

CAPACITOR CONTACTORS type CNNK 2.5 - CNNK 7.5

Features

- In conformity with: IEC 60947-1, IEC 60947-4
- Switching of 3 phase capacitors
- Ambient temperature of 55 °C
- Available in other AC voltages on request

Selection and ordering data

1



AC-6b utilization category For switching three-phase capacitors			Auxiliary contacts		Type	Weights kg
Capacitor rating at operating voltage 50 Hz		Ie (A)				
230 V kVAr	400 V kVAr	400 V/50 Hz	NO	NC		
1,4	2,5	3,6	1 0 0 1		CNNK 2,5 10 CNKN 2,5 01	0.25
2,8	5	7,2	1 0 0 1		CNNK 5 10 CNKN 6 01	0.26
4	7,5	11	0 0 1 1		CNNK 7,5 00 CNNK 7,5 11	0.27

CAPACITOR CONTACTORS type CNNK 10 - CNNK 30

Features

- In conformity with: IEC 60947-1, IEC 60947-4
- Switching of 3 phase capacitors
- Ambient temperature of 55 °C
- Available in other AC voltages on request

1

Selection and ordering data

AC-6b utilization category For switching three-phase capacitors			Auxiliary contacts		Type	Weights kg
Capacitor rating at operating voltage 50 Hz		le (A)				
230 V kVAr	400 V kVAr	400 V/50 Hz	NO	NC		
5	10	14	2	0	CNNK 10 20	0.314
			1	1		
6,7	12.5	18	2	0	CNNK 12 20	0.316
			1	1		
8.5	15	22	2	0	CNNK 15 20	0.318
			1	1		
11	20	29	1	0	CNNK 20 10	0.333
14	25	36	1	0	CNNK 25 10	0.404
20	30	44	1	0	CNNK 30 10	0.404



These CNNK contactors are equipped with early-make contacts.

This special type of contact has the purpose of connecting for a very brief interval, 2-3ms, during the contactor closing, resistors which limit the connecting current of the capacitors. These resistors are then excluded when the closing operation is complete and the current capacity is conveyed to the main contacts. With this type of circuit, it is possible to obtain minor wear of all the components of the system especially fuses and capacitors ensuring a longer life and better reliability.

CAPACITOR CONTACTORS type CNKM 40 - CNKM 75

Features

- In conformity with: IEC 60947-1, IEC 60947-4
- Switching of 3 phase capacitors
- Ambient temperature of 55 °C
- Available in other AC voltages on request

Selection and ordering data

1

AC-6b utilization category For switching three-phase capacitors			Auxiliary contacts 	Type	Weights kg
Capacitor rating at operating voltage 50 Hz		Ie (A)			
230 V kVAr	400 V kVAr	400 V/50 Hz			
25	40	58	0 0	CNKM 40 00	1.51
			2 2	CNKM 40 22	1.60
29	50	72	0 0	CNKM 50 00	1.53
			2 2	CNKM 50 22	1.62
32	60	87	0 0	CNKM 60E 00	1.7
			2 2	CNKM 60E 22	1.78
34	60	87	2 2	CNKM 60 22	2.4
38	75	108	2 2	CNKM 75 22	2.45



These CNKM contactors are equipped with early-make contacts.

This special type of contact has the purpose of connecting for a very brief interval, 2-3ms, during the contactor closing, resistors which limit the connecting current of the capacitors. These resistors are then excluded when the closing operation is complete and the current capacity is conveyed to the main contacts. With this type of circuit, it is possible to obtain minor wear of all the components of the system especially fuses and capacitors ensuring a longer life and better reliability.

ACCESSORIES for CONTACTORS type CNN

Selection and ordering data

Kits for assembling CNNK contactors

To optimise contactor stock management, a kit is available to transform normal three-pole contactors into CNNK types for power factor correction.

The table to the below indicates which kits to purchase depending on the standard contactor in stock.

1



BPK1

TYPE of CONTACTOR	TYPE of CAPACITOR BLOCK	TYPE of CAPACITOR CONTACTOR
CNN 9	BPK1	CNNK 10
CNN 12	BPK1	CNNK 12
CNN 18	BPK1	CNNK 15
CNN 25	BPK1	CNNK 20

ACCESSORIES for CONTACTORS type CNM

Selection and ordering data

Surge suppressors



For contactor	Description	Part No.	Weights kg
CNN P	RC elements for control voltage 24...60 V for mounting on the coil: A	739968	0.014
CNB 21, 31		739914	0.019
CNN 9 - 40	for mounting on the front cover: B for control voltages 110...240 V for mounting on the coil: A	739913	0.015
		739908	0.020

Additional terminal blocks



For contactor	Description	Part No.	Weights kg
CNN 32 - CNN 40	Set of 2 additional terminal blocks for connecting bare cables 25 mm ²	601478	0.070
CNM 45 - CNM 60	Set of 2 additional terminal blocks for connecting bare cables 35 mm ²	601479	0.210
CNM 75 - CNM 110	Set of 6 terminal covers for protection against inadvertent contact with the exposed busbar connections (DIN VDE 0106 Part 100)	603311	0.162

TECHNICAL INFORMATION

CAPACITOR CONTACTORS type CNNK 2,5 - CNNK 7,5

In conformity with: IEC 60947-1, IEC 60947-4

Special contactors for power factor correction

Choice criteria

The contactor during the closing transition is influenced by electrical currents having high frequencies and high amplitudes.

The frequencies of these currents range between 1 and 10kHz; the amplitudes must have values lower than the maximum permissible current peak of the contactor to be used.

1

Type designation	CNNK 2,5 10 CNNK 2,5 01	CNNK 5 10 CNNK 5 01	CNNK 7,5 00 CNNK 7,5 11	
Capacitor rating at operating voltage	1,4	2,8	4	
230V kVAr				
400-440V kVAr	2,5	5	7,5	
50/60Hz				
500-550V kVAr	3	5,5	9	
660-690V kVAr	3,7	7,5	11	
Rated operational current I_e/AC-6b et 400 V	A	7,2	11	
	3,6			
Insulation rating U _i	V	690		
Permissible ambient temperature	°C	- 25 to + 55		
Rated impuls withstand voltage U _{imp}	kV	8		
Consumption of electromagnet in cold state with U _n AC operated				
closing	VA	62		
p.f.		0,75		
closed	VA	7		
p.f.		0,3		
Coil voltage tolerances		0,85 - 1,1 U _n		
Degree of protection		IP 20		
Maximum permissible fuse ratings				
main circuit gL/gG	A	20	25	40
auxilliary circuit	A	16	20	25
Frequency of switching operations	s/h	240		
Electrical endurance	min.	100.000		
Sizes of connecting conductors - main circuit				
multi-wire conductor	mm ²	1.5-6	1.5-6	2.5-10
multi-wire conductor with cable shoe	mm ²	1.5-6	1.5-6	2.5-10
Terminal screw		M4	M4	M4
Screw head		PZ2	PZ2	PZ2
Tightening torque	Nm	1,2	1,2	1,4
- auxiliary circuit				
multi-wire conductor	mm ²	1-2,5		
multi-wire conductor with cable shoe	mm ²	0,75-1,5		
Terminal screw		M3,5		
Screw head		Pz1		
Tightening torque	Nm	0,8		
Loadability of auxiliary contacts rated continuous current I _{th} ; 35°C	A	10		
AC rated operational current I _e /AC15				
for 230V	A	6		
400V	A	4		
500V	A	2		
690V	A	1		

TECHNICAL INFORMATION

CAPACITOR CONTACTORS type CNNK 10 - CNNK 30

In conformity with: IEC 60947-1, IEC 60947-4

Special contactors for power factor correction

Main characteristics

These contactors are equipped with early - make contacts. This special type of contact has the purpose of connecting for a very brief interval, 2-3 ms, during the contactor closing, resistances which limit the connecting current of the capacitors. These resistances are then excluded when the closing operation is complete and the current capacity is conveyed to the main contacts.

1

Type designation	CNNK 10 20 CNNK 10 11	CNNK 12 20 CNNK 12 11	CNNK 15 20 CNNK 15 11	CNNK 20 10	CNNK 25E 10	CNNK 25 10	CNNK 30 10
Capacitor rating at operating voltage	5	6.7	8.5	11	14	14	20
230V kVAr							
400-440V kVAr	10	12.5	15	20	25	25	30
50/60Hz							
500-550V kVAr	12.5	15	18	24	30	30	35
660-690V kVAr	15	18	22	30	35	35	40
Rated operational current I _e /AC-6b et 400 V	A	14	18	22	29	36	44
Insulation rating U _i	V 690						
Permissible ambient temperature	°C - 25 to + 55						
Rated impuls withstand voltage U _{imp}	kV 8						
Consumption of electromagnet in cold state with U _n AC operated							
closing VA						65	
p.f.						0,75	
closed VA						8	
p.f.						0,3	
Coil voltage tolerances	0,85 - 1,1 U _n						
Degree of protection	IP 20						
Maximum permissible fuse ratings							
main circuit gL/gG A	25	35	50	50	63	63	80
auxilliary circuit A	16	16	16	16	16	16	16
Frequency of switching operations	s/h 240			120			
Electrical endurance	min. 200.000			150.000		100.000	
Sizes of connecting conductors - main circuit							
multi-wire conductor mm ²	1.5-6	1.5-6	1.5-6	2.5-10	2.5-10	6-25	6-25
multi-wire conductor with cable shoe mm ²							
Terminal screw	M4	M4	M4	M4	M4	M5	M5
Screw head	PZ2	PZ2	PZ2	PZ2	PZ2	Hexagon socket	
Tightening torque Nm	1,2	1,2	1,2	1,4	1,6	2	2
- auxiliary circuit							
multi-wire conductor mm ²	1-2,5						
multi-wire conductor with cable shoe mm ²	0,75-1,5						
Terminal screw	M3,5						
Screw head	Pz1						
Tightening torque Nm	0,8						
Loadability of auxiliary contacts rated continuous current I _{th} ; 35°C	A			10			
AC rated operational current I _e /AC15							
for 230V A				6			
400V A				4			
500V A				2			
690V A				1			

TECHNICAL INFORMATION

CAPACITOR CONTACTORS type

CNKM 40 - CNKM 75

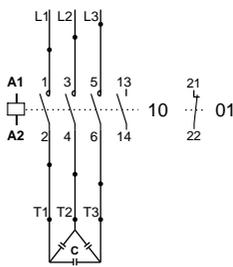
In conformity with: IEC 60947-1, IEC 60947-4

Special contactors for power factor correction

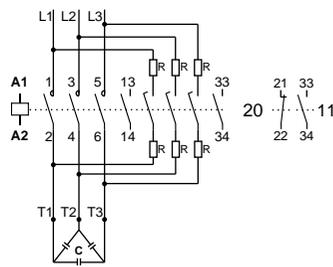
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Type designation	CNKM 40 00 CNNK 40 22	CNKM 50 00 CNKM 50 22	CNKM 60E 00 CNKM 60E 22	CNKM 60 22	CNKM 75 22
Capacitor rating at operating 230V kVAr	25	29	32	34	38
voltage 400-440V kVAr	40	50	60	60	75
50/60Hz 500-550V kVAr	50	60	70	75	88
660-690V kVAr	58	70	80	92	100
Rated operational current I_e/AC-6b et 400 V A	58	72	87	87	108
Insulation rating U _i V	750			1000	
Permissible ambient temperature °C	- 25 to + 55				
Rated impuls withstand voltage U _{imp} kV	8				
Consumption of electromagnet in cold state with U _n AC operated					
closing VA	215		310		
p.f. closed VA	0,6		0,5		
p.f.	26		26		
	0,29		0,24		
Coil voltage tolerances	0,85 - 1,1 U _n				
Degree of protection	IP 20				
Maximum permissible fuse ratings					
main circuit gL/gG A	100	125	160	160	160
auxilliary circuit A	16	16	16	16	16
Frequency of switching operations s/h	100				
Electrical endurance min.	100.000		85.000	100.000	75.000
Sizes of connecting conductors - main circuit					
multi-wire conductor mm ²	16-35	16-35	16-50	35-50 (with IP 20) 50	
multi-wire conductor with cable shoe mm ²				50-70 (without IP 20)	
Terminal screw	M8			M6 (with IP 20)	
Screw head	Hexagon socket			M8 (without IP 20)	
Tightening torque Nm	4			3.5	
- auxiliary circuit					
multi-wire conductor mm ²	1-2,5				
multi-wire conductor with cable shoe mm ²	0,75-1,5				
Terminal screw	M3,5				
Screw head	Pz1				
Tightening torque Nm	0,8				
Loadability of auxiliary contacts rated continuous current I _{th} ; 35°C A				16	
AC rated operational current I _e /AC15					
for 230V A	10				
400V A	6				
500V A	4				
690V A	2				

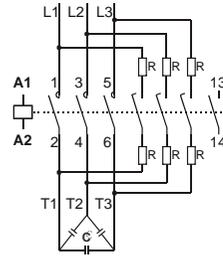
CONNECTION DIAGRAMS AND TERMINAL MARKINGS FOR SINGLE COMPENSATION



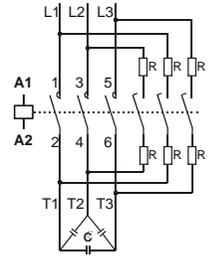
**CANNK 2,5; CANNK 5
CANNK 7,5**



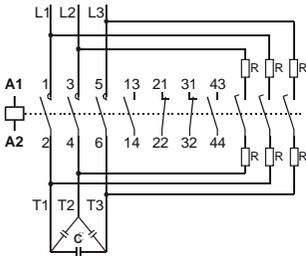
**CANNK 10; CANNK 12
CANNK 15**



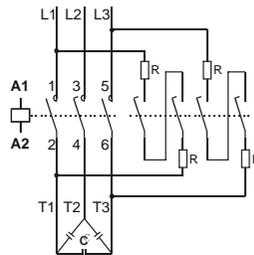
**CANNK 20 10; CANNK 25E 10
CANNK 25 10, CANNK 30 10**



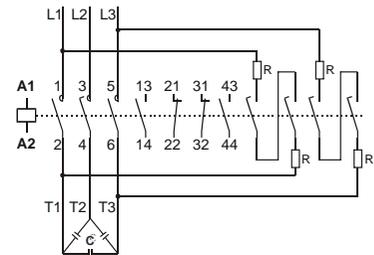
**CNKM 40 00
CNKM 50 00**



**CNKM 40 22
CNKM 50 22**



CNKM 60E 00



**CNKM 60E 22, CNKM 60 22
CNKM 75 22**

VERY IMPORTANT NOTE:

For single compensation air coils or 3 - phase reactors (coils with magnetic core and air gap) are not necessary.

When the contactor is used for group compensation it's recommendable to use appropriate 3-phase filter circuit reactors (coils with magnetic core and air gap).

This will reduce the value of higher harmonics and will prevent resonant current to prevail.

At single compensation the power of selected contactor is according to capacitor rated power.

At group and central compensation, when reactors are not in use, one step higher rating of the contactor is recommendable.

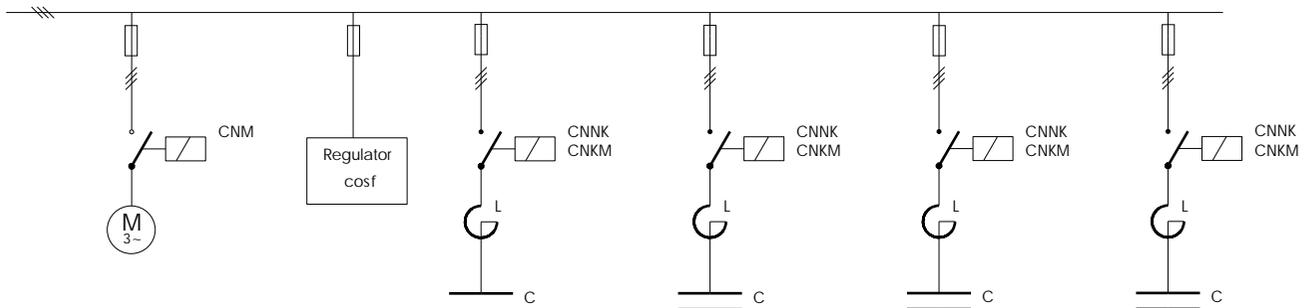


Before switch the contactor in the circuit, capacitor must be discharged (the voltage at the terminals must be < 50 V).

During exploitation, current value must not exceed the declared values.

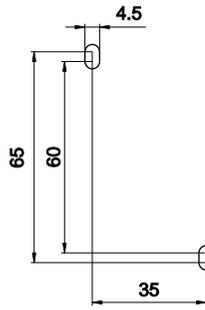
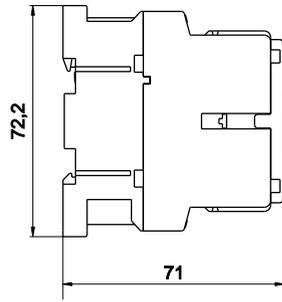
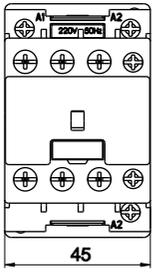
CONNECTION DIAGRAM FOR GROUP (CENTRAL) COMPENSATION

380/400 V / 50Hz

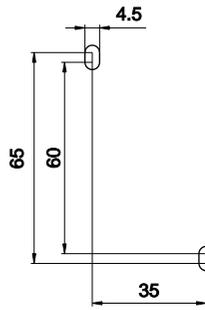
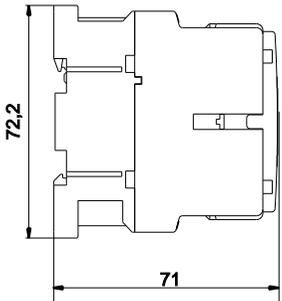
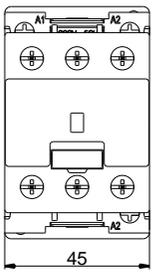


DIMENSION DRAWINGS (mm)

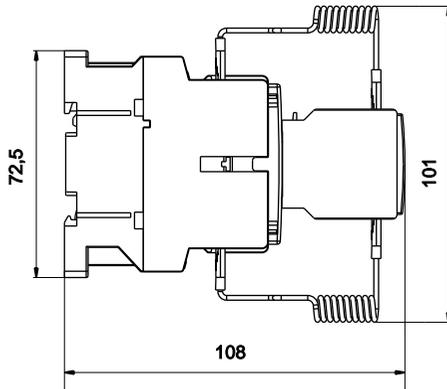
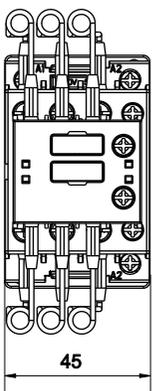
CNNK 2,5; CNNK 5



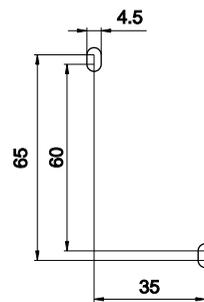
CNNK 7,5



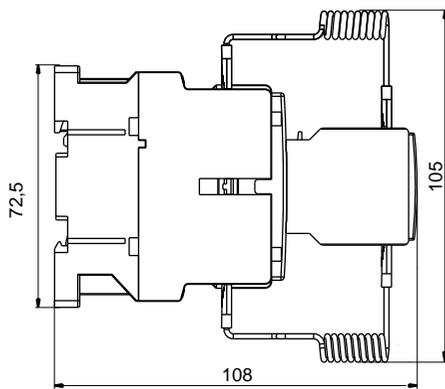
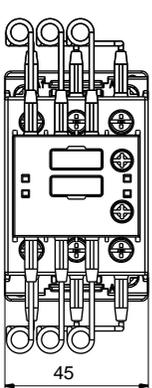
CNNK 10; CNNK 12; CNNK 15



CNNK 10; CNNK 12;
CNNK 15; CNNK 20

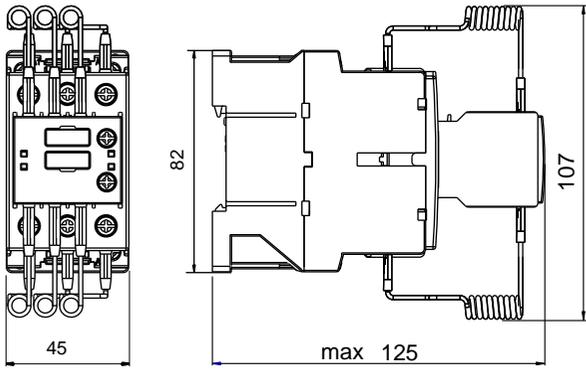


CNNK 20

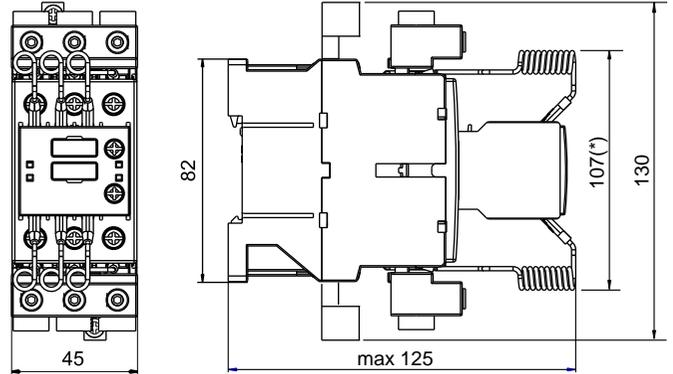


DIMENSION DRAWINGS (mm)

CNNK 25E

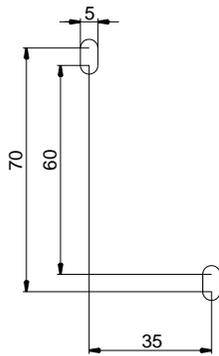


CNNK 25; CNNK 30

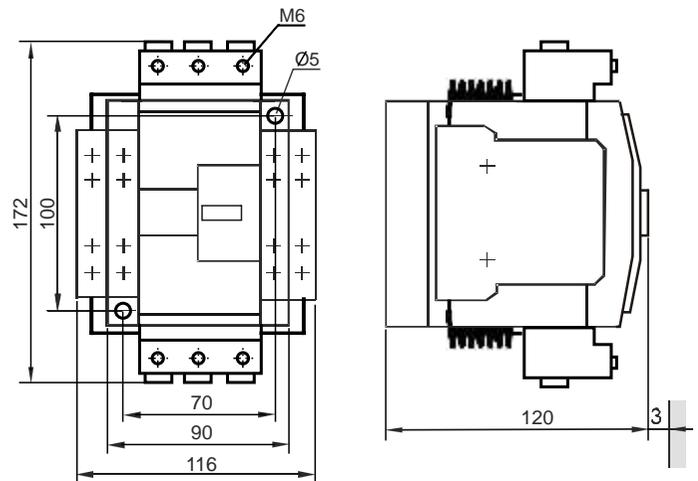


Drilling plan (mm)

CNNK 25E; CNNK 25,
CNNK 30



CNKM 40, CNKM 50;
CNKM 60E



CNKM 60 and CNKM 75 without IP 20

CNKM 60 and CNKM 75 with IP 20

