iFPI (intelligent Fluorescent Penetrant Inspection) systems and iREL equipment are provided with the control systems that integrate into the customers control scheme. Whether the plant has a central DCS or the equipment needs to be controlled locally, REL has a control solution for the application. UL Listing of complete panels is also available.
Glo Black LED UV lights

1. C4 Magnum 120V Plug-in
2. C4 Nomad 18V Portable
3. Profusion Booth Lighting

REL's Glo-Black LED UV Inspection lights utilize the latest in safe high output UV-A LED technology. Each light module contains a high flux-UV LED emitter that has a built in static-electric discharge circuit to allow the light to perform in all harsh environments regardless of ambient conditions.

All three lights are designed to meet all intensity requirements of Fluorescent Penetrant Inspection (FPI) and Magnetic Particle Inspection (MPI). Tested to comply with both ASTM E3022 Standard and Roll-Royce RRES 90061 Requirements.
Loading Station

SMART HMI
ROBUST iFPI

1. Recipe selection
2. Load carrier
3. Start cycle

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The Load Station aligns the carrier to the Automated Material Handling System (AMHS). Carriers with parts are manually set onto the load station to begin the process. The loaded parts must not protrude outside the processing size envelope of the FPI line.
Penetrant Spray Station

The Penetrant Application Station utilizes electrostatic spray application. Separate guns are used for top and bottom spray application, as well as penetrant type/level of penetrant. This station will allow operator interaction through an access door on the front. When needed, the operator can stop the process and open the access doors to inspect the parts for complete coverage. The station incorporates a turntable that rotates the carrier 360° to allow complete coverage from the electrostatic spray and visual inspection of all four sides of the carrier. There is typically a handheld electrostatic spray gun for use in touching-up areas on the parts, and a HEPA filtration system, controlled by the PLC to remove the spray mist from the enclosure.
Dwell Station

SMART HMI
ROBUST IFPI

1. Convey basket into Dwell Station

2. Timer set according to daily throughput

3. Basket conveyed to next station

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The Penetrant Dwell Station controls the time required for the carrier to sit while the penetrant is ‘wetting’ the part surface area. The dwell allows for multiple carrier staging between the Penetrant Application and Pre-Rinse Stations.
Pre-Rinse Station

SMART HMI  
ROBUST iFPI

1. Pop-up turn table lifts and turns basket
2. Fresh water pre-rinse
3. Touch up/ convey basket

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Rinsing is accomplished by a pressure controlled spray header. This spray header stays stationary while the carrier pops up and rotates through the spray streams. The rinse water supply pump utilizes recycled water for the initial part rinsing followed by a freshwater supplied rinse.
Emulsifier Station

SMART HMI
ROBUST iFPI

1. Robust lowerator for immersion
2. Emulsifier agitation
3. Raise up/convey basket

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Emulsifier Station

This dip system is pneumatically or electrically powered and controlled to allow for smooth accelerations and consistent processing time during transit to ensure that the process specifications called out by ASTM 1417 are met. For this station the control system doesn’t allow parts to dip if there is a basket in the post rinse station. This is to ensure that the parts are being rinsed within the specified 2 minute window after emulsification.
Post Rinse Station

SMART HMI
ROBUST iFPI

1. Pop-up turn table lifts and rotates basket

2. Full 360° rinse with turn-table

3. Touch up / convey basket

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Rinsing is accomplished by a pressure controlled spray header. This spray header stays stationary while the carrier pops up and rotates through the spray streams. The rinse water supply pump utilizes recycled water for the initial part rinsing followed by a freshwater supplied rinse.

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Dryer Station

SMART HMI
ROBUST iFPI

1. Convey basket into Dryer
2. Temperature controlled Dryer
3. Convey basket

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This station can be powered by electricity, gas, or steam. REL puts a heating coil in the duct that is circulating the air in the station. Temperature control in the oven chamber is accomplished through the PLC. REL ovens come with a customer specified calibration port for oven temperature verification.
Dry Developer Station

SMART HMI
ROBUST iFPI

1. Convey basket into Dry Developer

2. Cloud dry developer applied (not actual powder in image)

3. Basket conveyed into unloading area

Dry Developer Station

This station applies dry developer to part surfaces by the use of a cloud. Electrostatic spray is available also. A Dust Collector with a HEPA filter keeps dust from migrating outside of the station area.

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Inspection and Unloading

SMART HMI
ROBUST iFPI

1. Parts conveyed into inspection area

2. Basket emptied and sent to loading station

3. Multiple inspection stations

Inspection \ Unloading

Parts are inspected with blacklight in this climate controlled multi-station inspection area. Fire suppression systems & process monitoring can also be included with the system.

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