CKD

New Products

Large flow Pulsed blow valve BNPL Series



CKD's Pulse Blow Valve
The choice for reducing energy consumption and CO_2 emissions

Air reduction*

96 %



10A/15A

20A/25A

*Reference value under our test conditions. Air reduction rate for 20A/25A.

CKD Corporation

CC-1692AA

Large-flow pulse blow valve

BNPL Series

Pulsed blow saves air

Lineup of 4 bore sizes matched to large workpieces

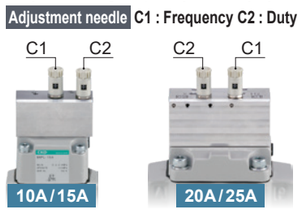


Quantified frequency and duty ratio

Employs a graduated adjustment needle

Intuitive adjustment while visually confirming frequency and duty cycle





For frequency and duty adjustment methods, see P. 5.

Protects adjustment needle

Option with protective cover

Protects the knob and prevents malfunction.



Long service life

Durability of 100 million cycles or more

Achieving durability of 100 million cycles or more through our company's proprietary testing

Durability
100M
cycles or more

Meets global standards

CE UKCA cULus RoHS

Wide range of bore sizes

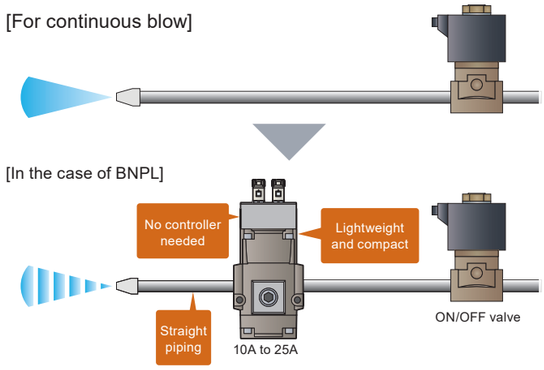
Connection port size [Rc/NPT/G]

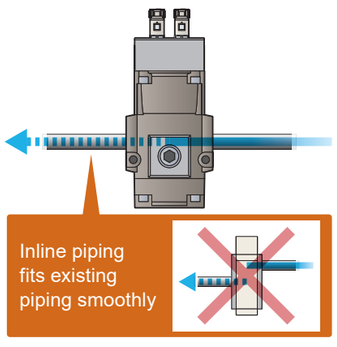
10 15 20 25

Port size
4
Types

Easy installation using existing piping

Add one unit to existing continuous-blow piping to convert it to a pulse-blow circuit.



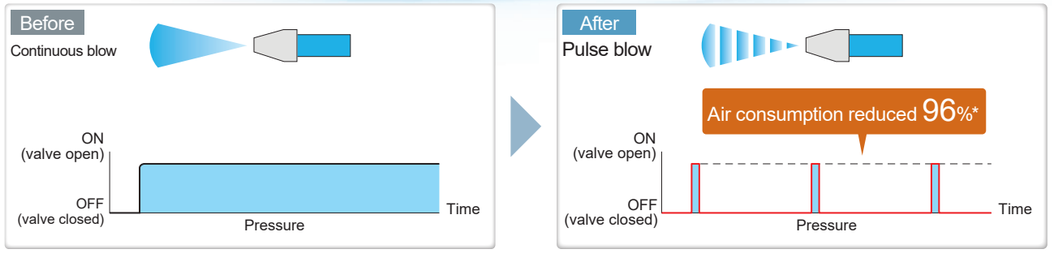


Contributing to "Eco*"

* Ecology & Economy

Eco through air reduction

96 % reduction in continuous blow ratio



* These are reference values obtained under our company's test conditions.

Reducing air consumption also reduces electricity consumption.

Item	Continuous blow	Pulse blow
Air consumption per unit (0.5 MPa, 1.3 Hz, secondary sideø8)	1800 L/min (ANR)	**72 L/min (ANR)**
Annual air consumption (250 days/year, 8 h/day)	216,000 m^3	**8,640 m^3**
Annual CO_2 emissions	12.96t - CO_2	**0.52t - CO_2**
Annual power consumption	22,898 kWh	**916 kWh**

Replaced with one pulse blow unit

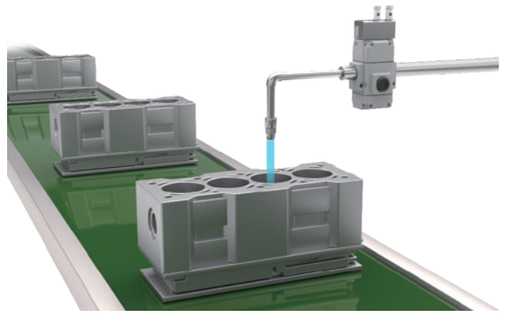
Saves
12.44 t-CO_2/year

Reference
CO_2 emissions per 1 m^3 of compressed air : 60 g

Application examples

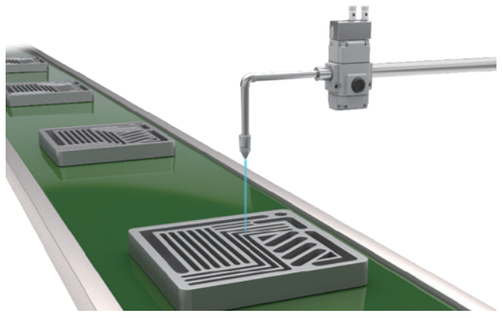
Water drainage

By making the air blow after washing automotive parts intermittent, air consumption can be significantly reduced.



Foreign matter removal

Even cutting chips in machined grooves can be removed efficiently with air savings using high-flow pulse blow.





Large-flow pulse blow valve

BNPL Series

● Connection port size : Rc, NPT, G3/8 to 1

CE UKCA RoHS

For compatible detailed model numbers, please visit our company website.

Model No. Notations

BNPL - 10 A - C

- BNPL: Model number
- 10: ❶ Port size
- A: ❷ Piping thread type
- C: ❸ Options

❶Connection port size

Code	Contents
10	3/8
15	1/2
20	3/4
25	1

❷Piping thread type

	Code	Contents
	A	Rc thread
*1	N	NPT thread
*1	G	G thread

*1 : This is a custom product.

❸Options

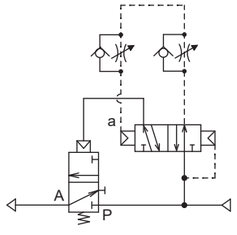
Code	Contents
Blank	Without protective cover
C	With protective cover

● Option Model No. Notations

BNPL - PROTECTIVE - COVER - 1

Code	Contents
1	For 10A/15A
2	For 20A/25A

Circuit symbol



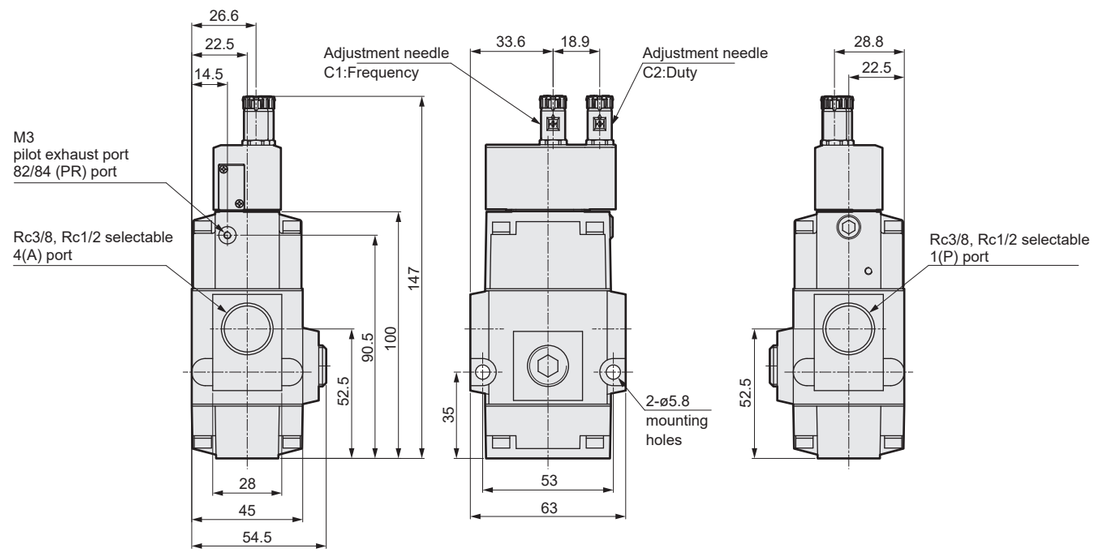
Specifications

Item		BNPL			
Valve construction		Internal pilot type with pulse adjustment			
Fluid used		Compressed air			
Maximum operating pressure	MPa	0.7			
Minimum operating pressure	MPa	0.2			
Proof Pressure	MPa	1.05			
Connection port sizes P, A ports : Rc/NPT/G		3/8	1/2	3/4	1
Effective orifice area	mm²	75	90	175	200
Weight	kg	0.55		1.35	
Mounting orientation		Universal			
Recommended Frequency	Hz	2 to 4 (*1)			

*1 : This is the recommended value at a supply pressure of 0.5 MPa. The frequency varies depending on operating conditions (supply pressure, pressure drop, pipe diameter, pipe length, nozzle, etc.), so exercise particular caution when operating at 4 Hz or above.

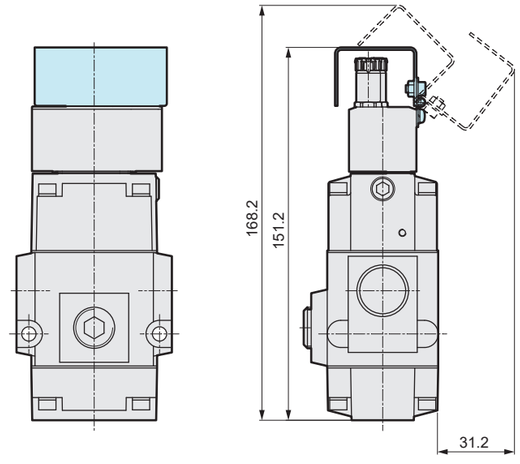
External dimensions (10A/15A)

● BNPL-10A/15A



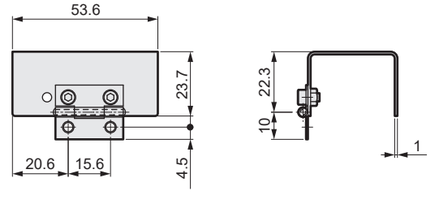
External dimensions with options

● With protective cover (C)



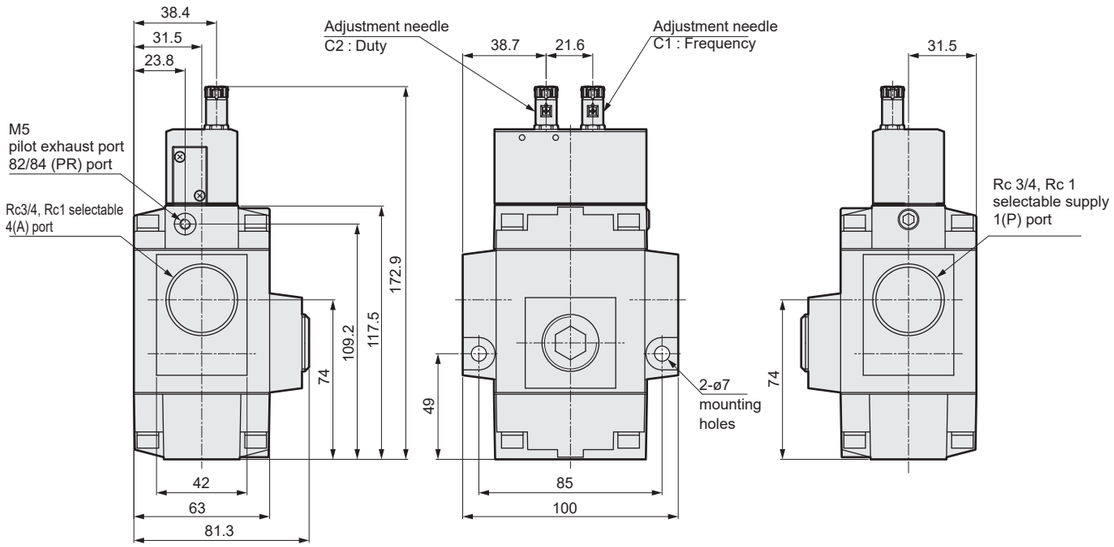
Protective cover external dimensions drawing

● BNPL-PROTECTIVE-COVER-1



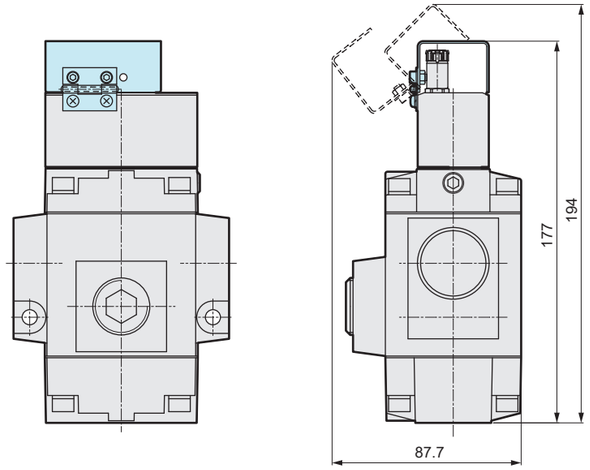
External dimensions (20A/25A)

● BNPL-20A/25A



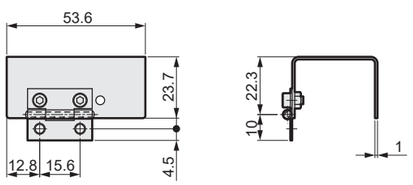
External dimensions with options

● With protective cover (C)



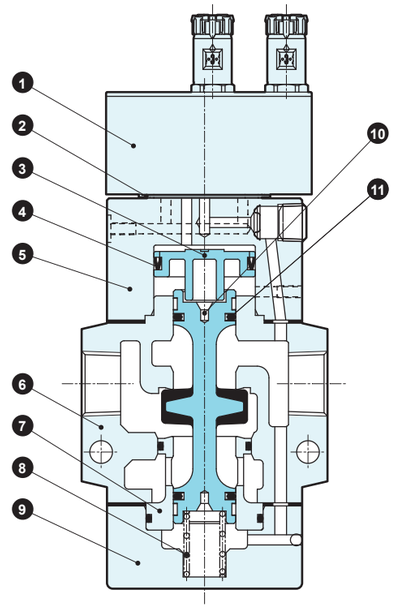
Protective cover external dimensions drawing

● BNPL-PROTECTIVE-COVER-2

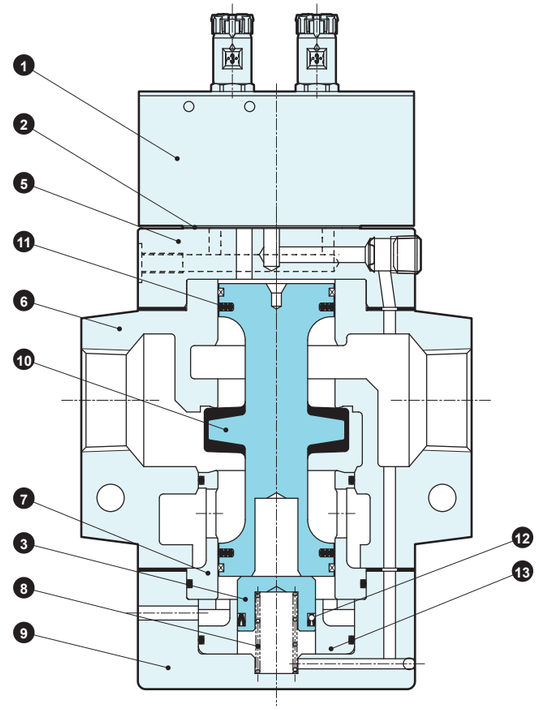


Structure·Materials

● BNPL-10A/15A



● BNPL-20A/25A



Part number	Part Names	Material		Part number	Part Names	Material	
1	Pulse generator	-	-	8	Spring	SUS304	Stainless steel
2	Gasket	HNBR	Hydrogenated nitrile rubber	9	Cap	AC4C	Aluminum casting
3	Piston	POM	Acetal resin	10	Valve stem	NBR, A2017	Nitrile rubber, aluminum
4	Packing	NBR	Nitrile rubber	11	Packing	HNBR	Hydrogenated nitrile rubber
5	Stuffing	AC4C	Aluminum casting	12	MY Packing	HNBR	Hydrogenated nitrile rubber
6	Body	AC4C	Aluminum casting	13	Piston bush	A6061	Aluminum
7	Valve seat	A6061	Aluminum				

For maintenance parts, please visit the CKD Component Products site
(https://www.ckd.co.jp/kiki/en/) → "model No." → Maintenance Parts.

Frequency / Duty adjustment method

■ Frequency [Hz]
Represents the number of cycles repeated per second.
The frequency is adjusted by turning the adjustment needle of C1.

■ Duty cycle
Indicates the ON / OFF signal ratio within one cycle.
Adjust the duty ratio by turning the adjustment needle C2.

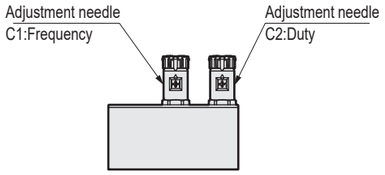
Refer to the frequency / duty characteristic table below for adjustment values.

*1 : The frequency varies depending on operating conditions (supply pressure, pressure drop, pipe diameter, pipe length, nozzle, etc.), so exercise particular caution when operating at 4 Hz or above.

Frequency / Duty Characteristics

· Connection port size : 15A

· Supply pressure : 0.5 MPa
· Secondary-side piping length : 15A x 150 mm
· Tip nozzle diameter : ø5



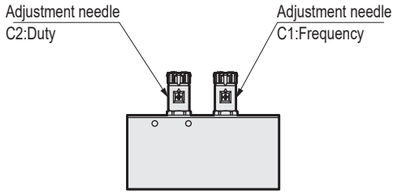
C2 \ C1	Adjustment needle scale (Frequency) 0.5	1	2	3	4	5
Adjustment needle scale (Duty) 0.5	1.2	1.6	1.7	1.7	1.7	1.7
	47%	30%	17%	12%	9%	8%
1	1.7	2.4	2.8	3.0	3.0	3.0
	62%	43%	25%	18%	13%	11%
2	2.1	3.3	4.6	5.2	5.5	5.7
	78%	62%	41%	30%	23%	19%
3	2.2	3.6	5.4	6.3	6.8	7.1
	84%	70%	51%	39%	31%	26%
4		3.9	6.0	7.3	8.0	8.5
		75%	58%	46%	39%	33%
5		4.2	6.5	8.0	9.0	9.6
		79%	64%	53%	44%	38%
6		4.8	6.9	8.7	9.8	10.5
		82%	67%	56%	48%	42%
7		5.1	6.9	8.9	10.3	11.2
		82%	70%	59%	51%	45%
8		4.8	7.3	9.0	10.4	11.5
		84%	72%	62%	54%	48%

Upper row : Frequency [Hz]
Lower row : Air reduction rate (OFF-Duty)

* The characteristics for connection port size 10A are similar.

· Connection port size : 25A

· Supply pressure : 0.5 MPa
· Secondary-side piping length : 25A x 180 mm
· Tip nozzle diameter : ø8



C2 \ C1	Adjustment needle scale (Frequency) 0.5	1	2	3	4	5	6	7	8
Adjustment needle scale (Duty) 0.5	0.8	1.3	1.7	1.9	1.9	1.8	2.1	1.9	1.9
	73%	51%	30%	21%	16%	12%	11%	9%	7%
1	1.0	1.8	2.5	3.1	2.9	3.4	3.5	3.5	3.3
	84%	69%	44%	35%	24%	22%	19%	16%	13%
2	1.1	2.1	3.6	4.4	5.1	5.3	5.7	5.8	5.7
	96%	93%	63%	50%	43%	34%	31%	27%	22%
3	1.3	2.3	4.0	5.2	6.1	6.7	7.1	7.3	7.5
	96%	93%	87%	83%	79%	45%	39%	35%	32%
4	1.3	2.4	4.7	5.7	6.6	7.4	8.0	8.5	8.8
	96%	93%	85%	82%	79%	76%	73%	71%	70%
5		2.4	4.8	6.5	7.9	8.6	8.9	9.2	9.5
		94%	85%	79%	75%	72%	72%	70%	69%
6			4.8	6.6	8.1	9.2	10.1	10.7	11.1
			86%	80%	75%	71%	68%	65%	64%
7			4.9	6.8	8.3	9.4	10.4	11.2	11.7
			87%	81%	76%	71%	67%	64%	62%
8			4.9	6.8	8.5	9.7	10.8	11.5	12.2
			87%	82%	76%	72%	68%	64%	62%

Upper row : Frequency [Hz]
Lower row : Air reduction rate (OFF-Duty)

* The characteristics for connection port size 20A are similar.

Safety Precautions

Be sure to read this section before use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured. It is important to select, use, handle and maintain the product appropriately to ensure that the CKD product is used safely. Observe warnings and precautions to ensure device safety. Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience.

2 Use this product in accordance with specifications.
This product must be used within its stated specifications. In addition, never modify or additionally machine this product.
This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments.
(Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)
❶ Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
❷ Use for applications where life or assets could be significantly affected, and special safety measures are required.

3 Observe organization standards and regulations, etc., related to the safety of device design and control, etc.
ISO4414, JIS B 8370 (Pneumatics fluid power - General rules and safety requirements for systems and their components)
JFPS2008 (Principles for pneumatic cylinder selection and use)
Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.
❶ Inspect and service the machine and devices after confirming safety of all systems related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility.Discharge any compressed air from the system, and pay attention to possible water leakage and leakage of electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

5 Observe warnings and cautions in the following pages to prevent accidents.

■ The precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

DANGER: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, and when there is a high degree of emergency to a warning.

WARNING: If handled incorrectly, a dangerous situation may occur, resulting in death or serious injury.

CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation.
Every item provides important information and must be observed.

Warranty

1 Warranty period
The product specified herein is warranted for one (1) year from the date of delivery to the location specified by the customer.

2 Warranty coverage
If the product specified herein fails for reasons attributable to CKD within the warranty period specified above, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge. However, following failures are excluded from this warranty :
1) Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or the Instruction Manual.
2) Failure caused by use of the product exceeding its durability (cycles, distance, time, etc.) or caused by consumable parts.
3) Failure not caused by the product.
4) Failure caused by use not intended for the product.
5) Failure caused by modifications / alterations or repairs not carried out by CKD.
6) Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
7) Failure caused by acts of nature and disasters beyond control of CKD.
The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.
Note : For details on the durability and consumable parts, contact your nearest CKD sales office.

3 Compatibility check
The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Safety Precautions

Always read this section before use. For general valve precautions, refer to Directional Control Valve (1) (RJ-011AA).

Individual Precautions:Large-Flow Pulse Blow Valve BNPL Series

During design and selection

■ Usage Instructions

- Frequency varies depending on operating conditions. Apart from the adjustment needle, the following conditions significantly affect the operating frequency
  ① Piping diameter and piping length (primary side, secondary side)
  ② Supply pressure (higher pressure results in faster frequency)
  ③ Nozzle (smaller secondary-side outlet results in faster frequency)
- There are individual variations in the graduation marks of the adjustment needle.
- The relationship between the adjustment needle graduation marks and frequency / OFF-Duty is as shown in the characteristic table ; however, due to individual variations, there may be positions where pulse air is not generated. Additionally, there may be variations of approximately 1 Hz due to individual differences.
- Even when the adjustment needle is fully closed, a slight blow will occur ; therefore, do not use the adjustment needle setting for the purpose of stopping operation.
- To set the valve to continuous blow mode, block the stuffing pilot exhaust port (PR) with a plug or equivalent.
- Adjusting one adjustment needle will also slightly change the other adjustment.

■ During mounting, installation, and adjustment

- Long secondary-side piping reduces the air-saving effect. Install the valve as close to the workpiece as possible (within 1 m).
- Flush the primary and secondary piping thoroughly to remove all dust and foreign matter before connecting the valve.
- Do not connect an air gun, pressure-reducing valve or similar to the output port : the resulting back-pressure makes the product unusable.

⚠ WARNING

■ Fluid Temperature

Use within the specified fluid temperature range.

■ Ambient Environment

① Do not use in atmospheres containing corrosive gases or substances that attack the component materials.
② Do not use near heat-generating sources or in locations exposed to radiant heat.
③ Use within the specified ambient temperature range.
④ When using in cold regions, implement appropriate anti-freezing measures.
⑤ In locations where oil, welding spatter, or similar substances may come into contact with the product, apply appropriate protective measures.

⚠ Caution

■ Regarding ultra-dry air

The interior is initially lubricated with grease. This product may not be suitable for use when ultra-dry air is required throughout the circuit up to the end of the line.

■ Minimum operating pressure

0.2 MPa or higher is required to operate the BNPL Series. If the fluid supply port piping cross-section is restricted, the pressure drop when the valve actuates can make operation unstable.

■ Ensuring maintenance space

Ensure sufficient space for maintenance and inspection.

■ Regarding vibration

Install and use in a location free from vibration.

■ Wear protective goggles and earplugs, as air blow operations may cause flying debris to enter the eyes and may result in noise-induced hearing loss.

■ If left in locations with heavy dust or where dust is scattered, there is a possibility that dust may enter the interior or cause clogging of the silencer, resulting in malfunction.

■ Do not apply excessive rotational torque when adjusting the needle.

■ Read the instruction manual before using this product, and use it appropriately.

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Components Product Site (https://www.ckd.co.jp/kiki/en/) → 'model No.' → Instruction Manual.

Related Products

Pulse Blow Valve BNP Series

Two convenient types to suit your application (Gun Type BNP-G / Unit Type BNP-U)

■ Contributing to carbon neutrality
Reduces air consumption by 75 % compared to continuous blow
■ High reliability
Incorporates the main valve section of a highly reliable, long-life solenoid valve
■ Ease of use
Frequency can be easily adjusted with one turn of the knob
Supply side equipped with push-in fitting (BNP-U)
Low-profile compact design (BNP-U)
Design for easy aiming and gripping (BNP-G)
Equipped with needle protection cover (BNP-G)

Click!

Catalog No. CC-1640AA



Air blow nozzle BN□ Series

■ Wide variety of variations
A lineup of various shapes to suit different industries and applications
■ Energy saving
Adopts a special structure that amplifies air by entraining surrounding air, enabling powerful air ejection even with low air consumption
■ Uniformity
Adopts a special structure that ejects air more uniformly onto the target area, achieving stable workpiece quality
■ Low noise
A quiet design that suppresses turbulence for a worker-friendly environment, with flat type and round type available to suit the application

Click!



Pilot kick-type General purpose valve ADK Series

■ 2-port solenoid valve for multi-fluid control
Suitable for controlling a wide variety of fluids including air, water, gas, oil, and vacuum
■ Extensive options and variations
A rich selection of options is available, including wetted-part materials and coil housings
■ Diverse series variations
A wide range of series is available covering piston type, diaphragm type, connection port size, orifice diameter, operating pressure, and more
■ DC low-wattage series
Achieves significant energy savings with a power consumption of 7 W

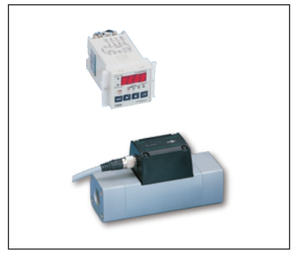
Click!



Compressed air flow sensor (Flurex) PFD Series

■ Six rich variations covering a wide flow range
25 L / min to 16000 L / min
■ Abundant output variations
digital display, switch output, totalizing pulse output, and analog output
■ No correction required
direct digital reading : Tedious pressure correction and temperature correction are unnecessary. The value shown on the digital display can be read directly as-is.

Click!



For details, please refer to the CKD Component Products Site (https://www.ckd.co.jp/kiki/en/) → "Model No.".

WORLD-NETWORK



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ASIA

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- 杭州支店(HANGZHOU BRANCH OFFICE)
- 無錫支店(WUXI BRANCH OFFICE)
- 昆山支店(KUNSHAN BRANCH OFFICE)
- 蘇州支店(SUZHOU BRANCH OFFICE)
- 常州支店(CHANGZHOU BRANCH OFFICE)
- 南京支店(NANJING BRANCH OFFICE)
- 合肥支店(HEFEI BRANCH OFFICE)
- 成都支店(CHENGDU BRANCH OFFICE)
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