Allen-Bradley
by ROCKWELL AUTOMATION

Catalog #: 20BD027A3AYNANC0

PowerFlex 700 AC Drive 27 A at 20 Hp 20B

Lifecycle status: DISCONTINUED

Rockwell Automation announces that as of June 1, 2023, the PowerFlex 700 AC Drive 27 A at 20 Hp 20B will be discontinued and no longer available for sale. Customers are encouraged to remove references to the affected product(s).

Discontinued Date: June 1, 2023
Replacement Category: Engineering Replacement

Technical Specifications

Mechanical

Degree of protection (IP)	IP20
Shock	15 G peak for 11 ms duration (±1.0 ms)
PWM frequency	4 kHz @ 650V DC
Vibration	0.152 mm (0.006 inch) displacement, 1 G peak

Electrical

Number of analogue outputs	2
Mains voltage	480 V
Integrated breaking resistance	No
Brake IGBT	Brake IGBT installed
Internal communication module	No communication module
Fuse current rating	50 A @ 650V DC
Input voltage rating	480V AC, 3-phase, 60 Hz
AC input undervoltage trip	280V AC @ 480V
Bus voltage, nom	648V DC @ 480V
Bus undervoltage shutoff/fault	305V DC @ 480V
Bus overvoltage trip	810V DC @ 480V

Output voltage rating	0…460V AC @ 480V AC, 1-phase
Circuit breaker current rating, max	100 A @ 480V AC, 3-phase
Motor circuit protector current rating, max	50 A @ 480V AC, 3-phase
Output current rating, continuous	27 A @ 650V DC
Output current rating, 1 min	33 A @ 650V DC
Output current rating, 3 sec	44 A @ 650V DC
Logic control ride-thru	0.5 seconds minimum, 2 seconds typical
Brake resistor	No internal brake resistor
Input current rating	28.9 A @ 650V DC
Documentation	Manual
Carrier frequency	2, 4, 8, and 10 kHz. Drive rating based on 4 kHz
Encoder quadrature	90 degrees, ±27 degrees at 25 °C (77 °F)
AC input overvoltage trip	570V AC @ 480V
Input power rating	20.6 kVA @ 480V AC, 3-phase
Dual element time delay fuse current rating	35…60 A @ 480V AC, 3-phase
Non-time delay fuse current rating	35…100 A @ 480V AC, 3-phase
Digital input latency, typical	9.2 ms @ stop signal for SVC motor control
Heat sink thermistor	Monitored by microprocessor overtemp trip
Digital input latency	9.2…16.0 ms @ start signal for SVC motor control
Drive to motor power ratio, max	Recommended not greater than 2:1 ratio
Stop modes	Multiple programmable stop modes including — Ramp, Coast, DC-brake, Fast brake, Ramp-to-hold and S-curve
Frequency accuracy	Digital input: within ±0.01% of set output frequency
Acceleration/deceleration	Two independently programmable accel and decel times. Each time can be programmed from 0…3600 seconds in 0.1 second increments
Analog input latency, typical	6.4 ms @ speed signal for SVC motor control
Number of digital inputs	6
Number of digital outputs	3
Number of analogue inputs	2
Internal watts loss	91 W @ 480V, 20 Hp normal duty (IP20, NEMA/UL Type 1)
Motor voltage, nom	460V @ 380…480V drive rating, 480V nominal line voltage
Supporting protocol for DeviceNet	Yes

Human interface model	LCD display full numeric keypad with programming keys
Max. output frequency	420 Hz
External watts loss	303 W @ 480V, 20 Hp normal duty (IP20, NEMA/UL Type 1)
Total watts loss	394 W @ 480V, 20 Hp normal duty (IP20, NEMA/UL Type 1)
Supporting protocol for EtherNet/IP	Yes
Line voltage, nom	480V @ 380...480V drive rating, 460V nominal motor voltage
Mains frequency	60 Hz
Actual short circuit rating	Determined by AIC rating of installed fuse/circuit breaker
Internal EMC filtering	With EMC filter with common mode choke
Custom drive/firmware	No custom firmware
Feedback option	No feedback
Analog input latency	4.8...12.4 ms @ speed signal for SVC motor control
Drive full power range	460...528V @ 380...480V drive rating
Drive operating range	342...528V @ 380...480V drive rating
Torque regulation	Without feedback: ±5 %, 600 rad/sec bandwidth
Enclosure type	IP20/NEMA/UL Type 1
Output current rating	27 amps, 20 Hp normal duty, 15 Hp heavy duty, frame 2
Control options	Vector control with 24V DC I/O
Drive overcurrent trip	Instantaneous current limit: 220...300% of rated current (dependent on drive rating)
Efficiency	97.5% at rated amps, nominal line volts
Encoder supply	12V, 250 mA. 12V, 10 mA minimum inputs isolated with differential transmitter, 250 kHz maximum
Speed control-speed regulation	Without feedback (Vector Control Mode): 0.1 % of base speed across 120:1 speed range, 120:1 operating range, 50 rad/sec bandwidth
Current limit capability	Proactive current limit programmable from 20...160% of rated output current, Independently programmable proportional and integral gain
Selectable motor control	Sensorless vector with full tuning. Standards V/Hz with full custom capability and vector control
Frequency control-speed regulation	With slip compensation (Volts per Hertz mode): 0.5% of base speed across 40:1 speed range, 40:1 operating range, 10 rad/sec bandwidth

Input phases	3-phase input provides full rating for all drives. 1-phase operation possible on certain drives and provides 50 % of rated current. Frames 0...6: drive can be supplied as 6 pulse or 18 pulse in an engineered package.
Control method	Sine coded PWM with programmable carrier frequency, ratings apply to all drives, the drive can be supplied as 6 pulse or 18 pulse in an engineered solution
Encoder requirements	Encoders must be line driver type, quadrature (dual channel) or pulse (single channel), 8...15V DC output (4...6V DC when jumpers are in 5V position), single-ended or differential and capable of supplying a min. of 10 mA per channel, maximum input frequen
Number of phases output	3
Number of phases input	3
Relative symmetric net voltage tolerance	10 %
With control element	Yes
Supporting protocol for LON	Yes
Supporting protocol for TCP/IP	Yes
Supporting protocol for PROFIBUS	Yes
Supporting protocol for CAN	Yes
Supporting protocol for Modbus	Yes
Motor overload protection	Frames 0...6 vector control: powerflex 700 drives with vector control, which is identified by a C or D in position 15 of the catalog number, provide class 10 motor overload protection according to NEC article 430 and motor overtemperature protection acco
Input frequency tolerance	47 Hz
Encoder duty cycle	50% ±10%
Displacement power factor (all drives)	0.98 across speed range
Short circuit rating, max	200000 amps symmetrical
Output voltage range	0 to rated motor voltage
Encoder type	Incremental, dual channel
Power ride-thru	15 milliseconds at full load
Short circuit trip	Phase-to-phase on drive output
Ground fault trip	Phase-to-ground on drive output
Drive to motor power ratio, min	Recommended not less than 1:2 ratio
Control logic noise immunity	Showering arc transients upto 1500V peak
Line transients	Up to 6000 volts peak per IEEE C62.41-1991

Intermittent overload	110% overload capability for up to 1 minute, 150% overload capability for up to 3 seconds

Construction

Height, approx	IP20, NEMA/UL type 1: 342.5 mm
Depth, approx	IP20, NEMA/UL type 1: 200 mm
Width, approx	IP20, NEMA/UL type 1: 222 mm
Weight, approx	IP20, NEMA/UL type 1: 15.2 kg (drive and packaging weight)

Environmental

Sound level	Frame 2: 57 dB @ 50 CFM fan velocity
Altitude	1000 m (3300 ft.) maximum without derating
Degree of protection (NEMA)	1
Surrounding air temperature	IP20, NEMA/UL type 1 (with top label): 0...50 °C (0...122 °F) @ frames 5...6, most ratings
Atmosphere	Drive must not be installed in an area where the ambient atmosphere contains volatile or corrosive gas, vapors or dust, If the drive is not going to be installed immediately, store the drive where it is not exposed to a corrosive atmosphere
Operating temperature	50 °C @ 650V DC
Storage temperature	-40 °C
Relative humidity	5...95% noncondensing
Pollution degree 1 according to EN 61800-5-1	No pollution occurs, only dry non-conductive pollution occurs, and has no influence
Pollution degree 4 according to EN 61800-5-1	The pollution generates persistent conductivity caused, for example, by conductive dust, rain or snow
Pollution degree 3 according to EN 61800-5-1	Conductive pollution occurs, dry non-conductive pollution occurs and becomes conductive due to condensation
Pollution degree 2 according to EN 61800-5-1	Normally only non-conductive pollution occurs, Occasionally a temporary conductivity, caused by condensation is expected when the drive is out of operation
Surrounding environment pollution degree	All enclosures are acceptable for pollution degree 1 and 2, an enclosure that meets or exceeds IP54, NEMA/UL Type 12, is required for pollution degree 3 and 4