

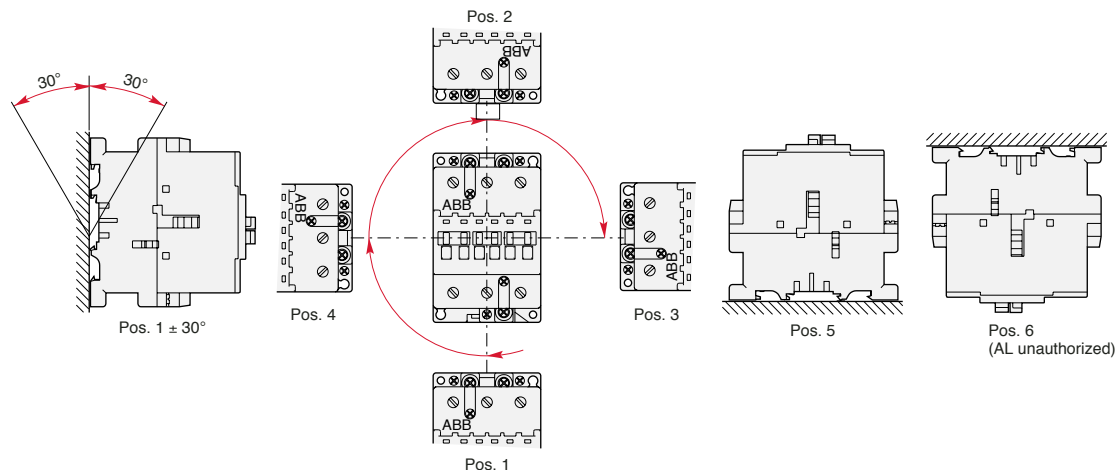
UL & CSA Technical data

A/AE9 – A/AE/AF110, AL9 – AL40

AC & DC operated

ABB contactor frame size		A/AE/AL 9	A/AE/AL 12	A/AE/AL 16	A/AE/AL 26	A/AE/AL 30	A/AE/AL 40	A/AE/AF 45	A/AE/AF 50	A/AE/AF 63	A/AE/AF 75	A/AE/AF 95	A/AE/AF 110	
NEMA size		00	—	0	1	1P	—	—	2	—	3	—	—	
Number of poles		3 OR 4	3	3 OR 4	3 OR 4	3	3	4	3 OR 4	3	3 OR 4	3	3	
AC rating information														
NEMA cont. amp rating	thermal current	9	—	18	27	36	—	—	45	—	90	—	—	
NEMA maximum H.P. ratings		1 phase												
115	VAC	1/3	—	1	2	3	—	—	3	—	—	—	—	
230	VAC	1	—	2	3	5	—	—	7.5	—	—	—	—	
NEMA maximum H.P. ratings		3 phase												
200	VAC	1.5	—	3	7.5	—	—	—	10	—	25	—	—	
230	VAC	1.5	—	3	7.5	—	—	—	15	—	30	—	—	
460/575	VAC	2	—	5	10	—	—	—	25	—	50	—	—	
U.L. general purpose current		40°C	21	25	30	40	50	60	65	80	90	105	125	140
Max. 3 Ph Switching motor loads		A	9	11	17	28	34	42	—	54	65	80	95	110
U.L. maximum H.P. ratings		1 phase												
115	VAC	1/2	3/4	1.5	2	3	3	—	3	5	7.5	7.5	10	
230	VAC	2	2	3	5	7.5	7.5	—	7.5	10	15	20	25	
U.L. maximum H.P. ratings		3 phase												
200-208	VAC	2	3	5	7.5	10	10	—	15	20	25	30	30	
220-240	VAC	2	3	5	10	10	15	—	20	25	30	30	40	
440-480	VAC	5	7.5	10	20	25	30	—	40	50	60	60	75	
550-600	VAC	7.5	10	15	25	30	40	—	50	60	75	75	100	
U.L. maximum H.P. ratings		VDC												
120	VDC	1	1.5	2	3	3	5	—	7.5	10	10	—	—	
240	VDC	2	3	3	5	7.5	10	—	15	20	25	—	—	
Lighting — ballast and incandescent		600VAC	15	15	20	35	50	60	65	65	85	105	—	—
Resistive heating applications		600VAC	15	15	20	35	50	60	65	65	85	105	—	—
CSA Elevator ratings														
220 – 240VAC	3 phase	—	—	5	—	—	10	—	15	—	20	—	—	
440 – 480VAC	3 phase	—	—	10	—	—	20	—	30	—	30	—	—	
550 – 600VAC	3 phase	—	—	10	—	—	20	—	30	—	40	—	—	
230VAC	1 phase	—	—	2	—	—	5	—	7.5	—	10	—	—	
Auxiliary contacts														
NEMA rating	AC	A600	A600	A600	A600	A600	A600	—	A600	A600	A600	A600	A600	
AC rated voltage	VAC	600	600	600	600	600	600	—	600	600	600	600	600	
AC thermal rated current	A	10	10	10	10	10	10	—	10	10	10	10	10	
AC maximum volt-ampere making	VA	7200	7200	7200	7200	7200	7200	—	7200	7200	7200	7200	7200	
AC maximum volt-ampere breaking	VA	720	720	720	720	720	720	—	720	720	720	720	720	
NEMA rating	DC	P600	P600	P600	P600	P600	P600	—	P600	P600	P600	P600	P600	
DC rated voltage	VDC	600	600	600	600	600	600	—	600	600	600	600	600	
DC thermal rated current	A	5	5	5	5	5	5	—	5	5	5	5	5	
DC Maximum make-break	A	0.2	0.2	0.2	0.2	0.2	0.2	—	0.2	0.2	0.2	0.2	0.2	
Approximate weight														
Contactor	lbs.	0.7	0.7	0.7	1.01	1.2	2.25	2.25	2.25	2.25	2.25	3.5	5	
Starter	lbs.	1.04	1.04	1.04	1.35	1.54	3	3	3	3	3	6	7	
Terminal wire range														
Number of wires per phase	AWG	18-10	18-10	18-10	12-8	8-4	8-4	8-1	8-1	8-1	8-1	6-2/0	6-2/0	
		2	2	2	2	2	2	1	1	1	1	1	1	
Maximum short circuit ratings														
MCCB, MCP, Amps/kA	480VAC	50/35	50/35	50/35	100/35	150/65	150/65	—	150/85	250/85	250/85	250/85	250/85	
MCCB, MCP, Amps/kA	600VAC	10/35	10/35	10/35	100/35	150/25	150/25	—	—	—	—	250/35	250/35	
Fuse, Amps — type/kA	600VAC	30J/200	30J/200	30J/200	60J/200	60J/200	100J/200	—	100J/200	200J/200	200J/200	200J/200	200J/200	

Mounting positions



UL & CSA Technical data

A/AF145 – AF750

AC & DC operated

Across the line
contactors

1

ABB contactor frame size		A/AF 145	A/AF 185	A/AF 210	A/AF 260	A/AF 300	AF 400	AF 460	AF 580	AF 750
NEMA size		4	—	—	5	—	—	6	—	7
Number of poles		3	3	3	3	3	3	3	3	3
AC rating information										
NEMA maximum H.P. ratings		3 phase								
200	VAC	40	—	—	75	—	—	150	—	—
230	VAC	50	—	—	100	—	—	200	—	300
460/575	V	100	—	—	200	—	—	400	—	600
U.L. general purpose current		40°C								
Max. 3 Ph switching motor loads		Amps								
U.L. maximum H.P. ratings		1 phase								
115	VAC	10	15	—	—	—	—	—	—	—
230	VAC	25	30	40	50	—	—	—	—	—
U.L. maximum H.P. ratings		3 phase								
200—208	VAC	40	50	60	75	100	125	150	200	250
220—240	VAC	50	60	75	100	100	150	200	250	300
440—480	VAC	100	125	150	200	250	350	400	500	600
550—600	VAC	125	150	200	250	300	400	500	600	700
Auxiliary contacts										
NEMA rating		AC								
AC rated voltage		VAC								
AC thermal rated current		A								
AC maximum volt—ampere making		VA								
AC maximum volt—ampere breaking		VA								
NEMA rating		DC								
DC rated voltage		VDC								
DC thermal rated current		A								
DC Maximum make—break		A								
NEMA rating		A600	A600	A600	A600	A600	A600	A600	A600	A600
AC rated voltage		600	600	600	600	600	600	600	600	600
AC thermal rated current		10	10	10	10	10	10	10	10	10
AC maximum volt—ampere making		7200	7200	7200	7200	7200	7200	7200	7200	7200
AC maximum volt—ampere breaking		720	720	720	720	720	720	720	720	720
NEMA rating		P600	P600	P600	P600	P600	P600	P600	P600	P600
DC rated voltage		600	600	600	600	600	600	600	600	600
DC thermal rated current		5	5	5	5	5	5	5	5	5
DC Maximum make—break		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Approximate weight										
Contactor		lbs.								
Starter		lbs.								
Contactor		7.1	7.1	13	13	13	26	26	33	33
Starter		9.11	9.11	17.67	17.67	17.67	35	35	45	45
Terminal wire range		AWG								
Number of wires per phase		MCM								
Number of wires per phase		1	1	1	1	2	2	2	2	3
Maximum short circuit ratings										
MCCB,MCP,amps/kA		480VAC								
MCCB,MCP,amps/kA		600VAC								
Fuse, amps—Type/kA		600VAC								
MCCB,MCP,amps/kA		400/85	400/85	800/85	800/85	800/85	800/80	800/80	1200/42	1200/42
MCCB,MCP,amps/kA		400/35	400/35	800/35	800/35	800/35	800/42	800/42	—	—
Fuse, amps—Type/kA		400J/200	400J/200	600J/200	600J/200	600J/200	1000L/80	1000L/80	1200L/80	1200L/80

UL & CSA Technical data

AF1350 – AF1650

AC & DC operated

ABB contactor frame size		AF 1350	AF 1650
NEMA size		—	8
Number of poles		3	3
AC rating information			
NEMA maximum H.P. ratings	3 phase		
200	VAC	—	—
230	VAC	—	450
460/575	V	—	900
U.L. general purpose current			
	40°C	1350	1650
Max. 3 Ph switching motor loads	Amps	960	1080
U.L. maximum H.P. ratings	1 phase		
115	VAC	—	—
230	VAC	—	—
U.L. maximum H.P. ratings	3 phase		
200–208	VAC	—	—
220–240	VAC	400	450
440–480	VAC	800	900
550–600	VAC	900	1000
Auxiliary contacts			
NEMA rating	AC	Consult factory	
AC rated voltage	VAC		
AC thermal rated current	A		
AC maximum volt—ampere making	VA		
AC maximum volt—ampere breaking	VA		
NEMA rating	DC		
DC rated voltage	VDC		
DC thermal rated current	A		
DC Maximum make—break	A		
Approximate weight			
Contactor	lbs.	75	75
Starter	lbs.	—	—
Terminal wire range			
	AWG	Consult factory	
Number of wires per phase			
Maximum short circuit ratings			
MCCB,MCP,amps/kA	480VAC	Consult factory	
MCCB,MCP,amps/kA	600VAC		
Fuse, amps—Type/kA	600VAC		

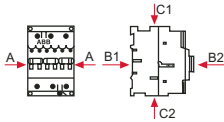
UL/CSA & IEC Technical data

A/AE9 – A/AE/AF/TAE110

Across the line
contactors

1

Contactor types:	A..., AE... AF..., TAE...	9	12	16	26	30	40	45	50	63	75	95	110
		-	-	-	-	-	-	45	50	63	75	95	110
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											
Air temperature close to contactor – fitted with thermal O/L relay	°C	see "Conditions for use" page 1.50, for control voltage limits and authorized mounting positions -25 to +55											
– without thermal O/L relay	°C	-40 to +70 (55 max. for TAE... contactors)											
– for storage	°C	-60 to +80											
Climatic withstand		acc. to IEC 60068-2-30 and 60068-2-11 - UTE C 63-100 specification II											acc. to IEC 68-2-30
Operating altitude	m	≤ 3000											
Shock withstand acc. IEC 60068-2-27 and EN 60068-2-27 Mounting position 1 (see page 1.50)		1/2 sinusoidal shock for 11 ms: no change in contact position Shock direction Making position Breaking position A 20 g 20 g B1 10 g 5 g ① B2 15 g ② 15 g ② C1 20 g 20 g C2 20 g 20 g											



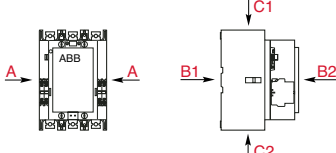
Not valid for DIN-rail
mounting

① 3 g for AF 45-22, AE 45-22, AF 75-22 and AE 75-22.
② 10 g for AF 45-22, AE 45-22, AF 75-22 and AE 75-22.

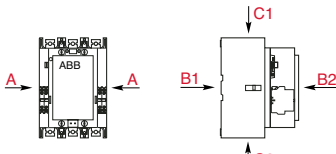
UL/CSA & IEC Technical data

A/AF145 – AF1650

A/AF145 – AF750

Contactor types:	A...	145	185	210	260	300	–	–	–	–
	AF...	145	185	210	260	300	400	460	580	750
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} Standards	kV	8 Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1								
Air temperature close to contactor – fitted with thermal O/L relay	°C	see "Conditions for use" page 1.51 , for control voltage limits and authorized mounting positions -25 to +55								
– without thermal O/L relay	°C	-40 to +70								
– for storage	°C	-40 to +70								
Climatic withstand		acc. to IEC 60068-2-30								
Operating altitude	m	≤ 3000								
Shock withstand acc. IEC 60068-2-27 and EN 60068-2-27 Mounting position 1 (see page 1.51)		1/2 sinusoidal shock for 30 ms: no change in contact position 5 g in all directions (A, B1, B2, C1, C2)								
										

AF1350 – AF1650

Contactor types:	AF...	1350	1650
Rated insulation voltage U_i according to IEC 60947-4-1		1000	
according to UL/CSA	V	600	
Rated impulse withstand voltage U_{imp} Standards	kV	8 Devices complying with international standards IEC 60947-1 / 60947-4-1 and European standards EN 60947-1 / 60947-4-1	
Air temperature close to contactor – fitted with thermal O/L relay		see "Conditions for use" page 1.51 , for control voltage limits and authorized mounting positions °C-25 to +55	
– without thermal O/L relay		°C-40 to +70	
– for storage		°C-40 to +70	
Climatic withstand		acc. to IEC 60068-2-30	
Operating altitude	m	≤ 3000	
Shock withstand acc. IEC 60068-2-27 and EN 60068-2-27 Mounting position 1 (See page 1.51)		1/2 sinusoidal shock for 30 ms: no change in contact position 5 g in all directions (A, B1, B2, C1, C2)	
			

IEC Technical data

DC circuit switching

A/AE9 – GAE75




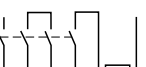








Across the line
contactors

1

General

The arc switching on d.c. is more difficult than on a.c.

- For selecting a contactor it is essential to determine the current, the voltage and the L/R time constant of the controlled load.
- For information, typical time constant values are quoted hereafter: non inductive loads such as resistance furnaces (L/R ≈ 1 ms), inductive loads such as shunt motors (L/R ≈ 2 ms) or series motors (L/R ≈ 7.5 ms).
- The addition of a resistor in parallel with an inductive winding helps in the elimination of the arcs.
- All the poles required for breaking must be connected in series between the load and the source polarity not linked to earth (or chassis).

		A9	A12	A16	A26	A30	A40	A45	A50	A63	A75	GA75	
		–	–	–	–	–	–	AF45	AF50	AF63	AF75	–	
		AE9	AE12	AE16	AE26	AE30	AE40	AE45	AE50	AE63	AE75	GAE75	
Utilization category DC-1, L/R ≤ 1 ms													
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120	120
	110 V	A	10	15	20	–	–	–	–	–	–	–	120
	220 V	A	–	–	–	–	–	–	–	–	–	–	120
	440 V	A	–	–	–	–	–	–	–	–	–	–	100
	600 V	A	–	–	–	–	–	–	–	–	–	–	75
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120	–
	110 V	A	25	27	30	45	55	60	70	100	110	120	–
	220 V	A	10	15	20	–	–	–	–	–	–	–	–
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120	–
	110 V	A	25	27	30	45	55	60	70	100	110	120	–
	220 V	A	25	27	30	45	55	60	70	100	110	120	–
	≤ 72 V	A	25	27	30	45	–	–	70	100	–	120	–
	110 V	A	25	27	30	45	–	–	70	100	–	120	–
	220 V	A	25	27	30	45	–	–	70	100	–	120	–
	440 V	A	10	15	20	–	–	–	–	–	–	–	–
Utilization category DC-3, L/R ≤ 2 ms													
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120	120
	110 V	A	6	7	8	–	–	–	–	–	–	–	120
	220 V	A	–	–	–	–	–	–	–	–	–	–	100
	440 V	A	–	–	–	–	–	–	–	–	–	–	85
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120	–
	110 V	A	25	27	30	45	55	60	70	100	110	120	–
	220 V	A	6	7	8	–	–	–	–	–	–	–	–
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120	–
	110 V	A	25	27	30	45	55	60	70	100	110	120	–
	220 V	A	25	27	30	45	55	60	70	100	110	120	–
	≤ 72 V	A	25	27	30	45	–	–	70	100	–	120	–
	110 V	A	25	27	30	45	–	–	70	100	–	120	–
	220 V	A	25	27	30	45	–	–	70	100	–	120	–
	440 V	A	6	7	8	–	–	–	–	–	–	–	–
Utilization category DC-5, L/R ≤ 7.5 ms													
	≤ 72 V	A	9	12	16	25	30	40	50	50	63	75	85
	110 V	A	4	4	4	–	–	–	–	–	–	–	85
	220 V	A	–	–	–	–	–	–	–	–	–	–	85
	440 V	A	–	–	–	–	–	–	–	–	–	–	35
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120	–
	110 V	A	10	15	20	30	45	50	70	80	90	100	–
	220 V	A	4	4	4	–	–	–	–	–	–	–	–
	≤ 72 V	A	25	27	30	45	55	60	70	100	110	120	–
	110 V	A	25	27	30	45	55	60	70	100	110	120	–
	220 V	A	9	12	16	25	30	40	50	50	63	75	–
	≤ 72 V	A	25	27	30	45	–	–	70	100	–	120	–
	110 V	A	25	27	30	45	–	–	70	100	–	120	–
	220 V	A	10	15	20	30	–	–	70	70	–	100	–
	440 V	A	4	4	4	–	–	–	–	–	–	–	–

IEC Technical data










DC circuit switching

A/AF/AE95 — AF750

Technical Data

- The tables indicate for the standard contactors the I_b max. operating currents depending on: the utilization category (i.e. L/R) DC-1, DC-3, DC-5 as defined in the IEC 60947-4-1 publication, the operating voltage U_g and the pole coupling details. See page 1.81.
Ampere values quoted in the tables below are valid for a -25 ... +70 °C temperature close to the contactors, as long as the AC-1 Ampere values (see pages 1.45 - 146) for the corresponding ambient temperature are not exceeded.
- Max. switching frequency: 300 ops/h.
- For switching higher d.c. ratings, we recommend the use of bar mounted contactors, R series (63 ... 2000 A).

The selection table for AE 50 ... AE 110 contactors can be used for the TAE 50 ... TAE 110 types.

a.c. operated contactors			A95	A110	A145	A185	A210	A260	A300	—	—	—	—
a.c. / d.c. operated (electronic coil interface)			AF95	AF110	AF145	AF185	AF210	AF260	AF300	AF400	AF460	AF580	AF750
d.c. operated contactors			AE95	AE110	—	—	—	—	—	—	—	—	—
Utilization category DC-1, L/R ≤ 1 ms													
	≤110 V	A	—	—	—	—	—	—	—	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	—	—	—	—	—	—	—	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	145	160	250	275	350	400	450	600	700	800	1050
	440 V	A	—	—	—	—	—	—	—	600	700	800	1050
	600 V	A	—	—	—	—	—	—	—	600	700	800	1050
	600 V	A	—	—	—	—	—	—	—	600	700	800	1050
Utilization category DC-3, L/R ≤ 2.5 ms													
	≤110 V	A	—	—	—	—	—	—	—	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	—	—	—	—	—	—	—	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	145	160	250	275	350	400	450	600	700	800	1050
	440 V	A	—	—	—	—	—	—	—	600	700	800	1050
	600 V	A	—	—	—	—	—	—	—	600	700	800	1050
	600 V	A	—	—	—	—	—	—	—	600	700	800	1050
Utilization category DC-5, L/R ≤ 15 ms													
	≤110 V	A	—	—	—	—	—	—	—	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	—	—	—	—	—	—	—	600	700	800	1050
	≤110 V	A	145	160	250	275	350	400	450	600	700	800	1050
	220 V	A	145	160	250	275	350	400	450	600	700	800	1050
	440 V	A	—	—	—	—	—	—	—	600	700	800	1050
	600 V	A	—	—	—	—	—	—	—	600	700	800	1050
	600 V	A	—	—	—	—	—	—	—	600	700	800	1050

IEC Technical data

DC circuit switching

AL9 — AL40


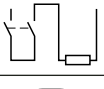
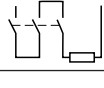
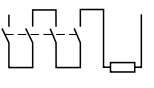

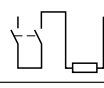
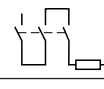
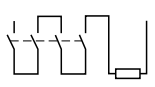

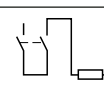
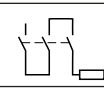

Across the line
contactors

1

General

The arc switching on d.c. is more difficult than on a.c.

- For selecting a contactor it is essential to determine the current, the voltage and the L/R time constant of the controlled load.
- For information, typical time constant values are quoted hereafter: non inductive loads such as resistance furnaces ($L/R \approx 1$ ms), inductive loads such as shunt motors ($L/R \approx 2$ ms) or series motors ($L/R \approx 7.5$ ms).
- The addition of a resistor in parallel with an inductive winding helps in the elimination of the arcs.
- All the poles required for breaking must be connected in series between the load and the source polarity not linked to earth (or chassis).

A.C. operated contactors		AL9	AL12	AL16	AL26	AL30	AL40	
Utilization category DC-1, $L/R \leq 1$ ms								
	≤ 72 V	A	25	27	30	45	55	60
	110 V	A	10	15	20	–	–	–
	220 V	A	–	–	–	–	–	–
	440 V	A	–	–	–	–	–	–
	600 V	A	–	–	–	–	–	–
	≤ 72 V	A	25	27	30	45	55	60
	110 V	A	25	27	30	45	55	60
	220 V	A	10	15	20	–	–	–
	≤ 72 V	A	25	27	30	45	55	60
	110 V	A	25	27	30	45	55	60
	220 V	A	25	27	30	45	55	60
	≤ 72 V	A	25	27	30	45	–	–
	110 V	A	25	27	30	45	–	–
	220 V	A	25	27	30	45	–	–
	440 V	A	10	15	20	–	–	–
Utilization category DC-3, $L/R \leq 2$ ms								
	≤ 72 V	A	25	27	30	45	55	60
	110 V	A	6	7	8	–	–	–
	220 V	A	–	–	–	–	–	–
	440 V	A	–	–	–	–	–	–
	≤ 72 V	A	25	27	30	45	55	60
	110 V	A	25	27	30	45	55	60
	220 V	A	6	7	8	–	–	–
	≤ 72 V	A	25	27	30	45	55	60
	110 V	A	25	27	30	45	55	60
	220 V	A	25	27	30	45	55	60
	≤ 72 V	A	25	27	30	45	–	–
	110 V	A	25	27	30	45	–	–
	220 V	A	25	27	30	45	–	–
	440 V	A	6	7	8	–	–	–
Utilization category DC-5, $L/R \leq 7.5$ ms								
	≤ 72 V	A	9	12	16	25	30	40
	110 V	A	4	4	4	–	–	–
	220 V	A	–	–	–	–	–	–
	440 V	A	–	–	–	–	–	–
	≤ 72 V	A	25	27	30	45	55	60
	110 V	A	10	15	20	30	45	50
	220 V	A	4	4	4	–	–	–
	≤ 72 V	A	25	27	30	45	55	60
	110 V	A	25	27	30	45	55	60
	220 V	A	9	12	16	25	30	40
	≤ 72 V	A	25	27	30	45	–	–
	110 V	A	25	27	30	45	–	–
	220 V	A	10	15	20	30	–	–
	440 V	A	4	4	4	–	–	–

IEC Technical data

DC circuit switching

EK110 – EK1000

General




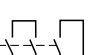





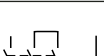

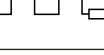


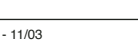
The arc switching on d.c. is more difficult than on a.c.

- For selecting a contactor it is essential to determine the current, the voltage and the L/R time constant of the controlled load.
- For information, typical time constant values are quoted hereafter: non inductive loads such as resistance furnaces ($L/R \approx 1$ ms), inductive loads such as shunt motors ($L/R \approx 2$ ms) or series motors ($L/R \approx 7.5$ ms).
- The addition of a resistor in parallel with an inductive winding helps in the elimination of the arcs.
- All the poles required for breaking must be connected in series between the load and the source polarity not linked to earth (or chassis).

Technical Data

- The tables indicate for the standard contactors the I_b max. operating currents depending on: the utilization category (i.e. L/R) DC-1, DC-3, DC-5 as defined in the IEC 60947-4-1 publication (see page 1.75 for more details), the operating voltage U_b and the pole coupling details. Ampere values quoted in the tables below are valid for a $-25 \dots +70$ °C temperature close to the contactors, as long as the AC-1 Ampere values (see page 1.61) for the corresponding ambient temperature are not exceeded.
- Max. switching frequency: 300 ops/h.
- For switching higher d.c. ratings, we recommend the use of bar mounted contactors, R series (63 ... 2000 A).

Selection Table

a.c. / d.c. operated contactors			EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Utilization category DC-1, $L/R \leq 1$ ms									
	≤ 72 V	A	120	145	210	210	370	550	–
	110 V	A	120	145	210	210	370	550	–
	≤ 72 V	A	200	200	300	300	550	800	–
	110 V	A	200	200	300	300	550	800	–
	220 V	A	200	200	300	300	550	800	–
	≤ 72 V	A	200	200	300	300	550	800	–
	110 V	A	200	200	300	300	550	800	–
	220 V	A	200	200	300	300	550	800	–
	440 V	A	–	–	210	210	450	650	–
	600 V	A	–	–	–	–	450	650	–
	≤ 72 V	A	200	200	300	300	550	800	–
	110 V	A	200	200	300	300	550	800	–
	220 V	A	200	200	300	300	550	800	–
	440 V	A	200	200	260	300	450	650	–
	600 V	A	–	–	260	300	450	650	–
	600 V	A	–	–	–	–	450	650	–
Utilization category DC-3, $L/R \leq 2$ ms									
	≤ 72 V	A	120	145	210	210	370	550	–
	≤ 72 V	A	135	145	210	210	450	650	–
	110 V	A	135	135	210	210	450	650	–
	220 V	A	135	135	210	210	450	650	–
	≤ 72 V	A	135	145	210	210	450	650	–
	110 V	A	135	135	210	210	450	650	–
	220 V	A	135	135	210	210	450	650	–
	440 V	A	–	–	210	210	450	650	–
	600 V	A	–	–	–	–	450	650	–
	≤ 72 V	A	135	145	210	210	450	650	–
	110 V	A	135	135	210	210	450	650	–
	220 V	A	135	135	210	210	450	650	–
	440 V	A	135	135	210	210	450	650	–
	600 V	A	–	–	170	210	450	650	–
Utilization category DC-5, $L/R \leq 7.5$ ms									
	≤ 72 V	A	135	145	210	210	450	650	–
	110 V	A	135	135	210	210	450	650	–
	220 V	A	135	135	210	210	450	650	–
	≤ 72 V	A	135	145	210	210	450	650	–
	110 V	A	135	135	210	210	450	650	–
	220 V	A	135	135	210	210	450	650	–
	440 V	A	–	–	210	210	450	650	–
	600 V	A	–	–	–	–	450	650	–
	≤ 72 V	A	135	145	210	210	450	650	–
	110 V	A	135	135	210	210	450	650	–
	220 V	A	135	135	210	210	450	650	–
	440 V	A	135	135	210	210	450	650	–
	600 V	A	–	–	170	210	450	650	–
	600 V	A	–	–	–	–	450	650	–

IEC Technical data

A/AE9 – A/AE/AF/TAE110

Across the line
contactors

1

Main Pole - Utilization Characteristics

Contactor types:	A..., AE...	9	12	16	26	30	40	45	50	63	75	95	110	
	AF..., TAE...	-	-	-	-	-	-	45	50	63	75	95	110	
Rated operational voltage U_e max.	V	690						1000 (690 for AF... contactors)						
Rated frequency limits	Hz	25-400												
Conventional free-air thermal current I_{th} acc. to IEC 60947-4-1, open contactors $\sigma \leq 40^\circ\text{C}$	A	26	28	30	45	65	65	100	100	125	125	145	160	
with conductor cross-sectional area mm ²	4	4	4	6	16	16	35	35	50	50	50	70	70	
Rated operational current I_e / AC-1 for air temperature close to contactor	A	25	27	30	45	55	60	70	100	115	125	145	160	
U_e max. 690 V	$\sigma \leq 40^\circ\text{C}$	A	22	25	27	40	55	60	85	95	105	135	145	
	$\sigma \leq 55^\circ\text{C}$	A	18	20	23	32	39	42	50	70	80	85	115	
	$\sigma \leq 70^\circ\text{C}$ ③	A	2.5	4	4	6	10	16	25	35	50	50	70	
with conductor cross-sectional area mm ²														
Utilization categorie AC-3														
for air temperature close to contactor $\leq 55^\circ\text{C}$														
Rated operational current I_e AC-3 ①														
3-phase motors	220-230-240 V	A	9	12	17	26	33	40	40	53	65	75	96	110
	380-400 V	A	9	12	17	26	32	37	37	50	65	75	96	110
	415 V	A	9	12	17	26	32	37	37	50	65	72	96	110
	440 V	A	9	12	16	26	32	37	37	45	65	70	93	100
	500 V	A	9	12	14	22	28	33	33	45	55	65	80	100
	690 V	A	7	9	10	17	21	25	25	35	43	46	65	82
	1000 V	A	-	-	-	-	-	-	-	23 ②	25 ②	28 ②	30 ②	30 ②
Rated operational power AC-3 ①														
1500 r.p.m. 50 Hz 1800 r.p.m. 60 Hz 3-phase motors	220-230-240 V	kW	2.2	3	4	6.5	9	11	11	15	18.5	22	25	30
	380-400 V	kW	4	5.5	7.5	11	15	18.5	18.5	22	30	37	45	55
	415 V	kW	4	5.5	9	11	15	18.5	18.5	25	37	40	55	59
	440 V	kW	4	5.5	9	15	18.5	22	22	25	37	40	55	59
	500 V	kW	5.5	7.5	9	15	18.5	22	22	30	37	45	55	59
	690 V	kW	5.5	7.5	9	15	18.5	22	22	30	37	40	55	75
	1000 V	kW	-	-	-	-	-	-	-	30 ②	33 ②	37 ②	40 ②	40 ②
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	80	100	125	160	160	200	200	
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	1000	1320	1320	1320	1320	1320	1320	
10 s	A	100	120	140	210	400	650	800	800	800	800	800	800	
30 s	A	60	70	80	110	225	370	500	500	500	500	500	500	
1 min	A	50	55	60	90	150	250	350	350	350	350	350	350	
15 min	A	26	28	30	45	65	110	110	135	135	160	175	175	
Maximum breaking capacity $\cos \phi = 0.45$ ($\cos \phi = 0.35$ for $I_e > 100$ A)														
at 440 V	A	250	420	820	900	1300	1160	1160	1160	1160	1160	1160	1160	
at 690 V	A	90	170	340	490	630	800	800	800	800	800	800	800	
Heat dissipation per pole	I_e / AC-1	W	0.8	1	1.2	1.8	2.5	3	2.5	5	6.5	7	6.5	7.5
	I_e / AC-3	W	0.1	0.2	0.35	0.6	0.9	1.3	0.65	1.3	1.5	2	2.7	3.6
Max. electrical switching frequency														
- for AC-1	cycles/h	600						600 (300 for AF..., AE... TAE...)					300	
- for AC-3	cycles/h	1200 (600 for AE...)						600 (300 for AF..., AE... TAE...)					300	
- for AC-2, AC-4	cycles/h	300						150					150	
Electrical durability														
see pages 1.70 - 1.73														
Mechanical durability														
- millions of operating cycles		10 (5 for AE... and TAE... contactors)												
- max. mechanical switching frequency	cycles/h	3600 (300 for AF... contactors)												



① For the corresponding hp/A values of 1500 r.p.m., 50Hz, 3-phase motors, see page 1.76.

② AF... contactors excluded

③ Unauthorized for TAE... contactors.

IEC Technical data
A/AF145 – AF750

Main Pole - Utilization Characteristics

Contactor types:	A...	145	185	210	260	300	–	–	–	–	
	AF...	145	185	210	260	300	400	460	580	750	
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 $\varnothing \leq 40$ °C	A	250	275	350	400	500	600	700	800	1050	
with conductor cross-sectional area ①	mm ²	120	150	185	240	300 ③	2 x 185	2 x 240	2 x 240	2 x 80 x 5 ②	
Rated operational current I_e / AC-1 for air temperature close to contactor											
U_e max. 690 V											
$\varnothing \leq 40$ °C	A	250	275	350	400	500	600	700	800	1050	
$\varnothing \leq 55$ °C	A	230	250	300	350	400	500	600	700	800	
$\varnothing \leq 70$ °C	A	180	180	240	290	325	400	480	580	720	
with conductor cross-sectional area	mm ²	120	150	185	240	300 ③	2 x 185	2 x 240	2 x 240	2 x 80 x 5 ②	
Utilization categorie AC-3 for air temperature close to contactor ≤ 55 °C											
Rated operational current I_e AC-3											
3-phase motors											
	220-230-240 V	A	145	185	210	260	305	400	460	580	750
	380-400 V	A	145	185	210	260	305	400	460	580	750
	415 V	A	145	185	210	260	300	400	460	580	750
	440 V	A	145	185	210	240	280	400	460	580	750
	500 V	A	145	170	210	240	280	400	460	580	750
	690 V	A	120	170	210	220	280	350	400	500	650
	1000 V	A	–	–	–	–	–	–	–	–	–
											
Rated operational power AC-3											
	220-230-240 V	kW	45	55	59	80	90	110	132	160	220
	380-400 V	kW	75	90	110	140	160	200	250	315	400
	415 V	kW	75	90	110	140	160	220	250	355	425
	440 V	kW	75	90	110	140	160	220	250	355	450
	500 V	kW	90	110	132	180	200	250	315	400	520
	690 V	kW	110	132	160	200	250	315	355	500	600
	1000 V	kW	–	–	–	–	–	–	–	–	–
											
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	315	355	400	500	630	800	1000			
Rated short-time withstand current I_{cw} at 40 °C ambient temp., in free air, from a cold state											
	1 s	A	1800	2000	2500	3500	4600	7000			
	10 s	A	1200	1500	1700	2400	4400	6400			
	30 s	A	800	1000	1200	1500	3100	4500			
	1 min	A	600	800	1000	1100	2500	3500			
	15 min	A	280	320	400	500	840	1300			
Maximum breaking capacity $\cos \varphi = 0.45$ ($\cos \varphi = 0.35$ for $I_e > 100$ A)											
	at 440 V	A	1500	2000	2300	2600	3000	4000	5000	6000	7500
	at 690 V	A	1200	1600	2000	2400	2500	3500	4500	5000	7000
Heat dissipation per pole											
	I_e / AC-1	W	13	16	18	25	32	30	42	32	50
	I_e / AC-3	W	5	8	9	14	18	16	21	17	28
Max. electrical switching frequency											
– for AC-1	cycles/h	300		300		300		300		300	
– for AC-3	cycles/h	300		300		300		300		300	
– for AC-2, AC-4	cycles/h	150		150		60		60		60	
Electrical durability											
see pages 1.69 ... 1.73											
Mechanical durability											
– millions of operating cycles		5		3		3		3		3	
– max. mechanical switching frequency	cycles/h	3600 (300 for AF... contactors)		3600 (300 for AF... contactors)		3600 (300 for AF... contactors)		3600 (300 for AF... contactors)		3600 (300 for AF... contactors)	

① Conductors with preparation.

② Dimensions of the bars (in mm).

③ For currents above 450A, use terminal extension / enlargement pieces LX 300 / LW 300 see page 1.31).


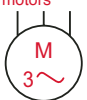
IEC Technical data

AF1350 – AF1650

Across the line
contactors

1

Main Pole - Utilization Characteristics

Contactor types:	AF...	1350	1650
Rated operational voltage U_e max.	V	1000	1000
Rated frequency limits	Hz	25-400	25-400
Conventional free-air thermal current I_{th} acc. to IEC 60947-4-1, open contactors $\varnothing \leq 40^\circ\text{C}$	A	1350	1650
with conductor cross-sectional area ^①	mm ²	2/100x5	3/100x5
Rated operational current I_e / AC-1 for air temperature close to contactor			
U_e max. 690 V	$\left\{ \begin{array}{l} \varnothing \leq 40^\circ\text{C} \\ \varnothing \leq 55^\circ\text{C} \\ \varnothing \leq 70^\circ\text{C} \end{array} \right.$	A 1350 1150 1000	A 1650 1450 1270
with conductor cross-sectional area	mm ²	$2 \times 80 \times 5^{①}$	$2 \times 80 \times 5^{①}$
Utilization categorie 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	860
3-phase motors	380-400 V	A	860
	415 V	A	860
	440 V	A	860
	500 V	A	—
	690 V	A	—
	1000 V	A	—
			
Rated operational power AC-3			
	220-230-240 V	kW	257
	380-400 V	kW	475
	415 V	kW	500
	440 V	kW	560
	500 V	kW	—
	690 V	kW	—
	1000 V	kW	—
1500 r.p.m. 50 Hz			
1800 r.p.m. 60 Hz			
3-phase motors			
			
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	Product coordination with ABB circuit breaker Consult factory	
Rated short-time withstand current I_{cw} at 40 °C ambient temp., in free air, from a cold state			
	1 s	A	10,000
	10 s	A	8000
	30 s	A	6000
	1 min	A	4500
	15 min	A	1600
Maximum breaking capacity $\cos \varnothing = 0.45$ ($\cos \varnothing = 0.35$ for $I_e > 100$ A)			
	at 440 V	A	10,000
	at 690 V	A	—
Max. electrical switching frequency			
– for AC-1	cycles/h	60	60
– for AC-3	cycles/h		
– for AC-2, AC-4	cycles/h		
Electrical durability		50,000	50,000
Mechanical durability			
– millions of operating cycles		500,000	500,000
– max. mechanical switching frequency	cycles/h	60	60

① Dimensions of the bars (in mm).

IEC Technical data

A/AF9 – AF110

Magnet System Characteristics for A... Contactors

Contactor types: A...			9	12	16	26	30	40	45	50	63	75	95	110			
Rated control circuit voltage U_c																	
– at 50 Hz			V 20 ... 690														
– at 60 Hz			V 24 ... 600														
Coil operating limits according to IEC 60947-4-1			$\vartheta \leq 55^\circ\text{C}$ 0.85 ... 1.1 x U_c						$\vartheta \leq 70^\circ\text{C}$ 0.85 ... 1.1 x U_c								
Drop-out voltage in % of U_c			roughly 40 ... 65 %														
Coil consumption																	
Average pull-in value			50 Hz VA			120			180			350					
			60 Hz VA			140			210			450					
			50/60 Hz ① VA/VA			74/70			125/120			190/180			410/365		
Average holding value			50 Hz VA/W			8/2			12/3			18/5.5			22/6.5		
			60 Hz VA/W			8/2			12/3			18/5.5			26/8		
			50/60 Hz ① VA/W			8/2			12/3			18/5.5			27/7.5		
Operating time																	
between coil energization and:																	
– N.O. contact closing			ms 10 ... 26			8 ... 21			8 ... 27			10 ... 25					
– N.C. contact opening			ms 7 ... 21			6 ... 18			7 ... 22			7 ... 22					
between coil de-energization and:																	
– N.O. contact opening			ms 4 ... 11			4 ... 11			4 ... 11			7 ... 15					
– N.C. contact closing			ms 9 ... 16			7 ... 14			7 ... 14			10 ... 18					

Magnet System Characteristics for AF... Contactors

Contactor types: AF...			-	-	-	-	-	-	45	50	63	75	95	110
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 according to IEC 60947-4-1			$\vartheta \leq 70^\circ\text{C}$ 0.85 ... 1.1 x U_c											
Drop-out voltage in % of U_c			55 %											
Coil consumption														
Average pull-in value			50 Hz VA			210			350					
			60 Hz VA			210			350					
			d.c. W			190			400					
Average holding value			50 Hz VA/W			7/2.8			7/3.5					
			60 Hz VA/W			7/2.8			7/3.5					
			d.c. W			2.8			2					
Operating time														
between coil energization and:														
– N.O. contact closing			ms 30 ... 100			30 ... 100			30 ... 80					
– N.C. contact opening			ms 27 ... 95			27 ... 95			27 ... 77					
between coil de-energization and:														
– N.O. contact opening			ms 30 ... 110			30 ... 110			55 ... 125					
– N.C. contact closing			ms 35 ... 115			35 ... 115			60 ... 130					

① 50/60 Hz coils: voltage codes 8 0 to 8 8. see page 1.28.

IEC Technical data

A145 – AF750

Across the line
contactors

1

Magnet System Characteristics for A... Contactors

Contactor types:	A...	145	185	210	260	300	-	-	-	-
Rated control circuit voltage U_c										
- at 50 Hz	V	24 ... 690								
- at 60 Hz	V	24 ... 690								
Coil operating limits according to IEC 60947-4-1		$\sigma \leq 70^\circ\text{C}$ 0.85 ... 1.1 x U_c								
Drop-out voltage in % of U_c		roughly 25 ... 65 %								
Coil consumption										
Average pull-in value	50 Hz VA	550			1350					
	60 Hz VA	600			1550					
	50/60 Hz ① VA/VA	700/650			1700/1550					
Average holding value	50 Hz VA/W	35/11			60/16					
	60 Hz VA/W	40/12			65/19					
	50/60 Hz ① VA/W	44/13			80/21					
Operating time										
between coil energization and:										
- N.O. contact closing	ms	13 ... 27			17 ... 35					
- N.C. contact opening	ms	8 ... 22			12 ... 30					
between coil de-energization and										
- N.O. contact opening	ms	5 ... 10			7 ... 13					
- N.C. contact closing	ms	9 ... 13			10 ... 16					

Magnet System Characteristics for AF... Contactors

Contactor types:	AF...	145	185	210	260	300	400	460	580	750	
Rated control circuit voltage U_c											
- at 50 Hz	V	48 ... 250									
- at 60 Hz	V	48 ... 250									
- d.c.	V	24 ... 250									
Coil operating limits according to IEC 60947-4-1		$\sigma \leq 70^\circ\text{C}$ 0.85 ... 1.1 x U_c									
Drop-out voltage in % of U_c		55 %									
Coil consumption											
Average pull-in value	50 Hz VA	430			470			890		850	
	60 Hz VA	430			470			890		850	
	d.c. W	500			520			990		950	
Average holding value	50 Hz VA/W	12/3.5			10/2.5			12/4		12/4.5	
	60 Hz VA/W	12/3.5			10/2.5			12/4		12/4.5	
	d.c. W	2			2			4		4.5	
Operating time											
between coil energization and:											
- N.O. contact closing	ms	30 ... 115						50 ... 120			
- N.C. contact opening	ms	30 ... 115						50 ... 120			
between coil de-energization and											
- N.O. contact opening	ms	25 ... 80						40 ... 70			
- N.C. contact closing	ms	25 ... 80						40 ... 70			

① 50/60 Hz coils: voltage codes 8 0 to 8 8. see page 1.28.

IEC Technical data

AF1350 — AF1650

Magnet System Characteristics for AF... Contactors

Contactor types: AF..		1350	1650
Rated control circuit voltage U_c			
– at 50 Hz	V	100 - 250	
– at 60 Hz	V	100 - 250	
– d.c.	V	100 - 250	
Coil operating limits according to IEC 60947-4-1		$\vartheta \leq 70\text{ °C}$ 0.85 ... 1.1 x U_c	
Drop-out voltage in % of U_c		55 %	
Coil consumption			
Average pull-in value			
50 Hz	VA	1900	
60 Hz	VA	1900	
d.c.	W	1700	
Average holding value			
50 Hz	VA/W	48/17	
60 Hz	VA/W	48/17	
d.c.	W	16	
Operating time			
between coil energization and:			
– N.O. contact closing	ms	50 - 80	
– N.C. contact opening	ms	50 - 80	
between coil de-energization and			
– N.O. contact opening	ms	35 - 55	
– N.C. contact closing	ms	35 - 55	
With PLC			
between coil energization and			
– N.O. contact opening	ms	40 - 65	
– N.C. contact closing	ms	40 - 65	
between coil de-energization and			
– N.O. contact opening	ms	10 - 30	
– N.C. contact closing	ms	10 - 30	

① 50/60 Hz coils: voltage codes 8 0 to 8 8. see page 1.28.

IEC Technical data

AE9 – AE110

TAE – TAE110

Across the line
contactors

1

Magnet System Characteristics for AE... Contactors

Contactor types: AE...		9	12	16	26	30	40	45	50	63	75	95	110
Rated control circuit voltage U_c	V d.c.	12 ... 250											
Coil operating limits according to IEC 60947-4-1		$\vartheta \leq 55^\circ\text{C}$ 0.85 ... 1.1 x U_c										$\vartheta \leq 70^\circ\text{C}$	
Drop-out voltage in % of U_c		roughly 10 ... 30 %						roughly 15 ... 40 %					
Coil consumption - Average values													
– pull-in value	W	90			110			200			400		
– holding value	W	2			2.5			4			2.4		
Coil time constant													
– open	L/R ms	2			3			3			6		
– closed	L/R ms	9			16			15			30 ... 40		
Operating time													
between coil energization and:													
– N.O. contact closing	ms	10 ... 16			13 ... 21			13 ... 30			15 ... 25		
– N.C. contact opening	ms	8 ... 12			11 ... 16			10 ... 27			12 ... 22		
between coil de-energization and													
– N.O. contact opening	ms	5 ... 14 ①			6 ... 12 ①			5 ... 15 ①			15 ... 20 ①		
– N.C. contact closing	ms	11 ... 17 ①			8 ... 16 ①			8 ... 18 ①			18 ... 23 ①		

Magnet System Characteristics for TAE... Contactors

Contactor types: TAE...		–	–	–	–	–	–	45	50	–	75	95	110
Rated control circuit voltage U_c	V d.c.	17 ... 264											
Coil operating limits according to IEC 60947-4-1		$\vartheta \leq 55^\circ\text{C}$ U_c min. ... U_c max.											
Drop-out voltage in % of U_c max.		roughly 20 ... 35 %											
Coil consumption values for U_c min. ... U_c max.													
– pull-in value	W							120 ... 250			300 ... 1000		
– holding value	W							1.7 ... 6.5			2 ... 7		
Coil time constant													
– open	L/R ms							3			6		
– closed	L/R ms							15			40		
Operating time													
between coil energization and:													
– N.O. contact closing	ms							13 ... 30			15 ... 25		
– N.C. contact opening	ms							10 ... 27			12 ... 22		
between coil de-energization and													
– N.O. contact opening	ms							5 ... 15 ②			15 ... 20 ②		
– N.C. contact closing	ms							8 ... 18 ②			18 ... 23 ②		

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 4 to 8 for a diode suppressor. AE 9 ... AE 40 contactors and $U_c \geq 110$ V: table values for contactors with RV 5 surge suppressor (factory mounted).

② 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 4 to 8 for a diode suppressor.

IEC Technical data

A9 – A110

Built-in Auxiliary Contacts - Utilization Characteristics

Contactor types: A...		9	12	16	26	30	40	45	50	63	75	95	110	
Rated operational voltage U_e max.	V	690						-	-	-	-	-	-	-
Conventional free air thermal current I_{th} - $\theta \leq 40$ °C	A	16						-	-	-	-	-	-	-
Rated frequency limits	Hz	25 ... 400						-	-	-	-	-	-	-
Rated operational current I_e / AC-15 according to IEC 60947-5-1														
24-127 V 50/60 Hz	A	6						-	-	-	-	-	-	-
220-240 V 50/60 Hz	A	4						-	-	-	-	-	-	-
380-440 V 50/60 Hz	A	3						-	-	-	-	-	-	-
500 V 50/60 Hz	A	2						-	-	-	-	-	-	-
690 V 50/60 Hz	A	2						-	-	-	-	-	-	-
Rated operational current I_e / DC-13 according to IEC 60947-5-1														
24 V d.c.	A / W	6 / 144						-	-	-	-	-	-	-
48 V d.c.	A / W	2.8 / 134						-	-	-	-	-	-	-
72 V d.c.	A / W	2 / 144						-	-	-	-	-	-	-
125 V d.c.	A / W	1.1 / 138						-	-	-	-	-	-	-
250 V d.c.	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 fuse	A	10						-	-	-	-	-	-	-
Rated short-time withstand current I_{cw} for 1.0 s	A	100						-	-	-	-	-	-	-
for 0.1 s	A	140						-	-	-	-	-	-	-
Minimum switching capacity	V / mA	17 / 5						-	-	-	-	-	-	-
Non-overlapping time between N.O. and N.C. contacts	ms	≥ 2						-	-	-	-	-	-	-
Insulating resistance at 500 V d.c. after durability test	MOhm	5						-	-	-	-	-	-	-
Heat dissipation per pole at 6 A	W	0.10						-	-	-	-	-	-	-

IEC Technical data

A/AE9 – AF/TAE110

Across the line
contactors

1

Mounting characteristics

Contactor types:	A..., AE...	9	12	16	26	30	40	45	50	63	75	95	110
	AF..., TAE...	-	-	-	-	-	-	45	50	63	75	95	110
Mounting positions	see "Conditions for use"												
Mounting distances	The contactors can be assembled side by side												
Mounting													
on DIN rail	35 x 7.5 mm								35 x 15 mm				
according to IEC 715 and EN 50022 / EN 50023	35 x 15 mm								75 x 25 mm		75 x 25 mm		
by screws (not supplied)	2 x M4								2 x M6				

Conditions for Use

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

Contactors	Mounting position	Ambient temperature	Control voltage
A 9 ... A 110, AE 9 ... AE 110	1, 1 ± 30°, 2, 3, 4, 5	≤ 55 °C	0.85 ... 1.1 x U _c
		55 ... 70 °C	U _c
	6	≤ 55 °C	0.95 ... 1.1 x U _c
		> 55 °C unauthorized	-
AF 45 ... AF 110	1, 1 ± 30°, 2, 3, 4, 5	≤ 70 °C	0.85 U _c min. ... 1.1 x U _c max.
	6 unauthorized	-	-
TAE 45 ... TAE 110	1, 1 ± 30°, 2, 3, 4, 5	≤ 55 °C	U _c min. ... U _c max.
		> 55 °C unauthorized	-
	6 unauthorized	-	-

Notes for 4-pole contactors

Whatever the coil voltage: Pos. 5 unauthorized for A 45-22-00, AE 45-22-00, A 75-22-00, AE 75-22-00 contactors.

For 60 Hz coil voltage: (only for devices fitted with CA 5-... and CAL 5-11 auxiliary contacts or TP timer)

- A 45-40-00, A 50-40-00 and A 75-40-00 contactors

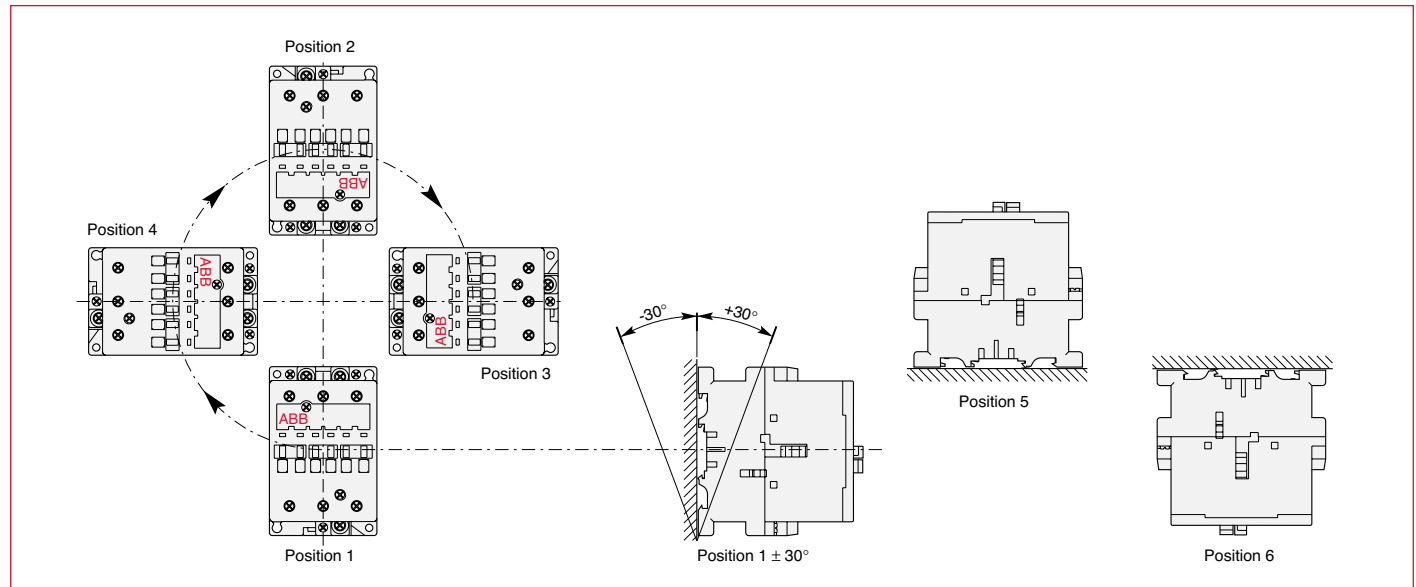
Mounting positions 1 to 5 and ambient temperature ≤ 55 °C: tolerance reduced to 0.9 ... 1.1 U_c (instead of 0.85 ... 1.1 U_c) for coil voltage codes 7 □ and 8 □.

- A 45-22-00 and A 75-22-00 contactors

Mounting positions 1 to 4 (pos. 5 unauthorized) and ambient temperature ≤ 55 °C: tolerance reduced to 0.9 ... 1.1 U_c (instead of 0.85 ... 1.1 U_c) for coil voltage codes 7 □ and 8 □.

For mounting position 6 or ambient temperature of 55 to 70 °C the information given on this page remains applicable.

Mounting Positions (see the above table for authorized positions)



IEC Technical data

A/AF145 — AF1650

Mounting Characteristics — A/AF145 — AF750

Contactor types:	A...	145	185	210	260	300	—	—	—	—
	AF...	145	185	210	260	300	400	460	580	750
Mounting positions	see "Condition for use"									
Mounting distances	The contactors can be assembled side by side									
Fixing										
on DIN rail	—									
according to IEC 715 and EN 50022 / EN 50023	—									
by screws (not supplied)	4 x M5					4 x M6				

Mounting Characteristics — AF1350 — AF1650

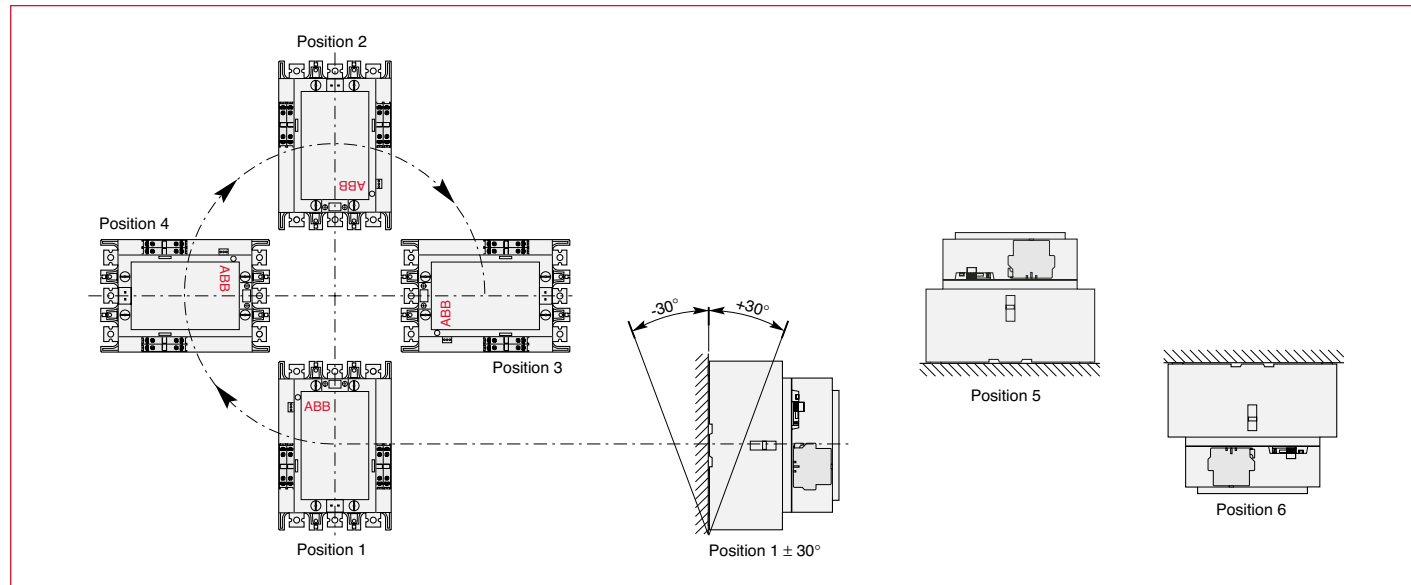
Contactor types:	AF	1350	1650
Mounting positions	see "Condition for use"		
Mounting distances	The contactors can be assembled side by side		
Fixing			
on DIN rail	—		
according to IEC 715 and EN 50022 / EN 50023	—		
by screws (not supplied)	4 x M8		

Conditions for Use

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

Contactors	Mounting position	Ambient temperature	Control voltage
A 145 ... A 300	1, 1 ± 30°, 2, 3, 4, 5	≤ 70 °C	0.85 ... 1.1 x U _c
	6 unauthorized	—	—
AF 145 ... AF 750	1, 1 ± 30°, 2, 3, 4, 5	≤ 70 °C	0.85 x U _c min. ... 1.1 x U _c max.
	6 unauthorized	—	—

Mounting Positions (see the above table for authorized positions)



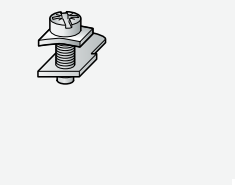
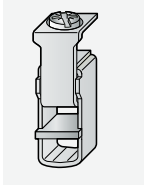
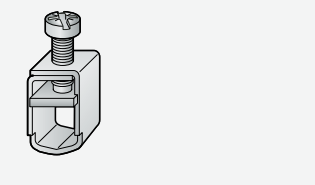
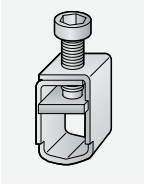












IEC Technical data

A/AE9 – AF/TAE110

Across the line
contactors

1

Connecting Characteristics

Contactor types:	A..., AE...	9	12	16	26	30	40	45	50	63	75	95	110
	AF..., TAE...	-	-	-	-	-	-	45	50	63	75	95	110
Main terminals													
		with cable clamp		with double connector 2 x (5.6 x 6.5 mm)			with single connector (13 x 10 mm)				with single connector (14 x 14 mm)		
Connecting capacity (min. ... max.)													
Main conductors (poles)													
Rigid: solid ($\leq 4 \text{ mm}^2$)		1 ... 4		1.5 ... 6			2.5 ... 16		6 ... 50		10 ... 95		
stranded ($\geq 6 \text{ mm}^2$)		1 ... 4		1.5 ... 6			2.5 ... 16		6 ... 16		6 ... 35		
Rigid with connector													
single for Cu cable													
single for Al/Cu cable													
double for Al/Cu cable													
Flexible with cable end		0.75 ... 2.5		0.75 ... 4			2.5 ... 10		6 ... 35		10 ... 70		
		0.75 ... 2.5		0.75 ... 4			2.5 ... 10		6 ... 25		6 ... 35		
Bars or lugs		8		10			-		-		30 ^②		
		3.7		4.2			-		-		6		
Auxiliary conductors													
(built-in auxiliary terminals + coil terminals)													
Rigid solid		1 ... 4										0.75 ... 2.5	
		1 ... 4										0.75 ... 2.5	
Flexible with cable end		0.75 ... 2.5						1 ... 2.5		0.75 ... 2.5			
		0.75 ... 2.5											
Lugs		8		①		8							
		3.7		①		3.7							
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											
- Main terminals		IP 20						IP 10					
- Coil terminals		IP 20											
- Built-in auxiliary terminals		-											
Screw terminals		(delivered in open position, screws of unused terminals must be tightened)											
Main terminals		(+,-) pozidriv 2 screws										hexagon socket M8 (s = 4 mm)	
		M3.5		M4		M5		M6					
Coil terminals		M3.5 (+,-) pozidriv 2 screws with cable clamp											
Built-in auxiliary terminals		(+,-) pozidriv 2 screws with cable clamp										-	
		M3.5		M4		M5							
Tightening torque													
Main pole terminals													
- recommended	Nm / lb.in	1.00 / 9		1.7 / 15			2.30 / 20		4.00 / 35		6.00 / 53		
- max.	Nm	1.20		2.20			2.60		4.50		6.50		
Coil terminals													
- recommended	Nm / lb.in	1.00 / 9											
- max.	Nm	1.20											
Built-in auxiliary terminals													
- recommended	Nm / lb.in	1.00 / 9		1.7 / 15		1.00 / 9							
- max.	Nm	1.20		2.20		1.20							
Terminal marking and positioning		see pages 1.34											

① $L \leq 8$ and $l > 3.7$ for coil terminal - $L \leq 10$ and $l > 4.2$ for built-in auxiliary terminals.
② With LW 110 enlargement piece. See page 1.31.