

23 05 23 – General-Duty Valves for Piping

1. Introduction

- A. This Construction Standard covers valves for building plumbing and mechanical systems, including, but not limited to:
 - 1. Hot-water heating.
 - 2. Steam and Condensate.
 - 3. Chilled-water.
 - 4. Condenser-water.
 - 5. Glycol cooling-water.
 - 6. Potable water.
 - 7. Non Potable water.
 - 8. Blowdown-drain.
 - 9. Air-vent.
- B. Designers should coordinate with Duke FMD to coordinate selection and execution requirements for piping systems.

2. References

- A. NC State Mechanical Code, 2012
- B. NC State Plumbing Code, 2012
- C. Duke University Construction Standards, Section 22 07 16 Plumbing Equipment Insulation
- D. Duke University Construction Standards, Section 23 07 16 HVAC Equipment Insulation
- E. Duke University Construction Standards, Section 33 63 00 Steam Energy Distribution
- F. Duke University Construction Standards, Section 33 61 00 Hydronic Energy Distribution
- G. Duke University Construction Standards, Section 23 00 00.01 Requirements for Drawings

3. Performance Requirements

- A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature:
 - 1. Hot-Water Heating: 150 psig at 250 deg F
 - 2. Steam & Condensate: 150 psig at 366 deg F

3. Chilled-Water: 200 psig at 75 deg F
4. Condenser-Water: 150 psig at 100 deg F
5. Glycol Cooling-Water: 100 psig at 150 deg F
6. Potable Water: 80 psig at 75 deg F
7. Potable Hot Water: 80 psig at 160 deg F
8. Non Potable Water: 80 psig at 75 deg F
9. Blowdown-Drain (Non Steam): 225 deg F
10. Air-Vent: 200 deg F

4. Design Standards

A. The following table illustrates desired piping standards for different mechanical systems:

<u>Service</u>	<u>Service</u>	<u>Size</u>	<u>Type</u>	<u>Pipe Connection</u>	<u>Class/Rating</u>	<u>Material/Construction</u>
High Pressure Steam	Isolation	2" and smaller	Gate	Socket Weld	800	Carbon Steel Body, OS&Y, Velan Forged Steel Valve or Equivalent
		2-1/2" and larger	Gate	Butt Weld	300	Cast Carbon Steel, OS&Y, Velan Cast Carbon Steel API 600 or Equivalent
	Throttle	2" and smaller	Globe	Socket Weld	800	Carbon Steel Body, OS&Y, Velan Forged Steel Valve or Equivalent
		2-1/2" and larger	Globe	Butt Weld	300	Cast Carbon Steel, OS&Y, Velan Cast Carbon Steel API 600 or Equivalent
	Check	2" and smaller	Wafer	Socket Weld	750 CWP	Stainless Steel Body, Stainless Internals, Spring Assisted non slam
		2-1/2" and larger	Wafer	Butt Weld	750 CWP	Stainless Steel Body, Stainless Internals, Spring Assisted non slam
Medium, Low Pressure Steam, Condensate	Isolation	2" and smaller	Gate	Socket Weld	800	Carbon Steel Body, OS&Y, Velan Forged Steel Valve or Equivalent
		2-1/2" and larger	Gate	Butt Weld	150	Cast Carbon Steel, OS&Y, Velan Cast Carbon Steel API 600 or Equivalent
	Throttle	2" and smaller	Globe	Socket Weld	800	Carbon Steel Body, OS&Y, Velan Forged Steel Valve or Equivalent

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	Check	2-1/2" and larger	Globe	Butt Weld	150	Cast Carbon Steel, OS&Y, Velan Cast Carbon Steel API 600 or Equivalent
		2" and smaller	Wafer	Socket Weld	750 CWP	Stainless Steel Body, Stainless Internals, Spring Assisted non-slam
		2-1/2" and larger	Wafer	Butt Weld	750 CWP	Stainless Steel Body, Stainless Internals, Spring Assisted non-slam
Chilled Water Condenser Water Heating Hot Water	Isolation	2" and smaller	Ball	Threaded	600 CWP	Bronze Body, Stainless Internals, Apollo 70-100 Series or equivalent
		2-1/2" and larger	Butter fly	Flanged	125/150	High Performance Butterfly, Carbon Steel, Stainless Disc, TFE Seat
	Throttle	2" and smaller	Globe	Threaded	200 CWP	Bronze Body, Stainless Internals, Apollo 120T Series or equivalent
		2-1/2" and larger	Globe	Flanged	125/150	Cast Carbon Steel, OS&Y, Velan Cast Carbon Steel API 600 or Equivalent
	Check	2" and smaller	Swing	Threaded	200 CWP	Bronze Body, Bronze Disc Apollo 161T or equivalent
		2-1/2" and larger	Wafer	Flanged	125/150	Cast Iron or Carbon Steel, spring assisted, non-slam, Crane Duo-Chek or equivalent
Potable & Non Potable Water (Hot & Cold)	Isolation	4" and smaller	Ball	Sweat or Brazed	400 CWP	Bronze Body, Stainless Internals, Apollo 32-100 Series or equivalent
		6" and larger	Butter fly	Flanged	125/150	Cast/Ductile Iron, Wafer Style, Nibco LD-2000 or equivalent
	Throttle	2" and smaller	Globe	Sweat	200 CWP	Bronze Body, Stainless Internals, Apollo 120S Series or equivalent
		2-1/2" and larger	Globe	Flanged	125/150	Cast/Ductile Iron, Bronze Internals, Nibco F-718-B or equivalent
	Check	2" and smaller	Swing	Sweat	200 CWP	Bronze Body, Bronze Disc Apollo 161S or equivalent
		2-1/2" and larger	Wafer	Flanged	125/150	Cast Iron, spring assisted, non-slam, Crane Duo-Chek or equivalent
Equipment Drains,	Isolation	2" and smaller	Ball	Threaded	600 CWP	Bronze Body, Stainless Internals, Apollo 70-100 Series or equivalent

<u>Service</u>	<u>Service</u>	<u>Size</u>	<u>Type</u>	<u>Pipe Connection</u>	<u>Class/Rating</u>	<u>Material/Construction</u>
Reclaim, Reuse/Gray Water		2-1/2" and larger	Butter fly	Flanged	125/150	Cast Carbon Steel, Non Rising Stem, Nibco F-619 or equivalent

1. Valves shall be insulated in accordance with Duke University Construction Standards, Section 22 07 16 Plumbing Equipment Insulation and 23 07 16 HVAC Equipment Insulation.
2. If necessary, balancing valves shall be provided to facilitate system testing and balancing not isolation. Isolation valves shall be installed in addition to balancing valves. Triple duty valves shall not be used on variable volume systems. The use of balancing valves is not required for hydronic systems operating with Variable Frequency Drives.
3. Valve identification tags shall be provided for all valves. Identification tags shall be manufactured from either brass or stainless steel. A valve identification chart referencing each installed valve shall be provided in the mechanical room in which the valves are installed. If a valve identification chart is already present, the chart should be updated to reflect the installation of new valves.

4. Installation and Performance Requirements

- A. Confirm installation responsibilities at out-set of project. Installation services will be provided in-house or contracted out.
- B. Coordinate all commissioning efforts with Duke Utilities and Engineering Services (DUES).