

# Operating Instructions

## PRESSURE INTERFACE CHAMBER

Model: 25-0695 (K-790A)

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## PRESSURE INTERFACE CHAMBER MODEL 25-0695 (K-790A)

### I. GENERAL INFORMATION

The **25-0695 (K-790A) Pressure Interface Chamber** is an accessory to the Tri-Flex 2 series Permeability Test System. Used during permeability test applications involving toxic permeants, the **Pressure Interface Chambers (PIC's)** provide a closed system for toxic liquids entering and exiting the test cell. Liquid from the burette panel is separated from the liquid in the chamber by a Viton® diaphragm. A pair of PIC's can be quickly installed for each permeability test cell used.

Each PIC has the following features: a stainless steel base; a stainless steel lower cylinder and a clear acrylic upper cylinder; one Viton® diaphragm in between the cylinders to separate the toxic liquid from the water; an acrylic top; and three clamping rods to hold the assembly together. The acrylic top is provided with a three-way valve for filling and draining purposes. A bottom three-way valve to allow the permeant to drain or to fill the PIC or the test cell is also included.

**Note: Stainless steel cell platen accessories must be used when testing involves toxic permeants.**

### II. RELATED USER DOCUMENTATION

These operating instructions do not contain all the necessary information and requirements for permeability testing procedures involving toxic permeants. Please refer to the Tri-Flex 2 Owner's Manual, ASTM D 5084, U.S. Army Corps of Engineers EM 1110-2-1906, or EPA requirements for specific industry requirements for permeability testing.

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**III. PIC ASSEMBLY**

During the initial learning process, it is helpful to view the burette channels in groups of three. For test applications involving only one permeability test cell, only the Master Control Panel, with one group of three burette channels, will be used. For higher-volume test applications involving more than one test cell, one or two Auxiliary Control Panels, each having two groups of three burette channels, will be used. Viewing each burette channel group from left to right, designate each burette channel as follows:

- a. Left is called "Lateral"
- b. Center is called "Upper"
- c. Right is called "Lower"

Each PIC is shipped completely assembled. Make sure the three clamping rods are tightened sufficiently. To connect tubing to the Permeameter Chamber, remove and save the tubing assembly from either the upper or lower positions of the cell ports. Securely connect the PIC's tube nut.

**IV. FILLING AND INSTALLING THE PIC**

Before filling and installing the PIC's, follow the steps outlined in Chapter IV, Sections A-1 through C-1, in the Tri-Flex 2 Owner's Manual. These steps explain how to set the power and main supply connections, how to fill and de-air the De-Aired Water Tank System, how to fill and de-air the burette channels, and how to set up the permeability test cell specimen.

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**A. Connecting the PIC's to the Test Cell (Fig. 2)**

1. Disconnect the compression fitting from the valve on the test cell marked "Lower". Put aside.
  - a. Using the supplied tubing assembly from the PIC, connect one end of Teflon tubing (#20 Fig. 1) from first PIC to the valve on the test cell marked "Lower". This connection will introduce the toxic fluid into the test specimen.

NOTE: Teflon tubing is supplied with each PIC. Use the Teflon tubing wherever toxic permeant will be in contact with the tubing. The tubing supplied with the cell is NOT Teflon.

- b. Turning the bottom ball valve #10 toward the tubing connected to the cell will direct the toxic liquid flow toward the test cell.
2. Disconnect the compression fitting from the valve on the test cell marked "Upper". Put aside.
  - a. Using the supplied tube assembly from the PIC, connect one end of the Teflon tubing (#20 Fig. 1) from the second PIC to the valve on the test cell marked "Upper".
  - b. Turning the bottom ball valve #10 in the direction of the Teflon tubing connected to the cell will direct the toxic fluid out of the test cell and into the second PIC.

**B. Filling the First PIC**

Assuming you have already filled the burette channels with de-aired water to the desired level, you are now ready to fill the PIC's. All five valves on the test cell should be in the closed position. All Burette/Annulus Flow Control valves should be in the "Cell Operate" position, while all Burette/Annulus Input Control valves should be in the "Vent" position.

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1. Place the PIC's tubing (#20) not connected to the cell into a container filled with toxic permeant. In order to pull the toxic permeant into the PIC, fill until the PIC will take no more permeant. Close ball valve (#10) by turning valve handle to point down.
2. To put a small vacuum on the PIC, connect the first PIC's top tubing (#2 Fig. 1) to the vacuum quick disconnect on the panel. Turn ball valve (#10) to the tubing not connected to the test cell. This will bring the Viton® diaphragm to the top of the PIC cylinder.
3. Disconnect the PIC from the panel's vacuum quick disconnect. Plug the upper tubing quick connect stem (#3) into the "lower" burette channel's quick disconnect on the front of the panel. Apply a very small pressure (e.g. 2.0 psi) to the top of the "lower" burette channel, to slowly fill the PIC with water.
4. Turn the PIC upside down. Apply a slight pressure (e.g. 1.5 psi) to the top of the "lower" burette channel, and open the ball valve (#10) by turning it towards the permeant source to release any air. Close the valve and turn the PIC back to the upright position.
5. Repeat steps 1 and 4 until PIC is completely filled with permeant.

**C. Filling the Second PIC**

The second of the pair of PIC's also is filled using the same procedure. It is responsible for draining the toxic permeant from the test cell.

1. Follow the steps in sections B-1 through B-7 for filling the PIC, this time substituting "upper" burette channel whenever "lower" burette channel is used.
2. Turn the bottom ball valve (#10) toward the permeant source to release most of the toxic permeant from the PIC back into the container. You need to fill both bottom Teflon tubing lines to the cell with toxic permeant, to rid them of any air by turning valve (#10) to the cell tubing position.

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**V. PERMEABILITY TEST PROCEDURE**

Follow the steps outlined in Chapter IV, Sections C-2 through E of the Tri-Flex Owner's Manual, for filling the test cell, specimen saturation and permeability test procedure.

**VI. DRAINING AND CLEANING THE PIC'S**

Directions apply to both PIC's.

**A. Draining the PIC's**

1. Make sure ball valve (#10) is in closed position. Disconnect the compression fitting from the valve on the cell.
2. Apply a small pressure (e.g. 1.0 psi) to the PIC. Open the directional ball valve (#10) slowly, to force toxic permeant into a toxic fluid drainage container, until no more permeant comes out.
3. Close ball valve (#10). Remove tube from toxic fluid drainage container.
4. Set the Burette/Annulus Input Control valve to a slight vacuum, to force all the water back into the burette channel. Turn the ball valve (#10) of PIC to the tube not connected to the cell to get the last bit of water out. Set the Burette/Annulus Input Control valve back to "Vent."
5. Disconnect tubing (#20) from panel and PIC.
6. Drain the system and burette channels as instructed in Chapter IV, Section F, of the Tri-Flex 2 Owner's Manual.

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**B. Cleaning the PIC's**

**WEAR PROTECTIVE CLOTHING WHEN CLEANING THE PIC. TAKE GREAT CARE NOT TO SPILL ANY TOXIC PERMEANT ON EXPOSED SKIN.**

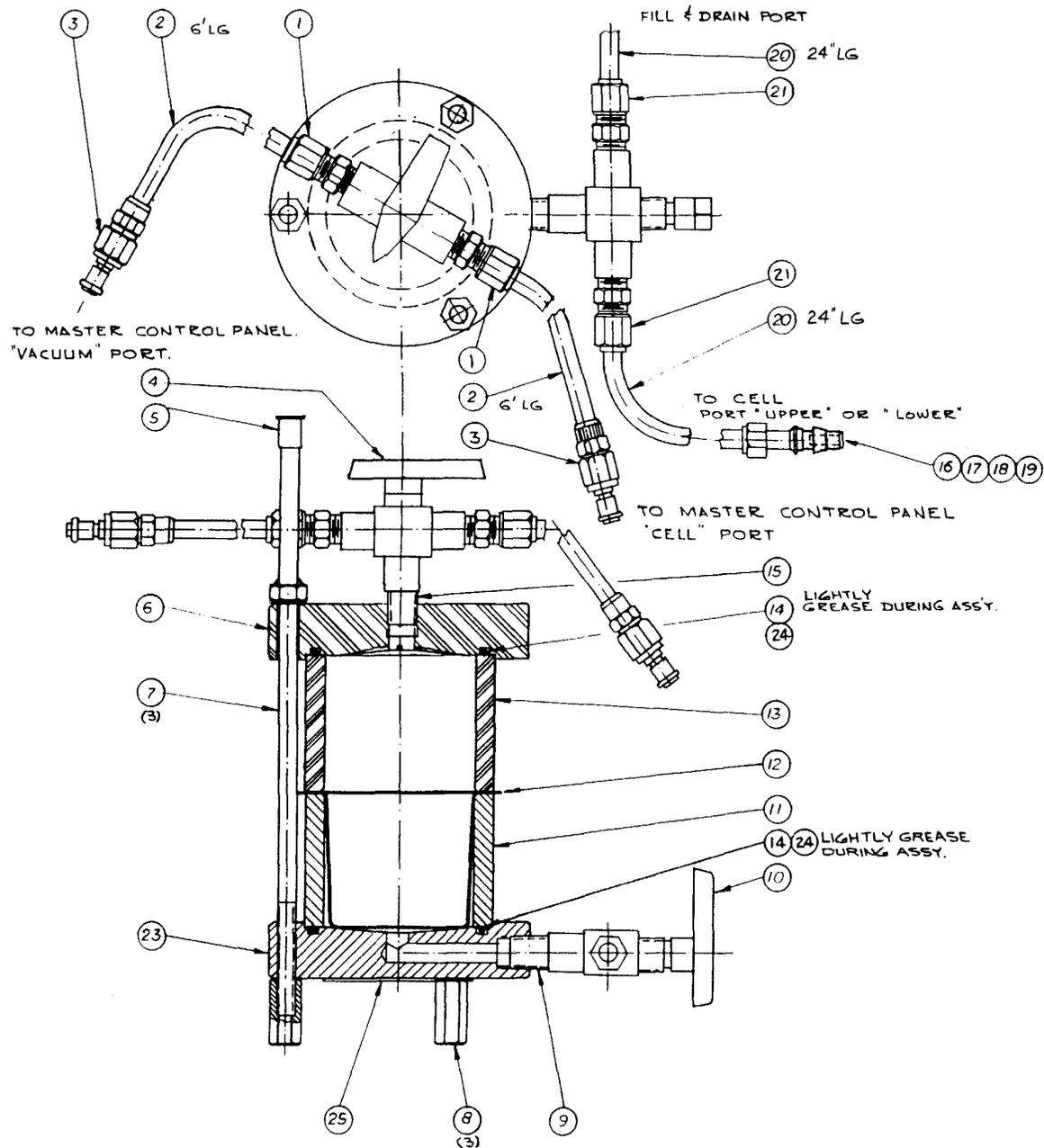
1. Remove three clamping rods from top of PIC. Gently lift the top straight off.
2. Take PIC apart, gently cleaning all toxic permeant from it.
3. Before reassembling the PIC, inspect the Viton® diaphragm for any defects. If necessary, replace with ELE/Soiltest part no. 9429-0032.

**C. Reassembling the PIC**

1. Reassemble each PIC as shown in Fig. 1. *Lightly* coat both Viton® "O" rings with vacuum grease. Make sure "O" rings (#14) have been inserted into upper and lower plates. Position bottom cylinder (#11), making sure the inside radius edge faces up. Insert Viton® diaphragm (#12), fabric side out, into bottom cylinder. Replace top cylinder (#13), with the inside radius edge facing down, on top of the diaphragm. When assembling the two halves of the cylinders, check that the cylinders are in line.
2. Replace the three clamping rods (#7). Alternately tighten the rods to get even pressure.

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FIGURE 1



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**PARTS LIST**

Item	Part No.	Description	Req'd.
1	8310-0010	Male Connector 1/8P x 1/4T	2
2	8702-8006	Poly-flow Tubing 1/4 OD	12'
3	8303-0059	Disconnect Coupling	2
4	8920-0052	Ball Valve. Brass	1
5	9407-0010	Cap Plug	3
6	3663-0004	Upper Plate	1
7	3663-0005	Clamping Rod Assembly	3
8	9606-0032	1/4-20 Coupling Nut	3
9	8306-0043	Nipple 1/8 NPT x 3/4 Lg. SS	1
10	8920-0057	Ball Valve S.S.	1
11	3663-0003	Lower Cylinder	1
12	9429-0032	Diaphragm, Viton®	1
13	3663-0002	Upper Cylinder	1
14	9409-0068	O-Ring 034 Viton®	2
15	8306-0009	Nipple 1/8 NPT x 3/4 Lg	1

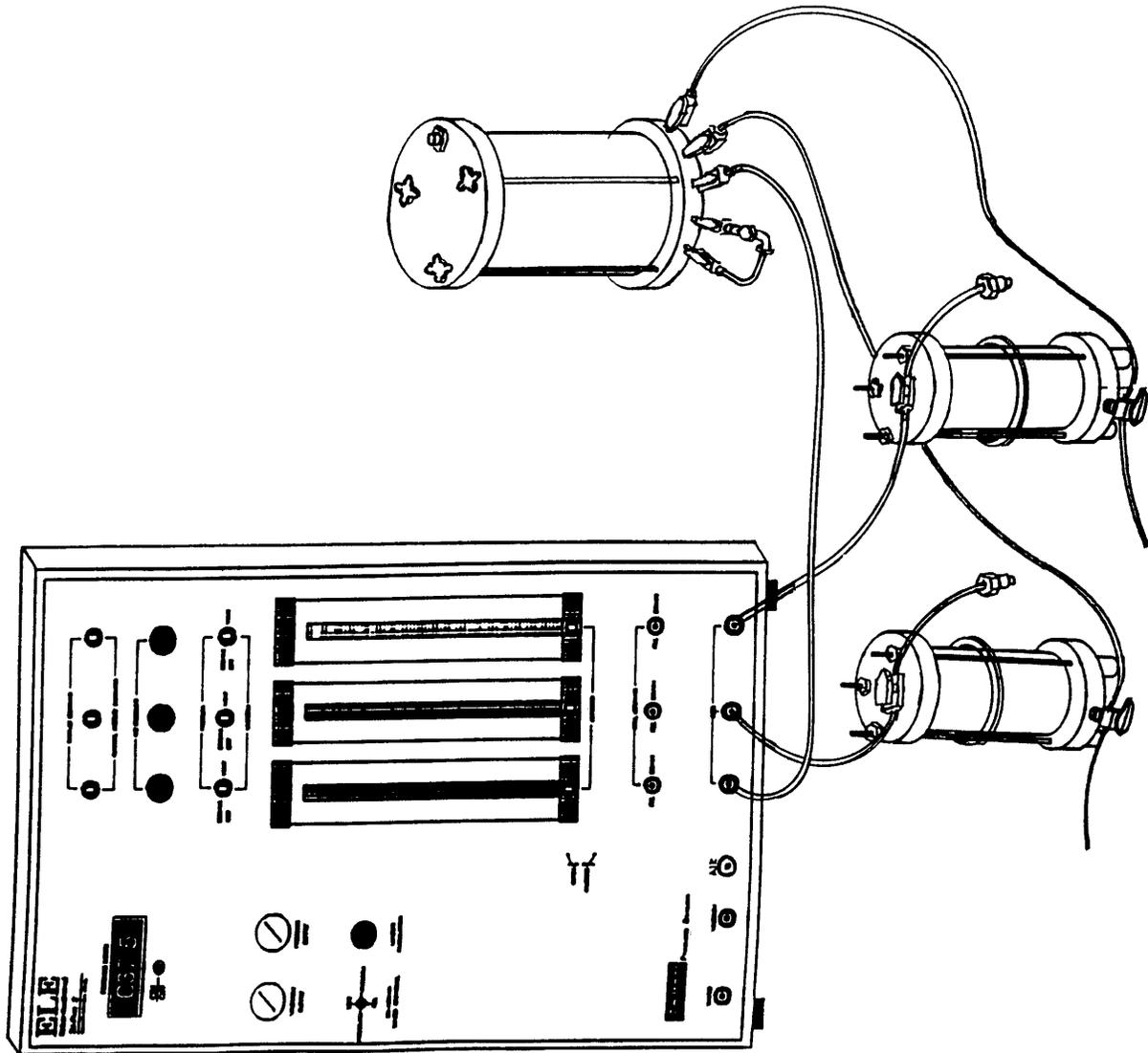
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**Parts List Continued:**

Item	Part No.	Description	Req'd.
16	8314-0006	Nut 1/4 OD Tube S.S.	1
17	8313-0011	Back Ferrule. SS	1
18	8310-0051	Insert. S.S.	1
19	8313-0010	Front Ferrule, S.S.	1
20	8702-0019	Teflon Tubing	4'
21	8310-0045	Connector 1/8 NPT x 1/4T	2
22	9802-0009	Teflon Tape	As Req'd
23	3663-0001	Base Plate	1
24	88-3115 (G-282)	Vacuum Grease	As Req'd
25	9302-0035	Label	1

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FIGURE 2



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