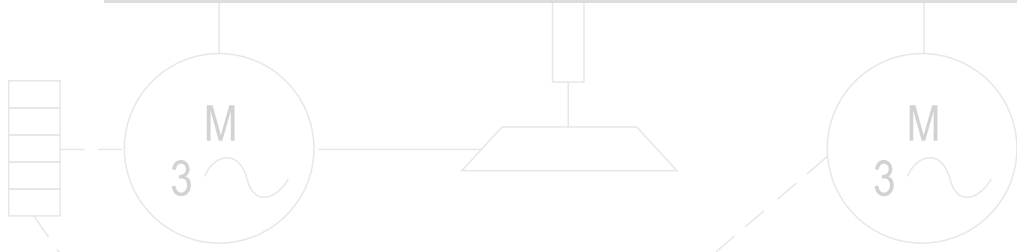
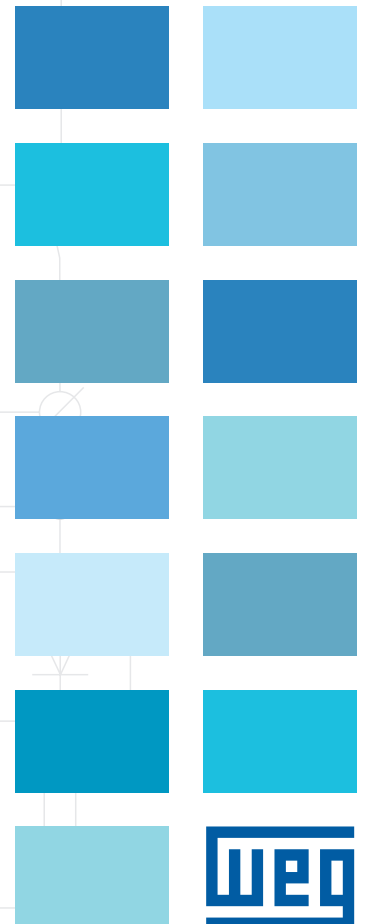


Shark™

Drive



Variable Frequency Drives

Shark™ Drive

The WEG SHARK™ line of Variable Frequency Drive is designed to complement the enclosure ruggedness of WEG's SHARK™ motor product line. The all Stainless Steel NEMA 4X Enclosure is ideal for high pressure hose washdown and corrosive environments that are typically found in the food processing and pharmaceutical industries. The SHARK™ Drive's complete package combination of the CFW09's triple control capability (Volts/Hz, Sensorless or Closed Loop Vector) matched with the SHARK™ Drive's NEMA 4X enclosure rating allows the SHARK™ Drive to succeed in virtually all applications in any industrial environment.



Applications

- Pumps
- Fans/Blowers
- Conveyors
- Rollout tables
- Agitators
- Mixers

Standard Features

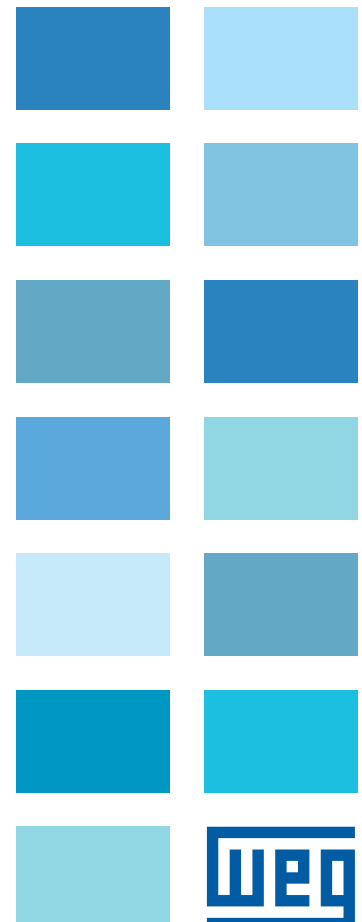
- NEMA 4X All Stainless Steel Enclosure
- V/Hz and sensorless Vector Control
- Self Tuning
- Single and Three-phase input voltage
- 200-240V or 380-480V input voltage
- 150% current overload capacity
- Dynamic Braking transistor
- 32 bit RISC microprocessor controlled PWM output
- 1.25/2.5/5/10kHz adjustable switching frequency
- Six isolated programmable digital inputs
- Three programmable relay outputs (250Vac/1A)
- Two isolated programmable analog inputs
- Two programmable analog outputs
- Protective features: Over current, motor overload, drive over temperature, output phase-to-phase and phase-to-ground short circuit, DC bus over and under voltage, power supply under voltage and phase loss 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, adjustable V/Hz profile, maximum and minimum adjustable frequency limits, two skip frequencies, adjustable output current limit, JOG, ride-thru and flying start and PID regulator
- Display readings: Motor speed, frequency, voltage, current and torque, output power (kW), four last faults, drive status, digital and analog I/O status, hours powered and hours running
- Ambient: 32°F (0°C) to 104°F (40°C), 3300 ft (1000m) altitude, 90% humidity, non-condensing

Optional Features

- Closed loop vector control
- RS-485 Serial Interface
- Fieldbus Comm: Profibus DP, DeviceNet or Modbus RTU*
- Encoder buffered output
- Additional digital and analog I/O



* Requires optional RS-232 or RS-485 interface





Variable Frequency Drives Shark™ Drive



NEMA4X Enclosure

VARIABLE FREQUENCY DRIVES

Motor Volts	Motor HP	Drive Amps	Catalog Number	Frame Size	Dimensions H x W x D	App. Shpg. Wt. (lbs.)	List Price	Multiplier Symbol
230 V	INPUT POWER SUPPLY: SINGLE OR THREE-PHASE - 230V							
	1.5	6	CFW090006TDN4Z	1	14.2 x 9.2 x 8.5	22	\$2,087	V1
	2	7	CFW090007TDN4Z	1	14.2 x 9.2 x 8.5	22	\$2,303	V1
	3	10	CFW090010TDN4Z	1	14.2 x 9.2 x 8.5	22	\$2,509	V1
	INPUT POWER SUPPLY: THREE PHASE - 230V							
	1.5	6	CFW090006TDN4Z	1	14.2 x 9.2 x 8.5	22	\$2,087	V1
	2	7	CFW090007TDN4Z	1	14.2 x 9.2 x 8.5	22	\$2,303	V1
	3	10	CFW090010TDN4Z	1	14.2 x 9.2 x 8.5	22	\$2,509	V1
460V	INPUT POWER SUPPLY: THREE PHASE - 460V							
	1.5	3.6	CFW090003TGN4Z	1	14.2 x 9.2 x 8.5	22	\$2,243	V1
	2	4	CFW090004TGN4Z	1	14.2 x 9.2 x 8.5	22	\$2,383	V1
	3	5.5	CFW090005TGN4Z	1	14.2 x 9.2 x 8.5	22	\$2,522	V1
	5	9	CFW090009TGN4Z	2	16.2 x 10.2 x 8.5	33	\$2,999	V1
	7.5	13	CFW090013TGN4Z	2	16.2 x 10.2 x 8.5	33	\$3,419	V1
	10	16	CFW090016TGN4Z	2	16.2 x 10.2 x 8.5	33	\$4,132	V1

Options & Accessories

	Description	Catalog Number	List Price	Multiplier Symbol
Keypads	Standard Keypad with LED & LCD	HMI-CFW09-LCD	\$202	V1
	Remote Station-includes Start PB, Stop PB, 1-NC and 1-NO contact block, Potentiometer 5k and legends (22mm) replaces CFW-REM	CSW-SP3PBS	\$460	Z5
	Remote Station-includes Start PB, Stop PB, 1-NC and 1-NO contact block, Potentiometer 5k and legends (30mm) replaces CFW-REM	CSW30-SP3PBS	\$535	Z5
Communi- cation	Profibus DP Communication Kit	KFB-PD	\$993	V1
	DeviceNet Communication Kit	KFB-DN	\$872	V1
I/O Expansion Boards	I/O Exp. Board A with Encoder Input, Encoder Output, RS-485 Serial Interface, I4 bit A/D, I4 bit D/A's, Digital Inputs and Outputs + Thermistor (PTC) Input	EBA.01-CFW09	\$1,345	V1
	I/O Exp. Board A with RS-485 Serial Interface, Digital Inputs and Outputs + Thermistor (PTC) Input	EBA.02-CFW09	\$317	V1
	I/O Exp. Board A with I4 bit A/D, I4 bit D/A's, Digital Inputs and Outputs + Thermistor (PTC) Input	EBA.03-CFW09	\$621	V1
	I/O Exp. Board B with Encoder Input, Encoder Output, RS-485 Serial Interface, Isolated Analog Input, Isolated Analog Outputs, Digital Inputs and Outputs + Thermistor (PTC) Input	EBB.01-CFW09	\$1,133	V1
	I/O Exp. Board B with Encoder Input, Digital Inputs and Outputs + Thermistor (PTC) Input	EBB.02-CFW09	\$533	V1
	I/O Exp. Board B with Isolated Analog Input, Isolated Analog Outputs, Digital Inputs and Outputs + Thermistor (PTC) Input	EBB.03-CFW09	\$634	V1
	I/O Exp. Board B with Encoder Input, 5V Power Supply for Encoder, Buffered Outputs for Encoder Signals, RS-485 Serial Port, 24V Digital Input, 2 X 24V OC Digital Outputs, 0...10V/4-20mA Analog Input, 2 X 4-20mA Analog Outputs and PTC Thermistor Input	EBB.04-CFW09	\$1,413	V1
	I/O Exp. Board B with 2 X 4-20mA Analog Outputs	EBB.05-CFW09	\$426	V1
	I/O Exp. Board C with Encoder Input, 5-15VDC External Power Supply	EBC1.01-CFW09	\$184	V1
	I/O Exp. Board C with Encoder Input with internal Power Supply - 5VDC	EBC1.02-CFW09	\$511	V1
	I/O Exp. Board C with Encoder Input with internal Power Supply - 12VDC	EBC1.03-CFW09	\$529	V1
	I/O Exp. Board E with RS-485 Serial Interface, Digital Inputs and Outputs + Thermistor (PTC) Input	EBE.01-CFW09	\$183	V2
	PLC/Motion Control Board	PLC1.01	\$985	V1
	PLC/Motion Control Board	PLC2.00	\$1,170	V1

Note: Dynamic Braking Resistors for the Shark Drive can be selected from page C-13. Use Volts and HP for proper selection.

Note: These are non-stocked items, consult WEG for availability.

*Can be used with Shark Drive Series

**External DB Transistor Module DBWXXXX36801 must be ordered

Variable Frequency Drives

Shark™ Drive

Technical Data



Power Supply	Voltage	Three Phase	220–230 V: 220 / 230 V (+10%, -15%) - 1 Ø up to 3HP without de-rating 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 (Displacement Power Factor)	Greater than 0.98			
Enclosure	Degree of Protection	NEMA 4X - All Stainless Steel			
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)			
		Flux Vector with Encoder			
	Switching Frequency	1.25 / 2.5 / 5.0 / 10 kHz			
	Frequency Range	0...204 Hz for V / F and Vector with Encoder Control (60 Hz Motor)			
		0...170 Hz for V / F and Vector with Encoder Control (50 Hz Motor)			
0...100 Hz for Sensorless Vector Control (50 or 60 Hz Motor)					
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 : 20:1		
		Sensorless Vector Mode	Regulation : 0.5% of Motor Rated Speed Resolution : 1 rpm (keypad reference) Range : 100:1		
		Flux Vector Mode with Encoder	Regulation with: 10 bit Analog Reference: +/- 0.1% of Motor Rated Speed 14 bit Analog Reference: +/- 0.01% of Motor Rated Speed ¹ Digital Reference (Ex: Keypad or Serial): +/- 0.01% of Motor Rated Speed Range : Down to 0 rpm		
	Torque Control	Flux Vector Modes	Regulation: +/- 10% of Motor Rated Torque Range : 0...150% of Motor Rated Torque		
	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 1 Programmable Isolated Input : 24 Vdc (for Motor PTC Thermistor) ¹	
				Encoder	1 Differential Input, with 12 Vdc Internal Isolated Power Supply (14 bit resolution) ¹
Control Outputs	Analog	2 Programmable Outputs (11 bit) : 0...10 V 2 Programmable Bipolar Outputs (14 bit) : -10...+10 V ¹ 2 Programmable Isolated Outputs (11 bit) : 0...20 mA or 4...20 mA ¹			
		Relay	2 Programmable Outputs, Form C Contacts (NO/NC) : 240 Vac, 1 A 1 Programmable Output, Form A Contact (NO) : 240 Vac, 1 A		
		Transistor	2 Programmable Isolated Outputs (Open Collector) : 24 Vdc, 50 mA ¹		
	Encoder	1 Isolated Differential Encoder Signals Output : 5...15 Vdc External Power Supply ¹			
	Communication	Serial	RS-232 with KCS-CFW09 Kit ¹ RS-485, Isolated, with EBA, EBE or EBB Board ¹		
Field Bus			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		
	VFD 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 12100 ft (4000 m) with 10% / 1000 m Output Current De-Rating			

Variable Frequency Drives Shark™ Drive



Technical Data

Conformities	EMC Directive 89 / 336 / EEC EN 61800-3	Electromagnetic Compatibility – Industrial Environment EMC - Emission and Immunity	
	LVC 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)		Phoenix Test - Labs GmbH - Germany	
Keypad	Programming	General VFD 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)	VFD 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 VFD 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	
		VFD Self-tuning to motor and load (Vector Modes)	
		Specific unit indication (Ex: l/s, th, %, 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 adjustments for the analog outputs	
		JOG function	
		JOG +/- JOG - function (momentary speed increase/decrease, phase shift)	
		COPY function (VFD / Keypad or Keypad / VFD)	
		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 30A / 380-480V	
		Multi-speed function (up to 8 preset speeds)	
		Speed Profiling function	
		Hour meter and Wattmeter	
	PID regulation (for automatic control of level, pressure, flow, etc.)		
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 ... 45A / 220-230V and 3.6 ... 30A / 380 -480V			
Options	I/O Expansion Boards	FieldBus Communications Kit (Mounted inside VFD)	