Danfoss FR10B 103U2954 Compressor

Category: Refrigeration
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Danfoss FR10B 103U2954 Compressor: Technical Identification, Application Range, and Performance Data

Most references that detail this model (FR10B, code 103U2954) explicitly describe it as a *"FR10B HST 1/4 HP"* or note power range information confirming the quarter-horsepower classification.

The *Danfoss FR10B* with code **103U2954** is a light commercial hermetic reciprocating compressor designed for low-back-pressure refrigeration on 220–240 V, 50/60 Hz power supplies. It is widely used in commercial refrigerators and freezers and is part of the Danfoss/SECOP FR series known for compact design and reliable operation in R12 and later R134a applications.

Nameplate decoding: FR10B 103U2954

The yellow identification label on this compressor summarizes its key application and electrical data in a compact format. Understanding every line of that label is essential for correct replacement, troubleshooting, or system redesign.

Nameplate information table

Field on label	Meaning	Technical notes
FR10B	Danfoss FR-series hermetic reciprocating compressor, size "10B"	Part of light commercial range for small refrigeration units.
103U2954	Complete compressor code number	Identifies factory configuration, oil charge and terminal box.
220–240 V ~ 60 Hz / 50 Hz	Dual-frequency single-phase motor	Designed for 220–240 V at either 50 or 60 Hz mains.
LBP / LBP-HBP	Low-back-pressure and some high-back-pressure use	Suited to freezers (LBP) and certain refrigerator duties (HBP) depending on model variant.
LST / HST motor	Low / high starting torque versions	CSIR or RSIR motor concepts, depending on accessory set and application.
Made in Slovenia	Manufacturing plant	Danfoss/SECOP European production facility.

Technical specifications and operating envelope

The FR10 family has been documented in several universal catalogs, which provide detailed operating conditions for R12 and later R134a refrigerants. The FR10B 103U2954 follows the same mechanical platform and performance class as the FR10G universal compressor.

Main technical data (FR10 series, R134a/R12 class)

Parameter	Typical value / range	Source indication
Refrigerant	R12 on legacy 103U2954 versions; R134a on FR10G successors	
Application	LBP (freezers −30 °C to −10 °C evap); some HBP/MBP possible	
Displacement	≈ 9.05 cm³	FR10G catalog data.
Voltage range	187–254 V at 50 Hz for LBP	
Max ambient temperature	43 °C	
Max condensing temperature	60–70 °C continuous/short	
Motor type	RSIR/CSIR single-phase	
Oil type / charge	Polyolester or mineral, ≈ 450 cm³ depending on refrigerant	
Max refrigerant charge	≈ 900 g	
Weight	Around 10–11 kg	

Performance snapshot at typical freezer conditions

Condition	Capacity (approx.)	Power input	Notes
Evap −25 °C, cond 55 °C, 220 V / 50 Hz	~130–150 W refrigerating	~200–230 W	FR10G LBP data as reference for FR10B.
Evap −15 °C, cond 55 °C	Higher capacity around 200 W	Increased input and COP	Suited for high-efficiency bottle coolers.

These figures are indicative and should always be cross-checked with the exact data sheet for the specific refrigerant and code number when designing or verifying a system.

Application in commercial refrigeration

The FR10B 103U2954 compressor is typically installed in small commercial cold rooms, display freezers, under-counter cabinets and chest freezers where compact dimensions and dependable low-temperature performance are critical. Its evaporating temperature range down to about −30 °C makes it suitable for frozen food storage and ice-cream applications.

Typical systems using FR10B

- Glass-door upright freezers in supermarkets and convenience stores.
- Compact chest freezers and island cabinets for frozen food.
- Under-counter commercial refrigerators where LBP/HBP dual range is required.

Advantages for installers and OEMs

Advantage	Description
Proven reliability	Long-running Danfoss/SECOP FR platform with global service support.
Wide voltage tolerance	Operates from 187–254 V, useful in markets with unstable mains.
Flexible application	LBP primary, with variants for HBP duties using alternative starting devices.
Compact footprint	Fits tight condensing unit housings and under-counter cabinets.

Service notes, replacement options and energy considerations

Over time, FR10B compressors in the field often need replacement because of mechanical wear, electrical failures or refrigerant conversion projects. When selecting a replacement, technicians frequently upgrade to modern FR10G or FR10GX R134a versions that offer similar footprint but better efficiency and environmental performance.

Replacement and retrofit guidance

1. **Match application range and refrigerant**
   - For original R12 systems, many retrofit projects convert to R134a with corresponding FR10G/FR10GX models, observing manufacturer guidelines for oil type and charge.
   - System components such as capillary tubes and filters must be recalculated for the new refrigerant to maintain correct superheat and capacity.

2. **Preserve electrical compatibility**
   - Ensure that the new compressor operates on 220–240 V, 50/60 Hz and that starting devices (PTC, relay, capacitor) match the recommended CSIR/RSIR configuration.
   - Check locked-rotor current and recommended fuse size to avoid nuisance tripping on older installations.

3. **Optimize energy efficiency**
   - Danfoss high-efficiency light commercial compressors can cut appliance energy consumption by 10–30% compared with older standard models, which is especially relevant in 24/7 commercial refrigeration.
   - When installing a replacement, technicians should verify condenser cleanliness, airflow, and thermostat settings to fully benefit from improved compressor performance.

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