

NF22E-.. / NFZ22E-.. Contactor Relays AC / DC Operated - with Screw Terminals

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

- NF(Z) contactor relays include an electronic coil interface providing reduced pull-in and holding consumption, particularly for AC control circuits
 - Only four coils are needed to cover control voltages between 24...500 V 50/60 Hz or 20...500 V DC
- NF(Z) offer extended operating limits and are suitable worldwide for different control voltages. e.g.: the coil 100...250 V 50/60 Hz - DC is suitable for Europe (230 V 50 Hz) and for North America (120 V 60 Hz and 208 V 60 Hz).
- NF(Z) contactors can manage large control voltage variations.
 - NFZ contactor relays equipped with a 24...60 V 50/60 Hz - 20...60 V DC coil allow direct control by 24 V DC 500 mA PLC-output
 - NFZ contactor relays withstand short voltage dips and voltage sags (SEMI F47-0706 compliance)
 - NF(Z) contactor relays have built-in surge protection and do not require additional surge suppressors
 - The contactor relays have mechanically-linked auxiliary contacts compliant with Annex L of IEC 60947-5-1 and include the "Mechanically Linked" symbol on their side.



3D CAD outline drawings available on «Control Product 3D» portal

Ordering Details

Number of contacts 1st stack	Control voltage Uc min. ... Uc max.	Type	Order code	EAN	Weight Pack ^(ing) 1 piece kg
	V 50/60 Hz V DC				

Contactor Relays

	24...60	20...60	NF22E-11	1SBH 137 001 R1122	3471523100114	0.270
	48...130	48...130	NF22E-12	1SBH 137 001 R1222	3471523100121	0.270
	100...250	100...250	NF22E-13	1SBH 137 001 R1322	3471523100138	0.270
	250...500	250...500	NF22E-14	1SBH 137 001 R1422	3471523100145	0.310

Note: NF22E-11 not suitable for a direct control by PLC-output. NF22E-11 available in some countries: please consult your ABB representative.

Contactor Relays - Low Consumption

Terminal layout		Data				
	-	12...20	NFZ22E-20	1SBH 136 001 R2022	3471523101708	0.310
	24...60	20...60	NFZ22E-21	1SBH 136 001 R2122	3471523101715	0.310
	48...130	48...130	NFZ22E-22	1SBH 136 001 R2222	3471523101722	0.310
	100...250	100...250	NFZ22E-23	1SBH 136 001 R2322	3471523101739	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

Certifications and Approvals



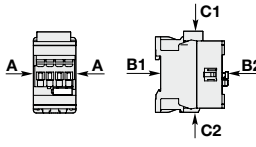
Contact Utilization Characteristics according to IEC

Standards		IEC 60947-1 / 60947-5-1 and EN 60947-1 / 60947-5-1
Rated operational voltage U_e max.		690 V
Conventional free-air thermal current I_{th} $\theta \leq 40^\circ\text{C}$		16 A
Rated frequency limits		25 ... 400 Hz
Rated operational current I_e / 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 I_e AC-15 acc. to IEC 60947-5-1
Breaking capacity AC-15		10 x I_e AC-15 acc. to IEC 60947-5-1
Rated operational current I_e / 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 gG type fuse		10 A
Rated short-time withstand current I_{cw}	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
Heat dissipation per pole at 6 A		0.1 W
Max. electrical switching frequency	AC-15	1200 cycles/h
	DC-13	900 cycles/h

Main Pole - Utilization Characteristics according to UL / CSA

Standards	UL 508, CSA C22.2 N°14
Rated insulation voltage U_i	600 V
Max. rated 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

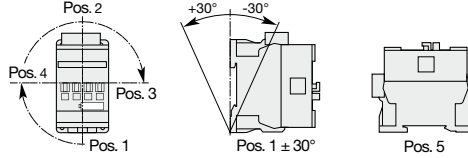
General Technical Data

Rated insulation voltage U_i		
acc. to IEC 60947-5-1		690 V
acc. to UL / CSA		600 V
Rated impulse withstand voltage U_{imp}		6 kV
Electromagnetic compatibility		Devices complying with IEC 60947-1 / EN 60947-1 - Environment A
Ambient air temperature close to contactor		
Operation in free air		-40 ... +70 °C
Storage		-60 ... +80 °C
Climatic withstand		Category B according to IEC 60947-1 Annex Q
Operating altitude		≤ 3000 m
Mechanical durability		
Number of operating cycles		20 millions operating cycles
Max. switching frequency		6000 cycles/h
Shock withstand acc. 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
		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

Magnet System Characteristics

Coil operating limits		AC supply	at $\theta \leq 60^\circ\text{C}$ 0.85 x U_c min ... 1.1 x U_c max at $\theta \leq 70^\circ\text{C}$ 0.85 x U_c min ... U_c max
acc. to IEC 60947-5-1		DC supply	at $\theta \leq 60^\circ\text{C}$ 0.85 x U_c min ... 1.1 x U_c max at $\theta \leq 70^\circ\text{C}$ (NF) 0.85 x U_c min ... U_c max - (NFZ) 0.85 x U_c min ... 1.1 x U_c max
AC control voltage 50/60 Hz	Rated control circuit voltage U_c		24 ... 500 V AC
	Coil consumption	Average pull-in value	(NF) 50 VA - (NFZ) 16 VA
		Average holding value	(NF) 2.2 VA / 2 W - (NFZ) 1.7 VA / 1.5 W
DC control voltage	Rated control circuit voltage U_c		12 ... 500 V DC
	Coil consumption	Average pull-in value	(NF) 50 W - (NFZ) 12 ... 16 W
		Average holding value	(NF) 2 W - (NFZ) 1.7 W
PLC-Output control			(NFZ) ≥ 500 mA 24 V DC
Drop-out voltage in % of U_c min.			≤ 60 % U_c min
Voltage sag immunity according to SEMI F47-0706			(NFZ) conditions of use on request
Dips withstand (level 0% according to IEC 61000-4-11) -20 °C ≤ θ ≤ +60 °C			(NFZ) 22 ms average for U_c = 24 ... 250 V 50/60Hz
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

Mounting Characteristics

Mounting positions		
Mounting distances		Max. add-on N.C. auxiliary contacts: see accessory fitting details for a NF contactor relay 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

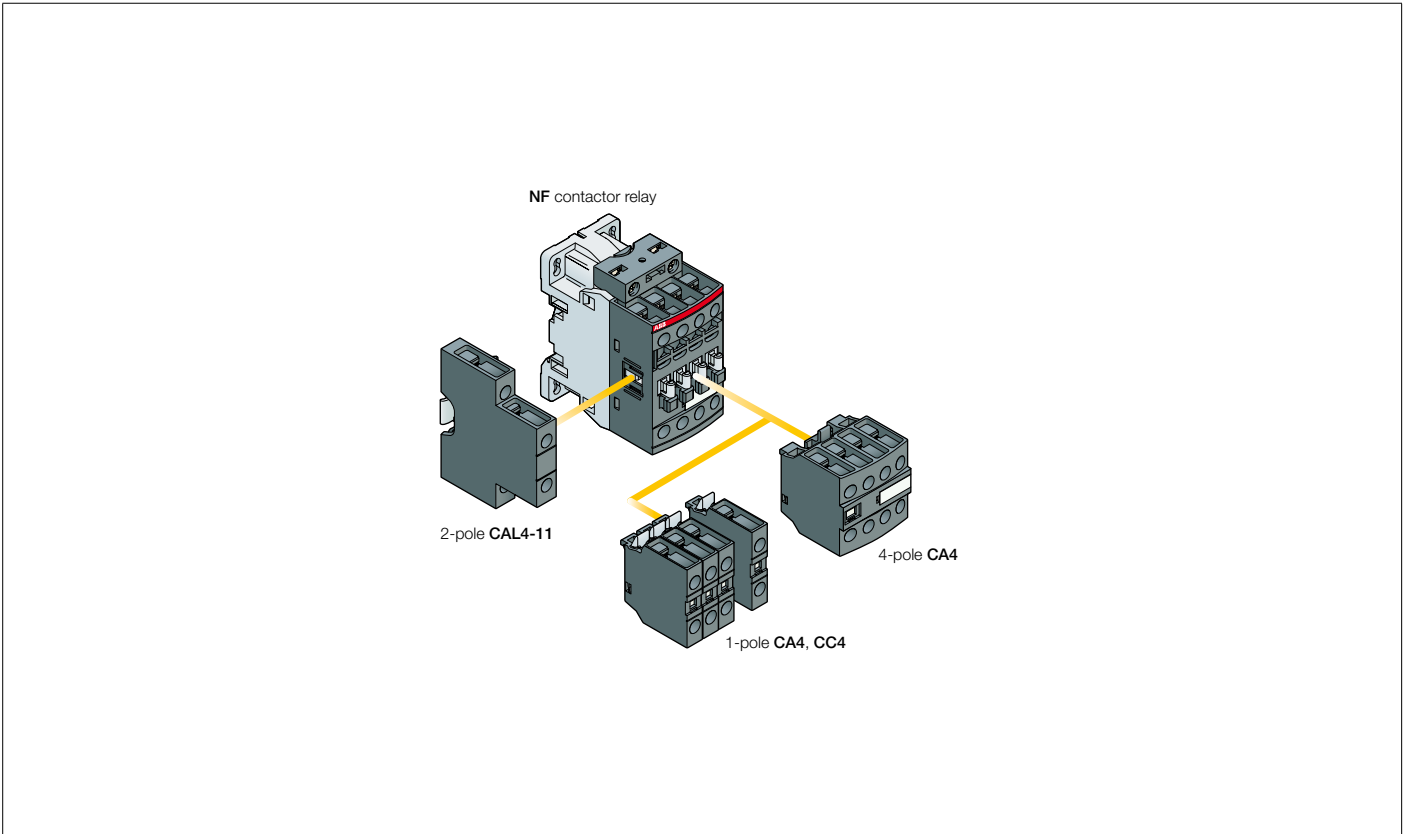
Main terminals			
		Screw terminals with cable clamp	
Connecting capacity (min. ... max.)			
Pole and coil terminals			
	Rigid	1 x	1 ... 2.5 mm²
		2 x	1 ... 2.5 mm²
	Flexible with non insulated ferrule	1 x	0.75 ... 2.5 mm²
		2 x	0.75 ... 2.5 mm²
	Flexible with insulated ferrule	1 x	0.75 ... 2.5 mm²
		2 x	0.75 ... 1.5 mm²
	Bars or lugs	L <	8 mm
Capacity according 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			
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
Tightening torque			
Pole terminals			1.2 Nm / 11 lb.in
Coil terminals			1.2 Nm / 11 lb.in

Accessory Fitting Details for a NF Contactor Relay

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

Front-mounted accessories				Side-mounted accessories			
Auxiliary contact blocks				Auxiliary contact blocks			
1-pole CA4				Left side		Right side	
1-pole CC4		4-pole CA4		2-pole CAL4-11			
Max. add-on N.C. auxiliary contacts: 3 N.C. max. on positions 1, 2, 3, 4 and 2 N.C. max. on positions 1 ±30°, 5							
4 max.	or	1		+	1		–
2 max.		–		+	1	+	1

Overview of main accessories (other accessories available)



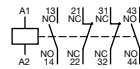
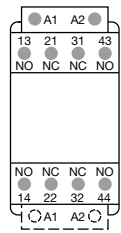
Main Accessories

Ordering Details

Description		Auxiliary contacts	Type	Order code	EAN	Pack ^(ing) piece	Weight
		   					kg (1 pce)
Additional auxiliary contact blocks	Front-mounted instantaneous auxiliary contact blocks	0 1 - -	CA4-01	1SBN 010 110 R1001	3471523130029	1	0.014
		1 0 - -	CA4-10	1SBN 010 110 R1010	3471523130005	1	0.014
		0 1 - -	CA4-01-T	1SBN 010 110 T1001	3471523130395	10	0.014
		1 0 - -	CA4-10-T	1SBN 010 110 T1010	3471523130371	10	0.014
	Front-mounted auxiliary contact blocks with N.O. leading contact and N.C. lagging contact	- - 0 1	CC4-01	1SBN 010 111 R1001	3471523130432	1	0.014
		- - 1 0	CC4-10	1SBN 010 111 R1010	3471523130425	1	0.014
	Side-mounted instantaneous auxiliary contact blocks	1 1 - -	CAL4-11	1SBN 010 120 R1011	3471523130043	1	0.040
		1 1 - -	CAL4-11-T	1SBN 010 120 T1011	3471523130418	10	0.040
	Front-mounted instantaneous auxiliary contact blocks	1 3 - -	CA4-13N	1SBN 010 140 R1213	3471523130272	1	0.055
		2 2 - -	CA4-22N	1SBN 010 140 R1222	3471523130241	1	0.055
		3 1 - -	CA4-31N	1SBN 010 140 R1231	3471523130258	1	0.055
		4 0 - -	CA4-40N	1SBN 010 140 R1240	3471523130265	1	0.055
Additional coil terminal block	Additional coil terminal block		LDC4	1SBN 070 156 T1000	3471523130678	10	0.010
Protective covers	Protective covers		BX4	1SBN 110 108 T1000	3471523130708	10	0.006
			BX4-CA	1SBN 110 109 W1000	3471523130715	50	0.001
Function markers	Function markers		BA4	1SNA 235 156 R2700	3472592351568	16	0.011
			HTP500-BA4	1SNA 235 712 R2400	3472592357126	1	0.220
			SPRC 1	1SNA 360 010 R1500	3472593600108	1	0.290

Terminal Marking and Positioning

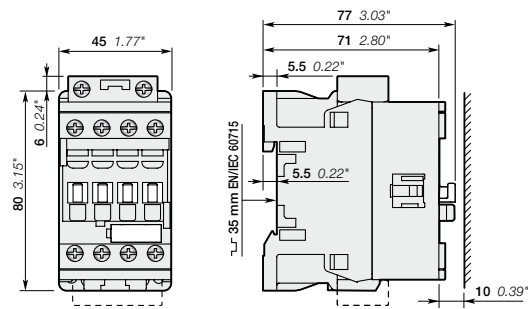
Standard devices without addition of auxiliary contacts



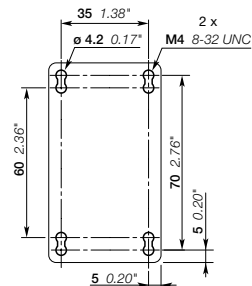
NF22E-.. / NFZ22E-..

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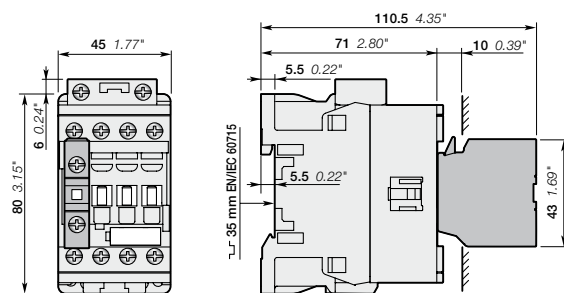
Dimensions mm, inches



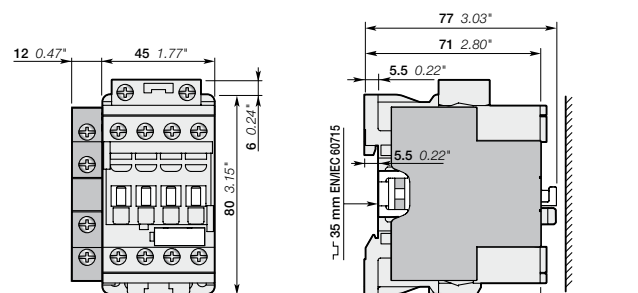
NF22E



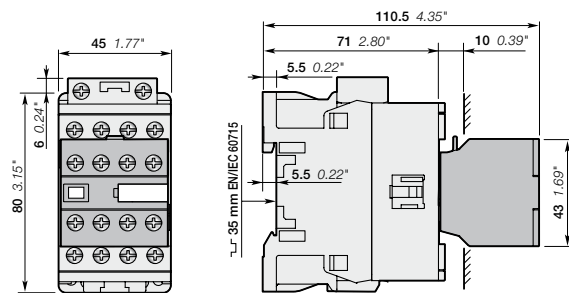
NF22E



NF22E
+ CA4, CC4 1-pole auxiliary contact block



NF22E
+ CAL4-11 2-pole auxiliary contact block



NF22E
+ CA4 4-pole auxiliary contact block

Note: contactor lateral distance to grounded component 2 mm 0.08" min.