CFW500 - VARIABLE SPEED DRIVE

High performance and reliability to improve your production process

Motors | Automation | Energy | Transmission & Distribution | Coatings

weg

CFW500
Variable Speed Drive

Summary

CFW500

Machinery Drive

Endless possibilities

With modern design, the variable speed drive CFW500 is a **high performance** VSD for applications that require speed and torque control of three-phase induction motors. The equipment has **sensorless vector control, closed loop vector control or scalar V/f**. It also has SoftPLC, which adds PLC (programmable logic controller) functions, safety functions (STO and SS1) - making easier to comply the machine and application safety requirements, Pump Genius, which adds dedicated functions for pumping systems and selectable plug-in modules, that **provide a flexible and optimized solution** for any application.

High performance

- Optional version with integrated safety functions
- Wide power range and high overload capacity
- High performance control methods

Flexible

- Connectivity
- Advanced resources and functions
- Assembly options

Robust

- Version with IP66 / NEMA type 4x

Innovative

- SoftPLC - built-in PLC functionalities
- Free programming softwares

Reliable

- WEG Quality
- Protection against ground fault, short circuit, over temperature and others
- Internal RFI filter to reduce high-frequency electromagnetic interference

| Integrated STO (Safe Torque Off) and SS1 (Safe Stop 1) fulfils requirements for safety performance SIL 3 / PL e, according to IEC 61800-5-2, EN ISO 13849-1, EN 62061, IEC 61508 and IEC 60204-1 | Provides machine builders a cost-effective solution to design protective measures to reduce the risk from unexpected and hazardous movement in industrial machines |

Models from 1,0 to 105 A (0,25 kW / 0,33 HP to 55 kW / 75 HP) at supply voltages 200-240, 380-480 or 500-600 V

Sensorless or closed loop vector control, VVW or Scalar V/f and permanent magnet motor control: VVW PM

Permits the CFW500 to be used in a large variety of applications, improving their overall performance

USB and fieldbus communication modules for the most used industrial networks, like CANopen, DeviceNet, Profibus-DP, EtherNet/IP, PROFINET IO or Modbus-RTU

Full integration with process network

Pump Genius software

Dedicated functions ideal for pumping systems

Surface or DIN rail mounting, including side-by-side installation

Saves space and cabling, reducing installation costs

Complete protection against contact with internal live parts, avoiding the entrance of dust or water coming from jets

The high protection degree dispenses the panel, reducing installation costs

The VSD, motor and application can work in an interactive way, because it is possible to make customized logic and applications.

WLP, WPS and SuperDrive G2 softwares available at *www.weg.net*

Ideal for machinery manufacturer

100% of the VSDs are tested at the factory under full load and maximum temperature

High reliability

Conformal Coating (Tropicalization) as standard, class 3C2 according to IEC 60721-3-3 and 3C3 as an option, to protect against corrosive gases in harsh environments

It prevents damage to the inverter which can be caused by adverse situations, normally external factors.
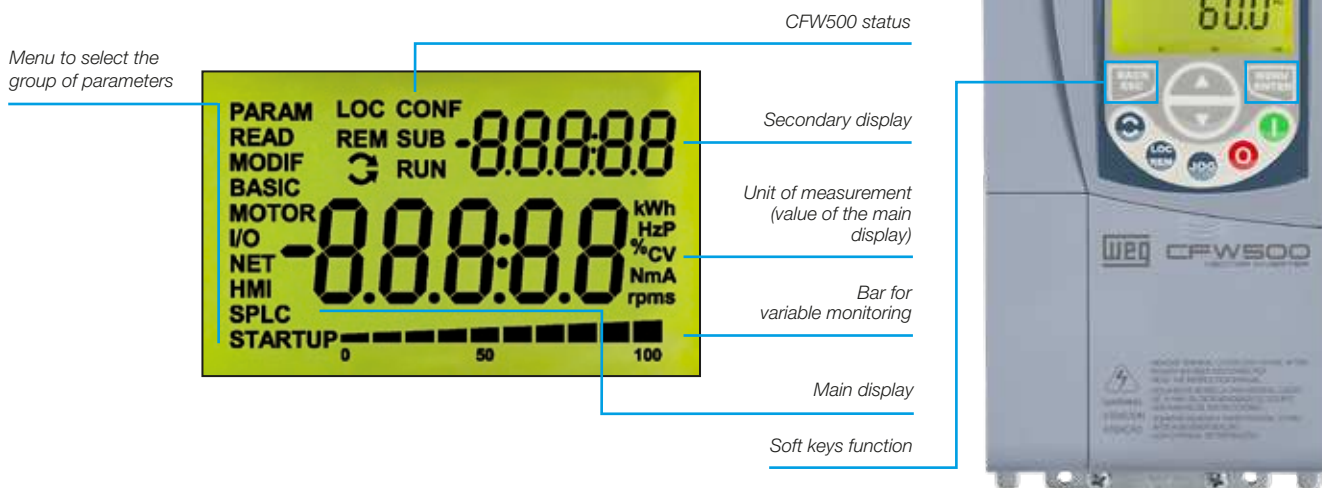
VSD lifetime is extended

Certifications

Simplified Programming and Operation

Operating Interface (HMI)

- Monitoring, setting of all parameters as well as commands
- Up to three parameters indication on the display, according to user selection
- Oriented start-up and grouped parameters

CFW500 status

Menu to select the
group of parameters

Secondary display

Unit of measurement
(value of the main
display)

Bar for
variable monitoring

Main display

Soft keys function

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 19.
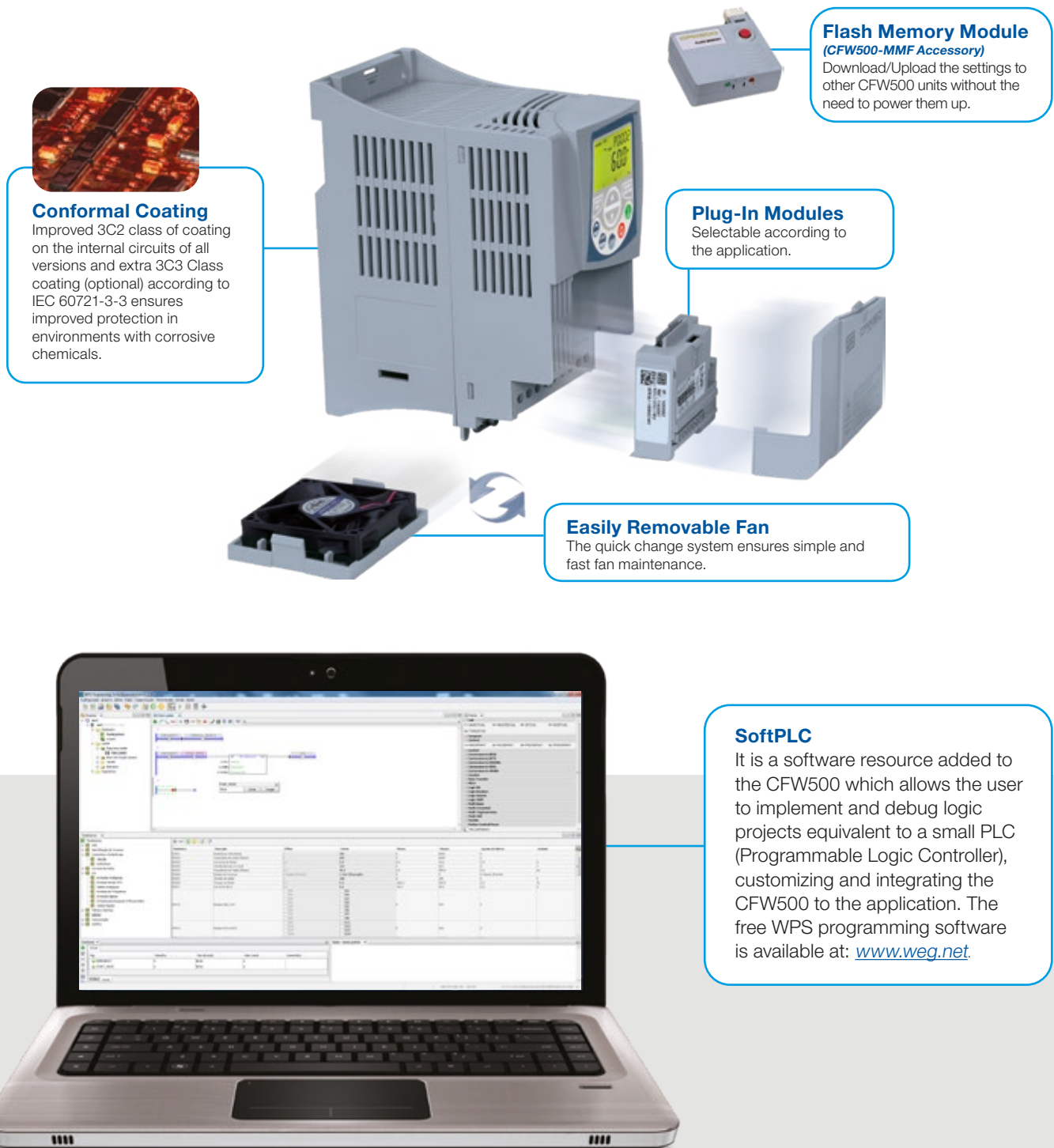
Remote Operating Interface (HMI)

Solutions for machine consoles and panels.

CFW500-HMIR
Accessory

Flexibility and Performance

The CFW500 has a modern design and it can be selected according to the application requirements, providing flexibility with excellent performance. The VSD gives the user the possibility to choose the plug-in module that best fits his application, or to use the standard version, that comes with the CFW500-IOS plug-in module. All plug-in modules comes with one RS485 port as standard.

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. By using the flash memory module, it is possible to download the existing setting from one CFW500 to other units without powering them up.

Flash Memory Module
(CFW500-MMF Accessory)
Download/Upload the settings to other CFW500 units without the need to power them up.

Conformal Coating
Improved 3C2 class of coating on the internal circuits of all versions and extra 3C3 Class coating (optional) according to IEC 60721-3-3 ensures improved protection in environments with corrosive chemicals.

Plug-In Modules
Selectable according to the application.

Easily Removable Fan
The quick change system ensures simple and fast fan maintenance.

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 WPS programming software is available at: *www.weg.net*.

Connectivity
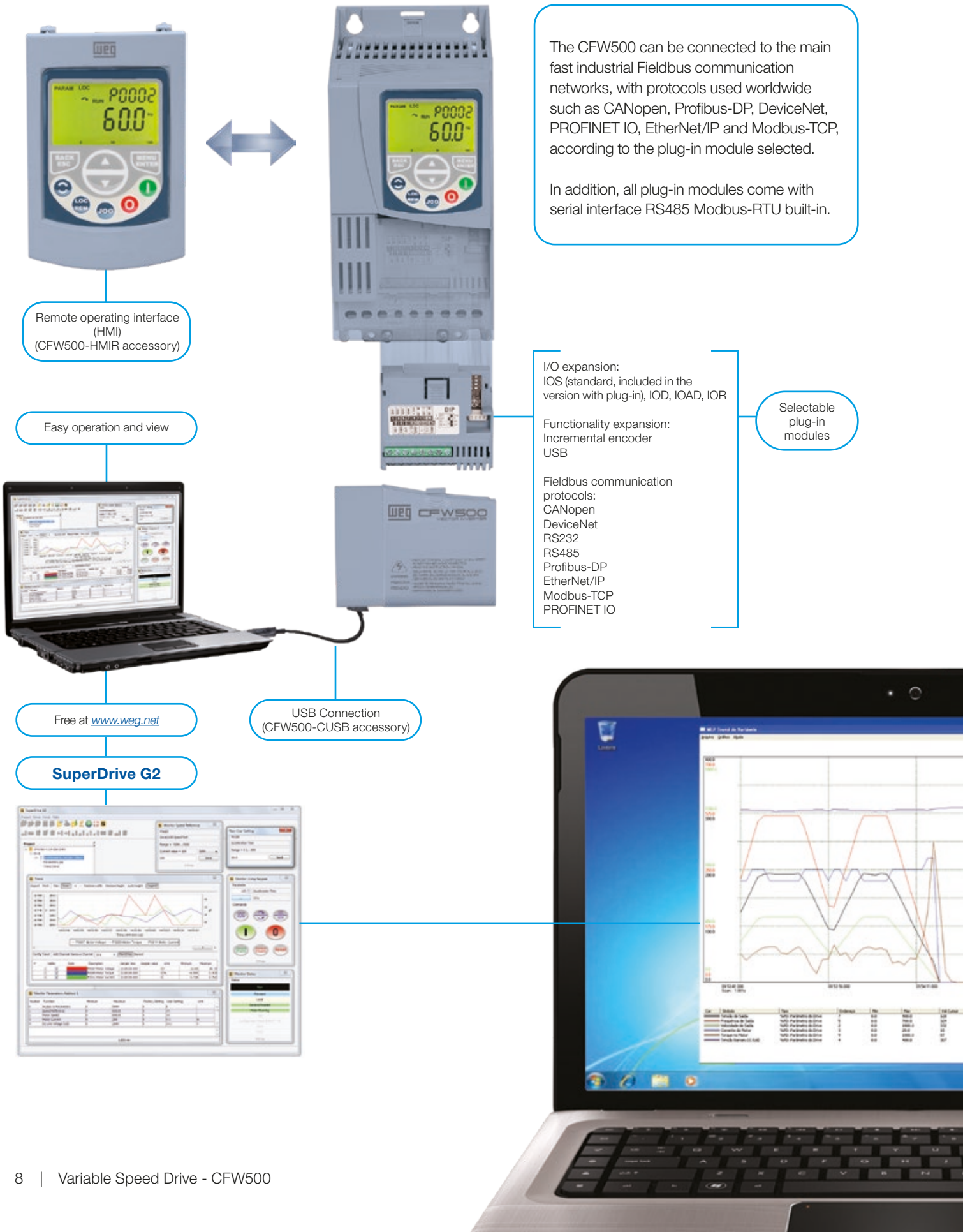
The CFW500 can be connected to the main fast industrial Fieldbus communication networks, with protocols used worldwide such as CANopen, Profibus-DP, DeviceNet, PROFINET IO, EtherNet/IP and Modbus-TCP, according to the plug-in module selected.

In addition, all plug-in modules come with serial interface RS485 Modbus-RTU built-in.

Remote operating interface (HMI)
(CFW500-HMIR accessory)

Easy operation and view

I/O expansion:
IOS (standard, included in the version with plug-in), IOD, IOAD, IOR

Functionality expansion:
Incremental encoder
USB

Fieldbus communication protocols:
CANopen
DeviceNet
RS232
RS485
Profibus-DP
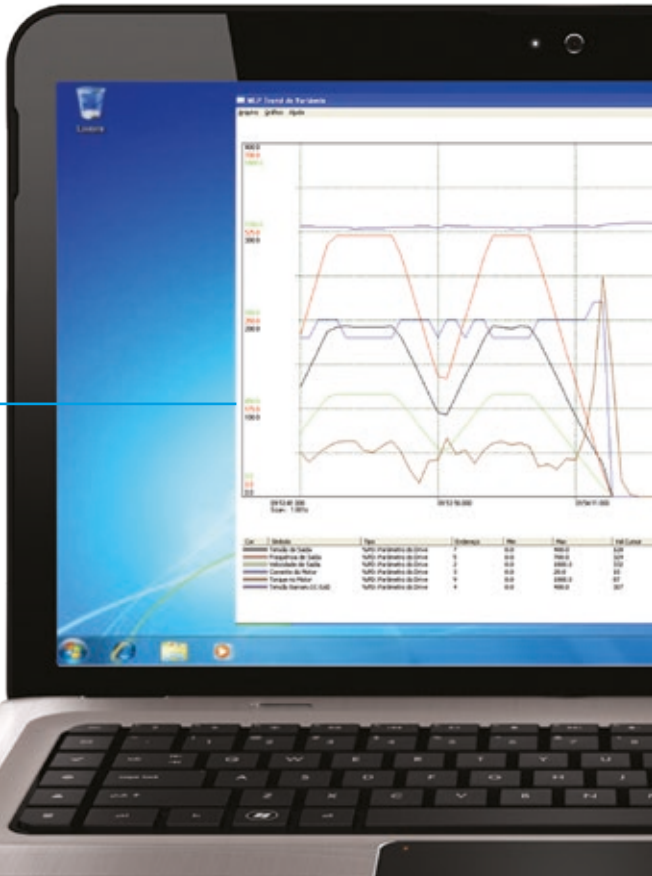EtherNet/IP
Modbus-TCP
PROFINET IO

Selectable plug-in modules

Free at www.weg.net

USB Connection
(CFW500-CUSB accessory)

SuperDrive G2

Features

- Special engineering units (RPM, ºC, Nm, mA, %, kW, kWh, among others)
- Password to protect the parameters
- Backup of all parameters (via SuperDrive G2 software, or plugin memory MMF)
- 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 and vector modes)

- Permanent magnet motor control: VVW PM
- Acceleration/deceleration ramps
- "S" type ramp
- DC braking
- Internal dynamic braking (except frame size A)
- PID controller to control processes in closed loop
- Flying start / Ride-through
- Sleep mode
- Skip frequencies or frequency ranges function adjustable
- Overload and overtemperature protection
- Overcurrent protection
- DC link voltage supervision
- Fault log
- Safety functions: STO and SS1
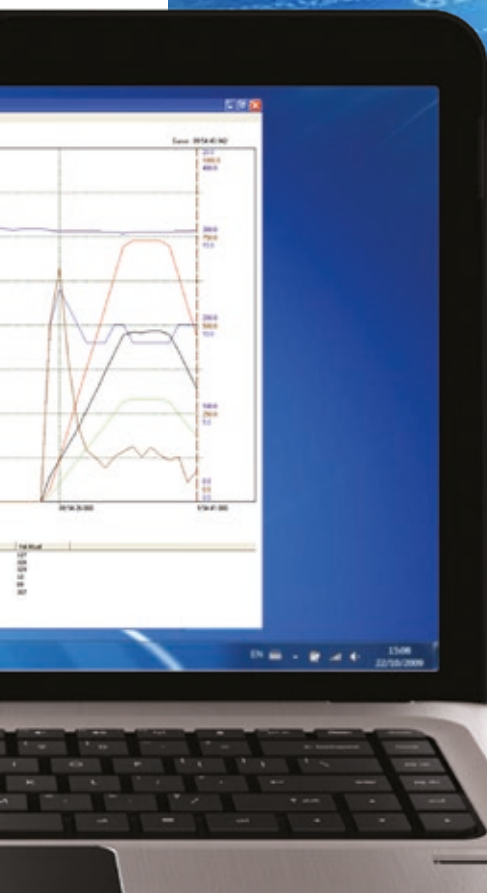
Using the SuperDrive G2 software, it is possible to change, monitor and view graphically the variables of the CFW500 on a personal computer.

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

Embedded Safety Functions[1)]

Used to reduce risk and to guarantee the safety of personnel and environment if there is a hazardous event due to a fault in operating machines. The embedded safety functions **STO and SS1** provide machine builders a cost-effective solution to design protective measures and reduce the risk from unexpected and hazardous movement in industrial machines and processes.

Advantages

- Safety functions integrated in the CFW500 drive, making easier to comply with the machine and application safety requirements
- Less components, no need for additional wiring, saving space and installation costs
- Easier installation, commissioning and maintenance
- No electromechanical components, meaning faster responses and higher degree of productivity
- Due to the high safety performance level SIL3, the CFW500 with Safety module may avoid the use of external safety relays for cables and emergency pushbuttons monitoring

Safety Functions

STO (Safe Torque Off)

This function immediately switches off the drive output to the motor, disabling the supply of torque-generating energy. STO is also used to prevent an unexpected startup of machinery or for an emergency stop, fulfilling stop category 0 (IEC 60204-1).
It is applicable if the motor can be brought to a standstill in a sufficiently short time by the load torque or friction or where motor coast to a stop is not relevant to safety.

STO behavior
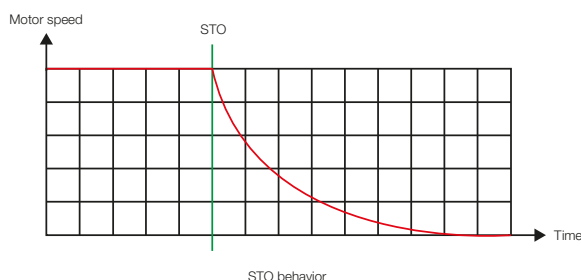
SS1 (Safe Stop 1)

This function enables motor deceleration and then, after a delay time, activates the STO function. SS1 can be used to implement a controlled stop and then removal of power, fulfilling stop category 1 according to IEC 60204-1. This function is used when, in the event of a safety related fault, the drive must stop as quickly as possible and then enter the STO state.
The stopping of a drive by means of SS1 function reduces the risk of danger, eliminates the need of external safety timers, increases the productivity of a machine and allows safety clearances in a machine to be reduced. The reason is the active stopping of the drive as compared with the use of the STO function only.

SS1 behavior

Note: 1) Safety Functions STO and SS1 are available in CFW500…Y2 version. It fulfils requirements for safety performance SIL 3 / PL e, according to IEC 61800-5-2, EN ISO 13849-1, EN 62061, IEC 61508 and IEC 60204-1.

Pump Genius

The Pump Genius is a customizable feature of WEG drives that enables your standard CFW500 to become dedicated for pumping systems. It ensures accurate pressure / flow control throughout the processing cycle, starting with raw water and its usage, ending on wastewater treatment. With an easy-to-use programming wizard, Pump Genius helps you to minimize downtime and maximize energy savings. Everything you need is selecting one option that best fits your application:

simplex
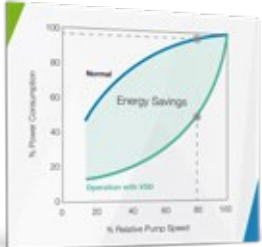
The Pump Genius Simplex software adds ideal features to the VSD for single pump control.

multipump

Pump Genius Multipump allows driving two or more pumps with only one inverter.

multiplex[1)]

Pump Genius Multiplex permits the VSDs to control, monitor and manage the entire system on their own, eliminating the need of external PLC.

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 minimum, avoiding that it runs at low speed 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.

Note: 1) Under development.
Find out more about Pump Genius visiting our website www.weg.net.

Applications

Extruders	**Conveyor belts**	**Roller tables**	**Fans / exhausters**
Centrifugal pumps	**Granulators / palletizers**	**Cutting and welding machines**	**Dryers and rotary ovens**
Process dosing pumps	**Stirrers / mixers**	**Rotary filters**	**Winding machines / uncoiling machines**
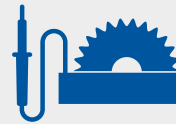
Coding[1]

| **1** | CFW500 | **2** | A | **3** | 02P6 | **4** | T | **5** | 4 | **6** | NB | **7** | 20 | **8** | C2 | **9** | Y2 | **10** | --- | **11** | --- |

1 - CFW500 variable speed drive
2 - Size of the CFW500, according to table 1 below
3 - Rated output current, according to table 1 below

Power supply	Single-phase (S)	Single-phase or three-phase (B)	Three-phase (T)		
Voltage	200-240 V ac	200-240 V ac	200-240 V ac	380-480 V ac	500 - 600 V ac
Current	01P6 = 1.6 A 02P6 = 2.6 A 04P3 = 4.3 A 07P0 = 7.0 A 07P3 = 7.3 A 10P0 = 10 A	01P6 = 1.6 A 02P6 = 2.6 A 04P3 = 4.3 A 07P3 = 7.3 A 10P0 = 10 A	07P0 = 7.0 A 09P6 = 9.6 A 16P0 = 16 A 24P0 = 24 A 28P0 = 28 A 33P0 = 33 A 47P0 = 47 A 56P0 = 56 A	01P0 = 1.0 A 01P6 = 1.6 A 02P6 = 2.6 A 04P3 = 4.3 A 06P1 = 6.1 A 02P6 = 2.6 A 04P3 = 4.3 A 06P5 = 6.5 A 10P0 = 10 A 14P0 = 14 A 16P0 = 16 A 24P0 = 24 A 31P0 = 31 A 39P0 = 39 A 49P0 = 49 A 77P0 = 77 A 88P0 = 88 A 0105 = 105 A	01P7 = 1.7 A 03P0 = 3.0 A 04.3 = 4.3 A 07P0 = 7.0 A 10P0 = 10 A 12P0 = 12 A

4 - Number of phases

S	Single-phase power supply
B	Single or three-phase power supply
T	Three-phase power supply

5 - Rated voltage

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

6 - Internal dynamic braking[2]

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

7- Protection degree

20	IP20 protection degree
N1	Cabinet type 1 protection degree
66	IP66 protection degree (Type 4x)

8 - RFI filter[3]

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

9 - Disconnect switch[4]

Blank	Without disconnect switch
DS	With disconnect switch

10 - Safety function[5]

Blank	Without safety function
Y2	With safety function (STO and SS1-t) as per EN 61800

11 - Special hardware versions - H xx
11.1 - Plug-in module

Blank	With standard plug-in module
H00	Without plug-in module

11.2 - Coating for harsh environments

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

12 - Special software version - S xx

Blank	Standard software
Sxx	Special software

Notes: 1) Other configurations available upon request.
2) Braking resistor not included. Braking IGBT is available as standard for the whole CFW500 line, except for frame size A of IP20 version.
3) 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.
4) Only for IP66 version.
5) Only for frames A to E of IP20 version and rated voltages 200-240 V or 380-480 V.

Specification

CFW500 IP20 or NEMA Type 1 - 200-240 V

CFW500 variable speed drive												Maximum applicable motor[1]				
Reference[2]								Power supply (V)		Frame size	Rated current (A)[2]	IEC				UL
												60 Hz		50 Hz		60 Hz
												220-230 V ac		220-230 V ac		230 V ac
Coding (available options for each model)												HP	kW	HP	kW	HP
1, 2, 3, 4, 5 and 6	7	8	9	10	11.1	11.2	12									
CFW500A01P6S2NB		Blank or C2						Single-phase	200-240	A	1.6	0.25	0.18	0.33	0.25	0.33
CFW500A02P6S2NB		Blank or C2									2.6	0.5	0.37	0.75	0.55	0.75
CFW500A04P3S2NB		Blank or C2									4.3	1.0	0.75	1.5	1.1	1.5
CFW500A07P0S2NB		Blank or C3									7.0	2.0	1.5	2.0	1.5	2.0
CFW500B07P3S2DB		C2								B	7.3	2.0	1.5	2.0	1.5	2.0
CFW500B10P0S2DB		C2									10	3.0	2.2	3.0	2.2	3.0
CFW500A01P6B2NB		Blank						Single-phase or three-phase	200-240	A	1.6	0.25	0.18	0.33	0.25	0.33
CFW500A02P6B2NB		Blank									2.6	0.5	0.37	0.75	0.55	0.75
CFW500A04P3B2NB		Blank									4.3	1.0	0.75	1.5	1.5	1.5
CFW500B07P3B2DB	20 or N1	Blank	Blank	Blank or Y2[3]	Blank or H00	Blank or EC	Blank or Sxx			B	7.3	2.0	1.5	2.0	1.5	2.0
CFW500B10P0B2DB		Blank									10	3.0	2.2	3.0	2.2	3.0
CFW500A07P0T2NB		Blank						Three-phase	200-240	A	7.0	2.0	1.5	2.0	1.5	2.0
CFW500A09P6T2NB		Blank									9.6	3.0	2.2	3.0	2.2	3.0
CFW500B16P0T2DB		Blank								B	16	5.0	3.7	5.5	4.0	5.5
CFW500C24P0T2DB		Blank								C	24	7.5	5.5	7.5	5.5	7.5
CFW500D28P0T2DB		Blank or C3								D	28	10	7.5	10	7.5	10
CFW500D33P0T2DB		Blank or C3									33	12.5	9.2	12.5	9.2	12.5
CFW500D47P0T2DB		Blank or C3									47	15	11	15	11	15
CFW500E56P0T2DB		Blank or C3								E	56	20	15	20	15	20

Notes: 1) The power values for maximum applicable motor shown in the tables above are reference values and valid for WEG motors. IEC motor powers are based on motor WEG four-pole W22 High Effciency IE2 three-phase induction motors with power supply of 220 V, 230 V, 380, 400 V, 525 or 575 V. NEMA motor power are based on WEG four pole W22 Premium. Motor rated currents may vary with speed and manufacturer, therefore, use the motor power ratings above only as a guidance. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.

2) The rated current informed for models of frames A to E are for HD (heavy duty) operation and for models of frame F are for ND (normal duty) operation. For further information, please check the user's manual.

3) The optional version with protection degree NEMA type 1 is not compatible with safety function.

Specification

CFW500 IP20 or NEMA Type 1 - 380-480 V

Reference[2] (Coding col 1-6)	7	8	9	10	11.1	11.2	12	Power supply (V)	Frame size	Rated current (A)[2]	IEC 60 Hz 380 V ac HP	IEC 60 Hz 380 V ac kW	IEC 50 Hz 380-400 V ac HP	IEC 50 Hz 400 V ac kW	UL 60 Hz 440-460 V ac HP
CFW500A01P0T4NB	20 or N1	Blank or C2	Blank	Blank or Y2[3]	Blank or H00	Blank or EC	Blank or Sxx	Three-phase 380-480	A	1.0	0.25	0.18	0.5	0.37	0.5
CFW500A01P6T4NB		Blank or C2								1.6	0.5	0.37	0.75	0.55	0.75
CFW500A02P6T4NB		Blank or C2								2.6	1.5	1.1	1.5	1.1	1.5
CFW500A04P3T4NB		Blank or C2								4.3	2.0	1.5	2.0	1.5	3.0
CFW500A06P1T4NB		Blank or C3								6.1	3.0	2.2	4.0	3.0	4.0
CFW500B02P6T4DB		Blank or C2							B	2.6	1.5	1.1	1.5	1.1	1.5
CFW500B04P3T4DB		Blank or C2								4.3	2.0	1.5	2.0	1.5	2.0
CFW500B06P5T4DB		Blank or C2								6.5	3.0	2.2	4.0	3.0	5.0
CFW500B10P0T4DB		Blank or C3								10	5.0	3.7	5.5	4.0	7.5
CFW500C14P0T4DB		Blank or C2							C	14	7.5	5.5	7.5	5.5	10
CFW500C16P0T4DB		Blank or C2								16	10	7.5	10	7.5	10
CFW500D24P0T4DB		Blank or C3							D	24	15	11	15	11	15
CFW500D31P0T4DB		Blank or C3								31	20	15	20	15	25
CFW500E39P0T4DB		Blank or C3							E	39	25	19	25	19	30
CFW500E49P0T4DB		Blank or C3								49	30	22	30	22	40
CFW500F77P0T4DB		Blank or C3							F	77	50	37	50	37	60
CFW500F88P0T4DB		Blank or C3								88	60	45	60	45	75
CFW500F0105T4DB		Blank or C3								105	75	55	75	55	75

CFW500 IP20 or NEMA Type 1 - 500-600 V

Reference[2] (Coding col 1-6)	7	8	9	10	11.1	11.2	12	Power supply (V)	Frame size	Rated current (A)[2]	IEC 60 Hz 575 V ac HP	IEC 60 Hz 575 V ac kW	IEC 50 Hz 575 V ac HP	IEC 50 Hz 575 V ac kW	IEC 50 Hz 525 V ac kW	UL 60 Hz 575 V ac HP
CFW500C01P7T5DB	20 or N1	Blank	Blank	Blank	Blank or H00	Blank or EC	Blank or Sxx	Three-phase 600	C	1.7	1.0	0.75	1.0	0.75	0.75	1.5
CFW500C03P0T5DB										3.0	2.0	1.5	2.0	1.5	1.5	2.0
CFW500C04P3T5DB										4.3	3.0	2.2	3.0	2.2	2.2	3.0
CFW500C07P0T5DB										7.0	5.0	3.7	5.5	4.0	4.0	5.0
CFW500C10P0T5DB										10.0	7.5	5.5	7.5	5.5	5.5	10
CFW500C12P0T5DB										12.0	10	7.5	10	7.5	7.5	10

Notes: 1) The power values for maximum applicable motor shown in the tables above are reference values and valid for WEG motors. IEC motor powers are based on motor WEG four-pole W22 High Effciency IE2 three-phase induction motors with power supply of 220 V, 230 V, 380, 400 V, 525 or 575 V. NEMA motor power are based on WEG four pole W22 Premium. Motor rated currents may vary with speed and manufacturer, therefore, use the motor power ratings above only as a guidance. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.
2) The rated current informed for models of frames A to E are for HD (heavy duty) operation and for models of frame F are for ND (normal duty) operation. For further information, please check the user's manual.
3) The optional version with protection degree NEMA type 1 is not compatible with safety function.

Specification

CFW500 IP66 (NEMA Type 4x) - 200-240 V

CFW500 variable speed drive												Maximum applicable motor[1]				
Reference[2]								Power supply (V)	Frame size	Rated current (A)[2]		IEC				UL
												60 Hz		50 Hz		60 Hz
												220-230 V ac		220-230 V ac		230 V ac
Coding (available options for each model)												HP	kW	HP	kW	HP
1, 2, 3, 4, 5 and 6	7	8	9	10	11.1	11.2	12									
CFW500A01P6S2DB		C3						Single-phase	A	1.6		0.25	0.18	0.33	0.25	0.33
CFW500A02P6S2DB		C3								2.6		0.5	0.37	0.75	0.55	0.75
CFW500A04P3S2DB		C3								4.3		1.0	0.75	1.5	1.1	1.5
CFW500A07P3S2DB		C3								7.3		2.0	1.5	2.0	1.5	2.0
CFW500A10P0S2DB		C3								10		3.0	2.2	3.0	2.2	3.0
CFW500A01P6B2DB		Blank						Single-phase or three-phase		1.6	200-240	0.25	0.18	0.33	0.25	0.33
CFW500A02P6B2DB	66	Blank	Blank or DS	Blank	Blank or H00	Blank or EC	Blank or Sxx			2.6		0.5	0.37	0.75	0.55	0.75
CFW500A04P3B2DB		Blank								4.3		1.0	0.75	1.5	1.5	1.5
CFW500A07P3B2DB		Blank								7.3		2.0	1.5	2.0	1.5	2.0
CFW500A10P0B2DB		Blank								10		3.0	2.2	3.0	2.2	3.0
CFW500A16P0T2DB		Blank						Three-phase	B	16		5.0	3.7	5.5	4.0	5.5
CFW500B24P0T2DB		Blank								24		7.5	5.5	7.5	5.5	7.5
CFW500B28P0T2DB		Blank or C3								28		10	7.5	10	7.5	10
CFW500B33P0T2DB		Blank or C3								33		12.5	9.2	12.5	9.2	12.5

Notes: 1) The power values for maximum applicable motor shown in the tables above are reference values and valid for WEG motors. IEC motor powers are based on motor WEG four-pole W22 High Effciency IE2 three-phase induction motors with power supply of 220 V, 230 V, 380, 400 V, 525 or 575 V. NEMA motor power are based on WEG four pole W22 Premium. Motor rated currents may vary with speed and manufacturer, therefore, use the motor power ratings above only as a guidance. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.
2) The rated current informed for models of frames A and B are for HD (heavy duty) operation.

Specification

CFW500 IP66 (NEMA Type 4x) - 380-480 V

CFW500 variable speed drive										Maximum applicable motor[1]				
Reference[2]							Power supply (V)	Frame size	Rated current (A)[2]	IEC				UL
										60 Hz		50 Hz		60 Hz
										380 V ac		380-400 V ac	400 V ac	440-460 V ac
Coding (available options for each model)														
1, 2, 3, 4, 5 and 6	7	8	9	10	11.1	11.2	12			HP	kW	HP	kW	HP
CFW500A01P0T4DB								Three-phase	380-480	A	1.0	0.25	0.18	0.5	0.37	0.5
CFW500A01P6T4DB										1.6	0.5	0.37	0.75	0.55	0.75
CFW500A02P6T4DB										2.6	1.5	1.1	1.5	1.1	1.5
CFW500A04P3T4DB										4.3	2.0	1.5	2.0	1.5	3.0
CFW500A06P1T4DB										6.1	3.0	2.2	4.0	3.0	4.0
CFW500BA02P6T4DB	66	Blank or C3	Blank or DS	Blank	Blank or H00	Blank or EC	Blank or Sxx			2.6	1.5	1.1	1.5	1.1	1.5
CFW500A04P3T4DB										4.3	2.0	1.5	2.0	1.5	2.0
CFW500A06P5T4DB										6.5	3.0	2.2	4.0	3.0	5.0
CFW500A10P0T4DB										10	5.0	3.7	5.5	4.0	7.5
CFW500B14P0T4DB									B	14	7.5	5.5	7.5	5.5	10
CFW500B16P0T4DB										16	10	7.5	10	7.5	10
CFW500B24P0T4DB										24	15	11	15	11	15
CFW500B31P0T4DB										31	20	15	20	15	25

CFW500 IP66 (NEMA Type 4x) - 500-600 V

CFW500 variable speed drive										Maximum applicable motor[1]				
Reference[2]							Power supply (V)	Frame size	Rated current (A)[2]	IEC				UL
										60 Hz		50 Hz		50 Hz	60 Hz
										575 V ac		575 V ac		525 V ac	575 V ac
Coding (available options for each model)														
1, 2, 3, 4, 5 and 6	7	8	9	10	11.1	11.2	12			HP	kW	HP	kW	kW	HP
CFW500B01P7T5DB								Three-phase	600	B	1.7	1.0	0.75	1.0	0.75	0.75	1.5
CFW500B03P0T5DB										3.0	2.0	1.5	2.0	1.5	1.5	2.0
CFW500B04P3T5DB	66	Blank	Blank or DS	Blank	Blank or H00	Blank or EC	Blank or Sxx			4.3	3.0	2.2	3.0	2.2	2.2	3.0
CFW500B07P0T5DB										7.0	5.0	3.7	5.5	4.0	4.0	5.0
CFW500B10P0T5DB										10	7.5	5.5	7.5	5.5	5.5	10
CFW500B12P0T5DB										12	10	7.5	10	7.5	7.5	10

Notes: 1) The power values for maximum applicable motor shown in the tables above are reference values and valid for WEG motors. IEC motor powers are based on motor WEG four-pole W22 High Effciency IE2 three-phase induction motors with power supply of 220 V, 230 V, 380, 400 V, 525 or 575 V. NEMA motor power are based on WEG four pole W22 Premium. Motor rated currents may vary with speed and manufacturer, therefore, use the motor power ratings above only as a guidance. The proper sizing of the CFW500 to be used must be determined as a function of the rated current of the motor used.
2) The rated current informed for models of frames A and B are for HD (heavy duty) operation.

Specification

Optional Items

These 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[1] braking resistor.
The braking IGBT is available as standard for the whole line, except for frame A of IP20 version.

Note: 1) External braking resistor not included. To specify the correct braking resistor, please refer to the CFW500 User's Manual.

NEMA1 Protection Kit[3] (N1)

Insert ".N1" in item 7 of the smart code frame sizes A, B, C, D, E or F.
According to the National Electrical Manufacturers Association (NEMA) standard, Type 1.
- Protects[2] against penetration of foreign solid objects (falling dust)
- Prevents access to hazardous parts
- Can also be acquired as an accessory (see accessories)

Notes: 2) Not recommended for external use, only indoor applications or inside enclosures.
3) Image of frame size A with NEMA1 kit.

Disconnect Switch[4]

Built-in disconnect switch for in the product for easy and safe maintenance or switching the mains off.

Note: 4) Only available for models with IP66 protection degree.

Internal RFI Filter

Inverters with internal RFI filter (code C2 or C3) when installed, maintained and used on the application they were designed for, and in compliance with the relevant installation standards and manufacturer's instructions, reduce conducted disturbance from the inverter to the main power supply in high frequency band (>150 kHz), complying to the relevant EMC standards, such as EN 61800-3 and EN 55011.

Conformal Coating

The standard version of the CFW500 offers protection class 3C2 - according to IEC 60721-3-3, ensuring greater protection for applications in environments with corrosive chemicals.
It is possible to request an extra coating on the internal circuit boards, protection class 3C3 - according to IEC 60721-3-3, by adding EC to item 11 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 filled in item 11 of the smart code.

Pump Genius

To use CFW500 with the Pump Genius contact WEG Automation sales department.

Accessories

Plug-In Module

On the CFW500, it is possible leave to choose later the model of the internal plug-in module by entering H00 in item 11 of the smart code. In this case, it is necessary to select the plug-in module as an accessory, according to the table bellow.

In case H00 is not selected in item 11 of the smart code, the CFW500 will be supplied with the CFW500-IOS plug-in. You must always use one plug-in module per CFW500.

Reference	Description	Illustrative figures
	Input and output (I/O) expansion	
CFW500-IOS[1]	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-B	Relay output expansion plug-in module	
	Functionality expansion	
CFW500-ENC	Plug-in module with encoder input	
CFW500-CUSB	Plug-in module with USB port	
	Communication on Fieldbus network	
CFW500-CCAN	CAN communication plug-in module (CANopen/DeviceNet)	
CFW500-CRS232	RS232 communication plug-in module	
CFW500-CRS485-B	RS485 communication plug-in module	
CFW500-CPDP	Profibus-DP communication plug-in module	
CFW500-CETH-IP	EtherNet/IP communication plug-in module	
CFW500-CEMB-TCP	Modbus-TCP communication plug-in module	
CFW500-CEPN-IO	PROFINET IO communication plug-in module	

Reference	Description	Illustrative figures
	Memory	
CFW500-MMF	Flash memory module	

	Interfaces	
	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)	
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)	
CFW500-KPCSA	Shielding kit for the power cables - size A (standard for option C2 and C3)	
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	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)	

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.

Accessories

Configuration of the Plug-In Modules[1]

Plug-in module	Functions															
	Inputs		Outputs			USB port	Input for Encoder[3]	Fieldbus networks							Supply	
	Digital	Analog	Analog	Digital relay	Digital transistor			CANopen DeviceNet	RS232	RS485	Profibus-DP	EtherNet/IP	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-B	5[2]	1	1	4	1	-	-	-	-	1	-	-	-	-	1	1
CFW500-ENC	5[2]	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-B	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.
The CFW500 allows the installation of one plug-in module per unit.
2) The digital input DI5 is always NPN, and it cannot be configured for PNP like the others.
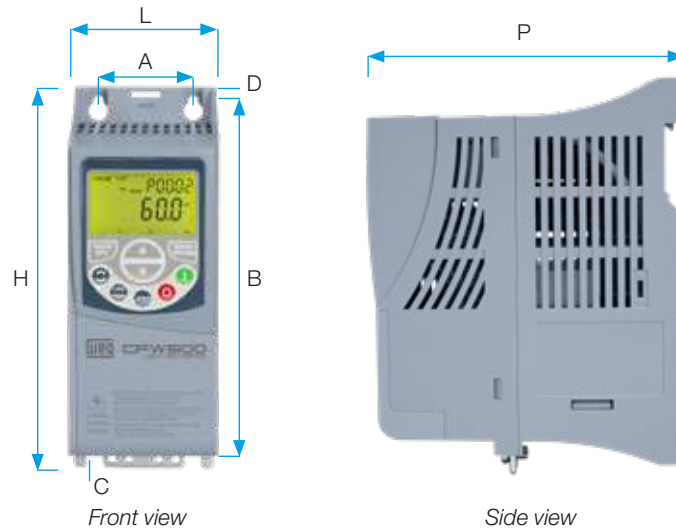3) Incremental Encoder (A/A - B/B).
See the installation guides of the plug-in modules on the website www.weg.net

Dimensions and Weights

IP20 Version

Front view *Side view*

Size	A mm [in]	B mm [in]	C mm [in]	D mm [in]	H mm [in]	L mm [in]	P mm [in]	Weight kg [lb]
A	50 [1.97]	175 [6.89]	11.9 [0.47]	7.2 [0.28]	189 [7.44]	75 [2.95]	150 [5.91]	0.8 [1.76]
B	75 [2.95]	185 [7.3]	11.8 [0.46]	7.3 [0.29]	199 [7.83]	100 [3.94]	160 [6.3]	1.2 [2.65]
C	100 [3.94]	195 [7.7]	16.7 [0.66]	5.8 [0.23]	210 [8.27]	135 [5.31]	165 [6.5]	2 [4.4]
D	125 [4.92]	290 [11.41]	27.5 [1.08]	10.2 [0.4]	306.6 [12.1]	180 [7.08]	166.5 [6.55]	4.3 [9.48]
E	150 [5.9]	330 [13]	34 [1.34]	10.6 [0.4]	350 [13.8]	220 [8.7]	191.5 [7.5]	10 [22.05]
F	200 [7.87]	525 [20.67]	42.5 [1.67]	15 [0.59]	550 [21.65]	300 [11.81]	254 [10]	26 [57.3]

Note: for the dimensions in the NEMA type 1 version, refer to the user manual.

IP66 Version

Front view *Side view*

Size	A mm [in]	B mm [in]	C mm [in]	D mm [in]	E mm [in]	H mm [in]	L mm [in]	P1 mm [in]	P2 mm [in]	Weight kg [lb]
A	150 [5,9]	250 [9,83]	5,7 [0,22]	7,5 [0,3]	225 [8,86]	265 [10,43]	165 [6,5]	227 [8,93]	252,5 [9,94]	10 [22.05]
B	200 [7,86]	325 [12,79]	5,7 [0,22]	7,5 [0,3]	300 [11,82]	340 [13,39]	215 [8,46]	227 [8,93]	252,9 [9,96]	12 [26.5]

Notes: P1 = Measure without disconnect switch.
P2 = Measure with disconnect switch.

Standards

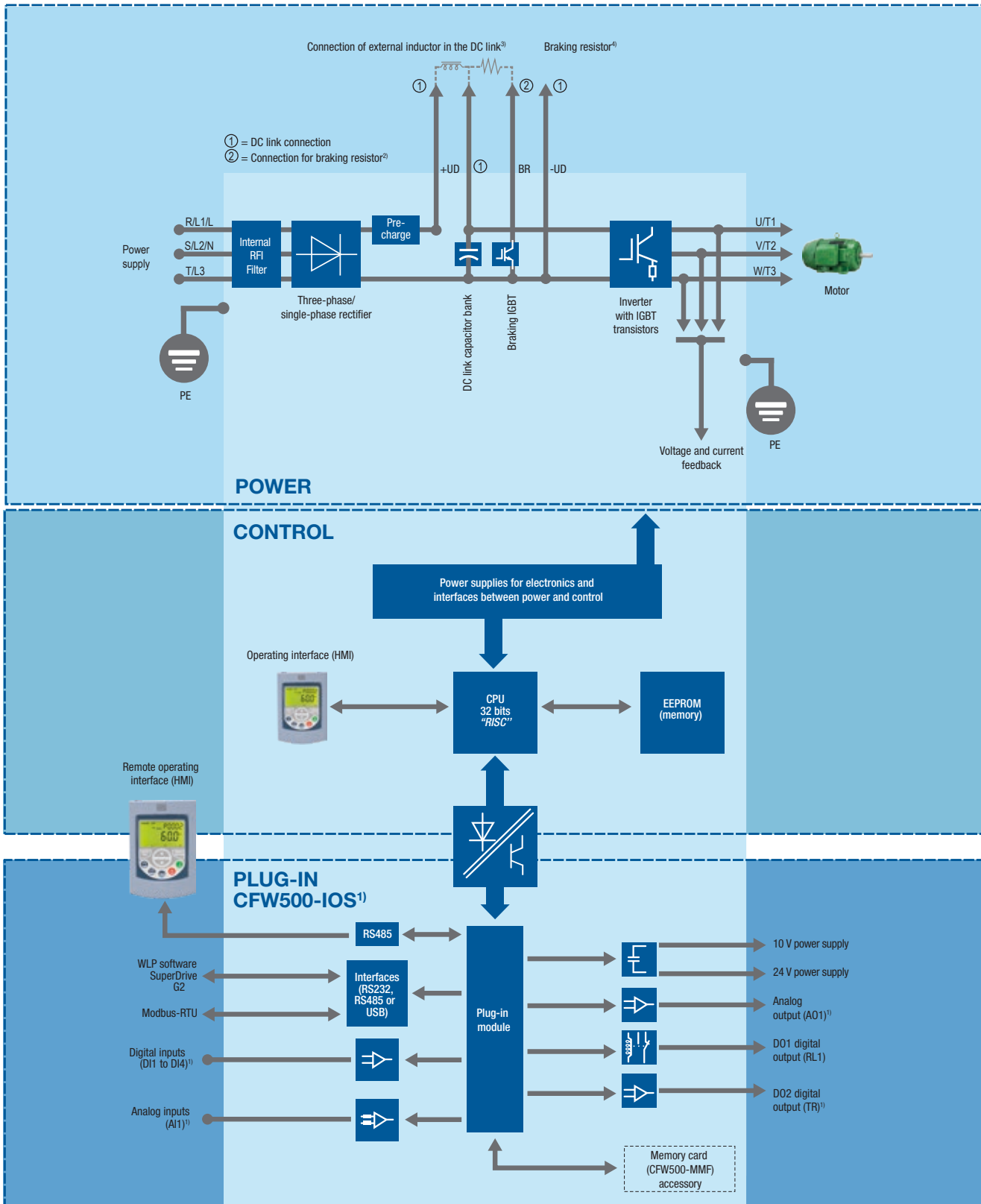|		
Standards	**Safety standards**	UL 508C - Power conversion equipment
		UL 840 - Insulation coordination including clearances and creepage distances for electrical equipment
		EN 61800-5-1 - Safety requirements electrical, thermal and energy
		EN 50178 - Electronic equipment for use in power installations
		EN 60204-1 - Safety of machinery. Electrical equipment of machines. Part 1: general requirements Note: 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
	Electromagnetic compatibility standards	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 characteristcs of industrial, scientific and medical (ISM) radio-frequency equipment
		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 - 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 construction standards	EN 60529 - Degrees of protection provided by enclosures (IP code)
		UL 50 - Enclosures for electrical equipment
		IEC60721-3-3 - Classification of environmental conditions - part 3: classification of groups of environmental parameters and their severities - Section 3: stationary use at weather protected locations level 3M4.
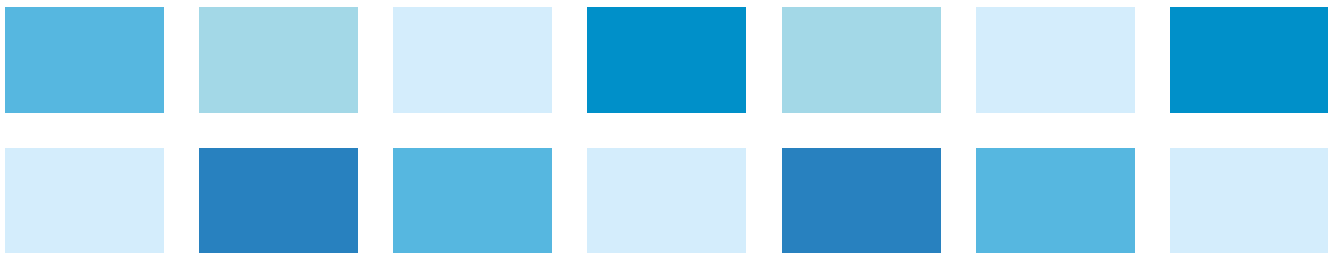
Technical Specifications

Power rating	**Power supply**	Tolerance: -15 to +10%
		Frequency: 50/60 Hz (48 Hz to 62 Hz)
		Phase imbalance: ≤3% of the rated phase-phase input voltage
		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%
Control	**Method**	V/F (scalar) VVW: voltage vector control Vector without encoder (sensorless) and closed loop vector with encoder PM VVW: voltage vector control for permanent magnet motors
	Output frequency	0 to 500 Hz, resolution of 0.015 Hz
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
	Sensorless	Speed regulation: 0.5% of the rated speed Speed variation range: 1:100
	Vector control with Encoder	Speed regulation: 0.1% of the rated speed Speed variation range: 1:100
	PM VVW Control	Regulation: 0.1 % of the rated speed Speed variation range: 1:20
Environment conditions	**Temperature around the CFW500**	-10 °C to 40 °C - NEMA type 1 (sizes A to E) -10 °C to 40 °C - IP20 (sizes A to E) when installed by side and / or with RFI filter -10 °C to 50 °C - IP20 (sizes A to E) without RFI filter 0 °C to 40 °C - IP20 (size F) with or without RFI filter For sizes A to E, when operating temperatures are above the specification, it is necessary to apply 2% of current derating for each Celsius degree (°C), limited to an increase of 10 °C. For size F, when operating temperatures are above the specification, it is necessary to apply 1% of current derating for each Celsius degree (°C) up to 50 °C, and 2% up to 60 °C (maximum).
	Aggressive environments	Protection Class 3C2 - Standard coating on the internal circuits, according to IEC 60721-3-3 (standard model) Protection Class 3C3 - Extra coating - optional, according to IEC 60721-3-3 (optional)
	Air relative humidity	5% to 95% non-condensing
	Altitude	Up to 1,000 m (maximum altitude under normal conditions) 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
Inputs[1]	**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 kΩ for voltage input, 500 Ω for current input Programmable functions, including PTC input Maximum voltage accepted in the inputs: 30 V dc
	Digital	4 isolated inputs 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
Outputs[1]	**Analog**	1 isolated output. Levels (0 to 10) V or (0 to 20) mA or (4 to 20) mA 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)
	Relay	1 relay with NO/NC contact Maximum voltage: 240 V ac Maximum current of 0.5 A Programmable functions
	Transistor	1 isolated open sink digital output (using as reference the 24 V dc power supply) Maximum current of 150 mA (maximum capacity of the 24 V dc power supply)[2] Programmable functions
	Power supply	24 V dc power supply. Maximum capacity: 150 mA[2] Power supply of 10 V dc. Maximum capacity: 2 mA
Communication	**Selectable plug-in**	Fieldbus: Modbus-RTU, CANopen, DeviceNet, Profibus-DP, EtherNet/IP, Modbus-TCP, PROFINET IO USB, RS485 and RS232 ports
Safety	**Protection**	Phase-phase overcurrent/short circuit in the output Phase-ground overcurrent/short circuit in the output Undervoltage/overvoltage in the power Overtemperature of the heatsink Motor overload Overload on the power module (IGBTs) External fault / alarm Programming error
Operating interface (HMI)	**Standard (built in the CFW500)**	9 keys: Run/Stop, Increment, Decrement, Direction of rotation, Jog, Local/Remote, Back/Esc and Enter/Menu LCD Display It allows accessing/changing all the parameters Accuracy of the indications: Current: 5% of the rated current Speed resolution: 0.1 Hz
Protection degree	**IP20**	Sizes A, B, C, D, E and F
	NEMA1/IP20	Sizes A, B, C, D, E and F with NEMA1 kit
	IP66	Sizes A and B (from 1.0 A to 31 A)

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 of IP20 or NEMA Type 1 Version

Connection of external inductor in the DC link[3]   Braking resistor[4]

① = DC link connection
② = Connection for braking resistor[2]

+UD ① BR -UD

Power supply
R/L1/L
S/L2/N
T/L3

Internal RFI Filter

Three-phase/ single-phase rectifier

Pre-charge

DC link capacitor bank

Braking IGBT

Inverter with IGBT transistors

U/T1
V/T2
W/T3

Motor

PE

Voltage and current feedback

PE

POWER

CONTROL

Power supplies for electronics and interfaces between power and control

Operating interface (HMI)

CPU 32 bits "RISC"

EEPROM (memory)

Remote operating interface (HMI)

PLUG-IN CFW500-IOS[1]

RS485

WLP software SuperDrive G2

Interfaces (RS232, RS485 or USB)

Modbus-RTU

Plug-in module

Digital inputs (DI1 to DI4)[1]

Analog inputs (AI1)[1]

10 V power supply

24 V power supply

Analog output (AO1)[1]

DO1 digital output (RL1)

DO2 digital output (TR)[1]
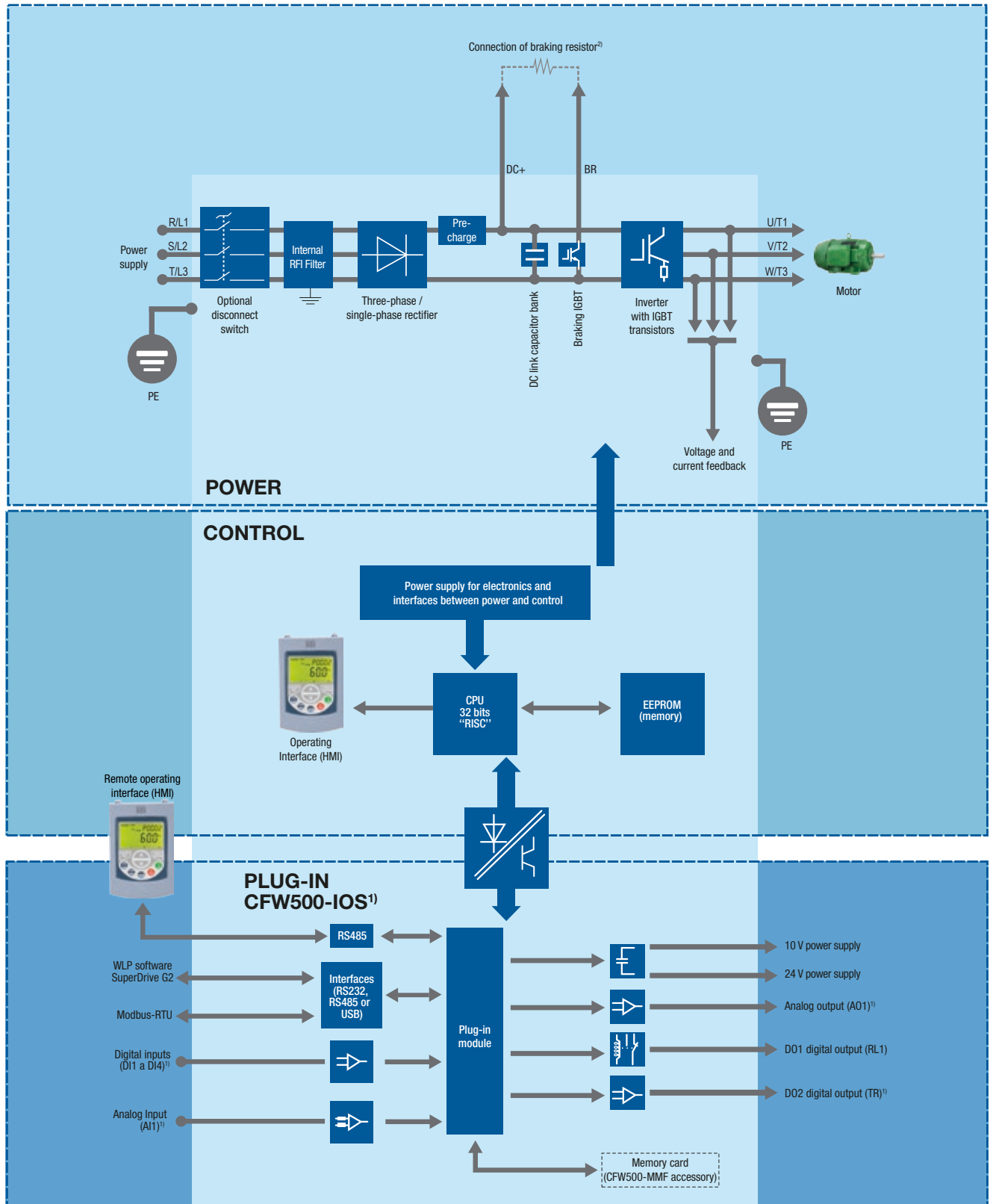
Memory card (CFW500-MMF) accessory

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) Connection available for sizes D and E only. Inductor on the DC link not included. Sizes F has DC link inductor built-in as standard, to protect the drive against current spikes.
4) Resistor not included. Internal dynamic braking (IGBT) built-in the whole line, except for frame size A of IP20 version.

Block Diagram of IP66 / NEMA Type 4x Version

Connection of braking resistor[2]

DC+   BR

R/L1

Power supply   S/L2

T/L3

Optional disconnect switch

Internal RFI Filter

Three-phase / single-phase rectifier

Pre- charge

DC link capacitor bank

Braking IGBT

Inverter with IGBT transistors

U/T1

V/T2

W/T3

Motor

PE

PE

Voltage and current feedback

POWER

CONTROL

Power supply for electronics and interfaces between power and control

Operating Interface (HMI)

CPU 32 bits "RISC"

EEPROM (memory)

Remote operating interface (HMI)

PLUG-IN CFW500-IOS[1]

RS485

10 V power supply

WLP software SuperDrive G2

Interfaces (RS232, RS485 or USB)

24 V power supply

Modbus-RTU

Plug-in module

Analog output (AO1)[1]

Digital inputs (DI1 a DI4)[1]

DO1 digital output (RL1)[1]

Analog Input (AI1)[1]

DO2 digital output (TR)[1]

Memory card (CFW500-MMF accessory)

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) Resistor not included. Internal dynamic braking (IGBT) built-in in the whole CFW500 IP66 version.

Global presence is essential, as much as understanding your needs.

Global Presence

With more than 30.000 employees worldwide, WEG is one of the largest electric motors, electronic equipments and systems manufacturers. We are constantly expanding our portfolio of products and services with expertise and market knowledge. We create integrated and customized solutions ranging from innovative products to complete after-sales service.

WEG's know-how guarantees our **CFW500** are the right choice for your application and business, assuring safety, efficiency and reliability.

Availability is to have a global support network

Partnership is to create solutions that suit your needs

Competitive edge is to unite technology and innovation

Know More

High performance and reliable products to improve your production process.

Excelence is to provide a whole solution in industrial automation that improves our customers productivity.

For **WEG's worldwide**
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