



TECHNICAL BULLETIN

January 1, 2025

Reference Subject: R410a systems with TXV/EEV metering devices when retrofitting to RS-53 (R470A) refrigerant:

Note: R410a systems with a capillary tube metering device will perform similar with RS-53 (R470A) with no adjustments or component changes.

To attain proper superheat control when using RS-53 in R410A systems regulated by TXVs or EEVs the following recommendations should be adhered to:

1. TXV Systems:

Because RS-53 operates at a lower pressure than R410A at the evaporator outlet the recommended solution is to install an R22 TXV. The R410A TXV will result in overfeeding the evaporator, which can cause:

- Flooding of the evaporator with refrigerant, reducing capacity.
- Excess refrigerant flow, making superheat control difficult.

These issues are eliminated with a R22 TXV, as RS-53 behaves similarly to R22 in the low-pressure section of the system. Alternatively, an R407C TXV can also be used, as its characteristics are similar to those of an R22 TXV.

2. EEV Systems:

- For the system to operate correctly, if the EEV software allows, enter the Antoine Equation Coefficients for RS-53. If not, the best option is to select the Antoine Equation Coefficients or setting for R22 or R407C configuration.

Regarding the high-pressure side, RS-53 condenses at a higher pressure than R410A, meaning sufficient condensing capacity is provided during summer operation.

In field tests, RS-53 has performed well in VRF systems without any modifications. Based on these tests, our recommended retrofit strategy from R410A to RS-53 is:

1. First, test RS-53 without making any system changes.
2. If superheat control issues arise, replace the TXV with an R22 TXV.

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