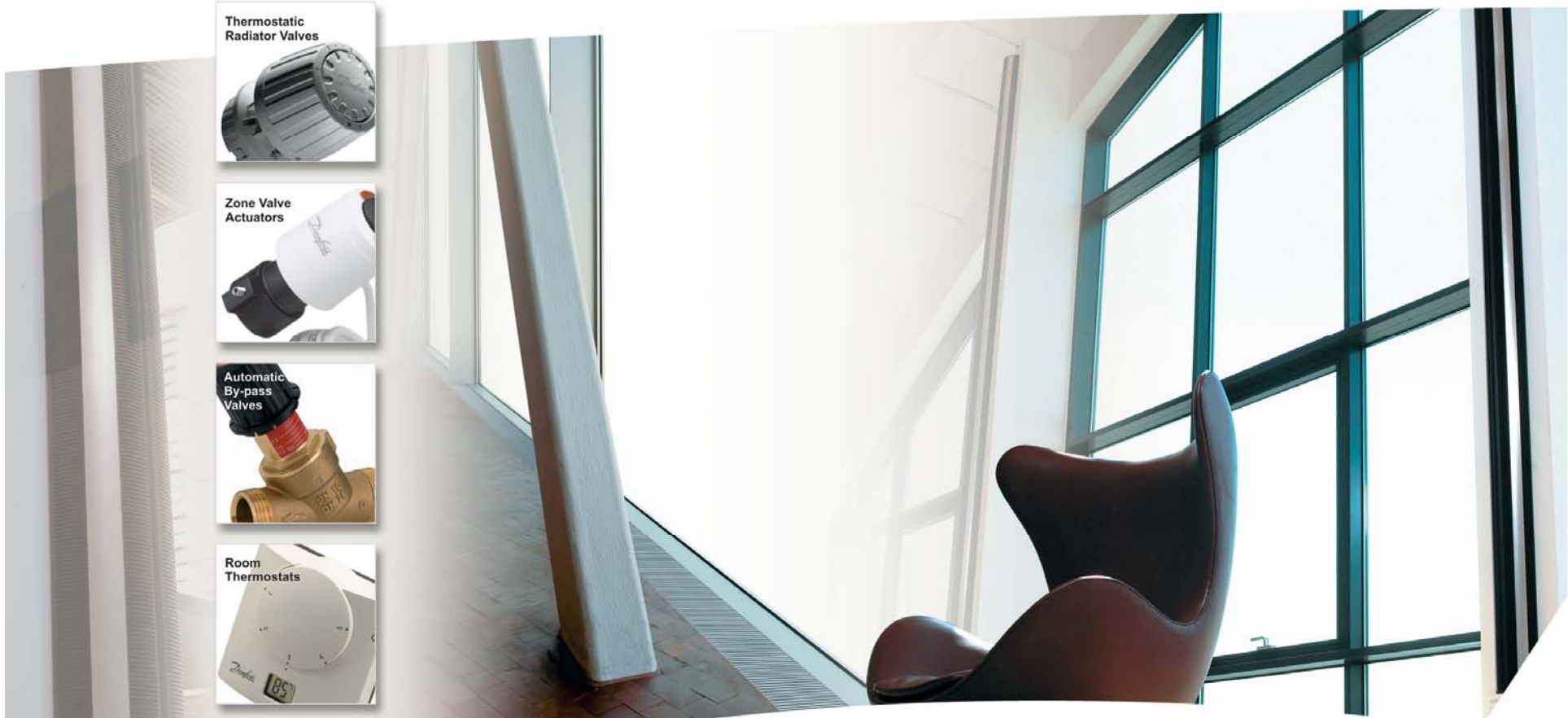


MAKING MODERN LIVING POSSIBLE



***RA2000 Series***  
***Thermostatic Radiator Valves***  
***1-pipe Low Pressure Steam Systems***

Hydronic Heating Division – North America

# 1-pipe Steam System

- Concept
  - 3 things inside the piping and radiation
    - Air
    - Steam
    - Condensate
- Advantages
  - Simple to pipe
  - Few components
- Disadvantages
  - Piping design critical
  - Venting balance important
  - Hard to control



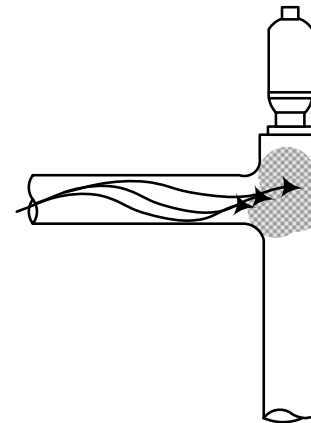
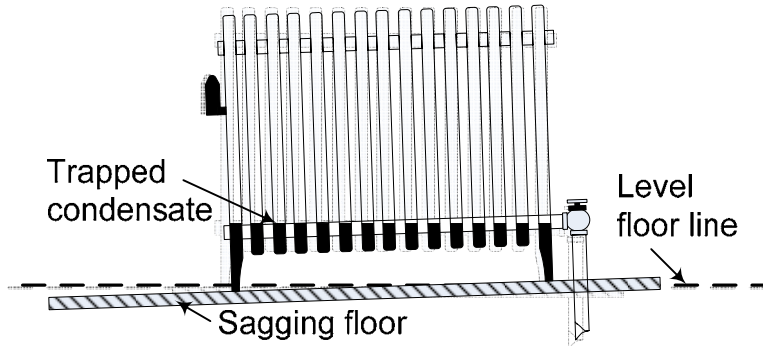
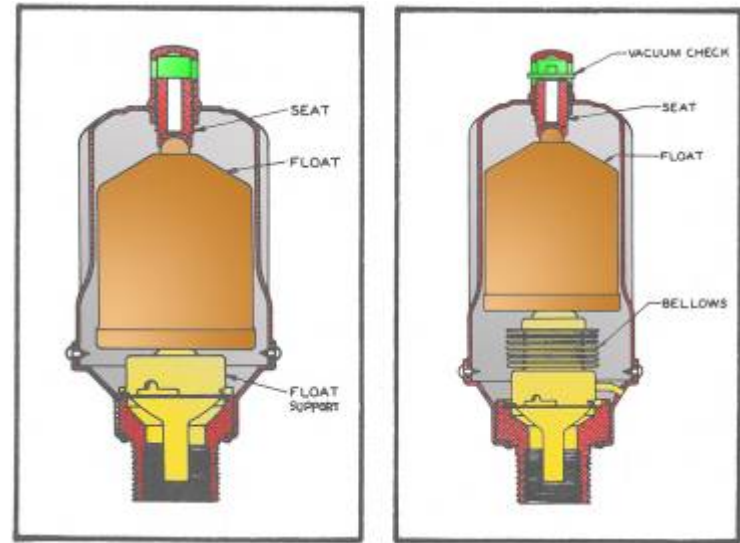
# Simple Control

- The Manual Valve
  - Steam and condensate in different direction through valve
  - Properly sized supply valve
  - Fully open or fully closed... only
- The Air Vent
  - High capacity air vents on the main
  - Smallest capacity vents on the near boiler radiators
  - Adjustable air vents

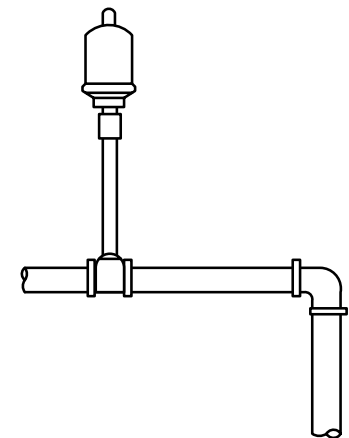


# Key Evidence on a 1-pipe Steam System

- The removal of air from the system, allows steam to desired locations
- Proper venting is key in system operation
- Requires proper sized piping and pitch

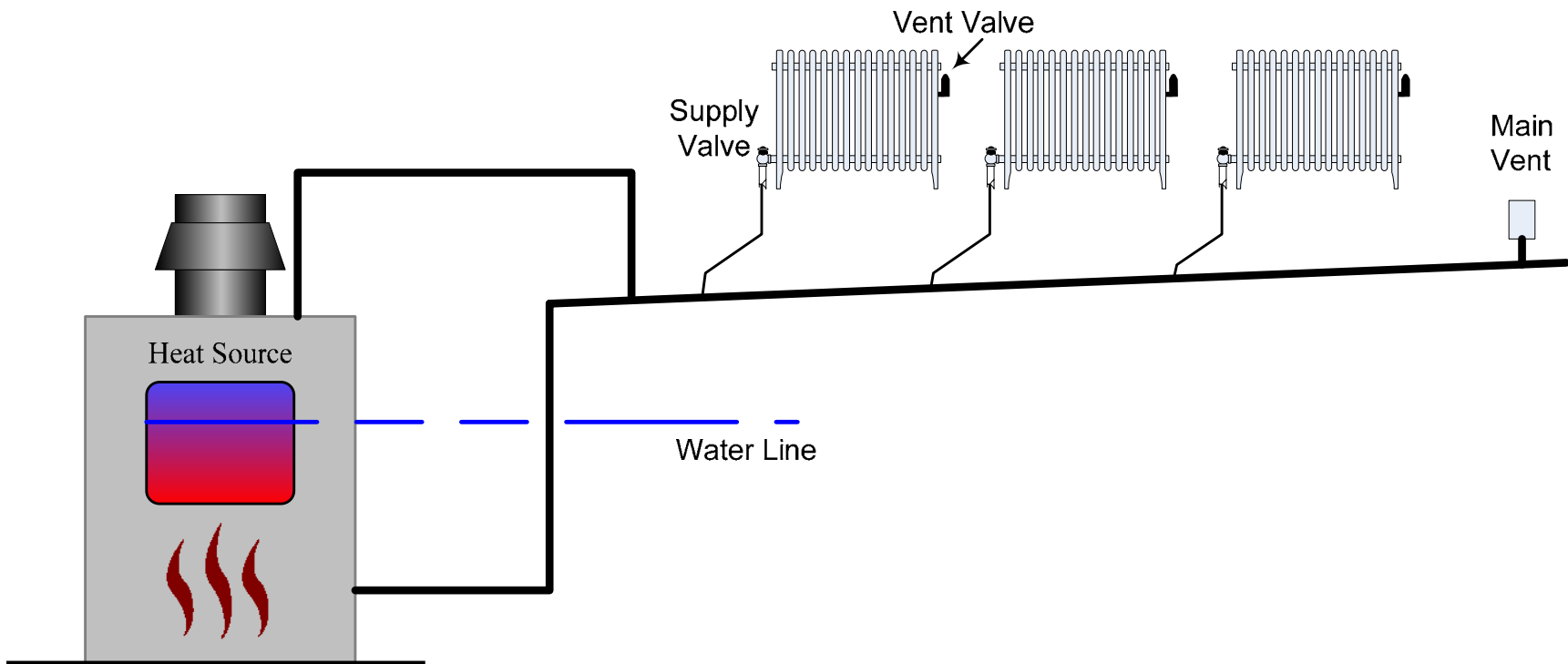


Improper method

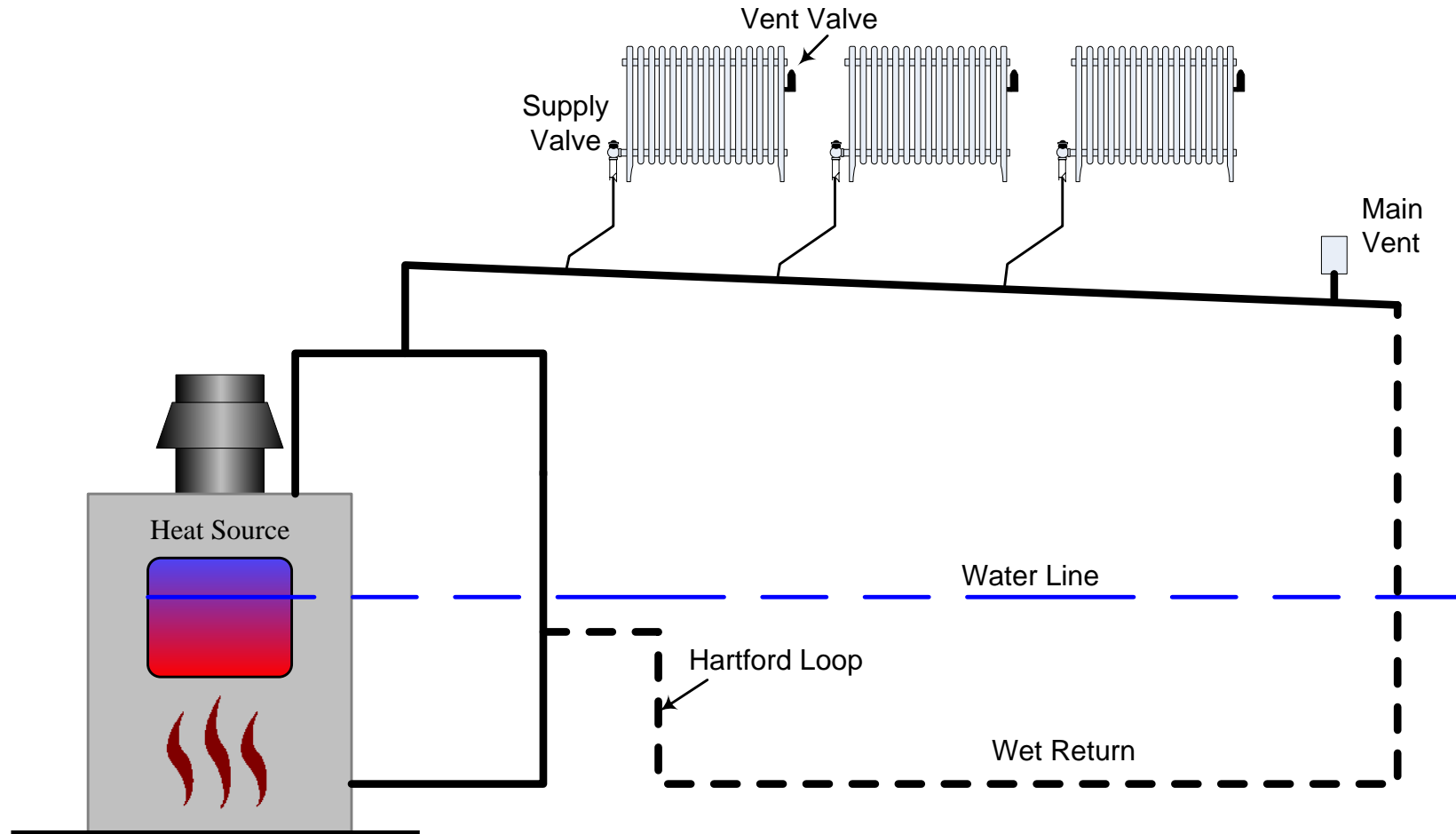


Proper method

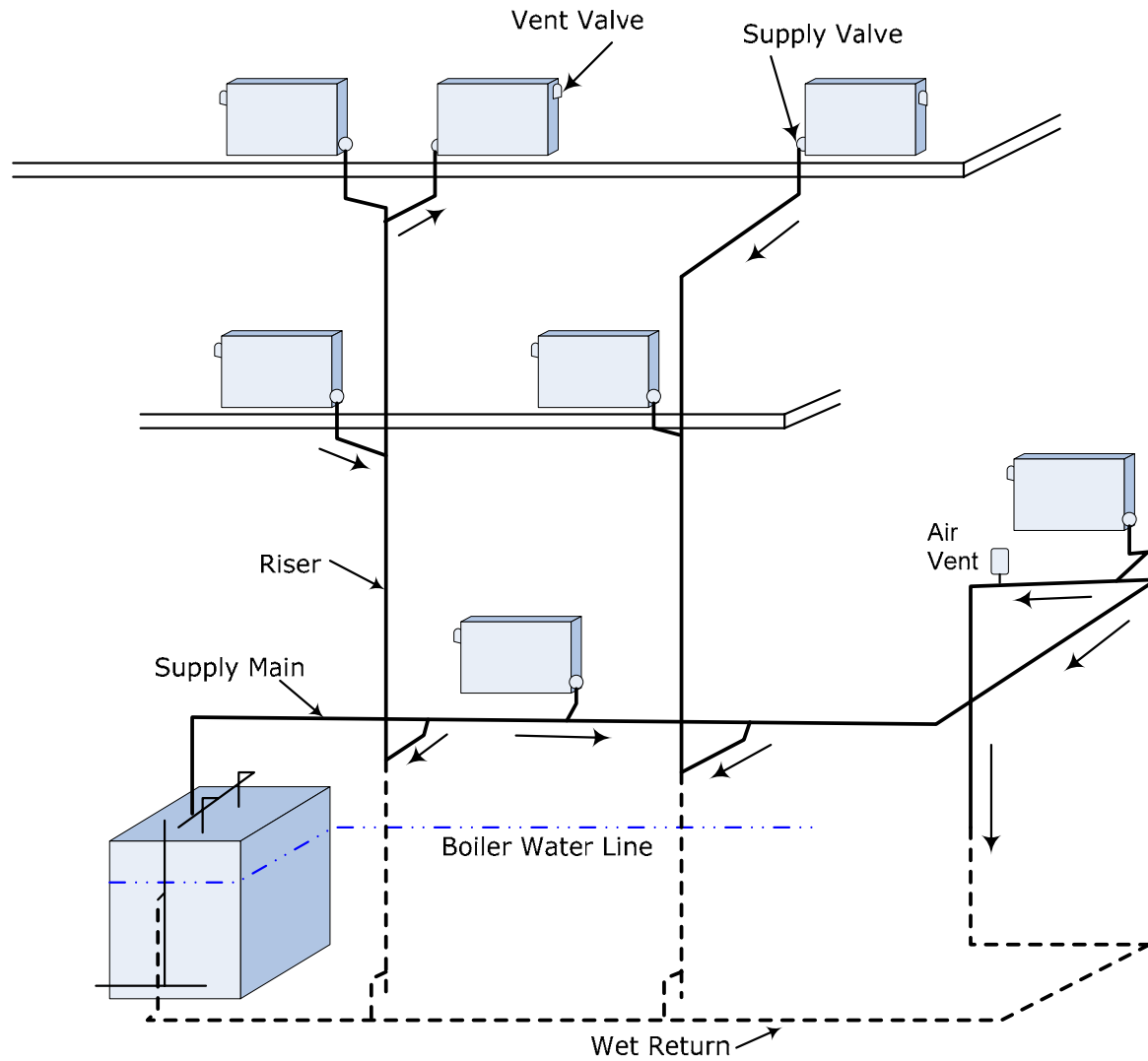
# 1-Pipe Counter Flow Steam System



# Parallel Flow System



# Up-Feed System



“Human race did not leave the stone age because we ran out of stones. We simply found a better way to do things.”

*What if you could control each radiator... automatically?*





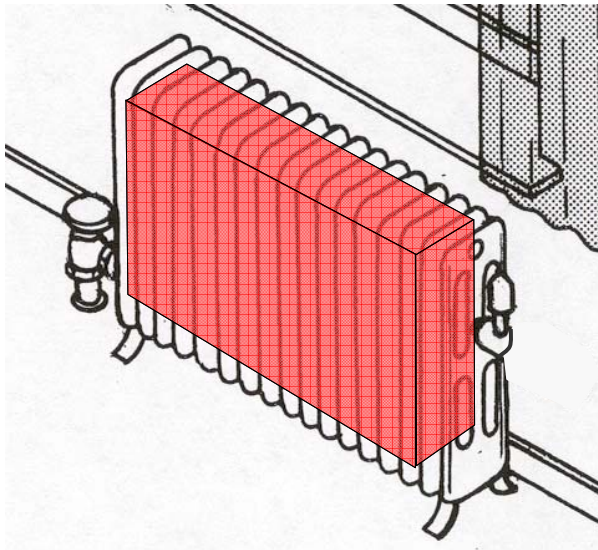
# Take Control



## Thermostatic Radiator Assembly (TRV) Provided Benefits

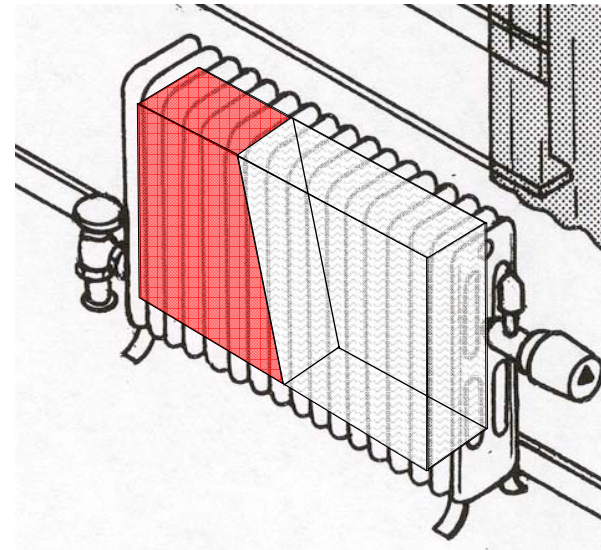
- Non-electric
- Self contained
- Self regulating
- Zoning capabilities
- Simple use of operation
- Potential fuel savings of more than 20%

## How do we do it?



*Air Vent Only*

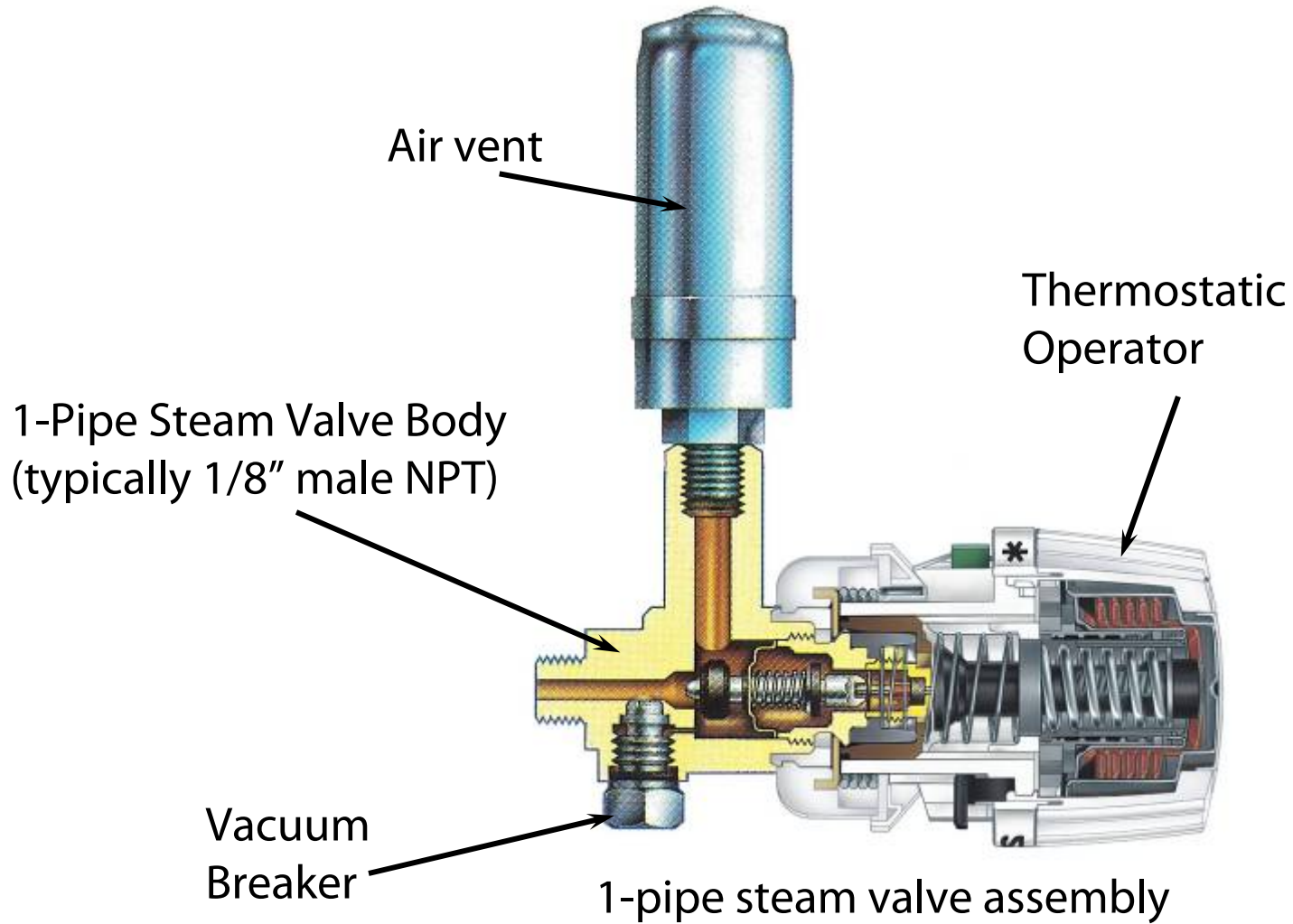
- Steam enters the radiator and forces the air out through the vent
- When the steam reaches the air vent, the vent closes
- The radiator is now filled with steam and radiates heat into the room
- Overheating can occur



*Installed TRV Assembly*

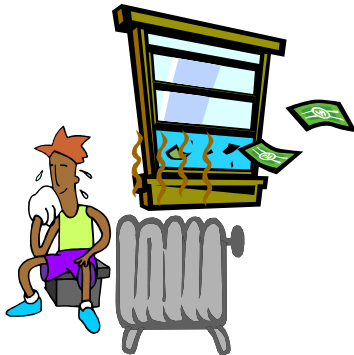
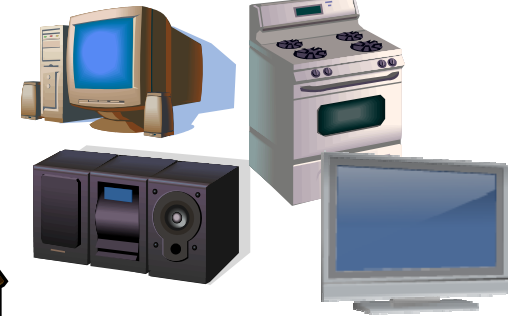
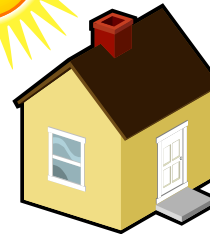
- Steam enters the radiator and forces the air through the air vent
- The TRV regulates the ability for the air to escape from the radiator based on room temperature and TRV set point
- The radiator is filled with an amount of steam meeting the set point, preventing overheating and saving fuel

# Typical 1-Pipe Steam Thermostatic Radiator Valve Assembly



# TRV's Reaction

- The thermostatic operator reacts to the heat gains and heat losses within the room
- Free heat gains within a room can originate from:
  - Solar gain
  - Appliances
  - Occupants within the room
- Therefore ...



ADD

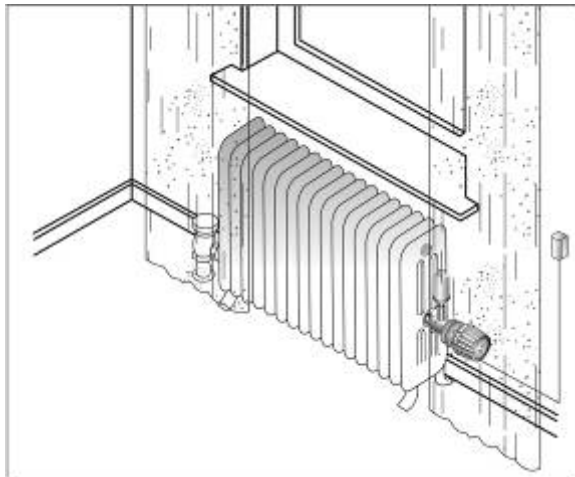
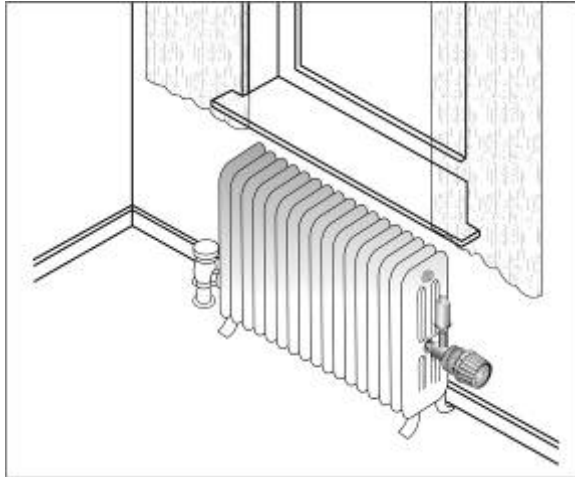


LEADS TO

Comfort, Control & Energy Savings

# Typical Installation Configurations

## Free Standing Radiator



Built-in dial & sensor



Tamper proof dial and sensor



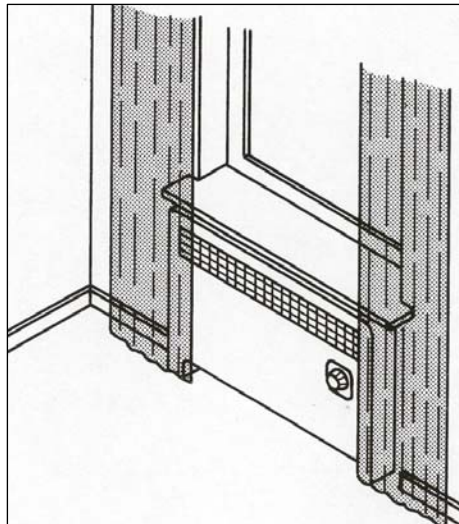
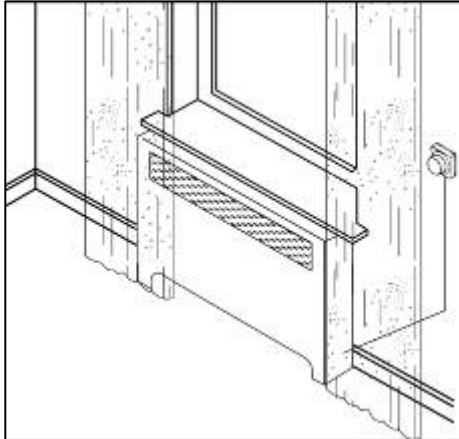
Dial w/ remote sensor



Tamper proof dial w/ remote sensor

# Typical Installation Configurations

## Enclosed Radiator



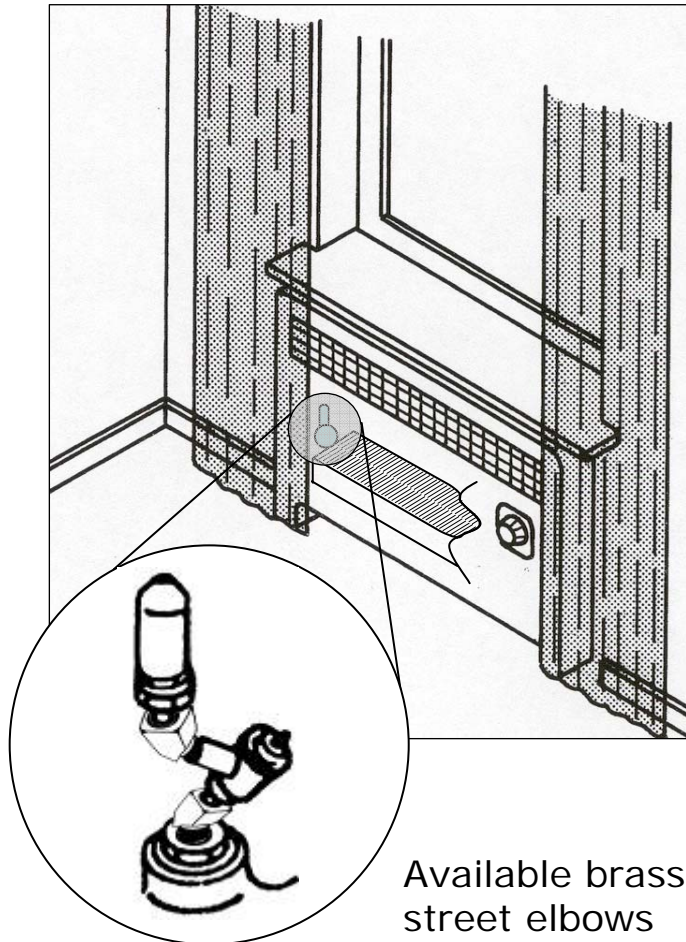
Remote wall mount dial  
and sensor



Cabinet mounted dial w/  
remote operator & sensor

# Typical Installation Configurations

## Convactor



Available brass street elbows



Remote wall mount dial and sensor



Cabinet mounted dial w/ remote operator & sensor

# Typical Valve Pattern



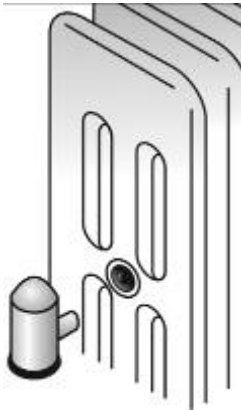
1-pipe steam valve



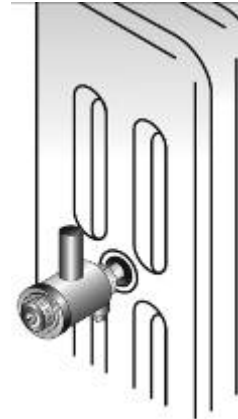
Straight shank  
air vent



# Method of Installation



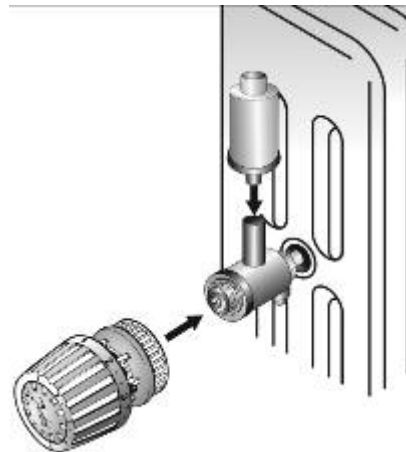
1) With steam system down, carefully remove existing air vent.



2) Carefully tighten the valve body into the air vent tapping



3) Tighten the straight shank air vent to the valve body  
(Do not use angle air vent)



4) Attach the thermostatic operator to the valve body



MAKING MODERN LIVING POSSIBLE



**Dial up comfort. Dial down heating costs.**  
**Achieve energy savings by installing the Danfoss thermostatic radiator valve.**



Hydronic Heating Division – North America