DIVISION 23

SECTION 23 05 23

GENERAL-DUTY VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Brass ball valves.
2. Bronze ball valves
3. Bronze swing check valves.
4. Iron swing check valves.
5. Bronze gate valves.
6. Iron gate valves.
7. Bronze globe valves.
8. Iron globe valves.
9. Chainwheels.

B. Related Sections:

1. Section 01 51 23 - Temporary Heating
2. Section 23 05 00 – Common Work Results For HVAC
3. Section 23 05 13 - Common Motor Requirements For HVAC Equipment
4. Section 23 05 23 - General Duty Valves For HVAC Piping
5. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment
6. Section 23 05 53 - Identification for HVAC Piping and Equipment
7. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC
8. Section 23 07 00 - HVAC Insulation
9. Section 23 09 13 - Instrumentation and Control for HVAC
10. Section 23 09 14 - Natural Gas and CO Gas Leak Detection Equipment
11. Section 23 09 23 - Control Dampers
12. Section 23 09 24 - Steam Flow Meters
13. Section 23 22 13 - Steam and Condensate Heating Piping
14. Section 23 25 19 - Water Treatment for Steam System Feedwater
15. Section 23 31 13 - Metal Ducts
16. Section 23 33 00 - Air Duct Accessories
17. Section 23 34 16 - Boiler Room Combustion Air Makeup And Ventilation System
18. Section 23 51 00 - Chimney Liner
19. Section 23 51 16 - Prefabricated Breechings and Accessories
20. Section 23 51 23 - Gas Vents
21. Section 23 52 39 - Firetube Boilers
22. Section 23 53 12 - Vacuum Condensate Pumps
23. Section 23 53 13 - Boiler Feedwater Pumps

1.02 SUBMITTALS

A. Product Data: For each type of valve indicated, submit manufacturer's product data including valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, required clearances and installation instructions.

B. Submit manufacturer's product data including valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, required clearances and installation instructions.

C. Shop Drawings: Submit valve schedule showing manufacturer's figure number, location, and valve features for each required valve. Include list indicating valve and its application in the schedule.

D. Maintenance data: Maintenance manuals

E. Maintenance Material:

1. Provide one plug valve wrench for every ten plug valves sized 2" and smaller, minimum of one. Provide wrench and set screw for each plug valve sized 2½" and larger. Deliver wrenches to the Authority and attach receipt to final payment.

2. Padlock and two (2) keys for each lock.

3. At least two dozen keys for the key operated air cocks shall be delivered to the Authority's Representative for operating these cocks.

1.03 QUALITY ASSURANCE

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer. Valve parts of same manufacturer, size and type shall be interchangeable.

B. ASME Compliance: ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

C. Codes and Standards

1. MSS Compliance: Mark valves in accordance with MSS-25: Standard Marking System for valves, fittings, flanges and unions and all other applicable MSS Standards.

2. ANSI Compliance: For face-to-face and end-to-end dimensions.

3. UL and FM Compliance: Provide valves used in fire protection piping which are UL-listed and FM approved.

4. ASME Compliance: Comply with ASME B31.9 for building services piping and ASME B31.1 for power piping.

5. Testing of material and equipment shall be in accordance with 28-113 of the Administrative Code (reference MC 301.5). Whenever the NYC Construction Codes or the Rules of the Department of Buildings requires that material be listed or labeled and material proposed to be used is not so listed or labeled, the use of such material shall be subject to prior approval by the Commissioner (Office of Technical Certification and Research OTCR) and such material shall be used only to the extent set forth in such approval. Materials that were previously approved by the Board of Standards and Appeal (BSA) or by the Department (MEA) before the effective date of the NYC Construction Codes may continue to be used, but only to the extent set forth in such approval, and only if such approval is not specifically amended or repealed by the Commissioner.

1.04 DEFINITIONS

A. CWP: Cold Working Pressure

B. WSP: Working Steam Pressure

C. NRS: Non-Rising Stem

D. RS: Rising Stem

E. OS&Y: Outside Screw and Yoke

F. WOG: Water Oil Gas

G. IBBM: Iron Body Bronze Mounted

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR VALVES

A. Refer to HVAC valve schedule articles for applications of valves.

B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

C. Valve Sizes: Same as upstream piping unless otherwise indicated.

D. Valve Actuator Types:

1. Handwheel: For valves other than quarter-turn types.
2. Chainwheel: Device for attachment to valve handwheel, stem, or other actuator; of size and with chain for mounting height, as indicated in the "Valve Installation" Article.

E. Valves in Insulated Piping: With 3-inches (50-mm) stem extensions and the following features:

1. Gate Valves: With rising stem.

F. Valve-End Connections:

1. Flanged: With flanges according to ASME B16.1 for iron valves.
2. Threaded: With threads according to ASME B1.20.1.

G. Provide all the valves shown on the Drawings (HVAC Work) and as necessary for the control and easy maintenance of all piping and equipment. Valves shall be first quality, have proper clearance, followers in the packing glands, and shall seal tight at the specified test pressure. Each valve shall have the maker's name or brand, the figure or list number and the guaranteed working pressure cast on the body and cast or stamped on the bonnet.

1. Working Pressure: Valves shall be designed for steam working pressure of not less than 125 psi, for water of not less than 200 psi and 350 psig hydrostatic tests.

2. Wheels: Shut-off valves shall have self-cooling type metal hand wheels except where specified otherwise. For valves other than outside screw and yoke type gate valves, the valve stem shall be extended through the wheel and be provided with hexagon nuts to secure the wheel in place.

3. Chain and Sprockets: Where the Drawings indicate valves to be chain operated, they shall be provided with operating chains, sprockets and guides supplied by Crane Co., or Jenkins Bros. Chains shall hang within 5' of the floor. Provision shall be made for fastening the chains out the way.

H. All valves shall be designed for packing under pressure with valve open or closed.

2.02 MATERIALS

A. Body

1. Cast Iron: ASTM A126, Class B, higher strength cast iron.

2. Bronze: For use up to 150 psig WSP (Working Steam Pressure), ASTM B62 and over 150 psig to 300 psig WSP, ASTM B61.

3. Cast Steel: ASTM A216 Grade WCB.

4. Forged Steel: ASTM A105**,** Grade 2.

5. Ductile Iron: ASTM A536, Grade 65-45-12.

B. Stem

1. Cast Manganese Bronze: ASTM B584.

2. Cast Silicon Brass: ASTM B584.

3. Rolled Silicon Brass: ASTM B98 Alloy D.

4. Rolled Aluminum Bronze: ASTM B150 Alloy 1.

5. Rolled Manganese Bronze: ASTM B138 Alloy A (half hard).

6. Naval Brass: ASTM B21 Alloy A or Alloy C (hard).

7. Carbon Steel: As specified for particular type of valve.

8. Stainless Steel: As specified for particular type of valve.

C. Trim: As specified for particular type of valve.

2.03 GATE VALVES

A. All gate valves shall be of the solid wedge disk type.

1. Bronze Gate Valve:

a. Class 125, 125 psig WSP, 200 psig WOG, bronze body with integral seat and screw-in or union bonnet.

b. Class 150, 150 psig WSP, 300 psig WOG, bronze body with integral seat, union bonnet (rising stem), threaded bonnet (non-rising stem), threaded ends

c. Class 300, 300 psig WSP, 600 psig WOG, bronze body with union or bolted bonnet and stainless steel seat; threaded ends; rising or non-rising stem.

2. Iron Gate Valve: Class 125, 125 psig WSP, 200 psig WOG, Iron Body Bronze Mounted (IBBM), bolted bonnet, Outside Screw and yoke (OS&Y), flanged ends.

B. Hose gate valves shall be 125 psi, 3/4", standard weight bronze with cap.

C. Manufacturers

Crane Co.; Crane Valve Group
Hammond Valve Corp.
NIBCO, Inc.
Stockham Division.
Milwaukee Valve Company
Lunkenheimer/Cincinnati Valve Company
Walworth Mfg. Co.
Smith-Cooper International
Conbraco Industries, Inc.;
Apollo Valves.
Jenkins Valves.

2.04 GLOBE VALVES

A. Except for automatic valves, no globe valve of size larger than 1/2" shall be used, unless otherwise specified or shown on the Drawings. Where globe valves are approved, they shall be of the same grade called for other valves.

2.05 CHECK VALVES

A. Check valves shall be of heavy pattern, straightway, re-grinding type with renewable seat, ground seat and approved type renewable discs. The discs for check valves, of size larger than 2" may be bronze faced.

B. Swing Check Valves: horizontal swing, Y-pattern, cast-bronze body and cap, bronze disc with rubber seat or composition seat, threaded or soldered end connections or cast-iron body and bolted cap, horizontal-swing bronze disc, flanged or grooved end connections. Face discs for cold water service can be Buna-N or Teflon.

C. Silent Check Valves: cast-iron body, bronze trim, stainless steel spring and flanged end connections.

D. Lift check valves shall be globe style, streamline, spring loaded.

E. Manufacturers:

Crane Co.; Crane Valve Group
Hammond Valve Corp.
Mueller Steam Specialty
NIBCO, Inc.
Stockham Division.
Milwaukee Valve Company
Walworth Mfg. Co.
Lunkenheimer/Cincinnati Valve Company
Jenkins Valves.

2.06 FORGED OR CAST STEEL VALVES

A. Gate Valves:

1. Class 800, forged steel body and bonnet, wedge, stem and seat ring: stainless steel; bonnet gasket: spiral wound stainless steel with 316 spiral wound graphite packing ring; hand wheel: malleable iron or steel, bolted bonnet, OS&Y, solid wedge, threaded or socket welded ends.

2. Class 300, cast steel body, bolted bonnet, OS&Y, solid wedge; seat rings: copper nickel alloy or monel; wedge: steel with stainless steel face hardened; hand-wheel: steel or malleable iron, flanged or welding ends.

B. Check Valves.

1. Horizontal swing check, cast steel body and bolted cap, Class 300. Disc shall be heavy one-piece construction, suspended on a detachable hinge with detachable hinge pin. Body and cap: cast steel; seat ring: Stainless steel; disc: stainless steel and renewable; hinge pin: stainless steel and renewable, gasket: soft corrugated iron.

2. Lift check, forged steel body and bolted or union type cap, Class 600. Body and cap: forged steel; seat ring: stainless steel; disc: stainless and renewable, gasket: spiral wound stainless steel with 316 spiral wound graphite.

3. Silent check, cast steel body, stainless steel trim and spring, Class 300, flanged ends.

4. Piston Check: Class 800 forged steel body, stainless steel piston disc and trim, bolted cap, non-asbestos gasket, threaded or socket welded ends.

C. Manufacturers:

R-P&C Valve/Bonney Forge Corporation
Newco Valves
Vogt Valves

2.07 GAUGE COCKS

A. Gauge cocks shall have all brass construction, “T” or lever handles with screwed ends. Asbestos packed cocks will not be approved.

2.08 PLUG VALVES

A. Lubricated Plug Valves shall be of the lubricated tapered plug type, with cast iron body. Plugs shall be Teflon coated and fitted with an "0" ring packing.

B. Tapered plugs shall be faced with a thermally bonded anti-friction material. Valves shall have "Sealed Port" lubrication system allowing complete lubrication of valve while in service, under line pressure, installed in any position.

2.09 VALVE OPERATORS AND CHAINWHEELS

A. Provide suitable handwheel for gates, globes or angle valves, and drain valves.

B. Provide valves that are located more than 7' from floor in equipment room areas, with chain operated sheaves. Extend chains to about 5' above floor and hook to clips arranged to clear walking aisles. Provide extended valve shafts, 4" min to keep chain away from pipe insulation.

C. Chainwheel Operator Description: Valve actuation assembly with sprocket rim, brackets, and chain.

1. Brackets: Type, number, size, and fasteners required to mount actuator on valve.
2. Attachment: For connection to butterfly valve stems.
3. Sprocket Rim with Chain Guides: Ductile iron, of type and size required for valve. Include zinc coating.
4. Chain: Hot-dip, galvanized steel, of size required to fit sprocket rim.

D. Manufacturers:

1. Babbitt Steam Specialty Co.
2. Roto Hammer Industries.
3. Trumbull Industries.

2.10 VALVE FEATURES

A. Provide valves with features indicated and, where not otherwise indicated, provide proper valve features as determined for installation requirements.

B. Bypass: Comply with MSS SP-45, and except as otherwise indicated, provide manufacturer's standard bypass piping and valving.

C. Drain: Comply with MSS SP-45, and provide threaded pipe plugs.

D. Flanged: Valve flanges complying with ANSI B16.1 (cast iron), ANSI B16.5, (steel), or ANSI B16.24 (bronze).

E. Threaded: Valve ends complying with ANSI B2.1.

F. Butt-Welding: Valve ends complying with ANSI B16.25.

G. Socket-Welding: Valve ends complying with ANSI B16.11.

H. Solder-Joint: Valve ends complying with ANSI B16.18.

I. Flangeless: Valve bodies manufactured to fit between flanges complying with ANSI B16.1 (cast iron), ANSI B16.5 (steel), or ANSI B16.24 (Bronze).

2.11 BALL VALVES FOR UP TO 2-INCHES SIZE IN COLD WATER MAKEUP, ONLY:

A. Ball valves shall be two-piece full ported 600 W.O.G. bronze body, solid blow-out proof stem, teflon seats, chrome plated bronze or brass ball and teflon seals, corrosion resistant steel lever handles with vinyl grips, balancing stop with screw or solder ends.

B. Screw end ball valves shall be Apollo Valves 77-100 Conbraco Industries, Inc., Crane 9211, Milwaukee BA-400, Hammond 8301A, NIBCO T-585-70, Stockham T-255-BR-R, Dwyer Series BV2MB, Smith-Cooper 1728155 Series.

C. Solder end ball valves shall be Apollo Valves 77-200 Conbraco Industries, Inc., Crane 9212, Milwaukee BA450, Hammond 8311, NIBCO S-585-70, Stockham S-255-BR-R, Smith-Cooper 1728156 Series.

D. Ball valves shall be used for up to 2-inches sizes, only.

E. Ball Valves for Press-fit Copper Fittings shall be two-piece bronze body with full port, chrome or brass plated ball, blow-out proof stem and PTFE or RTFE seats, rated at 250 psi minimum with press fitting ends; Viega Model 2970.10, NIBCO PC585-70; Apollo Valves 77W-140 Series. Ball valves shall have a metal lever handle.

PART 3 - EXECUTION

3.01 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.

3.02 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.

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. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Install valve drains with hose-end adapter for each valve that must be installed with stem below horizontal plane.

D. Install valves in position to allow full stem movement. Non-rising stem valves shall only be used where available clearances prevent full extension of rising stems.

E. Install chainwheels on operators for gate and globe valves NPS 6-inches diameter and larger and more than 84 inches above floor. Extend chains to 60 inches above finished floor and hook to clips to clear aisle passage.

F. Install swing check valves for proper direction of flow and in horizontal position with hinge pin level.

G. Install valves where required for proper operation of piping and equipment including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.

H. Install gate valves for shut-off; to isolate equipment, parts of systems, and vertical risers and any banked system of coils and to separate each coil.

I. Hose gate valves: Provide hose gate valves to drain the pipe at the low points of the system.

J. Install globe for throttling service and control device.

K. Use tapered lubricated plug valves in water systems for throttling service and at the discharge of all pumps. Use non-lubricated plug valves only when shut-off or isolating valves are also provided.

L. Provide tapered lubricated 1" drain gate valves at main shut-off valves, and at all low points of piping and apparatus.

M. Provide 1" gate vent valves at all high points in the piping system.

N. Provide lift check valves at the discharge of all pumps as shown on the Drawings.

O. Outside Screw and Yoke Type: Gate valves in lines leading from the boilers to the boiler steam header, in boiler blow-off lines, and at other points so specified or shown on the Drawings shall have outside screw and yoke (OS&Y) with bronze rising stem.

P. Insulation: Where insulation is indicated, install extended-stem valves, arranged in proper manner to receive insulation.

Q. Provide a new gate isolation valve at each junction of new piping to existing piping, to facilitate isolation of existing piping systems from subjection to the Code required pressure testing of the new piping systems. Only new piping systems shall be pressure tested, as specified.

3.03 MINIMUM VALVE INSTALLATION REQUIREMENTS PER NYCMC SECTION 1205:

A. Shutoff valves shall be installed on the supply and return side of all heat exchangers.

B. Shutoff valves shall be installed on the building supply and return of central utility systems and district heating systems.

C. Shutoff valves shall be installed on the connection to any pressure vessel.

D. Shutoff valves shall be installed on both sides of a pressure-reducing valve.

E. Shutoff valves shall be installed on connections to mechanical equipment and appliances. This requirement does not apply to components of a hydronic system such as pumps, metering devices and similar equipment.

3.04 ADJUSTING AND CLEANING

A. Valve Adjustment: Inspect each valve for possible leaks and adjust or replace valve packing to stop leaks, after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

B. Cleaning: Clean factory-finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

3.05 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:

1. Cold Water Makeup Shutoff Service, Only: Ball or gate valves.
2. Cold Water Throttling Service, Only: Globe or ball valves.
3. Shutoff Service, Steam and Steam-Condensate: Gate valves.
4. Throttling Service, Steam: Globe valves.
5. Pump-Discharge Check Valves:

    a. NPS 2 (DN 50) and Smaller: Bronze swing check valves with bronze disc.
    b. NPS 2-1/2 (DN 65) and Larger: Iron swing check valves with lever and spring.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

C. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing, NPS 2 (DN 50) and Smaller, For Cold Water Makeup, Only: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
2. For Copper Tubing, NPS 2-1/2 to NPS 4 (DN 65 to DN 100), For Cold water Makeup, Only: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
3. For Steel Piping, NPS 2 (DN 50) and Smaller: Threaded ends.
4. For Steel Piping, NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Flanged ends except where threaded valve-end option is indicated in valve schedules below, if applicable.
5. For Steel Piping, NPS 5 (DN 125) and Larger: Flanged ends.

3.06 VALVE APPLICATION SCHEDULE

A. Boiler Trim, 300 psig and less, 2" and less: Screwed end, forged steel gates, OS&Y, Rising Stem

B. Boiler Blow Off (BO) and Continuous Blow Down (CBD) 300 psig & Less: Welded end, OS&Y forged steel gates.

C. Boiler Feed Pump Suction:

1. 2” and Less: Screwed end, Class 125, 125 psig WSP, 200 psig WOG, bronze body gates

2. 2½” and Up: Flanged or threaded end, Class 125, 125 psig WSP, 200 psig WOG, OS&Y IBBM gates

D. Boiler Feed Pump Discharge:

1. 2" and Less: Screwed end, Class 125, 125 psig WSP, 200 psig WOG, bronze body gates; threaded end, Class 125, 125 psig WSP, 200 psig WOG, bronze body brass or bronze trim, horizontal swing checks

2. 2-1/2" and Up: Flanged end, Class 125, 125 psig WSP, 200 psig WOG, OS&Y IBBM gates; Flanged end, Class 125, 125 psig WSP, 200 psig WOG, IBBM body silent checks.

E. Boiler Feed at Boiler:

1. 1½" and Less: Weld end, Class 800, OS&Y, Rising Steam, forged steel body globe or angle valve; Weld end, Class 600, forged steel body lift checks.

2. 2" and Up: Flanged end, Class 300, OS&Y Rising Stem, cast steel body globe or angle valve; Flanged end, Class 300, cast steel body horizontal swing checks.

F. Chemical Feed, 2" and less: Screwed end forged steel OS&Y rising stem Class 800 gates, and screwed forged steel stainless steel ball Class 600 checks.

G. Cold Water Makeup in Buildings:

1. 2" and Less: Solder end, Class 125, 125 psig WSP, 200 psig WOG, bronze body gates and horizontal swing checks.

2. Alternative Option: Ball Valves, 2" in size and less with screwed, solder ends as required by the particular application, may be used in lieu of bronze body gate valves only for Cold Water Makeup in the Buildings, operating at a maximum of 125 psig WSP, 200 psig WOG.

3. 2-1/2" and Up: Flanged end, Class 125, 125 psig WSP, 200 psig WOG, OS&Y IBBM gates and IBBM horizontal swing checks.

H. Low-Pressure Steam-Condensate Returns:

1. 2" and Less: Screwed end, Class 125, 125 psig WSP, 200 psig WOG, bronze body gates and bronze body horizontal swing checks.

2. 2½" and Up: Flanged end, Class 125, 125 psig WSP, 200 psig WOG, OS&Y IBBM gates and IBBM horizontal swing checks.

I. Fuel Oil Fill, Only If Required For Temporary Boilers: 2½"" and up: Flanged end, Class 125, 125 psig WSP, 200 psig WOG, OS&Y IBBM gates; and bolted cover, renewable seat ring and horizontal swing checks.

J. Fuel Oil Pump Suction, Only If Required For Temporary Boilers:

1. 2" and Less: Screwed end; Class 125, 125 psig WSP, 200 psig WOG, bronze body gates.

2. 2½"" and Up: Flanged end; Class 125, 125 psig WSP, 200 psig WOG, OS&Y IBBM gates.

K. Fuel Oil Pump Discharge, Only If Required For Temporary Boilers:

1. 2" and Less: Screwed end, Class 300, 300 psig WSP, 600 psig WOG, bronze body union or bolted bonnet, solid wedge disc, cupro-nickel alloy or stainless steel seat rings gates; and Class 300, 300 psig WSP, 600 psig WOG, bronze body horizontal swing checks.

2. 2½"" and Up: Flanged end, Class 250, 250 psig WSP, 500 psig WOG, OS&Y IBBM gates; and IBBM horizontal swing checks.

L. Fuel Oil Return, Only If Required For Temporary Boilers:

1. 2" and Less: Screwed end, Class 125, 125 psig WSP, 200 psig WOG, bronze body gates and swing checks.

2. 2½" and Up: Flanged ends, Class 125, 125 psig WSP, 200 psig WOG, OS&Y IBBM gates; and IBBM horizontal swing checks.

M. Low-Pressure Steam

1. 2" and Less: Screwed end, Class 125, 125 psig WSP, 200 psig WOG, bronze body gates and horizontal swing checks.

2. 2-1/2" and Up: Flanged ends, Class 125, 125 psig WSP, 200 psig WOG, OS&Y IBBM gates; and IBBM horizontal swing checks.

N. Globe valves shall be of equivalent pressure ratings and manufacturer to that stated for gate valves.

O. Drain cocks with threaded ends for hose connection shall be provided for any low points in the risers.

3.07 VALVE MODEL NUMBERS:

A. Gate valves – 2" and Less:

Class 125:

Manufacturer	Threaded NRS	Threaded RS	Solder NRS	Solder RS
Crane	438	428	1320	1330
Hammond	IB645	IB640	IB647	IB635
Nibco	T113	T111	S113	S111
Stockham	B-103	B-100	B-104	B-108
Milwaukee	105	148	115	149
Lunkenheimer	2129	2127	2133	2132
Walworth	W4	W55	W4SJ	W55SJ

Manufacturer	Threaded NRS	Threaded RS	Solder NRS	Solder RS
Apollo	102T	101T	102S	101S
Jenkins	992AJ	990AJ	993AJ	991AJ

Class 150:

Manufacturer	Threaded NRS	Threaded RS
Crane	437	431UB
Hammond	IB646	IB629
Nibco	T133	T134
Stockham	B-128	B-120
Milwaukee	1140	1151
Lunkenheimer	2153	2151
Walworth	W14	W56
Apollo	106T	107T
Jenkins	2310J	47CUJ

Class 300:

Manufacturer	Threaded NRS	Threaded RS
Crane	636E	634E
Hammond	IB656	IB654
Nibco	T176SS	T174-SS
Stockham	B-147	B-145
Milwaukee	1186	1184
Lunkenheimer	771	1962 (Class 350)
Walworth	N/A	N/A
Apollo	N/A	111T
Jenkins	2282J	2280UJ

B. Gate valves – 2-1/2" and Up

Class 125:

Manufacturer	OS&Y RS	NRS
Crane	465-1/2	461
Hammond	IR1140	IR1138
Nibco	F-617-0	F-619
Stockham	G-623	G-612
Milwaukee	F-2885A	F-2882A
Lunkenheimer	1430	1428
Walworth	W726F	W719F
Apollo	611F	610F
Jenkins	454J (651J)	452J (326J)

C. Swing Check valves – 2" and Less:

Manufacturer	Class 125 Threaded Ends	Class 125 Solder Ends	Class 150 Threaded Ends
Crane	37	1340	141TF
Hammond	IB904	IB912	IB946
Nibco	T-413B	S-413B	T-433Y
Stockham	B-319Y	B-309Y	B-321
Milwaukee	509	1509	510T
Lunkenheimer	2144	2145	230-70
Walworth	W506	3406SJ	W512
Apollo	161TF	161S	164T
Jenkins	996AJ	997AJ	4092J

Class 300:

Manufacturer	Threaded
Crane	76E
Hammond	IB949
Nibco	T-473-B
Stockham	B-375
Milwaukee	507
Lunkenheimer	554-Y
Walworth	3428
Apollo	168T
Jenkins	4962J

D. Swing Check valves – 2-inches and Less:

Manufacturer	Class 125
Crane	373
Hammond	IR1124
Nibco	F-918
Stockham	G-931
Milwaukee	F-2974A
Lunkenheimer	1790 IBBM
Walworth	W928F
Apollo	910F
Jenkins	587J (624CJ)

E. Silent Check valves – 2½" and Larger

Manufacturer	Class 250
Crane	39E

Manufacturer	Class 250
Hammond	IR322
Nibco	F-968-B
Stockham	F-947
Milwaukee	F2970M
Lunkenheimer	N/A
Walworth	W8970F
Apollo	920F
Jenkins	339RJ(339J)

F. Forged Steel Valve – 2 inches and Less:

Gate Valve Class 800

Manufacturer	Threaded OS&Y	Socket Weld OS&Y
RP&C	EF56D	EF57D
Newco	18TFS2	18SFS2
Vogt	12111	SW12111

Piston Check Valve Class 800

Manufacturer	Threaded	Socket Weld
RP&C	LF90A	LF91A
Newco	48TFS2	48SFS2
Vogt	701	SW701

END OF SECTION