

Contactors and Contactor relays with Ring Tongue Terminals

d.c. Operated





Contactors, Contactor Relays with Ring Tongue Terminals

d.c. Operated

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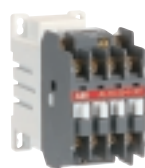
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Contactors with Ring Tongue Terminals



d.c. operated



3-pole

d.c. operated

Type

			AL 9..RT	AL 12..RT	AL 16..RT	AL 26..RT	AL 30..RT	AL 40..RT	
Rated power AC-3, 220-240 V	kW	IEC	2.2	3	4	6.5	9	11	
	380-400 V		kW	4	5.5	7.5	11	15	18.5
Rated current AC-1, 40 °C	A	UL/CSA	25	27	30	45	50	60	
	Rated power 220-240 V		hp	2	3	5	10	10	15
3-phase motor	440-480 V	hp	5	7.5	10	20	25	30	
	Rated current General use	A	21	25	30	40	50	60	

d.c. operated - Large coil voltage range

Type

			TAL 9..RT	TAL 12..RT	TAL 16..RT	TAL 26..RT	TAL 30..RT	TAL 40..RT	
Rated power AC-3, 220-240 V	kW	IEC	2.2	3	4	6.5	9	11	
	380-400 V		kW	4	5.5	7.5	11	15	18.5
Rated current AC-1, 40 °C	A	UL/CSA	25	27	30	45	50	60	
	Rated power 220-240 V		hp	2	3	5	10	10	15
3-phase motor	440-480 V	hp	5	7.5	10	20	25	30	
	Rated current General use	A	21	25	30	40	50	60	

4-pole

d.c. operated

Type

			AL 9..RT	AL 16..RT	AL 26..RT	
Rated current AC-1, 40 °C	A	IEC	25	30	45	
Rated current General use	A	UL/CSA	21	30	40	

d.c. operated - Large coil voltage range

Type

			TAL 9..RT	TAL 16..RT	TAL 26..RT	
Rated current AC-1, 40 °C	A	IEC	25	30	45	
Rated current General use	A	UL/CSA	21	30	40	

Accessories



Main accessories with Ring Tongue terminals

CA5..RT, 4-pole front-mounted auxiliary contact block available with 4 N.O., 2 N.O. + 2 N.C. or 3 N.O. + 1 N.C.



VM5-1 Mechanical Interlock unit



RT5 / RV5 surge suppressors

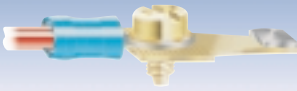
Other Accessories

Various other accessories with screw terminals can be used with the contactors with Ring Tongue terminals, these include:

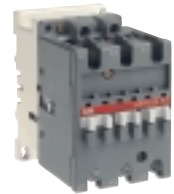
- VE5-1 and VE5-2 interlock units
 - CAL5-11 side-mounted auxiliary contact block
 - CA5.. 1-pole auxiliary contact block
 - CE5.. 1-pole auxiliary contact block
 - TP.. pneumatic timer block (only for (T)AE..RT and AF..RT)
 - TE5S electronic timer
 - TA..DU thermal overload relays (independent mounting kit DB25 required)
- For technical data and accessory fitting details, please see the main catalogue.

>> Ordering Details
>> Technical data

Types	AL../TAL..	AE../TAE..	AF..	Accessories
pages	5	10	13	37
pages	15 ... 26	15 ... 26		39



a.c. / d.c. operated



3-pole a.c. / d.c. operated

AE 50..RT AE 63..RT AE 75..RT

15	18.5	22
22	30	37
100	115	125

20	25	30
40	60	60
80	90	105

AF 50..RT AF 63..RT AF 75..RT

15	18.5	22
22	30	37
100	115	125

20	25	30
40	60	60
80	90	105

Type

Rated power AC-3, 220-240 V	kW
380-400 V	kW
Rated current AC-1, 40 °C	A

IEC

Rated power 220-240 V	hp
3-phase motor 440-480 V	hp
Rated current General use	A

UL/CSA

TAE 50..RT TAE 75..RT

15	22
22	37
100	125

4-pole a.c. / d.c. operated

Type

Rated current AC-1, 40 °C	A
Rated current General use	A

IEC

UL/CSA

AF 45..RT AF 75..RT

100	125
80	105

AE 45..RT AE 75..RT

100	125
80	105

TAE 45..RT TAE 75..RT

100	125
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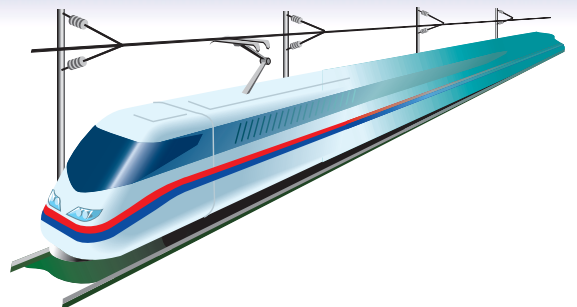
Traction application

The Ring Tongue connection is particularly suited to rolling stock applications.

Most of ABB contactors with Ring Tongue terminals, comply with the main railway requirements including:

- Operating limits according to IEC 60077
- Resistance to vibrations and shock according to IEC 61373
- Fire and smoke tests acc. to NFF 16101, NFF 16102 and to ASTM tests E662, E162 and E1354.

For details on specific products, technical data on request.





AL..RT and TAL..RT Contactors

d.c. Operated



Application

AL..RT, TAL..RT contactors are mainly used for controlling 3-phase motors and more generally for controlling power circuits up to 690 V a.c. or 220 / 440 V d.c. These contactors have a low power consumption for direct control from PLC outputs. Consequently they are perfectly adapted for all applications associated with PLC control.

AL..RT and TAL..RT contactors are the ring tongue terminal version of the AL range.

Their main features are:

- High connection reliability with no need to retighten the terminals on site.
- Vibration proof
- **TAL..RT** contactors comply with the main railway requirements (see page 17).

Description

The **AL..RT** series 3-pole contactors are of the block type design.

The **TAL..RT** series 3-pole contactors are of the block type design with a large coil voltage range.

- Main poles and auxiliary contact blocks
 - **AL 9..RT ... AL 40..RT 1-stack contactors:**
 - 3 main poles,
 - 1 built-in auxiliary contact,
 - front-mounted add-on auxiliary contact blocks.
- Control circuit: d.c. operated with solid core magnet circuit and low consumption coil. The coil must be energised from a d.c. supply and the polarity (+ and -) must be respected.
- Accessories: a wide range of accessories are available.

Variants

- 4-pole: **AL 9..RT ... AL 26..RT** contactors (with 4 N.O. or 2 N.O. + 2 N.C. main poles).

Contactor designation explanation

1) **AL 9-30-10RT**

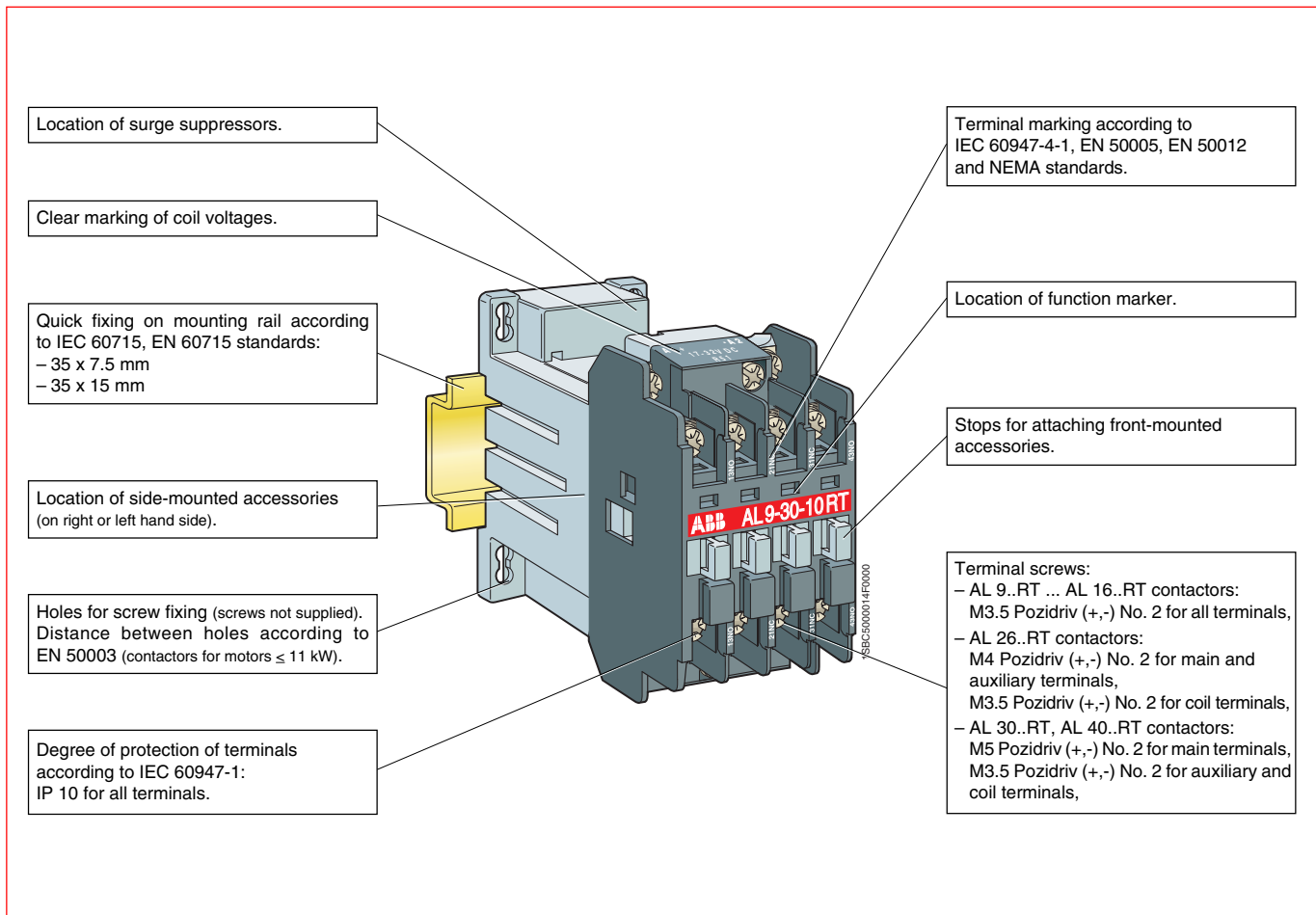
RT = Ring Tongue Terminals

2) **TAL 9-30-10RT**

T = Large coil voltage range

Blue = Standard contactor features

Black = Different variations according to the application





AL..RT 3-pole Contactors

d.c. Operated



1SBC5 9083 3F0304

AL 9-30-10RT



1SBC5 9167 4F0304

AL 26-30-10RT



1SBC5 9089 3F0304

AL 30-30-10RT

Ordering Details

3-pole Contactors - 3 W and 3.5 W consumption

IEC		UL/CSA		Auxiliary contacts fitted		Type	Order code	Weight kg
Rated power	Rated current	3-Phase motor rating	General use rating	1 st stack	2 nd stack			
400 V	$\theta \leq 40^\circ\text{C}$	480 V	600 V			state coil voltage <input type="text"/> (see table below)	state coil voltage code <input type="text"/> <input type="text"/> (see table below)	Pack ^{ing} 1 piece
kW	A	hp	A					
4	25	5	21	1 -	--	AL 9-30-10RT <input type="text"/>	1SBL 143 010 R <input type="text"/> <input type="text"/> 10	0.520
				- 1	--	AL 9-30-01RT <input type="text"/>	1SBL 143 010 R <input type="text"/> <input type="text"/> 01	0.520
5.5	27	7.5	25	1 -	--	AL 12-30-10RT <input type="text"/>	1SBL 163 010 R <input type="text"/> <input type="text"/> 10	0.520
				- 1	--	AL 12-30-01RT <input type="text"/>	1SBL 163 010 R <input type="text"/> <input type="text"/> 01	0.520
7.5	30	10	30	1 -	--	AL 16-30-10RT <input type="text"/>	1SBL 183 010 R <input type="text"/> <input type="text"/> 10	0.520
				- 1	--	AL 16-30-01RT <input type="text"/>	1SBL 183 010 R <input type="text"/> <input type="text"/> 01	0.520
11	45	20	40	1 -	--	AL 26-30-10RT <input type="text"/>	1SBL 243 010 R <input type="text"/> <input type="text"/> 10	0.750
				- 1	--	AL 26-30-01RT <input type="text"/>	1SBL 243 010 R <input type="text"/> <input type="text"/> 01	0.750
15	50	25	50	1 -	--	AL 30-30-10RT <input type="text"/>	1SBL 283 010 R <input type="text"/> <input type="text"/> 10	0.850
				- 1	--	AL 30-30-01RT <input type="text"/>	1SBL 283 010 R <input type="text"/> <input type="text"/> 01	0.850
18.5	60	30	60	1 -	--	AL 40-30-10RT <input type="text"/>	1SBL 323 010 R <input type="text"/> <input type="text"/> 10	0.850
				- 1	--	AL 40-30-01RT <input type="text"/>	1SBL 323 010 R <input type="text"/> <input type="text"/> 01	0.850

Coil voltages and codes

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



TAL..RT 3-pole Contactors

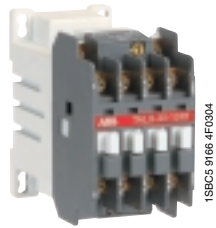
d.c. Operated



Ordering Details

3-pole Contactors - Large coil voltage range

IEC		UL/CSA		Auxiliary contacts fitted		Type	Order code	Weight kg
AC-3 Rated power	AC-1 Rated current	3-Phase motor rating	General use rating	1 st stack	2 nd stack			
400 V	$\theta \leq 40^{\circ}\text{C}$	480 V	600 V			state coil voltage <input type="text"/> (see table below)	state coil voltage code <input type="text"/> <input type="text"/> (see table below)	Pack ^{ing} 1 piece
kW	A	hp	A					
4	25	5	21	1 -	--	TAL 9-30-10RT <input type="text"/>	1SBL 143 060 R <input type="text"/> <input type="text"/> 10	0.520
				- 1	--	TAL 9-30-01RT <input type="text"/>	1SBL 143 060 R <input type="text"/> <input type="text"/> 01	0.520
5.5	27	7.5	25	1 -	--	TAL 12-30-10RT <input type="text"/>	1SBL 163 060 R <input type="text"/> <input type="text"/> 10	0.520
				- 1	--	TAL 12-30-01RT <input type="text"/>	1SBL 163 060 R <input type="text"/> <input type="text"/> 01	0.520
7.5	30	10	30	1 -	--	TAL 16-30-10RT <input type="text"/>	1SBL 183 060 R <input type="text"/> <input type="text"/> 10	0.520
				- 1	--	TAL 16-30-01RT <input type="text"/>	1SBL 183 060 R <input type="text"/> <input type="text"/> 01	0.520
11	45	20	40	1 -	--	TAL 26-30-10RT <input type="text"/>	1SBL 243 060 R <input type="text"/> <input type="text"/> 10	0.750
				- 1	--	TAL 26-30-01RT <input type="text"/>	1SBL 243 060 R <input type="text"/> <input type="text"/> 01	0.750
15	50	25	50	1 -	--	TAL 30-30-10RT <input type="text"/>	1SBL 283 060 R <input type="text"/> <input type="text"/> 10	0.850
				- 1	--	TAL 30-30-01RT <input type="text"/>	1SBL 283 060 R <input type="text"/> <input type="text"/> 01	0.850
18.5	60	30	60	1 -	--	TAL 40-30-10RT <input type="text"/>	1SBL 323 060 R <input type="text"/> <input type="text"/> 10	0.850
				- 1	--	TAL 40-30-01RT <input type="text"/>	1SBL 323 060 R <input type="text"/> <input type="text"/> 01	0.850



TAL 9-30-10RT

1SBC5 9166 4F0304



TAL 26-30-10RT

1SBC5 9092 4F0301



TAL 30-30-10RT

1SBC5 9162 4F0302

Coil voltages and codes

Voltage - U_c V d.c.	Code
<input type="text"/> <input type="text"/>	<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

Voltage tolerances (-15% and +10%) included in the U_c min. and U_c max. values for the TAL..RT contactors.



AL..RT and TAL..RT 4-pole Contactors d.c. Operated



TAL 9-40-00RT

1SBC5 9085 5F0304



TAL 26-40-00RT

1SBC5 9092 6F0304

Ordering Details

IEC	UL/CSA	Auxiliary contacts fitted	Type	Order code	Weight kg
AC-1 Rated current $\theta \leq 40^\circ\text{C}$	General use rating 600 V		state coil voltage [] [] (see table below)	state coil voltage code [] [] (see table below)	Pack ^{ing} 1 piece
A	A				

4 N.O. Main Poles - 3 W and 3.5 W consumption

25	21	--	AL 9-40-00RT [] []	1SBL 143 210 R [] [] 00	0.520
30	30	--	AL 16-40-00RT [] []	1SBL 183 210 R [] [] 00	0.520
45	40	--	AL 26-40-00RT [] []	1SBL 243 210 R [] [] 00	0.750

2 N.O. + 2 N.C. Main Poles - 3 W and 3.5 W consumption

25	21	--	AL 9-22-00RT [] []	1SBL 143 510 R [] [] 00	0.520
30	30	--	AL 16-22-00RT [] []	1SBL 183 510 R [] [] 00	0.520
45	40	--	AL 26-22-00RT [] []	1SBL 243 510 R [] [] 00	0.750

4 N.O. Main Poles - Large coil voltage range

25	21	--	TAL 9-40-00RT [] []	1SBL 143 260 R [] [] 00	0.520
30	30	--	TAL 16-40-00RT [] []	1SBL 183 260 R [] [] 00	0.520
45	40	--	TAL 26-40-00RT [] []	1SBL 243 260 R [] [] 00	0.750

2 N.O. + 2 N.C. Main Poles - Large coil voltage range

25	21	--	TAL 9-22-00RT [] []	1SBL 143 560 R [] [] 00	0.520
30	30	--	TAL 16-22-00RT [] []	1SBL 183 560 R [] [] 00	0.520
45	40	--	TAL 26-22-00RT [] []	1SBL 243 560 R [] [] 00	0.750

Coil voltages and codes for AL..RT

Voltage - U_c V d.c.	Code
[] []	[] []
12	8 0
24	8 1
42	8 2
48	8 3
60	8 4
75	8 5
110	8 6
125	8 7
220	8 8
240	8 9

Coil voltages and codes for TAL..RT

Voltage - U_c V d.c.	Code
[] []	[] []
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

Voltage tolerances (-15% and +10%) included in the U_c min. and U_c max. values for the TAL..RT contactors.



Accessory compatibility for AL..RT and TAL..RT Contactors

Compatibility between the Main Accessories

Many configurations are possible depending upon whether they are front-mounted or side-mounted.

Contactor configuration	Front-mounted accessory	Side-mounted accessory
<p>Main poles Available auxiliary contacts</p> <p>Contactor types</p>	<p>Auxiliary contact 4-pole CA 5-..RT</p>	<p>Mechanical interlock unit VM 5-1</p>

Position 1 ± 30° is not permitted.

(T)AL 9..RT to (T)AL 16..RT Contactors

(T)AL 9..RT ... (T)AL 16..RT	3 0 1 0	1 x CA 5-..MRT (4-pole) (1)	+	1 x VM 5-1
(T)AL 9..RT ... (T)AL 16..RT	3 0 0 1	-		1 x VM 5-1
(T)AL 9..RT ... (T)AL 16..RT	4 0 0 0	1 x CA 5-..ERT (4-pole) (1)	+	1 x VM 5-1
(T)AL 9..RT ... (T)AL 16..RT (3)	2 2 0 0	1 x CA 5-..ERT (4-pole) (2)	-	-

- (1) 2 N.C. auxiliary contacts maximum in all mounting positions except 5. In position 5 no N.C. are allowed.
 (2) 2 N.C. auxiliary contacts maximum.
 (3) Mounting in position 5 is not allowed.

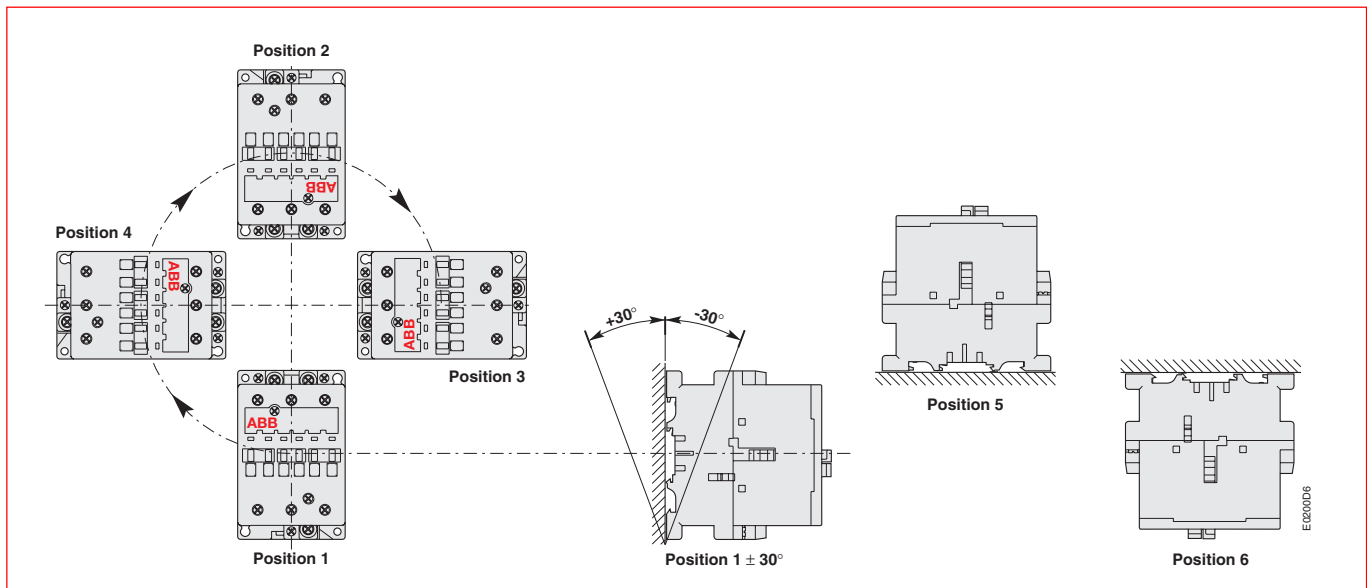
(T)AL 26..RT to (T)AL 40..RT Contactors

(T)AL 26..RT	3 0 1 0	1 x CA 5-..MRT (4-pole) (5)	+	1 x VM 5-1
(T)AL 26..RT	3 0 0 1	-		1 x VM 5-1
(T)AL 26..RT	4 0 0 0	1 x CA 5-..ERT (4-pole) (5)	+	1 x VM 5-1
(T)AL 26..RT (7)	2 2 0 0	1 x CA 5-..ERT (4-pole) (6)	-	-
(T)AL 30..RT, (T)AL 40..RT	3 0 1 0	1 x CA 5-..MRT (4-pole) (5)	+	1 x VM 5-1
(T)AL 30..RT, (T)AL 40..RT	3 0 0 1	-		1 x VM 5-1

- (5) 2 N.C. auxiliary contacts maximum in mounting position 5.
 (6) N.C. auxiliary contacts are not allowed.
 (7) Mounting position 5 is not allowed.

Conditions for Use: Please see page 23

Mounting Positions





AE..RT and TAE..RT 3-pole Contactors

d.c. Operated with Double-Winding Coil



Application

AE 50..RT ... AE 75..RT contactors, as well as **TAE..RT** versions, are mainly used for controlling 3-phase motors and generally for controlling power circuits up to 690 V a.c. / 1000 V a.c. or 220 V d.c. / 440 V d.c.

The **TAE..RT** contactors have ring tongue terminals and are designed to operate in control circuits with large voltage variations.

Example: battery supply.

Description

The **AE..RT** series 3-pole contactors are d.c. operated contactors.

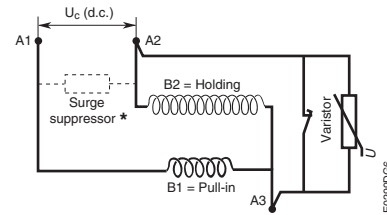
The **TAE..RT** series 3-pole contactors are d.c. operated contactors with large coil voltage range.

- Main poles and auxiliary contact blocks
 - 3 main poles,
 - front-mounted add-on auxiliary contact blocks.
- Control circuit: laminated magnet circuit and double-winding coil fed from d.c. supply via an insertion contact mounted on the device
 - AE 50..RT ... AE 75..RT, TAE 50..RT, TAE 75..RT: side mounted add-on lagging contact, for insertion of the second winding (factory mounted).
- Accessories: a wide range of accessories are available (see page 37).

Variants

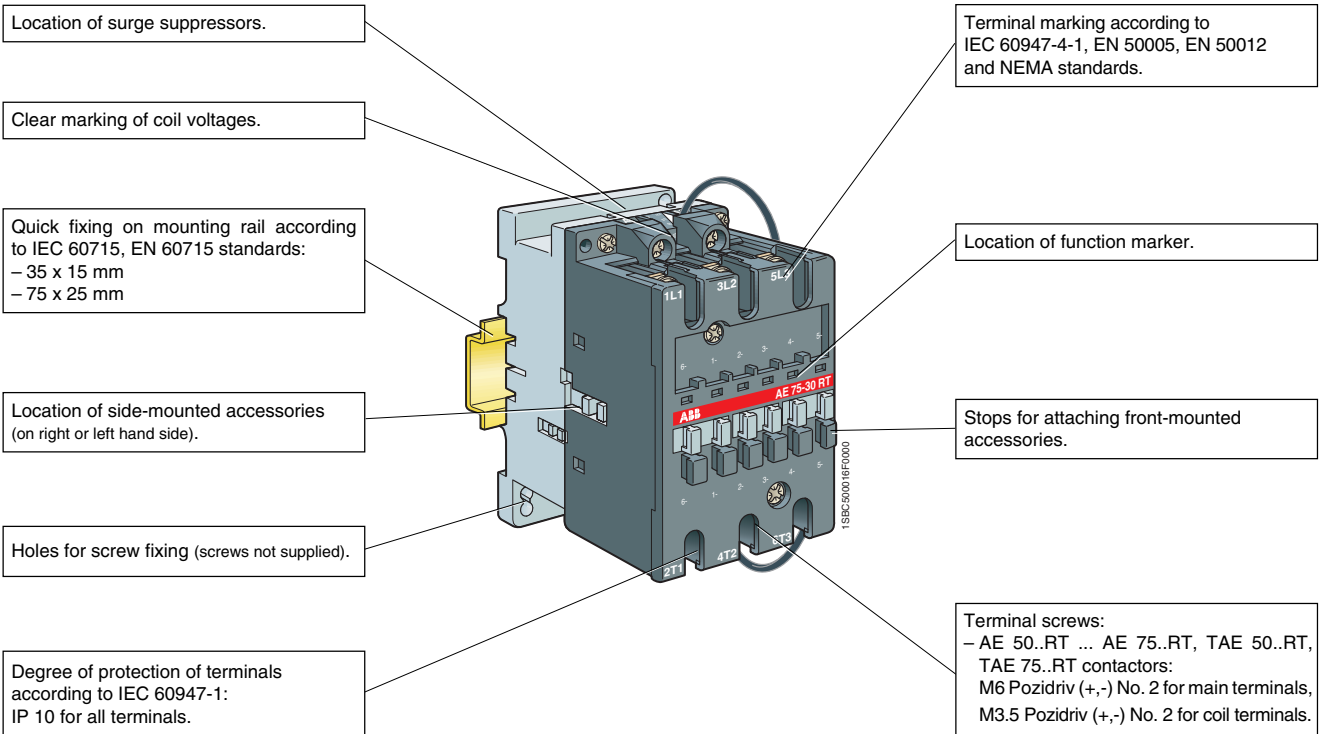
- 4 N.O. main poles: AE 45..RT ... AE 75..RT,
- 4 N.O. main poles: TAE 45..RT, TAE 75..RT.

* Extra RV 5 (or RT 5) surge suppressor can be added on to the "Pull-in" winding, if required. Please order separately (see page 37).



AE..RT and TAE..RT contactors

– Add-on lagging contact block (factory mounted) with built-in varistor for insertion of the "holding winding"





AE..RT and TAE..RT 3-pole Contactors

d.c. Operated with Double-Winding Coil



AE 75-30-00RT

1SBC5 9010 4FV004



TAE 50-30-00RT

1SBC5 81 83 3FC0371

Ordering Details

IEC	UL/CSA		Auxiliary contacts fitted	Type	Order code	Weight kg
AC-3 Rated power 400 V kW	AC-1 Rated current $\theta \leq 40^\circ\text{C}$ A	3-Phase motor rating 480 V hp	General use rating 600 V A	state coil voltage <input type="text"/> (see table below)	state coil voltage code <input type="text"/> <input type="text"/> (see table below)	Pack ^{ing} 1 piece

3-pole Contactors

22	100	40	80	--	AE 50-30-00RT <input type="text"/>	1SBL 359 010 R <input type="text"/> <input type="text"/> 00	1.200
30	115	60	90	--	AE 63-30-00RT <input type="text"/>	1SBL 379 010 R <input type="text"/> <input type="text"/> 00	1.200
37	125	60	105	--	AE 75-30-00RT <input type="text"/>	1SBL 419 010 R <input type="text"/> <input type="text"/> 00	1.200

3-pole Contactors - Large coil voltage range

22	100	--	--	--	TAE 50-30-00RT <input type="text"/>	1SBL 359 060 R <input type="text"/> <input type="text"/> 00	1.200
37	125	--	--	--	TAE 75-30-00RT <input type="text"/>	1SBL 419 060 R <input type="text"/> <input type="text"/> 00	1.200

Coil voltages and codes for AE..RT

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

Coil voltages and codes for TAE..RT

Voltage - U_c V d.c.	Code
<input type="text"/>	<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

⚠ Voltage tolerances (-15% and +10%) included in the U_c min. and U_c max. values for the TAE..RT contactors.



AE..RT and TAE..RT 4-pole Contactors



d.c. Operated with Double-Winding Coil



AE 45-40-00RT



TAE 75-40-00RT

Ordering Details

IEC	UL/CSA	Auxiliary contacts fitted	Type	Order code	Weight kg
AC-1 Rated current $\theta \leq 40^\circ\text{C}$	General use rating 600 V		state coil voltage <input type="text"/> (see table below)	state coil voltage code <input type="text"/> <input type="text"/> (see table below)	Pack ^{ing} 1 piece
A	A				

4 N.O. Main Poles

100	80	--	AE 45-40-00RT <input type="text"/>	1SBL 339 210 R <input type="text"/> <input type="text"/> 00	1.430
125	105	--	AE 75-40-00RT <input type="text"/>	1SBL 419 210 R <input type="text"/> <input type="text"/> 00	1.430

4 N.O. Main Poles - Large coil voltage range

100	--	--	TAE 45-40-00RT <input type="text"/>	1SBL 339 260 R <input type="text"/> <input type="text"/> 00	1.430
125	--	--	TAE 75-40-00RT <input type="text"/>	1SBL 419 260 R <input type="text"/> <input type="text"/> 00	1.430

Coil voltages and codes for AE..RT

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

Coil voltages and codes for TAE..RT

Voltage - U_c V d.c.	Code
<input type="text"/>	<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

Voltage tolerances (-15% and +10%) included in the U_c min. and U_c max. values for the TAE..RT contactors.



AF 50..RT ... AF 75..RT 3-pole Contactors

a.c. / d.c. Operated - Electronic Coil Interface



Application

AF 50..RT ... AF 75..RT contactors are mainly used for controlling 3-phase motors and generally for controlling power circuits up to 690 V a.c. and 220 V d.c. The contactors can also be used for many other applications such as bypass, capacitor switching, lighting, d.c. power circuits...

The **AF..RT** contactors are fitted with an electronic coil interface which accepts a wide control voltage range, on a.c. 50/60 Hz or d.c. supplies. The same contactor can accept various supply voltages according to the different countries where the final machine will be used or if there is fluctuations in the control voltage due to the local supply or network.

The **AF..RT** contactors have ring tongue terminals and are also fully suitable for operation in a.c. or d.c. control circuit liable to voltage interruptions or voltage dip risks.

Description

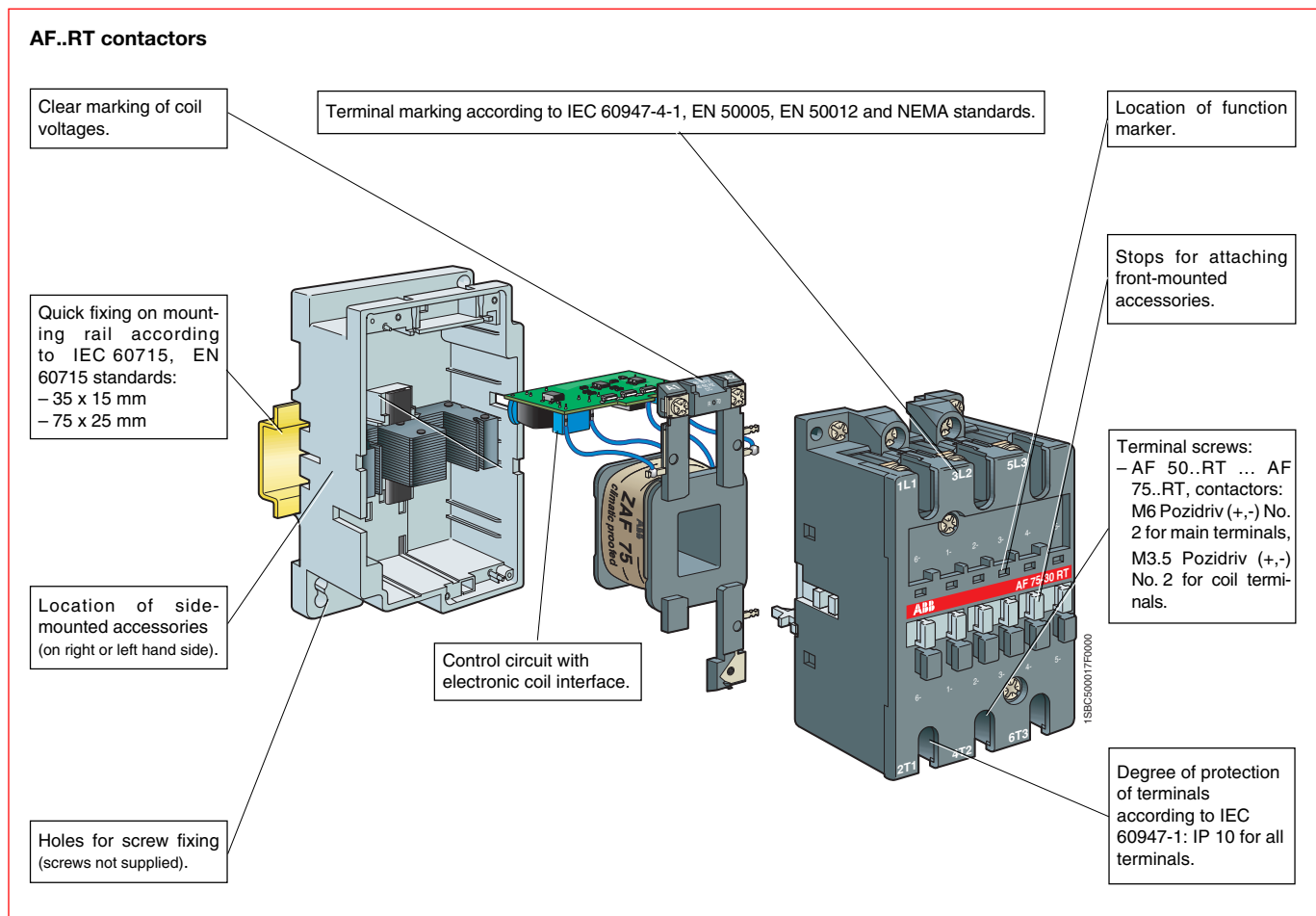
The **AF 50..RT ... AF 75..RT** 3-pole contactors are of the block type design.

- Main poles and auxiliary contact blocks
 - 3 main poles,
 - front-mounted add-on auxiliary contact blocks.
- Electronic control:

The contactors are fitted with an electronic interface that very precisely controls the voltage to the coil. The electronic control circuit always works using d.c. current through the coil and in a.c. operation the current is rectified before being applied to the coil. To achieve the current levels required for making and holding respectively, the voltage is pulsed across the coil with the aid of a transistor. The pulsing also implies that the current in the coil can be optimally regulated all the time relatively independently of the voltage level. The function is controlled by a specific integrated circuit developed by **ABB**.

Advantages

- Wide voltage range, e.g. 100 ... 250 V a.c. and d.c.,
- Can manage large voltage variations,
- Reduced power consumption,
- Very distinct closing and opening,
- Noise free,
- Can withstand voltage interruptions or voltage dips in the control supply (≤ 20 ms).
- Accessories: a wide range of accessories are available (☞ page 37).





AF 50..RT ... AF 75..RT 3-pole Contactors

a.c. / d.c. Operated - Electronic Coil Interface



AF 50-30-00RT



AF 75-30-00RT

Ordering Details

IEC	UL/CSA		Auxiliary contacts fitted		Type	Order code	Weight kg
AC-3 Rated power 400 V	AC-1 Rated current $\theta \leq 40^\circ\text{C}$	3-Phase motor rating 480 V	General use rating 600 V		state coil voltage <input type="text"/> (see table below)	state coil voltage code <input type="text"/> <input type="text"/> (see table below)	Pack ^{ing} 1 piece
kW	A	hp	A				
22	100	40	80	--	AF 50-30-00RT <input type="text"/>	1SBL 357 010 R <input type="text"/> <input type="text"/> 00	1.180
30	115	60	90	--	AF 63-30-00RT <input type="text"/>	1SBL 377 010 R <input type="text"/> <input type="text"/> 00	1.180
37	125	60	105	--	AF 75-30-00RT <input type="text"/>	1SBL 417 010 R <input type="text"/> <input type="text"/> 00	1.180

Coil voltages and codes

Voltage <input type="text"/> <input type="text"/> V - 50/60Hz	Voltage <input type="text"/> <input type="text"/> V d.c.	Code <input type="text"/> <input type="text"/>
—	20 ... 60	7 2 (1)
48 ... 130	48 ... 130	6 9
100 ... 250	100 ... 250	7 0

(1) The connection polarities indicated close to the coil terminals must be respected: **A1** for the **positive** pole and **A2** for the **negative** pole.

Electromagnetic compatibility

AF..RT contactors comply with international standards IEC 60947-1 (2004-03-Ed.4.0), 60947-4-1 (2002-12-Ed.2.1) and European standards EN 60947-1, 60947-4-1.

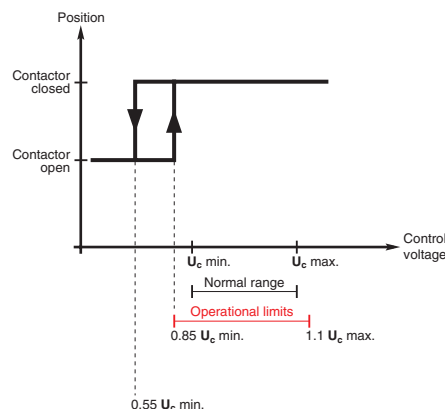
Notice: This product has been designed for **environment A**. Use of this product in **environment B** may cause unwanted electromagnetic disturbances in which case the user may be required to take adequate mitigation measures.

Definitions:

Environment A: "Mainly relates to low-voltage non public or industrial networks/locations/installations (EN 50082-2 article 4) including highly disturbing sources".

Environment B: "Mainly relates to low-voltage public networks (EN 50082-1 article 5) such as residential, commercial and light industrial locations/installations. Highly disturbing sources such as arc welders are not covered by this environment".

Operating diagram





AF 45..RT ... AF 75..RT 4-pole Contactors

a.c. / d.c. Operated - Electronic Coil Interface



AF 75-40-00RT

1SBC3 9007 7F9304

Ordering Details

IEC	UL/CSA	Auxiliary contacts fitted	Type	Order code	Weight kg
AC-1 Rated current $\theta \leq 40^\circ\text{C}$	General use rating 600 V		state coil voltage <input type="text"/> (see table below)	state coil voltage code <input type="text"/> <input type="text"/> (see table below)	Pack ^{ing} 1 piece
A	A				

4 N.O. Main Poles

100	80	--	AF 45-40-00RT <input type="text"/>	1SBL 337 210 R <input type="text"/> <input type="text"/> 00	1.420
125	105	--	AF 75-40-00RT <input type="text"/>	1SBL 417 210 R <input type="text"/> <input type="text"/> 00	1.420

Coil voltages and codes

Voltage <input type="text"/> <input type="text"/> V - 50/60Hz	Voltage <input type="text"/> <input type="text"/> V d.c.	Code <input type="text"/> <input type="text"/>
—	20 ... 60	7 2 (1)
48 ... 130	48 ... 130	6 9
100 ... 250	100 ... 250	7 0

(1) The connection polarities indicated close to the coil terminals must be respected: **A1** for the **positive** pole and **A2** for the **negative** pole.

Electromagnetic compatibility

AF..RT contactors comply with international standards IEC 60947-1 (2004-03-Ed.4.0), 60947-4-1 (2002-12-Ed.2.1) and European standards EN 60947-1, 60947-4-1.

Notice: This product has been designed for **environment A**. Use of this product in **environment B** may cause unwanted electromagnetic disturbances in which case the user may be required to take adequate mitigation measures.

Definitions:

Environment A: "Mainly relates to low-voltage non public or industrial networks/locations/installations (EN 50082-2 article 4) including highly disturbing sources".



Environment B: "Mainly relates to low-voltage public networks (EN 50082-1 article 5) such as residential, commercial and light industrial locations/installations. Highly disturbing sources such as arc welders are not covered by this environment".



AL..RT, TAL..RT Contactors

Technical Data - IEC Ratings

Main Pole - Utilization Characteristics

Contactor types: AL..RT, TAL..RT		9	12	16	26	30	40
Rated operational voltage U_e max. V		690					
Rated frequency limits Hz		25 ... 400					
Conventional free-air thermal current I_{th} acc. to IEC 60947-4-1, open contactors $\theta \leq 40^\circ\text{C}$	A	26	28	30	45	65	65
with conductor cross-sectional area	mm²	2 x 2.5	2 x 2.5	2 x 2.5	2 x 4	1 x 16	1 x 16
Rated operational current I_e / AC-1 for air temperature close to contactor							
U_e max. 690 V - 50/60 Hz	$\theta \leq 40^\circ\text{C}$	A 25	A 27	A 30	A 45	A 50	A 60
	$\theta \leq 55^\circ\text{C}$	A 22	A 25	A 27	A 40	A 45	A 55
	$\theta \leq 70^\circ\text{C}$ (1)	A 18	A 20	A 23	A 32	A 35	A 42
with conductor cross-sectional area	mm²	2 x 2.5	2 x 2.5	2 x 2.5	2 x 4	1 x 10	1 x 16
U_e max. 690 V - 50/60 Hz	$\theta \leq 40^\circ\text{C}$	A 18	A 20	A 22	A 38	–	–
	$\theta \leq 55^\circ\text{C}$	A 15	A 18	A 20	A 33	–	–
	$\theta \leq 70^\circ\text{C}$ (1)	A 13	A 15	A 17	A 27	–	–
with conductor cross-sectional area	mm²	1 x 2.5	1 x 2.5	1 x 2.5	1 x 6	–	–
Utilization category AC-3 for air temperature close to contactor $\leq 55^\circ\text{C}$							
Rated operational current I_e AC-3							
220-230-240 V	A	9	12	17	26	33	40
3-phase motors 380-400 V	A	9	12	17	26	32	37
415 V	A	9	12	17	26	32	37
440 V	A	9	12	16	26	32	37
500 V	A	9	12	14	22	28	33
690 V	A	7	9	10	13	18	21
							
Rated operational power AC-3							
1500 r.p.m. 50 Hz 220-230-240 V	kW	2.2	3	4	6.5	9	11
1800 r.p.m. 60 Hz 3-phase motors 380-400 V	kW	4	5.5	7.5	11	15	18.5
415 V	kW	4	5.5	9	11	15	18.5
440 V	kW	4	5.5	9	15	18.5	22
500 V	kW	5.5	7.5	9	15	18.5	22
690 V	kW	5.5	7.5	9	11	15	18.5
							
Rated making capacity AC-3 according to IEC 60947-4-1		10 x I_e AC-3					
Rated breaking capacity AC-3 according to IEC 60947-4-1		8 x I_e AC-3					
Short-circuit protection for contactors without thermal O/L relay - Motor protection excluded $U_e \leq 500$ V a.c. - gG type fuse	A	25	32	32	50	63	63
Rated short-time withstand current I_{cw} at 40°C ambient temp., in free air, from a cold state							
1 s	A	250	280	300	400	600	
10 s	A	100	120	140	210	400	
30 s	A	60	70	80	110	225	
1 min	A	50	55	60	90	150	
15 min	A	26	28	30	45	65	
Maximum breaking capacity $\cos \varphi = 0.45$ ($\cos \varphi = 0.35$ for $I_e > 100$ A)							
at 440 V	A	250			420	470	
at 690 V	A	100			106	175	
Heat dissipation per pole							
I_e / AC-1	W	0.8	1	1.2	1.8	2.4	3
I_e / AC-3	W	0.1	0.2	0.35	0.6	0.9	1.3
Max. electrical switching frequency							
– for AC-1	cycles/h	600					
– for AC-3	cycles/h	1200					
– for AC-2, AC-4	cycles/h	300					
Mechanical durability							
– millions of operating cycles		10					
– max. mechanical switching frequency	cycles/h	3600					

(1) Unauthorized for TAL..RT contactors.



AE..RT, TAE..RT and AF..RT Contactors

Technical Data - IEC Ratings

Main Pole - Utilization Characteristics

Contactor types: AE..RT, AF..RT TAE..RT	45	50	63	75
	45	50	-	75
Rated operational voltage U_e max. V	1000 (690 for AF..RT contactors)			
Rated frequency limits Hz	25 ... 400			
Conventional free-air thermal current I_{th} acc. to IEC 60947-4-1, open contactors $\theta \leq 40^\circ\text{C}$	A 100		125	
with conductor cross-sectional area mm²	2 x 25			
Rated operational current I_e / AC-1 for air temperature close to contactor				
U_e max. 690 V - 50/60 Hz	A 100		115	125
$\theta \leq 40^\circ\text{C}$	A 85		95	105
$\theta \leq 55^\circ\text{C}$	A 70		80	85
$\theta \leq 70^\circ\text{C}$ (2)	with conductor cross-sectional area mm² 2 x 25			
U_e max. 690 V - 50/60 Hz	A 70	80	90	95
$\theta \leq 40^\circ\text{C}$	A 60	68	75	80
$\theta \leq 55^\circ\text{C}$	A 50	55	60	65
$\theta \leq 70^\circ\text{C}$ (2)	with conductor cross-sectional area mm² 1 x 25			
Utilization category AC-3 for air temperature close to contactor $\leq 55^\circ\text{C}$				
Rated operational current I_e AC-3				
220-230-240 V	A 40	53	65	75
3-phase motors 380-400 V	A 37	50	65	75
415 V	A 37	50	65	72
440 V	A 37	45	65	70
500 V	A 33	45	55	65
690 V	A 25	35	43	46
1000 V	A -	23 (1)	25 (1)	28 (1)
Rated operational power AC-3 1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors				
220-230-240 V	kW 11	15	18.5	22
380-400 V	kW 18.5	22	30	37
415 V	kW 18.5	25	37	40
440 V	kW 22	25	37	40
500 V	kW 22	30	37	45
690 V	kW 22	30	37	40
1000 V	kW -	30 (1)	33 (1)	37 (1)
Rated making capacity AC-3 according to IEC 60947-4-1	10 x I_e AC-3			
Rated breaking capacity AC-3 according to IEC 60947-4-1	8 x I_e AC-3			
Short-circuit protection for contactors without thermal O/L relay - Motor protection excluded $U_e \leq 500$ V a.c. - gG type fuse	A 100		125	160
Rated short-time withstand current I_{cw} at 40 °C ambient temp., in free air, from a cold state				
1 s	A 1000			
10 s	A 650			
30 s	A 370			
1 min	A 250			
15 min	A 110		135	
Maximum breaking capacity $\text{COS } \varphi = 0.45$ ($\text{cos } \varphi = 0.35$ for $I_e > 100$ A)				
at 440 V	A 900		1300	
at 690 V	A 490		630	
Heat dissipation per pole				
I_e / AC-1	W 5	5	6.5	7
I_e / AC-3	W 0.65	1.3	1.5	2
Max. electrical switching frequency				
- for AC-1	cycles/h 300			
- for AC-3	cycles/h 300			
- for AC-2, AC-4	cycles/h 150			
Mechanical durability				
- millions of operating cycles	10 (5 for AE..RT and TAE..RT contactors)			
- max. mechanical switching frequency	cycles/h 3600	(300 for AF..RT contactors)		

(1) AF..RT contactors excluded



(2) Unauthorized for TAE..RT contactors



AL..RT, TAL..RT Contactors

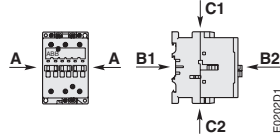
UL/CSA Ratings - Technical Data

Main Pole - Utilization Characteristics acc. to UL / CSA

Contactor types: AL..RT, TAL..RT	9	12	16	26	30	40	
NEMA size	00	0	0	1	1P	-	
Rated operational voltage U_e max. V	600						
General use I_e for air temperature close to contactor U_e max. 600 V $\theta \leq 40$ °C	A	21	25	30	40	50	60
Amp motor ratings 3-phase motors							
	{ 240 V A 480 V A 600 V A	6.8	9.6	15.2	28	28	42
		7.6	11	14	27	34	40
		9	11	17	27	32	41
hp motor ratings 3-phase motors							
	{ 240 V hp 480 V hp 600 V hp	2	3	5	10	10	15
		5	7.5	10	20	25	30
		7.5	10	15	25	30	40
Max. electrical switching frequency – for General use	cycles/h	600					
– for Motor use	cycles/h	1200					

General Technical Data - Contactors with Ring Tongue Terminals

Contactor types: AL..RT, TAL..RT	9	12	16	26	30	40
Rated insulation voltage U_i according to IEC 60947-4-1	V 690					
according to UL/CSA	V 600					
Rated impulse withstand voltage U_{imp}. kV	6					
Standards	Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1					
Certifications - Approvals	UL, CSA					
Air temperature close to contactor – without thermal O/L relay	°C -40 to +70 (55°C for TAL..RT)					
– for storage	°C -60 to +80					
Climatic withstand	acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II					
Operating altitude	m ≤ 3000					
Shock withstand 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					
	Shock direction	Closed position	Open position			
	A	20 g	10 g			
	B1	15 g	5 g			
	B2	10 g	10 g			
	C1	20 g	8 g			
	C2	14 g	8 g			



Specific Technical Data - Traction Application

The railway market usually has specific requirements about protect characteristics such as a large voltage range or ring tongue terminals. Specific tests are also required to ensure the product is capable of operating within a rolling stock application. The following data relates to the main railway requirements, other test results are available upon request.



Contactor types: TAL..RT	9	12	16	26	30	40
Standards	Devices complying with international standards IEC 60077 and NFF 62000					
Fire and smoke tests	In accordance with NFF 16101, NFF 16102 severity level 2 In accordance with ASTM E662 and ASTM E162					
Vibration withstand	In accordance with IEC 61373, severity category 1, class B, 0.8 g on all three axis					
Shock withstand	In accordance with IEC 61373, 5 g / 30 ms on all three axis					




AE..RT, TAE..RT, AF..RT Contactors

UL/CSA Ratings - Technical Data

Main Pole - Utilization Characteristics acc. to UL / CSA

Contactor types: AE..RT, AF..RT	45	50	63	75															
TAE..RT	45	50	-	75															
NEMA size	2	2	-	3															
Rated operational voltage U_g max. V	600																		
General use I_g for air temperature close to contactor U_g max. 600 V $\theta \leq 40^\circ\text{C}$ A	80	90	105																
Amp motor ratings 3-phase motors	 <table> <tr> <td>240 V A</td> <td>54</td> <td>68</td> <td colspan="2">80</td> </tr> <tr> <td>480 V A</td> <td>52</td> <td>77</td> <td colspan="2"></td> </tr> <tr> <td>600 V A</td> <td>52</td> <td>77</td> <td colspan="2"></td> </tr> </table>				240 V A	54	68	80		480 V A	52	77			600 V A	52	77		
240 V A	54	68	80																
480 V A	52	77																	
600 V A	52	77																	
hp motor ratings 3-phase motors	 <table> <tr> <td>240 V hp</td> <td>20</td> <td>25</td> <td colspan="2">30</td> </tr> <tr> <td>480 V hp</td> <td>40</td> <td>60</td> <td colspan="2"></td> </tr> <tr> <td>600 V hp</td> <td>50</td> <td>75</td> <td colspan="2"></td> </tr> </table>				240 V hp	20	25	30		480 V hp	40	60			600 V hp	50	75		
240 V hp	20	25	30																
480 V hp	40	60																	
600 V hp	50	75																	
Max. electrical switching frequency																			
- for General use cycles/h	300																		
- for Motor use cycles/h	300																		

General Technical Data - Contactors with Ring Tongue Terminals

Contactor types: AE..RT, AF..RT	45	50	63	75
TAE..RT	45	50	-	75
Rated insulation voltage U_i according to IEC 60947-4-1 V	1000			
according to UL/CSA V	600			
Rated impulse withstand voltage U_{imp} kV	8			
Standards	Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1			
Certifications - Approvals	UL, CSA (AE..RT and AF..RT)			
Air temperature close to contactor	 "Conditions for use" page 23, for control voltage limits and authorized mounting positions - without thermal O/L relay $^\circ\text{C}$ -40 to +70 (55 $^\circ\text{C}$ for TAE..RT) - for storage $^\circ\text{C}$ -60 to +80			
Climatic withstand	acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II			
Operating altitude m	≤ 3000			
Shock withstand 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 Shock direction Closed position Open position A 20 g 20 g B1 10 g 5 g B2 15 g 15 g C1 20 g 20 g C2 20 g 20 g			

Specific Technical Data - Traction Application

The railway market usually has specific requirements about protect characteristics such as a large voltage range or ring tongue terminals. Specific tests are also required to ensure the product is capable of operating within a rolling stock application. The following data relates to the main railway requirements, other test results are available upon request.

Contactor types: TAE..RT	45	50	-	75
Standards	Devices complying with international standards IEC 60077 and NFF 62000			
Fire and smoke tests	In accordance with NFF 16101, NFF 16102 severity level 2 In accordance with ASTM E662 and ASTM E162			
Vibration withstand	In accordance with IEC 61373, severity category 1, class B, 0.8 g on all three axis			
Shock withstand	In accordance with IEC 61373, 5 g / 30 ms on all three axis			



AL..RT, TAL..RT Contactors



Technical Data

Magnet System Characteristics for AL..RT Contactors

Contactor types: AL..RT (3 W / 3.5 W)	9	12	16	26	30	40
Rated control circuit voltage U_c V d.c.	12 ... 250					
Coil operating limits according to IEC 60947-4-1	$\theta \leq 55\text{ °C}$					
	0.85 ... 1.1 U_c					
Drop-out voltage in % of U_c	approx. 10 ... 30 %					
Coil consumption - Average values						
- pull-in value W	3.0			3.5		
- holding value W	3.0			3.5		
Coil time constant						
- open L/R ms	28			38		
- closed L/R ms	74			62		
Operating time						
between coil energization and:						
- N.O. contact closing ms	50 ... 100			55 ... 110		
- N.C. contact opening ms	20 ... 70			25 ... 75		
between coil de-energization and:						
- N.O. contact opening ms	10 ... 17 (1)			12 ... 18 (1)		
- N.C. contact closing ms	16 ... 27 (1)			18 ... 28 (1)		

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

Magnet System Characteristics for TAL..RT Contactors

Contactor types: TAL..RT	9	12	16	26	30	40
Rated control circuit voltage U_c V d.c.	9 ... 264					
Coil operating limits according to IEC 60947-4-1	$\theta \leq 55\text{ °C}$					
	$U_c \text{ min ... } U_c \text{ max}$					
Drop-out voltage in % of U_c max.	approx. 9 ... 25 %					
Coil consumption at pull-in and holding						
- U_c max. W	8.5			9		
- U_c min. W	2.5			2.7		
- U_c W	5			5.4		
Coil time constant						
- open L/R ms	28			38		
- closed L/R ms	74			62		
Operating time						
between coil energization and:						
- N.O. contact closing ms	50 ... 100			55 ... 110		
- N.C. contact opening ms	20 ... 70			25 ... 75		
between coil de-energization and:						
- N.O. contact opening ms	10 ... 17 (1)			12 ... 18 (1)		
- N.C. contact closing ms	16 ... 27 (1)			18 ... 28 (1)		

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



AE..RT, TAE..RT Contactors

Technical Data



Magnet System Characteristics for AE..RT Contactors

Contactor types: AE..RT	45	50	63	75
Rated control circuit voltage U_c V d.c.	12 ... 250			
Coil operating limits according to IEC 60947-4-1	$\theta \leq 55\text{ °C}$ 0.85 ... 1.1 U_c			
Drop-out voltage in % of U_c	approx. 15 ... 40 %			
Coil consumption - Average values				
– pull-in value W	200			
– holding value W	4			
Coil time constant				
– open L/R ms	3			
– closed L/R ms	15			
Operating time				
between coil energization and:				
– N.O. contact closing ms	13 ... 30			
– N.C. contact opening ms	10 ... 27			
between coil de-energization and:				
– N.O. contact opening ms	5 ... 15 (1)			
– N.C. contact closing ms	8 ... 18 (1)			

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

Magnet System Characteristics for TAE..RT Contactors

Contactor types: TAE..RT	45	50	–	75
Rated control circuit voltage U_c V d.c.	17 ... 264			
Coil operating limits according to IEC 60947-4-1	$\theta \leq 55\text{ °C}$ $U_c \text{ min} \dots U_c \text{ max}$			
Drop-out voltage in % of $U_c \text{ max.}$	approx. 10 ... 35 %			
Coil consumption values for $U_c \text{ min.} \dots U_c \text{ max.}$				
– pull-in value W	120 ... 250			
– holding value W	1.7 ... 6.5			
Coil time constant				
– open L/R ms	3			
– closed L/R ms	15			
Operating time				
between coil energization and:				
– N.O. contact closing ms	13 ... 30			
– N.C. contact opening ms	10 ... 27			
between coil de-energization and:				
– N.O. contact opening ms	5 ... 15 (1)			
– N.C. contact closing ms	8 ... 18 (1)			

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



AF..RT Contactors

Technical Data



Magnet System Characteristics for AF..RT Contactors

Contactor types: AF..RT		45	50	63	75
Rated control circuit voltage U_c					
- at 50 Hz	V	48 ... 250			
- at 60 Hz	V	48 ... 250			
- d.c.	V	20 ... 250			
Coil operating limits		$\theta \leq 70 \text{ }^\circ\text{C}$			
according to IEC 60947-4-1		0.85 U_c min. ... 1.1 U_c max.			
Drop-out voltage in % of U_c min.		55 %			
Coil consumption - Average values					
Average pull-in value		50 Hz	VA	210	
		60 Hz	VA	210	
		d.c.	W	190	
Average holding value		50 Hz	VA/W	7 / 2.8	
		60 Hz	VA/W	7 / 2.8	
		d.c.	W	2.8	
Operating time					
between coil energization and:					
- N.O. contact closing	ms	30 ... 100			
- N.C. contact opening	ms	27 ... 95			
between coil de-energization and:					
- N.O. contact opening	ms	30 ... 110			
- N.C. contact closing	ms	35 ... 115			



AL..RT, TAL..RT Contactors

Technical Data

Built-in Auxiliary Contacts (1-stack) - Utilization Characteristics

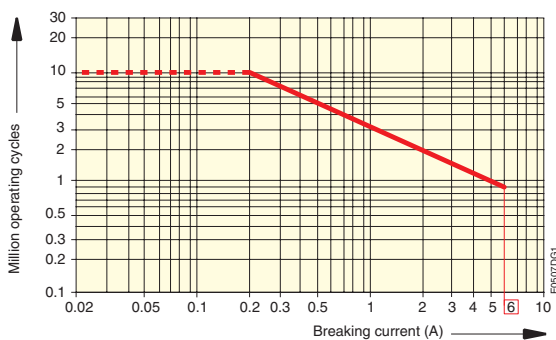
Contactors types: AL..RT, TAL..RT		9	12	16	26	30	40
Rated operational voltage U_e max. V a.c.		690					
Conventional free air thermal current $I_{th} - \theta \leq 40^\circ\text{C}$	A	16 (1 x 2.5 mm ²)					
Rated frequency limits	Hz	25 ... 400					
Rated operational current I_e according to IEC 60947-5-1 in a.c. 50/60 Hz		AC-15					
24 to 127 V	A	6					
220 to 240 V	A	4					
380 to 440 V	A	3					
500 V	A	2					
690 V	A	2					
in d.c.		DC-13					
24 V	A / W	6 / 144					
48 V	A / W	2.8 / 134					
72 V	A / W	2 / 144					
110 V	A / W	1.1 / 121					
125 V	A / W	1.1 / 138					
220 V	A / W	0.55 / 121					
250 V	A / W	0.55 / 138					
Rated making capacity acc. to IEC 60947-5-1		10 x I_e AC-15					
Rated breaking capacity acc. to IEC 60947-5-1		10 x I_e AC-15					
Short circuit protection gG type fuses	A	10					
Rated short-time withstand current I_{cw}							
1.0 s	A	100					
0.1 s	A	140					
Minimum switching capacity V / mA		17 / 5 (with a failure rate of $\leq 10^{-6}$ according to IEC 60947-5-4)					
Non-overlapping time between N.O. and N.C. contacts	ms	≥ 2					
Heat dissipation per pole at 6 A	W	0.1					

Electrical Durability for AC-15 Utilization Category

AC-15 utilization category according to IEC 60947-5-1 / EN 60947-5-1:
 – making current: $10 \times I_e$ with $\cos \varphi = 0.7$ and U_e
 – breaking current: I_e with $\cos \varphi = 0.4$ 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 690 V, 40 ... 60 Hz.



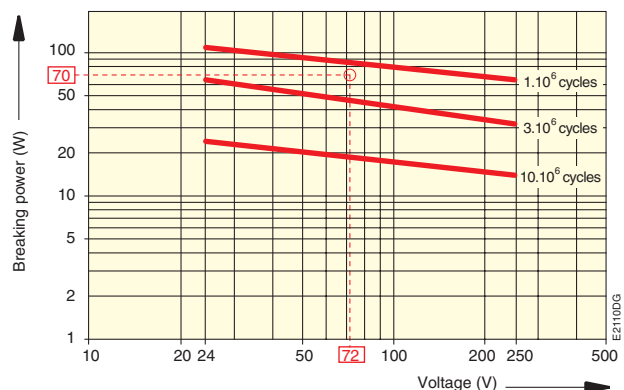
– AL..RT and TAL..RT contactor built-in auxiliary contacts
 – 4-pole CA 5-..RT add-on auxiliary contact blocks

Electrical Durability for DC-13 Utilization Category

DC-13 utilization category according to IEC 60947-5-1 / EN 60947-5-1:
 making and breaking current: I_e with U_e value.

Example: Control of d.c. electro-magnet: U_e voltage = 72 V d.c. and breaking power = 70 W.

On the opposite curve at intersection "O" 72 V / 70 W the corresponding value for the electrical durability is approximately 2.10^6 cycles.



– AL..RT and TAL..RT contactor built-in auxiliary contacts
 – 4-pole CA 5-..RT add-on auxiliary contact blocks



AL / TAL / AE / TAE / AF..RT Contactors

Technical Data

Mounting Characteristics

Contactor types:	9	12	16	26	30	40	45	50	63	75
Mounting distances	Contactors can be assembled side by side except TAL..RT at $20^{\circ}\text{C} \leq \theta \leq 55^{\circ}\text{C}$, see table below.									
	Pos. 1, 2, 5					Pos. 3, 4				
Fixing	35 x 7.5 mm					35 x 15 mm				
on rail	according to IEC 60715 and EN 60715					75 x 25 mm				
by screws (not supplied)	2 x M4					2 x M6				

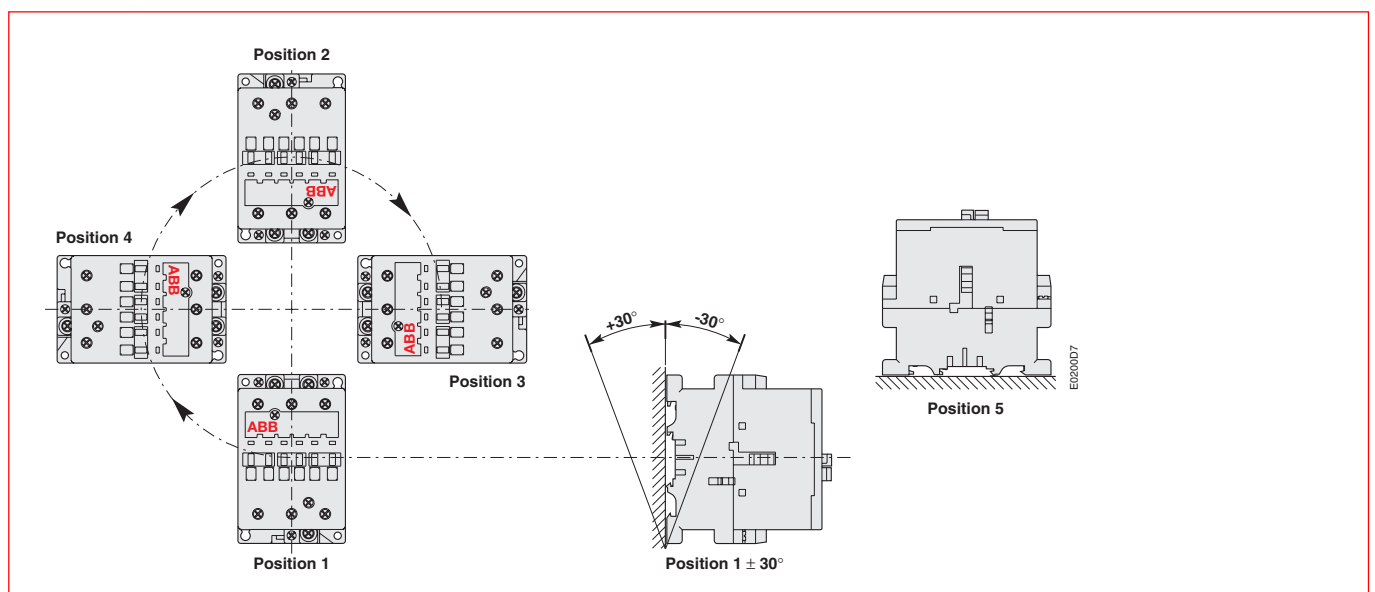
Conditions for Use

The contactor utilization conditions relating to the mounting position, ambient temperature and control voltage operating limits are summarized in the table below.

Contactors	Mounting position	Ambient temperature	Control voltage
AL9..RT ... AL40..RT	1, $1 \pm 30^{\circ}$, 2, 3, 4, 5 (1)	$\leq 55^{\circ}\text{C}$ $55 \dots 70^{\circ}\text{C}$	$0.85 \dots 1.1 \times U_c$ U_c
TAL9..RT... TAL40..RT	1, $1 \pm 30^{\circ}$, 2, 3, 4, 5 (1)	$\leq 55^{\circ}\text{C}$	$U_c \text{ min.} \dots U_c \text{ max.}$
AE45..RT ... AE75..RT	1, $1 \pm 30^{\circ}$, 2, 3, 4, 5	$\leq 55^{\circ}\text{C}$ $55 \dots 70^{\circ}\text{C}$	$0.85 \dots 1.1 \times U_c$ U_c
	6	$\leq 55^{\circ}\text{C}$ $> 55^{\circ}\text{C}$ unauthorized	$0.95 \dots 1.1 \times U_c$ -
TAE45..RT ... TAE75..RT	1, $1 \pm 30^{\circ}$, 2, 3, 4, 5	$\leq 55^{\circ}\text{C}$ $> 55^{\circ}\text{C}$ unauthorized	$U_c \text{ min.} \dots U_c \text{ max.}$ -
	6 unauthorized	-	-
AF45..RT ... AF75..RT	1, $1 \pm 30^{\circ}$, 2, 3, 4, 5	$\leq 70^{\circ}\text{C}$	$0.85 U_c \text{ min.} \dots 1.1 U_c \text{ max.}$
	6 unauthorized	-	-

(1) (T)AL9-22-00RT, (T)AL16-22-00RT, (T)AL26-22-00RT not allowed in position 5.

Mounting Positions (see the above table for authorized positions)





AL..RT, TAL..RT Contactors

Technical Data

Connecting Characteristics

Contactor types: **AL..RT, TAL..RT**

9 12 16 26 30 40

Main, coil and auxiliary terminals



Conductors with insulated ring tongue cable end

Connecting capacity (min. ... max.)

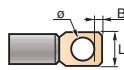
Main conductors (poles)

flexible  **mm²**

2 x 0.75 ... 2.5

2 x 1 ... 6

2 x 2.5 ... 16



Ø mm

> 3.7

> 4.2

> 5.2

L mm

≤ 7.7

≤ 10

≤ 12.5

B mm

≤ 2.2

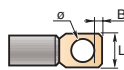
≤ 3.3

≤ 3.8

Coil conductors

flexible  **mm²**

2 x 0.75 ... 2.5



Ø mm

> 3.7


L mm

≤ 8

B mm

≤ 2.1

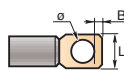
Auxiliary conductors

flexible  **mm²**

2 x 0.75 ... 2.5

2 x 0.75 ... 6

2 x 0.75 ... 2.5



Ø mm

> 3.7

> 4.2

> 3.7

L mm

≤ 7.7

≤ 10

≤ 8

B mm

≤ 2.2

≤ 3.3

≤ 2.2

Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529

Protection against direct contact acc. to VDE 0106 - Part 100

– All terminals

IP 10

Screw terminals for ring tongue cable end

(+,-) pozidriv 2 screws

– Main terminals

M 3.5

M 4

M 5

– Coil terminals

M 3.5

– Built-in aux. terminals

M 3.5

M 4

M 3.5

Tightening torque

Main pole terminals

– recommended

Nm / lb.in

1.00 / 9

1.70 / 15

2.30 / 20

– max.

Nm

1.20

2.20

2.60

Coil terminals

– recommended

Nm / lb.in

1.00 / 9

– max.

Nm

1.20

Built-in auxiliary terminals

– recommended

Nm / lb.in

1.00 / 9

1.70 / 15

1.00 / 9

– max.

Nm

1.20

2.20

1.20

Terminal marking and positioning

see page 40



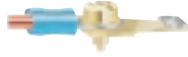
AE..RT, TAE..RT, AF..RT Contactors

Technical Data

Connecting Characteristics

Contactor types:	AE..RT, AF..RT	45	50	63	75
	TAE..RT	45	50	-	75


Main, coil and auxiliary terminals

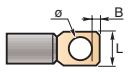


Conductors with insulated ring tongue cable end

Connecting capacity (min. ... max.)

Main conductors (poles)

flexible  **mm²**



Ø mm
L mm
B mm

2 x 6 ... 25

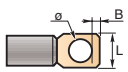
> 6

≤ 13

≤ 3.3

Coil conductors

flexible  **mm²**



Ø mm
L mm
B mm

2 x 0.75 ... 2.5

> 3.7

≤ 8

≤ 1.7

Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529

Protection against direct contact acc. to VDE 0106 - Part. 100

– All terminals

IP 10

Screw terminals for ring tongue cable end

– Main terminals

(+,-) pozidriv 2 screws

– Built-in aux. terminals

M 6

M 3.5

Tightening torque

Main pole terminals

– recommended

Nm / lb.in

4.00 / 40

– max.

Nm

4.50

Coil terminals

– recommended

Nm / lb.in

1.00 / 9

– max.

Nm

1.20

Terminal marking and positioning

see page 41

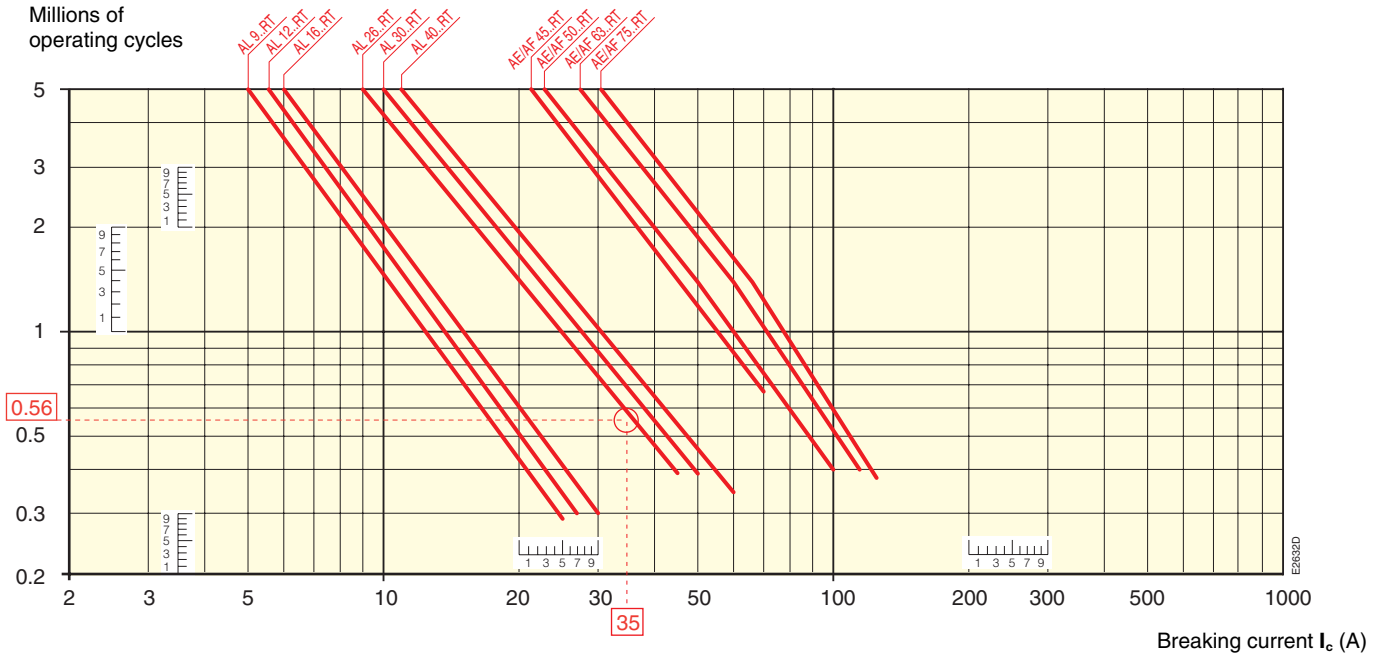


AL..RT, AE..RT, AF..RT Contactors

Electrical Durability

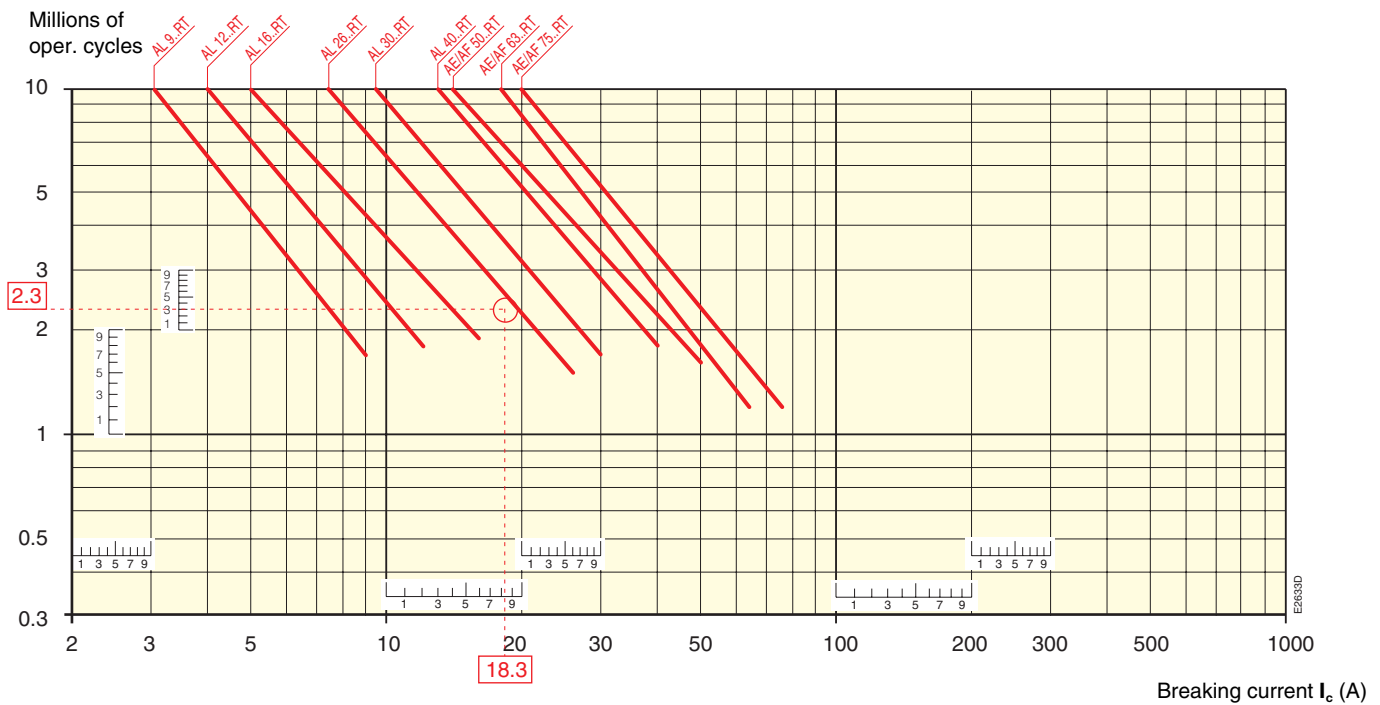
Electrical Durability for AC-1 Utilization Category $U_e \leq 690 V$. Ambient Temperature $\leq 55^\circ C$

Switching non-inductive or slightly inductive loads. The breaking current I_b for AC-1 is equal to the rated operational current of the load.



Electrical Durability for AC-3 Utilization Category - $U_e \leq 500 V$. Ambient Temperature $\leq 55^\circ C$

Switching cage motors: starting and switching off running motors. The breaking current I_b for AC-3 is equal to the rated operational current I_e ($I_b = I_e = \text{motor full load current}$).



NL..RT Contactor Relays



d.c. operated






4-pole, 1-stack

d.c. operated

Type	NL 22 ERT	NL 31 ERT	NL 40 ERT	
Main contacts	N.O. + N.C.	 2 2	 3 1	 4 0

4-pole, 1-stack




d.c. operated - Large coil voltage range

Type	TNL 22 ERT	TNL 31 ERT	TNL 40 ERT	
Main contacts	N.O. + N.C.	 2 2	 3 1	 4 0
IEC Rated operational current				
AC-15	240 V A	4		
	400 V A	3		
	690 V A	2		
DC-13	24 V A / W	6 / 144		
	250 V A / W	0.3 / 75		
UL/CSA Pilot duty		A 600, Q 300		



8-pole, 2-stack

d.c. operated

Type	TNL 44 ERT	TNL 62 ERT	TNL 80 ERT	
Main contacts	N.O. + N.C.	 4 4	 6 2	 8 0
IEC Rated operational current				
AC-15	240 V A	4		
	400 V A	3		
	690 V A	2		
DC-13	24 V A / W	6 / 144		
	250 V A / W	0.3 / 75		
UL/CSA Pilot duty		A 600, Q 300		

Main accessories

Auxiliary contacts	front mounting	CA 5-..NRT 4-pole
Surge suppressors		RT 5-.. (Transil Diode) / RV 5 (Varistor)



NL..RT, TNL..RT Contactor Relays



d.c. Operated

Application

NL..RT, TNL..RT contactor relays are the ring tongue version of the NL range and are used for switching control and auxiliary circuits. They have a low power consumption and are specially designed for strong vibrations and high reliability environments.

Their main features are:

- High connection reliability with no need to retighten the terminals on site
- Vibration proof
- TNL..RT contactor relays comply with the main railway requirements (see page 33).

Description

The NL..RT contactor relays are of the block type design.

The TNL..RT contactor relays are of the block type design with a large coil voltage range.

- Poles:
 - 1-stack contactor relays: 4-pole,
 - 2-stack contactor relays: 8-pole, with mechanically linked contact elements.
The width of 8-pole devices is identical to that of 4-pole devices; only the depth increased.
- Control circuit: d.c. operated with solid core magnet circuit and low consumption coil. The coil must be energised from a d.c. supply and the polarity (+ and -) must be respected.
- Accessories: a wide range of accessories are available.

Contactor relays designation explanation

1) NL 22 ERT

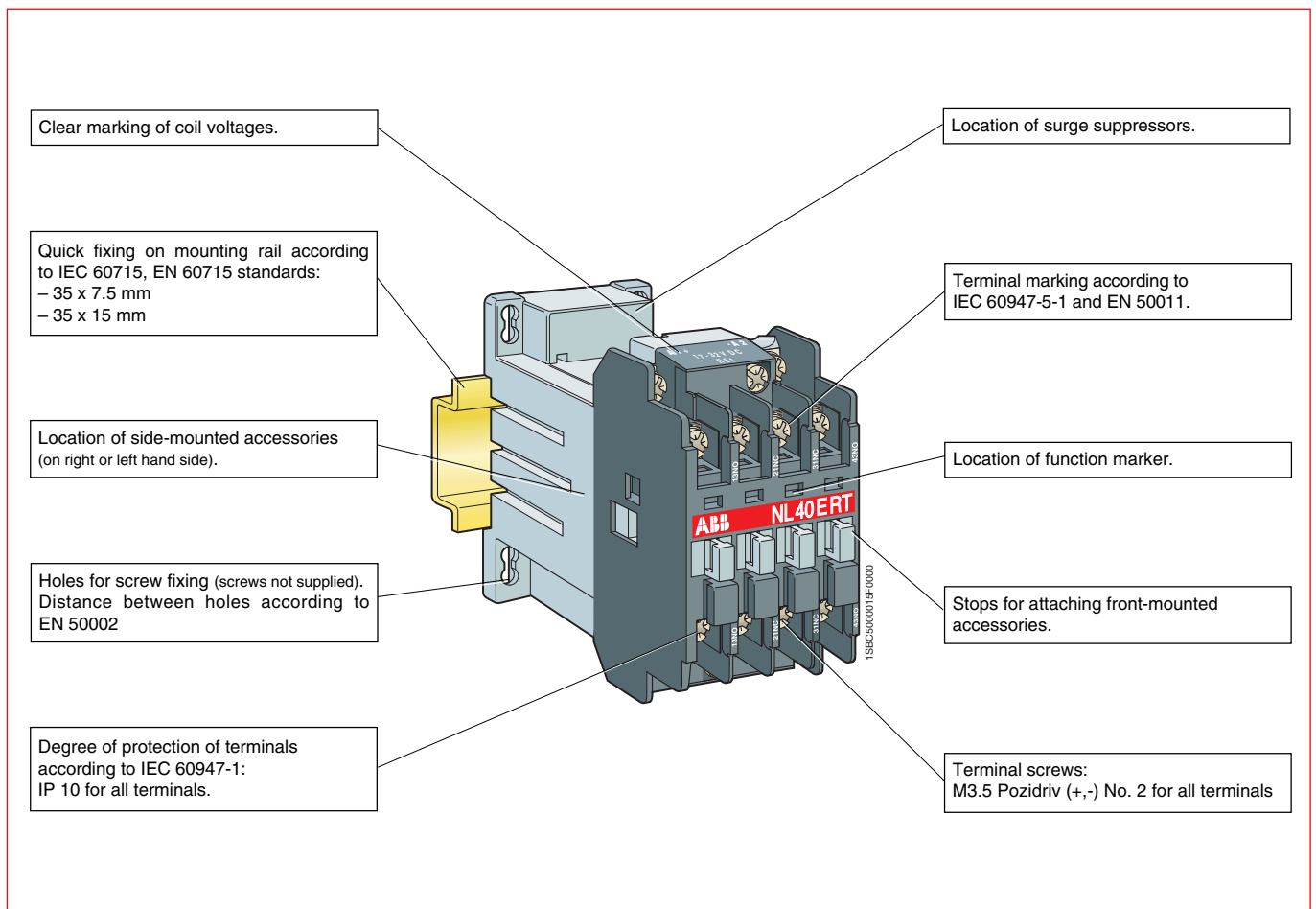
RT = Ring Tongue Terminals

2) TNL 80 ERT

T = Large coil voltage range

Blue = Standard contactor relays features

Black = Different variations according to the application





NL..RT, TNL..RT Contactor Relays

d.c. Operated



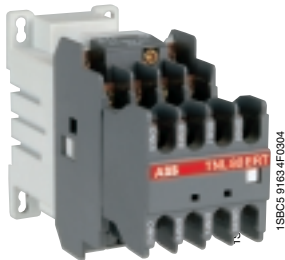
Ordering Details



NL 22 ERT



TNL 40 ERT



TNL 80 ERT

Number of contacts		Type	Order code	Weight
1 st stack	2 nd 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 ^{ing} 1 piece

4-pole, 1-stack

2	2	--	NL 22 ERT <input type="text"/>	1SBH 143 010 R <input type="text"/> <input type="text"/> 22	0.520
3	1	--	NL 31 ERT <input type="text"/>	1SBH 143 010 R <input type="text"/> <input type="text"/> 31	0.520
4	--	--	NL 40 ERT <input type="text"/>	1SBH 143 010 R <input type="text"/> <input type="text"/> 40	0.520

4-pole, 1-stack with a large coil voltage range

2	2	--	TNL 22 ERT <input type="text"/>	1SBH 143 060 R <input type="text"/> <input type="text"/> 22	0.520
3	1	--	TNL 31 ERT <input type="text"/>	1SBH 143 060 R <input type="text"/> <input type="text"/> 31	0.520
4	--	--	TNL 40 ERT <input type="text"/>	1SBH 143 060 R <input type="text"/> <input type="text"/> 40	0.520

8-pole, 2-stack with a large coil voltage range

4	--	- 4	TNL 44 ERT <input type="text"/>	1SBH 143 060 R <input type="text"/> <input type="text"/> 44	0.580
4	--	2 2	TNL 62 ERT <input type="text"/>	1SBH 143 060 R <input type="text"/> <input type="text"/> 62	0.580
4	--	4 --	TNL 80 ERT <input type="text"/>	1SBH 143 060 R <input type="text"/> <input type="text"/> 80	0.580

Coil voltages and codes NL..RT

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

Coil voltages and codes TNL..RT

Voltage V d.c.	Code
<input type="text"/>	<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

Voltage tolerances (-15% and +10%) included in the U_c min. and U_c max. values for the TNL..RT contactor relays.



Accessory compatibility for NL..RT and TNL..RT Contactor Relays

Compatibility between the Main Accessories

Contactor relay configuration	Front-mounted accessory
<p>Built-in contacts 1st Stack 2nd Stack</p> <p>Types</p>	<p>Auxiliary contact 4-pole CA 5-..NRT</p>

NL..RT Contactor Relays

NL 22 ERT (3)	2 2 0 0	1 x CA 5-..NRT (2)
NL 31 ERT	3 1 0 0	1 x CA 5-..NRT (1)
NL 40 ERT	4 0 0 0	1 x CA 5-..NRT (1)

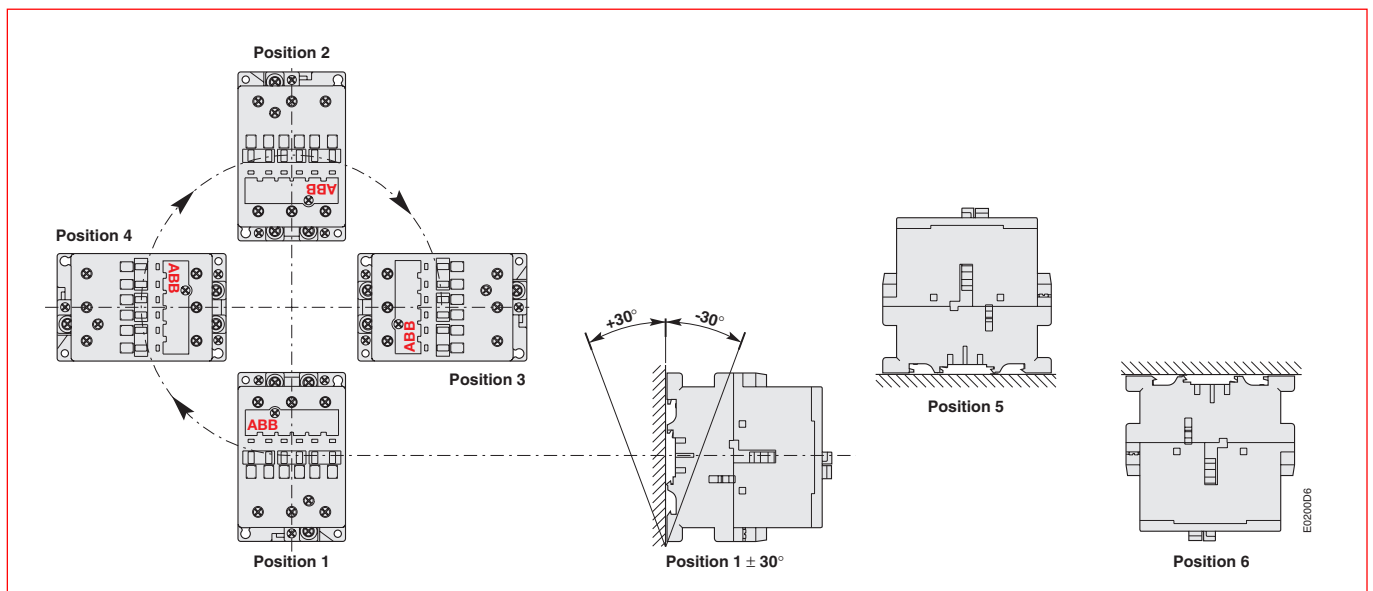
TNL..RT Contactor Relays

TNL 22 ERT (3)	2 2 0 0	1 x CA 5-..NRT (2)
TNL 31 ERT	3 1 0 0	1 x CA 5-..NRT (1)
TNL 40 ERT	4 0 0 0	1 x CA 5-..NRT (1)
TNL 44 ERT	4 0 0 4	—
TNL 62 ERT	4 0 2 2	—
TNL 80 ERT	4 0 4 0	—

(1) 2 N.C. auxiliary contacts maximum in all mounting positions except 5. In position 5 no N.C. are allowed.
 (2) 2 N.C. auxiliary contacts maximum.
 (3) Mounting in position 5 is not allowed.

Conditions for Use: Please see page 35

Mounting Positions





NL..RT, TNL..RT Contactor Relays

Technical Data

Contacts Utilization Characteristics

Contactor relay types:			NL..RT, TNL..RT
Rated operational voltage U_e max. V a.c.			690
Conventional free air thermal current $I_{th} - \theta \leq 40^\circ C$			A 16 (1 x 2.5 mm ²)
Rated frequency limits Hz			25 ... 400
Rated operational current I_e according to IEC 60947-5-1 in a.c. 50/60 Hz			AC-15
	24 to 127 V	A	6
	220 to 240 V	A	4
	380 to 440 V	A	3
	500 to 690 V	A	2
in d.c.			DC-13
	24 V	A / W	6 / 144
	48 V	A / W	2.8 / 134
	72 V	A / W	1 / 72
	110 V	A / W	0.55 / 60
	125 V	A / W	0.55 / 69
	220 V	A / W	0.3 / 66
	250 V	A / W	0.3 / 75
Rated making capacity acc. to IEC 60947-5-1			10 x I_e AC-15
Rated breaking capacity acc. to IEC 60947-5-1			10 x I_e AC-15
Short circuit protection $U_e \leq 500$ V a.c. - gG type fuses			A 10
Rated short-time withstand current I_{cw} at 40 °C ambient temp., in free air, from a cold state			1.0 s A 100 0.1 s A 140
Minimum switching capacity V / mA			17 / 5 (with a failure rate of $\leq 10^{-6}$ according to IEC 60947-5-4)
Heat dissipation per pole at 6 A W			0.1
Max. electric switching frequency cycles/h			1200
Mechanical durability			
– millions of operating cycles			> 20
– max. mechanical switching frequency cycles/h			6000

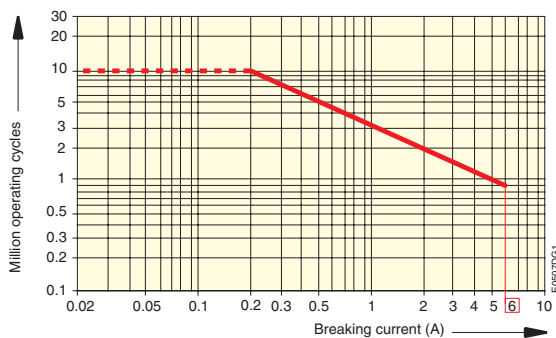
Electrical Durability for AC-15 Utilization Category

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

- making current: $10 \times I_e$ with $\cos \varphi = 0.7$ and U_e
- breaking current: I_e with $\cos \varphi = 0.4$ 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 690 V, 40 ... 60 Hz.



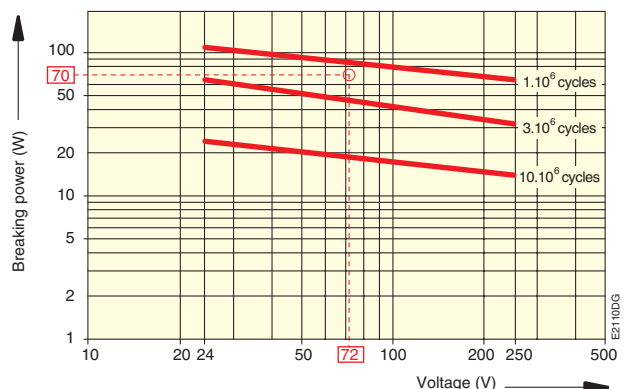
- NL..RT and TNL..RT contactor relays
- 4-pole CA 5-..RT add-on auxiliary contact blocks

Electrical Durability for DC-13 Utilization Category

DC-13 utilization category according to IEC 60947-5-1 / EN 60947-5-1: making and breaking current: I_e with U_e value.

Example: Control of d.c. electro-magnet: U_e voltage = 72 V d.c. and breaking power = 70 W.

On the opposite curve at intersection "O" 72 V / 70 W the corresponding value for the electrical durability is approximately 2.10^6 cycles.



- NL..RT and TNL..RT contactor relays
- 4-pole CA 5-..RT add-on auxiliary contact blocks

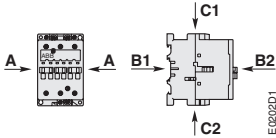


NL..RT, TNL..RT Contactor Relays

Technical Data

General Technical Data - Contactor Relays with Ring Tongue Terminals

Contactor relay types:	NL..RT, TNL..RT	
Rated insulation voltage U_i according to IEC 60947-4-1	V	690
according to UL/CSA	V	600
Rated impulse withstand voltage U_{imp}	kV	6
Standards	Devices complying with international standards IEC 60947-5-1 / 60947-4-1 and European standards EN 60947-5-1 / 60947-4-1	
Certifications - Approvals	UL, CSA, CCC (in progress)	
Air temperature close to contactor	see "Conditions for use" page 35, for control voltage limits and authorized mounting positions	
– for operation in free air	°C	-40 to +70 (55°C for TNL..RT)
– for storage	°C	-60 to +80
Climatic withstand	acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II	
Operating altitude	m	≤ 3000
Shock withstand 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	
	Shock direction	Closed position Open position
	A	20 g 10 g
	B1	15 g 5 g
	B2	15 g 10 g
	C1	20 g 8 g
	C2	14 g 8 g



Specific Technical Data - Traction Application

The railway market usually has specific requirements about protect characteristics such as a large voltage range or ring tongue terminals. Specific tests are also required to ensure the product is capable of operating within a rolling stock application. The following data relates to the main railway requirements, other test results are available upon request.

Contactor relay types:	TNL..RT
Standards	Devices complying with international standards IEC 60077 and NFF 62000
Fire and smoke tests	In accordance with NFF 16101, NFF 16102 severity level 2 In accordance with ASTM E662 and ASTM E162
Vibration withstand	In accordance with IEC 61373, severity category 1, class B, 0.8 g on all three axis
Shock withstand	In accordance with IEC 61373, 5 g / 30 ms on all three axis



NL..RT, TNL..RT Contactor Relays

Technical Data

Magnet System Characteristics for NL..RT Contactor Relays

Contactor relay types:	NL..RT	
Rated control circuit voltage U_c V d.c.	12 ... 250	
Coil operating limits according to IEC 60947-4-1	See conditions for use page 35	
Drop-out voltage in % of U_c	approx. 10 ... 30 %	
Coil consumption - Average values		
– pull-in value W	3.0	
– holding value W	3.0	
Coil time constant		
– open L/R ms	28	
– closed L/R ms	74	
Operating time		
between coil energization and:		
– N.O. contact closing ms	50 ... 100	
– N.C. contact opening ms	20 ... 70	
between coil de-energization and:		
– N.O. contact opening ms	10 ... 17 (1)	
– N.C. contact closing ms	16 ... 27 (1)	

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

Magnet System Characteristics for TNL..RT Contactor Relays

Contactor relay types	TNL..RT	
Rated control circuit voltage U_c V d.c.	9 ... 264	
Coil operating limits according to IEC 60947-4-1	See conditions for use page 35	
Drop-out voltage in % of U_c max.	approx. 9 ... 25 %	
Coil consumption at pull-in and holding		
– U_c max. W	8.5	
– U_c min. W	2.5	
– U_c W	5	
Coil time constant		
– open L/R ms	28	
– closed L/R ms	74	
Operating time		
between coil energization and:		
– N.O. contact closing ms	50 ... 100	
– N.C. contact opening ms	20 ... 70	
between coil de-energization and:		
– N.O. contact opening ms	10 ... 17 (1)	
– N.C. contact closing ms	16 ... 27 (1)	

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



NL..RT and TNL..RT Contactor Relays

Technical Data

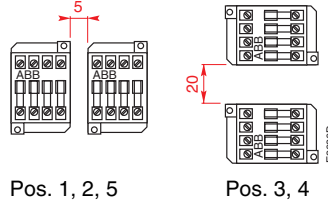
Mounting Characteristics

Contactor relay types:

Mounting distances

NL..RT, TNL..RT

Contactor can be assembled side by side except TNL..RT - at $20^{\circ}\text{C} \leq \theta \leq 55^{\circ}\text{C}$, see table below.



Fixing

on rail

according to IEC 60715 and EN 60715

by screws (not supplied)

35 x 7.5 mm

35 x 15 mm

2 x M4

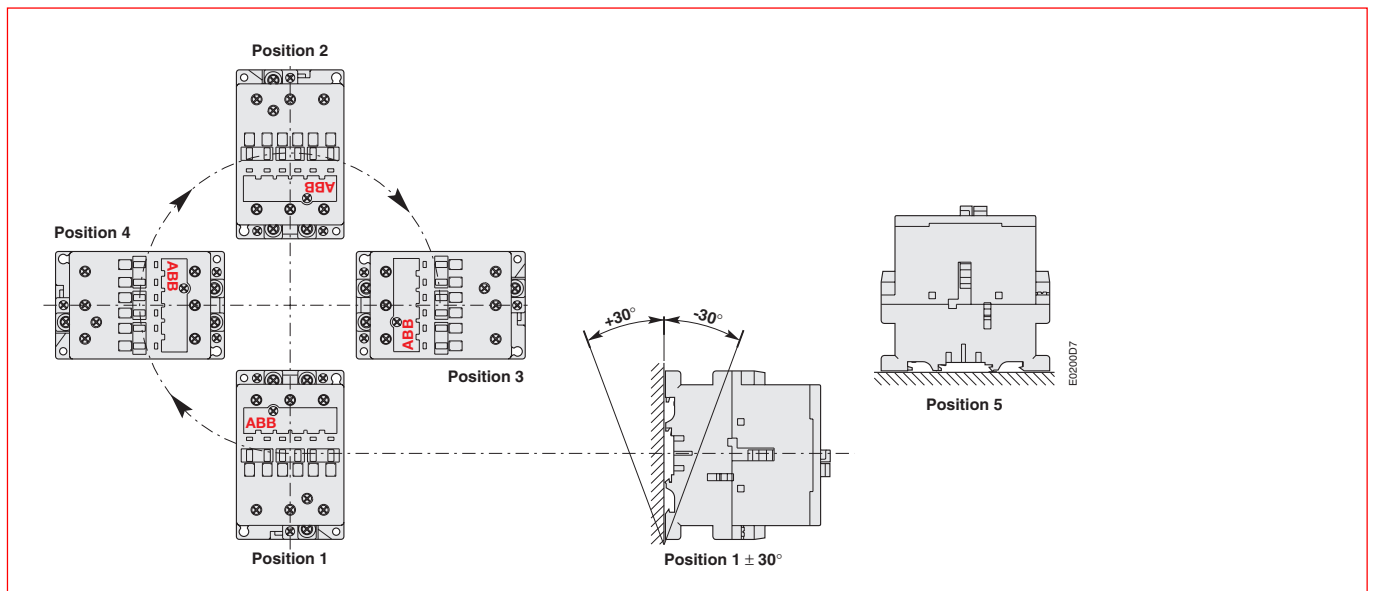
Conditions for Use

The contactor utilization conditions relating to the mounting position, ambient temperature and control voltage operating limits are summarized in the table below.

Contactor relay types	Mounting position	Ambient temperature	Control voltage
NL..RT	1, $1 \pm 30^{\circ}$, 2, 3, 4, 5 (1)	$\leq 55^{\circ}\text{C}$ $55 \dots 70^{\circ}\text{C}$	$0.85 \dots 1.1 \times U_c$ U_c
TNL..RT	1, $1 \pm 30^{\circ}$, 2, 3, 4, 5 (1)	$\leq 55^{\circ}\text{C}$	$U_c \text{ min.} \dots U_c \text{ max.}$

(1) (T)NL 22ERT not allowed in position 5.

Mounting Positions (see the above table for authorized positions)



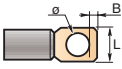

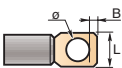




NL..RT, TNL..RT Contactor Relays

Technical Data

Connecting Characteristics

Contactor relay types	NL..RT, TNL..RT	
Poles and coil terminals	 <p>Conductors with insulated ring tongue cable end</p>	
Connecting capacity		
Pole conductors		
flexible  mm²	2 x 0.75 ... 2.5	
 Ø mm	> 3.7	
L mm	≤ 7.7	
B mm	≤ 2.2	
Coil conductors		
flexible  mm²	2 x 0.75 ... 2.5	
 Ø mm	> 3.7	
L mm	≤ 8	
B mm	≤ 2.1	
Degree of protection acc. to IEC 60947-1 / EN 60947-1 and IEC 60529 / EN 60529	IP 10	
All terminals	(+, -) pozidriv 2 screws	
Screw terminals for ring tongue cable end		
– Pole terminals	M 3.5	
– Coil terminals	M 3.5	
Tightening torque		
Pole terminals		
– recommended Nm / lb.in	1.00 / 9	
– max. Nm	1.20	
Coil terminals		
– recommended Nm / lb.in	1.00 / 9	
– max. Nm	1.20	
Terminal marking and positioning	see page 42	



AL..RT, TAL..RT, AE..RT, TAE..RT and AF..RT Contactors

Accessories



CA 5-40 ERT

1SBC5 9164 4F0302



VM 5-1

1SBE 8468 2C0001



RV 5/50

RT 5/32

1SBC5 7400 1F0301

1SBC5 7389 1F0301



BA 5-50

1SBC5 7587 4F0301

Ordering Details

Front-mounted 4-pole Auxiliary Contact Blocks

Mounting on contactors	Contacts blocks	Type	Order Code	Pack ^{ing} piece	Weight kg
					1 piece
(T)AL9 ... (T)AL26-40-00RT	$\left\{ \begin{array}{l} 4 \ 0 \\ 3 \ 1 \\ 2 \ 2 \end{array} \right.$	CA 5-40 ERT	1SBN 010 042 R1040	2	0.060
(T)AL9 ... (T)AL26-22-00RT		CA 5-31 ERT	1SBN 010 042 R1031	2	0.060
(T)AE45 ... (T)AE75..RT AF45 ... AF75..RT		CA 5-22 ERT	1SBN 010 042 R1022	2	0.060
(T)AL9...(T)AL40-30-10RT	$\left\{ \begin{array}{l} 3 \ 1 \\ 2 \ 2 \end{array} \right.$	CA 5-31 MRT	1SBN 010 042 R1131	2	0.060
		CA 5-22 MRT	1SBN 010 042 R1122	2	0.060

See the accessory compatibility table page 8.
For technical data see page 39

Interlocks

Mounting on contactors	Feature	Contacts	Type	Order Code	Pack ^{ing} piece	Weight kg
AL..RT, TAL..RT	Mechanical	- -	VM 5-1	1SBN 030 100 R1000	1	0.066

Note: Only same size contactors can be interlocked together.

Interlock compatibility between two horizontally mounted contactors

Left \ Right	(T)AL9..RT	(T)AL12..RT	(T)AL16..RT	(T)AL26..RT	(T)AL30..RT	(T)AL40..RT
(T)AL9..RT	VM5-1	VM5-1	VM5-1	-	-	-
(T)AL12..RT	VM5-1	VM5-1	VM5-1	-	-	-
(T)AL16..RT	VM5-1	VM5-1	VM5-1	-	-	-
(T)AL26..RT	-	-	-	VM5-1	VM5-1	VM5-1
(T)AL30..RT	-	-	-	VM5-1	VM5-1	VM5-1
(T)AL40..RT	-	-	-	VM5-1	VM5-1	VM5-1

Surge Suppressors

Mounting on contactors	Feature	Voltage range	Type	Order Code	Pack ^{ing} piece	Weight kg
(T)AL..RT (T)AE..RT	Varistor	24...50 V a.c./d.c.	RV 5/50	1SBN 050 010 R1000	2	0.015
		50...133 V a.c./d.c.	RV 5/133	1SBN 050 010 R1001	2	0.015
		110...250 V a.c./d.c.	RV 5/250	1SBN 050 010 R1002	2	0.015
		250...440 V a.c./d.c.	RV 5/440	1SBN 050 010 R1003	2	0.015
(T)AL..RT (T)AE..RT	Transil Diode	12...32 V d.c.	RT 5/32	1SBN 050 020 R1000	2	0.015
		25...65 V d.c.	RT 5/65	1SBN 050 020 R1001	2	0.015
		50...90 V d.c.	RT 5/90	1SBN 050 020 R1002	2	0.015
		77...150 V d.c.	RT 5/150	1SBN 050 020 R1003	2	0.015
		150...264 V d.c.	RT 5/264	1SBN 050 020 R1004	2	0.015

Function Marker

Mounting on contactors	Feature	Type	Order Code	Pack ^{ing} box	Weight kg
(T)AL..RT (T)AE..RT AF..RT	50 Pieces in a box	BA 5-50	1SBN 110 000 R1000	1	0.017

Other Accessories

Various other accessories with screw terminals can be used with the contactors with Ring Tongue terminals, these include:

- VE5-1 and VE5-2 interlock units
- CAL5-11 side-mounted auxiliary contact block
- CA5.. 1-pole auxiliary contact block
- CE5.. 1-pole auxiliary contact block
- TP.. pneumatic timer block (only (T)AE..RT and AF..RT)
- TE5S electronic timer
- TA..DU thermal overload relays (independant mounting kit DB25 required)

For technical data and accessory fitting details, please see the main catalogue.



NL..RT, TNL..RT Contactor relays

Accessories



CA 5-40 NRT

1SB03 9170 4F0304



RV 5/50

1SB03 7400 1F0301



RT 5/32

1SB03 7589 1F0301



BA 5-50

1SB03 7587 4F0301

Ordering Details

Front-mounted 4-pole Auxiliary Contact Blocks

Mounting on contactor relays	Contacts blocks	Type	Order Code	Pack ^{ing} piece	Weight kg
					1 piece
NL..RT, TNL..RT		4 0	CA 5-40 NRT	1SBN 010 042 R1240	2 0.060
		3 1	CA 5-31 NRT	1SBN 010 042 R1231	2 0.060
		2 2	CA 5-22 NRT	1SBN 010 042 R1222	2 0.060

See the accessory compatibility table page 31.

Surge Suppressors

Mounting on contactor relays	Feature	Voltage range	Type	Order Code	Pack ^{ing} piece	Weight kg
(T)NL..RT	Varistor	24...50 V a.c./d.c.	RV 5/50	1SBN 050 010 R1000	2	0.015
		50...133 V a.c./d.c.	RV 5/133	1SBN 050 010 R1001	2	0.015
		110...250 V a.c./d.c.	RV 5/250	1SBN 050 010 R1002	2	0.015
		250...440 V a.c./d.c.	RV 5/440	1SBN 050 010 R1003	2	0.015
	Transil Diode	12...32 V d.c.	RT 5/32	1SBN 050 020 R1000	2	0.015
		25...65 V d.c.	RT 5/65	1SBN 050 020 R1001	2	0.015
		50...90 V d.c.	RT 5/90	1SBN 050 020 R1002	2	0.015
		77...150 V d.c.	RT 5/150	1SBN 050 020 R1003	2	0.015
		150...264 V d.c.	RT 5/264	1SBN 050 020 R1004	2	0.015

Function Marker

Mounting on contactor relays	Feature	Type	Order Code	Pack ^{ing} box	Weight kg
NL..RT, TNL..RT	50 Pieces in a box	BA 5-50	1SBN 110 000 R1000	1	0.017


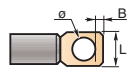
Nota: CAL5-11 with screw terminals can be used with NL..RT contactor relays. For technical data and accessory fitting details, see the main catalogue.



Auxiliary Contact Blocks

Front Mounting

Technical Data

Types		4-pole CA 5-..RT
Compliance with standards		IEC 60947-5-1 and EN 60947-5-1
Certification and approvals		UL / CSA
Rated insulation voltage U_i according to IEC 60947-5-1	V	690
according to UL / CSA	V	600
Rated operational voltage U_e	V a.c.	24 to 690
Conventional thermal current I_{th}	A	16
Rated operational current I_e according to IEC 60947-5-1 in a.c.		AC-15
24 to 127 V	A	6
220 to 240 V	A	4
380 to 440 V	A	3
500 to 690 V	A	2
in d.c.		DC-13
24 V	A / W	6 / 144
48 V	A / W	2.8 / 134
72 V	A / W	1 / 72
110 V	A / W	0.55 / 60
125 V	A / W	0.55 / 69
220 V	A / W	0.3 / 66
250 V	A / W	0.3 / 75
Short circuit protection - gG type fuses	A	10
Rated making capacity according to IEC 60947-5-1		10 x I_e AC-15
Rated breaking capacity according to IEC 60947-5-1		10 x I_e AC-15
Rated short-time withstand current I_{cw} 1 s	A	100
$\theta = 40^\circ\text{C}$ 0.1 s	A	140
Power loss per pole at 6 A	W	0.15
Min. switching capacity	V / mA	17 / 5
Mechanical durability – millions of operating cycles		10
– max. mech. switching frequency	cycles/h	3600
Electrical durability – millions of operating cycles		see page 32
– max. elec. switching frequency	cycles/h	1200
Connecting capacity (min. ... max.)		
flexible 	mm²	2 x 0.75 ... 2.5
	Ø mm	> 3.7
	L mm	≤ 7.7
	B mm	≤ 1.9
Degree of protection acc. to IEC 60529, IEC 60144, DIN 40050 and NFC 20-010		
– All terminals		IP 10
Screw terminals for ring tongue cable end – All terminals		(+,-) pozidriv 2 screws M 3.5
Tightening torque – recommended	Nm / lb.in	1.00 / 9
– max.	Nm	1.20

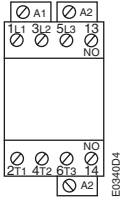


AL9..RT ... AL40..RT Contactors

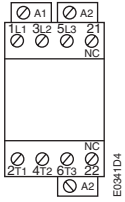
Terminal Marking and Positioning

3-pole Contactors - d.c. operated

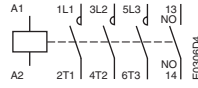
Standard devices without addition of auxiliary contacts



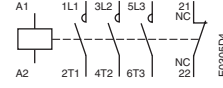
AL9 ... AL40-30-10RT
TAL9 ... TAL40-30-10RT



AL9 ... AL40-30-01RT
TAL9 ... TAL40-30-01RT

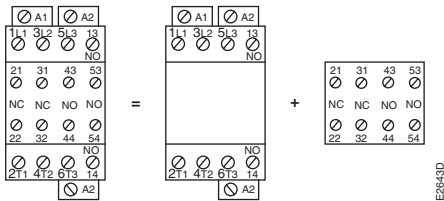


AL9 ... AL40-30-10RT
TAL9 ... TAL40-30-10RT



AL9 ... AL40-30-01RT
TAL9 ... TAL40-30-01RT

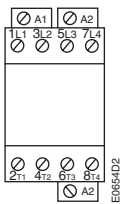
Other possible combinations with auxiliary contacts added by the user.



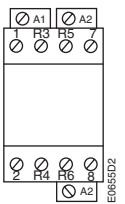
AL9 ... AL40-30-32RT = AL9 ... AL40-30-10RT + CA5-22MRT

4-pole Contactors - d.c. operated

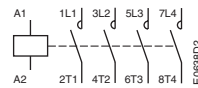
Standard devices without addition of auxiliary contacts



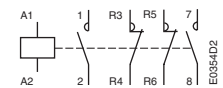
AL9 ... AL26-40-00RT
TAL9 ... TAL26-40-00RT



AL9 ... AL26-22-00RT
TAL9 ... TAL26-22-00RT

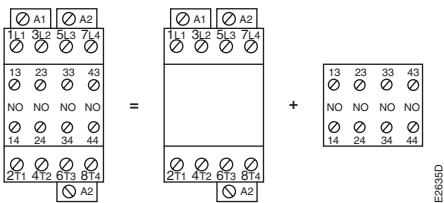


AL9 ... AL26-40-00RT
TAL9 ... TAL26-40-00RT



AL9 ... AL26-22-00RT
TAL9 ... TAL26-22-00RT

Other possible combinations with auxiliary contacts added by the user.



AL9 ... AL26-40-40RT = AL9 ... AL26-40-00RT + CA5-40ERT



AL9 ... AL26-40-40RT



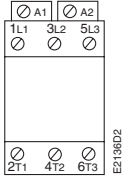
AE..RT, TAE..RT and AF..RT Contactors

Terminal Marking and Positioning

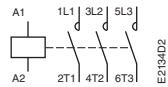
3-pole Contactors

AF 50..RT ... AF 75..RT - a.c. or d.c. operated

Standard devices without addition of auxiliary contacts



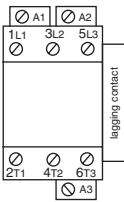
AF50 ... AF75-30-00RT



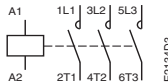
AF50 ... AF75-30-00RT

AE..RT and TAE..RT - d.c. operated

Standard devices without addition of auxiliary contacts

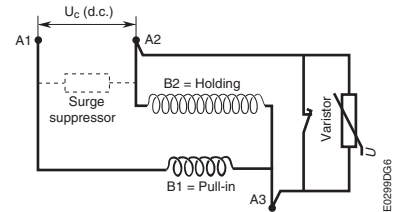


AE50 ... AE75-30-00RT
TAE50 / 75-30-00RT



AE50 ... AE75-30-00RT
TAE50 / 75-30-00RT

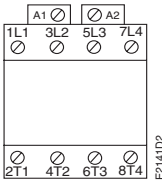
Coil Wiring for AE.., TAE..



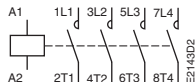
4-pole Contactors

AF 45..RT ... AF 75..RT - a.c. or d.c. operated

Standard devices without addition of auxiliary contacts



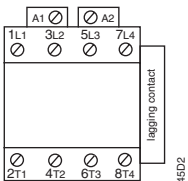
AF45 / 75-40-00RT



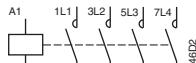
AF45 / 75-40-00RT

AE..RT and TAE..RT - d.c. operated

Standard devices without addition of auxiliary contacts

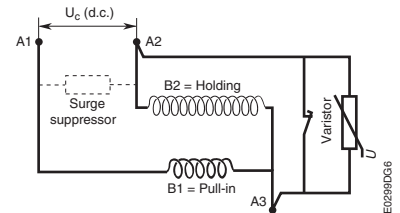


AE45 / 75-40-00RT
TAE45 / 75-40-00RT

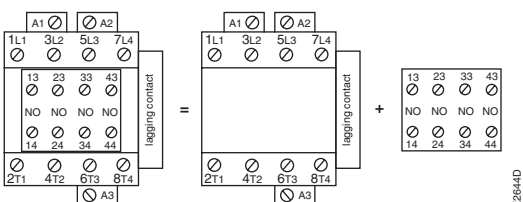


AE45 / 75-40-00RT
TAE45 / 75-40-00RT

Coil Wiring for AE.., TAE..



Other possible combinations with auxiliary contacts added by the user.



AE45 / 75-40-00RT = AE45 / 75-40-00RT + CA5-40ERT

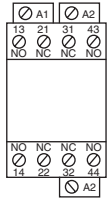


NL..RT, TNL..RT Contactor Relays

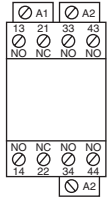
Terminal Marking and Positioning

NL..RT, TNL..RT Contactor Relays - d.c. operated

Standard devices without addition of auxiliary contacts



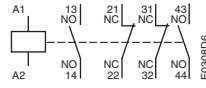
NL 22 ERT
TNL 22 ERT



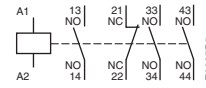
NL 31 ERT
TNL 31 ERT



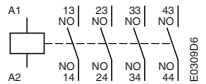
NL 40 ERT
TNL 40 ERT



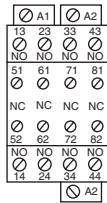
NL 22 ERT
TNL 22 ERT



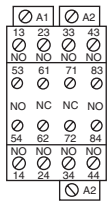
NL 31 ERT
TNL 31 ERT



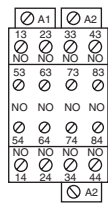
NL 40 ERT
TNL 40 ERT



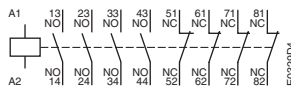
TNL 44 ERT



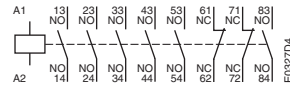
TNL 62 ERT



TNL 80 ERT



TNL 44 ERT

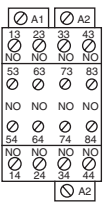


TNL 62 ERT

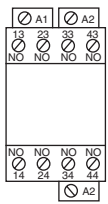


TNL 80 ERT

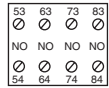
Other possible combinations with auxiliary contacts added by the user.



NL80ERT



NL40ERT



CA5-40NRT

=

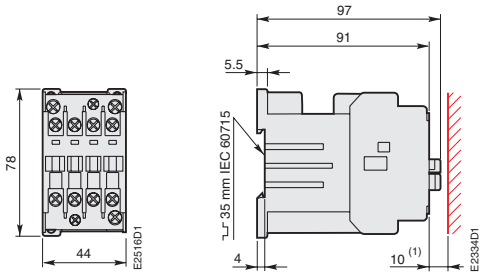
+



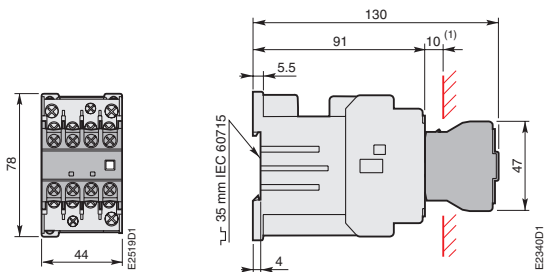
AL9..RT ... AL16..RT, TAL9..RT ... TAL16..RT 3 and 4-pole Contactors NL..RT, TNL..RT Contactor Relays



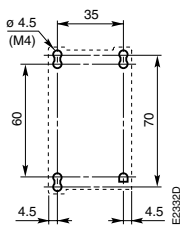
Dimensions (in mm)



AL9..RT ... AL16..RT, TAL9..RT ... TAL16..RT
NL..RT, TNL..RT



AL9..RT ... AL16..RT, TAL9..RT ... TAL16..RT
NL..RT, TNL..RT
+ CA 5..RT front-mounted 4-pole auxiliary contact block



AL9..RT ... AL16..RT, TAL9..RT ... TAL16..RT
NL..RT, TNL..RT
drilling plan

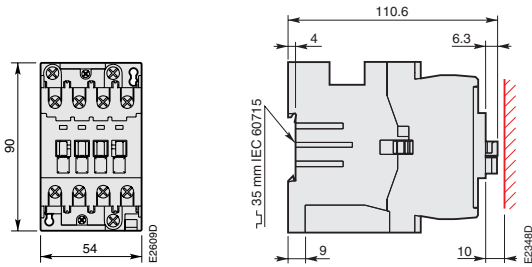
(1) Note: No recommended distance to earth is applicable to "NL..RT" contactor relays.



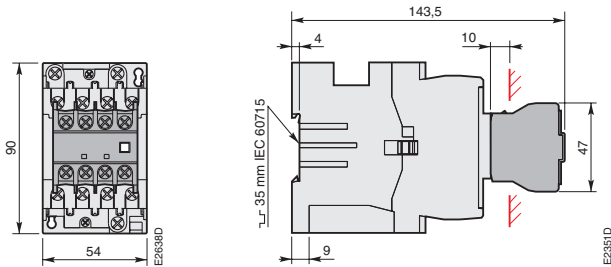
AL26..RT, TAL26..RT 3 and 4-pole Contactors



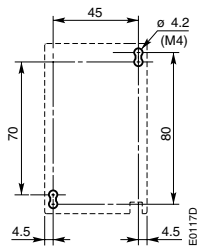
Dimensions (in mm)



AL26..RT, TAL26..RT



**AL26..RT, TAL26..RT
+ CA 5-..RT front-mounted 4-pole auxiliary contact block**



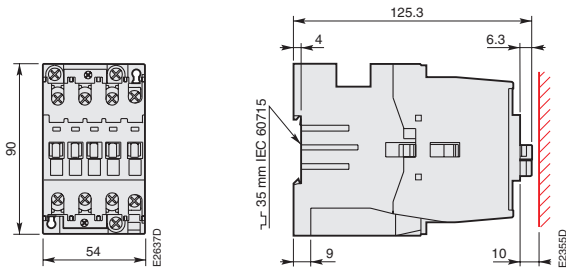
**AL26..RT, TAL26..RT
drilling plan**



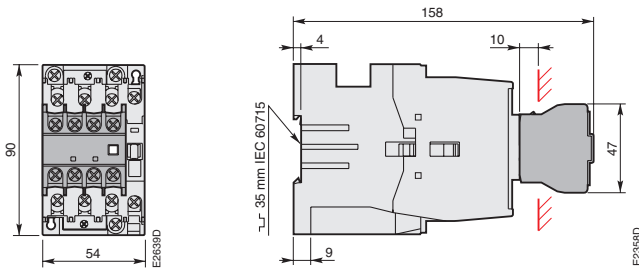
AL30..RT, AL40..RT, TAL30..RT, TAL40..RT 3 and 4-pole Contactors



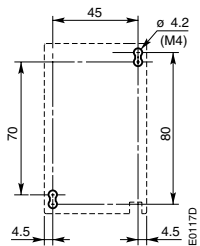
Dimensions (in mm)



AL30..RT, AL40..RT, TAL30..RT, TAL40..RT



AL30..RT, AL40..RT, TAL30..RT, TAL40..RT
+ CA 5-..RT front-mounted 4-pole auxiliary contact block



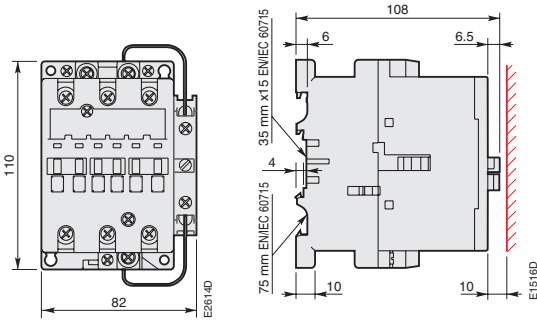
AL30..RT, AL40..RT, TAL30..RT, TAL40..RT
drilling plan



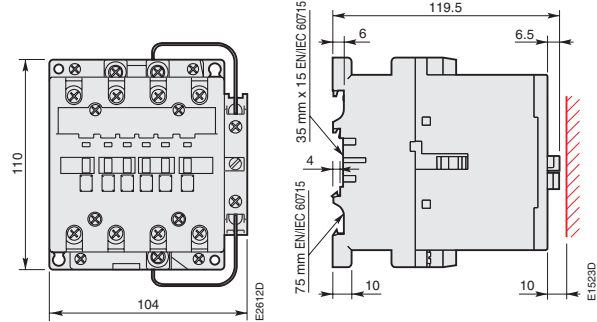
AE45RT ... AE75RT 3 & 4-pole Contactors TAE45RT ... TAE75RT 3 & 4-pole Contactors



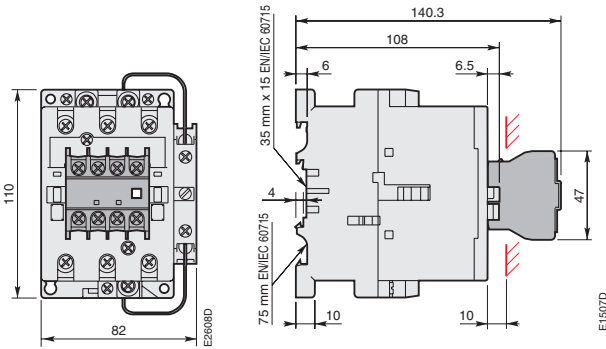
Dimensions (in mm)



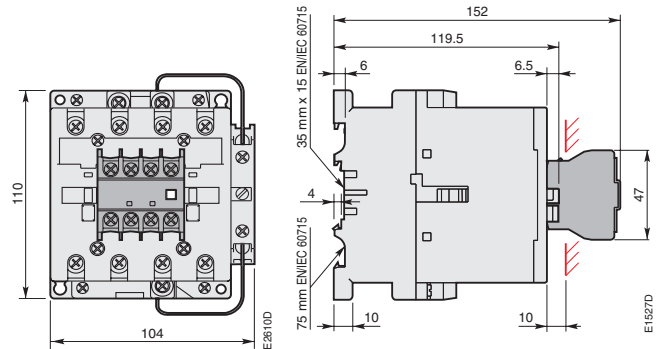
AE 50RT, AE 63RT, AE 75RT, TAE 50RT, TAE 75RT - 3-pole



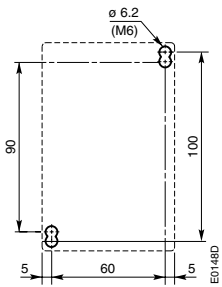
AE 45RT, AE 75RT, TAE 45RT, TAE 75RT - 4-pole



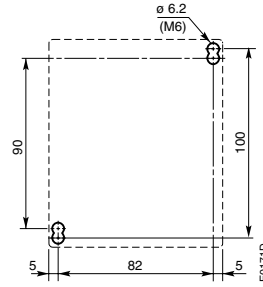
AE 50RT, AE 63RT, AE 75RT, TAE 50RT, TAE 75RT - 3-pole
+ CA 5 front-mounted 4-pole auxiliary contact block



AE 45RT, AE 75RT, TAE 45RT, TAE 75RT - 4-pole
+ CA 5 front-mounted 4-pole auxiliary contact block



AE 50RT, AE 63RT, AE 75RT, TAE 50RT, TAE 75RT drilling plan



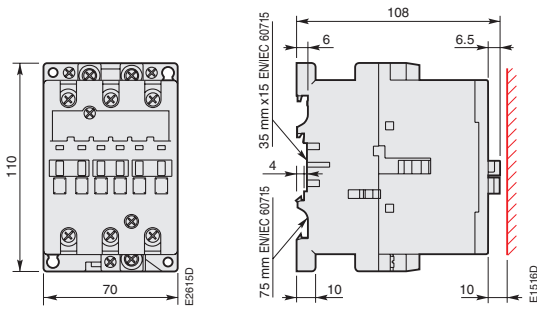
AE 45RT, AE 75RT, TAE 45RT, TAE 75RT drilling plan



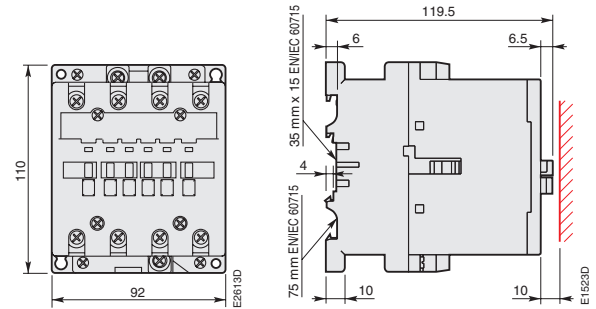
AF50RT, AF63RT, AF75RT 3-pole Contactors AF45RT, AF75RT 4-pole Contactors



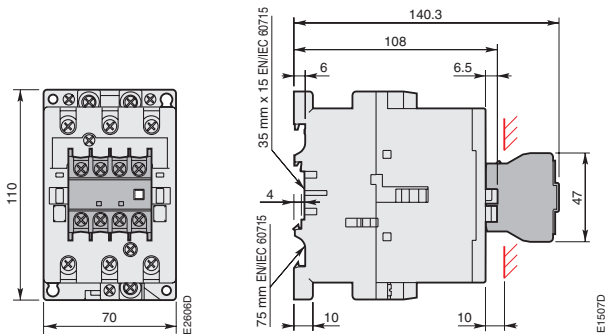
Dimensions (in mm)



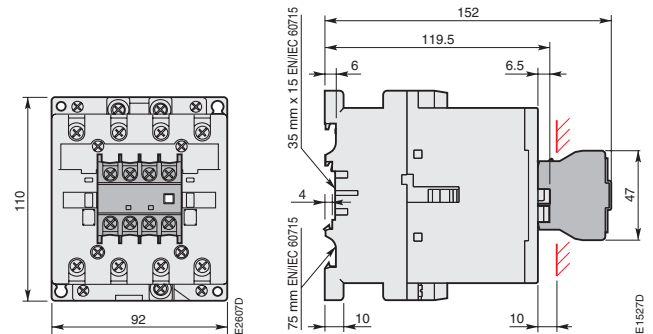
AF 50RT, AF 63RT, AF 75RT - 3-pole



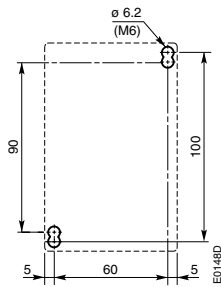
AF 45RT, AF 75RT - 4-pole



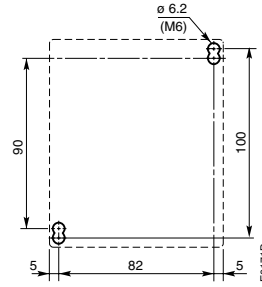
AF 50RT, AF 63RT, AF 75RT - 3-pole
+ CA 5 front-mounted 4-pole auxiliary contact block



AF 45RT, AF 75RT - 4-pole
+ CA 5 front-mounted 4-pole auxiliary contact block



AF 50RT, AF 63RT, AF 75RT drilling plan



AF 45RT, AF 75RT drilling plan



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