

Section 15959

AUTOMATIC CONTROL VALVE INSULATED ENCLOSURE (HOT BOX)

PART 1 GENERAL

1.01 SUMMARY

This Section includes the furnishing and the installation of Automatic Control Valve Insulated Enclosures (Hot Boxes) for control valves installed on water lines that are subject to low temperatures.

1.02 MEASUREMENT AND PAYMENT

No separate payment for Work performed under this Section. Include cost of same in Contract price bid for Work of which this is a component part.

1.03 REFERENCES

This specification references the following publications in their current editions. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

- A. SAE AMS-QQ-A-250/8: Aluminum Alloy 5052, Plate and Sheet (Stabilized Type)
- B. ASTM B209: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

1.04 SUBMITTALS

Submit shop drawings and product data under provisions of Section 01330 – "Submittal Procedures."

- A. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.
- B. Mark dimensions and values in units to match those specified.
- C. As a minimum, submit the following items:
  - 1. A layout of the enclosure including location of fixed and movable joints and hinges
  - 2. Details of design and fabrication of joints and hinges
  - 3. Details of support brackets and other supporting elements

4. Other pertinent elements necessary for a complete installation
5. Manufacturer's literature illustrating construction and dimensions
6. Manufacturer's literature illustrating the approved installation method

#### 1.05 RELATED REQUIREMENTS

- A. Section 01110 – "Summary of Work"
- B. Section 01325 – "Construction Schedule"
- C. Section 01330 – "Submittal Procedures"
- D. Other related Work as called for on Drawings or specified elsewhere in this or other Technical Specification Sections.

#### 1.06 QUALITY ASSURANCE

Manufacturer shall have at least three years of documented, successful experience designing, manufacturing and selling Automatic Control Valve Insulated Enclosures to various customers in different locations and climates.

#### 1.07 SYSTEM DESCRIPTION (NOT USED)

#### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all enclosures in Manufacturer's shipping containers. Provide sufficient protection to ensure arrival in undamaged condition and stored in a dry place until installation.
- B. Delivery schedules shall be coordinated with the Project Manager to avoid interruption in construction schedule.
- C. Storage of the enclosures shall be in designated construction staging areas. These enclosures shall be protected from dust, dirt, and debris.
- D. Use care in handling of these enclosures to avoid damage.

#### 1.09 PROJECT/SITE CONDITIONS

- A. Install enclosures in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare drawings showing proposed rearrangement of enclosures to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of the Project Manager before proceeding.

1.10 DEFINITIONS (NOT USED)

1.11 SEQUENCING

Construct Work in sequence under provisions of Sections 01110 – “Summary of Work” and 01325 – “Construction Schedule.”

1.12 - 1.13 (NOT USED)

PART 2 PRODUCTS

2.01 MANUFACTURER(S)

- A. Listing as an acceptable manufacturer shall not relieve the Manufacturer from conforming to Contract Specifications. Final acceptance will be based on conforming to these specifications. The Contractor shall list the enclosure that their bid is based on. Upon notice to proceed to Contractor, Contractor may give notice to proceed to selected enclosure manufacturer.

1. Hubbell Power Systems, Inc.
2. Park Environmental Equipment
3. Or Approved Equal

2.02 MATERIALS AND/OR EQUIPMENT

- A. Automatic Control Valve Insulated Enclosure (Hot Box)

1. Manufacturer/Model:

- a. Dura Fold® Aluminum Lok Box® Enclosures (Not Heated) by Hubbell Power Systems, Inc.,
- b. Model ACVEN-36 by Park Environmental Equipment,
- c. Or Approved Equal

2. Description:

Aluminum enclosure is pre-engineered to provide protection to automatic control valves installed above ground. These control valves are subject to freezing and vandalism. The enclosure is equipped with access doors to provide adequate access to the control valves.

3. The enclosure shall be manufactured from all new materials.

4. The exterior shall be fabricated with 0.090 aluminum (UNS A95052) alloyed with 2.5% magnesium tensile strength, range 31 to 44 KSI and very good corrosion resistance.
5. Enclosure conforms to SAE AMS-QQ-A-250/8 and ASTM B209 and is continuously welded.
6. The access doors shall be of like material to the exterior of the enclosure and shall be hinged with a continuous hinge. The door shall be equipped with a hasp and staple for a padlock. Box shall be designed such that when the hasp is secured with a padlock that the box cannot be opened.
7. The interior of the enclosure (top and sides) shall be structurally lined with insulation. Insulation shall be a minimum thickness of 1 1/2" and have an insulation value of R-10.
8. Two (2) removable kick plates shall be installed at the main pipe penetrations through the walls of the enclosure.
9. One (1) "One-Way" drain port to exclude debris and pests shall be installed in the enclosure. Drain panel shall have a stainless steel hinge and a stainless steel light strength spring as a positive means of closure so that the drain panel shall not be activated by wind. Drain panel shall be designed to remain closed except during water discharge.
10. Mounting Hardware:
  - a. The walls of the enclosure shall be securely attached to the concrete base with inside anchoring brackets.
  - b. Mounting hardware shall be furnished and shall be stainless steel or aluminum.
  - c. All threaded fasteners shall be furnished and shall be stainless steel and/or Hilti type Tap-Fast w/Quickcoat<sup>TM</sup> and Flo Seal washer or equal.
  - d. All masonry fasteners shall be furnished and shall be stud type Hilti Kwik Bolt II<sup>TM</sup> and/or Hilti type Hit Anchors or equal.

2.03 - 2.04 (NOT USED)

PART 3 EXECUTION

### 3.01 GENERAL/INSTALLATION

- A. Follow manufacturer's printed instructions and approved practice for installation of equipment.
- B. Each enclosure shall be anchored in place according to manufacturer's recommendations.
- C. Center penetration for pipe horizontally in side of box. Size diameter of penetration to fit the pipe. Opening should be O.D. + 1/8" maximum. Fill space between penetration hole and pipe with weatherproof insulating material.
- D. Field verify dimensions of all valves and appurtenances prior to ordering enclosures. Provide a minimum 4-inch clearance between interior of enclosure and all internal components including limit switches, or position indicators at point of highest extension, electrical conduit, and pilot tubing.
- E. Enclosures shall be designed to support a minimum vertical load of 100 pounds per square foot (psf).
- F. Contractor to position conduits to fall within the limits of the enclosure. Field penetrations of the side of the enclosure are to be avoided.
- G. All insulation installed on the interior of the Hot Box shall be glued to the aluminum walls and all seams shall be taped to prevent gaps.
- H. All-thread restraints shall not be allowed to penetrate the enclosure, excluding sites with existing piping.
- I. Electrical Heater and Mechanical Thermostat:
  - 1. For each Hot Box provide two 120 VAC GFCI duplex receptacles in weatherproof "IN-USE" covers, wiring devices, conduit, wire and related items to service the electric heater and mechanical thermostat that is to be installed in each Hot Box. See "ATTACHMENT" for more details regarding installation and wiring details.
  - 2. 120 VAC GFCI receptacles shall be installed to be easily accessible with the top of the Hot Box open.
  - 3. An electric heater and mechanical thermostat are to be supplied for every Hot Box that is installed at the water receiving facility. See "ATTACHMENT" for detailed information on the heaters and thermostat that are to be installed.

4. Electric Heater:
  - a. See "ATTACHMENT" for more requirements of electric heater
  - b. Fan Forced/Radiant
  - c. 120 Volt
  - d. Non-Oscillating
  - e. Auto Overheat Shut Off Protection
  - f. Safety Tip Over Switch
  - g. Power Indicator Light
  - h. 1 year warranty
  
5. Thermostat:
  - a. See "ATTACHMENT" for requirements of thermostat and details regarding installation and wiring details.
  - b. Two single pole throw double throw switches with two stage control.
  - c. Galvanized steel enclosure
  - d. Thermostat shall be installed with 18 amp rated contacts
  - e. 120 VAC GFCI receptacle supplying general power to the Hot Box shall be wired directly, to be operational at all times.
  - f. Power is supplied to the 120 VAC GFCI receptacle supplying power to the electric heater and controlled by the thermostat with a "NORMALLY OPEN" contact. Contact shall be signaled to "CLOSE" on drop of temperature below "LOW" temperature set point. Once the temperature is raised above the "LOW" temperature set point, the contact shall be signaled to "OPEN."
  - g. An alarm shall be sent to the PLC once the temperature drops below the "LOW" temperature set point. The alarm is controlled by a "NORMALLY CLOSED" contact. Contact shall be signaled to "OPEN" on drop of temperature. A second alarm shall be signaled if the temperature continues to drop and hits the "LOW-LOW" temperature set point. Once temperature rises above the "LOW" temperature set point, the contact shall be signaled to "CLOSE."

6. Electric heater shall be plugged directly into the 120 VAC GFCI receptacle. Power feeding the receptacle shall be controlled by the mechanical thermostat installed in the Hot Box. See "ATTACHMENT" for information on details covering the wiring of the thermostat.
  7. Electric heater shall be located in the Hot Box so as to minimize the possibility of overheating and piece of equipment, piping, or structure.
- J. All electrical/instrumentation penetrations in the Hot Box must occur on the side of the Hot Box with the removable kick plate and to either side of the removable kick plate.

3.02 - 3.10 (NOT USED)

**ATTACHMENT**

*[Design Engineer is to complete blanks per site requirements]*

1. Manufacturer: \_\_\_\_\_
2. Model: \_\_\_\_\_
3. Size of Hot Box: \_\_\_\_ Wide x \_\_\_\_ Long x \_\_\_\_ High \*
4. Electrical Heater: Electric Space Heater, Fan Forced, 120 V  
Dayton Model No. 1VNW9  
1,500/1,000/650 Watts, 1.5/1.0/0.65 kW, 60 Hz,  
Single Phase, 12.5/8.3/5.4 Amps,  
Heat Settings – 3 & Fan Only
5. Mechanical Thermostat: Thermostat, 2 SPDT, Range 30° to 110°  
Johnson Controls Model No. A28AA-4C  
Control Range: 30° to 110°

\* Size to be verified by Contractor in the field.

END OF SECTION