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TO: All York Guardian Branch Service Managers
All York Guardian Technical Service Managers
All Regional Sales Managers

SUBJECT: Oil Differences & considerations for HCFC'S (R22) & HCFC'S (R410A, R407C, etc.)

In the coming months Johnson Controls Unitary Products will be making compressor changes to our residential A/C dry ship condensing units (heat pumps are excluded at this time). The current compressors utilizing mineral oil will be replaced with compressors that utilize POE oil. This change is being made for two key reasons: 1) To support further consolidation of the remaining R22 service components and 2) Improved system reliability as POE oil has improved miscibility and viscosity when compared to mineral oil particularly when used in retrofit applications.

IMPORTANT:

Johnson Controls Unitary Products has always recommended installing matching certified indoor and outdoor units. With approved matched indoor and outdoor units, that will provide maximum efficiency, optimum performance, and better overall system reliability.

Mix and matching equipment will not automatically void the product warranty if guidelines in this document are followed. However, if the application is determined to be the cause of component failure, JCI reserves the right to void warranty on the product affected.

HEAT PUMP SPLIT SYSTEMS SHOULD ONLY BE INSTALLED AS A MATCHED SYSTEM.

As available supplies of virgin R22 continue to constrict in the United States (due to EPA mandated reductions agreed to in the Clean Air Act and Montreal Protocol) and prices to continue to escalate, Johnson Controls Unitary Products is publishing this service tips letter in regards to questions concerning so called "drop-in" or "alternative" refrigerants currently available in the market.

Dry ship, "AC only" condensing will begin shipping with "factory supplied" POE refrigeration oil in the coming months. As stated above, this change is being made to support further consolidation of legacy R22 components as well as provide for improved system reliability when applied in R22 retrofit applications. These compressors are manufactured for R407C, which are capable of utilizing either R22 or R407C refrigerant with POE oil and are warranted for either refrigerant. It is important to note that Johnson Controls Unitary Products limits its AHRI performance and technical information to R22 only; no support information is being supplied for any other "drop-in" or "alternative" refrigerants at this time. Many readily available "drop-in" (R438A, R442B, etc.) application data requires the addition of some POE oil (~10 – 20% minimum) to ensure adequate oil return in certain retrofit applications.

When changing out an existing R-22 condensing unit to a new dry charge R22 unit which contains POE oil, the following system considerations must be adhered to in order to be successful:

1. As with any retrofit installation, if the existing line sets are utilized they should be purged with high volumes and high pressures of dry nitrogen. If the system has long line sets greater than 75', a flushing agent may be used to reduce the percentage of mineral oil; a minimum of 20% POE is required in the system (by volume) and higher concentrations (up to 95%) are preferred.(the more mineral oil removed the better)
2. A new drier **must** be installed as POE oil is very hygroscopic and is also a substantially better solvent than mineral oil when mixed at concentrations above ~ 40%.
3. In long line set applications above 75', the traps may be cut out and replaced with plain ells as the POE oil has improved miscibility and viscosity compared to mineral oil and travels differently with this refrigerant.
4. Existing R-22 txvs will typically work with most R22 replacements (such as R407C, R438A, R422B, etc.), however system capacities will be slightly different and some adjustment may be required if such refrigerants are used. Recall that Johnson Controls Unitary Products will only support performance data for R22 systems. The contractor should use a psychometric analysis to figure true capacity with known airflow.
5. Replace critical elastomeric seals and gaskets commonly found in vales, Schrader cores, etc. particularly on the high side liquid portion.

Please contact Technical Services should you have any further questions regarding this topic.

FAQs

1) Why is Johnson Controls Unitary Products making this change?

To support further consolidation of legacy R22 components as well as provide for improved system reliability when applied in R22 retrofit applications.

2) Are the warranty terms or process changing on the “dry charge” products with the change to POE oil?

No. The existing terms and process do not change.

3) What if I use another refrigerant besides R22? Does that affect my warranty?

These compressors are warranted to work with either R22 or R407C only. Johnson Controls Unitary Products will only provide AHRI performance and technical support for R22. It is important to note that there are no AHRI listings for R407C at this time.

4) Is it acceptable to mix POE and mineral oil?

A minimum of 20% POE is required in the system (by volume) and higher concentrations (up to 95%) are preferred.

5) Why is Johnson Controls Unitary Products not approving some of the drop in alternatives such as MO-99 (R438A) and NU-22B (R422B) like some of the other manufacturers?

Compressor manufacturers do not endorse the use of these drop-in alternatives, as they could result in shorter compressor life, particularly with the use of mineral oil. Thus Johnson Controls Unitary Products does not warrant products with the use of the above refrigerants.

6) How will I know if I have a unit charged with POE oil?

By looking at the compressor model number and the addition of a label stating “Compressor Contains POE Oil” which will be located adjacent to Nitrogen Charged label on the equipment cover plate. The technical guides and installation manuals will also make reference to the POE oil.

7) Why are the dry charge heat pumps not being converted to POE oil?

Johnson Controls Unitary Products is performing additional testing to confirm performance and reliability with heat pumps which pose a greater failure risk due to their inherent nature of operation thus there is currently no date of commitment for this conversion to occur.

8) Why are the Source 1 aftermarket parts also changing to POE oil compressors? Will the existing Source 1 mineral oil compressors be discontinued?

Manufacturers of all types of R22 components (compressors, valves, controls, etc.) have been and will continue to consolidate their R22 offering, By consolidating their dry charge R22 compressor offering into a POE oil offering; the products are able to be applied to a wider range of equipment applications both domestically and internationally.

9) What if an installer is not able to obtain R22 (virgin or reclaim) and is forced to install one of the so-called “drop-ins”? Which drop-in would Johnson Controls recommend?

Johnson Controls Unitary Products does not support any of the alternative, drop-ins previously mentioned as we recommend and warrant AHRI matched systems only. However if an installer chooses to utilize such “drop-in’s” they assume the warranty risk. In such cases, the installer should follow the refrigerant manufacturer’s directions and application instructions for retrofitting R22 systems, which may require the addition of POE oil as well as other measures.

10) In condenser high applications lower components within the system must be proven to be free of mineral oil, traps, coils, underground piping, etc.

Johnson Controls Unitary Products recommends the removal of underground piping due to trapping of previous mineral oil. In systems where this is impractical high volumes of nitrogen at high pressures (up to 400psig) may be required to remove any trapped oil within these types of piping systems. Lower elevation evaporators may also trap oil in concentrations that will create issues with this type of change out so purging for up to two to three minutes at these pressures may be required to remove these quantities of leftover mineral oil.

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