

SECTION 335243 – AVIATION FUEL DISTRIBUTION AND VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Narrative:

1. To assure proper sealing of valves for testing purposes a number of existing resilient seated butterfly valves will be replaced with hard seated butterfly valves. The supplied valves shall match the face to face dimensions of the existing valves.
2. Modifications will also be required to the system to allow the introduction of Nitrogen to pressurize the piping for testing. The piping modifications will be made to existing threaded connections to preclude the need for welding or other hot work. The connections will be threaded throughout and incorporate threaded three piece ball valves.
3. All valves and connection points shall be labeled with valve tags for identification. Nomenclature shall be as indicated on the drawings.
4. Provide valves as scheduled on drawings

B. Section Includes:

1. Stainless ball valves.
2. Stainless hard-seated butterfly valves.
3. 316 Stainless Steel piping and fittings
4. Pressure gauges
5. Stainless blind flanges
6. Gaskets
7. Stainless steel valve tags

C. Verification:

1. Contractor shall verify dimensions of existing valves prior to ordering new. Contractor will be responsible for any required adjustments of the existing piping to accommodate new valves.

1.2 SUBMITTALS

- A. Product Data:** For each type of valve, piping, or appurtenance indicated.

1.3 QUALITY ASSURANCE

- A. Source Limitations for Valves:** Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:** ASME B16.5 and ASME B16.34 for ferrous valve dimensions and design criteria.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Valve Pressure and Temperature Ratings: Valves shall be 150# class
- B. Valve Sizes: Same as upstream piping unless otherwise indicated.
- C. Valve Actuator Types:
 - 1. Gear Actuator: For butterfly valves.
 - 2. Locking Handlever: For ball valves
- D. Valve-End Connections:
 - 1. Butterfly Valves: Lug Style API 609
 - 2. Threaded: With threads according to ASME B1.20.1.

2.2 STAINLESS STEEL BALL VALVES

- A. Three-Piece, Full-Port, Stainless Steel Ball Valves with Stainless Trim:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Apollo valves as manufactured by Conbraco.
 - b. Flow-Tek, Inc.; a subsidiary of Bray International, Inc.
 - c. Nibco.
 - d. Approved equal.
 - 2. Description:
 - a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig.
 - c. CWP Rating: 1500 psig.
 - d. Body Design: Three piece.
 - e. Body Material: ASTM A351-CF8M.
 - f. Ends: Threaded.
 - g. Seats: PTFE or TFE.
 - h. Stem: 316 SS
 - i. Ball: 316 SS.
 - j. Port: Full.

2.3 STAINLESS STEEL, HARD SEATED, TRIPLE-OFFSET BUTTERFLY VALVES

- A. 150 CWP, lug style, metal seated gear operators. Valves shall have zero leakage, bubble tight closure rating and be compatible with Jet A fuel :

1. Manufacturers:
 - a. Velan Inc. Torqseal
 - b. Approved Equal
2. Description:
 - a. Standard: API 609.
 - b. CWP Rating: 150 psig.
 - c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
 - d. Body Material: A 351 Grade CF8M.
 - e. Seat: Stellite 21
 - f. Stem: A638 type 660.
 - g. Disc: A 351 Grade CF8M.

2.4 STAINLESS STEEL PIPING, FLANGES, AND GASKETS

- A. Piping shall be schedule 40; 316 Stainless Steel, threaded. Piping shall be compatible with Jet A fuel.
 1. Fittings shall be forged 316 SS, threaded, sch 40, 150# class.
 2. Flanges shall be 150#, raised face, thread-on style or drilled and tapped as required.
 3. Provided metallic gasketing as required for valve installation. Gaskets shall be compatible with aviation fuels. Flexitallic or approved equal.

2.5 PRESSURE GAUGES

- A. Pressure gauges shall be liquid filled, stainless case with 316 stainless steel movement and internals. Gauges shall have 4" dials, acrylic lenses, and +/- 1.6% accuracy for full range of scale. Gauges shall read from 0 to 200 psi.
- B. Manufacturers:
 1. Ashcroft
 2. HO Trerice (D80 series basis of design)
 3. Approved Equal.

2.6 VALVE TAGS

- A. Valve tags shall be heavily embossed Stainless steel minimum 2" in diameter. Tags shall be securely attached to valves with stainless bead chain or stainless wire rope. Tag nomenclature shall be as indicated on the drawings.
- B. All valves and Nitrogen charging points shall receive tags.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown. Install new gaskets with every valve.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.

3.3 TESTING SEQUENCE:

Testing shall be performed as follows: System “A”: (Jet A)
Attach pressurized Nitrogen to connection point A
Close valves A-1, A-2,A-3,A-4,A-5 and A-6, open valve A-7
Observe pressurize system to 100 PSI and close valve A-7
Pressure test for a minimum of 4 hours with no loss of pressure
Disconnect Nitrogen and bleed pressure from valve A-7 slowly until pressure normalizes
Close valve A-7 and open A-1,A-2,A-3,A-4, A-5, and A-6

System “B”: (Av-gas)
Attach pressurized Nitrogen to connection point B
Close valves B-1, B-2,B-3, open valve B-4
Pressurize system to 100 PSI and close valve B-4
Observe pressure test for a minimum of 4 hours with no loss of pressure
Disconnect Nitrogen and bleed pressure from valve B-4 slowly until pressure normalizes

Close valve B-4 and open B-1, B-2, and B-3.

System “C”: (Mo-gas)

Attach pressurized Nitrogen to connection point C

Close valves C-1, C-2, C-3, open valve C-4

Pressurize system to 100 PSI and close valve C-4

Observe pressure test for a minimum of 4 hours with no loss of pressure

Disconnect Nitrogen and bleed pressure from valve C-4 slowly until pressure normalizes

Close valve C-4 and open C-1, C-2, and C-3.

System “D”: (Jet-A)

Attach pressurized Nitrogen to connection point D

Close valves D-1, D-2, D-3, D-4 open valve D-5

Pressurize system to 100 PSI and close valve D-4

Observe pressure test for a minimum of 4 hours with no loss of pressure

Disconnect Nitrogen and bleed pressure from valve D-5 slowly until pressure normalizes

Close valve D-5 and open D-1, D-2, D-3, and D-4.

System “E”: (Av-gas)

Attach pressurized Nitrogen to connection point E

Close valves E-1, E-2, E-3, open valve E-4

Pressurize system to 100 PSI and close valve E-4

Observe pressure test for a minimum of 4 hours with no loss of pressure

Disconnect Nitrogen and bleed pressure from valve E-4 slowly until pressure normalizes

Close valve E-4 and open E-1, E-2, and E-3.

System “F”: (Mo-gas)

Attach pressurized Nitrogen to connection point F

Close valves F-1, F-2, B-3, open valve B-4

Pressurize system to 100 PSI and close valve B-4

Observe pressure test for a minimum of 4 hours with no loss of pressure

Disconnect Nitrogen and bleed pressure from valve B-4 slowly until pressure normalizes

Close valve B-4 and open B-1, B-2, and B-3.

System “G”: (Mo-gas)

Attach pressurized Nitrogen to connection point G

Close valves G-1, G-2, G-3, open valve G-4

Pressurize system to 100 PSI and close valve G-4

Observe pressure test for a minimum of 4 hours with no loss of pressure

Disconnect Nitrogen and bleed pressure from valve G-4 slowly until pressure normalizes

Close valve G-4 and open G-1, G-2, G-3

3.4 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

END OF SECTION 335243