



Knowledge to Shape Your Future

# RB4000 and RB1700 Regulator Installation and Start Up

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**Warning** Itron does not endorse or warrant the completeness or accuracy of any third party regulator installation procedures or practices unless otherwise provided in writing by Itron.

This product, as of the date of manufacture, is designed and tested to conform to all governmental and industry safety standards as they may apply to the manufacturer. The purchaser/user of this product must comply with all fire control, building codes, and other safety regulations governing the application, installation, operation, and general use of this regulator to avoid leaking gas hazards resulting from improper installation, startup, or use of this product.

Follow your company's standard operating procedures regarding the use of personal protection equipment (PPE). Adhere to guidelines issued by your company in addition to those contained in this document when installing or repairing natural gas regulators.

To ensure safe and efficient operation of this product, Itron strongly recommends installation by a qualified professional.

Prior to pressure regulator installation in any piping, check to ensure that:

- The upstream and downstream flanges are parallel and the pressure regulating unit can be fitted without undue stress.
- The upstream piping is clean of all impurities (sand, welding, slag, or other foreign materials).
- The pressure regulator is not visibly damaged.
- The inlet and outlet regulator chambers are completely clean.

After the preceding installation conditions are met, install the regulator in the piping. Ensure the gas flow direction corresponds to the arrow on the regulator body.

Itron recommends the following safety considerations for regulator installation:

- The regulator valve body installation is in horizontal alignment.
- If the incoming or outgoing piping is constructed from ferrous material, piping contains an electrically insulating joint upstream and downstream.
- Free passage for maintenance operations.
- In systems with an on/off gas load, the downstream volume must be greater than 1 cubic foot per 1000 cubic feet per hour of flow rate.
  - and regulator piping includes:
    - an on/off valve upstream and downstream of the regulator.
    - a manometer or pressure gauge upstream and downstream for the regulator.
    - an upstream filter.
    - a relief valve for accidental overpressure (for example, downstream piping exposed to direct sunlight at zero flow).

- To prevent negative turbulence, perform all downstream piping diameter variations progressively. Avoid locating control line piping near direct sunlight or heat sources. You must connect the regulator's control line to the downstream pipe. Insert control line connections in a straight section of the downstream piping (see the installation diagrams).
- To prevent impurities and condensation from collecting and obstructing gas passage, Itron recommends welding the control line connections on the upper gas line piping.

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**Important** Control line piping must slope slightly downwards to the pipe (see the installation diagrams).

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- To achieve the best performance from your regulator, the gas velocity at the pipe's control line position must not exceed:

**Low pressure** <2.9 PSIG (50 to 65 ft/s)

**Medium/high pressure** >2.9 PSIG (65 to 130 ft/s)

After RB regulator installation, verify:

- The upstream and downstream on/off valves and the discharge vent pipe are closed.
- The inlet gas pressure does not exceed the established design value.

### **To start up the RB4000 or RB1700 regulator**

1. Partially open the upstream on/off valve slowly to begin a very small gas flow.
2. Setting the shutoff valve for minimum pressure intervention causes the valve to close in the absence of pressure. Reset the shutoff valve if it was set for minimum pressure intervention (see To reset the shutoff device).
3. Verify the pressure rises slowly on the upstream and downstream pressure gauges.

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**Important** The downstream pressure must stabilize around the pre-set value or a slightly higher value. If the pressure continues to rise, interrupt the starting procedure by closing the upstream on/off valve. Consult the trouble-shooting diagram to identify the malfunction's cause.

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4. After the upstream pressure value is stabilized, open the upstream on/off valve completely.
5. Slowly open the downstream on/off valve until the piping is completely filled.

The pressure regulator is operative after you complete the start up procedure. Follow the start up procedure when you install monitor-equipped regulators on the line with the active regulator (see the installation schematic).



**Important** A pressure gauge installed in the pipe section between two regulators must indicate the same pressure value as the upstream gauge.

## Regulator Settings

The regulator is typically delivered set to the order specifications. If the set pressure must be modified, set the value within the installed spring's setting range.



**Note** Verify the installed spring can achieve the desired set pressure value.

### *To modify regulator settings*

1. To increase the set pressure value, slowly rotate the spring adjustment ferrule (lock) nut clockwise using the adjustment wrench until the setting reaches the desired range (monitor the settings on the downstream gauge).
2. To decrease the set pressure value, slowly rotate the spring adjustment ferrule (lock) nut counter-clockwise using the adjustment wrench until the setting reaches the desired range (monitor the settings on the downstream gauge).

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**Important** Regulator settings may be changed while the regulator is delivering flow or the downstream on/off valve is closed. If the downstream on/off valve is closed, you must open the discharge plug (control line intake) downstream of the regulator. Close the discharge plug after the regulator reaches the desired setting.

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## Shutoff Device Settings



**Note** Verify the installed spring can achieve the desired set pressure value.

### *To change the shutoff device settings*

1. Check the shut off unit's setting.
2. To reach the maximum downstream pressure:  
Close the on/off valve downstream (see the installation schematic). Slowly increase the downstream pressure until the regulator reaches the maximum intervention pressure.  
Rotate the overpressure adjustment spring nut clockwise to increase the set pressure or counter-clockwise to decrease the set pressure.
3. To reach the minimum downstream pressure:  
Close the upstream on/off valve (see the installation schematic). Slowly discharge the downstream the downstream pressure until the regulator reaches the desired minimum intervention pressure.  
Rotate the under pressure adjustment spring nut clockwise to increase the setting value. Rotate the under pressure adjustment spring nut counter-clockwise to decrease the value.

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**Important** Perform the shutoff valve pressure value changes with the shutoff valve diaphragm under pressure!

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## Shutoff Device Reset



**Note** Reset the shutoff device only after you first identify the reason the shut off device triggered.

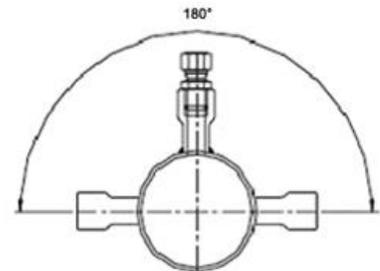
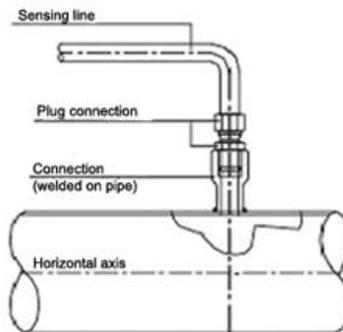
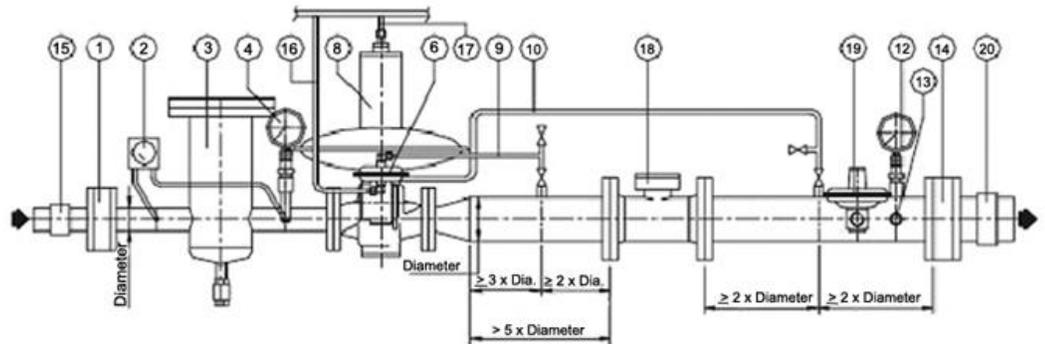
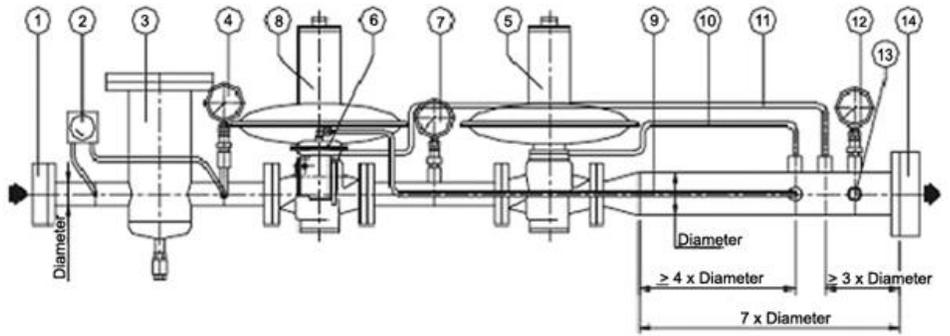
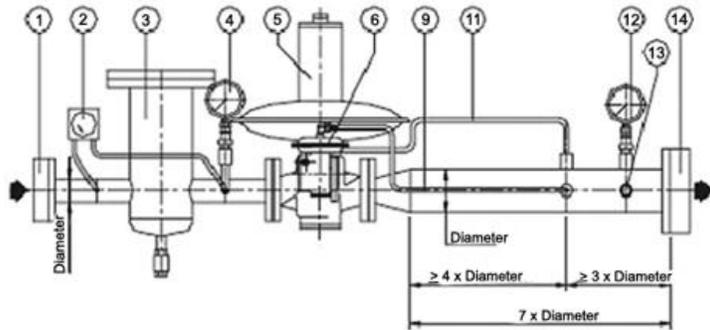
If the valve is equipped with the minimum downstream pressure intervention function, you must reset the shutoff valve to restore normal operating conditions.

### ***To restore normal operating conditions***

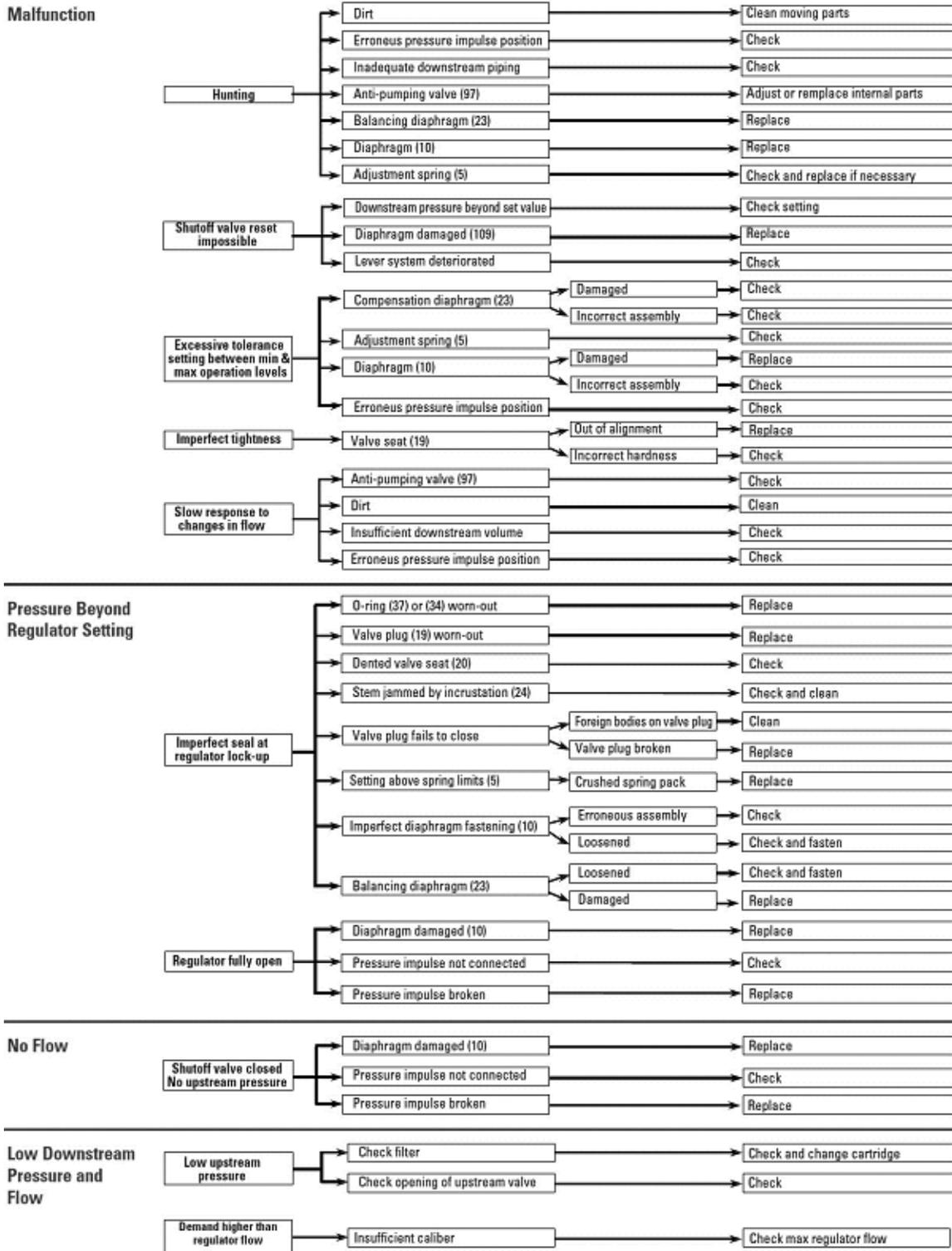
1. Close the downstream on/off valve.
2. Open the valve for the upstream and downstream pressure gauges.
3. Verify the downstream pressure = 0 (discharge any residual pressure by opening the discharge vent pipe).
4. Close the relief and discharge valves.
5. Test the unit's valve seat seal by opening the discharge valve. Check the seal using the bubble system test.
6. Slowly rotate the reset lever clockwise (see the installation schematic) until the internal bypass opens. Rotating the reset lever allows the outlet chamber, the downstream piping, and the shutoff valve diaphragm chamber to fill. Verify pressure on the downstream gauge.
7. After the downstream pressure stabilizes, continue using the reset lever until it connects with the control levers. At this point, the reset lever remains stable in an open position.
8. The shutoff valve is ready for service. Slowly re-open the downstream valve.

# Installation Schematics

Designator	Description
1	Upstream valve
2	Differential Pressure gauge
3	Strainer/filter
4	Upstream pressure gauge
5	Regulator/monitor
6	Shutoff valve
7	Pressure gauge
8	Monitor regulator
9	Shutoff valve impulse
10	Regulator impulse
11	Monitor regulator impulse
12	Downstream pressure gauge
13	Discharge vent pipe
14	Downstream valve
15	Upstream isolating connection
16	Discharge vent pipe
17	Regulator vent
18	Meter
19	Peak shaving valve
20	Downstream electrical insulating connection



# Troubleshooting



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