# **CFW500**

## Variable Speed Drive



# **Machinery Drive**

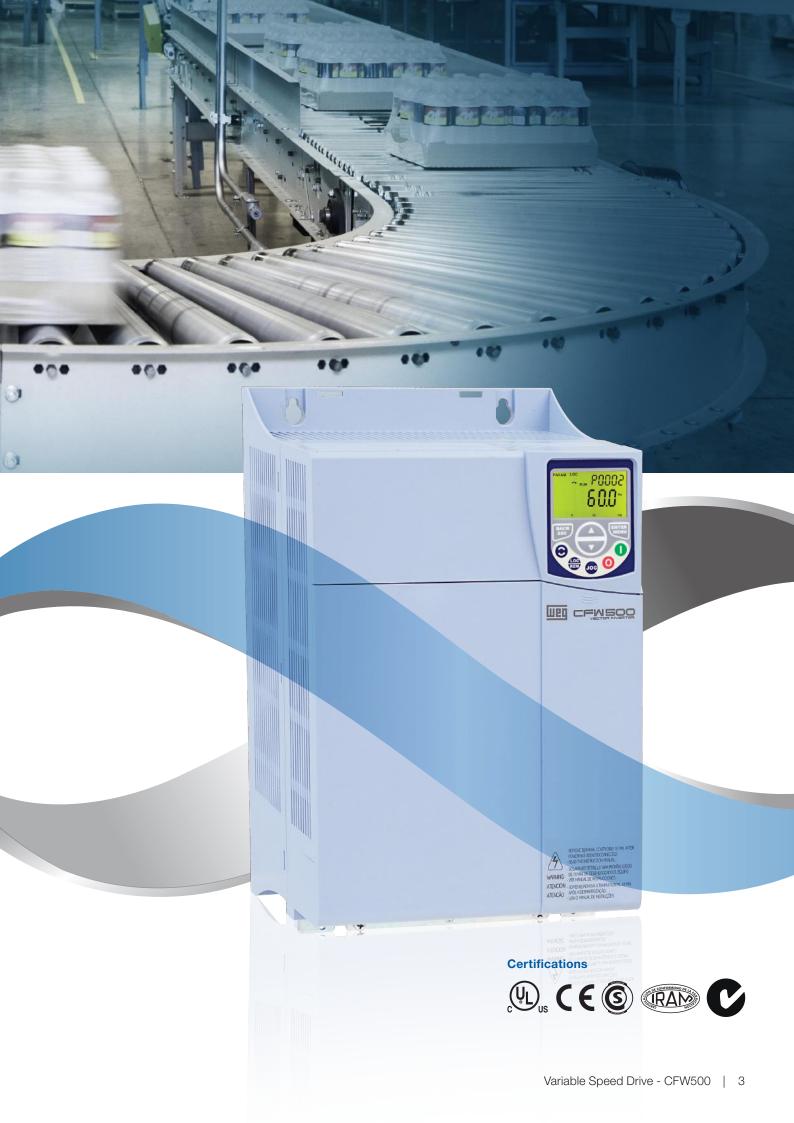
# **Endless** possibilities

The CFW500 variable speed drive is a *high-performance VSD* for applications that require speed and torque control of three-phase induction motors. It *has vector or scalar control,* SoftPLC, which adds PLC (Programmable Logic Controller) functions, Pump Genius, which allows driving several pumps, and selectable plug-in modules, *forming a flexible and optimized solution.* 

### **Characteristics**

- Output current 1.0 to 56.0 A (0.25 to 30.0 cv / 0.18 to 22.0 kW)
- Single and three-phase power supply 200-240 V, 380-480 V or 500-600 V
- Scalar (V/F), VVW Vector, Sensorless Vector and Vector with Encoder
- Selectable plug-in module
- Plug and play philosophy
- Built-in Operating and Programming Interface (HMI)
- Built-in RS485 port (in any plug-in module selected)
- Pump Genius Multipump
- SoftPLC built-in PLC functionalities
- Side by side installation (for temperatures below 40 °C)
- Operating ambient temperature 50 °C
- Surface or DIN rail mounting
- Brake IGBT (available on frame sizes B and C)
- 3C2 or 3C3 protection class for application in environments with corrosive chemical substances.

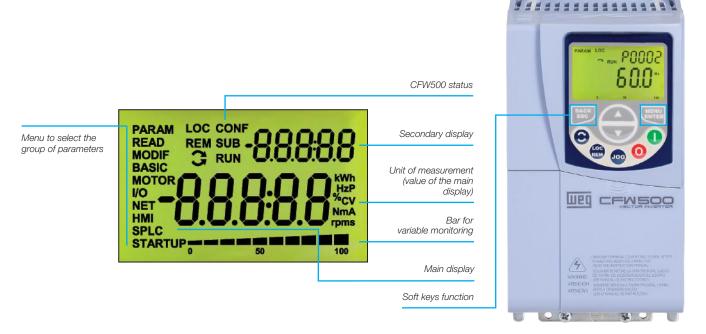
- IP20 protection degree (standard) and NEMA1 (optional)
- Fan with fast exchange system
- Internal RFI filter (optional)
- Fault or alarm diagnosis
- Fieldbus communications (according to plug-in module selected) CANopen, DeviceNet, Profibus-DP or Ethernet
- USB communication port (CFW500-CUSB plug-in)
- Memory card for data transfers (parameters and SoftPLC) without the necessity to power up the CFW500 (CFW500-MMF accessory)
- Free WLP and SuperDrive G2 programming softwares available at <u>www.weg.net</u>
- Remote serial operating interface (HMI) (CFW500-HMIR accessory)



### Simplified Programming and Operation

### **Operating Interface (HMI)**

- View, setting and command of all parameters
- Up to three parameters indication on the display, according to user selection
- Oriented start-up and grouped parameters



Note: the operating interface (HMI) of the CFW500 is not removable. For remote operation of the HMI, use the CFW500-HMIR accessory, according to the accessory table on page 12.

### **Remote Operating Interface (HMI)**

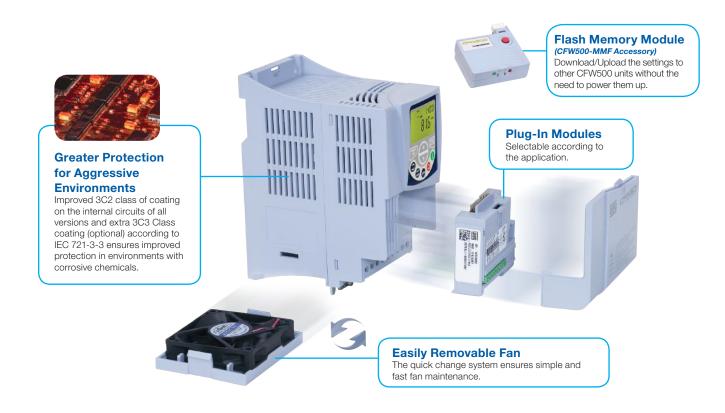
Solutions for machine consoles and panels.



### Flexibility and Performance

The CFW500 has a modern design, and it can be selected according to the application requirements, providing flexibility with excellent performance. In the plug-in module version, the CFW500-IOS module comes with the VSD. In the version without plug-in module, the desired plug-in module may be selected (always one plug-in module per VSD). All plug-in modules have built-in RS485 Modbus-RTU.

The installation of the CFW500 is simple, and its configuration and operation is intuitive with the navigation menus of the operating interface (HMI) with built-in LCD display. Using the flash memory module, it is possible to download the existing setting from one CFW500 to other units without powering them up.



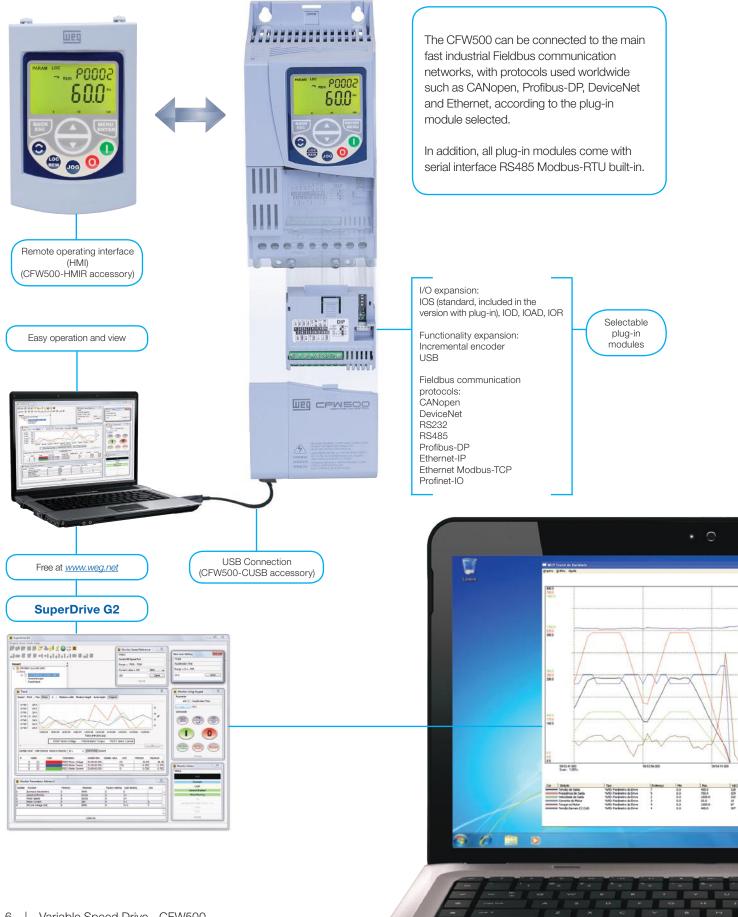


### SoftPLC

It is a software resource added to the CFW500 which allows the user to implement and debug logic projects equivalent to a small PLC (Programmable Logic Controller), customizing and integrating the CFW500 to the application. The free WLP programming software is available on: <u>www.weg.net</u>.



### Connectivity

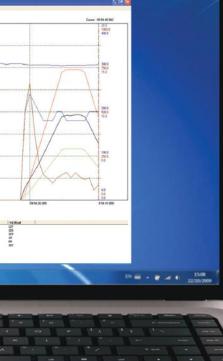


### Features

- Password to protect the parameters
- Special engineering units (RPM, °C, Nm, mA, %, kW, kWh, among others)
- Backup of all parameters (via SuperDrive G2 software, memory card or memory of the CFW500)
- Possibility to save up to two different settings on the memory of the CFW500
- Setting of the switching frequency according to the application requirements
- Speed reference via electronic potentiometer
- Multispeed with up to eight programmable speeds
- Slip compensation
- Manual or automatic torque boost (V/F scalar mode) or self-adjustment (VVW vector mode)

- Acceleration/deceleration ramps
- "S" type ramp
- DC braking
- Internal dynamic braking (frame size B and biggers)
- PID controller to control processes in closed loop
- Flying start / Ride-through
- Sleep mode
- Skip frequencies or frequency ranges function
- Overload and overtemperature protection
- Overcurrent protection
- DC link voltage supervision
- Fault log





Using the SuperDrive G2 software, it is possible to change, monitor and view graphically the variables of the CFW500 on a personal computer.

#### **Trend Function**

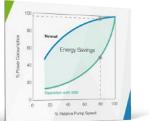
Trend charts for online monitoring of parameters and other variables within the SuperDrive G2 software.

### Pump Genius



### **multipump**

Pump Genius Multipump is a free application developed to be used with the SoftPLC of the CFW500, it allows driving two or more pumps with only one inverter.



### **Energy Savings**

The use of the CFW500 with the Pump Genius Multipump improves the performance and provides electric energy savings. Using this solution together with WEG W22 Premium motors, and reducing the pump speed even if slightly, it is possible to reduce the electric energy consumption by approximately 15%, thus contributing to the sustainable development of the planet.



### **Broken Pipe Alarm**

Pump Genius detects when the pump is consuming more electric energy than it should, by means of information on the pump load and speed, automatically generating an alarm warning of leaky pipes. In addition, with the monitoring of the system pressure, a clogging condition may be detected by configuring the maximum pressure to trigger the alarm of clogged pipe.



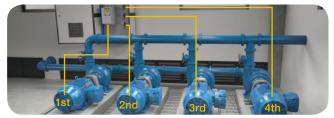
### **Sleep and Wake up Function**

The sleep function keeps the pump in the standby mode when the demand or flow is below the necessary for long periods, providing electric energy savings and increasing the lifetime of the pump. The wake up function restarts the drive automatically when the pressure falls below the set point.



#### **Pipe Charging Function**

It allows lubrication and smooth initial charging of the pipes, making the pump operate at a lower preset speed for a certain time, avoiding "Water Hammers", which may damage the piping system.





### **Fixed or Floating Control**

Using fixed control, two to four pumps may be driven in parallel, where the CFW500 will always drive the same pump. Using floating control, two to three pumps may be driven, and the pump driven by the inverter may change according to the rotation requirements. The user chooses if the pumps will start in a preset sequence or in rotation, defining which pump should be started or stopped, according to the monitoring logic of operation time of each pump. The free PumpGenius Multipump application for the CFW500 is available at <u>www.weg.net</u>. For further details refer to the catalog or programming manual.

### Applications



Centrifugal pumps



Process dosing pumps





Conveyor belts

Granulators / palletizers



Stirrers / mixers





Cutting and welding machines



Rotary filters





### Dryers and rotary ovens



Winding machines / uncoiling machines













### Coding



### 1 - CFW500 variable speed drive

#### 2 - Size of the CFW500, according to table 1 below

#### 3 - Rated output current, according to table 1 below

Rated output current of the	Number of phases	Rated voltage	Frame size	Internal dynamic braking <sup>1)</sup>	Degree of protection	Internal RFI filter <sup>2)</sup>	
01P6 = 1.6 A 02P6 = 2.6 A 04P3 = 4.3 A 07P0 = 7.0 A	Single-phase		A	NB		Blank or C2 Blank or C3	
07P3 = 7.3 A 10P0 = 10.0 A			В	DB		C2	
01P6 = 1.6 A 02P6 = 2.6 A 04P3 = 4.3 A	Single-phase	200-240 V	А	NB		Blank	
07P3 = 7.3 A 10P0 = 10.0 A	or three-phase		200-240 V	В	DB		(not available)
07P0 = 7.0 A 09P6 = 9.6 A			А	NB	IP20 or N1	Blank	
16P0 = 16 A 24P0 = 24 A	Three-phase		B C	DB DB		(not available)	
28P0 = 28 A 33P0 = 33 A 47P0 = 47 A			D	DB		Blank or C3	
56P0 = 56.0 A			E	DB			
01P0 = 1.0 A 01P6 = 1.6 A 02P6 = 2.6 A 04P3 = 4.3 A				A	NB		Blank or C2
06P1 = 6.1 A						Blank or C3	
02P6 = 2.6 A 04P3 = 4.3 A 06P5 = 6.5 A	Three-phase	380-480 V	В	DB		Blank or C2	
10P0 = 10.0 A	·					Blank or C3	
14P0 = 14.0 A 16P0 = 16.0 A			С	DB		Blank or C2	
24P0 = 24.0 A 31P0 = 31.0 A			D	DB		Blank or C3	
39P0 = 39.0 A 49P0 = 49.0 A			E	DB		Blank or C3	

#### 4 - Number of phases

S	Single-phase power supply							
В	Single or three-phase power supply							
Т	Three-phase power supply							
5 - Rated voltage								
2	200-240 V							

### 2 200-240 V 4 380-480 V 5 500-600 V

#### 6 - Internal dynamic braking

NB	Without internal dynamic braking IGBT
DB	With internal dynamic braking IGBT

#### 7- Protection degree

 20
 IP20 protection degree

 N1
 NEMA1 protection degree

### 8 - RFI filter

Blank	Without internal RFI filter
C2	With internal RFI filter - category 2
C3	With internal RFI filter - category 3

### 9 - Special hardware versions - H xx

### 9.1 - Plug-in module

Blank With standard plug-in module						
00 Without plug-in module						
9.2 - Coating for harsh environments						

	Class 3C2 - Standard coating
EC Class 3C3 - Extra coating	Class 3C3 - Extra coating

#### 10 - Special software version - S xx

Blank	Standard software
ХХ	Special software

Notes: 1) Braking resistor not included.

2) Conducted emission level (IEC 61800-3).

In order to minimize such problem, WEG variable speed drives contain common-mode capacitive filters, which are enough to avoid this type of interference in most cases. If necessary, our inverters also have radio frequency (RFI) filters to reduce even more those high-frequency electromagnetic interference signals. Item 8 of the table above shows how to select the models of internal RFI filters for the CFW500. Definitions of IEC/EN 61800-3 standard. Categories:

Category C1: variable speed drives with voltage rating below 1,000 V and intended for application in the "First Environment".

Category C2: inverters with voltage rating below 1,000 V not provided with plugs or movable installations, and, when applied in the "First Environment", they must be installed and commissioned by a professional.

Category C3: inverters with voltage ratings below 1,000 V developed for application in the "Second Environment" and not designed for application in the "First Environment".

Environments: First Environment: environments that include domestic installations, such as establishments directly connected without intermediate transformers to the low voltage power line, which supplies buildings used for domestic purposes.

Second environment: environments that include all the buildings other than those directly connected to the low voltage power line, which supplies buildings used for domestic purposes.

For RFI filters installed externally, refer to the CFW500 user manual.

### CFW500 With IOS Plug-In Module Built-In

	Maximum applicable motor <sup>1)</sup>									
Reference <sup>2)</sup>	Doworo		Frame Internal dynamic		Rated output	Power oupply (A)	Motor rat	ed power		
References	Powers	upply (V)	size	braking (IGBT)	current (A)	Power supply (V)	HP	kW		
CFW500A01P6S2NB20					1.60		0.25	0.18		
CFW500A02P6S2NB20	- Single-phase	200-240	A	N/A	2.60		0.50	0.37		
CFW500A04P3S2NB20			A	N/A	4.30		1.00	0.75		
CFW500A07P0S2NB20					7.00		2.00	1.50		
CFW500A01P6B2NB20					1.60		0.25	0.18		
CFW500A02P6B2NB20	Single-phase		A	N/A	2.60		0.50	0.37		
CFW500A04P3B2NB20	or	200-240			4.30		1.00	0.75		
CFW500B07P3B2DB20	three-phase		D	Duilt in	7.30		2.00	1.50		
CFW500B10P0B2DB20	1		В	Built-in	10.00	220	3.00	2.20		
CFW500A07P0T2NB20				NI/0	7.00		2.00	1.50		
CFW500A09P6T2NB20			A	N/A	9.60		3.00	2.20		
CFW500B16P0T2DB20			В		16.00		5.00	3.70		
CFW500C24P0T2DB20	Three-phase	000 040	С		24.00		7.50	5.50		
CFW500D28P0T2DB20		200-240		Built-in	28.00	- - -	10.00	7.50		
CFW500D33P0T2DB20		D	D		33.00		12.50	9.00		
CFW500D47P0T2DB20					47.00		15.00	11.00		
CFW500E56P0T2DB20	]		E		56.00		20.00	15.00		
CFW500A01P0T4NB20				N/A	1.00		0.25	0.18		
CFW500A01P6T4NB20			A		1.60		0.50	0.37		
CFW500A02P6T4NB20					2.60		1.50	1.10		
CFW500A04P3T4NB20				4.30		2.00	1.50			
CFW500A06P1T4NB20					6.10		3.00	2.20		
CFW500B02P6T4DB20							2.60		1.50	1.10
CFW500B04P3T4DB20			В		4.30	]	2.00	1.50		
CFW500B06P5T4DB20	1	380-480	В		6.50	380 or 440	3.00	2.20		
CFW500B10P0T4DB20					10.00		5.00	3.70		
CFW500C14P0T4DB20				Duitt in	14.00		7.50	5.60		
CFW500C16P0T4DB20	Three-phase		C	Built-in	16.00		10.00	7.50		
CFW500D24P0T4DB20					24.00		15.00	11.00		
CFW500D31P0T4DB20			D		31.00		20.00	15.00		
CFW500E39P0T4DB20			-		39.00		25.00	18.50		
CFW500E49P0T4DB20			E		49.00		30.00	22.00		
CFW500C01P7T5DB20					1.70		1.00	0.75		
CFW500C03P0T5DB20					3.00		2.00	1.50		
CFW500C04P3T5DB20		E00.000		D	4.30	600	3.00	2.20		
CFW500C07P0T5DB20		500-600	C	Built-in	7.00	600	5.00	3.70		
CFW500C10P0T5DB20					10.00		7.50	5.50		
CFW500C12P0T5DB20					12.00		10.00	7.50		

Notes: 1) The power values for maximum applicable motor shown in the table above are reference values and valid for WEG four-pole, three-phase induction motors with power supply of 220 V, 380 V, 440 V or 600 V. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.

2) Included in this reference the CFW500-IOS standard plug-in module. Smart code without "H00".

N/A = Not applicable.



### **CFW500 Without Plug-In Module**

You must select the smart code of the CFW500 without plug-in module (CFW500 xxx H00) + smart code of the desired plug-in module.

CFW500 variable speed drive						Maximum applicable motor <sup>1)</sup>			
Reference <sup>2)</sup>	Power s	upply (V)	Frame size	Internal dynamic	Rated output	Power supply (V)		ed power	
		1	Size	braking (IGBT)	current (A)		HP	kW	
CFW500A01P6S2NB20H00	Single-phase				1.60		0.25	0.18	
CFW500A02P6S2NB20H00		200-240	A	N/A	2.60		0.50	0.37	
CFW500A04P3S2NB20H00					4.30		1.00	0.75	
CFW500A07P0S2NB20H00					7.00		2.00	1.50	
FW500A01P6B2NB20H00					1.60		0.25	0.18	
CFW500A02P6B2NB20H00	Single-phase or three-phase		A	N/A	2.60		0.50	0.37	
FW500A04P3B2NB20H00		200-240			4.30		1.00	0.75	
FW500B07P3B2DB20H00			В	Built-in	7.30		2.00	1.50	
FW500B10P0B2DB20H00					10.00	220	3.00	2.20	
FW500A07P0T2NB20H00			A	N/A	7.00		2.00	1.50	
FW500A09P6T2NB20H00					9.60		3.00	2.20	
FW500B16P0T2DB20H00			В		16.00		5.00	3.70	
FW500C24P0T2DB20H00	Three-phase	200-240	C		24.00		7.50	5.50	
FW500D28P0T2DB20H00		200 210		Built-in	28.00		10.00	7.50	
FW500D33P0T2DB20H00			D		33.00		12.50	9.00	
FW500D47P0T2DB20H00					47.00		15.00	11.00	
FW500E56P0T2DB20H00			E		56.00		20.00	15.00	
FW500A01P0T4NB20H00			A 380-480 B	N/A	1.00	380 or 440	0.25	0.18	
CFW500A01P6T4NB20H00					1.60		0.50	0.37	
CFW500A02P6T4NB20H00					2.60		1.50	1.10	
FW500A04P3T4NB20H00					4.30		2.00	1.50	
CFW500A06P1T4NB20H00					6.10		3.00	2.20	
CFW500B02P6T4DB20H00					2.60		1.50	1.10	
CFW500B04P3T4DB20H00					4.30		2.00	1.50	
CFW500B06P5T4DB20H00		380-480			6.50		3.00	2.20	
FW500B10P0T4DB20H00						10.00		5.00	3.70
CFW500C14P0T4DB20H00				Duill 1	14.00		7.50	5.60	
FW500C16P0T4DB20H00	Three-phase		C	Built-in	16.00		10.00	7.50	
FW500D24P0T4DB20H00					24.00		15.00	11.00	
CFW500D31P0T4DB20H00			D		31.00		20.00	15.00	
CFW500E39P0T4DB20H00					39.00		25.00	18.50	
FW500E49P0T4DB20H00			E		49.00		30.00	22.00	
FW500C01P7T5DB20H00					1.70		1.00	0.75	
FW500C03P0T5DB20H00					3.00		2.00	1.50	
FW500C04P3T5DB20H00					4.30		3.00	2.20	
FW500C07P0T5DB20H00	-	500-600	C	Built-in	7.00	600	5.00	3.70	
CFW500C10P0T5DB20H00					10.00		7.50	5.50	
CFW500C12P0T5DB20H00					12.00		10.00	7.50	

Notes: 1) The power values for the maximum applicable motor shown in the table above are reference values and valid for WEG three-phase, four-pole induction motors with power supply of 220 V, 380 V, 440 V or 600 V. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.

2) No plug-in module included in this reference. A plug-in module must be added according to the table on page 15. N/A = Not applicable.

### CFW500 With IOS Plug-In Module and RFI Filter Built-In

	Maximum	applicable motor <sup>1)</sup>							
Reference <sup>2)</sup>	Powers	upply (V)	Frame	Internal dynamic	Rated output	Power supply (V)	Motor rated power		
		սիիւծ (ձ)	size	braking (IGBT)	current (A)	rower supply (v)	HP	kW	
CFW500A01P6S2NB20C2					1.60		0.25	0.18	
CFW500A02P6S2NB20C2	]		A	N//A	2.60		0.50	0.37	
CFW500A04P3S2NB20C2	- Single-phase	200-240		N/A	4.30		1.00	0.75	
CFW500A07P0S2NB20C3	- Single-phase	200-240			7.00		2.00	1.50	
CFW500B07P3S2DB20C2	]		В	Built-in	7.30		2.00	1.50	
CFW500B10P0S2DB20C2				Duilt-III	10.00		3.00	2.20	
N/A					1.60		0.25	0.18	
N/A	Single-phase		A	N/A	2.60		0.50	0.37	
N/A	or	200-240			4.30		1.00	0.75	
N/A	three-phase		в	Built-in	7.30	220	2.00	1.50	
N/A			В		10.00		3.00	2.20	
N/A				N/A	7.00		2.00	1.50	
N/A		_	A		9.60		3.00	2.20	
N/A	1		В		16.00		5.00	3.70	
N/A	Thurs allow	200-240	С		24.00		7.50	5.50	
CFW500D28P0T2DB20C3	- Three-phase	200-240		Built-in	28.00		10.00	7.50	
CFW500D33P0T2DB20C3	]		D		33.00		12.50	9.00	
CFW500D47P0T2DB20C3	]				47.00		15.00	11.00	
CFW500E56P0T2DB20C3	]		E		56.00		20.00	15.00	
CFW500A01P0T4NB20C2						1.00		0.25	0.18
CFW500A01P6T4NB20C2						1.60		0.50	0.37
CFW500A02P6T4NB20C2	]		A	N/A	2.60	380 or 440	1.50	1.10	
CFW500A04P3T4NB20C2					4.30		2.00	1.50	
CFW500A06P1T4NB20C3					6.10		3.00	2.20	
CFW500B02P6T4DB20C2					2.60		1.50	1.10	
CFW500B04P3T4DB20C2			в		4.30		2.00	1.50	
CFW500B06P5T4DB20C2	Three-phase	380-480	В		6.50		3.00	2.20	
CFW500B10P0T4DB20C3					10.00		5.00	3.70	
CFW500C14P0T4DB20C2			С	Duilt in	14.00		7.50	5.60	
CFW500C16P0T4DB20C2				Built-in	16.00		10.00	7.50	
CFW500D24P0T4DB20C3					24.00		15.00	11.00	
CFW500D31P0T4DB20C3			D		31.00		20.00	15.00	
CFW500E39P0T4DB20C3			_		39.00		25.00	18.50	
CFW500E49P0T4DB20C3	1		E		49.00		30.00	22.00	

Notes: 1) The power values for the maximum applicable motor shown in the table above are reference values and valid for WEG three-phase, four-pole induction motors with power supply of 220 V, 380 V or 440 V. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.

2) Included in this reference the CFW500-IOS standard plug-in module and internal RFI filter. N/A = Not applicable.





### CFW500 Without Plug-In Module And RFI Filter Built-In

You must select the smart code of the CFW500 without plug-in module + smart code of the desired plug-in module (according to the selection table on page 15).

	CFV	V500 variable	speed dr	ive		Maximum	Maximum applicable motor <sup>1)</sup>						
Reference <sup>2)</sup>	Power su	pply (V)	Frame size	Internal dynamic braking (IGBT)	Rated output current (A)	Power supply (V)	Motor rated powe						
CFW500A01P6S2NB20C2H00					1.60		0.25	kW 0.18					
CFW500A02P6S2NB20C2H00					2.60	-	0.50	0.37					
CFW500A04P3S2NB20C2H00	Single-phase		A	N/A	4.30	-	1.00	0.75					
CFW500A07P0S2NB20C3H00		200-240			7.00	-	2.00	1.50					
CFW500B07P3S2DB20C2H00					7.30		2.00	1.50					
CFW500B10P0S2DB20C2H00			В	Built-in	10.00	-	3.00	2.20					
N/A					1.60		0.25	0.18					
N/A	Single-phase or		A	N/A	2.60	-	0.50	0.37					
N/A		200-240			4.30		1.00	0.75					
N/A	three-phase			Duill 1	7.30	220	2.00	1.50					
N/A			В	Built-in	10.00		3.00	2.20					
N/A	Three-phase 2								N//A	7.00	1	2.00	1.50
N/A			A	N/A	9.60	· ·	3.00	2.20					
N/A			В	Built-in	16.00		5.00	3.70					
N/A		200-240	С		24.00		7.50	5.50					
FW500D28P0T2DB20C3H00					28.00		10.00	7.50					
CFW500D33P0T2DB20C3H00			D		33.00		12.50	9.00					
CFW500D47P0T2DB20C3H00					47.00		15.00	11.00					
CFW500E56P0T2DB20C3H00			E		56.00		20.00	15.00					
CFW500A01P0T4NB20C2H00				N/A	1.00	380 or 440	0.25	0.18					
CFW500A01P6T4NB20C2H00					1.60		0.50	0.37					
CFW500A02P6T4NB20C2H00	]		A		2.60		1.50	1.10					
CFW500A04P3T4NB20C2H00					4.30		2.00	1.50					
CFW500A06P1T4NB20C3H00					6.10		3.00	2.20					
CFW500B02P6T4DB20C2H00					2.60		1.50	1.10					
FW500B04P3T4DB20C2H00			В		4.30		2.00	1.50					
CFW500B06P5T4DB20C2H00	Three-phase	380-480			6.50		3.00	2.20					
CFW500B10P0T4DB20C3H00					10.00		5.00	3.70					
FW500C14P0T4DB20C2H00			с	Built-in	14.00		7.50	5.60					
FW500C16P0T4DB20C2H00				Duit-III	16.00		10.00	7.50					
CFW500D24P0T4DB20C3H00			D		24.00		15.00	11.00					
CFW500D31P0T4DB20C3H00					31.00	_	20.00	15.00					
CFW500E39P0T4DB20C3H00			Е		39.00		25.00	18.50					
CFW500E49P0T4DB20C3H00			-		49.00		30.00	22.00					

Notes: 1) The power values for the maximum applicable motor shown in the table above are reference values and valid for WEG three-phase, four-pole induction motors with power supply of 220 V, 380 V or 440 V. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.

2) No plug-in module included in this reference, only RFI filter. A plug-in module must be added according to the table on page 15. N/A = Not applicable.



#### Plug-In Module Selection<sup>1)</sup>

You must select the smart code of the plug-in module together with the smart code of the CFW500 without plug-in module. You must always select only one plug-in module per CFW500.

Reference	Description						
neierence	Input and output (I/O) expansion	Illustrative figures					
CFW500-I0S	Standard plug-in module (included in the version with plug-in module)						
CFW500-IOD	Digital input and output (I/O) expansion plug-in module						
CFW500-IOAD	Digital and analog input and output (I/O) expansion plug-in module						
CFW500-IOR	Relay output expansion plug-in module	E F L					
	Functionality expansion						
CFW500-ENC	Plug-in module with input for encoder	Lawrence ()					
CFW500-CUSB	Plug-in module with USB port	·					
	Communication on Fieldbus network	Bangas and and					
CFW500-CCAN	Can communication plug-in module (CANopen/DeviceNet)	Language and the					
CFW500-CRS232	RS232 communication plug-in module						
CFW500-CRS485	RS485 communication plug-in module	Manager Man					
CFW500-CPDP	Profibus-DP communication plug-in module	Heinerten					
CFW500-CETH-IP	Ethernet-IP communication plug-in module						
CFW500-CEMB-TCP	Ethernet Modbus-TCP communication plug-in module						
CFW500-CEPN-I0	Profinet IO communication plug-in module						

Note: 1) Accessory already included if the CFW500 version with the standard plug-in module is selected. The plug-in modules can also be sold separately as an accessory item or spare part.

#### Configuration of the Plug-In Modules<sup>1)</sup>

								Function	s							
Plug-in	Inputs		Outputs				Input for	Fieldbus networks							Supply	
module	Digital	Analog	Analog	Digital relay	Digital transistor	USB port	Input for Encoder <sup>3)</sup>	CANopen DeviceNet	RS232	RS485	Profibus-DP	Ethernet-IP	Ethernet Modbus-TCP	Profinet-IO	10 V	24 V
CFW500-IOS	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 <sup>2)</sup>	1	1	4	1	-	-	-	-	1	-	-	-	-	1	1
CFW500-ENC	5 <sup>2)</sup>	1	1	4	1	-	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	-
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
CFW500-CETH-IP	2	1	1	1	1	-	-	-	-	1	-	1	-	-	-	1
CFW500-CEMB-TCP	2	1	1	1	1	-	-	-	-	1	-	-	1	-	-	1
CFW500-CEPN-IO	2	1	1	1	1	-	-	-	-	1	-	-	-	1	-	1

Note: 1) All plug-in models have at least one RS485 port. The CFW500-CRS485 plug-in module has two RS485 ports.

1) All plug-in models have at least one n3455 point. The of Wood-on 15455 plug-in module per unit.
2) The digital inputs are always NPN, and it cannot be configured for PNP like the others.
3) Incremental Encoder (A/A - B/B)
See the installation guides of the plug-in modules on the website <u>www.weg.net</u>



#### **Optional Items**

They are hardware resources added to the CFW500 in the manufacturing process, and they should be requested via smart code.

#### Internal Dynamic Braking (IGBT)

Used for quick stop of the motor with external braking resistor.

In order to add the internal dynamic braking (IGBT) to the CFW500, "DB" must be entered in item 8 of the smart code, only available for frame size B and biggers models, according to table 1 of page 10. External braking resistance not included. For the calculation of the external braking resistance, refer to the CFW500 user manual.

#### **NEMA1** Protection Degree

When selected, they provide NEMA1 protection rating for the CFW500.

In order to add NEMA1 protection degree to the CFW500, enter N1 in item 7 of the smart code.

#### **Internal RFI Filter**

The RFI filters installed on the CFW500 inverters are used to reduce the disturbance conducted from the inverter to the power line in the high frequency band (>150 kHz). It is necessary to comply with the maximum emission levels of the electromagnetic compatibility standards, such as EN 61800-3 and EN 55011.

In order to add an internal RFI filter to the CFW500, enter C2 or C3 in item 8 of the smart code. Check the available models on page 16.

For RFI filters installed externally, refer to the CFW500 user manual.

#### **Special Hardware Versions**

They add functionalities to the standard versions:

#### **Plug-In Module**

On the CFW500, it is possible to choose the model of the internal plug-in module by entering H00 in item 9 of the smart code. Note that in this case it is necessary to select the plug-in module according to the table on page 15.

In case H00 is not selected in item 9 of the smart code, the CFW500 will be supplied with the CFW500-IOS plug-in.

#### **Protection for Aggressive Environments**

The standard version of the CFW500 offers protection class 3C2, according to IEC 721-3-3, in which the internal circuit boards are coated, ensuring greater protection for applications in environments with corrosive chemicals such as hydrogen sulfide, sulfur dioxide, chlorine and others.

It is possible to request an extra coating on the internal circuit boards, Protection Class 3C3, according to IEC 721-3-3, by adding EC to item 9 of the smart code, ensuring even greater protection for applications in harsh corrosive environment.

Note: in order to select the CFW500 without plug-in module (H00) and with extra coating on the internal circuit boards (HEC), H00EC must be entered in item 9 of the smart code.



#### Accessories

The accessories are hardware resources that may be added to the CFW500 in the application, and they are available in the table below:

Reference	Description Memory	Illustrative figures						
CFW500-MMF	Flash memory module	C.						
Interfaces								
CFW500-HMIR	Remote operating interface (HMI)							
CFW500-CCHMIR1M	1-meter cable set for remote operating interface (HMI)	· · · ·						
CFW500-CCHMIR2M	2-meter cable set for remote operating interface (HMI)	50009						
CFW500-CCHMIR3M	3-meter cable set for remote operating interface (HMI)							
CFW500-CCHMIR5M	5-meter cable set for remote operating interface (HMI)							
CFW500-CCHMIR75M	7.5-meter cable set for remote operating interface (HMI)							
CFW500-CCHMIR10M	10-meter cable set for remote operating interface (HMI)							
	Description							
CFW500-KN1A	NEMA 1 Kit - size A (standard for option N1)							
CFW500-KN1B	NEMA 1 Kit - size B (standard for option N1)							
CFW500-KN1C	NEMA 1 Kit - size C (standard for option N1)							
CFW500-KN1D	NEMA 1 Kit - size D (standard for option N1)							
CFW500-KN1E	NEMA 1 Kit - size E (standard for option N1)	HI CONTROL MARKED						
CFW500-KPCSA	Shielding kit for the power cables - size A (standard for option C2 and C3)	Carlos Ca						
CFW500-KPCSB	Shielding kit for the power cables - size B (standard for option C2 and C3)							
CFW500-KPCSC	Shielding kit for the power cables - size C (standard for option C2 and C3)							
CFW500-KPCSD	CFW500-KPCSD Shielding kit for the power cables - size D (standard for option C2 and C3)							
CFW500-KPCSE	Shielding kit for the power cables - size E (standard for option C2 and C3)							





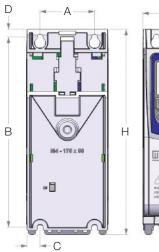
#### **Protections**

						CFW500 variable speed drive								
	Recommended WEG fuse and switch-disconnector			motor-protective						Internal	Dotod		ximum ble mot	
				CIFCUIT Dreaker'		Deference	Douvor our			Internal dynamic	Rated output		Motor rated power	
		Reference				Reference	Power supply (V)		size	braking (IGBT)	current	Power	potroi	
l <sup>2</sup> t (A <sup>2</sup> s)	Current (A)	Fuse	Switch- disconnector	Current (A)	Reference					(IGDT)	(A)	supply (V)	HP	kW
373	20	FNH00-20K-A	FSW160-3	6.30	MPW18-3-D063	CFW500A01P6S2					1.60		0.25	0.18
373	20	FNH00-20K-A	FSW160-3	10.00	MPW18-3-U010	CFW500A02P6S2			A	N/A	2.60		0.50	0.37
373	25	FNH00-25K-A	FSW160-3	16.00	MPW18-3-U016	CFW500A04P3S2	Single-	200-		N/A	4.30		1.00	0.75
800	40	FNH00-40K-A	FSW160-3	25.00	MPW40-3-U025	CFW500A07P0S2	phase	phase 240			7.00		2.00	1.50
450	40	FNH00-40K-A	FSW160-3	25.00	MPW40-3-U025	CFW500A07P3C2S2			В	Built-in	7.30		2.00	1.50
450	63	FNH1-63K-A	FSW250-3	32.00	MPW40-3-U032	CFW500A10P0C2S2				Built in	10.00		3.00	2.20
680	20	FNH00-20K-A	FSW160-3	6.30 / 2.5 <sup>3)</sup>	MPW18-3-D063 / MPW18-3-D025 <sup>3)</sup>	CFW500A01P6B2					1.60		0.25	0.18
680	20	FNH00-20K-A	FSW160-3	4.00 <sup>3)</sup>	MPW18-3-U010 / MPW18-3-U004 <sup>3)</sup>	CFW500A02P6B2	Single-		A	N/A	2.60	220	0.50	0.37
680	25/20 <sup>3)</sup>	FNH00-25K-A / FNH00-20K-A <sup>3)</sup>	FSW160-3	16.00 / 6.30 <sup>3)</sup>	MPW18-3-U016 / MPW18-3-D063 <sup>3)</sup>	CFW500A04P3B2	phase or three-phase	200- 240			4.30		1.00	0.75
450	40/20 <sup>3)</sup>	FNH00-40K-A / FNH00-20K-A <sup>3)</sup>	FSW160-3	25.00 / 16.00 <sup>3)</sup>	MPW40-3-U025 / MPW18-3-U016 <sup>3)</sup>	CFW500B07P3B2			В	Built-in	7.30	220	2.00	1.50
450	63/25 <sup>3)</sup>	FNH1-63K-A / FNH00-25K-A <sup>3)</sup>	FSW250-3 / FSW160-3 <sup>3)</sup>	32.00 / 16.00 <sup>3)</sup>	MPW40-3-U032 / MPW18-3-U016 <sup>3)</sup>	CFW500B10P0B2					10.00		3.00	2.20
680	20	FNH00-20K-A	FSW160-3	10.00	MPW18-3-U010	CFW500A07P0T2				N/A	7.00	2.00	1.50	
1,250	25	FNH00-25K-A	FSW160-3	16.00	MPW18-3-U016	CFW500A09P6T2				N/A	9.60		3.00	2.20
1,000	40	FNH00-40K-A	FSW160-3	25.00	MPW40-3-U025	CFW500B16P0T2					16.00		5.00	3.70
1,000	63	FNH00-63K-A	FSW160-3	40.00	MPW40-3-U040	CFW500C24P0T2	Three-	200-			24.00		7.50	5.50
2,750	63	FNH00-63K-A	FSW160-3	40.00	MPW65-3-U040	CFW500D28P0T2	phase	240		D Built-in	28.00		10.00	7.50
2,750	80	FNH00-80K-A	FSW160-3	50.00	MPW65-3-U050	CFW500D33P0T2	-		D		33.00		12.50	9.20
2,750	100	FNH00-100K-A	FSW160-3	65.00	MPW80-3-U080	CFW500E56P0T2	-				47.00		15.00	11.00
6,600	125	FNH00-125K-A	FSW160-3	80.00	MPW65-3-U065	CFW500D47P0T2			E		56.00		20.00	15.00
450 450	20 20	FNH00-20K-A FNH00-20K-A	FSW160-3 FSW160-3	1.60 2.50	MPW18-3-D016 MPW18-3-D025	CFW500A01P0T4 CFW500A01P6T4	-		A	A N/A	1.00	-	0.25	0.18
450	20	FNH00-20K-A	FSW160-3	4.00	MPW18-3-D025 MPW18-3-U004	CFW500A01P614 CFW500A02P6T4	-				2.60		1.50	1.10
450	20	FNH00-20K-A	FSW160-3	6.30	MPW18-3-D063	CFW500A04P3T4					4.30		2.00	1.50
450	20	FNH00-20K-A	FSW160-3	10.00	MPW18-3-U010	CFW500A06P1T4					6.10		3.00	2.20
450	20	FNH00-20K-A	FSW160-3	4.00	MPW18-3-U004	CFW500B02P6T4	-				2.60		1.50	1.10
450	20	FNH00-20K-A	FSW160-3	6.30	MPW18-3-D063	CFW500B04P3T4					4.30		2.00	1.50
450	20	FNH00-20K-A	FSW160-3	10.00	MPW18-3-U010	CFW500B06P5T4	-	380-	В		6.50	380 or	3.00	2.20
1,000	25	FNH00-25K-A	FSW160-3	16.00	MPW18-3-U016	CFW500B10P0T4		480	0 C		10.00	440	5.00	3.70
1,000	35	FNH00-35K-A	FSW160-3	20.00	MPW40-3-U020	CFW500C14P0T4					14.00		7.50	5.60
1,000	35	FNH00-35K-A	FSW160-3	25.00	MPW40-3-U025	CFW500C16P0T4	Throo				16.00		10.00	7.50
1,800	63	FNH00-63K-A	FSW160-3	40.00	MPW65-3-U040	CFW500D24P0T4	Three- phase		D		24.00		15.00	11.00
1,800	63	FNH00-63K-A	FSW160-3	50.00	MPW65-3-U050	CFW500D31P0T4				D E Built-in	31.00		20.00	15.00
2,100	80	FNH00-80K-A	FSW160-3	50.00	MPW65-3-U050	CFW500E39P0T4			_		39.00		25.00	18.50
13,000	100	FNH00-100K-A	FSW160-3	55.00	MPW65-3-U065	CFW500E49P0T4			E		49.00		30.00	22.00
495	20	FNH00-20K-A	FSW160-3	2.50	MPW18-3-U025	CFW500C01P7T5					1.70		1.00	0.75
495	20	FNH00-20K-A	FSW160-3	4.00	MPW18-3-U004	CFW500C03P0T5					3.00		2.00	1.50
495	20	FNH00-20K-A	FSW160-3	6.30	MPW18-3-U063	CFW500C04P3T5		500- 600			4.30		3.00	2.20
495	20	FNH00-20K-A	FSW160-3	10.00	MPW18-3-U010	CFW500C07P0T5					7.00	600	5.00	3.70
495	25	FNH00-25K-A	FSW160-3	16.00	MPW18-3-U016	CFW500C10P0T5					10.00		7.00	5.50
495	25	FNH00-25K-A	FSW160-3	16.00	MPW18-3-U016	CFW500C12P0T5					12.00		10.00	7.50
100			101100 0	10.00		51 10000121010					12.00		10.00	1.00

Notes: 1) Protection of the electrical circuit only. In order to protect the VSDs, use the recommended ultra-fast fuses. 2) Motor powers are reference values, valid for WEG 4-pole standard motors, frequency of 60 Hz, voltage of 220, 380, 440 or 600 V. The proper size must be always determined according to the rated current of the motor used, which must be lower than or equal to the VSD rated

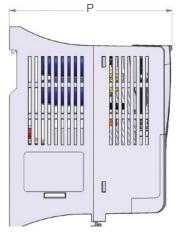
a) The first value refers to the single-phase power supply and the second value to the three-phase power supply.
4) Designed for exclusive industrial or professional use.
N/A = Non-applicable.

### Sizes





L



View of the mounting base

Front view

Side view

Size	А	В	C	D	H	L	Р	Weight
5120	mm	mm	mm	mm	mm	mm	mm	kg
A	50.0	175.0	11.9	7.2	189.0	75.0	150.0	0.8
В	75.0	185.0	11.8	7.3	199.0	100.0	160.0	1.2
С	100.0	195.0	16.7	5.8	210.0	135.0	165.0	2.0
D	125.0	290.0	27.5	10.2	306.6	180.0	166.5	4.3
E	150.0 330.0		34.0	10.6	350.0	220.0	191.5	10.0

Note: for the dimensions in the NEMA version, refer to the user manual.

### **Codes and 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
	Safety standards	EN 60204-1 - Safety of machinery. Electrical equipment of machines. Part 1: general requirements Note: In order to have a machine in accordance with this standard, the manufacturer of the machine is responsible for installing an emergency stop device and a device for disconnection from the power line
		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
		EN 61800-3 - Adjustable speed electrical power drive systems - Part 3: EMC product standard including specific test methods
Standards		EN 55011 - Limits and methods of measurement of radio disturbance characteristcs of industrial, scientific and medical (ISM) radio-frequency equipment
Stanuarus		CISPR 11 - Industrial, scientific and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement
	Electromagnetic	EN 61000-4-2 - Electromagnetic compatibility (EMC) - Part 4: testing and measurement techniques - Section 2: electrostatic discharge immunity test
	compatibility standards	EN 61000-4-3 - Electromagnetic compatibility - Part 4: testing and measurement techniques - Section 3: ratiated, radio-frequency, electromagnetic field immunity test
		EN 61000-4-4 - Electromagnetic compatibility - Part 4: testing and measurement techniques - Section 4: electrical fast transient/burst immunity test
		EN 61000-4-5 - Electromagnetic compatibility - Part 4: testing and measurement techniques - Section 5: surge immunity test
		EN 61000-4-6 - Electromagnetic compatibility - Part 4: testing and measurement techniques - Section 6: immunity to conducted disturbances, induced by radio-frequency fields
	Mechanical	EN 60529 - Degrees of protection provided by enclosures (IP code)
	construction standards	UL 50 - Enclosures for electrical equipment



### **Technical Specifications**

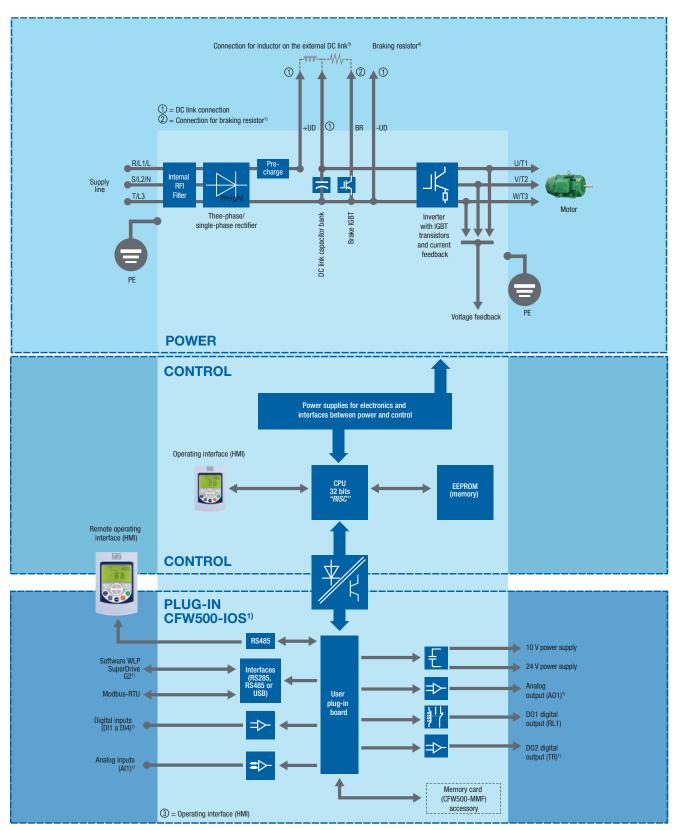
		Tolerance: -15 to +10%
		Frequency: 50/60 Hz (48 Hz to 62 Hz)
		Phase imbalance: <3% of the rated phase-phase input voltage
Power rating	Power supply	Transient voltages and overvoltages according to Category III (EN 61010/UL 508C)
		Maximum of 10 (line) connections per hour (1 every 6 minutes)
		Typical efficiency: ≥97%
		V/F (scalar)
	Method	VWW: voltage vector control
Control	moulou	Vector without encoder (sensorless) and vector with encoder
	Output froguenou	PWM SVM (space vector modulation)
	Output frequency	0 to 500 Hz, resolution of 0.015 Hz Speed regulation: 1% of the rated speed (with sleep compensation)
	V/F Control	Speed variation range: 1:20
	Vector control (10/14)	Speed regulation: 1% of the rated speed
Performance	Vector control (VVW)	Speed variation range: 1:30
i chomanee	Sensorless	Speed regulation: 0.5% of the rated speed
		Speed variation range: 1:100
	Vector control with Encoder	Speed regulation: ±0.01% of the rated speed Speed variation range: 1:100
		0 °C to 40 °C - NEMA1
		0 °C to 40 °C - IP20 side by side and / or with RFI filter
	Temperature around the CFW500	0 °C to 50 °C - IP20 without RFI filter For temperatures above the specification, it is necessary to apply a 2% of current derating for each degree Celsius (°C), limited to an
		increase of 10 °C
		Protection Class 3C2 - Standard coating on the internal circuits, according to IEC 721-3-3 (standard model)
Environment conditions	Aggressive environments	Protection Class 3C3 - Extra coating - optional, according to IEC 721-3-3 (optional)
	Air relative humidity	5% to 95% non-condensing
	Altitude	Up to 1,000 m (maximum altitude under normal conditions)
	Aititude	1,000 to 4,000 m: current derating of 1% for each 100 m above 1,000 m of altitude
	Pollution degree	2 (EN 50178 and UL 508C), with non-conductive pollution
		Condensation must not cause conduction of the accumulated residues
	Analog	1 isolated input. Levels: (0 to 10) V or (0 to 20) mA or (4 to 20) mA Linearity error ≤0.25%
		Impedance: 100 k $\Omega$ for voltage input, 500 $\Omega$ for current input
		Programmable functions Maximum voltage accepted in the inputs: 30 V dc
		4 isolated inputs
Inputs <sup>1)</sup>	Digital	Programmable functions:
		Active high (PNP): maximum low level of 15 V dc; minimum high level of 20 V dc
		Active low (NPN): maximum low level of 5 V dc; minimum high level of 9 V dc Maximum input voltage of 30 V dc
		Input current: 4.5 mA
		Maximum input current: 5.5 mA
		1 isolated output. Levels (0 to 10) V or (0 to 20) mA or (4 to 20) mA
	Analog	Linearity error <0.25% Programmable functions
		RL ≥10 kΩ (0 to 10 V) or RL ≤500 Ω (0 to 20 mA / 4 to 20 mA)
		1 relay with NO/NC contact
	Relay	Maximum voltage: 240 V ac Maximum current of 0.5 A
Outputs <sup>1)</sup>		Programmable functions
		1 isolated open sink digital output (using as reference the 24 V dc power supply)
	Transistor	Maximum current of 150 mA (maximum capacity of the 24 V dc power supply) <sup>2)</sup>
		Programmable functions
		24 V dc power supply. Maximum capacity: 150 mA <sup>2)</sup>
	Power supply	Power supply of 10 V dc.
		Maximum capacity: 2 mA
Communication	Selectable plug-in	Fieldbus: CANopen, DeviceNet, Profibus-DP, Ethernet-IP, Ethernet-Modbus, Profinet-I/O USB, RS485 and RS232 ports
		Phase-phase overcurrent/short circuit in the output
		Phase-phase overcurrent/short circuit in the output Phase-ground overcurrent/short circuit in the output
		Undervoltage/overvoltage in the power
Safety	Protection	Overtemperature of the heatsink Motor overload
		Overload on the power module (IGBTs)
		External fault / alarm
		Programming error
		9 keys: Run/Stop, Increment, Decrement, Direction of rotation, Jog, Local/Remote, Back/Esc and Enter/Menu LCD Display
Operating interface (HMI)	Standard	It allows accessing/changing all the parameters
oportaing interface (filli)	(built in the CFW500)	Accuracy of the indications: Current: 5% of the rated current
		Speed resolution: 0.1 Hz
	IP20	Sizes A, B, C, D and E
Protection degree	NEMA1/IP20	Sizes A, B, C, D and E with NEMA1 kit

Notes: 1) The number and/or types of analog/digital inputs/outputs may vary according to the plug-in module (accessory) used. In the table above, the standard plug-in module (CFW500-IOS) was taken into account. For further information, refer to the CFW500 user manual.

2) The maximum capacity of 150 mA considers the load of the 24 V power supply plus the transistor output, that is, the sum of the consumption of both must not exceed 150 mA.

3) Designed for exclusive industrial or professional use.

### Block Diagram



Notes: 1) The number of inputs and outputs (analog and digital), as well as other resources, may vary according to the plug-in module used. For further information, refer to the CFW500 user manual.

2) Not available for size A.

3) Available for sizes D and E only. Inductor on the DC link not included.

4) Resistor not included. Internal dynamic braking (IGBT) built-in on sizes B, C, D and E.

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