



YORK INTERNATIONAL

Error-Proofing & In-Line Testing from Matrix Decrease Warranty Costs

OUTCOMES

- Increased product quality and reduced warranty costs with error-proofing and in-line testing
- Lowered production costs by boosting efficiency and precisely filling refrigerant to spec
- Drove consistent, reliable processes across lines and shifts
- Improved flexibility to adapt workflows and testing requirements at the station level
- Increased operator satisfaction due to clear, digital instructions and real-time support
- Smoother handoffs between teams, leading to more efficient operations
- Empowered operators to make adjustments and contribute to continuous improvement

York International, now part of Bosch Home Comfort Group, is a leader in residential and commercial HVAC manufacturing.

The teams at York assemble and test furnaces, condensers, coils, and residential air conditioners, products that form the backbone of climate control in buildings across the world.

To meet high standards for quality and reliability, York partnered years ago with Matrix Automation to bring a new level of control and visibility to their manufacturing operations.

Quality Is Key

As a proactive manufacturer, York recognized the need to reduce warranty costs by improving product quality and minimizing errors on its production lines. The complexity of HVAC units, from the build of materials to extensive testing, meant that even small mistakes could carry a high price. The goals were clear: catch issues early, support operators, and ensure every product meets standards before leaving the plant.

Partnering with Matrix

Matrix Automation delivered a Manufacturing Execution System (MES) designed to fit directly into York's build of materials from order.

The system manages assembly at two York plants. It brings error-proofing to every step – guiding operators through assembly, ensuring the right components are used, and enforcing required in-line tests such as Hi-Pot and voltage checks. Matrix's solution integrates with the inspection, helping teams address quality issues immediately and document for improvement.

One of the system's strengths is its flexibility. York can adjust workflows and testing requirements at the station level, adapting quickly to new products or process changes.

"Matrix lets our team make changes across stations and lines when we need to," said Clifford Whitson, Technical Maintenance Supervisor at York International. "Operators trust the system. They know it's there to help them get the job done right, not slow them down."



CAPABILITIES

- Manages and optimizes all production stages – from build of materials through printing and box wrap – ensuring seamless workflows in manufacturing
- Guided assembly instructions for operators to ensure accuracy
- Automated component verification can prevent incorrect parts from being used
- Automated tool verification including calibration and enforced tool check-in
- Enforcement of required in-line tests, including Hi-Pot and voltage checks
- Real-time tracking of testing and inspection results – by serial number
- Flexible station-level workflow adjustments to accommodate changes
- Error-proofing & rework management
- Support for continuous improvement initiatives through detailed data collection and reporting

“Matrix has really changed the way we approach quality on the line.

Error-proofing helps us prevent problems. And, our teams can spot any issues right away and address them before they become bigger problems. It’s helped us stay proactive instead of reactive.”

*Clifford Whitson
Technical Maintenance Supervisor
York International*

Trusted Partnership with Matrix Automation Builds a Stronger HVAC Manufacturing Operation with MES-Driven Quality and Flexibility

The Matrix manufacturing solution also controls charging to a precise, known level of refrigerant, directing the charge station to reach the target amount quickly and efficiently through integration with the PLC. This capability enables York to use less refrigerant overall, reducing material costs and waste. The system checks for leaks by continuously monitoring refrigerant levels, ensuring they remain within expected parameters for each unit.

The Matrix system’s stability makes it a dependable solution in York’s production environment, consistently supporting high-quality output. Its portability allows York to relocate the system between plants as business needs change, providing flexibility and continuity even across plant locations.

Informed Operators

With the Matrix solution, plant operators have better information at their fingertips.

Diagnostics test data includes: control power, Hi-Pot, unit power, contactors, pins, starting, and more.

At all times, operators have detailed statistics for their station: number of passed, failed, and aborted; takt time; target time; average time; and last unit time. With complete data, teams can support continuous improvement and optimization.

Cool Results

Since implementing the Matrix solution years ago, York has seen measurable improvements in product quality and a reduction in warranty-related costs. Errors are caught early, and documentation is consistent across lines and shifts.

Operators appreciate the clear instructions and support built into the system, which has led to higher satisfaction and smoother handoffs between teams.

“We’ve been using Matrix for years now, and it’s become part of how we work,” Whitson explained. “When we see a challenge on the floor, we know we can tweak the system to help our people and keep quality where it needs to be.”

Next Steps

York International and Matrix Automation continue to focus on flexible station-level and plant automation that empowers operators and supports ongoing quality initiatives.

As York’s product lines evolve, the MES adapts, guiding operators through new processes and can help keep every unit up to standard.

Together, they’ve achieved a manufacturing environment where quality, cost control, and operator satisfaction all move forward.



Inside the Matrix Solution: From BOM to Box Wrap

The Matrix system includes two main areas: the Production Controller and the Line Manager.

The Production Controller comprises all of the operator and technician functions on the line itself. The Line Manager handles configuration and supervisory management.

Production Controller

The Production Controller screens consist of four functional areas: unit identification, test step status, test step comments, and current values of parameters under test.

The main Production Controller screen is the default at operator stations. This screen displays the current statistics at the station, the last test information, and prompts the operator with the next action to be taken for the current test.

As a test begins, the system automatically displays the Run Test screen, so the operator can track the current status of the test.

The Run Stations perform a series of tests on each unit based on the Model/Serial number of the unit. A test is made up of several separate steps. If an error occurs during a test step, causing the test to fail, the system displays information for the operator on the Run Test Error screen to identify the failure and its predicted causes.

Production Controller Functions

- Main production screen
- Run test screen
- Run test error screen
- Tool information and check-in
- Reprint (Unit Label)
- Bill of Materials (BOM) / Operational Method Sheet (OMS)
- Work instruction display
- System tracker
- Lead-off tracker
- Diagnostics
- Defect registration screen – and acknowledge defect
- Box wrap
- Quality Assurance
- Security
- Rework

Line Manager Functions

- Scheduler: An easy-to-use app for scheduling the next 1200 units including proposed and master schedules
- Test manager: Creating, editing, and viewing tests including by product models
- Tool manager: Enables a user in charge of calibration to specify the tools available at a line, at each specific station, and identify the next time those tools need to be calibrated.
- Operator certification
- Report wizard: Default and custom capabilities
- Rework
- BOM
- Tracker
- Scanner Lookup editor



"The system's flexibility allows us to make adjustments as our products and business evolve. That's been key, being able to adapt and keep everything running smoothly."

*Clifford Whitson
Technical Maintenance Supervisor
York International*

Visibility: Default Reports

- BOM
- Defects & Defect Details
- Developed & Historical Tests
- First Run By: Capability Chart, Serial Number, First Run Summary Line, Summary Model, Summary Station Type
- Label Reprints & Printer Setup
- Line Stats & Operator Stats
- Operator List & By Station
- Production Report
- Quality Defect Details
- Schedule
- Takt Time Chart
- Test Data & By Test
- Test Step Data Summary
- Tool Manager
- Unit Information

