

R-410a (Puron, Prozone, AZ-20)

R-410a is a recent invention which is a hydrofluorocarbon (HFC) refrigerant. HFC's contain no chlorine and as such, will not destroy the ozone layer like hydrochlorofluorocarbons (HCFC's).

R-22, the most popular air conditioning refrigerant in recent memory, is a HCFC. It will no longer be used in the manufacture of air conditioning systems produced in the U.S. and many other countries beginning in 2010.

R-410a is emerging as the replacement refrigerant. It is not however a drop-in replacement for R-22. Systems intended to utilize HFC instead of HCFC refrigerants must be designed for HFC.

Systems employing R-410a instead of R-22 will operate at higher pressures and use POE oil which is not compatible with the mineral oil used in R-22 systems.

Other R-410a considerations:

- Be sure that servicing equipment and replacement components are designed to operate with R-410a
- R-410a refrigerant cylinders are **rose colored**.
- Use dry nitrogen to flood systems while brazing to prevent the formation of copper oxide inside the piping.
- Recovery cylinder service pressure rating must be 400 psig, DOT 4BA400 or DOT BW400.
- R-410a systems should be charged with liquid refrigerant. Do not put liquid into the suction line without first running it through a metering device. Compressor damage may result.
- Manifold sets should be 700 psig high side and 180 psig low side with 550 psig low-side retard. Use hoses with 700 psig service pressure rating or higher. Some manufacturers specify 800 psig hoses and gages. Do not use the same manifold set on systems which use mineral oil, such as CFC and HCFC systems..
- R-410a is only compatible with POE oils.
- Leak detectors should be designed to detect HFC refrigerant.
- Do not use liquid-line filter driers with rated working pressures less than 600 psig.
- POE oils absorb moisture rapidly. Do not expose oil to the atmosphere.
- Vacuum pumps will not remove moisture from oil so don't leave the system open to the atmosphere.
- POE Oils **may cause damage** to certain plastics and roofing materials. Some plastic condensing unit pads may be vulnerable to POE oils.
- Wrap all filter driers and service valves with wet cloth when brazing. Do not use soft solders.
- A factory approved liquid-line filter drier is required on every unit.
- Do not use a R-22 TXV on a R-410a system. If indoor unit is equipped with an R-22 TXV, it must be changed to a R-410a TXV.
- Never open system to atmosphere while it is under a vacuum. Relieve a vacuum with pressure regulated dry nitrogen.

- Prior to opening a system after making a repair, evacuate to 500 microns.
- Do not vent R-410a into the atmosphere - it is illegal.
- Do not use piston or capillary tube coils unless the coil was specifically designed to utilize R-410a.
- Read, understand, and observe all warnings, cautions, and bold text in the manufacturer's instructions.
- According to **some** major manufacturers, if you have a leak in a R-410a system you can "top off" the charge with liquid. Any fractionation caused by molecules of the different refrigerants leaking at differing rates has been found to be insignificant. Follow the manufacturer's instructions for the system you are working on.
- R-410a systems operate at higher pressure than R-22 systems.
- Follow all manufacturer's instructions and cautions.

Seminars Coming Soon

- *Critical Charging*
- *TXV Operation & Troubleshooting*
- *R-410a Certification*
- *EPA Refrigerant Certification*
- *Electric Meter Use In HVAC/R*
- *ECM Motor Service*
- *Compressor Diagnostics*
- *Venting System Design*
- *Basic Electricity I & II*
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- *Heat Pumps*
- *Hot Water Boilers*
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- *Oil Burners*
- *Steam Boilers*
- *Michigan Commercial Energy Code*
- *Rooftop Unit Service*
- *Hot Surface & Spark Ignition Systems*
- *Gas Heating Service Basics*

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For current HCFC phase-out information follow the link below:

www.epa.gov/ozone/title6/phaseout/hcfc.html

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