

# WEG Automation Catalog

Power Factor Correction  
(UCWT and BCWT  
series)

Motors  
**Automation**  
Energy  
Transmission & Distribution

## **Power Factor Correction**

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Driving efficiency and sustainability

# Power Factor Correction

## Product Groups

**UCWT series** – Three Phase Capacitor Unit (Heavy Duty)

**BCWT series** – Bank of three phase capacitors with or without fuse protection, in NEMA 4 enclosure



WEG power factor correction capacitors were designed using self-healing metallized polypropylene film, have security protection against internal over pressure and the dielectric losses are less than 0.2 W/kVAr. The growing demand for electricity has required large investments in power generation to meet the rate of global development, both in developing countries where the population has gained greater access to consumer goods, and in developed countries, where energy efficiency has been object concern in order to reduce high investments in power generation. These investments, however, besides being planned in the medium and long term, involve the use of increasingly scarce natural resources which are subject to environmental pressures. In short term, the best way to increase the supply of electricity has been reducing waste and increasing energy efficiency. It is estimated that currently 40% of global consumption of electricity is related to the use of electric motors. Moreover, the application of new technologies has become increasingly common in many industry sectors, bringing deep changes in the form of application and control of electric motors. Within this context of technological changes and pressures for higher energy efficiency, WEG presents its line of capacitors for power factor correction.

### Standard Features:

- Self-healing metallized polypropylene film
- Internal over pressure security device
- Maximum allowed fault current of 10kA
- Dielectric losses smaller than 0.2 W/kVAr
- Internal discharge resistors in three-phase units, modules and banks
- Custom Built PFCC Banks available upon request

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## Sizing Power Factor Capacitors

There are 2 methods we will use examples to show how to size power factor correction capacitors.

The simplest method uses the selected chart below. The selection chart shows the maximum KVAR based on the motor hp and rpm. The KVAR recommended is designed to improve the power factor to approximately 0.95.

HP	3600 RPM		1800 RPM		1200 RPM		900 RPM		720 RPM		600 RPM	
	Required KVAR	Est. Amp Red. %										
1	0.5	15	0.75	24	1	29	1.5	39	1.5	42	2	42
1.5	0.75	15	0.75	24	1	29	1.5	39	2	42	2	42
2	1.0	15	1	24	1.5	29	2	39	2	42	2.5	42
3	1.5	14	1.5	23	2.5	28	3	38	3	40	3	40
5	2	14	2.5	22	3	26	3	31	3	40	5	40
7.5	2.5	14	3	20	3	21	5	28	5	38	5	45
10	3	14	3	18	5	21	5	27	7.5	36	7.5	38
15	5	12	5	18	5	20	7.5	24	7.5	32	10	34
20	5	12	5	17	7.5	19	7.5	23	12.5	25	17.5	30
25	7.5	12	7.5	17	7.5	19	10	23	12.5	25	17.5	30
30	7.5	11	7.5	16	10	19	12.5	22	15	24	22.5	30
40	10	12	12.5	15	15	19	17.5	21	22.5	24	25	30
50	12.5	12	17.5	15	20	19	22.5	21	22.5	24	30	30
60	15	12	20	14	22.5	17	25	20	30	22	35	28
75	20	12	22.5	14	25	15	27.5	17	30	14	40	19
100	22.5	11	30	14	30	12	35	16	40	15	45	17
125	25	10	35	12	35	12	40	14	45	15	50	17
150	30	10	40	12	40	12	50	14	50	14	60	17
200	35	10	50	11	50	10	60	13	60	13	90	17
250	40	11	60	10	60	10	75	13	85	13	100	17
300	45	11	60	10	75	12	100	14	100	13	120	17
350	50	12	75	8	90	12	120	13	120	13	135	15
400	75	10	75	8	100	12	130	13	140	13	150	15
450	75	8	90	8	120	10	140	12	160	14	160	15
500	100	8	100	9	150	12	160	12	180	13	180	15

### Example:

For a 75 hp motor running at 3600 rpm, the maximum value would be 20 KVAR.

**Important!** Do not oversize the capacitors, when sizing at the motor load to avoid over voltage on the circuit.

Note: the KVAR needed to correct the Power Factor is the same regardless of the motor voltage. The actual capacitor selection is dependant on voltage.



## Sizing Power Factor Capacitors

The next method uses a power factor multiplier chart and formula for calculating the recommended KVAR. This method is often used when sizing power factor capacitors for a system wide approach.

Existing power factor	Desired Power factor (F)														
	0.85	0.86	0.87	0.88	0.89	0.90	0.91	0.92	0.93	0.94	0.95	0.96	0.97	0.98	0.99
0.50	1.112	1.139	1.165	1.192	1.220	1.248	1.276	1.306	1.337	1.369	1.403	1.440	1.481	1.529	1.589
0.52	1.023	1.050	1.076	1.103	1.131	1.159	1.187	1.217	1.248	1.280	1.314	1.351	1.392	1.440	1.500
0.54	0.939	0.966	0.992	1.019	1.047	1.075	1.103	1.133	1.164	1.196	1.230	1.267	1.308	1.356	1.416
0.56	0.860	0.887	0.913	0.940	0.968	0.996	1.024	1.054	1.085	1.117	1.151	1.188	1.229	1.277	1.337
0.58	0.785	0.812	0.838	0.865	0.893	0.921	0.949	0.979	1.010	1.042	1.076	1.113	1.154	1.202	1.262
0.60	0.713	0.740	0.766	0.793	0.821	0.849	0.877	0.907	0.938	0.970	1.004	1.041	1.082	1.130	1.190
0.62	0.646	0.673	0.699	0.726	0.754	0.782	0.810	0.840	0.871	0.903	0.937	0.974	1.015	1.063	1.123
0.64	0.581	0.608	0.634	0.661	0.689	0.717	0.745	0.775	0.806	0.838	0.872	0.909	0.950	0.998	1.068
0.66	0.518	0.545	0.571	0.598	0.626	0.654	0.682	0.712	0.743	0.775	0.809	0.846	0.887	0.935	0.995
0.68	0.458	0.485	0.511	0.538	0.566	0.594	0.622	0.652	0.683	0.715	0.749	0.786	0.827	0.875	0.935
0.70	0.400	0.427	0.453	0.480	0.508	0.536	0.564	0.594	0.625	0.657	0.691	0.728	0.769	0.817	0.877
0.72	0.344	0.371	0.397	0.424	0.452	0.480	0.508	0.538	0.569	0.601	0.635	0.672	0.713	0.761	0.821
0.74	0.289	0.316	0.342	0.369	0.397	0.425	0.453	0.483	0.514	0.546	0.580	0.617	0.658	0.706	0.766
0.76	0.235	0.262	0.288	0.315	0.343	0.371	0.399	0.429	0.460	0.492	0.526	0.563	0.604	0.652	0.712
0.78	0.182	0.209	0.235	0.262	0.290	0.318	0.346	0.376	0.407	0.439	0.473	0.510	0.551	0.599	0.659
0.80	0.130	0.157	0.183	0.210	0.238	0.266	0.294	0.324	0.355	0.387	0.421	0.458	0.499	0.547	0.609
0.82	0.078	0.105	0.131	0.158	0.186	0.214	0.242	0.272	0.303	0.335	0.369	0.406	0.447	0.495	0.555
0.84	0.026	0.053	0.079	0.106	0.134	0.162	0.190	0.220	0.251	0.283	0.317	0.354	0.395	0.443	0.503
0.86	-	-	0.026	0.053	0.081	0.109	0.137	0.167	0.198	0.230	0.264	0.301	0.342	0.390	0.450
0.88	-	-	-	-	0.028	0.056	0.084	0.114	0.145	0.177	0.211	0.248	0.289	0.337	0.397
0.90	-	-	-	-	-	-	0.028	0.058	0.089	0.121	0.155	0.192	0.233	0.281	0.341
0.92	-	-	-	-	-	-	-	-	0.031	0.063	0.097	0.134	0.175	0.223	0.283
0.94	-	-	-	-	-	-	-	-	-	0.034	0.071	0.112	0.160	0.229	
0.96	-	-	-	-	-	-	-	-	-	-	-	0.041	0.089	0.149	
0.98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.060

First, determine the Total kW used in the system.

Second, look to the left hand column of the power factor correction multiplier chart (Table above), and select the original or existing power factor.

Third, select the desired power factor and choose the number (multiplier) that intersects the two columns.

Take the number (multiplier) and multiply it by the Total kW of the system.

### Example:

Total kW \_\_\_\_\_ = 500 kW

Existing Power Factor \_\_\_\_\_ = 0.78

Required Power Factor \_\_\_\_\_ = 0.92

Multiplier from Table above \_\_\_\_\_ = 0.376

### Formula:

$$0.376 \times 500 \text{ kW} = 188 \text{ kVar}$$

For automatic switching or fixed units at the main, choose the closest value. If the exact kVar is not listed, choose the next higher rating.

For the example listed above, it would be 200 kVar.

If the existing power factor is not known, you can calculate it.

The power factor formula is: Active Power (kW) divided by the Apparent Power (kVA)

$$\text{PF} = \text{kW} / \text{kVA}$$

*Notes: The examples shown on this catalog are strictly for guidance. Whenever possible, the load types and load curves of the installation should be evaluated. If more than 20% of the loads to be corrected are non-linear (VFDs, Soft-Starters, rectifiers, electronic reactors, etc.), Anti-Harmonics Inductors must be installed in series with the capacitors.*

*THD limit for capacitors: THD voltage < 5% Vrms and THD current < 15%.*

*The use of capacitors in electric systems with high harmonic distortions can internally damage the capacitive cells.*

# Power Factor Correction



## Three Phase Capacitive Units - UCWT (Heavy Duty)

**Reactive Power 0.45...26.82 kVAR**

**Rated Voltage 208V**

**Reactive Power 0.5...20 kVAR**

**Rated Voltage 240V**

**Reactive Power 0.5...50 kVAR**

**Rated Voltage 480V**



## Three Phase Capacitors - UCWT (Heavy Duty)<sup>1)2)</sup>

General Information	Circuit Protection	Disconnect Switches	Motor Protectors	Contactors	Overloads	Enclosed Starters	Relays	Pushbuttons and Pilot Lights	Terminal Blocks	Power Factor Correction	Rated Voltage (V)	60 Hz		Capacitance (μF)	Capacitance (μF) (Δ Connection)	Series <sup>3)</sup>	Dimensions ØxH (in)	Weight (lb)	Catalog Number	List Price	Multiplier
											Reactive Power (kVAR)	Rated Current In (A)									
208	208	208	208	208	208	208	208	208	208	208	0.45	1.2	9.1	9.1 x 3	D	2.4 x 6.1	1.19	UCWT0.5V25 L10	\$45		
											0.67	1.9	13.7	13.7 x 3	D	2.4 x 6.1	1.19	UCWT0.75V25 L10	\$47		
											0.89	2.5	18.3	18.3 x 3	D	2.4 x 6.1	1.19	UCWT1V25 L10	\$50		
											1.34	3.7	27.4	27.4 x 3	D	2.4 x 6.1	1.19	UCWT1.5V25 L10	\$55		
											1.79	5.0	36.6	36.6 x 3	D	2.4 x 6.1	1.19	UCWT2V25 L10	\$61		
											2.23	6.2	45.7	45.7 x 3	D	2.4 x 8.3	1.19	UCWT2.5V25 L16	\$70		
											2.68	7.4	54.8	54.8 x 3	D	2.4 x 8.3	1.52	UCWT3V25 L16	\$76		
											4.47	12.4	91.4	91.4 x 3	E	2.9 x 8.7	3.01	UCWT5V25 N20	\$124		
											6.70	18.6	137.1	137.1x3	E	2.9 x 11.1	3.85	UCWT7.5V25 N22	\$148		
											8.94	24.8	182.8	182.7x3	E	2.9 x 11.1	3.85	UCWT10V25 N22	\$175		
											8.94	24.8	182.8	182.7x3	F	3.9x9.0	2.17	UCWT10V25 Q26	\$184		
											11.17	31.0	228.5	228.3x3	F	3.3 x 14	4.40	UCWT12.5V25 Q26	\$192		
											13.41	37.2	274.2	274 x 3	F	3.3 x 14	4.40	UCWT15V25 S26	\$246		
											15.64	43.4	319.7	319.7x3	F	4.5 x 11.4	3.50	UCWT17.5V25 S28	\$258		
											17.88	49.6	385.4	385.4x3	F	4.5 x 11.4	3.50	UCWT20V25 S28	\$267		
											22.35	62.0	456.7	456.7x3	F	5.3 x 11.4	4.43	UCWT25V25 U28	\$278		
											26.82	74.4	548.1	548.1x3	F	5.3 x 11.4	4.43	UCWT30V25 U28	\$285		
240	240	240	240	240	240	240	240	240	240	240	0.50	1.2	7.7	7.7x3	D	2.4 x 6.1	1.19	UCWT0.5V29 L10	\$45		
											0.75	1.8	11.5	11.5x3	D	2.4 x 6.1	1.19	UCWT0.75V29 L10	\$47		
											1.00	2.4	15.4	15.4x3	D	2.4 x 6.1	1.19	UCWT1V29 L10	\$50		
											1.50	3.6	23.0	23.0x3	D	2.4 x 6.1	1.19	UCWT1.5V29 L10	\$55		
											2.00	4.8	30.7	30.7x3	D	2.4 x 6.1	1.19	UCWT2V29 L10	\$61		
											2.50	6.0	38.4	38.4x3	D	2.4 x 8.3	1.19	UCWT2.5V29 L16	\$70		
											3.00	7.2	46.1	46.1x3	D	2.4 x 8.3	1.19	UCWT3V29 L16	\$76		
											5.00	12.0	76.8	76.8x3	E	2.9 x 8.7	3.01	UCWT5V29 N20	\$124		
											7.50	18.0	115.2	115.2x3	E	2.9 x 11.1	3.98	UCWT7.5V29 N22	\$148		
											10.00	24.1	153.6	153.6x3	E	3.3 x 14	4.40	UCWT10V29 N22	\$175		
											10.00	24.1	153.5	153.6x3	F	2.5 x 9	4.40	UCWT10V29 Q26	\$184		
											12.50	30.1	192.0	192.0x3	F	3.3 x 14	4.40	UCWT12.5V29 Q26	\$246		
											15.00	36.1	230.3	230.3x3	F	4.5 x 9	5.10	UCWT15V29 S26	\$257		
											17.50	42.1	268.3	268.3x3	F	4.5 x 9	7.10	UCWT17.5V29 S28	\$269		
											20.00	48.1	307.0	307x3	F	4.5 x 9	7.05	UCWT20V29 S28	\$269		

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1) For other voltages, please contact WEG.

2) Discharge resistors sized so the voltage on the terminals of the capacitor is 1/10 of the rated voltage in 30 s.

3) The D series capacitors are provided with internal resistors in the capacitive cell. The E series capacitors are provided with external resistors in the capacitive cell.

Three Phase Capacitors - UCWT (Heavy Duty)<sup>1) 2)</sup>

Rated Voltage (V)	60 Hz		Capacitance (μF)	Capacitance (μF) (Δ Connection)	Series <sup>3)</sup>	Dimensions ØxH (in)	Weight (lb)	Catalog Number	List Price	Multiplier
	Reactive Power (kVAr)	Rated Current In (A)								
480	0.50	0.6	1.9	1.9 x 3	D	2.4 x 6.1	1.17	UCWT0.5V53 L10	\$43	Z11
	0.60	0.7	2.3	2.3 x3	D	2.4 x 6.1	1.17	UCWT0.5V52 L10	\$43	
	0.75	0.9	2.9	2.9 x 3	D	2.4 x 6.1	1.17	UCWT0.75V53 L10	\$45	
	0.90	1.1	3.5	3.5x3.5	D	2.4 x 6.1	1.17	UCWT0.75V52 L10	\$46	
	1.00	1.2	3.8	3.8 x 3	D	2.4 x 6.1	1.17	UCWT1V53 L10	\$47	
	1.50	1.8	5.8	5.8 x 3	D	2.4 x 6.1	1.17	UCWT1.5V53 L10	\$51	
	1.90	2.2	6.9	6.9x3	D	2.4 x 6.1	1.17	UCWT1.5V52 L10	\$51	
	2.00	2.4	7.7	7.7 x 3	D	2.4 x 6.1	1.17	UCWT2V53 L10	\$56	
	2.50	3.0	9.6	9.6 x 3	D	2.4 x 6.1	1.17	UCWT2.5V53 L10	\$60	
	3.60	4.3	13.8	13.8 x 3	D	2.4 x 6.1	1.63	UCWT3V52 L10	\$80	
	5.00	6.0	19.2	19.2 x 3	D	2.4 x 6.1	1.52	UCWT5V53 L16	\$80	
	7.50	9.0	28.8	28.8 x 3	E	2.9 x 8.7	2.93	UCWT7.5V53 N20	\$103	
	9.00	10.8	34.5	34.5x3	E	2.9 x 3	2.93	UCWT7.5V52 N20	\$114	
	10.00	12.0	38.4	38.4 x 3	E	2.9 x 8.7	3.04	UCWT10V53 N20	\$118	
	12.50	15.0	48.0	48.0 x 3	E	2.9 x 11.1	3.81	UCWT12.5V53 N22	\$131	
	15.00	18.0	57.6	57.6 x 3	E	2.9 x 11.1	3.90	UCWT12.5V52 N22	\$145	
	15.00	18.0	57.6	57.6 x 3	E	2.9 x 11.1	3.64	UCWT15V53 N22	\$155	
	15.00	18.0	57.6	57.6 x 3	E	2.9 x 11.1	5.73	UCWT15V53 Q26	\$155	
	17.50	21.0	67.2	67.15 x 3	E	3.3 x 14	4.40	UCWT17.5V53 Q26	\$219	
	18.00	21.7	69.1	69.1 x 3	F	3.3 x 14	4.40	UCWT15V52 Q26	\$224	
	20.00	24.1	76.8	76.7 x 3	F	3.3 x 14	4.40	UCWT20V53 S26	\$232	
	22.50	27.1	86.4	86.3 x 3	F	4.5 x 9	4.40	UCWT22.5V53 S26	\$246	
	25.00	30.1	96.0	96.3 x3	F	4.5 x 9	4.40	UCWT25V53 S26	\$259	
	30.00	36.1	115.1	115.1x3	F	4.5 x 9	4.40	UCWT30V53 S28	\$267	
	35.00	42.1	134.3	134.3x3	F	4.5 x 9	4.40	UCWT35V53 S28	\$274	
	40.00	48.1	153.5	153.5x3	F	5.3 x 9	12.23	UCWT40V53 U28	\$289	
	50.00	60.1	191.9	191.9x3	F	5.3 x 9	12.23	UCWT50V53 U28	\$325	

1) For other voltages, please contact WEG.

2) Discharge resistors sized so the voltage on the terminals of the capacitor is 1/10 of the rated voltage in 30 s.

3) The D series capacitors are provided with internal resistors in the capacitive cell. The E series capacitors are provided with external resistors in the capacitive cell.

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# Power Factor Correction



## UCWT(Heavy Duty) - Technical Data

	Technical Characteristics	D Series	E Series	F Series
General Information	Phases		Three Phase	
Circuit Protection	Power	0.45...5 [kVAr]	4.47...17.5 [kVAr]	8.94...50 [kvar]
Disconnect Switches	Rated Voltage		208...480 [V]	
Motor Protectors	Rated Frequency		50 or 60 [Hz]	
Contactors	Capacitance tolerance		±5 [%]	
Overloads	Useful Life		100.000 [h]	
Starters	Temperature class		Min temperature: -13 °F Max temperature: 131 °F	
			Avg. max. temp. in 24h = 13 °F Avg. max. temp. in 1 year = 95 °F	
Relays	Safety		Self-healing polypropylene film Disconnection for overpressure	
	Max. Short Circuit Capacity		10 [kA] @ 560V	
	Protection Degree	IP50		IP20
	Max. Altitude <sup>1)</sup>		6561 (ft)	
	Shield / Terminal	Plastic / Screw + Washer		Aluminum / Box
	Input Cable Connection	M3 Flat/Philips		Box Terminal
	Input Cable Section	20...10 AWG		10...8 AWG
	Input Cable Torque	7...13 (lb-in)		13...22 (lb-in)
	Discharge Resistance	Inside the product		Fast-on Terminal
	Discharge Resistor		Included	
	Capacitor Mounting Bolt		M12 bolt	
	Max. Torque for Capacitor		124 (lb-in)	
	Impregnation		Polyurethane Resin	
	Max. Voltage		1.1 x Vn 8h Duration for each 24 h - not continuous (system fluctuation)	
	Max. dV/dt		≤ 30 [V/μs]	
	Max. Current		1.3 x In (short periods of time)	
	Max. Inrush Currente		≤ 100 x In	
	Voltage Test Between Terminals		2.15 x Vn for 2 sec	
	Voltage Test Between Terminals and Enclosure		3 kV for 2 sec	
	Reference Standards		IEC 60831-1/2 UL 810	
	Certifications			

1) Maximum Altitude: 6561 ft. For application in higher altitudes, please contact WEG.

## Accessories for Capacitors

### Discharge Resistors

UCWT (E and F Series)				
Catalog Number	Resistance / Power	Package Quantity	List Price	Multiplier
RDC 39K 3W-UCW-T	3x39 kΩ / 3 W	1pk with 3 pieces	\$3	Z11
RDC 56K 3W-UCW-T	3x56 kΩ / 3 W	1pk with 3 pieces	\$3	
RDC 82K 3W-UCW-T	3x82 kΩ / 3 W	1pk with 3 pieces	\$3	
RDC 120K 3W-UCW-T	3x120 kΩ / 3 W	1pk with 3 pieces	\$3	
RDC 150K 3W-UCW-T	3x150 kΩ / 3 W	1pk with 3 pieces	\$3	
RDC 180K 3W-UCW-T	3x180 kΩ / 3 W	1pk with 3 pieces	\$3	
RDC 270K 3W-UCW-T	3x270 kΩ / 3 W	1pk with 3 pieces	\$3	
RDC 390K 3W-UCW-T	3x390 kΩ / 3 W	1pk with 3 pieces	\$3	

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## D Series

### Three Phase Capacitive Units - UCWT (Heavy Duty)

**Reactive Power 0.45...2.68 kVAR**

**Rated Voltage 208V**

UL File No. E192546

**Reactive Power 0.5...3 kVAR**

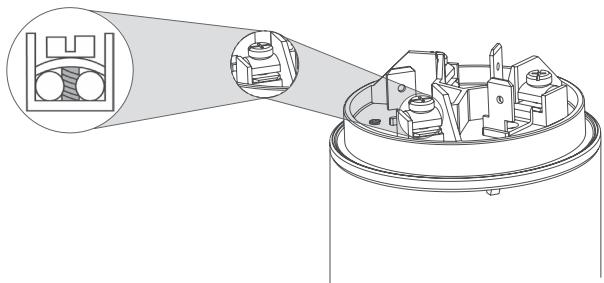
**Rated Voltage 240V**

**Reactive Power 0.5...5 kVAR**

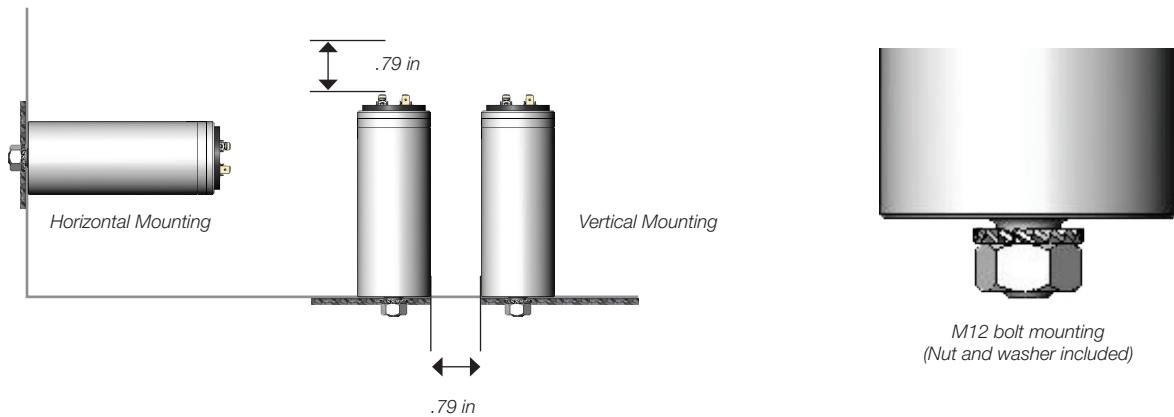
**Rated Voltage 480V**

#### Electrical Connections

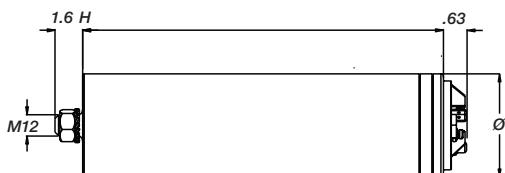
- Provided with NEMA 12 rating protection cover.
- M3 Flat/Philips screw terminals for connection of power cables.
- The D series capacitors are provided with internal resistors in the capacitive cell.
- Grounding is assured by connection of capacitive unit mounting bolt with assembly plate.



#### Mounting



#### Dimensions (in) and Protection Degree



Diameter (Ø)	Height (H)	Protection Degree
2.4	6.1	IP50
2.4	8.3	IP50

# Power Factor Correction



General Information

Circuit Protection

Disconnect Switches

Motor Protectors

Contactors

Overloads

Enclosed Starters

Relays

Pushbuttons and Pilot Lights

Terminal Blocks

Power Factor Correction

Appendix A

Appendix B

Appendix C

## E Series

### Three Phase Capacitive Units - UCWT (Heavy Duty)

**Reactive Power 4.47...8.94 kVAR**

**Rated Voltage 208V**

**Reactive Power 5...10 kVAR**

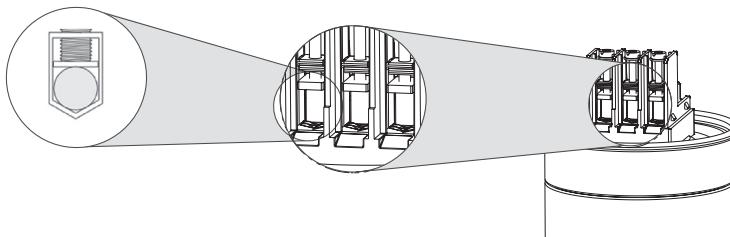
**Rated Voltage 240V**

**Reactive Power 0.5...5 kVAR**

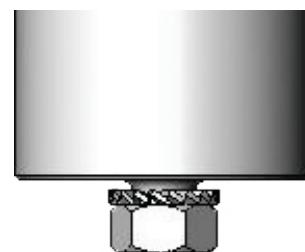
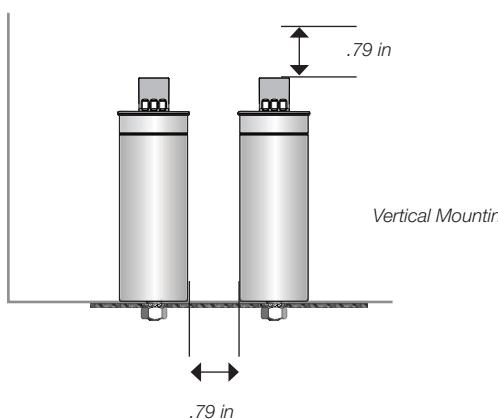
**Rated Voltage 480V**

#### Electrical Connections

- “Box” type terminals for connection of power cables.
- Fast-on connection terminals for discharge resistor connection
- The E series capacitors are provided with external resistors in the capacitive cell.
- Allows connection of power cables separately from discharge resistors.
- Grounding is assured by connection of capacitive unit mounting bolt with assembly plate.

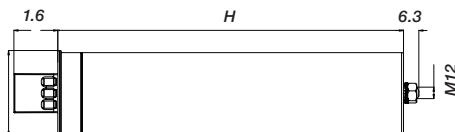


#### Mounting



M12 bolt mounting  
(Nut and washer included)

#### Dimensions (in) and Protection Degree



Diameter (Ø)	Height (H)	Protection Degree
2.9	8.7	IP20
2.9	11.1	IP20
3.3	14	IP20

## F Series

### Three Phase Capacitive Units - UCWT (Heavy Duty)

**Reactive Power 8.94...26.82 kVAR**

**Rated Voltage 208V**

**Reactive Power 10...20 kVAR**

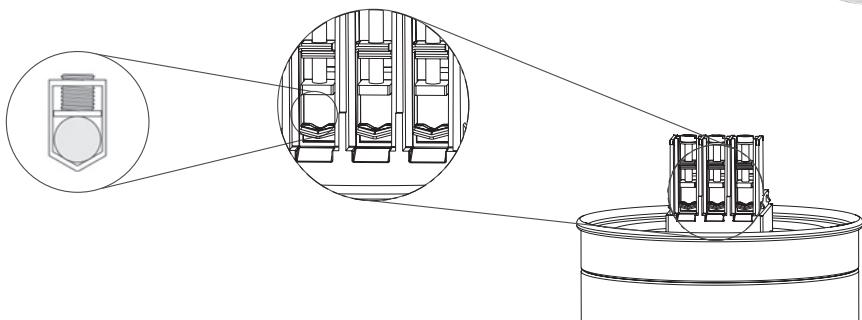
**Rated Voltage 240V**

**Reactive Power 18...50 kVAR**

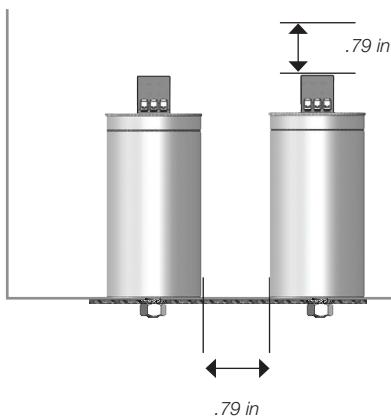
**Rated Voltage 480V**

#### Electrical Connections

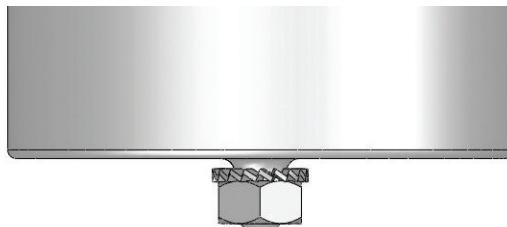
- “Box” type terminals for connection of power cables.
- Fast-on connection terminals for discharge resistor connection.
- The F series capacitors are provided with external resistors in the capacitive cell.
- Allows connection of power cables separately from discharge resistors.
- Grounding is assured by connection of capacitive unit mounting bolt with assembly plate.



#### Mounting



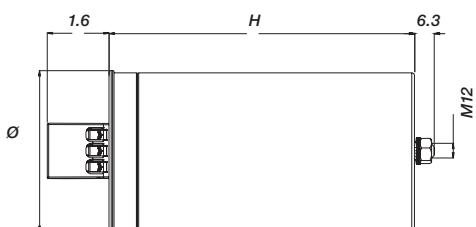
Vertical Mounting



M12 bolt mounting  
(Nut and washer included)

Reduced height accommodates installation in MCC buckets.

#### Dimensions (in) and Protection Degree



Diameter (Ø)	Height (H)	Protection Degree
3.9	9.1	IP20
4.6	9.1	IP20

## Three Phase Enclosed Capacitors - BCWT

### BCWT Series

#### Straight-forward Design

WEG Enclosed Power Factor Capacitor Banks include Three-phase WEG UCWT Capacitors in a NEMA 4 enclosure that is easy to install and wire.

#### Reliability

WEG UCWT Capacitors are assembled with high performance and low loss, self healing polypropylene dielectric film.

#### Flexibility

Three phase enclosed capacitor banks available with or without fuses. NEMA 4 enclosure is standard, so no need to worry whether the installation is indoors or outdoors.



## Three Phase Enclosed Capacitors - BCWT

Non-Fused - 240V

Catalog Number <sup>1</sup>	Reactive Power (kVar)	Rated Current In (A)	Enclosure Size (in) H x W x D	Enclosure Drawing Ref	List Price	Multiplier
<a href="#">BCWTC050V29A4-N</a>	0.5	1.20	11.8 x 7.9 x 4.8	A	\$603	Z11
<a href="#">BCWTC075V29A4-N</a>	0.75	1.80			\$606	
<a href="#">BCWTC100V29A4-N</a>	1	2.41			\$609	
<a href="#">BCWTC150V29A4-N</a>	1.5	3.61			\$617	
<a href="#">BCWTC200V29A4-N</a>	2	4.81			\$624	
<a href="#">BCWTC250V29B4-N</a>	2.5	6.01			\$643	
<a href="#">BCWTC300V29B4-N</a>	3	7.22			\$650	
<a href="#">BCWTC500V29B4-N</a>	5	12.03			\$709	
<a href="#">BCWTC750V29C4-N</a>	7.5	18.04			\$810	
<a href="#">BCWTD100V29E4-N</a>	10	24.06	23.6 x 11.8 x 4.8	E	\$967	
<a href="#">BCWTD125V29E4-N</a>	12.5	30.07			\$1,055	
<a href="#">BCWTD150V29E4-N</a>	15	36.08			\$1,121	
<a href="#">BCWTD175V29E4-N</a>	17.5	42.10			\$1,342	
<a href="#">BCWTD200V29E4-N</a>	20	48.11			\$1,374	
<a href="#">BCWTD250V29E4-N</a>	25	60.14			\$1,475	
<a href="#">BCWTD275V29E4-N</a>	27.5	66.15			\$1,561	
<a href="#">BCWTD300V29E4-N</a>	30	72.17			\$1,576	
<a href="#">BCWTD350V29F4-N</a>	35	84.20	23.6 x 15.8 x 4.8	F	\$1,791	
<a href="#">BCWTD400V29F4-N</a>	40	96.23			\$1,892	
<a href="#">BCWTD450V29F4-N</a>	45	108.25			\$2,015	

## Fused - 240V

Catalog Number <sup>1</sup>	Reactive Power (kVar)	Rated Current In (A)	Enclosure Size (in) H x W x D	Enclosure Drawing Ref	List Price	Multiplier
<a href="#">BCWTC050V29A4-F</a>	0.5	1.20	11.8 x 7.9 x 4.8	A	\$833	Z11
<a href="#">BCWTC075V29A4-F</a>	0.75	1.80			\$836	
<a href="#">BCWTC100V29A4-F</a>	1	2.41			\$839	
<a href="#">BCWTC150V29A4-F</a>	1.5	3.61			\$847	
<a href="#">BCWTC200V29A4-F</a>	2	4.81			\$854	
<a href="#">BCWTC250V29B4-F</a>	2.5	6.01			\$871	
<a href="#">BCWTC300V29B4-F</a>	3	7.22			\$881	
<a href="#">BCWTC500V29B4-F</a>	5	12.03			\$934	
<a href="#">BCWTC750V29C4-F</a>	7.5	18.04			\$1,236	
<a href="#">BCWTD100V29E4-F</a>	10	24.06	23.6 x 11.8 x 4.8	E	\$1,378	
<a href="#">BCWTD125V29E4-F</a>	12.5	30.07			\$1,696	
<a href="#">BCWTD150V29E4-F</a>	15	36.08			\$1,488	
<a href="#">BCWTD175V29E4-F</a>	17.5	42.10			\$1,663	
<a href="#">BCWTD200V29E4-F</a>	20	48.11			\$1,735	
<a href="#">BCWTD250V29E4-F</a>	25	60.14			\$1,848	
<a href="#">BCWTD275V29E4-F</a>	27.5	66.15			\$1,924	
<a href="#">BCWTD300V29F4-F</a>	30	72.17			\$2,384	
<a href="#">BCWTD350V29F4-F</a>	35	84.20			\$2,651	
<a href="#">BCWTD400V29F4-F</a>	40	96.23			\$2,760	
<a href="#">BCWTD450V29F4-F</a>	45	108.25			\$2,908	

<sup>1) For other voltages, please contact WEG.</sup>

# Power Factor Correction



## Three Phase Enclosed Capacitors - BCWT

### Non-Fused - 480V

Catalog Number <sup>1</sup>	Reactive Power (kVAr)	Rated Current In (A)	Enclosure Size (in) H x W x D	Enclosure Drawing Ref	List Price	Multiplier
<b>BCWTC050V53A4-N</b>	0.5	0.60	11.8 x 7.9 x 4.8	A	\$601	
<b>BCWTC075V53A4-N</b>	0.75	0.90			\$603	
<b>BCWTC100V53A4-N</b>	1	1.20			\$606	
<b>BCWTC150V53A4-N</b>	1.5	1.80			\$612	
<b>BCWTC200V53A4-N</b>	2	2.41			\$617	
<b>BCWTC250V53A4-N</b>	2.5	3.01			\$622	
<b>BCWTC300V53A4-N</b>	3	3.61			\$627	
<b>BCWTC500V53B4-N</b>	5	6.01	15.8 x 7.9 x 4.8	B	\$658	
<b>BCWTC750V53B4-N</b>	7.5	9.02			\$688	
<b>BCWTD100V53B4-N</b>	10	12.03			\$706	
<b>BCWTD125V53C4-N</b>	12.5	15.04	19.7 x 7.8 x 4.8	C	\$795	
<b>BCWTD150V53C4-N</b>	15	18.04			\$812	
<b>BCWTD175V53E4-N</b>	17.5	21.05			\$1,030	
<b>BCWTD200V53E4-N</b>	20	24.06	23.7 x 11.8 x 4.8	E	\$1,048	
<b>BCWTD225V53E4-N</b>	22.5	27.06			\$1,065	
<b>BCWTD250V53E4-N</b>	25	30.07			\$1,082	
<b>BCWTD275V53D4-N</b>	27.5	33.08	19.7 x 11.8 x 4.8	D	\$1,280	
<b>BCWTD300V53D4-N</b>	30	36.08			\$1,297	
<b>BCWTD350V53E4-N</b>	35	42.10			\$1,498	
<b>BCWTD400V53E4-N</b>	40	48.11	23.6 x 11.8 x 4.8	E	\$1,531	
<b>BCWTD450V53E4-N</b>	45	54.13			\$1,565	
<b>BCWTD500V53E4-N</b>	50	60.14			\$1,598	
<b>BCWTD600V53F4-N</b>	60	72.17	23.6 x 15.8 x 4.8	F	\$1,926	
<b>BCWTD750V53F4-N</b>	75	90.21			\$2,026	

Z11

1) For other voltages, please contact WEG.

General Information

Circuit Protection

Disconnect Switches

Motor Protectors

Contactors

Overloads

Enclosed Starters

Relays

Pushbuttons and Pilot Lights

Terminal Blocks

Power Factor Correction

Appendix A

Appendix B

Appendix C

## Three Phase Enclosed Capacitors - BCWT

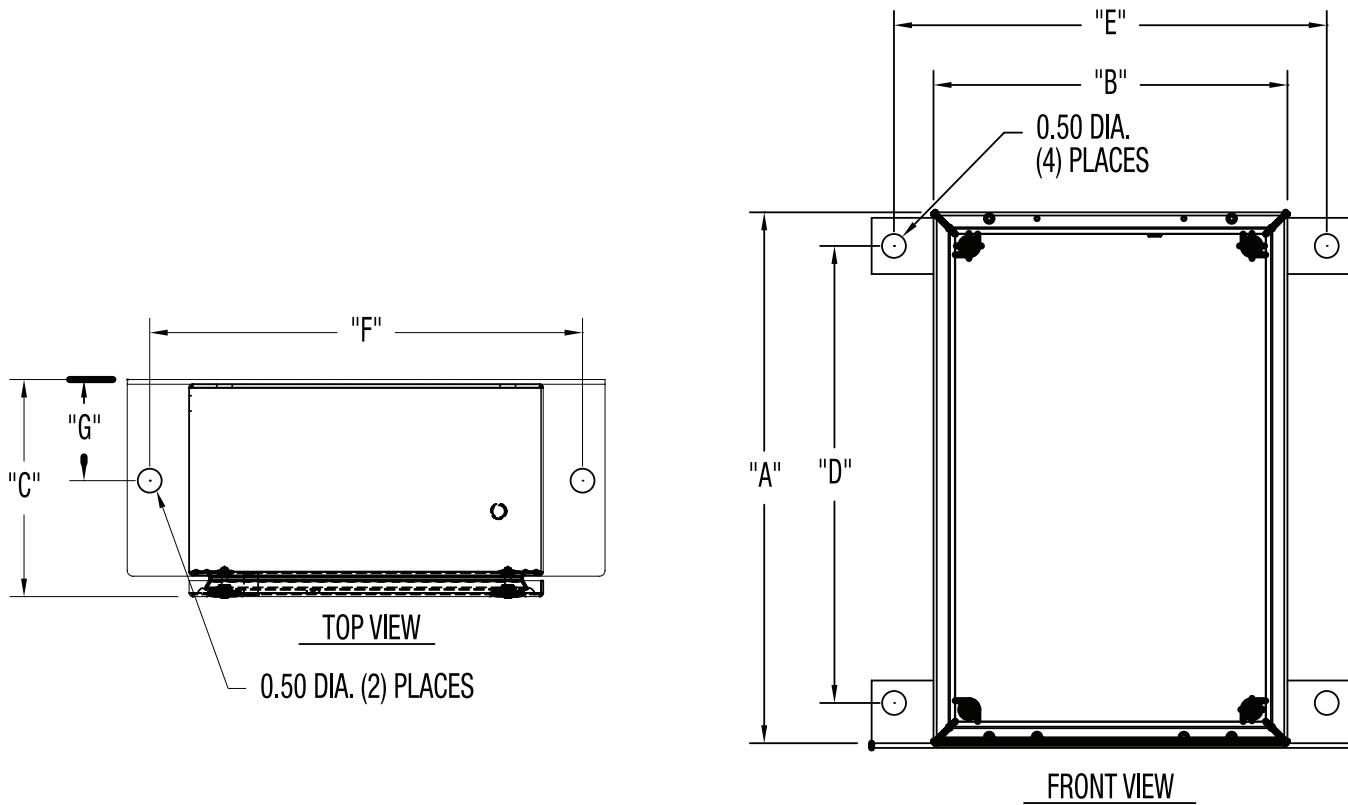
Fused - 480V

Catalog Number <sup>1</sup>	Reactive Power (kVAr)	Rated Current In (A)	Enclosure Size (in) H x W x D	Enclosure Drawing Ref	List Price	Multiplier
<b>BCWTC050V53A4-F</b>	0.5	0.60	11.8 x 7.9 x 4.8	A	\$832	Z11
<b>BCWTC075V53A4-F</b>	0.75	0.90			\$834	
<b>BCWTC100V53A4-F</b>	1	1.20			\$836	
<b>BCWTC150V53A4-F</b>	1.5	1.80			\$841	
<b>BCWTC200V53A4-F</b>	2	2.41			\$846	
<b>BCWTC250V53A4-F</b>	2.5	3.01			\$851	
<b>BCWTC300V53A4-F</b>	3	3.61			\$856	
<b>BCWTC500V53B4-F</b>	5	6.01			\$889	
<b>BCWTC750V53B4-F</b>	7.5	9.02			\$915	
<b>BCWTD100V53B4-F</b>	10	12.03			\$932	
<b>BCWTD125V53C4-F</b>	12.5	15.04		C	\$1,208	
<b>BCWTD150V53C4-F</b>	15	18.04			\$1,238	
<b>BCWTD175V53E4-F</b>	17.5	21.05			\$1,435	
<b>BCWTD200V53E4-F</b>	20	24.06			\$1,455	
<b>BCWTD225V53E4-F</b>	22.5	27.06	23.7 x 11.8 x 4.8	E	\$1,497	Relays
<b>BCWTD250V53E4-F</b>	25	30.07			\$1,513	
<b>BCWTD275V53D4-F</b>	27.5	33.08			\$1,587	
<b>BCWTD300V53D4-F</b>	30	36.08			\$1,656	
<b>BCWTD350V53E4-F</b>	35	42.10	23.6 x 11.8 x 4.8	E	\$1,836	Pushbuttons and Pilot Lights
<b>BCWTD400V53E4-F</b>	40	48.11			\$1,877	
<b>BCWTD450V53E4-F</b>	45	54.13			\$1,918	
<b>BCWTD500V53E4-F</b>	50	60.14			\$1,959	
<b>BCWTD600V53F4-F</b>	60	72.17	23.6 x 15.8 x 4.8	F	\$3,110	Terminal Blocks
<b>BCWTD750V53F4-F</b>	75	90.21			\$3,237	

1) For other voltages, please contact WEG.

## Three Phase Enclosed Capacitors - BCWT

### Enclosure Dimension (in)



CAPACITOR ENCLOSURE DIMENSIONS							
DRAWING REF	"A"	"B"	"C"	"D"	"E"	"F"	"G"
A	11.81	7.87	4.83	10.25	9.50	9.50	2.25
B	15.75	7.87	4.83	14.18	9.50	9.50	2.25
C	19.69	7.87	4.83	18.12	9.50	9.50	2.25
D	19.69	11.81	4.83	18.12	13.50	13.50	2.25
E	23.62	11.81	4.83	22.06	13.50	13.50	2.25
F	23.62	15.75	4.83	22.06	17.50	17.50	2.25

## Technical Information

## NEMA, UL and CSA Enclosure Ratings

Enclosure Rating	NEMA National Electrical Manufacturers Association (NEMA) Standard 250 and Electrical and Electronic Mfg. Association of Canada (EEMAC)	Underwriters Laboratories Inc. (UL50 and UL508)	Canadian Standards 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 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 a degree of protection against rain, snow, windblown dust, splashing and hose-directed water; undamaged by the external 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 a degree of protection against rain, snow, windblown dust, splashing and hose-directed water; undamaged by the external 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 the 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 circulating dust, lint, fibers, and flyings; dripping and light splashing of non-corrosive 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 dropping noncorrosive liquids.	Indoor use to provide a degree of protection against dust, dirt, fiber flyings, dripping water, and external condensation of noncorrosive liquids. Knockouts located in the top or bottom walls, or both.	Indoor use; provides a degree of protection against circulating dust, lint, fibers and flyings; dripping and light splashing of non-corrosive liquids; provided with knockouts.
Type 13	Enclosures are intended for indoor use primarily to provide a degree of protection 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 non-corrosive 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.

## Technical Information

### 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

#### Additional Letter (Optional)

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 of water 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.	Continuous Immersion	

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 50mm diameter sphere up to	Back of Hand	
B (For use with first numerals 0 and 1)	Test finger penetration to a maximum of 80mm must not contact	Finger	
C (For use with first numerals 1 and 2)	Wire of 2.5mm diameter x 10mm long must not contact hazardous	Tool	
D (For use with first numerals 2 and 3)	Wire of 1.0mm diameter x 100mm long must not contact hazardous	Wire	

## Technical Information

### Motor Current Ratings

Horsepower	60Hz AC Induction Motor					
	Single Phase		Three Phase			
	115V	230V	200V	230V	460V	575V
1/6	4.4	2.2	-	-	-	-
1/4	5.8	2.9	-	-	-	-
1/3	7.2	3.6	-	-	-	-
1/2	9.8	4.9	2.5	2.2	1.1	0.9
3/4	13.8	6.9	3.7	3.2	1.6	1.3
1	16.0	8.0	4.8	4.2	2.1	1.7
1 1/2	20.0	10.0	6.9	6.0	3.0	2.4
2	24.0	12.0	7.8	6.8	3.4	2.7
3	34.0	17.0	11.0	9.6	4.8	3.9
5	56.0	28.0	17.5	15.2	7.6	6.1
7 1/2	80.0	40.0	25.0	22.0	11.0	9.0
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.

## Technical Information

### NEMA Ratings – CWM Series contactors to NEMA Comparison

General Information	Circuit Protection	Disconnect Switches	Motor Protectors	Contactors	Overloads	Enclosed Starters	Relays	Pushbuttons and Pilot Lights	Terminal Blocks	Power Factor Correction	Maximum Horsepower (UL/CSA)						
											Single Phase		Three Phase				
											115V	230V	200V	230V	460V	575V	
00	CWM9N			00	1/3	1	1 1/2	1 1/2	2	2							
	CWM9			00	1/2	1 1/2	3	3	5	7 1/2							
	CWM12			00	3/4	2	3	3	7 1/2	10							
0	CWM18N			0	1	2	3	3	5	10							
	CWM18			0	1	3	5	5	10	15							
	CWM25			0	1 1/2	3	5	7 1/2	15	15							
1	CWM32N			1	2	3	7 1/2	7 1/2	10	10							
	CWM32			1	2	5	10	10	20	25							
	CWM40			1	3	5	10	10	25	25							
2	CWM50N			2	3	7 1/2	10	15	25	25							
	CWM50			2	3	7 1/2	15	15	30	40							
	CWM65			2	5	10	20	20	40	50							
	CWM80			2	5	15	20	25	50	60							
3	CWM95N			3	7 1/2	15	25	30	50	50							
	CWM95			3	7 1/2	15	25	30	60	75							
	CWM105			3	10	20	30	40	75	75							
4	CWM150N			4	-	-	40	50	100	100							
	CWM112			4	-	-	40	50	100	100							
	CWM150			4	-	-	50	60	125	150							
	CWM180			4	-	-	60	75	150	200							
5	CWM300N			5	-	-	75	100	200	200							
	CWM250			5	-	-	75	100	200	250							

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

### How to dimension control components in a starter

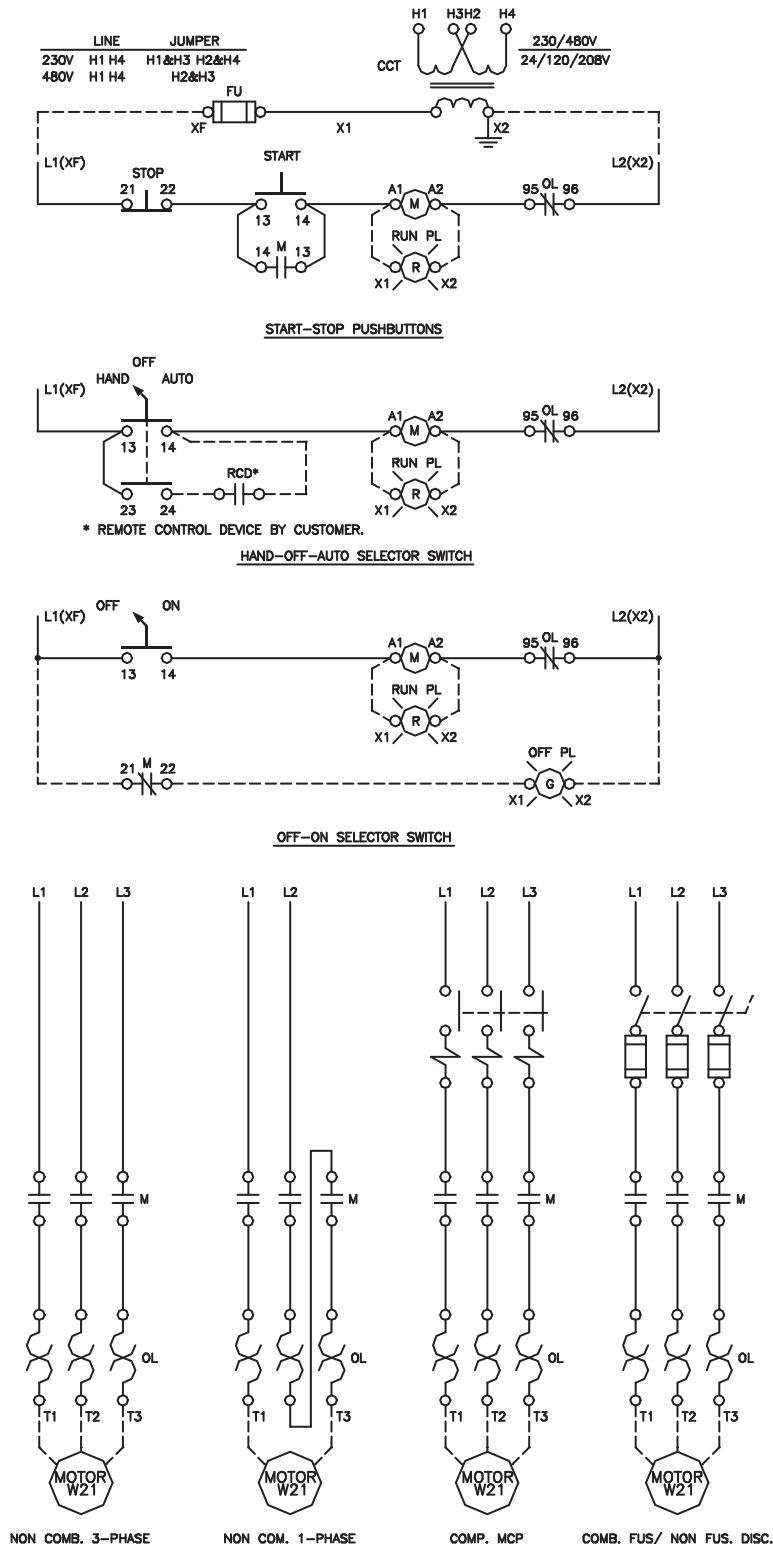
	Across-the-Line Starter	Reversing Starter	Wye-Delta Starter	Autotransformer Starter tap 65%	Autotransformer Starter tap 80%
<b>Contactor - K1</b>	FLA	FLA	0.58 x FLA	FLA	FLA
<b>Contactor - K2</b>	-	-	0.58 x FLA	0.42 x FLA	0.64 x FLA
<b>Contactor - K3</b>	-	-	0.33 x FLA	0.23 x FLA	0.16 x FLA
<b>Overload Relay - FT</b>	FLA	FLA	0.58 x FLA	FLA	FLA
<b>Manual Motor Protector MPW40</b>			FLA		

This table is for comparison & reference only.

## Technical Information

### Electrical Wiring Diagrams

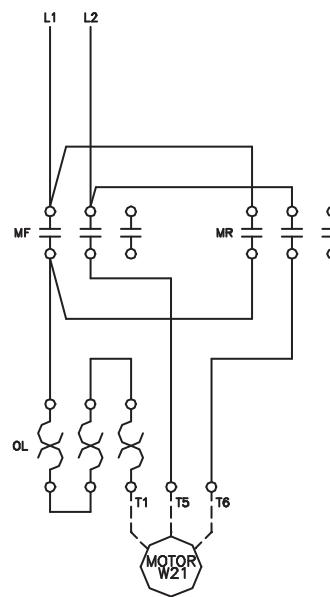
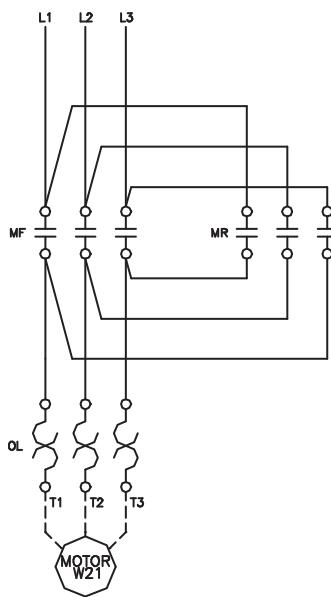
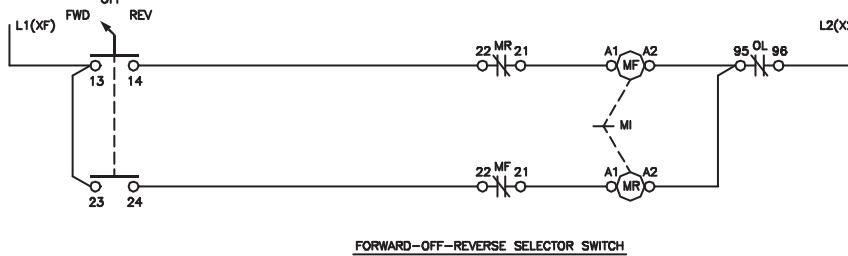
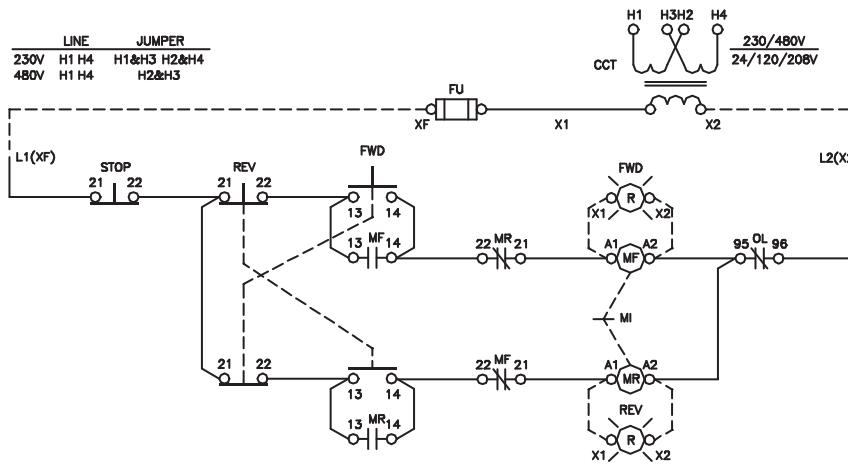
#### Motor Starters Non-Reversing



## Technical Information

### Electrical Wiring Diagrams

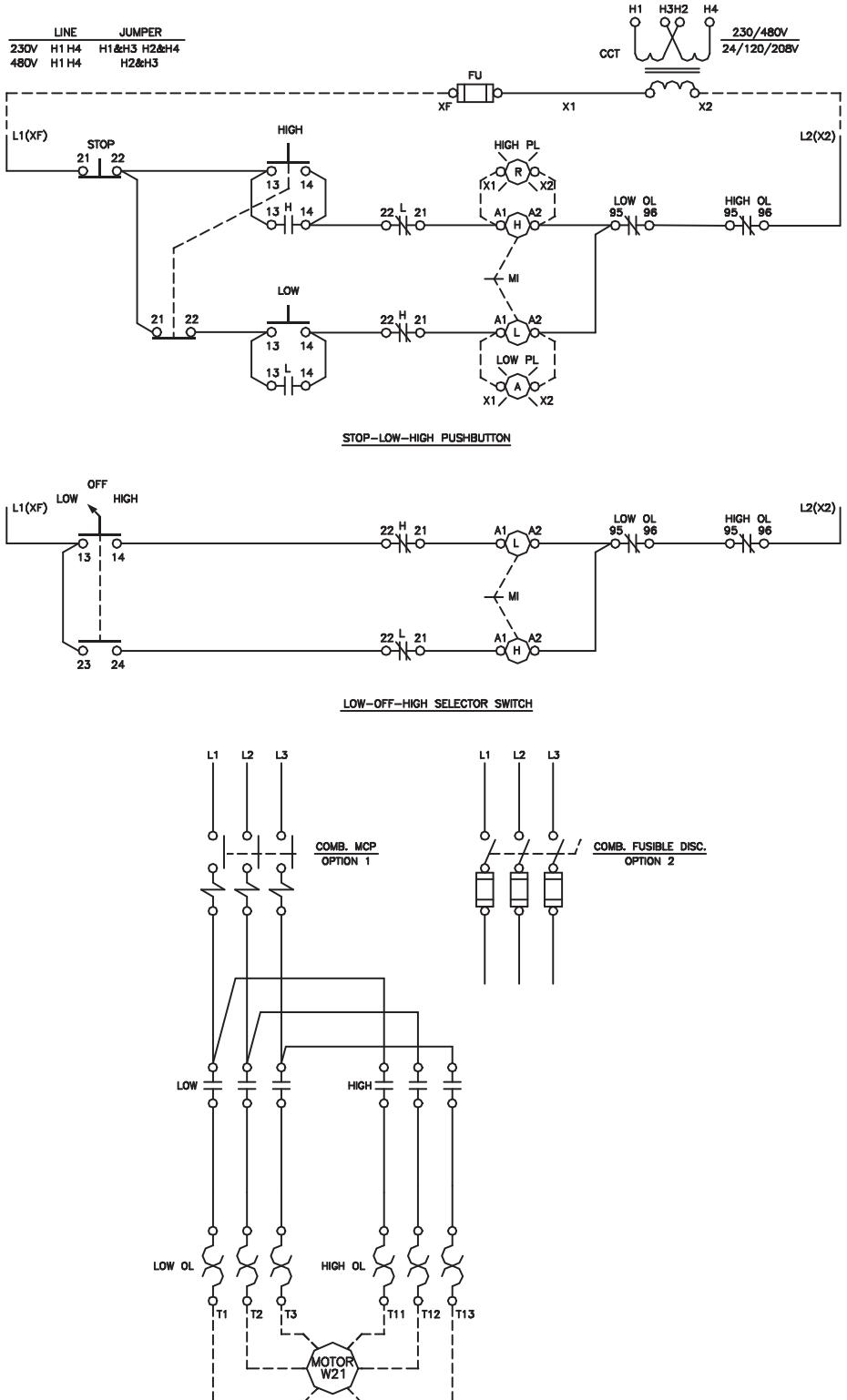
#### Motor Starters Reversing (1-3PH.)



## Technical Information

### Electrical Wiring Diagrams

#### Multi-Speed Two Separate Windings

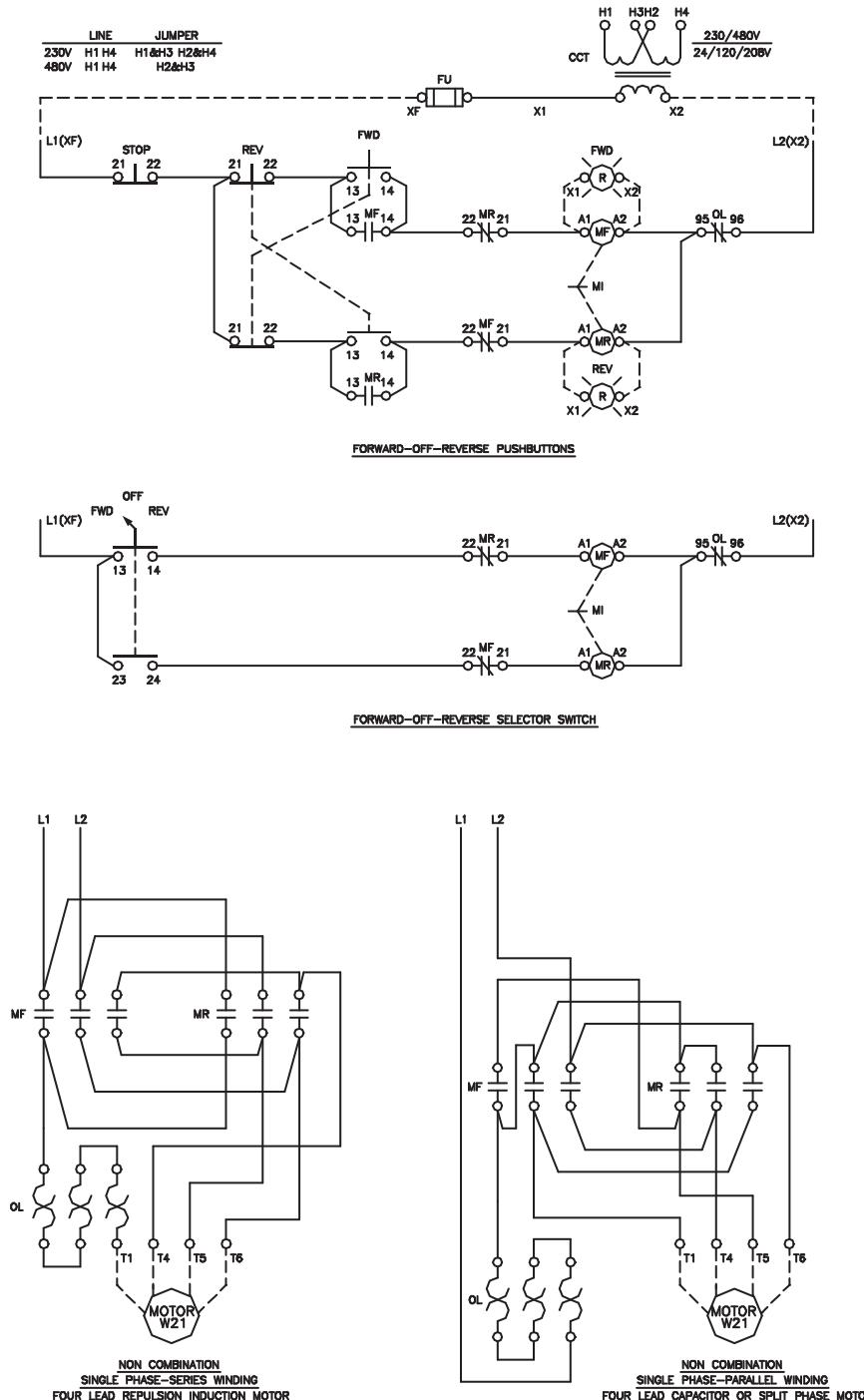


General Information
Circuit Protection
Disconnect Switches
Motor Protectors
Contactors
Overloads
Enclosed Starters
Relays
Pushbuttons and Pilot Lights
Terminal Blocks
Power Factor Correction
Appendix A
Appendix B
Appendix C

## Technical Information

# Electrical Wiring Diagrams

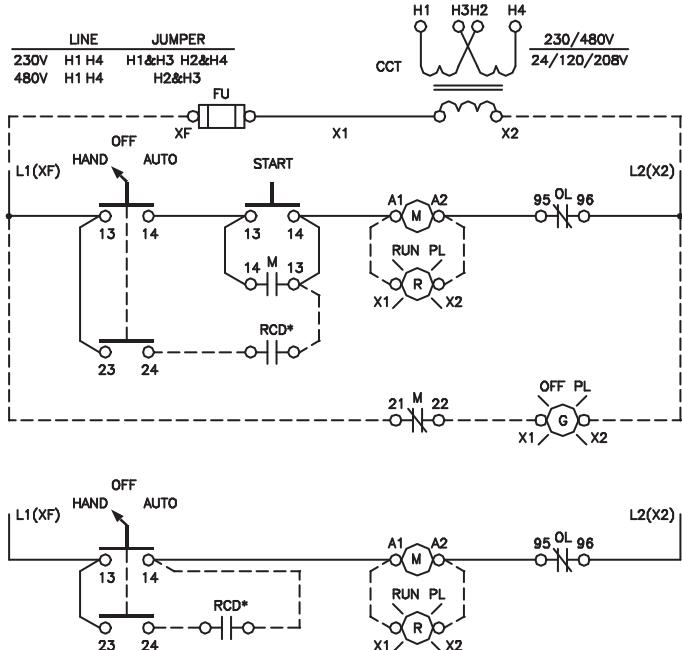
## **Motor Starters Reversing (1PH)**



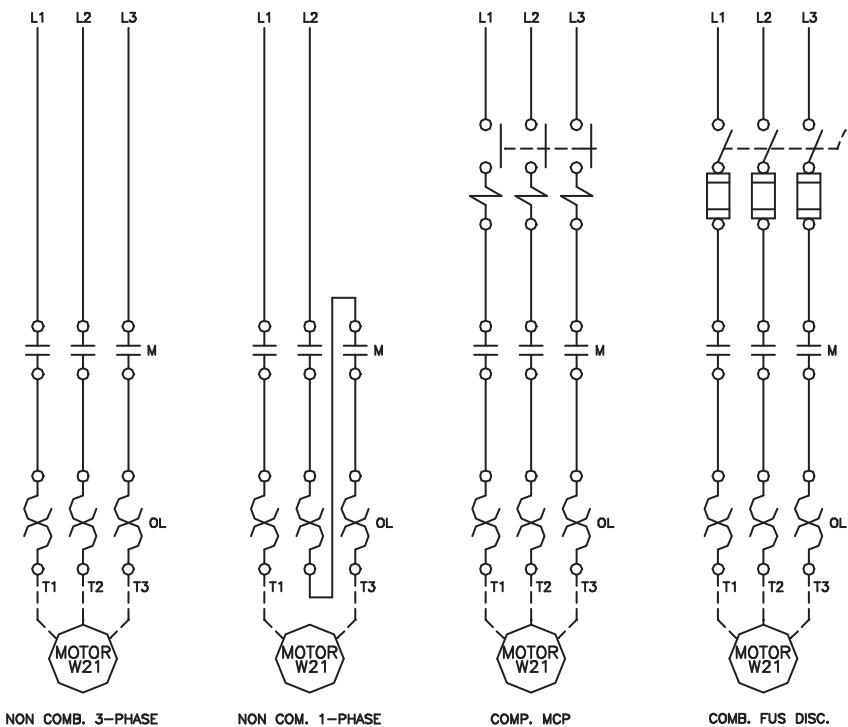
## Technical Information

### Electrical Wiring Diagrams

#### Pump Control Panels



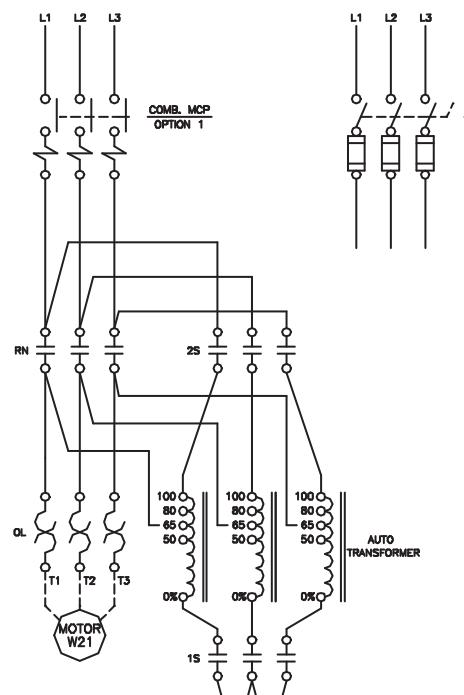
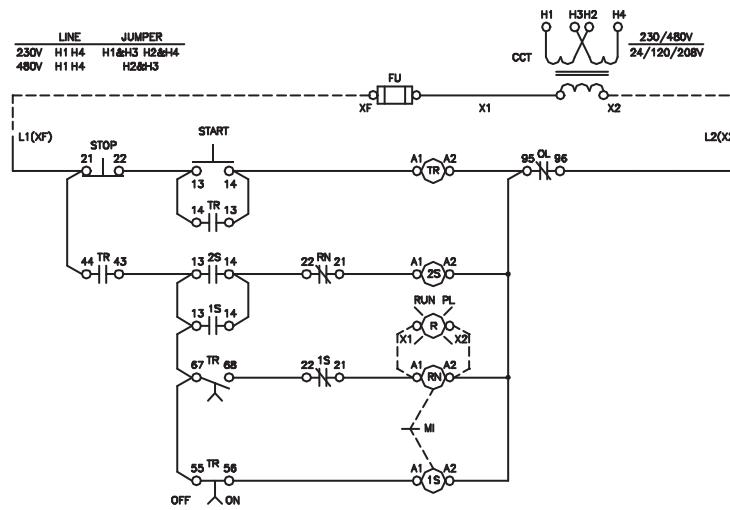
\* REMOTE CONTROL DEVICE BY CUSTOMER.



## Technical Information

## **Electrical Wiring Diagrams**

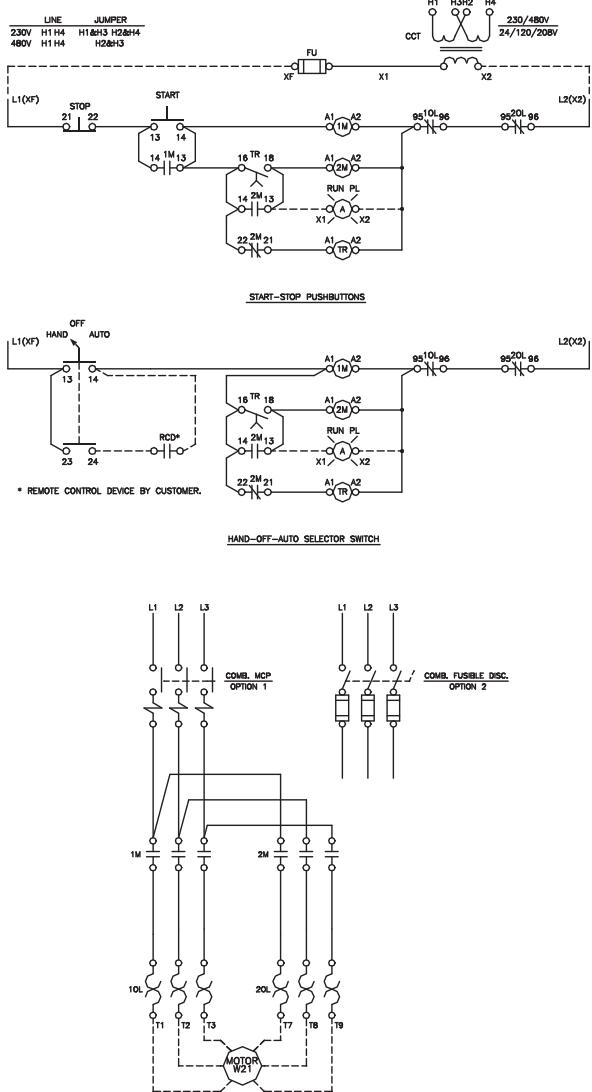
## Reduced Voltage Starters – Autotransformer



## Technical Information

### Electrical Wiring Diagrams

#### Reduced Voltage Starters – Part Winding



#### Reduced Voltage Starters – Wye Delta

