

# Pumps and Products for Industrial Assembly

**COMPONENT**



**COMPLETE**



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**IR ARO**®

# Electronic Index

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- Click on any (Red) Catalog Page Number to Return to This Page

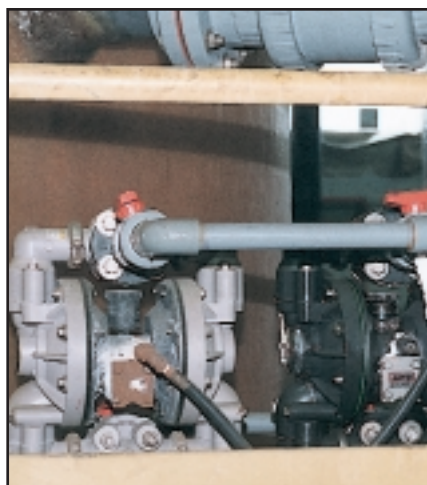
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**Where Process  
and Product  
Converge  
to Achieve  
Optimum  
Results.**

## **Welcome to the ARO® Zone.**

The place where your production processes and our engineered products “converge to achieve optimum results”. But beyond process and product there is a third essential element that makes the “zone” a very real place: the ARO Industrial Assembly Distributor. To make the leap from acceptable to optimum results it takes in-depth, working knowledge of both process and product. Your ARO Industrial Assembly Distributor knows both, and its knowledge and expertise, not hype, that will usher you and your operation into this new dimension of productivity. The ARO-Zone. . . get into it!



1½" pumps (with ANSI flanges) at work in a waste treatment application



This 666053-322 (1/2" Polypropylene) is used on a parts wash rack







A 666101-244 (1" Stainless Steel) is used to supply water treatment chemicals



This 1/2" pump transfers cutting fluid through a filtering chamber



ARO 1/2" pumps being used in a water pre-treatment operation



An LM2305A-41 (Thunder) pump in a bulk oil supply application.



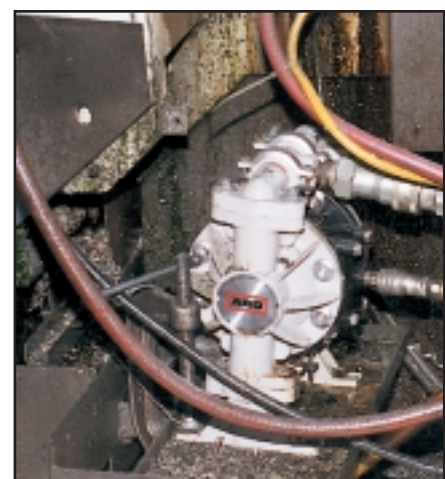
1/2" pump pulls cutting oil from a 55-gallon drum



A remote-actuated 1/2" pump supplies oil on an "as-needed" basis



A 666101-244 (1" Stainless Steel) and 6661M1-2A4-C (3:1 Power Pump) are used in a mixing/recirculation process



A 666053-X services a multi-station machining center

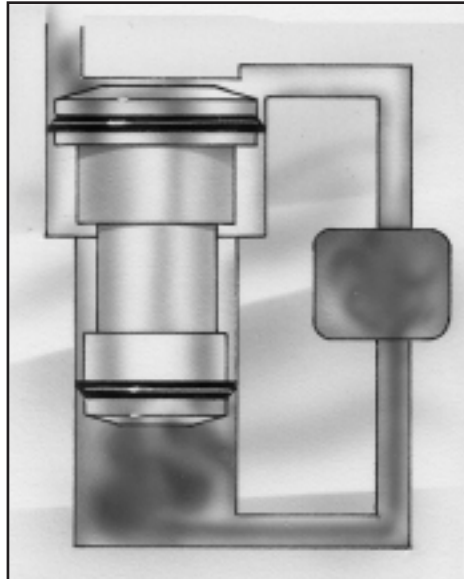


From  
“Unstallable™”  
to unstoppable,  
with Aro, its  
features that  
provide the  
force.

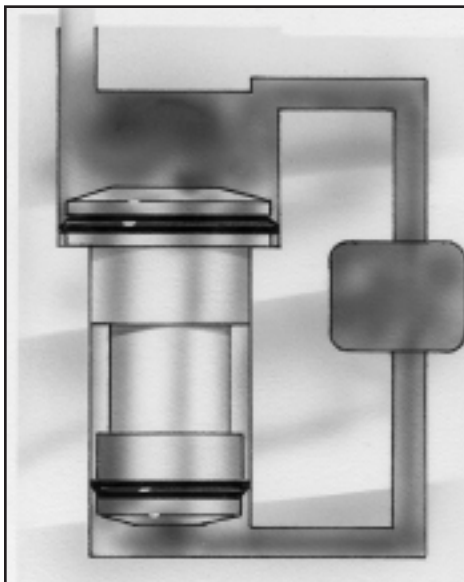


## Aro, Owner of the “Unstallable” Air Valve Design

As relevant today as the day it came to market, Aro is still the sole owner of the technology and the title: *Unstallable*. Aro uses no magnets, springs, re-set buttons, or other secondary actuators to insure pump shifting - only air.

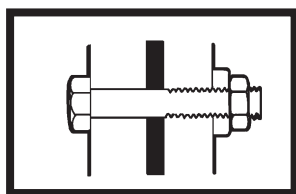


Aro's patented “unbalanced” major air valve has constant air pressure applied to its small end. This assures that the pump resets. Competitive designs lose their signal during every shift, making them vulnerable to stalling.



To reverse the valve, air pressure is supplied to the larger end of the valve, allowing the valve to shift - note that constant air pressure continues to be applied to the small end.

## For Safety, Reliability and Ease of Assembly: Bolted Is Better



ARO Pumps feature bolted construction to avoid the proven problems created by clampband type pump fasteners. These include material spills and leaks, bolt loosening and breakage due to poor joint integrity, and difficult reassembly.

# REGISTERED

## F I R M

Aro's Bryan, Ohio facility, where our pumps are manufactured, is registered by Underwriters Laboratories Inc. to ISO 9001 Quality Standards.

## An Air Valve that Forgives and Forgets



Aro's major air valve requires no added lubrication and the "wiping" action of the seals makes it extremely forgiving of contaminated compressed air supplies.



# YEAR 5

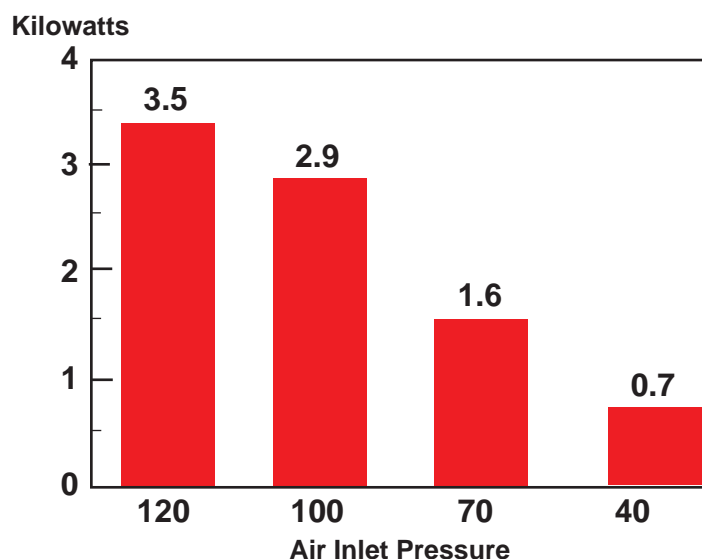
## WARRANTY

ARO Pumps are backed by a generous 5-year warranty on materials and workmanship for your purchasing peace of mind.

## Lost Air Is No Bargain

If your pneumatic pumps are not ARO Pneumatic Pumps, chances are their air valves are blowing out perfectly good air to atmosphere, at no small expense. And this is not intermittent. This is whenever and wherever these pumps are operating.

**Competitive Pump Design Kilowatts Wasted**



The close fitting air valve designs used on competitive pumps allow air to by-pass continually - wasting air - even when not pumping!

# CE

Aro's Pump design and manufacturing operations have demonstrated compliance with the quality process, health and safety, technical file and multi-lingual standards set forth by the FEM (Federation Europeene de la Manutention) for the European Union (Communitie Economique).

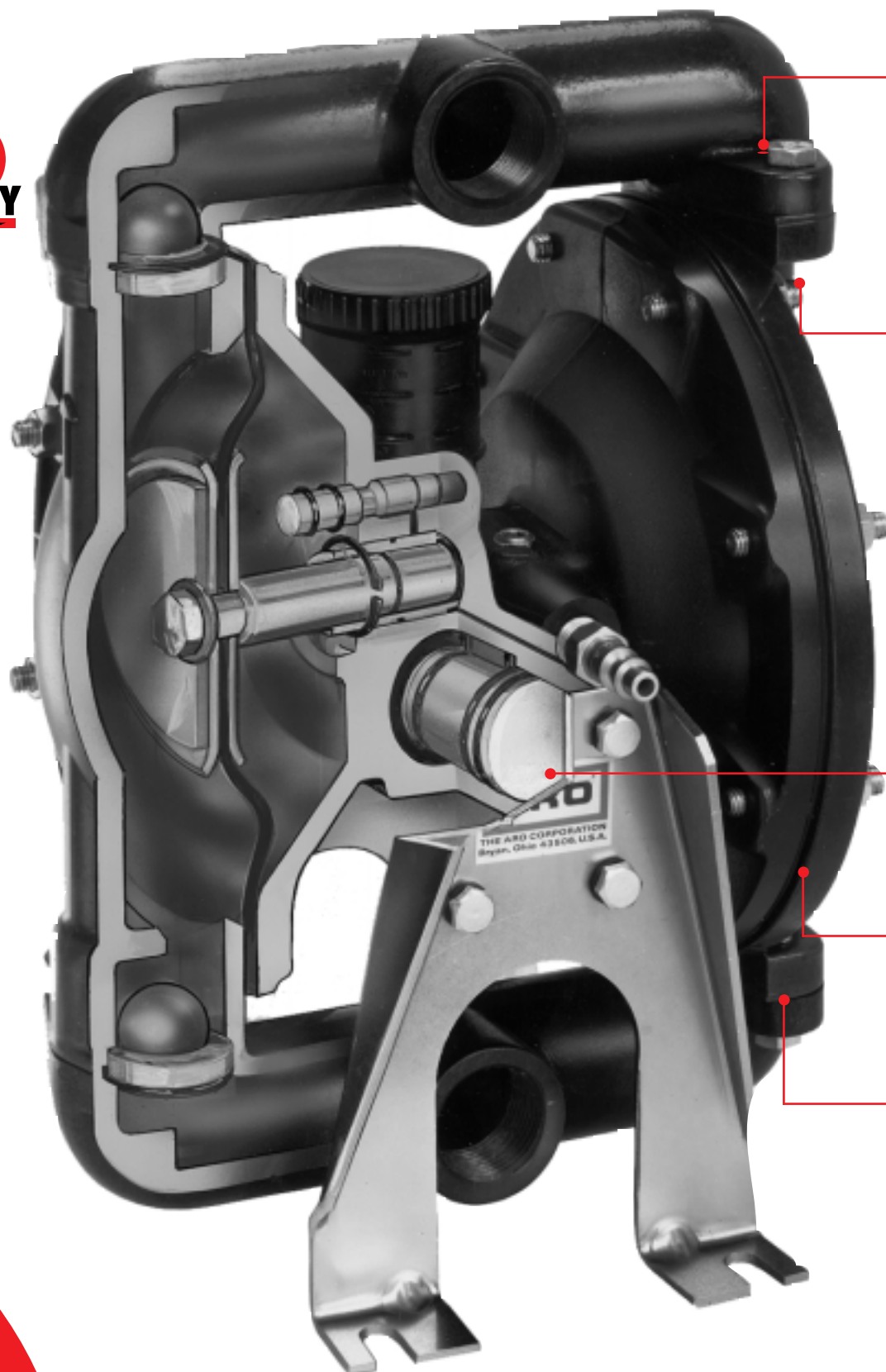
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## ***Design Features***

**YEAR** **5**  
**WARRANTY**



## Ideal For Abrasion And Solids Handling

Because it does not use rotating, sliding seals, like rotary/centrifugal pumps, more process engineers look to Aro diaphragm pumps for handling tough abrasion applications.

## Bolted Construction For Safe Reliability and Ease of Assembly:

All Aro diaphragm pumps use bolted construction that process professionals demand. And, Aro Non Metallic Diaphragm Pumps utilize fasteners that are constructed of 300 series stainless steel for maximum chemical resistance.

**Bolted is Safer** - bolted construction reduces the risk of spills, environmental contamination and the attendant, mandatory reports to regulatory agencies that spills can create.

**Bolted is Reliable** - Bolted construction withstands the heavy loading that diaphragm pumps are subjected to, without concerns of breakage or loosening.

**Bolted is Easier to Assemble** - Aro's bolted design allows for easy positioning and alignment of parts during reassembly. This is a significant advantage over band-clamp style pump fasteners, which are difficult to align and hold together during reassembly.

**Bolted is Less Expensive** - Aro's design uses standard bolts which cost significantly less to replace. Non standard fastening devices (such as band clamps) are considered "wear parts" and are more expensive to replace.

## Aro's Patented "Unbalanced" Air Valve

Aro's "Unbalanced" air valve design makes this, and all of Aro's Diaphragm Pumps "Unstallable". Because the unbalanced valve cannot settle in a neutral position when the pump is shut down, it can't become stuck, requiring the operator to hammer on the pump in order to start pumping again.

- Eliminates Shifting/Freezing Problems
- Does Not Require Lubrication
- Uses Significantly Less Power Than Competition
- Forgiving In Dirty Air

## Broad Material Selection

Aro offers a wide selection of materials, allowing your choice of the best possible wetted and non-wetted materials suited to your application.

## Positive Priming Provides Instant Start-Ups

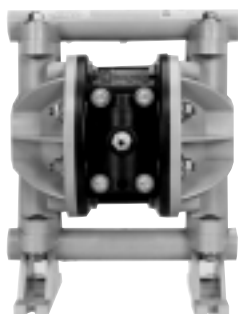
Check valves are located close to the diaphragm chambers, ensuring a positive prime first time every time.



# Model Overview



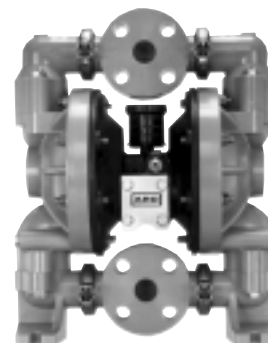
**1/4" Ports  
Non-Metallic**



**1/2" Ports  
Non-Metallic**



**1/2" Stainless Steel**



**1" Ports  
Non-Metallic**

MODEL	1/4" (Non-Met.)	1/2" (Non-Met.)	1/2" (Met.)	1" (Non-Met.)
Maximum Flow GPM (LPM)	4.6 (17.4)	13 (49)	13 (49)	47 (178)
Maximum Discharge Pressure PSI (BAR))	100 (6.8)	100 (6.8)	100 (6.8)	120 (8.3)
Fluid Ports Inlet/Outlet (BSP Available)	3/8" (F) - In 1/4" (F) - Out (No BSP)	1/2" (F) - In/Out (No BSP)	1/2" (F) - In/Out (No BSP)	1" Ansi Flange
Materials of Construction	Polypropylene Groundable Acetal	Polypropylene Groundable Acetal	Stainless Steel	Polypropylene
Pump Weight Lbs. (Kg.)	4.1 (1.85) Poly 4.6 (2.10) Acetal	8.8 (4.0) Acetal 7.2 (3.3) Poly	14.6 (6.6)	*20.3 (9.2) Poly
Maximum Solids Inches (mm)	Clean Fluids	3/32 (2.4)	3/32 (2.4)	1/8 (3.2)
Best Selling Models (BSP Available)	PD02P-APS-PTA PD02P-APS-PTT PD02P-ADS-DTT	66605J-388 66605J-3EB 66605J-344 66605H-644	PD05P-ASS-SAA PD05P-ASS-STT	6661A3-3EB-C 6661A3-344-C 6661B3-344-C
Recommended Filter/ Regulator	P29122-600 (Filter/Regulator)	P29221-610 (Filter/Regulator)	P29221-610 (Filter/Regulator)	P29221-610 (Filter/Regulator)
Air Line Kit	66073-1	66073-1	66073-1	66073-2

See Page

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\* Weights listed are for aluminum air motor models  
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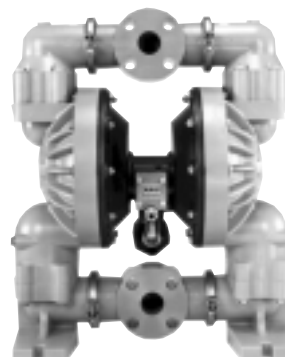
# Model Overview



**1" Ports  
Metallic**



**1" Ports  
Stainless  
(3:1 Ratio)**



**1-1/2" Ports  
Non-Metallic**



**1-1/2" Ports  
Metallic**

MODEL	1" (Met.)	1", 3:1 (Met.)	1-1/2" (Non-Met.)	1-1/2" (Met.)
Max. Flow GPM (Liters)	35 (133)	24 (90.7)	100 (379)	100 (379)
Maximum Operating Pressure PSI (BAR)	120 (8.3)	300 (20.7)	120 (8.3)	120 (8.3)
Fluid Ports BSP Available	1" (F) - In/Out	1" (F) - In/Out	1-1/2" Flange ANSI	1-1/2" (F)
Materials of Construction	Aluminum Stainless Steel	Stainless Steel	Polypropylene	Aluminum Stainless Steel
Pump Weight* Lbs. (Kg.)	*19 (8.6) Alum *36 (16.3) S. S.	*90 (40.7) S.S.	*62 (28) Poly	*51 (23.1) Alum 84(38.1) S. S.
Maximum Solids Inches (mm)	1/8 (3.2)	1/8 (3.2)	1/4 (6.4)	1/4 (6.4)
Best Selling Models	666100-322-C 666100-344-C 666101-344-C 666101-3EB-C 666111-244-C	6661M1-2A4-C 6661N1-2A4-C	6661T3-3EB-C 6661T3-344-C 6661U3-344-C	666150-322-C 666150-344-C 666151-344-C 666151-3EB-C 666161-244-C
Recommended Filter/ Regulator	P29221-610 (Filter/Regulator)	P29231-610 (Filter/Regulator)	P29241-610 (Filter/Regulator)	P29241-610 (Filter/Regulator)
Air Line Kit	66073-2	N/A	66084-1	66084-1

See Page

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17

18

\* weights listed are for aluminum air motor models

## Design Features

**A Pump with Striking Design and Powerful Performance.** This is what the plant professional wants, and with **Aro's N-Series and Thunder Pump**, this is what the plant professional gets. From *the* pump maker that knows fluid handling better than anyone: ARO.



5-Year Warranty  
on materials and  
workmanship.

## The Secret to Trouble Free Fluid Handling?

### Simplicity Itself.

Just one look at the air valve design of Aro's 3-inch pump tells the whole story: Simple is Better. Aro's design uses fewer parts in its air motor than the comparable competitive industrial pump. With fewer parts come fewer problems, it's *really* just that simple.

- **RELIABLE** - A stall-free, ice-free patented air motor design contained in a rugged housing that will withstand most working environments.
- **FEWER UNIQUE PARTS** - Pumps are constructed with fewer unique parts than the majority of comparable pumps. Install it and see for yourself how common parts translate into fewer headaches when it comes to service or routine maintenance.
- **NO MECHANICAL ASSIST** - The patented valving design uses no trip rods or push pins to break.
- **MINIMUM NUMBER OF TOOLS, NO SPECIAL TOOLS** - If you can find a standard wrench you can service it.
- **EASE OF INSTALLATION** - Air inlet and fluid outlet can be oriented in 90° increments.
- **LUBE-FREE AIR MOTOR**
- **THE RIGHT LOWER PUMP PACKINGS** - Choose from a wide variety of packing materials, including the ultra-tough UHME-PE/Teflon® combo, for the ultimate in pump-to-process compatibility.
- **CHOOSE YOUR METAL: CARBON STEEL OR STAINLESS STEEL** - Pump lowers are available in two distinct alloys for today's tough fluid material demands.
- **PUMP PACKAGES PROVIDE "ONE-STOP-SHOPPING"** - Portable or stationary airless spray or heavy material extrusion packages are factory specified and assembled for your immediate application.



1:1 Ratio Piston



2:1 Ratio Piston



4:1 Ratio

MODEL	1:1 Ratio Piston	2:1 Ratio Piston	4:1 Ratio Piston
Maximum Flow GPM (LPM)	18 (68.1)	4 GPM (15.1)	4.1 GPM (15.8)
Maximum Operating Pressure PSI (BAR)	150 (10.2)	150 (10.2)	150 (10.2)
Materials of Construction	Carbon Steel	Carbon Steel Stainless Steel	Carbon Steel Stainless Steel
Pump Weight Lbs. (Kg.)	12 (5.4)	12 (5.4) Carbon Steel Models 16 (7.2) S.S. Stub 19 (8.6) S.S. Drum	32 (14.5) Stub 46 (20.9) Drum
Maximum Solids Inches (mm)	Clean Fluids	Clean Fluids	Clean Fluids
Best Selling Models	612041-1 612041-3	650110-1C 650115-1C 650132-C 650133	NM2304A-11-311 NM2304A-41-311 NM2304B-11-311 NM2304B-41-311
Recommended Filter/ Regulator	C28123-600	C28123-600	C28123-600
Air Line Kit	66073-1	66073-1	
See Page	30	31-32	35-36

\* Weights listed are for aluminum air motor models  
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# Model Overview



LP3100-1  
5:1 Oil

**YEAR 5  
WARRANTY**



LP3001-1  
50:1 Grease



LP3003-1  
50:1 Grease

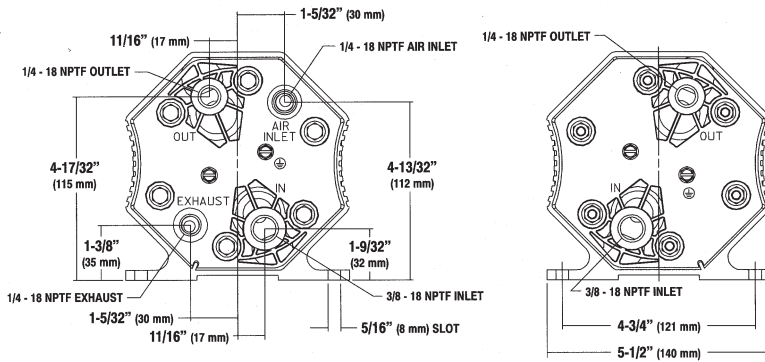
MODEL	5:1 Oil	50:1 Grease 35 lb.	50:1 Grease 120 lb.
Working Flow GPM (LPM) lbs. (Kg.)	6 (23)	4 lbs. (1.8 Kg.)	4 lbs. (1.8 Kg.)
Free Flow GPM Lbs.(Kg.)	9 (34)	7.5 lbs. (3.3 Kg.)	7.5 lbs. (3.3 Kg.)
Air Inlet NPT (F)	1/4"	1/4"	1/4"
Fluid Inlet/Outlet NPT(F)	1/2"-1-1/2"	3/8"	3/8"
Materials of Construction	Carbon Steel	Carbon Steel	Carbon Steel
Recommended Filter/ Regulator	P29122-600	P29122-600	P29122-600
Air Line Kit	66073-1	66073-1	66073-1
See Page	36	37	37

# Performance Specifications

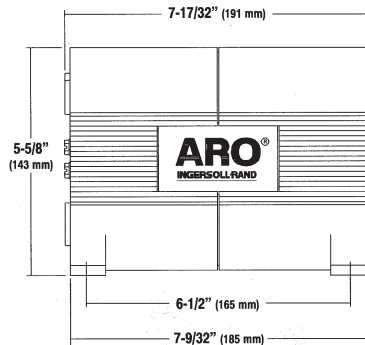
RATIO:	1:1
MAXIMUM G.P.M. (Liters):	4.6 (17.4)
DISPLACEMENT GALLONS (Liters) PER CYCLE:	.014 (.053)
AIR INLET:	1/4" (F)
FLUID INLET:	3/8" (F)
FLUID OUTLET:	1/4" (F)
MAX. OPERATING PRESSURE PSI (bar):	100 (6.8)
SUSPENDED SOLIDS MAX. DIA. IN. (mm):	Clean Fluids Only
WEIGHT - LBS. (KGS):	4.1 (1.85) Poly, 4.6 (2.10) Acetal
MAX. DRY SUCTION LIFT:	20 ft.

# Dimensional Data

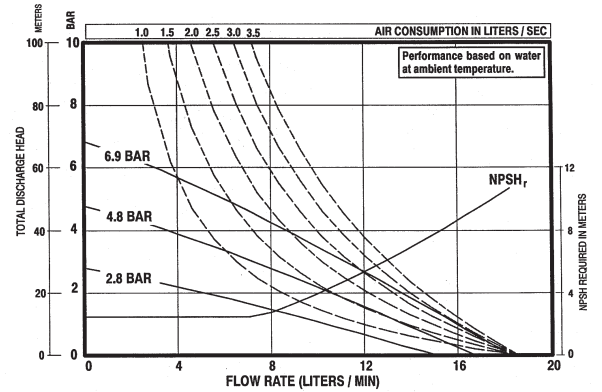
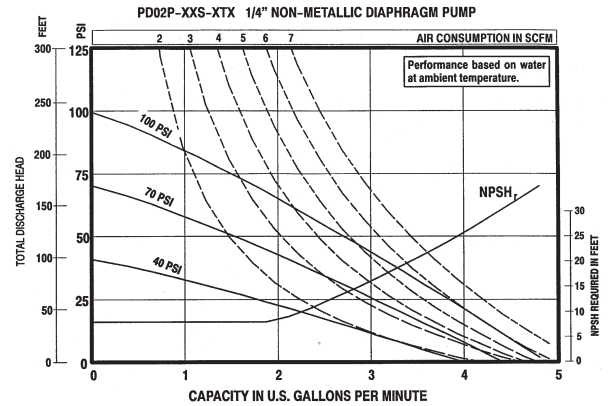
END VIEWS



SIDE VIEW



PERFORMANCE CURVES



# Accessories

## Recommended Filter/Regulator

Filter / Regulator: P29122-600  
(See Page 39)

For complete airline connection kit, see page 24.

For Diaphragm Pump Accessories see pages 23-24.



P29122-600

# Ordering

Best Selling Models | PD02P-APS-PTA, PD02P-APS-PTT, PD02P-ADS-DTT

Base Model	Center Section	Port	Wet End	Hardware	Seat Material	Disk Check/ Diaphragm
P D O 2	P	A	X	X	X	X
1/4" Pump	Polypropylene	A NPT Single Inlet/Single Outlet	S Stain. Steel	S Stain. Steel	TA Teflon/Santoprene TG Teflon/Nitrile TT Teflon/Teflon	
			D Acetal P Polypropylene	D Acetal P Polypropylene		

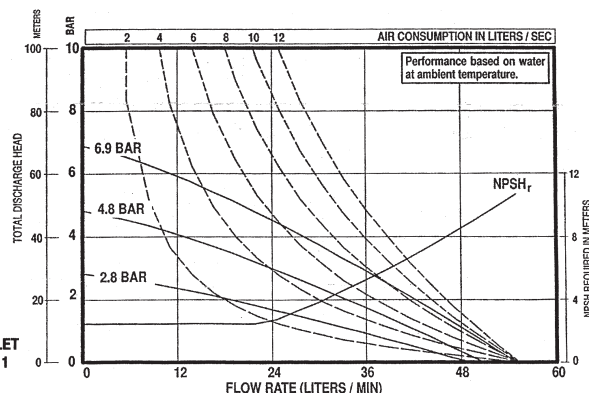
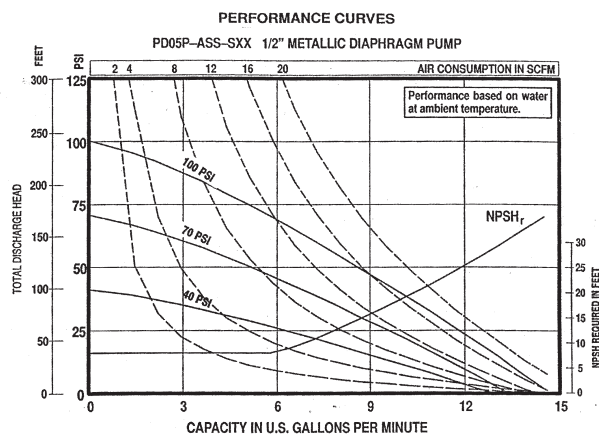
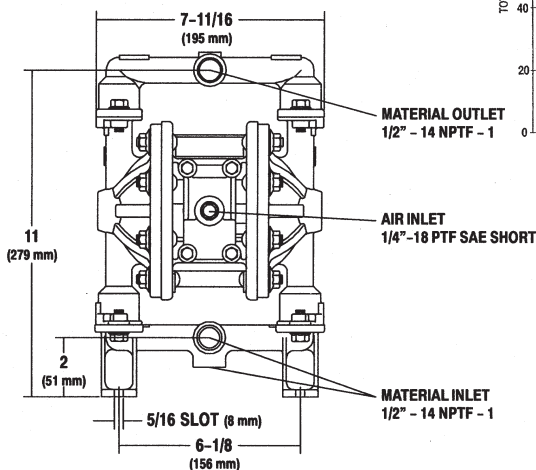
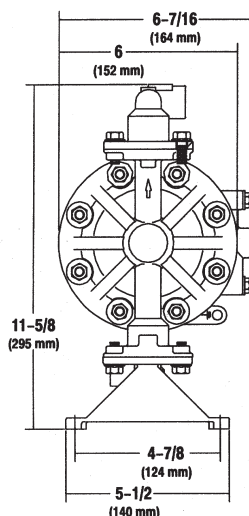
360°  
mounting  
versatility!

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# Performance Specifications

<b>RATIO:</b>	1:1
<b>MAXIMUM G.P.M. (Liters):</b>	13 (49)
<b>DISPLACEMENT GALLONS (Liters) PER CYCLE:</b>	.040 (.15)
<b>AIR INLET:</b>	1/4-inch NPT (F)
<b>FLUID INLET:</b>	1/2-inch NPT (F)
<b>FLUID OUTLET:</b>	1/2-inch NPT (F)
<b>MAX. OPERATING PRESSURE PSI (bar):</b>	100 psi (6.9 bar)
<b>SUSPENDED SOLIDS MAX. DIA. IN. (mm):</b>	3/32" (2.4mm)
<b>WEIGHT - LBS. (Kg):</b>	14.6 lbs (6.6 kgs)
<b>MAX DRY SUCTION LIFT:</b>	10 ft. (Teflon fitted)

# Dimensional Data



# Accessories

**Recommended Filter/Regulator**  
Filter / Regulator: P29122-600  
(See Page 39)

For Pulsation Dampener,  
see page 21.

For complete airline connection kit,  
see page 24.

For Diaphragm Pump  
Accessories see pages 23-24.



P29122-600

# Ordering

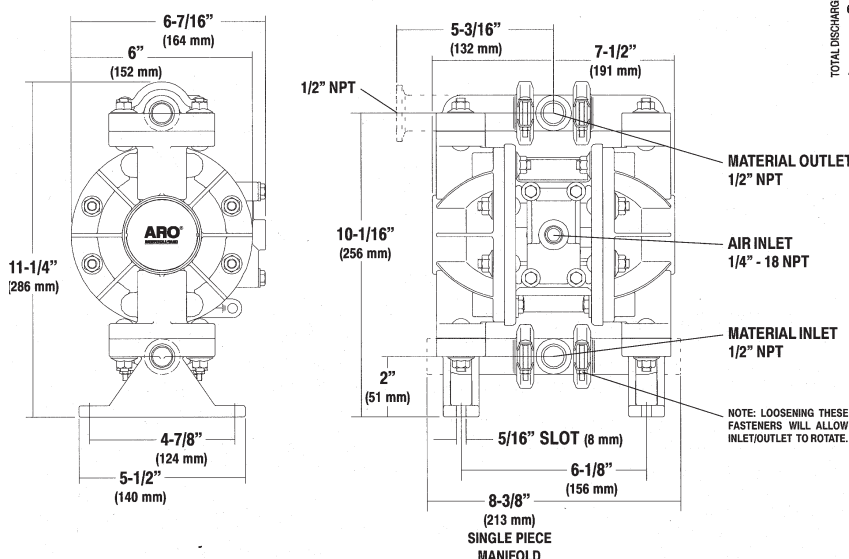
Best Selling Models | PD05-ASS-SAA, PD05P-ASS-STT

Base Model	Center Section	Port	Wet End	Hardware	Seat Material	Ball Check/ Diaphragm
<b>P D O 5</b>	<b>P</b>	<b>A S S</b>	<b>S</b>	<b>S</b>	<b>X X</b>	
1/2" Pump	Polypropylene	A NPT	S 316 St. Steel	S Stainless Steel	AA Santoprene/Santoprene GG Nitrile/Nitrile ST Stainless/Teflon TT Teflon/Teflon	
					S 300 Series	

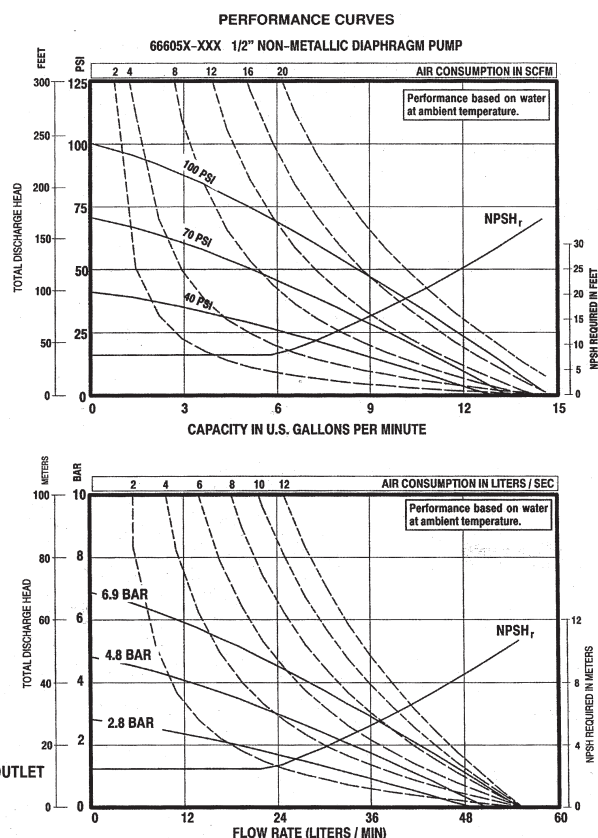
# Performance Specifications

<b>RATIO:</b>	1:1
<b>MAXIMUM G.P.M. (Liters):</b>	13 (49) Ball 10 (37.9) Duckbill Check
<b>DISPLACEMENT GALLONS (Liters) PER CYCLE:</b>	.04 (.15) Ball .032 (.12) Duckbill Check
<b>AIR INLET:</b>	1/4-inch NPT(F)
<b>FLUID INLET:</b>	1/2-inch NPT(F)
<b>FLUID OUTLET:</b>	1/2-inch NPT(F)
<b>MAX. OPERATING PRESSURE PSI (bar):</b>	100 (6.9)
<b>SUSPENDED SOLIDS MAX. DIA. IN. (mm):</b>	3/32-inch (2.4) Duckbill Check- Fibers
<b>WEIGHT - LBS. (Kg):</b>	7.2 (3.3) Polypropylene, 8.8 (4) Acetal
<b>MAX. DRY SUCTION LIFT:</b>	10 ft. (Teflon fitted)

## Dimensional Data



**Single-Piece Manifold Model**  
(Order model 66605J)



## Accessories

### Recommended Filter/Regulator

Filter / Regulator: P29122-600  
(See Page 39)

For Pulsation Dampener,  
see page 21.

For complete airline connection kit,  
see page 24.

For Diaphragm Pump  
Accessories see pages 23-24.



P29122-600

## Ordering

Best Selling Models | 66605J-388, 66605J-3EB, 66605J-344

Base Model	Air Motor	Wetted Parts	Check Valve Seats	Ball Check/ Diaphragm
6 6 6 0	5	X	X	X
1/2" Pump	Polypropylene	J* Polypropylene 3 Polypropylene * Single piece manifold	2 Stainless Steel 3 Polypropylene 6 Acetal 0 Duckbill	22 Nitrile/Nitrile 44 Teflon/Teflon 88 Polyurethane/Polyurethane A4 Stainless Steel/Teflon EB Santoprene/Santoprene D2 Nitrile/Nitrile

All hardware is 300 Series Stainless Steel.

See next page for special, groundable models

World's  
Best  
Selling  
Model

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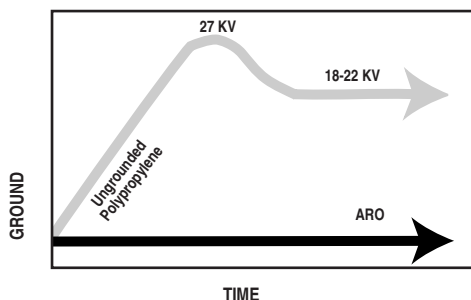
## Performance Specifications

RATIO:	1:1
MAXIMUM G.P.M. (Liters):	13 (49)
DISPLACEMENT GALLONS (Liters) PER CYCLE:	.04 (.15)
AIR INLET:	1/4-inch NPT(F)
FLUID INLET:	1/2- inch NPT(F)
FLUID OUTLET:	1/2 inch NPT(F)
MAX. OPERATING PRESSURE PSI (bar):	100 (6.9)
SUSPENDED SOLIDS MAX. DIA. IN. (mm):	3/32-inch (2.3)
WEIGHT - LBS. (Kg):	8.8 (4.0)
MAX. DRY SUCTION LIFT:	10 ft. (Teflon fitted)

## Dimensional Data

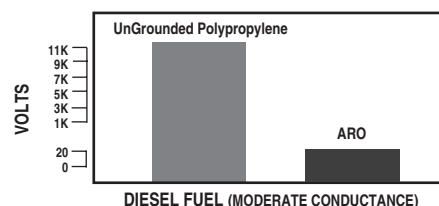
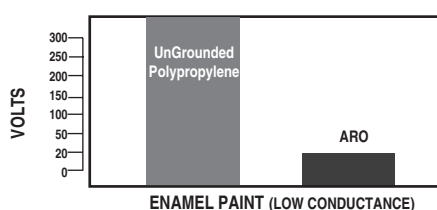
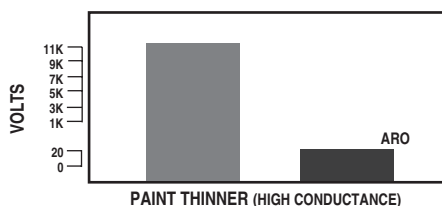
See 1/2-inch (ports) non-metallic pump dimensional and flow data on page 13.

## Independent Laboratory Test Results



### UNRESTRICTED FLOW TESTS

This test involved readings taken with a electro-static field strength meter during free-flow operation of the three pumps. Readings were taken at each pump's metallic clamps and fasteners, traditional electro-static "hot-spots."

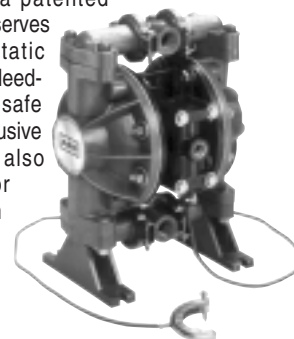


An independent lab test showed that the Aro Groundable pump, pumping materials such as paint thinner, diesel fuel and enamel paint under high flow conditions, accumulated a maximum of .0032 millijoules of energy. The report concluded that energies of this magnitude are not sufficient to ignite flammable vapors. Reported minimum ignition energies of several flammable fluids are as follows:

Methyl Ethyl Ketone: 0.53 millijoules	Acetone: 1.15 millijoules
Isopropyl Alcohol: 0.65 millijoules	Hydrogen: 0.02 millijoules

## Model Overview

ARO® Groundable Diaphragm Pump is constructed from a patented material blend that serves to route electrostatic buildup to a single bleed-off point, ensuring safe operation. This exclusive body composition also provides superior compatibility with harsh industrial solvents and other volatile materials.



## Accessories

### Recommended Filter/Regulator

Filter / Regulator: P29122-600  
(See Page 39)

For complete airline connection kit, see page 24.

For Diaphragm Pump Accessories see pages 23-24.



P29122-600

## Ordering

Best Selling Models | 66605H-2A4, 66605H-244, 66605H-644

Base Model				Air Motor	Wetted Parts	Check Valve Seats	Ball Check/ Diaphragm
6	6	6	0	5	X	X	X
1/2" Pump				Polypropylene		2 Stainless Steel 6 Acetal	A4 Stainless S./Teflon 44 Teflon/Teflon
				H Single Piece Manifold 6 3 Piece Manifold			

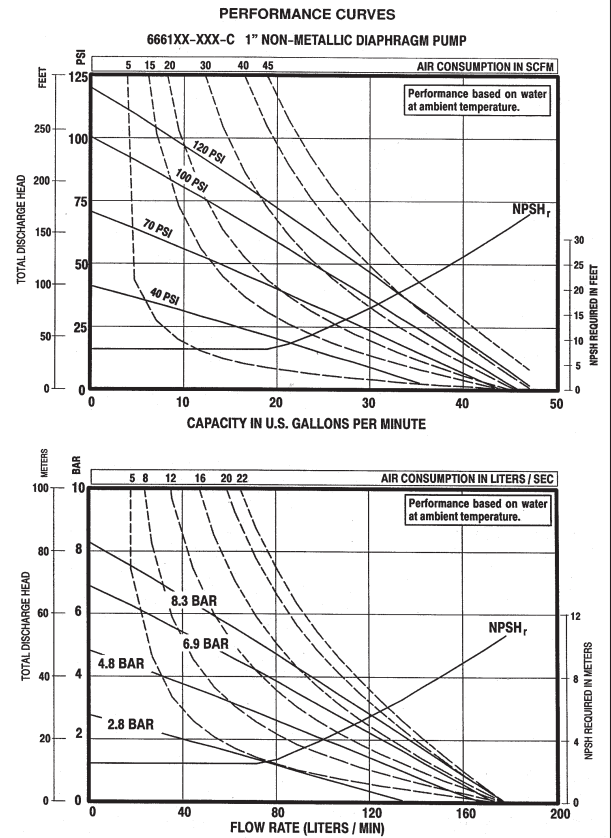
Perfect for solvents, or solvent based paints, lacquers and coatings.

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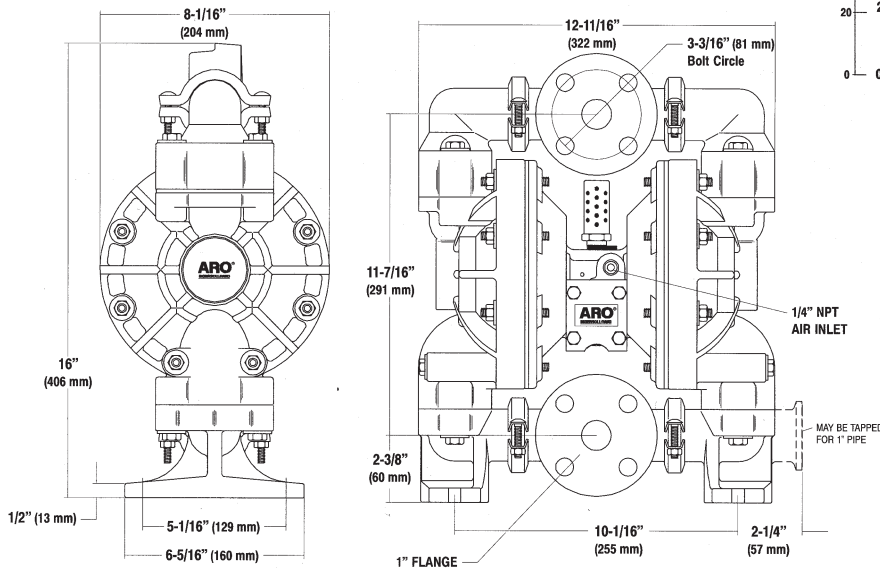
\* A groundable pump is defined as one which is not able to accumulate a charge of sufficient energy to ignite flammable vapors. Be sure that every component in your system is properly grounded.

# Performance Specifications

<b>RATIO:</b>	1:1
<b>MAXIMUM G.P.M. (Liters):</b>	47 (178)
<b>DISPLACEMENT GALLONS (Liters) PER CYCLE:</b>	.170 (.64)
<b>AIR INLET:</b>	1/4-inch NPT(F)
<b>FLUID INLET:</b>	ANSI Class 150, 1-inch Pipe Flange
<b>FLUID OUTLET:</b>	ANSI Class 150, 1-inch Pipe Flange
<b>MAX. OPERATING PRESSURE PSI (bar):</b>	120 (8.3)
<b>SUSPENDED SOLIDS MAX. DIA. IN. (mm):</b>	1/8-inch (3.2)
<b>WEIGHT - LBS. (Kg):</b>	20.2 (9.2) Polypropylene For Cast Iron center section models, add 8.5 lbs. (3.81 kg.)
<b>MAX. DRY SUCTION LIFT:</b>	15 ft. (Rubber fitted)



## Dimensional Data



## Accessories

### Recommended Filter/Regulator

Filter / Regulator: P29221-610  
(See Page 39)

67078 - Polypropylene Flange  
Kit 1" NPT (F)

For Pulsation Dampener,  
see page 21.  
For complete airline connection kit,  
see page 24.

For Diaphragm Pump  
Accessories see pages 23-24.



P29221-610

## Ordering

Best Selling Models | 6661A3-3EB-C, 6661A3-344-C, 6661B3-344-C

Base Model	Air Motor	Wetted Parts	Check Valve Seats	Ball Check/ Diaphragm
6 6 6 1	X	X	X	X X X
1" Pump	A Aluminum B Cast Iron	3 Polypropylene	3 Polypropylene 8 Stainless Steel (400, hardened)	22 Nitrile/Nitrile 44 Teflon/Teflon EB Santoprene/Santoprene

All hardware is 300 Series Stainless Steel.

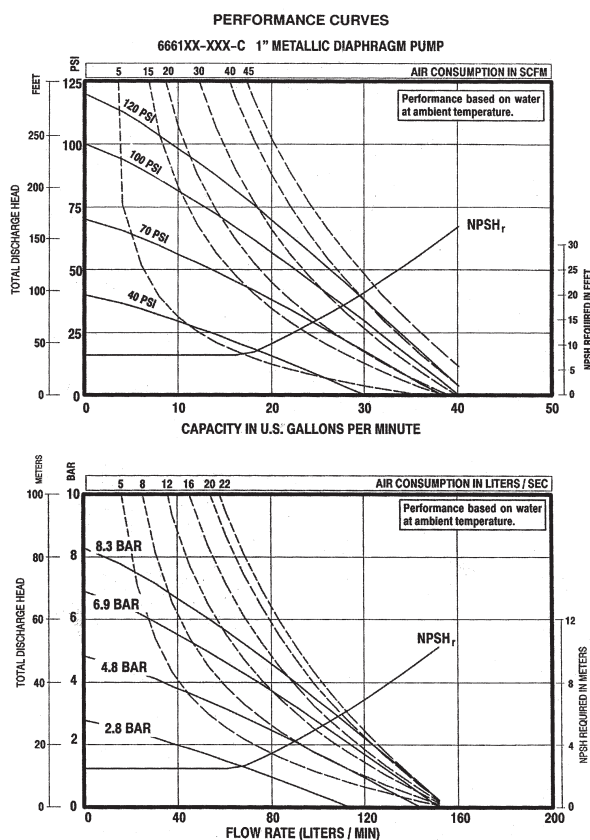
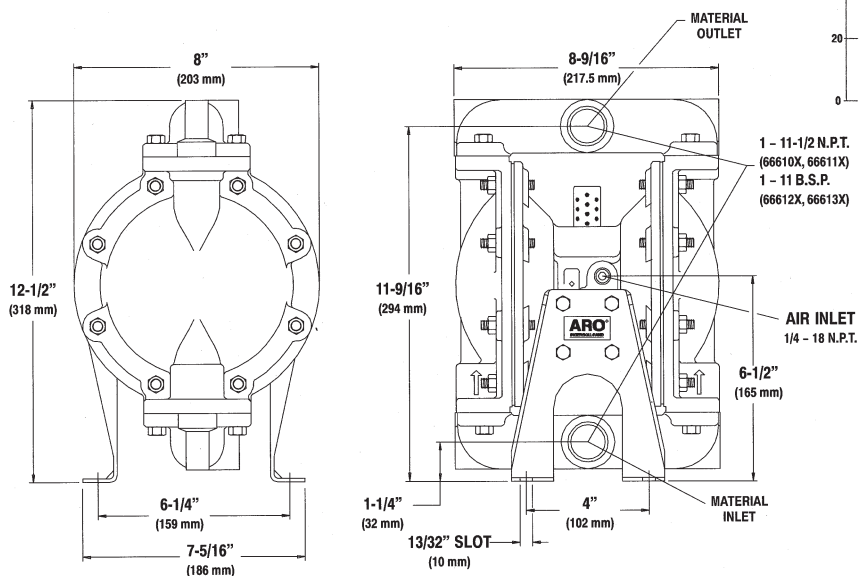
Perfect for  
aggressive  
chemicals

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# Performance Specifications

RATIO:	1:1
MAXIMUM G.P.M. (Liters):	35 (132)
DISPLACEMENT GALLONS (Liters) PER CYCLE:	.16 (.60)
AIR INLET:	1/4-inch NPT(F)
FLUID INLET:	1-inch NPT(F) or BSP(F)
FLUID OUTLET:	1-inch NPT(F) or BSP(F)
MAX. OPERATING PRESSURE PSI (bar):	120 (8.3)
SUSPENDED SOLIDS MAX. DIA. IN. (mm):	1/8-inch (3.2)
WEIGHT - LBS. (Kg):	19 (8.6) Aluminum 36 (16.3) Stainless Steel For Cast Iron center section models, add 8.5 lbs. (3.81 kg.)
MAX. DRY SUCTION LIFT:	20 ft. (Rubber fitted)

# Dimensional Data



# Accessories

**Recommended Filter/Regulator**  
Filter / Regulator: P29122-610  
(See Page 39)

For Pulsation Dampener,  
see page 21.

For complete airline connection kit,  
see page 24.

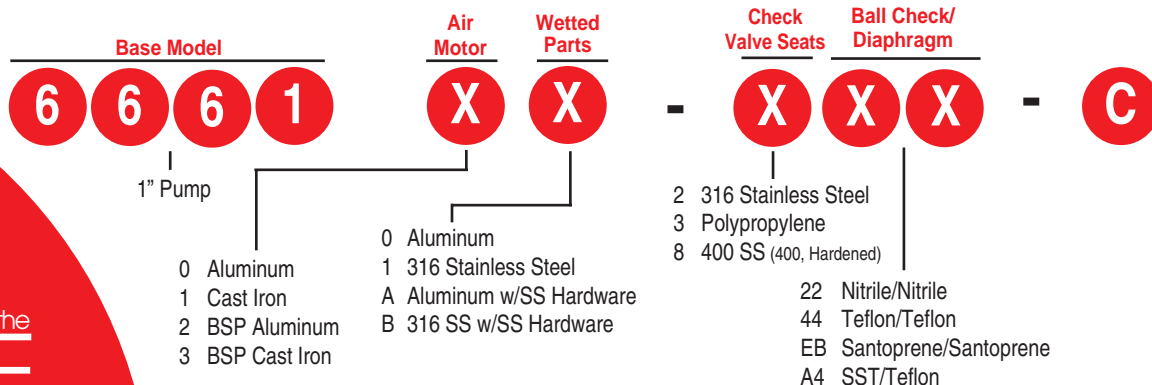
For Diaphragm Pump  
Accessories see pages 23-24.



P29221-610

# Ordering

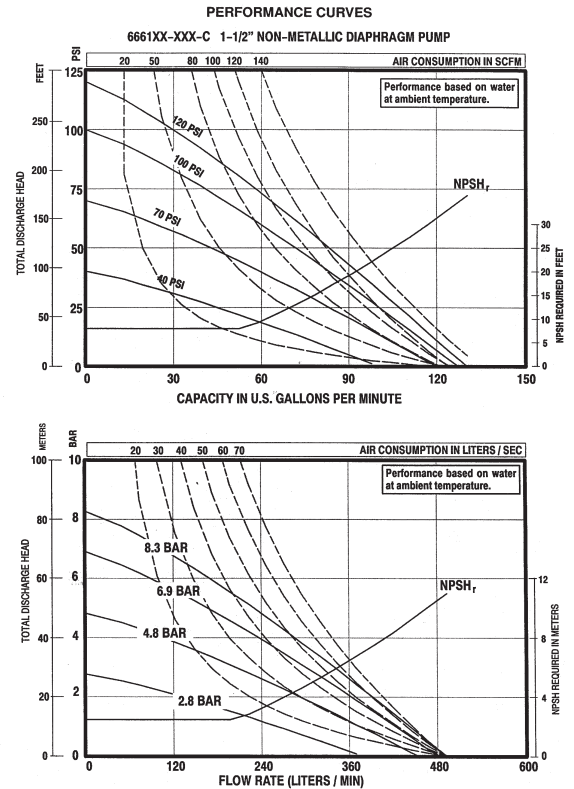
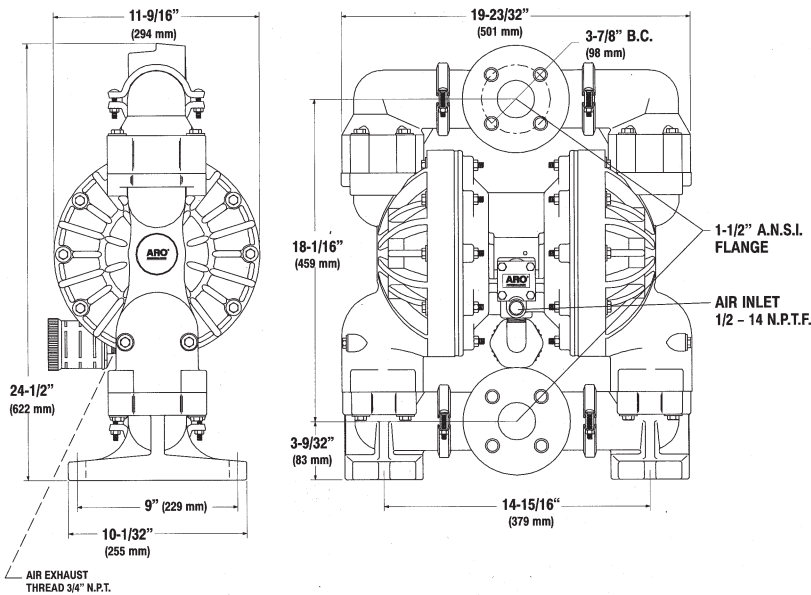
Best Selling Models | 666100-322-C, 666101-344-C, 666101-3EB-C, 666100-344-C, 666111-244-C



# Performance Specifications

<b>RATIO:</b>	1:1
<b>MAXIMUM G.P.M. (Liters):</b>	100 (379)
<b>DISPLACEMENT GALLONS (Liters) PER CYCLE:</b>	.72 (2.7)
<b>AIR INLET:</b>	1/2-inch NPT (F)
<b>FLUID INLET:</b>	ANSI Class 150, 1-1/2-inch Pipe Flange
<b>FLUID OUTLET:</b>	ANSI Class 150, 1-1/2-inch Pipe Flange
<b>MAX. OPERATING PRESSURE PSI (bar):</b>	120 (8.3)
<b>SUSPENDED SOLIDS MAX. DIA. IN. (mm):</b>	1/4-inch (6.4)
<b>WEIGHT - LBS. (Kg):</b>	62 (28) Polypropylene For Cast Iron center section, add 23 lbs. (10.4 kg)
<b>MAX. DRY SUCTION LIFT:</b>	14 ft. (Rubber fitted)

## Dimensional Data



## Accessories

**Recommended Filter/Regulator**  
Filter / Regulator: P29241-610  
(See Page 39)

67079 - Polypropylene Flange Kit  
1-1/2" NPT (F)

For complete airline connection kit,  
see page 24.

For Diaphragm Pump  
Accessories see pages 23-24.



P29241-610

## Ordering

Best Selling Models | 6661T3-3EB-C, 6661U3-344-C, 6661T3-344-C

Base Model	Air Motor	Wetted Parts	Check Valve Seats	Ball Check/ Diaphragm	
6 6 6 1	X	X	X	X	C
1-1/2" Pump	T Aluminum U Cast Iron	3 Polypropylene	3 Polypropylene 8 400 SS (400, Hardened)	22 Nitrile/Nitrile 44 Teflon/Teflon EB Santoprene/Santoprene	

All hardware is 300 Series Stainless Steel.

Perfect for  
aggressive  
chemicals

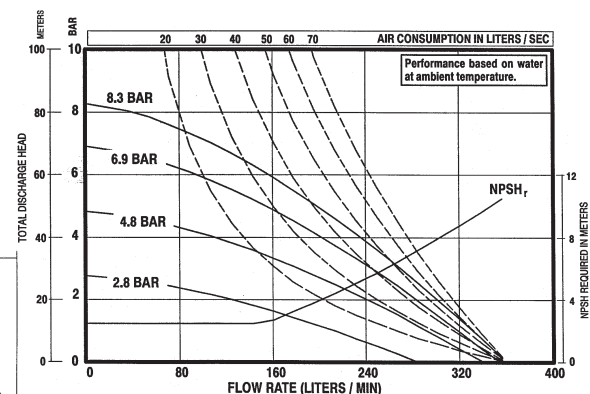
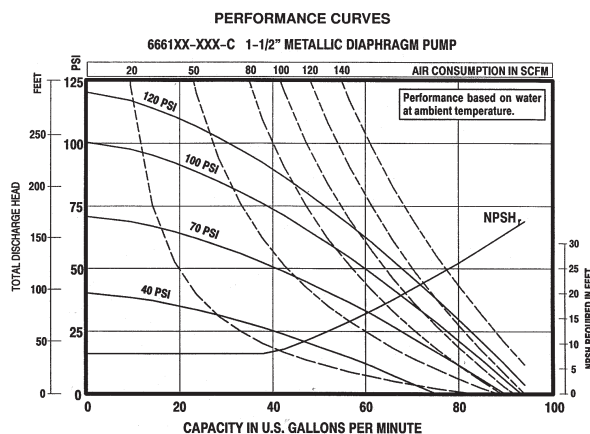
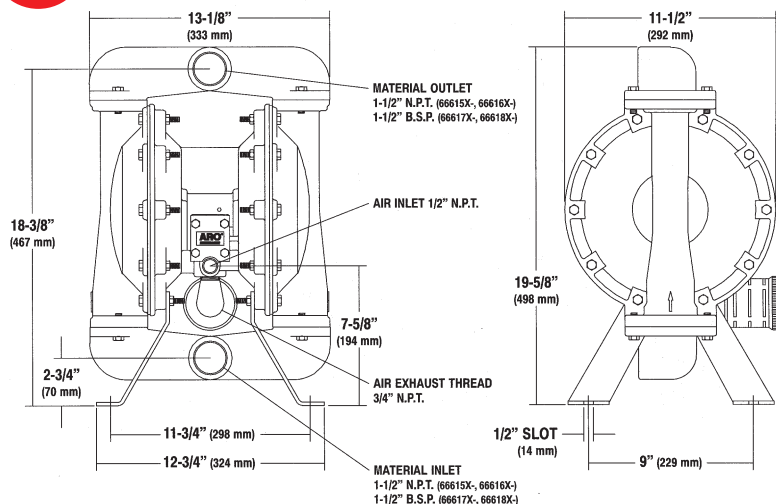
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# Performance Specifications

RATIO:	1:1
MAXIMUM G.P.M. (Liters):	100 (379)
DISPLACEMENT GALLONS (Liters) PER CYCLE:	.73 (2.76)
AIR INLET:	1/2-inch NPT(F)
FLUID INLET:	1-1/2-inch NPT(F) or BSP(F)
FLUID OUTLET:	1-1/2-inch NPT(F) or BSP(F)
MAX. OPERATING PRESSURE PSI (bar):	120 (8.3)
SUSPENDED SOLIDS MAX. DIA. IN. (mm):	1/4-inch (6.4)
WEIGHT - LBS. (Kg):	51 (23.1) Aluminum 84 (38.1) Stainless Steel For Cast Iron center section models, add 23 lbs. (10.4 kg.)
MAX. DRY SUCTION LIFT:	19 ft. (Rubber fitted)

## Dimensional Data



## Accessories

**Recommended Filter/Regulator**  
Filter / Regulator: P29241-610  
(See Page 39)

For Pulsation Dampener, see page 22.  
For complete airline connection kit, see page 24.

For Diaphragm Pump Accessories see pages 23-24.



P29241-610

## Ordering

Best Selling Models | 666150-322-C, 666150-344-C, 666151-344-C, 666161-244-C

Base Model	Air Motor	Wetted Parts	Check Valve Seats	Ball Check/ Diaphragm	
6 6 6 1	X	X	X	X	C
1-1/2" Pump	5 Aluminum 6 Cast Iron 7 BSP Aluminum 8 BSP Cast Iron	0 Aluminum 1 316 Stainless Steel A Aluminum w/SS Hardware B 316 SS w/SS Hardware	2 316 Stainless Steel 3 Polypropylene 8 400 SS (Hardened)	22 Nitrile/Nitrile 44 Teflon/Teflon EB Santoprene/Santoprene	

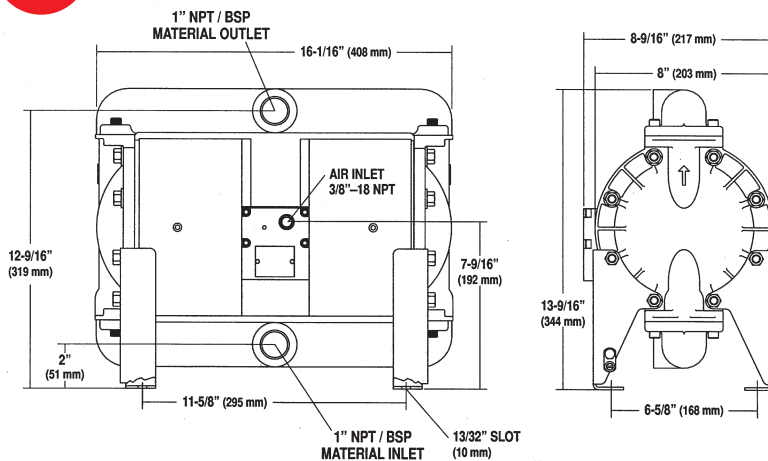
For viscous materials, stainless steel ball & checks available

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# Performance Specifications

<b>RATIO:</b>	3:1
<b>MAXIMUM G.P.M. (Liters):</b>	24 (90.7) Free Flow (12 GPM at 125 psi back pressure)
<b>DISPLACEMENT GALLONS (Liters) PER CYCLE:</b>	.09 (.341)
<b>AIR INLET:</b>	3/8-inch NPT(F) Short
<b>FLUID INLET:</b>	1 inch NPT(F) or BSP
<b>FLUID OUTLET:</b>	1 inch NPT(F) or BSP
<b>MAX. OPERATING PRESSURE PSI (bar):</b>	300 (20.4)
<b>PASS SOLIDS MAX. DIA. IN. (mm):</b>	1/8-inch (3.2)
<b>WEIGHT - LBS. (Kg):</b>	90 (40.7) Stainless Steel

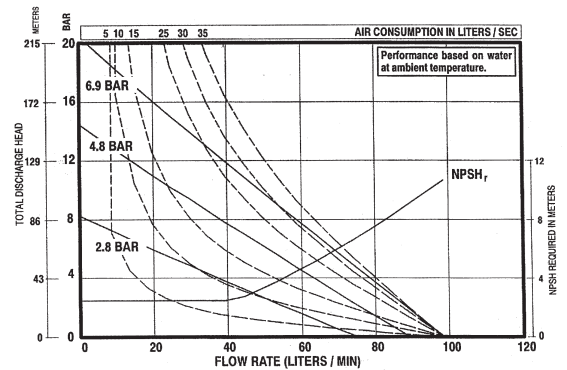
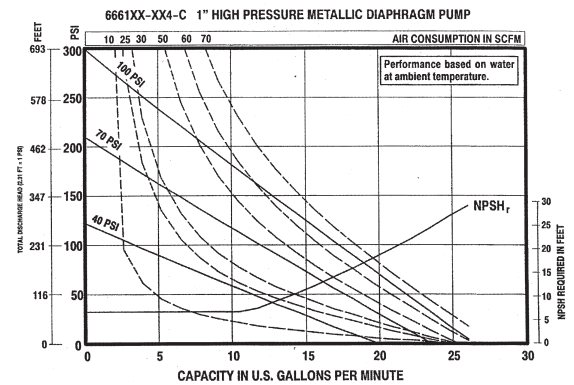
# Dimensional Data



Use the Aro High pressure pump in these and other applications:

- Systems with long piping runs and friction losses
- Inks
- Adhesives
- Filled Materials
- Drilling Grout
- Caulking
- Resins

Performance Curves



# Accessories

## Recommended Filter/Regulator

Filter / Regulator: P29231-610

(See Page 39)

67142 - Wall Mount Bracket

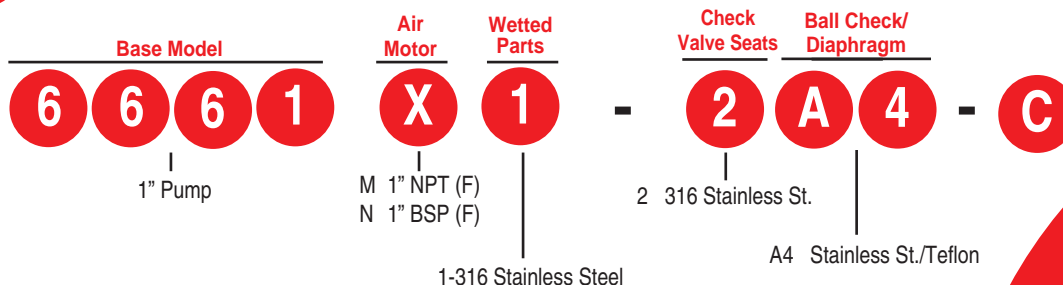
For complete airline connection kit, see page 24.

For Diaphragm Pump Accessories see pages 23-24.



P29231-610

# Ordering



All stainless steel is electro-polished passivated.

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## Performance Specifications

	1 Inch	1-1/2 Inch	2 Inch
<b>RATIO:</b>	1:1	1:1	1:1
<b>MAX. G.P.M. (Liters):</b>	29 (110)	75 (284)	105 (284)
<b>AIR INLET:</b>	1/4" NPT(F)	1/2" NPT(F)	1/2" NPT(F)
<b>PORT SIZE:</b>	1" NPT(F)	1-1/2" NPT(F)	2" NPT(F)
<b>MAX. OP. PRESSURE PSI (bar):</b>	50 (3.40)	50 (3.4)	50 (3.4)
<b>PASS SOLIDS MAX.DIA. IN. (mm):</b>	1/8" (3.2)	1/4" (6.4)	1/4" (6.4)
<b>WEIGHT LBS. (Kgs.):</b>	19 (8.6)	51 (23.1)	54 (24.5)

## Dimensional Data

See pg. 14 for 1" Metallic Pump dimensional data. See pg. 16 for 1-1/2" Metallic Pump dimensional data. The dimensions for the 1-1/2" Metallic Pump are the same for the 2" U.L. Fuel Pump.

## U.L. Listed Fuel Transfer Pumps

These Aro Diaphragm Pumps have been designed specifically for dispensing petroleum-based fuel. These pumps meet UL-79 specification, code and are compatible with:

- GASOLINE
- DIESEL FUEL
- KEROSENE
- AVIATION FUEL
- FUEL OIL
- UNLEADED FUEL

Used for high-volume transfer, bulk-unloading or fueling applications. To meet UL-79 specification, a 50 PSI pressure relief valve opens and bleeds off excess pressure. The relief valve can be plumbed to return the bleed-off fuel to the storage container.

## Ordering

MODEL	FLUID INLET/OUTLET PORT SIZE	SEAT	BALL
<b>DIAPHRAGM</b>			
<b>ALUMINUM CONSTRUCTION</b>			
650709-C	1-inch NPT	Kynar® PVDF	Acetal
Unleaded 650717-C	1-inch NPT	Kynar PVDF	Acetal
650710-C	1-1/2-inch NPT	Kynar PVDF	Acetal
Unleaded 650718-C	1-1/2-inch NPT	Kynar PVDF	Acetal
650711-C	2-inch NPT	Kynar PVDF	Acetal
Unleaded 650719-C	2-inch NPT	Kynar PVDF	Acetal

Viton Diaphragms are recommended for use with unleaded fuels.



1-inch

Air Connectors shown are not included.



1-1/2 -inch



2-inch

## Accessories

### Recommended Filter/Regulator (See Page 39)

#### 1" Diaphragm Pump

Filter / Regulator: P29221-610

#### 1-1/2" Diaphragm Pump

Filter / Regulator: P29241-610

#### 2" Diaphragm Pump

Filter: F25451-110

Regulator: 27354-600



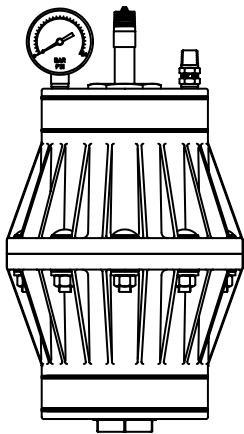
P29221-610



F25451-110



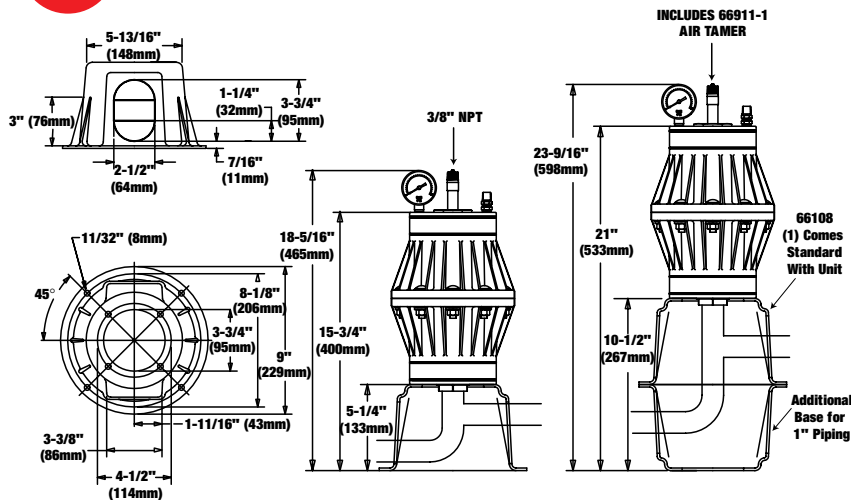
27354-600



## Specifications

PULSATION DAMPENER TYPE:	Non-Metallic / Automatic
MATERIAL / WEIGHT-LBS (kgs):	Polypropylene 8.2 (3.7) Conductive Acetal 9.5 (4.3) Pure Kynar (PVDF) 8.2 (3.7)
MATERIAL INLET/OUTLETS:	SB10X-AXX 1" - NPTF (Female), Standard SB10X-BXX - 1" BSP (Female)
AIR INLET:	Air Chuck Style Valve, Standard Air Tamer is 3/8" NPTF (Male) (Optional)
MAXIMUM AIR INLET PRESSURE:	100 PSIG (6.9 bar)
MAXIMUM MATERIAL INLET PRESSURE:	100 PSIG (6.9 bar)
MAXIMUM TEMPERATURE LIMITS:	Polypropylene 35° F - 150° F (+1.6° C - 65.5° C) Conductive Acetal 10° F - 180° F (-12° C - 82° C) Kynar 10° F - 200° F (-12° C - 93° C)
MAXIMUM FLUID VOLUME:	85 in <sup>3</sup>

## Dimensional Data



## Performance

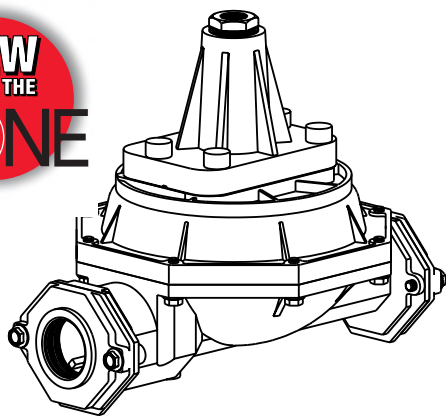
1/2" Pump:	85% pulsation reduction @ 60PSI back pressure / 5 GPM
1" Pump:	80% pulsation reduction @ 60PSI back pressure / 10 GPM

## Ordering

**Notice:** All possible options are shown in the chart below, however, certain combinations may not be recommended. Consult a representative or the factory if you have questions concerning availability.

Blocker Size	Air Body	Thread	Fluid Construction	Hardware	Diaphragm
S B X X X	-	X	X	X	X
10 - 1"	P - Polypropylene (Glass Filled) D - Conductive Acetal	A - NPT B - BSP	P - Polypropylene (Glass Filled) D - Conductive Acetal	S - Stainless (304)	A- Santoprene® G- Nitrile T- Teflon® U- Urethane

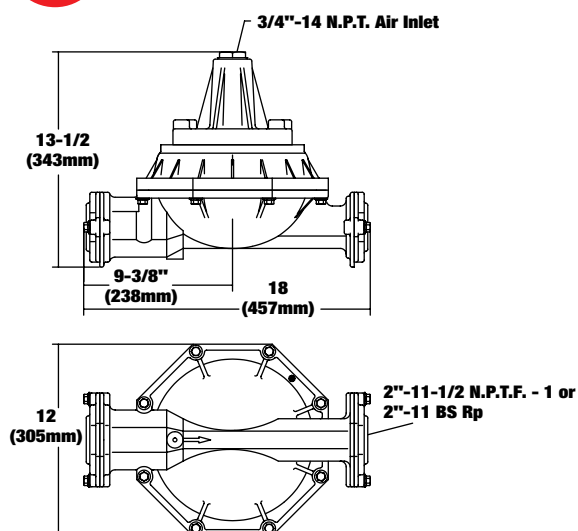




## Specifications

<b>PULSATION DAMPENER TYPE:</b>	Metallic / Automatic	
<b>MATERIAL / WEIGHT-LBS (kgs):</b>	Aluminum (fluid cap)	29 (13.2)
	Cast Iron (fluid cap)	70 (31.8)
	Stainless St. (fluid cap)	71 (32.2)
<b>MATERIAL INLET/OUTLETS:</b>	SB20X-AXX-X	2" -11-1/2 NPTF -1
	SB20X-BXX-X	2" -11 BS Rp
<b>AIR INLET:</b>	3/4" - 14 NPT (female)	
<b>MAXIMUM AIR INLET PRESSURE:</b>	120 PSIG (8.3 bar)	
<b>MAXIMUM MATERIAL INLET PRESSURE:</b>	120 PSIG (8.3 bar)	
<b>MAXIMUM TEMPERATURE LIMITS:</b>	200° F (93° C)	
<b>MAXIMUM FLUID VOLUME:</b>	159 in. <sup>3</sup> (2.61 lit.)	

## Dimensional Data

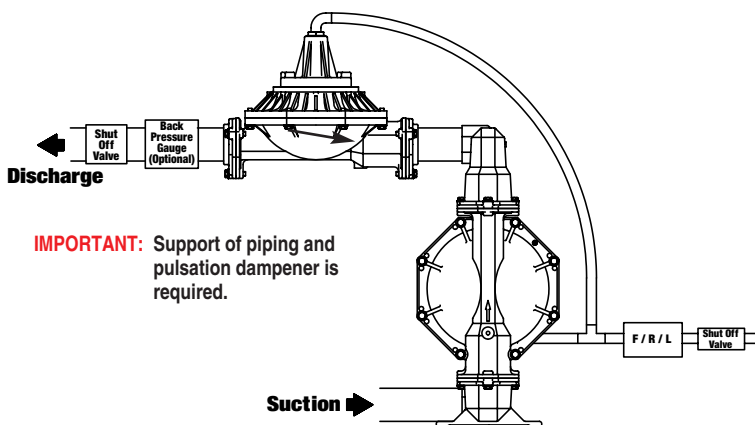


## Performance

<b>1-1/2" Pump:</b>	75% pulsation reduction @ 60PSI back pressure / 40 GPM
<b>2" Pump:</b>	60% pulsation reduction @ 60PSI back pressure / 100 GPM

## Typical Installation

Used with 1-1/2" Metal Diaphragm Pumps



## Ordering

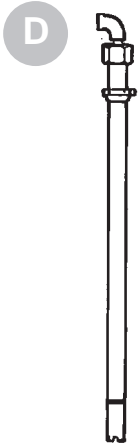
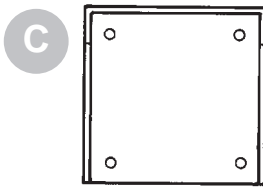
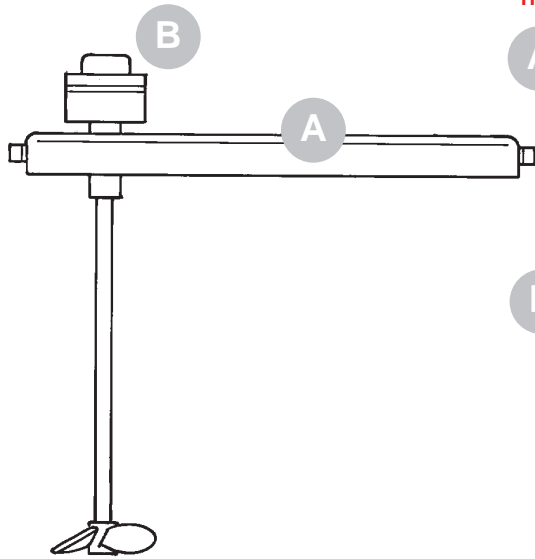
**Notice:** All possible options are shown in the chart below, however, certain combinations may not be recommended. Consult a representative or the factory if you have questions concerning availability.

<u>Blocker Size</u>					<u>Air Body</u>		<u>Thread</u>	<u>Fluid Consturction</u>	<u>Hardware</u>	<u>Diaphragm</u>
S	B	X	X	X		-	X	X	X	- X
20 - 2"					A - Aluminum C - Cast Iron		A - NPT B - BSP		S - Stainless (304) P - Plated Steel	A- Santoprene® G- Nitrile T- Teflon®/Santoprene®
							A - Aluminum S - Stainless Steel			

- Automatic air adjustment-standard
- Perfect for process applications
- Broad pump fluid compatibility



# Pumping Accessories



## ITEM DESCRIPTION

**A Drum Covers** - Available in either carbon (CS) or stainless Steel (SS), durable drum covers will accommodate both diaphragm pump and agitator, where needed.

**B Material Agitators** - Agitators available for both 5- and 55-gallon containers. Air-operated agitator motors generate between 500-1,000 RPM (5 gal. model), and 300-3,000 RPM (55 gal. model). Agitator shaft and propellers are constructed of corrosion-resistant 316 Stainless Steel.

**C Wall Mount Brackets** - Sturdy wall mount brackets provide a convenient means of mounting pumps for centralized transfer operations. Mounts are constructed of heavy-gauge, coated steel and include mounting hardware.

**D Siphon Tubes** - For use when pumping from a 55-gallon container, siphon tubes are available in plastic (PVC, PP, Teflon), carbon steel (CS), or 316 stainless steel (SS). 1-inch siphon tubes come with foot valve for positive priming. Both 1/2-inch and 1-inch models include bung adapters.

## USED WITH

## ORDER MODEL

1/4" Pump  
5-Gal. Cont. 67055-B (SS)

1/2" Pump  
5-Gal. Cont. 66815-1 (CS)  
5-Gal. Cont. 66971 (SS)

5-Gallon Cont. 651100  
55-Gallon Cont. 651103

1/4" Pump 67054-B  
1/2" Pump 76763 (doesn't include mounting hardware)

1" Pump (Metallic Only) 66100  
1-1/2" Pump (Metallic Only) 62133

1/4" Pump 67059-1 (Teflon)  
67059-4 (PP)

1/2" (Non-Met.) Pump 61409(PVC) 90°  
(55 Gal. Cont.) NPT(F)  
61412(PVC), straight  
NPT(M)

1" Pump 65109 (CS)  
(55 Gal. Cont.) NPT(F)  
66568 (SS)  
NPT(F)  
66779(PVC)  
NPT(F)

1" Pump 66779-2(PVC)  
For Bulk (275 NPT(F) 49"L  
Gal.) Tank use 66779-3(PVC)  
NPT(F) 61"L

# Pumping Accessories

ITEM DESCRIPTION

E

**All Pneumatic Liquid Level Sensors** - This device senses the backpressure (59916-1 high level) or lack of backpressure (59916-2 low level) on the end of tubing that is located in tank or sump. The tubing is strategically placed at a desired level or levels. When an input occurs the pneumatic output signal from this device is used to actuate an air valve. Contact ARO Customer Service for help in selecting proper air valve.

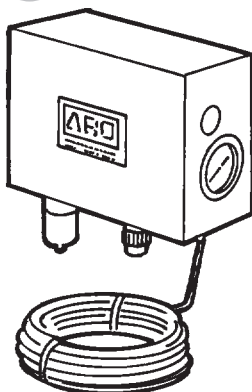
USED WITH

Any Style Pump

ORDER MODEL

59916-1  
59916-2

E



**Pressure Relief Valve** - Relief valve is preset to 125 psi ( $\pm 10$ psi). To be used in systems where thermal expansion or excess backpressure can develop in the fluid lines. Valve should be installed in a piping tee located near the outlet of the pump. Tubing or hose will be required to return bleed-off to fluid container. Valve is 1/4-18(M) inlet/outlet threaded.

Any Pump

93368-1

## Service Kits, Air Filter/Regulator Units/Kits

Air Line Kit contains filter/regulator, gauge, pipe nipple and 5 foot section of air hose.

SERVICE KITS			AIR KITS	
Pump Port Size	Air Valve Kit	Fluid Section Kit (Diaphragm Material)	Recommended Air Line Filter/Regulator Units	Air Line Kit
1/4"	637276	637313-PT (Teflon) 637313-PA (Santoprene)	P29122-600	66073-1
1/2"	637141	637140-XX*	P29122-600 P29221-610	66073-1 66073-2
1" Non-Metallic	637118-C	637161-XX*-C	P29221-610	66073-2
1" Metallic	637118-C	637119-XX*-C	P29221-610	66073-2
1" Metallic 3:1	637178	637179-XX*	P29231-610	-
1-1/2" Non-Metallic	637118-C	637165-XX*	P29241-610	66084-1
1-1/2" Metallic	637118-C	637124-XX*	P29241-610	66084-1

\*NOTE: To receive the correct ball and diaphragm materials - replace the **XX** with the last 2 digits of your pump model number.



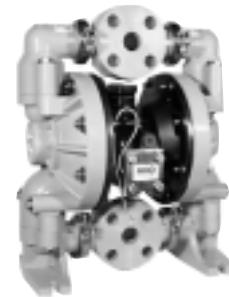
## Cycle Sensor Kits

ARO's new Cycle Sensor Kit provide continuous, real-time monitoring of your Diaphragm Pump's cycle rate. What's the advantage? By knowing your pump's actual operational cycle rate, not only can you adjust to achieve a more precise material flow, but you can also begin to track and measure your pump's performance and parts wear cycle. With this data now in hand, you'll be better prepared for your pump's service and replacement needs - as opposed to unanticipated pump failure and the frantic downtime emergencies that send you or your maintenance people scrambling.

- **Simple Installation** - The ARO Cycle Sensor Switch Kit install in minutes to provide years of reliable pump cycle intelligence.
- **Simple Operation** - Once connected to your PLC, an ARO Mini-batch Controller (see reverse for more information), or simple LED read-out meter, the closed-contact magnetic sensor switch provides failsafe accuracy and dependability.
- **Avoids Diaphragm Failure Mess and Downtime** -  
By providing critical pump cycle data, you can begin to take charge of your pump's service and replacement schedule instead of pump failure and its attendant mess taking charge of you.



67168



67169

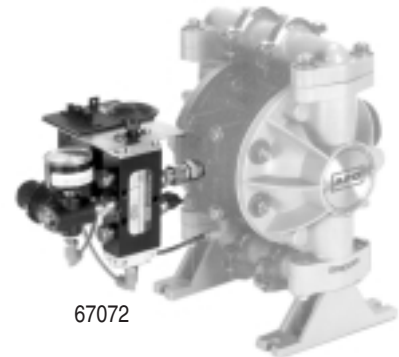
## Ordering

### Pump Cycle Sensor Kits

Kit Model	Diaphragm Pump Model
67168	1/2" Ports / Non-Metallic
67169	1", 1 1/2", 2" Ports / Non-Metallic & 1", 1 1/2" / Metallic

### Pneumatic Batch Counter

ARO® Pneumatic Batch Counter Kits control the volume of fluid dispensed by controlling the number of pump cycles. Since all ARO Diaphragm Pumps are positive displacement pumps, with a known displacement, the number of pump cycles, times the pump's displacement, equals the total volume dispensed. These kits are totally pneumatic (except for the solenoid operated remote start models) and are therefore explosive proof.



67072

## Ordering

### Pneumatic Batch Counter

Kit Model	Diaphragm Pump Model
67072	Manual start batch counter kit for 1/2" and 1" ports pumps



## Cycle Actuation Kits

Aro's new ARO®TRON Cycle Actuation Kits allow the cycle rate of an ARO Diaphragm Pump to be remote-controlled with an electrical signal from PLC's, pH or Pressure Sensors, or even simple Line Switches.

## Ordering

KIT MODEL	DESCRIPTION
67165-1	24 VDC Kit adapts to 1/2" pumps (metallic/ non-metallic)
67165-2	120 VAC Kit adapts to 1/2" pumps (metallic/non-metallic)
67165-3	No Coil* Kit adapts to 1/2" pumps (metallic/non-metallic) For 1/4" (ported) pump cycle actuation, use any of the above three 67165-X (24 VDC, 120 VAC, No Coil) kits with any of the following specially outfitted 1/4" pumps: 650771-1-B (PD02P-APS-PTT), 650771-2-B (PD02P-APS-PTA), 650771-3-B (PD02P-ADS-DTT)
67166-1	24 VDC Kit adapts to 1", 1-1/2" metallic and 1" and 1-1/2" (except 3:1 AODs)
67166-2	120 VAC Kit adapts to 1", 1-1/2" metallic and 1" and 1-1/2" (except 3:1 AODs)
67166-3	No Coil* Kit adapts to 1", 1-1/2" metallic and 1" and 1-1/2" (except 3:1 AODs) <b>*NOTE:</b> Extra coils (assorted voltage ratings) are available for non-24 VDC or 120 VAC applications. Contact Aro Customer Service for information. <b>**NOTE:</b> Valve Block available in aluminum only.

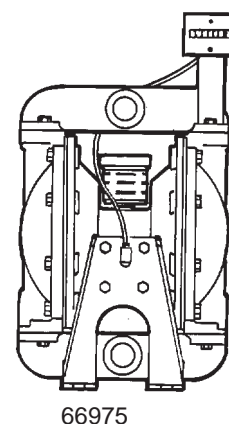
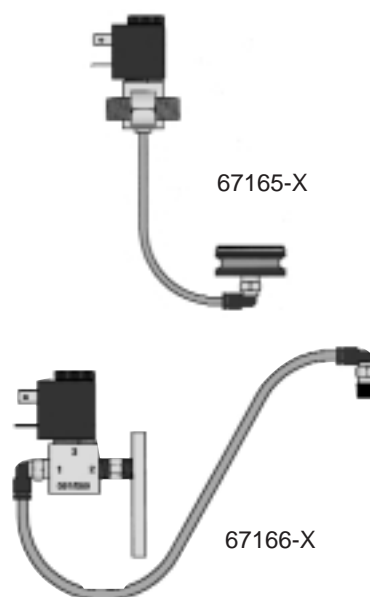
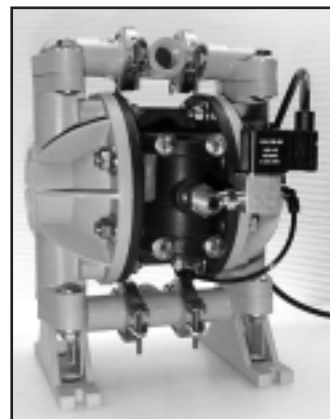
**Important Note:** To achieve optimum performance, be sure to provide a balanced ("time-on" equals "time-off") input signal from your electronic device. For Pump Displacement Data, see charts on previous pages.

## Cycle Actuation Kits

Easy to install cycle counter records up to 999.999 cycles. Kit comes complete with all necessary hardware for ease of installation. Excellent for fluid inventory, preventive maintenance, and fluid metering.

## Ordering

66975	Kit works with 1/2", 1" and 1 1/2" port pumps.
-------	--



Excellent for  
dosing /  
batching  
applications

Get in the  
**ARO** ZONE





## Features

- Ideal for Simple Batching Operations.
- Easy to Program.
- Special "Lock-Out" Programming Prevents Unauthorized Tampering.
- Can Be Powered By 110 VAC or 10-15 VDC.
- Pre-Scale Feature Translates Input Signals Working Units. (i.e. Ounces, Liters, Gallons)

## Specifications

MODEL NUMBER:	67161-1	Standard
	67161-2	Front Panel Pushbuttons
INPUT POWER:	110 VAC @ 6.5 VA	
	or 12-15 VDC @ 3.75	
OUTPUT POWER:	12 VDC @ 50 mA	
INPUT LEVELS:	ON:	4 - 30 VDC
	OFF:	0 - 1 VDC
RELAYS:	(2) Normally Open	
	10 A @ 240 VAC	
DISPLAY:	6 Digit, 55" LED	
OPERATING TEMPERATURE:	32° - 130°F (0° - 54°C)	
MAX HUMIDITY:	90% Noncondensing	

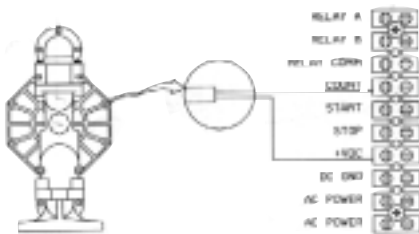


67161-2

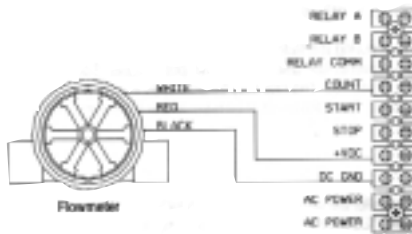
For simple batching operations, the ARO®TRON Mini-Batcher is the perfect choice. Featuring simple programming, "friendly" prompting screen, modular design and large "on-off" buttons, the Mini-Batcher is the fast, friendly, economical path to clean, consistent batching.

## Typical Input Applications

Diaphragm Pump With Cycle Counter

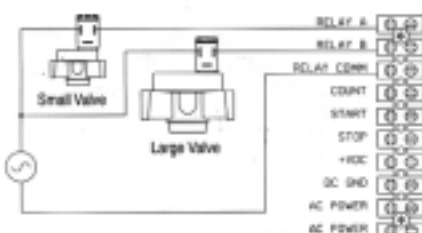


3-Wire Devices (Flowmeters, Etc.)

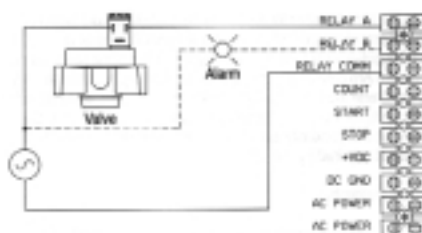


## Typical Output Applications

2-Stage Flow



Standard Flow With Optional Alarm



## Analog To Frequency Converter

Aro's new ARO® TRON Analog Frequency Converter was developed to work in conjunction with any ARO air operated diaphragm pump that is fitted with ARO's Solenoid Actuated Control Kit.



## Performance Specifications

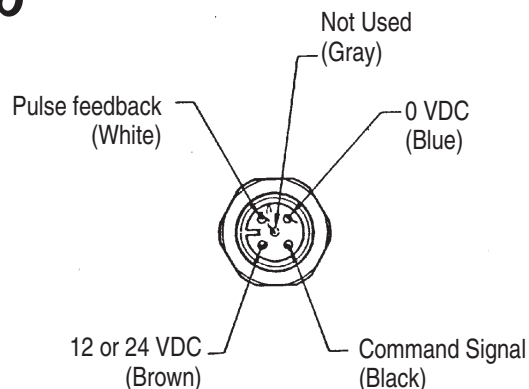
COMMAND SIGNAL:	(4-20 mA) (0-5 VDC)
OPERATING VOLTAGE:	12-24 VDC
FEED BACK SIGNAL:	20 mA Max. Sinking
MAX. COIL CURRENT:	350 mA

## Ordering

MODEL	FREQUENCY
94717-50	0 - 50
94717-100	0 - 100
94717-150	0 - 150
94717-200	0 - 200
94717-250	0 - 250



## Typical Pump/Converter Set-Up

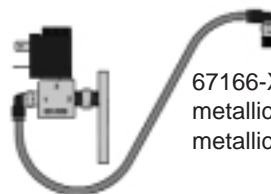


Cable Part No.	Length In Meters
94720-2	2
94720-4	4

Select one of the following Solenoid Control Kits in conjunction with an ARO Pump to complete your package.



67165-X  
(for 1/2" port pumps)



67166-X (for 1", 1-1/2"  
metallic and 1", 1-1/2" non-  
metallic port pumps)

NOTE: Will not  
work with 1" 3:1  
ratio pump.

## Proportional Controller

Aro's new ARO® TRON Proportional controller will allow a remote air regulator to variably control the air pressure supply to air operated pumps. The device can be operated in manual mode, in which the operator can set the desired speed and pressure. The unit can also be switched to run on an automatic mode, where the unit can be controlled by either a 4-20mA or a 10-VDC signal.

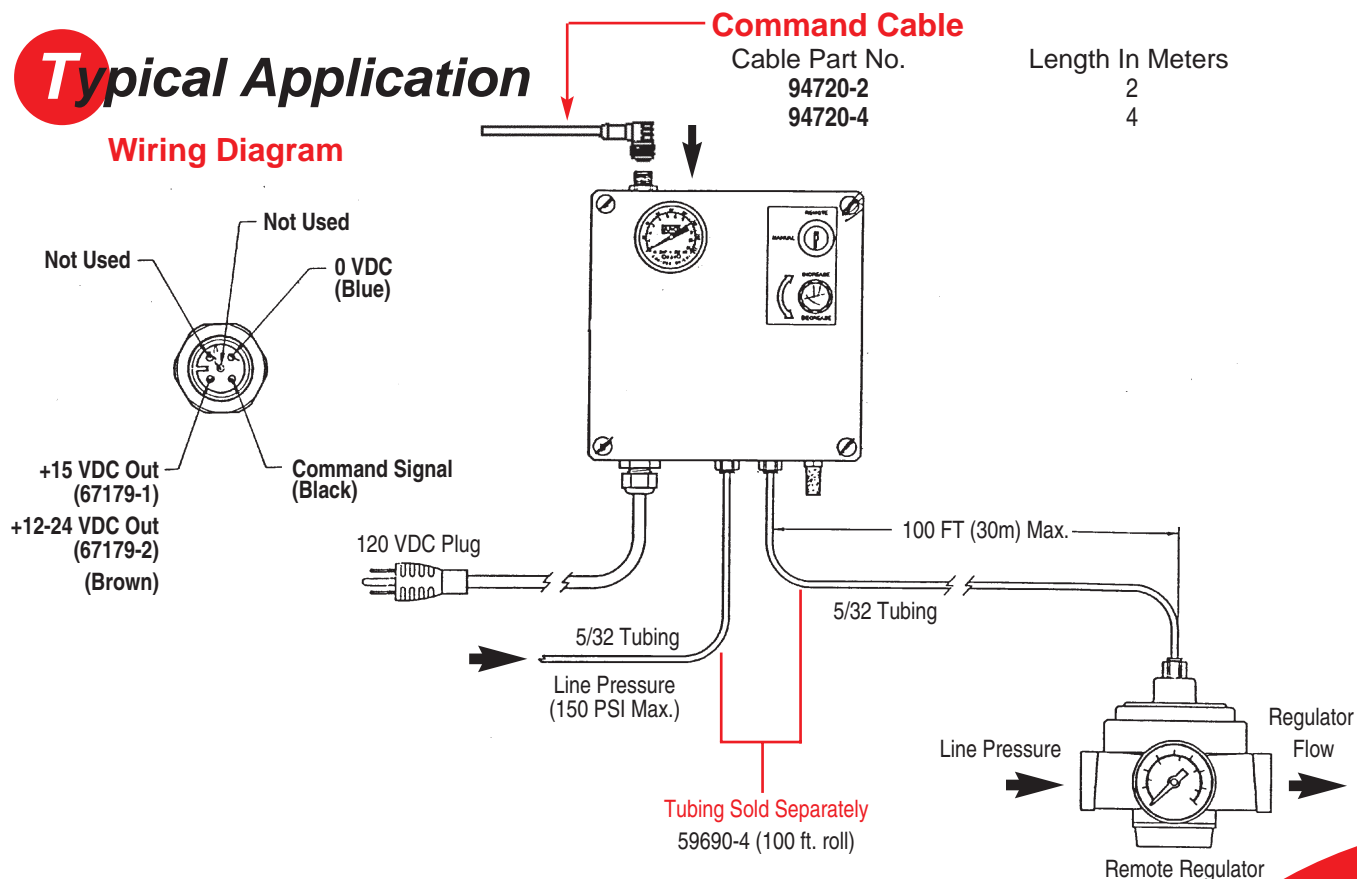


## Ordering

MODEL	Description	Power or Size
67179-1	Proportional Controller	120 AC
67179-2	Proportional Controller without Power Supply	12-24 VDC
94730-1	Remote Regulator (1/4" NPT)	1/2", 1"
94730-2	Remote Regulator (1/2" NPT)	1-1/2"

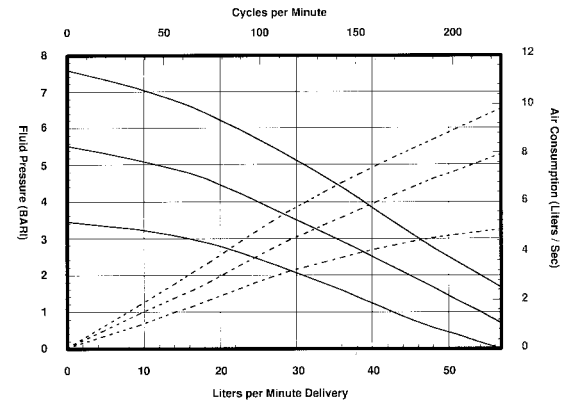
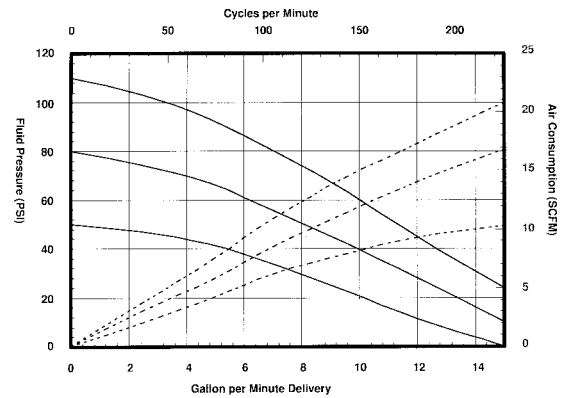
## Typical Application

### Wiring Diagram

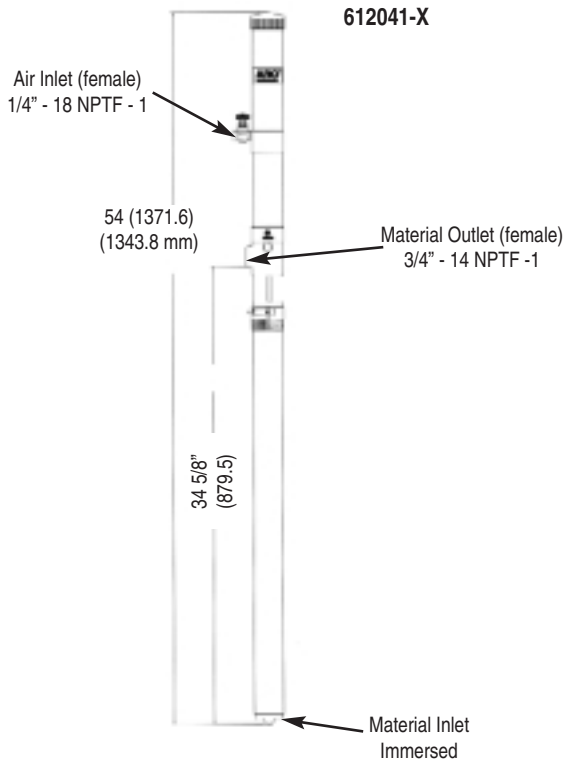


## Performance Specifications

AIR INLET PRESSURE RANGE:	0-150 PSI (0-10.3 bar)
FLUID PRESSURE RANGE:	0-150 PSI (0-10.3 bar)
MAX. REC'D CYCLES PER MINUTE:	75
DISPLACEMENT In <sup>3</sup> (cm <sup>3</sup> ) PER CYCLE:	18.8
VOLUME/CYCLES:	10.4 oz. (307.7 ml)
CYCLES PER GALLON (LITER):	12.3
MAXIMUM WORKING FLOW RATE:	9-GPM (34.1-lpm)
MAXIMUM FLOW RATE:	18 gpm (68.1 lpm)
NOISE LEVEL:	77.8 bd(A) @ 60 psi, 40 cycles per minute
RATIO:	1:1
AIR MOTOR DIAMETER:	2" (5.08 cm)
STROKE:	6" (15.24 cm)
AIR INLET:	1/4"-18 NPT 1 (F)
MATERIAL INLET:	Immersed
MATERIAL OUTLET:	3/4"-14 NPTF - 1 (F)
PUMP CONSTRUCTION:	Carbon Steel
LOWER PUMP REPAIR KIT:	637081 (-1 Buna) 637083 (-3 Teflon)



## Dimensional Data



## Accessories

AIR F/R/L:	C28123-600
Wall Mount:	61113
Muffler:	61879
AIR Line Oil:	62274 (1 Quart)
Siphon Hose:	65986 (5 Gal.) 65986-1 (55 Gal.)



See Page 35 for Piston Pump accessories.

C28123-600

## Ordering

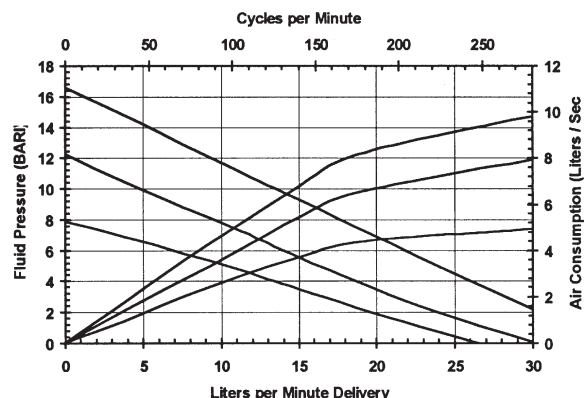
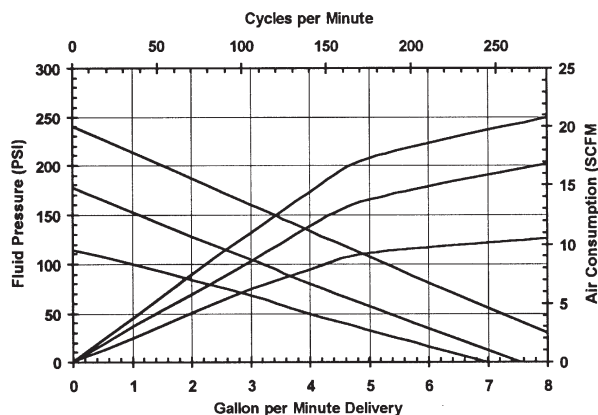
Base Model						Buna Packings	
6	1	2	0	4	1	-	1
Base Model						Teflon Packings	
6	1	2	0	4	1	-	3

5-Year  
Warranty!

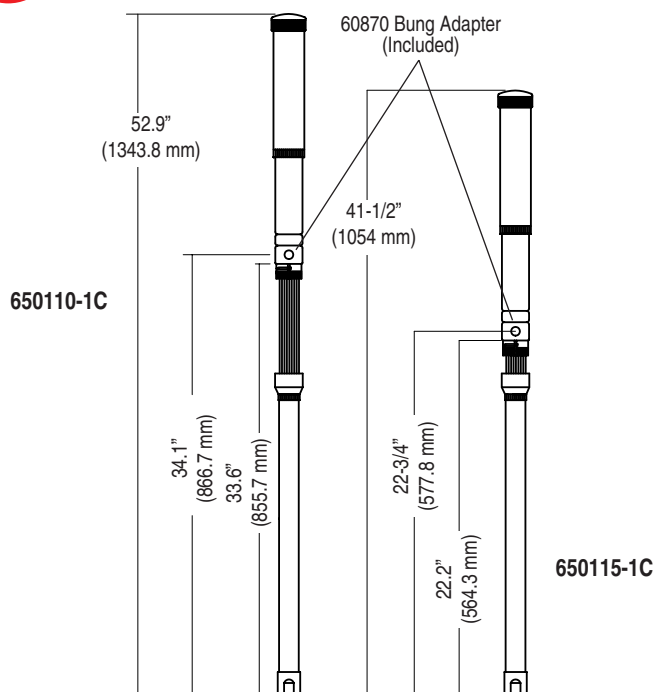
Get in the  
**ZONE**  
IRARO

## Performance Specifications

AIR INLET PRESSURE RANGE:	30-150 (2-10.2 bar)
FLUID PRESSURE RANGE:	60-300 PSI (4-20.4 bar)
MAX. REC'D CYCLES PER MINUTE:	120
DISPLACEMENT in <sup>3</sup> (cm <sup>3</sup> ) PER CYCLE:	7.2 (117.9)
CYCLES PER GALLON (LITER):	32 (8.4)
FLOW @ 120 CYCLES PER MINUTE:	4-GPM (15.1-lpm)
NOISE LEVEL @ 60 PSI:	77.8 db(A)
LOWER PUMP MATERIAL:	Carbon Steel
PLUNGER MATERIAL:	Carbon Steel
CYLINDER MATERIAL:	Carbon Steel
AIR MOTOR:	60702
MOTOR REPAIR KIT:	66098
MOTOR DIAMETER:	2" (5.2 cm)
STROKE:	6" (15.2 cm)
AIR INLET:	1/4" NPT (F)
LOWER PUMP REPAIR KIT:	637044 (Teflon) 637045 (UHMW-PE)
MATERIAL INLET:	1" NPT (F)-Stub Model Immersed-Drum Model
MATERIAL OUTLET:	1/2" NPT (F)
WEIGHT LBS. (Kgs.):	12 (5.4)



## Dimensional Data



## Accessories

AIR F/R/L:	C28123-600
Wall Mount:	61113
Muffler:	61879
AIR Line Oil:	62274 (1 Quart)
Siphon Hose:	65986 (5 Gal.) 65986-1 (55 Gal.)

See Page 35 for Piston Pump accessories.



C28123-600

## Ordering

Stub Mounted Base Model

6 5 0 1 1 5 - 1 C

Teflon Packings

55-Gallon Base Model

6 5 0 1 1 0 - 1 C

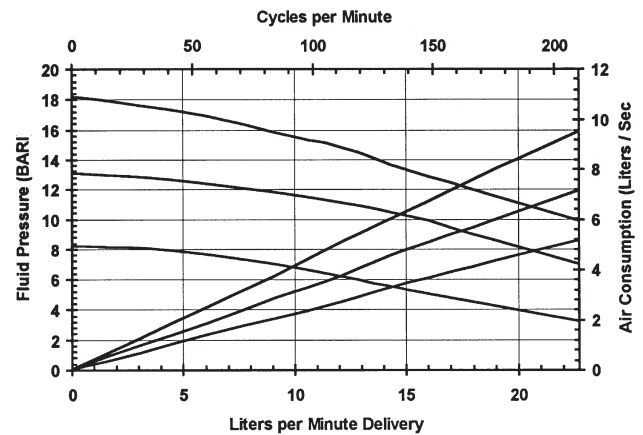
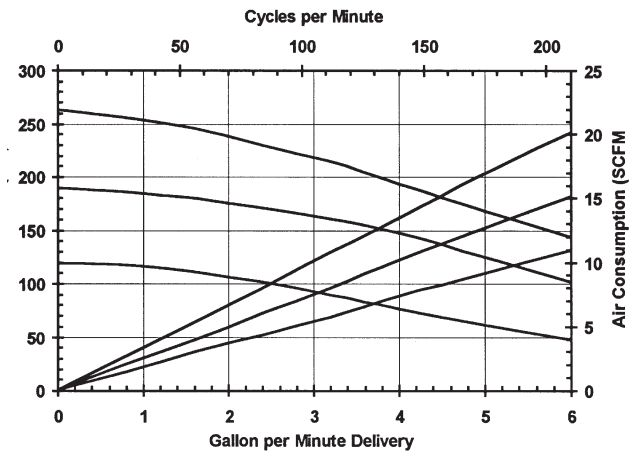
5-Year  
Warranty!

Get in the  
**ZONE**

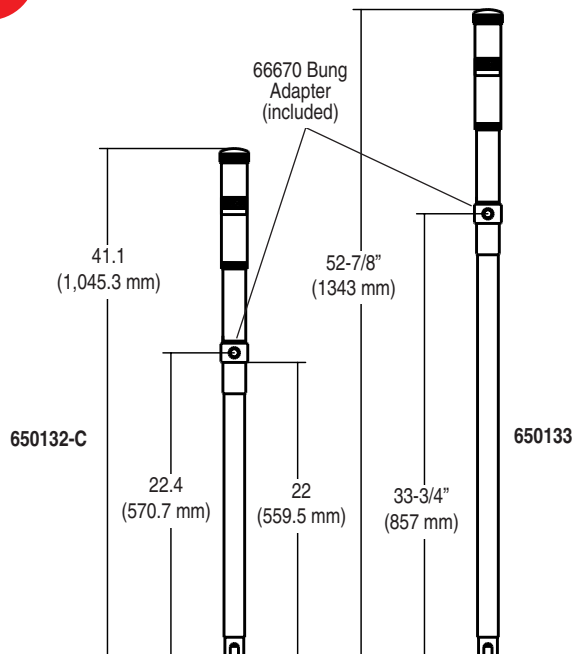


## Performance Specifications

AIR INLET PRESSURE RANGE:	30-150 (2-10.2 bar)
FLUID PRESSURE RANGE:	60-300 PSI (4-20.4 bar)
MAX. REC'D CYCLES PER MINUTE:	120
DISPLACEMENT In <sup>3</sup> (cm <sup>3</sup> ) PER CYCLE:	7.2 (117.9)
CYCLES PER GALLON (LITER):	32 (8.4)
FLOW @ 120 CYCLES PER MINUTE:	4-GPM (15.1-lpm)
NOISE LEVEL @ 60 PSI:	77.8 db(A)
LOWER PUMP MATERIAL:	316 Stainless Steel
PLUNGER MATERIAL:	316 Stainless Steel
CYLINDER MATERIAL:	Stainless Steel
AIR MOTOR:	60702
MOTOR REPAIR KIT:	66098
MOTOR DIAMETER:	2" (5.2 cm)
STROKE:	6" (15.2 cm)
AIR INLET:	1/4" NPT (F)
LOWER PUMP REPAIR KIT:	637044 (Teflon) 637045 (UHMW-PE)
MATERIAL INLET:	1" NPT (F)-Stub Model Immersed-Drum Model
MATERIAL OUTLET:	1/2" NPT (F)
WEIGHT LBS. (Kgs.):	16 (7.2) Stub Model 19 (8.6) Drum Model



## Dimensional Data



## Accessories

AIR F/R/L:	C28123-600
Wall Mount:	61113
Muffler:	61879
AIR Line Oil:	62274
Siphon Hose:	67140-1 (5 Gal.) 67140-2 (55 Gal.)

See Page 35 for Piston Pump Accessories



C28123-600

## Ordering

Stub Mounted Base Model

6 5 0 1 3 2 - C

Teflon Packings

55-Gallon Base Model

6 5 0 1 3 3

55-Gallon Base Model

6 5 0 1 3 3 - 4

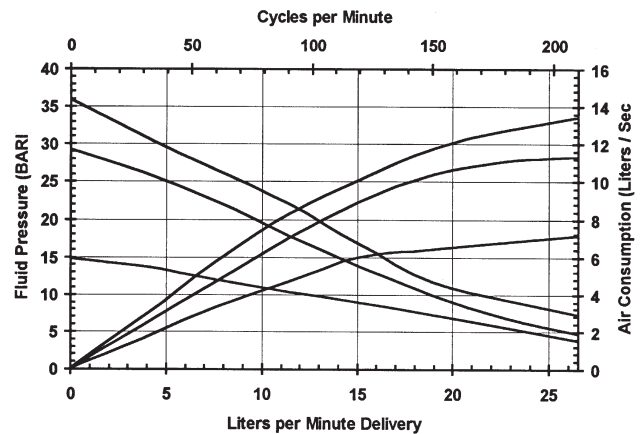
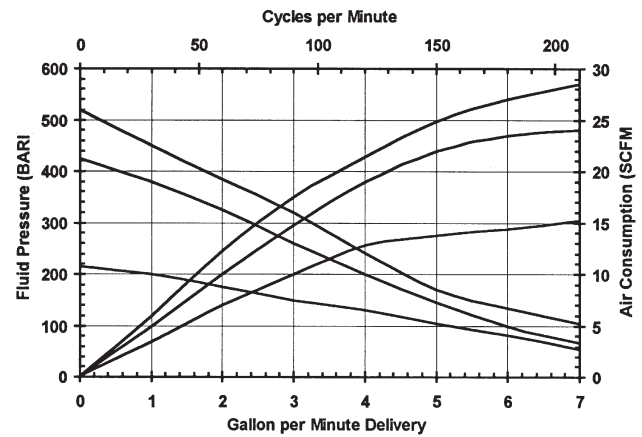
UHMW-PE Packings

5-Year  
Warranty!

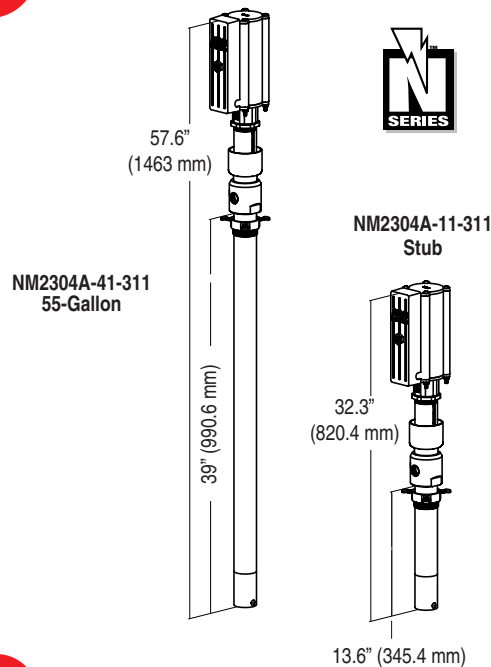
Get in the  
**ZONE**  
ARO

# Performance Specifications

AIR INLET PRESSURE RANGE:	150 (10.2 bar)
FLUID PRESSURE RANGE:	120-600 PSI (8.1-40.8 bar)
MAX. REC'D CYCLES PER MINUTE:	120
DISPLACEMENT In <sup>3</sup> (cm <sup>3</sup> ) PER CYCLE:	8.2 (134.3)
CYCLES PER GALLON (LITER):	28 (7.4)
FLOW @ 120 CYCLES PER MINUTE:	4.2-GPM (15.8-lpm)
NOISE LEVEL @ 100 PSI:	85 db(A)
LOWER PUMP MATERIAL:	Carbon Steel
PLUNGER MATERIAL:	Carbon Steel
AIR MOTOR:	66913
MOTOR REPAIR KIT:	637316
MOTOR DIAMETER:	3" (7.6 cm)
STROKE:	3" (7.6 cm)
AIR INLET:	1/4" - 18 N.P.T.F.-1(f)
LOWER PUMP REPAIR KIT:	637176 for NM2304A-X1-311
MATERIAL INLET:	1-1/2" NPT(F)
MATERIAL OUTLET:	3/4" NPT (F)
WEIGHT LBS. (Kgs.):	NM2304A-11-311 = 32 (14.5) NM2304A-41-311 = 46 (20.9)
2" BUNG ADAPTER:	Included



# Dimensional Data



# Accessories

AIR F/R:	P29122-600
Wall Mount:	61113
Wet Sol:	66333-B (1 Quart)

See Page 35 for Piston Pump accessories



P29122-600

# Ordering

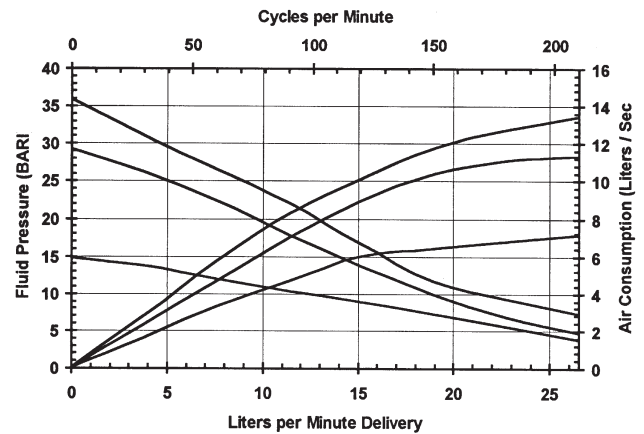
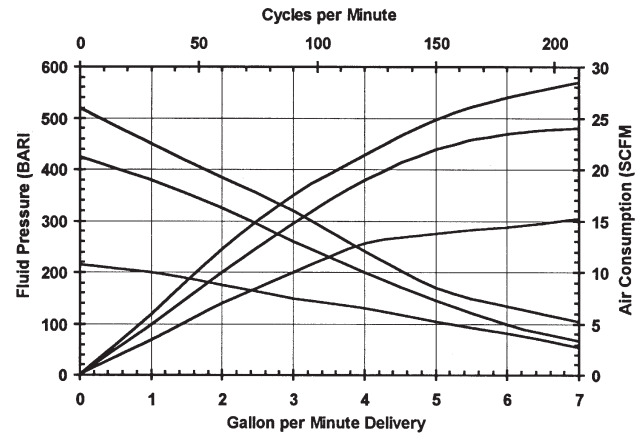
Base Model	Type	Packings
N M 2 3 0 4 A	X 1	3 1 1
	1 Stub (Wall Mount) 4 55-Gallon (205 Liters)	Glass-Filled Teflon (Upper/Lower)

5-Year  
Warranty!

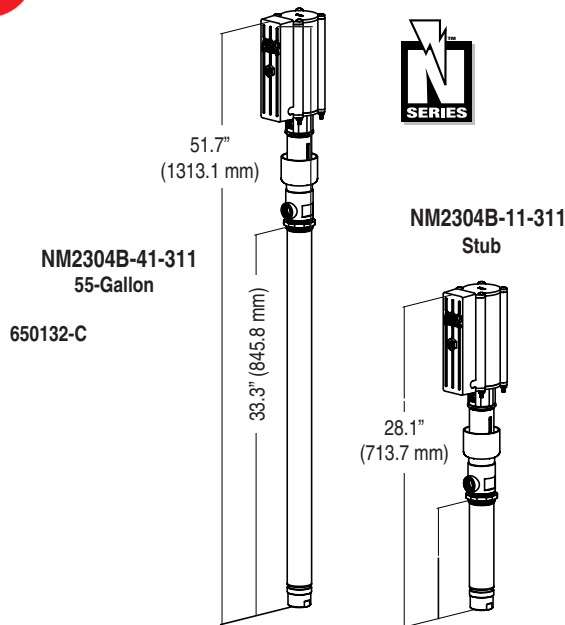
Get in the  
**ZONE**

## Performance Specifications

AIR INLET PRESSURE RANGE:	150 (10.2 bar)
FLUID PRESSURE RANGE:	120-600 PSI (8.1-40.8 bar)
MAX. REC'D CYCLES PER MINUTE:	120
DISPLACEMENT In <sup>3</sup> (cm <sup>3</sup> ) PER CYCLE:	8.2 (134.3)
CYCLES PER GALLON (LITER):	28 (7.4)
FLOW @ 120 CYCLES PER MINUTE:	4.2-GPM (15.8-lpm)
NOISE LEVEL @ 100 PSI:	85 db(A)
LOWER PUMP MATERIAL:	316 Stainless Steel
PLUNGER MATERIAL:	316 Stainless Steel
CYLINDER MATERIAL:	Stainless Steel
AIR MOTOR:	66913
MOTOR REPAIR KIT:	637316
MOTOR DIAMETER:	3" (7.6 cm)
STROKE:	3" (7.6 cm)
AIR INLET:	1/4" - 18 NPT(F)
LOWER PUMP SERIES:	65108 (NM2304B-11-311) 65106 (NM2304B-41-311)
LOWER PUMP REPAIR KIT:	637010 for NM2304B-X1-311
MATERIAL INLET:	1-1/4" NPT(F)
MATERIAL OUTLET:	3/4" NPT (F)
WEIGHT LBS. (Kgs.):	NM2304B-11 = 32 (14.5) NM2304B-41 = 46 (20.9)
2" BUNG ADAPTER:	Included



## Dimensional Data



## Accessories

AIR F/R:	P29122-600
Wall Mount:	61113
Wet Sol:	66333-B
Siphon Hose:	67140-1 (5-Gallon) 67140-2 (55-Gallon)

See Page 35 for Piston Pump accessories



P29122-600

## Ordering

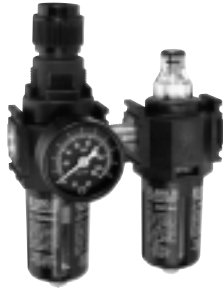
Base Model	Type	Packings
N M 2 3 0 4 B	- X 1 -	X 1 X
	1 Stub (Wall Mount) 4 55-Gallon (205 Liters)	311- Glass Filled Teflon C1B- UHMW-PE/Ultra Coat Ceramic* 31B- Teflon/Ultra Coat Ceramic*

\*Ultra-Coat option available on stub-type pumps only

5-Year  
Warranty!

Get in the  
**ZONE**

# Accessories



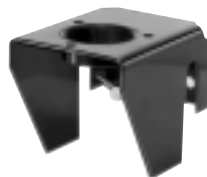
C28123-600



P29122-600



635040



61113



61879



66334-B

Model Number	Description	Pumps Used With	Port Size NPT	Reg. Pressure Range PSI (bar)	Max. Flow
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## AIR FILTER / REGULATOR / LUBRICATOR

### MINIATURE F / R / L

C28123-600	<b>Filter/Regulator-Lubricator</b> Drop/fog-type lubrication, 20 micron filter, polycarbonate bowls.	2" & "N", air motor pumps	1/4 (F)	5-125 (.3-8.5)	13 SCFM (6 dm³/s)
P29122-600	<b>Filter/Regulator</b> "Piggyback" unit features, 20 micron filter, polycarbonate bowls. 0-160 lb. gauge	2" & "N", air motors	1/4 (F)	5-125 (.3-8.5)	12 SCFM (6 dm³/s)

## OVER-RUN CONTROL

635040	<b>ARO Stop Valve</b>	Over-run control valve for all Piston Pumps. Valve automatically shuts pump off if material supply is interrupted.			
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## AIR LINE LUBRICANT

62274	<b>Gear Oil - One Quart Bottle</b> A high quality "EP" extreme pressure gear oil, non-detergent, rust or oxidation inhibited, with a viscosity of 700-1000 S.U.S. at 100°F.	Used in air line lubricator to air motor.			
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## WALL MOUNTS

61113	<b>Wall Mount Bracket</b> Has 2" NPT(F) opening to accept bung type pumps. Bracket slips over rim of open head drum or can be wall mounted.	Used with 2" and "N" Series" air motor stub pumps fitted with bung dapters or 55-gallon bung type pumps.			
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Model Number	Description	Pump Used With	Air Inlet NPT	Size Inches X Inches PSI (bar)
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## AIR MOTOR MUFFLER

61879	<b>Air Motor Muffler</b> Reduces air exhaust noise level to acceptable OSHA standards.	2" air motor, 2:1 ratio pumps	3/8 (M)	1-1/4 x 3-1/2 (32 x 89)
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## WET SOL "PLUS"

66333-B	<b>Wet Sol - One Quart Container</b> Designed to prolong packing life by keeping the piston rod and packings wetted. Also reduces the possibility of material hardening on the piston rod.	Used with all pumps with wet cups.			
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66334-B	<b>Wet Sol - One Gallon Container</b>				
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## SIPHON HOSES

67140-1	<b>5 Gallon,</b>	Stainless Steel tube and fittings. 5 ft. Hose, 3/4 in. (NPT), with nylon inner tube
67140-2	<b>55 Gallon,</b>	Stainless Steel tube and fittings. 5 ft. Hose, 3/4 in. (NPT), with nylon inner tube

## Piston Pumps

MODEL	AIR MOTOR DIAMETER	STROKE LENGTH	WORKING FLOW MAX. GPM (Liters)	FREE FLOW MAX. GPM (Liters)	RATIO	AIR INLET NPT(F)	FLUID INLET/ OUTLET NPT(F)	CONTAINER SIZE
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### Basic Pumps

LM2305A-11	3"	3"	6 (23)	9 (34)	5:1	1/4"	1-1/2 / 1/2	Stub
LM2305A-31	3"	3"	6 (23)	9 (34)	5:1	1/4"	1-1/2 / 1/2	16-Gallon
LM2305A-41	3"	3"	6 (23)	9 (34)	5:1	1/4"	1-1/2 / 1/2	55-Gallon

Each pump includes Bung Adapter Model #67145-4-B

### Pre-Assembled Thunder Oil Pump Package

LP3100-1	3"	3"	6 (23)	9 (34)	5:1	1/4"	1-1/2 / 1/2	16-Gallon
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16 Gal. PORTABLE GEAR OIL PACKAGE - Includes LM2305A-31 Basic Pump, 635190-1 Meter, 635391-1 Control Handle, 640058-2 Dolly, 94421 Drum Cover and 623501-6 Material Hose (6').

## Thunder Lubrication Pumps

- **RELIABLE** - Thunder features a stall-free, ice-free air motor design (patents applied for) contained in a rugged housing that will withstand most working environments.
- **THE RIGHT PRICE** - Through advanced designed - for -assembly technology, Thunder rolls through manufacturing faster than any pump on the market. With speed comes economy - which we're rolling on to you.
- **FEWER PARTS** - Thunder pumps are constructed with 50% fewer parts than the majority of comparable pumps. Install Thunder and see for yourself how fewer parts translate into fewer headaches when it comes to service or routine maintenance.
- **NO MECHANICAL ASSIST** - Thunder's valving design (patents applied for) uses no trip rods or push pins to break.
- **MINIMUM NUMBER OF TOOLS, NO SPECIAL TOOLS** - If you can find a standard wrench you can service Thunder.
- **NOISE LEVELS WITHIN INDUSTRY STANDARDS** - This is *one* form of thunder that's quiet: 2" 80 db's., 3" 85 db's.
- **LUBE-FREE AIR MOTOR**

**5  
YEAR  
WARRANTY**

Air Line  
Filter/Regulator



P29122-600  
See page 39.



LP3100-1



5:1 Oil  
LM2305A-11

## Extra Drum Covers

### THUNDER PACKAGES

Come complete with drum covers. For additional covers order by model numbers shown.



94420  
5-Gallon



94421  
16-Gallon



94422  
55-Gallon

5-Year  
Warranty

Get in the  
**ZONE**  
AR



# Piston Pumps

MODEL	AIR MOTOR DIAMETER	STROKE LENGTH	WORKING FLOW MAX. GPM (Liters)	FREE FLOW MAX. GPM (Liters)	RATIO	AIR* INLET NPT(F)	FLUID INLET/ OUTLET NPT(F)	CONTAINER SIZE
<b>Pre-Assembled Thunder Grease Pump Package</b>								
<b>Grease</b>	3"	3"	4 lbs. (1.8kg)	7.5 lbs. (3.3kg) 50:1		1/4"	3/8	See Below
LP3001-1	35-lb. <b>GREASE PACKAGE</b> - Includes LM2350E-21-B Pump, Drum Cover with Handle, Follower Plate, also includes Material Hose (10'), Swivel, Adapter, and Booster Gun.							
LP3003-1	120-lb. <b>GREASE PACKAGE</b> - Includes LM2350E-31-B Pump, Cover, Material Hose (10'), Swivel, Dolly, 636103 Booster Gun, Follower Plate, and Adapter.							
LP3005-1	400-lb. <b>GREASE PACKAGE</b> - Includes LM2350E-41-B Pump, Drum Cover, Material Hose (4 ft.), Air Line Hose (3 ft.). Order Follower Plate 640015-1 when required.							

**IMPORTANT:** The 50:1 ratio grease packages listed above have a maximum air inlet pressure of 150 PSI.

Air Line  
Filter/Regulator



P29122-600  
See page 39.



LP3001-1 (3" Air Motor)

**5**  
YEAR  
WARRANTY



LP3003-1  
(3" Air Motor)

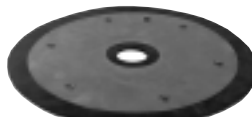
## Extra Follower Plates

### THUNDER PACKAGES

Come complete with a follower plate. To order extra plates refer to the model number/size below.



640095-2-B  
35 - Pound Pail



640165  
120 - Pound Drum



640015-1  
400 - Pound Drum

## Fluid Control Handles, Non-Metered



635193



635392



635399

MODEL DESCRIPTION

MAXIMUM  
WORKING  
PRESSURE  
PSI (bar)

FLUID  
INLET  
NPT (F)

FLUID  
OUTLET

### Motor Oil, Gear Oil, Transmission Fluid (high-volume)

635193	Has flexible rubberhose with nondrip nozzle. Use with 1:1 and 3:1 pumps.	600 (41)	3/4	Nondrip tip
635395-2	Has flexible rubberhose with nondrip nozzle. Use with 5:1 and 9:1 pumps.	900 (63)	3/4	Nondrip tip

### Motor Oil, Gear Oil, Transmission Fluid (standard-volume)

635392	Has flexible rubber hose, built-in swivel – and filter, and non-drip nozzle.	1,000 (69)	1/2	Nondrip tip
635399	Has flexible rubber hose, built-in swivel, and right-angle non-drip nozzle.	1,000 (69)	1/2	Nondrip tip

### Water, Anti-freeze

635129	Radiator bibb	300 (21)	1/4	Nondrip tip
635131	Radiator bibb. Has Neoprene spout.	300 (21)	1/4	Nondrip tip

## High Pressure Grease Control Handle

MODEL DESCRIPTION

MAXIMUM  
WORKING  
PRESSURE  
PSI (bar)

FLUID  
INLET  
NPT (F)

FLUID  
OUTLET

### Grease Control Handle

636103	High pressure booster handle delivers line pressure for normal lubrication. Trigger booster feature delivers 12,000 PSI (828 bar) to break loose tougher fittings. Includes curved nozzle with hydraulic coupler, inlet material filter and manual pressure vent for easy disconnection. WARNING: Do not use with whip hose!	7,500 (517)	1/8 (M) or 3/8 (F)	Hydraulic Coupler
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636103

## Swivel

MODEL DESCRIPTION

636077	Easy-turn swivel provides operator mobility when using fluid control handles. Do not install swivels in systems where they will be subjected to fluid pressures higher than their ratings.
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636077

# Air Systems Components

Model Number	Description	Pumps Used With	NPT Inlet	Max. Inlet PSI	Max. CFM	Micron Element	Size L x W
<b>Air Filter</b>							
F25121-200	Filter	1/4" (Dia.) 2" & N-Series Thunder (Piston)	1/4	150	38	20	4.2 x 2.0
F25221-110	Filter	1/2", 1" Models	1/4	175	54	40	7.0 x 2.6
F25241-110	Filter	1-1/2" Non-Metallic	1/2	250	122	40	7.0 x 2.6
F25451-110	Filter	2" Metallic (Fuel)	3/4	250	345	40	11.7 x 4.75



Model Number	Description	Pumps Used With	NPT Inlet	Gauge Ports	Max. Inlet PSI	Pressure Range	Max. CFM	Size L x W
<b>Air Regulator</b>								
127122-600	Regulator w/gauge	1/4" (Dia.), 2" & N-Series/Thunder (Piston)	1/4	1/8	200	0-125	38	3.125 x 1.625
R27221-600	Regulator w/gauge	1/2", 1" Models	1/4	1/4	200	0-125	54	4.75 x 2.6
R27241-600	Regulator w/gauge	1-1/2" Non-Metallic	1/2	1/4	200	0-125	122	4.75 x 2.6
27354-600	Regulator w/gauge	2" Metallic (Fuel)	3/4	1/4	250	0-125	345	8.6 x 3.5



Model Number	Description	NPT Inlet	Max. Inlet PSI	Max. CFM	Size L x W
<b>Air Lubricator</b>					
L26221-110	Lubricator	1/4	175	75	7.7 x 2.6
L26241-110	Lubricator	1/2	175	110	7.7 x 2.6



Model Number	Description	Pumps Used With	NPT Inlet	Gauge Ports	Max. Inlet PSI	Pressure Range	Max. CFM	Micron Element	Size L x W
<b>Air Filter / Regulator</b>									
P29122-600	Filter / Reg. w/gauge	1/4" (Dia.), 2" & N-Series Thunder (Piston)	1/4	1/8	150	0-125	12	20	6.0 x 2.0
P29221-610	Filter / Reg. w/gauge	1/2", 1" Models Diaphragm	1/4	1/4	175	0-125	93	40	9.5 x 2.6
P29241-610	Filter / Reg. w/gauge	1-1/2" Models Diaphragm	1/2	1/4	175	0-125	140	40	9.5 x 2.6



Model Number	Description	Used With	Model Number	Description	Used With	Model Number	Description	Used With
<b>Filter / Regulator Accessories</b>								
29660-1	20 Micron Element	125121-000 P29122-600	100067	0-160 lb. Gauge	R27221-600 R27241-600 27354-600 27364-600 P29221-610 P29241-610	104078	Automatic Drain	125121-000 P29122-600
29077	Mounting Bracket	27354-600 27364-600				104265	Nut/Bracket Kit	127122-600 P29122-600
29850	0-160 lb. Gauge	127122-600 P29122-600	104068	Automatic Drain	F25221-110 F25241-110 P29221-610 P29241-610 F25451-110 F25461-110	104119	40 Micron Element	F25451-110 F25461-110
100031-1	40 Micron Element	F25221-110 F25241-110 P29221-610 P29241-610				104172	Wall Mounting Kit	R27221-600 R27241-600 P29221-610 P29241-610

## 2-Way Pilot Actuated



- Normally Closed
- Brass Body
- Stainless Steel Stem
- Spring Return

## Pump Type/Size

Model Number	Port Size	Cv	Voltage	DIAPHRAGM PUMPS				PISTON PUMPS		
				1/4"	1/2"	1"	1-1/2"	2"	3"	
TB03EB-024-D	3/8"	4.5	24 DC	•	•	•		•	•	
TB03EB-120-A	3/8"	4.5	120 AC	•	•	•		•	•	
TB04EB-024-D	1/2"	4.5	24 DC				•			
TB04EB-120-A	1/2"	4.5	120 AC				•			

## 2-Way Direct Actuated



- Normally Closed
- Brass Body
- Stainless Steel Stem
- Spring Return

Model Number	Port Size	Cv	Voltage	DIAPHRAGM PUMPS				PISTON PUMPS		
				1/4"	1/2"	1"	1-1/2"	2"	3"	
TB022B-024-D	1/4"	.18	24 DC	•	•					
TB022B-120-A	1/4"	.18	120 AC	•	•					
TB035B-024-D	3/8"	4.0	24 DC			•	•	•	•	
TB035B-120-A	3/8"	4.0	120 AC			•	•	•	•	

## 3-Way Solenoid Actuated



CAT66P

- Normally Closed
- Aluminum Body
- Spring Return

Model Number	Port Size	Cv	Voltage	DIAPHRAGM PUMPS				PISTON PUMPS		
				1/4"	1/2"	1"	1-1/2"	2"	3"	
CAT66P-024-D	1/4"	.2	24 DC	•						
CAT66P-120-A	1/4"	.2	120 AC	•						
MQ3728-024-D	1/4"	1.5	24 DC		•	•		•	•	
MQ3728-120-A	1/4"	1.5	120 AC		•	•		•	•	
H253SS-024-D	3/8"	2.2	24 DC			•				
H253SS-120-A	3/8"	2.2	120 AC			•				
H254SS-024-D	1/2"	2.4	24 DC				•			
H254SS-120-A	1/2"	2.4	120 AC				•			

## Air Control Valves



104104-N02

- Composite Body
- Can be Panel Mounted
- Infinite Control Settings
- Corrosion-Resistant Stainless Steel Insert & Stem (NS Model)

Model Number	Port Size	Cv	DIAPHRAGM PUMPS				PISTON PUMPS		
			1/4"	1/2"	1"	1-1/2"	2"	3"	
104104-NS2	1/4"		•	•	•		•	•	
104104-N02	1/4"		•	•	•				
104104-N04	1/2"	4.5				•			

## Lock-Out Valves/Hasp



104174



100085

- Meets OSHA lock-out / tag-out regulations
- Installs upstream of air filter / regulator unit

Model Number	Port Size	DIAPHRAGM PUMPS				PISTON PUMPS		
		1/4"	1/2"	1"	1-1/2"	2"	3"	
104253-2	1/4"	•				•	•	
104174-2	1/4"	•	•	•				
104174-4	1/2"				•			
100085 (Hasp)	1/2"	•	•	•	•	•	•	

# Accessories

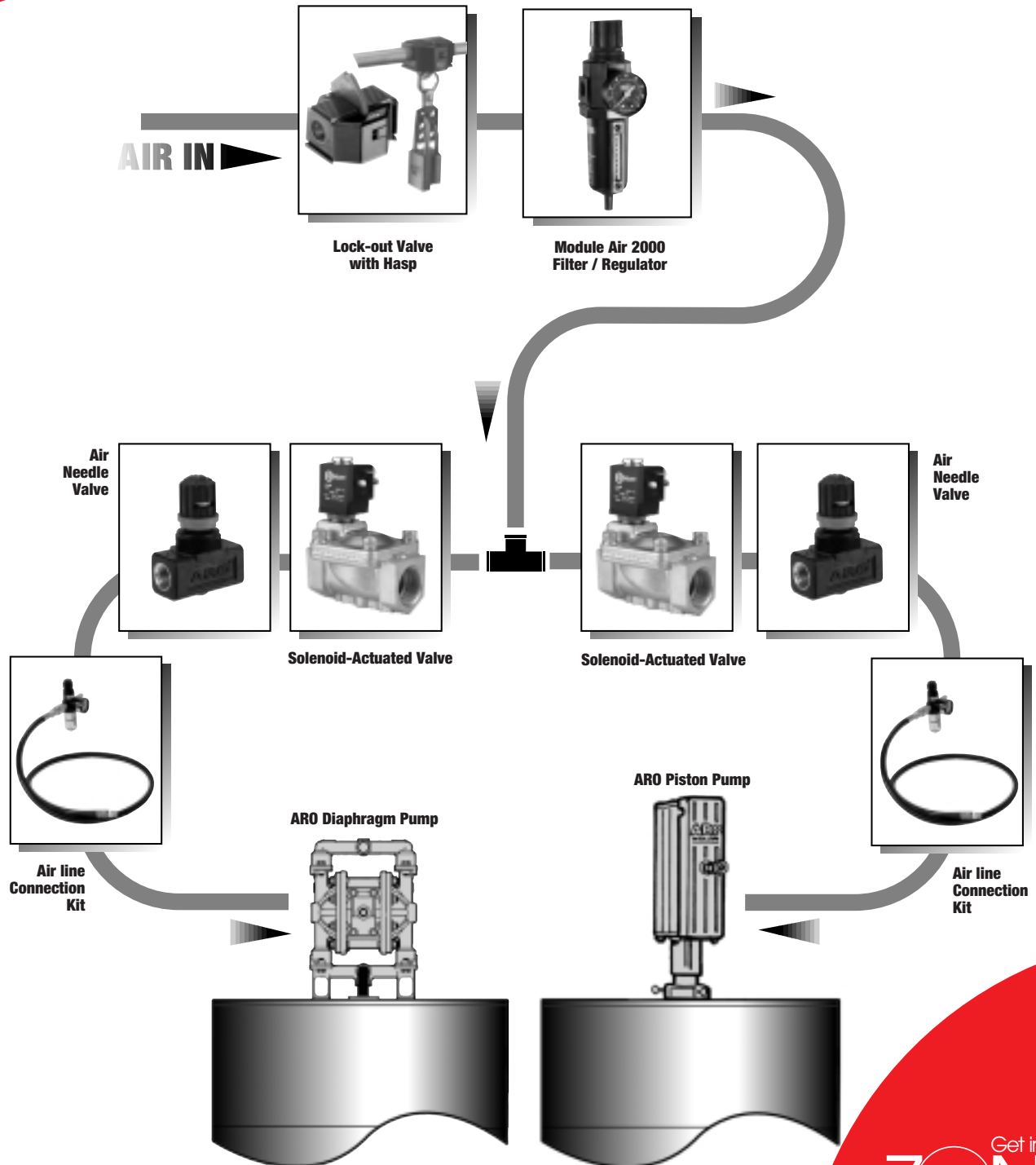
## Connectors

Model	Description
CSN	Strain relief connector for 3-way valves
CSN-30	Strain relief connector for 2-way valves and CAT66P-XXX-X Valves
CHW	Molded cable connector for 3-way valves, 36" molded leads
CHW-30	Molded cable connector for 2-way valves and CAT66P-XXX-X, 36" molded leads

## Coils

Model	Description
116218-39	22 mm, 24 VDC Coil
116218-33	22 mm, 120 VAC Coil
119378-39	30 mm, 24 VDC Coil
119378-33	30 mm, 120 VAC Coil

## Typical Installation





# Performance Technical Data

## Compatibility with ARO Materials

Rank	Chemical Name	Carbon Steel	Hardened Carbon Steel	301/302/303/304 Stainless	316 Stainless	400 Stainless	400 Hardened Stainless	Aluminum	Polypropylene	PVDF Kynar	Acetal	Nitrile / Geolast®	EPR / Santoprene®	Neoprene	Nylon	Polyurethane	Teflon	Viton	Hytel
35	Acetic Acid, Ethanoic Acid, Glacial Acetic Acid, Vinegar																		
43	Acetone, Propanoe																		
37	Acrylonitrile, Propenonitrile																		
48	Adipic Acid, 1-, 6-Hexadioic Acid																		
38	Aluminum Sulfate, Filter Aluminum																		
5	Ammonia, Ammonium Hydroxide																		
17	Ammonium Nitrate																		
30	Ammonium Sulfate																		
19	Benzene																		
36	Butadiene, 1-, 3-Butadiene																		
40	Calcium Chloride (salt substitute)																		
7	Calcium Hydroxide, Milk of Lime																		
6	Calcium Oxide, Lime, Quicklime																		
33	Carbon Black																		
12	Chlorine																		
32	Cumene, Isopropylbenzene																		
39	Cyclohexane, Hexahydrobenzene																		
20	Ethyl Benzene																		
18	Ethylene Dichloride (EDC)																		
8	Ethylene, Ethene																		
29	Ethylene Glycol, Glycol, Antifreeze																		
25	Ethylene Oxide																		
27	Formaldehyde, methanal																		
26	Hydrochloric Acid, Muriatic Acid Aqueous Hydrogen Chloride																		
3	Hydrogen Gas																		
50	Isopropyl Alcohol, Rubbing Alcohol, Isopropanol. 2-propanol																		
47	Methyl-tert-butyl ether (MTBE)																		
14	Nitric Acid (called fuming 80%)																		
4	Nitrogen Gas																		
9	Oxygen Gas																		
34	Phenol, Carboic Acid																		
11	Phosphoric Acid, Orthophosphoric Acid																		
31	Potassium Carbonate, Potassium Sulfate, Potassium Hydroxide, Potassium Nitrate, Potassium Chloride, Potassium Salts & Oxides																		
42	Propylene Oxide																		
15	Propylene, Propene																		
13	Sodium Carbonate, Soda Ash																		
10	Sodium Hydroxide, Caustic Soda																		
46	Sodium Silicate, Silica Gel																		
44	Sodium Sulfate, Salt Cake, Glaubers Salt																		
49	Sodium Tripolyphosphate (STPP), Sodium Triphosphate																		
21	Styrene, Vinyl Benzene, Phenylethene																		
2	Sulfuric Acid																		
24	Teraephthalic Acid (TA, TPA, PTA), Dimethylterephthalate (DMT)																		
45	Titanium Dioxide (white pigment)																		
28	Toluene, Toluol																		
16	Urea																		
41	Vinyl Acetate																		
22	Vinyl Chloride, (Chloroethylene)																		
1	Water																		
23	Xylene, Xylols (ortho, meta, para)																		

# Performance Technical Data

The pump sound pressure levels published below have been updated to an Equivalent Continuous Sound Level ( $L_{Aeq}$ ) to meet the intent of ANSI S1.13-1971. CAGI-PNEUROP S5.1 using four microphone locations.

PUMP PORT SIZE (INCHES)	AIR OPERATING PRESSURE (PSI)	CYCLES/ MIN	SOUND PRESSURE ( $L_{Aeq}$ )
<b>Diaphragm Pumps</b>			
1/4	70	60	59.8 db(A)
1/2	70	60	71.1 db(A)
1	70	60	64.5 db(A)
1-1/2	70	60	77.7 db(A)
<b>Piston Pumps</b>			
1:1	60	40	78 db(A)
2:1	60	40	76 db(A)
4:1	100	N/A	*85 db(A)

\* Tested with 94085 Muffler

## Viscosity Conversion Chart

Centi Poise	Poise	Saybolt Universal (SSU)	Saybolt Furrol	Ford No. 3	Ford No. 4	Zahn No. 1	Zahn No. 2	Zahn No. 3
1	.01	31						
2	.02	34						
4	.04	38						
7	.07	47		8				
10	.10	60		9	5	30	16	
15	.15	80	13	10	8	34	17	
20	.20	100	15	12	10	37	18	
25	.24	130	17	15	12	41	19	
30	.30	160	19	19	14	44	20	
40	.40	210	24	25	18	52	22	
50	.50	260	29	29	22	60	24	
60	.60	320	34	33	25	68	27	
70	.70	370	39	36	28	72	30	
80	.80	430	42	41	31	81	34	
90	.90	480	49	45	32	88	37	10
100	1.0	530	54	50	34		41	12
120	1.2	580	59	58	41		49	14
140	1.4	690	70	66	45		58	16
160	1.6	790	79	72	50		66	18
180	1.8	900	91	81	54		74	20
200	2.0	1000	100	90	58		82	23
220	2.2	1100	110	98	62		88	25
240	2.4	1200	120	106	65			27
260	2.6	1280	128	115	68			30
280	2.8	1380	138	122	70			32
300	3.0	1475	148	130	74			34
320	3.2	1530	153	136	89			36
340	3.4	1630	163	142	95			39
360	3.6	1730	173	150	100			41
380	3.8	1850	185	160	106			43
400	4.0	1950	195	170	112			46
420	4.2	2050	205	180	118			48
440	4.4	2160	216	188	124			50
460	4.6	2270	227	200	130			52
480	4.8	2380	238	210	137			54
500	5.0	2480	248	218	143			58
550	5.5	2660	266	230	153			64
600	6.0	2900	290	250	170			68
700	7.0	3380	338	295	194			76
800	8.0	3880	388	340	223			
900	9.0	4300	430	365	247			
1000	10.0	4600	460	390	264			
1100	11	5200	520	445	299			
1200	12	5620	562	480	323			
1300	13	6100	610	520	350			
1400	14	6480	648	550	372			
1500	15	7000	700	595	400			
1600	16	7500	750	635	430			
1700	17	8000	800	680	460			
1800	18	8500	850	720	490			
1900	19	9000	900	760	520			
2000	20	9400	940	800	540			
2100	21	9850	985	835	565			
2200	22	10300	1030	875	592			
2300	23	10750	1075	910	617			
2400	24	11200	1120	950	645			
2500	25	11600	1160	985	676			
3000	30	14500	1450	1230	833			
3500	35	16500	1650	1400	950			
4000	40	18500	1850	1570	1060			
4500	45	21000	2100	1780	1175			
5000	50	23500	2350		1350			
5500	55	26000	2600		1495			
6000	60	28000	2800		1605			
6500	65	30000	3000		1720			
7000	70	32500	3250		1870			
7500	75	35000	3500		2010			
8000	80	37000	3700		2120			
8500	85	39500	3950		2270			
9000	90	41000	4100		2360			
9500	95	43000	4350		2470			
10000	100	46500	4650		2670			
15000	150	69400	6940					
20000	200	92500	9250					
30000	300	138600	13860					
40000	400	185000	18500					
50000	500	231000	23100					
60000	600	277500	27750					
70000	700	323500	32350					
80000	800	370000	37000					
90000	900	415500	41550					
100000	1000	462000	46200					
125000	1250	578000	57800					
150000	1500	694000	69400					
175000	1750	810000	81000					
200000	2000	925000	92500					

## Performance Technical Data

### ARO Diaphragm Pumps

		Scale 1 - 5 (5 is best)		
	Temp Limit F (C)	Chemical	Abrasion	Flex Life*
Acetal	180 (91)	3	3	-
Aluminum	-	1	3	-
Buna N (Nitrile)	180 (82)	2	2	3
Cast Iron	-	3	4	-
Geolast (Nitrile Based)	180 (82)	2	2	3
Neoprene	200 (93)	2	2	3
Polypropylene	150 (79)	4	2	-
Polyurethane	150 (66)	1	4	4
Santoprene	225 (107)	4	4	5
Stainless Steel (300 Series)	-	4	4	-
Stainless Steel (400 Series)	-	3	5	-
Teflon	220 (104)	5	2	4
Viton	350 (104)	4	2	1

\* Applies to diaphragms only.

\*\*\* Note: These are guidelines only. Consult the manufacturer of pumped fluid for exact compatibility and temperature requirements.

## Five Year Pump Warranty

All ARO Pumps are backed up by our famous 5-year warranty, as a measure of the confidence we place in the quality of these products. A confidence that you can share.

### PUMP FIVE-YEAR WARRANTY

IR/ARO warrants to the original use purchaser of IR/ARO manufactured pumps that IR/ARO will repair or replace, free of charges, including return shipping costs within the Continental United States of America, any such product which under normal use and service proves defective in material or workmanship, as determined by IR/ARO Inspection, within FIVE YEARS from date of shipment from IR/ARO, provided the claimed defective product, or part thereof, is promptly returned to the IR/ARO factory or IR/ARO authorized warranty repair center with transportation prepaid.

This warranty does not cover failure of parts or components due to normal wear or damage, which in the judgment of IR/ARO, arises from misuse, abrasion, corrosion, negligence, accident, substitution of non-IR/ARO parts, faulty installation or tampering.

If IR/ARO Inspection discloses no defect in material or workmanship, repair or replacement and return will be made at customary charges.

This warranty covers IR/ARO manufactured pumps shipped on or after July 4, 1988.

Equipment not covered by IR/ARO warranty: accessories or components of equipment sold by IR/ARO that are not manufactured by IR/ARO (such as switches, hoses, gasoline engines, etc.) are subject to the warranty, if any, of their manufacturer. IR/ARO will provide the purchaser with reasonable assistance in making such claims.

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## NORTH AMERICA

### Canada

Production Equipment Group  
Ingersoll-Rand Canada Inc.  
51 Worcester Road  
Rexdale, Ontario M9W 4K2  
PHONE: 1 (416) 213-4500  
FAX: 1 (416) 213-4510

## LATIN AMERICA

### Latin America Headquarters

Ingersoll-Rand PEG  
Aro Division  
730 N.W. 107 Ave., Suite 300  
Miami, FL 33172-3107  
PH: (305) 222-0812/559-0500  
FAX: (305) 222-0864/559-7505

### Brazil

Ingersoll-Rand do Brasil Ltda.  
Av. Dr. Cardoso de Melo 1855  
Cep. 04548-005 São Paulo S.P.  
PH: (55-11) 3049-8900  
FAX: (55-11) 3846-4985

### Chile

Ingersoll-Rand Chile, Ltda.  
Nueva Tajamar 555  
Oficina 1502  
Santiago, Chile  
PH: 56-2 339-7939  
FAX: 56-2 339-7940

### Mexico

Ingersoll-Rand, S.A. de C.V.  
Blvd. Centro Industrial No.11  
Industrial Puente de Vigas  
54070 Tlanepantla, Edo. Mex.  
PH: (525) 3 90 40 21 Ext. 109  
FAX: (525) 3 90 40 31

## EUROPE

### European Headquarters

Europe, Africa & Middle East  
Ingersoll-Rand  
Zone du Chêne Sorcier  
B.P. 62  
Les Clayes sous Bois  
Cedex - France  
PH: (33) 01 30 07 69 50  
FAX: (33) 01 30 07 69 69

## ASIA

### Japan

Ingersoll-Rand Japan, Ltd.  
Shin-Yokohama Square Bldg. 5F  
3-12, Shin-Yokohama 2-chome  
Kohoku-ku, Yokohama-shi  
Kanagawa Pref. 222, Japan  
PH: (81) 45-476-7801  
FAX: (81) 45-476-7806

### Singapore

Ingersoll-Rand S.E.A. Pte Ltd.  
42, Benoi Road  
Singapore 2262  
PH: (65) 8611555  
FAX: (65) 8610317

### Australia

Ingersoll-Rand Australia, Ltd.  
1 Hartnett Drive  
Seaford, Vic 3198  
PH: (61) 3 9554-1600  
FAX: (61) 3 9554-1611

### China / Hong Kong

Ingersoll-Rand Hong Kong  
Suite 1201-3, 12 Floor,  
Central Plaza  
18 Harbour Road  
Wanchai, Hong Kong  
PH: (852) 2527-0183  
FAX: (852) 2529-5976

### Korea

Ingersoll-Rand Korea  
Production Equipment Group  
#1005, 10th Floor,  
Guhsung Bldg.  
541, Dohwa-Dong  
Mapo-Ku, Seoul  
Korea  
PH: (82) 2-703-8461 / 3  
FAX: (82) 2-3272-5894

### Taiwan

Ingersoll-Rand Taiwan  
12F-2, No. 79  
Shin-Tai Wu Road  
Sec. 1, Hsi-Chih Town  
Taipei Hsien, Taiwan, R.O.C.  
PH: 886-2-698-4858 Ext. 18  
FAX: 886-2-698-9897

