



***Catalog CA.F7.01***  
***F7 Drives for Industrial Automation***

***Date: 5/1/09***

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**YASKAWA**



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Other Documents and Manuals are available to support special use or installation of this product. These documents may be provided with the product or upon request. Contact Yaskawa Electric America, Inc. or visit [www.yaskawa.com](http://www.yaskawa.com), as required. Documents may include the following:

TM.F7.01... Drive User Manual included on CD ROM with product  
 TM.F7.02... Programming... Drive Programming Manual included on CD ROM with product  
 TM.F7.11... Parameter Access... Manual included on CD ROM with product  
 TM.AFD.12... ProfibusDP... Manual included on CD ROM with product  
 TM.AFD.13... DeviceNet... Manual included on CD ROM with product  
 TM.AFD.17... Modbus Plus... Manual included on CD ROM with product  
 TM.AFD.20... LonWorks... Manual included on CD ROM with product  
 TM.AFD.26... EtherNet/IP... Included on CD ROM with product  
 DriveWizard... Software and Manual...Included on CD ROM with product  
 Options Instructions... Included on CD ROM with product

## REVISIONS

| Change                                  | Page  |
|---|---|
| Changed revision date                   | all pages                                       |
| Updated Remote Operator Kit information | 16  |
| Changed revision date                   | all pages                                       |
| Updated text and table information      | 4, 5, 8, 10, 11, 15, 16, 17, 20, 21, 23, 24, 25 |
| Added trademarks                        | 2   |
| Updated training class info             | 29  |



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.

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 for the application. Providing the right fit to power requirements is also easy with 208 to 230/240 and 480 volt ratings, built-in bus choke above 30 HP, provisions for 12-pulse rectification above 30 HP, 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 drive software.

The F7 supports the industry's open architecture, open connectivity demands with network communications choices such as DeviceNet, Profibus-DP, 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.

### Performance Features

- Ratings: 0.5 to 150HP, 208 to 230/240 VAC  
0.75 to 500HP, 480 VAC
- Overload capacity:
- 150% for 1 min heavy duty, 110% for 1 min normal duty, 200% peak
- Starting torque, heavy duty: 150% at 0.5 Hz (open loop), at 0.3 Hz (closed loop)
- Starting torque, normal duty: 120% at 1.5 Hz (V/f)
- Output frequency: 0.01 to 300Hz for heavy duty, 400Hz for normal duty
- Controlled speed range: 40:1 (V/f), 50:1 (V/f with PG), 200:1 (open loop), 1000:1 (closed loop)
- Speed regulation: 2-3% (V/f), 0.5-1% (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
- 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, cUL, NEC)
- 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) NEMA-1, to 45°C (113°F) protected chassis
- Humidity: non-condensing 95%
- Altitude: to 3300 feet (1000 meter)
- Service Factor: 1.0
- Input voltage: +10% / -15%, 200 to 240VAC, 380 to 480VAC
- Enclosure: NEMA 1 or protected chassis (other options)
- Input frequency: 50/60Hz ± 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 (25HP and below)
- Ramp to stop or coast to stop
- High-slip braking
- 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
- Twelve-pulse rectification with optional input transformer: 30 to 150HP at 240V, 30 to 500HP at 480V
- Terminal strip, quick disconnect
- Split cover for ease of wiring
- Plug-in heat sink fan

### Inputs and Outputs

- Analog input: -10 to +10VDC (20K ohms) or 4 to 20 mA (250 ohm)
- Analog output: -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: one 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 508C (Power Conversion)
- CSA 22.2 No. 14-95 (Industrial Control Equipment)
- UL, cUL listed; CE marked
- UL 1995 (Plenum)
- EN 50178 (LVD)
- EN 61800-3 (w/ External Filter)
- IEC 529, 146
- FCC CFR 47 Part 15 Subpart B (w/ External Filter)

### Options

- Remote display/keypad
- Various feedback cards
- DriveWizard™ software (upload / download)
- DeviceNet, Profibus-DP, others
- Custom drive software
- Input breaker, disconnect, fuses
- 115 VAC interface
- DB resistors and modules
- Input/output reactors
- EMC-compliant filters
- DC link choke (25HP and below)
- Isolation transformer
- Line regeneration (RC5 or DC5)
- Dynamic braking (25HP and above)
- Twelve-pulse transformer

# F7

## Standard Drives

**F7 Drives** - 1/2-500HP, 208-230/240 and 480V, 3-phase<sup>(1)</sup> input, NEMA 1 or protected chassis enclosure

| Rated Input Voltage | Drive Model Number CIMR-F7U | Normal Duty <sup>(2)</sup>  |                           | Heavy Duty <sup>(2, 4)</sup> |                           | Standard Enclosure | Drive List Price \$ |
|---------------------|-----------------------------|-----------------------------|---------------------------|------------------------------|---------------------------|--------------------|---------------------|
|                     |                             | Rated Output Current (Amps) | Nominal HP <sup>(3)</sup> | Rated Output Current (Amps)  | Nominal HP <sup>(3)</sup> |                    |                     |
| 208V                | 20P41                       | 3.6                         | 1/2<br>3/4                | 3.2                          | 1/2                       | NEMA 1             |                     |
|                     | 20P71                       | 4.6                         | 1                         | 4.2                          | 3/4                       | NEMA 1             |                     |
|                     | 21P51                       | 7.8                         | 2                         | 7.0                          | 1                         | NEMA 1             |                     |
|                     | 22P21                       | 10.8                        | 3                         | 9.6                          | 2                         | NEMA 1             |                     |
|                     | 23P71                       | 16.8                        | 5                         | 15.2                         | 3                         | NEMA 1             |                     |
|                     | 25P51                       | 23.0                        | N/A                       | 23.0                         | 5                         | NEMA 1             |                     |
|                     | 27P51                       | 31.0                        | 7.5<br>10                 | 31.0                         | 7.5<br>10                 | NEMA 1             |                     |
|                     | 20111                       | 46.2                        | 15                        | 45.0                         | N/A                       | NEMA 1             |                     |
|                     | 20151                       | 59.4                        | 20                        | 58.0                         | 15                        | NEMA 1             |                     |
|                     | 20181                       | 74.8                        | 25                        | 71.4                         | 20                        | NEMA 1             |                     |
|                     | 20221                       | 88                          | 30                        | 85                           | 25                        | NEMA 1             |                     |
|                     | 20301                       | 115                         | 40                        | 115                          | 30<br>40                  | NEMA 1             |                     |
|                     | 20370                       | 162                         | 50                        | 145                          | 50                        | Protected Chassis  |                     |
|                     | 20450                       | 192                         | 60                        | 180                          | 60                        | Protected Chassis  |                     |
| 20550               | 215                         | 75                          | 215                       | 75                           | Protected Chassis         |                    |                     |
| 20750               | 312                         | 100                         | 283                       | 100                          | Protected Chassis         |                    |                     |
| 20900               | 360                         | 125                         | 346                       | 125                          | Protected Chassis         |                    |                     |
| 21100               | 415                         | 150                         | 360 <sup>(4)</sup>        | 150                          | Protected Chassis         |                    |                     |
| 240V                | 20P41                       | 3.6                         | 1/2<br>3/4                | 3.2                          | 1/2<br>3/4                | NEMA 1             |                     |
|                     | 20P71                       | 4.6                         | 1                         | 4.2                          | 1                         | NEMA 1             |                     |
|                     | 21P51                       | 7.8                         | 2                         | 7.0                          | 2                         | NEMA 1             |                     |
|                     | 22P21                       | 10.8                        | 3                         | 9.6                          | 3                         | NEMA 1             |                     |
|                     | 23P71                       | 16.8                        | 5                         | 15.2                         | 5                         | NEMA 1             |                     |
|                     | 25P51                       | 23.0                        | 7.5                       | 23.0                         | 7.5                       | NEMA 1             |                     |
|                     | 27P51                       | 31.0                        | 10                        | 31.0                         | 10                        | NEMA 1             |                     |
|                     | 20111                       | 46.2                        | 15                        | 45.0                         | 15                        | NEMA 1             |                     |
|                     | 20151                       | 59.4                        | 20                        | 58.0                         | 20                        | NEMA 1             |                     |
| 20181               | 74.8                        | 25                          | 71.4                      | 25                           | NEMA 1                    |                    |                     |
| 20221               | 88                          | 30                          | 85                        | 30                           | NEMA 1                    |                    |                     |
| 20301               | 115                         | 40                          | 115                       | 40                           | NEMA 1                    |                    |                     |
| 230V                | 20370                       | 162                         | 50<br>60                  | 145                          | 50                        | Protected Chassis  |                     |
|                     | 20450                       | 192                         | 75                        | 180                          | 60                        | Protected Chassis  |                     |
|                     | 20550                       | 215                         | N/A                       | 215                          | 75                        | Protected Chassis  |                     |
|                     | 20750                       | 312                         | 100<br>125                | 283                          | 100                       | Protected Chassis  |                     |
|                     | 20900                       | 360                         | 150                       | 346                          | 125                       | Protected Chassis  |                     |
|                     | 21100                       | 415                         | N/A                       | 360 <sup>(4)</sup>           | 150                       | Protected Chassis  |                     |

(1) For single-phase input applications, consult Yaskawa Drives Applications Engineering for proper sizing

(2) Normal Duty overload current rating is 110% of rated output current for 60 seconds; Heavy Duty overload current rating is 150% of rated output current for 60 seconds

(3) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors

(4) O.L. 138% for 60 seconds



F7 Drives (Continued)

| Rated Input Voltage | Drive Model Number<br>CIMR-F7U | Normal Duty <sup>(2)</sup>  |                           | Heavy Duty <sup>(2, 5)</sup> |                           | Standard Enclosure | Drive List Price \$ |
|---------------------|--------------------------------|-----------------------------|---------------------------|------------------------------|---------------------------|--------------------|---------------------|
|                     |                                | Rated Output Current (Amps) | Nominal HP <sup>(3)</sup> | Rated Output Current (Amps)  | Nominal HP <sup>(3)</sup> |                    |                     |
| 480V                | 40P41                          | 1.8                         | 1/2<br>3/4                | 1.8                          | 1/2<br>3/4                | NEMA 1             |                     |
|                     | 40P71                          | 2.1                         | 1                         | 2.1                          | 1                         | NEMA 1             |                     |
|                     | 41P51                          | 3.7                         | 2                         | 3.7                          | 2                         | NEMA 1             |                     |
|                     | 42P21                          | 5.3                         | 3                         | 5.3                          | 3                         | NEMA 1             |                     |
|                     | 43P71                          | 7.6                         | 5                         | 7.6                          | 5                         | NEMA 1             |                     |
|                     | 45P51                          | 12.5                        | 7.5                       | 12.5                         | 7.5                       | NEMA 1             |                     |
|                     | 47P51                          | 17.0                        | 10                        | 17.0                         | 10                        | NEMA 1             |                     |
|                     | 40111                          | 27.0                        | 15<br>20                  | 24.0                         | 15<br>15                  | NEMA 1             |                     |
|                     | 40151                          | 34.0                        | 25                        | 31.0                         | 20                        | NEMA 1             |                     |
|                     | 40181                          | 40.0                        | 30                        | 39.0                         | 25                        | NEMA 1             |                     |
|                     | 40221                          | 50.4                        | N/A                       | 45.0                         | 30                        | NEMA 1             |                     |
|                     | 40301                          | 67.2                        | 40<br>50                  | 60.0                         | 40                        | NEMA 1             |                     |
|                     | 40371                          | 77                          | 60                        | 75                           | 50                        | NEMA 1             |                     |
|                     | 40451                          | 96                          | 75                        | 91                           | 60                        |                    |                     |
|                     | 40551                          | 125                         | 100                       | 112                          | 75                        |                    |                     |
|                     | 40750                          | 156                         | 125                       | 150                          | 100                       | Protected Chassis  |                     |
|                     | 40900                          | 180                         | 150                       | 180                          | 125<br>150                | Protected Chassis  |                     |
|                     | 41100                          | 240                         | 200                       | 216                          | N/A                       | Protected Chassis  |                     |
|                     | 41320                          | 260                         | N/A                       | 260                          | 200                       |                    |                     |
|                     | 41600                          | 304                         | 250                       | 304                          | 250                       | Protected Chassis  |                     |
| 41850               | 414                            | 300<br>350                  | 370                       | 300                          | Protected Chassis         |                    |                     |
| 42200               | 515                            | 400<br>450                  | 506 <sup>(5)</sup>        | 350                          | Protected Chassis         |                    |                     |
| 43000               | 675                            | 500                         | 590 <sup>(5)</sup>        | 400<br>500                   | Protected Chassis         |                    |                     |

- (1) For single-phase input applications, consult Yaskawa Drives Applications Engineering for proper sizing
- (2) Normal Duty overload current rating is 110% of rated output current for 60 seconds; Heavy Duty overload current rating is 150% of rated output current for 60 seconds
- (3) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors
- (5) O.L. 150% for 45 seconds

# F7

## Dynamic Braking Options

### 10% Duty

**Dynamic Braking, 10% Duty Cycle** - Used to assist the drive to periodically decelerate a load without overvoltage trips. Ten percent dynamic braking is not typically used for "hold-back" type applications, such as unwinders, elevators, hoists, or downhill conveyors. Dynamic braking consists of at least one transistor and at least one resistor, and are sized for rated motor horsepower. The braking transistor may be included in the standard drive; this is indicated in the tables below. The resistors are sized for a 10% duty cycle (10 seconds maximum on-time of every 100 seconds), and will provide approximately 150% braking torque. Refer to the dynamic braking instruction sheet for more details; consult Yaskawa for information on higher duty cycles.

| Rated Input Voltage | Nominal HP <sup>(1)</sup> | Normal Duty Drive Model Number CIMR-F7U | Heavy Duty Drive Model Number CIMR-F7U | Transistor Module(s) |        |                     | Resistor(s)        |        |               |                              |                                    |
|---------------------|---------------------------|---|--|----------------------|--------|---------------------|--------------------|--------|---------------|------------------------------|------------------------------------|
|                     |                           |   |  | Part Number CDBR-    | Qty    | List Price (ea.) \$ | Part Number URS000 | Qty    | List Price \$ | Configuration <sup>(2)</sup> | Total List Price \$ <sup>(5)</sup> |
| 208V                | 1/2                       |   | 20P41                                  | Included             |        |                     | 034                | 1      |               | Single <sup>(3)</sup>        |                                    |
|                     | 3/4                       | 20P41                                   | 20P71                                  | Included             |        |                     | 022                | 1      |               | Single <sup>(3)</sup>        |                                    |
|                     | 1                         | 20P71                                   | 21P51                                  | Included             |        |                     | 022                | 1      |               | Single <sup>(3)</sup>        |                                    |
|                     | 2                         | 21P51                                   | 22P21                                  | Included             |        |                     | 023                | 1      |               | Single <sup>(3)</sup>        |                                    |
|                     | 3                         | 22P21                                   | 23P71                                  | Included             |        |                     | 024                | 1      |               | Single <sup>(3)</sup>        |                                    |
|                     | 5                         | 23P71                                   | 25P51                                  | Included             |        |                     | 025                | 1      |               | Single <sup>(3)</sup>        |                                    |
|                     | 7.5                       | 27P51                                   | 27P51                                  | Included             |        |                     | 026                | 1      |               | Single <sup>(3)</sup>        |                                    |
|                     | 10                        |   |  | Included             |        |                     | 027                | 1      |               | Single <sup>(3)</sup>        |                                    |
|                     | 15                        | 20111                                   | 20151                                  | Included             |        |                     | 140                | 1      |               | Single <sup>(4)</sup>        |                                    |
|                     | 20                        | 20151                                   | 20181                                  | Included             |        |                     | 136                | 1      |               | Single <sup>(4)</sup>        |                                    |
|                     | 25                        | 20181                                   | ---                                    | Included             |        |                     | 136                | 1      |               | Single <sup>(4)</sup>        |                                    |
|                     | 25                        | ---                                     | 20221                                  | 2022B                | 2      |                     | 135                | 1      |               | Single                       |                                    |
|                     | 30                        | 20221                                   | 20301                                  | 2022B                | 2      |                     | 135                | 1      |               | Dual                         |                                    |
|                     | 40                        | 20301                                   | 20301                                  | 2022B                | 2      |                     | 129                | 1      |               | Dual                         |                                    |
|                     | 50                        | 20370                                   | 20370                                  | 2110B                | 1      |                     | 100                | 1      |               | Single                       |                                    |
|                     | 60                        | 20450                                   | 20450                                  | 2110B                | 1      |                     | 096                | 1      |               | Single                       |                                    |
|                     | 75                        | 20550                                   | 20550                                  | 2110B                | 1      |                     | 096                | 1      |               | Single                       |                                    |
|                     | 100                       | 20750                                   | 20750                                  | 2110B & 2022B        | 1 each |                     | 096 & 128          | 1 each |               | Single                       |                                    |
| 125                 | 20900                     | 20900                                   | 2110B & 2022B                          | 1                    |        | 096 & 129           | 1                  |        | Single        |                              |                                    |
| 150                 | 21100                     | 21100                                   | 2110B                                  | 2                    |        | 097                 | 1                  |        | Dual          |                              |                                    |

(1) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors

(2) Single = 1 resistor per package  
 Dual = 2 resistors per package (requires 2 DB transistor modules, as indicated in table above)  
 Triple = 3 resistors per package (requires 3 DB transistor modules, as indicated in table above)

(3) This resistor package provides 120% braking torque

(4) This resistor package provides 100% braking torque

(5) Total List Price includes all resistors and transistor modules to provide the Dynamic Braking function





### Dynamic Braking, 10% Duty Cycle (continued for 230/240V)

| Rated Input Voltage | Nominal HP <sup>(1)</sup> | Normal Duty Drive Model Number CIMR-F7U | Heavy Duty Drive Model Number CIMR-F7U | Transistor Module(s) |          |                     | Resistor(s)        |      |               |                               |                                    |
|---------------------|---------------------------|---|--|----------------------|----------|---------------------|--------------------|------|---------------|-------------------------------|------------------------------------|
|                     |                           |   |  | Part Number CDBR-    | Qty      | List Price (ea.) \$ | Part Number URS000 | Qty  | List Price \$ | Config-uration <sup>(2)</sup> | Total List Price \$ <sup>(5)</sup> |
| 230/240V            | 1/2                       | 20P41                                   | 20P41                                  | Included             |          |                     | 034                | 1    |               | Single <sup>(3)</sup>         |                                    |
|                     | 3/4                       |   | 20P71                                  | Included             |          |                     | 022                | 1    |               | Single <sup>(3)</sup>         |                                    |
|                     | 1                         | 20P71                                   | 21P51                                  | Included             |          |                     | 022                | 1    |               | Single <sup>(3)</sup>         |                                    |
|                     | 2                         |   | 21P51                                  | Included             |          |                     | 023                | 1    |               | Single <sup>(3)</sup>         |                                    |
|                     | 3                         | 22P21                                   | 22P21                                  | Included             |          |                     | 024                | 1    |               | Single <sup>(3)</sup>         |                                    |
|                     | 5                         |   | 23P71                                  | 25P51                | Included |                     |                    | 025  | 1             |                               | Single <sup>(3)</sup>              |
|                     | 7.5                       | 25P51                                   | 25P51                                  | Included             |          |                     | 026                | 1    |               | Single <sup>(3)</sup>         |                                    |
|                     | 10                        |   | 27P51                                  | 27P51                | Included |                     |                    | 027  | 1             |                               | Single <sup>(3)</sup>              |
|                     | 15                        | 20111                                   | 20111                                  | Included             |          |                     | 140                | 1    |               | Single <sup>(4)</sup>         |                                    |
|                     | 20                        |   | 20151                                  | 20151                | Included |                     |                    | 136  | 1             |                               | Single <sup>(4)</sup>              |
|                     | 25                        | 20181                                   | 20181                                  | Included             |          |                     | 136                | 1    |               | Single <sup>(4)</sup>         |                                    |
|                     | 30                        | 20221                                   | 20221                                  | 2022B                | 2        |                     | 135                | 1    |               | Dual                          |                                    |
|                     | 40                        | 20301                                   | 20301                                  |                      |          |                     | 129                | 1    |               | Dual                          |                                    |
|                     | 50                        | 20370                                   | 20370                                  | 2110B                | 1        |                     | 100                | 1    |               | Single                        |                                    |
|                     | 60                        |   | 20450                                  |                      |          |                     | 096                | 1    |               | Single                        |                                    |
| 75                  | 20450                     | 20550                                   | 2110B                                  | 1                    |          | 096                 | 1                  |      | Single        |                               |                                    |
| 100                 | 20750                     | 20750                                   | 2110B & 2022B                          | 1                    | each     | 096 & 128           | 1                  | each | Single        |                               |                                    |
|                     |                           |   |  |                      |          |                     |                    |      | Single        |                               |                                    |
| 125                 |                           | 20900                                   | 20900                                  | 2110B & 2022B        | 1        |                     | 096 & 129          | 1    | each          | Single                        |                                    |
|                     | Dual                      |   |  |                      |          |                     |                    |      |               |                               |                                    |
| 150                 | 20900                     | 21100                                   | 2110B                                  | 2                    |          | 097                 | 1                  |      | Dual          |                               |                                    |

(1) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors

(2) Single = 1 resistor per package  
 Dual = 2 resistors per package (requires 2 DB transistor modules, as indicated in table above)  
 Triple = 3 resistors per package (requires 3 DB transistor modules, as indicated in table above)

(3) This resistor package provides 120% braking torque

(4) This resistor package provides 100% braking torque

(5) Total List Price includes all resistors and transistor modules to provide the Dynamic Braking function

# F7

## Dynamic Braking Options

10% Duty

### Dynamic Braking, 10% Duty Cycle (continued for 480V)

| Rated Input Voltage | Nominal HP <sup>(1)</sup> | Normal Duty Drive Model Number CIMR-F7U | Heavy Duty Drive Model Number CIMR-F7U | Transistor Module(s) |        |                     | Resistor(s)        |        |               |  |                                    |
|---------------------|---------------------------|---|--|----------------------|--------|---------------------|--------------------|--------|---------------|--|------------------------------------|
|                     |                           |   |  | Part Number CDBR-    | Qty    | List Price (ea.) \$ | Part Number URS000 | Qty    | List Price \$ | Config-uration <sup>(2)</sup>                  | Total List Price \$ <sup>(5)</sup> |
| 480V                | 1/2<br>3/4                | 40P41                                   | 40P41                                  | Included             |        |                     | 032                | 1      |               | Single <sup>(3)</sup>                          |                                    |
|                     | 1<br>2                    | 40P71<br>41P51                          | 40P71<br>41P51                         | Included             |        |                     | 032<br>033         | 1<br>1 |               | Single <sup>(3)</sup><br>Single <sup>(3)</sup> |                                    |
|                     | 3<br>5                    | 42P21<br>43P71                          | 42P21<br>43P71                         | Included             |        |                     | 034<br>035         | 1<br>1 |               | Single <sup>(3)</sup><br>Single <sup>(3)</sup> |                                    |
|                     | 7.5<br>10                 | 45P51<br>47P51                          | 45P51<br>47P51                         | Included             |        |                     | 036<br>037         | 1<br>1 |               | Single <sup>(3)</sup><br>Single <sup>(3)</sup> |                                    |
|                     | 15<br>20                  | 40111                                   | 40111<br>40151                         | Included             |        |                     | 038<br>040         | 1<br>1 |               | Single <sup>(3)</sup><br>Single <sup>(3)</sup> |                                    |
|                     | 25<br>30                  | 40151<br>40181                          | 40181<br>---                           | Included             |        |                     | 040<br>154         | 1<br>1 |               | Single <sup>(3)</sup><br>Single <sup>(3)</sup> |                                    |
|                     | 30                        | ---                                     | 40221                                  | 4045B                | 1      |                     | 150                | 1      |               | Single   |                                    |
|                     | 40<br>50                  | 40301                                   | 40301<br>40371                         | 4045B<br>4045B       | 1<br>2 |                     | 142<br>151         | 1<br>1 |               | Single<br>Dual                                 |                                    |
|                     | 60<br>75                  | 40371<br>40451                          | 40451<br>40551                         | 4045B                | 2      |                     | 151<br>143         | 1<br>1 |               | Dual<br>Dual                                   |                                    |
|                     | 100<br>125                | 40551<br>40750                          | 40750<br>40900                         | 4220B                | 1      |                     | 119                | 1      |               | Single   |                                    |
|                     | 150                       | 40900                                   | 40900                                  | 4220B                | 1      |                     | 165                | 1      |               | Single   |                                    |
|                     | 200                       | 41100                                   | 41320                                  | 4220B &<br>4045B     | 1<br>1 |                     | 165 & 142          | 1 each |               | Single<br>Single                               |                                    |
|                     | 250                       | 41600                                   | 41600                                  | 4220B &<br>4045B     | 1<br>2 |                     | 165 & 143          | 1 each |               | Single<br>Dual                                 |                                    |
|                     | 300<br>350                | 41850<br>41850                          | 41850<br>42200                         | 4220B                | 2      |                     | 166                | 1      |               | Dual   |                                    |
|                     | 400                       | 42200                                   | 43000                                  | 4220B                | 3      |                     | 120 & 165          | 1      |               | Dual<br>Single                                 |                                    |
|                     | 450<br>500                | 42200<br>43000                          | 43000<br>43000                         | 4220B                | 3      |                     | 167                | 1      |               | Triple   |                                    |

(1) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors

(2) Single = 1 resistor per package  
 Dual = 2 resistors per package (requires 2 DB transistor modules, as indicated in table above)  
 Triple = 3 resistors per package (requires 3 DB transistor modules, as indicated in table above)

(3) This resistor package provides 120% braking torque

(4) This resistor package provides 100% braking torque

(5) Total List Price includes all resistors and transistor modules to provide the Dynamic Braking function

# Dynamic Braking Options

3% Duty



**Dynamic Braking, 3% Duty Cycle** - Used to assist the drive to periodically decelerate a load without overvoltage trips. Three percent dynamic braking is not applicable for "hold-back" type applications, such as unwinders, elevators, hoists, or downhill conveyors. Dynamic braking consists of at least one transistor and at least one resistor, and are sized for rated motor horsepower. The braking transistor is included in the standard drive for these resistors. The resistors are sized for a 3% duty cycle (3 seconds maximum on-time of every 100 seconds), and will provide at least 100% braking torque. Refer to the dynamic braking instruction sheet for more details; consult Yaskawa for information on higher duty cycles. These resistors can be mounted directly to the heatsink on the back of the drive.

| Rated Input Voltage | Drive Model Number<br>CIMR-F7U | Nominal HP <sup>(1)</sup> | Resistor    |     |               |                |
|---------------------|--------------------------------|---------------------------|-------------|-----|---------------|----------------|
|                     |                                |                           | Part Number | Qty | List Price \$ | Braking Torque |
| 208V                | 20P41                          | 1/2                       | R7505       | 1   |               | 220            |
|                     | 20P71                          | 1                         | R7505       | 1   |               | 125            |
|                     | 21P51                          | 2                         | R7504       | 1   |               | 125            |
|                     | 22P21                          | 3                         | R7503       | 1   |               | 120            |
|                     | 23P71                          | 5                         | R7510       | 1   |               | 100            |
| 240V                | 20P41                          | 1/2                       | R7505       | 1   |               | 220            |
|                     | 20P71                          | 3/4                       | R7505       | 1   |               | 125            |
|                     | 21P51                          | 1                         | R7504       | 1   |               | 125            |
|                     | 22P21                          | 2                         | R7503       | 1   |               | 120            |
|                     | 23P71                          | 3                         | R7510       | 1   |               | 100            |
| 480V                | 40P41                          | 5                         | R7508       | 1   |               | 230            |
|                     | 40P71                          | 3/4                       | R7508       | 1   |               | 130            |
|                     | 41P51                          | 1                         | R7507       | 1   |               | 125            |
|                     | 42P21                          | 2                         | R7506       | 1   |               | 115            |
|                     | 43P71                          | 3                         | R7505       | 1   |               | 110            |

(1) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors

# F7

## Ring Kit Options

**Ring Kit** - These kits allow installation of the drive into a customer's enclosure with the heatsink mounted out the back to reduce overall enclosure size. Each kit includes all of the necessary components, including hardware and instructions.

| Rated Input Voltage | Drive Model Number<br>CIMR-F7U | Kit Model No.<br>UDA00417- | Kit List Price \$ |
|---------------------|--------------------------------|----------------------------|-------------------|
| 208-230/240V        | 20P41 thru 25P51               | D                          |                   |
|                     | 27P51                          | C                          |                   |
|                     | 20111                          |                            |                   |
|                     | 20151                          | B                          |                   |
|                     | 20181                          |                            |                   |
|                     | 20221                          | F                          |                   |
|                     | 20301                          | E                          |                   |
|                     | 20370 thru 21100               | Not Available              |                   |
| 480V                | 40P41 thru 45P51               | D                          |                   |
|                     | 47P51                          | C                          |                   |
|                     | 40111                          |                            |                   |
|                     | 40151                          | B                          |                   |
|                     | 40181                          |                            |                   |
|                     | 40221                          | E                          |                   |
|                     | 40301                          |                            |                   |
|                     | 40371 thru 40551               | A                          |                   |
|                     | 40750 thru 43000               | Not Available              |                   |

# End Cap Kit Options



**End Cap Kit, NEMA 1** - This option consists of a top and bottom cover to convert a protected chassis drive to a NEMA 1 enclosed unit. This option DOES NOT provide additional space for mounting auxilliary components (i.e. circuit breaker, input fuses, reactor, etc.).

| Rated Input Voltage | Drive Model Number<br>CIMR-F7U | Kit Model No.<br>UDA00365- | Overall Drive Dimensions |             |             | Kit List Price \$ |
|---------------------|--------------------------------|----------------------------|--------------------------|-------------|-------------|-------------------|
|                     |                                |                            | Height (in.)             | Width (in.) | Depth (in.) |                   |
| 208-230/240V        | 20P41 thru 20301               |                            | Not Required             |             |             |                   |
|                     | 20370                          | C                          | 32.24                    | 15.55       | No Change   |                   |
|                     | 20450                          |                            |                          |             |             |                   |
|                     | 20550                          | E                          | 40.83                    | 18.43       | No Change   |                   |
|                     | 20750                          |                            |                          |             |             |                   |
|                     | 20900                          | F                          | 49.33                    | 20.43       | No Change   |                   |
| 480V                | 21100                          |                            | Not Available            |             |             |                   |
|                     | 40P41 thru 40551               |                            | Not Required             |             |             |                   |
|                     | 40750                          | E                          | 40.83                    | 18.43       | No Change   |                   |
|                     | 40900                          |                            |                          |             |             |                   |
|                     | 41100                          | F                          | 49.33                    | 20.43       | No Change   |                   |
|                     | 41320                          |                            |                          |             |             |                   |
|                     | 41600                          | P                          | 52.52                    | 23.39       | No Change   |                   |
|                     | 41850<br>42200<br>43000        |                            | Not Available            |             |             |                   |

**Reactor, 3% and 5% Impedance** - May be used on either the input or output of a drive to reduce the effect of load or line side transients on the drive. The three-phase reactors are provided in a separate NEMA 1 enclosure.

| Rated Input Voltage | Drive Model Number<br>CIMR-F7U | 3% Enclosed Reactor      |                  |                  |              |              | 5% Enclosed Reactor      |                  |                  |              |              |      |
|---------------------|--------------------------------|--------------------------|------------------|------------------|--------------|--------------|--------------------------|------------------|------------------|--------------|--------------|------|
|                     |                                | Part Number<br>05P00620- | List Price<br>\$ | Dimensions (in.) |              |              | Part Number<br>05P00620- | List Price<br>\$ | Dimensions (in.) |              |              |      |
|                     |                                |                          |                  | H                | L            | W            |                          |                  | H                | L            | W            |      |
| 208V                | 20P41                          | 0020                     |                  | 8.0              | 8.0          | 6.0          | TBD<br>0021              |                  | 8.0              | 8.0          | 6.0          |      |
|                     | 20P71<br>21P51                 | 0027<br>0027             |                  | 8.0              | 8.0          | 6.0          | 0020<br>0028             |                  | 8.0              | 8.0          | 6.0          |      |
|                     | 22P21<br>23P71                 | 0036<br>0041             |                  | 8.0<br>13.0      | 8.0<br>13.0  | 6.0<br>13.0  | 0032<br>0036             |                  | 8.0              | 8.0          | 6.0          |      |
|                     | 25P51<br>27P51                 | 0041<br>0046             |                  | 13.0             | 13.0         | 13.0         | 0047<br>0051             |                  | 13.0             | 13.0         | 13.0         |      |
|                     | 20111<br>20151                 | 0054<br>0058             |                  | 13.0             | 13.0         | 13.0         | 0055<br>0059             |                  | 13.0             | 13.0         | 13.0         |      |
|                     | 20181<br>20221                 | TBD                      |                  | 13.0             | 13.0         | 13.0         | 0058<br>0067             |                  | 13.0             | 13.0         | 13.0         |      |
|                     | 20301<br>20370                 | 0066<br>0072             |                  | 13.0             | 13.0         | 13.0         | 0067<br>0073             |                  | 13.0             | 13.0         | 13.0         |      |
|                     | 20450<br>20550                 | 0077<br>0082             |                  | 13.0             | 13.0         | 13.0         | 0078<br>0083             |                  | 13.0<br>24.0     | 13.0<br>17.0 | 13.0<br>17.0 |      |
|                     | 20750                          | 0087                     |                  | 24.0             | 17.0         | 17.0         | 0088                     |                  | 24.0             | 17.0         | 17.0         |      |
|                     | 20900<br>21100                 | TBD                      |                  | TBD              |              |              | 0092<br>0096             |                  | 24.0             | 17.0         | 17.0         |      |
|                     | 230/<br>240V                   | 20P41                    | TBD<br>0020      |                  | 8.0          | 8.0          | 6.0                      | 0015<br>0021     |                  | 8.0          | 8.0          | 6.0  |
|                     |                                | 20P71<br>21P51           | 0020<br>0027     |                  | 8.0          | 8.0          | 6.0                      | 0021<br>0028     |                  | 8.0          | 8.0          | 6.0  |
|                     |                                | 22P21<br>23P71           | 0032<br>0036     |                  | 8.0          | 8.0          | 6.0                      | 0033<br>0037     |                  | 8.0          | 8.0          | 6.0  |
|                     |                                | 25P51<br>27P51           | 0041<br>0046     |                  | 13.0         | 13.0         | 13.0                     | 0042<br>0047     |                  | 13.0         | 13.0         | 13.0 |
| 20111<br>20151      |                                | 0050<br>0054             |                  | 13.0             | 13.0         | 13.0         | 0055<br>0055             |                  | 13.0             | 13.0         | 13.0         |      |
| 20181<br>20221      |                                | 0058<br>TBD              |                  | 13.0             | 13.0         | 13.0         | 0059<br>0058             |                  | 13.0             | 13.0         | 13.0         |      |
| 20301               |                                | 0066                     |                  | 13.0             | 13.0         | 13.0         | 0067                     |                  | 13.0             | 13.0         | 13.0         |      |
| 20370               |                                | 0066<br>0072             |                  | 13.0             | 13.0         | 13.0         | 0067<br>0073             |                  | 13.0             | 13.0         | 13.0         |      |
| 20450               |                                | 0077                     |                  | 13.0             | 13.0         | 13.0         | 0078                     |                  | 13.0             | 13.0         | 13.0         |      |
| 20750               |                                | 0082<br>0087             |                  | 13.0<br>24.0     | 13.0<br>17.0 | 13.0<br>17.0 | 0083<br>0088             |                  | 24.0             | 17.0         | 17.0         |      |
| 20900               |                                | TBD                      |                  | TBD              |              |              | 0092                     |                  | 24.0             | 17.0         | 17.0         |      |



**Reactor, 3% and 5% Impedance (continued for 480V)**

| Rated Input Voltage | Drive Model Number<br>CIMR-F7U | 3% Enclosed Reactor      |                  |                  |      |      | 5% Enclosed Reactor      |                  |                  |      |      |
|---------------------|--------------------------------|--------------------------|------------------|------------------|------|------|--------------------------|------------------|------------------|------|------|
|                     |                                | Part Number<br>05P00620- | List Price<br>\$ | Dimensions (in.) |      |      | Part Number<br>05P00620- | List Price<br>\$ | Dimensions (in.) |      |      |
|                     |                                |                          |                  | H                | L    | W    |                          |                  | H                | L    | W    |
| 480V                | 40P41                          | TBD<br>0015              |                  | 8.0              | 8.0  | 6.0  | TBD<br>0016              |                  | 8.0              | 8.0  | 6.0  |
|                     | 40P71                          | 0015                     |                  | 8.0              | 8.0  | 6.0  | 0016                     |                  | 8.0              | 8.0  | 6.0  |
|                     | 41P51                          | 0021                     |                  | 8.0              | 8.0  | 6.0  | 0023                     |                  | 8.0              | 8.0  | 6.0  |
|                     | 42P21                          | 0028                     |                  | 8.0              | 8.0  | 6.0  | 0029                     |                  | 8.0              | 8.0  | 6.0  |
|                     | 43P71                          | 0033                     |                  | 8.0              | 8.0  | 6.0  | 0034                     |                  | 8.0              | 8.0  | 6.0  |
|                     | 45P51                          | 0037                     |                  | 8.0              | 8.0  | 6.0  | 0038                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 47P51                          | 0037                     |                  | 8.0              | 8.0  | 6.0  | 0038                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 40111                          | 0042<br>0047             |                  | 13.0             | 13.0 | 13.0 | 0043<br>0048             |                  | 13.0             | 13.0 | 13.0 |
|                     | 40151                          | 0047                     |                  | 13.0             | 13.0 | 13.0 | 0048                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 40181                          | 0051                     |                  | 13.0             | 13.0 | 13.0 | 0052                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 40221                          | 0055                     |                  | 13.0             | 13.0 | 13.0 | 0056                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 40301                          | 0055<br>0059             |                  | 13.0             | 13.0 | 13.0 | 0056<br>0060             |                  | 13.0             | 13.0 | 13.0 |
|                     | 40371                          | 0062                     |                  | 13.0             | 13.0 | 13.0 | 0063                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 40451                          | 0062                     |                  | 13.0             | 13.0 | 13.0 | 0063                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 40551                          | 0067                     |                  | 13.0             | 13.0 | 13.0 | 0068                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 40750                          | 0073                     |                  | 13.0             | 13.0 | 13.0 | 0074                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 40900                          | 0078                     |                  | 13.0             | 13.0 | 13.0 | 0079                     |                  | 13.0             | 13.0 | 13.0 |
|                     | 41100                          | 0083                     |                  | 24.0             | 17.0 | 17.0 | 0084                     |                  | 24.0             | 17.0 | 17.0 |
| 41320               | 0088                           |                          | 24.0             | 17.0             | 17.0 | 0089 |                          | 24.0             | 17.0             | 17.0 |      |
| 41600               | 0088                           |                          | 24.0             | 17.0             | 17.0 | 0089 |                          | 24.0             | 17.0             | 17.0 |      |
| 41850               | 0092                           |                          | 24.0             | 17.0             | 17.0 | 0093 |                          | 24.0             | 17.0             | 17.0 |      |
| 42200               | 0100                           |                          | 24.0             | 17.0             | 17.0 | 0101 |                          | 24.0             | 17.0             | 17.0 |      |
| 43000               | 0104                           |                          | 30.0             | 24.0             | 24.0 | 0105 |                          | 30.0             | 24.0             | 24.0 |      |

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**Control Options** - These cards, cables and devices add control functionality to the standard drive. Items are shipped loose, unmounted. See Configured Section for factory mounted and wired control.

## Analog Input Options

**Analog Input (14 Bit).** This option provides for the interface of 2 high resolution analog inputs to the drive.

Signal levels (fixed):

- 1 channel, 0 to 10VDC (20kOhm)
- 1 channel, 4 to 20mADC (250Ohm)

*Mounts at option connector 2CN*

**Model No. AI-14U..... List \$**

**Analog Input (13 Bit + Sign).** This option provides for the interface of 3 high resolution analog inputs to the drive.

Signal levels (individually selectable):

- 0 to ±10VDC (20kOhm),
- 4 to 20mADC (250Ohm)

*Mounts at option connector 2CN*

**Model No. AI-14B..... List \$**

**Analog Input, Isolated (13 Bit + Sign).** This option provides for the interface of 3 isolated, high resolution analog inputs to the drive.

Signal levels (individually selectable):

- 0 to ±10VDC (20kOhm),
- 0 to 20mADC (250Ohm),
- 4 to 20mADC (250Ohm)

*Mounts at option connector 2CN*

**Model No. AI-040 (formerly AI-14B2) .....List \$**

**Trim Potentiometer.** This option provides a 5kOhm potentiometer for use as a dropping resistor for maximum or minimum analog input trim.

*Mounts to control terminal strip*

**Model No. AI-001**

**3-15PSI Transducer.** This option provides for the interface of a 3 to 15PSI pneumatic signal, and provides a 4 to 20mA output signal proportional to the input signal to the drive.

*Mounts to control terminal strip*

**Model No. AI-010**

## Analog Output Options

**Analog Output (8 Bit).** This option provides 2 signals for remote metering of any two of the drive's "U1" monitors. These are in addition to the two standard analog outputs.

Signal levels (fixed):

- 0 to 10VDC (20kOhm)

*Mounts at option connector 3CN*

**Model No. AO-08 ..... List \$**

**Analog Output (11 Bit + Sign).** This option provides 2 signals for remote metering of any two of the drive's "U1" monitors. These are in addition to the two standard analog outputs.

Signal levels (individually selectable):

- 0 to ±10VDC (20kOhm)

*Mounts at option connector 3CN*

**Model No. AO-12 ..... List \$**

**Analog Output, Isolated (11 Bit + Sign).** This option provides 2 isolated signals for remote metering of any two of the drive's "U1" parameters. These are in addition to the two standard analog outputs.

Signal levels (individually selectable):

- 0 to ±10VDC (20kOhm),
- 0 to 20mADC (500Ohm max),
- 4 to 20mADC (500Ohm max)

*Mounts at option connector 3CN*

**Model No. AO-001 (formerly AO-12B2) ....List \$**

## Digital Input Options

**Digital Input (8 Bit).** This option provides for the interface of an 8 bit digital input (binary or BCD) to the drive.

*Mounts at option connector 2CN*

**Model No. DI-08..... List \$**

**Digital Input (12 or 16 Bit).** This option provides for the interface of a 12 or 16 bit digital input (binary or BCD) to the drive.

*Mounts at option connector 2CN*

**Model No. DI-16H2 ..... List \$**

**120VAC Logic Interface (8-Input).** This option provides for the interface of 120VAC control logic circuits to the drive. This option is used for digital inputs S1 to S8.

*Mounts to control terminal strip*

**Model No. DI-001 ..... List \$**



# Control Options

## Control Options (continued)

### Digital Output Options

**Digital Output (2 Channel).** This option provides 2 additional digital outputs for use in monitoring the status outputs of the drive. Signal levels:

2 channels, Form C, 250VAC, 30VDC, 1A  
Mounts at option connector 3CN  
**Model No. DO-02C.....List \$**

**Digital Output (8 Channel).** This option provides 8 additional digital outputs for use in monitoring the status outputs of the drive. Signal levels:

2 channels, Form A, 250VAC, 30VDC, 1A  
6 channels, PHC, 48VDC, 50mA, Shared Common  
Mounts at option connector 3CN  
**Model No. DO-08 .....List \$**

### Encoder Feedback Options

**Single Encoder (PG) Feedback - Line Driver.** This option provides velocity and direction feedback from an encoder. This is primarily used for motor speed feedback in closed loop flux vector control. A 5VDC buffered output is also included.

Signal levels:  
5 or 12VDC differential line driver with compliments  
Maximum input frequency: 300kHz  
Phases A and B (Z required with some custom software)  
Mounts at option connector 4CN  
**Model No. PG-X2 .....List \$**

**Single Encoder (PG) Feedback - Open Collector.** This option provides velocity and direction feedback from an encoder. This is primarily used for motor speed feedback in closed loop flux vector control. A 24DC buffered output (open collector) is also included.

Signal levels:  
12VDC differential open collector with compliments  
Maximum input frequency: 32kHz  
Phases A and B (No marker pulse capability)  
Mounts at option connector 4CN  
**Model No. PG-B2 .....List \$**

**Dual Encoder (PG) Feedback - Line Driver.** This option provides velocity and direction feedback from 2 encoders. This card is used for 2-motor operation with standard software and for some custom software titles. A 5VDC buffered output is also included.

Signal levels:  
5 or 12VDC differential line driver with compliments  
Maximum input frequency: 300kHz  
Phases A and B (Z required with some custom software)  
Mounts at option connector 4CN  
**Model No. PG-W2 .....List \$**

### Digital Operator Options

**Digital Operator (LCD).** This option is the standard digital operator found on the drive. This option is only needed if the original keypad is lost or damaged.

Features include:  
LCD keypad display, 5 lines x 16 characters, backlight  
7 languages  
Copy function  
Mounts to keypad port  
**Model No. 300-016-999 .....List \$**

**Remote Operator Cables (3 or 10 feet).** These cables allow for tethering the keypad for easier viewing.

Mounts to keypad port  
**Model No. UWR0051 (3 feet) ..... List \$**  
**Model No. UWR0052 (10 feet) ..... List \$**

**UL Rated Remote Operator Kits.** This option is used to extend the existing Digital Operator to the wall of a separately priced, oversized UL Type 1, 3R, 4, 4X, or 12 enclosure (IPX6 environment). Price includes a faceplate bezel with digital operator carrier and membrane to cover the operator cutout in the enclosure door, a 3-foot cable, a 10-foot cable, and a 1:1 template for cutting the necessary cutouts in the enclosure. Keypad can be removed after kit installation.

Mounts to keypad port and enclosure wall.  
**Model No. UUX000458 (Blank Membrane)..... List \$**  
**Model No. UUX000459 (Yaskawa Logo Membrane) ..... List \$**

**Remote Operator Kit.** This option is used to extend the existing Digital Operator to the wall of a separately priced, oversized NEMA 1 enclosure (No UL rating). Price includes a faceplate membrane to cover the operator cutout in the enclosure door, a 3-foot cable, a 10-foot cable, a remote digital operator carrier, and a 1:1 template for cutting the necessary cutouts in the enclosure.

**Note: Keypad cannot be removed after initial installation.**  
Mounts to keypad port and enclosure wall.  
**Model No. UUX000444 (Yaskawa Logo Membrane) ..... List \$**



## Communications Options - These communications options are provided loose, unmounted. Network communications are available for most popular protocols.

**DeviceNet™ With ADR.** Each DeviceNet network supports up to 63 drives. Controllers are available from many PLC and/or PC suppliers. The DeviceNet network communications option board is designed to comply with all pertinent aspects of the ODVA (Open DeviceNet Vendor Association) specification and AC drive profile. All parameters, diagnostics, and operational commands are accessible via DeviceNet. Automatic Device Replacement (ADR) is supported in this DeviceNet option, including the functions of Auto Baud Rate sensing and Faulted Node Recovery (using Group 4 messaging). The DeviceNet satellite board mounts integrally in the drive and provides a DeviceNet standard open tap connector. Electronic Data Sheets may be downloaded from [www.yaskawa.com](http://www.yaskawa.com) to assist with network configuration and drive setup.

*Mounts at option connector 2CN.*

**Model No. CM012 .....List \$**

**Other DeviceNet Options.** For DeviceNet option kits CM056 and CM059, please follow the guidelines listed below. Please download the application note AN.AFD.14 from [www.yaskawa.com](http://www.yaskawa.com), which details the exact differences between all the DeviceNet option kits.

### New Installations

New installations without any requirements of backwards compatibility should use CM012 kit. The CM012 incorporates all the functionality of the CM056 and CM059 as well as ADR and many other new features.

### Existing Installations

When replacing a failed card in the field or adding an additional drive to an existing network, it is generally recommended to use the existing kit (CM056 or CM059) found in the installation. This will ease in the support of the network.

*Note: Each DeviceNet kit has unique EDS (electronic data sheets) files for each model of every drive series. These can be found on [www.yaskawa.com](http://www.yaskawa.com). If you choose to replace an existing kit with a different kit, you must use the new EDS file as well.*

**Profibus DP.** This option complies with the Profibus DP protocol specification. All parameters, diagnostics and operational commands are accessible via Profibus. The option board provides convenient Phoenix-type terminations for landing the shielded, twisted-pair wiring. Each Profibus network supports up to 99 drives. This option supports all of the Profibus data rates from 9.6 Kbps to 12 Mbps. Up to 32 bytes of input data and 32 bytes of output data are provided per message transaction. GSD files may be downloaded from [www.yaskawa.com](http://www.yaskawa.com) to assist with network configuration and drive setup.

*Mounts at option connector 2CN.*

**Model No. CM061**

**LonWorks.** This option is compatible with the Lon Mark Interoperability Association and complies with the Functional Profile for a Variable Frequency Motor Drive. The option board features the FFT-10A Free Topology Twisted-Pair Transceiver. Network connectivity is facilitated by either a Phoenix-style screw termination or RJ-45 connector. The kit includes a 12-inch pigtail (UWR00567-1) for interface wiring of the phoenix terminal block. Optional longer pigtail assemblies are available for use when drive is mounted within another enclosure. The 20-inch cable is for wall mount enclosures. The 78-inch cable may be used with any enclosure and may be cut to any length required.

*Mounts at option connector 2CN. Covers 3CN. Blocks 4CN.*

**Model No. CM048**

**Model No. UWR00567-2 (20-inch cable)**

**Model No. UWR00567-3 (78-inch cable)**

**Modbus Plus.** This option complies with Modicon's ModConnect Partners program and provides a seamless interface to Quantum, 984 and Compact PLCs. All parameters, diagnostics and operational commands are accessible via Modbus Plus. The option board provides a 9-pin D-shell connector for easy wiring and communicates via a 1 Mbps, twisted-pair, Local Area Network. Each Modbus Plus network supports up to 63 drives.

*Mounts at option connector 2CN. Covers 3CN.*

**Model No. CM071**

**Modbus TCP/IP.** This option complies with the Modbus TCP/IP protocol specification. This allows for communication over 10/100 Mbps Ethernet networks. This option has the ability to configure the IP Address from a user specified IP address, from a DHCP host or from a BootP host. All parameters, diagnostics and operational commands are accessible via Modbus TCP/IP. Auto-tuning the motor is also possible through this option using the DriveWizard PC program. This option supports up to 10 simultaneous PLC/PC connections.

*Mounts at option connector 2CN.*

**Model No. CM090**

**EtherNet/IP.** This option complies with the EtherNet/IP protocol specification. This allows for communication over 10/100 Mbps Ethernet networks. This option has the ability to configure the IP Address from a user specified IP address, from a DHCP host or from a BootP host. All parameters, diagnostics and operational commands are accessible via EtherNet/IP. Auto-tuning the motor is also possible through this option using the DriveWizard PC program.

*Mounts at option connector 2CN.*

**Model No. CM092**

| Rated Input Voltage    | Drive Model Number CIMR-F7U | Physical Dimensions (in.) |       |       | Weight (lbs) <sup>(1)</sup> | Standard Enclosure | Dimension Drawing Number <sup>(2)</sup> | Heat Loss (watts) <sup>(3)</sup> |          |       |      |
|------------------------|-----------------------------|---------------------------|-------|-------|-----------------------------|--------------------|---|----------------------------------|----------|-------|------|
|                        |                             | H                         | W     | D     |                             |                    |   | Heatsink                         | Internal | Total |      |
| 208V/<br>240V/<br>230V | 20P41                       | 11.02                     | 5.51  | 6.30  | 6.6                         | NEMA 1             | DD.F7.FR1.N1.01                         | 19                               | 39       | 58    |      |
|                        | 20P71                       |                           |       |       |                             |                    |   | 26                               | 42       | 68    |      |
|                        | 21P51                       |                           |       | 48    |                             |                    |   | 50                               | 98       |       |      |
|                        | 22P21                       |                           |       | 68    |                             |                    |   | 59                               | 127      |       |      |
|                        | 23P71                       |                           |       | 110   |                             |                    |   | 74                               | 184      |       |      |
|                        | 25P51                       | 164                       | 84    | 248   |                             |                    |   |                                  |          |       |      |
|                        | 27P51                       | 11.81                     | 7.87  | 7.87  | 13.2                        | NEMA 1             | DD.F7.FR3A.N1.01                        | 219                              | 113      | 332   |      |
|                        | 20111                       | 12.20                     |       |       |                             |                    |   | 357                              | 168      | 525   |      |
|                        | 20151                       | 13.78                     | 9.45  | 8.27  | 24.2                        |                    |   | DD.F7.FR4A.N1.01                 | 416      | 182   | 598  |
|                        | 20181                       | 14.96                     |       |       |                             |                    |   |                                  | 472      | 208   | 680  |
|                        | 20221                       | 21.06                     | 10.00 | 10.24 | 53                          |                    |   | DD.F7.FR5.N1.01                  | 583      | 252   | 835  |
|                        | 20301                       | 24.21                     | 10.98 |       |                             | 59                 | 883                                     |                                  | 333      | 1216  |      |
|                        | 20370                       | 23.62                     | 14.76 | 11.81 | 125                         | Protected Chassis  | DD.F7.FR7.IP00.01                       | 1010                             | 421      | 1431  |      |
|                        | 20450                       |                           |       | 12.99 | 139                         |                    |   | 1228                             | 499      | 1727  |      |
|                        | 20550                       | 28.54                     | 17.72 | 13.78 | 189                         |                    |   | DD.F7.FR10.IP00.01               | 1588     | 619   | 2207 |
| 20750                  | 191                         |                           |       |       |                             |                    |   |                                  | 1956     | 844   | 2800 |
| 20900                  | 33.46                       | 19.69                     | 14.17 | 238   | DD.F7.FR11.IP00.01          |                    |   | 2194                             | 964      | 3158  |      |
| 21100                  | 34.84                       | 22.64                     | 14.96 | 330   | DD.F7.FR12.IP00.01          | 2733               | 1234                                    | 3967                             |          |       |      |
| 480V                   | 40P41                       | 11.02                     | 5.51  | 6.30  | 6.6                         | NEMA 1             | DD.F7.FR1.N1.01                         | 14                               | 39       | 53    |      |
|                        | 40P71                       |                           |       |       |                             |                    |   | 17                               | 41       | 58    |      |
|                        | 41P51                       |                           |       | 36    |                             |                    |   | 48                               | 84       |       |      |
|                        | 42P21                       |                           |       | 59    |                             |                    |   | 56                               | 115      |       |      |
|                        | 43P71                       |                           |       | 80    |                             |                    |   | 68                               | 148      |       |      |
|                        | 45P51                       | 127                       | 81    | 208   |                             |                    |   |                                  |          |       |      |
|                        | 47P51                       | 11.81                     | 7.87  | 7.87  | 13.2                        | NEMA 1             | DD.F7.FR3A.N1.01                        | 193                              | 114      | 307   |      |
|                        | 40111                       | 232                       |       |       |                             |                    |   | 158                              | 390      |       |      |
|                        | 40151                       | 13.78                     | 9.45  | 8.27  | 22                          |                    | DD.F7.FR4B.N1.01                        | 296                              | 169      | 465   |      |
|                        | 40181                       |                           |       |       |                             |                    |   | 389                              | 201      | 590   |      |
|                        | 40221                       | 21.06                     | 10.98 | 10.24 | 53                          |                    | DD.F7.FR6B.N1.01                        | 420                              | 233      | 653   |      |
|                        | 40301                       |                           |       |       |                             | 691                |   | 298                              | 989      |       |      |
|                        | 40371                       | 25.00                     | 12.95 | 11.22 | 88                          | DD.F7.FR9A.N1.01   | 801                                     | 332                              | 1133     |       |      |
|                        | 40451                       | 28.15                     |       |       |                             |                    | 901                                     | 386                              | 1287     |       |      |
|                        | 40551                       | 28.15                     |       |       |                             |                    | 1204                                    | 478                              | 1682     |       |      |
|                        | 40750                       | 28.54                     | 17.72 | 13.78 | 194                         | Protected Chassis  | DD.F7.FR10.IP00.01                      | 1285                             | 562      | 1847  |      |
|                        | 40900                       |                           |       |       |                             |                    |   | 196                              | 1614     | 673   | 2287 |
|                        | 41100                       | 33.46                     | 19.69 | 14.17 | 224                         |                    | DD.F7.FR11.IP00.01                      | 1889                             | 847      | 2736  |      |
| 41320                  | 33.46                       | 19.69                     | 14.17 | 265   | 2388                        |                    | 1005                                    | 3393                             |          |       |      |
| 41600                  | 36.06                       | 22.64                     | 14.96 | 352   | DD.F7.FR13.IP00.01          |                    | 2791                                    | 1144                             | 3935     |       |      |
| 41850                  | 51.38                       | 27.95                     | 16.34 | 572   | Protected Chassis           | DD.F7.FR14.IP00.01 | 2636                                    | 1328                             | 3964     |       |      |
| 42200                  |                             |                           |       |       |                             |                    | 3797                                    | 1712                             | 5509     |       |      |
| 43000                  | 58.07                       | 36.06                     | 16.34 | 891   |                             | DD.F7.FR15.IP00.01 | 5838                                    | 2482                             | 8320     |       |      |

(1) This data represents the drive weight only, not shipping weight.

(2) Please refer to Yaskawa's website at [www.yaskawa.com](http://www.yaskawa.com) for dimension drawings.

(3) Total Heat Loss is the amount of heat dissipated by the drive at full load. This data is separated into "Heatsink" and "Internal" values. The value in the "Heatsink" column is the amount of heat dissipated by the heatsink, and would not need to be considered when calculating the enclosure size for applications that may require mounting the heatsink out the back of the enclosure using the Ring Kit option.

# Description

## 3/4-500HP

### F7/Configured

F7C



The F7/Configured package provides an F7 in a NEMA 12 FVFF or NEMA type12 enclosure, with space for several commonly used options, such as reactors, RFI filters, circuit breakers, etc. The F7/Configured has been designed for flexibility in providing the features and options commonly demanded by industrial control designers.

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. Patented high slip braking can eliminate the need for dynamic braking resistors for high inertia loads.

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 drive software.

The F7 supports a variety of communications protocols and input/output control cards.

#### Performance Features

- Ratings: 0.5 to 150HP, 208 to 230/240 VAC  
0.75 to 500HP, 480 VAC
- Overload capacity:
- 150% for 1 min heavy duty, 110% for  
1 min normal duty, 200% peak
- Starting torque, heavy duty:  
150% at 0.5 Hz (open loop), at 0.3 Hz  
(closed loop)
- Starting torque, normal duty:  
120% at 1.5 Hz (V/f)
- Output frequency: 0.01 to 300Hz for heavy  
duty, 400Hz for normal duty
- Controlled speed range:  
40:1 (V/f), 50:1 (V/f with PG), 200:1 (open  
loop), 1000:1 (closed loop)
- Speed regulation:  
2-3% (V/f), 0.5-1% (V/f with PG), 0.2%  
(open loop), 0.01% (closed loop)
- Speed/frequency resolution: 0.01% with dig-  
ital reference, 0.1% with analog reference
- 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, cUL, NEC)
- 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) NEMA-1, to 45°C  
(113°F) protected chassis
- Humidity: non-condensing 95%
- Altitude: to 3300 feet (1000 meter)
- Service Factor: 1.0
- Input voltage: +10% / -15%, 200 to  
240VAC, 380 to 480VAC
- Enclosure: NEMA 1 or protected chassis  
(other options)
- Input frequency: 50/60Hz ± 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 charac-  
ters, 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 (25HP and below)
- Ramp to stop or coast to stop
- High-slip braking
- 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
- Twelve-pulse rectification with optional  
input transformer: 30 to 150HP at 240V, 30  
to 500HP at 480V
- Terminal strip, quick disconnect
- Split cover for ease of wiring
- Plug-in heat sink fan

#### Inputs and Outputs

- Analog input: -10 to +10VDC (20K ohms)  
or 4 to 20 mA (250 ohm)
- Analog output: -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 contact: one 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 508C (Power Conversion)
- CSA 22.2 No. 14-95  
(Industrial Control Equipment)
- UL, cUL listed; CE marked
- UL 1995 (Plenum)
- EN 50178 (LVD)
- EN 61800-3 (w/ External Filter)
- IEC 529, 146
- FCC CFR 47 Part 15 Subpart B  
(w/ External Filter)

#### Configured Options

- Various feedback cards
- Various output cards
- DriveWizard™ software (upload / down-  
load)
- DeviceNet, Profibus-DP, and other proto-  
cols
- Custom drive software
- Input breaker
- Input disconnect
- Input fuses
- 115 VAC interface
- Trim pot
- Input/output reactors
- Input filters
- DC link choke (25HP and below)
- Dynamic braking



# Description

**3/4-500HP  
F7/Configured**

## Model Number Configuration & Pricing:

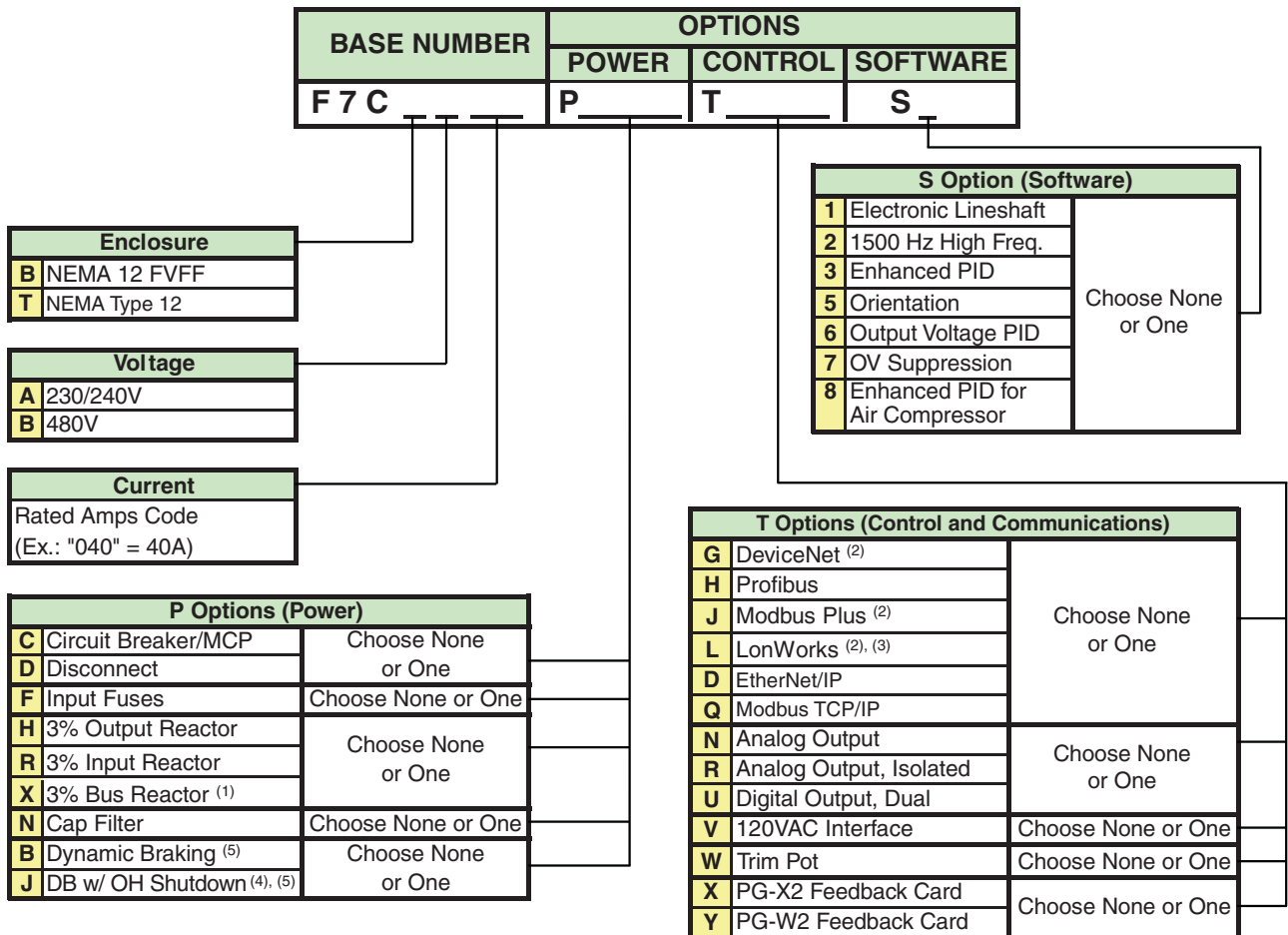
**Step 1.** First complete the Base Number for the required enclosure type, voltage and current rating.

**Step 2.** Add the Option code letter for each required option. Any Power option must be preceded by (P); any Control Option by (T), and Software Option by (S). No more than seven options may be selected. The letters P, T or S must be deleted if no options of that type are selected.

**Step 3.** Find the list price for the Base Number selected from the following pages. Add the list price of each selected option to this base price.

**Example:** F7 Configured package (**F7CB**) with a 480V, 40 Amp (**B040**), with Circuit Breaker and 3% Bus reactor (**P** followed by **CX**), Profibus-DP network communications capability (**T** followed by **H**) and no software option (delete the **S**). Model number is:

**F7CBB040PCXTH**



(1) 3% Bus Reactors are only available as an option on base numbers up to and including F7C\_A068 and B034; larger drives have a Bus Reactor as standard

(2) When this option is selected, port 3CN "Control Output" options **N** and **U** cannot be used

(3) When this option is selected, port 4CN "Feedback" options **X** and **Y** cannot be used

(4) When this option is selected, Power options **C** and **D** are not available

(5) Resistors for Dynamic Braking are NOT included, NOT factory-mounted. Price from DB section.



## Configured Option Descriptions:

### Enclosure Options

- (B) **NEMA 12 FVFF:** The drive and configured controls are provided in a NEMA 12 (IP22, UL Type 1) force-ventilated fan-filtered enclosure, large enough to accommodate any or all of the configured package options.
- (T) **NEMA 12:** The drive and configured controls are provided in a NEMA 12 (IP54, UL Type 12) enclosure, large enough to accommodate any or all of the Configured package options.

### P Options (Power)

- (C) **Circuit Breaker:** The standard configuration provides no branch short circuit protection or input disconnecting means. This option provides a thermal-magnetic circuit breaker that meets NEC branch circuit protection requirements, with a flange-mounted operating handle.
- (D) **Disconnect:** The standard configuration provides no input disconnecting means. This option provides a non-fused disconnect with a flange-mounted operating handle.
- (F) **Input Fuses:** The standard configuration does not include Drive Input Fuses. This option provides high-speed semi-conductor drive input fuses, rated for 200,000 amp RMS symmetrical interrupting capacity, that provides both drive input I2T protection and NEC approved branch circuit and short circuit protection.
- (R) **Input Reactor:** No form of input impedance is normally required for the Configured Drive. A 3% line reactor is available if additional impedance is desired (usually to reduce the effects of line-side transients and input THD).
- (X) **DC Bus Reactor:** No form of bus impedance is normally required for the Configured Drive. A 3% bus reactor is available if additional impedance is desired (usually to reduce the effects of line-side transients and input THD).
- (H) **Output Reactor:** No form of output impedance is normally required for the Configured Drive. A 3% load reactor is available if additional output impedance is desired (usually for long lead-lengths or noise reduction).
- (N) **Input Filter:** The standard configuration does not include a filter. The cap filter is a delta-wye capacitive network.
- (B) **Dynamic Braking:** This option is used to enhance the drive's ability to brake/stop the motor. The braking transistor module is included in the Configured package, and is sized for standard duty (10-15%). This option does NOT include DB resistors or any other DB resistor overtemp protection. See Dynamic Braking Section to select DB resistor.
- (J) **Dynamic Braking with Overtemp Shutdown:** This option is used to enhance the drive's ability to brake/stop the motor. The braking transistor module is included in the Configured package along with a shunt trip MCP and power circuitry to disconnect the input power from the drive, should the DB resistor overtemperature switch activate. The braking transistor is sized for standard duty (10-15%). This option does NOT include DB resistors, and cannot be ordered with Power Options (C) or (D). See Dynamic Braking Section to select DB resistor.

### T Options (Control and Communications)

- (G) **DeviceNet:** This option complies with the ODVA (Open DeviceNet Vendor Association) specification and AC drive profile. All parameter, diagnostics, and operational commands are accessible via DeviceNet. The option board provides a DeviceNet standard open tap connector. Each DeviceNet network supports up to 63 drives. Controllers are available from many PLC and/or PC suppliers. Electronic Data Sheets may be downloaded from [www.yaskawa.com](http://www.yaskawa.com) to assist with network configuration and drive setup. (CM056)
- (H) **Profibus-DP:** This option complies with the Profibus DP protocol specification. All parameters, diagnostics and operational commands are accessible via Profibus. The option board provides convenient Phoenix-type terminations for landing the shielded, twisted-pair wiring. Each Profibus network supports up to 99 drives. This option supports all of the Profibus data rates from 9.6 Kbps to 12 Mbps. Up to 32 bytes of input data and 32 bytes of output data are provided per message transaction. GSD files may be downloaded from [www.yaskawa.com](http://www.yaskawa.com) to assist with network configuration and drive setup.(CM061)



## Description

3/4-500HP  
F7/Configured

### Configured Option Descriptions (continued):

#### T Options (Control and Communications) (continued)

- (J) Modbus Plus:** This option complies with Modicon's ModConnect Partners program and provides a seamless interface to Quantum, 984 and Compact PLCs. All parameters, diagnostics and operational commands are accessible via Modbus Plus. The option board provides a 9-pin D-shell connector for easy wiring and communicates via a 1 Mbps, twisted-pair, Local Area Network. Each Modbus Plus network supports up to 63 drives. (CM071)
- (L) LonWorks:** This option is compatible with the Lon Mark Interoperability Association and complies with the Functional Profile for a Variable Frequency Motor Drive. The option board features the FFT-10A Free Topology Twisted-Pair Transceiver. Network connectivity is facilitated by either a Phoenix-style screw termination or RJ-45 connector. (CM048)
- (D) EtherNet/IP:** This option complies with the EtherNet/IP protocol specification. This allows for communication over 10/100 Mbps Ethernet networks. This option has the ability to configure the IP Address from a user specified IP address, from a DHCP host, or from a BootP host. All parameters, diagnostics and operational commands are accessible via EtherNet/IP. Auto-tuning the motor is also possible through this option using the DriveWizard PC program. (CM092)
- (Q) Modbus TCP/IP:** This option complies with the Modbus TCP/IP protocol specification. This allows for communication over 10/100 Mbps Ethernet networks. This option has the ability to configure the IP Address from a user specified IP address, from a DHCP host, or from a BootP host. All parameters, diagnostics and operational commands are accessible via Modbus TCP/IP. Auto-tuning the motor is also possible through this option using the DriveWizard PC program. This option supports up to 10 simultaneous PLC/PC connections. (CM090)
- (N) Analog Output, Bi-polar, 12 Bit:** This option provides 2 signals for remote metering of any two of the drive's "U1" monitors. These are in addition to the two standard analog outputs.  
Signal levels (individually selectable):  $\pm 10\text{VDC}$  (20kOhm), 11 bit + sign (AO-12)
- (R) Analog Output, Isolated, Bi-polar, 12 Bit:** This option provides 2 isolated signals for remote metering of any two of the drive's "U1" parameters. These are in addition to the two standard analog outputs.  
Signal levels (individually selectable): 0 to  $\pm 10\text{VDC}$  (20kOhm), 0/4 to 20mADC (500Ohm max), 11 bit + sign (AO-001)
- (U) Digital Output, Dual Relay:** This option provides 2 additional digital outputs for use in monitoring the status outputs of the drive. These are in addition to the 5 standard digital outputs.  
Signal levels: 2 channels, Form C, 250VAC, 30VDC, 1A (DO-02C)
- (V) 120VAC Input:** This option attaches directly to the control board terminal strip to all of the digital input (24VDC) terminals (S1 thru S8). External 120VAC control inputs can now be used with the drive. (DI-001)
- (W) Analog Input Trim Pot:** This option provides a 5kOhm potentiometer for use as a dropping resistor for maximum or minimum analog input trim. This voltage in turn can be used to supply a remote speed pot. (AI-001)
- (X) Single Encoder Feedback:** This option provides velocity and direction feedback from an encoder. This is primarily used for motor speed feedback in closed loop flux vector control. A 5VDC buffered output is also included. Signal levels: 5 or 12VDC differential line driver with compliments, maximum input frequency of 300kHz, phases A and B (Z required with some custom software). (PG-X2)
- (Y) Dual Encoder Feedback:** This option provides velocity and direction feedback from 2 encoders. This card is used for 2-motor operation with standard software and for some custom software titles. A 5VDC buffered output is also included. Signal levels: 5 or 12VDC differential line driver with compliments, maximum input frequency of 300kHz, phases A and B (Z required with some custom software). (PG-W2)



## Configured Option Descriptions (continued):

### S Options (Software)

- (1) **Electronic Lineshaft ELS (064):** This software option allows the Drive to act as a follower, controlling its motor's velocity and phase with respect to a master encoder signal. This software provides error (drift) free tracking of the master signal. Features include Advance, Retard, Lineshaft Disable, Registration Control, Alignment Control, and multiple preset gear ratios. The phase loop can be disabled thus making the drive a digital velocity follower. A PG-W2 Dual Encoder Feedback Card is required. The encoder must output a quadrature, line driver signal.
- (2) **1500 Hz High Frequency (056):** This software option allows the Drive to operate at an output frequency of up to 1500 Hz for high-speed spindle applications. It is available in V/Hz control mode only, and uses different drive current ratings and overload settings as compared to standard software. Therefore, the software manual (TM.F7SW.056.1500HzHighFrequency) must be consulted to properly size the drive for the application.
- (3) **Enhanced PID (058):** This software option allows the Drive to trim the speed reference with a PID feedback control loop. The feedback device, such as a dancer, is monitored with regard to its setpoint. Any error is sent to the PID and then the output of the PID is added to the frequency reference. Other features include PID feedback alarms, Accel/Decel control, and differential control.
- (5) **Orientation (063):** This software option allows the Drive to stop (or orientate) a machine to the same position every time the machine is stopped. This feature is designed for machine tools and punch/stamping presses where the machine must always stop at the same position to allow for automatic tool changing. An encoder feedback option card is always required. The machine configuration will determine which card, the PG-X2 or the PG-W2, is required.
- (6) **Output Voltage PID (061):** This software option allows the Drive to regulate its output voltage using a PID feedback loop. This function is useful for applications like uninterruptible power supplies (UPS) and vibratory welders. An external voltage-measuring device is required to provide the voltage feedback signal. This software is available in V/Hz control mode only.
- (7) **OV Suppression (062):** This software option allows the Drive to prevent overvoltage fault trips in cyclic applications like punch presses, shaker tables, and pump jacks (beam pumps) without the need for a dynamic braking resistor. This feature only works at constant speed and is not applicable for stopping the machine.
- (8) **Enhanced PID for Air Compressors (096):** This software option allows the Drive to provide optimum control of non-reciprocating rotary screw air compressors. The Drive will regulate the air pressure in an air compressor using a PID control loop. The pressure feedback device is monitored with regard to its setpoint and any error is corrected. Other features include PID feedback alarms, "blowdown valve" control, improved, scalable monitors with selectable display units, and an improved sleep function.

# F7C

## Configured Drives and Options

**F7 Configured Drives** - 3/4-500HP, 208-230/240 and 480V, 3-phase input, NEMA 12 enclosure, with factory-installed and wired options

| Rated Input Voltage | Rated Output Current (Amps) <sup>(2)</sup> | Nom. HP <sup>(1)</sup> | Base Number                      |              |      |              | P Options (Power) |               |             |   |           |           |               |   |           |  |  |
|---------------------|--|------------------------|----------------------------------|--------------|------|--------------|-------------------|---------------|-------------|---|-----------|-----------|---------------|---|-----------|--|--|
|                     |  |                        | Configured Enclosure             |              |      |              | Circuit Breaker   |               | Input Fuses | Line Impedance  |           |           | Input Filter  | Dynamic Braking <sup>(3)</sup>                          |           |  |  |
|                     |  |                        | B=NEMA 12 FVFF<br>T=NEMA Type 12 |              |      |              | C= MCP            | D= Disconnect | F= Fuses    | H=3% Output Reactor<br>R=3% Input Reactor<br>X=3% Bus Reactor |           |           | N= Cap Filter | B=Standard Duty<br>J=Standard Duty w/ Overtemp Shutdown |           |  |  |
|                     |  |                        | F7CB                             | Base List \$ | F7CT | Base List \$ | C List \$         | D List \$     | F List \$   | H List \$   | R List \$ | X List \$ | N List \$     | B List \$   | J List \$ |  |  |
| 240V                | 3.2  | 3/4                    | ---                              |              | A003 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 4.2  | 1                      | ---                              |              | A004 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 6.8  | 2                      | ---                              |              | A006 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 9.6  | 3                      | ---                              |              | A009 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 15.2                                       | 5                      | ---                              |              | A015 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 22   | 7.5                    | ---                              |              | A022 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 28   | 10                     | ---                              |              | A028 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 42   | 15                     | ---                              |              | A042 |              |                   |               |             |   |           |           |               |   |           |  |  |
| 230V                | 54   | 20                     | ---                              |              | A054 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 68   | 25                     | ---                              |              | A068 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 80   | 30                     | ---                              |              | A080 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 104  | 40                     | ---                              |              | A104 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 130  | 50                     | A130                             |              | ---  |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 154  | 60                     | A154                             |              | ---  |              |                   |               |             |   |           |           |               |   |           |  |  |
| 480V                | 192  | 75                     | A192                             |              | ---  |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 248  | 100                    | A248                             |              | ---  |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 312  | 125                    | A312                             |              | ---  |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 360  | 150                    | A360                             |              | ---  |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 1.6  | 3/4                    | ---                              |              | B001 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 2.1  | 1                      | ---                              |              | B002 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 3.4  | 2                      | ---                              |              | B003 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 4.8  | 3                      | ---                              |              | B004 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 7.6  | 5                      | ---                              |              | B007 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 11   | 7.5                    | ---                              |              | B011 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 14   | 10                     | ---                              |              | B014 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 21   | 15                     | ---                              |              | B021 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 27   | 20                     | ---                              |              | B027 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 34   | 25                     | ---                              |              | B034 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 40   | 30                     | ---                              |              | B040 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 52   | 40                     | ---                              |              | B052 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 65   | 50                     | ---                              |              | B065 |              |                   |               |             |   |           |           |               |   |           |  |  |
|                     | 77   | 60                     | ---                              |              | B077 |              |                   |               |             |   |           |           |               |   |           |  |  |
| 96                  | 75   | ---                    |                                  | B096         |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 124                 | 100  | B124                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 156                 | 125  | B156                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 180                 | 150  | B180                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 240                 | 200  | B240                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 302                 | 250  | B302                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 361                 | 300  | B361                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 414                 | 350  | B414                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 477                 | 400  | B477                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 515                 | 450  | B515                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |
| 590                 | 500  | B590                   |                                  | ---          |      |              |                   |               |             |   |           |           |               |   |           |  |  |

- (1) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors
- (2) This is the maximum rated output for the configured drive package, not the drive's output current rating.
- (3) See Dynamic Braking Section to select DB resistors.

### F7 Configured (Continued)

| Rated Input Voltage | Rated Output Current (Amps) <sup>(4)</sup> | Nom. HP <sup>(1)</sup> | T Options (Control and Communication)  |           |           |           |           |           |  |           |           |                     |            |                    | S Options  |               | Uses Drive Model Number CIMR-F7U |                 |
|---------------------|--|------------------------|--|-----------|-----------|-----------|-----------|-----------|--|-----------|-----------|---------------------|------------|--------------------|--|---------------|----------------------------------|-----------------|
|                     |  |                        | Network Communications   |           |           |           |           |           | Control Outputs  |           |           | Term. 1             | Terminal 2 | Encoder Feedback   | Software   |               |                                  |                 |
|                     |  |                        | G=DeviceNet<br>H=Profibus<br>J=Modbus Plus <sup>(2)</sup><br>L=LonWorks <sup>(2) (3)</sup><br>Q=Modbus TCP/IP<br>D=EtherNet/IP |           |           |           |           |           | N=Analog Output<br>R=Analog Output, Isolated<br>U=Digital Output |           |           | V=120 VAC Interface | W=Trim Pot | X=PG-X2<br>Y=PG-W2 | 1=ELS<br>2=1500Hz<br>3=PID, 5=ORI<br>6=OV PID<br>7=OV SUP<br>8=AIR PID |               |                                  |                 |
|                     |  |                        | G List \$  | H List \$ | J List \$ | L List \$ | Q List \$ | D List \$ | N List \$  | R List \$ | U List \$ | V List \$           | W List \$  | X List \$          | Y List \$  | 1,5,7 List \$ |                                  | 2,3,6,8 List \$ |
| 240V                | 3.2  | 3/4                    |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20P41           |
|                     | 4.2  | 1                      |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20P71           |
|                     | 6.8  | 2                      |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 21P51           |
|                     | 9.6  | 3                      |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 22P21           |
|                     | 15.2                                       | 5                      |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 23P71           |
|                     | 22   | 7.5                    |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 25P51           |
|                     | 28   | 10                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 27P51           |
|                     | 42   | 15                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20111           |
| 230V                | 54   | 20                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20151           |
|                     | 68   | 25                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20181           |
|                     | 80   | 30                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20221           |
|                     | 104  | 40                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20300           |
|                     | 130  | 50                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20370           |
|                     | 154  | 60                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20450           |
|                     | 192  | 75                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20550           |
|                     | 248  | 100                    |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20750           |
| 480V                | 312  | 125                    |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 20900           |
|                     | 360  | 150                    |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 21100           |
|                     | 1.6  | 3/4                    |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40P41           |
|                     | 2.1  | 1                      |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40P71           |
|                     | 3.4  | 2                      |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 41P51           |
|                     | 4.8  | 3                      |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 42P21           |
|                     | 7.6  | 5                      |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 43P71           |
|                     | 11   | 7.5                    |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 45P51           |
|                     | 14   | 10                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 47P51           |
|                     | 21   | 15                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40111           |
|                     | 27   | 20                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40151           |
|                     | 34   | 25                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40181           |
|                     | 40   | 30                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40221           |
|                     | 52   | 40                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40301           |
|                     | 65   | 50                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40371           |
|                     | 77   | 60                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40451           |
|                     | 96   | 75                     |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40551           |
|                     | 124  | 100                    |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               |                                  | 40751           |
| 156                 | 125  |                        |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               | 40900                            |                 |
| 180                 | 150  |                        |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               | 40900                            |                 |
| 240                 | 200  |                        |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               | 41320                            |                 |
| 302                 | 250  |                        |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               | 41600                            |                 |
| 361                 | 300  |                        |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               | 41850                            |                 |
| 414                 | 350  |                        |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               | 42200                            |                 |
| 477                 | 400  |                        |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               | 43000                            |                 |
| 515                 | 450  |                        |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               | 43000                            |                 |
| 590                 | 500  |                        |  |           |           |           |           |           |  |           |           |                     |            |                    |  |               | 43000                            |                 |

- (1) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors
- (2) When this option is selected, port 3CN "Control Output" options (N, U) cannot be used
- (3) When this option is selected, port 4CN "Encoder Feedback" options (X, Y) cannot be used
- (4) This is the maximum rated output for the configured drive package, not the drive's output current rating.



# Heatsink Filter Kit Options

**Heatsink Filter Kit Option** (only for Configured product) - The filter kit is mounted to the back of the enclosure, providing additional protection to the exposed drive heatsink and fan assemblies. It has been designed for extremely dirty or dusty environments in which cooling fans and heatsink fins could easily become clogged. The kit contains a duct and a pair of filters, which can be removed and cleaned, increasing fan life and cooling efficiency.

| Rated Input Voltage | Configured Package<br>Model Number<br>F7CT____ | Heatsink Filter Kit |               | Replacement Filter |               |
|---------------------|--|---------------------|---------------|--------------------|---------------|
|                     |  | Heatsink Filter Kit | List Price \$ | Model Number       | List Price \$ |
| 208-230/240V        | A003 thru A015                                 | UFL00003-1          |               | UFL00002-1         |               |
|                     | A022, A028                                     | UFL00003-2          |               | UFL00002-2         |               |
|                     | A042, A054                                     | UFL00003-3          |               | UFL00002-3         |               |
| 480V                | B001 thru B011                                 | UFL00003-1          |               | UFL00002-1         |               |
|                     | B014, B021                                     | UFL00003-2          |               | UFL00002-2         |               |
|                     | B027, B034                                     | UFL00003-3          |               | UFL00002-3         |               |



| Rated Input Voltage | Configured F7CB or F7CT | Rated Output Current (Amps) <sup>(2)</sup> | Nominal HP <sup>(1)</sup> | Physical Dimensions (in.) |       |       | Weight (lbs) <sup>(3)</sup> | Configured Enclosure | Dimension Drawing Number <sup>(4)</sup> |
|---------------------|-------------------------|--|---------------------------|---------------------------|-------|-------|-----------------------------|----------------------|---|
|                     |                         |  |                           | H                         | W     | D     |                             |                      |   |
| 240V                | A003                    | 3.2  | 3/4                       | 28.50                     | 17.50 | 11.75 | 87                          | NEMA 12              | DD.F7C.W1.N12.01                        |
|                     | A004                    | 4.2  | 1                         |                           |       |       | 87                          |                      |   |
|                     | A006                    | 6.8  | 2                         |                           |       |       | 90                          |                      |   |
|                     | A009                    | 9.6  | 3                         |                           |       |       | 92                          |                      |   |
|                     | A015                    | 15.2                                       | 5                         | 102                       |       |       |                             |                      |   |
|                     | A022                    | 22   | 7.5                       | 34.50                     | 20.00 | 15.00 | 128                         | NEMA 12              | DD.F7C.W2.N12.01                        |
|                     | A028                    | 28   | 10                        | 138                       |       |       |                             |                      |   |
|                     | A042                    | 42   | 15                        | 39.50                     | 25.00 | 15.50 | 192                         | NEMA 12              | DD.F7C.W3.N12.01                        |
| A054                | 54                      | 20   | 225                       |                           |       |       |                             |                      |   |
| A068                | 68                      | 25   | 52.00                     | 29.00                     | 19.75 | 301   | NEMA 12                     | DD.F7C.W4.N12.01     |   |
| A080                | 80                      | 30   |                           |                           |       | 346   |                             |                      |   |
| A104                | 104                     | 40   |                           |                           |       | 335   |                             |                      |   |
| 230V                | A130                    | 130  | 50                        | 84.00                     | 37.75 | 27.00 | 804                         | NEMA 12 FVFF         | DD.F7C.F1.N1.01                         |
|                     | A154                    | 154  | 60                        |                           |       |       | 820                         |                      |   |
|                     | A192                    | 192  | 75                        |                           |       |       | 880                         |                      |   |
|                     | A248                    | 248  | 100                       |                           |       |       | 880                         |                      |   |
|                     | A312                    | 312  | 125                       | 84.00                     | 73.25 | 27.00 | 1340                        | NEMA 12 FVFF         | DD.F7C.F2.N1.01                         |
| A360                | 360                     | 150  | 1450                      |                           |       |       |                             |                      |   |
| 480V                | B001                    | 1.6  | 3/4                       | 28.50                     | 17.50 | 11.75 | 87                          | NEMA 12              | DD.F7C.W1.N12.01                        |
|                     | B002                    | 2.1  | 1                         |                           |       |       | 87                          |                      |   |
|                     | B003                    | 3.4  | 2                         |                           |       |       | 88                          |                      |   |
|                     | B004                    | 4.8  | 3                         |                           |       |       | 96                          |                      |   |
|                     | B007                    | 7.6  | 5                         | 93                        |       |       |                             |                      |   |
|                     | B011                    | 11   | 7.5                       | 101                       |       |       |                             |                      |   |
|                     | B014                    | 14   | 10                        | 34.50                     | 20.00 | 15.00 | 134                         | NEMA 12              | DD.F7C.W2.N12.01                        |
|                     | B021                    | 21   | 15                        | 138                       |       |       |                             |                      |   |
|                     | B027                    | 27   | 20                        | 39.50                     | 25.00 | 15.50 | 178                         | NEMA 12              | DD.F7C.W3.N12.01                        |
|                     | B034                    | 34   | 25                        | 196                       |       |       |                             |                      |   |
|                     | B040                    | 40   | 30                        | 52.00                     | 29.00 | 19.75 | 295                         | NEMA 12              | DD.F7C.W4.N12.01                        |
|                     | B052                    | 52   | 40                        |                           |       |       | 295                         |                      |   |
|                     | B065                    | 65   | 50                        |                           |       |       | 366                         |                      |   |
|                     | B077                    | 77   | 60                        |                           |       |       | 370                         |                      |   |
|                     | B096                    | 96   | 75                        | 387                       |       |       |                             |                      |   |
|                     | B124                    | 124  | 100                       | 84.00                     | 37.75 | 27.00 | 890                         | NEMA 12 FVFF         | DD.F7C.F1.N1.01                         |
|                     | B156                    | 156  | 125                       |                           |       |       | 890                         |                      |   |
| B180                | 180                     | 150  | 890                       |                           |       |       |                             |                      |   |
| B240                | 240                     | 200  | 925                       |                           |       |       |                             |                      |   |
| B302                | 302                     | 250  | 1075                      |                           |       |       |                             |                      |   |
| B361                | 361                     | 300  | 1740                      | 84.00                     | 73.25 | 27.00 | 1800                        | NEMA 12 FVFF         | DD.F7C.F2.N1.01                         |
| B414                | 414                     | 350  | 1800                      |                           |       |       |                             |                      |   |
| B477                | 477                     | 400  | 1800                      |                           |       |       |                             |                      |   |
| B515                | 515                     | 450  | 2125                      |                           |       |       |                             |                      |   |
| B590                | 590                     | 500  | 2125                      |                           |       |       |                             |                      |   |

- (1) Horsepower rating is based on standard NEMA B 4-pole motor design as represented in NEC table 430.150 Full-Load Current, Three-Phase Alternating Current Motors
- (2) This is the maximum rated output for the configured drive package, not the drive's output current rating.
- (3) Data represents the total approx. weight of the drive with all possible standard options, not shipping weight.
- (4) Please refer to Yaskawa's website at [www.yaskawa.com](http://www.yaskawa.com) for dimension drawings.

# Software, Drawings, Manuals

## Software

**DriveWizard Software Kit.** This software package allows uploading and downloading of parameters via a PC for data storage and for programming of a drive. The software includes graphing and monitoring tools. It is a Windows-based program designed to make startup, commissioning, and troubleshooting of Yaskawa drives as simple as possible. Refer to our website at [www.yaskawa.com](http://www.yaskawa.com) for more information, including minimum system requirements. This kit includes the DriveWizard program on CD and a PC interface cable.  
**Model No. DWST616-C2**

**DriveWizard Software.** Software CD only. The software can also be downloaded for free on our website [www.yaskawa.com](http://www.yaskawa.com).  
**Model No. CD.DW.01**

**PC Interface Cable.** This 6 foot cable interconnects the drive keypad port to the 9-pin communications port on a PC. This cable is used in conjunction with DriveWizard software.  
**Model No. UWR00468-2**

## Drawings

**Approval/Special Drawings.** Pricing for drives and options is based on standard documentation, which consists of one Technical Manual, standard Instruction Sheets, Wiring Diagrams and Outline Drawings. When approval or special drawings must be prepared and submitted to the customer, a Drawing Price Addition must be made for each different drive being offered. Material procurement and manufacture will not commence until written drawing approval is received by the factory.

## Manuals/CDs

**Technical Manuals.** One manual and CD-ROM is included with each drive at no charge when shipped from the factory.

**Additional copies of Manual or CD-ROM:**

|                                |    |
|--------------------------------|----|
| <b>Part No. TM.F7.01</b> ..... | \$ |
| <b>Part No. CD4005</b> .....   | \$ |

In today's world of global competition, it is impossible for a company to survive without "state-of-the-art" technically trained associates and customers. Yaskawa Technical Training Services (TTS) is comprised of engineers who are specialists in their field.

Yaskawa Electric America has three training facilities in the United States. The primary training facility is in Yaskawa Electric America's North American Headquarters in Waukegan, Illinois (45 miles north of Chicago, 50 miles south of Milwaukee). This facility has six training rooms; two lecture halls, two training rooms and two training labs.

Besides the possibility of attending training classes in Waukegan and Los Angeles, Yaskawa Electric America can also bring training to the customer. On-site classes are available in two varieties. The first is to duplicate the official training classes at the customer's location. Full functioning demo units, data projector, computer and documentation can be shipped to recreate the official class on-site. The second variety is road show training. Road show training is a one-day training class that is specifically tailored to the students' needs and questions. Only basic demos are used and the topics covered in class are generated by the students in attendance.

The Yaskawa Virtual Training Room is another training option. All you need is an Internet connection and a telephone. This is a live, interactive training class, which gives you the ability to talk to the instructor as well as other students. The Internet connection allows us to show slides and demonstrate software packages. The telephone is for the audio portion of the training class. Web classes can be found on the Yaskawa formal training schedule and can also be done on-demand, per the time and preference of the customer.

## **Training Classes Available**

### **F7 Sales/Web Class**

Short, information packed class designed to present ample specific product information in a short amount of time, typically 1-3 hours. Can be done live or over the web.

### **F7 Installation and Start-Up Workshop**

The F7 Installation and Start-Up class is designed for technicians and engineers that need to know how to install and start up a F7 Drive.

### **F7 Application Programming**

The F7 Application Programming class is designed for technicians and engineers that need to know how to incorporate a F7 Drive into an application.

### **Hands-On Troubleshooting for AC Drives**

The Hands-On Troubleshooting for AC Drives class is designed for technicians and engineers that need to know the basic theory of troubleshooting a Yaskawa variable-frequency drive (P7, F7, G7).

To enroll, contact Technical Training Services.  
Phone: 1-800-Yaskawa (1-800-927-5292), dial 4, then 1.  
Fax: 847-887-7185  
E-mail: [training@yaskawa.com](mailto:training@yaskawa.com)

Check out the latest class schedule and cut sheets at [www.yaskawa.com](http://www.yaskawa.com)

# Terms and Conditions

## YASKAWA ELECTRIC AMERICA, INC. - STANDARD TERMS AND CONDITIONS OF SALE

### 1. GENERAL:

- (a) Any sale of products or services by Yaskawa Electric America, Inc. ("YEA") is governed exclusively by these Standard Terms and Conditions of Sale ("Standard Terms") and shall supersede any inconsistent or additional terms on Buyer's purchase order or any other document. These Standard Terms constitute the final, complete and exclusive agreement between YEA and the Buyer as to the subject matter hereof. YEA hereby objects to any inconsistent or additional terms. This Agreement may be amended only in writing signed by an authorized representative of YEA.
- (b) Any order placed with YEA must be in the form of a written purchase order or letter from Buyer ("Order") and shall set forth all information necessary for YEA to fill the Order, if accepted. All proposals, quotations or similar communications from YEA will be considered invitations to Buyer to submit an Order. A binding sales contract will result only when YEA accepts Buyer's Order, at YEA's office in Waukegan, Illinois or such other place as designated by YEA. YEA reserves the right to bill any Order at a minimum of \$100, plus any additional charges provided for herein.
- (c) All products shall be packaged for domestic shipment in accordance with YEA's standard specifications. If special packaging is required, it must be clearly requested on Buyer's Order. The price for any special packaging shall be billed to Buyer.

### 2. WARRANTY:

- (a) YEA warrants that each new and unused product sold by YEA shall be free of defects in material workmanship for a period of one (1) year from the date the product is first used by Buyer, or 18 months from the date of shipment, whichever occurs first. YEA warrants that its services shall be free of defects in workmanship for a period of ninety (90) days from the date they are first provided. Within the applicable warranty period, YEA will, at its sole discretion, either repair, replace or return the purchase price paid to YEA for any product, part or service found by YEA to be defective; provided that the subject product is used under normal conditions for which it was designed and installed, operated and maintained in accordance with YEA's instructions and (subject always to such instructions) in accordance with generally accepted industrial practices.
- (b) YEA's warranty obligation shall be conditioned upon receipt by YEA of written notice of any alleged defects within sixty (60) days after discovery. YEA will not be responsible or accept invoices for unauthorized repairs to any products, even if defective. YEA shall not be responsible for any products which have been altered, abused, misused, or improperly installed or repaired, or for any loss, damage, defect, claim or non-performance resulting from or attributable to Buyer's specifications.
- (c) Where Buyer requests that YEA supply non-stock products or component parts manufactured by a third-party, YEA will, to the extent permitted, pass through to Buyer any warranty of the manufacturer. As to such items, Buyer's sole remedy for breach of warranty shall be the remedy offered by and available from the manufacturer. YEA shall have no liability, whether in contract, tort or otherwise, for such products.
- (d) YEA does not guarantee production rates or the quality of goods made using YEA's products or services, nor shall any longer warranty periods apply, except as agreed in writing signed by an authorized YEA representative.
- (e) YEA's WARRANTY HEREIN IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES OF YEA AND ALL PARENT OR AFFILIATED COMPANIES OF YEA. ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE OR USE, ARE HEREBY EXCLUDED.
- (f) UNDER NO CIRCUMSTANCES SHALL YEA, OR ANY PARENT OR AFFILIATED COMPANY OF YEA, BE LIABLE TO BUYER OR ANY ENTITY FOR ANY SPECIAL, INDIRECT OR

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Yaskawa Electric America

CONSEQUENTIAL DAMAGES, WHETHER ARISING FROM BREACH OF CONTRACT, TORT, NEGLIGENCE, MISREPRESENTATION, STRICT LIABILITY OR OTHERWISE, INCLUDING FOR LOST PROFITS, IMPAIRMENT OF GOODS, WORK STOPPAGE OR OTHERWISE, IN ANY WAY ARISING OUT OF OR RELATED TO GOODS OR SERVICES SUPPLIED BY YEA OR ANY TRANSACTION TO WHICH THESE STANDARD TERMS APPLY. THE MAXIMUM LIABILITY OF YEA, INCLUDING, BUT NOT LIMITED TO, WITH RESPECT TO THE DESIGN, MANUFACTURE, SALE, DELIVERY, RESALE, INSPECTION, ASSEMBLY, INSTALLATION, TESTING, REPAIR, REPLACEMENT, MAINTENANCE OR USE OF ANY PRODUCT OR THE PERFORMANCE OF ANY SERVICE, SHALL NOT EXCEED THE PURCHASE PRICE PAID TO YEA FOR THE DEFECTIVE PRODUCT OR SERVICE.

### 3. DRAWINGS/MEASUREMENTS:

All drawings, tables, graphs and the like submitted by YEA or contained in YEA's publications shall be regarded as approximations only. Weights, measurements, capacities and all other particulars of products or services offered by YEA are approximations only. YEA is not responsible for such approximations, including, in particular, based on data supplied by Buyer.

### 4. INFRINGEMENT:

YEA's liability for infringement (and the liability of any parent or affiliated company of YEA) is limited to YEA's defense of any suit or proceeding brought against Buyer based on a claim that products sold hereunder, when employed in the manner intended by YEA, constitutes an infringement of any patent of the United States. If Buyer's use of the products in the manner intended by YEA is finally enjoined in such action, YEA shall, at its option, procure for Buyer the right to continue using the products, replace the same with non-infringing products, modify the products so that they become non-infringing equivalent products, or refund the purchase price (less allowance for use, damage or obsolescence). YEA makes no warranty against patent infringement resulting from portions of the products made to Buyer's specifications or the use of products in combination with any other products or in the practice of any process, and if a claim, suit or action is brought against YEA or any parent or affiliate of YEA, Buyer shall defend, indemnify and save YEA (and its parent/affiliates) harmless from and against any and all claims, losses or damages arising therefrom.

### 5. SHIPMENT, FORCE MAJEURE, PRICES AND ERROR:

- (a) Shipment/delivery dates are approximations only. YEA shall not be liable to pay any penalty or damages, including consequential damages, for any delay in shipment.
- (b) In no event shall YEA be liable for any damages, including consequential damages, caused by delays or non-performance resulting from or related to force majeure or other causes beyond YEA's reasonable control, including, but not limited to, war, blockade, civil disturbances, strikes and lockouts, labor shortages, fire and other casualties, acts of nature, accidents and governmental acts (including regulations concerning export and import licensing and currency exchange). In case of non-delivery, YEA's obligation shall be limited to the refund of any advance payment received from Buyer.
- (c) All claims for loss of or damage to products, whether concealed or obvious, must be made, in writing, to the carrier and to YEA by Buyer as soon as possible after receipt of shipment, and in no case beyond 30 days of shipment, or such claims shall be deemed waived. YEA will render reasonable assistance in providing information necessary for Buyer to process such damage claims with the carrier or any insurance company.



# Terms and Conditions

(d) YEA's quoted prices are firm for thirty (30) days from the date of YEA's written proposal. Thereafter, the applicable prices are those in effect at the time Buyer's Order is placed with YEA. YEA will notify Buyer of any price changes for incorporation into a revised Order prior to acceptance by YEA. Pricing based on volume discounts is subject to adjustment by YEA if actual shipping volumes do not meet minimum volume requirements of agreement. Clerical errors in any element of a proposal, purchase order, invoice or contract are subject to correction by YEA.

(e) (1) Buyer agrees to accept delivery within fifteen (15) days following the anticipated date of delivery. If Buyer refuses to take delivery within the fifteen (15) day period, YEA reserves the right to charge Buyer for storage charges plus interest.

(f) (2) All shipments are F.O.B. YEA's (or its suppliers') manufacturing plant or warehouse. YEA will, at Buyer's expense, arrange for the transportation of the products from the manufacturing plant or warehouse designated by YEA. Buyer is responsible to timely procure all necessary export and import licenses and all permits required for the consummation of the transaction.

## 6. TERMS OF PAYMENT:

(a) All payments are due within thirty (30) days of YEA's invoice. YEA reserves the right to require payment in advance, or satisfactory security, for any shipment or sale. YEA may cancel any shipment or Order for any Buyer which has failed to make payment or comply with any other provision of these Standard Terms. YEA reserves the right to seek any other remedy available at law or equity. Payment shall be made at the agreed time, to the place specified, and in the currency indicated on YEA's invoice. Buyer's failure to pay at the agreed time and place constitutes a waiver of Buyer's right to demand YEA's performance under the contract.

(b) When an account becomes past due according to its payment terms, Buyer shall pay interest on the balance due, at the greater of 1.50% per month (18% per annum) or the maximum permitted by law, until paid in full.

(c) If delivery and/or payment in installments are accepted by YEA, Buyer's failure to pay any installment when due shall give YEA the right to suspend work or delivery until such payment is made. In the event that any such default by Buyer continues for more than fifteen (15) days, YEA may then cancel the contract by written notice to Buyer. Upon cancellation of an installment contract, all items already delivered to and paid for in full by Buyer will be transferred to Buyer "AS IS, WHERE IS," without any warranty.

(d) All duties, tariffs, fees, costs and other charges connected with shipment, insurance, exportation and importation of the products are the responsibility of Buyer, and, if paid by YEA, such expenses may be recovered by YEA from Buyer, and Buyer shall indemnify YEA against claims for the same. Buyer is responsible for all taxes applicable or related to this transaction, including all sales, use and excise taxes.

## 7. RISK OF LOSS:

Risk of loss and/or damage to the products shall pass to Buyer upon delivery thereof to Buyer or its representative, or to a carrier for shipment to Buyer or its designated customer, as the case may be, at the manufacturing plant or warehouse of YEA or its supplier. Buyer is responsible to obtain insurance coverage on all shipments of products supplied by YEA.

## 8. RETURNS/CANCELLATION CHARGES:

Buyer shall not return any product to YEA without the written consent of, and upon terms agreed to, by YEA. If Buyer refuses to accept delivery, or improperly revokes acceptance of product, Buyer shall be responsible for YEA's cancellation charges and expenses.

Before returning products, a Return Merchandise Authorization ("R.M.A.") number must be obtained from YEA. Products returned without an R.M.A. number clearly marked on the outside of the shipping carton will be refused. Except for approved warranty returns, YEA will only accept for return and credit new, unused, current stock items, in the original packaging and undamaged. Buyer shall be responsible for all freight charges, import/export charges, duties, tariffs, taxes, insurance and risk of loss/damage regarding return shipment to YEA.

## 9. SECURITY INTEREST:

To secure any indebtedness due and owing from Buyer from time to time, Buyer hereby grants to YEA, and YEA hereby reserves, a continuing purchase money security interest in all Yaskawa-brand and other products heretofore or hereafter sold and delivered to Buyer by YEA, and all related parts, components and accessories therefor, and all proceeds arising from the sale or other disposition of the foregoing, including, but not limited to, cash, accounts, contract rights, accounts receivable, instruments and chattel paper. Buyer shall at no time grant any security interest that conflicts with that granted to YEA herein. Buyer shall cooperate with YEA, and hereby appoints YEA as its attorney-in-fact, to execute and file, on Buyer's behalf, any documents necessary to evidence and perfect YEA's security interest.

## 10. GOVERNING LAW, FORUM AND JURY WAIVER:

These Standard Terms and the relationship of the parties hereto shall be governed by the internal laws of the State of Illinois, U.S.A., without regard to its choice of law rules. For all claims or disputes arising out of or relating to the sale of products or services by YEA and/or the relationship of Buyer and YEA, Buyer shall file any and all lawsuits or claims exclusively in the state or federal courts located in Cook County, Illinois. Buyer hereby submits to the personal jurisdiction of said courts and waives any claim of improper or inconvenient venue. To the fullest extent permitted by law, Buyer hereby agrees to waive the right to trial by jury for all claims or disputes arising out of or relating to the sale of products or services by YEA and/or the relationship of Buyer and YEA. The parties agree that U.N. Convention of Contracts for the International Sale of Goods shall not apply to their relationship or the sale of products by YEA.

## 11. MISCELLANEOUS:

(a) Failure on the part of YEA to enforce any of its rights derived from this contract shall never be construed as a waiver of any of YEA's rights.

(b) The invalidity of one or more of the clauses herein shall not affect the validity of the other clauses, which for this purpose are considered severable.

(c) Any use by Buyer of any YEA trademark must be approved by YEA in writing.

(d) Buyer may not delegate its performance or assign its rights under this Agreement except upon the express written consent of YEA. In any case, these Standard Terms shall be binding upon the successors and legal representatives of Buyer.

(e) Buyer shall comply with all applicable laws and regulations regarding the use, import and export of the products sold hereunder. The products and services to be sold hereunder are not intended for use in any nuclear, chemical or weapons production or environmental damage. If Buyer uses the products or services for such or other impermissible purposes, it shall indemnify, hold harmless and defend YEA, all parent and affiliated companies of YEA, from and against all related claims and damages.

(f) All rights and remedies available to YEA under the Uniform Commercial Code and other applicable law are reserved to YEA as remedies in the event of Buyer's default.

**F7****Options Matrix**

| Model/<br>Part Number | Description                   | List<br>Price \$ | Old Model/Part Number |
|-----------------------|-------------------------------|------------------|-----------------------|
| 05P00620-0015         | Reactor, 600V, 2A, Enclosed   |                  |                       |
| 05P00620-0016         | Reactor, 600V, 2A, Enclosed   |                  |                       |
| 05P00620-0020         | Reactor, 600V, 4A, Enclosed   |                  |                       |
| 05P00620-0021         | Reactor, 600V, 4A, Enclosed   |                  |                       |
| 05P00620-0022         | Reactor, 600V, 4A, Enclosed   |                  |                       |
| 05P00620-0023         | Reactor, 600V, 4A, Enclosed   |                  |                       |
| 05P00620-0027         | Reactor, 600V, 8A, Enclosed   |                  |                       |
| 05P00620-0028         | Reactor, 600V, 8A, Enclosed   |                  |                       |
| 05P00620-0029         | Reactor, 600V, 8A, Enclosed   |                  |                       |
| 05P00620-0032         | Reactor, 600V, 12A, Enclosed  |                  |                       |
| 05P00620-0033         | Reactor, 600V, 12A, Enclosed  |                  |                       |
| 05P00620-0034         | Reactor, 600V, 12A, Enclosed  |                  |                       |
| 05P00620-0036         | Reactor, 600V, 18A, Enclosed  |                  |                       |
| 05P00620-0037         | Reactor, 600V, 18A, Enclosed  |                  |                       |
| 05P00620-0038         | Reactor, 600V, 18A, Enclosed  |                  |                       |
| 05P00620-0041         | Reactor, 600V, 25A, Enclosed  |                  |                       |
| 05P00620-0042         | Reactor, 600V, 25A, Enclosed  |                  |                       |
| 05P00620-0043         | Reactor, 600V, 18A, Enclosed  |                  |                       |
| 05P00620-0046         | Reactor, 600V, 35A, Enclosed  |                  |                       |
| 05P00620-0047         | Reactor, 600V, 35A, Enclosed  |                  |                       |
| 05P00620-0048         | Reactor, 600V, 35A, Enclosed  |                  |                       |
| 05P00620-0050         | Reactor, 600V, 45A, Enclosed  |                  |                       |
| 05P00620-0051         | Reactor, 600V, 45A, Enclosed  |                  |                       |
| 05P00620-0052         | Reactor, 600V, 45A, Enclosed  |                  |                       |
| 05P00620-0054         | Reactor, 600V, 55A, Enclosed  |                  |                       |
| 05P00620-0055         | Reactor, 600V, 55A, Enclosed  |                  |                       |
| 05P00620-0056         | Reactor, 600V, 55A, Enclosed  |                  |                       |
| 05P00620-0058         | Reactor, 600V, 80A, Enclosed  |                  |                       |
| 05P00620-0059         | Reactor, 600V, 80A, Enclosed  |                  |                       |
| 05P00620-0060         | Reactor, 600V, 80A, Enclosed  |                  |                       |
| 05P00620-0062         | Reactor, 600V, 100A, Enclosed |                  |                       |
| 05P00620-0063         | Reactor, 600V, 100A, Enclosed |                  |                       |
| 05P00620-0066         | Reactor, 600V, 130A, Enclosed |                  |                       |
| 05P00620-0067         | Reactor, 600V, 130A, Enclosed |                  |                       |
| 05P00620-0068         | Reactor, 600V, 130A, Enclosed |                  |                       |
| 05P00620-0072         | Reactor, 600V, 160A, Enclosed |                  |                       |
| 05P00620-0073         | Reactor, 600V, 160A, Enclosed |                  |                       |
| 05P00620-0074         | Reactor, 600V, 160A, Enclosed |                  |                       |
| 05P00620-0078         | Reactor, 600V, 200A, Enclosed |                  |                       |
| 05P00620-0079         | Reactor, 600V, 200A, Enclosed |                  |                       |
| 05P00620-0082         | Reactor, 600V, 250A, Enclosed |                  |                       |
| 05P00620-0083         | Reactor, 600V, 250A, Enclosed |                  |                       |
| 05P00620-0084         | Reactor, 600V, 250A, Enclosed |                  |                       |
| 05P00620-0087         | Reactor, 600V, 320A, Enclosed |                  |                       |

| Model/<br>Part Number | Description  | List<br>Price \$ | Old Model/Part Number |
|-----------------------|--|------------------|-----------------------|
| 05P00620-0088         | Reactor, 600V, 320A, Enclosed                          |                  |                       |
| 05P00620-0089         | Reactor, 600V, 320A, Enclosed                          |                  |                       |
| 05P00620-0092         | Reactor, 600V, 400A, Enclosed                          |                  |                       |
| 05P00620-0093         | Reactor, 600V, 400A, Enclosed                          |                  |                       |
| 05P00620-0096         | Reactor, 600V, 500A, Enclosed                          |                  |                       |
| 05P00620-0100         | Reactor, 600V, 600A, Enclosed                          |                  |                       |
| 05P00620-0101         | Reactor, 600V, 600A, Enclosed                          |                  |                       |
| 05P00620-0104         | Reactor, 600V, 750A, Enclosed                          |                  |                       |
| 05P00620-0105         | Reactor, 600V, 750A, Enclosed                          |                  |                       |
| AI-001                | Analog Input Trim Potentiometer Kit                    |                  | UTC000043             |
| AI-010                | Analog Input 3-15 PSI Transducer Kit                   |                  | USNN0001              |
| AI-040                | Analog Input Isolated (3 Inputs, 14 Bit)               |                  | AI-14B2               |
| AI-14B                | Analog Input Kit (3 Inputs, 12 Bit)                    |                  | ICG352, DS387         |
| AI-14U                | Analog Input Kit (1 Input, 14 Bit)                     |                  | ICG351, DS386         |
| AO-001                | Analog Output Isolated Kit, (2 Outputs, 11 Bit + Sign) |                  | AO-12B2               |
| AO-08                 | Analog Output Kit (2 Outputs, 8 Bit)                   |                  | ICG355, DS390         |
| AO-12                 | Analog Output Kit (2 Outputs, 11 Bit + Sign)           |                  | ICG356, DS391         |
| CD.DW.01              | DriveWizard Software CD                                |                  |                       |
| CDBR-2022B            | Dynamic Braking Transistor Module                      |                  | 46S03331-0020         |
| CDBR-2110B            | Dynamic Braking Transistor Module                      |                  |                       |
| CDBR-4045B            | Dynamic Braking Transistor Module                      |                  | 46S03331-0060         |
| CDBR-4220B            | Dynamic Braking Transistor Module                      |                  | 46S03331-0090         |
| CM048                 | LonWorks Communication Kit                             |                  |                       |
| CM056                 | DeviceNet Communication Kit, F7                        |                  | 46S03318-XXXX         |
| CM059                 | DeviceNet Communication Kit (SI-N1 Board)              |                  | SI-N1                 |
| CM061                 | Profibus DP Communication Kit (Includes Profibus II)   |                  | SI-P1                 |
| CM071                 | Modbus Plus Communication Kit                          |                  |                       |
| CM090                 | Ethernet Modbus TCP/IP Communication Kit               |                  |                       |
| CM092                 | EtherNet/IP Communication Kit                          |                  |                       |
| DI-08                 | Digital Input Kit (8 Data Inputs, BCD or Binary)       |                  | ICG353, DS388         |
| DI-16H2               | Digital Input Kit (12/16 Data Inputs, BCD or Binary)   |                  | CDR001021, DS390      |
| DO-02C                | Digital Output Kit (2 Form C, 250VAC, 30VDC, 1A)       |                  | CDR001023, DS011      |
| DO-08                 | Digital Output Kit (2 Form A and 6 PHC)                |                  | ICG367, DS383         |
| DWST616-C2            | DriveWizard Kit (Software and Cable)                   |                  |                       |
| PG-W2                 | PG Feedback Kit, Dual                                  |                  | CDR001040, DS014      |
| PG-B2                 | PG Feedback Kit  |                  |                       |
| PG-X2                 | PG Feedback Kit  |                  | CDR001015, DS003      |
| R7503                 | DB Resistor, Heat Sink Mt, 3% Duty Cycle, 70 Ohm       |                  | 50185432              |
| R7504                 | DB Resistor, Heat Sink Mt, 3% Duty Cycle, 100 Ohm      |                  | 50185431              |
| R7505                 | DB Resistor, Heat Sink Mt, 3% Duty Cycle, 200 Ohm      |                  | 50185430              |
| R7506                 | DB Resistor, Heat Sink Mt, 3% Duty Cycle, 300 Ohm      |                  | 50185532              |
| R7507                 | DB Resistor, Heat Sink Mt, 3% Duty Cycle, 400 Ohm      |                  | 50185531              |
| R7508                 | DB Resistor, Heat Sink Mt, 3% Duty Cycle, 750 Ohm      |                  | 50185530              |
| R7510                 | DB Resistor, Heat Sink Mt, 3% Duty Cycle, 62 Ohm       |                  | 50185433              |
| UDA00365-C            | End Cap Kit  |                  |                       |
| UDA00365-E            | End Cap Kit  |                  |                       |

**Options Matrix**

| Model/<br>Part Number | Description  | List<br>Price \$ | Old Model/Part Number |
|-----------------------|--|------------------|-----------------------|
| UDA00365-F            | End Cap Kit  |                  |                       |
| UDA00365-P            | End Cap Kit  |                  |                       |
| UDA00417-A            | Ring Kit   |                  |                       |
| UDA00417-B            | Ring Kit   |                  |                       |
| UDA00417-C            | Ring Kit   |                  |                       |
| UDA00417-D            | Ring Kit   |                  |                       |
| UDA00417-E            | Ring Kit   |                  |                       |
| UDA00417-F            | Ring Kit   |                  |                       |
| UOP000008             | LCD Digital Operator (Same as Supplied with Drive) |                  |                       |
| UOPN0005              | Remote Operator Kit (Cable, Carrier, and Membrane) |                  |                       |
| URS000096             | Dynamic Braking Resistor                           |                  |                       |
| URS000097             | Dynamic Braking Resistor                           |                  |                       |
| URS000100             | Dynamic Braking Resistor                           |                  |                       |
| URS000119             | Dynamic Braking Resistor                           |                  |                       |
| URS000120             | Dynamic Braking Resistor                           |                  |                       |
| URS000128             | Dynamic Braking Resistor                           |                  |                       |
| URS000129             | Dynamic Braking Resistor                           |                  |                       |
| URS000135             | Dynamic Braking Resistor                           |                  |                       |
| URS000136             | Dynamic Braking Resistor                           |                  |                       |
| URS000140             | Dynamic Braking Resistor                           |                  |                       |
| URS000142             | Dynamic Braking Resistor                           |                  |                       |
| URS000143             | Dynamic Braking Resistor                           |                  |                       |
| URS000150             | Dynamic Braking Resistor                           |                  |                       |
| URS000151             | Dynamic Braking Resistor                           |                  |                       |
| URS000154             | Dynamic Braking Resistor                           |                  |                       |
| URS000165             | Dynamic Braking Resistor                           |                  |                       |
| URS000166             | Dynamic Braking Resistor                           |                  |                       |
| URS000167             | Dynamic Braking Resistor                           |                  |                       |
| USR000022             | DB Resistor. 10% Duty Cycle, 200 Ohm, 250W         |                  | 05P00041-0825         |
| USR000023             | DB Resistor. 10% Duty Cycle, 100 Ohm, 250W         |                  | 05P00041-0826         |
| USR000024             | DB Resistor. 10% Duty Cycle, 70 Ohm, 250W          |                  | 05P00041-0827         |
| USR000025             | DB Resistor. 10% Duty Cycle, 40 Ohm, 846W          |                  | 05P00041-0828         |
| USR000026             | DB Resistor. 10% Duty Cycle, 30 Ohm, 824W          |                  | 05P00041-0829         |
| USR000027             | DB Resistor. 10% Duty Cycle, 20 Ohm, 1260W         |                  | 05P00041-0830         |
| USR000032             | DB Resistor. 10% Duty Cycle, 750 Ohm, 600W         |                  | 05P00041-0835         |
| USR000033             | DB Resistor. 10% Duty Cycle, 400 Ohm, 500W         |                  | 05P00041-0836         |
| USR000034             | DB Resistor. 10% Duty Cycle, 250 Ohm, 500W         |                  | 05P00041-0837         |
| USR000035             | DB Resistor. 10% Duty Cycle, 150 Ohm, 500W         |                  | 05P00041-0838         |
| USR000036             | DB Resistor. 10% Duty Cycle, 100 Ohm, 975W         |                  | 05P00041-0839         |
| USR000037             | DB Resistor. 10% Duty Cycle, 75 Ohm, 1050W         |                  | 05P00041-0840         |
| USR000038             | DB Resistor. 10% Duty Cycle, 50 Ohm, 1600W         |                  | 05P00041-0841         |
| USR000040             | DB Resistor. 10% Duty Cycle, 32 Ohm, 2340W         |                  | 05P00041-0843         |
| UWR00468-2            | Computer Interface Cable, 6 feet (2 meter)         |                  |                       |
| UWR0051               | Remote Operator Cable, 3 feet (1 meter)            |                  | DS071                 |
| UWR0052               | Remote Operator Cable, 10 feet (3 Meter)           |                  | DS073                 |

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# F7 Drives Catalog

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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