

Variable Speed Drive



CFW 09

VECTRUE INVERTER



- V/Hz + True Vector
- *Optimal Braking™*
- Self-tuning



CFW⁰⁹ Variable Speed Drive

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 new generation of WEG inverters 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 simpler, more compact and economic solution.

Vectrue Technology™

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

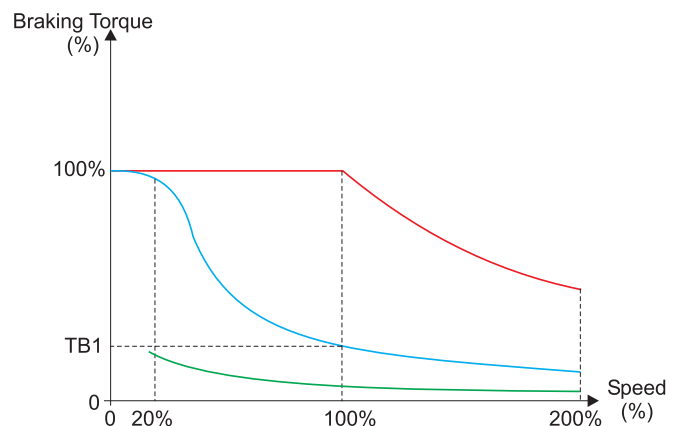
- ⇒ V / F or Vector Control modes via parameter selection;
- ⇒ True Flux Vector Control in either open or closed loop vector modes;
- ⇒ True Open Loop Vector Control with high torque and fast dynamic response, even at very low speeds;
- ⇒ Self-tuning for automatic drive set-up to match the drive to motor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

Optimal Braking™

For applications that require reduced braking times or to stop high inertia loads, traditional inverters use a Dynamic Braking scheme, where the excessive kinetic energy regenerated to the DC Link is dissipated as heat in a dynamic braking resistor connected to the drive.

The CFW-09 Vector Modes incorporate the Optimal Braking™ feature, which allows a sufficient braking performance to handle most applications that so far needed dynamic braking.

This innovation allows high dynamic performance drive systems with braking torques of about 5 times of typical DC braking.



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

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

Other Advantages

- ⇒ High performance RISC 32 bit microprocessor
- ⇒ Detachable SMART keypad with dual display (LCD and LED)
- ⇒ Wide power range: 1 ... 500HP (up to 1500HP with parallel configuration)
- ⇒ Variable and Constant Torque ratings
- ⇒ NEMA 1 enclosure up to 200HP and IP20 Protected Chassis up to 500HP
- ⇒ 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 communication: Profibus DP, DeviceNet or Modbus RTU (Optional)
- ⇒ UL, cUL, CE Certifications

Applications

CHEMICAL AND PETROCHEMICAL

Fans / Exhausts
Centrifugal Pumps
Metering / Process Pumps
Centrifuges
Mixers
Compressors
Extruders

PULP AND PAPER

Metering Pumps
Process Pumps
Fans / Exhausts
Agitators / Mixers
Rotating Filters
Rotating Kilns
Scrap Conveyors
Paper Machines
Paper Rewinders
Calenders

PLASTIC AND RUBBER

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

MINING AND CEMENT

Fans / Exhausts
Pumps
Screeners
Vibratory Feeders
Crushers
Dynamic Separators
Conveyors
Cement Kilns

SUGAR

Sugar Centrifuges
Process Pumps
Conveyors
Bagasse Dosers

TEXTILE

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

STEEL

Fans / Exhausts
Rollout Tables
Winders / Unwinders
Cranes
Presses / Lathes / Milling Cutters
Drillers / Grinders
Laminators
Cutting Lines
Ingot Molding Lines
Pipe Forming Machines
Wire Drawing Machines
Pumps

CERAMIC

Fans / Exhausts
Driers / Ovens
Ball Mills
Rollout Tables
Enamellers
Conveyors

FOOD

Metering / Process Pumps
Fans / Exhausts
Mixers
Driers / Ovens
Palletizers
Monorails
Conveyors

LUMBER

Veneer Lathes
Chippers
Planers
Saws

BEVERAGE

Metering / Process Pumps
Bottlers
Mixers
Rollout Tables
Conveyors

GLASS

Fans / Exhausts
Bottlers
Rollout Tables
Conveyors

HVAC

Process Pumps
Fans / Exhausts
Air Conditioning Units

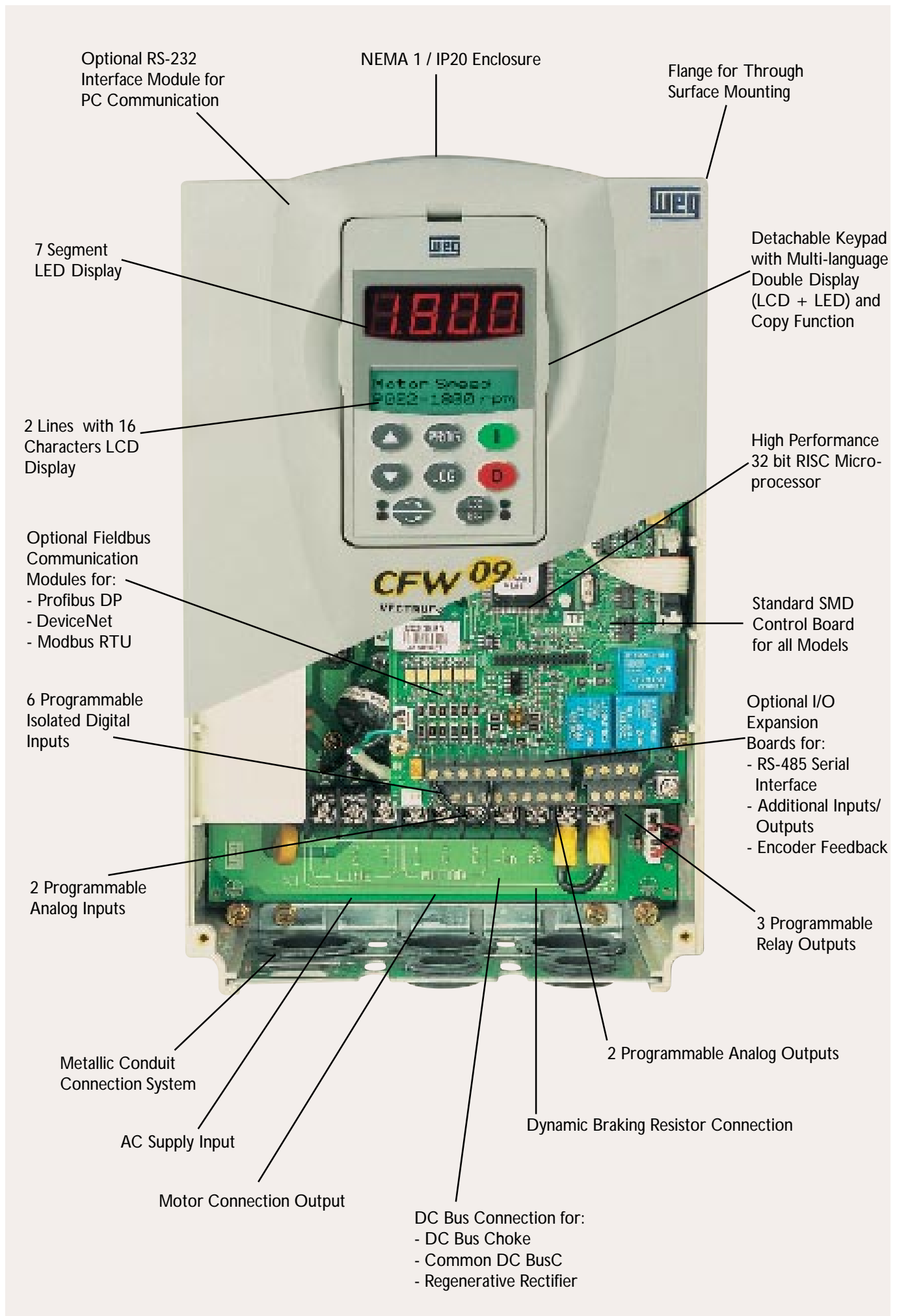
WASTE WATER

Centrifugal Pumps
Booster Systems

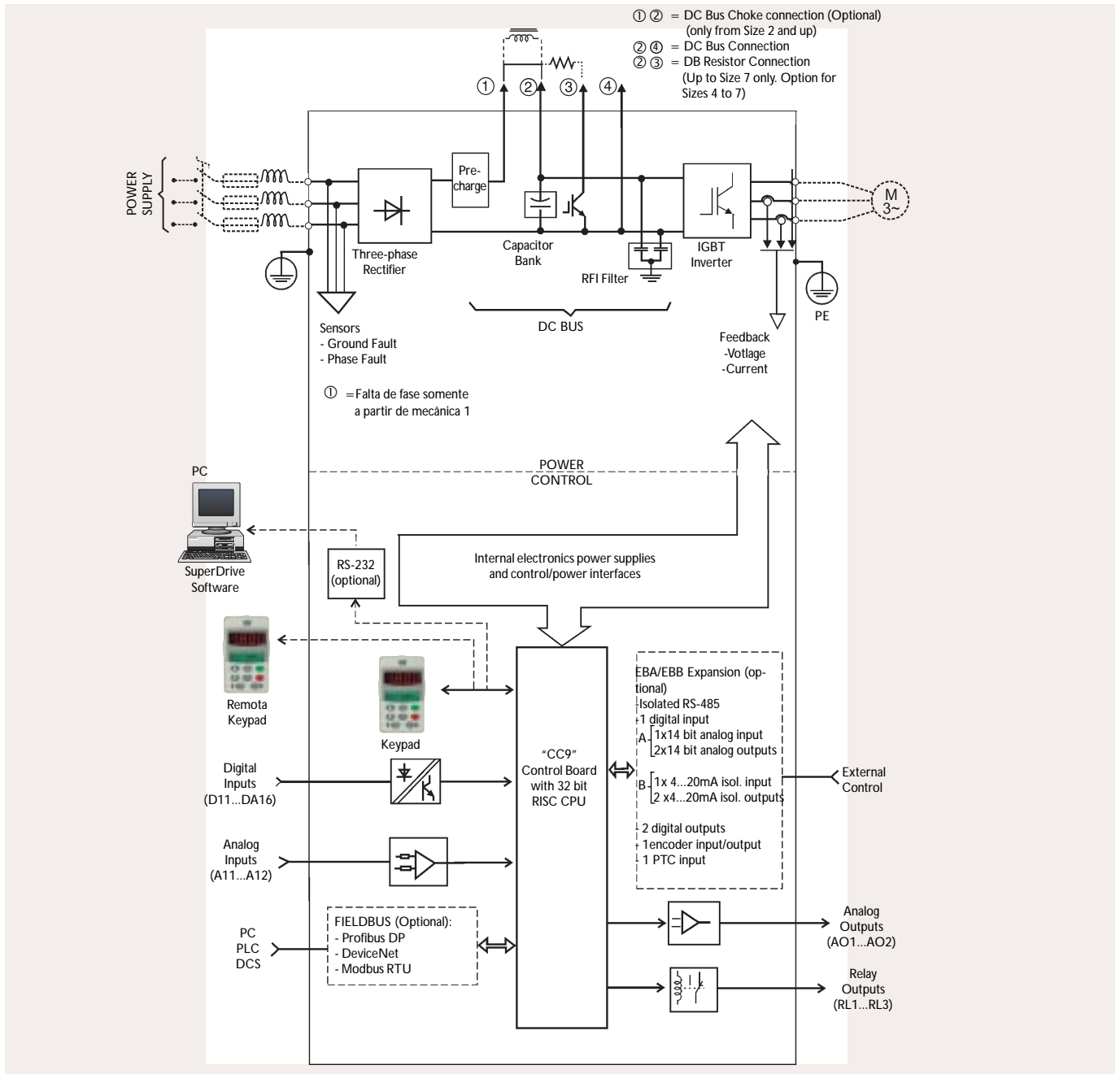
ELEVATORS

Load Elevators
Commercial Elevators
Overhead Cranes
Hoists

A Complete, Flexible and Compact Product



Block Diagram



"FieldBus" Communication

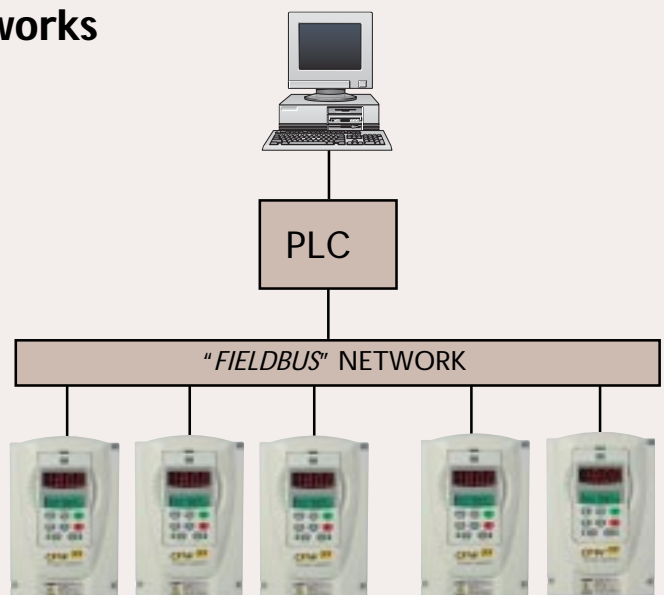
High Speed Communication Networks

Designed to integrate large industrial plant automation systems, high speed communication networks provide on-line supervision and control over the drives with the required operational flexibility.

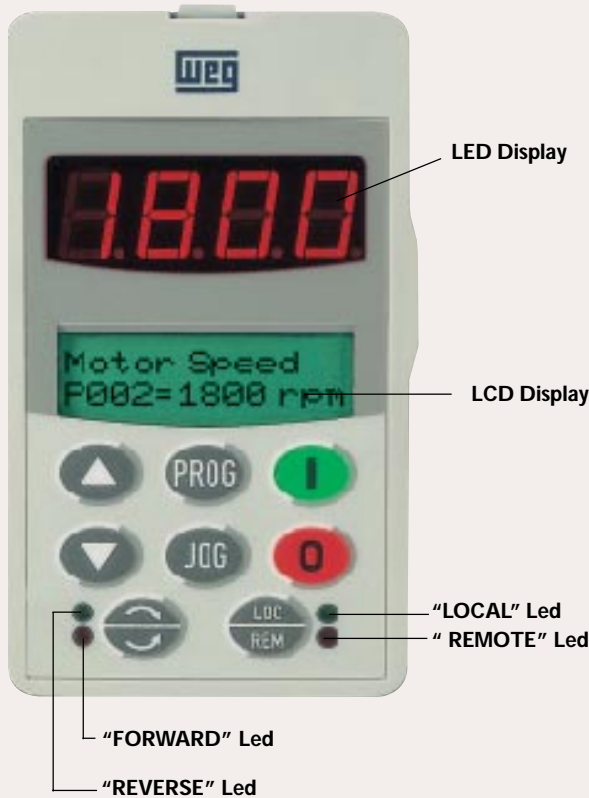
The CFW-09 inverters can be connected to "fieldbus" communication networks with the following protocols:

- FIELD BUS** →
- Profibus DP
 - DeviceNet
 - Modbus RTU


For the connection to Fieldbus networks, the CFW-09 allows the installation of an add on communication board according to the desired protocol. No other peripherals are necessary.





Keypad





Keypad Functions


- 


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


Stops the inverter 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 inverter operating mode as Local or Remote.

Intelligent Keypad

Intelligent operator 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

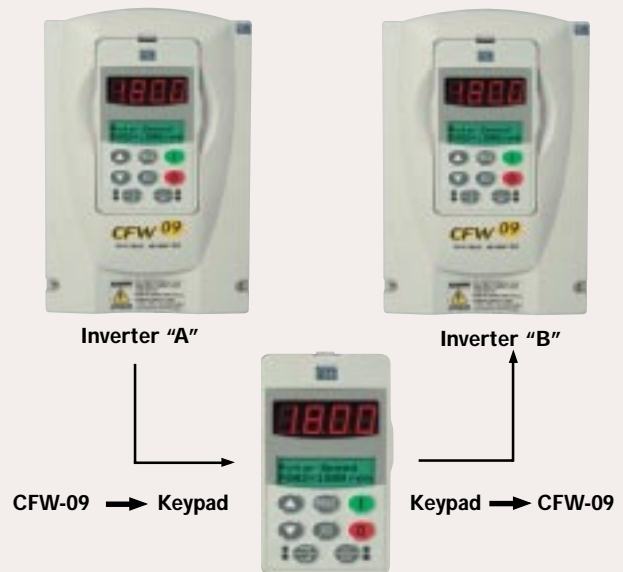
The language of the LCD display messages can be selected by the operator. English, Spanish and Portuguese available.

Oriented Start-up

The CFW-09 "Oriented Start-up" feature was specially created to facilitate and expedite the start-up procedure. At the first power-up or after a reset to factory default parameters, an automatic programming routine guides the operator through a sequence of steps for the introduction of the minimum parameters necessary for a perfect adaptation between drive and motor.

COPY Function

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



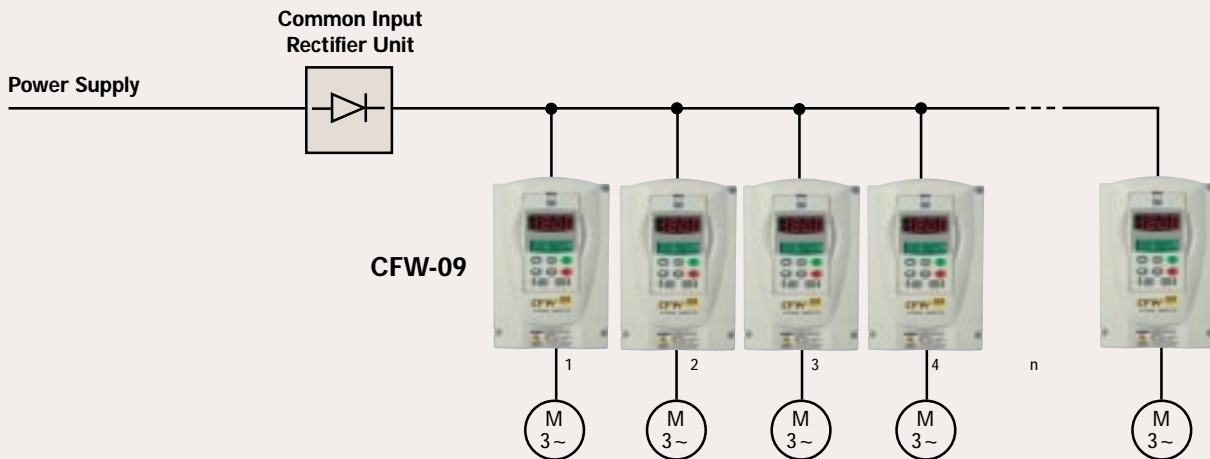
Common DC Bus Configuration

The CFW-09 inverters have DC Bus access to allow the implementation of applications that require a Common DC Bus Configuration as well as Regenerative Systems.

Common DC Bus

Used in multi-motor drive systems where the individual rectifier bridges are replaced by a common input rectifier unit and the multiple drives are fed directly to their DC Buses in a parallel configuration.

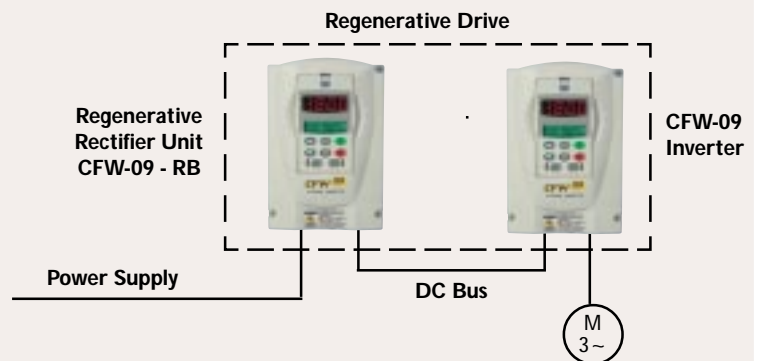
This solution allows energy transfer between the inverter units optimizing the power consumption of the system.



Regenerative Drive

A Regenerative Drive can be implemented connecting the DC Bus of a standard CFW-09 to the output of a Regenerative Rectifier Unit CFW-09-RB.

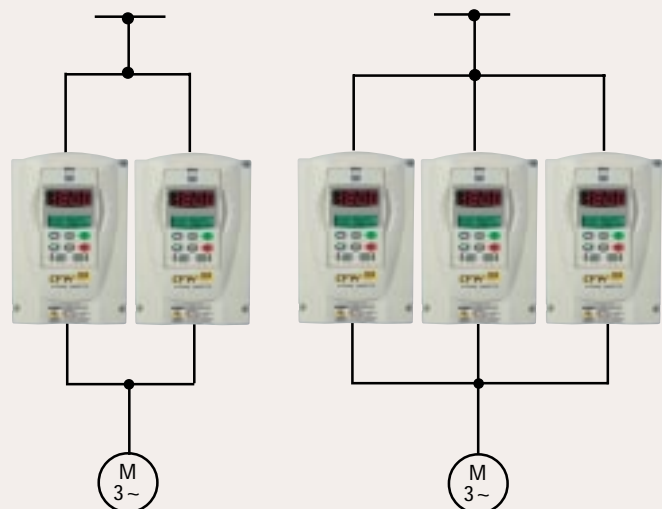
This solution provides line regenerative braking capability and unit near input power factor. Such a drive configuration is recommended for application with cyclic braking duty, extremely short braking times and high dynamic performance requirements, as: Paper Re-winders, Centrifuges, Cranes, etc.



Parallel Configuration

CFW-09 Units in Parallel

To extend its power range, the CFW-09 design allows the parallel connection of units. Up to three standard IP20 cabinet units can be connected in parallel to reach power ratings of up to 1500HP.



Technical Specifications

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%)
	Frequency		50 / 60 Hz +/- 2 Hz (48 ... 62 Hz)
	Phase Unbalance		Up to 3 %
	Cos φ (Displacement Power Factor)		Greater than 0.98
ENCLOSURE	Degree of Protection		NEMA 1 / IP 20 (Sizes 1 to 8) IP 20 (Sizes 9 and 10)
	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		Scalar (Voltage Source – 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% of 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)
			Range: 1:100
	Encoder Vector Mode	Regulation with:	
		10 bit Analog Reference: +/- 0.1% of Motor Rated Speed	
14 bit Analog Reference: +/- 0.01% of Motor Rated Speed ①			
Torque Control	Vector Modes	Digital Reference (Ex: Keypad or Serial): +/- 0.01% of Motor Rated Speed	
		Range: Down to 0 rpm	
CONTROL INPUTS	Analog		2 Programmable Differential Inputs (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 ①
			1 Programmable Isolated Input (10 bit): 0 ... 10 V, 0...20 mA or 4...20 mA ①
	Digital		6 Programmable Isolated Input: 24 Vdc
			1 Programmable Isolated Input: 24 Vdc ①
	Encoder		1 Programmable Isolated Input: 24 Vdc (for Motor PTC Thermistor) ①
CONTROL OUTPUTS	Analog		1 Differential Input, with 12 Vdc Internal Isolated Power Supply (14 bit resolution) ①
			2 Programmable Outputs (11 bit): 0 ... 10 V
			2 Programmable Bipolar Outputs (14 bit): -10 ... +10 V ①
	Relay		2 Programmable Isolated Outputs (11 bit): 0 ... 20 mA or 4 ... 20 mA ①
			2 Programmable Outputs, Form C Contacts (NO/NC): 240 Vac, 1 A
Transistor		1 Programmable Output, Form A Contact (NO): 240 Vac, 1 A	
Encoder		2 Programmable Isolated Outputs (Open Collector): 24 Vdc, 50 mA ①	
COMMUNICATION	Serial		1 Isolated Differential Encoder Signals Output: 5 ... 15 Vdc External Power Supply ①
			RS-232 with KCS-CFW09 Kit ①
	Field Bus		RS-485, Isolated, with EBA or EBB Board ① Profibus DP, DeviceNet or Modbus RTU, with KFB kits ①
SAFETY	Protections		DC Link Over Voltage
			Output Short Circuit
			DC Link Under Voltage
			Output Ground Fault
			Inverter Over Temperature
			External Fault
			Motor Over Temperature ①
			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 Phase Fault (30 A and above models)		
	Encoder Fault		
	Keypad Connection Fault		
AMBIENT	Temperature		0 ... 104 °F (40 °C), up to 122 °F (50 °C) with 2% / °C Output Current De-rating
	Humidity		5 ... 90% Non Condensing
	Altitude		0 ... 3300 ft (1000 m) (up to 13100 ft (4000 m) with 10% / 1000 m Output Current De-rating
CONFORMITIES	EMC Directive 89 / 336 / EEC		Electromagnetic Compatibility – Industrial Environment
	EN 61800-3		EMC - Emission and Immunity
	LVD 73/23/EEC		Low Voltage Directive
	IEC 146		Semiconductor Inverters
	UL 508 C		Power Conversion Equipment
	EN 50178		Electronic Equipment for Use in Power Installations
	EN 61010		Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use
CERTIFICATIONS	UL (USA) and cUL (CANADA)		Underwriters Laboratories Inc. USA
	CE (EUROPE)		Competent Body: Phoenix Test-Lab GmbH - Germany

① Optional

Technical Specifications

KEYPAD	Programming	General Inverter Functions Programming			
	Commands	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)	Inverter 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		
Hours Enabled (h)	Fault Messages				
CONTROL FEATURES AND OPTIONS	Standard	Keypad with LCD + LED displays (HMI-CFW09-LCD)			
		Password to protect inverter 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			
		Inverter 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 + / JOG – Function (momentary speed increase/decrease)			
		COPY Function (Inverter ® Keypad or Keypad ® Inverter)			
		Comparison functions for the digital outputs:			
		N* > Nx; N > Nx; N < Nx; N = 0; N = N*; Is > Ix; Is < Ix; 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 45 A / 220-230 V and 30 A / 380-480 V			
		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.) ②			
		FWD / REV selection			
		Local / 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			
		Options	Simplified keypad (with LED display only)		OPTIONAL
	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		
FiledBus Communications kits (Mounted inside inverter)			KFB – PD		
			KFB – DN		
			KFB – MR		
Inverter / PC Communication kit			SUPERDRIVE Software	SUPERDRIVE	
			Connectors and cables		
		KCS CFW-09			
Built-in dynamic braking transistor			“DB” Models		
Models: 54 ... 130 A / 220-230 V and 38 ... 142 A / 380-480 V					
External dynamic braking module			“FR”		
Models: 180 ... 600 A / 380-480 V					
Through surface mounting kit (for sizes 3 ... 8)			-		
EMC filter			-		

Data subject to change without previous notice.

Sizing Table

AC LINE VOLTAGE	CFW-09 INVERTER				RECOMMENDED MOTOR [®]				SIZE		
	Part Number CFW-09...	Built-in Dynamic Braking	Rated Current (A)		Voltage (V)	CT		VT			
			CT*	VT*		HP	kW	HP		kW	
220 / 230V	0006 T 2223 P S	Yes	6.0 [®]		220	1,5	1,1	1,5	1,1	1	
	0007 T 2223 P S		7.0 [®]			2,0	1,5	2,0	1,5		
	0010 T 2223 P S		10 [®]			3,0	2,2	3,0	2,2		
	0013 T 2223 P S		13			4,0	3,0	4,0	3,0		
	0016 T 2223 P S		16			6,0	4,4	6,0	4,4		
	0024 T 2223 P S		24			7,5	5,5	7,5	5,5		
	0028 T 2223 P S		28			10	7,5	10	7,5		
	0045 T 2223 P S		45			15	11	15	11		
	0054 T 2223 P S	Optional Built-in	54	68		20	15	25	18,5	3	
	0070 T 2223 P S		70	86		25	18,5	30	22		
	0086 T 2223 P S		86	105		30	22	40	30	5	
	0105 T 2223 P S		105	130		40	30	50	37		
	0130 T 2223 P S		130	150		50	37	60	45	6	
	0142 T 2223 P S		142	174		50	37	75	55		
0180 T 2223 P S	External DB Module	180		75	55	75	55	8			
0240 T 2223 P S		240		100	75	100	75				
380 / 400 / 415 / 440 / 460 / 480V	0003 T 3848 P S	Yes	3,6		380	1,5	1,1	1,5	1,1	1	
	0004 T 3848 P S		4,0			2,0	1,5	2,0	1,5		
	0005 T 3848 P S		5,5			3,0	2,2	3,0	2,2		
	0009 T 3848 P S		9,0			5,0	3,7	5,0	3,7		
	0013 T 3848 P S		13			7,5	5,5	7,5	5,5		
	0016 T 3848 P S		16			10	7,5	10	7,5		
	0024 T 3848 P S		24			15	11	15	11		
	0030 T 3848 P S		30			20	15	20	15		
	0038 T 3848 P S	Optional Built-in	38	45		25	18,5	30	22	4	
	0045 T 3848 P S		45	54		30	22	30	22		
	0060 T 3848 P S		60	70		40	30	50	37	5	
	0070 T 3848 P S		70	86		50	37	60	45		
	0086 T 3848 P S		86	105		60	45	75	55	6	
	0105 T 3848 P S		105	130		75	55	75	55		
	0142 T 3848 P S	142	174	100		75	125	92	7		
	0180 T 3848 P S	180		125		92	125	92			
	0240 T 3848 P S	240		150		110	150	110	8		
	0361 T 3848 P S	361		270		200	270	200			
	0450 T 3848 P S	External DB Module	450			300	220	300	220	9	
	0600 T 3848 P S		600			400	300	400	300		
	0686 T 3848 P S		686			500	370	500	370		
	0855 T 3848 P S		855			600	450	600	450		
	1140 T 3848 P S		1140			800	600	800	600		
	1283 T 3848 P S		1283			900	660	900	660		
	1710 T 3848 P S	1710		1300		950	1300	950	-		
	0003 T 3848 P S	Yes	3,6			440	1,5	1,1	1,5	1,1	1
	0004 T 3848 P S		4,0				2,0	1,5	2,0	1,5	
	0005 T 3848 P S		5,5				3,0	2,2	3,0	2,2	
	0009 T 3848 P S		9,0				6,0	4,4	6,0	4,4	
	0013 T 3848 P S		13				10	7,5	10	7,5	
	0016 T 3848 P S		16				12,5	9,2	12,5	9,2	
	0024 T 3848 P S		24				15	11	15	11	
	0030 T 3848 P S		30				20	15	25	18,5	
	0038 T 3848 P S	Optional Built-in	38	45			25	18,5	30	22	4
0045 T 3848 P S	45		54	30	22		40	30			
0060 T 3848 P S	60		70	40	30		50	37	5		
0070 T 3848 P S	70		86	50	37		60	45			
0086 T 3848 P S	86		105	60	45		75	55	6		
0105 T 3848 P S	105		130	75	55		100	75			
0142 T 3848 P S	142	174	100	75	125		92	7			
0180 T 3848 P S	180		150	110	150		110				
0240 T 3848 P S	240		200	150	200		150	8			
0361 T 3848 P S	361		300	220	300		220				
0450 T 3848 P S	External DB Module	450		350	260		350	260	9		
0600 T 3848 P S		600		500	370		500	370			
0686 T 3848 P S		686		600	450		600	450			
0855 T 3848 P S		855		700	500		700	500			
1140 T 3848 P S		1140		900	660		900	660			
1283 T 3848 P S		1283		1000	730		1000	730			
1710 T 3848 P S	1710		1500	1100	1500		1100	-			

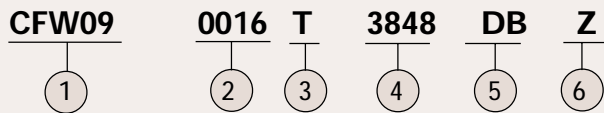
*CT = Constant Torque; VT = Variable Torque

Note: 1 - Recommended Motor ratings are based on Table 430-150 (Full-Load Current Three-Phase Alternating-Current Motors) of the US National Electrical Code (NEC).

2 - The 6, 7 and 10A/230V models can be single-phase powered without output current de-rating

Enclosure: IP20 Protected Chassis for all sizes.

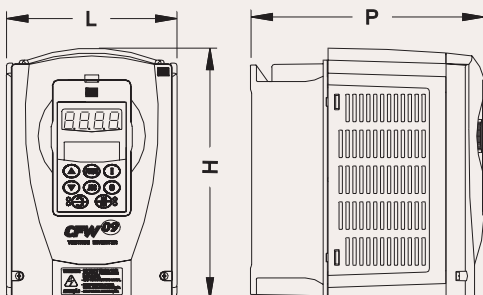
CFW-09 Part Number Specification



- 1 - WEG Frequency Inverter CFW-09 Series
- 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
- 5 - Languages: P = Portuguese
E = English
G = German
S = Spanish
- 6 - Product Version: S = Standard
O = Optional
- 7 - Enclosure: 00 = standard (see technical specifications table)
- 8 - HMI - Human Machine Interface: 00 = Standard (LED + LCD)
SI = Without HMI
- 9 - Dynamic Braking: 00 = Standard
DB = With Built-in Dynamic Braking Transistor
- 10 - Expansion Boards: 00 = Not provided
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
- 11 - FieldBus Communications cards: 00 = Standard (not provided)
PD = KFB-PD optional (Profibus DP)
DN = KFB-DN optional (Device Net)
MR = KFB-MR optional (Modbus RTU)
- 12 - Special Hardware: 00 = not provide
H1...Hn = Special Hardware version-Optional
- 13 - Special Software: 00 = Standard
S1...Sn = Special Software version-Otional
- 14 - Z = End of Code

220 ... 230 V	380 ... 480 V
0006 = 6.0 A	0003 = 3.6 A
0007 = 7.0 A	0004 = 4.0 A
0010 = 10 A	0005 = 5.5 A
0013 = 13 A	0009 = 9.0 A
0016 = 16 A	0013 = 13 A
0024 = 24 A	0016 = 16 A
0028 = 28 A	0024 = 24 A
0045 = 45 A	0030 = 30 A
0054 = 54 A	0038 = 38 A
0070 = 70 A	0045 = 45 A
0086 = 86 A	0060 = 60 A
0105 = 105 A	0070 = 70 A
0130 = 130 A	0086 = 86 A
0142 = 142 A	0105 = 105 A
0180 = 180 A	0142 = 142 A
0240 = 240 A	0180 = 180 A
	0240 = 240 A
	0361 = 361 A
	0450 = 450 A
	0600 = 600 A
	0686 = 686 A
	0855 = 855 A
	1140 = 1140 A
	1283 = 1286 A
	1710 = 1710 A

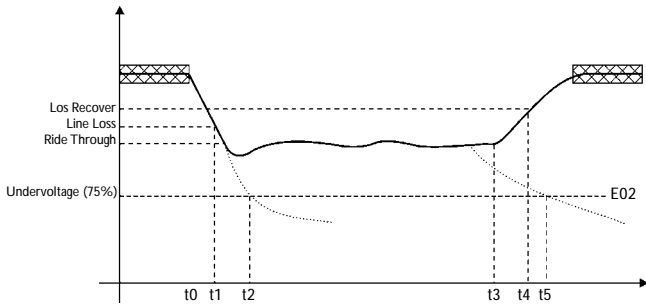
Dimensions and Weight



SIZE	Width - W mm (in)	Height - H mm (in)	Depth - D mm (in)	Weight lb (kg)
1	143 (5.6)	210 (8.3)	196 (7.7)	3.0 (6.6)
2	182 (7.2)	290 (11.4)		5.3 (11.7)
3	223 (8.9)	390 (15.3)	274 (10.8)	17 (37.5)
4	250 (9.8)	475 (18.7)		22 (48.5)
5	335 (13.2)	550 (21.6)		30 (66.1)
6		675 (26.6)	43 (94.8)	
7		835 (32.9)	310 (12.2)	55 (121)
8	410 (16.1)	975 (38.4)	370 (14.6)	80 (176)
9	689 (27.1)	1020 (40.2)	491 (19.3)	200 (441)
10	700 (27.5)	1185 (46.6)		230 (507)

Special Functions

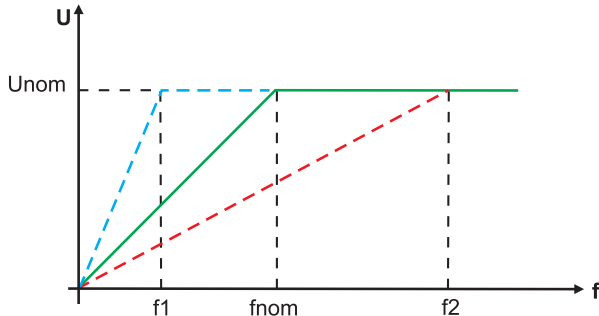
Automatic Process Cycle



- t_0 - Line loss;
- t_1 - Line loss detection;
- t_2 - Trip by Undervoltage (E02 without Ride-Through);
- t_3 - Line Recover;
- t_4 - Line Recover detection;
- t_5 - Trip by Undervoltage (E02 com Ride-Through);

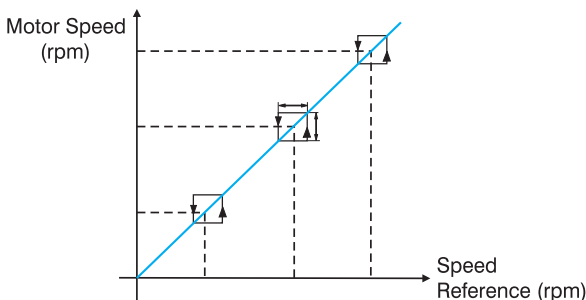
The purpose of the Ride-Through function is to ensure that the inverter maintains the motor running during the line loss, not allowing interruption or fault storing. The energy required for motor running is obtained from the kinetic energy of the motor (inertia) during its deceleration. As soon as the line is reestablished, the motor accelerates again to the speed defined by the reference.

Ajustable V/F Curve



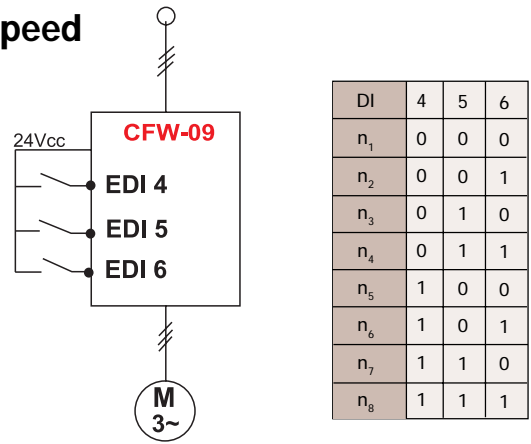
The alteration of the standard V/F curve intends to allow driving motors with rated voltage and/or frequency different from the power supply. The base frequency can be programmed to a new value, below or above the power supply frequency, the voltage can be set to any value below line voltage.

Critical Speeds Rejection



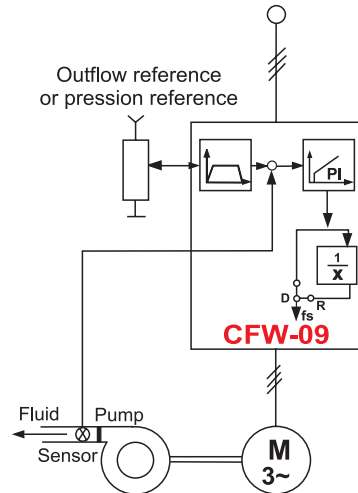
This function avoids the possibility of running the motor at critical speeds that may provoke mechanical resonance on the motor/load system causing excessive noise or vibration. Up to three speeds and a rejection band can be programmed.

Multi-speed



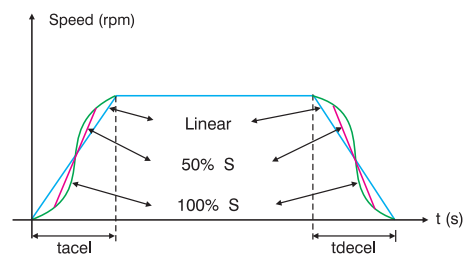
Up to eight different speeds can be programmed by the user and selected via the combination of three Digital Inputs. These Inputs can be switched by any external device such as Limit Switches, Photocells, Proximity Sensors, PLC, etc.

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, undesirable and some times unpractical for certain applications.



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