SECTION 11 53 33

**ISIMET LAv2 Utility Controller**

(Note to specifying engineer: When specifying systems utilizing this 3-Part CSI formatted specification, please remove any areas indicated in “Red” where not applicable to system design.)

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

1. **GENERAL**
	* + 1. **SUMMARY**

This document provides the minimum requirements for safely controlling and monitoring services including, but not limited to gas, water, electricity and/or fans. It also provides the minimum necessary requirements for addressing an emergency condition.

* + - 1. **SCOPE OF WORK AND MINIMUM REQUIREMENTS**
		1. Provide ISIMET LAv2 Utility Controller as means to control operation of aforementioned services/utilities.
		2. Each system shall include, at a minimum, the following:
* ISIMET Model: LAv2 Utility Controller
	+ UL Listed
	+ Clear indicator of services/utilities in active and inactive mode.
	+ Choose one:
		- Key Switch, for secure activation
		- Push Button
	+ Output notification signal when
		- A utilities flow is restricted
		- Emergency condition is initiated
	+ Metal cover with tamper-resistant screws to prevent tampering/unauthorized access
	+ ADA Compliant Emergency Shut-Off Button
* Gas solenoid(s), as specified
	+ UL Listed
* Water solenoid(s), as specified
	+ UL Listed
* Electrical disconnect, as specified
	+ UL Listed
* ISIMET Fuel Gas Sensor (FGS)
* ISIMET Emergency Shower Monitor (ESM)
* ISIMET Gas Pressure Transmitter (GPT)
* Remote ISIMET Emergency Shut-Off Button (IPO)
	+ 1. Contractor to provide installation labor, necessary supervision, materials and equipment for complete installation of the controller in each control area and 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.)
		2. Installation is to be completed per the Manufacturer’s Installation Manual.
			1. **MANUFACTURER QUALIFICATIONS**
		3. ISIMET LAv2 is the basis of the design. Alternative 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.
		4. Additional components may be provided to the specified system including solenoid valves, enclosures, notification beacon, piping, wiring, conduit, and any other material, as needed, to provide a complete and operational system that complies with this specification.
		5. Any alternative to ISIMET, of any component, shall be submitted for approval prior to installation.
		6. Minimum General Requirements are:

Except for electrical components, the Controller and other components are to be assembled and manufactured in the United States.

Controller shall comply with Underwriter’s Laboratory UL916 Standards.

All components referenced in Section 1.2 must be procured from the same manufacturer of the Controller.

Access to the internal components of the Safety Controller must be secured by a metal cover and tamper-resistant screws.

The listed services from Section 1.1 must shutdown upon an emergency condition as a result of the activation of an emergency-stop button.

The lab must have a system in place that will shut down gas if gas is detected by means of a fuel gas sensor.

The Controller must have the ability to automatically shut down after a certain period of time.

The Controller and Emergency Shower Monitor, if provided, must have the ability to shut down services should the emergency shower be activated.

The system shall be so designed that all utilities default to *OFF* during an emergency or power outage and cannot reset to *ON* without an authorized keyed operation.

The Controller shall have programable features that enable user to change timings and features.

A system containing transducers does not exclude the need for a Fuel Gas Sensor.

Controller must be manufactured by a company that has been manufacturing similar type controllers for at least 5 years.

* + - 1. **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.

The Controller must be manufactured and listed to the criteria in Section 1.3.C.

Installation of the Components and Package per the following Regulations

American disabilities Act

UL 61010

State and local building codes

National Building Codes

NFPA 70 National Electrical Code

NFPA 72 National Fire Alarm Code Uniform Building Code

All requirements of the local Authority having jurisdiction.

* + - 1. **QUALITY ASSURANCE**
1. General
	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, employing industrial standards and methods. Any and all defective material or inferior workmanship shall be corrected immediately at no additional cost.
	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.
	5. Contractor shall furnish manufacturer's 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. **Warranty Requirements**
				1. Provide verification that the warranty of the Controller is at least 5 years.
				2. Once the contractor verifies the system is installed correctly, provide the acknowledgement that manufacturer of the system components has received the warranty card.
			2. **Submittals**
				1. General: Comply with Division 1 Submittals Procedure
				2. Equipment is not to be ordered without approved submittals.
				3. Product Data: (For each Component of the Control Package.)
			3. Manufacturer,
			4. Model Number
			5. Detail all options and accessories
			6. Catalog Data Sheet
				1. 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.
				2. Provide detail wiring diagram for power and wiring between all components and integration into the building system.
				3. Provide Manufacturer’s operation and maintenance information as well as Installation instructions.
				4. Provide specific Control System location.
2. **PRODUCTS**

The ISIMET Model: LAv2 Package includes the minimum components and devices to independently secure any service located within local area of the installation. The following Package components shall be provided as shown on Drawings and as listed in the Equipment Schedule.

**CONTROLLER:**

At each area indicated in this document, or elsewhere as shown on Drawings, provide a Controller with panel mounted switches to activate remote solenoid(s), contactor(s) and/or other means of control of the services as indicated by Drawings. The Controller shall be restricted by means of an enabling key/switch or push button that activates output circuits. Controller shall integrate with energy/building management system or provide deactivation of services after a timing sequence has expired.

ISIMET Model: *(Designer choose one and delete the other)*

* LAv2 –HV- 120VAC Output System
* LAv2 –LV- 24VDC Output System

**SYSTEM COMPANIONS:**

**Gas & Fluids Systems:** *(Designer: Choose one and delete the companion controls)*

Provide and locate the following companions to the controller, as shown on drawings. Provide shock arrestor in flow stream at each domestic water service assembly.

1. Solenoid(s): Shall be individual solenoid valve(s), suitable for the intended medium; located near and integrated with Controller as shown on Drawings. Pipe sizes are as noted in Equipment Schedule.
2. Solenoid Valve Assembly(s): Shall be solenoid valve(s) assembly(s), suitable for the intended medium, provided with “Factory Pressure Tested” ball valve, solenoid, integral in-line strainer and union assembly for each service specified. Assemblies may be stand alone or rack mounted; located near and integrated with Controller as shown on drawings. Pipe sizes are as noted in Equipment Schedule.
3. Solenoid Valve Assembly(s) Enclosure: Shall be pre-assembled solenoid valve(s) assembly(s), suitable for the intended medium, provided with “Factory Pressure Tested” ball valve, solenoid, integral in-line strainer and union for each service specified. Enclosures to be located near and integrated with Controller as shown on drawings. Pipe sizes and arrangement are as noted in Equipment Schedules and details.

**Electrical Systems:**

Provide and locate an E-Series Enclosure with mechanically held contacts for each circuit as shown on drawings; the enclosure shall be located near and integrated with Controller.

**Remote Emergency Shut-Off Button:**

Provide and locate as shown on Drawings and/or Equipment Schedule, Remote Emergency Shut-Off Button(s), which shall be installed in accordance with local and national codes and regulations. Install any additional Emergency Shut-Off Buttons in line-of-sight locations that are readily accessible at points of egress, or as otherwise directed. Integrate Assembly with Controller.

**Monitoring Beacon:**

Provide and locate as shown on Drawings and/or Equipment Schedule, a wall mounted 24VDC Emergency/Alarm Light Indicator. Location and mounting height shall be as directed by Architect. Integrate Assembly with Controller.

**Emergency Shower Monitoring Unit:**

Provide and locate as shown on Drawings and/or Equipment Schedule, an Emergency Shower Monitoring Unit. Install flow-switch assembly in piping system directly up-stream of the shower. Integrate Assembly with Controller.

**Fuel Gas Sensor:**

Provide and locate as shown on Drawings and/or Equipment Schedule, a Fuel Gas Sensor in order to detect gas within the room, deactivating service and sending notification signal. The Fuel Gas Sensor shall be installed in direct air flow at proper mounting height as directed. Integrate Assembly with Controller.

**Gas Pressure Transmitter:**

Provide and locate as shown on Drawings and/or Equipment Schedule, a Gas Pressure Transmitter in order to detect pressure drop within the room, deactivating service and sending notification signal. Integrate Assembly with Controller.

**PART 3 – INTEGRATION AND CONFIGURATION**

**Energy/Building Management Control System – “EMS/BMS”:**

Where shown on Drawings, each Control System shall be configured so that all controlled services and devices disengage at the end of the daily occupied period. Withdrawal of the 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. Originating signal shall be dry-contact (voltage-free).

Where no “EMS” interface is available then Controller should be programmed for “first key timing” whereby unit will operate for the designated time prior to programmable 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. Originating signal shall be dry-contact (voltage-free). Configure Controller to comply with Alarm System monitoring requirements.

**Controller**

Controller shall be capable of field adjustments via DIP switch to meet specific project modification requirements.

**Utilities:**

Each utility service with outlets at work-stations shall be controlled by 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 supervision by means of the enabling key switch. Where systems include domestic hot and cold water, a single output circuit shall control those systems simultaneously.

**Emergency Reset:**

Unless stated elsewhere on drawings, the Utility Controller shall be configured so that reset of the Emergency Shut-Off State may occur at service enabling key switch or push button 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 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 E-Series Enclosure for the specified room. Fume hood shall not be operational until after first enabling key engagement.

**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. Emergency Shut-Off Button at Controller or station shall disable station. Reset after emergency 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, rooms having an exhaust fan shall have fan configured with the Controller. Fan shall be integrated with Utility Controller. Fan shall activate upon pressing of the Emergency Shut-Off Button. Fan shall shut off when Emergency Stop is activated. Exhaust fan shall not be operational until after first enabling key engagement.

**Emergency Shut-Off Button:**

Each Utility Controller System shall be configured so that pressing the Emergency Shut-Off Button will disable all services/utilities at all 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 emergency state. A delay setting, if desired, is to be field configured.

**Fuel Gas Sensor:**

Unit shall integrate with Controller and turn OFF designated outputs.

**Gas Pressure Transmitter:**

Unit shall integrate with Controller and turn OFF designated outputs.

**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.