



Energy Efficiency - Greater Productivity - Cost Saving - Sustainable Manufacturing

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How much money is leaking out of your system?

The United States Department of Energy, Office of Industrial Technologies has reported that “many facilities have no idea how much their compressed air systems cost on an annual basis, or how much money they could be saving by improving the performance of these systems.” Do you know how much money is leaking out of your system?

The excessive cost of leaks

An example of how expensive one **small leak** can cost, look at the figure to the right. An example of how expensive one

small leak can cost, look at the figure to the right. Just one small 1/4" hole can cost you **\$16,093.44** per year! Even without a visible hole, pinhole leaks are very common and add up to a costly energy bill. Energy costs are skyrocketing and so will the cost of air leaks that plague most systems. DOE also states “leaks can be a significant source of wasted energy in an industrial compressed air system, sometimes wasting 20-30% of a compressor’s output.” Leaks will drop system pressure and make “air tools function less efficiently, adversely affecting production.”

| Size | Cost per Year |
|---------|---------------|
| ● 1/16" | \$1,004.16 |
| ● 1/8" | \$4,022.40 |
| ● 1/4" | \$16,093.44 |

Costs calculated using electricity rate of 50.09¢ per kWh*, assuming constant operation and an efficient compressor. *Cost adjusted for average commercial retail price of electricity (Nov. 2007)

Eliminate your problems with ROBO Cylinder

You can eliminate costly losses with IAI’s *ROBO Cylinder* electric actuator today! *ROBO Cylinder* offers you easy to use software and all of the benefits of a high-quality electric actuator. Did you know that the effective energy efficiency of IAI’s *ROBO Cylinder* line is 80-90%, while “a typical overall efficiency is around 10%” for a compressed air system”? (U.S. DOE, OIT Sourcebook CAC F2-1)

Power Consumption Test: ROBO Cylinder vs Air Cylinder

Power consumption was tested between an air cylinder and IAI’s *ROBO Cylinder* by comparing the simultaneous operations of both actuators. The test was conducted in identical conditions, with the same variables: dwell time, unit cost of electricity, unit cost of compressed air, speed, payload, stroke, ambient temp and operating time-



green automation

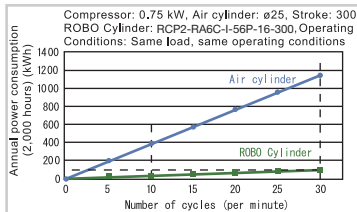
IAI
Quality and Innovation



IAI devised a precision power consumption test procedure to measure energy efficiency. Both the air cylinder and ROBO Cylinder were tested with identical variables. Variables included dwell time, cost of electricity, cost of compressed air, speed, payload, stroke, ambient temp and operating time.

ROBO Cylinder Running Costs only 1/3 to 1/10 of an Air Cylinder

As the operation frequency increases, the energy requirements of air cylinders increase exponentially, while the power consumption rate remains constant with the energy efficient ROBO Cylinders. Therefore, the differentials in power consumption between the two actuators increase as the number of cycles per minute increases. Based on IAI's calculations, when the two actuators are operating at 10 cycles per minute, the ROBO Cylinder only requires 1/3 the power of the air cylinder. When the actuators are operating at 30 cycles per minute, the difference is even more profound, with the ROBO Cylinder only requiring 1/10 the power of the air cylinder! Keep in mind that no industrial plant uses just one actuator; the more actuators your plant requires, the more savings and ROI with energy efficient ROBO Cylinders.



A quick way to realize your savings is to take your current costs of running your pneumatic system and slash it by 1/3, 1/10 if you're running your system hard!

IAI Energy Efficiency Enhancements

ROBO Cylinders are engineered to provide simplicity and great user experience along with efficient operation to minimize running costs. We have added extras to further help reduce environmental load and maximize ROI

Full Servo Control Mode

When set to the full servo control mode, the current to the pulse motor in the RCP2 series is reduced to 1/2 to 1/4 in standstill state. This provides an effective way to reduce power consumption when the motor remains in standstill set via user parameter.

Source:

1. Energy Information Administration, Form EIA-826, "Monthly Electric Sales and Revenue Report with State Distributions Report."
2. Department of Energy, Office of Industrial Technologies: Compressed Air Challenge "Inappropriate Uses of Compressed Air" Fact Sheet #2
3. Department of Energy, Office of Industrial Technologies: Compressed Air Challenge "Compressed Air System Leaks" Fact Sheet #7
4. Department of Energy, Office of Industrial Technologies: Compressed Air Challenge "Compressed Air System Economics" Fact Sheet #9
5. IAI Japan Internal R&D Testing Reports.
6. Pneumatic Energy Evaluation Report by Tokyo Institute of Technology
7. XE Foreign Exchange (1 USD @ 105.3 JPY Feb. 2008)
8. Fuji Research Institute Corporation; Electric Actuator World Sales

Automatic Servo-Off Mode

Once positioning is completed, the servo will automatically turn off after a specified time set by the operator. Since current does not flow while the servo is off, power consumption can significantly be reduced. (External force must not be applied while the servo is off)

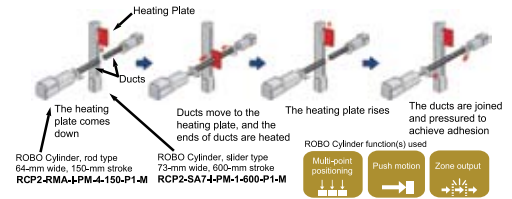
Real Applications, Real Savings Cost Reduction of \$31,920.00!

A well-known automotive manufacturer has had great success with IAI's ROBO Cylinder electric actuators. The application used by the manufacturer consists of a system that heats and adheres automotive ducts (resin pipes). The ROBO Cylinders are used for moving the heating plate and ducts requiring very accurate repeatability to successfully complete the work.

With the air system, adjusting the speed and push force at the time of joining ducts is difficult and cumbersome. This caused adhesion problems, and the defect rate was a very high 10%. Unlike the air system, the ROBO Cylinder system offers easy adjustability of speed and push force. As a result, the defect rate dropped to a low 3%.

The air cylinder system with its high 10% defect rate produced a loss of \$45,600. Conversely, because of ease in programming and the highly accurate nature of the ROBO Cylinder, a loss of only \$13,680 was seen with a low defect rate of 3%. In this application example, we can see the real world savings presented by upgrading to ROBO Cylinder.

ROBO Cylinder not only offers energy efficiency, but great repeatability, control and reduces defective parts providing excellent ROI. Upgrade today!



Upgrading to ROBO Cylinder helped save a automotive manufacturer \$31,920. The application called for the heating and joining of ducts.

The World Choses IAI

According to independent research done by Fuji Research Institute, IAI has 56.8% of the world market share for small electric linear actuators. (2006 Data) The quality and innovative products of IAI has been embraced by many businesses around the world to deliver high quality automation to their business models.

IAI's extensive ROBO Cylinder lineup will extend your possibilities and is your perfect solution by maximizing your ROI with proven reliability, energy efficiency and long maintenance-free intervals. Contact us regarding your application today!

Green Automation by IAI

Using energy in an efficient manner will cut running costs and benefit the environment and as a result, can significantly boost the image of a business in the public eye. With this said, it is essential and clear that we see the convergence of environmental and business needs are indeed in sync. We at IAI see this and are working hard to build energy efficient products so both businesses and our environment can benefit each and every day. See what IAI has to offer, and make Green Automation a part of your business today!

RoHS Compliant

IAI is RoHS compliant and recognizes the responsibility in reducing hazardous substances to better serve our customers and our environment.

ISO 9001:2000

In our uncompromising pursuit for "Quality," We have instituted ISO 9001:2000 and JIS Q9001:2000, a quality management system maintained by the International Organization for Standardization and Japanese Industrial Standards. We have been certified for ISO 9001:2000 and JIS Q9001:2000 by an independent auditor to be in conformance with ISO 9001:2000 and JIS 9001:2000. We at IAI are continually improving our methods to produce quality products and services that surpass customer expectations.



Contact us now for your application!

Air Cylinder

With the air cylinder system, adjusting the speed and push force at the time of joining ducts is difficult. This caused adhesion problems, and the defect rate was approximately 10%

- Initial Cost: \$2848.28
- Defect Rate: 10%
- Production Volume: 1,000 pieces/day = 20,000 pieces/month (20 days) = 240,000 pieces/year
- Unit price of part: \$1.90

Annual loss of air cylinder system due to joining problems
\$1.90 x 240,000 pieces/year x 10% = **\$45,600**

Costs associated with a pneumatic system.

ROBO Cylinder

With the ROBO Cylinder system, the speed and push force can be adjusted easily. As a result, the defect rate dropped to an astounding 3%

- Initial Cost: \$2848.28
- Defect Rate: 3%
- Production Volume: 1,000 pieces/day = 20,000 pieces/month (20 days) = 240,000 pieces/year
- Unit price of part: \$1.90

Annual loss of air cylinder system due to joining problems
\$1.90 x 240,000 pieces/year x 3% = **\$13,248**

This automotive manufacturer was able to reduce defects with ROBO Cylinder

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Contact us regarding your application: 1-800-736-1712 (CA) 1-800-944-0333 (IL) 1-888-354-9470 (GA)

Catalog No: UST-GA-2-0808

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