PROCESS VALVES

1. GENERAL

1.1 Description

.1 This Section specifies the supply, installation and testing of process valves used for isolation, manual throttling, and bypass.

1.2 Definitions

.1 Valve Identification

.1 Valves are identified in the drawings by valve symbols. Refer to the Drawings for lists of valve symbols and labels.

.2 Actuators:

.1 Valves are supplied with their standard operators as detailed in Part 2 unless otherwise noted in Section 15105, Section 17419 or Instrumentation Specification Sheets.

.3 Detailed Valve Specification Sheets:

.1 Detailed valve specification sheets are provided in Section 15105 for each type of valve which is:

.1 Identified in the process mechanical drawings with a valve symbol and/or,

.2 Described in Part 2 of this specification section.

.2 Where there is a conflict between valves described in this Section and other valves described in Division 15 and Division 17, conform to the more stringent requirements.

.4 Instrument Data Sheets for Modulating Control Valves

.1 Division 17 specifies and takes responsibility for the supply and installation of electric and pneumatic control valves, complete with valve body, actuator, position indicator, and other ancillaries. Valve bodies for these products will comply with the requirements as specified in Section 15105 and this Section.

1.3 Submittals

.1 Shop Drawings: Submit the following information in accordance with Section 01300:

.1 Catalog cuts and/or shop drawings for each type of valve indicating the valve number, materials of construction, dimensions, head loss characteristics through the valve, operating torque and valve end configuration.

.2 An amended Detailed Valve Specification Sheet for all valves. Indicate with check marks where the valve supplied meets the requirements specified and with written amendments where the product differs from the specification.

.2 Operating and Maintenance data for incorporation in Operation and Maintenance Manual, as specified in Section 01300. Include complete description of operation together with detailed drawings, a complete list of replacement and repair parts, and parts manufacturer's identifying numbers.

.3 Affidavits and registration numbers described below in Quality Assurance.

1.4 Quality Assurance

.1 Provide Canadian Registry Number (CRN) designated by the Territory of Nunavut for each valve type.

.2 Provide affidavits of compliance, as required by AWWA C500 for gate valves.

.3 For butterfly valves to be installed below ground, provide affidavits of compliance with AWWA C504.

.4 Valves are to be marked in accordance with MSS SP-25.

1.5 Shipment, Protection and Storage

.1 Deliver valves to site in accordance with Section 01650 and using loading methods which do not damage casings or coatings.

.2 Clearly tag valves stating size, type, coatings and mating parts.

.3 Store on-site until ready for incorporation in the work using methods recommended by the manufacturer to prevent damage, undue stresses, or weathering.

2. PRODUCTS

2.1 General

.1 Provide valves of the same type, size range and service from a single manufacturer.

.2 Provide new, unused valves for the work.

.3 Valve materials to be free from defects or flaws, with true alignment and bores.

.4 Unless otherwise indicated on the Process and Instrumentation drawings or specified in Division 17, valves shall be the same size as the pipe run in which they are to be installed.

.5 Clearly mark valve bodies in raised lettering to indicate the valve type, rating, and where applicable, the direction of flow. Conform to MSS SP25.

.6 Provide padlockable lockout feature on all sizes of the following valve types:

.1 Automated Control Valves (electric and pneumatic); FCV, LCV, PCV and XV only. Refer to the Drawings for abbreviation definitions.

.2 Specialty Valves; FV and PRV only. Refer to the Drawings for abbreviation definitions.

.3 Manual Isolation and Shut-off Valves; BF, BV, GL, GV, KV and PV only. Refer to Section 15105 for abbreviation definitions.

.7 Specific requirements for the materials, ratings and service conditions for each valve are listed in Section 15105.

.8 Valves to open counter-clockwise.

2.2 Drawings

.1 The process schematics indicate major process valves required for the process to operate as intended.

.2 The detailed process drawings, process standard drawings, and indicate the valves on the process schematics plus other valves required for isolation.

.3 In pipe runs, less than 100mm diameter, in addition to the valves indicated on the P&IDs, detailed drawings and standard drawings, provide isolation valves in accordance with the detail piping specification sheets in Section 15055 in straight pipe runs at intervals no greater than 60m and at takeoffs to individual services. Provide ball isolation valves in pipe of 65mm diameter and less, or in pipe of less than 100mm diameter and carrying solids. Provide butterfly isolation valves in pipe of 75mm diameter and greater and not carrying solids.

.4 Provide drain, air vent, and flushing connections in accordance with Section 15056.

.5 Unless otherwise specified, provide gate valves 400mm and larger with a bypass valve sized in accordance with AWWA C500.

.6 Where a valve may be required for the process to function correctly or is required to satisfy fire and safety codes but it is not shown in the drawings, inform the Engineer and provide details and suggestions for remedial action. Do not commence piping in the related pipe run until obtaining the Engineer's approval.

2.3 Valve Ends

.1 In pipe runs less than 75mm diameter provide valves with female threaded ends, unless indicated otherwise. Threads to conform to ANSI B1.20.1.

.2 Valves in pipe runs equal to or greater than 75mm diameter to be flanged unless indicated otherwise.

.3 For cast iron body valves, drill flanges to Class 125 pattern conforming to ANSI B16.1. For steel body valves, flanges to be Class 150 pattern or Class 300 pattern conforming to ANSI B16.5 or as noted in Section 15105.

.4 Do not use grooved joint valve ends.

.5 Use flanged joints for buried and exterior valves. The flanges are to be compatible with the pipe and jointing technique used.

.6 Use flanged joints for buried butterfly valves.

.7 Lug style wafer body valves shall have tapped holes, suitable for the bolt spacing of the pipe flanges placed on either side.

.8 Wafer body valves shall have positioning holes, suitable for the bolt spacing of the pipe flanges placed on either side.

.9 Use wafer body butterfly valves only for control applications, and only if other valve(s) are provided for blocking and isolation. Use lug style or flanged wafer body butterfly valves if the function is blocking and isolation, including control valves where separate block and isolation valves are not provided.

.10 For gate valves, end flanges shall be integral with the gate valve body and be faced and drilled in accordance with ANSI B16.1, Class 125 flanges.

2.4 Manual Operators

.1 Provide valves with manual operators unless specifically indicated otherwise on the process schematic drawings, mechanical drawings, in Section 15105, Division 17 or the Instrumentation Specification sheets.

.2 For hand wheels, clearly show the direction of opening in raised lettering and symbols.

.3 Hand wheel diameter to conform to the following:

Nominal Valve Diameter (mm)	Minimum Hand Wheel Diameter (mm)
12	50
20	50
25	60
38	75
50	85
65	105
75	200
100	250
150	300
200	350
250	400
300	450
350	450
400	550
450	600
500	600
600 and up	600

.4 The maximum rim pull on a hand wheel not to exceed 300 N when one side of the valve is at test pressure and the other side is at atmospheric pressure. Where a shaft mounted hand wheel would require greater than this force to operate, provide a gear operator. Unless different operators are scheduled or shown in the drawings, conform to the following minimum requirements:

.1 Gate Valves: less than 300mm, hand wheel; equal to or greater than 300mm, gear operator.

.2 Knife Gate Valves: less than 300mm, hand wheel; equal to or greater than 300mm, gear operator.

.3 Globe and Needle Valves: less than 200mm, hand wheel; equal to or greater than 200mm, gear operator.

.5 Match existing operating nuts. Provide two eight-point operating wrenches.

.6 Supply stem extensions and valve boxes for buried valves and stem extensions for submerged valves as specified in the drawings, Sections 15105, and in Clause 2.5 of this Section.

.7 Provide two operating tees.

.8 Lever operators to conform to the following dimensions:

Nominal Valve Diameter (mm)	Minimum Length of Lever (mm)
6	80
12	80
20	100
38	150
50	150
65	150
75	175
100	225
150	250
200	300
250	450
300	450

.9 Quarter turn lever operators to be perpendicular to the pipe run when the valve is closed.

.10 Lever operators on ball valves to be two position. Provide butterfly valves with 10 position latching levers except where used to balance air flows. Where used to balance air flows provide infinite position, screw down levers.

.11 The maximum pull at the end of the lever arm not to exceed 300 N when one side of the valve is at test pressure and one side is at atmospheric pressure. Where greater than this force would be required to operate the valve with a lever, provide a gear operator. Unless different operators are scheduled or shown in the drawings, conform to the following minimum requirements:

.1 Ball Valves: less than 150mm, lever operator; greater than or equal to 150mm, gear operator.

.2 Butterfly Valves: less than 250mm, lever operator; greater than or equal to 250 mm, gear operator.

.12 Gear operator to be worm gear type, equipped with a hand wheel and a visual indicator of the valve position. Equip operators with adjustable mechanical stop-limiting devices to prevent over-travel of the disc/ball in the open and closed positions and which are self-locking and designed to hold the valve in any intermediate position between full open and full closed. Gear operators shall be grease lubricated.

.13 Operators for exposed service shall be gasketed for weatherproof service. Place gear boxes above ground and liquid surfaces.

.14 For manual valves on lines 75mm and greater, mounted over 2.0m above the operating floor, provide chain wheel gear operators. Design the operator so that a force of 150N is sufficient to open the valve when one side of the valve is at test pressure and the other side is at atmospheric pressure. The chain pulley to mesh positively with the chain. Extend the chain from the valve operator to operating height 1.2m above the floor or as directed by the Engineer. The exact dimensions shall be field determined. Provide approved chain hooks where required to prevent chain from hanging within traffic paths.

2.5 Stem and Couplings

.1 Provide operating stems and couplings of stainless steel.

.2 Provide the stem with a slenderness ratio (L/R) less than 200.

.3 Hollow stems are acceptable but they must be provided with stem guides (mounting brackets) and thrust bearings designed to carry the weight of the stem extension, eliminate load on the stem, and prevent buckling.

.4 Machine cut the threaded portion of the stem.

.5 For stems in more than one piece and with a diameter of 44.5 mm and larger, join the different sections together by threaded and bolted connections.

.6 Groove and key the couplings. The couplings are to be of greater strength than the stem.

.7 Provide stem guides of stainless steel, type 304 and UHMWPE bushed.

2.6 Valve Stem Extensions

.1 Provide valve stem extensions where additional clearance is required for pipe insulation, for all submerged or buried valves and other locations where valve operation without the extension is difficult, and in manholes.

.2 Where angle valve stem extensions are employed, they shall be angle geared. Universal joint types are not permitted.

.3 For all valves equal to or greater than 150 mm requiring stem extensions, provide pedestal mounted operators as shown on the process mechanical drawings and standard details.

2.7 Valve Boxes

.1 Provide valve boxes for all buried valves as per the process mechanical and civil drawings and standard details.

2.8 Insulation

.1 Insulate valves in accordance with Section 15059.

.2 Preform insulation in a shape suitable for the valve, of the same material specified in Section 15059.

.3 Recovering to be as specified in Section 15059, with transition sections for the joints between the valve insulation and the pipe insulation.

.4 Insulation to be removable and reusable without destroying insulation or recovering.

2.9 Pressure (Self) Regulating Valves

.1 Pressure (self) regulation (PRV) valves shall be supplied, installed and calibrated under this Division. The following table lists the PRVs:

Instrument Designation	P&ID	On Line or Equipment	In x Out (mm dia)	Rated Flow (L/s)	In - Out Pressure (kPag)

.2 The standard for PRVs is Fisher or equal, with materials suitable for the commodity being handled. These valves shall meet the corresponding piping specification.

2.10 Pressure or Vacuum Safety Valves

.1 Pressure or vacuum safety (PSV) valves shall be supplied, installed and calibrated under this Division. The following table lists the PSVs supplied under this contract but not included in an equipment package:

Instrument Designation	P&ID	On Line or Equipment	Relief Capacity (L/s)	Relief Pressure (kPag)

.2 The standard for PSVs is Varec Series 3600B or equal, with materials suitable for the commodity being handled. Note that FOA (foul air) consists of about 200 ppm H_2S, 10 ppm mercaptans, acid gas condensate and water vapour. These valves shall be of all stainless steel construction.

2.11 Protective Coatings

.1 Unless otherwise specified, provide valves coated in accordance with Section 09905.

2.12 Cathodic Protection

.1 Unless otherwise specified, provide cathodic protection to underground valves.

2.13 Spare Parts

.1 Provide one spare valve including the appropriate operator for each valve type and size.

.2 Provide a list of all spare parts which would be expected to be required under normal conditions for a period of five years. At the Engineer's request, provide a price for these parts.

3. EXECUTION

3.1 Preparation

.1 The valve and piping arrangement indicated in the drawings is based on typical dimensions for valves of the specified type. Make the necessary modifications in the piping to allow for discrepancies between the valve dimensions shown and those supplied for the work.

.2 Prior to the installation of the valves, field measure and check all equipment locations, pipe alignments, and structural installation. Ensure that the valve location and orientation provides suitable access to manual operators and that sufficient space and accessibility is available for pneumatic and electric actuators.

.3 Where conflicts are identified, inform the Engineer and initiate the necessary piping modifications at no cost to the Owner.

3.2 Valve Installation

.1 Install valves in conjunction with the piping described in Sections 15050 and with control valves and their appurtenances described in Division 17.

.2 In horizontal pipe runs other than in locations where space does not permit, mount all valves except for butterfly valves and trunnion ball valves with a vertical operating shaft with the actuator at the top. Avoid installing install a valve with the operator shaft pointing down.

.3 Mount butterfly valves and trunnion ball valves with the shaft in a horizontal orientation unless impractical.

.4 Mount valves in a position for easy access to the operators and maintenance personnel.

.5 When joining valves to pipe or fittings, do not over torque bolts to correct for misalignment.

.6 Support valves in position using temporary supports until valves are fixed in place.

.7 Permanently support valves to prevent transmission of loads to adjacent pipework and/or equipment.

.8 Where valves are installed in PVC pipework greater than 100mm diameter, support valves independently and brace against operating loads and torque to prevent transmission of stresses to the adjacent pipework.

.9 Generally pipe supports and hangers are not shown unless for indication purposes only.

.10 Install gate valves in the closed position.

.11 Install valves which are bubble tight in one direction to seal in a direction opposite to normal flow unless otherwise noted or directed by the Engineer.

.12 Unless otherwise specified, install single seated ball valves and knife gate valves with the seat downstream. Install at tank connections with seat away from tank. Install on pump discharge and suction lines with seat adjacent to the pump.

.13 Install all valves in accordance with the manufacturer's recommendations.

.14 Protect valves installed below grade with a shrink sleeve or polyethylene sheath attached to the pipe with tapewrap.

.15 Insert wafer and lug wafer butterfly valves between the flanges in the closed position, align and bolt finger-tight. Then open the valve fully before torking the bolts. Test that the disk does not catch the edge of the flange on closing and opening.

3.3 Valve Extensions

.1 Install valve stem extensions where necessary to provide clearance from insulation.

3.4 Insulation

.1 Install insulation and recovering as specified in Section 15059 if indicated on the drawings.

3.5 Valve Testing

.1 Ensure that the position indicated by the lever or actuator matches the actual position of the valve.

.2 Operate valves under simulated and/or real process conditions to ensure they operate as intended.

.3 Pressure test the valves in conjunction with the pipes in which the valves are installed as specified in Section 15050.

END OF SECTION

DETAILED PROCESS VALVE SPECIFICATION SHEETS

1. GENERAL

1.1 Description

.1 The following pages provide a summary of the valve body materials, valve performances and reference specifications for use in the Work and should be read in conjunction with Sections 15050, 15055 and 15100. Furnish all valves in accordance with the requirements of this section and those requirements of Sections 15050, 15055, and 15100. Where there is a conflict, conform to the most stringent requirements.

.2 The table in 1.2.1 below provides a list of the two letter valve abbreviations and the corresponding full valve type names referenced in the following Detailed Valve Specification Sheets. Provide the valve type as indicated in the drawings by the valve symbol shown. See the valve tables within the detailed pipe specification sheets (Section 15055) for guidance to specific valve types suitable for a given commodity and line size. See the Detailed Valve Specification Sheets for information on the valves.

.3 Valves identified in the drawings with an equipment identification symbol or instrument identification symbol are specified in Sections 15100 and 17213, respectively. Detailed Valve Specification Sheets referenced by other sections are independent of the table below.

.4 Named Acceptable Products are shown to define basic materials and performance criteria required for each valve type. Modify valves as specified to meet the service requirements of the system and detailed specifications.

1.2 Definitions

.1 Abbreviations used in Detailed Valve Specification Sheets:

AV	- Angle Valve
BC	- Balancing Cock Valve
BD	- Butterfly Damper
BF	- Butterfly Valve
BV	- Ball Valve
CB	- Circuit Balancing Valve
CV	- Check Valve
DBV	- Duck Bill Valve
DV	- Diaphragm Valve
GA	- Gate/Root Valve
GL	- Globe Valve
GV	- Gate Valve
KV	- Knife Valve
MV	- Mud Valve

NV	- Needle Valve
PD	- Pump Discharge Valve
PV	- Plug Valve
TW	- Two Way/Three Way Multiport Valve
PN	- Pinch Valve
VE	- Vee Ball Valve

2. PRODUCTS

.1 Detailed Valve Specification Sheets follow.

3. EXECUTION

NOT USED

DETAILED PROCESS VALVE SPECIFICATION SHEETS

BF01

GENERAL						
TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Butterfly Valve	**BF01**	Air	75	5-120	850	120

TYPICAL SERVICE
On/Off valve for low pressure air.

VALVE MATERIALS		VALVE DESCRIPTION	
ITEM	MATERIAL	Reference Document	
Body	Cast Iron	Size Range	50 mm to 600 mm
Disc	Ductile Iron	Rating	Class 125
Disc Trim	Bronze or Nickel (Note 1)	Body/Valve Ends	Lugged (Note 2)
Seats	EPDM	Type of Disc	
Shaft	Stainless Steel (316/416)	Operator	Note 3
		Actuator	Note 4
		Lining	
		Coating	

NOTES

1. Full bronze disc for valves below 300 mm.
2. Full lug style body for placement between two Class 125 flanges.
3. See Section 15100.
4. See Division 17.

ACCEPTABLE PRODUCTS			
Keystone F22-784	Bray Series 31	DeZurik Fig. 632	Centreline Series 200
Toyo 918	Grinnell Series 8000	Lunkenheimer 507	Crane Series 44-BXZ

DETAILED PROCESS VALVE SPECIFICATION SHEETS

BF02

GENERAL

TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Butterfly Valve	**BF02**	Liquid	600	5-30	850	50

TYPICAL SERVICE

On/Off or Modulating Control Valve for Liquid Service without Stringy Material.

VALVE MATERIALS		**VALVE DESCRIPTION**	
ITEM	MATERIAL	Reference Document	API 609
Body	Cast Iron	Size Range	50 mm to 600 mm
Disc	Ductile Iron	Rating	Class 125
Disc Trim	Bronze or Nickel (Note 1)	Body/Valve Ends	Lug or Wafer (Note 2)
Seats	Buna-N	Type of Disc	
Shaft	Stainless Steel (316/416)	Operator	Note 3
		Actuator	
		Lining	
		Coating	

NOTES

1. Full bronze disc for valves below 200 mm.
2. Full lug or wafer style body for placement between two Class 125 flanges. In steel piping provide weldneck flanges on each side of valve.
3. See Section 15100.

ACCEPTABLE PRODUCTS

Keystone AR2-285	Bray Series 30/31	DeZurik Fig. 632	Centreline Series 200
Toyo 918	Grinnell Series 8000	Lunkenheimer 507	Crane Series 44-BXB

DETAILED PROCESS VALVE SPECIFICATION SHEETS

BF03

GENERAL						
TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Butterfly Valve	**BF03**	Liquid/Air	100 – 900	5 – 115	1000	120

TYPICAL SERVICE
On/Off or Modulating Valve for Liquid/Air

VALVE MATERIALS		VALVE DESCRIPTION	
ITEM	MATERIAL	Reference Document	
Body	Cast Iron (Note 6)	Size Range	50 mm to 600 mm
Disc	Ductile Iron (Note 6)	Rating	CWP 1000 kPag (Note 5)
Disc Trim	(Nylon 11) Bronze or Nickel (Note 1)	Body/Valve Ends	Lugged (Note 2)
Seats	EPDM (Note 7)	Type of Disc	
Shaft	Stainless Steel (316)	Operator	Note 3
		Actuator	Note 4

NOTES

1. Full bronze disc for valves below 300 mm. Nylon 11 trim is not acceptable for services operating above 90°C.
2. Full lug style body for placement between two Class 125 flanges.
3. See Section 15100.
4. See Division 17.
5. Provide valves for CWP 1400 kPag on AA service.
6. Provide valves with 304 stainless steel body and disc for PA system submerged locations.
7. Provide valves with seats bonded to a rigid reinforcing ring.

ACCEPTABLE PRODUCTS			
Keystone F222-784 (only to 100°C and 1000 kPag)	Bray Series 31 (only to 1000 kPag)	DeZurik Fig. 632	Watts BF-03 (only to 1000 kPag)
Grinnell LC8201/LC8202			

DETAILED PROCESS VALVE SPECIFICATION SHEETS

BV01

GENERAL						
TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Ball Valve	**BV01**	Liquid/Air	600	5-120	850	120

TYPICAL SERVICE
On/Off valve for utility water, air, and chemical solution lines.

VALVE MATERIALS		VALVE DESCRIPTION	
ITEM	MATERIAL	Reference Document	Note 2
Body	Bronze or Forged Brass	Size Range	10 mm to 65 mm
Ball	Bronze or Chrome plated brass - floating	Rating	Class 125
Seats	PTFE	Body/Valve Ends	Female Threaded (Note 3)
Shaft	Bronze or Stainless Steel (Note 1)	Pattern	Compact, Regular Port
		Operator	Lever
		Actuator	
		Lining	
		Coating	

NOTES

1. Blowout-proof stem.
2. Gas service valves to comply with CGA requirements
3. Provide threaded end cap and chain when used for drain service.

ACCEPTABLE PRODUCTS			
Newman Hattersley Fig. 1969	Crane CSC9202	Nibco 560/580	Watts B6100/B6000

DETAILED PROCESS VALVE SPECIFICATION SHEETS

BV02

GENERAL						
TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Ball Valve	**BV05**	Liquid	100 – 900	5 to 30	1000	50

TYPICAL SERVICE
On/Off or Modulating Valve for Process Lines

VALVE MATERIALS		VALVE DESCRIPTION	
ITEM	MATERIAL	Reference Document	MSS-SP72 (Note 4)
Body	Cast Steel or Cast Iron or Steel	Size Range	75 mm to 450 mm (Note 5)
Ball	Stainless Steel (304 or 316)	Rating	CWP 1400 kPag
Packing	Reinforced PTFE or AFE	Body/Valve Ends	Split Body, Flanged (Note 4)
Seats	Reinforced PTFE	Pattern	Full Port
Shaft	Stainless Steel (304 or 315) (Note 2)	Operator	Notes 1, 3
		Actuator	Note 3

NOTES

1. See Section 15100.
2. Blowout proof stem.
3. See Division 17.
4. Provide Class 125 to suit cast or ductile iron piping systems and Class 150 for steel systems.
5. Provide trunnion mounted ball on all valves 250 mm diameter and greater.

ACCEPTABLE PRODUCTS			
Kitz 150 SCTB	Watts G4000/G4000T	Velan F-10402-SSGA	Neles Jamesbury 6150
Crane KF941S-2			

DETAILED PROCESS VALVE SPECIFICATION SHEETS

BV03

GENERAL						
TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Ball Valve	**BV06**	Liquid	100 – 750	5 to 40	1000	60

TYPICAL SERVICE
Chemical/General Service Wastewater Lines

VALVE MATERIALS		VALVE DESCRIPTION	
ITEM	MATERIAL	Reference Document	Material: ASTM D1784 (Grade A) Threads: ASTM D2464
Body	PVC	Size Range	10 mm to 65 mm
Ball	PVC – floating ball	Rating	CWP 1000 kPag
Packing	O-Ring, EPDM or Viton (Note 4)	Body/Valve Ends	Schedule 80, Female Threaded, True Union
Seats	PTFE	Pattern	Full Port (Note 2)
Shaft	PVC (Note 1)	Operator	Lever
		Actuator	

NOTES

1. Blowout proof ball and stem required.
2. Bi-directional.
3. This valve is for use in PVC piping systems only; also refer to BV02.
4. Do not provide BV05 valves with Viton rings on CHS services.

ACCEPTABLE PRODUCTS			
Chemline 21 Series	Hayward Safe-Block	Nibco Tru-Block PVC	Fabco Superbloc
IPEX VX-True Union			

DETAILED PROCESS VALVE SPECIFICATION SHEETS

CV01

GENERAL						
TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Check Valve	**CV01**	Liquid	600	5-30	850	50

TYPICAL SERVICE
Check valve for utility water or wastewater.

VALVE MATERIALS		VALVE DESCRIPTION	
ITEM	MATERIAL	Reference Document	Body Material: ASTM B62
Body	Bronze	Size Range	10 mm to 65 mm
Disc	Bronze	Rating	Class 125
Seats	Bronze	Valve Ends	Female Threads
Hinge pin, trim	Bronze	Type of Disc	Swing Check Regular Port
Spring		Operator	
		Actuator	
		Lining	
		Coating	

NOTES

ACCEPTABLE PRODUCTS			
Crane 37	Newman Hattersley A60	Kitz No. 22	Jenkins 4092
Toyo 236	Powell 560Y	Lunkenheimer 554	

DETAILED PROCESS VALVE SPECIFICATION SHEETS

CV02

GENERAL						
TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Check Valve	**CV02**	Liquid	600	5-30	850	50

TYPICAL SERVICE
Check valve for utility water, sludge, or wastewater (Note 1).

VALVE MATERIALS		VALVE DESCRIPTION	
ITEM	MATERIAL	Reference Document	AWWA C508
Body	Cast Iron	Size Range	75 mm to 600 mm
Disc	Cast or Ductile Iron	Rating	Class 125
Seats	Bronze	Valve Ends	Flanged
Hinge pin, trim	Stainless steel	Type of Disc	Swing Check (Note 1)
		Operator	(Note 1)
		Actuator	
		Lining	
		Coating	

NOTES
1. For all check valves on pump discharges, provide weighted lever arm.

ACCEPTABLE PRODUCTS			
Crane 373	APCO Series 6000- Convertible	Newman Hatternsley 651	Terminal City
Jenkins 587	Powell 559	Lunkenheimer 1790	

DETAILED PROCESS VALVE SPECIFICATION SHEETS

CV03

GENERAL						
TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Check Valve	**CV03**	Liquid	600	5-30	850	50

TYPICAL SERVICE
Check valve for sludge lines.

VALVE MATERIALS		VALVE DESCRIPTION	
ITEM	MATERIAL	Reference Document	
Body	Cast Iron	Size Range	75 mm to 400 mm
Disc	(Note 1)	Rating	Class 125
		Valve Ends	Flanged
		Type of Disc	Ball Check (Note 1)
		Operator	
		Actuator	
		Lining	
		Coating	

NOTES
1. Hollow steel ball with elastomeric coating.

ACCEPTABLE PRODUCTS			
Flygt HDL 2016			

DETAILED PROCESS VALVE SPECIFICATION SHEETS

CV04

GENERAL

TYPE OF VALVE	SYMBOL	TYPE OF COMMODITY	OPERATING LIMITS		DESIGN LIMITS	
			PRESSURE (kPag)	TEMP. (°C)	PRESSURE (kPag)	TEMP. (°C)
Check Valve	**CV04**	Air	100	5-100	400	150

TYPICAL SERVICE

Check valve for low pressure air.

VALVE MATERIALS		**VALVE DESCRIPTION**	
ITEM	MATERIAL	Reference Document	Note 3
Body	Cast Iron	Size Range	75 mm to 750 mm
Disc	Stainless Steel	Rating	Class 125
Seats	Bronze	Valve Ends	(Note 1)
Hinge pin, trim	Stainless Steel	Type of Disc	Split Disk
Spring	Stainless Steel	Operator	
		Actuator	
		Lining	
		Coating	
		Specials	(Note 2)

NOTES

1. Wafer Body for mounting between Class 150 flanges.
2. Provide lifting lugs on valve greater than 50kg.
3. Refer to 15100.

ACCEPTABLE PRODUCTS

APCO 9000	Val-Matic 8000	Proquip Twin Flapper	Mission 12 HMP
Gulf MB12-5-0-9-1-5-F	Crane Duo-Check G12-HMP		