ACS550 Product Overview

Description

With drives ranging from 0.75 to 550Hp (0.75 to 355kW), the ACS550 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 ACS550 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 ACS550 is available in both "Normal Duty" ratings and "Heavy Duty" ratings. The Normal Duty rating provides a 110% short term overload rating for 1 minute of every 10 minutes. The Heavy Duty rating provides a 150% short term overload rating for 1 minute in ten minutes. 180% overload capacity is available for 2 seconds every 1 minute.

The ACS550 comes 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 applications to maximize convenience and minimize start-up time.

ACS550 Standard Features

Standard Features

UL, cUL, CSA, CE (208-480V) and GOST-R
Full Graphic and Multilingual Display with Real-time clock and assistant
Start-Up Assistant with Verify
Motor ID Run
Motor Control
  Sensorless Vector and Flux Vector
  Scalar Control
Input Fuses and Disconnect (ACS550-U2, PD, R5-R8 PC and CC)
1st Environment, Restricted CE Approval for 200-480Vtypes (30 m motor cable for R1-R6 frame.
2nd Environment for R7 & R8
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
Input Speed Signals
  Two (2) Current 0 (4) - 20 mA, 0 (2) - 10VDC
  Increase/Decrease reference Contacts
  Fieldbus adapters (communication modules)
Start/Stop
  2 wire control (dry contact closure)
  3 wire control (momentary dry contacts)
Adjustable Current Limit
Adjustable Torque Limit
Nine (9) Supervision Functions
Electronic Reverse
Power Loss Ride-Through
DC Injection Braking (in Scalar ONLY)
DC Magnetizing Start (provides maximum starting torque)
DC Hold
Flux Braking
Jog
Flux Optimization
Seven (7) Preset Speeds
Three (3) Critical Speed Lockout Bands
Self-Tuning Speed Controller
Automatic Reset Customer Selectable
Two (2) Independently Adjustable Accel and Decel Ramps
Linear or Adjustable “S” Curve Accel/Decel Ramps
Ramp to Stop or Coast to a Stop
Maximum Frequency Programmable up to 500 Hz
Two (2) Integral Programmable PID Setpoint Controllers
Mathematical Functions on Analog Reference Signals
DC Choke (R1 - R4 Frames) and AC Reactor (R5 Frames & above) Reactor
Integral Brake Chopper (R1 & R2 Frames)
Reference Trim
Mechanical Brake Control
Emergency Ramp Stop
Built-in Modbus RTU
Maintenance Calculator (v3.11a+)
Serial Communications Assistant (v3.11a+)
Drive Performance Optimization Assistant (v3.11a+)
User-defined Underload Curve (v3.11a+)
Coated Boards

Programmable Fault Functions

AI (1,2 Loss)
Encoder Error
Panel Loss
Assistant External Fault
Motor Thermal Protection
Stall Protection
Underload
Motor Phase Loss
Ground Fault
Communications Fault
Supervision of optional IO

Preprogrammed Protections:

Overcurrent
Short Circuit and Ground Fault
Overvoltage (Intermediate Circuit)
Undervoltage (Intermediate Circuit)
Input Phase Loss and Output Miswiring
Drive and Motor Overtemperature
Internal fault
Overspeed
Input power to Output (R1-R4)

Available options

I/O Options
  3 Relay Extension Module OREL-01
  115/230V Digital Interface Module OHDI-01
  Pulse Encoder Interface OTAC-01
Fieldbus Adapter 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
Dynamic Braking Units and Choppers
DriveWindow Light®-based Start-up & Programming
Fan Replacement Kits
NEMA 12 or 4X Remote Panel Mounting Kit
Flange Mounting Kits (R1 – R6)
FlashDrop
Drive with Disconnect or Circuit Breaker
Drive with Bypass
NEMA 3R Enclosure
NEMA 12 Enclosure

ACS550 Specifications

Input Connection

Input Voltage (U1, V1, W1)	(U1, V1, W1)208/220/230/240Vac 3-phase +10% / -15% 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	Terminals U1, V1, W1

Output Connection

Output Voltage	0 to U1, 3-phase symmetrical, UN at the field weakening point
Output Frequency	0 to 500 Hz
Frequency Resolution	0.01 Hz
Continuous Current	1.0 * I2N (normal use)1.0* I2hd (heavy-duty use)
Short Term Overload Capacity	INmax = 1.1 * I2N (1 min / 10 minutes)
	INhdmax = 1.5 * I2hd (1 min / 10 minutes)
Peak Overload Capacity	180% of I_{2hd} for 2 seconds each minute
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 U2, V2, W2

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	Less than 95%, no condensation allowed
Contamination Levels	
IEC	60721-3-1, 60721-3-2 and 60721-3-3
Chemical Gasses	3C2
Solid Particles	3S2
Installation Site Altitude	0 to 1000 m (3300 ft) above sea level. At sites over 1000 m 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 above sea level, please contact your local ABB distributor or representative for further information.

Altitude Ambient Conditions, Storage & 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	70 to 106 kPa (10.2 to 15.4 PSI)
Vibration Max	In accordance with ISTA 1A and 1B specifications
Shock (IEC 60068-2-29)	Max 100 m/s2 (330 ft/s2) 11 ms (36 fts)
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) R6: 15 cm (6 in)

Cooling Information

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

ACS550 Specifications (continued)

Maximum wire size for control terminals ..... 1.5 mm2 (146 AWG)

Analog Inputs

Two (2) Programmable
Current Reference..... 0 (4) to 20 mA, 100 Ohms, single ended
Voltage Reference..... 0 (2) to 10 V, 312 kOhm, single ended
Accuracy..... +/- 1%
Maximum Delay..... 12…32ms
Resolution..... 0.1%
Potentiometer Reference Power Supply
Voltage..... +10 VDC +/-2%
Maximum Load..... 10 mA
Applicable Potentiometer..... 1 kOhm to 10 kOhm

Analog Outputs

Two (2) Programmable Current Outputs
Signal Level..... 0 (4) to 20 mA
Accuracy..... +/-3% Full Scale Range at 25°C (77°F)
Maximum Load Impedance..... 500 ohms

Digital Inputs

Six (6) Programmable Digital Inputs
Isolation ..... Isolated as one group
Signal Level ..... 12…24 VDC, (10 V Logic 0). PNP and NPN
Input Current..... 15 mA at 24VDC
Maximum Delay..... 5 ms +/- 1ms
Internal 24 VDC Supply for Digital Inputs
Voltage..... 24 VDC, +/- 10%
Maximum Current..... 250 mA
Protection ..... Short Circuit Proof

Relay Outputs

Three (3) Programmable Relay Outputs
Maximum switching voltage..... 250 VAC / 30 VDC
Maximum switching current ..... 6 A at 30VDC, 1500 VA at 230VAC, or 0.4A at 120VDC
Maximum Continuous Current..... IC = 2 Amps RMS
Contact Material ..... Silver Nickel (AgN)
Isolation Test Voltage..... 4 kVAC, 1 minute
Output Updating Time..... 100 ms

Protections

Single Phase ..... Protected (input & output)
Overvoltage Trip Limit..... 1.3 * V1max
Undervoltage Trip Limit..... 0.65 * V1min
Overtemperature ..... 115°C (239°F) R1 - R4 and R7 & R8,
125°C (257°F) R5 & R6
Auxiliary Voltage..... Short Circuit Protected
Ground Fault..... Protected
Microprocessor Fault..... Protected
Motor Stall Protection..... Protected
Motor Overtemperature..... Protected (I2t)
Input Line Impedance..... 5% equivalent swing DC choke (R1-R4)
..... 3% AC line Reactor (R5-R8)

Motor / Drive Capabilities

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

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

ACS550 products carry third party certification as follows;

Product	Certification
ACS550-U1 240V & 480V	UL, cUL, CSA, CE, C-Tick and GOST-R
ACS550-U1 600 V	UL, cUL, CSA, C-Tick and GOST-R
ACS550-U2	UL, cUL and CE
ACS550-CC	UL and cUL
ACS550-PC and PD	UL and cUL

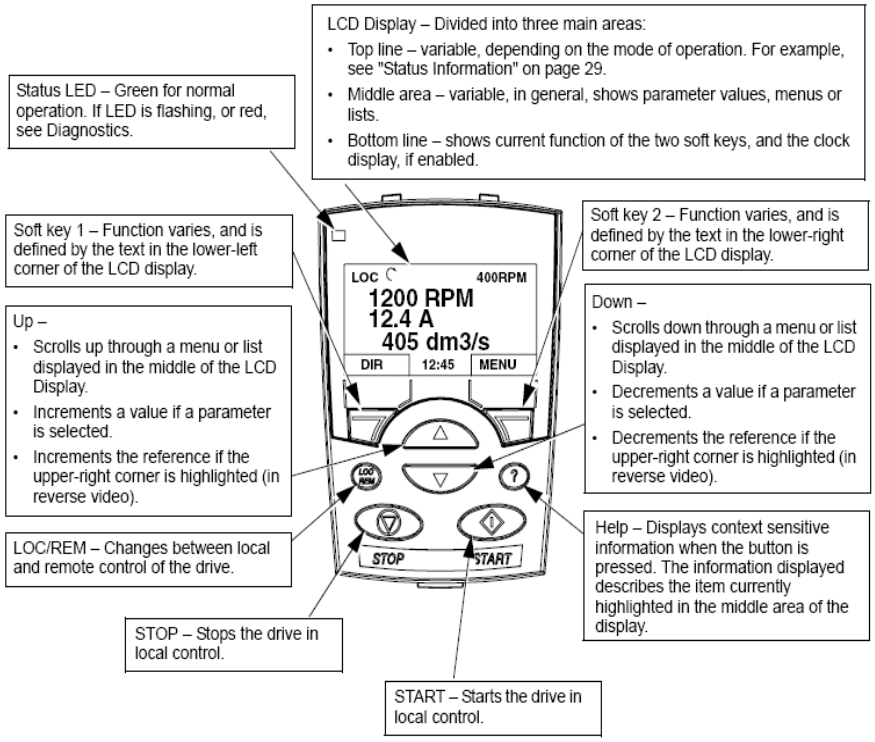
ACS550 Control Panel

Assistant Control Panel Features

The ACS550 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 – Group 01
- Parameters are Alpha-numeric
- N. A. version supports 18 languages as standard
    - English, English (Am), German, Italian, Spanish, Portuguese, Dutch, French, Danish, Finnish, Swedish, Russian, Polish, Turkish, Czech, Hungarian, Korean, Chinese
- 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.**

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



Cable Connections

When installing input power and motor wiring, refer to the following, as appropriate:

Terminal	Description
U1, V1, W1*	3-phase power supply input
PE	Protective Ground
U2, V2, W2	Power output to motor

The ACS550 -x1-xxxx-2 (208…240V series) can be used with a single phase supply, if output current is derated by 50%. For single phase supply voltage, connect power at U1 and W1.

For drives using braking (optional), refer to the following, as appropriate:

Frame Size	Terminal	Description	Braking Accessory
R1, R2	BRK+, BRK	Braking resistor	Braking resistor.
R3, R4, R5, R6	UDC+, UDC	DC bus	Contact your ABB representative to order either: -Braking unit or -Chopper and resistor

ACS550 Control Terminals

The following provides information for connecting control wiring at X1 on the drive.

X1	Identification	Hardware Description
1	SCR	Terminal for signal cable screen. (Connected internally to chassis ground.)
2	AI 1	Analog input channel 1, programmable. Default2 = frequency reference. Resolution 0.1%, accuracy ±1%.
		J1:AI1 OFF: 0…10 V (Ri = 312 kΩ)
		J1:AI1 ON: 0…20 mA (Ri = 100 Ω)
3	AGND	Analog input circuit common (connected internally to chassis gnd. through 1 MΩ).
4	+10 V	Potentiometer reference source: 10 V ±2%, max. 10 mA (1kΩ < R < 10kΩ).
5	AI2	Analog input channel 2, programmable. Default2 = not used. Resolution 0.1%, accuracy ±1%.
		J1:AI2 OFF: 0…10 V (Ri = 312 kΩ)
		J1:AI2 ON: 0…20 mA (Ri = 100 Ω)
6	AGND	Analog input circuit common (connected internally to chassis gnd. through 1 MΩ).
7	AO1	Analog output, programmable. Default2 = frequency. 0…20 mA (load < 500 Ω).
8	AO2	Analog output, programmable. Default2 = current. 0…20 mA (load < 500 Ω).
9	AGND	Analog output circuit common (connected internally to chassis gnd. through 1 MΩ).
10	+24 V	Auxiliary voltage output 24 VDC / 250 mA (reference to GND), short circuit protected.
11	GND	Auxiliary voltage output common (connected internally as floating).
12	DCOM	Digital input common. To activate a digital input, there must be ≥+10 V (or ≤-10 V) between that input and DCOM. The 24 V may be provided by the ACS550 (X1-10) or by an external 12…24 V source of either polarity.
13	DI 1	Digital input 1, programmable. Default[2] = start/stop.
14	DI 2	Digital input 2, programmable. Default[2] = fwd/rev.
15	DI 3	Digital input 3, programmable. Default[2] = constant speed sel (code).
16	DI 4	Digital input 4, programmable. Default[2] = constant speed sel (code).
17	DI 5	Digital input 5, programmable. Default[2] = ramp pair selection (code).
18	DI 6	Digital input 6, programmable. Default[2] = not used.
19	RO1C	Relay output 1, programmable. Default[2] = Relay
20	RO1A	Maximum: 250 VAC / 30 VDC, 2 A
21	RO1B	Minimum: 500 mW (12 V, 10 mA)
22	RO2C	Relay output 2, programmable. Default[2] = Running
23	RO2A	Maximum: 250 VAC / 30 VDC, 2 A
24	RO2B	Minimum: 500 mW (12 V, 10 mA)
25	RO3C	Relay output 3, programmable. Default[2] = Fault (-1)
26	RO3A	Maximum: 250 VAC / 30 VDC, 2 A
27	RO3B	Minimum: 500 mW (12 V, 10 mA)

[1] Digital input impedance 1.5 kΩ. Maximum voltage for digital inputs is 30 V.
[2] Default values depend on the macro used. Values specified are for the default macro.