

DATASHEET

Variable Speed Drives



Main Features



Reference : CFW501B16P0T2DB20C3
 Product code : 13608660
 Product reference : CFW501 HVAC
 Accessory module (control) : CFW500-485

Basic data

Power supply : 200-240 V
 Input minimum-maximum voltage : 170-264 V
 - Input : 3
 - Output : 3

Supply voltage range	200-240 V	
Overload cycle	Normal Overload (ND)	Heavy Overload (HD)
Rated current	16.0 A	Not applicable
Overload current for 60 sec	17,6 A	Not applicable
Overload current for 3 sec	24,0 A	Not applicable

Maximum applicable motor:

Voltage/Frequency	Power (HP/kW) [1]	
	Normal Overload (ND)	Heavy Overload (HD)
220V / 50Hz	5,5 / 4	Not applicable
220V / 60Hz	5 / 3,7	Not applicable
230V / 50Hz	5,5 / 4	Not applicable
230V / 60Hz	5 / 3,7	Not applicable
Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable
Not applicable	Not applicable	Not applicable

Accessory module (control) : CFW500-485
 Dynamic braking [2] : Standard with 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] : 14,9 A
 Typical input power factor : 0,95
 Displacement factor : 0,98
 Rated efficiency : ≥ 97%
 Maximum connections (power up cycles - on/off) per hour : 10 (1 each 6 minutes)
 DC power supply : 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	138 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

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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 kΩ
Impedance for current input	: 500 Ω
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 kΩ
RL for current output	: 500 Ω
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	: B
- Height	: 199 mm / 7.8 in
- Width	: 100 mm / 3.9 in
- Depth	: 160 mm / 6.3 in
- Weight	: 1,2 kg / 2.6 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	: 35 mm / 1.38 in
- Bottom	: 50 mm / 1.97 in
- Front	: 40 mm / 1.57 in
- Between inverters (IP20)	: 15 mm / 0.59 in

Electrical connections

Cable gauges and tightening torques:

	Recommended cable gauge	Recommended tightening torque
Power	4,0 mm ² (12 AWG)	0,5 N.m / 0.37 lb.ft
Braking	4,0 mm ² (12 AWG)	0,5 N.m / 0.37 lb.ft
Grounding	4,0 mm ² (12 AWG)	0,5 N.m / 0.37 lb.ft
Control	0,5 to 1,5 mm ² (20 to 14 AWG)	0,5 N.m / 0.37 lb.ft

SoftPLC	: Yes, incorporated
Maximum breaking current	: 20,0 A
Minimum resistance for the brake resistor	: 20 Ω
Recommended aR fuse [6]	: FNH00-40K-A
Recommended circuit breaker [6]	: MPW40-3-U025
Disconnect switch	: Not applicable
Motor coupling box	: Not applicable

Standards

Safety	- UL 508C - Power conversion equipment. - UL 840 - Insulation coordination including clearances and creepage distances for electrical equipment. - EN 61800-5-1 - Safety requirements electrical, thermal and energy. - EN 50178 - Electronic equipment for use in power installations. - 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. - EN 60146 (IEC 146) - Semiconductor converters. - EN 61800-2 - Adjustable speed electrical power drive systems - Part 2: General requirements - Rating specifications for low voltage adjustable frequency AC power drive systems.
Electromagnetic Compatibility	- EN 61800-3 - Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods. - EN 55011 - Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment.



Standards

	- CISPR 11 - Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement. - EN 61000-4-2 - Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 2: Electrostatic discharge immunity test. - EN 61000-4-3 - Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 3: Radiated, radio-frequency, electromagnetic field immunity test. - EN 61000-4-4 - Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test. - EN 61000-4-5 - Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 5: Surge immunity test. - EN 61000-4-6 - Electromagnetic compatibility (EMC)- Part 4: Testing and measurement techniques - Section 6: Immunity to conducted disturbances, induced by radio-frequency fields.
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).