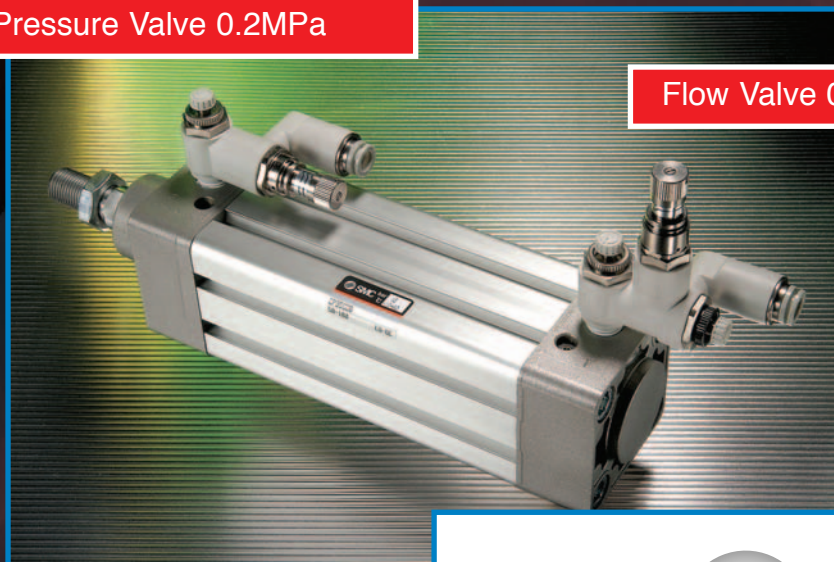




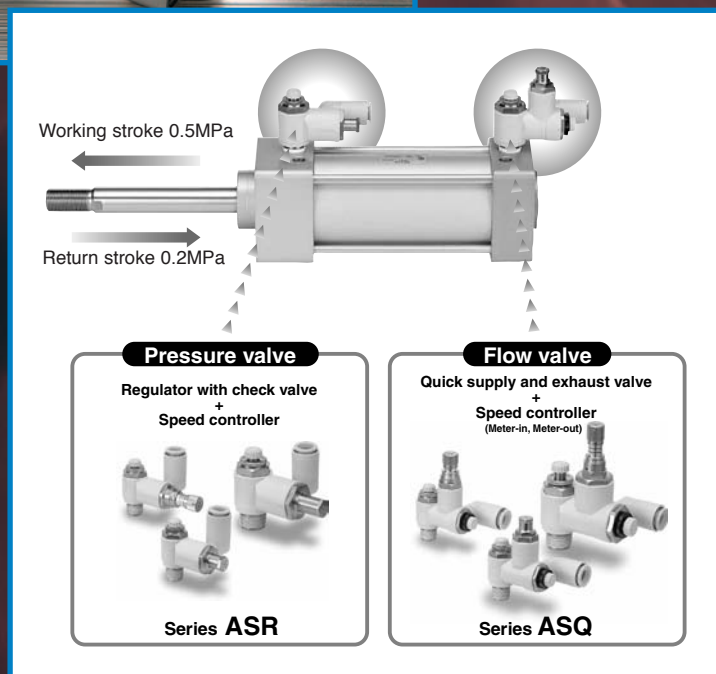
40% Reduction in Air Consumption

Pressure Valve 0.2MPa

Flow Valve 0.5MPa



Cuts air consumption by operating the return stroke at a reduced pressure.



SMC Pneumatics (Australia) Pty Ltd.

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SMC ENERGY SAVING

Is the cost of compressed air blowing you away?

$$E_{\text{nergy}} = m_{\text{ore}} C_{\text{ash}}^2$$

CONSERVATION

$$Q_s = \frac{1545 \times w \times T_s}{60 \times 144 \times MW \times P_s}$$

$$Q_1 = (1545 \times w \times Z_1 \times T_1) / (60 \times 144 \times MW \times P_1)$$

$$P_1 = \frac{MW \times 529.7 \times P_1}{386.7 \times T_1 \times 14.7}$$

$$H_{ad} = Z_{av} \times R \times T_1 \times (r^{\frac{k-1}{k}} - 1) / (\frac{k-1}{k})$$

$$GHP = \frac{w \times H_p}{60 \times 33000 \times E_p}$$

$$Q_1 \times P_1 \times \frac{Z_{av}}{Z_1} \times \frac{r^{\frac{n-1}{n}} - 1}{\frac{n-1}{n}}$$

$$GHP = \frac{229 \times E_p}{n}$$

Energy Saving Initiatives from SMC Pneumatics

SHAPING TECHNOLOGY WITH PNEUMATICS

E N E R G Y S A V I N G

www.smcaus.com.au
www.smc.co.nz
email: mktg@smcaus.com.au



DID You Know?

- Decreasing the air inlet temperature of the compressor by 3° degrees can reduce energy use by 1%.
- Reducing system pressure by 100kPa can reduce energy use by 8%
- Repairing system leakage can reduce energy use by 20% in a typical plant
- An air leak equivalent to a hole 5mm in diameter costs around \$4000.00 per year in wasted energy

Savings can start at the Compressor

Reducing the inlet temperature on a 110kW compressor from 24°C to 18°C operating for 2000 hours per year can save 4,400kWh per year.

Reducing the system pressure on a 75kW compressor from 800kPa to 700kPa operating from 2000 hours per year can save 12,000kWh per year.

The Air Audit Process - Getting started

Reason for Improvement

Recognise the potential of improvement

Measurement

Recognise current consumption

Improvement

Measurement

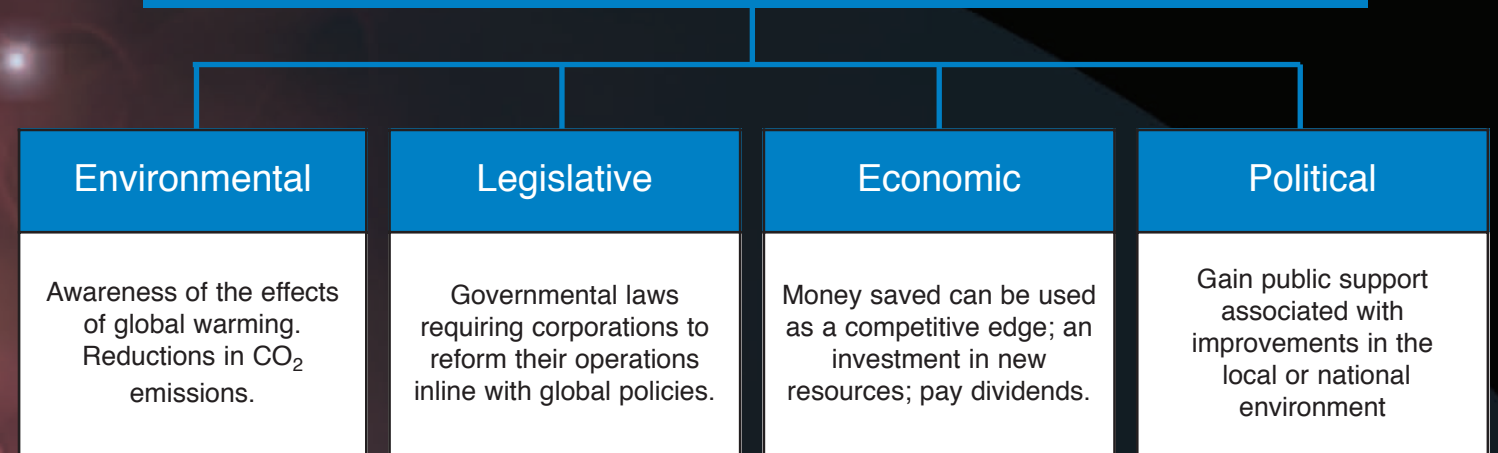
Verify the energy consumption after the improvement

Energy Savings



ENERGY SAVING

REASON FOR IMPROVEMENT



Measurement

Leakage - What Cost?



Discharge through an orifice

- ø3.2mm jagged edged hole
 - 700kPa pressure
 - leaks 740 l/min free air
 - at 61% efficiency = 450 l/min
- 1kW compressor makes 150 l/min F.A.D.
 - need 3.0kW to feed the hole
- Cost = $\frac{\text{kW} \times \text{\$/kWh} \times \text{period of operation}}{\text{motor efficiency}}$

$$= \frac{3.0 \times 0.08 \times 8,760 \text{ hrs/year}}{0.92} = \text{\$2,285.00 / year}$$

(Estimated cost \\$0.08/kWh)



Discharge from an air system

- 1,000 c.f.m. compressor (28.3m³) = 250hp motor (186kW)
- Say 15% to 20% lost through leakage = 4,250 to 5660 l/min
- Cost = $\frac{\text{kW} \times \text{\$/kWh} \times \text{period of operation}}{\text{motor efficiency}}$

$$= \frac{37 \times 0.08 \times 8,760 \text{ hours/year}}{0.92} = \text{\$21,250 to \$28,350 / year}$$

(Estimated cost \\$0.08/kWh)

Improvement



Measurement

In Australia, approximately 10% of all industrial electricity is used in powering compressed air systems