SECTION 230923.22 - POSITION INSTRUMENTS

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			1. SUMMARY
				1. Section includes position limit switches for use in direct-digital control systems for HVAC.
				2. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 230923 "Direct-Digital Control System for HVAC" for control equipment and software, relays, electrical power devices, uninterruptible power supply units, wire, and cable.

Section 230993 "Sequence of Operations for HVAC Controls" for requirements that relate to Section 230923.22.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

Include operating characteristics, electrical characteristics, and furnished accessories indicating default control signal with loss of power and electrical power requirements.

Include product description with complete technical data and product specification sheets.

* + - * 1. Shop Drawings:

Include details of product assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

Include diagrams for power, signal, and control wiring.

Include number-coded identification system for unique identification of wiring.

1. PRODUCTS

See Editing Instruction No. 1 in the Evaluations for cautions about named manufacturers and products. For an explanation of options and Contractor's product selection procedures, see Section 016000 "Product Requirements."

* + - 1. POSITION LIMIT SWITCHES

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=9821) Subject to compliance with requirements, provide products by the following:

Johnson Controls

[OMRON Corporation](http://www.specagent.com/Lookup?uid=123456944496).

Siemens Industry, Inc., Building Technologies Division

Approved equivalent.

Requirements in remaining paragraphs below are based on Omron's "Model D4A."

* + - * 1. Description: Select type of actuating head (plunger, roller lever, or rod) to suit application.

Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

* + - * 1. Performance:

Life expectancy: Not less than 30 million mechanical operations and 750,000 electrical operations.

Operating Frequency: 300 mechanical operations per minute and 30 electrical operations per minute.

Voltage: 125-, 250-, 480-, and 600-V ac or 8-, 12-, 14-, 24-, 30-, 48-, 125-, and 250-V dc, as required by application.

Current Rating: As required by application.

Temperature Rise: 50 deg C.

Ambient Temperature: 14 to 175 deg F (Minus 10 to 79 deg C).

Ambient Relative Humidity: 35 to 95 percent.

* + - * 1. Construction:

NEMA 250, Type 4X enclosure.

Switch Type: SPDT or DPDT, as required by application.

Retain first subparagraph below for indicator.

Status indicator integral to switch. Field switchable to light when contacts are actuated and operating, or contacts are free and not operating.

Electrical Connection: Screw or plug-in terminals.

Conduit Connection: NPS 1/2 (DN 50).

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
				2. Examine roughing-in for instruments installed in duct systems to verify actual locations of connections before installation.
				3. Prepare written report, endorsed by Installer, listing conditions detrimental to performance.
				4. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. INSTALLATION, GENERAL
				1. Install products level, plumb, parallel, and perpendicular with building construction.
				2. Properly support instruments, wiring, and conduit to comply with requirements indicated. Brace all products to prevent lateral movement, sway, or a break in attachment when subjected to a <**Insert value**> force.
				3. Fastening Hardware:

Stillson wrenches, pliers, and other tools that cause injury to or mar surfaces of rods, nuts, and other parts are prohibited for work of assembling and tightening nuts.

Tighten bolts and nuts firmly and uniformly. Do not to overstress threads by using excessive force or oversized wrenches.

Lubricate threads of bolts, nuts, and screws with graphite and oil before assembly.

* + - * 1. Install products in locations that are accessible and that permit maintenance from floor, equipment platforms, or catwalks. Where ladders are required for Director’s Representative's access, confirm unrestricted ladder placement is possible under occupied condition.
				2. Corrosive Environments:

Use products that are suitable for environment to which they are subjected.

If possible, avoid or limit use of materials in corrosive environments, including, but not limited to:

Laboratory exhaust airstreams.

Process exhaust airstreams.

When conduit is in contact with a corrosive environment, use Type 316 stainless-steel conduit and fittings or conduit and fittings that are coated with a corrosive-resistant coating that is suitable for environment.

Where instruments are located in a corrosive environment and are not corrosive resistant from the manufacturer, field install products in a NEMA 250, Type 4X enclosure constructed of Type 316L stainless steel.

* + - 1. ELECTRICAL POWER
				1. Provide electrical power to products requiring electrical connections.
				2. Provide circuit breakers. Comply with requirements in Section 262816 "Enclosed Switches and Circuit Breakers."
				3. Provide power wiring. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
				4. Provide raceways. Comply with requirements in Section 260533 "Raceways and Boxes for Electrical Systems."
			2. POSITION INSTRUMENTS INSTALLATION
				1. Mounting Location:

Rough-in instrument-mounting locations before setting instruments and routing, cable, wiring, and conduit to final location.

Use manufacturer mounting brackets to accommodate field mounting. Securely support and brace products to prevent vibration and movement.

* + - * 1. Seal penetrations to ductwork, plenums, and air-moving equipment to comply with duct static-pressure class and leakage and seal classes indicated, using neoprene gaskets or grommets.
			1. ADJUSTMENT, CALIBRATION, AND TESTING
				1. Digital Signals:

Check digital signals using a jumper wire.

Check digital signals using an ohmmeter to test for contact.

* + - * 1. Switches: Calibrate switches to make or break contact at set points indicated.
				2. Switches: Calibrate switches to make or break contact at set points indicated.

END OF SECTION 230923.22