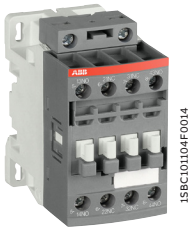
NF 4-pole and 8-pole contactor relays

NF 4-pole contactor relays

AC / DC operated

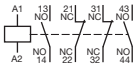
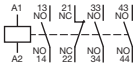


NF22E

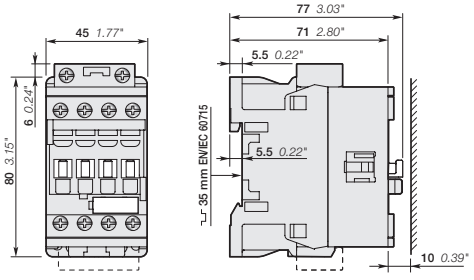
NF contactor relays are used for switching auxiliary and control circuits.

These contactor relays are of the block type design with:

- 4 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 4 control voltage ranges covering 24...500 V 50/60 Hz and 20...500 V DC
  - reduced panel energy consumption
  - very distinct closing and opening.
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Number of contacts	Rated control circuit voltage Uc min. ... Uc max.			Type	Order code	Weight Pkg (1 pce)
	V 50/60 Hz	V DC				kg
	24...60	20...60	(1)	NF22E-11	1SBH137001R1122	0.270
	48...130	48...130		NF22E-12	1SBH137001R1222	0.270
	100...250	100...250		NF22E-13	1SBH137001R1322	0.270
	250...500	250...500		NF22E-14	1SBH137001R1422	0.310
	24...60	20...60	(1)	NF31E-11	1SBH137001R1131	0.270
	48...130	48...130		NF31E-12	1SBH137001R1231	0.270
	100...250	100...250		NF31E-13	1SBH137001R1331	0.270
	250...500	250...500		NF31E-14	1SBH137001R1431	0.310
	24...60	20...60	(1)	NF40E-11	1SBH137001R1140	0.270
	48...130	48...130		NF40E-12	1SBH137001R1240	0.270
	100...250	100...250		NF40E-13	1SBH137001R1340	0.270
	250...500	250...500		NF40E-14	1SBH137001R1440	0.310

(1) NF..-11 not suitable for direct control by PLC-output.

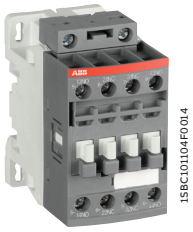


NF22E, NF31E, NF40E

Main dimensions mm, inches

NFZ 4-pole contactor relays

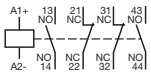
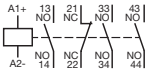
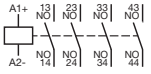
24 V DC operated designed for PLC



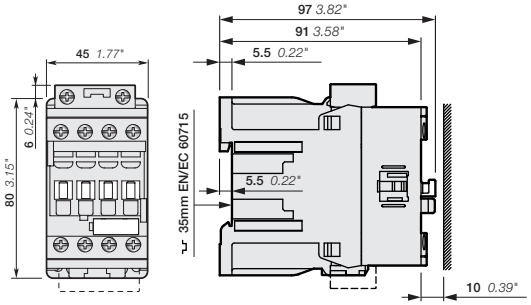
NFZ22E-30

NFZ contactor relays are used for switching auxiliary and control circuits. These contactor relays are of the block type design with:

- 4 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: 24 V DC operated with electronic coil interface allowing low holding consumption up to 1.7 W and reduced panel energy consumption
  - allow direct control by PLC-output ≥ 250 mA 24 V DC
  - very distinct closing and opening
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Number of contacts	Rated control circuit voltage Uc V DC	Type	Order code	Weight Pkg (1 pce) kg
4-pole contactor relays				
	24	NFZ22E-30	1SBH136001R3022	0.430
	24	NFZ31E-30	1SBH136001R3031	0.430
	24	NFZ40E-30	1SBH136001R3040	0.430

Note: NFZ contactor relays with DC control voltage 24 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.

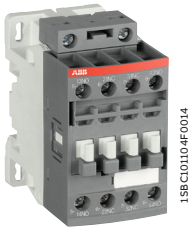


NFZ22E, NFZ31E, NFZ40E

Main dimensions mm, inches

NFZ 4-pole contactor relays

AC / DC operated for specific applications

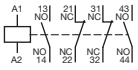
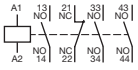
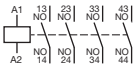


NFZ22E

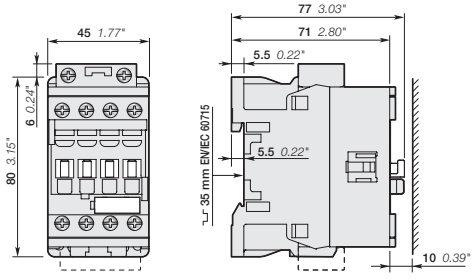
NFZ contactor relays are used for switching auxiliary and control circuits.

These contactor relays are of the block type design with:

- 4 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 4 control voltage ranges covering 24...250 V 50/60 Hz and 12...250 V DC
  - allow direct control by PLC-output ≥ 24 V DC 500 mA
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltage sags (SEMI F47-0706 conditions of use on request).
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Number of contacts	Rated control circuit voltage Uc min. ... Uc max.		Type	Order code	Weight Pkg (1 pce)
	V 50/60 Hz	V DC			kg
	–	12...20	NFZ22E-20	1SBH136001R2022	0.310
	24...60	20...60	NFZ22E-21	1SBH136001R2122	0.310
	48...130	48...130	NFZ22E-22	1SBH136001R2222	0.310
	100...250	100...250	NFZ22E-23	1SBH136001R2322	0.310
	–	12...20	NFZ31E-20	1SBH136001R2031	0.310
	24...60	20...60	NFZ31E-21	1SBH136001R2131	0.310
	48...130	48...130	NFZ31E-22	1SBH136001R2231	0.310
	100...250	100...250	NFZ31E-23	1SBH136001R2331	0.310
	–	12...20	NFZ40E-20	1SBH136001R2040	0.310
	24...60	20...60	NFZ40E-21	1SBH136001R2140	0.310
	48...130	48...130	NFZ40E-22	1SBH136001R2240	0.310
	100...250	100...250	NFZ40E-23	1SBH136001R2340	0.310

Note: Only NFZ contactor relays with DC control voltage 12...20 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.

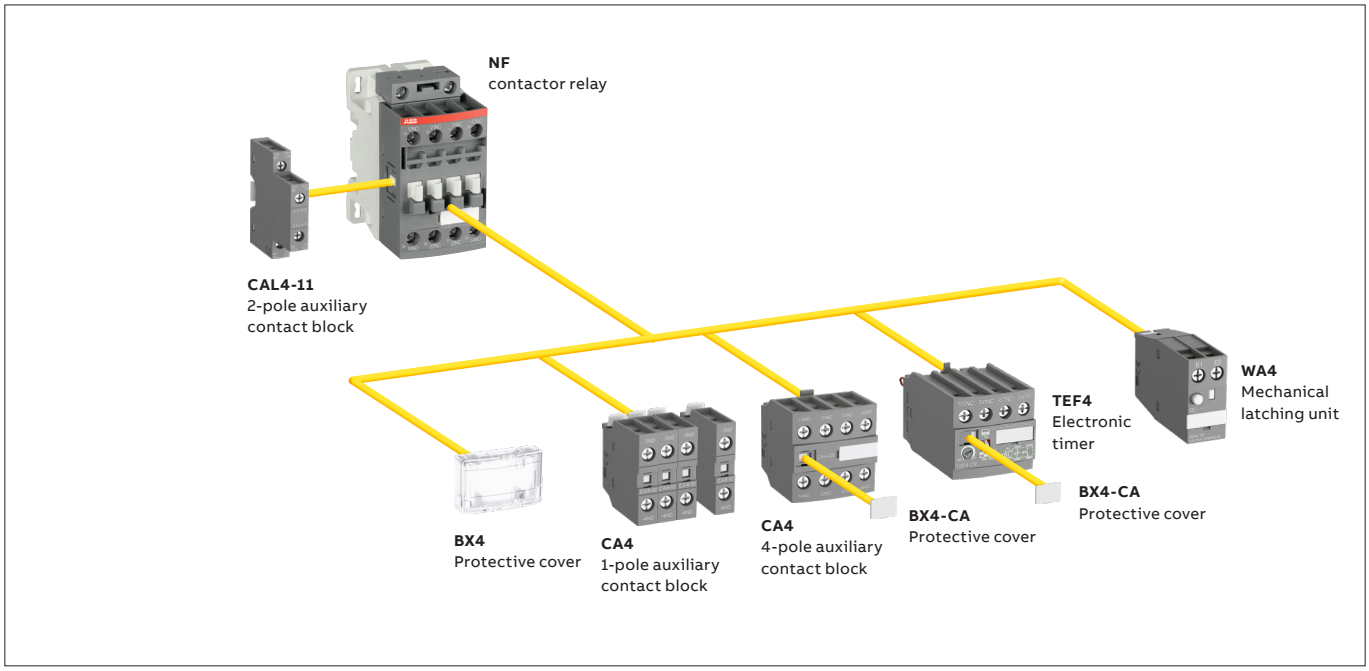


NFZ22E, NFZ31E, NFZ40E

Main dimensions mm, inches

NF 4-pole contactor relays

Contactor relays and main accessories



Main accessory fitting details - for ordering details, technical data and other accessories: see section accessories

Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

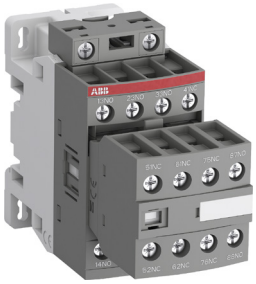
Contactor relay types	Main poles		Front-mounted accessories					Side-mounted accessories	
			Auxiliary contact blocks		Electronic timer	Mechanical latching unit		Auxiliary contact blocks	
								2-pole CAL4-11	
			1-pole CA4	4-pole CA4	TEF4	WA4 (3)		Left side	Right side
NF(Z)									
NF	2 2	E (1)	4 max.	**or** 1	**or** 1	**or** 1	+	1	–
	3 1	E (1)	2 max.	–	**or** 1	**or** 1	+	1	+ 1
	4 0	E (2)							
NFZ 24 V DC designed for PLC - coil 30									
NFZ	2 2	E (1)	4 max.	**or** 1	**or** 1	–	**or**	1	+ 1
	3 1	E (1)	2 max.	–	**or** 1	–	+	1	–
	4 0	E (2)	–	–	1	–	+	1	+ 1

(1) Including add-on contacts: 3 N.C. auxiliary contacts max. on positions 1, 2, 3, 4 and 2 N.C. max. on positions 1 ±30°, 5.
(2) Including add-on contacts: 4 N.C. auxiliary contacts max. on positions 1, 2, 3, 4 and 3 N.C. max. on positions 1 ±30°, 5.
(3) Accept 1-pole CA4 auxiliary contacts (1 block on each side of the mechanical latch) in respect to the total number of additional N.C. auxiliary contacts.
For WA4, accessory use with contactor relays coil 30, please consult your ABB local sales organization.

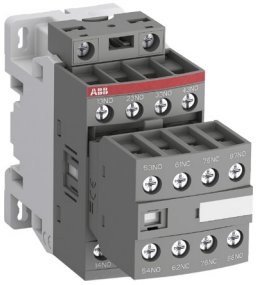
NF 8-pole contactor relays

AC / DC operated

NF44E



NF33/11

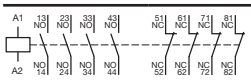
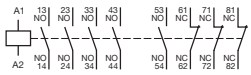
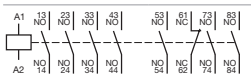
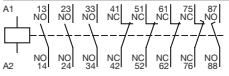


NF51/11

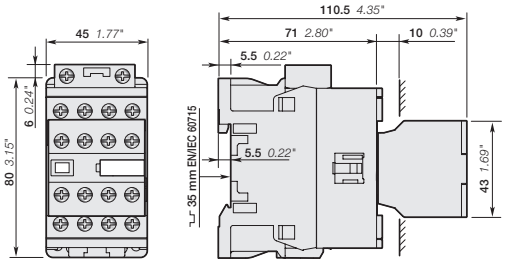
NF contactor relays are used for switching auxiliary and control circuits.

These contactor relays are of the block type design with:

- 8 poles with a permanently fixed 4-pole auxiliary contact block. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol) except for NF33/11 and NF51/11 variants
- overlapping of lagging / leading contacts for NF33/11 and NF51/11 variants
- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 4 coils to cover control voltages between 24...500 V 50/60 Hz and 20...500 V DC
  - reduced panel energy consumption
  - very distinct closing and opening
- built-in surge suppression
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Number of contacts 1st stack	2nd stack	Rated control circuit voltage Uc min. ... Uc max. V 50/60 Hz	V DC	Type	Order code	Weight Pkg (1 pce) kg
8-pole contactor relays						
		24...60	20...60 (1)	NF44E-11	1SBH137001R1144	0.320
		48...130	48...130	NF44E-12	1SBH137001R1244	0.320
		100...250	100...250	NF44E-13	1SBH137001R1344	0.320
		250...500	250...500	NF44E-14	1SBH137001R1444	0.360
		24...60	20...60 (1)	NF53E-11	1SBH137001R1153	0.320
		48...130	48...130	NF53E-12	1SBH137001R1253	0.320
		100...250	100...250	NF53E-13	1SBH137001R1353	0.320
		250...500	250...500	NF53E-14	1SBH137001R1453	0.360
		24...60	20...60 (1)	NF62E-11	1SBH137001R1162	0.320
		48...130	48...130	NF62E-12	1SBH137001R1262	0.320
		100...250	100...250	NF62E-13	1SBH137001R1362	0.320
		250...500	250...500	NF62E-14	1SBH137001R1462	0.360
		24...60	20...60 (1)	NF71E-11	1SBH137001R1171	0.320
		48...130	48...130	NF71E-12	1SBH137001R1271	0.320
		100...250	100...250	NF71E-13	1SBH137001R1371	0.320
		250...500	250...500	NF71E-14	1SBH137001R1471	0.360
		24...60	20...60 (1)	NF80E-11	1SBH137001R1180	0.320
		48...130	48...130	NF80E-12	1SBH137001R1280	0.320
		100...250	100...250	NF80E-13	1SBH137001R1380	0.320
		250...500	250...500	NF80E-14	1SBH137001R1480	0.360
8-pole contactor relays with overlapping of lagging / leading contacts						
		24...60	20...60 (1)	NF33/11-11	1SBH137001R1139	0.320
		48...130	48...130	NF33/11-12	1SBH137001R1239	0.320
		100...250	100...250	NF33/11-13	1SBH137001R1339	0.320
		250...500	250...500	NF33/11-14	1SBH137001R1439	0.320
		24...60	20...60 (1)	NF51/11-11	1SBH137001R1159	0.320
		48...130	48...130	NF51/11-12	1SBH137001R1259	0.320
		100...250	100...250	NF51/11-13	1SBH137001R1359	0.320
		250...500	250...500	NF51/11-14	1SBH137001R1459	0.320

(1) NF..-11 not suitable for direct control by PLC.



NF44E, NF53E, NF62E, NF71E, NF80E, NF33/11, NF51/11

Main dimensions mm, inches

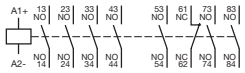
NFZ 8-pole contactor relays

24 V DC operated designed for PLC

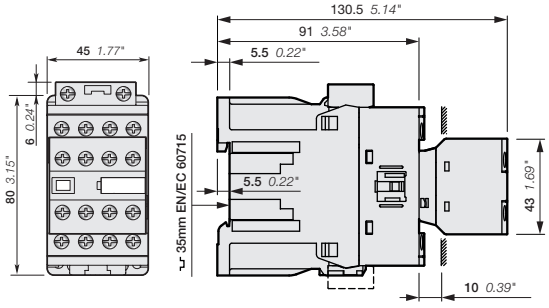
NFZ44E

NFZ contactor relays are used for switching auxiliary and control circuits. These contactor relays are of the block type design with:

- 8 poles with a permanently fixed 4-pole auxiliary contact block. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: 24 V DC operated with electronic coil interface allowing low holding consumption up to 1.7 W and reduced panel energy consumption
  - allow direct control by PLC-output ≥ 250 mA 24 V DC
  - very distinct closing and opening
- built-in surge suppression.

Number of contacts	Rated control circuit voltage Uc V DC	Type	Order code	Weight Pkg (1 pce) kg
8-pole contactor relays				
	24	NFZ44E-30	1SBH136001R3044	0.490
	24	NFZ53E-30	1SBH136001R3053	0.490
	24	NFZ62E-30	1SBH136001R3062	0.490
	24	NFZ71E-30	1SBH136001R3071	0.490
	24	NFZ80E-30	1SBH136001R3080	0.490

Note: NFZ contactor relays with DC control voltage 24 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.



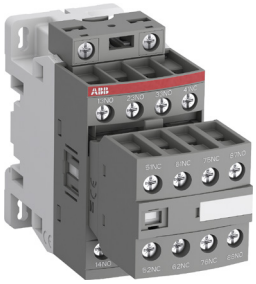
NFZ44E, NFZ53E, NFZ62E, NFZ71E, NFZ80E

Main dimensions mm, inches

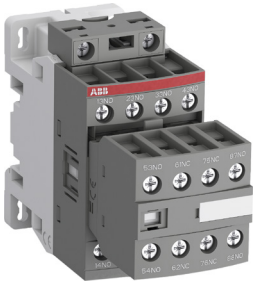
NFZ 8-pole contactor relays

AC / DC operated for specific applications

NFZ44E



NFZ33/11

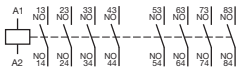
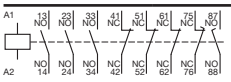
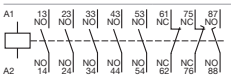


NFZ51/11

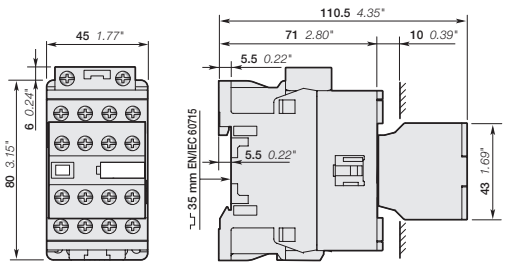
NFZ contactor relays are used for switching auxiliary and control circuits.

These contactor relays are of the block type design with:

- 8 poles with a permanently fixed 4-pole auxiliary contact block. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol) except for NFZ33/11 and NFZ51/11 variants
- overlapping of lagging / leading contacts for NFZ33/11 and NFZ51/11 variants
- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 4 coils to cover control voltages between 24 ... 250 V 50/60 Hz and 12 ... 250 V DC
  - allow direct control by PLC-output ≥ 24 V DC 500 mA
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltage sags (SEMI F47-0706 conditions of use on request).
- built-in surge suppression
- add-on auxiliary contact blocks for side mounting and a wide range of accessories.

Number of contacts 1st stack	2nd stack	Rated control circuit voltage Uc min. ... Uc max. V 50/60 Hz	V DC	Type	Order code	Weight Pkg (1 pce) kg
8-pole contactor relays						
		-	12...20	NFZ44E-20	1SBH136001R2044	0.360
		24...60	20...60	NFZ44E-21	1SBH136001R2144	0.360
		48...130	48...130	NFZ44E-22	1SBH136001R2244	0.360
		100...250	100...250	NFZ44E-23	1SBH136001R2344	0.360
		-	12...20	NFZ53E-20	1SBH136001R2053	0.360
		24...60	20...60	NFZ53E-21	1SBH136001R2153	0.360
		48...130	48...130	NFZ53E-22	1SBH136001R2253	0.360
		100...250	100...250	NFZ53E-23	1SBH136001R2353	0.360
		-	12...20	NFZ62E-20	1SBH136001R2062	0.360
		24...60	20...60	NFZ62E-21	1SBH136001R2162	0.360
		48...130	48...130	NFZ62E-22	1SBH136001R2262	0.360
		100...250	100...250	NFZ62E-23	1SBH136001R2362	0.360
		-	12...20	NFZ71E-20	1SBH136001R2071	0.360
		24...60	20...60	NFZ71E-21	1SBH136001R2171	0.360
		48...130	48...130	NFZ71E-22	1SBH136001R2271	0.360
		100...250	100...250	NFZ71E-23	1SBH136001R2371	0.360
		-	12...20	NFZ80E-20	1SBH136001R2080	0.360
		24...60	20...60	NFZ80E-21	1SBH136001R2180	0.360
		48...130	48...130	NFZ80E-22	1SBH136001R2280	0.360
		100...250	100...250	NFZ80E-23	1SBH136001R2380	0.360
8-pole contactor relays with overlapping of lagging / leading contacts						
		-	12...20	NFZ33/11-20	1SBH136001R2039	0.360
		24...60	20...60	NFZ33/11-21	1SBH136001R2139	0.360
		48...130	48...130	NFZ33/11-22	1SBH136001R2239	0.360
		100...250	100...250	NFZ33/11-23	1SBH136001R2339	0.360
		-	12...20	NFZ51/11-20	1SBH136001R2059	0.360
		24...60	20...60	NFZ51/11-21	1SBH136001R2159	0.360
		48...130	48...130	NFZ51/11-22	1SBH136001R2259	0.360
		100...250	100...250	NFZ51/11-23	1SBH136001R2359	0.360

Note: Only NFZ contactor relays with DC control voltage 12...20 V DC need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole

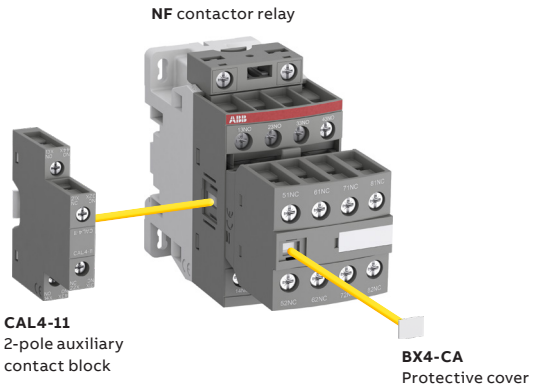


NFZ44E, NFZ53E, NFZ62E, NFZ71E, NFZ80E, NFZ33/11, NFZ51/11

Main dimensions mm, inches

NF 8-pole contactor relays

Contactor relays and main accessories



Main accessory fitting details - for ordering details, technical data and other accessories: see section accessories

Contactor relay types	Main poles			Side-mounted accessories Auxiliary contact blocks 2-pole CAL4-11 (1)	
				Left side	Right side
NF	4 4	E		1	–
	5 3	E			
	6 2	E			
	7 1	E			
	8 0	E			
	3 3	/	1 1		
	5 1	/	1 1		

(1) not allowed for 24 V DC operated contactor relay (coil 30).

NF contactor relays
Technical data

Contact utilization characteristics according to IEC

Contactor relay types	AC / DC operated	**NF**
Standards		IEC 60947-1 / 60947-5-1 and EN 60947-1 / 60947-5-1
Rated operational voltage Ue max.		690 V
Rated frequency (without derating)		50 / 60 Hz
Conventional free-air thermal current Ith θ ≤ 40 °C		16 A
Ie / Rated operational current AC-15 acc. to IEC 60947-5-1	24-127 V 50/60 Hz	6 A
	220-240 V 50/60 Hz	4 A
	400-440 V 50/60 Hz	3 A
	500 V 50/60 Hz	2 A
	690 V 50/60 Hz	2 A
Rated making capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Rated breaking capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Ie / Rated operational current DC-13 acc. to IEC 60947-5-1	24 V DC	6 A / 144 W
	48 V DC	2.8 A / 134 W
	72 V DC	1 A / 72 W
	110 V DC	0.55 A / 60 W
	125 V DC	0.55 A / 69 W
	220 V DC	0.27 A / 60 W
	250 V DC	0.27 A / 68 W
	400 V DC	0.15 A / 60 W
	500 V DC	0.13 A / 65 W
	600 V DC	0.1 A / 60 W
Short-circuit protection device gG type fuse		10 A
Conditional short-circuit current		1 kA
Rated short-time withstand current Icw	for 1.0 s	100 A
	for 0.1 s	140 A
Minimum switching capacity		12 V / 3 mA
with failure rate acc. to IEC 60947-5-4		10-7
Non-overlapping time between N.O. and N.C. contacts		≥ 2 ms
Power dissipation per pole at 6 A		0.1 W
Max. electrical switching frequency	AC-15	1200 cycles/h
	DC-13	900 cycles/h
Mechanically linked contacts acc. to annex L of IEC 60947-5-1		Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA4, CAL4 aux. contact blocks) are mechanically linked contacts.

Contact utilization characteristics according to UL / CSA

Contactor relay types	AC / DC operated	**NF**
Standards		UL 508, CSA C22.2 N°14
Max. operational voltage		600 V AC, 600 V DC
Pilot duty		A600, Q600
AC thermal rated current		10 A
AC maximum volt-ampere making		7200 VA
AC maximum volt-ampere breaking		720 VA
DC thermal rated current		2.5 A
DC maximum volt-ampere making-breaking		69 VA

NF contactor relays
Technical data

Magnet System Characteristics - NF contactor relays AC / DC operated

Contactor relay types	AC / DC operated	**NF**
Coil operating limits acc. to IEC 60947-5-1	AC supply	At θ ≤ 60 °C 0.85 x Uc min...1.1 x Uc max. At θ ≤ 70 °C 0.85 x Uc min...Uc max.
	DC supply	at θ ≤ 60 °C 0.85 x Uc min ... 1.1 x Uc max at θ ≤ 70 °C 0.85 x Uc min ... Uc max
AC control voltage 50/60 Hz		
Rated control circuit voltage Uc		24...500 V AC
Coil consumption	Average pull-in value	50 VA
	Average holding value	2.2 VA / 2 W
DC control voltage		
Rated control circuit voltage Uc		20...500 V DC
Coil consumption	Average pull-in value	50 W
	Average holding value	2 W
PLC-output control		Not suitable for direct control by PLC-output
Drop-out voltage		≤ 60 % of Uc min.
Voltage sag immunity acc. to SEMI F47-0706		–
Dips withstand -20 °C ≤ θ ≤ +60 °C		–
Operating time		
Between coil energization and:	N.O. contact closing	40...95 ms
	N.C. contact opening	38...90 ms
Between coil de-energization and:	N.O. contact opening	11...95 ms
	N.C. contact closing	13...98 ms

Magnet System Characteristics - NFZ contactor relays 24V DC operated - designed for PLC - coil 30

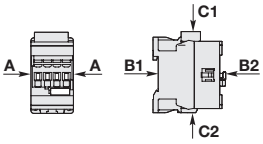
Contactor relay types	DC operated	**NFZ**
Coil operating limits acc. to IEC 60947-5-1	DC supply	at θ ≤ 60 °C 0.85 ... 1.1x Uc at θ ≤ 70 °C Uc
DC control voltage		
Rated control circuit voltage Uc		24 V DC
Coil consumption	Average pull-in value	6 W
	Average holding value	1.7 W
PLC-output control		≥ 250 mA 24 V DC for PLCs and safety PLCs using broken wire detection
Drop-out voltage		≤ 60 % of Uc min.
Operating time		
Between coil energization and:	N.O. contact closing	27 ... 53 ms
	N.C. contact opening	20 ... 35 ms
Between coil de-energization and:	N.O. contact opening	17 ... 29 ms
	N.C. contact closing	22 ... 57 ms

Magnet System Characteristics - NFZ... contactor relays - for specific applications - coils 20, 21, 22, 23

Contactor relay types	AC / DC operated	**NFZ**
Coil operating limits acc. to IEC 60947-5-1	AC supply	at θ ≤ 60 °C 0.85 x Uc min ... 1.1 x Uc max at θ ≤ 70 °C 0.85 x Uc min ... Uc max
	DC supply	at θ ≤ 70 °C 0.85 x Uc min ... 1.1 x Uc max
AC control voltage 50/60 Hz		
Rated control circuit voltage Uc		24...250 V AC
Coil consumption	Average pull-in value	16 VA
	Average holding value	1.7 VA / 1.5 W
DC control voltage		
Rated control circuit voltage Uc		12...250 V DC
Coil consumption	Average pull-in value	12 ... 16 W
	Average holding value	1.7 W
PLC-output control		(NFZ coil 21) ≥ 500 mA 24 V DC for PLCs - Not suitable for safety PLCs
Drop-out voltage		≤ 60 % of Uc min.
Voltage sag immunity acc. to SEMI F47-0706		Conditions of use on request
Dips withstand -20 °C ≤ θ ≤ +60 °C		(NFZ coil 21, 22, 23) 20 ms average for Uc ≥ 24 V 50/60 Hz or Uc ≥ 20 V DC
Operating time		
Between coil energization and:	N.O. contact closing	40...95 ms
	N.C. contact opening	38...90 ms
Between coil de-energization and:	N.O. contact opening	11...95 ms
	N.C. contact closing	13...98 ms

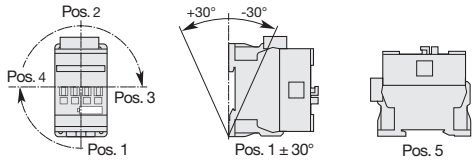
NF contactor relays
Technical data

General technical data

Contactor relay types	AC / DC operated	**NF**
Rated insulation voltage Ui		
acc. to IEC 60947-5-1		690 V
acc. to UL / CSA		600 V
Rated impulse withstand voltage Uimp.		6 kV
Electromagnetic compatibility		Devices complying with IEC 60947-1 / EN 60947-1 - Environment A and B (1)
Pollution degree		3
Ambient air temperature close to contactor relay		
Operation in free air		-40...+70 °C
Storage		-60...+80 °C
Climatic withstand		Category B according to IEC 60947-1 Annex Q
Maximum operating altitude (without derating)		3000 m
Mechanical durability		
Number of operating cycles		20 millions operating cycles
Max. switching frequency		6000 cycles/h
Shock withstand acc. to IEC 60068-2-27 and EN 60068-2-27 Mounting position 1		
	Shock direction	1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position
	A	30 g
	B1	25 g closed position / 5 g open position
	B2	15 g
	C1	25 g
	C2	25 g
Vibration withstand acc. to IEC 60068-2-6		5...300 Hz 4 g closed position / 2 g open position

(1) Environment B: all NF contactor relays produced since week 08-2013.
NF..E-12 (48...130 V 50/60 Hz-DC) compliant to environment A only: for environment B, select NFZ..E-22.

Mounting characteristics

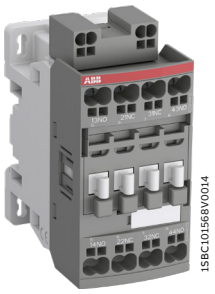
Contactor relay types	AC / DC operated	**NF**
Mounting positions		
		Max. add-on N.C. auxiliary contacts: see accessory fitting details for a NF contactor relay
Mounting distances		The contactor relays can be assembled side by side.
Fixing		
On rail according to IEC 60715, EN 60715		35 x 7.5 mm or 35 x 15 mm
By screws (not supplied)		2 x M4 screws placed diagonally

Connecting characteristics

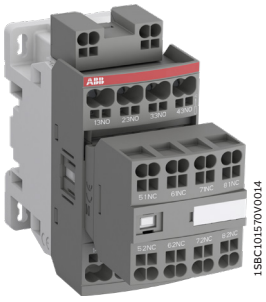
Contactor relay types	AC / DC operated	**NF**
Main terminals		 Screw terminals with cable clamp
Connection capacity (min. ... max.)		
Pole and coil terminals		
Rigid Solid/Stranded	1 x	1...2.5 mm²
	2 x	1...2.5 mm²
Flexible with non insulated ferrule	1 x	0.75...2.5 mm²
	2 x	0.75...2.5 mm²
Flexible with insulated ferrule	1 x	0.75...2.5 mm²
	2 x	0.75...1.5 mm²
Lugs	L <	8 mm
Connection capacity acc. to UL/CSA	1 or 2 x	AWG 18...14
Stripping length		10 mm
Tightening torque		
Pole terminals		1.2 Nm / 11 lb.in
Coil terminals		1.2 Nm / 11 lb.in
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529		
All terminals		IP20
Screw terminals		Delivered in open position, screws of unused terminals must be tightened
All terminals		M3.5
Screwdriver type		Flat Ø 5.5 / Pozidriv 2

NF..K contactor relays - with Push-in Spring terminals

AC / DC operated



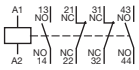
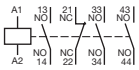
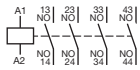
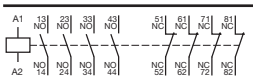
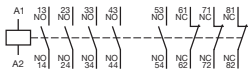
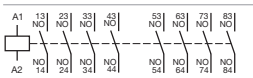
NF22EK



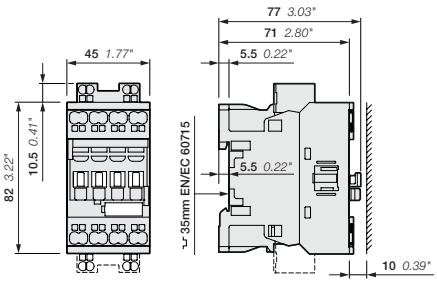
NF44EK

NF..K contactor relays are used for switching auxiliary and control circuits.
These contactor relays are of the block type design with:

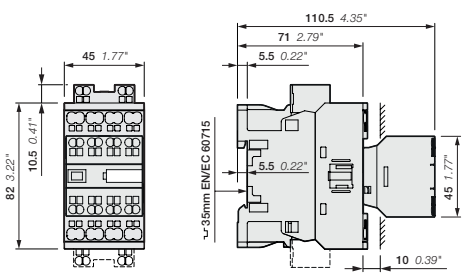
- 4 poles and 8 poles with a permanently fixed 4-pole auxiliary contact block.
  Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 4 control voltage ranges covering 24...500 V 50/60 Hz and 20...500 V DC
  - reduced panel energy consumption
  - very distinct closing and opening
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Number of contacts	Rated control circuit voltage Uc min. ... Uc max. V 50/60 Hz	V DC	Type	Order code	Weight Pkg (1 pce) kg
4-pole contactor relays					
	24 ... 60	20 ... 60 (1)	NF22EK-11	1SBH137005R1122	0.285
	48 ... 130	48 ... 130	NF22EK-12	1SBH137005R1222	0.285
	100 ... 250	100 ... 250	NF22EK-13	1SBH137005R1322	0.285
	250 ... 500	250 ... 500	NF22EK-14	1SBH137005R1422	0.325
	24 ... 60	20 ... 60 (1)	NF31EK-11	1SBH137005R1131	0.285
	48 ... 130	48 ... 130	NF31EK-12	1SBH137005R1231	0.285
	100 ... 250	100 ... 250	NF31EK-13	1SBH137005R1331	0.285
	250 ... 500	250 ... 500	NF31EK-14	1SBH137005R1431	0.325
	24 ... 60	20 ... 60 (1)	NF40EK-11	1SBH137005R1140	0.285
	48 ... 130	48 ... 130	NF40EK-12	1SBH137005R1240	0.285
	100 ... 250	100 ... 250	NF40EK-13	1SBH137005R1340	0.285
	250 ... 500	250 ... 500	NF40EK-14	1SBH137005R1440	0.325
8-pole contactor relays					
	24 ... 60	20 ... 60 (1)	NF44EK-11	1SBH137005R1144	0.330
	48 ... 130	48 ... 130	NF44EK-12	1SBH137005R1244	0.330
	100 ... 250	100 ... 250	NF44EK-13	1SBH137005R1344	0.330
	250 ... 500	250 ... 500	NF44EK-14	1SBH137005R1444	0.370
	24 ... 60	20 ... 60 (1)	NF53EK-11	1SBH137005R1153	0.330
	48 ... 130	48 ... 130	NF53EK-12	1SBH137005R1253	0.330
	100 ... 250	100 ... 250	NF53EK-13	1SBH137005R1353	0.330
	250 ... 500	250 ... 500	NF53EK-14	1SBH137005R1453	0.370
	24 ... 60	20 ... 60 (1)	NF62EK-11	1SBH137005R1162	0.330
	48 ... 130	48 ... 130	NF62EK-12	1SBH137005R1262	0.330
	100 ... 250	100 ... 250	NF62EK-13	1SBH137005R1362	0.330
	250 ... 500	250 ... 500	NF62EK-14	1SBH137005R1462	0.370
	24 ... 60	20 ... 60 (1)	NF71EK-11	1SBH137005R1171	0.330
	48 ... 130	48 ... 130	NF71EK-12	1SBH137005R1271	0.330
	100 ... 250	100 ... 250	NF71EK-13	1SBH137005R1371	0.330
	250 ... 500	250 ... 500	NF71EK-14	1SBH137005R1471	0.370
	24 ... 60	20 ... 60 (1)	NF80EK-11	1SBH137005R1180	0.330
	48 ... 130	48 ... 130	NF80EK-12	1SBH137005R1280	0.330
	100 ... 250	100 ... 250	NF80EK-13	1SBH137005R1380	0.330
	250 ... 500	250 ... 500	NF80EK-14	1SBH137005R1480	0.370

(1) NF..K-11 not suitable for direct control by PLC-output.



NF22EK, NF31EK, NF40EK



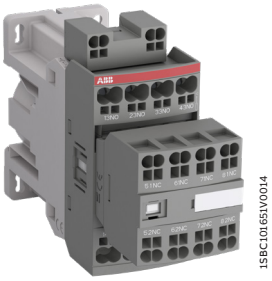
NF44EK, NF53EK, NF62EK, NF71EK, NF80EK

Main dimensions mm, inches

NFZ..K contactor relays - with Push-in Spring terminals

24 V DC operated designed for PLC

NFZ22EK-30

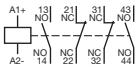
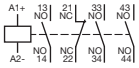
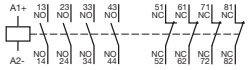
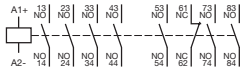


NFZ44EK-30

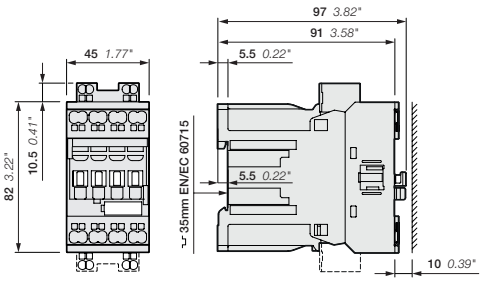
NFZ contactor relays are used for switching auxiliary and control circuits.

These contactor relays are of the block type design with 4 poles or 8 poles (with a permanently fixed 4-pole auxiliary contact block).

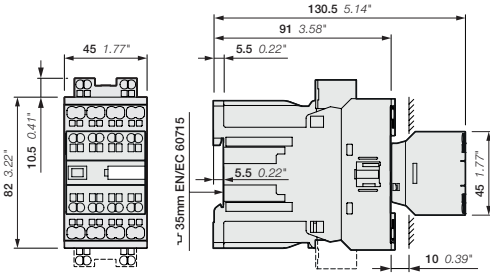
- contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: 24 V DC operated with electronic coil interface allowing low holding consumption up to 1.7 W and reduced panel energy consumption
  - allow direct control by PLC-output ≥ 250 mA 24 V DC
  - very distinct closing and opening
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Number of contacts	Rated control circuit voltage Uc min. ... Uc max. V DC	Type	Order code	Weight Pkg (1 pce) kg
4-pole contactor relays				
	24	NFZ22EK-30	1SBH136005R3022	0.435
	24	NFZ31EK-30	1SBH136005R3031	0.435
	24	NFZ40EK-30	1SBH136005R3040	0.435
8-pole contactor relays				
	24	NFZ44EK-30	1SBH136005R3044	0.490
	24	NFZ53EK-30	1SBH136005R3053	0.490
	24	NFZ62EK-30	1SBH136005R3062	0.490
	24	NFZ71EK-30	1SBH136005R3071	0.490
	24	NFZ80EK-30	1SBH136005R3080	0.490

Note: NFZ contactor relays with 24 V DC control voltage need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.
For product availability, please consult your ABB local sales organization.



NFZ22EK, NFZ31EK, NFZ40EK

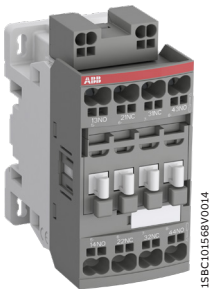


NFZ44EK, NFZ53EK, NFZ62EK, NFZ71EK, NFZ80EK

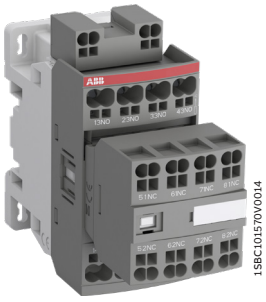
Main dimensions mm, inches

NFZ..K contactor relays - with Push-in Spring terminals

AC / DC operated for specific applications



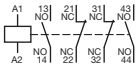
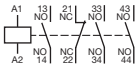
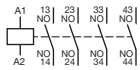
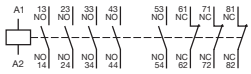
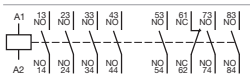
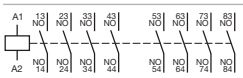
NFZ22EK



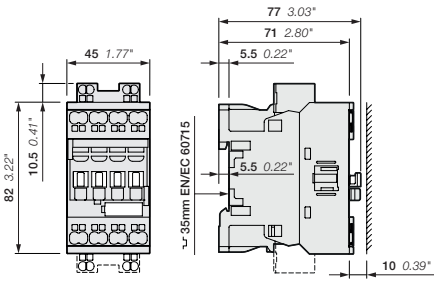
NFZ44EK

NFZ..K contactor relays are used for switching auxiliary and control circuits.
These contactor relays are of the block type design with:

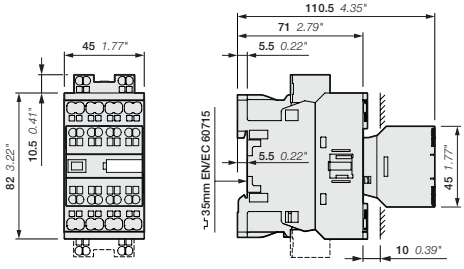
- 4 poles and 8 poles with a permanently fixed 4-pole auxiliary contact block.
  Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: AC or DC operated with electronic coil interface accepting a wide control voltage range (e.g. 100...250 V AC and DC)
  - can manage large control voltage variations
  - only 4 control voltage ranges covering 24...250 V 50/60 Hz and 12...250 V DC
  - allow direct control by PLC-output ≥ 24 V DC 500 mA
  - reduced panel energy consumption
  - very distinct closing and opening
  - can withstand short voltage dips and voltage sags (SEMI F47-0706 conditions of use on request).
- built-in surge suppression
- add-on auxiliary contact blocks for front or side mounting and a wide range of accessories.

Number of contacts	Rated control circuit voltage Uc min. ... Uc max. V 50/60 Hz	V DC	Type	Order code	Weight Pkg (1 pce) kg
4-pole contactor relays					
	–	12 ... 20	NFZ22EK-20	1SBH136005R2022	0.315
	24 ... 60	20 ... 60	NFZ22EK-21	1SBH136005R2122	0.315
	48 ... 130	48 ... 130	NFZ22EK-22	1SBH136005R2222	0.315
	100 ... 250	100 ... 250	NFZ22EK-23	1SBH136005R2322	0.315
	–	12 ... 20	NFZ31EK-20	1SBH136005R2031	0.315
	24 ... 60	20 ... 60	NFZ31EK-21	1SBH136005R2131	0.315
	48 ... 130	48 ... 130	NFZ31EK-22	1SBH136005R2231	0.315
	100 ... 250	100 ... 250	NFZ31EK-23	1SBH136005R2331	0.315
	–	12 ... 20	NFZ40EK-20	1SBH136005R2040	0.315
	24 ... 60	20 ... 60	NFZ40EK-21	1SBH136005R2140	0.315
	48 ... 130	48 ... 130	NFZ40EK-22	1SBH136005R2240	0.315
	100 ... 250	100 ... 250	NFZ40EK-23	1SBH136005R2340	0.315
8-pole contactor relays					
	–	12 ... 20	NFZ44EK-20	1SBH136005R2044	0.360
	24 ... 60	20 ... 60	NFZ44EK-21	1SBH136005R2144	0.360
	48 ... 130	48 ... 130	NFZ44EK-22	1SBH136005R2244	0.360
	100 ... 250	100 ... 250	NFZ44EK-23	1SBH136005R2344	0.360
	–	12 ... 20	NFZ53EK-20	1SBH136005R2053	0.360
	24 ... 60	20 ... 60	NFZ53EK-21	1SBH136005R2153	0.360
	48 ... 130	48 ... 130	NFZ53EK-22	1SBH136005R2253	0.360
	100 ... 250	100 ... 250	NFZ53EK-23	1SBH136005R2353	0.360
	–	12 ... 20	NFZ62EK-20	1SBH136005R2062	0.360
	24 ... 60	20 ... 60	NFZ62EK-21	1SBH136005R2162	0.360
	48 ... 130	48 ... 130	NFZ62EK-22	1SBH136005R2262	0.360
	100 ... 250	100 ... 250	NFZ62EK-23	1SBH136005R2362	0.360
	–	12 ... 20	NFZ71EK-20	1SBH136005R2071	0.360
	24 ... 60	20 ... 60	NFZ71EK-21	1SBH136005R2171	0.360
	48 ... 130	48 ... 130	NFZ71EK-22	1SBH136005R2271	0.360
	100 ... 250	100 ... 250	NFZ71EK-23	1SBH136005R2371	0.360
	–	12 ... 20	NFZ80EK-20	1SBH136005R2080	0.360
	24 ... 60	20 ... 60	NFZ80EK-21	1SBH136005R2180	0.360
	48 ... 130	48 ... 130	NFZ80EK-22	1SBH136005R2280	0.360
	100 ... 250	100 ... 250	NFZ80EK-23	1SBH136005R2380	0.360

Note: NFZ contactor relays with 12...20 V DC control voltage need to respect the connection polarities indicated close to the coil terminals: A1+ for the positive pole and A2- for the negative pole.



NFZ22EK, NFZ31EK, NFZ40EK



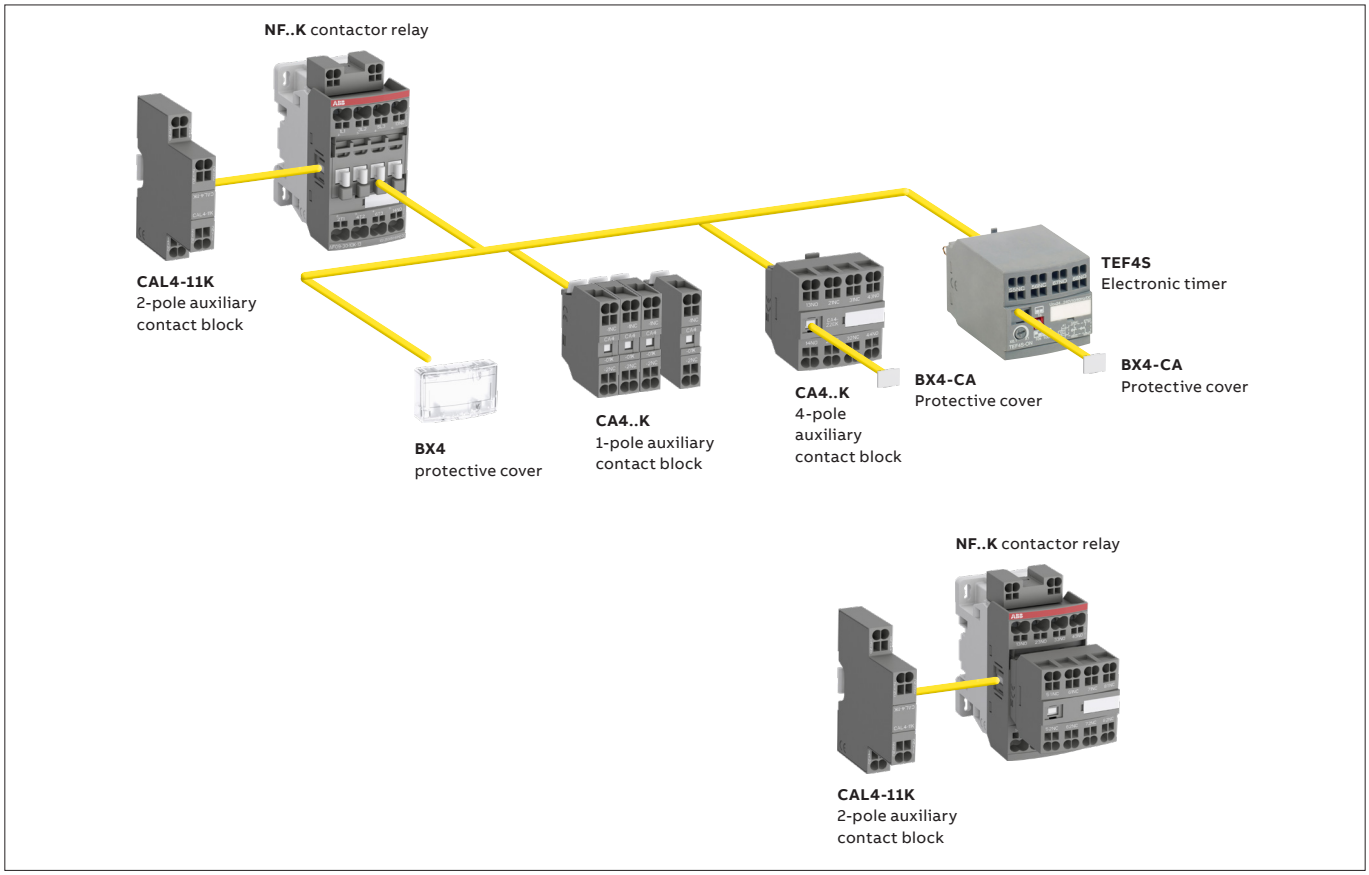
NFZ44EK, NFZ53EK, NFZ62EK, NFZ71EK, NFZ80EK

Main dimensions mm, inches

03

NF..K contactor relays - with Push-in Spring terminals

Contactor relays and main accessories



Main accessory fitting details - for ordering details, technical data and other accessories: see section accessories
Many configurations of accessories are possible depending on whether these are front-mounted or side-mounted.

Contactor relay types	Main poles			Front-mounted accessories					Side-mounted accessories	
				Auxiliary contact blocks		Electronic timer			Auxiliary contact blocks 2-pole CAL4-11K	
				1-pole CA4..K	4-pole CA4..K	TEF4S			Left side	Right side
NF(Z)										
NF	2 2	EK (1)		4 max.	or 1	or 1		+	1	-
	3 1	EK (1)		2 max.	-	or 1		+	1	+ 1
	4 0	EK (2)								
NF	4 4	EK		-	-	-	-	+	1	-
	5 3	EK								
	6 2	EK								
	7 1	EK								
	8 0	EK								
NFZ 24 V DC designed for PLC - coil 30										
NFZ	2 2	EK (1)		4 max.	**or** 1	**or** 1		or	1	+ 1
	3 1	EK (1)		2 max.	-	**or** 1		+	1	
	4 0	EK (2)				1		+	1	+ 1
NFZ	4 4	EK		-	-	-			-	-
	5 3	EK								
	6 2	EK								
	7 1	EK								
	8 0	EK								

(1) Including add-on contacts: 3 N.C. max. on positions 1, 2, 3, 4 and 2 N.C. max. on positions 1 ±30°, 5
(2) Including add-on contacts: 4 N.C. max. on positions 1, 2, 3, 4 and 3 N.C. max. on positions 1 ±30°, 5

NF..K contactor relays - with Push-in Spring terminals

Technical data

Contact utilization characteristics according to IEC

Contactor relay types	AC / DC operated	**NF..K**
Standards		IEC 60947-1 / 60947-5-1 and EN 60947-1 / 60947-5-1
Rated operational voltage Ue max.		690 V
Rated frequency (without derating)		50 / 60 Hz
Conventional free air thermal current Ith - θ ≤ 40 °C		16 A
Ie / Rated operational current AC-15 acc. to IEC 60947-5-1	24-127 V 50/60 Hz	6 A
	220-240 V 50/60 Hz	4 A
	400-440 V 50/60 Hz	3 A
	500 V 50/60 Hz	2 A
	690 V 50/60 Hz	2 A
Making capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Breaking capacity AC-15		10 x Ie AC-15 acc. to IEC 60947-5-1
Ie / Rated operational current DC-13 acc. to IEC 60947-5-1	24 V DC	6 A / 144 W
	48 V DC	2.8 A / 134 W
	72 V DC	1 A / 72 W
	110 V DC	0.55 A / 60 W
	125 V DC	0.55 A / 69 W
	220 V DC	0.27 A / 60 W
	250 V DC	0.27 A / 68 W
	400 V DC	0.15 A / 60 W
	500 V DC	0.13 A / 65 W
	600 V DC	0.1 A / 60 W
Short-circuit protection device gG type fuse		10 A
Conditional short-circuit current		1 kA
Rated short-time withstand current Icw	for 1.0 s	100 A
	for 0.1 s	140 A
Minimum switching capacity		12 V / 3 mA
with failure rate acc. to IEC 60947-5-4		10^{-7}
Non-overlapping time between N.O. and N.C. contacts		≥ 2 ms
Power dissipation per pole at 6 A		0.1 W
Maximum electrical switching frequency	AC-15	1200 cycles/h
	DC-13	900 cycles/h
Mechanically linked contacts acc. to annex L of IEC 60947-5-1		Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA4, CAL4 aux. contact blocks) are mechanically linked contacts

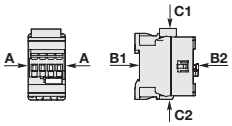
Contact utilization characteristics according to UL / CSA

Contactor relay types	**NF..K**
Standards	UL 508, CSA C22.2 N°14
Maximum operational voltage	600 V AC, 600 V DC
Pilot duty	A600, Q600
AC thermal rated current	10 A
AC maximum volt-ampere making	7200 VA
AC maximum volt-ampere breaking	720 VA
DC thermal rated current	2.5 A
DC maximum volt-ampere making-breaking	69 VA

NF..K contactor relays - with Push-in Spring terminals

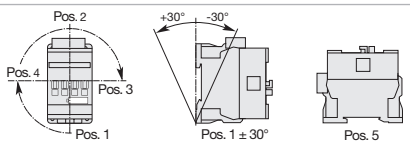
Technical data

General technical data

Contactor relay types	AC / DC operated	**NF..K**
Rated insulation voltage Ui		
acc. to IEC 60947-5-1		690 V
acc. to UL / CSA		600 V
Rated impulse withstand voltage Uimp.		6 kV
Electromagnetic compatibility		Devices complying with IEC 60947-1 / EN 60947-1 - Environment A and B (1)
Pollution degree		3
Ambient air temperature close to contactor relay		
Operation in free air		-40 ... +70 °C
Storage		-60 ... +80 °C
Climatic withstand		Category B according to IEC 60947-1 Annex Q
Maximum operating altitude (without derating)		3000 m
Mechanical durability		
Number of operating cycles		20 million operating cycles
Maximum switching frequency		6000 cycles/h
Shock withstand		
acc. to IEC 60068-2-27 and EN 60068-2-27		
Mounting position 1	Shock direction	1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position
	A	30 g
	B1	25 g closed position / 5 g open position
	B2	15 g
	C1	25 g
	C2	25 g
Vibration withstand		5 ... 300 Hz
acc. to IEC 60068-2-6		4 g closed position / 2 g open position

(1) NF..-12 (48...130 V 50/60 Hz-DC) compliant to environment A only. For environment B: select NFZ..-22.

Mounting characteristics

Contactor relay types	AC / DC operated	**NF..K**
Mounting positions		 Max. add-on N.C. auxiliary contacts: see accessory fitting details for a NF contactor relay
Mounting distances		The contactor relays can be assembled side by side
Fixing		
On rail according to IEC 60715, EN 60715		35 x 7.5 mm or 35 x 15 mm
By screws (not supplied)		2 x M4 screws placed diagonally

Connecting characteristics

Contactor relay types	AC / DC operated		**NF..K**
Main terminals			 Push-in Spring terminals
Connection capacity (min. ... max.)			
Pole and coil terminals			
Rigid Solid		1 x	1 ... 2.5 mm²
		2 x	1 ... 2.5 mm²
Flexible with non insulated		1 x	1 (push-in) / 0.5 (spring) ... 2.5 mm²
ferrule		2 x	1 (push-in) / 0.5 (spring) ... 2.5 mm²
Flexible with insulated ferrule		1 x	1 (push-in) / 0.5 (spring) ... 1.5 mm²
		2 x	1 (push-in) / 0.5 (spring) ... 1.5 mm²
Flexible without ferrule		1 x	(spring) 0.5 ... 2.5 mm²
		2 x	(spring) 0.5 ... 2.5 mm²
Connection capacity acc. to UL/CSA		1 or 2 x	AWG 18 ... 14
Stripping length			10 mm
Degree of protection			
acc. to IEC 60947-1 / EN 60947-1			
and IEC 60529 / EN 60529			IP20
Screwdriver type	All terminals		Flat Ø 3 mm x 0.5 mm

NF..K contactor relays - with Push-in Spring terminals

Technical data

Magnet System Characteristics for NF..K contactor relays - AC / DC operated

Contactor relay types	AC / DC operated	NF..K
Coil operating limits acc. to IEC 60947-5-1	AC supply	at θ ≤ 60 °C 0.85 x Uc min ... 1.1 x Uc max at θ ≤ 70 °C 0.85 x Uc min ... Uc max
	DC supply	At θ ≤ 60 °C 0.85 x Uc min ... 1.1 x Uc max At θ ≤ 70 °C 0.85 x Uc min ... Uc max
AC control voltage 50/60 Hz		
Rated control circuit voltage Uc		24 ... 500 V AC
Coil consumption	Average pull-in value	50 VA
	Average holding value	2.2 VA / 2 W
DC control voltage		
Rated control circuit voltage Uc		20 ... 500 V DC
Coil consumption	Average pull-in value	50 W
	Average holding value	2 W
PLC-output control		Not suitable for direct control by PLC-output
Drop-out voltage		≤ 60 % of Uc min.
Voltage sag immunity according to SEMI F47-0706		–
Dips withstand -20 °C ≤ θ ≤ +60°C		–
Operating time		
Between coil energization and:		
	N.O. contact closing	40 ... 95 ms
	N.C. contact opening	38 ... 90 ms
Between coil de-energization and:		
	N.O. contact opening	11 ... 95 ms
	N.C. contact closing	13 ... 98 ms

Magnet System Characteristics for NFZ..K contactor relays 24V DC operated - designed for PLC - coil 30

Contactor relay types	AC / DC operated	NFZ..K
Coil operating limits acc. to IEC 60947-5-1	DC supply	At θ ≤ 60 °C 0.85 ... 1.1 x Uc At θ ≤ 70 °C Uc
DC control voltage		
Rated control circuit voltage Uc		24 V DC
Coil consumption	Average pull-in value	6 W
	Average holding value	1.7 W
PLC-output control		≥ 250 mA 24 V DC for PLCs and safety PLCs using broken wire detection
Drop-out voltage		≤ 60 % of Uc min.
Operating time		
Between coil energization and:		
	N.O. contact closing	27 ... 53 ms
	N.C. contact opening	20 ... 35 ms
Between coil de-energization and:		
	N.O. contact opening	17 ... 29 ms
	N.C. contact closing	22 ... 57 ms

Magnet System Characteristics for NFZ..K contactor relays - for specific applications - coils 20, 21, 22, 23

Contactor relay types	AC / DC operated	NFZ..K
Coil operating limits acc. to IEC 60947-5-1	AC supply	At θ ≤ 60 °C 0.85 x Uc min ... 1.1 x Uc max At θ ≤ 70 °C 0.85 x Uc min ... Uc max
	DC supply	At θ ≤ 70 °C 0.85 x Uc min ... 1.1 x Uc max
AC control voltage 50/60 Hz		
Rated control circuit voltage Uc		24 ... 250 V AC
Coil consumption	Average pull-in value	16 VA
	Average holding value	1.7 VA / 1.5 W
DC control voltage		
Rated control circuit voltage Uc		12 ... 250 V DC
Coil consumption	Average pull-in value	12 ... 16 W
	Average holding value	1.7 W
PLC-output control		(AF..Z coil 21) ≥ 500 mA 24 V DC for PLCs - Not suitable for safety PLCs
Drop-out voltage		≤ 60 % of Uc min.
Voltage sag immunity according to SEMI F47-0706		(NFZ coil 21, 22, 23) conditions of use on request
Dips withstand -20 °C ≤ θ ≤ +60°C		(NFZ coil 21, 22, 23) 20 ms average for Uc ≥ 24 V 50/60 Hz or Uc ≥ 20 V DC
Operating time		
Between coil energization and:		
	N.O. contact closing	40 ... 95 ms
	N.C. contact opening	38 ... 90 ms
Between coil de-energization and:		
	N.O. contact opening	11 ... 95 ms
	N.C. contact closing	13 ... 98 ms