

ENGINEERING  
TOMORROW

*Danfoss*

ASV automatic balancing valves

# Smart heating optimization **increases your building's lifetime value**

Automatic balancing and temperature control solution for two-pipe heating systems.

**61%**

of residents rate  
expected energy  
costs as a major  
factor when choosing  
their next home.

# Happy tenants are good tenants

Investing in more efficient heating  
is a sound commercial decision

There are few feelings as pleasant as a comfortable and warm apartment on a cold or rainy day. Even better if your tenants know that you've installed a heating system that's saving them money, reducing CO2 emissions and helping to protect the environment.

Tenants today are more aware and more demanding than ever. With easy access to information from a range of media, their expectations are high and getting higher. And they will not hesitate to let you know if they feel those expectations are not being met.



Eliminate system imbalance  
and increase energy efficiency  
**Simple and effective**



On average

**68%**

of a building's total energy use is absorbed by the heating system.



## Introducing **Danfoss ASV** solution

A smart solution that strengthens  
your letting business

Danfoss' ASV solution is a simple and cost-effective approach to boosting the efficiency of heating systems by using the latest high-performance balancing valves and temperature controllers. This offers a number of direct benefits, not least in retaining and attracting good tenants.

Satisfied tenants complain less, saving you time and money on services and administration. They are more likely to stay, saving you re-letting costs and protecting your cash flow. Their good opinion of the building they live in spreads among their neighbors, helping to build local demand for your properties as well as boosting your image with regard to social responsibility. With

energy costs continuing to rise above the rate of inflation, there is no better way to keep your tenants happy than by offering them a comfortable living environment while minimizing what they have to pay to achieve it.

### **Seizing a major opportunity**

At present, around 80-90% of multi-family buildings – even those built in the last 30 years – have heating systems with little or no hydronic balancing and/or poor temperature control. This represents a major opportunity for improvement, for both commercial and environmental reasons. Fortunately, with the Danfoss ASV solution, achieving significant gains in the efficiency of your heating system and

the level of comfort is both easy and very affordable. Although exact results will vary from building to building, it is not unusual for a Danfoss ASV solution to pay for itself in as little as two years.



Scan to see an animation  
of the ASV solution.



# Rethinking your heating concept

The road to satisfied tenants

## Understanding the shortcomings of traditional systems

Generally, buildings constructed prior to 1990 have a single boiler or district heating connection providing heated water to all radiators in the building via a vertical or horizontal riser. Each riser provides heated water to a number of radiators, which are mostly manually controlled.

Based on a simple physical principle, the heated water follows the path of the least resistance and takes the shortest route. This means that the risers closest to the heat source transport more heated water than those further away. It also means that radiators closest to the heat source provide more heat more quickly than those at the end.

## System imbalances result in dissatisfied tenants

This traditional but inefficient design concept causes huge imbalances in the system, making it extremely difficult for tenants to achieve the comfort level they desire. Tenants will experience noisy radiators, excessive or inadequate heating and big differences in heating times between apartments. Those tenants living furthest from the boiler are too cold while those who are closest are too hot. They constantly need to adjust the radiator valves or sometimes even open windows to get the temperature down to a comfortable level, wasting large amounts of energy. Last but not least heat cost allocation via installed radiator heat meters is inaccurate, causing most residents to pay an unfair share of the overall high heating costs.

System imbalances and a lack of temperature control are major sources of tenant dissatisfaction. In the end, whether they have too much heat or too little, all tenants find it hard to achieve comfortable room temperatures while over-paying for their heating.

Save up to

# 20%

in energy through  
correct system balancing  
and by fitting radiator  
thermostats.

## Characteristics of an **unbalanced** system

- Uneven heat distribution and differences in start up times
- Noise from the heating system
- Difficulty of controlling temperature
- A lot of energy waste
- High energy bills
- High complaint-handling costs
- Many complaint handling efforts



# Quick, simple and highly **cost-effective**

Danfoss ASV automatic balancing solution is the answer

Three requirements should be met to fully optimize the heating system:



## Ensure that the risers are properly balanced

To achieve this Danfoss ASV automatic balancing valves should be installed. These provide the basis for achieving proper hydronic balance throughout the system, under all system conditions (partial or full load) and outside temperatures.

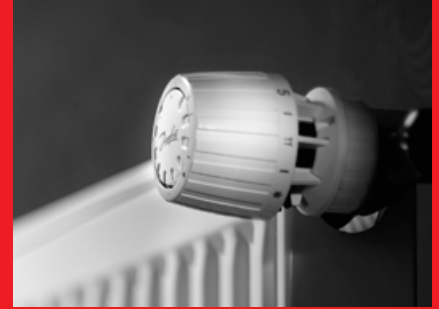
The result is stable pressures and even heat distribution among all risers throughout the entire heating season as well as significant energy savings.



## Ensure that all radiators are properly balanced

The next requirement is to ensure an even flow of water through the system by balancing the radiators. This can be achieved by simply fitting Danfoss RA-N pre-setting thermostatic radiator valves and commissioning each of them to the required setting.

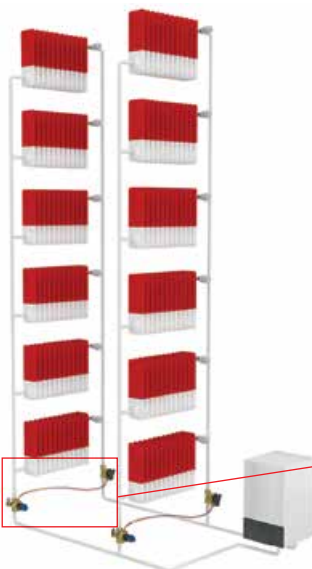
In this way, each radiator will get the right amount of heated water, preventing inefficient over and under heating while establishing fair measuring of heat consumption.



## Ensure easy and effective temperature control

Adding a Danfoss sensor to the thermostatic radiator valves to achieve automatic temperature regulation is the perfect way to provide tenants with an optimal indoor climate and maximum energy savings.

The desired room temperature can then be determined by the tenant for each single room of the apartment, ensuring constant comfort that can be adjusted at any time.



## **Automatic** balancing results

- Fewer heating and noise complaints
- Lower service and maintenance costs
- Increased indoor comfort
- Lower energy bills for your tenants
- Fair split of energy costs among tenants
- Increased rentability of your buildings



# Danfoss ASV solution

## for two-pipe heating systems

An overview of the products

### Balance risers by installing Danfoss ASV automatic balancing valves



Danfoss ASV consists of two components: a differential pressure controller ASV-PV and its partner valve ASV-BD. The components are connected to each other with an impulse tube that enables differential pressure over the riser to be controlled. In most cases, the installation of the valves takes place in the basement with hardly any inconvenience to your tenants.

#### Benefits include:

- eliminating the pressure fluctuations that cause noise problems
- establishing a good hydronic balance to avoid the problems of uneven heating
- minimum inconvenience for tenants during installation

### Balance radiators by installing and commissioning Danfoss RA-N or RA-UN thermostatic radiator valves



Danfoss RA-N and RA-UN thermostatic valves offer easy installation and pre-setting features. There are a wide range of models to cover any situation and as many as 14 setting options for accurate pre-setting. The RA-N valves are our standard pre-setting valves for average water flows. The RA-UN valves are especially suitable for pre-setting of low water flows.

#### Benefits include:

- establishing correct water flow for each radiator, reducing energy wastage
- providing the best possible working conditions for the thermostatic sensor

### Provide temperature control by installing Danfoss RA 2000 or RAW thermostatic sensors



The Danfoss RA 2000 and RAW thermostatic radiator sensors provide fully automated temperature control for improved comfort and reduced costs. The RA 2000 is 'best in class' when it comes to control accuracy and energy savings. The RAW is especially suitable for projects where cost is an important factor, offering excellent performance at a moderate price.

#### Benefits include:

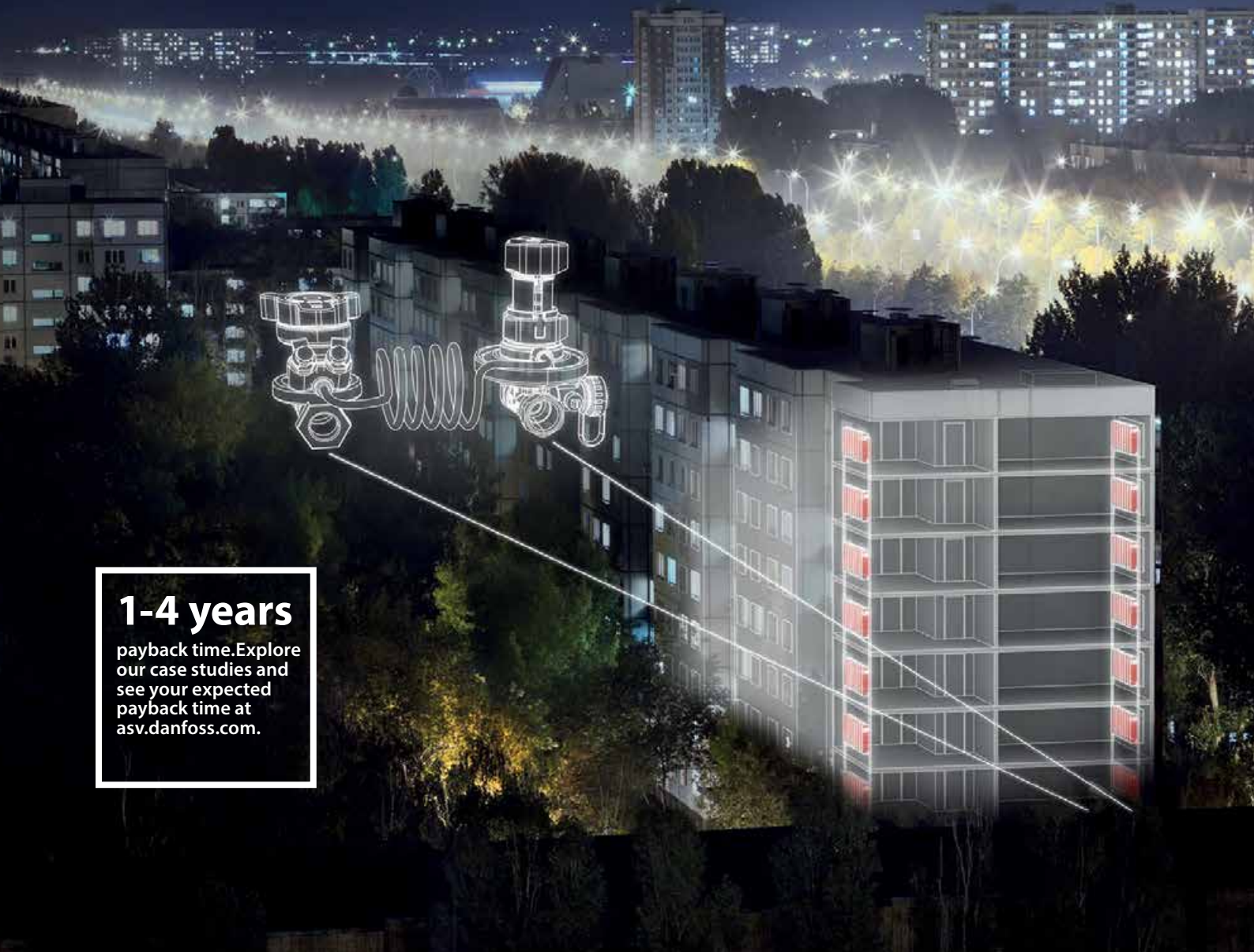
- automatic but adjustable room temperature control
- easy operation
- energy saving by automatically closing the radiator valve when the set temperature has been reached

### Get the full package and maximize the benefits

The best results are only achieved when both risers and radiators are hydronically balanced, and when radiators are equipped with thermostatic sensors for automatic temperature control.

#### After implementation, benefits include:

- no more noise complaints
- no more over and under heating complaints
- less maintenance and service costs
- an energy efficient heating system
- fair heat cost allocation
- improved rentability of apartments



**1-4 years**  
payback time. Explore our case studies and see your expected payback time at [asv.danfoss.com](http://asv.danfoss.com).

## Minor investment **significant results**

There is no more noticeable or quickly appreciated improvement you can make for your tenants than providing increased comfort and reduced energy bills.

Danfoss offers two automatic balancing solutions. Besides the riser fitted ASV solution the new radiator fitted *Dynamic Valve™* delivers the same benefits, only performed in another way. Both solutions are part of the Danfoss Renovation+ concept for renovations or retro-fitting in existing multi-family buildings. The best solution depends on the building size and type. As a rule of thumb *Dynamic Valve™* covers systems up to 60 kPa, while AVS is built for larger buildings with systems up to 150 kPa.

### **Boosting the lifetime value of your buildings**

The Danfoss automatic balancing solutions offer you flexible and highly cost-effective solutions for your renovation or new-build projects, regardless of building type, current condition or available budget.

By involving Danfoss ASV or *Dynamic Valve™* in your projects, you benefit from the support of experienced professionals in ensuring you get maximum return from your investment. At the same time, you significantly increase tenants' satisfaction while reducing annual heating service costs. This reduction of Total Cost of Ownership leaves you

with more time to concentrate on running your letting business.

We can visit your planned renovation site and advise you on the most suitable strategy and solutions for designing, upgrading or renovating your heating system.

Feel free to contact us at any time, or simply ask your preferred installer about Danfoss solutions.



*Dynamic Valve™*

# Working with a market leader

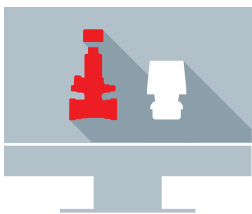
Our experience is your guarantee of satisfaction

Danfoss was the original inventor of both the radiator thermostat and the automatic differential pressure controller: the two main components of the Danfoss automatic balancing solutions for two-pipe heating systems in multi-family houses. Today, we have been serving the needs of the heating industry for over 80 years and are a market leader in automatic heating control technology.

In addition to the *ASV* and *Dynamic Valve*™ automatic balancing solutions for two-pipe heating systems, Danfoss offers a range of other solutions and products for the renovation of multi-family houses, including:

- Danfoss automatic balancing solutions for one-pipe heating systems
- Domestic hot water system optimization using Danfoss MTCV circulation valves
- Decentralized heating system and instantaneous domestic hot water production with EvoFlat™ stations
- Substations and control components for buildings connected to district heating networks

**For more information, contact your personal Danfoss sales representative or nearest Danfoss office.**



Learn more about our products  
at **[heating.danfoss.com](http://heating.danfoss.com)**

**Danfoss A/S** · Heating Segment · Ulvehavevej 61 · DK-7100 Vejle · Denmark  
Telephone: +45 7488 8500 · Email: [heating@danfoss.com](mailto:heating@danfoss.com) · [www.heating.danfoss.com](http://www.heating.danfoss.com)

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