ACS800 AC Drives

Product Features

Standard Features
UL and cUL (07 requires option selection)
4 line by 20 Character Multilingual Alphanumeric Display
Intelligent Start-Up Assistant
Motor ID Run
Motor Control
  Direct Torque Control (DTC)
  Scalar Control
Input Fuses and Disconnect (U2/U7/07)
Adaptive Programming with fifteen (15) logic controller type function blocks
Three (3) programmable Analog Inputs
Seven (7) Digital inputs, (6) Programmable & (1) dedicated Start Interlock
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
  One (1) Voltage +/- 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 Magnetizing Start (provides max starting torque)
DC Hold
Flux Braking
Flux Optimization
Fifteen (15) 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 300 Hz
Integral Programmable PID Setpoint Controller
Mathematical Functions on Analog Reference Signals
Reactor with 3% impedance - DC (R2&R3 frames)
and AC (R4 frame & above)
Integral Brake Chopper (R2 & R3 frames)
Reference Trim
Programmable Brake Control
  (Not available for n*D4+n*R8i frames)
Master/Follower

Programmable Fault Functions
AI<Min
Panel Loss
External Fault
Motor Thermal Protection
Stall
Under load
Motor Phase Loss
Ground Fault
Communications Fault
Supervision of optional I/O
Preprogrammed Protections:
Over current
Short Circuit
Over voltage (Intermediate Circuit)
Under voltage (Intermediate Circuit)
Input Phase Loss
Ambient temperature
Drive over temperature
Internal fault
Over frequency

Available options
I/O Options
  DDCS Communications Card RDCO-01/02/03
  Analog I/O Extension Card RAIO-01
  Digital I/O Extension Card RDIO-01
  Pulse Encoder Interface RTAC-01
Field bus Adapter Modules
  DeviceNet™
  ProfiBus-DP™
  ModBus™ Adapter
  Interbus-S
  ControlNet™
  Ethernet
Dynamic Braking Choppers
CE EMC Filters (1st and 2nd Environments)
Windows® based Adaptive Programming Tool
DriveWindow® a Start-up and Programming Tool

Application Software options
Pump/Fan Control
Extruder
Spinning
 Traverse
Centrifuge / Decanter
Inline Control
Center Winder/Unwind (requires app review)
Perm Magnet Synchronous Motor (requires app review)
PCP (Progressive Cavity Pump)
Rod Pump Light
ACS800 AC Drives

Product Specifications

Input Connection
Input Voltage (U₁) 208/220/230/240Vac 3-phase +/-10%
380/400/415/440/460/480/500Vac 3-phase +/-10%
525/575/600/690Vac 3-phase +/-10%

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 (cos j) 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 -300 to +300 Hz, in DTC mode (0-3.2((U₁ input voltage/Uₙ motor)*fₙ motor))
Frequency Resolution 0.01 Hz
Continuous Current 1.0 * I₂N (normal use)
1.0* I₂hd (heavy-duty use)
Short Term Overload Capacity \( I_{\text{hmax}} = 1.1 * I₂N \) (1 min / 5 minutes @ 40°C), typical
\( I_{\text{hmax}} = 1.5 * I₂hd \) (at least 1 min / 5 min @ 40°C)
Peak Overload Capacity \( I_{\text{max}} \) (400 Vac and 500 Vac) (at least 10 seconds at start)
Field Weakening Point 8 to 300 Hz
Switching Frequency 3 kHz (average), DTC dynamically varies from 1 to 12kHz
Acceleration & Deceleration Time 0.00 to 1800 Sec
Efficiency 98% at nominal power level (97% with Regenerative AC Drives)
Connection U₂, V₂, W₂

Ambient Conditions, Operation
Air Temperature 0° to 40°C (104°F), 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 (w/o coating), 3C2 (with coating)
Solid Particles 3S2
Installation Site Altitude 0 to 1000m (3300ft) above sea level. At sites over 1000m (3300ft) above sea level, the maximum power is de-rated 1% for every additional 100m (330ft). If the installation site is higher than 2000m (6600ft) above sea level, please contact your local ABB distributor or representative for further information.
Vibration Max 1mm (0.04") 5 to 13.2 Hz, Max 7 m/s² (23 ft/s²) 13.2 to 100 Hz sinusoidal

Ambient Conditions, Storage & Transportation (in Protective Shipping Package)
Air Temperature -20° to 70°C (-4° 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 1mm (0.04") 5 to 13.2 Hz, Max 7 m/s² (23 ft/s²) 13.2 to 100 Hz
Shock (IEC 60068-2-29) Max 100 m/s² (330 ft/s²) 11 ms
Free Fall 250mm for weight less than 100Kg / 100mm for weight greater than 100Kg

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

Auxiliary Power Supply
Voltage 24 Vdc, +/- 10%
Maximum Current 250 mA
Protection Short Circuit Protection

Control Terminal Blocks
Size 0.3 to 3 mm² (12 to 22 AWG) - All control terminal blocks

Page 10 of 64 - Rev. G
## Analog Inputs

### Three (3) Programmable Differential Inputs

- **Two (2) Current Signals**: 0 (4) to 20 mA, Input Resistance $R_I = 100$ ohms
- **One (1) Voltage Signal**: -10Vdc / 0(2) to +10Vdc, Input Resistance $R_I = 200$ k-ohms
- **Common Mode Voltage**: +/-15 Vdc, max.
- **Common Mode Rejection Ratio**: > 60 dB at 50 Hz
- **Resolution**: 0.025% (12 bit)
- **Accuracy**: +/- 0.5%
- **Input Updating Time**: 6 ms (Standard Application Software)
- **Optional Isolation**: Available through optional external module

### Reference Power Supply

- **Voltage**: +10Vdc, 0, -10Vdc +/- 0.5% at 25° C (77° F)
- **Maximum Load**: 10 mA
- **Applicable Potentiometer**: 1 k-ohm to 10 k-ohm

### Analog Outputs

- **Two (2) Programmable Current Outputs**
  - **Signal Level**: 0 (4) to 20 mA
  - **Resolution**: 0.025% (12 bit)
  - **Accuracy**: +/-1% Full Scale Range at 25°C (77°F)
  - **Maximum Load Impedance**: 700 ohms
  - **Output Updating Time**: 24 ms (Standard Application Software)

### Digital Inputs

- **Six (6) Programmable Digital Inputs (Common Ground)**, plus One (1) Start Interlock
  - **Isolation**: Isolated, can be divided in two isolated groups
  - **Isolation Test Voltage**: 500 VAC, 1 minute
  - **Signal Level**: 24Vdc, -15% to +20%
  - **Logical switch thresholds**: < 8Vdc at “0”, >12Vdc at “1”
  - **Input Current**: 10 mA, Digital Input 1 to Digital Input 5, 5 mA Digital Input 6
  - **Filtering Time Constant**: 1 ms
  - **Input Updating Time**: 6 ms (Standard Application Software)

Internal 24 Vdc Supply for Digital Inputs

- **Voltage**: 24Vdc
- **Maximum Current**: 100 mA
- **Connector**: X22:7
- **Protection**: Short Circuit Proof

An external 24 Vdc supply may be used instead of the internal supply

### Relay Outputs

- **Three Programmable Relay Outputs**
  - **Switching Capacity**: 8 A at 24Vdc or 250Vac, 0.4 A at 120Vdc
  - **Maximum Continuous Current**: $I_C = 2$ Amps RMS
  - **Contact Material**: Silver Cadmium Oxide (AgCdO)
  - **Isolation Test Voltage**: 4 kVac, 1 minute
  - **Output Updating Time**: 100 ms (Standard Application Software)

### Protections

- **Single Phase**: Protected (input & output)
- **Over Voltage Trip Limit**: $1.3 \cdot U_{\text{max}}$
- **Under Voltage Trip Limit**: $0.65 \cdot U_{\text{min}}$
- **Over Temperature**: Protected
- **Auxiliary Voltage**: Short Circuit Protected
- **Ground Fault**: Protected
- **Microprocessor Fault**: Protected
- **Motor Stall Protection**: Protected
- **Motor Over Temperature**: Protected ($I^2t$)