**SECTION 230900 – INSTRUCTION AND CONTROL FOR HVAC**

**GENERAL**

**The following section should be added to 1.2.B**

1.2 SUMMARY

1. Related Sections include the following:
	1. Division 23 Section “Hydronic Piping” for requirements for piping packages for control valves.

**The following replaces the noted specification sections, except as noted.**

* 1. ACTUATORS
1. Electronic Actuators
	* 1. Manufactured, brand labeled or distributed by SIRAL.
	1. Product should be sized for torque required for damper seal at maximum design conditions and valve close-off pressure for system design.
	2. Coupling: Quick-connect (Under 6 seconds) shaft lock, toothed cradle; directly couple no tool quick connect and mount to the valve bonnet stem; or ISO-style direct-coupled mounting pad.
	3. Mounting: Actuators shall be capable of being mechanically and electrically paralleled to increase torque if required.
	4. Overload protected electronically throughout rotation.
	5. Fail Safe Operation: Mechanical fail safe shall incorporate a spring-return mechanism and indication of the position status on the actuator face
2. Power Requirements: 24Vac/dc [120Vac] [230Vac]
3. Proportional Actuators shall be software configurable through an EEPROM without the use of actuator mounted switches**.** Programmable functions shall include a scalable operating range from 0.5 – 32.0 vdc with a 2.0 vdc (min) span; variable runtime; and data logging.
4. Temperature Rating: -22 to +122**º**F **-30 to +50ºC [-58 to +122ºF -50 to +50ºC]**
5. Housing: Minimum requirement NEMA type 4 (4/4X) / IP54 (IP67).
6. Agency Listings: ISO 9001, cULus, CE or CSA
7. The manufacturer shall warrant all components for a period of 5 years from the date of production, with the first two years unconditional.
8. Industrial Actuators (*SHOULD BE INCLUDED with 2.16.I. Butterfly Valves – Resilient Seat and 2.16.J. Butterfly Valves –(e.g. – outdoor installations) by the bidder to meet project requirements.)*
	* 1. Manufactured, brand labeled or distributed by Siral.
	1. The combined valve and actuator assembly shall meet the close-off requirements as specified in Section 2.16.H – Butterfly Valves.
	2. Overload Protection: An auto-reset thermal switch embedded in the motor.
	3. Manual Override: Actuator shall be equipped with a hand wheel or shaft for manual override to permit operation of the actuator in the event of an electrical power failure
	4. Power Requirements: 120VAC [24VAC] [230VAC] 1Ф.
	5. Auxiliary Switches: 2 SPDT rated 3A at 250 VAC, pilot duty rated.
	6. Temperature Rating: -22 to +150**º**F.**-30 to +65ºC.**
	7. Housing: Minimum requirement NEMA type 4X/ IP67 with an industrial quality coating. Actuator shall have an internal heater to prevent condensation within the housing. A visual indication beacon shall indicate position status of the device.
	8. Agency Listing: ISO, CE, CSA
	9. The manufacturer shall warrant for 2 years from the date of production.
	10. CONTROL VALVES
9. Manufacturer:
	* 1. Manufactured, brand labeled and distributed by Siral.
10. Control Valves:
	1. Factory fabricated of type, body material, and pressure class based on maximum pressure and temperature rating of piping system, unless otherwise indicated.
	2. Sizing:
		1. Two-Position: Line size or size using a pressure differential of 1 psi.
		2. Two-Way Modulating: [3 psid] 5 psid or twice the load pressure drop, whichever is more.
		3. Three-Way Modulating: Twice the load pressure drop, but not more than [3 psid] 5 psid.

 [2.ii Sizing (steam):

* + - 1. Two-Position: Line size or sized using 10% of inlet gauge pressure.
			2. Modulating: 15 PSIG or less inlet steam pressure, the pressure drop shall be 80% of inlet gauge pressure]

*Choose this option when specifying steam valves.*

* 1. The control valve assembly shall be provided and delivered from a single manufacturer as a complete assembly.
1. The manufacturer shall warrant all components for a period of 5 years from the date of production, with the first two years unconditional (except as noted).
2. Characterized Control Valves:
3. 2” and Smaller: Nickel-plated forged brass body rated at no less than 400 psi, stainless steel ball and blowout proof stem, female NPT end fittings, with a dual EPDM O-ring packing design, fiberglass reinforced Teflon seats, and a Machined brass or stainless steel flow characterizing disc.
4. Valve assemblies shall be maintenance free.
5. [Six-way characterized control valves for changeover applications on combination heating/cooling chilled beams and other four pipe systems shall have the following characteristics:
	1. NPS ½”, ¾”and 1”: Nickel plated forged brass body rated at no less than 600 psi, dual stainless steel ball and blowout proof stems, and female NPT end fittings. Each three-way portion of the 6-way valve body shall have EPDM O-Ring packing design, Teflon PTFE seats, and a machined brass characterizing disc.
	2. The six-way control valve shall be controlled by a rotary actuator for managing two media in a switching application with an equal percentage flow characteristic. The valve shall be closed to flow at mid-rotation.]
6. Butterfly Valves – Resilient Seat:
	1. NPS 2 to 12: Valve body shall meet ANSI Class 125/150 flange standards, be full lugged design, 200 psig ductile iron body with a 304 stainless steel disc, EPDM seat with an extended neck. Disc-to-stem connection shall utilize an internal spline. The shaft shall be supported at four locations by RPTFE bushings. A coated disc shell is not acceptable.
	2. NPS 14 and Larger: : Valve body shall meet ANSI Class 125/150 flange standards, be full lugged design, 150 psig ductile iron body with a 304 stainless steel disc, EPDM seat with an extended neck. Disc-to-stem connection shall utilize an internal spline. The shaft shall be supported at four locations by RPTFE bushings. A coated disc shell is not acceptable. A coated disc shell is not acceptable.
	3. Sizing: Two-Position (on/off) butterfly valves shall be sized using the 900 Cv

 rating. Modulating butterfly valves shall be sized using the 600 Cv rating.

* 1. Flow Characteristics: Modified equal percentage, unidirectional dead end service.
	2. Close-Off Pressure Rating: Bubble-tight shutoff (no leakage).
	3. The combination of two 2-way butterfly valves in a tee configuration cross-linked to ensure proper flow orientation shall be permitted. The tee shall be constructed of cast iron/stainless steel.