

## ACH580-01/-31



### **ACH580-01, wall-mounted base drives**

The ACH580-01 wall-mounted drives are available from 1 to 100 HP at 208/240 V, 1 to 350 HP at 480 V, and 2 to 250 HP at 575 V. The ACH580-01 drives are available in UL (NEMA) Type 1 and 12 configurations. In standard installations, the drive is mounted directly onto a wall and uses the provided conduit box. Conduit openings are provided for bottom conduit entry & exit. For mounting in a customer-supplied cabinet, the conduit box may be removed. The ACH580-01 is a six-pulse drive that includes a 5% equivalent impedance for harmonic mitigation. The drive has a 100 kA SCCR rating when paired with appropriately sized upstream fuses.

### **ACH580-31, ultra low harmonic wall-mounted base drives**

The ACH580-31 wall-mounted drives are available from 5 to 150 HP at 480 V. The ACH580-31 are available in UL (NEMA) Type 1 and 12 configurations. In standard installations, the drive is mounted directly onto a wall and uses the provided conduit box. Conduit openings are provided for bottom conduit entry and exit. For mounting in a customer-supplied cabinet, the conduit plate may be removed.

The ACH580 drive sets new standards in both simplicity and reliability, and ensures smooth, energy-efficient operation of your HVAC systems in normal and mission-critical situations.

### **Features for HVAC**

The ACH580 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. Examples of drive protection features include undervoltage, overvoltage, overcurrent, and ground fault protection. The ACH580 also has a variety of motor protection features including overload and stall protections.

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 N2 as standard. Additional protocols, such as BACnet/IP and LonWorks (coming 2019), are available with optional fieldbus adapters.

# Feature overview

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## Communication

Protocols as standard (EIA-485): BACnet MS/TP, Modbus RTU, Johnson Controls N2  
Available as plug-in options: BACnet/IP, Modbus TCP, PROFIBUS-DP, DeviceNet, EtherNet/IP, LonWorks (coming 2019)

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## Application functions

Start interlock  
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  
Timer  
2 or 3 wire start/stop  
Ramp to stop  
2 independent adjustable accel/decel ramp

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## Protection functions

Overvoltage controller  
Undervoltage controller  
Motor earth-leakage monitoring  
Motor short-circuit protection  
Motor overtemperature protection  
Output and input switch supervision  
Motor overload protection (UL508C)  
Phase-loss detection (both motor and supply)  
Under load supervision (belt loss detection)  
Overload supervision  
Stall protection  
Loss of reference  
Panel loss  
Ground fault  
External events  
Overcurrent  
Current limit regulator  
Transient/Surge protection (MOV and choke)

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## Panel functions

First start assistant  
Primary settings for HVAC applications  
Hand-Off-Auto operation mode  
HVAC quick set-up  
Includes Day, Date and Time  
Operator Panel Parameter Backup (read/write)  
Full Graphic and Multilingual Display for Operator Control, Parameter Set-Up and Operating Data Display:

- Output Frequency (Hz)
- Speed (RPM)
- Motor Current
- Calculated % Motor Torque
- Calculated Motor Power (kW)
- DC Bus Voltage
- Output Voltage
- Heatsink Temperature
- Elapsed Time Meter (resettable)
- kWh (resettable)
- Input / Output Terminal Monitor
- PID Actual Value (Feedback) & Error Fault Text
- Warning Text
- Three (3) Scalable Process Variable Displays
- User-Definable Engineering Units

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## Motor control features

Scalar (V/Hz) and vector modes of motor control  
V/Hz shapes

- Linear
- Squared

Energy optimization  
IR compensation  
Slip compensation  
Three (3) Critical Frequency Lockout Bands

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## PID control

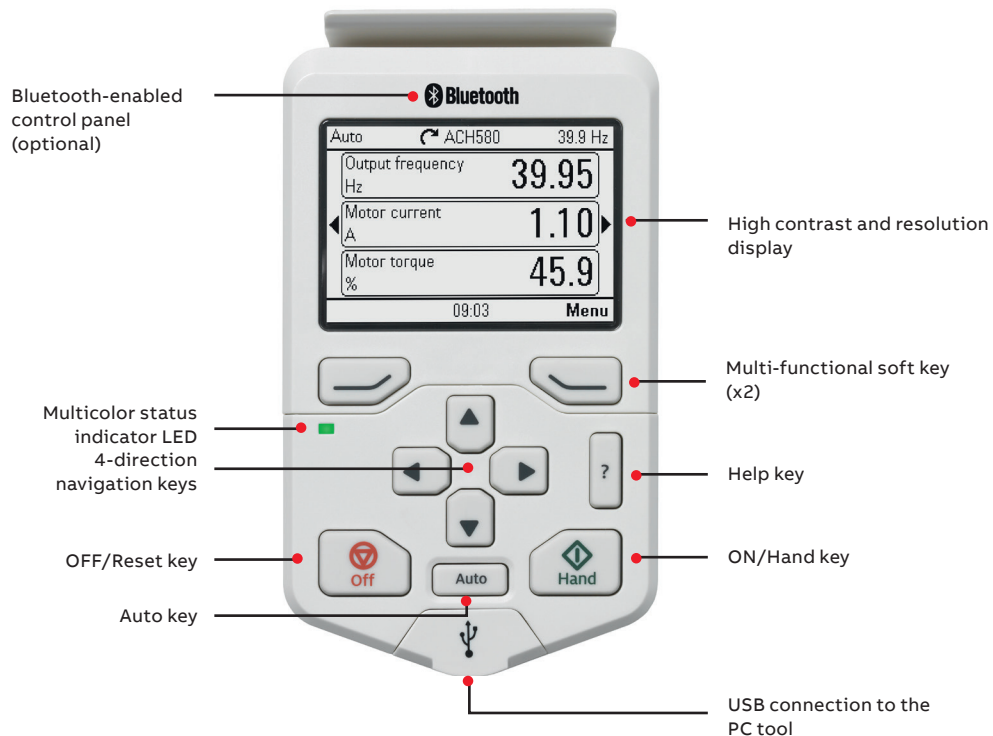
One (1) Process PID  
Four (4) Integral Independent Programmable PID Setpoint Controllers (Process and External)  
External Selection between Two (2) Sets of Process PID Controller Parameters  
PID Sleep/Wake-Up

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# Control panel features

The ACH580 Assistant Control Panel features:

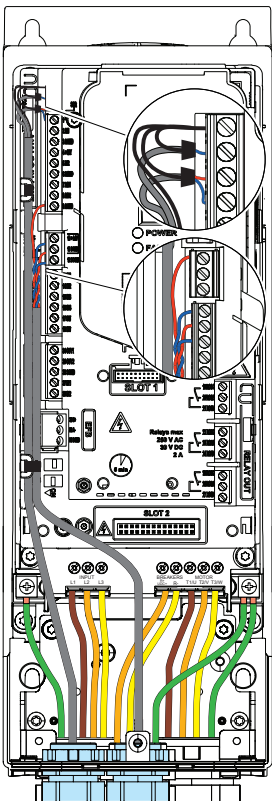
- Intuitive to operate
- Primary Setting menu to ease drive commissioning
- Real-time clock
- Diagnostic and maintenance functions
- Full-graphic display, including chart, graph, and meter options
- 21 editable home views
- USB interface for PC and tool connection as standard
- Parameters are alpha-numeric
- North American version supports 14 languages as standard
- Dedicated “Help” key
- 4 user sets
- Parameters are stored in control panel memory for later transfer to other drives or for backup of a particular system
- Back-up and restore parameters and/or motor data
- Automatic back-up 2 hours after parameter change
- Modified parameter display
- Creates unique short menu
- Shows parameters that differ from the default
- Bluetooth connectivity for use with mobile device (requires +J429 option)



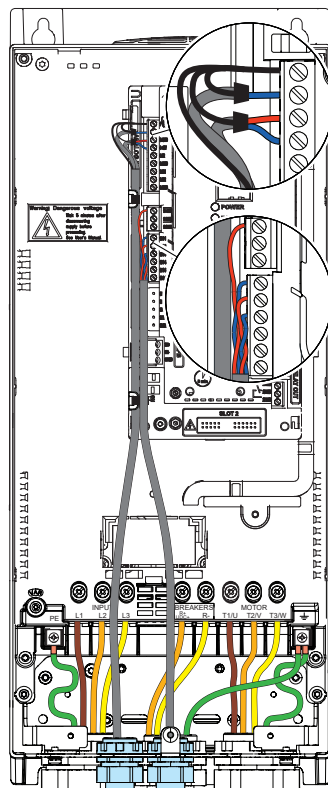
# Cable connections

The following illustrations show the ACH580-01 and ACH580-31 cable connection points for the base drive. The illustrations indicate the location of input and output power connections as well as equipment and motor grounding connection points.

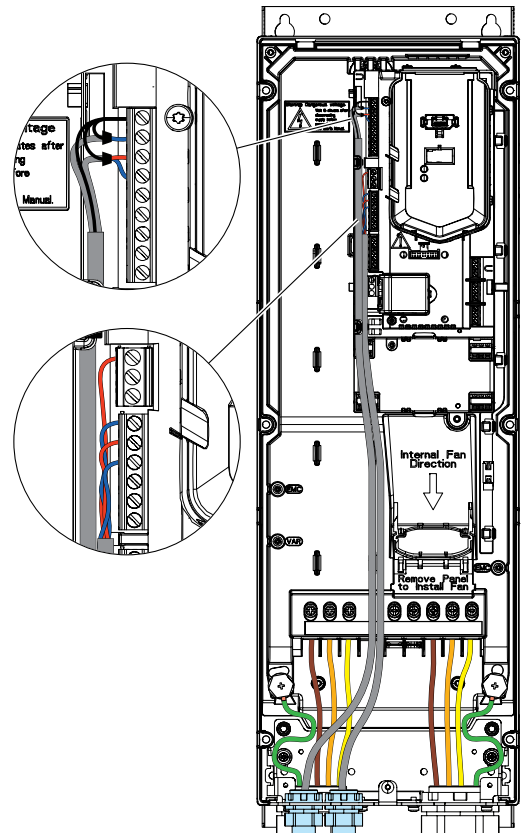
ACH580 drives are configured for wiring access from the bottom only. At least three separate metallic conduits are required, one for input power, one for output power to the motor and one for control signals.



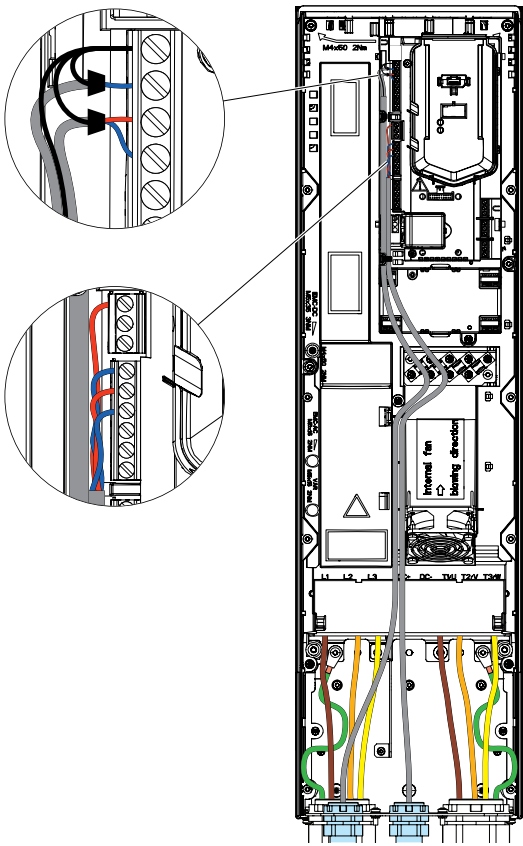
ACH580-01, R1-R2, UL (NEMA) Type 1 and 12



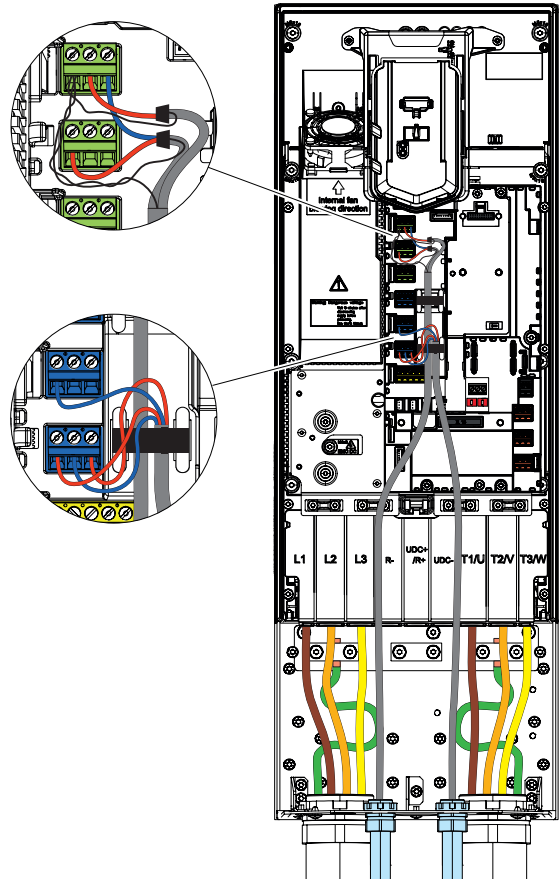
ACH580-01, R3, UL (NEMA) Type 1 and 12



ACH580-01, R4, UL (NEMA) Type 1 and 12



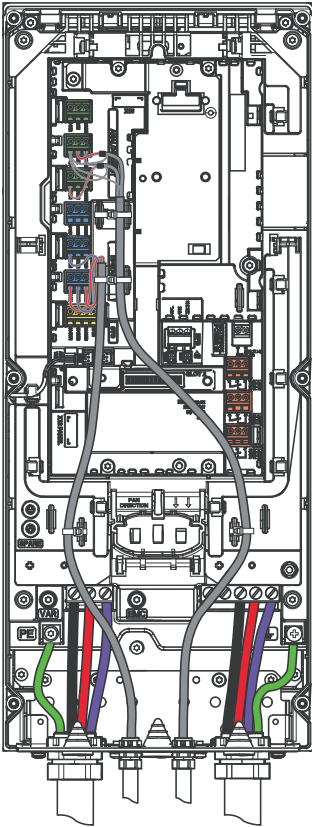
ACH580-01, R5, UL (NEMA) Type 1 and 2



ACH580-01, R6-9, UL (NEMA) Type 1 and 2



# Cable connections



ACH580-31, R3, UL (NEMA) Type 1 and 12

# Control connections

## Default I/O connections

This is the default configuration of control connections for HVAC applications.

## Default control connections for the HVAC default

		X1 Reference voltage and analog inputs and outputs					
0...10 V DC speed reference signal		1	SCR	Signal cable shield (screen)			
		2	AI1	<b>Output frequency/speed reference:</b> 0 to 10 V			
		3	AGND	Analog input circuit common			
		4	+10 V	Reference voltage 10 V DC			
		5	AI2	<b>Actual feedback:</b> 0 to 20 mA			
		6	AGND	Analog input circuit common			
		7	AO1	<b>Output frequency:</b> 0 to 10 V			
		8	AO2	<b>Output current:</b> 0 to 20 mA			
		9	AGND	Analog output circuit common			
		X2 & X3 Aux. voltage output and programmable digital inputs					
Start/Stop signal  Safety		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	<b>Stop (0)/Start (1)</b>			
		14	DI2	Not configured			
		15	DI3	<b>Constant frequency/speed selection</b>			
		16	DI4	<b>Start interlock 1 (1 = allow start)</b>			
		17	DI5	Not configured			
		18	DI6	Not configured			
		X6, X7, X8 Relay outputs					
Run status  Fault status		19	RO1C		<b>Damper control</b>	<b>Energize damper</b> 19 connected to 21 2 A	
		20	RO1A		250 V AC / 30 V DC		
		21	RO1B	2 A		<b>Running</b>	<b>Running</b> 22 connected to 24 2 A
		22	RO2C	250 V AC / 30 V DC			
		23	RO2A	2 A		<b>Fault (-1)</b>	<b>Fault condition</b> 25 connected to 26 2 A
		24	RO2B	250 V AC / 30 V DC			
		25	RO3C	2 A			
26	RO3A	250 V AC / 30 V DC					
27	RO3B	2 A					
		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			
		35	OUT2				
		36	SGND				
		37	IN1				
		38	IN2				
		X10 24 V AC/DC					
		40	24V AC/DC+ in	Ext. 24V AC/DC input to power up the control unit when the main supply is disconnected.			
		41	24V AC/DC- in				

X10 (24 V AC/DC) applicable to ACH580-01 R6-R9 and ACH580-31/34 only.