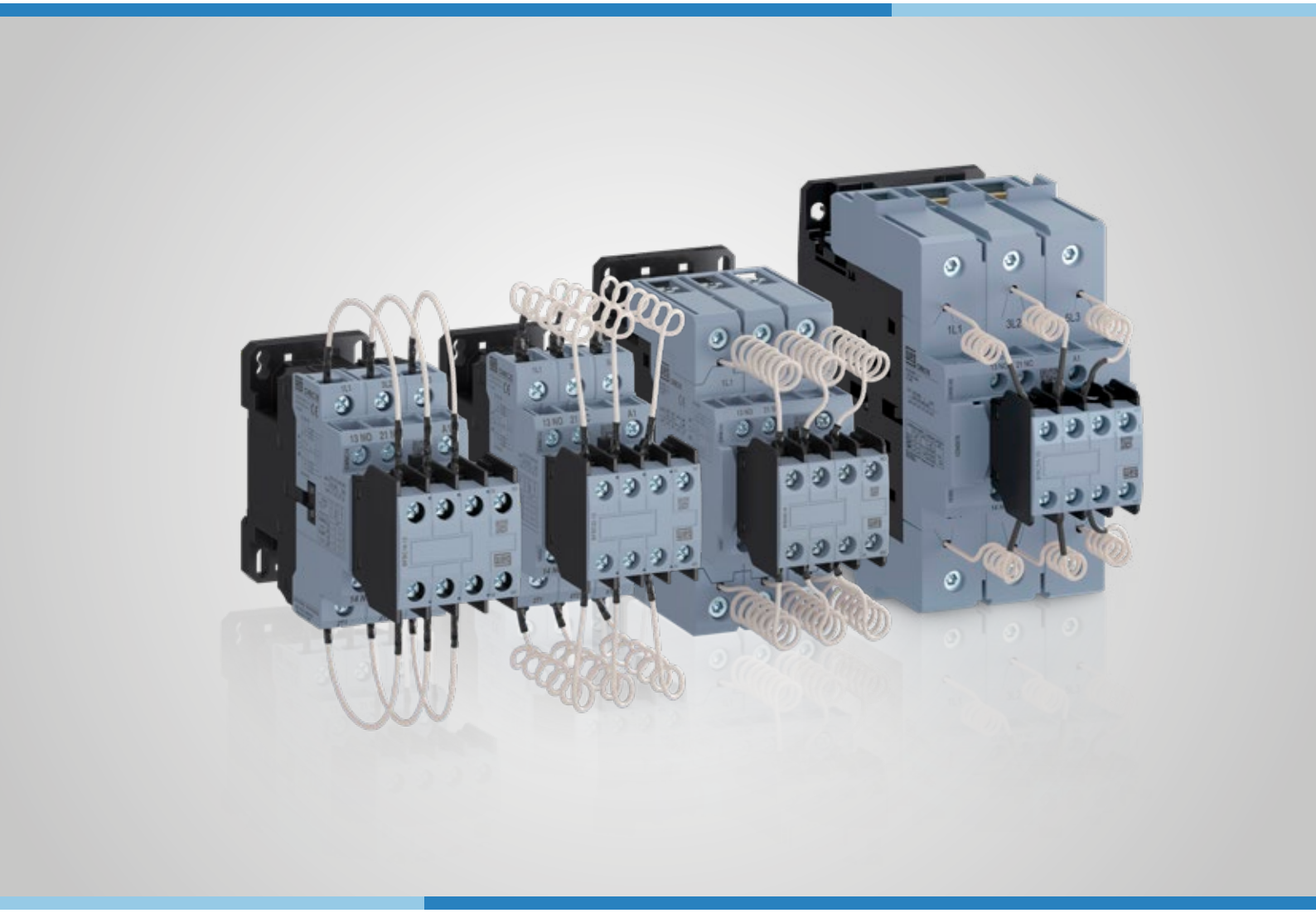
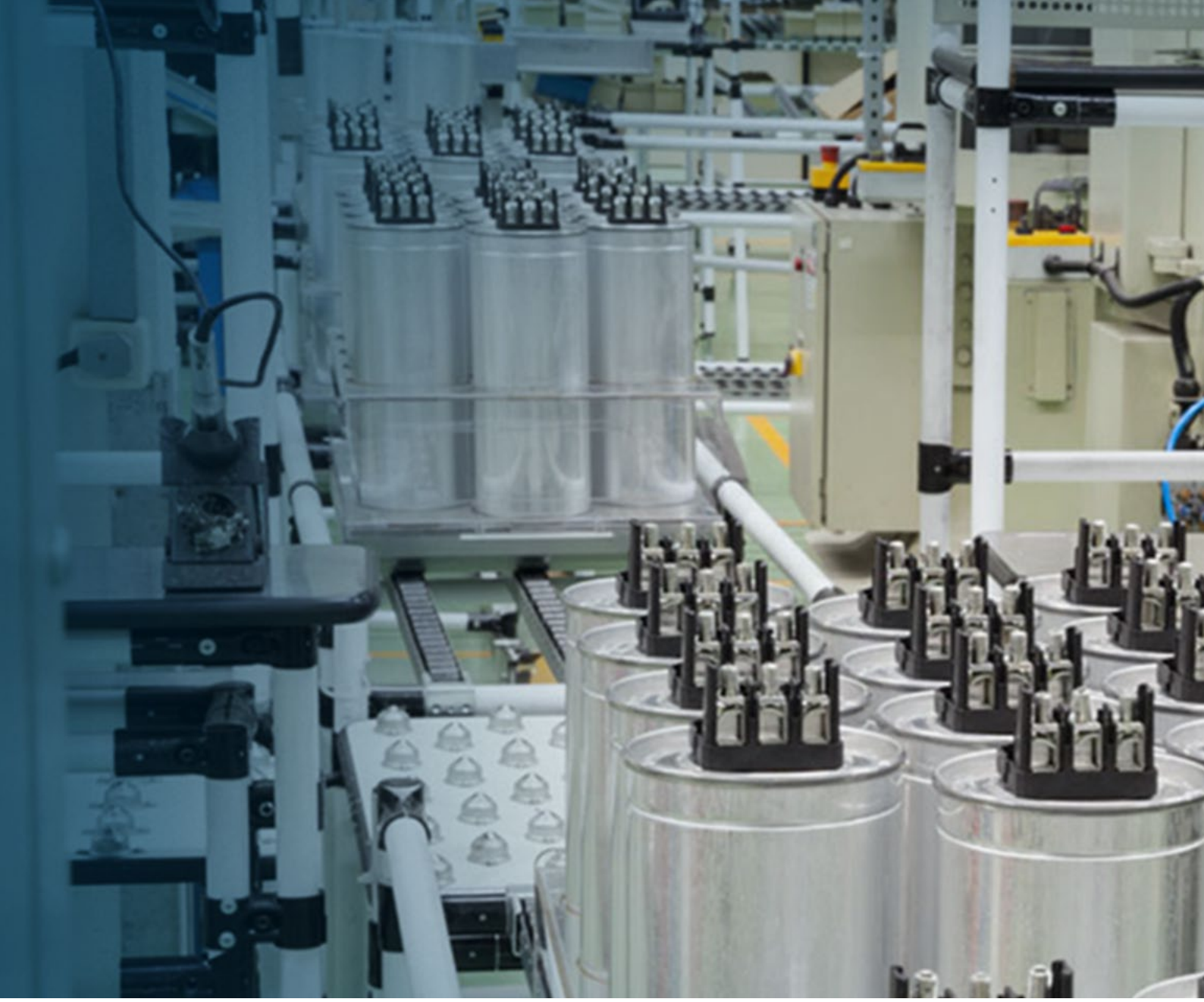
CWBC - CONTACTORS FOR CAPACITOR SWITCHING

Switching efficiency.
Correction reliability.



Motors | Automation | Energy | Transmission & Distribution | Coatings

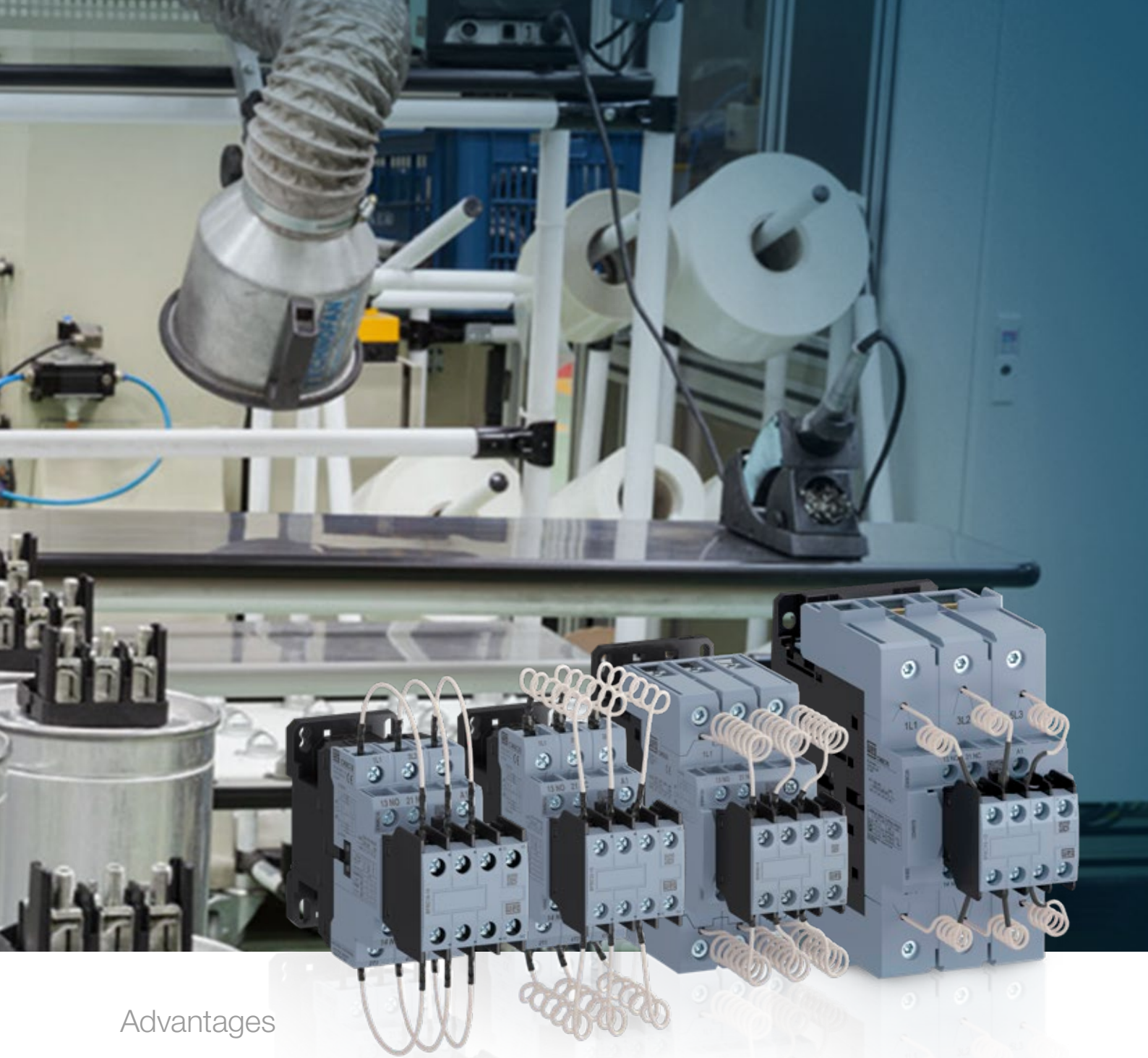


CAPACITOR SWITCHING FOR **POWER FACTOR CORRECTION**

The special line of CWBC contactors was designed according to IEC 60947-1 and UL 60947-1 standards and provides the best solution for switching your capacitors for power factor correction.

Main Characteristics

- Currents from 17 to 103 A (AC-6b)
- Compact products
- Power supply from 24 to 600 V
- Low consumption coils
- Enclosure for surge suppressors



Advantages

Modular Design:
DIN rail 35 mm mounting
or with screws

Pre-Charge Resistors:
reduce high in-rush
currents

Early Make Contact Block:
connect the pre-charge
resistors and then
disconnect them after a
few moments

Auxiliary Contacts:
3 built-in auxiliary contacts
2 NO + 1 NC or 1 NO + 2 NC

Certifications

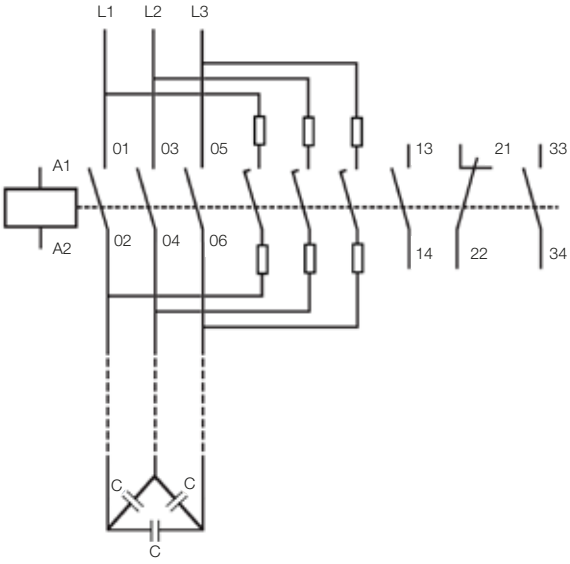
Note: 1) CWBC95 under certification process.

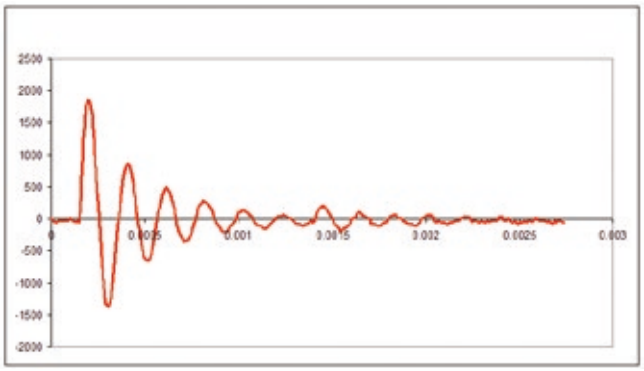
CWBC Contactors for Switching Capacitors

In-Rush Currents

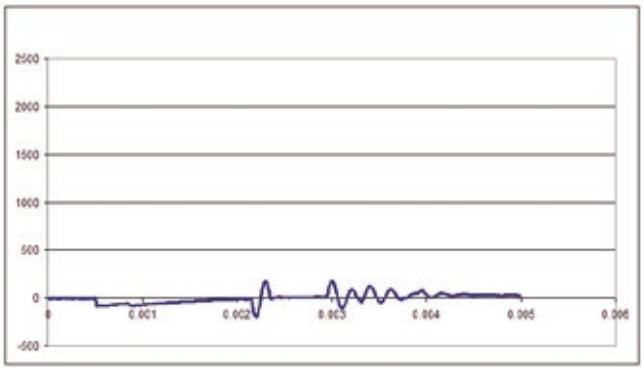
When capacitors banks are switched, the voltage associated with a low line impedance may produce high currents on the capacitors. This current may reach 100 x I_n (A), being one of the main causes of reduction in the capacitor lifespan.

The CWBC contactors have pre-charge resistors that limit the in-rush currents when the capacitors are switched. The resistors, assembled in series with the early make contact blocks, are connected before the main contacts. After the main contacts close, the early make contacts are disconnected, and only the capacitors in parallel remain with their inductive load for the proper power factor correction.





I_n(A) with standard contactors



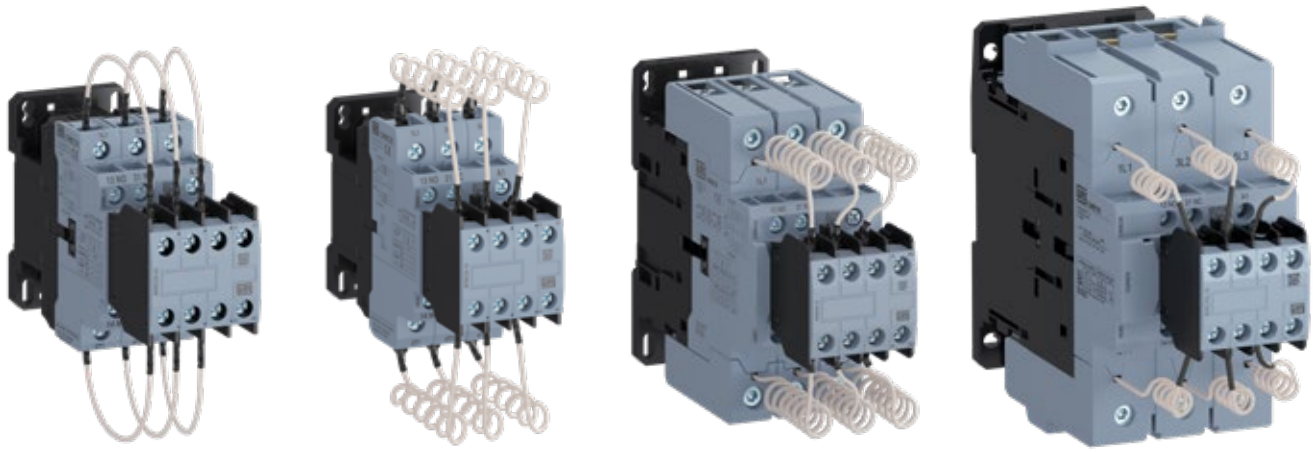
I_n(A) with CWBC contactors

Calculation of the Capacitor Rated Current

$$I_c = \frac{\text{React.pow. (kvar)} \times 1000}{\sqrt{3} \times V_{FF}} \text{(A)}$$

Where:
I_c = Capacitor bank current
V_{FF}= Voltage between phases

CWBC Contactors for Switching Capacitors



Three-pole from 17 A to 103 A (θ = 55 °C)

I_e AC-6b ($T_{amb.}$ = 55 °C) Ue<480 V A	Reactive power for AC-6b capacitor banks ($T_{amb.}$ = 55 °C)					Integrated auxiliary contacts per contactor		Code to fill in with the control voltage	Weight[2] kg
	220 V 230 V kvar	380 V 415 V kvar	440 V kvar	480 V kvar	660 V kvar	•3 / •4 NO	•1 / •2 NC		
17	6	10	13	14	14	2	1	CWBC9-21-30♦	0.398
						1	2	CWBC9-12-30♦	0.398
22	8	16	16	17	20	2	1	CWBC18-21-30♦	0.398
						1	2	CWBC18-12-30♦	0.398
28	11	20	23	25	30	2	1	CWBC25-21-30♦	0.448
						1	2	CWBC25-12-30♦	0.448
40	15	25	30	33	40	2	1	CWBC32-21-30♦	0.448
						1	2	CWBC32-12-30♦	0.448
63	25	40	45	50	65	2	1	CWBC50-21-30♦	0.915
						1	2	CWBC50-12-30♦	0.915
77	30	50	60	65	70	2	1	CWBC65-21-30♦	0.915
						1	2	CWBC65-12-30♦	0.915
103	40	68	78	85	85	2	1	CWBC95-21-30♦	1.663
						1	2	CWBC95-12-30♦	1.663

Replace "♦" with the control voltage code[1].

Alternating Current (CWBC9...95)

Code	D02	D07	D13	D15	D17	D23	D24	D25	D33	D34	D35	D36	D39
V (50/60 Hz)	24	48	110	120	127	220	230	240	380	400	415	440	480

Direct Current (CWBC9...65)

Code	C03	C07	C09	C12	C13	C15
V dc	24	48	60	110	125	220

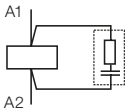
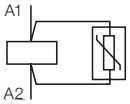
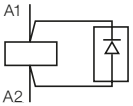
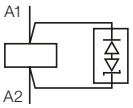
Alternating Current/Direct Current with Electronic Module (CWBC95)

Code	E04	E64	E65	E66
V ac (50/60 Hz) and V dc	24...60 V	48...130 V	110...255 V	250...500 V

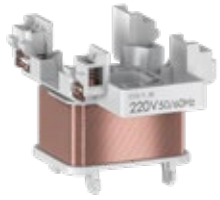
Notes: 1) Other voltages on request.
2) Weights for contactors with control circuit in alternating current. For DC control circuit, add 0.110 kg to the CWBC9/18 models and 0.120 kg to the CWBC25/32 models; add 0.060 kg to the CWBC50/65 AC models. For CWBC95 with electronic coil add 0.010kg.

Accessories

Surge Suppressors - Plug-In Type

Illustrative picture	Use with	Voltages	Diagram	Code	Part number	Weight kg
	CWBC9...95	24...48 V 50/60 Hz		RCBD53	12242511	0.008
		50...127 V 50/60 Hz		RCBD55	12242512	
		130...250 V 50/60 Hz		RCBD63	12242513	
		12...48 V 50/60 Hz / 12...60 V dc		VRBE49	12242514	
		50...127 V 50/60 Hz / 60...180 V dc		VRBE34	12242515	
		130...250 V 50/60 Hz / 180...300 V dc		VRBE50	12242516	
		277...380 V 50/60 Hz / 300...510 V dc		VRBE41	12242517	
		400...510 V 50/60 Hz		VRBD73	12242558	
		12...600 V dc		DIBC33[1]	12242560	
		12...250 V dc		DIZBC26[2]	12242561	

Spare Coils

Illustrative picture	Use with	Control type	Code to complete with the control voltage[3]	Part number	Weight kg
	CWC9...32	AC	BRB-38♦	On request	0.08
	CWBC50/65	AC	BRB-80♦	On request	0.09
		DC	BRB-80♦	On request	0.40
	CWBC95	AC	BRB-110♦	On request	0.15
		AC/DC	BRB-125♦	On request	0.15

Replace "♦" with the control voltage code[3].

Alternating Current (CWBC9...95)

Code	D02	D07	D13	D15	D17	D23	D24	D25	D33	D34	D35	D36	D39
V (50/60 Hz)	24	48	110	120	127	220	230	240	380	400	415	440	480

Direct Current (CWBC9...65)

Code	C03	C07	C09	C12	C13	C15
V dc	24	48	60	110	125	220

Alternating Current/Direct Current with Electronic Module (CWBC95)

Code	E04	E64	E65	E66
V ac (50/60 Hz) and V dc	24...60 V	48...130 V	110...255 V	250...500 V

Notes: 1) Contactors with control in direct current assembled with DIB surge suppressor blocks increases the opening time by six times.
Do not use with BFBC auxiliary contact blocks that contain NC contact (CWBCx-12-30 contactors).
2) Contactors with control in direct current assembled with DIZB surge suppressor blocks increases the opening time by four times.
3) Other voltages on request.

Technical Data

Basic Data

Models			CWBC9/18	CWBC25/32	CWBC50/65	CWBC95
Compliance with the standards			IEC/EN 60947-1 IEC/EN 60947-4-1 IEC/EN 60947-5-1			
Rated insulation voltage U_i (pollution degree 3)	IEC 60947-4-1	(V)	690			
	UL, CSA	(V)	600			
Rated impulse withstand voltage U_{imp} (IEC/EN 60947-1)		(kV)	6			
Frequency limits		(Hz)	25...400			
Mechanical life	AC coil	(millions of operations)	1			
	DC coil	(millions of operations)	1			
Electrical life	I_e (AC-6b)	(millions of operations)	0.1			
Maximum frequency of operation cycles		(ops./h)	120 (1 operation every 30 seconds)			
Protection rating (IEC 60529)	Main terminals		IP10 (front)			
	Coil and auxiliary contacts		IP20 (front)			
Mounting			Screws or DIN rail 35 mm (EN 50022)			
Coil connection points	Contactors with AC coil		2			
	Contactors with DC coil		2			
Vibration resistance (IEC 60068-2-6)	Open contactor	(g)	4			
	Closed contactor	(g)	4			
Resistance to mechanical shocks (½ sine wave = 11ms - IEC 60068-2-27)	Open contactor	(g)	10			
	Closed contactor	(g)	15			
Ambient air temperature	Operation		-25 °C...+55 °C			
	Storage		-55 °C...+80 °C			
Maximum operation altitude without modification in the rated values[1)]			3,000 m			

Notes: 1) Check the time between activations of the capacitor used, as this time is normally greater than that of the contactor and must be observed (the longer time between activations shall prevail) to avoid damage to the set.
2) For altitudes of 3,000...4,000 m, consider 0.90 x Ie and 0.80 x Ui; for altitudes of 4,000...5,000 m, consider 0.80 x Ie and 0.75 x Ui.

Auxiliary Contacts

Model			CWBC9...95
Compliance with the standards			IEC/EN 60947-5-1
Rated insulation voltage U_i (pollution degree 3)	IEC/EN 60947-4-1, VDE 0660	(V)	690
	UL, CSA	(V)	600
Rated operational voltage U_e	IEC/EN 60947-4-1, VDE 0660	(V)	690
	UL, CSA	(V)	600
Conventional thermal current I_{th} ($\theta \leq 55$ °C)		(A)	10
Rated operational current I_e			
AC-15 (IEC 60947-5-1)	220/230 V	(A)	10
	380/440 V	(A)	4
	500 V	(A)	2.5
	660/690 V	(A)	1.5
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
Making capacity	$U_e \leq 690$ V 50/60 Hz - AC-15	(A)	10 x I_e
Breaking capacity	$U_e \leq 400$ V 50/60 Hz - AC-15	(A)	1 x I_e
Short circuit protection with fuse (gL/gG)		(A)	10
Control circuit reliability		(V / mA)	17 / 5
Electrical life	(millions of operations)		1
Mechanical life	(millions of operations)		10
Non-overlapping time between NO and NC contacts		(ms)	1.5
Impedance of the contacts		(mΩ)	2.5

Technical Data

Control Circuit - Alternate Current (AC)

Models			CWBC9...32	CWBC50/65	CWBC95
Rated insulation voltage U_i (pollution degree 3)	IEC/EN 60947-4-1	(V)	690	1,000	1,000
	UL, CSA	(V)	600	600	600
Standard voltages at 50/60 Hz		(V)	12...500	24...500	24...500
Coil operation limits	At 50 Hz	(xUs)	0.8...1.1	0.8...1.1	0.8...1.1
	At 60 Hz	(xUs)	0.8...1.1	0.8...1.1	0.8...1.1
Average coil consumption 50/60 Hz (operation at 60 Hz)	Closed magnetic circuit	(VA)	7.5	17.5	25
	Power factor switched on	(cos φ)	0,27	0.28	0.4
	Thermal power dissipation	(W)	1.5...2.5	4...5.5	9...11
	Closing of the magnetic circuit	(VA)	75	185	410
	Power factor switching on	(cos φ)	0.7	0.55	0.48
Average coil consumption 50/60 Hz (operation at 50 Hz)	Closing of the NO contacts	(ms)	9	27	27
	Opening of the NO contacts	(ms)	0.24	0.25	0.4
	Thermal power dissipation	(W)	1.5...2.5	5.5...7.8	11...13.4
	Closing of the magnetic circuit	(VA)	90	202	426
	Power factor switching on	(cos φ)	0.8	0.56	0.5
Average operating time	Closing of the NO contacts	(ms)	15...25	10...15	8...12.5
	Opening of the NO contacts	(ms)	8...12	8...12	4...8

Control Circuit - Direct Current (DC)

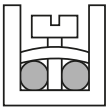
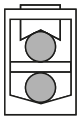
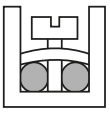
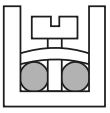
Models			CWBC9...32	CWBC50/65	CWBC95
Rated insulation voltage U_i (pollution degree 3)	IEC/EN 60947-4-1	(V)	690	690	-
	UL, CSA	(V)	600	600	-
Standard voltages		(V)	12...500	12...500	-
Coil operation limits		(xUs)	0.8...1.1	0.8...1.1	-
Average DC coil consumption	Closed magnetic circuit	(W)	5.8	10.6	-
	Closing of the magnetic circuit	(W)	5.8	105.5	-
Average operating time	Closing of the NO contacts	(ms)	35...45	20...30	-
	Opening of the NO contacts	(ms)	8...12	4...8	-

Control Circuit - Alternating Current/Direct Current with Electronic Module (AC/DC)

Models			CWBC9/32	CWBC50/65	CWBC95
Rated insulation voltage U_i (pollution degree 3)	IEC/EN 60947-4-1, VDE 0660	(V)	-	-	1,000
	UL, CSA	(V)	-	-	600
Standard voltages		(V)	-	-	24...500
Coil operation limits	in V dc	(xUs)	-	-	0.8...1.1
	at 50 Hz	(xUs)	-	-	0.8...1.1
	at 60 Hz	(xUs)	-	-	0.8...1.1
Average consumption			-	-	1.0 x Us and cold coil
AC power supply (60 Hz)	Closed magnetic circuit	(ms)	-	-	10.8
	Power factor	(VA)	-	-	0.47
	Thermal power dissipation	(cos φ)	-	-	5.1
	Closing of the magnetic circuit	(W)	-	-	217
	Power factor	(VA)	-	-	0.88
DC power supply	Closed magnetic circuit	(cos φ)	-	-	2...5
	Closing of the magnetic circuit	(W)	-	-	180...220
Average operating time	Closing of the NO contacts	(W)	-	-	32...48
	Opening of the NO contacts	(ms)	-	-	30...55

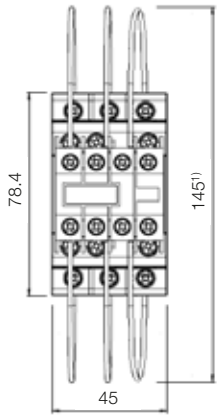
Technical Data

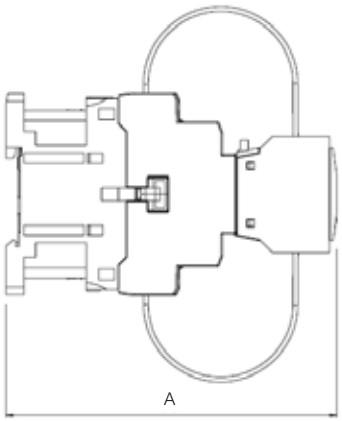
Terminal Capacity and Tightening Torque

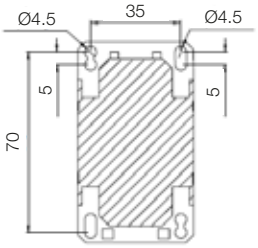
Models			CWBC9/18	CWBC25/32	CWBC50/65	CWBC95
Power circuit						
Mounting system screw type			Phillips number 2	Phillips number 2	ALLEN 4 mm	ALLEN 4 mm
Flexible conductor without terminal	(mm²)		1 x 1...6 2 x 1...6	1 x 2.5...10 2 x 2.5...10	-	-
Flexible conductor with terminal	(mm²)		1 x 1...6 2 x 1...4	1 x 1.5...10 2 x 1.5...6	-	-
Solid wire	(mm²)		1 x 1...6 2 x 1...6	1 x 2.5...10 2 x 2.5...10	-	-
Tightening torque	(mm²)		1.7	2.5	-	-
Flexible conductor without terminal	(mm²)		-	-	1 x 2.5...35 2 x 2.5...35	1 x 2.5...70 2 x 2.5...70
Flexible conductor with terminal	(Nm)		-	-	1 x 2.5...35 2 x 2.5...35	1 x 2.5...70 2 x 2.5...70
Solid wire	(mm²)		-	-	1 x 2.5...35 2 x 2.5...35	1 x 2.5...25 2 x 2.5...25
Tightening torque	(Nm)		-	-	5.0	6.0
Control circuit and auxiliary contacts						
Mounting system screw type			Philips number 2			
Flexible conductor without terminal	(mm²)		1 x 1...4 2 x 1...4			
Flexible conductor with terminal	(mm²)		1 x 1...4 2 x 1...2.5			
Solid wire	(mm²)		1 x 1...4 2 x 1...4			
Tightening torque	(Nm)		1.0			
Front Mounted Block (BFBC)						
Mounting system screw type			Philips number 2			
Flexible conductor without terminal	(mm²)		1 x 1...2.5 2 x 1...2.5			
Flexible conductor with terminal	(mm²)		1 x 1...2.5 2 x 1...2.5			
Solid wire	(mm²)		1 x 1...2.5 2 x 1...2.5			
Tightening torque	(Nm)		1.0			

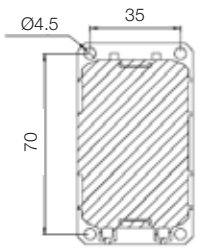
Dimensions (mm)

CWBC9/18



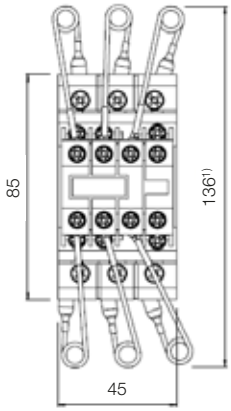


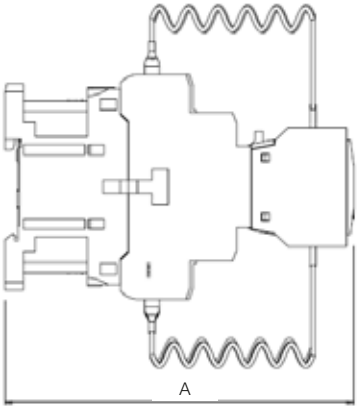


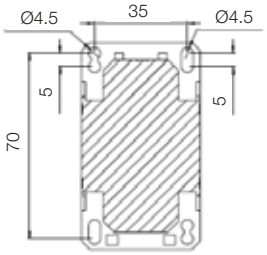


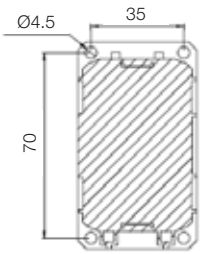
Coil	
AC	DC
A=128.3	A=137.5

CWBC25/32



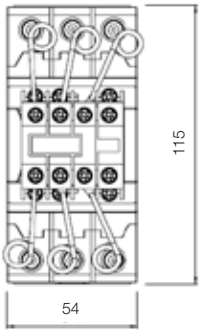


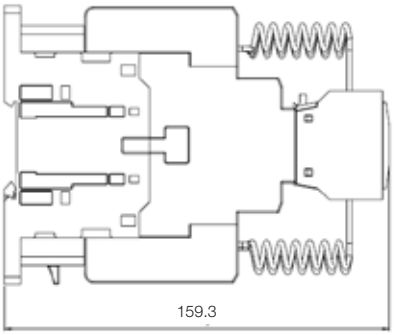


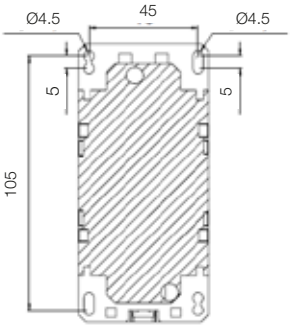


Coil	
AC	DC
A=131.8	A=141

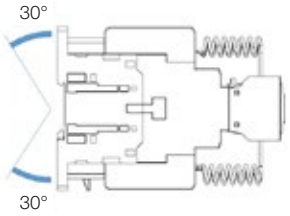
CWBC50/65



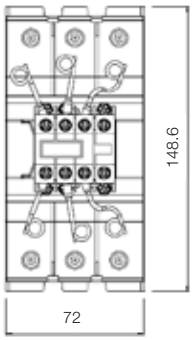


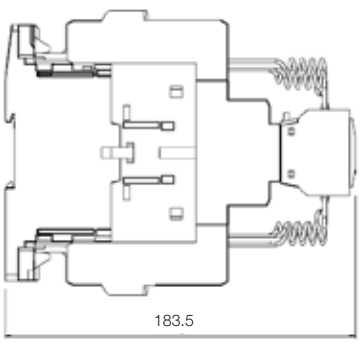


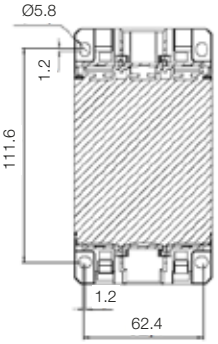
Mounting Position

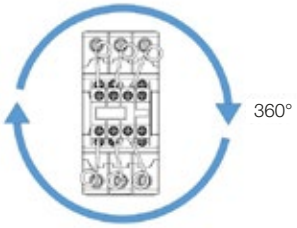


CWBC95









Note: 1) Approximate size.

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 ***CWBC - Contactors for Capacitor Switching*** 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.

Visit: **www.weg.net**

youtube.com/wegvideos

For WEG's worldwide
operations visit our website

www.weg.net

AUTOMATION

+55 47 3276.4000

automacao@weg.net

Jaraguá do Sul - SC - Brazil

Cod: 50101361 | Rev: 00 | Date (m/y): 02/2022.