

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

Product Specifications

Input Connection

Input Voltage (U ₁)	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 U ₁ , V ₁ , W ₁

Output Connection

Output Voltage	0 to U ₁ , 3-phase symmetrical, U _N at the field weakening point
Output Frequency	-300 to +300 Hz, in DTC mode (0-3.2((U ₁ input voltage/U _N motor)*f _N motor)) with dU/dT choke limited 120Hz
Frequency Resolution	0.01 Hz
Continuous Current	1.0 * I _{2N} (normal use) 1.0 * I _{2hd} (heavy-duty use)
Short Term Overload Capacity	I _{Nmax} = 1.1 * I _{2N} (1 min / 5 minutes @ 40°C), typical I _{hdmax} = 1.5 * I _{2hd} (at least 1 min / 5 min @ 40°C)
Peak Overload Capacity	I _{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)
Short circuit withstand rating	65,000 AIC (UL) R2-R8
Connection	U ₂ , V ₂ , W ₂

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/s ² (23 ft/s ²) 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/s ² (23 ft/s ²) 13.2 to 100 Hz
Shock (IEC 60068-2-29)	Max 100 m/s ² (330 ft/s ²) 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 mm ² (12 to 22 AWG) - All control terminal blocks
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Product Specifications

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	$1.3 * U_{1max}$
Under Voltage Trip Limit	$0.65 * U_{1min}$
Over Temperature	Protected
Auxiliary Voltage	Short Circuit Protected
Ground Fault	Protected
Microprocessor Fault	Protected
Motor Stall Protection	Protected
Motor Over Temperature	Protected (I^2t)