OPERATOR'S MANUAL & SALES AND ENGINEERING DATA

INCLUDING: SPECIFICATIONS, SERVICE KITS, GENERAL INFORMATION, TROUBLESHOOTING.
INCLUDE MANUALS: AF044X-XX Air Motor (pn 97999-1466), 1875AXXXXXX Lower Pump End (pn 97999-1582) & S-632 General Information Manual (pn 97999-624).

RELEASED: 9-15-10
REVISED: 4-27-22
(REV: F)

4-1/4" AIR MOTOR
9:1 RATIO
4" STROKE

AF0409AX1XXXX-XX-X

TWO-BALL PUMP SERIES

Carbon Steel

READ THIS MANUAL CAREFULLY BEFORE INSTALLING, OPERATING OR SERVICING THIS EQUIPMENT.

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

SERVICE KITS

- Use only genuine ARO® replacement parts to assure compatible pressure rating and longest service life.
- **637489** for repair of air motor section.
- **K1875AXXXXXX** for repair of lower pump end.

Refer to the chart on page 2 for description of "XXXXXX" options.

SPECIFICATIONS

Model Series (refer to option chart)	AF0409AX1XXXX-XX-X
Pump Type	Air Operated, Two-Ball Double Acting Pump
Ratio	9:1
Air Motor	AF0442-XX
Motor Repair Kit	637489
Motor Diameter	4-1/4" (10.8 cm)
Stroke (double acting)	4" (10.2 cm)
Air Inlet (female)	1/2 - 14 NPTF - 1
Air Exhaust (female)	1-1/4 - 11-1/2 NPTF - 1
Lower Pump End Series	1875AXXXXXXX
Lower Pump Repair Kit	K1875AXXXXXXX
Material Outlet (female)	3/4 - 14 NPTF - 1

PUMP PERFORMANCE

Air Inlet Pressure Range	30 - 150 psig (2 - 10.3 bar)
Fluid Pressure Range	270 - 1350 psig (18.6 - 93.1 bar)
Maximum Rec'd Cycles / Minute	60
Displacement Per Cycle	11.0 in^3 (180.3 cc)
Cycles Per Gallon (L)	21 (5.5)
Flow at 60 Cycles/Minute	2.9 gpm (10.8 lpm)
Noise Level @ 60 psig - 40 cpm	89.2 dB(A)②

② The pump sound pressure level has been updated to an Equivalent Continuous Sound Level (LA_{eq}) to meet the intent of ANSI S1.13-1971, CAGI-PNEUROP S5.1 using four microphone locations.

PUMP DATA

MODEL AF0409AX1XXXX-XX-X

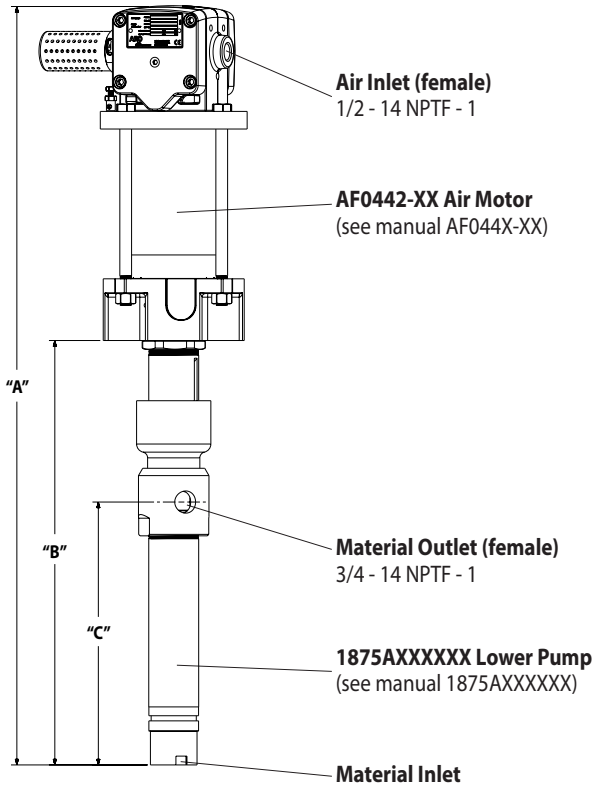


Figure 1

Model	Description	A		B		C	
		Inches	mm	Inches	mm	Inches	mm
AF0409A11XXXX-XX-X	Remote Mount	34.2	868.6	20.0	508.0	13.1	332.7
AF0409A21XXXX-XX-X	5 Gallon	33.5	850.9	19.3	490.2	12.4	314.9
AF0409A51XXXX-XX-X	55 Gallon	59.6	1513.8	45.2	1148.0	38.4	975.3
AF0409A81XXXX-XX-X	Remote Mount	33.1	840.7	18.8	477.5	12.0	304.8
AF0409A91XXXX-XX-X	5 Gallon	32.3	820.4	18.0	457.2	11.1	281.9

NOTE: Dimensions are shown in inches and (mm) and are supplied for reference only.

IMPORTANT

This is one of four documents which support the pump. Replacement copies of these forms are available upon request.

☒ **AF0409AX1XXXX-XX-X** Model Operator's Manual (pn 97999-1492)
☐ **S-632** General Information - Industrial Piston Pumps (pn 97999-624)
☐ **1875AXXXXXX** Lower Pump End Operator's Manual (pn 97999-1582)
☐ **AF044X-XX** Air Motor Operator's Manual (pn 97999-1466)

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MODEL DESCRIPTION CHART

AF0409 A X 1 X X X X- X X

Check Type / Wetted Material
A - Two Ball, Carbon Steel

Container Suitability
1 - Remote Mounting
2 - 5 gallon
5 - 55 gallon
8 - Remote Mounting w Optional Inlet
9 - 5 gallon with Optional Piston

Inlet / Outlet Tread Type
1 - SAE

Upper Packing
A - Viton / Virgin PTFE Staggered
F - UHMW-PE
H - UHMW- PE / Leather Staggered
K - Filled PTFE
L - Leather
S - Virgin PTFE
U - Filled PTFE / Leather Staggered

Lower Packing
F - UHMW-PE
L - Leather
S - Virgin PTFE

Spring Type / Solvent Cup
2 - Coil Spring, Standard Solvent Cup

Plunger Type
4 - Carbon Steel, hard Chrome Plated
D - Carbon Steel, Hard Chrome Plated Alternate Piston

Air Motor Option
Blank - No Option
0 - No Option
1 - Carbon Integrated Ball Valve Regulator

Pump Option
Blank - No Option
1 - Hex Split Bung Adapter
2 - Round Split Bung Adapter
3 - Three Screw Bung Adapter

GENERAL DESCRIPTION

The two-ball pump design provides for easy priming of the lower foot valve. The double acting feature is standard in all ARO industrial pumps. Material is delivered to the pump discharge outlet on both the up and down stroke.

The motor is connected to the lower pump end by a spacer tube and solvent cup. This allows for lubrication of the upper packing gland and to prevent air motor contamination because of normal wear and eventual leakage through the material packing gland. Be sure the solvent cup is adequately filled with lubricant to protect the upper packings and insure longest service life.

⚠WARNING HAZARDOUS PRESSURE. Do not exceed maximum operating pressure of 1350 psig (93.1 bar) at 150 psig (10.3 bar) inlet air pressure.

Pump Ratio X Inlet Pressure to Pump Motor	=	Maximum Pump Fluid Pressure

Pump ratio is an expression of the relationship between the pump motor area and the lower pump end area. EXAMPLE: When 150 psig (10.3 bar) inlet pressure is supplied to the motor of a 4:1 ratio pump, it will develop a maximum of 600 psig (41.4 bar) fluid pressure (at no flow) - as the fluid control is opened, the flow rate will increase as the motor cycle rate increases to keep up with the demand.

⚠WARNING Refer to general information sheet for additional safety precautions and important information.

NOTICE: Thermal expansion can occur when the fluid in the material lines is exposed to elevated temperatures. Example: Material lines located in a non-insulated roof area can warm due to sunlight. Install a pressure relief valve in the pumping system.

Replacement warning label (pn 92325) is available upon request.

TROUBLESHOOTING

Pump problems can occur in either the air motor section or the lower pump end section. Use these basic guidelines to help determine which section is affected. Be sure to eliminate any possible non-pump problems before suspecting pump malfunction.

Pump will not cycle.
- No pressure to the motor. See motor manual.
- Restricted return lines. Clean restriction.
- Damaged motor. Service the motor.

No material at the outlet (pump continually cycles).
- Check the material supply, disconnect or shut off the air supply and replenish the material, reconnect.

Material on one stroke only (fast downstroke).
- The lower check may not be seating in the foot valve (see lower pump disassembly). Remove the check from the foot valve, clean and inspect the valve seat area. If check or foot valve are damaged, replace.

Material on one stroke only (fast downstroke).
- The middle packings may be worn (see lower pump disassembly). Replace the seals as necessary.

Material leakage out of the solvent cup or material appears on the pump plunger rod.
- The upper packing seals may be worn (see lower pump disassembly). Replace upper packing seals as necessary.

PUMP CONNECTION - UPPER / LOWER

DISASSEMBLY

NOTE: All threads are right hand.

1. Loosen the (90571) lock nut and unscrew the entire pump from the air motor. This will expose the (6) connector pin (see figure 2).
2. Remove the (5) retaining ring and (6) connector pin to release the air motor piston rod from the lower pump piston rod.
3. Remove (4) spacer, (2) washer, four (3) packings, (2) washer and (1) wavy spring washer from the air motor cavity (see figure 2).

65968 Adapter Kit Assembly

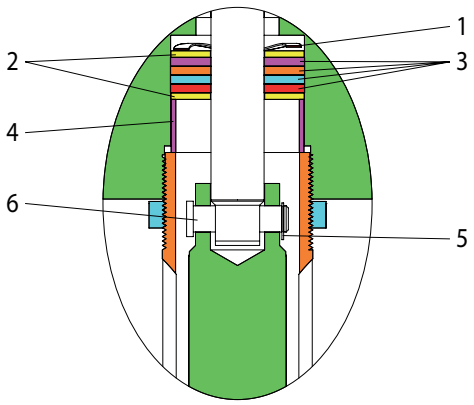


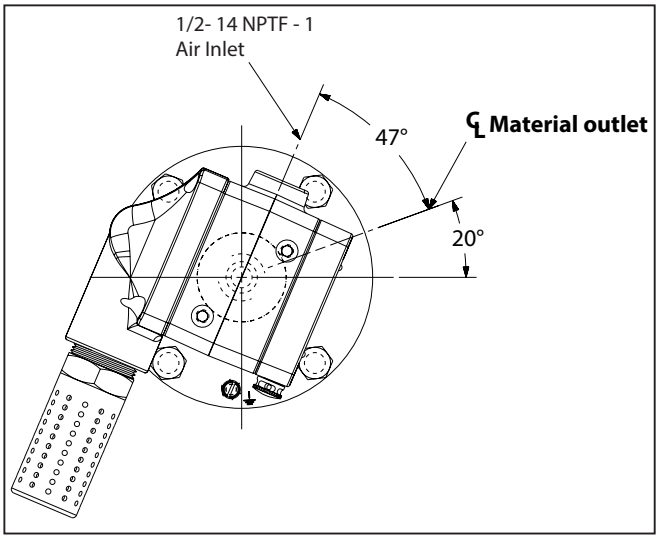
Figure 2

PARTS LIST			
Item	**Description (size)**	**Qty**	**Part No.**
1	Wavy Spring Washer	(1)	90251
2	Washer	(2)	90568
3	Packing	(4)	90567
4	Spacer	(1)	90570
5	Retaining Ring	(1)	Y145-2
6	Connector Pin	(1)	90572

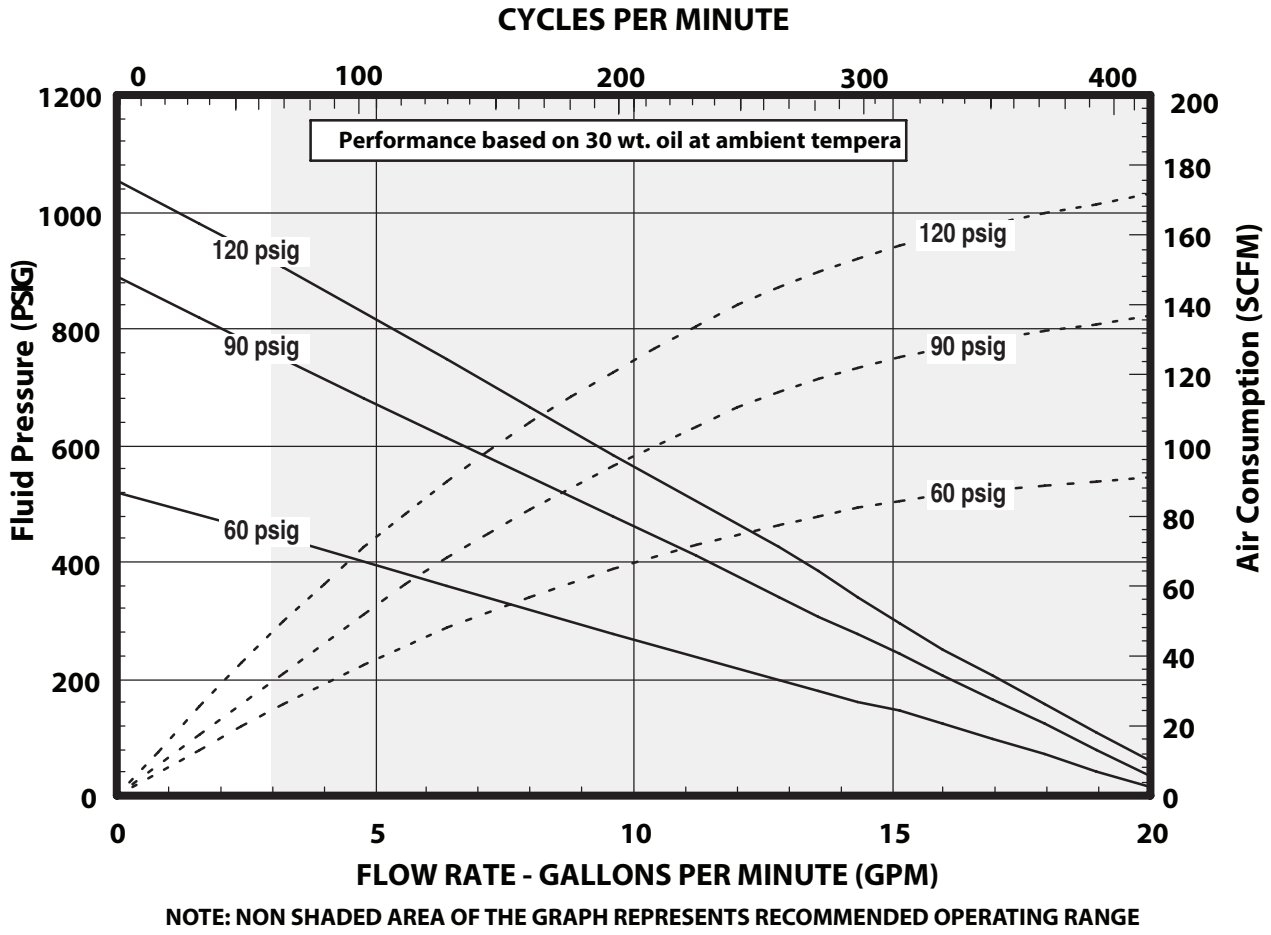
REASSEMBLY

1. Assemble (1) wavy spring washer, (2) washer, four (3) packings, (2) washer and (4) spacer into cavity in the air motor.
2. Assemble the lower pump piston rod to the air motor piston rod, aligning the through holes.
3. Assemble the (6) connector pin through the hole, securing with (5) retaining ring.
4. Screw the lower pump assembly to the air motor.
5. Screw the (90571) lock nut against the air motor base and tighten

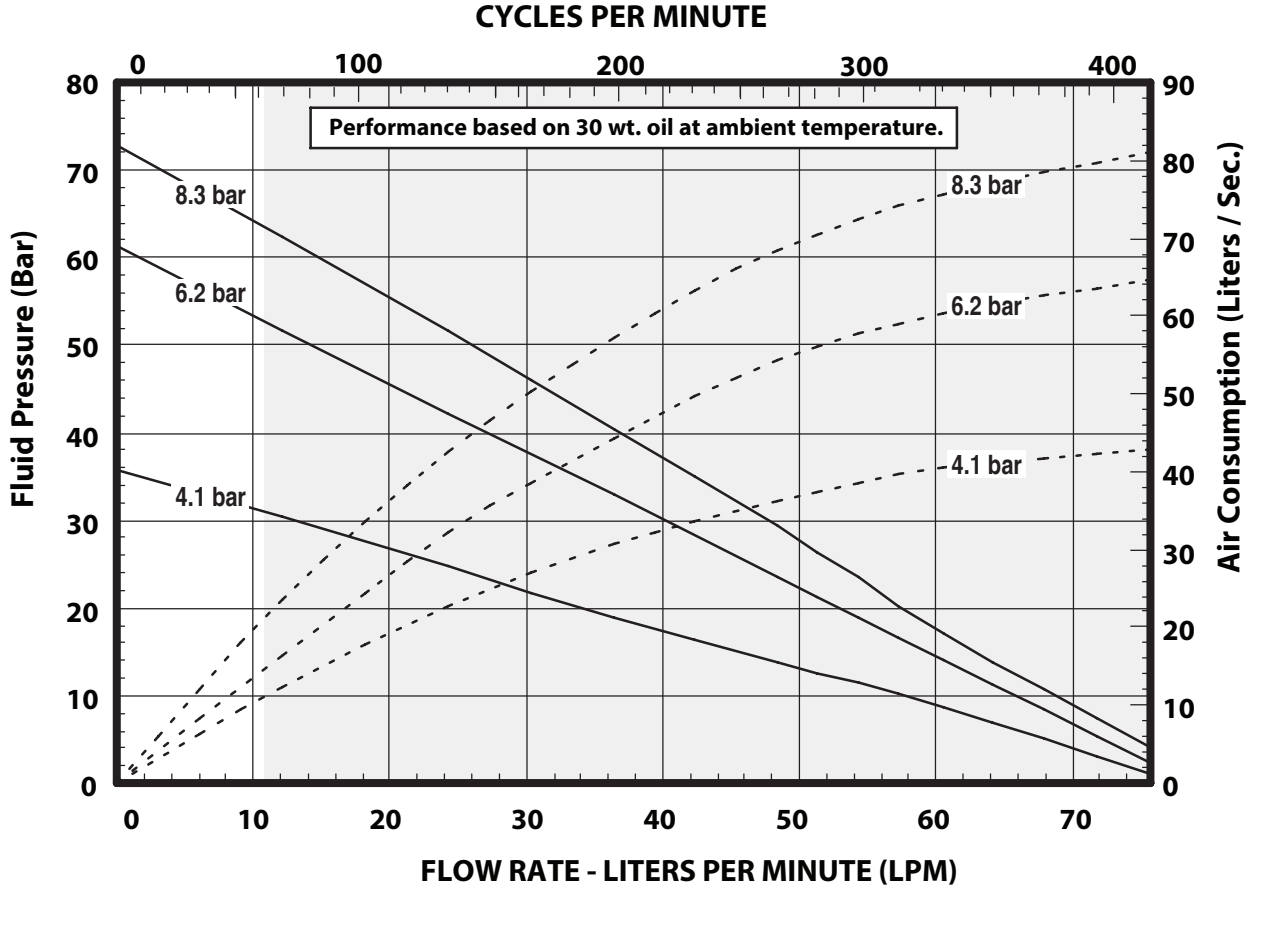
TOP VIEW



PERFORMANCE CURVES



NOTE: NON SHADED AREA OF THE GRAPH REPRESENTS RECOMMENDED OPERATING RANGE



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