TEE NTU 170 MT Compressor 1/4 HP R600a

Category: Refrigeration
written by www.mbsm.pro | 18 January 2026

Focus Keyphrase: TEE NTU 170 MT Compressor 1/4 HP R600a Low Back Pressure Technical Specifications and Replacement Guide
SEO Title: Mbsmpro.com, Compressor, NTU 170 MT, 1/4 hp, TEE, Cooling, R600a, 204 W, 0.9 A, 1Ph 220-240V 50Hz, LBP, RSIR, -35°C to -10°C
Meta Description: Technical analysis of the TEE NTU 170 MT compressor. Discover 1/4 HP power specs, R600a efficiency, LBP cooling capacity, wiring diagrams, and cross-reference replacement charts.
Slug: compressor-tee-ntu170mt-r600a-1-4-hp-specs
Tags: Mbsmgroup, Mbsm.pro, mbsmpro.com, mbsm, TEE, Turk Elektrik, NTU 170 MT, R600a, 1/4 HP Compressor, LBP, Refrigerator Repair, HVAC Engineering, EMT2121U, HTK12AA, HMK12AA, NT1114Y, HYB12MHU, GL90AA, FFI7.5HAK, NL7F
Excerpt: The TEE NTU 170 MT is a high-efficiency hermetic reciprocating compressor designed for low back pressure applications using R600a refrigerant. Known for its reliability in household refrigeration, this unit operates at 220-240V 50Hz. This article explores its technical specs, cooling capacity, and suitable replacements for HVAC technicians and engineers worldwide.

The Engineering Excellence of the TEE

NTU 170 MT: A Deep Dive into R600a Refrigeration

In the evolving world of domestic refrigeration, efficiency and environmental impact are the primary drivers of innovation. The TEE NTU 170 MT, manufactured by Turk Elektrik, stands as a testament to these principles. As a Low Back Pressure (LBP) compressor optimized for R600a (isobutane), this model has become a staple in modern household refrigerators and freezers across Europe and the Middle East.

Understanding the NTU 170 MT Architecture

The NTU 170 MT is engineered to handle the unique thermodynamic properties of R600a. Unlike older R134a systems, R600a operates at lower pressures but requires a larger displacement to achieve comparable cooling capacities. This compressor utilizes a robust motor designed for RSIR (Resistive Start – Inductive Run) operation, ensuring a reliable start even under varying voltage conditions typically found in domestic environments.

The “MT” series is specifically calibrated for high-performance cooling while maintaining a low noise floor. With a Locked Rotor Amperage (LRA) of 14A, it demonstrates significant starting torque, which is essential for overcoming the initial pressures of the refrigeration cycle after a defrost period.

Technical Specification Table

Feature	Specification
Model	NTU 170 MT
Utilisation	LBP (Low Back Pressure)
Domaine	Freezing / Deep Cooling
Oil Type and Quantity	Mineral Oil (approx. 180 ml)
Horsepower (HP)	1/4 HP
Refrigerant Type	R600a (Isobutane)
Power Supply	220-240VAC / 50Hz / 1Ph
Cooling Capacity BTU	~700 BTU/h (at -23.3°C Evaporating Temp)
Motor Type	RSIR
Displacement	11.20 cc
Winding Material	High-Grade Copper
Pression Charge	0.5 to 1.2 Bar (Low side depending on load)
Capillary Recommendation	0.031″ ID x 3 meters (approximate)
Temperature Function	-35°C to -10°C
Cooling System	Static (No fan required for compressor)
Commercial Class	Domestic / Light Commercial
Amperage (FLA)	0.8 A – 1.0 A
LRA (Locked Rotor)	14 A
Relay Type	PTC Starter
Capacitor	Not required (RSIR), Optional Run Cap for CSIR conversion

Electrical Wiring Schema (RSIR Configuration)

For field technicians, understanding the terminal configuration is vital. The TEE NTU 170 MT follows the standard triangular pin layout:

1. **Common (C):** Top pin (typically connected to the overload protector).
2. **Start (S):** Right pin (connected to the PTC relay for starting).
3. **Main/Run (M):** Left pin (connected to the neutral line).

Schema Logic:

[Line] -> [Overload Protector] -> [Common Pin]
[Neutral] -> [PTC Relay] -> [Main Pin] & [Start Pin (Momentary)]

Performance Comparison: R600a vs. R134a Equivalents

When comparing the NTU 170 MT to R134a units of similar horsepower, several differences emerge. The R600a model offers a superior Coefficient of Performance (COP).

Metric	TEE NTU 170 MT (R600a)	Equivalent R134a Model (e.g., GL90AA)
Efficiency (COP)	1.45 – 1.55 W/W	1.20 – 1.35 W/W
Operating Pressure	Low / Vacuum	High
Eco-Impact	GWP 3 (Low)	GWP 1430 (High)
Noise Level	Very Low	Moderate

Compatibility and Replacement Guide

Finding a direct replacement requires matching the displacement and the LBP characteristic. Below are the recommended alternatives for the NTU 170 MT.

Top 5 Replacements (R600a – Same Gas):

1. **Embraco:** EMT2121U
2. **Secop (Danfoss):** HTK12AA
3. **ACC / Cubigel:** HMK12AA
4. **Jiaxipera:** NT1114Y
5. **Huayi:** HYB12MHU

Top 5 Replacements (R134a – Conversion Required):

Note: Converting from R600a to R134a requires a full system flush, capillary adjustment, and oil compatibility check.

1. **Zem:** GL90AA
2. **Embraco:** FFI 7.5HAK
3. **Secop:** TLES7.5KK.3
4. **Tecumseh:** THB1375YSS
5. **Carlyle:** S26SC

Engineering Notices and Maintenance Tips

- **Vacuuming Procedure:** Due to the hygroscopic nature of the systems and the low pressures of R600a, a deep vacuum (minimum 200 microns) is mandatory. R600a systems are highly sensitive to non-condensables.
- **Charging Safety:** R600a is flammable. Always ensure the work area is well-

ventilated. Use a dedicated electronic scale, as the charge weight is significantly lower than R134a (often only 40-60 grams).

- **Filter Drier:** Always replace the filter drier with one specifically labeled for R600a (XH-9 or equivalent) during any compressor swap.
- **Capillary Blockage:** Because R600a operates at lower discharge temperatures, carbonization is rare, but moisture-related ice blockages are common if the system is not perfectly dry.

Benefits for the End-User

Using a TEE NTU 170 MT ensures the refrigerator operates with minimal energy consumption. For the homeowner, this translates to lower electricity bills and a quieter kitchen environment. For the technician, the wide availability of parts for the TEE/Arçelik ecosystem makes it a preferred choice for long-term maintenance.

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