

# ACQ550 Product Overview

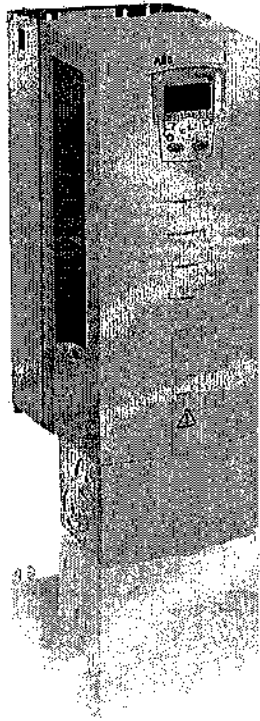
## **Description**

The ACQ550 is an adjustable frequency AC drive designed specifically for the water market that achieves the ultimate in flexible motor control performance. Offering two modes of motor control: Scalar (V/Hz) and Sensorless Vector, the ACQ550 performs accurate speed control of any standard induction motor.

With drives ranging from 0.75 to 550Hp (0.75 to 355kW), the ACQ550 AC Drive features a multi-lingual, full graphical control panel that also provides start-up, maintenance and diagnostic assistants. The assistants simplify drive set-up, operation, and fault diagnostics. The control panel can be mounted on the cover of the drive, or remotely, and has capabilities to upload and download drive configuration parameters.

All ACQ550 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 or greater than the full load amp rating of the motor (if full motor torque is required). Motor power in kW ratings are provided where applicable and are based upon IEC 4-pole motor ratings.

The ACQ550 comes equipped with an extensive library of preprogrammed application macros that, at the touch of a button, allow rapid configuration of inputs, outputs, and parameters for specific water applications to maximize convenience and minimize start-up time. The ACQ550 can be used for the simplest to the most demanding pumping applications. Two integral option slots can be configured with additional relay outputs as well as a host of different communication bus adapters.



## ACQ550 Standard Features

UL, cUL labeled CSA and CE Marked (208-480V)  
EMI/RFI Filter (1<sup>st</sup> Environment, Restricted Distribution)  
Coated Circuit Boards  
Integral Brake Chopper (R1 & R2 Frames)  
Input Impedance  
5% Equivalent Impedance with Internal Reactor(s)  
Patented Swinging Choke Design for Superior Harmonic Mitigation  
Built In DC Choke (R1 - R4) Frames  
Built in AC Reactor (R5-R6 Frames)  
3% Equivalent Impedance (R8) Frame  
Pump Specific Application Macros  
Programmable Maximum Frequency to 500 Hz  
Assistants  
Start-Up Assistants  
Pump Specific Assistants  
Motor ID Run  
Maintenance Assistants  
Diagnostic Assistants  
Serial Communications Assistant  
Drive Performance Optimization Assistant  
Operator Panel  
Parameter Backup (read/write)  
Full Graphic and Multilingual Display,  
Operator Control,  
Real Time Clock  
Includes Day, Date and Time  
Parameter Set-Up and Operating  
Data Display:  
Output Frequency (Hz) / Motor Speed (RPM)  
Motor Current  
Calculated Energy Savings (\$, kWh/MWh, CO<sup>2</sup>)  
Calculated % Motor Torque  
Calculated Motor Power (kW)  
DC Bus Voltage  
Output Voltage  
Heatsink Temperature  
Elapsed Time Meter (reset-able)  
KWh (reset-able)  
Input / Output Terminal Monitor  
PID Actual Value (Feedback) & Error  
Fault Text  
Warning Text  
Three (3) Scalable Process Variable Displays  
User Definable Engineering Units  
Motor Control  
Scalar Control and Sensor-less Vector  
Two (2) programmable Analog Inputs  
Six (6) programmable Digital Inputs  
Two (2) programmable Analog Outputs  
Three (3) Programmable Form C Relay Outputs  
Adjustable filters on Analog Inputs and outputs  
Mathematical Functions on Analog Reference Signals  
All Control Inputs Isolated from Ground and Power  
Two (2) Resident Serial Communication Protocols  
BACnet (MS/TP)  
Modbus RTU  
Input Speed Signals  
Current 4 to 20 mA  
Voltage 0 to 10 VDC  
Increase/Decrease Reference Contacts (Floating Point)  
Serial Communications  
Start/Stop  
2 Wire (Dry Contact Closure)  
3 Wire (Momentary Contact)  
Application of Input Power  
Application of Reference Signal (PID Sleep/Wake-Up)  
Serial Communications  
Start Functions  
Automatic Start Mode  
Dc-magnetization  
Flying Start  
Torque Boost  
Torque Boost with Flying Start

Seven (7) Preset Speeds  
Nine (9) Supervision Functions  
Jog function  
Adjustable Current Limit  
Adjustable Torque Limit  
DC Injection Braking (in Scalar ONLY)  
Flux Braking  
DC Hold  
Electronic Reverse  
Automatic Extended Power Loss Ride Through (Selectable)  
Self-Tuning Speed Controller  
PID Control  
Two (2) Integral Independent Programmable PID  
Set point Controllers (Process and External)  
External Selection between Two (2) Sets of  
Process PID Controller Parameters  
PID Sleep/Wake-Up  
Timer Functions  
Four (4) Daily Start/Stop Time Periods  
Four (4) Weekly Start/Stop Time Periods  
Four Timers for Collecting Time Periods and Overrides  
Maintenance Calculator  
Motor Control Features  
Scalar (V/Hz) and Vector Modes of Motor Control  
V/Hz Shapes  
Linear  
Squared  
Energy Optimization  
Flux Optimization  
IR Compensation  
Slip Compensation  
Three (3) Critical Frequency Lockout Bands  
Preprogrammed Protection Circuits  
Overcurrent  
Short Circuit  
Over voltage  
Under voltage  
Input Phase Loss and Output Mis-wiring  
Output Device (IGBT) over temperature  
Internal fault  
Over speed  
Programmable Fault Functions for Protection Include  
Loss of Analog Input  
Panel Loss  
External Fault  
Motor Thermal Protection  
Stall  
Under load (User Defined)  
Motor Phase Loss  
Ground Fault  
Communications Fault  
Supervision of optional IO  
Ramp to Stop  
Coast to Stop  
Emergency Stop  
DC Braking / Hold at Stop  
Flux Braking  
Accel/Decel  
Two (2) sets of Independently Ramps  
Linear or Adjustable 'S' Curve Accel/Decel Ramps

### Additional Options Available

I/O Options  
3 Relay Extension Module OREL-01  
115/230V Digital Interface Module OHDI-01  
Fieldbus Adapter Modules (Communication Modules)  
DeviceNet RDNA-01  
Profibus-DP RPBA-01  
ControlNet RCNA-01  
CANopen RCAN-01  
Ethernet/IP and Modbus/TCP RETA-01  
Profinet IO and Modbus/TCP RETA-02  
DriveWindow Light®  
Start-up, Operations, Programming and Diagnostic Tool.  
Flange Mounting Kits (R1 - R6 Frames)  
Fan Replacement Kits  
NEMA 12 or 4X Remote Panel Mounting Kit

## ACQ550 Specifications

### Input Connection

Input Voltage (U1, V1, W1) .....	208/220/230/240Vac 3-phase +10% / -15%
.....	208/220/230/240 VAC 1-phase +/-10%
.....	380/400/415/440/460/480Vac 3-phase +10% / -15%
.....	500/525/550/575/600Vac 3-phase +10 / -15%
Input Frequency .....	48 to 63 Hz, maximum rate of change 17%/second
Line Imbalance.....	Max +/-3% of nominal phase to phase input voltage
Fundamental Power Factor.....	0.98 (at nominal load)
Connection: .....	U <sub>1</sub> , V <sub>1</sub> , W <sub>1</sub> (U <sub>1</sub> , V <sub>1</sub> , 1-phase)

### Output Connection

Output Voltage .....	0 to U <sub>1</sub> , 3-phase symmetrical, UN at the field weakening point
Output Frequency .....	-500 to 500 Hz
Frequency Resolution .....	0.01 Hz
Continuous Output Current:	
Normal Duty: .....	1.0 * I <sub>2N</sub> (Nominal rated output current, Variable Torque)
Heavy Duty .....	1.0* I <sub>2hd</sub> (heavy-duty use)
Short Term Overload Capacity:	
Normal Duty: I <sub>Nmax</sub> .....	1.1 * I <sub>2N</sub> , (1 min/10 min)
Heavy Duty: I <sub>Nhdmax</sub> .....	1.5 * I <sub>2hd</sub> (1 min/10 min)
Peak Overload Capacity: .....	1.80% of I <sub>2hd</sub> for 2 seconds each minute
Base Motor Frequency Range: .....	10 to 500 Hz
Switching Frequency: .....	1, 4, 8 or 12 kHz
Acceleration Time: .....	0.1 to 1800 s
Deceleration Time: .....	0.1 to 1800 s
Efficiency: .....	0.98 at nominal power level
Short Circuit Withstand Rating: .....	100,000 AIC (UL) w/o fuses
Connection: .....	U <sub>2</sub> , V <sub>2</sub> , W <sub>2</sub>
Field Weakening Point.....	10 to 500 Hz
Switching Frequency.....	1, 4, 8 or 12kHz (Frame dependent)
Acceleration & Deceleration Time.....	0.0 to 1800 s
Efficiency.....	98% at nominal power level
Short circuit withstand rating.....	100,000 AIC
Connection.....	Terminals U <sub>2</sub> , V <sub>2</sub> , W <sub>2</sub>

### Ambient Conditions, Operation

Air Temperature .....	-15° to 40°C (5° to 104°F), no frost allowed, above 40°C the maximum output current is de-rated 1% for every additional 1°C (up to 50°C (122°F) maximum limit)
Relative Humidity .....	5 to 95%, no condensation allowed, maximum relative humidity is 60% in the presence of corrosive gasses
Contamination Levels	
IEC .....	60721-3-1, 60721-3-2 and 60721-3-3
Chemical Gasses.....	3C1 and 3C2
Solid Particles .....	3S2
Installation Site Altitude.....	0 to 1000 m (3300 ft) above sea level. At sites over 1000 m (3300 ft) above sea level, the maximum power is de-rated 1% for every additional 100 m (330 ft). If the installation site is higher than 2000 m (6600 ft) above sea level, please contact your local ABB distributor or representative for further information

### Ambient Conditions, Storage (in Protective Shipping Package)

Air Temperature:.....	-40° to 70°C (-40° to 158°F)
Relative Humidity: .....	Less than 95%, no condensation allowed
Vibration: .....	In accordance with ISTA 1A and 1B specifications
Shock (IEC 60086-2-29): .....	Max 100 m/s <sup>2</sup> (330 ft/s <sup>2</sup> ) 11 ms

### Ambient Conditions, Transportation (In Protective Shipping Package)

Air Temperature:.....	-40° to 70°C (-40° to 158°F)
Relative Humidity: .....	Less than 95%, no condensation allowed
Atmospheric Pressure:.....	60 to 106 kPa (8.7 to 15.4 PSI)
Vibration:.....	Max 3.5 mm (0.14 in) 2 to 9 Hz, Max 15 m/s <sup>2</sup> (49 ft/s <sup>2</sup> ) 9 to 200 Hz sinusoidal
Shock (IEC 60086-2-29): .....	Max 100 m/s <sup>2</sup> (330 ft/s <sup>2</sup> ) 11 ms (36 ft/s <sup>2</sup> )
Free Fall:.....	R1: 76 cm (30 in)
	R2: 61 cm (24 in)
	R3: 46 cm (18 in)
	R4: 31 cm (12 in)
	R5 & 6: 25 cm (10 in)

## Cooling Information

Cooling Method.....	Internal Fan
Power Loss .....	Approximately 3% of rated power

## ACQ550 Specifications (continued)

### Analog Inputs

Quantity.....	Two (2) programmable
Voltage Reference:.....	0 (2) to 10 V, 312kOhm, single ended
Current Reference:.....	0 (4) to 20 mA, 100Ohm, single ended
Potentiometer:.....	10 VDC, 10 mA (1K to 10KOhms)
Input Updating Time.....	8 ms
Terminal Block Size.....	2.3mm <sup>2</sup> / 14AWG

### Reference Power Supply

Reference Voltage.....	+10 VDC, 1% at 25°C (77°F)
Maximum Load .....	10 mA
Applicable Potentiometer.....	1 kOhm to 10 kOhm
Terminal Block Size.....	2.3mm <sup>2</sup> / 14AWG

### Analog Outputs

Quantity.....	Two (2) programmable current outputs
Signal Level .....	0 (4) to 20 mA
Accuracy .....	+/- 1% full scale range at 25°C (77°F)
Maximum Load Impedance.....	500 Ohms
Output Updating Time.....	2 ms
Terminal Block Size.....	2.3mm <sup>2</sup> / 14AWG

### Digital Inputs

Quantity.....	Six (6) programmable digital inputs
Isolation.....	Isolated as one group
Signal Level .....	24 VDC, (10V Logic 0)
Input Current.....	15 mA at 24 VDC
Input Updating Time:.....	4 ms
Terminal Block Size.....	2.3mm <sup>2</sup> / 14AWG

### Internal Power Supply

Primary Use .....	Internal supply for digital inputs
Voltage:.....	+24 VDC, max 250 mA
Maximum Current:.....	250 mA
Protection:.....	Short circuit protected

### Relay Outputs

Three (3) Programmable Relay Outputs	
Maximum switching voltage.....	250 VAC / 30 VDC
Maximum switching current .....	8 A at 30VDC, 1500 VA at 230VAC, or 0.4A at 120VDC
Maximum Continuous Current .....	IC = 2 Amps RMS
Contact Material.....	Silver Tin Oxide with Gold
Isolation Test Voltage .....	4 kVAC, 1 minute
Output Updating Time.....	100 ms

### Protections

Single Phase.....	Protected (input & output)
Overcurrent Trip Limit:.....	3.5 x I <sub>2N</sub> instantaneous
Adjustable Current Regulation Limit:.....	1.1 x I <sub>2N</sub> (RMS) max.
Overvoltage Trip Limit:.....	1.3 * V <sub>1max</sub> 1.30 x U <sub>N</sub>
Undervoltage Trip Limit:.....	0.85 * V <sub>1min</sub>
Overtemperature (Heatsink) .....	115°C (239°F) R1 - R4 and R7 & R8, 125°C (257°F) R5 & R6
Auxiliary Voltage:.....	Short Circuit Protected
Ground Fault:.....	Protected
Short Circuit:.....	Protected
Microprocessor fault:.....	Protected
Motor Stall Protection:.....	Protected
Motor Overtemperature Protection (I <sub>2t</sub> ):.....	Protected
Input Power Loss of Phase:.....	Protected
Loss of Reference:.....	Protected
Short Circuit Current Rating:.....	100,000 RMS symmetrical Amperes
Input Line Impedance:.....	5% equivalent swing DC choke (R1-R4) 3% AC line Reactor (R5-R8)

U<sub>1</sub> = Input Voltage

U<sub>N</sub> = Nominal Motor Voltage

U<sub>2</sub> = Output Voltage  
P<sub>N</sub> = Power – Normal Duty (HP)

f<sub>N</sub> = Nominal Motor Frequency  
I<sub>2N</sub> = Nominal Motor Current – Normal Duty

Specifications are subject to change without notice. Please consult the factory when specifications are critical.

### Motor / Drive Capabilities

$$2 \leq \frac{I_m}{I_{2hd}} \leq 2$$

$$0.2 \leq \frac{P_m}{P_{Nhd}} \leq 0.2$$

### ACQ550 products carry third party certification as follows

Product	Certification
ACQ550-U1 240V & 480V	UL, cUL, CSA, CE, C-Tick
ACQ550-U1 600 V	UL, cUL, CSA, C-Tick
ACQ550-CC	UL and cUL
ACQ550-PC and PD	UL and cUL

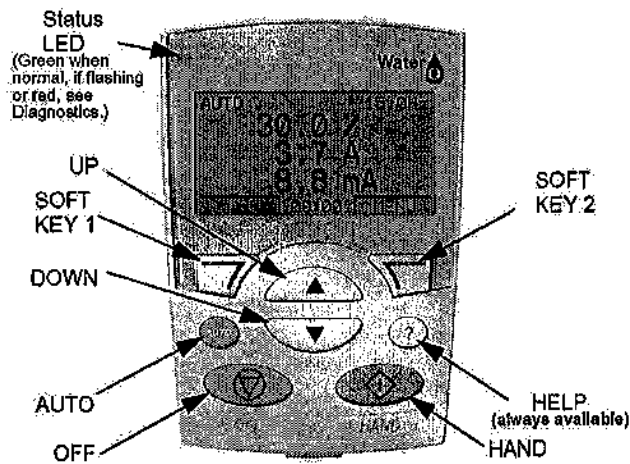
The following graphic summarizes the button functions and displays on the Assistant Control Panel.

## ACQ550 Control Panel

The ACQ550 Control Panel is a multifunction control panel with full graphic LCD display and multiple language capability. The control panel can be connected to and detached from the ACQ550 at any time. The panel can be used to upload and copy parameters to other ACQ550 drives.

The ACQ550 Assistant Control Panel features:

- Intuitive to operate
- Start-up Assistant to ease drive commissioning
- Real Time Clock
- Diagnostic and Maintenance functions
- Full Graphic Display – **BIG BOLD letters**
- Displays 3 Operating parameters
- Parameters are Alpha-numeric
- Supports 19 languages as standard
  - English, English (Am), German, Italian, Spanish, Portuguese, Dutch, French, Danish, Finnish, Swedish, Russian, Polish, Turkish, Czech, Hungarian, Korean, Chinese, Japanese
- Dedicated Help key
- Key functions change (soft keys)
- Back-up and Restore
  - Parameters and/or motor data
- Changed Parameter Display
  - Creates unique short menu
  - Shows parameters that differ from default
- Copy function
  - Parameters can be copied to the control panel memory for later transfer to other drives or for backup of a particular system



Run Indication and Shaft Direction ↻ located in upper left corner of display.

Control Panel Display	Significance
Rotating arrow (clockwise or counterclockwise)	Drive is running and at set point Shaft direction is forward or reverse
Rotating arrow blinking	Drive is operating but not at set point
Stationary arrow	Drive is stopped

#### LED Indicators

The green LED indicates that the power is on and the drive is operating normally. The red LED indicates a fault. A blinking green LED indicates an alarm condition. A blinking red LED indicates a fault that requires power to be cycled off and on to reset the drive.

#### Fault Indications

The ACQ550 Control Panel can display over 20 alarm and fault messages. The last fault and previous faults (1 to 9) are retained in memory. The last fault and previous faults (1 & 2) also record important diagnostic information to assist in troubleshooting. Most faults can be reset by pressing the RESET key (Soft Key 1).

#### Parameters

Application specific parameters are immediately accessible through a selection of start-up "Assistants". A complete list of parameters is also available grouped by function in approximately 33 menu groups. One of the basic menu functions can be used to display the complete list of changed parameters.

#### Real Time Clock

The Operator Control Panel includes a real time clock which provides Day, Date and Time information, displayed in a choice of formats. The real time clock has a 10 year battery backup and provides time and date stamping of drive faults and other events. The clock is also used by the ACQ550's internal timer functions, providing an integral time clock for start/stop control as well as other control operations.

## Control Modes

When the HAND key is pressed, the drive starts and pressing the UP/DOWN keys can modify the reference frequency. The HAND (keypad) control mode is indicated.

When the OFF key is pressed, the drive stops and the OFF control mode is indicated.

When the AUTO key is pressed, the AUTO control mode is indicated. The drive can be started and stopped using whichever remote start/stop command has been configured, a contact closure applied to the start/stop input, a serial communication command or a process feedback signal. In AUTO mode the drive speed is typically controlled by the external speed reference input or by the PID controller.

If the HAND key is pressed while the drive is running in the AUTO control mode, the drive continues to run without changing speed, but ceases to respond to external input or PID speed reference changes. (Bumpless transfer) Pressing the UP/DOWN keys can modify the reference frequency.

If the AUTO key is pressed while the drive is running in the HAND control mode and an external start command is present, the drive continues to run and follows the acceleration or deceleration control ramp to the speed set by the external input or PID speed reference.

## Cable Connections

Terminal	Description	Note
U1, V1, W1	3~ power supply input	Use of 1~ supply requires 50% derate of output current and is applicable for 208 to 240 VAC operation only.
PE / GND	Protective Ground	Follow local rules for cable size.
U2, V2, W2	Power output to motor	
Uc+, Uc-	DC bus	
X1 1 to 18	Control Wiring	Low voltage control – Use shielded cable
X1 19 to 27	Control Wiring	Low voltage or 115VAC
X1 28 to 32	Serial Communications	Use shielded cable

Follow local codes for cable size. To avoid electromagnetic interference, use separate metallic conduits for Input power wiring, motor wiring, control and communications wiring. Keep these four classes of wiring separated in situations where the wiring is not enclosed in metallic conduit. Also, keep 115VAC control wiring separated from low voltage control wiring and power wiring.

Use shielded cable for control wiring.

Ampacity is based on the use of 60 °C rated power cable up to 100 Amps (75°C greater than 100 Amps).

Refer to the Included tables for current ratings, fuse recommendations and maximum wire size capacities and tightening torques for the terminals. The ACQ550 is suitable for use on a circuit capable of delivering not more than 100,000 RMS symmetrical amperes, 480 V maximum. The ACQ550 has an electronic motor protection feature that complies with the requirements of the National Electric Code (NEC). When this feature is selected and properly adjusted. Additional overload protection is not required unless more than one motor is connected to the drive or unless additional protection is required by applicable safety regulations.

For CE installation requirements, see ABB publication CE-US-02 "CE Council Directives and Variable Speed Drives." Contact your local ABB representative for specific IEC installation instructions.

## ACQ550 Control Terminals - Main I/O Terminal X1

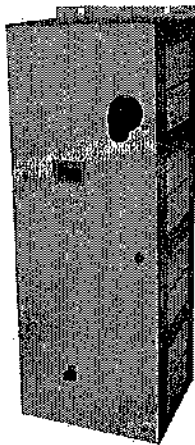
X1	Identification	Description
1	SCR	Terminal for signal cable screen. (Connected internally to chassis ground.)
2	AI 1	Analog input channel 1, programmable. Default <sup>2</sup> = External reference Resolution 0.1 % accuracy $\pm 1$ %. 0 (4) - 20 mA ( $R_i = 312 \text{ k}\Omega$ ) (J1:AI1 ON) 0 (2) - 10 V ( $R_i = 100 \Omega$ ) (J1:AI1 OFF)
3	AGND	Analog input common. (Connected internally to chassis ground through 1 M $\Omega$ )
4	10 V	10 V/10 mA reference voltage output for analog input potentiometer, accuracy $\pm 2$ %. (1 k $\Omega \leq R \leq 10 \text{ k}\Omega$ )
5	AI 2	Analog input channel 2, programmable. Default <sup>2</sup> = PID Feedback Resolution 0.1 % accuracy $\pm 1$ %. 0 (4) - 20 mA ( $R_i = 312 \text{ k}\Omega$ ) (J1:AI2 ON) 0 (2) - 10 V ( $R_i = 100 \Omega$ ) (J1:AI2 OFF)
6	AGND	Analog input common. (Connected internally to chassis ground through 1 M $\Omega$ )
7	AO1	Analog output channel 1, programmable. Default <sup>2</sup> = Output frequency 0 (4) - 20 mA (load < 500 $\Omega$ ), accuracy $\pm 3\%$ full scale.
8	AO2	Analog output channel 2, programmable. Default <sup>2</sup> = Output current 0 (4) - 20 mA (load < 500 $\Omega$ ), accuracy $\pm 3\%$ full scale.
9	AGND	Analog output common. Connected internally to chassis ground through 1 M $\Omega$ )
10	24 V	Auxiliary voltage output 24 V DC / 250 mA (Reference to AGND). Short circuit protected.
11	GND	Common for digital input (DI) return signals.
12	DCOM	Digital input circuit common for all digital inputs (DIs). Connected internally as floating. To activate a digital input, there must be $\geq +10 \text{ V}$ (or $\leq -10 \text{ V}$ ) between that input and DCOM. The 24 V may be provided by the ACH550 (X1:10) or by an external 12-24 V source of either polarity.
13	DI 1	Digital input 1, programmable. Default <sup>2</sup> = Start/Stop (AUTO mode) Activation starts the drive
14	DI 2	Digital input 2, programmable. Default <sup>2</sup> = Not configured.
15	DI 3	Digital input 3, programmable. Default <sup>2</sup> = Constant (Preset) speed. Activation selects constant speed 1

16	DI 4	Digital input 4, programmable. Default <sup>2</sup> = Start enable 1 (safety interlock) Deactivation stops the drive.	
17	DI 5	Digital input 5, programmable. Default <sup>2</sup> = Not configured.	
18	DI 6	Digital input 5, programmable. Default <sup>2</sup> = Not configured.	
19	RO1C	Common	Relay output 1, programmable (Default <sup>2</sup> = Ready – 19 connected to 21). 12 - 250 V AC / 30 V DC, 10 mA - 2 A
20	RO1A	Normally Closed (NC)	
21	RO1B	Normally Open (NO)	
22	RO2C	Common	Relay output 2, programmable (Default <sup>2</sup> = Running - 22 connected to 24). 12 - 250 V AC / 30 V DC, 10 mA - 2 A
23	RO2A	Normally Closed (NC)	
24	RO2B	Normally Open (NO)	
25	RO3C	Common	Relay output 3, programmable (Default <sup>2</sup> = Fault (-1) <sup>3</sup> - 25 connected to 27). 12 - 250 V AC / 30 V DC, 10 mA - 2 A
26	RO3A	Normally Closed (NC)	
27	RO3B	Normally Open (NO)	
28	Screen	Terminal for signal cable screen. (Connected internally to chassis ground.)	
29	B	RS-485 Serial Communications Positive input connection	
30	A	RS-485 Serial Communications Negative input connection	
31	AGND	Analog input common. (Connected internally to chassis ground through 1 M $\Omega$ .)	
32	Screen	Terminal for signal cable screen. (Connected internally to chassis ground.)	

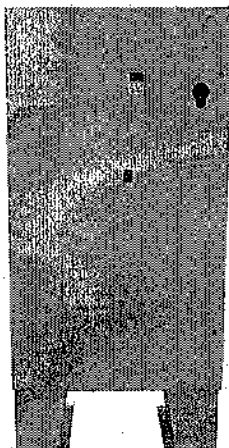
- Notes: 1. Digital input impedance 1.5 k $\Omega$ . Maximum voltage for digital inputs is 30 V. Use multi-strand wire, size range: 20-18 AWG (0.5-1.5 mm<sup>2</sup>)  
2. Default values depend on the macro used. Values specified are for the default macro  
3. For fail-safe reasons, the Fault (-1) Relay signals a "Fault", when the ACH550 is powered down.  
4. Maximum wire size for control terminals, 1.5 mm<sup>2</sup> (146 AWG)

## Drive with Bypass Standard Features

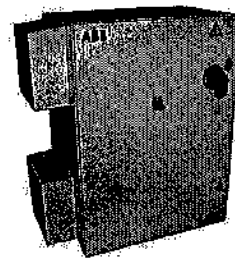
### ACQ550-CC Drive with Bypass – Overview



NEMA 1 Wall Mount



NEMA 1 Floor Mount



NEMA 3R Wall Mount

### ACQ550 Packaged Drive with Bypass

The ACQ550-CC is a complete Drive with Bypass Package that includes an ACQ550 Adjustable Frequency Drive, a bypass function that allows the motor to be run at full voltage in the event the drive is shut down for service, a main disconnect means and branch circuit short circuit and ground fault protection. Complete, pre-engineered packages reduce time, effort and the cost of installing the popular drive bypass option.



The bypass function is configured entirely of standard industrial control components. It includes two electrically interlocked contactors, a motor overload relay, a control power transformer with primary and secondary fusing, and a cover mounted DRIVE-OFF-BYPASS selector switch.

Bypass is accomplished by means of the two contactors. One is the bypass contactor used to connect the motor directly to the power line. The other is the output contactor that disconnects the motor from the drive output when operating in the bypass mode. This prevents the "back feeding" that would occur if line voltage were applied to the drive output terminals. The drive output contactor and the bypass contactor are electrically interlocked to prevent simultaneous operation.

### **Bypass Motor Overload Protection**

Motor overload protection for the bypass mode is provided by a motor overload relay connected in both the drive and bypass modes of operation. For motor full load currents through 80 amperes, the Motor Overload Relay is an adjustable trip, bimetallic overload relay with a class 20 trip characteristic. Above 80 amperes, the Motor Overload Relay is an adjustable trip electronic overload relay with selectable class 10, 20 or 30 trip characteristics.

### **Externally Operated Devices**

ACQ550 Drive W/ Bypass Packages include an input circuit breaker with a door mounted external operating handle that is interlocked with the enclosure door and lockable in the OFF position with up to three padlocks. The multi-lingual, alphanumeric drive control panel is mounted on the door of NEMA 1 and NEMA 12 enclosures, and on the drive within NEMA 3R enclosures. An optional drive service switch (+F267) isolates the drive from the power source for service and provides superior functionality to a three-contactor arrangement.

