



Nitrogen Gas Generation Systems

LPS - Layup Protection Systems

Presented by:
South-Tek Systems
“Manufacturers / Designers of Nitrogen Generating Equipment”

Copyrighted All Rights Reserved - 2013

REV 51513



Who is South-Tek Systems?

- “ Founded in 1997
- “ Designs and Manufactures Membrane and PSA, reliable, high purity Nitrogen Generators
- “ Corporate Offices located in Raleigh, NC
 - “ Accounting
 - “ Administrative
- “ Manufacturing and R&D located in Wilmington, NC
 - “ Engineering and Product Development
 - “ Manufacturing
 - “ Service
 - “ Sales
 - “ Marketing

South-Tek's High Visibility Customers

- É Abbott Labs
- É Army/Navy/Marines
- É BE&K
- É Discovery Channel Data Center
- É Eaton Corp
- É Equinix Data Centers
- É Frito Lay
- É Hewlett Packard
- É ITT
- É Lockheed Martin
- É Outback Steakhouse Inc
- É Progress Energy
- É Qwest Communication
- É Teledyne
- É Trane Corporation
- É USDA
- É Wheelabrator
- É WorleyParsons

Applications / Customer Examples

- “ HRSG purge - Progress Energy / Florida Power and Light / PSEG
- “ Transfer Line Purge ó Plains LPG
- “ Rail Car oil purge and Peanut butter load out ó Little Debbie snacks
- “ Food Manufacturing - Chiquita Banana
- “ Plastic injection molding ó Gram packaging / Gatorade
- “ Nano Lab ó Ostendo
- “ Electronic boards, automotive ó Delphi, CKNA
- “ Electronic boards ó Teledyne, Hewlett Packard
- “ Fire Suppression Systems ó The Discovery Channel, Lockheed Martin
- “ Vessel Blanketing ó Pacific Biodiesel/ Sofix
- “ Snack Food manufacturing ó Frito Lay
- “ Pharmaceutical Processing ó Pfizer / Abbott Labs
- “ Transmission Tower purge ó WSOC TV, WCPE FM
- “ Tire Filling ó Rent and Roll, Buick, GM
- “ Medical/Laboratory ó FDA, USDA (15+)
- “ Draft Beer ó BWW, Fridayø Outback, Ruby Tuesday (3K+)
- “ Optics / NVG Equipment ó ARMY, USMC, USAF, USN (200+)
- “ Brazing ó TRANE
- “ Heat Treating ó Robinson Helicopters

How it works

“ Nitrogen has been utilized successfully by Power Plants for years for lay up, and has been proven to protect against corrosion in these similar applications. Nitrogen makes up over 78% of the air we breathe, so is the perfect “green” solution for corrosion protection. Because Nitrogen is inert, by displacing the oxygen within the wetted parts with a low pressure, slow flow nitrogen purge, you ultimately inhibit the oxidation / corrosion process. A Nitrogen Generator is the most convenient, safe and economical way to provide a reliable supply of N₂ gas when it is needed for boiler lay up and other applications.

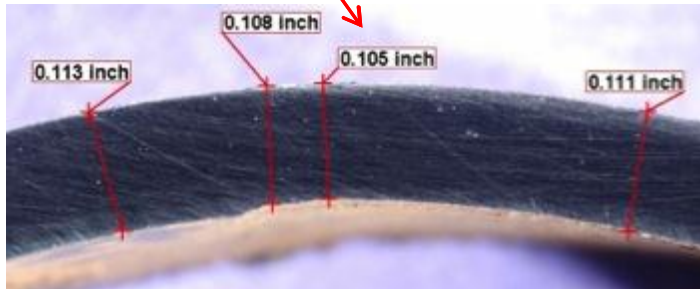
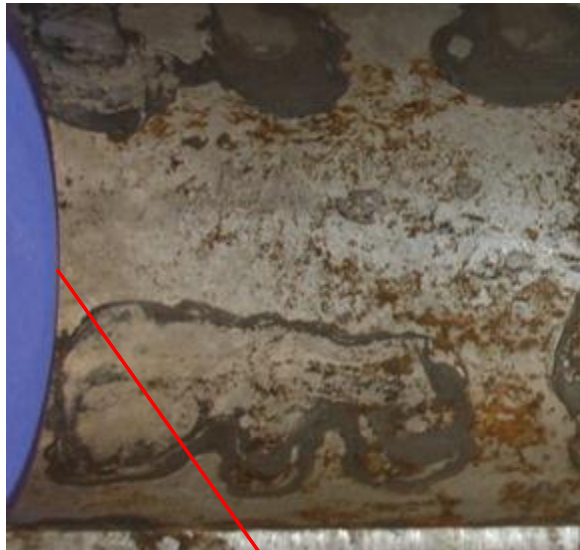
Test Results for As-Found Black Steel, 1116 days in Compressed Air



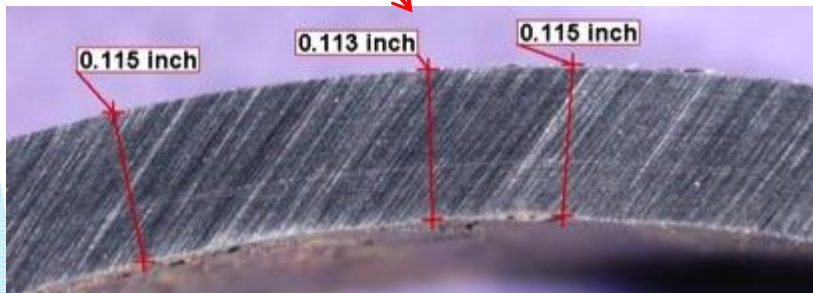
Test Results for As-Found Black Steel, 1116 days in Nitrogen



Test Results for Cleaned Black Steel, 1116 days in Compressed Air



Test Results for Cleaned Black Steel, 1116 days in Nitrogen





Why can you separate Nitrogen from the air?

Molecule Size Relationship:

Nitrogen (N_2) molecules are the size of beach balls

Oxygen (O_2) molecules are the size of pin heads

Why can you separate Nitrogen from the air?

É 78% N₂

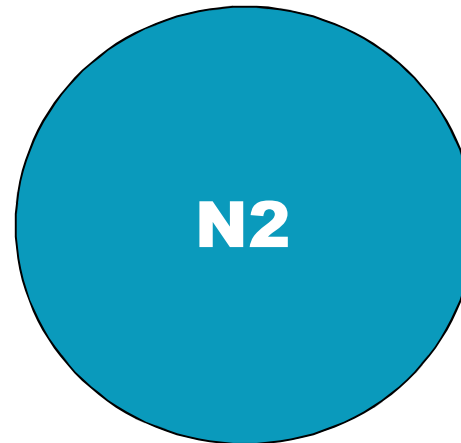
É 20.9% O₂



É 1 % Ar



É Balance CO₂,
CO, rare gases





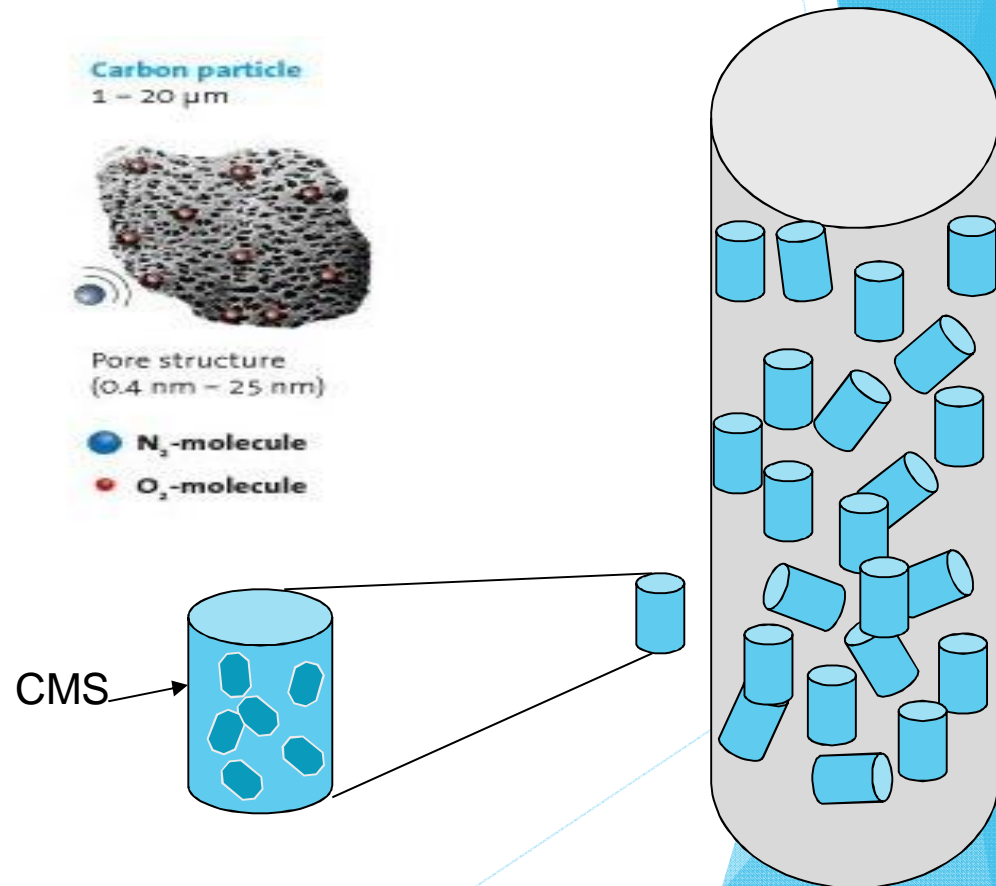
N₂ PSA Gas Generator Technology

PSA = “*Pressure Swing Adsorption*”

What is Pressure Swing Adsorption (PSA) ?

- ▶ A technology used to generate non-cryogenic (gaseous) Nitrogen on-site
- ▶ Carbon Molecular Sieve (CMS) adsorbs oxygen and water vapor molecules under high pressure - while allowing Nitrogen to pass through
- ▶ Skid-mounted units can supply up to 75,000 SCFH of continuous Nitrogen product

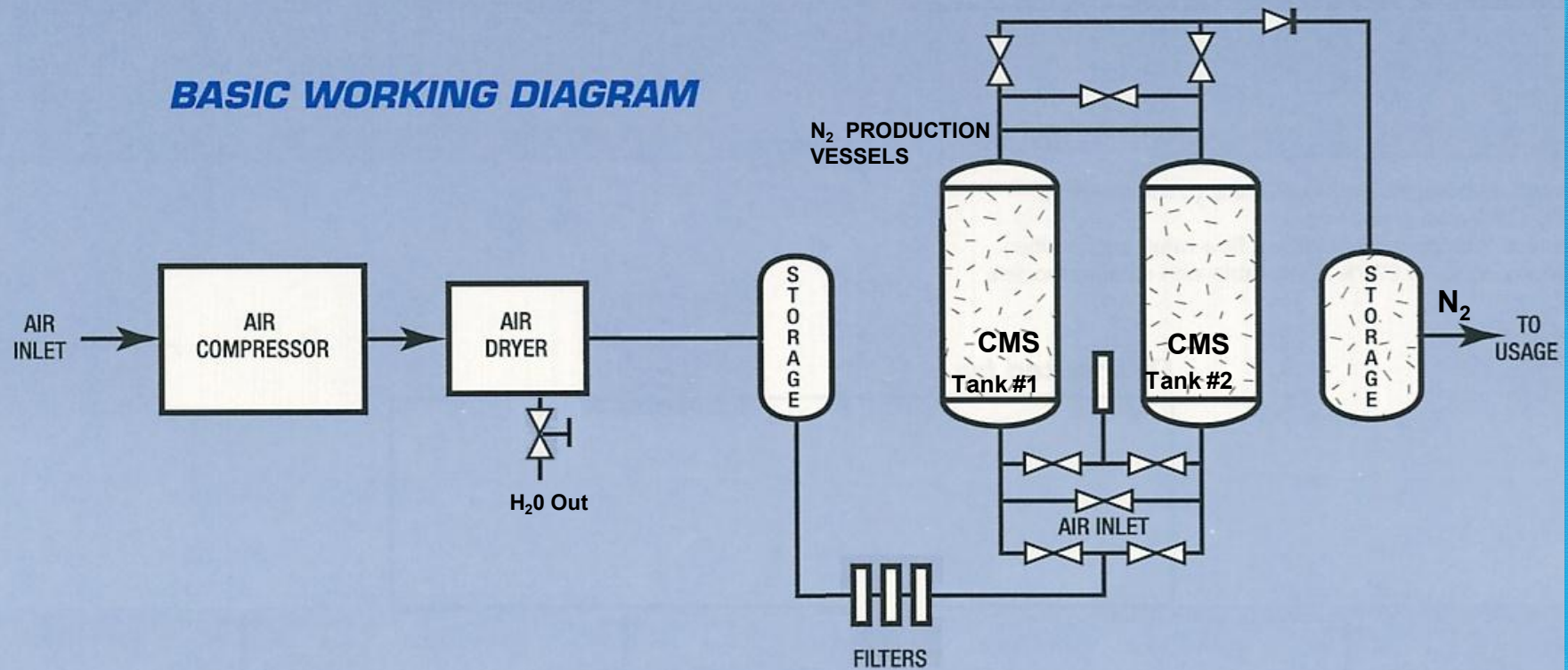
Sieve Bed Pressure Vessels Filled with Carbon Molecular Sieve



N₂ PSA

Gas Generator Technology

BASIC WORKING DIAGRAM



**South-Tek
Systems**

STS N2 GEN LPS

► Engineering and Experience



South-Tek Systems

Designers and Manufacturers of N2 Generators





Advantage STS

- ▶ Purity Certification on all systems
 - ▶ Customers are provided with a DAS (Data Acquisition System) purity certification

Purity Certification


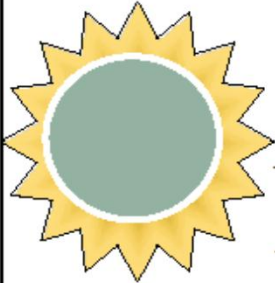
STS *South-Tek Systems*

N2 GEN MODEL: N2 GEN 70C

SERIAL NUMBER: 23765
PRODUCTION / DAS DATE: 1/24/2012
NITROGEN PURITY LEVEL: 99.99%
NITROGEN FLOW RATE: 154 SCFH

NOTERY SIGNATURE

DAS / TEST SUPERVISOR



Advantage STS

► Purity Certification on all systems



South-Tek Systems Nitrogen Generator Flow-Pressure-Purity Certification

Customer Name: Nitrogen Gas User
 Plant Manager: _____
 _____ 123 ABC Lane
 _____ Wilmington, NC 28405
 _____ 123-456-7890

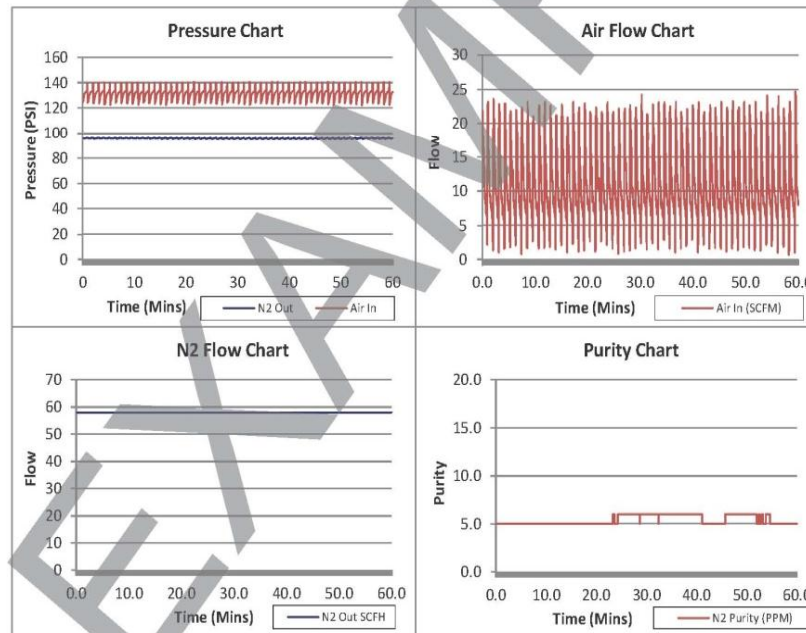
PSA Model # PC-0025
 PSA Serial # 63274
 PSA Build Date: 1/17/2013
 PSA Test Date: 01/22/13

PSA Design Criteria:

Compressed Air Pressure In: 135 PSI
 Avg Compressed Air Flow In: 12.6 SCFM
 Air/N2 Ratio: 13.03
 Nitrogen Pressure Out: 95 PSI
 Nitrogen Flow Out: 58.0 SCFH
 Nitrogen Purity: 10.0 PPM of O2
 Storage Tank Size: 60 GAL

PSA DAS Test Results:

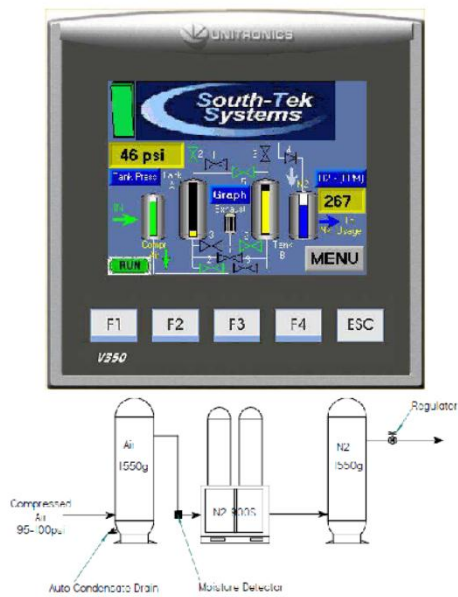
Compressed Air Pressure In: 133 PSI
 Avg Compressed Air Flow In: 11.1 SCFM
 Air/N2 Ratio: 11.50
 Nitrogen Pressure Out: 96 PSI
 Nitrogen Flow Out: 58.0 SCFH
 Nitrogen Purity: 5.2 PPM of O2
 Storage Tank Size: 60 GAL



Advantage STS

▶ Standard and optional electronics packages

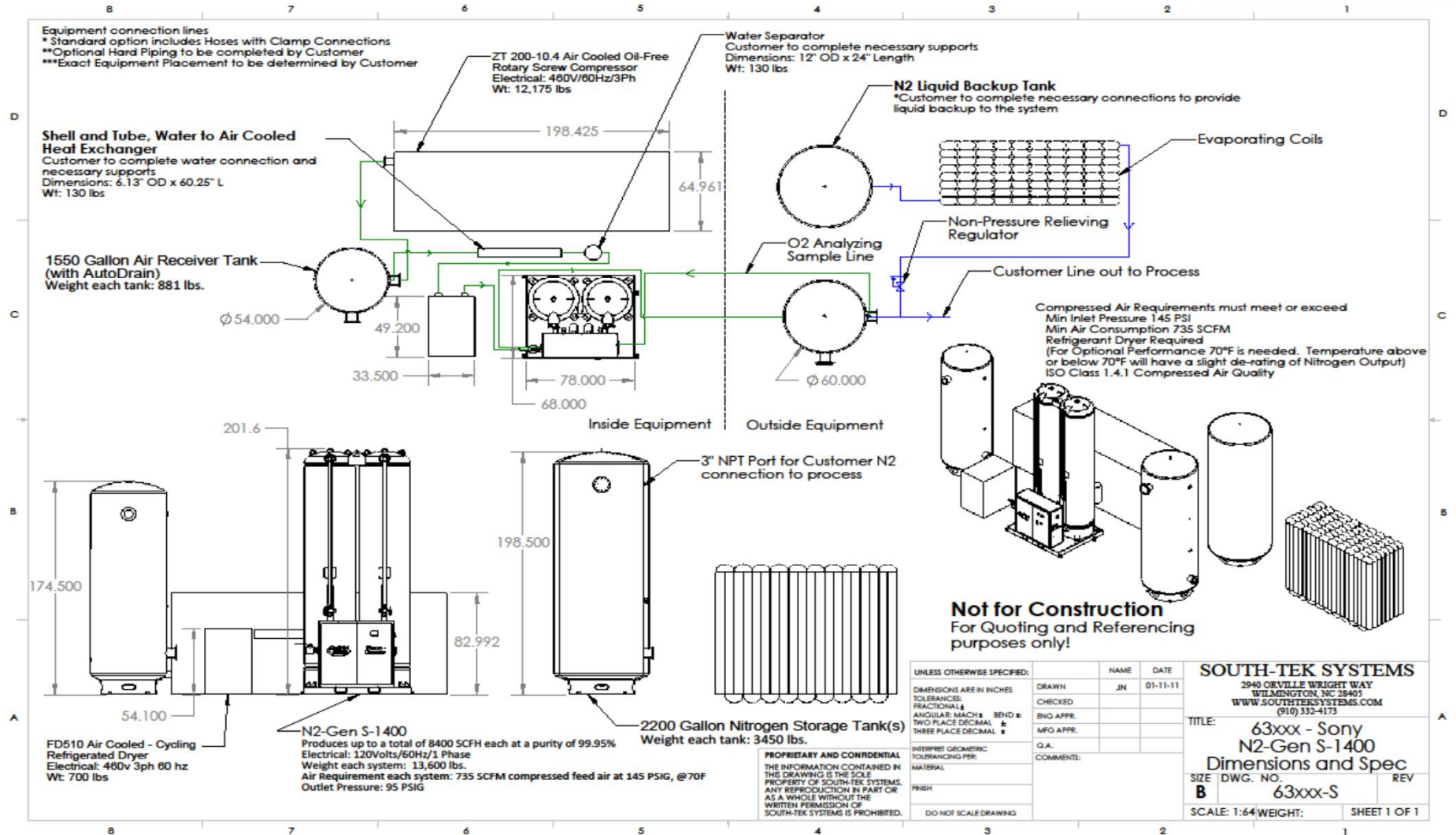
South-Tek Systems, LLC – N₂ PSA Generator Unitronics PLC
 / HMI Program Users / System Manual – (For V350-35-RA12 ONL1)
 Manual Rev. 1.0



Page 1 of 29
 PLC Programming By HCS, Inc. – Wilmington, NC – Date: 07/15/2010

- ” Oxygen analyzer
- ” RS 232
- ” Ethernet
- ” Mod Bus
- ” 4-20
- ” 0 ó 10
- ” Maintenance reminders
- ” Low pressure alarms
- ” Nitrogen flow rates
- ” AB or other controllers available

Engineering and Experience





Advantage STS

- ▶ Engineering and Experience

Quality, we build it





South-Tek Systems

“STS has your Nitrogen Generation Solution...”

2940 Orville Wright Way

Wilmington, NC 28405

tel: (910) 332-4173, fax: (910) 332-4178

Email: info@southteksystems.com

Website: www.southteksystems.com