

# DATASHEET

## Variable Speed Drives



### Main Features



Reference : CFW501A06P1T4NB20C3  
 Product code : 12209624  
 Product reference : CFW501 HVAC  
 Accessory module (control) : CFW500-485

### Basic data

Power supply : 380-480 V  
 Input minimum-maximum voltage : 323-528 V  
 - Input : 3  
 - Output : 3

| Supply voltage range        | 380-480 V            |                     |
|-----------------------------|----------------------|---------------------|
| Overload cycle              | Normal Overload (ND) | Heavy Overload (HD) |
| Rated current               | 6.1 A                | Not applicable      |
| Overload current for 60 sec | 6,7 A                | Not applicable      |
| Overload current for 3 sec  | 9,2 A                | Not applicable      |

Maximum applicable motor:

| Voltage/Frequency | Power (HP/kW) [1]    |                     |
|-------------------|----------------------|---------------------|
|                   | Normal Overload (ND) | Heavy Overload (HD) |
| 380V / 50Hz       | 3 / 2,2              | Not applicable      |
| 380V / 60Hz       | 3 / 2,2              | Not applicable      |
| 400V / 50Hz       | 3 / 2,2              | Not applicable      |
| 400V / 60Hz       | 3 / 2,2              | Not applicable      |
| 440V / 50Hz       | 4 / 3                | Not applicable      |
| 440V / 60Hz       | 4 / 3                | Not applicable      |
| 460V / 60Hz       | 4 / 3                | Not applicable      |
| 480V / 60Hz       | 4 / 3                | Not applicable      |

Accessory module (control) : CFW500-485  
 Dynamic braking [2] : Standard without braking  
 External electronic supply 24Vcc : Not available  
 Safety Stop : Not available  
 Internal RFI filter : With filter (C3 category)  
 External RFI filter : Not available  
 Link Inductor : No  
 Memory card : Not included in the product  
 USB port : Only with plug-in  
 Line frequency : 50/60Hz  
 Line frequency range (minimum - maximum) : 48-62 Hz  
 Phase unbalance : Less or equal to 3% of input rated line voltage  
 Transient voltage and overvoltage : Category III  
 Single-phase input current [3] : Not applicable  
 Three-phase input current [3] : 5,7 A  
 Typical input power factor : 0,94  
 Displacement factor : 0,98  
 Rated efficiency : ≥ 97%  
 Maximum connections (power up cycles - on/off) per hour : 10 (1 each 6 minutes)  
 DC power supply : Not allow  
 Standard switching frequency : 5 kHz  
 Selectable switching frequency : 2,5 and 15 kHz  
 Real-time clock : Not available  
 Copy Function : Yes, by MMF ou plug-in  
 Dissipated power:

| Mounting type | Overload       |                |
|---------------|----------------|----------------|
|               | ND             | HD             |
| Surface       | 105 W          | Not applicable |
| Flange        | Not applicable | Not applicable |

### Source available to the user

Output voltage : 24 Vcc  
 Maximum capacity : 150 mA

### Control/performance data

Power supply : Switched-mode power supply  
 Control method - induction motor : V/f (escalar) and VVW  
 Encoder interface : Only with plug-in  
 Control output frequency [5] : 0-500 Hz  
 Frequency resolution : 0,015 Hz

29/03/2024

The information contained are reference values. Subject to change without notice. Image merely illustrative.

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### Control/performance data

#### V/F Control

- Speed regulation : 1% of rated speed
- Speed variation : 1:20

#### VVW Control

- Speed regulation : 1% of rated speed
- Speed variation : 1:30

#### Sensorless vector control

- Speed regulation : Not applicable
- Speed variation : Not applicable

#### Vector control with Encoder

- Speed regulation : Not applicable
- Speed variation : Not applicable

### Analog Inputs

- Quantity (standard) : 2
- Levels : 0-10V, 0-20mA and 4-20mA
- Impedance for voltage input : 100 k $\Omega$
- Impedance for current input : 500  $\Omega$
- Function : Programmable
- Maximum allowed voltage : 30 Vcc

### Digital inputs

- Quantity (standard) : 4
- Activation : Active low and high
- Maximum low level : 5 V (low) e 15 V (high)
- Minimum high level : 9 V (low) e 20 V (high)
- Input current : 4,5 mA
- Maximum input current : 5,5 mA
- Function : Programmable
- Maximum allowed voltage : 30 Vcc

### Analog outputs

- Quantity (standard) : 1
- Levels : 0 to 10V, 0 to 20mA and 4 to 20mA
- RL for voltage output : 10 k $\Omega$
- RL for current output : 500  $\Omega$
- Function : Programmable

### Digital outputs

- Quantity (standard) : 2 NO/NC relay and 1 transistor
- Maximum voltage : 240 Vca and 24 Vcc
- Maximum current : 0,5 A and 150 mA
- Function : Programmable

### Communication

- Modbus-RTU (with accessory: Any plug-in module)
- Modbus/TCP (with accessory CFW500-CEMB-TCP)
- Profibus DP (with accessory: CFW500-CPDP)
- Profibus DPV1 (with accessory: CFW500-CPDP)
- Profinet (with accessory CFW500-CEPN-IO)
- CANopen (with accessory: CFW500-CCAN)
- DeviceNet (with accessory: CFW500-CCAN)
- EtherNet/IP (with accessory CFW500-CETH-IP)
- EtherCAT (Not available)
- BACnet (CFW500 G2 / CFW501 G2 / MW500 G2 with accessory: Any plug-in module)

### Available protection

- Output phase-phase overcurrent/Short
- Overcurrent/Short circuit phase-ground
- Under/Overvoltage in power
- Heat sink overtemperature
- Motor overload
- IGBT's modules overload
- Fault/External alarm
- Programming error

### Operation interface (HMI)

- Availability : Included in the product
- HMI installation : Fixed HMI
- Number of HMI buttons : 9
- Display : Numeric LCD
- Indication accuracy : 5% of rated current
- Speed resolution : 1 rpm

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### Operation interface (HMI)

|                                   |                  |
|-----------------------------------|------------------|
| Standard HMI degree of protection | : IP20           |
| HMI battery type                  | : Not applicable |
| HMI battery life expectancy       | : Not applicable |
| Remote HMI type                   | : Accessory      |
| Remote HMI frame                  | : Not applicable |
| Remote HMI degree of protection   | : IP54           |

### Ambient conditions

|                                                                                                                                                                                                                                                                                                                                                                                                   |                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Enclosure                                                                                                                                                                                                                                                                                                                                                                                         | : IP20                   |
| Pollution degree                                                                                                                                                                                                                                                                                                                                                                                  | : 2 (EN50178 and UL508C) |
| Temperature around the inverter: of 0 °C / 32 °F to 50 °C / 122 °F. For temperatures above the specified is necessary to apply current reduction of 2 % per °C of 50 (122) o 60 °C (140 °F).                                                                                                                                                                                                      |                          |
| Relative humidity: 5% to 95% without condensation.                                                                                                                                                                                                                                                                                                                                                |                          |
| Altitude: up to 1000 m (3281 ft) under normal conditions. Of 1000 m (3281 ft) to 4000 m (13123 ft) reduce the current in 1% for each 100 m above (0,3% for each 100 ft above) of 1000 m (3281 ft). Reduce the maximum voltage (240 V for models 200...240 V, 480 V for models 380...480 V and 600 V for models 500...600 V) in 1,1% for each 100 m above (0,33% for each 100 ft above) of 2000 m. |                          |

### Sustainability policies

|                   |                            |
|-------------------|----------------------------|
| RoHS              | : Yes                      |
| Conformal Coating | : 3C2 (IEC 60721-3-3:2002) |

### Dimensions and weight

|          |                    |
|----------|--------------------|
| - Size   | : A                |
| - Height | : 189 mm / 7.4 in  |
| - Width  | : 75 mm / 2.95 in  |
| - Depth  | : 150 mm / 5.91 in |
| - Weight | : 0,8 kg / 1.8 lb  |

### Mechanical Installation

|                                      |                                         |
|--------------------------------------|-----------------------------------------|
| Mounting position                    | : Surface or DIN rail                   |
| Fixing screw                         | : M4                                    |
| Tightening torque                    | : 2 N.m / 1.48 lb.ft                    |
| Allows side-by-side assembly         | : Yes, maximum ambient temperature 40°C |
| Minimum spacing around the inverter: |                                         |
| - Top                                | : 15 mm / 0.59 in                       |
| - Bottom                             | : 40 mm / 1.57 in                       |
| - Front                              | : 30 mm / 1.18 in                       |
| - Between inverters (IP20)           | : 10 mm / 0.39 in                       |

### Electrical connections

Cable gauges and tightening torques:

|           | Recommended cable gauge                   | Recommended tightening torque |
|-----------|-------------------------------------------|-------------------------------|
| Power     | 1,5 mm <sup>2</sup> (16 AWG)              | 0,5 N.m / 0.37 lb.ft          |
| Braking   | Not applicable                            | 0,5 N.m / 0.37 lb.ft          |
| Grounding | 2,5 mm <sup>2</sup> (14 AWG)              | 0.5 N.m / 0.37 lb.ft          |
| Control   | 0,5 to 1,5 mm <sup>2</sup> (20 to 14 AWG) | 0,5 N.m / 0.37 lb.ft          |

|                                           |                     |
|-------------------------------------------|---------------------|
| SoftPLC                                   | : Yes, incorporated |
| Maximum breaking current                  | : Not available     |
| Minimum resistance for the brake resistor | : Not available     |
| Recommended aR fuse [6]                   | : FNH00-20K-A       |
| Recommended circuit breaker [6]           | : MPW18-3-U010      |
| Disconnect switch                         | : Not applicable    |
| Motor coupling box                        | : Not applicable    |

### Standards

|                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety                        | <ul style="list-style-type: none"><li>- UL 508C - Power conversion equipment.</li><li>- UL 840 - Insulation coordination including clearances and creepage distances for electrical equipment.</li><li>- EN 61800-5-1 - Safety requirements electrical, thermal and energy.</li><li>- EN 50178 - Electronic equipment for use in power installations.</li><li>- EN 60204-1-Safety of machinery. Electrical equipment of machines. Part 1: General requirements. Note: To have a machine in accordance with that standard, the manufacturer of the machine is responsible for the installation of an emergency-stop device and a network switching equipment.</li><li>- EN 60146 (IEC 146) - Semiconductor converters.</li><li>- EN 61800-2 - Adjustable speed electrical power drive systems - Part 2: General requirements - Rating specifications for low voltage adjustable frequency AC power drive systems.</li></ul> |
| Electromagnetic Compatibility | <ul style="list-style-type: none"><li>- EN 61800-3 - Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods.</li><li>- EN 55011 - Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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### Standards

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | <ul style="list-style-type: none"><li>- CISPR 11 - Industrial, scientific and medical (ISM) radio-frequency equipment</li><li>- Electromagnetic disturbance characteristics - Limits and methods of measurement.</li><li>- EN 61000-4-2 - Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 2: Electrostatic discharge immunity test.</li><li>- EN 61000-4-3 - Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 3: Radiated, radio-frequency, electromagnetic field immunity test.</li><li>- EN 61000-4-4 - Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test.</li><li>- EN 61000-4-5 - Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 5: Surge immunity test.</li><li>- EN 61000-4-6 - Electromagnetic compatibility (EMC)- Part 4: Testing and measurement techniques - Section 6: Immunity to conducted disturbances, induced by radio-frequency fields.</li></ul> |
| Mechanical Construction | - EN 60529, UL 50 and IEC 60721-3-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

### Certifications

UL, CE, RCM, EAC, UKCA and RoHS CHINA

### Notes

- 1) Motor power is orientative, valid for standard WEG Motors of IV poles. The correct sizing must be done according to the nominal current of the motor used, which must be less than or equal to the rated output current of the inverter;
- 2) Braking resistor is not included;
- 3) Considering minimum line impedance of 1%;
- 4) For more information, refer to the user manual of CFW501 HVAC;
- 5) All images are merely illustrative.
- 6) For operation with switching frequency above nominal, apply derating to the output current (refer to the user manual).