Unionaire PUJ012HR5R0WPK 12000 BTU Heat Pump R22 Technical Specifications and Compressor Replacement Guide

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220V, Cooling and Heating

When working in the HVAC field, encountering a Unionaire system is quite common, especially in regions requiring robust performance under high ambient temperatures. The PUJ012HR5R0WPK is a classic example of a reliable reversible heat pump designed to handle both the scorching summer heat and the chill of winter. As a technician, seeing these specifications tells a clear story of a 1-ton (12,000 BTU) system built for durability and efficiency.
The heart of this system is its rotary compressor, optimized for R22 refrigerant. While R22 is being phased out globally, many of these units remain in service because of their heavy-duty build quality. With a cooling and heating capacity of 3.52 kW, this model provides a balanced thermal load for standard residential or small commercial spaces.

Technical Performance and Engineering Insight

From an engineering perspective, the electrical characteristics of this unit are standard but precise. With a Rated Load Amperage (RLA) of 6A for the compressor and a Locked Rotor Amperage (LRA) of 31A, the electrical draw is manageable for most residential circuits, provided a 10A fuse or circuit breaker is utilized.
The design pressures are particularly noteworthy. A high-side pressure of 400 PSI and a low-side of 82 PSI indicate a system that operates comfortably within the safety margins of R22, ensuring longevity even when the outdoor unit is exposed to intense sun. The 0.850 kg refrigerant charge is a relatively small amount for a 12,000 BTU unit, reflecting an efficient heat exchanger design that maximizes every gram of gas.

Efficiency Metrics (COP)

Efficiency in a heat pump is measured by the Coefficient of Performance. Below is a breakdown of estimated performance across various evaporating temperatures for a compressor of this class.

Evaporating Temp (°C)	Cooling Capacity (Watts)	Power Consumption (Watts)	COP (W/W)
10	4100	1150	3.56
7.2 (Standard Rating)	3520	1080	3.26
5	3200	1020	3.13
0	2650	950	2.78
-5	2150	880	2.44
-10	1700	820	2.07

Technical Specification Table: Unionaire PUJ012HR5R0WPK

Data Point	Specification
Model	PUJ012HR5R0WPK
Utilisation	HBP (High Back Pressure)

Domaine	Comfort Cooling & Heating (Heat Pump)
Cooling Wattage at -23°C	N/A (AC Application)
Cubic feet/Litres capacity	Effectively cools rooms approx. 150-250 sq. ft.
Kcal/h	3024 Kcal/h
Oil Type and Quantity	Mineral Oil (SUNISO 3GS or equivalent), ~350ml
Horsepower (HP)	1.5 HP
Refrigerant Type	R22
Power Supply	220-240V / 50Hz / 1 Phase
Cooling Capacity BTU	12,000 BTU/h
Motor Type	Permanent Split Capacitor (PSC)
Displacement	Approx. 16.0 to 18.0 cc
Winding Material	Copper
Pression Charge	High: 400 PSI / Low: 82 PSI
Capillary Size	0.054″ x 30″ (Typical for 12k BTU AC)
Recommended Application	Split Unit Air Conditioners
Temperature Function	Reversible (Cooling/Heating)
Fan Requirement	Yes (Forced Air Condenser)
Commercial Use	Yes (Light Commercial/Residential)
Amperage in Function (RLA)	6.0 A
Locked Rotor Amps (LRA)	31.0 A
Type of Relay	Potential Relay or Start Kit (Optional)
Capacitor Value	30uF or 35uF / 450V
Country of Origin	Made in Egypt

Compressor Replacement Guide

If the original compressor in the PUJ012HR5R0WPK fails, finding an exact match or a compatible alternative is essential for maintaining system balance.

5 Direct Replacements (R22 Gas)

1. **GMCC** – PH215X2C-4FT1 (Highly reliable rotary)
2. **Highly (Hitachi)** – ASD102SK
3. **LG** – QJ222P
4. **Panasonic** – 2K22C225A
5. **Samsung** – UR4D124

5 Replacements (Alternative Refrigerant / Conversion)

Note: Converting from R22 to other gases often requires oil changes and capillary adjustments.

1. **GMCC (R410A)** – PA145X2C-4FZ1 (Requires system modification)
2. **Tecumseh (R404A)** – AE4440Z (For MBP applications)
3. **Danfoss (R407C)** – HRP034T4
4. **Copeland (R134a)** – ARE37C3E (Only for specific low-pressure setups)
5. **Bristol (R22/R407C)** – H23A153DBEA

Technician’s Advice and Maintenance Notice

1. **Refrigerant Charge:** Always use a scale. The nameplate specifies exactly 0.850 kg. Overcharging this unit will lead to high head pressure and premature compressor failure, especially in a heat pump where the reversing valve adds complexity.
2. **Electrical Protection:** Ensure the 10A breaker is dedicated. If the LRA (31A) is hit frequently due to short-cycling, the windings will degrade. Installing a “Hard Start Kit” can significantly extend the life of older compressors in this model.
3. **Reversing Valve Check:** Since this is a heat pump, if you find the unit is not cooling but the compressor is running, check the solenoid on the reversing valve before assuming the compressor is faulty.
4. **Clean Coils:** A 12,000 BTU unit relies heavily on airflow. Clogged condenser fins will quickly push the high-side pressure above the 400 PSI design limit.

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Excerpt: The Unionaire PUJ012HR5R0WPK is a robust 12,000 BTU (1.5 HP) heat pump system designed for efficient cooling and heating. Utilizing R22 refrigerant with an 850g charge, this 220V/50Hz unit is a staple in residential HVAC. Our guide covers its electrical RLA/LRA specs, design pressures, and provides a detailed list of compatible compressor replacements.



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