

## USER MANUAL - ANNEX

### PRESSURE REGULATORS

#### TTA005-08\_EN

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This user manual is intended as annex to the general user manual, document number TTA048.

**This user manual is not a stand-alone document.**





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 <b>Insert Deal srl</b> <small>COMPRESSED AIR AND TECHNICAL GAS EQUIPMENT</small>	<h1 style="text-align: center;">USER MANUAL - ANNEX</h1> <h2 style="text-align: center;">PRESSURE REGULATORS</h2>	TTA005-08_EN
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## 1. Introduction

This is not a stand-alone document.

This user manual shall be read in conjunction with the general user manual, document number TTA048.



**WARNING:** When this symbol is present, special care shall be considered.

## 2. Safety precautions



The safety precautions are listed in the general user manual, document number TTA048. Make sure to have read and understood them thoroughly before starting any activity.



Beware of the dangers intrinsically connected with equipment under pressure and potential hazardous fluids.



Wear suitable personal protective equipment.



Execute all the maintenance operations without pressure in the system.

## 3. Product description and functionality

Pressure regulators are designed to reduce a high pressure (upstream) to a lower value (downstream), adjustable by the user.

For the standard regulators, the downstream pressure can be set to the desired value by rotating the knob, T-lever or screw of the pressure reducer. The permissible downstream pressure range is marked on the product.

For the dome-loaded versions, the downstream pressure can be set to the desired value by changing the pressure in the dome.

After the initial setting by the user, the product is self-adjusting and maintains constant downstream pressure. However, variable flowrates or large variations to the inlet pressure may affect the actual downstream pressure: consult ID Insert Deal for the selection of the most suitable product for the application.

Depending on the specific model:

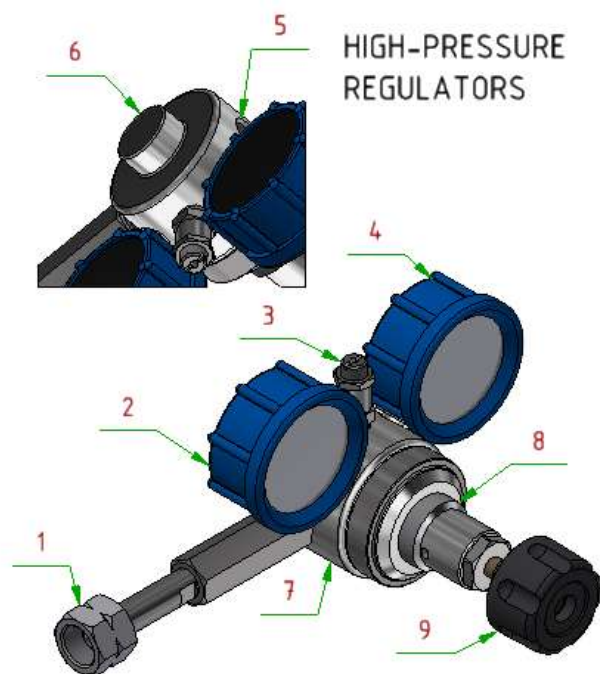
- One or two pressure-gages may be provided to monitor the downstream and upstream pressure. If only one pressure gage is provided, it monitors the downstream side (low pressure).
- The over-pressure relief valve may be provided.
- Self-relief feature can be provided. That is, the downstream pressure can be discharged from the pressure regulator. Please note this option is not included as a standard.



The over-pressure relief valve, if provided, protects the low-pressure chamber of the regulator: it is not a safety valve for the downstream equipment.



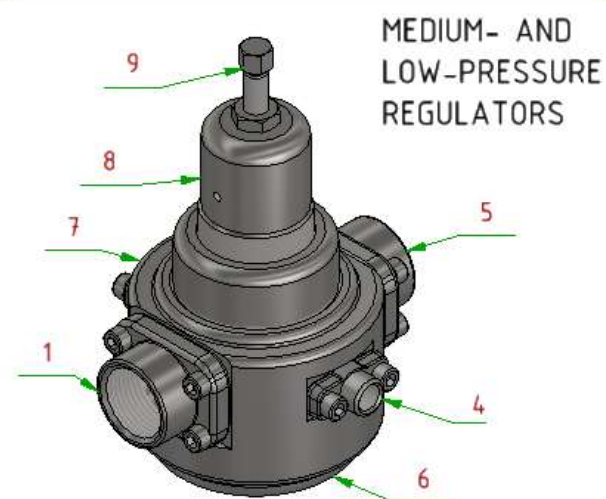
For dangerous or toxic fluids, convey to a safe area the fluid discharged from the over-pressure-relief valve or from the self-relief feature.



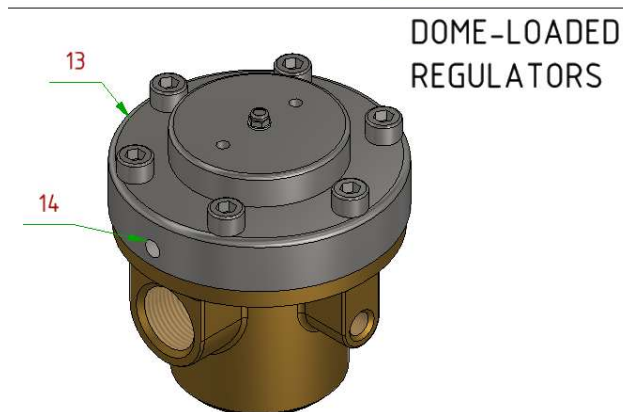
HIGH-PRESSURE  
REGULATORS

### Part list:

1. Inlet connecton.
2. High-pressure gage.
3. Pressure relief valve.
4. Low-pressure gage (connection).
5. Outlet connection.
6. Lower plug.
7. Main body.
8. Bonnet / spring cage.
9. Adjusting knob/screw.
13. Dome-loaded bonnet.
14. Pilot connection.



MEDIUM- AND  
LOW-PRESSURE  
REGULATORS



DOME-LOADED  
REGULATORS

### 4. Installation and commissioning



Make sure the product is compatible with the process fluid.



Operate in an adequately clean environment for the final application. Avoid dirt contamination of sealing elements and other process wetted parts.



Make sure the system is clean. If necessary, before the installation of the product, flush the system to remove dirt. Prevent the ingress of dirt, as it may affect the product functionality.

During installation and commissioning operations, the components in contact with the process fluid shall be free of grease and oil.

All the below instructions shall be considered as a minimum requirement.

Any other technique or action that improves the overall safety shall be taken in consideration by the user.

For installation and commissioning, proceed as follows:

- Make sure the cylinder connection and the others process connections are clean.
- Make sure the adjusting knob/screw (9) is in loose position so that the spring inside the regulator is not compressed. Rotate the adjusting knob/screw (9) counterclockwise if necessary.
- Install the pressure gage, if not provided, or plug the connection (4).
- Check the flow direction marked on the pressure regulator to establish the correct inlet (1) and outlet (5) connections.
- Connect the inlet (1) of the regulator to the cylinder or applicable process connection. Tighten the connection according to the applicable standard.
  - High-pressure regulators (with design pressure > 80 bar) shall be installed with the pressure gages pointed upwards.
  - Medium- and low-pressure regulators (with design pressure ≤ 80 bar) shall be installed with the adjusting knob/screw pointed upwards. The pressure gage connections are frontal.
  - If other configurations are necessary based on the system layout, contact ID Insert Deal for advice.
- Connect the outlet (5) of the regulator to the downstream line. Tighten the connection according to the applicable standard.
- For dome-loaded versions, connect the supply pressure circuit to the regulator (14).
- Slowly open the upstream block valve and put pressure in the upstream side of the regulator. Check the indication of the upstream gage (2). Check the connetions for leakage.
- Regulate the outlet pressure rotating the adjusting knob/screw (9) clockwise, or feeding the pilot circuit. Check the indication of the downstream gage (4). Check the connetions for leakage.
- To reduce the outlet set pressure, turn the adjusting knob/screw (9) counterclockwise. For regulators not provided with the self-relief function, the excess downstream pressure shall be bled from the downstream piping.
- If provided, tighten the nut on the adjusting knob/screw (9) to fix the position. Other models may be provided with a “push to lock” knob.

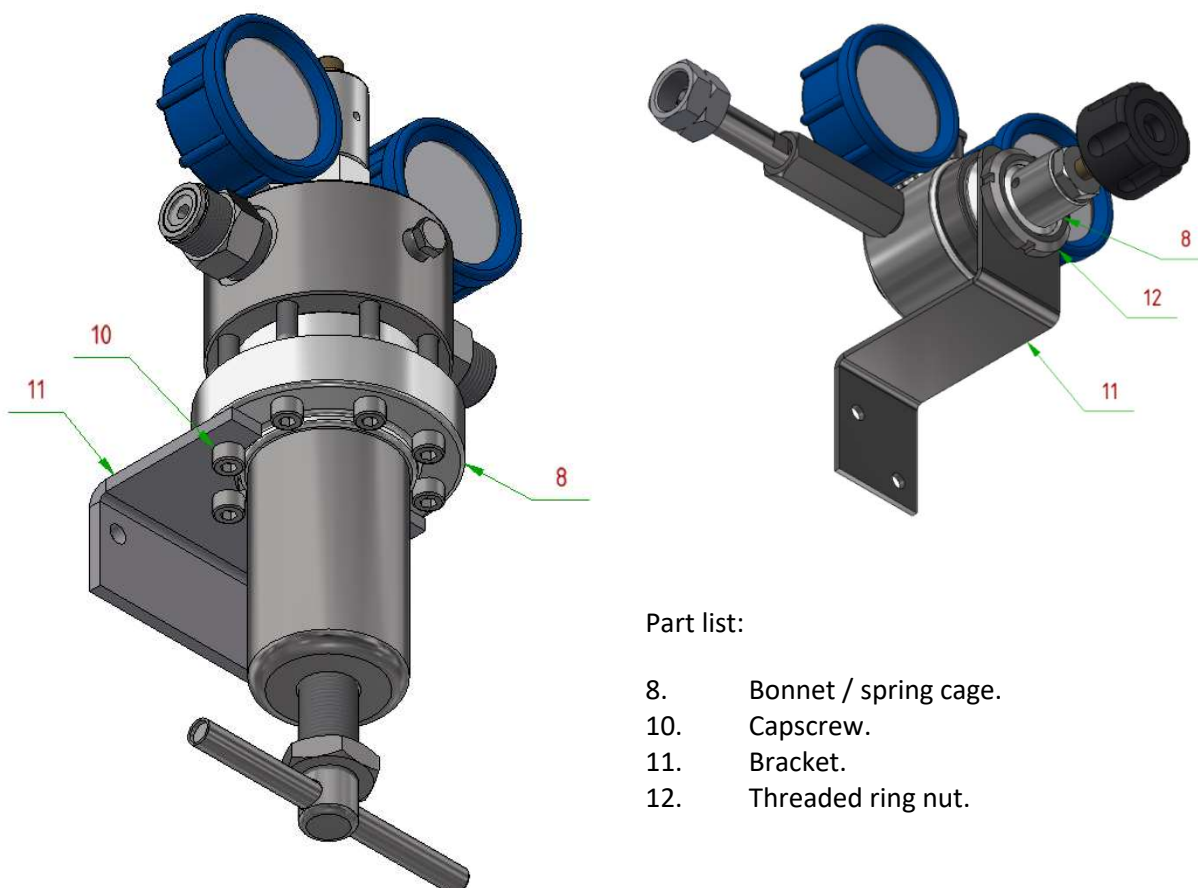
Do not remove or change the setting of the pressure relief valve (3).

Do not remove or change the setting of the lower plug (6).



For dome-loaded versions, proceed carefully with the pressure in the pilot circuit and account for the pilot ratio. The outlet pressure of the main regulator shall not exceed the allowable range.

Some products may be provided with optional bracket for panel or wall mounting, as shown below.



### Part list:

- 8. Bonnet / spring cage.
- 10. Capscrew.
- 11. Bracket.
- 12. Threaded ring nut.


Depending on the model, the bracket (11) can be fixed to the regulator by different means.

To install the bracket on regulators with bolted bonnets, proceed as follows:

- Remove the capscrews (10). Remove only those necessary to install the bracket.
- Assemble the bracket (11) on the bonnet (8).
- Re-assemble and tighten the capscrews (10). For recommended tightening torque refer to the general user manual.
- Fix the bracket (1) to the wall or panel with suitable screws and nuts.

To install the bracket on regulators with screwed bonnets, proceed as follows:

- Assemble the bracket (11) on the bonnet (8).
- Assemble the threaded ring nut (12) and tighten it to the bonnet (8).
- Fix the bracket (1) to the wall or panel with suitable screws and nuts.

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Assemble the bracket on the regulator before connecting the regulator to the line.

## 5. Inspection and maintenance

Inspect the product at periodic intervals.

Check for leakage, corrosion or any potential malfunction. Check that the performance, in terms of pressure and/or flowrate, meet the system requirements.

Execute pressure tests, if necessary. Consult ID Insert deal for advice.

Clean the product, if necessary, as it the presence of debris may affect the correct functionality.



When approaching the product for maintenance, pay attention to hot or cold surfaces.

In case the inspections detect malfunctions, or if soft parts need replacing, proceed as follows:


- Close the upstream shut-off valve to isolate the regulator from the pressure source.
- Bleed the downstream line to remove the pressure.
- Check the pressure gages to confirm the absence of residual pressure, both upstream and downstream of the regulator.
- Rotate the adjusting knob counterclockwise to release the spring action. Failure to do so may lead to injury when the bonnet (8) is removed.
- For dome-loaded versions, remove the pressure from the pilot circuit. Only then, disconnect the pilot circuit from the regulator.
- Remove the regulator from the line.
- Disassemble the upper bonnet (8) and/or lower plug (6). Only qualified personnel shall execute these operations. In case of doubts, contact ID Insert Deal for further support.
- Inspect and clean the internal components according to the maintenance plan.
- Reassemble the components executing the previous steps in the reverse order.

## 6. Troubleshooting

The following troubleshooting table helps the identification of the probable cause of malfunctions and how to solve them.

Malfunction	Probable cause	Remedy
External leakage.	Loose connection.	Tighten the connection.
	The sealing element is damaged.	If the problem persists, replace the sealing element.
Specific leakage from the bonnet.	Diaphragm is damaged.	Replace the diaphragm.
The regulator cannot totally close (the outlet pressure tends to increase). or	Internal floating components are misaligned.	Open the downstream line, then close it rapidly.
	Ingress of foreign matter.	Clean the seat area. Perform a visual check to assess the integrity of the surfaces.



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Discharge of fluid from over-pressure relief valve.	The obturator and/or seat is damaged.	If the problem persists, replace the obturator and/or seat.
The adjusting knob/screw is difficult to operate.	Ingress of foreign matter.	Clean the internals. Perform a visual check to assess the integrity of the surfaces and the adjusting screw/knob.
Outlet pressure is too low.	Pressure source empty.	Check the pressure source.
	Pilot pressure too low.	Check the pilot circuit.
Excessive noise due to vibration.	High flowrate.	Reduce the flowrate demand, if possible.
	Resonance.	Report the process condition to ID Insert Deal for a tailor-made solution.
Formation of ice on the pressure regulator.	High flowrate.	Reduce the flowrate demand, if possible.
		Preheat the gas entering the regulator.
Low flowrate.	Inlet pressure is too low.	Increase the inlet pressure, but do not exceed the limits marked on the product.
	Wrong model selection.	Replace the regulator with a bigger one.
	Filter is dirty and obstructs the flow.	Replace or clean the filter.
The regulator cannot reach the desired outlet pressure at the desired flowrate.	High flowrate.	Reduce the flowrate demand, if possible.
	Wrong static setting.	Adjust the screw/knob.
	Wrong model selection.	Replace the regulator with a different one.

Table 1

If the malfunction cannot be repaired on site, contact ID Insert Deal for further support.