

Product Information

Sigma-Aldrich® Pure-Pac® II System

Technical Bulletin AL-236

TECHNICAL BULLETIN

Product Description

The Sigma-Aldrich® Pure-Pac® II packaging/dispensing system provides a convenient method for storing and dispensing laboratory and development scale quantities of high purity solvents, fine organics, and other high hazard liquids. The properties of these products require the prevention of external contamination and/or personal exposure be kept to a minimum. Many of the liquids must be handled and stored without exposure to atmospheric moisture or oxygen. The design of the Pure-Pac II system allows ready and convenient transfer of these liquids using the equipment and techniques described in this bulletin.

Sigma-Aldrich provides the special equipment needed for handling these deposit containers and their contents. A complete and detailed listing of equipment is furnished in the Appendix of this bulletin.

Figure 1.
Pure-Pac II Containers



Components

All Pure-Pac II Containers are 304 Stainless Steel with Simriz® gaskets and seals.

Size	Tare Weight (lbs)	Height (inches)	Width (inches)
20 L	16	20	11
50 L	31	23	16
200 L	99	38	24

Figure 2.
Pure-Pac II Container Cutaway



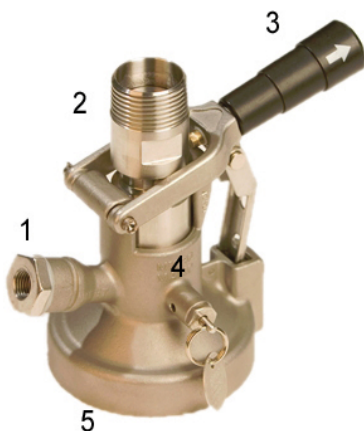
Equipment Required For Dispensing

(See Appendix for Dispensing kits)

- Micromatic MacroValve coupler
- Transfer line to connect the MarcoValve coupler and the process vessel/analytical instrumentation
- Inert gas supply (nitrogen or argon)
- Grounding Strap (Catalog Numbers Z197866, Z197904, or Z197912, see Appendix)
- Optional - level sensor available for 50 L and 200 L sizes

Figure 3.

Micromatic MacroValve Coupler



- 1 Nitrogen Inlet
- 2 Solvent Outlet
- 3 Coupler Handle
- 4 Pressure Relief
- 5 Extractor Valve Connector

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Caution: Due to the hazardous nature of many of the products packaged in the Pure-Pac II containers, all users must read this bulletin carefully and completely before starting any actual laboratory/production work. If unsure of any of these procedures or need assistance, please contact Sigma-Aldrich prior to use.

Storage/Stability

Store the Pure-Pac II containers upright under positive nitrogen pressure in a well-ventilated area out of direct sunlight. Refrigerate when necessary. Any chemical residue on the outside or on top of the container must be removed. Failure to remove the chemical residue from the exterior of the container can result in damage of the container. The Pure-Pac II container must be clearly labeled with the product name and hazard labels. Please do not mark directly on the Pure-Pac containers. Use tags or place labels on the plastic sleeves to label as partial or empty.

Procedure

Upon receiving a Pure-Pac II container, reading and closely following the transfer procedure described in this bulletin, regardless of the quantity needed or the chemical transferred, is recommended. Since the products packaged in Pure-Pac II containers are typically sensitive to external contamination, highly hazardous, and may be reactive or sensitive to water, oxygen or both, they must be handled while using appropriate personal protective equipment and must never be exposed to the atmosphere.

The user must be a fully qualified and experienced laboratory or chemical production worker to handle these reagents without problems. All users must be aware of the very hazardous nature of many of these products. The Material Safety Data Sheet (MSDS), which is provided with each order, must be read and understood by the user prior to starting any work with the product contained in a Pure-Pac II container. In general, handle only under an inert atmosphere and exercise caution to prevent inhalation of vapors or direct contact with the skin. Operators must wear appropriate personal protective equipment throughout the entire transfer procedure.

During all nitrogen-pressure transfers, the flowing liquid can generate a static charge. Therefore, the container and receiver must be connected to a suitable ground (Catalog Numbers Z197866, Z197904, or Z197912, see Appendix).

Technical experts are available by telephone to answer questions regarding the proper handling of products in Pure-Pac II containers. Contact Sigma-Aldrich immediately at 1-800-213-1206 if an inadvertent deviation from the recommended transfer procedure occurs during use of a Pure-Pac II container.

Assembly of MacroValve Coupler Dispensing Kit

(Catalog Number Z566039, 3/8-inch tube fitting kit and Catalog Number Z566020, 1/2-inch tube fitting kit, see Appendix)

1. Wrap all male-NPT threads with PTFE sealing tape. This will help seal the threads between the pipe thread fittings. The sealing tape should be wrapped tight and running in the same direction as the threads, so that the turning motion of the joining pipefitting follows the tape winding direction. This will keep the tape from unraveling during tightening.
2. Thread and tighten the 1-inch male-NPT connection on the MacroValve coupler to the 1-inch female-NPT × 1/2-inch female-NPT reducing coupler.
3. Thread and tighten the 1/2-inch male-NPT × 1/2-inch female-NPT street elbow into the reducing coupler.
4. Thread and tighten either the 1/2-inch male-NPT × 3/8-inch tube fitting or 1/2-inch male-NPT × 1/2-inch tube fitting into the street elbow.
5. Thread and tighten the 1/4-inch male-NPT × 1/4-inch hose barb into the nitrogen inlet on the MacroValve Coupler.

Transfer Procedure

1. Place the Pure-Pac II container in a secure and upright position in a safe and well-ventilated area. If the product is to be delivered by weight, secure the container on a floor scale.
2. Ground the container using an appropriate grounding strap (Catalog Numbers Z197866, Z197904, or Z197912, see Appendix).
3. Remove the protective cap on the extractor valve.
4. Connect a suitable nitrogen line to the nitrogen inlet on the MacroValve Coupler. Make sure the nitrogen source is turned off.
5. Connect the liquid transfer line to the outlet port on the coupler. Verify the process vessel or analytical instrumentation is prepared for the transfer and the in-line valve is closed.
6. Make sure the coupler handle is in the top (up) position, and the handle is in the inward orientation with the pin on the end of the handle fully extended out (see Figure 4). Align the coupler notched key with slots on the extractor valve and place the coupler on top of the extractor valve. The coupler should sit flush on top of the extractor valve (see Figure 5). Turn the coupler clockwise approximately 1/6 of a turn until it can go no further (see Figure 6).

Note: There should be no resistance in turning the coupler. If any resistance is noted, please remove coupler and ensure coupler handle is completely in the up position.

Figure 4. MacroValve Coupler with the handle in the inward orientation with the pin on the end of the handle fully extended out



Figure 5. Alignment of the coupler notched key with extractor valve



Figure 6.
Rotation of Coupler



7. Once the coupler is completely rotated into position, engage the coupler by pulling the handle outward while pushing down (see Figure 7). When the coupler is engaged correctly, the handle will lock into position in the inward orientation and the pin connected to the handle should audibly click into the locked position, thus preventing anyone from inadvertently disconnecting the coupler. The system is now opened.

Caution: The handle cannot be pushed down if the coupler is incorrectly connected to the extractor valve. If excessive force has to be applied, return to step 4.

Caution: The Pure-Pac II container has a slight positive pressure. Material will begin to flow through the coupler once it is engaged on the extractor valve.

Figure 7.
Engaging the coupler



8. Turn on the nitrogen source to begin pressurizing the Pure-Pac container. The pressure should be regulated to 5 psig.
Caution: A properly functioning regulator must be used with the inert gas supply. The pressure should not exceed 12 psig.
9. Open the in-line valve on the liquid transfer line to begin transferring the liquid.
10. When the desired amount of liquid has been transferred, close the in-line valve on the liquid-transfer line and the valve on the nitrogen source.

Removing the Coupler

1. Close the nitrogen source to the coupler and the in-line valve on the solvent transfer line.
2. Pull the handle on the coupler outward. The handle will be forced to the up (closed) position (see Figure 8). There should be an audible click and the pin connected to the handle should pop out when the handle is in the inward orientation and fully up (closed) position. The system is now closed.
Note: Do not attempt to rotate or remove the coupler until the handle is in the fully up (closed) position). The coupler should rotate freely once the handle is fully disengaged.
3. Turn the coupler counterclockwise (see Figure 9) and remove it from the Pure-Pac container.
Caution: The liquid-transfer line may still contain hazardous material. Always wear the proper protective equipment when handling the materials packaged in the Pure-Pac containers.

Figure 8.
Disengaging the handle



Figure 9.
Removal of Coupler



Servicing/Cleaning the Coupler

Caution: The MacroValve Coupler may still contain hazardous material. Always wear the proper protective equipment when handling the materials packaged in the Pure-Pac containers.

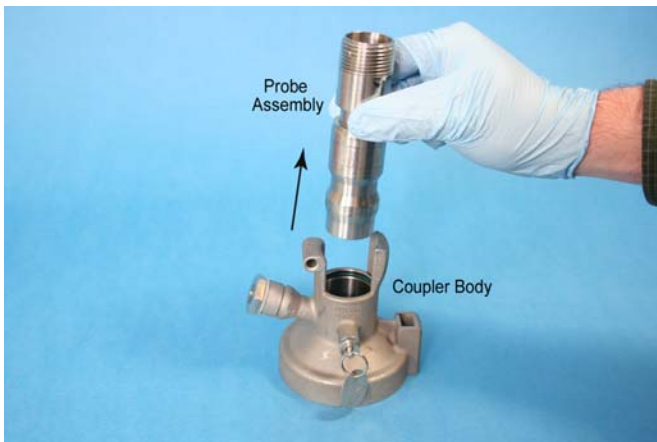
1. Remove hinge pin from coupler.



2. Pull handle assembly away from coupler.



3. Pull the probe assembly and coupler body apart from each other.



4. Inspect the two O-rings from inside coupler body. Replace the O-rings if they are damaged or worn. Do not use a lubricant on the O-rings. This could affect the quality of the solvent.



5. Inspect the main gasket. Replace the gasket if it is damaged or worn. Do not use a lubricant on the gasket. This could affect the quality of the solvent. **Note:** Proceed to step 6 if the coupler needs to be completely cleaned. Otherwise, skip to step 11.
6. Remove NRV seal from probe. Once the seal is removed, the NRV spring can be removed. **Caution:** The probe may still contain hazardous material. Always wear the proper protective equipment.



7. Clean the NRV and probe with the appropriate solvent.
8. Dry the NRV and probe.
9. Replace the NRV seal. The seal must be secured over the groove for proper installation.



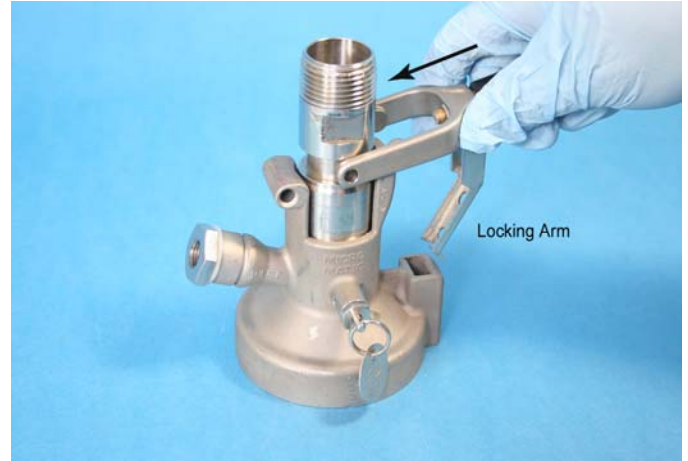
10. Place the NRV seal assembly on the NRV spring. Press firmly into the probe until the seal locks into place.



11. Reinstall the probe assembly into the coupler body. Do not use a lubricant on the probe. This could affect the quality of the solvent.



12. Reinstall the handle assembly into the coupler body. Ensure that the locking arm is in the locking arm guide.



13. Replace the hinge pin.
Note: Lock hinge pin securely.



Replacing the Pressure Relief Valve from the Coupler

1. Remove the coupler from the Pure-Pac II container.
2. Loosen the relief valve with a wrench. Unthread the relief valve from the coupler body.



3. Thread in the new relief valve and tighten with a wrench.

Container Return

To return a Pure-Pac container to Sigma-Aldrich, the container must contain residual product only with the MacroValve Coupler detached. Any chemical residue on the outside of the container must be removed. Failure to remove chemical residue from the exterior of the container can result in damage to the container and may lead to the loss of the deposit. Empty Pure-Pac containers contain product residue, which is fully regulated as hazardous material and must be shipped in accordance with all applicable shipping regulations. Please do not mark directly on the containers or place any additional labels on the containers. Use tags or place labels on the plastic sleeve to label as empty and as needed for shipping purposes.

Return empty Pure-Pac II containers to:

Sigma-Aldrich Returns
5485 County Road V
Sheboygan Falls, WI 53085-2814

Sigma-Aldrich has teamed up with Unishippers to provide an easy and straightforward option for returning empty Pure-Pac containers. To set-up an Unishippers account and to schedule a pick-up, please visit: sigma-aldrich.com/cylinderreturn.

Pure-Pac is a registered trademark of Sigma-Aldrich Co. LLC.

Simriz is a registered trademark of Freudenberg-NOK. Swagelok and SNOOP are registered trademarks of Swagelok Co.

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Appendix

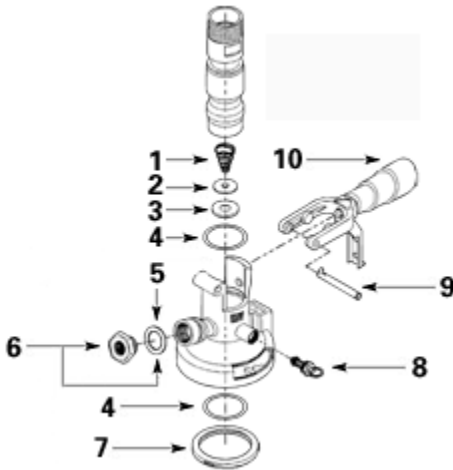
Pure-Pac II Dispense Coupler Kits - Z566020, MacroValve Coupler with 3/8-inch tube fitting and Z566039, MacroValve Coupler with 1/2-inch tube fitting

MacroValve Coupler Kit Components

Catalog Number	Description
Z560723	MacroValve Coupler
Z562300	Reducing Coupler 1-inch female-NPT × 1/2-inch female-NPT
Z562319	Street elbow 1/2-inch male-NPT × 1/2-inch female-NPT
Z263532 or Z263567	3/8-inch tube fitting × 1/2-inch male-NPT or 1/2-inch tube fitting × 1/2-inch male-NPT
Z565547	1/4-inch male-NPT × 1/4-inch hose ID
Z104388	PTFE sealing tape



MacroValve Replacement Parts



Item	Catalog Number	Description
1	Z569070	MacroValve Dry Break NRV Spring for the Pure-Pac II MacroValve Coupler
2	Z569089	MacroValve NRV Spring Retainer for the Pure-Pac II MacroValve Coupler
3	Z569097	MacroValve Probe Seal, FFKM for the Pure-Pac II MacroValve Coupler
4	Z569100	MAV coupler probe O-Ring, FKM for the Pure-Pac II MacroValve Coupler
5	Z569119	Nylon Washer for the Pure-Pac II Macro Valve Coupler
6	Z569127	MacroValve Thread Adaptor Assembly for the Pure-Pac II MacroValve Coupler
7	Z569135	MacroValve Main Gasket, Viton for the Pure-Pac II MacroValve Coupler
7	Z569143	MacroValve Main Gasket, FFKM for the Pure-Pac II MacroValve Coupler
8	Z569151	MacroValve PRV Assembly, Viton 12 PSIG for the Pure-Pac II MacroValve Coupler
9	Z569178	MacroValve Handle Hinge Pin for the Pure-Pac II MacroValve Coupler
10	Z569186	MacroValve Pull Handle Assembly for the Pure-Pac II MacroValve Coupler

Quick-Connect Stem

Catalog Number	Description
Z566055	Swagelok® PTFE-sealed quick-disconnect stem NPTM 1/4 inch (Swagelok part number SS-QTM2-D-4PM)
Z562289	Swagelok PTFE-sealed quick-disconnect stem NPTM 3/8 inch (Swagelok part number SS-QTM2-D-6PM)
Z568465	Swagelok PTFE-sealed quick-disconnect stem NPTM 3/8 inch (Swagelok part number SS-QTM4-D-6PM)
Z562327	Swagelok PTFE-sealed quick-disconnect stem NPTM 1/2 inch (Swagelok part number SS-QTM8-D-8PM)

Quick-Connect Body

Catalog Number	Description
Z566101	Swagelok PTFE-sealed quick-disconnect stem tube insert size 1/4 inch (Swagelok part number SS-QTM2A-B-400)
Z562343	Swagelok stainless steel PTFE-sealed quick-connect reducing adapter (Swagelok part number SS-QTM4A-B-600)
Z562351	Swagelok stainless steel PTFE-sealed quick-connect body NPTM 1/2 inch (Swagelok part number SS-QTM8A-B-810)

Honsberg Level Sensor Display (Catalog Number Z562378) - For use with optional Pure-Pac II level sensor. Displays the volume or % remaining in the Pure-Pac II.



Micromatic MacroValve Flushing Adapter (Catalog Number Z566128) - Allows nitrogen to be flushed through the MacroValve Coupler and the solvent transfer line when they are disconnected from the Pure-Pac II container.



Grounding Straps - Prevents sparking of static electricity generated by the transfer of flammable liquids.

Description	Catalog Number
3 ft L, 2 copper alligator clips	Z197866
3 ft L, with 2 hand clamps	Z197904
10 ft L, with 1/4-inch terminal and hand clamp	Z197912



PTFE Sealing Tape - Eliminates the need for lubricants and vacuum greases on ground-glass joints, desiccators, bell jars, etc. Provides a vacuum-tight seal, yet will release readily even after long periods of time. Roll size is 520 inches.

Description	Catalog Number
1/4 inch wide	Z148814
1/2 inch wide	Z104388
1 inch wide	Z221880



SNOOP® gas leak detector (Catalog Number Z273910) - Nontoxic, nonflammable and leaves no residue. 8-oz. squeezable bottle with tube extendable to 12 inches for reaching places with limited accessibility.

Transfer Lines, PTFE with Stainless Steel Braid

Description	Catalog Number
Length 4 ft, endfitting size 1/4 inch, hose I.D. 1/4 inch	Z562394
Length 8 ft, endfitting size 1/4 inch, hose I.D. 1/4 inch	Z562408
Length 4 ft, hose I.D. 3/8 inch	Z263591
Length 8 ft, hose I.D. 3/8 inch	Z263605
Length 4 ft, endfitting size 1/2 inch	Z263613
Length 8 ft, endfitting size 1/2 inch	Z263621
Length 10 ft, hose I.D. 1 inch	Z282707

