

AL9 - AL40, AL9Z - AL16Z

Non-reversing, mechanically interlocked, reversing DC operated, UL rated, 3 phase

Across the line
1



AL Contactors — 3W and 3.5W consumption

General purpose current	UL motor switching current	Maximum motor horsepower ratings				Standard Aux. contacts		Non-reversing		Mechanically interlocked		Reversing	
		208V	240V	480V	575/600V	NO	NC	Catalog number	List price	Catalog number	List price	Catalog number	List price
AC1		UL rated											
21	9	2	2	5	7.5	1 0	0 1	AL9-30-10-81 AL9-30-01-81	\$ 110	AL9M-30-10-81 AL9M-30-01-81	\$ 319	AL9R-30-10-81 AL9R-30-01-81	\$ 379
25	11	3	3	7.5	10	1 0	0 1	AL12-30-10-81 AL12-30-01-81	135	AL12M-30-10-81 AL12M-30-01-81	417	AL12R-30-10-81 AL12R-30-01-81	477
30	17	5	5	10	15	1 0	0 1	AL16-30-10-81 AL16-30-01-81	150	AL16M-30-10-81 AL16M-30-01-81	441	AL16R-30-10-81 AL16R-30-01-81	501
40	28	7.5	10	20	25	1 0	0 1	AL26-30-10-81 AL26-30-01-81	190	AL26M-30-10-81 AL26M-30-01-81	473	AL26R-30-10-81 AL26R-30-01-81	533
50	34	10	10	20	30	1 0	0 1	AL30-30-10-81 AL30-30-01-81	260	AL30M-30-10-81 AL30M-30-01-81	618	AL30R-30-10-81 AL30R-30-01-81	678
60	42	10	15	30	40	1 0	0 1	AL40-30-10-81 AL40-30-01-81	300	AL40M-30-10-81 AL40M-30-01-81	715	AL40R-30-10-81 AL40R-30-01-81	775

ALZ Contactors — 2.4W consumption

General purpose current	UL motor switching current	Maximum motor horsepower ratings				Standard Aux. contacts		Non-reversing		Mechanically interlocked		Reversing	
		208V	240V	480V	575/600V	NO	NC	Catalog number	List price	Catalog number	List price	Catalog number	List price
AC1		UL rated											
21	9	2	2	5	7.5	1 0	0 1	AL9Z-30-10-15 AL9Z-30-01-15	\$ 110	AL9ZM-30-10-15 AL9ZM-30-01-15	\$ 319	AL9ZR-30-10-15 AL9ZR-30-01-15	\$ 379
25	11	3	3	7.5	10	1 0	0 1	AL12Z-30-10-15 AL12Z-30-01-15	135	AL12ZM-30-10-15 AL12ZM-30-01-15	417	AL12ZR-30-10-15 AL12ZR-30-01-15	477
30	17	5	5	10	15	1 0	0 1	AL16Z-30-10-15 AL16Z-30-01-15	150	AL16ZM-30-10-15 AL16ZM-30-01-15	441	AL16ZR-30-10-15 AL16ZR-30-01-15	501

Coil voltage selection

All DC operated catalog numbers include a 24VDC coil. To select other coil voltages, substitute the code from the Coil Voltage Selection Chart for the two digits after the last dash in the catalog number.

Ex.: A 48V coil is required for an AL30 contactor: AL30-30-10-83

Auxiliary contact blocks

For additional auxiliary contact blocks, see catalog number explanation on page 1.6. Add \$ 20 to list price for each additional auxiliary, and see page 1.18 for available combinations.

Coil voltage selection

Hz	Contr. type	Volts							
		12	24	48	110	125	220	240	
DC	AL	80	81	83	86	87	88	89	
DC	AL...Z		15	28					

For other voltages, see page 1.26.

Mechanical interlock

Mechanically interlocked contactors are designed for reversing, 2 speed, reduced voltage, etc. type starter applications. The complete assembly consists of two mechanically and electrically interlocked contactors mounted as follows with line and load terminals:

- AL9 & AL16 — mounted on 35mm DIN rail
- AL26 & AL40 — mounted on common baseplate

Power wiring is not included.

The NC electrical interlock is provided

Reversing

Reversing contactors are designed for reversing type starter applications. The complete assembly consists of two mechanically and electrically interlocked contactors mounted with line and load terminals.

① Only coil voltages available for AL9Z – AL16Z.

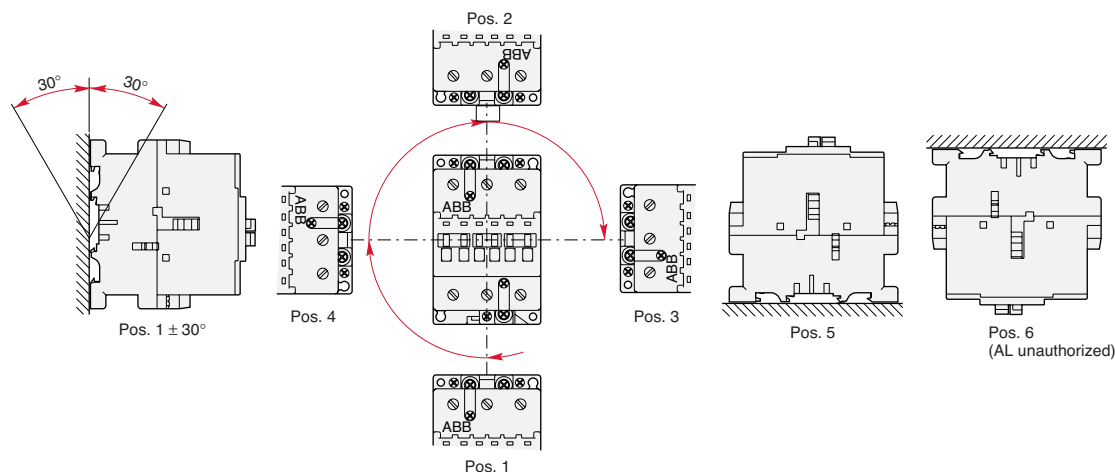
UL & CSA Technical data

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
Number of wires per phase		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





IEC Technical data

AL9 — AL40

Across the line
contactors

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Main Pole - Utilization Characteristics

Contactor types:	AL	AL9	AL12	AL16	AL26	AL30	AL40	
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								
with conductor cross-sectional area mm ²	A	26	28	30	45	65	65	
	4	4	4	6	16	16	35	
Rated operational current I_e / AC-1 for air temperature close to contactor								
U_e max. 690 V	$\varnothing \leq 40$ °C	A	25	27	30	45	55	60
	$\varnothing \leq 55$ °C	A	22	25	27	40	55	60
	$\varnothing \leq 70$ °C ^③	A	18	20	23	32	39	42
with conductor cross-sectional area mm ²		2.5	4	4	6	10	16	
Utilization categorie AC-3 for air temperature close to contactor ≤ 55 °C								
Rated operational current I_e AC-3 ^①								
3-phase motors 	220-230-240 V	A	9	12	17	26	33	40
	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	17	21	25
	1000 V	A	—	—	—	—	—	—
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
	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	15	18.5	22
	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	25	32	32	50	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	820	
	at 690 V	A	90			170	340	
Heat dissipation per pole								
	I_e / AC-1	W	0.8	1	1.2	1.8	2.5	
	I_e / AC-3	W	0.1	0.2	0.35	0.6	0.9	
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					

IEC Technical data

AL9 — AL40, TAL9 – TAL40

Magnet system characteristics for AL contactors

Contactor types: AL	AL9	AL12	16	26	30	40
Rated control circuit voltage U_c	V d.c. 12 ... 240 (24V & 48V for AL...Z)					
Coil operating limits according to IEC 60947-4-1	$\varnothing \leq 55^\circ\text{C}$ 0.85 ... 1.1 x U_c					
Drop-out voltage in % of U_c	roughly 15 ... 30 %					
Coil consumption - Average values						
– pull-in value	W	3 (2.4 for AL9Z - AL16Z)			3.5	
– holding value	W	3 (2.4 for AL9Z - AL16Z)			3.5	
Coil time constant						
– open	L/R	ms	40			
– closed	L/R	ms	90			
Operating time between coil energization and:						
– N.O. contact closing	ms	50 ... 75				
– N.C. contact opening	ms	45 ... 70				
between coil de-energization and						
– N.O. contact opening	ms	15 ... 30				
– N.C. contact closing	ms	17 ... 32				

Magnet System Characteristics for TAL... Contactors

Contactor types: TAL	TAL9	TAL12	TAL16	TAL26	TAL30	TAL40
Rated control circuit voltage U_c	V d.c. 9 ... 264					
Coil operating limits according to IEC 60947-4-1	$\varnothing \leq 55^\circ\text{C}$ 0.85 ... 1.1 x U_c					
Drop-out voltage in % of U_c max.	roughly 20... 35 %					
Coil consumption values for U_c max. and 20 °C						
– U_c max. DC	W	8.5			9	
– U_c min. DC	W	2.5			2.7	
– U_c DC	W	5			5.4	
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 4 to 8 for a diode suppressor.

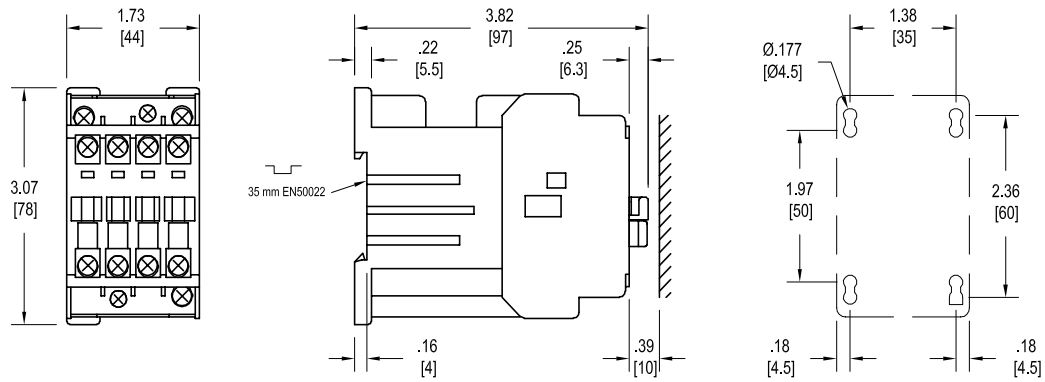
Approximate dimensions 3 & 4 pole contactors, AL9 – AL40

Across the line
contactors

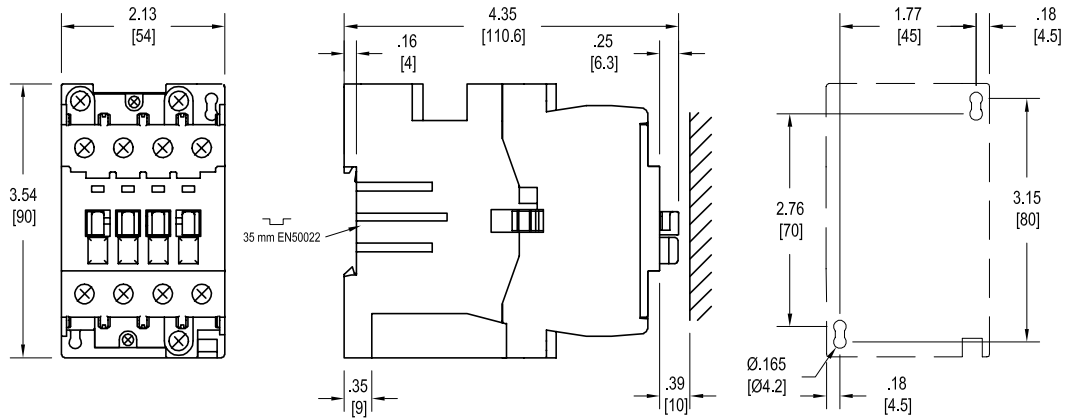
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00.00 Inches
00.00 [Millimeters]

AL9, AL12,, AL16 — Contactor, 3 & 4 pole



AL26 — Contactor, 3 & 4 pole



AL30, AL40 — Contactor, 3 pole

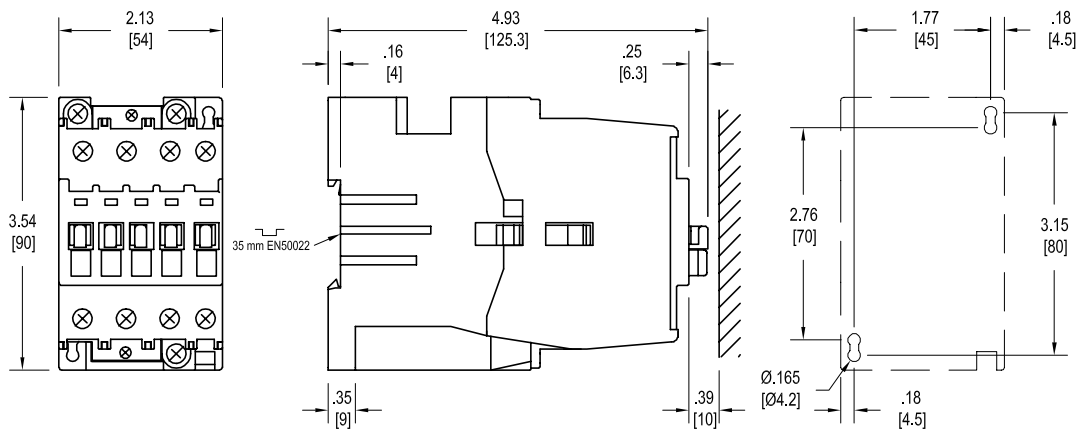




ABB Inc.
1206 Hatton Road
Wichita Falls, TX 76302
Telephone 888-385-1221; 940-397-7000
Fax 940-397-7085
<http://www.abb-control.com>

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