



# RETROFIT GUIDE

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**Friedrichs**  
Kältemittel

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# Retrofit Guide

## Identify your refrigerant

Prior to commencing any retrofit works an alternative refrigerant has to be selected. The selection is based on operational parameters as well as system design.

AFK can assist in the selection of the most appropriate refrigerant solution for your system. Either call the team on +49 4185 7001-0 or complete the contact us form on our website [www.afk-hh.de](http://www.afk-hh.de).

## Record operational data

It is recommended that you record the system operational parameters to establish the equipment normal operating conditions. Data should include pressure / temperature measurements throughout the system; including the main compressor suction and discharge along with condenser and evaporator conditions. This information will be invaluable when calibrating the system to the new refrigerant.

## Recover the current charge and record the quantity of refrigerant recovered

The existing charge should be recovered, and its weight recorded. This should be carried out using a suitable recovery machine capable of achieving a good evacuation level to ensure that there is the minimum vapour left in the system. The charge has to be collected in a recovery cylinder for safe and legal refrigerant disposal via an approved route. AFK have a fleet of suitable cylinders. Please note, AFK recovery cylinders are NOT SUITABLE for Ammonia.

## Choose Compressor Lubricant

AFK recommends that you use a lubricant approved by the compressor manufacturer. Check with the compressor manufacturer for the approved viscosity grade of lubricant for the compressor in the system being retrofitted.

## Drain the lubricant and record the quantity of lubricant removed

Drain the compressor of oil lubricant, not forgetting to include the oil separators and/or suction accumulators. Record the volume of lubricant removed from the system. This value will be used as a guide to determine the quantity of lubricant required. Should you need to dispose of recovered oil, AFK offer an oil disposal service.

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## Change Lubricant Filters (if Present)

If the system has oil filters, it is good practice to change these filters at the same time. New filters will help to protect the system and minimize the amount of original oil charge left within the system.

## Recharge Compressor and Components with the Correct Grade Oil

Add to the compressor and oil separator the same correct volume of suitable oil, for example, the volume of the oil drained as described above can be used as a guide.

## Evaluate the Expansion Device

AFK recommends consulting with the equipment manufacturer before carrying out a retrofit. Most expansion valves should operate satisfactorily with the chosen retrofit refrigerant but may require an alternative orifice or changing completely.

## Replace Sealing Devices

If converting from an HCFC there is a requirement to replace all elastomeric ("O" Ring) seals as required. *(This should not be required if changing from a current HFC to an alternative HFC or HFO).*

## Replace the Filter Drier

Following any system maintenance, it is good service practice is to replace the filter drier.

## Check for System Leaks

Check the system for leaks using normal service practices.

## Evacuate the System

Use normal service practices to evacuate the system. To ensure removal of air and other contaminants, it is recommended to evacuate the system to a vacuum level of 2 Torr or better, with the evacuation pump connected to both the high and low pressure side of the system. Attempting to evacuate a system with the pump connected to only the low side of the system does not guarantee complete removal of moisture and other contaminants.

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Use a good electronic gauge to measure the vacuum as standard refrigeration gauge manifolds are not calibrated for this low pressure.

## Charge System with Retrofit refrigerant

When charging the system with the new refrigerant, it is important to note that the majority of retrofit products are blends and not pure single component refrigerants. For this reason, specific charging procedures are required to ensure optimal system performance. It is essential when using any refrigerant from the 400 series, (Zeotropic Refrigerants) that the system be liquid charged. Vapor-charging a 400 series blend can result with an inaccurate refrigerant composition and may damage the system. AFK cylinders are equipped with a dual port valve to simplify liquid charging.

**NOTE:** To prevent compressor damage, do not charge liquid into the suction line of the unit.

AFK recommend initially charging the system with 90-95% by weight of the original charge.

## Check System Operation

Start the system and let conditions stabilise. Compressor suction saturation pressures for the new refrigerant after stabilisation may not be similar to that of original operating conditions. Compressor discharge pressures may differ from the original operation. The condenser fan and ambient controls may require adjustment. It may be necessary to reset the high pressure cutout to compensate for the changes to operational pressures of the system. This procedure should be done carefully to avoid exceeding the system conditions.

## Adjust Refrigerant Charge, if Necessary

The required quantity of charge will depend upon the original charge and which product is to be used, contact AFK for guidance on this. To avoid overcharging the system it is best to charge the system by first measuring the operating conditions (including discharge and suction pressures, suction line temperature, compressor amps, and super heat) before using the liquid sight glass as a guide.

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Use dew-point pressure as a reference in determining the appropriate saturated temperature for a superheat setting. To determine the saturated temperature for a sub cooling calculation, use bubble-point pressure.

### Label Components and System

After retrofitting the system, it is a requirement to label the system, in accordance with relevant standards to identify the type of refrigerant along with its GWP, total system GWP, the type of lubricant (by brand name) and viscosity grade in the system. This will help ensure that the proper refrigerant and lubricant will be used to service the equipment in the future.

### Monitor the System

Observe system operating parameters. Check the condition of the oil. It may become necessary to change the oil and oil filters along with suction filters (if fitted) shortly after the retrofit has taken place since the retrofit activity can cause material to be returned material to the compressor. AFK offers a range of analysis services. For more information please visit our website or contact us on +49 4185 7001-0.

## Retrofit Checklist

- Record operational data for original system performance (current, suction pressure, discharge pressure, super-heat, sub-cooling etc.).
- Recover refrigerant charge using appropriate recovery equipment.
- Record the amount of refrigerant recovered. (required for waste documentation as well as calculating new charge requirements)
- Choose compressor oil. Consult compressor manufacturer for recommendations.
- Drain the existing oil from the compressors, separators and oil reservoirs.
- Measure amount of oil recovered.
- Change / clean compressor oil filters if present.
- Recharge the system with the correct grade and specification of oil; use the same amount that was removed.
- Evaluate the expansion devices; consult the valve manufacturers for recommendations. Some systems may require new valves or orifice assembly components
- If converting from an HCFC there is a requirement to replace all elastomeric ("O" Ring) seals as required. (This should not be required if changing from a current HFC to an alternative HFC or HFO)
- Replace filter driers and suction filters.
- Recharge the system with the correct grade and specification of oil; use the same amount that was removed.
- Leak check the system and make repairs as required.
- Evacuate the system.
- Charge the system with new refrigerant. For guidance on quantity contact AFK.

## Retrofit Checklist

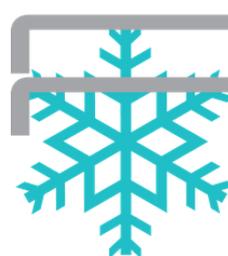
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- Remember to liquid charge from the cylinder. The initial charge should be approximately 90 -95% of the advised charge by weight with final adjustment being made during final commissioning of the equipment. Record the amount of refrigerant charged.
- Check system operation and operating controls. The operational pressures may be different to original and condenser fan and ambient controls may require adjustment to allow for this.
- Adjust refrigerant charge if necessary.
- Label components and the system with the type of refrigerant and lubricant including quantities used.
- Monitor the system observing the condition of the oil. Change filters as necessary. The retrofit activity changes to operational conditions may return oil and other residues from the original installation to the compressor unit.



CONTACT US  
FOR MORE  
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