

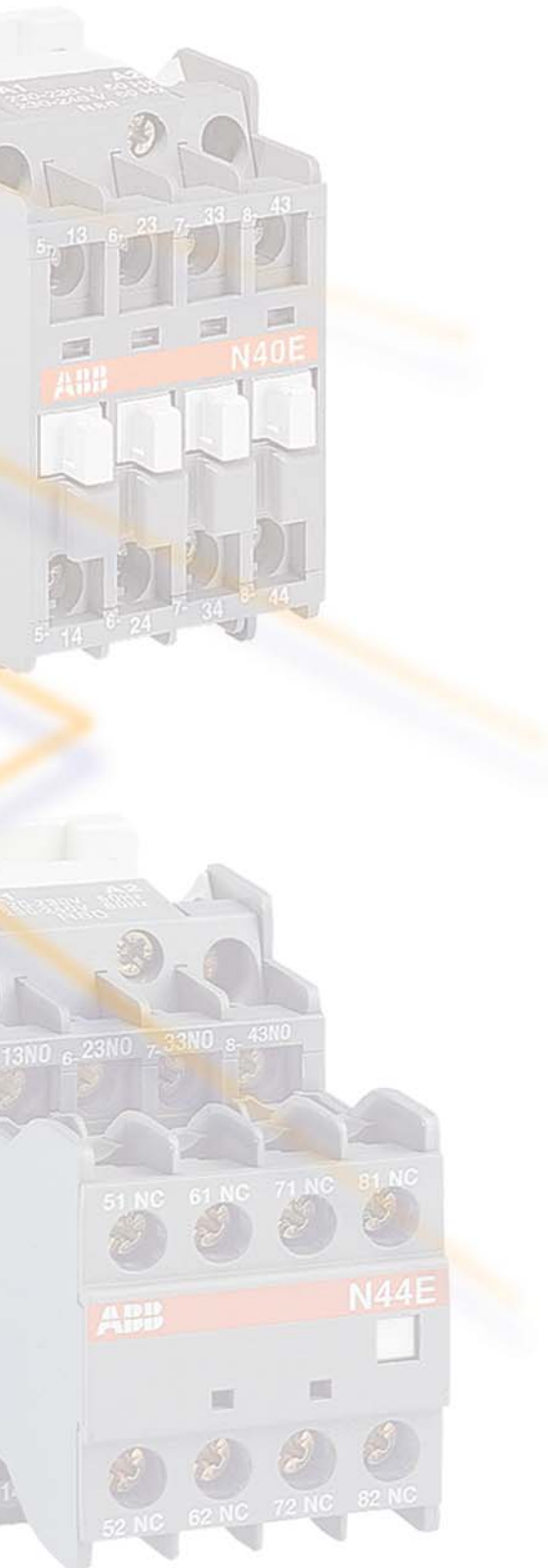




# 4-pole Contactor Relays

# 8-pole Contactor Relays

*Auxiliary Circuit Switching*



## Contents

### Panorama

N... Contactor Relays (a.c. Operated) .....	3/2
NL... Contactor Relays (d.c. Operated) .....	3/3

### N... Contactor Relays, a.c. Operated

Description .....	3/4
Ordering Details .....	3/5
Accessory fitting details .....	3/8

### NL..., NL Z... and TNL... Contactor Relays, d.c. Operated

Description .....	3/6
Ordering Details .....	3/7
Accessory fitting details .....	3/9

<b>Technical Data</b> .....	3/10
-----------------------------	------

### Additional Information

Auxiliary Contacts for Safety Circuits .....	3/15
Accessories and Coils .....	Section 4
General Technical Data and Approvals .....	Section 7
Terminal Marking and Positioning .....	Section 8
Dimensions .....	Section 9

# N... Contactor Relays



a.c. operated



## 4-pole, 1-stack

**N 22 E**

**N 31 E**

**N 40 E**

**Main contacts** N.O. + N.C



IEC Rated operational current		
AC-15	240 V	A
	400 V	A
	690 V	A
DC-13	24 V	A / W
	250 V	A / W

4  
3  
2  
6 / 144  
0.3 / 75

**UL/CSA** Pilot duty

A 600, Q 300

## Main accessories

**Auxiliary contacts** front mounting  
side mounting

**CA 5-10** 1 N.O. / **CA 5-01** 1 N.C. / **CA 5-..** 4-pole

**CAL 5-11** 1 N.O. + 1 N.C.

**Timer** front mounting

**TP 40 DA, TP 180 DA** Direct timing / **TP 40 IA, TP 180 IA** Inverse timing

**Surge suppressors**

**RV 5** (Varistor) / **RC 5-1** (RC type)

## 8-pole, 2-stack



**N 44 E**

**N 53 E**

**N 62 E**

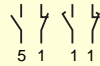
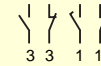
**N 71 E**

**N 80 E**

**N 33/11**

**N 51/11**

**Main contacts** N.O. + N.C



with overlapping of lagging / leading contacts

IEC Rated operational current		
AC-15	240 V	A
	400 V	A
	690 V	A
DC-13	24 V	A / W
	250 V	A / W

4  
3  
2  
6 / 144  
0.3 / 75

**UL/CSA** Pilot duty

A 600, Q 300

## Main accessories

**Auxiliary contacts** side mounting

**CAL 5-11** 1 N.O. + 1 N.C.

**Surge suppressors**

**RV 5** (Varistor) / **RC 5-1** (RC type)

# NL... Contactor Relays



d.c. operated



## 4-pole, 1-stack

	NL 22 E	NL 31 E	NL 40 E
<b>Main contacts</b> N.O. + N.C.			
<b>IEC Rated operational current</b>			
<b>AC-15</b> 240 V A		4	
400 V A		3	
690 V A		2	
<b>DC-13</b> 24 V A / W		6 / 144	
250 V A / W		0.3 / 75	
<b>UL/CSA</b> Pilot duty		A 600, Q 300	
<b>Main accessories</b>			
<b>Auxiliary contacts</b> front mounting	CA 5-10 1 N.O. / CA 5-01 1 N.C. / CA 5-.. 4-pole		
side mounting	CAL 5-11 1 N.O. + 1 N.C.		
<b>Surge suppressors</b>	RV 5 (Varistor) / RT 5 (Transil diode)		



## 8-pole, 2-stack

	NL 44 E	NL 53 E	NL 62 E	NL 71 E	NL 80 E	NL 33/11	NL 51/11
<b>Main contacts</b> N.O. + N.C.							
							with overlapping of lagging / leading contacts
<b>IEC Rated operational current</b>							
<b>AC-15</b> 240 V A					4		
400 V A					3		
690 V A					2		
<b>DC-13</b> 24 V A / W					6 / 144		
250 V A / W					0.3 / 75		
<b>UL/CSA</b> Pilot duty					A 600, Q 300		
<b>Main accessories</b>							
<b>Surge suppressors</b>	RV 5 (Varistor) / RT 5 (Transil diode)						

# N... Contactor Relays

## a.c. Operated



### Application

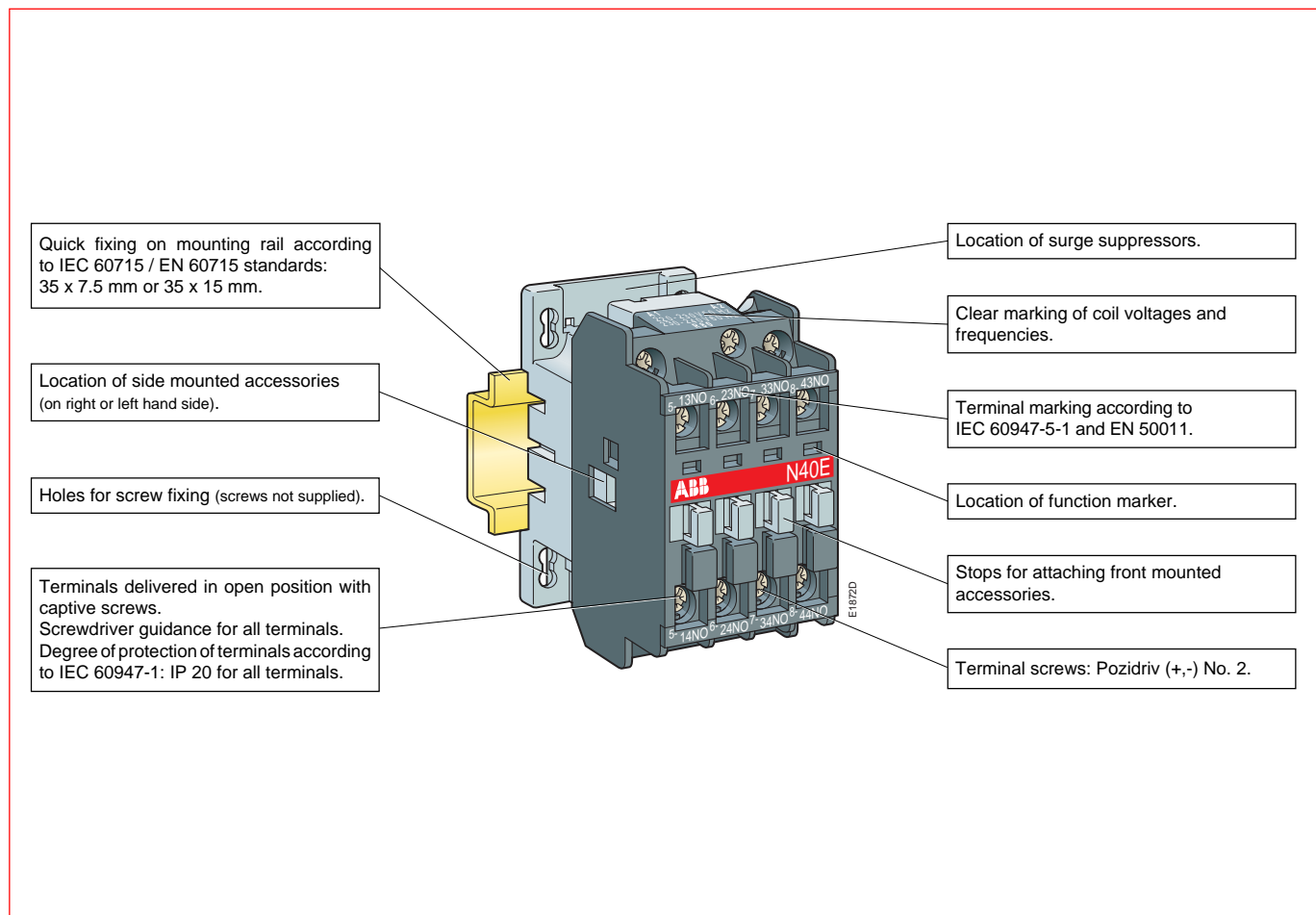
N... contactor relays are used for switching auxiliary circuits and control circuits.

### Description

- Poles:
  - 1-stack contactor relays: 4-pole (mechanically linked contact elements available),
  - 2-stack contactor relays: 8-pole (mechanically linked contact elements available).  
The width of 8-pole devices is identical to that of 4-pole devices; only the depth is increased.
- Control circuit: a.c. operated with laminated magnet circuit.
- Accessories: a wide range of accessories is available.

### Variants

- d.c. operated: NL..., NL Z... contactor relays with low consumption coil.
- d.c. operated: TNL... contactor relays with low consumption and large coil voltage range.



# N... Contactor Relays

## a.c. Operated



N 40 E

1SB05 7362 2F0301



N 44 E

1SB05 7586 4F0301

### Ordering Details

Number of contacts		Type	Order code	Weight
1 <sup>st</sup> stack	2 <sup>nd</sup> stack			kg
		state coil voltage <input type="text"/> (see table below)	state coil voltage code <input type="text"/> <input type="text"/> (see table below)	Pack <sup>ing</sup> 1 piece

#### 4-pole, 1-stack

2	2	-	-	-	-	N 22 E <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 22	0.340
3	1	-	-	-	-	N 31 E <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 31	0.340
4	-	-	-	-	-	N 40 E <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 40	0.340

#### 8-pole, 2-stack

4	-	-	4	-	-	N 44 E <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 44	0.400
4	-	1	3	-	-	N 53 E <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 53	0.400
4	-	2	2	-	-	N 62 E <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 62	0.400
4	-	3	1	-	-	N 71 E <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 71	0.400
4	-	4	-	-	-	N 80 E <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 80	0.400

#### With overlapping of lagging / leading contacts

3	1	-	2	1	1	N 33/11 <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 39	0.400
4	-	1	1	1	1	N 51/11 <input type="text"/>	1SBH 141 001 R <input type="text"/> <input type="text"/> 59	0.400

#### Coil voltages and codes

Voltage	Voltage	Code
<input type="text"/> <input type="text"/> <input type="text"/> V - 50Hz	<input type="text"/> <input type="text"/> <input type="text"/> V - 60Hz	<input type="text"/> <input type="text"/>
24	24	8 1
48	48	8 3
110	110 ... 120	8 4
220 ... 230	230 ... 240	8 0
230 ... 240	240 ... 260	8 8
380 ... 400	400 ... 415	8 5
400 ... 415	415 ... 440	8 6

Other voltages: page 0/1.

>> Accessory Fitting Details ..... page 3/8  
 >> Technical Data ..... page 3/10  
 >> Auxiliary Contacts for Safety Circuits ..... page 3/15

>> General - Approvals ..... section 7  
 >> Terminal Marking and Positioning ..... section 8  
 >> Dimensions ..... section 9

3

# NL..., NL Z... and TNL... Contactor Relays

## d.c. Operated



### Application

NL..., NL Z... and TNL... contactor relays are used for switching auxiliary circuits and control circuits. Their low power consumption allows the direct control from transistor PLC outputs.

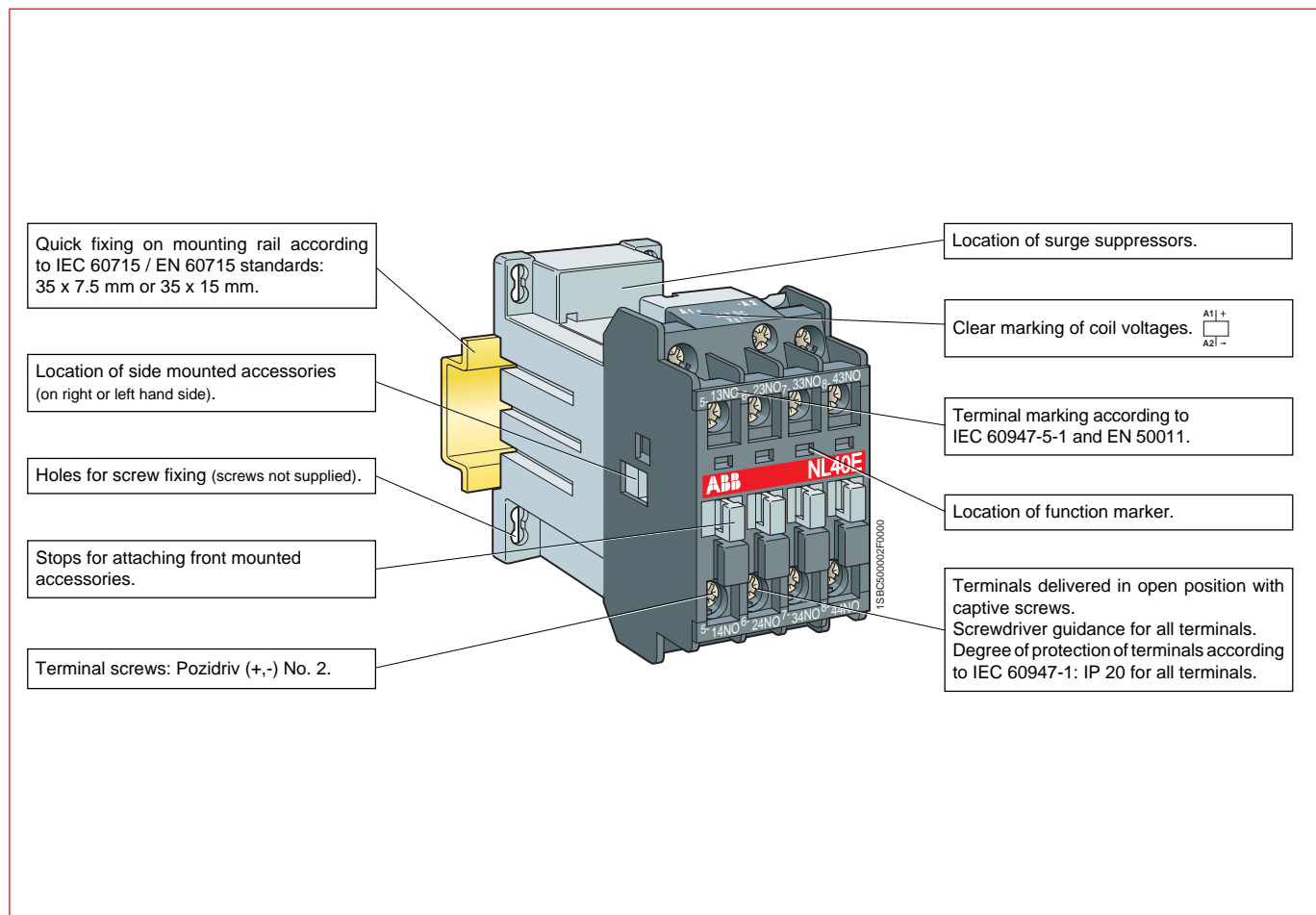
### Description

The NL... contactor relays are fitted with low consumption d.c. coils:

- NL... contactor relays: **3 W** (pull-in and holding),
- NL Z... contactor relays with very low consumption: **2.4 W** (pull-in and holding).

The TNL... version offers a large coil voltage range.

- Poles:
  - 1-stack contactor relays: 4-pole (mechanically linked contact elements available),
  - 2-stack contactor relays: 8-pole (mechanically linked contact elements available).  
The width of 8-pole devices is identical to that of 4-pole devices ; only the depth is increased.
- Control circuit: d.c. operated. The polarity on the coil terminals (A1+ and A2-) must be respected.
- Accessories: a wide range of accessories is available.



# NL..., NL Z... and TNL... Contactor Relays

## d.c. Operated



NL 22 E

1SBSC5 8791 4F0302



NL 80 E

1SBSC5 8794 4F0301



TNL 22 E

1SBSC5 90194 4F0304



TNL 80 E

1SBSC5 9020 3F0304

### Ordering Details

Number of contacts		Type	Order code	Weight
1 <sup>st</sup> stack	2 <sup>nd</sup> stack			kg
		state coil voltage <input type="text"/> <input type="text"/> (see table below)	state coil voltage code <input type="text"/> <input type="text"/> (see table below)	Pack <sup>ing</sup> 1 piece

#### 4-pole, 1-stack - 3 W consumption

2	2	-	-	-	-	NL 22 E <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 22	0.520
3	1	-	-	-	-	NL 31 E <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 31	0.520
4	-	-	-	-	-	NL 40 E <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 40	0.520

#### 8-pole, 2-stack - 3 W consumption

4	-	-	4	-	-	NL 44 E <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 44	0.580
4	-	1	3	-	-	NL 53 E <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 53	0.580
4	-	2	2	-	-	NL 62 E <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 62	0.580
4	-	3	1	-	-	NL 71 E <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 71	0.580
4	-	4	-	-	-	NL 80 E <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 80	0.580

#### With overlapping of lagging / leading contacts

3	1	-	2	1	1	NL 33/11 <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 39	0.580
4	-	1	1	1	1	NL 51/11 <input type="text"/>	1SBH 143 001 R <input type="text"/> <input type="text"/> 59	0.580

#### 4-pole, 1-stack - 2.4 W consumption

2	2	-	-	-	-	NL Z 22 E <input type="text"/>	1SBH 144 001 R <input type="text"/> <input type="text"/> 22	0.520
3	1	-	-	-	-	NL Z 31 E <input type="text"/>	1SBH 144 001 R <input type="text"/> <input type="text"/> 31	0.520
4	-	-	-	-	-	NL Z 40 E <input type="text"/>	1SBH 144 001 R <input type="text"/> <input type="text"/> 40	0.520

#### 4-pole, 1-stack - Large coil voltage range

2	2	-	-	-	-	TNL 22 E <input type="text"/>	1SBH 143 061 R <input type="text"/> <input type="text"/> 22	0.520
3	1	-	-	-	-	TNL 31 E <input type="text"/>	1SBH 143 061 R <input type="text"/> <input type="text"/> 31	0.520
4	-	-	-	-	-	TNL 40 E <input type="text"/>	1SBH 143 061 R <input type="text"/> <input type="text"/> 40	0.520

#### 8-pole, 2-stack - Large coil voltage range

4	-	-	4	-	-	TNL 44 E <input type="text"/>	1SBH 143 061 R <input type="text"/> <input type="text"/> 44	0.580
4	-	2	2	-	-	TNL 62 E <input type="text"/>	1SBH 143 061 R <input type="text"/> <input type="text"/> 62	0.580
4	-	4	-	-	-	TNL 80 E <input type="text"/>	1SBH 143 061 R <input type="text"/> <input type="text"/> 80	0.580

#### Coil voltages and codes: NL...

Voltage - U <sub>c</sub> <input type="text"/> V d.c.	Code <input type="text"/> <input type="text"/>
12	8 0
24	8 1
42	8 2
48	8 3
50	2 1
60	8 4
75	8 5
110	8 6
125	8 7
220	8 8
240	8 9
250	3 8

#### Coil voltages and codes: TNL...

Voltage - U <sub>c</sub> <input type="text"/> V d.c.	Code <input type="text"/> <input type="text"/>
17 ... 32	5 1
25 ... 45	5 2
36 ... 65	5 4
42 ... 78	5 8
50 ... 90	5 5
77 ... 143	6 2
90 ... 150	6 6
152 ... 264	6 8

Other voltages: please consult us.



Voltage tolerances (-15 % and +10 %) included in the U<sub>c</sub> min. and U<sub>c</sub> max. values for the TNL... contactor relays.

#### Coil voltages and codes: NL Z...

Voltage - U <sub>c</sub> <input type="text"/> V d.c.	Code <input type="text"/> <input type="text"/>
24	1 5
48	2 0

>> Accessory Fitting Details ..... page 3/9  
 >> Technical Data ..... page 3/10  
 >> Auxiliary Contacts for Safety Circuits ..... page 3/15

>> General - Approvals ..... section 7  
 >> Terminal Marking and Positioning ..... section 8  
 >> Dimensions ..... section 9

3

# N... Contactor Relays

## Accessory Fitting Details - For Ordering Details, see "Accessories"

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

Contactor types	Built-in contacts		Front mounted accessories			Side mounted accessories
	1 <sup>st</sup> stack	2 <sup>nd</sup> stack	Auxiliary contact 1-pole CA 5-... (or 1-pole CE 5-...)	Auxiliary contact 4-pole CA 5-...	Pneumatic timer TP .. A	Auxiliary contact 2-pole CAL 5-11

### N... Contactor Relays

N 22 E (1)	2 2	- - - -	1 to 4 x CA 5-... (or 1 x CE 5-...) (2)	or 1 x CA 5-... (4-pole)	or 1 x TP .. A	+ 1 to 2 x CAL 5-11
N 31 E (1)	3 1	- - - -	1 to 4 x CA 5-... (1 to 2 x CE 5-... max.) (3)	or 1 x CA 5-... (4-pole)	or 1 x TP .. A	+ 1 to 2 x CAL 5-11
N 40 E	4 0	- - - -				
N 44 E	4 0	0 4 - -				
N 53 E	4 0	1 3 - -				
N 62 E	4 0	2 2 - -				1 to 2 x CAL 5-11
N 71 E	4 0	3 1 - -				
N 80 E	4 0	4 0 - -				

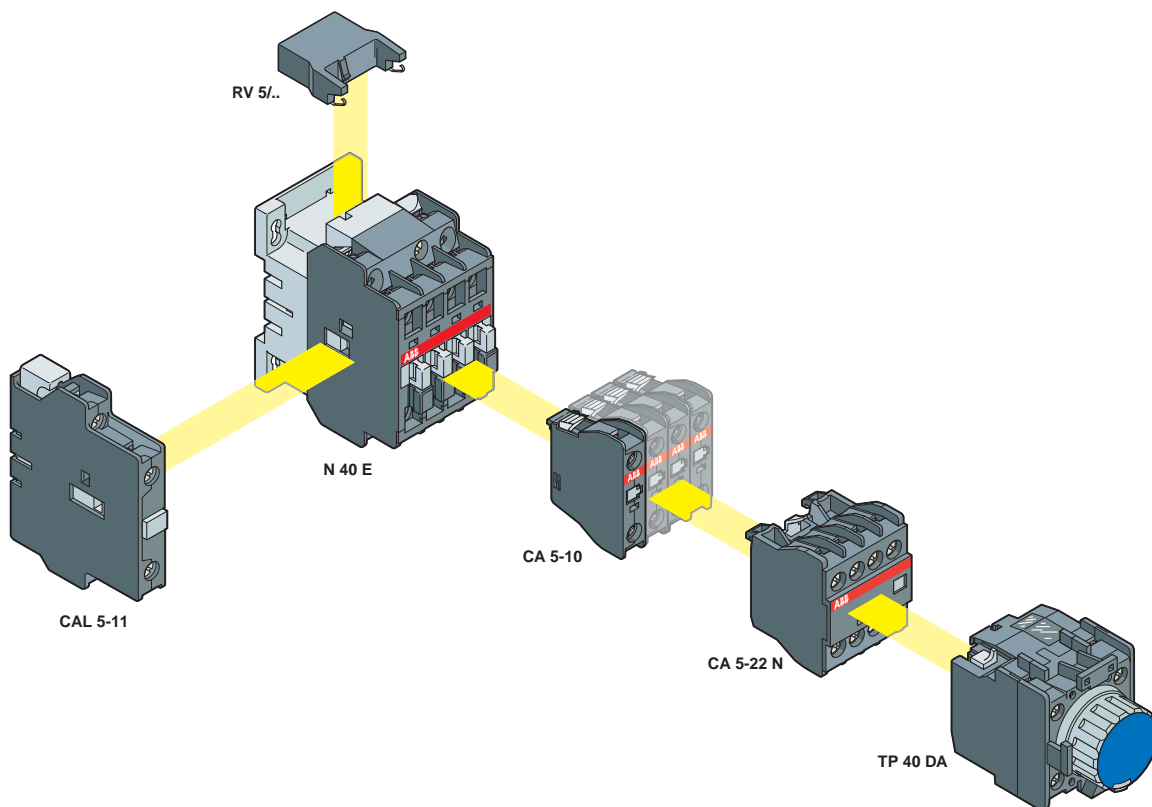
### N... Contactor Relays with overlapping of lagging / leading contacts

N 33/11	3 1	0 2 1 1	-	-	-	1 to 2 x CAL 5-11
N 51/11	4 0	1 1 1 1				

- (1) 2 x N.C. front mounted auxiliary contacts maximum in mounting position 5.  
N 22 E and N 31 E in mounting position 5, TP..DA not allowed.
- (2) CE5-.. auxiliary contacts **not allowed in mounting position 5**.
- (3) The total number of N.O. or N.C. CE 5-.. and other additional N.C. CA 5-.. auxiliary contacts is **limited to 2**.  
CE 5-.. auxiliary contacts **not allowed in mounting position 5**.

### N... contactor relays and main accessories

For mounting position diagram, see "Technical Data"



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# NL..., NL Z... and TNL... Contactor Relays

## Accessory Fitting Details - For Ordering Details, see "Accessories"

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

Contactor types	Built-in contacts		Front mounted accessories			Side mounted accessories (6)
	1 <sup>st</sup> stack	2 <sup>nd</sup> stack	Auxiliary contact 1-pole CA 5-...	Auxiliary contact 4-pole CA 5-...	Auxiliary contact 1-pole CE 5-...	Auxiliary contact 2-pole CAL 5-11

### NL... Contactor Relays

Contactor types	Built-in contacts 1 <sup>st</sup> stack	Built-in contacts 2 <sup>nd</sup> stack	Auxiliary contact 1-pole CA 5-...	Auxiliary contact 4-pole CA 5-...	Auxiliary contact 1-pole CE 5-...	Auxiliary contact 2-pole CAL 5-11
NL 22 E (5)	2 2	- - - -	1 to 4 x CA 5-... (4)	or 1 x CA 5-... (4-pole) (4)	-	or 1 x CAL 5-11 (3)
NL 31 E	3 1	- - - -	1 to 4 x CA 5-... (1)	or 1 x CA 5-... (4-pole) (1)	or 1 to 2 x CE 5-... (2)	or 1 x CAL 5-11 (3)
NL 40 E	4 0	- - - -				
NL 44 E	4 0	0 4 - -				
NL 53 E	4 0	1 3 - -				
NL 62 E	4 0	2 2 - -				
NL 71 E	4 0	3 1 - -				
NL 80 E	4 0	4 0 - -				

### NL... Contactor Relays with overlapping of lagging / leading contacts

NL 33/11	3 1	0 2 1 1				
NL 51/11	4 0	1 1 1 1				

### NL Z... and TNL... Contactor Relays

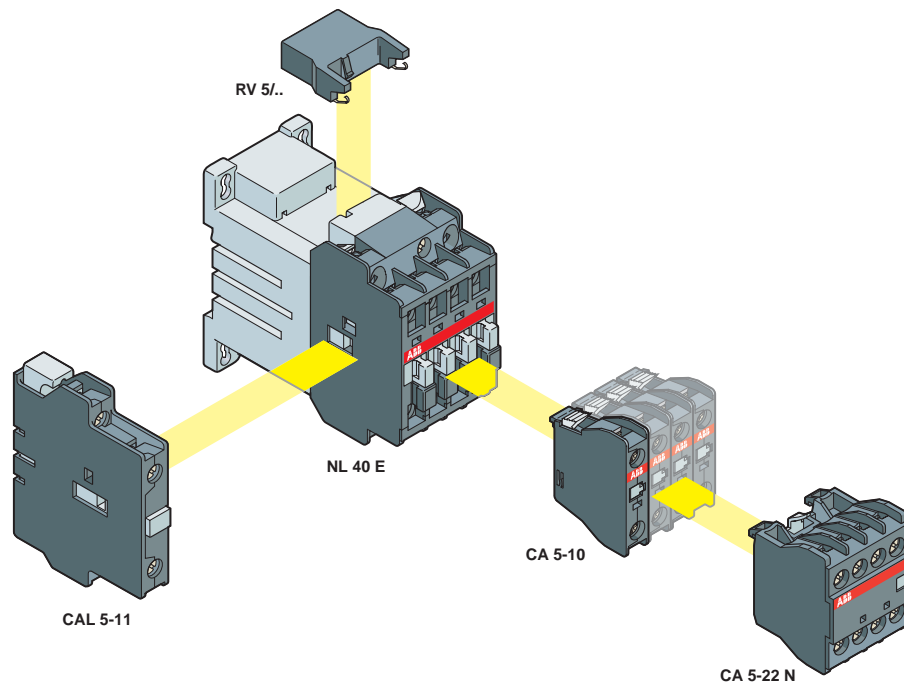
Contactor types	Built-in contacts 1 <sup>st</sup> stack	Built-in contacts 2 <sup>nd</sup> stack	Auxiliary contact 1-pole CA 5-...	Auxiliary contact 4-pole CA 5-...	Auxiliary contact 1-pole CE 5-...	Auxiliary contact 2-pole CAL 5-11
NL Z 22 E (5)(6)	2 2	- - - -	1 to 2 x CA 5-...	-	-	
NL Z 31 E (6)	3 1	- - - -	1 to 2 x CA 5-... (1)	-	or 1 to 2 x CE 5-... (2)	
NL Z 40 E (6)	4 0	- - - -				
TNL 22 E (5)	2 2	- - - -	1 to 4 x CA 5-... (4)	or 1 x CA 5-... (4-pole) (4)	-	
TNL 31 E	3 1	- - - -	1 to 4 x CA 5-... (1)	or 1 x CA 5-... (4-pole) (1)	or 1 to 2 x CE 5-... (2)	
TNL 40 E	4 0	- - - -				
TNL 44 E	4 0	0 4 - -				
TNL 62 E	4 0	2 2 - -				
TNL 80 E	4 0	4 0 - -				

- (1) A maximum of 2 N.C. auxiliary contacts can be fitted in all mounting positions except 5. In position 5 no N.C. auxiliary contacts are permitted.
- (2) CE 5-... is not allowed in mounting position 5.
- (3) With CAL5-11 the control voltage is limited to  $0.9 U_c \dots 1.1 U_c$  in all mounting positions.
- (4) A maximum of 2 N.C. auxiliary contacts can be fitted.
- (5) Mounting position 5 is not allowed.
- (6) Mounting position  $1 \pm 30^\circ$  is not allowed.

3

## NL..., NL Z... and TNL... contactor relays and main accessories

For mounting position diagram, see "Technical Data"



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# N..., NL..., NL Z... and TNL... Contactor Relays

## Technical Data

### Contact Utilization Characteristics

#### Utilization characteristics according to IEC

Contactor relay types	N...	NL...	NL Z...	TNL...
<b>Rated operational voltage <math>U_e</math> max.</b>	V 690			
<b>Conventional free air thermal current <math>I_{th}</math></b> according to IEC 60947-5-1, open contactors $\theta \leq 40$ °C	A 16			
<b>Rated frequency limits</b>	Hz 25 ... 400			
<b>Rated operational current <math>I_e</math> / AC-15</b> according to IEC 60947-5-1				
24-127 V    50/60 Hz	A	6		
230-240 V   50/60 Hz	A	4		
400-415 V   50/60 Hz	A	3		
500 V    50/60 Hz	A	2		
690 V    50/60 Hz	A	2		
<b>Rated operational current <math>I_e</math> / DC-13</b> according to IEC 60947-5-1				
24 V d.c.	A / W	6 / 144		
48 V d.c.	A / W	2.8 / 134		
72 V d.c.	A / W	1 / 72		
110 V d.c.	A / W	0.55 / 60		
125 V d.c.	A / W	0.55 / 69		
220 V d.c.	A / W	0.30 / 66		
250 V d.c.	A / W	0.30 / 75		
<b>Making capacity</b> according to IEC 60947-5-1	10 x $I_e$ / AC-15			
<b>Breaking capacity</b> according to IEC 60947-5-1	10 x $I_e$ / AC-15			
<b>Short-circuit protection</b> $U_e \leq 500$ V a.c. - gG type fuse	A	10		
<b>Rated short-time withstand current <math>I_{cw}</math></b> at 40 °C ambient temp., in free air, from a cold state				
1.0 s	A	100		
0.1 s	A	140		
<b>Minimum switching capacity</b> with failure rate acc. to IEC 60947-5-4	V / mA	17 / 5		
		$\leq 10^{-6}$	$\leq 10^{-7}$	
<b>Non-overlapping time between N.O. and N.C. contacts</b>	ms	$\geq 2$		
<b>Heat dissipation per pole at 6 A</b>	W	0.10		
<b>Max. electric switching frequency</b>	cycles/h	1200		
<b>Mechanical durability</b> – millions of operating cycles		> 20		
– max. mechanical switching frequency	cycles/h	6000		

#### Utilization characteristics according to UL/CSA

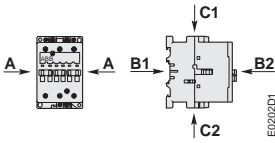
Contactor relay types	N...	NL...	NL Z...	TNL...
<b>Max. rated voltage</b>	V 600			
<b>Pilot duty</b>	A 600, Q 300			

# N..., NL..., NL Z... and TNL... Contactor Relays

## Technical Data

### General Technical Data

Contactor relay types	N...	NL...	NL Z...	TNL...
<b>Rated insulation voltage <math>U_i</math></b> according to IEC 60947-5-1	<b>V</b>	690		
according to UL/CSA	<b>V</b>	600		
<b>Rated impulse withstand voltage <math>U_{imp.}</math></b>	<b>kV</b>	8		
<b>Standards</b>	Devices complying with IEC 60947-5-1 and EN 60947-5-1			
<b>Air temperature</b> close to contactor	see "Conditions for use", for control voltage limits and authorized mounting positions			
– for operation in free air	<b>°C</b>	-40 to +70		-40 to +55
– for storage	<b>°C</b>	-60 to +80		
<b>Climatic withstand</b>	acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II			
<b>Operating altitude</b>	<b>m</b>	≤ 3000		
<b>Shock withstand</b> acc. IEC 60068-2-27 and EN 60068-2-27 Mounting position 1	1/2 sinusoidal shock for 11 ms: no change in contact position			
	<b>Shock direction</b>	Closed or open position	Closed position	Open position
	A	20 g		10 g
	B1	5 g	15 g	5 g
	B2	15 g	10 g	10 g
	C1	20 g	20 g	8 g
	C2	20 g	14 g	8 g



3

<a href="#">&gt;&gt; Conditions for Use ..... page 3/13</a>	<a href="#">&gt;&gt; Certifications - Approvals ..... section 7</a>
<a href="#">&gt;&gt; Mounting Positions ..... page 3/13</a>	<a href="#">&gt;&gt; Dimensions ..... section 9</a>

# N..., NL..., NL Z... and TNL... Contactor Relays

## Technical Data

### Magnet System Characteristics for N... Contactor Relays

Contactor relay types			N...
<b>Rated control circuit voltage <math>U_c</math></b>	50/60 Hz	<b>V</b>	24 ... 690
<b>Coil operating limits</b> acc. to IEC 60947-5-1	0.85 ... 1.1 x $U_c$ (at $\theta \leq 55^\circ\text{C}$ ) Please also refer to "Conditions for Use"		
<b>Drop-out voltage</b> in % of $U_c$	approx. 40 ... 65 %		
<b>Coil consumption</b>			
Average pull-in value	50 Hz	<b>VA</b>	70
	60 Hz	<b>VA</b>	80
Average holding value	50/60 Hz (1)	<b>VA / VA</b>	74 / 70
	50 Hz	<b>VA / W</b>	8 / 2
	60 Hz	<b>VA / W</b>	8 / 2
	50/60 Hz (1)	<b>VA / W</b>	8 / 2
<b>Operating time</b>			
between coil energization and:			
– N.O. contact closing		<b>ms</b>	10 ... 26
– N.C. contact opening		<b>ms</b>	7 ... 21
between coil de-energization and:			
– N.O. contact opening		<b>ms</b>	4 ... 11
– N.C. contact closing		<b>ms</b>	9 ... 16

(1) 50/60 Hz coils: see "Coil Voltage Code Table".

### Magnet System Characteristics for NL... and NL Z... Contactor Relays

Contactor relay types			NL...	NL Z...
<b>Rated control circuit voltage <math>U_c</math></b>		<b>V d.c.</b>	12 ... 250	24 and 48
<b>Coil operating limits</b> acc. to IEC 60947-5-1	0.85 ... 1.1 x $U_c$ ( $\theta \leq 55^\circ\text{C}$ ) Please also refer to "Conditions for Use"			
<b>Drop-out voltage</b> in % of $U_c$	approx. 10 ... 30 %			
<b>Coil consumption - Average values</b>				
– pull-in value		<b>W</b>	3.0	2.4
– holding value		<b>W</b>	3.0	2.4
<b>Coil time constant</b>				
– open	L/R	<b>ms</b>	28	
– closed	L/R	<b>ms</b>	74	
<b>Operating time</b>				
between coil energization and:				
– N.O. contact closing		<b>ms</b>	50 ... 100	
– N.C. contact opening		<b>ms</b>	20 ... 70	
between coil de-energization and:				
– N.O. contact opening		<b>ms</b>	10 ... 17 (1)	
– N.C. contact closing		<b>ms</b>	16 ... 27 (1)	

(1) The use of surge suppressors increases the opening time with a factor of 1.1 to 1.5 for a varistor suppressor and a factor of 1.5 to 3 for a transil diode suppressor.

### Magnet System Characteristics for TNL... Contactor Relays

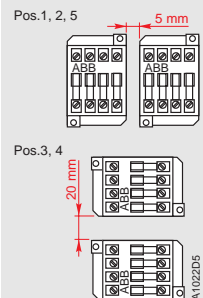
Contactor relay types			TNL...
<b>Rated control circuit voltage <math>U_c</math></b>		<b>V d.c.</b>	17 ... 264
<b>Coil operating limits</b>	$U_{c \text{ min.}}$ ... $U_{c \text{ max.}}$ ( $\theta \leq 55^\circ\text{C}$ ) Please also refer to "Conditions for Use"		
<b>Drop-out voltage</b> in % of $U_{c \text{ max.}}$	approx. 9 ... 25 %		
<b>Coil consumption</b> for $U_{c \text{ min.}}$ ... $U_{c \text{ max.}}$		<b>W</b>	2.5 ... 8.5 at pull-in and holding
<b>Coil time constant</b>			
– open	L/R	<b>ms</b>	28
– closed	L/R	<b>ms</b>	74
<b>Operating time</b>			
between coil energization and:			
– N.O. contact closing		<b>ms</b>	50 ... 100
– N.C. contact opening		<b>ms</b>	20 ... 70
between coil de-energization and:			
– N.O. contact opening		<b>ms</b>	10 ... 17 (1)
– N.C. contact closing		<b>ms</b>	16 ... 27 (1)

(1) The use of surge suppressors increases the opening time with a factor of 1.1 to 1.5 for a varistor suppressor and a factor of 1.5 to 3 for a transil diode suppressor.



# N..., NL..., NL Z... and TNL... Contactor Relays

## Technical Data

### Mounting Characteristics

Contactor relay types	N...	NL...	NL Z...	TNL...
Mounting positions	see "Conditions for Use"			
Mounting distances	No mounting distance required between contactors			Distances for ambient temperature 20...55 °C 

### Fixing

on rail	 35 x 7.5 mm
according to IEC 60715 and EN 60715	 35 x 15 mm
by screws (not supplied)	2 x M4

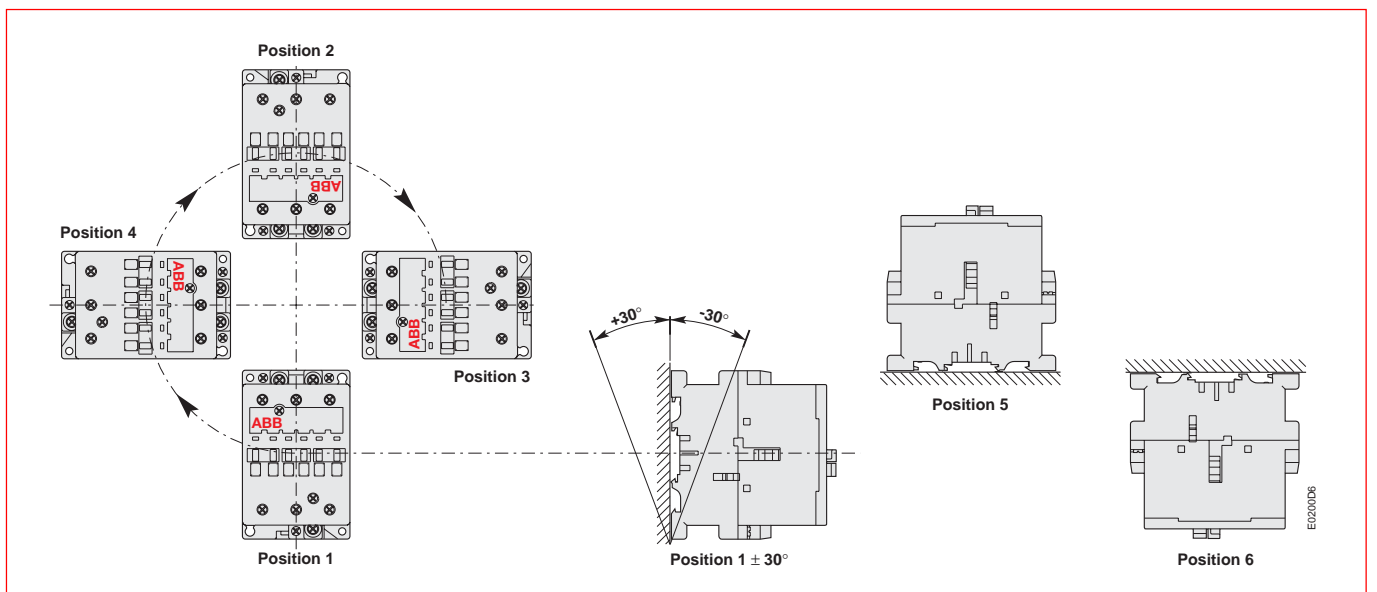
### Conditions for Use

Sustainable utilization conditions for contactor relays involving at the same time the Mounting position, Ambient temperature and Control Voltage operating limits are summarized in the table below.

Contactor relay types	N...	NL...	NL Z...	TNL...
<b>Control Voltage / Ambient temperature</b>				
Mounting positions 1, 2, 3, 4, 5 (1)	$0.85 \dots 1.1 \times U_c$			$U_c \text{ min. } \dots U_c \text{ max.}$ unauthorized
Mounting position 1 ± 30°	$0.85 \dots 1.1 \times U_c$		unauthorized	$U_c \text{ min. } \dots U_c \text{ max.}$
Mounting position 6	$0.95 \dots 1.1 \times U_c$	unauthorized	unauthorized	

(1) NL 22 E, NL Z 22 E, and TNL 22 E not allowed in position 5.

### Mounting Positions (see the above table for authorized positions)










>> Coil Voltage Code Table ..... page 0/1	>> Terminal Marking and Positioning ..... section 8
>> Influence of the Length of Conductors Used in Control Circuit ..... page 2/88	>> Dimensions ..... section 9

# N..., NL..., NL Z... and TNL... Contactor Relays

## Technical Data

### Connecting Characteristics

Contactor relay types	N...	NL...	NL Z...	TNL...
<b>Terminals</b>	 with cable clamp			
<b>Connecting capacity</b> (min. ... max.)				
Pole and coil terminals				
Rigid solid	 1 x mm <sup>2</sup>	1 ... 4		
	 2 x mm <sup>2</sup>	1 ... 4		
Flexible with cable end	 1 x mm <sup>2</sup>	0.75 ... 2.5		
	 2 x mm <sup>2</sup>	0.75 ... 2.5		
Lugs				
– Pole terminals		L mm ≤	7.7	
		l mm >	3.7	
– Coil terminals		L mm ≤	8	
		l mm >	3.7	
<b>Capacity according to UL/CSA</b>	<b>AWG</b>	18 - 14		
<b>Degree of protection</b>	Protection against direct contact in acc. with EN 50274			
acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529				
All terminals	IP 20			
<b>Screw terminals</b>	(delivered in open position, screws of unused terminals must be tightened)			
All terminals	M 3.5 (+,-) pozidriv 2 screws with cable clamp			
<b>Tightening torque</b>				
– recommended	<b>Nm / lb.in</b>	1.00 / 9		
– max.	<b>Nm</b>	1.20		

>> Terminal Marking and Positioning ..... section 8

# Auxiliary Contacts for Safety Circuits

## Contactor Relays

### Mechanically Linked Contact Elements for Contactor Relays


(known as "forced contacts", "positively activated contacts" or "linked contacts").

**Definitions from standards: mechanically linked contact elements**  according to IEC 60947-5-1, Annex L 3.0.

Combination of "n" Make auxiliary contact element(s) and "m" Break auxiliary contact element(s) are designed in such a way that they cannot be in the closed position simultaneously.

One control circuit device may have more than one group of mechanically linked contact elements.

The table below gives the contactor relays that offer mechanically linked auxiliary contacts according to IEC 60947-5-1, Annex L.

Contactor relays	Built-in auxiliary contacts
	
<b>N 22 E, NL 22 E, TNL 22 E</b>	2 2
<b>N 31 E, NL 31 E, TNL 31 E</b>	3 1
<b>N 44 E, NL 44 E, TNL 44 E</b>	4 4
<b>N 53 E, NL 53 E</b>	5 3
<b>N 62 E, NL 62 E, TNL 62 E</b>	6 2
<b>N 71 E, NL 71 E</b>	7 1

The information provided for **NL** and **TNL** contactor relays can also be used for **NL Z...** type. For each contactor type, see "Accessory Fitting Details".

### Direct Opening Action of N.C. Built-in Auxiliary Contacts

Annex K2.1 of IEC 60947-5-1 defines a control switch with direct opening action: "the full contact opening of the break contact element(s) is obtained when the actuator is moved through the direct opening travel by applying the force stated by the manufacturer".

The N.C. built-in auxiliary contacts of contactor relays ARE NOT CONCERNED by the annex K.

Nevertheless, N.C. auxiliary contacts are designed to have "direct opening action" and are suitable for uses such as lifts / elevators (according to EN 81-1).