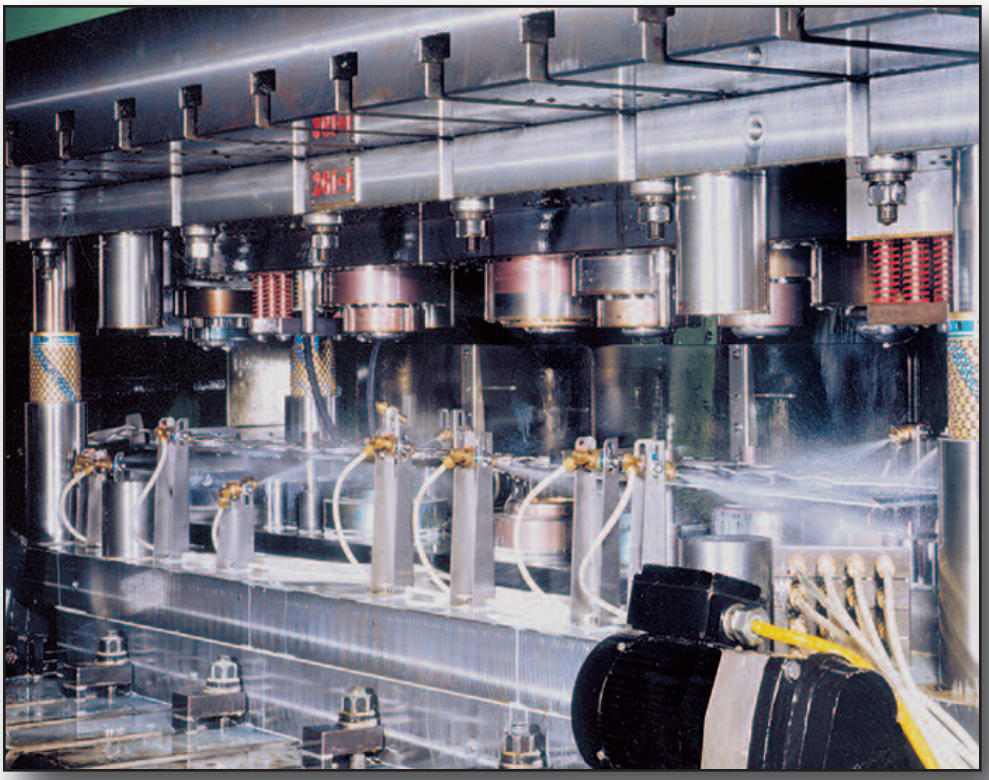
LUBE-SYSTEMS

PAX

Designed for Stampers by Stampers

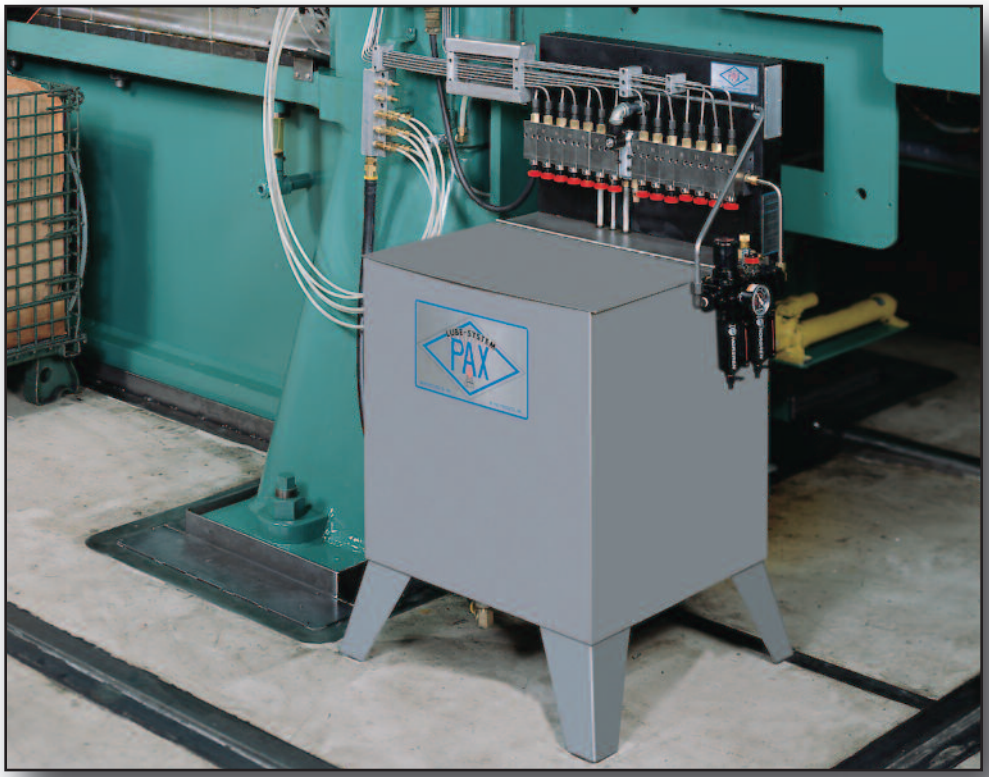
PAX LUBRICATION SYSTEMS



Pax is the pioneer of in-die lubrication. The original Pax system was designed and manufactured in 1975 by skilled tool and die craftsmen and tested in our own stamping facility.

By applying only the lubricant needed, only where it is needed, exactly when it is needed, Pax customers have:

- Increased Production Speeds
- Decreased Lube Consumption
- Increased Die Life
- Improved Part Quality
- Improved Working Conditions



Pre-Pressurized & V-Series Systems

Summary of System Features:

- No priming issues.
- Standard systems provide **"Airless" spray**,
  ~ Provides better adhesion to material and less airborne lube than sprays that mix air with lubricant.
- Can apply lubricant to the stock and to the tool.
- Systems arranged to promote lubrication recycling.
- Stainless Steel Reservoirs can be filled while system is in operation.
- Dual lubrication, Tankless, and Central system configurations available.

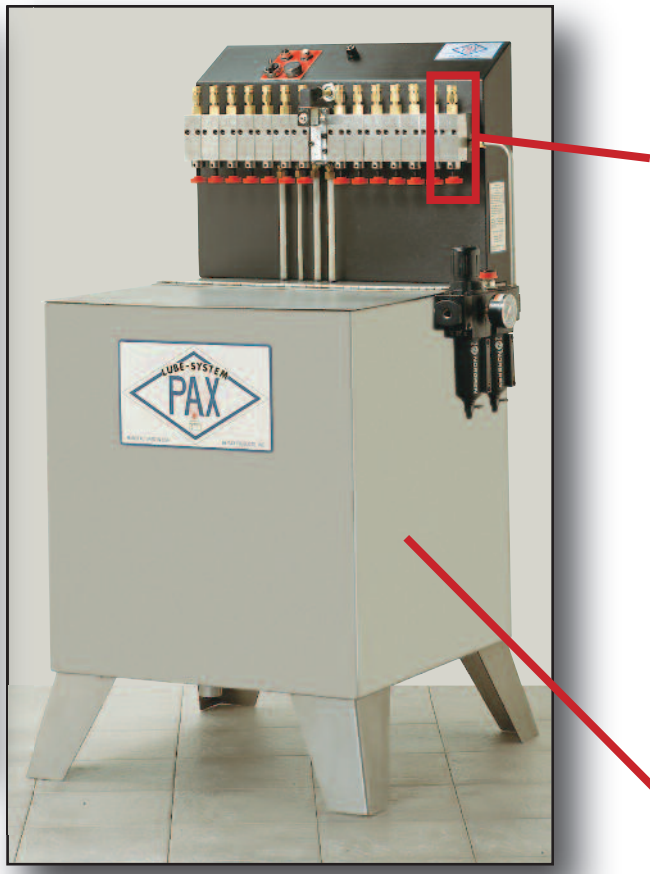
Pre-Pressurized System
Sprays more viscous lubricants.
Refer to page 4 for details on this system.

V-Series System
Independently programmable spray lines.
Refer to page 8 for details.

PAX Pre-Pressurized

Model 2-2
(Shown with optional Timer and Mounting Bracket)

Model 5-6



Model 30-14

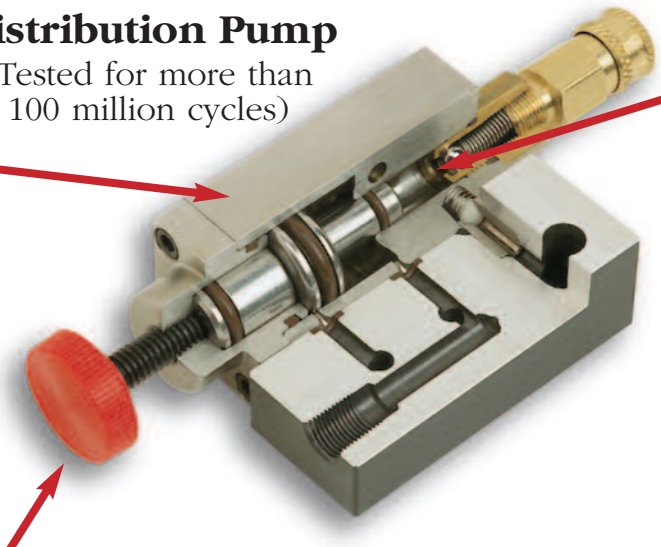
Pax Pre-Pressurized Systems with Reservoirs

	Model						
	2-2	5-6	15-6	15-10	30-6	30-10	30-14
Number of Distribution Pumps	1 to 2	1 to 6	1 to 6	1 to 10	1 to 6	1 to 10	1 to 14
Reservoir Capacity	2 Gallon (7,5 Liter)	5 Gallon (19 Liter)	15 Gallon (57 Liter)		30 Gallon (113 Liter)		
Size (Width x Depth x Height)	14.5x11x14" 37x28x36 cm	17.5x14x28.5" 45x36x72 cm	21x17x42" 53x43x107 cm		25x22x42" 63,5x56x107 cm		
Approximate Weight	24 Lbs. 11 kg	50 Lbs. 23 kg	80 Lbs. 36 kg		105 Lbs. 48 kgMax.		
Lubrication Capacity (Std. Vol.)	.021 oz. (0,62 mil) per Cycle x Number of Pumps						
Max. Lubrication Capacity (High Vol.)	.042 oz. (1,24 mil) per Cycle x Number of Pumps						
Maximum Cycles/Min. (Full Capacity)	300 CPM (Higher speeds are possible with reduced spray volume)						
Operation Pressure	30 to 125 psi (205 to 860 kilopascal)						
Maximum Air Consumption	.002 scfm per Cycle x Number of Pumps						
Voltage	115 VAC/60 HZ is Standard. Other voltages available upon request.						

LUBE SYSTEM

Distribution Pump

(Tested for more than 100 million cycles)



Airless Spray

The standard system configuration utilizes individual, air driven distribution pumps which have a 10:1 air pressure to lubrication pressure ratio. The resulting "airless" spray better adheres to the material and results in less airborne lube than sprays that mix air with the lubricant.

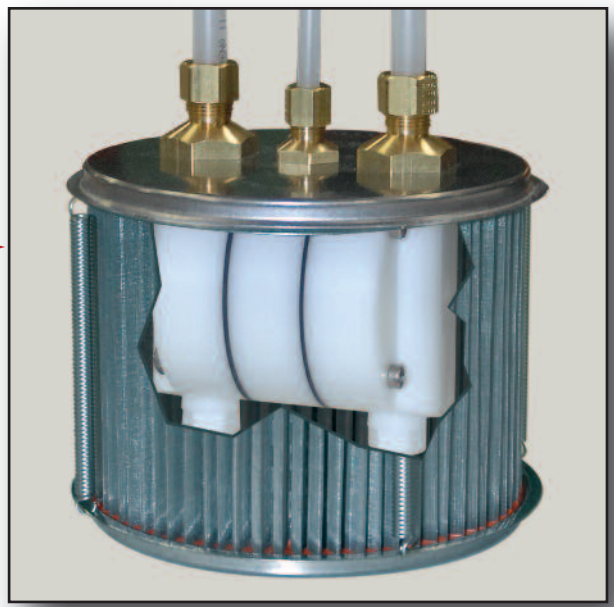
Applies of High Viscosity Fluids

The Pax system can operate from 40 psi (for light viscosity fluids) to 125 psi (for more viscous fluids). For higher viscosity fluids (above 300 SUS), the Pax high pressure piston spray nozzle may be required.

Simple Volume Adjustment

Volume of lubricant sprayed can be adjusted between .02 to less than .002 fluid ounces (0.621 to .068 cc). Higher volume pumps are available.

Filtered Supply Pump



No Priming Issues

Pressurized lubricant is consistently supplied to the distribution pumps by a diaphragm pump located inside of the stainless steel reservoir filter.

This design eliminates priming and maintenance issues associated with suction type systems.

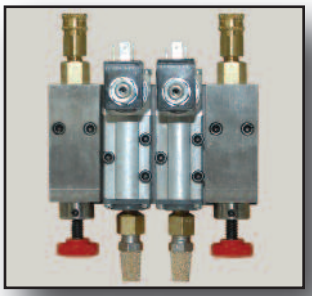
PAX Pre-Pressurized

Pre-Pressurized Tankless Systems

Pax tankless systems can be utilized with central lubrication supply systems or to spray lubrication directly out of the drum or other customer supplied reservoirs.

	Model 2T	Model 6T	Model 10T	Model 14T
Number of Distribution Pumps	1 to 2	1 to 6	1 to 10	1 to 14
Max. Lubrication Capacity (Std. Vol.)	.021 oz. (0,62 mil) per Cycle x Number of Pumps			
Max. Lubrication Capacity (High Vol.)	.042 oz. (1,24 mil) per Cycle x Number of Pumps			
Maximum Cycles/Min. (Full Capacity)	300 CPM (Higher speeds are possible with reduced spray volume)			
Operation Pressure	30 to 125 psi (205 to 860 kilopascal)			
Maximum Air Consumption	.002 scfm per Cycle x Number of Pumps			
Voltage	115 VAC/60 HZ is Standard. Other voltages available upon request.			

Model 6T



Model TS-2

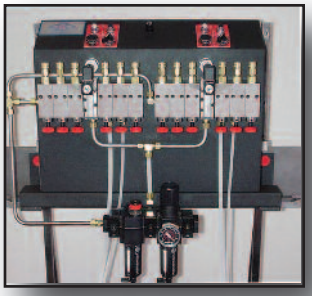
Pre-Pressurized Dual Solenoid Systems

Multiple solenoid systems provide the ability to independently cycle the different banks of distribution pumps. This is most advantageous for transfer and long feed progression applications when a certain number of pumps need to be cycled multiple times or at varying times throughout the stroke.

In cases where even greater control flexibility is required, Pax's V-Series system should be considered.

	TS-2*	6-6T	5-2-2	30-6-6
Number of Distribution Pumps	1 - 2 1/Solenoid	1 - 12 6/Solenoid	1 - 4 2/Solenoid	1 - 12 6/Solenoid
Reservoir Capacity	Tankless Units Reservoir Not Included		5 Gallon (19 Liters)	30 Gallon (113,5 Liters)
Max. Lubrication Capacity (Std. Vol.)	.021 oz. (0,62 mil) per Cycle x Number of Pumps			
Max. Lubrication Capacity (High Vol.)	.042 oz. (1,24 mil) per Cycle x Number of Pumps			
Maximum Cycles/Min. (Full Capacity)	300 CPM (Higher speeds are possible with reduced spray volume)			
Operation Pressure	30 to 125 psi (205 to 860 kilopascal)			
Maximum Air Consumption	.002 scfm per Cycle x Number of Pumps			
Voltage	115 VAC/60 HZ is Standard. Other voltages available upon request.			

* The TS-2 unit does not include an FRL assembly or an electrical control.



Model 6-6T

Model 30-6-6

LUBE SYSTEM

Pre-Pressurized System Options

- Magnetic Base Limit Switch with Cord
- Power Cord with Plug
- Digital Counter (for Intermittent Sprays)*
- Digital Timer (for Multiple Sprays)*
- Multi-Spray Control
- Pax Spray Cabinet and Spray Assemblies

* These options cannot be provided in combination on Models 2-2 and 2T.

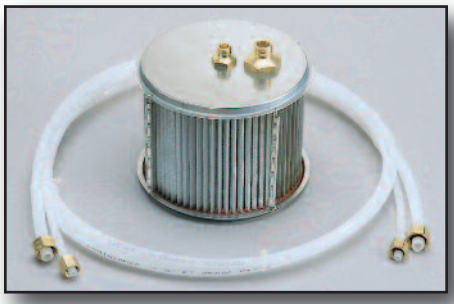
Additional Options for Systems with Reservoirs

- Reservoir Strainer**
- Air Agitation(for Water Soluble Lubricants)
- Low Level Float (Includes Lamp Indicator & Relay)
- Air Shut Off Valve (Safety Lockout)
- Automatic Refill Option (Includes Float Switches and Refill Solenoid Valve)**

** Not available on Model 2-2.

Additional Options for Tankless Systems

- Single Diaphragm Supply Pump & Filter (6T, 6-6T)
- Double Diaphragm Supply Pump & Filter (10T, 14T)
- Low Level Float for Supply Pump & Filter (6T, 10T 14T, 6-6T)
- Barrel Mount Diaphragm Supply Pump, Mini Filter, and Low Level Float



Supply Pump & Filter for 6T and 6-6T.

Barrel Mount Adapter w/Low Level Float

Rebuild & Upgrade Your Older Pax Systems

RENEWAL PROGRAM — LUBE-SYSTEMS PAX

Older Pax systems can be restored to like new condition and **Original**, vacuum style **Pax Systems** can be **upgraded** to the **Pre-Pressurized** design; which will eliminate all priming and maintenance issues associated with suction type systems.

Please contact your local Pax representative for additional information on system rebuilds or for information regarding other options not listed in this brochure.

PAX "V-Series" LUBE SYSTEM

Airless Spray

No air is mixed with the pressurized lubricant supplied to the spray lines. This results in an "airless" spray that better adheres to the material and creates much less airborne lubrication than air atomized sprays,

Capable of Spraying Fluids of Various Viscosities

Air pressure can be regulated as required for different viscosity fluids. For fluids with viscosity higher than 100 SUS it is important to identify the supplier and viscosity of the fluid so Pax may provide the most efficient configuration for the application.

Model V10-15

(Shown With Optional Controller and Air Agitation)

Independently Programmable Spray Lines

Each solenoid valve can be independently controlled and may be programmed to spray at different intervals, and for different durations (minimum 20 milli-seconds) during a press cycle. Pax's optional PLC control or an alternate, existing control may be utilized to operate the system.

No Priming Issues

A large diaphragm pump supplies filtered fluid to the individual spray lines at pressures up to 100 psi.

Reduced Maintenance

System requires no airline lubrication, requires no dynamic seals and has no accumulators.

PAX "V-Series" LUBE SYSTEM

Pax V-Series Systems with Reservoirs

	V5-5	V5-15	V5-30	V10-15	V10-30	V15-30
Reservoir Capacity Gallons (Liters)	5 (19)	15 (57)	30 (113)	15 (57)	30 (113)	30 (113)
Number of Solenoids	1 to 5			1 to 10		1 to 15
Operation Air Pressure	30 to 100 psi (205 to 860 kilopascal)					
Voltage	115 VAC/60 HZ is Standard, Other voltages available upon request.					

Model V5-5

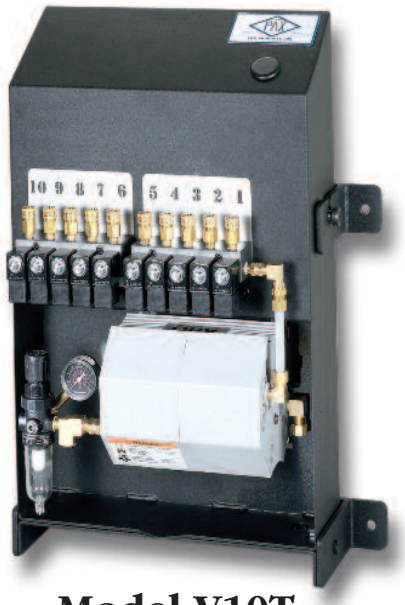
Pax V-Series Tankless Systems

Pax tankless systems can be utilized with central lubrication supply systems or to spray lubrication directly out of the drum or other customer supplied reservoirs. Depending on the application, the tankless units can be provided with the optional diaphragm supply pump and one of the optional filter assemblies listed on the following page; or the units can be supplied without a pump or filter assembly for central lubrication systems.

	Model V5M**	Model V5T	Model V10T	Model V15T
Number of Solenoids	1 to 5	1 to 5	1 to 10	1 to 15
Operation Air Pressure	30 to 100 psi (205 to 860 kilopascal)			
Voltage	115 VAC/60 HZ is Standard, Other voltages available upon request.			

Model V5M

** The Pax Model V5M may be utilized for central lube system applications that are currently equipped with a PLC to control the solenoid valves. This assembly includes 5 solenoid valves, a hard anodized aluminum manifold with numbered positions, and a terminal box. For applications that require the Pax PLC interface, the Pax V5T, V10T and V15T tankless systems may be utilized.



Model V10T
Shown With Diaphagm Supply Pump

PAX "V-Series" System Options

V-Series System Options

- Pax Controller Interface
- Lubricant Purge Switch (Not Required with Controller Interface)
- Magnetic Base Limit Switch with Cord
- Power Cord with Plug
- Pax Spray Cabinet and Spray Assemblies

Additional Options for Systems with Reservoirs

- Reservoir Strainer
- Air Agitation for Reservoir (for Water Soluble Lubricants)
- Low Level Float (Includes Lamp Indicator & Relay)
- Air Shut Off Valve (Safety Lockout)
- Automatic Refill Option (Includes Float Switches and Refill Solenoid Valve)

Additional Options for Tankless Systems

- Diaphragm Pump
- Tankless Filter Assembly
- Tankless Filter & Low Level Float Assembly
- Barrel Mount Adapter, Filter & Low Level Float Assembly

Strainer

Pax Optional Controller Interface

Pax Touch Screen Interface provides the user the ability to:

- Program each spray line independently or in groups.
- Purge all spray lines at one time regardless of settings.
- Capable of saving specific job set-ups.
- User friendly touch screen control.

Automatic Refill, Low Level Float and Air Agitation Options

PAX Spray Cabinets

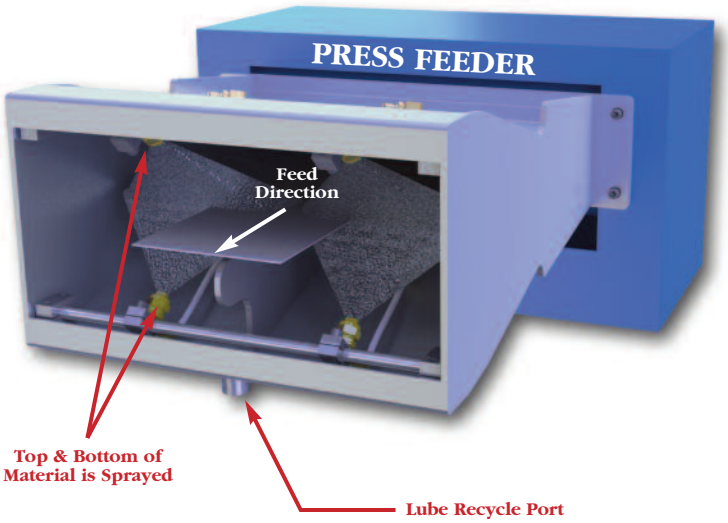
The Pax Spray Cabinet is an ideal solution for lubricating stock prior to entering the die area. It is designed with adjustable, built-in spray nozzles positioned above and below the material passline and it provides a method of containing, collecting, and recycling the lubricant. The cabinet is typically mounted to the feeder and therefore adjusts with the feeder for pass line changes. Cabinets are custom designed for each application and are available for material width ranging from 4" to over 72" in width.

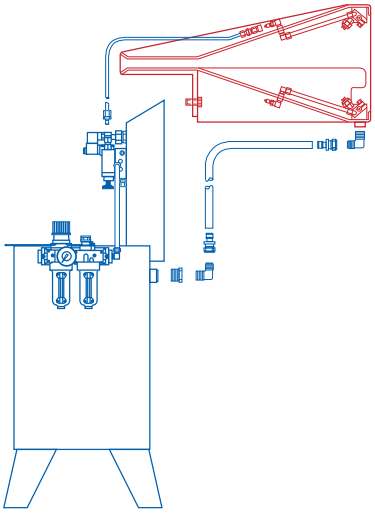
Features and Benefits:

- Non-Contact Lubrication with No Consumable Parts
- Collects and Recycles Lubricant
- Accommodates Different Stock Widths Without Adjustment
- Mounts To and Adjusts With Feed
- Promotes Cleanliness and Safety

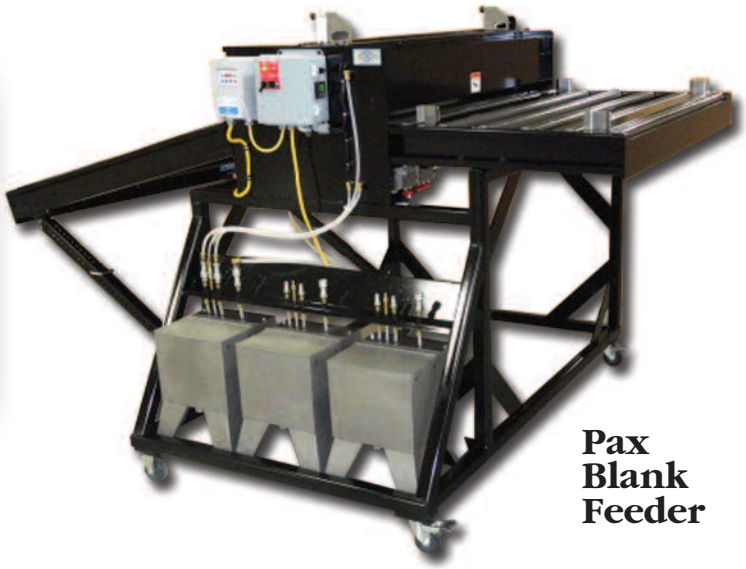
Options:

- Adjustable Stock Guide
- Upper and Lower Stock Tables
- Air Assist Spray Nozzles
- Removable Mounting Brackets
- Enclosed Design With Removable Access Panels
- Complete Cabinet Customization





Pax 72" Spray Cabinet



Pax Blank Feeder

PAX Spraying Assemblies

Overview of Spray Lines Types

Soft, plastic spray lines have the advantage of being highly bendable without kinking but, more rigid spray lines expand less under pressure and therefore provide a better spray pattern (especially for thicker lubrication). Pax offers three types of spray lines.:

- Soft (Polyethylene) Tubing that can be used with the Pax Pre-Pressurized unit for lower viscosity lubricants.
- Hard (Nylon) tubing that can be utilized on all Pax spray systems.
- Steel Tubing, which provides the best spray results for thicker lubricants.

Standard Spray Line Assemblies

This 8' long, ¼" spray line has a quick connect male plug on one end, (to connect to the Pax distribution pumps), and a spray nozzle (including nozzle body, check valve, tip retainer, and choice of spray tip) on the other end. The customer is responsible for determining mounting arrangement.

Spray Line Configurations	Pax Part Numbers			
	Pre-Pressurized			V-Series
	H.P. Nozzle	Piston Nozzle	H.P. Piston	
Spray Line w/Soft (Polyethylene) Tubing	06-3009-30	06-3102-30	N/A	N/A
Spray Line w/Hard (Nylon) Tubing	06-3010-30	06-3101-30	Contact Pax	06-3008-30

Magnetic Base Spray Assembly

Magnetic base provides flexibility for positioning the assembly as required and the rigid clamping and spraying assembly assures that the unit remains where it is positioned. The assembly includes a 250 lb. pull magnet with steel post, clamp assembly, stainless steel tube, female nozzle assembly with choice of spray tip, quick connect male plug and 8' of ¼" tubing,

Magnetic Base Spray Assembly Configurations	Pax Part Numbers			
	Pre-Pressurized			V-Series
	H.P. Nozzle	Piston Nozzle	H.P. Piston	
MBSA w/Soft (Polyethylene) Tubing	06-3013-31	06-3103-31	N/A	N/A
MBSA w/Hard (Nylon) Tubing	06-3014-31	06-3104-31	06-3149-30	06-3012-31
Low Vol. MBSA w/⅛" Hard (Nylon) Tubing	06-3023-31	Contact Pax	N/A	Contact Pax

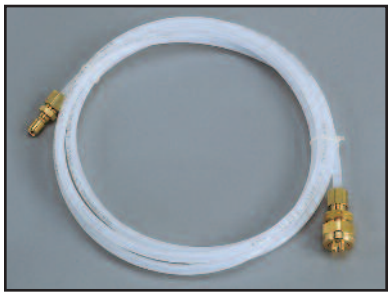
Flextube Magnetic Base Spray Assembly

The flextube assembly provide ultimate flexibility for positioning of the spray nozzle, however it can also be more easily moved out of position than either the magnetic base assembly or the bracket mount assembly. One Flextube assembly includes a 250 lb. magnet w/ bracket and release lever, flextube segments, 8' of ¼" tubing, tubing nozzle assembly and male plug.

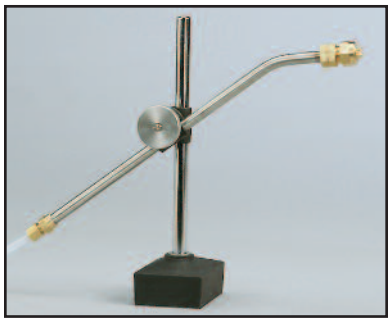
Flexible Base Spray Assembly Configurations	Pax Part Numbers			
	Pre-Pressurized			V-Series
	H.P. Nozzle	Piston Nozzle	H.P. Piston	
Flextube w/Soft (Polyethylene) Tubing	06-3017-30	Contact Pax	N/A	N/A
Flextube w/Hard (Nylon) Tubing	06-3018-30	Contact Pax	06-3149-30	06-3016-30

Magnetic Base Spray Shield

Pax Part number **00-2168-10**
The spray shield provides an easy method to help contain die lubrication. The magnetic base holds the shield firmly in place and a built in scale provides an easy reference for setting shield height.



Standard Spray Line Assembly



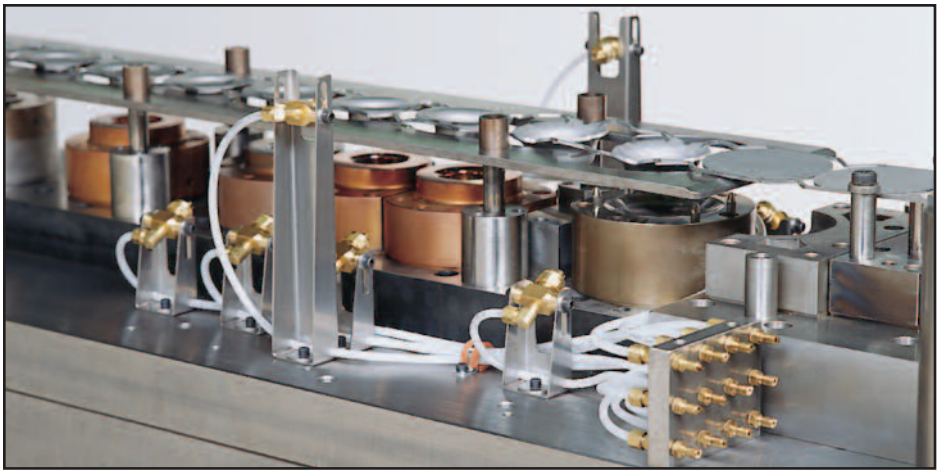
Magnetic Base Spray Assembly

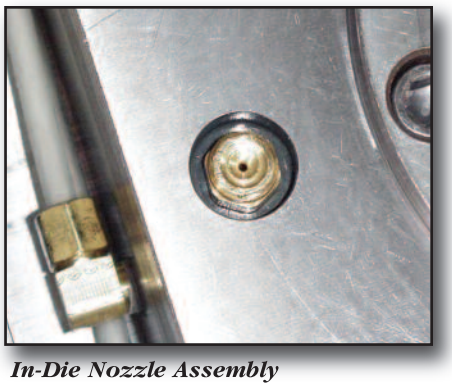
Flexible Magnetic Base

PAX In-Die Lubrication Components

Pax Bracket Mount Spray Assemblies

Pax bracket assemblies are the ideal way of permanently mounting spray assemblies. The spray angle can be adjusted by simply rotating either the nozzle and/or the bracket and the vertical height of the nozzle can be adjusted by moving the nozzle within the bracket slot. Once the position of the assembly is finalized, it is locked in place by tightening the bracket screws.



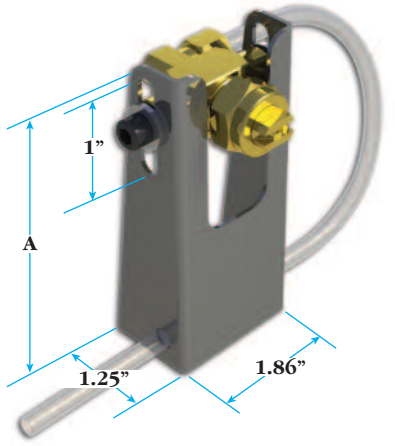


In-Die Nozzle Assembly

Pax Standard Bracket Mount Spray Assembly

Includes stainless steel bracket, spray nozzle, choice of spray tip, tip retainer, check valve, ⅛" male elbow, mounting screw and stainless steel washer. (Requires ¼-20 tapped hole for mounting).

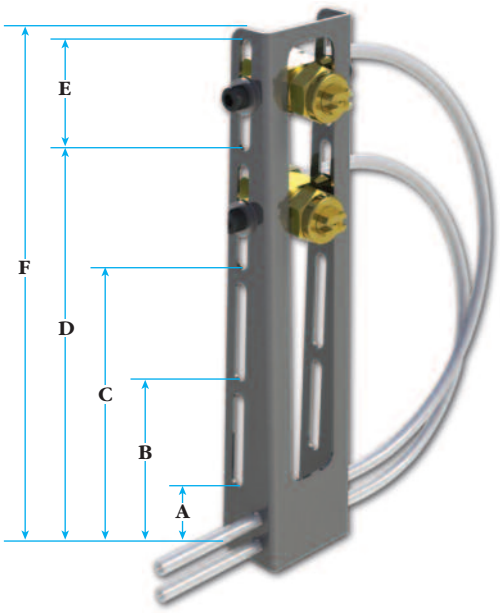
Bracket Size	A	Pax Part Numbers			
		Pre-Pressurized			V-Series
		H.P. Nozzle	Piston Nozzle	H.P. Piston	
1" to 2"	2.45"	06-3031-30	06-3134-30	06-3151-30	06-3109-30
2" to 3"	3.45"	06-3032-30	06-3135-30	06-3152-30	06-3110-30
3" to 4"	4.45"	06-3033-30	06-3136-30	06-3153-30	06-3111-30
4" to 5"	5.45"	06-3034-30	06-3137-30	06-3154-30	06-3112-30
5" to 6"	6.45"	06-3035-30	06-3138-30	06-3155-30	06-3113-30
6" to 7"	7.45"	06-3036-30	06-3139-30	06-3156-30	06-3114-30
7" to 8"	8.45"	06-3037-30	06-3140-30	06-3157-30	06-3115-30
8" to 9"	9.45"	06-3038-30	06-3141-30	06-3158-30	06-3116-30
9" to 10"	10.45"	06-3039-30	06-3142-30	06-3159-30	06-3117-30



Pax Multi-Nozzle Bracket Mount Spray Assembly

Includes stainless steel bracket, a mounting screw, a stainless steel washer and two of each of the following: spray nozzle, choice of spray tip retainer, check valve, and ⅛" male elbow. (Requires ¼-20 tapped hole for mounting).

Bracket Size	Bracket Dimensions						Pax Part Numbers			
							Pre-Pressurized			V-Series
	A	B	C	D	E	F	H.P. Nozzle	Piston	H.P. Piston	
5"	1.5"	3.5"	N/A	N/A	1.5"	5.3"	06-3120-30	06-3166-30	06-3160-30	06-3126-30
6"	1.6"	3.2"	4.9"	N/A	1.1"	6.3"	06-3121-30	06-3167-30	06-3161-30	06-3127-30
7"	1.5"	3.5"	5.5"	N/A	1.5"	7.3"	06-3122-30	06-3168-30	06-3162-30	06-3128-30
8"	1.7"	4.0"	6.2"	N/A	1.8"	8.3"	06-3123-30	06-3169-30	06-3163-30	06-3129-30
9"	1.5"	3.5"	5.5"	7.5"	1.5"	9.3"	06-3124-30	06-3170-30	06-3164-30	06-3130-30
10"	1.5"	3.7"	6.0"	8.2"	1.8"	10.3"	06-3125-30	06-3171-30	06-3165-30	06-3131-30

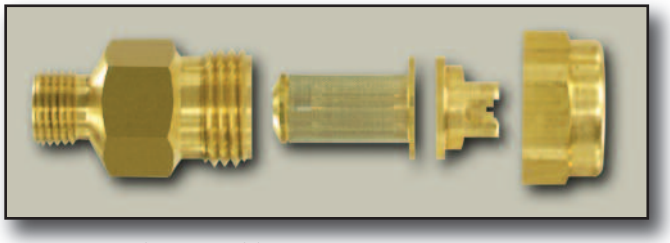


PAX Spraying Nozzles, Tips & Fittings

Pax Standard Spray Nozzle Assemblies

These standard assemblies provide an "airless" spray for a broad range of lubricants and they are available in different configurations as listed below. Each assembly is comprised of a nozzle body, a check valve, a spray tip, and a tip retainer. Please note that the Pax Pre-Pressurized and V-Series systems utilize different nozzle assemblies.

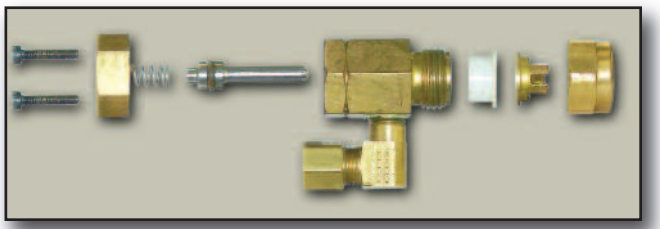
Spray Nozzle Assembly for Pre-Pressurized Systems



Spray Nozzle Assembly for V-Series Systems

Piston and High Pressure Piston Nozzle Assemblies For Pre-Pressurized Systems

These nozzles can spray a large range of lubricants, but the Piston Nozzle was specifically designed to spray lubricants with a viscosity below 100 SUS to reduce the potential for dripping and the High Pressure Piston Nozzle was specifically designed to spray lubricants with viscosities above 300 SUS. In place of the check valve that is utilized in the standard, pre-pressurized nozzle shown above, the piston and high pressure piston nozzle utilize a spring actuated piston built into the nozzle body.



Piston Nozzle Assembly For Pre-Pressurized Systems

Air Assist Nozzles

Unlike Pax's other nozzles, these nozzles mix air with the lubricant, which creates a lighter, mist type spray. To minimize the amount of lubricant that could enter into the air from an air assist nozzle, Pax recommends that these types of nozzles are utilized inside of Pax spray cabinets.

Air Assist Nozzle

Spray Nozzle Assemblies	Pax Part Numbers	
	Pre-Pressurized	V-Series
⅛" NPT FEMALE Threads	06-3004-30	06-3001-30
⅛" NPT MALE Threads	06-3005-30	06-3002-30
¼" TUBING Compression Nut & Sleeve	06-3006-30	06-3003-30
Piston Nozzle w/Compression Nut & Sleeve	06-3100-30	N/A
H.P. Piston Nozzle w/Compression Nut & Sleeve	06-3144-30	N/A

06-3001-30

06-3002-30

06-3003-30

06-3100-30

06-3004-30

06-3005-30

06-3006-30

06-3144-30

PAX Spraying Nozzles, Tips & Fittings

Spray Tips

Please contact Pax for information on additional tips.

Style	Type	Pattern Size	Part No.
Flat	25°	1.50" x 3.50"	06-0973-20
Flat	50°	2.00" x 5.75"	06-0951-20
Flat	65°	2.00" x 7.50"	06-1908-20
Flat	80°	2.00" x 9.50"	06-0950-20
Flat	95°	2.25" x 12.00"	06-1909-20
Flat	110°	2.50" x 14.00"	06-0952-20
Deflected	.041" Orifice	4.00" x 18.00"	06-0956-20
Cone	.020" Orifice	3.50" Diameter	06-0958-20
Cone	.024" Orifice	4.25" Diameter	06-0953-20
Cone	.030" Orifice	5.50" Diameter	06-0959-20

Note: A low viscosity (Tellus #10) lubricant was used to obtain the pattern sizes described. The tips were placed in the vertical position and held 6" from the surface with an air pressure setting on the FRL of 35 psi. Pattern sizes may vary depending upon lubricant viscosity and air pressure setting.

Flat Tip

Deflected Flat Tip

Cone Tip

Various Fittings and Adapters May Be Used:

NOTE: MNPT = Male Pipe Thread **FNPT** = Female Pipe Thread **QC** = Quick Connect

06-0928-32
¼" Compression QC Plug

06-0967-10
⅛" MNPT QC Plug

06-1905-20
⅛" MNPT QC Plug w/Valve Core

01-0912-20
⅛" FNPT QC Plug

06-0910-20
¼" x ⅛" FNPT Compression

06-1925-20
¼" Tubing x ⅛" MNPT

01-0901-20
¼" Compression x ⅛" MNPT

06-1902-20
⅛" FNPT x QC Coupling

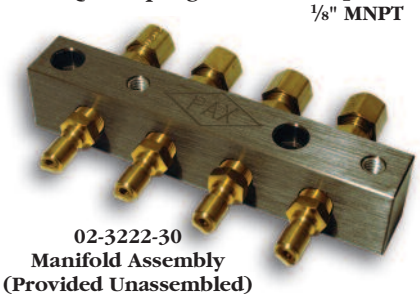
03-0911-20
⅛" MNPT x QC Coupling

01-0914-21
¼" Compression x ⅛" MNPT

06-1920-20
Swivel Adapter
⅛" MNPT x ⅛" FNPT

4-Port Stackable Die Manifold

06-1980-10
⅛" FNPT Stackable Manifold



02-3222-30
Manifold Assembly
(Provided Unassembled)

Note: Other fittings available upon request.

PAX CONVEYORS

LUBE-SYSTEMS PAX

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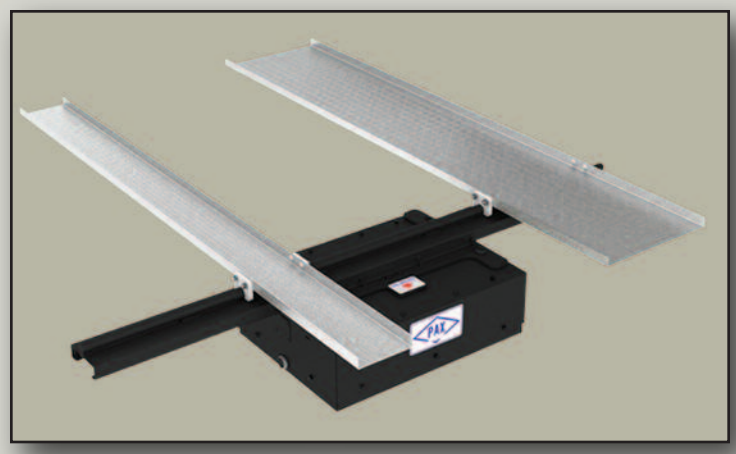
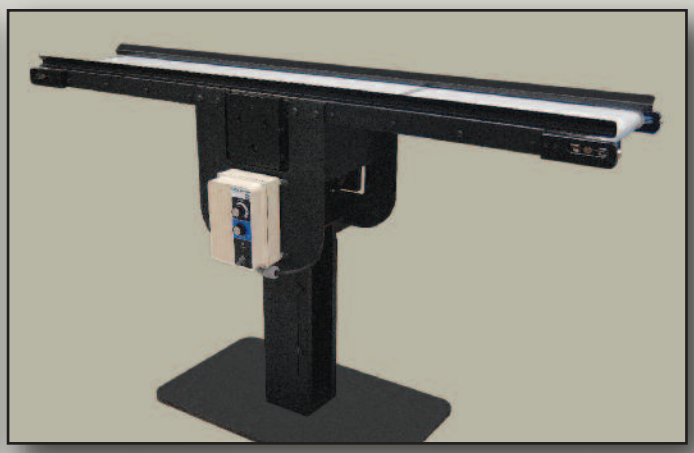


EGD Shaker Conveyors



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