CATALOG

ABB drives for HVAC

ACH580, 0.75 to 500 kW, 1 to 700 hp

ACH580 series
Leading the way in HVAC drives

Comfort. It's something we take for granted in the buildings we live and work in. But comfort requires efficient systems to control heating, ventilation, and air conditioning (HVAC) to ensure the air we breathe is pure and the temperature is comfortable. We also need to ensure air quality and safety in the most energy-efficient and cost-effective way in both normal and mission-critical situations.

For half a century, ABB has been leading the way in optimizing HVAC systems using drive control to ensure that you can take comfort for granted. The new series of HVAC dedicated variable-frequency drives (VFDs) provide the quality, reliability, and energy savings you expect, and are easy to use and safe to maintain. All you need to do is to set the drive up, and then focus on what counts.

Contents

The next step in HVAC drives

The ACH580 drives come with a range of advanced features that not only provide an excellent user experience, but also make drive integration, commissioning, and operation easier than ever before.

Scalable performance with full HVAC functionality
ABB HVAC drives come with complete HVAC functionality in a package tailored to your needs and share the same user interface. This makes it easy to choose the optimal product based on installation location and the power output required.

Easy to select and install
Depending on the drive model, all the essentials – chokes, EMC filters, cabling clamps, certified BACnet communication, and enclosures from IP00/UL (NEMA) Type Open to IP55/UL (NEMA) Type 12 – are offered as standard, thus simplifying selection, installation, and commissioning.

Safe maintenance
The Safe Torque Off (STO) function is TÜV-certified to SIL 3/PL e and built in as standard in all HVAC drives to protect both people and machines. The new ACH580 packaged disconnect solution provides a main disconnect switch, which further increases safety for people working on HVAC equipment.

Motor control options to meet your application needs
ABB HVAC drives can be integrated with several types of AC motors, including induction, permanent magnet (PM) and even synchronous reluctance (SynRM) motors. The ability to use these motors can reduce your energy costs even more.

Added flexibility and accessibility
ABB HVAC drives have extensive I/O connections as standard and provide flexibility with additional I/O configurations.

ABB HVAC drives are ideal for all your HVAC applications, such as air-handling units, chillers, and cooling towers. They are suitable for use in a wide range of facilities from residential and commercial buildings to hospitals, data centers, airports and tunnels.

Effortless commissioning and operation
The drive's HVAC-specific software, intuitive keypad with customizable text and views, and menu-driven programming simplify set-up and operation of even the most complex applications. The optional Bluetooth® capability together with ABB's Drivetune smartphone app allows you to commission and tune the drive remotely, providing you with access to the same primary settings and other menus available on the drive's HVAC control panel.

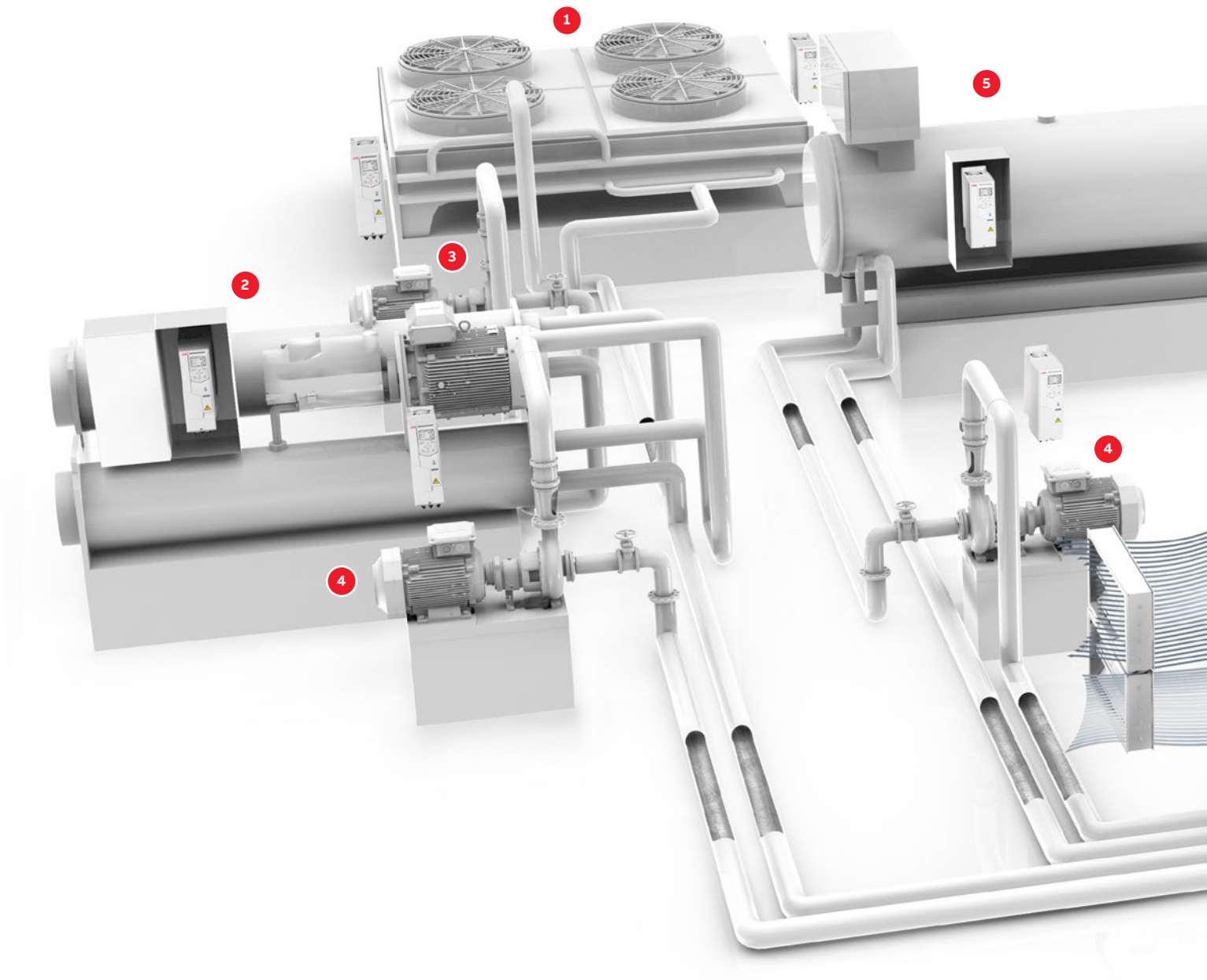
Easy integration into HVAC systems
BTL certified BACnet MS/TP, Modbus RTU, and N2 come as standard in every ACH580 drive. In addition, a wide range of optional fieldbus adapters, including BTL certified BACnet/IP, are available to enable connectivity with all major building automation and control systems.

Clean building power supply
The drive's active front-end technology secures a unity power factor and the lowest possible level of harmonic distortion in the building. In combination with the ACH580-01 optimized DC choke design, the ACH580 ultra-low harmonic (ULH) drive provides the optimum cost/performance ratio in the industry.

Advanced software tools for easy configuration, startup and maintenance
Drive composer is a state-of-the-art PC tool, which can be simply connected to the drive's control panel via a USB interface. It supports startup, configuration, monitoring and process tuning. Cold configuration for unpowered drives saves time as parameters can already be set in the warehouse, thanks to the CCA-01 cold configuration adapter.

Premier HVAC control

We understand the complexity of air handling systems and the need to produce high levels of comfort, control, and safety. Be assured that, regardless of the season or external conditions, we help make your system efficient, safe, and informative.



1 Cooling tower
Cools down the condenser water.
- The drive controls the speed of multiple fans simultaneously to achieve high energy savings, while optimising the installation cost

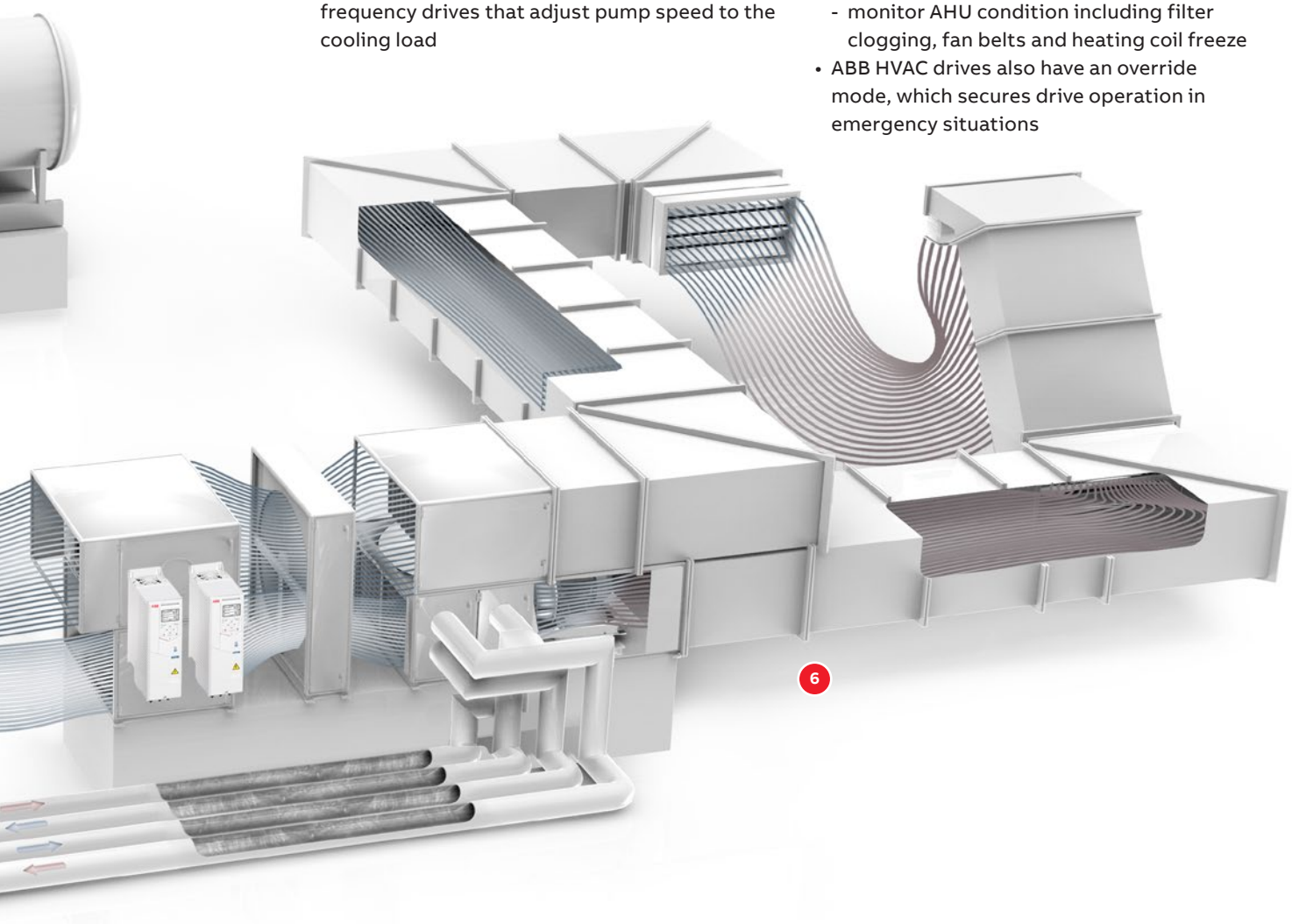
2 Chiller
Chills water or other liquid to cool down and dehumidify the indoor air.
- The drive controls the speed of the compressor for better energy efficiency
- By-pass valves can be avoided
- Less mechanical stress as there are less starts and stops
- Mechanical resonance speeds can be avoided
- Maximum speed is not limited by nominal supply frequency
- Less stress to supply network as high inrush currents can be avoided with VFD controlled start

3 Condenser water pump
Circulates water between the cooling tower and the chiller.
- Energy savings can be achieved with variable frequency drives that adjust pump speed to the cooling load

4 Chilled and hot water circulator pumps
Circulate water (or other liquid) between heating coil and boiler or cooling coil and chiller.
- The cooling and heating loads vary a lot over time. Speed controlled circulator pumps make sure that an adequate amount of water or other liquid is distributed in the building.
- Soft start and stop of the pump reduces hydraulic stress on pipelines and valves

5 Boiler
Heats up the water for building heating.
- The drive controls the burner fan to adjust the amount of combustion air to the heating load

6 Air handling unit
Circulates, mixes, cleans, humidifies/ dehumidifies, heats/cools air.
- Drives can be used to
  - control the speed of supply and return fans
  - eliminate mechanical stress of air duct system
  - avoid fan resonance speeds
  - control the speed and efficiency of the rotary heat exchangers
  - control the dampers
  - monitor AHU condition including filter clogging, fan belts and heating coil freeze
- ABB HVAC drives also have an override mode, which secures drive operation in emergency situations



Common characteristics for the ACH580 HVAC drives family

HVAC control panel with primary settings
- Primary settings make commissioning of the drive easier than ever before
- An optional Bluetooth® enabled control panel allows easy smartphone connection and remote support possibilities
- Easily available USB interface for PC and tool connection
- Help button for problem-solving

HVAC communication protocols
- BTL certified BACnet MS/TP and other common HVAC communication protocols such as N2 and Modbus RTU as standard
- BACnet/IP with an internal fieldbus option

Suitable for various HVAC applications
ABB HVAC drives are suitable not only for variable torque applications like fans and pumps, but also for basic constant torque applications like compressors.

Robust and reliable design
- All units are tested under full load in maximum allowed ambient temperature to verify the quality
- Printed circuit boards are protected with extra coating to be able to operate in humid and harsh environments

Energy efficiency calculators
Optimize energy efficiency with features that help you to save and manage energy. You can monitor the hourly, daily cumulative, last hour, last day and last month energy consumption via kWh counters.

Diagnostic menu
Analyze and resolve issues with the control panel's diagnostics menu. You can quickly analyze why the drive is performing as it is; running, stopped or running at the present speed.

Shared features of the ABB all-compatible drives portfolio

Drivetune smartphone app
The Drivetune smartphone app together with the Bluetooth® enabled control panel allows you to set up and commission the drive remotely from a safe and comfortable location, using the same primary settings menu that is available on the control panel on the drive.

Integrated and certified Safe torque off (STO)
- TÜV-certified Safe Torque Off helps to build functionally safe HVAC machines and you can document the safety functions in the equipment
- Embedded STO is certified to SIL 3/PL e

Embedded load analyzers
Analyze and optimize the application with the load profile log, which shows how the drive has operated.

EMC/RFI category C2
- EMC category C2 level design allows installation in commercial and residential buildings so called first environment
- Option to increase EMC compliance to C1 level

Integrated process control
Reduce costs with the built-in HVAC controllers. They allow the HVAC drives not only to control themselves using an external feedback signal, but also to control other processes, such as your rotary heat exchanger or your heating and cooling coils.

Flexibility in programming
Scale up and customize the drive to your application's requirements with flexible parameter pointers or visual adaptive programming.

Extensive I/O capabilities
- ABB HVAC drives have an extensive number of I/O terminals in standard configuration
- Colored terminals and clear terminal marking significantly ease drive wiring process
- I/O status can be monitored via I/O menu
- I/O can be forced on or off to verify drive's either from the display or via your fieldbus connected controls

Advanced motor control
- Support for induction (IM), permanent magnet (PM) and synchronous reluctance (SynRM) motors
- Reduce audible motor noise by spreading the switching frequencies over user-specified range

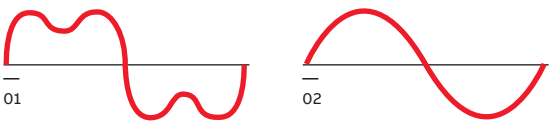
Same PC tools for ABB all-compatible drives
The Drive composer PC tool can be downloaded for free from new.abb.com.

Connectivity
- ABB's F-series fieldbus adapters can be used throughout the all-compatible platform
- Mobile phone connectivity via the optional Bluetooth® assistant control panel
- Fieldbus settings are made easy with the Primary settings menu

ACH580 ultra-low harmonic (ULH) drive

What are harmonics?
In an ideal case the current in an AC grid is a pure sine wave and does not contain harmonics. In reality the current deviates from this pure sine wave and contains harmonics. Harmonic current is typically measured as a percentage value, called total harmonic distortion (THDi).

Harmonics can cause damage to sensitive electronic equipment, interference to communication equipment, tripping of circuit breakers, blowing of fuses and capacitor failures. The effects can also include overheating of cables and motors, overloading of transformers, generator failure and power factor capacitor damage.



01 Diode supply
02 Active supply

01 02

Complete HVAC functionality
The ACH580 ULH comes standard with an intuitive control panel used to configure, control, and monitor the drive. An optional Bluetooth control panel allows the drive to be configured via the control panel or the DriveTune app.

A robust HVAC firmware package provides drive, motor, and application protection features. Application specific features, such as accepting four separate start interlocks (safeties), along with broken belt detection, are also included. The drive includes BACnet MS/TP, Modbus RTU, and Johnson Controls N2 as standard.

Savings in total cost of ownership
Installation costs are reduce with the simple three wires in and three wires out design. Maintenance costs are lowered as compared to other harmonic mitigation solutions like passive filters, multi-pulse and active filters there are less components to maintain and stock as spares.

Using the ACH580 ULH allows your engineer to design your electrical system and backup generators to the right size and not oversizing for the harmonics in the network.

Reliability for your building
Harmonics in the network could cause problems with other electrical equipment in the same electrical network. In the worst case it might cause your sensitive electrical equipment to fail.

Harmonics can cause problems also in retrofit projects. In such projects, a transformer might not be able to meet the harmonic levels caused by nonlinear loads such as standard 6-pulse drives, so there is a risk of overloading the transformer.

In addition to problems caused by harmonics, also weak network can cause troubles to your systems. Weak electrical networks that have sags in line voltage may cause motors to overheat, trip or fail.

The ACH580 ULH drive offers a reliable solution to overcome these challenges as it is able to lower the harmonic content so that sensitive equipment stay running and transformers or generators don't fail. Also the ACH580 ULH can boost output voltage so that motor always runs with nominal voltage despite the fluctuations in line voltage.

Optimized size and performance
ACH580 ULH has all the harmonic mitigation technology in the drive. With a THDi of 3% or less, there is no need to install external components for reducing harmonics, this drive doesn't create the harmonics to fix.

If you are interested to learn more about harmonics, please read our ABB Harmonics in HVAC application guide 3AUA0000230021

Complete HVAC drive offering

No matter the frame size or power, all ABB HVAC drives offer ease of use, scalability, and quality.

Wall-mounted drives, ACH580-01 and ACH580-31 ultra-low harmonic version
ACH580 wall-mounted drives are available in IP21/UL (NEMA) Type 1 to IP55/UL (NEMA) Type 12 protection class with a power range up to 250 kW/350 hp for ACH580-01 and up to 110 kW/150 hp for ACH580-31 ultra low harmonic variant. Drives offer side-by-side, flange, and horizontal mounting options.

The IP55/UL (NEMA) Type 12 variants are designed for applications exposed to dust, moisture, vibration, and other harsh conditions.

The ACH580-01 is a six-pulse drive that includes an optimized DC choke for harmonic mitigation.

ACH580-31 ultra-low harmonic drives with built-in harmonics mitigation solution help to keep the power network clean providing exceptionally low harmonic content. This brings significant benefits, including improved reliability and increased energy savings, as well as extended equipment lifetime.

Drive modules for cabinet installation, ACH580-04 and ACH580-34 ultra-low harmonic version
ACH580 drive modules are perfect for system integrators, cabinet builders, and OEMs who want to optimize cabinet design using ACH580-04 in power range 250–500 kW or ACH580-34 ultra low harmonic version in power range 132–355 kW without compromising on easy installation, commissioning and maintenance.

The ACH580-04 comes with a choke for harmonic mitigation and ACH580-34 has embedded active front-end solution keeping harmonics content in the network to a minimum.

Cabinet-built drives, ACH580-07
Cabinet-built ACH580-07 drives are available with IP21 protection class as standard (with optional IP42 and IP54 enclosures) in frame sizes R6 to R11. The drives feature a new cooling arrangement and a high-quality, global cabinet design. Available in a power and voltage range of 75–500 kW and 3-phase, 380–480 V. ACH580-07 drives always have chokes for harmonic mitigation built-in.

Main disconnect switch for increased safety

Main disconnect switch
The main disconnect switch option provides a possibility to disconnect the drive from the main supply when needed. This prewired main disconnect switch option saves time, money and space as it is integrated in the drive. There is no need to install additional, external isolation devices to the supply side of the drive. The option improves safety as it is always visible, when operating on the drive.

Auxiliary contact allows signalling the switch position to BMS to avoid unnecessary controller alarms. The switch can be padlocked to open position to disable drive operation during e.g. maintenance.

Option code	Description
+B056 +F278	ACH580-01 IP55 drive and main disconnect switch with auxiliary contact (NO)
+F316	ACH580-01 IP55 drive and main disconnect switch with auxiliary contact (NO) and EMC C1 filter

High protection for operation in harsh environments

Thanks to the drive's wall-mountable construction in both IP21 and IP55 configurations the ACH580-01 can be installed in clean rooms, and even dusty and wet environments. The cabinet-built variant comes with IP21 as standard and is also available with IP42 and IP54 protection classes for use in harsh environments.

The robust, protective design ensures that no additional enclosures or components, such as dust filters and fans, are needed. Overall, drives for harsh environments require smaller capital expenses by avoiding or advancing maintenance of external components, which in turn improves the reliability of the drive and the process.

Option code	Description
+B051	IP20 finger shrouds for modules
+B054	IP42 for cabinet-built drives
+B055	IP54 for cabinet-built drives
+B056	IP55 for wall-mountable drives

Reduced panel cooling need

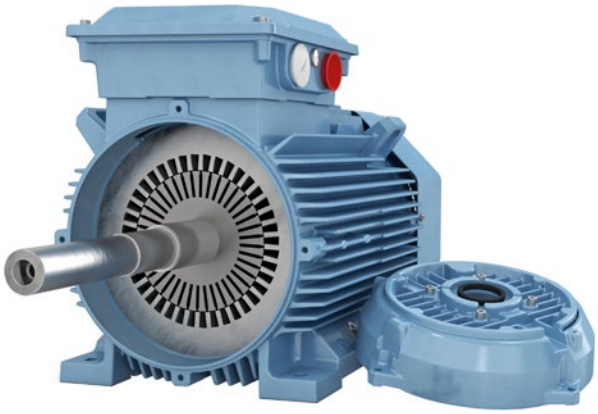
The ACH580-01 wall-mounted drive offers flange mounting as an option, separating the control electronics from the main circuit cooling airflow, saving space and ensuring optimal cooling. This results in better thermal management during panel installation and reduces the overall enclosure size. Furthermore, the need for air-conditioning can often be eliminated, as up to 80 percent of the heat load is removed through the back of the panel.

Option code	Description
+C135	Flange mounting

Advanced cooling

The simple and robust design of the ACH580-07 cabinet-built drive ensures reliable operation, even in harsh environments. The flange-mounting feature is standard for the cabinet-built ACH580 drive, which separates the heat-generating power electronics from the more sensitive control electronics and extends the product's lifetime. The hot air can be ducted away from the motor control center, reducing the need for air-conditioning significantly.

Ultimate efficiency and reliability to optimize your system's total cost of ownership



Traditional IE2 induction motor

IE4 synchronous reluctance motor SynRM

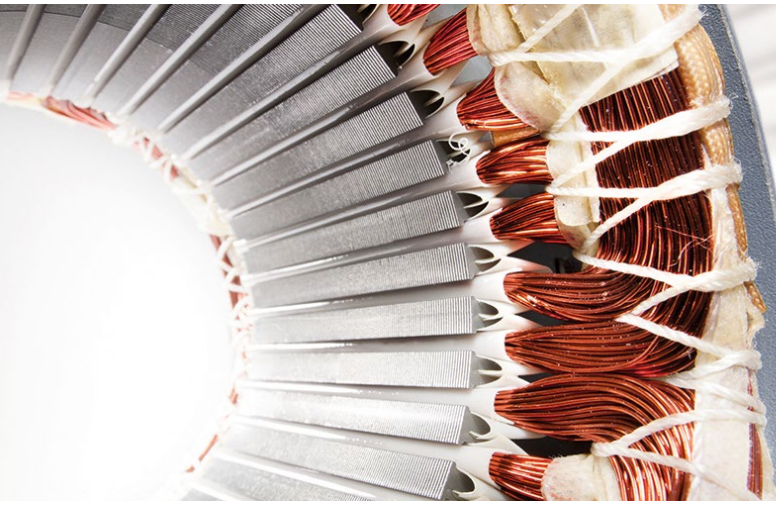
Losses

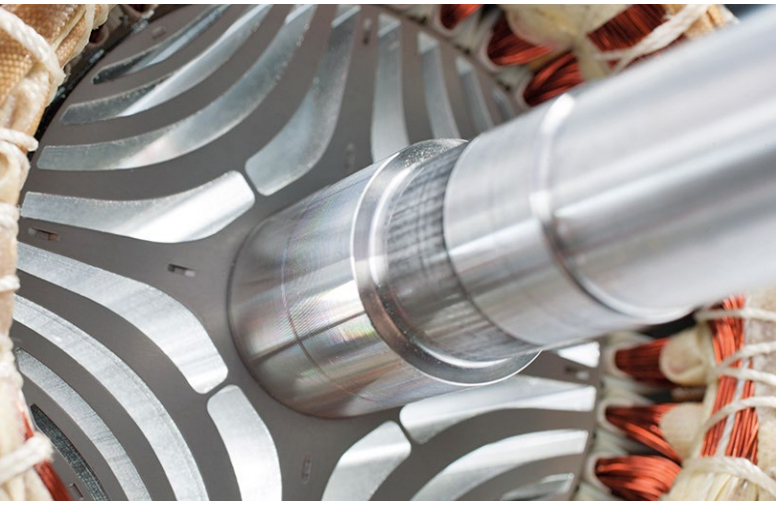
Innovation inside
The idea is simple: Take a conventional, proven stator technology and a totally new rotor design. Then combine them with a dedicated HVAC industry drive loaded with new, application-specific software. Finally, optimize the whole package for applications such as fans, pumps, compressors, air-handling units and chillers.

Magnet-free design
Synchronous reluctance technology combines the performance of a permanent magnet motor with the simplicity and service-friendliness of an induction motor. The new rotor has neither magnets nor windings, and suffers virtually no power losses. And as it has an identical footprint, it is easy to replace an induction motor with a SynRM.

Superior reliability to minimize the cost of not running
IE4 synchronous reluctance motors have very low winding temperatures, which increases the reliability and life of the winding. More importantly, a cool synchronous reluctance rotor means significantly lower bearing temperatures – an important factor because bearing failures cause about 70 percent of unplanned motor outages.

Choose the motor for your HVAC application





Choose the best motor for your application. A natural match for induction motors, ABB HVAC drives can also control high-efficiency motors such as permanent magnet or synchronous reluctance motors for greater efficiency.

Induction motors, the industry workhorse
Pair the ACH580 with an induction motor (IM) for simple and reliable operation in many HVAC applications and in a wide range of environments. Further simplifying setup, the HVAC drives can be integrated with virtually any type of IM by entering the nameplate motor data only.

Permanent magnet motors for smooth operation
ABB has the software, hardware and application knowledge to support PM motor technology. PM technology offers users high efficiency across the speed range and customized housing for applications such as fan walls and cooling towers, as well as eliminating the need for mechanical speed reduction equipment.

IE4 SynRM for optimized energy efficiency
Combining ABB's HVAC drive control technology with our synchronous reluctance motors will give you a motor and a drive package that ensures high energy efficiency, reduces motor temperatures, and provides a significant reduction in motor noise. The key is in the efficiency-optimized rotor design of our SynRM motors.

ABB automation products

All-compatible drives portfolio
The all-compatible drives share the same architecture; software platform, tools, user interfaces and options. Yet, there is an optimal drive from the smallest water pump to the biggest cement kiln, and everything in the between. When you have learned to use one drive it, is easy use the other drives in the portfolio.

Automation Builder Engineering suite
Automation Builder integrates the engineering and maintenance for PLC, drives, motion. HMI and robotics. It complies with the IEC 61131-3 standard offering all five IEC programming languages for PLC and drive configuration. Automation Builder supports a number of languages and comes with new libraries. FTP functions, SMTP, SNTP, smart diagnostics and debugging capabilities.

AC motors
ABB's low voltage AC motors are designed to save energy, reduce operating costs and enable demanding motor applications to perform reliably and without unscheduled downtime. General performance motors combine convenience and easy handling seamlessly with ABB's engineering expertise. Process performance motors provide the most comprehensive.

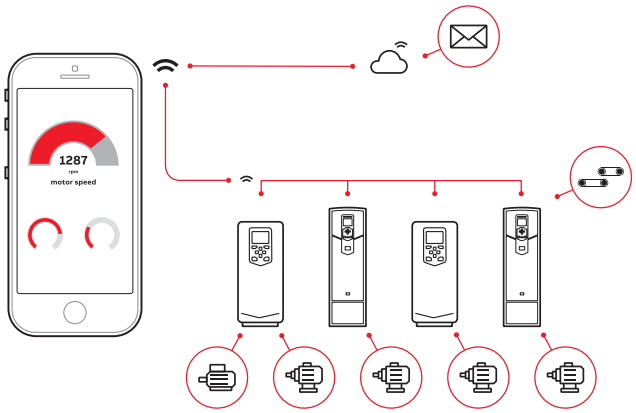
Control panels
Our control panels offer a wide range of touchscreen graphical displays from 3.5" up to 15". They are provided with user-friendly configuration software that enables tailor made customized HMI solutions. Rich sets of graphical symbols and the relevant drivers for ABB automation products are provided. Control panels for visualization of AC500 web server applications are available.

Softstarters
ABB's softstarters increase a motor's lifetime by protecting it from electrical stresses. With everything that you need in one unit, from bypass contactor to overload protection, a single Softstarter makes for a compact and complete starting solution.

AC500-eCo
Meets the cost-effective demands of the small PLC market while offering total inter-operability with the core AC500 range. Web server, FTP server and Modbus-TCP for all Ethernet versions. A Pulse Train Out-put module is available for multi-axis positioning.

ABB Ability™ smartphone apps

Better connectivity and user experience with Drivetune



Easy and fast access to product information and support

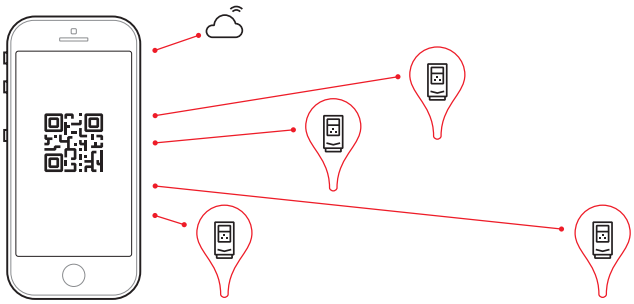
Startup, commission and tune your drive and application

Instantly access drive status and configuration with a simplified user guidance

Optimize performance via drive troubleshooting features

Create and share backups and support packages

Services and support on the go with Drivebase



Search for support documents and contacts

Access your product and service information in the cloud from anywhere

View your drives installed base and plan service activities

Use dynamic QR code to troubleshoot your drive

Report service events

Access information anywhere

Download the apps using the QR codes below or directly from the app stores

Drivetune for commissioning and managing drives

Drivebase for ensured reliability and reduced downtime on production sites

Services to match your needs

Your service needs depend on your operations, the life cycle of your equipment, and your business priorities. We have identified our customers' four most common needs, and we created service options to satisfy them. Which will you choose to keep your drives at peak performance?

Is uptime your priority?

Keep your drives running with precisely planned and executed maintenance.

Example services include:
- ABB Ability™ Life Cycle Assessment
- Installation and Commissioning
- Spare Parts
- Preventive Maintenance
- Reconditioning
- ABB Drive Care agreement
- Drive Exchange

Operational efficiency

Is rapid response a key consideration?

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

Example services include:
- Technical Support
- On-site Repair
- ABB Ability™ Remote Assistance
- Response time agreements
- Training

Rapid response

Drives service
Your choice, your future

The longevity of your drives is influenced by the service you choose.
Whatever you choose, it should be a well-informed decision. We have the expertise and experience to help you find and implement the right service for your drive equipment. Start by asking yourself these two critical questions:
- Why would my drive be serviced?
- What would my optimal service options be?

From here, count on our guidance and full support throughout the entire lifetime of your drives.

Your choice, your business efficiency
ABB Drive Care lets you focus on your core business. A selection of predefined service options matching your needs provides optimal, more reliable performance, extends your drive's lifetime, and controls costs. This reduces the risk of unplanned downtime and makes it easier to budget for maintenance.

We can help you more if we know where you are!
Register your drive for advanced services.

Need to extend your assets' lifetime?

Maximize the lifetime of your drive with our services.

Example services include:
- ABB Ability™ Life Cycle Assessment
- Upgrades, Retrofits and Modernization
- Replacement, Disposal and Recycling

Life cycle management

Is performance most critical to your operation?

Get optimal performance out of your machinery and systems.

Example services include:
- ABB Ability™ Remote Services
- Engineering and Consulting
- Inspection and Diagnostics
- Upgrades, Retrofits and Modernization
- Workshop Repair
- Tailored services

Performance improvement

A lifetime of peak performance

You're in control of every phase of the life of your drive. At the heart of drive services is a four-phase product life cycle management model. This model defines the services recommended and available throughout your drive's lifespan.

Now it's easy for you to see the exact service and maintenance available for your drives.

ABB drives life cycle phases explained:

	Full range of life cycle services and support		Limited range of life cycle services and support	Replacement and end-of-life services
Product	Product is in active sales and manufacturing phase.	Serial production has ceased. Product may be available for plant extensions, as a spare part or for installed base renewal.	Product is no longer available.	Product is no longer available.
Services	Full range of life cycle services is available.	Full range of life cycle services is available. Product enhancements may be available through upgrade and retrofit solutions.	Limited range of life cycle services is available. Spare parts availability is limited to available stock.	Replacement and end-of-life services are available.

Keeping you informed
We notify you every step of the way using life cycle status statements and announcements.

The benefit for you is clear information about the status of your drives and the exact services available. It helps you plan the preferred service actions ahead of time and make sure that continuous support is always available.

Step 1

Life Cycle Status Announcement
Provides early information about the upcoming life cycle phase change and how it affects the availability of services.

Step 2

Life Cycle Status Statement
Provides information about the drive's current life cycle status, the availability of product and services, the life cycle plan, and recommended actions.

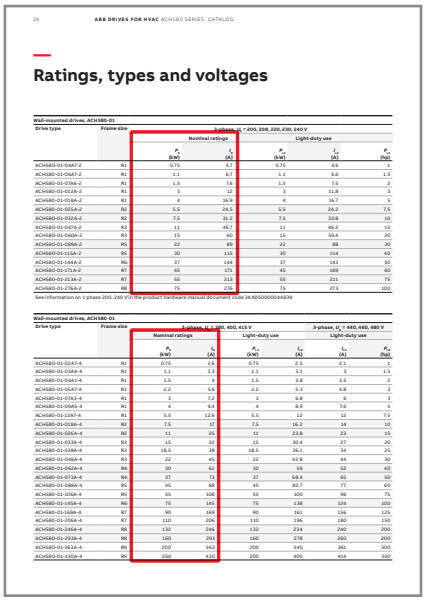
How to select a drive

This is how you build up your own ordering code using the type designation key.

Start by identifying your supply voltage. This tells you what rating table to use. See pages 24, 25 and 26.

Choose your motor's power and current rating from the ratings tables on pages 24, 25 and 26.

Select your drive's order code from the rating table based on your motor's nominal power rating.



Ratings, types and voltages

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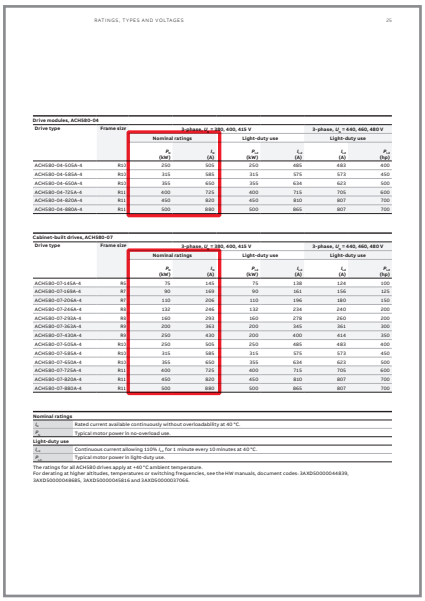

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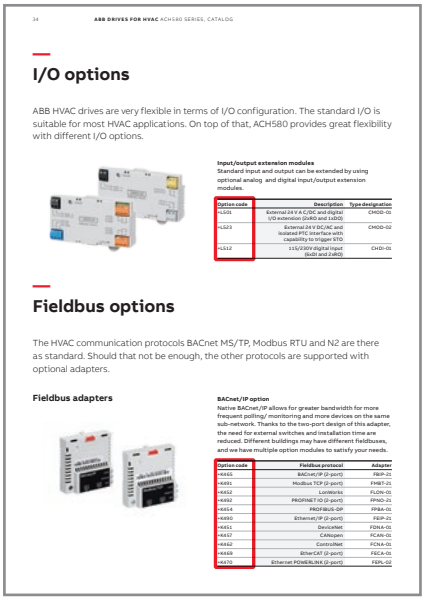
Choose your options (on pages 12, 13, 31, 33 and 34) and add the option codes to the drive's order code. Remember to use a "+" mark before each option code.



I/O options

Fieldbus options

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Type designation example:

			3						4	
ACH580	–	0	1	–	03A3	–	4	+	L501	

Product series

Type: 0 = standard, 1 = regen, 3 = ultra-low harmonic

Construction: 1 = wall-mounted, 4 = drive module, 7 = cabinet-built

Rating

Voltage: 1 = 1 ph 230 V, 3 = 3 ph 230 V, 4 = 3 ph 400 V

Options

ACH580 technical data

Mains connection	
Input voltage and output power range	3-phase, U_N 200 to 240 V, +10/-15% ACH580-01: from 0.75 up to 75 kW 3-phase, U_N 380 to 480 V, +10/-15% ACH580-01: from 0.75 up to 250 kW ACH580-04: from 250 up to 500 kW ACH580-07: from 75 up to 500 kW ACH580-31: from 4 to 110 kW ACH580-34: from 132 to 355 kW
Frequency	48 to 63 Hz
Power factor ACH580-01, ACH580-04 and ACH580-07	0.98
Power factor ACH580-31 and ACH580-34	1.0
Motor connection	
Voltage	0 to U_N, 3-phase
Frequency	0 to 500 Hz
Motor control	Scalar and vector
Supported motor types	Asynchronous motor, permanent magnet motor (vector), SynRM (vector)
Environmental limits	
Transportation and storage temperature	-40 to +70 °C
Operation temperature	ACH580-01, ACH580-31 and ACH580-34: -15 to +50 °C ACH580-04: -15 to +55 °C ACH580-07: 0 to +50 °C
Relative humidity	5 to 95 % no condensation allowed
Altitude	Rated current available at 0 to 1000 m Reduced by 1% per 100 m over 1000 m up to 4000 m
Degree of protection	ACH580-01 and ACH580-31: IP21 (UL Type 1) or IP55 (UL Type 12) ACH580-04 and ACH580-34: IP00, IP20 ACH580-07: IP21 as standard, IP42 or IP54 as option
Contamination level	Operation at Class 3C2, Class 3S2 according to IEC 60721-3-3 Transportation at Class 2C2, Class 2S2 according to IEC 60721-3-3 Storage at Class 1C2, Class 1S2 according to IEC 60721-3-3
Inputs and outputs (standard configuration)	
2 analog inputs	Selection of Current/Voltage input mode is user programmable.
Voltage signal	0 (2) to 10 V, R_{in} >200 kΩ
Current signal	0 (4) to 20 mA, R_{in} = 100 Ω
Potentiometer reference value	10 V ±1% max. 20 mA
2 analog outputs	AO1 is user programmable for current or voltage. AO2 current
Voltage signal	0 to 10 V, R_{load}: >100 kΩ
Current signal	0 to 20 mA, R_{load}: < 500 Ω
Internal auxiliary voltage	24 V DC ±10%, max. 250 mA
6 digital inputs	12 to 24 V DC, 24 V AC, Connectivity of PTC sensors supported by a single digital input. PNP or NPN connection (5 DIs with NPN connection).
3 relay outputs	Maximum switching voltage 250 V AC/30 V DC Maximum continuous current 2 A rms
Supported thermistors	Any of the analog inputs, or digital input 6, are configurable for PTC with up to 6 sensors. Both analog outputs can be used to feed the PT100, PT1000, KTY83, KTY84 or Ni1000 sensors.

External power supply	
Standard:	
ACH580-01 frames R6-R9, ACH580-04 all frames, ACH580-07 all frames, ACH580-31 all frames, ACH580-34 all frames	1.5 A at 24 V AC/DC ±10%
With option:	
ACH580-01 frames R1-R5	1.04 A at 24 V AC/DC ±10%

Communication

Protocols as standard (EIA-485): BACnet MS/TP, Modbus RTU and N2.
Available as 2-port plug-in options: BACnet/IP, Modbus TCP, PROFINET IO, EtherNet/IP, EtherCAT, EtherNet POWERLINK.
Available as plug-in options: CANopen, DeviceNet, LonWorks, Profibus DP.
Available as an external 2-port option: EtherNet adapter for remote monitoring.

Application functions

First start assistant
Primary settings for HVAC applications
Hand-Off-Auto operation mode
Start interlock (de-frost)
Delayed start
Run permissive (damper monitoring)
Override operation mode
Real-time clock (scheduling)
PID controllers for motor and process
Motor flying start
Motor preheating
Energy optimizer and calculators

Protection functions

Overvoltage controller
Undervoltage controller
Motor and motor cable earth-leakage monitoring
Motor and motor cable short-circuit protection
Motor overtemperature protection
Output and input switch supervision
Motor overload protection
Phase-loss detection (both motor and supply)
Under load supervision (belt loss detection)
Overload supervision
Stall protection
Loss of control reference

Product compliance

CE
Low Voltage Directive 2014/35/EU, EN 61800-5-1:2007
Machinery Directive 2006/42/EC, EN 61800-5-2:2007
EMC Directive 2014/30/EU, EN 61800-3:2004 + A1:2012
RoHS directive 2011/65/EU
Quality assurance system ISO 9001 and
Environmental system ISO 14001
Waste electrical and electronic equipment directive (WEEE) 2002/96/EC
Galvanic isolation according to PELV
UL, EAC, RCM, cUL
TÜV Nord (safety functions)

Harmonics compliance

Built-in optimized DC choke as standard in ACH580-01 meets the requirements of IEC 61000-3-12:2011.
ACH580-31/34 with active front-end helps system to comply with IEEEE519 and G5/4 requirements.

EMC according to EN 61800-3:2004 + A1:2012

Frames R1 to R9 (up to 250 kW) designed to comply with EMC category C2 requirements as standard. Frames R10 and R11 (up to 500 kW) comply with category C3 with standard pre-configured built-in filter.

Functional safety

STO according to EN 61800-5-2:2016, IEC 61508 Parts 1-2:2010, ISO 13849-1:2015, ISO 13849-2:2012, IEC 62061:2015
SIL 3/PL e

Ratings, types and voltages

Wall-mounted drives, ACH580-01						
Drive type	**Frame size**	**3-phase, U_N = 200, 208, 220, 230, 240 V**				
		Nominal ratings		**Light-duty use**		
		P_N (kW)	**I_N (A)**	**P_{Ld} (kW)**	**I_{Ld} (A)**	**P_{Ld} (hp)**
ACH580-01-04A7-2	R1	0.75	4.7	0.75	4.6	1
ACH580-01-06A7-2	R1	1.1	6.7	1.1	6.6	1.5
ACH580-01-07A6-2	R1	1.5	7.6	1.5	7.5	2
ACH580-01-012A-2	R1	3	12	3	11,8	3
ACH580-01-018A-2	R1	4	16.9	4	16.7	5
ACH580-01-025A-2	R2	5.5	24.5	5.5	24.2	7,5
ACH580-01-032A-2	R2	7.5	31.2	7.5	30.8	10
ACH580-01-047A-2	R3	11	46.7	11	46.2	15
ACH580-01-060A-2	R3	15	60	15	59.4	20
ACH580-01-089A-2	R5	22	89	22	88	30
ACH580-01-115A-2	R5	30	115	30	114	40
ACH580-01-144A-2	R6	37	144	37	143	50
ACH580-01-171A-2	R7	45	171	45	169	60
ACH580-01-213A-2	R7	55	213	55	211	75
ACH580-01-276A-2	R8	75	276	75	273	100

See information on 1 phase 200..240 V in the product hardware manual document code 3AXD50000044839

Wall-mounted drives, ACH580-01							
Drive type	**Frame size**	**3-phase, U_N = 380, 400, 415 V**				**3-phase, U_N = 440, 460, 480 V**	
		Nominal ratings		**Light-duty use**		**Light-duty use**	
		P_N (kW)	**I_N (A)**	**P_{Ld} (kW)**	**I_{Ld} (A)**	**I_{Ld} (A)**	**P_{Ld} (hp)**
ACH580-01-02A7-4	R1	0.75	2.6	0.75	2.5	2.1	1
ACH580-01-03A4-4	R1	1.1	3.3	1.1	3.1	3	1.5
ACH580-01-04A1-4	R1	1.5	4	1.5	3.8	3.5	2
ACH580-01-05A7-4	R1	2.2	5.6	2.2	5.3	4.8	3
ACH580-01-07A3-4	R1	3	7.2	3	6.8	6	3
ACH580-01-09A5-4	R1	4	9.4	4	8.9	7.6	5
ACH580-01-12A7-4	R1	5.5	12.6	5.5	12	12	7.5
ACH580-01-018A-4	R2	7.5	17	7.5	16.2	14	10
ACH580-01-026A-4	R2	11	25	11	23.8	23	15
ACH580-01-033A-4	R3	15	32	15	30.4	27	20
ACH580-01-039A-4	R3	18.5	38	18.5	36.1	34	25
ACH580-01-046A-4	R3	22	45	22	42.8	44	30
ACH580-01-062A-4	R4	30	62	30	58	52	40
ACH580-01-073A-4	R4	37	73	37	68.4	65	50
ACH580-01-088A-4	R5	45	88	45	82.7	77	60
ACH580-01-106A-4	R5	55	106	55	100	96	75
ACH580-01-145A-4	R6	75	145	75	138	124	100
ACH580-01-169A-4	R7	90	169	90	161	156	125
ACH580-01-206A-4	R7	110	206	110	196	180	150
ACH580-01-246A-4	R8	132	246	132	234	240	200
ACH580-01-293A-4	R8	160	293	160	278	260	200
ACH580-01-363A-4	R9	200	363	200	345	361	300
ACH580-01-430A-4	R9	250	430	200	400	414	350

Drive modules, ACH580-04

Drive type	Frame size	3-phase, U_N = 380, 400, 415 V				3-phase, U_N = 440, 460, 480 V	
		Nominal ratings		Light-duty use		Light-duty use	
		P_N (kW)	I_N (A)	P_{Ld} (kW)	I_{Ld} (A)	I_{Ld} (A)	P_{Ld} (hp)
ACH580-04-505A-4	R10	250	505	250	485	483	400
ACH580-04-585A-4	R10	315	585	315	575	573	450
ACH580-04-650A-4	R10	355	650	355	634	623	500
ACH580-04-725A-4	R11	400	725	400	715	705	600
ACH580-04-820A-4	R11	450	820	450	810	807	700
ACH580-04-880A-4	R11	500	880	500	865	807	700

Cabinet-built drives, ACH580-07

Drive type	Frame size	3-phase, U_N = 380, 400, 415 V				3-phase, U_N = 440, 460, 480 V	
		Nominal ratings		Light-duty use		Light-duty use	
		P_N (kW)	I_N (A)	P_{Ld} (kW)	I_{Ld} (A)	I_{Ld} (A)	P_{Ld} (hp)
ACH580-07-145A-4	R6	75	145	75	138	124	100
ACH580-07-169A-4	R7	90	169	90	161	156	125
ACH580-07-206A-4	R7	110	206	110	196	180	150
ACH580-07-246A-4	R8	132	246	132	234	240	200
ACH580-07-293A-4	R8	160	293	160	278	260	200
ACH580-07-363A-4	R9	200	363	200	345	361	300
ACH580-07-430A-4	R9	250	430	200	400	414	350
ACH580-07-505A-4	R10	250	505	250	485	483	400
ACH580-07-585A-4	R10	315	585	315	575	573	450
ACH580-07-650A-4	R10	355	650	355	634	623	500
ACH580-07-725A-4	R11	400	725	400	715	705	600
ACH580-07-820A-4	R11	450	820	450	810	807	700
ACH580-07-880A-4	R11	500	880	500	865	807	700

Nominal ratings	
I_N	Rated current available continuously without overloadability at 40 °C.
P_N	Typical motor power in no-overload use.
Light-duty use	
I_{Ld}	Continuous current allowing 110% I_{Ld} for 1 minute every 10 minutes at 40 °C.
P_{Ld}	Typical motor power in light-duty use.

The ratings for all ACH580 drives apply at +40 °C ambient temperature.
For derating at higher altitudes, temperatures or switching frequencies, see the HW manuals, document codes: 3AXD50000044839, 3AXD50000048685, 3AXD50000045816 and 3AXD50000037066.

Ratings, types and voltages

Wall-mounted drives, ACH580-31 ultra-low harmonic version

Drive type	Frame size	3-phase, U_N = 380, 400, 415 V				3-phase, U_N = 440, 460, 480 V	
		Nominal ratings		Light-duty use		Light-duty use	
		P_N (kW)	I_N (A)	P_{Ld} (kW)	I_{Ld} (A)	I_{Ld} (A)	P_{Ld} (hp)
ACH580-31-09A5-4	R3	4	9.4	4	8.9	7.6	5
ACH580-31-12A7-4	R3	5.5	12.6	5.5	12	12	7.5
ACH580-31-018A-4	R3	7.5	17	7.5	16.2	14	10
ACH580-31-026A-4	R3	11	25	11	23.8	23	15
ACH580-31-033A-4	R6	15	32	15	30	27	20
ACH580-31-039A-4	R6	18.5	38	18.5	36	34	25
ACH580-31-046A-4	R6	22	45	22	43	44	30
ACH580-31-062A-4	R6	30	62	30	59	52	40
ACH580-31-073A-4	R6	37	73	37	69	65	50
ACH580-31-088A-4	R6	45	88	45	84	77	60
ACH580-31-106A-4	R8	55	106	55	101	96	75
ACH580-31-145A-4	R8	75	145	75	138	124	100
ACH580-31-169A-4	R8	90	169	90	161	156	125
ACH580-31-206A-4	R8	110	206	110	196	180	150

Drive modules, ACH580-34 ultra-low harmonic version

Drive type	Frame size	3-phase, U_N = 380, 400, 415 V				3-phase, U_N = 440, 460, 480 V	
		Nominal ratings		Light-duty use		Light-duty use	
		P_N (kW)	I_N (A)	P_{Ld} (kW)	I_{Ld} (A)	I_{Ld} (A)	P_{Ld} (hp)
ACH580-34-246A-4	R11	132	246	132	234	240	200
ACH580-34-293A-4	R11	160	293	160	278	260	200
ACH580-34-365A-4	R11	200	365	200	347	361	300
ACH580-34-442A-4	R11	250	442	250	420	414	350
ACH580-34-505A-4	R11	250	505	250	480	414	350
ACH580-34-585A-4	R11	315	585	315	556	430	350
ACH580-34-650A-4	R11	355	650	355	618	483	400

Nominal ratings	
I_N	Rated current available continuously without overloadability at 40 °C.
P_N	Typical motor power in no-overload use.
Light-duty use	
I_{Ld}	Continuous current allowing 110% I_{Ld} for 1 minute every 10 minutes at 40 °C.
P_{Ld}	Typical motor power in light-duty use.

The ratings for all ACH580 drives apply at +40 °C ambient temperature.
For derating at higher altitudes, temperatures or switching frequencies, see the HW manuals, document codes: 3AXD50000044839, 3AXD50000048685, 3AXD50000045816 and 3AXD50000037066.


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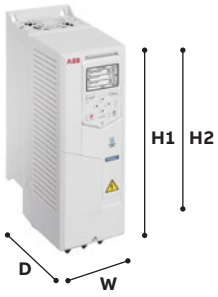
Dimensions

ACH580-01, wall-mounted frames IP21

Frames	Height				Width		Depth		Weight	
	H1 *)		H2 **)							
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
R1	373	14.7	331	13.0	125	4.9	223	8.8	4.6	10.1
R2	473	18.6	432	17.0	125	4.9	229	8.9	6.6	14.6
R3	490	19.3	490	19.3	203	8.0	229	8.9	11.8	26.0
R4	636	25.0	636	25.0	203	8.0	257	10.2	19.0	41.9
R5	732	28.8	596	23.5	203	8.0	295	11.6	28.3	62.4
R6	727	28.6	548	21.6	252	9.9	369	14.5	42.4	93.5
R7	880	34.6	600	23.6	284	11.2	370	14.6	54	119.1
R8	965	38.0	680	26.8	300	11.8	393	15.5	69	152.2
R9	955	37.6	680	26.8	380	15.0	418	16.5	97	213.9

*) Height of the drive with gland box
**) Height of the drive without gland box



ACH580-01, wall-mounted frames IP55

Frames	Height *)		Width		Depth		Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
R1	403	15.9	128	5.0	233	9.2	4.8	10.6
R2	503	19.8	128	5.0	239	9.4	6.8	15.0
R3	490	19.3	206	8.1	237	9.3	13.0	28.7
R4	636	25.0	203	8.0	265	10.4	20	44.1
R5	732	28.8	203	8.0	320	12.6	29	64.0
R6	727	28.6	252	9.9	380	15.0	43	94.8
R7	880	34.6	284	11.2	381	15.0	56	123.5
R8	965	38.0	300	11.8	452	17.8	77	169.8
R9	955	37.6	380	15.0	477	18.8	103	227.1

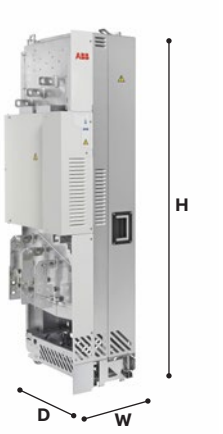
*) Height of the drive with gland box
H2 dimension is the same as IP21 type

ACH580-01, wall mounted frames IP55 disconnect switch / EMC C1 variants

Frames	Height		Width		Depth		Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
R1	403	15.9	128	5.0	255	10.0	5.4	11.8
R2	503	19.8	128	5.0	257	10.1	7.5	16.4
R3	733	28.9	207	8.2	258	10.2	15.0	33.1
R4	879	34.6	206	8.1	286	11.3	23.3	51.5
R5	1023	40.3	203	8.0	342	13.5	33.0	64.0

ACH580-04, module frames IP00/IP20

Frames	Height		Width		Depth		Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
R10	1462	57.6	350	13.8	529	20.8	162	357.5
R11	1662	65.4	350	13.8	529	20.8	200	440.9



ACH580-07, cabinet-built frames IP21

Frames	Height		Width		Depth		Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
R6	2145	84.4	430	16.9	673	26.5	210	463
R7	2145	84.4	430	16.9	673	26.5	220	485
R8	2145	84.4	530	20.9	673	26.5	255	562
R9	2145	84.4	530	20.9	673	26.5	275	606
R10	2145	84.4	830	32.7	698	27.5	535	1179
R11	2145	84.4	830	32.7	698	27.5	581	1280

ACH580-31, ultra-low harmonic wall-mounted frames IP21

Frames	Height		Width		Depth		Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
R3	495	19.5	205	8.1	354	13.9	21	46
R6	771	30.4	252	9.9	392	15.5	61	134
R8	965	38.0	300	11.8	438	17.3	112	247

ACH580-31, ultra-low harmonic wall-mounted frames IP55

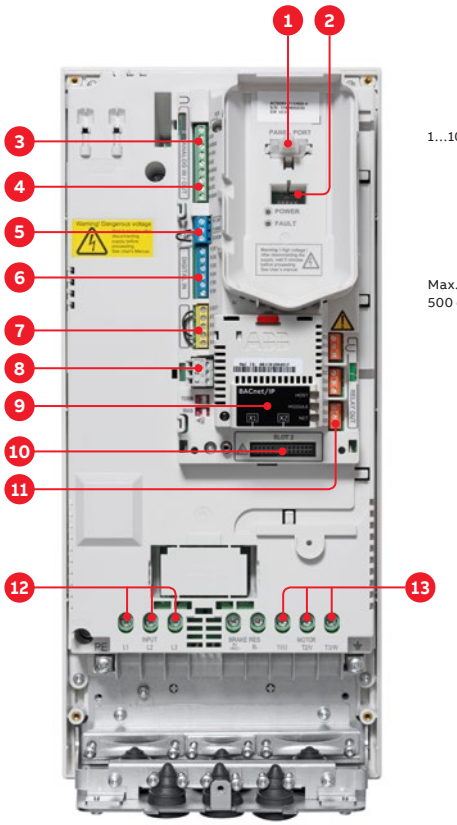
Frames	Height		Width		Depth		Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
R3	495	19.5	205	8.1	360	14.2	21	46
R6	771	30.4	252	9.9	449	17.7	63	139
R8	965	38.0	300	11.8	496	19.5	118	260

ACH580-34, ultra-low harmonic module frames IP00/IP20

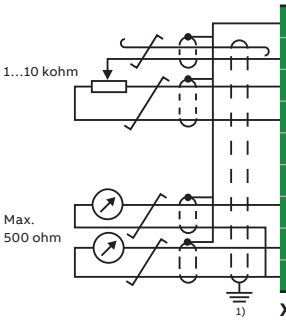
Frames	Height		Width		Depth		Weight	
	(mm)	(in)	(mm)	(in)	(mm)	(in)	(kg)	(lb)
R11	1741	68.5	636.5	25.1	512	20.2	376	829

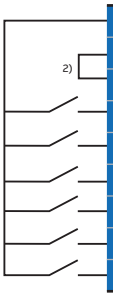
ACH580 standard I/O diagram

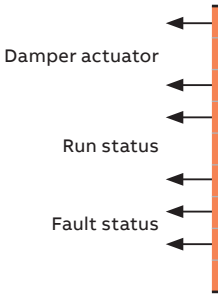
Default control connections

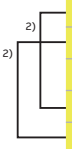


1. Panel port (PC tools, control panel)
2. ABB drive customizer port for programming the drive without mains
3. Analog inputs (2 × AI)
4. Analog outputs (2 × AO)
5. 24 V DC output
6. Digital inputs (6 × DI)
7. Safe torque off (STO)
8. Embedded fieldbus
9. Communication options (fieldbuses)
10. I/O extensions
11. Relay outputs (3 × RO)
12. Mains connection
13. Motor connection









Terminal	Meaning	Default connections	
X1	**Reference voltage and analog inputs and outputs**		
1	SCR	Signal cable shield (screen)	
2	AI1	**Output frequency/speed reference:** 0 to 10 V	
3	AGND	Analog input circuit common	
4	+10 V	Reference voltage 10 V DC	
5	AI2	**Actual feedback:** 0 to 20 mA	
6	AGND	Analog input circuit common	
7	AO1	**Output frequency:** 0 to 10 V	
8	AO2	**Motor current:** 0 to 20 mA	
9	AGND	Analog output circuit common	
X2 & X3	**Aux. voltage output and programmable digital inputs**		
10	+24 V	Aux. voltage output +24 V DC, max. 250 mA	
11	DGND	Aux. voltage output common	
12	DCOM	Digital input common for all	
13	DI1	**Stop (0)/Start (1)**	
14	DI2	Not configured	
15	DI3	**Constant frequency/speed selection**	
16	DI4	**Start interlock 1 (1 = allow start)**	
17	DI5	Not configured	
18	DI6	Not configured	
X6, X7, X8	**Relay outputs**		
19	RO1C	**Damper control** 250 V AC/30 V DC 2 A	Energize damper 19 connected to 21
20	RO1A		
21	RO1B		
22	RO2C	**Running** 250 V AC/30 V DC 2 A	Running 22 connected to 24
23	RO2A		
24	RO2B		
25	RO3C	**Fault (-1)** 250 V AC/30 V DC 2 A	Fault condition 25 connected to 26
26	RO3A		
27	RO3B		
X5	**Embedded fieldbus**		
29	B+	Embedded fieldbus, EFB (EIA-485)	
30	A-		
31	DGND		
S4	TERM	Termination switch	
S5	BIAS	Bias resistors switch	
X4	**Safe torque off**		
34	OUT1	Safe torque off. Factory connection. Both circuits must be closed for the drive to start. See chapter *The Safe torque off function* in the *hardware manual* of the drive.	
35	OUT2		
36	SGND		
37	IN1		
38	IN2		
X10	**24 V AC/DC**		
40	24 V AC/DC+ in	R6 to R11 and all ACH580-31 and ACH580-34: Ext. 24 V AC/DC input to power up the control unit when the main supply is disconnected.	
41	24 V AC/DC- in		

Notes:

[1] Ground the outer shield of the cable 360° under the grounding clamp on the grounding shelf for the control cables.

[2] Connected with jumpers at the factory.

Control panel options and mounting kits

The standard delivery of the ABB HVAC drives include the HVAC control panel, which has the Hand-Off-Auto operation logic and multiple other HVAC features. A variety of different control panel accessories are available for ACH580 drives.

Bluetooth control panel
ACH-AP-W
The optional Bluetooth panel enables connection with the Drivetune mobile app. The app is available for free from Google Play and the Apple App store. With the Drivetune app HVAC users have all the similar functions as there is on the standard ACH-AP-H or ACH-AP-W control panels: Primary settings, I/O menu, diagnostics and full parameter list among other functions.

Control panel bus adapters
CDPI-01
Control panel bus adapters are used to connect HVAC control panels with a RJ-45 cable to the drive from a distance, e.g. when mounting the control panel on a cabinet door. In addition, CDPI adapters can be used to daisy chain several ACH drives together to be controlled with a single control panel or PC tool.

Control panel mounting kit for outdoor installation
DPMP-04/05
Enables control panel outdoor mounting thanks to IP66 protection class, UV resistance and IK07 impact protection rating.

Control panel mounting platform
DPMP-01
This mounting platform is for flush mountings. This requires also CDPI-01 for ACH580 (blank control panel with the RJ-45 connector) and a control panel.

Control panel mounting platform
DPMP-02 for ACH580-01
and ACH580-31,
DPMP-03 for ACH580-04 and
ACH580-34
This mounting platform is for surface mountings. This requires also CDPI-01 for ACH580 (blank control panel with the RJ-45 connector) and a control panel (HVAC, Bluetooth® or industrial).

Door mounting kits
DPMP-EXT for ACH580-01
and ACH580-31
The door mounting kit is ideal for cabinet installations. Should you want to use a different control panel than the one delivered with the drive, it needs to be ordered separately.

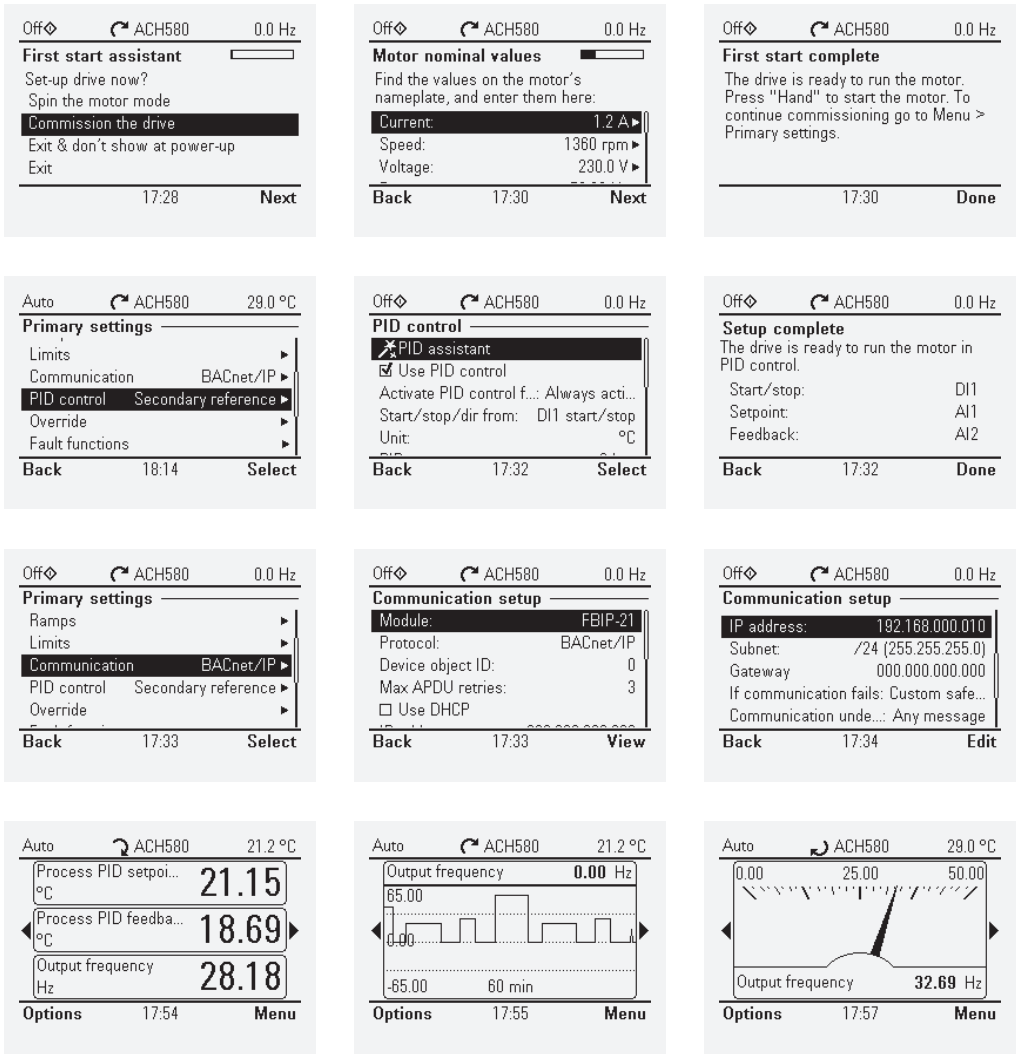
Option code	Description	Type designation
+J400	The Hand-Off-Auto control panel as standard in the delivery	ACH-AP-H
+J429	Control panel with Bluetooth interface	ACH-AP-W
+J424	Blank control panel cover (no control panel delivered)	CDUM-01
3AXD50000004419	Panel bus adapter for ACH580	CDPI-01
3AUA0000108878	Control panel mounting platform (flush mounted, requires also panel bus adapter on the drive)	DPMP-01
3AXD50000009374	Control panel mounting platform (surface mounted, requires also panel bus adapter on the drive)	DPMP-02
3AXD50000016230 *)	Control panel mounting platform (surface mounted, requires also panel bus adapter on the drive, only for ACH580-04/34)	DPMP-03
3AXD50000217717 *)	Control panel mounting kit for outdoor installation	DPMP-04
3AXD50000240319 *)	Control panel mounting kit for outdoor installation, only for ACH580-04/34	DPMP-05
3AXD50000010763	Door mounting kit for the panel (for one drive, contains both DPMP-02 and CDPI-01)	DPMP-EXT

*) For availability please contact your local ABB

Easiness on a whole new level

Enjoy the simplicity with the assistant control panel's intuitive user interface, assistants and ready-made macros. The panel guides you through commissioning without a need to know any drive parameters and helps in unclear situations.

Assistant control panel, ACH-AP-H
Set up the drive, fine-tune motor control and monitor values that matter using the assistant control panel, delivered as standard with all HVAC drives.



Commission without a hassle
Select language, set time and date, name the drive, enter motor values, test rotating the motor.

Primary settings
Commission HVAC controllers with the intuitive PID assistant. Set the communication up. Tune the limits, commission override function, set the ramps, everything can be done with primary settings.

Home view displays
Effortlessly monitor the values that are the most important to you. You can select values for monitoring from a ready-made list or choose user-defined parameters.

Help button
The help button provides more information about your selection and it can be pressed in any view.

Tools

Enjoy the easiness offered by the cold configuration tool and Drive composer PC tool. These tools lighten your workload, especially if there are many drives. The cold configurator tool provides a quick way to parametrize unpowered drives even in their boxes, and the Drive composer PC tool offers advanced means, for example, for commissioning and monitoring.

Safe configuration for unpowered drives
The CCA-01 cold configuration adapter provides a serial communication interface for unpowered drives. With the adapter, safe isolation of both serial communication and control board power supply is possible. The power supply is taken from a PC USB port.

Cold configurator adapter		
Ordering code	**Description**	**Type designation**
3AXD50000019865	Cold configurator adapter, packed kit	CCA-01

PC tools
The Drive composer PC tool offers fast and harmonized setup, commissioning, monitoring and the capability to create adaptive block programs. The free version of the tool provides startup and maintenance capabilities and gathers all drive information, such as parameter loggers, faults, and backups into a support diagnostics file. Drive composer pro provides additional features such as custom parameter windows, graphical control diagrams of the drive's configuration, and improved monitoring and diagnostics.

Drive composer		
Link/ordering codes	**Description**	**Type designation**
new.abb.com/drives/software-tools/drive-composer	Link to download Drive composer entry	
9AKK105408A3415	Drive composer entry PC tool (document)	
3AUA0000108087	Drive composer pro PC tool (single user licence)	DCPT-01
3AUA0000145150	Drive composer pro PC tool (10 users licence)	DCPT-01
3AUA0000145151	Drive composer pro PC tool (20 users licence)	DCPT-01

I/O options

ABB HVAC drives are very flexible in terms of I/O configuration. The standard I/O is suitable for most HVAC applications. On top of that, ACH580 provides great flexibility with different I/O options.

Input/output extension modules
Standard input and output can be extended by using optional analog and digital input/output extension modules.

Option code	Description	Type designation
+L501	External 24 V A C/DC and digital I/O extension (2xRO and 1xDO)	CMOD-01
+L523	External 24 V DC/AC and isolated PTC interface with capability to trigger STO	CMOD-02
+L512	115/230V digital input (6xDI and 2xRO)	CHDI-01

Fieldbus options

The HVAC communication protocols BACnet MS/TP, Modbus RTU and N2 are there as standard. Should that not be enough, the other protocols are supported with optional adapters.

Fieldbus adapters

BACnet/IP option
Native BACnet/IP allows for greater bandwidth for more frequent polling/ monitoring and more devices on the same sub-network. Thanks to the two-port design of this adapter, the need for external switches and installation time are reduced. Different buildings may have different fieldbuses, and we have multiple option modules to satisfy your needs.

Option code	Fieldbus protocol	Adapter
+K465	BACnet/IP (2-port)	FBIP-21
+K491	Modbus TCP (2-port)	FMBT-21
+K452	LonWorks	FLON-01
+K492	PROFINET IO (2-port)	FPNO-21
+K454	PROFIBUS-DP	FPBA-01
+K490	Ethernet/IP (2-port)	FEIP-21
+K451	DeviceNet	FDNA-01
+K457	CANopen	FCAN-01
+K462	ControlNet	FCNA-01
+K469	EtherCAT (2-port)	FECA-01
+K470	Ethernet POWERLINK (2-port)	FEPL-02

du/dt filters

du/dt filtering suppresses inverter output voltage spikes and rapid voltage changes that stress motor insulation. Additionally, du/dt filtering reduces capacitive leakage currents and high- frequency emissions from the motor cable as well as high-frequency losses and bearing currents in the motor. The need for du/dt filtering depends on the motor insulation. For information on the construction of the motor insulation, consult the manufacturer. More information on the du/dt filters can be found in the ACH580 hardware manual.

External du/dt filter for ACH580-01 and ACH580-04

	du/dt filter type *) 3 filters included, dimensions apply to one filter.															
	Unprotected (IP00)								Protected to IP22				Protected to IP54			
ACH580 400 V	NOCH0016-60	NOCH0030-60	NOCH0070-60	NOCH0120-60 *)	FOCH0260-70	FOCH0320-50	FOCH0610-70	FOCH0875-70	NOCH0016-62	NOCH0030-62	NOCH0070-62	NOCH0120-62	NOCH0016-65	NOCH0030-65	NOCH0070-65	NOCH0120-65
ACH580-01-02A7-4	x								x				x			
ACH580-01-03A4-4	x								x				x			
ACH580-01-04A1-4	x								x				x			
ACH580-01-05A7-4	x								x				x			
ACH580-01-07A3-4	x								x				x			
ACH580-01-09A5-4	x								x				x			
ACH580-01-12A7-4	x								x				x			
ACH580-01-018A-4		x								x				x		
ACH580-01-026A-4		x								x				x		
ACH580-01-033A-4			x								x				x	
ACH580-01-039A-4			x								x				x	
ACH580-01-046A-4			x								x				x	
ACH580-01-062A-4			x								x				x	
ACH580-01-073A-4				x								x				x
ACH580-01-088A-4				x								x				x
ACH580-01-106A-4				x								x				x
ACH580-01-145A-4					x											
ACH580-01-169A-4					x											
ACH580-01-206A-4					x											
ACH580-01-246A-4					x											
ACH580-01-293A-4					x											
ACH580-01-363A-4						x										
ACH580-01-430A-4						x										
ACH580-04-505A-4							x									
ACH580-04-585A-4							x									
ACH580-04-650A-4							x									
ACH580-04-725A-4								x								
ACH580-04-820A-4								x								
ACH580-04-880A-4								x								

External du/dt filters for ACH580-07

	du/dt filter type *) 3 filters included, dimensions apply to one filter.		
	Protected to IP54		
ACH580 400 V	BOCH-0880A-7	COF-01	COF-02
ACH580-07-0145A-4		x	
ACH580-07-0169A-4		x	
ACH580-07-0206A-4		x	
ACH580-07-0246A-4			x
ACH580-07-0293A-4			x
ACH580-07-0363A-4			x
ACH580-07-0430A-4			x
ACH580-07-0505A-4	x		
ACH580-07-0585A-4	x		
ACH580-07-0650A-4	x		
ACH580-07-0725A-4	x		
ACH580-07-0820A-4	x		
ACH580-07-0880A-4	x		

Dimensions and weights of the du/dt filters

du/dt filter	Height (mm)	Width (mm)	Depth (mm)	Weight (kg)
NOCH0016-60	195	140	115	2.4
NOCH0016-62/65	323	199	154	6
NOCH0030-60	215	165	130	4.7
NOCH0030-62/65	348	249	172	9
NOCH0070-60	261	180	150	9.5
NOCH0070-62/65	433	279	202	15.5
NOCH0120-60 [3)]	200	154	106	7
NOCH0120-62/65	765	308	256	45
FOCH0260-70	382	340	254	47
FOCH0320-50	662	319	293	65
FOCH0610-70	662	319	293	65
FOCH0875-70	662	319	293	65
BOCH-0880A-7	400	248	456	18
COF-01	570	296	360	23
COF-02	570	360	301	23

C1 filters for ACH580-01

Option code	Description	Frames
+F316	Main disconnect switch with auxiliary contact (NO) and EMC C1 filter	R1 to R5, IP55
+E223	EMC C1 filter	R1 to R5, IP55

Selection guide
IE4 synchronous reluctance motors

This table presents technical performance data for IE4 SynRM motors. Variant codes and construction details are based on the M3BP motor. Protection IP55, cooling IC 411, insulation class F, temperature rise class B. Motor values are given with an ACH580 drive supply.

Output (kW)	Motor type *)	Product code	Motor efficiency (%)	Motor nominal current (A)	Motor nominal torque (Nm)	Motor weight (kg)	Matched ACH580-01 drive for HVAC fan, pump and compressor use	Package efficiency **) IES at nominal point (Pn) (%)	PDS ***) IES2 efficiency class low limit (%)	Above IES2 low limit (%)	Frame size
3000 RPM / 100 Hz							**400 V network**				
1.5	M3AL90L4	3GAL092 507-_SB[2)]	84.2	3.9	4.8	13	ACH580-01-04A1-4	82.1	76.2	7.7	R1
2.2	M3AL90LA4	3GAL092517-_SB[2)]	85.9	5.6	7.0	13	ACH580-01-05A7-4	83.8	78.3	6.9	R1
3	M3AL100LB4	3GAL102527-_SB[1)2)]	88.6	9.5	9.6	23	ACH580-01-12A7-4	86.4	79.8	8.2	R1
4	M3AL112MB4	3GAL112327-_SB[1)2)]	89.9	13.6	12.7	33	ACH580-01-018A-4	87.7	81.1	8.1	R1
5.5	M3AL132SMA4	3GAL132217-_SC	90.9	12.6	17.5	41	ACH580-01-12A7-4	88.4	82.5	7.2	R1
7.5	M3AL132SMB4	3GAL132227-_SC	91.7	16.9	23.9	41	ACH580-01-018A-4	89.3	83.9	6.4	R2
11	M3AL132SMC4	3GAL132237-_SC	92.6	25	35.0	47	ACH580-01-026A-4	90.0	85.3	5.5	R2
11	M3BL160MLA4	3GBL162417-_SC	92.6	25.0	35.0	133	ACH580-01-026A-4	90.2	85.3	5.8	R2
15	M3AL132SMD4	3GAL132247-_SC	93.3	33.5	47.7	47	ACH580-01-039A-4	90.7	86.2	5.2	R3
15	M3BL160MLB4	3GBL162427-_SC	93.3	34.8	48.0	133	ACH580-01-039A-4	90.5	86.2	5.0	R3
18.5	M3BL160MLC4	3GBL162437-_SC	93.7	42.8	59.0	133	ACH580-01-046A-4	91.4	86.9	5.2	R3
22	M3BL180MLA4	3GBL182417-_SC	94.0	50.0	70.0	160	ACH580-01-062A-4	91.6	87.3	4.9	R4
30	M3BL200MLA4	3GBL202417-_SC	94.5	68.8	95.0	259	ACH580-01-073A-4	92.2	88.1	4.6	R4
37	M3BL200MLB4	3GBL202427-_SC	94.8	84.6	118	259	ACH580-01-088A-4	92.7	88.6	4.7	R5
45	M3BL225SMA4	3GBL222217-_SC	95.0	103	143	282	ACH580-01-106A-4	92.2	89.0	3.6	R5
55	M3BL225SMF4	3GBL222267-_SC	95.3	122	175	282	ACH580-01-145A-4	92.6	89.4	3.5	R6
1500 RPM / 50 Hz											
1.1	M3AL90LA4	3GAL092513-_SB[2)]	81.4	2.9	7.0	13	ACH580-01-03A4-4	79.4	74.0	7.3	R1
1.5	M3AL90LB4	3GAL092523-_SB[2)]	82.8	3.8	9.6	16	ACH580-01-04A1-4	80.7	76.2	5.9	R1
2.2	M3AL100LB4	3GAL102523-_SB[1)2)]	86.2	5.8	14.0	23	ACH580-01-07A3-4	84.0	78.3	7.3	R1
3	M3AL100LB4	3GAL102523-_SB[2)]	85.5	7.1	19.1	23	ACH580-01-07A3-4	83.4	79.8	4.4	R1
4	M3AL112MB4	3GAL112323-_SB[1)2)]	88.0	10.6	25.5	33	ACH580-01-12A7-4	85.8	81.1	5.8	R1
5.5	M3AL132SMA4	3GAL132213-_SC	91.9	12.1	35.0	63	ACH580-01-12A7-4	89.6	82.5	8.6	R1
7.5	M3AL132SMB4	3GAL132223-_SC	92.6	16.2	47.7	63	ACH580-01-018A-4	90.1	83.9	7.4	R2
11	M3AL132SMC4	3GAL132233-_SC	93.3	24	70	69	ACH580-01-026A-4	90.6	85.3	6.2	R2
11	M3BL160MLA4	3GBL162413-_SC	93.3	24.9	70	160	ACH580-01-026A-4	90.9	85.3	6.6	R2
15	M3BL160MLB4	3GBL162423-_SC	93.9	33.7	95	177	ACH580-01-039A-4	91.3	86.2	5.9	R3
18.5	M3BL180MLA4	3GBL182413-_SC	94.2	42.0	118	177	ACH580-01-046A-4	92.0	86.9	5.9	R3
22	M3BL200MLF4	3GBL202463-_SC	94.5	49.1	140	304	ACH580-01-062A-4	92.2	87.3	5.6	R4
30	M3BL200MLA4	3GBL202413-_SC	94.9	66.7	191	304	ACH580-01-073A-4	92.6	88.1	5.1	R4
37	M3BL250SMF4	3GBL252263-_SC	95.2	82.0	236	428	ACH580-01-088A-4	93.1	88.6	5.1	R5
45	M3BL250SMG4	3GBL252273-_SC	95.4	99.5	286	428	ACH580-01-106A-4	92.8	89.0	4.3	R5
55	M3BL250SMA4	3GBL252213-_SC	95.7	121	350	454	ACH580-01-145A-4	93.1	89.4	4.1	R6
75	M3BL280SMA4	3GBL282213-_DC	96.0	173	478	639	ACH580-01-206A-4	93.6	90.0	4.0	R7
90	M3BL280SMB4	3GBL282223-_DC	96.1	202	573	639	ACH580-01-206A-4	93.7	90.2	3.9	R7
110	M3BL280SMC4	3GBL282233-_DC	96.3	245	699	697	ACH580-01-246A-4	93.5	90.5	3.3	R8
110	M3BL315SMA4	3GBL312213-_DC	96.3	244	702	873	ACH580-01-246A-4	94.0	90.5	3.9	R8
132	M3BL315SMB4	3GBL312223-_DC	96.4	290	842	925	ACH580-01-293A-4	94.0	90.7	3.6	R8
160	M3BL315SMC4	3GBL312233-_DC	96.6	343	1018	965	ACH580-01-363A-4	94.2	90.9	3.6	R9
200	M3BL315MLA4	3GBL312413-_DC	96.7	427	1272	1116	ACH580-01-430A-4	94.5	91.1	3.7	R9

[1)] Motor with restamped output required (option +002)
[2)] Motor non-conformable with IE4 EE class

*) Motor type M3AL = aluminum motor frame
*) Motor type M3BL = cast iron motor frame
**) Calculated package efficiency values for ACH580-01
***) PDS = Power Drive System

Output (kW)	Motor type *)	Product code	Motor efficiency (%)	Motor nominal current (A)	Motor nominal torque (Nm)	Motor weight (kg)	Suggested ACH580 drive for no overload pump use *)	Package efficiency **) IES at nominal point (Pn) (%)	PDS ***) IES2 efficiency class low limit (%)	Above IES2 low limit (%)	Frame size
3000 rpm											
55	M3BL225SMF4	3GBL 222267-_SC	95.3	122	175	282	ACH580-07-145A-4	92.6	89.4	3.5	R6
1500 rpm											
55	M3BL250SMA4	3GBL 252213-_SC	95.7	121	350	454	ACH580-07-145A-4	93.1	89.4	4.1	R6
75	M3BL280SMA4	3GBL 282213-_DC	96.0	173	478	639	ACH580-07-206A-4	93.6	90.0	4.0	R7
90	M3BL280SMB4	3GBL 282223-_DC	96.1	202	573	639	ACH580-07-206A-4	93.7	90.2	3.9	R7
110	M3BL280SMC4	3GBL 282233-_DC	96.3	245	699	697	ACH580-07-246A-4	93.5	90.5	3.3	R8
110	M3BL315SMA4	3GBL 312213-_DC	96.3	244	702	873	ACH580-07-246A-4	94.0	90.5	3.9	R8
132	M3BL315SMB4	3GBL 312223-_DC	96.4	290	842	925	ACH580-07-293A-4	94.0	90.7	3.6	R8
160	M3BL315SMC4	3GBL 312233-_DC	96.6	343	1018	965	ACH580-07-363A-4	94.2	90.9	3.6	R9
200	M3BL315MLA4	3GBL 312413-_DC	96.7	427	1272	1116	ACH580-07-430A-4	94.5	91.1	3.7	R9

[1)] Motor with restamped output required (option +002)
[2)] Motor non-conformable with IE4 EE class

*) Motor type M3AL = aluminum motor frame
*) Motor type M3BL = cast iron motor frame
**) Calculated package efficiency values for ACH580-01
***) PDS = Power Drive System

Notes

Additional information
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3AUA0000186691 REV F EN 9.14.2019