RTO Troubleshooting Field Checklist

A Systematic Pre-Call & On-Site Diagnostic Guide

virautomation.com
(317) 536-3058 | info@virautomation.com

1. Pre-Departure Information Gathering

- ☐ Obtain unit make, model, and installation year
- ☐ Request current alarm codes and fault history
- ☐ Ask for most recent stack test results (if available)
- ☐ Confirm equipment access requirements (scaffolding, lifts, confined space)
- ☐ Review available P&IDs and control panel drawings
- ☐ Identify PLC platform (Allen-Bradley, Siemens, etc.) and software version

2. Safety & Lockout/Tagout Verification

- ☐ Confirm LOTO procedures are posted and current
- ☐ Verify all E-stops are functional and accessible
- ☐ Check flame safety system certifies per NFPA 86
- ☐ Inspect purge timer settings against design specifications
- ☐ Confirm LEL/combustible gas monitoring is calibrated

3. Combustion Air & Process Gas Flow

- ☐ Check combustion blower amp draw vs. nameplate
- ☐ Inspect inlet damper actuator stroke and position feedback
- ☐ Verify process gas flow meter calibration
- ☐ Confirm dilution air dampers operate through full range
- ☐ Check ductwork for leaks, corrosion, or blockages

4. Burner System Inspection

- ☐ Verify main burner ignition sequence timing
- ☐ Inspect pilot assembly and flame rod/UV scanner
- ☐ Clean UV scanner lens - clean with soft cloth, verify signal strength
- ☐ Check gas train valve proof-of-closure (POC) switches
- ☐ Verify gas pressure regulator set point vs. design
- ☐ Inspect spark ignitor electrode gap and condition
- ☐ Confirm flame signal strength meets minimum threshold

5. Valve & Damper Sequence Verification

- ☐ Observe poppet/butterfly valve sequencing through full cycle
- ☐ Verify valve stroke time - compare to OEM baseline
- ☐ Check valve seat condition for media bypass
- ☐ Confirm switching valve position feedback to PLC
- ☐ Test manual override function of all automated valves

6. Ceramic Media Bed Assessment

- ☐ Check bed temperatures across all chambers
- ☐ Compare chamber-to-chamber differential - refer to OEM specs for tolerance
- ☐ Inspect media for cracking, channeling, or plugging (visual from access doors)
- ☐ Verify bed thermocouples are reading accurately (compare redundant sensors if available)

7. PLC & Controls Diagnostics

- ☐ Download and review fault log (last 30 days minimum)
- ☐ Check for forced I/O - document any forces found
- ☐ Verify analog input scaling (4-20mA signals reading correctly)
- ☐ Test all safety interlocks in sequence
- ☐ Confirm HMI alarm history matches PLC fault log
- ☐ Review trending data for temperature, pressure, and flow anomalies

8. Compressed Air System

- ☐ Verify air supply pressure - check per OEM specification
- ☐ Inspect air lines for leaks, moisture, or oil contamination
- ☐ Check air actuator response time on all valves
- ☐ Confirm air dryer and filter are serviced
- ☐ Inspect instrument air regulators for proper set points

9. Emissions & Stack Monitoring

- ☐ Review most recent CEMS data (if equipped)
- ☐ Check stack thermocouple accuracy
- ☐ Verify destruction efficiency trending (if calculated by PLC)
- ☐ Inspect sensing lines for plugging or condensation
- ☐ Confirm opacity monitor calibration (if equipped)

10. Electrical & Instrumentation

- ☐ Check control panel for loose terminations or burnt components
- ☐ Verify 24VDC power supply output voltage
- ☐ Inspect VFD parameters and fault history (if applicable)
- ☐ Test all limit switches and proximity sensors
- ☐ Confirm instrument calibration dates are current

11. Documentation & Handoff

- ☐ Document all findings with photos
- ☐ Record current PLC program version (backup if possible)
- ☐ Note any temporary bypasses or workarounds in place

- ☐ Provide written summary of recommended actions
- ☐ Confirm next steps and timeline with plant contact

VIR Automation - Thermal Oxidizer & RTO Controls Specialists

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Schedule a Free Assessment at virautomation.com/contact