



**10%**

saving on cabling  
with the  
NovoCon®  
daisy chain  
solution

ENGINEERING  
TOMORROW

*Danfoss*

Case story |  
Danfoss AB-QM 4.0, NovoCon® & ChangeOver6

## Efficient HVAC control systems for new education- and rehabilitation center

In the city of Rotterdam, the Netherlands, a new education and rehabilitation center called ROeR (ROtterdam education and Rehabilitation center) is being built. The site has a total area of over 13,000m<sup>2</sup>, including swimming pool, gymnasiums, educational areas and rehabilitation center. Initiated by the Municipality of Rotterdam and Rijndam Rehabilitation, with Royal BAM Group as main contractor, Terberg Totaal Installaties is responsible for the HVAC systems in this project. The project offers a great possibility to contribute to a comfortable living environment, involving advanced technology, in this treatment center especially for children with disabilities.

Sustainability is an integral part of the ROeR project. By means of heat pumps, air handling units, over 730 solar panels and underfloor heating & cooling, the building is "all-electric".

## The challenge

ROeR's new treatment center consists of many building parts. Hence a lot of cabling per building section would also be needed. Terberg sought a solution to reduce the amount of cabling for the control technology with minimal risk of failure costs. The desire was to pull only one cable instead of multiple cables per room. Terberg was also looking for a solution to control the underfloor heating and cooling per building section as efficiently as possible.

## Faster

commissioning  
via the  
NovoCon®  
configuration  
tool



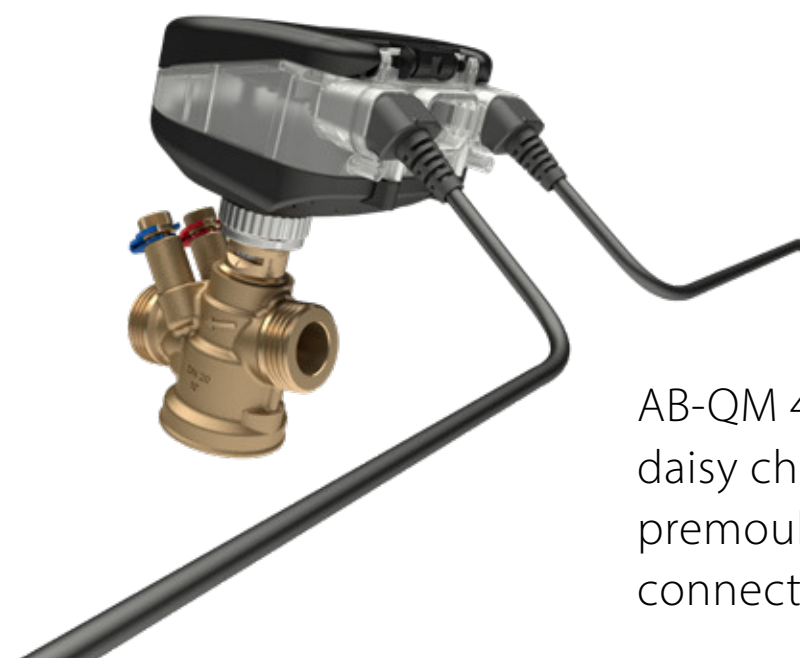
## The solution

Thanks to the use of the NovoCon® Energy and the pluggable daisy chain cabling with BACnet MS/TP bus communication, it was possible to minimize the amount of cables. An additional advantage is the integrated I/O of the NovoCon® Energy. This project uses NovoCons® standard available internal temperature control. Because of the smart software in the NovoCon® digital IoT actuators, the temperature doesn't need to be controlled from a master Building Management System (BMS), although it can be connected to it.

This NovoCon® Energy controls the underfloor heating and cooling per building section. This makes optimal use of the available functionalities and minimizes risks.

Danfoss supplied the following products:

- 127 pressure independent control valves (PICV) with digital actuators (AB-QM 4.0, NovoCon® S and ChangeOver6)
- 11 medium sized pressure independent control valves type AB-QM with digital actuators type NovoCon® M for the technical room

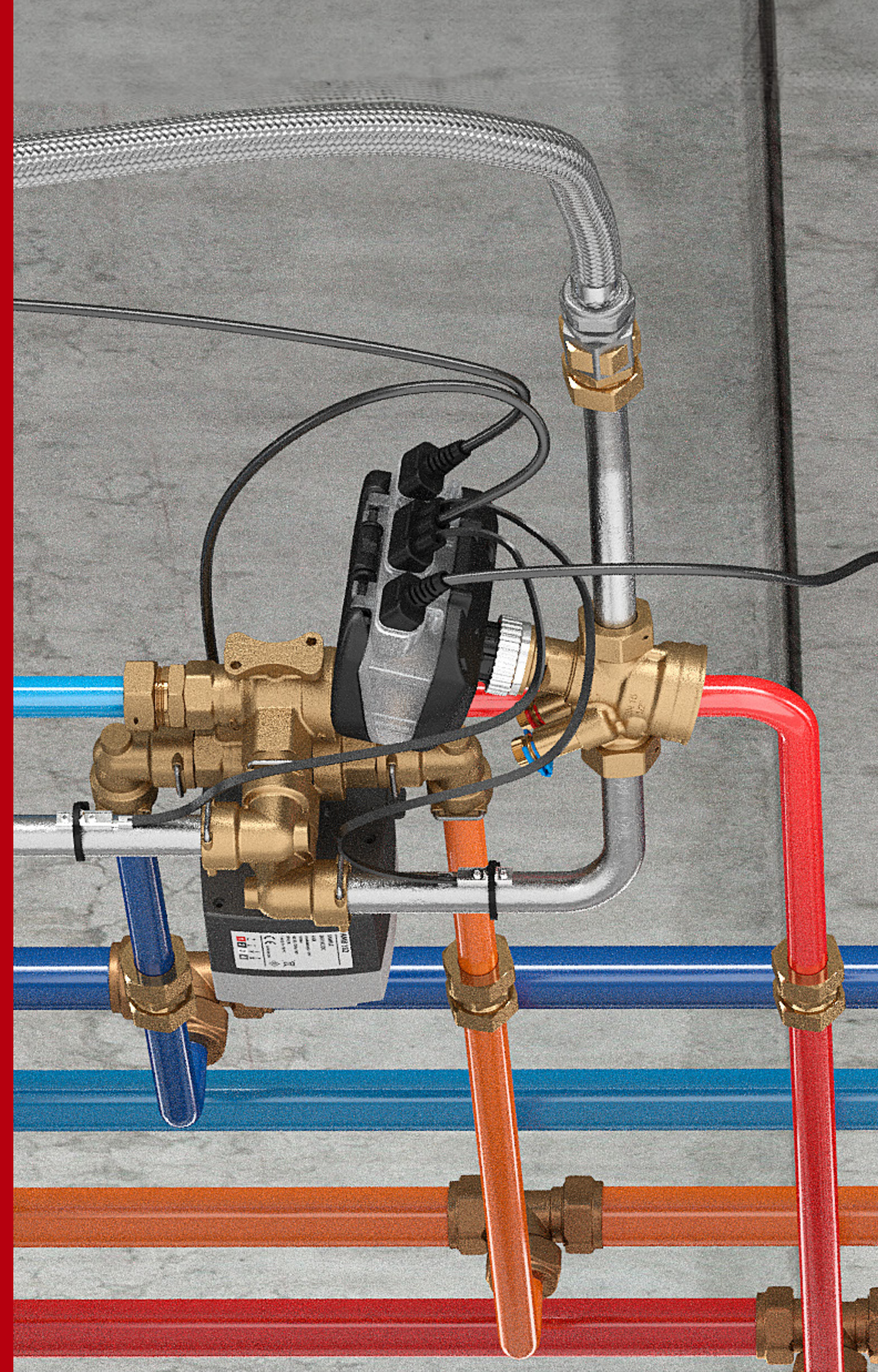


AB-QM 4.0 with NovoCon® S, daisy chain cabled with premoulded, pluggable, connectors

**"The internal temperature control allows us to have the groups controlled independently. We were able to simplify the design and by working with the pluggable BACnet bus we were able to commission the AB-QM 4.0 valves with NovoCon® via this bus in one go. A great solution that we were able to realize in partnership with Danfoss"**

**Stefan de Groot**

Project Manager Measurement & Control Technology

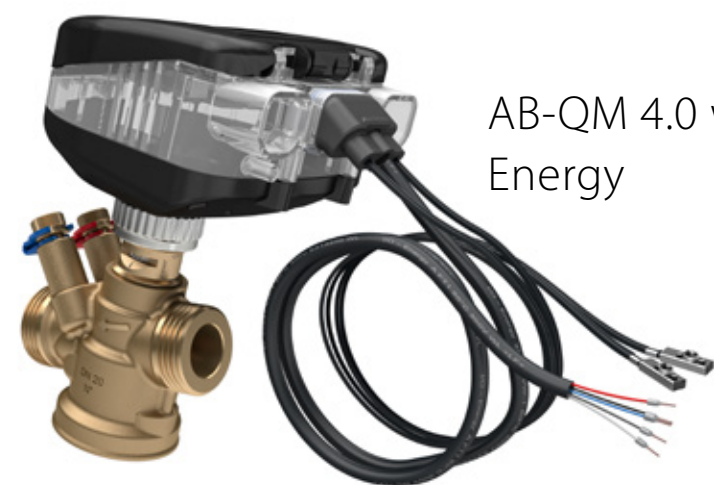


## NovoCon® Energy with integrated I/O

The digital IoT actuators also offer integrated I/Os for additional functionality, flexibility and cost savings. In some applications this can replace the I/O modules of the BMS. Some examples of using the actuator's I/Os include:

- Flow & energy indication by connecting sensors to measure supply and return temperatures with NovoCon® Energy
- Energy management, e.g. limiting the return temperature for system efficiency optimization
- Optimized solution for 4-pipe change-over applications in combination with NovoCon® CO6 (only for NovoCon® S)
- Combine with different sensors (e.g. room temperature, humidity, or condensation) and control different devices such as fans with the NovoCon® Remote I/O cable.

NovoCon® is applicable in different types of HVAC systems, such as air handling units (AHU), fan coil units (FCU), induction units and chilled beams.

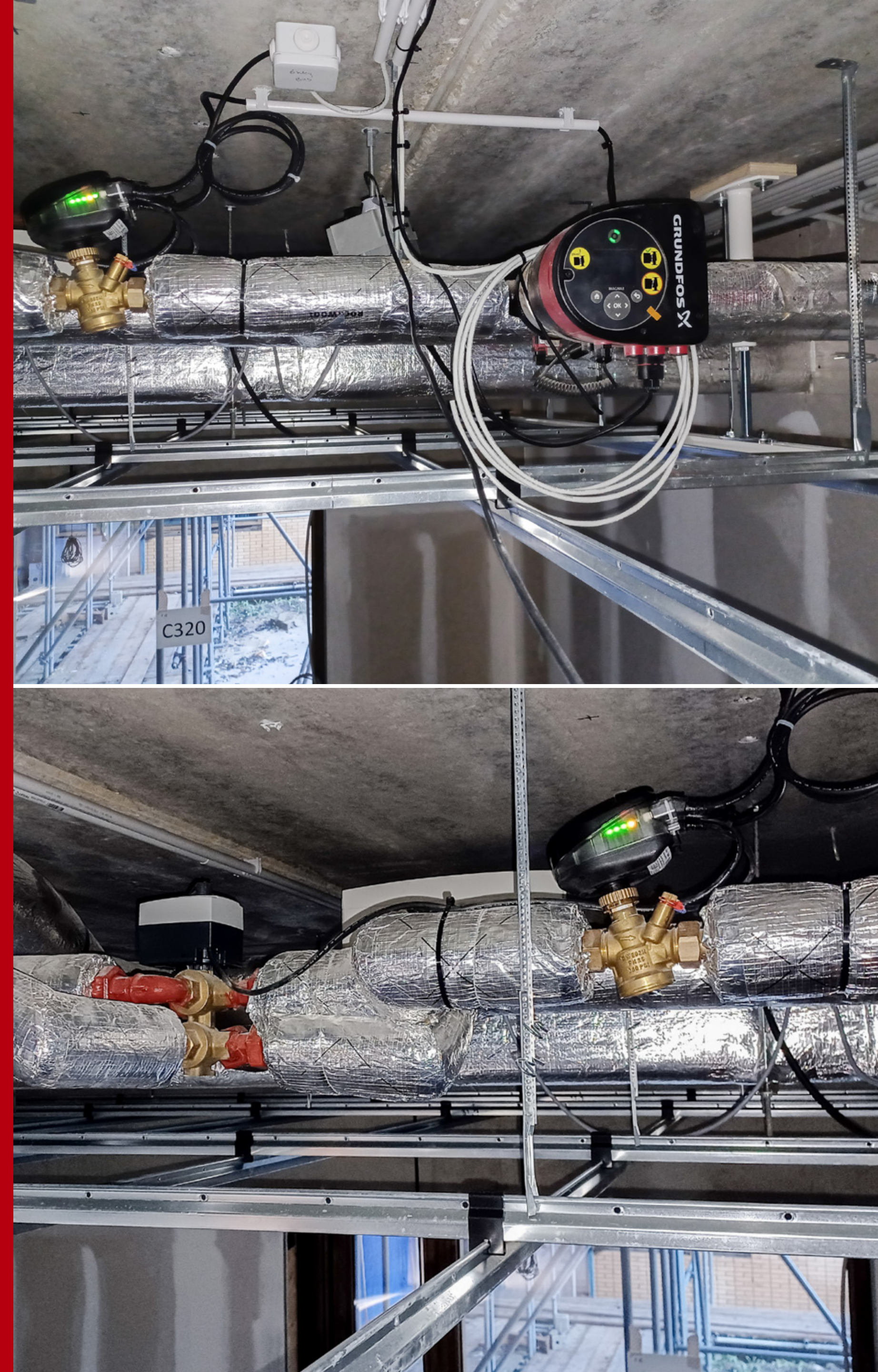


AB-QM 4.0 with NovoCon® Energy

### Marko Munnik

Sales Manager District Energy & Buildings NL of Danfoss says he is very pleased with the fine cooperation with Terberg Totaal Installaties.

**"This project is a good example of making optimal use of all available functionalities of our NovoCon®. We are proud that we as Danfoss were able to make a contribution to this beautiful project."**



# The result

By applying the NovoCon® and the pluggable daisy chain solution, it was possible to save on the amount of cabling. In addition, the risk of failure costs due to installation errors could be reduced. As an additional benefit of this application, Terberg was able to apply the internal control of the NovoCon® Energy into their HVAC control approach. This is an advantage in the final control setup that will be delivered to the client, but also for providing the building heat during the construction and installation phase.

**Energy-  
management**  
integrated into  
the NovoCon®  
application

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