

# XA

## Low Flow Air Atomizing

The XA nozzle system uses the energy in compressed air to produce highly atomized sprays at low flow rates. There are many interchangeable components that can be assembled to achieve a variety of spraying objectives.

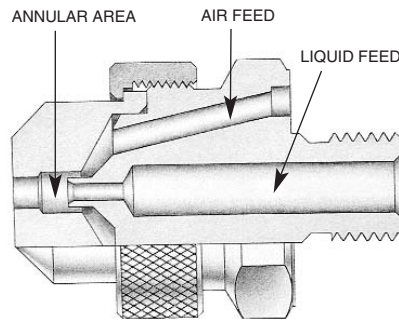
### SPRAY SET-UPS

XA nozzles produce eight distinctly different types of sprays, depending on which interchangeable air and fluid caps are selected. The spray type and flow rate are determined by the "set-up" — a specific combination of one air cap and one fluid cap.

#### Internal Mix Set-ups

Liquid and air streams meet within the nozzle and are mixed together and expelled through the same orifice(s). This internal mixing means the streams are not independent; a change in air flow will affect the liquid flow. This makes precise metering of the liquid more difficult than with an External Mix Set-up. Internal Mix Set-ups are able to produce the finest atomization of any of the XA set-ups, but they are generally not suitable for use with liquids which

have a viscosity that is above 200 centipoise.



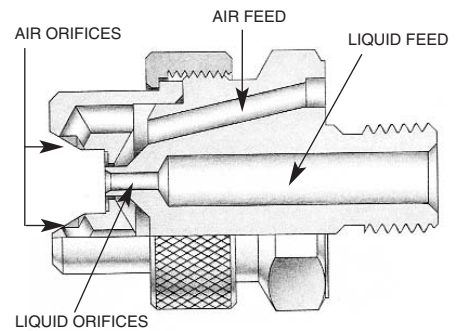
Cutaway View: Internal Mix Set-up

#### External Mix Set-ups

The air and liquid streams exit the nozzle independently and are combined and mixed outside of the nozzle. Because there is no connection between the air and liquid lines within the nozzle, the air and liquid flow rates can be controlled indepen-

dently, allowing precise metering of the liquid. The atomization can be controlled by adjusting the air flow rate—more air produces finer atomization. In most cases these set-ups do not atomize as finely as Internal Mix Set-ups.

External Mix Set-ups may be used with liquids having a viscosity above 200 centipoise and for abrasive suspensions. BETE Applications Engineering can provide guidance for spraying high viscosity liquids.

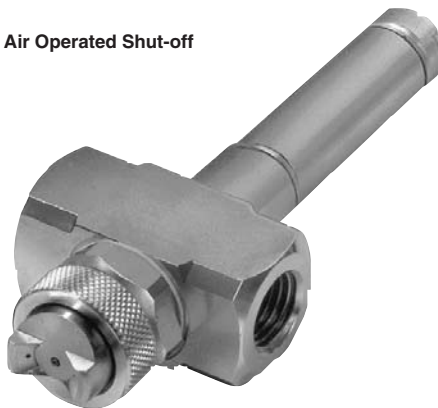


Cutaway View: External Mix Set-up

#### Siphon Set-ups

Internal and External Mix Set-ups require the liquid to be supplied to the nozzle under pressure from a municipal water supply, pump, or pressure pot. Siphon Set-ups use the

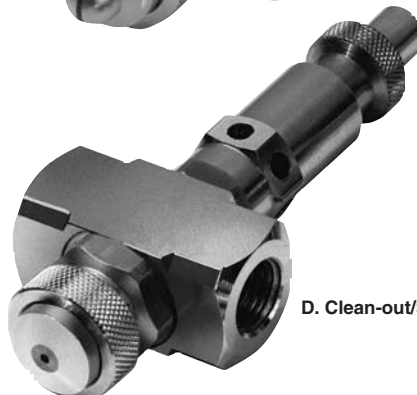
E. Air Operated Shut-off



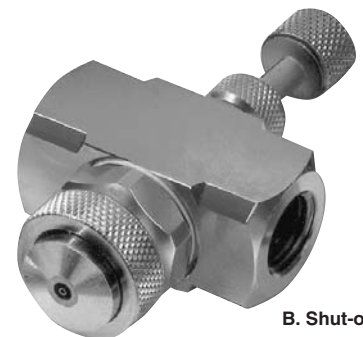
A. End Plug



D. Clean-out/Shut-off



B. Shut-off



Bold letters (A, B, C, D, E, F) refer to hardware assemblies shown on p. 84.

## XA Components & Options

flow of compressed air within the nozzle to siphon liquid from a container. Siphon Set-ups are frequently used for spraying additives from a container without the use of a pump. They provide the lowest flow rates available in the XA series (as low as 0.1 GPH). They are generally not suitable for use with liquids having a viscosity above 200 centipoise.

By supplying the liquid under pressure, SR Set-ups may be used with liquids having a viscosity above 200 centipoise. In this case, the liquid flow rate is regulated by the fluid cap, and can be determined by using the EF chart for the specific fluid cap.

### BASIC OPERATION

The basic XA nozzle assembly consists of a body, a spray set-up, and a "hardware assembly" that can provide shut-off and clean-out capabilities.

### Non-Automatic Operation

The XA00 Square Body is the basic component of a non-automatic XA nozzle. Air and liquid feeds are located at opposite ends, perpendicular to the spray.

The XA03 Body has air and liquid feeds on one side, perpendicular to the spray axis.

The XA05 Body has air and liquid inlets located in-line with the spray. *Hardware assemblies cannot be used with the XA05 body.*

### Hardware Assemblies for Non-Automatic Operation

**A. Plug.** The minimum option hardware assembly required for XA operation. Provides neither clean-out nor shut-off.

**B. Shut-off.** Turning the knurled knob will stop the flow of liquid to the nozzle. Should not be used to meter the flow of liquid.

**C. Clean-out.** Pressing the spring-loaded plunger will force a small diameter rod through the liquid orifice, cleaning any obstruction. Useful for intermittent spraying of a liquid that may dry in the orifice when not in use.

**D. Clean-out/Shut-off.** Combines functions of hardware assemblies B and C in one unit.

XA00 Body  
with C Hardware



XA05 Body



FF Air Cap



PF Air Cap



SR Air Cap



SR Air Cap



PR Air Cap



Fluid Cap



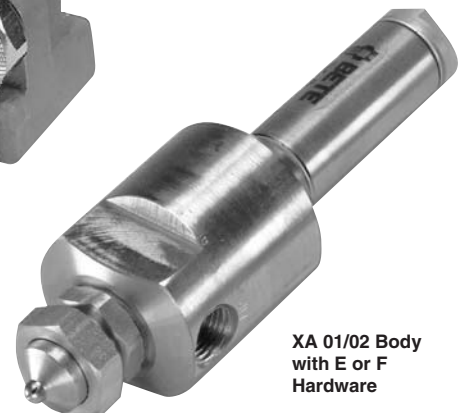
EF Air Cap



XW Air Cap



XA03 Body



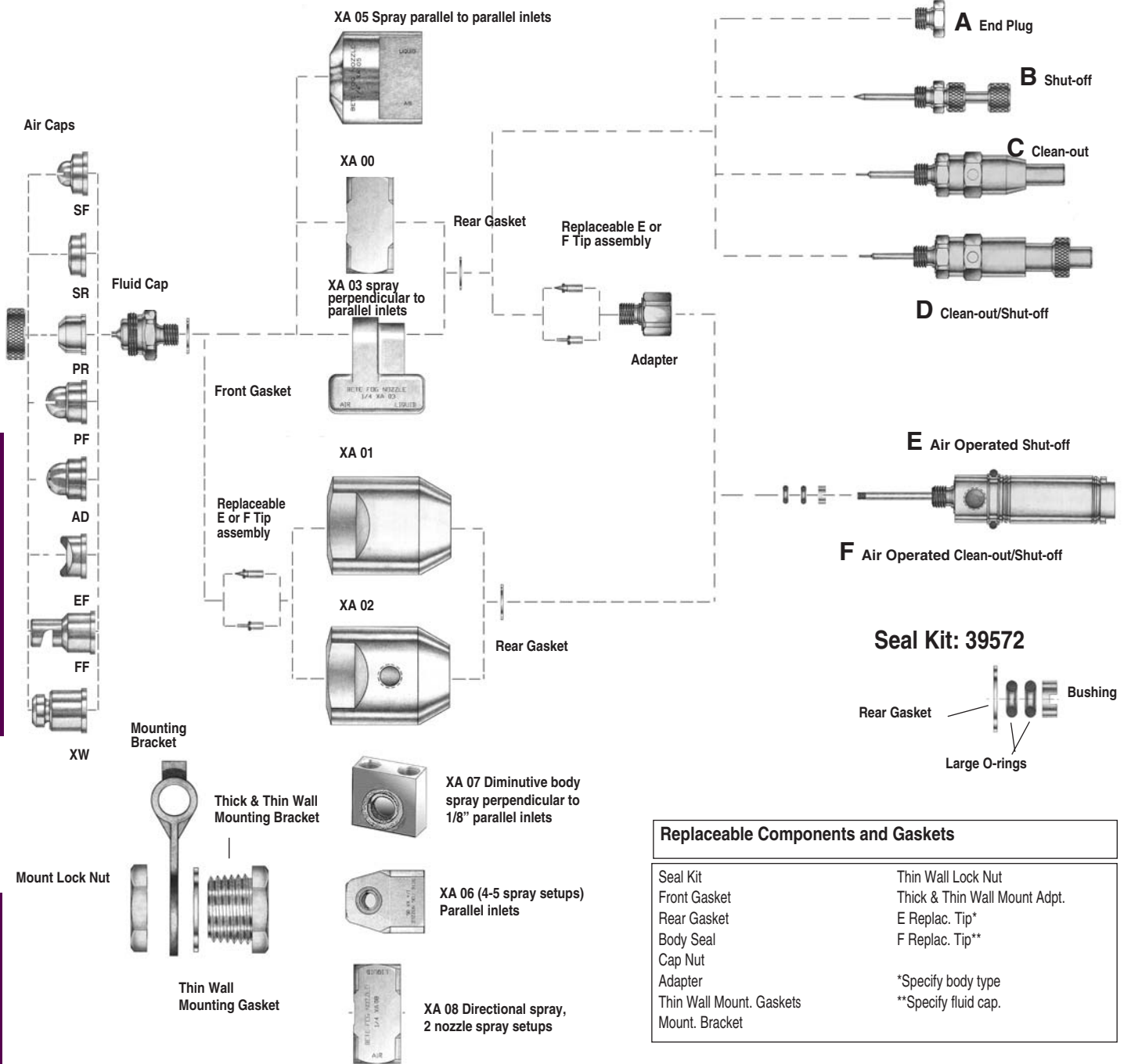
XA 01/02 Body  
with E or F  
Hardware

# XA Components & Options

## Spray Set-up

## Body Styles and Seals

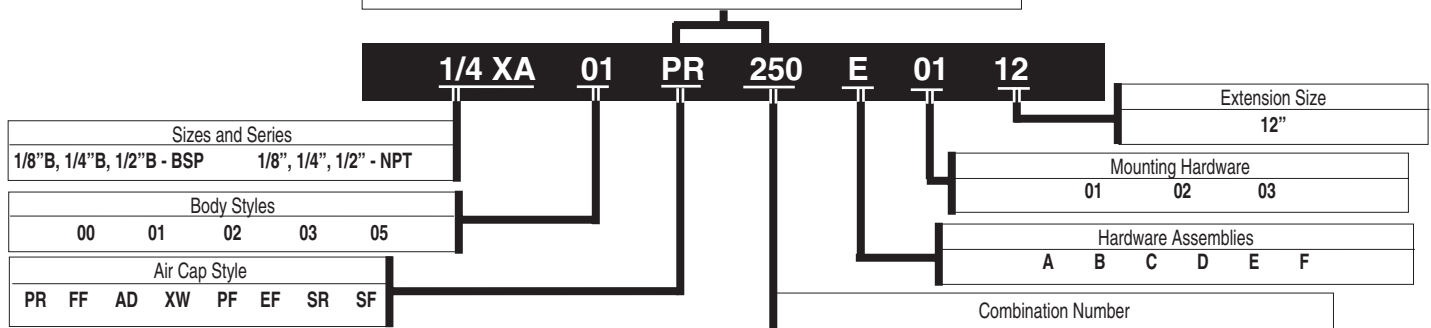
## Hardware Assemblies



Replaceable Components and Gaskets	
Seal Kit	Thin Wall Lock Nut
Front Gasket	Thick & Thin Wall Mount Adpt.
Rear Gasket	E Replac. Tip*
Body Seal	F Replac. Tip**
Cap Nut	
Adapter	*Specify body type
Thin Wall Mount. Gaskets	**Specify fluid cap.
Mount. Bracket	

## TO ORDER

## Spray Set-up Number



AIR ATOMIZING

TO ORDER: specify pipe size, body style, spray set-up #, hardware and mounting assemblies, and material.

# XA Components & Options

## AUTOMATIC OPERATION

For critical applications which require automatic, no-drip, or high-speed spray shut-off, the XA can be supplied with an air-cylinder-operated shut-off or clean-out/shut-off. These air cylinders provide virtually instantaneous liquid shut-off at rates of up to 180 cycles per minute. *The air cylinders require a minimum of 30 PSI.*

### Bodies for Automatic Operation

The XA01 and XA02 Round Bodies are rugged, highly reliable, and well suited to the rigors of high-cycle automatic operation. They have been designed to simplify the feed piping required for installing automatic nozzles by providing a constant location for the air inlet piping. With their neat, professional appearance, they are particularly recommended for OEM applications.

The XA01 Round Body has one inlet for air and one for liquid. Because the air inlet supplies air for both cylinder movement and liquid atomization, spraying during start-up and shut-off is not as crisp and precise as with the XA02. *The XA01 body cannot be used with atomizing air pressure under 30 PSI.*

The XA02 Round Body has two inlets for air and one inlet for liquid. One of the air inlets supplies the cylinder and the other supplies atomizing air. The XA02 body

must be used when the air cylinder operates at a different pressure from the atomizing air or where the atomizing air is supplied below 30 PSI.

*NOTE: The XA00 Square and XA03 Bodies used for non-automatic operation can also be used, with hardware assemblies E or F, for automatic operation. Special design features allow field upgrading to automatic operation.*

### Hardware Assemblies for Automatic Operation

**E. Air-Operated Shut-off.** Removal of air pressure to the cylinder causes a spring-loaded poppet valve actuator to shut off liquid flow.

**F. Air-Operated Clean-out/Shut-off.** Operation similar to E, but includes a clean-out needle.

### SOLENOID VALVES

Electrically operated solenoid valves can be used to control the operation of any XA nozzle. BETE can supply solenoid valves matched to your specific application.

### Solenoids for Automatic XA Nozzles.

A 3-way, quick-exhaust solenoid valve is required to operate the E or F hardware assembly. The valve is located in the line that supplies air to

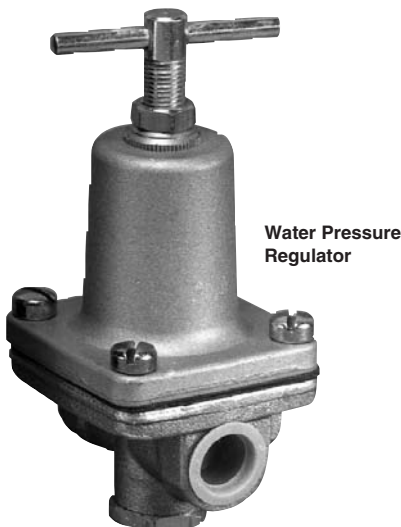
the cylinder, as close to the nozzle as possible. Independent control of the atomizing air of an XA02 or square body requires an additional 2-way solenoid valve.

### Solenoids for Non-Automatic XA Nozzles.

Two-way solenoid valves can be used to stop and start the flow of air and liquid to any non-automatic XA nozzle.

### FILTERS, REGULATORS AND STRAINERS

For optimum reliability, every pressure-fed XA nozzle should have a strainer and regulator in the liquid feed line and a filter and regulator in the air feed line. Every XA nozzle with a Siphon Feed Set-up should have a filter and regulator in the air line. The size and type of each of these components depends on the application, and can be determined by your BETE sales representative. BETE maintains an inventory of filters, strainers, and regulators that can be supplied with your XA nozzle to ensure reliable operation. These components can be purchased individually or in kit form.



Water Pressure Regulator



Air Regulator



Air Filter

BETE

AIR ATOMIZING

CALL 413-772-2166  
Call for the name of your nearest BETE representative.

# XA Components & Options

## SPRAY EXTENSIONS

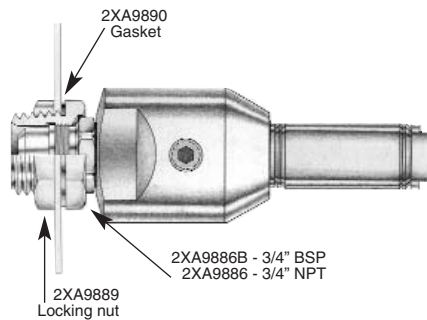
The spray set-up can be moved away from the nozzle body by using optional 6" or 12" extensions. These allow the spray to be moved closer to the target while keeping the nozzle body and associated piping at a distance.

## MOUNTING HARDWARE

In many XA installations the nozzle is supported by the rigid metal pipe that supplies air or liquid. There are several components which can provide support for the XA Bodies when it isn't appropriate to suspend the nozzle from piping; for example, when the nozzle will spray through the wall of a tank or duct, or when the air and liquid will be supplied through flexible tubing. All XA bodies except the XA03 can be used with any of the mounting hardware described here.

### Thin Wall 02 Adapter

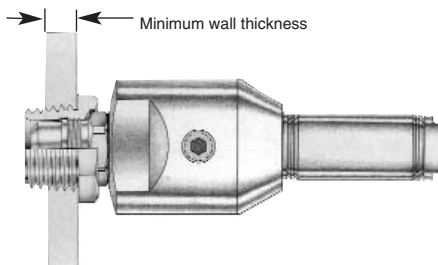
Three-piece adapter used to support an XA nozzle with the body located outside a tank or duct having a relatively thin (less than 3/8") wall and the spray directed into the interior. To use this adapter, a 1-1/16" diameter hole must be drilled through the wall. This adapter both secures the air cap and attaches the nozzle body to the tank wall.



XA02 with Thin Wall 02 Adapter

### Thick Wall 01 Adapter

Similar in design and function to the Thin Wall Adapter, but intended for use with tanks or ducts with walls that are thick enough (3/8" or over) to be drilled and tapped for a 3/4" NPT thread.



XA02 with Thick Wall 01 Adapter

### Mounting Bracket 03 Adapter

This bracket is used in combination with a Thin Wall Adapter to support an XA nozzle from a 1/2"-diameter metal rod. The bracket allows flexibility in aiming the spray.

## MATERIALS

### Bodies, Fluid Caps, Air Caps, Hardware Assemblies, Mounting Hardware

The standard materials for the XA series are nickel-plated brass and 303 and 316 stainless steels. Other metals and plastics can be supplied on request. See pages 20 and 21 for a complete material list.

### Air Cylinders

The air cylinders used for XA hardware assemblies E and F have rods and cylinders made of stainless steel and end caps made of anodized aluminum. All metal parts in contact with the spray liquid are 316 stainless steel.

### Seals

The standard material for XA gaskets is compressed fiber with a neoprene binder. For installations requiring FDA approval, SBR gaskets are available. Other elastomeric and metallic gasket materials can be supplied on request.

The standard material for O-rings in XA automatics is Viton®. Other materials available on request.



Liquid Strainer



Spray Extension

XA03 Mounting Bracket

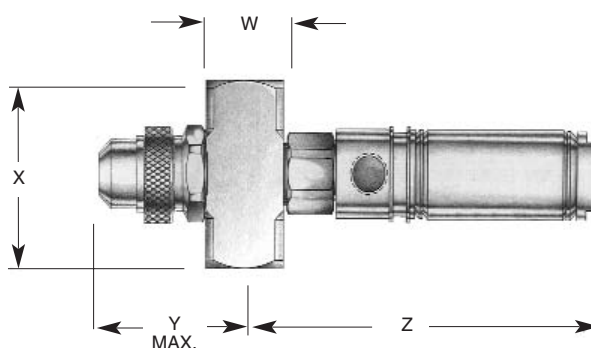
# XA Components & Options

## Spray Set-up Numbers

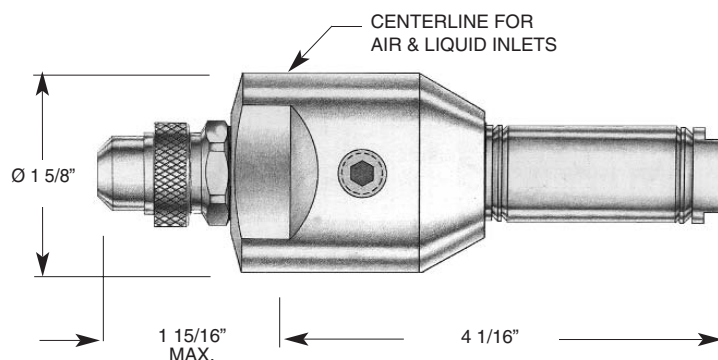
SPRAY SET-UP	PIPE SIZE BSP or NPT	SET-UP NO.	FLUID CAP	AIR CAP		
EF	FLAT FAN (EXTERNAL MIX)	EF 050	FC7	AC1001		
		EF 100	FC7	AC1003		
		EF 150	FC4	AC1001		
		EF 200	FC4	AC1003		
		EF 250	FC3	AC1001		
		OR	EF 300	FC3	AC1003	
		EF 350	FC6	AC1002		
		EF 400	FC6	AC1004		
		EF 450	FC2	AC1002		
		EF 500	FC2	AC1004		
		EF 550	FC1	AC1002		
		EF 600	FC1	AC1004		
		EF 650	FC8	AC1005		
		EF 700	FC9	AC1005		
		EF 800	FC5	AC1005		
			1/2	EF 5050	FC501	AC5001
SF	SIPHON FLAT FAN	1/8	SF 050	FC3	AC1101	
		OR	SF 100	FC6	AC1102	
		1/4	SF 150	FC2	AC1103	
		SF 200	FC2	AC1104		
SR	SIPHON ROUND	1/8	SR 050	FC7	AC1201	
		OR	SR 150	FC4	AC1201	
		1/4	SR 200	FC4	AC1202	
		SR 250	FC3	AC1202		
		SR 400	FC1	AC1204		
		SR 450	FC5	AC1205		
	1/2	SR 5050	FC501	AC5201		
PF	PRESSURE FLAT FAN	1/8	PF 050	FC4	AC1301	
		OR	PF 100	FC3	AC1303	
		1/4	PF 150	FC3	AC1301	
		PF 200	FC3	AC1302		
		PF 250	FC2	AC1304		
		PF 300	FC1	AC1304		
		PF 350	FC1	AC1305		
		PF 400	FC5	AC1306		
			1/2	PF 5050	FC501	AC5301
		PF 5100	FC502	AC5302		
XW	EXTRA WIDE-ANGLE ROUND	1/8 OR 1/4	XW 050	FC8	AC1401	
		1/2	XW 5050	FC502	AC5401	
PR	PRESSURE ROUND	1/8	PR 050	FC4	AC1501	
		OR	PR 100	FC4	AC1502	
		1/4	PR 150	FC3	AC1502	
		PR 200	FC2	AC1503		
		PR 250	FC1	AC1503		
		PR 300	FC5	AC1504		
			1/2	PR 5050	FC501	AC5501
		PR 5100	FC502	AC5502		
AD	WIDE ANGLE ROUND	1/8	AD 050	FC4	AC1601	
		OR	AD 100	FC2	AC1603	
		1/4	AD 150	FC2	AC1602	
		AD 200	FC1	AC1603		
		AD 250	FC1	AC1604		
		AD 300	FC5	AC1605		
			1/2	AD 5050	FC501	AC5601
		AD 5100	FC501	AC5602		
		AD 5150	FC501	AC5603		
		AD 5200	FC502	AC5604		
FF	DEFLECTED FLAT FAN	1/8 OR 1/4	FF 050	FC10	AC1701	

## Dimensions with Hardware Options for XA00 Body, BSP or NPT

Pipe Size	Hardware Option	Dimensions in inches			
		W	X	Y	Max. "Z"
1/8 OR 1/4	A				9/16
	B				1 5/8
	C	13/16	1 11/16	1 15/16	2 5/8
	D				3 3/16
	E				4 1/16
	F				4 1/16
1/2	A	1 1/4	2 1/2	2 11/16	1



Overall Dimensions of XA Assemblies with XA00 Body (Shown with E or F Hardware)



Overall Dimensions for Assemblies with XA01 or XA02 Bodies

AIR ATOMIZING

Call for the name of your nearest BETE representative.

CALL 413-772-2166

# XA Components & Options

## SYSTEM SET-UPS AND ACCESSORIES

BETE carries a complete line of controls and accessories required for setting up a system using the XA Series nozzles.

Contact your BETE representative for details.

### Pressure System Set-up

In a pressure-fed system, the liquid is supplied under pressure to either internal or external mix BETE XA Series nozzles.

Air and liquid regulators control the fluid delivery pressure, while the air filter and liquid strainer ensure that the supplied fluids are free of particulate.

Operational control is maintained by manual or solenoid valves used in conjunction with the various hardware assemblies.

### Siphon System Set-up

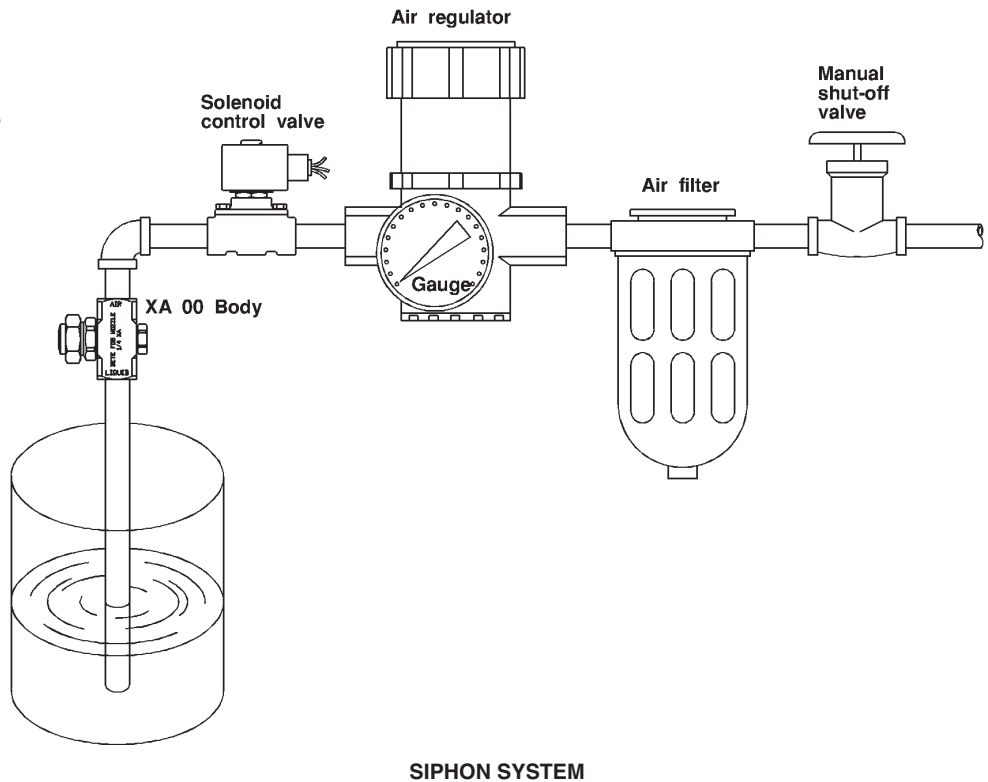
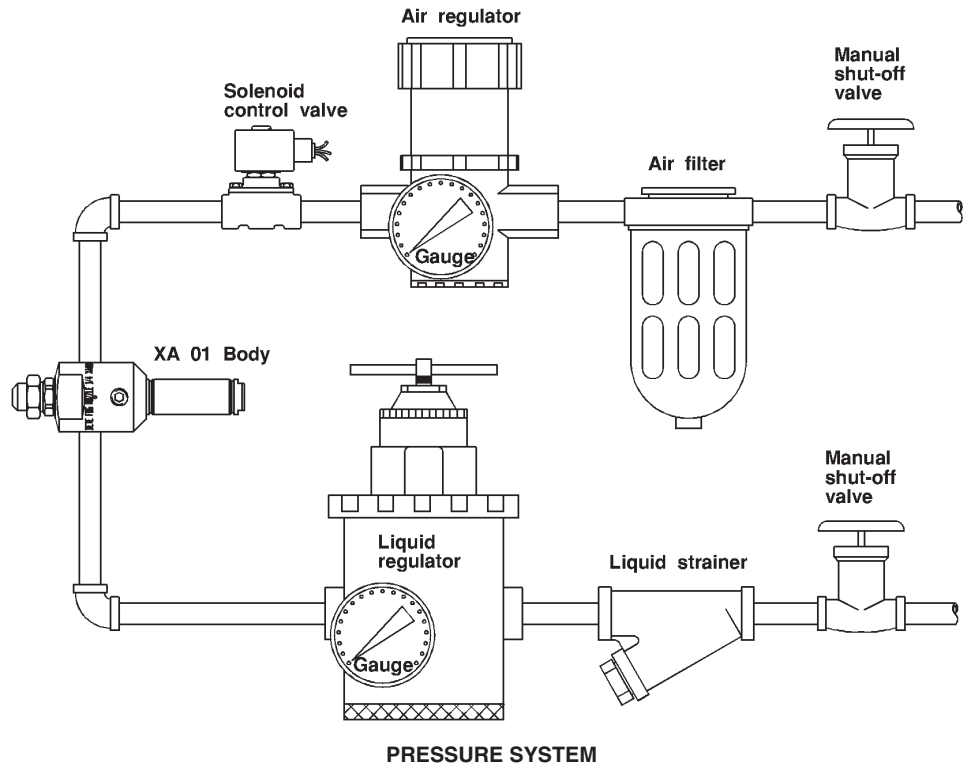
In a siphon-fed system, the liquid is supplied by either a siphon or gravity feed.

An air regulator controls the air delivery pressure, while the air filter ensures that the compressed air is of high quality.

Operational control is maintained by manual or solenoid valves used in conjunction with the various hardware assemblies.

When used as a gravity feed set-up, a positive liquid shutoff capability should be provided.

Filters, regulators, and strainers matched to your XA application are available from stock.



TO ORDER: specify pipe size, body style, spray set-up #, hardware and mounting assemblies, and material. See page 84.