Motors | Automation | Energy | Transmission & Distribution | Coatings

CFW100 - Mini Drive

Variable Frequency Drive

CFW100

Mini Drive

Technology is at your fingertips with the smallest volume VFD in the market. The CFW100 is a single-phase variable frequency drive developed for simple applications ranging from ¼ to 1 HP (0.18 kW to 0.75 kW). A strong partner for OEMs, it gives induction motors a selectable scalar (V/F) or voltage vector control (VVW), HMI and plug and play philosophy, with easy and fast installation and operation.

- **Mini** — Compact
- **Focus** — Single-phase supply
- **Compatible** — Plug-in modules; Flash memory
- **Robust** — High overload capacity
- **Efficient** — Functions to streamline operation and performance; SoftPLC
- **Reliable** — WEG quality
- **Integrated** — Communication protocols; Connectivity

Many applications... at your fingertips!

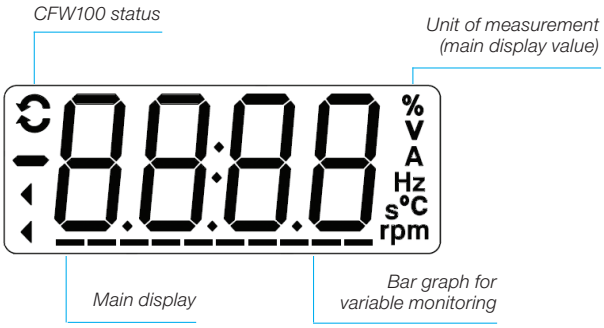
Advantages	Benefits
The smallest VFD in the market, able to operate with 50 °C ambient temperature without derating.	Reduction in electrical panel space.
Appropriate for commercial and residential applications, however still suitable for industrial enviroments.	Saving time and installation cost when compared to three-phase applications.
The optional communication network and I/O modules are fast and easily installed, allowing adaptation of the standard VFD to each application.	Time saving, standardization and optimized costs based on requirements.
Within seconds, it is possible to download the programming from a CFW100 to others without powering them up.	Fast, easy and reliable programming for manufacturers that produce machines in large quantities.
It withstands an overload of 150% for one minute every 10 minutes, at an ambient temperature of 50 °C.	Does not require oversizing of the VFD.
PID: process control with SoftPLC. **Sleep:** disables the VFD automatically. **Flying start:** allows control of a motor that is turning freely, accelerating it from the speed at which it was running. **Ride through:** keeps the VFD in operation during voltage dips.	Energy saving. Enables fast operating response of the machine and prevents occasional mechanical breakdowns. Prevents machine stoppage and downtime.
Built-in PLC, enabling the VFD, motor and application to work in an interactive way. It allows the user to implement customized logic and applications.	Eliminates the need for an external PLC, reducing costs, optimizing space and simplifying the system.
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 which can be caused by adverse situations, normally external factors.
Thermal protection of IGBTs based on manufacturer curve.	
Conformal Coating as Standard. Classified as 3C2 according to IEC 60721-3-3.	VFD lifespan is extended: protection against dust, humidity, high temperatures and chemicals.
Modbus (RS485) and CANopen.	Full integration with process network.
USB and Bluetooth®.	Higher global connections with and without cables.

Easy Configuration Fitting Everywhere

- Fast commissioning. Innovative design, extremely compact and uniform. Optimized cost x benefit.

Human-Machine Interface

- View two parameters at the same time, selected by the user. Unique in this category of VFD.



Friendly Programming

- Built-in HMI for the standard product
- Oriented start-up: programming step by step

Remote HMI

Solution for panel door or machine console.

Easy replacement for contactors or similar product.

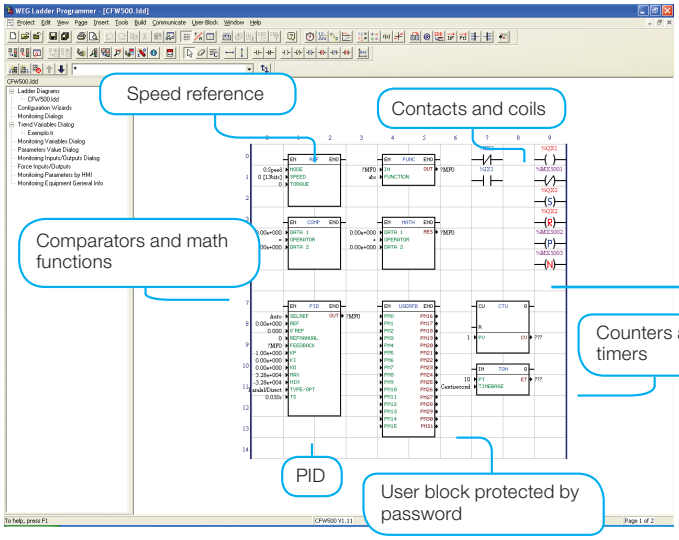
Standard product no plug-in needs

1 - Supply terminals
2 - Plug-in connection ONLY
3 - Digital inputs
4 - Motor terminals

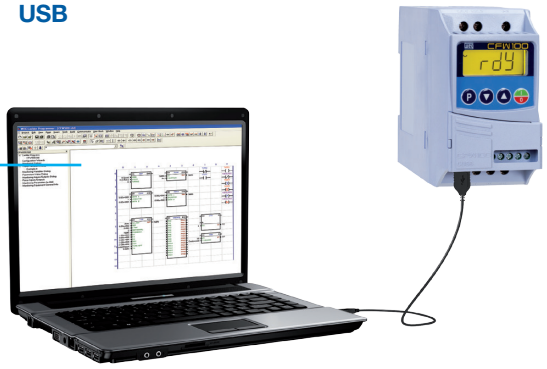
Conectivity

SoftPLC

Adds the functionalities of a PLC to the CFW100, allowing the creation of applications. The WLP software and the SoftPLC functionality are a smart and simple way to make your CFW100, motor and application work together.



USB



USB cable

Bluetooth®

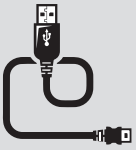
Plug-in module
CFW100-CBLT

Flexibility

CFW100-CRS485
Plug-in module

CFW100-HMIR
IP54

Flash memory
CFW100-MMF



3 meter USB cable

SuperDrive G2

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

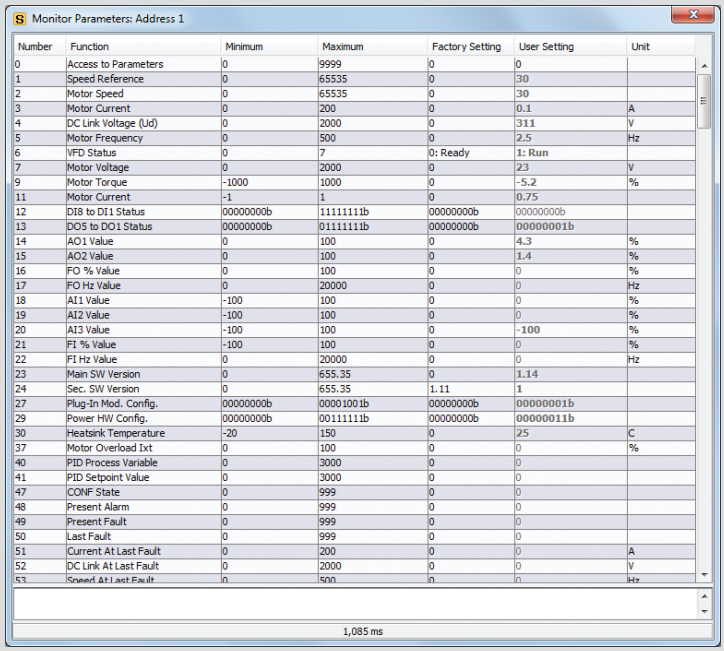
Free on www.weg.net

Trend Function

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

Changing and Monitoring of Parameters in a List/Table

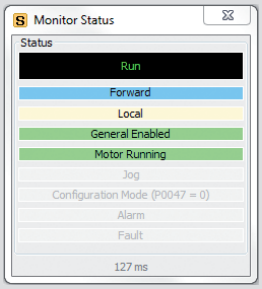
Parameter set storage in a computer file format.



Number	Function	Minimum	Maximum	Factory Setting	User Setting	Unit
0	Access to Parameters	0	9999	0	0	
1	Speed Reference	0	65535	0	30	
2	Motor Speed	0	65535	0	30	
3	Motor Current	0	200	0	0.1	A
4	DC Link Voltage (Ud)	0	2000	0	311	V
5	Motor Frequency	0	500	0	2.5	Hz
6	VFD Status	0	7	0: Ready	1: Run	
7	Motor Voltage	0	2000	0	23	V
9	Motor Torque	-1000	1000	0	-5.2	%
11	Motor Current	-1	1	0	0.75	
12	DI8 to DI1 Status	00000000b	11111111b	00000000b	00000000b	
13	DO5 to DO1 Status	00000000b	01111111b	00000000b	00000001b	
14	AO1 Value	0	100	0	4.3	%
15	AO2 Value	0	100	0	1.4	%
16	FO % Value	0	100	0	0	%
17	FO Hz Value	0	20000	0	0	Hz
18	AI1 Value	-100	100	0	0	%
19	AI2 Value	-100	100	0	0	%
20	AI3 Value	-100	100	0	-100	%
21	FI % Value	-100	100	0	0	%
22	FI Hz Value	0	20000	0	0	Hz
23	Main SW Version	0	655.35	0	1.14	
24	Sec. SW Version	0	655.35	1.11	1	
27	Plug-In Mod. Config.	00000000b	00001001b	00000000b	00000001b	
29	Power HW Config.	00000000b	00111111b	00000000b	00000011b	
30	Heatsink Temperature	-20	150	0	25	C
37	Motor Overload Ixt	0	100	0	0	%
40	PID Process Variable	0	3000	0	0	
41	PID Setpoint Value	0	3000	0	0	
47	CONF State	0	999	0	0	
48	Present Alarm	0	999	0	0	
49	Present Fault	0	999	0	0	
50	Last Fault	0	999	0	0	
51	Current At Last Fault	0	200	0	0	A
52	DC Link At Last Fault	0	2000	0	0	V
53	Speed At Last Fault	0	500	0	0	Hz

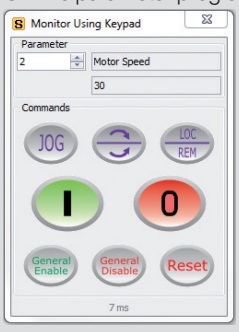
- Transfer of parameters from the PC to the CFW100 and vice versa
- Off-line editing of parameters stored on the PC

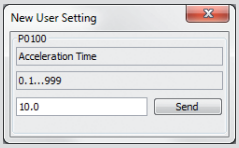
Status Monitoring



Operation with HMI

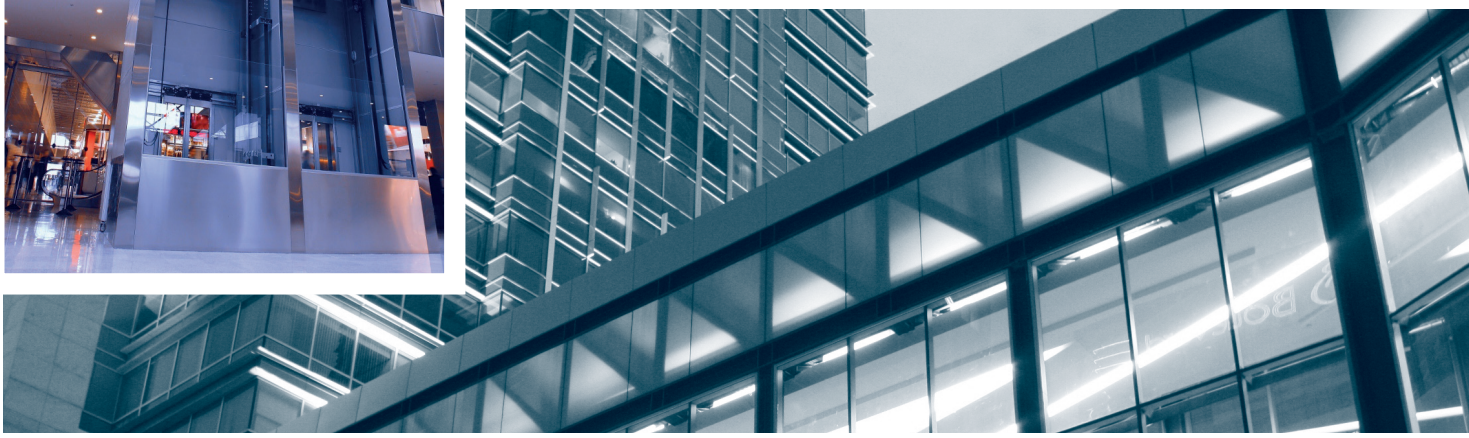
On-line parameter programming.





OEM Solutions

Mini frequency inverters with integrated micro-PLC are well suited for simple technical applications in the commercial sector and OEM users, such as elevators doors or fitness equipment, as well as small fans, mixing machines, roller tables and special-purpose machines for small processes. Combining extensive functionality with extremely small size, the CFW100 is easy to integrate into electrical cabinets and many machines.



Applications

Commercial Dryers

Centrifugal pumps

Fans / Ventilation

Process dosing pumps

Blenders / Mixers

Stackers / Palletizers

Rotary filters

Roller tables

Small material handling applications

Product Coding

The CFW100 product code identifies its construction characteristics, nominal current, voltage range and options. Using the product code, it is possible to select the CFW100 required for your application simply and quickly.

Product and series	Drive identification				Protection class	RFI emmision level	Hardware revision	Software version
	Frame size	Rated output current	Supply phases	Rated voltage				
CFW100	A, B and C	01P6 up to 4P2	S	2	20	C2 or C3	- - -	- - -
CFW100	Refer to table							
	20 = IP20							
	Blank = with no RFI filter C2 = Meets category 2 of IEC 61800-3 standard, with internal RFI filter C3 = Meets category 3 of IEC 61800-3 standard, with internal RFI filter							
	Blank = Standard hardware Hx = Special hardware							
	Blank = Standard software Sx = Special software							

Frame size	Rated output current	Supply phases	Rated voltage	Protection class	RFI emission level
A	01P6 = 1.6 Amps	S = Single-phase	2 = 200 V...240 V ac	20 = IP20	Blank
B	02P6 = 2.6 Amps				
C	04P2 = 4.2 Amps				

Drive Ratings

The correct way to select a VFD is by matching its output current to 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 Voltages Between 220 V and 230 V

Motor volts	Motor HP	Rated current (A)	Catalog number	Frame size	Enclosure
Three-phase 230 V	Input power supply: Single-phase 200-240 V				
	1/4 or 1/3	1.6	CFW100 A 01P6 S2	A	IP20
	3/4	2.6	CFW100 B 02P6 S2	B	IP20
	1	4.2	CFW100 C 04P2 S2	C	IP20

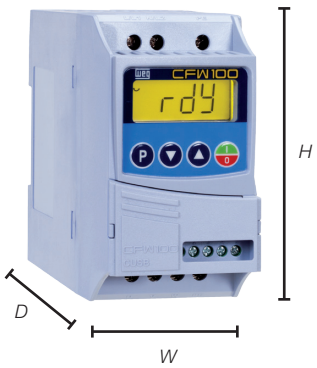
Notes: HP rating based on FLA values from WEG Fractional Motors, 2 and 4 poles, 230 V / 460 V ac.
Use as a guide only. Motor FLA may vary with speed and manufacturer.
Always compare motor FLA to Nominal AMPS of VFD and overload conditions.

Dimensions and Weights

IP20

Frame size IP20	Height in. (mm)	Width in. (mm)	Depth in. (mm)	Weight Lbs. (kg)
A	3.94 (100)	2.17 (55)	5.08 (129)	1.05 (0.48)
B	4.60 (117)	2.17 (55)	5.08 (129)	1.25 (0.57)
C	4.94 (125.6)	2.17 (55)	5.08 (129)	1.34 (0.61)

Note: dimension and weights are not considering external RFI filter.



Accessories and Optionals

The CFW100 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 CFW100 to the power supply, in the high frequency band (>150 kHz), according to standards 61800-3 and EM 55011	-	External filter	Please check a local supplier, the WEG Branch or the User's Manual
I/O expansion modules (plug-in) [3]	Accessory	Used to configure the I/O points according to the needs of the application/machine	-	CFW100-IOAR	User installation
Communication module (plug-in) [3]	Accessory	Used for the communication of the CFW100 with the main networks of the market (Fieldbus)	-	CFW100-CUSB (USB) CFW100-CRS485 (RS485) CFW100-CCAN (CANopen)	-
	Accessory	Used for communication of VFD with a computer	-	CFW100-CUSB (USB) CFW100-CBLT (Bluetooth®)	-
Flash memory module (plug-in) [3]	Accessory	Used to download the programming of a CFW100 to others without having to power them up	-	CFW100-MMF	-
Remote keypad (up to 3 meters)	Accessory	Used to transfer the operation to the panel door or machine console. Maximum distance of 3 m without external supply [4]. Degree of protection: IP54	-	CFW100-KHMIR (Kit includes remote keypad CFW100-HMIR + CFW100-CRS485 module + 3 meter USB cable)	-

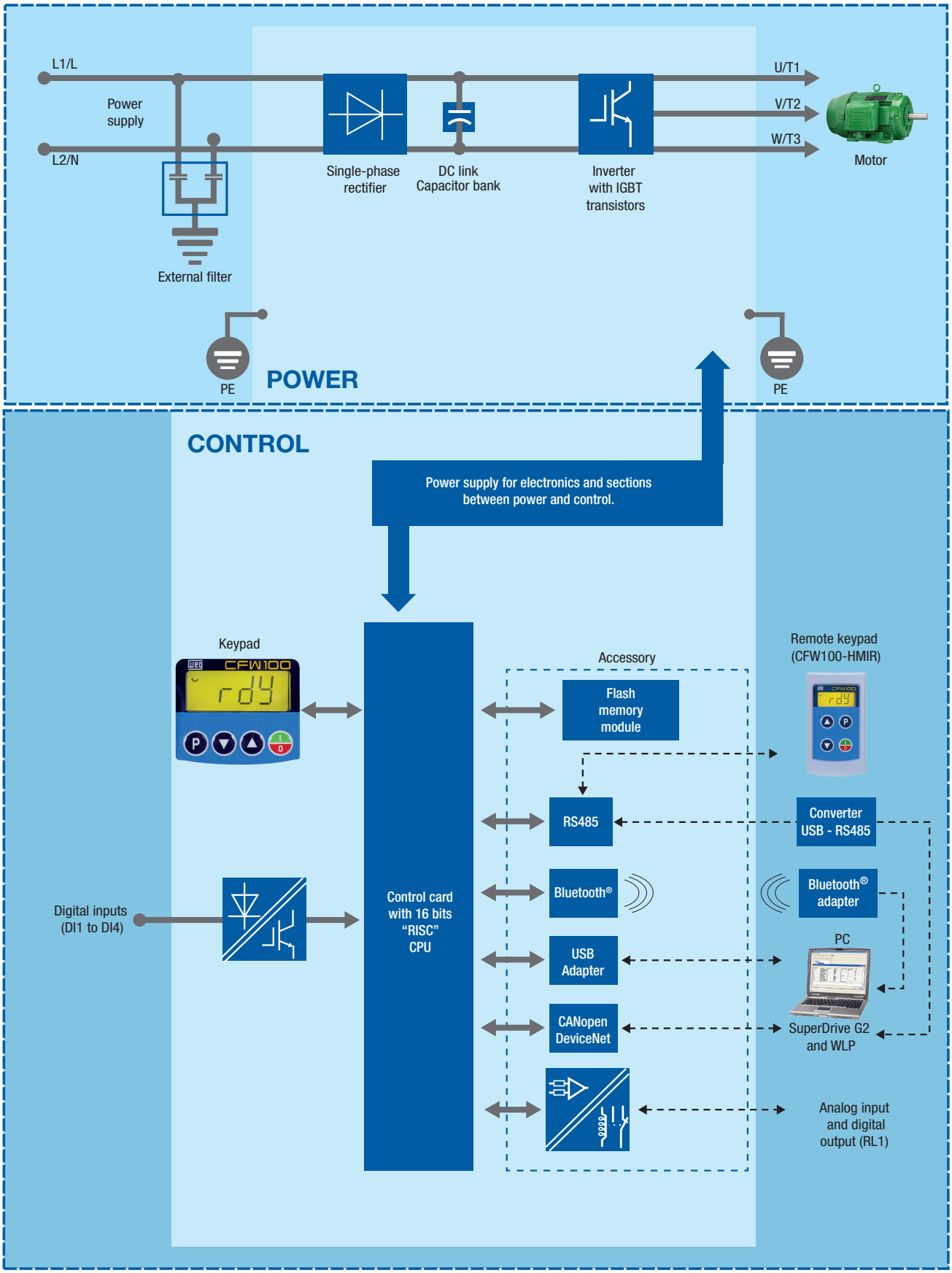
Notes: 1) Optional = hardware resources added to the CFW100 in the manufacturing process. Accessory = hardware resource requested as a separated item.
2) Request the product according to the code available on page 8.
3) The CFW100 allows installing one plug-in module per unit.
4) For cable lengths greater than 3 meter, please use RS485 connection with external power supply.

Plug-In Modules Specification

CFW100 option module	Drive and option card I/O table						
	DI	AI	DOR	USB	Bluetooth®	RS485	CANopen
CFW100 drive only	4						
CFW100-IOAR	4	1	1				
CFW100-CUSB	4			1			
CFW100-CBLT	4				1		
CFW100-CRS485	4					1	
CFW100-CCAN	4						1

Step by Step

Block Diagram



Technical Data

Mains supply	Voltage and power range	1-phase, 200-240 V ac (+10% - 15%)
		¼ to 1 HP (0.18 kW to 0.75 kW)
	Supply frequency	50/60 Hz (48 Hz a 62 Hz)
Motor connection	Voltage	3-phase, 0-100% of supply voltage
	Output frequency	0 to 300 Hz, regulation of 0.1 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
	Desaceleration time	0.1 to 999s
Environment	Temperature	50 ºC - IP20 without RFI filter
		2% current derating for each ºC above the specifc operating temperature, limited to 60 ºC
	Air relative humidity	5% to 90% non-condensing
	Altitude	Up to 1,000 m
		1,000 m to 4,000 m - 1% current derating for each 100 m above 1,000 m
	Degree of protection	IP20
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
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 protocol	Modbus-RTU	Plug-in module for RS485
	CANopen	Plug-in module CFW100-CCAN
Conectivity	USB	Plug-in module CFW100-CUSB
	Bluetooth®	Plug-in module CFW100-CBLT

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 (with external filter)	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.