SECTION 22 63 00

LABORATORY SAFETY DEVICE SYSTEM

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American Gas Safety (AGS); Control and Detection Panels.  
This section is based on the products of American Gas Safety, which is located at:  
4500 140th Ave. N. Suite 101.  
Clearwater, Florida 33762.  
Toll Free: None.  
Phone: (727) 608-4375.  
Email: info@americangassafety.com.  
Web: www.americangassafety.com.  
[Click Here] for additional information.  
American Gas Safety (AGS) is the number one manufacturer of gas safety & control solutions in North America, delivering high-quality, internationally recognized products. Our comprehensive range includes fixed gas detection systems, gas safety controllers, gas shut-off controls, and water leak detection systems, all designed and manufactured to meet rigorous UL and CE standards.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Laboratory Safety Device System including:
       1. Utility Controller.
       2. Pressure Transducer.
       3. Solenoid Rack Assembly.
       4. Solenoid Enclosure Assembly.
       5. Gas Valves.
       6. Water Solenoid Valves.
       7. Electrical Contactor.
       8. Remote Panic Button.
       9. Fuel Gas Sensor.
       10. Manual Fan Control.
       11. Automatic Fan Purge.
       12. Accessories.
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 28 42 00 - Gas Detection.
    2. Section MasterFormat No - MasterFormat Title.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American Gas Association (AGA), current standards.
    2. CSA Group (CSA):
       1. CSA/ANSI Z21.21:23/CSA 6.5:23, Automatic Valves for Gas Appliances; 2023.
    3. National Fire Protection Association (NFPA):
       1. NFPA 70, National Electrical Code; 2023.
       2. NFPA 72, National Fire Alarm and Signaling Code; 2025.
       3. NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
    4. National Sanitation Foundation (NSF).
       1. NSF/ANSI 61, Drinking Water System Components - Health Effects; 2016.
    5. Underwriters Laboratories (UL):
       1. UL 94, Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
       2. UL 429, Electrically Operated Valves; 2021.
       3. UL 61010-1, Standard for Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use; Part 1: General Requirements, 3rd Edition; 2024.
       4. UL File Number E464760, Process Control Equipment, Electrical: American Gas Safety LLC, Mini Merlin CH4CO, Mini Merlin LPGCO.
       5. UL File Number MP1436, Valves, Electrically Operated.
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00, Administrative Requirements.
     2. Product Data:
        1. Manufacturer's data sheets on each product to be used.
        2. Model numbers.
        3. Catalog data sheets with photographs.
        4. Wiring and equipment connection diagrams showing factory equipment and field installed equipment.
        5. Preparation instructions and recommendations.
        6. Storage and handling requirements and recommendations.
        7. Detailed installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern, and color.
    2. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
       1. Include plans, elevations, section, and mounter and attachment details.
       2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
       3. Wiring Diagrams: Detail wiring for signal, power, and control wiring.
    3. Operation and Maintenance Data: Provide emergency, operation, and maintenance manuals.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.
     2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
     3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
  2. PRE-INSTALLATION CONFERENCE
     1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
  3. DELIVERY, STORAGE, AND HANDLING
     1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
     2. Protect from damage due to weather, excessive temperature, and construction operations.
  4. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
  5. WARRANTY
     1. Manufacturer's standard 3-year parts warranty.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: American Gas Safety, which is located at:4500 140th Ave. N., Suite 101Clearwater, FL 33762Tel: 727-608-4375Fax: 727-530-0428Email: [request info (info@americangassafety.com)](https://arcat.com/rfi?action=email&company=American%252BGas%252BSafety&message=RE%253A%2520Spec%2520Question%2520(15210ags)%253A%2520&coid=52452&spec=15210ags&rep=&fax=727-530-0428);Web: <https://americangassafety.com/>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with the provisions of Section 01 60 00.
  1. SYSTEM DESCRIPTION
     1. Provide products and devices for complete laboratory safety device system with components approved by manufacturer and designed to operate together as a system.
     2. UL listed and labelled as shown in Equipment Schedule.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. GENERAL
     1. Provide systems and accessories in accordance with manufacturer's written requirements.
     2. Utility controllers with fascia panel mounted switches to activate remote solenoids and relays to control gases, domestic water, electrical convenience outlets and other services or devices as shown on Drawings.
     3. Certified and listed to UL61010 standards.
     4. Equipped with authority key lock restricting activation and de-activation of output signals to the instructor or educator.
     5. Provide with fascia mounted recessed panic button.
     6. Provide with line voltage signals for output circuits.
     7. Provide with Inputs for remote panic buttons and gas sensors.

\*\* NOTE TO SPECIFIER \*\* Delete item below if not controlling gas.

* + 1. Utilize and operate pressure transducer to perform pressure drop test on natural gas line before allowing gas to be supplied Controller to continuously check incoming gas supply pressure throughout operation.
  1. UTILITY CONTROLLER
     1. Basis of Design: AGS Merlin 1000S, Single Output Utility controller With Gas Pressure Proving as manufactured and supplied by American Gas Safety; www.americangassafety.com.
        1. Associated Gas Sensors:
           1. Carbon Dioxide.
           2. Natural Gas.
           3. Carbon Monoxide.
           4. Liquid Petroleum Gas.
        2. Visual Indication: LED.
        3. Mains Electrical Power Input: 110-120VAC.
        4. Utility Output: 110-120VAC.
        5. Current Consumption: 12W maximum (50mA) at 120VAC.
        6. Internal Fuse: 3.15A.
        7. Gas Valve Output: 3.15A.
        8. Operating Temperature: 32 to 104 Degrees F (0 to 40 Degrees C), 0-95 percent RH, non condensing.
        9. Audible Alarm Buzzer dB: 65 dB (300 mm distance in quiet conditions).
        10. Pressure Sensor Operating Pressure: 0-1.45 psi.
        11. Housing Material: Polylac PA-765 Flame Retardant.
        12. Flame Rating: UL 94.
        13. UL Approval Reference: UL 61010-1, E464760.
        14. Overall Dimensions: 7.08 x 10 x 3.03 inches (179 x 254 x 77 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 1000S+, Dual Output Utility controller With Gas Pressure Proving as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Associated Gas Sensors:
          1. Carbon Dioxide.
          2. Natural Gas.
          3. Carbon Monoxide.
          4. Liquid Petroleum Gas.
       2. Visual Indication: LED.
       3. Mains Electrical Power Input: 110-120VAC.
       4. Utility Output 1: 110-120VAC.
       5. Utility Output 2: 110-120VAC.
       6. Current Consumption: 12W maximum (50mA) at 120VAC.
       7. Internal Fuse: 3.15A.
       8. Gas Valve Output: 3.15A.
       9. Operating Temperature: 32 to 104 Degrees F (0 to 40 Degrees C), 0-95 percent RH, non condensing.
       10. Audible Alarm Buzzer dB: 65 dB (300 mm distance in quiet conditions).
       11. Pressure Sensor Operating Pressure: 0-1.45 psi.
       12. Housing Material: Polylac PA-765 Flame Retardant.
       13. Flame Rating: UL 94.
       14. UL Approval Reference: UL 61010-1, E464760.
       15. Overall Dimensions: 7.08 x 10 x 3.03 inches (179 x 254 x 77 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 1000S+i, Dual Output Utility controller as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Associated Gas Sensors:
          1. Carbon Dioxide.
          2. Natural Gas.
          3. Carbon Monoxide.
          4. Liquid Petroleum Gas.
       2. Visual Indication: LED.
       3. Mains Electrical Power Input: 110-120VAC.
       4. Utility Output 1: 110-120VAC.
       5. Utility Output 2: 110-120VAC.
       6. Current Consumption: 12W maximum (50mA) at 120VAC.
       7. Internal Fuse: 3.15A.
       8. Gas Valve Output: 3.15A.
       9. Operating Temperature: 32 to 104 Degrees F (0 to 40 Degrees C), 0-95 percent RH, non condensing.
       10. Audible Alarm Buzzer dB: 65 dB (300 mm distance in quiet conditions).
       11. Housing Material: Polylac PA-765 Flame Retardant.
       12. Flame Rating: UL 94.
       13. UL Approval Reference: UL 61010-1, E464760.
       14. Overall Dimensions: 7.08 x 10 x 3.03 inches (179 x 254 x 77 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 1000Si, Single Output Utility controller as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Associated Gas Sensors:
          1. Carbon Dioxide.
          2. Natural Gas.
          3. Carbon Monoxide.
          4. Liquid Petroleum Gas.
       2. Visual Indication: LED.
       3. Mains Electrical Power Input: 110-120VAC.
       4. Utility Output 1: 110-120VAC.
       5. Gas Valve Output: 110-120VAC.
       6. Current Consumption: 12W maximum (50mA) at 120VAC.
       7. Internal Fuse: 3.15A.
       8. Gas Valve Output: 3.15A.
       9. Operating Temperature: 32 to 104 Degrees F (0 to 40 Degrees C), 0-95 percent RH, non condensing.
       10. Audible Alarm Buzzer dB: 65 dB (300 mm distance in quiet conditions).
       11. Housing Material: Polylac PA-765 Flame Retardant.
       12. Flame Rating: UL 94.
       13. UL Approval Reference: UL 61010-1, E464760.
       14. Overall Dimensions: 7.08 x 10 x 3.03 inches (179 x 254 x 77 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 1000SW, Dual Output Utility controller With Gas Pressure Proving as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Associated Gas Sensors:
          1. Carbon Dioxide.
          2. Natural Gas.
          3. Carbon Monoxide.
          4. Liquid Petroleum Gas.
       2. Visual Indication: LED.
       3. Mains Electrical Power Input: 110-120VAC.
       4. Utility Output 1: 110-120VAC.
       5. Utility Output 2: 110-120VAC.
       6. Current Consumption: 12W maximum (50mA) at 120VAC.
       7. Internal Fuse: 3.15A.
       8. Gas Valve Output: 3.15A.
       9. Operating Temperature: 32 to 104 Degrees F (0 to 40 Degrees C), 0-95 percent RH, non condensing.
       10. Audible Alarm Buzzer dB: 65 dB (300 mm distance in quiet conditions).
       11. Pressure Sensor Operating Pressure: 0-1.45psi.
       12. Housing Material: Polylac PA-765 Flame Retardant.
       13. Flame Rating: UL 94.
       14. UL Approval Reference: UL 61010-1, E464760.
       15. Overall Dimensions: 7.08 x 10 x 3.03 inches (179 x 254 x 77 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 1000SW+, Triple Output utility controller with Gas Pressure Proving as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Associated Gas Sensors:
          1. Carbon Dioxide.
          2. Natural Gas.
          3. Carbon Monoxide.
          4. Liquid Petroleum Gas.
       2. Visual Indication: LED.
       3. Mains Electrical Power Input: 110-120VAC.
       4. Utility Output 1: 110-120VAC.
       5. Utility Output 2: 110-120VAC.
       6. Utility Output 3: 110-120VAC.
       7. Current Consumption: 12W maximum (50mA) at 120VAC.
       8. Internal Fuse: 3.15A.
       9. Gas Valve Output: 3.15A.
       10. Operating Temperature: 32 to 104 Degrees F (0 to 40 Degrees C), 0-95 percent RH, non condensing.
       11. Audible Alarm Buzzer dB: 65 dB (300 mm distance in quiet conditions).
       12. Pressure Sensor Operating Pressure: 0-1.45psi.
       13. Housing Material: Polylac PA-765 Flame Retardant.
       14. Flame Rating: UL 94.
       15. UL Approval Reference: UL 61010-1, E464760.
       16. Overall Dimensions: 7.08 x 10 x 3.03 inches (179 x 254 x 77 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 1000SW+i, Triple Output Utility Control as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Associated Gas Sensors:
          1. Carbon Dioxide.
          2. Natural Gas.
          3. Carbon Monoxide.
          4. Liquid Petroleum Gas.
       2. Visual Indication: LED.
       3. Mains Electrical Power Input: 110-120VAC.
       4. Utility Output 1: 110-120VAC.
       5. Utility Output 2: 110-120VAC.
       6. Utility Output 3: 110-120VAC.
       7. Current Consumption: 12W maximum (50mA) at 120VAC.
       8. Internal Fuse: 3.15A.
       9. Gas Valve Output: 3.15A.
       10. Operating Temperature: 32 to 104 Degrees F (0 to 40 Degrees C), 0-95 percent RH, non condensing.
       11. Audible Alarm Buzzer dB: 65 dB (300 mm distance in quiet conditions).
       12. Housing Material: Polylac PA-765 Flame Retardant.
       13. Flame Rating: UL 94.
       14. UL Approval Reference: UL 61010-1, E464760.
       15. Overall Dimensions: 7.08 x 10 x 3.03 inches (179 x 254 x 77 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 1000SWi, Dual Output Utility controller as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Associated Gas Sensors:
          1. Carbon Dioxide.
          2. Natural Gas.
          3. Carbon Monoxide.
          4. Liquid Petroleum Gas.
       2. Visual Indication: LED.
       3. Mains Electrical Power Input: 110-120VAC.
       4. Utility Output 1: 110-120VAC.
       5. Utility Output 2: 110-120VAC.
       6. Current Consumption: 12W maximum (50mA) at 120VAC.
       7. Internal Fuse: 3.15A.
       8. Gas Valve Output: 3.15A.
       9. Operating Temperature: 32 to 104 Degrees F (0 to 40 Degrees C), 0-95 percent RH, non condensing.
       10. Audible Alarm Buzzer dB: 65 dB (300 mm distance in quiet conditions).
       11. Housing Material: Polylac PA-765 Flame Retardant.
       12. Flame Rating: UL 94.
       13. UL Approval Reference: UL 61010-1, E464760.
       14. Overall Dimensions: 7.08 x 10 x 3.03 inches (179 x 254 x 77 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 1000W+, Dual Electric and Water Output Utility Control as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Visual Indication: LED.
       2. Mains Electrical Power Input: 110-120VAC.
       3. Utility Output 1: 110-120VAC.
       4. Utility Output 2: 110-120VAC.
       5. Current Consumption: 12W maximum (50mA) at 120VAC.
       6. Internal Fuse: 3.15A.
       7. Gas Valve Output: 3.15A.
       8. Operating Temperature: 32 to 104 Degrees F (0 to 40 Degrees C), 0-95 percent RH, non condensing.
       9. Audible Alarm Buzzer dB: 65 dB (300 mm distance in quiet conditions).
       10. Housing Material: Polylac PA-765 Flame Retardant.
       11. Flame Rating: UL 94.
       12. UL Approval Reference: UL 61010-1, E464760.
       13. Overall Dimensions: 7.08 x 10 x 3.03 inches (179 x 254 x 77 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 500S, Single Utility Control as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Power Supply: 110-120VAC.
       2. Utility Output: 110-120VAC.
       3. Enclosure:
          1. Wall mount.
          2. Flush mount.
       4. BAS Output: N/C COM N/O, maximum 1A at 120VAC.
       5. EM Stop Input: Dry Contact.
       6. Fire Alarm Input: Dry Contact.
       7. Internal Fuse: 3.15A.
       8. Adjustable BAS Signal Output: Alarm "ON" or Utility "ON" / Utility "OFF".
       9. Overall Dimensions: 7-1/2 x 5-1/2 x 2-3/8 inches (191 x 140 x 51 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* + 1. Basis of Design: AGS Merlin 500S+, Dual Utility Control as manufactured and supplied by American Gas Safety; www.americangassafety.com.
       1. Two zone isolation panel with two outputs.
       2. Power Supply: 110-120VAC.
       3. Utility Outputs 1 and 2: 110-120VAC.
       4. Enclosure:
          1. Wall mount.
          2. Flush mount.
       5. BAS Output: N/C COM N/O, maximum 1A at 120VAC.
       6. EM Stop Input: Dry Contact.
       7. Fire Alarm Input: Dry Contact.
       8. Internal Fuse: 3.15A.
       9. Adjustable BAS Signal Output: Alarm "ON" or Utility "ON" / Utility "OFF".
       10. Overall Dimensions: 7-1/2 x 5-1/2 x 2-3/8 inches (191 x 140 x 51 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not controlling gas.

* 1. PRESSURE TRANSDUCER
     1. With each controller, provide a UL approved pressure transducer to be installed on the natural gas pipe, either via solenoid valve or by reducing fitting located as close to solenoid valve as permissible on downstream side.
     2. Transducer: 12VDC powered by utility control and with a 0-12VDC return signal.

\*\* NOTE TO SPECIFIER \*\* Choose individual solenoids for gas and water services or select factory assembled and tested rack or enclosure options. Delete where appropriate.

* 1. SOLENOID RACK ASSEMBLY
     1. Basis of Design: SOLRACK, Pre-assembled solenoid valve rack for use with AGS utility controllers as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     2. Provide factory assembled and tested solenoids mounted on aluminium strut with each controller.
     3. Select size and valve type as shown on Drawings.
     4. Valve assembly to incorporate correctly sized ball valve, in line strainer, and unions.
     5. Gas valve assemblies to have black iron pipe work.
     6. Cold and hot water valve assemblies to have copper piping.
     7. Each NPT connection to have truth markings and be pressure tested to 2-1/2 times expected operating pressure.
     8. Assemblies: Maximum 20 inches (508 mm) end to end with width dependant on number and type of solenoid valves.
     9. Provide factory wired assembly wired to accept input voltage from control panel.
     10. Install UL approved pressure transducer on natural gas pipe, via solenoid valve or by reducing fitting located as close to solenoid valve as permissible on downstream side.
     11. Transducer: 12VDC powered by utility control and with a 0-12VDC return signal.
  2. SOLENOID ENCLOSURE ASSEMBLY
     1. Basis of Design: SOLENC, Pre-assembled solenoid valve enclosures for use with AGS utility controllers as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     2. Provide factory assembled and tested solenoids mounted on aluminum strut and housed in 16 gauge steel enclosures.
     3. Select size and valve type as shown on Drawings.
     4. Each valve assembly to incorporate correctly sized ball valve, in line strainer, and unions.
     5. Gas valve assemblies to have black iron pipe work.
     6. Cold and hot water valve assemblies to have copper piping.
     7. Each NPT connection to have truth markings and be pressure tested to 2-1/2 times expected operating pressure.
     8. Assemblies: Maximum 20 inches (508 mm) end to end with width dependant on number and type of solenoid valves.
     9. Provide factory wired assembly wired to accept input voltage from control panel.
     10. Steel Enclosures:
         1. Stainless Steel.
         2. Powder Coated: Light grey.
     11. Latch:
         1. Quarter turn latch.
         2. Key lock latch.
  3. GAS VALVES
     1. Basis of Design: AGS-GSV Gas Solenoid Valves, Normally Closed, Safety Shut Off, as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     2. Valve Size:
        1. AGS-GSV1: 1 inch (25.40 mm).
        2. AGS-GSV114: 1-1/4 inches (31.75 mm).
        3. AGS-GSV112: 1-1/2 inches (38.10 mm).
        4. AGS-GSV2: 2 inches (50.80 mm).
     3. UL 429 Listed, CSA Certified.
     4. FM 400 liquid or gas safety shut-off valve.
     5. Aluminum body two-way normally closed valve rated for natural gas (methane) and liquid petroleum gas (LPG).
     6. Size: Same as pipe size shown on Drawings.
     7. Power: 120 volt AC single phase actuator, 15 watts.
     8. Maximum Pressure Capacity: 5 PSI.
  4. WATER SOLENOID VALVES
     1. Basis of Design: AGS SOLVLV Solenoid Valves, 2-way, internally piloted, Normally Closed, as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     2. NSF 61 approved and listed.
     3. Brass, lead free, with EPDM seal.
     4. Power:
        1. 120VAC.
        2. 12 VDC.
     5. Number of Solenoids, Intended Use, and Pipe Sizes: As noted in Equipment Schedule or on Drawings.

\*\* NOTE TO SPECIFIER \*\* When selecting electrical outlet control, add electrical contactors.

* 1. ELECTRICAL CONTACTOR
     1. Basis of Design: AGSCON, Pre-mounted Contactor Enclosures for use with AGS Utility controllers, as manufactured and supplied by American Gas Safety; www.americangassafety.com.
        1. AGSCON1:
           1. Number of Contactors: 1.
           2. Total Number of Circuits (Poles): 4.
        2. AGSCON2:
           1. Number of Contactors: 2.
           2. Total Number of Circuits (Poles): 8.
        3. AGSCON3:
           1. Number of Contactors: 3.
           2. Total Number of Circuits (Poles): 12.
        4. AGSCON4:
           1. Number of Contactors: 4.
           2. Total Number of Circuits (Poles): 16.
        5. AGSCON5:
           1. Number of Contactors: 5.
           2. Total Number of Circuits (Poles): 20.
     2. Electrical Contactors:
        1. Model AGSCON4P20ANO: 20 amp, 4-Pole, 120VAC coil voltage, Normally Open.
        2. Model AGSCON2PNO2PNC: 20 amp, 120V AV coil voltage, two Normally Open and 2 Normally Closed contacts.
     3. Enclosure:
        1. Model AGSCONENC10104: 10 x 10 x 4 inches (254 x 254 x 102 mm) powder-coated steel enclosure.
           1. 4-pole.
           2. 8-pole.
           3. 12-pole.
        2. Model AGSCONENC12124: 12 x 12 x 4 inches (305 x 305 x 102 mm) powder-coated steel enclosure.
           1. 16-pole.
           2. 20-pole.
     4. Run circuits from electrical panel, through contactors to receptacles.
     5. Provide factory assembled contactors in 16-guage mild steel, Type 1 junction box and rated for 20amp service with four poles in a normally open configuration capable of receiving a 110v 3amp signal.
     6. Reference Electrical Panel Schedule or Drawings for model, number of contactors, location, and circuit numbers.
     7. Electrical contactors to receive signal from utility control panel to govern electrical power going to receptacles.
  2. REMOTE PANIC BUTTON
     1. Basis of Design: AGS-ESOTW, Emergency Shut Off, Push Button With Twist Reset, as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     2. Station Housing Material: Molded Polycarbonate.
     3. Where room size and configuration restrict clear path from work areas to utility controller, prove wall mounted remote panic button where shown on Drawings.
     4. Button:
        1. Red mushroom twist re-set type recessed in yellow polycarbonate enclosure with clear lift-up protective shield.
        2. UL listed with clear label text stating Emergency Power Off.
     5. Locate assembly as shown on Drawings and Equipment Schedule.
     6. Integrate assembly with volt free dry contact input on Controller.
  3. FUEL GAS SENSOR
     1. Basis of Design: AGSNGIS, Fuel Gas Sensor, as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     2. Provide NG (Methane) Gas Sensor to detect natural gas within room as shown on Drawings and Equipment Schedule.
     3. Detector to provide clear digital traffic light reading of percentage LEL value.
     4. Detector to provide a local visual and audible alarm.
     5. Integrate fuel gas sensor with low voltage input on controller. Sensor quantities and location in accordance with manufacturer's written instructions and as shown on Drawings.

\*\* NOTE TO SPECIFIER \*\* If controlling fan, choose between manual on/off or only on in alarm /panic.

* 1. MANUAL FAN CONTROL
     1. Basis of Design: AGS FS1, Manual Fan Control, as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     2. Provide manual fan switch for exhaust fan operation.
     3. Fan to operate independent of main controller and provide an optional purge sequence if main controller is in alarm.
     4. Fan switch to contain adjustable purge timings and power/operation status LED.
  2. AUTOMATIC FAN PURGE
     1. Basis of Design: AGS-F, Automatic Fan Purge, as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     2. Provide relay incorporating adjustable time delay function rated to interlock power to exhaust fan and utility controller.
     3. Relay to be enclosed in electrical junction box and mounted close to fan power supply.
  3. ACCESSORIES
     1. Manual Re-set Control:
        1. Basis of Design: AGS Merlin FAM1, as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     2. Fan Purge Relay With In-built Timed Delay:
        1. Basis of Design: AGS FANRELAYTD, as manufactured and supplied by American Gas Safety; www.americangassafety.com.
     3. Flush Mounting Kit for 500/GDFP/FS1 Ranges:
        1. Basis of Design: AGS FMK500, as manufactured and supplied by American Gas Safety; www.americangassafety.com.

1. EXECUTION
   1. GENERAL
      1. Provide full system configuration, integration, testing, and start-up in compliance with manufacturer's written instructions and approved shop drawings.
      2. Building Automation or Management Systems (BMS):
         1. Where shown on Drawings, provide low voltage integration wiring from each controller to connection point on BMS.
         2. Controller to provide NO, COM and NC relay output for BAS/BMS integration.
         3. Relay to change state in Alarm or Gas On.
         4. Controller to accept low voltage signal from Fire Alarm to shutdown utilities in case of fire alarm. Final connection by others. See manufacturer's written instructions.
      3. Exhaust Fan:
         1. Provide low voltage integration wiring from each controller to connection point on Exhaust Fan controller, where shown on Drawings.
         2. Alternatively utilize permanent 12VDC output and BMS output to connect to 12VDC relay to interrupt manual control of exhaust fans. Final connection by others.
   2. EXAMINATION
      1. Do not begin installation until the Work has have been properly constructed and prepared.
      2. If preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
   3. PREPARATION
      1. Clean surfaces thoroughly prior to installation.
      2. Prepare for Work using methods recommended by manufacturer for achieving best results under project conditions.
   4. SYSTEM CONFIGURATION
      1. Utility Controllers:
         1. Factory configured to standard configurations and capable of field adjustments to meet specific project modification requirements.
         2. Configurations are limited to DIP switch adjustments on rear of fascia panel without requirement of additional equipment.
      2. Room Utilities:
         1. Each utility service with outlets at work-stations controlled by independent output circuit at the Utility controller.
         2. Control of services combined onto one output circuit as shown on Drawings.
         3. Activate services by Controller fascia panel master control switches and engaging of the authority control key.
         4. Restrict activation of utility services to instructor by means of authority key lock switch.
      3. Time-Out Function:
         1. Pre-set each Controller to shut down after 2-hours, 4-hours, or 8-hours, or disable function.
         2. Adjust configuration using DIP switches on reverse side of fascia panel.
      4. Panic Alarm Re-Set:
         1. Controller to re-set from panic alarm after engagement of the authority key on fascia panel and after local panic alarm has been re-set, unless otherwise shown.
      5. Fire Alarm Re-set:
         1. Configure Utility controller for continued fire alarm signal to Controller to prevent re-set, unless otherwise shown.
      6. Purge-Exhaust Fan:
         1. Rooms with exhaust fan to have fan configured with utility controller so fan will automatically purge room in case of emergency.
         2. Integrate fan with Controller using the BMS output.
         3. Provide control wiring from Controller contacts to BMS and configure controller using DIP switches on reverse side of fascia panel.
         4. See manufacturer's written installation instructions for switch options.
      7. EPO's and Panic Buttons:
         1. Configure each controller so pressing remote EPO or Panic Buttons will disable all utilities.
         2. If required; configure water and electrical utilities to stay on in an emergency.
         3. Configure each controller to automatically shut down in all alarm modes for gas services.
      8. Fuel Gas Sensor:
         1. Unit to integrate with controller and shut down designated outputs.
   5. INSTALLATION
      1. Install in accordance with manufacturer's written instructions, approved submittals, and in proper relationship with adjacent construction.
      2. Verify manufacturer's mounting heights to comply with ADA or other standards.
      3. Where a specific device to be installed by other trades, furnish and turn over to appropriate trade for installation.
      4. Install and make final connections to monitoring and remote EPO's and Panic Buttons as shown on Drawings.
      5. Install low voltage and volt free control wiring from utility controller to connection point on BMS and Exhaust Fan controller. Final connection by others.
   6. PLUMBING
      1. Make final connections to piping systems in accordance with Division 22 requirements and as shown on Drawings.
   7. ELECTRICAL
      1. Install conduit and wiring and make final wiring connections to equipment as shown on Drawings and in accordance with approved shop drawings.
   8. FIELD QUALITY CONTROL
      1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.
      2. System Testing and Start-up:
         1. Prior to the placement of utility controller system into service, perform start-up procedures and checklists as outlined in manufacturer's operations and maintenance written procedures.
         2. Verify components and devices comply with manufacturer's written requirements and installation is in conformance with the Contract Documents.
         3. Upon completion of start-up tests, place system into service.
         4. Complete warranty registration documents and submit originals with project close-out and Operation and Maintenance documentation.
         5. Review operating procedures with Owner's Representative.
         6. Provide system authority keys to Owner's Representative.
   9. CLEANING AND PROTECTION
      1. Clean products in accordance with the manufacturer's recommendations.
      2. Touch-up, repair or replace damaged products prior to Substantial Completion.

\*\* NOTE TO SPECIFIER \*\* If an Equipment Schedule will be included in the specifications, include the schedule the Article below.  
Equipment Schedule should include the following:  
Product (i.e. Controller, Gas Valve, Electrical Contactor, etc.).  
Model (Manufacturer's model number for product).  
Description (Brief description of product.).  
Notes (Additional notes, i.e. "c/w pressure proving", "for fire blanket", "includes ball valve, inline strainer and unions", "stainless steel", etc).

* 1. EQUIPMENT SCHEDULE

A.

END OF SECTION