



ALLEN-BRADLEY

Contactors and Overload Relays

Application Data

Allen-Bradley Drives

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Definitions

The following definitions apply to the table below and technical information on the following pages.

Rated Insulation Voltage (U_i): The maximum rated operational voltage of the contactor as defined in IEC 158-1.

Rated Continuous (Thermal) Current I_{th} : The maximum current that the device can carry (without any switching) for an eight hour period without the temperature rise of its parts exceeding the limits specified in IEC Publication 158-1.

Rated Operational Current (I_e): The maximum value of current which may be switched within a specific utilization category. In utilization categories pertaining to motor loads this current is the full load current of the motor.

Inrush Current: The instantaneous current caused by energizing an electric circuit. With an inductive or capacitive circuit, the inrush current will be higher than the continuous current. For a motor, the inrush current will be the motor locked rotor current; approximately six times the motor full load current.

Resistive Load (Heating and some Lighting applications): Power factor is equal to 1 and in phase with voltage.

Inductive Load (motor, reactor and transformer applications): Power factor is less than 1 and lags voltage. This is caused by the power consumed in creating the magnetic field.

Capacitive Load (Capacitors most commonly used for power factor correction): Power factor is less than 1 and leads voltage.

Specifications

Specifications		Catalog No. Suffix -A09	Catalog No. Suffix -A12	Catalog No. Suffix -A18	Catalog No. Suffix -A24	Catalog No. Suffix -A30	Catalog No. Suffix -A38	
Mechanical Endurance (No Load Operating Cycles in Millions)		20	20	15	15	15	15	
Operating Position		± 22.5° From Normal						
Degree of Protection (per IEC 529)		IP20	IP20	IP20	IP20	IP20	IP20	
Insulation Voltage IEC (U _i)		660	660	660	660	660	660	
Permitted Ambient Temperature		-20 To +40						
Enclosed °C		-20 To +55						
Open °C		-40 To +65						
Storage °C								
Altitude		2000M						
Coil Operating Limits % of Rated Voltage		AC or DC 85 to 110%						
Average Operational Times (in milliseconds)		Pick-up AC	13-30	13-20	17-25	17-25	16-24	12-22
		DC	44	44	47	47	45	-
		Drop-Out AC	6-12	6-12	6-12	6-12	6-13	6-11
		DC	9.0	9.0	9.0	9.0	14	-
		DC with Suppression	44	44	84	30.1	40	-
AC Coil Consumption (±10%)	Inrush VA	60Hz	77	77	84	84	90	161
		50Hz	71	71	77	77	83	153
	Sealed VA	60Hz	6.2	6.2	6.5	6.5	7.7	19
		50Hz	6.7	6.7	6.9	6.9	7.9	20
Sealed Power Factor	60Hz	.27	.27	.28	.28	.25	.23	
	50Hz	.25	.25	.26	.26	.24	.22	
DC Coil Consumption (±10%)	Pure DC Coil	Sealed Watts	8.3	8.3	8.3	8.3	8.3	10
	Economized DC Coil	Inrush Watts	-	-	-	-	-	160①
		Sealed Watts	-	-	-	-	-	1.58①
Resistance to Shock (11 msec Halfsine) (Open to contact touch)		10g	10g	10g	10g	10g	10g	
Contactor Terminal Capacity								
Contactor Power Poles		mm ²	2-4	2-4	2-6	2-6	2-10	2-25
		AWG	2-#12	2-#12	2-#10	2-#10	2-#8	1-#4
Auxiliary Contact		mm ²	2-4	2-4	2-6	2-6	2-4	2-4
		AWG	2-#12	2-#12	2-#10	2-#10	2-#12	2-#12
Coil Terminals		mm ²	2-4	2-4	2-4	2-4	2-4	2-4
		AWG	2-#12	2-#12	2-#12	2-#12	2-#12	2-#12
Average Impedance (Per Power Pole)		mΩ	2.4	2.4	2.1	2.1	2.1	1.5
Total Number of Auxiliary Contacts Operable by Contactor (including those supplied as standard)			5	5	5	5	5	5

	Catalog No. Suffix -A45	Catalog No. Suffix -A60	Catalog No. Suffix -A75	Catalog No. Suffix -B110	Catalog No. Suffix -B180	Catalog No. Suffix -B250	Catalog No. Suffix -B300	Catalog No. Suffix -B400	Catalog No. Suffix -B600
	15	15	15	10	10	5	5	5	5
	± 22.5° From Normal								
	IP20	IP20	IP20	IP00	IP00	IP00	IP00	IP00	IP00
	660	660	660	660	660	660	660	660	660
	-20 TO +40 -20 TO +55 -40 TO +65								
	2000M								
	85 TO 110%								
	12-22 -	14-29 -	14-29 -	16-35 -	20-44 -	18-42 -	18-42 -	18-36 -	25-79 -
	6-11 - -	6-14 - -	6-14 - -	5-14 - -	9-20 - -	7-17 - -	7-17 - -	8-18 - -	10-22 - -
	161 153	348 327	348 327	552 537	840 825	1596 1562	1596 1562	3120 3080	4680 4730
	19 20	34 37	34 37	64 72	75 85	113 124	113 124	168 176	216 216
	.23 .22	.20 .19	.20 .19	.21 .21	.25 .22	.28 .25	.28 .25	.42 .37	.49 .45
	10	17	17	24	-	-	-	-	-
	160 ^① 1.58 ^①	309 ^① 2.69 ^①	309 ^① 2.69 ^①	383 ^① 3.32 ^①	518 ^① 5.57 ^①	- -	- -	- -	- -
	10g	8g	8g	7g	7g	7g	7g	6g	4g
	1-25 1-#4 2-4 2-#12 2-4 2-#12	1-35 1-#2 2-4 2-#12 2-4 2-#12	1-35 1-#2 2-4 2-#12 2-4 2-#12	1-50 ^② 1-#1/0 ^② 2-4 2-#12 2-4 2-#12	1-120 ^② 1-#4/0 ^② 2-4 2-#12 2-4 2-#12	1-240 ^② 1-500MCM ^② 2-4 2-#12 2-4 2-#12	1-240 ^② 1-500MCM ^② 2-4 2-#12 2-4 2-#12	2-185 ^② 2-350MCM ^② 2-4 2-#12 2-4 2-#12	2-240 ^② 2-500MCM ^② 2-4 2-#12 2-4 2-#12
	1.5	1.2	1.2	0.5	0.4	0.3	0.3	0.3	0.1
	5	5	5	5	5	5	5	6	6

① These values represent the burden on the power supply only. The burden on the input signal is 3.6 watts inrush and 0.2 watts sealed.
② Using Allen-Bradley Bulletin 199 Terminal Lug Kits.

Motor and Resistive Load Ratings

Specifications	Catalog No. Suffix -A09	Catalog No. Suffix -A12	Catalog No. Suffix -A18	Catalog No. Suffix -A24	Catalog No. Suffix -A30	Catalog No. Suffix -A38	
Rated Operating Current							
Continuous (thermal) Current I_{th} A	22	22	35	35	45	80	
AC1 Duty, Switching Resistive Loads A	22	22	35	35	45	80	
AC2, AC3 & AC4 Maximum Operational Current Rating I_e A	9	12	18	24	30	38	
Maximum Power Rating in kW 3 Phase							
220V kW	2.2	3	4	5.5	7.5	10	
380V kW	4	5.5	7.5	11	15	18.5	
415V kW	4	5.5	7.5	11	15	18.5	
500V kW	5.5	7.5	11	15	18.5	22	
660V kW	5.5	7.5	11	15	18.5	18.5	
Maximum HP Rating 3 Phase							
220V HP	2	3	5	5	7-1/2	10	
230V HP	2	3	5	7-1/2	10	10	
460V HP	5	7-1/2	10	15	20	25	
575V HP	7-1/2	10	15	20	25	30	
Maximum HP Rating 1 Phase							
115V HP	1/3	1/2	1	2	2	3	
230V HP	1	2	3	3	5	5	
Standard Auxiliary Contact Rating	Same as Operating Current Ratings Above				NEMA A600		

UL Listings and CSA Certifications

Bulletin Number	UL File Number	UL Guide	CSA Number
100	E3125	NLDX Card A	LR123X
193	E14840	NKCR Card N	LR49598
195	E14840	NKCR2	LR49598

	Catalog No. Suffix -A45	Catalog No. Suffix -A60	Catalog No. Suffix -A75	Catalog No. Suffix -B110	Catalog No. Suffix -B180	Catalog No. Suffix -B250	Catalog No. Suffix -B300	Catalog No. Suffix -B400	Catalog No. Suffix -B600
	80	100	100	160	225	400	400	600	800
	80	100	100	160	225	400	400	600	800
	45	60	75	110	180	250	304	414	608
	11 22 22 30 22	15 30 30 37 37	22 37 37 45 45	30 55 55 75	45 90 90 110 110	75 132 132 160 160	90 160 160 200 200	120 220 220 280 280	180 315 315 445 445
	10 15 30 40	15 20 40 50	20 25 50 60	30 40 75 100	60 60 150 150	75 100 200 250	100 100 250 300	125 150 350 400	200 250 500 600
	3 7-1/2	5 10	5 10	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
NEMA A600									

Electrical Life in Utilization Category

Life Load Curves

Bulletin 100 IEC based contactors are designed for superior performance in a wide variety of applications. When selecting IEC based products, the user must give consideration to the specific load, utilization category and required electrical life of the application. The life load curves listed here are based on Allen–Bradley tests according to the requirements defined in IEC 158–1. Since contact life in application conditions is dependent on environmental conditions and duty cycle, actual application contact life may vary from that indicated by the curves shown here.

To find the contactor’s estimated electrical life, follow these guidelines:

1. Choose the appropriate graph that most closely approximates the utilization category of the application.
2. Locate the intersection of the life load curve of the appropriate contactor with the applications operational current (I_e) found on the horizontal axis.
3. Read the estimated contact life in number of operating cycles along the vertical axis

Utilization Categories

Category	Typical Duty
AC1	Non–inductive or slightly inductive loads
AC2	Starting of slip–ring motors.
AC3	Starting of squirrel cage motors and switching off only after the motor is up to speed.
AC4	Starting of squirrel cage motors with inching and plugging duty.

Contact Life for Mixed Utilization Categories AC3 and AC4

In many applications, the utilization category cannot be defined as either purely AC3 or AC4. In those applications, the electrical life of the contactor can be estimated from the following equation.

$$L_{\text{mixed}} = \frac{L_{\text{AC3}}}{1 + P_{\text{AC4}} \left(\frac{L_{\text{AC3}}}{L_{\text{AC4}}} - 1 \right)} \quad \text{Where:}$$

L_{mixed} : Approximate contact life for a mixed AC3/AC4 utilization category application.

L_{AC3} : Approximate contact life in operating for AC3 utilization category (from AC3 life load curves on Page 9).

L_{AC4} : Approximate contact life in operating cycles for AC4 utilization category (from AC4 life load curves on Page 10)

P_{AC4} : Percentage of AC4 operating cycles.

AC3

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AC4^①

① Note the AC4 life load curves are based upon the assumption that motors used will have a locked rotor current equal to or less than 600% of motor full load current.

AC1

AC2

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Switching Three Phase Capacitors

Operating Conditions –

Maximum Rated voltage – 660 volts AC.

Maximum Ambient Temperature – 40° C.

Operating Rate – Single capacitor banks with damping. No more than 10 operations per hour. For applications requiring more than 10 operations per hour contact your local Allen–Bradley Sales Office for information.

Power Rating in kVAR ^①

Catalog Number Suffix	60Hz				50Hz			
	200V	240V	480V	600V	220V	380V	500V	660V
-A09	3	3.5	7	8	3	5.5	8	8
-A12	4	4.5	9	10	4.5	7	10	10
-A18	6	7.5	15	16	6.5	11.5	16	16
-A24	8	10	19	20	9	15	20	20
-A30	10.5	12.5	25	25	11.5	20	25	25
-A38	13	18	35	35	15	25	35	35
-A45	16	20	40	40	18	30	40	40
-A60	20	25	45	45	20	35	45	45
-A75	25	30	55	55	25	45	55	55
-B110	30	38	75	75	35	60	75	75
-B180	40	50	100	100	45	80	100	100
-B400	105	125	250	200	115	200	250	200
-B600	160	190	380	300	170	300	400	300

^① Maximum available current of 10 kA. For systems with larger available current, contact your nearest Allen–Bradley Sales Office.

**Controller Ratings for
 Transformer Primary
 Switching kVA**

Operating Conditions –

Maximum Rated voltage – 660 volts AC.

Maximum Ambient Temperature – 40° C.

Operating Rate – Less than 120 operations per hour, but no more than 2 per minute.

Inrush Currents of not more than 20 Times Peak Continuous Current Ratings

Catalog Number Suffix	kVA for Single Phase Volts				kVA for Three Phase Volts					
	120V	240V	480V	600V	208V	240V	380V	480V	600V	660V
-A09	.72	1.5	2.9	3.6	2.2	2.5	4	5	6.2	6.8
-A12	.96	1.9	3.9	4.8	2.9	3.3	5.3	6.7	8.3	9.1
-A18	1.4	2.9	5.8	7.2	4.3	5	7.9	10	12	13
-A24	1.9	3.9	7.7	9.6	5.8	6.7	11	13	16	18
-A30	2.4	4.8	9.6	12	7.2	8.4	13	17	20	23
-A38	3.1	6.1	12	15	9.2	11	17	21	26	29
-A45	3.6	7.2	14	18	11	13	20	25	31	34
-A60	4.8	9.6	19	24	14	17	26	33	41	45
-A75	6.0	12	24	30	18	21	33	42	52	57
-B110	8	16	32	36	24	28	44	56	62	69
-B180	12	23	46	52	35	40	63	80	90	99
-B250	16	32	64	72	48	56	88	111	125	138
-B300	19	39	77	87	58	67	106	134	150	165
-B400	26	51	92	92	77	89	140	160	160	160
-B600	39	77	139	139	116	134	210	240	240	240

Guidelines for Short Circuit Protective Device Selection

Determine the level of protection required for the application; (i.e., Is Type 2 coordination, ASTA Certification or UL Listing of the application required?).

Select the protective device required for the application from the column labeled for the level of protection required. For U.S. applications, in no case should the protective device selected exceed the maximum device rating as allowed per Article 430 of the National Electrical Code.

UL Listed Combinations – UL Listed for the combination of contactor, or contactor and overload relay, and the maximum size short circuit protection device. UL List combinations are listed for a maximum short circuit current of 5kA.

UL Certified Type 2 Combinations – Certified to provide Type 2 coordination under short circuit conditions (as defined by IEC Standard 947-4-1) with the combination of contactor, overload relay and maximum size short circuit protective device. UL Certified Type 2 combinations are certified for a maximum short circuit current of 100kA. **For additional information about UL Type 2 Certification, refer to Allen–Bradley Publication 100-2.8.**

ASTA Certified Type 2 Combinations – Certified by ASTA (Association of Short Circuit Testing Authorities) to provide Type 2 coordination under short circuit conditions when using the listed combination of contactor, overload relay and GEC manufactured type BS88 fuses. This certification is applicable in countries where British Standards or derivatives of such are applied to electrical installations. ASTA Certified combinations are certified for a maximum short circuit current of 80kA.

Table 1
Contactors Only

Contactor Catalog Num- ber Suffix	Maximum Short Circuit Protection Device Rating/Setting in Amperes				
	Type 2 Coordination			UL Listed Combinations	
	UL Class K1/RK1, J, CC Fuses ^①	BS88 Fuses	gL Fuses	UL Class K5/RK5 /L Fuses ^②	Circuit Breakers
-A09	15	25	25	-	15
-A12	25	25	25	-	15
-A18	25	32	35	-	50
-A24	40	32	35	-	50
-A30	50	40	40	-	90
-A38	110	80	80	-	110
-A45	110	100	100	-	110
-A60	200	125	125	-	175
-A75	225	125	125	225	200
-B110	300	200	200	300	300
-B180	400	315	315	400	400
-B250	450	400	400	450	450
-B300	601 (Class L) ^③	500	500	601 (Class L) ^③	450
-B400	800 (Class L) ^③	630	630	800 (Class L) ^③	800
-B600	1200 (Class L) ^③	1000	1000	1200 (Class L) ^③	-

^① In Canada, CSA Certified when using CSA fuse designation HRCI-J.

^② In Canada, CSA Certified when using CSA fuse designation HRCII-C, HRCI-R.

^③ In Canada, CSA Certified when using CSA designation HRC-L.

Note: Class CC fuses have a 30A maximum rating.

Guidelines for Short Circuit Protective Device Selection (cont'd)

Table 2
Contactors and Overload Relays Used Together (Starters)

Contactor Catalog Number Suffix	Overload Relay	Maximum Short Circuit Protection Device Rating/Setting in Amperes				
		UL Listed Combinations		UL Certified Type 2 Combination		ASTA ^④ Certified Type 2 Combinations
		UL Class K5/RK5 Fuses ^①	Circuit Breakers	UL Class J Fuses (CSA HRCI-J Fuse ^②)	UL Listed Time-Delay Class CC (CSA HRCI MISC.) Fuse ^③	Using GEC BS88 Fuses
-A09	BSA18	1	-	-	-	-
	BSA26	1	-	-	-	-
	BSA35	1	-	-	-	-
	BSA70	1	-	-	-	-
	BSA90	3	-	-	-	-
	BSA12	3	-	-	-	-
	BSA16	6	-	2	2.5	NIT6
	BSB22	6	-	3	3	NIT6
	BSB30	10	-	6	6	NIT10
	BSB42	15	-	6	6	NIT16
	BSB60	20	-	10	10	NIT20
	BSB80	30	-	10	20	NIT20M25
	BSC10	40	-	15	20	NIT20M25
-A12	BSB80	30	-	10	20	-
	BSC10	40	-	15	20	-
	BSC15	60	-	20	30	NIT20M32
-A18	BSA18	1	15	-	-	-
	BSA26	1	15	-	-	-
	BSA35	1	15	-	-	-
	BSA70	1	15	-	-	-
	BSA90	3	15	-	-	-
	BSB12	3	15	-	-	-
	BSB16	6	15	2	2.5	-
	BSB22	6	15	3	3	-
	BSB30	10	15	6	6	-
	BSB42	15	15	6	6	-
	BSB60	20	20	10	10	-
	BSB80	30	25	10	20	-
	BSC10	40	30	15	20	-
BSC15	60	45	20	30	TIA32M35	
BSC24	90	50	30	-	TIA32M40	

① CSA fuse designation HRCI-J must also be UL Listed as Class J fuses.

② In Canada, CSA Certified when using CSA fuse designation HRCI-J, HRCI-T.

③ Only Littelfuse manufactures a UL Listed Class CC time delay specifically for use in motor circuits. Class CC fuses are available through 30A only. CSA HRCI-MISC fuses must also be UL Listed as Class CC fuses.

④ ASTA Certification requires the use of these GEC fuses.

Note: Class CC fuses have a 30A maximum rating and therefore would not be used on motor applications where the full load current exceeds 12A.

Guidelines for Short Circuit Protective Device Selection (cont'd)

Table 2
Contactors and Overload Relays Used Together (Starters) (continued)

Contactor Catalog Number Suffix	Overload Relay	Maximum Short Circuit Protection Device Rating/Setting in Amperes				
		UL Listed Combinations		UL Certified Type 2 Combination		ASTA ^④ Certified Type 2 Combinations
		UL Class K5/RK5 Fuses ^①	Circuit Breakers	UL Class J Fuses (CSA HRCI-J Fuse ^②)	UL Listed Time-Delay Class CC (CSA HRCI MISC.) Fuse ^③	Using GEC BS88 Fuses
-A24	BSC15	60	45	20	30	-
	BSC24	90	50	30	-	TIA32M50
-A30	BSC24	90	50	30	-	-
	BSC32	90	90	40	-	TIA32M63
-A38	CPC30	110	110	-	-	-
	CPC45	110	110	50	-	TIS63M80
-A45	CPC30	110	110	-	-	-
	CPC45	110	110	50	-	TIS63M80
-A60	CPC63	200	175	80	-	TIS63M100
	CPC75	225	200	100	-	TCP100M125
-B110	HPC66	250	250	-	-	-
	HPD110	300	300	150	-	TF160
-B180	DPC88	350	350	-	-	-
	DPD120	400	350	200	-	TF200
	DPD200	400	400	-	-	TF200M250
-B250	EPD180	450	450	300	-	TF200M250
	EPD300	450	450	-	-	TKF315M355
-B300	EPD180	450 ^{⑤⑥}	450 ^⑤	300	-	-
	EPD300	450 ^{⑤⑥⑦}	450 ^⑤	-	-	TKF315M355
-B400	FPD240	700 ^⑧	700	-	-	-
	FPD400	800 ^⑧	800	-	-	-
-B600	GPD378	1000 ^⑧	-	-	-	TTM500
	GPD630	1200 ^⑧	-	-	-	-

- ① In Canada, CSA Certified when using CSA fuse designation HRCII-C, HRCI-R.
- ② CSA fuse designation HRCI-J must also be UL Listed as Class J fuses.
- ③ Only Littelfuse manufactures a UL Listed Class CC time delay specifically for use in motor circuits. Class CC fuses are available through 30A only. CSA HRCI-MISC fuses must also be UL Listed as Class CC fuses.
- ④ ASTA Certification requires the use of these GEC fuses.
- ⑤ 10kA maximum short circuit current available.
- ⑥ Class K5 fuse.
- ⑦ 18kA maximum short circuit available – Class L fuse.
- ⑧ In Canada, CSA Certified when using CSA fuse designation HRC-L.

Lighting Loads

Typical Electric Discharge Loads – Mercury vapor, sodium vapor, metal halogen and florescent lamps.

Compensated Loads – Loads that use a power factor correction capacitor to improve the power factor of the load. These loads typically exhibit an inrush current of 15 to 20 times the continuous current of the load.

Selection Information – To select a contactor for controlling a lighting load, use the following procedure:

1. Determine the type of load to be controlled. For example – is it an incandescent type load or an electric discharge type; compensated or non-compensated type?
2. Determine the continuous current of the lighting load.
3. Select a contactor that has a current rating greater than or equal to the continuous rating of the load that is being switched.

Maximum Switching Current				
Catalog Number Suffix	Circuit Closing Inrush Current (Amps Peak including Offset)	Electric Discharge Lamp Loads $\leq + 300V$		Incandescent Lamp Loads (Amps)
		Non-Compensated (Amps)	Compensated (Amps)	
-A09 ^①	136	12	9	9
-A12 ^①	182	16	12	12
-A18 ^①	273	23	18	18
-A24 ^①	364	31	24	24
-A30	455	39	30	30
-A38	576	52	38	38
-A45	682	62	45	45
-A60	909	72	60	60
-A75	1136	90	75	75
-B110	1667	140	110	110
-B180	2727	225	180	180
-B250	3788	317	250	250
-B300	4546	380	300	300
-B400	6061	520	400	400
-B600	9091	720	600	600

^① When using contactor catalog numbers 100-A09 through 100-A24, all four poles can be used for switching lighting loads.

Star-Delta Ratings

These listed ratings assume equally sized contactors are used for both the star and delta contactors and assume normal acceleration times. For extended acceleration time (beyond 20 seconds) contact your nearest Allen-Bradley Sales Office.

Catalog Number Suffix	Three Phase Horsepower 60Hz				Three Phase Kilowatts 50Hz			
	200V	230V	460V	575V	220V	380/415V	500V	660V
-A09	5	5	10	15	4.0	7.5	10	10
-A12	5	7-1/2	15	20	5.5	11	15	15
-A18	7-1/2	10	20	25	7.5	15	18.5	18.5
-A24	7-1/2	10	25	30	11	18.5	22	25
-A30	10	15	30	40	11	22	30	30
-A38	15	20	40	50	15	30	37	37
-A45	20	25	50	60	22	37	45	45
-A60	30	40	75	100	30	55	63	63
-A75	40	50	100	125	37	63	75	75
-B110	60	60	150	150	45	90	110	110
-B180	75	100	250	250	80	150	180	180
-B250	125	150	350	400	110	220	280	280
-B300	150	200	400	450	140	257	315	315
-B400	225	250	500	600	220	350	450	450
-B600	350	400	-	-	277	545	-	-

Overload Relay Trip Times

The tripping of the Bulletin 193 bimetal overload relay can be approximated by using Table 3 below and following these instructions:

1. Locate the intersection of the “approximate trip time” curve with the proper “multiple of current–setting” found on the horizontal axis.
2. Read the “approximate trip time” in seconds along the vertical axis.

Table 3
For Bulletin 193 Series B Overload Relays

Overload Relay Contact Ratings

The following ratings apply to the normally open and normally closed isolated contacts on Bulletin 193 overload relays:

Thermal Current – 5 Amperes.

Insulation Voltage IE (U_i) – 660V.

AC11 Ratings	
U _e (Volts)	I _e (Amperes)
12 - 120	3
220 - 240	1.5
380 - 480	0.75
500 - 600	0.6

Maximum Wire Size Per Power Terminal

Maximum Wire Size ①		
Catalog Number	1 Wire per Terminal	
	mm ²	AWG or MCM
193-BSA	10	#8
193-BSB	10	#8
193-BS10 to 193-BSC24	10	#8
193-CPC	35	#2
193-HPD110	50	#1/0
193-DP②	120	#4/0
193-EP②	240	500MCM
193-FP②③	150	350MCM
193-GP②③	240	500MCM

① Not more than 19 strand wire.

② Using Allen-Bradley Bulletin 199 Terminal Lug Kits.

③ Two wires per phase (terminal) as indicated.

Accessories

Auxiliary Contact Ratings

For auxiliary contacts (Catalog Numbers 195-FA and 195-GA) and pneumatic timers (Catalog Numbers 196-FTA and FTB).

AC11 Ratings		DC11 Ratings	
U_e (Volts)	I_e (Amperes)	U_e (Volts)	I_e (Amperes)
12-120	6	28	5.0
220-240	3	110	1.25
380-480	1.5	220	0.62
500-600	1.2	440	0.27
		600	0.20

Thermal Current – 10 Amperes. NEMA/EEMAC A600, P600.

Insulation Voltage IEC (U_i) – 660V

Latch Attachment Catalog No. 197-FL ①

Inrush: 14.4 at 60Hz and 13.0 at 50Hz

Seal: 3.7 at 50/60Hz

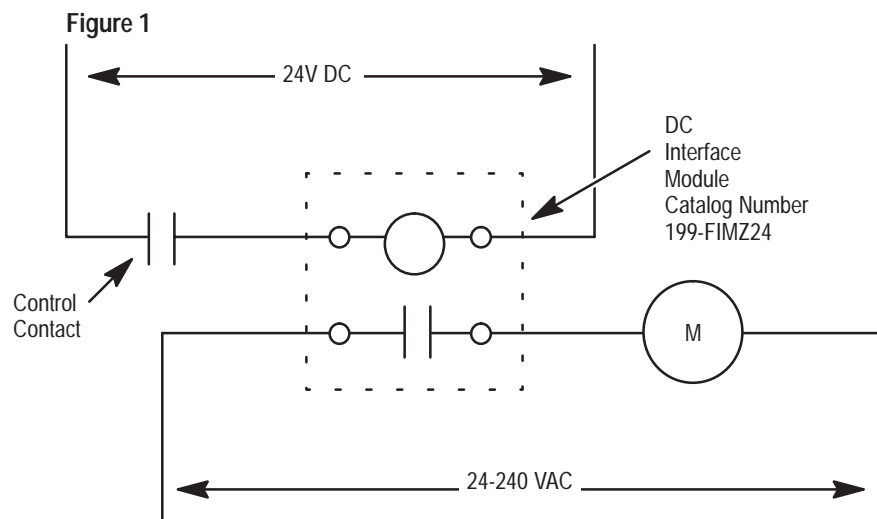
① The Catalog Number as listed is not complete. To complete the Catalog Number, refer to the product listing in either the Allen-Bradley Industrial Control Catalog.

24 volt DC Interface Module Catalog No. 199-FIMZ24

A 24 volt DC, 0.5 watt input signal can be used to operate the 24-240 volt AC coil of the contactors, Catalog Numbers 100-A09 through 100-A30, and all 700F control relays.

Interface Module Total Operation Times:

Pick-up: 22-31 Milliseconds; Drop-out 14-20 Milliseconds



Switching DC Loads

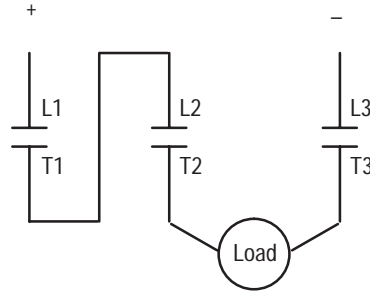
Use the following tables as a guideline for selecting the proper bulletin 100 contactor for switching DC loads. Notice that these guidelines are only for three power poles wired in series. **Note:** L/R in the tables below is equal to the ratio of inductance to resistance in the circuit being switched and is measured in milliseconds. The higher this ratio or time constant the more stored energy the circuit contains.

Catalog Number	DC1 Ratings L/R ≤ 1 millisecond (3 poles in series)		DC3 & DC5 Ratings L/R ≤ 1 millisecond (3 poles in series)	
	Maximum Operational Current at 40°C Amperes		Maximum Operational Current at 40°C Amperes	
	115 volts	230 volts	115 volts	230 volts
100-A09	22	10	9	3 ^②
100-A12	22	10	12	4 ^②
100-A18	35	22	18	5 ^②
100-A24	35	22	24	6 ^②
100-A30	45	25	30	8
100-A38	65	60	38	– ^③
100-A45	65	60	45	– ^③
100-A60	100	100	60	– ^③
100-A75	100	100	75	– ^③
100-B110	150	150	110	110 ^①
100-B180	200	200	180	180 ^①
100-B250	300	300	250	250 ^①
100-B300	300	300	300	300 ^①
100-B400	400	400	400	200 ^①
100-B600	630	630	600	300 ^①

- ① Maximum application current must be 25% of maximum operational current.
- ② Maximum operational currents for 4 poles in series:
Catalog Nos. 100-A09 and 100-A12 = 8A; and, Catalog Nos. 100-A18 and 100-A24 = 15A.
- ③ Not suitable for application at 230 volts.

Switching DC Loads (con't)

Figure 2
Example of 3 Poles Wired in Series



DC Utilization Categories

Category	Typical Applications
DC1	Non-inductive or slightly inductive loads; resistive furnaces.
DC3	Shunt motors: starting, plugging or inching; Dynamic breaking of DC motors.
DC5	Series motors: starting, plugging or inching; Dynamic breaking of DC motors.



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