

## MODULAR CONTROL SOLUTION

United Process Controls' UPC's control solution is a modular package customized to significantly improve your annealing, bright annealing, and normalizing operations, meet industry standards requirements, provide precise and reliable process control for greater savings and improved product quality. We offer compact, fully automatic modules for new installations or retrofits. Each solution consists of a cost-effective module or combination of modules delivered with state-of-the-art equipment and backed by our extensive technological expertise.

## FEATURES

- Full compliance with AMS 2750D, NFPA 86-C section 14-9, CQI-9, and Nadcap
- Latest achievements in annealing process control
- Cost-effective module configurations for new installations or retrofits

## PROCESS ATMOSPHERE ANALYSIS

### Accurate, Continuous, Automatic Measurement

The process atmosphere module is based on the AccuCarb LTA or FurnaceDoctor FX. AccuCarb LTA is specially designed oxygen probe for use in annealing atmospheres; and the FurnaceDoctor FX stationary infrared analyzer is recommended for use with endothermic or exothermic gases. The FurnaceDoctor FX is a high accuracy system that measures CO, CO<sub>2</sub>, and hydrocarbons. If used in conjunction with UPC's Protherm series of controllers, PF calculation is possible.



## FEATURES

- High accuracy and reliability
- Special low temperature electrode assembly
- Gas tight design for safety in hydrogen based atmospheres
- Long sensor life

## Get Control of Oxidation and De-Carb!



## FEATURES

- Accurate, affordable infrared measurement of CO, CO<sub>2</sub>, and CH<sub>4</sub>
- Computation of % Carbon and expected oxygen probe millivolts
- Single- or Multi-point measurements
- Built-in Ethernet
- Encrypted data – fully CQI 9 compliant

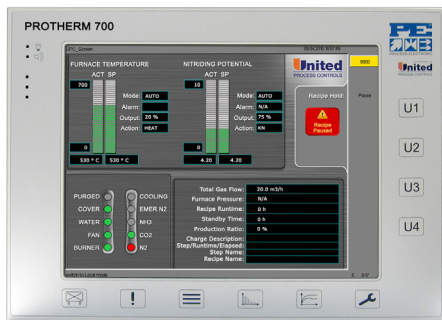
# ANNEALING & BRIGHT ANNEALING CONTROL SOLUTIONS

## PROCESS CONTROL

### Precise Monitoring, Controlling & Recording

The process control module is based on Protherm 455, 500, 600 or 700 from simple annealing atmosphere control to full furnace automation for batch or continuous lines.

All UPC instrumentation includes local data logging and compliance to automotive or aerospace specifications.



### FULLY INTEGRATED CONTROL SYSTEMS AVAILABLE



### TEMPERATURE, ATMOSPHERE & SAFETY CONTROLS

## EQUIPMENT

- Protherm 455, 500, 600 or 700 controller with standard configuration
- External I/O's (Protherm 500, 600, 700)
- Internal I/O's (Protherm 455)
- Steel plate (mountable) or cabinet (enclosure)
- Pre-wired with terminal blocks & isolation relays
- Electrical drawings / user manual
- Factory assembled and tested

## INTEGRATION & CONNECTION

- Integrated web server (Protherm 500, 600, 700)
- Integrated VNC remote connection (Protherm 455)
- Modbus RTU
- Ethernet LAN interface
- Modbus / TCP interface
- Optional Profibus
- Seamless integration with SCADA systems

## ADVANTAGES

- Precise atmosphere control - PF or reduction/oxidation potential (redox)
- Alarm notification and processing
- Multi-level password protected interface
- Real time and historical paperless chart recorder displaying process variables
- Recipes and recipe templates can be created and modified
- Precise temperature control (cascade mode available)
- Internal data storage
- PDF reports (Protherm 500, 600, 700)
- Data export in CSV format (Protherm 500, 600, 700)
- Data export in HTML format (Protherm 455)

# ANNEALING & BRIGHT ANNEALING CONTROL SOLUTIONS

## PROCESS ATMOSPHERE CONTROL

### Efficiency with Automated Control

#### MAIN COMPONENTS

- N<sub>2</sub> emergency flow line
- Purge flow monitoring device
- Electronic flow control of combustible gases
- Process gas lines are equipped with solenoid valves, manual valves, and Waukee Valve-Tronic Plus™ electronic flow meters
- System is factory assembled, prewired, and tested
- Optional Safeties: Purge confirmation, safe admission temperatures, proof of flow, check valves, limiting orifice valves, and automatic purge



## ACCUCARB LTA

### Accurate, Cost-Effective Atmosphere Measurement



The AccuCarb LTA is an oxygen sensor designed specifically for annealing atmospheres and temperatures. While the electrode designs of standard oxygen probes fall short due to the high impedance of the device at annealing temperatures, the unique electrode contact and solid electrolyte substrate of the AccuCarb LTA takes care of this problem. The sensor is also gas-tight for hydrogen applications to ensure safe operation.

## FURNACEDOCTOR FX

### Multi Point Gas Analysis

FurnaceDoctor FX is suitable for installations using exothermic and endothermic gases. It provides complete 3-gas analysis (CO, CO<sub>2</sub>, CH<sub>4</sub>), and when used in conjunction with a Protherm instrument, provides the ability for PF control.



## BENEFITS

- Automatic calibration and sampling
- Fully automated operations
- Filter block alarms
- Smart sampling - only samples when process is ready to be sampled
- User calibration to NIST standards

## ACCESSORIES

All the Tools to Build a Complete System



### Oxygen Probe Accessories

- Probe reference air and burn off systems
- Connectors, cables and reference air tubing

### Reference Air / Burn Off

- When AccuCarb LTA is used with Hydrocarbon additions, burn off is used only in non hydrogen-based atmospheres.
- Pumps, flow meters, and indicator lights are included with compression fitting for tubing.

## FLOW CONTROL ELEMENTS

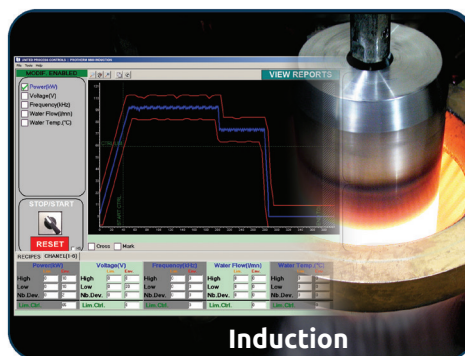
For Retrofit Applications

### ACTIVE OPTION

- Accurate flow measurement and control
- Large, bright flow display
- Internal PID maintains constant flow to set point despite pressure variations
- Set point from control instrument or flow meter keyboard
- Built-in web server with historical alarm log
- Modbus/TCP communications standard
- High, Low, and deviation alarms
- Flow totalization
- Direct interface to Protherm instrumentation or SCADA packages



## OTHER CONTROL SOLUTIONS



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