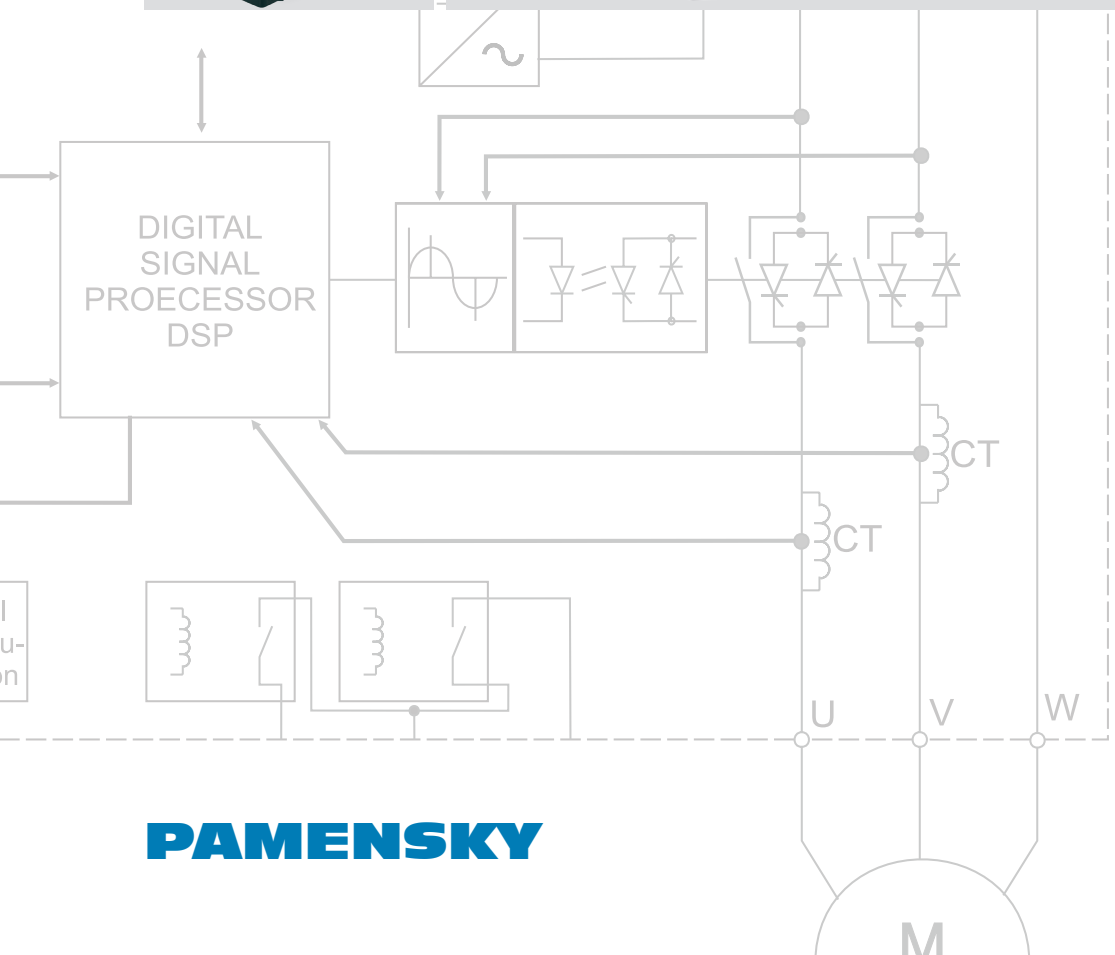
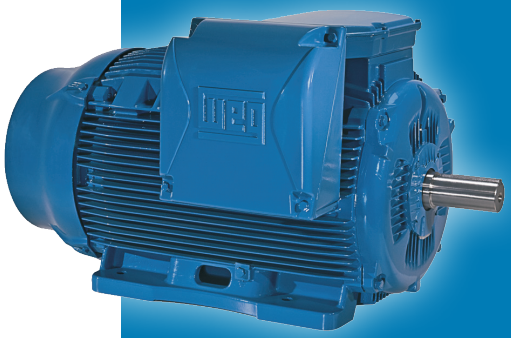
Automation

Variable Frequency Drives
Soft Starters
Controls & Protection Devices

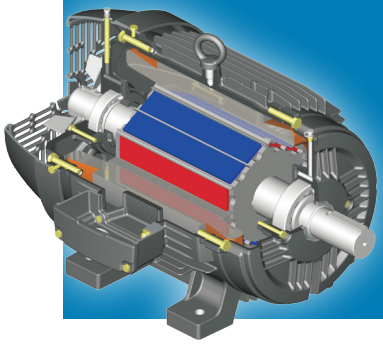


PAMENSKY

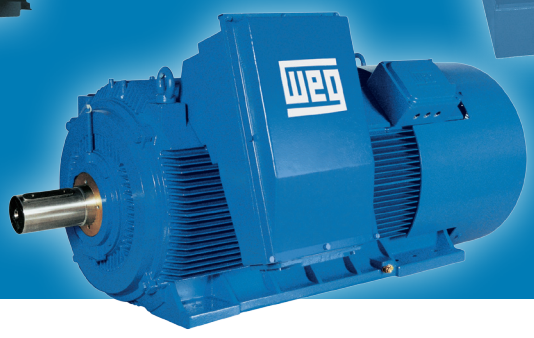
WEG Motors
NEMA and IEC Electric Motors



Wmagnet Drive System
Permanent Magnet Motors



WEG Energy Products
Low and High Voltage Machines, Transformers and Generators



The Companies

WEG

WEG is acknowledged today as one of the largest manufacturers of electric motors, controls and transformers in the world. Twenty two thousand people are employed in the different manufacturing units which cover over 1,000,000 square meters of constructed area.

In support of exports in over 100 countries worldwide, WEG has manufacturing facilities in Brazil, Argentina, Mexico, Portugal, China and India and branch offices located in all five continents. WEG's great success with export activities is based on the company's willingness to meet worldwide standard requirements, keeping product inventories in strategic locations personnel training and prompt service.

V.J. Pamensky Canada Inc.

V.J. Pamensky Canada Inc. was founded in Toronto, Ontario in September 1977 as the exclusive importer of WEG Electric Motors, Controls and Transformers into Canada. The original inventory was small, as were the premises, but these products quickly found a place in the Canadian industrial market. From these beginnings, growth came rapidly, resulting in successive moves to different locations in order to meet the demands for increased inventory and service.

Today, V.J. Pamensky Canada Inc. is one of the largest importers of electric motors and controls in Canada with offices and warehouses across the country. V.J. Pamensky Canada Inc. has probably the largest inventory of any Electric Motor and Control Company in Canada.

V.J. Pamensky Canada Inc. offers 24 hour emergency service, and will customize and modify products to meet the Customer's most demanding specifications.

Inverter Duty Motors - CSA Approved

APPROVED BY

LR 50962

WEG Motors are wound with Spike Resistant WISE WIRE

Meets NEMA MG1 Part 30 & 31

WEG Severe Duty High Efficiency TEFC Motors – Temp Code: T3	WEG High Efficiency Explosion Proof Motors – Temp Code: T3C
■ CSA Certified for Division 2, Class I, Groups B, C & D and *Division 2, Clas II, Group F	■ CSA Certified for Division 1, Class I, Groups C & D and *Division 1, Clas II, Groups F & G
■ Inverter Duty Certified for 12:1 CT & 1000:1 VT	■ Inverter Duty Certified for 12:1 CT & 1000:1 VT
■ Inverter Duty Certified for 100:1 CT with a WEG VFD running in Optimized Flux mode	■ Inverter Duty Certified for 100:1 CT with a WEG VFD running in Optimized Flux mode
WEG NEMA Premium™ Efficiency TEFC Motors – Temp Code: T3	**WEG Explosion Proof NEMA Premium™ Efficiency Motors – Temp Code: T3C**
■ CSA Certified for Division 2, Class I, Groups B, C & D and *Division 2, Clas II, Group F	■ CSA Certified for Division 1, Class I, Groups C & D and *Division 1, Clas II, Groups F & G
■ Inverter Duty Certified for 20:1 CT & 1000:1 VT	■ Inverter Duty Certified for 20:1 CT & 1000:1 VT
■ Inverter Duty Certified for 1000:1 CT with a WEG VFD running in Optimized Flux mode	■ Inverter Duty Certified for 1000:1 CT with a WEG VFD running in Optimized Flux mode

* Please call 1 877 PAMENSKY for details about this product

Temperature Codes are subject to change. Please call for details.

STANDARD WARRANTY AND TERMS AND CONDITIONS

Warranty Period:

All WEG Automation products sold by V.J. Pamensky Canada Inc. are warranted by the manufacturer (WEG) to be free of defects in material and workmanship for a period of 1 (one) year from date of invoice but not more than 18 (eighteen) months from date of manufacture.

Terms and Conditions:

All sales are subject to the standard V.J. Pamensky Canada Inc. terms and conditions of sale are available on the company website: www.pamensky.com.

Restocking Policy:

All returned goods are subject to prior approval and must be accompanied by a return goods authorization (RGA) number. These goods must be returned within 30 days, freight prepaid, in resalable condition and in original packaging. The standard restocking charge is 15% but the charge may be higher depending on the condition of the product and packaging being returned.

Authorized Service Centers:

WEG has service centers around the world to service the needs of our customers. Information regarding the nearest service center can be located by calling 1-800-ASK-4WEG (1-800-275-4934) or on our web site www.pamensky.com. Any warranty repair must be pre-approved by VJP.

Warranty Service:

If in the event that a WEG product should require warranty service due to defective materials or workmanship, VJP will, at its option either repair or replace the defective product. Warranty is applied to products that have been, at all times, operated or used under the normal operating conditions for which the product was designed and properly maintained. Both VJP and WEG are not responsible for any expenses incurred in installation, removal from service, transport or consequential expenses (see terms and conditions at www.pamensky.com).

Disclaimer of Expenses:

VJP and WEG disclaim all other express or implied warranties, including without limitation all implied warranties of merchantability pertaining to such product or parts. The foregoing obligation to repair or replace such products or parts shall be the sole and exclusive remedy of the purchaser, its customers, or users of the products or parts.

Warranty Contact:

warranty@pamensky.com

Phone: 1-800 275-4934

Fax: 1-416-781-4352

Table of Contents

CFW-08 Plus - Variable Frequency Drive
Purchasing Data

Standard 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 built-in on some models
- 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
- NEMA 1 Kit for metallic conduit connection

Optional Features

- Parallel Remote Keypad (HMI) (7 segment LED)Serial
- Remote Keypad (HMI) (7 segment LED)Interface Module for Serial Remote Keypad (HMI)
- Interface Module for Parallel Remote Keypad (HMI)
- Interface Module for starting with digital input in 120 Vac
- Interconnection Cable of the Serial Remote HMI (1; 2; 3; 5; 7.5 and 10 m)
- Interconnection Cable of the Parallel Remote HMI (1; 2; 3; 5; 7.5 and 10 m)
- Serial Communication module RS-232
- Serial Communication module RS-485
- CANopen Communication module
- DeviceNet Communication module
- ProfiBus DP Communication module
- RS-232 to RS-485 Converter
- Windows based programming software - SUPERDRIVE
- Din rail mounting kit
- EMC Filter with high Attenuation Capacity (Class A - internal)
- EMC Filter with high Attenuation Capacity (Class B - external)

CFW-08 Plus - Variable Frequency Drive
Purchasing Data

Power Supply Voltage	Power Supply	CFW–08 DRIVES					Maximum Applicable Motor			Dimensions (mm)			Weight (lbs.)
		Part Number	List Price	Dynamic Braking	Current (A)	Size	Voltage (V)	Power rating HP	Power rating kW	H	W	D	
200/220/230/240V	Single-Phase	CFW0800163P1	$460	No	1.6	1	230	0.25	0.25	6.0	3.0	5.2	2.2
		CFW0800263P1	465	No	2.6			0.5	0.37				
		CFW080043P1	491	No	4			1	0.75				
		CFW0800733P1	788	Yes	7.3	2		2	1.5	7.9	4.5	5.9	4.4
		CFW0801003P1	866	Yes	10			3	2.2				
	Three-Phase	CFW080016B2P	535	No	1.6	1		0.33	0.25	6.0	3.0	5.2	2.2
		CFW080026B2P	543	No	2.6			0.5	0.37				
		CFW08004B2P	568	No	4			1	0.75				
		CFW080070T2P	669	Yes	7.3	2		2	1.5	7.9	4.5	5.9	4.4
		CFW080073B2P	788	Yes	10			3	2.2				
		CFW080100B2P	866	No	7	1		2	1.5	6.0	3.0	5.2	2.2
		CFW080160T2P	1,044	Yes	16	2		5	4	7.9	4.5	5.9	4.4
		CFW080220T2P	1,643	Yes	22	3		7.5	5.5	8.0	5.6	6.5	5.5
		CFW080280T2P	2,114	Yes	28	4		10	7.5	11.4	7.2	7.7	13.2
		CFW080330T2P	2,711	Yes	33			12.5	9.5				
	Three-Phase	CFW080010T4P	662	No	1	1	460	0.33	0.25	6.0	3.0	5.2	2.2
		CFW080016T4P	685	No	1.6			0.75	0.55				
		CFW080026T4P	705	No	2.6			1.5	1.1				
		CFW080027T4P	767	No	4			2	1.5				
		CFW08004T4P	793	Yes	2.7	2		1.5	1.1	7.9	4.5	5.9	4.4
		CFW080043T4P	979	Yes	4.3			2	1.5				
		CFW080065T4P	1,168	Yes	6.5			4	3				
		CFW080100T4P	1,357	Yes	10			6	4.5				
		CFW080130T4P	1,574	Yes	13	3		7.5	5.5	8.0	5.6	6.5	5.5
		CFW080160T4P	1,775	Yes	16			10	7.5				
		CFW080240T4P	2,556	Yes	24	4		15	11.3	11.4	7.2	7.7	13.2
		CFW080300T4P	3,078	Yes	30			20	15				
500–600V	Three-Phase	CFW080017575	1,057	Yes	1.7	3	575	1	0.75	8.0	5.6	6.5	5.5
		CFW080030575	1,111	Yes	3.0			2	1.5				
		CFW080043575	1,256	Yes	4.3			3	2.2				
		CFW080070575	1,406	Yes	7.0			5	3.7				
		CFW080100575	1,625	Yes	10			7.5	5.5				
		CFW080120575	1,824	Yes	12			10	7.5				

NOTE: The maximum motor power ratings listed above were based on WEG II and IV–pole motors. For motors 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 according to the rated motor current.

CFW-08 Plus - Variable Frequency Drive
Purchasing Data

CFW08 Wash - NEMA 4X (IP56)

The frequency inverter CFW-08 Wash is an inverter dedicated to applications that require a higher protection degree. The Nema 4X protection degree assures protection against dust, dirt and directed water jets.

The recommended environments for the CFW-08 Wash include:
- NEMA 4X indoor environments
- NEMA 12 indoor environments
- IP56 environments

Power Supply Voltage	Power Supply	CFW–08 Wash Drives					Maximum Applicable Motor			Dimensions (in.)			Weight (lbs.)
		Part Number	List Price	Dynamic Braking	Current (A)	Size	Voltage (V)	Power rating HP	Power rating kW	H	W	D	
200 – 240 V	Single-Phase	CFW0800732N4	$1,326	Yes	7.3	A	230	2	1.5	10.4	6.5	8.5	5
		CFW0801002N4	1,456	Yes	10			3	2.2				
	Three-Phase	CFW0800732N4	1,326	Yes	7.3	A		2	1.5				
		CFW0801002N4	1,456	Yes	10			3	2.2				
		CFW0801602N4	1,558	Yes	16			5	4				
		CFW0802202N4	2,090	Yes	22	B		7.5	5.5	13.4	8.5	8.5	18
		CFW0802802N4	2,688	Yes	33			10	7.5				
		CFW0803302N4	3,296	Yes	40			12.5	9.2				
380 – 480 V	Three-Phase	CFW0800274N4	1,120	Yes	2.7	A	460	1	0.75	10.4	6.5	8.5	5
		CFW0800434N4	1,428	Yes	4.3			2	1.5				
		CFW0800654N4	1,680	Yes	6.5			3	3				
		CFW0801004N4	1,800	Yes	10			5	3.7				
		CFW0801304N4	2,088	Yes	13	B		7.5	5.5	13.4	8.5	8.5	18
		CFW0801604N4	2,354	Yes	16			10	7.5				
		CFW0802404N4	3,248	Yes	24			15	11				
		CFW0803004N4	4,250	Yes	30			20	15				
500 – 600 V	Three-Phase	CFW0800175N4	1,578	Yes	1.7	B	575	1	0.75	13.4	8.5	8.5	18
		CFW0800305N4	1,818	Yes	3.0			2	1.5				
		CFW0800435N4	1,876	Yes	4.3			3	2.2				
		CFW0800705N4	2,098	Yes	7.0			5	3.7				
		CFW0801005N4	2,338	Yes	10			7.5	5.5				
		CFW0801205N4	2,624	Yes	12			10	7.5				

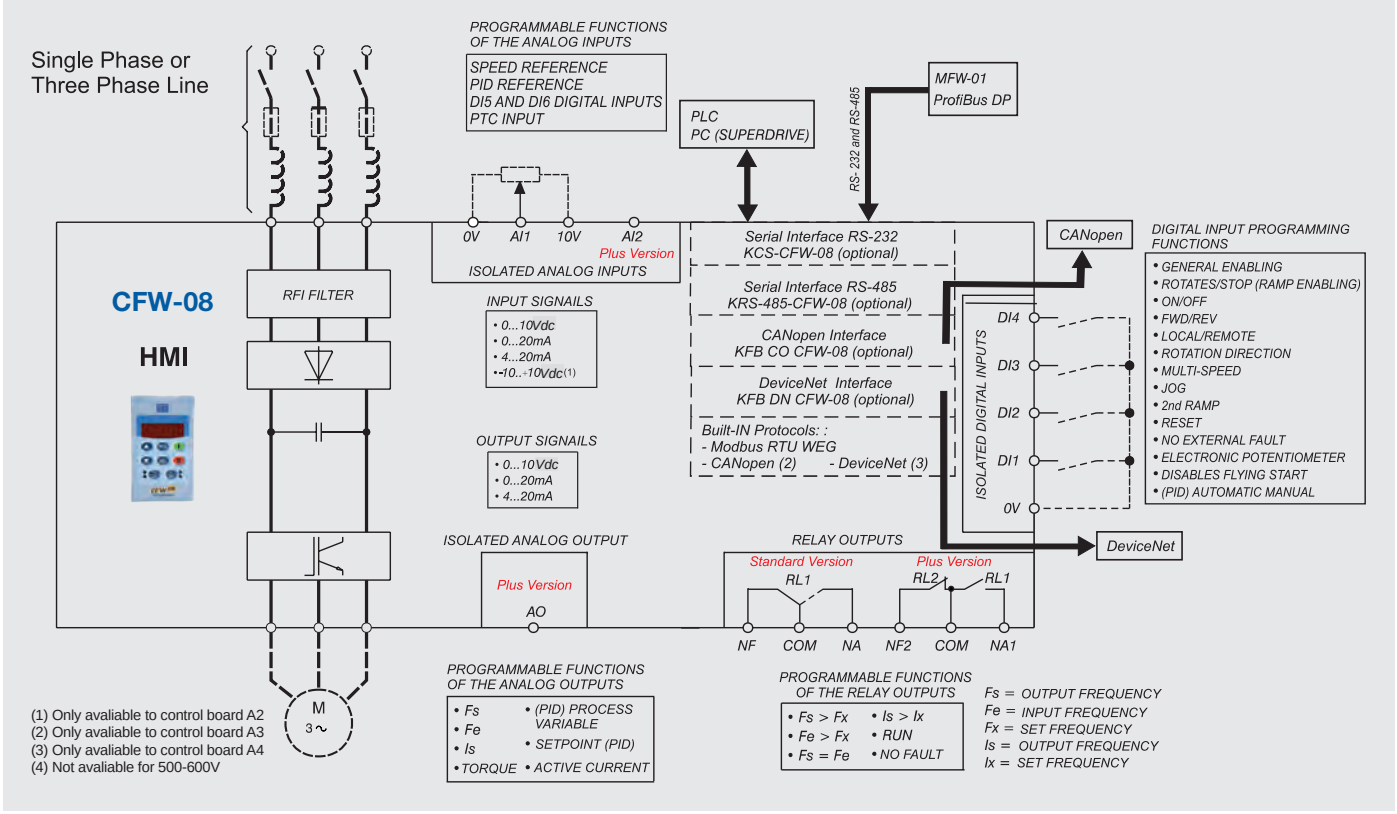
NOTE: The maximum motor power ratings listed above were based on WEG II and IV–pole motors. For motors with different number of poles (ex.: VI and VIII poles), other voltages (ex.: 220V, 380V and 460V) and/or motors from other manufacturers, specify the VSD according to the rated motor current.

CFW-08 Plus - Variable Frequency Drive
Accessories

CFW08 Plus – Accessories

	Description	Part Number	List Price
Keypads	NEMA4 Remote Keypad (requires CFW08-MIS-RS & cable)	CFW08-HMI08	$148
	Remote Keypad Interface	CFW08-MIS-RS	70
	Keypad Cover	CFW08TCL	14
Keypad Cables	1m (3.3 ft) Remote Keypad Cable	CFW08HMI08S1	22
	2m (6.6 ft) Remote Keypad Cable	CFW08HMI08S2	24
	3m (10 ft) Remote Keypad Cable	CFW08HMI08S3	26
	5m (16 ft) Remote Keypad Cable	CFW08HMI08S5	40
	7.5m (25 ft) Remote Keypad Cable	CFW08HMI08S7	48
	10m (33 ft) Remote Keypad Cable	CFW08HMI08S10	52
Options	RS-232 Serial Comm. Module (mounted in place of keypad)	CFW08KCS	112
	PC Communication Kit	CFW08KSD	144
	Interface for RS-485 Communication	CFW08KRS485	214
	NEMA1 Kit - IP20 - Size1	CFW08KN1-M1	32
	NEMA1 Kit - IP20 - Size2	CFW08KN1-M2	42

CFW-08 Plus - Variable Frequency Drive
Block Diagram



CFW-08 Plus - Variable Frequency Drive
Technical Data

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%)
			380-480V: 380 / 400 / 415 / 440 / 460 / 480 / 525 / 575 V (10% - 15%)
	Frequency		50 / 60 Hz +/- 2 Hz (48...62 Hz)
	Cos * (Displacement Power Factor)		> 0.98
Enclosure	Drive	Standard	NEMA 1 in sizes 3 and 4and IP 20 in sizes 1 and 2
	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
			Sensorless vector control (WC: Voltage Vector Control)
	Switching Frequency		IGBT Transistors - Frequencies: 2.5 / 5.0 / 10 / 15 kHz
	Frequency Range		0...300Hz
	Fequency Resolution		Analog Ref.: 0.1% of Fmax. And digital ref.: 0.01 Hz (f<100Hz); 0.1 Hz (f>100 Hz)
	Accuracy (25º C = 10ºC)		Analog Ref.: 0.5% and digital Ref.: 0.01%
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
Control Inputs	Analog		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)
			2 Isolated PTC inputs via AL1 and AL2
Outputs	Relay (2)		2 Programmable outpluts, I no and TNC
	Analog (2)		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 tp 4000 m with output current derating 10% / 1000 m)
Finishing	Color		Polytherm 20 mt gray and Polytherm 20 mt blue
Conformities	Electromagnetic Compatibility		EMC Directive 89/336/EEC - Industrial Environment; EN 61800-3 (EMC - Emission and Immunity) - Special Request
	Low Voltage		LVD 73/23/EEC - Low Voltage Directive / UL 508C
	IEC 146		Semiconductors convertors
	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)		SGS / England
	IRAM (ARGENTINA)		Instituto Argentino de Normalización
	C-Tick (AUSTRALIA)		Australian Communications Authority

(1) Only avaliable to control board .
(2) To control board A5 (multipump) there are 3 output by relays (contact N/O) there is no output analog.

CFW-09 - Variable Frequency Drive
Purchasing Data

Standard Features

- V/Hz or Sensorless Vector Control via parameter selection
- Self Tuning to motor parameters
- NEMA 1 Enclosure up to 200HP
- IP20 “Finger Safe” Enclosure from 250 to 500HP
- 200-240V, 380-480V or 500-600/690V input voltage
- Single or Three-phase input voltage up to 3HP/230V
  - Call 1 877 PAMENSKY for higher than 3HP
- 150% current overload capacity
- DC bus connections accessible
- Detachable Smart Keypad with dual display and Copy Function
- 32 bit RISC microprocessor controlled PWM output
- 1.25 / 2.5 / 5 / 10 kHz adjustable switching frequency
- Six isolated programmable digital inputs
- Three programmable relay outputs (250Vac / 1A)
- Two isolated programmable analog inputs
- Two programmable analog outputs (0 - 10 Vdc)
- 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” amp 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 motor speed limits, three skip frequencies, adjustable output current limit, JOG, ride-thru, flying start and PID regulator
- Display readings: Motor speed, frequency, voltage, current and torque, output power (kW), last four faults, drive status, digital and analog I/O status, hours powered and hours running
- Ambient: 32ºF (0ºC) to 104ºF (40ºC), 3300 ft (1000m) altitude, 90% humidity, non- condensing

Optional Features

- Closed loop vector control
- Remote keypad with cable and mounting frame
- RS-232 or RS-485 Serial Interface
- On/Off line PC programming with Superdrive
- Fieldbus Comm: Profibus DP, DeviceNet or Modbus RTU (Requires optional RS-232 or RS-485 Interface)
- Encoder buffered output
- Additional digital and analog I/O
- Dynamic Braking capabilities for most models

CFW-09 - Variable Frequency Drive
Purchasing Data

Power Supply Voltage	CFW–09 DRIVE						MAXIMUM APPLICABLE MOTOR					Dimensions (in.)			Weight (lbs.)
	Part Number	List Price	Built–In Dynamic Braking	Rated Current (A)		Size	Voltage (V)	Constant Torque		Variable Torque					
				CT*	VT*			HP	KW	HP	KW	H	W	D	
220 / 230V	CFW09.06/230	$1,468	Yes	6		1	230	1.5	1.1	1.5	1.1	8.3	5.6	7.7	8
	CFW09.07/230	1,486		7				2	1.5	2	1.5				
	CFW09.10/230	1,563		10				3	2.2	3	2.2				
	CFW09.13/230	1,605		13				3	2.2	3	2.2				
	CFW09.16/230	1,731		16		2		5	3.7	5	3.7	11.4	7.2	7.7	13
	CFW09.24/230	2,274		24				7.5	5.5	5.5	5.5				
	CFW09.28/230	2,517		28				10	7.5	10	7.5				
	CFW09.45/230	3,837		45		3		15	11	15	11	15.3	8.9	10.8	42
	CFW09.54/230	5,339	Optional Built-in	54	68	4		20	15	25	18.5	18.7	9.8	10.8	50
	CFW09.70/230	7,716		70	86	5		25	18.5	30	22	21.6	13.2	10.8	90
	CFW09.86/230	8,124		86	105			30	22	40	30				
	CFW09105/230	9,788		105	130	6		40	30	50	37	26.6	13.2	11.8	121
	CFW09130/230	10,488		130	150			50	37	60	45				
	CFW09142/230	12,178		142	174	7		50	37	60	45	32.9	13.2	11.8	154
	CFW09180/230	16,863		180		8		60	45	60	45	38.4	16.1	14.6	221
	CFW09240/230	24,057		240				75	55	75	55				
380 / 400 / 415 / 440 / 460 / 480 V	CFW09.03/460	1,646	Yes	3.6		1	460	1.5	1.1	1.5	1.1	8.3	5.6	7.7	8
	CFW09.04/460	1,685		4				2	1.5	2	1.5				
	CFW09.09/460	1,744		5.5				3	2.2	3	2.2				
	CFW09.09/460	1,884		9				5.5	4	5.5	4				
	CFW09.13/460	1,980		13		2		7.5	5.5	7.5	5.5	11.4	7.2	7.7	13
	CFW09.16/460	2,464		16				10	7.5	10	7.5				
	CFW09.24/460	2,654		24				15	11	15	11				
	CFW09.30/460	3,780		30	36	3		20	15	25	18.5	15.3	8.9	10.8	42
	CFW09.38/460	4,502	Optional Built-in	38	45	4		25	18.5	30	22	18.7	9.8	10.8	50
	CFW09.45/460	5,628		45	54			30	22	30	22				
	CFW09.60/460	6,976		60	70	5		40	30	50	37	21.6	13.2	10.8	90
	CFW09.70/460	7,430		70	86			50	37	60	45				
	CFW09.86/460	9,110		86	105	6		60	45	75	55	26.6	13.2	11.8	121
	CFW09105/460	9,956		105	130			75	55	100	55				
	CFW09142/460	11,862		142	174	7		100	75	125	90	32.9	13.2	11.8	154
	CFW09180/460	18,778	External DB Module	180		8		125	90	125	90	38.4	16.1	14.6	221
	CFW09211/460	21,410		211				150	110	150	110				
	CFW09240/460	22,280		240				175	132	175	132				
	CFW09312/460	26,396		312		9		220	160	220	160	40.2	688	19.3	476
	CFW09361/460	27,584		361				270	200	270	200				
	CFW09450/460	35,964		450		10		340	260	340	260	46.6	700	19.3	571
	CFW09515/460	41,636		515				400	300	400	300				
	CFW09600/460	47,492		600				430	350	430	370				
500 / 600 V	CFW09.02/575	1,742	Yes	2.9	4.2	2	575	2	1,5	2	2,2	11.4	7.2	7.7	13
	CFW09.04/575	1,801		4,2	7			3	2,2	2.95	4				
	CFW09.07/575	2,305		7	10			5.5	4	3	5.5				
	CFW09.10/575	2,413		10	12			7.5	5.5	7.4	7.5				
	CFW09.12/575	2,935		12	14			10	7.5	10	9.2				
	CFW09.14/575	3,271		14	14			12.3	9.2	12.3	9.2				
	CFW09.22/575	4,194	Optional Built-in	22	27	4		20	15	20	18.5	18.7	9.8	10.8	50
	CFW09.27/575	4,928		27	32			25	18.5	25	22				
	CFW09.32/575	6,708		32	32			30	22	30	22				
	CFW09.44/575	8,941	Optional Built-in	44	53	7		40	30	40.2	37	32.9	13.2	11.8	154
	CFW09.53/575	10,550		53	63			50	37	50	45				
	CFW09.63/575	12,558		63	79			60	45	60.3	55				
	CFW09.79/575	14,928		79	99			75	55	73.7	75				
500 – 690V	CFW09107/575	18,119	External DB Module	107(100)	147(127)	8E		100	75	100	90	45.1	16.1	16.6	253
	CFW09147/575	27,295		147(127)	196(179)			147.5	90	147.5	132				
	CFW09211/575	36,995		211(179)	211(179)			200	150	201	150				
	CFW09247/575	39,018		247(225)	315(259)	10E		248	185	248	220	46.6	27.5	22.9	682
	CFW09315/575	42,264		315(259)	343(305)			295	220	295	260				
	CFW09343/575	56,796		343 (305)	418(340)			350	260	350	315				
	CFW09418/575	61,225		418(840)	472(428)			422	315	422	355				
	CFW09472/575	65,161		472(428)	555(428)			475	355	475	400				

CFW-09 - Variable Frequency Drive
Purchasing Data

575V with Dynamic Braking

Power Supply Voltage	CFW–09 DRIVE						MAXIMUM APPLICABLE MOTOR				Dimensions (in.)			Weight (lbs.)
	Part Number	List Price	Built–In Dynamic Braking	Rated Current (A)		Size	Voltage (V)	Constant Torque		Variable Torque		H	W	D	
				CT*	VT*			HP	KW	HP	KW				
500 / 600 V	CFW09.22/5DB	$4,917	Yes	22	27	4	575	20	15	20	18.5	18.7	9.8	10.8	50
	CFW09.27/5DB	5,798		27	32			25	18.5	25	22				
	CFW09.32/5DB	7,861		32	32			30	22	30	22				
	CFW09.44/5DB	10,225		44	53	7		40	30	40.2	37	32.9	13.2	11.8	154
	CFW09.53/5DB	11,972		53	63			50	37	50	45				
	CFW09.63/5DB	14,344		63	79			60	45	60.3	55				
	CFW09.79/5DB	16,879		79	99			75	55	73.7	75				

CFW09 Shark - NEMA 4X (IP56)

CFW-09 Drives with Degree of Protection NEMA 4X designed for highly aggressive environments including:

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

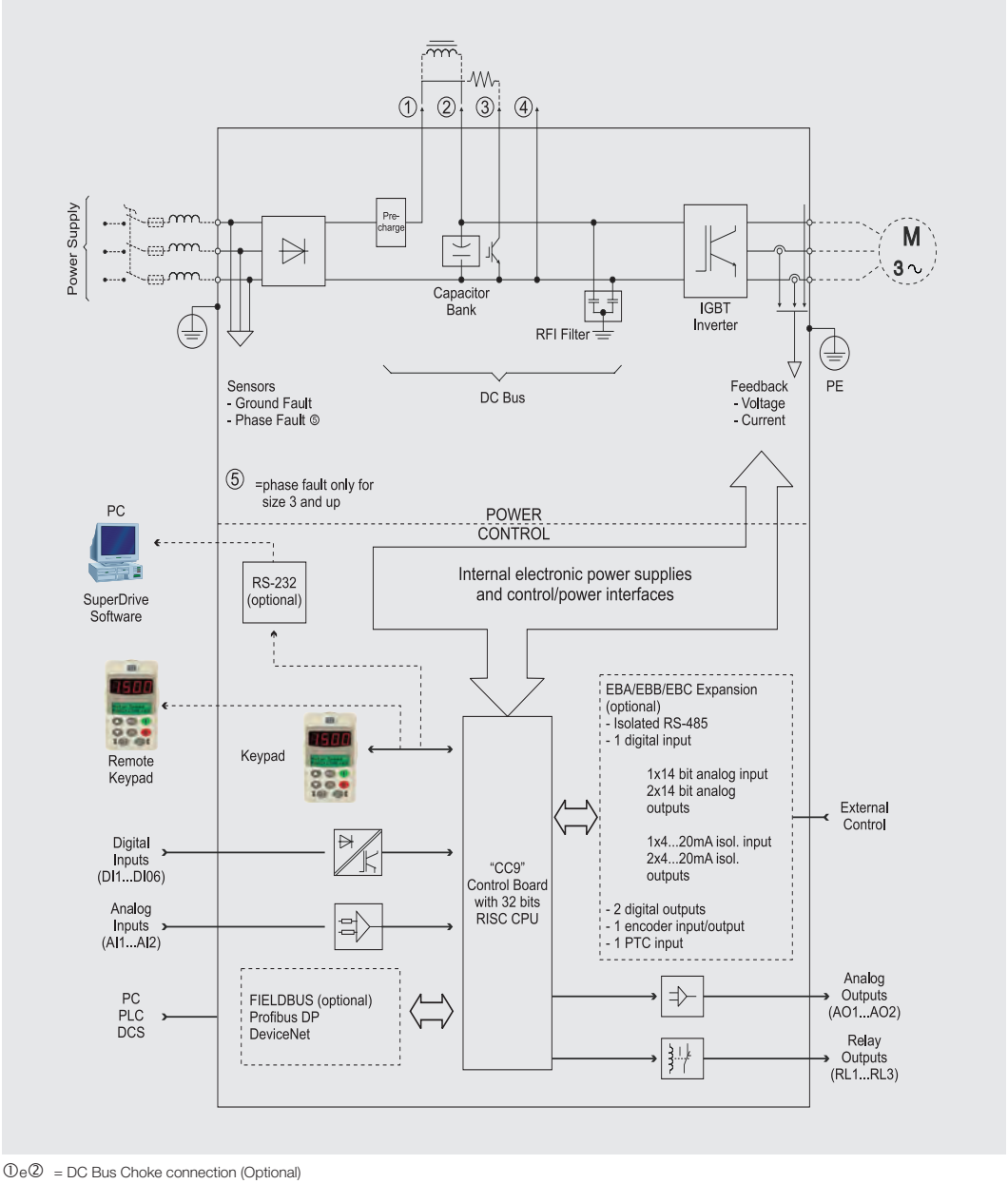
Power Supply Voltage	CFW–09 DRIVE						MAXIMUM APPLICABLE MOTOR			Dimensions (in.)			Weight (lbs.)
	Part Number	List Price	Braking Transistor	Rated Current (A)		Size	Voltage (V)	Constant Torque / Variable Torque		H	W	D	
				CT*	VT*			HP	KW				
220 / 230 V	CFW0906/2N4	$2,660	Standard Built-in	6		1	220	1.5	1.1	14.2	9.2	8.5	10
	CFW0907/2N4	2,782		7				2	1.5				
	CFW0910/2N4	2,906		10				3	2.2				
	CFW0916/2N4	3,276		16		2		5	3.7	16.2	10.2	8.5	15
380 / 480 V	CFW0903/4N4	2,782		3.6		1	380	1.5	1.1	14.2	9.2	8.5	10
	CFW0904/4N4	2,854		4				2	1.5				
	CFW0905/4N4	2,980		5.5				3	2.2				
	CFW0909/4N4	3,114		9		2		5	3.7	16.2	10.2	8.5	15
	CFW0913/4N4	3,300		13				7.5	5.5				
	CFW0916/4N4	3,980		16				10	7.5				

CFW-09 - Variable Frequency Drive
Accessories

Description		Part Number	List Price
Dynamic Braking	External Dynamic Braking Module for 180A Model (16 X 9 X 10 NEMA 1 Enclosure)	CFW09DB180/4	$2,154
	External Dynamic Braking Module for 211 & 240A Models (16 X 9 X 10 NEMA 1 Enclosure)	CFW09DB240/4	2,630
	External Dynamic Braking Module for 312, 361,450,515, & 600A Models (16 X 9 X 10 NEMA 1 Enclosure)	CFW09DB361/4	3,208
	External Dynamic Braking Module for 107,147,211,& 247A Models at 575V (16 X 9 X 10 NEMA 1 Enclosure)	CFW09DB100/6	3,954
	External Dynamic Braking Module for 315 & 343A Models at 575V (16 X 9 X 10 NEMA 1 Enclosure)	CFW09DB259/6	5,214
	External Dynamic Braking Module for 418 & 472 Amp Models at 575V (16 X 9 X 10 NEMA 1 Enclosure)	CFW09DB380/6	6,462
Keypads	Standard Keypad with LED & LCD	CFW09HMILCD	210
	NEMA 4/IP56 Remote Keypad with LED & LCD	CFW09HMILCD4	274
	Remote Keypad FRAME KIT	CFW09KMR09	90
	Blank Keypad with Power & Error LED's	CFW09TCL	30
Keypad Cables	1m (3.3 ft) Remote Keypad Cable	CFW09HMI091	32
	2m (6.6 ft) Remote Keypad Cable	CFW09HMI092	40
	3m (10 ft) Remote Keypad Cable	CFW09HMI093	50
	5m (16 ft) Remote Keypad Cable	CFW09HMI095	76
	7.5m (25 ft) Remote Keypad Cable (Requires CFW09KMR09)	CFW09HMI097	90
	10m (33 ft) Remote Keypad Cable (Requires CFW09KMR09)	CFW09HMI0910	108
Communication *see note	Superdrive PC Communication Kit (includes software & hardware accessories)	CFW09KSD	180
	RS-232 Serial Interface	CFW09KCS	88
	Profibus DP Communication Kit	CFW09KFBPD	1,060
	DeviceNet Communication Kit	CFW09KFBDN	912
	Ethernet IP Communication Kit (V3.70 or superior) NEW!	CFW09KFBEN	1,590
Caps	External DC Bus Cap Kit 1500uF (includes bleeder resistor, mounting bracket, & screws)	CFW09CAP1500	240
	External DC Bus Cap Kit 4700uF (includes bleeder resistor, mounting bracket, & screws)	CFW09CAP4700	280
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	CFW09EBA01	1,436
	I/O Exp. Board A with RS-485 Serial Interface, Digital Inputs and Outputs + Thermistor (PTC) Input	CFW09EBA02	340
	I/O Exp. Board A with I4 bit A/D, I4 bit D/A's, Digital Inputs and Outputs + Thermistor (PTC) Input	CFW09EBA03	664
	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	CFW09EBB01	1,210
	I/O Exp. Board B with Encoder Input with internal Power Supply - 12VDC, Digital Inputs and Outputs + Thermistor (PTC) Input	CFW09EBB02	570
	I/O Exp. Board B with Isolated Analog Input, Isolated Analog Outputs, Digital Inputs and Outputs + Thermistor (PTC) Input	CFW09EBB03	678
	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	CFW09EBB04	1,510
	I/O Exp. Board B with 2 X 4-20mA Analog Outputs	CFW09EBB05	440
	I/O Exp. Board C with Encoder Input, 5-15VDC External Power Supply	CFW09EBC01	198
	I/O Exp. Board C with Encoder Input with internal Power Supply - 12VDC	CFW09EBC03	530
	I/O Exp. Board E with RS-485 Serial Interface, Digital or Thermistor (PTC) Input	CFW09EBE01	196
	PLC/Motion Control Board	CFW09PLCCARD	972
	PLC/Motion Control Board with Communication Capabilities	CFW09PLC2	1,166
Through Surface Mounting	Kit for Through Surface Mounting - Size 3	CFW09KMFM3	16
	Kit for Through Surface Mounting - Size 4	CFW09KMFM4	20
	Kit for Through Surface Mounting - Size 5	CFW09KMFM5	22
	Kit for Through Surface Mounting - Size 6	CFW09KMFM6	22
	Kit for Through Surface Mounting - Size 7	CFW09KMFM7	22
	Kit for Through Surface Mounting - Size 8	CFW09KMFM8	28

* Modbus RTU –requires optional RS-232 or RS-485 interface.

CFW-09 - Variable Frequency Drive
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)

CFW-09 - Variable Frequency Drive
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 Ihan 0.98 at Full Load	
Enclosure	Degree of Protection	NEMA 1/IP 20 (sizes 1...8 and 8E), IP20 (sizes 9,10 and 10E)	
		NEMA 4X I IP 56 (modules up to 10HP) 230 - 460V	
	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% at Full Load	
Performance	Speed Control	V / F Mode	Regulation (wilh 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: +1- 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
			Speed Regulation Range: Down to 0 rpm
	Torque Control	Vector Modes	Regulation: + - 10% of Motor Rated Torque
			Range: O ... 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) : O ... 10 V 0...20 mA or 4...20 mA <D	
	Digital	6 Programmable Isolated Input: 24 Vdc	
		1 Programmable Isolated Input: 24 Vdc	
		1 Programmable Isolated Input: 24 Vdc (for Motor PTC Thermistor)	
	Encorder	1 Isolated Differencial Encoder Signals Output: 5 ...15 Vdc External Power Supply	
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 wilh KCS-GFW09 Kn <D - RS-485 Isolated with EBA or EBB Board <D	
		Protocolo Johnson Contols-N2 (optional)	
	Fieldbus	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 Phase Fault (30 A and above models)
		Encoder Fault	Keypad Connection Fault
Environment	Temperature	0ºC (32ºF)...40ºC (104ºF), up to 50ºC (122ºF) with 2% / ºC (1,1% / ºF) 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 Immunitv (on request)	
	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	
	EN 61010	Safety Requirements for Electrical Equipament for Measurement Control and laboratory Use	
Certifications	UL (USA) and cUL (CANADA)	Underwriters laboratories Inc. USA	
	CE (EUROPE)	Phoenix Test-Lab GmbH – Germany (Competent Body)	
	IRAM (ARGENTINA)	Instituto Argentino de Normalización	
	C-Tiek (AUSTRALIA) 2250/1132383	Australian Communications Aulhority	

CFW-09 - Variable Frequency Drive
Technical Data

Keypad	Programming	General Drive Functions Programming		
	Controls	Start/Stop , Increase/Decrease Speed, JOG, FWD/REV and Local/Remote		
	Monitoring	Speed Reference (rpm)	Oulput Current (A)	
		Motor Speed (rpm)	Oulput 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	
		Outout Power (kW)	Analog Inputs Value	
		Hours Powered Up (h)	Four Last Faults	
		Hours Enabled (h)	Fault Messages	
Control Features and Options	Standard	Keypad wilh 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 lhe 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 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 Wattrneter		
		Overlapping PID Regulator (for automatic control of level, pressure, flow, etc.)		
		FWD I REV selection		
		Local I Remate 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 . OX - CFW09 EBB .OX.- CFW09 EBC1 .OX- CFW10 EBE1. OX - CFW09
		FieldBus Communications kits (Mounted inside drive)	Profibus DP	KFB - PD
			DeviceNet	KFB - DN
			DeviceNet Drive Profile	KFB - DD
			EtherNet 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 wilh flange (for sizes 3...8)		KMF - CFW09
		Removable mounting kit (for slzes 9...10)		KME - CFW09
		Inductor kit for DC link (for sizes 2...8)		KIL - CFW09
		EMC filter with high attenuation capacity		RF

CFW-10 - Variable Frequency Drive
Purchasing Data

Standard Features

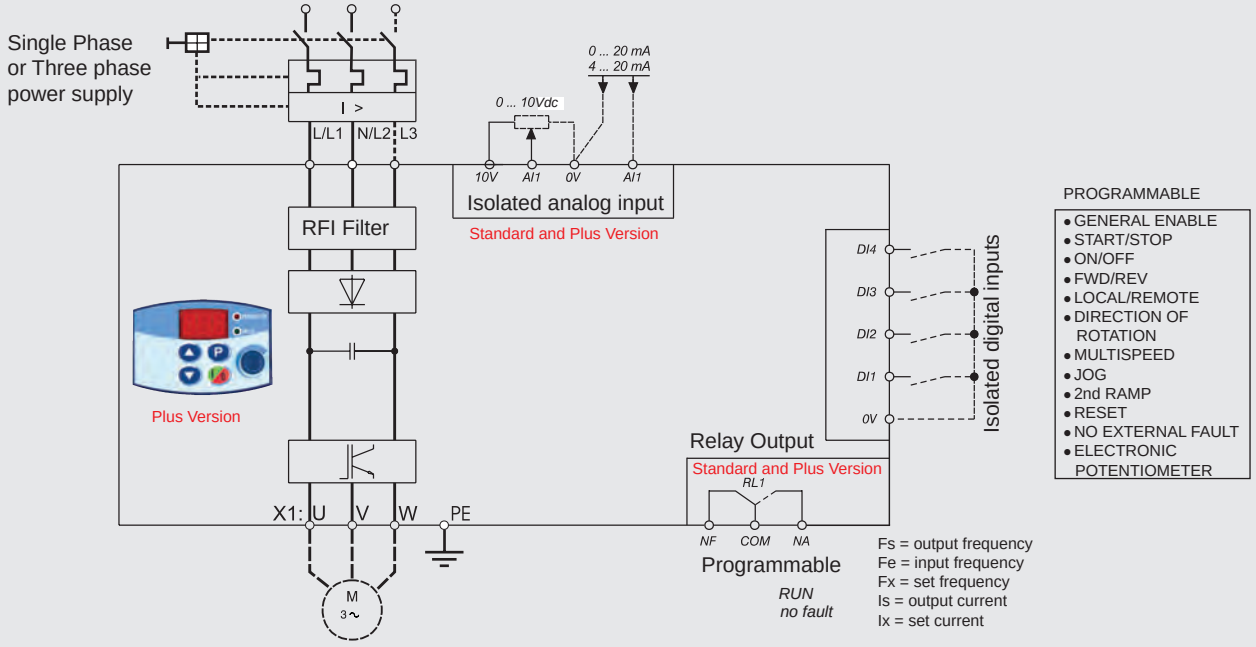
- (V/F) Control
- IP20 Finger-safe Enclosure
- Single-phase 110-127 input voltage up to 1 HP (Three phase output only)
- Single-phase 200-240 input voltage up to 3 HP (Three phase output only)
- 150% current overload capacity
- DSP controlled PWM output
- 2.5 - 15 kHz ajustable switching frequency
- 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: 122ºF (50ºC), 3300ft (1000m) altitude, 90% humidity, non-condensing for model 15,2A, 104°F (40°C).

CFW-10 - Variable Frequency Drive
Purchasing Data

Power Supply Voltage	Variable Speed Drives CFW–10					Maximum Applicable Motor			Dimensions (in)			Weight (lbs)
	Power Supply	Model	List Price	Output (A)	Size	Voltage (V)	Power rating HP	Power rating kW	H	W	D	
110–127	Single phase	CFW100016S1	$401	1,6	1	230	0.25	0.25	5.20	3.74	4.76	1.98
		CFW100026S1	432	2,6	1		0.5	0.55				
		CFW100040S1	656	4.0	2		1.0	0.75	6.34	4.53	4.80	3.31
200–240		CFW100016S2	349	1.6	1		0.25	0.25	5.20	3.74	4.76	1.98
		CFW100026S2	375	2.6	1		0.5	0.55				
		CFW100040S2	385	4.0	1		1.0	0.75				
		CFW100073S2	571	7.3	2		2.0	1.5	6.34	4.53	4.80	3.31
		CFW100100S2	680	10	3		3.0	2.2	7.52			3.97

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.
** CE Certification pending.*

CFW-10 - Variable Frequency Drive
block Diagram



CFW-10 - Variable Frequency Drive
Technical Data

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 (f<100Hz); 0.1Hz (f>100Hz)
	Output Frequency Accuracy		Analogue Ref.: 0.5% and Digital Ref.: 0.01%
	Overload capacity		150% during 60 sec. every 10 min. (1.5 x In - Rated Current)
Control Inputs	Analog		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)
			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)		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...122ºF (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 Voltge 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

CFW-11 - Variable Frequency Drive
Purchasing Data

Standard Features

- Plug and play philosophy (connect and use) enables quick and easy installation of accessories and options.
- USB for microcomputer connection for using SUPERDRIVE G2 programming and monitoring software as well as updating inverter firmware.
- Human-Machine Interface (HMI) with backlit graphic display and soft-keys, greatly facilitates inverter programming and operation.
- DC link inductors (symetrically connected to positive and negative DC link terminals) enable compliance with IEC61000-3-12 standard requirements regarding harmonics, (no need for external line reactance)
- Intelligent thermal management enables full protection of IGBTs, monitoring of heatsink and internal air temperature.
- Automatic control of the heatsink fan with speed sensor (additional protection) and easily detachable from the unit for cleaning and maintenance.
- Normal Duty and Heavy Duty ratings to adapt optimally to all kinds of loads.
- Protection with failure and alarm warnings.
- Motor overload protection in compliance with IEC 60947-4-2/UL 508 C.
- Memory card built into the standard product allows user to create functions without the need to use an external PLC (soft-PLC via IEC61131-3 programming software)
- Guided start-up simplifies initial user programming.
- Real time clock
- TRACE / SCOPE function to assist with the start-up and system diagnostics.

Optional Features

- Interface for incremental encoder 5 to 12Vdc
- Interface for RS-485 serial communication (modbus)
- Interface for RS-232C serial communication
- CAN interface
- Profibus DP interface
- PLC functions; IEC programming
- Devicenet 4 interface
- Ethernet IP interface
- Blind cover for slot HMI
- Frame for remote HMI
- Conduit kit

575V CFW-11 Drives Coming Soon

CFW-11 - Variable Frequency Drive
Purchasing Data

Power Supply Voltage	CFW–11 DRIVE							MAXIMUM APPLICABLE MOTOR					Dimensions (in.)			Weight (lbs.)
	Power Supply	Part Number	List Price	Bullt–In Dynamlc Braking	Rated Current (A)		Size	Voltage (V)	Normal Duty (ND)		Heavy Duty (HD)					
					ND*	HD*			HP	KW	HP	KW	H	W	D	
200 – 240 V	Single-Phase	CFW110010S2ON1Z	$2,273	Yes	10	10	A	230	3	2.2	3	2.2	5.71	9.72	8.94	13.4
	Single-Phase or Three-Phase	CFW110006B2ON1Z	2,078		6	5	A		1.5	1.1	1	0.75	5.71	9.72	8.94	12.6
		CFW110007B2ON1Z	2,143		7	7			2	1.5	2	1.5				
	Three-Phase	CFW110007T2ON1Z	1,987		7	5.5	A		2	1.5	1.5	1.1	5.71	9.72	8.94	12.6
		CFW110010T2ON1Z	2,112		10	8			3	2.2	2	1.5				
		CFW110013T2ON1Z	2,304		13	11			4	3	3	2.2				13.4
		CFW110016T2ON1Z	2,366		16	13			5	3.7	4	3				13.9
		CFW110024T2ON1Z	2,942		24	20	B		7.5	5.5	6	4	7.48	11.54	8.94	20.1
		CFW110028T2ON1Z	3,000		28	24			10	7.5	7.5	6				
		CFW110033T2ON1Z	3,418		33.5	28			12.5	9.2	10	7.5				
		CFW110045T2ON1Z	3,847		45	36	C		15	11	12.5	9.2	8.66	14.88	11.54	41.7
		CFW110054T2ON1Z	4,735		54	45			20	15	15	11				
		CFW110070T2ON1Z	5,518		70	56			25	18.5	20	15				
		CFW110086T2SZ	6,994		86	70	D		30	22	25	18.5	11.81	19.84	12.01	71.7
		CFW110105T2SZ	8,986		105	86			40	30	30	22				
		CFW110142T2ON1Z	13,152	No	142	115	E		50	37	40	30	28.90	13.20	14.10	143.3
		CFW110180T2ON1Z	18,307		180	142			60	45	50	37	32.60	13.20	14.10	
		CFW110211T2ON1Z	23,448		211	180			75	55	60	45				
380 – 480 V	Three-Phase	CFW110003T4ON1Z	2,042	Yes	3.6	3.6	A	460	2	1.5	2	1.5	5.71	9.72	8.94	5.7
		CFW110005T4ON1Z	2,174		5	5.			3	2.2	3	2.2				5.9
		CFW110007T4ON1Z	2,246		7	5.5			4	3	3	2.2				
		CFW110010T4ON1Z	2,321		10	10			6	4	6	4				6.1
		CFW110013T4ON1Z	2,431		13.5	11			7.5	5.5	6	4				6.3
		CFW110016T4ON1Z	2,947		17	13.5	B		10	7.5	7.5	5.5	7.48	11.54	8.94	9.1
		CFW110024T4ON1Z	3,569		24	19			15	11	12.5	902				9.7
		CFW110028T4ON1Z	4,423		31	25			20	15	15	11				10.4
		CFW110033T4ON1Z	4,877		38	33	C		25	18.5	20	15	8.66	14.88	11.54	18.9
		CFW110045T4ON1Z	6,146		45	38			30	22	25	18.5				
		CFW110054T4ON1Z	7,615		58.5	47			40	30	30	22				
		CFW110070T4SZ	8,292		70.5	61	D		50	37	40	30	11.81	19.84	12.01	32.5
		CFW110086T4SZ	9,989		88	73			60	45	50	37				
		CFW110105T4ON1Z	11,153	No	105	88	E		75	55	60	45	28.90	13.20	14.10	143.3
		CFW110142T4ON1Z	13,118		142	115			100	75	75	55				
		CFW110180T4ON1Z	19,234		180	142			150	110	100	75	32.60	13.20	14.10	
		CFW110211T4ON1Z	22,373		211	180			175	132	150	110				
575V	Three-Phase	CFW110003T5ON1Z														
		CFW110005T5ON1Z														
		CFW110007T5ON1Z														
		CFW110010T5ON1Z														
		CFW110013T5ON1Z														
		CFW110016T5ON1Z														
		CFW110024T5ON1Z														
		CFW110028T5ON1Z														
		CFW110033T5ON1Z														
		CFW110045T5ON1Z														
		CFW110054T5ON1Z														
		CFW110070T5SZ														
		CFW110086T5SZ														
		CFW110105T5ON1Z														
		CFW110142T5ON1Z														
		CFW110180T5ON1Z														
		CFW110211T5ON1Z														

575V COMING SOON

* ND – Normal Duty
  - 110% during 60 seconds every 10 minutes
  - 150% during 3 seconds every 10 minutes
* HD – Heavy Duty
  - 150% during 60 seconds every 10 minutes
  - 200% during 3 seconds every 10 minutes

CFW-11 - Variable Frequency Drive
Purchasing Data

CFW-11 with Dynamic Braking option

Power Supply Voltage	CFW–11 DRIVE WITH DYNAMIC BRAKING TRANSISTOR							MAXIMUM APPLICABLE MOTOR					Dimensions (in.)			Weight (lbs.)
	Power Supply	Part Number	List Price	Bullt–In Dynamlc Braking	Rated Current (A)		Size	Voltage (V)	Normal Duty (ND)		Heavy Duty (HD)					
					ND*	HD*			HP	KW	HP	KW	H	W	D	
200 – 240 V	Three-Phase	CFW110142T2ON1DBZ	$14,066	No	142	115	E	230	50	37	40	30	28.90	13.20	14.10	143.3
		CFW110180T2ON1DBZ	19,574		180	142			60	45	50	37	32.60	13.20	14.10	
		CFW110211T2ON1DBZ	25,078		211	180			75	55	60	45				
380 – 480 V	Three-Phase	CFW110105T4ON1DBZ	11,928	No	105	88	E	460	75	55	60	45	28.90	13.20	14.10	143.3
		CFW110142T4ON1BDZ	14,030		142	115			100	75	75	55				
		CFW110180T4ON1DBZ	20,566		180	142			150	110	100	75	32.60	13.20	14.10	
		CFW110211T4ON1DBZ	23,923		211	180			175	132	150	110				

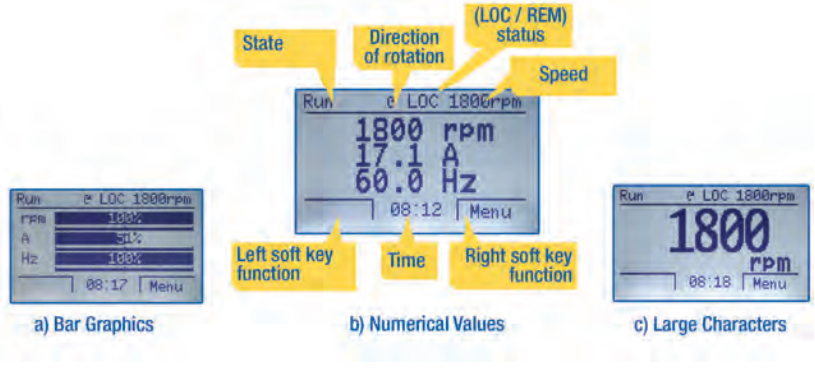
* ND – Normal Duty
  - 110% during 60 seconds every 10 minutes
  - 150% during 3 seconds every 10 minutes
* HD – Heavy Duty
  - 150% during 60 seconds every 10 minutes
  - 200% during 3 seconds every 10 minutes

Superdrive Programming Software

Programming software for PC (USB connection), Windows™ environment for parametrization, command and monitoring of CFW11 inverters.

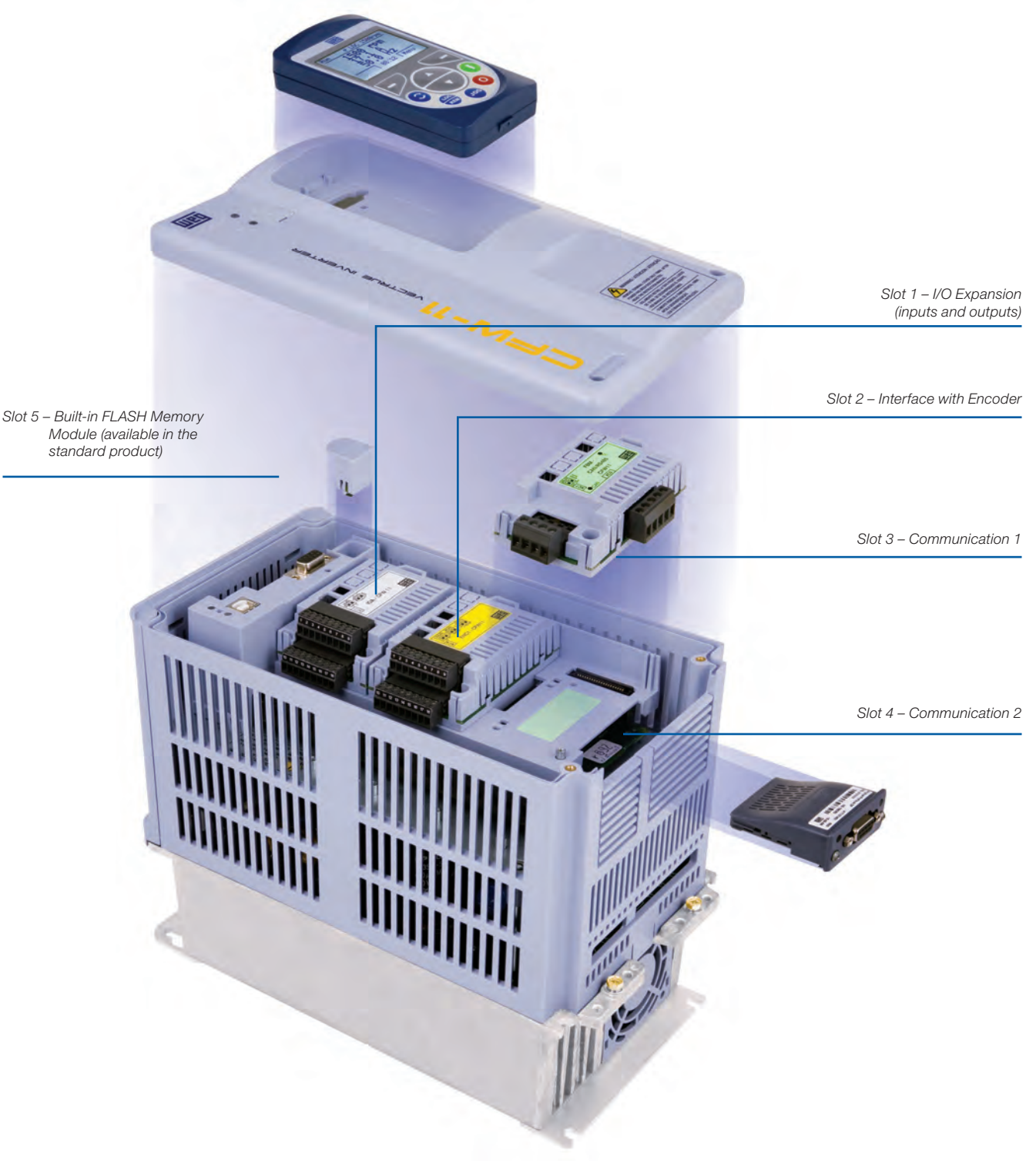
Human Machine Interface (HMI)

Monitoring Modes

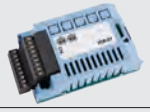
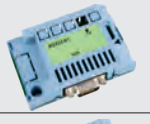


CFW-11 - Variable Frequency Drive
Accessories

CFW-11 was developed based on Plug-and-Play philosophy. It automatically recognizes and configures the accessories used, enabling easy installation and safe operation eliminating manual configuration.



CFW-11 - Variable Frequency Drive
Accessories

Description		Slot (see previous page)	Appearance	Part Number	List Price
I/O Expansion	2 14-bit analog inputs in voltage or current 2 digital inputs 2 14-bit analog outputs in voltage or current 2 open collector type digital outputs	1		CFW11IOA-01	$996
	2 isolated 12-bit analog inputs 2 digital inputs 2 isolated 11-bit analog outputs in voltage or current 2 open collector type digital outputs	1		CFW11IOB-01	532
Interface with Encoder	Incremental encoder module 5 to 12 Vdc 100 kHz With encoder signal repeater	2		CFW11ENC-01	436
	Incremental encoder module 5 to 12 Vdc 100 kHz	2		CFW11ENC-02	382
Communication	RS-485 Serial Communication Module (Modbus-RTU)	3		CFW11RS485-01	202
	RS-232C Serial Communication Module (Modbus-RTU)	3		CFW11RS232-02	152
	CAN/RS-485 Interface Module (CANopen, DeviceNet and Modbus)	3		CFW11CAN/RS485-01	430
	CAN Interface Module (CANopen and DeviceNet)	3		CFW11CAN-01	358
	Profibus DP Interface Module	4		CFW11PROFDP-05	1,078
	DeviceNet Interface Module	4		CFW11DEVICENET-05	1,078
	RS-232 Interface Module (passive) (Modbus-RTU)	4		CFW11RS232-05	262
	RS-485 Interface Module (passive) (Modbus-RTU)	4		CFW11RS485-05	316
	EtherNet/IP Interface Module	4		CFW11ETHERNET/IP-05	1,058
	Module with PLC Functions (for more information please see next page)	1,2 and 3		CFW11PLC11-01	1,856

CFW-11 - Variable Frequency Drive
Accessories

Description		Part Number	List Price
Power Cable Shielding	Kit for power cable shielding for frame size A	CFW11PCSA-01	$40
	Kit for power cable shielding for frame size B	CFW11PCSB-01	42
	Kit for power cable shielding for frame size C	CFW11PCSC-01	44
Conduit Kit	Conduit Kit for frame size A	CFW11KN1A-01	70
	Conduit Kit for frame size B	CFW11KN1B-01	82
	Conduit Kit for frame size C	CFW11KN1C-01	94
IP21 Kit	IP21 Kit for frame size D	CFW11KIP21D-01	100
Flash Memory	Flash Memory Module for CFW-11	CFW11MMF-01	60
Keypad Accessories	CFW-11 Keypad	CFW11HMI-01	302
	Frame for HMI installation on panel door or machine console	CFW11RHMIF-01	58
	Blind cover for the complete closure of the product when used without HMI	CFW11HMID-01	44
Cables for HMI	1m (3.3 ft) Remote Keypad Cable	CFW11IHMCAB-RS-1M	44
	2m (6.6 ft) Remote Keypad Cable	CFW11IHMCAB-RS-2M	50
	3m (10 ft) Remote Keypad Cable	CFW11IHMCAB-RS-3M	54
	5m (16 ft) Remote Keypad Cable	CFW11IHMCAB-RS-5M	62
	7.5m (25 ft) Remote Keypad Cable	CFW11IHMCAB-RS-7.5M	74
	10m (33 ft) Remote Keypad Cable	CFW11IHMCAB-RS-10M	84

PLC Accessory – CFW11PLC11-01

PLC11-01 accessory permits the CFW-11 to assume PLC functions, speed reference and positioning module. This accessory avoids the use of an external PLC in some applications, reducing considerably the cost of the solution. This accessory is only used for complex applications or when the CANopen Master/Slave function is used, a greater number of I/O points and the user program (application) exceeds the 15 kbytes memory. In case the application does not have these limitations, the SoftPLC function built-in to the standard product can be used.

Features:

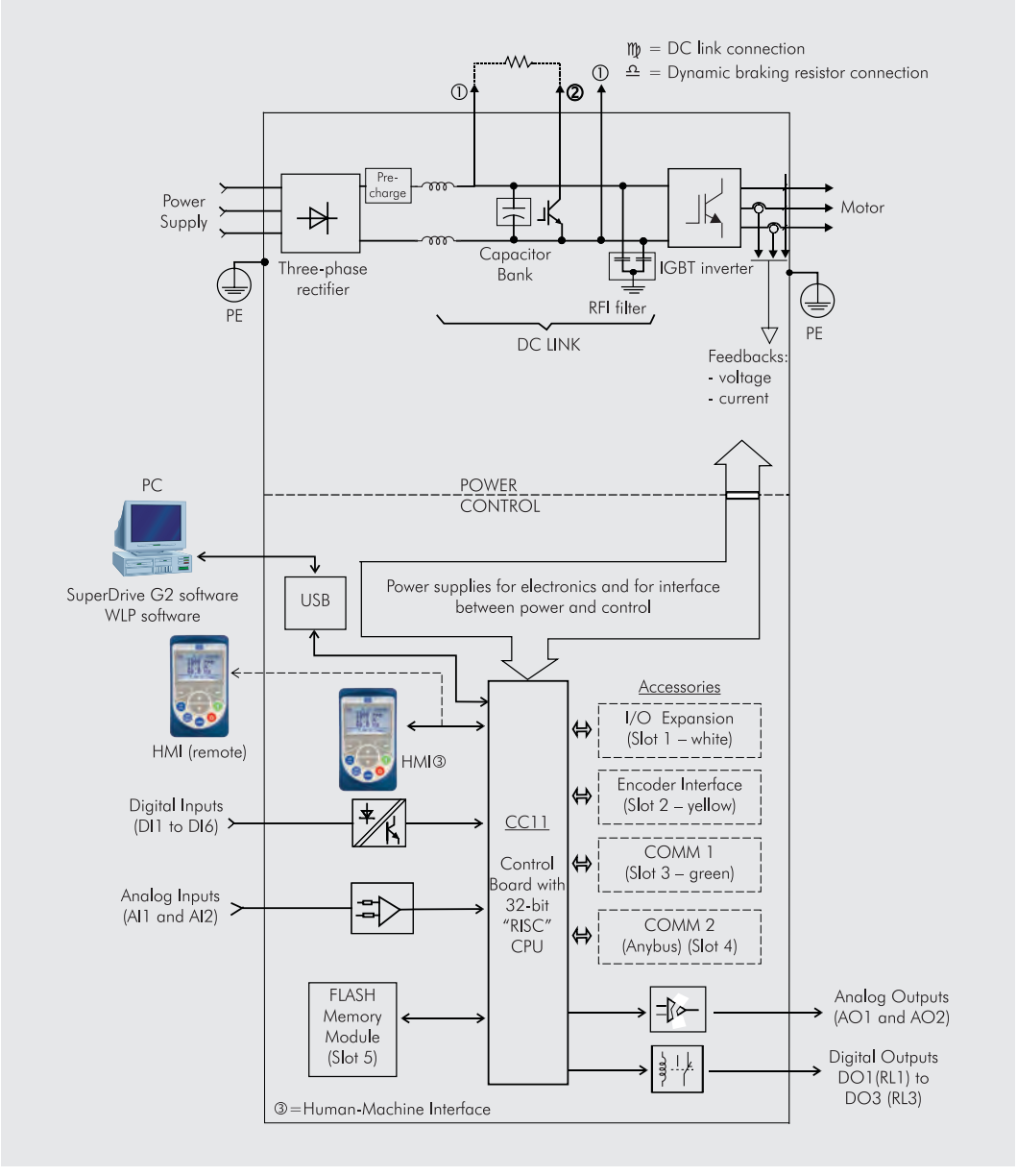
- 9 digital inputs.
- 3 relay outputs.
- 3 digital outputs.
- 1 14-bit analog input in voltage or current.
- 2 14-bit analog outputs in voltage or current.
- 2 encoder interfaces.
- 1 input for motor PTC.
- RS-485 Modbus-RTU.
- CANopen, DeviceNet Protocols.
- CANopen Master / Slave.
- Programming in LADDER (free software).
- Positioning with trapezoidal and "S" profile (absolute and relative).
- Homing.
- 100 parameters that can be configured by the user.
- On-line monitoring.
- WLP / WSCAN Software: network configuration and programming software in the same environment.

USB Connection

G2 Superdrive

- Software in Windows environment, for CFW-11 parameterization, command and monitoring.
- Automatic CFW-11 identification.
- Reads CFW-11 parameters.
- Writes CFW-11 parameters.
- Edits parameters on-line in the CFW-11.
- Edits parameters off-line in the PC.
- Allows all documentation of the application to be created.
- Easily accessible.
- Permits parameterization, command and monitoring of the inverter through G2 Superdrive software.
- Allows Trace function data to be visualized through G2 Superdrive software.
- Allows application software to be recorded (SoftPLC function) through WLP software.
- A 2m shielded USB cable is provided with the product.
- Online help.
- Free software at www.weg.net

CFW-11 - Variable Frequency Drive
Block Diagram



CFW-11 - Variable Frequency Drive
Technical Data

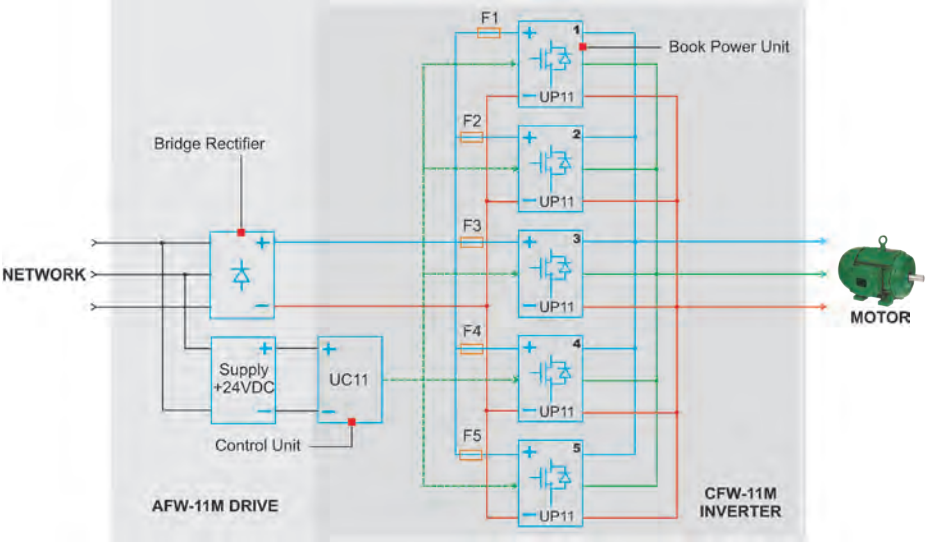
Power Supply and Power Range	Voltage and power range	Single-Phase	200-240 V / +10%/-15%: 1.5 to 3 hp (1.1 to 2.2 kW)
		Three-Phase	200-240 V / +10%/-15%: 1.5 to 40 hp (1.1 to 30 kW)
			380-480 V / +10%/-15%: 2 to 60 hp (1.5 to 45kW)
	Frequency	50 / 60 Hz +-2% (48 to 63 Hz)	
	Displacement factor	Greater than 0.98	
	Efficiency	Greater than 0.97	
Motor	Voltage	Three Phase, 0 up to power supply voltage	
	Frequency	0 to 400 Hz	
	Switching Frequency	Standard: 5kHz Options available: 2.5 / 5 / 10 kHz	
	Overload	Normal Duty Cycle	110% for 1 min every 10min
			150% for 3 sec every 10min
		Heavy Duty Cycle	150% for 1 min every 10min
			200% for 3 sec every 10min
	Time (ramps)	Acceleration	0 to 999 seconds
		Deceleration	0 to 999 seconds
Performance	Scalar (V/f)	Speed Control	Regulation: 1% of rated speed
			Speed variation range: 1:20
	Voltage Vector (VVW)		Regulation: 1% of rated speed
			Speed variation range: 1:30
	Sensorless Vector		Regulation: 0.5% of rated speed
			Speed variation range: 1:100
	Vector with Encoder (with accessory ENC-01 or ENC-02)		Regulation: +/- 0.01% of rated speed with 14-bit analog input (IOA)
			Regulation: +/- 0.01% of rated speed with digital reference (keyboard, serial fieldbus, electronic potentiometer, multispeed)
			Regulation: +/- 0.05% of rated speed with 12-bit analog input
	Sensorless Vector	Torque Control	Range: 10 to 180%
			Regulation: +/- 5% of rated torque
			Range: 20 to 180%
			Regulation: +/-10% of rated torque (above 3 Hz)
Inputs and Outputs (I/Os) in the Standard Product	Inputs	Digital	6 isolated inputs, 24 Vdc, programmable functions
		Analog	2 differential inputs isolated by differential amplifier, programmable functions
			Resolution: - AI1: 12 bits - AI2: 11 bits + signal
			Signals: (0 to 10) V, (0 to 20) mA or (4 to 20) mA
			Impedance: - 400 kΩ for signal (0 to 10) V - 500 Ω for signal (0 to 20) mA or (4 to 20) mA
	Outputs	Relay	3 relays with NA/NF (NO/NC) contacts, 240 Vac / 1A, programmable functions
		Analog	2 isolated outputs, programmable functions
			Resolution: 11 bits
			Load: 0 to 10 V: R_L >= 10 kΩ 0 to 20 mA or 4 to 20 mA: R_L < 500Ω
	Available supply to user		24 Vdc + -20%, 500 mA
Environment	Temperature of Operation	- 10ºC to 50ºC	
		Up to 60°C with current derating (2% for each 1°C above 50°C)	
	Humidity	5 to 90% without condensation	
	Altitude	0 to 1000 meters	
		Up to 4000 meters with current reduction (1% for every 100 meters above 1000 meters)	
Degree of Protection	NEMA 1	Frame Size A, B and C	
	IP20	Frame Size D without IP21 kit	
Braking Methods	Rheostatic Braking	Supply available to user	
		External braking resistor (not provided)	
	Optimal Braking	Does not need braking resistor	
	DC Braking	Direct current applied to the motor	

CFW-11 - Variable Frequency Drive
Technical Data

Communication	Profibus DP	PROFIBUS DP (slot 4)
	DeviceNet	CAN/RS485-01 (slot 3)
		CAN-01 (slot 3)
		DEVICENET-05 (slot4)
	CANopen	CAN/RS485-01 (slot 3)
		CAN-01 (slot 3)
	CANopen Master/Slave	PLC11-01 (slot 1/2/3)
	EtherNet TCP/IP	ETHERNET/IP-05 (slot 4)
	RS485 - ModBus RTU	RS485-01
		CAN/RS485-01
		RS485-05
	RS232 - ModBus RTU	RS232-01
		RS232-05
	USB	Built-into the standard product
		Communication with Superdrive Software
		Communication with WLP Software used for programming and monitoring the Soft PLC function and the PLC11-01 accessory
Protections	Overcurrent / short circuit	
	Under / overvoltage in the power circuit	
	Phase loss	
	Overtemperature in the inverter (IGBTs, rectifier and internal air in the electronic cards)	
	Overtemperature in the motor	
	Overload in the braking resistor	
	Overload in the IGBTs	
	Overload in the motor	
	Fault / external alarm	
	Fault in the CPU or memory	
	Phase-to-ground short circuit at the output	
	Fault in the heatsink fan	
	Overspeed of motor	
	Incorrect connection of encoder	
Safety Standards	UL 508C Power conversion equipment	
	UL 840 Insulation coordination including clearances and creepage distances for electrical equipment	
	EN 61800-5-1 Safety requirements electrical, thermal and energy	
	EN 50178 Electronic equipment for use in power installations	
	EN 60204-1 Safety of machinery. Electrical equipment of machines. Part 1: General requirements. Note: In order to have a machine in conformity with this norm, the machine manufacturer is responsible for the installation of an emergency shutdown device and an equipment for network sectioning	
	EN 60146 (IEC 146) Semiconductor converters	
	EN 61800-2 Adjustable speed electrical power drive systems Part 2: General requirements – rating specifications for low voltage adjustable frequency a.c. power drive systems	
Mechanical Construction Standards	EN 60529 - Degrees of protection provided by enclosures (IP Code)	
	UL 50 - Enclosures for electrical equipment	
Electromagne Compatibility Standards (EMC)	EN 61800-3 - Adjustable speed electrical power drive systems Part 3: EMC product standard including specific test methods	
	EN 55011 - Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment	
	CISPR 11 - Industrial, scientific and medical (ISM)radio-frequency equipment Electromagnetic disturbance characteristics. Limits and methods of measurement	
	EN 61000-4-2 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques Section 2: Electrostatic discharge immunity test	
	EN 61000-4-3 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques Section 3:Radiated, radiofrequency, electromagnetic field immunity test	
	EN 61000-4-4 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques Section 4: Electrical fast transient / burst immunity test	
	EN 61000-4-5 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques Section 5: Surge immunity test	
	EN 61000-4-6 - Electromagnetic Compatibility Standards (EMC) Part 4: Testing and measurement techniques Section 6: Immunity to conducted disturbances, induced by radio-frequency fields	

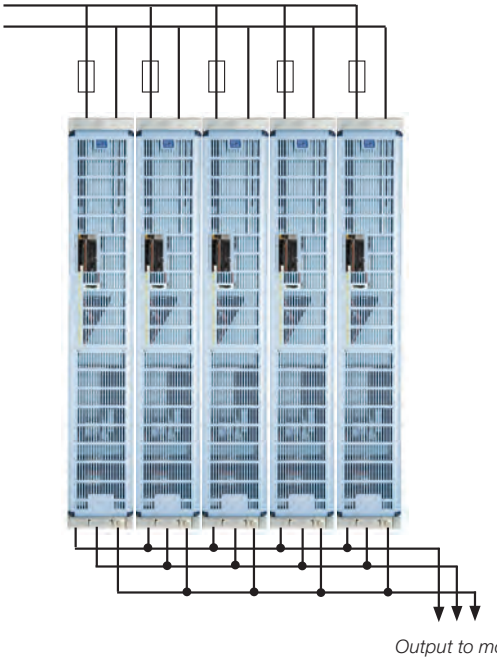
CFW-11M - Modular Variable Frequency Drive
Product Information

The CFW-11M (modular drive) is the new generation of WEG frequency inverters for elevated powers. It is available in powers from 400 to 2500 HP and voltages from 500 to 690 V, with 6 and 12 pulse input rectifier.



Power Book Unit

DC Link (connected to rectifier)



Output to motor

Power Units

Compact modular inverter units that can be configured to the applicable motor power.

- Easy servicing.
- Configurable up to 5 power units.
- DC supplied by an input rectifier.
- Compact book format (width much smaller than the depth).

Configurable up to 5 power book units

Call 1 877 PAMENSKY for details and pricing.

MVW-01 - Medium Voltage Variable Frequency Drive
Purchasing Data

Product Information

WEG is a supplier of speed variation systems for Medium Voltage that can offer a complete package: Input Switchgear, Dry-type or Oil-type Phase-shifting Transformer, Variable Frequency Drive (VFD) and Medium Voltage Motor.

WEG Medium Voltage Variable Frequency Drives are designed with state of the art technology and use a multilevel structure with high voltage IGBTs (6,5kV) reducing the motor harmonic currents to extremely low levels.

The input rectifier configuration with 12-pulse or 18-pulse results in high power factor fully meeting IEEE-519 requirements.

The MVW-01 is designed with multiprocessing control architecture and uses a 32-bit high performance processor (64-bits bus) with floating-point capability, ensuring a high performance control of the drive and motor.

The MVW-01 follows the same programming philosophy of the LV WEG drive, resulting in a simple speed variation solution for MV applications.

The MVW-01 drives introduce remarkable innovation on the segment of medium voltage speed variation, combining robustness, simplicity, reliability and safety in a compact solution with the latest generation technology.

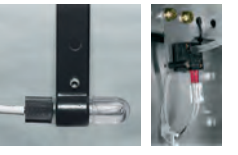
Standard Features

- Totally digital with high performance 32-bits processor (64-bits bus)
- Smart keypad with dual display (LCD and LED)
- Motor voltages: 2.3, 3.3 or 4.16kV
- Power ratings up to 4500HP
- IP41/NEMA 1 Enclosure
- Air-cooled
- 12-pulse Input Rectifier (18-pulse as an option): high power factor (> 0.95)
- Multilevel topology (NPC - Neutral Point Clamp - 3/5 levels)
- Fiber optic insulation between the control section and the high voltage power section
- Voltage Source Inverter (VSI)
- Latest generation technology of High Voltage IGBT's (6.5kV) results in a reduced number of components, hence improving the system efficiency / reliability
- Ultra-reliable dry-type plastic film power capacitors
- Withdrawable power arms (easy and fast maintenance)
- High efficiency (> 98.5%)
- Low noise level (< 75dB)
- Low drive losses (low heat generation)

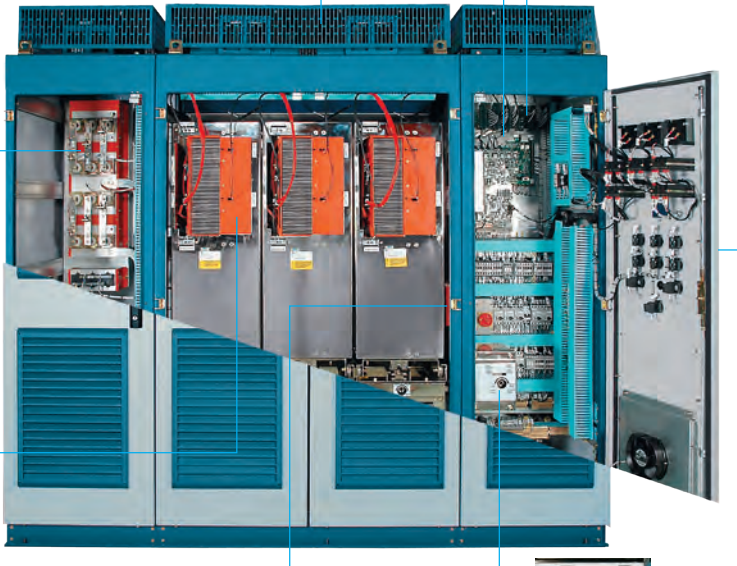
MVW-01 - Medium Voltage Variable Frequency Drive
Purchasing Data

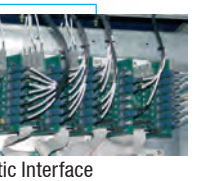
MVW-01 Features

Air–cooling
- Simple maintenance
- Low drive losses (low heat generation)
- Low noise level



Monitoring and Protections
- Arc detection for the power section
- Temperature monitoring
- Ventilation monitoring through pressure sensor



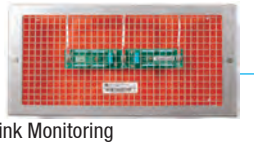


Fiber Optic Interface
- Noise immunity
- High Voltage insulation
- Fiber optic for the power and control interconnection: gate drives, feedbacks, temperature monitoring, voltage.

12–pulse or 18–pulse Input Rectifier
- Low harmonic distortion
- High power factor (> 0.95)

Simple Keypad
- Double display (LED and LCD) for easy visualization and programming
- Uses the same keypad as WEG low voltage drives (graphical keypad as an option)
- MV Drive programming follows the same philosophy of the LV drives

Withdrawable IGBT Arms
- Withdrawable Power Arms
- Gate-drives / feedbacks / monitoring – optic fiber
- Simple control connections
- Stabs for power connections
- Simple and fast maintenance



DC Link Monitoring
- Visual indication of the voltage presence on the DC Link

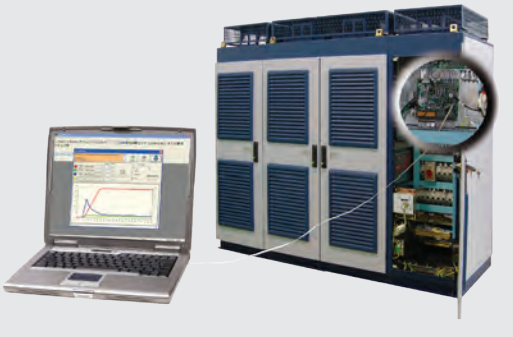
Operational Safety
- Mechanical interlocking for the power sections
- Electro-mechanical interlocking with the main input circuit breaker does not allow the doors to open when the circuit breaker is on.

Software for Drives Programming

SuperDrive is a programming software for the MVW-01 drives. The software incorporates functions such as: parameters upload and download, drive operation and monitoring,
off-line programming, and trace function.

SuperDrive is a Windows compatible software (Windows 95, Windows 98, Windows ME, Windows NT Workstation 4.0, Windows 2000 Professional, Windows XP).

The Drive-PC communication uses a RS-232 or a RS-485 interface.



MVW-01 - Medium Voltage Variable Frequency Drive
Purchasing Data

Rated Voltage (V)	Rated Drive Current (A)		Motor				Frame Size
			Constant Torque		Variable Torque		
	CT	VT	HP	kW	HP	kW	
2300	120	137	500	400	600	450	A
	140	160	600	450	700	500	
	165	175	700	500	750	560	
	175	200	750	560	900	710	
	210	240	900	710	1000	750	
	250	280	1000	800	1250	900	
	280	320	1250	900	1500	1120	
	386	440	1750	1250	2000	1400	B
	450	490	2000	1400	2250	1600	
	490	560	2250	1600	2500	1800	
	560	640	2500	1800	3000	2200	
3300	85	97	500	400	600	450	A
	100	112	600	450	700	500	
	112	128	700	500	800	630	
	138	150	800	630	900	710	
	150	160	900	710	1000	800	
	160	182	1000	800	1250	900	
	186	212	1250	900	1500	1120	
	235	265	1500	1120	1750	1250	
	265	302	1750	1250	2000	1400	
	310	354	2000	1400	2250	1600	
	375	428	2500	1800	2750	2000	C
	500	571	3000	2200	3750	2800	
	580	650	3750	2800	4000	3000	
4160	70	80	500	400	600	450	A
	80	91	600	450	700	500	
	94	107	700	500	800	630	
	110	120	800	630	900	710	
	120	130	900	710	1000	800	
	130	148	1000	800	1250	900	
	162	170	1250	900	1350	1000	
	170	188	1350	1000	1500	1120	
	188	214	1500	1120	1750	1300	
	250	286	2000	1400	2250	1600	
	300	342	2250	1600	2750	2000	C
	357	408	3000	2200	3500	2600	
	475	542	4000	2900	4500	3300	

Note: 1- Suggested ratings. Size the drive based on the motor current and on the load duty cycle.
2- CT = Constant Torque - 150% overload for 60 seconds every 10 minutes.
VT= Variable Torque - 115 % overload for 60 seconds every 10 minutes

MVW-01 - Medium Voltage Variable Frequency Drive
Technical Data

Main Power Supply	Voltage	2300, 3300 or 4160V (+ 10%, -20% with output power de-rating)	
	Frequency	50 or 60Hz (± 3%)	
	Phase Unbalance	Less than 3%	
	Cos j (Power Factor)	Greater than 0.97	
Control Power Supply	Voltage	220V / 380V / 400V / 415V / 440V / 460V / 480V	
	Frequency	50 or 60Hz (± 3Hz)	
	Phase Unbalance	Less than 3%	
Enclosure	Standard	NEMA 1 / IP41	
Control	Microprocessor	32 bits	
	Control Type	SVM Sinusoidal PWM (Space Vector Modulation) and optimal pulses (OPP)	
		Fully Digital	
	Control Mode	V / Hz – Voltage Source	
	Switching Mode	High Voltage IGBT (HV – IGBT)	
	Frequency Range	0 ... 100 Hz	
	Overload Capacity	150% for 60 seconds, every 10 minutes (1,5 x I rated - CT)	
		115% for 60 seconds, every 10 minutes (1,15 x I rated - VT)	
	Efficiency	Greater than 98.5%	
Performance	Speed Control	Regulation (with Slip Compensation): 0,5% of Motor Rated Speed	
		V /Hz Resolution: 1 rpm (Keypad Reference	
		Speed Regulation Range: 1:20	
Control Inputs	Analog	2 Programmable Differential Inputs (10 bits): 0...10V, 0...20mA or 4...20mA	
		1 Programmable Isolated Input (10 bits): 0...10V, 0...20mA or 4...20mA	
		1 Programmable Bipolar Input (14 bits): -10 ... +10 V, 0...20mA or 4...20mA *	
		1 Programmable Isolated Input (10 bits): 0...10V, 0...20mA or 4...20mA *	
	Digital	8 Programmable Isolated Inputs: 24Vdc	
		1 Programmable Isolated Input: 24Vdc *	
		1 Programmable Isolated Input: 24Vdc (for Motor PTC Thermistor) *	
Control Outputs	Analog	2 Programmable Outputs (11 bits): 0...10V	
		2 Programmable Isolated Outputs (11 bits): 0 ... 20mA or 4 ... 20mA	
		2 Programmable Bipolar Outputs (14 bits): -10 ... +10V *	
		2 Programmable Isolated Outputs (11 bits): 0 ... 20mA or 4 ... 20mA *	
	Relay	5 Programmable Outputs, Form C Contacts (NO/NC): 240Vac, 1A	
	Transistor	2 Programmable Isolated Outputs (Open Collector): 24Vdc, 50mA *	
Communication	Serial Interface	RS-232 (point-to-point)	
		RS-485, Isolated, with EBA or EBB Expansion Boards (multi-point up to 30 drives) *	
	Fieldbus Communication	Modbus RTU (Built-in) via RS-485 serial	
		Profibus DP or DeviceNet (via Communication Board)	
Safety	Protections (storage of the last 100 faults/ alarms with date and time)	DC Link Overvoltage	Output Short Circuit
		DC Link Undervoltage	Output Ground Fault
		Drive and Motor Overtemperature	External Fault
		Output Overcurrent	Self-diagnosis Fault and Programming Error
		Motor Overload (I x t)	Serial Communication Fault
		Dynamic Braking Resistor Overload	Power Supply Phase Loss
		CPU / EPROM Error (Watchdog)	Keypad Connection Fault
Ambient	Temperature	0 ... 104 °F (40 °C) (up to 122 °F (50 °C) with 2,5% Output Current De-rating / °C)	
	Humidity	5 ... 90% Non Condensing	
	Altitude	0 ... 3300 ft (1000 m) (up to 13100 ft (4000 m) with 10% output current derating / 1000m	
Finishing	Color	Munsell Gray 5PB7/4 (Doors)	
		Munsell Blue 5PB2/6 (Base, Roof and Shutter)	
Conformities/Standards	Electromagnetic Compatibility	EMC Directive 89 / 336 / EEC – Industrial Environment	
		CEI Standard – IEC 61800-3 (EMC – Emission and Immunity	
	CEI – IEC 61800	Adjustable Speed Electrical Power Drive System	
		Part 4 – General Requirements	
		Part 5 – Safety Requirements	
	UL (USA)	Underwriters Laboratories Inc. USA (File E253837)	

** Optional*

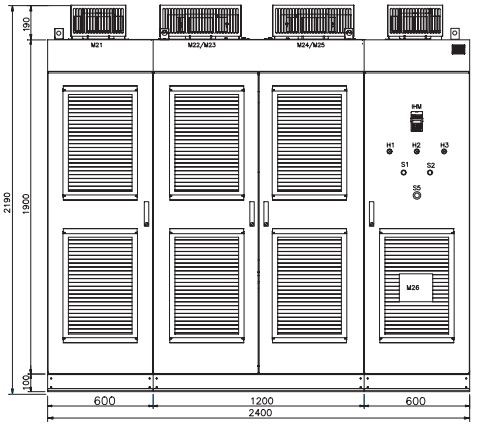
MVW-01 - Medium Voltage Variable Frequency Drive
Purchasing Data

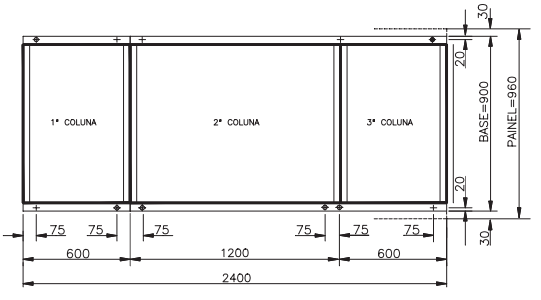
Keypad	Commands	Start / Stop, General Functions Programming	
		Increase / Decrease Speed	
		JOG, FWD/VER and Local/Remote	
	Monitoring	Speed Reference (rpm)	Output Current (A)
		Motor Speed (rpm)	Output Voltage (V)
		Speed Proportional Value (Ex: ft/min)	Drive Status
		Output Frequency (Hz)	Status of Digital Inputs
		DC Link Voltage (V)	Status of Digital Outputs
		Motor Torque (%)	Status of Relay Outputs
		Output Power (kW)	Analog Inputs Value
		Hours Powered Up (h)	100 Last Faults with Date and Time
		Hours Enabled (h)	Fault / Alert Messages
Control Features	Standard	Keypad with LCD + LED displays	
		Password to protect drive programming	
		LCD display language selection: English, Spanish and Portuguese	
		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.)	
		Slip compensation (V / Hz Mode)	
		Manual and Automatic Torque Boost – I x R (V / Hz Mode	
		Adjustable V / Hz Curve (V / Hz Mode)	
		Minimum and maximum speed limits	
		Maximum current limit	
		Adjustable motor overload protection	
		Adjustable digital gain and offset for the analog inputs	
		Adjustable digital gain for the analog outputs	
		JOG function	
		JOG + / JOG – Function (momentary speed increase/decrease)	
		COPY Function (Drive Keypad or Keypad Drive)	
		Comparison functions for the digital outputs:	
		$N^* > Nx$; $N > Nx$; $N < Nx$; $N = 0$; $N = N^*$; $Is > Ix$; $Is < Ix$; $T > Tx$ and $T < Tx$ Where: N = Motor speed; N^* = Speed reference; Is = Output Current and T = Motor torque	
		Linear and "S type" ramps / double ramp	
		Independent acceleration and deceleration ramps	
		Multi-speed function (up to 8 preset speeds)	
		Special resources (Hour meter and Wattmeter)	
		Overlapped PID Regulator (for automatic level, flow, pressure, and weight control)	
		Direction of Rotation selection (FWD/REV)	
		Local / Remote Operation selection	
		Flying Start function (restart with a spinning load)	
		Critical Speed Avoidance (Skip Speed)	
		Ride-Through function (operation during momentary power loss)	
		Built-in Modbus RTU (needs the RS-232 or RS-485 interface)	
	Options	NEMA 4 Remote Keypad (LCD display)	
		Remote Keypad cable (3.3, 6.6, 10, 16, 25 and 35 ft)	
		Remote Keypad frame kit	
		Expansion Boards with special functions	
		Profibus-DP	
		DeviceNet	
		SUPERDRIVE Kit with RS-232 Serial Interface Communication (Drive PC)	

MVW-01 - Medium Voltage Variable Frequency Drive
Mechanical Data

Size	Width in (mm)	Height in (mm)	Depth in (mm)	Weight (Kg)
A	95 (2400)	87 (2190)	38 (980)	1560
B	103 (2600)			1700
C	158 (4000)			2700

SIZE A





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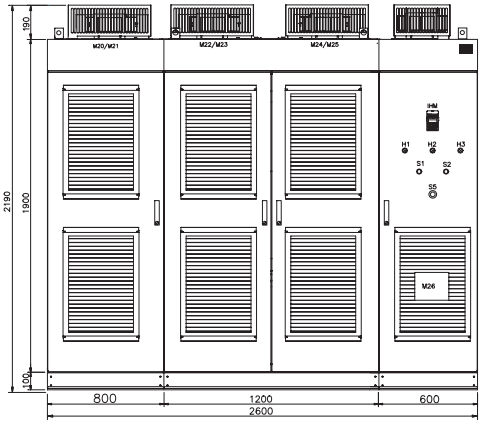

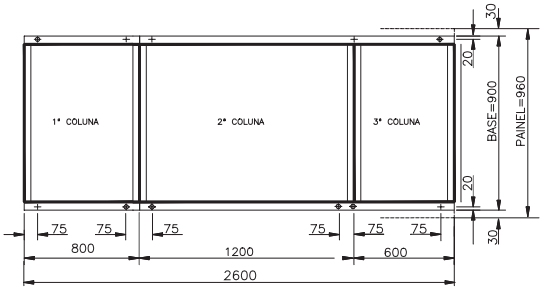

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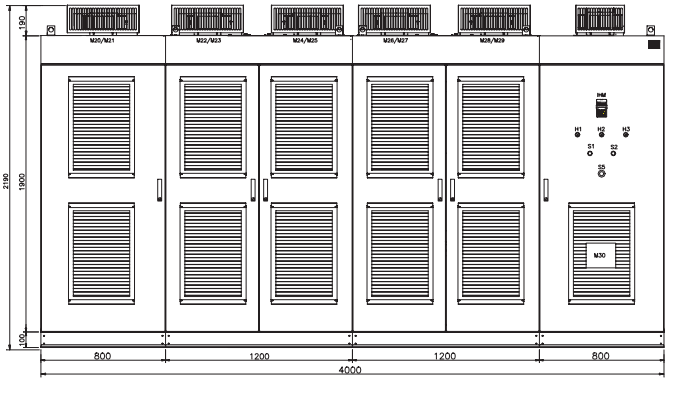
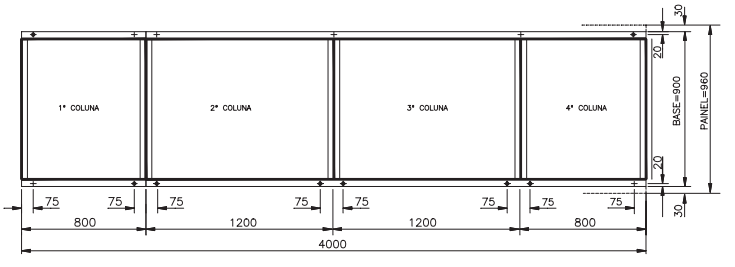




SCA 05 ServoDrives & SWA ServoMotors
Purchasing Data

Standard Features

- Torque / speed / positioning mode
- POSITIONING function with automatic cycle (10 programmable positions via parameters) programmable acceleration and deceleration ramps
- Torque control type “Digital PID with Feedforward” and speed control type “PID”
- Auto tuning of gains
- Encoder simulator: A, A, B, B, Nand N signals; 1 to 4096 PPR programmable
- Detachable keypad with LED display (5 digits - 7 segment)
- Parameters programming via integrated HMI, remote HMI or serial communication (PC)
- Built-in CANopen, Modbus and Devicenet networks’
- Profibus DP (optional)
- Master/Slave function for CAN open network
- High perfomance RISC 32 bit microprocessor
- RS-485 and RS-232C serial interface
- PWM modulation with IGBT power transistors, which allows a silent efficient servomotor running
- Built-in dynamic braking IGBT
- Pulse train input’
- DC link terminal available for parallel connection of other servodrives
- International certifications: UL e cUL, CE, C-Tick e IRAM

Technical Data	Units	Models		
		SCA050004	SCA050008	SCA050024
Rated Current	A	4	8	24
Dynamic Current (3s)	A	8	16	48
Voltage	V	3 x 220/230V (+10%,-15%)		
Output Voltage	V	0...200-230V		
Switching Frequency	kHz	10		
Programmable Digital Inputs	Quantity	6 (15...24Vcc)		
Programmable Digital Outputs	Quantity	3 (2 relay and 1 transistor)		
Programmable Analog Inputs	Quantity	2 (0...± 10V, 0...20mA or 4...20mA) (14 bits and 10 bits)		
Programmable Analog Outputs	Quantity	2 (0...±10V) (12 bits)		
Speed Regulation	-	32 bits		
Environment Temperature	°C	45		
Enclosure	-	IP20		
Frequency Input to Pulse Train	kHz	100		

Call 1 877 PAMENSKY for more information and pricing

SSW-05 Plus - Soft Starter
Purchasing Data

Standard Features

- 208 - 460V, 460-575V 50/60Hz input power supply
- Duty cycle: 300% rated current during 10 seconds, 4 starts per hour
- Built-in bypass contacts
- One digital input for Start/Stop (90 - 250 Vac)
- One digital input for Fault Reset (90 - 250 Vac)
- One relay output for Run indication (1 Amp - 250V)
- One relay output for Full Voltage indication (1 Amp - 250V)
- RS-232 serial port
- Adjustable acceleration and deceleration ramps (1 - 20 seconds)
- Adjustable pedestal voltage (30 - 80% of line voltage)
- Protective features: Motor overload, over current and locked rotor, SCR overload, phase loss and phase sequence
- DIN rail or direct mount
- Ambient: 32ºF (0ºC) to 131ºF (55ºC), 3300ft (1000m) altitude, 90% non-condensing humidity

Optional Features

- Remote Keypad
- PC Programming Software

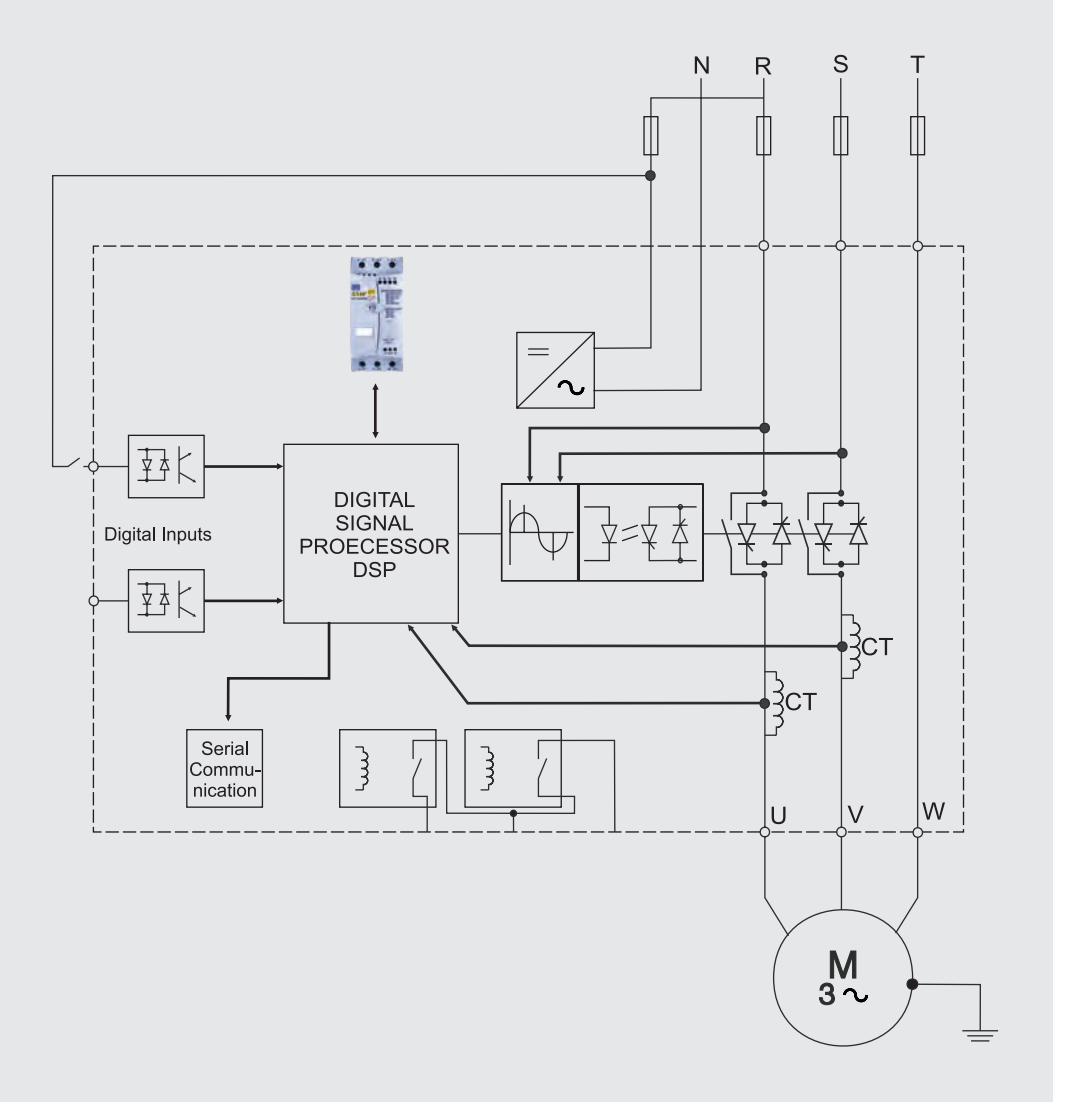
SSW-05 Plus - Soft Starter
Purchasing Data

Power Supply Voltage	Micro Soft–Starter SSW–05 Plus				MAXIMUM APPLICABLE MOTOR			Dimensions (IN.)			Weight (lb)
	Power Supply	Model	List Price	Soft Starter AMPS	Voltage (V)	HP	kW	Height	Width	Depth	
220 – 460 V	Three-Phase	SSW050032X4	$581	3	230	0.75	0.55	5.1	2.3	5.7	1.63
		SSW050102X4	594	10		3	2.2				
		SSW050162X4	654	16		5	3.7				
		SSW050232X4	705	23		7.5	5.5				
		SSW050302X4	757	30		10	7.5				
		SSW050452X4	974	45		15	11	7.3	3.1	6.8	3.68
		SSW050602X4	1,191	60		20	15				
		SSW050852X4	1,432	85		30	22				
		SSW050032X4	581	3	460	1.5	1.1	5.1	2.3	5.7	1.63
		SSW050102X4	594	10		5	3.7				
		SSW050162X4	654	16		10	7.5				
		SSW050232X4	705	23		15	11				
		SSW050302X4	757	30		20	15				
		SSW050452X4	974	45		30	22	7.3	3.1	6.8	3.68
		SSW050602X4	1,191	60		40	30				
		SSW050852X4	1,432	85		60	45				
460 – 575 V	Three-Phase	SSW05003575	581	3	575	2	1.5	5.1	2.3	5.7	1.63
		SSW05010575	594	10		7.5	5.5				
		SSW05016575	654	16		10	7.5				
		SSW05023575	705	23		20	15				
		SSW05030575	757	30		25	18.5				
		SSW05045575	974	45		40	30	7.3	3.1	6.8	3.68
		SSW05060575	1,191	60		50	37				
		SSW05085575	1,432	85		75	55				

SSW-05 Plus - Soft Starter
Accessories

Description		Part Number	List Price
Keypads	Remote Keypad with LED Display	SSW05HMIRS	$124
Keypad Cables	1m (3.3 ft.) Remote Keypad Cable	CFW08HMI08S1	22
	2m (6.6 ft.) Remote Keypad Cable	CFW08HMI08S2	24
	3m (10 ft.) Remote Keypad Cable	CFW08HMI08S3	26
	5m (15 ft.) Remote Keypad Cable	CFW08HMI08S5	40
	7.5m (25 ft.) Remote Keypad Cable	CFW08HMI08S7	46
	10m (33 ft.) Remote Keypad Cable	CFW08HMI08S10	52

SSW-05 Plus - Soft Starter
Block Diagram



SSW-05 Plus - Soft Starter
Technical Data

Power Supply	Voltage	220 - 460 Vac (+10%, -15%)
		460 - 575 Vac (+10%, -15%)
	Frequency	50 / 60 Hz
	Electronic Supply	Switched mode power supply (90 – 250 Vac)
Enclosure	Injected Plastic Case	IP00
Control	Method	Motor Voltage Variation
	CPU	DSP type microprocessor
Starting Duty Cycle	Standard	300% (3 x Inom.) during 10 s, 4 starts per hour
Inputs	Digital	1 input for starting and stopping
		1 input for error reset
Outputs	Digital	1 relay output for full voltage indication (By-Pass)
		1 relay output for operation indication
Communication	Serial Interface	RS-232C
Safety	Protections	Motor overload
		Phase sequence
		Phase loss
		Locked rotor
		SCRs overload
		Overcurrent
		Internal fault (watchdog)
Functions	Starting Voltage	30 - 80% of the rated voltage
Resources	Programmable Acceleration Ramp	1 – 20 s
	Programmable Deceleration Ramp	Off – 20 s
	Motor Rated Current and Soft-Starter Rated Current Ratio	30 - 100%
Ambient	Temperature	0 ... 55ºC - standard operation at rated current
	Humidity	0 ... 90% non condensing
	Altitude	0 ... 1000 m (3,300 ft) - standard operation at rated current
		1000...4000m - with current derating (1%/ 100 m (328 ft) above 1000m (13.300ft)
Finishing	Color	Ultra mat gray (cover) and ultra mat blue (base) WEG standard
Installation	Fixing	Fixing by bolts or assembly on DIN 35 mm rail
Conformities / Standards	Safety	UL 508 Standard – Industrial Control Equipment / IRAM
	Low Voltage	IEC 60947-4-2
	EMC	EMC Directive 89 / 336 / EEC - Industrial Environment

SSW-06 - Soft Starter
Purchasing Data

Standard Features

- 220 - 575V, 50/60Hz input power supply (-15/+10%)
- Built-in run rated (AC1) bypass contactor
- Duty cycle: 300% full load amps for 30 seconds, 10 starts per hour
- Voltage ramp or current limit start modes
- Detachable keypad with dual display (LCD and LED) and copy function
- 90 - 250Vac auxiliary control voltage
- Single 32 bit RISC processor based control board
- IP00 protected chassis enclosure
- Six isolated 24Vdc programmable digital inputs
- Three programmable relay outputs (2 Amp - 250V)
- One 0 - 10Vdc programmable analog output
- One 4 - 20mA programmable analog output
- Motor PTC thermistor input
- RS-232 serial interface
- Adjustable acceleration and deceleration ramps (1 - 299 seconds)
- Adjustable pedestal voltage (25 - 90% of line voltage)
- Current limitation from 150-500% torque control
- Diagnostic features: Motor overload, over current and phase loss, motor immediate over and under current, SCR over temperature and fault, line phase loss and phase sequence, line over and under voltage
- Display readings: Motor current, voltage, kW and power factor, line voltage and frequency, four last fault trips, run and power-up timers
- Ambient: 32ºF (0ºC) to 131ºF (55ºC), 3300 ft (1000m) altitude, 90% non-condensing humidity
- Braking capabilities: Reverse Braking, Optimal Braking, DC Braking
- ModBUS (Built-in)

Optional Features

- RS-485 serial interface
- Remote keypad cables and mounting frame
- PC programming software
- Profibus Expansion Board
- DeviceNet Expansion Board

SSW-06 - Soft Starter
Purchasing Data

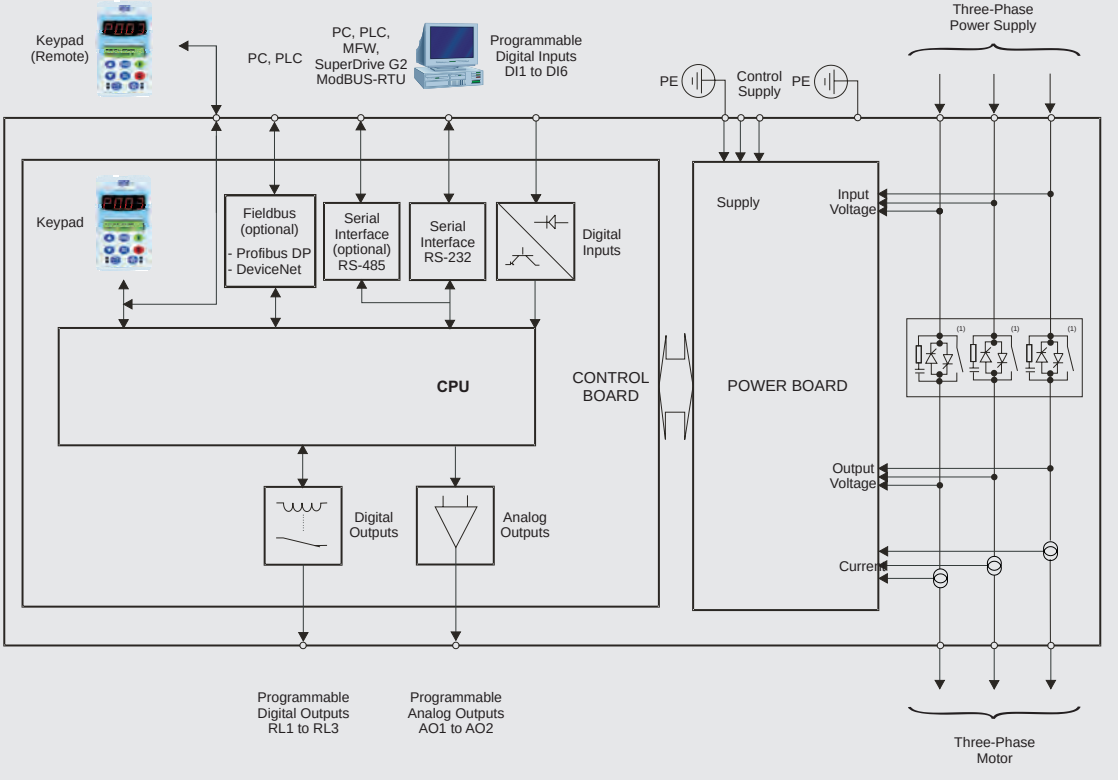
Power Supply Voltage	Soft–Starter SSW–06					MAXIMUM APPLICABLE MOTOR					Dimensions (in.)			Weight (lb)
	Power Supply	Model	List Price	Soft Starter AMPS	Frame Size	Voltage (V)	3 Leads (Standard)		6 Leads (Inside Delta)		Height	Width	Depth	
							HP	kW	HP	kW				
230 V	Three-Phase	SSW060852X5	$3,008	85	2	230	30	22	50	37	14.6	5.2	9.6	19
		SSW061302X5	3,760	130			50	37	75	55				
		SSW061702X5	4,605	170	3		60	45	100	75	17.3	8.8	10.9	41
		SSW062052X5	5,791	205			75	55	125	90				
		SSW062552X5	8,021	255	4		100	75	150	110	21.7	14.6	12.2	91
		SSW063122X5	8,509	312			125	90	200	150				
		SSW063652X5	8,643	365			150	110	250	185				
		SSW064122X5	10,142	412	5		150	110	250	185	25.6	14.6	13.7	121
		SSW064802X5	12,556	480			200	150	350	260				
		SSW066042X5	14,005	604			250	185	450	330				
		SSW066702X5	15,936	670	6		250	185	450	330	31.3	21.3	14.1	265
		SSW068202X5	18,832	820			300	225	550	410				
		SSW069502X5	28,491	950	7		350	260	650	485	35.2	22.4	13.6	236
		SSW0611002X5	35,737	1100	8		450	330	800	600	48.6	27.0	17.0	480
		SSW0614002X5	45,876	1400			500	370	1000	750				
460 V	Three-Phase	SSW060852X5	3,008	85	2	460	60	45	100	75	14.6	5.2	9.6	19
		SSW061302X5	3,760	130			100	75	150	110				
		SSW061702X5	4,605	170	3		125	90	200	150	17.3	8.8	10.9	41
		SSW062052X5	5,791	205			150	110	250	185				
		SSW062552X5	8,021	255	4		200	150	350	260	21.7	14.6	12.2	91
		SSW063122X5	8,509	312			250	185	450	330				
		SSW063652X5	8,643	365			300	225	500	370				
		SSW064122X5	10,142	412	5		350	260	550	410	25.6	14.6	13.7	121
		SSW064802X5	12,556	480			400	300	650	485				
		SSW066042X5	14,005	604			500	370	800	600				
		SSW066702X5	15,936	670	6		550	410	900	670	31.3	21.3	14.1	265
		SSW068202X5	18,832	820			600	450	1150	820				
		SSW069502X5	28,491	950	7		700	525	1350	1000	35.2	22.4	13.6	236
		SSW0611002X5	35,737	1100	8		800	600	1600	1175	48.6	27.0	17.0	480
		SSW0614002X5	45,876	1400			1050	775	2000	1475				
575 V	Three-Phase	SSW060852X5	3,008	85	2	460	75	55	150	110	14.6	5.2	9.6	19
		SSW061302X5	3,760	130			125	90	200	150				
		SSW061702X5	4,605	170	3		150	110	300	220	17.3	8.8	10.9	41
		SSW062052X5	5,791	205			200	150	350	260				
		SSW062552X5	8,021	255	4		250	185	450	330	21.7	14.6	12.2	91
		SSW063122X5	8,509	312			300	225	550	410				
		SSW063652X5	8,643	365			350	260	650	485				
		SSW064122X5	10,142	412	5		450	330	750	550	25.6	14.6	13.7	121
		SSW064802X5	12,556	480			500	370	850	630				
		SSW066042X5	14,005	604			600	450	1100	800				
		SSW066702X5	15,936	670	6		650	485	1200	900	31.3	21.3	14.1	265
		SSW068202X5	18,832	820			750	550	1500	1200				
		SSW069502X5	28,491	950	7		850	630	1750	1290	35.2	22.4	13.6	236
		SSW0611002X5	35,737	1100	8		1000	750	2000	1475	48.6	27.0	17.0	480
		SSW0614002X5	45,876	1400			1300	1000	2500	1850				

Note: Models rated 950, 1100 and 1400 do not have a built-in by-pass

SSW-06 - Soft Starter
Accessories

Description		Part Number	List Price
Keypads and Keypad Cables	Standard Keypad with LED & LCD	SSW06HMILCD	$218
	Remote Keypad FRAME KIT	SSW06KMR	30
	3.3 ft. Remote Keypad Cable	CFW09HMI091	32
	6.6 ft. Remote Keypad Cable	CFW09HMI092	40
	10 ft. Remote Keypad Cable	CFW09HMI093	50
	16 ft. Remote Keypad Cable	CFW09HMI095	76
Communication	Profibus DP Communication Kit	SSW06KFBPD	990
	DeviceNet Communication Kit	SSW06KFBDN	850
	Interface for RS-485 Communication	RS485 Comm Board	174
IP20 Kits	SSW06 IP20 Kit - Size 2 (85-130A)	SSW06IP20M2	200
	SSW06 IP20 Kit - Size 3 (170-205A)	SSW06IP20M3	224
	SSW06 IP20 Kit - Size 4 (255-365A)	SSW06IP20M4	240

SSW-06 - Soft Starter
Block Diagram



(1) Models 950A, 1100A and 1400A do not have an internal By-pass contactor.

SSW-06 - Soft Starter
Technical Data

Power Supply	Power	220 to 575 Vac -15% to +10%, or 198 to 632 Vac	
	Control	110 to 230 Vac -15% to +10%, or 94 to 253 Vac	
	Fan	Models from 255 to 820 A: 115 Vac (104 to 127) Vac / 230 vac (207 to 253) Vac	
		Model 950 A: 115 Vac (103,5 to 122) Vac / 230 Vac (207 to 243,8) Vac	
		Models from 1100 to 1400 A: 230 vac (207 to 243,8) Vac	
	Frequency	50 to 60 Hz (+/- 10%), or 45 to 66 Hz	
Degree of Protection	Metallic cabinet	IP00	
Control	Control method	Motor voltage variation (Three phase induction motor)	
	CPU	32-Bit RISC microcontroller	
	Types of control	Voltage ramp	
		Current limitation	
		Current limitation ramp	
		Pump control	
		Torque control 1, 2 or 3 points	
Starting Duty Cycles (10 starts / hour)	Rated	300% (3 x I nom.) during 30 s for 3-cable connection and during 25 s for 6-cable connection	
	Heavy	450% (4,5 x I nom.) during 30 s with 33% rated current reduction; 450 % (4,5 x I nom.) during 25 s for 6-cable connection	
Inputs	Digital	5 x 24 Vdc isolated programmable inputs	
		1 x 24 Vdc insolated programmable input for motor PTC	
Outputs	Relay	3 programmable outputs 250 Vac / 2 A: (2 x NA) + (1 x NO + NC – Fault)	
	Analog	1 Programmable output (11 bits) 0…10 Vdc	
		1 programmable output (11 bits) 0...20 mA or 4...20 mA	
Safety	Protections	Overvoltage	Power supply phase loss
		Undervoltage	Output phase loss (motor)
		Voltage imbalance	Thyristor failure
		Undercurrent	CPU failure (watch dog)
		Overcurrent	Programming error
		Current imbalance	Serial communication error
		Overload (motor) – i^2t	Self-check error
		Thyristors over temperature	HMI-SSW06 communication error
		Motor over temperature / PTC	Starting time expired
		Phase sequence failure	Fieldbus communication error
		External fault	Serial communication error
		Open by-pass contact failure (1)	Undervoltage in the electronic board
		Closed by-pass contact failure (1)	Frequency out of range
		Overcurrent in the by-pass (1)	
		Undercurrent before by-pass closing (1)	
Functions/Resources	Standard	Removable Human-Machine Interface with double display LED + LCD	
		Programming access password	
		HMI language selection: Portuguese, English, Spanish and German	
		Control type selection: Voltage ramp, current limitation, current limitation ramp, pump control and torque control	
		Local/ Remote operation selection	
		Self-checking and automatic fault reset	
		Oriented start-up according to the control type	
		Standard or within-the-delta (6 leads) connection	
		All protections and functions available in both types of connection to the motor	
		PUMP CONTROL function (protection against “water hammer” in pumps)	
		COPY function (Soft-starter -> HMI or HMI -> soft-starter)	
		Built-in by-pass for the models 85 to 820 A	
		Serial interface RS-232 with Modbus RTU protocol. RS-485 optional	
		Insolated input for motor PTC	
		Standard or user parameters reset (Brings back the standard or user values)	
		Special features: Running hours	
		Programmable over and undervoltage and voltage imbalance between phases	
		Programmable over and undercurrent and current imbalance between phases	
		Under and overcurrent before by-pass	
		Programmable immediate overcurrent	
		Programmable time for immediate overcurrent	
		Programmable immediate undercurrent	
		Programmable time for immediate undercurrent	
		Programmable line nominal voltage	
		Fully programmable voltage ramp	
		Programmable current limitation	
		Programmable current ramp	
		Programmable pump control	
		Fully flexible torque control	
		Auto reset of the programmable thermal memory	
		Thermal class protection (motor overload) programmable from class 5 to 45.	

SSW-06 - Soft Starter
Technical Data

Functions/Resources	Optional	Frame for remote HMI
		Cable to interconnect the soft-starter with the remote HMI 1, 2, 3 and 5 m
		RS-485 communication kit
		PROFIBUS-DP communication kit
		Device Net communication kit
		IP20 protection for the models from 85 up to 820 A
Human–Machine Interface (HMI–SSW06–LCD)	Controls	Start, stop, reset and parameterization (main functions programming)
	Supervision (read)	Increase and decrease parameters and their values
		Motor current (% Soft-starter In)
		Motor current (% Motor In)
		Motor current (A)
		Line frequency (0…99.9 Hz)
		Line voltage (0…999 V)
		Output voltage (0…999 V)
		Motor torque (% motor I n)
		Load active power – (kW)
		Load apparent power – (kVA)
		Soft-starter status
		Digital and analog inputs and outputs status
		Load Cos □ (0.00 – 0.99)
		Energized hours
		Enabled hours
		Last six error codes memory
		Soft-starter software version
Enviroment Conditions	Temperature	0 to 55ºC (Models from 85 to 820 A) standard operation at rated current
		0 to 40ºC (Models from 950 to 1400 A) standard operation at rated current
	Humdity	5...90 %, non-condensing
	Altitude	0... 1000 m: standard operation at rated current
		1000... 4000 m; with output current reduction of 1%/100 m, over 1000 m
Finishing Painting	Color	Cover: ultra mat gray
		Cabinet: ultra mat blue
Standards	Safety	UL 508 Standard – Industrial control equipment (2)
	Low voltage	EN 60947-4-2 Standard; LVD 73/23/EEC – Low voltage directive
	EMC	EMC directive 89 / 336 / EEC – Industrial environment
	UL (USA) / cUL (Canadá)	Underwritters Laboratories Inc. – USA (2)
	CE (Europe)	Certified by EPCOS
	IRAM (Argentina)	Instituto Argentino de Normalización (2)
	C-Tick (Australia)	Australian Communications Authority

Notes: (1) Models from 10A to 820A
(2) Models from 85A to 1400A approved

SSW-07 - Soft Starter
Purchasing Data

Standard Features

- Strong reduction on mechanical stresses over the coupling and transmission devices (gearboxes, pulleys, gears, conveyors, etc.) during the start
- Eliminates mechanical shock
- Increases motor and machine mechanical equipment lifetime due to the elimination of mechanical shock
- Easy operation, setup, maintenance & installation
- Simple electric installation
- Operates in environments up to 55ºC (without current reduction for all models)
- Integral, electronic motor protection
- Built-in electronic thermal relay
- Avoids the “Water Hammer” in pumps
- Limitation of voltage drop during start
- Universal voltage (220 to 575 Vac)
- Switched type power supply with EMC filter for the control electronics (110 to 240 Vac)
- Voltage monitoring of the electronics to back-up Ixt values (thermal image)
- Local Keypad

Optional Features

- RS 485 Serial Interface
- RS 232 Serial Interface
- Remote keypad
- PTC Kit
- IP20 Kit for M3

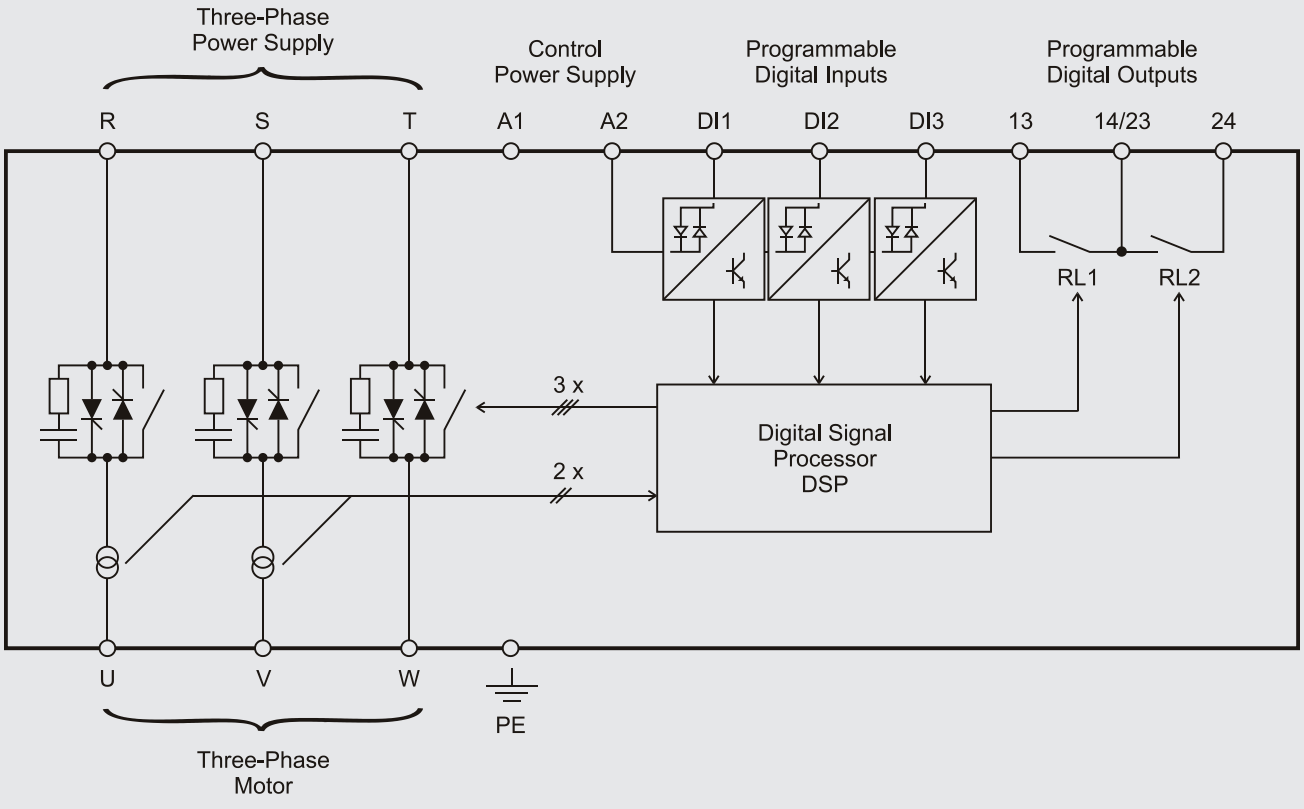
SSW-07 - Soft Starter
Purchasing Data

Power Supply Voltage	Soft–Starter SSW–07					MAXIMUM APPLICABLE MOTOR			Dimensions (in.)			Weight (lb)
	Power Supply	Model	List Price	Soft Starter AMPS	Frame Size	Voltage (V)	HP	kW	Height	Width	Depth	
230 V	Three-Phase	SSW0700172X5	$1,266	17	1	230	5	3.7	6.38	3.74	6.18	2.9
		SSW0700242X5	1,346	24			7,5	5.5				
		SSW0700302X5	1,386	30			10	7.5				
		SSW0700452X5	1,558	45	2		15	11	8.2	5.57	7.94	7.28
		SSW0700612X5	1,736	61			20	15				
		SSW0700852X5	2,070	85			30	22				
		SSW0701302X5	2,560	130	3		50	37	10.9	8.6	8.66	16.8
		SSW0701712X5	3,210	171			60	45				
		SSW0702002X5	3,778	200			75	55				
460 V	Three-Phase	SSW0700172X5	1,266	17	1	460	10	75	6.38	3.74	6.18	2.9
		SSW0700242X5	1,346	24			15	11				
		SSW0700302X5	1,386	30			20	15				
		SSW0700452X5	1,558	45	2		30	22	8.2	5.57	7.94	7.28
		SSW0700612X5	1,736	61			40	30				
		SSW0700852X5	2,070	85			60	45				
		SSW0701302X5	2,560	130	3		100	75	10.9	8.6	8.66	16.8
		SSW0701712X5	3,210	171			125	90				
		SSW0702002X5	3,778	200			150	110				
575 V	Three-Phase	SSW0700172X5	1,266	17	1	575	15	11	6.38	3.74	6.18	2.9
		SSW0700242X5	1,346	24			20	15				
		SSW0700302X5	1,386	30			25	18.5				
		SSW0700452X5	1,558	45	2		40	30	8.2	5.57	7.94	7.28
		SSW0700612X5	1,736	61			50	37				
		SSW0700852X5	2,070	85			75	55				
		SSW0701302X5	2,560	130	3		125	90	10.9	8.6	8.66	16.8
		SSW0701712X5	3,210	171			150	110				
		SSW0702002X5	3,778	200			200	150				

SSW-07 - Soft Starter
Accessories

Description		Part Number	List Price
Keypads	Keypad	SSW07HMIL	$160
	Remote Keypad Kit	SSW07HMIR	312
Keypad Cables	1m (3.3 ft.) Remote Keypad Cable	CFW08HMI08S1	22
	2m (6.6 ft.) Remote Keypad Cable	CFW08HMI08S2	24
	3m (10 ft.) Remote Keypad Cable	CFW08HMI08S3	26
	5m (15 ft.) Remote Keypad Cable	CFW08HMI08S5	40
	7.5m (25 ft.) Remote Keypad Cable	CFW08HMI08S7	46
	10m (33 ft.) Remote Keypad Cable	CFW08HMI08S10	52
Communication	RS-232 Communication Kit	SSW07KRS232	128
	RS-485 Communication Kit	SSW07KRS485	150
	Cable for Communication RS232 (DB9-DB9) - 3m	SSW07CAB-RS-3	70
	Cable for Communication RS232 (DB9-DB9) - 10m	SSW07CAB-RS-10	150
KITS	Ventilation Kit M2 (Frame Size 2, 45 to 85A)	SSW07VENTKIT-M2	68
	Ventilation Kit M3 (Frame Size 3, 130 to 200A)	SSW07VENTKIT-M3	96
	PTC Kit for motor	SSW07KITPTC	114
	IP20 Kit for M3 (Frame Size 3, 130 to 200A)	SSW07IP20KIT	70
	Superdrive G2 Kit (KRS-232-SSW07+CAB-COMM-3+CD Software)	SSW07KSDG2	206

SSW-07 - Soft Starter
Block Diagram



SSW-07 - Soft Starter
Technical Data

Power Supply	Power	220 to 575 Vac	
	Control	110 to 240 Vac (-15% to +10%), or 94 to 264 Vac	
	Frequency	50 to 60 Hz (+/- 10%), or 45 to 66 Hz	
Degree of Protection	Injected plastic case	IP20 in models from 17 to 85 A	
		IP00 in models from 130 to 200 A (IP20 as option)	
Control	Control Method	Motor Voltage Variation	
	CPU	DSP type microprocessor (Digital Signal Processor)	
	Types of Control	Voltage ramp	
		Current limit	
Starting Cycle (1)	Normal	300% (3 x Inom.) during 30 s, 10 starts per hour (every 6 minutes)	
Inputs	Digital	3 isolated programmable inputs	
Outputs	Relay	02 relays with NO contacts, 240Vac, 1A, programmable functions	
Starting Duty Cycle	Normal 17 - 30A	300%	
	Normal 45 - 200A	3 starts	
	With optional ventilation kit 45-200A	10 starts	
Safety	Protections (Standard)	Overcurrent	Locked rotor
		Overcurrent before By-pass	Excess starting time
		Phase loss	Frequency outside tolerance
		Inverted phase sequence	By-pass contact open
		Overtemperature in power heatsink	Undervoltage in control supply
		Motor overload (class 5 to 30)	
	Protections (with Accessory)	Undercurrent	Programming error
		Current imbalance	Serial communication error
		Undercurrent before by-pass	HMI communication error
		External fault	Overtemperature in motor PTC
Functions / Resources	Standard	Voltage ramp (Initial voltage: 30% to 90%)	
		Current limitation (150% to 450% of SSW-07 rated current)	
		Starting time (1 to 40s)	
		Kick Start (Off - 0.2 to 2s)	
		Deceleration ramp (0 to 40s)	
		Motor and SSW-07 current relation (50% to 100%)	
		Faults automatic-reset	
		Thermal memory automatic-reset	
		Factory standard reset	
		Soft-starter built-in By-pass	
Programming Accessory (HMI or Serial communication)		On, Off / Reset and Parameterization (function programming)	
		Starting time up to 999s	
		Deceleration time up to 999s	
		Program enabling password	
		Selection for Local / Remote operation	
		COPY function (SSW-07 >>> HMI and HMI >>> SSW-07)	
		Programmable rated voltage	
		Motor current (%Soft-Starter In)	
		Motor current (%motor In)	
		Motor current (A)	
		Current indication in each phase R-S-T	
		Supply network frequency	
		Apparent power supplied to load (kVA)	
		Soft-Starter status	
		Digital input and output status	
		Last 4 faults	
		Soft-Starter Software Version	
		Heatsink temperature	
		Motor thermal protection status	
Accessories and Options	Options	Plug-in type local HMI	
		HMI remote Kit	
		5 and 10m cable for remote HMI interconnection	
		RS-232 communication kit	
		SSW-07 interconnection leads >>> PC Serial (RS-232) 3 and 10m	
		RS-485 communication kit	
		Motor PTC kit	
		Ventilation kit for size 2 (45 to 85 A)	
		Ventilation kit for size 3 (130 to 200 A)	
		IP20 kit for size 3 (130 to 200 A)	
Finishing	Color	Lid: Ultra mat gray	
		Cabinet: Ultra mat blue	
Conformities / Standards	Safety	UL 508 Standard- Industrial Control Equipment	
	Low voltage	EN60947-4-2; LVD 2006/95/EC Standard – Low voltage Directive	
	EMC	EMC 89/336/EEC Directive – Industrial Environment	
	UL (USA) / cUL (Canada)	Underwriters Laboratories Inc. – USA	
	CE (Europe)	Conformity test conducted by EPCOS	
	C-Tick (Australia)	Australian Communication Authority	

Miniature Contactors
Purchasing Data

Product Information

The CWC Series miniature contactor features more horsepower for its size than any other miniature contactor on the market. The CWC's compact dimensions for its current rating, up to 25A, AC-3 utilization category, allows it to take up less space inside electrical enclosures while still running motors up to 10HP @ 575V. The dimensions remain the same whether the coil voltage is AC or DC making panel design and assembly easier. DC models feature low consumption coils allowing the CWC to be operated directly from a PLC without interface relays.

The following configurations are available "off-the-shelf."

- 3 Pole Normally Open Power Contacts with one built-in Auxiliary Contact (Can be Normally Open or Normally Closed)
- 3 Pole Normally Open Reversing Contactors rated AC-4 Utilization Category
- 4 Pole Power Contacts (four Normally Open, or two Normally Open and two Normally Closed)
- Control Relay

An extensive lineup of modular and tool-free accessories makes the CWC Series the most flexible and easy-to-use miniature contactor available today.

Features

- Rated up to 10 HP @ 575V
- Direct mounting to the WEG RW17D overload relay and MPW25 manual motor protector with ECCMP-C0 accessory
- Frame size remains the same for AC and DC coil contactors
- Heavy-duty operation
- Tool-free DIN rail mounting
- Complete line of snap-on accessories

Miniature Contactors
Purchasing Data

Three Pole Miniature Contactor with AC Coils

Rated operational current A	Conv. thermal current A	Maximum Applicable Motor (HP)						Auxliary contacts per contactor		Part Number	List Price	Weight (lbs)
		Single–Phase		Three–Phase				NO	NC			
		115V	230V	200V	230V	460V	575V					
7	18	1/3	3/4	1-1/2	1-1/2	5	5	1	0	CWC07L310X	$29	0.43
								0	1	CWC07L301X	29	
9	20	1/3	1	2	3	5	7-1/2	1	0	CWC09L310X	31	
								0	1	CWC09L301X	31	
12	22	1/2	2	3	3	7-1/2	7-1/2	1	0	CWC12L310X	32	
								0	1	CWC12L301X	32	
16	22	1	2	3	5	10	10	1	0	CWC16L310X	33	
								0	1	CWC16L301X	33	
25	32							0	0	CWC25L300X	42	0.44

Replace 'X' with code for AC Coil Voltage Code Selection		
60 Hz	120V	208-240V
CODE	**J**	**S**
50 Hz	110V	-

Miniature Control Relay with AC Coils

Ith	Rating	Auxiliary Contacts		Part Number	List Price
		N.O.	N.C.		
10	A600, Q600	2	2	CAW04R422X	$30
		3	1	CAW04R431X	30
		1	3	CAW04R413X	30
		4	0	CAW04R440X	30
		0	4	CAW04R404X	30

Replace 'X' with code for AC Coil Voltage Code Selection					
60 Hz	24V	120V	208-240V	480V	600V
CODE	**V04**	**J**	**S**	**V47**	**V56**
50 Hz	-	110V	-	400-415V	-

Miniature Contactors
Technical Data

Part number			CWC07	CWC09	CWC012	CWC016	CWC025	CWCA0
Standards			IEC/EN 60 947. DIN VDE 0660. UL. CSA					
Rated insulation voltage U_i IEC/EN 60 947. DIN VDE 0660			690 V					
UL. CSA			600 V					
Rated impuse withstand voltage U_{imp}			4kV					
Rated operational frequency			25 - 400 Hz					
Degree of protection Main circuits			IP20					
Control circuits and auxiliary contacts			IP20					
Ambient temperature Operating temperature Storage temperature			-25°C to +55°C -55°C to +80°C					
Altitude Normal values 90 % I_e / 80 % U_e 80 % I_e / 75 % U_e			to 3000 m 3000 to 4000 m 4000 to 5000 m					
Overvoltage category / Pollution degree			III / 3					
Climatic proofing			IEC 60 680-2					
Pole number of main circuits			3					4
Rated operational voltage U_e			690V					690 V
Conv. thermal current I_{th} at < 55°C rated operational current I_e / AC-1			18 A	20 A	22 A	22 A	32 A	10 A
Rated operational current I_e AC-4 ($U_e \leq 440V$)			2.8	3.5	4.5	5	9	-
AC-3 Utilization Category Rated operational power								
220/230 V	kW / hp		1.5 / 2	2.2 / 3	3 / 4	4 / 5	5.5 / 7.5	-
380 V	kW / hp		3 / 4	4 / 5	5.5 / 7.5	7.5 / 10	11 / 15	-
400/415 V	kW / hp		3 / 4	4.5 / 6	5.5 / 7.5	7.5 / 10	11 / 15	-
440 V	kW / hp		3.7 / 5	4.5 / 6	5.5 / 7.5	7.5 / 10	11 / 15	-
500 V	kW / hp		3.7 / 5	4.5 / 6	5.5 / 7.5	7.5 / 10	11 / 15	-
690 V	kW / hp		3.7 / 5	5.5 / 7.5	7.5 / 10	7.5 / 10	11 / 15	-
Maximum numbers of auxiliary contacts			5				2	4
Short circuit rating max. fuse gL-gG		(A)	20	20	25	25	35	10
Maximum electrical operations per hour AC-1		Ops/h	300					-
AC-3		Ops/h	600					-
AC-4		Ops/h	300					-
no load		Ops/h	2500					2500
Mechanical lifespan		Ops x 10^6	10				3	10
Electrical lifespan (AC-3)		Ops x 10^6	1.4	1.3	1.2	1.1	0.6	-
Rated operational current I_e								
AC-15	220-230 V	A	-	-	-	-	-	10
	380-400 V	A	-	-	-	-	-	6
	415 V	A	-	-	-	-	-	5
	500 V	A	-	-	-	-	-	4
DC-13	24 V	A	-	-	-	-	-	6
	48 V	A	-	-	-	-	-	4
	110 V	A	-	-	-	-	-	2
	220 V	A	-	-	-	-	-	0.7
Control circuit reliability			-					U_e min=17 V I_e min= 5 mA
Terminal capacity			1 or 2 x (0.5...2.5)				1 or 2 x (1...2.5) 1 or 2 x (2.5...6.0)	1 or 2 x (0.5...2.5)
Tightening torque N.m			1...1.5				1.8	1...1.5

Miniature Contactors
Technical Data

Control circuit

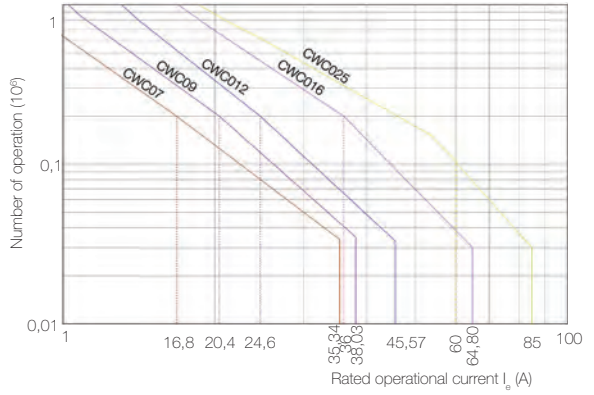
Part number				CWC07	CWC09	CWC012	CWC016	CWC025	CWCA0
Coil consumption	AC	Pick-up	VA	30				58	30
		Cos j		0.8				0.8	0.8
		Sealing	VA	2...3				4.5...5.8	2...3
		Cos j		0.27				0.27	0.27
Operation time	Closing / Opening (AC)		ms	8...20 / 6...13				13...16 / 13.5...17	8...20 / 6...13
Coils rated voltage			V	12-660VAC / 12-440VDC				12-660VAC	12-660VAC / 12-440VDC
Coil operational limits				0.85...1.1					
Bifrequency coils	Pick-up		xUs	0.5...0.8					
	Drop-out		xUs	0.2...0.6					

Auxiliary contact block BFC		
Terminal capacity Number of conductors and Cross section (min. and max.)	Flexible without cable lug (mm^2)	2x (0.5...2.5)
	Flexible without cable lug (mm^2)	2x (0.75...1.5)
	AWG Cables	(12...22)
Tightening torque Nm		08...1.5Nm
Conventional thermal current (I_{th})	A	10
Rated operational current (I_e) AC - 15	A	6/4(220/240V). 3/2(380/440V). 2(500V)
Rated operational current (I_e) DC - 13		1.5(24V). 0.5(60V). 0.2(220-240V)

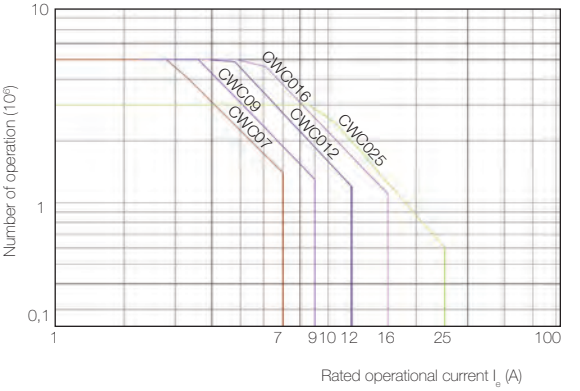
Timing Relay		
Rated insulation voltage (U_i)	V	300
Supply voltage (U_e)	1 – 2 terminals	24...240 VDC/VAC 50/60 Hz (TEC0)
		24...60 VDC/VAC 50/60 Hz (TDC0)
		100...240 VDC/VAC 50/60 Hz (TDC0)
		220-240 VAC 50/60Hz (TETC0)
		110-130 VAC 50/60Hz (TETC0)
		24-28 VAC 50/60Hz (TETC0)
Control Voltage (U_c) only TDC0 - pg 18	2 – B1 terminals	24...60 VDC/VAC 50/60 Hz (TDC0)
		100...240 VDC/VAC 50/60 Hz (TDC0)
Voltage operational limits		0.85...1.1 x Uc (VAC)
		0.8...1.25 x Uc (VDC)
Consumption	mA	≤ 5
Minimum time for Reset (Recovery time)	ms	650
Minimum control time (only TDC0)	ms	50
Setting accuracy (% of the full scale value)	%	+/-5
Repeat Accuracy	%	+/-1
Changeover time Y - Δ	ms	50

Electrical Lifespan

AC-4 (U_e ≤ 440VAC)



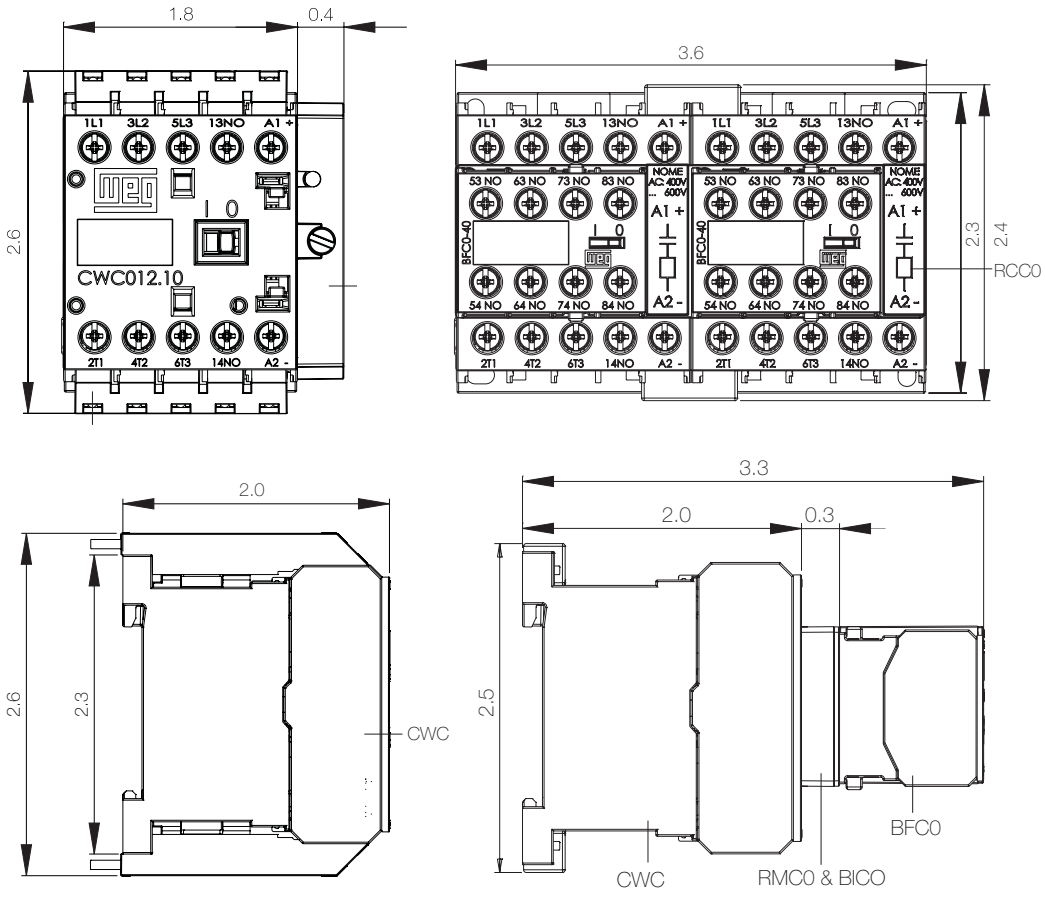
AC-3 (U_e ≤ 440VAC)



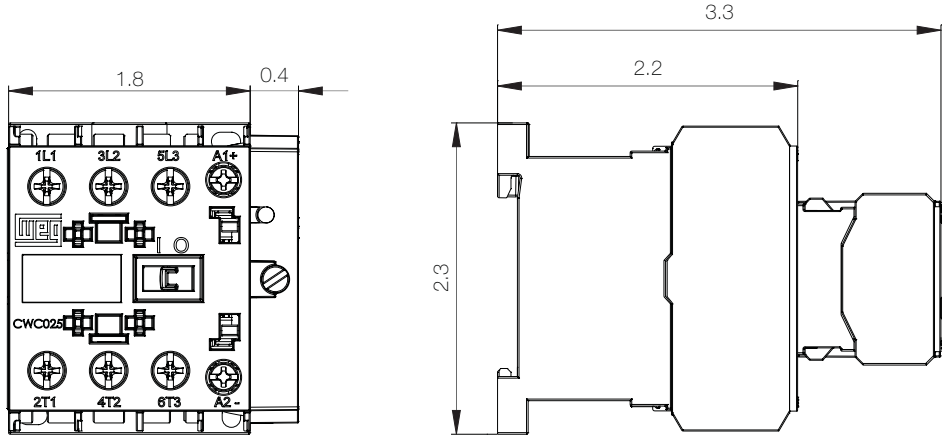
Miniature Contactors
Technical Data

Mini contactors - Dimensions (in)

CWC07 up to 16 and CWCA0



CWC025



Standard Contactors
Purchasing Data

Product Information

The CWM general-purpose contactor line has been designed taking into consideration industrial duty and reliability.

Rated for inductive loads up to 800A or 440kW @380/400V, WEG can OFFer the suitable contactor for your application.

CWM contactors allow total panel space optimization, with only a few compact frame sizes from 4 to 440kW @ 400/415V. Reducing inventory is a “snap” with CWM’s common accessories. For example, side-mounted auxiliary contact blocks are the same from 9 to 300A (AC-3) @ 440V.

Designed for extended mechanical and electrical life, dependable switching in even the most heavy-duty applications can be achieved. No matter how demanding the application, all WEG contactors are tested and approved to be used under Type 1 and Type 2 short circuit coordination. Ensuring global acceptance, all components conform to UL508 (USA and Canada), IEC60947 and CE.

All WEG contactors are manufactured to assure the highest quality manufacturing processes and component materials.

This way, WEG offers reliable solutions for low-voltage applications in electric panel assemblers, OEMs, distributors and end users.

Features

- General purpose motor applications
- Fractional power through 600HP @ 460V
- Compact frame sizes
- Panel mountable or 35mm DIN rail up to 75HP @ 460V
- Built-in auxiliary contacts up to 10HP @ 460V
- Front and side mountable auxiliary contact blocks
- Finger-touch protection IP20
- Wide coil voltage selection AC or DC
- AC/DC coils with electronic modules available from 100HP and up
- Replaceable main contacts for entire line

Standard Contactors
Purchasing Data

CWM Series Contactors

Rated operational current A	Conv. thermal current A	Maximum Applicable Motor (HP)						Auxliary contacts per contactor		Part Number	List Price	Weight (lbs)
		Single–Phase		Three–Phase				NO	NC			
		115V	230V	200V	230V	460V	575V					
9	25	1/2	1.5	3	3	5	7 1/2	1	0	CWM9L310X	$42	0.65
								0	1	CWM9L301X	42	
12	25	3/4	2	3	3	7 1/2	10	1	0	CWM12L310X	55	0.65
								0	1	CWM12L301X	55	
18	32	1	3	5	5	10	15	1	0	CWM18L310X	60	0.65
								0	1	CWM18L301X	60	
25	32	2	5	7 1/2	7 1/2	15	15	0	0	CWM25L300X	71	0.65
								1	1	CWM25L311X	71	
32	60	3	5	10	10	20	25	0	0	CWM32L300X	101	1.15
								1	1	CWM32L311X	101	
40	60	3	5	10	15	30	25	0	0	CWM40L300X	143	1.19
								1	1	CWM40L311X	143	
50	90	3	7.5	15	15	40	40	0	0	CWM50L300X	163	2.44
								1	1	CWM50L311X	163	
65	110	5	10	20	20	50	50	0	0	CWM65L300X	182	2.47
								1	1	CWM65L311X	182	
80	110	7 1/2	15	20	25	50	60	0	0	CWM80L300X	233	2.49
								1	1	CWM80L311X	233	
95	140	7 1/2	15	25	30	60	75	0	0	CWM95L300X	284	3.20
								1	1	CWM95L311X	284	
105	140	10	20	30	40	75	75	0	0	CWM105L300X	331	3.24
								1	1	CWM105L311X	331	
150	170	-	-	50	60	125	150	2	2	CWM150L322X	658	5.60
180	200	-	-	60	75	150	200	2	2	CWM180L322X	909	8.91
250	300	-	-	75	100	200	250	2	2	CWM250L322X	1,321	13.54
300	400	-	-	100	125	250	350	2	2	CWM300L322X	1,514	13.54
400	450	-	-	125	150	300	300	2	2	CWME400L322X	2,082	call
630	660	-	-	150	200	400	400	2	2	CWME630L322X	3,158	call
800	900	-	-	200	300	600	600	2	2	CWME800L322X	4,620	call

REPLACE 'X' WITH AC COIL VOLTAGE CODE SELECTION FOR CONTACTORS CWM9, 12, 18, 25, 32, 40, 50, 65, 80, 95, 105									
60 Hz	24V[1)]	48V[1)]	120V	208V[1)]	208-240V	240V[1)]	277V[1)]	480V	600V[1)]
CODE	**G**	**F**	**J**	**L**	**L1**	**S**	**N**	**U**	**Y**
50 Hz	-	42V	110V	-	-	-	230-240V	400-415V	500V

REPLACE 'X' WITH AC/DC COIL VOLTAGE CODE SELECTION FOR CONTACTORS CWM112, 150, 180, 250, 300		
Voltage	110-130Vac/Vdc	208-250Vac/Vdc
CODE	**E10**	**E13**
Mounting on	CWM112-300	CWM112-300

REPLACE 'X' WITH AC/DC COIL VOLTAGE CODE SELECTION FOR CONTACTORS CWM400, 630, 800				
Voltage	100-240Vac/100-220Vdc	100-127Vac/100-110Vdc	200-240Vac/200-220Vdc	440-575Vac
CODE	**E36**	**E35**	**E39**	**D82**
Mounting on	CWME400	CWME630-800	CWME630-800	CWME400-800

Standard Contactors
Acessories

Auxiliary contact blocks for CWM9 to CWME800

- Terminal markings to EN 50 005 and EN 50 012
- Positive driven contacts in accordance with IEC/EN 60947-4-1 resp. IEC/EN60947-5-1

Illustrative picture	for use with	max.number of contacts/ contactor	Auxiliary contacts NO	Auxiliary contacts NC	Terminal markings	List Price	Part number
	CWM9...105	4 / CWM9...25	1	0		$5	CWMBCXMF10
			0	1		5	CWMBCXMF01
			1[1]	0		13	CWMBCXMFA10
		6 / CWM32...40	0	1[2]		13	CWMBCXMFR01
	CWM9...300	8 / CWM50...105	2	0		15	CWMBCXML20
		8 / CWM112...300	1	1		15	CWMBCXML11
			2	0		15	CWMBCXMRL20 [3]
			1	1		15	CWMBCXMRL11 [3]
	CWME400...800	8 / CWME400...800	1	1		44	CWMBCXML11CWME800
						44	CWMBCXMRL11CWME800

Mechanical interlock for contactors

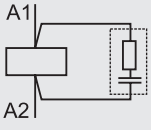
Illustrative picture	For use with	List Price	Part number
	CWM9...CWM105	$ 22	CWMBLIM9105
	CWM112...CWM300	56	CWMBLIM300E
	CWME400	44	CWMBLIM400
	CWME630...800	1308	CWMBLIM800

Notes: 1) Early-make contact
2) Late-break contact
3) For combination of more than 2 side-mounted auxiliary contacts
4) This accessory allows mechanical and electrical interlock.

Standard Contactors
Acessories

Surge Suppressors

- Direct connectable to coil terminals A1 - A2
- Other sizes available on request

Illustrative picture	For use with	Voltage	Circuit diagram	List Price	Part number
	CWM9...40	130 - 250 V 50/60Hz		$22	CWMBAMRC6
	CWM112...250	130 - 250 V 50/60Hz		22	CWMBAMRC9

Individual spare coils

Illustrative picture	Description	For use with	List Price	Part number
	AC coil	CWM9....25. CWMC25	$10	CWMBCA425X
		CWM32...40. CWMC32	16	CWMBCA440X
		CWM50...105. CWMC50...65	22	CWMBCA105X
		CWM112	24	CWMBCA112X
		CWM180	44	CWMBCA180X
		CWM250	60	CWMBCA250X
	Dual-voltage Coils AC/DC (contactors with electronic module)	CWM112...150	28	CWMBCE-150X
		CWM180	44	CWMBCE-180X
		CWM250...300	74	CWMBCE-300X
		CWME400	492	CWMEBCE-400X
		CWME630...800	600	CWMEBCE-800X

REPLACE 'X' WITH AC COIL VOLTAGE CODE SELECTION FOR CONTACTORS CWM9, 12, 18, 25, 32, 40, 50, 65, 80, 95, 105									
60 Hz	24V[1)]	48V[1)]	120V	208V[1)]	208-240V	240V[1)]	277V[1)]	480V	600V[1)]
CODE	**G**	**F**	**J**	**L**	**L1**	**S**	**N**	**U**	**Y**
50 Hz	-	42V	110V	-	-	-	230-240V	400-415V	500V

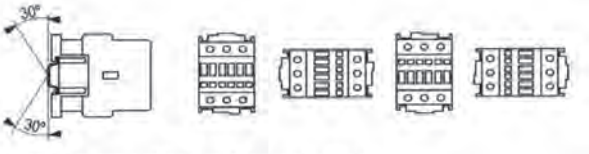
REPLACE 'X' WITH AC/DC COIL VOLTAGE CODE SELECTION FOR CONTACTORS CWM112, 150, 180, 250, 300		
Voltage	110-130Vac/Vdc	208-250Vac/Vdc
CODE	**E10**	**E13**
Mounting on	CWM112-300	CWM112-300

REPLACE 'X' WITH AC/DC COIL VOLTAGE CODE SELECTION FOR CONTACTORS CWM400, 630, 800				
Voltage	100-240Vac/100-220Vdc	100-127Vac/100-110Vdc	200-240Vac/200-220Vdc	440-575Vac
CODE	**E36**	**E35**	**E39**	**D82**
Mounting on	CWME400	CWME630-800	CWME630-800	CWME400-800

Standard Contactors
Technical Data

General Ratings - CWM9 to CWM105

TYPE		CWM9	CWM12	CWM18	CWM25	CWM32	CWM40	CWM50	CWM65	CWM80	CWM95	CWM105
Standards		Devices according to International Standards IEC 60947-1 / 60947-4-1, European Standards EN 60947-1 / 60947-4-1, Underwriters Laboratories - UL 508; CSA C.22.2/14; VDE 0660/102										
Rated Insulation Voltage Ui Acc. IEC; VDE 0660 Acc. UL; CSA	 [V] [V]	 1000 600										
Rated Impulse Voltage Uimp Acc. IEC60947-1	 [kV]	6						8				
Rated Operating Frequency	[Hz]	25…400										
Degree of Protection Main terminals Coil terminals Auxiliary terminals		Protection against direct contact Acc. VDE 0160 - Part. 100 IP20 IP20 IP20						IP10				
Ambient Temperature Storage Operating		 -55 to +80oC (-67 to +176oF) -25 to +55oC (-13 to +131oF)										
Altitude Up to 1,500m Other altitudes		 Nominal values See graphic on page 94										
Pollution Degree		3										
Climatic Withstand		According to IEC 68-2										
Mounting		35mm rail Acc. DIN EN 50 022										
Vibration Resistance (5 to 200 Hz) Contactor open Contactor closed at Uc	 [g] [g]	 3 6	 3 6	 3 6	 7.5 8	 8 12	 8 12	 4.5 9	 4.5 9	 4.5 9	 5 7	 5 7
Mechanical Endurance AC Coil	 Million ops.	 10										
Electrical Endurance AC-3	Million ops.	1.8	1.6	1.2	1.3	1.2	1.2	1.1	1.3	1.1	1.1	1
Shock Resistance (1/2 sin wave = 11ms) Contactor open Contactor closed at Uc	 [g] [g]	 8 12	 8 12	 8 12	 8 12	 7 12	 7 12	 6 10	 6 10	 6 10	 6 10	 6 10
Weight AC Coil	 [kg] [lb]	 0.30 0.65	 0.30 0.65	 0.30 0.65	 0.30 0.65	 0.52 1.15	 0.54 1.19	 1.11 2.44	 1.12 2.47	 1.13 2.49	 1.45 3.20	 1.47 3.24
Terminal Capacity		Cross / Slotted Combination						Allen Head				
												
Fine - Stranded with sleeve	Top [mm2]	2x0.5-2.5	2x0.5-2.5	2x0.5-2.5	2x1-2.5	0.75-16	0.75-16	1-35	1-35	1-35	1.5-50	1.5-50
	Bottom [mm2]	or 2x2.5-6	or 2x2.5-6	or 2x2.5-6	or 2x2.5-10	1.0-16	1.0-16	2.5-35	2.5-35	2.5-35	4-35	4-35
Coarse - Stranded / Solid	Top [mm2]	2x1-2.5	2x1-2.5	2x1-2.5	2x1-2.5	1-16	1-16	1.5-35	1.5-35	1.5-35	2.5-50	2.5-50
	Bottom [mm2]	or 2x2.5-6	or 2x2.5-6	or 2x2.5-6	or 2x2.5-10	1.5-16	1.5-16	6-35	6-35	6-35	6-35	6-35
Stranded / Solid (UL / CSA)	Top [AWG]	2x20-12	2x20-12	2x20-12	2x18-12	18-6	18-6	16-2	16-2	16-2	16-1	16-1
	Bottom [AWG]	or 2x12-10	or 2x12-10	or 2x12-10	or 2x12-8	16-6	16-6	14-2	14-2	14-2	10-2	10-2
Drive Size		Philips #2						5/32" (4mm.)				
Tightening Torque	lb-in (Nm)	8.9...15 (1...1.7)	8.9...15 (1...1.7)	8.9...15 (1...1.7)	14.2...26.6 (1.6...3)	22.1...35.4 (2.5...4)	22.1...35.4 (2.5...4)	35.4...53.1 (4...6)	35.4...53.1 (4...6)	35.4...53.1 (4...6)	44.3...57.5 (5...6.5)	44.3...57.5 (5...6.5)
Operating Position		see below										



With the same pick-up and drop-out voltage
With the same rated power

Standard Contactors
Technical Data

Power Contacts - CWM9 to CWM105

TYPE				CWM9	CWM12	CWM18	CWM25	CWM32	CWM40	CWM50	CWM65	CWM80	CWM95	CWM105
Standard UL/CSA Ratings														
Rated Operating Voltage			[V]						600					
General Purpose Rating			[A]	25	25	32	32	60	60	90	110	110	140	140
Switching Motor Loads Full Voltage - 60Hz														
	1-phase	115V	[A]	9.8	13.8	16	24	34	34	56	56	80	80	100
		230V	[A]	10	12	17	28	28	28	40	50	68	68	88
		115V	[HP]	1/2	3/4	1	2	3	3	5	5	7-1/2	7-1/2	10
		230V	[HP]	1-1/2	2	3	5	5	5	7-1/2	10	15	15	20
	3-phase	200V	[A]	11	11	17.5	25	32.2	32.2	48.3	62.1	62.1	78.2	92
		230V	[A]	9.6	9.6	15.2	22	28	42	42	54	68	80	104
		460V	[A]	7.6	11	14	21	27	40	52	65	65	77	96
		575V	[A]	9	11	17	17	27	27	41	52	62	77	77
		200V	[HP]	3	3	5	7-1/2	10	10	15	20	20	25	30
		230V	[HP]	3	3	5	7-1/2	10	15	15	20	25	30	40
		460V	[HP]	5	7-1/2	10	15	20	30	40	50	50	60	75
		575V	[HP]	7-1/2	10	15	15	25	25	40	50	60	75	75
Standard IEC Ratings														
Rated Operating Voltage			[V]				690					1000		
Rated Thermal Current Ith			[A]	25	25	32	45	60	60	90	110	110	140	140
Switching Motor Loads AC-2; AC-3; AC-4 - 50Hz														
	3-phase	220-240V	[A]	9	12	18	25	32	40	50	65	80	95	105
		380-400V	[A]	9	12	18	25	32	40	50	65	80	95	105
		415-440V	[A]	9	12	18	25	32	40	50	65	80	95	105
		500V	[A]	7.5	10.5	14	19	24	32	38	55	63	79	85
		660-690V	[A]	7	9	13	15	22	25	34	44	48	60	80
		220-240V	[kW]	2.2	3	4	7.5	9	11	15	18.5	22	25	30
		380-400V	[kW]	4	5.5	7.5	11	15	18.5	22	30	37	45	55
		415-440V	[kW]	4	5.5	7.5	11	15	22	25	37	45	50	55
		500V	[kW]	5.5	7.5	10	15	18.5	25	30	40	45	55	65
		660-690V	[kW]	5.5	7.5	10	15	18.5	30	35	45	45	55	65
Maximum Switching Rate														
		AC-1	[ops/hr]	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
		AC-3	[ops/hr]	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	600	600
		no load	[ops/hr]	9,000	9,000	9,000	9,000	9,000	9,000	5,000	5,000	5,000	5,000	5,000
AC-4														
200,000 operations;		<= 690V	[A]	5	7	8	12	16	18.5	23	30	37	44	50
50/60Hz		220-230V	[kW]	1.1	1.5	1.5	3	4	4.5	5.5	7.5	9.2	11	12.5
			[HP]	1.5	2	2	4	5.4	6	7.5	10	12.5	15	17
		380-400V	[kW]	2.2	3	3.7	5.5	7.5	9.2	11	15	18.5	22	22
			[HP]	3	4	5	7.5	10	12.5	15	20	25	30	30
		415-440V	[kW]	2.2	3.7	4.5	5.5	9.2	11	11	15	22	22	30
			[HP]	3	5	6	7.5	12.5	15	15	20	30	30	40
		500V	[kW]	3	4	5.5	7.5	10	11	15	18.5	22	25	30
			[HP]	4	5.4	7.5	10	13	15	20	25	30	33	40
		660-690V	[kW]	3	4.5	5.5	7.5	11	12.5	15	20	25	30	33
			[HP]	4	6	7.5	10	15	17	20	27	33	40	45
Maximum Switching Rate			[ops/hr]	360	360	360	360	360	200	200	200	200	200	200
Making Capacity			[A]	450	450	450	450	550	1000	1000	1000	1000	1280	1280

Standard Contactors
Technical Data

Power Contacts - CWM9 to CWM105 cont.

TYPE			CWM9	CWM12	CWM18	CWM25	CWM32	CWM40	CWM50	CWM65	CWM80	CWM95	CWM105
Breaking Capacity	Ue=400V Ue<=400V	[A]	250	250	250	450	450	920	920	920	920	1050	1050
	Ue=500V	[A]	250	250	250	320	450	920	920	920	920	1050	1050
	Ue=690V	[A]	130	130	130	170	205	780	780	780	780	950	950
Impedance per Pole		[mW]	2.41	2.41	2.35	1.65	1.28	0.95	0.85	0.86	0.86	0.76	0.76
Power Dissipation per Pole													
	AC-1	[W]	1.47	1.47	2.46	3.34	4.6	3.42	6.86	10.4	10.4	14.89	14.89
	AC-3	[W]	0.19	0.34	0.78	1.03	1.31	1.52	2.12	3.63	5.5	6.86	8.37
Short Time Current Icw													
	1 sec.	[A]	455	455	570	630	1010	1265	1580	2530	2530	3300	3300
	5 sec.	[A]	205	205	254	280	450	450	710	1130	1130	1485	1485
	10 sec.	[A]	144	144	180	200	320	400	500	800	800	1050	1050
	30 sec.	[A]	85	85	104	115	185	230	290	460	460	600	600
	1 min.	[A]	60	60	74	80	130	165	205	325	325	430	430
	3 min.	[A]	35	35	46	50	90	100	120	185	185	250	250
	Rec. time	[min.]	10	10	10	10	10	10	10	10	10	10	10
Short Circuit Coordination													
Coordination Type "1"	gL/gG	[A]	50	50	63	63	100	125	200	200	200	250	250
Coordination Type "2"	gL/gG	[A]	25	35	35	50	63	80	100	125	125	160	200

Built-in Auxiliary Contacts

TYPE			CWM9	CWM12	CWM18
Rated Insulation Voltage Ui					
Acc. IEC; VDE 0660		[V]		1000	
Acc. UL; CSA		[V]		600	
Rated Operating Voltage Ue					
Acc. IEC; VDE 0660		[V]		690	
Acc. UL; CSA		[V]		600	
Rated Thermal Current Ith <=55oC		[A]		20	
Rated Operating Current Ie					
Acc. IEC 60947-5-1 / AC-15	110-127V	[A]		10	
	220-240V	[A]		10	
	380-400V	[A]		6	
	415-450V	[A]		5	
	500V	[A]		4	
	660-690V	[A]		2	
Acc. UL; CSA				A600	
Rated Operating Current Ie					
Acc. IEC 60947-5-1 / DC-13	24V	[A]		6	
	48V	[A]		4	
	110V	[A]		2	
	220V	[A]		0.7	
	440V	[A]		0.7	
Acc. UL; CSA				P600	
Making Capacity Im					
AC-15 / AC-11	Ue <= 690V 50/60Hz	[A]		250	
DC-13 / DC-11	Ue <= 440Vdc	[A]		250	
Breaking Capacity Ic					
AC-15 / AC-11	Ue <= 400V 50/60Hz	[A]		250	
DC-13 / DC-11	Ue <=220Vdc	[A]		2	
Short Circuit Protection with Fuses					
Acc. IEC 60947-5-1 - gL/gG		[A]		10	
Minimum Switching Capacity		[V/mA]		17/5	
Electrical Endurance		Million ops.		1	
Mechanical Endurance		Million ops.		10	
Guaranteed Non-Overlap Time		[ms]		1.5	
Insulation Resistance		[MOhm]		>10	

Standard Contactors
Technical Data

Control Circuit Ratings - AC Coil - CWM9 to CWM105

TYPE		CWM9	CWM12	CWM18	CWM25	CWM32	CWM40	CWM50	CWM65	CWM80	CWM95	CWM105
Rated Insulation Voltage Ui												
Acc. IEC; VDE 0660	[V]						1000					
Acc. UL; CSA	[V]						600					
Rated Operating Voltage Ue												
Acc. IEC; VDE 0660	[V]						690					
Acc. UL; CSA	[V]						600					
Standard Voltages 60Hz	[V]						24...600					
Coil Operating limits												
Monofrequency coils xUc							0.85…1.1					
Pick-up xUc	[V]		0.4...0.76			0.5...0.76				0.5...0.76		
Drop-out xUc	[V]		0.25...0.65			0.3...0.65				0.25...0.6		
Reinforced coils xUc												
Pick-up xUc	[V]									0.4...0.7		
Drop-out xUc	[V]									0.3...0.6		
Operating Time												
Coil energization - N.O.	[ms]		8...20			10...19				15...30		
Coil de-energization - N.O.	[ms]		6...13			5...25				9...15		
Coil Consumption												
Monofrequency coils												
Sealed	[VA]		5.5...9.3			9.5...12.5			16.8...25		16.8...25	
Inrush	[VA]		70			115			295		295	
Thermal Power Dissipation												
60Hz	[W]		2.6			4.3				8.0		
Power Factor												
Closed	Cos phi		0.28			0.34				0.32		
Opened	Cos phi		0.85			0.69				0.54		

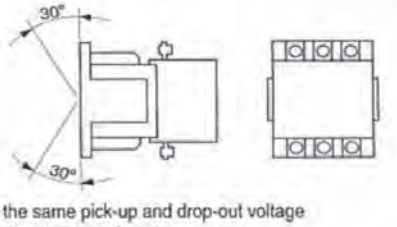
Control Circuit Ratings - DC Coil - CWM9 to CWM105

TYPE		CWM9	CWM12	CWM18	CWM25	CWM32	CWM40	CWM50	CWM65	CWM80	CWM95	CWM105
Rated Insulation Voltage Ui												
Acc. IEC; VDE 0660	[V]						1000					
Acc. UL; CSA	[V]						600					
Standard Voltages	[V]		12...440			24...240				24...240		
Coil Operating limits							0.85...1.1					
Pick-up xUc	[V]		0.4...0.7			0.45...0.75				0.7...0.8		
Drop-out xUc	[V]		0.15...0.4			0.15...0.45				0.4...0.6		
Operating Time												
Coil energization - N.O.	[ms]		35...45			40...55				50...60		
Coil de-energization - N.O.	[ms]		7...12			30...65				55...60		
Coil Consumption												
Closed	[W]		3.8...7.5			6				6.5		
Magnetic circuit opened	[W]		3.8...7.5			240				340		

Standard Contactors
Technical Data

General Ratings - CWM112 to CWME800

TYPE		CWM112	CWM150	CWM180	CWM250	CWM300	CWME400	CWME630	CWME800
Standards		Devices according to International Standards IEC 60947-1 / 60947-4-1, European Standards EN 60947-1 / 60947-4-1, Underwriters Laboratories - UL 508; CSA C.22.2/14; VDE 0660/102							
Rated Insulation Voltage Ui Acc. IEC; VDE 0660 Acc. UL; CSA	 [V] [V]	 1000 600							
Rated Impulse Voltage Uimp Acc. IEC60947-1 Rated Operating Frequency	 [kV] [Hz]	 8 25…400							
Degree of protection Main terminals Coil terminals Auxiliary terminals		Protection against direct contact acc. VDE 0160 - Part. 100 IP00 IP20 IP20							
Ambient Temperature Storage Operating		 -55 to +80oC (-67 to +176oF) -25 to +55oC (-13 to +131oF)							
Altitude Up to 1,500m Other altitudes		Nominal values							
		See graphic on page __					up to 2000m		
Pollution Degree		3							
Climatic withstand		According to IEC 68-2							
Mounting		Screw to panel							
Vibration Resistance (5 to 200 Hz) Contactor open Contactor closed at Uc	 [g] [g]	 4 4							
Mechanical Endurance AC Coil	 Million ops.	 10					 5		
Electrical Endurance AC-3	Million ops.	1.1	1.1	1.0	1.0	1.0	0.5		
Shock Resistance (1/2 sin wave = 11ms) Contactor open Contactor closed at Uc	 [g] [g]	 3 3							
Weight AC/DC Coil - CWM_E Series only	 [kg] [lb]	 2.54 5.60	 2.54 5.60	 4.04 8.91	 6.14 13.54	 6.14 13.54	 - -	 - -	 - -
Terminal Capacity									
									
Fine - Stranded with sleeve	[mm2]	2 x (25-70)	2 x (25-70)	2 x (50-120)	2 x (50-150)	2 x (50-150)	1 x 150	1 x 240	1 x 240
AWG wires with end sleeve		1 x 300 or 2 x 107	1 x 300 or 2 x 107	1 x 300 or 2 x 107	1 x 500 or 2 x 300	1 x 500 or 2 x 300	Nº2 30×5	Nº2 50×5	Nº2 60×5
Busbars	[mm]	2 x (15 x 3)	2 x (15 x 3)	2 x (20 x 3)	2 x (30 x 5)	2 x (30 x 5)	-	-	-
Tightening Torque	lb-in (Nm)	47.8-53.1 (5.4-6)	47.8-53.1 (5.4-6)	123.9-141.6 (14-16)	203.6-230.1 (23-26)	203.6-230.1 (23-26)	203.6 (23)	504.5 (57)	504.5 (57)
Operating Position		see below							



With the same pick-up and drop-out voltage
With the same rated power

Standard Contactors
Technical Data

Power Contact - CWM112 to CWME800

TYPE			CWM112	CWM150	CWM180	CWM250	CWM300	CWME400	CWME630	CWME800
UL/CSA Applications										
Rated Operating Voltage		[V]	600							
General Purpose Rating		[A]	170	170	200	300	400	450	660	900
Switching Motor Loads Full Voltage - 60Hz										
1-phase	115V	[A]	-	-	-	-	-	-	-	-
	230V	[A]	-	-	-	-	-	-	-	-
	115V	[HP]	-	-	-	-	-	-	-	-
	230V	[HP]	-	-	-	-	-	-	-	-
3-phase	200V	[A]	120	150	177	221	285	359	414	552
	230V	[A]	130	154	192	248	312	360	480	772
	460V	[A]	124	156	180	240	302	361	477	-
	575V	[A]	99	144	192	242	336	289	382	-
	200V	[HP]	40	50	60	75	100	125	150	200
	230V	[HP]	50	60	75	100	125	150	200	300
	460V	[HP]	100	125	150	200	250	300	400	600
	575V	[HP]	100	150	200	250	350	300	400	600
Standard IEC Ratings										
Rated Operating Voltage		[V]	1000							
Rated Thermal Current Ith		[A]	180	225	225	350	350	450	660	900
Switching Motor Loads AC-3 - 60Hz										
3-phase	220-240V	[A]	112	150	180	250	300	400	630	800
	380-400V	[A]	112	150	180	250	300	400	630	800
	415-440V	[A]	112	150	180	250	300	400	630	800
	500V	[A]	95	130	155	220	265	350	500	720
	660-690V	[A]	82	110	135	185	220	300	420	630
	220-240V	[kW]	30	45	55	75	90	110	185	220
	380-400V	[kW]	55	75	90	132	160	220	330	450
	415-440V	[kW]	55	90	110	150	185	220	370	500
	500V	[kW]	55	90	110	160	200	220	330	500
	660-690V	[kW]	75	110	110	160	200	260	400	560
Maximum Switching Rate										
	AC-1	[ops/hr]	600	600	600	600	600	500	500	500
	AC-3	[ops/hr]	600	600	600	600	600	500	500	500
	no load	[ops/hr]	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Standard Contactors
Technical Data

Power Contact cont. - CWM112 to CWME800

TYPE			CWM112	CWM150	CWM180	CWM250	CWM300	CWME400	CWME630	CWME800
AC-4										
200,000 operations;	<= 690V	[A]	50	55	58	100	130	-	-	-
50/60Hz	220-230V	[kW]	18.5	20	22	37	45	90	110	185
		[HP]	25	27	30	50	60	125	150	250
	380-400V	[kW]	30	33	37	55	75	150	220	330
		[HP]	40	44	50	75	100	200	300	450
	415-440V	[kW]	37	40	45	63	80	185	220	370
		[HP]	50	54	60	84	107	250	300	500
	500V	[kW]	40	45	50	75	90	-	-	-
		[HP]	54	60	67	100	121	-	-	-
	660-690V	[kW]	45	50	55	90	100	-	-	-
		[HP]	600	67	75	121	133	-	-	-
Maximum Switching Rate		[ops/hr]	150	150	150	150	150	-	-	-
Making Capacity		[A]	1430	1820	2100	2600	3000			
Breaking Capacity										
	Ue<=400V	[A]	1290	1350	1400	2000	-	4000	6300	8000
	Ue=500V	[A]	1290	1350	1400	2000	-	4000	6300	8000
Impedance per pole		[mW]	0.5	0.5	0.45	0.3	0.3	-	-	-
Power Dissipation per Pole										
	AC-1	[W]	16	25	21.6	35	45.7	-	-	-
	AC-3	[W]	6.2	11.1	13.8	17.9	25.7	-	-	-
Short Time Current Icw										
	1 sec.	[A]	3165	3763	4649	4427	-	-	-	-
	5 sec.	[A]	1820	2164	2673	2546	-	-	-	-
	10 sec.	[A]	1430	1700	2100	2000	-	-	-	-
	30 sec.	[A]	826	980	1212	1155	-	-	-	-
	1 min.	[A]	584	694	857	816	-	-	-	-
	3 min.	[A]	337	401	495	471	-	-	-	-
	Recovery time	[min.]	10	10	10	10	10	-	-	-
Short Circuit Coordination										
Coordination type "1"	gL/gG	[A]	315	355	355	500	630	630	800	1000
Coordination type "2"	gL/gG	[A]	224	250	250	400	500	-	-	-

Standard Contactors
Technical Data

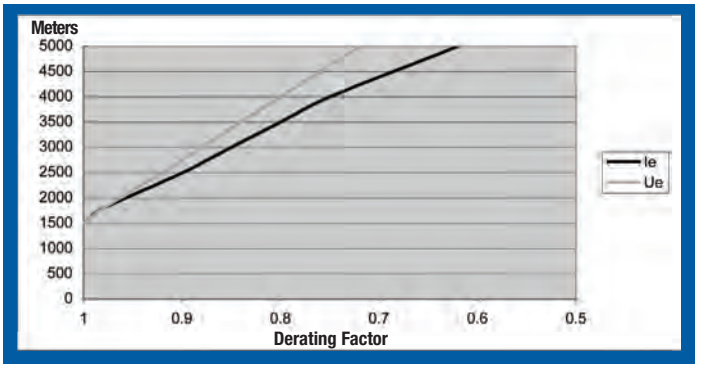
Electronic Module Control Circuit - CWM112 to CWME800

TYPE		CWM112	CWM150	CWM180	CWM250	CWM300	CWME400	CWME630	CWME800
Rated Insulation Voltage Ui									
Acc. IEC; VDE 0660	[V]	1000							
Acc. UL; CSA	[V]	600							
Rated Operating Voltage Ue									
Acc. IEC; VDE 0660	[V]	690							
Acc. UL; CSA	[V]	600							
Standard Voltages 50Hz; 60Hz; DC	[V]	24…600							
Coil Operating limits									
xUc	[V]	0.65…1.1							
Pick-up xUc	[V]	0.70...0.85							
Drop-out xUc	[V]	0.40...0.60							
Operating Time									
Coil energization - N.O.	[ms]	60…70	60…70	60…70	60…70	60…70	64…68	66…70	66…70
Coil de-energization - N.O.	[ms]	13…17	13…17	13…17	13…17	13…17	43…47	45…49	45…49
Coil Consumption									
Closed AC	[VA]	14.8	14.8	14.1	14.1	14.1	14	17	29
Opened AC	[VA]	213	213	214	229	229	571	1000	1000
Closed DC	[VA]	2.4	2.4	2.4	2.5	2.5	14	17	17
Opened DC	[VA]	166	166	154	171	171	571	1000	1000
Thermal Power Dissipation									
AC	[W]	3.9	3.9	3.8	3.7	3.7	4.7	4.9	5.3
DC	[W]	2.4	2.4	2.4	2.5	2.5	5.0	6.3	7.8

Standard Contactors
Technical Data

Auxiliary Contact Block Ratings

TYPE			BCXMF	BCXML	BCXMRL	BLIM.02
Rated Insulation Voltage Ui						
Acc. IEC; VDE 0660		[V]		1000		
Acc. UL; CSA		[V]		600		
Rated Operating Voltage Ue						
Acc. IEC; VDE 0660		[V]		690		
Acc. UL; CSA		[V]		600		
Rated Thermal Current Ith <=55oC		[A]		10		
Rated Operating Current Ie						
Acc. IEC 60947-5-1 / AC-15	110-127V	[A]		6		
	220-240V	[A]		6		
	380-400V	[A]		4		
	415-450V	[A]		3.5		
	500V	[A]		2.5		
	660-690V	[A]		1.5		
Acc. UL; CSA				A600		
Rated Operating Current Ie						
Acc. IEC 60947-5-1 / DC-13	24V	[A]		4		
	48V	[A]		2		
	110V	[A]		0.7		
	220V	[A]		0.3		
	440V	[A]		0.15		
Acc. UL; CSA				Q600		
Making Capacity Im						
AC-15 / AC-11	Ue <= 400V 50/60Hz	[A]		90		
DC-13 / DC-11	Ue <= 220Vdc	[A]		90		
Breaking Capacity Ic						
AC-15 / AC-11	Ue <= 400V 50/60Hz	[A]		60		
DC-13 / DC-11	Ue <= 220Vdc	[A]		0.95		
Short Circuit Protection with Fuses						
Acc. IEC 60947-5-1 - gL/gG		[A]		10		
Minimum Switching Capacity		[V/mA]		17/5		
Electrical Endurance		Million ops.		1		
Mechanical Endurance		Million ops.		10		
Guaranteed Non-Overlap Time		[ms]		1.5		
Insulation Resistance		[MOhm]		>10		



NOTE:
Altitude compensation in CWM Series contactors, considers a factor according to which the rated power must be reduced.

The derating of the permissible operating power for installation altitudes above 1,500 m (5,000 ft) is calculated according to:

Total derating = Derating $_{current}$ x Derating $_{voltage}$

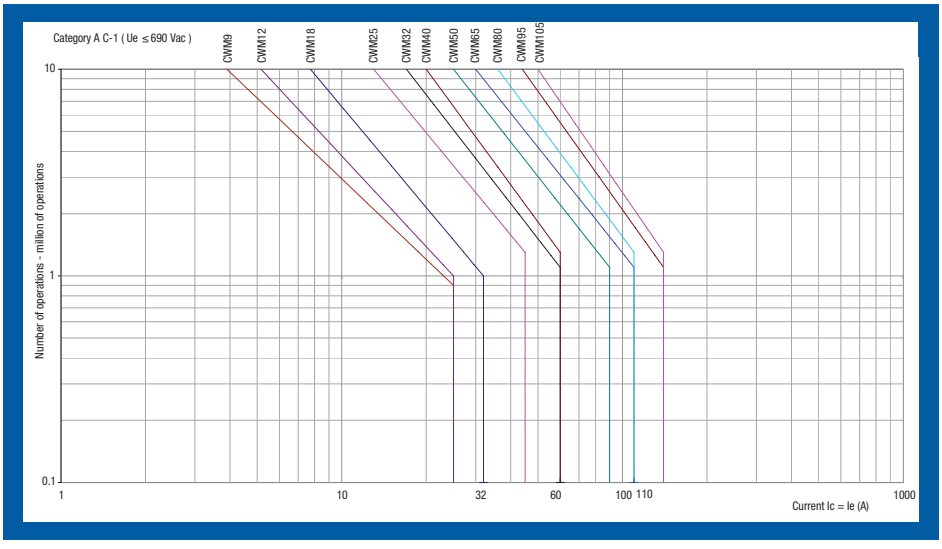
Example: Altitude: 3,000 m (10,000 ft):

Derating current K1 = 0.85
Derating voltage K2 = 0.88

Total derating = 0.85 x 0.88 = 0.75 x HP

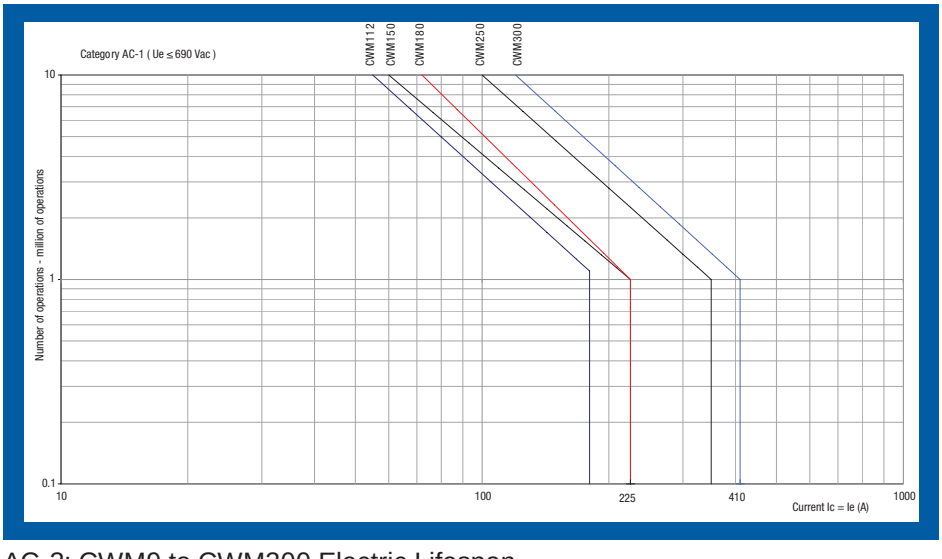
Standard Contactors
Technical Data

AC-1: CWM9 to CWM105 Electric Lifespan



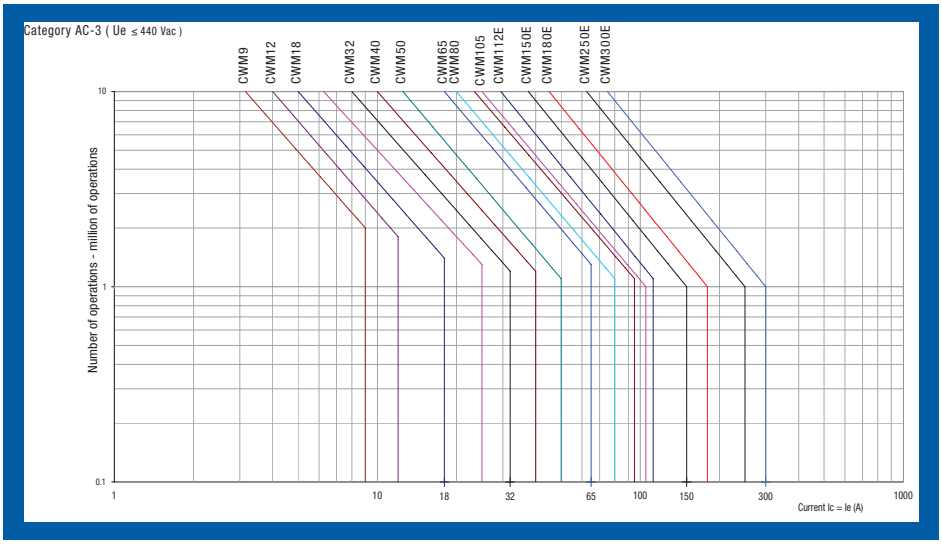
Control of resistive circuits (power factor >= 0.95) The current broken (Ic) in category AC-1 is equal to the current (Ie) drawn by the load.

AC-1: CWM112 to CWM300 Electric Lifespan



Control of resistive circuits (power factor >= 0.95) The current broken (Ic) in category AC-1 is equal to the current (Ie) drawn by the load.

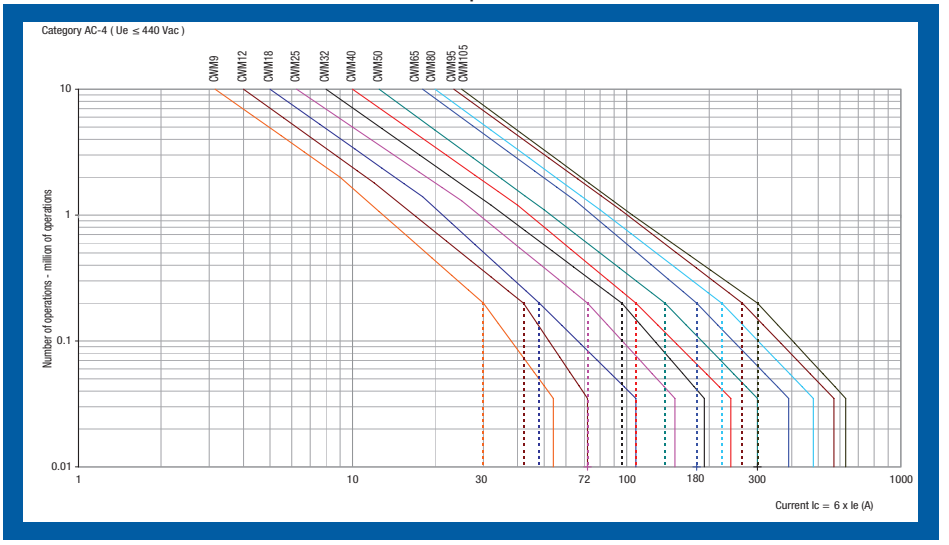
AC-3: CWM9 to CWM300 Electric Lifespan



Control of 3-phase asynchronous squirrel cage motors with breaking while running. The current broken (Ic) in category AC-3 is equal to the operational current of the motor (Ie).

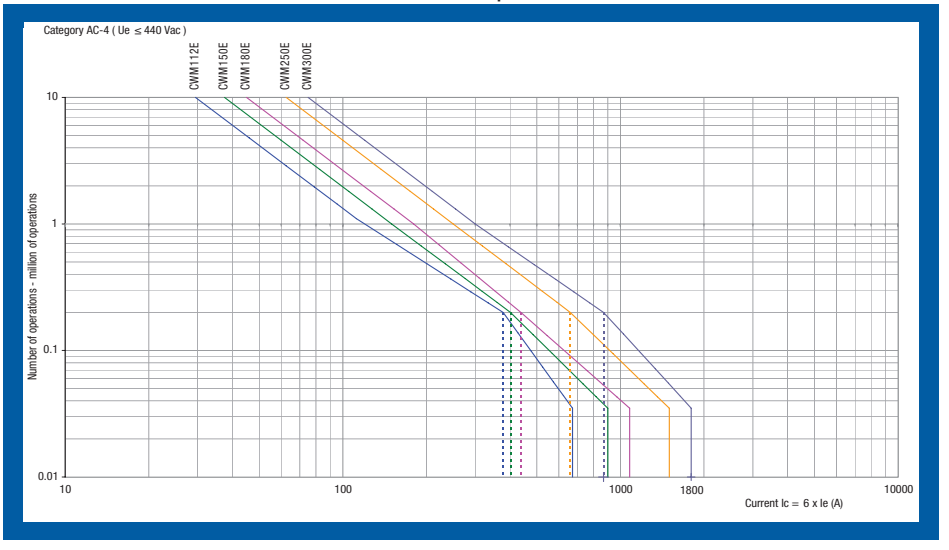
Standard Contactors
Technical Data

AC-4: CWM9 to CWM105 Electric Lifespan



Control of 3-phase asynchronous squirrel cage motors with breaking while motor stalled.
The current broken (Ic) in category AC-4 is equal to 6 times the operational current of the motor (Ie).

AC-4: CWM112 to CWM300 Electric Lifespan



Control of 3-phase asynchronous squirrel cage motors with breaking while motor stalled.
The current broken (Ic) in category AC-4 is equal to 6 times the operational current of the motor (Ie).

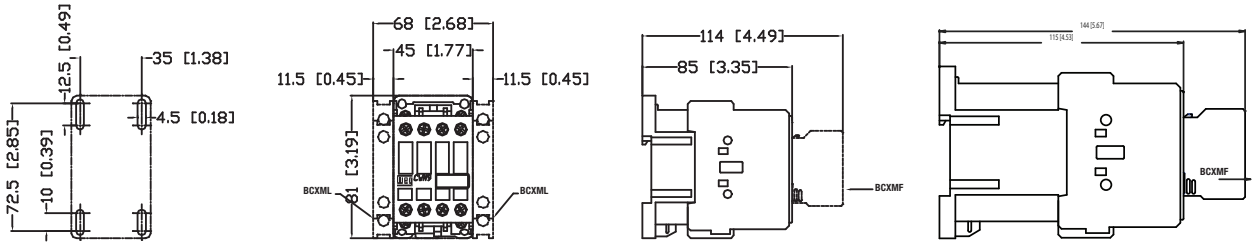
In many applications there is a mixture of AC-3 and AC-4 duty. For these applications the electric lifespan of a particular contactor can be estimated using the formula:

$$E = \frac{AC3}{1-\left(\frac{P}{100}\right)+\left(\frac{P}{100}\times\frac{AC3}{AC4}\right)}$$

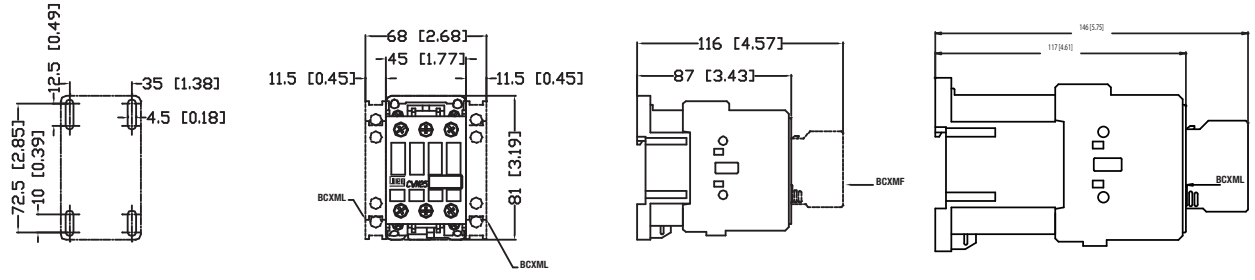
Where:
E = Estimated electric lifespan for mixed duty application.
AC-3 = Number of electrical operations taken from the AC-3 Duty life curve.
AC-4 = Number of electrical operations taken from the AC-4 Duty life curve.
P = Proportion of AC-4 operations to total operations for the application, expressed as a percentage.

Standard Contactors
Mechanical Data

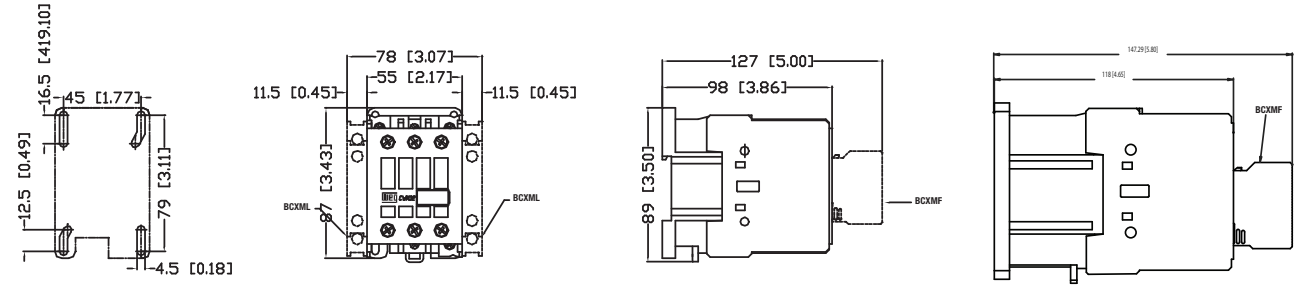
CWM9, CWM12 and CWM18



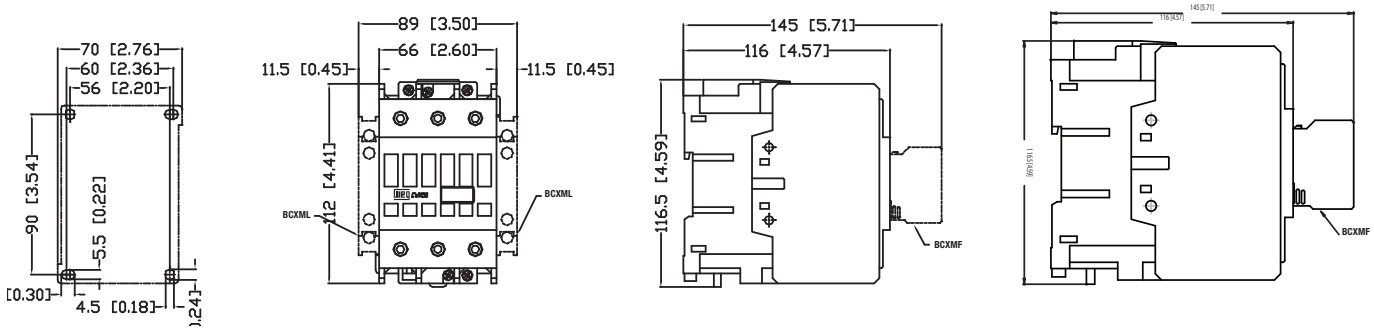
CWM25



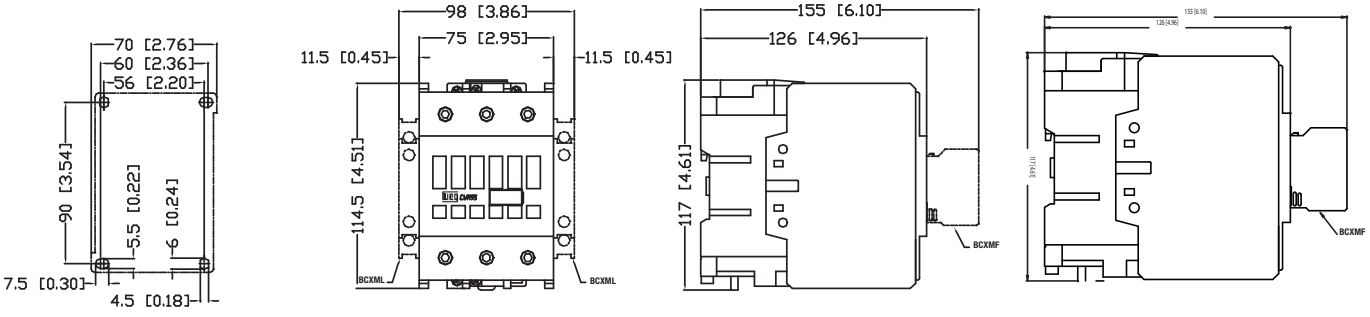
CWM32 and CWM40



CWM50, CWM65 and CWM80

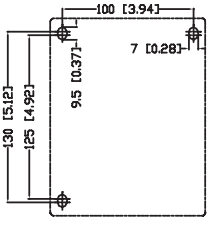


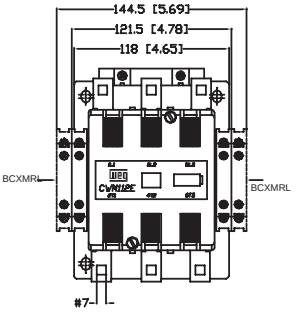
CWM95 and CWM105

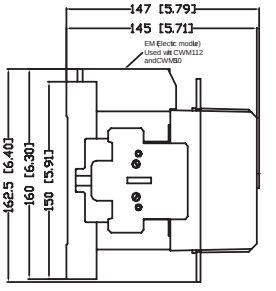


Standard Contactors
Mechanical Data

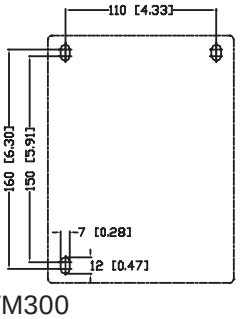
CWM112 and CWM150

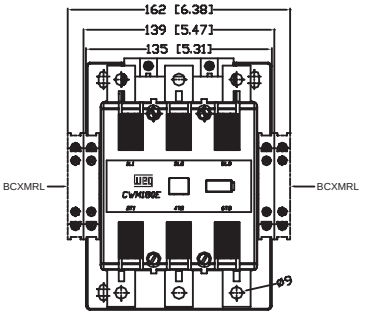


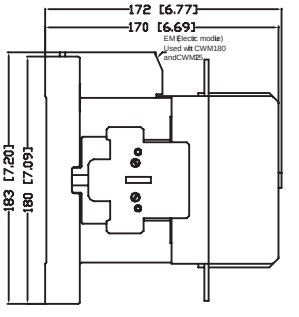




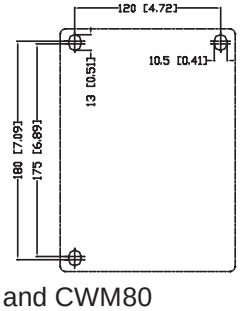
CWM180

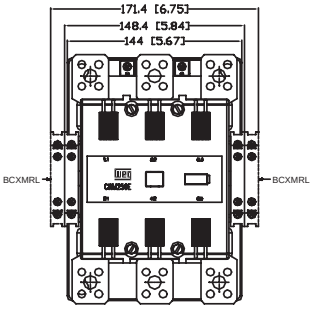


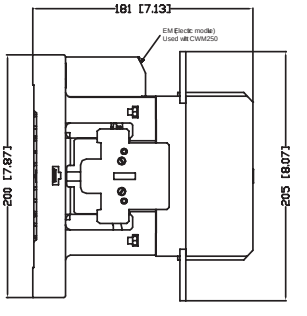




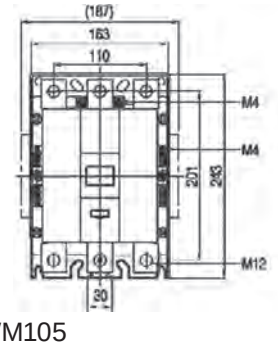
CWM250 and CWM300

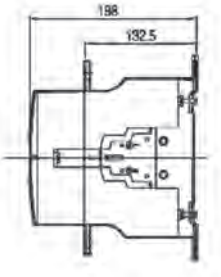


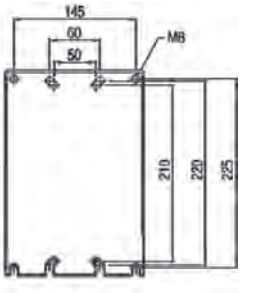




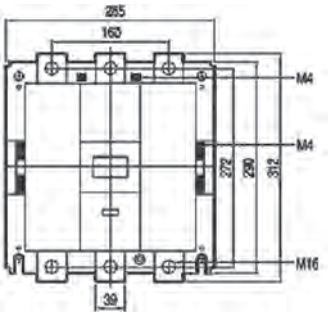
CWM50, CWM65 and CWM80

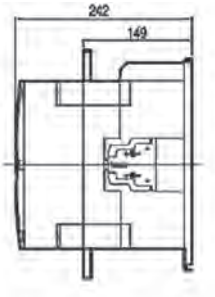


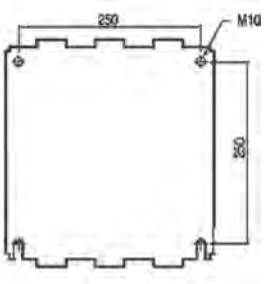




CWM95 and CWM105







Thermal Overload Relays
Purchasing Data

Product Information

RW overload relays are important equipment within the WEG Controls range of products. As usual for WEG products, an extended operational service life is one of the main features you can find in RW overload relays. WEG's RW Class 10 Thermal Overload Relays are designed to be used with, and as perfect compliment to WEG's minicontactors and contactors. Effectively, RW overload relays can be mounted directly to WEG minicontactors and contactors, assuring electrical and mechanical operation as an open across-the-line starter. Accessories are also available for separate mounting.

RW overload relays are fitted with fixed bimetallic parts, which eliminate any need for heater elements for field installation or future upgrading to a more efficient motor. All sizes provide complete motor protection by offering:

- Ambient temperature compensation
- Phase failure sensitivity protection.

Product Features

Dial FLC Setting

The trip-current is set via an infinitely adjustable dial designed with the motor's full load current.

Temperature Compensation

Because RW overload relays include a fourth bimetallic strip in addition to the three that are directly heated by the motor current, ambient temperature variations in the range of -20ºC to +60ºC are no obstacle for accurate protection of your motors under even the toughest conditions.

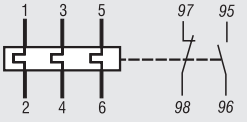
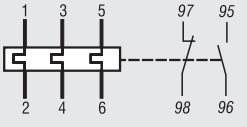
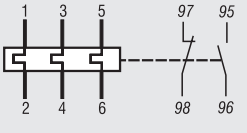
Phase Failure Sensitivity

WEG overload relays include phase failure sensitivity protection as standard. This feature ensures fast tripping in case of phase loss, protecting your motor and avoiding expensive repairs / corrective maintenance services.

Multi Function Button

The programmable RESET button can be selected to operate in a Manual or Automatic mode, with or without TEST capabilities of the isolated "trip" NC and "alarm" NO auxiliary contacts. The multifunction RESET / TEST button can be set in four different positions; H (manual RESET only), HAND (manual RESET/TEST), AUTO (automatic RESET/ TEST) and A (automatic RESET only). In HAND and AUTO positions, when RESET button is pushed, both NO (97-98) and NC (95-96) contacts change states.

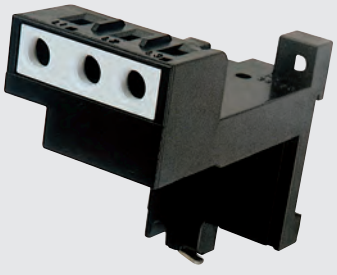
Thermal Overload Relays
Purchasing Data

For use with	Setting range of overload release Ir (A)	Circuit diagram	Fuse gL–gG [1] A	Part Number	List Price	Weight (lbs)
CWC07...16	1.8...2.8		6	CWMRW171D2.8	$40	0.33
	2.8...4.0		10	CWMRW171D4.0	40	
	4.0...6.3		16	CWMRW171D6.3	40	
CWM9...CWM32	0.28...0.4		2	CWMRW27D0.4	39	0.32
	0.4...0.63		2	CWMRW27D0.63	39	
	0.56...0.8		2	CWMRW27D0.8	39	
	0.8...1.2		4	CWMRW27D1.2	39	
	1.2...1.8		6	CWMRW27D1.8	39	
	1.8...2.8		6	CWMRW27D2.8	39	
	2.8...4.0		10	CWMRW27D4.0	39	
	4.0...6.3		16	CWMRW27D6.3	39	
	5.6...8.0		20	CWMRW27D8.0	44	
	7.0...10		25	CWMRW27D10	44	
	8.0...12.5		25	CWMRW27D12.5	44	
	10...15		35	CWMRW27D15	44	
	11...17		35	CWMRW27D17	44	
	15...23		50	CWMRW27D23	44	
	22...32		63	CWMRW27D32	44	
CWM32...CWM40	25...40		80	CWMRW671D40	76	0.66
	32...50		100	CWMRW672D50	82	
CWM50...CWM80	40...57		100	CWMRW672D57	82	0.68
	50...63		100	CWMRW672D63	109	
	57...70		125	CWMRW672D70	109	
	63...80		125	CWMRW672D80	109	
CWM95...CWM105	75...97		200	CWMRW1171D97	125	1.15
	90...112		250	CWMRW1171D112	125	
CWM112	75...97		200	CWMRW1172D97	151	1.21
	90...112		250	CWMRW1172D112	151	
CWM150...CWM250	100...150		315	CWMRW3171D150	211	5.07
	140...215		355	CWMRW3171D215	211	
	200...310		500	CWMRW3171D310	272	

Note: 1) Type 2 Coordination

Thermal Overload Relays
Accessories

Mounting kit

Illustrative picture	Description	For use with	Part Number	List Price
	Enables overload to be mounted directly to a panel via screws or DIN rail	RW27-1D	CWMBF27D	$13.00
		RW67-1D RW67-2D	CWMBF67D	22.00
		RW117-1D	CWMBF117D	28.00

Thermal Overload Relays
Technical Data

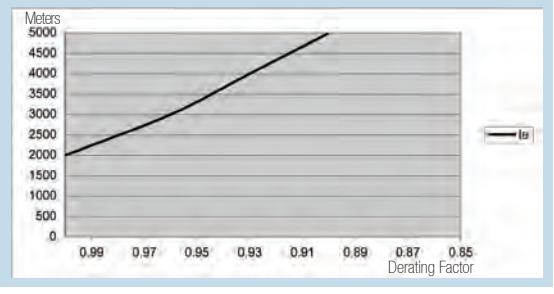
TYPE			RW17D	RW27D	RW67D	RW117D	RW317D	RW407D
Standards			Devices according to International Standards IEC 60947-1 / 60947-4-1, European Standards EN 60947-1 / 60947-4-1, Underwriters Laboratories - UL 508; CSA C.22.2/14; VDE 0660/102					
Number of Poles			3					
Tripping Class			10					
Phase Failure Sensitivity			Yes					
Temperature Compensation			Yes					
Rated Insulation Voltage Ui								
Acc. IEC 60947-4-1		[V]	690				1000	
Acc. UL; CSA		[V]	600					
Rated Operation Voltage Ue								
Acc. IEC 60947-4-1		[V]	690				1000	
Acc. UL; CSA		[V]	600					
Rated Impulse Voltage Uimp		[kV]	6					
Current								
Direct			YES				NO	
Alternating		[Hz]	up to 400				50/60	
Degree of Protection			Protection against direct contact acc. VDE 0160 - Part 100 - IP20					
Ambient Temperature								
Storage			-50 to +80ºC (-58 to 176ºF)					
Operating			-20 to +70ºC (-4 to 158ºF)					
Ambient temperature compensation			-20 to +60ºC (-4 to 140ºF)					
Pollution Degree			3					
Mounting			Direct on contactor or separately with accessory				Separate	
Power Dissipation per Pole		[W]	up to 3		up to 5.5		-	-
Weight		[kg]	0.15	0.15	0.31	0.52	2.30	3.12
		[lb]	0.33	0.32	0.68	1.15	5.06	6.88
Shock Resistance								
IEC 60 068 part 2-27		[g/ms]	8/10					
Main Terminals Capacity			Cross / Slotted Combination1)			Allen Head	Slide Bar	Slide Bar
Fine - Stranded with Sleeve		[mm2]	1.5 - 10	1.5 - 10	6.0 - 35	6.0 - 35	-	-
Coarse - Stranded / Solid		[mm2]	1.5 - 6.0	1.5 - 6.0	6.0 - 35	25 - 35	-	-
Slide Bars		[mm2]	-	-	-	-	2x(25x5)	2x(60x10)
Stranded / Solid (UL / CSA)		[AWG]	14 - 6	14 - 6	18 - 2	8 – 1/0	8 – 1/0	8 – 1/0
Tightening Torque		[N.m]	1.4 - 2.3	1.4 - 2.3	4.0 - 6.0	4.0 - 6.0	14 - 26	23 - 26
		[lb-in]	12.4 - 20.4	12.4 - 20.4	35.4 - 53.1	35.4 - 53.1	123.9 - 230.1	203.6 - 230.1

TYPE			RW17D	RW27D	RW67D	RW117D	RW317D	RW407D
Front Auxiliary Contact			1 NO + 1 NC					
Rated Auxiliary Contacts								
AC-14/15	24V	[A]	4.0					
	60V	[A]	3.5					
	125V	[A]	3.0					
	230V	[A]	2.0					
	400V	[A]	1.5					
	500V	[A]	0.5					
	690V	[A]	0.3					
DC-13/14	24V	[A]	1.0					
	60V	[A]	0.5					
	110V	[A]	0.25					
	220V	[A]	0.1					
UL508			C600 ; R300					
Rated Thermal Current		[A]	6					
Short Circuit Protection								
Fuses Type D or NH	gL/gG	[A]	6					
Auxiliar Terminals Capacity								
Fine - Stranded with Sleeve		[mm2]	1.0 - 2.5					
Coarse - Stranded / Solid		[mm2]	1.0 - 2.5					
Stranded / Solid (UL / CSA)		[AWG]	16 - 12					
Tightening Torque		[N.m]	1.0 - 1.5					
		[lb-in]	8.9 - 13.3					

Thermal Overload Relays
Technical Data

Temperature Compensation	Current Correction
65ºC	0.94
70ºC	0.87
75ºC	0.81
80ºC	0.73

Altitude	Voltage Correction [Ue]
Up to 2,000m (6,667ft.)	690
Up to 3,000m (10,000ft.)	550
Up to 4,000m (13,333ft.)	480
Up to 5,000m (16,667ft.)	420



The derating of the permissible operating current for installation altitudes above 2,000m (6,667 ft) and ambient temperatures over 60ºC (140ºF) is calculated according to:

Total derating = Derating $_{altitude}$ x Derating $_{ambient\ temperature}$

Example;
Altitude: 3,000 m (10,000 ft) K1 = 0.96
Ambient temperature: 70ºC (158ºF) K2 = 0.87

Total current derating = 0.96 x 0.87 = 0.84 x Ie
In this case, the maximum rated voltage we can connect to our RW overload relay is 550V.

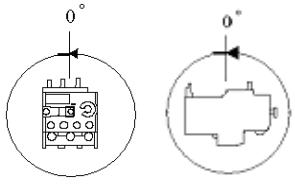
In order to select the proper overload relay, you have to choose a device with a current range that accommodates:
Overload Setting Point = FLA_{motor} / (K1 x K2)

As in the example above, K1 x K2 = 0.84
For a motor with FLA = 20Amps

Overload Setting Point = 20 / 0.84 = 23.8Amps

Operating Positions

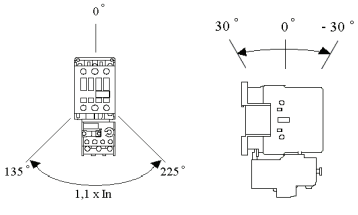
RW17D, RW27D, RW67D, RW117D, RW317D, RW407D



Mounting without contactor

The relays can be mounted at any position.

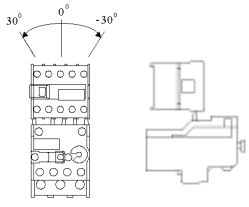
RW27D, RW67D, RW117D, RW317D, RW407D



Mounting without contactor

The mounting position showed in the left-hand figure is equivalent to 0° - not requiring a correction factor on the dial of the relay. The assembly can work with mounting variations of 0° to 180°. However, the mounting with the relay above the contactor, position between 135° and 225°, requires a correction factor of +10% on the dial of the relay. Laterally, as shown in the right-hand figure, the inclination can not exceed ±30° for perfect functioning of the contactor.

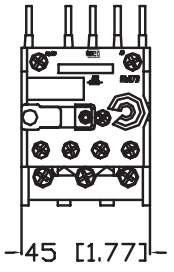
RW17D with CWC07

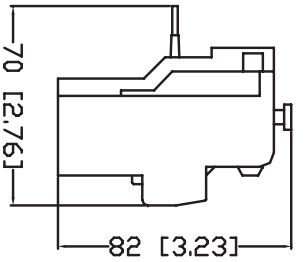


As shown in the left-hand figure, the inclination can not exceed ±30° for perfect functioning of the contactor. Laterally, as shown in the right-hand figure, the mounting position is equivalent to 0° - not requiring a correction factor on the dial of the relay. The assembly can work with mounting variations of 0° to 180°.

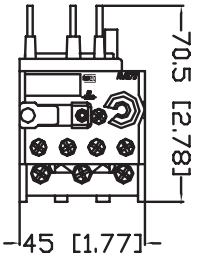
Thermal Overload Relays
Mechanical Data

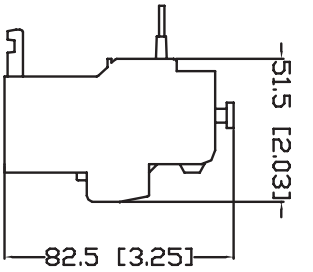
RW17-1D3



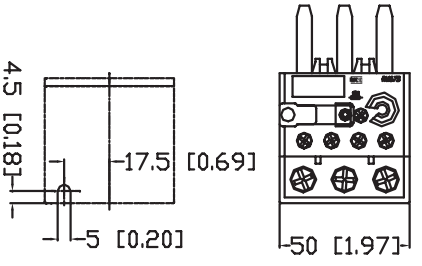


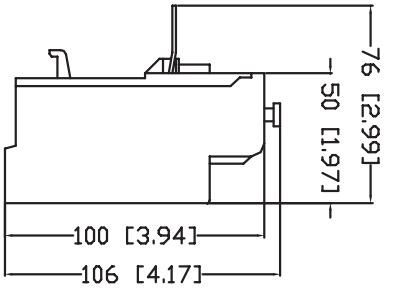
RW27-1D3



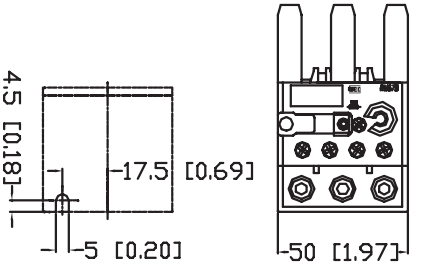


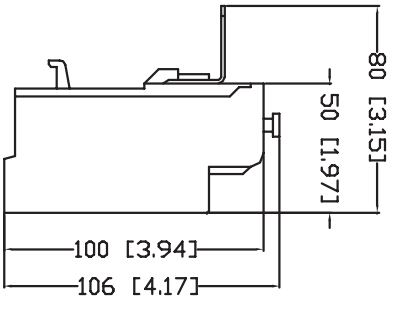
RW67-1D3



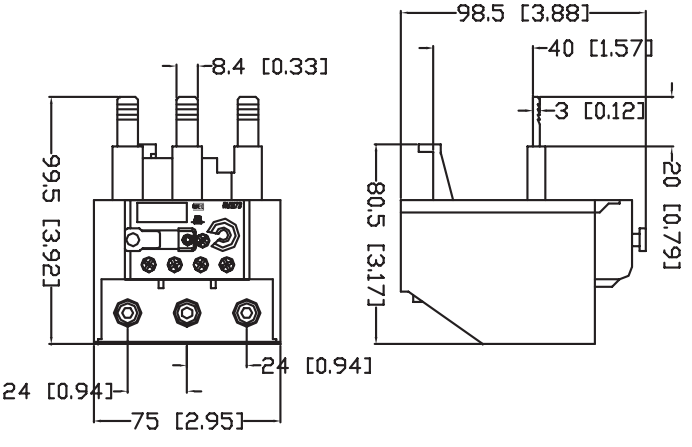


RW67-2D3



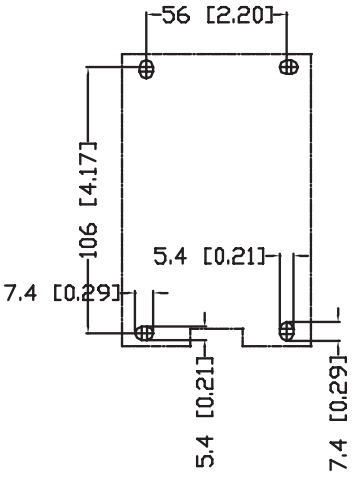


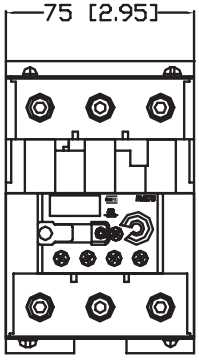
RW117-1D3

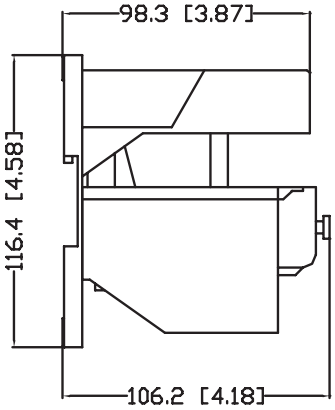


Thermal Overload Relays
Mechanical Data

RW117-2D3







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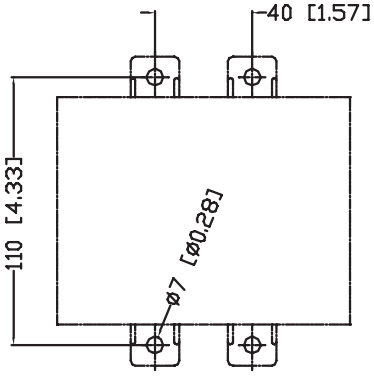

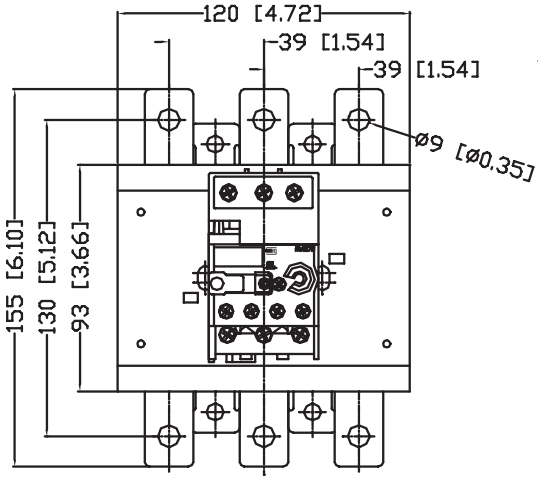

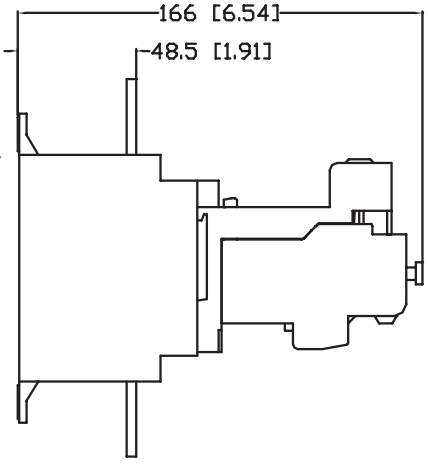

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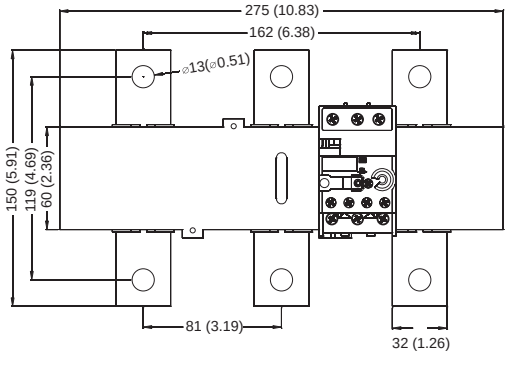
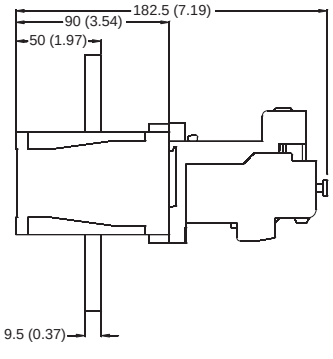
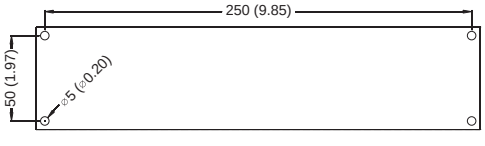






Motor Protective Circuit Breaker
Purchasing Data

Product Information

With the latest technology and design, MPW series provide saving panel space and suitable to be used in most applications in motor control.

It combines short-circuit and motor overload protections in just one component. These devices include a three-position rotary ON-TRIP-OFF handle, which can be padlocked in the OFF position

Designed for DIN rail mounting, while lugs for direct panel mounting are also available as accessory.

MPW Motor Protective Circuit Breakers are available in four models: MPW16/MPW25 (45mm), MPW65 (54mm) and MPW100 (70mm) and designed for use according to international standards, making them suitable for applications all over the world.

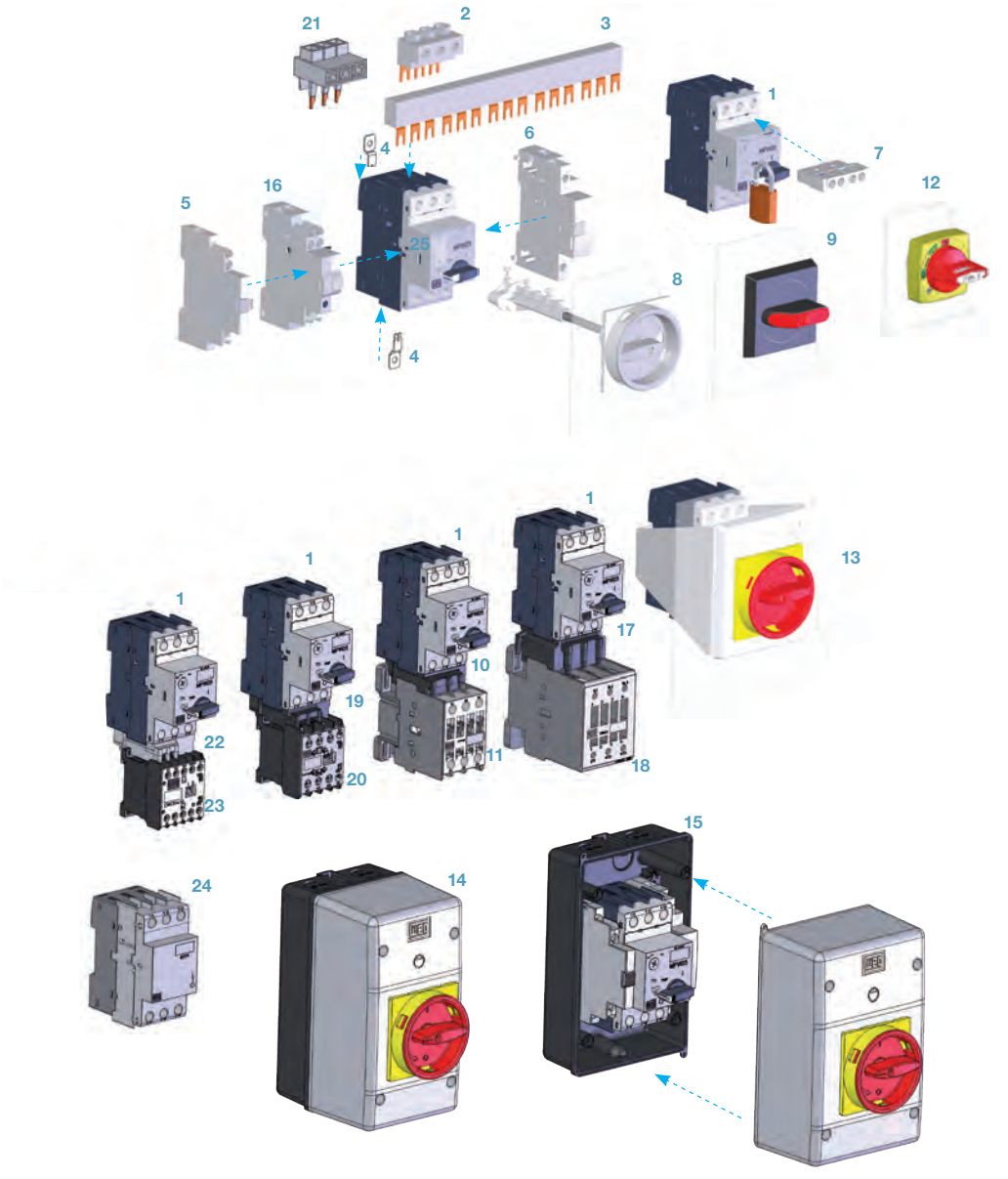
Motor Protective Circuit Breaker
Purchasing Data

Motor Protective Circuit Breakers MPW - Overview

			MPW25 up to 32A		
					
General Technical Data	Maximum Rated Current I_{max} (I_u)		32A	65A	100A
	Number of poles		3	3	3
	Short–Circuit release		13 x I_u max	13 x I_u max	13 x I_u max
	Rated Operational Voltage U_e		690V	690V	690V
	Rated Frequency		50/60Hz	50/60Hz	50/60Hz
	Utilization category	IEC 60 947–2 (Circuit Breaker)	A	A	A
		IEC 60 947–4–1 (Motor starter)	AC-3	AC-3	AC-3
	Tripping Test		Yes	Yes	Yes
	Overload Protection		Yes	Yes	Yes
	Phase failure sensitivity		Yes	Yes	Yes
	Tripping Indication		Yes	Yes	Yes
	Tripping Class		10	10	10
	Mechanical life	Number of operations	100,000	50,000	50,000
	Electrical life	Number of operations	100,000	25,000	25,000
	Temperature compensation		-20...+60ºC	-20...+60ºC	-20...+60ºC
	Type of protection		Thermomagnetic	Thermomagnetic	Thermomagnetic
Setting overload release Ir(A)			Part Number	Part Number	Part Number
1...1.6			CWMMPW25D1.6	-	-
1.6...2.5			CWMMPW25D2.5		
2.5...4			CWMMPW25D4.0		
4...6.3			CWMMPW25D6.3		
6.3...10			CWMMPW25D10		
10...16			CWMMPW25D16		
16...20			CWMMPW25D20		
20...25			CWMMPW25D25		
25...32			CWMMPW25D32		
32...40			-	CWMMPW6540	
40...50				CWMMPW6550	
50...65				CWMMPW6565	
55...75				-	CWMMPW10075
70...90					CWMMPW10090
80...100					CWMMPW100100

Motor Protective Circuit Breaker
Purchasing Data

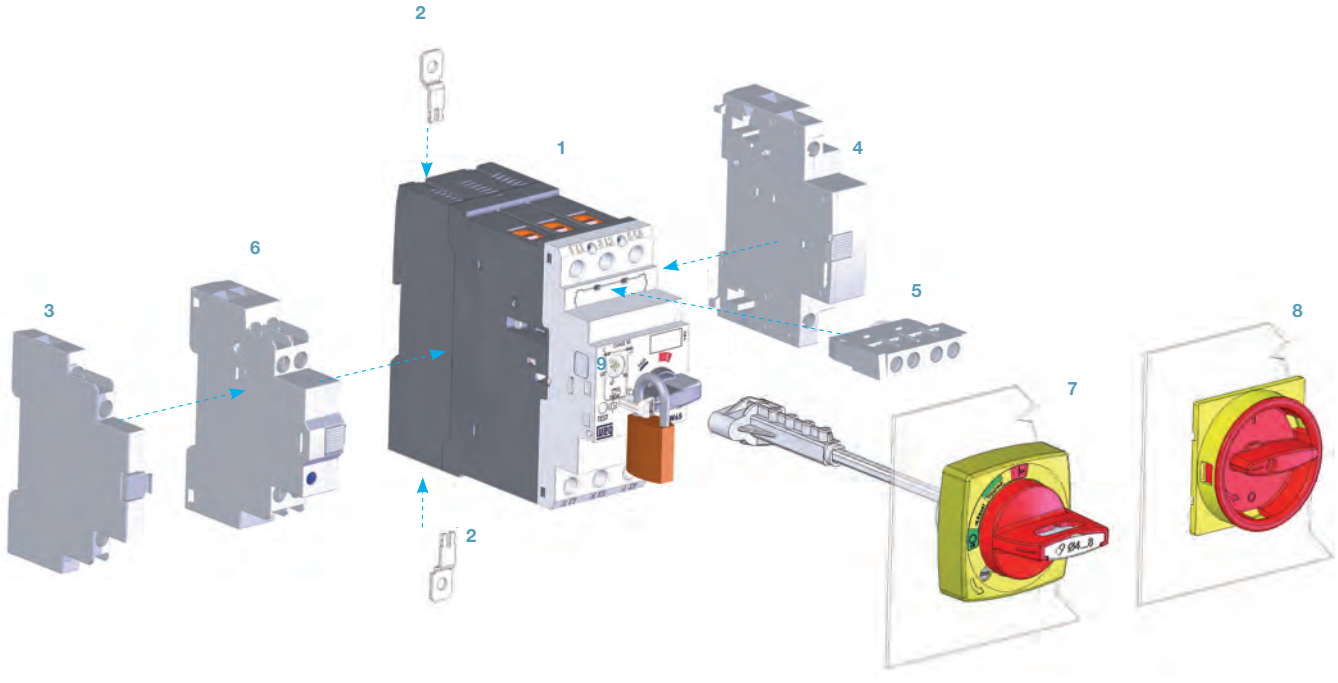
Motor Protective Circuit Breaker MPW25 - Overview



1 - Motor protective circuit breaker MPW25
2 - Feeder terminal FTBBS
3 - Three-phase commoning block BBS
4 - Push-in-lugs PLMP
5 - Side auxiliary contact block ACBS
6 - Undervoltage release URMP or shunt release SRMP
7 - Front auxiliary contact block ACBF
8 - Door coupling rotary handle RMMP
9 - Panel door rotary handle MR MPW25
10 - Conector ECCMP-25 (MPW25 + CWM9...25)
11 - Contactors CWM9...25
12 - Door coupling rotary handle MRX
13 - Front plate FME55
14 - Standard insulated enclosure MPE55
15 - Large insulated enclosure MLPE55
16 - Trip signalling block TSB
17 - Conector ECCMP-32 (MPW25 + CWM32...40)
18 - Contactors CWM32...40
19 - Conector ECCMP-C025 (MPW25 + CWC025)
20 - Mini contactor CWC025
21 - Feeder terminal for “Type E” motor starter according to UL LST25
22 - Conector ECCMP-C0 (MPW25 + CWC07...16)
23 - Mini contactor CWC07...16
24 - Current limiter CLT25
25 - Scale cover SCMP

Motor Protective Circuit Breaker
Purchasing Data

Motor Protective Circuit Breaker MPW65 – Overview



1 - Motor protective circuit breaker MPW65
2 - Push-in-lugs PLMP
3 - Side auxiliary contact block ACBS
4 - Undervoltage release URMP or shunt release SRMP
5 - Frontal auxiliary contact block ACBF
6 - Trip signalling block TSB
7 - Door coupling rotary handle MRX65
8 - Door coupling rotary handle RMMP65
9 - Scale cover SCMP

Motor Protective Circuit Breaker
Purchasing Data

Motor Protective Circuit Breaker MPW25 - Thermomagnetic

- Overload and short circuit protection
- Fixed short circuit release 13 x I_u
- Phase-failure sensivity according to IEC/EN 60947-4-1/DIN VDE 0660 T.102
- Temperature compensation
- For use as main switch
- MPW25 up to 10 A at 400/415 V are self protected

Reference table for selecting protection of three–phase motor 50/60Hz – 4 poles [1]						Rated Current I_u(A)	Setting Overload Release I_r(A)	Instantaneous Magnetic Trip I_{rm}(A)	List Price	Part Number	Weight (lb)
220–240V hp / kW	380–415V hp / kW	440–480V hp / kW	500V hp / kW	550–600V hp / kW	690V hp / kW						
0.33 / 0.25	0.5 / 0.37	1 / 0.75	1 / 0.75	1 / 0.75	1.5 / 1.1	1.6	1...1.6	20.8	$100	CWMMPW25D1.6	0.7
0.5 / 0.37	1 / 0.75	1.5 / 1.1	1.5 / 1.1	1.5 / 1.1	2 / 1.5	2.5	1.6...2.5	32.5	100	CWMMPW25D2.5	
1 / 0.75	2 / 1.5	2 / 1.5	2 / 1.5	3 / 2.2	4 / 3	4	2.5...4	52	100	CWMMPW25D4.0	
1.5 / 1.1	3 / 2.2	4 / 3	4 / 3	5 / 3.7	5.5 / 4	6.3	4...6.3	81.9	100	CWMMPW25D6.3	
3 / 2.2	6 / 4.5	7.5 / 5.5	5.5 / 4	7.5 / 5.5	10 / 7.5	10	6.3...10	130	110	CWMMPW25D10	
5 / 3.7	10 / 7.5	12.5 / 9.2	12.5 / 9.2	15 / 11	15 / 11	16	10...16	208	110	CWMMPW25D16	
7.5 / 5.5	12.5 / 9.2	15 / 11	15 / 11	-	20 / 15	20	16...20	260	124	CWMMPW25D20	
-	15 / 11	-	20 / 15	20 / 15	25 / 18.5	25	20...25	325	146	CWMMPW25D25	
12.5 / 9.2	20 / 15	20 / 15	25 / 18.5	30 / 22	30 / 22	32	25...32	416	158	CWMMPW25D32	

Motor Protective Circuit Breaker MPW65 - Thermomagnetic

- Overload and short circuit protection
- Fixed short circuit release 13 x I_u
- Phase-failure sensivity according to IEC/EN 60947-4-1/DIN VDE 0660 T.102
- Temperature compensation
- For use as main switch
- MPW65 above 65 A provide a breaking capacity of 50 kA at 400/415 V according to IEC/EN 60947-2

Reference table for selecting protection of three–phase motor 50/60Hz – 4 poles [1]						Rated Current I_u(A)	Setting Overload Release I_r(A)	Instantaneous Magnetic Trip I_{rm}(A)	List Price	Part Number	Weight (lb)
220–240V hp / kW	380–415V hp / kW	440–480V hp / kW	500V hp / kW	550–600V hp / kW	690V hp / kW						
15 / 11	25 / 18.5	30 / 22	30 / 22	-	50 / 37	40	32...40	520	$300	CWMMPW6540	1.7
-	30 / 22	40 / 30	40 / 30	50 / 37	60 / 45	50	40...50	650	300	CWMMPW6550	
25 / 18.5	40 / 30	50 / 37	60 / 45	60 / 45	75 / 55	65	50...65	845	300	CWMMPW6565	

Motor Protective Circuit Breaker MPW100 - Thermomagnetic

- Overload and short circuit protection
- Fixed short circuit release 13 x I_u
- Phase-failure sensivity according to IEC/EN 60947-4-1/DIN VDE 0660 T.102
- Temperature compensation
- For use as main switch
- MPW100 up to 100 A at 400/415 V are self protected
- MPW100 above 100 A provide a breaking capacity of 50 kA (Icu) at 400/415 V according to IEC/EN 60947-2

Reference table for selecting protection of three–phase motor 50/60Hz – 4 poles [1]						Rated Current I_u(A)	Setting Overload Release I_r(A)	Instantaneous Magnetic Trip I_{rm}(A)	List Price	Part Number	Weight (lb)
230V hp / kW	400V hp / kW	460V hp / kW	500V hp / kW	575V hp / kW	690V hp / kW						
25 / 18.5	50 / 37	60 / 45	60/45	75 / 55	75 / 55	75	55...75	975	$500	CWMMPW10075	2.2
30 / 22	60 / 45	75 / 55	75/55	75 / 55	100 / 75	90	70...90	1170	534	CWMMPW10090	
40 / 30	60 / 45	75 / 55	75/55	75 / 55	125 / 90	100	80...100	1300	534	CWMMPW100100	

Motor Protective Circuit Breaker
Accessories

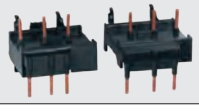
Front Auxiliary Contact Block

For use with	Illustrative picture	Auxiliary Contacts		List Price	Part Number
		NO	NC		
MPW25 MPW65		1	1	$14	CWMACBF11
MPW100				28	CWMACBF11MPW100

Left side auxiliary contact block

For use with	Illustrative picture	Auxiliary Contacts		List Price	Part Number
		NO	NC		
MPW25 MPW65		1	1	$14	CWMACBS11
		2	-	14	CWMACBS20
		-	2	14	CWMACBS02
MPW100		1	1	40	CWMACBS11MPW100
		2	-	40	CWMACBS20MPW100
		-	2	40	CWMACBS02MPW100

Block modules for motor protective circuit breaker assembly + contactors

For use with	Illustrative picture	Description	Contactors	List Price	Part Number
MPW25		- For direct connection (electrical and mechanical) of motor circuit breakers to contactors. Note: - Not applicable to CWM contactors with DC coils.	CWC07…16 CWC025 CWM9…25 CWM32...40	$12	CWMECCMPW25

Door Coupling Rotary Handle

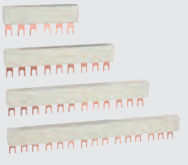
For use with	Illustrative Picture	Description	Handle Colour	List Price	Part Number
MPW65		- Degree of protection IP55; - Shows circuit breaker position "I"(ON) or "O"(OFF); - Panel door can only be opened in OFF position; - Adjustable shaft length. -Shaft sizes: 330-355mm (Model 330). To assemble the handle on the circuit breaker the shaft must have a length of at least 80mm; - Up to 3 padlocks can be used in the OFF position. This blocks circuit breaker operation and opens panel door; - Handle can be mounted on panels with a thickness of 1 to 5mm; - Handle can be assembled even with circuit breaker turned in 90º position	Red/ Yellow	$64	CWMRMMPE330

Motor Protective Circuit Breaker
Accessories

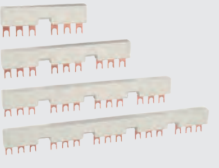
Three-phase feeder terminal

For use with	Illustrative picture	Description	List Price	Part Number
MPW16/16i. MPW25/25i/25t		- For feeding the commoning blocks; - Rated insulation voltage: 690VAC; - I_e: 63A; - Terminals: 6-25mm² rigid wire and 6-16mm² flexible wire with terminal.	$24	CWMFTBBS

Three-phase commoning blocks for circuit breakers without side fitted auxiliary contacts

For use with	Illustrative picture	Description	Numbers of Circuit Breakers	List Price	Part Number
MPW16/16i MPW25/25i/25t		- For parallel blocking of side-by-side mounted circuit breakers. without side auxiliary contacts; - Enables the use of frontal auxiliary contact block ACBF-11; - U_e: 690VAC; - I_e: 63A.	2	$26	CWMBBS455-2
			3	28	CWMBBS455-3
			4	34	CWMBBS455-4
			5	36	CWMBBS455-5

Three-phase commoning blocks for motor protection circuit breakers with side fitted auxiliary contacts

For use with	Illustrative picture	Description	Numbers of Circuit Breakers	List Price	Part Number
MPW16/16i MPW25/25i/25t		- For parallel blocking of side-by-side mounted circuit breakers; - Enables the use of side auxiliary contact block ACBS mounted on each motor protective circuit breaker; - U_e: 690VAC; - I_e: 63A.	2	$28	CWMBBS545-2
			3	30	CWMBBS545-3
			4	36	CWMBBS545-4
			5	38	CWMBBS545-5

Motor Protective Circuit Breaker
Technical Data

Part Number		MPW25	MPW65	MPW100
Maximum Rated Current I_{max} (I_u)		32A	65A	100A
Number of poles		3	3	3
Instantaneous short–circuit		13 x I_e max.	13 x I_e max.	13 x I_e max.
Rated operational voltage U_e		690V [1]	690V	690V
Rated operational frequency [2]		50/60Hz	50/60Hz	50/60Hz
Insulation Voltage U_i		690V	690V	1000V
Rated impulse withstand voltage U_{imp}		6kV	6kV	8kV
Utilization category	IEC 60 947–2 (Circuit breaker)	A	A	A
	IEC 60 947–4–1 (Motor starter)	AC-3	AC-3	AC-3
Tripping Test		Yes	Yes	Yes
Overload Protection		Yes	Yes	Yes
Phase failure sensitivity		Yes	Yes	Yes
Tripping indication		Yes	Yes	Yes
Tripping Class		10	10	10
Maximum operation per hour	Operations/hour	15	15	25
Altitude (m)		2000	2000	2000
Degree of protection		IP20	IP20	IP20
Mechanical life span	Number of operations	100,000	50,000	50,000
Electrical life span	Number of operations	100,000	25,000	25,000
Ambient temperatures allowed				
Transport and storage		-50...+80ºC	-50...+80ºC	-50...+80ºC
Operation [3]		-20...+70ºC	-20...+70ºC	-20...+60ºC
Temperature compensation		-20...+60ºC	-20...+60ºC	-20...+60ºC
Resistance to Impact (g)		15	15	25
Standards				
IEC/EN 60 947–1. DIN VDE 0660 (part 100)		Yes	Yes	Yes
IEC/EN 60 947–2. DIN VDE 0660 (part 101)		Yes	Yes	Yes
IEC/EN 60 947–4–1. DIN VDE 0660 (part 102)		Yes	Yes	Yes
Terminal capacity				
Type of terminal		Flat	Box	Box
Tightening torque	N.m	2...2.5	4...6	4...6
	lb.in	18...22	35...55	35...53
Type of screws		Philips (Nº2)	Allen (4mm)	Allen (4mm)
Dimensions				
Width (mm)		45	54	70
Height (mm)		97	125	165
Depth (mm)		98	157	171

Altitude - Correction factor

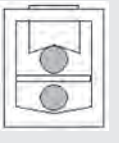
Altitude (above sea level) – h	Rated operational voltage U_e	Current correction factor I_u
h ≤ 2000 m	690 V	1 x I_u
2000 < h ≤ 3000 m	550 V	0,96 x I_u
3000 < h ≤ 4000 m	480 V	0,93 x I_u
4000 < h ≤ 5000 m	420 V	0,90 x I_u

The MPW motor protective circuit breakers do not undergo any change to their specified performance when applied at an altitude of up to 2000 meters above sea level.
However, as the altitude increases, the atmospheric properties vary in terms of dielectric rigidness and pressure.
Therefore, current and voltage correction factors must be applied for altitudes exceeding 2000 meters, as shown in the table on the right:

Notes: 1) 500V with plastic box;
2) On request: 0 to 400Hz
3) Reduce current for temperatures exceeding +60°C (87% to 70°C)

Motor Protective Circuit Breaker
Technical Data

Main Terminal Capacity

Part Number	Type	Number of conductors	Cross–Section
MPW16/16i	Rigid or flexible cable	1 or 2	1...4 mm² 18...12 AWG
MPW25/25i/25t	Rigid or flexible cable	1 or 2	1...2.5 mm² 2.5...6 mm² 14...8 AWG [1)]
MPW65/65t	**Type**	**1 conductor connection in upper part only**	**Cross–Section**
	Rigid cable		1...35 mm²
	Cable without terminal		1.5...35 mm²
	Cable with terminal		1...35 mm2
	Flexible cable		1.5...35 mm²
			17...2 AWG
	Type	**1 conductor connection in lower part only**	**Cross–Section**
	Rigid cable		2.5...35mm²
	Cable without terminal		6...35mm²
	Cable with terminal		2.5...35mm²
	Flexible cable		6...35mm²
			13...2 AWG
	Type	**Connection of 2 condutors – Conductor in upper part**	**Cross–Section**
	Rigid cable		1...35mm²
	Cable without terminal		1.5...35mm²
	Cable with terminal		1...35mm²
	Flexible cable		1.5...35mm²
			17...2 AWG
	Type	**Conductor in lower part**	**Cross–Section**
	Rigid cable		2.5...35mm²
	Cable without terminal		6...35mm²
	Cable with terminal		2.5...35mm²
	Flexible cable		6...35mm²
			13...2 AWG
MPW100	**Type**	**Number of conductors**	**Cross–Section**
	Rigid cable	1	2.5...70 mm²
			12...2/0 AWG
		2	2.5...50 mm²
			12...1/0 AWG
	Flexible cable	1	2.5...50 mm²
			12...1/0 AWG
		2	2.5...35 mm²
			10...2 AWG

Note: 1) 8 AWG for flexible cable only

Motor Protective Circuit Breaker
Technical data

Auxiliary Contact Block - ACB

Part Number	ACBF–11			ACBS–11. ACBS–20. ACBS–02. TSB			
For use with	MPW16/16i. MPW25/25i/25t. MPW65/65i						
Utilization Category	24 VAC		220–230 VAC	24 VAC	230 VAC	400 VAC	690 VAC
AC–15	2 A		0.5 A	6 A	6 A	3 A	1 A
AC–12	2.5 A		2.5 A	10 A	10 A	10 A	10 A
DC–13	24 VDC	48 VDC	60 VDC	24 VDC	110 VDC	220 VDC	440 VDC
	1 A	0.3 A	0.15 A	2 A	0.5 A	0.25 A	0.1 A
Type of terminal	Flat						
Type of screw	Philips (Nº2)						
Tightening torque	0.8…1.2 N.m (7…10 lb.in)						
Rigid cable	1 or 2 x (0.5...1.5 mm²). 1 or 2 x (0.75…2.5 mm²). 2 x (18…14 AWG)						
Flexible cable							
Backup fuses gL/gG	10 A						

Part Number	ACBF–11 MPW100		ACBS–11/ACBS–20/ACBS–02/TSB AT–11 MPW100	
For use with	MPW100			
Utilization Category	240 VAC		24 VAC	240 VAC
AC–15	3 A		6 A	4 A
DC–13	24 VDC	220VDC	24 VDC	220VDC
	1 A	0.1 A	2 A	0.25 A
Type of screw	Philips (Nº2)			
Tightening torque	0.8…1.2 N.m (7…10 lb.in)			
Rigid cable	1 (0.5…2.5mm² / 20…14 AWG)		1 or 2 x (0.5…2.5mm² / 20…14 AWG)	
Flexible cable	1(0.5...4mm² / 20...10 AWG) or 2(0.75...2.5mm² / 18...14 AWG)			
Back–up fuses gL/gG	16 A			

Undervoltage Release - URMP

Part Number	URMP	URMP V_ _ MPW100
For use with	MPW16/16i. MPW25/25i/25t. MPW65/65i	MPW100
Operating voltage (Enables cir. breaker switch on)	0.85...1.1xU_s	
Non–operating voltage (guarantees circuit breaker switch OFF)	0.7...0.35xU_s	
Energization Consumption	20.2 VA / 13 W	8.5 VA / 6 W
Consumption	7.2 VA / 2.4 W	3 VA / 1.2 W
Max. opening time	20 ms	
Type of terminal	Flat	
Type of screws	Philips (Nº2)	
Tightening torque	0.8…1.2 N.m (7…10 lb.in)	
Rigid cable	1 or 2 x (0.5...1.5 mm²). 1 or 2 x (0.75…2.5 mm²). 2 x (18…14 AWG)	1 or 2 x (0.5...2.5 mm² / 20...14 AWG)
Flexible cable		1 (0.5...4 mm² / 20...10 AWG) or 2 x (0.75...2.5 mm2 / 18...14 AWG)
Back–up fuses gL/gG	10 A	

Shunt Release - SRMP

Part Number	SRMP	SRMP–K_ _ MPW100
For use with	MPW16/16i. MPW25/25i/25t. MPW65/65i	MPW100
Operating Voltage (guarantee circuit breaker switch OFF)	0.7...1.1xU_s	
Consumption – Energization	20.2 VA / 13 W	8.5 VA / 6 W
Maximum opening time	20 ms	
Type of terminal	Flat	
Type of screw	Philips (Nº2)	
Tightening torque	0.8…1.2 N.m (7…10 lb.in)	
Rigid cable	1 or 2 x (0.5...1.5 mm²). 1 or 2 x (0.75…2.5 mm²) 2 x (18…14 AWG)	1 ou 2 x (0.5...2.5 mm² / 20...14 AWG)
Flexible cable		1 (0.5...4 mm² / 20...10 AWG) or 2 x (0.75...2.5 mm2 / 18...14 AWG)
Back–up fuses gL/gG	10 A	

Motor Protective Circuit Breaker
Technical Data

Rated Short-Circuit Breaking Capacity (IEC 60947-2)
MPW25 / MPW65

Part Number	Setting Overload Release (A)	220–230VAC			380–415VAC			440VAC			460–500VAC			630–690VAC		
		I_{cu}	I_{cs}	Max. Fuse (gL/gG)	I_{cu}	I_{cs}	Max. Fuse (gL/gG) [1]	I_{cu}	I_{cs}	Max. Fuse (gL/gG) [1]	I_{cu}	I_{cs}	Max. Fuse (gL/gG) [1]	I_{cu}	I_{cs}	Max. Fuse (gL/gG) [1]
		kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
MPW25	0.10...0.16	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
	0.16...0.25	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
	0.25...0.4	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
	0.4...0.63	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
	0.63...1	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
	1...1.6	100	100	-	100	100	-	100	100	-	100	100	-	100	100	-
	1.6...2.5	100	100	-	100	100	-	100	100	-	100	100	-	8	8	25
	2.5...4	100	100	-	100	100	-	100	100	-	100	100	-	8	8	32
	4...6.3	100	100	-	100	100	-	100	100	-	100	100	-	8	8	50
	6.3...10	100	100	-	100	100	-	50	25	80	42	21	63	8	8	50
	10...16	100	100	-	50	25	100	50	15	80	10	8	80	5	5	63
	16...20	100	100	-	50	25	125	50	15	80	10	8	80	5	5	63
	20...25	100	100	-	50	25	125	50	15	100	10	8	80	5	5	63
	25...32	100	100	-	50	25	125	25	15	100	10	8	80	5	5	63
MPW65	10...16	100	100	-	50	50	100	50	50	80	15	15	80	8	8	63
	16...20	100	100	-	50	50	125	50	50	80	15	15	80	8	8	63
	20...25	100	100	-	50	50	125	50	50	100	15	15	80	8	8	63
	25...32	100	100	-	50	50	125	50	50	100	15	15	80	5	5	63
	32...40	100	100	-	50	50	160	50	50	125	15	10	100	5	5	63
	40...50	100	100	-	50	50	160	50	50	125	15	10	100	5	5	80
	50...65	100	100	-	50	50	160	50	50	125	15	10	100	5	5	80

MPW100

Part Number	Setting Overload Release (A)	220–240 VAC			380–415 VAC			440–460 VAC			500–525 VAC			600–690 VAC		
		I_{cu}	I_{cs}	Max. Fuse (gL/gG)	I_{cu}	I_{cs}	Max. Fuse (gL/gG) [1]	I_{cu}	I_{cs}	Max. Fuse (gL/gG) [1]	I_{cu}	I_{cs}	Max. Fuse (gL/gG) [1]	I_{cu}	I_{cs}	Max. Fuse (gL/gG) [1]
		kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
MPW100	55...75	100	100	-	75	50	-	50	38	200	12	9	160	6	6	125
	70...90	100	100	-	75	50	-	50	38	200	12	9	160	6	6	160
	80...100	100	100	-	75	50	-	50	38	200	12	9	160	6	6	160

Self protected against short-circuits up to 100kA

\- *Back-up fuse not required*

1) *Fuse amounts required for greater short-circuit currents. UL values on request*

Motor Protective Circuit Breaker
Technical data

Motor Protective Circuit Breakers MPW - Rated Short-Circuit Breaking Capacity (IEC 60947-2) - Limiter Function

MPW25 + CLT25

Part Number	Setting Overload Release (A)	380–415VAC			440VAC			460–500VAC			630–690VAC		
		I_{cu}	I_{cs}	Max. Fuse (gL/gG)	I_{cu}	I_{cs}	Max. Fuse (gL/gG)	I_{cu}	I_{cs}	Max. Fuse (gL/gG)	I_{cu}	I_{cs}	Max. Fuse (gL/gG)
		kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
MPW25 + CLT25	0.10...0.16	♦	♦	-	♦	♦	-	♦	♦	-	♦	♦	-
	0.16...0.25	♦	♦	-	♦	♦	-	♦	♦	-	♦	♦	-
	0.25...0.4	♦	♦	-	♦	♦	-	♦	♦	-	♦	♦	-
	0.4...0.63	♦	♦	-	♦	♦	-	♦	♦	-	♦	♦	-
	0.63...1	♦	♦	-	♦	♦	-	♦	♦	-	♦	♦	-
	1...1.6	♦	♦	-	♦	♦	-	♦	♦	-	♦	♦	-
	1.6...2.5	♦	♦	-	♦	♦	-	♦	♦	-	50	50	-
	2.5...4	♦	♦	-	♦	♦	-	♦	♦	-	50	50	-
	4...6.3	♦	♦	-	♦	♦	-	♦	♦	-	50	50	-
	6.3...10	♦	♦	-	100	100	-	100	100	-	50	50	-
	10...16	100	100	-	100	100	-	100	100	-	50	50	-
	16...20	100	100	-	100	100	-	100	100	-	50	50	-
	20...25	100	100	-	100	100	-	100	100	-	10	10	-
	25...32	100	100	-	100	100	-	100	100	-	10	10	-

MPW65

Part Number	Setting Overload Release (A)	380–415VAC			440VAC			460–500VAC			630–690VAC		
		I_{cu}	I_{cs}	Max. Fuse (gG/gL)	I_{cu}	I_{cs}	Max. Fuse (gG/gL)	I_{cu}	I_{cs}	Max. Fuse (gG/gL)	I_{cu}	I_{cs}	Max. Fuse (gG/gL)
		kA	kA	A	kA	kA	A	kA	kA	A	kA	kA	A
MPW65 + MPW65i–3–U065	10...16	65	65	-	65	65	-	65	65	-	25	25	-
	16...20	65	65	-	65	65	-	65	65	-	25	25	-
	20...25	65	65	-	65	65	-	65	65	-	25	25	-
	25...32	65	65	-	65	65	-	65	65	-	25	25	-
	32...40	65	65	-	65	65	-	65	65	-	25	25	-
	40...50	65	65	-	65	65	-	65	65	-	25	25	-
	50...65	65	65	-	65	65	-	65	65	-	25	25	-

Self protected against short-circuits up to 100kA

\- *Back-up fuse not required*

1) Fuse amounts required for higher short-circuit currents.

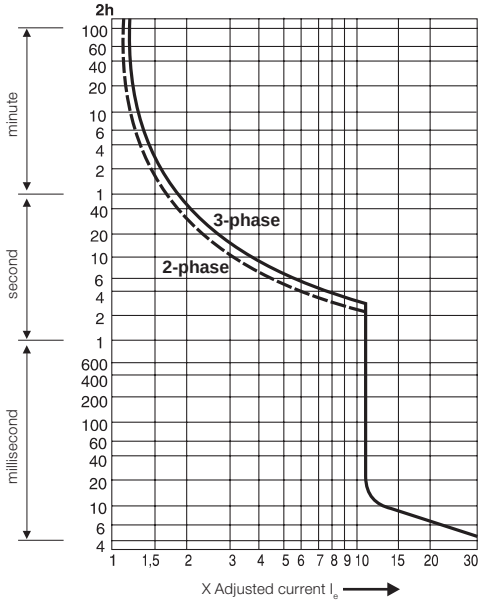
♦ *Not applicable due to MPW25/MPW65 already having 100 kA of I_{cu} / I_{cs} in referred ranges.*

Motor Protective Circuit Breaker
Technical Data

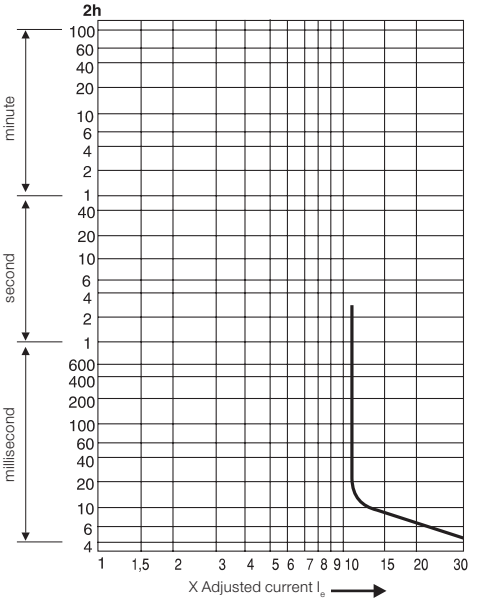
Motor Protective Circuit Breakers MPW - Characteristics Curves

The tripping characteristic shows the motor circuit breaker trip time in relation to the rated current. The curves show average tolerance range values for an ambient temperature of 20ºC, starting in cold state. Thermal trip time when working in operating temperature is reduced to around 25% of the presented values. Under normal operating conditions, all 3 circuit breaker phases must be conducting.

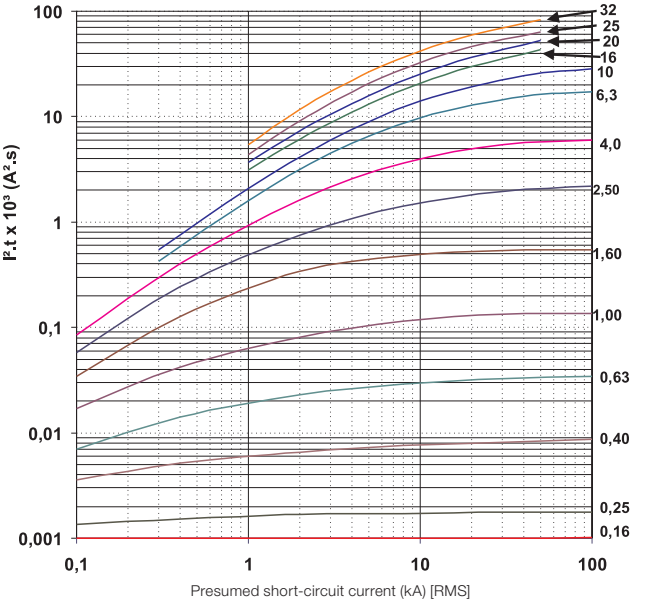
MPW16/25/65



MPW16i/25i/65i



Characteristic I^2t at 415V - MPW25/25i

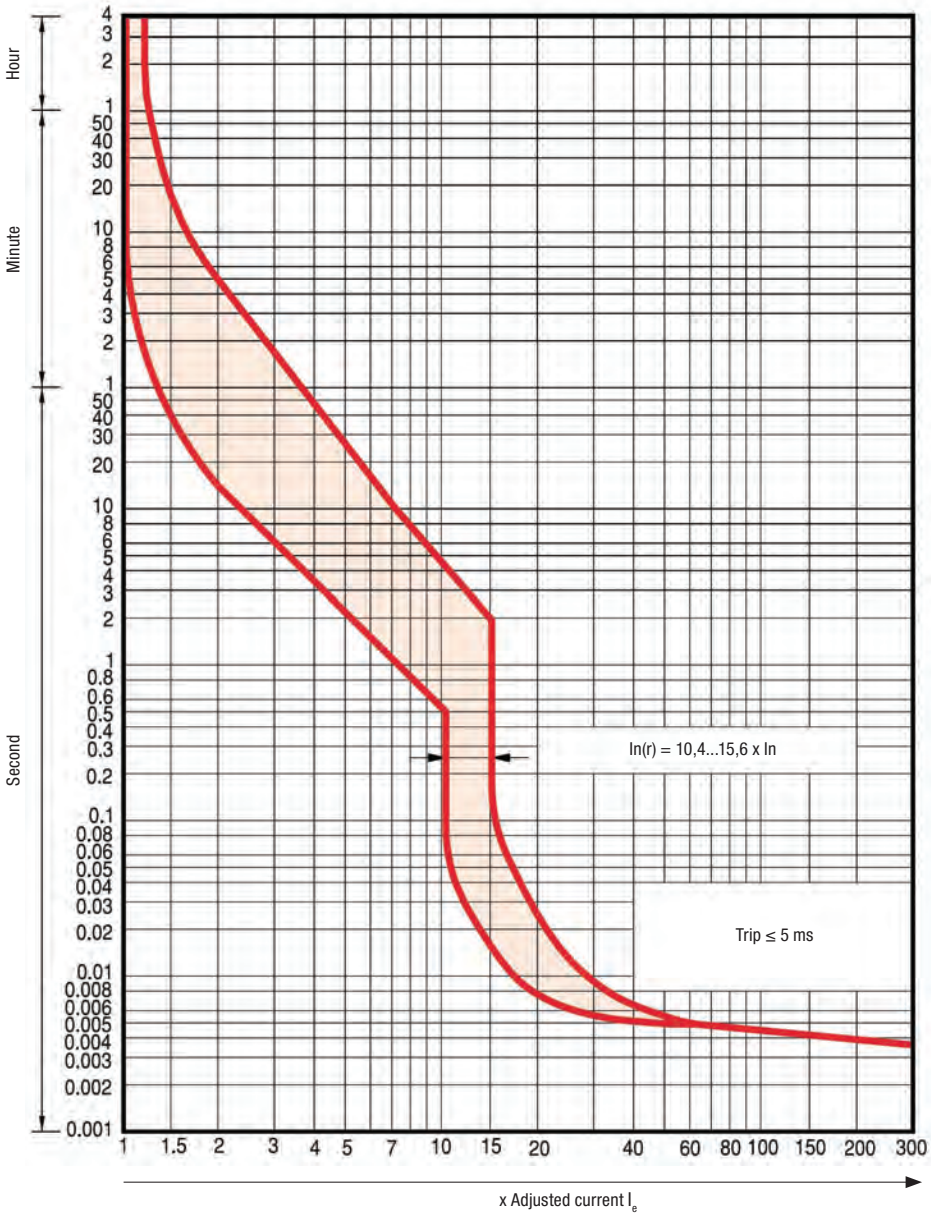


Note: 1) Other characteristic curves on request

Motor Protective Circuit Breaker
Technical data

Motor Protective Circuit Breakers MPW - Tripping Characteristic Curves

MPW100

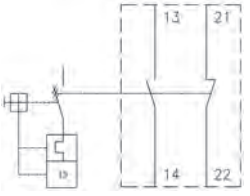


Notes: 1) Thermal Tripping current: Curve presented for an ambient temperature of 20ºC starting from cold state.
2) Magnetic Tripping Current: Corresponds to 13 times the maximum adjustment range value.

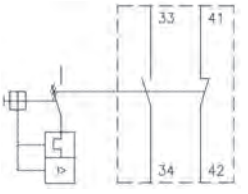
Motor Protective Circuit Breaker
Technical Data

Connection Diagrams

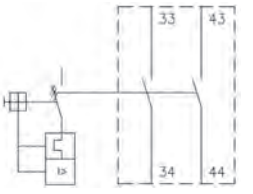
ACBF–11 and ACBF 11 MPW100



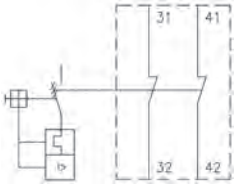
ACBS–11 and ACBS–11–MPW100



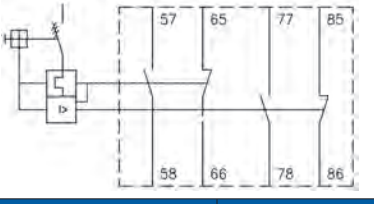
ACBS–20 and ACBS–20–MPW100



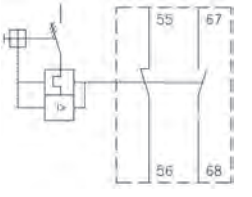
ACBS–02 and ACBS–02 MPW100



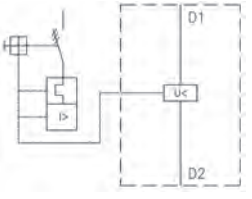
TSB



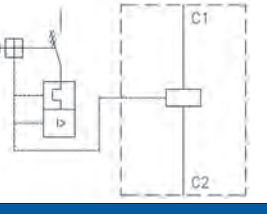
TSB AT11 MPW100



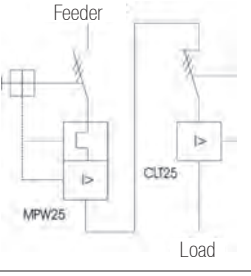
URMP



SRMP

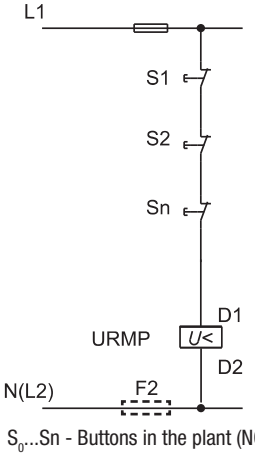


MPW25 + CLT25



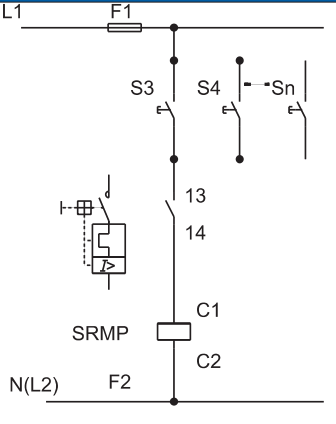
Typical Circuits

Undervoltage Release URMP



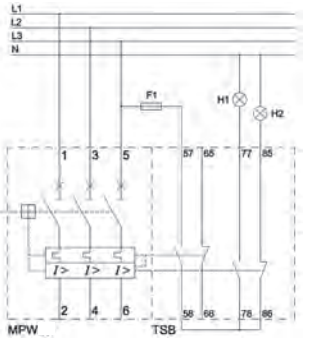
S_0...Sn - Buttons in the plant (NC)

Shunt Release SRMP



S_0...Sn - Buttons in the plant (NO)
S - MPW auxiliary contact

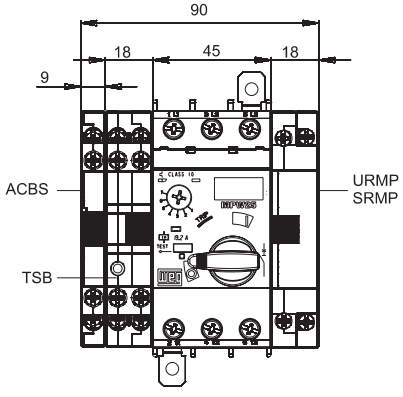
Trip Signalling Block TSB

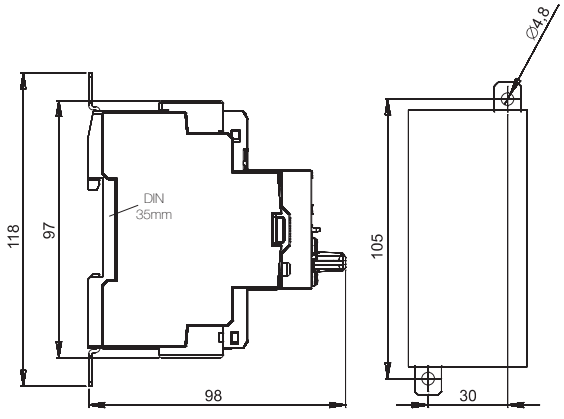


H_1 - Short-circuit trip signalling
H_2 - Overcurrent trip signalling

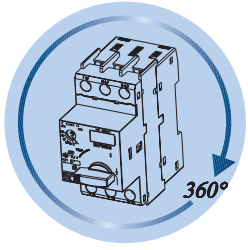
Motor Protective Circuit Breaker
Mechanical Data

MPW25 + Accessories

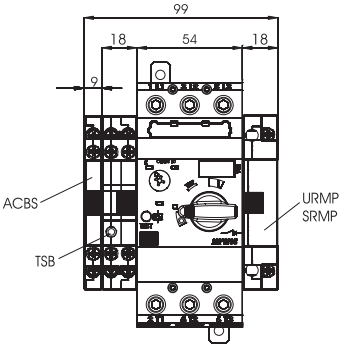


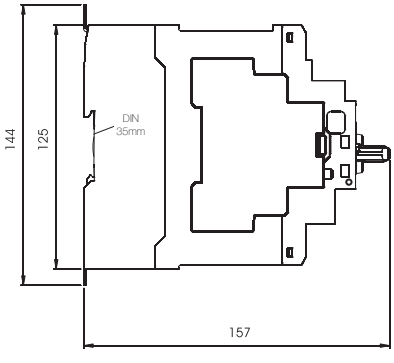


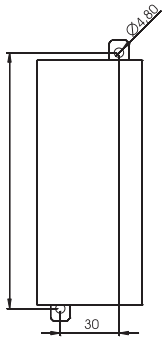
Mounting Position



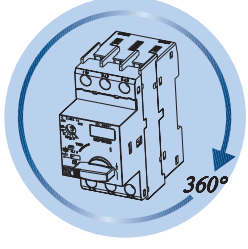
MPW65 + Accessories



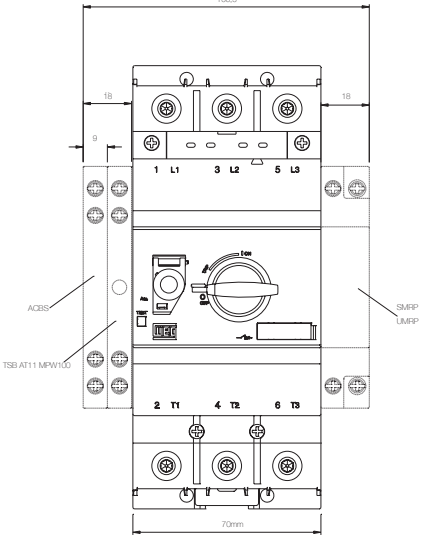


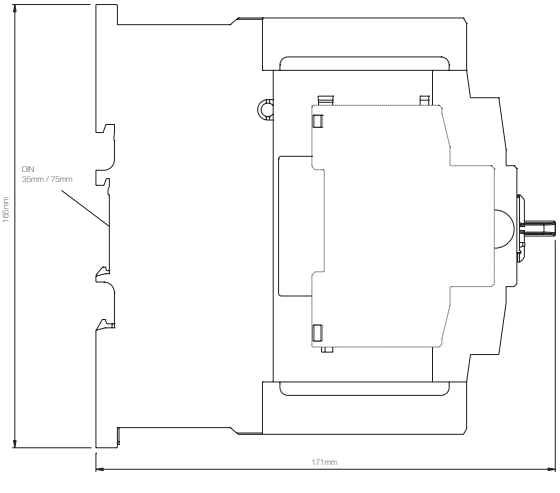


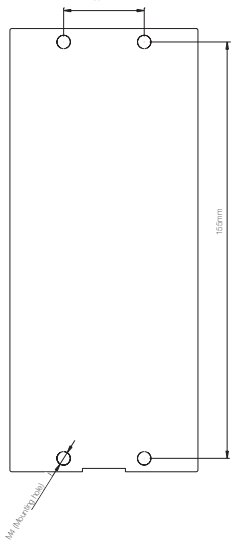
Mounting Position



MPW100







Enclosed Motor Starters - NEMA 4X
Purchasing Data

Product Information

WEG offers non-reversing and non-combination NEMA-4X magnetic starter up to 75HP at 460V.

Featuring components that meet IEC design standards and UL horsepower ratings, including WEG contactors and overload relays, the PESW magnetic starters are ideal to help protect motors and ensure smooth operation year-after-year. Assembled together in a NEMA 4X enclosure with two options out of the shelves: Start/Stop Pushbutton and RESET or just the RESET button on the cover for quick and easy operation.

WEG PESW starters are recommended for all single and three phase applications where across-the-line starters can be applied.

Enclosed Motor Starters
Purchasing Data

Single-phase D.O.L Starter

Maximum UL Horsepower		Contactor Size	List Price	Part Number
Single Phase				
115V	230V			
1/2	1.5	CWM9	$123	PESW9*AXRM##
3/4	2	CWM12	135	PESW12*AXRM##
1	3	CWM18	141	PESW18*AXRM##
2	5	CWM25	148	PESW25*AXRM##
3	5	CWM40	289	PESW40*AXRM##
3	7.5	CWM50	529	PESW50*AXRM##
5	10	CWM65	566	PESW65*AXRM##

Three phase D.O.L Starter

Three Phase				Contactor Size	List Price	Part Number
200V	230V	460V	575V			
3	3	5	7.5	CWM9	$139	PESW9*AXR##
3	3	7.5	10	CWM12	145	PESW12*AXR##
5	5	10	15	CWM18	161	PESW18*AXR##
7.5	7.5	15	15	CWM25	169	PESW25*AXR##
10	10	20	25	CWM32	226	PESW32*AXR##
10	15	30	25	CWM40	340	PESW40*AXR##
15	15	40	40	CWM50	622	PESW50*AXR##
20	20	50	50	CWM65	637	PESW65*AXR##
20	25	50	60	CWM80	691	PESW80*AXR##
25	30	60	75	CWM95	836	PESW95*AXR##
30	40	75	75	CWM105	871	PESW105*AXR##

Replace * in Part Number with appropriate coil voltage code

60Hz	120V	208...240V	480V	575V
CODE	A	B	C	D
50Hz	110V	–	400–415V	500V

Replace ## in Part Number with appropriate Overload Relay code

FLA Range	PESW09	PESW12	PESW18	PESW25	PESW32	PESW40	PESW50	PESW65	PESW80	PESW95	PESW105
0.8...1.2	23										
1.2...1.8	24										
1.8...2.8	25										
2.8...4.0	26										
4.0...6.3	27										
5.6...8.0	28										
7.0...10	29										
8.0...12.5		30									
10...15		31									
11...17			32								
15...23				33							
22...32					34						
25...40						35	36				
32...50							38	38			
40...57								39			
57...70									41		
63...80										43	
75...97											44

Enclosed Motor Starters
Technical Data

Wiring Diagram

Three phase D.O.L. Starter

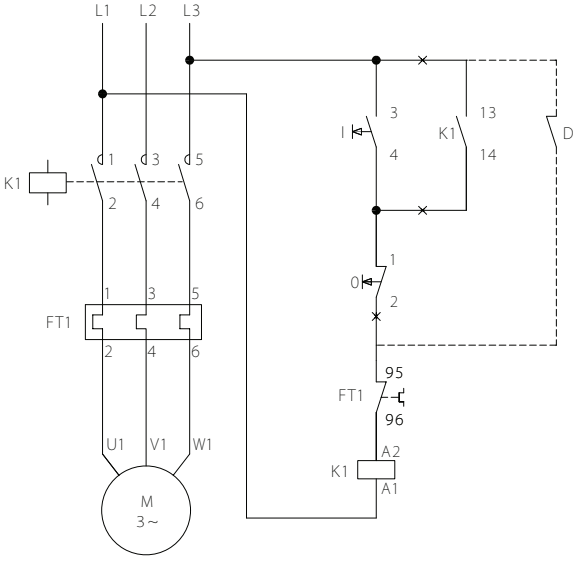


Figure 1

Control circuit with phase to phase coil supply

When using 230V, 400V, 500V, and 690V on the Part Number, WEG D.O.L. starters (DLW) will be factory-connected, as per wiring diagrams of figure 1, that is, with phase to phase coil suplly.
For the voltages with phase to phase coil supply, contact WEG.

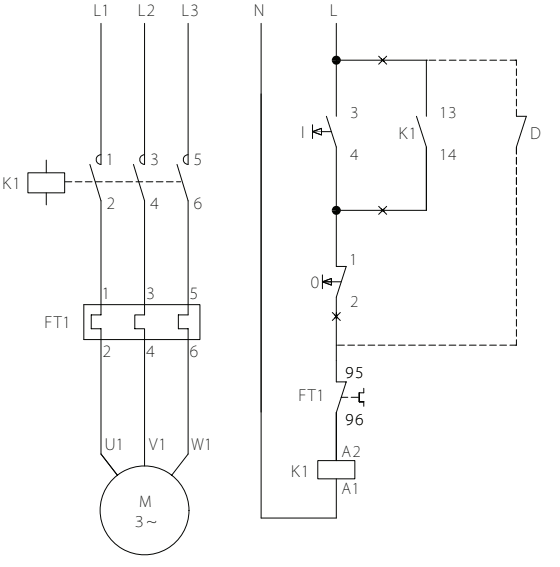
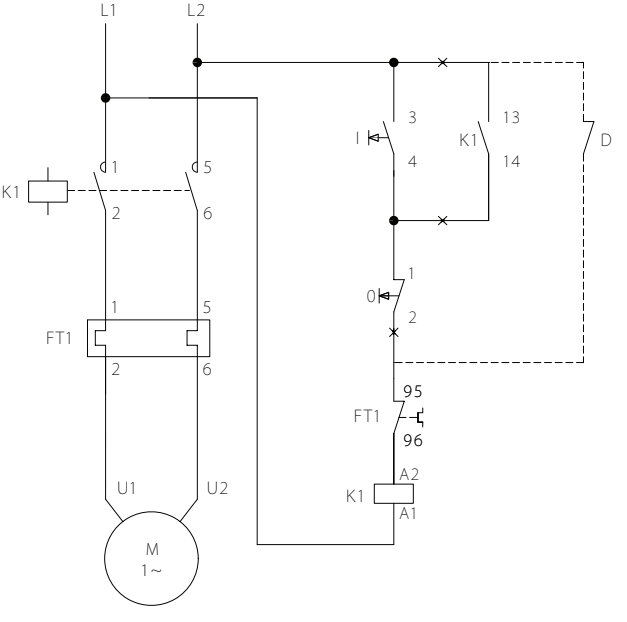


Figure 2

Control circuit with separate coil supply

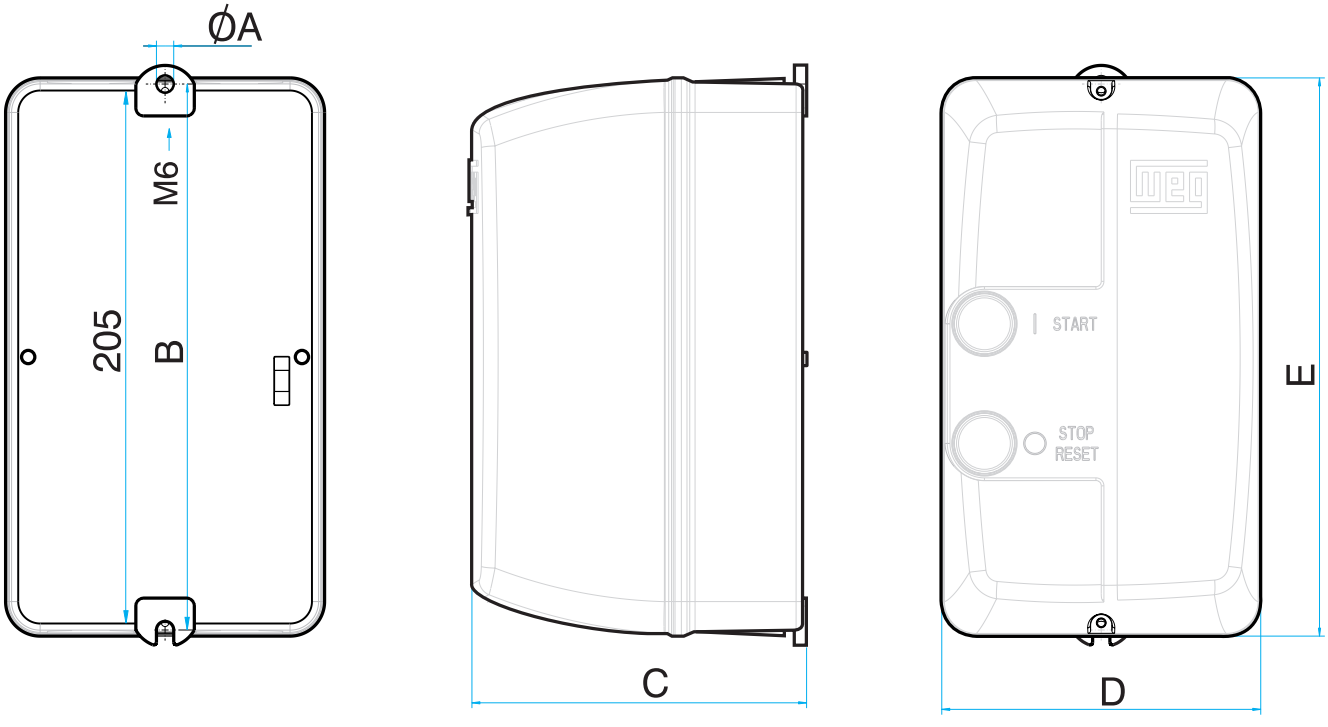
When using 24V, 48V, 110V, etc. on the Part Number, WEG D.O.L. starters (DLW) will be factory-connected, as per wiring diagrams of figure 2, that is, with control circuit to be connected through a separate coil supply.

Single-phase D.O.L Starter



Note: When using remote control, disconnect the circuit at the points marked with the "x" in figures 1 and 2 and connect the external devices (Thermostat, pushbutton, etc), as indicated with dotted lines.

Enclosed Motor Starters
Mechanical Data



SIZE 04 mm (in) mm(in)	SIZE 06 mm (in)	SIZE 08 mm (in)	SIZE 10 mm (in)
øA = 4.5 (0.2)	øA = 6.5 (0.3)	øA = 6.0 (0.2)	øA = 7.0 (0.3)
B = 180 (7.1)	B = 205 (8.1)	B = 275 (10.8)	B = 355 (14.0)
C = 111 (4.4)	C = 126 (5.0)	C = 143 (5.6)	C = 167 (6.6)
D = 105 (4.1)	D = 120 (4.7)	D = 180 (7.1)	D = 250 (9.9)
E = 185 (7.3)	E = 210 (8.3)	E = 280 (11.0)	E = 360 (14.2)

Provision for cable gland fitting	Standard		
	Top	Bottom	Back
Size 04	2 x 1/2"	2 x 1/2"	ø18mm (0.7in)
Size 06	2 x 1/2" and 3/4"	2 x 1/2" and 3/4"	ø22mm (0.9in)
Size 08	2 x 3/4" and 1"	2 x 3/4" and 1"	-
Size 10	2 x 3/4" and 1"	2 x 3/4" and 1"	-
	1 x 1" and 1 1/4"	1 x 1" and 1 1/4"	-

For wall mounting on starters size 08 and 10, four screws with the following characteristics should be used:
- Pan, dome or rounded shaped head;
- Starter size 08:
  - Screws size 1/4 (or M6 – ISO Standard);
  - Dimensions: diameter thread shall be maximum 1/4 in. and diameter head shall be maximum 15/64 in.
- Starter size 10:
  - Screws size 12 (or M5 – ISO Standard);
  - Dimensions: diameter thread shall be maximum 0.236 in. and diameter head shall be maximum 0.394 in.

Pusbuttons and Pilot Lights
Purchasing Data

Product Information

WEG has used its leading-edge technology & development capability to design CSW series line of pushbuttons, pilot lights, selector switches and accessories. These user friendly and durable Ø22mm pilot devices allow their use in several industrial applications and environments. Besides the high luminosity, the BIDL blocks have many other interesting characteristics, such as:

- Long life expectancy
- Great performance on shock and vibration applications
- Extremely low power consumption and thermal dissipation
- High luminosity and color definition (independant of the lens)

Fast and easy assembling system

The Mounting of the contact blocks to the operator (pushbutton, selector switch or indicator) is done through a snap-on flange which ensures a fast and tight fitting. This system allows its removal in a practical and fast way, without tools. Each single block can be mounted or removed individually: to assemble, just snap the components together and a common screwdriver is all that is necessary for the disassembly. The ergonomic design of the new locking ring allows hand tightening, without the need for a screwdriver.

Contact blocks – safety and reliability

High efficiency self-cleaning contact bridges; Pure Silver Contacts (Ag100), ensure in every condition maximum reliability and to monitor control circuits at low energy levels (5mA/12V). NC Contacts with “Positive Break” system, ensures the circuit interruption.

Accessories

A complete line of accessories is available, including legend plates, protection covers, lenses for pilot lights, solid and engraved caps for flush pushbuttons.

Pusbuttons and Pilot Lights
Purchasing Data

Flush	Part Number	List Price
	○ WABF0	$6.80
	● WABF1	6.80
	● WABF2	6.80
	● WABF3	6.80
	● WABF4	6.80
	● WABF5	6.80

Double	Part Number	List Price
	WABD	$14.30

Illuminated Flush	Part Number	List Price
	○ WABFI0	$11.40
	● WABFI1	11.40
	● WABFI2	11.40
	● WABFI3	11.40
	● WABFI4	11.40

Emergency Stop – Twist Release	Part Number	List Price
	● WABEG	$15.10

Pilot Lights	Part Number	List Price
	○ WASD0	$10.10
	● WASD1	10.10
	● WASD2	10.10
	● WASD3	10.10
	● WASD4	10.10

Pushbuttons and Pilot Lights
Purchasing Data

Selector Switches

KNOB	LEVER	with KEY(1)	ILLUMINATED
			 substitute # for colour code (see below)

Part Number	List Price	Part Number	List Price	Part Number	List Price	Part Number	List Price	POSITION	DIAGRAM
WACK2F45	$16	WACA2F45	$17	WACY2F45	$45	WACKI2F45#	$10		1
WACK2R45	18	WACA2R45	19	-	-	-	-		1
WACK2F90	16	WACA2F90	17	-	-	-	-		2
WACK2R90	18	WACA2R90	19	-	-	-	-		2
WACK3F45	16	WACA3F45	17	WACY3F45	45	WACKI3F45#	10		3
WACK3R45	18	WACA3R45	19	-	-	-	-		3
WACK3RE45	18	WACA3RE45	19	-	-	-	-		3
WACK3RD45	18	WACA3RD45	19	-	-	-	-		3

(1) Key is released in any position
Substitute CY for CYD for key release on the right only
Substitute CY for CYE for key release on the left only
Substitute CY for CYC for key release in the center only

DIAGRAM 1

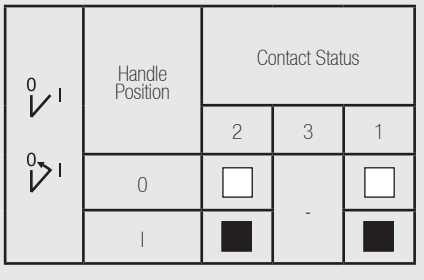


DIAGRAM 2

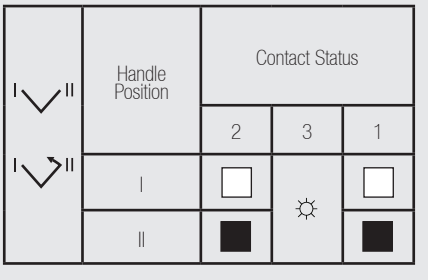
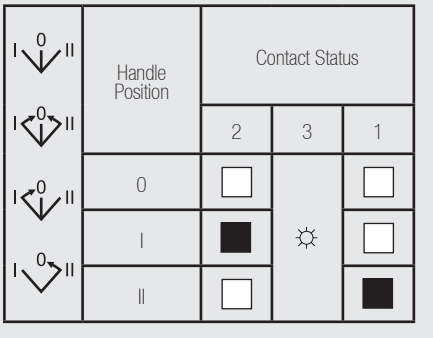


DIAGRAM 3



☐ Contacts in rest position
■ Contacts actuated
☼ Mounting position for the LED or lamp blocks only

Color Code

Colour	Clear/White	Red	Green	Yellow	Blue	Black
Code	○	●	●	●	●	●
Symbol						

Pusbuttons and Pilot Lights
Accessories

Single Contact Block

1NC
Part Number: WABC01

1NO
Part Number: WABC10

List Price: $5.10

Double Contact Block

1NO-1NC
Part Number: WABC11

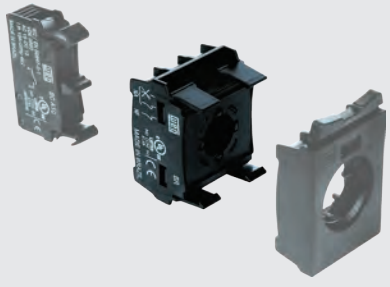
2NO
Part Number: WABC20

List Price: $9.20

Push–on / Push–off Block

Part Number: WABR

- Device for flush, extended and mushroom pushbuttons



List Price: $8.50

Note: Use only with single contact blocks. 1NO-contacts must be WABCA10 (early make) type.

Full Voltage AC/DC Lamp Block

Part Number: WABR

List Price: $8.50

Note: For BA9S lamps 380V / 2W max.

LED Block

Part Numbers:
24Vac/Vdc: **BIDL24VAC/VDC#**
110-130Vac: **BIDL110–130VAC#**
220-240Vac: **BIDL220–240VAC#**

List Price: $17.60

Note: Replace # with desired colour code (see below)

Color Code

Colour	Clear/White	Red	Green	Yellow	Blue	Black
Code	0	1	2	3	4	5
Symbol	○	●	●	●	●	●

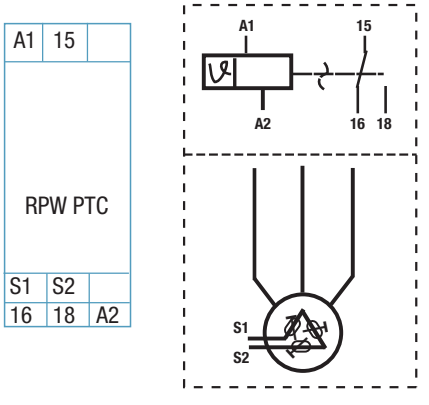
Protection Relay - RPW-PTC
Purchasing Data

The Thermistor Relay RPW PTC is used to measure the motor temperature by PTC sensor inside of the motor. When the motor temperature rises above the PTC sensor class, the output relay is de-energized avoiding damages to the motor.

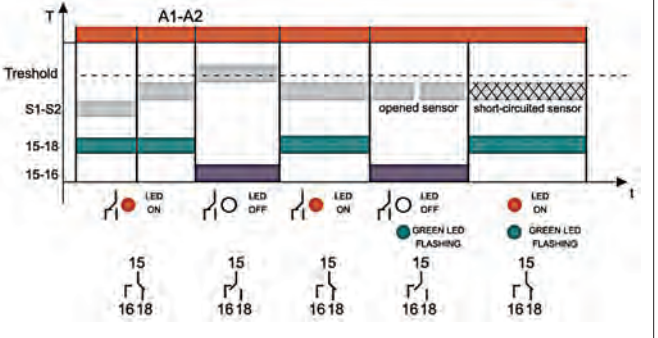
Operation: Connected directly to the supply voltage and in series to the PTC sensor (maximum of 3), the output relay is automatically energized (close the 15-18 terminals) and turns on the red LED indicating that the temperature is within acceptable values. If an over temperature occurs, the probe resistance is rapidly increased and the output relay is de-energized (close the 15-16 terminals) and the red LED is turned off, remaining on this situation until the temperature decreases at a normal value. The RTW PTC is able to evaluate if the PTC sensor has a fault (not caused by an over temperature) or is not connected (open circuit). In such situations, the green LED will start flashing.

Part Number	List Price
CWMRPWPTC	$170

Connection Diagram

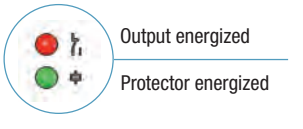


Functional Diagram



LED Indication

Protection Relay RPW is provided with LED's for status indication.
note: The green LED will start flashing if a failure occurs on the PTC sensor.



Assembly

The RPW relay can be mounted directly on DIN rail 35mm or fixed with screws using the accessory PLMP.

Load Filters and Line Reactors
Purchasing Data

Three Phase Reactors - Line/Load Reactors - Selection Table

Ratings	Impedance	HP									
		1	1.5	2	3	5	7.5	10	15	20	25
208V	3%	CFWRL-00401	CFWRL-00801	CFWRL-00801	CFWRL-01201	CFWRL-01801	CFWRL-02501	CFWRL-03501	CFWRL-04501	CFWRL-05501	CFWRL-08001
	5%	CFWRL-00402	CFWRL-00802	CFWRL-00802	CFWRL-01202	CFWRL-01802	CFWRL-02502	CFWRL-03502	CFWRL-04502	CFWRL-05502	CFWRL-08002
240V	3%	CFWRL-00401	CFWRL-00801	CFWRL-00801	CFWRL-01201	CFWRL-01801	CFWRL-02501	CFWRL-03501	CFWRL-04501	CFWRL-05501	CFWRL-08001
	5%	CFWRL-00402	CFWRL-00802	CFWRL-00802	CFWRL-01202	CFWRL-01802	CFWRL-02502	CFWRL-03502	CFWRL-04502	CFWRL-05502	CFWRL-08002
380V	2%	CFWRL-00204	CFWRL-00402	CFWRL-00401	CFWRL-00802	CFWRL-00801	CFWRL-01201	CFWRL-01801	CFWRL-02501	CFWRL-03501	CFWRL-04501
	4%	CFWRL-00201	CFWRL-00404	CFWRL-00402	CFWRL-00803	CFWRL-00802	CFWRL-01202	CFWRL-01802	CFWRL-02502	CFWRL-03502	CFWRL-04502
400V	2%	CFWRL-00201	CFWRL-00402	CFWRL-00402	CFWRL-00802	CFWRL-00801	CFWRL-01201	CFWRL-01801	CFWRL-02501	CFWRL-03501	CFWRL-04501
	4%	CFWRL-00202	CFWRL-00404	CFWRL-00403	CFWRL-00803	CFWRL-00802	CFWRL-01202	CFWRL-01802	CFWRL-02502	CFWRL-03502	CFWRL-04502
415V	2%	CFWRL-00201	CFWRL-00402	CFWRL-00402	CFWRL-00802	CFWRL-00801	CFWRL-01201	CFWRL-01801	CFWRL-02501	CFWRL-03501	CFWRL-04501
	4%	CFWRL-00202	CFWRL-00404	CFWRL-00403	CFWRL-00803	CFWRL-00802	CFWRL-01202	CFWRL-01802	CFWRL-02502	CFWRL-03502	CFWRL-04502
480V	3%	CFWRL-00201	CFWRL-00201	CFWRL-00402	CFWRL-00402	CFWRL-00802	CFWRL-01202	CFWRL-1802	CFWRL-02502	CFWRL-03502	CFWRL-03502
	5%	CFWRL-00202	CFWRL-00202	CFWRL-00403	CFWRL-00403	CFWRL-00803	CFWRL-01203	CFWRL-01803	CFWRL-02503	CFWRL-03503	CFWRL-03503
600V	3%	CFWRL-00202	CFWRL-00202	CFWRL-00403	CFWRL-00403	CFWRL-00803	CFWRL-00802	CFWRL-01202	CFWRL-1802	CFWRL-02502	CFWRL-02502
	5%	CFWRL-00203	CFWRL-00203	CFWRL-00404	CFWRL-00404	CFWRL-00804	CFWRL-00803	CFWRL-01203	CFWRL-01803	CFWRL-02503	CFWRL-02503

Selection Table

Fundamental Amps	Inductance (mh)	List Price	Part Number	Dimensions H x W x D	Shipping Weight (lbs.)
2	12.0	$246	CFWRL-00201	4.1 x 2.8 x 4.4	4
2	20.0	258	CFWRL-00202	4.1 x 2.8 x 4.4	4
2	32.0	296	CFWRL-00203	4.1 x 2.8 x 4.4	4
2	6.0	216	CFWRL-00204	4.1 x 2.5 x 4.4	3
4	32.0	248	CFWRL-00401	4.1 x 2.8 x 4.4	4
4	6.5	258	CFWRL-00402	4.1 x 2.8 x 4.4	4
4	9.0	268	CFWRL-00403	4.1 x 3.4 x 4.4	5
4	12.0	306	CFWRL-00404	4.1 x 3.4 x 4.4	6
8	1.5	262	CFWRL-00801	4.8 x 3.0 x 6.0	7
8	32.0	294	CFWRL-00802	4.8 x 3.0 x 6.0	8
8	5.0	400	CFWRL-00803	4.8 x 3.4 x 6.0	11
8	7.5	410	CFWRL-00804	4.8 x 3.4 x 6.0	13
12	1.3	308	CFWRL-01201	5.0 x 3.3 x 6.0	9
12	2.5	328	CFWRL-01202	5.0 x 3.3 x 6.0	10
12	4.2	470	CFWRL-01203	5.0 x 3.9 x 6.0	18
18	0.8	402	CFWRL-01801	5.3 x 3.2 x 6.0	9
18	1.5	414	CFWRL-01802	5.3 x 3.5 x 6.0	12
18	2.5	546	CFWRL-01803	6.1 x 4.0 x 8.1	16
25	0.5	420	CFWRL-02501	5.8 x 3.5 x 7.2	11
25	1.3	476	CFWRL-02502	5.8 x 3.5 x 7.2	14
25	1.8	622	CFWRL-02503	5.8 x 4.3 x 7.2	20
35	0.4	476	CFWRL-03501	4.8 x 3.0 x 6.0	8
35	0.8	498	CFWRL-03502	4.8 x 3.4 x 6.0	11
35	1.3	760	CFWRL-03503	4.8 x 3.4 x 6.0	13
45	0.3	628	CFWRL-04501	5.0 x 3.3 x 6.0	9
45	0.7	750	CFWRL-04502	5.0 x 3.3 x 6.0	10
45	1.2	962	CFWRL-04503	5.0 x 3.9 x 6.0	18
55	0.3	794	CFWRL-05501	5.3 x 3.2 x 6.0	9
55	0.5	864	CFWRL-05502	5.3 x 3.5 x 6.0	12
55	0.9	1,142	CFWRL-05503	6.1 x 4.0 x 8.1	16
80	0.2	810	CFWRL-08001	5.8 x 3.5 x 7.2	11
80	0.4	1,154	CFWRL-08002	5.8 x 3.5 x 7.2	14
80	0.7	2,016	CFWRL-08003	5.8 x 4.3 x 7.2	20

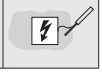
NEMA, UL and CSA Enclosure Ratings

NEMA Enclosure Rating	NEMA National Electrical Manufacturers Association (NEMA Standard 250) and Electrical and Electrical Mfg. Association of Canada (EEMAC)	c UL us Underwriters Laboratories Inc. (UL50 and UL508)	CSA Canadian Stadards Association (Standard C22.2 No. 94)
Type 1	Enclosures are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment or locations where unusual service conditions do not exist.	Indoor use primarily to provide protection against contact with the enclosed equipment and against a limited amount of falling dust.	General purpose enclosure. Protects against accidental contact with live parts.
Type 3	Enclosures are intended for outdoor use primarily to provide a degree of protection against windblown dust, rain, and sleet; undamaged by the formation of ice on the enclosure.	Outdoor use to provide a degree of protection against windblown dust and windblown rain; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain, snow, and windblown dust; undamaged by the external formation of ice on the enclosure.
Type 3R*	Enclosures are intended for outdoor use primarily to provide a degree of protection against falling rain and sleet; undamaged by the by the formation of ice on the enclosure.	Outdoor use to provide a degree of protection against falling rain; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against rain and snow; undamaged by the external formation of ice on the enclosure.
Type 4	Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose-directed water; undamaged by the formation of ice on the enclosure.	Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water, and hose-directed water; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use; provides adegree of protection against rain, snow, windblown dust, splashing and hose-directed water; undamaged by the formation of ice on the enclosure.
Type 4X	Enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, and hose-directed water; undamaged by the formation of ice on the enclosure.	Either indoor or outdoor use to provide a degree of protection against falling rain, splashing water, and hose-directed water; undamaged by the formation of ice on the enclosure; resists corrosion.	Indoor or outdoor use; provides adegree of protection against rain, snow, windblown dust, splashing and hose-directed water; undamaged by the formation of ice on the enclosure; resists corrosion.
Type 6	Enclosures are intended for use indoors or outdoors where occasional submersion is encountered; limited depth; undamaged by the formation of ice on the enclosure.	Indoor or outdoor use to provide a degree of protection against entry of water during temporary submersion at a limited depth; undamaged by the external formation of ice on the enclosure.	Indoor or outdoor use; provides a degree of protection against entry of water during temporary submersion at a limited depth; undamaged by the external formation of ice on the enclosure; resists corrosion.
Type 12	Enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping noncorrosive liquids.	Indoor use to provide a degree of protection against dust, dirt, fiber flyings, dripping water, and external condensation of noncorrosive liquids.	Indoor use; provides a degree of protection against circulation of dust, lint, fibers and flyings; dripping and light splashing of noncorrosive liquids; not provided with knockouts.
Type 12K	Enclosures with knockouts are intended for indoor use primarily to provide a degree of protection against dust, falling dirt, and dripping noncorrosive liquids.	Indoor use to provide a degree of protection against dust, dirt, fiber flyings, dripping water, and external condensation of noncorrosive liquids. Knockouts in the top or bottom walls, or both.	Indoor use; provides a degree of protection against circulation of dust, lint, fibers and flyings; dripping and light splashing of noncorrosive liquids; provided with knockouts.
Type 13	Enclosures are intended for indoor use primarily to provide a degree of protecting against dust, spraying of water, oil, and noncorrosive coolant.	Indoor use to provide a degree of protection against lint, dust seepage, external condensation and spraying of water, oil, and noncorrosive liquids.	Indoor use; provides a degree of protection against circulating dust, lint, fibers, and flyings; seepage and spraying of noncorrosive liquids, including oils and coolants.

*NFPA 70 (National Electric code) defines new Type 3RX as providing the same degree of protection as Type 3R, with the addition of protection against corrosive agents.

IEC Enclosure Ratings

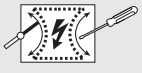
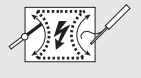
First Numeral

Protection Against Ingress of Solid Objects		Protection of Persons Against Access to Hazardous Parts with:	Examples
IP	Requirements		
0	No Protection.	Non-Protected	
1	Full penetration of 50mm diameter sphere not allowed. Contact with hazardous parts.	Back of Hand	
2	Full penetration of 12.5mm diameter sphere not allowed. The jointed test finger shall have adequate clearance from hazardous parts.	Finger	
3	The access probe of 2.5mm diameter shall not penetrate.	Tool	
4	The access probe of 1.0mm diameter shall not penetrate.	Wire	
5	Limited ingress of dust permitted (no harmful deposit).	Wire	
6	Totally protected against ingress of dust.	Wire	

Second Numeral

Protection Against Harmful Ingress of Water		Protection from Water:	Examples
IP	Requirements		
0	No Protection.	Non-Protected	
1	Protected against vertically falling drops of water. Limited ingress permitted.	Vertically Dripping	
2	Protected against vertically falling drops with enclosure tilted 15° from the vertical. Limited ingress permitted.	Dripping up to 15° from the Vertical	
3	Protected against sprays to 60° from the vertical. Limited ingress permitted.	Limited Spraying	
4	Protected against water splashed from all directions. Limited ingress permitted.	Splashing from all Directions	
5	Protected against jets of water. Limited ingress permitted.	Hosing Jets from all Directions	
6	Protected against strong jets of water. Limited ingress permitted.	Strong Hosing Jets from all Directions	
7	Protected against the effects of immersion between 15cm and 1m.	Temporary Immersion	
8	Protected against long periods of immersion under pressure.	Contiuous Immersion	

Additional Letter (Optional)

Protection Against Ingress of Solid Objects		Protection of Persons Against Access to Hazardous Parts with:	Examples
IP	Requirements		
A (For use with first numeral 0)	Penetration of 50.0mm diameter sphere up to guard face must not contact hazardous parts.	Back of Hand	
B (For use with first numerals 0 and 1)	Test finger penetration to a maximum of 80.0mm must not contact hazardous parts.	Finger	
C (For use with first numerals 1 and 2)	Wire of 2.5mm diameter x 100.0mm long must not contact hazardous parts when spherical stop face is partially entered.	Tool	
D (For use with first numerals 2 and 3)	Wire of 1.0mm diameter x 100.0mm long must not contact hazardous parts when spherical stop face is partially entered.	Wire	

Motor Current Ratings

Horsepower	80Hz AC Induction Motor					
	Single Phase		Three Phase			
	115V	230V	200V	230V	460V	
0.16	4.40	2.20	-	-	-	-
0.25	5.80	2.90	-	-	-	-
0.33	7.20	3.60	-	-	-	-
0.50	9.80	4.90	2.50	2.20	1.10	0.90
0.75	13.8	6.90	3.70	3.20	1.60	1.30
1	16.0	8.00	4.80	4.20	2.10	1.70
1.5	20.0	10.0	6.90	6.00	3.00	2.40
2	24.0	12.0	7.80	6.80	3.40	2.70
3	34.0	17.0	11.0	9.60	4.80	3.90
5	56.0	28.0	17.5	15.2	7.60	6.10
7.5	80.0	40.0	25.0	22.0	11.0	9.00
10	100	50.0	32.0	28.0	14.0	11.0
15	135	68.0	48.0	42.0	21.0	17.0
20	-	88.0	62.0	54.0	27.0	22.0
25	-	110	78.0	68.0	34.0	27.0
30	-	136	92.0	80.0	40.0	32.0
40	-	176	120	104	52.0	41.0
50	-	216	150	130	65.0	52.0
60	-	-	177	154	77.0	62.0
75	-	-	221	192	96.0	77.0
100	-	-	285	248	124	99.0
125	-	-	359	312	156	125
150	-	-	414	360	180	144
200	-	-	552	480	240	192
250	-	-	692	602	302	242
300	-	-	-	-	361	289
350	-	-	-	-	414	336
400	-	-	-	-	477	382
500	-	-	-	-	590	472

The information in this table was extracted from Table 430.248 and 430.250 of the NEC.
The following values of full load currents are for motors running at usual speeds and motors with normal torque characteristics. The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110-120, 220-240, 440-480 and 550-600 Volts.

NEMA Ratings - CWM Series Contactors to NEMA Comparison

NEMA Ratings	WEG Contactor Series	Maximum Horsepower (UL/CSA)					
		Single Phase		Three Phase			
		115V	230V	200V	230V	460V	575V
00		.33	1	1.5	1.5	2	2
	CWM9	.5	1.5	3	3	5	7.5
	CWM12	.75	2	3	3	7.5	10
0		1	2	3	3	5	5
	CWM18	1	3	5	5	10	15
	CWM25	1.5	3	5	7.5	15	15
1		2	3	7.5	7.5	10	10
	CWM32	2	5	10	10	20	25
	CWM40	3	5	10	10	25	25
2		3	7.5	10	15	25	25
	CWM50	3	7.5	15	15	30	40
	CWM65	5	10	20	20	40	50
	CWM80	5	15	20	25	50	60
3		7.5	15	25	30	50	50
	CWM95	7.5	15	25	30	60	75
	CWM105	10	20	30	40	75	75
4		-	-	40	50	100	100
	CWM112	-	-	40	50	100	100
	CWM150	-	-	50	60	125	150
	CWM180	-	-	60	75	150	200
5		-	-	75	100	200	200
	CWM250	-	-	75	100	200	250

This table is for comparison & reference only. WEG CWM Series contactors are not NEMA labeled.

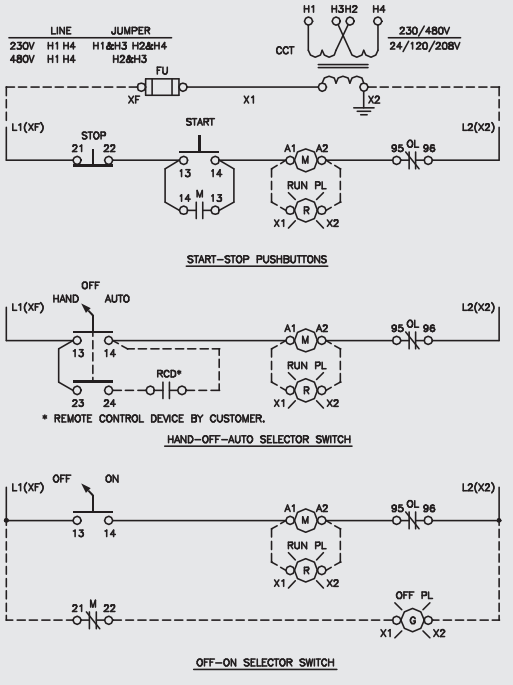
How to dimension control components in a starter

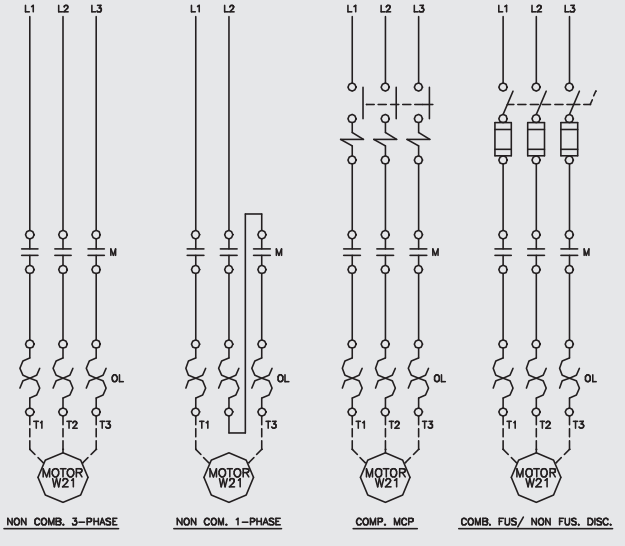
	Across the Line Starter	Reversing Starter	Wye–Delta Starter	Autotransformer Starter tap 65%	Autotransformer Starter tap 85%
Contactor - K1	FLA	FLA	0.58 x FLA	FLA	FLA
Contactor - K2	-	-	0.58 x FLA	0.42 x FLA	0.64 x FLA
Contactor - K3	-	-	0.33 x FLA	0.23 x FLA	0.16 x FLA
Overload Relay	FLA	FLA	0.58 x FLA	FLA	FLA
Manual Motor Protector - MPW25	FLA				

This table is for comparison & reference only.

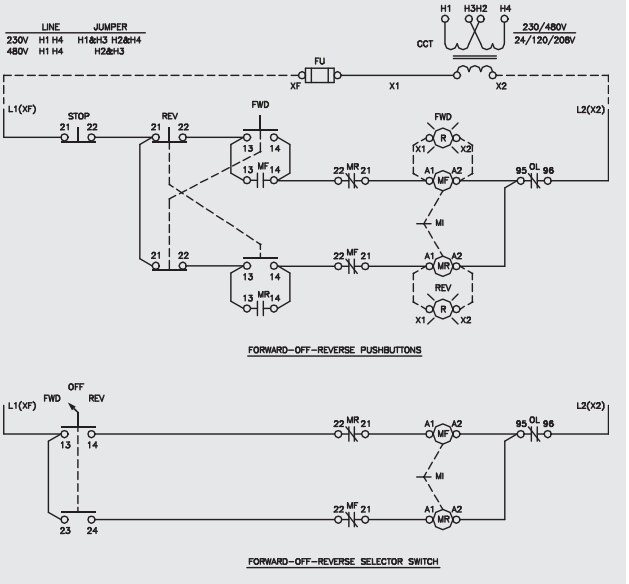
Electrical Wiring Diagrams

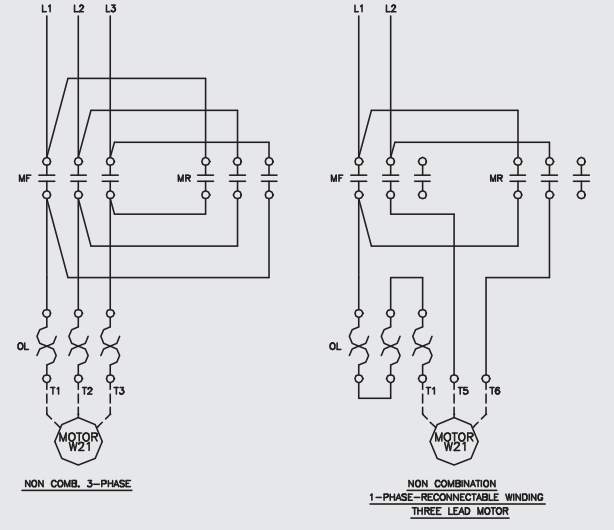
Motor Starters Non-Reversing





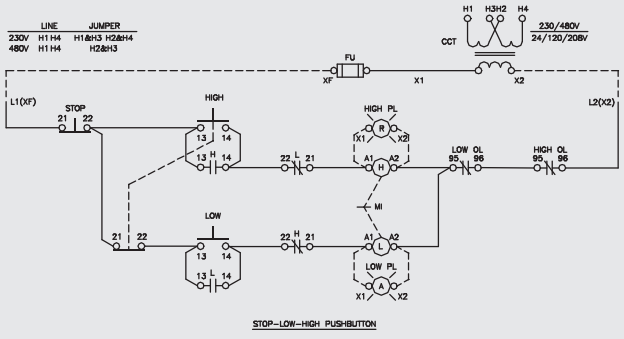
Motor Starters Reversing (1-3PH.)



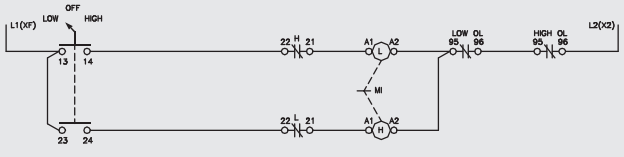


Electrical Wiring Diagrams

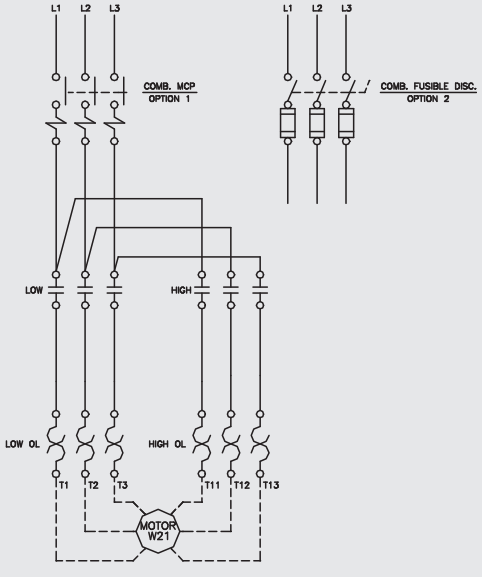
Multi-Speed Two Separate Windings



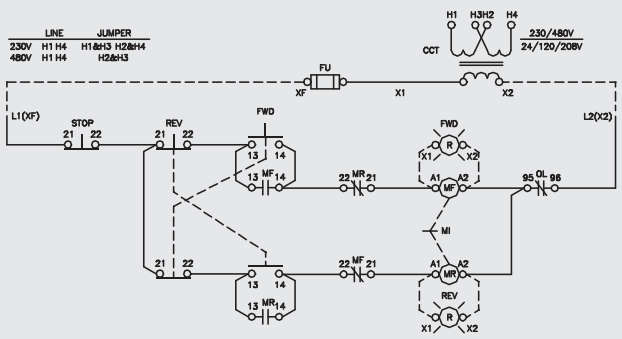
STOP–LOW–HIGH PUSHBUTTON



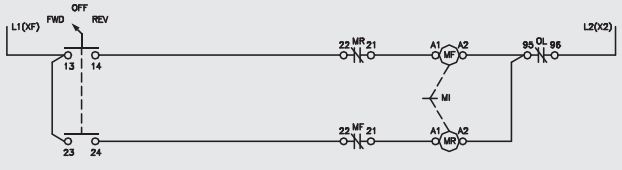
LOW–OFF–HIGH SELECTOR SWITCH



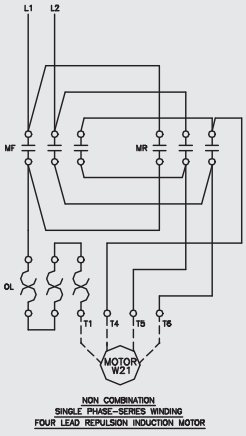
Motor Starters Reversing (1PH.)



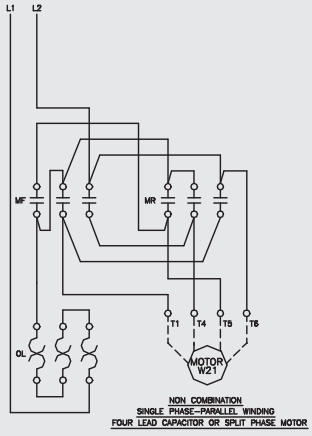
FORWARD–OFF–REVERSE PUSHBUTTONS



FORWARD–OFF–REVERSE SELECTOR SWITCH



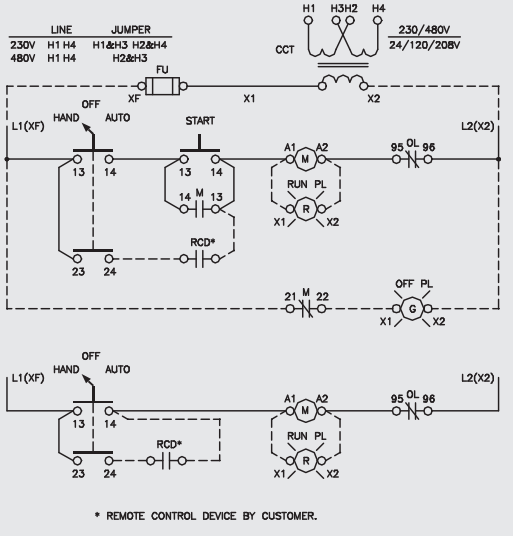
NON COMBINATION
SINGLE PHASE–SERIES WINDING
FOUR LEAD REPULSION INDUCTION MOTOR

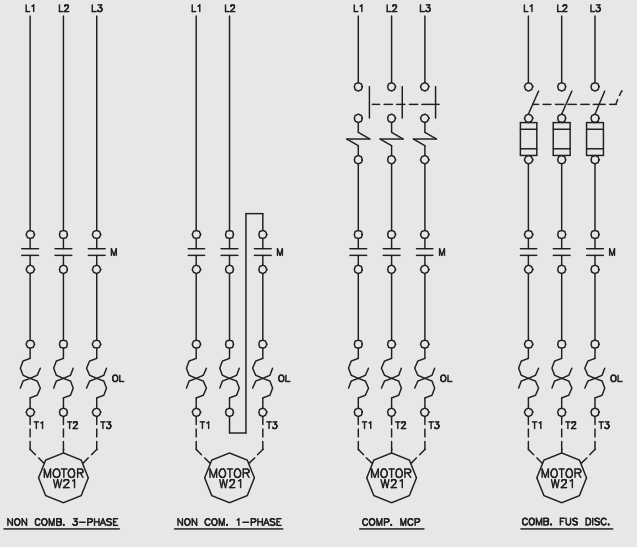


NON COMBINATION
SINGLE PHASE–PARALLEL WINDING
FOUR LEAD CAPACITOR OR SPLIT PHASE MOTOR

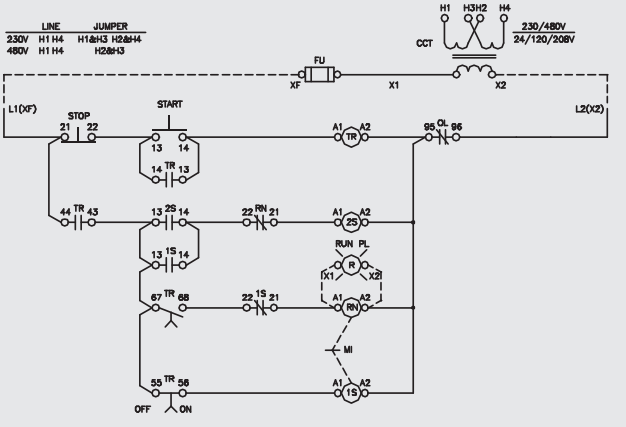
Electrical Wiring Diagrams

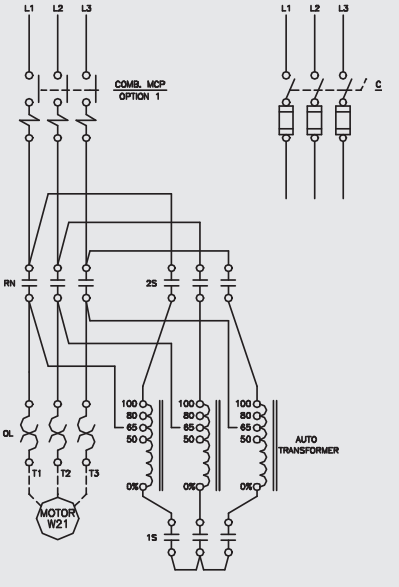
Pump Control Panels





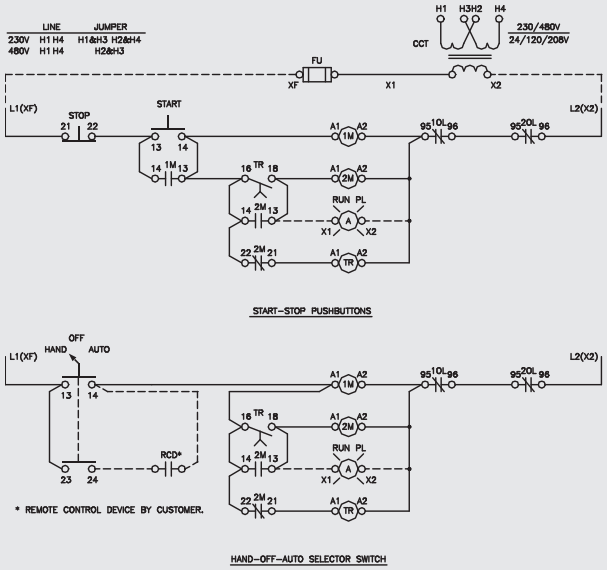
Reduced Voltage Starters - Autotransformer

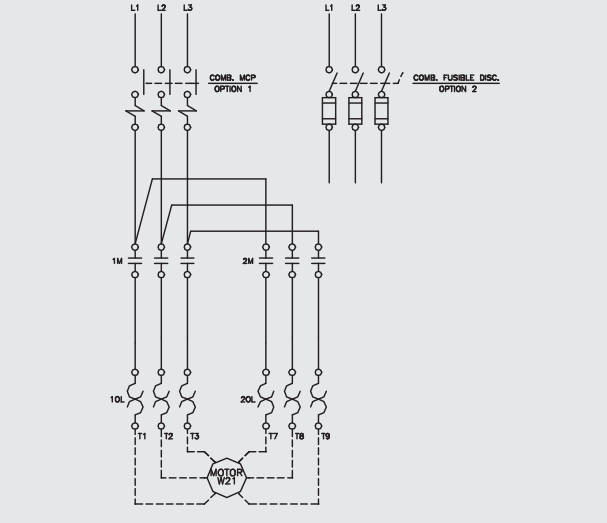




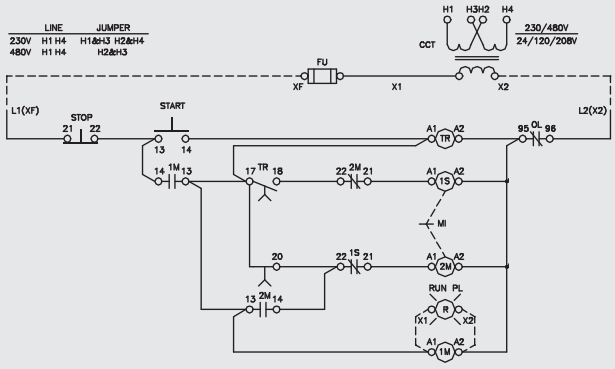
Electrical Wiring Diagrams

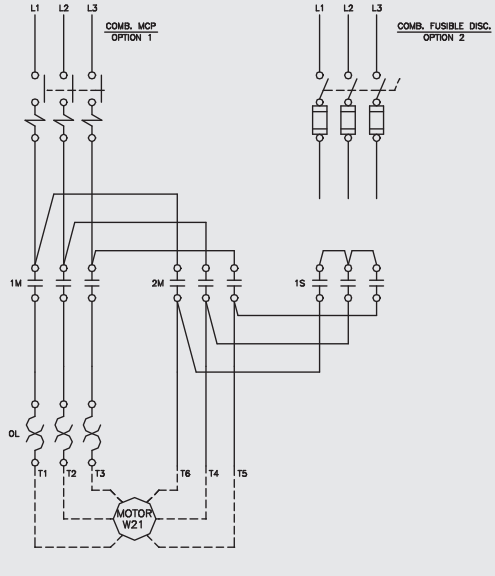
Reduced Voltage Starters - Part Winding





Reduced Voltage Starters - Wye Delta





Soft Starter and Direct on-line Starter Sizing Guide

HP	RPM	Frame	Voltage	WEG Matched Soft Starter											
				Direct–on–line Starter			SSW 05			SSW 06			SSW 07		
				230V	460V	575V	230V	460V	575V	230V	460V	575V	230V	460V	575V
1	3600	143T	208-230/460 & 575V	PESW-9V24AX-R26	PESW-9V47AX-R24	PESW-9V56AX-R24				SSW0600102X5					
	1800	143T	208-230/460 & 575V	PESW-9V24AX-R26	PESW-9V47AX-R24	PESW-9V56AX-R24				SSW0600102X5					
	1200	145T	208-230/460 & 575V	PESW-9V24AX-R26	PESW-9V47AX-R24	PESW-9V56AX-R24				SSW0600102X5					
	900	182T	208-230/460 & 575V	PESW-9V24AX-R26	PESW-9V47AX-R24	PESW-9V56AX-R24				SSW0600102X5					
1.5	3600	143T	208-230/460 & 575V	PESW-9V24AX-R27	PESW-9V47AX-R25	PESW-9V56AX-R25		SSW05003575	SSW05003575	SSW0600102X5					
	1800	145T	208-230/460 & 575V	PESW-9V24AX-R27	PESW-9V47AX-R25	PESW-9V56AX-R25		SSW05003575	SSW05003575	SSW0600102X5					
	1200	182T	208-230/460 & 575V	PESW-9V24AX-R27	PESW-9V47AX-R25	PESW-9V56AX-R25		SSW05003575	SSW05003575	SSW0600102X5					
	900	184T	208-230/460 & 575V	PESW-9V24AX-R27	PESW-9V47AX-R25	PESW-9V56AX-R25		SSW05003575	SSW05003575	SSW0600102X5					
2	3600	145T	208-230/460 & 575V	PESW-9V24AX-R28	PESW-9V47AX-R26	PESW-9V56AX-R25			SSW05003575	SSW0600102X5					
	1800	145T	208-230/460 & 575V	PESW-9V24AX-R28	PESW-9V47AX-R26	PESW-9V56AX-R25			SSW05003575	SSW0600102X5					
	1200	184T	208-230/460 & 575V	PESW-9V24AX-R28	PESW-9V47AX-R26	PESW-9V56AX-R25			SSW05003575	SSW0600102X5					
	900	213T	208-230/460 & 575V	PESW-9V24AX-R28	PESW-9V47AX-R26	PESW-9V56AX-R25			SSW05003575	SSW0600102X5					
3	3600	W182T	208-230/460 & 575V	PESW-9V24AX-R29	PESW-9V47AX-R27	PESW-9V56AX-R26	SSW050102X4	SSW05010575		SSW0600102X5	SSW0600102X5	SSW0600102X5	SSW0700172X5		
	1800	W182T	208-230/460 & 575V	PESW-9V24AX-R29	PESW-9V47AX-R27	PESW-9V56AX-R26	SSW050102X4	SSW05010575		SSW0600102X5	SSW0600102X5	SSW0600102X5	SSW0700172X5		
	1200	213T	208-230/460 & 575V	PESW-9V24AX-R29	PESW-9V47AX-R27	PESW-9V56AX-R26	SSW050102X4	SSW05010575		SSW0600102X5	SSW0600102X5	SSW0600102X5	SSW0700172X5		
	900	215T	208-230/460 & 575V	PESW-9V24AX-R29	PESW-9V47AX-R27	PESW-9V56AX-R26	SSW050102X4	SSW05010575		SSW0600102X5	SSW0600102X5	SSW0600102X5	SSW0700172X5		
5	3600	184T	208-230/460 & 575V	PESW-18V24AX-R32	PESW-9V47AX-R28	PESW-9V56AX-R27	SSW050162X4	SSW05010575	SSW05010575	SSW0600162X5	SSW0600102X5	SSW0600102X5	SSW0700172X5	SSW0700172X5	SSW0700172X5
	1800	184T	208-230/460 & 575V	PESW-18V24AX-R32	PESW-9V47AX-R28	PESW-9V56AX-R27	SSW050162X4	SSW05010575	SSW05010575	SSW0600162X5	SSW0600102X5	SSW0600102X5	SSW0700172X5	SSW0700172X5	SSW0700172X5
	1200	215T	208-230/460 & 575V	PESW-18V24AX-R32	PESW-9V47AX-R28	PESW-9V56AX-R27	SSW050162X4	SSW05010575	SSW05010575	SSW0600162X5	SSW0600102X5	SSW0600102X5	SSW0700172X5	SSW0700172X5	SSW0700172X5
	900	254T	208-230/460 & 575V	PESW-18V24AX-R32	PESW-9V47AX-R28	PESW-9V56AX-R27	SSW050162X4	SSW05010575	SSW05010575	SSW0600162X5	SSW0600102X5	SSW0600102X5	SSW0700172X5	SSW0700172X5	SSW0700172X5
7.5	3600	213T	208-230/460 & 575V	PESW-25V24AX-R33	PESW-12V47AX-R30	PESW-9V56AX-R29	SSW050232X4	SSW05016575	SSW05010575	SSW0600232X5	SSW0600162X5	SSW0600102X5	SSW0700242X5	SSW0700172X5	SSW0700172X5
	1800	213T	208-230/460 & 575V	PESW-25V24AX-R33	PESW-12V47AX-R30	PESW-9V56AX-R29	SSW050232X4	SSW05016575	SSW05010575	SSW0600232X5	SSW0600162X5	SSW0600102X5	SSW0700242X5	SSW0700172X5	SSW0700172X5
	1200	254T	208-230/460 & 575V	PESW-25V24AX-R33	PESW-12V47AX-R30	PESW-9V56AX-R29	SSW050232X4	SSW05016575	SSW05010575	SSW0600232X5	SSW0600162X5	SSW0600102X5	SSW0700242X5	SSW0700172X5	SSW0700172X5
	900	256T	208-230/460 & 575V	PESW-32V24AX-R33	PESW-12V47AX-R30	PESW-9V56AX-R29	SSW050232X4	SSW05016575	SSW05010575	SSW0600232X5	SSW0600162X5	SSW0600102X5	SSW0700242X5	SSW0700172X5	SSW0700172X5
10	3600	215T	208-230/460 & 575V	PESW-32V24AX-R34	PESW-18V47AX-R32	PESW-12V56AX-R30	SSW050302X4	SSW05016575	SSW05016575	SSW0600302X5	SSW0600162X5	SSW0600162X5	SSW0700302X5	SSW0700172X5	SSW0700172X5
	1800	215T	208-230/460 & 575V	PESW-32V24AX-R34	PESW-18V47AX-R32	PESW-12V56AX-R30	SSW050302X4	SSW05016575	SSW05016575	SSW0600302X5	SSW0600162X5	SSW0600162X5	SSW0700302X5	SSW0700172X5	SSW0700172X5
	1200	256T	208-230/460 & 575V	PESW-32V24AX-R34	PESW-18V47AX-R32	PESW-12V56AX-R30	SSW050302X4	SSW05016575	SSW05016575	SSW0600302X5	SSW0600162X5	SSW0600162X5	SSW0700302X5	SSW0700172X5	SSW0700172X5
	900	284T	208-230/460 & 575V	PESW-32V24AX-R34	PESW-18V47AX-R32	PESW-12V56AX-R30	SSW050302X4	SSW05016575	SSW05016575	SSW0600302X5	SSW0600162X5	SSW0600162X5	SSW0700302X5	SSW0700172X5	SSW0700172X5
15	3600	254T	208-230/460 & 575V	PESW-40V24AX-R35	PESW-25V47AX-R33	PESW-18V56AX-R32	SSW050452X4	SSW05023575	SSW05023575	SSW0600452X5	SSW0600232X5	SSW0600162X5	SSW0700452X5	SSW0700242X5	SSW0700172X5
	1800	254T	208-230/460 & 575V	PESW-40V24AX-R35	PESW-25V47AX-R33	PESW-18V56AX-R32	SSW050452X4	SSW05023575	SSW05023575	SSW0600452X5	SSW0600232X5	SSW0600162X5	SSW0700452X5	SSW0700242X5	SSW0700172X5
	1200	284T	208-230/460 & 575V	PESW-40V24AX-R35	PESW-25V47AX-R33	PESW-18V56AX-R32	SSW050452X4	SSW05023575	SSW05023575	SSW0600452X5	SSW0600232X5	SSW0600162X5	SSW0700452X5	SSW0700242X5	SSW0700172X5
	900	286T	208-230/460 & 575V	PESW-50V24AX-R36	PESW-32V47AX-R33	PESW-18V56AX-R32	SSW050452X4	SSW05023575	SSW05023575	SSW0600452X5	SSW0600232X5	SSW0600162X5	SSW0700452X5	SSW0700242X5	SSW0700172X5
20	3600	256T	208-230/460 & 575V	PESW-65V24AX-R39	PESW-32V47AX-R34	PESW-32V56AX-R33	SSW050602X4	SSW05030575	SSW05023575	SSW0600602X5	SSW0600302X5	SSW0600232X5	SSW0700612X5	SSW0700302X5	SSW0700242X5
	1800	256T	208-230/460 & 575V	PESW-65V24AX-R39	PESW-32V47AX-R34	PESW-32V56AX-R33	SSW050602X4	SSW05030575	SSW05023575	SSW0600602X5	SSW0600302X5	SSW0600232X5	SSW0700612X5	SSW0700302X5	SSW0700242X5
	1200	286T	208-230/460 & 575V	PESW-65V24AX-R39	PESW-32V47AX-R34	PESW-32V56AX-R33	SSW050602X4	SSW05030575	SSW05023575	SSW0600602X5	SSW0600302X5	SSW0600232X5	SSW0700612X5	SSW0700302X5	SSW0700242X5
	900	324T	208-230/460 & 575V	PESW-65V24AX-R39	PESW-32V47AX-R34	PESW-32V56AX-R33	SSW050602X4	SSW05030575	SSW05023575	SSW0600602X5	SSW0600302X5	SSW0600232X5	SSW0700612X5	SSW0700302X5	SSW0700242X5
25	3600	284TS	208-230/460 & 575V	PESW-80V24AX-R41	PESW-40V47AX-R35	PESW-32V56AX-R34		SSW05045575	SSW05030575	SSW0600852X5	SSW0600452X5	SSW0600302X5	SSW0700852X5	SSW0700452X5	SSW0700302X5
	1800	284T	208-230/460 & 575V	PESW-80V24AX-R41	PESW-40V47AX-R35	PESW-32V56AX-R34		SSW05045575	SSW05030575	SSW0600852X5	SSW0600452X5	SSW0600302X5	SSW0700852X5	SSW0700452X5	SSW0700302X5
	1200	324T	208-230/460 & 575V	PESW-80V24AX-R41	PESW-40V47AX-R35	PESW-32V56AX-R34		SSW05045575	SSW05030575	SSW0600852X5	SSW0600452X5	SSW0600302X5	SSW0700852X5	SSW0700452X5	SSW0700302X5
	900	326T	208-230/460 & 575V	PESW-80V24AX-R41	PESW-50V47AX-R36	PESW-32V56AX-R34		SSW05045575	SSW05030575	SSW0600852X5	SSW0600452X5	SSW0600302X5	SSW0700852X5	SSW0700452X5	SSW0700302X5

30	3600	286TS	208-230/460 & 575V	PESW-95V24AX-R43	PESW-50V47AX-R36	PESW-50V56AX-R36	SSW050852X4	SSW05045575	SSW05045575	SSW060852X5	SSW0600452X5	SSW0600302X5	SSW0700852X5	SSW0700452X5	SSW0700302X5
	1800	286T	208-230/460 & 575V	PESW-95V24AX-R43	PESW-50V47AX-R38	PESW-50V56AX-R36	SSW050852X4	SSW05045575	SSW05045575	SSW060852X5	SSW0600452X5	SSW0600302X5	SSW0700852X5	SSW0700452X5	SSW0700302X5
	1200	326T	208-230/460 & 575V	PESW-95V24AX-R43	PESW-50V47AX-R38	PESW-50V56AX-R36	SSW050852X4	SSW05045575	SSW05045575	SSW060852X5	SSW0600452X5	SSW0600302X5	SSW0700852X5	SSW0700452X5	SSW0700302X5
	900	364/5T	208-230/460 & 575V	PESW-95V24AX-R43	PESW-50V47AX-R38	PESW-50V56AX-R36	SSW050852X4	SSW05045575	SSW05045575	SSW060852X5	SSW0600452X5	SSW0600302X5	SSW0700852X5	SSW0700452X5	SSW0700302X5
40	3600	324TS	208-230/460 & 575V	PESW-105V24AX-R45	PESW-65V47AX-R39	PESW-50V56AX-R38		SSW05060575	SSW05045575	SSW061302X5	SSW0600602X5	SSW0600452X5	SSW0701302X5	SSW0700612X5	SSW0700452X5
	1800	324T	208-230/460 & 575V	PESW-105V24AX-R45	PESW-65V47AX-R39	PESW-50V56AX-R38		SSW05060575	SSW05045575	SSW061302X5	SSW0600602X5	SSW0600452X5	SSW0701302X5	SSW0700612X5	SSW0700452X5
	1200	364/5T	208-230/460 & 575V	PESW-105V24AX-R45	PESW-65V47AX-R39	PESW-50V56AX-R38		SSW05060575	SSW05045575	SSW061302X5	SSW0600602X5	SSW0600452X5	SSW0701302X5	SSW0700612X5	SSW0700452X5
	900	364/5T	208-230/460 & 575V	PESW-105V24AX-R45	PESW-65V47AX-R39	PESW-50V56AX-R38		SSW05060575	SSW05045575	SSW061302X5	SSW0600602X5	SSW0600452X5	SSW0701302X5	SSW0700612X5	SSW0700452X5
50	3600	326TS	208-230/460 & 575V		PESW-80V47AX-R41	PESW-65V56AX-R39		SSW05085575	SSW05060575	SSW061302X5	SSW060852X5	SSW0600602X5	SSW0701302X5	SSW0700612X5	SSW0700612X5
	1800	326T	208-230/460 & 575V		PESW-80V47AX-R41	PESW-65V56AX-R39		SSW05085575	SSW05060575	SSW061302X5	SSW060852X5	SSW0600602X5	SSW0701302X5	SSW0700612X5	SSW0700612X5
	1200	364/5T	208-230/460 & 575V		PESW-80V47AX-R41	PESW-65V56AX-R39		SSW05085575	SSW05060575	SSW061302X5	SSW060852X5	SSW0600602X5	SSW0701302X5	SSW0700612X5	SSW0700612X5
	900	404/5T	208-230/460 & 575V		PESW-80V47AX-R41	PESW-65V56AX-R39		SSW05085575	SSW05060575	SSW061302X5	SSW060852X5	SSW0600602X5	SSW0701302X5	SSW0700612X5	SSW0700612X5
60	3600	364/5TS	208-230/460 & 575V		PESW-95V47AX-R43	PESW-80V56AX-R41		SSW05085575	SSW05085575	SSW061702X5	SSW060852X5	SSW0600602X5	SSW0701712X5	SSW0700852X5	SSW0700612X5
	1800	364/5T	208-230/460 & 575V		PESW-95V47AX-R43	PESW-80V56AX-R41		SSW05085575	SSW05085575	SSW061702X5	SSW060852X5	SSW0600602X5	SSW0701712X5	SSW0700852X5	SSW0700612X5
	1200	404/5T	208-230/460 & 575V		PESW-95V47AX-R43	PESW-80V56AX-R41		SSW05085575	SSW05085575	SSW061702X5	SSW060852X5	SSW0600602X5	SSW0701712X5	SSW0700852X5	SSW0700612X5
	900	404/5T	208-230/460 & 575V		PESW-95V47AX-R43	PESW-80V56AX-R41		SSW05085575	SSW05085575	SSW061702X5	SSW060852X5	SSW0600602X5	SSW0701712X5	SSW0700852X5	SSW0700612X5
75	3600	364/5TS	208-230/460 & 575V		PESW-105V47AX-R44	PESW-95V56AX-R43			SSW05085575	SSW062052X5	SSW061302X5	SSW060852X5	SSW0702002X5	SSW0701302X5	SSW0700852X5
	1800	364/5T	208-230/460 & 575V		PESW-105V47AX-R44	PESW-95V56AX-R43			SSW05085575	SSW062052X5	SSW061302X5	SSW060852X5	SSW0702002X5	SSW0701302X5	SSW0700852X5
	1200	404/5T	208-230/460 & 575V		PESW-105V47AX-R44	PESW-95V56AX-R43			SSW05085575	SSW062052X5	SSW061302X5	SSW060852X5	SSW0702002X5	SSW0701302X5	SSW0700852X5
	900	444/5T	208-230/460 & 575V		PESW-105V47AX-R44	PESW-95V56AX-R43			SSW05085575	SSW062052X5	SSW061302X5	SSW060852X5	SSW0702002X5	SSW0701302X5	SSW0700852X5
100	3600	404/5TS	208-230/460 & 575V							SSW062552X5	SSW061302X5	SSW061302X5		SSW0701302X5	SSW0701302X5
	1800	404/5T	208-230/460 & 575V							SSW062552X5	SSW061302X5	SSW061302X5		SSW0701302X5	SSW0701302X5
	1200	444/5T	208-230/460 & 575V							SSW062552X5	SSW061302X5	SSW061302X5		SSW0701302X5	SSW0701302X5
	900	444/5T	208-230/460 & 575V							SSW062552X5	SSW061302X5	SSW061302X5		SSW0701302X5	SSW0701302X5
125	3600	444/5TS	460 & 575V							SSW063122X5	SSW061702X5	SSW061302X5		SSW0701712X5	SSW0701302X5
	1800	444/5T	460 & 575V							SSW063122X5	SSW061702X5	SSW061302X5		SSW0701712X5	SSW0701302X5
	1200	444/5T	460 & 575V							SSW063122X5	SSW061702X5	SSW061302X5		SSW0701712X5	SSW0701302X5
	900	504/5T	460 & 575V							SSW063122X5	SSW061702X5	SSW061302X5		SSW0701712X5	SSW0701302X5
150	3600	445TS	460 & 575V							SSW063652X5	SSW062052X5	SSW061702X5		SSW0702002X5	SSW0701712X5
	1800	445T	460 & 575V							SSW063652X5	SSW062052X5	SSW061702X5		SSW0702002X5	SSW0701712X5
	1200	447T	460 & 575V							SSW063652X5	SSW062052X5	SSW061702X5		SSW0702002X5	SSW0701712X5
	900	504/5T	460 & 575V							SSW063652X5	SSW062052X5	SSW061702X5		SSW0702002X5	SSW0701712X5
200	3600	447TS	460 & 575V							SSW064802X5	SSW062552X5	SSW062052X5			SSW0702002X5
	1800	447T	460 & 575V							SSW064802X5	SSW062552X5	SSW062052X5			SSW0702002X5
	1200	447T	460 & 575V							SSW064802X5	SSW062552X5	SSW062052X5			SSW0702002X5
	900	449T	460 & 575V							SSW064802X5	SSW062552X5	SSW062052X5			SSW0702002X5
250	3600	447TS	460 & 575V							SSW066042X5	SSW063122X5	SSW062552X5			
	1800	447T	460 & 575V							SSW066042X5	SSW063122X5	SSW062552X5			
	1200	586/7T	460 & 575V							SSW066042X5	SSW063122X5	SSW062552X5			
	900	586/7T	460 & 575V							SSW066042X5	SSW063122X5	SSW062552X5			
300	3600	586/7TS	460 & 575V							SSW068202X5	SSW063652X5	SSW063122X5			
	1800	586/7T	460 & 575V							SSW068202X5	SSW063652X5	SSW063122X5			
	1200	586/7T	460 & 575V							SSW068202X5	SSW063652X5	SSW063122X5			
	900	586/7T	460 & 575V							SSW068202X5	SSW063652X5	SSW063122X5			

Note:
- Motors above are foot mount. Also available with C-Flange and C-Flange Footless.
- DOL Starters above include Start/Stop Pushbuttons and Reset. Also available with Reset Only or with NEMA 1 Metallic Enclosure.
- More Soft Starters and Variable Frequency Drives available. Also available: line reactors and DB resistors. For more information call 1 877 PAMENSKY.

Variable Frequency Drive Sizing Guide

HP	RPM	Frame	Voltage	WEG Matched Variable Frequency Drive					
				CFW 08 Plus			CFW 09		
				230V	460V	575V	230V	460V	575V
1	3600	143T	208-230/460 & 575V	CFW08004B2P	CFW080026T2P	CFW080017575	CFW09.06/230	CFW09.03/460	CFW09.02/575
	1800	143T	208-230/460 & 575V	CFW08004B2P	CFW080026T2P	CFW080017575	CFW09.06/230	CFW09.03/460	CFW09.02/575
	1200	145T	208-230/460 & 575V	CFW08004B2P	CFW080026T2P	CFW080017575	CFW09.06/230	CFW09.03/460	CFW09.02/575
	900	182T	208-230/460 & 575V	CFW08004B2P	CFW080026T2P	CFW080017575	CFW09.06/230	CFW09.03/460	CFW09.02/575
1.5	3600	143T	208-230/460 & 575V	CFW080073B2P	CFW080040T4P	CFW080030575	CFW09.06/230	CFW09.03/460	CFW09.02/575
	1800	145T	208-230/460 & 575V	CFW080073B2P	CFW080040T4P	CFW080030575	CFW09.06/230	CFW09.03/460	CFW09.02/575
	1200	182T	208-230/460 & 575V	CFW080073B2P	CFW080040T4P	CFW080030575	CFW09.06/230	CFW09.03/460	CFW09.02/575
	900	184T	208-230/460 & 575V	CFW080073B2P	CFW080040T4P	CFW080030575	CFW09.06/230	CFW09.03/460	CFW09.02/575
2	3600	145T	208-230/460 & 575V	CFW080073B2P	CFW080043T4P	CFW080030575	CFW09.07/230	CFW09.04/460	CFW09.02/575
	1800	145T	208-230/460 & 575V	CFW080073B2P	CFW080043T4P	CFW080030575	CFW09.07/230	CFW09.04/460	CFW09.02/575
	1200	184T	208-230/460 & 575V	CFW080073B2P	CFW080043T4P	CFW080030575	CFW09.07/230	CFW09.04/460	CFW09.02/575
	900	213T	208-230/460 & 575V	CFW080073B2P	CFW080043T4P	CFW080030575	CFW09.07/230	CFW09.04/460	CFW09.02/575
3	3600	W182T	208-230/460 & 575V	CFW080100B2P	CFW080065T4P	CFW080042575	CFW09.10/230	CFW09.05/460	CFW09.04/575
	1800	W182T	208-230/460 & 575V	CFW080100B2P	CFW080065T4P	CFW080042575	CFW09.10/230	CFW09.05/460	CFW09.04/575
	1200	213T	208-230/460 & 575V	CFW080100B2P	CFW080065T4P	CFW080042575	CFW09.10/230	CFW09.05/460	CFW09.04/575
	900	215T	208-230/460 & 575V	CFW080100B2P	CFW080065T4P	CFW080042575	CFW09.10/230	CFW09.05/460	CFW09.04/575
5	3600	184T	208-230/460 & 575V	CFW080160T2P	CFW080100T4P	CFW080070575	CFW09.16/230	CFW09.09/460	CFW09.07/575
	1800	184T	208-230/460 & 575V	CFW080160T2P	CFW080100T4P	CFW080070575	CFW09.16/230	CFW09.09/460	CFW09.07/575
	1200	215T	208-230/460 & 575V	CFW080160T2P	CFW080100T4P	CFW080070575	CFW09.16/230	CFW09.09/460	CFW09.07/575
	900	254T	208-230/460 & 575V	CFW080160T2P	CFW080100T4P	CFW080070575	CFW09.16/230	CFW09.09/460	CFW09.07/575
7.5	3600	213T	208-230/460 & 575V	CFW080220T2P	CFW080130T4P	CFW080100575	CFW09.24/230	CFW09.13/460	CFW09.10/575
	1800	213T	208-230/460 & 575V	CFW080220T2P	CFW080130T4P	CFW080100575	CFW09.24/230	CFW09.13/460	CFW09.10/575
	1200	254T	208-230/460 & 575V	CFW080220T2P	CFW080130T4P	CFW080100575	CFW09.24/230	CFW09.13/460	CFW09.10/575
	900	256T	208-230/460 & 575V	CFW080220T2P	CFW080130T4P	CFW080100575	CFW09.24/230	CFW09.13/460	CFW09.10/575
10	3600	215T	208-230/460 & 575V	CFW080280T2P	CFW080160T4P	CFW080120575	CFW09.28/230	CFW09.16/460	CFW09.12/575
	1800	215T	208-230/460 & 575V	CFW080280T2P	CFW080160T4P	CFW080120575	CFW09.28/230	CFW09.16/460	CFW09.12/575
	1200	256T	208-230/460 & 575V	CFW080280T2P	CFW080160T4P	CFW080120575	CFW09.28/230	CFW09.16/460	CFW09.12/575
	900	284T	208-230/460 & 575V	CFW080280T2P	CFW080160T4P	CFW080120575	CFW09.28/230	CFW09.16/460	CFW09.12/575
15	3600	254T	208-230/460 & 575V		CFW080240T4P		CFW09.45/230	CFW09.24/460	CFW09.14/575
	1800	254T	208-230/460 & 575V		CFW080240T4P		CFW09.45/230	CFW09.24/460	CFW09.14/575
	1200	284T	208-230/460 & 575V		CFW080240T4P		CFW09.45/230	CFW09.24/460	CFW09.14/575
	900	286T	208-230/460 & 575V		CFW080240T4P		CFW09.45/230	CFW09.24/460	CFW09.14/575
20	3600	256T	208-230/460 & 575V		CFW080300T4P		CFW09.54/230	CFW09.30/460	CFW09.22/575
	1800	256T	208-230/460 & 575V		CFW080300T4P		CFW09.54/230	CFW09.30/460	CFW09.22/575
	1200	286T	208-230/460 & 575V		CFW080300T4P		CFW09.54/230	CFW09.30/460	CFW09.22/575
	900	324T	208-230/460 & 575V		CFW080300T4P		CFW09.54/230	CFW09.30/460	CFW09.22/575
25	3600	284TS	208-230/460 & 575V				CFW09.70/230	CFW09.38/460	CFW09.27/575
	1800	284T	208-230/460 & 575V				CFW09.70/230	CFW09.38/460	CFW09.27/575
	1200	324T	208-230/460 & 575V				CFW09.70/230	CFW09.38/460	CFW09.27/575
	900	326T	208-230/460 & 575V				CFW09.70/230	CFW09.38/460	CFW09.27/575

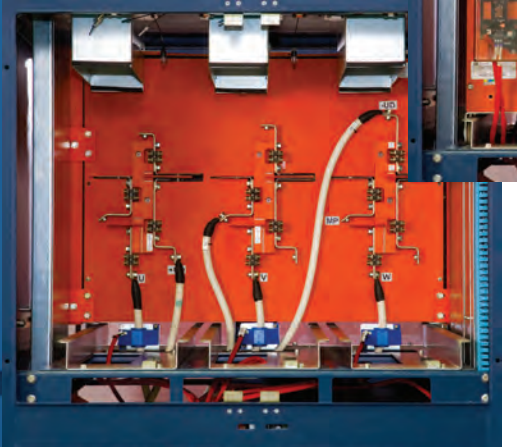
30	3600	286TS	208-230/460 & 575V		CFW09.86/230	CFW09.45/460	CFW09.32/575
	1800	286T	208-230/460 & 575V		CFW09.86/230	CFW09.45/460	CFW09.32/575
	1200	326T	208-230/460 & 575V		CFW09.86/230	CFW09.45/460	CFW09.32/575
	900	364/5T	208-230/460 & 575V		CFW09.86/230	CFW09.45/460	CFW09.32/575
40	3600	324TS	208-230/460 & 575V		CFW09105/230	CFW09.60/460	CFW09.44/575
	1800	324T	208-230/460 & 575V		CFW09105/230	CFW09.60/460	CFW09.44/575
	1200	364/5T	208-230/460 & 575V		CFW09105/230	CFW09.60/460	CFW09.44/575
	900	364/5T	208-230/460 & 575V		CFW09105/230	CFW09.60/460	CFW09.44/575
50	3600	326TS	208-230/460 & 575V		CFW09130/230	CFW09.70/460	CFW09.53/575
	1800	326T	208-230/460 & 575V		CFW09130/230	CFW09.70/460	CFW09.53/575
	1200	364/5T	208-230/460 & 575V		CFW09130/230	CFW09.70/460	CFW09.53/575
	900	404/5T	208-230/460 & 575V		CFW09130/230	CFW09.70/460	CFW09.53/575
60	3600	364/5TS	208-230/460 & 575V		CFW09180/230	CFW09.86/460	CFW09.63/575
	1800	364/5T	208-230/460 & 575V		CFW09180/230	CFW09.86/460	CFW09.63/575
	1200	404/5T	208-230/460 & 575V		CFW09180/230	CFW09.86/460	CFW09.63/575
	900	404/5T	208-230/460 & 575V		CFW09180/230	CFW09.86/460	CFW09.63/575
75	3600	364/5TS	208-230/460 & 575V		CFW09240/230	CFW09105/460	CFW09.79/575
	1800	364/5T	208-230/460 & 575V		CFW09240/230	CFW09105/460	CFW09.79/575
	1200	404/5T	208-230/460 & 575V		CFW09240/230	CFW09105/460	CFW09.79/575
	900	444/5T	208-230/460 & 575V		CFW09240/230	CFW09105/460	CFW09.79/575
100	3600	404/5TS	208-230/460 & 575V			CFW09142/460	CFW09.107575
	1800	404/5T	208-230/460 & 575V			CFW09142/460	CFW09.107575
	1200	444/5T	208-230/460 & 575V			CFW09142/460	CFW09.107575
	900	444/5T	208-230/460 & 575V			CFW09142/460	CFW09.107575
125	3600	444/5TS	460 & 575V			CFW09180/460	CFW09147/575
	1800	444/5T	460 & 575V			CFW09180/460	CFW09147/575
	1200	444/5T	460 & 575V			CFW09180/460	CFW09147/575
	900	504/5T	460 & 575V			CFW09180/460	CFW09147/575
150	3600	445TS	460 & 575V			CFW09180/460	CFW09147/575
	1800	445T	460 & 575V			CFW09180/460	CFW09147/575
	1200	447T	460 & 575V			CFW09180/460	CFW09147/575
	900	504/5T	460 & 575V			CFW09180/460	CFW09147/575
200	3600	447TS	460 & 575V			CFW09240/460	CFW09211/575
	1800	447T	460 & 575V			CFW09240/460	CFW09211/575
	1200	447T	460 & 575V			CFW09240/460	CFW09211/575
	900	449T	460 & 575V			CFW09240/460	CFW09211/575
250	3600	447TS	460 & 575V			CFW09312/460	CFW09247/575
	1800	447T	460 & 575V			CFW09312/460	CFW09247/575
	1200	586/7T	460 & 575V			CFW09312/460	CFW09247/575
	900	586/7T	460 & 575V			CFW09312/460	CFW09247/575
300	3600	586/7TS	460 & 575V			CFW09361/460	CFW09315/575
	1800	586/7T	460 & 575V			CFW09361/460	CFW09315/575
	1200	586/7T	460 & 575V			CFW09361/460	CFW09315/575
	900	586/7T	460 & 575V			CFW09361/460	CFW09315/575

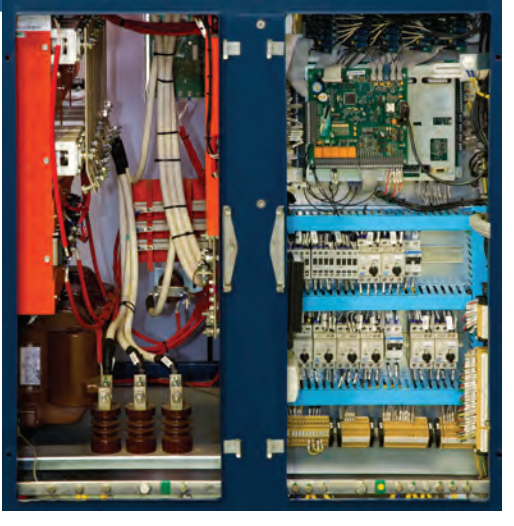
Note:
- Motors above are foot mount. Also available with C-Flange and C-Flange Footless.
- DOL Starters above include Start/Stop Pushbuttons and Reset. Also available with Reset Only or with NEMA 1 Metallic Enclosure.
- More Soft Starters and Variable Frequency Drives available. Also available: line reactors and DB resistors. For more information call 1 877 PAMENSKY.

Custom Panels

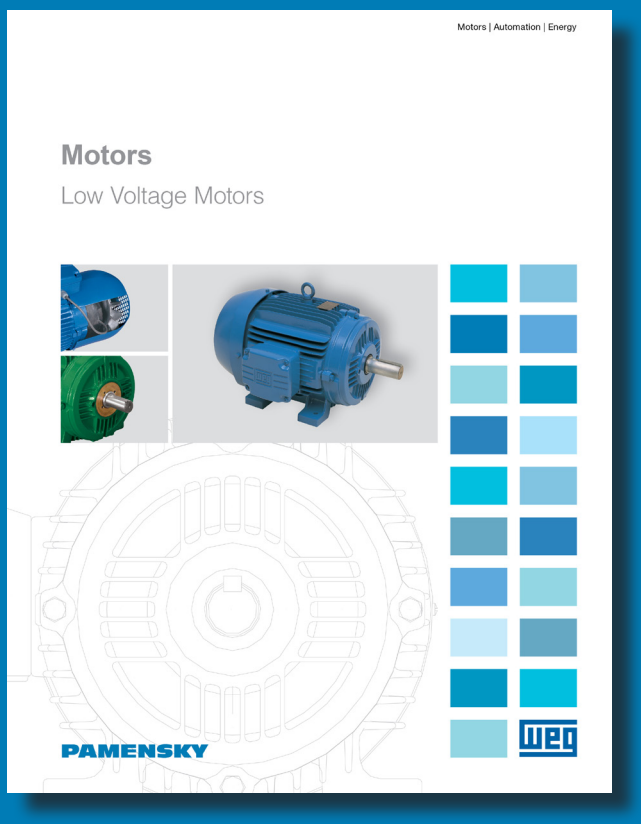
V. J Pamensky Canada Inc. is able to offer custom panels manufactured in Canada integrating WEG variable frequency drives, soft starters and controls into rugged and reliable industrial control panels. We are able to produce unique custom drive and soft starter panels designed to meet customer specifications. All of our panels are fully compliant with local certifications as required by the customer. Our years of experience in the Canadian market give us a unique advantage providing both the motor and controls in one integrated engineered solution.

In addition to the custom panels provided in Canada we can also supply them from the WEG factories in Brazil and Mexico.





Look for This Catalogs



Worldwide Entities That Have Approved WEG

Argentina

Australia

Test Safe

Belgium

Brazil

INMETRO

CEPEL

Canada

China

CNEX
国家防爆

France

Germany

PTB

VDE
Prüf- und Zertifizierungsinstitut

Italy

CESI

Japan

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NOM

ANCE

GARANTIA DE FIDE

Norway

DNV

Portugal

INERIS

Switzerland

Saudi Arabia

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SABS

United Kingdom

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BSRIA

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PAMENSKY

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			T2C 4V3		
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