

# AS..S 3-pole contactors and NS..S contactor relays with spring terminals

## **AS..S 3-pole contactors - with spring terminals**

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## **NS..S contactors relays - with spring terminals**

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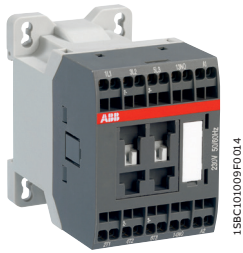
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# AS09..S ... AS16..S 3-pole contactors

4 to 7.5 kW

AC operated - with spring terminals



AS09-30-10S

AS09 ... AS16 contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC.

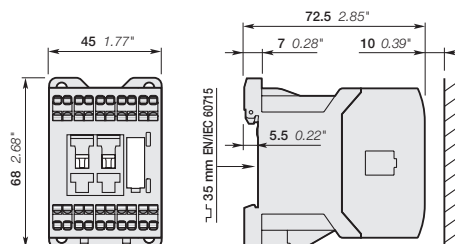
These contactors are of the block type design with:

- spring terminals
- 3 main poles and 1 built-in auxiliary contact
- control circuit: AC operated
- add-on auxiliary contact blocks for front mounting and a comprehensive range of accessories.

IEC		UL/CSA		Rated control circuit voltage Uc (1)		Auxiliary contacts fitted	Type	Order code	Weight
Rated operational power	current $\square \leq 40^\circ\text{C}$	3-phase motor rating 480 V	General use rating 600 V AC	V 50 Hz	V 60 Hz				
400 V AC-3	AC-1								
kW	A	hp	A						kg
4	20	5	12	24	24	1 0	AS09-30-10S-20	1SBL101004R2010	0.220
					220	220	0 1	AS09-30-01S-20	1SBL101004R2001
				230	230	1 0	AS09-30-10S-25	1SBL101004R2510	0.220
						0 1	AS09-30-01S-25	1SBL101004R2501	0.220
				230	230	1 0	AS09-30-10S-26	1SBL101004R2610	0.220
						0 1	AS09-30-01S-26	1SBL101004R2601	0.220
5.5	22	7.5	12	24	24	1 0	AS12-30-10S-20	1SBL111004R2010	0.220
					220	220	0 1	AS12-30-01S-20	1SBL111004R2001
				230	230	1 0	AS12-30-10S-25	1SBL111004R2510	0.220
						0 1	AS12-30-01S-25	1SBL111004R2501	0.220
				230	230	1 0	AS12-30-10S-26	1SBL111004R2610	0.220
						0 1	AS12-30-01S-26	1SBL111004R2601	0.220
7.5	22	10	15.2	24	24	1 0	AS16-30-10S-20	1SBL121004R2010	0.220
					220	220	0 1	AS16-30-01S-20	1SBL121004R2001
				230	230	1 0	AS16-30-10S-25	1SBL121004R2510	0.220
						0 1	AS16-30-01S-25	1SBL121004R2501	0.220
				230	230	1 0	AS16-30-10S-26	1SBL121004R2610	0.220
						0 1	AS16-30-01S-26	1SBL121004R2601	0.220

Note: for multiple packaging, please contact your ABB local sales organization.

(1) Other control voltages see voltage code table.



AS09..S, AS12..S, AS16..S

Main dimensions mm, inches

# ASL09..S ... ASL16..S 3-pole contactors

4 to 7.5 kW

DC operated - with spring terminals



ASL09-30-10S

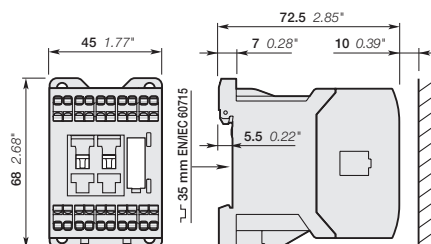
ASL09..S ... ASL16..S contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:

- spring terminals
- 3 main poles and 1 built-in auxiliary contact
- control circuit: low 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 comprehensive range of accessories.

IEC		UL/CSA		Rated control circuit voltage Uc (1)	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational power	current $\square \leq 40^\circ\text{C}$	3-phase motor rating 480 V	General use rating 600 V AC					
400 V				V DC				kg
AC-3	AC-1							
kW	A	hp	A					
4	20	5	12	24	1 0	ASL09-30-10S-81	1SBL103004R8110	0.280
					0 1	ASL09-30-01S-81	1SBL103004R8101	0.280
5.5	22	7.5	12	24	1 0	ASL12-30-10S-81	1SBL113004R8110	0.280
					0 1	ASL12-30-01S-81	1SBL113004R8101	0.280
7.5	22	10	15.2	24	1 0	ASL16-30-10S-81	1SBL123004R8110	0.280
					0 1	ASL16-30-01S-81	1SBL123004R8101	0.280

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 (1) Other control voltages see voltage code table.



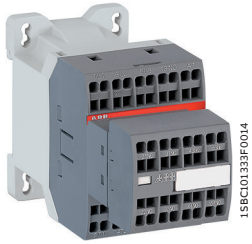
ASL09..S, ASL12..S, ASL16..S

Main dimensions mm, inches

# AS09..S ... AS16..S 2-stack 3-pole contactors

4 to 7.5 kW

AC operated - with spring terminals



AS09-30-32S

AS09..S ... AS16..S contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC.

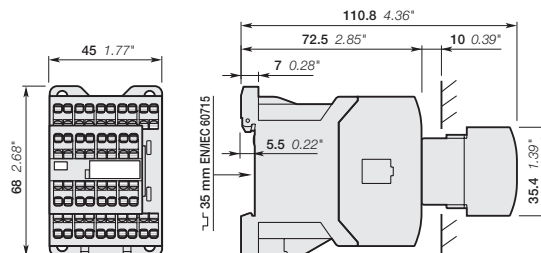
These contactors are of the block type design with:

- spring terminals
- 1st stack with 3 main poles and 1 N.O. built-in auxiliary contact
- 2nd stack with permanently fixed 2 N.O. + 2 N.C. auxiliary contact block
- the auxiliary contact elements are mechanically linked (side-marked symbol) and the N.C. auxiliary contacts are mirror contacts
- control circuit: AC operated
- a comprehensive range of accessories.

IEC		UL/CSA		Rated control circuit voltage U <sub>c</sub> (1)		Auxiliary contacts fitted	Type	Order code	Weight
Rated operational power	current □ ≤ 40 °C	3-phase motor rating 480 V	General use rating 600 V AC	V 50 Hz	V 60 Hz				
400 V									Pkg (1 pce) kg
AC-3	AC-1								
kW	A	hp	A						
4	20	5	12	24	24	3 2	AS09-30-32S-20	1SBL101004R2032	0.260
				220	220	3 2	AS09-30-32S-25	1SBL101004R2532	0.260
				230	230	3 2	AS09-30-32S-26	1SBL101004R2632	0.260
5.5	22	7.5	12	24	24	3 2	AS12-30-32S-20	1SBL111004R2032	0.260
				220	220	3 2	AS12-30-32S-25	1SBL111004R2532	0.260
				230	230	3 2	AS12-30-32S-26	1SBL111004R2632	0.260
7.5	22	10	15.2	24	24	3 2	AS16-30-32S-20	1SBL121004R2032	0.260
				220	220	3 2	AS16-30-32S-25	1SBL121004R2532	0.260
				230	230	3 2	AS16-30-32S-26	1SBL121004R2632	0.260

Note: for multiple packaging, please contact your ABB local sales organization.

(1) Other control voltages see voltage code table.



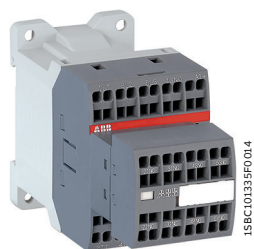
AS09..S, AS12..S, AS16..S

Main dimensions mm, inches

# ASL09..S ... ASL16..S 2-stack 3-pole contactors

4 to 7.5 kW

DC operated - with spring terminals



ASL09-30-32S

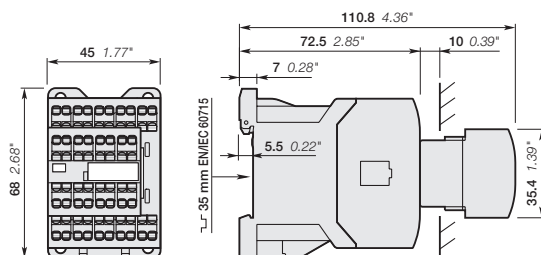
ASL09..S ... ASL16..S contactors are mainly used for controlling 3-phase motors and power circuits up to 690 V AC and 220 V DC.

These contactors are of the block type design with:

- spring terminals
- 1st stack with 3 main poles and 1 N.O. built-in auxiliary contact
- 2nd stack with permanently fixed 2 N.O. + 2 N.C. auxiliary contact block
- the auxiliary contact elements are mechanically linked (side-marked symbol) and the N.C. auxiliary contacts are mirror contacts
- control circuit: low 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)
- a comprehensive range of accessories.

IEC		UL/CSA		Rated control circuit voltage U <sub>c</sub> (1)	Auxiliary contacts fitted	Type	Order code	Weight
Rated operational power	current $\square \leq 40^\circ\text{C}$	3-phase motor rating 480 V	General use rating 600 V AC					
400 V	AC-1	hp	A	V DC				kg
kW	A							
4	20	5	12	24	3 2	ASL09-30-32S-81	1SBL103004R8132	0.320
5.5	22	7.5	12	24	3 2	ASL12-30-32S-81	1SBL113004R8132	0.320
7.5	22	10	15.2	24	3 2	ASL16-30-32S-81	1SBL123004R8132	0.320

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



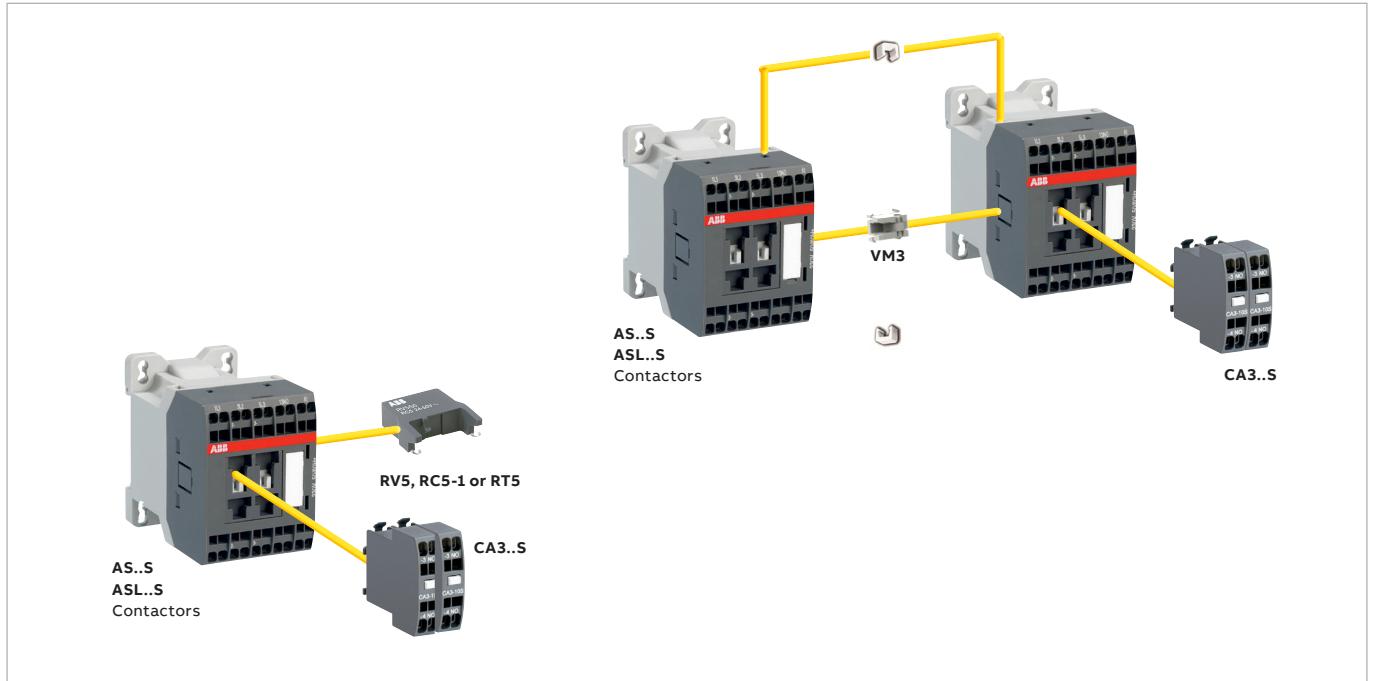
ASL09..S, ASL12..S, ASL16..S

Main dimensions mm, inches



# AS09..S ... AS16..S and ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

## Main accessories

### Contactor and main accessories (other accessories available)



### Main accessory fitting details

Contactor types	Main poles 	Built-in auxiliary contacts 	Front-mounted accessories		Side-mounted accessories	
			Auxiliary contact blocks 1-pole CA3..S	Mechanical interlock unit (between 2 contactors) VM3	Surge suppressors	
AS09..S ... AS16..S	3 0	1 0	2 max.	+ 1	+ RV5	or RC5-1
AS09..S ... AS16..S	3 0	0 1	-	1	+ RV5	or RC5-1
ASL09..S ... ASL16..S	3 0	1 0	2 max.	+ 1	+ RV5	or RT5
ASL09..S ... ASL16..S	3 0	0 1	-	1	+ RV5	or RT5
ASL09..S ... ASL16..S	3 0	3 2	-	1	+ RV5	or RT5

# AS09..S ... AS16..S and ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

## Main accessories



CA3-10S

1SBC101037F0014

### Front-mounted instantaneous auxiliary contact blocks

For contactors	Auxiliary contacts	Type	Order code	Pkg qty	Weight (1 pce)
					kg
AS09..S ... AS16..S	1 0	CA3-10S	1SBN011019T1010	10	0.011
ASL09..S ... ASL16..S	0 1	CA3-01S	1SBN011019T1001	10	0.011



VM3

1SBC101069F0014

### Mechanical interlock unit

For contactors	Type	Order code	Pkg qty	Weight (1 pce)
AS09..S ... AS16..S, ASL09..S ... ASL16..S	VM3	1SBN031005T1000	10	0.002

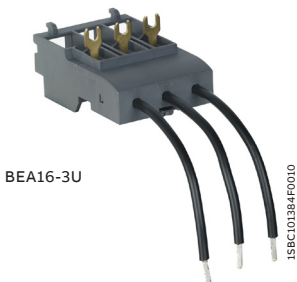


RV5

1SBC574001F0301

### Surge suppressors

For contactors	Rated control circuit voltage - Uc		Type	Order code	Pkg qty	Weight (1 pce)	
	V	AC					DC
AS09..S ... AS16..S, ASL09..S ... ASL16..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
AS09..S ... AS16..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
ASL09..S ... ASL16..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



BEA16-3U

1SBC101384F0010

### Connecting links with manual motor starters

For contactors	Manual motor starter	Type	Order code	Pkg qty	Weight (1 pce)
AS09..S ... AS16..S ASL09..S ... ASL16..S	MS116-0.16 ... MS116-16 MS132-0.16 ... MS132-16	BEA16-3U	1SBN081020R1000	1	0.045

# AS09..S ... AS16..S and ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

## Technical data

### Main pole - Utilization characteristics according to IEC

Contactor types	AC operated	AS09..S	AS12..S	AS16..S
	DC operated	ASL09..S	ASL12..S	ASL16..S
Standards	IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1			
Rated operational voltage U <sub>e</sub> max.	690 V			
Rated frequency (without derating)	50 / 60 Hz			
Conventional free-air thermal current I <sub>th</sub> acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$		20 A	22 A	22 A
With conductor cross-sectional area		2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>
AC-1 Utilization category				
For air temperature close to contactor				
I <sub>e</sub> / Rated operational current AC-1	$\theta \leq 40^\circ\text{C}$	20 A	22 A	22 A
U <sub>e</sub> max. $\leq 690\text{ V}, 50/60\text{ Hz}$	$\theta \leq 60^\circ\text{C}$	15 A	17 A	17 A
	$\theta \leq 70^\circ\text{C}$	12 A	14 A	14 A
With conductor cross-sectional area		2.5 mm <sup>2</sup>		
AC-3 Utilization category				
For air temperature close to contactor $\theta \leq 60^\circ\text{C}$				
I <sub>e</sub> / Max. rated operational current AC-3 (1)				
	220-230-240 V	9 A	12 A	15.7 A
	400 V	9 A	12 A	15.5 A
	415 V	9 A	12 A	15.5 A
	440 V	8 A	11 A	13.6 A
	500 V	8 A	11 A	12.5 A
	690 V	5 A	7 A	9 A
Rated operational power AC-3 (1)				
	220-230-240 V	2.2 kW	3 kW	4 kW
	400 V	4 kW	5.5 kW	7.5 kW
	415 V	4 kW	5.5 kW	7.5 kW
	440 V	4 kW	5.5 kW	7.5 kW
	500 V	4 kW	5.5 kW	7.5 kW
	690 V	4 kW	5.5 kW	7.5 kW
Rated making capacity AC-3	10 x I <sub>e</sub> AC-3 acc. to IEC 60947-4-1			
Rated breaking capacity AC-3	8 x I <sub>e</sub> AC-3 acc. to IEC 60947-4-1			
AC-8a Utilization category				
(without thermal overload relay - U <sub>e</sub> 400 V 50/60 Hz - $\theta \leq 40^\circ\text{C}$ )				
I <sub>e</sub> / Rated operational current AC-8a		12 A	16 A	22 A
Rated operational power AC-8a		5.5 kW	7.5 kW	11 kW
Short-circuit protection device for contactors without thermal overload relay - Motor protection excluded (2)				
U <sub>e</sub> $\leq 500\text{ V AC}$ - gG type fuse		25 A		
Rated short-time withstand current I <sub>cw</sub> at 40 °C ambient temperature, in free air from a cold state	1 s	230 A	250 A	250 A
	10 s	100 A	124 A	124 A
	30 s	65 A	75 A	75 A
	1 min	50 A	55 A	55 A
	15 min	20 A	22 A	22 A
Maximum breaking capacity cos $\phi = 0.45$	at 440 V	155 A		
	at 690 V	90 A		
Power dissipation per pole	I <sub>e</sub> / AC-1	0.9 W	1.1 W	1.1 W
	I <sub>e</sub> / AC-3	0.18 W	0.33 W	0.55 W
Max. electrical switching frequency	AC-1	600 cycles/h		
	AC-3	1200 cycles/h		
	AC-4	300 cycles/h		

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m. 50 Hz or 1800 r.p.m. 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

(2) For the protection of motor starters against short circuits, see "Coordination with short-circuit protection devices".

# AS09..S ... AS16..S and ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

## Technical data

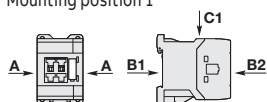
### Main pole - Utilization characteristics according to UL / NEMA / CSA

Contactor types	AC operated	AS09..S	AS12..S	AS16..S
	DC operated	ASL09..S	ASL12..S	ASL16..S
Standards	UL 508, CSA C22.2 N°14			
Max. operational voltage	690 V			
NEMA size	00		00	00
NEMA continuous amp rating	Thermal current	9 A		
NEMA maximum horse power ratings 1-phase, 60 Hz	115 V AC	1/3 hp	1/3 hp	1/3 hp
	230 V AC	1 hp	1 hp	1 hp
NEMA maximum horse power ratings 3-phase, 60 Hz	200 V AC	1-1/2 hp	1-1/2 hp	1-1/2 hp
	230 V AC	1-1/2 hp	1-1/2 hp	1-1/2 hp
	460 V AC	2 hp	2 hp	2 hp
	575 V AC	2 hp	2 hp	2 hp
UL / CSA General use rating 600 V AC		12 A	12 A	15.2 A
	With conductor cross-sectional area	AWG 14	AWG 14	AWG 12
UL / CSA maximum 1-phase motor rating Full load current	120 V AC	7.2 A	9.8 A	13.8 A
	240 V AC	8 A	10 A	12 A
Horse power rating	120 V AC	1/3 hp	1/2 hp	3/4 hp
	240 V AC	1 hp	1-1/2 hp	2 hp
UL / CSA maximum 3-phase motor rating Full load current (1)	200-208 V AC	7.8 A	7.8 A	11 A
	220-240 V AC	6.8 A	9.6 A	15.2 A
	440-480 V AC	7.6 A	11 A	14 A
	550-600 V AC	9 A	11 A	11 A
	Horse power rating (1)	200-208 V AC	2 hp	2 hp
	220-240 V AC	2 hp	3 hp	5 hp
	440-480 V AC	5 hp	7-1/2 hp	10 hp
	550-600 V AC	7-1/2 hp	10 hp	10 hp
Short-circuit protection device for contactors without thermal overload relay - Motor protection excluded	Fuse rating	40 A	50 A	60 A
	Fuse type, 600 V	J		
Max. electrical switching frequency	For general use	600 cycles/h		
	For motor use	1200 cycles/h		

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

### General technical data

Contactor types	AC operated	AS09..S	AS12..S	AS16..S
	DC operated	ASL09..S	ASL12..S	ASL16..S
Rated insulation voltage Ui acc. to IEC 60947-4-1	690 V			
	acc. to UL / CSA 600 V			
Rated impulse withstand voltage Uimp.	6 kV			
Pollution degree	3			
Ambient air temperature close to contactor	Operation	-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	10 millions operating cycles		
	Max. switching frequency	3600 cycles/h		
Shock withstand acc. to IEC 60068-2-27 and EN 60068-2-27	Shock direction	AS contactors - AC operated		ASL contactors - DC operated
Mounting position 1	A	20 g		20 g closed position / 10 g open position
	B1	10 g closed position / 5 g open position		15 g closed position / 5 g open position
	B2	15 g		10 g
	C1	20 g closed position / 9 g open position		15 g closed position / 8 g open position
	C2	20 g closed position / 14 g open position		14 g closed position / 8 g open position
	Vibration withstand acc. to IEC 60068-2-6	5...300 Hz / 3 g closed position / 2 g open position		



## AS09..S ... AS16..S and ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

### Technical data

#### Magnet system characteristics for AS09..S ... AS16..S contactors

Contactor types		AC operated	AS09..S	AS12..S	AS16..S
Coil operating limits acc. to IEC 60947-4-1		AC supply	0.85...1.1 x U <sub>c</sub> (at $\theta \leq 60^\circ\text{C}$ ); U <sub>c</sub> (at $\theta \leq 70^\circ\text{C}$ )		
AC control voltage	Rated control circuit voltage U <sub>c</sub>	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 <sub>c</sub>		
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 ASL09..S ... ASL16..S contactors

Contactor types		DC operated	ASL09..S	ASL12..S	ASL16..S
Coil operating limits acc. to IEC 60947-4-1		DC supply	0.85...1.1 x U <sub>c</sub> (at $\theta \leq 60^\circ\text{C}$ ); U <sub>c</sub> (at $\theta \leq 70^\circ\text{C}$ )		
DC control voltage	Rated control circuit voltage U <sub>c</sub>		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 <sub>c</sub>		
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 types		AC operated	AS09..S	AS12..S	AS16..S
		DC operated	ASL09..S	ASL12..S	ASL16..S
Mounting positions					
Mounting distances		The contactors 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			

# AS09..S ... AS16..S and ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

## Technical data

### Connecting characteristics

Contactor types	AC operated	<b>AS09..S</b>	<b>AS12..S</b>	<b>AS16..S</b>
	DC operated	<b>ASL09..S</b>	<b>ASL12..S</b>	<b>ASL16..S</b>
Main terminals	 <p>Spring terminals</p>			
Connection capacity (min. ... max.)				
Main conductors (poles)				
	Rigid Solid/Stranded	1 x	0.75...2.5 mm <sup>2</sup>	
		2 x	0.75...2.5 mm <sup>2</sup>	
	Flexible with non insulated ferrule	1 x	0.75...2.5 mm <sup>2</sup>	
		2 x	0.75...2.5 mm <sup>2</sup>	
	Flexible with insulated ferrule	1 x	0.75...1.5 mm <sup>2</sup>	
		2 x	0.75...1.5 mm <sup>2</sup>	
Connection capacity acc. to UL / CSA		1 or 2 x	AWG 18...12	
Stripping length		10 mm		
Auxiliary conductors (built-in auxiliary terminals + coil terminals)				
	Rigid Solid/Stranded	1 x	0.75...2.5 mm <sup>2</sup>	
		2 x	0.75...2.5 mm <sup>2</sup>	
	Flexible with non insulated ferrule	1 x	0.75...2.5 mm <sup>2</sup>	
		2 x	0.75...2.5 mm <sup>2</sup>	
	Flexible with insulated ferrule	1 x	0.75...1.5 mm <sup>2</sup>	
		2 x	0.75...1.5 mm <sup>2</sup>	
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		

## AS09..S ... AS16..S and ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

### Technical data

#### Built-in auxiliary contacts according to IEC

Contactor types	AC operated	AS09..S	AS12..S	AS16..S
	DC operated	ASL09..S	ASL12..S	ASL16..S
Rated operational voltage U <sub>e</sub> max.		690 V		
Rated frequency (without derating)		50 / 60 Hz		
Conventional free air thermal current I <sub>th</sub> - θ ≤ 40 °C		10 A		
I <sub>e</sub> / 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 I <sub>e</sub> AC-15 acc. to IEC 60947-5-1		
Breaking capacity AC-15		10 x I <sub>e</sub> AC-15 acc. to IEC 60947-5-1		
I <sub>e</sub> / 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 gG type fuse		10 A		
Rated short-time withstand current I <sub>cw</sub>	for 1.0 s	100 A		
	for 0.1 s	140 A		
Minimum switching capacity with failure rate acc. to IEC 60947-5-4		12 V / 3 m		
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 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 (CA3 aux. contact blocks) are mechanically linked contacts.		
Mirror contacts acc. to annex F of IEC 60947-4-1		Built-in N.C. auxiliary contacts or additional N.C. auxiliary contacts (CA3 aux. contact blocks) are mirror contacts.		

#### Built-in auxiliary contacts according to UL / CSA

Contactor types	AC operated	AS09..S	AS12..S	AS16..S
	DC operated	ASL09..S	ASL12..S	ASL16..S
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		

—  
**Notes**

A large rectangular area filled with a grid of small, light gray dotted lines, intended for handwritten notes.

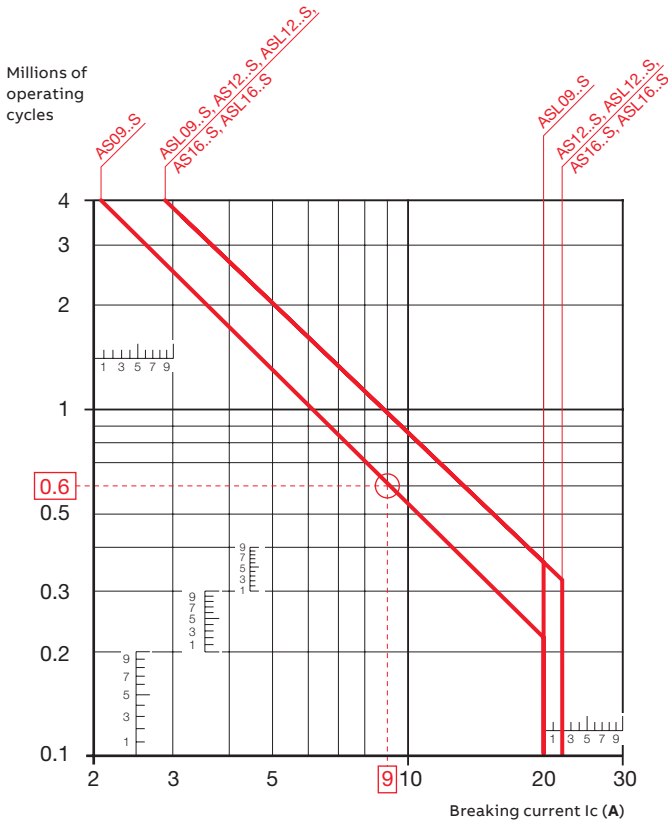
# AS09..S ... AS16..S and ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

## Electrical durability

**Electrical durability for AC-1 utilization category -  $U_e \leq 690\text{ V}$**

**Note: AC-1 maximum current is selected according to ambient temperature. Please see technical data.**

Switching non-inductive or slightly inductive loads. The breaking current  $I_c$  for AC-1 is equal to the rated operational current of the load. Maximum electrical switching frequency: 600 cycles / hour.



Example:

Breaking current = 9 A.

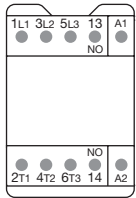
On the opposite curve at intersection "O" 9 A the corresponding value for the electrical durability is approximately 0.6 millions operating cycles.

# AS09..S ... AS16..S 3-pole contactors - with spring terminals

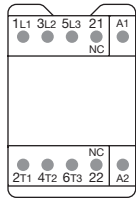
## Terminal marking and positioning

### AS..S contactors - AC operated

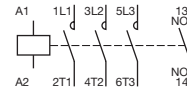
Standard devices without addition of auxiliary contacts



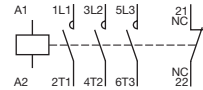
AS09 ... AS16-30-10S



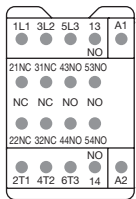
AS09 ... AS16-30-01S



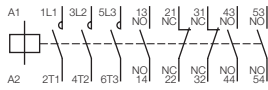
AS09 ... AS16-30-10S



AS09 ... AS16-30-01S

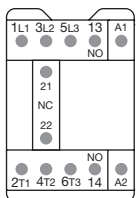


AS09 ... AS16-30-32S

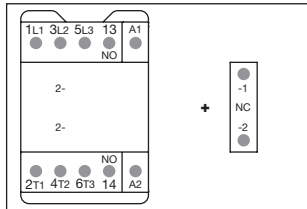


AS09 ... AS16-30-32S

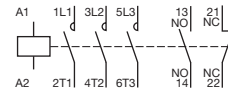
### Other possible contact combinations with auxiliary contact blocks added by the user



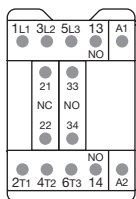
Combination 11



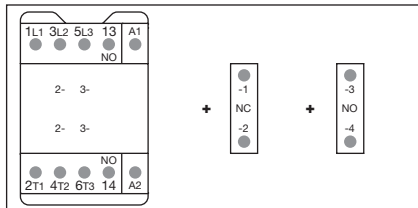
AS09 ... AS16-30-10S + CA3-01S



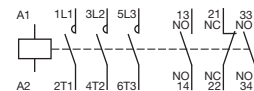
Combination 11



Combination 21

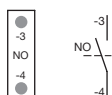


AS09 ... AS16-30-10S + CA3-01S + CA3-10S



Combination 21

### CA3..S 1-pole auxiliary contact blocks



CA3-10S



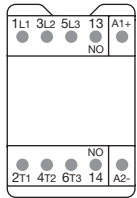
CA3-01S

# ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

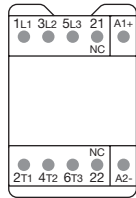
## Terminal marking and positioning

### ASL..S contactors - DC operated (the polarity A1+, A2- must be respected)

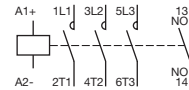
Standard devices without addition of auxiliary contacts



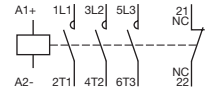
ASL09 ... ASL16-30-10S



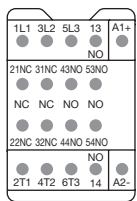
ASL09 ... ASL16-30-01S



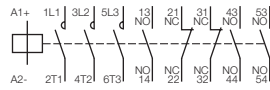
ASL09 ... ASL16-30-10S



ASL09 ... ASL16-30-01S

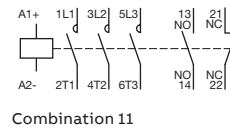
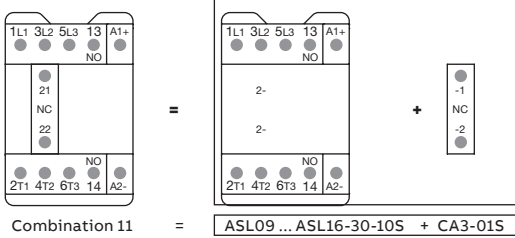


ASL09 ... ASL16-30-32

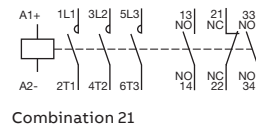
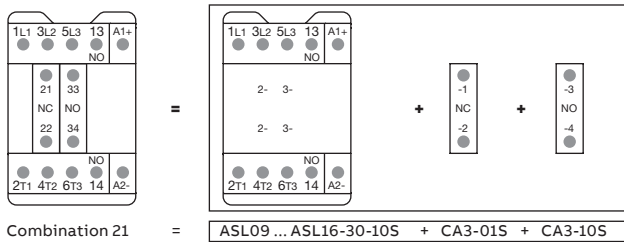


ASL09 ... ASL16-30-32S

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

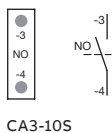


Combination 11

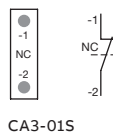


Combination 21

### CA3..S 1-pole auxiliary contact blocks



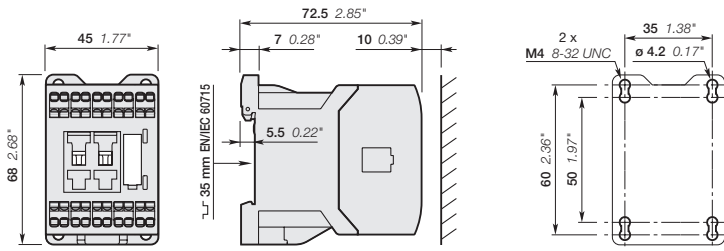
CA3-10S



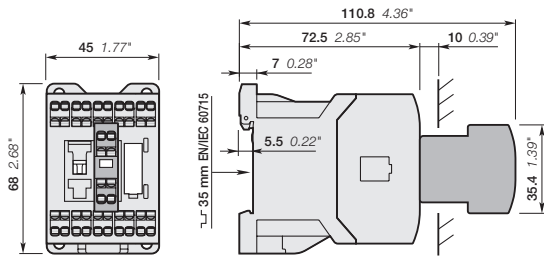
CA3-01S

# AS09..S ... AS16..S 3-pole contactors - with spring terminals

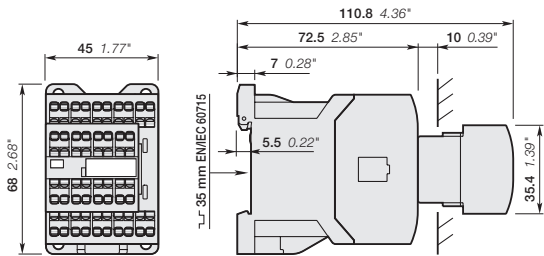
## Dimensions



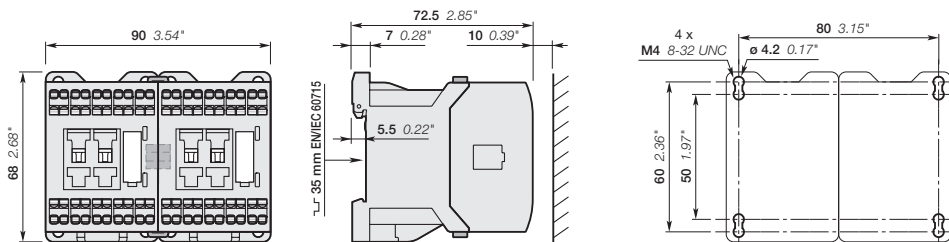
AS09..S, AS12..S, AS16..S



AS09..S, AS12..S, AS16..S  
+ CA3..S front-mounted 1-pole auxiliary contact block



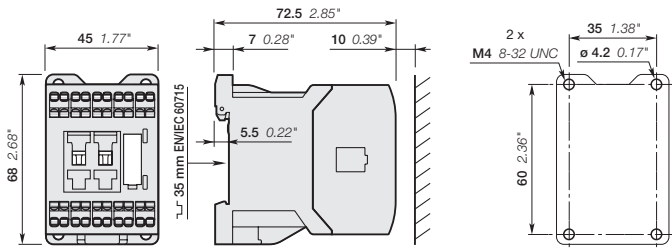
AS09...16-30-32S



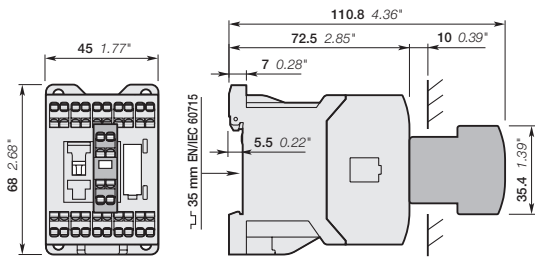
AS09..S, AS12..S, AS16..S  
+ VM3 mechanical interlock unit including two BB3 fixing clips

# ASL09..S ... ASL16..S 3-pole contactors - with spring terminals

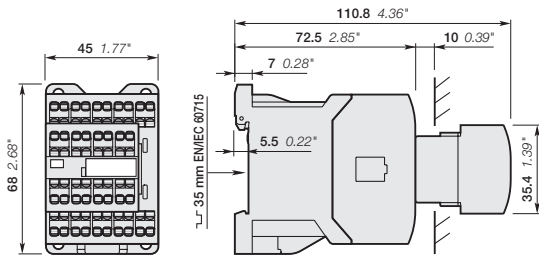
## Dimensions



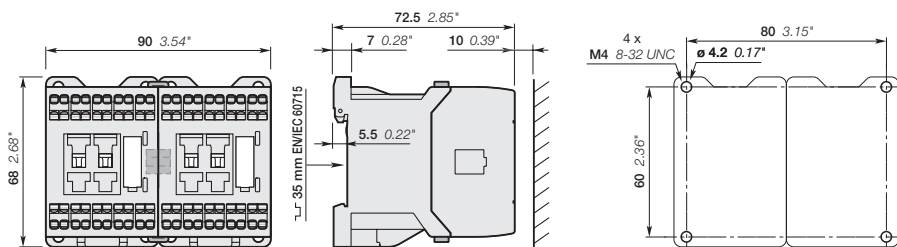
ASL09..S, ASL12..S, ASL16..S



ASL09..S, ASL12..S, ASL16..S  
+ CA3..S front-mounted 1-pole auxiliary contact block



ASL09...16-30-32S



ASL09..S, ASL12..S, ASL16..S  
+ VM3 mechanical interlock unit including two BB3 fixing clips

# NS..S contactor relays - with spring terminals

AC operated



NS22ES

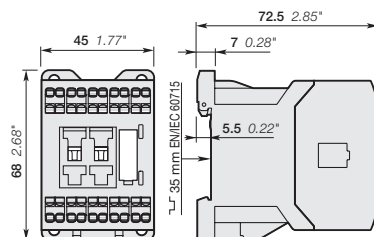
NS..S contactor relays are used for switching auxiliary and control circuits.

These contactor relays are designed with:

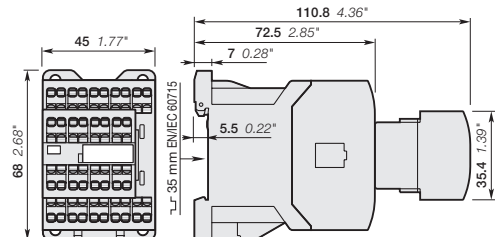
- spring terminals
- 4 poles or 8 poles. Contactor relays have mechanically linked auxiliary contact elements (side-marked symbol)
- control circuit: AC operated
- add-on auxiliary contact blocks for front mounting and a comprehensive range of accessories.

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			
		24	24	NS22ES-20	1SBH101004R2022	0.220
		220	220	NS22ES-25 Relay	1SBH101004R2522	
		230	230	NS22ES-26	1SBH101004R2622	0.220
		24	24	NS31ES-20	1SBH101004R2031	0.220
		220	220	NS31ES-25 Relay	1SBH101004R2531	
		230	230	NS31ES-26	1SBH101004R2631	0.220
		24	24	NS40ES-20	1SBH101004R2040	0.220
		220	220	NS40ES-25 Relay	1SBH101004R2540	
		230	230	NS40ES-26	1SBH101004R2640	0.220
		24	24	NS44ES-20	1SBH101004R2044	0.260
		220	220	NS44ES-25 Relay	1SBH101004R2544	
		230	230	NS44ES-26	1SBH101004R2644	0.260
		24	24	NS53ES-20	1SBH101004R2053	0.260
		220	220	NS53ES-25 Relay	1SBH101004R2553	
		230	230	NS53ES-26	1SBH101004R2653	0.260
		24	24	NS62ES-20	1SBH101004R2062	0.260
		220	220	NS62ES-25 Relay	1SBH101004R2562	
		230	230	NS62ES-26	1SBH101004R2662	0.260
		24	24	NS71ES-20	1SBH101004R2071	0.260
		220	220	NS71ES-25 Relay	1SBH101004R2571	
		230	230	NS71ES-26	1SBH101004R2671	0.260
		24	24	NS80ES-20	1SBH101004R2080	0.260
		220	220	NS80ES-25 Relay	1SBH101004R2580	
		230	230	NS80ES-26	1SBH101004R2680	0.260

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



NS22ES, NS31ES, NS40ES



NS44ES, NS53ES, NS62ES, NS71ES, NS80ES

Main dimensions mm, inches

# NSL..S contactor relays - with spring terminals

DC operated



NSL22ES

NSL..S contactor relays are used for switching auxiliary and control circuits.

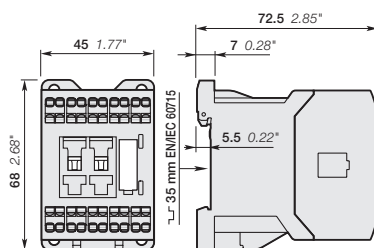
These contactor relays are designed with:

- 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.

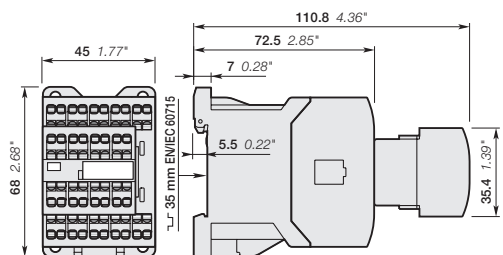
Number of contacts		Rated control circuit voltage Uc (1)  V DC	Type	Order code	Weight  Pkg (1 pce) kg
1st stack	2nd stack				
		24	NSL22ES-81	1SBH103004R8122	0.280
		24	NSL31ES-81	1SBH103004R8131	0.280
		24	NSL40ES-81	1SBH103004R8140	0.280
		24	NSL44ES-81	1SBH103004R8144	0.320
		24	NSL53ES-81	1SBH103004R8153	0.320
		24	NSL62ES-81	1SBH103004R8162	0.320
		24	NSL71ES-81	1SBH103004R8171	0.320
		24	NSL80ES-81	1SBH103004R8180	0.320

Note: for multiple packaging, please contact your ABB local sales organization.

(1) Other control voltages see voltage code table.



NSL22ES, NSL31ES, NSL40ES



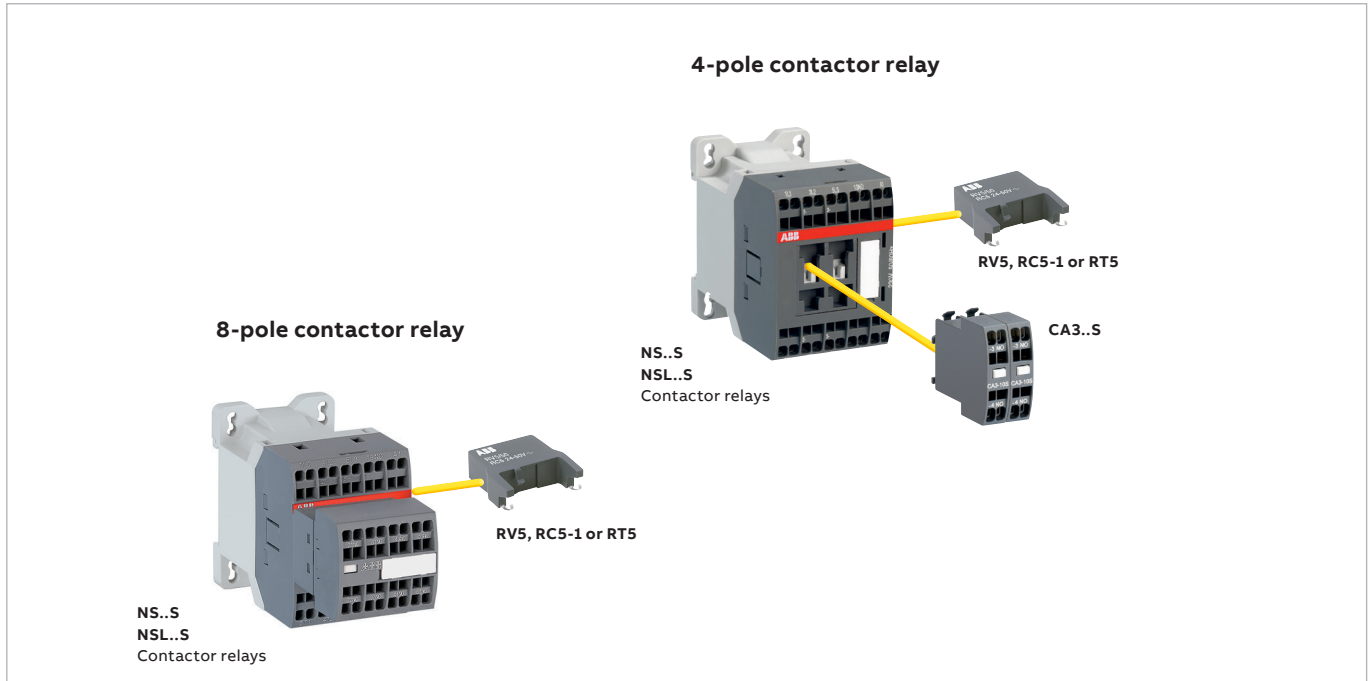
NSL44ES, NSL53ES, NSL62ES, NSL71ES, NSL80ES

Main dimensions mm, inches

# 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	-		RV5	or RC5-1
NS..S	5 3 E				
NS..S	6 2 E				
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	-		RV5	or RT5
NSL..S	5 3 E				
NSL..S	6 2 E				
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
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	<b>NS..S</b>
	DC operated	<b>NSL..S</b>
Standards	IEC 60947-5-1 and EN 60947-5-1	
Rated operational voltage $U_e$ max.	690 V	
Rated frequency (without derating)	50 / 60 Hz	
Conventional free-air thermal current $I_{th}$ $\theta \leq 40$ °C	10 A	
$I_e$ / 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 $I_e$ AC-15 acc. to IEC 60947-5-1
Breaking capacity AC-15	10 x $I_e$ AC-15 acc. to IEC 60947-5-1	
$I_e$ / 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 $U_e \leq 500$ V AC - gG type fuse	10 A
Rated short-time withstand current $I_{cw}$ at 40 °C ambient temperature, in free air from a cold state	for 1.0 s	100 A
	for 0.1 s	140 A
Minimum switching capacity with failure rate acc. to IEC 60947-5-4	12 V / 3 mA	
Non-overlapping time between N.O. and N.C. contacts	10-7	
Power dissipation per pole at 6 A	1.5 ms	
Max. electrical switching frequency	AC-15	0.1 W
	DC-13	1200 cycles/h
Mechanically linked contacts acc. to annex L of IEC 60947-5-1	900 cycles/h	
	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.	

#### Contact utilization characteristics according to UL / CSA

Contactor relay types	AC operated	<b>NS..S</b>
	DC operated	<b>NSL..S</b>
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

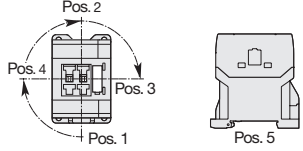
### Magnet system characteristics for NS..S contactor relays

Contactor relay types	AC operated	<b>NS..S</b>		
Coil operating limits acc. to IEC 60947-5-1	AC supply	0.85...1.1 x U <sub>c</sub> (at $\theta \leq 60^\circ\text{C}$ ); U <sub>c</sub> (at $\theta \leq 70^\circ\text{C}$ )		
AC control voltage	Rated control circuit voltage U <sub>c</sub>	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 <sub>c</sub>		
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	<b>NSL..S</b>
Coil operating limits acc. to IEC 60947-5-1	DC supply	0.85...1.1 x U <sub>c</sub> (at $\theta \leq 60^\circ\text{C}$ ); U <sub>c</sub> (at $\theta \leq 70^\circ\text{C}$ )
DC control voltage	Rated control circuit voltage U <sub>c</sub>	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 <sub>c</sub>
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.		

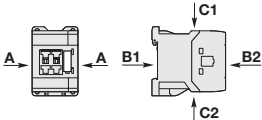
### Mounting characteristics and conditions for use

Contactor relay types	AC operated	<b>NS..S</b>
	DC operated	<b>NSL..S</b>
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	<b>NS..S</b>	
	DC operated	<b>NSL..S</b>	
Rated insulation voltage Ui acc. to IEC 60947-5-1 acc. to UL / CSA		690 V 600 V	
Rated impulse withstand voltage Uimp.		6 kV	
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		3600 cycles/h	
Shock withstand acc. to IEC 60068-2-27 and EN 60068-2-27		1/2 sinusoidal shock for 11 ms: no change in contact position, closed or open position	
Mounting position 1	Shock direction		
		NS contactor relays - AC operated	
		NSL contactor relays - DC operated	
	A	20 g	20 g closed position / 10 g open position
	B1	5 g	15 g closed position / 5 g open position
	B2	15 g	10 g
	C1	19 g closed position / 8 g open position	19 g closed position / 8 g open position
C2	16 g closed position / 13 g open position	14 g closed position / 8 g open position	
Vibration withstand acc. to IEC 60068-2-6		5...300 Hz 3 g closed position / 2 g open position	

### Connecting characteristics

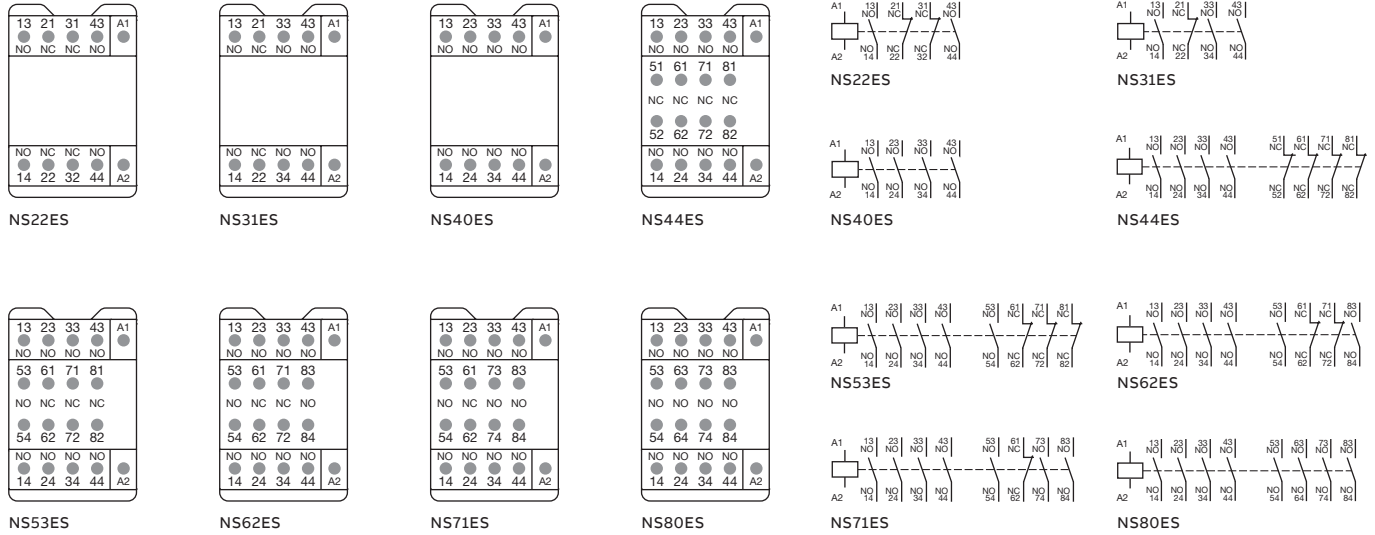
Contactor relay types	AC operated	<b>NS..S</b>
	DC operated	<b>NSL..S</b>
Main terminals		 <p>Spring terminals</p>
Connection capacity (min. ... max.)		
Pole and coil terminals		
Rigid Solid/Stranded	1 x	0.75...2.5 mm <sup>2</sup>
	2 x	0.75...2.5 mm <sup>2</sup>
Flexible with non insulated ferrule	1 x	0.75...2.5 mm <sup>2</sup>
	2 x	0.75...2.5 mm <sup>2</sup>
Flexible with insulated ferrule	1 x	0.75...1.5 mm <sup>2</sup>
	2 x	0.75...1.5 mm <sup>2</sup>
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

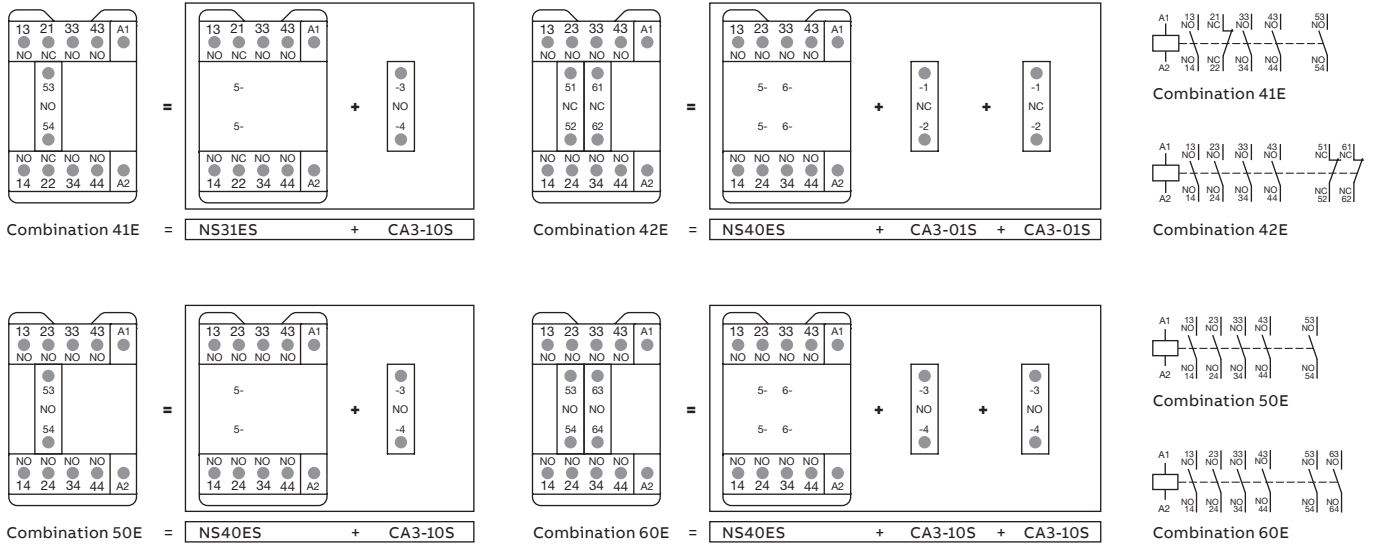
## Terminal marking and positioning

### NS..S contactor relays - AC operated

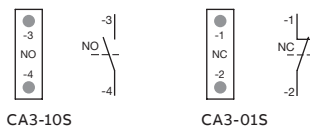
Standard devices without addition of auxiliary contact blocks



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



### CA3..S 1-pole auxiliary contact blocks

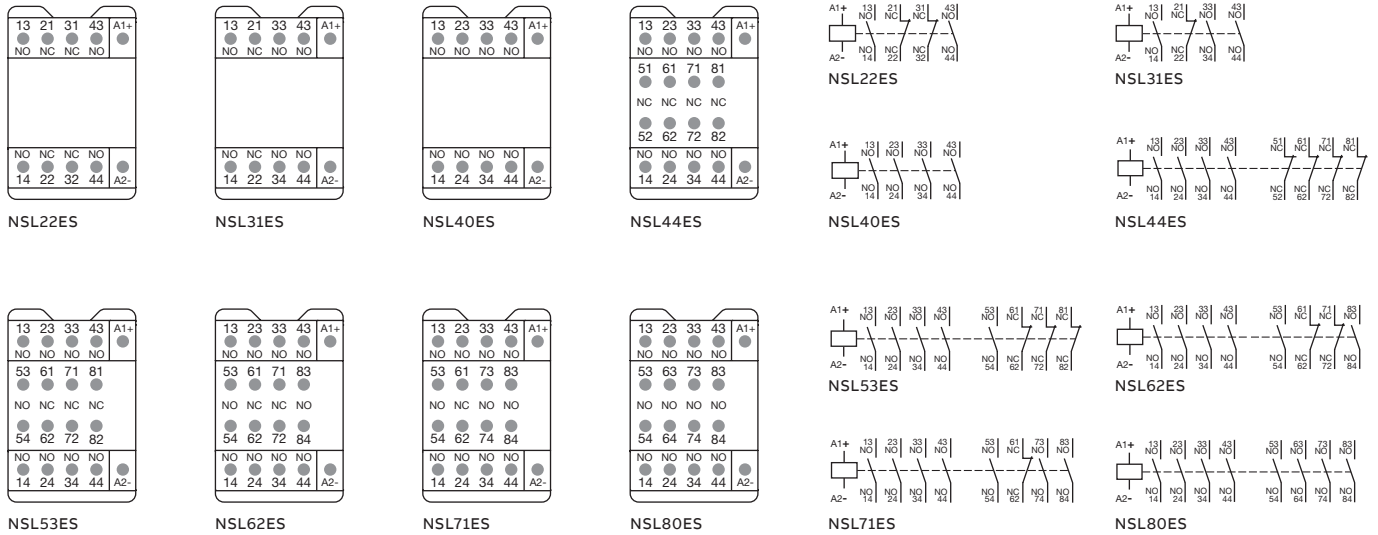


# NSL..S contactor relays - with spring terminals

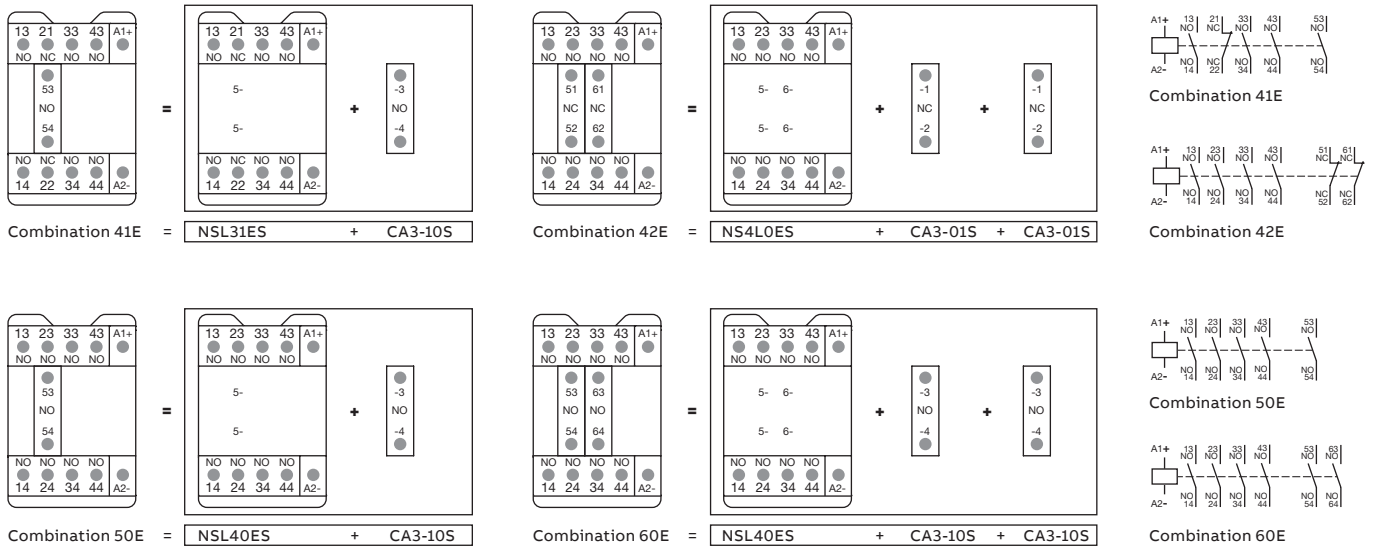
## Terminal marking and positioning

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

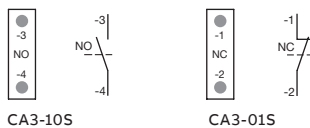
Standard devices without addition of auxiliary contact blocks



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



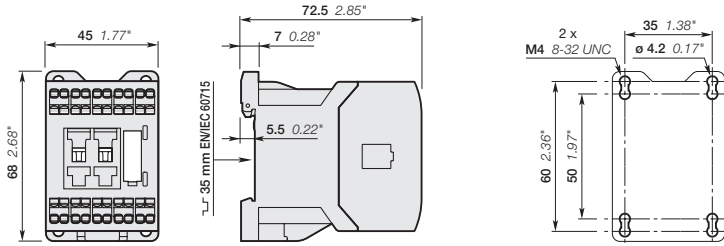
### CA3..S 1-pole auxiliary contact blocks



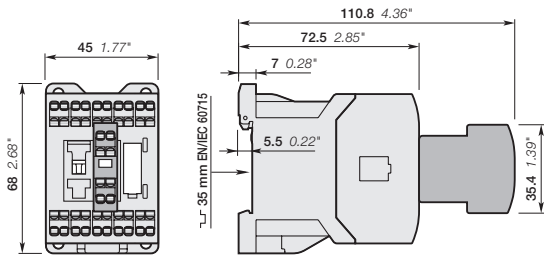
# NS..S contactor relays - with spring terminals

## Dimensions

### 4-pole contactor relays

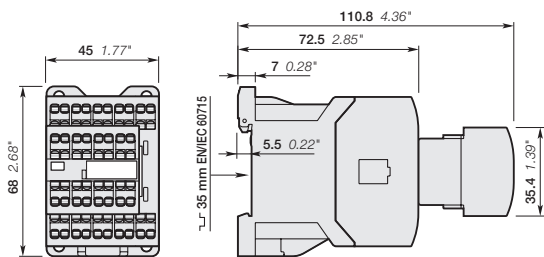


NS22ES, NS31ES, NS40ES



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

### 8-pole contactor relays

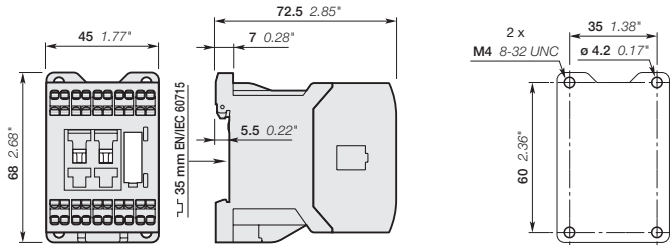


NS44ES, NS53ES, NS62ES, NS71ES, NS80ES

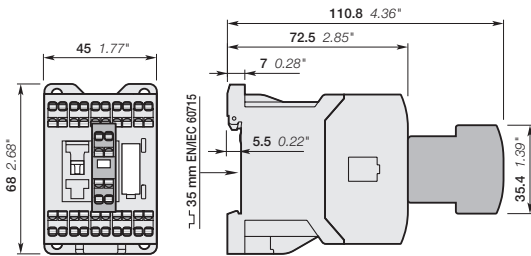
# NSL..S contactor relays - with spring terminals

## Dimensions

### 4-pole contactor relays

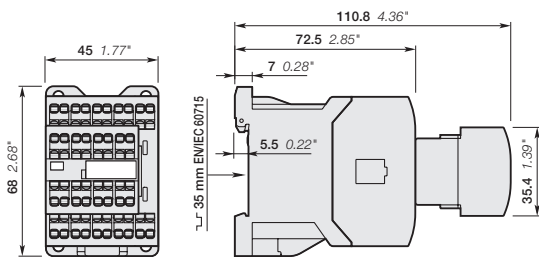


NSL22ES, NSL31ES, NSL40ES



NSL22ES, NSL31ES, NSL40ES  
+ CA3..S front-mounted 1-pole auxiliary contact block

### 8-pole contactor relays



NSL44ES, NSL53ES, NSL62ES, NSL71ES, NSL80ES

# Auxiliary contact blocks - with spring terminals

## Accessories




CA3-10S

The auxiliary contact blocks are used for the operation of auxiliary circuits and control circuits. CA3 1-pole auxiliary contact blocks, designed for standard industrial environments, are equipped with:

- N.O. or N.C. contacts.
- spring-type connecting terminals.

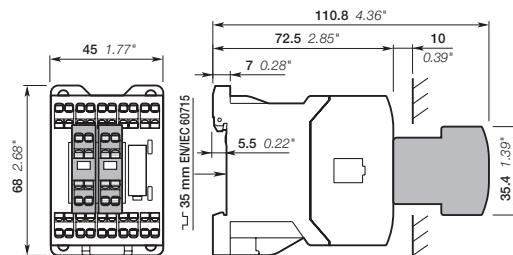
All 1-pole auxiliary contact blocks are protected against accidental direct contact and bear the corresponding function marking.

A maximum of two 1-pole auxiliary contact blocks can be front-mounted on 1-stack contactors or 1-stack contactor relays.

For contactors	For contactor relays	Contact blocks	Type	Order code	Pkg qty	Weight (1 pce)
						kg

### 1-pole auxiliary contact blocks with spring terminals

AS09..S ... AS16..S	NS..S, NSL..S	1 -	CA3-10S	1SBN011019T1010	10	0.011
ASL09..S ... ASL16..S		- 1	CA3-01S	1SBN011019T1001	10	0.011



Main dimensions mm, inches

## Auxiliary contact blocks - with spring terminals

### Front mounting

#### Technical data

Types	<b>1-pole CA3..S</b>
-------	----------------------







#### Contact utilization characteristics according to IEC

Standards	IEC 60947-5-1 and EN 60947-5-1	
Rated insulation voltage $U_i$ acc. to IEC 60947-5-1	690 V	
Pollution degree	3	
Rated impulse withstand voltage $U_{imp}$	6 kV	
Rated operational voltage $U_e$ max.	690 V	
Conventional thermal current $I_{th}$ - $\theta \leq 40^\circ\text{C}$	10 A	
$I_e$ / 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	10 x $I_e$ AC-15 acc. to IEC 60947-5-1	
Breaking capacity	10 x $I_e$ AC-15 acc. to IEC 60947-5-1	
$I_e$ / 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 gG type fuse	10 A	
Rated short-time withstand current $I_{cw}$ $\theta = 40^\circ\text{C}$	for 1.0 s	100 A
	for 0.1 s	140 A
Minimum switching capacity with failure rate acc. to IEC 60947-5-4	12 V / 3 mA	
Power dissipation per pole at 6 A	10-7	
Mechanical durability	0.1 W	
Number of operating cycles	10 millions operating cycles	
Max. switching frequency	3600 cycles/h	
Max. electrical switching frequency	AC-15	1200 cycles/h
	AC-13	900 cycles/h
Mechanically linked contact acc. to annex L of IEC 60947-5-1	Additional N.O. or N.C. auxiliary contacts (CA3..S aux. contact blocks) are mechanically linked contacts	
Mirror contacts acc. to annex F of IEC 60947-4-1	Additional N.C. auxiliary contacts (CA3..S aux. contact blocks) are mirror contacts	

#### Contact utilization characteristics according to UL / CSA

Standards	UL 508, CSA C22.2 N°14	
Max. operational voltage	690 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	

#### Connecting characteristics

Connection capacity (min. ... max.)		
	Rigid Solid/Stranded	1 x 0.75...2.5 mm <sup>2</sup>
		2 x 0.75...2.5 mm <sup>2</sup>
	Flexible with non insulated ferrule	1 x 0.75...2.5 mm <sup>2</sup>
		2 x 0.75...2.5 mm <sup>2</sup>
	Flexible with insulated ferrule	1 x 0.75...1.5 mm <sup>2</sup>
		2 x 0.75...1.5 mm <sup>2</sup>
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	
Screw terminals	Spring terminals	
All terminals	Spring terminals	
Screwdriver type	Flat Ø 3.5	

# Auxiliary contact blocks for AS09..S ... AS16..S, ASL09..S ... ASL16..S contactors and NS, NSL contactor relays - with spring terminals

## Electrical durability

### Electrical durability for AC-15 utilization category - $U_e \leq 400\text{ V}$

AC-15 utilization category according to IEC 60947-5-1 / EN 60947-5-1:

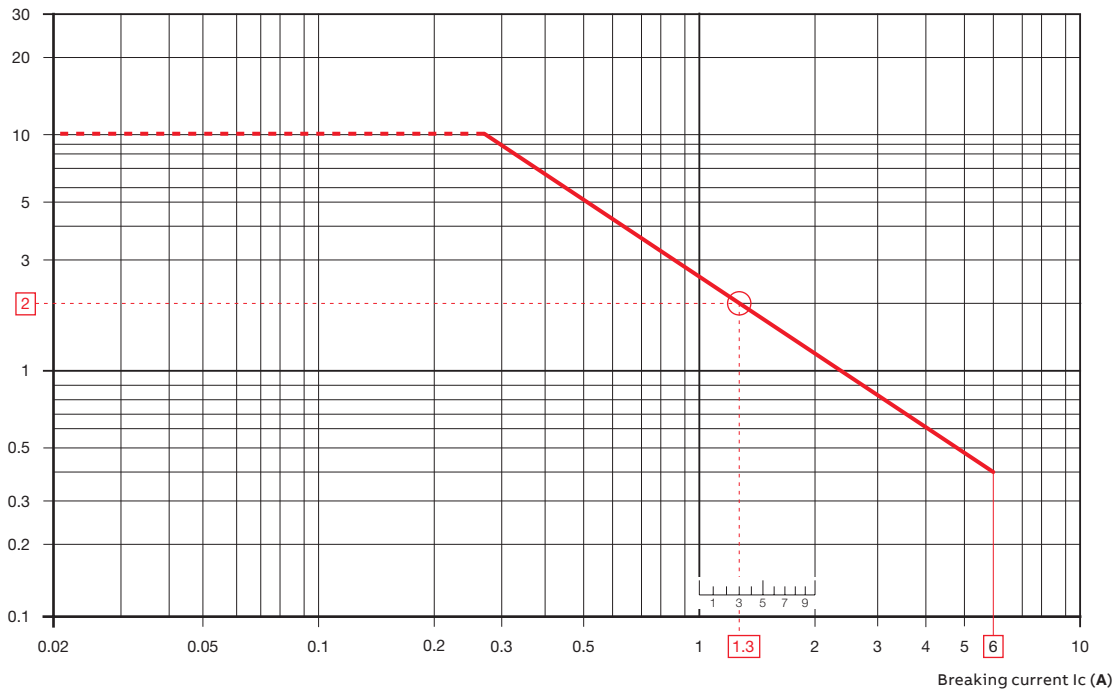
- making current:  $10 \times I_e$  with  $\cos \phi = 0.7$  and  $U_e$
- breaking current:  $I_e$  with  $\cos \phi = 0.4$  and  $U_e$ .

This curve represents the electrical durability of the built-in or add-on auxiliary contacts in relation to the breaking current.

The curve has been drawn for resistive and inductive loads up to 400 V:

- AS09..S ... AS16..S and ASL09..S ... ASL16..S contactor built-in auxiliary contacts
- 1-pole CA3..S
- NS..S and NSL..S contactor relays.

Millions of operating cycles



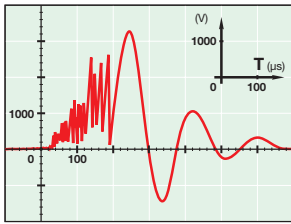
### Example:

Breaking current = 1.3 A

On the opposite curve at intersection "O" 1.3 A the corresponding value for the electrical durability is approximately 2 millions operating cycles.

# Surge suppressors for contactor coils

## Accessories



The operation of inductive circuits causes overvoltages, in particular on opening the contactor coil. The electromagnetic energy stored in the coil during contactor closing is restored on opening in the form of surges, the slope and amplitude of which may rise to several kilovolts. A number of drawbacks are observed ranging from interference on the electronic devices to the breakdown of insulators and even the destruction of certain sensitive components.

The graph opposite reproduces the oscillogram showing voltage discharges at the terminals of a 42 V / 50 Hz coil without peak clipping. The coil was switched by 8 series-connected poles of a contactor relay.

Following a burst of discharges with a very steep slope, a damped oscillation emerges with a peak value of 3500 V.

### Overvoltage Factor

The overvoltage factor  $k$  is defined as the ratio of the maximum overvoltage peak value  $\hat{U}_s$  to the peak value  $\hat{U}_c$  of the coil rated control voltage  $U_c$ :

$$k = \frac{\hat{U}_s \text{ max.}}{\hat{U}_c} \quad \text{in DC} \quad k = \frac{\hat{U}_s \text{ max.}}{U_c} \quad \text{in AC} \quad k = \frac{\hat{U}_s \text{ max.}}{U_c \sqrt{2}}$$

For example the following is obtained for the above graph:  $k = \frac{3500}{42 \sqrt{2}} \approx 60$

To reduce the harmful effects of these overvoltages, ABB has developed a range of surge suppressors designed to reduce the  $k$  factor defined above and to limit or even completely eliminate the high pre-damping voltage frequencies.

Each case is different, but the technical data tolerances and generous sizing of parts have enabled us to reduce the number of variants.

We have chosen the following solutions: transil diodes, varistors and RC blocks.

Note: A varistor is a resistor whose value decreases to a very large extent when a certain voltage is applied at its terminals.



RV5

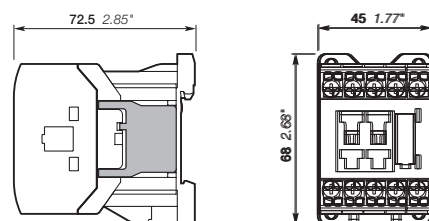


RC5-1



RT5

For contactors	For contactor relays	Rated control circuit voltage - $U_c$		Type	Order code	Pkg qty	Weight (1 pce) kg	
		V	DC					AC
AS...S, ASL...S	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
AS...S	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
ASL...S	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



Main dimensions mm, inches

**Easy connection to the coil terminals**  
(parallel mounting)  
Clip-on for both fixing and connection.

**No additional space**  
Clipped onto the right side part of the contactor base without changing contactor overall dimensions and keeping a free access to coil terminals.

## Surge suppressors for contactor coils

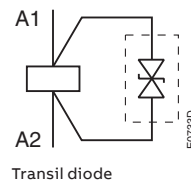
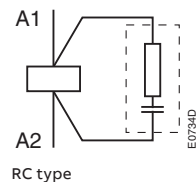
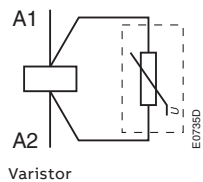
### Technical data

Varistor	RV5/50	RV5/133	RV5/250	RV5/440
Rated control circuit voltage $U_c$	24...50 V AC 24...50 V DC	50...133 V AC 50...133 V DC	110...250 V AC 110...250 V DC	250...440 V AC 250...440 V DC
Residual overvoltage (clipping voltage)	132 V AC 132 V DC	270 V AC 270 V DC	480 V AC 480 V DC	825 V AC 825 V DC
Opening time growth factor	none			
Operating temperature	-20...+70 °C			
Advantages	High energy absorption: good damping - Unpolarized system.			
Drawback	Clipping as from $U_{vdr}^*$ , thus voltage front up to this point.			
	* $U_{vdr}$ = Varistor operating voltage (voltage dependent resistor), tolerance $\pm 10\%$ .			

RC type	RC5-1/50	RC5-1/133	RC5-1/250	RC5-1/440
Rated control circuit voltage $U_c$	24...50 V AC	50...133 V AC	110...250 V AC	250...440 V AC
Residual overvoltage (clipping voltage)	2 to 3 x $U_c$ max.			
Opening time growth factor	2...3			
Operating temperature	-20...+70 °C			
Advantages	Very fast clipping - Attenuation of steep fronts and thus of high frequencies.			

Transil diode	RT5/32	RT5/65	RT5/90	RT5/150	RT5/264
Rated control circuit voltage $U_c$	12...32 V DC	25...65 V DC	50...90 V DC	77...150 V DC	150...264 V DC
Residual overvoltage (clipping voltage)	50 V DC	100 V DC	150 V DC	210 V DC	390 V DC
Opening time growth factor	1.1...1.2				
Operating temperature	-20...+70 °C				
Advantages	Good energy absorption - Unpolarized system - Simple, reliable system.				
Drawback	Delay on drop out which does not however reduce contactor breaking capacity.				

### Wiring diagrams



## Connecting links for starting solutions and other accessories



### Connecting links

The BEA16-3U insulated connecting links are used to connect an AS..S AC operated contactor or an ASL..S DC operated contactor with a manual motor starter.

The connecting link ensure the electrical and mechanical connection between the contactor and the manual motor starter.

For contactors	Manual motor starter	Type	Order code	Pkg qty	Weight (1 pce) kg
AS09..S ... AS16..S	MS116-0.16 ... MS116-16	BEA16-3U	1SBN081020R1000	1	0.045
ASL09..S ... ASL16..S	MS132-0.16 ... MS132-16				



### Test block

BDT4 test block is suitable for switching on contactor off-load.

Marking on the block indicates the contactor type to fit with.

For contactors	Type	Order code	Pkg qty	Weight (1 pce) kg
AS..S, ASL..S, NS..S, NSL..S	BDT4	1SBN110122T1000	10	0.007



### Function markers

Box of 16 blank cards (16 markers by card) printable on HTP500 thermal transfer printer and AMS 500 marking table to identify your contactors, overload relays or manual motor starters. Marker dimensions: 7 x 20 mm (.276" x .787").

For contactors	Type	Order code	Pkg qty	Weight (1 pce) kg
AS..S, ASL..S, NS..S, NSL..S	BA4	1SNA235156R2700	16	0.011
AMS 500 support plate for 8 BA4	SPRC 1	1SNA360010R1500	1	0.220
HTP500 support plate	HTP500-BA4	1SNA235712R2400	1	0.290

## Voltage code table

The below tables indicate the available coil voltages and corresponding digits for order codes. When placing an order, please give either type or order code. Select a standard contactor from ordering detail pages. Change the coil voltage code in the type or in the order code according to the table below. Example: for contactor AS09-30-10S and coil 42 V 50/60 Hz, type is AS09-30-10S-21 and order code is 1SBL101004R2110.

### 3-pole contactors - with spring terminals

**Type**

**AS16 - 30 - 10 S - 26**

**AS**  
**ASL**

**Contactor type**  
AC operated  
DC operated

**Order code**

**1SBL121004R 26 10**

Contactor with spring terminal

**AC coil code**

50 Hz	60 Hz
20	24 V 24 V
21	42 V 42 V
22	48 V 48 V
23	110 V 110 V
24	115 V 115 V
16	- 120 V
25	220 V 220 V
<b>26</b>	<b>230 V 230 V</b>
27	240 V 240 V
17	- 277 V
13	380 V -
28	400 V 400 V
29	415 V 415 V

**DC coil code**

80	12 V
81	24 V
83	48 V
84	60 V
86	110 V
87	125 V
88	220 V
89	240 V

### Contactor relays - with spring terminals

**Type**

**NS 40 E S - 26**

**NS**  
**NSL**

**Contactor type**  
AC operated  
DC operated

**Order code**

**1SBH101004R 26 40**

Contactor with spring terminal

**AC coil code**

50 Hz	60 Hz
20	24 V 24 V
21	42 V 42 V
22	48 V 48 V
23	110 V 110 V
24	115 V 115 V
16	- 120 V
25	220 V 220 V
26	230 V 230 V
27	240 V 240 V
17	- 277 V
13	380 V -
28	400 V 400 V
29	415 V 415 V

**DC coil code**

80	12 V
81	24 V
83	48 V
84	60 V
86	110 V
87	125 V
88	220 V
89	240 V

