



ACH580 HVAC Drives

Product Introduction

ACH580 HVAC Drives

The new standard



ACH580 HVAC Drives

The market leader building on a proven history of innovative HVAC products

ACH500



- Applications to improve the control of HVAC Equipment

1993 – 2000

ACH400



- Applications to improve the control of HVAC Equipment

2000 – 2003

ACH550



- Applications to improve the control of HVAC Equipment
- Onboard HVAC Comm. protocols

2003 – Present

ACH580



- Applications to improve the control of HVAC Equipment
- Onboard HVAC Comm. Protocols
- **Ultra-Low Harmonic (ULH)**

New!!
2019 – Present

4th Generation - Over 25 years of expert knowledge in designing and building HVAC Drives

ACH580 HVAC Drives

ACH580-01 Highlights

Easy ordering, installation, commissioning and use

- Compact wall-mounted drives in enclosure classes Type 1 and Type 12 up to 350hp, 460V
- Color coded I/O terminals for ease of installation
- Primary settings and Assistants make commissioning fast and efficient

Essential features for high performance

- Accurate and energy efficient motor control for various motor types
- Mitigation of harmonics
- Functional programming for tailoring the drive to your specific application
- Optimized configurations for each job



ACH580 Control Panel

A drive that speaks HVAC language

HVAC control panel as a standard

Standard control panel supports multiple different languages

- Primary settings makes the commissioning of the drive fast and simple

USB interface for PC and tool connection as standard

- Possible to move information between PC and the drive with no extra hardware

Help button for problem solving

- Less calls to technical support

Drive settings can be stored to control panel

- Easy transfer of parameter from drive to another
- Ensures drive settings are not lost

QR Code with unit information



ACH580 Control Panel

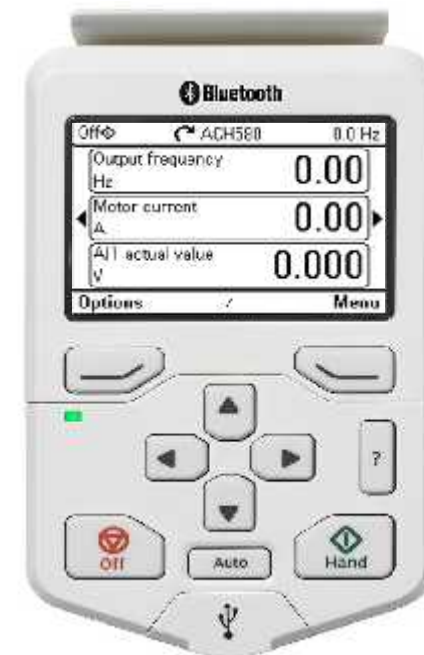
ACH-AP-W and DriveTune

ACH580 can be equipped with **ACH-AP-W** Assistant control panel with wireless Bluetooth interface

- Order with plus code +J429

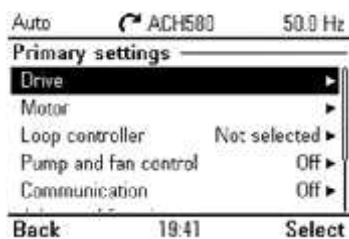
Drivetune mobile application

- Used in **basic commissioning** and in **troubleshooting & maintenance** tasks
- Available for Android and iOS



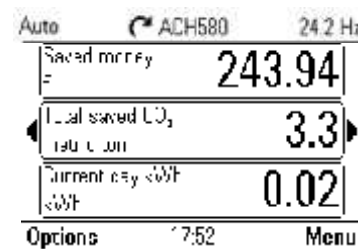
ACH580 Control Panel

Features for start-up and use



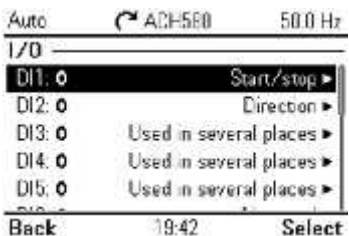
Primary settings

- Includes most commonly used settings for most typical applications
- Assistants embedded to menus under different drive function topics
- Quick and easy I/O configuration



Energy efficiency menu

- Shows the energy, monetary and CO₂ emissions savings
- kWh counter for hourly and daily consumption monitoring
- Consumed kWh pulse output connection to external load monitoring equipment



I/O Menu

- One menu showing all I/O:s and functions controlled by each terminal
- Shows real time electrical statuses for all terminals and also what each terminal logically means to the drive



Diagnostic tools

- The assistant panel has help function to provide user information in case of problems.
 - Simply by pressing the help button – “?” user will be offered with clear instructions how to solve the issue.
- Amplitude-, peak-value- and event-logger keep track of occurred problems

ACH580 Connectivity

ACH580-01 Control Unit

Standard features

There are two different control unit versions used in ACH580 products, CCU-23 and CCU-24

CCU-23 is used in frames R1-R5 and CCU-24 in frames R6-R9

Both control units have the color coded terminals for

- 2 Analog inputs
- 2 Analog outputs
- 6 Digital inputs (1 pulse input)
- Safe Torque Off
- 3 Relay outputs
- EIA-485

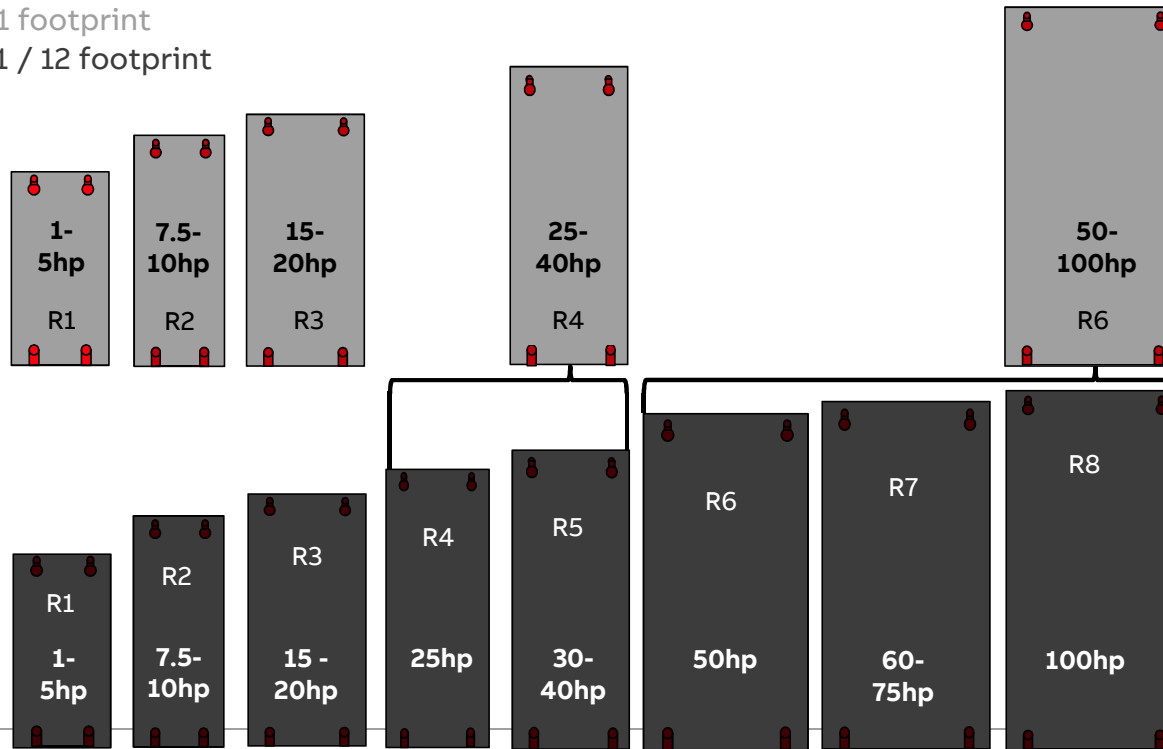
I/Os can be expanded with optional C-series I/O option modules



ACH580 to ACH550 dimensions

Equal or smaller units with wider power range (200V)

ACH550 Type 1 footprint
ACH580 Type 1 / 12 footprint

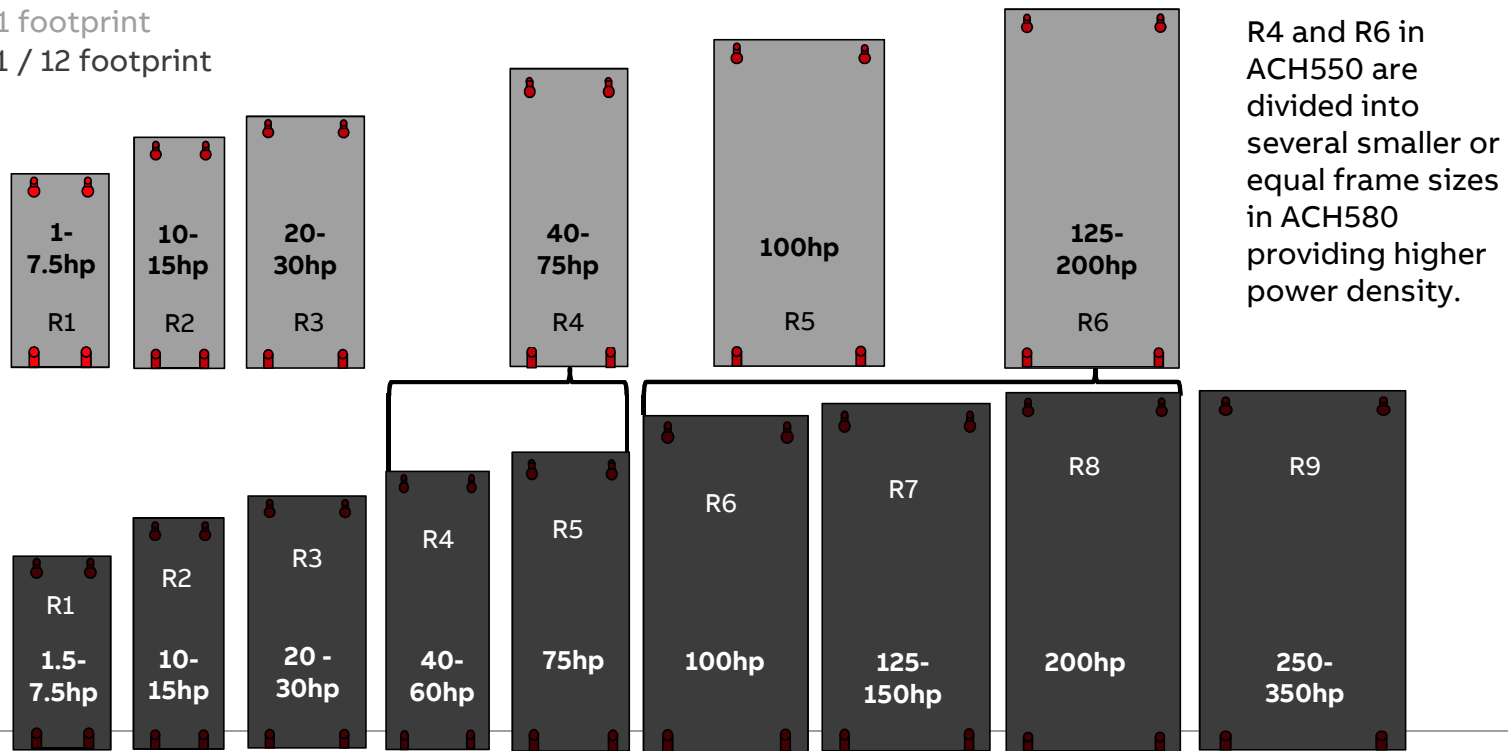


R4 and R6 in ACH550 are divided into several smaller or equal frame sizes in ACH580 providing higher power density.

ACH580 to ACH550 dimensions

Equal or smaller units with wider power range (400V)

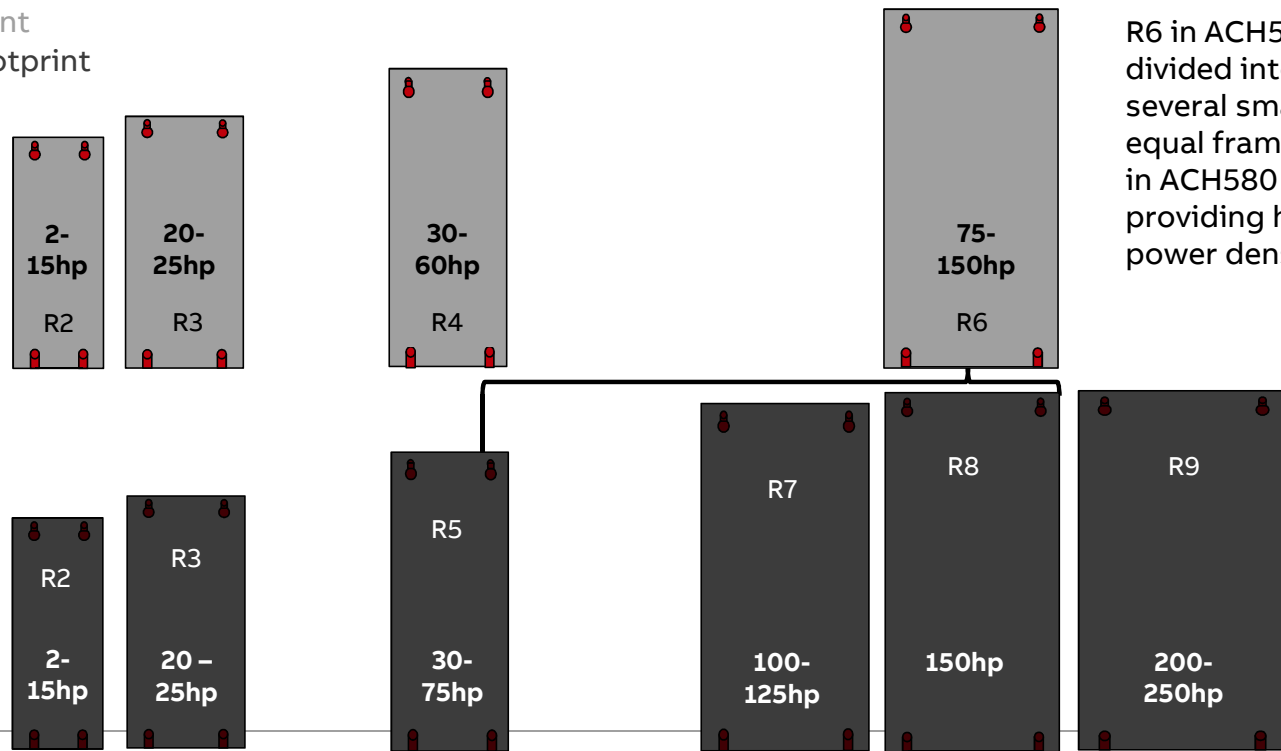
ACH550 Type 1 footprint
ACH580 Type 1 / 12 footprint



ACH580 to ACH550 dimensions

Equal or smaller units with wider power range (600V)

ACH550 Type 1 footprint
ACH580 Type 1 / 12 footprint



R6 in ACH550 is divided into several smaller or equal frame sizes in ACH580 providing higher power density.

ACH580 hardware overview

Compact UL Type 12 (IP55)

High power density from compact drive

- Width and height same as Type 1 unit

Separate panel door

- Protection class remains even without control panel

Type 12 allows installation closer to motor in many applications

- Save costs with shorter motor cables

No need for regular change of cabinet filters

- Reduced maintenance costs

Light and robust design

- Optimized choke technology

- Increased use of plastics



ACH580 Enclosed Product

More than a module but no Bypass

Vertical and Box configurations

Available with Input Disconnect or Circuit Breaker (padlockable in off position)

- Fast Acting Fuses (standard)
- 100kA rated (standard)

Control Panel (standard)

Available 1-350 HP

Available Type 1, 12, and 3R

- Thermostatically controlled strip heater in 3R
- Thermostatically controlled cooling fan(s) 3R
- Custom configurations/packages available



ACH580 Eclipse Bypass

Technically superior, no change required.

Vertical and Box configurations



The compact Vertical configuration saves space. The Box configuration provides more flexibility to allow for installation in dusty or outdoor spaces.

- Available up to 100HP at 230V, 350HP at 460V, and 150HP at 575V
- Available Type 1, 12 and 3R Rated Enclosures

Intelligent Microprocessor Controlled Bypass w/ industry leading capabilities

- Serial Communication capability (standard)
- Voltage tolerance +30% to -35% (standard)
- Dedicated VFD fuses (standard)
- Single Phase, Brownout, and Welded Contactor protection (standard)
- Programmable Class 10, 20, 30 OL protection (standard)
- Programmable auto transfer to Bypass (standard)
- Damper Control and Firemans Override functions (standard)
- 100kA rated (standard)
- Custom configurations/packages available

ACH580-31 Ultra Low Harmonic Drives for HVAC

The premier Ultra Low Harmonic (ULH) solution

The fully integrated ULH solution provides an unprecedented, compact form factor with a wide range in horsepower. The ACH580-31 Ultra-low harmonic drive provides exceptionally low harmonic content, 3% or less, this helps you to easily comply with the most stringent recommendations of IEEE519.

Prevention is better than the cure

The ACH580-31 Ultra Low Harmonic drive keeps the power network clean

A Comparison

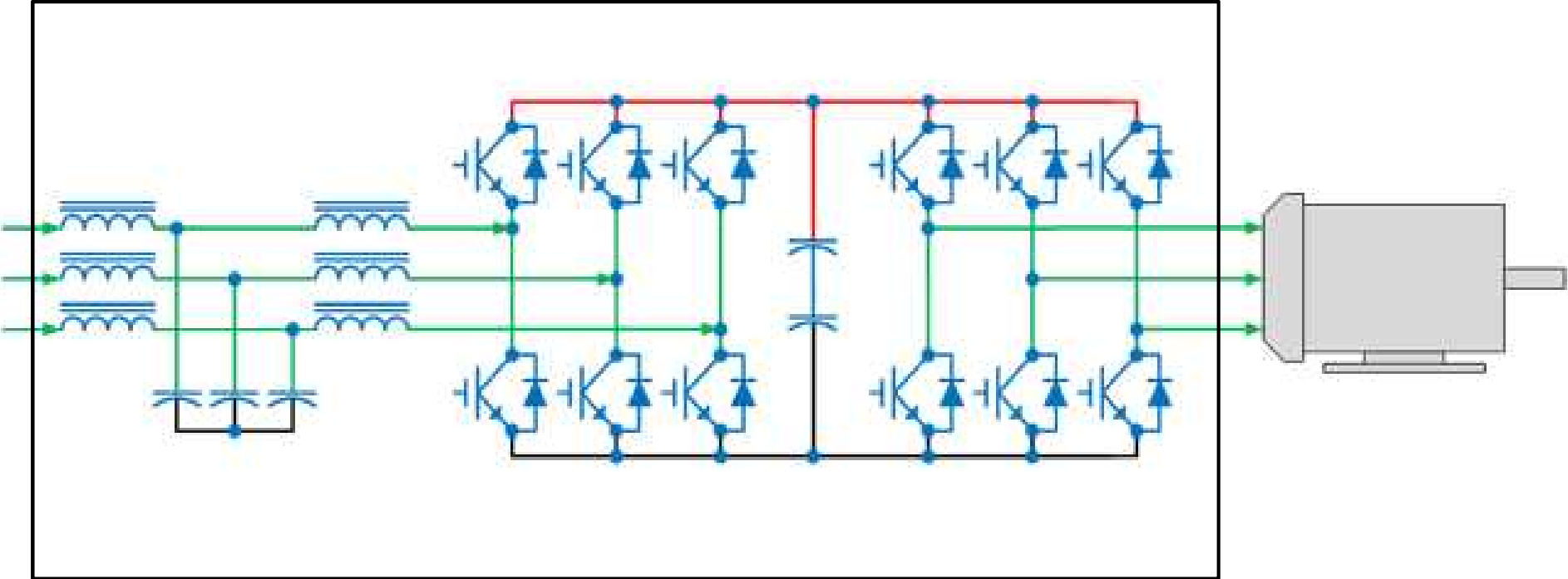
Effectiveness of Harmonic Mitigation Techniques

Technique	THDi% (current)
6-pulse rectifier, no mitigation (reference level)	72% or higher
6-p with 3% line reactors, or equivalent DC reactor	40-45%
6-p with 5% line reactors or equivalent DC reactor	35-40%
12 pulse rectifier with 5% impedance transformer	8-12%
Modern Passive trap filter	5%
18 pulse rectifier with 5% impedance transformer	5%
Active harmonic filter	4%
ACH580-31 ULH	3%

Ultra-low harmonic drive has the lowest harmonic distortion.

ACH580-31 Ultra Low Harmonic Drives for HVAC

Solutions to reduce harmonics



ACH580-31 Ultra Low Harmonic Drives for HVAC

Product Overview

- R3 Frame 5-15HP Wall Mount
- R6 Frame 20-60HP Wall Mount
- R8 Frame 75-150HP Wall Mount
- R11 Frame 200+ Floor Mount
- UL Type 1 (IP21) and UL Type 12 (IP55) with conformal coated boards
- All the features, benefits, options as standard ACH580 6 pulse and more
- Custom configurations/packages available



ACH580-31 R3

ACH580-31 R6

ACH580-31 R8



ACH580-31 IP55

ACH580-34 R11

ACH580-31 Ultra Low Harmonic Drives for HVAC

Advantages

**Fully integrated
Harmonic
mitigation**

**Cost
containment**

No hidden costs
Best harmonic mitigation value

**Easy, compact
solution**

Ease of use

- Easy installation
 - 3 wires in / 3 wires out
- Consistent user Interface across ABB all-compatible drives
- All in one integrated solution
 - No external filtering devices
 - No multi-pulse transformers
 - Unprecedented form factor

**Superior
performance
in all conditions**

Expertise

**Energy
efficiency**

- Total Harmonic Current Distortion (THDi) less than 3%
- Clean and stable solution
- Will not distort existing power network
- Improves electrical network efficiency
- Unity Power Factor
- Full motor voltage even in a weak electrical network

ACH580 HVAC drives

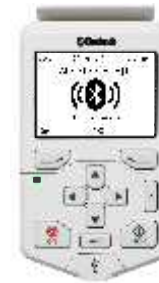
All-compatible platform

Shared features of the all-compatible platform



Adaptive programming

- ACH580 firmware includes an easy to use and visual adaptive programming feature
- Adaptive programming can be used to add logical functions and conditions for process fine-tuning



User Interface

- Intuitive control panel options with similar functionality across platform
- Mobile phone connectivity via optional Bluetooth assistant control panel



Same PC tools for ABB All-compatible drives

- Free of charge Drive Composer Entry available in www.abb.com
- Same parameter structure makes all-compatible platform easy to use



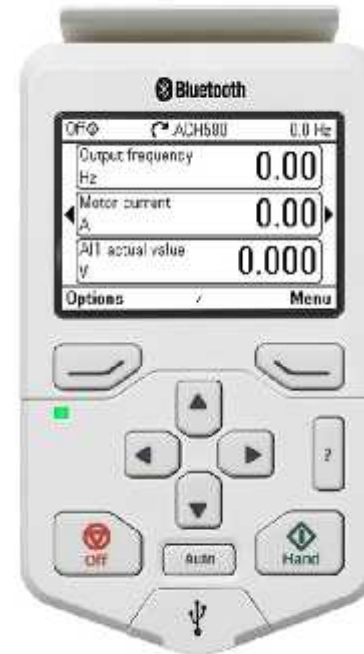
Connectivity

- ACH580 supports F-series fieldbus adapters used in ABB all-compatible platform
- Fieldbus settings made easy with redesigned simple settings menu

Key ACH580 improvements over ACH550

Ease of use

- Effortless commissioning and operation with new intuitive main menu
 - Primary Settings menu including assistants for defining essential settings without going into the parameter list
 - I/O menu for faster configuration
 - Motor default parameters preset to match Baldor EM series motors
- Colored terminals
- Intuitive 4-key navigation in menus and assistants
- New diagnostics menu to help with any issues you might have with the ACH580
- Clear, robust laser marked terminals



Key ACH580 improvements over ACH550

Reliability / Safety

-
- Available Bluetooth control Panel protects your personnel
 - Arc Flash
 - Lose the ladder
 - Cut the cord
 - Motor heating mode for motor condensation prevention
 - Improved protection functions (e.g. ground-fault detection)
 - Speed controlled main cooling fan



Lose the ladder

No need to access difficult-to-reach work areas to access drive information



Protect your personnel

Stay out of hazardous areas when commissioning and tuning a drive (arc flash)

Key ACH580 improvements over ACH550

One drive, many HVAC applications, many motor types

-
- Same or reduced size in all frames compared to ACH550
 - Wall mounted power range extended to 350hp (480V) and 250hp (600V)
 - ACH580-01 UL Type 12 with small depth increase compared to UL Type 1 (hood required)
 - 21 editable home view signals with different display styles
 - Support for induction, PM and SynRM motors
 - Flexible parameter interface with pointer parameters allow using values outside default parameter selection lists
 - Adaptive programming
 - 4 individual user sets



Key ACH580 improvements over ACH550

Connectivity

- Drive composer entry – PC tool available free, use with the entire family of all-compatible drives
- External 24V power supply for control board and fieldbus standard on frames R6-R9 and as option for smaller frames
- Available Bluetooth control panel
- USB for PC tool connection via assistant control panel
- Simplified embedded fieldbus settings allow fast configuration of most commonly used building automation protocols:
 - BACnet MS/TP, Johnson Controls N2, Modbus RTU
- Uses same F-series Fieldbus modules as other all-compatible drives including:
 - BACnet/IP, Profibus-DP, LonWorks, DeviceNet, Ethernet/IP, Modbus TCP



ACH580 Options

I/O options extend ACH580 standard connections



CMOD-01

- 24 VDC/AC input to keep control unit powered
- Two additional relay outputs
- One digital output



CHDI-01

- Six (6) 115VAC or 230VAC digital inputs
 - CHDI-01 option adds 6 more digital inputs
- Two relay outputs

ACH580 Options

Connectivity options

- Embedded fieldbus
 - The major building automation protocols including: BACnet MS/TP, Johnson Controls N2, Modbus RTU are embedded in the ACH580
- Fieldbus modules
 - The ACH580, along with other members of the All-Compatible series of drives, uses the F-Series Fieldbus Modules
 - BACnet/IP, LonWorks (2019 availability), Profibus, Ethernet, DeviceNet, and Modbus TCP.
 - Uses option slot 1 on the ACH580
 - Redundant Ethernet capability
 - Dual Protocol capability



ACH580 Options

Configuration options

Tools to configure, set parameters, monitor and control

Drive Composer / Drive Composer Pro –

- Drive Composer (free version) provides basic functionality for setting parameters, basic monitoring, taking local control of the drive from the PC, and event logger handling.
- Drive Composer Pro – in addition to free version, adds: control diagrams, fast monitoring, working with multiple drives on the PC tool network, macro script editing for parameters and much more

Cold configuration adapter (CCA-01) - Provides PC tool connection to an unpowered drive

- Drive composer
- Drive loader 2
 - Standard software packages
 - Customized software packages



ACH580 – ABB HVAC drives

Application(s)



Retail Facilities



Commercial & Public Buildings



Tall Buildings



Places of Assembly



Educational Facilities



Hotels, Motels and Dormitories



Health Care Facilities



Justice Facilities

ACH580 – ABB HVAC drives

Application(s)



Laboratories



Data Centers



**Museums, Galleries,
Archives, & Libraries**



**Enclosed Vehicular
Facilities**



Clean Spaces



**Drying and Storing
Selected Farm Crops**



**Environmental
Control for Animals
and Plants**



Kitchen Ventilation



ABB