AF-60LP™ Micro Drive
Standard Specifications

Environmental Conditions

Enclosure	IP20 (NEMA 1 with optional NEMA 1 kit)
Installation Location	Do not install in locations where product could be exposed to dust, corrosive gas, inflammable gas, oil mist, vapor, water drops or direct sunlight. There must be no salt in the atmosphere. Condensation must not be caused by sudden changes in temperature. For use at altitudes of 3280 ft. (1000M) or less without derating.
Ambient Temperature	-10° to +50°C
Ambient Humidity	5 to 95% RH (non-condensing)
Vibration	1.0g
Storage Temperature	-25° to 65°C

Standards

Approvals	CE, UL, cUL, and C-Tick Suitable for use on a circuit capable of delivering not more than 100,000 rms symmetrical amperes for 230V and 460V. WEEE and RoHS Compliant

Input Power Supply

Rated Input AC Voltage	200-240 Vac, 1-phase, 50-60 Hz, +/- 10% V 200-240 Vac, 3-phase, 50-60 Hz, +/- 10% V 380-480 Vac, 3-phase, 50-60 Hz, +/- 10% V
Maximum Voltage Imbalance	3% of rated supply voltage
True Power Factor	> 0.4 nominal at rated load
Displacement Power Factor	> 0.98
Switching on input power supply	Maximum twice/minute
Environment according to EN60664-1	Overvoltage category III/pollution degree 2

Output

Rated Output Voltage	0-100% of supply voltage
Output Frequency	0-200 Hz (Adv. Vector Control Plus Mode), 0-400 Hz (Volts/Hertz Mode)
Switching on output	Unlimited
Accel/Decel Times	0.05-3600 seconds
Overload Current Rating	150% of drive rated current for 1 minute

Control

Control Method	Sinusoidal PWM Control (V/Hz with torque vector control)
Switching Frequency Select	2, 4, 8, 12, 16 kHz
Operation Method	Keypad operation: Hand, Off, Auto Digital Input: Programmable for Start/Stop, Forward/Reverse, Jog Timer operation: Stop after predetermined time frame Link operation: RS-485 Modbus RTU
Frequency Reference Setting	Up or Down buttons on keypad or external reference
Analog Input	Built in Potentiometer 0-10 Vdc analog input 4-20ma analog input
Preset Speeds	8 presets via digital inputs
Link Operation	Drive RS-485 or Modbus RTU
Second Reference Setting	Switch from speed reference 1 to reference 2 via digital input
Trim Reference Setting	Available for speed reference offset via potentiometer, voltage input, or current input
Acceleration/Deceleration Time	0.05-3600 seconds (two acceleration and deceleration rates are selectable via digital inputs. Acceleration and deceleration patterns can be selected from linear or S-curve
DC Injection Braking	Starting frequency: 0.0-400 Hz Braking time: 0.0-60.0 seconds Braking level: 0-150% of rated current
Frequency Limit	0-400 Hz
Jump Frequency Control	Two jump (or skip) frequencies via parameter set to avoid mechanical vibration
Jogging Operation	Operation via On key or digital input (Fwd or Rev)
Auto-Restart After Power Failure	Restarts the drive without stopping after instantaneous power failure
Slip Compensation	Maintains motor at constant speed with load fluctuations
Energy Savings	Controls output voltage to minimize motor loss during constant speed operation
Start Mode Function	This functionality smoothly catches a spinning motor

Logic Controller (LC)

Logic Controller Events	Over 23 types of Programmable Events
Comparators	Array of 4 Comparators
Timers	Array of 3 Timers, adjustable from 0.0 to 3600 sec
Logic Rules	Array of 4 Boolean Logic Rules
Logic Controller States	Array of 20 Logic Controller Action States

Process Controller (PI)

Process CL Feedback Select	No function, analog input 1, analog input 2, pulse input, local bus reference
Process PI Control	Normal or Inverse
Process PI Anti Windup	Disabled or enabled
Process PI Start Speed	0.0-200 Hz
Process PI Proportional Gain	0.00-10.00
Process PI Integral Gain	0.10-9999 seconds
Process PI Feed Forward Factor	0-400%
On Reference Bandwidth	0-200%

Indication

LEDs	Green - drive is on Yellow - indicates a warning Red - indicates an alarm
Monitor Units Available	Frequency, current, voltage, power, horsepower, % load, speed, or time

Trip Codes

2	Live Zero Error
4	Line Phase Loss
7	DC Overvoltage
8	DC Undervoltage
9	Drive Overload
10	Motor Overtemperature
11	Motor Thermistor Overtemperature
12	Torque Limit
13	Overcurrent
14	Ground Fault
16	Short Circuit
17	Control Word Timeout
25	Brake Resistor Short-Circuited
27	Brake Chopper Short-Circuited
28	Brake Check
29	Power Board Overtemperature
30	Missing U Phase
31	Missing V Phase
32	Missing W Phase
38	Internal Fault
47	Control Voltage Fault
51	Auto Tune Check - Wrong Motor Parameters
52	Auto Tune Low Inom - Motor current is too low
59	Current Limit
63	Mechanical Brake Low
80	Drive restored to factory settings

Monitoring Parameters Available

Power	kW
Power	HP
Motor Voltage	V
Frequency	Hz
Motor Current	A
Frequency	%
Motor Thermal	%
DC Link Voltage	V
Drive Current	A
Drive Max Current	A
Logic Controller State	On/Off