

NS..S contactor relays - with spring terminals AC operated



NS22ES

Description

NS..S contactor relays are used for switching auxiliary and control circuits. These contactor relays are designed with:

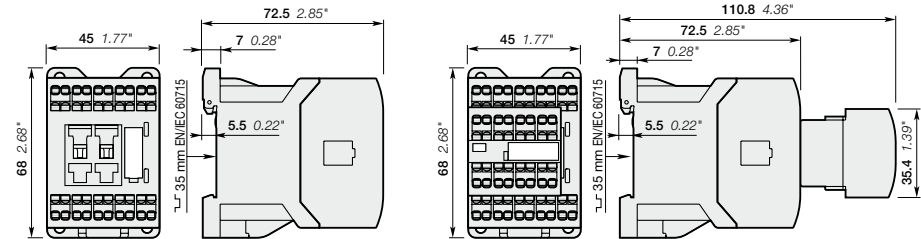
- spring terminals
- 4 poles or 8 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: AC operated
- add-on auxiliary contact blocks for front mounting and a comprehensive range of accessories.

Ordering details

Number of contacts		Rated control circuit voltage Uc (1)	Type	Order code	Weight Pkg (1 pce) kg	
1st stack	2nd stack					
		V 50 Hz	V 60 Hz			
	A1	24	24	NS22ES-20	1SBH101004R2022	0.220
	A2	-	120	NS22ES-16	1SBH101004R1622	0.220
		230	230	NS22ES-26	1SBH101004R2622	0.220
	A1	24	24	NS31ES-20	1SBH101004R2031	0.220
	A2	-	120	NS31ES-16	1SBH101004R1631	0.220
		230	230	NS31ES-26	1SBH101004R2631	0.220
		400	400	NS31ES-28	1SBH101004R2831	0.220
	A1	24	24	NS40ES-20	1SBH101004R2040	0.220
	A2	-	120	NS40ES-16	1SBH101004R1640	0.220
		230	230	NS40ES-26	1SBH101004R2640	0.220
		400	400	NS40ES-28	1SBH101004R2840	0.220
	A1	24	24	NS44ES-20	1SBH101004R2044	0.260
	A2	-	120	NS44ES-16	1SBH101004R1644	0.260
		230	230	NS44ES-26	1SBH101004R2644	0.260
		400	400	NS44ES-28	1SBH101004R2844	0.260
	A1	24	24	NS53ES-20	1SBH101004R2053	0.260
	A2	-	120	NS53ES-16	1SBH101004R1653	0.260
		230	230	NS53ES-26	1SBH101004R2653	0.260
		400	400	NS53ES-28	1SBH101004R2853	0.260
	A1	24	24	NS62ES-20	1SBH101004R2062	0.260
	A2	-	120	NS62ES-16	1SBH101004R1662	0.260
		230	230	NS62ES-26	1SBH101004R2662	0.260
		400	400	NS62ES-28	1SBH101004R2862	0.260
	A1	24	24	NS71ES-20	1SBH101004R2071	0.260
	A2	-	120	NS71ES-16	1SBH101004R1671	0.260
		230	230	NS71ES-26	1SBH101004R2671	0.260
		400	400	NS71ES-28	1SBH101004R2871	0.260
	A1	24	24	NS80ES-20	1SBH101004R2080	0.260
	A2	-	120	NS80ES-16	1SBH101004R1680	0.260
		230	230	NS80ES-26	1SBH101004R2680	0.260
		400	400	NS80ES-28	1SBH101004R2880	0.260

Note: for multiple packaging, please contact your ABB local sales organization.
(1) Other control voltages see voltage code table.

Main dimensions mm, inches



NS22ES, NS31ES, NS40ES

NS44ES, NS53ES, NS62ES, NS71ES, NS80ES

NSL..S contactor relays - with spring terminals

DC operated



NSL22ES

Description

NSL..S contactor relays are used for switching auxiliary and control circuits. These contactor relays are designed with:

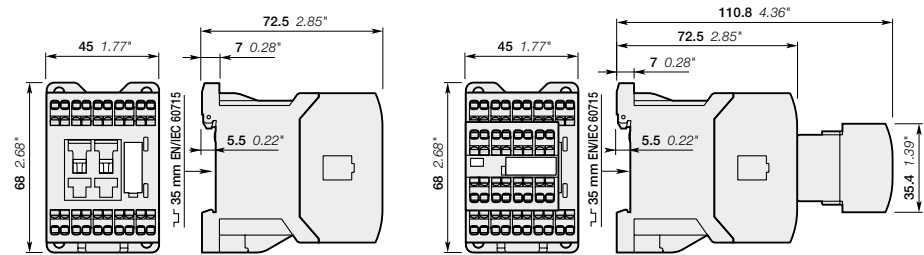
- spring terminals
- 4 poles or 8 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: low coil consumption (3 W at pull-in and holding) DC operated with solid core magnet. Suitable for direct control by PLC outputs (the polarity on the coil terminals A1+ and A2- must be respected)
- add-on auxiliary contact blocks for front mounting and a comprehensive range of accessories.

Ordering details

Number of contacts		Rated control circuit voltage Uc (1) V DC	Type	Order code	Weight Pkg (1 pce) kg
1st stack	2nd stack				
		24	NSL22ES-81	1SBH103004R8122	0.280
		48	NSL22ES-83	1SBH103004R8322	0.280
		110	NSL22ES-86	1SBH103004R8622	0.280
		220	NSL22ES-88	1SBH103004R8822	0.280
		24	NSL31ES-81	1SBH103004R8131	0.280
		48	NSL31ES-83	1SBH103004R8331	0.280
		110	NSL31ES-86	1SBH103004R8631	0.280
		220	NSL31ES-88	1SBH103004R8831	0.280
		24	NSL40ES-81	1SBH103004R8140	0.280
		48	NSL40ES-83	1SBH103004R8340	0.280
		110	NSL40ES-86	1SBH103004R8640	0.280
		220	NSL40ES-88	1SBH103004R8840	0.280
		24	NSL44ES-81	1SBH103004R8144	0.320
		48	NSL44ES-83	1SBH103004R8344	0.320
		110	NSL44ES-86	1SBH103004R8644	0.320
		220	NSL44ES-88	1SBH103004R8844	0.320
		24	NSL53ES-81	1SBH103004R8153	0.320
		48	NSL53ES-83	1SBH103004R8353	0.320
		110	NSL53ES-86	1SBH103004R8653	0.320
		220	NSL53ES-88	1SBH103004R8853	0.320
		24	NSL62ES-81	1SBH103004R8162	0.320
		48	NSL62ES-83	1SBH103004R8362	0.320
		110	NSL62ES-86	1SBH103004R8662	0.320
		220	NSL62ES-88	1SBH103004R8862	0.320
		24	NSL71ES-81	1SBH103004R8171	0.320
		48	NSL71ES-83	1SBH103004R8371	0.320
		110	NSL71ES-86	1SBH103004R8671	0.320
		220	NSL71ES-88	1SBH103004R8871	0.320
		24	NSL80ES-81	1SBH103004R8180	0.320
		48	NSL80ES-83	1SBH103004R8380	0.320
		110	NSL80ES-86	1SBH103004R8680	0.320
		220	NSL80ES-88	1SBH103004R8880	0.320

Note: for multiple packaging, please contact your ABB local sales organization.
(1) Other control voltages see voltage code table.

Main dimensions mm, inches



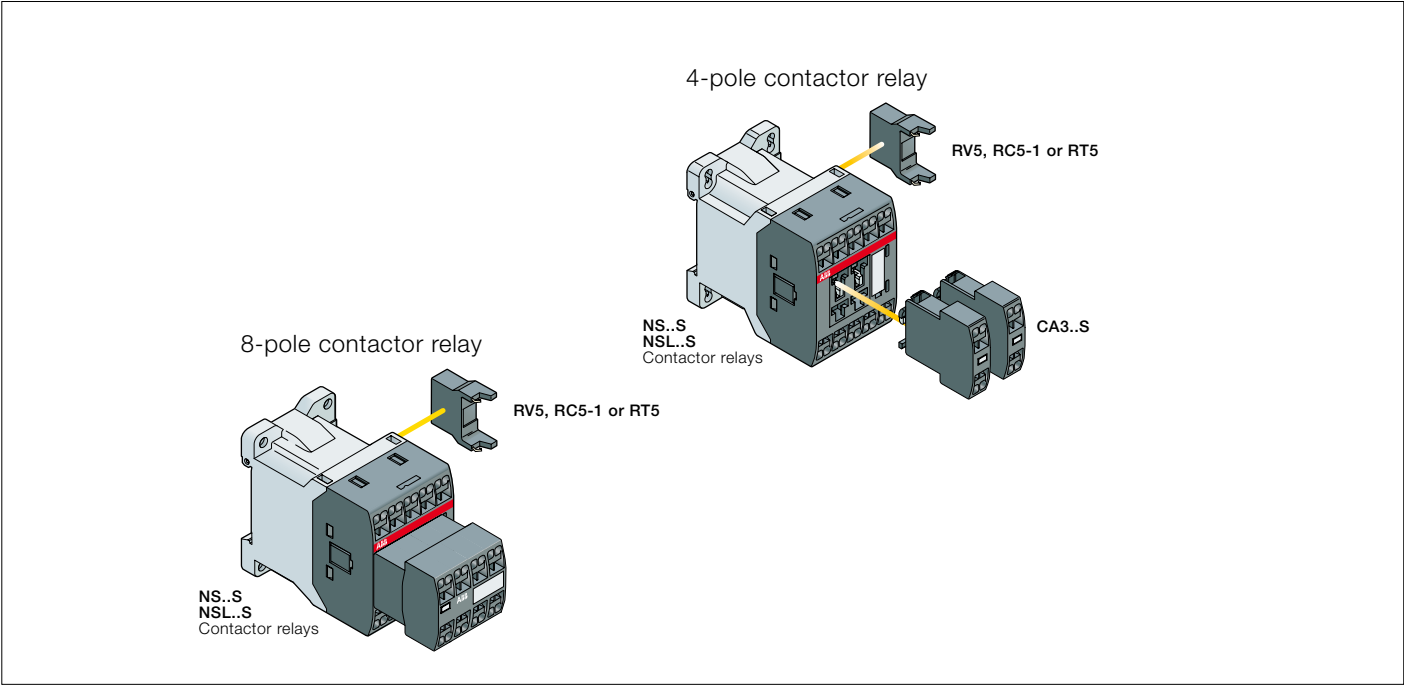
NSL22ES, NSL31ES, NSL40ES

NSL44ES, NSL53ES, NSL62ES, NSL71ES, NSL80ES

NS..S and NSL..S contactor relays - with spring terminals

Main accessories

Contactor relays and main accessories



Main accessory fitting details

Contactor types	Main poles		Front-mounted accessories		Side-mounted accessories	
			Auxiliary contact blocks		Surge suppressors	
			1-pole CA3..S			
NS..S	2	2 E	2 max.	+	RV5	or RC5-1
NS..S	3	1 E				
NS..S	4	0 E				
NS..S	4	4 E				
NS..S	5	3 E				
NS..S	6	2 E	-		RV5	or RC5-1
NS..S	7	1 E				
NS..S	8	0 E				
NSL..S	2	2 E	2 max.	+	RV5	or RT5
NSL..S	3	1 E				
NSL..S	4	0 E				
NSL..S	4	4 E				
NSL..S	5	3 E				
NSL..S	6	2 E	-		RV5	or RT5
NSL..S	7	1 E				
NSL..S	8	0 E				

NS..S and NSL..S contactor relays - with spring terminals

Main accessories



CA3-10S

Front mounted instantaneous auxiliary contact blocks

For contactor relays	Auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce)
	 				kg
NS..S, NSL..S	1 0	CA3-10S	1SBN011019T1010	10	0.011
	0 1	CA3-01S	1SBN011019T1001	10	0.011



RV5

Surge suppressors

For contactor relays	Rated control circuit voltage - Uc			Type	Order code	Pkg qty	Weight (1 pce)
	V	AC	DC				kg
NS..S, NSL..S	24...50	●	●	RV5/50	1SBN050010R1000	2	0.015
	50...133	●	●	RV5/133	1SBN050010R1001	2	0.015
	110...250	●	●	RV5/250	1SBN050010R1002	2	0.015
	250...440	●	●	RV5/440	1SBN050010R1003	2	0.015
NS..S	24...50	●	-	RC5-1/50	1SBN050100R1000	2	0.012
	50...133	●	-	RC5-1/133	1SBN050100R1001	2	0.012
	110...250	●	-	RC5-1/250	1SBN050100R1002	2	0.012
	250...440	●	-	RC5-1/440	1SBN050100R1003	2	0.012
NSL..S	12...32	-	●	RT5/32	1SBN050020R1000	2	0.015
	25...65	-	●	RT5/65	1SBN050020R1001	2	0.015
	50...90	-	●	RT5/90	1SBN050020R1002	2	0.015
	77...150	-	●	RT5/150	1SBN050020R1003	2	0.015
	150...264	-	●	RT5/264	1SBN050020R1004	2	0.015

NS..S and NSL..S contactor relays - with spring terminals

Technical data

Contact utilization characteristics according to IEC

Contactor relay types	AC operated	NS..S
	DC operated	NSL..S
Standards	IEC 60947-5-1 and EN 60947-5-1	
Rated operational voltage Ue max.	690 V	
Rated frequency (without derating)	50 / 60 Hz	
Conventional free-air thermal current Ith $\theta \leq 40^\circ\text{C}$	10 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
Short-circuit protection device for contactors		
Ue $\leq$ 500 V AC - gG type fuse	10 A	
Rated short-time withstand current Icw	for 1.0 s	100 A
at 40 °C ambient temperature, in free air from a cold state	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	1.5 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	Built-in N.O. or N.C. auxiliary contacts and additional N.O. or N.C. auxiliary contacts (CA3..S aux. contact blocks) are mechanically linked contacts.	
acc. to annex L of IEC 60947-5-1		

Contact utilization characteristics according to UL / CSA

Contactor relay types	AC operated	NS..S
	DC operated	NSL..S
Standards	UL 508, CSA C22.2 N°14	
Max. operational voltage	600 V AC, 250 V DC	
Pilot duty	A600, Q300	
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	

NS..S and NSL..S contactor relays - with spring terminals

Technical data

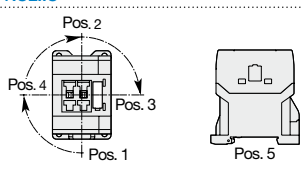
Magnet system characteristics for NS..S contactor relays

Contactor relay types	AC operated	NS..S
Coil operating limits	AC supply	
acc. to IEC 60947-5-1		0.85...1.1 x U _c (at $\theta \leq 60\text{ °C}$); U _c (at $\theta \leq 70\text{ °C}$)
AC control voltage	Rated control circuit voltage U _c	at 50 Hz 24...415 V
		at 60 Hz 24...415 V
	Coil consumption	
	Average pull-in value	50 Hz 33 VA
		60 Hz 33 VA
		50/60 Hz 33 VA
	Average holding value	50 Hz 6.5 VA / 1.5 W
		60 Hz 5 VA / 1.2 W
		50/60 Hz 6.5 VA / 1.5 W
Drop-out voltage		Approx. 30...50 % of U _c
Operating time		
Between coil energization and:	N.O. contact closing	9...24 ms
	N.C. contact opening	6...18 ms
Between coil de-energization and:	N.O. contact opening (1)	5...19 ms
	N.C. contact closing (1)	7...22 ms
		(1) The use of RC5-1 surge suppressor increases opening time by a factor of 2 to 3.

Magnet system characteristics for NSL..S contactor relays

Contactor relay types	DC operated	NSL..S
Coil operating limits	DC supply	
acc. to IEC 60947-5-1		0.85...1.1 x U _c (at $\theta \leq 60\text{ °C}$); U _c (at $\theta \leq 70\text{ °C}$)
DC control voltage	Rated control circuit voltage U _c	12...240 V DC
	Coil consumption	
	Average pull-in value	3 W
	Average holding value	3 W
Drop-out voltage		Approx. 10...40 % of U _c
Coil time constant	Open	L/R 12 ms
	Closed	L/R 40 ms
Operating time		
Between coil energization and:	N.O. contact closing	36...59 ms
	N.C. contact opening	31...53 ms
Between coil de-energization and:	N.O. contact opening (1)	13...17 ms
	N.C. contact closing (1)	15...20 ms
		(1) The use of RT5 surge suppressor increases opening time by a factor of 1.1 to 1.2.

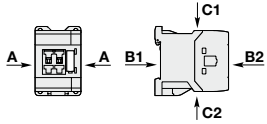
Mounting characteristics and conditions for use

Contactor relay types	AC operated	NS..S
	DC operated	NSL..S
Mounting positions		
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

NS..S and NSL..S contactor relays - with spring terminals

Technical data

General technical data

Contactor relay types	AC operated	NS..S
	DC operated	NSL..S
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
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		3600 cycles/h
Shock withstand		1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position
acc. to IEC 60068-2-27 and EN 60068-2-27	Shock direction	
Mounting position 1		
		NS contactor relays - AC operated
	A	20 g
	B1	5 g
	B2	15 g
	C1	19 g closed position / 8 g open position
	C2	16 g closed position / 13 g open position
		NSL contactor relays - DC operated
		20 g closed position / 10 g open position
		15 g closed position / 5 g open position
		10 g
		19 g closed position / 8 g open position
		14 g closed position / 8 g open position
Vibration withstand		5...300 Hz
acc. to IEC 60068-2-6		3 g closed position / 2 g open position

Connecting characteristics

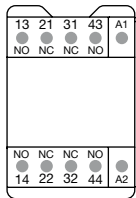
Contactor relay types	AC operated	NS..S
	DC operated	NSL..S
Main terminals		 Spring terminals
Connection capacity (min. ... max.)		
Pole and coil terminals		
 Rigid solid	1 x	0.75...2.5 mm ²
	2 x	0.75...2.5 mm ²
 Flexible with non insulated ferrule	1 x	0.75...2.5 mm ²
	2 x	0.75...2.5 mm ²
 Flexible with insulated ferrule	1 x	0.75...1.5 mm ²
	2 x	0.75...1.5 mm ²
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		
All terminals		IP20
Screwdriver type		Flat Ø 3.5

NS..S contactor relays - with spring terminals

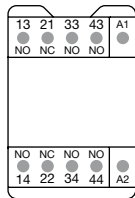
Terminal marking and positioning

NS..S contactor relays - AC operated

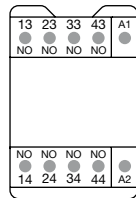
Standard devices without addition of auxiliary contact blocks



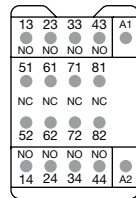
NS22ES



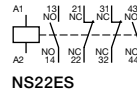
NS31ES



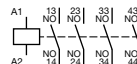
NS40ES



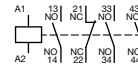
NS44ES



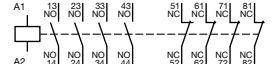
NS22ES



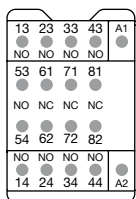
NS40ES



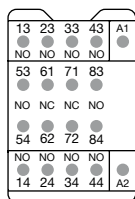
NS31ES



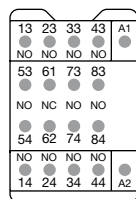
NS44ES



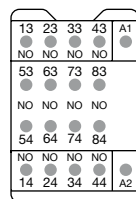
NS53ES



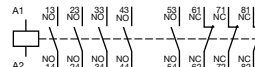
NS62ES



NS71ES



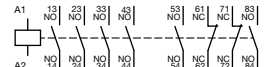
NS80ES



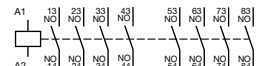
NS53ES



NS71ES

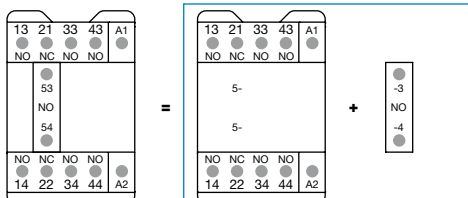


NS62ES

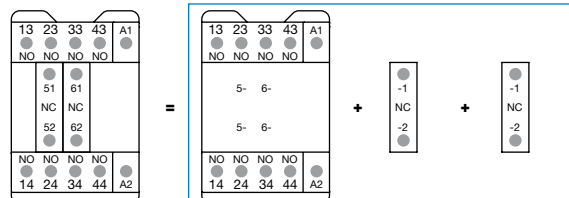


NS80ES

Other possible contact combinations with auxiliary contact blocks added by the user



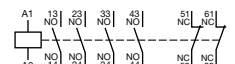
Combination 41E = NS31ES + CA3-10S



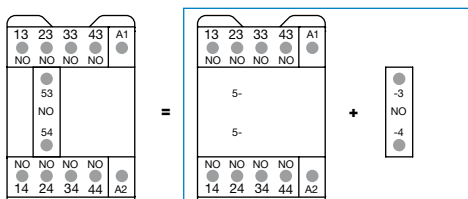
Combination 42E = NS40ES + CA3-01S + CA3-01S



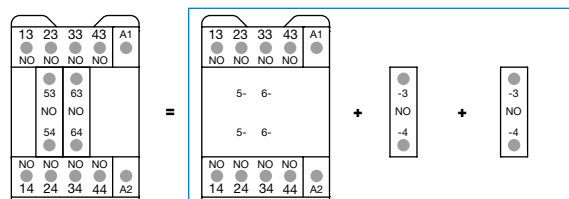
Combination 41E



Combination 42E



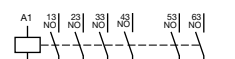
Combination 50E = NS40ES + CA3-10S



Combination 60E = NS40ES + CA3-10S + CA3-10S

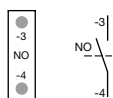


Combination 50E

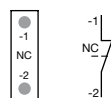


Combination 60E

CA3..S 1-pole auxiliary contact blocks



CA3-10S



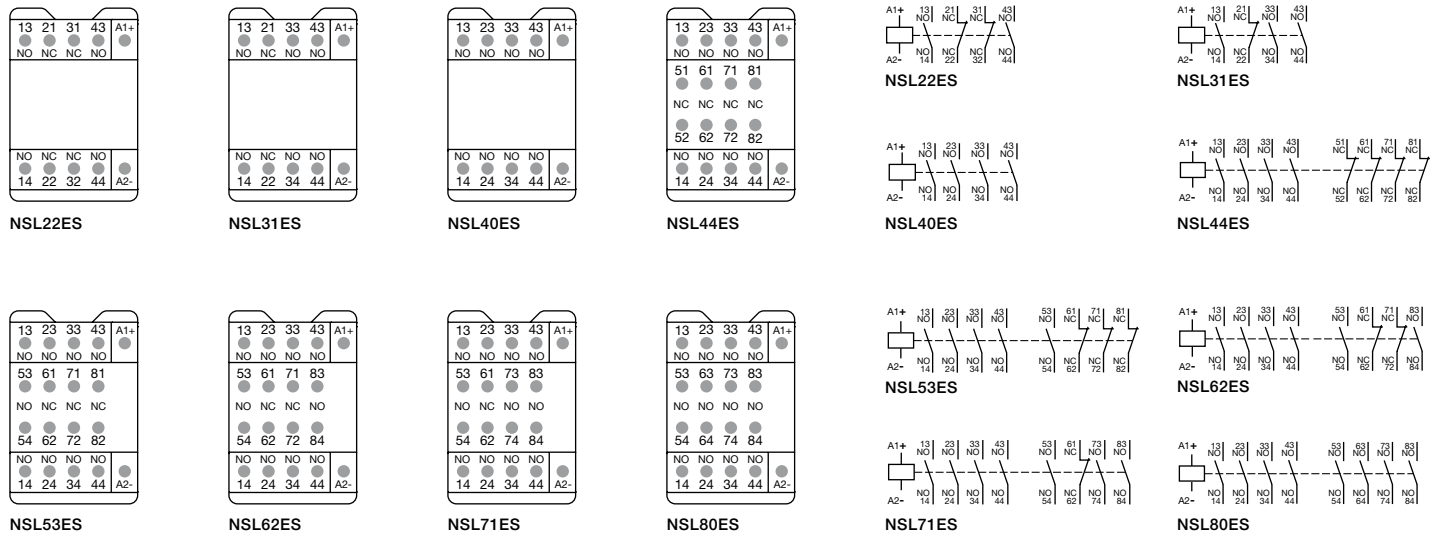
CA3-01S

NSL..S contactor relays - with spring terminals

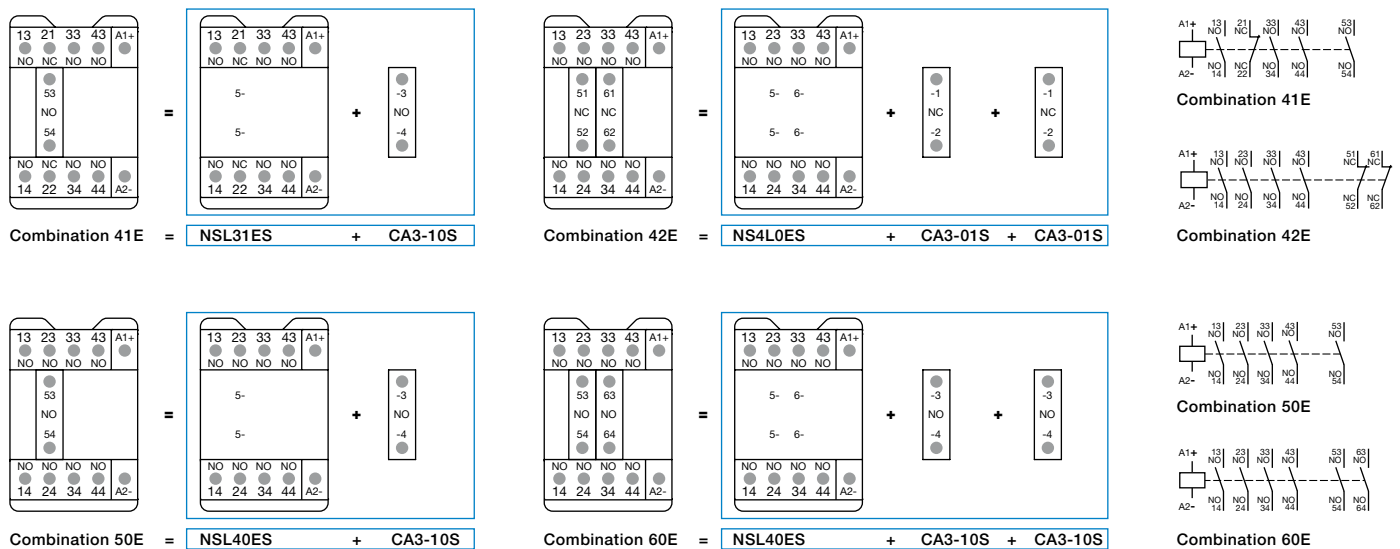
Terminal marking and positioning

NSL..S contactor relays - DC operated (the polarity A1+, A2- must be respected)

Standard devices without addition of auxiliary contact blocks



Other possible contact combinations with auxiliary contact blocks added by the user



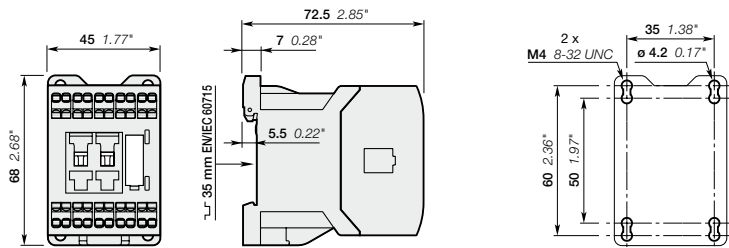
CA3..S 1-pole auxiliary contact blocks



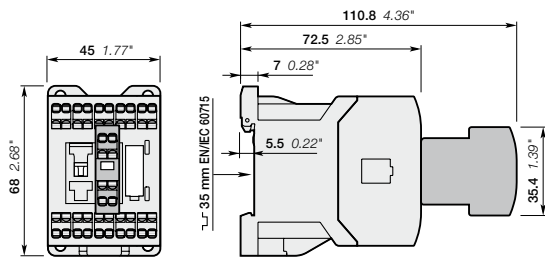
NS..S contactor relays - with spring terminals

Main dimensions mm, inches

4-pole contactor relays

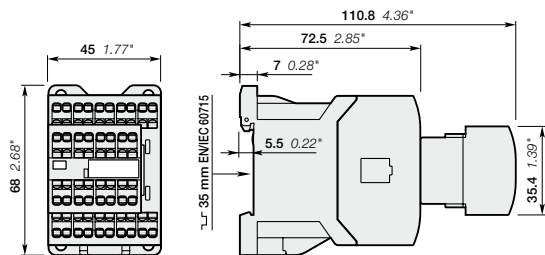


NS22ES, NS31ES, NS40ES



NS22ES, NS31ES, NS40ES
+ CA3..S front-mounted 1-pole auxiliary contact block

8-pole contactor relays

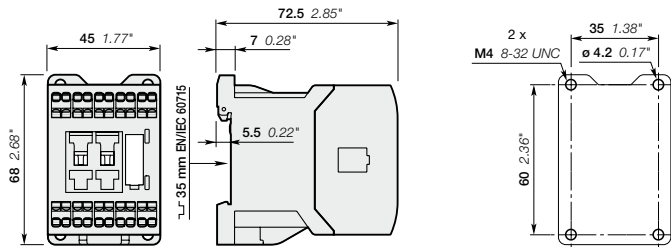


NS44ES, NS53ES, NS62ES, NS71ES, NS80ES

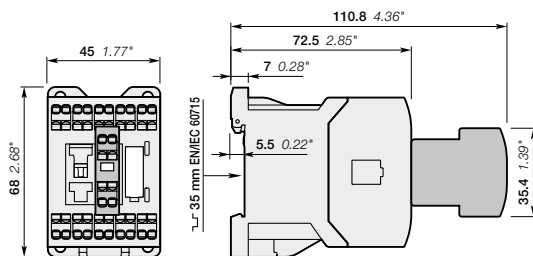
NSL..S contactor relays - with spring terminals

Main dimensions mm, inches

4-pole contactor relays



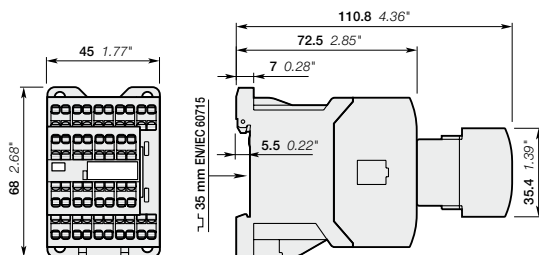
NSL22ES, NSL31ES, NSL40ES



NSL22ES, NSL31ES, NSL40ES

+ CA3..S front-mounted 1-pole auxiliary contact block

8-pole contactor relays



NSL44ES, NSL53ES, NSL62ES, NSL71ES, NSL80ES