometimes a diaphragm is "blown up". This can be caused by a high pressure water jet stream directed at the diaphragm, but it can also be a sign that the application has leaked and/or is on a vacuum. Extra care should be taken into account for installation, mounting

and/or maintenance to prevent this problem from recurring.



### Damaged (dents) diaphragms

The diaphragm has a thickness of only 75 micron and thus transmits the pressure accurately. However, it is also very sensitive and vulnerable and needs to be handled with care. In case the diaphragm is dented, it no longer gives a correct reading. A renewal of the Diaphragm Seal is the solution.

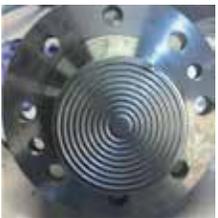
In the example of an extended type the diaphragm can be removed, the flange cleaned and machined, and a new diaphragm is welded to it, then, the complete application is mounted and filled and tested. The instrument is as good as new.



### Diaphragm is corroded

Some processes are so aggressive that they corrode the diaphragm material. A correct selection of diaphragm material ensures a longer lifetime. Bliss Americas can assist and advise in making the selection. Several types of diaphragm materials are available from

Bliss Americas (a.o. Tantalum, Monel 400, Titanium Gr. 1, Duplex 2205, Hastelloy C-276, Nickel 201 or Inconel 600). Also, exotic flange materials are readily available.



### Process medium gets behind the diaphragm

When the diaphragm is damaged and the process medium gets behind the diaphragm a hazardous situation can exist. Because the complete system stays more or less liquid filled and continues to transmit a (process) pressure.

This could give the (wrong) impression that the application is still functioning correctly. In the meantime, the process medium could corrode the flange material, which could lead to a dangerous situation. A periodic check to see if the diaphragm is still in perfect condition is recommended, especially with corrosive processes.



### Development of customer specific requirements

For specific applications, Bliss Americas develops together with the customer a joint solution for a "measurement challenge". Recently a customer asked Bliss Americas for a specific construction due to the limited space in the plant.

Here, the transmitter was placed in the radius of the Diaphragm Seal flange instead of the standard construction where the instrument is placed axial to the flange.

## BLISS AMERICAS

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