

Industrial Workhorse



Normal and Heavy Duty

F7 Drive, 0.5 - 500 HP

The F7 Drive: This AC drive is the Industrial Workhorse that can handle every conventional application found within the typical industrial plant from simple variable torque pumping to sophisticated networked material handling. All of this is possible with the smart and flexible design platform of the F7, providing both Normal and Heavy Duty ratings, four modes of control, network communication options, application-specific drive software, power/package options, and an array of standard and optional input/output choices.

The F7 is factory-programmed and ready to run. For operational simplicity and clarity, the LCD operator display has 5 lines x 16 characters. It can be set to any of 7 languages. The keypad is intuitive and includes parameter copying to move a chosen set of parameters from one drive to another. If the application requires programming, the F7 makes it easy. Parameters are grouped in easy to use sets; quick start and advanced. To enhance parameter and data management, Drive Wizard software for the PC is available at no charge, for upload/download, trending, and graphing.

This drive is designed for tough industrial environments. It is rugged and reliable, with an MTBF of 28 years. A variety of enclosure options provide the right environmental protection. The dual ratings, Normal and Heavy duty, enable the most economical match of overload

capacity and starting torque for the application. Providing the right fit to power requirements is also easy with 208/240 and 480 volt ratings, built-in bus choke (30 HP and above) and 12-pulse capability (30 HP and above), common bus capability, and regeneration options. Patented high slip braking can eliminate the need for dynamic braking resistors for high inertia loads. Other features include motor auto-tuning and a wide range of configurable options, such as breakers and fuses.

To provide the optimum control method, the F7 can operate in conventional V/f, V/f with encoder feedback, open loop vector, or closed loop vector mode. Drive performance can be further enhanced for a specific application with optional software.

The F7 supports the industry's open architecture, open connectivity demands with network communications choices such as DeviceNet, Profibus-DP, EtherNet/IP, Modbus TCP/IP and others. Drive coordination with other equipment is simplified with inputs and outputs for digital pulse train, 4 to 20ma, -10 to +10V, and an assortment of programmable contacts.

For new installations or retrofits, the F7 is truly the Industrial Workhorse, perfect for every conventional application...and even some unconventional ones.

Performance Features

- Ratings: 0.5 to 150HP, 208 to 240 VAC
0.75 to 500HP, 480 VAC
- Overload capacity:
150% for 1 min heavy duty,
nominal 110% for 1 min normal duty
- Starting torque, heavy duty:
150%, at 0.5 Hz (open loop),
150%, at 0.3 Hz (closed loop)
- Starting torque, normal duty:
120%, at .05 Hz (V/f)
- Output frequency: 0.01 to 300Hz for heavy duty,
400Hz for normal duty
- Controlled speed range:
40:1 (V/f), 40:1 (V/f with PG), 100:1 (open loop),
1000:1 (closed loop)
- Speed regulation:
2-3% (V/f), 0.02% (V/f with PG), 0.2% (open
loop), 0.01% (closed loop)
- Speed/frequency resolution: 0.01% with digital
reference, 0.1% with analog reference, 0.01 Hz
with Modbus
- Electronic reversing
- Adjustable accel/decel: 0.1 to 6000 sec
- Stall prevention
- Drive efficiency: 96 to 98%
- Displacement power factor: 0.98
- Power loss ride-thru: 2 sec
- Inertial ride-thru
- Selectable auto restart after momentary power
loss
- Programmable auto restart
(0 to 10 attempts) on re-settable fault
- Critical frequency rejection: 3 selectable,
adjustable bands

Protective Features

- DC bus CHARGE indicator
- Optically-Isolated controls
- Phase-to-phase / phase-to-neutral short circuit
protection
- Ground fault protection
- Electronic motor overload (UL)
- Current and torque limit
- Over-torque / under-torque detection

- Fault circuit: over-current, over-voltage, and
over-temperature
- Input/output phase loss

Service Conditions

- Ambient service temperatures:
-10° to 40°C (104°F) NEMA1, to
45°C (113°F) protected chassis
- Humidity: non-condensing 95%
- Altitude: to 3300 feet (1000 meter)
- Input voltage: +10% / -15%, 3 phase,
200 to 240VAC, 380 to 480VAC
- Enclosure: NEMA 1 or protected chassis (other
options)
- Input frequency: 50/60Hz $\pm$ 5%
- 3-phase, 3-wire phase insensitive
- Vibration: 1G, (10 to 20Hz), 0.2G (20 to 50Hz)

Design Features

- LCD keypad display, 5 lines x 16 characters,
backlit, 7 languages, copy function
- Multi-speed settings: 17 available
- Setpoint (PID) trim control
- Signal follower: bias and gain
- Up / down / hold reference (digital M.O.P.)
- Timer function; on/off delay
- 32-bit microprocessor logic
- Easy access, quick start parameter groups
- Non-volatile memory/program retention
- Flash memory for update and custom
applications
- 24VDC control logic
- DC injection braking, adjustable level
- Dynamic braking
- High-slip braking
- Ramp to stop or coast to stop
- Dual motor parameter sets
- Synchronized start into rotating motor
- Motor auto-tuning, static and dynamic
- Common bus capability
- DC link choke: 30 to 150HP at 240VAC, 30 to
500HP at 480VAC
- Terminal strip, quick disconnect
- Split cover for easy wiring
- Plug-in heat sink fan

Inputs and Outputs

- Analog inputs: -10 to +10VDC (20K ohms) or 4
to 20 mA (250 ohm)
- Analog outputs: -10 to +10VDC or 4-20mA
proportional to output parameters
- Digital pulse train input/output (32KHz max)
- Digital Inputs: 8 multi-function
- Programmable outputs: Three form A
- Fault contacts: form C
- RS-485/422 communication terminals

Additional Features for V/f

- Torque boost: full range, auto
- V/f ratio: 15 preset, one adjustable
- Slip compensation

Standards & Reliability

- UL, cUL & CE listed
- IEC: 146A
- MTBF: Exceeds 28 years
- Tested on fully-loaded motors
- Surface mount technology

Options

- Remote display/keypad
- LED Keypad
- Various feedback cards
- DriveWizard™ software (upload / download)
- DeviceNet, Profibus-DP, EtherNet/IP,
Modbus TCP/IP
- Custom drive software: Dancer trim, 1000Hz,
Digital velocity follower, etc.
- 115 VAC interface
- Input breaker, disconnect, fuses
- DB resistors and modules
- NEMA 12 enclosures
- Input/output reactors
- EMC-compliant filters
- DC link choke if not standard
- Isolation transformer
- Line regeneration (RC5 or DC5)
- Dynamic braking if not standard
- Twelve-pulse rectification with input transformers:
30 to 150HP at 240V, 30 to 500HP at 480V

Other Industrial Drives



V7 Drive NEMA 1, V/f or open loop vector,
1/8 - 10 HP. *Flyer FL.V7.01*



V74X Drive Integral NEMA 4X/12, V/f or
open loop vector, 1/8-15 HP.
Flyer FL.V74X.01



G7 Drive Ultimate Performance Solution 3
level Inverter, 1/8 - 500 HP. *Flyer FL.G7.01*



P7 Drive Industrial Fan/Pump, V/f, Normal
Duty, 5 - 500 HP. *Flyer FL.P7.01*



Yaskawa Electric America, Inc.
2121 Norman Drive South
Waukegan, IL 60085

800-YASKAWA (927-5292) Fax: 847-887-7310
DrivesHelpDesk@yaskawa.com www.yaskawa.com

F7 Drive