



SECTION 11 53 33

ISIMET LP1 LABORATORY UTILITY SAFETY PACKAGE OR EQUAL

To Safely Control and Monitor Gas, Water and Electricity in Each Science Classroom/Laboratory

Part 1: GENERAL

1.1 SUMMARY

This document provides the minimum requirements for safely providing and monitoring the gas, water and electricity in each science classroom/laboratory. It also provides the minimum necessary requirement for addressing gas, water and electricity in the classroom should an emergency condition occur.

1.2 SCOPE OF WORK AND MINIMUM REQUIREMENTS OF A SCIENCE LAB SAFETY PACKAGE

- A. Provide a LP1 Laboratory Safety Utility Controller Package for each science room/laboratory. This System is to include, at a minimum, the following items:
- (1) Laboratory Safety Utility Controller with locking enclosure
 - (1) Gas Solenoid with locking enclosure
 - (2) A Hot and a Cold Water solenoid (two solenoids) with locking enclosure,
 - (1) Electrical disconnect with locking enclosure,
 - (1) Fuel Gas Sensor
 - (1) Panic button
 - (1) Emergency Notification Beacon
 - (1) Emergency Shower monitor.
- B. Contractor to provide installation labor, necessary supervision, materials and equipment for complete installation of the LP1 in each science room/laboratory required to ensure proper and complete operation of all systems. (Miscellaneous appurtenances are not necessarily specified or indicated on the Drawings. Contractor shall provide all labor and materials not specifically indicated on the Drawings or specified in these Specifications.)
- C. Installation is to be completed per the Instructions.

1.3 Manufacturer Qualifications

- A. ISIMET LP1 Package is basis of the design. Alternatives packages containing all components, as listed in Section 1.2.A are acceptable as long as the minimum requirements of Section 1.3.C. are met.
- B. Any Alternative to ISIMET, of any component, shall be submitted for approval prior to installation.
- C., Minimum General Requirements of the Laboratory Package are:
1. Except for electrical components, the Controller and other components are to be assembled and manufactured in the United States.
 2. Utility Controller shall be assembled and listed to the following:
 - a. NEMA 1 rating for enclosures
 - b. UL Listed to provide as rated for two-hour fire rated wall when located in fire rated wall.
 - c. UL Listed to "Industrial Control panels" category



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- d. UL Listed to "Cabinets" category
- e. Utility Controller shall comply with Underwriter's Laboratory UL916 Standards.
 - 3. All components referenced in section 1.2.A must be procured from the same manufacturer of the Laboratory Utility Controller.
 - 4. Access to the internal components of the Safety Utility Controller must be secured by a keyed-lock. (Access into the Utility Controller cannot be protected solely by only screws - of any type.)
 - 5. Activation of gas, water and electricity within the classroom/laboratory must require an enabling keyed switch.
 - 6. The gas water and electricity must be able to be shut down, for emergency shutdown, by both an emergency-stop button and at least one panic button within the Laboratory.
 - 7. The lab must have a system in place that will shut down gas if gas is detected by means of a fuel gas sensor.
 - 8. The Controller must have the ability to automatically shut down after a certain period of time.
 - 9. The Controller and Emergency shower monitor must have the ability to shut down gas and electricity should the emergency shower be activated.
 - 10. The system shall be so designed that all utilities default to "off" during an emergency or panic situation and cannot reset to on without an authorized keyed operation.
 - 11. Controller shall have programable features that enable user to change timings and features.
 - 12. A system containing transducers does not exclude the need for a Fuel Gas Sensor.
 - 13. Utility Controller must have been manufacturing the Controller for at least 5 years.

1.4 CODES AND REGULATIONS REFERENCES

General, Publications: The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified.

- A. The Utility Controller must be manufactured and listed to the criteria in Section 1.3.C.1
- B. Installation of the Components and Package per the following Regulations
 - 1. American disabilities Act
 - 2. UL 61010
 - 3. State and local building codes
 - 4. National Building Codes
 - 5. NFPA 70 National Electrical Code
 - 6. NFPA 72 National Fire Alarm Code Uniform Building Code
 - 7. All requirements of the local Authority having jurisdiction.

1.5 QUALITY ASSURANCE

1.5.1 General (per 16010 General Electrical Requirements)

- 1. It is the intent of these Specifications and the Drawings, to secure the highest quality in all equipment and materials, and to require first-class workmanship, in order to facilitate trouble free operation and minimum maintenance of the electrical system.
- 2. All work, including installation, connection, calibration, testing and adjustment, shall be performed by qualified, experienced personnel who are technically skilled in their trades, are thoroughly instructed, and are competently supervised by a certified electrician. The resulting complete installation shall reflect professional quality work,



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employing industrial standards and methods. Any and all defective material or inferior workmanship shall be corrected immediately at no additional cost to the District.

3. All equipment and materials shall be new, listed by UL and bearing the UL label, unless exception to this requirement is inherent to an individual item specified herein, or exception is otherwise specified, or approved, via a written allowance.
4. Equipment and materials shall be the products of reputable, experienced manufacturers. Singular items in the project shall be the products of the same manufacturer. All equipment and materials shall be of industrial grade and heavy-duty construction, shall be of sturdy design and manufacture, and shall be capable of long, reliable, trouble-free service.
6. Contractor shall furnish manufacturer's electrical equipment of the types and sizes specified which has successfully operated for not less than the past five years, except where specific types are named by manufacturer and catalog number or designation under other Sections of the Contract Documents.

1.6 WARRANTY REQUIREMENTS

- A. Provide verification that the warranty of the Controller is at least 1 year.
- B. Once the contractor verifies the system is installed correctly, provide the acknowledgement that manufacturer of the system components, has received the warranty card.

1.7 SUBMITTALS

- A. General: Comply with Division 1 Submittals Procedure
- B. Equipment is not to be ordered without approved submittals.

All deviations from the Contract Documents shall be indicated within a submittal. Each deviation shall reference the corresponding drawing or specification number, show the contract document requirement text and/or illustration, and shall be accompanied by a detailed written justification for the deviation.
- C. Product Data: (For each Component of the Laboratory Utility Control Package.)
 1. Manufacturer,
 2. Model Number
 3. Detail all options and accessories
 4. Catalog Data Sheet
- D. Provide detail wiring diagram for power and wiring between all components and integration into the building system.
- E. Provide Manufacturer's operation and maintenance information as well as Installation instructions.
- F. Provide specifics on Panic Button(s) and Utility Controller location.

PART 2: PRODUCTS

The LP1 Package includes the minimum components and Devices for controlling the gas, water and electricity in the science lab. The following LP1 Package components shall be provided as shown on Drawings and as listed in the Equipment Schedule.

UTILITY CONTROLLER:



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At each science classroom and elsewhere as shown on Drawings, provide a Utility Controller with panel mounted switches to activate remote solenoids and relays to control the domestic water, gas, and electrical convenience outlets or other indicated services or devices. Unit shall control utility outlets at student workstations or other locations as indicated by Drawings. The Controller shall be equipped with an enabling key switch that restricts activation of output circuits, to the Instructor. Deactivation of output circuits shall not require engagement of enabling key.

E - SERIES ENCLOSURE WITH ELECTRICAL DISCONNECT

At each science classroom and as shown on Drawings, provide an E-Series Enclosure with mechanically held contacts for each circuit as shown on Drawings. The enclosure shall be integrated with Utility Controller as shown on Drawings. Locate enclosure as shown on Drawings.

S - SERIES SOLENOID ENCLOSURE WITH SOLENOIDS

At each science classroom and where shown on Drawings, provide an S-Series Enclosure. Provide with integral in-line strainer for each domestic water service assembly. Enclosure shall be integrated with Utility Controller as shown on Drawings. Number of solenoid assemblies, intended use and pipe sizes are as noted in Equipment Schedule. Locate enclosure as shown on Drawings. Provide shock arrestor in flow stream at each domestic water service assembly.

REMOTE PANIC BUTTON

Where shown on Drawings and where classroom size and configuration restrict maximum clear path range distance from Remote Panic Button to Utility Controller or other additional Panic Buttons per Code and verify if Panic Button needs to be near Exit door. Integrate Assembly with Controller.

MONITORING BEACON:

Where shown on Drawings and in Equipment Schedule, furnish and install a wall mounted Panic-Alarm Light Indicator. Location and mounting height shall be as directed by Architect. Make final wiring connection to Indicator.

EMERGENCY SHOWER MONITORING UNIT:

Where shown on Drawings and in Equipment Schedule, furnish and install an Emergency Shower Monitoring Unit. Install flow-switch assembly in piping system directly up-stream of the shower.

FUEL GAS SENSOR

Where shown on Drawings and in Equipment Schedule, furnish and install a Fuel Gas Sensor in order to gas within the classroom.

OPTIONAL COMPONENT/DEVICES:

LA - SERIES CONTROL PANEL:

Where shown on Drawings, provide an LA Series Control Panel at Prep Room and at instructor's demonstration station having utility outlets. LA Series shall control all utilities at station and integrate with Utility Controller at remote output contacts. Panel shall be mounted at station on surface face of casework. Panel shall be equipped with an enabling key switch that restricts operation to the Instructor and a momentary panic button assembly.

Where shown on Drawings, provide an LA - Series Control Panel at instructor's demonstration station. Panel shall control all utilities at the station and be mounted on surface of casework.



PART 3 – INTEGRATION AND CONFIGURATION

Energy Management Control System – “EMS”

Where shown on drawings, each Utility Control System shall be configured so that all controlled utilities and devices disengage at the end of the daily occupied period. Withdrawal of the low voltage control signal from the Energy Management Control System at the room's air handling device shall disable the Controller during the non-occupied “ems” mode. Signal shall originate from either a 5 VDC point on the unit's PCU or from 24 VAC dry contacts.

Where no “EMS” interface is available then Controller should be programmed for “first keying” whereby unit will operate for the designated time prior to programmed shutdown.

Integration of Building Alarm System:

Where shown on Drawings, Controller shall be wired to accept fire alarm input signal from Building Alarm system for automatic shutdown. Configure Controller to comply with Alarm System monitoring requirements.

Utility Controllers

Utility Controller shall be capable of field adjustments to meet specific project modification requirements. Configurations shall be limited to jumper placement on the circuit board and specific program position changes on digital display at PC Board without requirement for additional modifications to equipment.

Classroom Utilities:

Each utility service with outlets at student work-stations shall be controlled by Utility Controller. Control of services shall not be combined onto one output circuit unless indicated on Drawings. Services shall be activated by Controller door panel switches and the engaging of the service enabling key. Activation of utility services shall be restricted to the Instructor by means of the enabling key switch. Where systems include domestic hot and cold water, a single output circuit shall control those systems simultaneously.

Panic Reset:

Unless stated elsewhere on Drawings, the Utility Controller shall be configured so that reset of Panic State may occur at service enabling key switch on door panel.

Fire Alarm Reset:

Unless stated elsewhere on Drawings, the Utility Controller shall be configured so that continued fire alarm signal to enclosure shall prevent reset.

Fume Hoods:

Where indicated by the Drawings, configure classroom fume hoods so that Utility Controller will disable the fume hood during room non-occupied mode. Operating power shall be routed through control relay located in ELC-Series Enclosure for the specified room. Fume hood shall not be operational until after first enabling key engagement.

Instructor Demonstration Stations and Prep Rooms:

Integration with Controller shall permit shutdown of station on “ems” withdrawal and reactivation upon “ems” active only upon key engagement at LA Series Panel. Panic button at Controller or station shall disable station. Reset after panic at the station shall be independent from primary Controller. Panel shall be mounted at station on surface of casework and as directed by the Architect.

Purge-Exhaust Fan:

Where indicated by the Drawings, classrooms having an exhaust fan shall have fan configured with Utility Controller. Fan shall be integrated with Utility Controller. Fan shall activate upon pressing of the



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Panic Button. Fan shall shut off when Emergency Stop is activated. Exhaust fan shall not be operational until after first enabling key engagement.

Panic Button:

Each Utility Controller System shall be configured so that pressing the panic button will disable all utilities at all student work-stations and any integrated demonstration stations. .

Emergency Showers:

Where shown on Drawing, provide an Emergency Shower Monitoring Unit to recognize flow at the emergency shower. Upon flow, Controller shall integrate with Controller and set system in Panic state. A delay setting, if desired, is to be field configured.

Fuel Gas Sensor:

Unit shall integrate with Controller and turn OFF designated outputs.

Hand-Held Key Fob Panic Button:

When indicated in Equipment Schedule that *Line of Sight* Utility Controller is provided, key fob Panic Button shall deactivate all output circuits while sending alarm and activating purge fan.



PART 4- EXECUTION

INSTALLATION:

Install in accordance with manufacturer's recommendations and instructions and codes per 1.4.B

Furnish and install all devices as shown on Drawings and as specified herein. Where device is to be installed by other trades, furnish and then turn over to appropriate trade for installation.

PLUMBING:

Contractor shall furnish necessary piping and fittings.

ELECTRICAL:

Electrical Contractor shall furnish all conduit and wiring, making final wiring connections to all equipment as indicated by Drawings and specifications. Contractor shall be responsible for all system configurations, integration, test and start-up.

SPECIAL NOTE ON THE NEED FOR WIRING CONDUIT:

Unless otherwise specified for wiring systems, provide conduits for control and integration wiring from point of connection to each device to accessible point above ceiling.



