

# ABB drives for HVAC

## ACH580-01 technical data sheet

### Comprehensive climate control, effortless operation

The next evolution of climate control 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 to set it up and focus on what counts.

Introducing the ACH580 drives for HVAC.

#### Technical data

##### Supply connection

|                           |                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------|
| Voltage and power range   | 3-phase, 380 to 480 V, +10/-15%<br>(0.75 to 250 kW), auto-identification of supply voltage |
| Frequency                 | 48 to 63 Hz                                                                                |
| Fundamental power factor  | 0.98                                                                                       |
| Efficiency at rated power | 98%                                                                                        |

##### Motor connection

|                         |                                                                     |
|-------------------------|---------------------------------------------------------------------|
| Supported motor control | Scalar and vector                                                   |
| Supported motor types   | Asynchronous motor, permanent magnet motor (vector), SynRM (vector) |
| Voltage                 | 3-phase, from 0 to supply voltage                                   |
| Frequency               | 0 to 500 Hz                                                         |

##### Environmental limits

##### Ambient temperature

|                                               |                                                                                                                       |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Transportation and storage                    | -40 to 70 °C                                                                                                          |
| Air temperature/relative humidity (operation) | -15 to +50 °C; 5 to 95% no condensation allowed                                                                       |
| Output current                                | Rated current available at 0 to 1000 m reduced by 1% per 100 m over 1000 to 2000 m 2000 to 4000 m, please consult ABB |
| Degree of protection                          | IP21 (UL type 1) or IP55 (UL type 12)                                                                                 |

##### Inputs and outputs

##### 2 analog inputs

|                                                        |                                               |
|--------------------------------------------------------|-----------------------------------------------|
| Current/voltage input mode selected from control panel |                                               |
| Voltage signal                                         | 0 (2) to 10 V, $R_{in} > 200 \text{ k}\Omega$ |
| Current signal                                         | 0 (4) to 20 mA, $R_{in} = 100 \Omega$         |
| Potentiometer reference value                          | 10 V $\pm 1\%$ max. 20 mA                     |

##### 2 analog outputs

|                                                               |                                             |
|---------------------------------------------------------------|---------------------------------------------|
| AO1 software configurable for current or voltage. AO2 current |                                             |
| Voltage signal                                                | 0 to 10 V, $R_{load} > 100 \text{ k}\Omega$ |
| Current signal                                                | 0 to 20 mA, $R_{load} < 500 \Omega$         |
| Internal auxiliary voltage                                    | 24 V DC $\pm 10\%$ , 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 and outputs

|                                                                                 |                                                                                                                                                       |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum switching voltage 250 V AC/30 V DC. Maximum continuous current 2 A rms. |                                                                                                                                                       |
| PTC and PT 100                                                                  | 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 sensor |

##### External power supply

|                             |                                 |
|-----------------------------|---------------------------------|
| Optional in frames R0... R5 | 1.04 A at 24 V AC/DC $\pm 10\%$ |
| Standard in frames R6... R9 | 1.50 A at 24 V AC/DC $\pm 10\%$ |

##### Communication

|                                                                         |
|-------------------------------------------------------------------------|
| Protocols as standard (EIA-485): BACnet MS/TP, Modbus RTU and N2        |
| Available as plug-in options: BACnet/IP, LonWorks, Modbus TCP, etc.     |
| Available as an external 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)           |
| Loop controllers for motor and process |
| Motor flying start                     |
| Motor preheating                       |
| Energy optimizer and calculators       |

##### 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                    |
| Phase-loss detection (both motor and supply) |
| Under load supervision (belt loss detection) |
| Overload supervision                         |
| Stall protection                             |
| Loss of AI signal monitoring                 |

##### Product compliance

|                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low Voltage Directive 2006/95/EC                                                                                                                                   |
| EMC Directive 2004/108/EC                                                                                                                                          |
| Quality assurance system ISO 9001 and Environmental system ISO 14001                                                                                               |
| CE, UL, cUL, and EAC approvals                                                                                                                                     |
| Galvanic isolation according to PELV                                                                                                                               |
| RoHS2 (Restriction of Hazardous Substances)                                                                                                                        |
| EN 61800-5-1:2007; IEC/EN 61000-3-12; EN61800-3: 2004 + A1: 2012 Category C2 (1 <sup>st</sup> environment restricted distribution); Safe torque off (EN 61800-5-2) |

##### Standards and directives

|                                                                |
|----------------------------------------------------------------|
| Class C2 (1 <sup>st</sup> environment restricted distribution) |
|----------------------------------------------------------------|

##### EMC

##### (according to EN61800-3)

##### Harmonics

|                   |
|-------------------|
| IEC/EN 61000-3-12 |
|-------------------|

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| $U_N = 380 \text{ to } 480 \text{ V (380, 400, 415, 440, 460, 480 V)}$ |                           |            |                                |
|------------------------------------------------------------------------|---------------------------|------------|--------------------------------|
| Frame size                                                             | Types and nominal ratings |            | Type designation <sup>1)</sup> |
|                                                                        | IP21/UL type 1            |            | IP21/UL type 1                 |
|                                                                        | $P_N$<br>kW               | $I_N$<br>A |                                |
| R0                                                                     | 0.75                      | 2.6        | ACH580-01-02A6-4               |
| R0                                                                     | 1.1                       | 3.3        | ACH580-01-03A3-4               |
| R0                                                                     | 1.5                       | 4.0        | ACH580-01-04A0-4               |
| R0                                                                     | 2.2                       | 5.6        | ACH580-01-05A6-4               |
| R1                                                                     | 3.0                       | 7.2        | ACH580-01-07A2-4               |
| R1                                                                     | 4.0                       | 9.4        | ACH580-01-09A4-4               |
| R1                                                                     | 5.5                       | 12.6       | ACH580-01-12A6-4               |
| R2                                                                     | 7.5                       | 17.0       | ACH580-01-017A-4               |
| R2                                                                     | 11.0                      | 25.0       | ACH580-01-025A-4               |
| R3                                                                     | 15.0                      | 32.0       | ACH580-01-032A-4               |
| R3                                                                     | 18.5                      | 38.0       | ACH580-01-038A-4               |
| R3                                                                     | 22.0                      | 45.0       | ACH580-01-045A-4               |
| R4                                                                     | 30                        | 62         | ACH580-01-062A-4               |
| R4                                                                     | 37                        | 73         | ACH580-01-073A-4               |
| R5                                                                     | 45                        | 88         | ACH580-01-088A-4               |
| R5                                                                     | 55                        | 106        | ACH580-01-106A-4               |
| R6                                                                     | 75                        | 145        | ACH580-01-145A-4               |
| R7                                                                     | 90                        | 169        | ACH580-01-169A-4               |
| R7                                                                     | 110                       | 206        | ACH580-01-206A-4               |
| R8                                                                     | 132                       | 246        | ACH580-01-246A-4               |
| R8                                                                     | 160                       | 293        | ACH580-01-293A-4               |
| R9                                                                     | 200                       | 363        | ACH580-01-363A-4               |
| R9                                                                     | 250                       | 430        | ACH580-01-430A-4               |

| Dimensions, weights and free space requirements |                |          |          |          |         |         |              |
|-------------------------------------------------|----------------|----------|----------|----------|---------|---------|--------------|
| Frame size                                      | IP21/UL type 1 |          |          |          |         |         |              |
|                                                 | H1<br>mm       | H2<br>mm | H3<br>mm | H4<br>mm | W<br>mm | D<br>mm | Weight<br>kg |
| R0                                              | –              | –        | 303      | 330      | 125     | 210     | 4.5          |
| R1                                              | –              | –        | 303      | 330      | 125     | 223     | 4.6          |
| R2                                              | –              | –        | 394      | 430      | 125     | 227     | 7.5          |
| R3                                              | –              | –        | 454      | 490      | 203     | 228     | 14.9         |
| R4                                              | –              | –        | 600      | 636      | 203     | 257     | 19           |
| R5                                              | 596            | 596      | 732      | 633      | 203     | 295     | 34           |
| R6                                              | 548            | 549      | 726      | 589      | 252     | 369     | 45           |
| R7                                              | 600            | 601      | 880      | 641      | 284     | 370     | 55           |
| R8                                              | 680            | 677      | 965      | 721      | 300     | 393     | 70           |
| R9                                              | 680            | 680      | 955      | 741      | 380     | 418     | 98           |

| Frame size | IP55/UL type 12 |            |           |           |                |
|------------|-----------------|------------|-----------|-----------|----------------|
|            | H3<br>(mm)      | H4<br>(mm) | W<br>(mm) | D<br>(mm) | Weight<br>(kg) |
| R0         | 303             | 330        | 125       | 222       | 5.1            |
| R1         | 303             | 330        | 125       | 233       | 5.5            |
| R2         | 394             | 430        | 125       | 239       | 7.8            |
| R3         | 454             | 490        | 203       | 237       | 15.1           |
| R4         | 600             | 636        | 203       | 265       | 20             |
| R5         | 732             | 632.5      | 203       | 320       | 34             |
| R6         | 726             | 589.4      | 252       | 380       | 46             |
| R7         | 880             | 641.4      | 284       | 381       | 56             |
| R8         | 965             | 721.1      | 300       | 452       | 74             |
| R9         | 955             | 741.4      | 380       | 477       | 102            |

NOTE: HVAC control panel and EMC filter are included as standard.

#### Nominal ratings

|       |                                                                |
|-------|----------------------------------------------------------------|
| $I_N$ | Nominal output current                                         |
| $P_N$ | Typical motor continuous power at an ambient temperature 50 °C |

1) For the IP55 (UL Type 12) unit, add +B056 at the end of the type code.

H1 = Height with cable connection box  
W = Width  
D = Depth



For more information please contact:  
<http://new.abb.com/drives/segments/hvac>

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