

HYDRONIC & STEAM HEATING **PRODUCTS**



FEED WATER REGULATORS

BALL VALVES

RELIEF VALVES

BACKFLOW PREVENTERS

IN-LINE CHECK VALVES

PIPELINE STRAINERS

BALANCING VALVES

PLUMBING SPECIALTIES



American Made Quality since 1928





A history of Quality, Service and Innovation

Now in its ninth decade, Conbraco Industries, Inc. is a leading manufacturer of flow control products for U.S. and international markets. The company's headquarters is based in Matthews, North Carolina with manufacturing plants and foundries located in Pageland and Conway, South Carolina.

Conbraco has a history of new product development and innovation that dates back to the company's inception in 1928. Today, the Conbraco line of products is marketed under the "Apollo Valves" brand and includes: ball valves, butterfly valves, backflow prevention devices, water pressure reducing valves, mixing valves, safety relief valves, water gauges, strainers, actuation and APOLLOXPRESS® products.

Conbraco's vertically integrated manufacturing ensures a consistency of production, testing, quality and availability. You can be assured that Conbraco flow control products will deliver long term reliability. All manufacturing facilities are ISO 9001:2008 certified.

The Conbraco line continues to expand with new products, designs and advanced materials to better serve the needs of our customers. Markets served include: chemical processing, pulp and paper, petroleum, residential and commercial plumbing and heating, OEM, irrigation, water works, and fire protection.



PAGELAND, SC
Bronze Foundry and Manufacturing Plant



PAGELAND, SC
Final Assembly and Distribution Center



CONWAY, SC
Steel Foundry and Manufacturing Plant



MATTHEWS, NC
Corporate Headquarters



Throughout this catalog, products that have a Lead Free* option will be identified with this logo.



* LEAD FREE: The wetted surfaces of this product shall contain no more than 0.25% lead by weighted average. Complies with CA AB1953, VT Act 193, MD HB372, LA HB471 and Federal Public Law 111-380. ANSI 3rd party approved and listed.

** Any imported products are clearly identified as "Apollo International™".

Conbraco Industries offers a wide range of Apollo® products for potable and non-potable applications. When the use of lead free valves is required by code, specification or legislation, it is the sole responsibility of our customers to ensure that only lead free Apollo® products are installed in systems intended for potable water service. Further information related to our product offering and the federal Reduction of Lead In Drinking Water Act is available at www.apollovalves.com/lead_free, or by contacting Conbraco Customer Service.

HYDRONIC & STEAM HEATING PRODUCTS

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HYDRONIC HEATING PRODUCTS

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58A	58A	Balancing Valve	6
58B	58B	Balancing Valve	7
FCT	35-403	Multi-Orifice Control Valve	7
FC	35FC	Flow Check Valve	7
BAV	58	Balancing Valve	8
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LOW PRESSURE STEAM HEATING PRODUCTS

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RELATED PRODUCTS

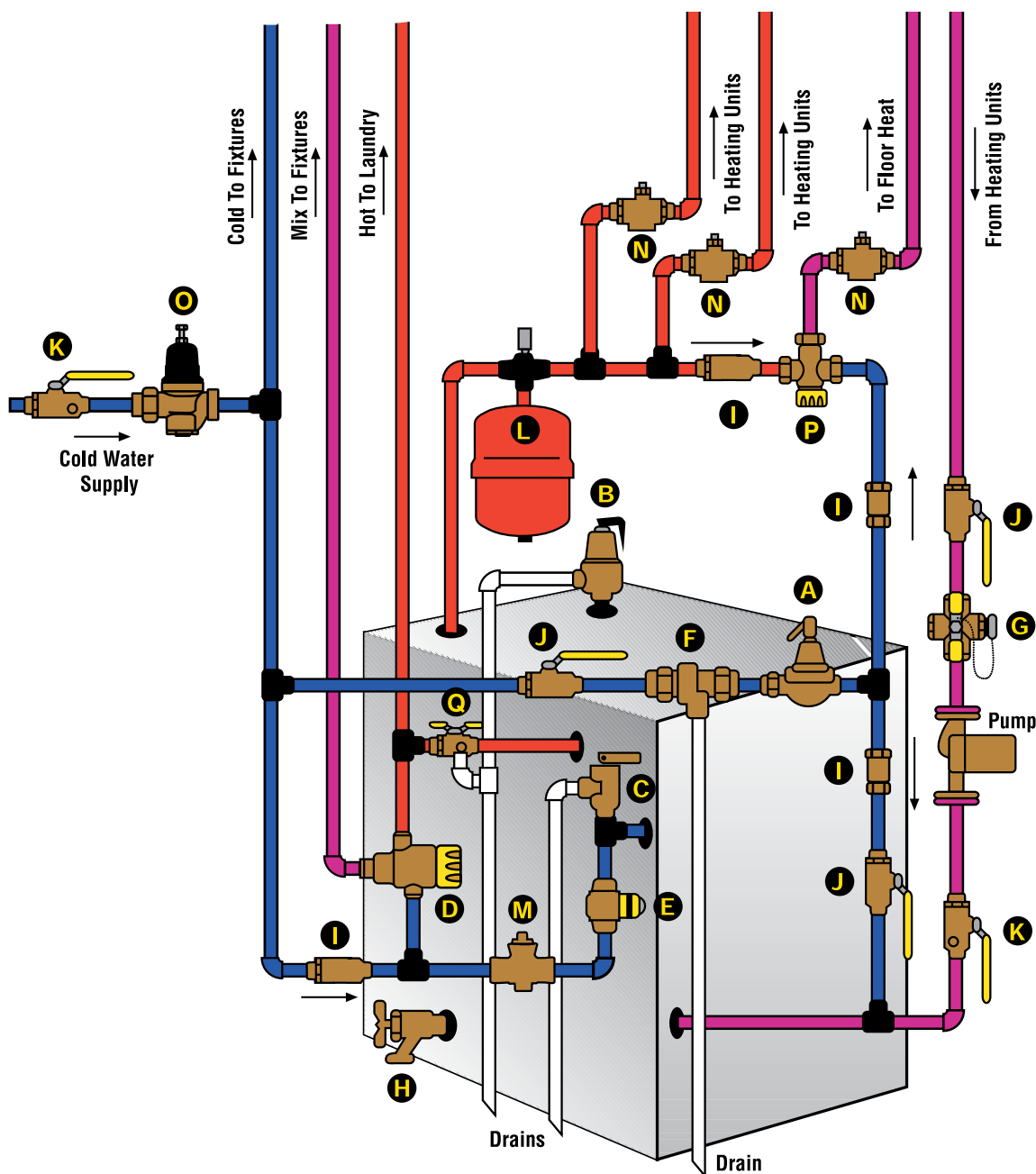
Model #	Series	Description	
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77F	77F	Full Port Threaded Brass Ball Valve	26
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MISCELLANEOUS

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HYDRONIC & STEAM HEATING PRODUCTS



- A Bronze Body Feed Water Regulator** – 35-703-01 (FFS12)
- B ASME Section IV Water Boiler Safety Relief Valve**
– 10-102-05 (RVW10F)
- C Pressure Relief Valve (Tankless Coil)** – 17-401-04 (RVW1712150)
- D Thermostatic Mixing Valve** – 34A-200(MVA)
- E Flow Control Valve (Tankless Coil)** – 35-403-01 (FCT12)
- F Backflow Preventer** – 40-4A3-3AM (DCAP12)
- G Purge/Balancing Valve** – 78-668-01 (PBSS34)
- H Boiler Drain Valve** – 31-202-04 (BD9034)

- I Bronze Check Valve** – 61 Series (CVB)
- J Apollo® Ball Valve** – 70 Series
- K Apollo® Ball Valve – Stop and Drain** 95-204-01
- L Hydronic Expansion Tank** – 16-XT (EXT)
- M Balancing Valve** – 58-004-01 (BAV34)
- N All Bronze Hydronic Flow Check** – 35-FC Series (FC)
- O Bronze Body Water Pressure Reducing Valve** – 36E Series (PRE)
- P Hot Water Tempering Valve** – 34 Series (TV)
- Q Thermal Expansion Control Valve** – 78 RV Series (EXV)

HYDRONIC & STEAM HEATING PRODUCTS

Water Pressure Reducing Valves

MODEL PRE

LIGHT DUTY RESIDENTIAL & COMMERCIAL APPLICATION



Designed for light duty residential and commercial applications to protect water supplies from excessive pressure. Excellent flow performance at low pressure drop. The dezincification resistant bronze body and dielectric polymer cage provide maximum corrosion resistance. Designed for easy in-line servicing with simple cartridge removal. They meet ASSE 1003 and CSA B356 standards. They are listed with IAPMO and the city of Los Angeles.

FEATURES

- Balanced piston design
- Sealed cage for vault installations
- Built-in thermal expansion by-pass
- Integral stainless steel strainer
- Modular seat disc and strainer cartridge
- Control pressure ranges: 15-75 psi and 75-150 psi
- NPT, Solder, PEX, CPVC and Press and Push connections
- Maximum supply pressure: 400 psig
- Working temperature range: 33°F-180°F
- 100% manufactured in USA
- Lead Free option (36ELF)



MODEL NUMBER MATRIX

PRE	X	X	X	X	
UNION		PRESSURE SETTING (ADJ)	SIZE	CONNECTION	LEAD FREE
Blank = Single Union x NPT		Blank = 15-75 psig	12 = 1/2"	Blank = FNPT	LF = Lead Free
D = Double Union		H = 75-125 psig	34 = 3/4"	S = Solder	
T = No Union			1 = 1"	C = CPVC	
				P = Push	
				X = PEX	
				PR = Press	

PART NUMBER MATRIX

36E						
36ELF -	1	X	X	X	X	X
	STYLE	UNION	SIZE	OPTION	PRESSURE	CONNECTION
36E = Standard		0 = No Union NPT	3 = 1/2"	0 = Standard	1 = 15-75 psig	T = FNPT Thread
36ELF = Lead Free		1 = Single Union	4 = 3/4"	B = Bronze	3 = 75-150 psig	S = Solder
		2 = Double Union	5 = 1"	Cap		C = CPVC
						P = Push
						X = PEX
						PR = Press

HYDRONIC & STEAM HEATING PRODUCTS

Hydronic Heating Specialties

MODEL FF



ALL BRONZE FEED WATER PRESSURE REGULATORS

Available in 1/2" union threaded, threaded and solder union configurations. Purge lever/fast fill feature. Cartridge replaceable in-line.

FEATURES

- No cage screws to rust
- Individually set at 15 psig - Adjustable 10 to 25 psig
- Temperatures to 210°F
- Heavy pattern bronze body and spring cover
- High capacity
- SS strainer, in-line, standard
- Choice of inlet connections

Model Number	Part Number	Size (in.)	Height (in.)	Length (in.)	Wt./100 (lbs.)
FF12	35-503-01	1/2 Union Threaded	5.25	4.31	255
FFT12	35-603-01	1/2 Threaded	5.25	3.50	225
FFS12	35-703-01	1/2 Solder Union	5.25	3.18	232
FFPR12	35-803-01	1/2 Press Union x NPT	5.25	4.53	232



MODEL FFB



ALL BRONZE COMBINATION DCAP BACKFLOW PREVENTER AND FEED WATER REGULATORS

Positive protection against backflow when supply pressure falls below system pressure. Assembly combines FWR feedwater regulator and DCAP dual check assembly backflow preventer.

FEATURES

- Purge lever/fast fill feature
- Designed for continuous pressure, hot or cold water service
- Built-in strainer
- Max pressure 175 psig
- Max temp 210°F
- Series 40-400 Backflow device is ASSE and CSA listed

Model Number	Part Number	Size (in.)	Height (in.)	Length (in.)	Wt./100 (lbs.)
FFB12	35-6A3-BF	1/2 Union NPT x NPT	5.25	8.50	450
FFBS12	35-6H3-BF	1/2 Solder Union x NPT	5.25	8.50	440
FFB12C	35-6A3-BFC*	1/2 Union NPT x NPT	5.25	8.50	450
FFBS12C	35-6H3-BFC*	1/2 Solder Union x NPT	5.25	8.50	440
FFBPR12	35-6A3-BF-PR	1/2 Press Union x NPT	5.25	9.17	450



*"C" Models for Canadian market - Discharge port not threaded.



MODEL 58A



BALANCING VALVES

Apollo Model 58A balance provide two position hydronic circuit isolation capability and multi-turn throttling adjustment required for proportional balancing of hydronic systems. The valve has a unique needle valve adjustment, with integrated digital readout. Available in NPT, Solder and XPress connections.

FEATURES

- DZR Brass body
- P/T plugs
- Compatible with all flow meters
- Easy adjustment and setpoint indicator
- Reversible lever
- Isolated flow shut-off does not affect adjustments
- Connection options include: Thread (-T), Solder (-S), Press (-PR)

Series Number	Size (in.)	Connection	C _v	Wt. (lbs.)
58A103 T	1/2	NPT/SWEAT/PRESS	1.79	1.1
58A104 T	3/4	NPT/SWEAT/PRESS	4.51	1.4
58A105 T	1	NPT/SWEAT/PRESS	8.18	1.8
58A106 T	1-1/4	NPT/SWEAT/PRESS	13.89	3.3
58A107 T	1-1/2	NPT/SWEAT/PRESS	23.9	4.3
58A108 T	2	NPT/SWEAT/PRESS	33.77	6.0

www.apollovalves.com

Customer Service (704) 841-6000



HYDRONIC & STEAM HEATING PRODUCTS

Hydronic Heating Specialties

MODEL 58B



BALANCING VALVES

Apollo Model 58B balance valves proportionally balance hydronic systems. Flow measurement is achieved through an integrated venturi flow meter affixed to an Apollo LD-141 ductile iron butterfly valve. Available in Flanged Connections 2-1/2" – 12".

FEATURES

- P/T plugs
- Compatible with All Flow Meters
- Easy Adjustment and Setpoint Indicator
- Compatible with ANSI 125# & 150# Flanges
- Memory Stop feature
- Conforms to MSS SP-67 & API 609
- Meets performance requirements of AWWA C-504

Series Number	Size (in.)	Connection	Cv	Wt. (lbs.)
58B109F	2-1/2	FLANGED	194.5	57
58B100F	3	FLANGED	194.5	63
58B10AF	4	FLANGED	415	81
58B10BF	5	FLANGED	585	92
58B10CF	6	FLANGED	1170	107
58B10EF	8	FLANGED	2240	156
58B10GF	10	FLANGED	2921	200
58B10HF	12	FLANGED	3977	250

MODEL FCT



MULTI-ORIFICE CONTROL VALVE

Provides flow control on tankless heaters; for delivery of 2-1/2, 3, 3-1/2, and 4 GPM. Easy adjustment.

FEATURES

- Maximum temperature: 250°F
- Maximum pressure: 150 psig

Model Number	Part Number	Size (in.)	Height (in.)	Length (in.)	Wt./100 (lbs.)
FCT12	35-403-01	1/2 Solder	2.11	2.00	42.8

MODEL FC



ALL BRONZE HYDRONIC FLOW CHECK VALVES

The flow check is designed to provide positive shut-off when water service is interrupted.

FEATURES

- Corrosion resistant
- Wear resistant metal to metal seat
- Replaceable seat assembly
- By-pass option
- Sweat, thread or press connections available
- Designed for easy maintenance
- Suitable for hot or cold water service
- Maximum working pressure 50 psi. for 3/4" - 1-1/4" 125 psig for 1-1/2" - 2"
- Maximum operating temperature 250°F

Model Number	Part Number	Size (in.)	Connection	Wt./100 (lbs.)
FC34	35-FC4-01	3/4	NPT	233
FC1	35-FC5-01	1	NPT	261
FC114	35-FC6-01	1-1/4	NPT	502
FC112	35-FC7-01	1-1/2	NPT	867
FC2	35-FC8-01	2	NPT	1220
FCS34	35-FC4-02	3/4	Sweat	112
FCS1	35-FC5-02	1	Sweat	155
FCPR34	35FC401PR	3/4	Press	254
FCPR1	35FC501PR	1	Press	296



HYDRONIC HEATING PRODUCTS

Hydronic Heating Specialties

MODEL BAV



BALANCING VALVES

Provide dependable hydronic control; for use with 1/2" and 3/4" copper water piping. Pressure rated to 150 psig.

Model Number	Part Number	Size (in.)	Cv	Wt./100 (lbs.)
BAV12	58-003-01	1/2 Solder	4	30.0
BAV34	58-004-01	3/4 Solder	14	53.4

MODEL PBSS



BRONZE PURGE, BALANCE & SHUT-OFF VALVE

Straight-through flow; all brass cover and chain prevent accidental system drainage; hose thread connection for disposal of drained media.

FEATURES

- RPTFE seals
- Adjustable packing
- Zinc plated steel tee handle w/ vinyl grips
- 600 Psig CWP in open position
- Solder x Solder x Hose Connections

Model Number	Part Number	Size (in.)	Wt./100 (lbs.)
PBSS34	78-668-01	3/4	206
PBSS1	78-668-02	1	359
	78-671-01*	3/4	198

* Available with screwdriver slotted stainless steel stem.

EXT (16-XT) SERIES



EXPANSION TANKS FOR HYDRONIC SYSTEMS

Conbraco non-potable expansion tanks help maintain balanced pressure throughout a hot water heating system by absorbing thermal expansion. Pre-pressurized, they're designed to prevent system damage and unnecessary discharges by relief valves and ensure long, trouble-free system life.

FEATURES

- Welded steel construction
- Rugged flexible diaphragm
- Pre-charged at 12 psig
- Compact design saves energy and space
- Glycol compatible
- Maximum working pressure: 150 psig
- Ideal for peak use systems such as car washes, processing plants, hotels/motels, commercial laundries.
- 1 year warranty
- Made in USA

Part Number	Capacity (gal.)	Exp. Vol. (gal.)	Connection	A	B	Net Wt. (lbs.)
16-XT1-03	2.1	1.4	1/2 NPT	11.75	8.00	6.3
16-XT3-03	5.0	3.0	1/2 NPT	16.00	10.50	11.5
16-XT5-03	6.0	4.2	1/2 NPT	14.00	12.75	13.7
16-XT7-03	14.0	8.5	1 NPT	20.00	15.75	24.0

HYDRONIC HEATING PRODUCTS

Dual Check With Atmospheric Port

MODEL DCAP

DUAL CHECK WITH ATMOSPHERIC PORT BACKFLOW PREVENTER



Protects residential and commercial water supply lines from back-siphonage or back-pressure of non-potable substances. Suitable for hot or cold water service. Low head loss.

FEATURES

- Approved by **ASSE & CSA**
- Maximum working pressure: 175 psig
- Independently acting check valves
- Sizes 1/2" and 3/4"
- Corrosion resistant
- Economical
- Durable
- Easy to install, maintain and repair
- Operating temperature: 33°F to 210°F
- Designed, manufactured, assembled and tested in South Carolina, USA

PART NUMBER MATRIX

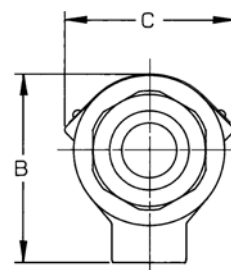
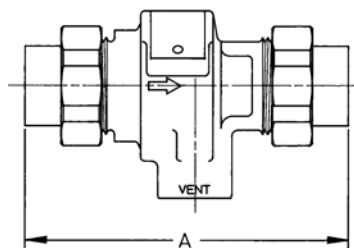
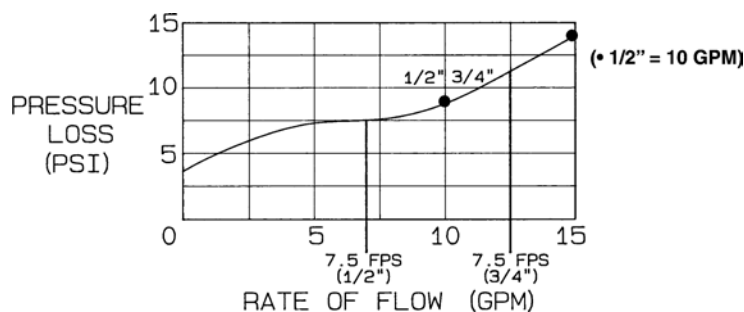
40 [X]	4 X	X - X	X	M	X
	UNION INLET CONNECTION	INLET AND OUTLET SIZE	UNION OUTLET CONNECTION	OPTION	
40 = Standard 40LF = Lead Free	A = FNPT H = Solder joint 2 = Female BSPP P = Press	3 = 1/2" 4 = 3/4"	A = FNPT B = MNPT F = Female BSPP H = Solder joint P = Press	C = Canadian (discharge port not threaded)	

MODEL NUMBER MATRIX

DCAP [X]	X	X
INLET CONNECTION	OUTLET CONNECTION	INLET AND OUTLET SIZE (IN.)
F – FNPT S – Solder joint B – Female BSPP P – Press (1/2" only)	F – FNPT M – MNPT S – Female BSPP B – Solder joint P – Press (1/2" only)	12 = 1/2" 34 = 3/4"

FLOW CURVES

(*) Rated flow as determined by USC's FCCC&HR and ASSE design performance standards.



Dimensions (in.) Size (in.)	Weights (lbs.) 1/2, 3/4
A	5.00
B	2.94
C	2.62
Unit Weight	1.90

HYDRONIC HEATING PRODUCTS

Reduced Pressure Principle Devices

MODEL RP 4A

REDUCED PRESSURE PRINCIPLE



The Apollo Series RP 4A Reduced Pressure Principle Backflow Preventer is designed to give maximum protection against backflow caused by either back-pressure or back-siphonage from substances that are hazardous. The durable but economical device is easily maintained in the line with modular check cartridge assemblies that require no special tools. It consists of two independently acting spring-loaded check valves with an automatic differential relief valve located between the check valves. All testcocks are mounted at the top of the unit to assure easy access during repair and maintenance when unit is installed in tight places.

FEATURES

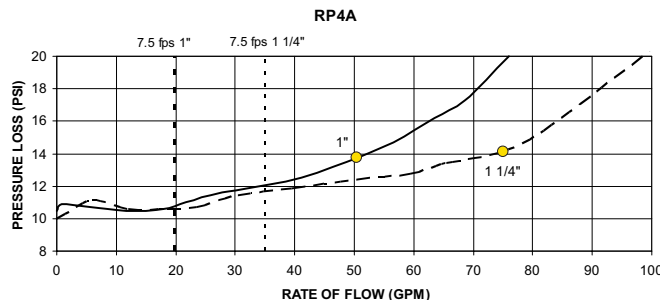
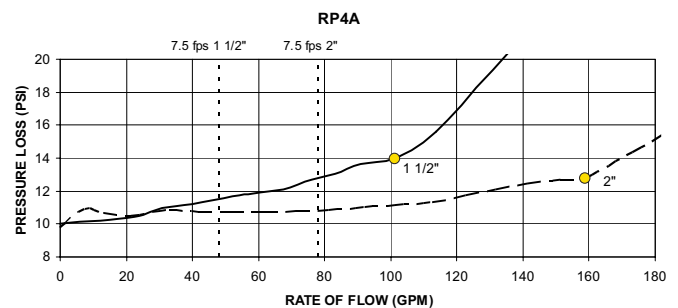
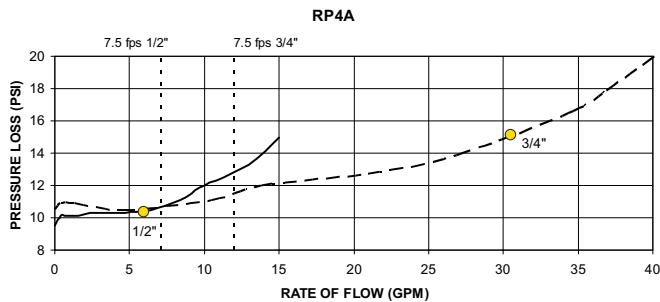
- Maximum protection against back-pressure/back-siphonage
- Modular check valve cartridges w/easily replaced parts
- Reversible/removable chloramine-resistant silicone seat discs
- Low head pressure loss
- Top mounted test cocks
- Threaded testcock protectors
- Internal sensing passage
- ASSE 1013 (other approvals pending)
- CSA B64.4
- Lead-Free option
- UL Classified (less shut-offs)
- USC FCCHR *
- Standard with Apollo® full port ball valves with stainless steel handles
- Corrosion resistant
- Maximum working pressure 175 psig
- Operating temperature range 33°F-180°F
- Horizontal installation approvals on 1/2" through 2"
- Designed, manufactured, assembled and tested in South Carolina, USA
- 5 year, domestic warranty
- * Contact factory for approval details

PART NUMBER MATRIX

4A [X]	2 X	X	T X	X
	Y-STRAINER	SIZE	SHUT-OFF VALVES	OPTIONS (CAN BE COMBINED)
4A = Standard 4ALF = Lead Free	0 = Standard 1 = With Y-Strainer (Shipped loose)	3 = 1/2" 4 = 3/4" 5 = 1" 6 = 1-1/4" 7 = 1-1/2" 8 = 2"	1 = Less ball valves 2 = w/ball valves (Standard) 4 = w/union ball valves	F = SAE threaded test cocks (standard 1/2, 3/4", 1") L = Lever handle (3/4" & 1" only) LL = Locking lever handles (1-1/4", 1-1/2", 2")* LT = Locking tee handles (3/4" - 1") PR = Press P = Push

FLOW CURVES

(*) Rated flow as determined by USC's FCCC&HR and ASSE design performance standards.

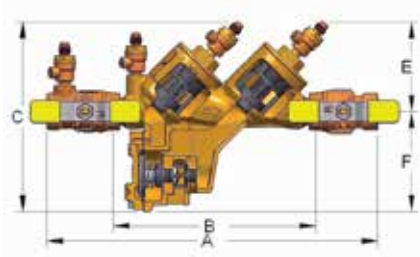


HYDRONIC HEATING PRODUCTS

Reduced Pressure Principle Devices

MODEL RP 4A (CONT'D)

REDUCED PRESSURE PRINCIPLE



Dimensions												
Model No. Factory No. Size	RP4A12 4A 203 T 1/2"	RP4A12 4A 203 T 15 mm.	RP4A34 4A 204 T 3/4"	RP4A34 4A 204 T 20 mm.	RP4A1 4A 205 T 1"	RP4A1 4A 205 T 25mm.	RP4A114 4A 206 T 1-1/4"	RP4A114 4A 206 T 32 mm.	RP4A112 4A 207 T 1-1/2"	RP4A112 4A 207 T 40 mm.	RP4A2 4A 208 T 2"	RP4A2 4A 208 T 50 mm.
A	11-1/8	283	12-3/4	324	14-5/8	371	18-5/8	473	18-3/4	476	21-1/8	537
B	7-3/8	187	8-1/2	216	9-1/2	241	11-3/4	298	11-5/8	295	12-3/4	324
C	7-1/8	181	7-3/8	187	8	203	9-7/8	251	9-7/8	251	11	279
D	2-7/8	73	3-1/8	79	3-1/4	83	5-1/8	130	5-1/8	130	5-7/8	149
E	3-1/4	83	3-1/2	89	4	100	4-1/2	114	4-1/2	114	5	127
F	3-7/8	98	3-7/8	98	4	100	5-3/8	137	5-3/8	137	6	150
WEIGHTS	lbs.	kg.	lbs.	kg.	lbs.	kg.	lbs.	kg.	lbs.	kg.	lbs.	kg.
Net Wt.	7.2	3.3	8.8	4.0	12.6	5.7	18.5	8.4	21.5	9.8	33.4	15.1

Backflow Preventer Accessories

MODEL AGD

AIR GAP DRAIN



For installation with Conbraco's RP4A Series Reduced Pressure Principle backflow preventers.

The Apollo Air Gap Drain (AGD) is designed to funnel minor relief valve discharges, due to line pressure fluctuations and /or minor check valve fouling, into the drainage system. Drain piping is easily attached to the drain's threaded bottom.

Note: The AGD is NOT designed to collect the full discharge capacity of the relief valve.

Dimensions - in.(mm) – Weights - lbs.(kg)					
R.P. 4A Series	AGD4A Model No.	A	B	C	Wt./Ea
1/2", 3/4", 1"	AGD4A1	6.5 (165)	3.4 (86)	1" NPT	.10 (.05)
1-1/4" - 1-1/2"	AGD4A112	8.5 (216)	4.1 (104)	1-1/2" NPT	.20 (.10)
2"	AGD4A2	10.0 (254)	5.3 (135)	2" NPT	.35 (.16)

HYDRONIC HEATING PRODUCTS

ASME Section IV Hot Water Relief Valves

MODEL RVW30



10-102



10-104



MODEL NUMBER MATRIX

RVW 10 [X]	X	XX
INLET	FINISH	PRESSURE SETTING
Blank - 3/4" NPT F - 3/4" FNPT	Blank - plain brass C - satin chrome P - polished chrome	

SECTION IV ASME HOT WATER RELIEF VALVES

These capacity-certified relief valves protect against excessive water pressure (from thermal expansion) and steam generated when Btu input controls fail. Valves comply with ASME Section IV requirements. Ideal for use with hot water boilers and heating systems.

FEATURES

- Brass or bronze body available with optional satin or polished chrome finish
- Maximum temperature service: 250°F
- Registered in all Canadian provinces and territories, CRN #0G8547.5C
- Stainless steel springs standard

Model Number	Part Number	Size(in.) Inlet NPT	Size(in.) Outlet NPT	Certified Pressure Range psig	Height (in.)	Wt./100 (lbs.)	*Certified Capacity 30 psig
RVW10F	10102-05*	3/4 F	1 F	20-60	3.41	1.05	710,000
RVW10	10104-05*	3/4 M	1 F	20-60	3.82	1.18	710,000

*National Board Capacity Certified – Btu Per Hour (90% of actual capacity at 10% accumulation)
ASME boiler and pressure vessel code – Section IV – Heating Boilers

SUFFIX KEY Part Number Pressure psig	Plain Brass	Satin Chrome	Polished Chrome
20	-02	-41	-67
22	-03	-42	-68
25	-04	-43	-69
30	-05	-44	-70
35	-06	-45	-71
40	-07	-46	-72
43	-08	-47	-73
45	-09	-48	-74
50	-10	-49	-75
55	-11	-50	-76
60	-12	-51	-77

Note: When ordering, specify pressure and finish by adding the two digit suffix after the part number, i.e. 10-407-05: 3/4" FNPT x 3/4" FNPT at 30 psig with plain brass finish.

MODEL RVW17



PRESSURE RELIEF VALVES

Prevents excessive thermal expansion buildup in plumbing systems, tank applications and tankless water heaters. Conforms to HUD/FHA requirements; ideal for well systems.

FEATURES

- Bronze body, stainless steel spring
- CSA certified design to ANSI Z21.22 "Relief Valves for Hot Water Supply Systems"
- ASME capacity certified from 75 to 150 psig*
- CRN #0G8547.5C registered in all Canadian provinces and territories

Model Number	Part Number	Size (in.)	CSA Capacity Rating (BTU/Hr)	Wt./100 (lbs.)	*ASME Certified Discharge Capacities BTU/HR.			
					75	100	125	150
RVW1712	17-401	1/2 M x 1/2 F	15,000	57	-	-	-	-
RVW1734	17-402	3/4 M x 3/4 F	200,000	53	505,000	648,000	791,000	934,000

Note: When ordering specify pressure by adding the two digit key number after the part number as follows: 75 psig - 01; 100 psig - 02; 125 psig - 03; 150 psig - 04; 160 psig - 05. For model numbers, add the desired pressure at the end of the number.

Example: RVW1712125 - 1/2" relief valve set at 125psig.

* 3/4 model only: National Board Capacity Certified - BTU per hour (90% of actual capacity at 10% accumulation) ASME boiler and pressure vessel code - Section IV - Heating Boilers

HYDRONIC HEATING PRODUCTS

ASME Section IV Hot Water Relief Valves

MODEL RVW60

ASME SECTION IV HIGH CAPACITY RELIEF VALVES



High-capacity heating system valves with female inlet, expanded or standard female outlet. Elevated seat for drainage of water away from seat area. Entire pressure range is National Board capacity certified. Protects against excessive water pressure due to failure of controls to regulate BTU input.

FEATURES

- High BTU capacity rating
- Silicone seat
- Fabric reinforced molded diaphragm isolates spring from water at all times
- Bronze body and spring cage
- Maximum temperature service 250°F
- Registered in Canadian provinces and territories CRN #OG8547.5C
- Made in USA
- 100% factory tested

Model Number	Part Number	Size(in.)		Pressure Range psig	Wt./100 (lbs.)	Dimensions (in.)		
		Inlet NPT	Outlet NPT			A	B	C
RVW6034	10-604	3/4F	3/4F	15-160	232	1.03	5.25	1.62
RVW601	10-605	1F	1F	15-160	410	1.25	6.69	2.00
RVW60114	10-606	1-1/4F	1-1/4F	15-160	795	1.25	8.37	2.47
RVW60112	10-607	1-1/2F	1-1/2F	15-160	1100	2.00	10.75	2.75
RVW602	10-608	2F	2F	15-160	2375	2.19	14.00	3.69
RVW6134	10-614	3/4F	1 F	15-160	226	1.03	5.25	1.72
RVW611	10-615	1 F	1-1/4F	15-160	390	1.25	6.69	2.00
RVW61114	10-616	1-1/4F	1-1/2F	15-160	755	1.25	8.37	2.47
RVW61112	10-617	1-1/2F	2F	15-160	1145	2.00	10.75	2.75
RVW612	10-618	2F	2-1/2F	15-160	2315	2.19	14.00	3.66

Pressure psig	Part No. Suffix	3/4 x 3/4 10-604	1 x 1 10-605	1-1/4 x 1-1/4 10-606	1-1/2 x 1-1/2 10-607	2 x 2 10-608
30	-05	827,000	1,339,000	2,316,000	3,151,000	5,193,000
50	-10	1,209,000	1,956,000	3,384,000	4,604,000	7,589,000
60	-12	1,399,000	2,265,000	3,918,000	5,331,000	8,786,000
75	-15	1,686,000	2,728,000	4,720,000	6,421,000	10,583,000
100	-20	2,162,000	3,500,000	6,055,000	8,238,000	13,577,000
125	-25	2,639,000	4,272,000	7,390,000	10,054,000	16,571,000
150	-34	3,116,000	5,044,000	8,725,000	11,871,000	19,565,000

STANDARD DISCHARGE PORT

RVW 60 [X]	X
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SIZE	PRESSURE SETTING
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Example: 10-608-05 = 2"x2" 10-600 set 30 psig

OVERSIZED DISCHARGE PORT (HIGH CAPACITY)

RVW 61 [X]	X
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SIZE	PRESSURE SETTING
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Example: 10-615-12 = 1"x1-1/4" 10-610 set 60 psig

Pressure psig	Part No. Suffix	3/4 x 1 10-614	1 x 1-1/4 10-615	1-1/4 x 1-1/2 10-616	1-1/2 x 2 10-617	2 x 2-1/2 10-618
30	-05	970,000	1,570,000	2,716,000	3,696,000	6,091,000
50	-10	1,418,000	2,295,000	3,969,000	5,400,000	8,900,000
60	-12	1,641,000	2,657,000	4,596,000	6,252,000	10,305,000
75	-15	1,977,000	3,200,000	5,535,000	7,531,000	12,412,000
100	-20	2,536,000	4,105,000	7,101,000	9,661,000	15,924,000
125	-25	3,096,000	5,011,000	8,668,000	11,792,000	19,435,000
150	-34	3,655,000	5,916,000	10,234,000	13,923,000	22,947,000

Use Suffix No. to designate last two digits of Part No. for desired pressure. Other pressure settings available upon request.

BTU/HR at 10% overpressure National Board certified, ratings are 90% of actual.

HYDRONIC HEATING PRODUCTS

Mixing Valves "Point of Source"

MODEL 34-200



HYDRONIC TEMPERING VALVE

Designed to provide extension of water heater capacity and hot water temperature control in hydronic heating applications. Numbered indicator control allows easy setup and adjustment. Available in low or high temperature options depending on floor or baseboard application.

FEATURES

- Low temperature range 85°-120°F (-L1)
- High temperature range 120°-180°F (-01)
- Stainless steel spring
- Corrosion resistant bronze body
- Thermoplastic shuttle assembly
- Solder connections are standard
- In-line repairable
- Fingertip temperature control
- Made in USA - ARRA compliant

Model Number	Size (in.)	Dimensions		Weight Lbs.
		Height	Width	
34-203-01	1/2	4.45	3.75	1.4
34-204-01	3/4	4.47	4.00	1.46

MODEL MVA



THERMOSTATIC MIXING VALVES

34A Series are ASSE 1017 certified mixing valves designed for hot water distribution systems; or "point of source" applications. 34H Series are designed for radiant heat applications, to provide better control of hot water supply. Numbered indicator control allows easy setup and fingertip control. Available in low or high temperature range options depending on application. Integrated check provides added protection of thermostat and cross connection control.

FEATURES

- Low temperature range (85°-140°F)
- High temperature range (120°-180°F)
- Stainless steel spring
- Bronze body
- Supply pressures to 125 psig
- Union threaded, solder, CPVC and PEX connections
- Union fitting may be placed on any inlet or outlet
- Integrated inlet checks
- High flow capacity
- Broad temperature range
- Cold water failure protection
- CSA B125.01 (34A only)
- Calibrated max 120°F setpoint option avail.
- 20 mesh screens on both inlets

Size (in.)	Connection	Low Temp Model No. 85°-140°	Low Temp. Part No. 85°-140°	Cal. Max Temp 120° Model No.	Cal. Max Temp 120° Part No.	High Temp 120°-180° Model No.	High Temp* 120°-180° Part No.
1/2	swt x swt x swt	MVAS12	34A-213-S	MVABS12	34A-213-BS	MVAHS12	34A-213-HS
1/2	fnp x fnp x fnp	MVA12	34A-213-T	MVAB12	34A-213-BT	MVAH12	34A-213-HT
1/2	CPVC x cpvc x cpvc	MVAC12	34A-213-C	MVABC12	34A-213-BC		
1/2	pex x pex x pex	MVAX12	34A-213-X	MVABX12	34A-213-BX	MVAHX12	34A-213-HX
1/2	swt x swt x cpvc	MVASC12	34A-213-SC	MVABSC12	34A-213-BSC		
1/2	fnpt x fnpt x cpvc	MVATC12	34A-213-TC	MVABTC12	34A-213-BTC		
1/2	pex x pex x cpvc	MVAXC12	34A-213-XC	MVABXC12	34A-213-BXC		
1/2	cpvc x cpvc x pex	MVACX12	34A-213-CX	MVABXC12	34A-213-BCX		
1/2	swt x swt x pex					MVAHSX12	34A-213-HSX
1/2	fnpt x fnpt x pex					MVAHTX12	34A-213-HTX
3/4	swt x swt x swt	MVAS34	34A-214-S	MVABS34	34A-214-BS	MVAHS34	34A-214-HS
3/4	fnp x fnp x fnp	MVA34	34A-214-T	MVAB34	34A-214-BT	MVAH34	34A-214-HT
3/4	CPVC x cpvc x cpvc	MVAC34	34A-214-C	MVABC34	34A-214-BC		
3/4	pex x pex x pex	MVAX34	34A-214-X	MVABX34	34A-214-BX	MVAHX34	34A-214-HX
3/4	swt x swt x cpvc	MVASC34	34A-214-SC	MVABSC34	34A-214-BSC		
3/4	fnpt x fnpt x cpvc	MVATC34	34A-214-TC	MVABTC34	34A-214-BTC		
3/4	pex x pex x cpvc	MVAXC34	34A-214-XC	MVABXC34	34A-214-BXC		
3/4	cpvc x cpvc x pex	MVACX34	34A-214-CX	MVABXC34	34A-214-BCX		
3/4	swt x swt x pex					MVAHSX34	34A-214-HSX
3/4	fnpt x fnpt x pex					MVAHTX34	34A-214-HTX
1	swt x swt x swt	MVAS1	34A-215-S	MVABS1	34A-215-BS	MVAHS1	34A-215-HS
1	fnp x fnp x fnp	MVA1	34A-215-T	MVAB1	34A-215-BT	MVAH1	34A-215-HT
1	CPVC x cpvc x cpvc	MVAC1	34A-215-C	MVABC1	34A-215-BC		
1	pex x pex x pex	MVAX1	34A-215-X	MVABX1	34A-215-BX	MVAHX1	34A-215-HX
1	swt x swt x cpvc	MVASC1	34A-215-SC	MVABSC1	34A-215-BSC		
1	fnpt x fnpt x cpvc	MVATC1	34A-215-TC	MVABTC1	34A-215-BTC		
1	pex x pex x cpvc	MVAXC1	34A-215-XC	MVABXC1	34A-215-BXC		
1	cpvc x cpvc x pex	MVACX1	34A-215-CX	MVABXC1	34A-215-BCX		
1	swt x swt x pex					MVAHSX1	34A-215-HSX
1	fnpt x fnpt x pex					MVAHTX1	34A-215-HTX

*High temperature versions are not ASSE 1017 certified.

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HYDRONIC & STEAM HEATING PRODUCTS

Mixing Valves "Point of Source"

MODEL MVC



COMMERCIAL HIGH CAPACITY MIXING VALVES

34C Series ASSE 1017 listed, high-capacity mixing valves are thermostatically controlled regulating valves designed for use in large commercial potable and non-potable hot water systems or "point of source" applications. Simple adjustment of water temperature from 90°-140°F or 130°-180°F.

FEATURES

- Sizes: 3/4", 1", 1-1/4", 1-1/2", 2"
- Low temp range (90°-140°F)
- High temp range (130°-180°F)
- Threaded connections
- Installs easily on heating source
- Patented design for easy in-line maintenance
- Supply pressures to 150 psig
- U. S. Patent No. 6,328,219
- CSA B125.01

Size (in.)	Low Temp.* Model No. 90°-140° F	Low Temp.* Part No. 90°-140° F	High Temp. Model No. 130°-180° F	High Temp. Part No. 130°-180° F
3/4	MVC34	34C-104-01	MVCH34	34C-104-H1
1	MVC1	34C-105-01	MVCH1	34C-105-H1
1-1/4	MVC114	34C-106-01	MVCH114	34C-106-H1
1-1/2	MVC112	34C-107-01	MVCH112	34C-107-H1
2	MVC2	34C-108-01	MVCH2	34C-108-H1

*ASSE 1017 Certified

Plumbing Specialties

MODEL CG



COMPRESSION GAUGE COCKS

For draining expansion tanks, other liquid storage vessels.

FEATURES

- **(CG) 26-100:** rated up to 125 psig
- **(CGH) 26-300:** soft metal seat/stuffing box rated up to 250 psig
- **(CGB) 26-310:** stainless steel ball seat/stuffing box rated up to 250 psig

Model Number	Size Number	Pipe Size (in.)	Wt./100 (lbs.)	Wheel Type
CG38	26-101-01	3/8	25.0	ALUMINUM
CGC38	26-102-01	3/8	30.0	COMPOSITION
CG12	26-104-01	1/2	28.3	ALUMINUM
CGC12	26-105-01	1/2	30.0	COMPOSITION
CGH38	26-301-01	3/8	39.0	ALUMINUM
CGHC38	26-302-01	3/8	40.0	COMPOSITION
CGH12	26-304-01	1/2	40.0	ALUMINUM
CGHC12	26-305-01	1/2	44.0	COMPOSITION
CGH34	26-307-01	3/4	49.0	ALUMINUM
CGHC34	26-308-01	3/4	51.7	COMPOSITION
CGB38	26-311-01	3/8	39.0	ALUMINUM
CGB38	26-312-01	3/8	42.0	COMPOSITION
CGB12	26-314-01	1/2	40.0	ALUMINUM
CGB12	26-315-01	1/2	44.0	COMPOSITION
CGB34	26-317-01	3/4	50.0	ALUMINUM
CGBC34	26-318-01	3/4	50.0	COMPOSITION

*26-100 series is not available with packing nut

Specify the following suffix for finish: 01 - Satin Brass; 28 - Polished Brass.

HYDRONIC & STEAM HEATING PRODUCTS

Plumbing Specialties

43-100 SERIES

STEAM GAUGE COCKS



Female fitting with male union for easy installation.

FEATURES

- Satin brass finish is standard
- Rated 100 WSP for standard bottom, 150 WSP for nut version

Part Number	Description	Size (in.)	Wt./100 (lbs.)
43-101-01	100 SWP	1/4	45
43-101-04	150 SWP	1/4	45

MODEL SGS

STEAM GAUGE SIPHON



27-401

The "pigtail" siphon is used to protect pressure gauges from excessive temperature. 1/4" heavy gauge seamless brass tubing.

FEATURES

- Chrome plate option
- Brass (-01)
- 180° loop or 90° loop
- Service rating: 250 psig saturated steam, 400 psig at 100°

Model Number	Part Number	Pipe Size (in.)	Wt./100 (lbs.)
SGS180	27-401-01	1/4	44.0
SGS90	27-402-01	1/4	40.0



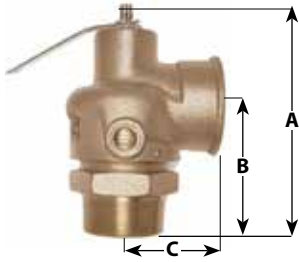
27-402

STEAM HEATING PRODUCTS

ASME Section IV Low Pressure Steam Safety Valves

MODEL RVS12

LOW PRESSURE STEAM HEATING BOILER SAFETY VALVES



Use on medium and large commercial steam heating boilers. National Board capacity certified at 15 psig.

FEATURES

- PTFE coated O-Ring seat seal
- All bronze construction
- 3/8" NPT side tapping for drain
- Top guide, rust-proof steel spring
- High capacity
- Registered in all Canadian provinces and territories, CRN #0G8547.5C
- Lower pressure settings available

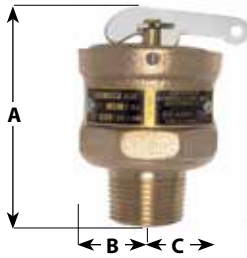
Model Number	Part Number	Size(in.) Inlet NPT	Outlet NPT	Max. Pressure psig	Capacity* lbs./hr.	Wt./100 (lbs.)	Dimensions (in.)		
							A	B	C
RVS122	12-205-08	2	2	15	2500	514	6.00	3.75	2.62
RVS12212	12-206-08	2-1/2	2-1/2	15	3529	835	8.50	5.25	3.06
RVS123	12-208-08	3	3	15	4100	1162	9.50	6.00	3.75

Note: For pressures other than 15 psi use the following suffix codes on the part number: 5 psig - 03; 6 psig - 04; 8 psig - 05; 10 psig - 06; 12 psig - 07; 15 psig - 08

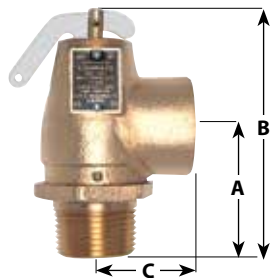
*National Board Capacity Certified-(15 psi rating, 90% of actual capacity at 33% accumulation.)

MODEL RVS13

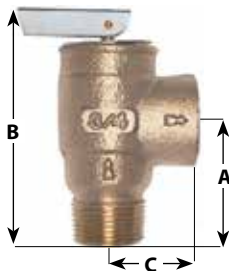
LOW PRESSURE STEAM HEATING BOILER SAFETY VALVES



13-101



13-200



13-511



For use on small commercial steam heating boilers. National Board capacity-certified at 15 psig in accordance with ASME Section IV.

FEATURES

- Optional rough or polished chrome finish
- Flat seat, PTFE faced disc for positive seal
- Standard set pressure of 15 psig; capacities apply to valves set @ 15 psig
- Pressure setting below 15 available
- Positive drainage of condensate from seat area
- **RVS13T** is top outlet discharge
- Registered in all Canadian provinces and territories, CRN #0G8547.5C

Model Number	Part Number	Size(in.) Inlet NPT	Outlet NPT	Max. Pressure psig	Capacity* lbs./hr.	Wt./100 (lbs.)	Dimensions (in.)		
							A	B	C
RVS13T15	13-101-B15	3/4 M	Top	15	410	64	2.87	0.94	1.250
RVS1334	13-211-B15	3/4 M	3/4 F	15	475	107	1.81	3.69	1.437
RVS131	13-202-B15	1 M	1 F	15	643	110	2.06	3.87	1.218
RVS13114	13-213-B15	1-1/4 M	1-1/2 F	15	1200	218	2.53	4.50	1.875
RVS13112	13-214-B15	1-1/2 M	2 F	15	1900	320	3.00	5.25	2.187
RVS13L3415	13-511-B15	3/4 M	3/4 F	15	407	62	1.69	3.25	1.187
RVS13L34F15	13-512-B15	3/4 F	3/4 F	15	407	59	1.81	2.75	1.187

*National Board Capacity Certified at 15 psig (90% of actual capacity at 33% accumulation.)

Use key to designate last two digits of model number. Last two digits indicate pressure and finish.

Key to Suffix to Part Number

B = Plain
P = Polished Chrome
S = Satin Chrome

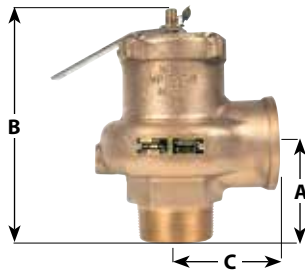
Two digit pressure setting from 05 PSIG to 15 PSIG.

STEAM HEATING PRODUCTS

ASME Section IV Low Pressure Steam Safety Valves

MODEL RVS14

HIGH CAPACITY LOW PRESSURE STEAM BOILER SAFETY VALVES



National Board capacity-certified in accordance with ASME Section IV at 15 psig. For large commercial steam heating boilers where high capacity is critical. Capacities up to 6843 lbs./hr.

FEATURES

- Nozzle-type chrome-plated seat
- Optional test gag available to allow hydrostatic testing. (Add "G" suffix to pressure code when ordering.)
- PTFE coated O-ring for positive seal
- One piece body, all bronze construction
- Rust proof steel spring
- Registered in all Canadian provinces and territories, CRN #0G8547.5C

Model Number	Part Number	Size (in.)	*Capacity lbs./hr.	Wt./Each (lbs.)	Dimensions (in.)		
					A	B	C
RVS14215	14-205-08	2 x 2	3150	8.4	3.00	7.12	3.12
RVS1421215	14-206-08	2-1/2 x 2-1/2	4676	13.0	3.50	8.25	3.50
RVS14315	14-207-08	3 x 3	6843	17.0	4.12	9.37	3.87

*National Board Capacity Certified at 15 psig. (90% of actual capacity at 33% accumulation.)

Note: To specify set pressure, use the following suffix codes on the part number: 5 psig - 03; 6 psig - 04; 8 psig - 05; 10 psig - 06; 12 psig - 07; 15 psig - 08 after the part number.

Water Heater Products

MODEL TP

WATER HEATER T&P RELIEF VALVES



Automatic temperature and pressure relief valves feature unique non-metallic coating which protects the element against galvanic and electromechanical corrosion by isolating it from the heated water. This coating is electrostatically applied for uniform coverage, then thermobonded, resulting in optimum adhesion for extended service life. **CSA** design certified at all settings to ANSI Z21.22. **ASME Section IV** rated at 125 psig and 150 psig settings for 3/4" NPT only.

FEATURES

- Meets HUD/FHA requirements
- Cast bronze body, stainless steel spring
- Rated 210°F maximum
- CRN #0G0053.6C registered in all Canadian provinces and territories
- ASME capacity certified for 3/4" NPT only

Model Number	Part Number	PSIG Set	Size (in.)	Element Length (in.)	Wt./100 (lbs.)	CSA Capacity rating BTU/HR.
TP112125	18C-401-27	125	1/2 M x 1/2 F	1.5	64.0	15,000
TP112	18C-401-28	150	1/2 M x 1/2 F	1.5	64.0	15,000
TP312125	18C-401-29	125	1/2 M x 1/2 F	3	64.0	15,000
TP312	18C-401-30	150	1/2 M x 1/2 F	3	64.0	15,000
TP134125	18C-402-27	125	3/4 M x 3/4 F	1.5	64.4	95,000
TP134	18C-402-28	150	3/4 M x 3/4 F	1.5	64.4	95,000
TP334125	18C-402-29	125	3/4 M x 3/4 F	3	64.4	105,000
TP334	18C-402-30	150	3/4 M x 3/4 F	3	64.4	105,000
TP834125	18C-402-36	125	3/4 M x 3/4 F	8	64.4	105,000
TP834	18C-402-37	150	3/4 M x 3/4 F	8	64.4	105,000
TP334175	18C-402-24	175	3/4 M x 3/4 F	3	64.4	105,000
TP334X125	18C-402X-38	125	3/4 M x 3/4 F	3	64.4	105,000
TP334X	18C-402X-39	150	3/4 M x 3/4 F	3	64.4	105,000

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WATER HEATING PRODUCTS

Water Heater Products

MODEL EXV



BRONZE WATER HEATER SHUT-OFF VALVES WITH THERMAL EXPANSION CONTROL VALVE

These valves provide thermal expansion protection and water heater shut-off in a single, simple installation. They're space-saving and a less costly alternative to bulky expansion tanks for avoiding potential hazards in closed systems.

FEATURES

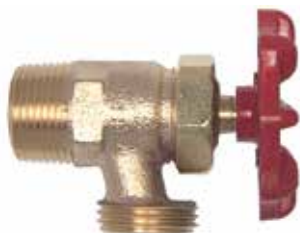
- Sweat, threaded and PEX connections available
- Corrosion-resistant all-bronze body
- Chrome-plated ball
- Stainless steel fasteners and springs
- Bubble-tight shut-off
- 210°F max
- Relief valve available with hose barb fitting, 1/2" pex fitting, compression fitting or 1/2" combination sweat/thread fitting which makes discharge piping assembly easy
- Expansion control valve taps into side of shut-off valve
- Listed with CSA B125.1 & B125.3
- Listed with IAPMO

PART NUMBER MATRIX

78	-X	-X	-X	- RV
SERIES	SIZE	SET PRESSURE	RELIEF VALVE CONNECTION	
78 = Standard	3 = 3/4 SWT	0 = 125 psig	4 = 3/8" Hose barb	
78LF = Lead Free	4 = 3/4 THD	1 = 100 psig	5 = 1/2" Pex	
	7 = 3/4 PEX	2 = 80 psig	6 = 3/8" Compression fitting	
			7 = 1/2" NPT/SWT fitting	

Water Heater Drain Valves

MODEL BD90



90° DRAIN VALVES

For deluxe water heaters and low pressure boilers.

FEATURES

- Pressure to 200 psig, temperatures to 250°F
- All cast bronze bodies
- Aluminum wheel handle
- 31-200 Series heavy pattern, 3/4" MNPT inlet
- 31-500 Series standard pattern, 1/2" MNPT inlet with I.D. of NPT thread machined for 1/2" copper pipe

Model Number	Part Number	Wt/100 (lbs.)	Shank Length (in.)	Inlet (in.)
BD9034	31-202-04	43.00	5/8	3/4 MNPT
BD90134	31-212-04	46.50	15/16	3/4 MNPT
BD9012	31-501-04	31.00	5/8	1/2 MNPT/1/2 Sweat

MODEL BDQ



APOLLO INTERNATIONAL™ BALL VALVE BIBB FAUCET

Features heavy pattern with large opening. Ideal for boiler and water heater drains, general liquid dispensing and drainage.

FEATURES

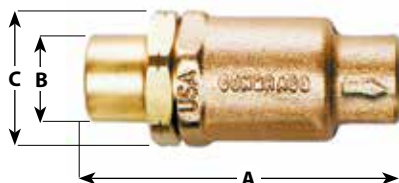
- Nickel plated finish; sizes 1/2" and 3/4"
- Pressure rating 200 psig liquid
- Maximum temperature 250°F

Model Number	Part Number	Size (in.)	Inlet (in.)	Outlet (in.)	Wt./100 (lbs.)
BDQ12	35-301-03	1/2	1/2 swt/thread connector	3/4-11.5 NHR hose	38.4
BDQ34	35-302-03	3/4	3/4 thread connector	3/4-11.5 NHR hose	44.5

RELATED HYDRONIC & STEAM HEATING PRODUCTS

In-Line Check Valves

MODEL CVBES



SOLDER END SOFT SEAT CHECK VALVES

All bronze with stainless steel springs and elastomeric seats for tighter shut-off. No radial alignment is needed. Exceptional resistance to corrosion.

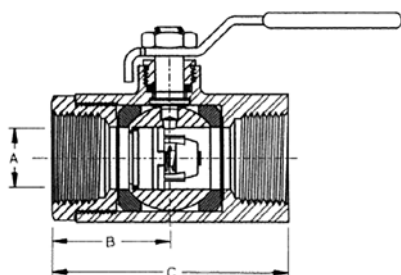
FEATURES

- Sizes: 1/2" to 2"
- Bubble-tight shut-off, ideally suited for gaseous service
- Straight-through design minimizes velocity changes
- Solder end; 400 psig CWP
- Approximate opening pressure 1/2 psi
- Retainer is notched for easy identification
- Max Temperature 250°F
- Numerous options are available

Model Number	Part Number	Size (in.)	Dimensions (in.)			Wt./100 (lbs.)
			A	B	C	
CVBES12	61-603-01	1/2	2.75	1.12	1.25	138
CVBES34	61-604-01	3/4	3.68	1.20	1.62	175
CVBES1	61-605-01	1	4.50	1.93	2.12	145
CVBES114	61-606-01	1-1/4	6.11	2.13	2.38	330
CVBES112	61-607-01	1-1/2	6.87	2.50	2.81	610
CVBES2	61-608-01	2	7.46	3.38	3.75	1010

Ball Valve With Integral Check

70-100-BC



UNIDIRECTIONAL BALL VALVE WITH INTEGRAL CHECK

FEATURES

- Ideally suited for all water and air systems not to exceed 250 psig.
- This combination product offers a positive shut-off and a bubble-tight check capability where space savings is a must.
- Ideal for OEM use.
- FNPT threaded connections
- Lever handle standard
- Adjustable packing gland
- Rated 250 psig@ 200°F max

Part Number	Size (in.)	Dimensions (in.)					Weight (lbs.)
		A	B	C	D	E	
70-103-BC	1/2	0.420	1.110	2.220	1.800	3.870	0.64
70-104-BC	3/4	0.450	1.500	3.000	2.120	4.870	1.33
70-105-BC	1	0.590	1.680	3.370	2.250	4.870	1.77
70-106-BC	1-1/4	0.750	2.000	4.000	2.730	5.500	3.29
70-107-BC	1-1/2	1.020	2.140	4.310	3.090	8.000	4.63
70-108-BC	2	1.270	2.350	4.680	3.280	8.000	6.01

SUFFIX KEY

Suffix	Option	Size (in.)
02	Static Grounded	-
04	2-1/4" Stem Extension	2-1/4
07	Tee Handle	-
08	90 degree Reverse Stem	-
10	SS lever and Nut	-
15	Round Handle	-
17	Rough Chrome Plating	-
27	Latch Lock Lever	-
32	SS Tee Handle and Nut	-
45	Less Lever and Nut	-

RELATED HYDRONIC & STEAM HEATING PRODUCTS

Gate, Globe & Check Valves

161S (125 SOLDER END) / 161T (125 NPT)



161S

161T

Meets MSS SP-80 standard
ASTM B62 bronze materials
MSS SP-139 lead free option (CWP only)

CLASS 125 BRONZE DISC SWING CHECK

FEATURES

- Y-Pattern
- Metal Seat
- 200 CWP
- 125 SWP
- **Lead Free** option (NSF 61/NSF 372)

161S Part Number	161T Part Number	Size (in.)	161S Length	161T Length	Height	161S Wt./100 (lbs.)	161T Wt./100 (lbs.)
—	61Y-191-01	1/4	—	2.14	1.51	—	0.64
—	61Y-192-01	3/8	—	2.14	1.51	—	0.62
61Y-093-01	61Y-193-01	1/2	2.53	2.48	1.65	0.62	0.73
61Y-094-01	61Y-194-01	3/4	3.36	2.94	1.90	0.91	1.06
61Y-095-01	61Y-195-01	1	4.07	3.57	2.26	1.70	1.70
61Y-096-01	61Y-196-01	1-1/4	4.68	4.50	2.99	2.00	3.30
61Y-097-01	61Y-197-01	1-1/2	5.28	4.50	2.99	2.70	3.10
61Y-098-01	61Y-198-01	2	6.50	5.25	3.74	4.90	5.50
61Y-099-01	61Y-199-01	2-1/2	8.30	8.00	5.11	9.70	11.70
61Y-090-01	61Y-190-01	3	9.58	9.24	6.05	15.00	17.80

Height is measured from centerline to top of unit.

101S (125 SOLDER END) / 101T (125 NPT)



101S

101T

Meets MSS SP-80 standard
ASTM B62 bronze materials
MSS SP-139 lead free option (CWP only)

CLASS 125 RISING STEM GATE VALVE

FEATURES

- Threaded Bonnet
- Solid Bronze Disc
- 200 CWP
- 125 SWP
- Max. Temp: 406°F
- **Lead Free** option (NSF 61/NSF 372)

101S Part Number	101T Part Number	Size (in.)	101S Length	101T Length	Height	101S Wt./100 (lbs.)	101T Wt./100 (lbs.)
30-001-01	—	1/4	1.76	—	4.57	0.80	—
30-002-01	—	3/8	1.76	—	4.51	0.77	—
30-003-01	30-083-01	1/2	2.03	1.88	4.85	1.00	1.00
30-004-01	30-084-01	3/4	2.07	2.43	5.71	1.30	1.30
30-005-01	30-085-01	1	2.45	2.96	6.71	2.16	2.20
30-006-01	30-086-01	1 1/4	2.63	3.14	8.10	3.20	3.20
30-007-01	30-087-01	1 1/2	2.88	3.44	9.08	4.36	4.40
30-008-01	30-088-01	2	3.06	4.11	11.28	7.01	7.00
30-009-01	30-089-01	2 1/2	4.13	4.79	14.58	13.79	13.80
30-000-01	30-080-01	3	4.48	5.43	19.07	17.70	17.70

Length is measured from end to end. Height is measured from centerline to top of wheel in full open position.

102S (125 SOLDER END) / 102T (125 NPT)



102S

102T

Meets MSS SP-80 standard
ASTM B62 bronze materials
MSS SP-139 lead free option (CWP only)

CLASS 125 NON RISING STEM GATE VALVE

FEATURES

- Threaded Bonnet
- Solid Bronze Disc
- 200 CWP
- 125 SWP
- Max. Temp: 406°F
- **Lead Free** option (NSF 61/NSF 372)

102S Part Number	102T Part Number	Size (in.)	102S Length	102T Length	Height	102S Wt./100 (lbs.)	102T Wt./100 (lbs.)
—	30-031-01	1/4	—	1.76	3.29	—	0.74
—	30-032-01	3/8	—	1.76	3.29	—	0.71
30-043-01	30-033-01	1/2	1.88	2.03	3.56	0.85	0.85
30-044-01	30-034-01	3/4	2.43	2.07	4.05	1.19	1.19
30-045-01	30-035-01	1	2.96	2.45	4.55	1.98	1.98
30-046-01	30-036-01	1 1/4	3.14	2.63	5.14	2.80	2.80
30-047-01	30-037-01	1 1/2	3.44	2.88	6.02	3.95	3.95
30-048-01	30-038-01	2	4.11	3.06	7.09	5.88	5.88
30-049-01	30-039-01	2 1/2	4.79	4.13	9.11	12.19	12.19
30-040-01	30-030-01	3	5.43	4.48	12.61	16.84	16.84

Length is measured from end to end. Height is measured from centerline to top of wheel in full open position.

www.apollovalves.com

Customer Service (704) 841-6000

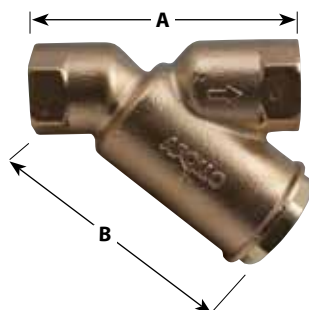


RELATED HYDRONIC & STEAM HEATING PRODUCTS

Pipeline Strainers

MODEL YB

BRONZE NPT "Y" STRAINERS



Rugged, dependable, protection against foreign particles. Corrosion-resistant bronze body and large area stainless steel screens. Operating pressures to 400 psig.

FEATURES

- Sizes: 1/8" to 4"
- Self-aligning screen makes cleaning easy
- Small sizes ideal for O.E.M. applications
- Rated 400 psig at 150°F CWP
- Working pressure (non-shock) 125 psig at 350°F steam
- Press connection: Max. pressure = 250 psi
- Press connection: Max. temperature = 250°F
- New 59-400 Series M x F
- Optional tapped caps available (less plug, suffix -02)
- Optional mesh screens available upon request
- Sizes 1/8" to 1/2" available as UL® recognized component
- Made in USA
- 100% factory pressure tested
- Lead Free option

Model Number	Std. Part Number	PRESS Part Number	Size (in.)	Dimensions (in.)			(Suf-fix-02)	Screen Area		
				A	A (PRESS)	B		(in. ²)	Wt./100	PRESS Wt./100
YB18	59-000-01	—	1/8	2.00	—	1.25	1/8 NPT	1.38	44.5	—
YB14	59-001-01	—	1/4	2.00	—	1.25	1/8 NPT	1.38	42.5	—
YB38	59-002-01	—	3/8	2.69	—	2.00	1/4 NPT	3.19	78.6	—
YB12	59-003-01	59-003-01PR	1/2	2.69	4.75	2.00	1/4 NPT	3.19	75.1	100.0
YB34	59-004-01	59-004-01PR	3/4	3.87	6.1	3.25	1/2 NPT	8.18	174.0	200.0
YB1	59-005-01	59-005-01PR	1	4.75	7.25	4.00	3/4 NPT	12.9	276.0	300.0
YB114	59-006-01	59-006-01PR	1-1/4	5.12	7.62	4.25	3/4 NPT	16.2	358.0	380.0
YB112	59-007-01	59-007-01PR	1-1/2	5.75	8.25	5.00	1 NPT	22.8	541.0	570.0
YB2	59-008-01	59-008-01PR	2	6.75	10.39	6.00	1-1/4 NPT	32.7	747.0	770.0
YB212	59-009-01	—	2-1/2	7.94	—	5.87	1-1/4 NPT	47.3	1130.0	—
YB3	59-010-01	—	3	9.12	—	6.87	1-1/2 NPT	64.8	1580.0	—
YB204	59-011-01	—	4	11.94	—	10.12	1-1/2 NPT	115.0	3070.0	—
YBM34	59-404-01	—	3/4 M x F	4.87	—	3.25	1/2 NPT	8.18	174	—
YBM1	59-405-01	—	1 M x F	5.12	—	4.00	3/4 NPT	12.9	276	—
UL Listed Strainers										
YBUL18	59-UL0-01	—	1/8	2.00	—	1.25	1/8 NPT	1.38	44.5	—
YBUL14	59-UL1-01	—	1/4	2.00	—	1.75	1/8 NPT	1.38	42.5	—
YBUL38	59-UL2-01	—	3/8	2.69	—	2.00	1/4 NPT	3.19	78.6	—
YBUL12	59-UL3-01	—	1/2	2.69	—	2.00	1/4 NPT	3.19	75.1	—

Note: Dimensions shown are subject to change.

Model No.* Suffix	Part No. Suffix	Option
Blank	-01	Solid Cap (Standard)
N	-02	Tapped Cap
K	-P2	Tapped Cap with Plug
NBV	-06	Strainer/Ball Valve Combination
20	-E1	20 MESH
40	-A1	40 MESH
60	-B1	60 MESH
80	-C1	80 MESH
100	-H1	100 MESH

* When using model numbers, enter suffix before size.

Example: YSBN112 = 1-1/2" strainer with tapped cap.

Note: Options can be combined on some sizes - Contact customer service.

Standard Screen Size (in.)	Screen Opening
1/8 to 1/2	50 Mesh
3/4 to 3	20 Mesh
4	.125 Perforation

59-005-01PR

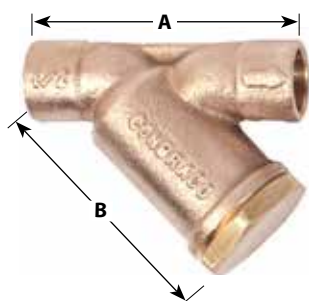


RELATED HYDRONIC & STEAM HEATING PRODUCTS

Pipeline Strainers

MODEL YBS

BRONZE SWEAT END "Y" STRAINERS



FEATURES

- Working pressure (non-shock)
400 CWP - Cold Working Pressure
- Sizes: 1/2" to 2"
- Optional tapped caps available (suffix -02)

Standard Screen Size (in.)	Screen Opening
1/2	50 Mesh
3/4 to 2	20 Mesh
Part No. Suffix	Option
-01	Solid cap (standard)
-02	Tapped Cap
-P2	Tapped cap with pipe plug

Model Number	Part Number	Size (in.)	Dimensions (in.)		Tapped Cap (Suffix-02)	Wt./100	Screen Area (in. ²)
			A	B			
YBS12	59-303-01	1/2	2.75	1.81	1/4 NPT	50	3.19
YBKS12	59-303-P2	1/2			1/4 NPT	50	
YBS34	59-304-01	3/4	4.00	2.87	1/2 NPT	121	8.18
YB20KS34	59-304-P2	3/4			1/2 NPT	121	
YBS1	59-305-01	1	4.75	3.56	3/4 NPT	189	12.90
YB20KS1	59-305-P2	1			3/4 NPT	189	
YBS114	59-306-01	1-1/4	5.25	3.94	3/4 NPT	280	16.20
YB20KS114	59-306-P2	1-1/4			3/4 NPT	280	
YBS112	59-307-01	1-1/2	6.00	4.62	1 NPT	426	22.80
YBKS112	59-307-P2	1-1/2			1 NPT	426	
YBS2	59-308-01	2	7.25	5.00	1-1/4 NPT	627	32.70
YBKS2	59-308-P2	2			1-1/4 NPT	627	

MODEL YCT APOLLO® INTERNATIONAL

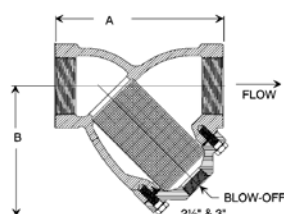
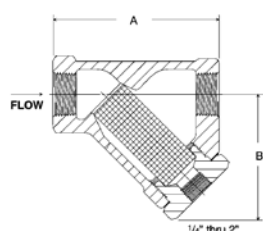
CAST IRON THREADED Y-STRAINER

Install these hardworking strainers upstream in almost any application to protect valves, regulators, solenoids and meters from rust, dirt and pipe scale.

FEATURES

- 20 mesh screens standard to 2"; .045 perf
2-1/2" to 3", others available
- Screen cap is tapped to install flush valve or plug
- Sizes: 1/4" to 3"
- Working Pressure (non-shock)
250 psig @ 406°F. Steam
400 psig @ 150°F. Water, Oil, Gas

Part Number	Size (in.)	Dimensions (in.)		Blow-off NPT	Wt. (lbs.)	Screen Area (in. ²)
		A	B			
YCT01M20	1/4	3.19	2.37	1/4	1.25	2.8
YCT02M20	3/8	3.19	2.37	1/4	1.25	2.8
YCT03M20	1/2	3.19	2.37	1/4	1.50	2.8
YCT04M20	3/4	3.75	3.37	3/8	2.25	4.7
YCT05M20	1	4.00	3.50	1/2	3.00	7.0
YCT06M20	1-1/4	5.00	4.12	3/4	5.25	12.1
YCT07M20	1-1/2	5.75	4.69	3/4	6.50	16.4
YCT08M20	2	7.00	5.44	1	11.13	23.1
YCT09P045	2-1/2	9.25	5.68	1	23.50	55.0
YCT00P045	3	10.00	7.00	1	33.00	78.4

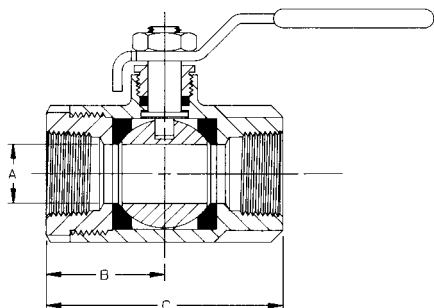


RELATED HYDRONIC & STEAM HEATING PRODUCTS

General Purpose Standard Port Valves

70-100 SERIES

STANDARD PORT THREADED BALL VALVE



The Apollo 70 series is the most widely used bronze ball valve in the industry. It features a blowout-proof stem, RPTFE seats and stuffing box ring, adjustable packing gland and chromium-plated ball.

FEATURES

- Rated 600 psig non-shock
- 150 psig for saturated steam
- US Made
- 100% factory tested
- Wide range of seat and handle options

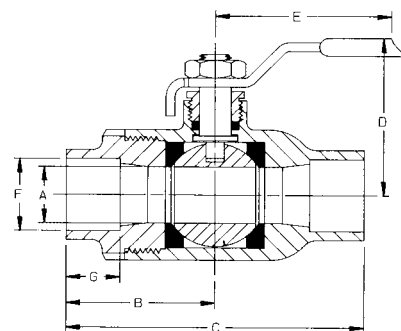
Part Number	Size (in.)	Dimensions* (in.)			Carton Qty.
		A	B	C	
70-101-01	1/4	0.37	1.03	2.06	10
70-102-01	3/8	0.37	1.03	2.06	10
70-103-01	1/2	0.50	1.12	2.25	10
70-104-01	3/4	0.68	1.50	3.00	10
70-105-01	1	0.87	1.68	3.37	10
70-106-01	1-1/4	1.00	2.00	4.00	5
70-107-01	1-1/2	1.25	2.18	4.37	5
70-108-01	2	1.50	2.34	4.68	2
70-109-01A	2-1/2	2.00	3.12	6.25	1
70-100-01	3	2.50	3.37	6.75	1
70-10A-01	4	3.12	3.68	7.37	1

*Body only. Total will vary with handle and end connection options. Contact Conbraco Customer Service for these dimensions.

All 70-100 Series valves are available in sizes 1/4" through 4".

70-200 SERIES

SOLDER END BALL VALVE



Reliable ball valves designed for soft-soldering into lines without the need for disassembly. Tested valve installs without disturbing seats and seals. Soldering temperature: 500°F or less.

FEATURES

- Vacuum service to 29" Hg
- Adjustable packing gland
- US Made
- RPTFE seats and stuffing box ring
- Rated 600 psig CWP, non-shock
- 150 psi for saturated steam
- 100% factory tested
- Wide range of seat and handle options

Part Number	Size (in.)*	Dimensions (in.)						
		A	B	C	D	E	F	G
70-202-01	3/8	0.37	1.28	2.56	1.75	3.87	0.505	0.37
70-203-01	1/2	0.50	1.43	2.87	1.75	3.87	0.63	0.50
70-204-01	3/4	0.68	1.93	3.87	2.12	4.87	0.88	0.75
70-205-01	1	0.87	2.25	4.50	2.25	4.87	1.13	0.90
70-206-01	1-1/4	1.00	2.31	4.62	2.62	5.50	1.38	0.96
70-207-01	1-1/2	1.25	2.62	5.25	3.06	8.00	1.63	1.09
70-208-01	2	1.50	3.18	6.37	3.25	8.00	2.13	1.34
70-209-01A	2-1/2	2.00	3.74	7.51	3.72	8.00	2.63	1.48
70-200-01	3	2.50	4.12	8.25	4.12	8.00	3.13	1.67

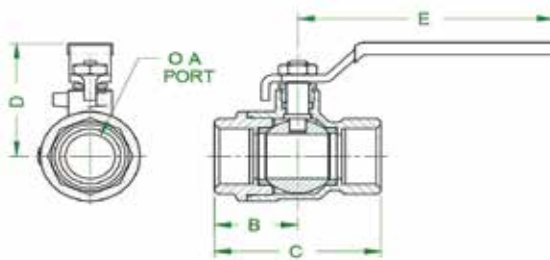
*Based on 70-200-01 – Dimensions may vary with options.

RELATED HYDRONIC & STEAM HEATING PRODUCTS

International Economy Valves

77F SERIES

FULL PORT THREADED BRASS BALL VALVE



The Apollo 77F-100 Series is a full port forged brass ball valve suitable for a wide range of plumbing and heating applications. These NPT threaded, 2-piece valves combine reliable operation with maximum economy. Valves include most pertinent agency approvals. Proudly Made in the USA.

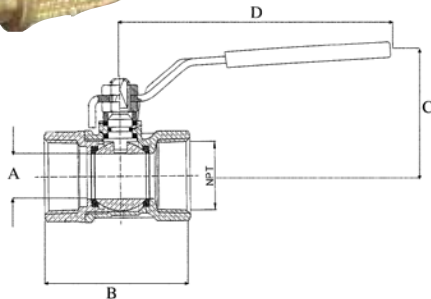
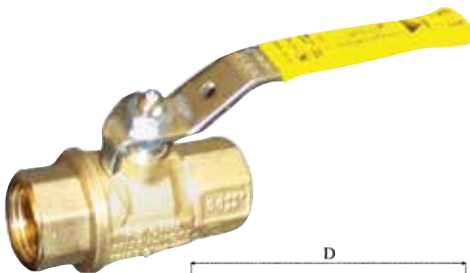
FEATURES

- Heavy Pattern Forged Design
- Full-Port Flow
- Superior RPTFE Seats and Packing
- Adjustable Stem Packing
- Blow-Out Proof Stem
- Corrosion Resistant Materials
- Silicone Free Assembly
- 100% Factory Tested
- Made in USA, ARRA Compliant
- Gas Approvals
- UL/FM Fire Protection
- Multi-Agency Approvals

Part Number	Size (in.)	Dimensions (in.)					Wt.
		A	B	C	D	E	
77F10101	1/4	0.38	0.81	1.62	1.61	2.85	0.3
77F10201	3/8	0.38	0.85	1.70	1.61	2.85	0.3
77F10301	1/2	0.50	1.14	2.25	1.66	2.85	0.5
77F10401	3/4	0.75	1.26	2.51	1.91	3.86	0.8
77F10501	1	1.00	1.60	3.20	2.11	3.86	1.3
77F10601	1-1/4	1.25	1.73	3.46	2.44	4.75	2.1
77F10701	1-1/2	1.50	2.00	4.00	2.91	5.42	3.2
77F10801	2	2.00	2.37	4.47	3.69	7.77	5.6
77F20301	1/2	0.50	1.37	2.37	1.66	2.85	0.4
77F20401	3/4	0.75	1.72	3.13	1.91	3.86	0.9
77F20501	1	1.00	2.01	3.73	2.11	3.86	1.3
77F20601	1-1/4	1.25	2.07	3.97	2.44	4.75	2.0
77F20701	1-1/2	1.50	2.42	4.69	2.91	5.42	3.3
77F20801	2	2.00	2.91	5.82	3.69	7.77	5.6

64 SERIES

APOLLO® INTERNATIONAL FULL-PORT BRASS BALL VALVES



Economy full-port forged ball valve with maximum flow; ideal choice for all plumbing applications. Lever handle is standard on all sizes.

FEATURES

- Sizes 2-1/2", 3" and 4"
- Threaded (~100) and solder end (~200) connections
- Pressure rated to 600 psig CWP
- Temperatures to 366°F (185°C)
- Blowout-proof stem
- Chrome-plated brass ball
- Secondary O-ring stem seal
- PTFE seats, thrust bearing and stem packing

Optional Kits Valve Size (in.)	Stem Extensions	Balancing Stops	Locking Handles	Lever Handles
2-1/2 and 3	78-1505-01	78-1510-01	-	78-1650-01
4	-	-	-	78-1651-01

STANDARDS COMPLIANCE

- ANSI Z21.15.CGA9.1
- AGA No. 3-88
- ANSI B1.20.1
- ANSI B16.18
- CAN/CGA-3.16-M88
- ASME/ANSI B16.33
- ASME/ANSI B16.38
- MSS SP-110
- UL Guide YSDT
- UL Guide YRPV
- UL Guide VQGU
- NSF61
- RoHS Compliant



64-100 Part No.	Size (in.)	Dimensions (in.)				
		A	B	C	D	Cv
64-109-01	2-1/2 NPT	2.56	5.59	5.02	8.07	629
64-100-01	3 NPT	3.15	6.45	5.45	8.07	1018
64-10A-01	4 NPT	3.94	7.60	6.34	10.23	1622

64-200 Part No.	Size (in.)	Dimensions (in.)				
		A	B	C	D	Cv"
64-209-01	2-1/2	2.56	6.93	5.02	8.07	629
64-200-01	3	3.15	8.09	5.45	8.07	1018
64-20A-01	4	4.13	10.25	6.34	10.23	1622

Note: Specify -07 suffix for "T" handle, ie. 64-105-07. Available with threaded models only in 1/4"-1" sizes.
* Lever handle available on 1/2" - 4"

www.apollovalves.com

Customer Service (704) 841-6000



RELATED HYDRONIC & STEAM HEATING PRODUCTS

APOLLOXPRESS® Full Port Bronze Ball Valve

77W, 77W-HC & 77V SERIES

APOLLOXPRESS® FULL PORT BRONZE BALL VALVE

FEATURES

- Full Port
- Adjustable Stem Packing
- Fast, Easy, Economical Installation
- Blow-Out Proof Stem
- Corrosion Resistant Materials
- Made in the USA
- 100% Factory Tested
- Silicone Free
- Ridgid® Press Tool Compatible
- Lead Free option
- Leak Before Press® Technology
- Approvals:
 - MSS SP-110 Ball Valves
 - ANSI/NSF 61-8 Potable Water
 - Directive 2002/95/CE (RoHS) Compliant
- Performance Rating:
 - Maximum operating pressure 250 psi CWP
 - Body design pressure rating 600 psi CWP
 - Temperature range 0°F -250°F

77W-HC APOLLO-PRESS® HOSE CAP AND CHAIN BALL VALVE

The Apollo-Press™ Press x Hose Cap & Chain ball valves are designed for direct mechanical connection to ASTM B88-Type K, L, and M copper tubing in the hard drawn condition for sizes 1/2"- 3/4". Valves feature a 3/4" hose connection with heavy brass cap to protect the threads. The 77W-HC is ideal for most plumbing and heating systems, including potable water.

APPROVED APPLICATIONS

- Potable Water
- Hydronic Heating (50% glycol max)
- Not compatible with soft annealed copper tubing

Suffix	Option
-01	Standard
-04	2-1/4" Stem Extension
-10	Stainless Steel Handle and Nut
-A3	Plain Grip

(77W-140-HC SERIES) Stainless Steel Ball and Stem

77V PRESS END FORGED BRASS BALL VALVE

The APOLLOXPRESS® 77V Series press ball valve is ideal for installation in most plumbing and heating systems. Now with Leak Before Press® feature and 250 psig maximum working pressure.

Part Number	Size (in.)*	Dimensions (in.)			Weight (lbs.)
		A	B	C	
77W-103-01	1/2	1.775	5.281	1.636	0.660
77W-104-01	3/4	1.972	6.555	1.800	1.060
77W-105-01	1	2.173	6.710	2.110	1.730
77W-106-01	1-1/4	3.090	9.410	2.740	4.420
77W-107-01	1-1/2	3.050	9.810	2.680	4.760
77W-108-01	2	3.435	10.510	3.815	6.440

Part Number	Size (in.)*	Dimensions (in.)			Weight (lbs.)
		A	B	C	
77W-103-HC	1/2	1.80	3.12	1.54	0.61
77W-104-HC	3/4	2.01	3.45	1.72	1.09

Part Number	Size (in.)*	Dimensions (in.)					Weight (lbs.)
		A	B	C	D	E	
77V10301	1/2"	0.50	1.57	2.89	1.66	2.85	0.4
77V10401	3/4"	0.75	1.90	3.63	1.91	3.86	0.9
77V10501	1"	1.00	2.20	3.88	2.11	3.86	1.2
77V10601	1-1/4"	1.25	2.23	4.22	2.44	4.75	2.3
77V10701	1-1/2"	1.50	2.84	5.45	2.91	5.42	3.4
77V10801	2"	2.00	3.40	6.57	3.69	7.77	6.0



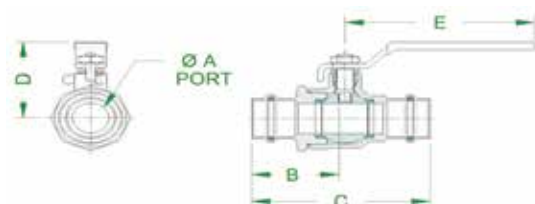
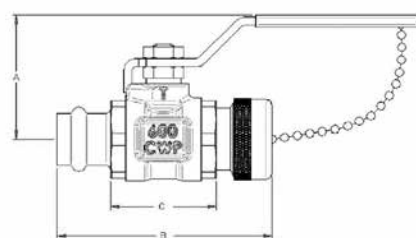
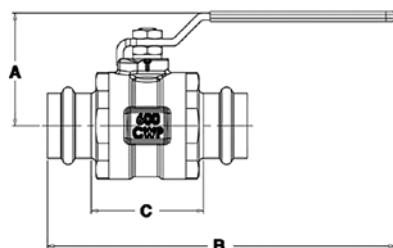
77W



77W-HC



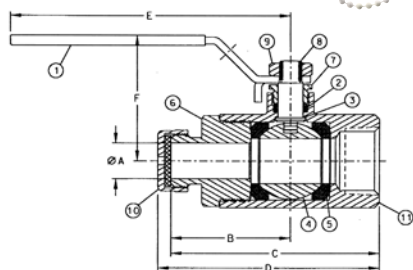
77V



RELATED HYDRONIC & STEAM HEATING PRODUCTS

Specialty Valves

70-HC SERIES



CAP AND CHAIN VALVE WITH 3/4 INCH HOSE CONNECTION HEAVY BRASS CAP AND REVERSE HANDLE

Ideally suited for direct connections to hoses, valve features a securely attached cover with chain which prevents damage to hose threads. -200 model designed for soft soldering into lines without disassembly.

FEATURES

- Reverse handle is standard for easier installation
- Stainless steel lever & nut standard
- NPT and solder connections
- Chromium plated ball
- Blowout-proof stem design
- RPTFE seats and stuffing box ring
- Adjustable packing gland
- Full pressure rated brass hose cap
- -11 Therma-Seal® insulating handle option
- 70-14x-HC- SS ball and stem

Model Number	Size (in.)	Dimensions (in.)					
		A	B	C	D	E	F
70-103-HC	1/2 NPT x 3/4 Hose	0.50	1.68	2.81	2.97	3.87	1.75
70-104-HC	3/4 NPT x 3/4 Hose	0.68	1.96	3.50	3.67	4.87	2.12
70-105-HC	1 NPT x 3/4 Hose	0.87	2.24	3.92	4.16	5.28	2.43
70-203-HC	1/2 Solder x 3/4 Hose	0.50	1.68	3.14	3.28	3.89	1.75
70-204-HC	3/4 Solder x 3/4 Hose	0.68	1.96	3.94	4.09	4.89	2.12
70-195-HC	1 Solder x 3/4 Hose	0.87	2.24	4.49	4.73	5.28	2.43

70-10X-92 SERIES



BALL VALVE WITH STANDARD BALANCING STOP PLATE

Designed for hydronic applications, this valve comes with a simple stop plate that fits over its standard lever handle. Also available with tee or round handles. Features a chromium-plated ball, RPTFE seats and stuffing box ring, a blowout-proof stem design and adjustable packing gland. Size: 1/4" to 3".

FEATURES

- Rated 600 psig CWP, non-shock
- MSS-SP110
- CRN: 0C10908.5C
- 150 psig for saturated steam

70-100-94 SERIES



BALL VALVE WITH BALANCING STOP AND STEM EXTENSION

Ideal for HVAC systems. Stop plate and a 2-1/4" stem extension combination to accommodate insulation and handle repositioning. Size: 1/4" to 3".

FEATURES

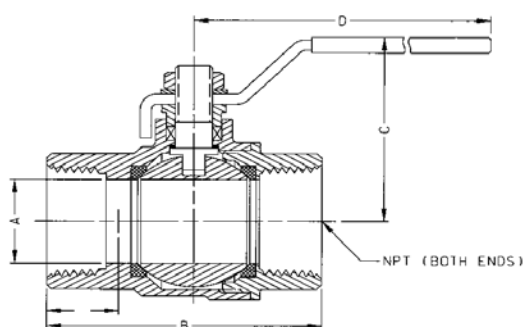
- Chromium-plated ball
- RPTFE seats
- Stuffing box ring
- Blowout-proof stem design
- Adjustable packing gland
- Contact customer service for exact handle dimensions
- Pressure Ratings:
600 psig CWP Cold, Non-Shock
150 psig Saturated Steam

RELATED HYDRONIC & STEAM HEATING PRODUCTS

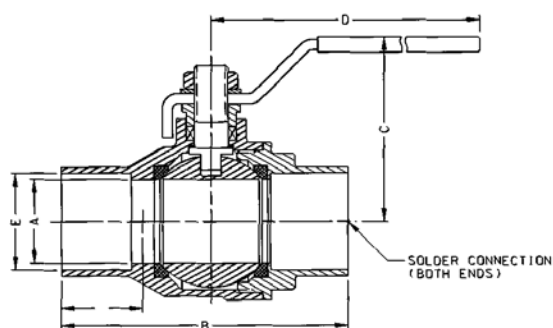
Two-Piece Full-Port Valves

94A SERIES

94A ECONOMY FULL-PORT SERIES BALL VALVES



94A-100



94A-200

94A Series Ball Valves from Apollo® International are built for reliability with minimum investment. These full-port ball valves with forged brass body are UL listed and CSA approved. Series 94A ball valves in sizes 1/4" through 4" offer a rated working pressure of 600 psig CWP.

FEATURES

- Adjustable stem packing nut
- MSS - SP110
- Silicone free

Part No.	Size (in.)	NPT					Wt. (Lb.)	Carton QTY.
		A	B	C	D	E		
94A-101-01	1/4	0.395	1.746	1.278	3.543	-	0.33	20
94A-102-01	3/8	0.407	1.756	1.278	3.543	-	0.30	20
94A-103-01	1/2	0.583	2.047	1.921	3.543	-	0.44	50
94A-104-01	3/4	0.748	2.362	2.087	3.780	-	0.66	30
94A-105-01	1"	0.945	2.756	2.559	4.528	-	1.10	20
94A-106-01	1-1/4	1.260	3.307	2.953	4.528	-	1.57	12
94A-107-01	1-1/2	1.575	3.661	3.346	5.512	-	2.40	9
94A-108-01	2	1.969	4.181	3.681	5.512	-	3.37	6
94A-109-01	2-1/2	2.520	5.378	4.764	8.661	-	7.60	3
94A-100-01	3	2.953	6.039	5.079	8.661	-	9.36	2
94A-10A-01	4	3.945	7.386	5.868	9.606	-	16.86	2
Sweat								
94A-203-01	1/2	0.583	2.047	1.839	3.543	0.630	0.38	50
94A-204-01	3/4	0.748	2.748	1.996	3.780	0.878	0.64	30
94A-205-01	1	0.945	3.228	2.441	4.528	1.130	0.99	20
94A-206-01	1-1/4	1.260	3.819	2.854	4.528	1.378	1.40	12
94A-207-01	1-1/2	1.575	4.425	3.169	5.512	1.630	2.17	9
94A-208-01	2	1.969	5.315	3.449	5.512	2.130	2.97	6
94A-209-01	2-1/2	2.520	6.263	4.764	8.661	2.630	6.36	3
94A-200-01	3	2.953	7.150	5.079	8.661	3.130	8.32	2
94A-20A-01	4	3.945	7.386	5.868	9.606	4.130	15.78	2

CSA listed (File # 226234) per the following standards:	
CAN 1-9.1	1/2 psig
CGA 3.16	125 psig
CGA CR91-002	5 psig
ANSI Z21.15	1/2 psig
ASME B16.44	5 psig
ANSI/ASME B16.33	125 psig

UL listed (File # MH18844) per the following guides:	
LP-Gas Shut-Off Valves (YSDT)	
Manual Valves (MHKZ)	
Compressed Gas Shut-Off Valves (YQNZ)	
Flammable Liquid Shut-Off Valves (YRBX)	
Gas Shut-Off Valves (YRPV)	
FM and NSF certified	

95A SERIES

APOLLO INTERNATIONAL FULL-PORT BRASS BALL VALVE WITH STOP & WASTE



FEATURES

- Pressure rated to 600 psig CWP;
- Temperatures to 300°F (148.8°C) max
- Suitable for water, oil and gas
- Competitive design

Threaded	Sweat	Size (in.)
95A-303-01	95A-403-01	1/2
95A-304-01	95A-404-01	3/4
95A-305-01	95A-405-01	1

RELATED HYDRONIC & STEAM HEATING PRODUCTS

Purge & Drain Valves

95-200 SERIES

APOLLO® BRONZE FULL-PORT SOLDER END STOP AND WASTE VALVE

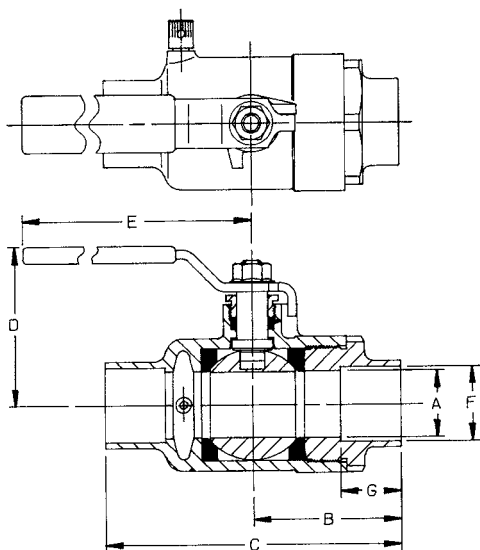


Perfect choice for hydronic and water systems where system draining is required. Replaces globe style stop and waste valves. Designed to be soft soldered into lines with no disassembly.

FEATURES

- Rated 400 psig CWP, non-shock
- Drain cap designed to prevent fluid loss
- Made in the USA
- Adjustable packing gland
- Many options available
- 100% factory tested

Part Number	Size (in.)	Dimensions (in.)						
		A	B	C	D	E	F	G
95-203-01	1/2	0.50	1.43	2.87	1.75	3.87	0.63	0.50
95-204-01	3/4	0.81	2.12	4.12	2.15	4.87	0.88	0.75
95-205-01	1	1.00	2.21	4.43	2.43	4.87	1.13	0.90
95-103-01	1/2	0.50	1.09	2.18	1.75	3.87		
95-104-01	3/4	0.81	1.56	3.12	2.15	4.87		
95-105-01	1	1.00	1.81	3.62	2.43	4.87		



RELATED HYDRONIC & STEAM HEATING PRODUCTS

Gas/Fuel Shut-Off Valves

GBVB SERIES

CSA GAS SHUT-OFF BALL VALVES



GBVB Single Tap

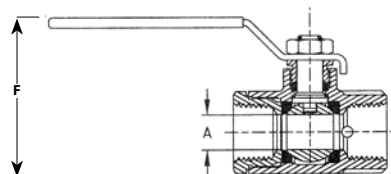
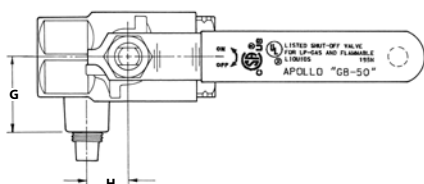


GBVBD Dual Tap

Designed for indoor "main burner" applications, with cast-in single or dual pilot tap for faster, simpler installation. Fully complies with ASME B16.44, ANSI Z21.15, CGA9.1, and CR91-002 standards. ASTM B584 bronze body, chrome-plated ball, brass stem, retainer and gland screws for corrosion resistance.

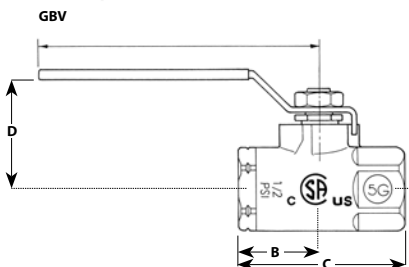
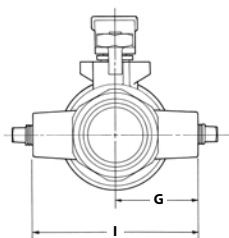
FEATURES

- For natural gas, manufactured and mixed gas, liquefied petroleum gases and LP gas-air mixtures
- Rated pressures of 1/2 and 5 psig
- CSA/ANSI Z21.15
- UL125, UL842
- High capacity
- Comes standard with a reversible plated steel lever handle. Options include a die-cast zinc "wing" handle and "tee" handle
- Standard connection is FNPT x FNPT
- ANSI Z21.15, CGA9.1
- ASME B16.44
- UL Guide YRBX
- UL Guide MHKZ
- UL Guide YRPV
- UL Guide YSDT



Model No. Single Tapped	Part No. Single Tapped	Size (in.)	Tapping	Dimensions(in.)									Capacity BTU/hr.
				A	B	C	D	E	F	G	H	I	
GBVB12	50GB301	1/2	1/8	0.50	1.11	2.25	1.68	3.85	2.27	1.00	0.53	-	693,000
GBVB34	50GB401	3/4	1/8	0.75	1.26	2.67	1.93	3.85	2.72	1.12	0.75	2.24	1,258,000
GBVB1	50GB501	1	1/8	1.00	1.65	3.42	2.19	4.78	3.18	1.53	0.94	3.06	3,144,000
GBVB114	50GB601	1-1/4	1/8	1.25	1.87	3.86	2.37	4.78	3.56	1.62	1.15	3.24	6,441,000
GBVB112	50GB701	1-1/2	1/8	1.50	2.05	4.22	2.81	5.40	4.21	1.81	1.31	3.62	7,745,000
GBVB2	50GB801	2	1/8	2.00	2.48	5.02	3.18	5.40	4.93	2.18	1.68	4.36	14,741,000
GBVBA1	50GB5A1	1	1/4	1.00	1.65	3.42	2.19	4.78	3.18	1.53	0.94	3.06	3,144,000
GBVBA114	50GB6A1	1-1/4	1/4	1.25	1.87	3.86	2.37	4.78	3.56	1.62	1.15	3.24	6,441,000
GBVBA112	50GB7A1	1-1/2	1/4	1.50	2.05	4.22	2.81	5.40	4.21	1.81	1.31	3.62	7,745,000
GBVBA2	50GB8A1	2	1/4	2.00	2.48	5.02	3.18	5.40	4.93	2.18	1.68	4.36	14,741,000

*Note: Capacities based on 1000 Btu/cubic feet gas at 0.64 specific gravity, at a P.D. of 1" W.C.



Model No. Dual Tapped	Part No. Dual Tapped	Size (in.)	Tapping	Dimensions(in.)									Capacity BTU/hr.
				A	B	C	D	E	F	G	H	I	
--	--	1/2	1/8	0.50	1.11	2.25	1.68	3.85	2.27	1.00	0.53	-	693,000
GBVBD3/4	50GB401A	3/4	1/8	0.75	1.26	2.67	1.93	3.85	2.72	1.12	0.75	2.24	1,258,000
GBVBD1	50GB501A	1	1/8	1.00	1.65	3.42	2.19	4.78	3.18	1.53	0.94	3.06	3,144,000
GBVBD11/4	50GB601A	1-1/4	1/8	1.25	1.87	3.86	2.37	4.78	3.56	1.62	1.15	3.24	6,441,000
GBVBD11/2	50GB701A	1-1/2	1/8	1.50	2.05	4.22	2.81	5.40	4.21	1.81	1.31	3.62	7,745,000
GBVBD2	50GB801A	2	1/8	2.00	2.48	5.02	3.18	5.40	4.93	2.18	1.68	4.36	14,741,000
GBVBDA1	50GB5A1A	1	1/4	1.00	1.65	3.42	2.19	4.78	3.18	1.53	0.94	3.06	3,144,000
GBVBDA11/4	50GB6A1A	1-1/4	1/4	1.25	1.87	3.86	2.37	4.78	3.56	1.62	1.15	3.24	6,441,000
GBVBDA11/2	50GB7A1A	1-1/2	1/4	1.50	2.05	4.22	2.81	5.40	4.21	1.81	1.31	3.62	7,745,000
GBVBDA2	50GB8A1A	2	1/4	2.00	2.48	5.02	3.18	5.40	4.93	2.18	1.68	4.36	14,741,000

*Note: Capacities based on 1000 Btu/cubic feet gas at 0.64 specific gravity, at a P.D. of 1" W.C.

RELATED HYDRONIC & STEAM HEATING PRODUCTS

Gas/Fuel Shut-Off Valves

GBV SERIES

APOLLO INTERNATIONAL™ GAS APPLIANCE BALL VALVES

These gas appliance ball valves are designed for natural gas, manufactured and mixed gas, liquefied petroleum gases and LP gas-air mixture applications. They comply with the latest editions of these published standards:

FEATURES

- ANSI Z21.15, CGA9.1
- ASME B16.44
- UL Guide YR BX
- UL Guide MHKZ
- UL Guide YRPV
- UL Guide YSDT

Model Number	Part Number	Size and End Connection (in.)
GBVU12	51GF301A	1/2 FNPT x 1/2 FNPT
GBVU34	51GF401A	3/4 FNPT x 3/4 FNPT



GBV SERIES

CSA GAS SHUT-OFF VALVES

Manual shut-off valves engineered specifically for low-pressure gas service. **Canadian Standard Association** design and capacity certified with American-made quality. High-copper content body, chrome-plated ball, PTFE seats. Rated for temperatures from 32°F to 125°F at pressures of 1/2 and 5 PSIG.

FEATURES

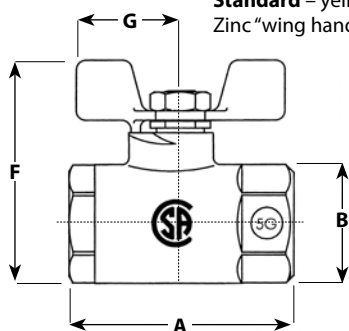
- Complies with ANSI Z21.15, CR91-002, and ASME 16.44
- Lever (-L1) or tee handle (-T1) options available
- Use with natural, manufactured, mixed and liquefied petroleum gases, LP gas-air mixtures
- Standard die-cast zinc "wing" handle, epoxy coated, for easy shut-off

Model Number	Part Number	Size (in.)	Connection	BTU/Hr*
GBV38	51GB201	3/8	3/8 NPT	318,700
GBV12	51GB301	1/2	1/2 NPT	623,750
GBV34	51GB401	3/4	3/4 NPT	1,265,000
GBV1	51GB501	1	1 NPT	2,037,500

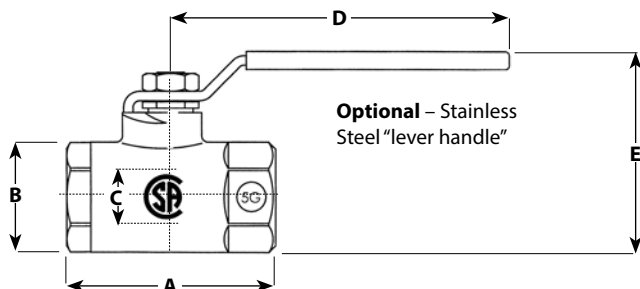
* Capacity based on a gas having a heating value of 1000 Btu/cubic feet and an S.G. of 0.64 at a P.D. of 1" W.C.



Standard – yellow die-cast Zinc "wing handle."



Optional – Stainless Steel "lever handle"



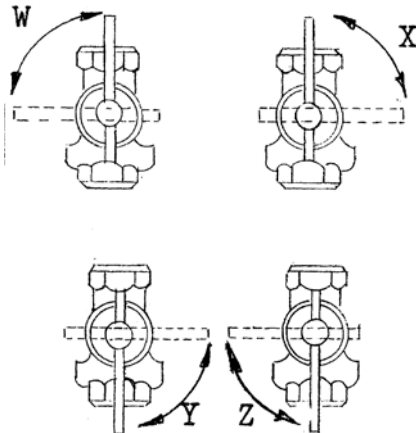
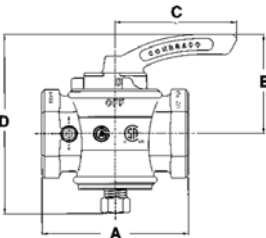
Size (in.)	Dimensions (in.)						
	A	B	C	D	E	F	G
3/8	2.04	1.06	0.38	3.85	2.24	2.20	0.81
1/2	2.24	1.18	0.50	3.85	2.30	2.24	0.81
3/4	2.97	1.55	0.69	4.75	2.85	2.90	1.00
1	3.33	1.81	0.88	4.75	3.10	3.15	1.00

RELATED HYDRONIC & STEAM HEATING PRODUCTS

Gas Cocks

MODEL GCB

MANUAL MAIN CONTROL VALVES



CSA design certified for 1/2 psig and temperatures from 32° to 125°F. Complies to ANSI Z 21.15.CGA 9.1-M97.

FEATURES

- Factory tested 100% at 10 psig
- Bronze construction, stainless steel springs
- Capacities to 7.8 million Btu/hour
- Equal female inlet/outlet

Model Number	Part Number	Size (in.)	BTU/hr.	Wt./100 (lbs.)	Dimensions			
					A	B	C	D
GCB*12	50-203	1/2	800,000	88	2.50	1.44	1.72	2.75
GCB*34	50-303	3/4	1,310,000	156	2.94	1.69	2.06	3.50
GCB*1	50-403	1	2,100,000	197	3.94	2.19	2.87	3.87
GCB*114	50-503	1-1/4	3,250,000	300	3.66	2.75	3.16	4.69
GCB*112	50-603	1-1/2	3,700,000	478	4.37	3.31	3.50	5.75
GCB*2	50-703	2	7,300,000	845	5.44	3.72	4.50	6.75
GCB*212	50-803	2-1/2	7,800,000	1000	5.87	3.72	4.50	6.75

* Denotes handle position (see below)

Part No.
Handle
Suffix
Position

Size Pilot (in.)	W	X	Y	Z
1/8 NPT	01	02	03	04
1/4 NPT	05	06	07	08

All main burner valves furnished with 1/8" NPT pilot tapping. Valves 1" and larger can be furnished with 1/4" NPT pilot tapping. Drilled & tapped on both sides with one plugged.

MODEL NUMBER

GCB [X]	X	X
TAPPING	HANDLE ORIENTATION	SIZE (IN.)
BLANK - 1/8"	W	12 = 1/2"
T - 1/4"	X	34 = 3/4"
P - PLUG TAP	Y	1 = 1"
	Z	114 = 1-1/4"
		112 = 1-1/2"
		2 = 2"
		212 = 2-1/2"

MODEL GC

GAS SERVICE COCKS



T-Handle with Stop



Lever Handle w/Stop

Tee or lever handle cocks; **CSA design certified.** In sizes 1/4" to 3/4".

FEATURES

- Capacities: 117,000 to 749,000 Btu/hour
- Designed to meet ANSI Z21.15.CGA 9.1 requirements of 1/2 psig at temperatures from 32° F to 125°F
- Accepted for use in City of New York Department of Buildings MEA 45-90-M

Model Number	Part Number	Pipe Size (in.)	Wt./100 (lbs.)	Capacity (BTU/hr.)
GCT14	51-103-01	1/4	35	117,000
GCT38	51-104-01	3/8	47	274,600
GCT12	51-105-01	1/2	54	274,000
GCT34	51-106-01	3/4	83	749,000
GCL38	51-107-01	3/8	50	274,600
GCL12	51-108-01	1/2	56	274,600
GCL34	51-109-01	3/4	87	749,000

RELATED HYDRONIC & STEAM HEATING PRODUCTS

Gas Cocks

MODEL GC2

GAS GENERAL SERVICE COCKS

Available with tee head, flat head, square head or lever head in sizes from 1/4" to 1". Wrench operated and tested at 125 psig.

FEATURES

- Nut and washer bottom with stop
- For operation up to 500°F



T-Head

Model Number	Part Number	Size (in.)	Wt./100 (lbs.)
GC2T14	52-101-01	1/4	32.0
GC2T38	52-102-01	3/8	29.0
GC2T12	52-103-01	1/2	45.0
GC2T34	52-104-01	3/4	65.8
GC2T1	52-105-01	1	92.9

Flat Head

Model Number	Part Number	Size (in.)	Wt./100 (lbs.)
GC2F14	52-201-01	1/4	30.0
GC2F38	52-202-01	3/8	28.0
GC2F12	52-203-01	1/2	43.0
GC2F34	52-204-01	3/4	57.0
GC2F1	52-205-01	1	90.6

Square Head

Model Number	Part Number	Size (in.)	Wt./100 (lbs.)
GC2S14	52-301-01	1/4	31.0
GC2S38	52-302-01	3/8	28.0
GC2S12	52-303-01	1/2	43.0
GC2S34	52-304-01	3/4	62.7
GC2S1	52-305-01	1	90.0

Lever Head

Model Number	Part Number	Size (in.)	Wt./100 (lbs.)
GC2L14	52-401-01	1/4	34.3
GC2L38	52-402-01	3/8	31.0
GC2L12	52-403-01	1/2	46.0
GC2L34	52-404-01	3/4	66.7
GC2L1	52-405-01	1	97.0

MODEL GC3

GAS COCKS

Available in male and female sizes: 1/8", 1/4" and 3/8".



Model Number	Part Number	Male Size (in.)	Female Size (in.)	Wt./100 (lbs.)
GC318	53-299-01*	1/8	1/8	14.0
GC314	53-300-01*	1/4	1/4	18.5
GC338	53-301-01	3/8	3/8	45.0

* Design certified by CSA to meet ANSI Z21.15.CGA 9.1 pressure requirements of 1/2 psig



MISC. HYDRONIC & STEAM HEATING PRODUCTS

Gas Cocks

MODEL GCA

GAS HOSE COCKS & APPLIANCE CONNECTOR VALVE

CSA design certified bronze gas valves with 56,500 Btu/hour capacity.



Model Number	Part Number	Pipe Size (in.)	Outlet (in.)	Wt./100 (lbs.)
GCA38FL	54-201-01	3/8	3/8 SAE	36.0
GCA12FL38	54-202-01	1/2	3/8 SAE	33.4
GCA12FL	54-203-01	1/2	1/2 SAE	35.0
GCA34FL12	54-204-01	3/4	1/2 SAE	45.1
GCA34FL58	54-206-01	3/4	5/8 SAE	50.0
GCA12FL58	54-207-01	1/2	5/8 SAE	57.0
GCA34FL38	54-208-01	3/4	3/8 SAE	44.0
GCA34M12	54-209-01	3/4	1/2 MNPT	44.0

Model Number	Part Number	Pipe Size (in.)	Outlet (in.)	Wt./100 (lbs.)
GCA38	54-101-01	3/8	1/8 MNPT	41.0
GCA12	54-102-01	1/2	1/8 MNPT	34.8
GCA34	54-103-01	3/4	1/8 MNPT	40.0

MODEL GCR

GAS COCK WITH THROTTLE ADJUSTMENT DESIGN CERTIFIED BY CSA

FEATURES

- Designed to meet ANSI Z21.15.CGA9.1-M97 pressure requirements of 1/2 psig
- Thread size: 1/4" male x 1/4" female



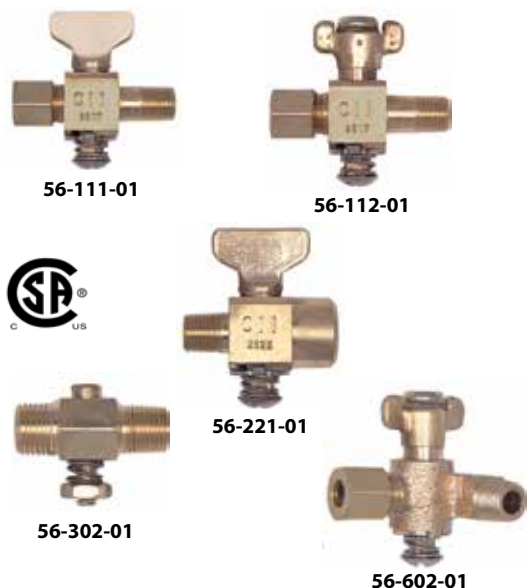
Model Number	Part Number	Size (in.)	Wt./100 (lbs.)
GCR14	55-302-01	1/4 M x 1/4 F	33



MODEL GCP

PILOT COCKS

Wide variety of **CSA design** certified pilot cocks. Designed to meet ANSI Z21.15.CGA 9.1-M97 pressure requirements of 1/2 psig at temperatures from 32° to 125° F.



Model Number	Part Number	Thread Size	Wt./100 (lbs.)
GCP	56-111-01	1/8 NPT x 1/4 Tube Plain	15.0
GCP T	56-112-01	1/8 NPT x 1/4 Tube Throttle Adjust.	14.0
GCP F	56-221-01	1/8 NPT x 1/8 FNPT Plain	16.1
GCP FT	56-222-01	1/8 NPT x 1/8 FNPT Throttle Adjust.	16.1
GCP S	56-302-01*	1/8 NPT x 1/4 Tube	08.0
GCP RH	56-601-01	1/8 NPT x 1/4 Tube Right Hand	17.0
GCP RHT	56-602-01	1/8 NPT x 1/4 Tube RH Throttle Adjust	17.0
GCP LH	56-603-01	1/8 NPT x 1/4 Tube Left Hand.	17.0
GCP LHT	56-604-01	1/8 NPT x 1/4 Tube LH Throttle Adjust.	17.0

*Not CSA Certified

MISC. HYDRONIC & STEAM HEATING PRODUCTS

Water Gauges & Accessories

20-100 SERIES

STANDARD PATTERN BRONZE WATER GAUGES

Use for all types of liquid level verification; available with 3/8" or 1/2" NPT male pipe connections. Aluminum or plastic composition hand wheels; EPDM gauge glass gaskets standard. Other glass gaskets available.

FEATURES

- Ball checks standard on **20-150** models
- Equipped with two copper guard rods
- Standard 1/4" needle drain valve in lower arm
- Rated: 125 psig @ 350°F, 300 psig @ 100°F (See note!)
- CRN Registered



Part Number	Pipe Size (in.)	Glass O.D. & Length	Wt./100 (lbs.)	Wheel Type
20-101	3/8	5/8 x 10	145	ALUMINUM
20-102	3/8	5/8 x 10	145	COMPOSITION
20-104	1/2	5/8 x 12	160	ALUMINUM
20-105	1/2	5/8 x 12	160	COMPOSITION
20-150	1/2	5/8 x 12	160	ALUMINUM
20-151	1/2	5/8 x 12	160	COMPOSITION

Note: Service ratings are subject to pressure/temperature ratings of gauge glass and glass gaskets. Many more models and options to choose from including ASME, automatic, chain wheel and stainless steel models. Request brochure PHBRWGA or visit our website for further information.

Plumbing Specialties

MODEL RAV

RADIATOR AIR VALVE



Model Number	Part Number	Size (in.)	Wt./100 (lbs.)
RAV	27-202-02	1/8	2.0
RAVK	H-2404-00	Key only	0.9

HELPFUL FORMULAS & CONVERSION DATA

Helpful Formulas

Basic Heat Transfer Calculation

$$q \left(\frac{\text{Btu}}{\text{hr}} \right) = \dot{m} \, c_p \, \Delta t$$

$$\frac{\text{Btu}}{\text{hr}} = \left| \frac{\text{lb}}{\text{hr}} \right| \left| \frac{\text{Btu}}{\text{lb. } ^\circ\text{F}} \right| \left| \frac{^\circ\text{F}}{1} \right|$$

$$q \left(\frac{\text{Btu}}{\text{hr}} \right) = Q \, 500 \, c_p \, \Delta t$$

$$q \frac{\text{Btu}}{\text{hr}} = \left| \frac{Q \text{ Gal}}{\text{min}} \right| \left| \frac{60 \text{ min}}{\text{hr}} \right| \left| \frac{8.34 \text{ lb}}{\text{Gal}} \right| \left| \frac{\text{Btu}}{\text{lb. } ^\circ\text{F}} \right| \left| \frac{^\circ\text{F}}{1} \right|$$

q = heat transfer (Btu/hr.)

Q = flow rate (gpm)

c_p = specific heat of fluid

Δt = change in fluid temperature $^\circ\text{F}$

Flow Rate Calculation based on C_v

$$Q = C_v \sqrt{\frac{\Delta P}{SG}}$$

Q = flow rate (gpm)

C_v = device flow coefficient

ΔP = change in fluid pressure across the device (psi)

SG = Specific Gravity of fluid

System Curve (Circulator performance)

$$\left(\frac{Q_2}{Q_1} \right)^2 = \left(\frac{h_2}{h_1} \right)$$

$$\left(\frac{Q_2}{Q_1} \right)^3 = \left(\frac{P_2}{P_1} \right)$$

Q = flow rate at known or new condition (gpm)

h = change in fluid head (pressure) (psi or feet head)

P = work to move fluid (pumping horsepower)

Pressure vs. Head Conversion

$$\frac{\text{Area}}{\rho}$$

$$\left| \frac{\text{Ft}^3}{62.4 \text{ lb.}} \right| \left| \frac{144 \text{ in}^2}{1 \text{ Ft}^2} \right| = 2.31 \frac{\text{ft}}{\text{psi}}$$

Relationship of Water Pressure in Feet to PSI

ρ = fluid density (lb/ft³)

Head incorporates velocity and static pressure and is typically used for expressing pressure (and pump energy) on pump curves in hydronic systems

Power Curve (Circulator performance)

$$P_{HP} = \frac{Q \times h}{3960 \times \eta_p}$$

P_{HP} = pumping horsepower (work to move fluid)

Q = flow rate at operating condition (gpm)

h = fluid head (feet head)

η_p = pump efficiency at operating point

Useful Conversion Factors & Data

Energy:

1 Watt hour = 3.413 btu 1 Kilowatt hour = 3,413 btu

1 Therm = 100,000 btu 1MMBtu = 1,000,000 btu

Power and Heat Flow:

1 Kilowatt = 3,413 btu/hr 1 Ton = 12,000 btu/hr

1 Horsepower = 0.746 kilowatt = 2546 btu/hr

Temperature:

$^\circ\text{C} = (^\circ\text{F} - 32)/1.8$

$^\circ\text{F} = (^\circ\text{C} \times 1.8) + 32$

Weight and Volume:

1 Gal water = 8.34 lbs

1 Cubic foot water = 62.4 lbs

1 Cubic foot water = 7.482 gal

Steam Conversion Factors:

Boiler horsepower (BHP) x 34.5 = lb. of steam water per hr. (lb/hr)

Boiler horsepower (BHP) x 0.069 = Gal of water per minute (gpm)

Making or Melting Ice:

Latent Heat of *Fusion* – Requires 143.5 btu per lb. at 32 $^\circ\text{F}$

Heating or Cooling Liquid Water:

Sensible Heat – Requires 1 btu per lb. per $^\circ\text{F}$

Vaporizing Water (Steam):

Latent Heat of *Vaporization* – Requires 970 btu per lb. at 14.7 psia

Heat from Combustion:

Natural Gas (Typical) – 1000 btu per cubic foot

Propane – 2550 per cubic foot

No. 2 Fuel Oil – 138,000 btu per gallon

TERMS, CONDITIONS & WARRANTY INFORMATION

General Pipe Size and Heat Transfer Capacity for HVAC

Friction	0.85 ft/100	4.5 ft/100	Heat Transfer Capacity			
Steel Pipe Size	Min Flow GPM	Max Flow GPM	Btu/Hr 20° Δt	Btu/Hr 50° Δt	Btu/Hr 12° Δt	Tons
½"	0.75	2	20,000	50,000	12,000	1.00
¾"	1.5	4.25	42,500	106,250	25,500	2
1"	4	8.5	85,000	212,500	51,000	4.25
1¼"	7	17	170,000	425,000	102,000	8.5
1½"	10.5	26	260,000	650,000	156,000	13
2"	20	50	500,000	1,250,000	300,000	25
3"	60	145	1,450,000	3,625,000	870,000	72.5
4"	120	300	3,000,000	7,500,000	1,800,000	150
5"	220	525	5,250,000	13,125,000	3,150,000	262.5
6"	350	850	8,500,000	21,250,000	5,100,000	425
8"	700	1800	18,000,000	45,000,000	10,800,000	900
10"	1300	3300	33,000,000	82,500,000	19,800,000	1650
12"	2100	5250	52,500,000	131,250,000	31,500,000	2625

WARRANTY AND LIMITATIONS OF LIABILITY

Conbraco Industries, Inc. warrants, to its initial purchaser only, that its products which are delivered to this initial purchaser will be of the kind described in the order or price list and will be free of defects in workmanship or material for a period of FIVE years from the date of delivery to you, our initial purchaser. This warranty applies to Apollo brand product with "Made in the USA" markings only.

Should any failure to conform to this warranty appear within FIVE years after the date of the initial delivery to our initial purchaser, Conbraco will, upon written notification thereof and substantiation that the goods have been stored, installed, maintained and operated in accordance with Conbraco's recommendations and standard industry practice, correct such defects by suitable repair or replacement at Conbraco's own expense.

APOLLO INTERNATIONAL PRODUCTS: Conbraco Industries, Inc. warrants its International products, to its initial purchaser only, that its international products which are delivered to this initial purchaser will be of the kind described in the order or price list and will be free of defects in workmanship or material for a period of TWO years from the date of delivery to you, our initial purchaser.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHER WARRANTY OF QUALITY, WHETHER EXPRESSED OR IMPLIED, EXCEPT THE WARRANTY OF TITLE AND AGAINST PATENT INFRINGEMENT. Correction of non-conformities, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of Conbraco to our initial purchaser, with respect to the goods, whether based on contract, negligence, strict tort or otherwise. It is the intention of Conbraco Industries, Inc. that no warranty of any kind, whether expressed or implied shall pass through our initial purchaser to any other person or corporation.

LIMITATION OF LIABILITY: Conbraco Industries, inc. SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES SUCH AS, BUT NOT LIMITED TO, DAMAGES OR TO LOSS OF OTHER PROPERTY OR EQUIPMENT, LOSS OF PROFITS OR REVENUE, COST OF CAPITAL, COST OF PURCHASED OR REPLACEMENT GOODS, OR CLAIMS OF CUSTOMERS OF OUR INITIAL PURCHASER. THE REMEDIES OF OUR INITIAL PURCHASER, AND ALL OTHERS, SET FORTH HEREIN, ARE EXCLUSIVE, AND THE LIABILITY OF CONBRACO WITH RESPECT TO SAME SHALL NOT, EXCEPT AS EXPRESSLY PROVIDED HEREIN, EXCEED THE PRICE OF THE GOODS UPON WHICH SUCH LIABILITY IS BASED.

* It is the end user's responsibility to confirm that items intended for use satisfy local codes and standards.



INTERNATIONAL SALES & REGIONAL MANAGERS

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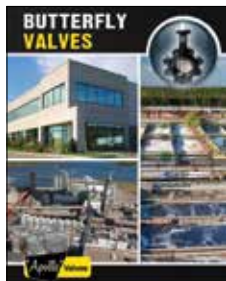
Commercial Products Catalog



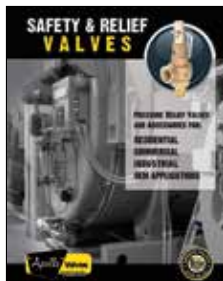
Mixing Valve Catalog



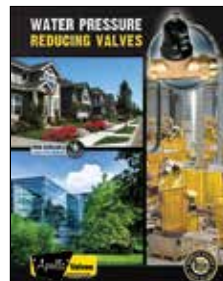
Backflow Prevention Catalog



Butterfly Valve Catalog



Safety & Relief Valves Catalog



Water Pressure Reducing Valves Catalog

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Brencliff Group	Australia	petermcl@brencliff.com	61-0477-223110	
Pegler Yorkshire	United Kingdom	adrian.byrne@conbraco.com	44-7740-449858	
Pegler Yorkshire Mid East	Middle East/India	peter.pydubai@gmail.com	971-4-454-2353	971-4-454-2352
	Europe/Africa/Israel	Contact Customer Service	1-704-841-6000	1-704-841-6021

current as of 6/4/13



for additional information, submittal sheets and manuals, visit www.apollovalves.com

Customer Service (704) 841-6000



SALES & CUSTOMER SERVICE:
Phone: (704) 841-6000 Fax: (704) 841-6020
www.apollovalves.com



APOLLO VALVES INDUSTRIAL & COMMERCIAL REPS

	AGENCY	AREAS COVERED	EMAIL	PHONE	FAX
SOUTHEAST	SOUTHEAST REGION REPS				
	Mid South Marketing, Inc.	VA/MD/Washington DC/WV-East	michael.uecker@msmsales1.com	804-213-3801	804-213-3802
	Pro Marketing, Inc.	NC/SC/TN-East	sales@promarketinginc.net	864-578-4334	864-578-4889
	Spirit Group	FL (except Panhandle)	info@spiritgroupinc.com	407-291-6035	407-299-0378
	Tim Morales & Associates, Inc.	AL/FL Panhandle	sales@timmorales.com	251-602-8333	251-602-8339
	White Wolf Group	GA	info@whitewolfgroupinc.com	800-401-4870	888-908-9372
NORTHEAST	NORTHEAST REGION REPS				
	Conroy & Griese Sales, Inc.	NY-East/NJ-North	iezzi52@aol.com	856-429-2660	856-429-2230
	Layden Company	NY-Upstate/PA-East/DE/NJ-South	joejr@laydencompany.com	610-363-6657	877-529-3361
	Urell, Inc.	MA/New England States	apollo@urell.com	617-923-9500	617-926-9414
NORTH CENTRAL	NORTH CENTRAL REGION REPS				
	FourMation Sales	MN/ND/SD/WI-West	ryan@fourmationsales.com	763-420-6900	763-420-6993
	Marshall-Rodeno Heartland	NE/IA (Except River Counties)	dnaylor@marshallrodeno.com	303-575-6701	303-575-6706
	Midwest Spec	Northern OH, Western PA, WV	glsales@mwspec.com	330-538-0406	330-538-0410
	Midwest Spec	Southern OH, KY	rvsales@mwspec.com	800-755-7732	513-353-1589
	New Tech Marketing	Northern-IL/WI-East/IN/MI-UP/IA-River Counties	sales@new-techmarketing.com	630-378-4300	630-378-0343
	New Tech Marketing	MO/Southern IL/Northeast Kansas	ntm112@aol.com	618-394-0329	618-394-0427
	V.E. Sales Co., Inc.	MI (Except Upper Peninsula)	tomv@vesalesinc.com	586-774-7760	586-774-1490
SOUTH CENTRAL	SOUTH CENTRAL REGION REPS				
	Marathon Flow Control	TX, OK, KS except Northeast, LA	sales@marathonflowcontrol.com	214-201-0100	214-201-0104
	NSC Marketing Group Inc.	OK	nsc_tulsa@sbcglobal.net	918-627-5340	918-664-1408
	PEPCO Sales & Marketing	TX	is@pepcosales.com	972-823-8700	972-823-8717
	Southern Marketing Group	MS/TN-West/AR/Bowie Cty.-TX	SMG49@bellsouth.net	901-547-0042	901-547-0035
WESTERN	WESTERN REGION REPS				
	Elmco Duddy	CA - South	tduddy@elmcoduddy.com	626-333-9942	626-855-4811
	Gordon & Associates	WA, OR, AK, Northern counties ID, HI	laura@gordonandassoc.com	360-566-1470	360-566-1478
	HC Fletcher	CA - North	apollosales@hcfletcher.com	800-432-7047	949-660-9072
	Marshall-Rodeno Associated	ID-SE, NV-NE, UT, CO, MT, NM	dnaylor@marshallrodeno.com	303-575-6701	303-575-6706
	Romatec	CA - North PVF (Non AB 1953)	apollo@romatec.com	877-530-3530	661-588-3534
	Southwest Valves	CA (Waterworks)	c.burell@southwestvalve.com	559-261-2703	559-261-2711
	Southwestern Industrial Sales Co.	AZ, Nevada (except NE)	sales@sw-ind.com	480-458-5838	480-458-5843
CANADA	CANADA REPS				
	Barclay Sales Ltd.	British Columbia	jblair@barclaysales.com	604-945-1010	604-945-3030
	Conbraco Industries, Canada	178 Pennsylvania Ave., Unit 1, Concord, Ontario L4K 4B1	conbraco.canada@conbraco.com	905-761-6161	905-761-6666
	D & M Mechanical Sales	Ontario/East	don@dandmsales.ca	613-384-7084	613-384-3407
	Dynamic Agencies, Ltd.	Saskatchewan	doug.dynamicage@sasktel.net	306-343-1901	306-343-1901
	J. Levandier Sales, Inc.	NS, NB, PE & NL	vickie@jlevandiersales.com	506-858-1615	506-858-1084
	Kern Industries, Ltd.	Alberta-North	colin@kernind.com	780-451-2056	780-454-6687
	Kern Industries Calgary, Ltd.	Alberta-South	laura.wood@kernindustries.ca	403-730-7791	403-239-8179
	Key to the North Sales Agency, Inc.	Ontario-North	office@keytothenorth.net	705-867-1401	705-867-1606
	Task Controls, Inc.	Ontario	infotoronto@taskcontrols.com	416-291-3004	416-754-3481
	Tom Beggs Agencies Ltd.	Manitoba/NW Ontario	tba@mts.net	204-953-1900	204-774-6915
	Ventes Techniques Nimatec, Inc.	Quebec	nimatec@nimatec.com	450-691-9427	450-691-4949
IRRIGATION ONLY	IRRIGATION REPS				
	Active Sales Northwest, Inc.	OR, WA, Western ID	stevek@activesalesnw.com	541-726-0320	541-726-1148
	Biz Sales Company	OH, KY, MI, IN, parts of PA, WV, WI	dzavelson@bizpvf.com	216-595-2888	216-595-2899
	Fourmation Sales	MN/ND/SD/WI-West	dean@fourmationsales.com	763-262-4700	763-262-4740
	Hall Marketing	AL, LA	hallmarketing@bellsouth.net	228-547-4637	228-832-6666
	J&J Midwest Sales	NE, IA, MO, KS	john@jandjmidwestsales.com	314-422-8419	
	John Hart	FL	jhart@lascofittings.com	772-595-7773	
	Larry Perkins	TX - Southern	lperkins@lascofittings.com	936-443-1096	
	Marel Enterprises	New England, NY, DE, MD, VA, DC, parts of PA & WV	marelenterprise@gmail.com	631-271-1718	631-427-8558
	Marsh & Moore	GA	jaustin@marshmoore.com	352-321-7499	904-827-8795
	Marshall-Rodeno Associated	CO/WY/MT/ID-SE/UT/NV-NE	dnaylor@marshallrodeno.com	303-575-6701	303-575-6706
	NSC Marketing Group Inc.	OK	nsc_tulsa@sbcglobal.net	918-627-5340	918-664-1408
	Pro Marketing, Inc.	NC/SC/TN-East	sales@promarketinginc.net	864-578-4334	864-578-4889
	Sherman Dobbs	TX - Northern	sdobbs@lascofittings.com	469-442-8510	972-417-9733
	Southern Marketing Group	MS/TN-West/AR/Bowie Cty.-TX	SMG49@bellsouth.net	901-547-0042	901-547-0035
	Spec Management Group	CA	msmarch4@cox.net	949-481-4225	949-487-0990
	Tim Morales & Associates, Inc.	AL	sales@timmorales.com	251-602-8333	251-602-8339
	VPC Sales	AZ	chudson@vpcsales.com	661-257-3923	661-257-3928