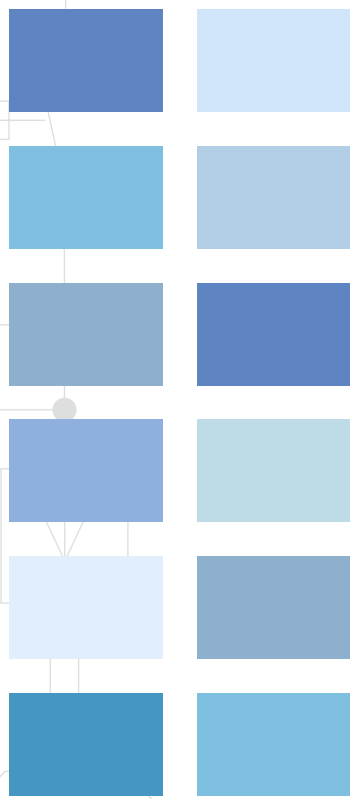
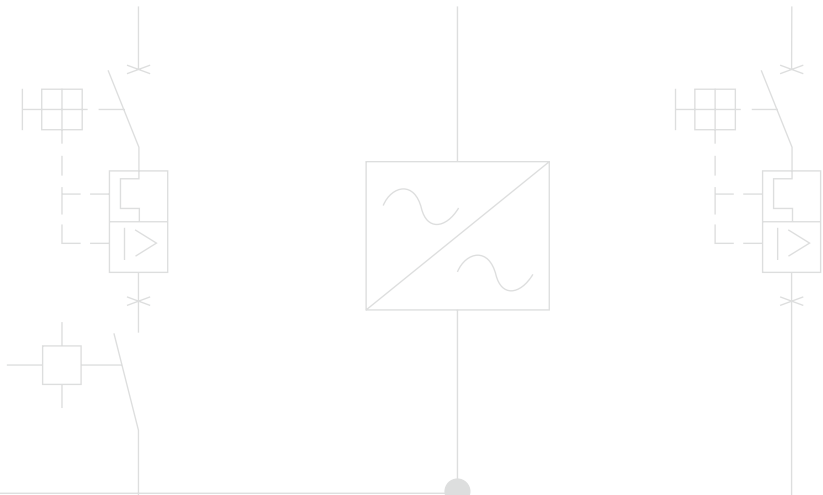


# CFW-11

## Frequency Inverter



## Frequency Inverter CFW-11

The CFW-11 frequency inverter is a variable speed drive series with state of the art technology for three-phase induction motors. It can be used in a vast range of applications, since it is designed for running on either Normal or Heavy Duty Cycle loads. Its performance is excellent, providing increased productivity and an improvement in the quality of the process in which it is used.

1.5 to 40 hp – 1.1 to 30 kW  
200-240 V – Single-phase (up to  
3 hp / 2.2kW) or Three-Phase  
2 to 60 hp – 1.5 to 45kW  
380-480 V – Three-phase



### Innovative and simple

The CFW-11 presents many innovations that are helpful and beneficial to customers, mainly due to the simplicity of its installation and operation. The CFW-11 was developed based on Plug-and-Play philosophy (connect and use) allowing simple and fast installation of the inverter and its accessories. The HMI (Human-Machine Interface) has a navigation and programming system similar to mobile phones, with soft-key buttons. It is possible to access the parameters sequentially or through groups of parameters. The HMI also makes the Oriented Start-up function available, guiding the user through the necessary programming.

### Flexibility

The CFW-11 adapts itself to the customer's needs through a broad range of accessories, which are easily installed. Besides this, the standard product comes with the SoftPLC function that attributes PLC functions to the inverter, which allows the customer to create his/her own applications (user programs) through the WLP software (programming in LADDER).



## Technology - Patents

### Vectrue Technology™

#### WEG FREQUENCY INVERTER CONTROL TECHNOLOGY

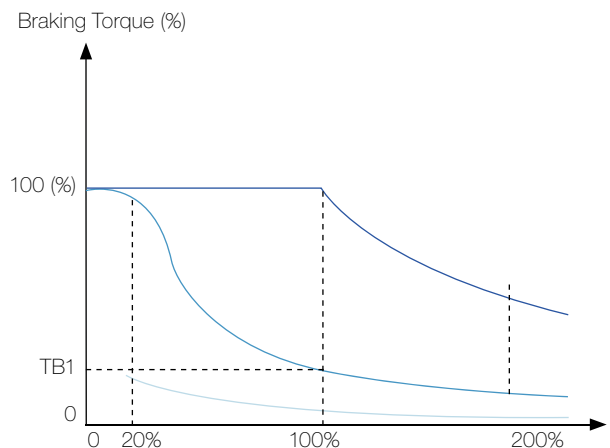
- Linear and adjustable V/f scalar, VVW (Voltage Vector WEG) and vector controls are available in the same product.
- Two (2) types of vector control: sensorless and with encoder (it requires the encoder interface accessory).
- Sensorless vector control permits high torque and quick response, even at low speeds and at startup.
- The self-tuning function automatically sets the vector control or VVW to the motor and load used.
- Through the adjustable V/f control, it is possible, for example, to adjust a quadratic V/f curve, providing energy savings for quadratic torque loads (e.g.: centrifuge pumps and fans).



### Optimal Braking™

#### WEG FREQUENCY INVERTER BRAKING TECHNOLOGY

For applications requiring short stopping times and/or stops under high inertial loading, conventional inverters use Dynamic (rheostatic) Braking, where the load's kinetic energy is regenerated to the inverter DC link and the excess is dissipated in the form of heat in a braking resistor that is interconnected with the power circuit. The CFW-11 inverters have a built-in Optimal Braking™ function, for the vector control mode, enabling an optimal braking, capable of responding to many applications that could only be solved by dynamic braking before. This technological innovation permits operations with high dynamic performance, with braking torques 5 times greater than regular DC braking torques, besides the great advantage of eliminating the use of the braking resistor. The curve shows the advantages of this new braking method called Optimal Braking™, thus ensuring an ideal and optimized solution for braking applications, at a low cost.



**Typical Braking Torque x Speed Graph for a 10 hp / 7.5 kW motor driven by a CFW-11 inverter**

- Dynamic Braking Torque Curve
- Optimal Braking™ Torque Curve
- DC Braking Torque Curve



### Optimal Flux™

#### TECHNOLOGY FOR MOTORS DRIVEN BY FREQUENCY INVERTERS IN APPLICATIONS WITH CONSTANT TORQUE LOADS

- Rated torque at low speeds eliminating the need for independent ventilation or motor over-dimensioning.
- Space saving and cost reduction of the application.
- Improved performance of the package inverter and motor (an exclusive WEG solution).

High efficiency WEG motor + CFW-11

Solution applied only to CFW-11 with high efficiency WEG motors.

## Applications

The CFW-11 frequency inverter can be used in both simple and sophisticated applications, due to its broad range of functions and easy configuration, installation and operation. The CFW-11, through its Vectrue Inverter™ technology, presents excellent static and dynamic performance, precise torque and speed control, dynamic response, positioning precision, and high overload capacity. The CFW-11 was also developed for applications where the decisive factor is safety, through several built-in protections and alarms as well as through the safety stop function in accordance with EN 954-1, category III.



### Multi-Pump Control

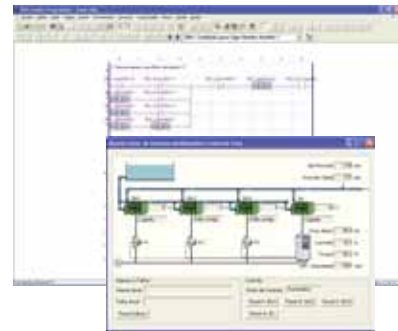
The CFW-11 permits the system to maintain the line pressure of a pipe constant, regardless of flow demand fluctuations.

This allows the system to use only the necessary number of pumps to supply its demand. It controls the speed of one of the pumps, turning the others on and off according to demand.

Besides controlling the system output pressure, it also monitors the suction pressure and the captation tank level.

The CFW-11 automatically alternates the pump that is running according to the number of hours each one has been operating, as to ensure uniform use.

This Multi-Pump Control is available free of charge through a SoftPLC function application software available on the WEB site.



### Pumps and fans

- Precise control of process variables (pressure, flow, temperature, etc.) through a PID regulator superposed to the speed control.
- Optimization of power consumption through speed control with an adjustable V/f curve.
- Possibility of safety and maintenance signaling and alarms of pumps and fans.
- Availability of PID regulators to control other process accessories like valves, dumpers, other frequency inverters, etc.



### Compressors

- Optimization of system pressurization control with energy savings and improvement of compressor efficiency.
- Reduction of motor startup current minimizing the wear and tear of the mechanical system permitting a reduction of contracted demand.
- Possibility of safety and maintenance signaling and alarms of pressurization system.
- Provides startup system control of other compressor units with an increased efficiency of the pressurization system.



## Applications

### Paper and Cellulose / Wood

- Display with three magnitudes visualized at the same time.
- USB communication in the front of the inverter for data gathering and programming.
- Highly precise speed and torque control.
- Flexible hardware programming and configuration, facilitating application with synchronisms.
- Network communication with main market protocols.
- Elevated degree of compactness, permitting the assembly of several inverters in reduced space. Modular inverters for large powers, providing an excellent power vs. volume ratio.
- Quick and simplified programming.
- Highly reliable and robust.



### Cement and Mining

- Robust hardware and large overload capacity (models dimensioned in HD).
- Elevated degree of compactness, permitting the assembly of several inverters in reduced space. Modular inverters for large powers, providing an excellent power vs. volume ratio.
- Network communication, with the main market protocols.
- Quick and simplified programming.



### Chemical and Petrochemical

- Highly reliable and robust.
- Elevated degree of compactness, permitting the assembly of several inverters in reduced space. Modular inverters for large powers, providing an excellent power vs. volume ratio.
- Plug-and-play system for additional modules, ensuring elevated flexibility in adapting to existing systems.
- Network communication, with the most used and renowned market protocols.



### Ironworks and Metallurgy

- Highly precise speed and torque control.
- Large overload capacity (models dimensioned in HD).
- Flexible hardware programming and configuration, facilitating application with synchronisms.
- Network communication with the main market protocols.
- Elevated degree of compactness, permitting the assembly of several inverters in reduced space. Modular inverters for large powers, providing an excellent power vs. volume ratio.



## Applications

### Elevation

- SoftPLC function.
- Three modes of vector control.
- Highly compact.
- Intelligent control of ventilation system.



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### Refrigeration

- SoftPLC function built into the standard product enabling the use of two controllers simultaneously. This characteristic is for HVAC applications.
- Display with three magnitudes visualized at the same time.
- USB communication in the front of the inverter for data gathering and programming.



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### Sugar and Alcohol

- Modular and compact.
- 12-pulse rectifier for reduction of harmonics.
- Regenerative rectifier for centrifuges.
- Highly robust and durable.



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### Process Machines

- Built-in PLC and RTC.
- High connectivity.
- Fieldbus.
- Highly precise speed and torque in all speed ranges.
- User friendly interface and programming.





## Human-machine interface

The human-machine interface (HMI) was developed for simple and fast interaction while providing excellent visibility for the user.

- Graphic display.
- Soft-keys for easy operation.
- Backlight.
- Real time clock.
- Copy function.
- Plug-in (connection with CFW-11 turned on).
- Language selection.
- Remote HMI.



Left soft-key: function defined by the display

Right soft-key: function defined by the display

Selection of Rotation Direction

Key for scrolling through menus and parameters and for modifying parameter content

Local / Remote Selection

Start key

Stop key

JOG key



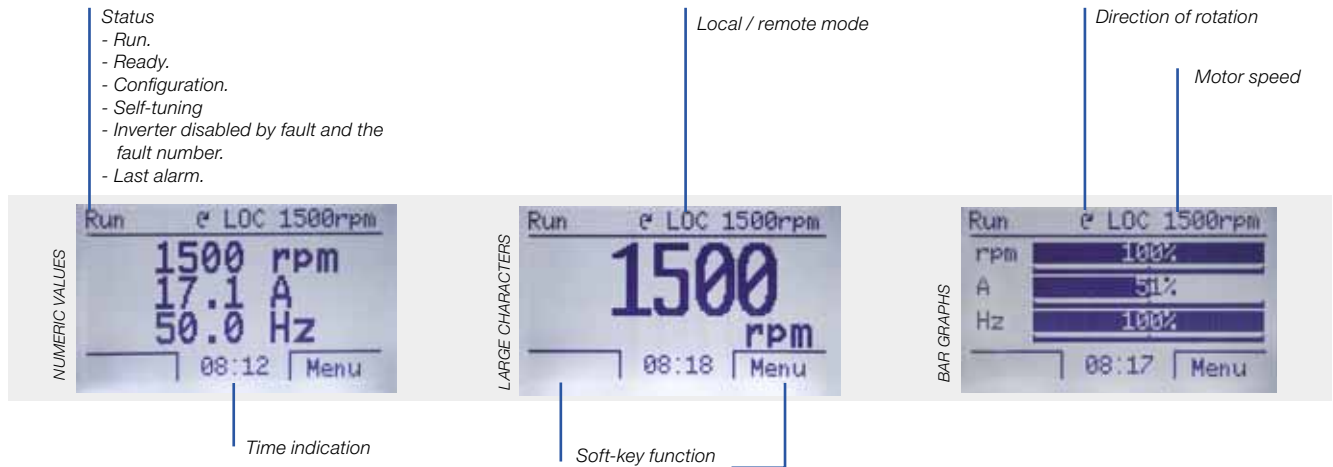
### Remote HMI

The HMI can be installed on panel doors or machine consoles with a protection degree of IP56.



## Visualization Modes

The HMI presents functions and a hierarchy by group of parameters that makes programming easy and very fast.



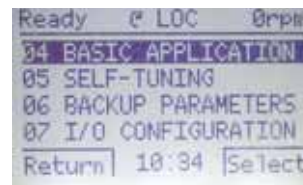
### Oriented Start-up

CFW-11 guides the user through the necessary programming to adjust the inverter to the motor and power supply.



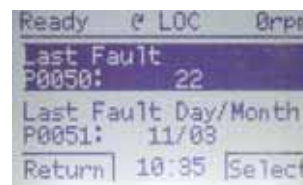
### Basic Application

The Basic Application Group contains the basic parameters, which need to be adjusted in most applications. The CFW-11 guides the user through these parameters.



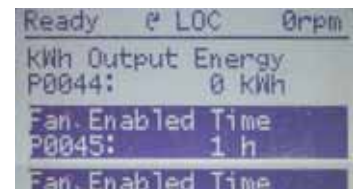
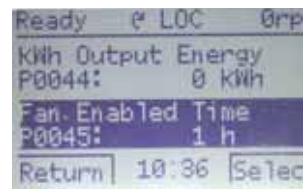
### Fault History Group

This only shows the parameters with information related to the last 10 faults, e.g. day, month, year and time that they have occurred.



### Read Only Parameters Group

This shows only the read only parameters.



### Backup Parameters Group

The Backup Parameters Group allows CFW-11 parameters to be transferred to the HMI or FLASH Memory Module (available in the standard product) and vice versa. During CFW-11 operation, the modified parameters are saved in the FLASH Memory Module regardless of user command.

### Functions Group

There are several groups divided by functions, only making available the parameters related to the function. Example: Vector Control Group, Communication Group, I/O Configuration Group, etc.

### Selectable Language

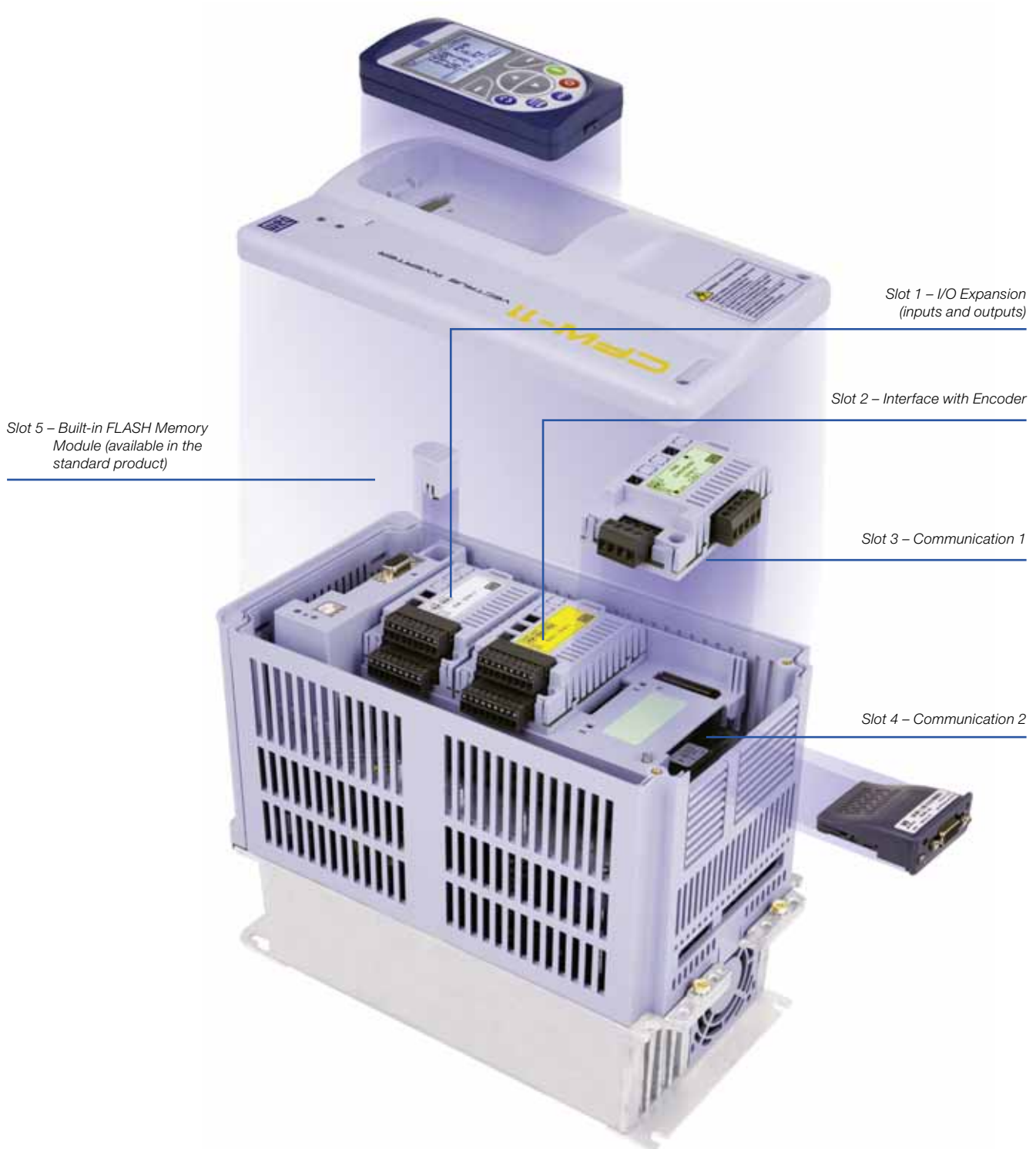
The user can choose the HMI language: Portuguese, English, Spanish, German, etc.

### Changed Parameters Group

Only shows parameters that are different from the factory default.

## Accessories

CFW-11 was developed based on Plug-and-Play philosophy. It automatically recognizes and configures the accessories used, enabling easy installation and safe operation eliminating manual configuration.



## Accessories

	Name	Description	Slot	Appearance
I/O Expansion	IOA-01	2 14-bit analog inputs in voltage or current 2 digital inputs 2 14-bit analog outputs in voltage or current 2 open collector type digital outputs	1	
	IOB-01	2 isolated 12-bit analog inputs 2 digital inputs 2 isolated 11-bit analog outputs in voltage or current 2 open collector type digital outputs	1	
Interface with Encoder	ENC-01	Incremental encoder module 5 to 12 Vdc 100 kHz With encoder signal repeater	2	
	ENC-02	Incremental encoder module 5 to 12 Vdc 100 kHz	2	
Communication	RS485-01	RS-485 Serial Communication Module (Modbus-RTU)	3	
	RS232-01	RS-232C Serial Communication Module (Modbus-RTU)	3	
	CAN/RS485-01	CAN/RS-485 Interface Module (CANopen, DeviceNet and Modbus)	3	
	CAN-01	CAN Interface Module (CANopen and DeviceNet)	3	
	PROFIBUSDP-05	Profibus DP Interface Module	4	
	DEVICENET-05	DeviceNet Interface Module	4	
	RS232-05	RS-232 Interface Module (passive) (Modbus-RTU)	4	
	RS485-05	RS-485 Interface Module (passive) (Modbus-RTU)	4	
	ETHERNET/IP-05	EtherNet/IP Interface Module	4	
	PLC11-01	Module with PLC Functions (for more information please see page 11)	1, 2 and 3	

## Accessories

### Kit for power cable shielding

There is a kit to make easier the connection of the motor cable shield to the ground, providing a low-impedance connection for high frequencies.

Name	Description
PCSA-01	Kit for power cable shielding for frame size A
PCSB-01	Kit for power cable shielding for frame size B
PCSC-01	Kit for power cable shielding for frame size C

Note: 1) The kit for power cable shielding is provided for the inverters with internal radiofrequency (RFI) suppressor filter.  
Example: BR CFW11 0007 T 2 O FA Z  
2) In frame size D the power cable shielding option is factory standard, even for inverters without internal RFI suppressor filter.



### Conduit Kit

Name	Description
KN1A-01	Conduit Kit for frame size A
KN1B-01	Conduit Kit for frame size B
KN1C-01	Conduit Kit for frame size C

Note: In the KN1X-01 conduit kit (frame size A, B and C) power cable shielding is also provided.

### IP21 Kit

Name	Description
KIP21D-01	IP21 Kit for frame size D

### Degree of Protection

#### For frame size A, B and C:

- IP21 – standard CFW-11  
Example: BR CFW11 0007 T 2 S Z
- Nema1 / IP21- standard CFW-11 + conduit Kit  
Example: BR CFW11 0007 T 2 O N1 Z

#### For frame size D:

- Nema1 / IP20 – standard CFW-11  
Example: BR CFW11 0086 T 2 S Z
- Nema1 / IP21- standard CFW-11 + IP21 Kit  
Example: BR CFW11 0086 T 2 O 21 Z



### Safety stop in accordance with EN-954-1, category III1

With the activation of the safety stop function, the PWM drive pulses of the IGBTs are disabled. Since there is no voltage applied to the motor there is no rotating magnetic field in the motor. Thus, it is ensured that the motor remains stopped providing system safety.



## Accessories

### Blind cover – HMID-01<sup>1</sup>

Blind cover for the complete closure of the product when used without HMI.



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### Frame for HMI(IP56) – RHMIF-01

Frame for HMI installation on panel door or machine console.



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### External control supply in 24 Vdc<sup>1</sup>

Used with communication networks (Profibus DP, DeviceNet, EtherNet/IP, etc.) so that the control circuit and the interface for the communication network continue working even with the power circuit de-energized.

<sup>1</sup> These options must be provided already installed in the CFW-11 (please see nomenclature on page 26).

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### RFI suppressor filter (to the inverter be in accordance with EN 61800-3 and EN 55011<sup>1</sup>)

CFW-11 models with built-in RFI suppressor filter, when properly installed, meet the requirements of the electromagnetic compatibility directive – “EMC Directive 2004/108/EC”.  
E.g.: EU CFW11 0007 T 2 O FA Z

<sup>1</sup> These options must be provided already installed in the CFW-11 (please see nomenclature on page 26).

## Accessories

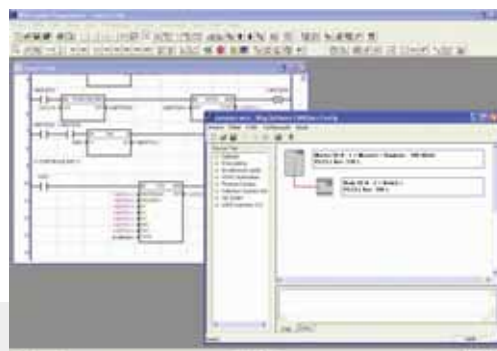
### PLC Accessory – PLC11-01

PLC11-01 accessory permits the CFW-11 to assume PLC functions, speed reference and positioning module. This accessory avoids the use of an external PLC in some applications, reducing considerably the cost of the solution. This accessory is only used for complex applications or when the CANopen Master/Slave function is used, a greater number of I/O points and the user program (application) exceeds the 15 kbytes memory. In case the application does not have these limitations, the SoftPLC function built-in to the standard product can be used (please see page 13).

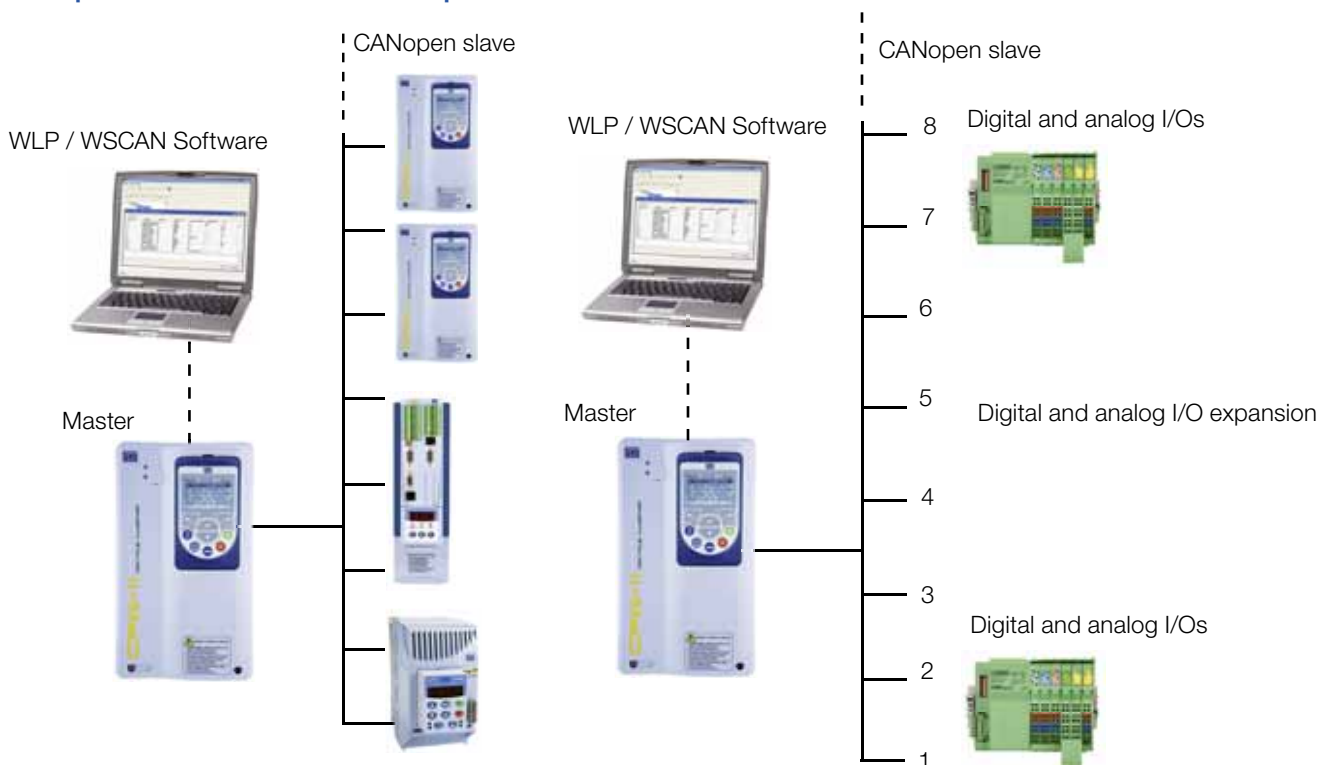


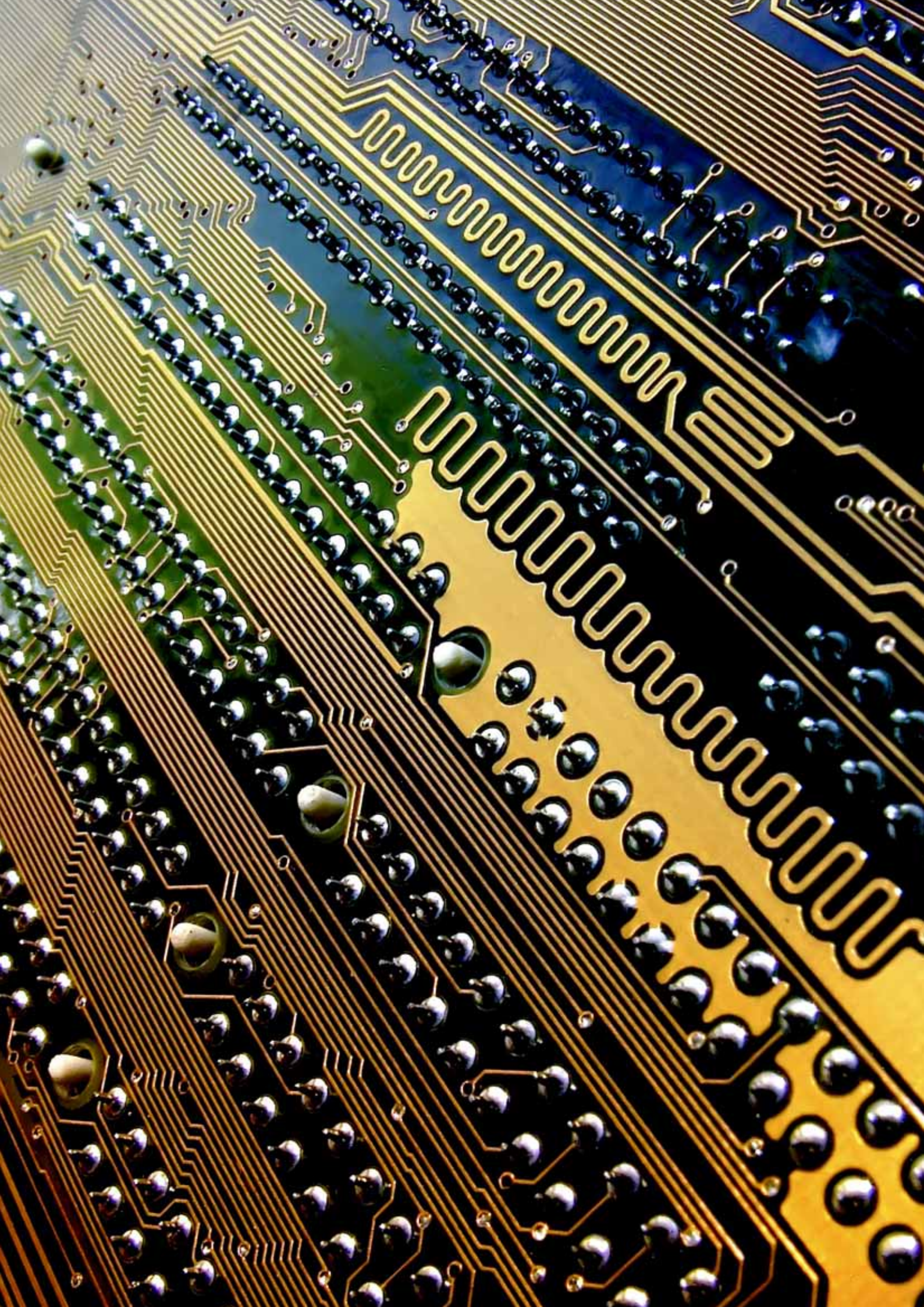
#### Features:

- 9 digital inputs.
- 3 relay outputs.
- 3 digital outputs.
- 1 14-bit analog input in voltage or current.
- 2 14-bit analog outputs in voltage or current.
- 2 encoder interfaces.
- 1 input for motor PTC.
- RS-485 Modbus-RTU.
- CANopen, DeviceNet Protocols.
- CANopen Master / Slave.
- Programming in LADDER (free software).
- Positioning with trapezoidal and “S” profile (absolute and relative).
- Homing.
- 100 parameters that can be configured by the user.
- On-line monitoring.
- WLP / WSCAN Software: network configuration and programming software in the same environment.



### Example of use of PLC11-01 as CANopen network master





## USB Connection

### G2 Superdrive

Software in Windows environment, for CFW-11 parameterization, command and monitoring.

- Automatic CFW-11 identification.
- Reads CFW-11 parameters.
- Writes CFW-11 parameters.
- Edits parameters on-line in the CFW-11.
- Edits parameters off-line in the PC.
- Allows all documentation of the application to be created.
- Easily accessible.
- Permits parameterization, command and monitoring of the inverter through G2 Superdrive software.
- Allows Trace function data to be visualized through G2 Superdrive software.
- Allows application software to be recorded (SoftPLC function) through WLP software.
- A 2m shielded USB cable is provided with the product.
- Online help.
- Free software on the site [www.weg.net](http://www.weg.net)



Monitoring and parameterization of the list of parameters. Comparison to factory default is easy.



Integrated environment



Monitoring and command window using virtual HMI. On/Off function, JOG, local / remote, reversion and reset



Parameter setting



Status monitoring

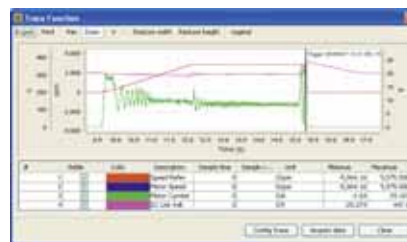
### Trace Function

Trace function is used to register CFW-11 variables (like current, voltage, speed, etc.) when a given event occurs in the system (ex.: alarm / fault, overload, overvoltage, etc.).

This event in the system is called a trigger because it triggers the data storage process.

The stored variables can be visualized in the form of graphs by using the G2 SuperDrive software. TRACE function simulates a 4-channel oscilloscope.

It is a very useful tool in the start-up of a system and in the diagnoses of defects.



Example of graph visualization screen



Trace function configuration in the G2 Superdrive

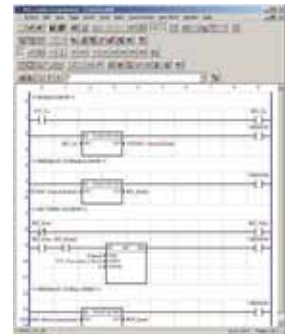


## USB Connection

### SoftPLC Function

It is a resource that attributes PLC functions to the CFW-11, granting flexibility to the user and allowing him/her to develop his/her own applications (user programs).

- LADDER programming language – WLP Software.
- Access to all inverter parameters and I/Os.
- PLC, mathematical and control blocks.
- Download, upload and online monitoring.
- Memory capacity of 15.36 kbytes.
- Allows all documentation of the application to be created.
- Online help.
- Free software on the site [www.weg.net](http://www.weg.net)



Simple and practical programming environment

### Incorporated in the standard CFW11

- 40 User Parameters that can be individually programmed allowing tags, units, minimum and maximum values, number of decimal digits and other characteristics to be edited.

Parameter	Tag	Unit	Minimum	Maximum	D	H	R	S	C	L	B	U
P1010	Uw_Velocidade		0	32767	0	0	0	0	0	0	1	0
P1012	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1013	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1014	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1015	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1016	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1017	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1018	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1019	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1020	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1021	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1022	Parametro PLC		0	32767	0	0	0	0	0	0	1	0
P1023	Parametro PLC		0	32767	0	0	0	0	0	0	1	0

### FLASH Memory Module

- It stores the image of the CFW-11 parameters. It ensures that the programming will not be lost because there is a backup of the parameters.
- It permits the transfer of parameters stored in the FLASH Memory Module to the CFW-11 and vice versa. Excellent function for manufacturers of machines or in processes where parameterization is repeated (Copy Function).
- It stores the program generated by the SoftPLC function.

### Incorporated in the standard CFW11



# Specification Table

### Normal Duty (ND) Cycle:

- 110% during 60 seconds every 10 minutes
- 150% during 3 seconds every 10 minutes

### Heavy Duty (HD) Cycle:

- 150% during 60 seconds every 10 minutes
- 200% during 3 seconds every 10 minutes



Frame Size A    Frame Size B    Frame Size C    Frame Size D

### Supply voltage: 200-240 V

Type of Duty										Model	Frame Size	Weight (kg)
Normal Overload					Heavy Overload							
Motor Power		Output Current (A)			Motor Power		Output Current (A)					
HP	kW	Rated	60 sec.	3 sec.	HP	kW	Rated	60 sec.	3 sec.			
Single-phase supply												
3	2.2	10	11	15	3	2.2	10	15	20	CFW11 0010 S 2	A	6.1
Single-phase or Three-phase Supply												
1.5	1.1	6	6.6	9	1	0.75	5	7.5	10	CFW11 0006 B 2	A	5.7
2	1.5	7	7.7	10.5	2	1.5	7	10.5	14	CFW11 0007 B 2	A	5.7
Three-phase Supply												
2	1.5	7	7.7	10.5	1.5	1.1	5.5	8.3	11	CFW11 0007 T 2	A	5.7
3	2.2	10	11	15	2	1.5	8	12	16	CFW11 0010 T 2	A	5.7
4	3	13	14.3	19.5	3	2.2	11	16.5	22	CFW11 0013 T 2	A	6.1
5	3.7	16	17.6	24	4	3	13	19.5	26	CFW11 0016 T 2	A	6.3
7.5	5.5	24	26.4	36	6	4.5	20	30	40	CFW11 0024 T 2	B	9.1
10	7.5	28	30.8	42	7.5	5.5	24	36	48	CFW11 0028 T 2	B	9.1
12.5	9.2	33.5	36.9	50.3	10	7.5	28	42	56	CFW11 0033 T 2	B	9.1
15	11	45	49.5	67.5	12.5	9.2	36	54	72	CFW11 0045 T 2	C	18.9
20	15	54	59.4	81	15	11	45	67.4	90	CFW11 0054 T 2	C	18.9
25	18.5	70	77	105	20	15	56	84	112	CFW11 0070 T 2	C	18.9
30	22	86	94.6	129	25	18.5	70	105	140	CFW11 0086 T 2	D	32.5
40	30	105	115.5	157.5	30	22	86	129	172	CFW11 0105 T 2	D	32.5

### Supply voltage: 380-480 V

Use with Normal Duty (ND) cycle					Use with Heavy Duty (ND) cycle					Model	Frame Size	Weight (kg)
Motor Power		Output Current (A)			Motor Power		Output Current (A)					
HP	kW	Rated	60 sec.	3 sec.	HP	kW	Rated	60 sec.	3 sec.			
Three-phase Supply												
2	1,5	3,6	3,96	5,4	2	1,5	3,6	5,4	7,2	CFW11 0003 T 4	A	5,7
3	2,2	5	5,5	7,5	3	2,2	5	7,5	10	CFW11 0005 T 4	A	5,9
4	3	7	7,7	10,5	3	2,2	5,5	8,3	11	CFW11 0007 T 4	A	5,9
6	4	10	11	15	6	4	10	15	20	CFW11 0010 T 4	A	6,1
7,5	5,5	13,5	14,9	20,3	6	4	11	16,5	22	CFW11 0013 T 4	A	6,3
10	7,5	17	18,7	25,5	7,5	5,5	13,5	20,3	27	CFW11 0017 T 4	B	9,1
15	11	24	26,4	36	12,5	9,2	19	28,5	38	CFW11 0024 T 4	B	9,7
20	15	31	34,1	46,5	15	11	25	37,5	50	CFW11 0031 T 4	B	10,4
25	18,5	38	41,8	57	20	15	33	49,5	66	CFW11 0038 T 4	C	18,9
30	22	45	49,5	67,5	25	18,5	38	57	76	CFW11 0045 T 4	C	18,9
40	30	58,5	64,4	87,8	30	22	47	70,5	94	CFW11 0058 T 4	C	18,9
50	37	70,5	77,6	105,8	40	30	61	91,5	122	CFW11 0070 T 4	D	32,5
60	45	88	96,8	132	50	37	73	109,5	146	CFW11 0088 T 4	D	32,5

## Dimensions

Frame Size	Width W (mm)	Height H (mm)	Depth D (mm)
A	145	247	227
B	190	293	227
C	220	378	293
D	300	504	305



Frame Size A



Frame Size B



Frame Size C



Frame Size D

# Mechanical Installation | Positioning and Setting

## Standard Installation



Frame Size	Free Space		
	A (mm)	B (mm)	C (mm)
A	25	25	10
B	40	45	10
C	110	130	10
D	110	130	10

When one inverter is assembled on the top of another, use the distance A+B and deflect the hot air coming from the inverter below.

## Side by side Installation



Only for Frame Size A, B and C: side by side assembly without lateral spacing with the removal of the top cover.

## Economy of space



## Mechanical Installation | Panel Assembly

### Surface Assembly

Mechanics	a2 (mm)	b2 (mm)	c2 (mm)
A	115	250	M5
B	150	300	M5
C	150	375	M6
D	200	525	M8



### Flange Assembly (external part with degree of protection IP54)

Frame Size	a3 (mm)	b3 (mm)	c3 (mm)	d3 (mm)	e3 (mm)
A	130	240	M5	135	225
B	175	285	M5	179	271
C	195	365	M6	205	345
D	275	517	M8	285	485



# Technical Characteristics

Power supply and Power Range		
Voltage and power range	Single-Phase	200-240 V / +10%/-15%: 1.5 to 3 hp (1.1 to 2.2 kW)
	Three-Phase	200-240 V / +10%/-15%: 1.5 to 40 hp (1.1 to 30 kW)
		380-480 V / +10%/-15%: 2 to 60 hp (1.5 to 45kW)
Frequency	50 / 60 Hz +-2% (48 to 63 Hz)	
Displacement factor	Greater than 0.98	
Efficiency	Greater than 0.97	

Motor		
Voltage	Three Phase, 0 up to power supply voltage	
Frequency	0 to 400 Hz	
Switching Frequency	Standard: 5kHz Options available: 2.5 / 5 / 10 kHz	
Overload	Normal Duty Cycle	110% for 1 min every 10min
		150% for 3 sec every 10min
	Heavy Duty Cycle	150% for 1 min every 10min
		200% for 3 sec every 10min
Time (ramps)	Acceleration	0 to 999 seconds
	Deceleration	0 to 999 seconds

Environment	
Temperature of Operation	- 10°C to 50°C
	Up to 60°C with current derating (2% for each 1°C above 50°C)
Humidity	5 to 90% without condensation
Altitude	0 to 1000 meters
	Up to 4000 meters with current reduction (1% for every 100 meters above 1000 meters)

Protection Degree	
IP20	Frame Size A, B and C without upper cover and conduit kit
NEMA 1 / IP20	Frame Size D without IP21 kit
IP21	Frame Size A, B and C with upper cover and conduit kit
NEMA 1 / IP21	Frame Size A, B and C with upper cover and conduit kit
	Frame Size D with IP21 kit

Braking Methods	
Rheostatic Braking	Supply available to user
	External braking resistor (not provided)
Optimal Braking	Does not need braking resistor
DC Braking	Direct current applied to the motor

Performance		
Scalar (V/f)	Speed Control	Regulation: 1% of rated speed
		Speed variation range: 1:20
Voltage Vector (VVV)		Regulation: 1% of rated speed
		Speed variation range: 1:30
Sensorless Vector		Regulation: 0.5% of rated speed
		Speed variation range: 1:100
Vector with Encoder (with accessory ENC-01 or ENC-02)		Regulation: +/- 0.01% of rated speed with 14-bit analog input (IOA)
		Regulation: +/- 0.01% of rated speed with digital reference (keyboard, serial fieldbus, electronic potentiometer, multispeed)
	Regulation: +/- 0.05% of rated speed with 12-bit analog input	
Sensorless Vector	Torque Control	Range: 10 to 180%
		Regulation: +/- 5% of rated torque
		Range: 20 to 180%
		Regulation: +/-10% of rated torque (above 3 Hz)

Inputs and Outputs (I/Os) in the Standard product		
Inputs	Digital	6 isolated inputs, 24 Vdc, programmable functions
	Analog	2 differential inputs isolated by differential amplifier, programmable functions
		Resolution: - AI1: 12 bits - AI2: 11 bits + signal
		Signals: (0 to 10) V, (0 to 20) mA or (4 to 20) mA
		Impedance: - 400 kΩ for signal (0 to 10) V - 500 Ω for signal (0 to 20) mA or (4 to 20) mA
Outputs	Relay	3 relays with NA/NF (NO/NC) contacts, 240 Vac / 1A, programmable functions
	Analog	2 isolated outputs, programmable functions
		Resolution: 11 bits
Available supply to user		Load: 0 to 10 V: $R_L \geq 10\text{ k}\Omega$ 0 to 20 mA or 4 to 20 mA: $R_L < 500\Omega$
		24 Vdc + -20%, 500 mA

## Technical Characteristics

Communication	
Profibus DP	PROFIBUS DP (slot 4)
DeviceNet	CAN/RS485-01 (slot 3)
	CAN-01 (slot 3)
	DEVICENET-05 (slot4)
CANopen	CAN/RS485-01 (slot 3)
	CAN-01 (slot 3)
CANopen Master/Slave	PLC11-01 (slot 1/2/3)
EtherNet TCP/IP	ETHERNET/IP-05 (slot 4)
RS485 - ModBus RTU	RS485-01
	CAN/RS485-01
	RS485-05
RS232 - ModBus RTU	RS232-01
	RS232-05
USB	Built-into the standard product
	Communication with Superdrive Software
	Communication with WLP Software used for programming and monitoring the SoftPLC function and the PLC11-01 accessory

Protections
Overcurrent / short circuit
Under / overvoltage in the power circuit
Phase loss
Overtemperature in the inverter (IGBTs, rectifier and internal air in the electronic cards)
Overtemperature in the motor
Overload in the braking resistor
Overload in the IGBTs
Overload in the motor
Fault / external alarm
Fault in the CPU or memory
Phase-to-ground short circuit at the output
Fault in the heatsink fan
Overspeed of motor
Incorrect connection of encoder

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 conformity with this norm, the machine manufacturer is responsible for the installation of an emergency shutdown device and an equipment for network sectioning
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 a.c. power drive systems

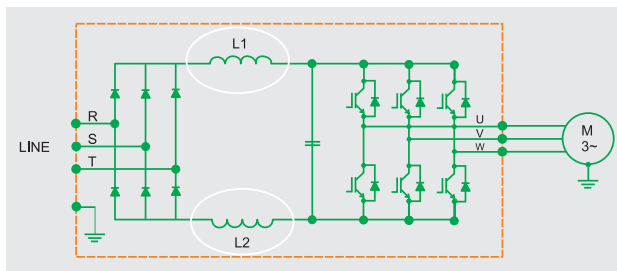
Mechanical Construction Standards
EN 60529 - Degrees of protection provided by enclosures (IP Code)
UL 50 - Enclosures for electrical equipment

Electromagnetic Compatibility standards (EMC)
EN 61800-3 - Adjustable speed electrical power drive systems Part 3: EMC product standard including specific test methods
EN 55011 - Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment
CISPR 11 - Industrial, scientific and medical (ISM)radio-frequency equipment Electromagnetic disturbance characteristics Limits and methods of measurement
EN 61000-4-2 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques - Section 2: Electrostatic discharge immunity test
EN 61000-4-3 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques - Section 3:Radiated, radiofrequency, electromagnetic field immunity test
EN 61000-4-4 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques - Section 4: Electrical fast transient / burst immunity test
EN 61000-4-5 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques - Section 5: Surge immunity test
EN 61000-4-6 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques - Section 6: Immunity to conducted disturbances, induced by radio-frequency fields

## Technical Characteristics

### Built-in Inductors in the DC Link

- Allows inverter installation in any network (there is no minimum impedance restriction).
- Typical power factor for rated condition:
- 0.94 for models with three-phase supply
- 0.70 for models with single-phase or single-phase/three-phase supply
- Meets the IEC61000-3-12 standard, related to low order current harmonics in the network.



### No need for external line reactor

### Single DC Busbar (DC Link)

CFW-11 inverters have access to the internal DC link allowing to be used in applications where a single DC link is used, as well as for regenerative systems.

Used for configurations in multi-motor machine systems where the bridge rectifiers of each inverter are replaced by a single general input rectifying unit, through the interconnection of the inverters by means of a single DC link. This solution also improves energy consumption of the system as a result of the energy transfer between the inverter units.



### Economy of space

### Intelligent Thermal Management

- Monitoring of the heatsink and internal air temperatures of the electronic boards providing total protection of the IGBTs and the CFW-11 as a whole.
- The heatsink fan is turned on and off automatically, depending on the temperature of the power modules.
- The speed and the number of hours of operation of the fan are monitored and indicated in corresponding parameters. Alarm or fault messages are generated related to these variables.
- The fan is easily removed for cleaning or replacement.



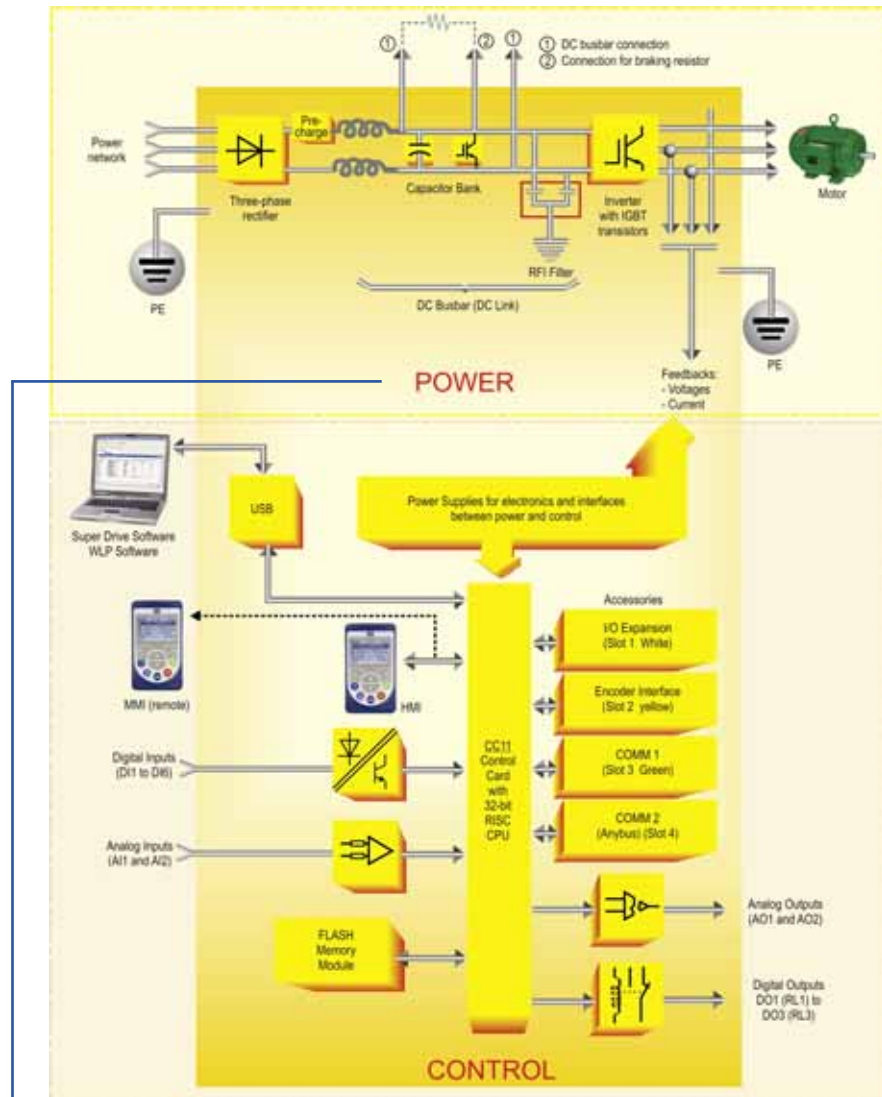
### Functions

- Multi-speed: up to 8 pre-programmed speeds.
- PID regulator: automatic control of level, pressure, flow, weight, etc.
- Ride-Through: operation during momentary failures of the power supply.
- Skip Frequency: rejection of critical or resonant speeds.
- S Ramp: smoothness in the acceleration / deceleration.

- All CFW-11 models sizes A, B, C and D have built-in braking IGBT in the standard product.
- Motor temperature protection with thermistors (PTC, PT100 and KTY84).
- Surrounding air temperature range is from -10°C up to 50°C. It is possible to operate up to 60°C with a derating of output current.
- Motor overload protection according to IEC 60497-4-2 and UL508C.



# Technical Characteristics



## Coding

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
BR	CFW11	-	0016	T	4	S	-	-	-	-	-	-	-	-	Z

### 1 - Market identification

It defines the language of the manual and the factory parameterization

BR = Brazil

### 2 - Line

CFW11 = WEG Frequency Inverter series CFW11

### 3 - Type of inverter construction

Blank = Inverter in cabinet

M = Inverter with modular construction to meet elevated powers, "modular drive" line

### 4 - Rated output current for normal overload system

Supply	Single-phase (S)	Single-phase or Three-phase (B)	Three-Phase (T)			
	200 - 240 V (2)	200 - 240 V (2)	200-240 V (2)	380-480 V (4)	500-600 V (5)	660-690 V (6)
Voltage	0010 = 10 A	0006 = 6 A	0007 = 7 A	0003 = 3 A	0470 = 470 A	0427 = 427 A
		0007 = 7 A	0010 = 10 A	0005 = 5 A	0893 = 893 A	0811 = 811 A
			0013 = 13 A	0007 = 7 A	1340 = 1340 A	1217 = 1217 A
			0016 = 16 A	0010 = 10 A	1786 = 1786 A	1622 = 1622 A
			0024 = 24 A	0013 = 13 A	2232 = 2232 A	2028 = 2028 A
			0028 = 28 A	0017 = 17 A		
			0033 = 33 A	0024 = 24 A		
			0045 = 45 A	0031 = 31 A		
			0054 = 54 A	0038 = 38 A		
			0070 = 70 A	0045 = 45 A		
			0086 = 86 A	0058 = 58 A		
			0105 = 105 A	0070 = 70 A		
				0088 = 88 A		

### 5 - Number of phases

S = Single-phase

B = Single-phase or three-phase

T = Three-phase

### 6 - Voltage

2 = 200-240 V

4 = 380-480 V

5 = 500-600 V

6 = 660-690 V

### 7 - Optional Accessories

S = standard product

O = product with optional accessories

### 8 - Degree of Protection (not applicable to models CFW-11M)

Blank = factory standard

(Sizes A, B and C: IP21 - D: Nema 1/ IP20)

N1 = Nema 1

21 = IP21

### 9 - Man-machine interface

Blank = factory standard (1)

IC = without interface (blind cover)

### 10 - Braking

Blank = factory standard

(Sizes A, B, C and D: built-in braking IGBT)

### 11 - RFI Filter (not applicable to models CFW-11M)

Blank = factory standard

FA = Category C3 internal RFI filter

### 12 - Safety Stop

Blank = factory standard (without safety stop function)

Y = with safety stop function according to EN-954-1 category 3

### 13 - External Electronic Supply 24 Vdc

(not applicable to models CFW-11M)

Blank = factory standard:

model CFW-11 (without) ; model CFW-11M (with)

### 14 - Special hardware

Blank = factory standard (without)

H1 = special hardware nr. 1

### 15 - Special Software

Blank = factory standard (without)

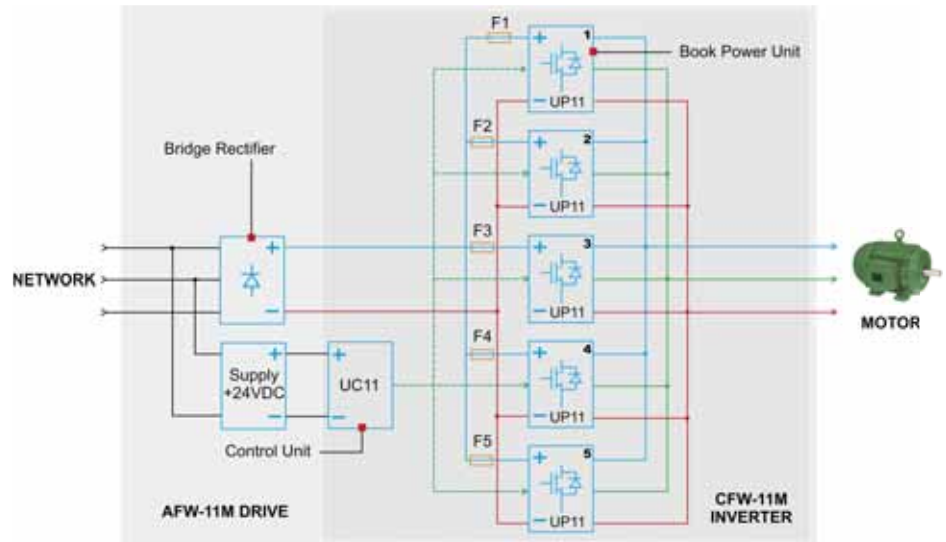
S1 = special software nr. 1

### 16 - End of Code indicator digit

Z = end of code indicator

## CFW11M - Modular Drive

The CFW-11M (modular drive) is the new generation of WEG frequency inverters for elevated powers. It is available in powers from 400 to 2500 HP and voltages from 500 to 690 V, with 6 and 12 pulse input rectifier.

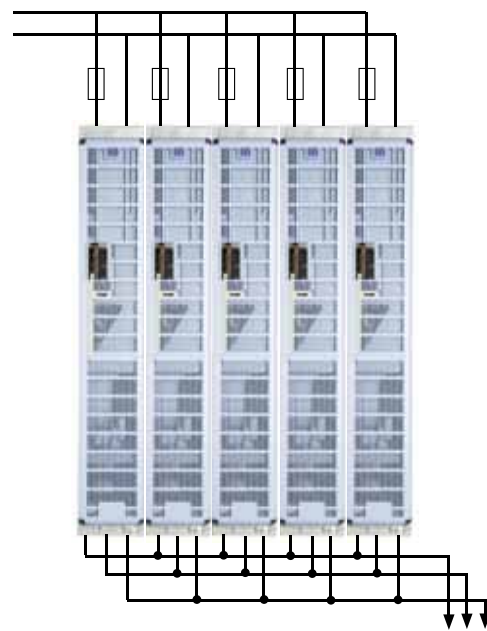


Notes: The fuses presented in the block diagram above are not included in the inverter CFW-11M, but are part of the AFW-11M drive  
Maximum AFW-11M configuration with 5 power units (2500 HP)

DC Link (connected to rectifier)



Power Book Unit



Output to motor

### Power Units

Compact modular inverter units that can be configured to the applicable motor power.

- Easy servicing.
- Configurable up to 5 power units.
- DC supplied by an input rectifier.
- Compact book format (width much smaller than the depth).

Configurable up to 5 power book units

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