# **Quick Installation Guide**

# **CFW300 Micro Drive**



**1 SAFETY INSTRUCTIONS** 

This quick installation guide contains the basic information necessary to commission the CFW300. It has been written to be used by qualified personnel with suitable training or technical qualification for operating this type of equipment. The personnel shall follow all the safety instructions described in this manual defined by the local regulations. Failure to comply with the safety instructions may result in death, serious injury, and/or equipment damage.

### **2 SAFETY WARNINGS IN THE MANUAL**



It is not the intention of this guide to present all the possibilities for the application of the CFW300, as well as WEG cannot take any liability for the use of the CFW300 which is not

For further information about installation, full parameter list and recommendations, visit the website www.weg.net.



The procedures recommended in this warning have the purpose of protecting the user against death, serious injuries and considerable material damage



### ATTENTION!

The procedures recommended in this warning have the purpose of avoiding material damage.



The information mentioned in this warning is important for the proper understanding and good operation of the product



High voltages are present.



Components sensitive to electrostatic discharge Do not touch them.



Mandatory connection to the protective ground (PE).



Connection of the shield to the ground.

### 3 PRELIMINARY RECOMMENDATIONS



Always disconnect the main power supply before touching any electrical component associated to the inverter. Several components can remain charged with high voltages or remain in movement (fans) even after the AC power is disconnected or switched off. Wait at least ten minutes after turning off the input power for the complete discharge of the powe capacitors. Always connect the grounding point of the inverter to the protection earth (PE). The XC10 connector does is not USB compatible, therefore, it cannot be connected to

This connectors serve only as interface between the CFW300 frequency inverter and its accessories



Frequency Inverter may interfere with other electronic equipment. Follow the precautions  $% \left( 1\right) =\left( 1\right) \left( 1\right)$ recommended in manual available in www.weg.net.

### Do not perform any withstand voltage test! If necessary, contact the manufacturer.



Electronic boards have components sensitive to electrostatic discharges.

Do not touch directly on components or connectors. If necessary, first touch the grounding point of the inverter, which must be connected to the protection earth (PE) or use a proper grounding strap.



When the inverter is stored for a long period, it becomes necessary to perform the capacitor reforming. Refer to the procedure recommended in www.weg.net.

### 4 ABOUT THE CFW300

 $The CFW300\ frequency\ inverter\ is\ a\ high-performance\ product\ which\ allows\ speed\ and\ torque\ control\ of\ three-phase\ induction\ motors.\ This\ product\ provides\ the\ user\ with\ the\ options\ of\ vector\ (VVW)\ or\ scalar\ product\ provides\ three-phase\ induction\ product\ provides\ three-phase\ induction\ product\ provides\ three-phase\ induction\ product\ product\ provides\ product\ produ$ (V/f) control, both programmable according to the application.

### **5 TERMINOLOGY**

Table 1: Terminology of the CFW300 inverters

	Product	IVI	loaei iaeni				Degree of	Hardware	Software
	and Series	Frame Size	Rated Current	Phase Number	Rated Voltage	Brake	Protection	Version	Version
Ex.:	CFW300	A	01P6	S	2	NB	20		
е s		Refer to Table	e 2						Blank = standard
Available	CFW300	NB = without	t braking re	ostática					Sx = special software
val pti	CFVV300	DB = with bra	aking reosta	ática				Blank = sta	ndard
∢ ∪		20 = IP20						Hx = specia	l hardware

Table 2: Available options for each field of the nomenclature according to the rated current and voltage of the inverter

Frame Size	Output Rated Current	N° of Phases	Rated Voltage	Brake
	01P6 = 1.6 A			
	02P6 = 2.6 A		1 = 110127 Vac	
	04P2 = 4.2 A		1 = 110127 Vac	
	06P0 = 6.0 A			
	01P6 = 1.6 A	S = single-phase power supply		
	02P6 = 2.6 A			
	04P2 = 4.2 A			
	06P0 = 6.0 A			
	07P3 = 7.3 A		2 = 200240 Vac	
A	01P6 = 1.6 A		2 - 200240 vac	NB
	02P6 = 2.6 A			
	04P2 = 4.2 A	T = three-phase power supply		
	06P0 = 6.0 A			
	07P3 = 7.3 A			
	01P6 = 1.6 A			
	02P6 = 2.6 A			
	04P2 = 4.2 A	D = DC power supply	3 = 280340 Vdc	
	06P0 = 6.0 A			
	07P3 = 7.3 A			
В	10P0 = 10.0 A	B = single-phase or three-phase power supply or DC		DB
٥	15P2 = 15.2A	T = three-phase power supply or DC	or 280340 Vdc	

### **6 RECEIVING AND STORAGE**

The CFW300 is supplied packed in a cardboard box. There is an identification label affixed to the outside of the package, identical to the one affixed to the side of the inverter.

- The CFW300 identification label corresponds to the purchased model.
- Any damage occurred during transportation.

Report any damage immediately to the carrier

If the CFW300 is not installed soon, store it in a clean and dry location (temperature between -25 °C and 60 °C (-13 °F and 140 °F)), with a cover to prevent dust accumulation inside it.

### 7 IDENTIFICATION LABEL

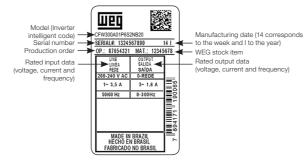
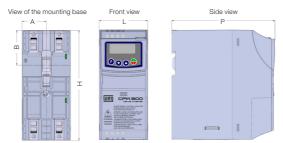


Figure 1: Description of the CFW300 identification label

# 8 DIMENSIONS



Frame	Α	В	Н	L	Р	Weight	Mounting	Recommended Torque
Size	mm (in)	mm (in)	mm (in)	mm (in)	mm (in)	kg (lb)	Bolt	N.m (Ibf.in)
Α	35.0 (1.37)	50.1 (1.97)	157.9 (6.22)	70.0 (2.76)	148.4 (5,84)	0.900 (1.98)	M4	2 (17.7)
В	35.0 (1.37)	50.1 (1.97)	198.9 (8.08)	70.0 (2.76)	158.4 (6.24)	1.340 (2.98)	M4	2 (17.7)

Dimension tolerance: ±1,0 mm (±0,039 in)

Figure 2: Inverter dimensions for mechanical installation

# 9 INSTALLATION AND CONNECTION

# **Environmental Conditions**

Direct exposure to sunlight, rain, high humidity or sea-air.

- Inflammable or corrosive gases or liquids.
- Excessive vibration.
- Dust, metallic particles or oil mist.

# Environment conditions permitted for the operation of the inverter

- Temperature surrounding the inverter: 0 °C to 50 °C (32 °F to 122 °F) IP20.
   For temperatures surrounding the inverter higher than the specifications above, it is necessary to apply
- of 2 % of current derating for each degree Celsius, limited to an increase of 10 °C (50 °F).  $\blacksquare$  Air relative humidity: 5 % to 95 % non-condensing.
- Maximum altitude: up to 1000 m (3.300 ft) rated conditions
- From 1000 m to 4000 m (3.300 ft to 13.200 ft) 1 % of current derating for each 100 m above 1000 m

■ Pollution degree: 2 (according to EN50178 and UL508C), with non-conductive pollution. Condensation nust not originate conduction through the accumulated residues.

### 10 ELECTRICAL INSTALLATION

- The following information is merely a guide for proper installation. Comply with applicable local regulations for electrical installations.
- Make sure the AC power supply is disconnected before starting the installation.
   The CFW300 must not be used as an emergency stop device. Provide other devices



Figure 3: Power terminals, grounding points and reco.

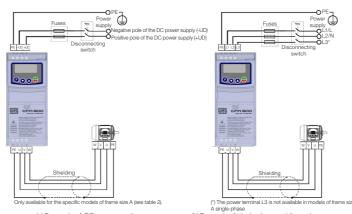
### 10.1 POWER CONNECTIONS

L/L1, N/L2, L3 (R,S,T): power supply connection.

U, V and W: connection for the motor.-UD: negative pole of the DC power supply.

+UD: positive pole of the DC power supply.

+BR, BR: connection of the braking resistor (available for frame size B models).



(a) Frame size A DC power supply (b) Frame size A single-phase and three-phase power suppl

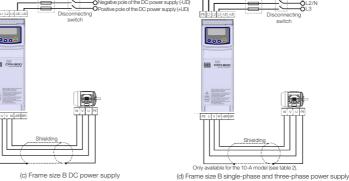


Figure 4: (a) to (d) Power and grounding connections

# 10.2 INSTALLATIONS ACCORDING TO EUROPEAN DIRECTIVE OF ELECTROMAGNETIC

The CFW300 inverter series, when properly installed, meet the requirements of the directive of the electromagnetic compatibility.

These inverters were developed for professional applications only. Therefore, the emission limits of harmonic currents by the standards EN 61000-3-2 and EN 61000-3-2/A 14.

# 10.2.1 Conformal Installation

- Shielded output cables (motor cables) with shield connected at both ends, motor and inverter, by meanse of a low impedance to high frequency connection. Maximum motor cable length and conduced and radiated emission levels according to Table 6.
- 2. Shielded control cables, keeping the separation distance from other cables according to Table 3.2 the user's manual.
- 3. Grounding of the inverter according to instruction of the 3.2.4 Grounding Connections the user's manual.
- Grounded power supply.
- 5. Use short wiring to ground the external filter or inverter.
- 6. Ground the mounting plate using a flexible braid as short as possible. Flat conductors have lower impedance at high frequencies.
- Use sleeves for cable conduits whenever possible

The CFW300 is suitable for application in a circuit able to supply not more than 30.000 symetric Arms maximum of 127 / 240 V, when protected by fuses classified as indicated below

Table 3: List of models of CFW300 series, main electrical specifications

king	Power Wire Size for DC+ and BR Terminals	mm² (AWG)										gui	0									2.5	2.5
Bra	Braking rms Current	[A]										brak ilah										9	9
nic	Recommended	[Ω]										mamic brakii not available	5									39	39
Dynamic Braking	Resistor  Maximum Current	(Imax)										Dynamic braking	2									=	=
	Grounding Wire Size	mm² (AWG)	2.5 (14)	2.5 (14)	4.0 (12)	4.0 (12)	2.5 (14)	2.5 (14)	2.5 (14)	4.0 (12)	4.0 (12)	2.5 (14)	2.5 (14)	2.5 (14)	4.0 (12)	4.0 (12)	2.5 (14)	2.5 (14)	2.5 (14)	4.0 (12)	4.0 (12)	4.0 (12)	4.0 (12)
	Power Wire Size	mm² (AWG)	1.5 (16)	2.5 (14)	2.5 (14)	4.0 (12)	1.5 (16)	1.5 (16)	1.5 (16)	2.5 (14)	2.5 (14)	1.5 (16)	1.5 (16)	1.5 (16)	2.5 (14)	2.5 (14)	1.5 (16)	1.5 (16)	1.5 (16)	2.5 (14)	2.5 (14)	2.5 (14)	4.0 (12)
Recommended Fuse	Recommended Fuse	e WEG	FNH00-20K-A	FNH00-20K-A	FNH00-35K-A	FNH00-40K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-25K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-20K-A	FNH00-35K-A	FNH00-35K-A
com	Current	[A]	8	8	88	8	8	8	8	8	25	8	8	8	8	8	8	8	8	8	8	35	33
Re	I²t [A²s]		166	166	999	999	166	166	166	099	099	500	500	500	500	500						300	685
	Circuit Breaker	WEG	MPW40-3-U010	MPW40-3-U016	MPW40-3-U020	MPW40-3-U032	MPW40-3-D063	MPW40-3-U010	MPW40-3-U016	MPW40-3-U016	MPW40-3-U020	MPW40-3-D025	MPW40-3-D063	MPW40-3-U010	MPW40-3-U010	MPW40-3-U016	MPW40-3-D025	MPW40-3-D063	MPW40-3-U010	MPW40-3-U010	MPW40-3-U016	MPW40-3-U025	MPW40-3-U025
		[A]	10.0	16.0	20.0	32.0	6.3	10.0	16.0	16.0	20.0	2.5	6.3	10.0	10.0	16.0	2.5	6.3	10.0	10.0	16.0	25.0	25.0
	Maximum Motor	[HP/kW]	0.25/0.18	0.5/0.37	1/0.75	1.5/1.32	0.25/0.18	0.5/0.37	1/0.75	1.5/1.32	2/1.5	0.25/0.18	0.5/0.37	1/0.75	1.5/1.32	2/1.5	0.25/0.18	0.5/0.37	1/0.75	1.5/1.32	2/1.5	3/2.2	5/3.7
	Overload Currents	1 min [Arms]	2.4	3.9	6.3	9.0	2.4	3.9	6.3	9.0	11.0	2.4	3.9	6.3	9.0	11.0	2.4	3.9	6.3	9.0	11.0	15.0	22.8
c	Output Rated Current	[Arms]	1.6	2.6	4.2	6.0	1.6	2.6	4.2	0.9	7.3	1.6	2.6	4.2	0.9	7.3	1.6	2.6	4.2	6.0	7.3	10.0	15.2
	Frame Size		⋖	⋖	⋖	⋖	⋖	⋖	⋖	⋖	⋖	⋖	⋖	⋖	⋖	∢	⋖	⋖	⋖	⋖	∢	ш	ш
	Power Supply Rated Vo	Itage	110127 Vac	110127 Vac	110127 Vac	110127 Vac	200240 Vac	200240 Vac	200240 Vac	200240 Vac	200240 Vac	280340 Vdc	200240 Vac ou 280340 Vdc	200240 Vca ou 280340 Vcc									
	Number of Input Phas	ses	-	-	-	-	-	-	-	-	-	m	m	e	ю	m	-	-	-	-	-	1/3	m
	Inverter		CFW300A01P6S1NB20	CFW300A02P6S1NB20	CFW300A04P2S1NB20	CFW300A06P0S1NB20	CFW300A01P6S2NB20	CFW300A02P6S2NB20	CFW300A04P2S2NB20	CFW300A06P0S2NB20	CFW300A07P3S2NB20	CFW300A01P6T2NB20	CFW300A02P6T2NB20	CFW300A04P2T2NB20	CFW300A06P0T2NB20	CFW300A07P3T2NB20	CFW300A01P6D3NB20	CFW300A02P6D3NB20	CFW300A04P2D3NB20	CFW300A06P0D3NB20	CFW300A07P3D3NB20	CFW300B10P0B2DB20	CFW300B15P2T2DB20



The inverter must be connected to a protective ground (PE).

Use a minimum wire gauge for ground connection equal to the indicated in Table 3. Connect the inverter grounding connections to a ground bus bar, to a single ground point or to a common grounding point (impedance  $\leq 10 \Omega$ ).

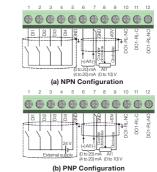
The neuter conductor of the line that feeds the inverter must be solidly grounded; however this conductor must not be used to ground the inverter.

Do not share the grounding wiring with other equipment that operate with high currents (e.g.: high voltage motors, welding machines, etc.).



The wire gauges listed in Table 3 are guiding values. Installation conditions and the maximum permitted voltage drop must be considered for the proper wiring sizing.

# 10.3 CONTROL CONNECTIONS



Digital input 1
Digital input 2 Analog input 1 (Current) 
 7
 GND
 Reference 0 V

 8
 Al1
 Analog input 1 (Tension)
 10 DO1-RL-NC Digital output 1 (NC contact of relay 1)
11 DO1-RL-C Digital output 1 (Common point of relay 12 DO1-RL-NO Digital output 1 (NO contact of relay 1) (\*) For further information, refer to the detailed specification in table 7 The CPW300 inverters are supplied with the digital inputs configured as active low (NPN). In order to change the configuration, check the use of parameter P271 in the programming manual of the CPW300.

 Analog input A11 is set for input to to 10 V; in order to change it, check parameter P233 of the programming manual of the CPW300.

Figure 5: (a) and (b) Signals of C300 control card connector

# For the correct connection of the control, use:

- Gauge of the cables: 0.5 mm² (20 AWG) to 1.5 mm² (14 AWG). Maximum torque: 0.5 N.m (4.50 lbf.in).
- . Wiring of the connector of the control board with shielded cable and separated from the other wiring (power, command in 110 V / 220 Vac, etc.).

## 10.3.1 Emission and Immunity Levels

Table 4: Emission and immunity levels

LINIO FITERIORIERIORI	Dasic Standard	Level
Emission:		
Mains terminal disturbance voltage Frequency range: 150 kHz to 30 MHz)	JEO/EN 04000 0	It depends on the inverter model on the length of the
Electromagnetic radiation disturbance Frequency Range: 30 MHz to 1000 MHz)	IEC/EN 61800-3	cabo motor cable. Refer to Table 6
Immunity:		
Electrostatic discharge (ESD)	IEC 61000-4-2	4 kV for contact discharge and 8 kV for air discharge
Fast transient-Burst	IEC 61000-4-4	2 kV / 5 kHz (coupling capacitor) input cables 1 kV / 5 kHz control cables and remote HMI cables 2 kV / 5 kHz (coupling capacitor) motor cables
Conducted Radio-Frequency Common Mode	IEC 61000-4-6	0.15 to 80 MHz; 10 V; 80 % AM (1 kHz) Motor, control and remote HMI cables
Surges	IEC 61000-4-5	1.2/50 µs, 8/20 µs 1 kV line-to-line coupling 2 kV line-to-ground coupling
Radio-Frequency Electromagnetic Field	IEC 61000-4-3	80 to 1000 MHz 10 V/m 80 % AM (1 kHz)

### Definition of Standard IEC/EM 61800-3: "Adjustable Speed Electrical Power Drives Systems" ■ Environments::

First Environment: environments that include domestic installations, as well as establishments directly connected without intermediate transformer to a low-voltage power supply network which supplies buildings used for domestic purposes.

Second Environment: aincludes all establishments other than those directly connected to a low-voltage power supply network that supplies buildings used for domestic purposes. ■ Categories:

Category C1: inverters with a voltage rating less than 1000 V and intended for use in the First Environment. Category C2: inverters with a voltage rating less than 1000 V intended for use in the First Environment, not provided with a plug connector or movable installations. They must be installed and commissioned by

Category C3: inverters with a voltage rating less than 1000 V and intended for use in the Second Environment only (not designed for use in the First Environment).



A professional is a person or organization familiar with the installation and/or commissioning of inverters, including their EMC aspects.

### 10.3.2 Characteristics of the RFI Filter

CFW300 inverters are installed with external filter when it is intended to reduce the disturbance conducted from the inverter to the power line in the high frequency band (> 150). It is observe the maximum levels of conducted emission of electromagnetic compatibility standards, such as EN 61800-3 and EN 55011. For further information about the RFI filter model, refer to Table 5.

The figure below demonstrate the connection of the filter to the inverter

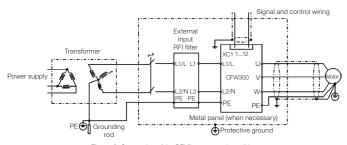


Figure 6: Connection of the RFI filter - general conditions

Table 5: External RFI filter models for CFW300

WEG Item	Name	Description
13015615	CFW300-KFA	RFI filter kit CFW300 frame size A
13015616	CFW300-KFB	RFI filter kit CFW300 frame size B

Table 6: Conducted and radiated emission levels, and additional information

Inverter Model		Conducted Emission - M	Conducted Emission - Maximum Motor Cable Length						
	inverter woder	Category C3	Category C2	Category					
1	CFW300AXXPXS1XX20 (1)	27 m (1063 in)	3 m (118 in)	C3					
2	CFW300AXXPXS2XX20 (1)	27 m (1063 in)	20 m (787 in)	C3					
3	CFW300B10P0B2DB20	27 m (1063 in)	27 m (1063 in)	C3					

- The switching frequency is 5 kHz.

(1) Where there is an "X", it is assumed as any corresponding value of Table 2.

# 10.4 ACCESSORIES

The accessories are hardware resources that can be added in the application with the CFW300. The accessories are incorporated to the inverters in an easy and quick way by using the concept "Plug and Play". The accessory must be installed or modified with the inverter de-energized. They may be order separately, and are sent in their own package containing the components and manuals with detailed instructions for their installation, operation and setting.

# 11 USE OF THE KEYPAD TO OPERATE THE INVERTER



## 11.1 INDICATIONS OF DISPLAY



## 11.2 OPERATING MODES OF THE HMI

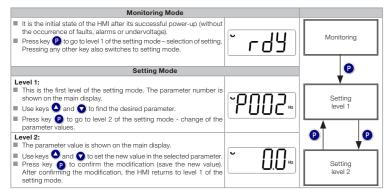


Figure 7: HMI operating modes

### 12 START-UP PREPARATION



### DANGER!

Always disconnect the main power supply before making any connection.

- 1. Check if the power, grounding and control connections are correct and firm
- 2. Remove all the materials left behind from the installation work from inside the inverter or the cabinet. 3. Verify the motor connections and if its voltage and current are within the inverter rated value.
- 4. Mechanically uncouple the motor from the load. If the motor cannot be uncoupled, make sure that any speed direction (forward or reverse) will not result in personnel injury and/or equipment damage.
- Close the inverter or cabinet covers.
- Measure the power supply and verify if it is within the allowed range.
   Apply power to the input: close the input disconnecting switch.
- 8. Check the result of the first time power-up: The HMI display indicates

### 12.1 BASIC APPLICATION

Seq	Display Indication/Action	Seq	Display Indication/Action
1	■ Initialization mode. ■ Press key ② to enter the first level of the parameterization mode. ■ Press keys ③ or ⑥ to select the parameter P100.	2	Press key (2) if you need to change the content of P100 – "Acceleration Time" or press key (1) for the next parameter.
3	FIDI.  ■ If necessary, change the content of *P101 - Deceleration Time*.  ■ Use key to select the parameter P133.	4	■ If necessary, change the content of "P133 - Minimum Speed". ■ Press key  of for the next parameter.
5	Fress key of or the next parameter.  Fress key of or the next parameter.	6	■ If necessary, change the content of *P135 - Output Maximum Current*. ■ Press key  to select parameter P002.
7	■ Press key  to view the parameter content.	8	Press key that the motor will accelerate up to 3.0 Hz (factory default setting of P133 - Minimum Frequency).  Press and hold it until it reaches 60.0 Hz.
9	Press key . The motor will decelerate to a stop.	10	■ When the motor stops, the display will indicate "ready".

## 12.2 TYPE OF CONTROL V/f (P202 = 0)

Seq	Display Indication/Action	Seq	Display Indication/Action
1	■ Initialization mode. ■ Press key ② to enter the first level of the parameterization mode.	2	■ Press keys  or  to select parameter P202.
3	Press key  if you need to change the content of "P202 – Type of Control" for P202 = 0 (V/f).  Press key  to select parameter P401.	4	If necessary, change the content of parameter "P401 – Motor Rated Current" according to the nameplate.  Press key of the next parameter.
5	Se necessário altere o conteúdo de "P402 - Rotação Nominal Motor".  Press key of for the next parameter.	6	If necessary, change the content of "P403 - Motor Rated Frequency".

### 13 TECHNICAL SPECIFICATIONS

### POWER DATA

Power Supply:

- Tolerance: -15 % to +10 %.
- Frequência: 50/60 Hz (48 Hz a 62 Hz).
- Phase imbalance: ≤ 3 % of the rated phase-to-phase input voltage.
   Overvoltage according to Category III (EM 61010/UL 508C).
- Transient voltages according to Category III.
- Maximum of 10 connections per hour (1 every 6 minutes).
- Typical efficiency: ≥ 97 %.
- Classification of chemically active substances: level 3C2.
   Mechanical condition rating (vibration): level 3M4.
- Audible noise level: < 60dB.

## 14 ELECTRONICS/GENERAL DATA

Table 7: Electronics/general data					
Control	Method	Types of control: - Vif (Scalar) - VVW: voltage vector control.  PWM SVM (Space Vector Modulation)			
	Output frequency	■ 0 to 400 Hz, resolution of 0.1 Hz			
Performance	V/F control	Speed regulation: 1 % of the rated speed (with slip compensation)  Speed variation range: 1:20			
	Vector control (VVW)	Regulação de velocidade: 1 % da velocidade nominal Faixa de variação de velocidade: 1:30			
Inputs	Analog	1 insulated input. Levels: (0 to 10) V or (0 a 20) mA or (4 to 20) mA     Innearity error ≤ 0.25 %     Impedance: 100 kQ for voltage input, 500 Ω for current input     Programmable functions     Maximum voltage permitted in the input: 30 Vdc			

Inputs	Digital	Isolated inputs     Programmable functions:     -active high (PNP): maximum low level of 10 Vdc / minimum high level of 20 Vdc     -active low (NPN): maximum low level of 5 Vdc / minimum high level of 10 Vdc     Maximum input voltage of 30 Vdc     Input current: 11 mA
Outputs	Relay	Maximum input current: 20 mA I relay with NO/NC contact Maximum voltage: 250 Vac Maximum current: 0.5 A Programmable functions
	Power supply	■ 10 Vdc power supply. Maximum capacity: 50 mA
Safety	Protection	Overcurrent/phase-phase short circuit in the output     Inder/overvoltage     Motor overload     Overtemperature in the power module (IGBTs)     Fault / external alarm     Programming error
Integral keypad (HMI))	Standard keypad	4 keys: Start/Stop, Up arrow, Down arrow and Programming  LCD Display  Wiew/edition of all parameters  Indication accuracy:  - current: 5 % of the rated current - speed resolution: 0.1 Hz
Enclosure	IP20	Frames sizes A and B

### 15 CONSIDERED STANDARDS

### Table 8: Considered 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 machiners. Part 1: general requirements Note: the final assembler of the machine is responsible for installing a safety stop device and a supply disconnecting device ■ 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
Mechanical standards	EN 60529 - degrees of protection provided by enclosures (IP code)     UL 50 - enclosures for electrical equipment     IEC 60721-3-3 - classification of environmental conditions
Electromagnetic compatibility (EMC) standards n	■ 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 (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 field 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 5: surge immunity test.

(\*) Compliance with standards upon installation of RFI filter. For further details refer to consulte www.weg.net.

### 16 MAIN PAREMETERS

The table below contains the mains parameters of the CFW300.



V/f = parameter available in V/f mode.

cfg = configuration parameter, value can only be changed with the motor stopped.

Param.	Description	Adju	stable Range	Factory Setting	Prop.
P000	Access to Parameters	0 to 9999		1	
P001	Speed Reference	0 to 9999			ro
P002	Output Speed (Motor)	0 to 9999			ro
P003	Motor Current	0.0 to 40.0 A			ro
P004	DC Link Voltage (Ud)	0 to 524 V			ro
P005	Output Frequency (Motor)	0.0 to 400.0 Hz			ro
P006	Inverter Status	0 = Ready 1 = Run	3 = Fault 4 = Self-Tuning		ro
		2 = Undervoltage	5 = Configuration		
P007	Output Voltage	0 to 240 V			ro
P011	Active Current	-40.0 to 40.0 A			ro
P012	DI8 to DI1 Status	0 to FF (hexa) Bit 0 = DI1 Bit 1 = DI2 Bit 2 = DI3 Bit 3 = DI4	Bit 4 = DI5 Bit 5 = DI6 Bit 6 = DI7 Bit 7 = DI8		ro
P022	FI Value in Hz	1 to 3000 Hz			ro
P023	Main SW Version	0.00 to 99.99			ro
P030	Module Temperature	0.0 to 200.0 °C			ro
P037	Motor Overload lxt	0.0 to 100.0 %			ro
P037	CONFIG Status	0.0 to 999			ro
P047	Present Alarm	0 to 999		-	
P048 P049	Present Alarm Present Fault	0 to 999		-	ro
P049 P050	Last Fault				ro
		0 to 999			ro
P100	Acceleration Time	0.1 to 999.9 s		5.0 s	
P101	Deceleration Time	0.1 to 999.9 s		10.0 s	
P120	Speed Ref. Backup	0 = Inactive 1 = Active 2 = Backup by P121		1	
P121	Reference via HMI	0.0 to 400.0 Hz		3.0 Hz	
P124	Multispeed Ref. 1	-400.0 to 400.0 Hz		3.0 Hz	
P125	Multispeed Ref. 2	-400.0 to 400.0 Hz		10.0 (5.0) Hz	
P126	Multispeed Ref. 3	-400.0 to 400.0 Hz		20.0 (10.0) Hz	
P127	Multispeed Ref. 4	-400.0 to 400.0 Hz		30.0 (20.0) Hz	
P128	Multispeed Ref. 5	-400.0 to 400.0 Hz		40.0 (30.0) Hz	
P129	Multispeed Ref. 6	-400.0 to 400.0 Hz		50.0 (40.0) Hz	
P130	Multispeed Ref. 7	-400.0 to 400.0 Hz		60.0 (50.0) Hz	
P131	Multispeed Ref. 8	-400.0 to 400.0 Hz		66.0 (55.0) Hz	
P133	Minimum Frequency	0.0 to 400.0 Hz		3.0 Hz	
P134	Maximum Frequency	0.0 to 400.0 Hz		66.0 (55.0) Hz	
P135	Maximum Output Current	0.0 to 40.0 A		1.5 x I <sub>nom</sub>	
P136	Manual Torque Boost	0.0 to 30.0 %		0.0 %	V/f
P137	Automatic Torque Boost	0.0 to 30.0 %		0.0 %	V/f
P138	Slip Compensation	-10.0 to 10.0 %		0.0 %	V/f
P139	Output Current Filter	0.000 to 9.999 s		0.005 s	V/1
P142	Maximum Output Voltage	0.0 to 100.0 %		100.0 %	cfg, V/f
P143	Intermediate Output Voltage	0.0 to 100.0 %		50.0 %	cfg, V/f
P145	Field Weakening Start	0.0 to 100.0 %		60.0 (50.0) Hz	cfg, V/f
	Frequency			` ′	Ŭ.
P146	Intermediate Frequency	0.0 to 400.0 Hz		30.0 (25.0) Hz	cfg, V/f
P156	Overload Current	0.1 to 2.0 x I <sub>nom</sub>		1.2 x I <sub>nom</sub>	
P202	Type of Control	0 = V/f 1 = V/f Quadratic	2 to 4 = Not Used 5 = VVW	0	cfg
P204	Load/Save Parameters	0 to 4 = Not Used 5 = Load 60 Hz 6 = Load 50 Hz 7 = Load User 1 8 = Not Used	9 = Save User 1 10 = Not Used 11 = Load Default SoftPLC 12 to 13 = Reserved	0	cfg

P220	LOC/REM Selection Source	0 = Always Local 1 = Always Remote 2 to 3 = Not Used 4 = Dlx 5 = Serial/USB (LOC)	6 = Serial/USB (REM) 7 to 8 = Not Used 9 = CO/DN/DP (LOC) 10 = CO/DN/DP (REM) 11 = SoftPLC	0	cfg
P221	LOC Reference Sel	0 = HMI Keys 1 = Al1 2 = Al2 3 = Not Used 4 = FI 5 = Al1 + Al2 > 0 6 = Al1 + Al2 7 = E.P. 8 = Multispeed	9 = Serial/USB 10 = Not Used 11 = CO/DN/DP 12 = SoftPLC 13 = Not Used 14 = Al1 > 0 15 = Al2 > 0 16 = Not Used 17 = Fl > 0	0	cfg
P222	REM Reference Sel.	See Options in P221		3	cfg
P223	LOC Rotation Sel.	0 = Forward 1 = Reverse 2 to 3 = Not Used 4 = DIx 5 = Serial/USB (FWD) 6 = Serial/USB (REV)	7 to 8 = Not Used 9 = CO/DN/DP (FWD) 10 = CO/DN/DP (REV) 11 = Not Used 12 = SoftPLC	0	cfg
P263	DI1 Input Function	0 = Not Used 1 = Run/Stop 2 = General Enable 3 = Not Used 4 = Forward 5 = Reverse 6 = Start 7 = Stop 8 = Direction of Rotation 9 = LOC/REM 10 = JOG 11 = Increase E.P. 12 = Decelerate E.P. 13 = Multispeed 14 = 2 <sup>m</sup> Ramp 15 to 17 = Not Used 18 = No Ext. Alarm 19 = No Ext. Fault 20 = Reset	25 = Regul. DC Link 26 = Lock Prog. 27 to 31 = Not Used 32 = 2 <sup>nd</sup> Ramp Multispeed 33 = 2 <sup>nd</sup> Ramp E.P. Ac. 34 = 2 <sup>nd</sup> Ramp E.P. De. 35 = 2 <sup>nd</sup> Ramp E.P. De. 35 = 2 <sup>nd</sup> Ramp E.P. De. 36 = 2 <sup>nd</sup> Ramp E.P. De. 37 = Turn ON / Ac. E.P. 38 = De. E.P. / Turn OFF 39 = Stop 40 = Safety Switch 41 = Function 1 Application 42 = Function 2 Application 43 = Function 3 Application 45 = Function 4 Application 46 = Function 6 Application 47 = Function 7 Application 48 = Function 8 Application 48 = Function 8 Application	1	cfg
P264	DI2 Input Function	See Options in P263		8	cfg
P265	DI3 Input Function	See Options in P263		0	cfg
P266	DI4 Input Function	See Options in P263		0	cfg
P267	DI5 Input Function	See Options in P263	·	0	cfg
P268	DI6 Input Function	See Options in P263		0	cfg
P269	DI7 Input Function	See Options in P263		0	cfg
P270	DI8 Input Function	See Options in P263		0	cfg
P295	Inv. Rated Current	1.6 to 15.2 A		According inverter model	ro
P296	Line Rated Voltage	0 = Reserved 1 = 110 / 127 Vac	2 = 200 / 240 Vac or 310 Vdc	According inverter model	ro
P297	Switching Frequency	2.5 to 15.0 kHz		5.0 kHz	cfg
P401	Motor Rated Current	0.0 to 40.0 A		1.0 x I <sub>nom</sub>	cfg

# 17 FAULTS AND ALARMS

Most common faults and alarms

Fault / Alarm	Description		Possible Causes
A046	Motor overload alarm		Settings of P156 is too low for the used motor
Motor Overload			Overload on the motor shaft
A050	Overtemperature alarm from the power	-	High temperature at IGBTs: P030 > 90 °C (> 194 °F) (Frame size A)
Power Module Overtemperature	module temperature sensor (NTC)	-	and P030 $>$ 116 °C ( $>$ 240.8 °F) (Frame size B) High ambient temperature around the inverter ( $>$ 50 °C ( $>$ 122 °F)
Overtemperature		Г.	and high output current
			Blocked or defective fan
		=	Heatsink is too dirty, preventing the air flow
A090	External alarm via Dlx (option "no		Wiring on DI1 to DI8 inputs are open or have poor contact
External Alarm	external alarm" in P263 to P270)		
A700	No communication with remote HMI,	-	Check if the communication interface with the HMI is properly
Remote HMI Communication	but here is frequency command or reference for this source		configured in parameter P312 HMI cable disconnected
F021	Undervoltage fault on the intermediate	_	Wrong voltage supply; check if the data on the inverter label comply
Undervoltage on the	circuit	Ι-	with the power supply and parameter P296
DC Link		=	Supply voltage too low, producing voltage on the DC link below
			the minimum value (in P004):
			Ud < 250 Vdc in 110 / 127 Vac (P296 = 1) or Ud < 200 Vdc in
		_	200 / 240 Vac (P296 = 2) Phase fault in the input
			Fault in the pre-charge circuit
F022	Overvoltage fault on the intermediate		Wrong voltage supply; check if the data on the inverter label comply
Overvoltage on the DC	circuit	Ι-	with the power supply and parameter P296
Link			Supply voltage is too high, producing voltage on the DC link above
			the maximum value (in P004):
			Ud > 460 Vdc in 110 / 127 Vac (P296 = 1) or Ud > 410 Vdc in
			200 / 240 Vac (P296 = 2). Load inertia is too high or deceleration ramp is too fast
			P151 setting is too high
F031	Main control cannot establish the		Accessory damaged
Fault in Communication	communication link with the IOs		Poor connection of the accessory
with IOs Expansion	expansion accessory		Problem in the identification of the accessory; refer to P027
Accessory			
F032	Main control cannot establish		Accessory damaged
Fault in Communication	the communication link with the		Poor connection of the accessory
with IOs Communication Accessory	communication accessory	г.	Problem in the identification of the accessory; refer to P028
F051	Overtemperature fault measured		High temperature at IGBTs: P030 > 100 °C (> 212 °F) (Frame size A)
IGBTs	on the temperature sensor of the	-	e P030 > 126 °C (> 258.8 °F) (Frame size B)
Overtemperatures	power pack	=	High ambient temperature around the inverter (>50 °C (>122 °F))
			and high output current
			Blocked or defective fan
		-	Heatsink is too dirty, preventing the air flow
F070	Overcurrent or short-circuit on the	Е.	Short-circuit between two motor phases
Overcurrent/ Shortcircuit	output, DC link or braking resistor		IGBTs module in short-circuit or damaged Start with too short acceleration ramp
SHORICICUIL			Start with notor spinning without the Flying Start function
F072	Motor overload fault (60 s in 1.5 x Inom)		P156 setting is too low in relation to the motor operating current
Make of Consideration	` ` '		Overload on the motor shaft
Motor Overload			Electric noise
	Fault related to the supervision		
F080 CPU Fault (Watchdog)	algorithm of the inverter main CPU	=	Inverter firmware fault
F080 CPU Fault (Watchdog) F081	algorithm of the inverter main CPU Fault of end of memory to save user's	=	Inverter firmware fault Attempt to save (P204 = 9) more than 32 parameters (with values
F080 CPU Fault (Watchdog) F081 End of User's Memory	algorithm of the inverter main CPU Fault of end of memory to save user's parameter table	-	Inverter firmware fault Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table
F080 CPU Fault (Watchdog) F081 End of User's Memory F082	algorithm of the inverter main CPU Fault of end of memory to save user's	-	Inverter firmware fault Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table Attempt to copy the parameters from the flash memory module to
F080 CPU Fault (Watchdog) F081 End of User's Memory F082 Fault in the Copy	algorithm of the inverter main CPU Fault of end of memory to save user's parameter table	-	Inverter firmware fault Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table
F080 CPU Fault (Watchdog) F081 End of User's Memory F082 Fault in the Copy Function (MMF)	algorithm of the inverter main CPU Fault of end of memory to save user's parameter table Fault in the copy of parameters	•	Inverter firmware fault Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table Attempt to copy the parameters from the flash memory module to the inverter with different software versions
F080 CPU Fault (Watchdog) F081 End of User's Memory F082 Fault in the Copy Function (MMF) F084	algorithm of the inverter main CPU Fault of end of memory to save user's parameter table Fault in the copy of parameters  Fault related to the automatic	•	Inverter firmware fault Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table Attempt to copy the parameters from the flash memory module to the inverter with different software versions
F080 CPU Fault (Watchdog) F081 End of User's Memory F082 Fault in the Copy Function (MMF) F084	algorithm of the inverter main CPU Fault of end of memory to save user's parameter table Fault in the copy of parameters	-	Inverter firmware fault Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table Attempt to copy the parameters from the flash memory module to the inverter with different software versions  Poor contact in the connection between the main control anthe
F080 CPU Fault (Watchdog) F081 End of User's Memory F082 Fault in the Copy Function (MMF) F084 Auto-diagnosis Fault	algorithm of the inverter main CPU Fault of end of memory to save user's parameter table Fault in the copy of parameters  Fault related to the automatic identification algorithm of the inverter hardware	-	Inverter firmware fault  Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table  Attempt to copy the parameters from the flash memory module to the inverter with different software versions  Poor contact in the connection between the main control anthe power pack  Hardware not compatible with the firmware version  Defect on the internal circuits of the inverter
F080 CPU Fault (Watchdog) F081 End of User's Memory F082 Fault in the Copy Function (MMF) F084 Auto-diagnosis Fault	algorithm of the inverter main CPU Fault of end of memory to save user's parameter table Fault in the copy of parameters  Fault related to the automatic identification algorithm of the inverter hardware  External fault via Dix ("no external	-	Inverter firmware fault Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table Attempt to copy the parameters from the flash memory module to the inverter with different software versions  Poor contact in the connection between the main control anthe power pack Hardware not compatible with the firmware version
FO80 CPU Fault (Watchdog) F081 End of User's Memory F082 Fault in the Copy Function (MMF) F084 Auto-diagnosis Fault External Fault	algorithm of the inverter main CPU Fault of end of memory to save user's parameter table Fault in the copy of parameters  Fault related to the automatic identification algorithm of the inverter hardware  External fault via Dlx ("no external fault" in P263 to P270)		Inverter firmware fault  Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table.  Attempt to copy the parameters from the flash memory module to the inverter with different software versions.  Poor contact in the connection between the main control anthe power pack.  Hardware not compatible with the firmware version.  Defect on the internal circuits of the inverter.  Wiring on DI1 to DI8 inputs are open or have poor contact.
F080 CPU Fault (Watchdog) F081 End of User's Memory F082 Fault in the Copy Function (MMF) F084 Auto-diagnosis Fault	algorithm of the inverter main CPU Fault of end of memory to save user's parameter table Fault in the copy of parameters  Fault related to the automatic identification algorithm of the inverter hardware  External fault via Dix ("no external		Inverter firmware fault  Attempt to save (P204 = 9) more than 32 parameters (with values different from the factory default) on the User parameter table  Attempt to copy the parameters from the flash memory module to the inverter with different software versions  Poor contact in the connection between the main control anthe power pack  Hardware not compatible with the firmware version  Defect on the internal circuits of the inverter



For further information, refer www.weg.net.