

Reciprocating compressors

Refrigerant and oil compatibility

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Disclaimer: Information given below is a summary of data available in Danfoss literature. For more details, see application guidelines and all relevant document.

Background:

Refrigerant manufacturers are responding to challenges on climate change and global warming by developing new products and Danfoss encourages the further development and application of low-GWP refrigerants.

Reciprocating compressors have been improved and are now approved for use with refrigerant R448A/R449A/R452A, which could replace R404A and R507 in the middle temperature refrigeration application.

A new class of POE oil (175PZ) is being implemented. This new oil is an improvement, to enable the oil (175PZ) to withstand more mechanically demanding and more stressful operations with new refrigerants. The new 175PZ POE oil is totally miscible and compatible with the POE oil previously used.

This modification has no impact on the performance nor the reliability or the operating envelope of the affected compressors, Life tests have been carried out along the same specification for the current version.

The reference of the oil on the compressor nameplate will change as will the reference for ordering a can of oil.

Please refer to following table:

Can	POE 175 PZ
1 liter can	120Z0638
2.5 liter can	120Z0639

After emptying the current stock, this new oil will be available starting in November 2017. The 1 and 2.5 liter cans are already available.

The following tables intends to give you some visibility on the possibilities of retrofit for compressors still in operation, and that do not benefit of recent mechanical and lubrication improvements.

MTZ

Table below is for compressor factory oil charged with POE 160 PZ.

Factory charged oil in the compressor	Original qualified refrigerant in the compressor	Authorized refrigerant if oil changed to POE 175 PZ	Comment
POE 160PZ	R404A / R407F / R407A / R507 / R407C	R404A / R407F / R407A / R507 / R407C / R448A / R449A / R452A	<p>POE 160 PZ and POE 175 PZ are compatible and miscible.</p> <p>For R448A, R449A and R452A, max 20% of residual 160 PZ</p> <p>For R404A, R407F, R407A, R507, R407C, the POE 160 PZ and POE 175 PZ can be mixed in all proportions</p>

Note : with R448A, R449A and R452 A, cooling capacity is slightly reduced (see Coolselector) and COP improved.

For recently released improved products, factory oil charged with POE 175PZ, see table below.

Factory charged oil in the compressor	Original qualified refrigerant in the compressor	Comment
POE 175PZ	R404A / R407F / R407A / R507 / R407C / R448A / R449A / R452A	<p>Compressors with mechanical and lubrication improvement.</p> <p>From 20th Nov. 2017, progressive release of qualified code numbers (1)</p>

(1) For additional information, see Cooling Product Notification FRCC.EN.268.A1.02

NTZ

Table below is for compressor factory oil charged with POE 160 Z/SZ/MPZ/PZ.

Factory charged oil in the compressor	Original qualified refrigerant in the compressor	Authorized refrigerant if oil changed to POE 175 PZ	Comment
POE 160 Z/SZ/MPZ/PZ	R404A / R507	R404A / R507 / R452A	<p>Compressor original code = code A</p> <p>example: NTZ xxx x x x xx A</p> <p>POE 160 Z/SZ/MPZ/PZ and POE 175 PZ are compatible and miscible.</p> <p>For R452A, max 20% of residual 160 Z/SZ/MPZ/PZ</p> <p>For R404A, R507, the POE 160 Z/SZ/MPZ/PZ and POE 175 PZ can be mixed in all proportions</p>

For recently released improved products, factory oil charged with POE 175PZ, see table below.

Factory charged oil in the compressor	Original qualified refrigerant in the compressor	Comment
POE 175 PZ	R404A / R507 / R452A	<p>Compressor original code = code B</p> <p>example: NTZ xxx x x x xx B</p> <p>Compressors with mechanical and lubrication improvement.</p> <p>Progressive release of qualified code numbers (1)</p>

(1) For additional information, see Cooling Product Notification FRCC.EN.210.A1.02, FRCC.EN.222.A1.02, FRCC.EN.222.A2.02

VTZ

Factory charged oil in the compressor	Original qualified refrigerant in the compressor	Authorized refrigerant if oil changed to POE 175 PZ
POE 160 PZ	R404A / R507 / R134a / R407A / R407C / R407F	No refrigerant qualified