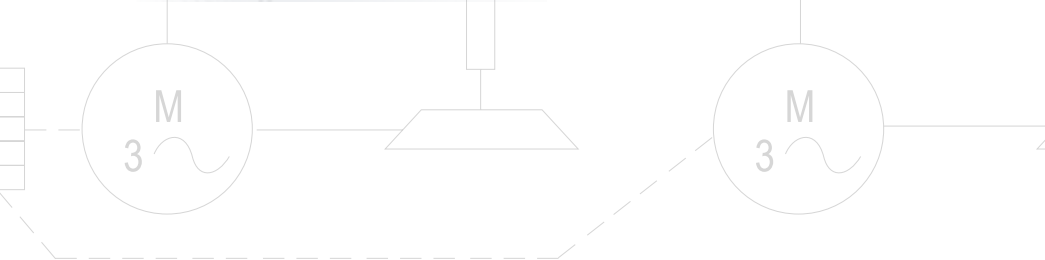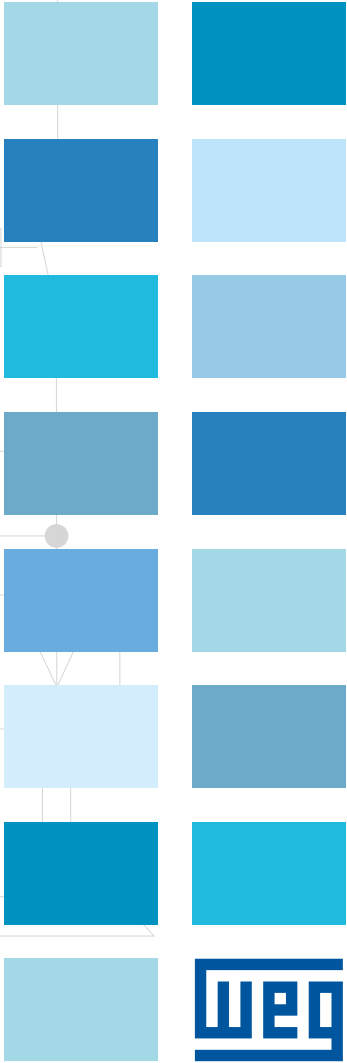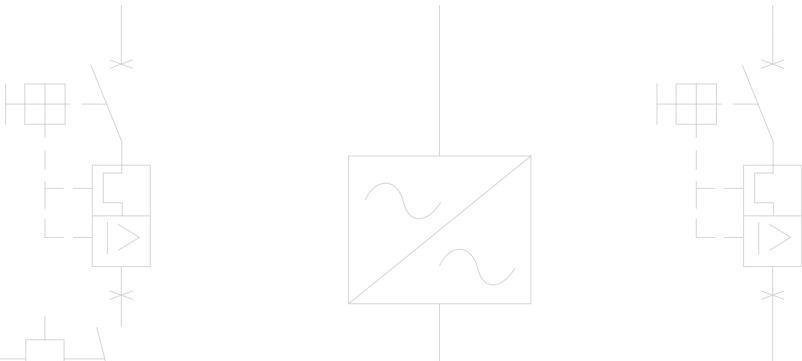# Automation
HVAC-R Solution

WEG

The Best HVAC-R Performance

The HVAC-R market deserves dedicated and fully equipped drives. With this in mind, WEG has launched a dedicated line of variable speed drives for heating, ventilation, air conditioning and refrigeration. The CFW501 and CFW701 were designed with features and functions required for HVAC-R systems counting on the same **reliability, robustness and energy-efficient control** found in the WEG industrial drives. WEG, a leading supplier of automation products now brings this new product for use in hospitals, airports, commercial buildings, hotels, shopping malls and similar facilities.

Highlights

Harmonic Mitigation
- No line reactor required
- No restrictions for installation, minimum impedance is not required
- Meets the 61000-3-12 standard, related to low order current harmonics in the power supply

User Friendly Programming
- Oriented start-up: step by step
- Easy and intuitive operation
- Parameter groups: shortcut to the parameters of interest
- Engineering units, such as: °C, °F, bar, mbar, psi, m³, gal, kW, rpm and others

Safety Stop[1]
In accordance with EN 61800-5-2, EN ISO 13849-1, IEC 62061, IEC 61508 Parts 1-7, EN 50178, IEC 60204-1, Cat. 3/PL d. and SIL 2.
- With this optional, when the safety circuit is tripped caused by external factors the IGBT firing circuit is deactivated and the power delivered to the motor is ceased

Note: 1) CFW701 only.

TÜVRheinland®
CERTIFIED

Thermal Management
- Lifetime of the VFD is increased by monitoring of the heatsink and internal air temperatures
- Heatsink fans are temperature driven
- CFW701 provides information about operation hours as well as alarm and fault codes
- Fans easily removed for maintenance

RFI Filter Built-In
- Meets the requirements of electromagnetic compatibility standards

Communication Protocols Available in the Standard Product
- Bacnet MS/TP
- Metasys N2
- Modbus-RTU

Conformal Coating (3C2)
- VSD lifetime is extended: protection against agressive and corrosive atmospheres

PLC Function Built-In
Flexible programming offered by the free of charge software WLP gives the user the capability to write his own functions. Software available at *www.weg.net*

Special Functions

Bypass
Through one of its relay output the CFW501 and CFW701 allows the motor to be switched to the main power supply using additional components.

Fire Mode
This function makes the drive to inhibit its internal faults, making the motor run during adverse conditions without stopping the process.

Advanced PID
Three PID control loops: one controls the process itself (the one the motor is running) and two are additional PID loops for use to control independent process variables (it might be for the control of an external process not related to what the main PID loop is handling). This eliminates the use of an additional PID controller.

Note: the CFW501 has one additional PID instead two.

Broken Belt Detection
Monitors motor torque and prevents the drive from running with no load in case of a broken belt.

Sleep / Wake-Up Mode
Prevents the operation of the motor at low speeds for a programmed period of time. Wake-up mode determines motor restart conditions.

Dry Pump Protection
Prevents the pump from running dry.

PTC Monitoring
PTC input terminals for motor temperature protection.

Filter Maintenance Alarm
Warns about the need to replace the filter.

Short Cycle Protection
It prevents loads like compressors from sucessives cycles of ON/OFF commands.

Energy Saving
Depending on the motor speed and load conditions, flux is reduced decreasing losses and improving efficiency.

The future of our planet depends on conscious and sustainable actions and as the World's population continues to grow rapidly, modern automated solutions are required. Technology is ever present in our lives, we have to find ways to efficiently produce the energy that drives all of these innovations. What are you doing to grow sustainability?

Use energy in a conscious way

Go Green!

Power comsumption %

Flow (%)

— Valve
— VSD
— CFW701 or CFW501 with energy saving enabled
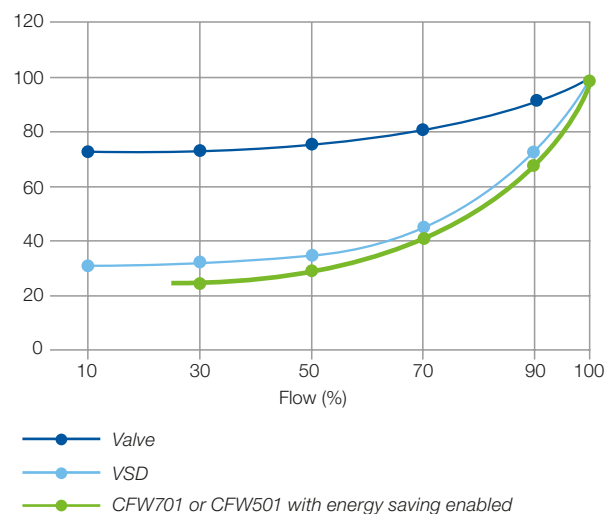
Applications

Shopping malls, commercial buildings

- Integrate and manage the whole HVAC-R system through VSDs with fire mode, filter maintenance alarm and SoftPLC

Offices, schools, universities

- Accurate temperature control for perfect comfort levels

Medical centers, hospitals, clean rooms

- Keep clean air with both right temperature and humitidity requirements is the key to ensure air quality in critical environments. The PID functions embedded to the VFD can be used for that achievement

Airports, conference centers

- Effective control of airflow and pressure, provide users with the right comfort
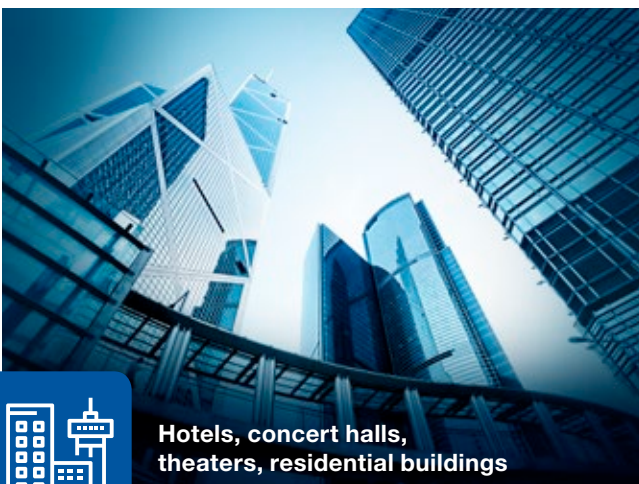
Hotels, concert halls, theaters, residential buildings

- Lifetime of pumping systems is increased due to reduction of mechanical stress and embedded protections, like dry pump and short cycle, which garantee safe operation

Stadiums, sports facilities, entertainment buildings

- The automatic energy saving fuction pursues efficient control of pumps, fans and compressors to make sure the best usage of natural and financial resources is under control

SoftPLC - Built-In the Standard Product

PLC funtionalities are available as standard in the WEG HVAC-R series. The SoftPLC function allows the user to customize applications through a simple, intuitive and free of charge ladder programming software named WLP.
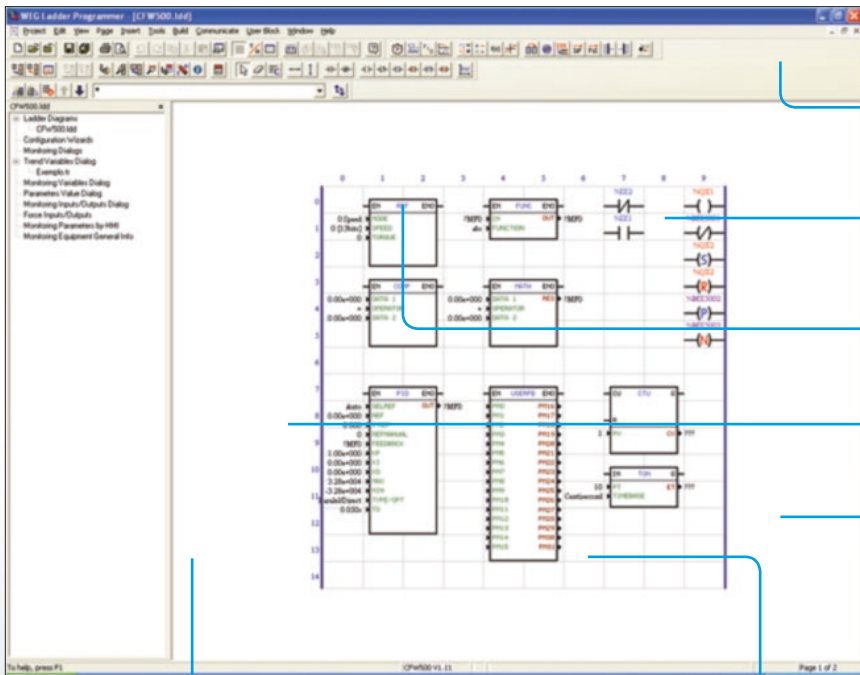
Easy programming: Ladder

Contacts and coils

Speed reference

Comparators and math functions

Counters and timers

FREE download at _www.weg.net_

User block protected by password
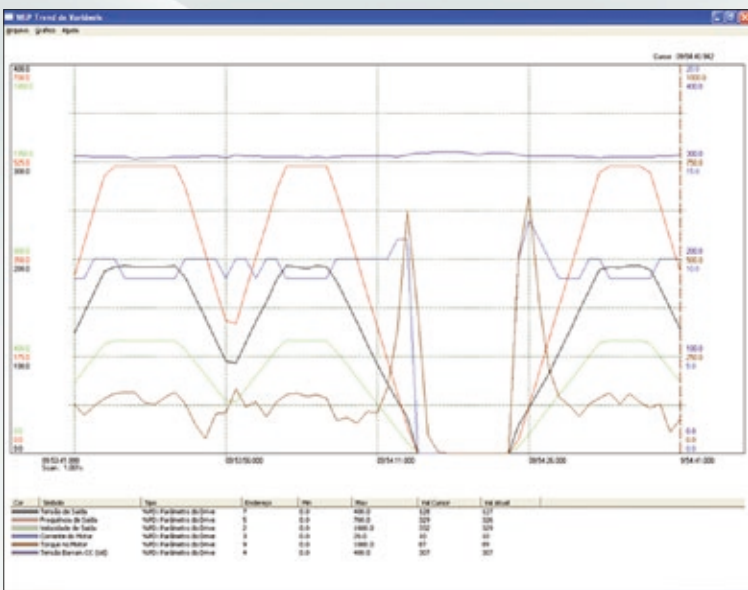
Trend Function
- Online graphic monitoring of parameters/variables
- Configurable up to six channels
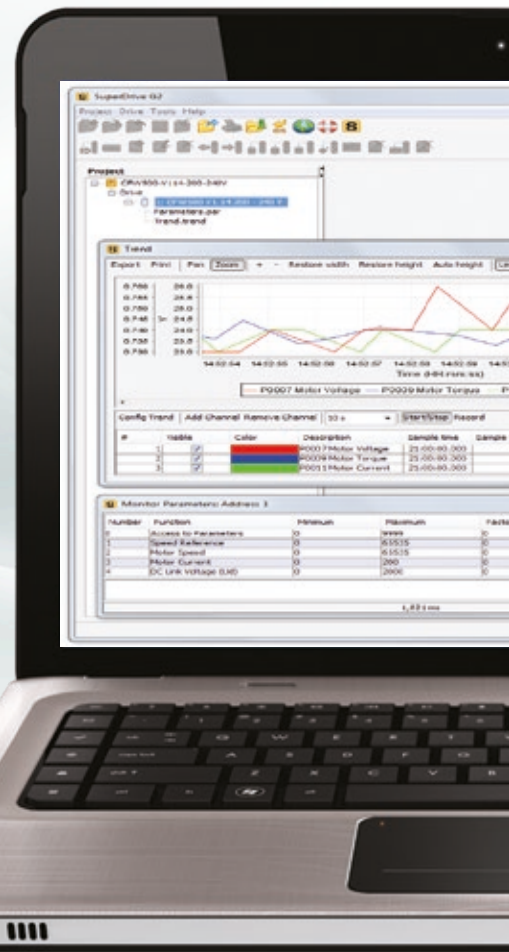
SuperDrive G2

Software application to program, control and monitor WEG VSDs.

Trend Function
- Online graphic monitoring of parameters/variables
- Possibility to export an image with the respective graph based upon the selected period

USB connection

Friendly environment

FREE download at *www.weg.net*

CFW501

CFW501 is a compact variable speed drive designed for heating, ventilation and air conditioning applications. It offers excellent efficiency and shares the same platform as CFW500, adding features such as fire mode, bypass, dry-pump and broken belt detection. It supports the most used communication protocols in the HVAC-R industry: BACnet, Modbus-RTU and Metasys N2, available in the standard product.

Coding

The CFW501 code identifies its construction characteristics, nominal current, voltage range and optionals. Using the coding below, it is possible to select the CFW501 required for your application, simple and quickly.

Reference	Model identification				Braking IGBT	Protection degree	Conducted emission level[1]	Hardware version	Software version
	Frame size	Output current	N° of phases	Power supply voltage					
CFW501	A	03P6	T	4	NB	20	C2	---	---
CFW501	Check table on page 9								
	NB = without dynamic braking DB = with dynamic braking								
	20 = IP20 N1 = NEMA1 enclosure								
	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								
	Blank = with CRS485 plug-in module								
	Blank = standard Sx = special software								

Note: 1) Depending on the model, ferrite core migh be needed (check user's manual for more details).

Frame size	Output current	Nº of phases	Power supply voltage	Braking IGBT	Protection degree	Conducted emission level
A	01P6 = 1.6 A	T = three-phase power supply	2 = 200...240 V	NB	20 or N1	C3
A	02P6 = 2.6 A			NB		
A	04P3 = 4.3 A			NB		
A	07P0 = 7.0 A			NB		
A	09P6 = 9.6 A			NB		
B	07P3 = 7.3 A			DB		
B	10P0 = 10 A			DB		
B	16P0 = 16 A			DB		
B	17P0 = 17 A			DB		
B	19P4 = 19.4 A			DB		
C	24P0 = 24 A			DB		
A	01P0 = 1.0 A		4 = 380...480 V	NB		
A	01P6 = 1.6 A			NB		
A	02P6 = 2.6 A			NB		
A	04P3 = 4.3 A			NB		
A	06P1 = 6.1 A			NB		
B	02P6 = 2.6 A			DB		
B	04P3 = 4.3 A			DB		
B	06P5 = 6.5 A			DB		
B	10P0 = 10 A			DB		
C	14P0 = 14 A			DB		C2
C	16P0 = 16 A			DB		C2
D	24P0 = 24 A			DB		C3
D	31P0 = 31 A			DB		C3

Drive Ratings

The correct way to select a VFD is matching its output current with the motor rated current. However, the tables below present the approximate motor power for each VFD model. Use the motor power ratings below only as a guidance. Motor rated currents may vary with motor characteristics and manufacturer.

CFW501 HVAC-R					Maximum applicable motor[1]					
					IEC				uL	
Reference	Power Supply (V)		Frame Size	Braking IGBT	Output current (A)	Power Supply (V) 50 Hz	kW	Power Supply (V) 60 Hz	hp	Power Supply (V) 60 Hz	hp
CFW501A01P6T2NB20C3	Three-phase	200-240	A	N/A	1.60	230	0.25	220	0.33	230	0.33
CFW501A02P6T2NB20C3			A	N/A	2.60		0.55		0.75		0.5
CFW501A04P3T2NB20C3			A	N/A	4.30		1.1		1.5		1.0
CFW501A07P0T2NB20C3			A	N/A	7.00		1.5		2.0		2.0
CFW501A09P6T2NB20C3			A	N/A	9.60		2.2		3.0		3.0
CFW501A12P2T2NB20C3			A	N/A	12.2		3.0		3.0		3.0
CFW501B16P0T2DB20C3			B	Built-in	16.00		4.0		5.0		5.0
CFW501B17P0T2DB20C3			B	Built-in	17.00		4.0		5.0		5.0
CFW501B19P4T2DB20C3			B	Built-in	19.40		5.5		5.0		5.0
CFW501C24P0T2DB20C3			C	Built-in	24.00		5.5		7.5		7.5
CFW501A01P0T4NB20C3	Three-phase	380-480	A	N/A	1.00	415	0.25	460	0.33	460	0.33
CFW501A01P6T4NB20C3			A	N/A	1.60		0.55		1.0		0.75
CFW501A02P6T4NB20C3			A	N/A	2.60		1.1		1.5		1.0
CFW501A04P3T4NB20C3			A	N/A	4.30		1.5		3.0		2.0
CFW501A06P1T4NB20C3			A	N/A	6.10		3.0		3.0		3.0
CFW501B02P6T4DB20C3			B	Built-in	2.60		1.1		1.5		1.0
CFW501B04P3T4DB20C3			B	Built-in	4.30		1.5		3.0		2.0
CFW501B06P5T4DB20C3			B	Built-in	6.50		3.0		3.0		3.0
CFW501B10P0T4DB20C3			B	Built-in	10.00		4.0		7.5		5.0
CFW501C14P0T4DB20C2			C	Built-in	14.00		7.5		10.0		10.0
CFW501C16P0T4DB20C2			C	Built-in	16.00		7.5		10.0		10.0
CFW501D24P0T4DB20C3			D	Built-in	24.00		11.0		20.0		15.0
CFW501D31P0T4DB20C3			D	Built-in	31.00		11.0		25.0		20.0

Note: 1) The power rating values for maximum applicable motor shown in the table above are reference values and valid for WEG motors. IEC motor powers are based on motor WEG four-pole W22 High Efficiency IE2 three-phase induction motors. NEMA motor power are based on WEG four pole W22 Premium. Motor rated currents may vary with speed and manufacturer, use the motor power ratings below only as a guindance. The proper sizing of the CFW501 to be used must be determined as a function of the rated current of the motor used.
Motor power stated on these tables are based on IEC and NEMA standard for IV poles motor.

Accessories and Optionals

The CFW501 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
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. To specify the braking resistance, refer to the CFW501 user manual.	DB	-	Factory installation only
NEMA 1 kit	Optional or accessory	Used when instalation requires NEMA 1 protection degree and/or conduit. This accessory cannot be used along cable shield kit.	N1	CFW501-KN1A (frame size A) CFW501-KN1B (frame size B) CFW501-KN1C (frame size C) CFW501-KN1D (frame size D)	Factory or user installation
Cable shield kit	Accessory	Used to ground power and control cables.	-	CFW501-KPCSA (frame size A) CFW501-KPCSB (frame size B) CFW501-KPCSC (frame size C) CFW501-KPCSD (frame size D)	User installation
Flash memory module (plug-in)	Accessory	Used to download the program from a CFW501 to others without having to power them up.	-	CFW501-MMF	-
Remote HMI	Accessory	Used to transfer the operation to the panel door or machine console. Maximum distance of 10 m. Degree of protection IP54.	-	CFW501-HMIR	-
Cables for remote HMI	Accessory	Used to connect the CFW501 to the remote HMI (CFW501-HMIR).	-	CFW501-CCHMIRXM, where cables with lengths (X) of 1, 2, 3, 5, 7.5 and 10 meters	-

Note: 1) Optional items are hardware resources added to the CFW501 in the manufacturing process, and they should be requested via smart code. The accessories are hardware resources that may be added to the CFW501 in the application.
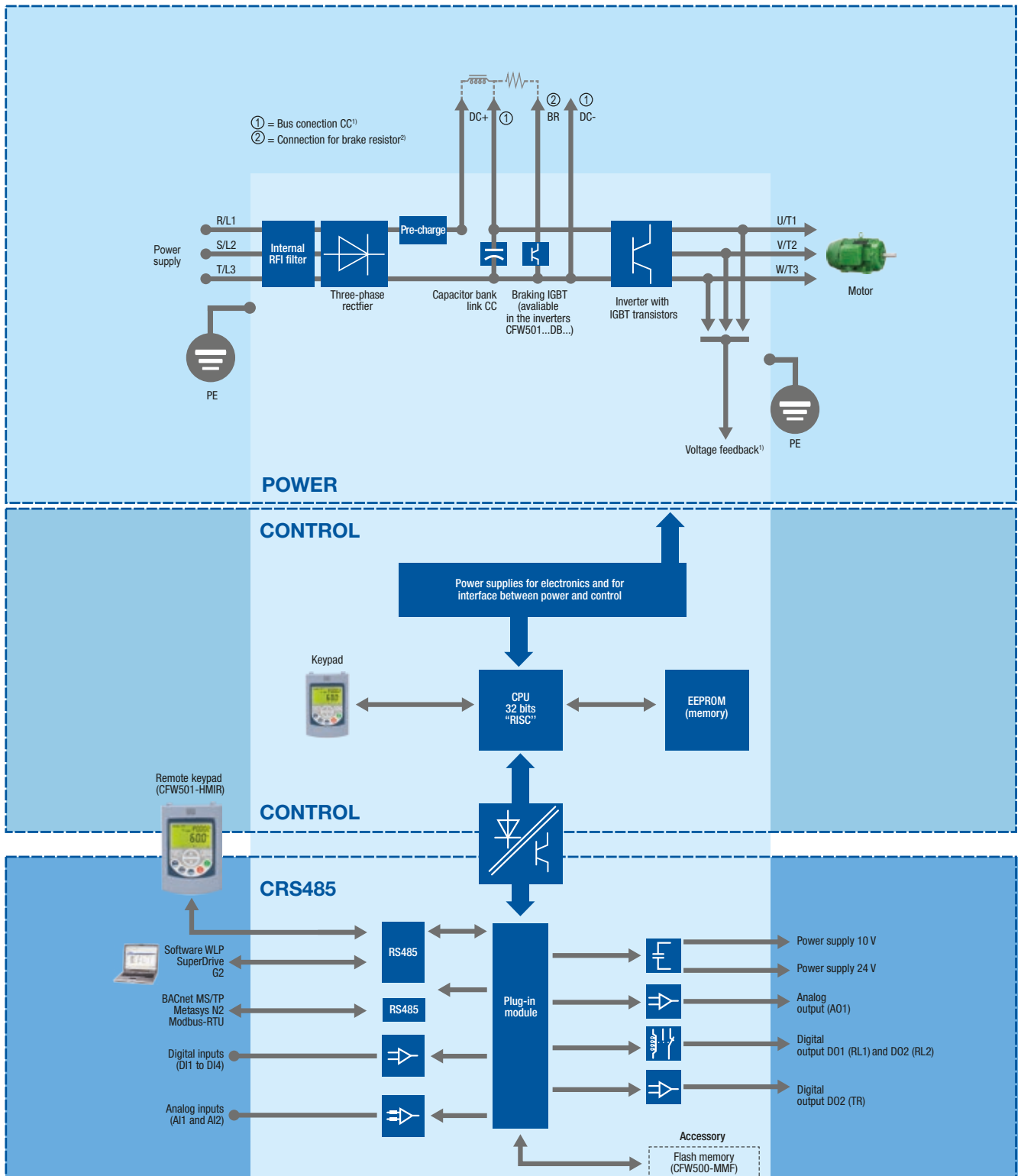
Dimensions and Weights

IP20

NEMA1

IP20

Frame size	H mm	W mm	D mm	Weight kg
A	189.1	75.2	149.5	0.8
B	199.1	100.2	160.1	1.2
C	210	135.2	165.1	2
D	306.6	180	166.5	4.3

NEMA1

Frame size	H mm	W mm	D mm	Weight kg
A	223	75.2	149.5	1.05
B	243.3	100.2	160.1	1.49
C	254.8	135.2	165.1	2.35
D	362	180	166.5	4.8

Block Diagram

① = Bus conection CC[1]
② = Connection for brake resistor[2]

POWER

CONTROL

CONTROL

CRS485

Notes: 1) Not available for frame size A.
       2) Not available for frame size A. Braking resistor is not included.

CFW701

CFW701 is an advanced variable speed drive designed for heating, ventilation and air conditioning applications. It offers excellent efficiency and shares the same platform as CFW700, adding features such as fire mode, bypass, dry-pump and broken belt detection. It supports the most used communication protocols in the HVAC-R market: BACnet, Modbus-RTU and Metasys N2, available in the standard product.

Product Coding

The CFW701 code identifies its construction characteristics, nominal current, voltage range and options. Using the coding below, you may select the CFW701 required for your application simply and quickly.

Product and series	Model identification				Braking IGBT	Enclosure	Conducted emission level[1)2)]	Discon. switch[3)]	Safety stop[4)]	External control voltage	Special hardware version	Special software version
	Frame size	Rated output current	Number of power phases	Rated voltage								
CFW701	B	06P0	S	2	DB	55	C3	DS	Y1	W1	---	---
CFW701	Check table on page 11							Blank = not available DS = with disconnect switch				Blank = standard
												Sx = special software
	NB = without dynamic braking										Blank = standard	
	DB = with dynamic braking										Hxx = special hardware	
	20 = IP20[5)]									Blank = without 24 V dc power supply		
	21 = IP21 (not avaliable for frame size E inverters)									W1 = 24 V dc power supply		
	N1 = NEMA1 enclosure (UL type 1) (protection degree according to IEC: IP21 for frame sizes A, B and C and IP20 for frame sizes D and E)											
	55 = IP55 only for 200...240 V and 380...480 V models of frame sizes B, C, D and E							Blank = not available Y1 = with STO function (Safe Torque Off) according to EN 954-1/ISO 13849-1, category 3				
	C3 = according to category 3 (C3) of IEC 61800-3, with built-in C3 RFI filter[6)]											

Frame size	Rated output current for ND overload	Number of power phases	Rated voltage	Available options for the remaining identification			
				Braking IGBT	Protection degree	Conducted emission level[6]	Disconnect switch
A	06P0 = 6.0 A 07P0 = 7.0 A 10P0 = 10 A	S = Single-phase	2 = 200-240 V	DB	20, 21 or N1	C3	Blank
B	06P0 = 6.0 A 07P0 = 7.0 A 10P0 = 10 A				55		Blank or DS
A	07P0 = 7.0 A 10P0 = 10 A 13P0 = 13 A 16P0 = 16 A	T = Three-phase	2 = 200-240 V	DB	20, 21 or N1		Blank
B	07P0 = 7.0 A 10P0 = 10 A 13P0 = 13 A 16P0 = 16 A 24P0 = 24 A 28P0 = 28 A 33P5 = 33.5 A				55		Blank or DS
C	45P0 = 45 A 54P0 = 54 A 70P0 = 70 A				20, 21, N1 or 55		
D	86P0 = 86 A 0105 = 105 A						
E	0142 = 142 A 0180 = 180 A 0211 = 211 A		2 = 220-230 V	NB or DB			
A	03P6 = 3.6 A 05P0 = 5.0 A 07P0 = 7.0 A 10P0 = 10 A 13P5 = 13.5 A	T = Three-phase	4 = 380-480 V	DB	20, 21 or N1		Blank
B	03P6 = 3.6 A 05P0 = 5.0 A 07P0 = 7.0 A 10P0 = 10 A 13P5 = 13.5 A 17P0 = 17A 24P0 = 24 A 31P0 = 31 A				55		Blank or DS
C	38P0 = 38 A 45P0 = 45 A 58P5 = 58.5 A				20, 21, N1 or 55		
D	70P5 = 70.5 A 88P0 = 88 A						
E	0105 = 105 A 0142 = 142 A 0180 = 180 A 0211 = 211 A			NB or DB			
B	02P9 = 2.9 A 04P2 = 4.2 A 07P0 = 7.0 A 10P0 = 10 A 12P0 = 12 A 17P0 = 17A	T = Three-phase	5 = 500-600 V	DB	20, 21 or N1		Blank
C	22P0 = 22 A 27P0 = 27 A 32P0 = 32 A 44P0 = 44 A						
E	53P0 = 53 A 63P0 = 63 A 80P0 = 80 A 0107 = 107 A 0125 = 125 A 0150 = 150 A			NB or DB	20 or N1		

Notes: 1) 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 CFW701 user manual.
2) For C2 or C1 categories, please check Appendix B of User's Manual.
3) Only applicable to models with degree of protection IP55.
4) Safety stop option is not available for frame size A inverters with N1 (NEMA1 enclosure) or IP21 options.
5) IP20 version is not available for frame size D (the standard product is according to NEMA1).
6) It is possible to meet the requirements of category C2 with this filter on frame size A models. For further details, please check the User's Manual.

Drive Ratings

The correct way to select a VFD is matching its output current with the motor rated current. However, the tables below present the approximate motor power for each VFD model. Use the motor power ratings below only as a guidance. Motor rated currents may vary with motor characteristics and manufacturer.

Note: motor power stated on these tables are based on IEC and NEMA standard for IV poles motor.

Protection Degree: IP2x

Reference[1]	Power supply (V)		Frame size	Braking IGBT	Rated output current (A)	Maximum applicable motor[2]					
						IEC				UL	
						Power supply (V) 50 Hz	kW	Power supply (V) 60 Hz	HP	Power supply (V) 60 Hz	HP
CFW701A06P0S2DBxxC3	Single-phase		A	Built-in	6.0	230	1.5	220	2.0	230	1.5
CFW701A07P0S2DBxxC3	Single-phase				7.0		1.5		2.0		2.0
CFW701A10P0S2DBxxC3					10.0		2.2		3.0		3.0
CFW701A07P0T2DBxxC3	Three-phase	200-240			7.0		1.5		2.0		2.0
CFW701A10P0T2DBxxC3					10.0		2.2		3.0		3.0
CFW701A13P0T2DBxxC3					13.0		3.0		4.0		3.0
CFW701A16P0T2DBxxC3					16.0		4.0		5.0		5.0
CFW701B24P0T2DBxxC3			B		24.0		5.5		7.5		7.5
CFW701B28P0T2DBxxC3					28.0		7.5		10.0		10.0
CFW701B33P5T2DBxxC3					33.5		9.2		12.5		10.0
CFW701C45P0T2DBxxC3			C		45.0		11.0		15.0		15.0
CFW701C54P0T2DBxxC3					54.0		15.0		20.0		20.0
CFW701C70P0T2DBxxC3					70.0		22.0		25.0		25.0
CFW701A03P6T4DBxxC3	Three-phase	380-480	A	Built-in	3.6	415	1.5	460	2.0	460	2.0
CFW701A05P0T4DBxxC3					5.0		2.2		3.0		3.0
CFW701A07P0T4DBxxC3					7.0		3.0		5.0		3.0
CFW701A10P0T4DBxxC3					10.0		4.0		7.5		5.0
CFW701A13P5T4DBxxC3					13.5		5.5		10.0		7.5
CFW701B17P0T4DBxxC3			B		17.0		9.2		10.0		10.0
CFW701B24P0T4DBxxC3					24.0		11.0		20.0		15.0
CFW701B31P0T4DBxxC3					31.0		15.0		25.0		20.0
CFW701C38P0T4DBxxC3			C		38.0		18.5		30.0		25.0
CFW701C45P0T4DBxxC3					45.0		22.0		30.0		30.0
CFW701C58P5T4DBxxC3					58.5		30.0		50.0		40.0
CFW701D70P5T4DBxxC3			D		70.5		37.0		60.0		50.0
CFW701D88P0T4DBxxC3					88.0		45.0		75.0		60.0
CFW701E0105T4DBxxC3			E		105.0		55.0		75.0		75.0
CFW701E0142T4DBxxC3					142.0		75.0		125.0		100.0
CFW701E0180T4DBxxC3					180.0		90.0		150.0		150.0
CFW701E0211T4DBxxC3					211.0		110.0		150.0		150.0
CFW701E0105T4NBxxC3				Not included	105.0		55.0		75.0		75.0
CFW701E0142T4NBxxC3					142.0		75.0		125.0		100.0
CFW701E0180T4NBxxC3					180.0		90.0		150.0		150.0
CFW701E0211T4NBxxC3					211.0		110.0		150.0		150.0
CFW701B02P9T5DBxxC3	Three-phase	500-600	B	Built-in	2.9	525	1.5	575	2.0	575	2.0
CFW701B04P2T5DBxxC3					4.2		2.2		3.0		3.0
CFW701B07P0T5DBxxC3					7.0		4.0		5.0		5.0
CFW701B10P0T5DBxxC3					10.0		5.5		7.5		7.5
CFW701B12P0T5DBxxC3					12.0		7.5		10.0		10.0
CFW701B17P0T5DBxxC3					17.0		11.0		15.0		15.0
CFW701D22P0T5DBxxC3			D		22.0		15.0		20.0		20.0
CFW701D27P0T5DBxxC3					27.0		18.5		25.0		25.0
CFW701D32P0T5DBxxC3					32.0		22.0		30.0		30.0
CFW701D44P0T5DBxxC3					44.0		30.0		40.0		40.0
CFW701E53P0T5DBxxC3			E		53.0		37.0		50.0		50.0
CFW701E63P0T5DBxxC3					63.0		45.0		60.0		60.0
CFW701E80P0T5DBxxC3					80.0		55.0		75.0		75.0
CFW701E0107T5DBxxC3					107.0		75.0		100.0		100.0
CFW701E0125T5DBxxC3					125.0		90.0		125.0		125.0
CFW701E0150T5DBxxC3					150.0		110.0		150.0		150.0
CFW701E53P0T5NBxxC3				Not included	53.0		37.0		50.0		50.0
CFW701E63P0T5NBxxC3					63.0		45.0		60.0		60.0
CFW701E80P0T5NBxxC3					80.0		55.0		75.0		75.0
CFW701E0107T5NBxxC3					107.0		75.0		100.0		100.0
CFW701E0125T5NBxxC3					125.0		90.0		125.0		125.0
CFW701E0150T5NBxxC3					150.0		110.0		150.0		150.0

Notes: 1) Motor powers are reference values valid for WEG 4-pole, 60 Hz, 220/380/525 V standard motors.
2) The brake IGBT on frame E inverters may be internally mounted by including DB in the smart code or externally mounted by adding NB to the smart code and using the DBW03 external accessory.

Protection Degree: IP55

Protection Degree IP55

CFW701 HVAC-R					Maximum applicable motor[2]					
					IEC				UL	
Reference[1]	Power supply (V)	Frame size	Braking IGBT	Rated output current (A)	Power supply (V) 50 Hz	kW	Power supply (V) 60 Hz	HP	Power supply (V) 60 Hz	HP
CFW701B06P0S2DB55C3	Single-phase	B	Built-in	6.0	230	1.5	220	2.0	230	1.5
CFW701B07P0S2DB55C3	Single-phase	B	Built-in	7.0	230	1.5	220	2.0	230	2.0
CFW701B10P0S2DB55C3	Single-phase	B	Built-in	10.0	230	2.2	220	3.0	230	3.0
CFW701B07P0T2DB55C3	Three-phase	B	Built-in	7.0	230	1.5	220	2.0	230	2.0
CFW701B10P0T2DB55C3	Three-phase	B	Built-in	10.0	230	2.2	220	3.0	230	3.0
CFW701B13P0T2DB55C3	Three-phase	B	Built-in	13.0	230	3.0	220	3.0	230	3.0
CFW701B16P0T2DB55C3	Three-phase	B	Built-in	16.0	230	4.0	220	5.0	230	5.0
CFW701B24P0T2DB55C3	Three-phase	B	Built-in	24.0	230	5.5	220	7.5	230	7.5
CFW701B28P0T2DB55C3	Three-phase	B	Built-in	28.0	230	7.5	220	10.0	230	10.0
CFW701B33P5T2DB55C3	Three-phase	B	Built-in	33.5	230	9.2	220	10.0	230	10.0
CFW701C45P0T2DB55C3	Three-phase	C	Built-in	45.0	230	11.0	220	15.0	230	15.0
CFW701C54P0T2DB55C3	Three-phase	C	Built-in	54.0	230	15.0	220	20.0	230	20.0
CFW701C70P0T2DB55C3	Three-phase	C	Built-in	70.0	230	22.0	220	25.0	230	25.0
CFW701D86P0T2DB55C3	Three-phase	D	Built-in	86.0	230	22.0	220	30.0	230	30.0
CFW701D0105T2DB55C3	Three-phase	D	Built-in	105.0	230	30.0	220	40.0	230	40.0
CFW701E0142T2NB55C3	Three-phase	E	Not included	142.0	230	45.0	220	60.0	230	50.0
CFW701E0180T2NB55C3	Three-phase	E	Not included	180.0	230	55.0	220	75.0	230	60.0
CFW701E0211T2NB55C3	Three-phase	E	Not included	211.0	230	55.0	220	75.0	230	75.0
CFW701B03P6T4DB55C3	Three-phase	B	Built-in	3.6	415	1.5	460	2.0	460	2.0
CFW701B05P0T4DB55C3	Three-phase	B	Built-in	5.0	415	2.2	460	3.0	460	3.0
CFW701B07P0T4DB55C3	Three-phase	B	Built-in	7.0	415	3.0	460	5.0	460	3.0
CFW701B10P0T4DB55C3	Three-phase	B	Built-in	10.0	415	4.0	460	7.5	460	5.0
CFW701B13P5T4DB55C3	Three-phase	B	Built-in	13.5	415	5.5	460	10.0	460	7.5
CFW701B17P0T4DB55C3	Three-phase	B	Built-in	17.0	415	5.5	460	10.0	460	10.0
CFW701B24P0T4DB55C3	Three-phase	B	Built-in	24.0	415	9.2	460	20.0	460	15.0
CFW701B31P0T4DB55C3	Three-phase	B	Built-in	31.0	415	11.0	460	25.0	460	20.0
CFW701C38P0T4DB55C3	Three-phase	C	Built-in	38.0	415	15.0	460	30.0	460	25.0
CFW701C45P0T4DB55C3	Three-phase	C	Built-in	45.0	415	18.5	460	30.0	460	30.0
CFW701C58P5T4DB55C3	Three-phase	C	Built-in	58.5	415	22.0	460	50.0	460	40.0
CFW701D70P5T4DB55C3	Three-phase	D	Built-in	70.5	415	30.0	460	60.0	460	50.0
CFW701D88P0T4DB55C3	Three-phase	D	Built-in	88.0	415	37.0	460	75.0	460	60.0
CFW701E0105T4NB55C3	Three-phase	E	Not included	105.0	415	45.0	460	75.0	460	75.0
CFW701E0142T4NB55C3	Three-phase	E	Not included	142.0	415	55.0	460	125.0	460	100.0
CFW701E0180T4NB55C3	Three-phase	E	Not included	180.0	415	75.0	460	150.0	460	150.0
CFW701E0211T4NB55C3	Three-phase	E	Not included	211.0	415	90.0	460	150.0	460	150.0

Notes: 1) Motor powers are reference values valid for WEG 4-pole, 60 Hz, 220/380/440/575 V standard motors.
2) Frames B and C available in plastic enclosures, frames D and E in metal enclosures.
3) The brake IGBT on frame E inverters may be internally mounted by adding DB to the smart code or externally mounted by adding NB to the smart code and using the DBW03 external accessory.
4) If an input switch disconnector is required, add "DS" to the end of the code. Available for IP55 models only.

Accessories and Optionals

The CFW701 series was developed to meet the hardware configurations required by a wide range of applications. The table below shows the available options:

Option	Type[1]	Description	Optional item code[2]	Accessory code	Available
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. To select the braking resistance, refer to the CFW701 user manual	DB	-	Factory installation only
Degree of protection	Optional	For an IP20 product according to IEC standards. This version does not come with a KIP21X or KN1X kit inside the product box	20[3]	-	-
		For an IP55 product, according to IEC and NEMA standards	55	-	Factory installation only
	Accessory	For an IP21 product according to IEC standards. This version comes with a KIP21X kit inside the product box but not installed on the CFW701	21[4]	KIP21A-01 (frame size A) KIP21B-01 (frame size B) KIP21C-01 (frame size C) KIP21D-01 (frame size D)	User installation[4]
		For a NEMA1 product according to NEMA standards. This product comes with a KN1X kit inside the product box but not installed on the CFW701	N1[5]	KN1A-02 (frame size A) KN1B-02 (frame size B) KN1C-02 (frame size C) KN1E-01 (frame size E - 105 A and 142 A) KN1E-02 (frame size E - 180 A and 211 A)	User installation[5]
Safety stop	Optional	After the activation of the safety stop function, the PWM pulses in the output of the drive are blocked. It is according to ISO 13849-1 and EN ISO 13849-1	Y1	-	Factory installation only
24 V dc external power supply for feeding control circuit	Optional	It is a board on the power circuit containing a DC converter with a 24 V dc input and outputs suitable to supply voltage to the control circuit of CFW701	W1	-	Factory installation only
Relay output module	Accessory	A relay output expansion module - CCK-01, which has two relay outputs with reversible contacts and capacity of 1 A / 250 V for each contact	-	CCK-01	User installation
Flash memory module	Accessory	Used to download the programming of a CFW701 to others (copy function)	-	MMF-02	User installation
Mounting frame for remote keypad	Accessory	Used to transfer the keypad to the panel door or machine console. Maximum distance of 10 m. Degree of protection IP56	-	RHMIF-03	User installation
Cables for remote keypad	Accessory	Used to connect the CFW701 to the remote keypad (CAB-RS-XM)	-	CAB-RS-XM, where cables with lengths (X) of 1, 2, 3, 5, 7.5 and 10 meters	User installation

Notes: 1) Optional = hardware resources added to the CFW701 in the manufacturing process. Accessory = hardware resource requested as a separated item.
　　　 2) Request the product according to the Product Coding table.
　　　 3) If you have N1 or 21 version, the VSD can be used as IP20 without installing the KIP21X and/or KN1X kit.
　　　 4) Frame size E is IP21 as standard without KIP21X kit.
　　　 5) Frame size D is NEMA1 as standard without KN1X kit.

Dimensions and Weights

| Frame	Height mm (in)[3]			Width mm (in)		Depth mm (in)		Weight kg (lb)		
Size	IP20	NEMA1	IP55	IP20 / NEMA1	IP55	IP20 / NEMA1	IP55	IP20	NEMA1	IP55
A	269 (10.60)	305 (12.02)	-	145 (5.71)	-	227 (8.94)	237 (9.33)	6.3 (13.9)	7.1 (15.7)	-
B	316 (12.42)	351 (13.82)	529 (20.83)	190 (7.46)	273 (10.75)	227 (8.94)	237 (9.33)	10.4 (22.9)	11.3 (24.9)	17 (37.4)
C	405 (15.94)	448.1 (17.64)	670 (26.38)	220 (8.67)	307 (12.09)	293 (11.52)	306 (12.05)	20.5 (45.2)	21.4 (47.2)	30 (66.1)
D	550 (21.65)	550 (21.65)	754 (29.69)	300 (11.81)	375 (14.76)	305 (12.00)	301 (11.86)	32.6 (71.8)	32.6 (71.8)	49 (108.02)
E	675 (26.57)	1)	1000 (39.3)	335 (13.2)	430 (16.93)	358 (14.1)	389 (15.31)	65 (143.3)	2)	96 (211.64)

Notes: 1) 28.94 (735) = 0142 T2, 0105 T4, 0142 T4 and T5 models;
　　　　 32.63 (828.9) = 0180 T2/T4, 0211 T2/T4.
　　　 2) 67.12 (147.97) = 0142 T2, 0105 T4, 0142 T4 and T5 models;
　　　　 69.3 (152.78) = 0180 T2/T4, 0211 T2/T4.
　　　 3) Height does not consider the power shielding terminals.

Block Diagram
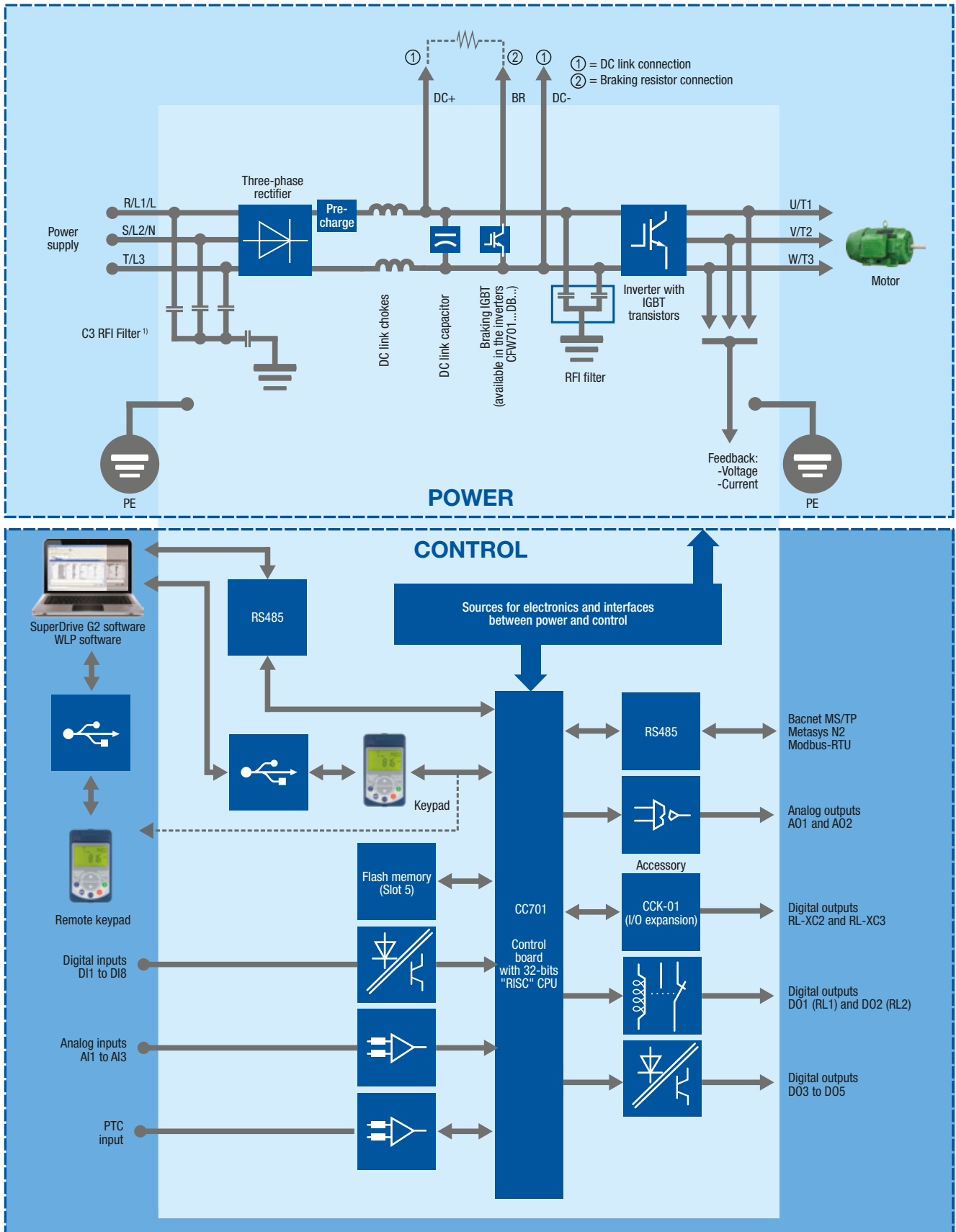
Note: 1) The capacitor against the ground filter C3 (in the models size A, it is possible to meet category C2) must be disconnected for IT networks and grounded delta. Refer to the input connections on CFW701 user manual.

VSD Comparison

			CFW701	CFW501
Power data	220-240 V ac (-15% / +10%)	Single-phase	1.1 to 2.2 kW (1.5 to 3 HP)	✖
		Three-phase	1.1 to 55 kW (1.5 to 75 HP)	0.18 to 5.5 kW (0.25 to 7.5 HP)
	380-480 V ac (-15% / +10%)	Three-phase	1.5 to 132 kW (2 to 175 HP)	0.18 to 15 kW (0.25 to 20 HP)
	500-600 V ac (-15% / +10%)		2 to 110 kW (1.5 to 150 HP)	✖
	Number of connections		< 60/h	< 10/h
	Frequency		50 to 60 Hz (48 to 62 Hz)	
	Phase imbalance		≤ 3% of the rated phase-to-phase input voltage	
	Typical efficiency		≥ 97%	
	Built-in disconnect switch		O	✖
Control	Method	V/f (Scalar)	✔	✔
		VVW	✔	✔
		Sensorless vector	✔	✖
	Output frequency		0 up to 3.4 x the rated motor frequency[1]	0 to 500 Hz, resolution of 0.015 Hz
	Switching frequency		1.25 to 10 kHz (according to inverter model)	2.5 to 15 kHz (all models)
Performance	Normal duty (ND)		110% (1min) / 10 min	110% (1min) / 6 min
	Heavy duty (HD)		150% (1min) / 10min	✖
	Aceleration time		0.1 to 999s	
	Deceleration time		0.1 to 999s	
HVAC-R functions	Fire mode		✔	✔
	Bypass		✔	✔
	Short cycle protection		✔	✔
	Sleep / Wake-up modes		✔	✔
	Broken belt		✔	✔
	Dry pump		✔	✔
	Energy saving mode		✔	✔
	Filter maintenance alarm		✔	✔
	PTC monitoring		✔	✔
	Harmonic mitigation		✔[2]	✔
	Advanced external PID controllers		2 loops	1 loop
Safe torque off	STO		O	✖
Braking methods	Dynamic braking capacity		✔[3]	✔[4]
	Optimal braking		✔	✖
	DC braking		✔	✔
I/Os	Inputs	Digital	NPN / PNP	8	4
		Analog	3 (0-10 V, -10 to 10 V or 0 / 4-20 mA)	2 (0-10 V, -10 to 10 V or 0 / 4-20 mA)
	Outputs	Digital	Relay NO / NC	2 (240 V ac / 0,75 A)	2 (240 V ac / 0,5 A)
			Open drain	3 (24 V / 80 mA)	1 (24 V / 150 mA)
		Analog	2 (0-10 V or 0 / 4-20 mA) not isolated	2 (0-10 V or 0 / 4-20 mA) not isolated
	24 V power supply capacity		500 mA	150 mA
	STO		O	✖
Communication	RS485	Modbus-RTU	✔	✔
		BACnet MS/TP	✔	✔
		Metasys N2	✔	✔
	USB		✔	✖
Protection degree	IP20		✔	✔
	IP21		O	✖
	NEMA 1		O	A
	IP55		✔	✖
Environment conditions	Inverter surrounding temperature		-10 °C up to 50 °C[5]	0 °C up to 50 °C[5]
	Humidity		from 5% to 95% non-condensing	
	Altitude		0 to 1,000 m without derating	
			From 1,000m up to 4,000 m with current reduction of 1% for each 100 m	
			From 2,000 m to 4,000 m above sea level - maximum voltage reduction (240 V for 200...240 V models, 230 V for 220...230 V models, 480 V for 380...480 V models and 600 V for 500 ...600 V models) of 1.1% for each 100 m above 2,000 m	
	Conducted emission level		C3 = according to category 3 (C3) of IEC 61800-3, with built-in C3 RFI filter	
	Coating class of electronic boards		Protection class 3C2 - Standard coating on the internal circuits, according to IEC 60721-3-3 (standard model)	
			Protection class 3C3 - Extra coating - optional, according to IEC 60721-3-3 (optional)	
Certification			UL, CE, C-Tick, Iram, Ghost, BTL	UL, CE, C-Tick, Iram, Ghost, BTL

✔ Available as standard	A Available with an accessory	O Available as an optional version	✖ Not available

Notes: 1) The rated motor frequency can vary depending on the VSD model and the chosen control mode. The maximum output frequency is also limited by the switching frequency. For more details, please check the User's Manual of the referred product.
2) DC link chokes built-in, no need for line reactor.
3) Braking IGBT available as standard for frame sizes A, B, C and D for 460 V and D for 660 V. For frame E models, please insert "DB" in smart code.
4) Standard for frames B, C and D.
5) The maximum ambient temperature can vary depending on the VSD model and installation. For more details, please check the User's Manual of the referred product.

Standards

Safety standards	UL 508C	Power conversion equipment.
	UL 840	Insulation coordination including clearances and creepage distances for electrical equipment.
	EN 61800-5-1	Safety requirements electrical, thermal and energy.
	EN 50178	Electronic equipment for use in power installations.
	EN 60204-1	Safety of machinery. Electrical equipment of machines. Part 1: General requirements. *Note: For the machine to comply with this standard, the manufacturer of the machine is responsible for installing an emergency stop device and equipment to disconnect the input power supply.*
	EN 60146 (IEC 146)	Semiconductor converters.
	EN 61800-2	Adjustable speed electrical power drive systems - Part 2: General requirements - Rating specifcations for low voltage adjustable frequency AC power drive systems.
Electromagnetic Compatibility (EMC) Standards	EN 61800-3	Adjustable speed electrical power drive systems - Part 3: EMC product standard including specifc test methods.
	EN 55011	Limits and methods of measurement of radio disturbance characteristics of industrial, scientifc and medical (ISM) radio-frequency equipment.
	CISPR 11	Industrial, scientifc and medical (ISM) radio-frequency equipment - Electromagnetic disturbance characteristics - Limits and methods of measurement.
	EN 61000-4-2	Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 2: Electrostatic discharge immunity test.
	EN 61000-4-3	Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 3: Radiated, radio-frequency, electromagnetic feld immunity test.
	EN 61000-4-4	Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test.
	EN 61000-4-5	Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 5: Surge immunity test.
	EN 61000-4-6	Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 6: Immunity to conducted disturbances, induced by radio-frequency fields.
Mechanical construction standards	EN 60529	Degrees of protection provided by enclosures (IP code).
	UL 50	Enclosures for electrical equipment.

Sustainability

Sustainability has been an integrated part of WEG's philosophy since its foundation. That is why awareness with environment protection has been a **major concern** in the company for the **responsible use of natural resources**.

Half of the energy produced around the world is used to operate pumps, while one third of the world's population live in areas experiencing water shortages. It is internationally recognized that the effective use of electric power significantly reduces environmental impacts and helps to guarantee the sustainable use of natural resources for future generations.

Guarantee the lowest environmental impact of our products and manufacturing processes by:

 Being in compliance with the applicable environmental legislation

 Improving continuously by establishing environmental goals and targets

 Acting preventively with the aim of protecting the environment

 Ecoefficient processes and products, saving natural resources

Certifications
ISO 50001:2011
ISO 14001:2014
ISO 9001:2008
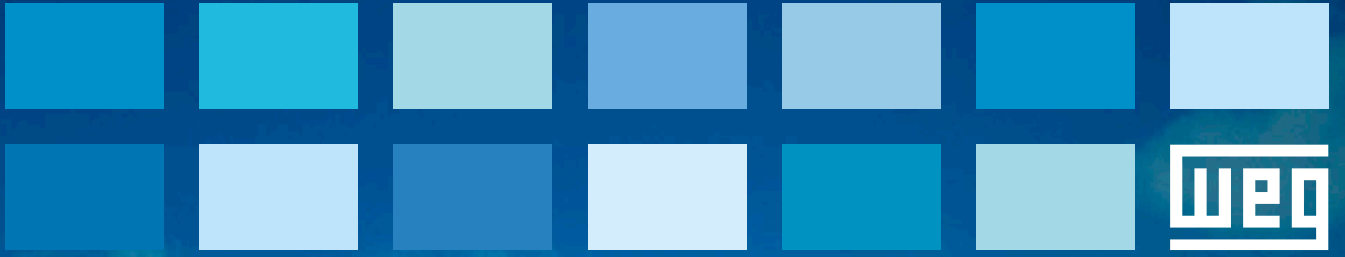
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FOR **INNOVATIVE**
PROJECTS

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Availability is to have a global support network

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Competitive edge is to unite technology and inovation

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High performance and reliable products to improve your production process.

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