

TWO PIECE BALL VALVES

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<u>MATERIALS OR STYLE</u>		<u>TYPE</u>	<u>VARIATIONS</u>	<u>SIZE</u>
70	Bronze	1 NPT Female/150 Flange	1 One Size Larger	1 1/4"
71	Bronze with pads	2 Solder & Soc. Weld/150 Flange Full Port	2 Male Retainer	2 3/8"
72	Carbon Steel, High Pressure	3 Union End NPT/Reg.Port Soc.Weld	3 Adjustable Stop Lever	3 1/2"
73	Carbon Steel	4 Union End Solder/Reg.Port Soc.Weld	4 SS Sall & Stem	4 3/4"
73A	A105 Carbon Steel	5 Spring Return/High Pressure Full Port NPT	5 Original Balancing Stop- Attach to Lever or T-Handle	5 1"
74	Nickel	6 3-way, NPT/High Pressure Soc.Weld Full Port	6 One Size Smaller	6 1 1/4"
75	Pad-Locking Bronze	7 Butt Weld/300 Flange	7 Female Retainer	7 1 1/2"
76	CF8M Stainless Steel	8 Male x Female, NPT/600 Flange	8 (Not Assigned)	8 2"
76F	CF8M Stainless Steel, Full Port	9 3-way Solder/O-Ring Boss/300 Flange Full Port	9 Pinned Retainer	9 2 1/2"
77	Bronze Full Port			0 3"
77C	Bronze Full Port Economy			A 4"
78	Special Valves			C 6"
79	Refrigerant Valves			E 8"
7A	Chlorine Carbon Steel			G 10"
7K	Bronze Full Port Drain			H 12"
80	Bronze, UL Listed			
81	Bronze UL Listed Plain Ball			
82	Bronze 3-Piece Full Port			
83	CS 3-Piece			
83R	CS 3-Piece, Actuator Ready			
85	SS 3-Piece, Reg.Port			
85R	SS 3-Piece, Reg.Port, Actuator Ready			
86	SS 3-Piece, Full Port			
86R	SS 3-Piece, FullPort, Actuator Ready			
87	CF8M SS Flanged			
87A	CF8M SS Flanged			
87A-400	Alloy-20 Flanged			
88	Carbon Steel Flanged			
88A	Carbon Steel Flanged			
89	Cast Carbon Steel w/Pads			
9A	Bronze, Hvy.Patt. Unibody			
90	Bronze, Unibody, UL Listed			
91	Bronze, Unibody			
92	Cast Carbon Steel Unibody			
93	CS Unibody			
95	Bronze Stop & Drain			
96	CF8M SS Unibody			
399	Alloy-20 NPT			
401	Alloy-20, 3-Piece, Full Port			

DESIGN

-01	Standard	-46	SS Latch Lock Lever, Lock in Closed Position Only
-02	Stem Grounded	-47	SS Oval Latch Lock Handle, SS Nut
-03	1-1/4" Carbon Steel Ext.Stem	-48	SS Oval Handle, No Latch, SS Nut
-04	2-1/4" Carbon Steel Ext.Stem	-49	Assembled Dry
-05	Plain Ball	-50	2-1/4" CS Locking Stem Extension
-06	2000 lb. 73-100 Series (1-1/4" to 2")	-51	One Tack Weld (I-7362-05-1X)
-07	Steel Tee Handle	-52	Two Tack Weld (I-7362-05-2X)
-08	90 degree reversed stem	-53	Three Tack Weld (I-7362-05-3X)
-09	SS Lever	-54	Four Tack Weld (I-7362-05-4X)
-10	SS Lever & Nut	-56	MultiFill Seats and Packing
-12	Stamp "157 SWP" & Bagged	-57	Oxygen Cleaned (Bronze and SS Only)
-13	Stamp "157 SWP"	-58	Chain Lever, Horizontal
-14	Side Vented Ball (uni-directional)	-59	SS External Trim - 3-pc Valves
-15	Wheel Handle, Steel	-60	Grounded Ball & Stem
-16	Chain Lever, Vertical	-61	Grounded Ball & Stem, Assembled Dry
-17	Rough Chrome Plate - Bronze Valves	-62	Body Centre Section
-21	UHMWPE Trim (non-PTFE)	-63	NPT x Solder/Socket Weld
-22	Viton Union Seals	-64	250 lb. Steam Trim
-23	Tank Flange (2" 3-pc valves only)	-65	MultiFill Seats & Graphite Packing
-24	Graphite Packing	-66	FNPT x Butt Weld
-25	Graphite Packing, Vented Ball & Tack Welded Ret.	-68	4" Stem Extension (3" & 4" 3-pc. 82 Series
-26	Chevron Pkg Vent Assd.Dry Monel Trim (7A)	-69	Purge Ports Drilled/Tapped @ Bottom & approx. 45" from Top
-27	SS Latch Lock Lever & Nut	-70	4" Extended Bonnet
-28	Actuator Mounting Pad Not Drilled/Tapped	-72	RTFE Packing
-29	Graphite Packing & Seals	-73	TFE Packing - Spiral Wound Body Seals - TFE Fillers - Flange BV
-30	Cam-Lock and Grounded Stem	-74	Graphite Packing - Spiral Wound Body Seals - Graphoil Fillers - Flange BV
-31	7B Series w/Boss not Drilled/Tapped	-75	MPTEF Seats, PTFE Packing, RPTFE Gaskets
-32	SS Hi-Rise Tee Handle & Nut	-76	Live Loaded 87A/88A Series (Lever)
-33	76-300 Series w/Pad Drilled/Tapped	-77	Live Loaded 87A/88A Series (Gear & Actuated)
-34	Nylatron Seats (96 Series)	-78	Delrin Seats
-35	VTFE Trim	-79	Nylon Seats/Graphite Packing 72 Series
-36	SS HiRise Round Handle, SS Nut	-80	Multi-Seal (Super TFE) 87A/88A Series
-38	Peek Seats & Bearing (Graphite packing & seals)	-97	Grnd.Whl.Handle, Pinned or Tack Welded
-39	SS Hi-Rise Locking Wheel Handle, SS Nut	-98	Grnd.Whl. Pinned or Tack Welded & 1-1/4" Stem Ext.
-40	Cyl-loc and Grounded Stem	-SW	Limit Switch Mounted
-41	Auto.Drain (Bronze Valves Only)	-MG	Gear Operated, Std. Hand Wheel
-42	Non-Vented Ball, No Holes in Slot (CS and SS)	-MH	Gear Operated, Std. Hand Wheel, Lockout Device
-43	Cyl-Loc, Grnd B&S, 680 LocTite or 2-Tack Welds	-MJ	Gear Operated, Oversize Hand Wheel
-44	Seal Weld 76-100 & 89-100	-MK	Gear Operated, Oversize Hand Wheel, Lockout Device
-45	Less Lever & Nut	-P01	BSPP (Parallel) Thread Connection
		-BC	Ball Check
		T01	BSPT (Tapered) Thread Connection

Apollo® 70-100 Series Bronze Ball Valve

Threaded, 600 psig WOG, Cold Non-Shock. 150 psig Saturated Steam.
Vacuum Service to 29 inches Hg.
Federal Specification: WW-V-35C, Type: II, Composition: BZ, Style: 3.

FEATURES

- Chromium plated ball
- RPTFE seats and stuffing box ring
- Blow-out-proof stem design
- Adjustable packing gland

STANDARD MATERIAL LIST

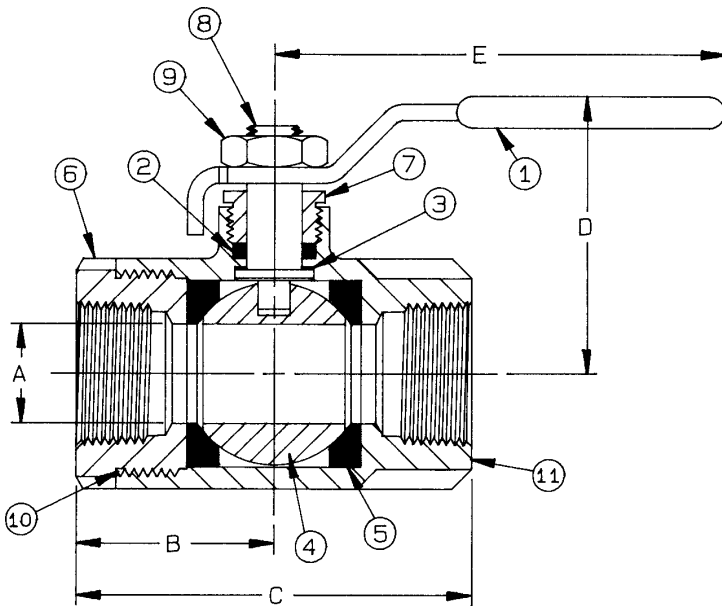
1. Lever and grip	Steel, zinc plated w/vinyl	7. Gland nut	B16
2. Stem packing	RPTFE	8. Stem	B16
3. Stem bearing	RPTFE	9. Lever nut	Steel, zinc plated
4. Ball	B16, chrome plated	10. Body seal (1-1/4" to 3")	PTFE
5. Seat (2)	RPTFE	11. Body	B584-C84400
6. Retainer	B16 (1/4" to 1") B584-C84400 (1-1/4" to 3")		

VARIATIONS AVAILABLE:

- 70-120 Series (Adjustable Stop Lever)
- 70-140 Series (316 SS Ball & Stem)
- 70-150 Series (Balancing Stop)
- 70-190 Series (Locked Retainer)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 3"
-03-	1-1/4" Stem Extension	1/4" to 3"
-04-	2-1/4" Stem Extension	1/4" to 3"
-05-	Plain Ball	1/4" to 3"
-07-	Tee Handle	1/4" to 2"
-08-	90° Reversed Stem	1/4" to 3"
-10-	SS Lever & Nut	1/4" to 3"
-14-	Vented Ball (see page J-2)	1/4" to 3"
-15-	Round Handle	1/4" to 2"
-16-	Vertical Chain Lever	3/4" to 2"
-17-	Rough Chrome Plating	1/4" to 3"
-21-	UHMWPE Seats (Non-PTFE)	1/4" to 3"
-24-	Graphite Stem Packing	1/4" to 3"
-27-	Latch Lock Lever	1/4" to 3"
-30-	CamLock Handle	1/4" to 2"
-32-	SS Tee Handle & Nut	1/4" to 2"
-35-	PTFE Trim	1/4" to 3"
-39-	SS Latch Lock Wheel Handle	1/4" to 2"
-40-	Cyl-Loc	1/4" to 2"
-41-	Auto Drain (See page J-8)	1/4" to 2"
-45-	Less Lever & Nut	1/4" to 3"
-46-	Latch Lock Lever - Lock Close Only	1/4" to 3"
-47-	SS Latch-Lock Oval Handle	1/4" to 1"
-48-	SS Oval Handle	1/4" to 2"
-49-	Assembled Dry	1/4" to 3"
-50-	2-1/4" Locking Stem Extension	1/4" to 3"
-56-	Multifill Seats	1/4" to 3"
-57-	Cleaned for Gaseous Oxygen	1/4" to 3"
-58-	Horizontal Chain Lever	3/4" to 2"
-60-	Static Grounded Ball & Stem	1/4" to 3"
-63-	Threaded x Solder	3/8" to 3"
-64-	250 Lb. Steam Trim	1/4" to 3"
-P01-	BSPP (Parallel) Thread Connection	1/4" to 3"
-T01-	BSPT (Tapered) Thread Connection	1/4" to 3"



BRONZE BALL VALVE

NUMBER	SIZE	A	B	C	D	E	Wt.
70-101-01	1/4"	.37	1.03	2.06	1.75	3.87	.60
70-102-01	3/8"	.37	1.03	2.06	1.75	3.87	.56
70-103-01	1/2"	.50	1.12	2.25	1.75	3.87	.63
70-104-01	3/4"	.68	1.50	3.00	2.12	4.87	1.39
70-105-01	1"	.87	1.68	3.37	2.25	4.87	1.72
70-106-01	1-1/4"	1.00	2.00	4.00	2.62	5.50	3.26
70-107-01	1-1/2"	1.25	2.18	4.37	3.06	8.00	4.61
70-108-01	2"	1.50	2.34	4.68	3.25	8.00	6.06
70-109-01A	2-1/2"	2.00	3.12	6.25	3.72	8.00	17.25
70-100-01	3"	2.50	3.37	6.75	4.12	8.00	18.60

**For Pressure/Temperature Ratings,
Refer to Page N-10, Graph No. 4**

Apollo® 70-200 Series

Solder End Bronze Ball Valve

Solder End, 600 psig WOG, Cold Non-Shock. 150 psig Saturated Steam.
 Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: BZ, Style: 3.

FEATURES

- Chromium plated ball
- RPTFE seats and stuffing box ring
- Blow-out-proof stem design
- Adjustable packing gland

STANDARD MATERIAL LIST

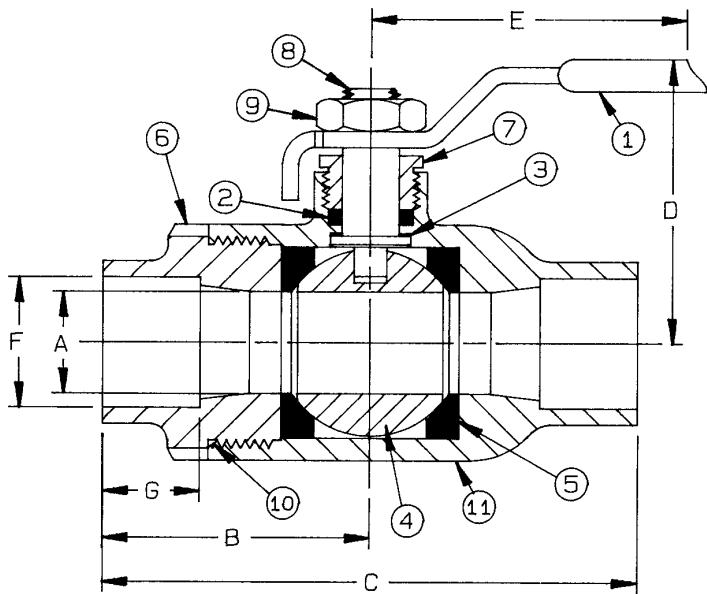
1. Lever and grip	Steel, zinc plated w/vinyl	7. Gland nut	B16
2. Stem packing	RPTFE	8. Stem	B16
3. Stem bearing	RPTFE	9. Lever nut	Steel, zinc plated
4. Ball	B16, chrome plated	10. Body seal	PTFE
5. Seat (2)	RPTFE	(1-1/4" to 3")	
6. Retainer	B16 (3/8" to 1")	11. Body	B584-C84400
	B584-C84400 (1-1/4" to 3")		

VARIATIONS AVAILABLE:

- 70-220 Series (Adjustable Stop Lever)
- 70-240 Series (316 SS Ball & Stem)
- 70-250 Series (Balancing Stop)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	3/8" to 3"
-03-	1-1/4" Stem Extension	3/8" to 3"
-04-	2-1/4" Stem Extension	3/8" to 3"
-05-	Plain Ball	3/8" to 3"
-07-	Tee Handle	3/8" to 2"
-08-	90° Reversed Stem	3/8" to 3"
-10-	SS Lever & Nut	3/8" to 3"
-14-	Vented Ball (see page J-2)	3/8" to 3"
-15-	Round Handle	3/8" to 2"
-16-	Vertical Chain Lever	3/4" to 2"
-24-	Graphite Stem Packing	3/8" to 3"
-27-	Latch Lock Lever	3/8" to 3"
-32-	SS Tee Handle & Nut	3/8" to 2"
-35-	PTFE Trim	3/8" to 3"
-39-	SS Latch Lock Wheel Handle	3/8" to 2"
-45-	Less Lever & Nut	3/8" to 3"
-46-	Latch Lock Lever - Lock Close Only	3/8" to 3"
-47-	SS Latch-Lock Oval Handle	3/8" to 1"
-48-	SS Oval Handle	3/8" to 2"
-49-	Assembled Dry	3/8" to 3"
-50-	2-1/4" Locking Stem Extension	3/8" to 3"
-56-	Multifill Seats	3/8" to 3"
-57-	Cleaned for Gaseous Oxygen	3/8" to 3"
-58-	Horizontal Chain Lever	3/4" to 2"
-60-	Static Grounded Ball & Stem	3/8" to 3"
-63-	Threaded x Solder	3/8" to 3"



BRONZE BALL VALVE

NUMBER	SIZE	A	B	C	D	E	F	G	Wt.
70-202-01	3/8"	.37	1.28	2.56	1.75	3.87	.505	.37	.63
70-203-01	1/2"	.50	1.43	2.87	1.75	3.87	.630	.50	.71
70-204-01	3/4"	.68	1.93	3.87	2.12	4.87	.880	.75	1.44
70-205-01	1"	.87	2.25	4.50	2.25	4.87	1.130	.90	1.91
70-206-01	1-1/4"	1.00	2.31	4.62	2.62	5.50	1.380	.96	2.95
70-207-01	1-1/2"	1.25	2.62	5.25	3.06	8.00	1.630	1.09	3.99
70-208-01	2"	1.50	3.18	6.37	3.25	8.00	2.130	1.34	5.71
70-209-01A	2-1/2"	2.00	3.74	7.51	3.72	8.00	2.630	1.48	15.53
70-200-01	3"	2.50	4.12	8.25	4.12	8.00	3.130	1.67	16.74

The 70-200 is designed to be soft soldered into lines without disassembly. This allows a tested valve to be installed without disturbing the seats and seals in any way. Soldering temperature not to exceed 500°F.

**For Pressure/Temperature Ratings,
 Refer to Page N-10, Graph No. 4**

Apollo® 70-800 Series

Male x Female Bronze Ball Valve

Male x Female Threaded, 600 psig WOG, Cold Non-Shock. 150 psig Saturated Steam.
 Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: BZ, Style: 3.

FEATURES

- Chromium plated ball
- RPTFE seats and stuffing box ring
- Male x Female threaded end connections
- Blow-out-proof stem design
- Adjustable packing gland

STANDARD MATERIAL LIST

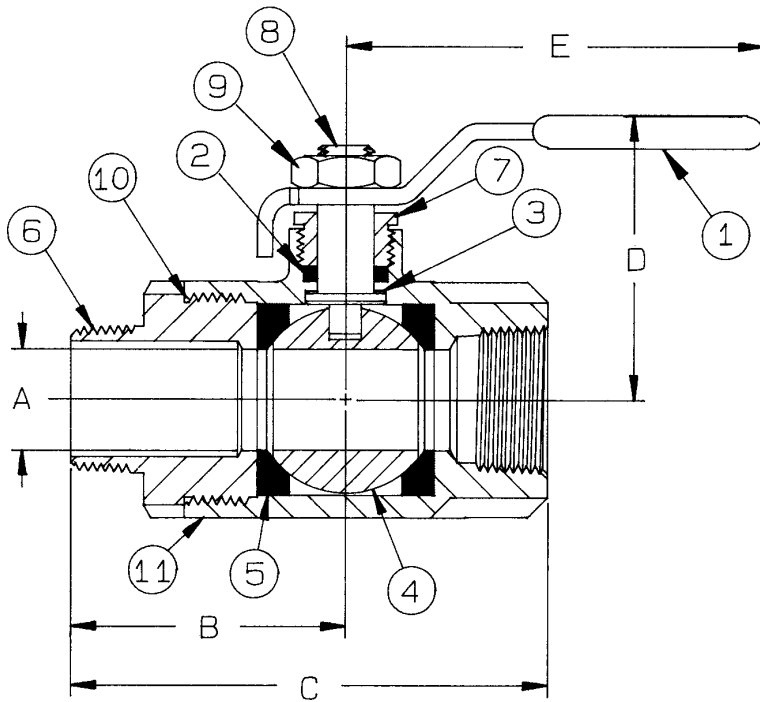
1. Lever and grip	Steel, zinc plated w/vinyl	7. Gland nut	B16
2. Stem packing	RPTFE	8. Stem	B16
3. Stem bearing	RPTFE	9. Lever nut	Steel, zinc plated
4. Ball	B16, chrome plated	10. Body seal	PTFE
5. Seat (2)	RPTFE	(1-1/4" to 1-1/2")	
6. Retainer	B16	11. Body	B584-C84400

VARIATIONS AVAILABLE:

- 70-820 Series (Adjustable Stop Lever)
- 70-840 Series (316 SS Ball & Stem)
- 70-850 Series (Balancing Stop)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 1-1/2"
-03-	1-1/4" Stem Extension	1/4" to 1-1/2"
-04-	2-1/4" Stem Extension	1/4" to 1-1/2"
-05-	Plain Ball	1/4" to 1-1/2"
-07-	Tee Handle	1/4" to 1-1/2"
-08-	90° Reversed Stem	1/4" to 1-1/2"
-10-	SS Lever & Nut	1/4" to 1-1/2"
-14-	Vented Ball (see page J-2)	1/4" to 1-1/2"
-15-	Round Handle	1/4" to 1-1/2"
-16-	Vertical Chain Lever	3/4" to 1-1/2"
-21-	UHMWPE Seats (Non-PTFE)	1/4" to 1-1/2"
-24-	Graphite Stem Packing	1/4" to 1-1/2"
-27-	Latch Lock Lever	1/4" to 1-1/2"
-30-	CamLock Handle	1/4" to 1-1/2"
-32-	SS Tee Handle & Nut	1/4" to 1-1/2"
-35-	PTFE Trim	1/4" to 1-1/2"
-39-	SS Latch Lock Wheel Handle	1/4" to 1-1/2"
-40-	Cyl-Loc	1/4" to 1-1/2"
-41-	Auto Drain (see page J-8)	1/4" to 1-1/2"
-45-	Less Lever & Nut	1/4" to 1-1/2"
-46-	Latch Lock Lever - Lock Close Only	1/4" to 1-1/2"
-47-	SS Latch-Lock Oval Handle	1/4" to 1"
-48-	SS Oval Handle	1/4" to 1-1/2"
-49-	Assembled Dry	1/4" to 1-1/2"
-50-	2-1/4" Locking Stem Extension	1/4" to 1-1/2"
-56-	Multifill Seats	1/4" to 1-1/2"
-57-	Cleaned for Gaseous Oxygen	1/4" to 1-1/2"
-58-	Horizontal Chain Lever	3/4" to 1-1/2"
-60-	Static Grounded Ball & Stem	1/4" to 1-1/2"
-64-	250 Lb. Steam Trim	1/4" to 1-1/2"



MALE X FEMALE BRONZE BALL VALVE

NUMBER	SIZE	A	B	C	D	E	Wt.
70-801-01	1/4"	.37	1.40	2.43	1.75	3.87	.63
70-802-01	3/8"	.37	1.46	2.50	1.75	3.87	.60
70-803-01	1/2"	.50	1.68	2.81	1.81	3.87	.72
70-804-01	3/4"	.68	2.00	3.50	2.12	4.87	1.42
70-805-01	1"	.87	2.31	4.00	2.25	4.87	1.93
70-806-01	1-1/4"	1.00	2.31	4.31	2.62	5.50	3.19
70-807-01	1-1/2"	1.25	3.00	5.18	3.06	8.00	4.60

**For Pressure/Temperature Ratings,
 Refer to Page N-10, Graph No. 4**

Apollo® 71-100 Series

Bronze Ball Valve With Mounting Pad

Threaded, 600 psig WOG, Cold Non-Shock. 150 psig Saturated Steam.
 Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: BZ, Style: 3.

FEATURES

- Chromium plated ball
- RPTFE seats and stuffing box ring
- Mounting pad for easy actuator mounting
- Blow-out-proof stem design
- Adjustable packing gland

STANDARD MATERIAL LIST

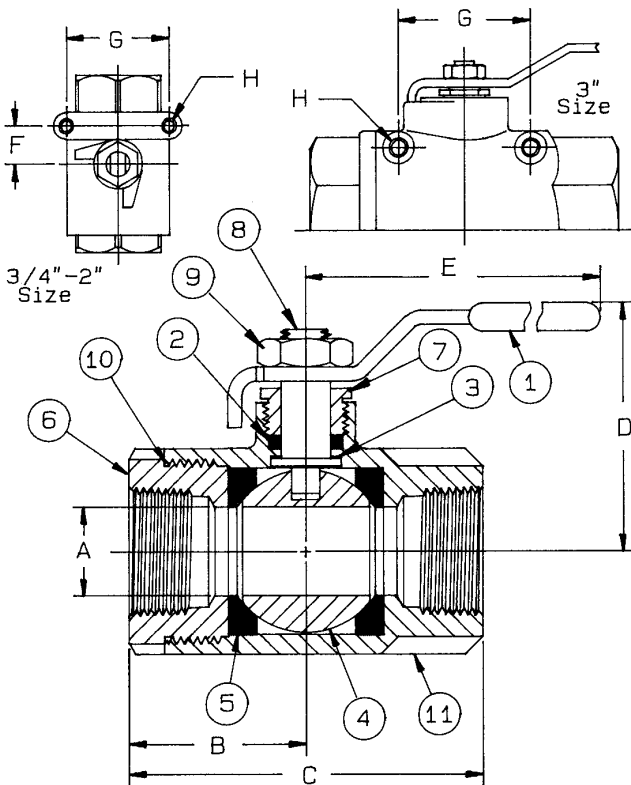
1. Lever and grip	Steel, zinc plated w/vinyl	9. Lever nut	Steel, zinc plated
2. Stem packing	RPTFE	10. Body seal	PTFE
3. Stem bearing	RPTFE	(1-1/4" to 3")	
4. Ball	B16, chrome plated	11. Body	B584-C84400
5. Seat (2)	RPTFE		
6. Retainer	B16 (3/4" to 1")		
	B584-C84400 (1-1/4" to 3")		
7. Gland nut	B16		
8. Stem	B16		

VARIATIONS AVAILABLE:

- 71-120 Series (Adjustable Stop Lever)
- 71-140 Series (316 SS Ball & Stem)
- 71-150 Series (Balancing Stop)
- 71-190 Series (Locked Retainer)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	3/4" to 3"
-03-	1-1/4" Stem Extension	3/4" to 3"
-04-	2-1/4" Stem Extension	3/4" to 3"
-05-	Plain Ball	3/4" to 3"
-07-	Tee Handle	3/4" to 2"
-08-	90° Reversed Stem	3/4" to 3"
-10-	SS Lever & Nut	3/4" to 3"
-14-	Vented Ball (see page J-2)	3/4" to 3"
-15-	Round Handle	3/4" to 2"
-16-	Vertical Chain Lever	3/4" to 2"
-21-	UHMWPE Seats (Non-PTFE)	3/4" to 3"
-24-	Graphite Stem Packing	3/4" to 3"
-27-	Latch Lock Lever	3/4" to 3"
-30-	CamLock Handle	3/4" to 2"
-32-	SS Tee Handle & Nut	3/4" to 2"
-35-	PTFE Trim	3/4" to 3"
-39-	SS Latch Lock Wheel Handle	3/4" to 2"
-40-	Cyl-Loc	3/4" to 2"
-41-	Auto Drain (see page J-8)	3/4" to 2"
-45-	Less Lever & Nut	3/4" to 3"
-46-	Latch Lock Lever - Lock Close Only	3/4" to 3"
-47-	SS Latch-Lock Oval Handle	3/4" to 1"
-48-	SS Oval Handle	3/4" to 2"
-49-	Assembled Dry	3/4" to 3"
-50-	2-1/4" Locking Stem Extension	3/4" to 3"
-56-	Multifill Seats	3/4" to 3"
-57-	Cleaned for Gaseous Oxygen	3/4" to 3"
-58-	Horizontal Chain Lever	3/4" to 2"
-60-	Static Grounded Ball & Stem	3/4" to 3"
-64-	250 Lb. Steam Trim	3/4" to 3"
-P01-	BSPP (Parallel) Thread Connection	3/4" to 3"
-T01-	BSPT (Tapered) Thread Connection	3/4" to 3"



BRONZE BALL VALVE WITH MOUNTING PAD

NUMBER	SIZE	A	B	C	D	E	F	G	H	Wt.
71-104-01	3/4"	.68	1.50	3.00	2.12	4.87	.87	1.37	10-24 NC	1.63
71-105-01	1"	.87	1.68	3.37	2.25	4.87	.87	1.37	10-24 NC	1.86
71-106-01	1-1/4"	1.00	2.00	4.00	2.62	5.50	.93	1.50	1/4-20 NC	3.39
71-107-01	1-1/2"	1.25	2.18	4.37	2.87	8.00	.93	1.50	1/4-20 NC	4.68
71-108-01	2"	1.50	2.34	4.68	3.06	8.00	.93	1.50	1/4-20 NC	5.72
71-100-01	3"	2.50	3.37	6.75	4.12	8.00	N/A	2.75	1/4-20 NC	18.60

*See 77-140 Series Full Port for 1/4", 3/8", 1/2" and 2-1/2" Sizes

**For Pressure/Temperature Ratings,
 Refer to Page N-10, Graph No. 4**

Apollo® 71-ARX Series

Bronze Std. Port Ball Valve with Actuator Ready ISO Mounting Pad

Threaded, 600 psig WOG, Cold Non-Shock, 250 psig Saturated Steam.
 Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: BZ, Style: 3.

FEATURES

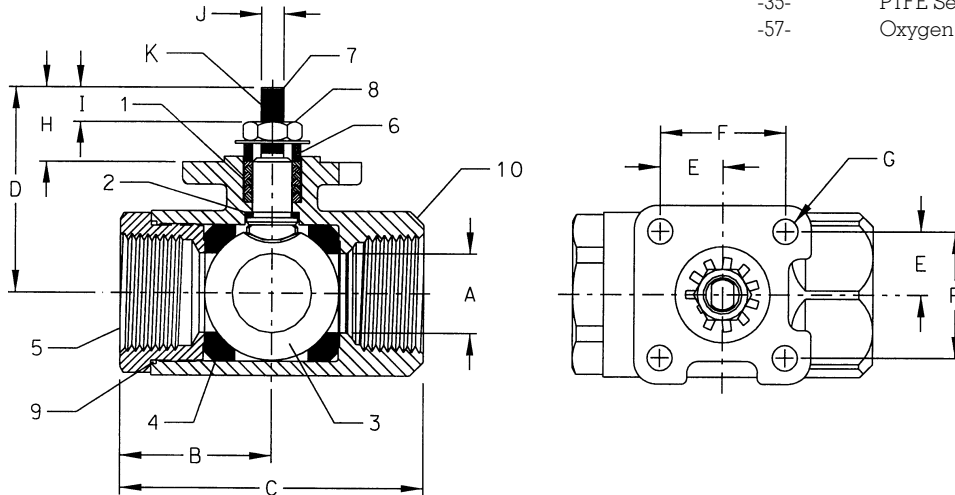
- Multi-piece packing set
- ISO 5211 mounting pad
- Stainless ball & stem
- Blow-out-proof stem design
- Adjustable packing gland
- Live loaded packing

STANDARD MATERIAL LIST

1. Stem packing	MPTFE	6. Gland	B16
2. Stem bearing	RPTFE	7. Stem	316 SS
3. Ball	316 SS	8. Jam nut	SS
4. Seat (2)	MPTFE	9. Body seal	PTFE (1-1/4" to 3")
5. Retainer	B16 (3/4" to 1")	10. Body	B584-C84400
	B584-C84400 (1-1/4" to 3")		

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-14-	Vented Ball	3/4" to 3"
-24-	Graphite Stem Packing	3/4" to 2"
-27-	Latch Lock Handle	3/4" to 3"
-35-	PTFE Seats	3/4" to 3"
-57-	Oxygen Cleaned	3/4" to 3"



**For Pressure/Temperature Ratings,
 Refer to Page N-10, Graph No. 4**

BRONZE STD. PORT BALL VALVE WITH ISO MOUNTING PAD

NUMBER	SIZE	A	B	C	D	E	F	G	H	I	J (FLATS)	K (THRDS.) UNF	WT.
71-AR4-64	3/4"	.68	1.50	3.00	2.16	.70	1.39	.28	.84	.37	.247/.249	3/8-24	1.38
71-AR5-64	1"	.87	1.68	3.37	2.28	.70	1.39	.28	.84	.37	.247/.249	3/8-24	1.76
71-AR6-64	1-1/4"	1.00	1.98	3.97	3.16	.98	1.95	.34	1.16	.54	.370/.372	5/8-18	3.51
71-AR7-64	1-1/2"	1.25	2.18	4.37	3.16	.98	1.95	.34	1.16	.58	.370/.372	5/8-18	4.40
71-AR8-64	2"	1.50	2.34	4.68	3.37	.98	1.95	.34	1.16	.55	.370/.372	5/8-18	5.89
71-AR9-64	2-1/2"	2.00	3.12	6.25	3.85	.98	1.95	.34	1.16	.54	.370/.372	5/8-18	14.12
71-AR0-64	3"	2.50	3.37	6.75	4.18	.98	1.95	.34	1.16	.54	.370/.372	5/8-18	18.55

Apollo® 72-100 Series

Carbon Steel High Pressure Ball Valve

Threaded, 3000 psig WOG, Cold Non-Shock Body rating (see P/T Chart referenced below for seat rating).
150 psig Saturated Steam.

Vacuum Service to 29 inches Hg.

Federal Specification: WW-V-35C, Type: II, Composition: CS, Style: 3.

FEATURES

- Barstock design
- RPTFE seats and stuffing box ring
- Fire safe design when ordered with graphite packing
- Nitride corrosion protection
- Adjustable packing gland
- Full port, except 2"
- Blow-out-proof stem design
- Heavy duty lever

STANDARD MATERIAL LIST

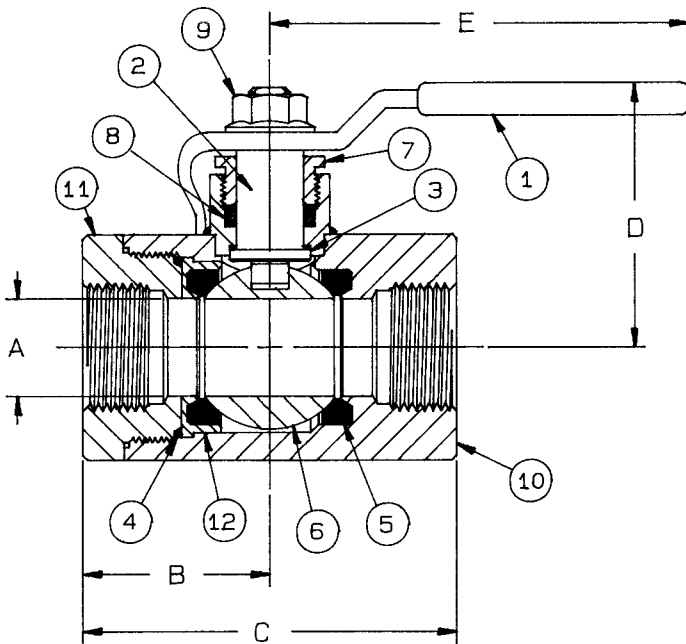
1. Lever and grip	Steel, zinc plated w/vinyl	7. Gland nut	A108-CS
2. Stem	A108-CS chrome plated	8. Stem packing	RPTFE
3. Stem bearing	RPTFE	9. Lever nut	Steel, zinc plated
4. Retainer seal	RPTFE	10. Body	A108-CS
5. Seat (2)	RPTFE	11. Retainer	A108-CS
6. Ball	A108-CS chrome plated	12. Seat holder	A108-CS

VARIATIONS AVAILABLE:

72-140 Series (316 SS Ball & Stem)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/2" to 2"
-03-	1-1/4" Stem Extension	1" to 1-1/2"
-04-	2-1/4" Stem Extension	1" to 1-1/2"
-07-	Tee Handle	1/2" to 1-1/2"
-08-	90° Reversed Stem	1/2" to 2"
-10-	SS Lever & Nut	1/2" to 1-1/2"
-14-	Vented Ball (see page J-2)	1/2" to 2"
-15-	Round Handle	1/2" to 1"
-19-	Lock Plate	1/2" to 2"
-21-	UHMWPE Seats (Non-PTFE)	1/2" to 2"
-24-	Graphite Stem Packing	1/2" to 2"
-45-	Less Lever & Nut	1/2" to 2"
-56-	Multifill Seats	1/2" to 2"
-60-	Static Grounded Ball & Stem	1/2" to 2"
-64-	250 Lb. Steam Trim	1/2" to 2"



CARBON STEEL HIGH PRESSURE BALL VALVE

NUMBER	SIZE	A	B	C	D	E	Wt.
72-103-01	1/2"	.62	1.46	2.87	2.50	5.62	1.98
72-104-01	3/4"	.81	1.87	3.71	2.62	5.62	3.09
72-105-01	1"	1.00	2.12	4.15	3.12	6.62	4.87
72-106-01	1-1/4"	1.25	2.32	4.65	3.43	8.00	7.67
72-107-01	1-1/2"	1.50	2.64	5.23	3.56	8.00	10.50
72-108-01	2"	1.75	3.00	5.84	4.18	9.00	15.26

**For Pressure/Temperature Ratings,
Refer to Page N-16, Graph No. 15**

Apollo® 72-900 Series

Carbon Steel SAE Straight Thread Ball Valve

Threaded, 3000 psig WOG, Cold Non-Shock Body Rating (see P/T Chart referenced below for seat rating).
150 psig Saturated Steam.

Vacuum Service to 29 inches Hg.

Federal Specification: WW-V-35C, Type: II, Composition: CS, Style: 3.

FEATURES

- Barstock design
- RPTFE seats and stuffing box ring
- Fire safe design when ordered with graphite packing
- Nitride corrosion protection
- Adjustable packing gland
- Full port, except 2"
- Blow-out-proof stem design
- Heavy duty lever
- SAE J512/J514 Straight Thread O-Ring Boss

STANDARD MATERIAL LIST

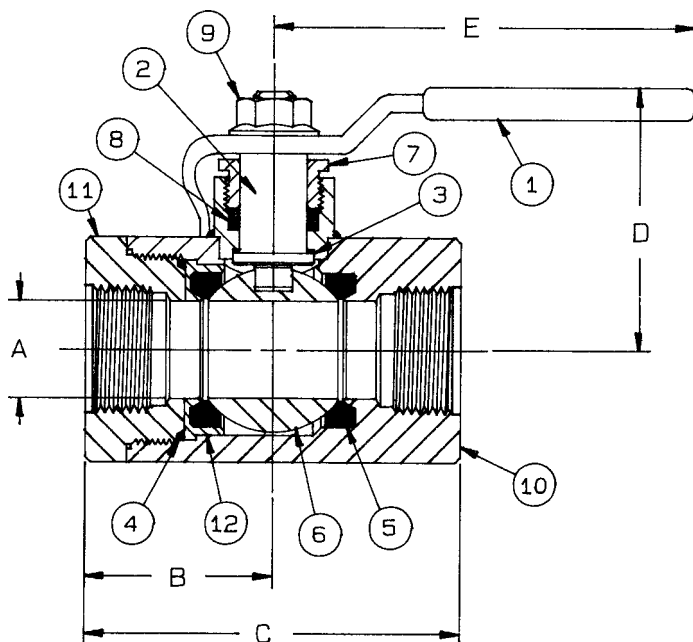
1. Lever and grip	Steel, zinc plated w/vinyl	7. Gland nut	A108-CS
2. Stem	A108-CS chrome plated	8. Stem packing	RPTFE
3. Stem bearing	RPTFE	9. Lever nut	Steel, zinc plated
4. Retainer seal	RPTFE	10. Body	A108-CS
5. Seat (2)	RPTFE	11. Retainer	A108-CS
6. Ball	A108-CS chrome plated	12. Seat holder	A108-CS

VARIATIONS AVAILABLE:

72-940 Series (316 SS Ball & Stem)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 2"
-03-	1-1/4" Stem Extension	1" to 1-1/2"
-04-	2-1/4" Stem Extension	1" to 1-1/2"
-07-	Tee Handle	1/4" to 1-1/2"
-08-	90° Reversed Stem	1/4" to 2"
-10-	SS Lever & Nut	1/4" to 1-1/2"
-14-	Vented Ball (see page J-2)	1/4" to 2"
-15-	Round Handle	1/4" to 1"
-19-	Lock Plate	1/4" to 2"
-21-	UHMWPE Seats (Non-PTFE)	1/4" to 2"
-24-	Graphite Stem Packing	1/4" to 2"
-45-	Less Lever & Nut	1/4" to 2"
-56-	Multifill Seats	1/4" to 2"
-60-	Static Grounded Ball & Stem	1/4" to 2"
-64-	250 Lb. Steam Trim	1/4" to 2"



CARBON STEEL SAE STRAIGHT THREAD
O-RING BOSS BALL VALVE

NUMBER	NOM. TUBE O.D.	SIZE	A	B	C	D	E	Wt.
72-901-01	1/4"	7/16"-20	.39	1.46	2.84	2.50	5.62	2.09
72-902-01	3/8"	9/16"-18	.51	1.46	2.84	2.50	5.62	2.06
72-903-01	1/2"	3/4"-16	.62	1.46	2.84	2.50	5.62	2.56
72-904-01	3/4"	1-1/16"-12	.81	1.87	3.71	2.62	5.62	3.07
72-905-01	1"	1-5/16"-12	1.00	2.12	4.15	3.12	6.62	4.91
72-906-01	1-1/4"	1-5/8"-12	1.25	2.32	4.65	3.43	8.00	7.73
72-907-01	1-1/2"	1-7/8"-12	1.50	2.64	5.23	3.56	8.00	10.21
72-908-01	2"	2-1/2"-12	1.75	3.00	5.84	4.18	9.00	14.88

**For Pressure/Temperature Ratings,
Refer to Page N-16, Graph No. 15**

Apollo® 73-100 Series

Carbon Steel Ball Valve

Threaded, 1/4" to 1" 2000 psig WOG, 1-1/4" to 2" 1500 psig WOG. Cold Non-Shock. 150 psig Saturated Steam. Vacuum Service to 29 inches Hg.
Federal Specification: WW-V-35C, Type: II, Composition: CS, Style: 3.

FEATURES

- Barstock design
- RPTFE seats and stuffing box ring
- Fire safe design when ordered with graphite packing
- Adjustable packing gland
- Blow-out-proof stem design
- Nitride corrosion protection

STANDARD MATERIAL LIST

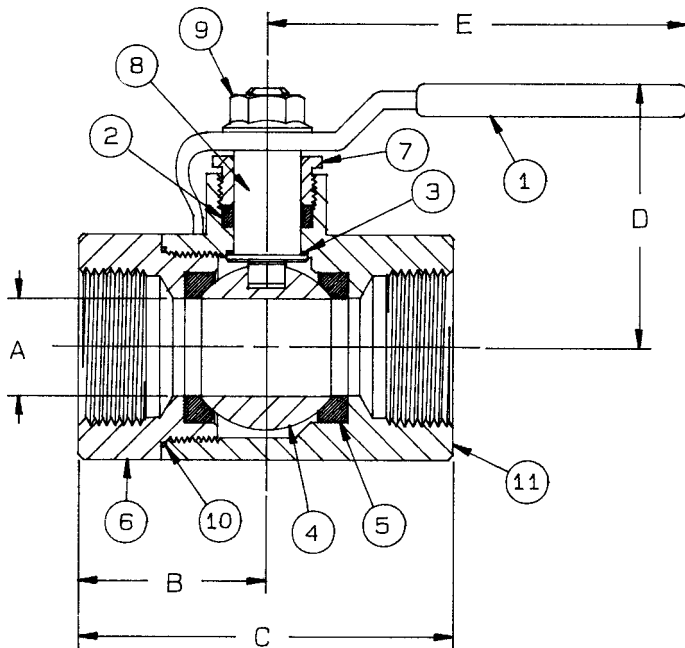
1. Lever and grip	Steel, zinc plated w/vinyl	7. Gland nut	A108-CS
2. Stem packing	RPTFE	8. Stem	A108-CS
3. Stem bearing	RPTFE	9. Lever nut	Steel, zinc plated
4. Ball	A108-CS chrome plated	10. Body seal (1-1/4" to 2")	PTFE
5. Seat (2)	RPTFE	11. Body	A108-CS
6. Retainer	A108-CS		

VARIATIONS AVAILABLE:

73-140 Series (316 SS Ball & Stem)
73-160 Series (NACE Trim)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 2"
-03-	1-1/4" Stem Extension	1/4" to 2"
-04-	2-1/4" Stem Extension	1/4" to 2"
-06-	2000 psig WOG	1-1/4" to 2"
-07-	Tee Handle	1/4" to 1-1/2"
-08-	90° Reversed Stem	1/4" to 2"
-10-	SS Lever & Nut	1/4" to 2"
-14-	Vented Ball (see page J-2)	1/4" to 2"
-15-	Round Handle	1/4" to 1-1/2"
-19-	Lock Plate	1/4" to 2"
-24-	Graphite Stem Packing	1/4" to 2"
-44-	Seal Welded	1/4" to 2"
-45-	Less Lever & Nut	1/4" to 2"
-56-	Multifill Seats	1/4" to 2"
-60-	Static Grounded Ball & Stem	1/4" to 2"
-64-	250 Lb. Steam Trim	1/4" to 2"
-P01-	BSPP (Parallel) Thread Connection	1/4" to 2"
-T01-	BSPT (Tapered) Thread Connection	1/4" to 2"



CARBON STEEL BALL VALVE

NUMBER	SIZE	A	B	C	D	E	Wt.
73-101-01	1/4"	.37	1.03	2.06	1.75	3.87	.66
73-102-01	3/8"	.37	1.03	2.06	1.75	3.87	.63
73-103-01	1/2"	.50	1.12	2.25	1.81	3.87	.75
73-104-01	3/4"	.68	1.50	3.00	2.12	4.87	1.58
73-105-01	1"	.87	1.68	3.37	2.25	4.87	2.07
73-106-01	1-1/4"	1.00	2.00	4.00	2.62	5.50	3.74
73-107-01	1-1/2"	1.25	2.18	4.37	2.87	5.50	5.31
73-108-01	2"	1.50	2.75	5.50	3.06	8.00	8.03

**For Pressure/Temperature Ratings,
Refer to Page N-15, Graph No. 13 (1/4"
to 1")
Refer to Page N-14, Graph No. 11
(1-1/4" to 2")**

Apollo® 73A-100 Series

Carbon Steel Ball Valve

AAR Approved #E999032

Threaded, 2000 psig WOG, Cold Non-Shock. 150 psig Saturated Steam.
 Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: CS, Style: 3.

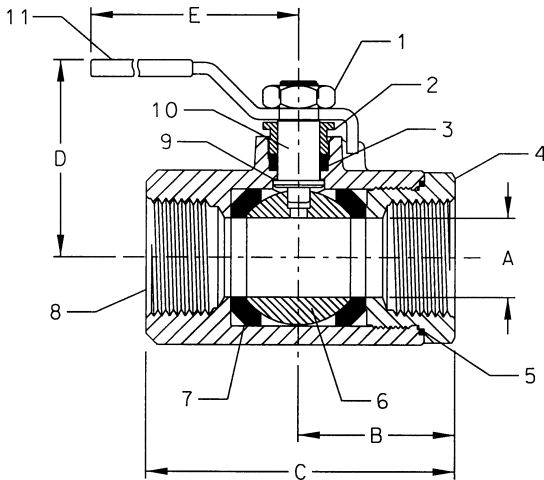
FEATURES

- RPTFE seats & packing
- Actuator mounting pads
- Forged construction
- Raised handle stops
- Blow-out-proof stem design
- Adjustable packing gland
- Nitride corrosion protection
- (-24) Fire safe to API 607 4th ed. class 600 burn

STANDARD MATERIAL LIST

1. Lever nut	Steel, zinc plated	6. Ball	A108-CS chrome plated
2. Gland nut	A108-CS	7. Seat (2)	RPTFE
3. Stem packing	RPTFE	8. Body	A105
4. Retainer	A108-CS	9. Stem bearing	RPTFE
5. Body seal	RPTFE (1/2" to 2")	10. Stem	A108-CS
		11. Lever/grip	Steel, zinc plated, with vinyl

VARIATIONS AVAILABLE: 73A-140- Series (316 SS Ball & Stem)
 (NACE compliant)



OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 2"
-03-	1-1/4" Stem Extension	1/4" to 2"
-04-	2-1/4" Stem Extension	1/4" to 2"
-07-	Tee Handle	1/4" to 1-1/2"
-08-	90° Reversed Stem	1/4" to 2"
-10-	SS Lever & Nut	1/4" to 2"
-14-	Vented ball	1/4" to 2"
-15-	Round Handle	1/4" to 1-1/2"
-24-	Graphite Stem Packing	1/4" to 2"
-27-	Latch Lock Lever	1/4" to 2"
-44-	Seal welded	1/4" to 2"
-45-	Less Lever & Nut	1/4" to 2"
-56-	Multi-fill Seats	1/4" to 2"
-60-	Static Grounded Ball & Stem	1/4" to 2"
-64-	250 Lb. Steam Trim	1/4" to 2"
-71-	Actuator Mtg. Drilled & Tapped	1/4" to 2"
-P01-	BSPP (Parallel) Thread Conn.	1/4" to 2"
-T01-	BSPT (Tapered) Thread Conn.	1/4" to 2"

CARBON STEEL BALL VALVE

NUMBER	SIZE	A	B	C	D	E
73A-101-01	1/4"	.37	1.02	2.53	1.72	3.85
73A-102-01	3/8"	.37	1.02	2.53	1.72	3.85
73A-103-01	1/2"	.50	1.18	2.29	1.78	3.85
73A-104-01	3/4"	.68	1.57	3.07	2.07	4.75
73A-105-01	1"	.87	1.73	3.40	2.18	4.75
73A-106-01	1-1/4"	1.00	1.98	3.97	2.72	5.50
73A-107-01	1-1/2"	1.25	2.14	4.32	3.12	7.75
73A-108-01	2"	1.50	2.73	5.44	3.27	7.75

**For Pressure/Temperature Ratings,
 Refer to Page N-15, Graph No. 13**

Apollo® 76-100 Series

Stainless Steel Ball Valve

Threaded, 1/4" to 1" 2000 psig WOG, 1-1/4" to 2" 1500 psig WOG, 2-1/2" to 3" 1000 psig WOG
 Cold Non-Shock. 150 psig Saturated Steam, Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: SS, Style: 3.

FEATURES

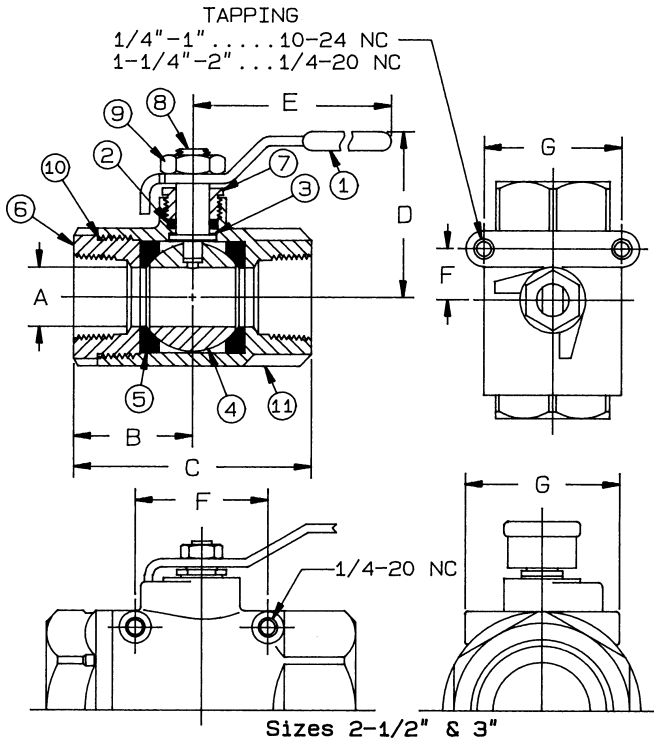
- Investment cast components
- RPTFE seats and stuffing box ring
- Mounting pad for easy actuator mounting
- Blow-out-proof stem design
- Adjustable packing gland
- Meets NACE MR-01-75
- SS lever and nut
- (-24) 1/4" to 2" Certified to API 607, 4th Edition, Class 600 burn

STANDARD MATERIAL LIST

1. Lever and grip	304 SS w/vinyl	7. Gland nut	A276-316
2. Stem packing	RPTFE	8. Stem	A276-316
3. Stem bearing	RPTFE	9. Lever nut	18-8 SS
4. Ball	A276-316	10. Body seal	PTFE
5. Seat (2)	RPTFE	(1-1/4" to 3")	
6. Retainer	A276-316 (1/4" to 1")	11. Body	A351-CF8M
	A351-CF8M (1-1/4" to 3")		

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 3"
-03-	1-1/4" Stem Extension	1/4" to 3"
-04-	2-1/4" Stem Extension	1/4" to 3"
-07-	Tee Handle	1/4" to 2"
-08-	90° Reversed Stem	1/4" to 3"
-14-	Vented Ball (see page J-2)	1/4" to 2"
-15-	Round Handle	1/4" to 2"
-16-	Vertical Chain Lever	3/4" to 2"
-19-	Lock Plate	1/4" to 2"
-21-	UHMWPE Seats (Non-PTFE)	1/4" to 3"
-24-	Graphite Stem Packing	1/4" to 3"
-27-	Latch Lock Lever	1/4" to 3"
-30-	CamLock Handle	1/4" to 2"
-32-	SS Tee Handle & Nut	1/4" to 2"
-35-	PTFE Trim	1/4" to 3"
-39-	SS Latch Lock Wheel Handle	1/4" to 2"
-40-	Cyl-Loc	1/4" to 2"
-44-	Seal Welded	1/4" to 2"
-45-	Less Lever & Nut	1/4" to 3"
-46-	Latch Lock Lever - Lock Close Only	1/4" to 3"
-47-	SS Latch Lock Oval Handle	1/4" to 1"
-48-	SS Oval Handle	1/4" to 2"
-49-	Assembled Dry	1/4" to 3"
-50-	2-1/4" Locking Stem Extension	1/4" to 3"
-57-	Cleaned For Gaseous Oxygen	1/4" to 3"
-58-	Horizontal Chain Lever	3/4" to 2"
-60-	Static Grounded Ball & Stem	1/4" to 3"
-64-	250 Lb. Steam Trim	1/4" to 3"
-P01-	BSPP (Parallel) Thread Connection	1/4" to 3"
-T01-	BSPT (Tapered) Thread Connection	1/4" to 3"



STAINLESS STEEL BALL VALVE

NUMBER	SIZE	A	B	C	D	E	F	G	Wt.
76-101-01	1/4"	.37	1.03	2.06	1.75	3.87	.50	1.12	.58
76-102-01	3/8"	.37	1.03	2.06	1.75	3.87	.50	1.12	.54
76-103-01	1/2"	.50	1.12	2.25	1.81	3.87	.50	1.12	.63
76-104-01	3/4"	.68	1.50	3.00	2.12	4.87	.87	1.37	1.27
76-105-01	1"	.87	1.68	3.37	2.25	4.87	.87	1.37	1.63
76-106-01	1-1/4"	1.00	2.00	4.00	2.62	5.50	.93	1.50	3.06
76-107-01	1-1/2"	1.25	2.18	4.37	3.05	8.00	.93	1.50	4.04
76-108-01	2"	1.50	2.75	5.50	3.24	8.00	.93	1.50	6.05
76-109-01	2-1/2"	2.50	3.37	6.75	4.12	8.00	2.75	3.37	15.57
76-100-01	3"	2.50	3.37	6.75	4.12	8.00	2.75	3.37	16.79

**For Pressure/Temperature Ratings,
 Refer to Page N-15, Graph No. 14 (1/4"
 to 1")
 Refer to Page N-14, Graph No. 12
 (1-1/4" to 2")
 Refer to Page N-12, Graph No. 8
 (2-1/2" to 3")**

Apollo® 76-ARX Series

Stainless Steel Std. Port Ball Valve with Actuator Ready ISO Mounting Pad

Threaded, 1/4"-1" 2000 psig WOG, 1-1/4"-2" 1500 psig WOG, 2-1/2"-3" 1000 psig WOG, Cold Non-Shock. 250 psig Saturated Steam.

Vacuum Service to 29 inches Hg.

Federal Specification: WW-V-35C, Type: II, Composition: SS, Style: 3.

FEATURES

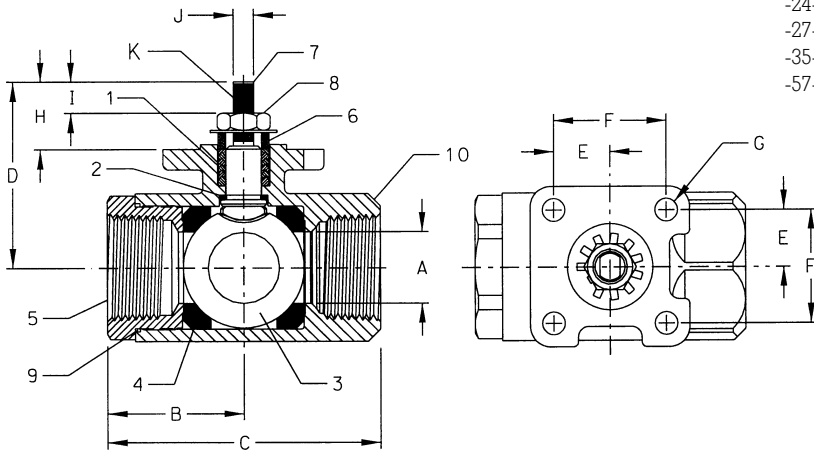
- Multi-piece packing set
- ISO 5211 mounting pad
- Blow-out-proof stem design
- Adjustable packing gland
- Live loaded packing

STANDARD MATERIAL LIST

1. Stem packing	MPTFE	6. Gland	A276-316
2. Stem bearing	RPTFE	7. Stem	A276-316
3. Ball	316 SS	8. Jam nut	SS
4. Seat (2)	MPTFE	9. Body seal	PTFE (1-1/4" to 3")
5. Retainer	A276-316 (1/4" to 1") A351-CF8M (1-1/4" to 3")	10. Body	A351-CF8M

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-14-	Vented Ball	1/4" to 3"
-24-	Graphite Stem Packing	1/4" to 3"
-27-	Latch Lock Handle	1/4" to 2"
-35-	PTFE Seats	1/4" to 3"
-57-	Oxygen Cleaned	1/4" to 3"



**For Pressure/Temperature Ratings,
Refer to Page N-15, Graph No. 14
(1/4" to 1")
Refer to Page N-14, Graph No. 12
(1-1/4" to 2")
Refer to Page N-12, Graph No. 8
(2-1/2" to 3")**

STAINLESS STEEL STD. PORT BALL VALVE WITH ISO MOUNTING PAD

NUMBER	SIZE	A	B	C	D	E	F	G	H	I	J (FLATS)	K (THRDS.) UNF	WT.
76-AR1-64	1/4"	.37	1.03	2.06	1.40	.59	1.17	.28	.61	.23	.247/.249	3/8-24	.52
76-AR2-64	3/8"	.37	1.03	2.06	1.40	.59	1.17	.28	.61	.23	.247/.249	3/8-24	.48
76-AR3-64	1/2"	.50	1.12	2.25	1.54	.59	1.17	.28	.61	.21	.247/.249	3/8-24	.58
76-AR4-64	3/4"	.68	1.50	3.00	2.16	.70	1.39	.28	.84	.37	.247/.249	3/8-24	1.26
76-AR5-64	1"	.87	1.68	3.37	2.28	.70	1.39	.28	.84	.37	.247/.249	3/8-24	1.62
76-AR6-64	1-1/4"	1.00	1.98	3.97	3.16	.98	1.95	.34	1.16	.54	.370/.372	5/8-18	3.22
76-AR7-64	1-1/2"	1.25	2.18	4.37	3.16	.98	1.95	.34	1.16	.58	.370/.372	5/8-18	4.06
76-AR8-64	2"	1.50	2.75	5.50	3.37	.98	1.95	.34	1.16	.55	.370/.372	5/8-18	6.18
76-AR9-64	2-1/2"	2.00	3.12	6.25	3.85	.98	1.95	.34	1.16	.54	.370/.372	5/8-18	12.96
76-AR0-64	3"	2.50	3.37	6.75	4.18	.98	1.95	.34	1.16	.54	.370/.372	5/8-18	17.06

Apollo® 77-100 Series

Bronze Full Port Ball Valve

Threaded, 600 psig WOG, Cold Non-Shock. 150 psig Saturated Steam.
 Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: BZ, Style: 3.

FEATURES

- Chromium plated ball
- RPTFE seats and stuffing box ring
- Mounting pad for easy actuator mounting
- Blow-out-proof stem design
- Adjustable packing gland
- Full port for full flow & min. pressure drop

STANDARD MATERIAL LIST

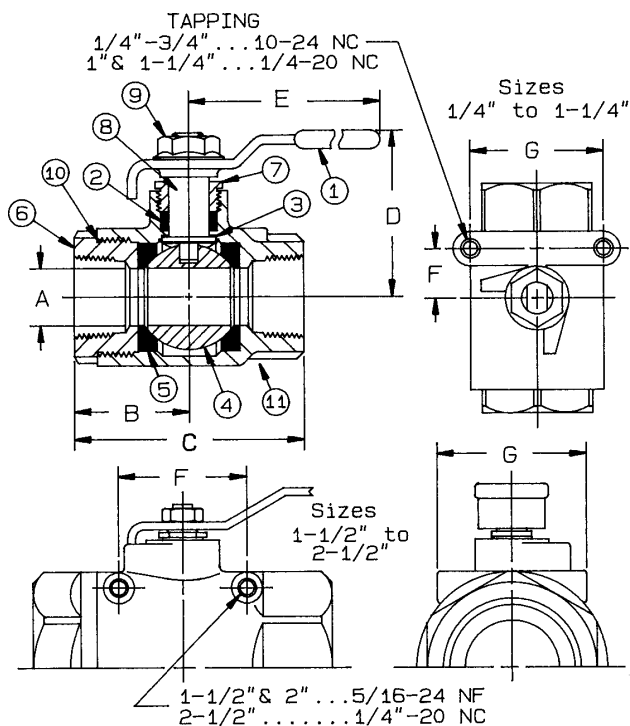
1. Lever and grip	Steel, zinc plated w/vinyl	10. Body seal	PTFE (1-1/4" to 2-1/2")
2. Stem packing	RPTFE	11. Body	B584-C84400
3. Stem bearing	RPTFE		
4. Ball	B16, chrome plated		
5. Seat (2)	RPTFE		
6. Retainer	B16 (1/4" to 1")		
	B584-C84400 (1-1/4" to 2-1/2")		
7. Gland nut	B16		
8. Stem	B16		
9. Lever nut	Steel, zinc plated		

VARIATIONS AVAILABLE:

- 77-140 Series (316 SS Ball & Stem)
- 77-150 Series (Original Balancing Stop)
- 77-190 Series (Locked Retainer)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 2-1/2"
-03-	1-1/4" Stem Extension	1/4" to 2-1/2"
-04-	2-1/4" Stem Extension	1/4" to 2-1/2"
-05-	Plain Ball	1/4" to 2-1/2"
-07-	Tee Handle	1/4" to 1-1/4"
-08-	90° Reversed Stem	1/4" to 2-1/2"
-10-	SS Lever & Nut	1/4" to 2-1/2"
-14-	Vented Ball (see page J-2)	1/4" to 2-1/2"
-15-	Round Handle	1/4" to 1-1/4"
-16-	Vertical Chain Lever	3/4" to 2-1/2"
-17-	Rough Chrome Plating	1/4" to 2-1/2"
-18-	Plain Yellow Grip	1/4" to 2-1/2"
-20-	Slot Vented Ball	1/4" to 2-1/2"
-24-	Graphite Stem Packing	1/4" to 2-1/2"
-27-	Latch Lock Lever	1/4" to 2-1/2"
-28-	Mounting Pad Not Drilled & Tapped	1/4" to 2-1/2"
-30-	CamLock Handle	1/4" to 1-1/4"
-32-	SS Tee Handle & Nut	1/4" to 1-1/4"
-35-	PTFE Trim	1/4" to 2-1/2"
-36-	SS High-Rise Round Handle & Nut	1/4" to 1-1/4"
-40-	Cyl-Loc	1/4" to 1-1/4"
-45-	Less Lever & Nut	1/4" to 2-1/2"
-46-	Latch Lock Lever - Lock Close Only	1/4" to 2-1/2"
-47-	SS Latch-Lock Oval Handle	1/4" to 3/4"
-48-	SS Oval Handle	1/4" to 2"
-49-	Assembled Dry	1/4" to 2-1/2"
-50-	2-1/4" Locking Stem Extension	1/4" to 2-1/2"
-56-	Multifill Seats	1/4" to 2-1/2"
-57-	Cleaned For Gaseous Oxygen	1/4" to 2-1/2"
-58-	Horizontal Chain Lever	3/4" to 2-1/2"
-60-	Static Grounded Ball & Stem	1/4" to 2-1/2"
-63-	Threaded x Solder	1/4" to 2-1/2"
-64-	250 Lb. Steam Trim	1/4" to 2-1/2"
-P01-	BSPF (Parallel) Thread Connection	1/4" to 2-1/2"
-T01-	BSPT (Tapered) Thread Connection	1/4" to 2-1/2"



BRONZE FULL PORT BALL VALVE

NUMBER	SIZE	A	B	C	D	E	F	G	Wt.
77-101-01	1/4"	.43	1.12	2.25	1.81	3.87	.50	1.12	.79
77-102-01	3/8"	.50	1.12	2.25	1.81	3.87	.50	1.12	.75
77-103-01	1/2"	.50	1.12	2.25	1.81	3.87	.50	1.12	.69
77-104-01	3/4"	.81	1.56	3.12	2.12	4.87	.87	1.37	1.83
77-105-01	1"	1.00	1.81	3.62	2.62	5.50	.93	1.50	3.32
77-106-01	1-1/4"	1.25	2.12	4.25	2.87	5.50	.93	1.50	5.05
77-107-01	1-1/2"	1.50	2.37	4.75	3.34	8.00	2.08	3.06	6.71
77-108-01	2"	2.00	2.65	5.37	3.71	8.00	2.41	3.52	11.75
77-109-01	2-1/2"	2.50	3.25	6.50	4.12	8.00	2.75	3.37	17.25

**For Pressure/Temperature Ratings,
 Refer to Page N-10, Graph No. 4**

Apollo® 77-ARX Series

Carbon Steel Full Port Ball Valve with Actuator Ready ISO Mounting Pad

Threaded, 1/4"-1" 2000 psig WOG, 1-1/4"-2" 1500 psig WOG, 2-1/2"-3" 1000 psig WOG, Cold Non-Shock. 150 psig Saturated Steam.
 Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: CS, Style: 3.

FEATURES

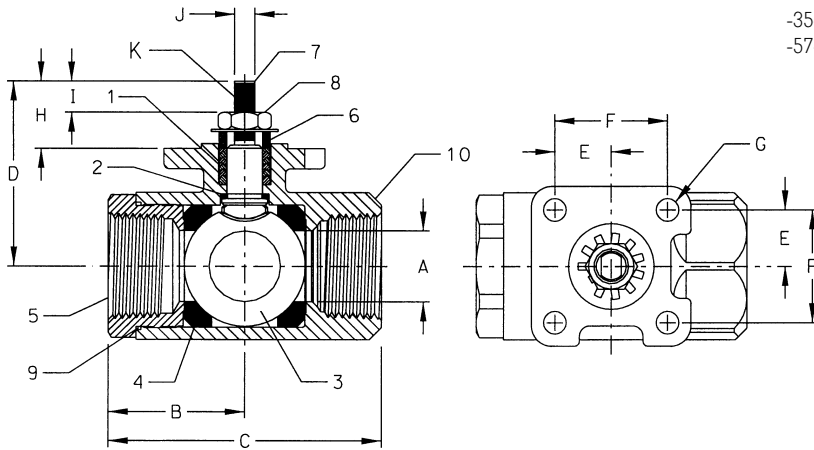
- Multi-piece packing set
- ISO 5211 mounting pad
- Stainless ball & stem
- Blow-out-proof stem design
- Adjustable packing gland
- Live loaded packing

STANDARD MATERIAL LIST

1. Stem packing	MPTFE	6. Gland	A276-316
2. Stem bearing	RPTFE	7. Stem	A276-316
3. Ball	316 SS	8. Jam nut	SS
4. Seat (2)	MPTFE	9. Body seal	PTFE (1-1/4" to 3")
5. Retainer	A108-CS (1/4" to 3")	10. Body	A216-WCB

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-14-	Vented Ball	1/4" to 3"
-24-	Graphite Stem Packing	1/4" to 3"
-27-	Latch Lock Handle	1/4" to 2"
-35-	PTFE Seats	1/4" to 3"
-57-	Oxygen Cleaned	1/4" to 3"



**For Pressure/Temperature Ratings,
 Refer to Page N-10, Graph No. 4**

CARBON STEEL STD. PORT BALL VALVE WITH ISO MOUNTING PAD

NUMBER	SIZE	A	B	C	D	E	F	G	H	I	J (FLATS)	K (THRDS.) UNF	WT.
77-AR1-64	1/4"	.37	1.03	2.06	1.40	.59	1.17	.28	.61	.23	.247/.249	3/8-24	.60
77-AR2-64	3/8"	.37	1.03	2.06	1.40	.59	1.17	.28	.61	.23	.247/.249	3/8-24	.57
77-AR3-64	1/2"	.50	1.12	2.25	1.54	.59	1.17	.28	.61	.21	.247/.249	3/8-24	.62
77-AR4-64	3/4"	.68	1.50	3.00	2.16	.70	1.39	.28	.84	.37	.247/.249	3/8-24	1.76
77-AR5-64	1"	.87	1.68	3.37	2.28	.70	1.39	.28	.84	.37	.247/.249	3/8-24	3.44
77-AR7-64	1-1/2"	1.25	2.18	4.37	3.16	.98	1.95	.34	1.16	.58	.370/.372	5/8-18	6.25
77-AR8-64	2"	1.50	2.75	5.50	3.37	.98	1.95	.34	1.16	.55	.370/.372	5/8-18	11.72

Apollo® 77-200 Series

Bronze Full Port Solder End Ball Valve

Solder End, 600 psig WOG, Cold Non-Shock. 150 psig Saturated Steam.
 Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: BZ, Style: 3.

FEATURES

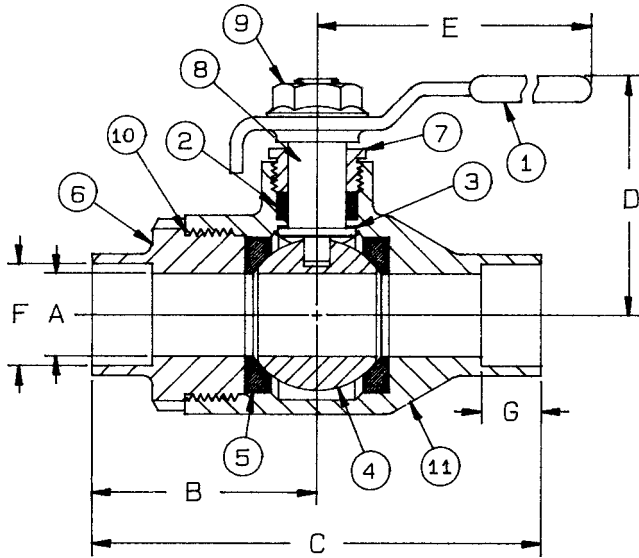
- Chromium plated ball
- RPTFE seats and stuffing box ring
- Full port for full flow & min. pressure drop
- Blow-out-proof stem design
- Adjustable packing gland

STANDARD MATERIAL LIST

1. Lever and grip	Steel, zinc plated w/vinyl	7. Gland nut	B16
2. Stem packing	RPTFE	8. Stem	B16
3. Stem bearing	RPTFE	9. Lever nut	Steel, zinc plated
4. Ball	B16 chrome plated	10. Body seal	PTFE
5. Seat (2)	RPTFE	(1-1/4" to 2-1/2")	
6. Retainer	B16 (3/4" to 1")	11. Body	B584-C84400
	B584-C84400 (1-1/4" to 2-1/2")		

VARIATIONS AVAILABLE:

77-240 Series (316 SS Ball & Stem)
 77-250 Series (Balancing Stop)



The 77-200 is designed to be soft soldered into lines without disassembly. This allows a tested valve to be installed without disturbing the seats and seals in any way. Soldering temperature not to exceed 500°F.

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	3/4" to 2-1/2"
-03-	1-1/4" Stem Extension	3/4" to 2-1/2"
-04-	2-1/4" Stem Extension	3/4" to 2-1/2"
-05-	Plain Ball	3/4" to 2-1/2"
-07-	Tee Handle	3/4" to 1-1/4"
-08-	90° Reversed Stem	3/4" to 2-1/2"
-10-	SS Lever & Nut	3/4" to 2-1/2"
-14-	Vented Ball (see page J-2)	3/4" to 2-1/2"
-15-	Round Handle	3/4" to 1-1/4"
-16-	Vertical Chain Lever	3/4" to 2-1/2"
-17-	Rough Chrome Plating	3/4" to 2-1/2"
-20-	Slot Vented Ball	3/4" to 2-1/2"
-24-	Graphite Stem Packing	3/4" to 2-1/2"
-27-	Latch Lock Lever	3/4" to 2-1/2"
-30-	CamLock Handle	3/4" to 1-1/4"
-32-	SS Tee Handle & Nut	3/4" to 1-1/4"
-35-	PTFE Trim	3/4" to 2-1/2"
-40-	Cyl-Loc	3/4" to 1-1/4"
-45-	Less Lever & Nut	3/4" to 2-1/2"
-46-	Latch Lock Lever - Lock Close Only	3/4" to 2-1/2"
-47-	SS Latch-Lock Oval Handle	3/4" ONLY
-48-	SS Oval Handle	3/4" to 2-1/2"
-49-	Assembled Dry	3/4" to 2-1/2"
-50-	2-1/4" Locking Stem Extension	3/4" to 2-1/2"
-56-	Multifill Seats	3/4" to 2-1/2"
-57-	Cleaned For Gaseous Oxygen	3/4" to 2-1/2"
-58-	Horizontal Chain Lever	3/4" to 2-1/2"
-60-	Static Grounded Ball & Stem	3/4" to 2-1/2"
-63-	Threaded x Solder	3/4" to 2-1/2"

BRONZE FULL PORT SOLDER END BALL VALVE

NUMBER	SIZE	A	B	C	D	E	F	G	Wt.
77-204-01	3/4"	.81	2.12	4.12	2.12	4.87	.878	.75	1.65
77-205-01	1"	1.00	2.33	4.64	2.62	5.50	1.129	.90	2.99
77-206-01	1-1/4"	1.25	2.60	5.15	2.87	5.50	1.378	.96	4.55
77-207-01	1-1/2"	1.50	3.00	6.00	3.34	8.00	1.629	1.09	6.04
77-208-01	2"	2.00	3.62	7.24	3.71	8.00	2.129	1.34	10.58
77-209-01	2-1/2"	2.50	3.93	7.87	4.12	8.00	2.630	1.48	15.53

**For Pressure/Temperature Ratings,
 Refer to Page N-10, Graph No. 4**

Apollo® 77-900 Series

Bronze Full Port SAE Straight Thread Ball Valve

Straight Threads, 600 psig WOG, Cold Non-Shock. 150 psig Saturated Steam.

Vacuum Service to 29 inches Hg.

Federal Specification: WW-V-35C, Type: II, Composition: BZ, Style: 3.

FEATURES

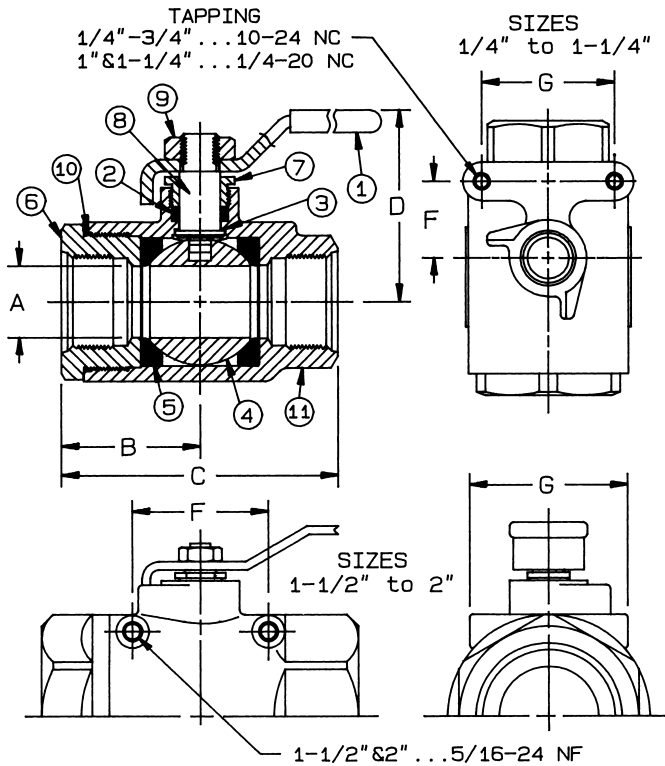
- Chromium plated ball
- RPTFE seats and stuffing box ring
- Mounting pad for easy actuator mounting
- Straight thread w/O-Ring boss connection
- Blow-out-proof stem design
- Adjustable packing gland
- Full port for full flow & min. pressure drop
- SAE J512/J514 Straight Thread O-Ring Boss

STANDARD MATERIAL LIST

1. Lever and grip	Steel, zinc plated w/vinyl	7. Gland nut	B16
2. Stem packing	RPTFE	8. Stem	B16
3. Stem bearing	RPTFE	9. Lever nut	Steel, zinc plated
4. Ball	Brass, chrome plated	10. Body seal	PTFE (1-1/4" to 2")
5. Seat (2)	RPTFE	11. Body	B584-C84400
6. Retainer	B16 (1/4" to 1")		
	B584-C84400 (1-1/4" to 2")		

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 2"
-03-	1-1/4" Stem Extension	1/4" to 2"
-04-	2-1/4" Stem Extension	1/4" to 2"
-07-	Tee Handle	1/4" to 2"
-08-	90° Reversed Stem	1/4" to 2"
-10-	SS Lever & Nut	1/4" to 2"
-15-	Round Handle	1/4" to 2"
-17-	Rough Chrome Plating	1/4" to 2"
-24-	Graphite Stem Packing	1/4" to 2"
-27-	Latch Lock Lever	1/4" to 2"
-30-	CamLock Handle	1/4" to 2"
-32-	SS Tee Handle & Nut	1/4" to 2"
-35-	PTFE Trim	1/4" to 2"
-46-	Latch Lock Lever - Lock Close Only	1/4" to 3"
-48-	SS Oval Handle	1/4" to 2"
-50-	2-1/4" Locking Stem Extension	1/4" to 2"



BRONZE FULL PORT SAE O-RING BOSS BALL VALVE

NUMBER	NOM. TUBE O.D.	SIZE	A	B	C	D	E	F	G	Wt.
77-901-01	1/4"	7/16"-20	.43	1.12	2.25	1.81	3.87	.50	1.12	.79
77-902-01	3/8"	9/16"-18	.50	1.12	2.25	1.81	3.87	.50	1.12	.75
77-903-01	1/2"	3/4"-16	.50	1.12	2.25	1.81	3.87	.50	1.12	.69
77-904-01	3/4"	1-1/16"-12	.81	1.56	3.12	2.12	4.87	.87	1.37	1.83
77-905-01	1"	1-5/16"-12	1.00	1.81	3.62	2.62	5.50	.93	1.50	3.32
77-906-01	1-1/4"	1-5/8"-12	1.25	2.12	4.25	2.87	5.50	.93	1.50	5.05
77-907-01	1-1/2"	1-7/8"-12	1.50	2.37	4.75	3.34	8.00	2.09	3.06	6.71
77-908-01	2"	2-1/2"-12	2.00	2.65	5.37	3.71	8.00	2.41	3.52	11.75

**For Pressure/Temperature Ratings,
Refer to Page N-10, Graph No. 4**

Apollo® 89-100 Series

Carbon Steel Ball Valve

NPT Threaded, 1/4" to 1" 2000 psig WOG, 1-1/4" to 2" 1500 psig WOG, 2-1/2" to 3" 1000 psig WOG
 Cold Non-Shock. 150 psig Saturated Steam. Vacuum Service to 29 inches Hg.
 Federal Specification: WW-V-35C, Type: II, Composition: CS, Style: 3.
 Complies with MSS SP-110

FEATURES

- Investment cast components
- RPTFE seats and stuffing box ring
- Mounting pad for easy actuator mounting
- Blow-out-proof stem design
- Adjustable packing gland
- Nitride corrosion protection
- (-24) Certified to API 607, 4th, Edition, Class 600 burn

STANDARD MATERIAL LIST

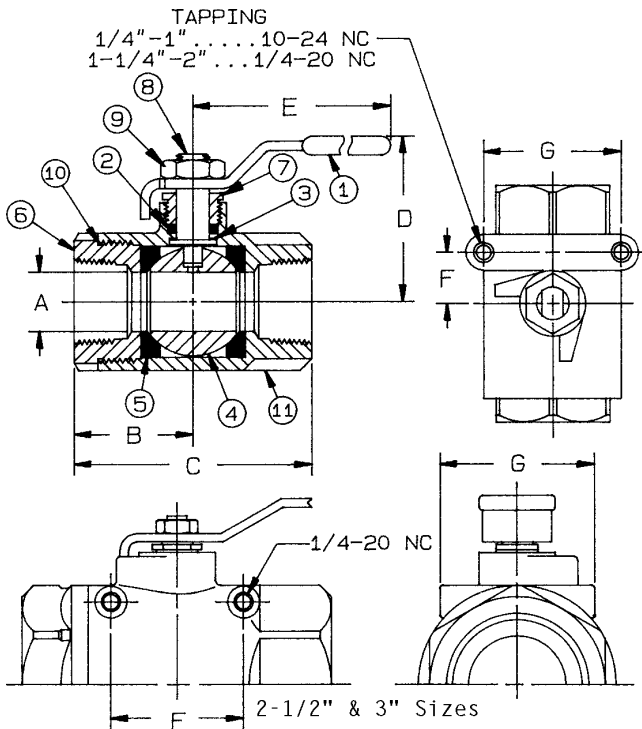
1. Lever and grip	Steel, zinc plated w/vinyl	9. Lever nut	Steel, zinc plated
2. Stem packing	RPTFE	10. Body seal	PTFE (1-1/4" to 3")
3. Stem bearing	RPTFE	11. Body	A216-WCB
4. Ball	A108-CS chrome plated		
5. Seat (2)	RPTFE		
6. Retainer	A108 CS (1/4" to 1")		
	A216-WCB (1-1/4" to 3")		
7. Gland nut	A108-CS		
8. Stem	A108-CS		

VARIATIONS AVAILABLE:

- 89-140 Series (316 SS Ball & Stem)
- 89-190 Series (Locked Retainer)

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 3"
-03-	1-1/4" Stem Extension	1/4" to 3"
-04-	2-1/4" Stem Extension	1/4" to 3"
-07-	Tee Handle	1/4" to 2"
-08-	90° Reversed Stem	1/4" to 3"
-10-	SS Lever & Nut	1/4" to 3"
-14-	Vented Ball (see page J-2)	1/4" to 3"
-15-	Round Handle	1/4" to 2"
-16-	Vertical Chain Lever	3/4" to 2"
-18-	Plain Yellow Grip	1/4" to 3"
-19-	Lock Plate	1/4" to 2"
-24-	Graphite Stem Packing	1/4" to 3"
-27-	Latch Lock Lever	1/4" to 3"
-30-	CamLock Handle	1/4" to 2"
-32-	SS Tee Handle & Nut	1/4" to 2"
-35-	PTFE Trim	1/4" to 3"
-39-	SS Latch Lock Wheel Handle	1/4" to 2"
-40-	Cyl-Loc	1/4" to 2"
-44-	Seal Welded	1/4" to 2"
-45-	Less Lever & Nut	1/4" to 3"
-46-	Latch Lock Lever - Lock Close Only	1/4" to 3"
-47-	SS Latch-Lock Oval Handle	1/4" to 1"
-48-	SS Oval Handle	1/4" to 2"
-50-	2-1/4" Locking Stem Extension	1/4" to 3"
-56-	Multifill Seats	1/4" to 3"
-58-	Horizontal Chain Lever	3/4" to 2"
-60-	Static Grounded Ball & Stem	1/4" to 3"
-64-	250 Lb. Steam Trim	1/4" to 3"
-P01-	BSPP (Parallel) Thread Connection	1/4" to 3"
-T01-	BSPT (Tapered) Thread Connection	1/4" to 3"



CARBON STEEL BALL VALVE

NUMBER	SIZE	A	B	C	D	E	F	G	Wt.
89-101-01	1/4"	.37	1.03	2.06	1.75	3.87	.50	1.12	.58
89-102-01	3/8"	.37	1.03	2.06	1.75	3.87	.50	1.12	.54
89-103-01	1/2"	.50	1.12	2.25	1.81	3.87	.50	1.12	.63
89-104-01	3/4"	.68	1.50	3.00	2.12	4.87	.87	1.37	1.27
89-105-01	1"	.87	1.68	3.37	2.25	4.87	.87	1.37	1.63
89-106-01	1-1/4"	1.00	2.00	4.00	2.62	5.50	.93	1.50	3.06
89-107-01	1-1/2"	1.25	2.18	4.37	3.05	8.00	.93	1.50	3.98
89-108-01	2"	1.50	2.75	5.50	3.24	8.00	.93	1.50	5.99
89-109-01	2-1/2"	2.50	3.37	6.75	4.05	8.00	2.75	3.37	15.57
89-100-01	3"	2.50	3.37	6.75	4.12	8.00	2.75	3.37	16.79

**For Pressure/Temperature Ratings,
 Refer to Page N-15, Graph No. 13 (1/4"
 to 1")
 Refer to Page N-14, Graph No. 11
 (1-1/4" to 2")**

Apollo® 89-ARX Series

Carbon Steel Std. Port Ball Valve with Actuator Ready ISO Mounting Pad

Threaded, 1/4"-1" 2000 psig WOG, 1-1/4"-2" 1500 psig WOG, 2-1/2"-3" 1000 psig WOG, Cold Non-Shock. 250 psig Saturated Steam.
Vacuum Service to 29 inches Hg.

Federal Specification: WW-V-35C, Type: II, Composition: CS, Style: 3.

FEATURES

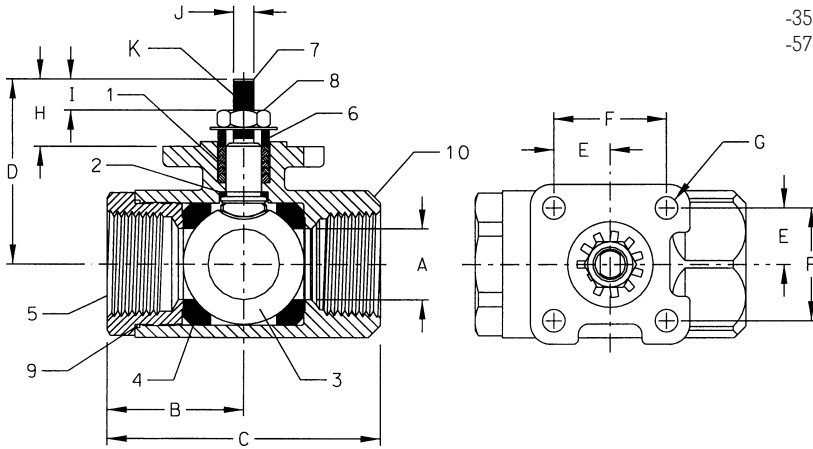
- Multi-piece packing set
- ISO 5211 mounting pad
- Stainless ball & stem
- Blow-out-proof stem design
- Adjustable packing gland
- Live loaded packing

STANDARD MATERIAL LIST

1. Stem packing	MPTFE	6. Gland	A276-316
2. Stem bearing	RPTFE	7. Stem	A276-316
3. Ball	316 SS	8. Jam nut	SS
4. Seat (2)	MPTFE	9. Body seal	PTFE (1-1/4" to 3")
5. Retainer	A108-CS (1/4" to 3")	10. Body	A216-WCB

OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-14-	Vented Ball	1/4" to 3"
-24-	Graphite Stem Packing	1/4" to 3"
-27-	Latch Lock Handle	1/4" to 2"
-35-	PTFE Seats	1/4" to 3"
-57-	Oxygen Cleaned	1/4" to 3"



**For Pressure/Temperature Ratings,
Refer to Page N-15, Graph No. 14
(1/4" to 1")
Refer to Page N-14, Graph No. 12
(1-1/4" to 2")
Refer to Page N-12, Graph No. 8
(2-1/2" to 3")**

CARBON STEEL STD. PORT BALL VALVE WITH ISO MOUNTING PAD

NUMBER	SIZE	A	B	C	D	E	F	G	H	I	J (FLATS)	K (THRDS.) UNF	WT.
89-AR1-64	1/4"	.37	1.03	2.06	1.40	.59	1.17	.28	.61	.23	.247/.249	3/8-24	.52
89-AR2-64	3/8"	.37	1.03	2.06	1.40	.59	1.17	.28	.61	.23	.247/.249	3/8-24	.49
89-AR3-64	1/2"	.50	1.12	2.25	1.54	.59	1.17	.28	.61	.21	.247/.249	3/8-24	.58
89-AR4-64	3/4"	.68	1.50	3.00	2.16	.70	1.39	.28	.84	.37	.247/.249	3/8-24	1.26
89-AR5-64	1"	.87	1.68	3.37	2.28	.70	1.39	.28	.84	.37	.247/.249	3/8-24	1.62
89-AR6-64	1-1/4"	1.00	1.98	3.97	3.16	.98	1.95	.34	1.16	.54	.370/.372	5/8-18	3.22
89-AR7-64	1-1/2"	1.25	2.18	4.37	3.16	.98	1.95	.34	1.16	.58	.370/.372	5/8-18	4.06
89-AR8-64	2"	1.50	2.75	5.50	3.37	.98	1.95	.34	1.16	.55	.370/.372	5/8-18	6.18
89-AR9-64	2-1/2"	2.00	3.12	6.25	3.85	.98	1.95	.34	1.16	.54	.370/.372	5/8-18	13.06
89-AR0-64	3"	2.50	3.37	6.75	4.18	.98	1.95	.34	1.16	.54	.370/.372	5/8-18	17.06

Apollo® 399-100 Series

Alloy-20 Ball Valve

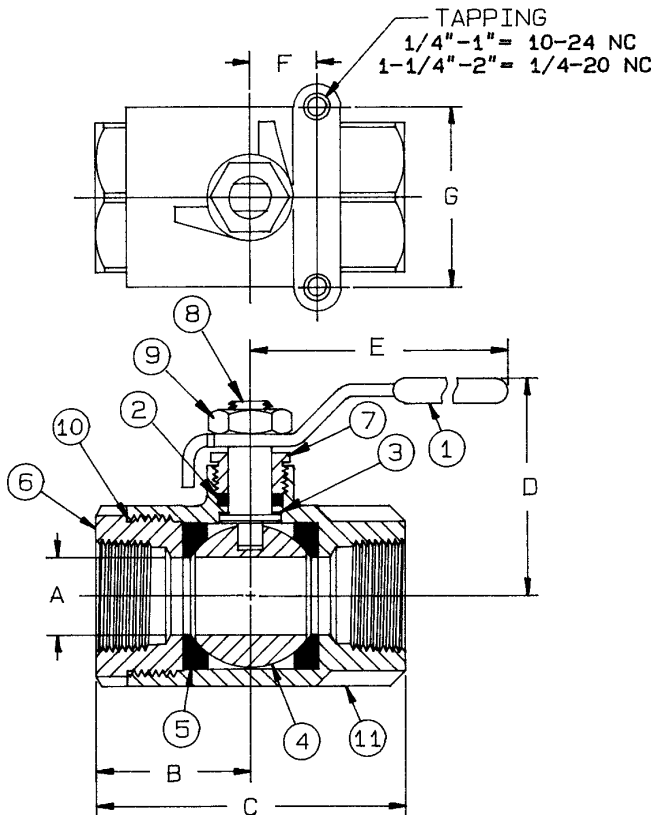
Threaded, 1/4" to 1" 2000 psig WOG, 1-1/4" to 2" 1500 psig WOG. Cold Non-Shock.
150 psig Saturated Steam. Vacuum Service to 29 inches Hg.
Federal Specification: WW-V-35C, Type: II, Composition: SS, Style: 3.

FEATURES

- Investment cast components
- RPTFE seats and stuffing box ring
- Mounting pad for easy actuator mounting
- (-24) Certified to API standard 607, 4th Edition, Class 600 burn
- Blow-out-proof stem design
- Adjustable packing gland
- Meets NACE MR-01-75

STANDARD MATERIAL LIST

1. Lever and grip	304 SS w/vinyl	7. Gland nut	316 SS
2. Stem packing	RPTFE	8. Stem	B473-N08020
3. Stem bearing	RPTFE	9. Lever nut	304 SS
4. Ball	B463-2OCB-3	10. Body seal	PTFE (1-1/4" to 2")
5. Seat (2)	RPTFE	11. Body	A351-CN7M
6. Retainer	B473-N08020 (1/4" to 1") A351-CN7M (1-1/4" to 2")		



OPTIONS AVAILABLE:

(SUFFIX)	OPTION	SIZES
-02-	Static Grounded	1/4" to 2"
-03-	1-1/4" Stem Extension	1/4" to 2"
-04-	2-1/4" Stem Extension	1/4" to 2"
-07-	Tee Handle	1/4" to 2"
-08-	90° Reversed Stem	1/4" to 2"
-14-	Vented Ball (see page J-2)	1/4" to 2"
-15-	Round Handle	1/4" to 2"
-16-	Vertical Chain Lever	3/4" to 2"
-18-	Plain Yellow Grip	1/4" to 2"
-19-	Lock Plate	1/4" to 2"
-21-	UHMWPE Seats (Non-PTFE)	1/4" to 2"
-24-	Graphite Stem Packing	1/4" to 2"
-27-	Latch Lock Lever	1/4" to 2"
-28-	Mounting Pad Not Drilled & Tapped	1/4" to 2"
-30-	CamLock Handle	1/4" to 2"
-32-	SS Tee Handle & Nut	1/4" to 2"
-35-	PTFE Trim	1/4" to 2"
-40-	Cyl-Loc	1/4" to 2"
-45-	Less Lever & Nut	1/4" to 2"
-46-	Latch Lock Lever - Lock Close Only	1/4" to 2"
-47-	SS Latch-Lock Oval Handle	1/4" to 1"
-48-	SS Oval Handle	1/4" to 2"
-49-	Assembled Dry	1/4" to 2"
-50-	2-1/4" Locking Stem Extension	1/4" to 2"
-56-	Multifill Seats	1/4" to 2"
-57-	Cleaned For Gaseous Oxygen	1/4" to 2"
-58-	Horizontal Chain Lever	3/4" to 2"
-60-	Static Grounded Ball & Stem	1/4" to 2"
-64-	250 Lb. Steam Trim	1/4" to 2"
-P01-	BSPP (Parallel) Thread Connection	1/4" to 2"
-T01-	BSPT (Tapered) Thread Connection	1/4" to 2"

ALLOY-20 BALL VALVE

NUMBER	SIZE	A	B	C	D	E	F	G	Wt.
399-101-01	1/4"	.37	1.03	2.06	1.75	3.87	.50	1.12	.58
399-102-01	3/8"	.37	1.03	2.06	1.75	3.87	.50	1.12	.54
399-103-01	1/2"	.50	1.12	2.25	1.81	3.87	.50	1.12	.63
399-104-01	3/4"	.68	1.50	3.00	2.12	4.87	.87	1.37	1.27
399-105-01	1"	.87	1.68	3.37	2.25	4.87	.87	1.37	1.63
399-106-01	1-1/4"	1.00	2.00	4.00	2.62	5.50	.93	1.50	3.06
399-107-01	1-1/2"	1.25	2.18	4.37	2.87	8.00	.93	1.50	4.04
399-108-01	2"	1.50	2.34	4.68	3.06	8.00	.93	1.50	6.05

**For Pressure/Temperature Ratings,
Refer to Page N-18, Graph No. 20 (1/4"
to 1")
Refer to Page N-18, Graph No. 19
(1-1/4" to 2")**