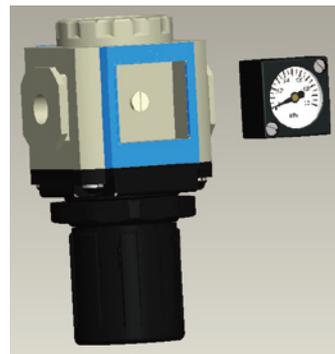
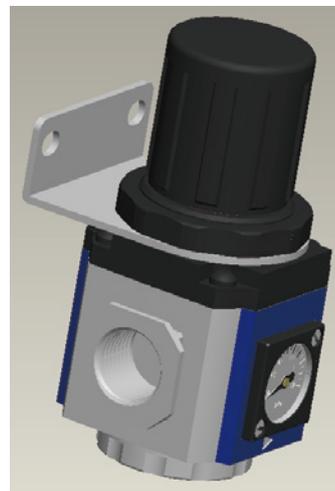
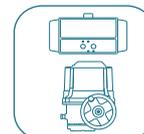
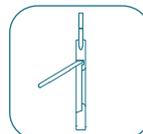
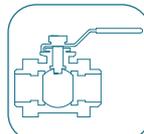
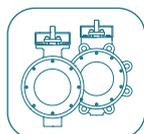
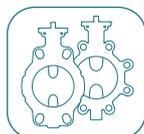


Pressure Regulator

Fig.530



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Introduction

The Fig.530 Air Pressure Regulator is designed for stable and precise control of air pressure in industrial applications. The unit is available with or without a reflux valve, featuring a press-in self-locking device to prevent external disturbances and ensure consistent pressure regulation.

Specifications

Model	5301200-06	5301200-08	5301300-08	5301300-10	5301300-15	5301400-10	5301400-15	5301600-20	5301600-25
Fluid	Air								
Port size	1/8"	1/4"	1/4"	3/8"	1/2"	3/8"	1/2"	3/4"	1"
Pressure range	0.5bar~9bar (7psi~130psi)								
Max. pressure	10bar (145psi)								
Proof pressure	15bar (215psi)								
Temperature range	-20°C~+70°C								
Weight	160g		350g			720g		1700g	

Installation

Preparation

- Ensure that all system components are free of dust and debris.
- Use the appropriate pipe joint bore size for installation.
- Choose a location that allows for easy access for maintenance and monitoring.

Installation Steps

- Mounting:** The regulator can be installed on a plate-type bracket or using the optional fixing bracket.
- Connect Air Lines:** Attach the inlet and outlet air lines to the corresponding ports, ensuring the regulator is mounted in the correct direction of flow.
- Check Alignment:** Ensure that the regulator is aligned properly to avoid pressure drops or inaccuracies.
- Ensure Tightness:** Tighten all connections to prevent air leakage.

Operation

Adjusting Pressure

- Turn the Regulating Button (part 10) to adjust the pressure.
- For more precise adjustments, monitor the embedded gauge.
- Press the Self-Locking Device to lock the pressure setting and prevent unwanted changes.

Operating Conditions

- The device operates best within the temperature range of -20°C to 70°C.
- Do not exceed the maximum operating pressure of 0.9 MPa for standard models or 0.4 MPa for low-pressure models.

Maintenance

Regular Checks

- Inspect the regulator for air leaks and ensure all connections remain secure.
- Check the embedded gauge regularly to monitor pressure levels.
- Examine the regulating diaphragm and O-rings for wear and tear.

Cleaning and Replacement

- Cleaning:** If contaminants enter the system, disconnect the regulator and clean all components with compressed air.
- Replacement:** Refer to the parts list for replacements. Key components include the regulating diaphragm, O-rings, and springs, which should be replaced periodically based on usage.

Troubleshooting

Trouble	Possible cause	Solution
Pressure Does Not Regulate Properly	Opposite flow direction or opposite installation of regulator.	Check flow direction and install the regulator correctly if wrong.
	Foreign materials caught in air line	Disassemble the regulator and clean the internal components. Inspect the valve for any damage and replace it if necessary.
Unstable Pressure Output	External vibrations or incorrect pressure setting.	Ensure the regulator is mounted securely and that the pressure setting is correct. Use the locking mechanism to prevent pressure adjustments due to vibrations.
Air Leaks	Diaphragm is damaged.	Replace the diaphragm
	Loose fittings, worn/damaged O-rings.	Tighten all connections, and inspect the O-rings. Replace them if they are worn or damaged.

Performance Specifications

Pressure Characteristics: When the air pressure regulator's outlet is connected to a constant orifice, the relationship curve between the set outlet pressure and the changing inlet pressure is shown in Figure 1. When the inlet pressure is adjusted to the nominal pressure, the change in outlet pressure is no greater than 0.05 MPa.

Pressure Adjustment: The inlet pressure of the regulator is the nominal pressure, and its outlet pressure can be adjusted uniformly within the allowable range without any step changes.

Flow Characteristics: When the inlet pressure of the air pressure regulator is at the nominal pressure, the relationship curve between the outlet airflow (under standard conditions) and the outlet pressure is shown in Figure 2.

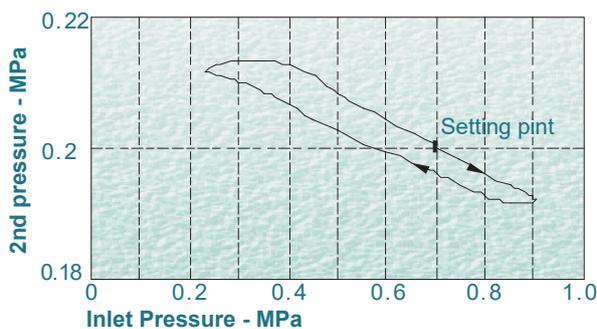


Figure 1

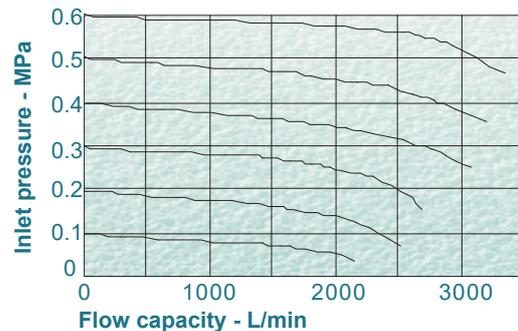


Figure 2

Relief Characteristics: An air pressure reducing valve with a relief structure should be able to relieve pressure when the downstream pressure exceeds 35% of the set value. The characteristic curve of the outlet pressure and relief flow rate is shown in Figure 3.

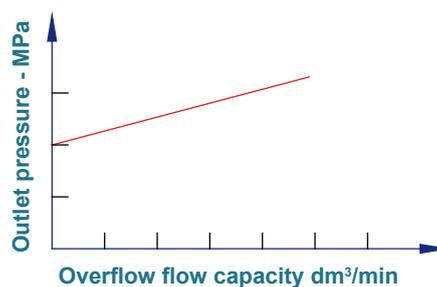
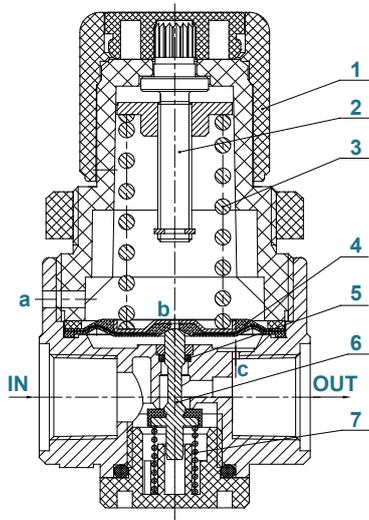


Figure 3



No.	Part name
1	Pressure knob
2	Adjusting spindle
3	Spring
4	Diaphragm
5	O-ring
6	Spool
7	Spring

Working Principle

Above picture shows the structural principle of a pressure regulator.

By pulling the main adjustment knob (1) outward and rotating it clockwise, the main adjustment spindle (2) compresses the spring (3), pushing the main adjustment diaphragm (4) downward. This downward movement pushes the spool (6), opening the inlet valve, allowing airflow and increasing output pressure. Part of the output airflow passes through the damping hole (c) into the air chamber beneath the diaphragm, creating an upward force. This force attempts to close the inlet valve, reducing the output pressure, a mechanism referred to as negative feedback. When this upward force balances with the spring force, the output pressure stabilizes at a certain value.

If the input pressure fluctuates, for instance, when the pressure suddenly increases, the output pressure also rises. The increased force acting on the diaphragm disrupts the balance, causing the diaphragm to move upward and compress the spring. This results in a momentary overflow through the overflow hole (b), and with the help of the return spring (7) and air pressure, the pressure adjustment column moves upward, reducing the valve opening. This increases throttling and decreases the output pressure until a new balance is achieved.

If the input pressure remains constant and the output flow changes, causing fluctuations in the output pressure (increase or decrease), the regulator relies on the overflow action of the overflow hole (b) and the balancing force on the diaphragm to push the spool (6), maintaining pressure stability. When the valve's output load changes and the flow increases, the flow velocity through the damping hole (c) increases, causing a pressure drop. This makes the diaphragm move downward, further opening the inlet valve to restore the outlet pressure close to its original stable value.

When the main adjustment knob (1) is turned counterclockwise, the spring (3) force gradually decreases, allowing the compressed air in the diaphragm chamber to continuously discharge through the exhaust hole (a) via the overflow hole (b). As the return spring (7) pushes the spool (6) upward, the inlet valve gradually closes until the final output pressure drops to zero.

After pressure adjustment is complete, the main adjustment knob (1) is pushed back and locked in place to maintain a constant set pressure.

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