**Product Overview**

ACQ580

The ACQ580 is the latest addition to the ABB drives portfolio. This robust, compact and energy efficient drive is designed for securing the flow of water and wastewater in your pumping system.

**Secure the flow**

The ACQ580 variable frequency drive (VFD) delivers innovative pumping features for the water

and wastewater industry. Primary Setting menu and assistants simplifies commissioning, setup and daily control. Embedded water and wastewater application features create an intuitive environment for users and dedicated pumping features enhance the performance of the pumping system.

**Speak the language**

Leveraging clear, water industry terminology, the control panel enables operators to efficiently interface with the drives in terms they use every day. The optional Bluetooth control panel allows for wireless commissioning and monitoring.

**Feel the Power**

ACQ580 drives are designed for customers who value reliability, high quality, and robustness. With embedded pump functionality, the ACQ580 keeps the pump system operating optimally and efficiently. Product features, such as coated boards and optional compact UL Type 12 enclosures, make the ACQ580 suitable for harsh conditions.

All ACQ580 drives are current rated devices. The HP ratings provided are for reference only and are based on typical 4-pole motors at nominal voltages (NEC Table 430.250). If full motor torque is required, ensure the drive has a continuous current rating equal to, or greater than the full load amp rating of the motor.

The ACQ580 is available in both normal and heavy-duty ratings. Normal duty ratings provide a 110% short term overload rating for one minute every ten minutes. Heavy duty ratings provide a 150% short term overload rating for one minute every ten minutes. All ACQ580 drives and their protective functions are thoroughly tested for optimal performance.



 **Control panel features**

The ACQ580 Assistant Control Panel features:

* An intuitive interface
* Primary Settings menu to simplify drive commissioning
* A real Time Clock
* Diagnostic and Maintenance functions
* A full graphic display, including chart, graph, meter options
* 21 editable home views
* A USB interface for PC and tool connection
* Alpha-numeric parameters
* A choice of 14 languages
* A dedicated Help key
* Four user sets
* The ability to store parameters in control panel memory for later transfer to other drives or for backup of a particular system.
* A back-up and restore feature
	+ Parameters and/or motor data
	+ Automatic back-up two hours after parameter change
* A modified parameter display
	+ Creates unique short menu
	+ Shows parameters that differ from default



**Feature overview**

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| **Water Application Functions** |
| Intelligent multi-pump control Quick rampsSleep boost Auto change Level control Soft pipe fillSensorless flow calculations Pump cleaningPump priorityTwo independent adjustable accel/decel ramp Two or three wire start/stop control Motor preheatingPID controllers for motor and process Motor flying start Process PID controlCoast to stop Ramp to stopReal-time clock (scheduling) Run permissivesStart interlock delayed start PID controller parameters PID sleep / wake-upSet point controllers (process and external) Dry pump protectionDry run protectionPressure protection Inlet pressure protection Maximum pressure protection Minimum pressure protection Flow protectionStart-up assistantsPrimary settings for ease of use Sophisticated process controlEnergy optimizer and calculator Diagnostic assistantBuilt-in and stand-alone process controlPID loop Load profileAdaptive programming |
| **Motor control features** |
| Scaler (V/HZ) and vector control Motor ID runU/F ratio* Linear
* Squared

Energy optimization IR compensation Slip compensationCritical frequency lockout bands Flux braking |
| **Communication Protocols** |
| Standard Modbus RTU (EIA-485)Available optional protocols:* Ethernet I/P
* DeviceNet
* Modbus TCP
* Profibus-DP
* PROFINET
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| **Control panel functions / features** |
| First start assistantPrimary settings for W/WW applicationsHand-Off-Auto operationFull-graphic and multi-lingual display Parameters are alpha-numeric21 editable home views Four user sets Dedicated Help keyBackup/restore (read/write) of parameters and  motor data Automatic back-up two hours after parameter change Parameters stored in control panel memoryStandard USB interface for PC and tool connection Operating data display:* Output frequency (Hz)
* Speed (RPM)
* Motor current (A)
* Calculated % motor torque
* Calculated motor power (kW)
* DC bus voltage (V)
* Output voltage (V)
* Heatsink temperature
* Elapsed time meter (resettable)
* kWh (resettable)
* Input / Output terminal monitor
* PID actual value (feedback)
* Error fault text
* Warning text
* Three scalable process variable displays
* Real-time clock
* User-definable engineering units

Modified parameter display* Creates unique short menu
* Shows parameters that differ from default

Diagnostic and maintenance functions Supports 14 languages |
| **Protective Functions** |
| AI Supervision Overvoltage UndervoltageDrive temperatureEarth (ground) fault detectionEmergency stopLocal control loss detection Motor phase loss detection Overcurrent protection Overspeed protectionSafe Torque Off detection Short circuitStall protectionSupply phase loss detection Swapped supply and motor cablingMotor overtemperature protection (UL508C) Input and Output switch supervision Underload supervisionOverload supervision Loss of reference Panel lossExternal events Current limit regulatorTransient/ surge protections (MOV and Choke) |

**Control terminals**

**Default I/O connections**

This is the default configuration of control connections for water and wastewater applications.

**Default control connections for water applications**



**Technical specifications**

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| **Supply connection** |  |
| Voltage and power rangeInput voltage (U1) ACQ580-01-xxxA-2 ACQ580-01-xxxA-4 ACQ580-01-xxxA-6 | 208-240 V440-480 V525-600 V |
| Input voltage tolerance | 10% / -15% |
| Line Limitations | Max ±3% of nominal phase to phase input voltage  |
| Power Factor (cos Φ) at nominal load |
|  ACQ580-01 | 0.98 |
| Efficiency at rated power |  |
|  ACQ580-01 | 98% |
| Power Loss | Approximately 2-3% of rated power |
| **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 |
| Short Term Overload Capacity Variable Torque | 110% for 1 min/10min |
| Peak Overload Capacity Variable Torque | 1.35 for 2 second (2 sec / 1 minute) |
| Switching Frequency | 2, 4, 8 or 12 kHz (Up to 150 Hp); 1 or 4 kHz (Over 150 Hp), Automatic fold back in case of overload |
| Acceleration/Deceleration Time | 0 to 1800 s |
| Short Circuit Current Rating  | 100 kA (UL) with fusing |
| **External power supply** |  |
| ACQ580-01, R6-R9: Standard | 1.50 A at 24 V AC/DC ±10% / 36W |
| ACQ580-01, R1-R5: Optional card | 1.04 A at 24 V AC/DC ±10% / 25W |
| **Safety** |  |
| Safe Torque Off (STO) |  |
| STO Standard Input | 17...30 VDC, 55mA |
| **Degree of Protection** |  |
| Degree of protection (IEC/EN 60529)  |
|  ACQ580-01 | IP21, IP55 |
| Enclosure types (UL 508C/61800-5-1) |
|  ACQ580-01 | UL (NEMA) Type 1 & 12 |

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| **Inputs and outputs** |  |
| 2 analog inputs | Selection of Current/Voltage input mode is user programmable. |
| Voltage reference | 0 (2) to 10 V, Rin > 200 kΩ |
| Current reference | 0 (4) to 20 mA, Rin = 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 reference | 0 to 10 V, Rload: > 100 kΩ |
| Current reference | 0 to 20 mA, Rload: < 500 Ω |
| Applicable potentiometer | 1 kΩ to 10 kΩ |
| Internal auxiliary voltage | 24 V DC ±10%, max. 250 mA |
| Accuracy | +/- 1% full scale range at 25°C (77°F) |
| Output updating time | 2 ms |
| 6 digital inputs | 12 to 24 V DC, 10 to 24 V AC, Connectivity of PTC sensors supported by a single digital input.PNP or NPN connection (5 DIs with NPN connection).Programmable |
| Input Updating Time  | 2 ms |
| 3 relay outputs | Maximum switching voltage 250 V AC/30 V DC.Maximum continuous current 2 A rms.Programmable, Form C |
| Contact material | Silver Tin Oxide (AgSnO2) |
| PTC, PT100 and PT1000 | Any of the analog inputs, or digital input 6, are configurable for PTC with up to 6 sensors. |
| Adjustable filters on analog inputs and outputs |
| All control inputs isolated from ground and power |
| **Operation** |  |
| Air Temperature  | -15 to +40 oC (5 to 104 oF) 50oC (122oF) available with derate0 to -15 oC (32 to 5 oF)No Frost AllowedOutput derated above +40oC (104oF) |
| Installation site Altitude  |  0 to 1000 m (3281 ft) above sea levelOutput derated above 1000m (3281 ft) up to 4000m (13123ft) |
| Relative Humidity  | 5 to 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses |
| Atmospheric pressure | 70 to 106 kPa (10.2 to 15.4 PSI) 0.7 to 1.05 atmospheres |
| Vibration | Risk category IV Certified (IBC 2018) |

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| **Environmental protections** |  |
| Chemical Gasses | Class 3C2 (UL Type 1 , IP21) Class 3C2 (UL Type 12 , IP55) Note: Conformal coated PCBs |
| Solid Particles  | Class 3S2No conductive dust allowed  |
| Pollution degree (IEC/EN 61800-5-1) | Pollution degree 2 |
| **Product Compliance**  |  |
| Standards and directivesLow Voltage Directive 2006/95/ECEMC Directive 2004/108/EC60721-3-3: 200260721-3-1:1997Quality assurance system ISO 9001 andEnvironmental system ISO 14001CE, UL, cUL, CSA and EAC approvalsGalvanic isolation according to PELVRoHS2 (Restriction of Hazardous Substances)EN 61800-5-1: 2007; IEC/EN 61000-3-12;EN 61800-3: 2017 + A1: 2012 Category C2(1st environment restricted distribution);Safe torque off (EN 61800-5-2) Seismic (IBC, OSHPD) - Coming 2019 |
| EMC (according to EN61800-3)  | Class C2 (1st environment, restricted distribution) |
| **Available Options** |  |
| External 24V AC/DC and digital I/O extension (2xRO and 1xDO) (CMOD-01) |
| Additional 115/230 V Digital input (6xDI and 2xRO) (CHDI-01) |
| Fieldbus Adapter Modules  | EtherNet/IP, Modbus TCP, PROFIBUS-DP, PROFINET, DeviceNet |
| Operation, Programming and Diagnostic Tool | Drive Composer Pro / Entry |
| Cold configuration tool (CCA-01) |  |
| Keypad Standard Optional | Hand/Off/Auto Bluetooth |

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| **Storage (in Protective Shipping Package)** |
| Air Temperature | -40 to +70°C (-40 to +158°F) |
| Relative Humidity | Less than 95%No condensation allowedMaximum relative humidity is 60% in the presence of corrosive gasses |
| Chemical Gasses | Class 1C2 |
| Solid Particles | Class 1S2Contact ABB regarding Class 1S3 |
| Atmospheric pressure | 70 to 106 kPa0.7 to 1.05 atmospheres |
| Vibration (ISTA)R1...R4R5...R9 | In accordance with ISTA 1AIn accordance with ISTA 3E |
| **Transportation (in Protective Shipping Package)** |
| Air Temperature | -40 to 70 °C (-40 to 158 °F) |
| Relative Humidity | Less than 95%No condensation allowedMaximum relative humidity is 60% in the presence of corrosive gasses |
| Atmospheric Pressure | 60 to 106 kPa (8.7 to 15.4 PSI)0.6 to 1.05 atmospheres |
| Free Fall | R1: 76 cm (30 in) R2: 61 cm (24 in) R3: 46 cm (18 in) R4: 31 cm (12 in) R5: 25 cm (10 in) |
| Chemical Gasses | Class 2C2 |
| Solid Particles | Class 2S2 |
| Shock/ Drop (ISTA)R1….R4R5….R9 | In accordance with ISTA 1AIn accordance with ISTA 3E |
| Vibration (ISTA)R1….R4R5….R9 |  |