Figures show reliable effects.

<table>
<thead>
<tr>
<th></th>
<th>Company A performance</th>
<th>Company B performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electricity</strong></td>
<td>1400 kW</td>
<td>7000 kW</td>
</tr>
<tr>
<td><strong>CO₂</strong></td>
<td>0.9 t reduction/year</td>
<td>1.7 t reduction/year</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>¥80 million reduction/year</td>
<td>¥150 million reduction/year</td>
</tr>
</tbody>
</table>

We help you save energy.

- We help you to improve and standardize your equipment, and adopt new equipment.
- We also proactively promote activities through official organizations, such as holding seminars at the energy-saving center.

*<Energy-saving themes>*

- Air Blow
- Blowing by Air Gun
- Air Purge
- Actuators
- Lower Pressure in the Piping Line
- Low Power Consumption
- Air Line Maintenance
Index

Recommend Energy-saving Equipment

**Air Blow**
- Nozzles for Blowing
  - Series KN  P.1
- **Related Equipment**
  - Compact Manometer  Series PPA  P.1

**Blowing by Air Gun**
- Blow Gun
  - Series VMG  P.2

**Air Purge**
- 2-Color Display Digital Flow Switch
  - Series PFM  P.3

**Actuators**
- Pressure Valve
  - Series ASR  P.4
- Regulator with Backflow Function
  - Series ARK/ARM/ARJ  P.5
- Direct Operated Precision Regulator
  - Series ARP  P.6
- Compact Cylinder with Solenoid Valve
  - Series CVQ  P.7
- Non-rotating Double Power Cylinder/Double Power Cylinder
  - Series MGZ  P.8
- Booster Regulator
  - Series VBA  P.9

**Lower Pressure in the Piping Line**
- S Couplers
  - Series KK130  P.10

**Low Power Consumption**
- 3/4/5 Port Solenoid Valve
  - Series SY/VQ/VF  P.11
- Energy Saving Type 2 Port Solenoid Valve
  - Series VXE  P.12
- Coolant Valve
  - Series SGC  P.13
- Refrigerated Air Dryer
  - Series IDF  P.14
- Refrigerated Thermo-chiller
  - Series HRZ  P.15

**Air Line Maintenance**
- Digital Flow Switch for Air
  - Series PF2A  P.16
- Digital Flow Switch for Water
  - Series PF2W  P.16
- 2-Color Display High-Precision Digital Flow Switch
  - Series ISE30A  P.16
- Compact Digital Pressure Switch
  - Series ISE10  P.16
- 2-Color Display Digital Pressure Switch
  - Series ISE80  P.16

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- Air Blow
- Lower Pressure in the Piping Line
- Air Purge
- Low Power Consumption
- Actuators
- Air Line Maintenance

![Image](https://example.com/image.png)
Nozzles for Blowing

**Series KN**

**Reduction of the air consumption with a small diameter nozzle**
- Blow circuit facilitating effective pressure use

**Energy-saving Circuit**
- Making it shorter with a less bent copper tube
- Installing a nozzle (ø2) at the end of the copper tube

- Flow rate per nozzle
  - Energy-saving model: 171 l/min (ANR)
  - Conventional model: 285 l/min (ANR)

- Blow time: 2 sec.
- Annual operating cycles: 900,000

- Energy-saving model:
  - 5,130 m³/year (ANR)($7,700/year reduction)
- Conventional model:
  - 8,550 m³/year (ANR)($12,830/year)

**Related Equipment**
- Use to measure workpiece collision pressure.
  - Standard sensing head/KNP
  - Needle sensing head/KNP

**Corresponding value:** Air unit ¥1.5/m³ (ANR)

Refer to the catalog for details.

Approved

**Compact manometer Series PPA**
20% reduction in power consumption with the SMC “blow gun” + “S coupler” + “coil tube”

- Blow gun facilitating effective pressure use
- Pressure loss of 1% or less (Nozzle diameter: ø2.5)

Energy-saving Circuit

Impact pressure: 0.011 MPa
(Distance: 100 mm)
Blow time: 10 seconds (Frequency: 12 times/hour)
Working hours: 10 hours/day (250 days/year)
Total working hours: 8,300 hours
Compressor pressure: 0.5 MPa
Air consumption: 257 l/min (ANR)

Power consumption by compressor: 1.25 kW
(¥155,625/year)

Corresponding value: Electricity unit ¥15/kWh
Refer to the energy saving program and catalog for details.
Reduction of the air consumption from the exhaust port of a part presence sensor

- A simple part presence circuit using a digital flow switch.

Excluding air consumption from a detection nozzle

Energy-saving Circuit

**PFM**
- Detection nozzle diameter: ø2.0
- Supply pressure: 0.2 MPa
- **0 l/min (ANR)**
- **100%**
- **¥7,430/year reduction**

Conventional Circuit

**ISA2-H**
- Detection nozzle diameter: ø2.0
- Supply pressure: 0.2 MPa
- **22 l/min (ANR)**
- Operating time: 15 hours/day, 250 days/year
- **4,950 m³/year (ANR)**
- **¥7,430/year**

Excluding air consumption from a detection nozzle

Corresponding value: Air unit ¥1.5/m³ (ANR)

- Refer to the catalog for details.
Reduction of the air consumption by regulating the non-operating return-stroke side

- Construction combining a regulator with check valve and a flow control valve
- When the retraction side is on the non-operating side that does not require power

### Energy-saving Circuit

- Bore size: ø50
- Stroke: 200 mm
- Pressure on the extension side: 0.5 MPa
- Pressure on the retraction side: 0.2 MPa

**Per single reciprocation**

- **3.3 l (ANR)**
- 25% increase
- **3,011 m³/year (ANR)**
- **¥ 4,520/year**

**When it is operated 900,000 times/year**

**Corresponding value:** Air unit ¥1.5/m³ (ANR)

### Conventional Circuit

- Bore size: ø50
- Stroke: 200 mm
- Pressure: 0.5 MPa

**Per single reciprocation**

- **4.3 l (ANR)**
- **3,902 m³/year (ANR)**
- **¥ 5,850/year**

**When it is operated 900,000 times/year**

**Refer to the catalog for details.**
Regulator with Backflow Function

Series AR□K  Series ARM10/11  Series ARJ210 (X209)
Series ARM5  Series ARJ1020F  Series ARM5

Lowering of the pressure of a non-operating stroke for the entire cylinder
- Reduction of the air consumption by regulating the non-operating return-stroke side
- When the retraction side is on the non-operating side that does not require power

Energy-saving Circuit
Bore size: ø50
Stroke: 200 mm
Pressure on the extension side: 0.5 MPa
Pressure on the retraction side: 0.2 MPa

Per single reciprocation

3.3 l (ANR) ▲25%

When it is operated 900,000 times/year

3,011 m³/year (ANR)
(yen 1,330/year reduction)

Conventional Circuit
Bore size: ø50
Stroke: 200 mm
Pressure: 0.5 MPa

Per single reciprocation

4.3 l (ANR)

When it is operated 900,000 times/year

3,902 m³/year (ANR)
(yen 5,850/year)

Corresponding value: Air unit ¥1.5/m³ (ANR)
- Refer to the catalog for details.
Greatly reducing the bleed air flow compared with the conventional model (ARP3000)

- Constantly bleeding a small amount of air in order to make precise pressure adjustment possible
- Interchangeable mounting available

ARP3000 → ARP30

(No equivalent models for APR20 and 40 are available since they are newly added ones.)

**Energy-saving Model**

<table>
<thead>
<tr>
<th></th>
<th>Conventional Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>When setting 0.3 MPa</td>
<td></td>
</tr>
<tr>
<td>0.8 l/min (ANR)</td>
<td>4 to 6 l/min (ANR)</td>
</tr>
<tr>
<td>When air supplying time is 24 hours/day, 250 days/year</td>
<td>When air supplying time is 24 hours/day, 250 days/year</td>
</tr>
<tr>
<td>288 m³ or less/year (¥430/year)</td>
<td>1,440 to 2,160 m³/year (¥2,160 to ¥3,240/year)</td>
</tr>
</tbody>
</table>

(¥1,730/year to ¥2,810/year reduction)

Energy-saving model

Corresponding value: Air unit ¥1.5/m³ (ANR)

Refer to the catalog for details.
Reduction of the flow consumption between a cylinder and a valve

- Piping between a cylinder and a valve not necessary

**Energy-saving Model**

**CVQ**
- Bore size: Ø32
- Stroke: 50 mm
- No piping between a valve and a cylinder
- Supply pressure: 0.5 MPa

Per single reciprocation

0.42 l (ANR)

When it is operated 900,000 times/year

380 m³/year (ANR)

(¥340/year reduction)

**Conventional Model**

**CQ2**
- Bore size: Ø32
- Stroke: 50 mm
- Piping bore: 4 mm
- Piping length: 2 m
- Supply pressure: 0.5 MPa

Per single reciprocation

0.67 l (ANR)

When it is operated 900,000 times/year

606 m³/year (ANR)

(¥910/year)

Corresponding value: Air unit ¥1.5/m³ (ANR)

- Refer to the catalog for details.
**Double Power Cylinder Series MGZ**

**Reduction of the air consumption by reducing the cylinder size**
- Possible to reduce air consumption in the retracting direction, compared with a standard cylinder with equivalent output in the extending direction, thanks to a doubled piston area for the extending direction.

**Double extension output power!!**
SMC’s unique construction doubles the piston area for the extending direction. An ideal air cylinder for lifting and press applications.

<table>
<thead>
<tr>
<th>Bore size: ø63</th>
<th>Bore size: ø80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke: 200 mm</td>
<td>Stroke: 200 mm</td>
</tr>
<tr>
<td>Pressure on the extension side: 0.5 MPa</td>
<td>Pressure on the extension side: 0.5 MPa</td>
</tr>
</tbody>
</table>

For Bore Ø63:
- Theoretical output (Extension side): 2,973 N
- Per single reciprocation
- Energy-saving product
- When it is operated 900,000 times/year
- 9.9 l (ANR) 
- 8,910 m³/year (ANR)
- (¥ 13,370/year)

For Bore Ø80:
- Theoretical output (Extension side): 2,520 N
- Per single reciprocation
- Conventional product
- When it is operated 900,000 times/year
- 11.5 l (ANR)
- 10,350 m³/year (ANR)
- (¥ 15,530/year)

**Energy-saving Circuit**
- Bore size: ø63
- Stroke: 200 mm
- Pressure on the extension side: 0.5 MPa
- Theoretical output (Extension side): 2,973 N
- Per single reciprocation
- Energy-saving product
- When it is operated 900,000 times/year
- 9.9 l (ANR) 
- 8,910 m³/year (ANR)
- (¥ 13,370/year)

**Conventional Circuit**
- Bore size: ø80
- Stroke: 200 mm
- Pressure on the extension side: 0.5 MPa
- Theoretical output (Extension side): 2,520 N
- Per single reciprocation
- Conventional product
- When it is operated 900,000 times/year
- 11.5 l (ANR)
- 10,350 m³/year (ANR)
- (¥ 15,530/year)

**Corresponding value:** Air unit ¥1.5/m³ (ANR)

Refer to the catalog for details.
Boost an insufficiently powered portion with a booster regulator

- Optimizing the booster circuit: Replacing it with a minimum sized booster circuit

### Energy-saving Circuit

When boosting pressure on the extension side only
- Retraction: 0.4 MPa
- Extension: 0.8 MPa (Boosting pressure)

Per single reciprocation

\[ 8.7 \times 10^6 \text{ L} \] (ANR)

\[ 13 \times 10^6 \text{ L} \] (ANR)

\[ 33\% \]

When it is operated 900,000 times/year

\[ 7,830 \text{ m}^3/\text{year} \] (ANR)

\[ 11,700 \text{ m}^3/\text{year} \] (ANR)

\[ ¥11,750/\text{year} \]

\[ ¥17,550/\text{year} \]

\[ ¥5,800/\text{year} \] (ANR)

\[ ¥8,700/\text{year} \] (ANR)

Corresponding value: Air unit ¥1.5/m³ (ANR)

Refer to the catalog for details.
Since pressure loss is smaller than the conventional model (Series KK13), even if inlet pressure is reduced, equivalent outlet pressure and flow rate can be achieved when it is used for air blow. Enables lower compressor discharge pressure. It is possible to reduce the cost with lower air and energy consumption of compressors.

**Energy-saving Circuit**
- Operating pressure at the outlet: 0.5 MPa
- Compressor efficiency: 0.7
- Annual operating time: 2500 hours
- Flow rate: 1.2 m³/min (ANR)

**Conventional Circuit**
- Operating pressure at the outlet: 0.5 MPa
- Compressor efficiency: 0.7
- Annual operating time: 2500 hours
- Flow rate: 1.2 m³/min (ANR)

- Inlet pressure: 0.54 MPa (7% decrease)
- Power consumption by compressor: ¥262,000/year
- Corresponding value: Electricity unit ¥15/kWh (¥11,000/year reduction)

- Inlet pressure: 0.58 MPa
- Power consumption by compressor: ¥273,000/year

Refer to the energy saving program and catalog for details.

---

**S Couplers**

Series KK130

Constantly used between 0 and 2 m³/min (ANR)
Reduced power consumption when energized

- Power consumption is reduced by power saving circuit.

Power consumption is decreased by approx. 1/3 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 62 ms at 24 VDC.) Refer to electrical power waveform as shown below.

### Electrical power waveform

- **Applied voltage**
  - 24 V
  - 0 V
- **Energy saving**
  - 0.1 W
  - 0 W
- **Standard**
  - 0.4 W

Effective energizing time is over 62 ms at 24 VDC.

### Energy-saving Model

**SY: 0.1 W**

(With power-saving circuit)

When the energizing time is 5 hours/day, 250 days/year

\[0.13 \text{ kWh/year} \quad (\times 2/\text{year}) \quad \downarrow 81\%\]

\n
(\times 8/\text{year reduction})

Corresponding value: Electricity unit ¥15/kWh

- Refer to the catalog for details.

### Conventional Model

**SY: 0.55 W**

When the energizing time is 5 hours/day, 250 days/year

\[0.69 \text{ kWh/year} \quad (\times 10/\text{year})\]
Energy Saving Type 2 Port Solenoid Valve

Direct Operated
Series VXE21/22/23

Pilot Operated
Series VXED21/22/23

Zero Differential Pressure Type Pilot Operated
Series VXEZ22/23

Built-in energy saving circuit. Electrical consumption reduced by approx. 1/3 during holding compared with a conventional model (New Series VX).

- Coil heat reduction
- Interchangeable
  The mounting dimensions and its basic specifications are equivalent to those of conventional models.
- Replaceable coil
  Possible to change the solenoid coil assembly for the VX2, VXD and VXZ with the energy saving coil type. (Restricted for the rated voltage 12, 24 VDC)

Energy-saving Model
VXE21: 1.5 W
VXE22: 2.3 W
VXE23: 3.0 W
Series VXE23
Energizing time: 5 hours/day, 250 days/year
3.8 kWh/year (¥140/year reduction)

Conventional Model
New VX21: 4.5 W
New VX22: 7.0 W
New VX23: 10.5 W
Series VX23
Energizing time: 5 hours/day, 250 days/year
13.1 kWh/year (¥197/year)

Corresponding value: Electricity unit ¥15/kWh
- Refer to the catalog for details.
**Coolant Valve**

**Reduction of the power consumption when energized**
- **Flow rate: Av factor** (In case of 0.5 MPa specification)
  - SGC: 155
  - SGC3: 284
  - SGC4: 440
- **Service life: 5 million cycles or more** (Based on SMC's test condition)

**Energy-saving Model**
- **SGC**: 0.35 W (Without light)
  - (24 VDC) 0.58 W (With light)
- **SGC (Without light)**
  - Energizing time: 5 hours/day, 250 days/year
- **0.4 kWh/year (¥84/year reduction)**
  - Energy-saving model
  - Reduced power consumption

**Conventional Model**
- **VNC1**: 1.8 W (Without light)
  - (24 VDC) 2 W (With light)
- **VNC2 to 9**: 4.8 W (Without light)
  - (24 VDC) 5 W (With light)
- **6 kWh/year (¥90/year)**
  - Conventional model

Corresponding value: Electricity unit ¥15/kWh
- Refer to the catalog for details.

**Refrigerated Air Dryer**

**Reduction of the power consumption using a high-performance heat exchanger**
- **Improved air flow capacity** (by an average of 17% as measured in 12 models)

**Energy-saving Model**
- **IDF15E**: 620 W
  - Air flow capacity: 3100 l/min (ANR)
- **Operating time**: 24 hours/day, 250 days/year
- **3,720 kWh/year (¥55,800/year)**
  - Energy-saving model

**Conventional Model**
- **IDF15C**: 662 W
  - Air flow capacity: 2400 l/min (ANR)
- **Operating time**: 24 hours/day, 250 days/year
- **3,972 kWh/year (¥59,580/year)**
  - Conventional model

Corresponding value: Electricity unit ¥15/kWh
- Refer to the catalog for details.
**Digital Switches**

**Improving control and visibility of pressure and flow rate.**
- Pressure, flow control of the main line and equipment line.
- Measuring instruments are used effectively. Flow rate is numerically controlled, and targets and effects are clearly shown.

**Digital Flow Switches**
- Digital Flow Switch for Air
- Digital Flow Switch for Water
- 2-Color Display Digital Flow Switch

**Digital Pressure Switches**
- 2-Color Display High-Precision Digital Pressure Switch
- Compact Digital Pressure Switch
- 2-Color Display Digital Pressure Switch

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