Motors | Automation | Energy | Transmission & Distribution | Coatings

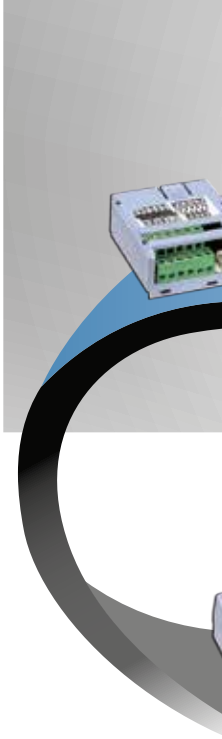
CFW500 Machinery Drives

Variable Frequency Drives

CFW500

One VFD, endless possibilities

The CFW500 has advanced technology plug and play options, developed for fast commissioning, providing great flexibility and competitive advantage while offering excellent performance and reliability. Designed for exclusively industrial or professional use, is perfect for OEM, system integrators, panel installers and End Users providing great benefit from the added value.



Compatible
Wide range of accessories

Flexible
Application functions

Robust
150% overload for one minute

Efficient
Streamlines operation and performance

Reliable
WEG quality

Integrable
Fieldbus networks

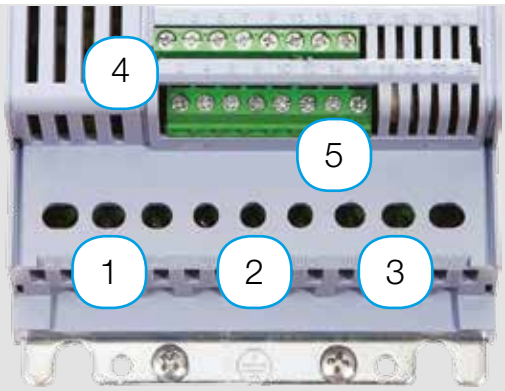
Features

- Plug-In modules
- Flash memory module
- SoftPLC
- High overload capacity
- Functions to streamline operation and performance
- WEG quality
- Communication networks

Advantages	Benefits
The optional communication network and I/O modules are easily installed, allowing interface of the standard VFD to each application.	Time saving, standardization and optimized costs according to the needs.
Quickly replicate the programming and application from one CFW500 to others without the need to apply power to the drive.	Fast, easy and reliable programming for manufacturers that produce machines in large quantities.
Built-in SoftPLC enables the VFD to do much more than just turn a motor. Programming flexibility combined with network and I/O options make the CFW500 a powerful part of an integrated system.	Often eliminates the need for an external PLC, reducing costs, optimizing space and simplifying the system.
The standard CFW500 is capable of 150% overload for one minute, repeatable every 6 minutes, based on ambient temperature of 50 °C.	Does not require oversizing the VFD.
Integral PID for process control that includes 'Sleep Mode' to allow the VFD to stop or resume modulating automatically	Saves energy and reduces running time on the motor and equipment.
Flying start synchronizes the CFW500 to a spinning motor to capture the motor and resume operation from the existing speed.	Enables fast recovery of a spinning motor, reducing the time it takes to resume normal motor/drive operation while avoiding a fault trip condition.
Ride through keeps the VFD in operation during voltage dips.	Avoids fault tripping when there is a dip in the supply voltage. Prevents machine stoppage and downtime.
100% of the VFDs are tested with load at the factory under rated conditions.	High reliability.
Protection against ground fault, short circuit, over temperature and others.	Prevents damage to the inverter caused by problems external to the VFD.
Thermal protection of IGBTs based on manufacturer curve.	
Conformal Coating as Standard. Classified as 3C2 per IEC specification 60721-3-3.	VFD lifespan is extended: protection against dust, humidity, high temperatures and chemicals.
CANopen, DeviceNet, Profibus-DP and Modbus-RTU.	Versatile integration with process networks for a wide range of applications.

Easy Configuration

- Fast commissioning
- Innovative design, compact and uniform
- Optimized cost vs benefit



With plug-in module CFW500-IOS

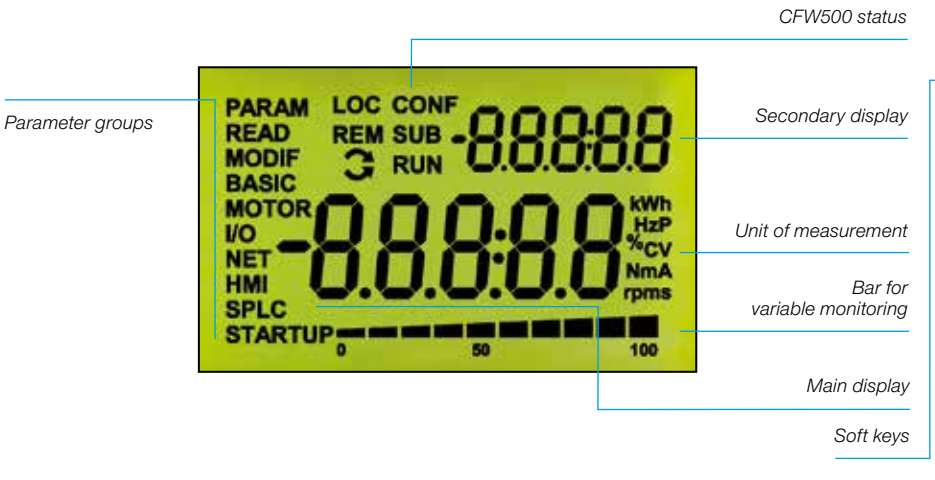
1 - Power terminals
2 - Access to DC link
3 - Motor terminals
4 - Control terminals (I/O)
5 - RS485 port

Applications

- Centrifugal pumps
- Process dosing pumps
- Fans / ventilators
- Blenders / mixers
- Compressors
- Conveyors
- Roller tables
- Granulators
- Commercial dryers
- Rotary filters

Human-Machine Interface

- Display up to three variables at the same time, selected by the user



Friendly Programming

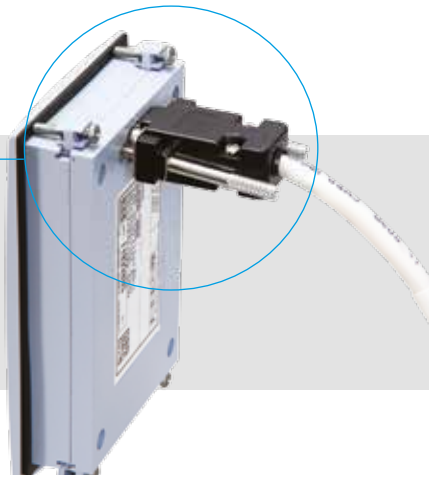
- Oriented start-up: programming step by step
- Easy and intuitive operation, fast access to the parameters
- Parameter group: shortcut to the parameters of interest

Remote HMI

Suitable for enclosure door or machine console.

RS485
Included in all plug-in modules

CFW500-HMIR
IP54



CFW500-CCHMIRXM
X = up to 10 m

Energy Efficiency

In industry, electric motors are responsible for nearly 70% of all the electric energy consumption.
By using VFD, is possible to reduce consumption up to 40%.

Besides being efficient in the control of electric motors, they reduce machine wear, save raw material, improve process quality and increase productivity.

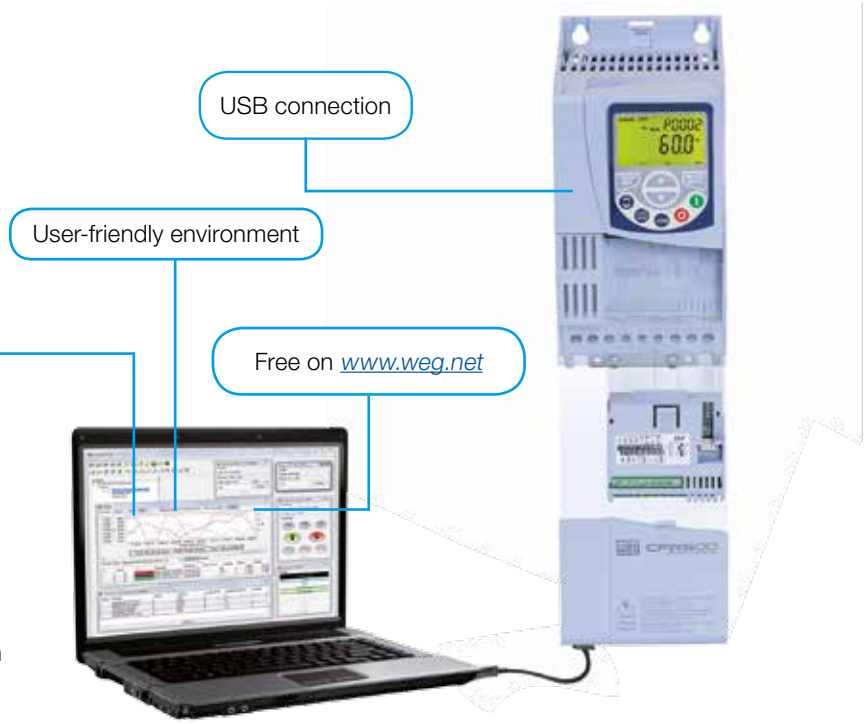
Visit our WEG website, to calculate how much energy can be saved by using the CFW500 VFD - **www.weg.net/us**.

Ensure energy efficiency for your equipment and machines. Save money and contribute to the conservation of the environment.

Certifications

SuperDrive G2

Software application for programming, control and monitoring of WEG VFD.

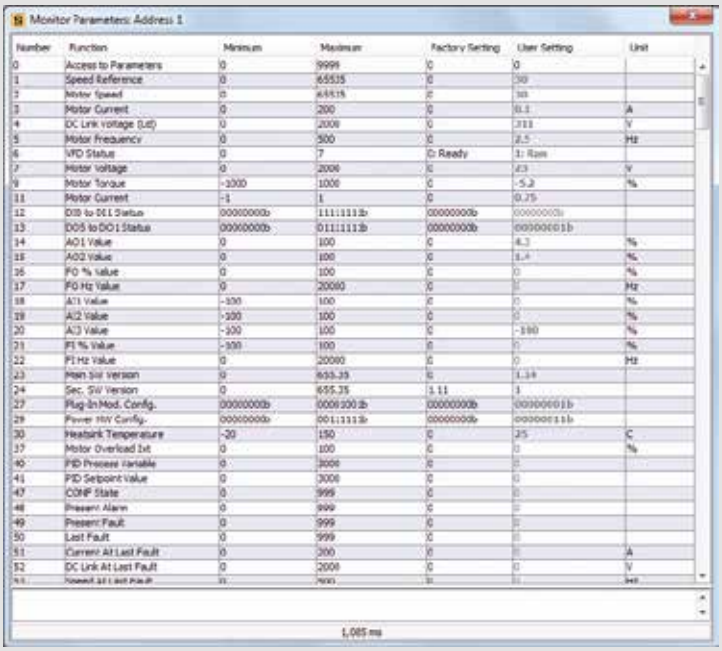


Trend Function

- On-line graphic monitoring of parameters/variables
- Capability to export an image of the respective graph based to the selected period

Changing and Monitoring of Parameters in a List/Table

Parameter set storage in a computer file format.



- Upload/download of parameters from the PC to the CFW500 and vice versa
- Off-line editing of parameters stored on the PC

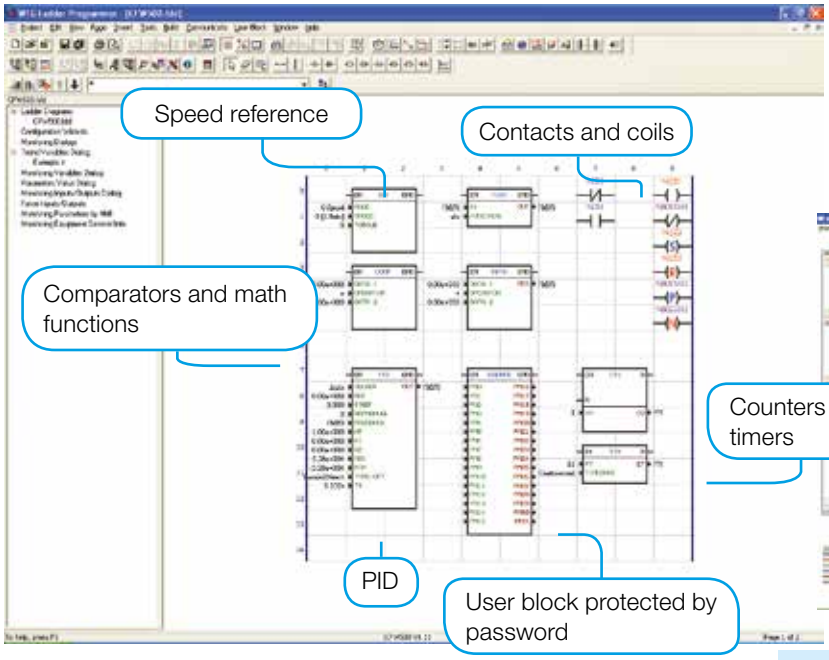
Status Monitoring

Operation with HMI

On-line parameter editing.

SoftPLC - Built-In on the Standard Product

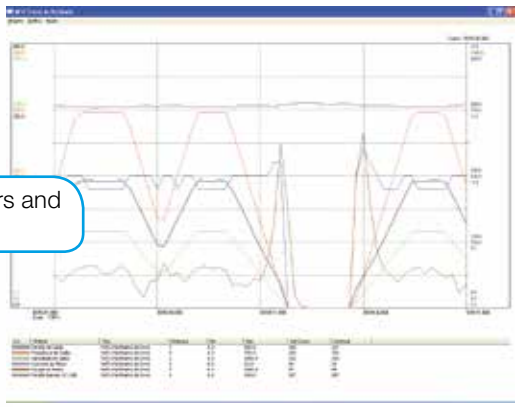
Adds the functionality of a PLC to the CFW500, allowing the creation of special applications. The WLP software and the SoftPLC functionality are a smart and simple way to make your CFW500, motor and application work together.



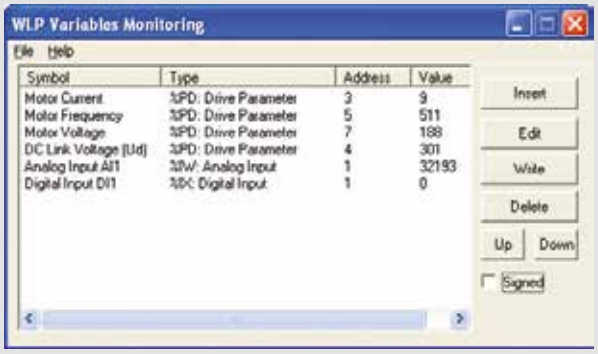
Easy programming: Ladder

Trace Function

- On-line graphic monitoring of parameters/variables
- Configurable up to six channels



On-line Monitoring Parameters/Variables List

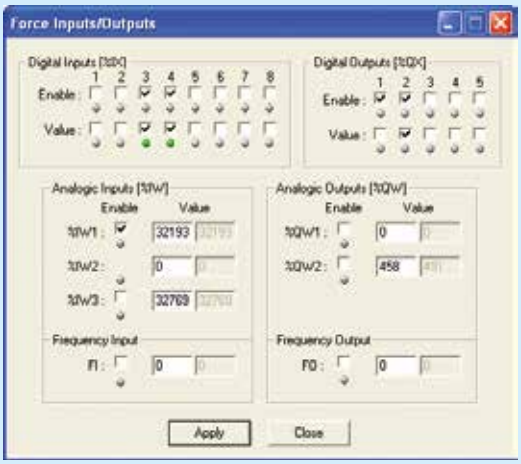


Parameter Edition

It allows to change the parameters values.

Enable/Disable I/O

It simplifies and speeds up the validation of the application.



I/O Monitoring

Product Coding

The CFW500 code identifies its construction characteristics, nominal current, voltage range and optionals. Using the product code, it is possible to select the CFW500 required for your application simply and quickly.

Product and series	Drive identification				Braking option	Protection class	RFI emmision level	Hardware revision	Software version
	Frame	Rated current	Supply phases	Rated voltage					
CFW500	A, B, C or D	01P6 up to 31P0	S, B or T	2 or 4	NB or DB	N1 or 20	C2 or C3	- - -	- - -
CFW500	Refer to table								
	NB = without dynamic braking DB = with dynamic braking								
	20 = IP20 N1 = NEMA1 enclosure								
	Blank = with no RFI filter C2 = meets category 2 of IEC 61800-3 standard, with internal RFI flter C3 = meets category 3 of IEC 61800-3 standard, with internal RFI flter								
	Blank = standard plug-in module (CFW500-IOS) H00 = without plug-in module								
	Sx = Special software Blank = Standard software								

Frame size	Rated output current	Supply phases	Supply voltage	Braking feature	Protection class	RFI emission level
A	01P6 = 1.6 Amps	S = Single-phase	2 = 200 V...240 V ac	NB	20 = IP20 N1 = NEMA1	Blank or C2
	02P6 = 2.6 Amps					
	04P3 = 4.3 Amps					
	07P0 = 7.0 Amps					Blank or C3
A	01P6 = 1.6 Amps	B = Single-phase or Three-phase				Blank
	02P6 = 2.6 Amps					
	04P3 = 4.3 Amps					
B	07P3 = 7.3 Amps			DB		
	10P0 = 10.0 Amps					
A	07P0 = 7.0 Amps	T = Three-phase		NB		
	09P6 = 9.6 Amps					
B	16P0 = 16.0 Amps			DB		
C	24P0 = 24.0 Amps					
D	28P0 = 28.0 Amps					Blank or C3
	33P0 = 33.0 Amps					
	47P0 = 47.0 Amps					
A	01P0 = 1.0 Amps	T = Three-phase	4 = 380...480 V ac	NB		Blank or C2
	01P6 = 1.6 Amps					
	02P6 = 2.6 Amps					
	04P3 = 4.3 Amps					
	06P1 = 6.1 Amps					Blank or C3
B	02P7 = 2.7 Amps			DB		Blank or C2
	04P3 = 4.3 Amps					
	06P5 = 6.5 Amps					
	10P0 = 10.0 Amps					Blank or C3
C	14P0 = 14.0 Amps					Blank or C2
	16P0 = 16.0 Amps					
D	24P0 = 24.0 Amps					Blank or C3
	31P0 = 31.0 Amps					

Notes: 1) To know which models have these options in the standard product the table below should be checked.
2) RFI filter.
Categories:
- Category C1: inverters with voltages below 1,000 V, for use in the First Environment.
- Category C2: inverters with voltages below 1,000 V, with plugs or mobile installation, when used in the "First Environment", must be installed and started-up by a qualified professional.
- Category C3: inverters with voltages below 1,000 V, developed for use in the Second Environment and not designed for use in the "First Environment".
Environments:
- First Environment: environments that include household installations, such as buildings directly connected, without intermediate transformer, to a low-voltage power supply grid, which supplies buildings used for domestic purposes.
- Second Environment: includes all the buildings other than those directly connected to a low-voltage power supply grid, which supplies buildings used for domestic purposes.
For the RFI filters of external installations, refer to the CFW500 user manual.

Drive Ratings

The correct way to select a VFD is matching its output current with the motor rated current. However, the tables below present the approximate motor power for each VFD model. Use the motor power ratings below only as a guide. Motor rated currents may vary with speed and manufacturer.

Motor volts	Motor HP	Rated current (A)	Catalog number	Frame size	Enclosure	Braking transistor	Dimensions (in.) H x W x D	App. shpg. wt. (lbs)
230 V	Input power supply: single-phase 200 - 240 V							
	1/4 or 1/3	1.6	CFW500 A 01P6 S2 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	3/4	2.6	CFW500 A 02P6 S2 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	1.5	4.3	CFW500 A 04P3 S2 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	2	7	CFW500 A 07P0 S2 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	Input power supply: single or three-phase 200 - 240 V							
	1/4 or 1/3	1.6	CFW500 A 01P6 B2 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	3/4	2.6	CFW500 A 02P6 B2 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	1.5	4.3	CFW500 A 04P3 B2 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	2	7.3	CFW500 B 07P3 B2 DB N1	B	NEMA 1	Yes	9.6 x 3.9 x 6.3	3.3 (1.5)
	3	10	CFW500 B 10P0 B2 DB N1	B	NEMA 1	Yes	9.6 x 3.9 x 6.3	3.3 (1.5)
	Input power supply: three-phase 200 - 240 V							
	2	7	CFW500 A 07P0 T2 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	3	9.6	CFW500 A 09P6 T2 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	5	16	CFW500 B 16P0 T2 DB N1	B	NEMA 1	Yes	9.6 x 3.9 x 6.3	3.3 (1.5)
	7.5	24	CFW500 C 24P0 T2 DB N1	C	NEMA 1	Yes	10.0 x 5.3 x 6.5	5.3 (2.4)
	10	28	CFW500 D 28P0 T2 DB N1	D	NEMA 1	Yes	14.3 x 7.1 x 6.6	10.2 (4.6)
	15	47	CFW500 D 47P0 T2 DB N1	D	NEMA 1	Yes	14.3 x 7.1 x 6.6	10.2 (4.6)
460 V	Input power supply: three-phase 380 - 480 V							
	1/2	1	CFW500 A 01P0 T4 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	1	1.6	CFW500 A 01P6 T4 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	2	2.6	CFW500 A 02P6 T4 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	3	4.3	CFW500 A 04P3 T4 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	3	6.1	CFW500 A 06P1 T4 NB N1	A	NEMA 1	No	8.8 x 3.0 x 5.9	2.4 (1.1)
	2	2.6	CFW500 B 02P6 T4 DB N1	B	NEMA 1	Yes	9.6 x 3.9 x 6.3	3.3 (1.5)
	3	4.3	CFW500 B 04P3 T4 DB N1	B	NEMA 1	Yes	9.6 x 3.9 x 6.3	3.3 (1.5)
	5	6.5	CFW500 B 06P5 T4 DB N1	B	NEMA 1	Yes	9.6 x 3.9 x 6.3	3.3 (1.5)
	7.5	10	CFW500 B 10P0 T4 DB N1	B	NEMA 1	Yes	9.6 x 3.9 x 6.3	3.3 (1.5)
	10	14	CFW500 C 14P0 T4 DB N1	C	NEMA 1	Yes	10.0 x 5.3 x 6.5	5.3 (2.4)
	15	24	CFW500 D 24P0 T4 DB N1	D	NEMA 1	Yes	14.3 x 7.1 x 6.6	10.2 (4.6)
	25	31	CFW500 D 31P0 T4 DB N1	D	NEMA 1	Yes	14.3 x 7.1 x 6.6	10.2 (4.6)

Notes: HP rating based on FLA values from WEG W22, 2 and 4 poles, 230 V ac and 460 V ac, NEMA motors.
Use as a guide only. Motor FLA may vary with speed and manufacturer.
Always compare motor FLA to Nominal AMPS of VFD and overload conditions.

Accessories and Optionals

The CFW500 VFD was developed to meet the hardware configurations required by a wide range of applications. The table below presents the available options:

Option	Type [1]	Description	Optional item code [2]	Accessory code	Available
RFI filter	Optional	Used to reduce the disturbance conducted from the CFW500 to the power supply, in the high frequency band (>150 kHz), according to standards 61800-3 and EN 55011.	C2 or C3	-	Factory installation only
Braking IGBT	Optional	Used in high-inertia applications for the fast stop of the motor by means of an external braking resistance. Resistance not included. For the calculation of the braking resistance, refer to the CFW500 user manual.	DB	-	Factory installation only
Degree of protection NEMA1	Optional or accessory	Used for the CFW500 VFD to have degree of protection NEMA1 and/or when metallic conduits are used for the cables.	N1	CFW500-KN1A (frame size A) CFW500-KN1B (frame size B) CFW500-KN1C (frame size C) CFW500-KN1D (frame size D)	Factory or user installation
Cable shield kit	Accessory	Used to shield the power and control cables. Important: for the version with RFI filter, this filter comes with the product.	-	CFW500-KPCSA (frame size A) CFW500-KPCSB (frame size B) CFW500-KPCSC (frame size C) CFW500-KPCSD (frame size D)	User installation
I/O expansion modules (plug-in) [3]	Accessory	Used to configure the I/O points according to the needs of the application/machine.	-	CFW500-IOS CFW500-IOD CFW500-IOAD CFW500-IOR	-
Communication module (plug-in) [3]	Accessory	Used for the communication of the CFW500 with the main networks of the market (Fieldbus).	-	CFW500-CUSB (USB) CFW500-CCAN (CANopen / DeviceNet) CFW500-CRS232 CFW500-CRS485 CFW500-CPDP (Profibus-DP)	-
Flash memory module (plug-in) [3]	Accessory	Used to download the programming of a CFW500 to others without having to power them up.	-	CFW500-MMF	-
Remote keypad	Accessory	Used to transfer the operation to the panel door or machine console. Maximum distance of 10 m. Degree of protection IP54.	-	CFW500-HMIR	-
Cables for remote keypad	Accessory	Used to interconnect the CFW500 to the remote HMI (CFW500-HMIR).	-	CFW500-CCHMIRXM, where cables with lengths (X) of 1, 2, 3, 5, 7,5 and 10 meters	-

Plug-In Modules Specification [3]

CFW 500 option module	Option card I/O table											
	DI	AI	AO	DOR	DOT	USB	CAN	RS232	RS485	ProfiBus	10 V dc	24 V dc
CFW500-IOS [4]	4	1	1	1	1				1		1	1
CFW500-IOD	8	1	1	1	4				1		1	1
CFW500-IOAD	6	3	2	1	3				1		1	1
CFW500-IOR	5	1	1	4	1				1		1	1
CFW500-CUSB	4	1	1	1	1	1			1		1	1
CFW500-CCAN	2	1	1	1	1		1		1		1	1
CFW500-CRS232	2	1	1	1	1			1	1			1
CFW500-CRS485	4	2	1	2	1				2		1	1
CFW500-CPDP	2	1	1	1	1				1	1		1

Notes: 1) Optional = hardware resources added to the CFW500 in the manufacturing process. Accessory = hardware resource requested as a separated item.
2) Request the product according to the code available on page 10.
3) All models of plug-in modules have at least one RS485 port. The CFW500-CRS485 plug-in module has two RS485 ports. The CFW500 allows installing one plug-in module per unit.
4) CFW500-IOS module included as standard on all drives.

Dimensions and Weights

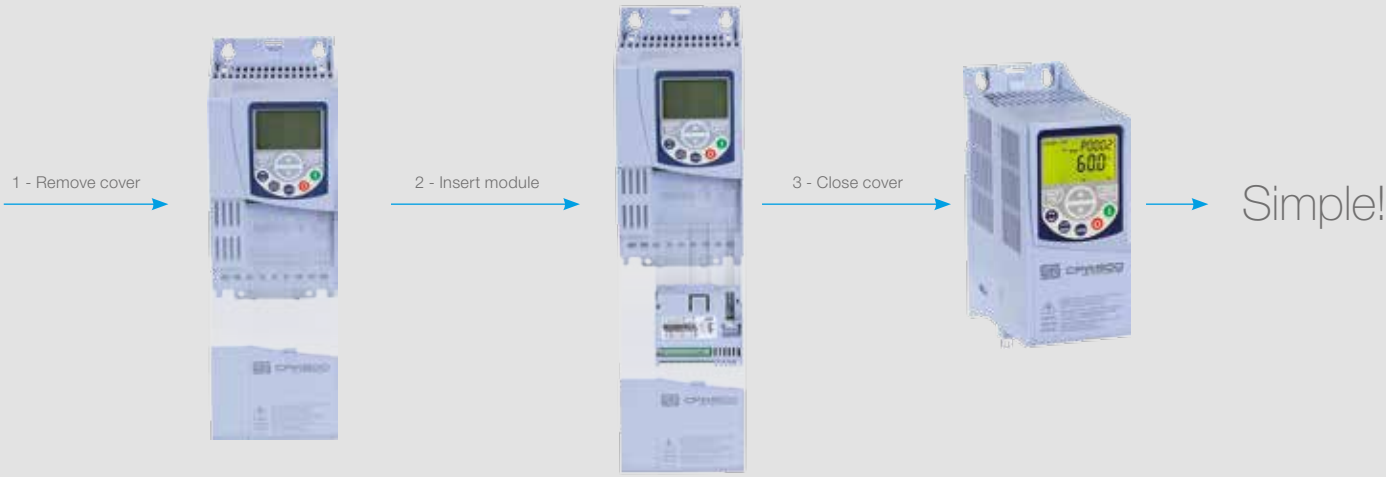
IP20

Frame size IP20	Height in. (mm)	Width in. (mm)	Depth in. (mm)	Weight lbs. (kg)
A	7.4 (189.1)	3.0 (75.2)	5.9 (149.5)	1.8 (0.8)
B	7.8 (199.1)	3.9 (100.2)	6.3 (160.1)	2.6 (1.2)
C	8.3 (210.0)	5.3 (135.2)	6.5 (165.1)	4.4 (2.0)
D	12.1 (306.6)	7.1 (180.0)	6.6 (166.4)	9.5 (4.3)

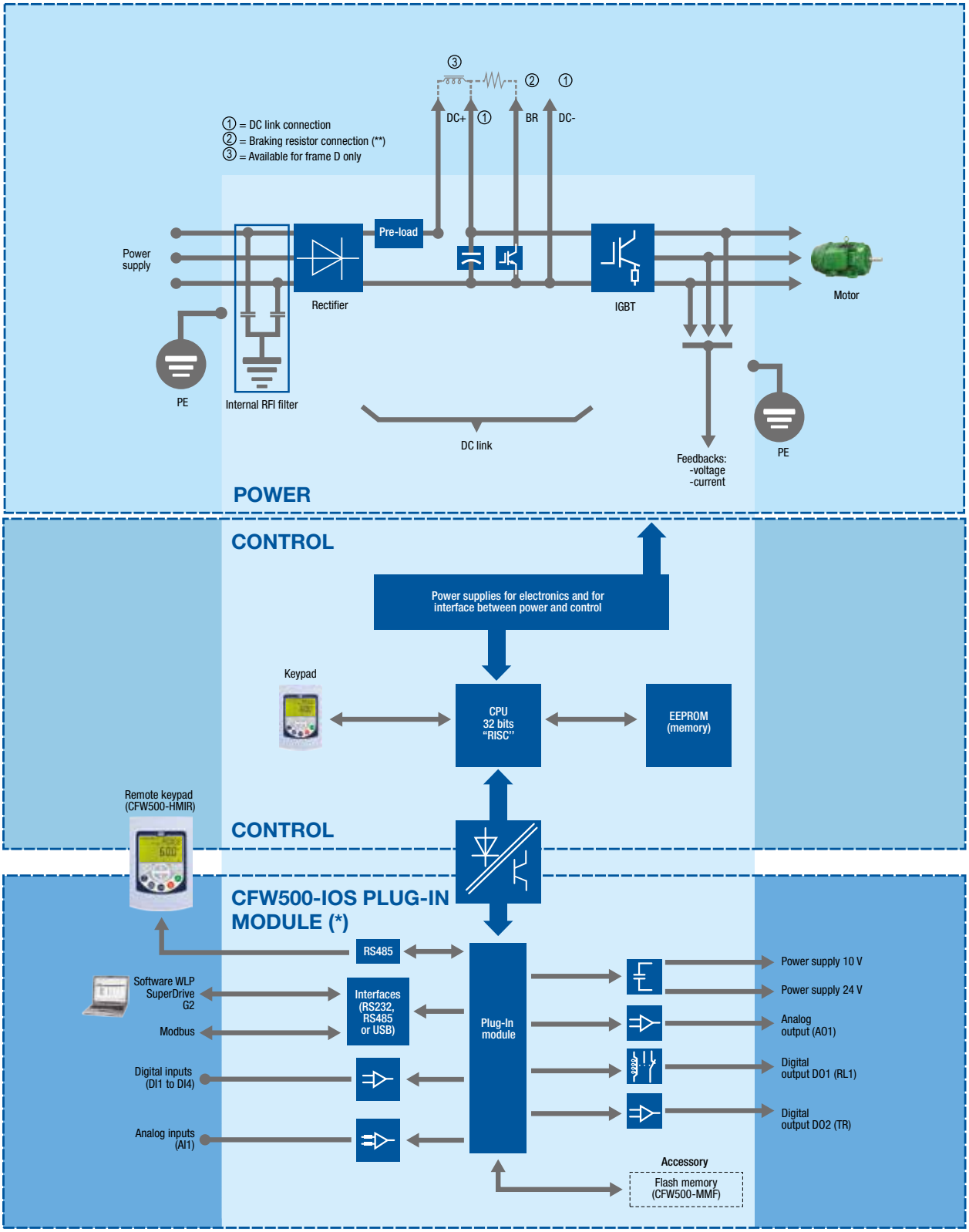
NEMA1

Frame size NEMA1	Height in. (mm)	Width in. (mm)	Depth in. (mm)	Weight lbs. (kg)
A	8.8 (223.0)	3.0 (75.2)	5.9 (149.5)	2.4 (1.1)
B	9.6 (243.3)	3.9 (100.2)	6.3 (160.1)	3.3 (1.5)
C	10.0 (254.8)	5.3 (135.2)	6.5 (165.1)	5.3 (2.4)
D	14.3 (361.9)	7.1 (180.0)	6.6 (166.4)	10.2 (4.6)

Step by Step



Block Diagram



Notes: (*) The number of inputs and outputs (analog and digital), as well as other resources, may vary according to the used plug-in module. For further information, refer to the CFW500 user manual.
(**) Not available for frame size A.

Technical Data

Power supply	Voltage and power range	1-phase, 200-240 V ac (+10%-15%) 0.25 to 2 HP (0.25 to 1.5 kW)
		1-phase/3-phase, 200-240 V ac (+10%-15%) 0.25 to 3 HP (0.25 to 2.2 kW)
		3-phase, 200-240 V ac (+10%-15%) 2 to 15 HP (1.5 to 11 kW)
		3-phase, 380-480 V ac (+10%-15%) 0.5 to 25 HP (0.25 to 19 kW)
	Supply frequency	50/60 Hz (48 Hz to 62 Hz)
Motor connection	Voltage	3-phase, 0-100% of supplied voltage
	Output frequency	0 a 500 Hz
	Displacement power factor	>0.97
	Overload capacity	1.5 x In (drive) for 1 minute every 6 minutes
	Switching frequency	Default 5 kHz (selectable 2.5 to 15 kHz)
	Aceleration time	0.1 to 999s
	Deceleration time	0.1 to 999s
Environment	Temperature	40 ºC - NEMA1
		40 ºC - IP20 side by side and/or with RFI filter
		50 ºC - IP20 without RFI filter (except the models for 9.6 A and 24 A for 200-240 V)
		2% of current derating for each ºC above the specific operating temperature, limited to an increase of 10 ºC
	Humidity	5% to 95% non-condensing
	Altitude	Up to 1,000 m - rated conditions
		1,000 m to 4,000 m - 1% of current derating for each 100 m above 1,000 m of altitude
	Degree of protection	IP20 or NEMA1 (with NEMA1 kit)
Performance	V/f control	Speed regulation: 1% of the rated speed (with slip compensation)
		Speed variation range: 1:20
	Vector control (VVW)	Speed regulation: 1% of the rated speed
		Speed variation range: 1:30
Braking methods	DC current applied to motor dynamic braking	Available as standard for frame sizes B and C. For frame size A “DB” models need to be used. An extra resistor must be connected in for dynamic braking capability
Safety	Protection	Overcurrent/phase-phase short circuit in the output
		Overcurrent/phase-ground short circuit in the output
		Under/overvoltage
		Overtemperature in the heatsink
		Overload in the motor
		Overload in the power module (IGBTs)
		External alarm / fault
		Setting error
Communication	Modbus-RTU	All plug-in modules for RS485 and CFW500-CRS232 for RS232
	Profbus-DP	Plug-in module CFW500-CPDP
	DeviceNet	Plug-in module CFW500-CCAN
	CANopen	Plug-in module CFW500-CCAN
Chokes (external as accessory)	AC input chokes	For reducing THD
	AC output chokes	For longer motor cables

Technical Data - Standards

Safety standards	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: For the machine to comply with this standard, the manufacturer of the machine is responsible for installing an emergency stop device and equipment to disconnect the input power supply.*
	EN 60146 (IEC 146)	Semiconductor converters.
	EN 61800-2	Adjustable speed electrical power drive systems - Part 2: General requirements - Rating specifcations for low voltage adjustable frequency AC power drive systems.
Electromagnetic compatibility (EMC) Standards	EN 61800-3	Adjustable speed electrical power drive systems - Part 3: EMC product standard including specifc test methods.
	EN 55011	Limits and methods of measurement of radio disturbance characteristics of industrial, scientifc and medical (ISM) radio-frequency equipment.
	CISPR 11	Industrial, scientifc 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 feld 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 standards	EN 60529	Degrees of protection provided by enclosures (IP code).
	UL 50	Enclosures for electrical equipment.