



## *ProValve – make it easy*

[BEL probing permeate sampling valve](#), ProValve, provides a direct connection to the permeate stream. The sampling valve allows free access for probing to determine the permeate quality at different points down the length of the Pressure Vessel. A seal located on the sampling unit stops any permeate from flowing around the probing tube while probing.



### **Measuring the permeate concentration:**

Using the [BEL probing permeate sampling valve](#) allows to measure the permeate of a pressure vessel while online.

### **Why to Sampling / Probing:**

If one pressure vessel shows a significantly higher permeate concentration than the other vessels of the same stage, then this vessel should be probed. The problem may be either a poorly performing membrane element, an O-ring leak at an interconnector or end adapter, or possibly even a cracked adapter/interconnector.

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#### **BEL COMPOSITE IBERICA S.L.**

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## PROBING PROCEDURE.

Probing procedure involves the insertion of a plastic tube into the full length of the permeate tube in order to measure the permeate conductivity at different locations inside the pressure vessel.

The use of the [BEL probing permeate sampling valve](#) allows to probe a pressure vessel while online without unloading the membrane elements. Also it eliminates water leakage at the point of entry.

The [BEL probing permeate sampling valve](#) should be used at the opposite end of the pressure vessel from the product header piping, with the permeate manifold remaining in place.

### **Before start**

Obtain a piece of aprox. 6mm (1/4") of outside diameter polyethylene tubing. The tubing should be several centimeters longer than the total length of the vessel.

Calculate approximately the distance from the end of the ProValve to first membrane element. We will call it (A) distance from now.

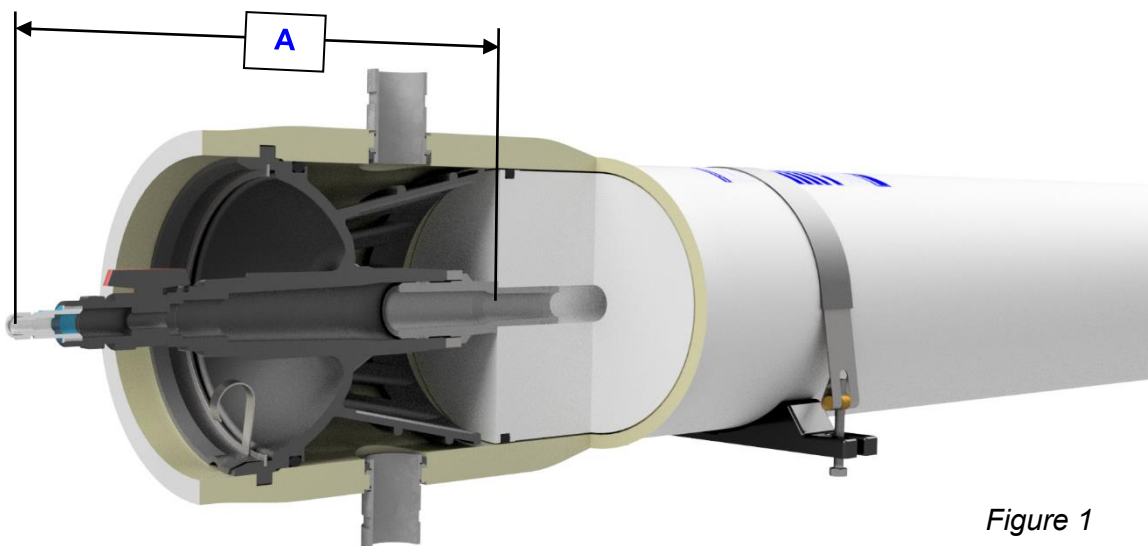


Figure 1

As reference with standard accessories for BEL vessels you can use these values:

Model of pressure vessel	Distance "A" (mm)	
	Sideports Vessels	Endport Vessels
300 psi	322	338
450/600 psi	325	338
1000/1200 psi	328	338
1500 psi	338	338
1800 psi	338	338

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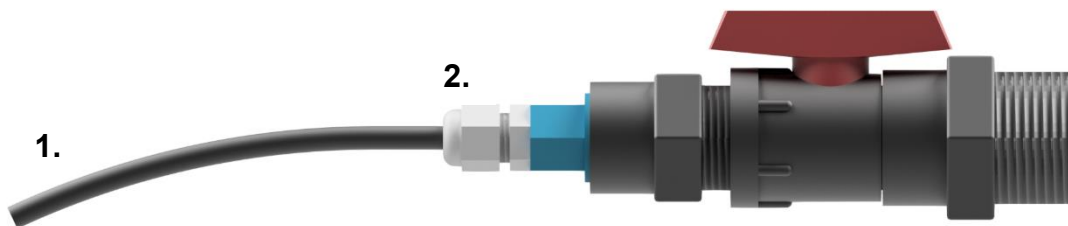
Using a permanent marker, mark in one end of the tubing the (A) distance described. Then, mark the tubing in increments of 508 mm (20") from this point. This way if we introduced the tubing on the Provalve when the piping reach to the 1<sup>st</sup> mark the end of the tubing (from where the sample will come) will be placed at the beginning of the 1<sup>st</sup> membrane element. If we push the tubing until the next mark the end of the tubing will be placed at the middle of the 1<sup>st</sup> membrane element, and so on. (See figure 4 for more details).

The last mark performed on the tubing must coincide with the end of the last membrane. From now we will call this mark the "full length mark."

### **Starting the sampling procedure.**

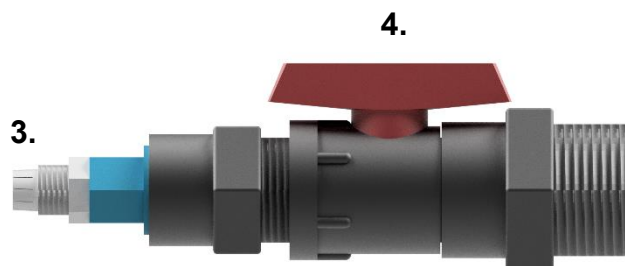
Using the [BEL probing permeate sampling valve](#) measure the conductivity of the water coming out of the vessel. Recheck several times to make sure the value is constant. Record the conductivity and note the location.

With the balve closed, remove the polyethylene pipe hose (1.) and the Quick connector (2.) of the ProValve.



*Figure 2*

The provalve should look like this:



*Figure 3*

Be sure that the system has run for at least 15 minutes before start the test.

Insert the tubing with all the marks performed as described above into the quick connector (3. as showed figure 3) while opening up the ball valve (4. as showed figure 3) on the Provalve.

To stop any permeate from flowing around the probing tube fit the quick connector bolt (3. as showed figure 3) in the way that you can be able to push/pull the piping easily but the permeate don't flows out.

Push the tubing in until the "full length" mark is reached.

After 1 minute, measure the conductivity of the water coming out of the tubing. Recheck several times to make sure the value is constant. Record the conductivity and note the location.

Pull the tubing out 508 mm (20") using the marks as a guide, wait 1 more minute, and repeat the measurement procedure. You may slightly close the quick connector (3. as showed figure 3) to hold the tubing in place.

When the end of the tubing comes out of the vessel close the ball valve mount again the originals pipe hose and quick connector of the Provalve as on the figure 2.

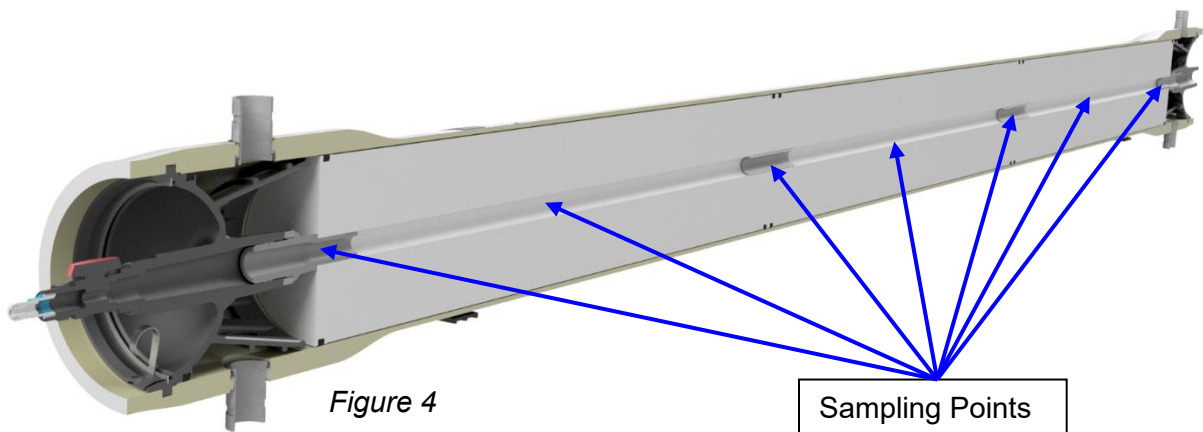


Chart the values of the permeate conductivity over the length of the vessel. A steady trend should be observed as a function of position.

#### Notes:

A normal conductivity profile shows a steady increase of the permeate produced at the feed side of the pressure vessel towards the concentrate end of the vessel. An unusually large deviation from this profile locates the source of the high salt passage problem. O-ring problems are generally indicated by a step change in the conductivity profile at coupler/adaptor locations, while a marked increase outside this region points to a leakage from an element, e.g., due to a backpressure damage. Consult your membrane supplier for more detailed info.

*BEL's ProValve (Cat. # 004-008-010) is designed for all BEL 8" vessels and available now to make it easy for you.*

*Please contact your BEL's sales office:*

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