



ENGINEERING
TOMORROW



Energy optimization of **commercial buildings**

Rising energy costs. International, regional, national and local environmental regulations and legislation. Sustainability targets and ESG reporting. Tenant comfort, safety and satisfaction. Whether you invest in, own, manage or design commercial buildings, these areas all impact your business in one way or another.

How can you ensure that your commercial buildings are energy-efficient, sustainable, regulatory compliant and attractive to tenants and investors, while keeping operation costs under control?

The answer lies in retrofitting.

> START HERE

Three keys to **retrofitting** your **commercial building**

Research shows that over 80% of all existing heating systems have an immense optimization potential. Retrofitting is an ideal way to unlock this potential and enhance your commercial building's performance and sustainability.

Take a look at three effective retrofit strategies >

Together, we're optimizing the future.
Building by building.


Maximize property potential through retrofitting.



Three effective **retrofit strategies**

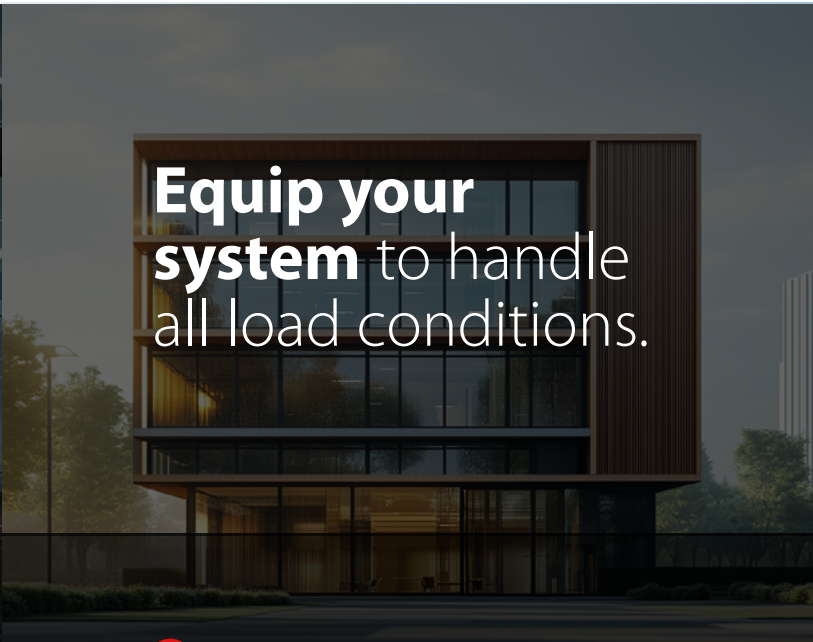
There are three steps to successfully retrofitting your building's HVAC system.

Let's look at each step in greater detail.



Implement **hydronic balancing**.

1 [Learn more >](#)



Equip your system to handle all load conditions.

2 [Learn more >](#)



Add a layer of **digitalization**.

3 [Learn more >](#)



Step 1 | Implement hydronic balancing

Implementing **hydronic balancing**

A system is hydronically balanced when it has the right flow rates during full and partial load conditions. A balanced system ensures sufficient capacity at all loads, precise temperature control and maximum system efficiency.

There are two types of hydronic balancing:

Static hydronic balancing >

Dynamic hydronic balancing >

While each type has its strengths, for large commercial or multi-family buildings, with many radiators or heating circuits, dynamic balancing offers the greatest energy efficiency potential.



Step 2 | Equip your system to handle all load conditions

How **dynamic balancing** increases heating efficiency

Variable flow systems, typically used in multi-family or commercial buildings, regulate the amount of water in the system based on the load. While this system type is more energy efficient, it's also more challenging to balance. This is where dynamic hydronic balancing comes in.

Dynamic hydronic balancing uses pressure independent control valves (PICVs) to ensure the right flow in every unit under any condition. These valves incorporate differential pressure controllers, which simplify balancing and reduce the heating system's interdependence. The results are a system that's perfectly balanced at all loads, with more precise temperature control and maximum system efficiency.

Does it matter which PICV you choose? >



Step 2 | Equip your system to handle all load conditions

Does it matter **which PICV** you choose?

Yes. The reason why has to do with the practical challenges of retrofitting an existing commercial building.

CHALLENGE #1: KNOWING WHAT'S IN THE SYSTEM.

To dynamically balance a system, you need to control the whole system by the terminal unit. The challenge with a retrofit is that you often don't know what's in the system. When you're retrofitting an older building, it can be challenging to get updated drawings, so you risk working with outdated, inaccurate information.

✓ How to solve it

With Danfoss' AB-QM PICVs, you don't need to know what's in the system. All you need to know is the flow for the terminal unit. There's no need for sizing or authority calculation. You can just set the flow.

CHALLENGE #2: LIMITED OPERATIONAL BUDGET.

Another common challenge with retrofitting is the budget and resources available. It's not always feasible to install PICVs throughout an entire heating system in one go.

✓ How to solve it

With AB-QM PICVs, you can retrofit the system one-by-one, and replace by terminal unit, by branch or by section. This is a tremendous advantage when you're working on a limited budget.

19.3% savings in electricity and ROI in 4 years

Find out how a 4* resort was able to significantly reduce energy consumption and operating costs, while improving guest satisfaction, by fitting existing fan coil units with AB-QM PICVs.

[Read the case story here >](#)



Learn more about
AB-QM PICVs



Step 3 | Add a layer of digitalization

Digitalize your HVAC system and unlock its full energy-savings potential

Implementing dynamic hydronic balancing using PICVs can take you a long way in improving your commercial building's energy efficiency. However, there are still installation and operational challenges on the road to full energy optimization. To optimize a heating system's operation, you need real-time system performance information. You need transparency regarding energy flow within your building. And you need an efficient way of adapting the system to changes in usage patterns or building design. **The key to solving these challenges is to digitalize the actuators.**

[Deep dive into our energy efficient solutions for commercial buildings >](#)



Step 3 | Add a layer of digitalization

NovoCon[®] – your gateway to a smart, connected building

The basis of any good digital HVAC system is enabling accurate flow control. You can achieve this by installing a PICV and coupling with a digital actuator, which enables you to digitalize your HVAC system. A digital actuator:

- can give you flow indications without you having to install an expensive flow measuring device,
- enables BMS integration and bi-directional communication,
- gives you real-time status on the valve and its surroundings,
- by adding a temperature sensor – can provide you with real-time thermal, power and energy consumption data.



Step 3 | Add a layer of digitalization

NovoCon[®] – your gateway to a smart, connected building

NovoCon[®] digital IoT actuators are tailor made to work with Danfoss' AB-QM PICVs. They enable:



1 Energy monitoring

Identify energy leaks and maintain your HVAC system's performance.

2 Energy benchmarking

Compare floor-to-floor, room-to-room or building-to-building to see how your system is performance and perform proactive maintenance.

3 Energy management

Set delta T, return and supply temperature values so NovoCon can intervene if the levels are exceeded.

[Learn more about NovoCon[®] Digital Actuators >](#)

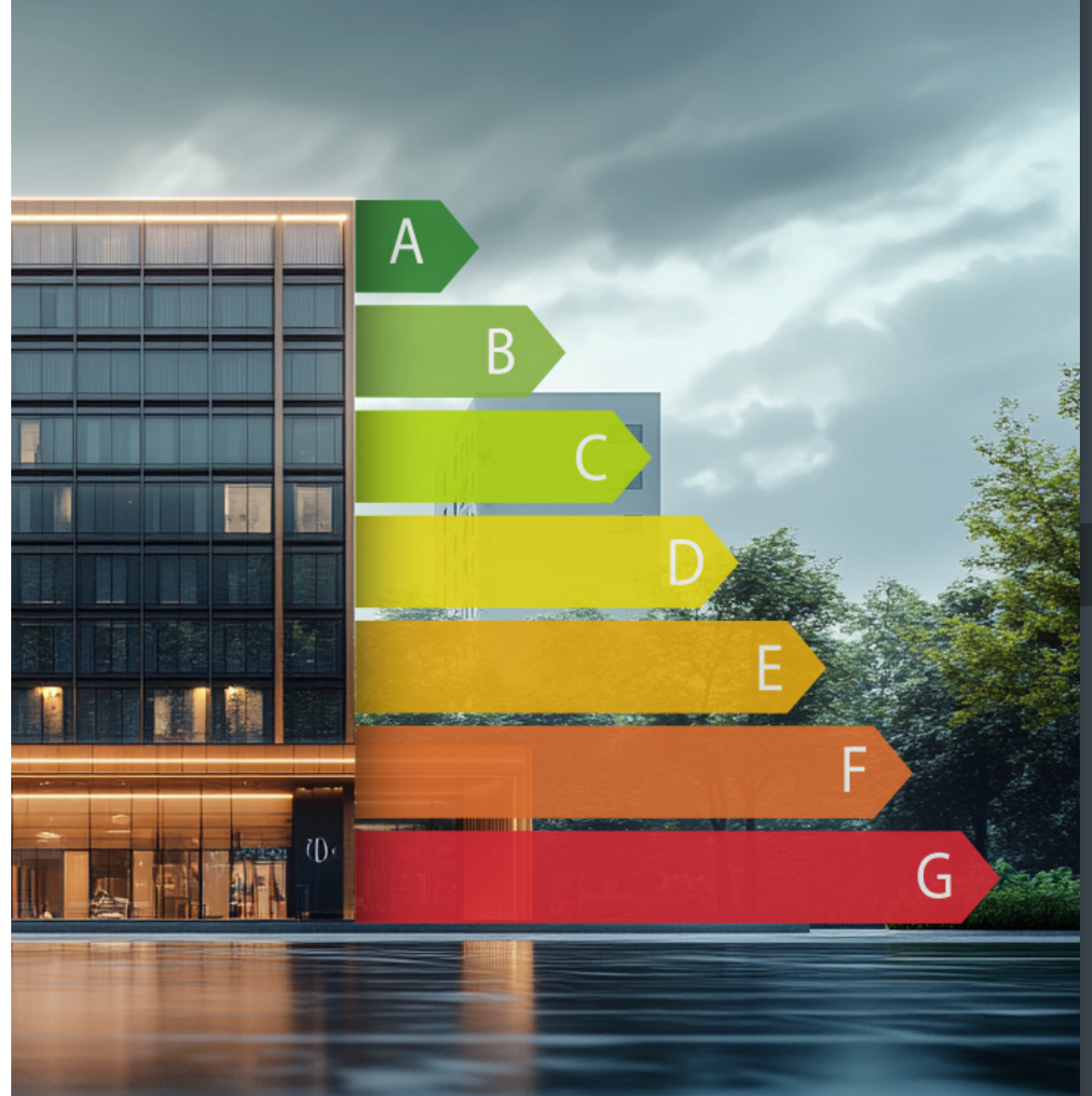


Let's **work together** to retrofit your buildings

Improving your building's envelope, energy generation and supply and/or the way energy flows within the building can have a significant impact on a building's energy performance. Making even small adjustments to one or more of these elements can go a long way in decarbonizing your commercial building.

Connect with us – and let's optimize the future.
Building by building.

Contact us here >



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