

PROPOSAL

Presented To:

Derwick Associates Corporation

for

Controls Retrofit

Prepared By



Proposal No. 1310-3882

October 7, 2010

**This document is privileged and contains confidential information intended for use only by
Derwick.**

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1.0 Introduction

ProEnergy Controls Solutions (“ProEnergy”) is pleased to provide this proposal to Derwick Associates Corporation (“Derwick”) for a Control System Upgrade located at Margarita Island. This system will replace the existing GE Speedtronic Mark V control, and add the capability of dual fuel operation for a General Electric Frame 7EA Gas Turbine Generator. This control system will execute all governing for the gas turbine and all associated sequencing functions necessary to perform turbine start-up, power generation, shutdown, and protection.

Primary turbine operations include the following:

- Start Sequencing
- Flame Detection
- Speed Governor Control
- Exhaust Gas Temperature Control
- Accel/Decel Fuel Limiting
- Dual Fuel Systems Control
- Fuel Valve Position Controls w/ dual LVDT Position Feedback
- IGV Position Control w/ dual LVDT Position Feedback
- Bleed Valve Control
- Generator Stator Temperature Monitoring
- Bearing Temperature Monitoring
- Wheelspace Temperature Monitoring
- Auto/Manual Synchronization
- Mega Watt/VAR Control
- Alarm/Fault Monitoring
- Ancillary System controls as applicable (i.e. enclosure fans, hydraulic ratchet, motor controls, etc.)

2.0 Work Scope

ProEnergy will provide the new cabinets complete with control hardware, software, and cabinet internal wiring. An HMI computer and software will also be provided.

Installation, commissioning, and site services will be addressed via a separate proposal once we agree upon the system to be supplied.

3.0 Controls Platform

The new controls system proposed will be based upon the AB ControlLogix Platform with Flex I/O. This ensures that replacement parts are readily available from Rockwell’s worldwide supplier network. This open expandable platform ensures that EDC will be able to maintain this

system either with their own resources, with contracted support, or through the engineering and support services provided by ProEnergy.

ControlLogix with Flex I/O has been used in turbine control applications for years on a variety of turbine types, including:

- Heavy Industrial Gas turbines
- Aero-derivative Gas turbines
- Light Industrial Gas turbines
- Industrial Steam turbines
- Mainline Steam turbines
- Hydro turbines

Specific functions for the Flex I/O modules:

- Speed sensing – interface to existing speed probes
- Vibration – Flex XM vibration modules will interface to existing Vibration sensors
- Fuel valves control – demand and feedback signals to existing stop and control valves
- Guide vane control - demand and feedback signals to existing servos
- Temperature monitoring and control - interface to existing thermocouples and RTDs

4.0 Pricing

ProEnergy will perform the scope of work identified above for a price of ***\$540,000.00 per unit.***

5.0 Terms & Conditions

This proposal shall be valid for thirty (30) days; provided, however, the obligation to treat this proposal as confidential, and that it cannot be shared with any third party without the prior written consent of ProEnergy shall survive.

This proposal, and any resulting contract or agreement, shall be subject to the terms and conditions to be mutually agreed upon.

6.0 Follow Up

Please contact the following person at ProEnergy for information regarding this proposal:

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Attachment A

Controls System Overview

Functional Overview

The Allen Bradley based control system will support all current modes of operation currently being provided by the GE Speedtronic Mark V turbine controls package. A chain of governor control programs are provided within the control system software, each providing a dedicated fuel demand with selection logic being used to determine which loop should be in control. If the system approaches any operational limits, a descriptive alarm will be issued. If a limit is exceeded, or if there is a system failure, the unit will be shutdown. The new systems will provide trending and archiving functionality, the ability to produce operator logs, and to capture high speed data during a trip event to help identify the root cause of the trip.

Dual Fuel Control

The control system will provide outputs for the existing Gas Fuel system and to support the requirements of a Liquid Fuel system. This includes Gas and Liquid Fuel Valve position controls and controls for the liquid fuel pump, ignitors, and all associated shutoff, vent, dump, manifold purge, fill, and atomizing air valves.

Generator Stator Temperature Monitoring

The control system will provide generator stator temperature monitoring. This includes high and low RTD identification, display of their associated values, and the temperature spread between them. Alarms or trips will be generated based on high temperatures or an excessive spread.

Exhaust Temperature Monitoring and Control

The new control system will provide Exhaust temperature monitoring and control. An average of the valid thermocouples will be used to provide a value for EGT Control. Individual thermocouples will be rejected if they are sensed as faulty or can manually be rejected by the operator via HMI. Failure of thermocouples will be alarmed and an excessive number of failures will cause a unit trip. The temperature spread of valid T/Cs will be monitored and alarmed if the spread is excessive.

Bearing Temperature Monitoring

The control system will monitor bearing temperatures including Lube Oil Bearing Drain Temp 1, 2 and 3, Generator Bearing Drain Temp 1 and 2, Active and Inactive Thrust Bearing Temps, Turbine Bearing Metal Temperatures 1, 2 and 3, and Generator Bearing Metal Temperatures 1 and 2. High temperature alarms and trips will be provided.

Vibration Monitoring

The control system will monitor all vibration and position signals from both the Turbine and Generator and provide alarms and/or trips.

Hydraulic/Lube Oil Control and Monitoring

The control system will provide outputs for the existing Lube Oil and Hydraulic Oil systems. This includes managing primary and emergency pumps and valves, as well as monitoring all associate I/O corresponding to pressures, temperatures, tank levels and status for alarm and fault management.

Additional Control Functions

The control system will manage functionality associated with Inlet Guide Vanes, Bleed Valves, Space Heaters, Coolers and Cooling Fans, the Water Wash system, and the Generator Controls Interface. Smoke, Fire, and Gas Detection are also provided.

Operator Interface

A local HMI running on a desktop PC will provide the primary operator interface for control system operation, monitoring and troubleshooting. Operators will be able to perform all control selections, monitor the turbines performance and operating parameters, and see the status of auxiliary systems. All system and operational alarms and unit trip information including first out trip information will be provided on the local HMI. Real time trending and optional archiving functionality are available.

Attachment B1

Controls Hardware Description

ControlLogix System Overview

The ControlLogix system provides discrete, drives, motion, process, and safety control together with communication and state-of-the-art I/O in a small, cost-competitive package. The system is modular, so you can design, build, and modify it efficiently - with significant savings in training and engineering.

System Components

ControlLogix system components include:

| Component | Description |
|------------------------------------|---|
| ControlLogix Controllers | <ul style="list-style-type: none">• Options include: ControlLogix standard controllers, GuardLogix safety controllers, and ControlLogix-XT extended temperature controllers.• User memory ranges from 2 to 32 MB, depending on controller type. |
| ControlLogix Communication Modules | <ul style="list-style-type: none">• Options include: EtherNet/IP, ControlNet, DeviceNet, Data Highway Plus, Remote I/O, Foundation Fieldbus, Serial, DH-485, and SynchLink.• Install multiple communication-interface modules into the ControlLogix backplane to configure a gateway to bridge or route control and information data between different networks. |
| ControlLogix Power Supplies | <ul style="list-style-type: none">• ControlLogix power supplies are used with the 1756 chassis to provide 1.2V, 3.3V, 5V, and 24V DC power directly to the chassis backplane.• Select one power supply for each chassis, if you are using standard power supplies.• Select a power supply bundle if you are planning a redundant power supply system. |
| ControlLogix Chassis | <ul style="list-style-type: none">• Choose from ControlLogix standard or ControlLogix-XT chassis.• Standard chassis are available with 4, 7, 10, 13, or 17 slots.• ControlLogix-XT chassis are available with 5 or 7 slots.• Slot fillers are required for empty slots. |

Optional system components include:

| Component | Description |
|------------------------|--|
| Visualization Products | <ul style="list-style-type: none"> Visualization products, together with Logix for control and NetLinX architecture for communication, make up the Rockwell Automation Integrated Architecture strategy. Choose from PanelView Plus and PanelView Plus CE electronic operator interface and Rockwell Automation industrialized personal computer hardware. Available Rockwell Software supervisory control software includes FactoryTalk View software. |
| Software | <ul style="list-style-type: none"> Your selection of modules and network configuration determines what software packages you need to configure and program your system. Program your ControlLogix system with RSLogix 5000 Enterprise Series software. Additional design and configuration products include RSNetworkx and RSLinx software. |

ControlLogix Controllers Overview

The ControlLogix controller provides a scalable controller solution that is capable of addressing a large amount of I/O points. The controller can be placed into any slot of a ControlLogix I/O chassis and multiple controllers can be installed in the same chassis. Controllers in the same chassis communicate with each other over the backplane (just as controllers can communicate over networks) but operate independently.

ControlLogix controllers can monitor and control I/O across the ControlLogix backplane, as well as over I/O links. ControlLogix controllers can communicate over EtherNet/IP, ControlNet, DeviceNet, DH+, Remote I/O, and RS-232-C (DF1/DH-485 protocol) networks and many third party process and device networks. To provide communication for a ControlLogix controller, the proper communication interface module must be installed into the chassis.

ControlLogix Controllers Environmental Specifications

| | ControlLogix Controllers |
|-----------------------|----------------------------|
| Operating temperature | 0...60 °C (32...140 °F) |
| Storage temperature | -40...85 °C (-40...185 °F) |
| Relative humidity | 5...95% noncondensing |
| Vibration | 2 g at 10...500 Hz |
| Operating shock | 30 g |
| Nonoperating shock | 50 g |

Standard ControlLogix Controllers

The ControlLogix controller is part of the Logix5000 family of controllers. A ControlLogix system includes:

- The ControlLogix controller, available in different combinations of user memory.
- RSLogix 5000 programming software.
- Separate communication modules for network communications
- A built-in serial port on every 1756-L6x controller.
- A built-in USB port on every 1756-L7x controller.



Features

| Feature | 1756-L61, 1756-L62, 1756-L63, 1756-L64, 1756-L65 | 1756-L73, 1756-L75 |
|---|---|--------------------|
| Controller tasks | <ul style="list-style-type: none"> • 32 tasks • 100 programs/task • Event tasks: all event triggers | |
| Communication options | <ul style="list-style-type: none"> • EtherNet/IP • ControlNet • DeviceNet • Data Highway Plus • Remote I/O • SynchLink • Third-party process and device networks | |
| Controller connections supported, max | 250 | 500 |
| Network connections, per network module | <ul style="list-style-type: none"> • 100 ControlNet (1756-CN2/A) • 40 ControlNet (1756-CNB) • 256 EtherNet/IP; 128 TCP (1756-EN2x) • 128 EtherNet/IP; 64 TCP (1756-ENBT) | |
| Controller redundancy | Full support | |
| Programming languages | <ul style="list-style-type: none"> • Relay ladder • Structured text • Function block • SFC | |

Attachment B2
Allen Bradley Flex I/O Brochure

FLEX™ I/O and FLEX I/O-XT™ Modules

In-Cabinet Modular I/O Platform

Advantages

Reduced Space: Wire directly from sensor to terminal base and eliminate the terminal strip

Functionality: From two point to 32-point modules offer functions of larger rack-based I/O

Increased Productivity: Easy configuration and setup of I/O modules using wizards speeds engineering and installation

Reduced Downtime: Removal and Insertion Under Power (RIUP) and module level diagnostics

Exceptional Choices: More than 90 varieties specialty modules meet the needs of a wide variety of applications

Network Flexibility: Communicates on EtherNet/IP, ControlNet, DeviceNet, Remote I/O and other open networks

Improved Plant Operations: HART analog modules pass through HART data to asset management software or controller for improved plant operations



FLEX I/O offers all the functions of larger rack-based I/O without the space requirements. Its cost effectiveness, flexibility, modularity, and reliability have made it the most popular distributed I/O platform with more than four million modules sold.

FLEX I/O helps eliminate multiple long wiring runs, reduces terminations, decreases engineering and installation costs and time, and substantially reduces down time. It complements all Rockwell Automation controller platforms for a distributed I/O solution.

The FLEX I/O system can communicate on EtherNet/IP™, ControlNet™, DeviceNet™, and many other open networks including, but not limited to, Remote I/O, PROFIBUS DP, and Interbus-S. You can independently select the I/O, termination style, and network to meet your application needs.

LISTEN.
THINK.
SOLVE.®



Allen-Bradley • Rockwell Software

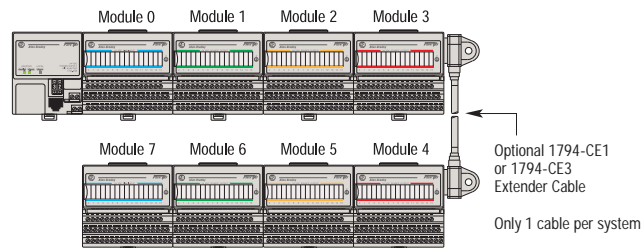
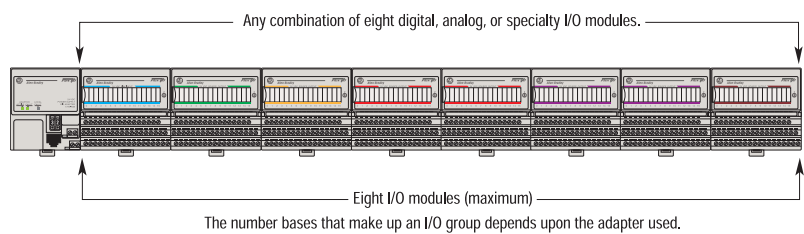
**Rockwell
Automation**

The FLEX I/O system contains a network adapter, terminal bases, and I/O modules. You can power the system with a FLEX power supply or any other compatible power source. You can use as many as eight terminal bases per adapter, allowing a wide variety of I/O channels per adapter, or mix and match digital, analog and specialty I/O modules to meet your specific needs. For instance,

- 256 digital inputs/outputs with 32-point modules
- 96 analog inputs

FLEX I/O can be mounted horizontally or vertically on standard 35mm DIN rail or panel mounted without derating. Select FLEX I/O modules are available with conformal coating for corrosive environments as standard stocked items (K versions).

FLEX Ex™, an intrinsically safe line extension is also in the FLEX I/O family. FLEX Ex is designed to be distributed throughout hazardous areas without the use of bulky explosion proof or purged enclosures.



When using the optional extender cable, module groups are numbered sequentially along the length of the system.


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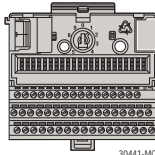


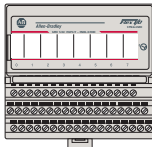
FLEX I/O Products

The following table lists the available FLEX I/O products.

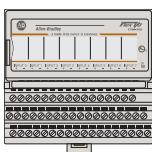
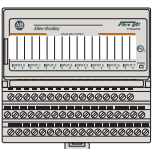
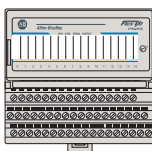
| General Specifications | | | | | |
|---|-------------|---|---|---------------------------------------|--------------------------------|
| Operating Temperature | | | | | |
| • FLEX I/O | | 0...55 °C (32....131 °F) | | | |
| • FLEX I/O-XT | | -20...70 °C (-4....185 °F) | | | |
| Storage Temperature | | -40...85 °C (-40....185 °F) | | | |
| Relative Humidity | | 5...95% non-condensing | | | |
| Shock, Operating* | | 30 g peak acceleration, 11(±1) ms pulse width | | | |
| Shock, Non-Operating* | | 50 g peak acceleration, 11(±1) ms pulse width | | | |
| Vibration* | | Tested 5 g @ 10...500 Hz per IEC 68-2-6 | | | |
| * To maintain these specifications, you must use DIN rail locks | | | | | |
| Dimensions and Weights | | | | | |
| | | Dimentions (HxWxD), Approx. | Weight | | |
| I/O Modules | | 46 x 94 x 53 mm (1.8 x 3.7 x 2.1 in) | 0.1 kg (0.3 lb) | | |
| I/O Adapters≠ | | 87 x 68 x 69 mm (3.4 x 2.7 x 2.7 in) | 0.2 kg (0.4 lb) | | |
| Terminal Bases | | 94 x 94 x 69 mm (3.4 x 3.7 x 2.7 in) | 0.2 kg (0.5 lb) | | |
| Power Supplies | 1794-PS13 | 87 x 68 x 69 mm (3.4 x 2.7 x 2.7 in) | 0.2 kg (0.5 lb) | | |
| | 1794-PS3 | 87 x 94 x 69 mm (3.4 x 3.7 x 2.7 in) | 0.4 kg (0.8 lb) | | |
| ≠ 1794-AENT, 1794-ACN15, and 1794-ACNR15 adapters have the following dimensions: 87 x 94 x 69 mm (3.4 x 3.7 x 2.7 in) | | | | | |
| | | | | | |
| | Product | Catalog Number | Description | | |
| Communications Components | Adapter | 1794-ACN15 | 24Vdc ControlNet Adapter | | |
| | | 1794-ACNR15 | 24Vdc ControlNet Redundant Media Adapter | | |
| 1794-ACNR15XT | | 24Vdc ControlNet Redundant Media Adapter, XTEMP (-20C to 70C) | | | |
| 1794-ADN | | 24Vdc DeviceNet Adapter | | | |
| 1794-AENT | | FLEX Adapter EtherNet I/P | | | |
| 1794-APB | | 12Mbps PROFIBUS DP Adapter | | | |
| 1794-APBDV1 | | 12Mbps PROFIBUS DP –V1 Adapter | | | |
| 1794-ASB | | 24Vdc Remote I/O Adapter (to 8 modules) | | | |
| 1794-ASB2 | | 24Vdc Remote I/O Adapter (to 2 modules) | | | |
| Termination Styles | | Terminal Base Units | 1794-TB2 | 2-Wire Screw Clamp Terminal Base Unit | |
| | 1794-TB3* | | 3-Wire Screw Clamp Terminal Base Unit | | |
| | 1794-TB3S* | | 3-Wire Spring Clamp Terminal Base Unit | | |
| | 1794-TB32 | | 32-Point Screw Clamp Terminal Base Unit | | |
| | 1794-TB32S | | 32-Point Spring Clamp Terminal Base Unit | | |
| | 1794-TB3T* | | Temperature Terminal Base Unit | | |
| | 1794-TB3TS* | | Spring Clamp Temperature Terminal Base Unit | | |
| | 1794-TB3G* | | Screw Clamp Grounded Terminal Base Unit | | |
| | 1794-TB3GS* | | Spring Clamp Grounded Terminal Base Unit | | |
| | 1794-TBN* | | Terminal Base Unit (NEMA-style) | | |
| | 1794-TBNF | | Fused Terminal Base Unit (NEMA-style) | | |
| | 1794-TBKD | | Knife Disconnect Terminal Base Unit | | |
| | 1794-TB37DS | | 37 Pin D-Shell Termination (digital & analog modules) | | |
| | 1794-TB62DS | | 62 Pin D-Shell Termination (32pt. I/O modules) | | |
| | AC I/O | | 120Vac Modules | 1794-IA8 | 120Vac 8 Input Module |
| | | | | 1794-IA8I | 120Vac 8 Isolated Input Module |
| | | | | 1794-IA16 | 120Vac 16 Input Module |
| 1794-OA8 | | 120Vac Output Module | | | |
| 1794-OA8I | | 120Vac 8 Isolated Output Module | | | |
| 1794-OA16 | | 120Vac 16 Output Module | | | |
| | | | | | |
| 220Vac Modules | | 1794-IM8 | 220Vac 8 Input Module | | |
| | | 1794-IM16 | 220Vac 16 Input Module | | |
| | | 1794-OM8 | 220Vac 8 Output Module | | |
| | | 1794-OM16 | 220Vac 16 Output Module | | |
| | | 1794-OM16A | 240Vac 16 Output Module | | |
| | | | | | |
| | | | | | |



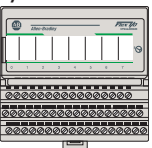

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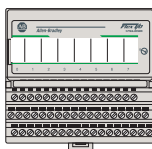
* Use with XT modules



Specialty I/O



| | Product | Catalog Number | Description |
|----------------------------|----------------------------|-----------------|---|
| DC I/O | 5Vdc Modules | 1794-IG16 | 5Vdc 16 TTL Input Module |
| | | 1794-OG16 | 5Vdc 16 TTL Output Module |
| | 24Vdc Modules | 1794-IB8 | 24Vdc 8 Sink Input Module |
| | | 1794-IB10XOB6 | 24Vdc 10 Sink Input/6 2A Source Output Module |
| | | 1794-IB10XOB6XT | 24Vdc 10 Sink Input/6 2A Source Output Module, XTEMP (-20C to 70C) |
| | | 1794-IB16 | 24Vdc 16 Sink Input Module |
| | | 1794-IB16XT | 24Vdc 16 Channel Discrete Input Module, XTEMP (-20C to 70C) |
| | | 1794-IB16D | 24Vdc 16 Sink Input Module, with Diagnostics |
| | | 1794-IB16XOB16P | 24Vdc Combo Module, 16 Sink Inputs/16 Source Outputs, Protected Module |
| | | 1794-IB32 | 24Vdc 32 Sink Input Module |
| | | 1794-IV16 | 24Vdc 16 Source Input Module |
| | | 1794-IV32 | 24Vdc 32 Source Input Module |
| | | 1794-OB8 | 24Vdc 8 Source Output Module |
| | | 1794-OB8EP | 24Vdc Electronically Fused 8 2A Output Module |
| | | 1794-OB8EPXT | 24Vdc Channel Discrete Electronically Fused 8 2A Output Module, XTEMP (-20C to 70C) |
| | | 1794-OB16 | 24Vdc 16 Source Output Module |
| | | 1794-OB16D | 24Vdc 16 Source Output Module, with Diagnostics |
| | | 1794-OB16P | 24Vdc 16 Source Output Module, Protected |
| | | 1794-OB16PXT | 24Vdc 4 Input/20Output Analog Combo Module, XTEMP (-20C to 70C) |
| | | 1794-OB32P | 24Vdc 32 Source Output Module, Protected |
| | | 1794-OV32 | 24Vdc 32 Source Output Module |
| | | 1794-OV16 | 24Vdc 16 Sink Output Module |
| | | 1794-OV16P | 24Vdc 16 Sink Output Module, Protected |
| | 48Vdc | 1794-IC16 | 48Vdc 16 Sink Input Module |
| | | 1794-OC16 | 48Vdc 16 Source Output Module |
| | 125Vdc | 1794-IH16 | 125Vdc 16 Sink Input Module |
| Analog I/O | 24Vdc Analog Modules | 1794-IE4XOE2 | 24Vdc 4 Input/2 Output Analog Combo Module |
| | | 1794-IE4XOE2XT | 24Vdc 4 Input/2 Output Analog Combo Module XTEMP (-20C to 70C) |
| | | 1794-IE8 | 24Vdc Selectable Analog 8 Input Module |
| | | 1794-IE8XT | 8 Channel 16 Bit Analog Input Module XTEMP (-20C to 70C) |
| | | 1794-IE8H | 24V dc Selectable Analog, 8 Input, with HART pass-thru |
| | | 1794-IE8XOE4 | 24Vdc 8 Input/4 Output Selectable Analog Module |
| | | 1794-IE12 | 24Vdc Selectable Analog 12 Input Module |
| | | 1794-OE4 | 24Vdc Selectable Analog 4 Output Module |
| | | 1794-OE8H | 24Vdc Selectable Analog 8 Output, with HART pass-thru |
| | | 1794-OE12 | 24Vdc Selectable Analog 12 Output Module |
| Isolated Analog I/O | Analog Modules | 1794-IF4I | 24Vdc Source Isolated 4 Input Module |
| | | 1794-IF4IXT | 24Vdc Source Isolated 4 Input Module, XTEMP (-20C to 70C) |
| | | 1794-IF2XOF2I | 24Vdc 2 Input/2 Output Isolated Analog Combo Module |
| | | 1794-IF2XOF2IXT | 24Vdc 2 Input/2 Output Isolated Analog Combo Module, XTEMP (-20C to 70C) |
| | | 1794-OF4I | 24Vdc Source Isolated 4 Output Module |
| | | 1794-OF4IXT | 24Vdc Source Isolated 4 Output Module, XTEMP (-20C to 70C) |
| | | 1794-IF8IH | FLEX Isolated HART Analog Input |
| | | 1794-OF8IH | FLEX Isolated HART Analog Output |
| Relay | Relay Module | 1794-OW8 | 8 Isolated Relay Output Module, 2A normally open |
| | | 1794OW8XT | 8 Channel Relay Output Module, XTEMP (-20C to 70C) |
| | Encoder Input Module | 1794-ID2 | 24Vdc 2 Channel Incremental Encoder Input Module |
| | Frequency Input Module | 1794-IJ2 | 24Vdc 2 Input Frequency Module |
| | | 1794-IJ2XT | 2 Channel Counter Module, XTEMP (-20C to 70C) |
| | Pulse Counter Input Module | 1794-IP4 | 24Vdc 4 Channel Pulse Counter Module |



| | Product | Catalog Number | Description |
|---|--------------------------------|----------------|---|
| Relay Specialty I/O (Continued) | RTD Input Module | 1794-IR8 | 24Vdc RTD Input Module |
| | Thermocouple/RTD | 1794-IRT8 | 24Vdc Thermocouple/RTD/mV Module |
| | Input Module | 1794-IRT8XT | 24Vdc Thermocouple/RTD/mV Module, XTEMP (-20C to 70C) |
| | Thermocouple/mV | 1794-IT8 | 24Vdc Thermocouple/mV Module |
| | Input Module | | |
| | Very High Speed Counter Module | 1794-VHSC | 24Vdc 4 Digital Output Module |
| Power Supply | Power Supply | 1794-PS13 | 24Vdc, 1.3A |
| | | 1794-PS3 | 24Vdc, 3.0A |
| Accessories | Accessories | 1794-CE1 | Extender Cable, 0.3m (1 ft.) |
| | | 1794-CE3 | Extender Cable, 0.9m (3 ft.) |
| | | 1794-CJC2 | Cold Junction Compensator Kit |
| | | 1794-N2 | FLEX Dummy Filler Module |
| | | 1794-NM1 | Mounting Kit for panel mounting |
| | | 1794-LBL | Label Kit for terminal bases |
| | | 1492-EA35 | DIN Rail Locks (for vertical mounting) |
| | | | eCADWorks (ABECAD) free at Software free at http://www.rockwellautomation.com/en/e-tools/drawings.html |
| | | | Integrated Architecture Builder 4.0 free at www.ab.com/logix/iab |

| | Product | Catalog Number | Description |
|----------------------------------|---|----------------|-------------|
| Certifications* | UL Listed Industrial Control Equipment | | |
| | UL Listed for Class I, Division 2 Groups A, B, C, D Hazardous Locations | | |
| | CE Marked for all applicable directives† | | |
| | CE/ATEX† | | |
| | CSA Certified Process Control Equipment for Class I, Division 2 Group A, B, C, D Hazardous Locations | | |
| | C-Tick Marked for all applicable acts | | |
| | Marine Certification≈ | | |
| | SIL 2 Certification≈ | | |
| | *When product is marked. See specific module installation instructions for details | | |
| | †CE Marking - Declaration of Conformity: http://www.rockwellautomation.com/products/certification/ce/index.html | | |
| Conformal Coated Products | ≈See the Certification for Marine and Off-shore Applications web site for details | | |
| | ≈See the SIL 2: http://www.rockwellautomation.com/products/certification/ce/index.html | | |
| | FLEX I/O conformal coated products meet or exceed the following standards: | | |
| | ANSI / ISA-S71.04-1985, Class G1, G2, G3 environments | | |
| Publications | CEI IEC 6065A-4 Class 1 and 2 environments | | |
| | UL 746E | | |
| | 1794-SG002_-EN-P FLEX Selection Guide | | |
| | ACIG-BR002_-EN-P Distributed I/O Products Brochure | | |
| | 1794-BR017_-EN-P FLEX Conformal Coating Brochure | | |



Encompass Partner Products

| Company | Product | Description | Connectivity |
|--------------------------|--|--|--|
| ProSoft Technology, Inc. | "C" Programmable Solutions | "C" Programmable, Application Development and other application dependent interfaces available. | Backplane |
| ProSoft Technology, Inc. | FLEX-Communication Adapters 3170 Family | Allows Rockwell Automation FLEX I/O modules to interface to various protocols. | RS-232/422/485, Other Networks, Remote I/O |
| ProSoft Technology, Inc. | FLEX-Protocol Solutions MVI 94 Family | The FLEX communication modules are designed to connect the FLEX platform to any serial field device. | RS-232/422/485, Other Networks, Serial/DF1 |

For more information go to www.rockwellautomation.com/encompass and search for referenced products under the platform FLEX I/O.

FLEX, FLEX Ex and FLEX I/O-XT are trademarks of Rockwell Automation, Inc.
ControlNet, DeviceNet, and EtherNET/IP are registered trademarks of ODVA Inc.

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

Attachment C1

HMI System Overview

Functional Overview

The ProEnergy Controls Solutions HMI application will be created using Rockwell Automation's Factory Talk View Studio Site Edition software.

Each screen will include a Title bar with date and time and a critical data summary which will display important information for the unit such as operating mode, mode status, speed, load, and governor mode. Each screen will also include navigation buttons with single button selection for common screens such as the Main Overview, Alarm, and Trend screens. In addition to the standard turbine screens, there will be an alarm summary screen and a screen to access any trends. Alarms can be acknowledged and reset from any screen.

Background Colors used are designed not to interfere with alarming, indicators and other indications that are used in operations. The base background color will be a light gray. Typically, ProEnergy Controls Solutions will provide a local HMI which will be placed in close proximity to the turbine. If needed, an additional remote HMI can be provided.

Alarms

Alarms will be displayed on the Alarm Summary screen. The summary shall have a black background with rows and columns for Time, Date, Alarm Name/Number and Description. Depending on Software functionality, multiple columns may be available and configured to customer specifications. The Alarm Summary Screen shall contain a First-Out Shutdown Indication for troubleshooting.

Alarm Color coding will be as follows:

- **Red** for Shutdowns or Trips.
- **Yellow** for Alarms

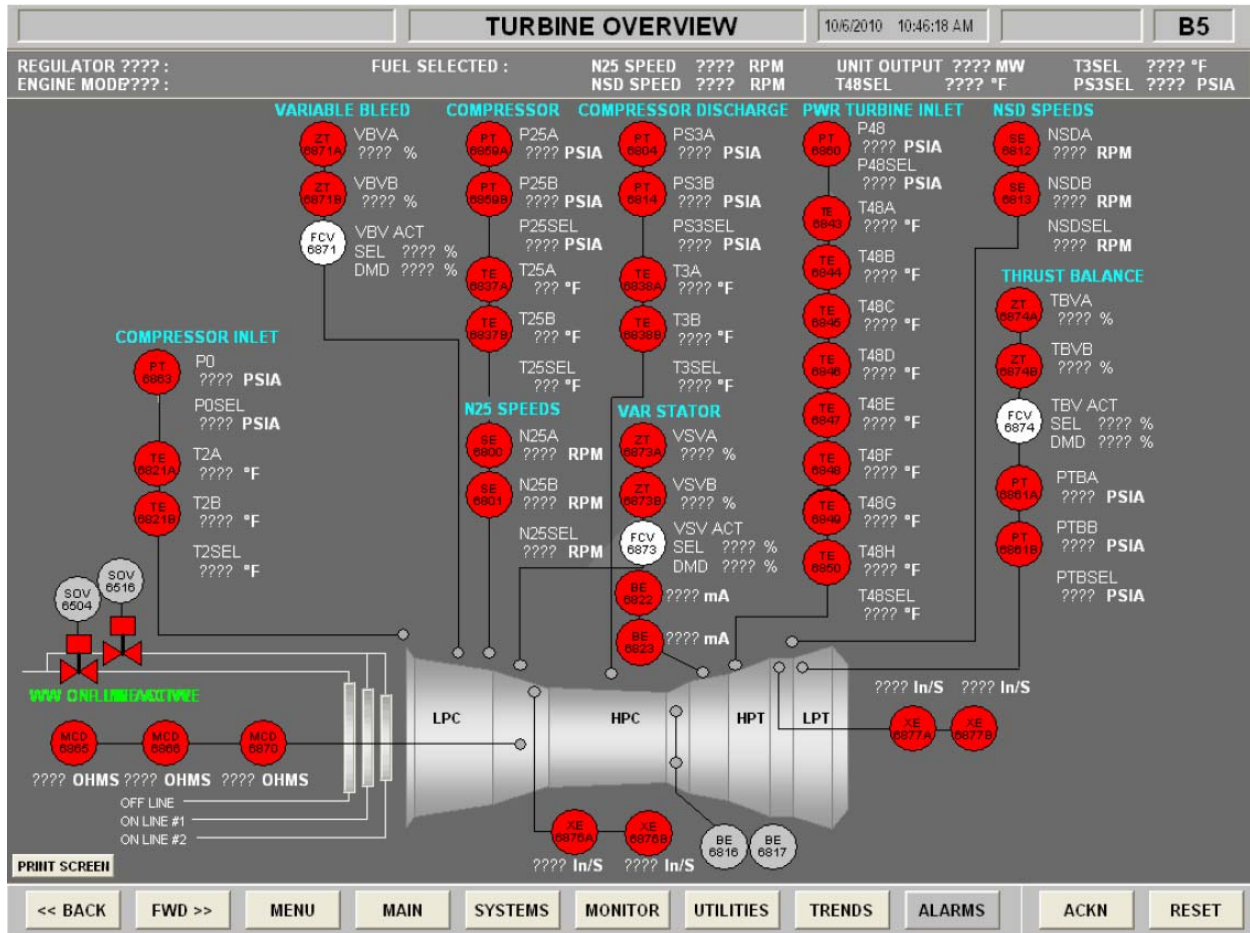
Trending

Real-Time trending will be provided per customer requirements. Historical trending can also be provided if needed.

Example Screens

Typical screens would include a system overview screen, permissive and sequence screens, fuel system screens, auxiliary system overview screens (as applicable). Although the following screens are not a representation of a Frame 7EA, these will illustrate examples of some typical screens that would be developed.

Turbine Overview



Start Permissives

| TURB START PERMISSIVES | | 10/6/2010 10:39:42 AM | A5 |
|--|-----------------|--|---------------------------------------|
| REGULATOR ???? : ENGINE MODE ???? : | FUEL SELECTED : | N25 SPEED ???? RPM NSD SPEED ???? RPM | UNIT OUTPUT ???? MW T48SEL ???? °F |
| | | | T3SEL ???? °F PS3SEL ???? PSIA |

UNIT

- ☐ NO SHUTDOWNS
- ☐ FOUR HOUR LOCK OUT NOT ACTIVE
- ☐ NOT CALIBRATION MODE
- ☐ TURBINE LUBE OIL TANK TEMP OK
- ☐ TURB TANK LEVEL OK
- ☐ HYD - STARTER OK (START)
- ☐ GEN LUBE OIL TANK TEMP OK
- ☐ GEN BEARING TEMP OK
- ☐ GLO TANK LEVEL OK
- ☐ STATOR TEMP GT 14 DEG F
- ☐ CDP PURGE VALVES IN CORRECT POSITION
- ☐ CUSTOMER START PERMISSIVE
- ☐ VIB SYS MALFUNCTION
- ☐ DISCRETE OUT FORCE MODE DISABLED
- ☐ 4 T48 SENSORS FAILED
- ☐ 3 ADJACENT T48 SENSOR FAILED
- ☐ VBV FEEDBACK DIFF
- ☐ T3 A & B FAILED

FUEL & WATER SYSTEMS

- ☐ FUEL SELECTED
- ☐ FUEL DRIVER OK
- ☐ FUEL VLV ON MIN STOP
- ☐ FUEL SUPPLY PRESSURE OK
- ☐ FUEL SYSTEM READY
- ☐ WATER INJECTION SYSTEM - OK

CONTROL SYSTEM HARDWARE OK

- ☐ MICRONET HARDWARE OK
- ☐ LINKNET HARDWARE OK

TURBINE

- ☐ N25 REF AT MIN
- ☐ NSD AT SYNC POSITION
- ☐ T48 LESS THAN 400
- ☐ N25 LESS THAN 300 RPM

WATER INJECTION PERMISSIVES

- ☐ LOAD ABOVE MINIMUM
- ☐ SHUTDOWN WATER INJECTION SYSTEM
- ☐ WATER INJECTION SYSTEM - OK
- ☐ WATER INJ. SUPPLY PRESSURE OK
- ☐ WATER INJ. SUPPLY PRESS SNSR OK
- ☐ NOx SUPPRESSION SYSTEM REMOTE SD

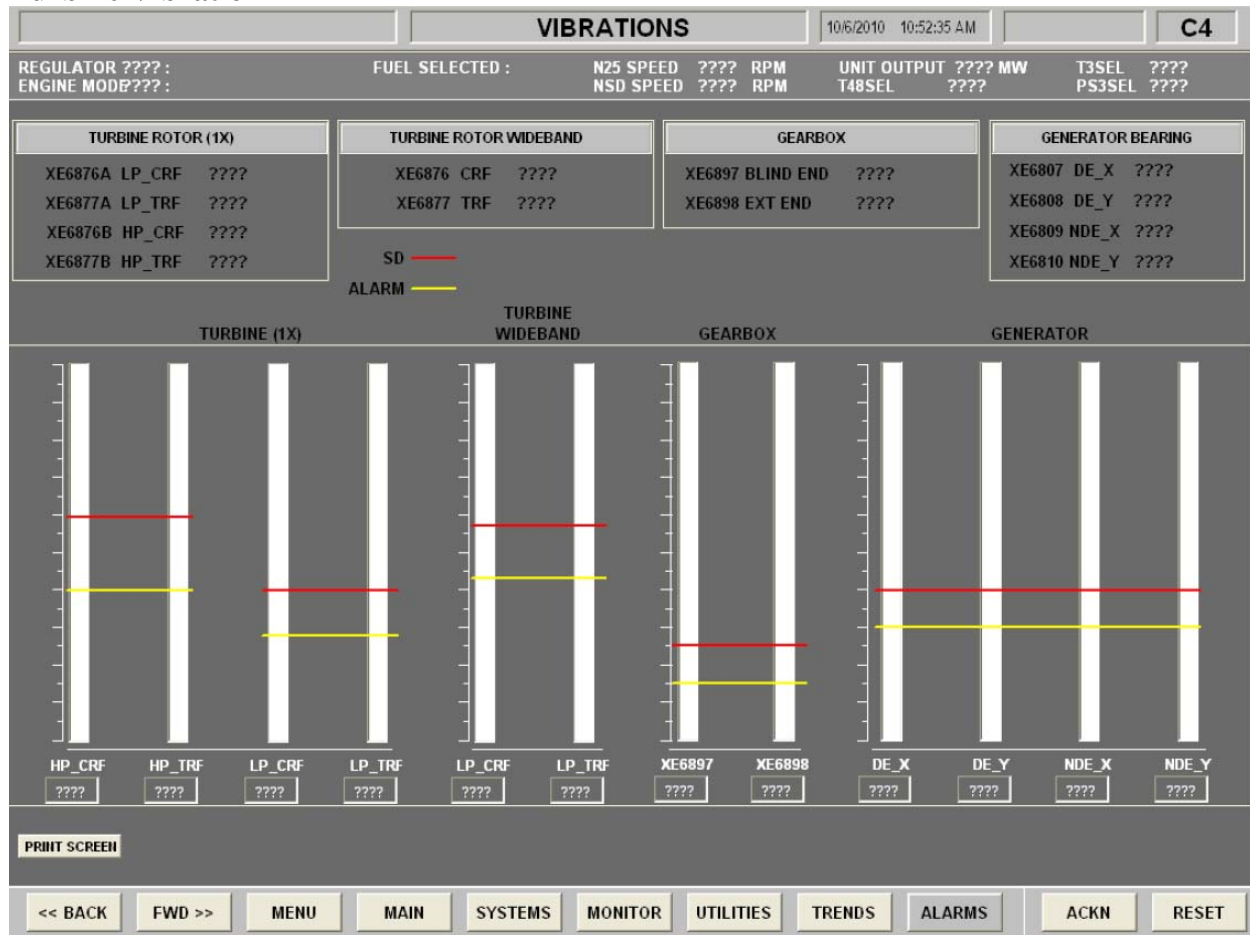
PRINT SCREEN

<< BACK
FWD >>

MENU
MAIN
SYSTEMS
MONITOR
UTILITIES
TRENDS
ALARMS

ACKN
RESET

Turbine Vibration



Turbine Alarms

| ALARM SUMMARY | | | | 10/6/2010 10:53:20 AM | | F1 | |
|--------------------|--|-----------------|--|-----------------------|---------------------|----|---------------|
| REGULATOR ???? : | | FUEL SELECTED : | | N25 SPEED ???? RPM | UNIT OUTPUT ???? MW | | T3SEL ???? : |
| ENGINE MODE ???? : | | | | NSD SPEED ???? RPM | T48SEL ???? : | | PS3SEL ???? : |

| Ack | Time In | Date In | Node | Tagname | Description | Value |
|-----|---------|---------|------|---------|-------------|-------|
| | | | | | | |

Total Alarms: 0
Filter: Off
Sort: Time In, Descending
Run

ALARM HISTORY

PRINT SCREEN

<< BACK
FWD >>
MENU
MAIN
SYSTEMS
MONITOR
UTILITIES
TRENDS
ALARMS
ACKN
RESET

Attachment C2
Allen Bradley FactoryTalk Brochure

FactoryTalk® View Site Edition

Supervisory HMI Software for Enterprise Solutions

INTEGRATED PRODUCTION AND PERFORMANCE SUITE



PERFORMANCE AND VISIBILITY

FactoryTalk View Site Edition (SE)

Local: Station Level HMI

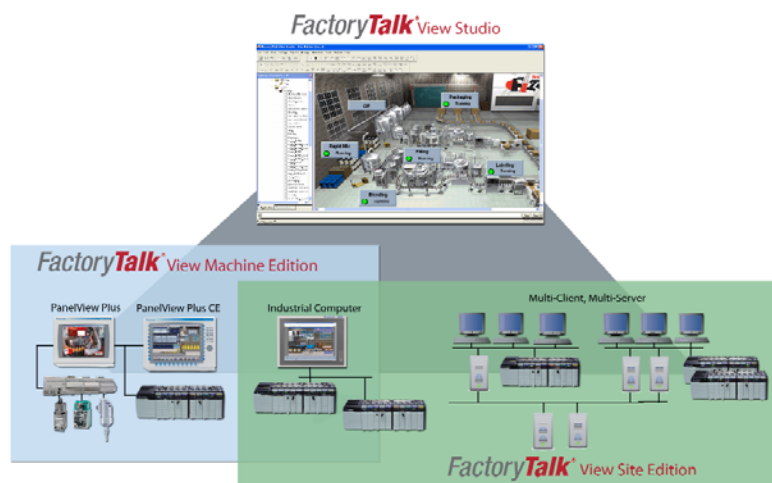
- Ideally suited for line-level monitoring, control and data acquisition.
- Provides advanced HMI capabilities.
- Can be applied to stand-alone one-server, one-client applications.

Network: Site Level HMI

- Distributed and scalable architecture that supports distributed-server/multi-user applications with redundancy.
- Provides maximum control over information where you want it.
- Highly scalable architecture can be applied to a stand-alone one-server/one-user application or to multiple users interfacing with multiple servers.
- Targeted at supervisory-level monitoring and control applications that need a distributed and scalable architecture.

FactoryTalk ViewPoint

- Allows manufacturers to remotely monitor plant-floor operations, extending visualization and real-time decision capabilities to browser-based remote users.
- View applications from the office, home or on the road via an Internet browser.



This suite offers you a common development environment, application reuse, and architecture to help you increase productivity, reduce operation costs, and improve quality.

FactoryTalk View - Overview

Supporting the Rockwell Automation Integrated Architecture, FactoryTalk® View is part of the scalable and unified suite of monitoring and control solutions designed to span stand-alone machine-level applications up through supervisory-level multi-server, multi-client and multi-user HMI applications.

FactoryTalk View, including FactoryTalk View SE and FactoryTalk View ME, are HMI software products designed with a common look, feel, and navigation to help speed HMI application development and training time. Premier integration with Logix-based controllers allows faster and more accurate system implementation.

LISTEN.
THINK.
SOLVE.®



Allen-Bradley • Rockwell Software

**Rockwell
Automation**

FactoryTalk View SE Products:

FactoryTalk View Studio

Configuration software for developing and testing HMI applications. A common development editor for both FactoryTalk View Machine Edition and Site Edition applications.

FactoryTalk View SE Server

HMI server that stores HMI project components (for example, graphic displays) and serves these components to clients. May be made redundant for higher availability.

FactoryTalk View SE Client

Client software for viewing and interacting with supervisory-level applications developed using FactoryTalk View Studio. Full control and read-only clients are available.

FactoryTalk View SE Station

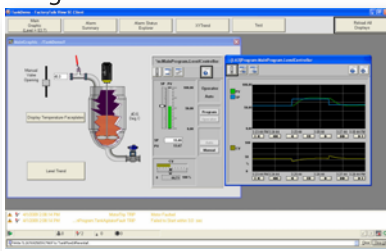
Traditional "stand-alone" HMI solution that packages a server and client for use on a single computer.

FactoryTalk ViewPoint

Web-based HMI expands access to plant-floor applications to users virtually anywhere.

Help Reduce Development and Commissioning Time

- **Online/Remote Editing:** Configure your application from anywhere on the network and easily make changes to a running system with remote, multi-user configuration capability.
- **System-wide Tag Reuse:** Maximize productivity by directly accessing tag information in the ControlLogix™ or CompactLogix™ controller. Define tags once and use multiple times throughout the system without the need to define HMI tags.
- **Graphics Reuse:** Define graphics displays once and reference them throughout a distributed system.
- **Global Objects:** Save development time by linking the appearance and behavior of a base graphic object to multiple references of the object throughout an application.
- **Faceplates and Add on Instructions (AOIs):** Pre-configured visualization faceplates for process, Kinetix™, I/O modules and Logix AOIs simplify configuration and system diagnostics.



- **Audit Tools:** Monitor programming changes for faster troubleshooting and to avoid commissioning delays.
- **Test Display:** Test display changes without running the entire application.
- **FactoryTalk Alarms and Events:** Powerful alarming defined in the ControlLogix or CompactLogix controller. Eliminates alarm data polling and the need for HMI tags.
- **Minimize Scripting:** Powerful animation and expression functionality and extensive object selection.

Facilitate Regulatory Compliance

- **Security Tools:** Provide access only to those who are trained and competent. Manage user rules according to responsibility. Centralized security for all components within the system.
- **Track User Actions:** Provide an audit trail for improved regulatory compliance and to verify whether a process change complies with established standards.
- **Electronic Signatures:** Secure operations by verifying the identity of the operator before an action can occur. Optional supervisory sign-off is also provided.
- **Alarm and Event Timestamp:** Detect alarm conditions quicker and with more accuracy, since alarm

timestamps are applied directly by the ControlLogix or CompactLogix controller.

Optimize Performance and Help Increase Productivity

- **Redundancy:** No loss of access to control information with HMI and data server redundancy for high availability.
- **Scalability:** Scale HMI applications from single panel ME applications to SE stand-alone to SE distributed. In addition, scale to thin clients, such as FactoryTalk ViewPoint.
- **Manage and Monitor Assets:** Use clients, studio or ViewPoint to monitor from anywhere.
- **Docked Displays:** Continuous access to important functions.

Improve Total Cost of Ownership

- **Single Development Environment:** Between FactoryTalk ME and SE. Reuse components and services.
- **Common Services Platform:** Unique data is created once then re-used.
- **Unified Data and Services:** Infrastructure integrates third-party controllers.
- **Centralized Security Authority:** Better control over authorized user actions helps prevent injuries.
- **FactoryTalk Activations:** Provides a seven day grace period that

allows the system to run for seven days even if the license fails. Concurrent licensing provides licenses to computers as they are needed, thus saving costs.

Globalize Your System

• Localized Development:

Environment translated into French, German, Japanese and Chinese. Also available are translated faceplates, graphic files, and FactoryTalk Alarm & Event alarm summary and alarm banner.

• Runtime Language Switching:

Reduces maintenance and development cost for different user needs with ability to work on the same application in a user's local language.

Support Your Investment:

• Import and Reuse RSView32

Projects: Retain graphic displays,

animated objects, text, tags, alarms, expressions and macros.

- **ME Migration:** Migrate ME applications into FactoryTalk View SE as your applications grow.
- **Interconnectivity with Legacy and Third-party Controllers:** KEPServer Enterprise provides connectivity to non-Rockwell Automation devices and networks.

Support Open Standards

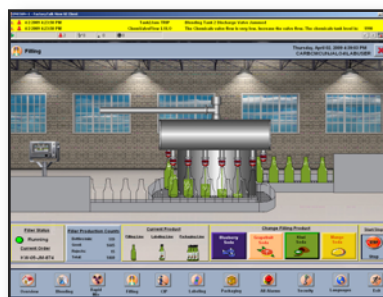
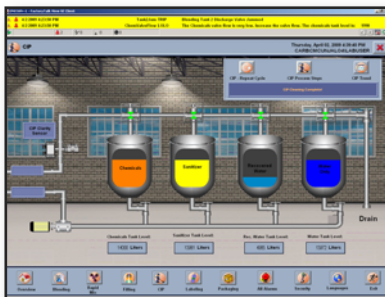
- **Common ODBC:** Log data directly to third party databases for display in historical trends.
- **OPC Servers:** Use RSLinx™ or other OPC Servers for communications with controllers.
- **XML Import/Export:** Develop / modify graphics in XML language outside of FactoryTalk View Studio.
- **Client-side VBA:** Customize the behavior of an application.

Reference Architectures

• Best Practice Architectures:

Detailed designs and best practices implementation guidance for a plant-wide or enterprise-wide architecture.

<http://www.ab.com/networks/architectures.html>



Common Services shared across FactoryTalk-enabled products:

- **FactoryTalk Audit:** Provide an audit trail of operator and alarm information in a centralized log database.
- **FactoryTalk Live Data:** Optimize plant communications by managing connections between FactoryTalk enabled products and data servers.
- **FactoryTalk Security:** Centralized configuration and runtime security for all components in the system. Authenticate the identities of users and authorizes user requests including line-of-sight security.
- **FactoryTalk Alarms and Events:** System-level alarming solution that spans the Integrated Architecture to quickly alert you to conditions requiring immediate action.
- **FactoryTalk Activations:** Common software license management for all products.
- **FactoryTalk Directory:** Common address book of resources that are shared among FactoryTalk Services enabled products, eliminating the need to recreate or import tags.
- **FactoryTalk Diagnostics:** Service to record and store messages generated by the system in a centralized log database.

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Attachment D
Preliminary Cabinet Layout



TM

Pro Energy

CONTROL SOLUTIONS

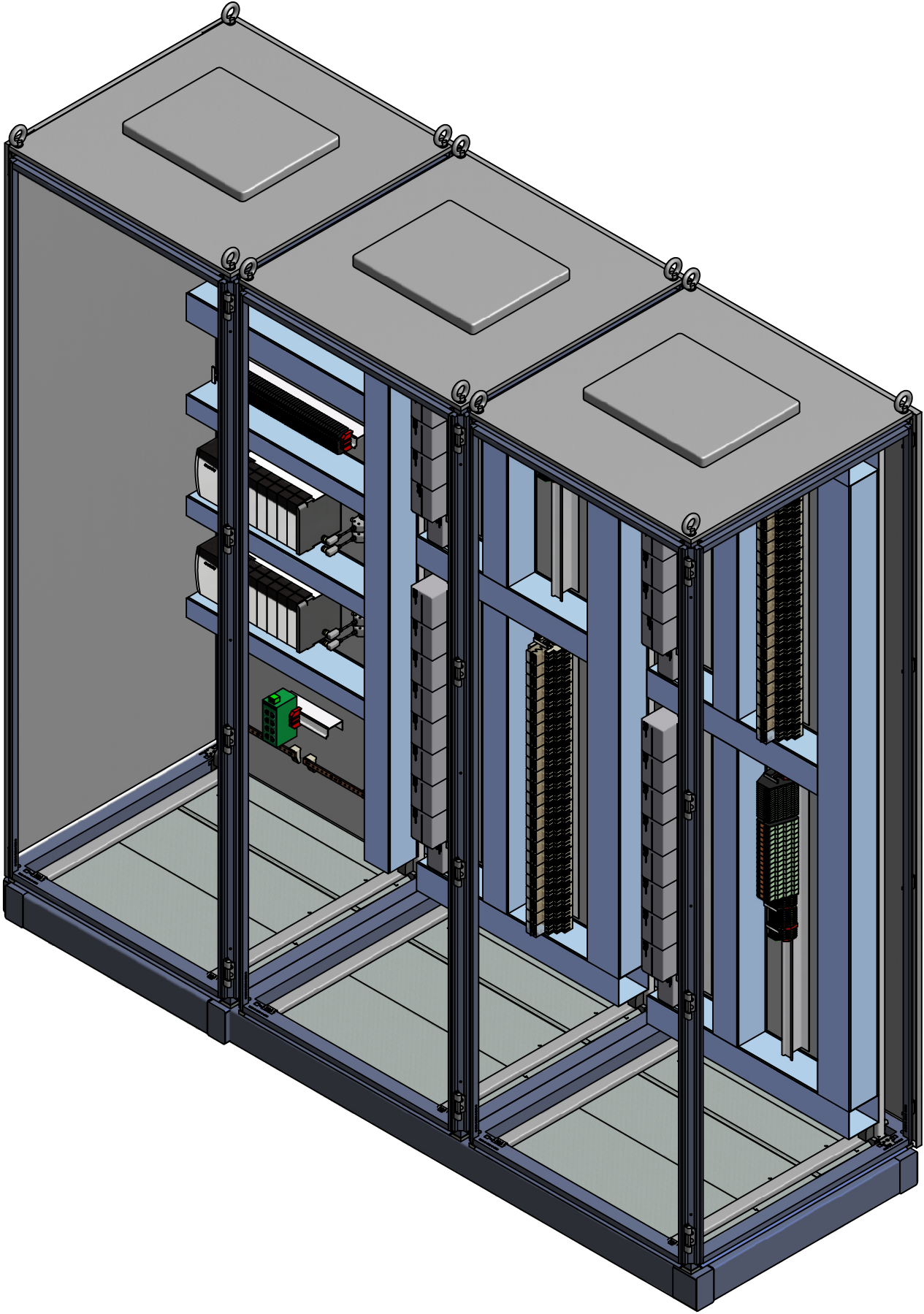
"Experience Our Energy"

STANDARD BASE FOR CONTROL CABINET

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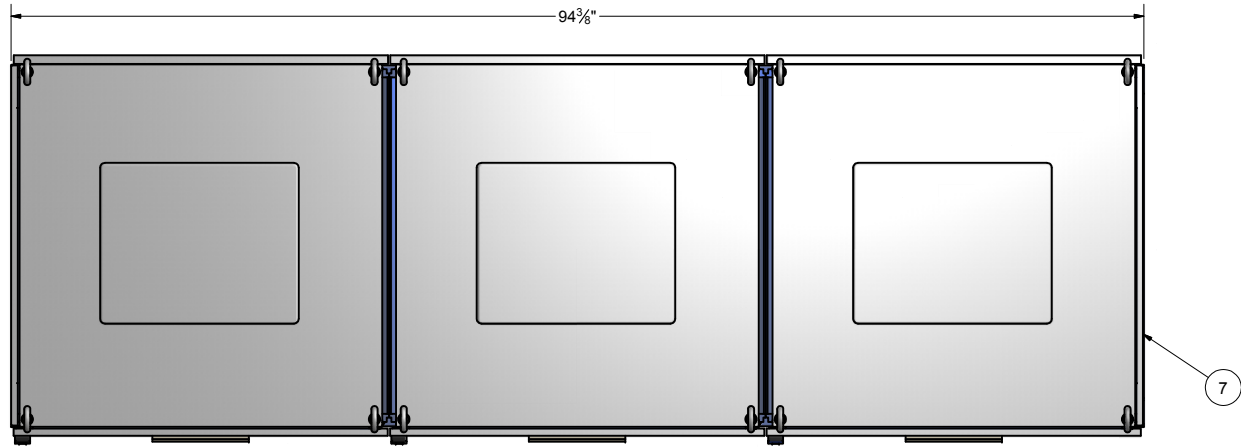
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| REVISION | | CHANGE DESCRIPTION | | APPROVED BY | | DATE | | CUSTOMER INFORMATION | | | | <div><div>2001 ProEnergy Blvd. Sedalia, Missouri 65301 660-829-5100 office 660-829-1160 fax</div></div> | | | | DRAWN BY | | GSPEER | | DATE | | 9/22/2010 | | SIZE | | D | | TITLE | | | | STANDARD CONTROL CABINET | | | | | | | | | |
| 1 | | NEW | | AHARRIS | | 9/22/2010 | | CUSTOMER INFORMATION | | CHECKED BY | | | | | | JBAUER | | DATE | | | | SCALE | | NTS | | | | | | | | | | | | | | | | | |
| PAGE DESCRIPTION | | | | | | | | TITLE PAGE | | | | | | | | APPROVED BY | | AHARRIS | | DATE | | | | DWG. SET TOTAL NO. OF PGS. 11 | | DRAWING NUMBER | | | | 9907-0002 | | | | SHEET | | 1 OF 11 | | REV | | 1 | |
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| 4 | DISCRETE I/O PANEL ASSEMBLY OVER ALL DIMENSIONS AND PARTS LIST |
| 5 | DISCRETE I/O DIN RAIL A AND DIN RAIL C PARTS LIST |
| 6 | DISCRETE I/O DIN RAIL B AND DIN RAIL D PARTS LIST |
| 7 | DISCRETE I/O PANEL B ASSEMBLY PARTS LIST |
| 8 | PLC PANEL ASSEMBLY OVER ALL DIMENSIONS AND PARTS LIST |
| 9 | ASSEMBLIES INCOMING POWER, CIRCUIT BREAKER, POWER SUPPLIES, AND ETHERNET SWITCH PART LISTS |
| 10 | ASSEMBLIES FUSE BLOCK A AND B PARTS LIST |
| 11 | ASSEMBLIES PLC A AND B PARTS LIST |



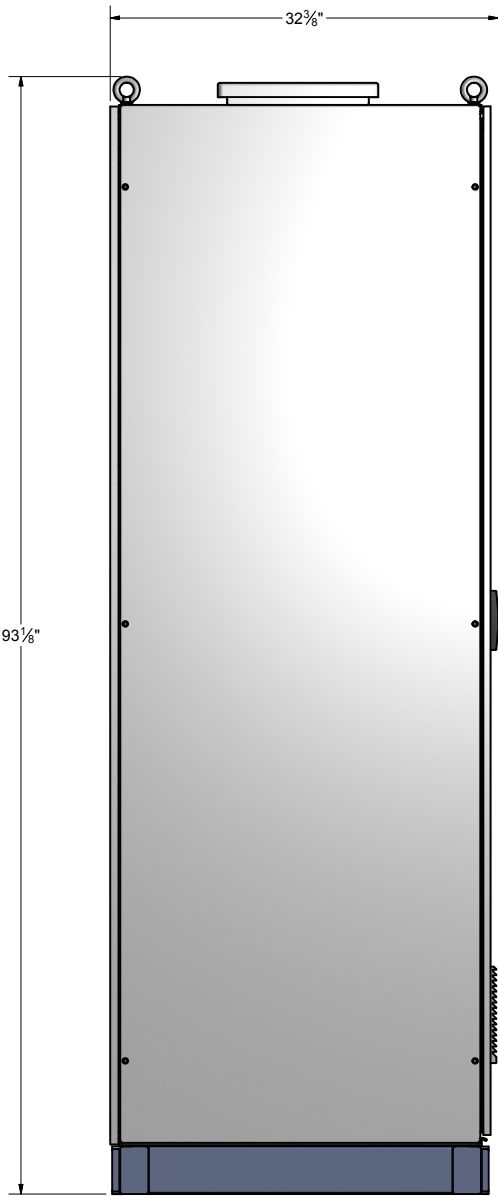
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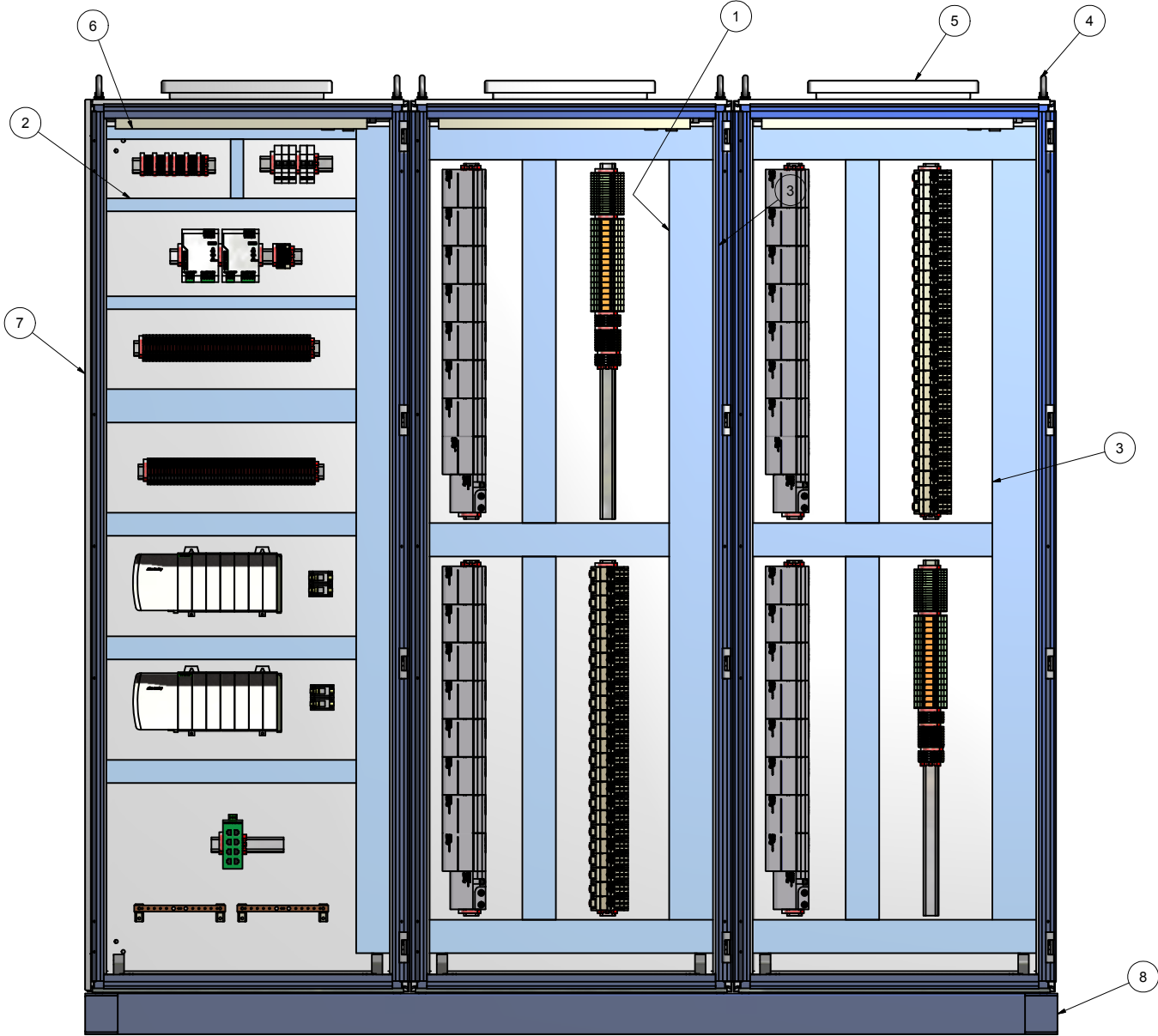


TOP VIEW WITH DOORS

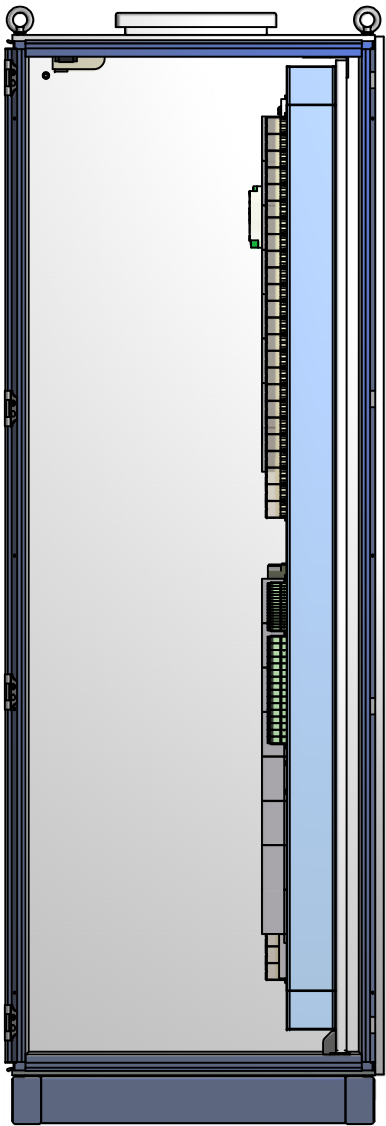
| CABINET OVER ALL DIMENSION AND PARTS LIST | | | | |
|---|-----------------------------|-------------------|--|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | PROENERGY CONTROL SOLUTIONS | 8801-0001 | DISCRETE I O PANEL | 1 |
| 2 | PROENERGY CONTROL SOLUTIONS | 8801-0002 | PLC PANEL | 1 |
| 3 | PROENERGY CONTROL SOLUTIONS | 8801-0003 | DISCRETE I O PANEL B | 1 |
| 4 | RITTAL | 8826009-03 | 8826.009 BAYED 8828.500 86.6H X 63W X 31.5D COMPLETE | 1 |
| 5 | RITTAL | 3169007 | ROOF MOUNTED PAGODA FAN | 3 |
| 6 | RITTAL | 9968112 | 24" FLOURESCENT LIGHT | 3 |
| 7 | RITTAL | 8626791 | SIDE PANEL | 2 |
| 8 | RITTAL | PLINTH 2400 X 800 | | 1 |



LEFT SIDE WITH DOORS



FRONT VIEW WITHOUT DOORS



RIGHT SIDE WITHOUT DOORS

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ProEnergy

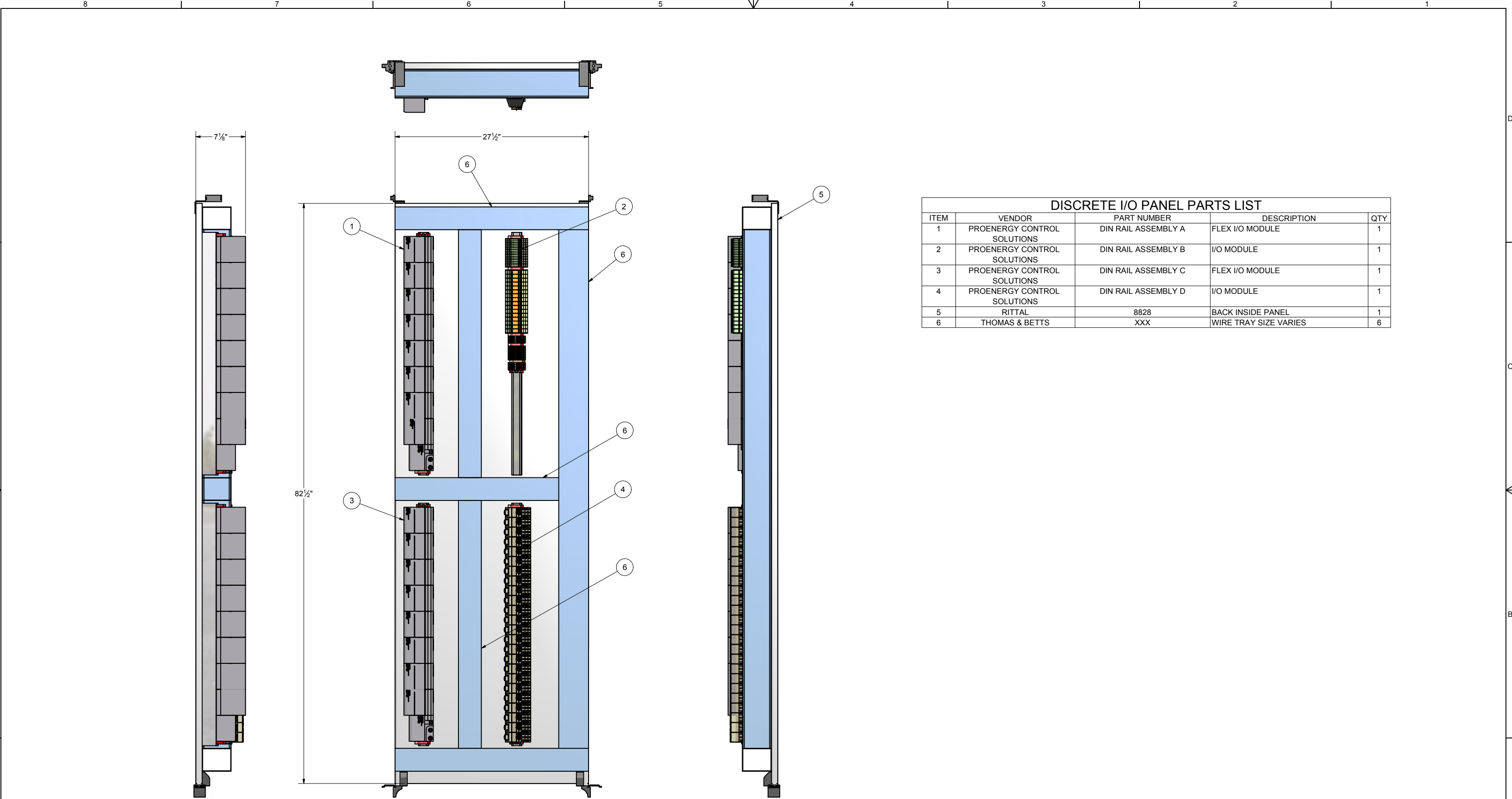
CONTROLS SOLUTIONS

2001 ProEnergy Blvd.

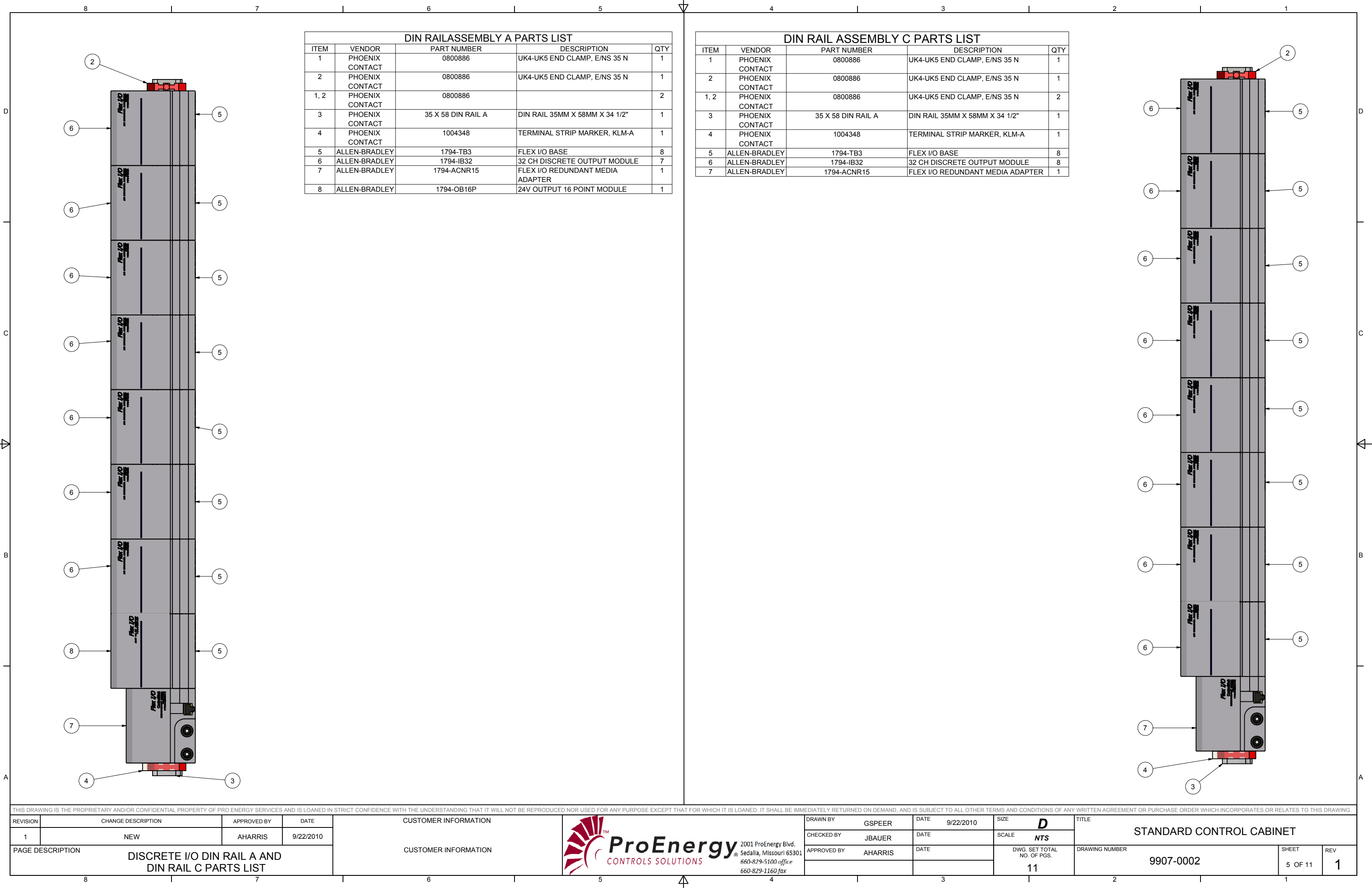
Sedalia, Missouri 65301

660-829-5100 office

660-829-1160 fax

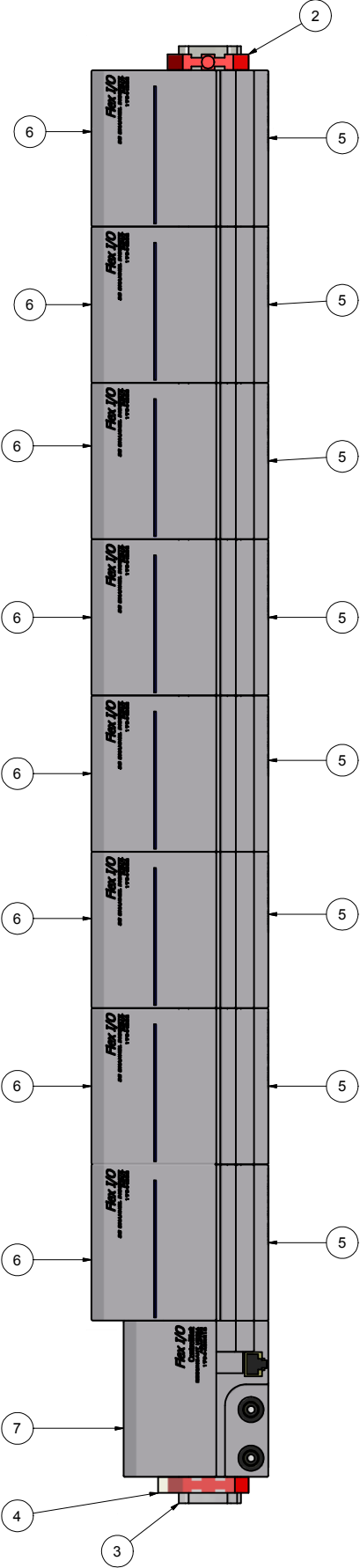


| DISCRETE I/O PANEL PARTS LIST | | | | |
|-------------------------------|-----------------------------|---------------------|-----------------------|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | PROENERGY CONTROL SOLUTIONS | DIN RAIL ASSEMBLY A | FLEX I/O MODULE | 1 |
| 2 | PROENERGY CONTROL SOLUTIONS | DIN RAIL ASSEMBLY B | I/O MODULE | 1 |
| 3 | PROENERGY CONTROL SOLUTIONS | DIN RAIL ASSEMBLY C | FLEX I/O MODULE | 1 |
| 4 | PROENERGY CONTROL SOLUTIONS | DIN RAIL ASSEMBLY D | I/O MODULE | 1 |
| 5 | RITTAL | 8828 | BACK INSIDE PANEL | 1 |
| 6 | THOMAS & BETTS | XXX | WIRE TRAY SIZE VARIES | 6 |



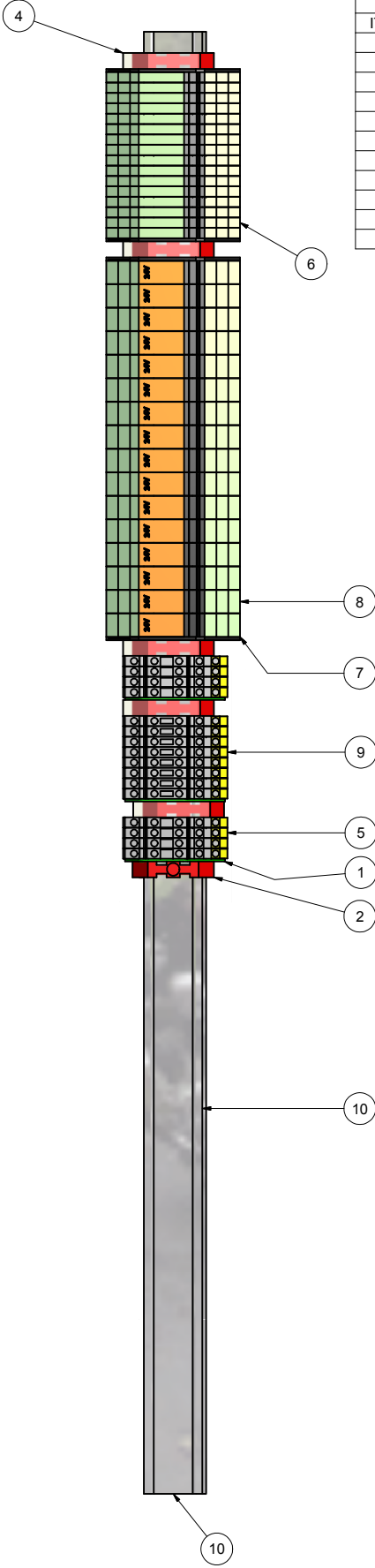
| DIN RAILASSEMBLY A PARTS LIST | | | | |
|-------------------------------|-----------------|--------------------|----------------------------------|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 2 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 1, 2 | PHOENIX CONTACT | 0800886 | | 2 |
| 3 | PHOENIX CONTACT | 35 X 58 DIN RAIL A | DIN RAIL 35MM X 58MM X 34 1/2" | 1 |
| 4 | PHOENIX CONTACT | 1004348 | TERMINAL STRIP MARKER, KLM-A | 1 |
| 5 | ALLEN-BRADLEY | 1794-TB3 | FLEX I/O BASE | 8 |
| 6 | ALLEN-BRADLEY | 1794-IB32 | 32 CH DISCRETE OUTPUT MODULE | 7 |
| 7 | ALLEN-BRADLEY | 1794-ACNR15 | FLEX I/O REDUNDANT MEDIA ADAPTER | 1 |
| 8 | ALLEN-BRADLEY | 1794-OB16P | 24V OUTPUT 16 POINT MODULE | 1 |

| DIN RAIL ASSEMBLY C PARTS LIST | | | | |
|--------------------------------|-----------------|--------------------|----------------------------------|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 2 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 1, 2 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 2 |
| 3 | PHOENIX CONTACT | 35 X 58 DIN RAIL A | DIN RAIL 35MM X 58MM X 34 1/2" | 1 |
| 4 | PHOENIX CONTACT | 1004348 | TERMINAL STRIP MARKER, KLM-A | 1 |
| 5 | ALLEN-BRADLEY | 1794-TB3 | FLEX I/O BASE | 8 |
| 6 | ALLEN-BRADLEY | 1794-IB32 | 32 CH DISCRETE OUTPUT MODULE | 8 |
| 7 | ALLEN-BRADLEY | 1794-ACNR15 | FLEX I/O REDUNDANT MEDIA ADAPTER | 1 |



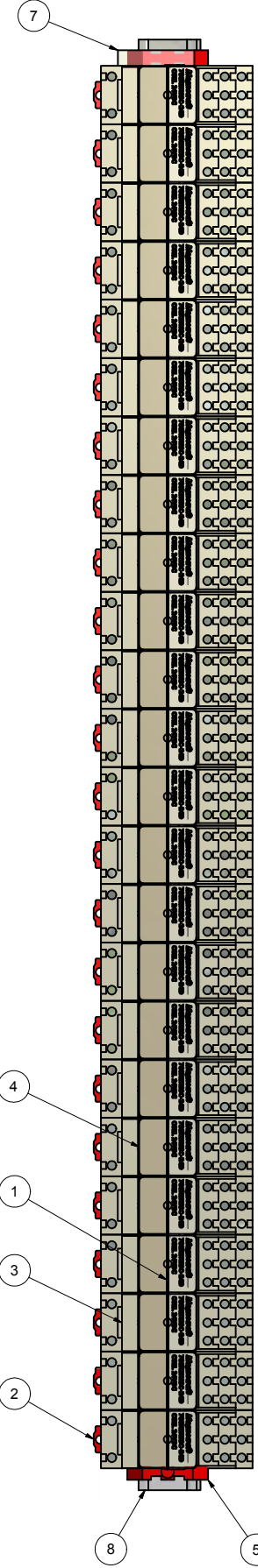
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| REVISION | CHANGE DESCRIPTION | | APPROVED BY | DATE | CUSTOMER INFORMATION |  <div>2001 ProEnergy Blvd. Sedalia, Missouri 65301 660-829-5100 office 660-829-1160 fax</div> | DRAWN BY | GSPEER | DATE | 9/22/2010 | SIZE | D | TITLE STANDARD CONTROL CABINET | | | |
| 1 | NEW | | AHARRIS | 9/22/2010 | | | CUSTOMER INFORMATION | CHECKED BY | JBAUER | DATE | | SCALE | | | | NTS |
| PAGE DESCRIPTION | | | | | CUSTOMER INFORMATION |  <div>2001 ProEnergy Blvd. Sedalia, Missouri 65301 660-829-5100 office 660-829-1160 fax</div> | APPROVED BY | AHARRIS | DATE | | DWG. SET TOTAL NO. OF PGS. | | DRAWING NUMBER | 9907-0002 | SHEET | REV |
| DISCRETE I/O DIN RAIL A AND DIN RAIL C PARTS LIST | | | | | | | | | | | | 11 | | | 5 OF 11 | 1 |

8 7 6 5 4 3 2 1



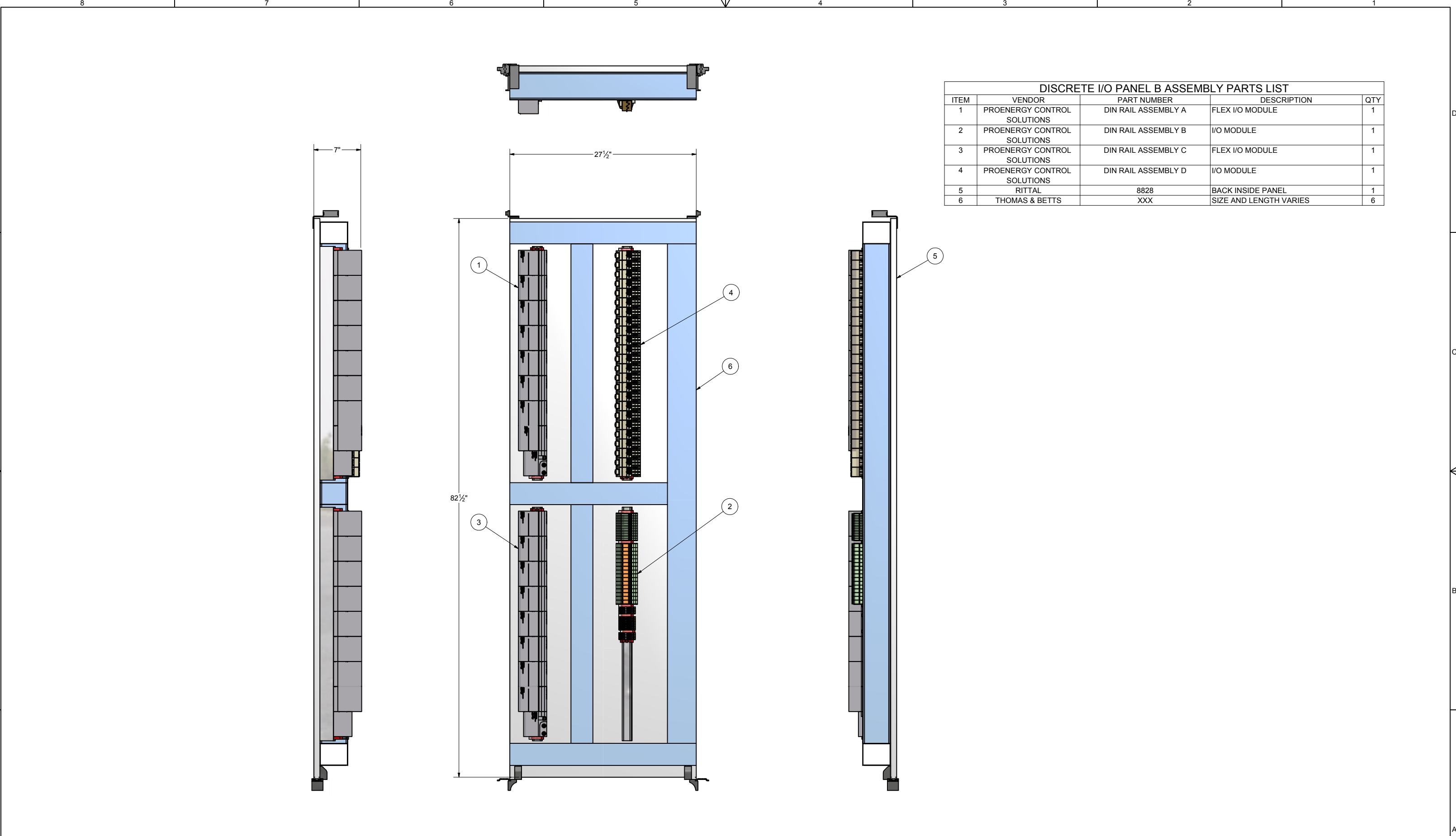
| DIN RAIL B ASSEMBLY PARTS LIST | | | | |
|--------------------------------|-----------------|--------------------|---|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | PHOENIX CONTACT | 1413272 | END COVER DOK 1,5 | 3 |
| 2 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 3 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 5 |
| 3, 2 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 6 |
| 4 | PHOENIX CONTACT | 1004348 | TERMINAL STRIP MARKER, KLM-A | 5 |
| 5 | PHOENIX CONTACT | 2717139 | Three-Level TB DOK 1.5-2D Bottom Ground | 8 |
| 6 | PHOENIX CONTACT | 2966171 | RELAY - PLC-RSC- 24DC/21 | 16 |
| 7 | PHOENIX CONTACT | 2966841 | COVER END SEPARATOR, PLC-ATP BK | 4 |
| 8 | PHOENIX CONTACT | 2967620 | PLC-RSC-24DC 21HC RELAY BLOCK | 16 |
| 9 | PHOENIX CONTACT | 3011054 | Three-Level TB DOK 1.5-2D_Bottom Ground | 8 |
| 10 | PHOENIX CONTACT | 35 X 58 DIN RAIL A | DIN RAIL 35MM X 58MM X 34 1/2" | 1 |

| DIN RAIL D ASSEMBLY PARTS LIST | | | | |
|--------------------------------|-----------------|--------------------|---------------------------------|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | NEWARK | 16-1351 | RELAY HOLD-DOWN CLIP | 24 |
| 2 | NEWARK | 70-788EL11-1 | RELAY BASE 25A 300V | 24 |
| 3 | NEWARK | 70-ASMD-25 | RELAY SUPPRESSION DIODE | 24 |
| 4 | NEWARK | 788XBX69C-24D | RELAY 24VDC-COIL 2PDT 3A@150VDC | 24 |
| 5 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 6 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 6, 5 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 2 |
| 7 | PHOENIX CONTACT | 1004348 | TERMINAL STRIP MARKER, KLM-A | 1 |
| 8 | PHOENIX CONTACT | 35 X 58 DIN RAIL A | DIN RAIL 35MM X 58MM X 34 1/2" | 1 |



D C B A

8 7 6 5 4 3 2 1



| DISCRETE I/O PANEL B ASSEMBLY PARTS LIST | | | | |
|--|-----------------------------|---------------------|------------------------|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | PROENERGY CONTROL SOLUTIONS | DIN RAIL ASSEMBLY A | FLEX I/O MODULE | 1 |
| 2 | PROENERGY CONTROL SOLUTIONS | DIN RAIL ASSEMBLY B | I/O MODULE | 1 |
| 3 | PROENERGY CONTROL SOLUTIONS | DIN RAIL ASSEMBLY C | FLEX I/O MODULE | 1 |
| 4 | PROENERGY CONTROL SOLUTIONS | DIN RAIL ASSEMBLY D | I/O MODULE | 1 |
| 5 | RITTAL | 8828 | BACK INSIDE PANEL | 1 |
| 6 | THOMAS & BETTS | XXX | SIZE AND LENGTH VARIES | 6 |

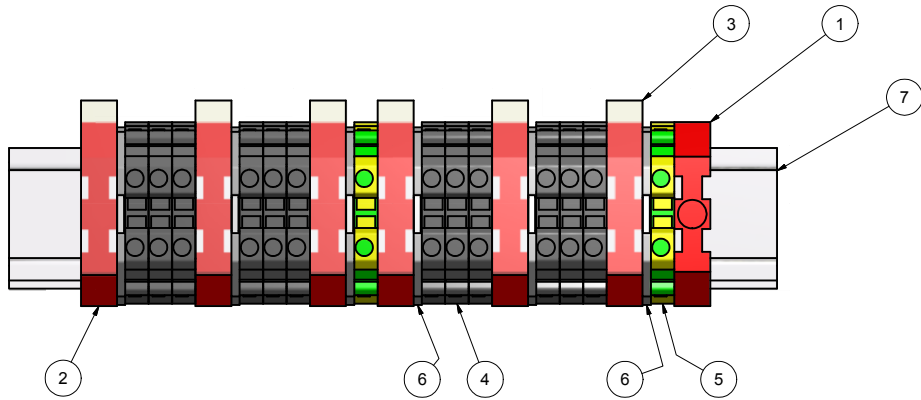
| PLC PANEL ASSEMBLY PARTS LIST | | | | |
|-------------------------------|-----------------------------|--------------------------------|---|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | ALLEN BRADLEY | PLC A | PLC ASSEMBLY 7 SLOT | 1 |
| 2 | ALLEN-BRADLEY | 1786-TPR | "T" TAP CONTROLNET | 4 |
| 3 | PROENERGY CONTROL SOLUTIONS | CIRCUIT BREAKER | CIRCUIT BREAKER | 1 |
| 4 | PROENERGY CONTROL SOLUTIONS | ETHERNET SWITCH | ETHERNET SWITCH | 1 |
| 5 | PROENERGY CONTROL SOLUTIONS | FUSE BLOCK A | FUSE BLOCKS WITH LED AND 10AMP FUSE | 1 |
| 6 | PROENERGY CONTROL SOLUTIONS | FUSE BLOCK B | FUSE BLOCKS WITH/OUT LED AND WITH 10 AMP FUSE | 1 |
| 7 | PROENERGY CONTROL SOLUTIONS | INCOMING POWER TERMINAL BLOCKS | INCOMING POWER | 1 |
| 8 | PROENERGY CONTROL SOLUTIONS | PLC B | PLC ASSEMBLY 7 SLOT | 1 |
| 9 | PROENERGY CONTROL SOLUTIONS | POWER SUPPLIES AND THERMOSTAT | POWER AND THERMOSTAT | 1 |
| 10 | RITTAL | 7113.000 | RAIL GROUNDING | 2 |
| 11 | RITTAL | 8828 | BACK INSIDE PANEL | 1 |
| 12 | THOMAS & BETTS | XXX | WIRE TRAY SIZE VARIES | 9 |

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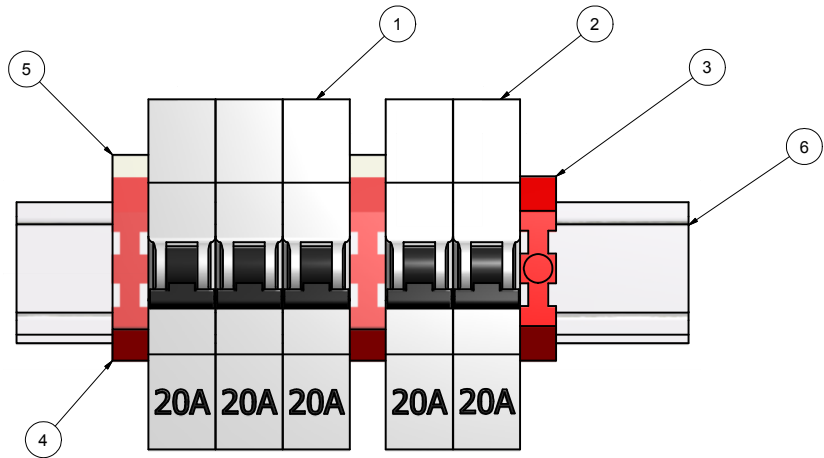
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| 1 | | NEW | | AHARRIS | | 9/22/2010 | | CHECKED BY | | JBAUER | | | | | | DATE | | | | SCALE | | NTS | | | | | | | | | | | | | | | | | | | | | | | |
| PAGE DESCRIPTION | | | | | | | | PLC PANEL ASSEMBLY OVER ALL DIMENSIONS AND PARTS LIST | | | | | | | | CUSTOMER INFORMATION | | | | APPROVED BY | | AHARRIS | | DATE | | DWG. SET TOTAL NO. OF PGS. | | 11 | | DRAWING NUMBER | | | | 9907-0002 | | | | SHEET | | 8 OF 11 | | REV | | 1 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**ProEnergy**
CONTROLS SOLUTIONS

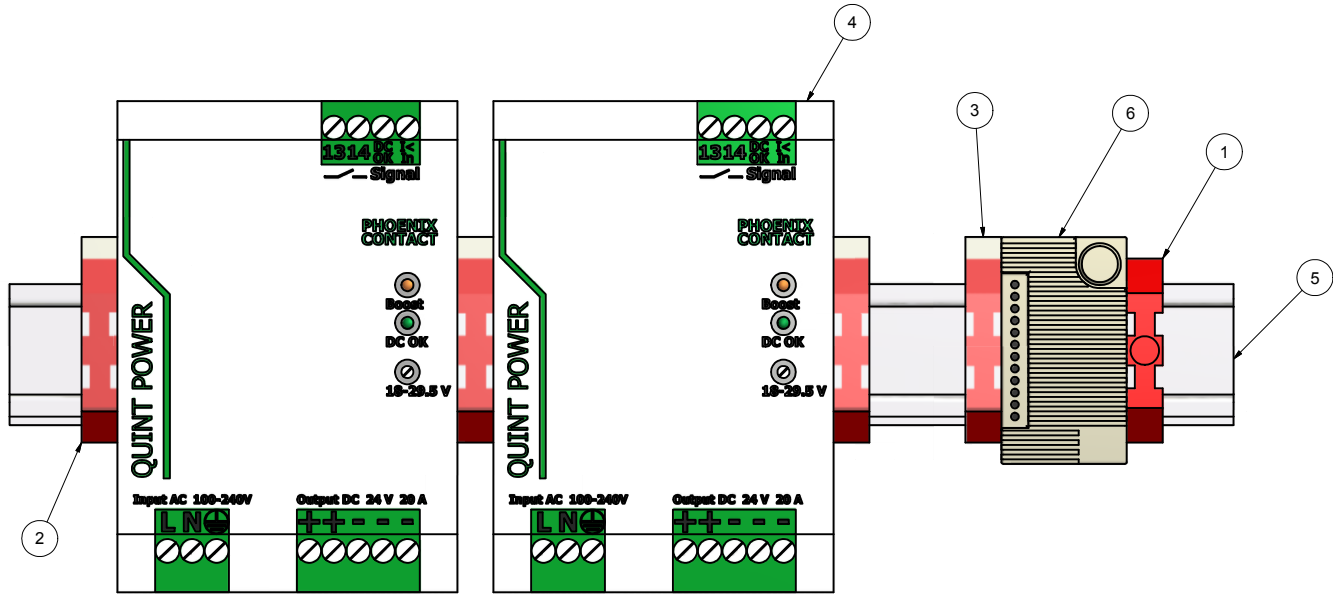
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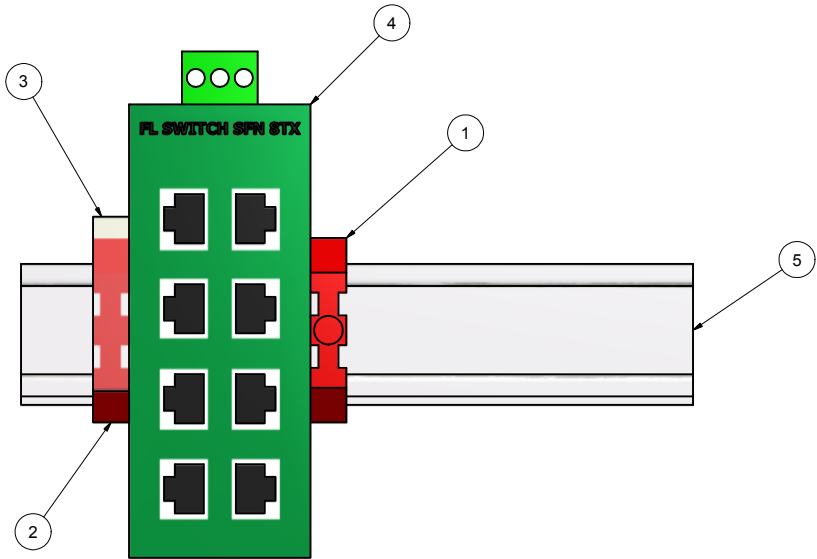
| INCOMING POWER TERMINAL BLOCK PARTS LIST | | | | |
|--|-----------------|--------------------|------------------------------------|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 2 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 6 |
| 2, 1 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 7 |
| 3 | PHOENIX CONTACT | 1004348 | TERMINAL STRIP MARKER, KLM-A | 6 |
| 4 | PHOENIX CONTACT | 3044160 | UNIVERSAL TB UT4 | 12 |
| 5 | PHOENIX CONTACT | 3044173 | UNIVERSAL TB UT 10-PE GREEN YELLOW | 2 |
| 6 | PHOENIX CONTACT | 3047028 | END COVER FOR UT2.5 - UT10 TB | 6 |
| 7 | PHOENIX CONTACT | 35 X 58 DIN RAIL B | DIN RAIL 35MM X 58MM X 12" | 1 |



| CIRCUIT BREAKER PARTS LIST | | | | |
|----------------------------|-------------------|--------------------|---|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | AUTOMATION DIRECT | WMZS1D20 | SINGLE POLE CIRCUIT BREAKER 20A D CURVE | 3 |
| 2 | AUTOMATION DIRECT | WMZS2D20 | CIRCUIT BREAKER 2 POLE 20A D CURVE | 1 |
| 3 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 4 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 2 |
| 4, 3 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 3 |
| 5 | PHOENIX CONTACT | 1004348 | TERMINAL STRIP MARKER, KLM-A | 2 |
| 6 | PHOENIX CONTACT | 35 X 58 DIN RAIL C | DIN RAIL 35MM X 58MM X 12" | 1 |



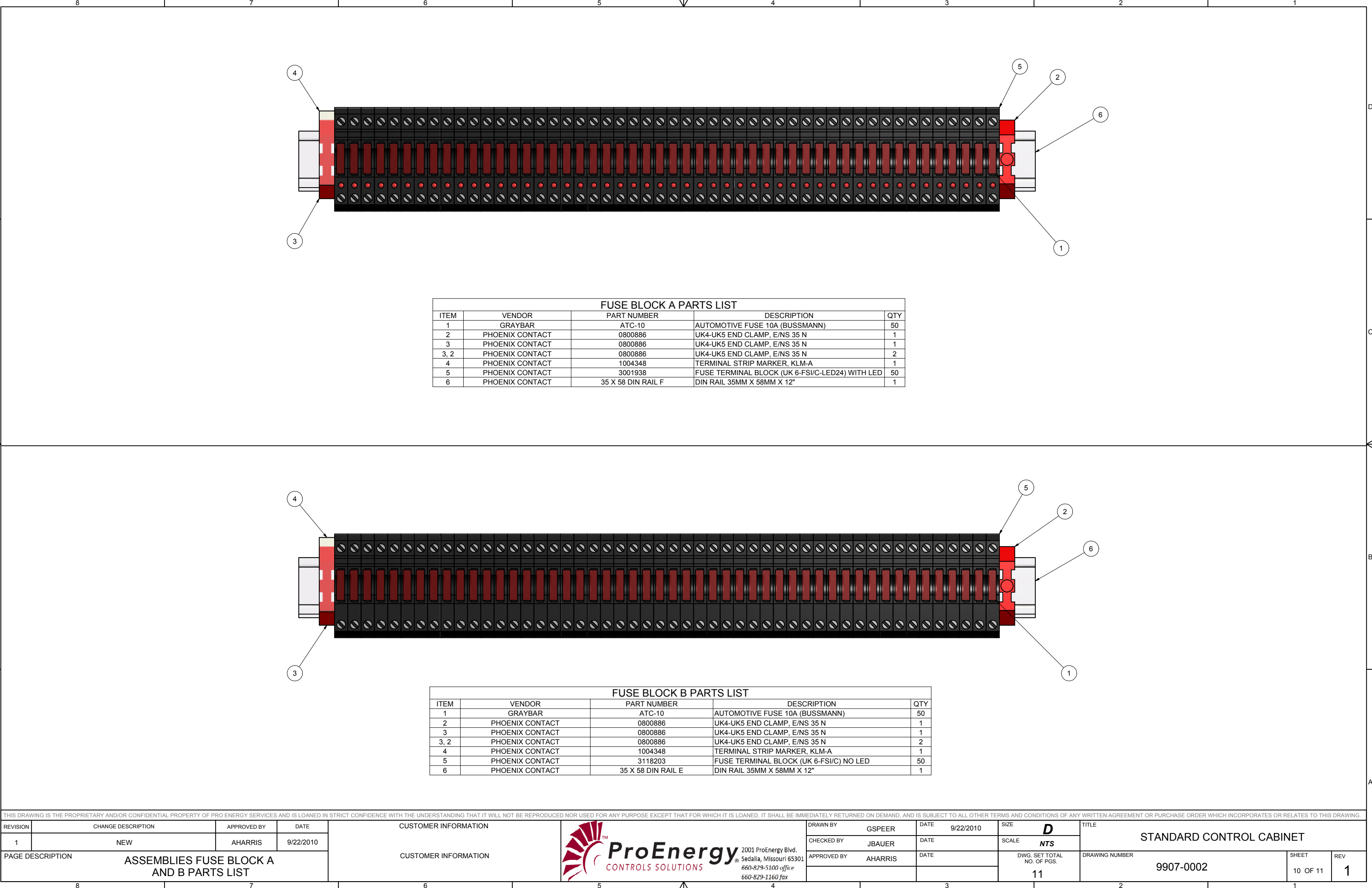
| POWER SUPPLIES AND THERMOSTAT PARTS LIST | | | | |
|--|-----------------|--------------------|---|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 2 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 4 |
| 2, 1 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 5 |
| 3 | PHOENIX CONTACT | 1004348 | TERMINAL STRIP MARKER, KLM-A | 4 |
| 4 | PHOENIX CONTACT | 2866776 | QUINT-PS-SFB-1AC-24DC-20-POWER-SUPPLY | 2 |
| 5 | PHOENIX CONTACT | 35 X 58 DIN RAIL D | DIN RAIL 35MM X 58MM X 12" | 1 |
| 6 | RITTAL | 3110000 | THERMOSTAT SINGLE POLE QUICK BREAK SWITCH | 1 |



| ETHERNET SWITCH PARTS LIST | | | | |
|----------------------------|-----------------|--|--|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 1 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 2 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 1 |
| 2, 1 | PHOENIX CONTACT | 0800886 | UK4-UK5 END CLAMP, E/NS 35 N | 2 |
| 3 | PHOENIX CONTACT | 1004348 | TERMINAL STRIP MARKER, KLM-A | 1 |
| 4 | PHOENIX CONTACT | 2891929=SWITCH=ETHERNET SWITCH 8 PORT FL SWITCH SFN 8 TX | ETHERNET SWITCH 8-PORT (FL SWITCH SFN 8TX) | 1 |
| 5 | PHOENIX CONTACT | 35 X 58 DIN RAIL G | DIN RAIL 35MM X 58MM X 12" | 1 |

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| 1 | NEW | AHARRIS | 9/22/2010 | | CHECKED BY | JBAUER | DATE | | SCALE | NTS | STANDARD CONTROL CABINET | | | |
| PAGE DESCRIPTION ASSEMBLIES INCOMING POWER, CIRCUIT BREAKER, POWER SUPPLIES, AND ETHERNET SWITCH PART LISTS | | | | | APPROVED BY | AHARRIS | DATE | | DWG. SET TOTAL NO. OF PGS. 11 | DRAWING NUMBER 9907-0002 | SHEET 9 OF 11 | REV 1 | | |
| | | | | | | | | | | | | | | |

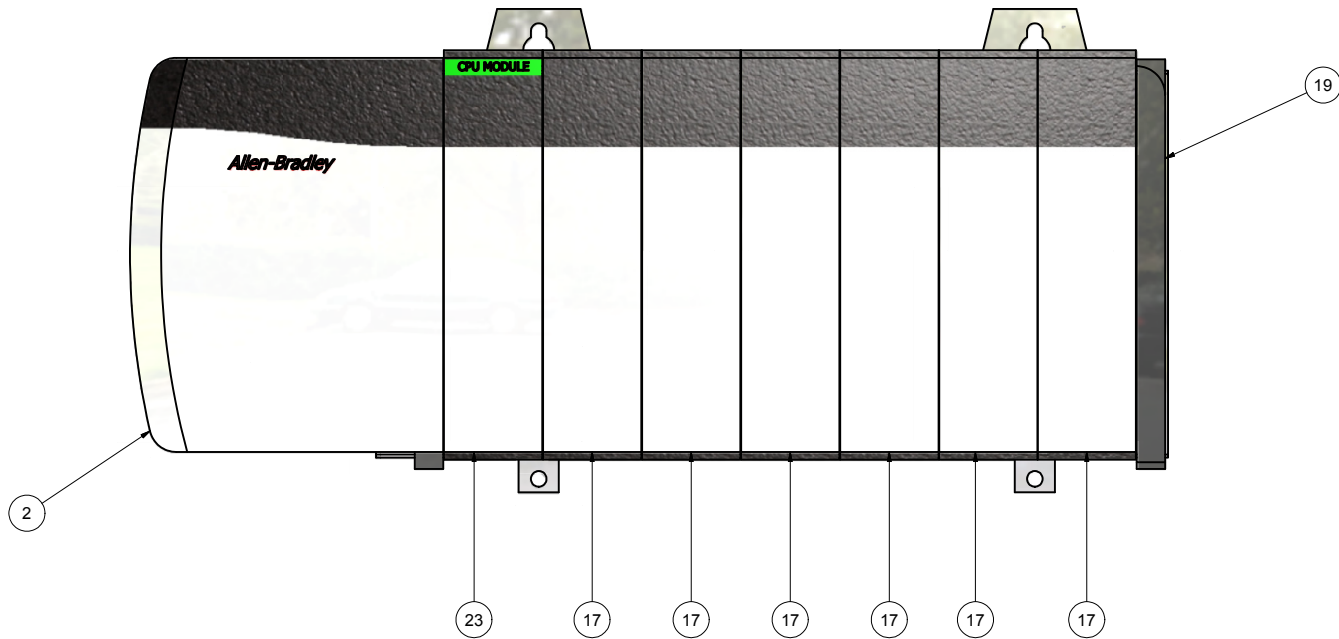


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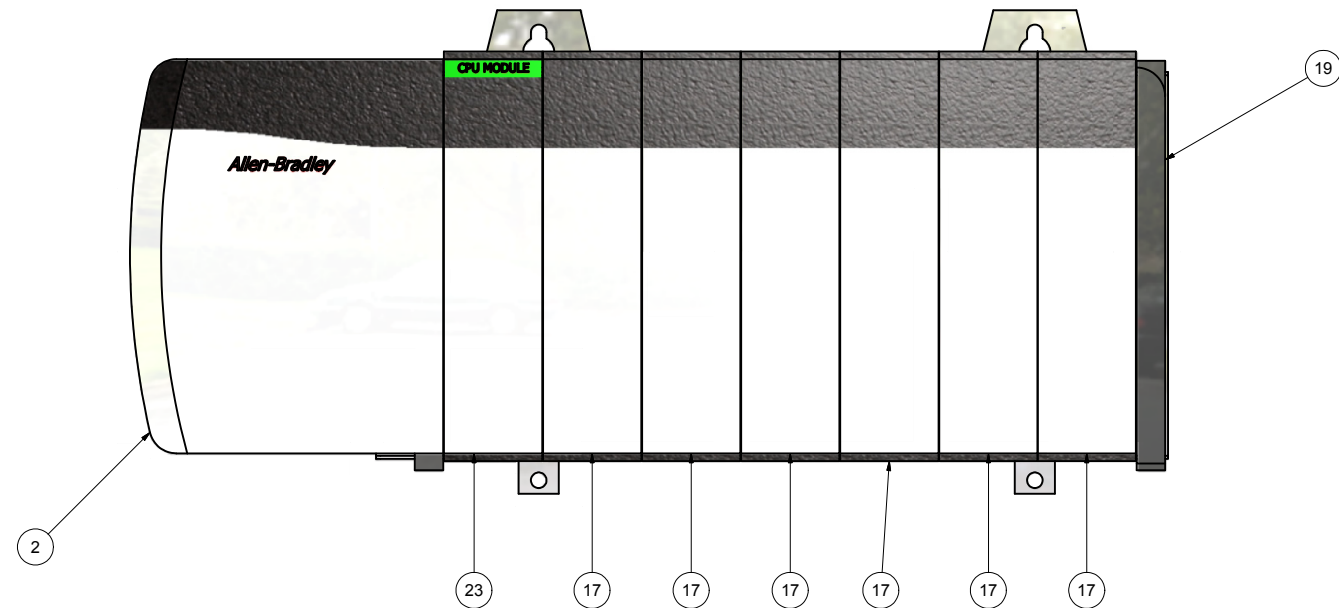
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| ASSEMBLIES FUSE BLOCK A AND B PARTS LIST | | | | | | | | | | | | | | | | 10 OF 11 | 1 | | | |



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| PLC A ASSEMBLY PARTS LIST | | | | |
|---------------------------|---------------|-------------|---------------------------|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 2 | | 1756-PA72 | 85-265VAC POWER SUPPLY | 1 |
| 17 | ALLEN-BRADLEY | 1756-N2 | SPARE SLOT FILLER | 6 |
| 19 | | 1756-A7 | PLC CHASSIS BODY 7 SLOTS | 1 |
| 23 | ALLEN-BRADLEY | 1756-L61 | LOGIX 5561 PROCESSOR UNIT | 1 |



| PLC B ASSEMBLY PARTS LIST | | | | |
|---------------------------|---------------|-------------|---------------------------|-----|
| ITEM | VENDOR | PART NUMBER | DESCRIPTION | QTY |
| 2 | | 1756-PA72 | 85-265VAC POWER SUPPLY | 1 |
| 17 | ALLEN-BRADLEY | 1756-N2 | SPARE SLOT FILLER | 6 |
| 19 | | 1756-A7 | PLC CHASSIS BODY 7 SLOTS | 1 |
| 23 | ALLEN-BRADLEY | 1756-L61 | LOGIX 5561 PROCESSOR UNIT | 1 |

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| 1 | NEW | | AHARRIS | 9/22/2010 | | | | CHECKED BY | JBAUER | DATE | | SCALE | NTS | | | |
| PAGE DESCRIPTION ASSEMBLIES PLC A AND B PARTS LIST | | | | CUSTOMER INFORMATION | | APPROVED BY | | AHARRIS | DATE | | DWG. SET TOTAL NO. OF PGS. 11 | DRAWING NUMBER 9907-0002 | | SHEET 11 OF 11 | REV 1 | |
| | | | | | | | | | | | | | | | | |