

Clean air unit CAU30 Series

CLEAN AIR UNIT



Realizing a clean blow system

with one unit

High-rigidity aluminum body with transparent filter

Piping-free unit type

Just insert tubes for piping. The clean air unit significantly saves the assembling work and its compact body saves space. Simplified model number management for ordering

All oil-prohibited specifications

All fluid-path parts are cleaned and free of oil, and are manufactured in a dust-free room from assembling to packaging.

Oil-prohibited regulator
(Relief type, no relief type)

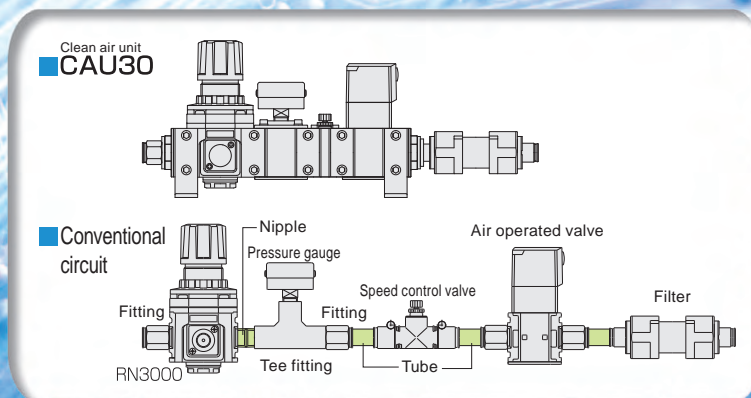
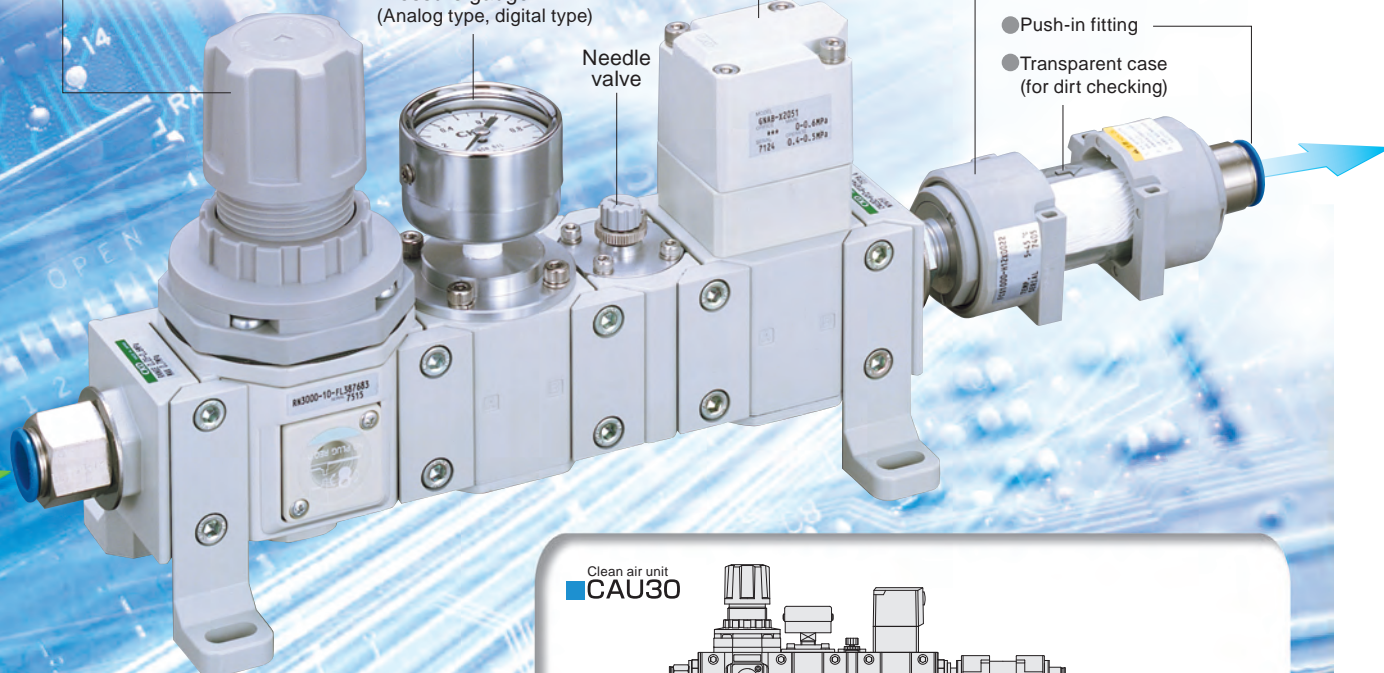
Pressure gauge
(Analog type, digital type)

Needle valve

Air operated valve
(Single operation, multiple operation)

Clean filter valve
(Filtration: 0.01 μm , removal ratio: 99.99%)

- Push-in fitting
- Transparent case (for dirt checking)



Clean air unit
CAU30 Series

Compact and clean air supply unit of the all-oil-prohibited specification requiring little piping work



CKD
Green
Technology

High-rigidity aluminum body

The aluminum body has high rigidity (except for the filter).

Two-flow type available

Provides a wider variation of air supply.



Providing high air flow

Provides high stable flow of 400 l/min (ANR).

Modular type allowing flexible combination

Can be combined with various instruments for different uses. This unit can be connected with air operated valves and needle valves, which was not possible before.

Best suited to the liquid crystal industry

This unit has been developed mainly for ionizers. It can also be used for automobile parts, foods, and medication.

High precision filtration of 0.01 μm

A hollow fiber membrane element is used as a filter. Particle filtration of 0.01 μm and removal ratio of 99.99% are realized.

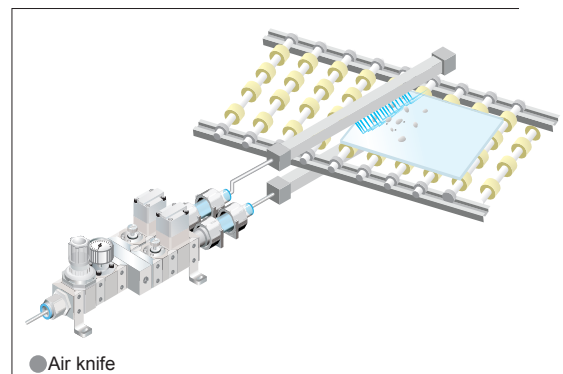
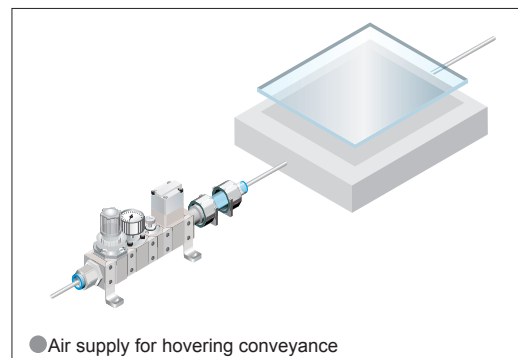
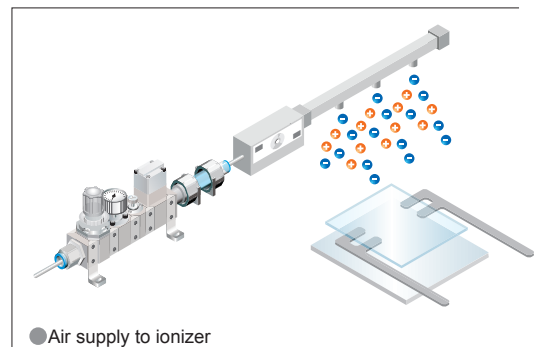
Visual dirt checking

The filter with its transparent case allows visual checking of dirt. This eases the maintenance work.

Complied with RoHS directive

All substances that can adversely affect the environment, including lead and hexavalent chrome, have been eliminated.

Major applications



RoHS



Safety Precautions

Always read this section before starting 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 in handling.
- 2** Use this product in accordance with specifications.
This product must be used within its stated specifications. Do not attempt to modify or additionally machine the product. This product is intended for use as a general-purpose industrial device or part. It is not intended for use outdoors or for use under the following conditions or environment.
(If you consult CKD upon adoption and consent to CKD product specification, it will be applicable; however, safeguards should be adopted to circumvent dangers in the event of failure.)
 - ① Use for special applications requiring safety including nuclear energy, railroad, aviation, ship, vehicle, medical equipment, equipment or applications coming into contact with beverage or food, amusement equipment, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
 - ② Use for applications where life or assets could be adversely affected, and special safety measures are required.
- 3** Observe corporate standards and regulations, etc., related to the safety of device design and control, etc.
ISO 4414, JIS B 8370 (pneumatic system rules)
JFPS 2008 (Principles for pneumatic cylinder selection and use)
Including High Pressure Gas Maintenance Law, Occupational Safety and Sanitation Laws, other safety rules, body standards and regulations, etc.
- 4** Do not handle, pipe, or remove devices before confirming safety.
 - ① Inspect and service the machine and devices after confirming safety of the entire system related to this product.
 - ② Note that there may be hot or charged sections even after operation is stopped.
 - ③ When inspecting or servicing the device, turn off the energy source (air supply or water supply), and turn off power of the facility. Discharge any compressed air from the system, and pay attention to possible and leakage of water and electricity.
 - ④ 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 on the pages below to prevent accidents.

■ The safety cautions 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, or when there is a high degree of emergency to a warning. |
|  WARNING | When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries. |
|  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. In any case, important information that must be observed is explained.

Disclaimer

- 1** Warranty period
“Warranty Period” is one (1) year from the first delivery to the customer.
- 2** Scope of warranty
In case any defect attributable to CKD is found during the Warranty Period, CKD shall, at its own discretion, repair the defect or replace the relevant product in whole or in part, according to its own judgment.
Note that the following faults are excluded from the warranty term:
 - (1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
 - (2) Failure caused by other than the delivered product
 - (3) Use other than original design purposes.
 - (4) Third-party repair/modification
 - (5) Faults caused by reason that is unforeseeable with technology put into practical use at the time of delivery.
 - (6) Failure attributable to force majeure.The warranty mentioned here covers the discrete delivered product. Only the scope of warranty shall not cover losses induced by the failure of the delivered product.
- 3** Compatibility confirmation
In no event shall CKD be liable for merchantability or fitness for a particular purpose, notwithstanding any disclosure to CKD of the use to which the product is to be put.



For safety

Pneumatic components: Warnings, cautions

Always read this section before starting use.

Design and selection

1. Common

WARNING

- Use this product in accordance with the specifications range.
- This product is for industrial use only. Must not be used in components or circuits for medical equipment or components that involve human lives.
- Take measures to prevent harm to operators or objects in case this product fails to operate properly.
- Understand compressed air features before designing a pneumatic circuit.
- Refer to device catalogs for details on precaution.

2. Regulator

WARNING

- Install a safety device where an output pressure exceeding the regulator's set pressure value could result in damage or faulty operation of secondary side devices.
- If the regulator cannot be used with the secondary side sealed circuit or balance circuit, contact CKD. Depending on use, such as when back pressure rises, set pressure may increase by 0.2 MPa.

CAUTION

- Secondary pressure flows to the primary side when primary pressure is released.
Secondary fluids flowing to the primary side could cause other devices to malfunction. Provide a circuit that maintains pressure.
- Set the regulator's secondary pressure to 85% or less than that of the primary side. The pressure could drop further.
- When used in applications where primary pressure is 0.7 MPa or more, keep the difference between primary and set pressure within 0.4 MPa.
Pulsation could occur if the difference in pressures is high or if secondary piping is large. If so, lower the primary side pressure or restrict the secondary line. Consult with CKD if the pulsation still does not cease.

3. Needle

CAUTION

- This valve can not be used as a stop valve that has no leakage. Due to its structure, a slight leakage has been allowed.

4. Air-operated valve

WARNING

- This product can not be used as an emergency shut off valve.
Valves in this catalog are not designed to ensure safety such as emergency shutoff. When using in such a system, provide other measures to ensure safety.

CAUTION

- External pilot air
 - ① Drainage measures: Compressed air contains high levels of drainage (water, oxidized oil, tar, foreign matter). This may significantly reduce the reliability of the pneumatic components. Improve air quality and clean air by dehumidifying with an after cooler or dryer, removing foreign matter with a filter, and removing tar with a tar removal filter, etc.
 - ② Filter: Install a filter with a 5- μ m or less filter element.

5. Inline clean filter

WARNING

- Do not use this product in an atmosphere containing organic solvents or chemicals, etc., or where the product could come in contact with them.
The polyamide housing may be damaged.

CAUTION

- Do not flow over the maximum flow rate.
Doing so may degrade the filtering performance or damage the element membrane.
 - This device cannot be used as an absolute filter.
The filtration performance is 99.9% within specified conditions.
- * For precautions on the digital pressure gauge (PPD3-R10N-6B-P80), see the catalog of the CKD clean instrument system (No.CB-033S).

Installation and adjustment

1. Common

⚠ CAUTION

- Avoid installing this product where it is exposed to direct sunlight.
- Avoid installing this product in a location having vibration or impact.
- Securing maintenance space
 - Secure sufficient space for maintenance and inspection.
- Always thoroughly read the Instruction Manual before installing this product.
- Check the flow direction by arrows and connect correctly.
- Connect pipes without applying excessive force on the product.
 - When piping or during use, do not apply tension, pressure, bending or external force from the tube on the product.
- Select a correct piping tube.
 - Use CKD soft nylon tube or urethane tube.
 - Consult with CKD for other fluorine resin tubes.
- Securely insert piping into the push-in joint before use.
- When supplying compressed air for the first time after piping, do not apply high pressure suddenly.
 - Connected piping could be dislocated and tubing could jump about.
- Flush and wash pipes when using them.
 - Dirt or foreign materials in piping will lower product performance.
- Air quality: The recommended air quality is compressed air grade 1.3.1 as per JIS B 8392-1:2000.
 - Use compressed air free of oxidized oil, tar, or carbon from the air compressor.
 - Use a CKD clean air system depending on the application.

Compressed air quality grade - JIS B 8392-1:2000

Grade	Maximum particle diameter (μm)	Minimum pressure dew point (°C)	Maximum oil density (mg/m ³)
1	0.1	-70	0.01
2	1	-40	0.1
3	5	-20	1
4	15	3	5
5	40	7	25
6	—	10	—

For example, grade 1.2.1 indicates solid particles of 0.1 μm, a pressure dew point of -40°C, and an oil density of 0.01 mg/m³.

- Do not move or swing the product holding the adjustment knob, the clean filter, or the pressure gauge on the regulator.
 - Hold the body of the product when carrying the the product.
- Refer to device catalogs for details on precaution.

2. Needle

⚠ CAUTION

- Do not turn the knob too strong when you fully close or open it. Do not adjust the needle by pinching the lock nut. Doing so will gall or break the needle.
- Check that lock nuts are not loose.
- Check the number of turns of the needle valve.
 - The needle valve has dislocation prevention, but the needle could break or gall if you turn it too far. Check the number of turns for the product used.
- Fully close the needle, and open to adjust speed.
 - Turning the needle to the right closes the valve, and turning it to the left opens the valve.

3. Air-operated valve

⚠ CAUTION

- When piping, pay attention to the supply port on the pilot operation side.

Model no.	Supply port on the pilot operation side
CAU30-*V1*	X
CAU30-*V3*	X and Y

- See the table below for the connection torque for pilot air piping.

Nominal pipe diameter	Recommended torque for pipe connection (Nm)
Rc1/8	7 to 9

- Grease is used at the pilot part.
In use of the single acting type in a clean room, pay attention to the exhaustion of the pilot air.

4. Pressure gauge

⚠ CAUTION

- Repeated and sudden increases and decreases in pressure and pressure pulsation must be avoided because it could adversely affect pressure gauge life.

* For precautions on the digital pressure gauge (PPD3-R10N-6B-P80), see the catalog of the CKD clean instrument system (No.CB-033S).

During use and maintenance

1. Common

WARNING

- Use within the maximum operation pressure and maximum working pressure range.

CAUTION

- Read the instruction manual thoroughly before starting maintenance or use of the product to ensure correct operation.
- At the maintenance of the product, stop supplying flow and check that there is no residual pressure.
- Do not disassemble or modify the product.
- Do not step the product, nor put the heavy things on it.
- Storage
 - Do not leave the product in a hot or highly humid atmosphere or outside of the specified range for a long time. Doing so deteriorates the resin and the rubber.
 - Consult with CKD when storing this unit outside specifications.
- Refer to device catalogs for details on precaution.

2. Air-operated valve

WARNING

- To ensure that the product is used optimally, regularly inspect the product every six months. This frequency varies with the frequency of use.

CAUTION

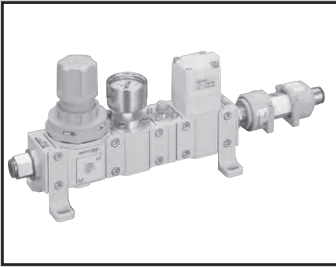
- If the product is not used for more than a month, carry out trial operation.
- Pilot air pressure
Use the pilot air pressure in accordance with the specification.

3. Inline clean filter

CAUTION

- Filter element clogging will decrease performance. Regularly inspect, clean, and replace the element.
- Regularly check the resin for cracks, damage, and other deterioration.
 - Cracks, damage or other deterioration could result in breakage, so if found, replace with a new product.

* For precautions on the digital pressure gauge (PPD3-R10N-6B-P80), see the catalog of the CKD clean instrument system (No.CB-033S).



Clean air unit

CAU30 Series

● Port size: $\varnothing 10$, $\varnothing 12$

Common specifications

Item	Clean air unit	
Working fluid	Compressed cleaning air	
Max. working pressure	MPa	0.7 (0.5 for the low pressure type)
Withstanding pressure	Mpa	1
Working temperature	°C	5 to 45
Set pressure range	MPa	0.05 to 0.6 (0.05 to 0.3 for the low pressure type)
Port size (IN/OUT)	$\varnothing 10$, $\varnothing 12$	
Filtration rating	μm	0.01 (Removal ratio: 99.99%)
Flow performance	l/min	400 Note 1
Tolerable pressure difference Note 2	MPa	0.5
Needle rotation	12 turns or more	
Pilot air pressure for valve	MPa	0.4 to 0.5
Pilot port size for valve	MPa	Rc1/8
Oil-prohibited specifications	Oil-prohibited flow paths	

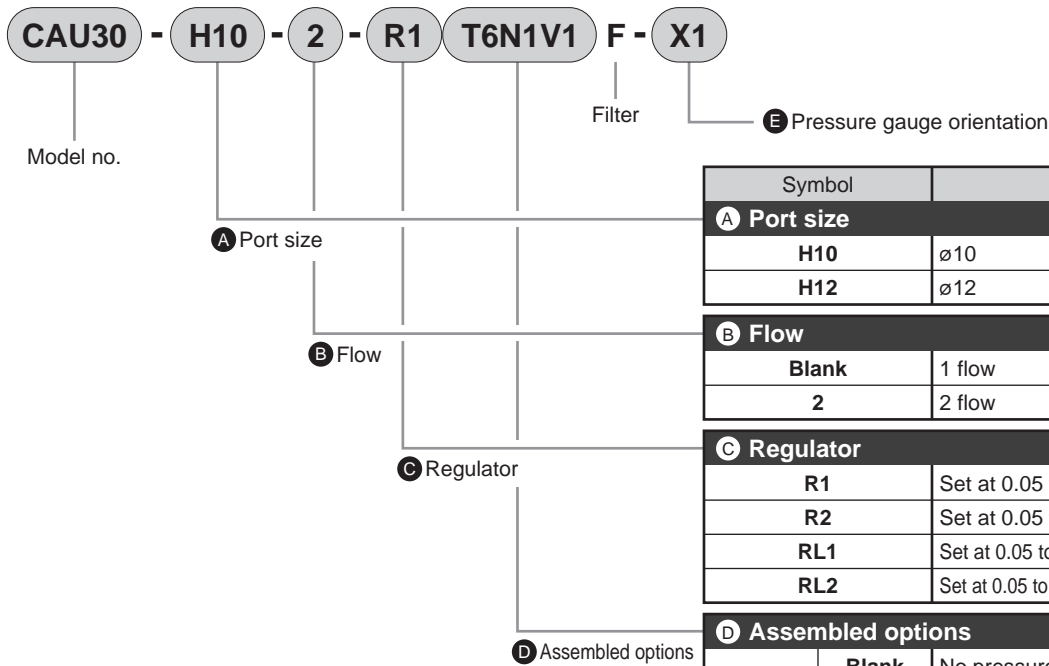
Note 1: This is the flow for a primary pressure of 0.7 MPa, a configured pressure of 0.5 MPa, and a pressure drop of 0.15 MPa. See the flow characteristics table for details.

Note 2: Pressure difference between the front and the back sides of the filter

Pressure switch specification (Digital pressure gauge: PPD3-R10N-6B)

Item	Pressure switch with display
Pressure sensor element	Pressure sensor of diffused semiconductor
Accuracy (25°C)	$\pm 2\%$ F.S.
Temperature characteristics (0°C to 50°C)	$\pm 4\%$ F.S.
Display	3-digit LED display letter height: 8 mm
Power voltage	12 to 24 VDC $\pm 10\%$
Current consumption	50 mA or less
Switch output model	Two-point output of NPN transistor open collector
Switch output current	50 mA or less
Switch output voltage fall	2.4 V or less
Switch output responsiveness	Approx. 5 msec
Analog output	1 to 5 V ± 0.1 V
Retention of configurations	EEPROM
Lead wire	Body: Oil-resistant vinyl cord 4-core (0.3 mm ²) 1 m
Protective circuit	Protection against reverse power connection and reverse switch output connection

How to order



Symbol	Description
A Port size	
H10	ø10
H12	ø12

B Flow	
Blank	1 flow
2	2 flow

C Regulator		Note 1
R1	Set at 0.05 to 0.6 MPa, relief	
R2	Set at 0.05 to 0.6 MPa, no relief	
RL1	Set at 0.05 to 0.3 MPa (For low pressure) Relief	
RL2	Set at 0.05 to 0.3 MPa (For low pressure) No relief	

D Assembled options		Note 2
Pressure gauge	Blank	No pressure gauge block
	T6 Note 3	With a pressure output port block (The pressure output port is installed with the port being open.)
	GY49 Note 4	Analog pressure gauge installed (G49D-6-□-P94)
	P31 Note 5	Digital pressure gauge installed (PPD3-R10N-6B)
Needle	Blank	No needle block
	N1	With a needle block
Air-operated valve	Blank	No air-operated valve block
	V1	Single acting type (normal close)
	V3	Double acting type

⚠ Note on model no. selection

Note 1
Pressure range of the pressure gauge (MPa)

	When RL1 or RL2 selected	When R1 or R2 selected
G49D	0 to 0.4	0 to 0.7
PPD3	-0.1 to 0.98	

- Note 2: Select options for the pressure gauge, the needle, and the air-operated valve.
- Note 3: Option T6 provides only the pressure output port block being installed. The pressure output port is Rc1/8.
- Note 4: If you select "RL1" or "RL2" for the regulator and "GY49" for the pressure gauge, this becomes a low-pressure pressure gauge (with pressure range of 0 to 0.4 MPa).
(Pressure gauge option P31 is a standard pressure gauge (with pressure range of 100 to 980 kPa).)
- Note 5: The output format when the digital pressure gauge being installed (PPD3) is the 2-point NPN transistor output (built to order).
- Note 6: The orientation of the pressure gauge in the figure is for the case of pressure GY49. Pressure gauge P31 also has the same orientation.

<Example 1 of model number>

CAU30-H10-R1GY49N1V1F

- A Port size: ø10
- B Flow: 1 flow
- C Regulator: 0.05 to 0.6 MPa, relief
- D Installation options: Analog pressure gauge (G49D), needle, air-operated valve (single acting type) installed
- E Pressure gauge orientation: Standard

<Example 2 of model number>

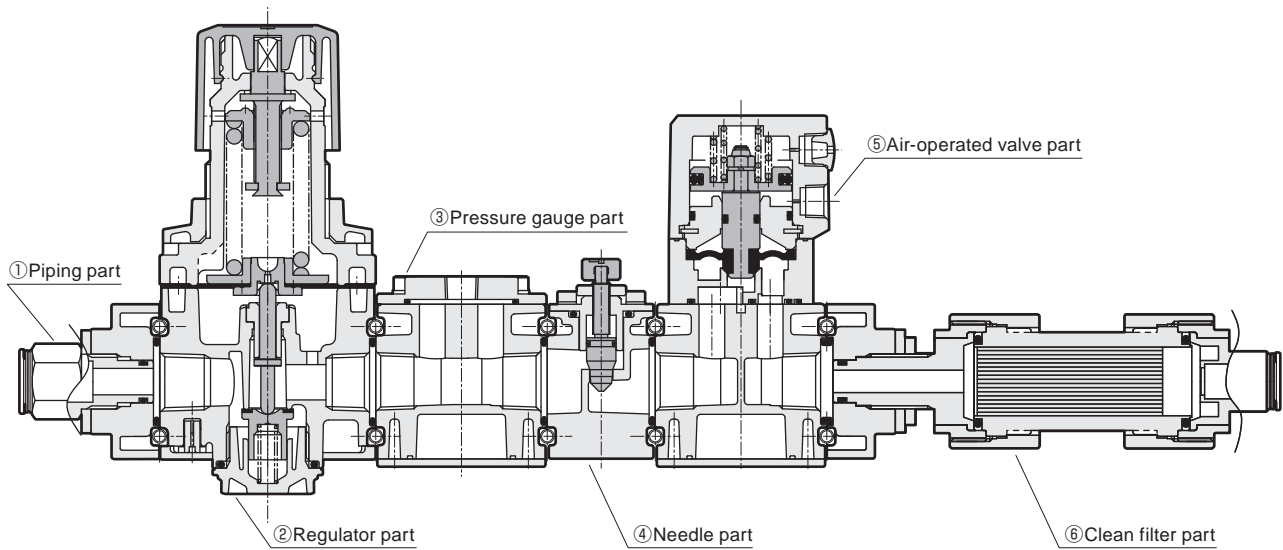
CAU30-2-H12-RL1P31V3F-X2

- A Port size: ø12
- B Flow: 2 flows
- C Regulator: 0.05 to 0.3 MPa, relief
- D Installation option: Digital pressure gauge (PPD3), Air-operated valve (double acting type) installed
- E Pressure gauge orientation: 180° clockwise

E Pressure gauge orientation		Note 6
Blank	Standard orientation	
X1	90° clockwise	
X2	180° clockwise	
X3	270° clockwise	

Clean Air Unit Series

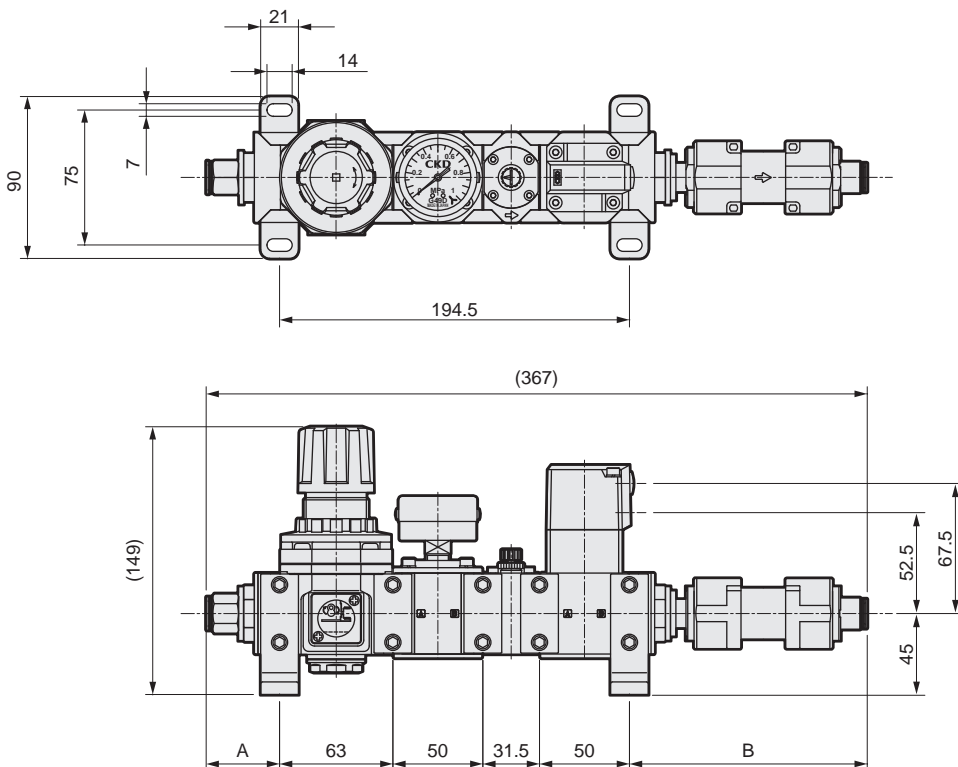
Internal structure and materials of flow path parts



No.	Part name	Materials of flow path parts	
①	Piping part	Aluminum alloy, brass (nickel plating), fluorine rubber, nitrile rubber, hydrogenated nitrile rubber	
②	Regulator part	Aluminum alloy, zinc alloy, nitrile rubber, hydrogenated nitrile rubber, fluorine rubber, polyacetal resin	
③	Pressure gauge part	Port only	Aluminum alloy, fluorine rubber
		G49D	Stainless steel, steel (chrome plating)
		PPD3	Aluminum alloy, fluorine rubber, silicon diaphragm
④	Needle part	Aluminum alloy, brass (nickel plating), nitrile rubber, fluorine rubber	
⑤	Air-operated valve part	Aluminum alloy, stainless steel, fluorine rubber, polypropylene, ethylene-propylene rubber	
⑥	Clean filter part	Aluminum alloy, fluorine rubber, polypropylene, urethane, polyamide	

Dimensions (1 flow)

● CAU30-□-R□GY49N1V□F (regulator, pressure gauge, needle, valve, filter)



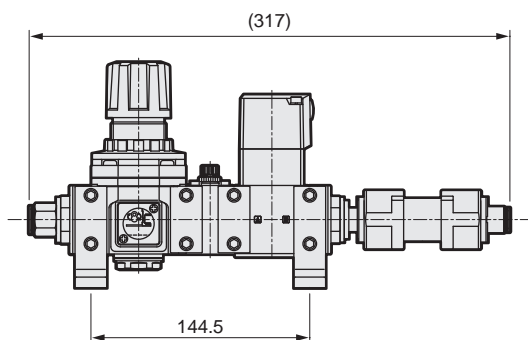
Port sizes

Port size	A	B
H10	41	132
H12	42.5	133.5

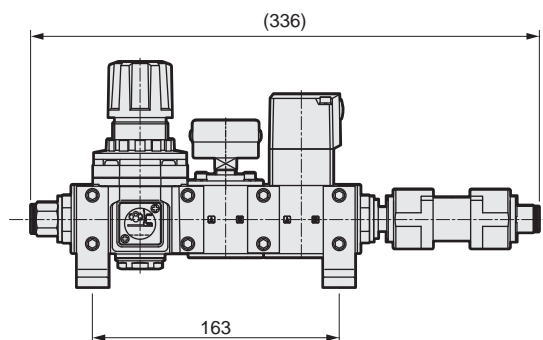
* Pressure gauges T6 and P31 have the same size as GY49.

Dimensions (1 flow)

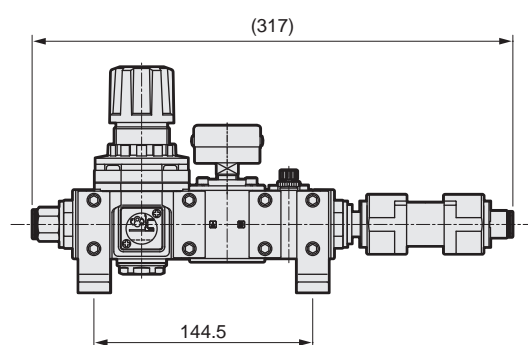
- CAU30-□-R□N1V□F
(Regulator, needle, valve, filter)



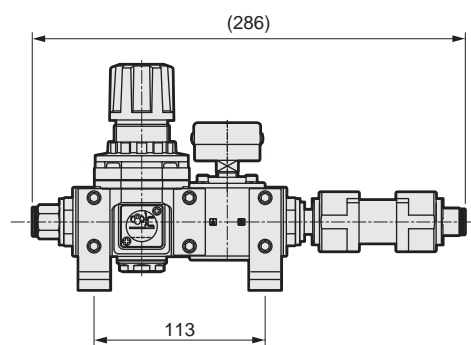
- CAU30-□-R□GY49V□F
(Regulator, pressure gauge, valve, filter)



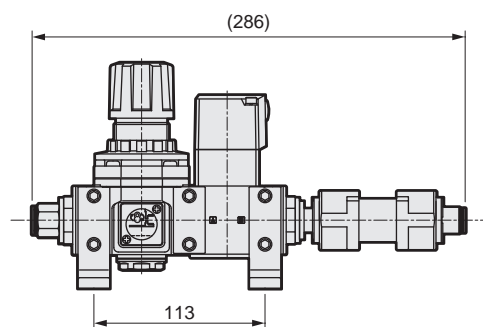
- CAU30-□-R□GY49N1F
(Regulator, pressure gauge, needle, filter)



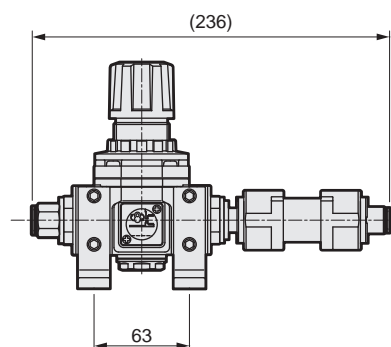
- CAU30-□-R□GY49F
(Regulator, pressure gauge, filter)



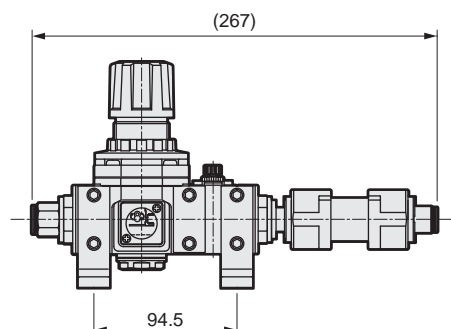
- CAU30-□-R□V□F
(Regulator, valve, filter)



- CAU30-□-R□F
(Regulator, filter)



- CAU30-□-R□N1F
(Regulator, needle, filter)

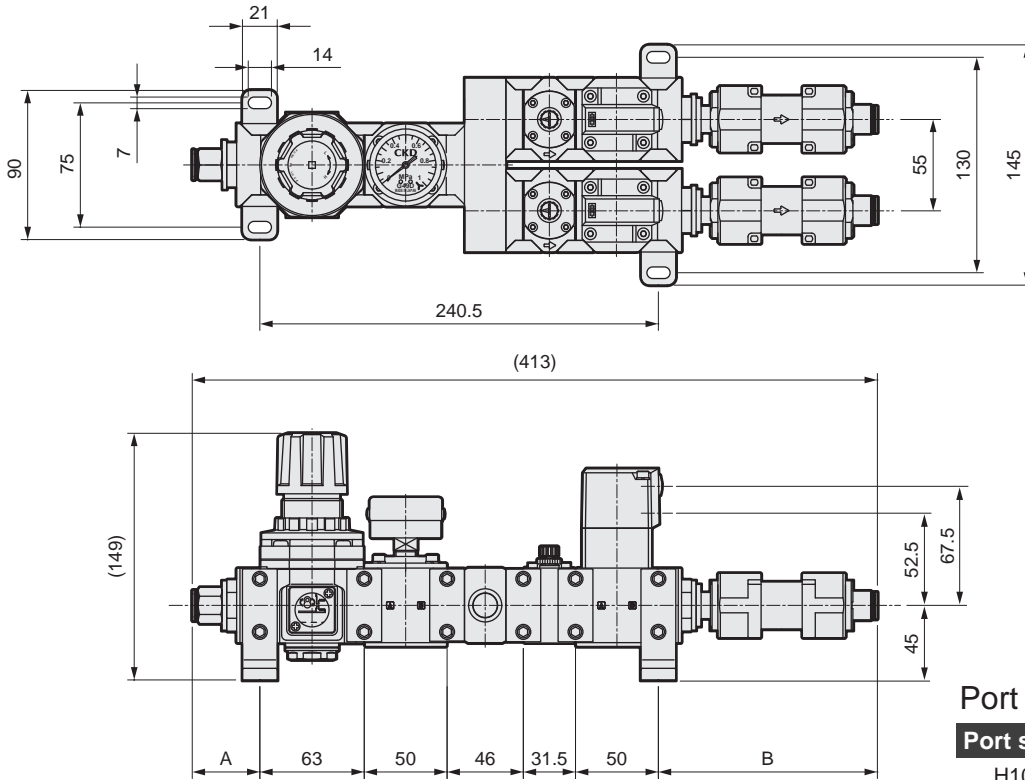


* Pressure gauges T6 and P31 have the same size as GY49.

Clean Air Unit Series

Dimensions (2 flow)

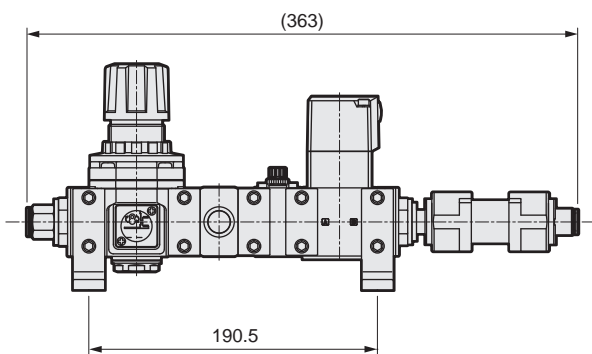
- CAU30-□-2-R□GY49N1V□F (regulator, pressure gauge, needle, valve, filter)



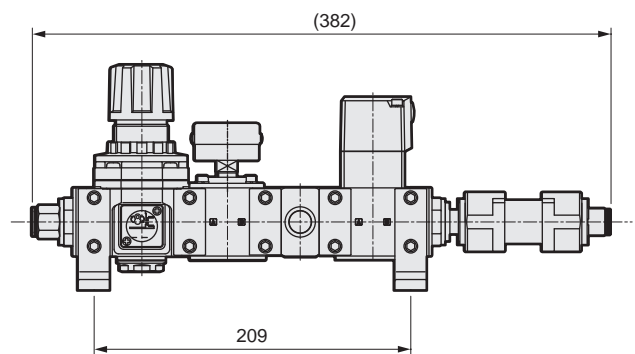
Port sizes

Port size	A	B
H10	41	132
H12	42.5	133.5

- CAU30-□-2-R□N1V□F (Regulator, needle, valve, filter)



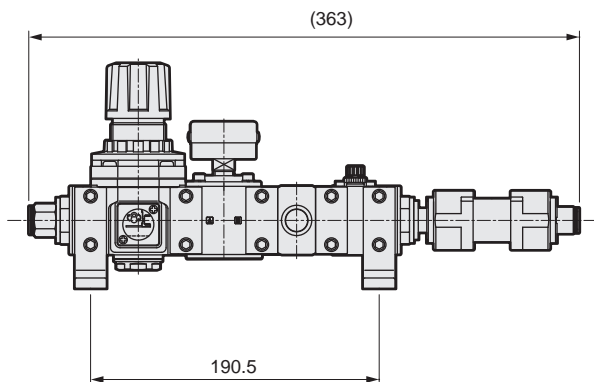
- CAU30-□-2-R□GY49V□F (Regulator, pressure gauge, valve, filter)



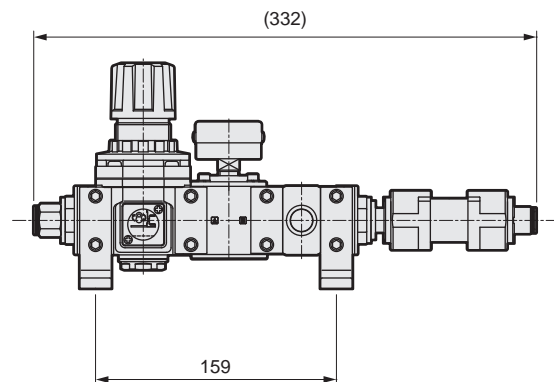
* Pressure gauge "T6" and "P31" sizes are the same as the GY49 size.

Dimensions (2 flow)

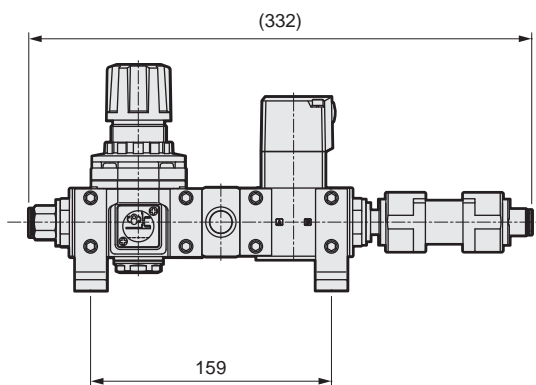
- CAU30-□-2-R□GY49N1F
(Regulator, pressure gauge, needle, filter)



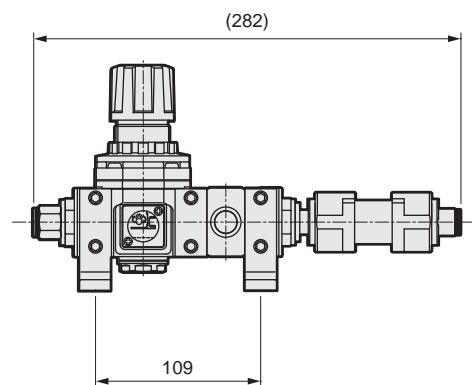
- CAU30-□-2-R□GY49F
(Regulator, pressure gauge, filter)



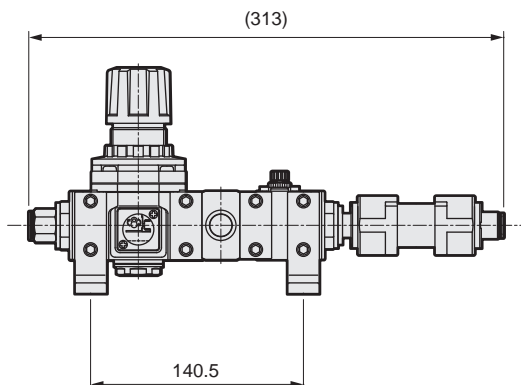
- CAU30-□-2-R□V□F
(Regulator, valve, filter)



- CAU30-□-2-R□F
(Regulator, filter)



- CAU30-□-2-R□N1F
(Regulator, needle, filter)

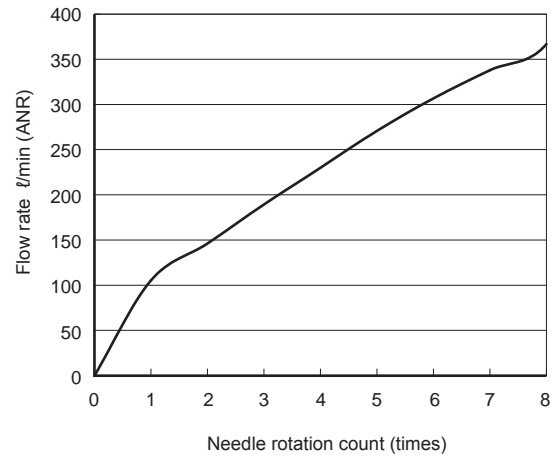
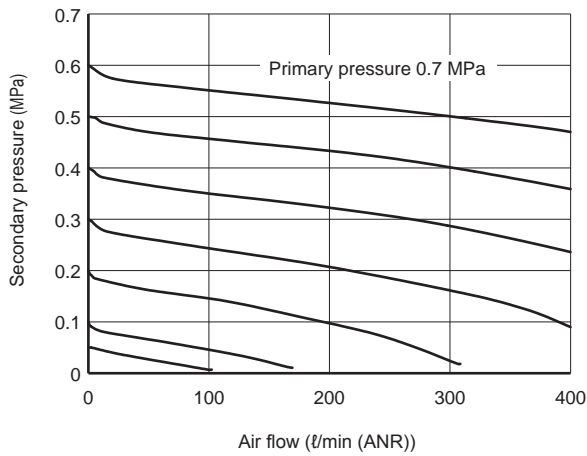


* Pressure gauges T6 and P31 have the same size as GY49.

Clean Air Unit Series

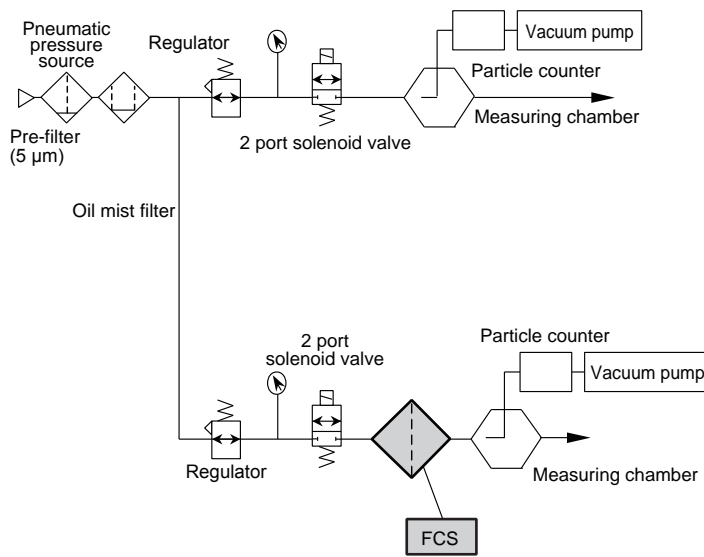
Flow characteristics

- Flow characteristics relative to the pressure setting on the regulator
- Flow characteristics relative to the needle rotation count

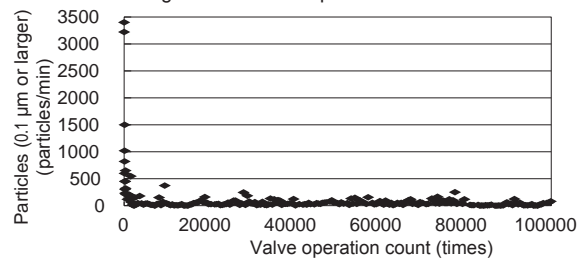


Note 1: This is the flow property when the regulator, the pressure gauge, the needle valve, the air-operated valve, and the filter are assembled and the needle is fully open.

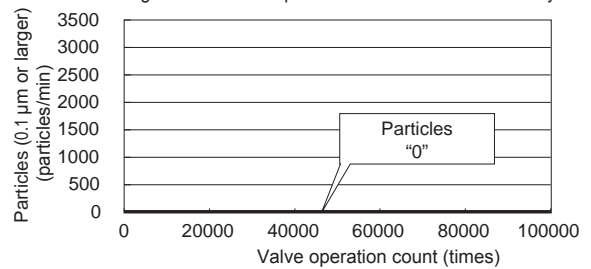
Particle removal performance of the clean filter



■ Dust from the regulator and the 2-port solenoid valve is detected.



■ Dust from the regulator and the 2-port solenoid valve is removed by FCS.



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