

# Installation Instructions

# RA2000 One Pipe Steam (1PS) Thermostatic Radiator Valve



## Description:

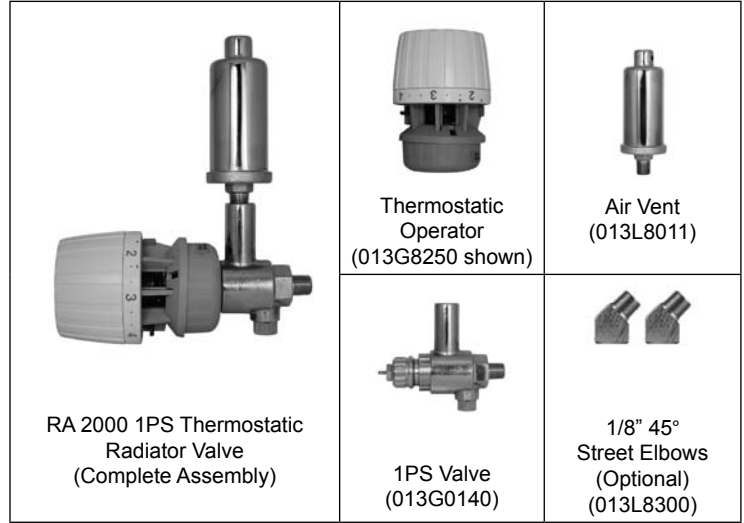
RA 2000 one pipe steam (1PS) thermostatic radiator valve is a three part assembly consisting of a valve body (013G0140), air vent (013L8011) and thermostatic operator (air vent and thermostatic operators are sold separately). See Thermostatic Operator Selection instructions below to determine correct operator for your application.

The 1PS thermostatic radiator valve assembly is designed to provide accurate temperature control and quiet operation on all "non-vacuum" low pressure (max. 15 psig) one pipe steam heating systems.

**Note:** For proper valve operation, the steam supply must be cycled by a boiler control. Do not install the 1PS thermostatic radiator valve assembly in a zone where the boiler is cycled by an existing space thermostat. 1PS thermostatic radiator valve assembly is not recommended for copper fin tube radiators.

## Function:

A temperature change around the thermostatic operator's sensor results in a modulating action of air venting from the radiator or convector. When the thermostatic operator calls for heat, steam enters the radiator and pushes air out through the vent.



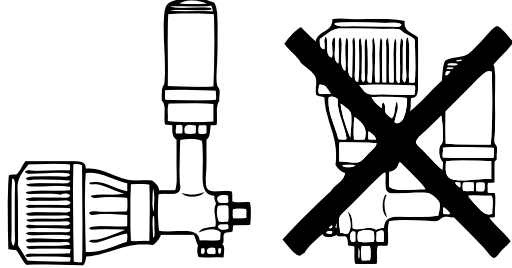
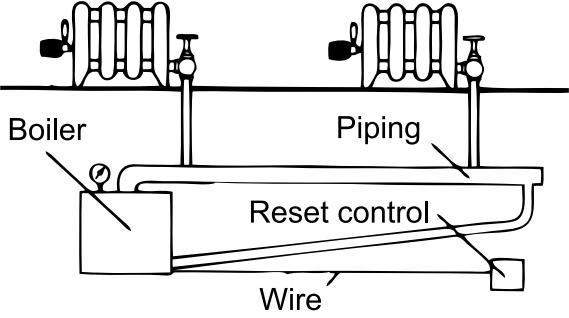
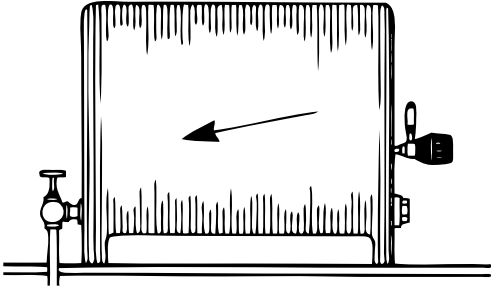
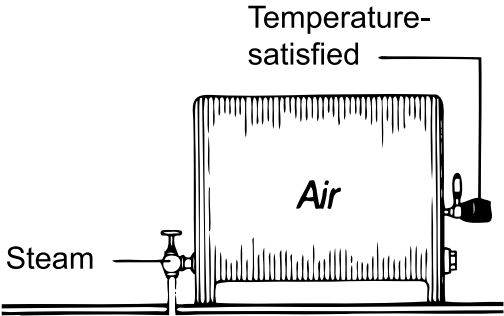
When the setting temperature is reached, the 1PS valve will be closed and no further air venting takes place.

The venting action occurs during each system (boiler) on-cycle only when heat is required. Air will re-enter the radiator during the system off-cycle via a patented "across the seat" vacuum breaker. This eliminates condensate build-up and allows natural system aspiration to occur.

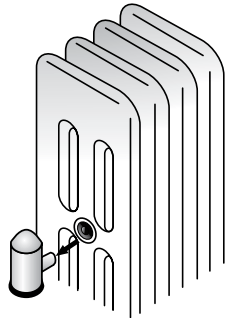
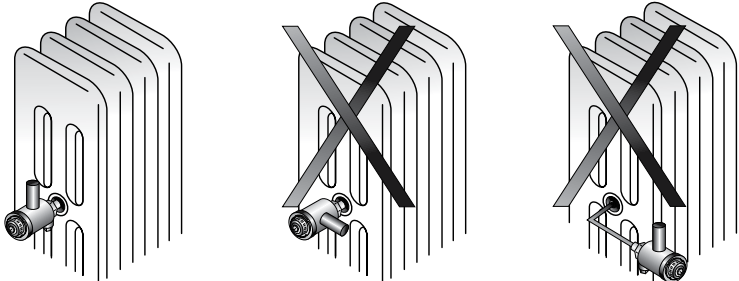
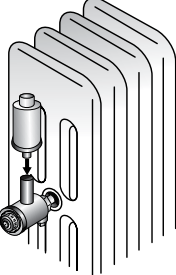
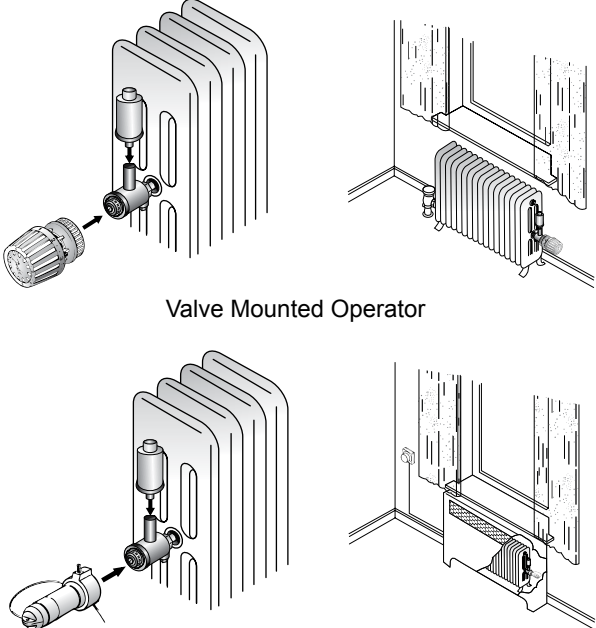
## Thermostatic Operator Selection:

<p><b>Free Standing Radiators:</b> The free-standing one-pipe low-pressure steam radiator is positioned where air continually passes freely over the operator</p>			
<p>a)</p>	<p>(013G8250) (013G8240) Use standard or tamper resistant model with combined dial/operator/sensor. Always install the operator horizontally.</p>	<p>b)</p>	<p>(013G8252) Use dial / operator with remote sensor. The sensor and capillary tube may be extended up to 6' and can be easily wall mounted.</p>
<p><b>Convectors:</b> The one-pipe low-pressure steam convector is inaccessible; room air cannot continually pass freely over the valve.</p>		<p><b>Enclosed Radiators:</b> The cabinet enclosed radiator configuration requires that the dial and sensor be mounted separately, away from the valve.</p>	
<p>Available for mounting the 1PS assembly onto convectors are 1/8" 45° street elbows, part number 013L8300. When ordering these elbows two pieces are needed per convector.</p>	<p>(013G8562) Use dial / operator with remote sensor. The sensor and capillary tube may be extended up to 6' and can be easily wall mounted.</p>		<p>(013G8564) Use operator with separate remote dial and remote sensor. Place the remote sensor beneath the element or on a draft-free wall. The remote dial mounts on the enclosure or wall.</p>

**Prior to Installation:**

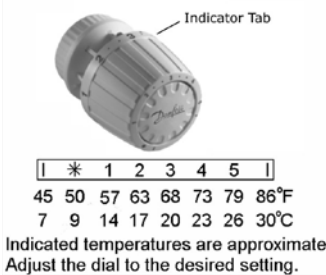
 <p>Correct                      Incorrect</p>	<p>The operator with valve-mounted dial and sensor must be mounted horizontally.</p> <p><b>IMPORTANT</b> In one-pipe steam systems sufficient pitch is required to permit condensate return. Condensate should not be trapped in the valve or vent.</p>
 <p>Boiler                      Piping</p> <p>Reset control</p> <p>Wire</p>	<p>Boiler/Steam supply must be cycled by a reset control and must not run at constant pressure (which would prevent air from entering back into the system).</p>
	<p>Make sure that free-standing radiators or cast iron convectors are properly pitched and that hand valves are FULLY open.</p>
 <p>Temperature-satisfied</p> <p>Air</p> <p>Steam</p>	<p>To aid in preventing overheating of rooms that are temperature satisfied, boiler steam pressure must be kept low, recommended normally at or below 2 psig. Otherwise air will be compressed in the radiator, allowing steam to enter when not required.</p>

**Installation:**

<p><b>1.</b> With the heat source off, carefully remove existing air vent from the radiator.</p>	
<p><b>2.</b> Carefully thread the valve body into the radiator. Tighten the valve such that the orientation of the air vent port is up.</p> <p>The piping of an extension between the radiator and valve body should not be done.</p>	
<p><b>3.</b> Tighten the air vent (013L8011) to the valve body.</p> <p>If using an air vent not supplied by Danfoss, it must be a straight shank vent.</p>	
<p><b>4.</b> Mount the thermostatic operator to the valve. Refer to the installation instructions included with the thermostatic operator for proper mounting to the valve.</p>	 <p style="text-align: center;">Valve Mounted Operator</p> <p style="text-align: center;">Wall Mounted Operator</p>



**Setting:**

	<p>The user can easily set room temperature by turning the dial clockwise or counterclockwise. The diagram to the left shows the approximate relationship between dial scale numbers and room temperature.</p> <p>At its lowest setting, the RA 2000-1PS provides frost protection and maintains room temperature at approximately 45°F. At its highest setting, the RA 2000-1PS maintains room temperature at approximately 85°F.</p> <p>The temperature on all RA 2000-1PS models may be limited or locked (see instructions included with specific operator for details on this procedure).</p>
---	--

**Troubleshooting:**

Symptoms	Cause / Issue
<p><b>“Spitting” air vent</b></p>	<ul style="list-style-type: none"> <li>• Check the pitch of the radiator</li> <li>• Fully open the supply valve</li> <li>• Check riser air vent for main system</li> <li>• Verify if excessive pressure is within system</li> </ul>
<p><b>Overheating within room</b></p>	<ul style="list-style-type: none"> <li>• Ensure thermostatic operator is in an appropriate location</li> <li>• Move remote sensor or dial/sensor to a different location</li> <li>• The vacuum breaker mechanism may be clogged with debris</li> <li>• Verify if excessive pressure is within system</li> </ul>
<p><b>Under heating within room</b></p>	<ul style="list-style-type: none"> <li>• Ensure thermostatic operator is in an appropriate location</li> <li>• Move remote sensor or dial/sensor to a different location</li> <li>• The air vent may be stuck closed</li> <li>• Check riser air vent for main system</li> <li>• Check the pitch of the radiator</li> <li>• Verify if excessive pressure is within system</li> </ul>

Danfoss can accept no responsibility for possible errors in printed materials and reserves the right to alter its products without notice. All trademarks in this material are property of the respective companies. Danfoss and Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.



**Danfoss Inc.  
Heating Division**  
6711 Mississauga Road, Suite 410  
Mississauga, ON, L5N 2W3  
Tel.: 905-285-2050, Fax: 905-285-2055  
www.na.heating.danfoss.com

**Danfoss Inc.  
Heating Division**  
7941 Corporate Drive  
Baltimore, MD 21236 USA  
Tel.: 443-512-0266, Fax: 443-512-0270  
www.na.heating.danfoss.com