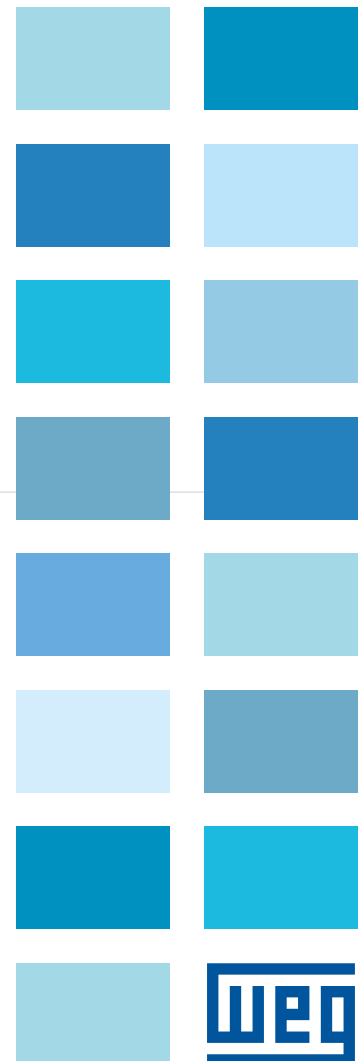
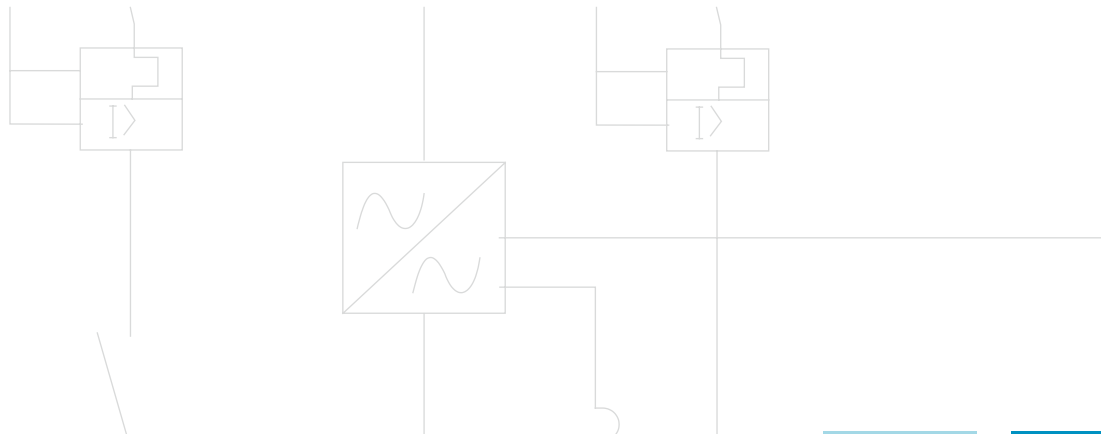
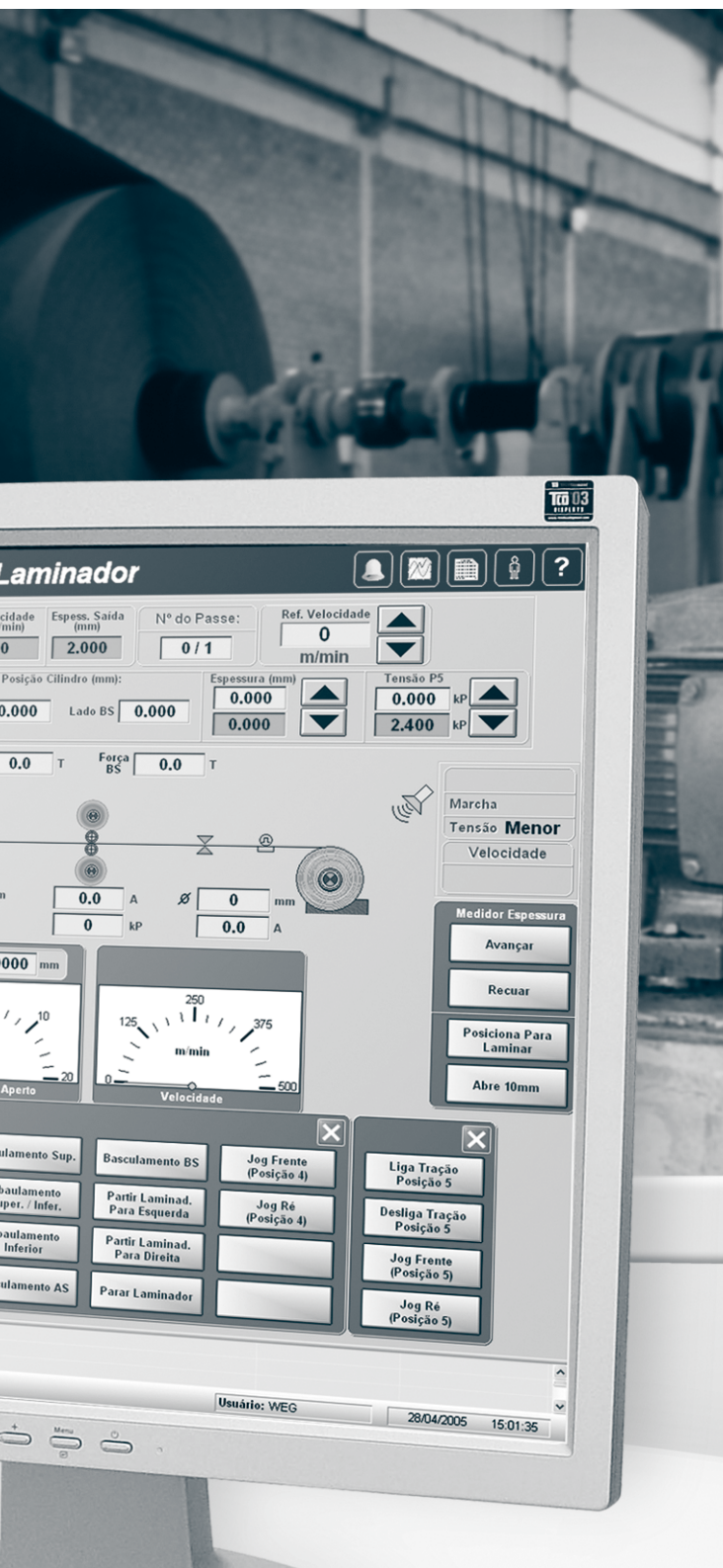


Automation

Variable Speed Drives



VSD



VSDs are intended for speed control of three-phase induction motors in a wide variety of industrial applications. The WEG VSD series offer state-of-the-art technology in motor control with a modern design, great number of features, and easily installed and operated.

These products are designed with high-software optimization and are easily set through a simple Human-Machine Interface. Additionally, they comprise functions and resources that allow protection and control of electric motors extremely easily and efficiently. They are suitable to operate with scalar or vectorial control.



CFW-08

The WEG CFW-08 VSDs are intended for speed control of three-phase induction motors. These VSDs incorporate the most advanced technology features in a compact product, besides a set of special functions that are available. WEG CFW-08 VSDs are easy to install and operate. They are equipped with an optimized software that can be easily set through a keypad, which enables them to process and control most of industrial machines. In addition, the CFW-08 Plus is equipped with dead time compensation technique, thus avoiding motor instability and providing increase of torque at low speeds.

Standard Features

- DSP (Digital Signal Processor) control provides a reasonable improvement of inverter performance
- State-of-the-Art Technology with the newest generation of IGBTs
- Electronics with SMT components
- Scalar (V/F) or sensorless vector control
- Sinusoidal PWM modulation- Space Vector Modulation
- Latest generation IGBT modules
- Considerable motor noise reduction
- Interface with membrane keypad (standard and remote HMI)
- Flexible programming
- Compact dimensions
- Easy installation and operation
- High starting torque
- Conduit installation kit
- Optional internal (class A) and external (class B) EMC filters

Main Applications

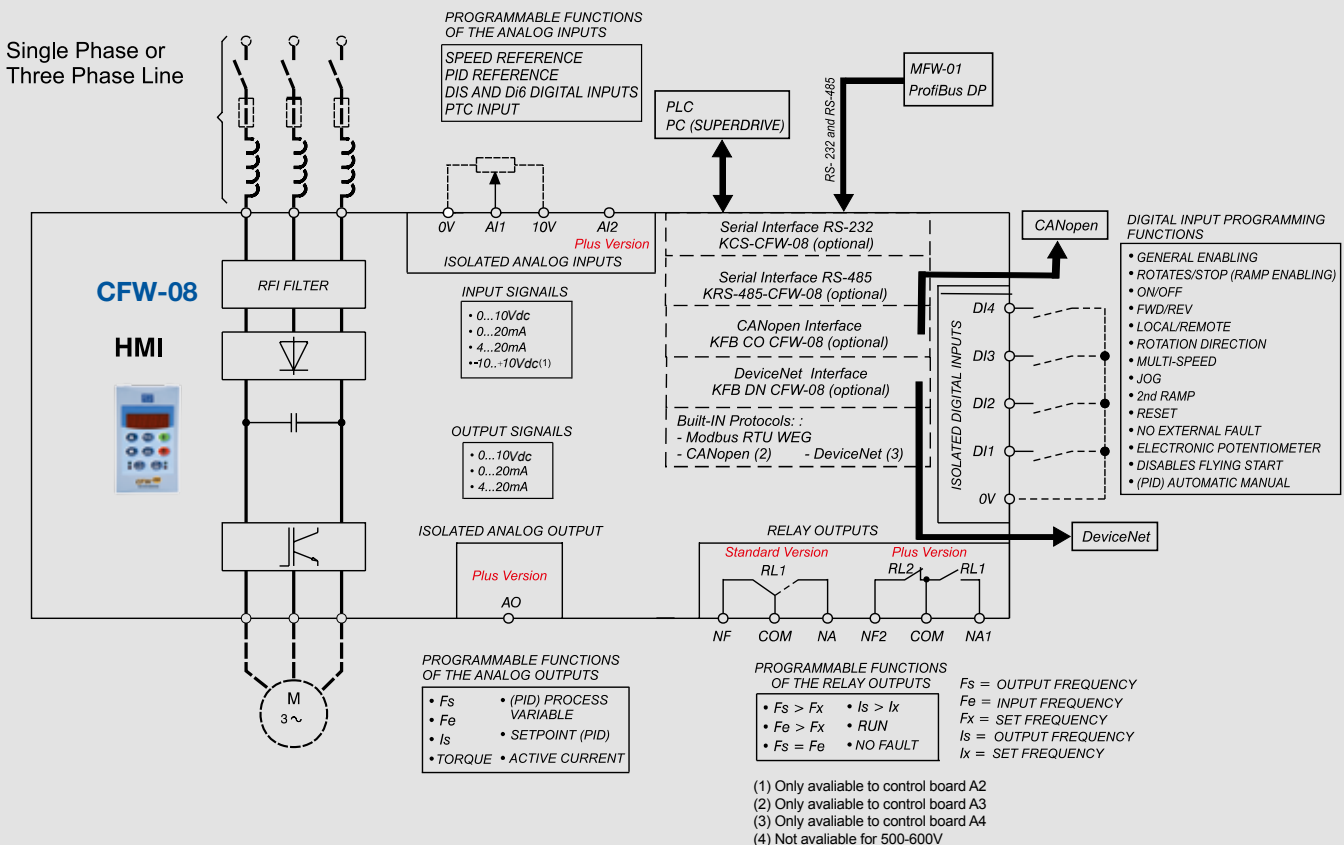
- Centrifugal pumps
- Process pumps
- Fans / Exhausters
- Stirrers / Mixers
- Extruding machines
- Conveyors
- Roller tables
- Granulators / Peletizers
- Driers / Rotating ovens
- Rotating filters
- Winding / Unwinding machines
- Cutting and welding machines



Certifications



Block Diagram



CFW-08 - Specification Table

Power Supply Voltage	Power Supply	CFW-08 DRIVES				Maximum Applicable Motor			Dimensions (mm)			Weight (Kg)			
		Model	Dynamic Braking	Current (A)	Size	Voltage (V)	Power rating		H	W	D				
							HP	kW							
200/220/230/240V	Single-Phase	CFW080016S2024ESZ	No	1.6	1	230	0.25	0.25	151	75	131	1			
		CFW080026S2024ESZ	No	2.6	1		0.5	0.37							
		CFW080040S2024ESZ	No	4	1		1	0.75							
	Single-Phase or Three-Phase	CFW080016B2024ESZ	No	1.6	1		0.33	0.25	151	75	131				
		CFW080026B2024ESZ	No	2.6	1		0.5	0.37							
		CFW080040B2024ESZ	No	4	1		1	0.75							
		CFW080073B2024ESZ	Yes	7.3	2*		2	1.5					200	115	150
	CFW080100B2024ESZ	Yes	10	2*	3		2.2								
	Three-Phase	CFW080070T2024ESZ	No	7	1		2	1.5	151	75	131		1		
		CFW080160T2024ESZ	Yes	16	2*		5	3.7	200	115	150		2		
		CFW080220T2024ESZ	Yes	22	3*		7.5	5.5	203	143	165		2.5		
		CFW080280T2024ESZ	Yes	28	4*		10	7.5	290	182	196		6		
		CFW080330T2024ESZ	Yes	33	4*		12.5	9.5							
	380/400/415/440/480V	Three-Phase	CFW080010T2024ESZ	No	1		1	400/415	0.25	0.18	151		75	131	1
CFW080016T2024ESZ			No	1.6	1	0.5	0.37								
CFW080026T2024ESZ			No	2.6	1	1	0.75								
CFW080040T2024ESZ			No	4	1	2	1.5								
CFW080027T2024ESZ			Yes	2.7	2*	1.5	1.1		200	115	150	2			
CFW080043T2024ESZ			Yes	4.3	2*	2	1.5								
CFW080065T2024ESZ			Yes	6.5	2*	3	3								
CFW080100T2024ESZ			Yes	10	2*	6	4								
CFW080130T2024ESZ			Yes	13	3*	7.5	5.5		203	143	165	2.5			
CFW080160T2024ESZ			Yes	16	3*	10	7.5								
CFW080240T2024ESZ			Yes	24	4*	15	11		290	182	196	6			
CFW080300T2024ESZ			Yes	30	4*	20	15								
Three-Phase		CFW080010T2024ESZ	No	1	1	440	0.33		0.25	151	75	131	1		
		CFW080016T2024ESZ	No	1.6	1.6		0.75		0.55						
		CFW080026T2024ESZ	No	2.6	2.6		1.5		1.1						
		CFW080040T2024ESZ	No	4	4		2		1.5						
		CFW080027T2024ESZ	Yes	2.7	2.7		1.5		1.1	200	115	150		2	
		CFW080043T2024ESZ	Yes	4.3	4.3		2		1.5						
		CFW080065T2024ESZ	Yes	6.5	6.5		4		3						
		CFW080100T2024ESZ	Yes	10	10		6		4.5						
		CFW080130T2024ESZ	Yes	13	13		7.5		5.5	203	143	165		2.5	
		CFW080160T2024ESZ	Yes	16	16		10		7.5						
		CFW080240T2024ESZ	Yes	24	24		15		11.3	290	182	196		6	
		CFW080300T2024ESZ	Yes	30	30		20		15						
500-600V	Three-Phase	CFW080017T5060ESZ	Yes	1.7	3	525	1	0.75	203	143	165	2.5			
		CFW080030T5060ESZ	Yes	3.0			2	1.5							
		CFW080043T5060ESZ	Yes	4.3			3	2.2							
		CFW080070T5060ESZ	Yes	7.0			5	4							
		CFW080010T5060ESZ	Yes	10			7.5	5.5							
		CFW080012T5060ESZ	Yes	12			10	7.5							
500-600V	Three-Phase	CFW080017T5060ESZ	Yes	1.7	3	575	1	0.75	203	143	165	2.5			
		CFW080030T5060ESZ	Yes	3.0			2	1.5							
		CFW080043T5060ESZ	Yes	4.3			3	2.2							
		CFW080070T5060ESZ	Yes	7.0			5	3.7							
		CFW080010T5060ESZ	Yes	10			7.5	5.5							
		CFW080012T5060ESZ	Yes	12			10	7.5							

NOTE: The maximum motor power ratings listed above were based on WEG II and IV-pole motors. For motor with different number of poles (ex.: VI and VIII poles), other voltages (ex.: 220V, 380V and 460V) and/or motors from other manufacturers, specify the VSD through the rated motor current.
 *VSDs with sizes 2, 3 and 4 have rheostat breaking, only size 1 does not have it.

CFW-08 - Models and optional accessories

Standard



Standard Model with HMI- CFW08-P (Human Machine Interface)



Blank Keypad



Optional Model without HMI (with dummy cover/blank keypad)



Serial Interface Module RS-485



Optional Kit: Serial communication RS-485 (KRS-485-CFW08)



Serial Interface Module RS-232 HMI Remote Interface Module



Optional Kit: Serial communication RS-232 (KCS-CFW08)

Optional Kit: Serial, remote HMI interface (MIS-CFW08-RS)



Parallel HMI Remote Interface Module



Optional Kit: Parallel, remote HMI interface (MIP-CFW08-RP)



DIN Rail Mounting Base



Optional Kit: Din rail mounting base (KMD-CFW08-M1) (only for Size 1)



Connection in Metallic Conduit



Optional Kit: Connection in Metallic Conduit (NEMA 1/IP21) KN1-CFW08-MX available for sizes 1 and 2



Interface module KAC - 120



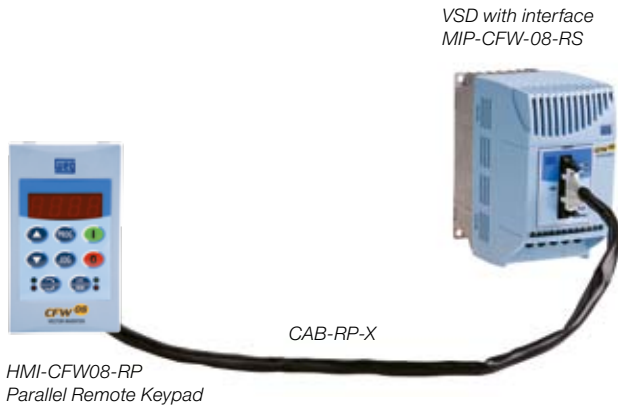
Optional Kit: Driving at 120 Vac of the digital inputs (KAC - 120 - CFW08)



CFW-08 - Remote Keypad

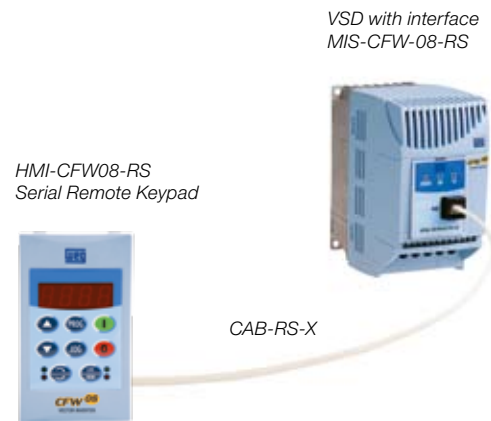
HMI remote on parallel

- It allows starting on panel door with maximum distance of 10m.

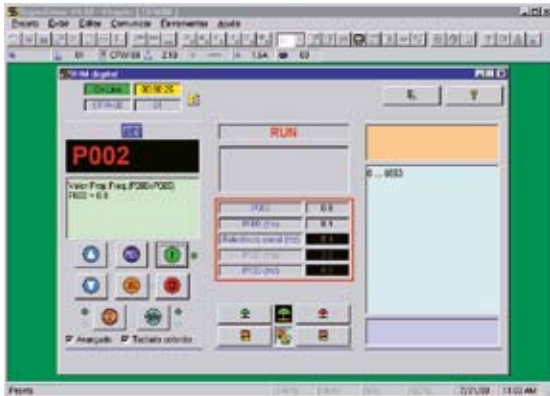


HMI remote serial

- It allows starting on panel door with maximum distance of 150m (Distance above 10m requires external source 12V / 250 mA).
- Copy function available



Superdrive



WEG Superdrive is a windows based software program that follows serial (RS 232 or RS 485) communication between a PC and all WEG Soft Starters and Variable Speed Drives (VSD). Superdrive is an excellent programming, documentation, and troubleshooting tool for WEG Starters and VSDs.

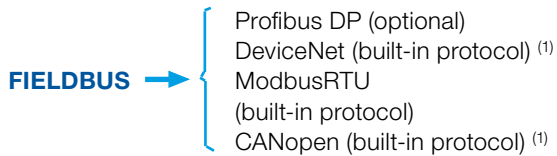
Superdrive is available for free download at www.weg.net. Hardware accessories may be required depending on the Soft Starter or VSD line.

Model with
SUPERDRIVE Kit
KSD-CFW08



CFW-08 - Fast network interconnection

CFW-08 Speed drives can be interconnected in “FieldBus” fast communication networks through the most wide spread, standard protocols. They can be:

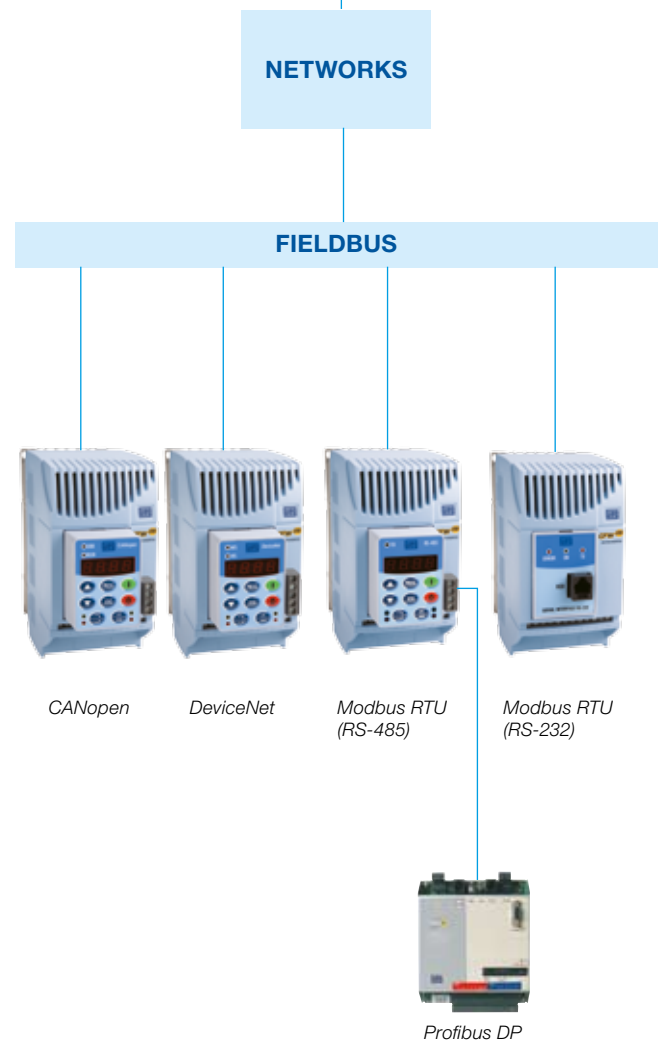


Intended mainly for the integration of large, industrial automation plants, the fast communication networks provide advantages in the supervision, monitoring and control of the drives. This provides high working performance and great operational flexibility, which are required characteristics in complex systems and / or integrated applications.

For the interconnection of the CFW-08 variable speed drives, the following options and characteristics can be used:

- Profibus DP: Communication uses a serial interface RS-232 (KRS-232-CFW08) or RS-485 (KRS-485-CFW08) switched to an MFW01 gateway for the Profibus DP.
- DeviceNet: Software available through the A4 control card and Device-Net interface (KFB-DN-CFW08) ⁽¹⁾
- CANopen: Software available through the A3 control card and CANopen interface (KFB-CO-CFW08) ⁽¹⁾
- Modbus - RTU: Software available through the A1 and A2 standard control cards and serial interface RS-232 (KCS-CFW08) or RS-485 (KRS-485-CFW08)

⁽¹⁾ Not available for 500-600V



CFW-08 - Multipump Drive

VSDs allow a system to maintain the line pressure in pipes completely constant, independently from fluctuations in outflow demand.

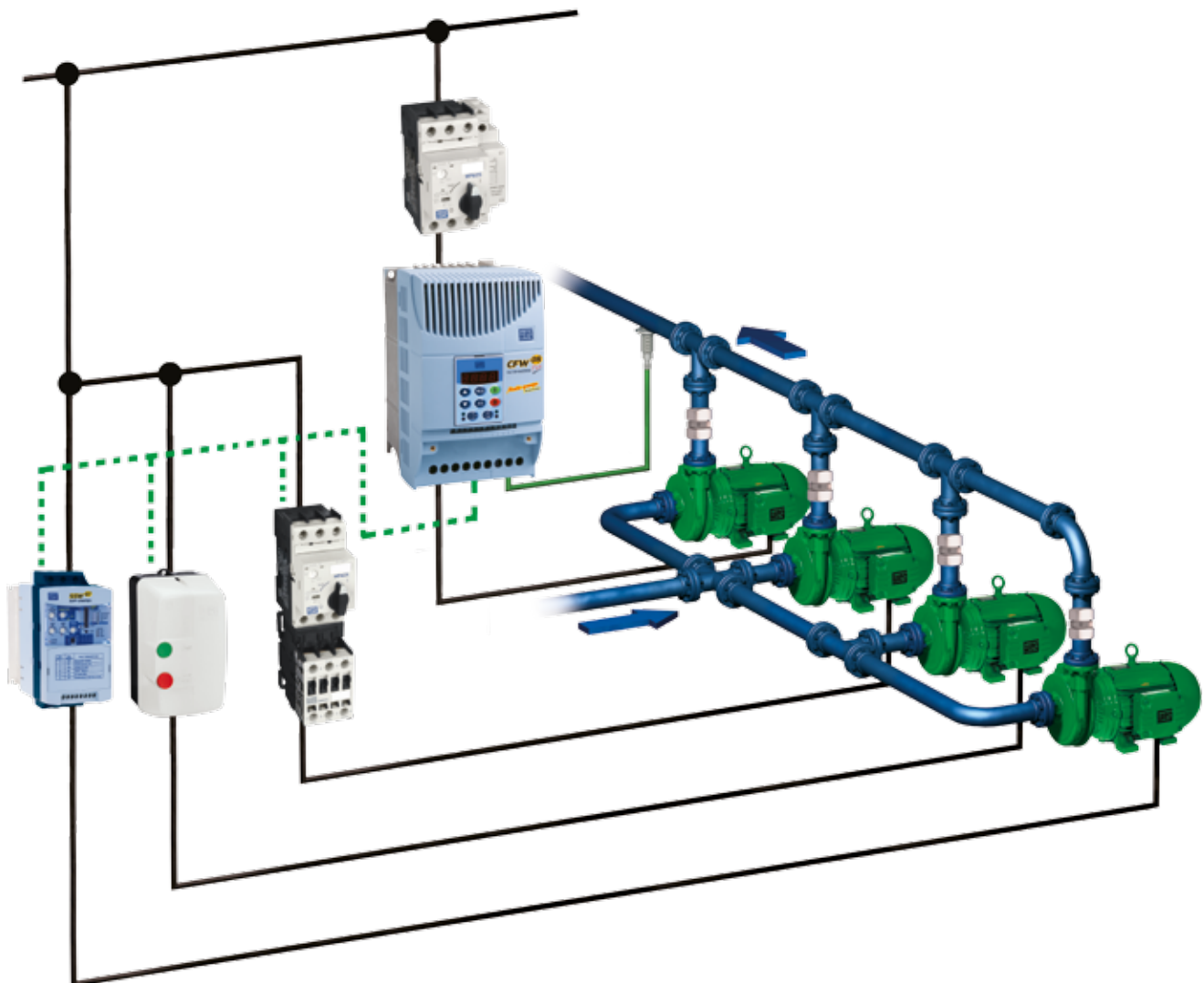
The Multipump Drive controls up to 4 pumps simultaneously. Another interesting function of the multipump drive is the intelligent start of the auxiliary pumps for their operation time is considered.

Besides controlling the pumps output pressure, the drive also monitors the suction pressure and the level of the capture reservoir.



Advantages of the multipump control

- Energy Savings;
- Longer lifetimes for the pumps;
- Maintains the line pressure constant;
- Provides the necessary outflow according to the demand of the system;
- Soft starts, protecting the mechanical and electrical installation;
- Alternation in running auxiliary pumps based on operating hours.



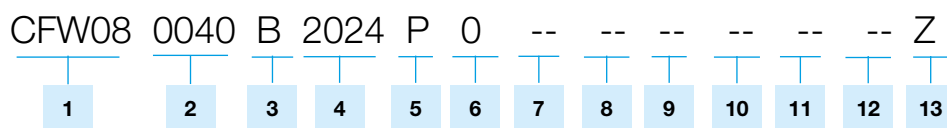
CFW-08 - Technical Data

Model		CFW-08 Standard	CFW-08 Plus
POWER SUPPLY	Voltage	Single-Phase	200-240V: 200/220/230/240 V (+10% - 15%)
		Three-Phase	200-240V: 200/220/230/240 V (+10% - 15%)
	Frequency		380-480V: 380 / 400 / 415 / 440 / 460 / 480 / 525 / 575 V (10% - 15%)
	Cos * (Displacement Power Factor)		50 / 60 Hz +/- 2 Hz (48...62 Hz)
ENCLOSURE	Drive	Standard	NEMA 1 in sizes 3 and 4and IP 20 in sizes 1 and 2
		Optional	NEMA 1 with optional kit for connection in metallic conduit (KN1-CFW08-MX)
	HMI	Optional	NEMA 12 Parallel, remote HMI (IP54) (HMI-CFW08-RS)
			NEMA 12 Serial, remote HMI (IP54) (HMI-CFW08-RS)
CONTROL	Power Supply Type		Switching power supply
	Control Method		DSP (Digital Signal Processor), 16 bits, sinusoidal PWM (Space Vector Modulation)
	Control Type		Imposed voltage - linear V/Hz or quadratic
	Switching Frequency		Sensorless vector control (WC: Voltage Vector Control)
	Frequency Range		IGBT Transistors - Frequencies: 2.5 / 5.0 / 10 / 15 kHz
	Frequency Resolution		0...300Hz
	Accuracy (25° C = 10°C)		Analog Ref.: 0.1% of Fmax. And digital ref.: 0.01 Hz (f<100Hz); 0.1 Hz (f>100 Hz)
PERFORMANCE	Overload capacity		150% during 60 sec. Every 10 min (1.5 x Rated Current.)
	Efficiency		>95%
	Speed control		Regulation: 1% of the rated speed with slip compensation
INPUTS	Analog	1 isolated input 0..10 V. 0/4...20 mA or - 10...+10V (AI1)1	2 isolated inputs 0..10, 0/4...20mA or - 10...+10V (AI1 e AI2)1
	Digital	4 Programmable isolated inputs - with NPN or PNP logic (DI1...DI4) 1 Isolated PTC input via AI1	2 Isolated PTC inputs via AI1 and AI2
OUTPUTS	Relay (2)	1 programmable output, 1 reversal contact (NU/NC)	2 Programmable outputs, 1 no and TNC
	Analog (2)	Programming options: Is > Ix; Fs > Fx; Fe > Fx; Fs = Fe; Run 1 Isolated analog output 0...10V, 0/4...20mA (8 bits)	
COMMUNICATION	Serial Interface	RS-232 or RS-485 (optional)	
	"Field Bus" Networks	Unit for ProfiBus DP Communication, DeviceNet (optional) and ModBus RTU (built-in)	
SAFETY	Protections	DC link overvoltage / undervoltage	
		Overtemperature	
		Output overcurrent	
		Motor overload (i x t)	
		Hardware fault, external fault and serial communication error	
		Output phase to phase and phase to ground short circuit	
		Programming fault and self-tuning error	
HUMAN-MACHINE INTERFACE (HMI)	Commands	On/Off , Parameter Setting (Programming of special functions)	
		Frequency Increment / Decrement (Speed)	
		JOG, Reversal of Direction of Rotation and Local /Remote Selection	
	Monitoring (Reading)	Motor Output Frequency (Hz)	
		DC Link Voltage (V)	
		Value proportional to the frequency (Ex.:RPM)	
		Heat Sink Temperature	
		Motor Output Current (A)	
		Motor Output Voltage (V)	
		Error / Fault Messages	
Load Torque			
ENVIRONMENT	Temperature	0 ... 40 °C (up to 50 °C with output current derating 2% / °C)	
	Humidity	5 ... 90% non condensing	
	Altitude	0 ... 1000 m (up to 4000 m with output current derating 10% / 1000 m)	
FINISHING	Color	Politherm 20 mt gray and Politherm 20 mt blue	
STANDARDS	Electromagnetic Compatibility	EMC Directive 89/336/EEC - Industrial Environment; EN 61800-3 (EMC - Emission and Immunity)	
	Low Voltage	LVD 73/23/EEC - Low Voltage Directive / UL 508C	
	IEC 146	Semiconductors converters	
	UL 508 C	Power conversion equipment	
	EN 50178	Electronic equipment for use in power installations	
CERTIFICATIONS	EN 61010	Safety requirements for electrical equipment for measurement, control and laboratory use	
	UL (USA) and cUL (CANADA)	Underwriters Laboratories Inc. / USA	
	CE (EUROPE)	SGS / England	
	IRAM (ARGENTINA)	Instituto Argentino de Normalización	
	C-Tick (AUSTRALIA)	Australian Communications Authority	

(1) Only available to control board .

(2) To control board A5 (multipump) there are 3 output by relays (contact N/A) there is not output analog.

CFW-08 - Coding



1 - CFW-08 Variable Speed Drives

2 - Output Rated Current:

200-240 V		380-480 V	
0016	1,6 A	0010	1,0 A
0026	2,6 A	0016	1,6 A
0040	4,0 A	0026	2,6 A
0070	7,0 A	0027	2,7 A
0073	7,3 A	0040	4,0 A
0100	10 A	0043	4,3 A
0160	16 A	0065	6,5 A
0170	17 A	0100	10 A
0220	22 A	0130	13 A
0280	28 A	0160	16 A
0330	33 A	0240	24 A
		0300	30 A

3 - Power Supply

S = single-phase
T = three-phase
B = single-phase or three-phase

4 - Power Supply Voltage

2024 = 200-240 V
3848 = 380-480 V
5060 = 500 - 600 V

5 - Manual Language

P = Portuguese
E = English
S = Spanish
G = German

6 - Options

S = Standard
O = Options

7 - Enclosure

Blank = standard
SI = without keypad

8 - Keypad/HMI

Em branco= standard
SI = without interface

9 - Control Board

Blank = standard (CFW-08 Standard)
A1 = control 1 (CFW-08 PLUS)
A2 = control 2 (CFW-08 Plus with bipolar analog inputs)
A3 = CANopen ⁽¹⁾
A4 = DeviceNet ⁽¹⁾
A5 = Pumps

10 - EMI Filter

Blank = without filter
FA = Internal Class A filter

11 - Special Hardware

Blank = not provided
Hx = X version special hardware

12 - Special Software

Blank = not provided
Sx = X version special software

13 - End of Code

Ex.: CFW080040B2024EOA1Z
VSD of CFW-08 series, 4.0 A, single-phase or three-phase at 200-240 Vac, manual in English and control board 1 (CFW-08 Plus).

⁽¹⁾ Not available for 500-600V

CFW-08 - Resources / Special Functions

Standard / Plus Features

- Incorporated Human-Machine Interface - 7 segment LED
- Programming enabling password
- Fault self-diagnosis and Auto-Reset
- Specific value indication (programmable) - (Ex.: m/min; rpm, etc)
- Slip compensation (U/F control)
- Manual and automatic torque boost
- Adjustable U/F curve
- Self-tuning (sensorless vector control)
- Dynamic braking
- JOG Function (transitory speed pulses)
- COPY Function via remote keypad (HMI-CFW08-RS)
- Linear, 'S' type and double ramps
- Acceleration and deceleration ramps (independent)
- DC braking (DC Current)
- Multi-Speed Function (up to 8 pre-programmable speeds)
- FWD/REV Selection
- Local/Remote Operation selection
- PID Regulator (automatic level, pressure control, etc)
- Running motor start (Flying Start)
- Rejection of critical or resonant frequencies (Skip Frequency)
- Operation during transitory line loss (Ride-through)
- Units for Fieldbus Communication:
 - Modbus RTU (built-in)
 - DeviceNet
 - CANopen
- Multipump control

Optional Features

- Parallel Remote Keypad (HMI) (7 segment LED) - HMI-CFW08-RP
- Serial Remote Keypad (HMI) (7 segment LED) - HMI-CFW08-RS
- Interface Module for Serial Remote Keypad (HMI) - MIS-CFW08-RS
- Interface Module for Parallel Remote Keypad (HMI) - MIP-CFW08-RP
- Interface Module for starting with diital entrances in 120 Vac - KAC - 120 - CFW08
- Interconnection Cable of the Serial Remote HMI (1; 2; 3; 5; 7.5 and 10 m) - CAB-RS-X
- Interconnection Cable of the Parallel Remote HMI (1; 2; 3; 5; 7.5 and 10 m) - CAB-RP-X
- Serial Communication module RS-232 - KCS-CFW08
- Serial Communication module RS-485 - KCS-485-CFW08
- CANopen Communication module KFB-CO-CFW08
- DeviceNet Communication module KFB-DN-CFW08
- ProfiBus DP Communication module KCS-CFW08 or KRS-485-CFW08 + MFM-01/PD
- RS-232 to RS-485 Converter (MCS-CFW08 Module required) - MIW-02
- Windows based programming software - SUPERDRIVE
- NEMA 1 Kit for metallic conduit connection - KN1-CFW08-MX
- Din rail mounting kit - KMD-CFW08-M1
- EMC Filter with high Attenuation Capacity (Class A - internal)
- EMC Filter with high Attenuation Capacity (Class B - external)



CFW-09



The WEG CFW-09 Series of Variable Speed Drives incorporate the world's most advanced technology in drives for three-phase AC induction motors.

The Vectrue Technology™ represents a significant advancement, allowing this generation of WEG VSD to combine V/F, Sensorless Vector and Closed Loop Vector (with encoder) control techniques, all in one product.

An innovation was also introduced to simplify applications that require braking torque. A new feature named Optimal Braking™ eliminates the need for the dynamic braking resistor in some applications allowing a simple, more compact and economical solution.



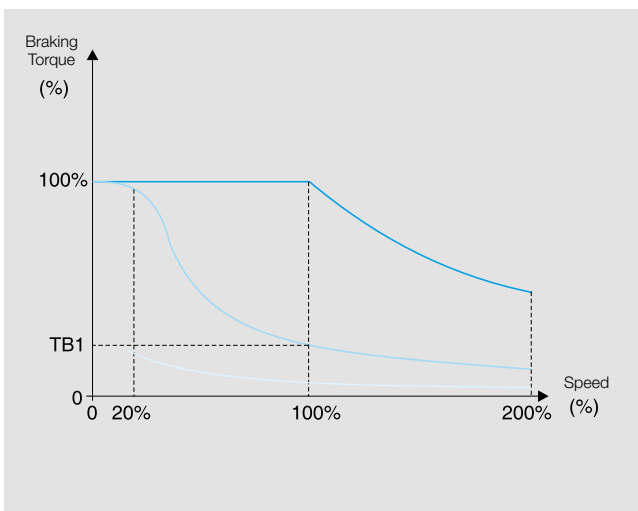
Vectrue Technology ®

This technology was developed by WEG for variable speed applications with three-phase AC induction motors providing the following advantages:




- V/ F or Vector Control modes via parameter selection;
- True Flux Vector Control in either open or closed loop vector modes;
- True Open Loop Vector Control with high torque and fast dynamic response, even at very low speeds;
- Self-tuning for automatic drive set-up to match the drive to motor and load in vector modes.

CFW-09 - Optimal Braking™

For applications requiring short stopping times and/or stops under high inertial loading, the traditional braking devices call for Dynamic Braking, in which the load kinetic energy is regenerated to the inverter DC link and the excess of which is dissipated in the form of heat in a braking resistor which is interlinked to the power circuit. The CFW-09 VSD has a built-in “Optimal Braking®” function, for the vector mode, enabling an optimal braking which can cater for many applications that could previously only be solved by dynamic braking. This technological innovation enables high dynamic performance activation/starts to be obtained with braking torques about 5 times the DC braking torque besides the great advantage of eliminating the need for a braking resistor. The graph shows the advantage of this new braking system “Optimal Braking®”, thereby ensuring an ideal solution for braking applications at low cost.



Typical Braking Torque x Speed curve for motors driven by the CFW-09

 Dynamic Braking Torque Curve
 “Optimal Braking”™ Torque Curve
 DC Braking Torque Curve

CFW-09 - Other Advantages

- High performance RISC 32 bit microprocessor;
- Vector and Scale Control with selection by parameter;
- Detachable SMART keypad with dual display (LCD and LED);
- Wide power range: 1.1.. 1,100 kW;
- Variable and Constant Torque ratings;
- Degree of Protection NEMA 1 / IP 20 standard up to 132kW, IP 20 up to 330kW and NEMA 4X / IP 56 in stainless steel enclosure up to 7.5kW;
- Compact design;
- Simplified installation and programming;
- Oriented start-up;
- Through surface mounting option;
- On/Off-line PC programming with SuperDrive software (Optional);
- DC bus connections available;
- Fieldbus network communication: Profibus DP or DeviceNet (optional). Modbus RTU (built-in) also available;
- International certifications including UL and cUL, CE, C-Tick and IRAM.



CFW-09 - Applications

Chemical and Petrochemical

- Fans / Exhausters
- Centrifugal Pumps
- Metering / Processing Pumps
- Mixers
- Compressors
- Extruders

Mining and Cement

- Fans / Exhausters
- Pumps
- Screeners
- Vibratory Feeders
- Crushers
- Dynamic Separators
- Conveyors
- Cement Ovens

Steel

- Fans / Exhausters
- Roller Tables
- Winders / Unwinders
- Overhead Cranes / Cranes
- Presses / Lathes / Milling Cutters
- Drillers / Grinders
- Laminators
- Cutting Lines
- Ingot Molding Lines
- Pipe Forming Machines
- Wire Drawing Machines
- Pumps

Lumber

- Veneer Lathes
- Chippers
- Plains
- Saws

HVAC

- Processing Pumps
- Fans / Exhausters
- Air Conditioners Units

Pulp and Paper

- Metering Pumps
- Processing Pumps
- Fans / Exhausters
- Agitators / Mixers
- Rotating Filters
- Rotating Ovens
- Scrap Conveyors
- Paper Machines
- Paper Rewinders
- Calenders

Sugar

- Sugar Centrifugal Pumps
- Process Pumps
- Conveyors
- Waste Dosers

Ceramic

- Fans / Exhausters
- Driers / Ovens
- Ball Mills
- Rollout Tables
- Enameling machine
- Conveyors

Beverage

- Metering / Processing Pumps
- Bottlers
- Mixers
- Roller Tables
- Conveyors

Plastic and Rubber

- Extruders
- Injection Machines
- Mixers
- Calenders / Pullers
- Winders / Unwinders
- Cutting and Welding Machines
- Granulators

Waste Water

- Centrifugal Pumps
- Booster Systems

Textile

- Mixers / Agitators
- Washers / Driers
- Looms
- Spinning Machines
- Carding Machines
- Warpers
- Winders

Food

- Metering / Process Pumps
- Fans / Exhausters
- Mixers
- Driers / Ovens
- Palletizers
- Monorails
- Conveyors

Glass

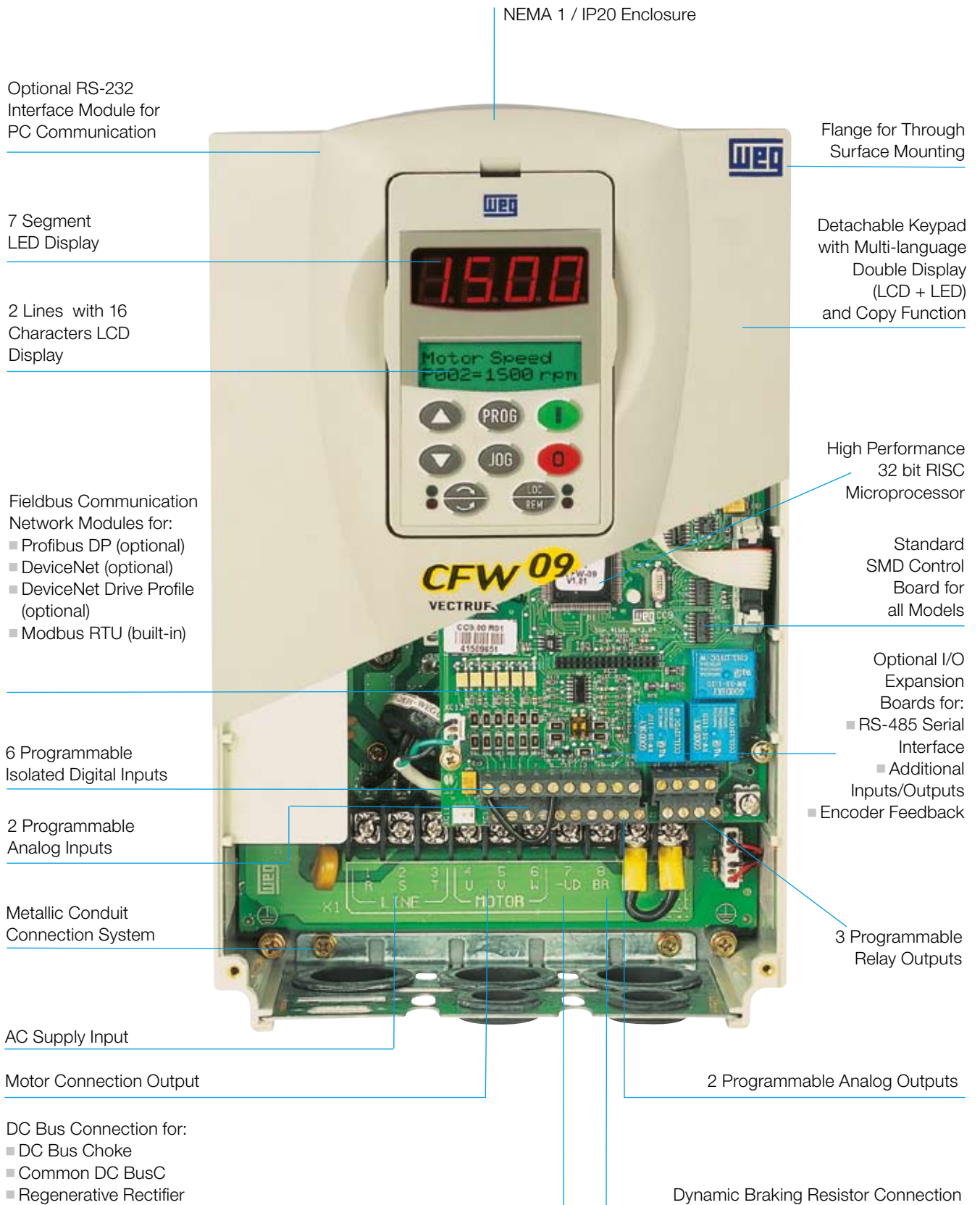
- Fans / Exhausters
- Bottlers
- Roller Tables
- Conveyors

Elevators

- Load Elevators
- Commercial Elevators
- Overhead Cranes
- Hoists



CFW-09 - A Complete, Flexible and Compact Product



NEMA 1 / IP20 Enclosure

Optional RS-232 Interface Module for PC Communication

Flange for Through Surface Mounting

7 Segment LED Display

Detachable Keypad with Multi-language Double Display (LCD + LED) and Copy Function

2 Lines with 16 Characters LCD Display

High Performance 32 bit RISC Microprocessor

- Fieldbus Communication Network Modules for:
- Profibus DP (optional)
 - DeviceNet (optional)
 - DeviceNet Drive Profile (optional)
 - Modbus RTU (built-in)

Standard SMD Control Board for all Models

6 Programmable Isolated Digital Inputs

- Optional I/O Expansion Boards for:
- RS-485 Serial Interface
 - Additional Inputs/Outputs
 - Encoder Feedback

2 Programmable Analog Inputs

Metallic Conduit Connection System

3 Programmable Relay Outputs

AC Supply Input

Motor Connection Output

2 Programmable Analog Outputs

- DC Bus Connection for:
- DC Bus Choke
 - Common DC BusC
 - Regenerative Rectifier

Dynamic Braking Resistor Connection

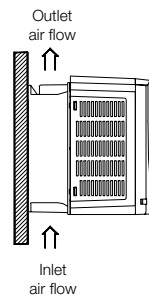
CFW-09 - Mounting Configurations



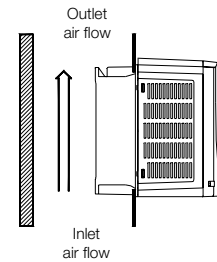
The CFW-09 allows flexible mounting configurations. Besides the traditional Base mounting, they allow flange mounting, where the heat sink is mounted at the back of the mounting plate.

As a result, the warm air generated by the power components inside the panel is so blown out that minimizes drive overheating, which is caused by heating sources inside the panel.

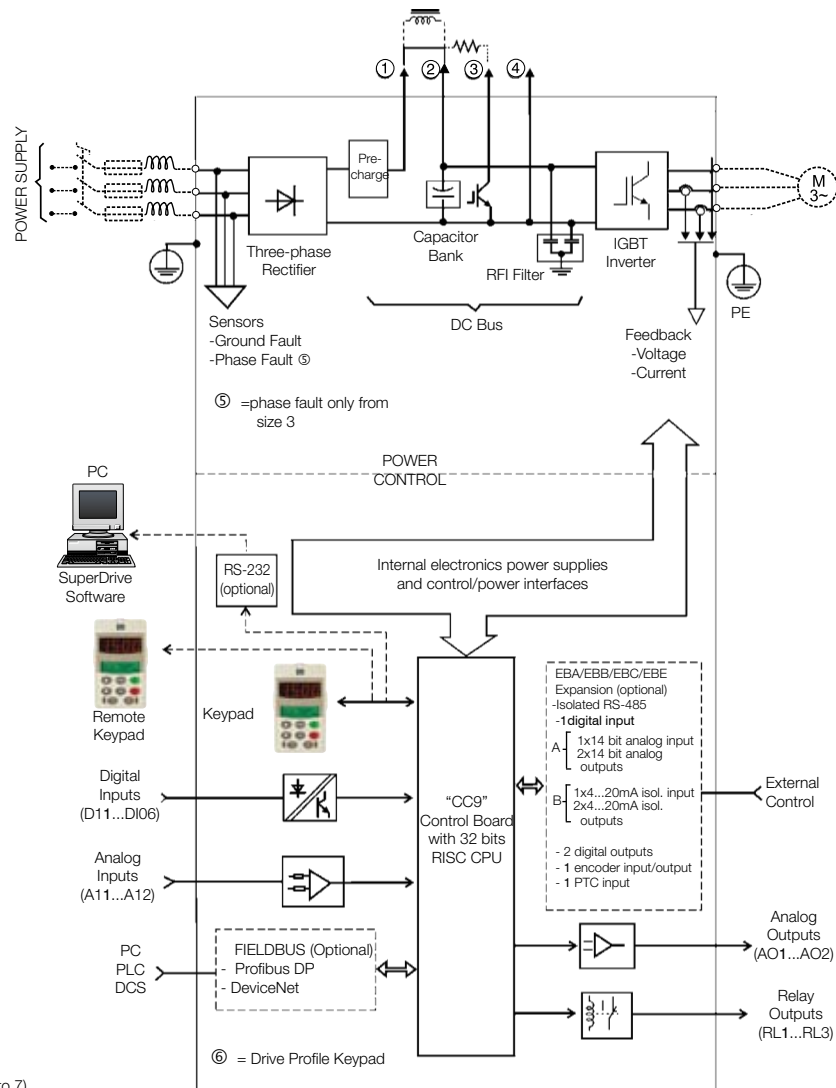
Base mounting



Flange mounting



Block Diagram



- ①e② = DC Bus Choke connection (Optional) (only from Size 2 and up)
- ②e④ = DC Bus Connection
- ②e③ = DB Resistor Connection (Up to Size 7 only. Option for Sizes 4 to 7)
- Ⓞ = Drive Profile Keypad

CFW-09 - Keypad

Intelligent Keypad

Intelligent operating interface with double display, LED (7 segment) and LCD (2 lines with 16 characters), providing optimum distant viewing along with a detailed description of all parameters and messages.

Selectable Language

The intelligent operating interface also allows the product user to choose the language to be used in programming, reading and presenting the parameters and alphanumerical messages through the LCD display.

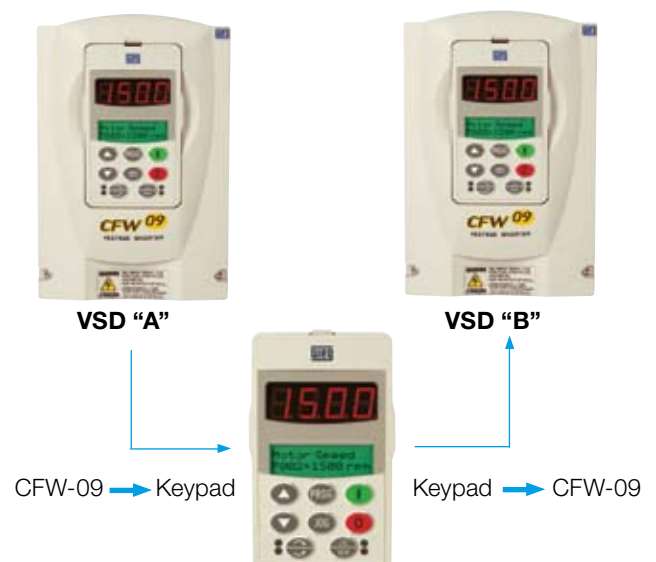
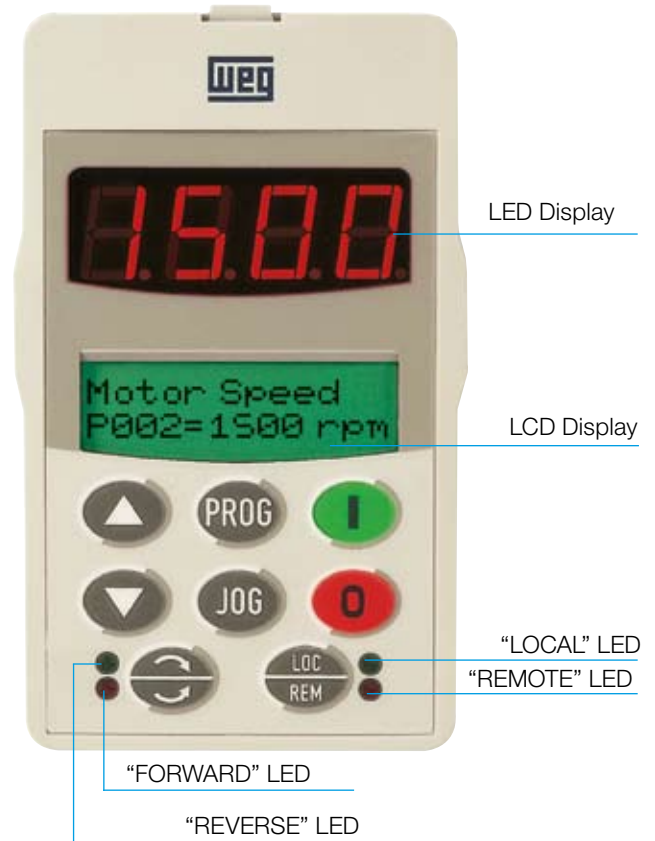
The product's high hardware and software capacity enables the user to use various languages such as Portuguese, English and Spanish so as to make it adaptable for users throughout the world.

Oriented Start-up

Frequency inverters are used for controlling the speed of induction motors, the adaptation and performance of which are directly related to its characteristics as well as to the power source network. The CFW-09 VSD have a built-in programming capability which has been specially designed for quick and easy start-up of the product, according to a guided and automatic sequence which leads the user through the sequential programming of the minimum parameters required for perfect adaptation of the drive to the activated motor.

COPY Function

This intelligent keypad also incorporates a "Copy Function", which allows copying parameters from one drive to others, providing easy and reliable programming repeatability for duplicate applications.



CFW-09 - Keypad Functions



Starts the drive via a controlled acceleration ramp.
When running switches the display indication:
→ rpm - Volts - Status - Torque - Hz - Amps →



Stops the drive via a controlled deceleration ramp.
Resets the inverter after a fault trip has occurred.



Increases the speed or parameter number/content.



Decreases the speed or parameter number/content.



Switches the display between the parameter number and its content (position/content) for programming.



While pressed the motor is run at JOG speed.



FWD/REV key. When pressed reverses the direction of rotation.



Selects the drive operating mode as Local or Remote.

Superdrive Programming Software

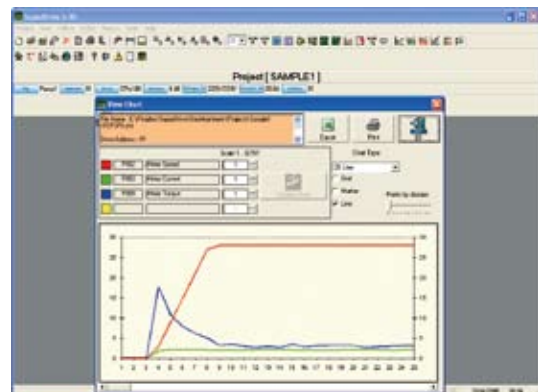
Windows Programming software via PC microcomputer, for parameterization, control and monitoring of CFW-09 drives. It allows editing of "on-line" parameters, directly on the drive or editing "off-line" parameter files, saved in the microcomputer.

It also allows storage of parameter files of all CFW-09 drives available on the installation.

The software also incorporates functions to transfer the set of parameters from the microcomputer to the drive, as well as from the drive to the microcomputer.

The communication between drive and microcomputer is made via serial interface RS-232 (point to point) or RS-485 for network interconnection.

Free software on the site www.weg.net



CFW-09 - Technical Data

POWER SUPPLY	Voltage	Three-phase:	220-230 V: 220 230 V (+10% -15%)	
			380 - 480 V: 380 / 400 / 415 / 440 / 460 / 480 V (+10%, - 15%)	
			500 - 600 V; 500 - 690 V; 660 - 690 V; 660/690 (+ 10%, -15%)	
	Frequency	50 / 60 Hz +/- 2 Hz (48 ... 62 Hz)		
Phase Unbalance	Up to 3%			
Cos (Displacement Power Factor)	Greater than 0.98			
ENCLOSURE	Degree of Protection	NEMA 1/IP 20 (sizes 1...8 and 8E), IP20 (sizes 9,10 and 10E) NEMA 4X IP 56 (modules up to 10HP)		
	Finishing Color	Plastic Cover - Light Gray PANTONE 413 C (sizes 1 and 2)		
		Metallic Cover and Sides - Light Gray RAL 7032 (sizes 3 to 10)		
		Base - Dark Gray RAL 7022 (sizes 3 to 10)		
CONTROL	Power Supply	Switched Mode Power Supply Fed from the DC Link		
	Microprocessor	32 bit RISC Technology		
	PWM Technique	SVM Sine wave PWM (Space Vector Modulation) Software Implemented Current flux and Speed Regulators (Full Digital)		
	Control Modes	V / F		
		Sensorless Vector (without encoder) Vector with Encoder		
	Switching Frequency	1.25 / 2.5 / 5.0 / 10 kHz		
	Frequency Range	0...1020 Hz for V / Hz Control		
		0...408 Hz for Vector Control		
	Overload Capacity	150% for 60 seconds every 10 minutes		
		180% for 1 second every 10 minutes		
Efficiency	Greater than 97%			
PERFORMANCE	Speed Control	V / F Mode	Regulation (with Slip Compensation) : 1% 01 Motor Rated Speed	
			Resolution: 1 rpm (Keypad Reference)	
		Speed Regulation Range: 1: 20		
		Sensorless Vector Mode	Regulation: 0.5% of Motor Rated Speed	
			Resolution: 1 rpm (Keypad Reference)	
		Speed Regulation Range: 1:100		
	Encoder Vector Mode	Regulation with:		
		10 bit Analogy Reference: +- 0.1% 01 Motor Rated Speed		
		14 bit Analogy Reference: +- 0.01% 01 Motor Rated Speed		
		Digital Reference (Ex: Keypad): + / - 0.01 % of Motor Rated Speed		
Torque Control	Vector Modes	Speed Regulation Range: Down to 0 rpm		
		Regulation: + - 10% of Motor Rated Torque		
		Range: 0 ... 150% 01 Motor Rated Torque		
CONTROL INPUTS	Analog	2 Programmable Differential Input (10 bit) : 0...10 V 0...20 mA or 4...20 mA		
		1 Programmable Bipolar Input (14 bit): -10 ... + 10 V 0...20 mA or 4...20 mA <D		
		1 Programmable Isolated Input (10 bit) : 0 ... 10 V 0...20 mA or 4...20 mA <D		
	Digital	6 Programmable Isolated Input: 24 Vdc		
Encoder	1 Programmable Isolated Input: 24 Vdc			
	1 Programmable Isolated Input: 24 Vdc (for Motor PTC Thermistor)			
COMMUNICATION	Serial	RS-232 with KCS-GFW09 Kn <D - RS-485 Isolated with EBA or EBB Board <D		
	Fieldbus	Protocolo Johnson Contols-N2 (optional) Modbus RTU Standard, Profibus DP, DeviceNet, EtherNet / IP, DeviceNet Drive Profile with KFB kits.		
SAFETY	Protections	D C Link Under Voltage	Output Short Circuit	
		D C Link Over Voltage	Output Ground Fault	
		Drive Over Temperature	External Fault	
		Motor Over Temperature	Self -diagnosis Fault	
		Output Over Current	Programming Error	
		Motor Overload (i x t)	Serial Communication Fault	
		Dynamic Braking Resistor Overload	Motor or Encoder Connection Fault	
		CPU / EPROM Error (watchdog)	Power Supply Ohase Fault (30 A and above models)	
		Encoder Fault	Keypad Connection Fault	
AMBIENT	Temperature	0°C (32°F)...40°C (104°F), up to 50°C (122°F) with 2% / °C (1,1% / °F) output current derating		
	Humidity	5...90% Non Condensing		
	Altitude	0...1000m (3300ft), up to 4000m (13100ft) with 10% / 1000m (3% / 1000ft) output current derating		
CONFORMITIES	EMC Directive 89 / 336 / EEC - EM 61800-3	Elec tromagnetie Compatibil -Industrial Environment - EMC - Emission and Immunity		
	LVD 73 / 23 / EEC	low Voltage Directive		
	IEC 146	Semiconductor drive		
	UL 508C	Power Conversion Enuinment		
	EN 50178	Electronic Equipment for Use in Power Installations		
CERTIFICATIONS	EN 61010	Safety Requirements for Electrical Equipment for Measurement Control and laboratory Use		
	UL (USA) and cUL (CANADA)	Underwriters laboratories Ine. USA		
	CE (EUROPE)	Phoenix Test-Lab GmbH – Germany (Competent Body)		
	IRAM (ARGENTINA)	Instituto Argentino de Normalización		
C-Tiek (AUSTRALIA) 2250/1132383	Australian Communications Authority			

CFW-09 - Technical Data

KEYPAD	Programming	General Drive Functions Programming			
	Controls	Start/Stop , Increase/Decrease Speed, JOG, FWD/REV and Local/Remote			
Monitoring		Speed Reference (rpm)	Output Current (A)		
		Motor Speed (rpm)	Output Voltage (Vac)		
		Speed Proportional Value (Ex: ft/min)	Drive Status		
		Output Frequency (Hz)	Digital Inputs Status		
		DC Link Voltage (Vdc)	Transistor Outputs Status		
		Motor Torque (%)	Relay Outputs Status		
		Output Power (kW)	Analog Inputs Value		
		Hours Powered Up (h)	Four Last Faults		
CONTROL FEATURES AND OPTIONS	Standard	Hours Enabled (h)			
		Fault Messages			
		Keypad with LCD + LED displays (HMI-CFW09-LCD)			
		Password to protect drive programming			
		LCD display language selection: English, Spanish and Portuguese			
		Control mode selection (via parameter); V / F, Sensorless Vector or Vector with Encoder			
		Fault auto-diagnosis and auto-reset			
		Parameters reset to factory or user default			
		Drive Self-tuning to motor and load (Vector Modes)			
		Specific unit indication (Ex: l/s, t/h, %, etc.)			
		Motor slip compensation (V / F Mode)			
		Manual and automatic Torque Boost (V / F Mode)			
		Adjustable V / F Curve (V / F Mode)			
		Minimum and maximum speed limits			
		Output current limit			
		Adjustable motor overload protection			
		Digital gain and offset adjustments for the analog inputs			
		Digital gain adjustment for the analog outputs			
		JOG function			
		JOG + I JOG - Function (momentary speed increase/decrease)			
		COPY Function (Drive © Keypad or Keypad © Drive)			
		Comparison functions for the digital outputs: N* > Nx; N > Nx; N < Nx; N = 0; N = N*; Is > lx ; Is < lx; T > Tx and T < Tx Where: N = Motor speed; N* = Speed reference; Is = Output Current and T = Motor torque			
		Linear and S independent acceleration and deceleration ramps, two sets of ramps			
		DC Braking			
		Optimal Braking (Vector Modes)			
		Built-in dynamic braking transistor – Models up to 45A/220-230V and up to 30A/380-480V and up to 14A/500-600V			
		Multi-speed function (up to 8 preset speeds)			
		Speed Profiling function			
		Hour meter and Wattmeter			
		Overlapping PID Regulator (for automatic control of level, pressure, flow, etc.)			
		FWD I REV selection			
		Local I Remote operation selection			
		Flying Start function (restart with the motor spinning)			
		Skip Speed (critical speed rejection)			
		Ride-Through (operation during momentary power loss)			
		Built-in dynamic braking transistor: Models: 6 ... 45 A / 220 - 230 V and 36 ... 30 A / 380 - 480 V			
		FieldBus communication: Modbus RTU built-in			
		Options	Simplified keypad (with LED display only)		HMI-CFW09-LED
			IP 55 Remote keypad (LED display only)		HMI-CFW09-LED-N4
			IP 55 Remote keypad (LCD + LED displays)		HMI-CFW09-LCD-N4
Remote Keypad cable (3.3, 6.6,10.16.25 and 35 ft)			CAB - HMI 09-X		
Blank Keypad for local installation			TCL - CFW09		
Blank Keypad for remote installation			TCR - CFW09		
Remote Keypad frame kit			KMR - CFW09		
I/O Expansion Boards			EBA .0X - CFW09		
			EBB .0X - CFW09		
			EBC1 .0X - CFW10		
			EBE1 .0X - CFW09		
FieldBus Communications kits (Mounted inside drive)	Profibus DP		KFB - PD		
	DeviceNet		KFB - DN		
	DeviceNet Drive Profile		KFB - DD		
	EtherNet I IP		KFB - EN		
VSD I PC Communication kit	Software SUPERDRIVE		KSD - CFW09		
	Conectores e Cabos				
	KCS - CFW09				
Intertace Serial Module RS-232			KCS - CFW09		
Built-in dynamic braking transistor Models: 54...130 A / 220-230 V and 38...142 A / 380-480 V			"DB" Models		
External dynamic braking module	Models 180...600A/220-230V e 380-480V		DBW - 01		
	Models 107...472A/500-690V		DBW - 02		
	Models 100...428A/660-690V				
Easy mounting kit with flange (for sizes 3...8)		KMF - CFW09			
Removable mounting kit (for sizes 9...10)		KME - CFW09			
Inductor kit for DC link (for sizes 2...8)		KIL - CFW09			
EMC filter with high attenuation capacity		RF			

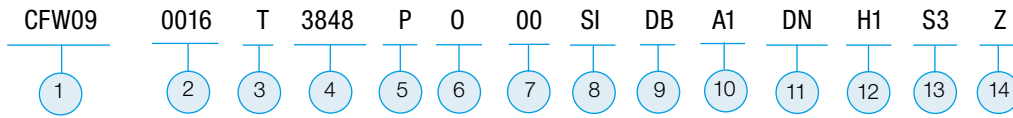
CFW-09 - Sizing Table

AC Power Supply Voltage	CFW-09 DRIVE				MAXIMUM APPLICABLE MOTOR				Size	
	Part Number CFW-09..	Built-In Dynamic	Rated Current (A)		Voltage (V)	Constant Torque		Variable Torque		
		Braking	CT*	VT*		KW	HP	KW		HP
220 / 230V	0006 T 2223 E S	Yes	6		230	1.1	1.5	1.1	1.5	1
	0007 T 2223 E S		7			1.5	2	1.5	2	
	0010 T 2223 E S		10			2.2	3	2.2	3	
	0013 T 2223 E S		13			2.2	3	2.2	3	
	0016 T 2223 E S		16			3.7	5	3.7	5	
	0024 T 2223 E S		24			5.5	7.5	5.5	5.5	
	0028 T 2223 E S		28			7.5	10	7.5	10	
	0045 T 2223 E S		45			11	15	11	15	
	0054 T 2223 E S	Optional Built-in	54	68		15	20	18.5	25	2
	0070 T 2223 E S		70	86		18.5	25	22	30	
	0086 T 2223 E S		86	105		22	30	30	40	5
	0105 T 2223 E S		105	130		30	40	37	50	
	0130 T 2223 E S		130	150		37	50	45	60	6
380 / 400 / 415 / 440 / 460 / 480 V	0003 T 3848 E S	Yes	3.6		400 / 415	1.1	1.5	1.1	1.5	1
	0004T 3848 E S		4			1.5	2	1.5	2	
	0005 T 3848 E S		5.5			2.2	3	2.2	3	
	0009 T 3848 E S		9			4	5.5	4	5.5	
	0013 T 3848 E S		13			5.5	7.5	5.5	7.5	
	0016 T 3848 E S		16			7.5	10	7.5	10	
	0024 T 3848 E S		24			11	15	11	15	
	0030 T 3848 E S		30			15	20	18.5	25	
	0038 T 3848 E S	Optional Built-in	38	45		18.5	25	22	30	2
	0045 T 3848 E S		45	54		22	30	22	30	
	0060 T 3848 E S		60	70		30	40	37	50	3
	0070T 3848 E S		70	86		37	50	45	60	
	0086 T 3848 E S		86	105		45	60	55	75	4
	0105 T 3848 E S		105	130		55	75	55	100	
	0142 T 3848 E S		142	174		75	100	90	125	5
	0180T 3848 E S	External DB Module	180			90	125	90	125	6
	0211 T 3848 E S		211			110	150	110	150	
	0240 T 3848 E S		240			132	175	132	175	
	0312 T 3848 E S		312			160	220	160	220	
	0361T 3848 E S		361			200	270	200	270	
	0450 T 3848 E S		450			260	340	260	340	
	0515 T 3848 E S		515			300	400	300	400	
	0600 T 3848 E S		600			350	430	370	430	
	0686 T 3848 E S	External DB Module	0686			355	600	475	600	7
	0855 T 3848 E S		0855			500	700	500	700	
	0979 T 3848 E S		0979			560	800	560	800	
	1140 T 3848 E S		1140			630	900	630	900	
1283 T 3848 E S	1283		710	1000	710	1000				
1468 T 3848 E S	1468		800	1250	800	1250				
1710 T 3848 E S	1710		1000	1500	1000	1500				
500/600V	0002 T 5060 E S	Yes	2.9	4.2	525	1.5	2.0	2.2	2.0	2
	0004 T 5060 E S		4,2	7		2.2	3	4.0	2.95	
	0007 T 5060 E S		7	10		4.0	5.5	5.5	3.0	
	0010 T 5060 E S		10	12		5.5	7.5	7.5	7.40	
	0012 T 5060 E S		12	14		7.5	10	9.2	10	
	0014 T 5060 E S		14	14		9.2	12.3	9.2	12.3	
	0022 T 5060 E S	Optional Built-in	22	27		15	20	18.5	20	4
	0027 T 5060 E S		27	32		18.5	25	22	25	
	0032 T 5060 E S		32	32		22	30	22	30	
	0044 T 5060 E S		44	53		30	40.2	37	40.2	
	0053 T 5060 E S	Optional Built-in	53	63		37	50	45	50	7
	0063 T 5060 E S		63	79		45	60.3	55	60.3	
	0079 T 5060 E S		79	99		55	73.7	75	73.7	

CFW-09 - Sizing Table

AC Power Supply Voltage	CFW-09 INVERTER				MAXIMUM APPLICABLE MOTOR				Size	
	Part Number CFW-09..	Built-In Dynamic	Rated Current (A)		Voltage (V)	Constant Torque		Variable Torque		
		Braking	CT*	VT*		KW	HP	KW		HP
500/600V	0107 T 5060 E S	External	107(100)	147(127)	525	75	100	90	100	8E
	0147 T 5060 E S		147(127)	196(179)		90	147.5	132	147.5	
	0211 T 5060 E S		211(179)	211(179)		150	201	150	201	
	0247 T 5060 E S		247(225)	315(259)		185	248	220	248	
	0315 T 5060 E S		315(259)	343(305)		220	295	260	295	10E
	0343 T 5060 E S		343 (305)	418(340)		260	350	315	350	
	0418 T 5060 E S		418(840)	472(428)		315	422	355	422	
	0472 T 5060 E S		472(428)	555(428)		355	475.7	400	475.7	
	0600 T 5060 E S		0600	450		600	450	600	-	
	0652 T 5060 E S		0652	500		650	500	650		
	0794 T 5060 E S		0794	600		850	600	850		
	0897 T 5060 E S		0897	630		950	630	950		
	0978 T 5060 E S		0978	710		1000	710	1000		
	1191 T 5060 E S		1191	900		1300	800	1300		
1345 T 5060 E S	1345	1120	1500	1120	1500					
500/600V	0002 T 5060 E S	Yes	2.9	4.2	575	1,5	2	2,2	3	2
	0004 T 5060 E S		4,2	7		2,2	3	3,7	5	
	0007 T 5060 E S		7	10		3,7	5	5,5	7,5	
	0010 T 5060 E S		10	12		5,5	7,5	7,5	10	
	0012 T 5060 E S		12	14		7,5	10	9,2	12,5	
	0014 T 5060 E S		14	14		11	15	11	15	
	0022 T 5060 E S	22	27	15		20	18,5	25	4	
	0027 T 5060 E S	27	32	18,5		25	22	30		
	0032 T 5060 E S	32	32	22		30	22	30		
	0044 T 5060 E S	44	53	30		40	37	50	7	
	0053 T 5060 E S	53	63	37		50	45	60		
	0063 T 5060 E S	63	79	45		60	55	75		
	0079 T 5060 E S	79	99	55		75	75	100		
	0107 T 5060 E S	107(100)	147(127)	75		100	110	150	8E	
	0147 T 5060 E S	147(127)	196(179)	110		150	150	200		
	0211 T 5060 E S	211(179)	211(179)	150		200	150	200		
	0247 T 5060 E S	247(225)	315(259)	185		250	220	300		
	0315 T 5060 E S	315(259)	343(305)	220		300	250	350	10E	
	0343 T 5060 E S	343 (305)	318(340)	250		350	300	400		
	0418 T 5060 E S	418(840)	472(428)	300		400	370	500		
0472 T 5060 E S	472(428)	555(428)	370	500	450(370)	600				
0600 T 5060 E S	600	450	600	450	600	-				
0652 T 5060 E S	0652	490	650	490	650					
0794 T 5060 E S	0794	635	850	635	850					
0897 T 5060 E S	0897	710	950	710	950					
0978 T 5060 E S	0978	750	1000	750	1000					
1191 T 5060 E S	1191	970	1300	970	1300					
1345 T 5060 E S	1345	1120	1500	1120	1500					
660 / 690 V	0492 T 6669 E S	Optimal with external unit	0492	448	600	448	600	-		
	0580 T 6669 E S		0580	560	750	560	750			
	0646 T 6669 E S		0646	635	850	635	850			
	0813 T 6669 E S		0813	750	1000	750	1000			
	0869 T 6669 E S		0869	900	1200	900	1200			
	0969 T 6669 E S		0969	970	1300	970	1300			
	1220 T 6669 E S		1220	1120	1500	1120	1500			
	0100 T 6669 E S		100	127	90	125	110		150	8E
	0127 T 6669 E S	127	179	110	150	160	220			
	0179 T 6669 E S	179	160	220	160	220				
	0225 T 6669 E S	225	259	200	275	250	350			
	0259 T 6669 E S	259	305	250	350	280	370	10E		
	0305 T 6669 E S	305	340	280	370	315	430			
	0340 T 6669 E S	340	428	315	430	400	500			
0428 T 6669 E S	428	400	500	400	500					

CFW-09 - Part Number Specification



- 1 - CFW-09 VSD
- 2 - Output Rated Current for Constant Torque (CT) Sizing
- 3 - Power Supply: T = Three-phase
- 4 - Power Supply Voltage: 2223 = 220 ... 230 VAC
3848 = 380 ... 480 VAC
5060 = 500 ... 600 VAC
6669 = 660 ... 690 VAC
- 5 - Languages: P = Portuguese
E = English
G = German
S = Spanish
F = French
R = Russian
Sw = Swedish
- 6 - Product Version: S = Standard
O = Optional
- 7 - Enclosure: 00 = Standard (see technical specifications table)
N4 = NEMA 4 x IP 56 (models up to 10HP)
- 8 - HMI - Human Machine Interface: 00 = standard (with HMI of LED'S + LCD)
SI = Without HMI
IL = Optional only with LED HMI
- 9 - Dynamic Braking: 00 = Standard
DB = With Built-in Dynamic Braking Transistor
RB = Regenative rectifying unit (models from 105A at 220V, and from 86A at 380-480V)

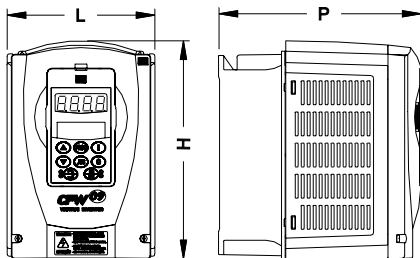
220 - 230 V	380 - 480 V	500 - 600 V	500 - 690 V	660 - 690 V
0006 = 6,0 A	0003 = 3,6 A	0002 = 2,9 A	0107 = 107 A	0100 = 100 A
0007 = 7,0 A	0004 = 4,0 A	0004 = 4,2 A	0147 = 147 A	0127 = 127 A
0010 = 10 A	0005 = 5,5 A	0007 = 7,0 A	0211 = 211 A	0179 = 179 A
0013 = 13 A	0009 = 9,0 A	0010 = 10 A	0247 = 247 A	0225 = 225 A
0016 = 16 A	0013 = 13 A	0012 = 12 A	0315 = 315 A	0259 = 259 A
0024 = 24 A	0016 = 16 A	0014 = 14 A	0343 = 343 A	0305 = 305 A
0028 = 28 A	0024 = 24 A	0022 = 22 A	0418 = 418 A	0340 = 340 A
0033 = 33 A	0030 = 30 A	0027 = 27 A	0472 = 472 A	0428 = 428 A
0038 = 38 A	0038 = 38 A	0032 = 32 A		
0045 = 45 A	0045 = 45 A	0044 = 44 A		
0054 = 54 A	0060 = 60 A	0053 = 53 A		
0070 = 70 A	0070 = 70 A	0063 = 63 A		
0086 = 86 A	0086 = 86 A	0079 = 79 A		
0105 = 105 A	0105 = 105 A	0107 = 0107A		
0130 = 130 A	0142 = 142 A	0147 = 0147A		
0142 = 142 A	0180 = 180 A	0211 = 0211A		
0180 = 180 A	0211 = 211 A	0247 = 0247A		
0240 = 240 A	0240 = 240 A	0315 = 0315A		
0361 = 361 A	0312 = 312 A	0418 = 418 A		
	0361 = 361 A	0472 = 472 A		
	0450 = 450 A	0600 = 600A		
	0515 = 515 A	0794 = 794A		
	0600 = 600 A	0897 = 897A		
	0686 = 686 A	0978 = 978A		
	0855 = 855 A	1191 = 1191A		
	1140 = 1140 A	1345 = 1345A		
	1283 = 1286 A			
	1710 = 1710 A			

- 10 - Expansion Boards:
 - 00 = Standard
 - A1 = EBA.01-CFW09 optional
 - A2 = EBA.02-CFW09 optional
 - A3 = EBA.03-CFW09 optional
 - B1 = EBB.01-CFW09 optional
 - B2 = EBB.02-CFW09 optional
 - B3 = EBB.03-CFW09 optional
 - B4 = EBB.04-CFW09 optional
 - B5 = EBB.05-CFW09 optional
 - C1 = EBC1.01-CFW09 optional
 - C2 = EBC1.02-CFW09 optional
 - C3 = EBC1.03-CFW09 optional
 - E1 = Optional with EBE1.00 - CFW09
 - P1 = PLC1.01-CFW09 optional
 - P2 = PLC2.00-CFW09 optional
- 11 - FieldBus Communications cards:
 - 00 = Standard (not provided)
 - PD = KFB-PD optional (Profibus DP)
 - DN = KFB-DN optional (Device Net)
 - DD = Optional with KFB – DD (Device Net Drive Profile / Special software)
 - EN = EtherNet / IP standard
- 12 - Special Hardware:
 - 00 = not provided
 - H1...Hn = Special Hardware version-Optional
 - HD = Models from 105A at 220V, and from 86A at 380-480V are power supplied via DC link
 - HC/HV = The CFW09 VSDs mechanics from 2 to 8 have and inductor line for the DC link built into the product. To request the VSD with the inductor in place just add the code "HC" (for drives operating on Variable Torque).
- 13 - Special Software:
 - 00 = Standard software version
 - S1...Sn = Optional with version a special software
 - SF = Protocol Metasys N2
 - SC = Hoist functions
 - SN = Winder I with power calculation
 - SQ = Special version for Kit Device Net Drive Profile
- 14 - Z = End of Code

Example:
CFW09 0013 T 2223 E S Z
CFW09 0105 T 3848 E 0 IL A1 PD Z
CFW09 0086 T 3848 E 0 SI DB B2 MR S3 Z

CFW-09 - Dimensions and Weight

NEMA 1 / IP 20



SIZE	Width - W		Height - H		Depth - D		Weight	
	mm	(in)	mm	(in)	mm	(in)	lb	(kg)
1	143	(5.6)	210	(8.3)	196	(7.7)	7.7	(3.5)
2	182	(7.2)	290	(11.4)			13.2	(6.0)
3	223	(8.9)	390	(15.3)	274	(10.8)	41.9	(19.0)
4	250	(9.8)	475	(18.7)			49.6	(22.5)
5	335	(13.2)	550	(21.6)			90.4	(41.0)
6			675	(26.6)	121.3	(55.0)		
7			835	(32.9)	300	(11.8)	154.3	(70.0)
8	410	(16.1)	975	(38.4)	370	(14.6)	220.5	(100.0)
8E			1145	(45.1)			253.0	(115.0)
9	688	(27.1)	1020	(40.2)	492	(19.3)	476.2	(216)
10	700	(27.5)	1185	(46.6)	582	(22.9)	571.0	(259)
10E							682.0	(310.0)

CFW-09 Shark

CFW-09 Drives with Degree of Protection NEMA 4X (IP 56), designed for highly aggressive environments including:

- Chemical industry
- Petrochemical
- Food industry
- Other applications requiring full protection to the electronic equipment.



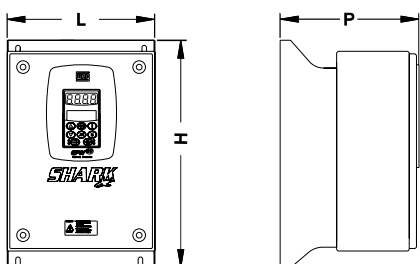
POWER SUPPLY VOLTAGE	CFW-09 DRIVE			MAXIMUM APPLICABLE MOTOR [Ⓞ]			Size	
	MODEL CFW09...	Rheostatic Braking	Outlet rated current (A)		Voltage (V)	Constant (CT*) / Variable (VT*) Torque		
			CT*	VT*		HP		kW
220-230	0006 T 2223 P O N4 Z	Standard built-in to the product	6		220	1,5	1,1	1
	0007 T 2223 P O N4 Z		7			2	1,5	
	0010 T 2223 P O N4 Z		10			3	2,2	
	0016 T 2223 P O N4 Z		16			5	3,7	
380-480	0003 T 3848 P O N4 Z	Standard built-in to the product	3,6		380	1,5	1,1	1
	0004 T 3848 P O N4 Z		4			2	1,5	
	0005 T 3848 P O N4 Z		5,5			3	2,2	
	0009 T 3848 P O N4 Z		9			5	3,7	2
	0013 T 3848 P O N4 Z		13			7,5	5,5	
	0016 T 3848 P O N4 Z		16			10	7,5	

*CT = Constant Torque (T load = CTE); VT = Variable Torque (e.g.: Quadratic Torque = > T load ~ n²)

Notes: 1 - Recommended motors 230/400VAC are based on WEG motors II and IV pole W21 line. For other polarity motors (e.g.: 6 and 8 poles), other (e.g.: 460V) and/or motors from other suppliers, specify the inverter based on nominal motor current.

2 - Models 6,7 and 10A/230V can be single-phase powered without output current derating.

Dimensions and Weight



NEMA 4X / IP 56

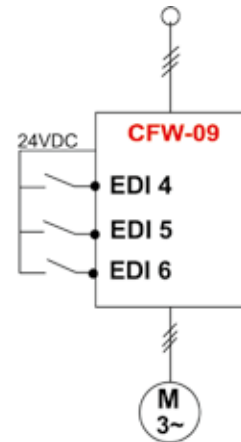
SIZE	Width - W		Height - H		Depth - D		Weight	
	mm	(in)	mm	(in)	mm	(in)	lb	(kg)
1	234	(9.2)	360	(14.2)	221	(8.5)	10	(22)
2	280	(10.2)	410	(16.2)			15	(33)

CFW-09 - Special Functions

Multi-speed

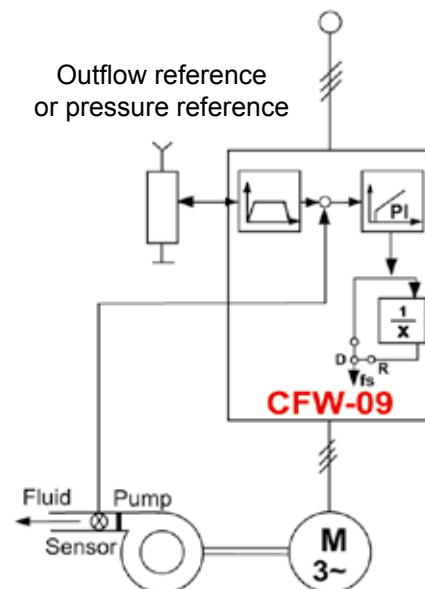
Up to eight different speeds can be programmed by the user and selected via the combination of three digital Inputs. These Inputs can be switched by any external device such as Limit Switches, Photocells, Proximity Sensors, PLC, etc.

DI	4	5	6
n_1	0	0	0
n_2	0	0	1
n_3	0	1	0
n_4	0	1	1
n_5	1	0	0
n_6	1	0	1
n_7	1	1	0
n_8	1	1	1



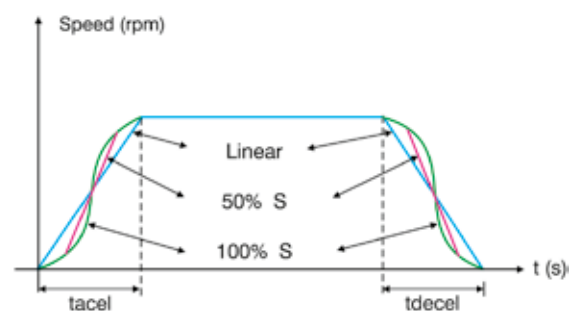
Overlapping PID Regulator

This built-in digital PID regulator was designed for applications where a process variable (flow, pressure, level, etc.) has to be controlled by the motor speed. To implement this regulator the CFW-09 needs a set point and a feedback signal from the process variable sensor so that a closed loop is formed. This function eliminates the need for an external regulator to control the process reducing the solution cost.



“S” Ramp

This function replaces the traditional linear acceleration and deceleration ramps by Type “S” Ramps providing smoother starting, braking and approximation to the set speed curves. The practical result is the elimination of mechanical shocks, which are undesirable and some times unpractical for certain applications.



CFW-10

Designed for the control and speed variation of three-phase induction electric motors, the CFW-10 VSD combines modern design with worldwide technology, where extreme compactness and easy programming stand out. With simple installation and operation, this product comes with optimized software resources, through a local Human-Machine interface, which enables it to be used in process controls and industrial machines.



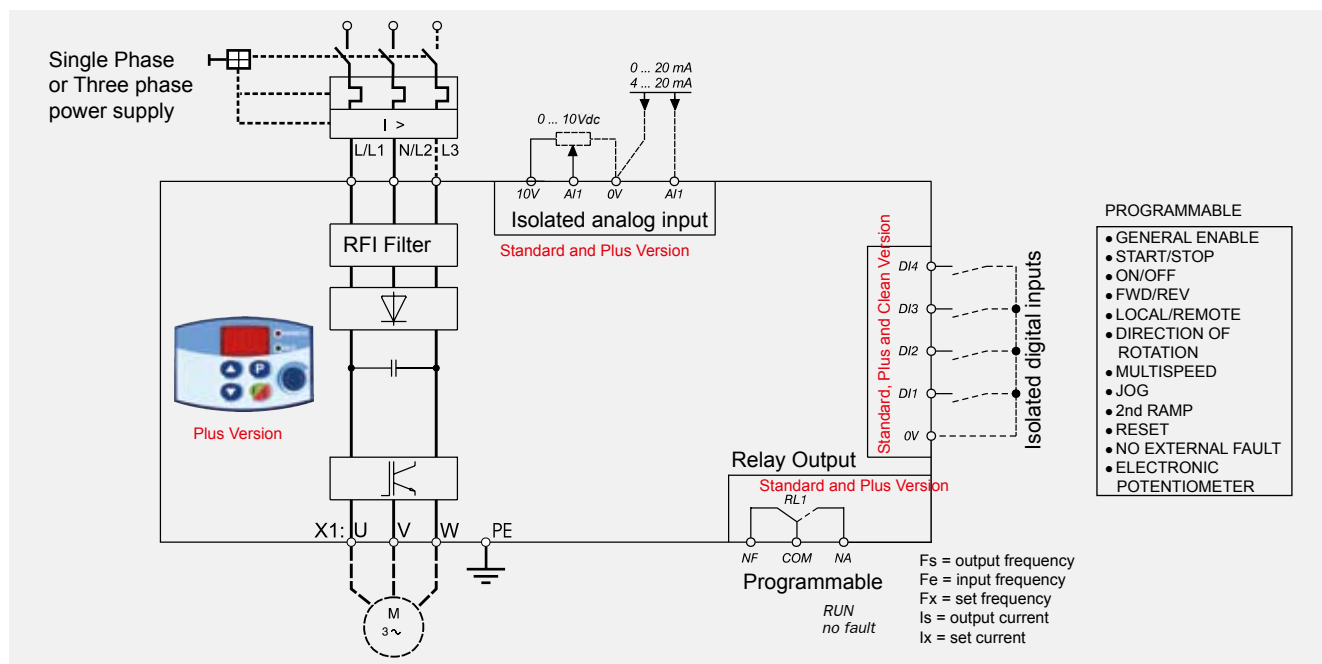
Benefits

- (V/F) Control
- IP20 Finger-safe Enclosure
- Single-phase 110-127 input voltage up to 0.75 KW
- Single-phase 200-240 input voltage up to 2.2 KW
- Three-phase
- 150% current overload capacity
- DSP controlled PWM output
- 2.5 - 15 kHz adjustable switching frequency
- Four isolated programmable digital inputs
- Programmable relay output
- One isolated programmable analog input
- Diagnostic features: Overcurrent, motor overload, drive over temperature, output short circuit, DC bus over and undervoltage and external fault
- Control features: Linear and "S" ramp acceleration and deceleration, local/remote control, DC braking, torque boost, motor slip compensation, electronic pot, preset speeds, maximum and minimum adjustable frequency limits, adjustable output current limit, JOG
- Display readings: Motor speed, frequency, voltage, current, last fault, heatsink temperature and drive status
- Ambient: 122°F (50°C), 3300ft (1000m) altitude, 90% humidity, non-condensing for model 15,2A, 104°F (40°C).

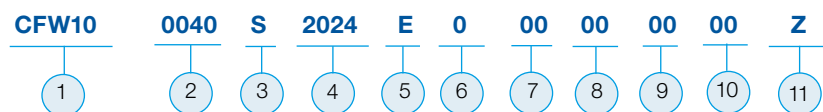
Applications

- Stirrers / Mixers
- Extruding Machines
- Roller tables
- Driers
- Rotating filters
- Centrifugal pumps
- Processing pumps
- Fans / Exhausters

Block diagram



CFW-10 - Coding



1 - CFW-10 Variable Speed Drives

2 - Output rated current:

110-127 V		200-240 V	
0016	1,6 A	0016	1,6A
0026	2,6 A	0026	2,6A
0040	4,0 A	0040	4,0A
		0073	7,3A
		0100	10,0A
		0152	15,2A

Only for three-phase model

3 - Number of phases

S = single-phase
T = Three - phase

4- Power Voltage Supply

1112 = 110-127 V (Single-phase only)
2024 = 200-240 V

5 -Manual Language

P = Portuguese
E = English
S = Spanish

6 -Options

S = standard
O = optional

7 - Control card

00 = standard
CL = clean
PL = plus (with potentiometer)

8- EMC Built-in filter

00 = (not available)
FA = with EMC filter (class A) –
Only for single-phase models (200-240V) models

9 - Special hardware

00 = not provided
Hx = special hardware in version X
CP = Cold Plate heatsink version

10 - Special software

00 = not provided
Sx = special software in version X

11 - End of code

Ex.: CFW100040S2024ESZ
VSD of CFW-10 series, 4.0 A, single -phase
at 200-240 VAC and manual in English.

CFW-10 - Specification Table

Power Supply Voltage	Variable Speed Drives CFW-10				Maximum Applicable Motor			Dimensions (mm)			Weight (Kg)			
	Power Supply	Model	In Output (A)	Size	Voltage (V)	Power rating		H	W	D				
						HP	kW							
110-127	Single phase	CFW100016S1112ESZ	1,6	1	230	0.25	0.18	132	95	121	0.9			
		CFW100026S1112ESZ	2,6	1		0.5	0.37							
		CFW100040S1112ESZ	4.0	2		1.0	0.75							
200-240		Single phase	CFW100016S2024ESZ	1.6		1	230	0.25	0.18	132	95	121	0.9	
			CFW100026S2024ESZ	2.6		1		0.5	0.37					
			CFW100040S2024ESZ	4.0		1		1.0	0.75					
		Three phase	CFW100073S2024ESZ	7.3		2		230	2.0	1.50	161	115	122	1.5
			CFW100100S2024ESZ	10		3			3.0	2.20	191			1.8
			Three phase	CFW100016T2024ESZ		1.6			1	230	0.25	0.18	132	95
	CFW100026T2024ESZ			2.6	1	0.5			0.37					
	CFW100040T2024ESZ			4	1	1.0			0.75					
	CFW100073T2024ESZ			7.3	1	2.0			1.5					
Three phase	CFW1000100T2024ESZ	10	2	230	3.0	2.2	161	115	122	1.5				
	CFW1000152T2024ESZ	15.2	3		5.0	3.70	191		122	1.8				

NOTES: The maximum motor power ratings listed above were based on WEG II and IV-pole motors.
For motors with different numbers of poles (ex.: VI and VIII-poles), other voltages (ex.: 230V) and/or motors from other manufacturers, specify the VSD through the motor rated current.

CFW-10 - Specification Table "Cold Plate"

Power Supply Voltage	Variable Speed Drives CFW-10				Maximum Applicable Motor			Dimensions (mm)			Weight (Kg)			
	Power Supply	Model	In Output (A)	Size	Voltage (V)	Power rating		H	W	D				
						HP	kW							
110-127	Single phase	CFW100016S1112EOCPZ	1,6	1	230	0.25	0.18	132	100	82	0.7			
		CFW100026S1112EOCPZ	2,6	1		0.5	0.37							
		CFW100040S1112EOCPZ	4.0	2		1.0	0.75							
200-240		Single phase	CFW100016S2024EOCPZ	1.6		1	230	0.25	0.18	132	100	82	0.7	
			CFW100026S2024EOCPZ	2.6		1		0.5	0.37					
			CFW100040S2024EOCPZ	4.0		1		1.0	0.75					
		Three phase	CFW100073S2024EOCPZ	7.3		2		230	2.0	1.50	161	120	82	1.0
			CFW100100S2024EOCPZ	10		3			3.0	2.20	191			1.2
			Three phase	CFW100016T2024EOCPZ		1.6			1	230	0.25	0.18	132	100
	CFW100026T2024EOCPZ			2.6	1	0.5			0.37					
	CFW100040T2024EOCPZ			4.0	1	1.0			0.75					
	CFW100073T2024EOCPZ			7.3	1	2.0			1.5					
Three phase	CFW1000100T2024EOCPZ	10	2	230	3.0	2.2	161	120	1.0					
	CFW1000152T2024EOCPZ	15.2	3		5.0	3.70	191		1.2					

CFW-10 - Technical Data

MODEL		CFW-10 Standard	CFW-10 Clean	CFW-10 with potentiometer
POWER SUPPLY	Voltage	Single-phase	110 - 127VAC: 110 / 127VAC (+10%, -15%)	
		Single-phase or Three-phase	200 - 240VAC: 200 / 220 / 230 / 240VAC (+10%, -15%)	
	Frequency		50 / 60 Hz +/- 2 Hz (48 - 62 Hz)	
	Cos φ (Displacement Power Factor)		> 0.98	
ENCLOSURE	Degree of Protection		IP 20	
CONTROL	Electronic Power Supply		Switching power supply	
	Control Method		Sinusoidal PWM modulation (Space Vector Modulation), Linear V/F or quadratic V/F	
	Switching Frequency		Frequencies: from 2.5 KHZ up to 15 KHZ	
	Frequency Range		0 - 300 Hz	
	Frequency Setting Resolution		Analog Ref.: 0.1% of max. frequency and Digital ref.: 0.01 Hz (<100Hz); 0.1Hz (>100Hz)	
	Output Frequency Accuracy Overload capacity		Analogue Ref.: 0.5% and Digital Ref.: 0.01% 150% during 60 sec. every 10 min. (1.5 x I _n - Rated Current)	
CONTROL INPUTS	Analog	1 programmable isolated Input 0 -10VDC, 0 - 20mA or 4 - 0mA	-	1 programmable isolated Input 0 -10VDC, 0 - 20mA or 4 - 0mA
	Digital	4 programmable isolated inputs 12 Vdc		
CONTROL OUTPUTS	Relay	1 programmable output, form C Contacts (NO/NC)	-	1 programmable output, form C Contacts (NO/NC)
		Programming Options: Is > Ix ; Fs > Fx ; Fe > Fx ; Fs = Fe ; Run; No Fault		
SAFETY	Protections	DC Link Overvoltage / Undervoltage		
		VSD Over temperature		
		Keypad Connection Fault		
		Motor Overload (i x t) / Output Short Circuit		
		CPU Error (Watchdog), External Fault		
		Output short-circuit		
		Programming Error./ Self-diagnosis Error		
KEYPAD (HMI)	Programming	Start/Stop, (General functions programming)		
	Commands	Start/Stop / Frequency Increases / Decreases Speed		
	Monitoring (reading)	-	-	Variable speed potentiometer
		Output Frequency (Hz)		
		DC Link Voltage (VDC)		
		Speed proportional value (Ex: tt/min)		
		Heat sink temperature		
		Output Current (Amps)		
		Output Voltage (Volts)		
	Last Fault Messages			
AMBIENT	Temperature	0...122°F (0 ... 50 °C) - 0...104°F (0...40°C) for 15,2A mode		
	Humidity	5 ... 90% non condensing		
	Altitude	0...3300ft (1000 m) up to (4000 m) with 10%/1000m output current de-rating		
ENCLOSURE	Color	Opaque gray - WEG development 205E1404		
CONFORMITIES	Electromagnetic Compatibility	EMC directive 89 / 336 / EEC		
		EN 61800-3		
	Low Voltage	LVD 73/23/EEC - Low Voltage Directive / UL 508C		
CONTROL FEATURES	Standard	Keypad with 7 segment displays (LED's)		
		Password to protect VSD Programming		
		Fault Auto-diagnosis and automatic reset		
		Motor Slip compensation (V/F mode)		
		Manual and automatic torque boost (I x R)		
		Linear and "S" independent acceleration ramp, two sets of ramps		
		JOG function		
		DC braking		
		Multi-Speed function (up to 8 pre programmable speeds)		
		Forward/Reverse Speed Selection via DI		
Local/Remote Reference Selection via DI				

Drive Comparison

		MODELS		
		CFW-08	CFW-09	CFW-10
Power Supply	Single-phase Voltage	200 - 240V:200/220/230/240 V (+10%, -15%)	-	110-127V: 110/127 V (+10 %, -15%) 200-240V: 200/220/230/240 V (+10%, -15%)
	3-phase voltage	200 - 240V:200/220/230/240 V (+10%, -15%)	220 - 230V:220/230V (+10%, - 15%)	200-240V: 200/220/230/240 V (+10%, -15%)
		380 - 480V : 380/400/415/440/460/ 480V (+10%, -15%)	380 - 480V : 380/400/415/440/460/480V (+10%, -15%)	
		500 - 600V:500/525/575/600V (+10%, -15%)	500 - 600V:500/525/575/600V (+10%, -15%) 500 - 690V:500/525/575/600/690V (+10%, - 15%)	
	Frequency	50 / 60 Hz +/- 2 Hz (48 ... 62Hz)		
	Cos φ (displacement power factor)	Greater than 0,98		
	Power factor	-		
Degree of Protection	Drive	Nema 1 on mechanical models 3 and 4 and IP 20 on mechanical models 1 and 2	NEMA 1 / IP20 (Size 1...8) IP20 (Size 9...10)	IP 20
		Nema 1 with additional metallic conduit connection kit		
	Remote MMI	NEMA12 Parallel, remote MMI (IP54) (MMI-CFW08-RP) NEMA12 Serial, remote MMI (IP54) (MMI-CFW08-RS)	NEMA 4x / IP 56	-
Flange mounted	Size 2,3 and 4		Yes	-
Braking IGBT	Size 2,3 and 4		mechanical models 1 and 2 standard, optional for mechanical models 8 and 10	Size 2 and 3
Control	Supply type	Switched Mode Power Supply		
	Control type	V/F (scalar) linear or quadratic	V/F (scalar) V/VW (Voltage Vector-Control WEG) Sensorless vector (without encoder) Vector with encoder	V/F (scalar) linear or quadratic
		Sensorless vector control (Voltage Vector-Control WEG)		
Switching	Available frequencies 2,5 / 5,0 / 10 / 15 kHz	Available frequencies 1,25/ 2,5 / 5,0 / 10 kHz	Available frequencies 2,5 up to 15 kHz	
Control	Speed variation	Band Range : 0 ... 300 Hz	0...204Hz (Supply frequency 60Hz) 0...170Hz (Supply frequency 50Hz) Above 204 Hz (please contact WEG)	Band Range : 0 ... 300 Hz
	Permitted overload	150% for 60 seconds every 10 minutes	CT: 150% for 60 seconds every 10 minutes VT: 110 to 120% for 60 seconds every 10 minutes	150% for 60 seconds every 10 minutes (1,5 x Inom.)
Performance	Efficiency	Greater than 0,95 %	98%	Greater than 0,95 %
	Speed control	V/F Setting: 1% Rated Speed with Slip Compensation Resolution: 0.01 Hz (f<100Hz); 0.1 Hz(f<100Hz) (keypad reference)	V/F Setting: 1% Rated Speed with Slip Compensation Resolution; 1 rpm (keypad reference) regulation rate = 1:20	V/F Setting: 1% Rated Speed with Slip Compensation Resolution: 0.01 Hz (f<100Hz); 0.1 Hz(f<100Hz) (keypad reference)
		Regulation; 0.5% of the rated speed.	Regulation; 0.5% of the rated speed.	
	Control V/VW	Resolution; 1 rpm (keypad reference)	Resolution; 1 rpm (keypad reference) regulation rate = 1:30	-
	Speed control	-	Regulation; 0.5% of the rated speed. Resolution; 1 rpm (keypad reference) regulation rate = 1:100	-
		-	10 bit analog reference setting: +/- 0.01% Rated Speed: with 14-bit analog reference +/-0.01% Rated Speed: with digital reference	-
	Torque Control	-	Rate: Up to 0	-
		-	Setting: +/- 10% (sensorless) +/- 5% (encoder) motor Rated torque Setting: 0...150% (encoder) motor Rated torque	-

Drive Comparison

		MODELS		
		CFW-08	CFW-09	CFW-10
Inputs and Outputs	Digital	4 programmable isolated digital inputs with NPN or PNP logic (DI1...DI4)	6 programmable inputs, optoisolated, bidirectional, 24Vdc	4 programmable isolated inputs
		PTC isolated inputs via AI and AI2 Programmable isolated inputs via AI1 and AI2 with NPN or PNP logic (DI5 and DI6)	2 outputs with reverser contacts (NO/NC) and 1 output with NO contact, programmable	
	Relay	Programmable 2-output relay, reversible contacts (NO/NC)	2 programmable outputs, NO/NC contacts 2 programmable outputs, NO/NC contacts	1 programmable output, reversal NO/NC contacts
Analog	2 isolated analog inputs 0...10V/ 4...20mA / -10 ...10V, 8 bits	1 isolated input 0 ...10V, (0)4 ... 20mA, 8 bits	2 programmable differential inputs, 10 bits	1 isolated input 0...10 V, 0...20 mA or 4...20 mA
			2 programmable outputs, 0 a 10V, 11 bits	
	2 programmable outputs bipolares (-10...10V), 14 bits (optional) 2 programmable outputs isoladas, 11 bits (optional)			
Communication	Serial Interface	RS-232 or RS-485	RS - 232 via serial kit KCS - CFW09 RS - 485, isolated, via EBA or EBB RS-485 cards (accessory)	
	FieldBus networks	Profibus DP unit for communication (optional) and DeviceNet or CANopen or RTU ModBus (built-in)	RTU ModBus via Profibus DP, DeviceNet or DeviceNet Profile serial interface via additional KFB kit	
Safety	Protections	Overvoltage and undervoltage in intermediary circuit		
		Overheating in the inverter and motor		Inverter overheating
		Output overcurrent		
		Motor overload (i x t)		
		Hardware error, external defect or serial communication error	Braking resistor overload	Hardware Error, external fault.
		Output short-circuit and output ground short-circuit	CPU error (Watchdog)	EPROM output short-circuit
		Programming error and self-adjusting error	Incremental encoder failure	Programming Error
		-	Output short-circuit	-
		-	Output ground short-circuit	
		-	External Error	
-	Autodiagnosing and programming error			
-	Serial communication failure			
-	Inverted motor / Encoder connection			
-	Power Supply Phase Fault			
-	MMI-CFW09 interface failure			
Ambient conditions	Temperature	0...40 °C (up to 50 C with reduction of 2%/ ° C in the output current)	0...40 °C (up to 50 C with reduction of 2%/ ° C in the output current)	0...50 °C (without reduction in the output current)
	Humidity	5...90% without condensation	5...90% without condensation	5...90% without condensation
	Altitude	0.....1000 m (up to 4000 m with 1% / 100 m in the output current)	0.....1000 m (up to 4000 m with 1% / 100 m in the output current)	0.....1000 m (up to 4000 m with 1% / 100 m in the output current)
Human-Machine Interface (HMI)	Control	On/off, Setting Parameters (general programming)		
		Increase / decrease frequency		
		JOG, inversion of rotation direction and local / remote potentiometer selection for speed control	Variable speed potentiometer	
	Monitoring (reading)	Motor output frequency		
		Intermediate circuit voltage	Inverter status	Intermediate circuit voltage
		Frequency proportional value	Digital input and output status	Speed proportional value
		Heat sink temperature	Motor speed	Heat sink temperature
		Motor output current (A)		
		Motor output voltage (V)		
		Error messages / output power defects		
Load torque		-		
Inverter status	Relay output status			
Functions	Rheostatic braking	Built-in in frame size 2,3,4	Built-in in frame size 1,2 optional in frame size 3,4,5,6,7	Built-in frame size 2,3
	CC braking	Built-in	Built-in	Built-in
	Optimal Braking	-	Built-in	-
	+24 Vdc source available	-	-	-
	PID	Built-in	Built-in	Built-in

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