CKD

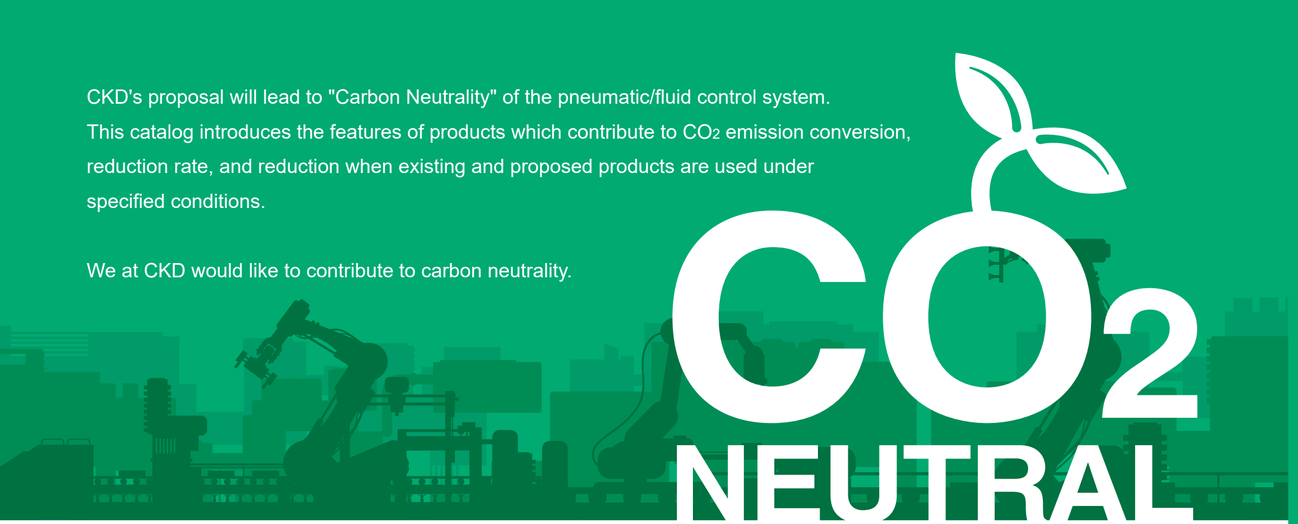
Eco-Friendly Component Guide

What CKD can do as a total FA supplier for Carbon Neutrality

CKD Corporation
CC-1565A 1

CKD's proposal will lead to "Carbon Neutrality" of the pneumatic/fluid control system.
This catalog introduces the features of products which contribute to CO_2 emission conversion, reduction rate, and reduction when existing and proposed products are used under specified conditions.

We at CKD would like to contribute to carbon neutrality.



CO_2 Emissions Calculation Conditions (Calculation Method)

This booklet introduces the CO_2 emissions conversion and reduction rates when using existing and proposed products under the following conditions from the viewpoints of air leakage, air consumption and power consumption.

[Conditions]
Annual Operating Days: 250 days Operating Hours: 8 hours/day
When 100 units of each component are used (* One main line filter is used)

■CO_2 discharge converted by air leakage and air consumption (t-CO_2/year)
Annual total air rate (leakage or consumption) ×0.06* ×0.001
* Conversion coefficient according to CKD track record

Total annual air quantity (leakage or consumption) =
Air volume per unit × Number of units × Operating hours (hours/days) × Annual operating days (days)

CKD calculation standard

Item	Estimated value	Remarks
CO_2 emission factor	0.00043 t-CO_2/kWh	Ministry of the Environment Release of Emission Factors by Electricity Utilities R1 track record Chubu Electric Power Miraiz CO_2 emission factor
CO_2 Emissions from Compressed Air	0.06 kg/m³	Track record conversion factor

■CO_2 emissions from power consumption (t-CO_2/year)
Annual power consumption (kW) ×0.00043* *CO_2 emission factor

Annual power consumption =
Power consumption (kW) × Number of units × Operation time (hours/days) × Annual operating days (days)

* CKD research

Air saving

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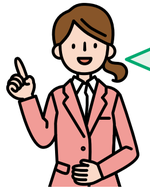
Durability count **20 million cycles or more!**[*1]

High Durability Components HP Series

Reduce waste | Reduce maintenance | Stable operation | Same dimensions



Air cylinders are operating while leaking air due to wear of the piston packing as they are used. Why not replace the cylinder with one that uses packing with superior wear resistance?

Product features

- Abrasion-resistant packing due to special compounding
- Uses grease supporting high-frequency usage
- Optimized sealing function

Compact cylinder SSD2 Series

CO_2 Emissions (Air leakage)

0.09
t-CO_2/20 million operation cycles

CO_2 Emissions (Air leakage)
100% Reduced
Reduction amount **0.09**
t-CO_2/20 million operation cycles

SSD2-HP Series

CO_2 Emissions (Air leakage)

0
t-CO_2/20 million operation cycles

* Calculations are based on an operating frequency of once/minute. Please refer to P.1 for CO_2 emissions calculation conditions (our calculation method).
*1: Depends on CKD specified conditions.

For other variations Click here

Green Power
Green power
Collaborative Robot Grippers are manufactured with 100% RENEWABLE ENERGY. (Certified by Green Power)

Durability count **100 million plus cycles!**[*1]

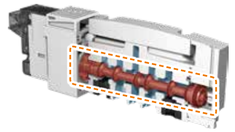
Pilot operated 3, 5-port valve 4G*R Series

Reduce waste | Reduce maintenance | Stable operation

Actually, the 5-port valve operates with internal leakage. As the number of operation times increases, air leakage increases and air consumption increases. Why not use a component with less internal leakage?

Product Features

- Special surface treatment of the sliding packing
- Special surface treatment of the interior
- Low friction achieved by optimizing the sealing function through CAE analysis



Pilot operated 3, 5-port valve 4G Series

CO_2 Emissions (Air leakage)

24.2

t-CO_2/100 million operation cycles

CO_2 Emissions (Air leakage)

90% Reduced

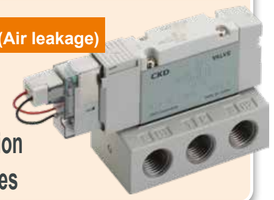
Reduction amount 21.8 t-CO_2/100 million operation cycles

4G*R Series

CO_2 Emissions(Air leakage)

2.4

t-CO_2/100 million operation cycles



* Calculations are based on an operating frequency of 10 cycles/minute. Please refer to P.1 for CO_2 emissions calculation conditions (our calculation method).

*1: Depends on CKD specified conditions.

Pressure loss reduced!

Medium main line filter AF2 Series

Reduce waste | Reduce maintenance | Improved visibility

If air component pressure loss is large, wasteful air consumption increases. Don't you want to use components that reduce pressure loss?

Product features

- Element structure with increased filtration area
- Hydrophobic/lipophobic element material
- Differential pressure check is always possible

Main line filter AF2000 Series

CO_2 Emissions (Air consumption)

1.94

t-CO_2/Year

CO_2 Emissions (Air consumption)

46% Reduced

Reduction amount 0.9 t-CO_2/Year

AF2 Series

CO_2 Emissions (Air consumption)

1.04

t-CO_2/Year

*CO_2 emissions are converted by air consumption for pressure loss. Please refer to P.1 for CO_2 emissions calculation conditions (our calculation method).

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Significantly reduces **Bleeding**!

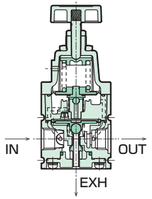
Precision regulator RPE1000 Series

Stable operation

General precision regulators normally bleed with or without air flow. Don't you want to reduce the bleeding and air consumption?

Product Features

- **Special structure significantly reduces air consumption**
- **Realizing stable flow characteristics / pressure control**



Precision regulator RP1000 Series

CO_2 Emissions (Air consumption)

0.94 t-CO_2/Year

CO_2 Emissions (Air consumption)

85% Reduced

Reduction amount 0.8 t-CO_2/Year

RPE1000 Series

CO_2 Emissions (Air consumption)

0.14 t-CO_2/Year

*CO_2 emissions are converted based on air consumption. Please refer to P.1 for CO_2 emissions calculation conditions (our calculation method).

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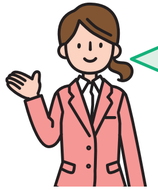
Power supply not required! **Intermittent blowing** realized

Pulsed blow valve NP1X Series

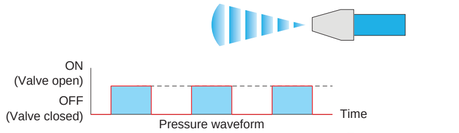
Reduce waste | Stable operation | Easy installation



In a production line with an air blow process, air blow accounts for 70% of air usage. Why not save air by using intermittent air blowers?

Product Features

- **Built-in pulse timer realizes intermittent blow**
- **Stable pulse waveform provides high durability even after 100 million cycles**[*1]



Pilot kick 2-port solenoid valve ADK11 Series

CO_2 Emissions (Air consumption)

68.9 t-CO_2/Year

CO_2 Emissions (Air consumption)

36% Reduced

Reduction amount 25.1 t-CO_2/Year

NP1X Series

CO_2 Emissions (Air consumption)

43.8 t-CO_2/Year

*CO_2 emissions are converted based on air consumption. Please refer to P.1 for CO_2 emissions calculation conditions (our calculation method).

* For made-to-order products, contact CKD Sales.

*1: Depends on CKD specified conditions.

*Made-to-order product

Air saving

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Strong injection even with minimal air consumption!

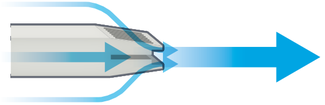
Air nozzle **BNE** Series

Easy installation | Low noise

In production lines with air blowing processes, air blow accounts for 70% of air used. Why don't you reconsider the nozzle tip and reduce the air usage?

Product Features

- **Employs a special structure**
- **Reduces air consumption by injecting air with even distribution**

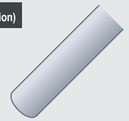


ø6 open pipe

CO_2 Emissions (Air consumption)

401.5

t-CO_2/Year



CO_2 Emissions Air consumption

46% Reduced

Reduction amount 185.5 t-CO_2/Year

BNE Series

CO_2 Emissions (Air consumption)

216

t-CO_2/Year

* CO_2 emissions are converted based on air consumption. Please refer to P.1 for CO_2 emissions calculation conditions (our calculation method).

* Primary pressure: 0.4MPa, Secondary pressure: Open to atmosphere.

Low power consumption

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Durability count **20 million cycles***1 realized

New

Direct acting 2, 3-port solenoid valve (Multi-Fit Valves) **FFB/FFG** Series

Reduce waste | Reduce maintenance | Easy installation | Low noise

Solenoid valves compatible with newly released general-purpose fluids can reduce power from 11W (DC) to 4.5W (DC). (Valve size 3)
Why not reduce power consumption by using low-power solenoid valves?

Product Features

- **Lower power consumption with newly designed coil**
- **Compatible with various fluids and reduced maintenance products**
- **Installation is liberalized by rotating the coil by 360°**

Direct acting 2-port solenoid valve AB Series

CO_2 Emissions (Power consumption)

0.0946

t-CO_2/Year

CO_2 Emissions (Power consumption)

59% Reduced

Reduction amount 0.056 t-CO_2/Year

FFB-3 Series

CO_2 Emissions (Power consumption)

0.0387

t-CO_2/Year

* CO_2 emissions are converted based on the amount of electricity consumed when power is supplied 6 times/hr. and power is supplied for 1 minute. Please refer to P.1 for the conditions of CO_2 emissions calculation (our calculation method).

*1: According to the conditions specified by CKD.

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Power consumption 0.6W (DC)

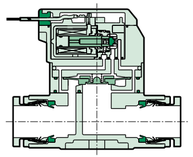
Pilot operated 2-port solenoid valve for compressed air EXA Series

Downsized | Less fittings | Easy installation

Pilot operated solenoid valves with low power consumption are desired for air blowers that require large flow rates. Why not reduce power consumption by using low-power solenoid valves?

Product Features

- **Low power consumption 3-way valve is adopted in the actuator**
- **Large flow rate with pilot operated (450L/min and over*1)**
- **Coil reduced in size and body reduced in weight**



Direct acting 2-port solenoid valve for compressed air **FAB Series**

CO_2 Emissions (Power consumption)

0.0989 t-CO_2/Year

CO_2 Emissions (Power consumption)

60% Reduced

Reduction amount **0.06** t-CO_2/Year

EXA Series

CO_2 Emissions (Power consumption)

0.0387 t-CO_2/Year

* CO_2 emissions are converted based on the amount of electricity consumed when power is supplied 6 times/hr. and power is supplied for 1 minute. Please refer to P.1 for CO_2 emissions calculation conditions (our calculation method).

*1: Trial calculation with ø6 fittings, primary pressure: 0.5 MPa, secondary pressure: open to the atmosphere.

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Durability count 10 million cycles or more!*1

Air booster ABP2-HP1 Series

Reduce waste | Reduce maintenance | Easy installation | Low noise

Compressors consume a lot of power and emit a lot of CO_2. Why not reduce the discharge pressure of the main compressor and use an air booster to increase pressure only where necessary to reduce power consumption?

Product features

- **Stable operation with proprietary technology**
- **Long service life using a switching valve with high durability**

High durability component HP Series

Compressor 0.7 MPa

CO_2 Emissions (Power consumption)

40.7 t-CO_2/Year

Output 75kW

0.7 MPa

CO_2 Emissions (Power consumption)

14% Reduced

Reduction amount **5.7** t-CO_2/Year

Compressor 0.5 MPa + Boosting by ABP2

CO_2 Emissions (Power consumption)

35.0 t-CO_2/Year

Output 75kW

0.5 MPa

+

* CO_2 emissions are converted based on the power consumption of a 75kW compressor. Please refer to P.1 for CO_2 emissions calculation conditions (our calculation method).

*1: Based on our specified conditions.

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Grasp the current **Air Consumption**

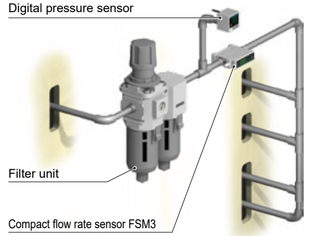
Compact flow rate sensor (RAPIFLOW)® FSM3 Series

Finding air leaks in your facility can be difficult. Why not try to save energy by understanding the current air consumption?

Visualized air consumption

Strong Point!!

Use the FSM3 flow sensor to monitor air consumption in facilities that use air equipment.



Flow rate range

500 ml/min to 1000 L/min

Features

- **IO-Link compatible**
  Continuous monitoring and remote control are enabled
- **Reduced pressure loss**
  Flow path redesign reduces pressure loss by up to 50%

CC-1390

Please try before purchase.

(Japan only)

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High-speed control of 0.5 sec is possible

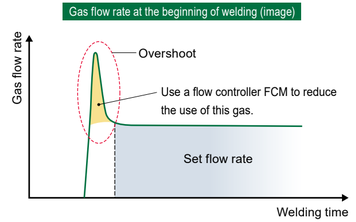
Compact flow rate controller RAPIFLOW® FCM Series

Would you like to control the flow of shielding gas (e.g. argon) for welding to reduce waste of gas usage?

Reduced gas consumption under quantitative control

Strong Point!!

The introduction of a flow controller FCM reduces the occurrence of overshoot. It reduces the use of excess gas.



Flow rate range (full scale flow rate)

500 ml/min to 50 L/min

Features

High response

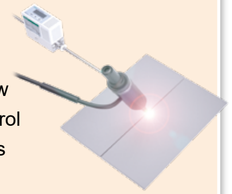
Equipped with micro-machined platinum sensor

As flow rate is quickly stablized, it also leads to faster equipment tact.

Applications

Flow rate control of argon gas for welding

Available with a broad flow rate range. Flow rate control of argon gas for welding is possible.



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Automation of the entire plant

IO-Link Compatible Components

IO-Link communication enables continuous monitoring and device error checking. Why don't we solve the labor shortage by remote operation?

Improving plant productivity with IoT

Compact flow rate sensor
FSM3 Series
- Gas type can be switched (5 types)
- Pressure loss reduction of max. 50% (compared with conventional)

Compact flow rate controller
FCM Series
- Compatible with various fluids
- High speed control available

Digital pressure sensor
PPX Series
- 14% less power (compared to conventional)
- With convenient functions such as copy function

Digital gap switch
GPS3 Series
- Flow path blockage indicator lamp
- Orifice easy disassembly

Electro-pneumatic regulator
EVD Series
- Built-in microcomputer for higher functionality
- Achieves high precision and high response

Karman Vortex Flow Rate Sensor
WFK2 Series
- Compatible with fluorine-based fluids
- With fluid temperature measuring function

Capacitance electromagnetic flow sensor
WFC Series
- No clogging with Flo-Thru structure
- Enhanced noise resistance

Pilot operated 3, 5-port valve
4G*R Series
- Low friction/long service life realized
- Improved responsivity after startup

Electric 2-Finger Gripper
FFLD Series
- Long stroke
- Built-in controller

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Realization of **non-stop production facilities**

Predictive maintenance

Production facilities that never stop are needed to improve productivity. Why not detect abnormalities in pneumatic components and replace them before they break?

Detects abnormalities in advance Predictive maintenance

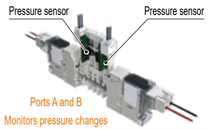
Strong Point!!

Detects abnormal secondary pressure in solenoid valves

With pressure sensor
Pilot operated 5-port valve

4GB*R Series

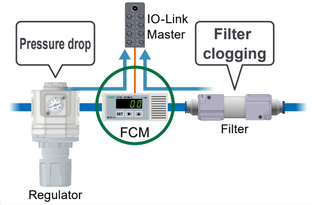
Detects abnormal valve operation through sensor output monitoring.



Self-error detection and peripheral system error detection

Flow rate controller

FCM Series



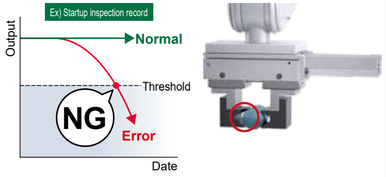
Monitoring attachments for abnormal gripping and jigs with changes in output

Length measurement function
Linear Slide Hand

LSHM-HP2 Series

Thin with length measuring function
Long stroke hand

LSTM-HP2 Series



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CKD Corporation

[Website]
https://www.ckd.co.jp/en/

Head Office・Plant	2-250, Ouji, Komaki, Aichi 485-8551	TEL(0568)77-1111	FAX(0568)77-1123
Tokyo Office	4F, Bunkahousou Media Plus, 1-31-1, Hamamatsu-cho, Minato-ku, Tokyo 105-0013	TEL(03)5402-3620	FAX(03)5402-0120
Osaka Office	6F, PMO EX Shin-Osaka, 4-2-10 Miyahara, Yodogawa-ku, Osaka 532-0003	TEL(06)6396-9630	FAX(06)6396-9631

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