

Cubigel ML90FB 1/3 HP R404A LBP

Compressor Specifications, Performance, and Replacements

Category: Refrigeration

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Model: ML90FB

Utilisation (mbp/hbp/lbp): LBP

Domaine (Freezing/Cooling): Freezing

Cooling wattage at -23°C: 407 W

cubic feet can this compressor cool?: 15-20 cu ft

Litres can this compressor cool?: 425-566 L

Kcal/h: 350

Oil Type and quantity: ISO VG 46 ESTER, 400 cm³

Horsepower (HP): 1/3

Refrigerant Type: R404A/R507

Power Supply: 220-240V 50Hz 1Ph

Cooling Capacity BTU: 1389

Motor Type: CSIR

Displacement: 8.86 cm³

Winding Material: Copper

Pression Charge: 400 cm³ oil charge

Cappillary: Capillary tube or expansion valve

Modele Frigo or refregirator can work with this compressor: Electrolux models, Polaris refrigeration units, Framec freezers, Mondial Framec commercial cabinets

Temperature function: -40°C to -10°C

with fan or no: With fan

Commercial or no: Commercial

Amperage in function: 2.3 A

Lara: 12.2 A

Type of relay: Overload protector relay (MRA38084 T0102)

Capacitor or no and valeur: Yes, starting capacitor 47-56 µF 330 V

Country of origin and exporting countries: Spain, exported to Europe, North America, Middle East, Africa

5 Compressor remplacement in same valeur in same gaz: Danfoss SC12CL, Embraco NEK6210GK, Tecumseh CAE2420Z, Secop SC12CL, Aspera NEK6210Z

5 Compressor remplacement in same valeur in oTHer gaz: Cubigel ML90TB (R134a), Embraco NEK6210U (R290), Danfoss SC12G (R134a), Tecumseh AE4440Y (R134a), Secop NL8.4MF (R600a)

Mbsmpro.com, Compressor, ML90FB, 1/3 hp, Cubigel, Freezing, R404A/R507, 407 W, 2.3 A, 1Ph 220-240V 50Hz, LBP, CSIR, -40°C to -10°C, freezing

The Cubigel ML90FB stands out as a reliable workhorse in the world of commercial refrigeration, particularly for low-temperature applications where consistent performance is key. Manufactured in Spain by Huayi Compressor (formerly part of the ACC Electrolux group), this hermetic reciprocating compressor is designed for low back pressure (LBP) operations, making it ideal for freezers and deep cooling systems that demand robust freezing capabilities. With a displacement of 8.86 cm³ and a 1/3 horsepower rating, it delivers solid cooling power while maintaining efficiency in demanding environments.

At its core, the ML90FB uses R404A or R507 refrigerants, which are well-suited for commercial freezing tasks. Its CSIR motor configuration ensures a strong start, supported by a starting capacitor in the 47-56 µF range at 330 V. The unit runs on a single-phase 220-240V 50Hz supply, drawing about 2.3 amps under nominal conditions, with a locked rotor amperage of 12.2 A. The internal windings are copper for better conductivity, with main winding resistance at 8.42 ohms and start winding at 29.75 ohms, all measured at 25°C. Oil lubrication comes from 400 cm³ of ISO VG 46 ester oil, which pairs perfectly with the refrigerants to minimize wear and enhance longevity.

One of the standout features is its fan-cooled design, which helps dissipate heat effectively, allowing operation in ambient temperatures up to 43°C. This makes it versatile for various setups, from standalone freezers to integrated commercial cabinets. The compressor supports capillary tube or expansion valve systems for precise refrigerant flow, ensuring optimal pressure management across its evaporating temperature range of -40°C to -10°C.

To give a clear picture of its performance, here's a table outlining efficiency metrics at a standard condensing temperature of 55°C, based on ASHRAE test conditions. Note that for evaporating temperatures above -10°C, the compressor is outside its optimal LBP range, so values are extrapolated or marked as not applicable (N/A) where data isn't reliable.

Evaporating Temp (°C)	Cooling Capacity (Watts)	Power Consumption (Watts)	COP
-30	279	286	0.98
-25	372	333	1.12
-23.3	407	350	1.16
-20	480	384	1.25
-15	605	440	1.38
-10	744	500	1.49
0	N/A (extrapolated ~950)	N/A (extrapolated ~580)	N/A
4	N/A	N/A	N/A
10	N/A	N/A	N/A

This table highlights how the ML90FB excels in deep freezing scenarios. For instance, at -23.3°C, it achieves a COP of 1.16, meaning it delivers over one watt of cooling per watt of input power—a respectable figure for LBP units. As temperatures rise toward -10°C, efficiency improves, but pushing beyond that could lead to reduced performance or higher wear.

Comparing the ML90FB to similar models brings its strengths into focus. Take the Embraco NEK6210GK, a direct equivalent in the R404A LBP category with roughly the same 1/3 HP rating and 8.7 cm³ displacement. The ML90FB edges out with slightly better cooling at -25°C (372 W vs. Embraco's ~360 W under similar conditions), though the Embraco might run quieter in some setups.

Against the Danfoss SC12CL, another 1/3 HP contender, the Cubigel offers comparable capacity but often at a lower amperage draw, potentially saving on energy bills in high-duty cycles. Value-wise, when stacked against Tecumseh's CAE2420Z (similar displacement and LBP focus), the ML90FB provides a higher COP at mid-range temps like -20°C (1.25 vs. 1.20), making it more efficient for sustained freezing operations.

Shifting gears to broader comparisons, let's look at how it fares against compressors using alternative refrigerants. For R134a systems, the Cubigel ML90TB mirrors the ML90FB's specs but operates in medium back pressure (MBP) for cooling rather than freezing. It delivers around 500 W at -10°C but with a lower COP of about 1.3 compared to the ML90FB's 1.49 at the same temp—highlighting the R404A model's superiority in low-temp efficiency. In the eco-friendly R290 space, Embraco's NEK6210U offers similar horsepower but with reduced capacity (around 350 W at -23°C vs. 407 W), though it boasts a greener footprint. Power consumption is comparable, but the ML90FB's ester oil compatibility gives it an edge in retrofit scenarios without full system overhauls.

Benefits of the ML90FB are plenty for engineers and technicians alike. Its thermally protected design guards against overloads, and the overload relay (MRA38084 type) ensures quick response to faults, minimizing downtime in commercial settings. The compact height of about 198 mm fits snugly into tight cabinets, and its vibration-dampening mounts reduce noise—a big plus for retail environments. On the efficiency front, it can handle cabinets up to 20 cubic feet or 566 liters in freezing mode, making it perfect for ice cream dispensers, blast freezers, or medical storage units.

A few pieces of advice: Always match the capacitor value precisely to avoid starting issues, and check the relay pickup/drop-out (7.1 A/6 A) during installation. For best results, pair it with a fan for cooling, and monitor oil levels—ester oil is key for R404A compatibility, but contamination can lead to breakdowns. If retrofitting, ensure the system pressures align, as this unit's max discharge is tuned for LBP. Notice that while it's commercial-grade, avoid overloading in extreme ambients above 43°C to prevent efficiency drops. Overall, this compressor balances power, reliability, and efficiency, making it a smart choice for pros tackling tough freezing jobs.

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Cubigel ML90FB Compressor: Specs, Efficiency, Comparisons & Tips

Dive into the Cubigel ML90FB 1/3 HP R404A compressor details, including performance tables, comparisons with equivalents like Embraco NEK6210GK, and practical advice for commercial freezing applications.

cubigel-ml90fb-compressor

Mbsmgroup, Mbsm.pro, mbsmpro.com, mbsm, Cubigel ML90FB, R404A compressor, LBP compressor, 1/3 HP compressor, freezing compressor, Danfoss SC12CL, Embraco NEK6210GK, Tecumseh CAE2420Z, Secop SC12CL, Aspera NEK6210Z, Cubigel ML90TB, Embraco NEK6210U, Danfoss SC12G, Tecumseh AE4440Y, Secop NL8.4MF

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