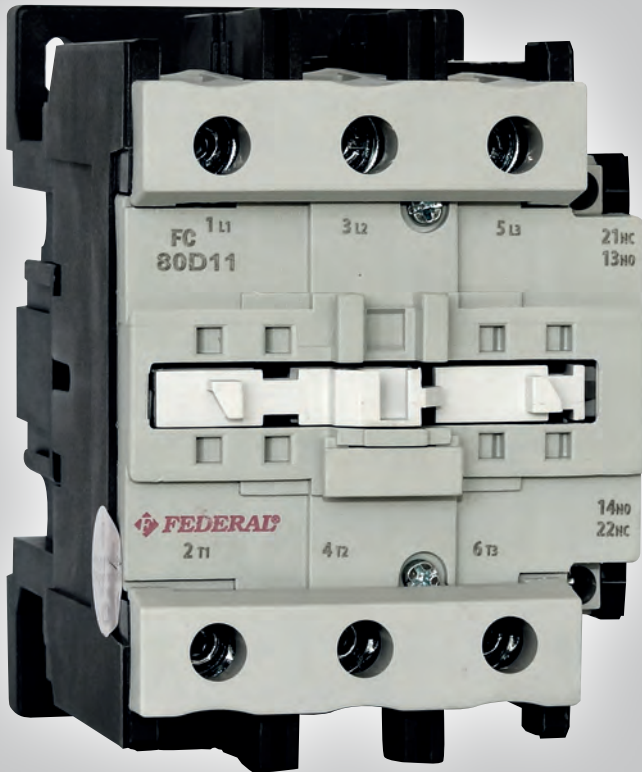


# CONTACTORS












IEC / EN 60947-4-1  
CE







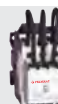
**Mounting Position** : Front face downwards  
**Altitude** : 2000 m (max)  
**Relative Humidity** : 90% (55°C)  
**Ambient Temperature** : between -25°C and +60°C  
**Pollution Degree** : III

All these given information are general. We have always right to change them.


## Power Contactors (AC - DC)

	FC06M FC09M		FC220D FC245D FC260D
	FC09D FC12D FC18D		FC300D
	FC25D		FC400D
	FC32D		FC475D
	FC38D		FC580D FC650D
	FC40D FC50D FC65D		FC750D
	FC80D FC95D		
	FC115D FC150D		

## Contactors for Capacitor Switching

	FC09DK FC12DK FC18DK		FC40DK FC50DK FC65DK
	FC25DK		FC80DK FC95DK
	FC32DK		FC115DK
	FC38DK		

## High Current Contactors

	EC300 ... EC2500
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**CAPACITOR CONTACTORS (IEC / EN 60947-4-1)**

**Order codes of auxiliary contact blocks**

Top Assembly Type	Order code
FCB-F20	8DD-A0020-0000
FCB-F11	8DD-A0011-0000
FCB-F02	8DD-A0002-0000
FCB-F40	8DD-A0040-0000
FCB-F31	8DD-A0031-0000
FCB-F22	8DD-A0022-0000
FCB-F13	8DD-A0013-0000
FCB-F04	8DD-A0004-0000

Side Assembly Type	Order code
FCAB-F11	8DD-B0011-0000
FCAB-F20	8DD-B0020-0000
FCAB-F02	8DD-B0002-0000

**Order codes of spare coils:**

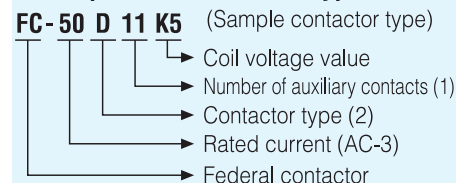
Type	Order code
FCC-D2	8DD-C□□20-0000
FCC-D4	8DD-C□□30-0000
FCC-D6	8DD-C□□40-0000
FCC-D8	8DD-C□□50-0000
FCC-D10	8DD-C□□60-0000
FCC-D12	8DD-C□□70-0000

□□ Indicates coil operating voltage

**Order codes of spare primary contact sets:**

Type	Order code
FC09 D	8DD-0000-0009
FC12 D	8DD-0000-0012
FC18 D	8DD-0000-0018
FC25 D	8DD-0000-0025
FC32 D	8DD-0000-0032
FC38 D	8DD-0000-0038
FC40 D	8DD-0000-0040
FC50 D	8DD-0000-0050
FC65 D	8DD-0000-0065
FC80 D	8DD-0000-0080
FC95 D	8DD-0000-0095
FC115 D	8DD-0000-0115
FC150 D	8DD-0000-0150
FC200 D	8DD-0000-0200
FC260 D	8DD-0000-0260
FC300 D	8DD-0000-0300
FC400 D	8DD-0000-0400
FC475 D	8DD-0000-0475
FC580 D	8DD-0000-0580
FC650 D	8DD-0000-0650
FC750 D	8DD-0000-0750

**Descriptions of contactor type codes:**



(1) First figure indicates number of normally open (NO) contacts and second figure indicates number of normally closed (NC) contacts.

Sample  
11=1NO + 1NC  
(2) M: Mini contactor  
D: Standard contactor  
DK: Compensation contactor

**Order codes of contactors :**

Type	AC-3 Ie (A)	kW 400 V	Standard auxiliary contact	Order code
FC06M22*	6	2.2	2 NO + 2 NC	9DM -K3 223-0006
FC06M	6	2.2	1 NO 1 NC	9DM -□□ 103-0006 9DM -□□ 013-0006
FC09M	9	4	1 NO 1 NC	9DM -□□ 103-0009 9DM -□□ 013-0009
FC09D	9	4	1 NO 1 NC	9DD -□□ 103-0009 9DD -□□ 013-0009
FC12D	12	5,5	1 NO 1 NC	9DD -□□ 103-0012 9DD -□□ 013-0012
FC18D	18	7,5	1 NO 1 NC	9DD -□□ 103-0018 9DD -□□ 013-0018
FC25D	25	11	1 NO 1 NC	9DD -□□ 103-0025 9DD -□□ 013-0025
FC32D	32	15	1 NO 1 NC	9DD -□□ 103-0032 9DD -□□ 013-0032
FC38D	38	18,5	1 NO 1 NC	9DD -□□ 103-0038 9DD -□□ 013-0038
FC40D	40	18,5	1 NO + 1 NC	9DD -□□ 113-0040
FC50D	50	22	1 NO + 1 NC	9DD -□□ 113-0050
FC65D	65	30	1 NO + 1 NC	9DD -□□ 113-0065
FC80D	80	37	1 NO + 1 NC	9DD -□□ 113-0080
FC95D	95	45	1 NO + 1 NC	9DD -□□ 113-0095
FC115D	115	55	-	9DD -□□ 003-0115
FC150D	150	75	-	9DD -□□ 003-0150
FC220D	220	110	-	9DD -□□ 003-0220
FC260D	260	140	-	9DD -□□ 003-0260
FC300D	300	160	-	9DD -□□ 003-0300
FC400D	400	200	-	9DD -□□ 003-0400
FC475D	475	250	-	9DD -□□ 003-0475
FC580D	580	315	-	9DD -□□ 003-0580
FC650D	650	355	-	9DD -□□ 003-0650
FC750D	750	400	-	9DD -□□ 003-0750

□□ Indicates coil operating voltage. \*Auxiliary contactor.

**Order codes of mechanical locks :**

Type	Order code
FC09D...FC38D	8DD-MK000-0001
FC40D...FC95D	8DD-MK000-0002

**Coil voltages :**

Give coil voltages of the contactors in accordance with the table below.

□□	24V	42V	48V	110V	220V	230V	240V	380V	415V	440V	500V
AC	A5	D5	E5	H5	K5	N5	R5	S5	T5	U5	V5
DC	A6		E6	H6	K6					U6	

Sample1: For 220 V, 50/60 Hz coil voltage; K5.

Sample2: For AC3 class 32 A, normally closed, coil voltage 48 V 50/60 Hz contactor: FC - 32DO1 E5.

Sample3: For AC3 class 95 A, normally 3 closed and 1 open auxiliary contacts, coil voltage 220 V 50/60 Hz contactor

FC - 95D11K5 + FCB-F02 (Contactor and 1 FCB - F02 contact block shall be adequate.)

## CAPACITOR CONTACTORS (IEC / EN 60947-4-1)

### Contactor for capacitor switching:

Contactor for capacitor switching have been designed to switch capacitors and can be safely utilized in compensation circuits thanks to their special design. Contactors limit start-up currents of the capacitors thanks to limiting contact blocks. In this way, life of either capacitors or circuit protective devices is extended. The only difference of FEDERAL contactor for capacitor switching from normal contactors is the transition block with current limiting resistances connected parallel to primary contacts on the contactor.

### Reasons for use of compensation contactor:

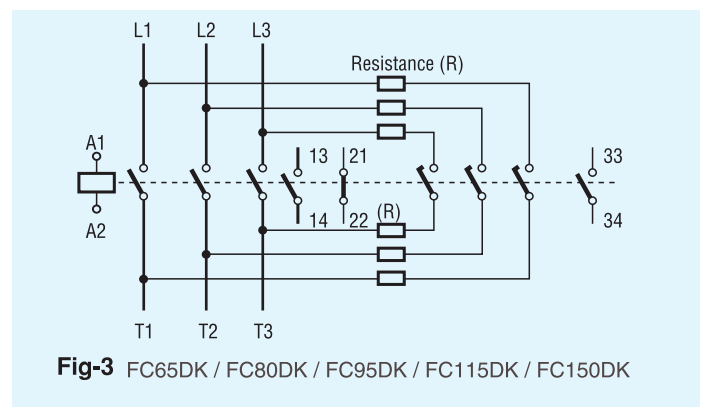
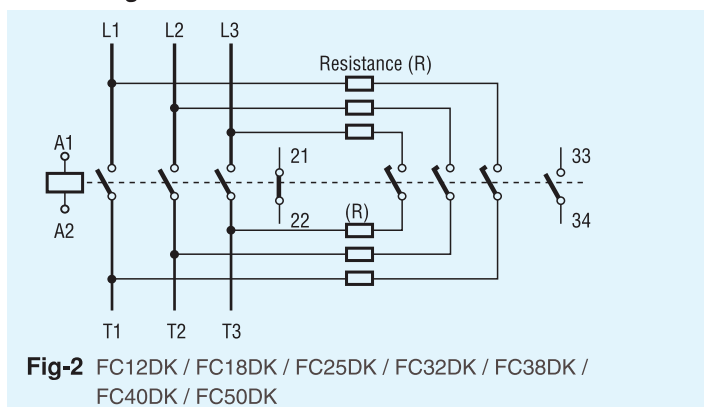
As it is known, capacitors cause high frequencies between 1 and 15 kHz and very short-time high currents that can be ten times more than the rated current during initial start-up. Inductance (shock coil) may be added to each three phases which the capacitor is connected to. However, as this transaction is difficult in practice, contactor for capacitor switching designed only for this purpose are utilized. In this way, life of the contactor shall extend by 100% when compared to normal contactors. To given an example, if electrical life of normal

contactors at maximum load is 100,000, life of contactor for capacitor switching is 200,000.

### Principles of operation:

Contactor for capacitor switching' principle of operation is as follows. When contactor coil receives energy, first contacts of the transition block are closed. Approximately 3,5 ms after first start-up current of the capacitor passes through these contactors, contacts of the transition block are opened and nominal current of the capacitors are carried by primary contacts.

### Circuit diagram:



Contactor Type (DK)		FC09	FC12	FC18	FC25	FC32	FC38	FC40	FC50	FC65	FC80	FC95	FC115	FC150
Number of Poles		3	3	3	3	3	3	3	3	3	3	3	3	3
Utilization Class AC-6b I <sub>e</sub> max 440V	A	13	16	20	22	26	33	39	52	59	79	85	92	105
Rated Thermal Current - I <sub>th</sub>	A	25	25	32	40	50	55	60	80	80	125	125	200	200
Rated Insulation Voltage - U <sub>i</sub> 50-60 Hz	V	630	630	630	630	630	630	630	630	630	630	630	630	630
Rated Impulse Withstand Voltage - U <sub>imp</sub>	kV	8	8	8	8	8	8	8	8	8	8	8	8	8
Rated Power 3 ~ AC-6b 55°C	220/240 V kVAr	5	7	8	9	10	15	20	25	25	35	40	45	50
	400/440 V kVAr	10	12,5	15	16,7	20	25	30	40	45	60	65	70	80
	480/525 V kVAr	12,5	15	16,7	20	24	25	30	45	45	60	65	70	80
Weight	kg	0,39	0,39	0,39	0,4	0,58	0,6	0,6	1,2	1,2	1,5	1,5	2,2	2,2
Number of Auxiliary Contacts		1NO + 1NC						1NO + 2NC				1NC		
Coil Power Consumption (Holding)	VA	9,5	9,5	9,5	9,5	11	11	11	30	30	30	30	22	22
Power Loss Per Pole (AC-6b)	W	0,6	1,0	1,4	1,7	2,5	3,9	5,6	4,5	5,0	7,5	8,8	6,5	8,5
Min-Max Tightening Torque	Nm	1-1,5	1-1,5	1-1,5	1-1,5	1,2-2	1,5-2,5	1,5-2,5	3,5-4,5	3,5-4,5	6-10	6-10	8-12	8-12
Dimensions 	a (Width) mm	47	47	47	47	57	57	57	77	77	87	87	120	120
	b (Height) mm	76	76	76	76	86	86	86	129	129	129	129	154	129
	c (Depth) mm	117	117	117	122	131	136	136	150	150	158	158	158	158

**CAPACITOR CONTACTORS (IEC / EN 60947-4-1)**

**Order codes of contactor for capacitor switching**

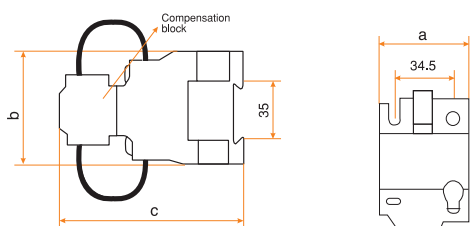
Type	AC-6b Ie (A)	kVA <sub>r</sub> 200/240 V	kVA <sub>r</sub> 400/440 V	Standard auxiliary contact	Order code
FC09DK	13	5	10	1 NO + 1 NC	9DK-□□ 113-0009
FC12DK	16	7	12,5	1 NO + 1 NC	9DK-□□ 113-0012
FC18DK	20	8	15	1 NO + 1 NC	9DK-□□ 113-0018
FC25DK	22	9	16,7	1 NO + 1 NC	9DK-□□ 113-0025
FC32DK	26	10	20	1 NO + 1 NC	9DK-□□ 113-0032
FC38DK	33	15	25	1 NO + 1 NC	9DK-□□ 113-0038
FC40DK	44	20	33,3	1 NO + 1 NC	9DK-□□ 213-0040
FC50DK	52	25	40	2 NO + 1 NC	9DK-□□ 213-0050
FC65DK	59	25	45	2 NO + 1 NC	9DK-□□ 213-0065
FC80DK	79	35	60	2 NO + 1 NC	9DK-□□ 213-0080
FC95DK	85	40	65	2 NO + 1 NC	9DK-□□ 213-0095
FC115DK	92	45	70	1 NO	9DK-□□ 103-0115
				1 NC	9DK-□□ 013-0115
FC-150DK	105	50	80	1 NO	9DK-□□ 103-0150
				1 NC	9DK-□□ 013-0150

**Order codes of contactor for capacitor switching accessories :**

Type	Order code
Compensation resistance block	8DK-D21-0□□□
Compensation block	8DK-D21-1□□□

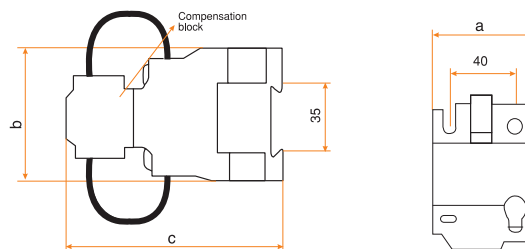
□□□ Contactor type

**FC09DK / FC12DK / FC18DK**



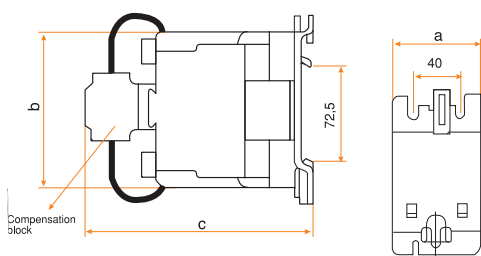
Type	a	b	c
FC09DK	47	76	117
FC12DK	47	76	117
FC18DK	47	76	117

**FC25DK / FC32DK / FC38DK**



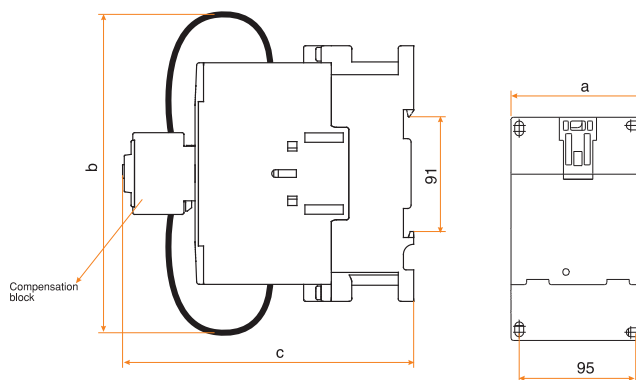
Type	a	b	c
FC25DK	47	76	122
FC32DK	57	86	131
FC38DK	57	86	136

**FC40DK / FC50DK / FC65DK / FC80DK / FC95DK**



Type	a	b	c
FC40DK	77	129	150
FC50DK	77	129	150
FC65DK	77	129	150
FC80DK	87	129	158
FC95DK	87	129	158

**FC115DK / FC150DK**



Type	a	b	c
FC115DK	120	154	158
FC150DK	120	154	158