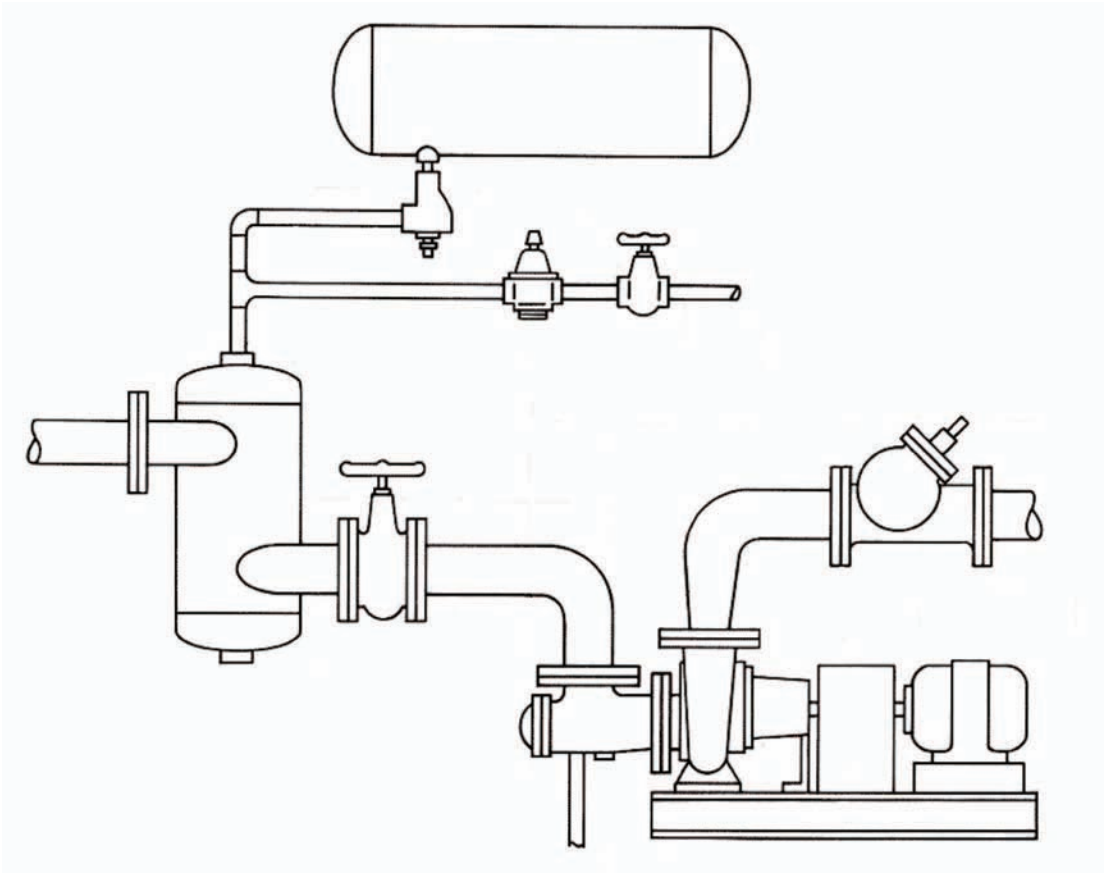


Airtrol® System

- The time proven method of air control for hydronic systems
- A complete line of air control components
- Guaranteed to prevent the accumulation of air in heating and cooling units
- Twenty year product warranty

A-300J

Bell & Gossett
a xylem brand

A PROVEN CONCEPT FOR AIR CONTROL

Hydronics is the science of heating and cooling with circulated water. The ability to transfer large quantities of heat to or from an area in sealed piping systems makes hydronics an excellent choice for all types of construction.

Basically the techniques of hydronic design are quite simple. Adherence to just a few basic fundamentals will enable a designer to produce an efficient and economical heating or cooling system for a wide range of applications. One of the most important of these fundamentals is positive air control.

Efficient circulating water (or anti-freeze) systems must be completely free of air for proper operation. Free air in piping circuits causes reduced or blocked circulation as well as noisy operation. Free air also has damaging effects on various system components. Yet, air, properly controlled, can offer both the expansion space and pressurization needs of a closed system. A Bell & Gossett Design Manual on Air Control reviews this subject in detail.

The Bell & Gossett Airtrol System is based upon this same concept of air control for closed hydronic systems of all sizes. The Airtrol System consists of three basic components:

1. The Rolairtrol Air Separator, serves to separate air bubbles from the system water before they can enter the system.
2. The compression tank or tanks; where all free air should be confined.
3. The Airtrol Tank Fitting serves to help confine air in the Compression tank, reduces gravity circulation which thru lower tank temperature reduces tank size and helps establish the correct initial air content in the tank when filling a system.

The Airtrol System has been in use on hydronic systems for over forty years and as a result of its complete success on all types and sizes of systems, is offered with both a product and a performance guarantee when installed in accordance with the published Bell & Gossett design data. Every hydronic system requires air control —guaranteed with the B&G Airtrol System.

A Bell & Gossett Design Manual on Air Control reviews this subject in detail.

AIRTROL SYSTEM PERFORMANCE GUARANTEE

The Bell and Gossett Airtrol System consists of three basic components:

The Airtrol Boiler Fitting or Inline or Rolairtrol Air Separator, the Airtrol Tank Fitting and the Bell and Gossett Compression Tank.

The Bell and Gossett Airtrol System is guaranteed to prevent the accumulation of air in heating and cooling units and prevent noises caused by entrained air in piping. In case of failure of any Bell and Gossett Airtrol System (within the USA) to operate correctly, when installed and operated in accordance with our published instructions on an air-tight system, we will provide, free of charge, the services of a factory trained engineer who will supervise steps necessary to provide satisfactory results.

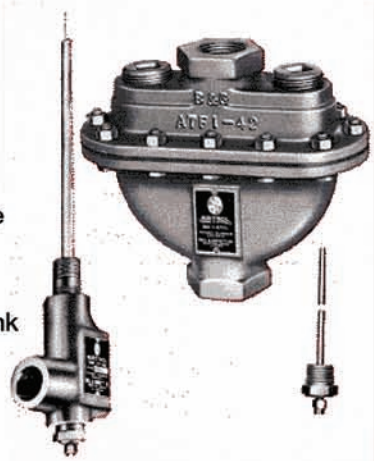
AIRTROL PRODUCT WARRANTY

The Airtrol Tank Fitting, Airtrol Boiler Fitting, Inline Air Separator, Rolairtrol Air Separator and Compression Tank are guaranteed for 20 years from date of installation against defects in material and workmanship. Labor charges for replacement are not allowed nor shall Bell and Gossett be liable for any special, indirect or consequential damages. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED.

A COMPLETE LINE OF AIR CONTROL PRODUCTS

AIRTROL® TANK FITTINGS

Directs free air to the compression tank. Restricts thermal circulation to boiler. Establishes initial tank air level. Allows compression tank size reduction.

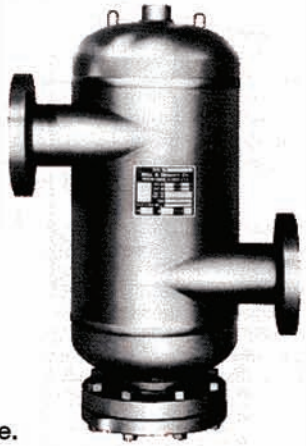


IN-LINE® AIRTROL FITTINGS

Available in only straight pipe connections; cast iron construction 1"- 3" pipe sizes.

ROLAIRTROL® AIR SEPARATOR

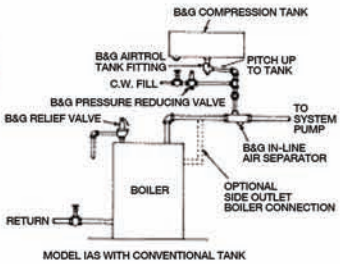
Unique design with tangential nozzles, separates air via centrifugal force. Highly efficient units include pump suction strainer option. Sizes from 3" to 24" are available.



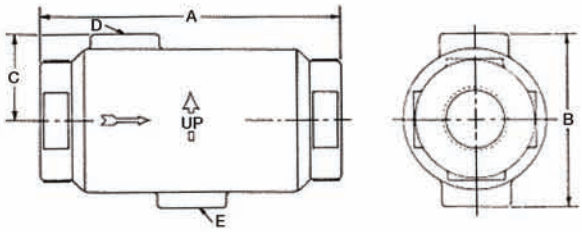
THE BELL & GOSSETT COMPRESSION TANK

Air-tight, ASME construction. Available in plain steel or painted. Sizes from 15 to 505 gallons. Gauge glass tappings are standard. Always use with B&G Airtol Tank Fittings.

IAS IN-LINE® AIRTROL FITTINGS

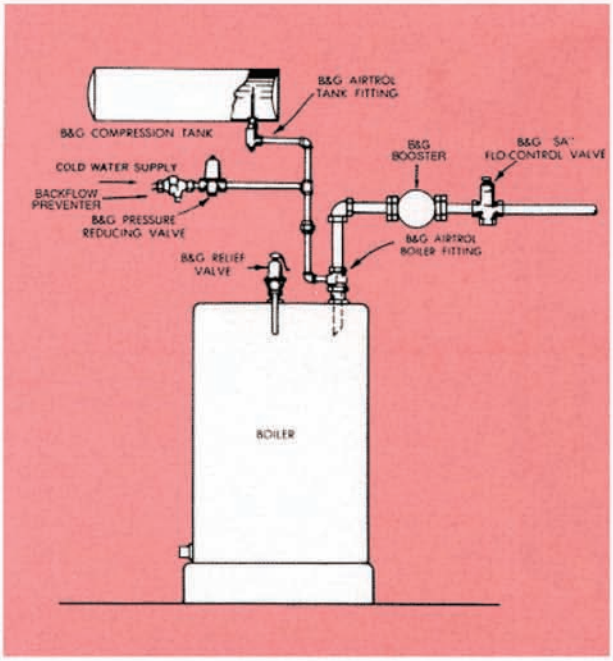


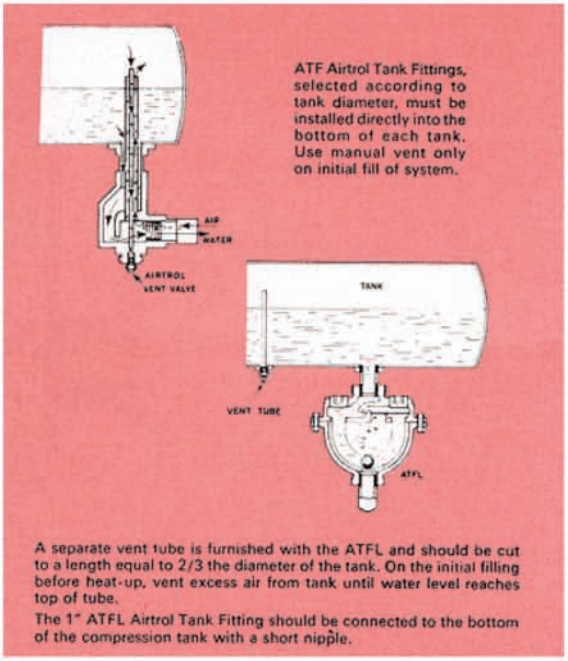
MODEL IAS WITH CONVENTIONAL TANK



Model No.	Size Inches NPT	Max. Flow GPM	Dimensions A IN	A mm	B IN	B mm	C IN	C mm	D IN	D mm	E IN	E mm	Approx. Shpg. Wgt. Lbs.	Kg
IAS-1	1	15	6⅛	152	3½	89	1⅞	45	¼	20	½	13	3¼	1.7
IAS-1¼	1¼	25											3½	1.6
IAS-1½	1½	35	8⅛	203	4½	114	2¼	57					8½	3.9
IAS-2	2	50											7½	3.4
IAS-2½	2½	75	10⅛	254	6⅜	162	3¼	81					23	10.5
IAS-3	3	125											21½	9.8

AIRTROL® TANK FITTINGS





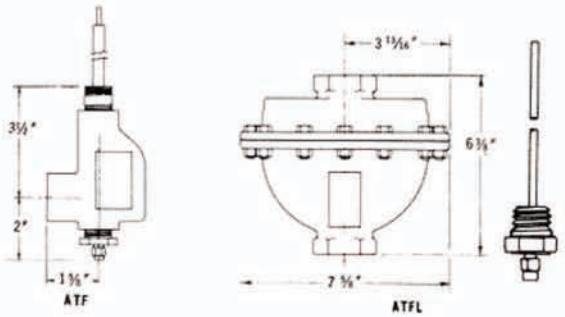
For proper operation, the air cushion Compression Tank(s) should be the only air space within a closed hydronic system. This air cushion can then provide adequate pressurization for all fluctuations of water volume.

However, because air can be absorbed in water, some means of restricting the flow of cooler water (gravity circulation) from the tank into the system is needed without restricting passage of free air into the tank. Compression tank size can be reduced considerably by reducing vapor pressure if this can be achieved.

B&G Airtrol Tank Fittings fill this need. The cross section of the ATF fitting illustrates how air bubbles can rise directly into the tank, but water flow is restricted by a baffle or trap. ATF fittings are available for tanks up to and including 24" diameter.

For tanks of 100 gallons and larger, the 1" ATFL fitting is recommended. As illustrated, air bubbles form an air trap at the bridge and rise unobstructed into the tank. Water will not circulate across this air trap so must return to the system via the "U" tube. A small differential in pressure between the system and the tank will move the non-ferrous ball past the small port, permitting tank water to return to the system. A large difference in pressure will force the ball to either end of the tube, thus permitting full flow through the tube to or from the system.

Both the ATF and ATFL are also equipped to help establish the correct initial air level in the compression tank when filling a system. After a system has been thoroughly cleaned and flushed, it is then filled with water. In the process of filling, air will be trapped in the compression tank. Usually too much air is trapped within the tank, since additional air will be collected in the process of heating and de-aerating the system water. A manual air vent is furnished on the ATF, separately with the ATFL, which will permit excess air to be released from the tank prior to heat-up of the system.

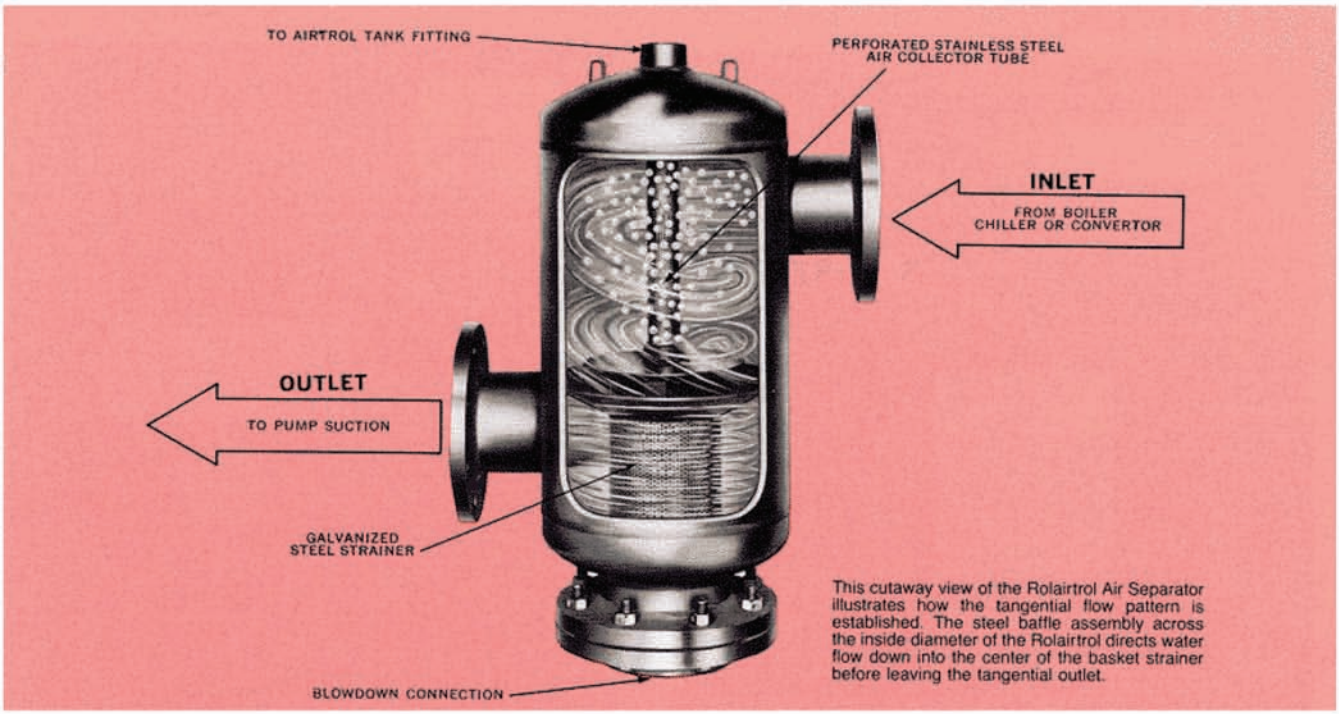


Catalog Number	Diameter of Compression Tank	Tank Connection	Boiler Connection
ATF- 9	9"	½" Male	¾" Female
ATF-12	12", 13" or 14"	½" Male	¾" Female
ATF-16	16"—18"	½" Male	¾" Female
ATF-20	20"—22"	½" Male	¾" Female
ATF-24	24"	½" Male	¾" Female
ATFL	For tanks 100 gals. and larger.	1" Female	1" Female

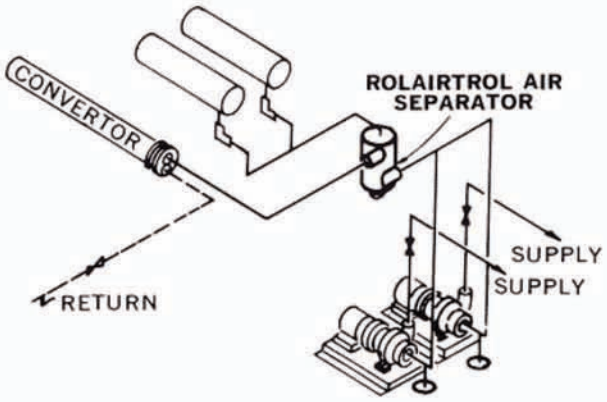
Maximum Design Limitations 175 psig @ 250°F

The Airtrol System is designed to maintain the right amount of air in the compression tank; therefore it is important to match the Airtrol Tank Fitting as closely as possible to the diameter of the tank being used.

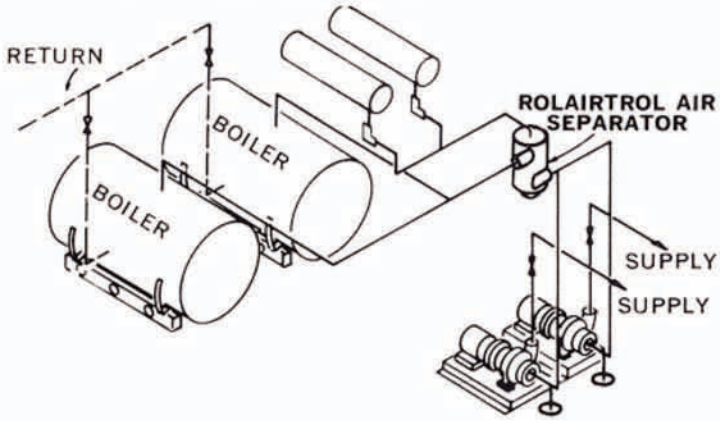
THE ROLAIRTROL® AIR SEPARATOR



This cutaway view of the Rolairtrol Air Separator illustrates how the tangential flow pattern is established. The steel baffle assembly across the inside diameter of the Rolairtrol directs water flow down into the center of the basket strainer before leaving the tangential outlet.



CONVERTOR SYSTEM WITH ZONE PUMPS

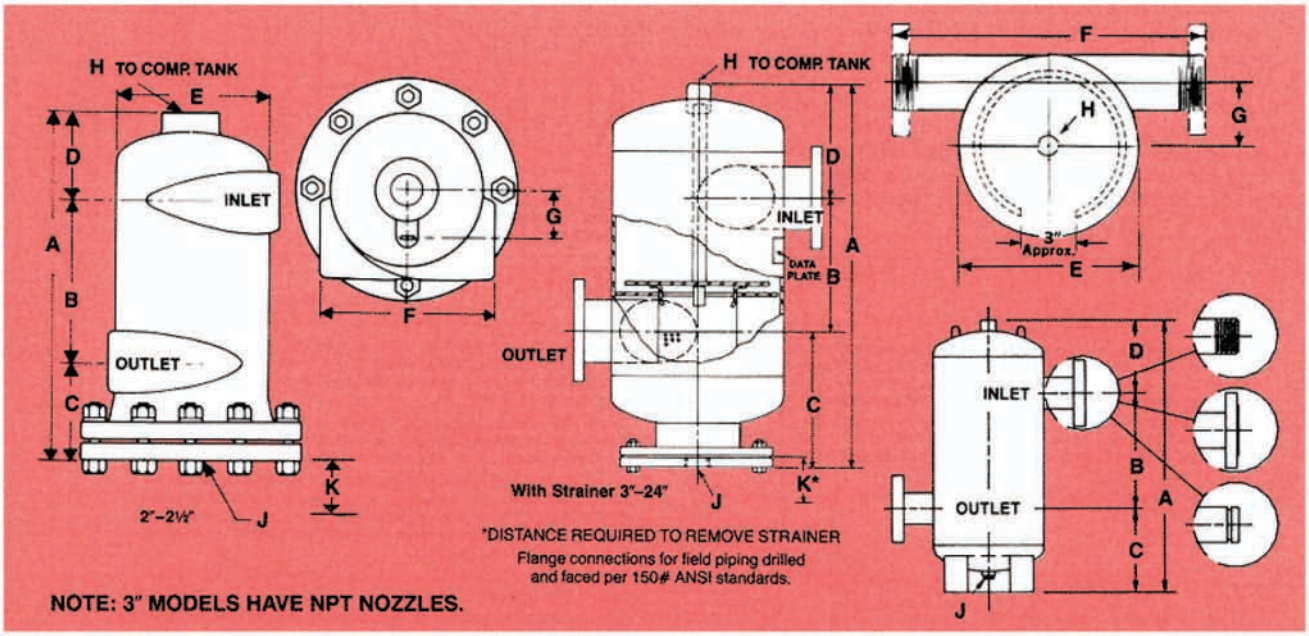


MULTIPLE BOILER WITH ZONE PUMPS

Typical installation for both boiler and convertor applications shows Rolairtrol Air Separator installed so that system strainer is always accessible for cleaning. Note system pump always operates away from Rolairtrol Air Separator.

The Rolairtrol Air Separator provides effective separation of free air from the system fluid thru its unique design and tangential nozzles which work together to create a low velocity vortex around the stainless steel air collector tube. The action of centrifugal forces causes heavier bubble free water to move to the outside while the lighter air entrained water moves into the low velocity area at the center. Physical size is reduced considerably over conventional low velocity separators. Models with removable system strainer require installation so that the strainer is always accessible for cleaning. Strainers should always be removed and cleaned after 24 hours and 30 days of system operation. Any system strainer should be checked regularly.

THE ROLAIRTROL® AIR SEPARATOR



*DISTANCE REQUIRED TO REMOVE STRAINER

Flange connections for field piping drilled and faced per 150# ANSI standards.

NOTE: 3" MODELS HAVE NPT NOZZLES.

Capacities, Dimensions and Weights

Model No.*	Capacity GPM	DIMENSIONS IN INCHES													Strainer Free Area Sq. Inches	Approx. Shpg. Wt. Lbs.
		Size of Tangential Openings		A	B	C	D	E	F	Grooved F	G	H	J	K		
R-2	56	2	NPT	15⅞	7	4	4⅞	6⅝	7⅜	—	2	1	1	8½	32	55
R-2½	90	2½		17⅜	7½	4½	5⅜	8⅛	9¼	—	2⅝				45	90
R-3(G)	190	3	NPT or Grooved	25 11/16	8	9⅝	8 1/16	10¼	16¾	16¾	3 11/16	1¼	1½	12	66	95
R-4(G)	300	4	Flanged or Grooved	30¾	10	11¼	9½	12¼	20½	19¾	4⅛	1½	2	14	140	165
R-5(G)	500	5		36⅛	12	13 3/16	10 15/16	16	23¾	23	5¼			17		220
R-6(G)	700	6		42¾	14	15½	13¼	18	25¾	25	5 11/16			20	220	300
R-8(G)	1300	8		53 13/16	18	19¼	16 9/16	24	31¾	31	7 11/16	2		23	310	460
R-10(G)	2000	10		64⅛	22	22 3/16	20 1/16	30	37¾	37¾	9⅝			29	435	860
R-12(G)	2750	12		77	27	27⅜	22⅝	36	46¼	46¼	11⅝			34	590	1200
R-14(G)	3400	14		89⅞	31½	32½	25⅞	42	54½	54½	14			37	715	1780
R-16(G)	4400	16		102¾	36	36½	30⅛	48	62½	62½	16			42	919	2425
R-18(G)	5200	18		123	40½	44¾	37¾	54	70¼	70¼	18			52	1521	3410
R-20(G)	6300	20		135⅞	45	49⅛	41¾	60	78	78	20			56	1989	5310
R-22(G)	7400	22		148⅛	49⅝	52¾	45¾	66	85⅛	85⅛	22			60	2322	6400
R-24(G)	8500	24		159⅜	54	56⅛	49¼	72	93½	93½	24			64	2841	7530
RL-2	56	2	NPT	15⅞	7	4	4⅞	6⅝	7⅜	—	2	1	1	N/A	N/A	50
RL-2½	90	2½		17⅜	7½	4½	5⅜	8⅛	9¼	—	2⅝					85
RL-3(G)	190	3	NPT or Grooved	26⅞	8	10 3/16	8 1/16	10¼	16¾	16¾	3 11/16	1¼				65
RL-4(G)	300	4	Flanged or Grooved	31 1/16	10	12	9 7/16	12¼	20½	19¾	4⅛	1½				100
RL-5(G)	530	5		37	12	14	11	16	23¾	23	5¼					160
RL-6(G)	850	6		44 1/16	14	16 3/16	13¼	18	25¾	25	5 11/16					205
RL-8(G)	1900	8		54½	18	20	16½	24	31¾	31	7 11/16	2				400
RL-10(G)	3600	10		64 1/16	22	22¾	19 15/16	30	37¾	37¾	9⅝					630
RL-12(G)	4800	12		75⅜	27	25⅝	22⅝	36	46¾	46¾	11⅝					980
RL-14(G)	6100	14		95	31½	35	28½	42	54½	54½	14					1700
RL-16(G)	8000	16		105¾	36	38⅛	31⅝	48	62½	62½	16					2325
RL-18(G)	9700	18		123	40½	44¾	37¾	54	70¼	70¼	18					3275
RL-20(G)	12000	20		135⅜	45	48⅝	41¾	60	78	78	20					5140
RL-22(G)	15000	22		148	49⅝	52⅝	45¾	66	85⅛	85⅛	22					6190
RL-24(G)	17000	24		159⅜	54	56⅛	49¼	72	93½	93½	24					7465

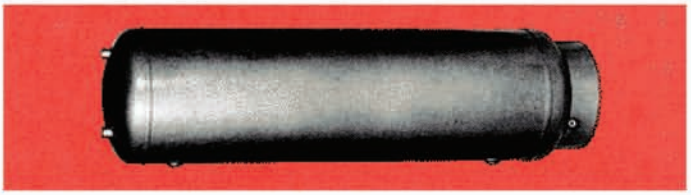
*Model "RL" Rolairtrol Air Separators are manufactured less strainer. The G in the model number designates a Rolairtrol Air Separator with grooved tangential openings.

Do not use for construction. Dimensions are approximate and subject to change. Contact factory for certified dimensions. **Maximum Design Limitations 125 psig @ 350°F

COMPRESSION TANKS

The compression tank on a closed hydronic system serves a very important function in providing adequate pressurization under all operating conditions. Above all, a compression tank must be absolutely air tight. B&G Tanks are available nationally in ASME construction, are of black steel construction, thoroughly tested and guaranteed leakproof. Gauge glass tappings are included as standard. See B&G Air Control Design Manual for compression tank selection procedure. Always use B&G Airtrol Tank Fittings for minimum tank size and effective air control.

(For Sizes Not Shown, Use Multiple Tanks)



DIMENSIONS AND WEIGHTS

MODEL NUMBER	DIMENSIONS - INCHES (MM)							TAPPINGS NPT INCHES (mm)	
	A	B	C	D	E	F	G	T	W
15	12 (305)	33 (838)	7 (178)	19 (483)	8 (203)	11-1/2 (292)	1-1/8 (29)	1	1/2
24	12 (305)	51 (1295)	7 (178)	37 (940)	8 (203)	11-1/2 (292)	1-1/8 (29)	1	1/2
30	14 (356)	48 (1219)	8-3/8 (213)	31-1/4 (794)	10 (254)	12 (305)	1-3/8 (35)	1	1/2
40	14 (356)	63 (1600)	8-3/8 (213)	46-1/4 (1175)	10 (254)	12 (305)	1-3/8 (35)	1	1/2
60	16 (406)	72 (1829)	9-1/4 (235)	53-1/2 (1359)	12 (305)	14 (356)	1 (25)	1	1/2
80	20 (508)	62 (1575)	10 (254)	42 (1067)	16 (406)	18 (457)	2-5/16 (59)	1	1/2
100	20 (508)	78 (1981)	10 (254)	58 (1473)	16 (406)	18 (457)	2-5/16 (59)	1	1/2
120	24 (610)	65 (1651)	11-1/8 (283)	42-3/4 (1086)	20 (508)	22 (559)	1-1/2 (38)	1	1/2
135	24 (610)	72 (1829)	11-1/8 (283)	49-3/4 (1264)	20 (508)	22 (559)	1-1/2 (38)	1	1/2
175	30 (762)	62-1/4 (1581)	13-1/2 (343)	35-1/4 (895)	22 (559)	26 (660)	1-3/8 (35)	1-1/2	1/2
220	30 (762)	77 (1956)	13-1/2 (343)	50 (1270)	22 (559)	26 (660)	1-3/8 (35)	1-1/2	1/2
240	30 (762)	84 (2134)	13-1/2 (343)	57 (1448)	22 (559)	26 (660)	1-3/8 (35)	1-1/2	1/2
305	30 (762)	105-3/4 (2686)	13-1/2 (343)	78-3/4 (2000)	22 (559)	26 (660)	1-3/8 (35)	1-1/2	1/2
400	36 (914)	93 (2362)	14-3/4 (375)	63-1/2 (1613)	28 (711)	30 (762)	1 (25)	1-1/2	1/2
505	36 (914)	116 (2946)	14-3/4 (375)	86-1/2 (2197)	28 (711)	30 (762)	1-1/8 (29)	1-1/2	1/2

Dimensions are subject to change. Not to be used for construction purposes unless certified.

TYPICAL SPECIFICATIONS

IAS

Furnish and install as shown on plans a horizontal in-line air separator designed to effectively separate free air in hydronic heating/cooling systems. The air separator shall be heavy duty cast iron designed to function satisfactorily at working pressures up to 175 PSI and liquid temperatures up to 300°F. The air separator shall have an integral weir designed to decelerate system flow to maximize air separation.

NOTE: Choose either A or B to Complete this Specification.

A. For Use with Conventional Compression Tanks

The in-line air separator shall further assist in controlling free air in the system by directing the separated air to a conventional compression tank while the bubble free water is circulated to the system. The in-line air separator shall allow expansion of the system fluid to be directed to the compression tank.

B. For Use with Precharged Bladder & Diaphragm Expansion Tanks

The in-line air separator shall further assist in eliminating free air from the system by directing the separated air to an air vent attached to the top of the air separator while the bubble free water is circulated to the system. The in-line air separator shall allow expansion of the system fluid to be directed to a precharged (CHOOSE ONE: BLADDER OR DIAPHRAGM) _____expansion tank attached to the bottom.

Each air separator shall be ITT Bell & Gossett Model No. IAS-_____ In-Line Airtrol Fitting.

COMPRESSION TANK

Furnish and install as shown on plans, a _____ gallon, _____" diameter x _____" long horizontal compression tank with two ½" NPT gauge glass tappings in one head and a minimum of two _____" NPT tappings (Select one: 15 thru 135 gallon tanks @ 1" or 175 thru 505 gallon tanks @ 1½") in the shell. The tank must be designed, constructed and stamped for _____ psig @ 650°F in accordance with Section VIII, Division I of the ASME Boiler and Pressure Vessel Code, and registered with The National Board of Boiler and Pressure Vessel Inspectors. The compression tank shall be painted with one coat of air dry enamel.

A Manufacturer's Data Report for Pressure Vessels, Form U-1 as required by the provisions of the ASME Boiler and Pressure Vessel Code shall be furnished for each compression tank upon request.

Each compression tank shall be Bell & Gossett Model No. _____.

ROLAIRTROL AIR SEPARATOR

Furnish and install, as shown on plans, a centrifugal type air separator. The unit shall have _____" (NPT/flanged/grooved) inlet and outlet connections tangential to the vessel shell. Vessel shell diameter to be three times the nominal inlet/outlet pipe diameter.

The unit shall have an internal stainless steel air collector tube with 5/32" diameter perforations and 63% open area designed to direct accumulated air to the compression tank via an NPT vent connection at top of unit.

The unit shall have a removable galvanized steel system strainer with 3/16" diameter perforations and a free area of not less than five times the cross-sectional area of the connecting pipe. A blowdown connection shall be provided to facilitate routine cleaning of the strainer. *(Delete this paragraph if system strainer is not specified.)*

Manufacturer to furnish data sheet specifying air collection efficiency and pressure drop at rated flow.

The air separator must be designed, constructed and stamped for 125 psig @ 350°F in accordance with Section VIII, Division I of the ASME Boiler and Pressure Vessel Code, and registered with the National Board of Boiler and Pressure Vessel Inspectors. The air separator(s) shall be painted with one shop coat of light gray air dry enamel.

A manufacturers' Data Report for Pressure Vessels, Form U-1 as required by the provisions of the ASME Boiler and Pressure Vessel Code shall be furnished for each air separator upon request.

Each air separator shall be Bell & Gossett Model No. R-_____ (with system strainer) or RL-_____ (less system strainer) Rolairtrol Air Separator for _____ GPM.

AIRTROL TANK FITTING

Furnish and install a compression tank fitting as shown on plans. It must contain an air separating trap and liquid control baffle to assure unrestricted air flow to the tank and air-free liquid flow from the tank. It must include a manual vent for adjustment of air volume in the tank. Cast iron _____psi (_____kPa) working pressure. All units shall be Bell & Gossett Model No. _____ Airtrol Tank Fitting.

xylem
Let's Solve Water

Xylem Inc.
8200 N. Austin Avenue
Morton Grove, Illinois 60053
Phone: (847) 966-3700
Fax: (847) 965-8379
www.xyleminc.com/brands/bellgossett