

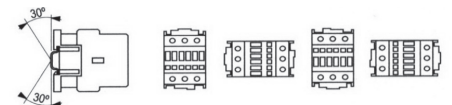


# Controls

## IEC Contactors - CWM Series

### General Ratings

TYPE	CWM9	CWM12	CWM18	CWM25	CWM32	CWM40	CWM50	CWM65	CWM80	CWM95	CWM105
<b>Standards</b>	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										
<b>Rated Insulation Voltage Ui</b>											
Acc. IEC; VDE 0660 [V]	1000										
Acc. UL; CSA [V]	600										
<b>Rated Impulse Voltage Uimp</b>											
Acc. IEC60947-1 [kV]	6						8				
<b>Rated Operating Frequency</b> [Hz]	25...400										
<b>Degree of Protection</b>	Protection against direct contact Acc. VDE 0160 - Part. 100										
Main terminals	IP20						IP10				
Coil terminals	IP20										
Auxiliary terminals	IP20										
<b>Ambient Temperature</b>											
Storage	-55 to +80oC (-67 to +176oF)										
Operating	-25 to +55oC (-13 to +131oF)										
<b>Altitude</b>											
Up to 1,500m	Nominal values										
Other altitudes	See graphic on page 94										
<b>Pollution Degree</b>	3										
<b>Climatic Withstand</b>	According to IEC 68-2										
<b>Mounting</b>	35mm rail Acc. DIN EN 50 022										
<b>Vibration Resistance (5 to 200 Hz)</b>											
Contactor open [g]	3	3	3	7.5	8	8	4.5	4.5	4.5	5	5
Contactor closed at Uc [g]	6	6	6	8	12	12	9	9	9	7	7
<b>Mechanical Endurance</b>											
AC Coil Million ops.	10										
<b>Electrical Endurance AC-3</b> Million ops.	1.8	1.6	1.2	1.3	1.2	1.2	1.1	1.3	1.1	1.1	1
<b>Shock Resistance (1/2 sin wave = 11ms)</b>											
Contactor open [g]	8	8	8	8	7	7	6	6	6	6	6
Contactor closed at Uc [g]	12	12	12	12	12	12	10	10	10	10	10
<b>Weight</b> [kg]	0.30	0.30	0.30	0.30	0.52	0.54	1.11	1.12	1.13	1.45	1.47
AC Coil [lb]	0.65	0.65	0.65	0.65	1.15	1.19	2.44	2.47	2.49	3.20	3.24
<b>Terminal Capacity</b>											
	Cross / Slotted Combination						Allen Head				
<b>Fine - Stranded with sleeve</b> 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
<b>Coarse - Stranded / Solid</b> 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
<b>Stranded / Solid (UL / CSA)</b> 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
<b>Drive Size</b>	Philips #2						5/32" (4mm.)				
<b>Tightening Torque</b> 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)
<b>Operating Position</b>	see below										



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

# Controls

## IEC Contactors - CWM Series

### Power Contacts

TYPE			CWM9	CWM12	CWM18	CWM25	CWM32	CWM40	CWM50	CWM65	CWM80	CWM95	CWM105	
<b>Standard UL/CSA Ratings</b>														
<b>Rated Operating Voltage</b> [V]			600											
<b>General Purpose Rating</b> [A]			25	25	32	32	60	60	90	110	110	140	140	
<b>Switching Motor Loads</b>														
Full Voltage - 60Hz														
<b>1-phase</b>	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	
<b>3-phase</b>	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	
<b>Standard IEC Ratings</b>														
<b>Rated Operating Voltage</b> [V]			690						1000					
<b>Rated Thermal Current Ith</b> [A]			25	25	32	45	60	60	90	110	110	140	140	
<b>Switching Motor Loads</b>														
AC-2; AC-3; AC-4 - 50Hz														
<b>3-phase</b>	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	
<b>Maximum Switching Rate</b>														
	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	
<b>AC-4</b>														
200,000 operations; 50/60Hz	<= 690V	[A]	5	7	8	12	16	18.5	23	30	37	44	50	
	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	
	<b>Maximum Switching Rate</b>			360	360	360	360	360	200	200	200	200	200	200
	<b>Making Capacity</b> [A]			450	450	450	450	550	1000	1000	1000	1000	1280	1280

# Controls

## IEC Contactors - CWM Series

### Power Contacts cont.

Type		CWM9	CWM12	CWM18	CWM25	CWM32	CWM40	CWM50	CWM65	CWM80	CWM95	CWM105
<b>Breaking Capacity</b>	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
<b>Impedance per Pole</b>	[mW]	2.41	2.41	2.35	1.65	1.28	0.95	0.85	0.86	0.86	0.76	0.76
<b>Power Dissipation per Pole</b>	AC-1 [W]	1.47	1.47	2.46	3.34	4.6	3.42	6.86	10.40	10.40	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
<b>Short Time Current Icw</b>	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
<b>Short Circuit Coordination</b>	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
<b>Rated Insulation Voltage Ui</b>	Acc. IEC; VDE 0660 [V]		1000	
	Acc. UL; CSA [V]		600	
<b>Rated Operating Voltage Ue</b>	Acc. IEC; VDE 0660 [V]		690	
	Acc. UL; CSA [V]		600	
<b>Rated Thermal Current Ith &lt;=55oC</b>	[A]		20	
<b>Rated Operating Current Ie</b>	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	
<b>Rated Operating Current Ie</b>	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	
<b>Making Capacity Im</b>	AC-15 / AC-11 Ue <= 690V 50/60Hz [A]		250	
	DC-13 / DC-11 Ue <= 440Vdc [A]		250	
<b>Breaking Capacity Ic</b>	AC-15 / AC-11 Ue <= 400V 50/60Hz [A]		250	
	DC-13 / DC-11 Ue <=220Vdc [A]		2	
<b>Short Circuit Protection with Fuses</b>	Acc. IEC 60947-5-1 - gL/gG [A]		10	
<b>Minimum Switching Capacity</b>	[V/mA]		17/5	
<b>Electrical Endurance</b>	Million ops.		1	
<b>Mechanical Endurance</b>	Million ops.		10	
<b>Guaranteed Non-Overlap Time</b>	[ms]		1.5	
<b>Insulation Resistance</b>	[MOhm]		>10	

# Controls

## IEC Contactors - CWM Series

### Control circuit ratings - AC Coil

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

### Control circuit ratings - DC Coil

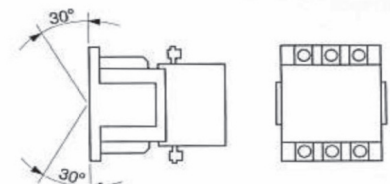
TYPE	CWM9	CWM12	CWM18	CWM25	CWM32E	CWM40E	CWM50E	CWM65E	CWM80E	CWM95E	CWM105E
<b>Rated Insulation Voltage Ui</b>											
Acc. IEC; VDE 0660	[V]						1000				
Acc. UL; CSA	[V]						600				
<b>Standard Voltages</b>	[V]	12...440			24...240			24...240			
<b>Coil Operating limits</b>											
0.85...1.1											
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			
<b>Operating Time</b>											
Coil energization - N.O.	[ms]	35...45			40...55			50...60			
Coil de-energization - N.O.	[ms]	7...12			30...65			55...60			
<b>Coil Consumption</b>											
Closed	[W]	3.8...7.5			6			6.5			
Magnetic circuit opened	[W]	3.8...7.5			240			340			

# Controls

## IEC Contactors - CWM & CWME Series

### General Ratings

TYPE	CWM112	CWM150	CWM180	CWM250	CWM300	CWME400	CWME630	CWME800	
<b>Standards</b>	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								
<b>Rated Insulation Voltage Ui</b>									
Acc. IEC; VDE 0660 [V]	1000								
Acc. UL; CSA [V]	600								
<b>Rated Impulse Voltage Uimp</b>									
Acc. IEC60947-1 [kV]	8								
<b>Rated Operating Frequency</b> [Hz]	25...400								
<b>Degree of protection</b>	Protection against direct contact acc. VDE 0160 - Part. 100								
Main terminals	IP00								
Coil terminals	IP20								
Auxiliary terminals	IP20								
<b>Ambient Temperature</b>									
Storage	-55 to +80oC (-67 to +176oF)								
Operating	-25 to +55oC (-13 to +131oF)								
<b>Altitude</b>									
Up to 1,500m	Nominal values								
Other altitudes	See graphic on page 88					up to 2000m			
<b>Pollution Degree</b>	3								
<b>Climatic withstand</b>	According to IEC 68-2								
<b>Mounting</b>	Screw to panel								
<b>Vibration Resistance (5 to 200 Hz)</b>									
Contacteur open [g]	4								
Contacteur closed at Uc [g]	4								
<b>Mechanical Endurance</b>									
AC Coil Million ops.	10					5			
<b>Electrical Endurance AC-3</b> Million ops.	1.1	1.1	1.0	1.0	1.0		0.5		
<b>Shock Resistance (1/2 sin wave = 11ms)</b>									
Contacteur open [g]	3								
Contacteur closed at Uc [g]	3								
<b>Weight</b>									
AC/DC Coil - CWM_E Series only [kg]	2.54	2.54	4.04	6.14	6.14	-	-	-	
[lb]	5.60	5.60	8.91	13.54	13.54	-	-	-	
<b>Terminal Capacity</b>									
Fine - Stranded with sleeve [mm <sup>2</sup> ]	2 x (25-70)		2 x (50-120)		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 500 or 2 x 300		Nº2 30x5	Nº2 50x5	Nº2 60x5
Busbars [mm]	2 x (15 x 3)		2 x (20 x 3)		2 x (30 x 5)		-	-	-
<b>Tightening Torque</b> lb-in (Nm)	47.8-53.1(5.4-6)		123.9-141.6(14-16)		203.6-230.1 (23-26)		203.6 (23)	504.5 (57)	504.5 (57)
<b>Operating Position</b>	see below								



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

# Controls

## IEC Contactors - CWM & CWME Series

### Power Contact

TYPE				CWM112	CWM150	CWM180	CWM250	CWM300	CWME400	CWME630	CWME800
<b>UL/CSA Applications</b>											
<b>Rated Operating Voltage</b>				[V] 600							
<b>General Purpose Rating</b>				[A] 170	170	200	300	400	450	660	900
<b>Switching Motor Loads</b>											
<b>Full Voltage - 60Hz</b>											
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	
<b>Standard IEC Ratings</b>											
<b>Rated Operating Voltage</b>				[V] 1000							
<b>Rated Thermal Current I<sub>th</sub></b>				[A] 180	225	225	350	350	450	660	900
<b>Switching Motor Loads</b>											
<b>AC-3 - 60Hz</b>											
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	
<b>Maximum Switching Rate</b>											
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	



# Controls

## IEC Contactors - CWM & CWME Series

### Power Contact cont.

TYPE			CWM112	CWM150	CWM180	CWM250	CWM300	CWME400	CWME630	CWME800
<b>AC-4</b>										
200,000 operations; 50/60Hz	<= 690V	[A]	50	55	58	100	130	-	-	-
	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	-	-	-
<b>Making Capacity</b>		[A]	1430	1820	2100	2600	3000			
<b>Breaking Capacity</b>										
	Ue<=400V	[A]	1290	1350	1400	2000	-	4000	6300	8000
	Ue=500V	[A]	1290	1350	1400	2000	-	4000	6300	8000
<b>Impedance per pole</b>		[mW]	0.5	0.5	0.45	0.3	0.3	-	-	-
<b>Power Dissipation per Pole</b>										
	AC-1	[W]	16	25	21.6	35	45.7	-	-	-
	AC-3	[W]	6.2	11.1	13.8	17.9	25.7	-	-	-
<b>Short Time Current Icw</b>										
	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	-	-	-
<b>Short Circuit Coordination</b>										
	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	-	-	-

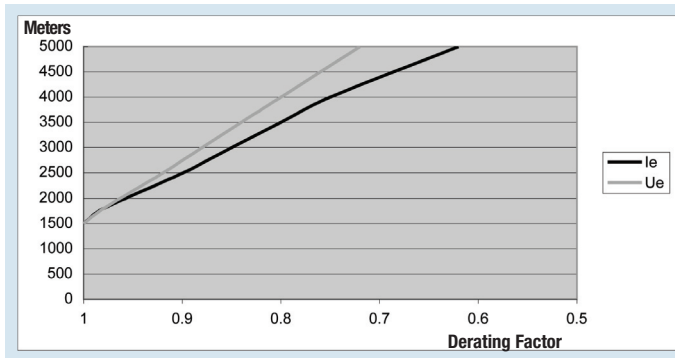
# Controls

## IEC Contactors - CWM Series

### Auxiliary contact block ratings

TYPE		BCXMF	BCXML	BCXMRL	BLIM.02
<b>Rated Insulation Voltage Ui</b>					
Acc. IEC; VDE 0660	[V]				1000
Acc. UL; CSA	[V]				600
<b>Rated Operating Voltage Ue</b>					
Acc. IEC; VDE 0660	[V]				690
Acc. UL; CSA	[V]				600
<b>Rated Thermal Current Ith &lt;=55oC</b>	[A]				10
<b>Rated Operating Current Ie</b>					
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
<b>Rated Operating Current Ie</b>					
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
<b>Making Capacity Im</b>					
AC-15 / AC-11	Ue <= 400V 50/60Hz [A]				90
DC-13 / DC-11	Ue <= 220Vdc [A]				90
<b>Breaking Capacity Ic</b>					
AC-15 / AC-11	Ue <= 400V 50/60Hz [A]				60
DC-13 / DC-11	Ue <= 220Vdc [A]				0.95
<b>Short Circuit Protection with Fuses</b>					
Acc. IEC 60947-5-1 - gL/gG	[A]				10
<b>Minimum Switching Capacity</b>	[V/mA]				17/5
<b>Electrical Endurance</b>	Million ops.				1
<b>Mechanical Endurance</b>	Million ops.				10
<b>Guaranteed Non-Overlap Time</b>	[ms]				1.5
<b>Insulation Resistance</b>	[MOhm]				>10

### Graphic Altitude



#### 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:

$$\text{Total derating} = \text{Derating}_{\text{current}} \times \text{Derating}_{\text{voltage}}$$

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

Derating current K1 = 0.85

Derating voltage K2 = 0.88

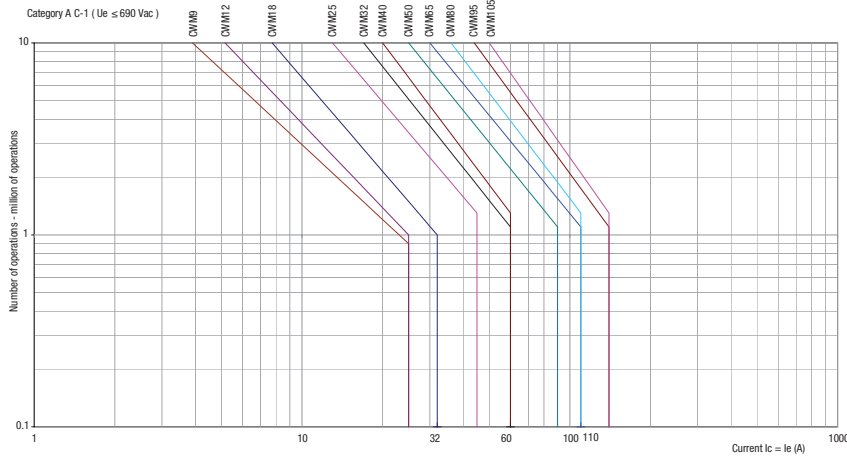
$$\text{Total derating} = 0.85 \times 0.88 = 0.75 \times \text{HP}$$



# Controls

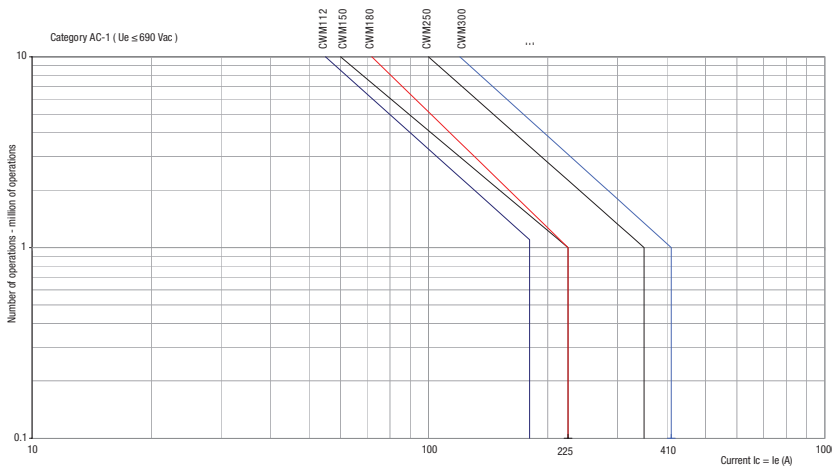
## IEC Contactors - CWM Series

### AC-1: CWM9...105 Electric Lifespan



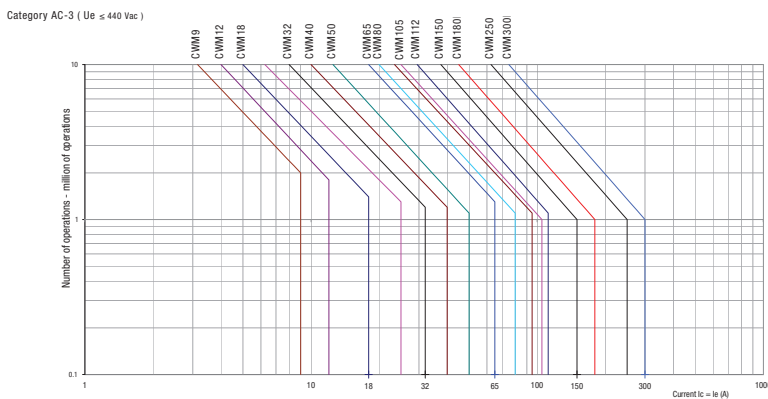
Control of resistive circuits (power factor ≥ 0.95) The current broken (I<sub>c</sub>) in category AC-1 is equal to the current (I<sub>e</sub>) drawn by the load.

### AC-1: CWM112...300 Electric Lifespan



Control of resistive circuits (power factor ≥ 0.95) The current broken (I<sub>c</sub>) in category AC-1 is equal to the current (I<sub>e</sub>) drawn by the load.

### AC-3: CWM9...300 Electric Lifespan



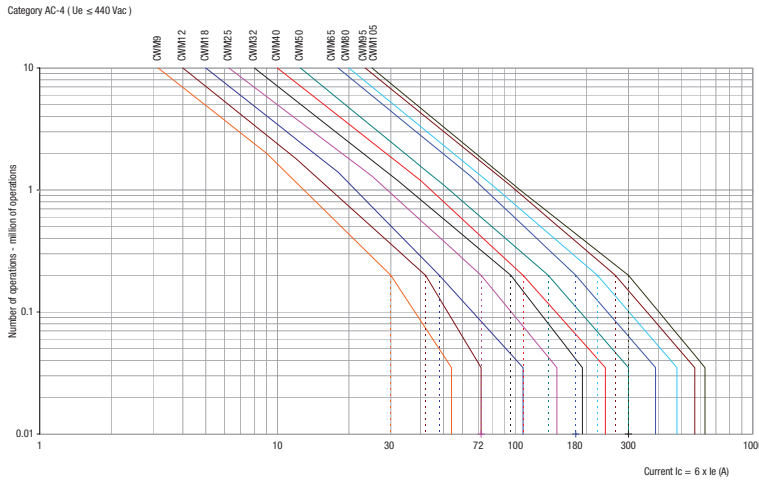
Control of 3-phase asynchronous squirrel cage motors with breaking while running. The current broken (I<sub>c</sub>) in category AC-3 is equal to the operational current of the motor (I<sub>e</sub>).



# Controls

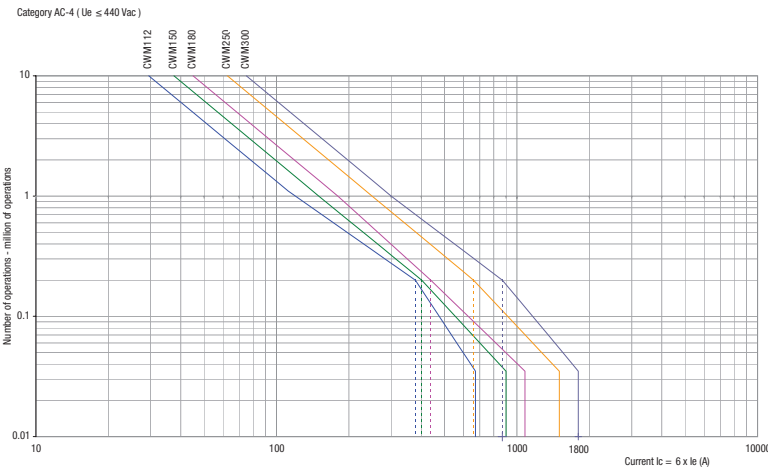
## IEC Contactors - CWM Series

### AC-4: CWM9...105 Electric Lifespan



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

### AC-4: CWM112...300 Electric Lifespan



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

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.