

ARO®

FLUID POWER SOLUTIONS

FILTERS-REGULATORS-LUBRICATORS, VALVES AND CYLINDERS



ARO's Fluid Power Products Keep the Unknown In Check



The smallest things pose the biggest threats to your facility. Air particle contaminants, improper pressure levels, lack of safety switches, and more can cause major damage to equipment and employees. Too often than not, plant managers are unaware of these threats until suddenly an essential tool doesn't work or their facility is shut down and they lose major time diagnosing the issue. ARO® builds the quality products to keep you from getting too familiar with the unknown. ARO® valves, cylinders, logic controls, and filters/regulators/lubricators (FRLs) make it easy to manage the small stuff. ARO® products are expertly engineered to protect your equipment and your employees from unscheduled downtime, premature breakdown, and injury risks. And because they integrate perfectly together, building a complete system for full protection is a breeze.

▀ Our robust valve offering is broad and deep

We have a valve for almost every solenoid, manual and mechanical application. In the rare case we don't have it, we can expertly modify or customize our standard product to meet your application needs. ARO® can provide customized pneumatic control solutions to meet the needs of large customers and OEMs

▀ The performance you deserve. The reliability you expect

ARO® has always delivered on a promise of performance, and valves are no exception. Built with the rugged reliability to handle heavy duty and dirty applications while offering excellent flow rates, our valves can control cylinder movement and machine sequence, operate pumps, and more with top-of-the-line efficiency.

ARO®

Product Portfolio

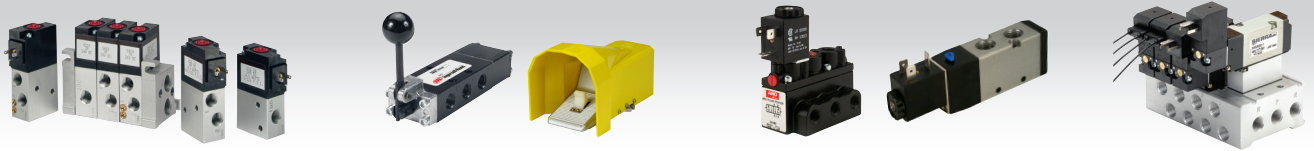
ARO-FLO SERIES



A great way to keep your air supply clean and conditioned in order for your equipment to operate at its peak performance.

- Filters, regulators and lubricators
- Combinations and individual components

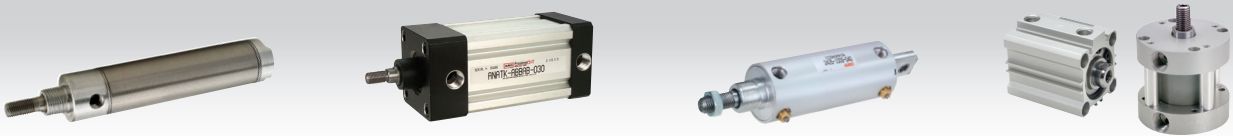
PNEUMATIC VALVES



Whether it's high flow or compact design, count on ARO® valves for your application

- Direct Acting Solenoid
- Manual / Mechanical
- Inline Solenoid Pilot
- Manifold, Plug N Play

PNEUMATIC CYLINDERS



Backed by 1-year warranty, we have one of the most reliable cylinder lines on the market today

- Light-Duty Round (Disposable)
- Square (NFPA Standard)
- Medium to Heavy-Duty Round
- Compact

PNEUMATIC LOGIC CONTROL



Ideal for controlling machine sequencing

- Individual elements, circuit board construction or Flex 6 function base assemblies

Typical Markets



Packaging and
Food Processing



Manufacturing



Woodworking



Metalworking



Material Handling



OEM/MRO



Automotive

ARO-Flo Series

FILTERS-REGULATORS-LUBRICATORS (FRL)

ARO-Flo filters, regulators and lubricators are a great way to keep your air supply clean and conditioned in order for your equipment to operate at its peak performance.

Get Your Hands Dirty, but Keep Your Air Clean

The ARO-Flo Series is a breath of fresh air when it comes to keeping your facility online and your tools in shape. Literally. Because clean air is a key ingredient in the effective operation of equipment and machinery in almost every industry, and these FRL solutions combine best-in-class air flow performance with the flexibility to work in any environment.

ARO-Flo Series FRLs set the standard for flow performance. Simply put, air flows better through ARO-Flo filters, regulators, and lubricators than almost any other air filtration device. Our solution results in less air being choked during the air preparation process, and your equipment can perform at its peak performance.

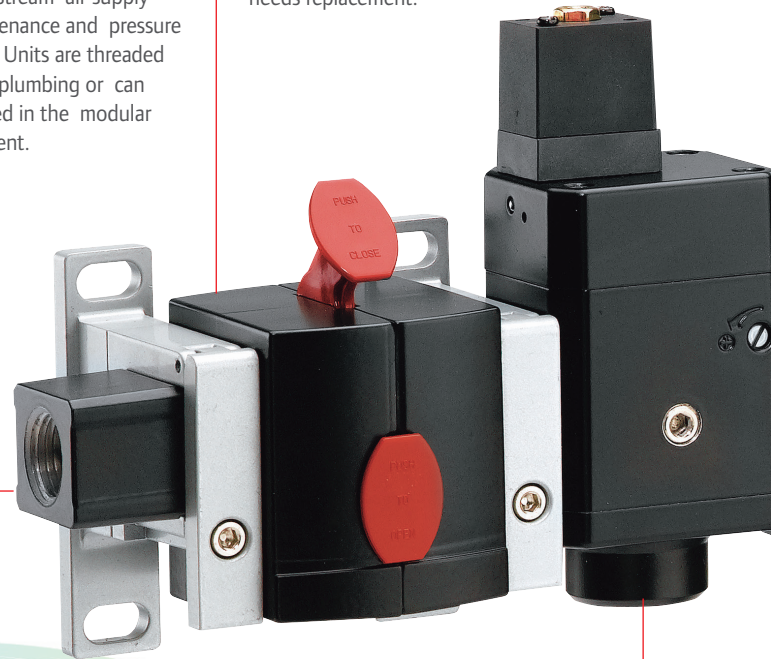
Air systems in many plants lack adequate air line filtration, and because many contaminants can't be compressed, they become even more concentrated as they move at high speed through air lines, causing accelerated wear, eroding lubrication, and putting your entire operation in jeopardy.

The ARO-Flo Series was made for modular. As a comprehensive FRL system, every product and accessory integrates together within each size range to give you a comprehensive control over your entire plant.



By utilizing a modular lockout valve the user can close off the downstream air supply for maintenance and pressure isolation. Units are threaded for direct plumbing or can be installed in the modular arrangement.

Optional filter life indicator works off of pressure differential to show a visible alert when the filter needs replacement.



Use of modular threaded pipe adapters allow for ease of service by allowing a unit to be quickly removed from the air line. Adapters can be used to pipe different thread sizes in the plumbing setup.

The ARO® Soft-start valve allows system pressure to build gradually, protecting downstream equipment and creating safer start-up condition.

Spares and Accessories



Refurb kits
104302



Mounting brackets
104409



Replacement parts
104338



Pressure switch
104415



Gauges
104334



Manifold block kit
104413-3-2



Lubricating oil
29665

1000 Series

1000 Series

1/8" & 1/4" Ports

Max flow: 59 scfm

Series size: Miniature

1500 Series

1500 Series

1/4" & 3/8" Ports

Max flow: 113 scfm

Series size: Compact

2000 Series

2000 Series

3/8", 1/2" & 3/4" Ports

Max flow: 222 scfm

Series size: Standard

3000 Series

3000 Series

3/4" & 1" Ports

Max flow: 368 scfm

Series size: Heavy-Duty

Super-Duty Series

Super-Duty Series

1", 1-1/2", 2" & 3" Ports

Max flow: 1,770 scfm

A T-bracket wall mount is standard on all combo units.

The settable gauge fan is a visual reference that allows the user to display the specific pressure range that is needed for their application.

The pressure switch is typically threaded into a manifold port block, and allows the sensing of high or low pressure thresholds set by the user.

The oil drip rate is controlled by adjusting the sight dome adjustment screw in a clockwise or counterclockwise direction.

The auto-fill option is standard on all ARO-Flo lubricators. Lubricating oil can be added while lubricators are under pressure.



The ARO-Flo check valve is typically installed downstream of the regulator. It is used to help prevent downstream pressure from moving upstream of the valve in the event of upstream pressure loss.

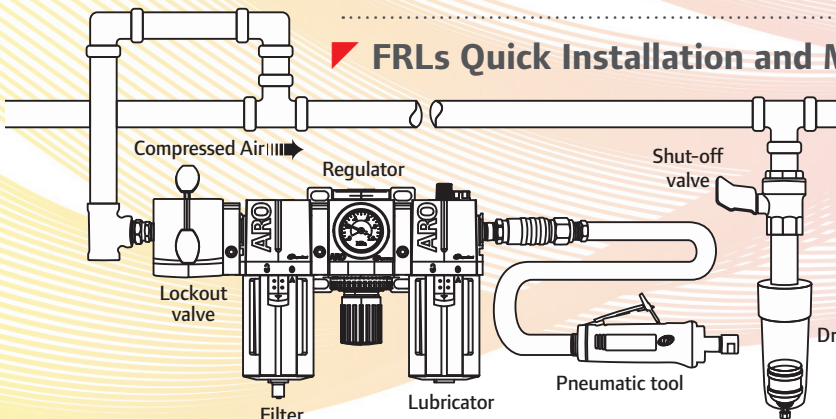
A panel nut is standard on all individual ARO-Flo regulators and piggybacks. Must be ordered separately on combination units.

Optional tamper kit installs in seconds and prevents adjustment of the regulated pressure.

The installation of a manifold port block enables design flexibility by allowing clean, regulated air to be diverted to other applications.

The positive locking thumb switch engages with an audible click, and visually aligns to the locking symbols.

FRLs Quick Installation and Modularity



The FRL should be installed as shown in the illustration to the left. Make sure that air flow markings are followed for proper air flow. Fit together easily with modular clamps and brackets.

Pneumatic Valves

DIRECT ACTING SOLENOID, MANUAL/MECHANICAL, INLINE AND MANIFOLD

Whether it's high flow or compact design, count on ARO® valves for your application.

We Keep You out of Harm's Way

Volatile environments can wreak havoc on your tools and equipment. Operating in these conditions also increases risk of air line contamination. When there's the potential for sparks to ignite vapors or flammable dust prohibiting the use of electrically-actuated valves, ARO® pneumatic valves are the safe, simple solution.

Built with the rugged reliability to handle heavy duty and dirty applications while offering excellent flow rates, our valves can control cylinder movement and machine sequence, operate pumps, and more with top-of-the-line efficiency. We have a valve for almost every manual and mechanical application. In the rare case we don't have it, we can expertly modify or customize our standard product to meet your application needs.

ARO® valves are built to operate under the harshest environmental and air line contaminant conditions, including safe, spark-free operation. Keep your employees safe. Keep your facility up and running. Keep ARO® valves in all your most essential equipment.



DIRECT ACTING SOLENOID

Premair and CAT Series

- Ideal for use with small disposable cylinders and electric to air interface



MANUAL / MECHANICAL

E, 50, K and Maxair Series

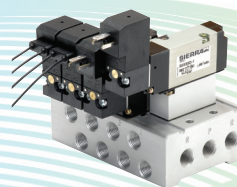
- 15 different actuator styles
- Ideal for starting, stopping and sequencing



INLINE SOLENOID PILOT

Alpha, K, Maxair

- Ideal for all general industrial applications



MANIFOLD, PLUG N PLAY

Alpha, Maxair and Sierra

- Compact and flexible for applications where multiple valves are required in tight spots

Additional Valves and Accessories

Inline Flow Control, Needle & Check Valves



Composite body is ideal for wash down applications and harsh environments.

Right Angle Flow Control Valves



For use with all pneumatic cylinders
Slotted or knob adjust.

Product line size range - body style solenoid valves

Valve Series (Page No.)	10-32 Port Size	1/8" Port Size	1/4" Port Size	3/8" Port Size	1/2" Port Size	3/4" Port Size	1" Port Size
Sierra	9 SCFM (0.25 Cv)	30 SCFM (0.70 Cv)					
Premair		10 SCFM (0.144 Cv)					
Maxair			26 SCFM (0.70 Cv)	61 SCFM (1.65 Cv)	150 SCFM (1.70 Cv)		
Alpha		30 SCFM (0.90 Cv)	50 SCFM (1.50 Cv)	61 SCFM (0.70 Cv)			
E			26 SCFM (0.70 Cv)				
H			55 SCFM (1.51 Cv)	81 SCFM (2.27 Cv)	85 SCFM (2.40 Cv)		
K				83 SCFM (2.30 Cv)	90 SCFM (2.57 Cv)	270 SCFM (7.54 Cv)	280 SCFM (7.80 Cv)

Product line size range - manifold/stacking solenoid valves

Sierra	9 SCFM (0.25 Cv)	30 SCFM (0.70 Cv)					
Premair		10 SCFM (0.14 Cv)					
Maxair			26 SCFM (0.70 Cv)	61 SCFM (1.65 Cv)	150 SCFM (1.75 Cv)		
Alpha		43 SCFM (1.32 Cv)	54 SCFM (1.60 Cv)	54 SCFM (1.60 Cv)	57 SCFM (1.75 Cv)		
Cat		1.8 SCFM (0.048 Cv)	2.2 SCFM (0.062 Cv)				

Product line size range - body style manual/mechanical

Valve Series (Page No.)	5/32" Push to Connect	1/8" Port Size	1/4" Port Size	3/8" Port Size	1/2" Port Size	3/4" Port Size	1" Port Size
200	4 SCFM (0.104 Cv)	7.5 SCFM (0.195 Cv)					
400	4 SCFM (0.104 Cv)	7.5 SCFM (0.195 Cv)					
50		16 SCFM (0.43 Cv)					
Maxair		8 SCFM (0.70 Cv)	26 SCFM (1.14 Cv)				
E			26 SCFM (0.70 Cv)				
K				83 SCFM (2.30 Cv)	90 SCFM (2.57 Cv)		

Circuitry/Limit Valves



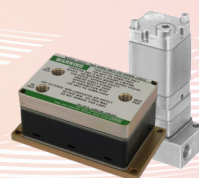
Ideal for sensing position of moving devices such as slides, gates, & cylinders.

Remote Pilot Operated Valves



For all general/industrial applications where electrical signals not acceptable.

Pneumatic Logic Controls



Ideal for controlling machine sequencing. ARO® Two-hand anti-tie-down meets OSHA specs.

Accessories Valves



Quick Exhaust Valves, Shuttle Valves, Sleeve Valves, Mufflers & Fittings.

Pneumatic Cylinders

ISO STANDARD, DISPOSABLE, ROUND LINE REPAIRABLE AND COMPACT

We have one of the most reliable cylinder line on the market today.

Run on ARO® Cylinders

If your biggest equipment is running on ARO® cylinders, you know everything's running smoothly. ARO® cylinders have been used in applications such as clamping, linear motion, product assembly, stamping, forming, cutting and more. They're purpose built for the power and flexibility to meet even the highest performance demands.

If you're specialty distributors and OEMs often require modified cylinders and customized pneumatic control systems. ARO® can add custom features to cylinders and provide custom solutions that work in the specialized systems they have developed for their customers.



LIGHT-DUTY ROUND

Silverair Series



- ARO's lowest installed cost solution
- Small and medium bore, interchangeable
- Bore Sizes: 1/2", 3/4", 1-1/16", 1-1/4", 1-1/2", 1-3/4", 2" & 2-1/2"

SQUARE (NFPA STANDARD)

Provenair® Series



- NFPA Interchange designed for rugged use
- Bore Sizes: 1-1/2", 2", 2-1/2", 3-1/4", 4", 5", 6", 8", 10"
- Available in aluminum and stainless-steel

MEDIUM TO HEAVY-DUTY ROUND

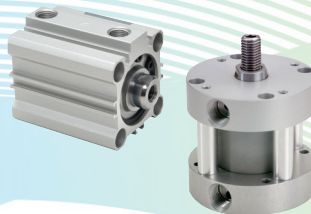
Micro-Air and Economair® Series



- Hard coated barrel I.D. provides low friction and smooth operation
- Bore Sizes - Economair: 1-1/2", 2", 2-1/2", 3" and 4" Micro-Air: 3/4" and 1-1/8"

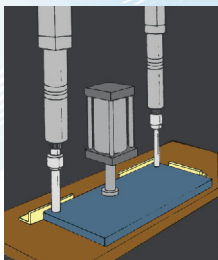
COMPACT

Premair Series



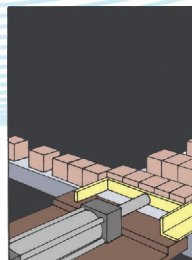
- Low Profile Square & Round Interchangeable

Applications



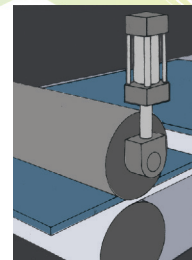
Clamping

Anywhere parts are being machined or bonded, cylinders can provide the clamping force to hold the part.



Linear Motion

Cylinders can move parts to and from assembly lines, control flow of parts, move parts across machining heads, lift racks from plating tanks, and close carton flaps.



Tensioning

Many belts, pulleys, and rollers can be tensioned with pneumatic cylinders. By regulating air pressure, the force can easily be adjusted.

INTERCHANGEABILITY

All Series are interchangeable with competitive models

DELIVERY

Standard delivery 3-5 days, Express Ship Guarantee 24 hour ship

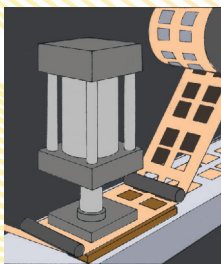
REPAIRABLE UNITS ARE EASY TO SERVICE, PROVIDING LONG LIFE

COMPLETE OFFERING

1 YEAR WARRANTY

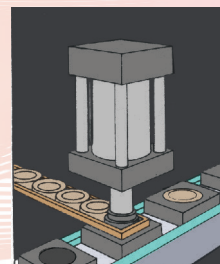
Cylinder Bore Selection Sizes *(Effective Piston Area X Operating Pressure = Force)*

Cylinder Bore (In.)	Effective Piston Area (Sq. In.)	Operating Pressure (PSI)						
		70	80	90	100	110	125	150
1/2"	0.196	14	16	18	20	22	25	29
3/4"	0.442	31	35	40	44	49	55	66
1-1/16"	0.89	62	71	80	89	98	111	134
1-1/8"	0.994	70	80	89	99	109	124	149
1-1/4"	1.227	88	98	110	123	135	153	184
1-1/2"	1.767	124	141	159	177	194	221	265
1-3/4"	2.405	168	192	216	240	265	301	361
2"	3.142	220	251	283	314	346	393	471
2-1/2"	4.91	344	393	442	491	540	614	737
3"	7.069	495	566	636	707	778	884	1,060
3-1/4"	8.296	581	664	747	830	913	1,037	1,244
4"	12.556	990	1,005	1,131	1,257	1,382	1,571	1,885
5"	19.635	1,374	1,571	1,767	1,964	2,160	2,454	2,945
6"	28.274	1,979	2,262	2,545	2,827	3,110	3,534	4,241



Stamping, Forming

Many small parts can be stamped or formed with pneumatic cylinders. Softer materials like leather, rubber and food are easily cut to shape or size with a blade moved by pneumatic cylinders. Also, pits, seeds, and cores can be removed from fruits using cylinders.



Product Assembly

Where parts are pressed together, cylinders can handle the task. Items like bushings, bearings, garment fasteners, rivets, and small products can be assembled with a cylinder.

Logic Control

INDIVIDUAL ELEMENTS, CIRCUIT BOARD CONSTRUCTION OR FLEX 6 FUNCTION BASE ASSEMBLIES

Making Safety The Logical Choice

Lack of safety switches and controls on machinery and fixtures is a major potential cause of operator injury, especially in small to mid-size manufacturing plants. That's why the smartest, safest plants trust ARO®. We are the leader in two-hand anti-tie-down controls. We should be. We were the first to make them. OSHA-compliant and reliable, these are ideally used on machines where an operators' hands must be monitored.

Pneumatic logic controls emphasize worker safety in a way that few tools on the market do. They tolerate all conditions—hot, cold, grimy, wet, you name it—and keep on going. These controls are ideal in volatile environments where fumes, chemicals and dust linger and possibly explode if introduced to a spark from electronic controls. ARO® manufactures a large range of proven, reliable pneumatic valves and control products to provide additional safety features to any plant operation

ARO's pneumatic logic controls reliably and accurately control machine sequencing with precision and economic efficiency. These are your best option for affordable, simple air-operated machines and fixtures—no expensive electronics required.



Two -Hand Anit-Tie-Down

- Ideal for machines where position of operator's hands must be monitored
- Actuate and hold both air valve buttons concurrently to maintain an output signal
- If either push button is released, the output air signal is exhausted, signalling operator hands are not in position
- Designed to comply with OSHA Regulations
- Available as individual unit, assembled packages, or unassemble package

Elements

- Symbols: Each element has a symbol based on the National Standard for diagramming moving part logic control
- Mounting: Elements have 5/8" (15.9mm) bolt extensions. Mounting hardware and seals provided with each element
- Test Ports: Many elements have 1/8" NPT ports connected to the "C" (output) port. These can be used as optional output ports, or as test ports
- Port Identification: Letters cast into the cove and base of each element correspond to input and output designations



Mounting

- Individual Elements
- Circuit Board Construction
- Function Base Assembly Method
- Back Tubulation Construction

Circuit Blocks & Flex-6

- Simplifies design and installation of control circuits
- Circuit changes or additions can be accomplished in seconds
- Very economical for simple air operated machines and fixtures
- Ideal for harsh and explosive environments
- All ports are 10/32 NPT threads



Additional Components and Accessories

- Indicators
- Enclosures
- Counters
- Liquid Level Sensors
- Fittings
- Panel Mounted Valves

Warranty

The ARO® valves and logic control in this brochure are backed up by our 5-year warranty, as a measure of the confidence we place in the quality of these products. A confidence that you can share.

ARO® ARO-Flo Series FRLs carry a 2-year warranty from date of purchase, provided the claimed defective product, or part thereof, is promptly returned.

ARO® cylinders carry a 1-year warranty from date of purchase.

ARO® will repair or replace, at its election, any product which is found upon its inspection to be defective during the period prescribed above. The product must be shipped prepaid to ARO® or an ARO® Customer Service Center together with proof of purchase. This warranty does not apply to failures or defects occurring as a result of abuse, misuse, negligent repairs, corrosion, erosion and normal wear and tear.



Valves and Logic Control



ARO-Flo Series FRLs



Cylinders

About ARO®

ARO® is a worldwide manufacturer of fluid management products that are skillfully engineered to deliver performance and serviceability, allowing success to flow freely in our customers' businesses. That's why ARO® is fluid intelligence—the smart choice in fluid management products for industrial operations.

With over an 85-year legacy of premier product performance and service excellence, ARO® provides fluid management equipment for customers and industries around the globe. ARO® has the right product to meet our customers' specific needs. We offer air-operated diaphragm pumps, piston pumps and packages, filters, regulators, and lubricators (FRLs), lubrication equipment, and pneumatic valves and cylinders.



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About Ingersoll Rand

Ingersoll Rand Inc. (NYSE:IR), driven by an entrepreneurial spirit and ownership mindset, is dedicated to helping make life better for our employees, customers and communities. Customers lean on us for our technology-driven excellence in mission-critical flow creation and industrial solutions across 40+ respected brands where our products and services excel in the most complex and harsh conditions. Our employees develop customers for life through their daily commitment to expertise, productivity and efficiency. For more information, visit www.IRco.com.

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