

## GREATEST VALUE, STRONGEST FLUSH!

- The industry standard for flushing refrigeration and air conditioning systems
- Ideal for system clean-up after burnouts
- Cleaning is fast, efficient and verifiable
- Flush line sets for R-410A conversions
- This solvent is approved as part of the U.S. EPA's Significant New Alternatives Policy (SNAP) Program

### Description

Rx11-flush is a unique solvent that has been engineered for flushing refrigeration and air conditioning systems. Its patented HFC based solvent formulation is powerful enough to flush away sludge, carbon residue, oils, acids, water and other particulate. This makes it ideal for system flushing after burnouts, retrofits and for flushing line sets for R-410A conversions. It is non-toxic, non-flammable and is non-ozone depleting.

### Application

From time to time, refrigeration and air conditioning systems suffer failures which result in contamination. The most common such failure is a compressor burnout. During such an event, the refrigeration system becomes contaminated with large quantities of unwanted particulate, sludge, acids, carbon residues and possibly moisture. All of these contaminants must be removed before the system can be returned to duty.

In earlier years, these systems were flushed with the popular CFC-based solvent R-11, a material that was favored because it was safe to use, cleaned efficiently and was easily

## Total System Protection

### Rx11-Flush



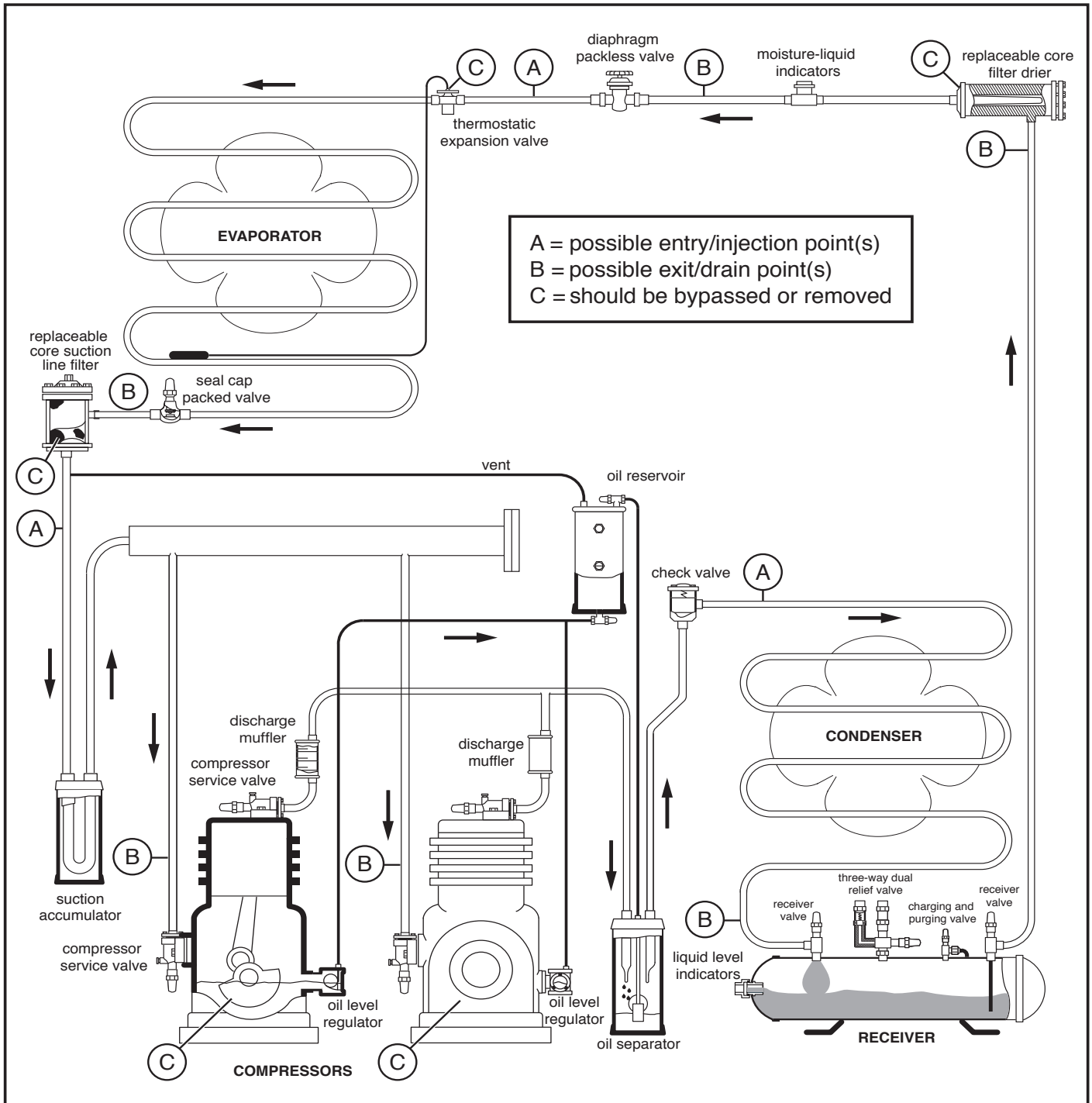
removed from the system. Unfortunately, R-11 was a major ozone-depleter and was gradually phased out of production.

Enter Rx11-flush, pioneered within cutting edge HFC technology. It offers all of the benefits of R-11 without the environmental concerns. It is a powerful cleaner, stronger than R-11 ever was, and it is the best prescription to effectively scrub the inside of the refrigeration system. It dries quickly, has a low boiling point, will not attack components, offers great worker safety ratings and is affordable.

Additionally, with the advent of 13 SEER equipment and the retrofit to R-410A equipment, Rx11-flush is the ideal solution for line sets. Simply put, they can be flushed.

### Features and Benefits

- Safer, non-toxic and non-flammable
- Used the same way as R-11
- Low boiling point enhances complete evaporation
- Can be used for new system cleaning, retrofits, and flushing line sets or after burnouts
- All packages are pressurized for easy application



### GENERAL GUIDELINES

1. Use only the appropriate refrigerant, proper recovery equipment, component parts, tools and lubricants as established in the industry and as listed in this service bulletin.
2. Do not inject the solvent into the compressor itself; only the supporting refrigeration system should be flushed.
3. Large systems or systems with unusual configurations that could trap the solvent should be disassembled and flushed section by section.
4. The exact amount of Rx11-flush required will vary by the internal design of the system, the nature of the system failure, the degree of contamination trapped in the system, and the temperatures at which the failure occurred.
5. If the system to be flushed includes larger components such as a receiver we recommend a visual inspection. If these components appear to be contaminated, and are small enough to be flushed with Rx11-flush, then do so. If they are too large to economically flush with Rx11-flush, then the use of a traditional degreasing solvent, such as Degreasing Solvent ef (Part No. 4162-07) should be considered for them.
6. **DANGER:** Never connect this canister to nitrogen via manifold sets or other charging hoses! Failure to insure system is free of pressure when injecting Rx11-flush may cause the can to burst and result in injury.

## Equipment Required

The following equipment will be required for each flushing operation:

1. Rx11-flush: The amount of Rx11-flush needed to adequately clean and flush the system will vary due to oil load, line configuration, etc. However, in typical applications, the following guidelines can be followed. 1 lb. canister will flush 3-4 ton systems, 2 lb. canister will flush 5-7 ton systems, and 13 lb. cylinder will flush up to 50 ton systems.
2. An Injection Valve (Part No. 4300-89)\* and standard refrigerant charging hose to inject the solvent into the AC/R system. The charging hose and injection valve should be dedicated and retained for future flushing.
3. A small, re-sealable, waste container that will hold the solvent after it is flushed through the system. Ideally
4. the solvent in the container must be visible so it can be inspected during the flushing process. This enables a technician to determine when the solvent begins to run clean, indicating that the system has been thoroughly purged.
4. A tank of clean compressed nitrogen, regulated to 120 psig. This tank should be equipped with a dispensing hose and will be used to purge the solvent from the system.
5. A vacuum pump with the appropriate hoses and clamps.
6. Safety equipment: Never flush a system without adequate face protection and rubber gloves. Convoluted piping in certain systems can cause momentary spikes in the solvent flow during the flushing process, resulting in erratic purges, which can splash into eyes and onto skin.
7. Adequate ventilation.

## Instructions To Flush System After Burnout

1. Confirm you have all the required components for the service as well as for the flushing operation prior to beginning.
2. If system is still operational, remove the existing refrigerant and lubricant using the appropriate methods and recovery equipment.
3. Review the configuration of the system. On larger systems, disassemble sections of the system so those individual portions can be cleaned section by section.
4. De-energize all of the electrical leads and ensure they are safely positioned. Remove the following components:
  - a) Disconnect the old compressor and remove it from the system.
  - b) Remove filter driers. If it is easier or more cost-effective, install a by-pass loop around the filter drier accumulators, etc.
  - c) On heat pumps, remove check valves and four-way reversing valves. Again, configure and install by-pass loops if desired.
5. Connect a waste container to a discharge port to capture the contaminated flushing solvent. As this solvent exits the system, it will contain oils, condensed water, acids, particulate and possibly other mechanical residues. While not normally hazardous, such residues need to be captured for proper disposal.
6. Crimp or restrict the discharge port to increase the mass flow and contact time of Rx11 through the lines. Connect your charging hose onto the system to be flushed. Make sure openings upstream are closed, except discharge port. Connect the Injection Valve\* to the Rx11 canister. When ready to inject Rx11-flush, connect the canister to the charging hose and open valve. The Rx11 will start entering the system.
7. Depending on the size of the system, ambient temperature & oil load, the time to adequately flush the system can vary. To ensure a proper flush, be sure the solvent flowing out of the exit point is clear and free of contaminants. If dirt remains, continue flushing until clear. If entire canister of solvent is not used for initial job, the remaining solvent can be used later. Note: The canister has been designed to empty itself completely only when the canister is standing in an upright position. Do not attempt to flush the system with a canister inverted or on its side.
8. Using the compressed nitrogen tank, connect the nitrogen tank to the system and inject it into the system behind the Rx11-flush solvent. Try to achieve a pressure of 120 psi with the nitrogen. The nitrogen will push the solvent through the entire system, agitating it and "scrubbing" the inside of the system. Eventually, all of the solvent will flow into the waste container at the drain port. DANGER: Insure the Rx11-flush canister is not connected to the nitrogen purge.
9. Observe the solvent being captured by the receiving container. If it is running clean and clear, the system has been successfully flushed. If the solvent is murky or still containing particulate, flush again.
10. Make your repairs. Remove any by-pass loops you installed. Tie-in the expansion devices. Replace the filter/driers. Secure the system.
11. Evacuate the system to a low micron pressure range with the vacuum pump and leak-check the system. This will evacuate any residual liquid solvent from the system. As the internal pressure drops, the solvent will boil into vapor and be removed from the system. Time for pulling the vacuum should be approximately fifteen minutes for a five-ton system.
12. As a final step, recharge the system with refrigerant and lubricants as recommended by the compressor or equipment manufacturer and the system instructions. Reconnect electrical and electronic connections. Test the operation of the system. Wipe down the system, leaving the work area neat and clean.



\*The Injection Valve (4300-89) is equipped with an audible pressure relief alarm that will sound if canister is inadvertently connected to a source of high pressure. If alarm sounds, immediately disconnect hose from source of high pressure. The valve is set to factory specs and should not be adjusted.

## Instructions to Flush Line Sets

1. Establish one end of the line set as the exit point.
2. Crimp or restrict the exit point. This will increase the mass flow and contact time of Rx11-flush through the line.
3. The amount of Rx11-flush needed to adequately clean and flush a line set will vary due to oil load, line configuration, etc. However, in a typical application, the following guide can be followed:
  - Up to 1/2" tubing: Use a 20-30 second burst of Rx11-flush through each line for every 50 feet. Use a 7-10 second burst with 13 and 26 pounders. This would represent a typical residential retrofit or flushing, and the popular 2 lb. canister of Rx11-flush can be expected to flush 8-10 lines or 4-5 line sets.
  - Up to 7/8" tubing: Use a 60-90 second burst of Rx11-flush through each line for every 50 feet. Use a 20-30 second burst with 13 and 26 pounders.
4. Follow the Rx11-flush with compressed nitrogen (120 psig) to increase mass flow for maximum cleaning power. The nitrogen will push the Rx11-flush along with the emulsified soils through the line. DANGER: Insure the Rx11-flush canister is not connected to the nitrogen purge.
5. Pull a vacuum on the line set to remove any residual solvent. Under vacuum, Rx11-flush rapidly boils off.

The line set will be clean and ready for service

## Safety and Additional Points

1. The waste solvent will contain used oils and other organic contamination. Pour the contaminated solvent into a waste oil drum for proper disposal. If the solvent needs to be transported, care should be taken to ensure the container is properly sealed to prevent spillage.
2. If an additional Rx11-flush is required to fully purge a larger system, you do not need to disconnect the Rx11 Injection Valve from the refrigeration system. Simply close the valve and remove it from the first Rx11-flush canister. Replace it with a new canister to continue flushing.
3. DANGER: Never connect this canister to nitrogen via manifold sets or other charging hoses! Failure to insure system is free of pressure when injecting Rx11-flush may cause the can to burst and result in injury.
4. Do not smoke or use an open flame around these materials.
5. Adequate ventilation is highly recommended, particularly in equipment rooms.
6. Use gloves and full face protection.

## Packaging

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|------------------------|--|
| 1 lb. Canister:        | <b>4300-09 (flushes 3-4 tons)</b>      |
| 2 lb. Canister:        | <b>4300-11 (flushes 5-7 tons)</b>      |
| "2+1" Display Pack:    | <b>4300-10 (flushes 14 tons)</b>       |
| 13 lb. Cylinder:       | <b>4300-15 (flushes up to 50 tons)</b> |
| 26 lb. Cylinder:       | <b>4300-26 (flushes over 50 tons)</b>  |
| Starter Kit:           | <b>4300-08</b>                         |
| Flushing Tool:         | <b>4300-50</b>                         |
| Rx11-flush Gun:        | <b>4300-51</b>                         |
| Rx11-flush Hose (24"): | <b>4300-52</b>                         |
| Injection Valve:       | <b>4300-89</b>                         |

