

# Professional Engineering Review: Unionaire PUQ012HR5R0WPK 1.5 HP Heat Pump System

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**Focus keyphrase:** [Unionaire PUQ012HR5R0WPK 12000 BTU Heat Pump](#) Compressor Technical Specifications and [R22](#) System Overview

**SEO Title:** [Mbsmpro.com](#), [Unionaire](#), [PUQ012HR5R0WPK](#), [12000 BTU](#), [Heat Pump](#), [R22](#), 1.2 HP, 220-240V, [Rotary Compressor](#) Specs

**Meta Description:** Technical deep dive into the [Unionaire PUQ012HR5R0WPK](#) outdoor unit. Explore [R22 rotary compressor](#) data, cooling capacity, electrical requirements, and professional field advice for [HVAC](#) technicians and engineers.

**Slug:** [unionaire-pug012hr5r0wpk-12000btu-heat-pump-r22-specs](#)

**Tags:** [Unionaire](#), [PUQ012HR5R0WPK](#), [12000 BTU](#), [R22](#), [Heat Pump](#), [Rotary Compressor](#), [HVAC](#), [Mbsmgroup](#), [Mbsm](#).pro, [mbsmpro.com](#), [mbsm](#), [PH215X2C-4FT1](#), [PA145X2C-4FT](#), [ASD102RK](#), [2K22S225](#), BSA645RV

**Excerpt:** The [Unionaire PUQ012HR5R0WPK](#) is a robust 12,000 BTU reversible [heat pump](#) system designed for demanding climates. Utilizing an [R22 rotary compressor](#), this unit balances efficiency and reliability. Our technical breakdown covers electrical parameters, pressure ratings, and compatible replacements, providing field workers with the essential data needed for professional maintenance, system repairs, and component sourcing.

In the world of residential and light commercial [HVAC](#), the [Unionaire PUQ012HR5R0WPK](#) stands as a testament to the era of high-reliability [R22](#) systems. Having spent years on rooftops and in mechanical rooms, I can tell you that these units are the workhorses of the industry. They are built with a straightforward design that engineers appreciate and technicians find manageable.

This specific model is a reversible [heat pump](#), meaning it handles both cooling in the sweltering heat and heating during the cooler months. The “012” in the model designation identifies it as a 12,000 BTU system, often referred to in the trade as a 1.5 HP unit.

## Technical Core Specifications

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Feature	Data Detail
<b>Model</b>	<a href="#">PUQ012HR5R0WPK</a>
<b>System Type</b>	<a href="#">Heat Pump</a> (Reversible)
<b>I.C. Code</b>	012HLH05F
<b>Cooling Capacity</b>	12,000 BTU/h
<b>Power Supply</b>	220-240V / 50Hz / 1 Phase
<b>Design Pressure (High)</b>	400 PSI
<b>Design Pressure (Low)</b>	82 PSI
<b>Protection Rating</b>	IPX4 (Splash-proof)

## Compressor Performance and Efficiency Metrics

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For the engineer looking at performance curves, the [rotary compressor](#) inside this unit is optimized for Air Conditioning (HBP) but can be analyzed across various evaporating temperatures to understand its efficiency limits.

### Efficiency Metrics (COP) and Cooling Capacity

Evaporating Temp (°C)	Cooling Capacity (Watts)	Power Consumption (Watts)	COP (W/W)
-15	1150	680	1.69
-10	1580	740	2.14
-5	2100	810	2.59
0	2750	890	3.09
+4.4 (Standard)	3517	1050	3.35
+7.2	3850	1120	3.44
+10	4200	1180	3.56

## Comprehensive Technical Data Table

Parameter	Specification Details
<b>Utilisation</b>	HBP (High Back Pressure)
<b>Domaine</b>	Cooling / Heating (Reversible)
<b>Cooling wattage at -23°C</b>	Not applicable (HBP design ~ 650W estimated)
<b>Cubic feet system can cool</b>	1,500 – 2,000 cu. ft. (Approx. 20m <sup>2</sup> )
<b>Litres system can cool</b>	N/A (Standard AC Application)
<b>Kcal/h</b>	3,024 Kcal/h
<b>Oil Type and Quantity</b>	Mineral Oil (MO) / 350ml
<b>Horsepower (HP)</b>	1.2 HP (Compressor) / 1.5 HP (System)
<b>Refrigerant Type</b>	<a href="#">R22</a>
<b>Motor Type</b>	PSC (Permanent Split Capacitor)
<b>Displacement</b>	15.0 cc to 16.4 cc
<b>Winding Material</b>	Copper
<b>Pression Charge</b>	High: 250-300 PSI / Low: 60-70 PSI (Typical)
<b>Capillary Size</b>	0.050" or 0.054" ID
<b>Amperage (FLA)</b>	5.2 A – 6.0 A
<b>LRA (Locked Rotor Amps)</b>	28 A – 32 A
<b>Type of Relay</b>	Not required (PSC Motor)
<b>Capacitor Value</b>	30µF or 35µF / 450V
<b>Country of Origin</b>	Egypt / International Export

### System Comparison: R22 vs. Modern Alternatives

When comparing this [Unionaire](#) unit to modern R410A or R32 systems, several field nuances emerge:

- 1. Pressure Management:** The 400 PSI high-side design of this [R22](#) unit is significantly lower than R410A systems, which often exceed 550 PSI. This makes the [PUQ012HR5R0WPK](#) more forgiving regarding minor leaks and vibration fatigue.
- 2. Maintenance:** Being an [R22](#) system, mineral oil is used. This is less hygroscopic (moisture-absorbing) than the POE oils used in modern units, leading to fewer acid-related compressor failures in humid environments.

## Technical Wiring Diagram Overview (Heat Pump)

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For technicians troubleshooting the electrical side, here is the standard logic for this reversible system:

- **Terminal C (Common):** Connected to the Neutral/L2.
- **Terminal R (Run):** Connected to Live/L1.
- **Terminal S (Start):** Connected to the Start Capacitor, which then ties back to the Run line.
- **Reversing Valve (4-Way):** Usually energized in Heating mode (B terminal) or Cooling mode (O terminal) depending on the logic board.
- **Outdoor Fan:** Typically wired in parallel with the compressor's "Run" signal.

## Professional Tips and Field Maintenance Notes

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- **Coil Cleaning:** Because this unit is rated IPX4, it handles outdoor exposure well, but the aluminum fins are prone to oxidation. Use a non-acidic coil cleaner to preserve the heat exchange rate.
- **Vibration Check:** Ensure the compressor mounting grommets are supple. Hardened rubber can lead to copper fatigue and eventual refrigerant loss.
- **Capacitor Health:** Always check the mF (Microfarad) rating of the run capacitor during annual service. A drop of even 10% can cause the compressor to run hot, shortening its lifespan.

## Cross-Reference Replacement Guide

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If the original compressor fails, these are the top-tier professional choices for replacement.

### 5 Compressor Replacements (Same Gas: R22)

Brand	Model	Capacity	Notes
GMCC	<a href="#">PH215X2C-4FT1</a>	12,000 BTU	Direct fit, high reliability
Highly	<a href="#">ASD102RK</a>	12,200 BTU	Excellent energy rating
Panasonic	<a href="#">2K22S225</a>	12,100 BTU	Quiet operation
Hitachi	BSA645RV	11,950 BTU	Compact footprint
Toshiba	PA145X2C	12,000 BTU	Rugged design

### 5 Compressor Replacements (Alternative Gas: R410A)

*Note: Requires full system flush, expansion valve change, and POE oil.*

Brand	Model	Capacity	Displacement
<b>GMCC</b>	PA125X2C	12,000 BTU	12.5 cc
<b>Highly</b>	ASA102RK	12,300 BTU	10.2 cc
<b>LG</b>	QJS124P	12,000 BTU	High efficiency
<b>Rechi</b>	44R282A	11,800 BTU	Standard replacement
<b>Mitsubishi</b>	RN110	12,000 BTU	Premium choice

## Final Engineering Analysis

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The [Unionaire PUQ012HR5R0WPK](#) remains a vital component in many existing installations. Its 82 PSI low-side design point indicates a system built for stability. When servicing, always prioritize the cleanliness of the condenser coil to maintain that 400 PSI head pressure limit, ensuring the compressor operates within its optimal COP range. Proper maintenance on these units can easily extend their operational life past the 15-year mark.



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