

# CWMC - CONTACTORS FOR SWITCHING OF CAPACITORS

Full solution for switching of capacitor for power factor correction



Motors | Automation | Energy | Transmission & Distribution | Coatings

# Contactors for Switching of CWMC Capacitors

## Switching of Power Factor Correction Capacitors

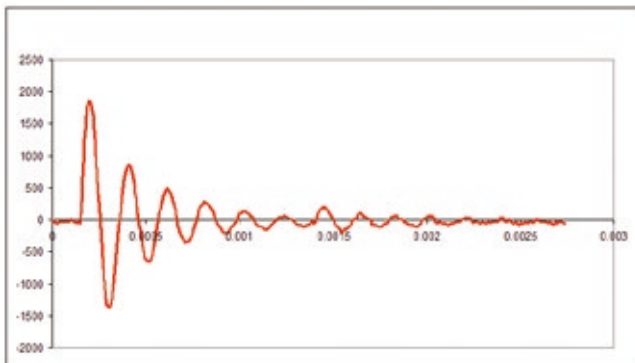
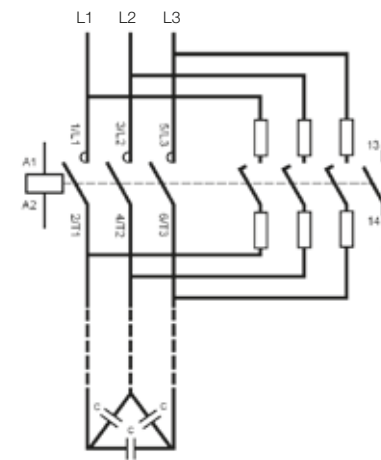
WEG's special CWMC contactors series for switching of capacitors is designed according to IEC 60947-1 and UL, and provides the best solution for the switching of power factor correction capacitors.

## In-Rush Currents

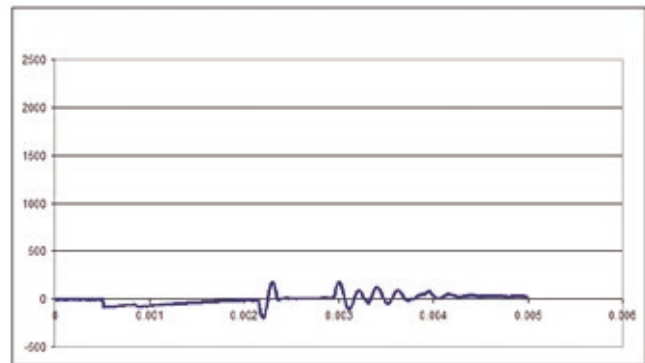
When capacitor banks are switched, the voltage associated with a low line impedance may produce high currents on the capacitors.

This current may reach  $100 \times I_n$ , being one of the main causes of reduction in the capacitor useful life.

The CWMC contactors feature pre-charge resistors that limit the "in-rush current" when the capacitors are switched. The resistors, mounted in series with the advanced contact blocks, are connected before the main contacts. After the main contacts close, they are disconnected, and only the capacitors in parallel with their inductive load remain for the proper power factor correction.



$I_n$  (A) with standard contactors



$I_n$  (A) with WEG CWMC contactor

## Modular Design

For 35 mm DIN rail or screw fixing

## Damping Resistors

Avoids high in-rush current

## Auxiliary Contact

CWMC allows use of standard contact blocks, the same used in CWM line, being either NO or NC

## Early Make Contact Block

They connect the pre-charge resistors and then disconnect them after a few moments



## Contactors for Switching of CWMC Capacitors



### Three-pole from 16 A up to 92 A ( $\theta = 55\text{ }^\circ\text{C}$ )

$I_e$ AC-6b ( $T_{amb.} = 55\text{ }^\circ\text{C}$ )	Reactive power for capacitors banks AC-6b ( $T_{amb.} = 55\text{ }^\circ\text{C}$ )					Integrated auxiliary contacts per contactor		Reference to complete with voltage code	Weight <sup>2)</sup> kg
	220 V 230 V kvar	380 V 415 V kvar	440 V kvar	480 V kvar	660 V kvar	*3  *4  NA	*1 *2 NF		
16	6	10	13	14	14	1	-	CWMC9-10-30♦ CWMC9-01-30♦	0.395
22	8	15	16	17	20	1	-	CWMC18-10-30♦ CWMC18-01-30♦	
30	11	20	23	25	30	1	-	CWMC25-10-30♦ CWMC25-01-30♦	0.440
40	15	26	30	33	40	1	-	CWMC32-10-30♦ CWMC32-01-30♦	
60	25	40	45	50	65	1	-	CWMC50-10-30♦ CWMC50-01-30♦	1.370
77	30	50	60	65	70	1	-	CWMC65-10-30♦ CWMC65-01-30♦	
93	35	61	71	77	87	1	-	CWMC80-10-30♦ CWMC80-01-30♦	1.595
						-	1		

Replace “♦” with the appropriate coil voltage code<sup>1)</sup>.

### Alternate Current

Code	X04	X15	X18	X26	X32	X37	X41	X42	X47
V (50 Hz)	20	95	110	190	220	240	325	380	415
V (60 Hz)	24	110	120	220	255	277	380	440	480

### Direct Current

Code (CWMC32...65)	C34	C37	C40	C44
V cc	24...28	42...50	110...130	208...240

Notes: 1) Other voltages on request;


2) Weights for contactors with alternating current control circuit. For direct current control circuit, add 0.020 kg to the CWMC32 models, and 0.050 kg to the CWMC50/65 models;

3) For CWMC9...32, auxiliary blocks cannot be included in addition to those that are already built-in.


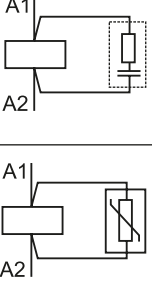


## Accessories


### Front Mounted Auxiliary Contact Block

Illustrative picture	For use with	Max. number of contacts / contactor	Auxiliary contacts		Reference	Code	Weight kg
			NO	NC			
	CWMC50...80	1 / CWMC50...80	1	0	BCXMF10	10356473	0.016
			0	1	BCXMF01	10356494	

### Surge Suppressors - Connect Directly to Coil Terminals A1-A2<sup>2)</sup>

Illustrative picture	For use with	Voltage	Circuit diagram	Reference	Code	Weight kg
	CWMC9...32	24...48 V 50/60 Hz		BAMRC4 D53	10045301	0.014
		50...127 V 50/60 Hz		BAMRC5 D55	10045302	
		130...250 V 50/60 Hz		BAMRC6 D63	10409766	
	CWMC50...80	24...48 V 50/60 Hz		BAMRC7 D53	10045303	
		50...127 V 50/60 Hz		BAMRC8 D55	10045304	
		130...250 V 50/60 Hz		BAMRC9 D63	10409767	
	CWMC9...80	270...380 V 50/60 Hz		BAMV1 D68	10664749	
		400...510 V 50/60 Hz		BAMV2 D73	10046382	

### Spare Coils

Illustrative picture	Control type	For use with	Reference to complete with voltage code	Code	Weight kg
	AC	CWMC9...25	BCA4-25♦	On request	0.065
		CWMC32	BCA4-40♦	On request	0.110
		CWMC50...80	BCA-105♦	On request	0.140
	DC	CWMC32	BECC4-40♦	On request	0.240
		CWMC50...65	BECC-105♦	On request	0.300

Replace "♦" with the appropriate coil voltage code<sup>1)</sup>.

### Alternate Current (0.75 x U<sub>e</sub>)

Code	X04	X06	X10	X11	X15	X18	X26	X30	X32	X37	X41	X42	X45	X46	X47	X50
V (50 Hz)	20	24	42	48	95	110	190	208	220	240	325	380	-	400	415	440
V (60 Hz)	24	28	48	56	110	120	220	240	255	277	380	440	400	460	480	510

### Direct Current

Code (CWMC32...65)	C34	C37	C40	C44
V dc	24...28	42...50	110...130	208...240

Notes: 1) Other voltages on request;

2) CWMC32...65 contactors with DC coil do not require surge suppression blocks, as they have a suppressor built in the coil;

3) For CWMC9...32, auxiliary blocks cannot be included in addition to those that are already built-in.

# Technical Data

## Basic Data

Models		CWMC9/18	CWMC25	CWMC32	CWMC50/65	CWMC80
Compliance with the standards		IEC 60947-1, IEC 60947-4, DIN VDE 0660(102)				
Rated insulation voltage $U_i$ (pollution degree 3)	IEC 60947-4-1, VDE 0660	1,000				
	UL, CSA	600				
Rated impulse withstand voltage $U_{imp}$ (IEC 60947-1)		6		8		
Frequency limits		25...400				
Mechanical life	AC coil (million operations)	1				
	DC coil (million operations)	1				
Electrical life	$I_e$ (AC-6b) (million operations)	0.1				
Maximum frequency of operation cycles	(operations/h)	120 (1 operation every 30 seconds)				
Protection rating (IEC 60529)	Main terminals	IP10				
	Coil and auxiliary contacts	IP20			IP10 (coil) and IP20 (auxiliary contacts)	
Mounting		Screws or DIN rail 35 mm (EN 50022)				
Coil connection points	Contactors with AC coil	4		4		3
	Contactors with DC coil	3		4		3
Vibration resistance (IEC 60068-2-6)	Open contactor (g)	3	4.5	7	4.5	5
	Closed contactor (g)	6	5	9		
Resistance to mechanical shocks (½ sine wave = 11ms - IEC 60068-2-27)	Open contactor (g)	8		7	6	
	Closed contactor (g)	12			10	
Ambient temperature	Operation	-25 °C...+55 °C				
	Storage	-55 °C...+80 °C				
Maximum operation altitude without modification in the rated values <sup>1)</sup>		3,000 m				

## Control Circuit - Alternate Current (AC)

Models		CWMC9...25	CWMC32	CWMC50...80
Rated insulation voltage $U_i$ (pollution degree 3)	IEC 60947-4-1, VDE 0660	1,000	1,000	1,000
	UL, CSA	600	600	600
Standard voltages at 50 Hz	(V)	10...550	10...550	10...550
Standard voltages at 60 Hz	(V)	12...660	12...660	12...660
Standard voltages at 50/60 Hz	(V)	12...660	12...660	12...660
Control voltage limits				
Coil operation limits (xUs)		0.85...1.1		
50 Hz and 60 Hz coil	Pick up (xUs)	0.4...0.76	0.5...0.76	0.5...0.76
	Drop out (xUs)	0.25...0.65	0.3...0.65	0.25...0.6
Average consumption		1.0 x Us and cold coil		
Coil $0.75 \times U_e$ (50 Hz e 60 Hz)	Closed magnetic circuit (VA)	6.1...10.2	11.4...15.0	16.8...26
	Power factor (cos φ)	0.28	0.34	0.32
	Thermal power dissipation (W)	2.6	4.3	8
	Closing of the magnetic circuit (VA)	120.36	177	307
	Power factor (cos φ)	0.85	0.69	0.54
Operation average time	Closing of the NO contacts (ms)	8...20	10...19	15...30
	Opening of the NO contacts (ms)	6...13	5...25	9...15

Note: 1) For 3,000...4,000 m altitudes (0.90xI<sub>e</sub> and 0.80xU) and 4,000...5,000 m (0.80xI<sub>e</sub> 0.75xU).



## Technical Data

### Control Circuit - Direct Current (DC)

Models			CWMC32	CWMC50...65
Rated insulation voltage $U_i$ (pollution degree 3)	IEC 60947-4-1, VDE 0660	(V)	1,000	1,000
	UL, CSA	(V)	600	600
Standard voltages		(V)	24...240	24...240
Control voltage limits				
Coil operation limits		(xUs)	0.85...1.1	
	Pick up	(xUs)	0.7...0.8	0.7...0.8
	Drop out	(xUs)	0.4...0.6	0.4...0.6
Average consumption			1.0 x Us	
	Closed magnetic circuit	(W)	6	6.5
	Closing of the magnetic circuit	(W)	240	340
Operation average time	Closing of the NO contacts	(ms)	50...60	50...60
	Opening of the NO contacts	(ms)	55...60	55...60

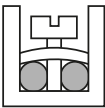
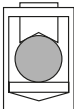
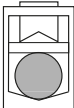
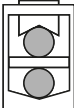
### Auxiliary Contact Block

Models			BCXMF10 and BCXMF01
Compliance with the standards			IEC 60947-5-1, IEC 60947-4-1
Rated insulation voltage $U_i$ (pollution degree 3)	IEC, VDE 0660	(V)	1,000
	UL, CSA	(V)	600
Rated operational voltage $U_e$	IEC, VDE 0660	(V)	690
	UL, CSA	(V)	600
Conventional thermal current $I_{th}$ ( $\theta \leq 55^\circ\text{C}$ )			(A) 10
Rated operational current $I_e$			
AC-15 (IEC 60947-5-1)	110-120 V	(A)	10
	220-230 V	(A)	10
	380-400 V	(A)	6
	415-440 V	(A)	5
	500 V	(A)	4
	660-690 V	(A)	2
UL, CSA			A600
DC-13(IEC 60947-5-1)	24 V	(A)	4
	48 V	(A)	2
	110 V	(A)	0.7
	220 V	(A)	0.3
	440 V	(A)	0.15
UL, CSA			Q600
Making capacity	$U_e \leq 400\text{ V } 50/60\text{ Hz - AC-15}$	(A)	90
Breaking capacity	$U_e \leq 400\text{ V } 50/60\text{ Hz - AC-15}$	(A)	60
Short circuit protection with fuse (gL/gG)			(A) 10
Control circuit reliability		(V / mA)	17 / 5
Electrical life		(million operations)	1
Mechanical life		(million operations)	10
Non-overlapping time between NO and NC contacts			(ms) >1.5
Impedance of the contacts			(m $\Omega$ ) 1.28




# Technical Data


## Terminal Capacity and Tightening Torque - Power Circuit

Models		CWMC9/18	CWMC25	CWMC32	CWMC50/65	CWMC80
Mounting system screw type		M3.5 Slot / Phillips	M4 Slot / Phillips	M4 Slot / Phillips	M8 Hexagon socket	M10 Hexagon socket
<b>Conductor cross-section</b>						
Flexible conductor without terminal	(mm <sup>2</sup> )		1x 1...6 2x 1...2.5 2x 2.5...6	1x 2.5...10 2x 2.5...10	-	-
Flexible conductor with terminal	(mm <sup>2</sup> )		1x 0.5...4 2x 0.5...2.5	1x 1...6.0 2x 1...2.5 2x 2.5...4	-	-
Solid wire	(mm <sup>2</sup> )		1x 0.5...6 2x 0.5...2.5 2x 2.5...6	x 1...10 2x 1...2.5 2x 2.5...10	-	-
Torque	(Nm)		1...1.5	1.6...2.5	-	-
<b>Connection of the conductors on top - bottom not used</b>						
Flexible conductor without terminal	(mm <sup>2</sup> )		-	-	1...16	1.5...35
Flexible conductor with terminal	(mm <sup>2</sup> )		-	-	0.75...16	1...35
Solid wire	(mm <sup>2</sup> )		-	-	0.75...16	1...35
Torque	(Nm)		-	-	2...2.5	4...6
<b>Connection of the conductors at the bottom - top not used</b>						
Flexible conductor without terminal	(mm <sup>2</sup> )		-	-	1.5...16	6...35
Flexible conductor with terminal	(mm <sup>2</sup> )		-	-	1...16	2.5...35
Solid wire	(mm <sup>2</sup> )		-	-	1...16	2.5...35
Torque	(Nm)		-	-	2...2.5	4...6
<b>2-conductor connection</b>						
First conductor/top						
Flexible conductor without terminal	(mm <sup>2</sup> )		-	-	1...16	1.5...35
Flexible conductor with terminal	(mm <sup>2</sup> )		-	-	0.75...16	1...35
Solid wire	(mm <sup>2</sup> )		-	-	0.75...16	1...25
Second conductor/bottom						
Flexible conductor without terminal	(mm <sup>2</sup> )		-	-	1.5...16	6...35
Flexible conductor with terminal	(mm <sup>2</sup> )		-	-	1...16	2.5...25
Solid wire	(mm <sup>2</sup> )		-	-	1...16	2.5...35
Torque	(Nm)	-	-	2...2.5	4...6	

## Terminal Capacity and Tightening Torque - Control Circuit

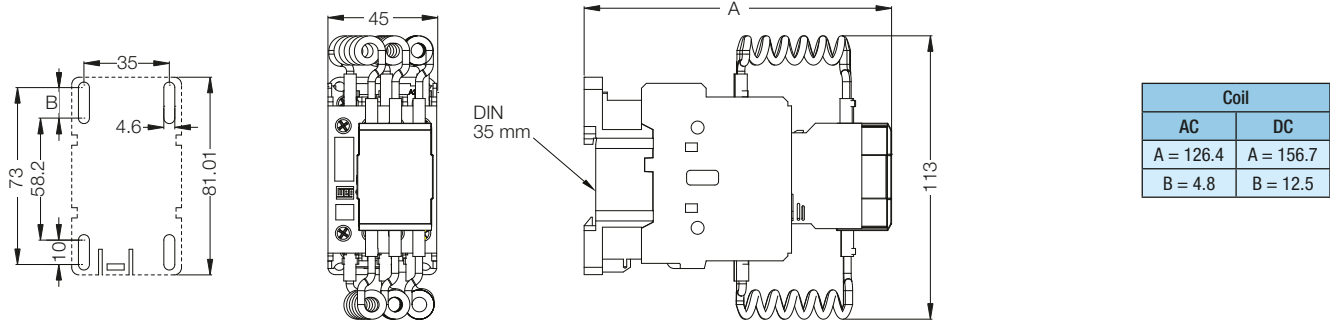
Models		CWMC9...25	CWMC32...80
Mounting system screw type		M3.5 Slot / Phillips	
Conductor cross-section			
Flexible conductor without terminal	(mm <sup>2</sup> )		1x 1...4 or 2x 1...2.5
Flexible conductor with terminal / solid wire	(mm <sup>2</sup> )		1x 0.5...4 or 2x 0.5...1.5 or 2x 1...2.5
Torque	(Nm)		0.8...1.1

## Terminal Capacity and Tightening Torque - Auxiliary Contacts

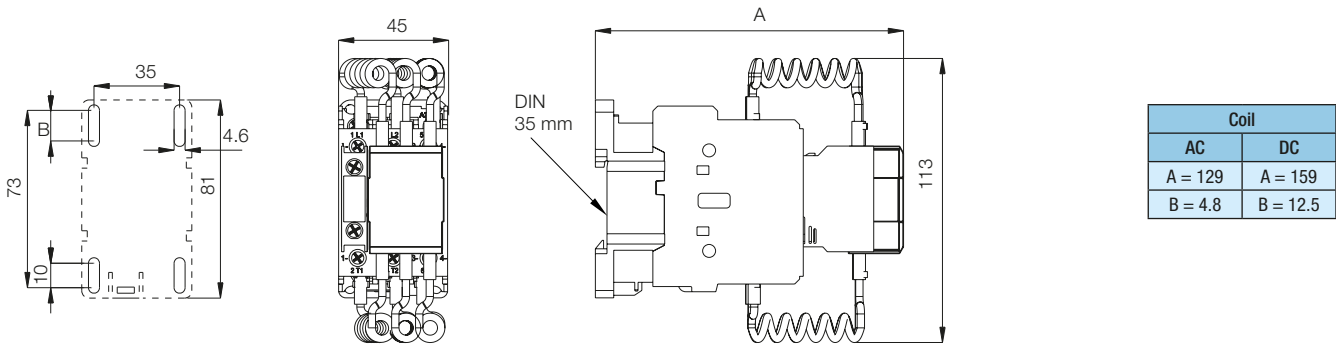
Models		BCXMF10 and BCXMF01	
Mounting system screw type		M3.5 Slot / Phillips	
Conductor cross-section			
Conductor with or without terminal	(mm <sup>2</sup> )		
Flexible conductor with terminal / solid wire	(mm <sup>2</sup> )		0.75...2.5 or 2x 0.75...2.5
Torque	(Nm)		0.8...1.5

## Dimensions (mm)

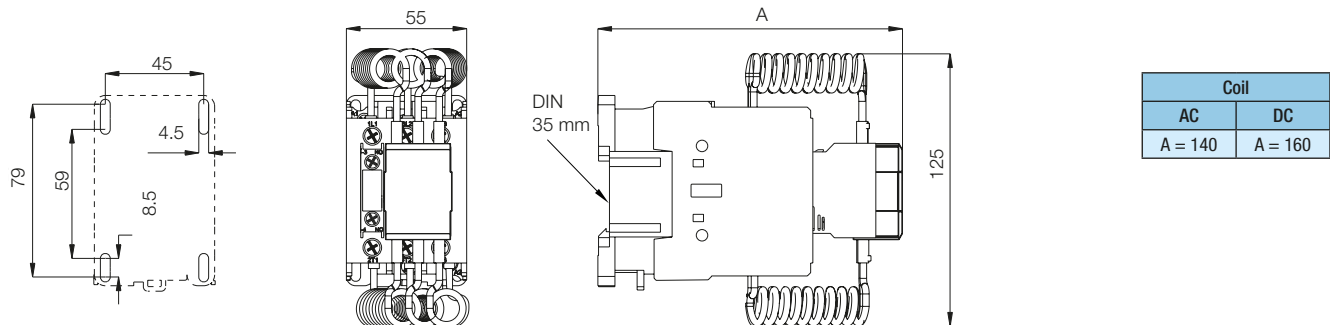
### CWMC9/18



### CWMC25



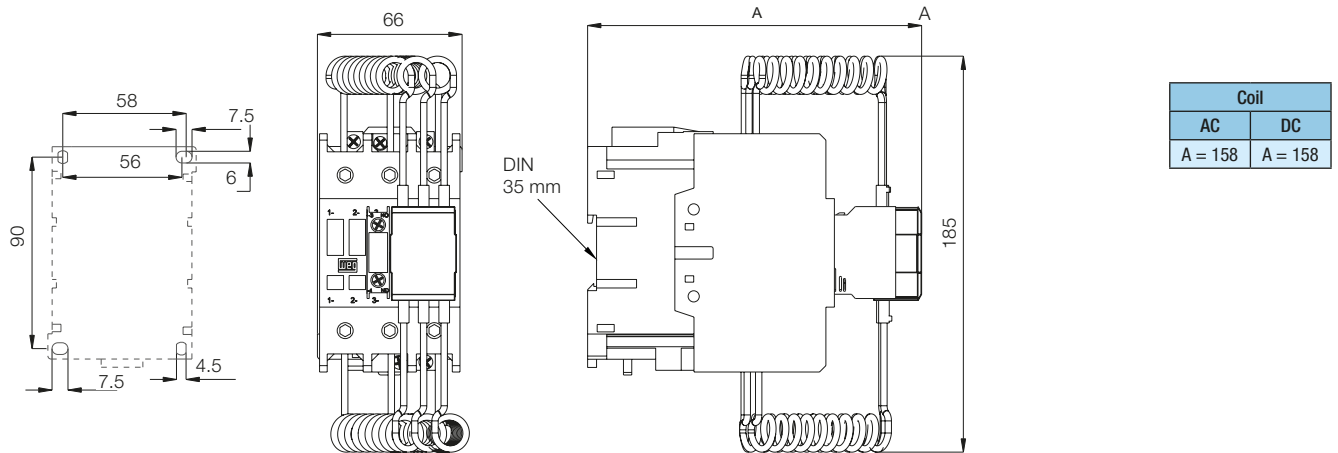
### CWMC32



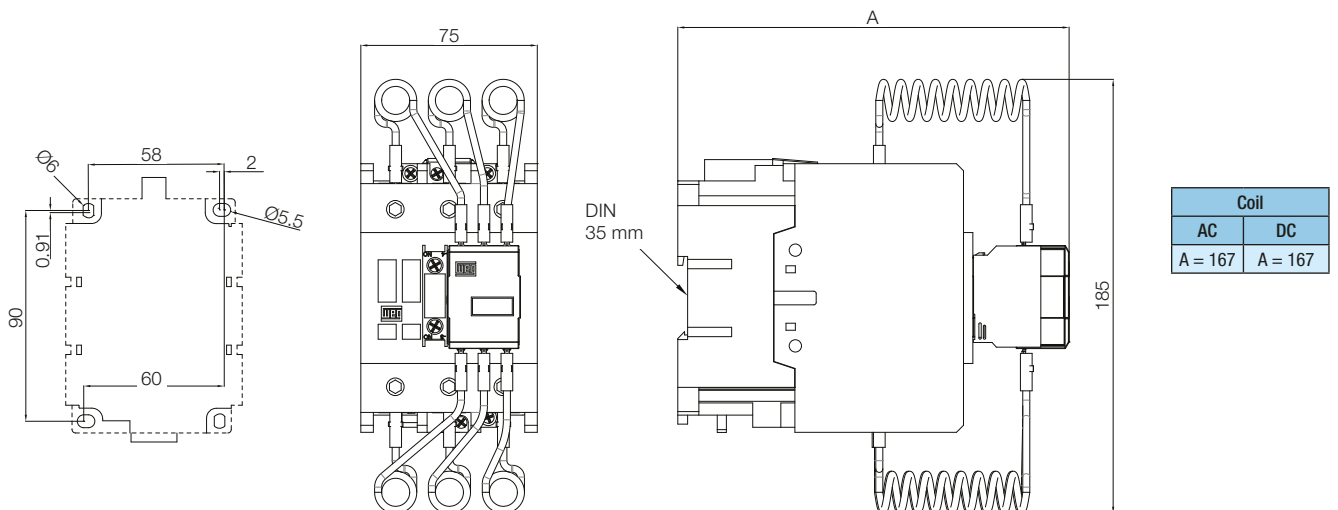


## Dimensions (mm)

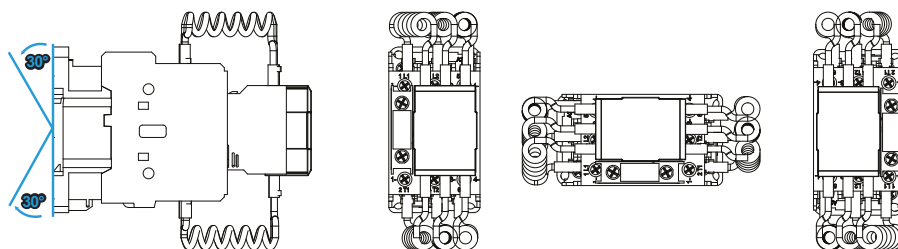
### CWMC50 and CWMC65



### CWMC80



### Mounting Position



# Global presence is essential, as much as understanding your needs.

## Global Presence

With more than 30.000 employees worldwide, WEG is one of the largest electric motors, electronic equipments and systems manufacturers. We are constantly expanding our portfolio of products and services with expertise and market knowledge. We create integrated and customized solutions ranging from innovative products to complete after-sales service.

WEG's know-how guarantees our **Contactors for Switching of Capacitors - CWMC Line** are the right choice for your application and business, assuring safety, efficiency and reliability.



**Availability** is to have a global support network



**Partnership** is to create solutions that suit your needs



**Competitive edge** is to unite technology and innovation



# Know More



High performance and reliable products to improve your production process.



Excellence is to provide a whole solution in industrial automation that improves our customers productivity.

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The values shown are subject to change without prior notice.  
The information contained is reference values.