



# ABB drives for HVAC

## ACH580-01, 0.75 to 250 kW

### Catalog

# Comprehensive climate control, effortless operations

Your HVAC systems need to work no matter what. Mission critical applications, such as hospitals or data centers, require fan control for proper airflow to protect the products and the people they serve. Commercial buildings, such as schools and offices, rely on that airflow for productivity through comfort. Additionally, these systems require proper control of pumps to ensure water and piping systems provide consistent and fine-tuned climate control.

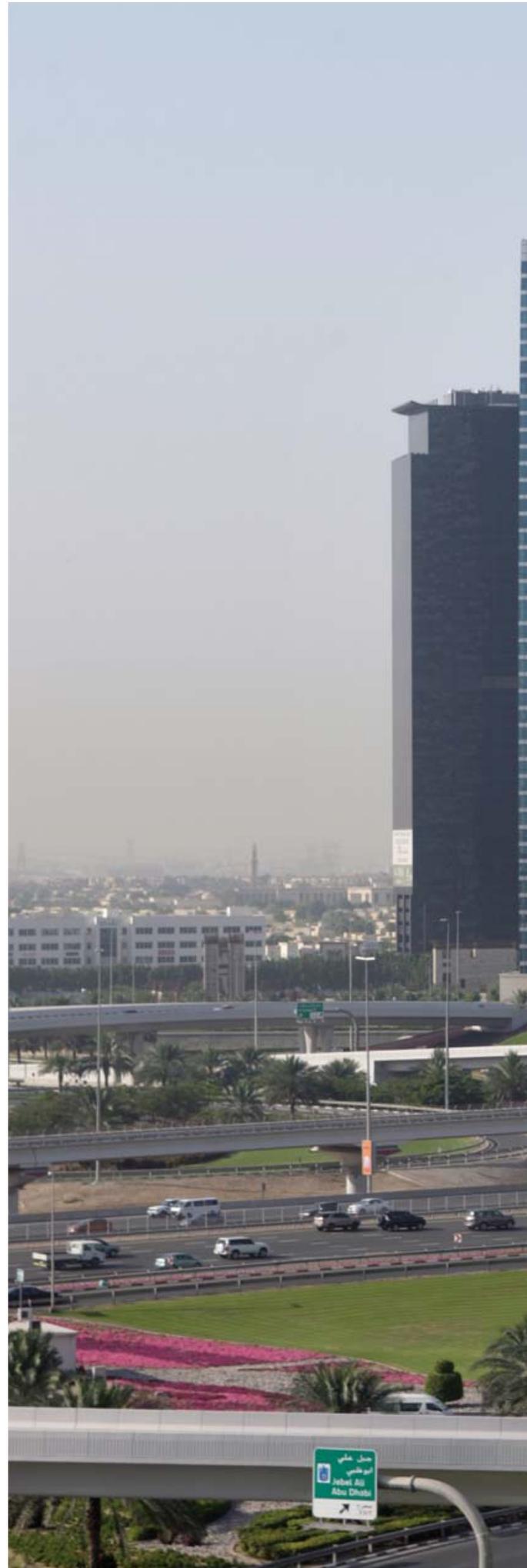
Safety is imperative all across the board.

The products you use are comprehensive in functionality and simple to operate. They're reliable right now and for the years to come. They'll keep you up to date on your system's efficiencies and give advanced notice of possible maintenance needs.

We understand this and believe that our ACH580 will allow you to focus on what counts.

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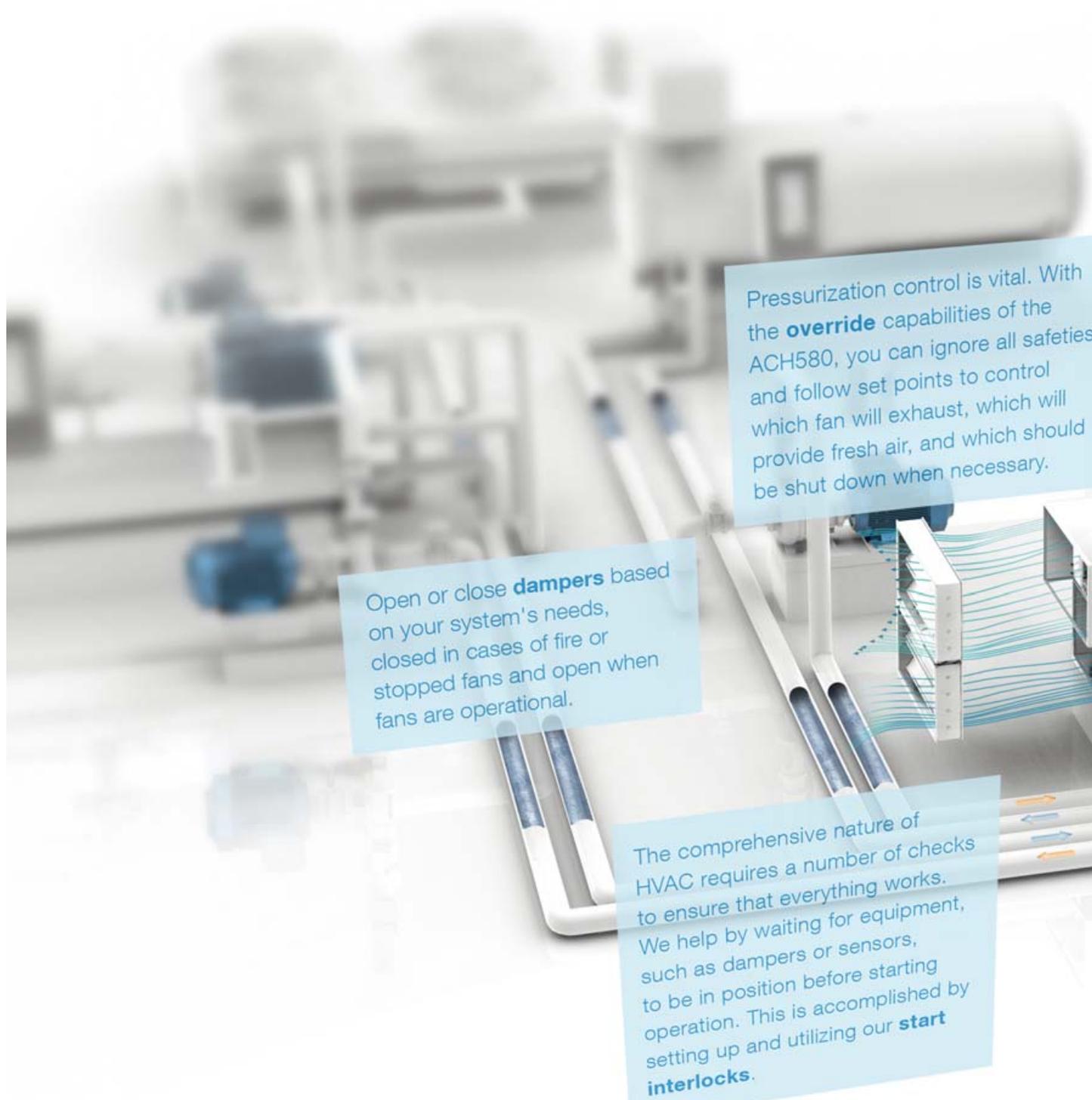


Energy efficiency. Comfort. Productivity. Safety.  
Everything counts in HVAC.



# Handling the air side

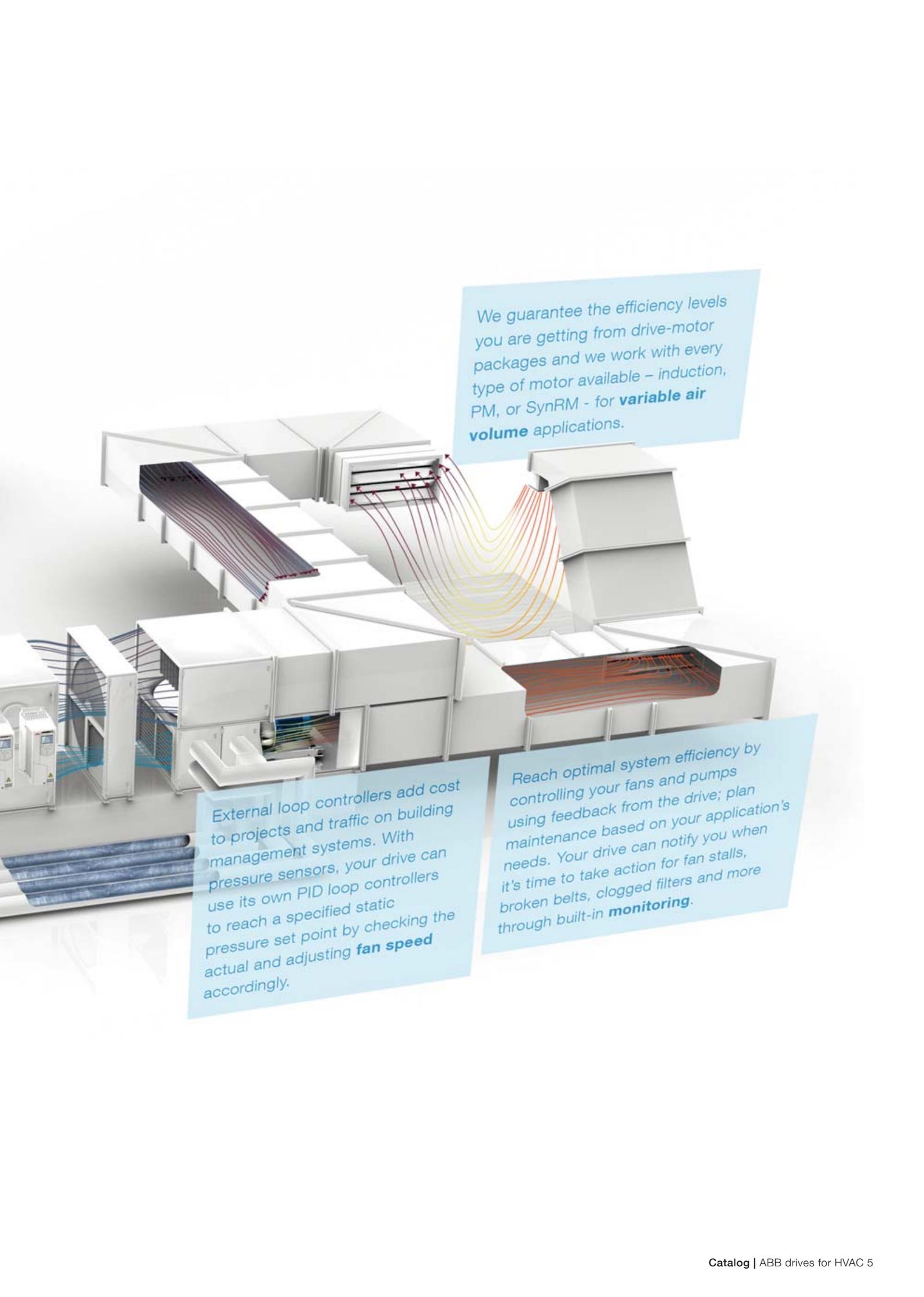
Controlling the flow of air requires numerous systems working together in harmony to produce the levels of comfort, control and safety required. You can rest assured that regardless of the season or external conditions we will make your system efficient, safe and informative.



Open or close **dampers** based on your system's needs, closed in cases of fire or stopped fans and open when fans are operational.

Pressurization control is vital. With the **override** capabilities of the ACH580, you can ignore all safeties and follow set points to control which fan will exhaust, which will provide fresh air, and which should be shut down when necessary.

The comprehensive nature of HVAC requires a number of checks to ensure that everything works. We help by waiting for equipment, such as dampers or sensors, to be in position before starting operation. This is accomplished by setting up and utilizing our **start interlocks**.



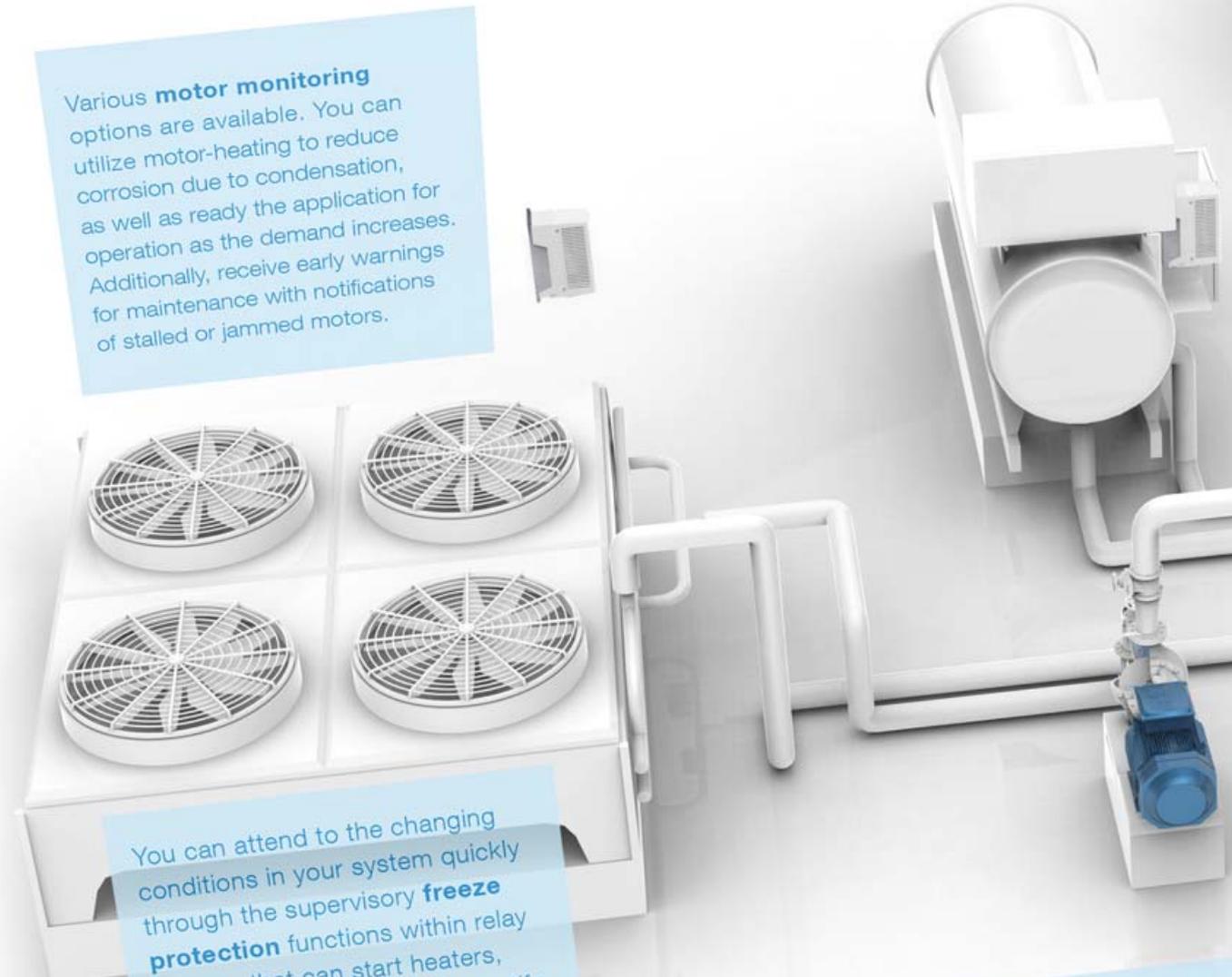
We guarantee the efficiency levels you are getting from drive-motor packages and we work with every type of motor available – induction, PM, or SynRM - for **variable air volume** applications.

External loop controllers add cost to projects and traffic on building management systems. With pressure sensors, your drive can use its own PID loop controllers to reach a specified static pressure set point by checking the actual and adjusting **fan speed** accordingly.

Reach optimal system efficiency by controlling your fans and pumps using feedback from the drive; plan maintenance based on your application's needs. Your drive can notify you when it's time to take action for fan stalls, broken belts, clogged filters and more through built-in **monitoring**.

# Controlling the water flow

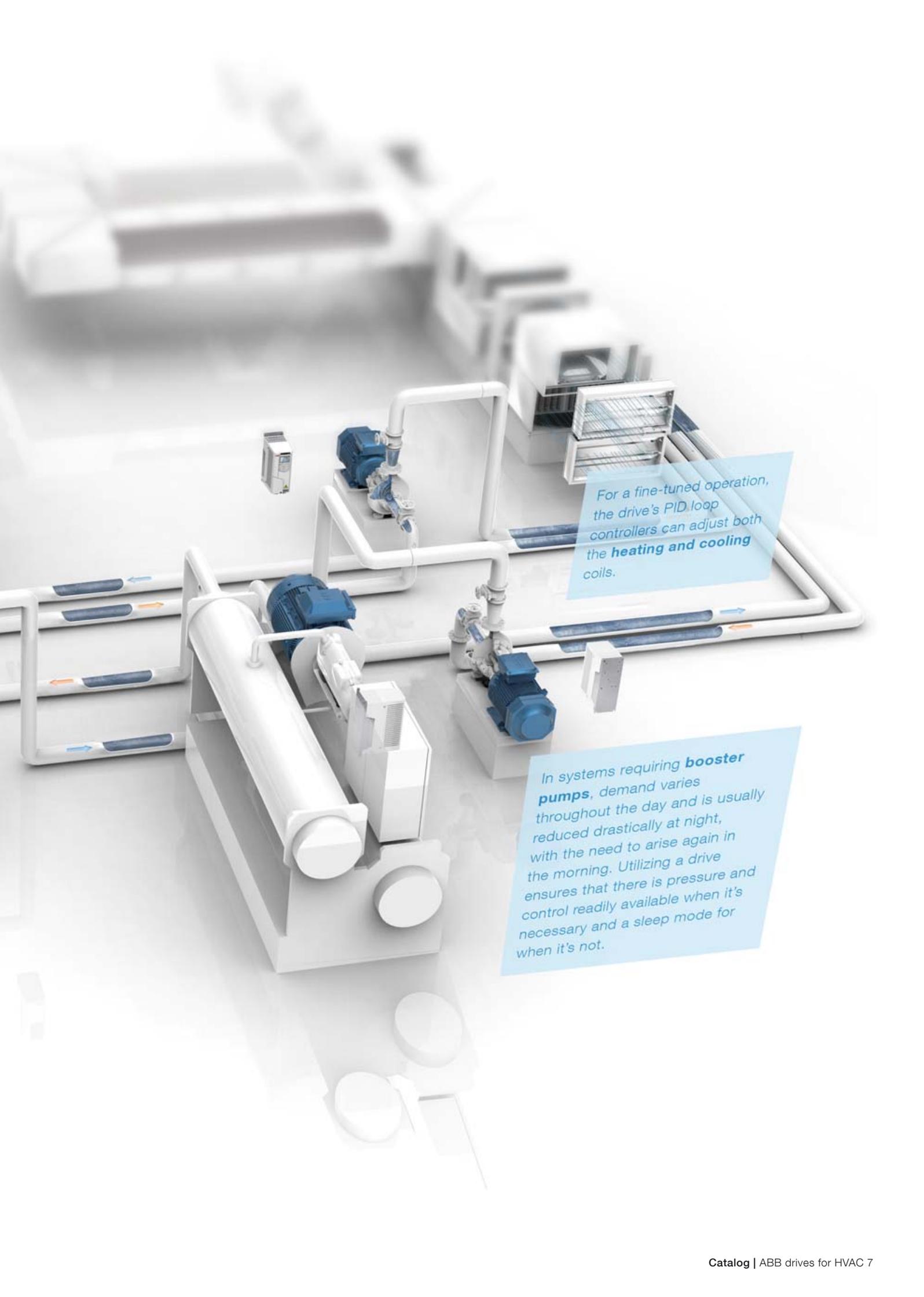
Water loops are responsible for regulating the temperature in a system. To accomplish this a number of applications must work in concert: condensers, pumps, chillers and boilers. All of these need to operate motors as efficiently and simply as possible, with functions designed for their aquatic needs.



Various **motor monitoring** options are available. You can utilize motor-heating to reduce corrosion due to condensation, as well as ready the application for operation as the demand increases. Additionally, receive early warnings for maintenance with notifications of stalled or jammed motors.

You can attend to the changing conditions in your system quickly through the supervisory **freeze protection** functions within relay outputs that can start heaters, change set points or simply notify you of freezing conditions.

You can save energy over traditional throttling valves by controlling your **primary pumps** with a VSD. Utilize a drive on your **secondary pumps** to minimize consistency issues with water flow and to provide maximum energy efficiency.



For a fine-tuned operation, the drive's PID loop controllers can adjust both the **heating and cooling** coils.

In systems requiring **booster pumps**, demand varies throughout the day and is usually reduced drastically at night, with the need to arise again in the morning. Utilizing a drive ensures that there is pressure and control readily available when it's necessary and a sleep mode for when it's not.

# The next evolution in climate control

It sets new standards both in simplicity and reliability. It can be integrated with any motor. It communicates in the languages you and your system already know. It exceeds specifications in mission critical environments. It provides productivity through comfort in commercial buildings. And the best part? All you need to do is focus on what counts.

Introducing the new ACH580 climate control drives.

## Simple to select, install and use

All essential needs such as chokes for reducing harmonics, EMC filters, IP55 and IP21 enclosures with the same footprint, cabling clamps and native BACnet communications are built into the drive simplifying selection, installation and commissioning.

## Guaranteed efficiency levels

Our drive collaborates directly with the motor to provide up-to-date energy efficiency information that helps you save energy in your applications, while monitoring just how much it is that you have saved.

## Any motor, any application

Whether you utilize traditional AC induction motors, PM motors or want to take your efficiency to the next step with our ACH580 drive and energy-efficient IE4 SynRM motor package, we can deliver the best performance in the most energy efficient manner possible.

## I/O capabilities

Never be without back-up I/O points on the jobsite again; take advantage of the added flexibility and accessibility offered by pass-through I/O.





### Seamless integration on your terms

When you walk by the new HVAC control panel it will show you the status of the drive on a customized home view, only displaying the information you need. Primary settings communicate in the languages that you and your system understand. Additionally, there's a real time clock with back-up battery and built-in help menus assist you through any questions you may have.

### On the job site

Our Hand-Off-Auto enabled control panel, ensures that all control and flexibility in the drive's operation is available to users natively without external switches and buttons. It allows you to gain quick access to related settings through the I/O menu and add information to I/O signals or customize fault and warning messages.

# Motor control and energy efficiency guaranteed

Comprehensive in its control, beautiful in its simplicity

**Our ACH580 drives control any type of AC motor for HVAC including induction, permanent magnet, and synchronous reluctance motors. More than that though, this drive family was designed to outperform any type of motor control platform by offering guaranteed efficiency packages with the most comprehensive and reliable set of capabilities.**

Our harmonic choke lowers harmonics across all partial loads of the drive. Our communications capabilities include both native BACnet and every other HVAC protocols required on the market. Our built-in energy optimizer creates the optimum flux inside a motor for a balance between energy consumption

and fast dynamic response at partial loads. Our harmonic choke lowers harmonics across all partial loads of the drive. There is not an HVAC application or motor that we cannot control simply and efficiently.



# Any motor in any HVAC application



## **Induction motors and the ACH580 form a reliable combination**

Induction motors are used throughout the industry in many HVAC applications and in a wide range of environments. ACH580 drives fit perfectly together with this type of motor by providing comprehensive functionality yet simple operation. IE3 motors and our VSD provides a perfect foundation for energy efficiency, while delivering capabilities such as exceeding nominal motor speed when maximum power is needed.



## **Permanent magnet motors and the ACH580 for smooth operation**

Permanent magnet technology is used for improved motor characteristics in terms of energy efficiency and compactness. This technology is particularly well-suited for low speed control applications, as they eliminate the need to use gear boxes. Even without speed or rotor position sensors the ACH580 drives control most types of permanent magnet motors.



## **IE4 synchronous reluctance motors and the ACH580 for optimized energy efficiency**

Our drive and motor pairings guarantees your energy efficiency levels. The key is in the rotor design. Combining the ACH580's control technology with our synchronous reluctance motors (SynRM) will give you a motor and a drive package that guarantees energy efficiency, reduces motor temperatures and provides a significant reduction in motor noise.

# Powerful and native communications



Embedded HVAC communications protocols reduce wiring costs and additional components. There are no added price tags, no unnecessary selections. You are able to control applications, report findings, read and write I/O settings and perform diagnostics natively through embedded BACnet MS/TP and other HVAC protocols. There's no need to retrain your teams for different features or terminology. You'd hardly even notice a difference from any controller to our drive.

## Loop controllers standard

The drive provides a PID loop controller with two configuration sets, which can be configured for fine-tuned control of motors, fans and pumps in HVAC applications. It also provides four external PID loop controllers that can be used for separate external devices such as dampers for variable air volume or valves for cooling and heating.

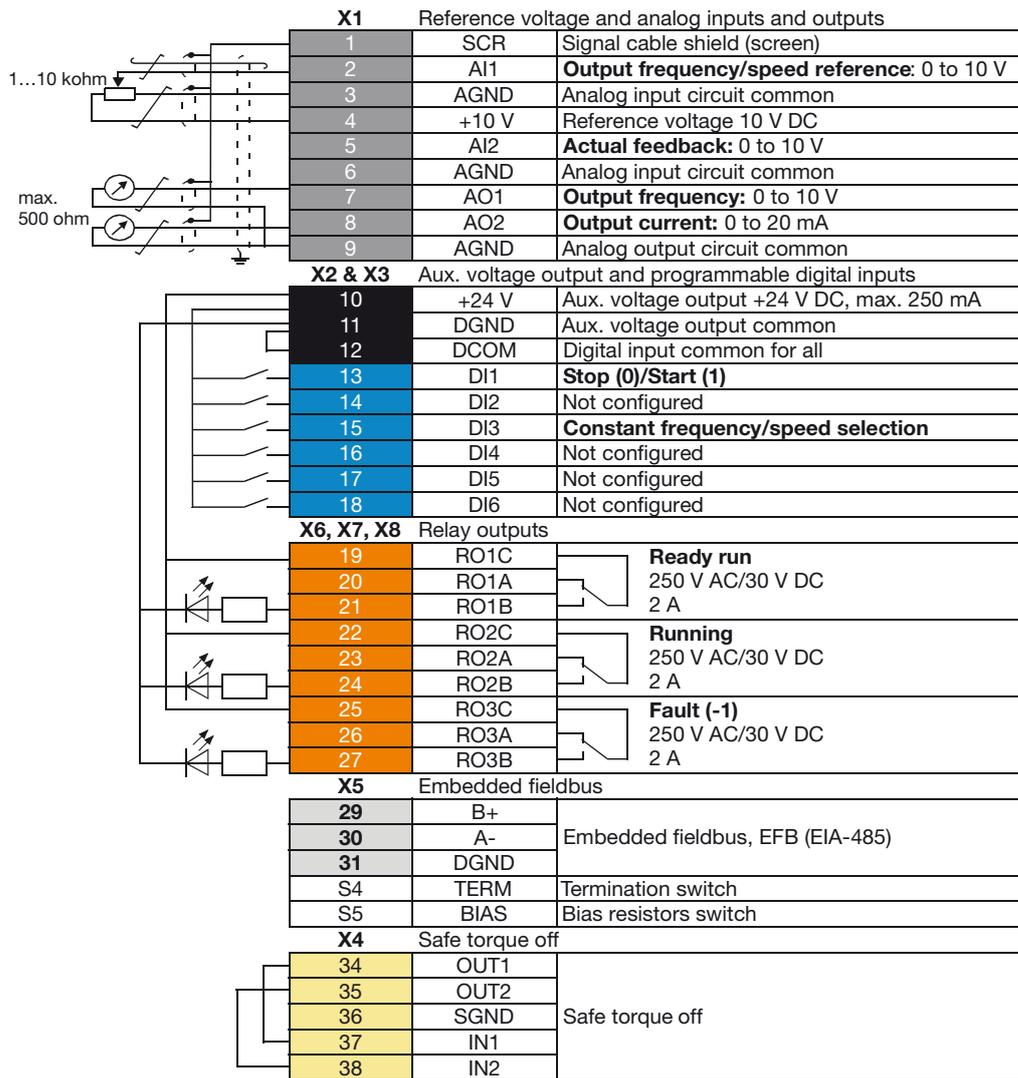
## Wireless connectivity

With a Bluetooth enabled keypad, you can commission, start, stop, monitor and reset faults all from devices that you're already comfortable with such as phones and tablets.

## Native BACnet/IP option

Just like BACnet MS/TP, there are no gateways or routers necessary. This additional 2-port option reduces points of failure and saves time on configuration.





Total load capacity of the auxiliary voltage output +24 V (X2:10) is 6.0 W (250 mA/24 V DC).

Wire sizes:

0.2 to 2.5 mm<sup>2</sup> (24 to 14 AWG): terminals +24 V, DGND, DCOM, B+, A-, DGND, ext. 24 V

0.14 to 1.5 mm<sup>2</sup> (26 to 16 AWG): terminals DI, AI, AO, AGND, RO, STO

Tightening torques: 0.5 to 0.6 N·m (0.4 lbf·ft)

- Relay outputs for accessories as a potential free contact that is compatible with other voltages and external voltage systems. PELV isolation is used on the terminals for higher voltages on the relay output terminals that work even at high altitudes (up to 4000 m).
- A designated digital input reserved for up to 6 PTC sensors allowing for motor protection without additional relays.
- No more confusion at the drive's terminals. They utilize a common color coded setup.
- Frustrating manual errors are mitigated by removing dipswitches for analog inputs and putting that functionality into the software settings.
- STO (Safe torque off) is the standard to meet the requirements for safety functions. It can enable you to wire local emergency stop circuits while reducing external components.

# Service as comprehensive as your drives

Your choice, your future.

Whether a drive is a part of the product you sell or a component in your HVAC system, reliable and efficient drive operation is key. Our global life cycle services are designed to ensure that the drives keep running exactly as you expect, wherever they are. You will find support from your first meeting with ABB to the drive installation, commissioning and maintenance, all the way up to the eventual drive replacement and recycling. With offices in over 90 countries, we are well placed to offer you technical advice and local support.

24/7 availability of support and troubleshooting network.

Standard product delivery available within two business days in continental Europe.



Robust and reliable design reduces costs spent on maintenance and aftermarket repairs.

Local partner expertise provides support to ensure proper product is selected, installed and commissioned with ABB's global support backing.

Your service needs depend on your operation, life cycle of your equipment and business priorities. What is your choice to keep your drives at peak performance?

## Is uptime your priority?

Keep your drives running with precisely planned and executed maintenance.

**Example services include:**

- ✓ Spare Parts
- ✓ Preventive Maintenance

## Is rapid response a key consideration?

If your drives require immediate action, our global network is at your service.

**Example services include:**

- ✓ Technical Support
- ✓ Remote Support

## Need to extend your assets' lifetime?

Maximize your drive's lifetime with our services.

**Example services include:**

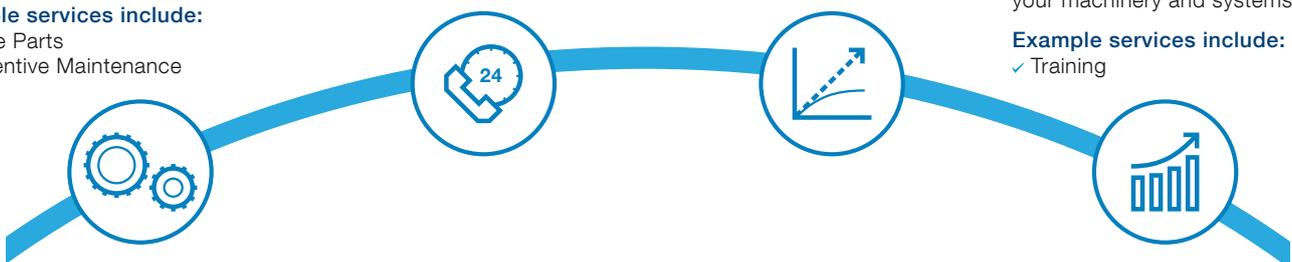
- ✓ Replacement, Disposal and Recycling

## Is performance most critical to your operation?

Get optimal performance out of your machinery and systems.

**Example services include:**

- ✓ Training



# All-compatible drives portfolio

Now, with the ACH580 drives for HVAC you can focus on what counts – your business.

The drive family is the next evolution of climate control, tackling both the air and water sides of the industry in one product. It will control your systems smoothly whether it is a mission critical application requiring uninterrupted performance or a commercial building requiring productivity through comfort. No matter the circumstances, you will have a drive that you can rely on.

The ACH580 makes climate control simple to operate and efficient to run. There is no need to retrain your teams or spend a lot of time on commissioning. It really is as simple as that; all you need to do is set it up and focus on what counts.



## Human

- Built-in HVAC features simplify ordering, installation and commissioning
- Primary settings menu and HVAC assistants help you commission the drive quickly
- The drive operates and communicates in the languages you and your system do
- Functional safety as standard

## System

- Ready to control your building's climate
- Robust and reliable drive ready for any motor in any HVAC application
- Native and embedded communication systems, including BACnet
- Wall-mountable power range up to 250 kW
- Truly global product with a wide voltage range

## Environment

- Save energy and the environment
- Support for new energy-efficient SynRM motors
- Guaranteed efficiency from electrical power to mechanical distribution
- Reduce energy usage and CO<sub>2</sub> emissions
- Enable pumps, fans and compressors to become more energy efficient

## Business

- Latest technology cuts operating costs, time spent on site commissioning and boosts productivity
- Life cycle services protect your investment and guarantee a long lifetime
- Experienced and expert channel partners ensure the proper selection of drives for applications
- Extensive range of products and services for all your needs

# Contact us

For more information please contact your local ABB representative or visit:

[new.abb.com/drives/HVAC](http://new.abb.com/drives/HVAC)  
[www.abb.com/drivespartners](http://www.abb.com/drivespartners)



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