CFW500 Machinery Drives

Variable Speed Drives

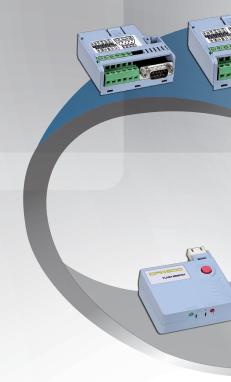




CFN500

One VSD, endless possibilities

Developed for fast commissioning, the CFW500 VSD is perfect for machines. Extremely compact and cost-effective, it fulfills the needs of machine manufacturers, integrated systems, panel installers and users for a wide range of applications.



Compatible

Wide range of accessories

Flexible

Application functions

Robust

150% overload for one minute

Efficient

Streamlines operation and performance

Reliable

WEG quality

Integrable

Fieldbus networks

Characteristics

Plug-in module

Flash memory module

SoftPLC

High overload capacity

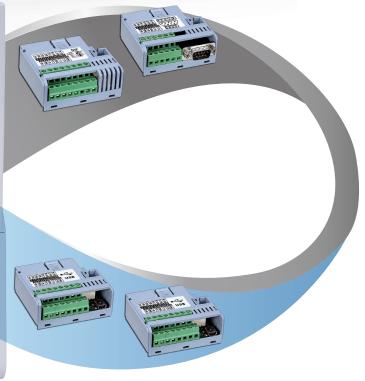
Functions to streamline operation and performance

WEG quality

Communication networks







Advantages

The optional communication network and I/O modules are fast and easily installed, allowing adapting the standard VSD to each application.

In few seconds, it is possible to download the programming from a CFW500 to others without powering them up.

Built-in PLC, enabling the VSD, motor and application to work in an interactive way. It allows the user to implement customized logics and applications.

It withstands an overload of 150% for one minute every 6 minutes, on ambient temperature of 50 °C.

PID: process control. Sleep: disables the VSD automatically.

Flying start: allows driving the motor that is in free spinning, accelerating it from the speed at which it was running.

> Ride through: keeps the VSD in operation during voltage dips.

100% of the VSDs are tested with load at the factory under rated conditions.

Protection against ground fault, short circuit, over temperature and others.

Thermal protection of IGBTs based on manufacturer curve.

All the electronic boards are conformally coated.

CANopen, DeviceNet, Profibus-DP and Modbus.

Benefits

Time saving, standardization and optimized costs according to the needs.

Fast, easy and reliable programming for manufacturers that produce machines in large quantities.

It eliminates the need of an external PLC, reducing costs, optimizing space and simplifying the system.

It does not require oversizing the VSD.

Energy saving.

It enables fast operating response of the machine and prevents occasional mechanical breakdowns.

It prevents machine stoppage and downtime.

High reliability.

It prevents damages to the inverter which can be caused by adverse situations, normally external factors.

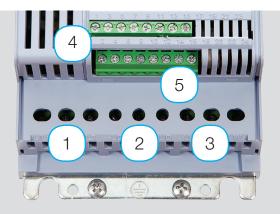
VSD lifespan is extended: protection against dust, humidity, high temperatures and chemicals.

Full integration with process network.



Easy Configuration





With plug-in module CFW500-IOS

- 1 Power terminals
- 2 Access to DC link
- 3 Motor terminals
- 4 Control terminals (I/Os)
- 5 RS485 port





Applications

- Centrifugal pumps
- Process dosing pumps
- Fans / exhausters
- Stirrers / mixer
- Compressors

- Conveyor belts
- Roller tables
- Granulators / palletizers
- DryersRotary filters



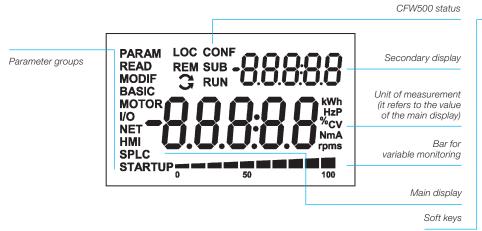






Human-Machine Interface

View of three parameters at the same time, selected by the user



-PERIOR TENNAL COST DAYS IN ATTER PARAM LOC RUN POUDCE SIMILARY -PERIOR TENNAL COST DAYS IN ATTER PARAM TO THE TOP THE

Friendly Programming

- Oriented start-up: programming step by step
- Soft keys: fast access to the parameters
- Parameter group: it directs to the parameters of interest

Remote HMI

Solution for panel door or machine console.



CFW500-HMIR IP54





RS485 Included in all plug-in modules

CFW500-CCHMIRXM X = up to 10 m



Energy Efficiency

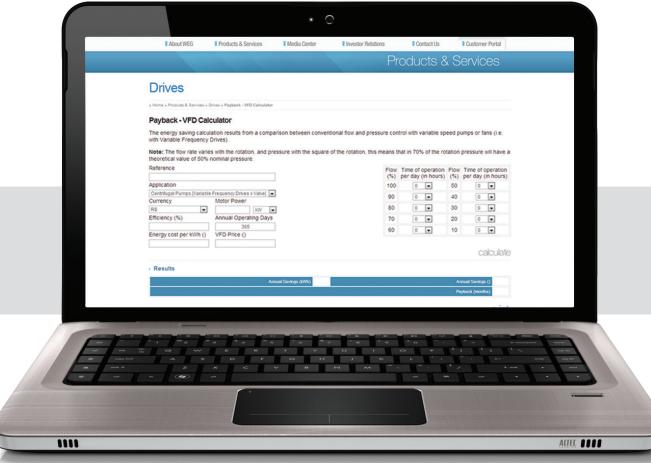
In the industry, the electric motors are responsible for nearly 70% of all the electric energy consumption. By using VSD, is possible to reduce consumption up to 40%.

Besides being efficient in the control of electric motors, they reduce machine wear, save raw material, improve process quality and increase productivity.

On WEG website, it is possible to calculate how much energy can be saved by using the CFW500 VSD.

Ensure energy efficiency for your equipment and machines. Save money and contribute to the conservation of the environment.

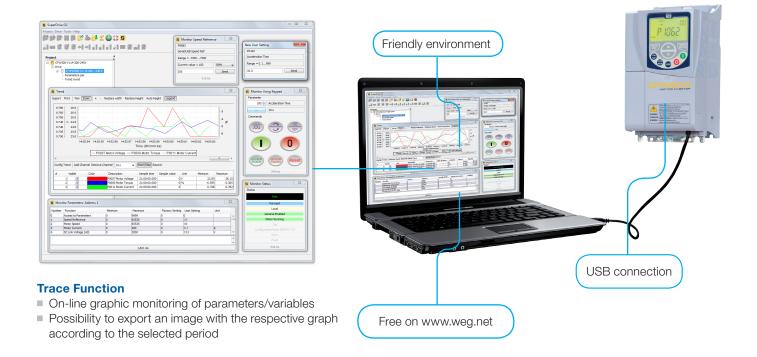






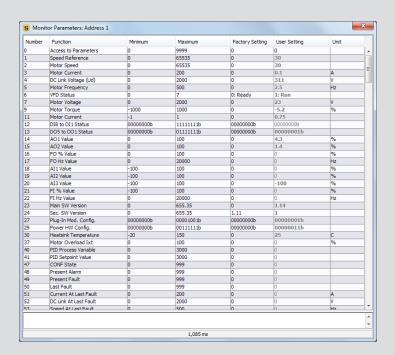
SuperDrive G2

Software application for programming, command and monitoring of WEG VSD.



Edition and Monitoring of Parameters in List/Table

Parameter set storage in a computer file format.



- Transfer of parameters from the PC to the CFW500 and vice versa
- Off-line edition of the parameters stored on the PC

Status Monitoring



Operation with HMI

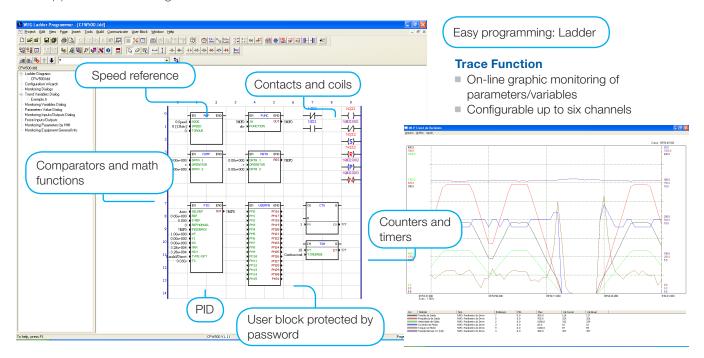
On-line parameter edition



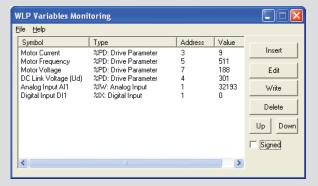


SoftPLC - Built-in on the Standard Product

It adds the functionalities of a PLC to the CFW500, allowing the creation of applications. The WLP software and the SoftPLC functionality are a smart and simple way to make your CFW500, motor and application work together.

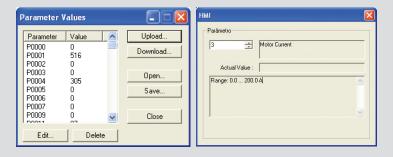


On-line Monitoring Parameters/Variables List



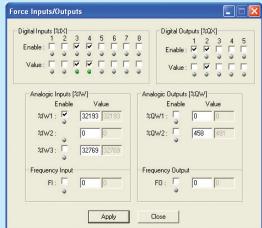
Parameter Edition

It allows to change the parameters values.



Enable/Disable I/Os

It simplifies and speeds up the validation of the application



I/Os Monitoring





Coding

The CFW500 code identifies its constructive characteristics, maximum current, voltage range and optionals. Using the smart code, it is possible to select the CFW500 necessary for your application in a simple and fast way.

Product and		Model ide	ntification		Braking ¹ Degree of		Conducted	Hardware	Software	
series	Frame size	Rated current	No. of phases	Rated voltage	DIAKINY .	protection 1	emission level ¹	version	version	
CFW500	Α	03P6	T	4	NB	20	C3	H00		
	Check table below	I								
		NB = without dynamic braking DB = with dynamic braking								
	20 = IP20 N1 = NEMA1 enclosure									
CFW500	Blank = with no RFI filter C2 = According to category 2 of IEC 61800-3 standard, with internal RFI filter C3 = According to category 3 of IEC 61800-3 standard, with internal RFI filter									
	H00 = without plug-in module Blank = standard Sx = special software									

⁽¹⁾ To know what models have this options in the standard product the table below shall be checked.

Frame sizes	Output Current	Input	Power supply voltage	Braking	Degree of protection	Conducted emission level (2)
	01P6 = 1.6 A					
A	02P6 = 2.6 A	S = single-phase		NB		Blank or C2
A	04P3 = 4.3 A	power supply		IND		
	07P0 = 7.0 A					Blank or C3
	01P6 = 1.6 A					
A	02P6 = 2.6 A	B = single-phase		NB		
	04P3 = 4.3 A	or three-phase	2 = 200 240 V			
В	07P3 = 7.3 A	power supply	phase	DB		
D	10P0 = 10 A			DR		Blank
А	07P0 = 7.0 A			NB		
A	09P6 = 9.6 A	T = three-phase				
В	16P0 = 16 A	power supply		DB	20 or N1	
С	24P0 = 24 A			DB	- 20 OF NT	
	01P0 = 1.0 A					
	01P6 = 1.6 A					Blank or C2
A	02P6 = 2.6 A			NB		DIATIK OF GZ
	04P3 = 4.3 A					
	06P1 = 6.1 A					Blank or C3
	02P7 = 2.7 A	T = three-phase power supply	4 = 380480 V			
В	04P3 = 4.3 A	power suppry		DB		Blank or C2
d	06P5 = 6.5 A			DΒ		
	10P0 = 10 A					Blank or C3
С	14P0 = 14.0 A			DB		Blank or C3
U	16P0 = 16.0 A			DD		DIGIIK UI GO

(2) RFI filter

Categories:

Category C1: inverters with voltages below 1,000 V, for use in the First Environment.

Category C2: inverters with voltages below 1,000 V, with plugs or mobile installation, when used in the "First Environment", must be installed and started-up by a qualified professional.

Category C3: inverters with voltages below 1,000 V, developed for use in the Second Environment and not designed for use in the "First Environment". Environments:

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

Second Environment: includes all the buildings other than those directly connected to a low-voltage power supply grid, which supplies buildings used for domestic purposes.

For the RFI filters of external installations, refer to the CFW500 user manual.

Drive Ratings

The correct way to select a VSD is matching its output current to the motor rated current. However, the tables below present the expected motor power for each VSD model.

Use the motor power ratings below only as a guidance. Motor rated currents may vary with speed and manufacturer. IEC motor powers are based on WEG 4-pole motors; NEMA motor powers are based on NEC table 430-150.

Motor Voltages Between 220 V and 230 V

				IEC	IEC	NEMA
Power Model		Rated current	50 Hz 220 V 230 V	60 Hz 220 V	60 Hz 230 V	
sup	ply	Model	Α	kW	HP	HP
		CFW500 A 01P6 S2	1.6	0.25	0.25	1
	<u>@</u>	CFW500 A 02P6 S2	2.6	0.55	0.5	1
	ļ -	CFW500 A 04P3 S2	4.3	1.1	1	1.5
		CFW500 A 07P0 S2	7	1.5	2	2
		CFW500 A 01P6 B2	1.6	0.25	0.25	1
<u> </u>		CFW500 A 02P6 B2	2.6	0.55	0.5	1
200-240 V	1/30	CFW500 A 04P3 B2	4.3	1.1	1	1.5
500		CFW500 B 07P3 B2	7.3	1.5	2	2
		CFW500 B 10P0 B2	10	2.2	3	3
		CFW500 A 07P0 T2	7	1.5	2	2
	30	CFW500 A 09P6 T2	9.6	2.2	3	3
	က	CFW500 B 16P0 T2	16	4	5	5
		CFW500 C 24P0 T2	24	5.5	7.5	7.5

Motor Voltages Between 380 V and 480 V

				IE	NEMA							
Power Model		Rated current	50 Hz 380 V 415 V	60 Hz 440 V 460 V	60 Hz 460 V							
sup	ply	A		kW	HP	HP						
		CFW500 A 01P0 T4	1	0.25	0.5	1						
		CFW500 A 01P6 T4	1.6	0.75	0.75	1						
		CFW500 A 02P6 T4	2.6	1.1	1.5	2						
		CFW500 A 04P3 T4	4.3	1.5	3	3						
000		CFW500 A 06P1 T4	6.1	3	4	3						
380-480 V	30	CFW500 B 02P6 T4	2.6	1.1	1.5	2						
380								CFW500 B 04P3 T4	4.3	1.5	3	3
		CFW500 B 06P5 T4	6.5	3	4	5						
		CFW500 B 10P0 T4	10	4	7.5	7.5						
		CFW500 C 14P0 T4	14	7.5	10	10						
		CFW500 C 16P0 T4	16	7.5	12.5	10						

Dimensions and Weights

IP20

Frame size	H mm	W mm	D mm	Weight Kg
A	189.1	75.2	149.5	0.8
В	199.1	100.2	160.1	1.2
С	210	135.2	165.1	2



NEMA1

Frame size	H mm	W mm	D mm	Weight Kg
Α	223	75.2	149.5	1.05
В	243.3	100.2	160.1	1.49
С	254.8	135.2	165.1	2.35





Accessories and Optionals

The CFW500 VSD 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 model	Available
RFI filter	Optional	Used to reduce the disturbance conducted from the CFW500 to the power supply, in the high frequency band (>150 kHz), according to standards 61800-3 and EN 55011.	C2 o C3	-	Installed at the factory
Braking IGBT	Optional	Used in high-inertia applications for the fast stop of the motor by means of an external braking resistance. Resistance not included. For the calculation of the braking resistance, refer to the CFW500 user manual.	DB	-	Installed at the factory
Degree of protection NEMA1	Optional or accessory	Used for the CFW500 VSD to have degree of protection NEMA1 and/or when metallic conduits are used for the cables.	N1	CFW500-KN1A (frame size A) CFW500-KN1B (frame size B) CFW500-KN1C (frame size C)	Installed at the factory or at the application
Cable shield kit	Accessory	Used to shield the power and control cables. Important: for the version with RFI filter, this filter comes with the product.	-	CFW500-KPCSA (frame size A) CFW500-KPCSB (frame size B) CFW500-KPCSC (frame size C)	Installed at the application
I/O expansion modules (plug-in) (3)	Accessory	Used to configure the I/O points according to the needs of the application/machine.	-	CFW500-IOS CFW500-IOD CFW500-IOAD CFW500-IOR	Installed at the application
Communication module (plug-in) ⁽³⁾	Accessory	Used for the communication of the CFW500 with the main networks of the market (Fieldbus).	-	CFW500-CUSB (USB) CFW500-CCAN (CANopen /DeviceNet) CFW500-CRS232 CFW500-CRS485 CFW500-CPDP (Profibus-DP)	Installed at the application
Flash memory module (plug-in) ⁽³⁾	Accessory	Used to download the programming of a CFW500 to others without having to power them up.	-	CFW500-MMF	Installed at the application
Remote HMI	Accessory	Used to transfer the operation to the panel door or machine console. Maximum distance of 10m. Degree of protection IP54.	-	CFW500-HMIR	Installed at the application
Cables for remote HMI	Accessory	Used to interconnect the CFW500 to the remote HMI (CFW500-HMIR).	-	CFW500-CCHMIRXM, where cables with lengths (X) of 1, 2, 3, 5, 7,5 and 10 meters	Installed at the application

⁽¹⁾ Optional = hardware resources added to the CFW500 in the manufacturing process Accessory = hardware resource requested as a separated item.

Plug-in Modules Specification (3)

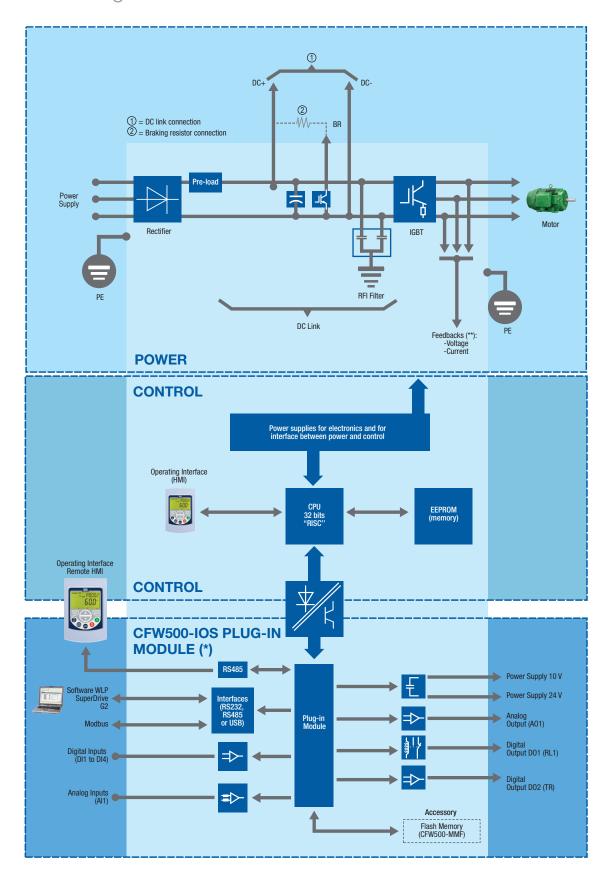
•												
		Functions										
Diva in modulo	Inp	uts		Outputs				Fieldbus	networks		Power	supply
Plug-in module	Digital	Analog	Analog	Digital relay	Digital transistor	USB Port	CANopen/ DeviceNet	RS232	RS485	Profibus-DP	10 V	24 V
CFW500-I0S	4	1	1	1	1	-	-	-	1	-	1	1
CFW500-IOD	8	1	1	1	4	-	-	-	1	-	1	1
CFW500-IOAD	6	3	2	1	3	-	-	-	1	-	1	1
CFW500-IOR	4	1	1	4	1	-	-	-	1	-	1	1
CFW500-CUSB	4	1	1	1	1	1	-	-	1	-	1	1
CFW500-CCAN	2	1	1	1	1	-	1	-	1	-	1	1
CFW500-CRS232	2	1	1	1	1	-	-	1	1	-	-	1
CFW500-CRS485	4	2	1	2	1	-	-	-	2	-	1	1
CFW500-CPDP	2	1	1	1	1	-	-	-	1	1	-	1

⁽³⁾ All models of plug-in modules have at least one RS485 port. The CFW500-CRS485 plug-in module has two RS485 ports. The CFW500 allows installing one plug-in module per unit.



⁽²⁾ Request the product according to the code available on page 10.

Block Diagram



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

^(**) Not available for frame size A.



Technical Data

		1-phase, 200-240 V ac (+10%-15%) 0.25 to 2 HP (0.25 to 1.5 kW)
	Vallage and account	1-phase/3-phase, 200-240 V ac (+10%-15%) 0.25 to 3 HP (0.25 to 2.2 kW)
Power supply	Voltage and power range	3-phase, 200-240 V ac (+10%-15%) 2 to 7.5 HP (1.5 to 5.5 kW)
		3-phase, 380-480 V ac (+10%-15%) 0.5 to 12.5 HP (0.25 to 7.5 kW)
	Supply frequency	50/60 Hz (48 Hz to 62 Hz)
	Voltage	3-phase, 0-100% of supplied voltage
	Output frequency	0 a 500 Hz
	Displacement power factor	>0.97
Motor connection	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
		40 °C - NEMA1
	Tomporoturo	40 °C - IP20 side by side and/or with RFI fiter
	Temperature	50 °C - IP20 without RFI filter
Facilitation		2% of current derating for each °C above the specific operating temperature, limited to an increase of 10 °C
Environment	Humidity	5 % to 90 % non-condensing
	,	Up to 1000 m - rated conditions
	Altitude	1000 m to 4000 m - 1 % of current derating for each 100 m above 1000 m of altitude
	Degree of protection	IP20 or NEMA1 (with kit NEMA1)
	- ogree er processer	Speed regulation: 1 % of the rated speed (with slip compensation)
	V/f control	Speed variation range: 1:20
Performance		Speed regulation: 1 % of the rated speed
	Vector control (VVW)	Speed variation range: 1:30
Braking methods	DC Current applied to motor dynamic braking	Available as standard for frame sizes B and C. For frame size A "DB" models has to be used. An extra resistor must be fitted in for dynamic braking capability
	aynamo zramig	Overcurrent/phase-phase short circuit in the output
		Overcurrent/phase-ground short circuit in the output
		Under/overvoltage
		Overtemperature in the heatsink
Safety	Protection	Overload in the motor
		Overload in the interior
		External alarm / fault
	Modbus-RTU	Setting error All plus in modulos for DS465 and CEMEON CRS222 for DS222
	Profbus-DP	All plug-in modules for RS485 and CFW500-CRS232 for RS232 Plug-in module CFW500-CPDP
Communication		Š
	DeviceNet	Plug-in module CFW500-CCAN
	CANopen	Plug-in module CFW500-CCAN
Chokes (external as	AC autout aboles	For reducing THD
accessory)	AC output chokes	For longer motor cables



Technical Data - Standards

	UL 508C	Power conversion equipment.
	UL 840	Insulation coordination including clearances and creepage distances for electrical equipment.
	EN61800-5-1	Safety requirements electrical, thermal and energy.
	EN 50178	Electronic equipment for use in power installations.
Safety standards	EN 60204-1	Safety of machinery. Electrical equipment of machines. Part 1: General requirements. Note: 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 specifications for low voltage adjustable frequency AC power drive systems.
	EN 61800-3	Adjustable speed electrical power drive systems - Part 3: EMC product standard including 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.
Electromagnetic Compatibility (EMC)	EN 61000-4-2	Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 2: Electrostatic discharge immunity test.
Standards	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	EN 60529	Degrees of protection provided by enclosures (IP code).
standards	UL 50	Enclosures for electrical equipment.



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For those countries where there is not a WEG own operation, find our local distributor at www.weg.net.



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