

University Contact: Energy & Engineering Group

(302) 831-1744

SECTION 230523_STEAM AND CONDENSATE VALVES

PART 1 - GENERAL

1.001 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Divisions Specification Sections, apply to this Section.

1.02 WORK INCLUDED

- A. Furnish and install all shut-off, globe, check, strainers, balancing and other type valves as shown and as required to make a complete and operational system.
- B. Provide isolation valves at all drains, piping mains and branches at all piping systems, equipment, risers and before and after all control valves.
- C. Secure all permits and local/state approval for the installation of all components included under this Section.

1.03 RELATED SECTIONS A. Examine all drawings and criteria sheets and all other Sections of the Specifications for requirements which affect work under this Section whether or not such work is specifically mentioned in this Section.

1.04 REFERENCES

- A. Applicable provisions of the following Codes and Trade Standard Publications shall apply to the work of this Section, and are hereby incorporated into, and made a part of the Contract Documents.
- B. Material standards shall be as specified or detailed hereinafter and as follows:
 - 1. MSS SP-67 – Butterfly Valves Manufacturers Standardization Society of the Valve and Fittings Industry.
 - 2. MSS SP-69 – Pipe Hangers and Supports – Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry.
 - 4. MSS SP-80 – Bronze Gate, Globe, Angle and Check Valves; Manufacturers Standardization Society of the Valve and Fittings Industry.

5. MSS SP-85 – Cast Iron Globe & Angles Valves, Flanged and Threaded Ends; Manufacturers Standardization Society of the Valve and Fittings Industry.
7. MSS SP-11- Ball Valves Threaded, Socket-Welding, Solder Joint, Flanged, Grooved and Flared Ends; Manufacturers Standardization Society of the Valve and Fittings Industry.

C. Use in conjunction with the following University of Delaware Standards:

1. Common Work for HVAC Systems 23 05 00
2. Common Requirements for HVAC Systems 23 05 01
3. HVAC Insulation 23 07 00
4. Steam and Condensate Piping Systems Above Grade 23 22 13
5. Steam and Condensate Piping Systems Below Grade 23 22 13.1
6. Steam and Condensate Specialties 23 22 14

1.05 SUBMITTALS

- A. Product Data: Include data on valve materials, pressure class, construction, dimensions and ratings. Provide manufacturers catalogue information. All valves of one type shall be by one specific manufacturer.
- B. Manufacturer’s Installation Instructions: Indicate hanging and support methods, joining procedures.

1.06 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing valve products specified in this section, with documented experience.
- B. Installer: Company specializing in performing work of the type specified in this section, with documented experience.
- C. All valves, strainers and traps shall contain manufacturer’s name and pressure class marked on the valve body.

1.07 REGULATORY REQUIREMENTS

- A. Perform Work in accordance with all State and Local codes.

- B. Conform to all State and Local code for installation of boiler safety valves and backflow prevention devices.
- C. Provide certificate of compliance from the authority having jurisdiction indicating approval of installation of all boilers.

PART 2 – PRODUCTS

2.01 Provide valves in accordance with the following Valve Table and Valve Schedule.

PIPING SERVICE	PIPE SIZE	VALVE END TYPE	CHECK VALVE	BALL VALVE	GATE VALVE	BUTTERFLY VALVE
CONDENSATE, 50 PSIG	3/8" - 2"	THREADED	C-01	B-01	G-01	-
	2-1/2"-3"	FLANGED	-	B-05	-	-
	4" - 6"	FLANGED	-	B-06	-	-
STEAM, MEDIUM PRESSURE (0-100 PSIG)	3/8" - 2"	THREADED	-	-	G-01	-
	2-1/2"-6"	FLANGED	-	-	-	W-01
	8"-12"	FLANGED	-	-	-	W-02
STEAM, HIGH PRESSURE (101-125 PSIG)	3/8" - 2"	THREADED	-	-	G-01	-
	2-1/2"-6"	FLANGED	-	-	-	W-03
	8"-12"	FLANGED	-	-	-	W-04

INSTALL BUTTERFLY VALVES ON STEAM (W-01, W-02) AND BALL VALVES (B-05, B-06) ON CONDENSATE INSIDE MANHOLES. DO NOT INSTALL GATE VALVES ON MAINS INSIDE MANHOLES.

MEDIUM PRESSURE STEAM HAS AN OPERATING PRESSURE OF 50 PSI (POSSIBLE FUTURE 100 PSI).

ONLY INSTALL BALL VALVES TO ISOLATE PRESSURE GAUGES.

USE GATE VALVE AT ALL OTHER LOCATIONS ON PIPE THAT IS 2" AND SMALLER.

BALL VALVES

VALVE CODE	B-01
RATING	
PRESSURE	100 PSIG
TEMPERATURE	300 F
SIZE RANGE (INCHES)	1/4" – 2-1/2"
BODY MATERIAL	BRONZE, ASTM B62 (C83600)
END TYPE	THREADED, FEMALE NPT ANSI B2.1
SEATS	TFE
SEALS	TFE
BALL	316 STAINLESS STEEL
STEM	BRONZE ASTM B62
BOLTS	
NUTS	
OPERATOR	STEEL LEVER
MANUFACTURER	APOLLO 77-14X-XX SERIES OR EQUAL WATTS, NIBCO OR JAMESBURY
NOTES:	PROVIDE 1" STEM EXTENSIONS.

BALL VALVES

VALVE CODE	B-05	B-06
RATING PRESSURE TEMPERATURE	200 PSIG 350°F	200 PSIG 350°F
SIZE RANGE (INCHES)	2-1/2" - 3"	4 - 6"
BODY MATERIAL	DUCTILE IRON/A536	DUCTILE IRON/A536
END TYPE	FLANGED - ANSI 150# RAISED FACE FLANGED	FLANGED - ANSI 150# RAISED FACE FLANGED
SEATS	PTFE	PTFE
BALL	STAINLESS STEEL/TEFLON FUSED	STAINLESS STEEL/TEFLON FUSED
STEM	STAINLESS STEEL	STAINLESS STEEL
NUTS/BOLTS	CARBON STEEL/ CARBON STEEL	CARBON STEEL/ CARBON STEEL
MANUFACTURER	AMERICAN VALVE COMPANY MODEL 4000D	AMERICAN VALVE COMPANY MODEL 4000D
NOTES	<p>VALVES SHALL BE RATED FOR DOUBLE END SERVICE AT FULL ANSI PRESSURE RATING, SOLID SEAT DESIGN.</p> <p>MANUAL OPERATORS SHALL BE UB/ABZ-A-10HT HIGH TEMP. MANUAL GEAR OPERATORS, MOUNTED AND ASSEMBLED WITH (CM-BRK) CUSTOM BRACKET AND COUPLING ASSEMBLY. VALVES SHALL BE SUITABLE FOR MINIMUM 350°F.</p> <p>HANDWEELS SHALL BE CAST IRON CONSTRUCTION OR OTHER NON-CORRODING MATERIAL. PROVIDE CHAIN OPERATORS WHERE INDICATED ON THE PLANS.</p>	<p>VALVES SHALL BE RATED FOR DOUBLE END SERVICE AT FULL ANSI PRESSURE RATING, SOLID SEAT DESIGN.</p> <p>MANUAL OPERATORS SHALL BE UB/ABZ-A-20HT HIGH TEMP. MANUAL GEAR OPERATORS, MOUNTED AND ASSEMBLED WITH (CM-BRK) CUSTOM BRACKET AND COUPLING ASSEMBLY. VALVES SHALL BE SUITABLE FOR MINIMUM 350°F.</p> <p>HANDWEELS SHALL BE CAST IRON CONSTRUCTION OR OTHER NON-CORRODING MATERIAL. PROVIDE CHAIN OPERATORS WHERE INDICATED ON THE PLANS.</p>

BALL VALVES INSIDE BUILDINGS MAY BE PROVIDED WITH MANUAL QUADRANT. HOWEVER SPACE BETWEEN VALVE AND OTHER OBSTRUCTION MUST ENSURE THAT THERE ARE NOT INTERFERENCES WITH THE LEVER.

CHECK VALVES

VALVE CODE	C-01
RATING PRESSURE TEMPERATURE	200 PSIG 450 F
SIZE RANGE (INCHES)	1/2"-2"
BODY MATERIAL	BRONZE ASTM B61 (C92200)
END TYPE	THREADED FEMALE NPT ANSI B1.020.1
SEATS	INTEGRAL
CAP TYPE	THREADED
DISK	BRONZE OR BRASS
GASKET	
BOLTS	
NUTS	
OPERATOR	
MANUFACTURERS	NIBCO T-473-BEI STOCKHAM B-345 CRANE 36 MILWAUKEE 508-005 KITZ 19

University of Delaware

Design & Construction Technical Guidelines

Division 23: HVAC

VALVE CODE	W-01	W-02
SIZE RANGE (INCHES)	2"-6" AND LARGER	8"-12" AND LARGER
RATING PRESSURE TEMPERATURE	150 PSIG 375 F	150 PSIG 375 F
BODY MATERIAL	CAST STEEL, ASTM A216, TYPE WCB	CAST STEEL, ASTM A216, TYPE WCB
END TYPE	ANSI 150#, LUGGED BODY	ANSI 150#, LUGGED BODY
SEATS/SEAL	FILLED TEFLON/FILLED TEFLON	FILLED TEFLON/FILLED TEFLON
STEM	17-4 STAINLESS STEEL STEAM	17-4 STAINLESS STEEL STEAM
DISK	TYPE 316 STAINLESS STEEL	TYPE 316 STAINLESS STEEL
MANUFACTURERS	ABZ MODEL 402-100	ABZ MODEL 402-100
NOTES:	<p>VALVES SHALL BE RATED FOR DOUBLE END SERVICE AT FULL ANSI PRESSURE RATING, SOLID SEAT DESIGN.</p> <p>MANUAL OPERATORS SHALL BE UB/ABZ-A-10HT HIGH TEMP. MANUAL GEAR OPERATORS THAT ARE SUITABLE FOR MINIMUM 350°F.</p> <p>HANDWEELS SHALL BE CAST IRON CONSTRUCTION OR OTHER NON-CORRODING MATERIAL.</p>	<p>VALVES SHALL BE RATED FOR DOUBLE END SERVICE AT FULL ANSI PRESSURE RATING, SOLID SEAT DESIGN.</p> <p>MANUAL OPERATORS SHALL BE UB/ABZ-A-20HT HIGH TEMP. MANUAL GEAR OPERATORS THAT ARE SUITABLE FOR MINIMUM 350°F.</p> <p>HANDWEELS SHALL BE CAST IRON CONSTRUCTION OR OTHER NON-CORRODING MATERIAL.</p>

VALVE CODE W-01 AND W-02 APPLY TO VALVING ON THE 45 PSI PRESSURE (MPS) STEAM SYSTEM OR WHERE INDICATED ON THE PLAN. THESE VALVES SHALL BE PROVIDED IN THE POWERHOUSE WHERE BUTTERFLY VALVES ARE INDICATED AFTER THE PRESSURE REDUCING STATIONS AND ON THE MEDIUM PRESSURE DISTRIBUTION SYSTEM.

BUTTERFLY VALVES

VALVE CODE W-03 AND W-04 APPLY TO ALL VALVING ON THE 125 PSI PRESSURE (HPS) STEAM SYSTEM OR WHERE INDICATED ON THE PLAN. THESE VALVES SHALL BE PROVIDED IN THE POWERHOUSE WHERE BUTTERFLY VALVES ARE INDICATED BETWEEN THE BOILER AND THE SECOND VALVE AFTER THE PRESSURE REDUCING STATION AND ON HIGH PRESSURE DISTRIBUTION SYSTEM.

VALVE CODE	W-03	W-04
SIZE RANGE (INCHES)	2"-6" AND LARGER	8"-12" AND LARGER
RATING PRESSURE TEMPERATURE	150 PSIG 375 F	150 PSIG 375 F
BODY MATERIAL	CAST STEEL, ASTM A216, TYPE WCB	CAST STEEL, ASTM A216, TYPE WCB
END TYPE	ANSI 300#, LUGGED BODY	ANSI 300#, LUGGED BODY
SEATS/SEAL	FILLED TEFLON/FILLED TEFLON	FILLED TEFLON/FILLED TEFLON
STEM	17-4 STAINLESS STEEL STEAM	17-4 STAINLESS STEEL STEAM
DISK	TYPE 316 STAINLESS STEEL	TYPE 316 STAINLESS STEEL
MANUFACTURERS	ABZ MODEL 422-100	ABZ MODEL 422-100
NOTES:	<p>VALVES SHALL BE RATED FOR DOUBLE END SERVICE AT FULL ANSI PRESSURE RATING, SOLID SEAT DESIGN.</p> <p>MANUAL OPERATORS SHALL BE UB/ABZ-A-10HT HIGH TEMP. MANUAL GEAR OPERATORS THAT ARE SUITABLE FOR MINIMUM 350°F.</p> <p>HANDWHEELS SHALL BE CAST IRON CONSTRUCTION OR OTHER NON-CORRODING MATERIAL.</p> <p>PROVIDE CHAIN OPERATORS WHERE INDICATED ON THE PLANS.</p>	<p>VALVES SHALL BE RATED FOR DOUBLE END SERVICE AT FULL ANSI PRESSURE RATING, SOLID SEAT DESIGN.</p> <p>MANUAL OPERATORS SHALL BE UB/ABZ-A-20HT HIGH TEMP. MANUAL GEAR OPERATORS THAT ARE SUITABLE FOR MINIMUM 350°F.</p> <p>HANDWHEELS SHALL BE CAST IRON CONSTRUCTION OR OTHER NON-CORRODING MATERIAL.</p> <p>PROVIDE CHAIN OPERATORS WHERE INDICATED ON THE PLANS.</p>

PART 3 EXECUTION

- A. Only valves listed for the valve code will be accepted. Alternative vendors supplying the listed valves shall not be accepted.
- B. Provide all shutoff, gate, globe, check, strainers, balancing and other types of valves as shown on the drawings and required for proper operation, maintenance, isolation and safety of all piping systems.
- C. Provide double block and bleed valving at all branches inside manholes and at building entries. Inside manholes these valves shall be visible and operable through manhole lids by maintenance personnel.
- D. Unless approved by the owner, all valves on steam mains shall be high performance butterfly valves with high temperature gear operator and all valves on the condensate mains shall be ball valve with gear operators. Other valves shall not be installed in these systems unless approved by the Steam Shop Manager
- E. A 2" purge (gate valve) shall be provided at each steam dirt leg. This valve shall be operable through a manhole lid.
- F. All valves and/or strainers of the same type shall be of the same manufacturer. Before purchasing any valve, the Contractor shall submit for approval the name of the manufacturer, the figure number which he proposes to furnish and engineering data on each figure number. For acceptable manufacturers, see schedules herein.
- G. Provide chain operators for all valves located 7'-0" above floor or higher.

END OF SECTION