

XA

Low Flow Air Atomizing

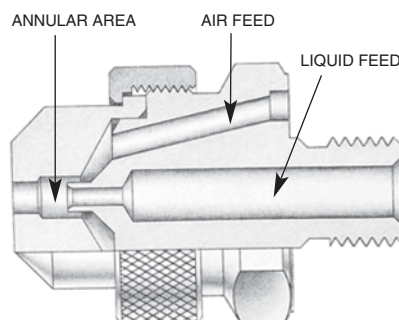
The XA nozzle system uses the energy in compressed air to produce highly atomized sprays at low flow rates. There are many interchangeable components that can be assembled to achieve a variety of spraying objectives.

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.



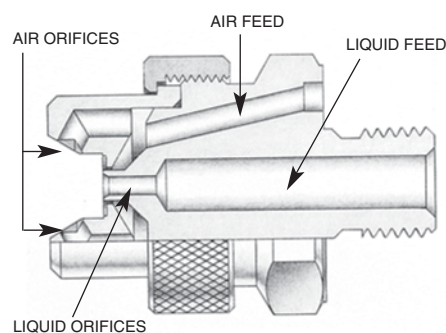
Cutaway View: Internal Mix Set-up

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 independently, 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 Engineers can provide guidance for



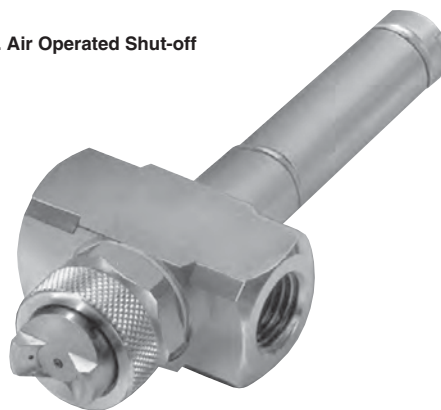
Cutaway View: External Mix Set-up

spraying high viscosity liquids.

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 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

E. Air Operated Shut-off



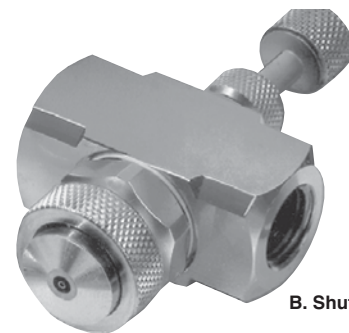
A. End Plug



D. Clean-out/Shut-off



B. Shut-off



Bold letters (A, B, C, D, E, F) refer to hardware assemblies shown on p. 78.

TO ORDER: specify pipe size, body style, spray set-up #, hardware and mounting assemblies, and material. See page 78.



XA Components & Options

lowest flow rates available in the XA series (as low as 0.38 L/hr). 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 dia-meter 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.



PR Air Cap



Fluid Cap



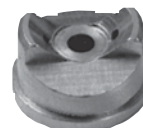
SR Air Cap



FF Air Cap



ER Air Cap



EF Air Cap



XW Air Cap

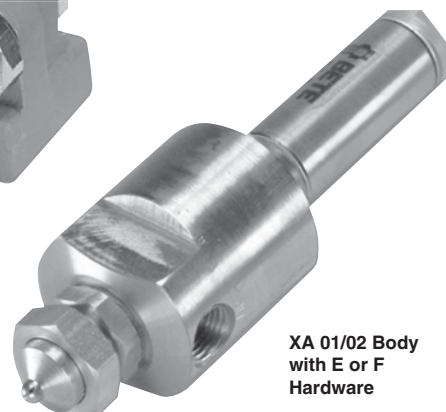


PF Air Cap



XA03 Body

XA00 Body
with C Hardware



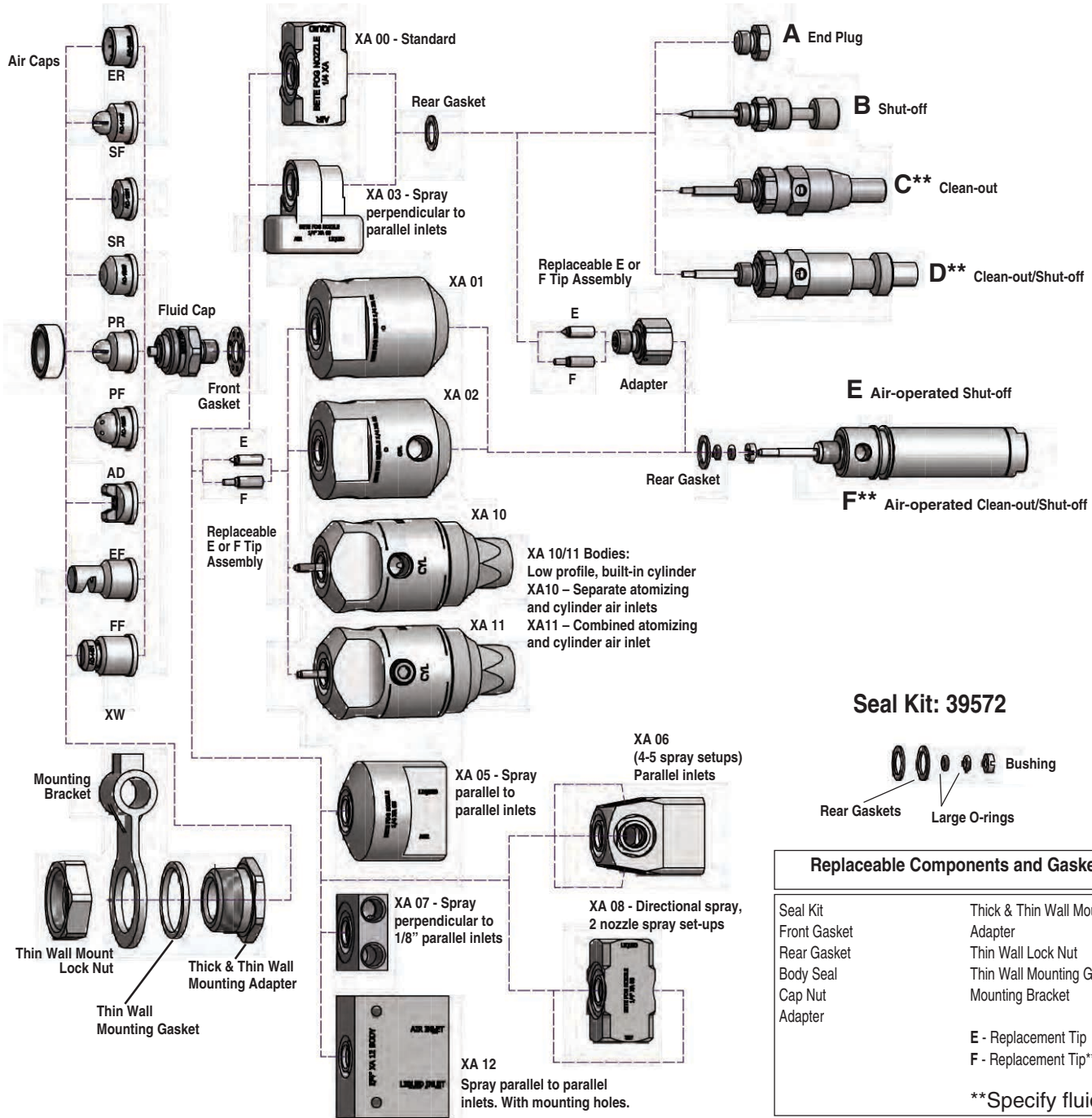
XA 01/02 Body
with E or F
Hardware

XA Components & Options

Spray Set-up

Body Styles and Seals

Hardware Assemblies



TO ORDER

Spray Set-up Number

1/4 XA 01 PR 250 E 01 12												Extension Size*
												12"
												Mounting Hardware
												01 02 03
												Hardware Assemblies
												A B C D E F
												Combination Number

Sizes and Series
1/8" B, 1/4" B, 1/2" B - BSP 1/8", 1/4", 1/2" - NPT

Body Styles
00 01 02 03 05 06 07 08 10 11 12

Air Cap Style
PR FF AD XW PF EF SR SF ER

*For extensions, A hardware is standard; E and F hardware may be provided on an application-specific basis.



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 5.5 bar to run that fast.*

Bodies for Automatic Operation

The **XA01, XA02, XA10, and XA11 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 2 bar.*

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 2 bar.

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.

The **XA10 and XA11 Bodies** have a built in air-operated cylinder. The integral cylinder provides a smaller profile for use where space is limited.

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 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.



Simple piping and robust design describe this multiple nozzle XA lance.



The XA06 manifold body can be fitted with up to five nozzle setups and is often used for humidification of large areas.



XA Components & Options

SPRAY EXTENSIONS

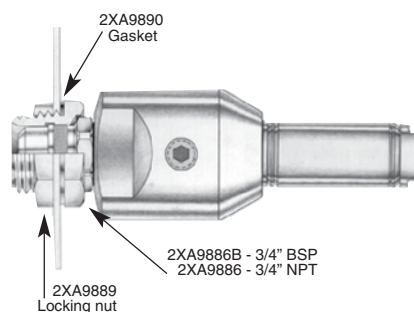
The spray set-up can be moved away from the nozzle body by using optional 152mm or 305mm extensions. These allow the spray to be moved closer to the target while keeping the nozzle body and associated piping at a distance.

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

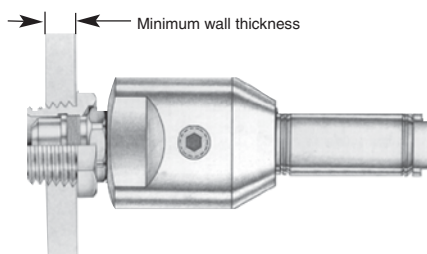
Three-piece adapter used to support an XA nozzle with the body located outside a tank or duct having a relatively thin (less than 10mm) wall and the spray directed into the interior. To use this adapter, a 27mm diameter hole must be drilled through the wall. This adapter both secures the air cap and 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 (10mm 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 13mm-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 page 12 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

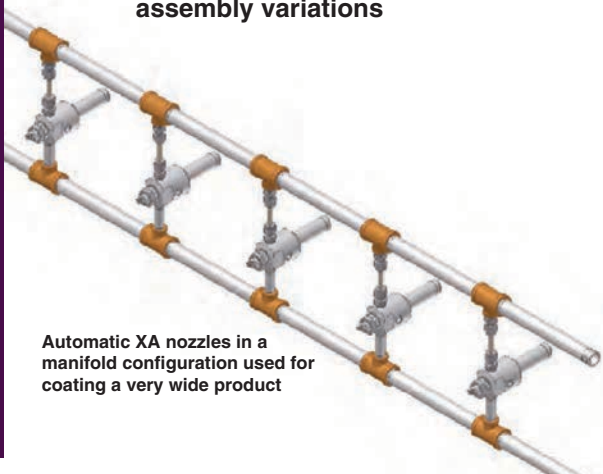
The standard material for XA gaskets is compressed fiber with a neoprene binder. For installations requiring FDA approval, SBR gaskets are available. Other elastomeric and metallic gasket materials can be supplied on request.

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

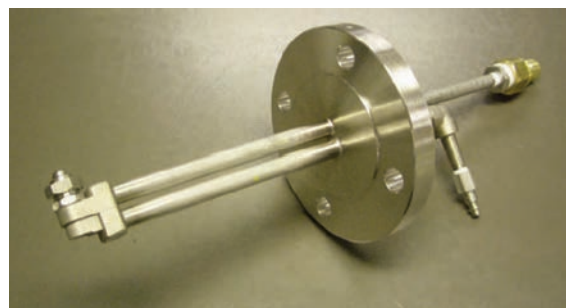


XA03 Mounting Bracket

BETE can fabricate XA nozzles into any number of lance assembly variations



Automatic XA nozzles in a manifold configuration used for coating a very wide product



Spray lance (see pages 18, 19) with a right angle XA and quick-connect fittings

TO ORDER: specify pipe size, body style, spray set-up #, hardware and mounting assemblies, and material. See page 78.



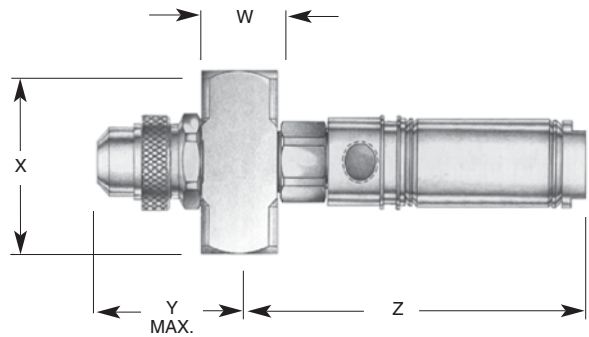
XA Components & Options

Spray Set-up Numbers

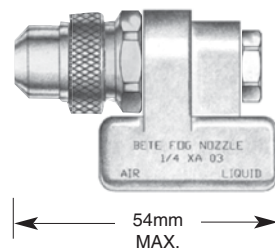
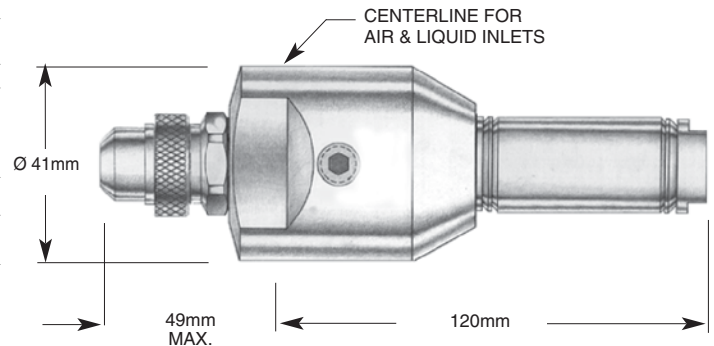
SPRAY SET-UP	PIPE SIZE BSP or NPT	SET-UP NO.	FLUID CAP	AIR CAP
EF	FLAT FAN (EXTERNAL MIX)	1/8	EF 050	AC 1001
			EF 100	AC 1003
			EF 150	AC 1001
			EF 200	AC 1003
		OR	EF 250	AC 1001
			EF 300	AC 1003
			EF 350	AC 1002
			EF 400	AC 1004
		1/4	EF 450	AC 1002
			EF 500	AC 1004
			EF 550	AC 1002
			EF 600	AC 1004
		1/2	EF 650	AC 1005
			EF 700	AC 1005
			EF 750	AC 1005
			EF 5050	AC 5001
SF	SIPHON FLAT FAN	1/8	SF 050	AC 1101
			SF 100	AC 1102
		OR	SF 150	AC 1103
			SF 200	AC 1104
SR	SIPHON ROUND	1/8	SR 050	AC 1201
			SR 150	AC 1201
			SR 200	AC 1202
			SR 250	AC 1202
		OR	SR 400	AC 1204
			SR 450	AC 1205
			SR 5050	AC 5201
			SR 5050	AC 5201
PF	PRESSURE FLAT FAN	1/8	PF 050	AC 1301
			PF 100	AC 1303
			PF 150	AC 1301
			PF 200	AC 1302
		OR	PF 250	AC 1304
			PF 300	AC 1304
			PF 350	AC 1305
			PF 400	AC 1306
XW	EXTRA WIDE-ANGLE ROUND	1/2	PF 5050	AC 5301
			PF 5100	AC 5302
		OR 1/4	XW 050	AC 1401
			XW 5050	AC 5401
PR	PRESSURE ROUND	1/8	PR 050	AC 1501
			PR 100	AC 1502
			PR 150	AC 1502
			PR 200	AC 1503
		OR	PR 250	AC 1503
			PR 300	AC 1504
			PR 5050	AC 5501
			PR 5100	AC 5502
AD	WIDE ANGLE ROUND	1/8	AD 050	AC 1601
			AD 100	AC 1603
			AD 150	AC 1602
			AD 200	AC 1603
		OR	AD 250	AC 1604
			AD 300	AC 1605
			AD 5050	AC 5601
			AD 5100	AC 5602
FF	DEFLECTED FLAT FAN	1/8 OR 1/4	AD 5150	AC 5603
			AD 5200	AC 5604
			FF 050	AC 1701
			FF 050	AC 1701
ER	NARROW ANGLE ROUND	1/8	ER 050	AC 1801
			ER 150	AC 1801
			ER 250	AC 1801
			ER 350	AC 1802
		OR	ER 450	AC 1802
			ER 550	AC 1802
			ER 650	AC 1803
			ER 750	AC 1803
			ER 850	AC 1803

Dimensions with Hardware Options for XA00 Body, BSP or NPT

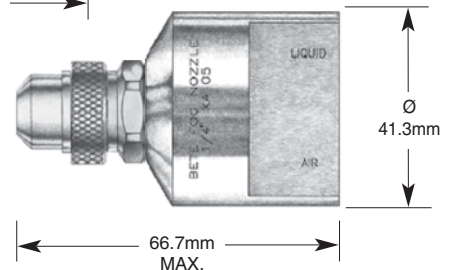
Pipe Size	Hardware Option	Dimensions in (mm)			
		W	X	Y	Max. "Z"
1/8 OR 1/4	A				14.3
	B				42.3
	C	22.2	42.9	49.2	63.5
	D				77.0
	E				103
	F				103
1/2	A	31.8	63.5	68.3	25.4



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



Overall Dimensions for Assemblies with XA05 Bodies



AIR ATOMIZING

CALL 413-772-0846
Call for the name of your nearest BETE representative.

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 of high quality.

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

Siphon System Set-up

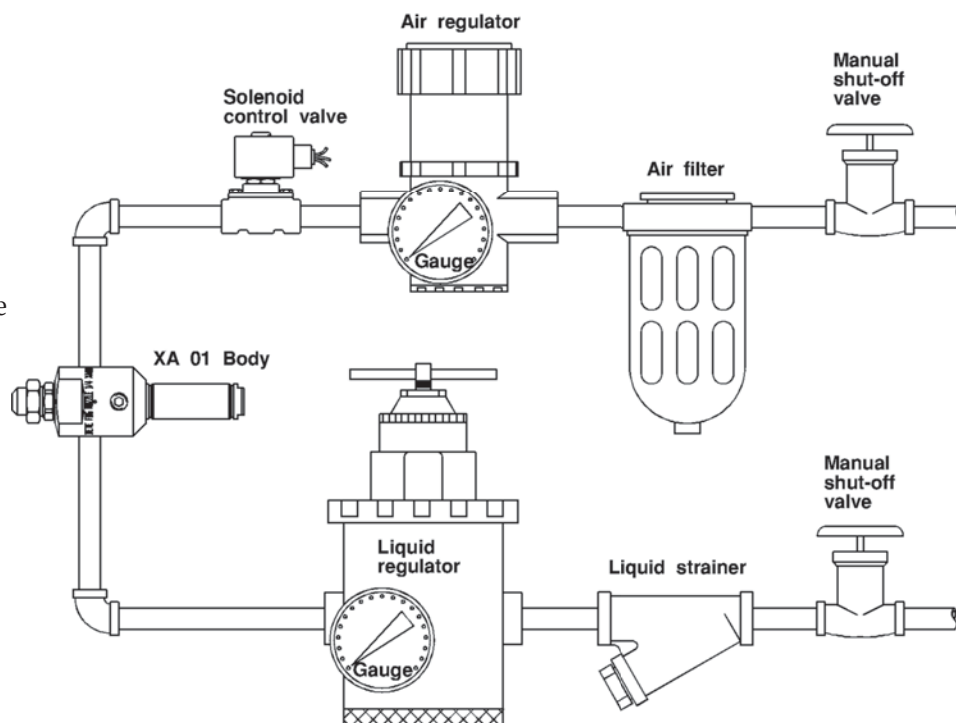
In a siphon-fed system, the liquid is supplied by either a siphon or gravity feed.

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

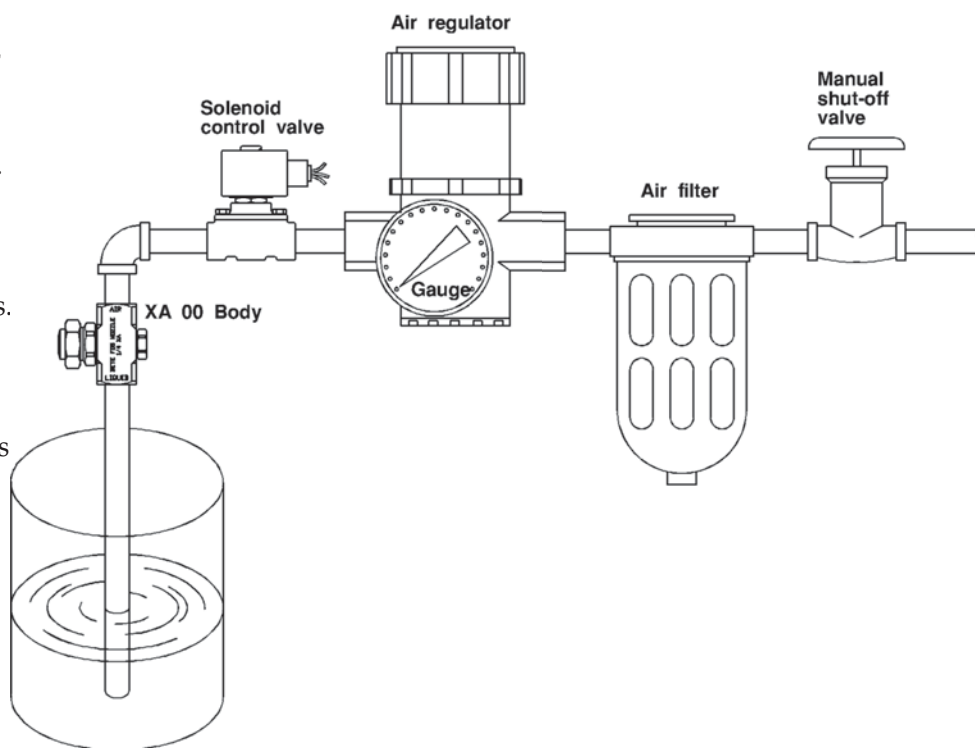
Operational control is maintained by manual or solenoid valves used in conjunction with the various hardware assemblies.

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.



PRESSURE SYSTEM



SIPHON SYSTEM

