

IEC Contactor Application Ratings

Freedom Series

The following electrical ratings are for the Freedom Series IEC contactors sizes A-Z and conform to the requirements as found in IEC 947-4-1. These ratings are not based on UL or NEMA requirements. The Utilization Categories that are mentioned (AC3, AC4, etc.) are ratings only found within IEC 947-4-1.

Utilization Category

Utilization Category is an IEC term used to describe a specific type of application. Convention has led to the assignment of several ratings to a given contactor for different utilization categories and voltages. The electrical system designer chooses which of several devices he or she prefers for the application, based on its ability to meet, or exceed, the required horsepower, voltage ratings, and other factors, including performance. This technical data should be available from the manufacturers literature. IEC contactors used in the U.S. are usually marked with voltage values (U_e) and with horsepower (or kilowatt) ratings, for use with the maximum AC3 rated operational current (I_e). IEC contactor selection is based on the percent that jogging and plugging (AC4) is of non-jogging and non-plugging (AC3) conditions in the duty cycle and desired contact (electrical) life. In general, any time the duty cycle includes significant jogging or plugging, a larger size IEC contactor is selected than would be needed for pure AC3 applications. See following page for complete listing of categories.

Nameplate Ratings

HP & KW – The maximum rating for each stated operational voltage (U_e) and Utilization Category. The most common Kilowatt or HP ratings on a contactor or starter are for AC3.

Thermal Current (I_{th}) – The maximum current which an open contactor or starter may be expected to carry continuously without exceeding the temperature rises allowed by the IEC Standard. This is not a load switching rating.

Rated Operational Current (I_e) – The maximum FLA at which a motor starter or contactor may be used for a given combination of voltage, frequency and utilization category. A device may have more than one operational current.

Rated Insulation Voltage (U_i) – A design parameter sometimes shown on the nameplate that defines the insulation properties of the controller. It is used for selection or application.

Rated Operational Voltage (U_e) – The voltage at which each stated horsepower or kilowatt rating applies.

Standard Designation – The specific IEC Standard to which the product has been tested is required by IEC to be marked. In the case of Freedom IEC the Standard is IEC 947-4-1.



Cutler-Hammer

EATON

Examples of Utilization Categories For Low-voltage Switchgear And Controlgear

Nature of Current	Category	Typical Applications	Relevant IEC Product Standard
A.C.	AC-1	Non-inductive or slightly inductive loads, resistance furnaces.	947-4
	AC-2	Slip-ring motors: switching off.	
	AC-3	Squirrel-cage motors: starting, switching off motors during running.	
	AC-4	Squirrel-cage motors: starting, Plugging ❶ inching ❷.	
	AC-5a	Switching of electric discharge lamp control.	
	AC-5b	Switching of incandescent lamps.	
	AC-6a	Switching of transformers.	
	AC-6b	Switching of capacitor banks.	
	AC-7a	Slightly inductive loads in household appliances and similar applications.	
	AC-7b	Motor-loads for household applications.	
	AC-8a	Hermetic refrigerant compressor motor control with manual resetting of overload releases.	
	AC-8b	Hermetic refrigerant compressor motor control with automatic resetting of overload releases.	
	AC-12	Control of resistive loads and solid-state loads with isolation by optocouplers.	
AC-13	Control of solid state loads with transformer isolation.	947-3	
AC-14	Control of small electromagnetic loads.		
AC-15	Control of a.c. electromagnetic loads.		
AC-20	Connecting and disconnecting under no-load conditions.		
AC-21	Switching of resistive loads, including moderate overloads.		
AC-22	Switching of mixed resistive and inductive loads, including moderate overloads.		
AC-23	Switching of motor loads or other highly inductive loads.		
A.C. and D.C.	A	Protection of circuits, with no rated short-time withstand current.	947-2
	B	Protection of circuits, with a rated short-time withstand current.	
D.C.	DC-1	Non-inductive or slightly inductive loads, resistance furnaces.	947-4
	DC-3	Shunt-motors, starting, plugging ❶, inching ❷, dynamic breaking of motors.	
	DC-5	Series-motors, starting, plugging ❶, inching ❷, dynamic breaking of motors.	
	DC-6	Switching of incandescent lamps.	947-5
	DC-12	Control of resistive loads and solid-state loads with isolation by optocouplers.	
	DC-13	Control of d.c. electromagnets.	
	DC-14	Control of d.c. electromagnetic loads having economy resistors in circuit.	947-3
	DC-20	Connecting and disconnecting under no-load conditions.	
	DC-21	Switching of resistive loads, including moderate overloads.	
DC-22	Switching of mixed resistive and inductive loads, including moderate overloads (e.g. shunt motors).		
DC-23	Switching of highly inductive loads (e.g. series motors).		

❶ By plugging is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.

❷ By inching (jogging) is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

As found in IEC 947-1.

Electrical Motor Ratings

- Operational currents shown are maximums.
- AC3 is a typical squirrel cage motor application. Starting, switching off motors during running.
- AC4 is jogging/plugging of squirrel cage motors.

Contactor Size	220/240 VAC				380/415 VAC				440/460 VAC			
	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps
CE15A	1.1	5.2	1.1	5.2	2.2	5.2	2.2	5.2	2.2	4.8	2.2	4.8
CE15B	1.5	6.8	1.5	6.8	4	9.1	4	9.1	4	7.8	4	7.8
CE15C	2.2	9.6	2.2	9.6	5.5	12	5.5	12	5.5	11	5.5	11
CE15D	4	16	4	16	7.5	16	7.5	16	7.5	14	7.5	14
CE15E	5.5	22	5.5	22	11	23	11	23	11	21	11	21
CE15F	7.5	28	5.5	22	15	30	11	23	15	27	11	21
CE15G	10	36	10	36	18.5	37	18.5	37	18.5	34	18.5	34
CE15H	11	42	11	42	22	44	22	44	22	40	22	40
CE15J	15	54	15	54	30	59	30	59	30	52	30	52
CE15K	18.5	68	15	54	37	73	30	59	37	65	30	52
CE15L	22	86	18.5	68	45	86	37	73	45	86	37	65
CE15M	30	106	22	86	55	106	45	86	55	106	45	86
CE15N	37	140	30	106	75	140	55	106	75	140	55	106
CE15P	45	170	37	128	90	170	65	128	90	170	65	128
CE15R	55	200	45	150	110	200	75	140	110	200	75	140
CE15S	90	300	50	170	160	300	90	170	160	300	90	170

Contactor Size	500/575 VAC				660 VAC			
	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps
CE15A	4	6.9	4	6.9	2.2	3	2.2	3
CE15B	5.5	9.4	5.5	9.4	4	5.2	4	5.2
CE15C	7.5	12	5.5	9.4	5.5	7.1	5.5	7.1
CE15D	11	17	7.5	12	7.5	9.1	7.5	9.1
CE15E	15	23	11	17	11	13	7.5	9.1
CE15F	18.5	28	11	17	15	17	7.5	9.1
CE15G	22	34	22	34	11	13	11	13
CE15H	30	45	30	45	15	17	15	17
CE15J	30	45	30	45	18.5	21	18.5	21
CE15K	37	55	30	45	22	26	18.5	21
CE15L	55	81	37	55	37	42	30	30
CE15M	75	105	45	66	45	50	37	42
CE15N	75	105	55	81	45	50	40	46
CE15P	90	130	65	98	45	50	45	50
CE15R	110	160	75	105	55	61	55	61
CE15S	160	210	110	160	75	80	75	80

* See following page for Sizes T – Z.

Electrical Motor Ratings (Continued)

Contactor Size	220/240 VAC				380 VAC				415/440 VAC			
	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps
CE15T	120	450	55	180	220	450	95	180	240	450	95	180
CE15U	160	550	60	200	280	550	105	200	315	550	105	200
CE15V	220	700	65	220	375	700	110	220	400	700	110	220
CE15W	220	700	65	220	375	700	110	220	400	700	110	220
CE15X	270	860	70	240	475	860	125	240	500	860	132	240
CE15Z	380	1200	132	400	650	1200	220	400	700	1200	230	400

Contactor Size	500/550 VAC				660 VAC				1000 VAC			
	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps	AC3 kW	AC3 Amps	AC4 kW	AC4 Amps
CE15T	300	420	95	140	335	350	110	140	220	170	---	---
CE15U	375	520	100	145	400	450	132	145	355	260	---	---
CE15V	450	630	105	150	600	630	140	150	500	350	---	---
CE15W	450	630	105	150	600	630	140	150	500	350	---	---
CE15X	550	760	110	160	650	680	150	160	560	380	---	---
CE15Z	840	1200	250	350	1120	1200	275	285	---	---	---	---

Environmental Data

Pollution Degree (IEC 947-1)	3
Impulse Withstand Voltage (Uimp)	6 kV
Operating Temperature	65 to -20 degrees C
Storage Temperature	70 to -40 degrees C
Humidity	50% RH at 65 C / 95% RH at 40 C
Operating Altitude	2,000 meters without derating
Vibration	See Vibration/shock Data File
Corrosion	Magnets coated with fine oil or anti-corrosive coating. All contact and return springs are stainless steel. Screws & base plates are zinc plated and chromate treated to withstand corrosion. Sulphur may have an effect on auxiliary contacts.

Rated Making & Breaking Capacities

- Rated operational voltages (Ue).
- Currents are symmetrical RMS.
- Power factors used are 0.45 for sizes A-L and 0.35 for sizes M-Z.
- Make & Break values are in Amps.

Contactor Size	220/240/380/415 VAC		440/460 VAC		500/575 VAC		660 VAC	
	Make	Break	Make	Break	Make	Break	Make	Break
CE15A	62.4	52	57.6	48	82.8	69	36	30
CE15B	109.2	91	93.6	78	112.8	94	62.4	52
CE15C	144	120	132	110	120	96	85.2	71
CE15D	192	160	168	140	170	136	190.2	91
CE15E	276	230	252	210	230	184	130	104
CE15F	300	240	270	216	280	224	170	136
CE15G	444	370	408	340	408	340	156	130
CE15H	528	440	480	400	540	450	204	170
CE15J	708	590	624	520	540	450	252	210
CE15K	730	590	650	520	550	450	260	210
CE15L	876	730	860	688	810	648	420	336
CE15M	1060	860	1060	860	1050	840	504	420
CE15N	1400	1120	1400	1120	1050	840	552	460
CE15P	1700	1360	1700	1360	1300	1040	600	500
CE15R	2000	1600	2000	1600	1600	1280	732	610
CE15S	3000	2400	3000	2400	2100	1680	960	800

Contactor Size	500 VAC		690 VAC		1000 VAC	
	Make	Break	Make	Break	Make	Break
CE15T	4500	3600	4500	3200	4500	1700
CE15U	5500	4500	5000	4000	5000	2000
CE15V	7000	5600	6300	5100	6300	3500
CE15W	7000	5600	6300	5100	6300	3500
CE15X	8600	6900	7000	5600	6800	3800
CE15Z	12000	10000	10300	7600	---	---

Wye-Delta Starter Application

- Ratings for three-phase, Wye-Delta, non-plugging/non-jogging magnetic IEC contactors for either open or closed-circuit transition.
- A Wye-Delta configuration includes a 1M, 2M & S contactor. The 2M and S are mechanically interlocked while the 1M is typically a starter.
- Ratings are equivalent for 1M, 2M & S contactors.
- Each contactor 1M & 2M carries only 0.577 times the motor FLA when the motor is switched to the delta (running) connections.
- The motor size is represented by “P” in kilowatts and “Ie” is the FLA.

Contactor Size	220/240 V		380/415 V		440/460 V		500/575 V		660 V	
	P	Ie	P	Ie	P	Ie	P	Ie	P	Ie
CE15A	2.2	9.6	5.5	12	5.5	11	7.5	12	4	4
CE15B	4	16	7.5	16	7.5	14	7.7	12	5.5	5.5
CE15C	4	16	11	23	11	21	11	17	7.5	7.5
CE15D	7.5	28	15	30	15	27	18.5	28	11	11
CE15E	7.5	28	18.5	37	18.5	34	22	34	18.5	18.5
CE15F	11	42	22	44	22	40	30	45	22	22
CE15G	15	54	30	59	30	52	37	55	18.5	18.5
CE15H	18.5	68	37	73	37	65	45	66	22	22
CE15J	22	80	45	86	45	77	45	66	30	30
CE15K	30	104	55	160	55	96	55	81	37	37
CE15L	45	150	75	140	75	130	90	130	55	55
CE15M	55	180	90	170	90	160	132	180	75	75
CE15N	75	240	132	240	132	220	132	180	75	75
CE15P	75	240	132	240	160	220	132	180	75	75
CE15R	110	380	200	380	220	380	160	225	90	90
CE15S	160	520	250	520	300	485	220	320	110	110

Contactor Size	220 V		380 V		415/440 V		500/550 V		660 V	
	P	Ie	P	Ie	P	Ie	P	Ie	P	Ie
CE15T	220	700	335	700	400	700	400	650	450	550
CE15U	270	900	450	900	500	900	500	800	600	650
CE15V	300	1100	600	1100	650	1100	700	900	800	850
CE15W	300	1100	600	1100	650	1100	700	900	800	850
CE15X	400	1300	700	1300	750	1300	850	1000	900	1000
CE15Z	---	---	950	---	---	---	1100	---	1400	---

Part Winding Ratings — UL 508

- Tested to UL 508 Part XIII section 149.
- FLA = Full Load Amps, LRA = Locked Rotor Amps.
- Test Criteria: Make LRA, Break LRA at 0.45 Power Factor
1 second on, 9 seconds off
30,000 operations

Contactor Size	200/230 V		460 V	
	FLA	LRA	FLA	LRA
CE15F	---	---	32	145
CE15G	---	---	37	183
CE15H	44	230	44	230
CE15J	60	290	60	290
CE15K	69	363	69	363
CE15L	85	454	85	454
CE15M	105	584	105	584
CE15N	140	725	---	---
CE15P	170	1150	170	870
CE15S	300	1350	300	1108
CE15U	520	1488	520	1488

Definite Purpose Ratings — UL 508

- Tested to UL 508 Part XIII.
- FLA = Full Load Amps, LRA = Locked Rotor Amps.
- Test Criteria: LRA for 50 operations at 0.4-0.5 Power Factor,
FLA for 30,000 operations at 0.75-0.80 Power Factor.

Contactor Size	FLA 600 V Max	LRA 600 V Max
CE15D	18	108
CE15E	25	150
CE15F	32	192
CE15G	37	222
CE15H	44	264
CE15J	60	360
CE15K	69	414
CE15L	85	510
CE15M	105	630
CE15N	140	840
CE15P	170	1020
CE15R	200	1200
CE15S	300	1800
CE15T	420	2520
CE15U	520	3120
CE15V	540	3240
CE15W	700	4200 ❶
CE15X	810	4860
CE15Z	1215	7290

❶ 4500 LRA at 480 Volts.

Rotor Circuit Application

- AC2 duty: slipping motors, starting and switching off.
- Amperage ratings for contactors connected in delta. For wye connected contactors divide ratings by 1.7. $U_{ir} = 690V$, $U_{er} = 575V$
- Electrical lifespan greater than 500,000 operations (making/breaking) – 100% DF rated currents. $DF = \text{Duty factor} = \text{on load period} / \text{total cycle time} \times 100$.
- Providing the starter has more than two steps and the rotor contactors are not required to make or break at voltages greater than 575 volts, the maximum rated rotor operational voltage of the starter is 1380 volts. This is allowed because the rated rotor operational voltage is only applied for a short start duration. Where rotor contactors are used for speed/torque control and the rated rotor operational voltage is applied for longer periods, the rated rotor operational voltage is limited to 690V.

Contactor Size	100% DF	60% DF	40% DF	20% DF
CE15A	12 Amps	15 Amps	19 Amps	27 Amps
CE15B	16	21	26	36
CE15C	21	27	33	46
CE15D	29	38	47	66
CE15E	40	51	63	89
CE15F	52	67	82	116
CE15G	64	83	101	143
CE15H	76	98	120	170
CE15J	104	134	164	232
CE15K	126	163	200	283
CE15L	165	213	261	369
CE15M	225	290	356	503
CE15N	330	426	522	738
CE15P	357	461	564	798
CE15R	393	507	621	879
CE15S	465	600	735	1040

Non-motor Utilization Categories

- Ratings are for 50/60 Hz. and maximum rated operational voltage is 575V.
- AC-5a: Switching of electric discharge lamp control. $U_e = 440V$ maximum.
- AC-5b: Switching of incandescent lamps.
- AC-6a: Switching of transformers.
- AC-1 : Non-inductive or slightly inductive loads; resistance furnaces.

Contactor Size	AC-5a	AC-5B				AC-6A		AC-1	
	Rated Amps	Rated Amps	Lamps per pole at 240V				Rated Amps	Max. Peak Inrush Current	Rated Amps
			60 W	100 W	200 W	500 W			
CE15A	18 A	3.0 A	12	12	3	1	3.1 A	372 A	20 A
CE15B	25	4.0	16	9	4	1	4.2	504	20
CE15C	25	5.2	20	12	6	2	5.4	648	20
CE15D	32	7.3	29	17	8	3	7.6	912	32
CE15E	32	10.0	40	24	12	4	10.0	1200	32
CE15F	32	12.0	48	28	14	5	13.0	1560	32
CE15G	50	14.6	58	35	17	7	15.0	1800	50
CE15H	60	19.0	76	45	22	9	20.0	2400	60
CE15J	75	19.0	76	45	22	9	20.0	2400	75
CE15K	80	24.0	96	57	28	11	24.0	2880	80
CE15L	100	37.0	148	88	44	17	39.0	4680	100
CE15M	135	46.0	184	110	55	22	48.0	5760	135
CE15N	150	60.0	240	144	72	28	63.0	7560	175
CE15P	185	73.0	292	175	87	35	77.0	9240	185
CE15R	220	86.0	344	206	103	41	90.0	10800	220
CE15S	315	129.0	516	309	154	61	135.0	16200	315
CE15T	360	260	N/A	N/A	N/A	N/A	180	5400	600
CE15U	450	315	N/A	N/A	N/A	N/A	225	6750	760
CE15V	570	440	N/A	N/A	N/A	N/A	284	8520	1000
CE15W	570	440	N/A	N/A	N/A	N/A	284	8520	1000
CE15X	700	500	N/A	N/A	N/A	N/A	315	9450	1100
CE15Z	1000	630	N/A	N/A	N/A	N/A	540	16200	1350

Single-bank Capacitor Switching

- AC-6b Utilization Category.
- The switching on, of a power factor correction capacitor results in a very high transient inrush current, the magnitude of which, depends upon the size of capacitor and the impedance of the supply. For optimum contactor selection the supply impedance must be taken into account. As the supply impedance and the prospective short circuit current are directly related, contactor ratings are provided with the corresponding maximum prospective short circuit current. Where a prospective short circuit current is greater than shown below, contact Milwaukee Marketing.
- Ratings are for 50/60 Hz. and maximum rated operational voltage is 575V.

Contactor Size	Maximum Rated Current	KVar						Maximum Prospective Short Circuit Current at Capacitor bank (iK)
		220 V	380 V	415 V	440 V	500 V	550 V	
CE15A	6.8 Amps	2.6	4.5	4.9	5.2	5.9	6.5	1.4 kAmps
CE15B	9.3	3.5	6.1	6.7	7.1	8.1	8.9	1.9
CE15C	12	4.6	7.9	8.6	9.1	10	11	2.5
CE15D	17	6.5	11	12	13	14	16	3.5
CE15E	22	8.4	14	15	16	19	21	6.5
CE15F	22	8.4	14	15	16	19	21	8
CE15G	35	13	23	25	26	30	33	8
CE15H	42	16	27	30	32	36	40	9.5
CE15J	52	19	34	37	39	45	49	13.5
CE15K	56	21	36	40	42	48	53	18.5
CE15L	70	26	46	50	53	60	66	21
CE15M	94	35	61	67	71	81	89	24
CE15N	105	40	69	75	80	90	100	36
CE15P	129	49	84	92	98	111	122	44
CE15R	154	58	101	110	117	133	146	51
CE15S	220	83	144	158	167	190	209	80
CE15T	300	115	200	200	200	260	260	8
CE15U	370	145	250	250	250	320	320	9
CE15V	440	170	300	300	300	380	380	12
CE15W	440	170	300	300	300	380	380	12
CE15X	520	200	350	350	350	450	450	14
CE15Z	760	290	500	500	500	660	660	18

Freedom IEC Contactors – Electrical Durability

The electrical durability of a contactor is the expected number of on-load operations the contactor would achieve before requiring replacement of the contacts, or if the design does not permit contact replacement, replacement of the contactor. The expected number of operations largely depends upon the current broken. Refer to the Contactor Life Curves found in this manual, which detail contact life as a function of current for utilization categories AC3 & AC4.

Selection of a larger contactor is required where:

1. The life required is greater than the rated AC3 or AC4 life. (and/or)
2. The frequency of operation is greater than tabulated below:

Contactor Size	Maximum Frequency of Operation	
	AC3 Duty	AC4 Duty
CE15AN to CE15PN	600 per hour	300 per hour
CE15RN	600 per hour	200 per hour
CE15SN	300 per hour	150 per hour
CE15TN to CE15XN	300 per hour	100 per hour
CE15Z	120 per hour	30 per hour

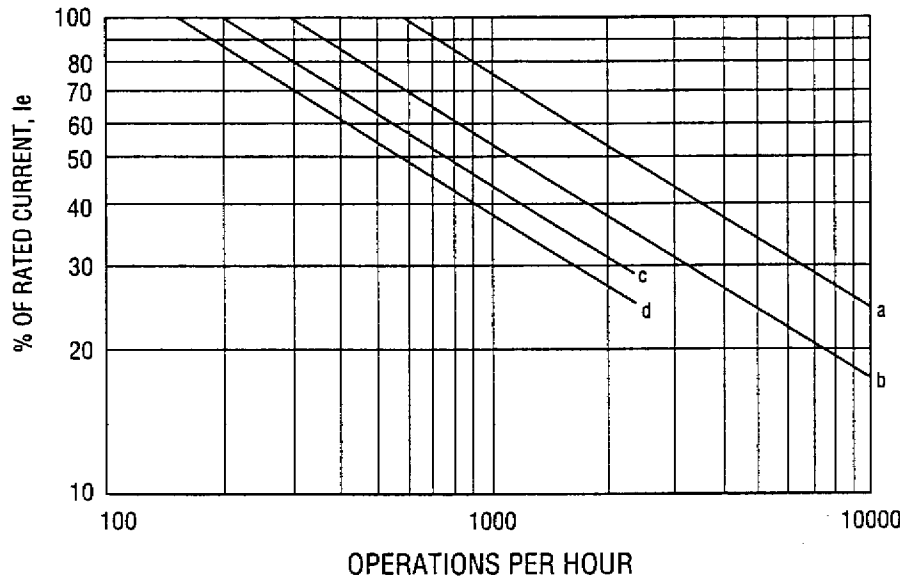
3. For applications where the frequency of operation is greater than above, refer to the derating curves on the following page. For a given number of operations, contactor size and utilization category, you are given the amount of rated current derating that needs to be taken into account for your application. For 1000 operations per hour on an AC3 application, a size A contactor would be derated by 24% or 76% of rated current.
4. For applications which involve a mixture of AC3 and AC4 switching duties, the following formula should be used to calculate the expected number of operations the contactor would achieve.

$$\text{Mixed duty life} = N \times P / (Z \times N) + (S \times P)$$

Where: N=AC3 life , P = AC4 life (life at application current)
 Z=AC4 operations proportion factor (% of total duty cycle)
 S=AC3 operations proportion factor (% of total duty cycle)

Example: 25% AC4 and 75% AC3

DERATING FOR INCREASED RATE OF OPERATION



	AC3	AC4
CE15AN	a	b
CE15BN	a	b
CE15CN	a	b
CE15DN	a	b
CE15EN	a	b
CE15FN	a	b
CE15GN	a	b
CE15HN	a	b
CE15JN	a	b
CE15KN	a	b
CE15LN	a	b
CE15MN	a	b
CE15NN	a	b
CE15PN	a	b
CE15RN	a	c
CE15SN	b	d

Physical and Mechanical Ratings

Contactor Size	Width (mm)	Weight (kg)	Number of Poles	Max. Auxiliary Circuits	Mechanical Life Millions	Replaceable Contacts	Protection Against Direct Ⓢ Contact
CE15A	45	0.41	4	9	20	No	IP20
CE15B	45	0.41	4	9	20	No	IP20
CE15C	45	0.41	4	9	20	No	IP20
CE15D	45	0.44	3	8	20	No	IP10 Ⓢ
CE15E	45	0.44	3	8	20	No	IP10 Ⓢ
CE15F	45	0.44	3	8	20	No	IP10 Ⓢ
CE15G	65	1.25	3	8	10	Yes	IP10 Ⓢ
CE15H	65	1.25	3	8	10	Yes	IP10 Ⓢ
CE15J	65	1.25	3	8	10	Yes	IP10 Ⓢ
CE15K	65	1.25	3	8	10	Yes	IP10 Ⓢ
CE15L	90	3.8	3	8	6	Yes	IP10 Ⓢ
CE15M	90	3.8	3	8	6	Yes	IP10 Ⓢ
CE15N	90	3.8	3	8	6	Yes	IP10 Ⓢ
CE15P	180	8.3	3	8	5	Yes	IP00 Ⓢ
CE15R	180	8.3	3	8	5	Yes	IP00 Ⓢ
CE15S	180	8.3	3	8	5	Yes	IP00 Ⓢ
CE15T	220	13.0	3	8	5	Yes	IP00 Ⓢ
CE15U	220	13.5	3	8	5	Yes	IP00 Ⓢ
CE15V	280	38.0	3	8	5	Yes	IP00 Ⓢ
CE15W	280	38.0	3	8	5	Yes	IP00 Ⓢ
CE15X	280	44.8	3	8	5	Yes	IP00 Ⓢ
CE15Z	334	71.8	3	15	5	Yes	IP00 Ⓢ

Ⓢ IP10 = Back of hand protection. IP20 = Finger protection.
 Ⓢ IP20 finger protection when optional cover shields are used.

Contactor Size	Power Terminals (Line or Load)	Control Terminals
CE15A-C	#12 - 16 stranded, #12 - 14 solid Cu	#12 - 16 stranded #12 - 14 solid Cu only
CE15D-F	#8 - 16 stranded, #10 - 14 solid Cu	
CE15G-K	#3 - 14 (upper) and/or #6 - 14 (lower) stranded or solid Cu	
CE15L	#1/0 - 14 Al Cu	
CE15M	#2/0 - 14 Al Cu	
CE15N	#3/0 - 8 Al Cu	
CE15P-S	350 kcmil - #6 Al Cu	
CE15T Ⓣ	(2) #2/0 - 600 kcmil	#12 - 16 standard or solid
CE15U Ⓣ	(2) #2/0 - 600 kcmil	
CE15V Ⓣ	(2) 750 kcmil - 3/0	
CD15W Ⓣ	(2) 750 kcmil - 3/0	#12 - 16 standard or solid
CE15X Ⓣ	(3) 750 kcmil - 3/0	#12 - 16 standard or solid
CE15Z Ⓣ	(4) 750 kcmil - 1/0	#12 - 16 standard or solid

Ⓣ Lug kits supplied separately.

Derating — Altitudes above 2000 meters

Altitude	Voltage (Ue) Factor	Current (Itn) Factor
2000 m	1	1
2500 m	0.93	0.97
3000 m	0.87	0.95
4000 m	0.77	0.90
5000 m	0.67	0.85

Power Loss Data

Contactor Size	Main Power Pole Data			Magnet Coil Data	
	Average Contact Resistance (Milli-Ohms)	Power Dissipated – per pole (Watts)		Power Dissipated – Sealed (Watts)	
		At I _{th}	At Max. I _e	A.C. Coils	D.C. Coils
CE15A	2	0.8	0.1	2.4	3.36
CE15B	2	0.8	0.18	2.4	3.36
CE15C	2	0.8	0.29	2.4	3.36
CE15D	1.3	1.3	0.38	3.1	3.36
CE15E	1.3	1.3	0.69	3.1	3.36
CE15F	1.3	1.3	1.2	3.1	3.36
CE15G	1.75	4.4	2.4	7.8	N/A
CE15H	1.75	6.3	3.5	7.8	N/A
CE15J	1.75	9.8	6.1	7.8	N/A
CE15K	1.75	11.2	9.3	7.8	N/A
CE15L	0.45	4.5	3.3	13	N/A
CE15M	0.45	8.2	5	13	N/A
CE15N	0.45	5.6	5	13	N/A
CE15P	0.25	8.5	7.5	27.2	5.3
CE15R	0.25	12	10	27.2	5.3
CE15S	0.25	25	22	27.2	5.3

I_{th} = Thermal Current – the maximum current which an open contactor or starter may be expected to carry continuously without exceeding the temperature rises allowed by the IEC standard.

I_e = Rated Operational Current – the maximum FLA at which a motor starter or contactor may be used for a given combination of voltage, frequency and utilization category.

Freedom Contactors – Listings & Standards

	45 mm frame	65 mm frame	90 mm frame	180 mm frame
	CE15A-F Series B1	CE15G-K Series B1	CE15L-N Series Series A1	CE15P-S Series A1
International Standards				
Tested & Complies with the Requirements of:	IEC 947-4-1	IEC 947-4-1	IEC 947-4-1	IEC 947-4-1
Eaton Report Numbers	50-19691 to 50-19696	50-19697 to 50-19700	50-20019 to 50-20020	50-20021 to 50-20024
North American Standards				
USA	UL Listed	UL Listed	UL Listed	UL Listed
UL file reference	E1491	E1491	E1491	E1491
Canada	CSA Approved	CSA Approved	CSA Approved	CSA Approved
CSA file reference	LR 353	LR 353	LR 353	LR 353

	220 mm frame	280 mm frame	334 mm frame
	CE15T-U Series A1	CE15V-X Series A1	CE15Z Series A1
International Standards			
Tested & Complies with the Requirements of:	IEC 158-1 ①	IEC 158-1 ①	IEC 158-1 ①
Eaton Report Numbers	N/A	N/A	N/A
North American Standards			
USA	UL Listed	UL Listed	UL Listed
UL file reference	E1491	E1491	E1491
Canada	CSA Approved	CSA Approved	CSA Approved
CSA file reference	LR 353	LR 353	LR 353

① IEC 947-4-1 Pending