

OPERATOR'S MANUAL

INGERSOLL-RAND / ARO PNEUMATIC CYLINDERS

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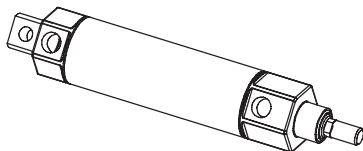
**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,
OPERATING OR SERVICING THIS EQUIPMENT.**

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

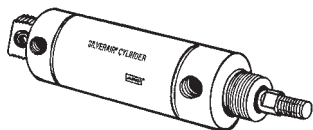
CYLINDER DATA



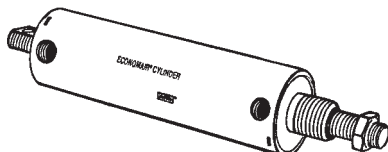
MICRO-AIR



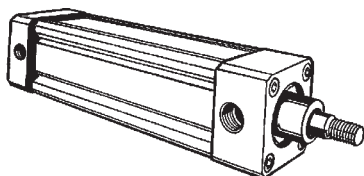
PREMAIR



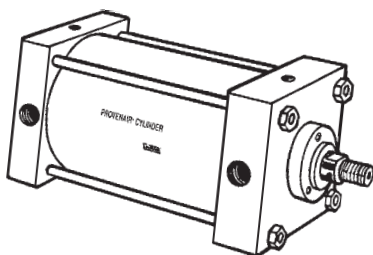
SILVERAIR



ECONOMAIR



PROVENAIR



PROVENAIR

Pressure Range 2 - 200 p.s.i.g. (0.14 - 14 bar)
MICRO-AIR SERIES 01

Type - Round, small bore, double-acting, light duty.
Bore Sizes 1/2", 3/4" 1-1/8"
Stroke Up to 6"
Thrust Range 4.9 to 199 lbs
Parts Manual available pn 119999-41

PREMAIR SERIES CD

Type - Round, small - medium bore, double-acting and single-acting, light duty.
Bore Sizes 7/16" to 1-1/4"
Stroke Up to 32"
Thrust Range Up to 245 lbs
Parts Manual available not serviceable

SILVERAIR SERIES S

Type - Round, small - medium bore, double-acting, light duty.
Bore Sizes 1/2" to 2-1/2"
Stroke Up to 6"
Thrust Range Up to 982 lbs
Parts Manual available not serviceable

ECONOMAIR SERIES 23, 24 & 28

Type - Round, small - medium bore, double-acting, medium to heavy duty.
Bore Sizes 1-1/8" to 4"
Stroke Up to 99-7/8"
Thrust Range 25 to 2,513 lbs
Options - Cushioned and non-cushioned, can be furnished with spring return and extension options.
Parts Manual available pn 119999-16

PROVENAIR SERIES (1-1/2" - 4" bore)

Type - NFPA square head, medium bore sizes, double-acting, medium to heavy duty, up to 250 p.s.i.g. (17.2 bar).
Bore Sizes 1-1/2", 2", 2-1/2", 3-1/4", 4"
Stroke Up to 99-7/8"
Thrust Range Up to 2,513 lbs
Options - Cushioned and non-cushioned, various mounts.
Parts Manual available pn 119999-30

PROVENAIR SERIES (5", 6", 8" & 10" bore)

Type - Square head, large bore sizes, double-acting, heavy duty, up to 250 p.s.i.g. (17.2 bar).
Bore Sizes 5", 6", 8", 10"
Stroke Up to 99-7/8"
Thrust Range Up to 19,635 lbs
Options - Cushioned and non-cushioned, various mounts.
Parts Manual available pn 119999-30

airpumping.co.uk

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ARO®
IR Ingersoll Rand®

GENERAL DESCRIPTION

ARO cylinders are pneumatic devices which convert compressed air into linear motion. Cylinders are widely used for such things as: clamping, pushing or pulling motion, product assembly, stamping and tensioning. The product offering ranges from light to heavy duty industrial applications, operating on air pressures up to 200 p.s.i.g. (14 bar). Model options include:

Stainless steel for corrosive environments, low friction packings and cushion versions used to decelerate heavy loads. For detailed information on models offered, refer to the ARO cylinder catalog.

WARNINGS AND PRECAUTIONS

⚠ WARNING These products may cause death, personal injury or property damage if they are improperly used or installed.

⚠ WARNING EXCESSIVE AIR PRESSURE. Do not exceed maximum working pressure which can result in serious injury or property damage. Use an air regulator to limit pressure to the cylinder.

⚠ WARNING PRESSURIZED CYLINDERS CAN CAUSE INJURY. Depressurize the system before cleaning, inspection, relubrication, servicing or disassembly to prevent injury from accidental cycling.

⚠ WARNING PINCH HAZARD. Keep clear of moving cylinders and fixtures to avoid injury.

The information in this document and other information from Ingersoll-Rand / ARO and its authorized distributors is intended for use by persons having technical expertise in selecting and using these products. You should analyze all technical and safety requirements of your specific application, including the consequences of any possible failure, before selecting a product. These products are not suitable for all applications, such as applications related to, or connected with, aviation, aircraft or aerospace.

Because the requirements for each application may vary considerably, you are solely responsible for conducting any testing or analysis that may be required to determine the suitability of the product for your application, and to insure that all performance, safety and warning requirements for your application are met.

These products are subject to Ingersoll-Rand / ARO's Limited Warranty which sets forth your sole and exclusive remedy in the event any products is found defective in workmanship or material. Ingersoll-Rand / ARO shall have no liability for any property damage, personal injury or other loss or damage (including incidental, special and consequential damages) resulting from the improper selection, installation or use of any product.

AIR AND LUBE REQUIREMENTS

AIR PRESSURE **Limited to 200 p.s.i.g. (14 bar)**

Proper moisture removal and filtration of contaminants will promote good service life and operation.

Install an air regulator to control the operating pressure, insure smooth operation and conserve energy.

LUBRICATION

ARO pneumatic cylinders are lubricated with Accrolube or Magnalube grease at the factory. This lubrication should provide satisfactory operation and cycle life. The use of lubricated air will, however, help to extend the cycle life.

INSTALLATION

Cylinders must only be installed by a competent technician who understands the system requirements, mechanical principles and equipment involved.

NOTE: Improper alignment of the cylinder can cause excessive wear on the rod seals. Check rod alignment to the machine parts in both the retracted and extended positions.

- Install the air regulator as close as practical to the cylinder.
- Keep cylinder ports plugged or covered prior to assembly to prevent contamination which can contribute to premature failure.
- Use Teflon tape on the air fittings to prevent leakage.

OPERATION

Improper application, installation, service or maintenance of ARO cylinders can cause bodily injury or shortened product life. Contact Ingersoll-Rand / ARO for questions concerning special applications.

CYLINDER MODELS WITH CUSHIONS

This feature can increase cylinder life, however, it should not be used exclusively to decelerate heavy loads. Cushioned cylinder models are equipped with adjustable needle valves in the end cap(s) for easy, precise adjustment of the cushion effect.

Theory of Operation: The cushion seal is a "floating" "O" ring which seals on a cushion boss, a part of the piston assembly. As the cushion boss enters the cushion "O" ring located in the head or cap, the main air exhaust flow is blocked and forced through a bypass passage containing the needle valve. The cushion effect is created by the resulting back pressure. The cushion needle is used to vary the restriction (back pressure) and control the degree of cushioning. Upon application of the air in the opposite direction, the incoming air forces the "O" ring cushion seal towards the inside of the cylinder and acts as a check valve in the free flow direction. Incoming air flows around the o.d. of the seal, providing full flow to the piston face with little or no pressure drop for quick stroke reversal.

CUSHION ADJUSTMENT NEEDLE

- Turn **CLOCKWISE** to increase cushion effect.
- Turn **COUNTERCLOCKWISE** to decrease cushion effect.

ADJUSTMENT NOTE: DO NOT ROTATE CUSHION ADJUSTMENT NEEDLE COMPLETELY CLOCKWISE. Complete shut off of the cushion adjustment needle valve will prevent the cylinder from completely extending or retracting.

MAINTENANCE

Periodic cylinder maintenance should be performed to insure maximum service life.

- Clean the filter / regulator bowl regularly. Relieve system pressure, empty the contents of the bowl and clean or replace the filter element.
- Check the fluid level in the lubricator regularly, replenish with the appropriate air line lubricant.

SERVICE

Disassembly and reassembly should be done in accordance with instructions provided in the service instructions.

- Metallic parts should be cleaned with a non-flammable solvent.
- Rubber parts should be cleaned with soap and water.
- Cleaned parts should be rinsed and dried using low pressure air.
- Replace any parts which are worn or damaged. Selected parts and seals are available in repair kit form.
- Lubricate moving parts and seals.

NOTE: Do not attempt to grip the piston rod with pliers or wrenches which can cause scouring. Nicks or scratches on the piston rod will damage the rod seals.

SERVICE KITS / REPAIR PARTS

Selected parts are provided in kit form. The ARO parts list / service instructions contain repair kit information and complete service parts information and are available upon request. Order parts manuals as shown on page 1.