Nitriding and FNC Control

Super Systems incorporated

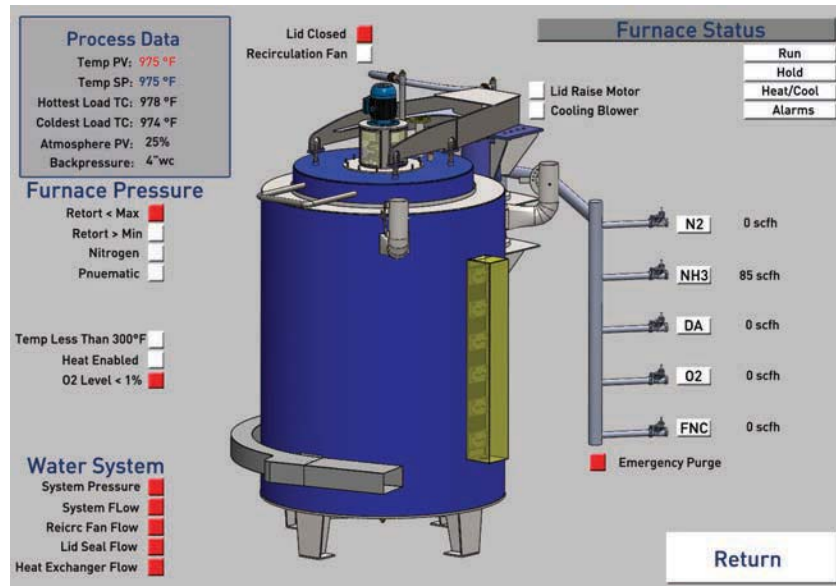SSi
Atmosphere · Vacuum · Gas Nitriding · Sensors

This SSi system will provide a furnace with the ability to run recipes for one- or two-stage automated gas nitriding cycles and control the necessary parameters to achieve precise metallurgical results. SSi's programmable controller includes a touch screen interface with a built-in data logger and controls K_N, %DA, temperature, back pressure, soak time, and all gas flows.

A small footprint for a complete electrical and flow control panel minimizes operator intervention with precision control and maximizes cycle times for furnace utilization and meeting quality standards.

Nitriding Potential	K_N
Dissociated Ammonia	%DA
Carburizing Potential	K_C

Process Data
- Temp PV: 975 °F
- Temp SP: 975 °F
- Hottest Load TC: 978 °F
- Coldest Load TC: 974 °F
- Atmosphere PV: 25%
- Backpressure: 4"wc

Furnace Pressure
- Retort < Max
- Retort > Min
- Nitrogen
- Pnuematic

- Temp Less Than 300°F
- Heat Enabled
- O2 Level < 1%

Water System
- System Pressure
- System FLow
- Reicrc Fan Flow
- Lid Seal Flow
- Heat Exchanger Flow

Lid Closed
Recirculation Fan

Lid Raise Motor
Cooling Blower

Furnace Status
- Run
- Hold
- Heat/Cool
- Alarms

- N2   0 scfh
- NH3   85 scfh
- DA   0 scfh
- O2   0 scfh
- FNC   0 scfh

Emergency Purge

Return

SSi provides equipment for measuring the concentration of reactive gases in the retort—gases necessary for determination of the nitriding and carbon activity meeting the following AMS Specifications:
AMS2759/6 (Nitriding),
AMS2759/10 (Automated Nitriding) and
AMS 2759/12 (FNC)

Full Furnace Safeties

Precision Measurement of Furnace Atmosphere

Temperature Control

Recipe Management

 Automated 2 stage nitriding including pre- and post-oxidation
 Remote recipe management

Process Gas Flow Control

 N_2, %DA, CO_2, NH_3, O_2

K_C, K_N, %DA Atmosphere Control

Pre-Ox, Post-Ox Control

Configurable I/O Based on Furnace Setup

Emergency N_2 Purge

Furnace Back Pressure Control

Furnace Overtemp
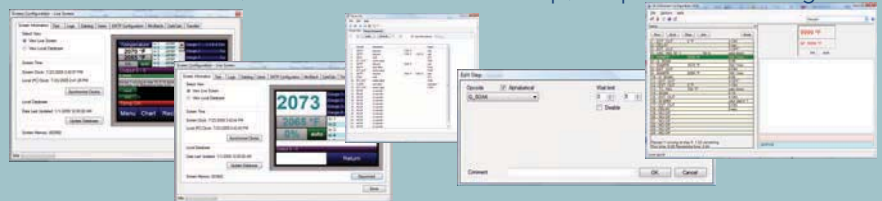
Furnace Pressure Monitoring

O_2 Monitoring

Software Configuration/Remote Management
TS Manager - Data management for touch screen flash card. Remote data viewer, historical data backup, SuperDATA integration.

Electronic Flow Control
- Nitrogen
- Ammonia
- Dissociated Ammonia (DA)
- CO_2

Hydrogen Analyzer
- Precision Measurement of Furnace Atmosphere

Oxygen Analyzer
- Furnace Safety - Quick Purge Time

Analog Pressure Meters

Easy To Maintain Sample and Process Gas Lines
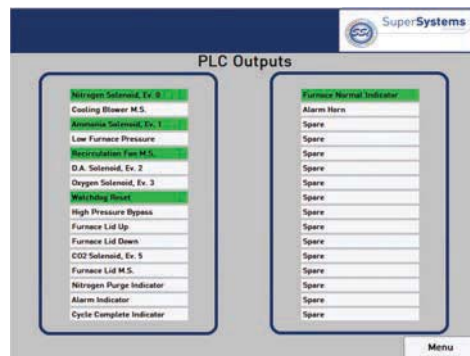- Auto Sample Parameters
- Manual Hand Valves
- Drip Legs
- Filters

Password Protected Operator Interface

Digital Data Logging

Built In Maintenance Alerts

High and Low Pressure Supply Supported

Extensive Sample Filtering

Exhaust Burnoff

SCR or Contact Heated

Alarms

Pressure Alarms:
High Furnace Pressure
Low Furnace Pressure
Back Pressure

Deviation Alarms:
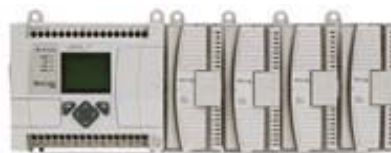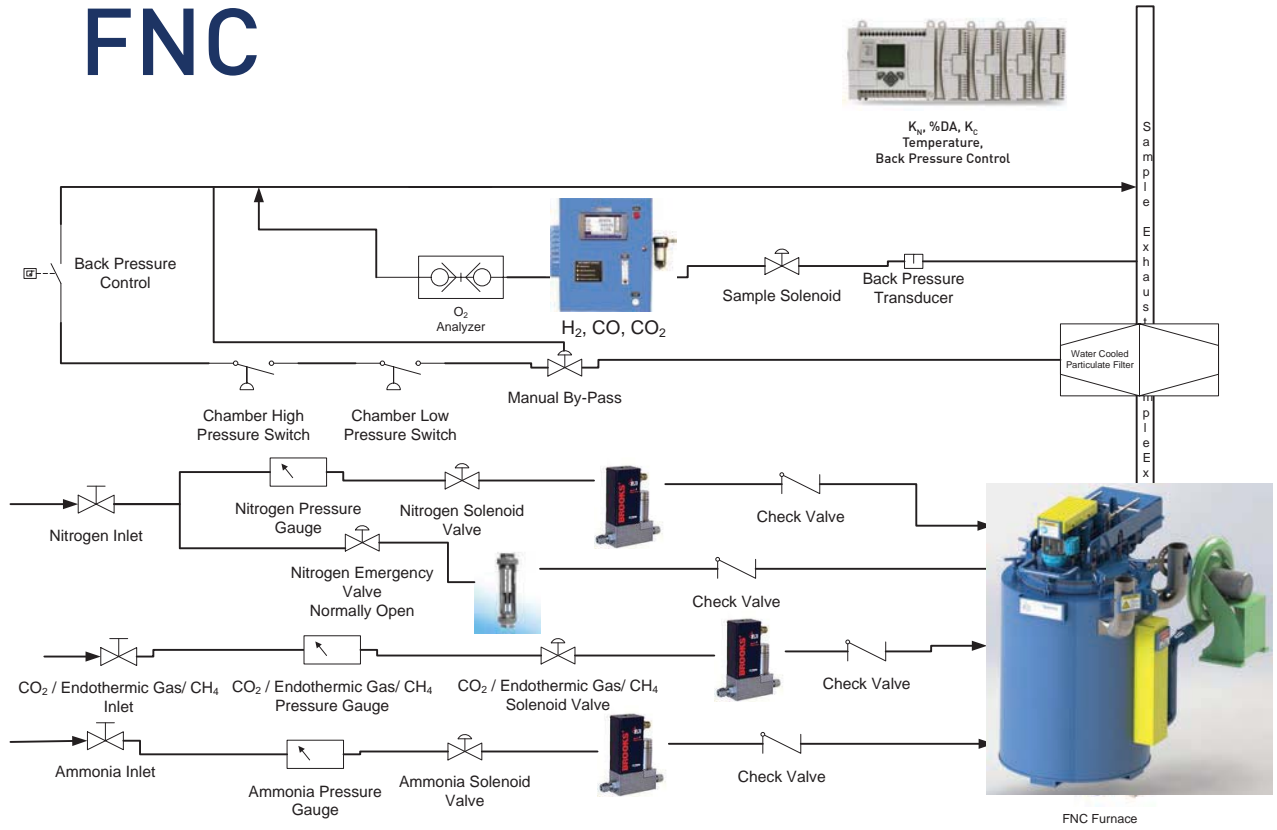Temperature Deviation
%DA Deviation
K_N Deviation

Other Alarms:
High Temperature Limit
Recipe Hold Time
Oxygen Levels
Low Flow
Purge

FNC

K_N, %DA, K_c
Temperature,
Back Pressure Control

Back Pressure
Control

O_2
Analyzer

H_2, CO, CO_2

Sample Solenoid

Back Pressure
Transducer

Sample Exhaust

Water Cooled
Particulate Filter

Manual By-Pass

Chamber High
Pressure Switch

Chamber Low
Pressure Switch

Nitrogen Inlet

Nitrogen Pressure
Gauge

Nitrogen Solenoid
Valve

Check Valve

Nitrogen Emergency
Valve
Normally Open

Check Valve

CO_2 / Endothermic Gas/ CH_4
Inlet

CO_2 / Endothermic Gas/ CH_4
Pressure Gauge

CO_2 / Endothermic Gas/ CH_4
Solenoid Valve

Check Valve

Ammonia Inlet

Ammonia Pressure
Gauge

Ammonia Solenoid
Valve

Check Valve

FNC Furnace

Nitriding

K_N, %DA, Temperature,
Back Pressure Control

O_2
Analyzer

H_2
Analyzer

Sample Solenoid

Back Pressure
Transducer

High Pressure Relief

Back Pressure
Control

Sample Exhaust

Water Cooled
Particulate Filter

Manual By-Pass

Nitrogen Inlet

Nitrogen Pressure
Gauge

Nitrogen Solenoid
Valve

Check Valve

Nitrogen Emergency
Valve
Normally Open

Check Valve

Optional

DA Inlet

DA Pressure
Gauge

DA Solenoid
Valve

Check Valve

Ammonia Inlet

Ammonia Pressure
Gauge

Ammonia Solenoid
Valve

Check Valve

Nitriding Furnace