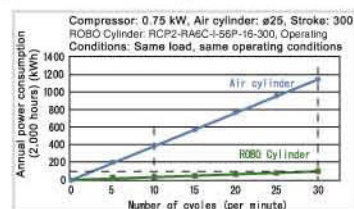




IAI devised a precision power consumption test procedure to measure energy efficiency. Both the air cylinder and *ROBO Cylinder* were tested with identical variables. Variables included dwell time, cost of electricity, cost of compressed air, speed, payload, stroke, ambient temp and operating time.

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 Mod

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 suppress power consumption when the motor remains in standstill for a long time.

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 20160 €

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 28800 €. Conversely, because of ease in programming and the highly accurate nature of the *ROBO Cylinder*, a loss of only 8640 € 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.

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: € 1900
- Defect Rate: 10%
- Production Volume: 1000 pieces/day = 20000 pieces/month (20 days) = 240000 pieces/year
- Unit price of part: € 1.20

Annual loss of air cylinder system due to joining problems
€ 1.20 x 240000 pieces/year x 10% = € 28800

Costs associated with a pneumatic system.

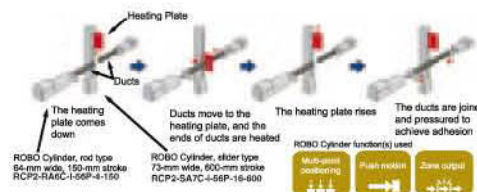
ROBO Cylinder

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: € 1900
- Defect Rate: 3%
- Production Volume: 1000 pieces/day = 20000 pieces/month (20 days) = 240000 pieces/year
- Unit price of part: € 1.20

Annual loss of air cylinder system due to joining problems
€ 1.20 x 240000 pieces/year x 3% = € 8640

This automotive manufacturer was able to reduce defects with *ROBO Cylinder*.



Upgrading to *ROBO Cylinder* helped save a automotive manufacturer 20160 €. 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 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.

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.

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.



Energy Efficiency - Greater Productivity - Cost Saving - Sustainable Manufacturing

How much money is leaking out of your system?

The Industry, Research and Energy (ITRE) Committee of the European Parliament 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 11000 € 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 system. Leaks and porosities 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"	€ 688
1/8"	€ 2750
1/4"	€ 11000

Costs calculated using electricity rate of 0.1 € 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?

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.

(continued on back side)

Slider type

24-V pulse motor

RCP2 Series



[Motor coupling type]
SA5C/SA6C/SA7C
SS7C
SS8C
HS8C

RCP2 Series



[Motor reversing type]
SA5R/SA6R/SA7R
SS7R
SS8R
HS8R

RCP2 Series



[Belt drive type]
BA6/BA6 U
BA7/BA7 U

RCP3 Series



[Separate motor straight type]
SA3C/SA4C/SA5C/SA6C

RCP3 Series



[Separate motor reversing type]
SA3R/SA4R/SA5R/SA6R

Controller-integrated type

Slider type

ERC2 Series



[Motor straight type]
SA6C/SA7C

Rod type

ERC2 Series



[Standard rod type]
RA6C/RA7C

ERC2 Series



[Rod type with single guide]
RGS6C/RGS7C

ERC2 Series



[Rod type with double guide]
RGD6C/RGD7C

24-V servo motor

RCA Series



[Motor coupling type]
SA4C/SA5C/SA6C

RCA Series



[Built-in motor type]
SA4D/SA5D/SA6D
SS4D/SS5D/SS6D

RCA Series



[Motor reversing type]
SA4R/SA5R/SA6R

RCA2 Series



[Separate motor straight type]
SA3C/SA4C/SA5C/SA6C

RCA2 Series



[Separate motor reversing type]
SA3R/SA4R/SA5R/SA6R

230-V servo motor

RCS2 Series



[Motor coupling type]
SA4C/SA5C/SA6C
SA7C/SS7C/SS8C

RCS2 Series



[Built-in motor type]
SA4D/SA5D
SA6D

RCS2 Series



[Motor reversing type]
SA4R/SA5R/SA6R
SA7R/SS7R/SS8R

24-V linear motor

RCL Series



[Ultra-small micro cylinder]
SA1L/SA2L/SA3L

Rod type

24-V pulse motor

RCP2 Series



[Motor coupling type]
RA2C/RA3C/RA4C
RA6C

RCP2 Series



[High-thrust type]
RA10C

RCP2 Series



[Single-guide type]
RGS4C/RGS6C

RCP2 Series



[Double-guide type]
RGD3C/RGD4C
RGD6C

24-V servo motor

RCA Series



[Motor coupling type]
RA3C/RA4C

RCA Series



[Built-in motor type]
RA3D/RA4D

RCA Series



[Motor reversing type]
RA3R/RA4R

RCA Series



[Single-guide type]
RGS3C/RGS4C

RCA Series



[Double-guide type]
RGD3C/RGD4C

230-V servo motor

RCS2 Series



[Motor coupling type]
RA4C/RA5C

RCS2 Series



[Built-in motor type]
RA4D

RCS2 Series



[Short type]
RA7AD/RA7BD

RCS2 Series



[Motor reversing type]
RA4R/RA5R

24-V servo motor

RCA Series



[Ultra-high thrust type]
RA13R

RCS2 Series



[Single-guide type]
RGS4C/RGS5C/RGS7C

RCS2 Series



[Double-guide type]
RGD4C/RGD5C/RGD7C

24-V linear motor

RCL Series



[Ultra-small micro cylinder]
RA1L/RA2L/RA3L

Table type

Arm type

Flat type

24-V pulse motor

RCP3 Series



[Separate motor straight type]
TA5C/TA6C/TA7C

RCP3 Series



[Separate motor reversing type]
TA5R/TA6R/TA7R

24-V servo motor

RCA Series



[Motor reversing type]
A4R/A5R/A6R

RCA2 Series



[Separate motor straight type]
TA5C/TA6C/TA7C

RCA2 Series



[Separate motor reversing type]
TA5R/TA6R/TA7R

230-V servo motor

RCS2 Series



[Motor reversing type]
A4R/A5R/A6R

RCS2 Series



[Built-in type]
F5D

Multi-Axes System

24-V pulse motor

IK2P Series



[XYB / XZ / YZB]
SS7R(C) + SA5R/SA6R/SA7R/SS8R(C) + SA7R

IK3P Series



[XYB + Z]
SS8R + SA7R + SA6R

230-V servo motor

IK2S Series



[XYB / XZ / YZB]
SS7R(C) + SA5R/SA6R/SA7R/SS8R(C) + SA7R

IK3S Series



[XYB + Z]
SS8R + SA7R + SA6R

Gripper type Rotary type

24-V pulse motor

RCP2 Series



2-finger gripper

[Pulse motor type]
GRSS/GRSL
GRS/GRM
GR3LS/GR3LM
GR3SS/GR3SM

230-V servo motor

RCS2 Series



2-finger gripper

[Servo motor type]
GPB

24-V pulse motor

RCP2 Series



Standard/multi-rotation

[Pulse motor type]
RTBS(L)/RTCS(L)
RTB(L)/RTC(L)
RTBB(L)/RTCB(L)

230-V servo motor

RCS2 Series



Standard rotation

[Servo motor type]
RT6R/RT6R
RT7R

Cleanroom type

24-V pulse motor

RCP2CR Series



[Motor coupling type]
SA5C/SA6C
SA7C/SS7C
SS8C/HS8C

24-V servo motor

RCA2CR Series



[Motor coupling type]
SA4C/SA5C/SA6C
[Built-in type]
SA5D/SA6D

230-V servo motor

RCS2CR Series



[Motor coupling type]
SA4C/SA5C/SA6C/SA7C
SS7C/SS8C
[Built-in type]
SA5D/SA6D

Dustproof/splash-proof type

24-V pulse motor

RCP2W Series



[Waterproof slider type]
SA16C

24-V servo motor

RCP2W Series



[Splash-proof rod type]
RA4C/RA6C

24-V servo motor

RCAW Series



[Splash-proof rod type]
RA3C/RA4C

230-V servo motor

RCS2W Series



[Splash-proof rod type]
RA4C

Controller

Gateway



[Gateway unit]

Absolute Unit



[PCON/ACON absolute module]

Built-in controller



[ERC2 built-in controller]

Network modules



[RCP2(3)/RCA(2)/RCL network controller]

24-V pulse motor



[RCP2(3) position controller]

24-V servo/linear motor



[RCA(2)/RCL position controller]

230-V servo motor



[RCS2 position controller]

24-V pulse motor



[RCP2 1-2-axis program controller]

24-V servo/linear motor



[RCA(2)/RCL 1-2-axis program controller]

230-V servo motor



[RCS2 1-2-axis program controller]

X-SEL



[RCS2 1-6-axis program controller]