

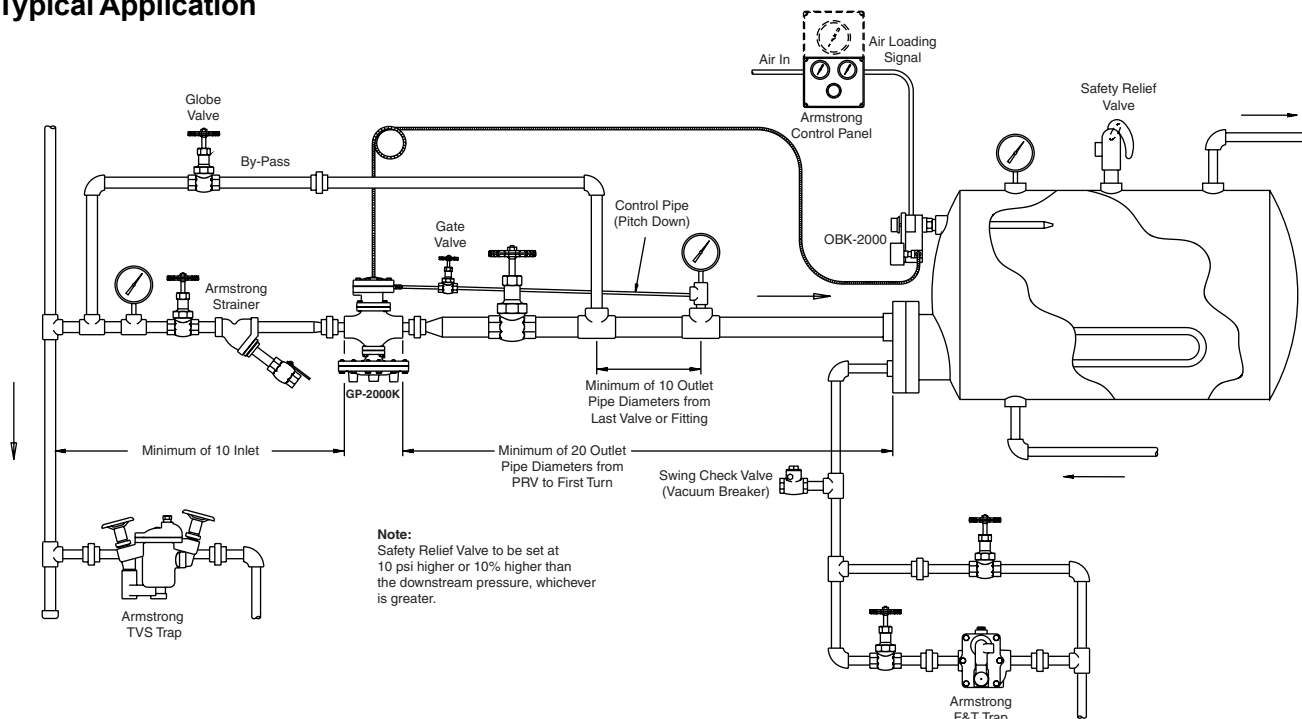


Model OBK-2000

Pneumatic Temperature Pilot Reverse Acting - For Heating

Installation, Operation and Maintenance

Typical Application



This bulletin should be used by experienced personnel as a guide to the installation of the Model OBK-2000 Pneumatic Temperature Pilot. Selection or installation of equipment should always be accompanied by competent technical assistance. You are encouraged to contact Armstrong International, Inc. or its local sales representative for additional information.

Installation Instructions

1. Be sure the OBK-2000 sensing bulb is **completely** submerged into the fluid that is being temperature controlled.
2. An Armstrong inverted bucket steam trap is recommended to drain condensate at the inlet of the regulator valve.
3. An Armstrong 100 Mesh Screen (Y) strainer should be installed before the regulator valve to reduce the chance of dirt fouling.
4. A pressure gauge is recommended before and after the regulator valve but prior to the heat exchanger.
5. If standard piping practice permits, a bypass line around the regulator is recommended. Quality globe valves are recommended on the by-pass line. This will allow operation while the regulator valve is being serviced.
6. Install a vacuum breaker after the heat exchanger but before the trap to prevent the system from going into a vacuum and preventing drainage of the heat exchanger.
7. Do not install quick opening and closing valves on the downstream side of the regulator.
8. Make sure you have the correct OBK-2000 for your application. Reverse acting (RA) for heating or direct acting (DA) for cooling. You will find these initials on the face at the right side bottom corner of your OBK-2000 pilot.
9. Check to make sure your supply air (S) and return air (R) lines are connected to the correct ports. These initials are found on the bottom back side main body of your OBK-2000.

Valve Adjustment Procedures

Improper installation and adjustment could cause hunting, water hammer or damage to the main parts of the regulator valve.

1. An Armstrong TVS Inverted Bucket Steam Trap is recommended to drain the condensate at the inlet of the PRV.
2. Open the by-pass globe valve (A) around the regulator to blow the system down. Care should be taken not to open the valve completely so the safety valve does not open, if one is installed. After adequate time to purge the system, close the by-pass globe valve (A).
3. Open the gate valve (B) on the inlet of the regulator.
4. Set your heat exchanger temperature to the desired setting on your OBK-2000 by turning the dial **counterclockwise to increase** the temperature and **clockwise to decrease** the temperature.
5. Open the gate valve (C) on the outlet of the regulator.
6. Allow the system time to stabilize (approx. 5-10 minutes, longer if volume of heated fluid is large) and adjust the temperature as needed with the OBK-2000 dial.
7. Response time to the regulator valve can be adjusted by the sensitivity adjustment screw located at the bottom of the OBK-2000. Turn the screw **clockwise to increase** response time, **counterclockwise to decrease** response time.

OBK-2000 Pneumatic Temperature Pilot Operation

Operation - Reverse Acting (RA) ó For Heating

During operation, a temperature change, in the medium being controlled, creates a change in the length of the sensitivity tube. An increase in temperature lengthens the sensitivity tube (1) and moves the invar rod (2) from the lever (3). Lever (3), pivots at point B, and is moved so the exhaust valve (4) is opened by the spring at D. This lever action decreases the supply air at point S in the control line at point R and closes the regulator valve (GP-2000K).

A decrease in temperature shortens the sensitivity tube at point (1) and moves the invar rod against the lever point (3). The lever at point (3) moves against the spring at point D to close the exhaust valve at point (4). This lever action increases the pressure in the control line at point R and opens the valve.

The sensitivity adjustment screw at point (6) regulates the rate of flow of the supply air to the controller to a change in temperature. Turning the screw **clockwise increases** the sensitivity by reducing the flow and increasing the response time. Turning the screw **counterclockwise decreases** the sensitivity by increasing the flow and reducing the response time.

Note: Valve closes on air failure, making it fail-safe.

Figure 2-1

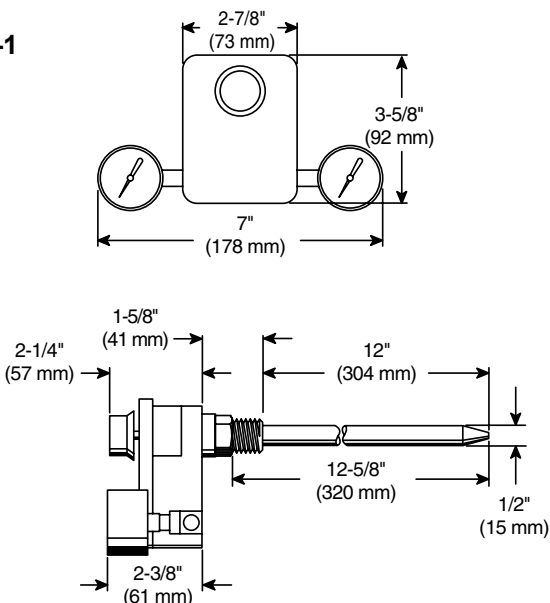
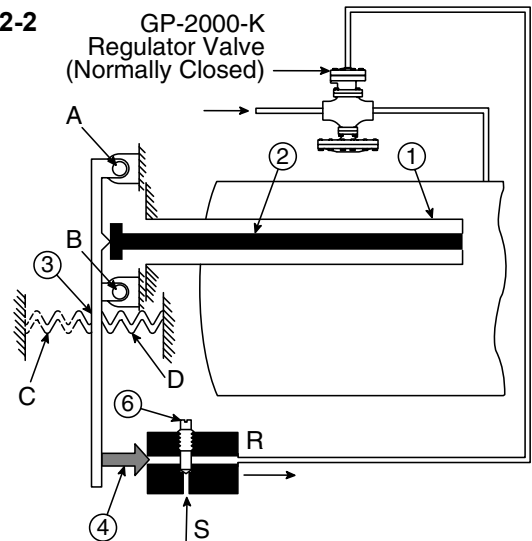


Figure 2-2



Positions (A) and (C) show pivot point (A) and spring (C) when controller is direct acting.

Troubleshooting Guide

Problem	Cause	Solution
Medium being controlled does not reach set temperature.	Improper adjustment.	Check OBK-2000 setting dial.
	Air supply failure to OBK-2000.	Check air gauges for proper function.
	Bulb assembly not completely submerged in medium to be controlled.	Check level of medium in tank.
	Regulator valve failure due to dirt or faulty trapping system.	Check valve for tight shut off. Check steam trap for proper function.
Medium being controlled exceeds set temperatures.	Improper adjustment of OBK-2000.	Check setting on OBK-2000.
	Wrong OBK-2000, direct acting instead of reverse acting.	Check for initials on bottom right corner for (RA) reverse acting or (DA) direct acting.
	Regulator valve will not shut off.	Clean regulator's main valve and seat.
Outlet pressure does not reach desired value.	Inlet pressure is not adequate for desired results.	Raise inlet pressure if possible.
	"T" Fitting is installed incorrectly.	Install fitting correctly.
	Orifice in "T" fitting is plugged.	Clean.
	Pilot valve sensing line is plugged.	Clean.
	Pilot valve is clogged.	Disassemble and clean (18) pilot valve seat. Also check (15) screen.
	Main diaphragm is damaged.	Disassemble and replace (12) main diaphragms.
	Valve size is too small and cannot supply enough capacity.	Resize and install larger valve.
Secondary pressure exceeds the pressure setting.	Adjustment is not proper.	Verify Air lead pressure.
	Orifice in "T" fitting is plugged.	Clean.
	Dirt is either caught between the main valve and seat or pilot valve and seat.	Increase or decrease air pressure to flush out dirt. If valve still leaks, clean it.
	Dirt is between (9) valve spindle and (10) guide.	Clean.
	By-pass valve is not shut or is leaking.	Repair.
	Sensing line is plugged.	Clean.
	Sensing line is not connected.	Install sensing line as shown on installation drawing.
	High pressure steam traps are discharging into outlet side of PRV and traps are blowing through.	Repair faulty traps.
Operation is unstable	Orifice in "T" fitting is partially plugged.	Remove and clean.
	Sensing pipe is installed at a point where there is too much turbulence.	Install sensing pipe at another location.
	Liquid is collecting in sensing line.	Slant pipe away from PRV.
	Quick opening valve located too close to the outlet or inlet PRV.	Relocate.
Excessive noise is present.	Valve size is larger than what was required.	Change valve or add silencer to outlet of PRV.
	Reduction ratio exceeds 20:1.	Use two stage reduction.
	Steam trap draining inlet of PRV is plugged.	Repair.
	Automatic valve (i.e., solenoid) is too close to	Relocate.

Note: The above chart assumes the use of an Armstrong Model GP-2000K series valve as the regulator to the heat exchanger. For Parts Reference, please see Figure 4-1.

Figure 4-1

