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Find the *Rockwell / Allen-Bradley 100-A09NJ3* at our website: ***Click HERE***



Bulletin 100

- 15 Sizes, 9…600A
- Guarded Terminals Dual Terminal Markings
- DC Control Option through 180A
- Wide Range of Accessories
  - Top and Side Mounting Auxiliary Contacts
  - Timers
  - Latches
  - Surge Suppressors
  - Mechanical/Electrical Interlocks

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection		**Approximate Dimensions**	
Bulletin 100 Contactors	3-6	Bulletin 100 Contactors	3-66
Bulletin 199 Wye-Delta Starter Kit	3-9	Bulletin 199 Wye-Delta Starter Kit	3-82
Accessories	3-38	**Renewal Parts**	3-154
Specifications	3-48		

Description

Bulletin 100 Modular Line of contactors, when combined with the Bulletin 193 SMP or Bimetallic overload relays, auxiliary contacts, timers, interlocks, suppressors, and DIN mounting rail provides a highly flexible grouping of world acceptable devices.

Conformity to Standards:

IEC 947-4

BS 5424

VDE 0660

IEC 947-4 Type 2 Co-ordination (UL and ASTA Certified)

Approvals Pending:

DEMKO — Denmark

NEMKO — Netherlands

SEMKO — Sweden

SETI — Finland

Approvals:

CSA Certified (File No. LR1234)

UL Listed (File No. E3125; Guide No. NLDX)

CE Marked (Per EU Low Voltage Directive 73/23/EEC 93/68/EEC)

A-B EXPRESS Fast Shipment Program

- Fast Shipment of Bulletin 100 IEC Contactors to satisfy your unexpected demands.
- Make your selections from any of the Cat. Nos. printed in blue and identify your order as

A-B EXPRESS

Your order must include:

- Cat. No. of the contactor selected with coil voltage code.
- If required, Cat. No. of any accessories.
- If required, Cat. No. of replacement coils or contact kits.

AC Operated Contactors

A-B EXPRESS Fast Shipment Program Cat. Nos. are printed in blue.



Cat. No. 100-A09...A30



Cat. No. 100-A38...A75



Cat. No. 100-B110...B600



Cat. No. 104-A09...A30

Max. Ie (A)	Ratings (AC3, AC4)										Non-Reversing Contactors		Reversing Contactors	
	kW (50 Hz)				HP (60 Hz)									
	3∅				1∅		3∅							
	220V	380V – 415V	500V	660V	115V	230V	200V	230V	460V	575V	Cat. No. ❷❸	❋	Cat. No.	❋
9 ❶	2.2	4	5.5	5.5	1/3	1	2	2	5	7-1/2	100-A09N⊗ 3		104-A09N⊗ 3	
12 ❶	3	5.5	7.5	7.5	1/2	2	3	3	7-1/2	10	100-A12N⊗ 3		104-A12N⊗ 3	
18 ❶	4	7.5	11	11	1	3	5	5	10	15	100-A18N⊗ 3		104-A18N⊗ 3	
24 ❶	5.5	11	15	15	2	3	5	7-1/2	15	20	100-A24N⊗ 3		104-A24N⊗ 3	
30	7.5	15	18.5	18.5	2	5	7-1/2	10	20	25	100-A30N⊗ 3		104-A30N⊗ 3	
38	10	18.5	22	18.5	3	5	10	10	25	30	100-A38N⊗ 3		104-A38N⊗ 3	
45	11	22	30	22	3	7-1/2	10	15	30	40	100-A45N⊗ 3		104-A45N⊗ 3	
60	15	30	37	37	5	10	15	20	40	50	100-A60N⊗ 3		104-A60N⊗ 3	
75	22	37	45	45	5	10	20	25	50	60	100-A75N⊗ 3		104-A75N⊗ 3	
110	30	55	75	75	–	–	30	40	75	100	100-B110N⊗ 3		104-B110N⊗ 3	
180	45	90	110	110	–	–	60	60	150	150	100-B180N⊗ 3		104-B180N⊗ 3	
250	75	132	160	160	–	–	75	100	200	250	100-B250N⊗ 3		104-B250N⊗ 3	
304	90	160	200	200	–	–	100	100	250	300	100-B300N⊗ 3		104-B300N⊗ 3	
414 ❹	120	220	280	280	–	–	125	150	350	400	100-B400N⊗ 3		104-B400N⊗ 3	
608 ❹	180	315	445	445	–	–	200	250	500	600	100-B600N⊗ 3		104-B600N⊗ 3	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 100-A09N⊗3** becomes **Cat. No. 100-A09NJ3**. For other voltages, consult Allen-Bradley Sales Office. **Note:** Coils below 110V are not available for **100-B400** and **100-B600** Contactors.

Voltage	24V	42V	48V	100V	100-110V	110V	120V	200V	208V	220V	240V	277V	347V	380V	415V	440V	480V	500V	550V	600V
50 Hz	K	W	Y	KF	–	D	KE	–	–	A	T	–	–	N	I	B	–	M	C	–
60 Hz	J	–	X	–	KF	–	D	–	H	L	A	F	KK	E	–	G	B	–	–	C
50/60 Hz	KD	–	KH	KF	–	S	–	KG	–	–	–	–	–	–	–	–	–	–	–	–

❶ 4 main poles of same rating. Right hand pole is normally used as auxiliary.

❷ **Power Terminal Lugs** — Contactor **Cat. Nos. 100-A09** through **100-A75** include wire terminal lugs. Contactor **Cat. No. 100-B110** through **100-B600** have terminal pads with a bolt and nut for connection of bus bars or crimp type connectors. If wire lugs are required for these devices, see Accessories on page 3-38.

❸ **Auxiliary Contacts** — Contactor **Cat. Nos. 100-A09** through **100-A24** have a normally open auxiliary contact that has the same electrical ratings as the main power contacts. All other sizes have a normally open auxiliary contact rated specifically for auxiliary circuits. Contactor **Cat. Nos. 100-B400** and **100-B600** are furnished with one additional normally closed auxiliary contact. Example: **Cat. No. 100-A09N⊗ 31**.

❹ Coils below 120V are not available for 400A through 600A devices due to high-inrush current, except for 110V 50Hz.

Accessories — Page 3-38
Specifications — Page 3-48
Approximate Dimensions — Page 3-66

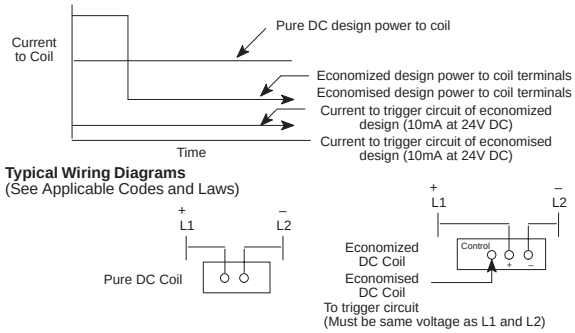
❋ **Prices – Consult Sales Office or price list**

DC Operated Contactors

A-B EXPRESS Fast Shipment Program Cat. Nos. are printed in blue.



Cat. No. 100-A09NZ...A30NZ



Pure DC Coil Contactors

Max. Ie (A)	Ratings (AC3, AC4) kW (50 Hz) 3∅ 220V	380V – 415V	500V	660V	HP (60 Hz) 1∅ 115V	230V	3∅ 200V	230V	460V	575V	Non-Reversing Contactors Cat. No.	❋	Reversing Contactors Cat. No.	❋
9 ❶	2.2	4	5.5	5.5	1/3	1	2	2	5	7-1/2	100-A09NZ⊗ 3		104-A09NZ⊗ 3	
12 ❶	3	5.5	7.5	7.5	1/2	2	3	3	7-1/2	10	100-A12NZ⊗ 3		104-A12NZ⊗ 3	
18 ❶	4	7.5	11	11	1	3	5	5	10	15	100-A18NZ⊗ 3		104-A18NZ⊗ 3	
24 ❶	5.5	11	15	15	2	3	5	7-1/2	15	20	100-A24NZ⊗ 3		104-A24NZ⊗ 3	
30	7.5	15	18.5	18.5	2	5	7-1/2	10	20	25	100-A30NZ⊗ 3		104-A30NZ⊗ 3	
38	10	18.5	22	18.5	3	5	10	10	25	30	100-A38NZ⊗ 3		104-A38NZ⊗ 3	
45	11	22	30	22	3	7-1/2	10	15	30	40	100-A45NZ⊗ 3		104-A45NZ⊗ 3	
60	15	30	37	37	5	10	15	20	40	50	100-A60NZ⊗ 3		104-A60NZ⊗ 3	
75	22	37	45	45	5	10	20	25	50	60	100-A75NZ⊗ 3		104-A75NZ⊗ 3	
110	30	55	75	75	–	–	30	40	75	100	100-B110NZ⊗ 3		104-B110NZ⊗ 3	

DC Solid-State Economized Dual Wound Coil Contactors



Cat. No. 100-A38NE...A75NE

Max. Ie (A)	Ratings (AC3, AC4) kW (50 Hz) 3∅ 220V	380V – 415V	500V	660V	HP (60 Hz) 1∅ 115V	230V	3∅ 200V	230V	460V	575V	Non-Reversing Contactors Cat. No.	❋
38	10	18.5	22	18.5	3	5	10	10	25	30	100-A38NE⊗ 3	
45	11	22	30	22	3	7-1/2	10	15	30	40	100-A45NE⊗ 3	
60	15	30	37	37	5	10	15	20	40	50	100-A60NE⊗ 3	
75	22	37	45	45	5	10	20	25	50	60	100-A75NE⊗ 3	
110	30	55	75	75	–	–	30	40	75	100	100-B110NE⊗ 3	
180	45	90	110	110	–	–	60	60	150	150	100-B180NE⊗ 3	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 100-A09NZ⊗3** becomes **Cat. No. 100-A09NZ123**. For other voltages, consult Allen-Bradley Sales Office.

Voltage	Type	12V	24V	48V	64V	80V	115V	125V	230V	250V
Coil Code	Pure DC	12	24	48	64	80	01	03	23	25
	Economized DC	–	24	48	–	–	01	–	23	–

❶ 4 main poles of same rating. Right hand pole is normally used as auxiliary.

Accessories — Page 3-38
Specifications — Page 3-48
Approximate Dimensions — Page 3-82

Welding Contactors



Cat. No. 100W-B180N⊗2



Cat. No. 100W-B600N⊗3

DESCRIPTION — These devices are designed for use on applications where a contactor is used to isolate the primary of a welding transformer from the supply power or where a contactor is used in series with the weld control SCR.

Normal applications require the contactor to carry the current without switching; therefore, the contactor has been assigned an intermittent rating which represents the short term current the contactor can successfully carry without exceeding its thermal capabilities.

Note: The average current during the operating cycle should not exceed the continuous rating of the contactor.

Continuous Rating	Intermittent Rating	Size	Number of Poles	Cat. No. ❶	❋
135A	2600A	4	2	100W-B180N⊗2	
			3	100W-B180N⊗3	
270A	3000A	5	2	100W-B300N⊗2	
			3	100W-B300N⊗3	
540A	3200A	6	2	100W-B600N⊗2	
			3	100W-B600N⊗3	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. To complete the Cat. No., select a Voltage Suffix Code from the chart below and insert into the Cat. No.. Example: **Cat. No. 100W-B180N⊗3** becomes **Cat. No. 100W-B180ND3**. For other voltages, consult Allen-Bradley Sales Office.

Voltage	24V	48V	110V	120V	208V	220V	240V	277V	380V	415V	440V	480V	500V	600V
60 Hz	J	X	–	D	H	L	A	F	–	–	G	B	–	C
50 Hz	K	Y	D	–	–	A	T	–	N	I	B	–	M	–

❶ When using Bulletin 199 terminal lug kits: Contactor **Cat. Nos. 100W-B180N⊗2** and **100W-B180N⊗3** use Lug Kit **Cat. No. 199-LF1**, Contactor **Cat. Nos. 100W-B300N⊗2** and **100W-B300N⊗3** use Lug Kit **Cat. No. 199-LG1**, and **Cat. Nos. 100W-B600N⊗2 and 100W-B600N⊗3** use Lug Kit **Cat. No. 199-LJ1**.

Accessories — Page 3-40
Specifications — Page 3-48
Approximate Dimensions — Page 3-72

Wye-Delta Starter Kits

Wye-Delta Starter Kits have been designed to aid in the field assembly of open transition Wye-Delta starters using Bulletin 100 Contactors. These kits include power wiring, shorting straps, mechanical interlocks, incoming terminal blocks, and the necessary mounting plate. Assembling a complete Wye-Delta starter requires the use of the following additional components:

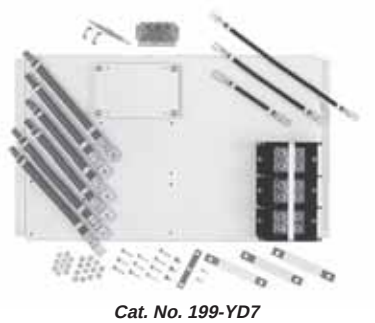
- Contactors
- Overload Relay
- On-Delay Timer:

  For **199-YD1** through **199-YD4**, use **Cat. No. 196-FTA**

  For **199-YD5** through **199-YD8**, use **Bulletin 700-F Control Relay** with **Cat. No. 196-FTA**
  or
  Use **Cat. No. 700-FSD45G**⊗ Electronic Timing Relay



Cat. No. 199-YD1



Cat. No. 199-YD7

Product Selection

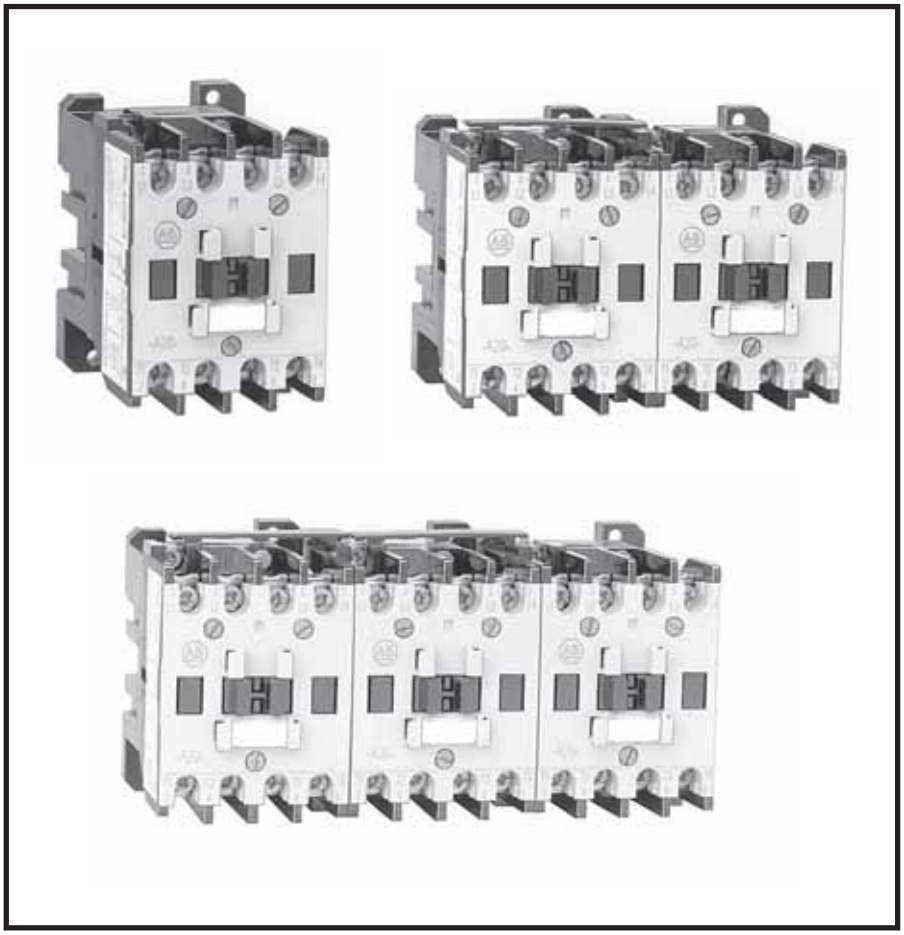
Use the table below to select the proper Wye-Delta starter assembly kit for your application.

3∅ Ratings												
kW (50 Hz)				HP (60 Hz)				Use with Cat. No. 100- ❶				
								Delta		Wye		
220V	380/ 415V	500V	660V	200V	230V	460V	575V	M1	M2	S1	Cat. No.	❋
4.0	7.5	11	11	5	5	10	15	A09	A09	A09	199-YD1	
5.5	11	15	15	5	7-1/2	15	20	A12	A12	A09	199-YD1	
7.5	15	18.5	18.5	7-1/2	10	20	25	A18	A18	A12	199-YD2	
11	18.5	22	25	7-1/2	10	25	30	A24	A24	A12	199-YD2	
11	22	30	30	10	15	30	40	A30	A30	A18	199-YD3	
15	30	37	37	15	20	40	50	A38	A38	A24	199-YD4	
22	37	45	45	20	25	50	60	A45	A45	A30	199-YD4	
30	55	75	75	30	40	75	100	A60	A60	A38	199-YD5	
37	63	80	80	40	50	100	125	A75	A75	A45	199-YD5	
45	90	110	110	60	60	150	150	B110	B110	A75	199-YD6	
80	150	180	180	75	100	225	250	B180	B180	B110	199-YD7	
110	220	280	280	125	150	350	400	B250	B250	B180	199-YD8	
140	257	315	315	150	200	400	450	B300	B300	B180	199-YD8	

❶ For use with AC operated contactors only.

Approximate Dimensions — Page 3-82

Electrically Held Lighting Contactors



Bulletin 100L

- Electrically Held
- 20A Rating
- 4, 8 and 12-Pole Configurations
- Open or Enclosed
- CSA Certified, UL Listed

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-11	Specifications	3-11
Accessories	3-38	Approximate Dimensions	3-73

Description

Bulletin 100 Lighting Contactors have been designed to control a variety of lighting loads. The product offering includes 4, 8, and 12 pole contactors with or without enclosures. The Bulletin 100 line of lighting contactors have been designed with a 20A rating for all popular lighting loads and other non-motor applications including tungsten filament lighting loads, electric discharge (fluorescent) loads, electric furnaces, and electric water heaters. In addition these contactors have been designed to meet the requirements of both CSA and UL.

Conformity to Standards:

IEC 947-4

CSA C22.2 No. 14

UL 508

Approvals:

CE Marked (Per Low Voltage Directive 73/23/EEC 93/68/EEC)

CSA Certified (File No. LR1234)

UL Listed (File No. E125316; Guide No. NLDX)

Your order must include:

- Cat. No. of the contactor selected with coil Voltage Suffix Code.
- If required, Cat. No. of any accessories.

Ratings

Type of Load	Max (A)	Max AC Volts Poles to Load ❶	
		1 for 1∅	3 for 3∅
Tungsten	20	277	480/277
	15	347	600/347
Ballast	20	277	480/277
	15	347	600/347
General Use Resistance Heating	30	600	600

❶ 20A, 250V DC Max with 3 Poles in Series.

Type	Number of Poles ❷	Cat. No.	❋
Open	4	100L-A20N⊗4	
	8	100L-A20N⊗8	
	12	100L-A20N⊗12	
IP42 (Type 1)	4	100L-A20A⊗4	
	8	100L-A20A⊗8	
	12	100L-A20A⊗12	
IP66 (Type 3/4/12)	4	100L-A20F⊗4	
	8	100L-A20F⊗8	
	12	100L-A20F⊗12	

❷ These contactors do not include an auxiliary hold-in contact. If a hold-in contact is required it can be ordered by adding a suffix **-90** to the Cat. No.Example: **Cat. No. 100L-A20NJ4-90**.

⊗ Voltage Suffix Code

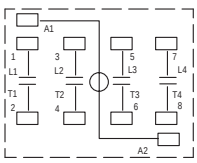
The Cat. No. as listed is incomplete. To complete the Cat. No., select a Voltage Suffix Code from the chart below and insert into the Cat. No. **Cat. No. 100L-A20N⊗4** becomes **Cat. No. 100L-A20NJ4**. For other voltages, consult Allen-Bradley Sales Office.

Voltage	24V	48V	110V	120V	208V	220V	240V	277V	347V	380V	415V	440V	480V	500V	600V
50 Hz	K	Y	D	–	–	A	T	–	–	N	I	B	–	M	–
60 Hz	J	X	–	D	H	L	A	F	KK	–	–	G	B	–	C

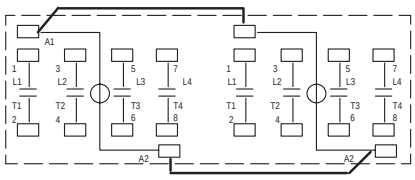
Typical Wiring Diagrams

(See Applicable Codes and Laws)

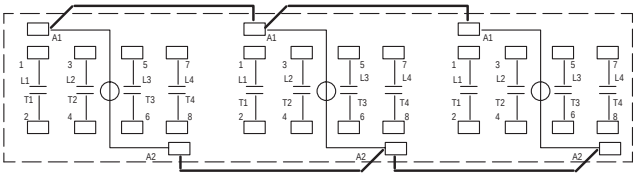
4 Poles



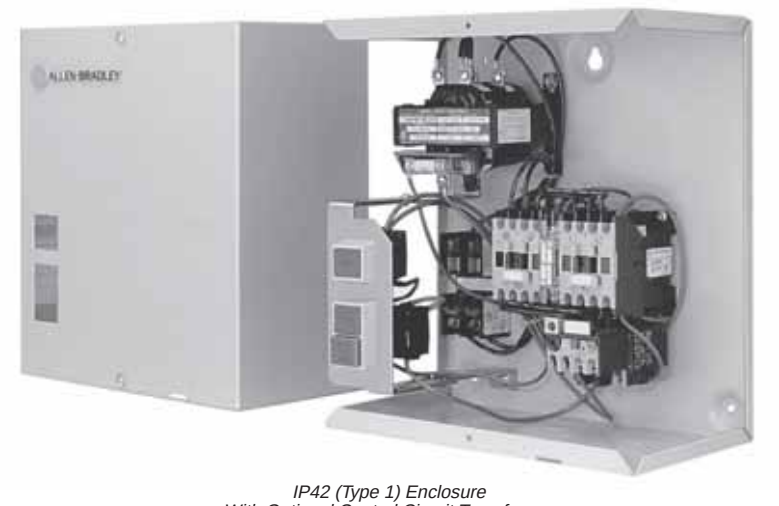
8 Poles



12 Poles



Accessories — Page 3-38
Approximate Dimensions — Page 3-73



IP42 (Type 1) Enclosure
With Optional Control Circuit Transformer
For Rev-OFF Push Buttons and Pilot Lights

Bulletin 105

- **Selection of Metal Enclosures IP42 (Type 1) and IP66 (Type 3/4/12)**
- **Bimetallic Class 10 Overload Relays**
- **SMP-1, SMP-2 or SMP-3 Solid-State Overload Relays**
- **Compact Design**
- **Meets International Standards**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-13	Modifications	3-45
Overload Relay Selection	3-34	Approximate Dimensions	3-75
Accessories	3-38		

Description

Bulletin 105 enclosed starters utilize Bulletin 104 reversing contactors and Bulletin 193 bimetallic (Class 10) or Smart Motor Protection overload relays. Reversing starters (9A through 300A) incorporate a “dual” interlock which provides both mechanical and electrical interlocking within a single unit. The 400A and 600A devices use a mechanical interlock plus normally closed auxiliaries to provide electrical interlock protection.

Conformity to Standards:

IEC 947

VDE 0660

CSA 22.2

UL 508

Approvals:

CE Marked
(Low Voltage Directive: 72/23/EEC, 93/68/EEC)

CSA Certified (File No. LR1234)

UL Listed (File No. E3125)

A-B EXPRESS Fast Shipment Program

- Fast Shipment of Bulletin 105 IEC Products to satisfy your unexpected demands
- Make your selections from any of the Cat. Nos. printed in blue and identify your order as

A-B EXPRESS

Your order must include:

- Cat. No. of the reversing starter selected.
- Voltage Suffix Code.
- Overload relay suffix code.
- If required, factory installed modifications suffix code.
- If required, Cat. No. of any accessories.

Enclosed Type

A-B EXPRESS Fast Shipment Program Cat. Nos. are printed in blue.

Ratings (AC3, AC4)								IP42 (Type 1) General Purpose Sheet Metal Enclosure					IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure				
	kW	HP						Enclosure Code					Enclosure Code				
	3∅	1∅ ❷		3∅													
Max Ie (A)	380V/ 415V	115V	230V	200V	230V	460V	575V	Style	W/O XFMR Dim.	With XFMR Dim.	Cat. No.	❋	Style	W/O XFMR Dim.	With XFMR Dim.	Cat. No.	❋
9	4	1/3	1	2	2	5	7-1/2	B	A08	A09	105-A09A⊗3-✪		D	F08	F09	105-A09F⊗3-✪	
12	5.5	1/2	2	3	3	7-1/2	10	B	A08	A09	105-A12A⊗3-✪		D	F08	F09	105-A12F⊗3-✪	
18	7.5	1	3	5	5	10	15	B	A08	A09	105-A18A⊗3-✪		D	F08	F09	105-A18F⊗3-✪	
24	11	2	3	5	7-1/2	15	20	B	A08	A09	105-A24A⊗3-✪		D	F08	F09	105-A24F⊗3-✪	
30	15	2	5	7-1/2	10	20	25	B	A09	A10	105-A30A⊗3-✪		D	F09	F10	105-A30F⊗3-✪	
38	18.5	3	5	10	10	25	30	B	A09	A10	105-A38A⊗3-✪		D	F09	F10	105-A38F⊗3-✪	
45	22	3	7-1/2	10	15	30	40	B	A09	A10	105-A45A⊗3-✪		D	F09	F10	105-A45F⊗3-✪	
60	30	5	10	15	20	40	50	B	A10	A11	105-A60A⊗3-✪		D	F10	F11	105-A60F⊗3-✪	
75	37	5	10	20	25	50	60	B	A10	A11	105-A75A⊗3-✪		D	F10	F11	105-A75F⊗3-✪	
110	55	–	–	30	40	75	100	D	A11	A12	105-B110A⊗3-✪		D	F11	F12	105-B110F⊗3-✪	
180	90	–	–	60	60	150	150	D	A12	A13	105-B180A⊗3-✪		D	F12	F13	105-B180F⊗3-✪	
250	132	–	–	75	100	200	250	D	A13	A14	105-B250A⊗3-✪		D	F13	F14	105-B250F⊗3-✪	
303	160	–	–	100	100	250	300	D	A13	A14	105-B300A⊗3-✪		D	F13	F14	105-B300F⊗3-✪	
414	220	–	–	125	150	350	400	D	A13	A14	105-B400A⊗3-✪		D	F13	F14	105-B400F⊗3-✪	
608	315	–	–	300	250	500	600	D	A14	A14	105-B600A⊗3-✪		D	F14	F14	105-B600F⊗3-✪	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 105-A09A⊗3-✪** becomes **Cat. No. 105-A09AB3-✪**.

Voltage		24	48	110	120	208	220	240	277	380	415	440	480	500	600
Common Control ❶	50 Hz	–	–	–	–	–	A	T	–	N	I	B	–	M	–
	60 Hz	–	–	–	–	H	L	A	–	–	–	G	B	–	C
Separate Control	50 Hz	K	Y	D	–	–	–	–	–	–	–	–	–	–	–
	60 Hz	J	X	–	D	–	–	–	F	–	–	–	–	–	–

✪ Overload Relay Code ❷

The Cat. No. as listed is incomplete. Select an overload relay code from page 3-34 to complete the Cat. No.

❶ When selecting a factory installed control circuit transformer (see Modifications page 3-45), use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 105-A09FB3-✪-6P** will have a transformer with a 480V primary/120V secondary and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 105-A09FBJ3-✪-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

❷ For single phase (1∅) applications, consult Allen-Bradley Sales Office for overload relay selection.

Overload Relay Selection — Page 3-34
Accessories — Page 3-38
Modifications — Page 3-45
Approximate Dimensions — Page 3-75



Open Type With Eutectic Alloy Overload Relay

Bulletin 105

- **Open Type**
- **Eutectic Alloy Overload Relay Accepts Class 10, 20 or 30 Heater Elements**
- **Compact Design Attached to a Common Mounting Plate**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-15	Modifications	3-45
Accessories	3-38	Approximate Dimensions	3-77

Description

Bulletin 105 enclosed starters utilize Bulletin 104 reversing contactors and a Bulletin 592 eutectic alloy overload relay on a common mounting plate. Reversing starters (9A through 180A) incorporate a “dual” interlock which provides both mechanical and electrical interlocking within a single unit.

Conformity to Standards:

CSA 22.2

UL 508

Your order must include:

- Cat. No. of the reversing starter selected.
- Voltage Suffix Code.
- Overload relay suffix code.

Open Type — Eutectic Alloy Overload Relay

Reversing Starters with AC Coils — Starters require 3 overload heater elements. See page 1-202 for selection tables.

Ratings (AC3, AC4)								Open Type	
Max Ie (A)	kW	HP							
	3∅	1∅		3∅					
	380V/415V	115V	230V	200V	230V	460V	575V	Cat. No.	❋
9	4	1/3	1	2	2	5	7-1/2	105-A09N⊗JOV	
12	5.5	1/2	2	3	3	7-1/2	10	105-A12N⊗JOV	
18	7.5	1	3	5	5	10	15	105-A18N⊗JOV	
24	11	2	3	5	7-1/2	15	20	105-A24N⊗JOV	
30	15	2	5	7-1/2	10	20	25	105-A30N⊗KOV	
38	18.5	3	5	10	10	25	30	105-A38N⊗COV	
45	22	3	7-1/2	10	15	30	40	105-A45N⊗COV	
60	30	5	10	15	20	40	50	105-A60N⊗COV	
75	37	5	10	20	25	50	60	105-A75N⊗DOV	
110	55	–	–	30	40	75	100	105-B110N⊗DOV	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 105-A09N⊗JOV** becomes **Cat. No. 105-A09NDJOV**.

Voltage		24	48	110	120	208	220	240	277	380	415	440	480	500	600
Common Control Coil Voltage Suffix Code	50 Hz	–	–	–	–	–	A	T	–	N	I	B	–	M	–
	60 Hz	–	–	–	–	H	L	A	–	–	–	G	B	–	C
Separate Control (without transformer) Coil Voltage Suffix Code	50 Hz	K	Y	D	–	–	–	–	–	–	–	–	–	–	–
	60 Hz	J	X	–	D	–	–	–	F	–	–	–	–	–	–

Reversing Starters with DC Coils — Starters require 3 overload heater elements. See page 1-202 for selection tables.

Ratings (AC3, AC4)								Open Type	
Max Ie (A)	kW	HP							
	3∅	1∅		3∅					
	380V/415V	115V	230V	200V	230V	460V	575V	Cat. No.	❋
9	4	1/3	1	2	2	5	7-1/2	105-A09NZ⊗JOV	
12	5.5	1/2	2	3	3	7-1/2	10	105-A12NZ⊗JOV	
18	7.5	1	3	5	5	10	15	105-A18NZ⊗JOV	
24	11	2	3	5	7-1/2	15	20	105-A24NZ⊗JOV	
30	15	2	5	7-1/2	10	20	25	105-A30NZ⊗KOV	
38	18.5	3	5	10	10	25	30	105-A38NZ⊗COV	
45	22	3	7-1/2	10	15	30	40	105-A45NZ⊗COV	
60	30	5	10	15	20	40	50	105-A60NZ⊗COV	
75	37	5	10	20	25	50	60	105-A75NZ⊗DOV	
110	55	–	–	30	40	75	100	105-B110NZ⊗DOV	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a voltage code from the table below to complete the Cat. No. Example: **Cat. No. 105-A09NZ⊗JOV** becomes **Cat. No. 105-A09NZ24JOV**.

Voltage	24V	115V
DC	24	01

Accessories — Page 3-38
Modifications — Page 3-45
Approximate Dimensions — Page 3-77
Heater Element Selection — Page 1-202

❋ **Prices – Consult Sales Office or price list**



IP66 (Type 3/4/12) Enclosure With Optional Control Circuit Transformer Push Buttons and Pilot Lights

Bulletin 106

- **Selection of Metal Enclosures IP42 (Type 1) and IP66 (Type 3/4/12)**
- **Bimetallic Class 10 Overload Relay**
- **SMP-1, SMP-2 or SMP-3 Solid-State Overload Relays**
- **Compact Design**
- **Meets International Standards**
- **Can Be Modified in the Field**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-17	Modifications	3-45
Overload Relay Selection	3-34	Approximate Dimensions	3-75
Accessories	3-38		

Description

Bulletin 106 Combination starters utilize a Bulletin 104 reversing contactor, a Bulletin 193 bimetallic (Class 10) or Smart Motor Protection overload relays, and a Bulletin 194R rotary disconnect switch. Reversing starters (9A through 300A) incorporate a “dual” interlock which provides both mechanical and electrical interlocking within a single unit.

Conformity to Standards:

IEC 947

VDE 0660

CSA 22.2

UL 508

Approvals:

CSA Certified

UL Listed

Your order must include:

- Cat. No. of the reversing combination starter selected.
- Voltage Suffix Code.
- Overload relay suffix code.
- If required, factory installed modifications suffix code.
- If required, Cat. No. of any accessories.

Disconnect Type

Ratings (AC3, AC4)							IP42 (Type 1) General Purpose Sheet Metal Enclosure				IP66 (Type 3, 4, 12) Watertight, Dusttight Sheet Metal Enclosure			
	kW	HP												
	3∅	3∅												
Max Ie (A)	380 – 415V	200V	230V	460V	575V	Fuse Clip Rating Amperes/ UL Class	Style	With & W/O XFMR Dim.	Cat. No.	❋	Style	With & W/O XFMR Dim.	Cat. No.	❋
9	4	2	2	5	7-1/2	30A/Class CC	D	A10	106-A09A⊗✪		D	F10	106-A09F⊗✪	
12	5.5	3	3	7-1/2	10	30A/Class J	D	A10	106-A12A⊗✪		D	F10	106-A12F⊗✪	
24	11	5	7-1/2	15	20	30A/Class J	D	A10	106-A24A⊗✪		D	F10	106-A24F⊗✪	
30	15	7-1/2	10	20	25	60A/Class J	D	A10	106-A30A⊗✪		D	F10	106-A30F⊗✪	
45	22	10	15	30	40	60A/Class J	D	A10	106-A45A⊗✪		D	F10	106-A45F⊗✪	
60	30	15	20	40	50	100A/Class J	D	A11	106-A60A⊗✪		D	F11	106-A60F⊗✪	
75	37	20	25	50	60	100A/Class J	D	A11	106-A75A⊗✪		D	F11	106-A75F⊗✪	
110	55	30	40	75	100	200A/Class J	D	A12	106-B110A⊗✪		D	F12	106-B110F⊗✪	
180	90	50	60	125	150	200A/Class J	D	A12	106-A180A⊗✪		D	F12	106-A180F⊗✪	
180	90	60	–	150	–	400A/Class J	D	A14	106-B180A⊗✪		D	F14	106-B180F⊗✪	
250	132	75	100	200	250	400A/Class J	D	A14	106-B250A⊗✪		D	F14	106-B250F⊗✪	
300	160	100	100	250	300	400A/Class J	D	A14	106-B300A⊗✪		D	F14	106-B300F⊗✪	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 106-A09A⊗✪** becomes **Cat. No. 106-A09AB✪**.

Voltage		208V	230-240V	460-480V	575-600V
Common Control ❶	60 Hz	H	A	B	C
Separate Control		AD	AD	CD	CD

✪ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 3-34.

❶ When selecting a factory installed control circuit transformer (see Modifications page 3-45), use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 106-A09FB3✪-6P** will have a transformer with a 480V primary/120V secondary and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 106-A09FBJ✪-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

Overload Relay Selection — Page 3-34
Accessories — Page 3-38
Modifications — Page 3-45
Approximate Dimensions — Page 3-75



Type 1 With Start-Stop Push Buttons and Reset
Cat. No. 109-A09B⊗3-1



Bulletin 100 Contactor With a Bulletin 193 Solid-State Overload Relay.

Bulletin 109

An Enclosed Starter Contains the Following Components:

- **Compact Design**
- **Impact Resistant Molded Enclosures**
- **IP42 (Type 1) or IP66 (Type 4/4X/12) Enclosure Ratings**
- **Bimetallic Class 10 Overload Relays**
- **SMP-1 or SMP-2 Solid-State Overload Relays**
- **Meets International Standards**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-19	Modifications	3-45
Overload Relay Selection	3-34	Approximate Dimensions	3-75
Accessories	3-38		

Description

Bulletin 109 enclosed starters are designed using Bulletin 100 contactors (9A through 24A) and Bulletin 193 bimetallic (Class 10) or Smart Motor Protection overload relays in a molded enclosure. These molded enclosures are compact in design which is essential where mounting space is a premium, yet they offer ample internal wiring space.

Installation is made simple with features such as conduit knockouts, pilot device knockouts and backed out terminal screws to reduce wiring time. The enclosure base contains a molded 35mm DIN rail which makes mounting the starter into the enclosure a “snap”.

A variety of accessories are available to allow flexibility to configure the appropriate starter to satisfy most application needs. These full voltage non-reversing starters continue the Bulletin 100 tradition by complying to both domestic and international standards.

A-B EXPRESS Fast Shipment Program

- Fast Shipment of Bulletin 109 IEC Products to satisfy your unexpected demands
- Make your selections from any of the Cat. Nos. printed in blue and identify your order as

A-B EXPRESS

Your order must include:

- Cat. No. of the starter.
- Voltage Suffix Code.
- Overload relay suffix code.
- If required, factory installed modifications suffix code.
- If required, Cat. No. of any accessories.

Conformity to Standards:

IEC 947

VDE 0660

UL 508

Approvals:

CE Marked
(Per Low Voltage Directive 73/23/EEC 93/68/EEC)

CSA Certified (File No. LR1234)

UL Listed (File No. E3125)

Enclosed Type — Molded Plastic

A-B EXPRESS Fast Shipment Program Cat. Nos. are printed in blue.

Ratings (AC3, AC4)								IP42 (Type 1) General Purpose Molded Plastic Enclosure				IP66 (Type 4, 4X, 12) Watertight, Dusttight Corrosion Resistant Molded Plastic Enclosure			
	kW	HP						Enclosure Code				Enclosure Code			
	3∅	1∅❶		3∅											
Max Ie (A)	380V/ 415V	115V	230V	200V	230V	460V	575V	Style	W/O XFMR Dim.	Cat. No.	❋	Style	W/O XFMR Dim.	Cat. No.	❋
9	4	1/3	1	2	2	5	7-1/2	A	B01	109-A09B⊗3-✪❷		A	K01	109-A09K⊗3-✪❸	
12	5.5	1/2	2	3	3	7-1/2	10	A	B01	109-A12B⊗3-✪❷		A	K01	109-A12K⊗3-✪❸	
18	7.5	1	3	5	5	10	15	A	B02	109-A18B⊗3-✪		A	K02	109-A18K⊗3-✪	
24	11	2	3	5	7-1/2	15	20	A	B02	109-A24B⊗3-✪		A	K02	109-A24K⊗3-✪	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 109-A09B⊗3-✪** becomes **Cat. No. 109-A09BA3-✪**.

Voltage		24V	48V	110V	120V	208V	220V	240V	277V	380V	415V	440V	480V	500V	600V
Common Control	50 Hz	–	–	–	–	–	A	T	–	N	I	B	–	M	–
	60 Hz	–	–	–	–	H	L	A	–	–	–	G	B	–	C
Separate Control	50 Hz	K	Y	D	–	–	–	–	–	–	–	–	–	–	–
	60 Hz	J	X	–	D	–	–	–	F	–	–	–	–	–	–

✪ Overload Relay Code ❶

The Cat. No. as listed is incomplete. Select an overload relay code from page 3-34 to complete the Cat. No.

❶ For single phase (1∅) applications, consult Allen-Bradley Sales Office for overload relay selection.
❷ For Bulletin 109 with SMP-2 solid-state overload relays, the enclosure code dimension changes to B02.
❸ For Bulletin 109 with SMP-2 solid-state overload relays, the enclosure code dimension changes to K02.

Overload Relay Selection — Page 3-34
Accessories — Page 3-38
Modifications — Page 3-45
Approximate Dimensions — Page 3-75



Type 1 Enclosure
With Push Button and Pilot Light

Bulletin 109

- **Selection of Metal Enclosures IP42 (Type 1) and IP66 (Type 3/4/12)**
- **Compact Design**
- **Bimetallic Class 10 Overload Relays**
- **SMP-1, SMP-2 or SMP-3 Solid-State Overload Relays**
- **Meets International Standards**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-21	Modifications	3-44
Overload Relay Selection	3-34	Approximate Dimensions	3-75
Accessories	3-38		

Description

Bulletin 109 enclosed starters are designed using Bulletin 100 contactors (9A through 608A) and Bulletin 193 bimetallic (Class 10) or Smart Motor Protection overload relays in a metal enclosure.

Conformity to Standards:

IEC 947

VDE 0660

CSA 22.2

UL 508

Approvals:

(Consult factory for all other approvals)

CE Marked
(Per Low Voltage Directive 73/23/EEC 93/68/EEC)

CSA Certified (File No. LR1234)

UL Listed (File No. E3125)

A-B EXPRESS Fast Shipment Program

- Fast Shipment of Bulletin 109 IEC Products to satisfy your unexpected demands
- Make your selections from any of the Cat. Nos. printed in blue and identify your order as

A-B EXPRESS

Your order must include:

- Cat. No. of the starter selected.
- Voltage Suffix Code.
- Overload relay code suffix.
- If required, factory installed modifications suffix code.
- If required, Cat. No. of any accessories.

Enclosed Type — Sheet Metal

A-B EXPRESS Fast Shipment Program Cat. Nos. are printed in blue.

Ratings (AC3, AC4)								IP42 (Type 1) General Purpose Sheet Metal Enclosure					IP66 (Type 3, 4, 12) Watertight, Dusttight Sheet Metal Enclosure				
	kW	HP						Enclosure Code					Enclosure Code				
	3∅	1∅ ❶		3∅													
Max Ie (A)	380V/ 415V	115V	230V	200V	230V	460V	575V	Style	W/O XFMR Dim.	With XFMR Dim.	Cat. No.	❋	Style	W/O XFMR Dim.	With XFMR Dim.	Cat. No.	❋
9	4	1/3	1	2	2	5	7-1/2	B	A02	A03	109-A09A⊗3-✪		D	F02	F03	109-A09F⊗3-✪	
12	5.5	1/2	2	3	3	7-1/2	10	B	A02	A03	109-A12A⊗3-✪		D	F02	F03	109-A12F⊗3-✪	
18	7.5	1	3	5	5	10	15	B	A02	A03	109-A18A⊗3-✪		D	F02	F03	109-A18F⊗3-✪	
24	11	2	3	5	7-1/2	15	20	B	A02	A03	109-A24A⊗3-✪		D	F02	F03	109-A24F⊗3-✪	
30	15	2	5	7-1/2	10	20	25	B	A03	A09	109-A30A⊗3-✪		D	F03	F09	109-A30F⊗3-✪	
38	18.5	3	5	10	10	25	30	B	A03	A09	109-A38A⊗3-✪		D	F03	F09	109-A38F⊗3-✪	
45	22	3	7-1/2	10	15	30	40	B	A03	A09	109-A45A⊗3-✪		D	F03	F09	109-A45F⊗3-✪	
60	30	5	10	15	20	40	50	B	A04	A10	109-A60A⊗3-✪		D	F04	F10	109-A60F⊗3-✪	
75	37	5	10	20	25	50	60	B	A04	A10	109-A75A⊗3-✪		D	F04	F10	109-A75F⊗3-✪	
110	55	–	–	30	40	75	100	D	A05	A11	109-B110A⊗3-✪		D	F05	F11	109-B110F⊗3-✪	
180	90	–	–	60	60	150	150	D	A06	A12	109-B180A⊗3-✪		D	F12	F12	109-B180F⊗3-✪	
250	132	–	–	75	100	200	250	D	A13	A13	109-B250A⊗3-✪		D	F13	F13	109-B250F⊗3-✪	
303	160	–	–	100	100	250	300	D	A13	A13	109-B300A⊗3-✪		D	F13	F13	109-B300F⊗3-✪	
414	220	–	–	125	150	350	400	D	A13	A13	109-B400A⊗3-✪		D	F13	F13	109-B400F⊗3-✪	
608	315	–	–	300	250	500	600	D	A14	A14	109-B600A⊗3-✪		D	F14	F14	109-B600F⊗3-✪	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 109-A09A⊗3-✪** becomes **Cat. No.109-A09AB3-✪**.

Voltage		24V	48V	110V	120V	208V	220V	240V	277V	380V	415V	440V	480V	500V	600V
Common Control ❷	50 Hz	–	–	–	–	–	A	T	–	N	I	B	–	M	–
	60 Hz	–	–	–	–	H	L	A	–	–	–	G	B	–	C
Separate Control (without transformer)	50 Hz	K	Y	D	–	–	–	–	–	–	–	–	–	–	–
	60 Hz	J	X	–	D	–	–	–	F	–	–	–	–	–	–

✪ Overload Relay Code ❶

The Cat. No. as listed is incomplete. Select an overload relay code from page 3-34.

❶ For single phase (1∅) applications, consult Allen-Bradley Sales Office for overload relay selection.

❷ When selecting a factory installed control circuit transformer (see Modifications page 3-44), use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 109-A09FB3-✪-6P** will have a transformer with a 480V primary/120V secondary and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 109-A09FBJ3-✪-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

Overload Relay Selection — Page 3-34
Accessories — Page 3-38
Modifications — Page 3-44



Open Type With Eutectic Alloy Overload Relay

Bulletin 109

- **Open Type**
- **Eutectic Alloy Overload Relay Accepts Class 10, 20 or 30 Heater Elements**
- **Compact Design Attached to a Common Mounting Plate**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-23	Modifications	3-44
Accessories	3-38	Approximate Dimensions	3-77

Description

Bulletin 109 open style starters utilize Bulletin 100 contactors and Bulletin 592 eutectic alloy overload relays on a common mounting plate.

Conformity to Standards:

CSA 22.2

UL508

Your order must include:

- Cat. No. of the starter selected.
- Voltage Suffix Code.
- Overload relay suffix code.

Open Type — Eutectic Alloy Overload Relay

Starters with AC Coils — Starters require 3 overload heater elements. See page 1-202 for selection tables.

Ratings (AC3, AC4)								Open Type	
Max Ie (A)	kW	HP							
	3∅	1∅		3∅					
	380V/415V	115V	230V	200V	230V	460V	575V	Cat. No.	❋
9	4	1/3	1	2	2	5	7-1/2	109-A09N⊗JOV	
12	5.5	1/2	2	3	3	7-1/2	10	109-A12N⊗JOV	
18	7.5	1	3	5	5	10	15	109-A18N⊗JOV	
24	11	2	3	5	7-1/2	15	20	109-A24N⊗JOV	
30	15	2	5	7-1/2	10	20	25	109-A30N⊗KOV	
38	18.5	3	5	10	10	25	30	109-A38N⊗COV	
45	22	3	7-1/2	10	15	30	40	109-A45N⊗COV	
60	30	5	10	15	20	40	50	109-A60N⊗COV	
75	37	5	10	20	25	50	60	109-A75N⊗DOV	
110	55	–	–	30	40	75	100	109-B110N⊗DOV	
180	90	–	–	60	60	150	150	109-B180N⊗TP2	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 109-A09N⊗JOV** becomes **Cat. No. 109-A09NDJOV**.

Voltage		24V	48V	110V	120V	208V	220V	240V	277V	380V	415V	440V	480V	500V	600V
Common Control Coil Voltage Suffix Code	50 Hz	–	–	–	–	–	A	T	–	N	I	B	–	M	–
	60 Hz	–	–	–	–	H	L	A	–	–	–	G	B	–	C
Separate Control (without transformer) Coil Voltage Suffix Code	50 Hz	K	Y	D	–	–	–	–	–	–	–	–	–	–	–
	60 Hz	J	X	–	D	–	–	–	F	–	–	–	–	–	–

Starters with DC Coils — Starters require 3 overload heater elements. See page 1-202 for selection tables.

Ratings (AC3, AC4)								Open Type	
Max Ie (A)	kW	HP							
	3∅	1∅		3∅					
	380V/415V	115V	230V	200V	230V	460V	575V	Cat. No	❋
9	4	1/3	1	2	2	5	7-1/2	109-A09NZ⊗JOV	
12	5.5	1/2	2	3	3	7-1/2	10	109-A12NZ⊗JOV	
18	7.5	1	3	5	5	10	15	109-A18NZ⊗JOV	
24	11	2	3	5	7-1/2	15	20	109-A24NZ⊗JOV	
30	15	2	5	7-1/2	10	20	25	109-A30NZ⊗KOV	
38	18.5	3	5	10	10	25	30	109-A38NZ⊗COV	
45	22	3	7-1/2	10	15	30	40	109-A45NZ⊗COV	
60	30	5	10	15	20	40	50	109-A60NZ⊗COV	
75	37	5	10	20	25	50	60	109-A75NZ⊗DOV	
110	55	–	–	30	40	75	100	109-B110NZ⊗DOV	
180	90	–	–	60	60	150	150	109-B180NZ⊗TP2	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 109-A09NZ⊗JOV** becomes **Cat. No. 109-A09NZ24JOV**.

Voltage	24V	115V
DC	24	01

Accessories — Page 3-38
Modifications — Page 3-44
Approximate Dimensions — Page 3-77
Heater Element Selection — Page 1-202

❋ **Prices – Consult Sales Office or price list**



IP66 (Type 3/4/12) Enclosure With Optional "START-STOP" Push Button and External Reset

Bulletin 112

- **Compact Design**
- **Can Be Modified in the Field**
- **Selection of Enclosures IP42 (Type 1) and IP66 (Type 3/4/12)**
- **Bimetallic Class 10 Overload Relays**
- **SMP-1, SMP-2 or SMP-3 Solid-State Overload Relays**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-25	Modifications	3-46
Overload Relay Selection	3-34	Approximate Dimensions	3-75
Accessories	3-38		

Description

Bulletin 112 is the first true IEC combination starter on the market, in that the enclosure and components have been designed to the specific IEC standard requirements. The Bulletin 112 combination starter consists of a Bulletin 100 Contactor, Bulletin 193 bimetallic (Class 10) or Smart Motor Protection overload relay and Bulletin 194R fused disconnect switch installed in a common enclosure. These full voltage combination starters are designed to provide the disconnecting means, short circuit protection (with suitable fuses), control and overload protection for three phase squirrel-cage motors.

A-B EXPRESS Fast Shipment Program

- Fast shipment of Bulletin 112 IEC Products to satisfy your unexpected demands.
- Make your selections from any of the Cat. Nos. printed in blue and identify your order as

A-B EXPRESS

Conformity to Standards:

IEC 947

VDE 0660

CSA 22.2

UL 508

Approvals:

(consult factory for all other approvals)

CE Marked
(Per Low Voltage Directive 73/23/EEC 93/68/EEC)

CSA Certified (File No. LR1234)

UL Listed (File No. E125316)

Your order must include:

- Cat. No. of the combination starter selected.
- Voltage Suffix Code.
- Overload relay suffix code.
- If required, factory installed modifications suffix code.
- If required, Cat. No. of any accessories.

Fusible Disconnect Type

A-B EXPRESS Fast Shipment Program Cat. Nos. are printed in blue.

Ratings (AC3, AC4)						IP42 (Type 1) General Purpose Sheet Metal Enclosure				IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure			
Max Ie (A)	HP 3 ∅ 200V	HP 3 ∅ 230V	HP 3 ∅ 460V	HP 3 ∅ 575V	Fuse Clip Rating Amperes/ UL Class	Style	With & W/O XFMR Dim.	Cat. No.	❋	Style	With & W/O XFMR Dim.	Cat. No.	❋
9	2	2	5	7-1/2	30A/Class CC	D	A04	112-A09A⊗✪		D	F04	112-A09F⊗✪	
12	3	3	7-1/2	10	30A/Class J	D	A04	112-A12A⊗✪		D	F04	112-A12F⊗✪	
24	5	7-1/2	15	20	30A/Class J	D	A04	112-A24A⊗✪		D	F04	112-A24F⊗✪	
30	7-1/2	10	20	25	60A/Class J	D	A10	112-A30A⊗✪		D	F10	112-A30F⊗✪	
45	10	15	30	40	60A/Class J	D	A10	112-A45A⊗✪		D	F10	112-A45F⊗✪	
60	15	20	40	50	100A/Class J	D	A11	112-A60A⊗✪		D	F11	112-A60F⊗✪	
75	20	25	50	60	100A/Class J	D	A11	112-A75A⊗✪		D	F11	112-A75F⊗✪	
110	30	40	75	100	200A/Class J	D	A12	112-B110A⊗✪		D	F12	112-B110F⊗✪	
180	50	60	125	150	200A/Class J	D	A12	112-A180A⊗✪		D	F12	112-A180F⊗✪	
180	60	–	150	–	400A/Class J	D	A13	112-B180A⊗✪		D	F13	112-B180F⊗✪	
250	75	100	200	250	400A/Class J	D	A13	112-B250A⊗✪		D	F13	112-B250F⊗✪	
300	100	100	250	300	400A/Class J	D	A13	112-B300A⊗✪		D	F13	112-B300F⊗✪	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 112-A09A⊗✪** becomes **Cat. No. 112-A09AB✪**.

Voltage		208V	230-240V	460-480V	575-600V
Common Control ❶	60 Hz	H	A	B	C
Separate Control		AD	AD	CD	CD

✪ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 3-34 to complete the Cat. No.

❶ When selecting a factory installed control circuit transformer (see Modifications page 3-44), use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 112-A09FB3-✪-6P** will have a transformer with a 480V primary/120V secondary and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 112-A09FBJ3-✪-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

Overload Relay Selection — Page 3-34
Accessories — Page 3-38
Modifications — Page 3-44
Approximate Dimensions — Page 3-75



IP66 (Type 3/4/12) Enclosure With Optional Start-Stop Push Button, Pilot Light and Control Circuit Transformer

Bulletin 113

- **Compact Design**
- **Can Be Modified in the Field**
- **Selection of Enclosures**
  - **IP42 (Type 1)**
  - **IP66 (Type 3/4/12)**
- **Bimetallic Class 10 Overload Relays**
- **SMP-1, SMP-2 or SMP-3 Solid-State Overload Relays**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-27	Modifications	3-46
Overload Relay Selection	3-34	Approximate Dimensions	3-75
Accessories	3-38		

Description

Bulletin 113 combination starter consists of a Bulletin 100 contactor, Bulletin 193 bimetallic (Class 10) or Smart Motor Protection overload relay and a motor circuit protector installed in a common enclosure. These full voltage combination starters are designed to provide the disconnecting means, short circuit protection, control and overload protection for three phase squirrel-cage motors.

Conformity to Standards:

IEC 947

VDE 0660

CSA 22.2

UL 508

Approvals:

CSA Certified

UL Listed

Your order must include:

- Cat. No. of the combination starter selected.
- Voltage Suffix Code.
- Overload relay suffix code.
- If required, factory installed modifications suffix code.
- If required, Cat. No. of any accessories.

Circuit Breaker Type

Ratings (AC3, AC4)					IP42 (Type 1) General Purpose Sheet Metal Enclosure				IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure			
Max Ie (A)	HP ❶ 3∅				Style	With & W/O XFMR Dim.	Cat. No.	❋	Style	With & W/O XFMR Dim.	Cat. No.	❋
	200V	230V	460V	575V								
24	1/2 ❷	1/2 ❷	3/4…1 ❷	3/4…1-1/2 ❷	D	A04 ❸	113-A24A⊗✪-36		D	F04 ❹	113-A24F⊗✪-36	
	3/4…1	3/4…1	1-1/2…3	2…3	D	A04 ❸	113-A24A⊗✪-38		D	F04 ❹	113-A24F⊗✪-38	
	1-1/2…3	1-1/2…3	5…7-1/2	5…10	D	A04 ❸	113-A24A⊗✪-41		D	F04 ❹	113-A24F⊗✪-41	
	5	5…7-1/2	10…15	15…20	D	A04 ❸	113-A24A⊗✪-43		D	F04 ❹	113-A24F⊗✪-43	
30	7-1/2	10	20	25	D	A10 ❸	113-A30A⊗✪-44		D	F10 ❹	113-A30F⊗✪-44	
45	10	–	25	30	D	A10 ❸	113-A45A⊗✪-45		D	F10 ❹	113-A45F⊗✪-45	
	–	15	30	–	D	A10 ❸	113-A45A⊗✪-45X		D	F10 ❹	113-A45F⊗✪-45X	
	–	–	–	40	D	A11	113-A45A⊗✪-46		D	F10 ❹	113-A45F⊗✪-46	
60	15	20	40	50	D	A11	113-A60A⊗✪-47		D	F11	113-A60F⊗✪-47	
75	20	25	50	60	D	A11	113-A75A⊗✪-48		D	F11	113-A75F⊗✪-48	
110	25	30	60	75	D	A12	113-B110A⊗✪-49		D	F12	113-B110F⊗✪-49	
	30	40	75	100	D	A12	113-B110A⊗✪-50		D	F12	113-B110F⊗✪-50	
180	40	50	100	125	D	A13	113-B180A⊗✪-51		D	F13	113-B180F⊗✪-51	
	50	60	125	150	D	A12	113-B180A⊗✪-52		D	F12	113-B180F⊗✪-52	
	60	–	150	–	D	A12	113-B180A⊗✪-52X		D	F13	113-B180F⊗✪-52X	
250	–	75	–	200	D	A13	113-B250A⊗✪-54		D	F13	113-B250F⊗✪-54	
	75	100	200	250	D	A13	113-B250A⊗✪-56		D	F13	113-B250F⊗✪-56	
300	100	–	250	300	D	A13	113-B300A⊗✪-57		D	F13	113-B300F⊗✪-57	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 113-A24A⊗✪-33** becomes **Cat. No. 113-A24AB✪-33**.

Voltage ✪		208V	230-240V	460-480V	575-600V
Common Control ❺	60 Hz	H	A	B	C
Separate Control		HD	AD	BD	CD

✪ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 3-34.

❶ For design “E” motor applications, consult the factory.
❷ For horsepower ratings less than those shown, consult the factory.
❸ For 575V applications, the dimension code is “A11”.
❹ For 575V applications, the dimension code is “F11”.
❺ When selecting a factory installed control circuit transformer (see Modifications page 3-46), use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 113-A24FB3✪-6P** will have a transformer with a 480V primary/120V secondary and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 113-A24FBJ✪-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

Overload Relay Selection — Page 3-34
Accessories — Page 3-38
Modifications — Page 3-44
Approximate Dimensions — Page 3-75



Bulletin 120E, 45 Amp
Type 12 Enclosure and Cover Controls



Bulletin 120E, 45 Amp
Type 12 Enclosure and Cover Controls

Bulletin 120E

- **Compact Design**
- **Selection of Enclosures IP42 (Type 1) and IP66 (Type 3/4/12)**
- **Bimetallic Class 10 Overload Relays**
  SMP-1, SMP-2 or SMP-3 Solid-State Overload Relays

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-29	Modifications	3-44
Overload Relay Selection	3-34	Approximate Dimensions	3-75
Accessories	3-38		

Description

Bulletin 120E multi-speed starters are designed to control “two speed, separate winding” AC squirrel cage induction motors. These starters are available for constant torque, variable torque or constant horsepower three phase motors. Multi-speed motors are commonly used on machine tools, fans, blowers, pumps, conveyors and many other types of equipment.

Bulletin 120E multi-speed motor starters utilize Bulletin 100 contactors and Bulletin 193 bimetallic (Class 10) or Smart Motor Protection overload relays. A wide variety of factory and field installed options are available.

For two speed consequent pole motor starters, consult Allen-Bradley Sales Office.

Constant Torque — Constant torque motors will supply a constant torque at each speed while the horsepower rating will vary directly with the speed. Typical applications include conveyors, compressors, hoists, mixers and milling machines.

Variable Torque — Variable torque motors have horsepower ratings that vary as a square of the speed and have torque ratings that vary directly with the speed. Typical applications include centrifugal pumps and fans.

Constant Horsepower — Constant horsepower motors have the same horsepower rating at each speed while the torque varies inversely to the speed. Typical applications include mixer, milling machines and cranes.

Conformity to Standards:

IEC 947

VDE 0660

CSA 22.2

UL 508

Approvals:

CSA Certified (File No. LR1234)

UL Listed (File No. E3125)

A-B EXPRESS Fast Shipment Program

- Fast shipment of Bulletin 120E IEC Products to satisfy your unexpected demands.
- Make your selections from any of the Cat. Nos. printed in blue and identify your order as

A-B EXPRESS

Your order must include:

- Cat. No. of the multi-speed starter selected.
- Voltage Suffix Code.
- If required, factory installed modifications suffix code.
- If required, Cat. No. of any accessories.

Enclosed Type

A-B EXPRESS Fast Shipment Program Cat. Nos. are printed in blue.

2 Speed Separate Winding, Constant or Variable Torque (Constant Horsepower—Consult Allen-Bradley Sales Office.)

Ratings (AC3, AC4)								IP42 (Type 1) General Purpose Sheet Metal Enclosure					IP66 (Type 3/4/12) Watertight, Dusttight Sheet Metal Enclosure				
	kW	HP						Enclosure Code					Enclosure Code				
	3∅	1∅ ❶		3∅													
Max Ie (A)	380V/ 415V	115V	230V	200V	230V	460V	575V	Style	W/O XFMR Dim.	With XFMR Dim.	Cat. No.	❋	Style	W/O XFMR Dim.	With XFMR Dim.	Cat. No.	❋
9	4	1/3	1	2	2	5	7-1/2	B	A08	A09	120E-A09A⊗3-✪-✪		D	F08	F09	120E-A09F⊗3-✪-✪	
12	5.5	1/2	2	3	3	7-1/2	10	B	A08	A09	120E-A12A⊗3-✪-✪		D	F08	F09	120E-A12F⊗3-✪-✪	
18	7.5	1	3	5	5	10	15	B	A08	A09	120E-A18A⊗3-✪-✪		D	F08	F09	120E-A18F⊗3-✪-✪	
24	11	2	3	5	7-1/2	15	20	B	A08	A09	120E-A24A⊗3-✪-✪		D	F08	F09	120E-A24F⊗3-✪-✪	
30	15	2	5	7-1/2	10	20	25	B	A09	A10	120E-A30A⊗3-✪-✪		D	F09	F10	120E-A30F⊗3-✪-✪	
38	18.5	3	5	10	10	25	30	B	A09	A10	120E-A38A⊗3-✪-✪		D	F09	F10	120E-A38F⊗3-✪-✪	
45	22	3	7-1/2	10	15	30	40	B	A09	A10	120E-A45A⊗3-✪-✪		D	F09	F10	120E-A45F⊗3-✪-✪	
60	30	5	10	15	20	40	50	B	A10	A11	120E-A60A⊗3-✪-✪		D	F10	F11	120E-A60F⊗3-✪-✪	
75	37	5	10	20	25	50	60	B	A10	A11	120E-A75A⊗3-✪-✪		D	F10	F11	120E-A75F⊗3-✪-✪	
110	55	–	–	30	40	75	100	D	A11	A12	120E-B110A⊗3-✪-✪		D	F11	F12	120E-B110F⊗3-✪-✪	
180	90	–	–	60	60	150	150	D	A12	A13	120E-B180A⊗3-✪-✪		D	F12	F13	120E-B180F⊗3-✪-✪	
250	132	–	–	75	100	200	250	D	A13	A14	120E-B250A⊗3-✪-✪		D	F13	F14	120E-B250F⊗3-✪-✪	
303	160	–	–	100	100	250	300	D	A13	A14	120E-B300A⊗3-✪-✪		D	F13	F14	120E-B300F⊗3-✪-✪	
414	220	–	–	125	150	350	400	D	A13	A14	120E-B400A⊗3-✪-✪		D	F13	F14	120E-B400F⊗3-✪-✪	
608	315	–	–	300	250	500	600	D	A14	A14	120E-B600A⊗3-✪-✪		D	F14	F14	120E-B600F⊗3-✪-✪	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 120E-A09A⊗3-✪-✪** becomes **Cat. No. 120E-A09AB3-✪-✪**.

Voltage		24V	48V	110V	120V	208V	220V	240V	277V	380V	415V	440V	480V	500V	600V
Common Control ❷	50 Hz	K	Y	D	–	–	A	T	–	N	I	B	–	M	–
	60 Hz	J	X	–	D	H	L	A	–	–	–	G	B	–	C
Separate Control	50 Hz	K	Y	D	–	–	–	–	–	–	–	–	–	–	–
	60 Hz	J	X	–	D	–	–	–	F	–	–	–	–	–	–

✪-✪ Overload Relay Code ❶

The Cat. No. as listed is incomplete. Select (2) overload relay codes from page 3-34.The first code will denote the high speed overload relay, and the second code will denote the low speed overload relay.

❶ For single phase (1∅) applications, consult Allen-Bradley Sales Office for overload relay selection.

❷ When selecting a factory installed control circuit transformer (see Modifications page 3-44), use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 120E-A09FB3-✪-6P** will have a transformer with a 480V primary/120V secondary and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 120E-A09FBJ3-✪-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

Overload Relay Selections — Page 3-34
Accessories — Page 3-38
Modifications — Page 3-44
Approximate Dimensions — Page 3-75



IP32 (Type 3R) Oversized Enclosure with Start Push Button and Selector Switch as Standard

Bulletin 132

- **IP32 (Type 3R)**
- **Bimetallic Class 10 Overload Relays**
- **SMP-1, SMP-2 or SMP-3 Solid-State Overload Relays**
- **Enclosure with Extra Panel Space for Mounting Accessory Devices**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-31	Modifications	3-44
Overload Relay Selection	3-34	Approximate Dimensions	3-75
Accessories	3-38		

Description

Bulletin 132 pump control panels are specifically designed for irrigation and similar outdoor pumping applications.

The pump control panel includes a Bulletin194R IEC fusible rotary disconnect switch, a Bulletin 100 IEC contactor, a Bulletin 193 bimetallic overload relay or Smart Motor Protection overload relays and a “HAND-OFF-AUTO” selector switch and a “START” button.

Bulletin 132 includes an IP32 (Type 3R) weather-resistant enclosure with a rugged, outdoor finish and brackets for pole or cross bar mounting. Conduit knockouts are located at the bottom of the enclosure. Padlock provisions are furnished on the door latches and the disconnect handle (both the “ON” and “OFF” positions).

Conformity to Standards:

UL 508

Approvals:

UL Listed

Your order must include:

- Cat. No. of the pump control panel.
- Voltage Code Suffix.
- Overload relay code suffix.
- If required, factory installed modifications code suffix.
- If required, Cat. No. of any accessories.

Fusible Disconnect Type

Ratings (AC3, AC4)						Enclosure Code		Fuse Clip Rating Amperes/UL Class	IP32 (Type 3R) Sleet Resistant, Outdoor Sheet Metal Enclosure	
Max. Ie (A)	kW	Horsepower								
	3∅	3∅								
	380/415V	200V	230V	460V	575V	Style	Pin		Cat. No. ❶	❋
9	4	2	2	5	7.5	F	F01	30A/Class CC	132-A09M⊗✪	
12	5.5	3	3	7.5	10	F	F01	30A/Class J	132-A12M⊗✪	
24	11	5	7.5	15	20	F	F01	30A/Class J	132-A24M⊗✪	
30	15	7.5	10	20	25	F	F01	60A/Class J	132-A30M⊗✪	
45	22	10	15	30	40	F	F01	60A/Class J	132-A45M⊗✪	
60	30	15	20	40	50	F	F02	100A/Class J	132-A60M⊗✪	
75	37	20	25	50	60	F	F02	100A/Class J	132-A75M⊗✪	
110	55	30	40	75	100	F	F03	200A/Class J	132-B110M⊗✪	
180	90	50	60	126	150	F	F04	200A/Class J	132-A180M⊗✪	
180	90	60	–	150	–	F	F04	400A/Class J	132-B180M⊗✪	
250	132	75	100	200	250	F	F04	400A/Class J	132-B250M⊗✪	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No.

Voltage		208V	230-240V	460-480V	575-600V
Common Control — Coil Voltage Suffix Code	60 Hz	H	A	B	C
120V Separate Control (without transformer) — Coil Voltage Suffix Code		AD	AD	CD	CD

✪ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 3-34.

❶ When selecting a factory installed control circuit transformer (see Modifications page 3-44), use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 132-A09MB✪-6P** will have a transformer with a 480V primary/120V secondary and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 132-A09MBJ✪-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

Overload Relay Selection — Page 3-34
Accessories — Page 3-38
Modifications — Page 3-44
Approximate Dimensions — Page 3-75



IP32 (Type 3R) Oversized Enclosure With Start Push Button and Selector Switch as Standard

Bulletin 133

- **IP32 (Type 3R)**
- **Bimetallic Class 10 Overload Relays**
- **SMP-1, SMP-2 or SMP-3 Solid-State Overload Relays**
- **Enclosure with Extra Panel Space for Mounting Accessory Devices**

TABLE OF CONTENTS

Description	Page	Description	Page
Product Selection	3-33	Modifications	3-44
Overload Relay Selection	3-34	Approximate Dimensions	3-75
Accessories	3-38		

Description

Bulletin 133 pump control panels are specifically designed for irrigation and similar outdoor pumping applications.

The pump control panel includes a motor circuit protector, a Bulletin 100 IEC contactor, a Bulletin 193 motor protection overload relay (bimetallic or smart motor protection) and a “HAND-OFF-AUTO” selector switch and a “START” button.

Bulletin 133 includes an IP32 (Type 3R) weather-resistant enclosure with a rugged, outdoor finish and brackets for pole or cross bar mounting. Conduit knockouts are located at the bottom of the enclosure. Padlock provisions are furnished on the door latches and the disconnect handle (both the “ON” and “OFF” positions).

Conformity to Standards:

UL 508

Approvals:

UL Listed

Your order must include:

- Cat. No. of the pump control panel.
- Voltage Code Suffix.
- Overload relay code suffix.
- If required, factory installed modifications code suffix.
- If required, Cat. No. of any accessories.

Circuit Breaker Type

Ratings (AC3, AC4)					Enclosure Code		IP32 (Type 3R) Sleet Resistant, Outdoor Sheet Metal Enclosure	
Max. Ie (A)	HP ❶ 3∅ 200V	230V	460V	575V	Style	Dim.	Cat. No. ❸	❋
24	1/2 ❷	1/2 ❷	3/4…1 ❷	3/4…1-1/2 ❷	F	F01	133-A24M⊗✪-36	
	3/4…1	3/4…1	1-1/2…3	2…3	F	F01	133-A24M⊗✪-38	
	1-1/2…3	1-1/2…3	5…7-1/2	5…10	F	F01	133-A24M⊗✪-41	
	5	5…7-1/2	10…15	15…20	F	F01	133-A24M⊗✪-43	
30	7-1/2	10	20	25	F	F01	133-A30M⊗✪-44	
45	10	–	25	30	F	F01	133-A45M⊗✪-45	
	–	15	30	–	F	F01	133-A45M⊗✪-45X	
	–	–	–	40	F	F01	133-A45M⊗✪-46	
60	15	20	40	50	F	F02	133-A60M⊗✪-47	
75	20	25	50	60	F	F02	133-A75M⊗✪-48	
110	25	30	60	75	F	F03	133-B110M⊗✪-49	
	30	40	75	100	F	F03	133-B110M⊗✪-50	
180	40	50	100	125	F	F04	133-B180M⊗✪-51	
	50	60	125	150	F	F04	133-B180M⊗✪-52	
	60	–	150	–	F	F04	133-B180M⊗✪-52X	
250	–	75	–	200	F	F04	133-B250M⊗✪-54	
	75	100	200	250	F	F04	133-B250M⊗✪-56	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 133-A09M⊗✪** becomes **Cat. No. 133-A09MB✪**.

Voltage		208V	230-240V	460-480V	575-600V
Common Control — Coil Voltage Suffix Code	60 Hz	H	A	B	C
120V Separate Control (without transformer) — Coil Voltage Suffix Code		AD	AD	CD	CD

✪ Overload Relay Code

The Cat. No. as listed is incomplete. Select an overload relay code from page 3-34.

❶ For design “E” motor applications, consult the factory.

❷ For horsepower ratings less than those shown, consult the factory.

❸ When selecting a factory installed control circuit transformer (see Modifications page 3-44), use the Common Control Voltage Suffix Code to denote the transformer primary voltage. The starter coil and transformer secondary voltage will both be 120V by default. Example: **Cat. No. 133-A24MB✪-38-6P** will have a transformer with a 480V primary/120V secondary and a 120V starter coil. If a starter coil voltage other than 120V is desired, a second Voltage Suffix Code must be added to denote the coil/transformer secondary voltage. Example: **Cat. No. 133-A24MBJ✪-38-6P** will have a transformer with a 480V primary/24V secondary and a 24V starter coil.

Overload Relay Selection — Page 3-34
Accessories — Page 3-38
Modifications — Page 3-44
Approximate Dimensions — Page 3-75

Overload Relay Code Selection

Overload Relay Selection

SMP-1 Overload Relay for 3∅ Applications: Phase Loss Protection, Class 10 or 20

For Use with Bulletin 105, 106, 109, 112, 113, 120E, 132 and 133					Full Load Current Adjustment Range (A)	3∅ Overload Relay Code Manual Reset ❶	❋	3∅ Overload Relay Code Auto/Manual Reset ❷	❋
A30	A24	A18	A12	A09	0.1….32	A1A		A4A	
					0.32…1.0	A1C		A4C	
					1.0…2.9	A1D		A4D	
					1.6…5.0	A1E		A4E	
					3.7…12	A1F		A4F	
					12…32	A1H		A4H	
			A45	A38	12…38	A1H		A4H	
	A75	A60			14…45	A1J		A4J	
B110					23…75	A1K		A4K	
					66…110	A1L		A4L	
B180					57…180	A1M		A4M	
B250 and B300					96…300	A1N		A4N	
B400					128…400	A1P		A4P	
B600					200…630	A1R		A4R	
All Sizes — No overload relay						XXX		XXX	

❶ Starter Cat. Nos. listed have Class 10 overload relays. To order Class 20 overload relays, change the overload relay from **A1_** to **A2_**. Example: **Cat. No. 105-A09AB3-A1A** becomes **Cat. No. 105-A09AB3-A2A**.

❷ Starter Cat. Nos. listed have Class 10 overload relays. To order Class 20 overload relays, change the overload relay from **A4_** to **A5_**. Example: **Cat. No. 105-A09AB3-A4A** becomes **Cat. No. 105-A09AB3-A5A**.

SMP-1 Overload Relay for 1∅ Applications: Phase Loss Protection, Class 10 or 20

For Use with Bulletin 105, 106, 109, 112, 113, 120E, 132 and 133					Full Load Current Adjustment Range (A)	1∅ Overload Relay Code Manual Reset ❶	❋	1∅ Overload Relay Code Auto/Manual Reset ❷	❋
A30	A24	A18	A12	A09	2….7	S1A		S4A	
					5…15	S1B		S4B	
					12…32	S1C		S4C	
			A45	A38	5…15	S1B		S4B	
					12…38	S1E		S4E	
	A75	A60			14…45	S1F		S1F	
					23…75	S1G		S1G	

❶ Starter Cat. Nos. listed have Class 10 overload relays. To order Class 20 overload relays, change the overload relay from **S1_** to **S2_**. Example: **Cat. No. 105-A09AB3-S1A** becomes **Cat. No. 105-A09AB3-S2A**.

❷ Starter Cat. Nos. listed have Class 10 overload relays. To order Class 20 overload relays, change the overload relay from **S4_** to **S5_**. Example: **Cat. No. 105-A09AB3-S4A** becomes **Cat. No. 105-A09AB3-S5A**.

SMP-2 Overload Relay: Auto/Manual Reset, Selectable Trip Class 10, 15, 20 or 30, Phase Loss, Ground Fault, and Jam Protection

For Use with Bulletin 105, 106, 109, 112, 113, 120E, 132 and 133					Full Load Current Range (A)	Overload Relay Code	❋	For Use with Cat. No. 105, 106, 109, 112, 113, 120, 132 and 133				Full Load Current Range (A)	Overload Relay Code	❋
A30	A24	A18	A12	A09	0.1….32	B1A					A45	A38	12…38	B1H	
					0.32…1.0	B1C				A75	A60		14…45	B1J	
					1.0…2.9	B1D		B110					23…75	B1K	
					1.6…5.0	B1E							66…110	B1L	
					3.7…12	B1F		B180					57…180	B1M	
					12…32	B1H		B250 and B300					96…300	B1N	
								B400					128…400	B1P	
All Sizes — No overload relay						XXX		B600					200…630	B1R	

SMP-3 Overload Relay

Contact Allen-Bradley Sales Office for availability and dimensions.

Note: Starters with SMP-1, SMP-2 or SMP-3 overload relays are not presently part of the AB Express Program.

❋ Prices – Consult Sales Office or price list

Overload Relay Code Selection

Bimetallic Overload Relay: Auto/Manual Reset, Class 10

For Use With Bulletin 105, 106, 109, 112, 113, 120F, 132 and 133	Full Load Current Range (A)	Overload Relay Code	❋	For Use With Cat. No. 105, 106, 109, 112, 113, 120, 132 and 133	Full Load Current Range (A)	Overload Relay Code	❋
A09	0.10….16	A18		A38	18…30	C30	
A12	0.16….24	A26		A45	30…45	C45	
A18	0.24….40	A35		A60	45…60	C63	
A24	0.40….60	A70		A75	60…75	C75	
A09	0.60…1.0	A90		B110	44…66	C66 ❶	
A12	0.80…1.2	B12			66…110	D110 ❶	
A18	1.0…1.6	B16		B180	80…120	D120 ❶	
A24	1.5…2.3	B22			120…200	D200 ❶	
A09	2.0…3.0	B30		B250 & B300	120…180	D180	
A12	2.8…4.2	B42			180…300	D300	
A18	4.0…6.0	B60		B400	160…240	D240	
A24	5.5…8.0	B80			240…400	D400	
A09	6.0…10	C10		B600	252…378	D378	
A12	10…16	C15			378…630	D630	
A18	16…24	C24					
A24	22…32	C32					
A30	All Sizes — No Overload Relay	XXX					

❶ Bulletin 112 Starters with overload relay codes -C86, -D110, -D120, -D200 are not part of the AB-Express Program.

IEC Enclosures



Style "A"



Style "B"

IP42 (Type 1) — General Purpose Molded Plastic Enclosures

Enclosure Code		Bulletin Line						Cat. No.	❋
Style	Dim.	105	106	109	112	113	120		
A	B01	–	–	A09…A12	–	–	–	198E-AA835	
A	B02	–	–	A18…A24	–	–	–	198E-AA845	
IP66 (Type 4, 4X, 12) — Raintight, Dusttight, Corrosion Resistant Molded Plastic Enclosures									
A	K01	–	–	A09…A12	–	–	–	198E-AK835	
A	K02	–	–	A18…A24	–	–	–	198E-AK845	

IP42 (Type 1) — General Purpose Metal Enclosures

Enclosure Code		Bulletin Line						Cat. No.	❋	Mounting Plate Cat. No.	❋
Style	Dim.	105	106	109	112	113	120				
B	A02	–	–	A09…A24 ❶	–	–	–	198E-BA966		–	
B	A08	A09…A24 ❶	–	–	–	–	A09…A24 ❶	198E-BA996		–	
B	A03	–	–	A30…A45 ❶ A09…A24 ❷	–	–	–	198E-BA1176		–	
B	A09	A30…A45 ❶ A09…A24 ❷	–	A30…A45 ❷	–	–	A30…A45 ❶ A09…A24 ❷	198E-BA11116		–	
B	A04	–	–	A60…A75 ❶	–	–	–	198E-BA1278		–	
B	A10	A60…A75 ❶ A30…A45 ❷	–	A60…A75 ❷	–	–	A60…A75❶ A30…A45 ❷	198E-BA12138		–	
B	A05	–	–	B110 ❶	–	–	–	198E-BA23108		198E-P2310	

❶ Without control circuit transformer.
❷ With control circuit transformer.

Accessories — Page 3-38
Modifications — Page 3-44
Approximate Dimensions — Page 3-75

❋ **Prices – Consult Sales Office or price list**

IEC Enclosures, Continued



Style "D"

IP66 (Type 3, 4, 12) — Raintight, Dusttight, Metal Enclosures

Enclosure Code		Bulletin Types						Cat. No.	❋	Mounting Plate Cat. No.	❋
Style	Dim.	105	106	109	112	113	120				
D	A04	–	–	–	A09…A24	A24	–	198E-DA1488T		198E-P148T	
D	A10	–	A09…A45	–	A30…A45	A30…A45	–	198E-DA14168T		198E-P1416T	
D	F08	A09…A45 ❶ A09…A24 ❷	–	–	–	–	A09…A45 ❶ A09…A24 ❷	198E-DF10106		198E-P1010	
D	F03	–	–	A09…A45 ❶ A09…A24 ❷	–	–	–	198E-DF1286		198E-P128	
D	F09	A60…A75 ❶ A30…A45 ❷		A30…A45 ❷			A60…A75 ❶ A30…A45 ❷	198E-DF12126		198E-P1212	
D	F04	–	–	A60…A75 ❶	–	–	–	198E-DF1488		198E-P148	
D	F04	–	–	–	A09…A24 ❶❷	A24 ❶❷	–	198E-DF1488T		198E-P148T	
D	F10	–	–	A60…A75 ❷	–	–	–	198E-DF14168		198E-P1416	
D	F10	–	A09…A45 ❶❷	–	A30…A45 ❶❷	A30…A45 ❶❷	–	198E-DF14168T		198E-P1416T	

❶ Without control circuit transformer.
❷ With control circuit transformer.

Accessories — Page 3-38
Modifications — Page 3-44
Approximate Dimensions — Page 3-66

Accessories — Field Installed

Accessories

	Description	Used with Cat. No.	Type	Cat. No.	❋
 *Cat. No. 195-MB22*	Auxiliary Contact ❶ Adder Deck (Top Mounted)	100-M_	2 N.C. 1 N.O.…1 N.C. 2 N.O.…2 N.C	193-MB02 ❷ 193-MB11 ❷ 193-MB22 ❷	
		All A09…A45 100L-_	2 N.O. 1 N.O.…1 N.C. 2 N.C. 4 N.O. 3 N.O.…1 N.C. 2 N.O.…2 N.C. 4 N.C.	195-FA20 195-FA11 195-FA02 195-FA40 195-FA31 195-FA22 195-FA04	
 *4-Pole* *2-Pole*	Gold Plated ❶ Auxiliary Contact Adder Deck (Top Mounted, 8mA, 24V min.)	100-A09…A45	2 N.O. 1 N.O.…1 N.C. 2 N.C. 4 N.O. 3 N.O.…1 N.C. 2 N.O.…2 N.C. 4 N.C.	195-FA20G 195-FA11G 195-FA02G 195-FA40G 195-FA31G 195-FA22G 195-FA04G	
	Auxiliary Contact ❶ Adder Deck (Side Mounted)	All A09…A30 100L-_	1 N.O. 1 N.C. 1 N.O.…1 N.C. 2 N.O. 2 N.C. 1 N.C. (Late Break) 1 N.O.…1 N.C. (Late Break)	195-BA10 195-BA01 195-BA11 195-BA20 195-BA02 195-BL01 195-BL11	
		All A38…B300	1 N.O. 1 N.C. 1 N.O.…1 N.C. 2 N.O. 2 N.C. 1 N.C. (Late Break)	195-GA10 195-GA01 195-GA11 195-GA20 195-GA02 195-GL01	
		All B400…B600	1 N.O. 1 N.C. 1 N.O.…1 N.C. 2 N.O. 2 N.C.	195-GA10 195-GB01 195-GB11 195-GA20 195-GB02	
	Gold Plated ❶ Auxiliary Contact Adder Deck (Side Mounted, 8mA, 24V min.)	100-A09…A30	1 N.O. 1 N.C. 1 N.O.…1 N.C. 2 N.O. 2 N.C.	195-BA10G 195-BA01G 195-BA11G 195-BA20G 195-BA02G	
	Low Level Switching ❶ Auxiliary Contact (8mA, 24V min.)	All A38…B300	2 N.O. ❸ 2 N.C. ❸	195-NX19 195-NX18	
	Solid-State Timing Element	100-M_	0.1…3 Second ON-Delay	196-MT3S ❷	
			1…30 Second ON-Delay	196-MT30S ❷	
	Star-Delta Timer		220V AC	196-MTSDA2 ❷	
			110V AC	196-MTSDA1 ❷	
	35mm DIN Rail Mounting Adapter for Above Timers			196-MTM ❷	
	Pneumatic Timer	All A09…A45	0.1…180 sec On Delay Off Delay	196-FTA 196-FTB	

❶ See page 3-56 for maximum number of auxiliary circuits.
❷ Must be ordered in multiples of 10.
❸ For maximum reliability, both contacts should be wired in parallel and used as a single circuit.

❋ Prices – Consult Sales Office or price list

	Description	Used with Cat. No.	Type	Cat. No.	❋
	Electronic Timing Relay	100-A09…B300 100-L_	WYE-DELTA ON/OFF Delay	700-FS ❶	
 *Cat. No. 197-FL_*  *Cat. No. 199-FIMZ__*	Latch Attachment	100-A09…A45	Unlatch VA (Cont. Rated) Inrush: 13.0 @ 50 Hz 14.4 @ 60 Hz Seal: 3.7 @ 50…60 Hz	197-FL ⊗	
	DC Interface Module	100-A09…A30 A DC input signal can be used to operate the 24…240V AC contactor coil	12V 24V 48V	199-FIMZ12 199-FIMZ24 199-FIMZ48	
 	Interlock Kit	100-M_	Mechanical Interlock	199-MXM1	
		100-A09…A30	Dual Interlock with Mechanical and Electrical Interlocks in One Unit	199-MCA1	
		100-A38…B300		199-MCD1	
		100-B400	Mechanical Interlock Only	199-MXH1 ❷	
		100-B600		199-MXJ1 ❷	
	R-C Suppressor	100-M_	24…48V AC	199-MSMA48 ❸	
			110…280V AC	199-MSMA1 ❸	
	MOV Suppressor		12…55V AC	199-MSMV1 ❸	
			56…136V AC	199-MSMV2 ❸	
			137…277V AC	199-MSMV3 ❸	
	Diode Suppressor		12…250V DC	199-MSMD1 ❸	
 *Cat. No. 199-FSMA1*  *Cat. No. 599-K04*	Surge Suppressor	100-A09…A30 100L-_	12…120V AC R/C	199-FSMA1	
			125…240V AC R/C	199-FSMA2	
		All A09…A30	24…48V AC Varistor	199-FSMA9	
			50…125V AC Varistor	199-FSMA10	
			130…250V AC Varistor	199-FSMA11	
			6…300V DC Diode	199-FSMZ-1	
		All A38…B180	12…120V AC Varistor	599-K04	
			12…240V AC Varistor	599-KA04	
		All B250…B600	12…120V AC Varistor	199-GSMA1	

⊗ Voltage Suffix Code

The Cat. No. as listed is incomplete. Select a Voltage Suffix Code from the table below to complete the Cat. No. Example: **Cat. No. 197-FL⊗** becomes **Cat. No. 197-FLA1**.

Voltage	24V	110V	120V	220V	240V	380V	415V
50 Hz	B24	A1	–	A2	–	B3	B41
60 Hz	A24	–	A1	–	A2	–	–

❶ The Cat. No. as listed is incomplete. For more information, see Bulletin 700, Type FS, in the Timers and Relays section.
❷ Includes mounting plate and hardware for assembly of reversing contactors.
❸ Must be ordered in multiples of 10.

Continued on next page.

Accessories — Field Installed

Accessories, Continued

	Description	Used with Cat. No.	Type	Cat. No.	❋
 Cat. No. 199-SC1  Cat. No. 199-SC2	Stab Connector Kits	100-A09, A12	Twin Stab for Power Terminals (50 per pack)	199-SC1	
		All Bulletin 100 Contactors	Single Stab for Coil Terminals (20 per pack)	199-SC2	
	Terminal Lug Kit	100-B110	3 Lugs per kit	199-LE1	
		100-B180, 100W-B180_		199-LF1	
		100-B250, -B300, 100W-B300_		199-LG1	
		100-B400		199-LH1	
		100-B600, 100W-B600_		199-LJ1	
	Terminal Cover Kit	100-B110	Provides IP20 Finger Protection (1 Pair Per Kit)	199-TCE1	
		100-B180		199-TCF1	
		100-B250, B300		199-TCG1	
		100-B400		193-TCH1	
		100-B600		193-TCJ1	
	DIN Rail (1 Meter)	100-A09…A45 ❶	35 x 7.5 mm	199-DR1 ❷	
	Power Wiring Kit	100-A09, A12	Provides Interconnecting Power Wires for 3 ∅ Squirrel Cage Reversing Motors	199-PWA1	
		100-A18, A24		199-PWB1	
		100-A30		199-PWB2	
		100-A38, A45		199-PWC1	
		100-A60, A75		199-PWD1 ❶	
		100-B110		199-PWE1 ❶	
		100-B180		199-PWF1 ❶	
		100-B250, B300		199-PWG1 ❶	
		100-B400		199-PWH1	
		100-B600		199-PWJ1	

❶ Not for use with **Cat. No. 100-A38** and **Cat. No. 100-A45** Pure DC Operated Contactors.
❷ Must be ordered in multiples of 10.

❋ Prices – Consult Sales Office or price list

	Description	For Use With Cat. No.	For Enclosure Style	Cat. No.	❋
	**"START-STOP" Push Button** Flush green "I/START" Extended red "O/STOP"	109-A09 and A12	A	198-MS1	
		109-A18 and A24	A	198-MS2	
	**"START-STOP" Push Button** Flush green "I/START" Extended red "O/STOP"	All	B & D	198-MS3 ❶	
	**"ON-OFF" Push Button** Flush green "ON" Extended red "OFF"	109-A09 and A12	A	198-MS4	
		109-A18 and A24	A	198-MS5	
	**"ON-OFF" Push Button**	105…133 100L-_	B & D	198-MS6 ❶	
	**"FORWARD, REVERSE-STOP" Push Buttons**	All	B & D	198-MS7 ❶	
	"HIGH-LOW, STOP" Push Buttons	All	B & D	198-MS8 ❶	
	"FAST-SLOW-STOP" Push Buttons	All		198-MS9 ❶	
	**External "RESET" Button** (for Bimetallic and SMP Overload Relays) Flush gray "R/RESET"	109-A09… A24	A	198-MR1	
	**External "RESET" Button** (for Bimetallic and SMP Overload Relays) Flush gray "R/RESET"	All	B & D	198-MR3	
	**"HAND-OFF-AUTO" Selector Switch** 3 Position Maintained Includes Legend Plate	105…133 100L-_	B & D	198-MT1 ❶	
	"FORWARD-OFF-REVERSE" Selector Switch **3 Position Maintained**	All	B & D	198-MT2 ❶	
	**"OFF-ON" Selector Switch** **2 Position Maintained**	105…133 100L-_	B & D	198-MT3	

❶ Requires mounting bracket **Cat. No. 198-BR1** when using enclosure style "B".

Continued on next page.

Accessories — Field Installed

Accessories, Continued

	Description		For Use With Cat. No.	For Enclosure Style	Cat. No.	❋
	**Red "ON" Pilot Light** Resistor Type	120V	A09-A24	A	198-PL11R	
		240V		A	198-PL12R	
	**Red "ON" Pilot Light** Transformer Type ❶	120V	105…133 100L-_	B & D	198-PL21R ❷	
		208V			198-PL25R ❷	
		240V			198-PL22R ❷	
		480V			198-PL23R ❷	
		600V			198-PL24R ❷	
	**Dual "ON" Pilot Light Forward — Red Reverse — White ❶**	120V	105 106	D	198-PL21RW	
		240V			198-PL22RW	
		480V			198-PL23RW	
	**Pilot Device Mounting Bracket (required when mounting pilot devices in style "B" enclosures)**		105…133 100L-_	B	198-BR1	
	**Control Circuit Transformer** With Top Mounted Fuse Block		All	B & D	1497-_ _ P	
	**Control Circuit Fuse Block** For Class CC Rejection Type Fuses (Fuses Not Included)		105…133 100L-_	B & D	1491-R162	
	**Grounding Bushing** Adapts to 1/2″ N.P.T., PG 16.5 & BS20 mm threads		109 A09-A24	A	198-GR1	
	**Terminal Shorting Bar** Provides jumper between ground and solid neutral terminals.		109 A09-A24	A	198-GR2	
	**Single Pole N.O. Auxiliary Contact for Disconnect Switch**		106, 112	D	195-GA10 ❸	

❶ Does not include Legend Plate. See page 11-299 for Bulletin 800E Legend Plate. Legend Plates for use on D enclosures only.
❷ Requires mounting bracket **Cat. No. 198-BR1** when using enclosure style "B".
❸ An auxiliary contact adaptor, **Cat. No. 194R-AA**, is required when installing auxiliary contact, **Cat. No. 195-GA10**.

❋ Prices – Consult Sales Office or price list

	Description	For Use With Cat. No.	For Enclosure Style	Cat. No.	❋
	**Fuse Cover for Disconnect Switch**	106,112-A09…A24	D	194R-FCA2	
		106,112-A30…A45		194R-FCJ60	
		106,112-A60…A75		194R-FCC1 ❶	
		106,112…B110		194R-FCD1 ❶	
		106,112…A180		194R-FCE1 ❶	
		106,112-B180…B300		194R-FCF1 ❶	
	**Closing Button** For 22.5mm Round Panel Hole	All	B & D	198-N1	

❶ 3 required per disconnect switch.

Bulletin 100-M Miniature Contactors Labelling Material

	Description		Pkg. Qty.	Cat. No.	❋
	Connectors	Double Spade	50	199-SC10	
		Single Spade	50	199-SC11	
	Neutral Link	10mm	1	199-NL1	
		16mm	1	199-NL2	
	Labels	Adhesive Paper, 105/sheet	10	199-ID1	
	Marking Tags	160 per sheet	10	199-ID2	
	Cover	Transparent/ Tag	100	199-ID3	
	Tag Carrier	For Clip-on Tags	100	199-ID4	

Clip-On Marking Tag Strip (10 per Strip)

Tag Marking	Pkg. Qty.	Cat. No.	❋	Tag Marking	Pkg. Qty.	Cat. No.	❋	Tag Marking	Pkg. Qty.	Cat. No.	❋
1…10	25	199-ID5		1	25	199-ID25		G	25	199-ID45	
11…20	25	199-ID6		2	25	199-I26D		H	25	199-ID46	
21…30	25	199-ID7		3	25	199-ID27		I	25	199-ID47	
31…40	25	199-ID8		4	25	199-ID28		J	25	199-ID48	
41…50	25	199-ID9		5	25	199-ID29		K	25	199-ID49	
51…60	25	199-ID10		6	25	199-ID30		L	25	199-ID50	
61…70	25	199-ID11		7	25	199-ID31		M	25	199-ID51	
71…80	25	199-ID12		8	25	199-ID32		N	25	199-ID52	
81…90	25	199-ID13		9	25	199-ID33		0	25	199-ID53	
91…100	25	199-ID14		9	25	199-ID34		P	25	199-ID54	
101…110	25	199-ID15		Unmarked	25	199-ID35		Q	25	199-ID55	
111…120	25	199-ID16		0…9	25	199-ID36		R	25	199-ID56	
121…130	25	199-ID17		+	25	199-ID37		S	25	199-ID57	
131…140	25	199-ID18		-	25	199-ID38		T	25	199-ID58	
141…150	25	199-ID19		A	25	199-ID39		U	25	199-ID59	
151…160	25	199-ID20		B	25	199-ID40		V	25	199-ID60	
161…170	25	199-ID21		C	25	199-ID41		W	25	199-ID61	
171…180	25	199-ID22		D	25	199-ID42		X	25	199-ID62	
181…190	25	199-ID23		E	25	199-ID43		Y	25	199-ID63	
191…200	25	199-ID24		F	25	199-ID44		Z	25	199-ID64	

Modifications — Factory Installed

Modifications

Listed on this and the following pages are factory installed modifications and special features which are available for the low voltage (600V maximum) starters listed in this catalog. To order, add a dash followed by the suffix number listed in these tables to the end of the product Cat. No. Example: **109-A09AD3-B16-11**.

Full Voltage Non-Reversing Starters (Bulletin 109)

Description of Modification	Suffix Code	Enclosure		A09	A12	A18	A24	A30	A38	A45	A60	A75	B110	A180	B180	B250	B300	B400	B600
		Style	Rating																
START-STOP Push Button	1	A	IP42 (1), IP66 (4/4X)	A	A	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
ON-OFF Push Button	1E	A	IP42 (1), IP66 (4/4X)	A	A	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
HAND-OFF-AUTO Selector Switch	3	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
OFF-ON Selector Switch	3E	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Red Pilot Light (Transformer Type)	4R	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Red LED Pilot Light (120V)	4R1	A	IP42 (1), IP66 (4/4X)	A	A	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Red LED Pilot Light (240V)	4R2	A	IP42 (1), IP66 (4/4X)	A	A	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Control Circuit Transformer 2 Primary and 1 Secondary Fuse Provided (Standard Capacity)	6P ❶❷	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
1 External Reset	7	A	IP42 (1), IP66 (4/4X)	A	A	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Enclosure Padlock Attachment	11	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Enclosure Mounting Feet	12	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Control Circuit Fuse Block 2 Fuses Provided	22	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
1 N.O. – 1 N.C. Auxiliary Contact on Contactor (Side Mount)	901	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
1 N.O. – 1 N.C. Auxiliary Contact on Contactor (Top Mount)	901T	B	IP42 (1)	A	A	A	A	A	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA

A=Available Option
NA=Not Available

❶ Not available for molded plastic enclosed devices.
❷ When ordering in Canada, use suffix 6. Primary fusing is not required by the Canadian Electrical Code.

❋ Prices – Consult Sales Office or price list

Full Voltage Reversing, Reversing Combination and Multi-Speed Starters (Bulletin 105, 106, 120E) ❶

Description of Modification	Suffix Code	Enclosure		A09	A12	A18	A24	A30	A38	A45	A60	A75	B110	A180	B180	B250	B300	B400	B600
		Style	Rating																
FOR-REV-STOP Push Buttons	1	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
HIGH-LOW-STOP Push Buttons	1	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
FOR-OFF-REV Selector Switch	3	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
HIGH-OFF-LOW Selector Switch	3	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Red FOR White REV Pilot Lights ❷	4RW	D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Red HIGH White LOW Pilot Lights ❷	4RW	D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Control Circuit Transformer 2 Primary and 1 Secondary Fuse Provided (Standard Capacity)	6P ❸	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
1 External Reset	7	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
2 External Resets (Multi-Speed Starters)	7	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Enclosure Padlock Attachment	11	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Enclosure Mounting Feet	12	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
Control Circuit Fuse Block 2 Fuses Provided	22	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
1 N.O. – 1 N.C. Auxiliary Contact on Contactor (Side Mount)	901	B	IP42 (1)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	A	A	A	NA	A	A	A	A	A
1 N.O. – 1 N.C. Auxiliary Contact on Contactor (Top Mount)	901T	B	IP42 (1)	A	A	A	A	A	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA
		D	IP66 (3/4/12)	A	A	A	A	A	A	A	NA	NA	NA	NA	NA	NA	NA	NA	NA

A=Available Option
NA=Not Available

❶ Bulletin 106 reversing combination starters are only available in style “D” enclosures.
❷ Transformer Type.
❸ When ordering in Canada, use suffix 6. Primary fusing is not required by the Canadian Electrical Code.

Modifications — Factory Installed

Modifications, Continued

Full Voltage Non-Reversing Combination Starters (Bulletins 112, 113)

Description of Modification	Suffix Code	Enclosure		A09	A12	A18	A24	A30	A38	A45	A60	A75	B110	A180	B180	B250	B300	B400	B600
		Style	Rating																
START-STOP Push Button	1	D	IP42 (1)	$ A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
HAND-OFF-AUTO Selector Switch	3	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
Red Pilot Light ❶	4R	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
Control Circuit Transformer 2 Primary and 1 Secondary Fuse Provided (Standard Capacity)	6P ❷	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
External Reset	7	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
Fuse Cover (For Disconnect Switch)	8	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
Enclosure Padlock Attachment	11	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
Enclosure Mounting Feet	12	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
Control Circuit Fuse Block 2 Fuses Provided	22	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
N.O. Auxiliary Contact (On Disconnect Switch)	98	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
1 N.O. – 1 N.C. Auxiliary Contact on Contactor (Side Mount)	901	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
1 N.O. – 1 N.C. Auxiliary Contact on Contactor (Top Mount)	901T	D	IP42 (1)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA
		D	IP66 (3/4/12)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	A	NA	NA

A=Available Option
NA=Not Available

❶ Transformer Type.
❷ When ordering in Canada, use suffix 6. Primary fusing is not required by the Canadian Electrical Code.

❋ Prices – Consult Sales Office or price list

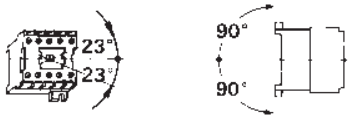
Pump Control Panels (Bulletin 132 and 133)

Description of Modification	Suffix Code	Enclosure		A09	A12	A18	A24	A30	A38	A45	A60	A75	B110	A180	B180	B250	B300	B400	B600
		Style	Rating																
Red Pilot Light ❶	4R	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA
Control Circuit Transformer 2 Primary and 1 Secondary Fuse Provided (Standard Capacity)	6P ❷	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA
Control Circuit Transformer 2 Primary and 1 Secondary Fuse Provided (100VA Extra Capacity)	6XP	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA
Control Circuit Fuse Block 2 Fuses Provided	22	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA
Motor Saver (Model 400) Voltage Monitor	190	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA
Motor Saver (Model 520) Current Monitor	191	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA
Lightning Arrestor	192	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA
Surge Suppressor	193	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA
24 Hour Timer Clock (Includes 50VA – 120 CPT)	194	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA
Back Spin Timer	195	F	IP32 (3R)	A	A	NA	A	A	NA	A	A	A	A	A	A	A	NA	NA	NA

A=Available Option
NA=Not Available

❶ Transformer Type.
❷ When ordering in Canada, use suffix 6. Primary fusing is not required by the Canadian Electrical Code.

Bulletin 100-M Miniature Contactor

Electrical		
Operating Range	Contactors Control Relays	85…110% of rated voltage 80…110% or rated voltage
Drop Out	Alternating current AC Direct current DC	35…65% nominal coil voltage 10…25% nominal coil voltage
Coil Consumption	AC Inrush VA Sealed VA DC Inrush VA Sealed VA	 22 VA 1.4 VA 2.5 Watts 2.5 Watts
Mechanical		
Operating Time	Pick-Up Drop Out	40 ms 20 ms
Environmental		
Ambient Temperature	In store, transport In operation AC-1, enclosed AC-2…AC-4 at rated operational current at 85% rated operational current In operation AC-1, open	–55°C…+ 80°C (–67°F…176°F) –50°C…+60°C (–58°F…140°F) –50°C…+70°C (–58°F…158°F) –50°C…+40°C (–58°F…104°F)
Resistance to Climatic Change	Humid heat Alternating climatic conditions	40°C (104°F), 95% relative humidity, 56 days 23°C (73.4°F), 83% / 40°C, 93%, 56 cycles
Mounting Position	Direct current operation DC) No restrictions (maximum pull-in voltage and temperature range with all permissible auxiliary contact adder decks	 any position
	Alternating current operation AC	
Construction		
Protection against Accidental Contact	Protection against finger and back of the hand contact	According to VBG 4
Terminals	Wire Stranded lead Without Connector Sleeve With Connector Sleeve	2 x 0.75 mm^2…2.5 mm^2 (18…14 AWG) 2 x 1.0…2.5 mm^2 (18…14 AWG) 2 x 0.75…1.5 mm^2 (18…16 AWG)

Product Selection — Page 3-4
Accessories — Page 3-38
Approximate Dimensions — Page 3-65

Bulletin 100-M Miniature Contactors Electrical Life

Duty classification and actuation for electrical service life verification (number of actuations under load in accordance with IEC 158-1).

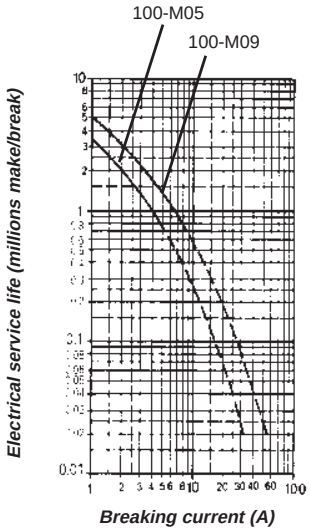
Duty Classification			Test Conditions					
			Making			Breaking		
			I/I_e	U/U_e	cos. φ	I_c/I_e	U_r/U_e	cos. φ
AC-1	Non-inductive or slightly inductive loads, resistance furnaces		1	1	0.95	1	1	0.95
AC-2	Slip ring motors: starting and reversing		2.5	1	0.65	2.5	1	0.65
AC-3	Squirrel cage motors: starting, switching off running motors	$I_e \leq$ 17A	6	1	0.65	1	0.17	0.65
AC-4	Squirrel cage motors: starting, reversing, jogging	$I_e \leq$ 17A	6	1	0.65	6	1	0.65
AC-11	Electromagnets for contactors, valves, lifting means		10	1	0.7	1	1	0.4

U_e	Rated operational voltage	I_e	Rated operation current
U	Voltage before make	I	Making current
U_r	Recovery voltage	I_c	Breaking current

Electrical service life of contactors as a function of breaking current.

The graph is valid up to 380/415V, 50/60 Hz, for switching of most types of motors and under most operating conditions including duty classifications AC-2 though AC-4 as well as for ohmic and slightly inductive loads (AC-1).

The electrical service life established under the above test conditions for the various duty classifications is shown in the adjacent graph as a function of breaking current. In general, these values can be used without hesitation for contact selection purposes.



Permissible frequency of operations for Bulletin 100-M mini-contactors

Switching of running squirrel-cage motors (AC-3)

Relative duty cycle 40%
Starting time t_A = 0.25%

Motor rated current I_e [A]	1.25	2.5	5	9
Operation /h	8000	2500	1200	600

Switching of motors during start-up (AC-2 and AC-4)

Duty cycle t_{ED} = 0.25 s (<t_A)

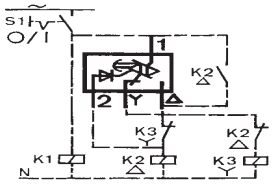
Starting current I_A [A]	1.25	6	20	36
Operations /h	8000	1200	300	120

Product Selection — Page 3-4
Accessories — Page 3-38
Approximate Dimensions — Page 3-65

IEC Specifications

Specifications, Continued

Bulletin 100-M Accessories

Electrical	Cat. No. 196-M	Cat. No. 196-MSD
Operational Voltage	AC and DC 110V –23%…250V +10%	AC only, 50/60 Hz 110V –23%…120V +10% 220V –20%…240V +10%
Voltage Drop	5V maximum	5V maximum
Load current for reliable function	10 mA minimum	10 mA minimum
Load current at 20°C (68°F) 40°C (104°F) 55°C (131°F)	 600 mA 440 mA 320 mA	 600 mA 440 mA 320 mA
Leakage current at 220V	5 mA	Y 17 mA, Δ 6 mA
Time range (delayed operation)	0.1…3 seconds 1…30 seconds	1…30 seconds
Transition time Y/Δ	–	90 ms ± 30 ms
Reset time	≥ 200 ms	≥ 200 ms
Voltage failure duration having no influence on time sequence	≤ 15 ms	≥ 200 ms
Repeat accuracy At fixed temperature With temperature range of –5°C…+55°C (23°F…+131°F)	 ±1% ±5%	 ±1% ±5%
Time interval for start commands	1.4 X set time	2 X set time
General	**Cat. No. 196-M**	**Cat. No. 196-MSD**
Functional description	After the set time has expired, the timer completes the circuit and switches on the series connected contactor.	After the set time has expired, contactor KY is switched off, and after the fixed switching interval 90 ± 30 ms, contactor KΔ is switched on.
Circuit diagrams		
Time setting	The 0.1 through 3 seconds and 1 through 30 seconds delay period is preset by means of the seconds marking and then corrected according to the process sequence or by checking with a stop watch.	
Environmental	**Cat. No. 196-M**	**Cat. No. 196-MSD**
Ambient temperature in operation in store	 –20°C…+55°C (–40°F…+131°F) –40°C…+80°C (–40°F…+176°F)	 –20°C…55°C (–40°F…+131°F) –40°C…+80°C (–40°F…+176°F)
Construction	**Cat. No. 196-M**	**Cat. No. 196-MSD**
Terminals: 0.8mm^2 (AWG 18)	 2 free cable ends, each 250mm long	 4 free cable ends, each 250mm long

Surge Suppressors

Electrical	Cat. No. 196-M	Cat. No. 196-MSD
Overvoltage factor	n = U_{max}/U_n = 0.8 to 2.5	

Product Selection — Page 3-4
Accessories — Page 3-38
Approximate Dimensions — Page 3-65

Bulletin 100-M Miniature Contactors
Electrical Ratings

Description			Cat. No. 100-M05					Cat. No. 100-M09				
Operating Voltage		V	220	240	380	415	500	220	240	380	415	500
I_{th} ❶ AC-1 ❷	Open ❸	A kW	20 7.5	20 8.3	20 13.1	20 14.3	20 17.3	20 7.5	20 8.3	20 13.1	20 14.3	20 17.3
	Enclosed ❸	A kW	16 6	16 6.7	16 10.5	16 11.5	16 14	16 6	16 6.7	16 10.5	16 11.5	16 14
Switching of 3-Phase Motors												
AC-2	Slip ring motors ❹	A	6.5	6	5.3	4.8	4	12	11	9	8.2	7
AC-3	Squirrel cage motor ❹	kW	1.5	1.5	2.2	2.2	2.2	3	3	4	4	4
	Normal loading	HP	2	2	3	3	3	4	4	5.5	5.5	5.5
AC-4	Squirrel cage motor	A	6.5	6	5.3	4.8	4	12	11	9	8.2	7
	Heavy-duty-operation	kW	1.5	1.5	2.2	2.2	2.2	3	3	4	4	4
	Inching ❹	HP	2	2	3	3	3	4	4	5.5	5.5	5.5
Star-Delta Starting ❹		A kW HP	9 2.2 3	8 2.2 3	8.5 3.7 5	7.6 3.7 5	6.5 3.7 5	15 4 5.5	14 4 5.5	16 7.5 10	14 7.5 10	12 7.5 10
Rated insulation voltage according to IEC 158-1		V	500					500				
Test Voltage 1 minute		V	3000					3000				
Back-Up Fuse without thermal overload relay		A	20					20				
Auxiliary Contacts												
Auxiliary Contact Block	AC-11	A	2	2	1	1	0.6	2	2	2	2	0.6
	I_{th} open ❸	A	10					10				
	I_{th} enclosed ❸	A	6					6				
Contactor	AC-11 ❶	A	6	5	2.5	2	1.25	6	5	2.5	2	1.25
	I_{th} open ❸	A	16					16				
	I_{th} enclosed ❸	A	12					12				
Back-Up Fuse		A	10					10				
Number of Auxiliary Contacts			1…5					1…5				

❶ I_{th} in accordance with IEC, AS, BS, SEV. Corresponds to the continuous current rating I_{th2} according to VDE.
❷ Rated power according to IEC, AS, BS, DEMKO, NEMKO, SEMKO, Finland, SEV, VDE for 3 phase non-inductive loads (50 through 60 Hz).
❸ "Open" values refer to 40°C (104°F) ambient temperature. "Enclosed" values refer to 60°C (140°F) ambient temperature.
❹ Rated current power for 50 through 60 Hz in accordance with IEC, AS, BS, SEV, VDE. Same data as AC-3 for occasional inching/plugging (AC-4).

Product Selection — Page 3-4
Accessories — Page 3-38
Approximate Dimensions — Page 3-65

Bulletin 100 Magnetic Contactors
Electrical Life in Utilization Categories AC1 and AC2

Life-Load Curves

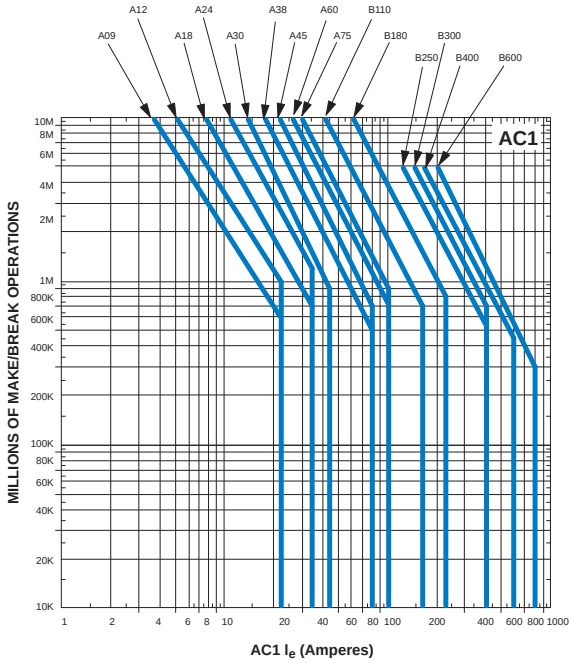
Bulletin 100 IEC-based contactors are designed for superior performance in a wide variety of applications. When selecting IEC-based products, the user must give consideration to the specific load, utilization category and required electrical life of the application. The life-load curves listed here are based on Allen-Bradley tests according to the requirements defined in IEC 947-4158-1. 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.

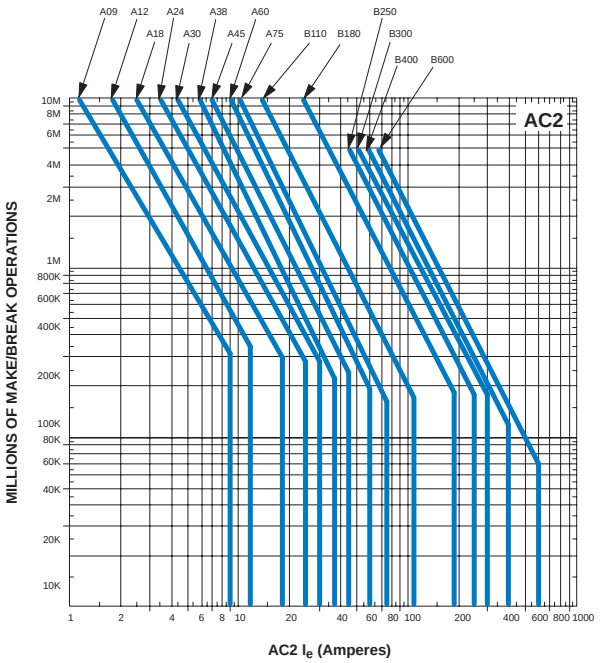
To find the contactor's estimated electrical life, follow these guidelines:

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 application's operational current (I_e) found on the horizontal axis.
3. Read the estimated contact life in millions of operations 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.





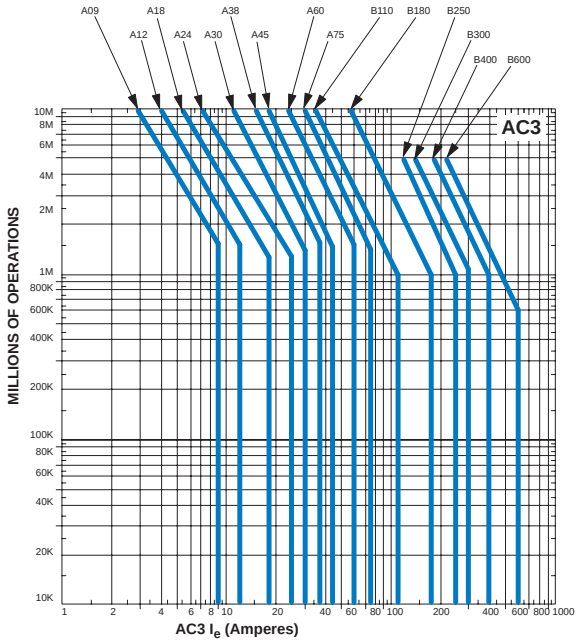
Product Selection — Page 3-4
Accessories — Page 3-38
Approximate Dimensions — Page 3-65

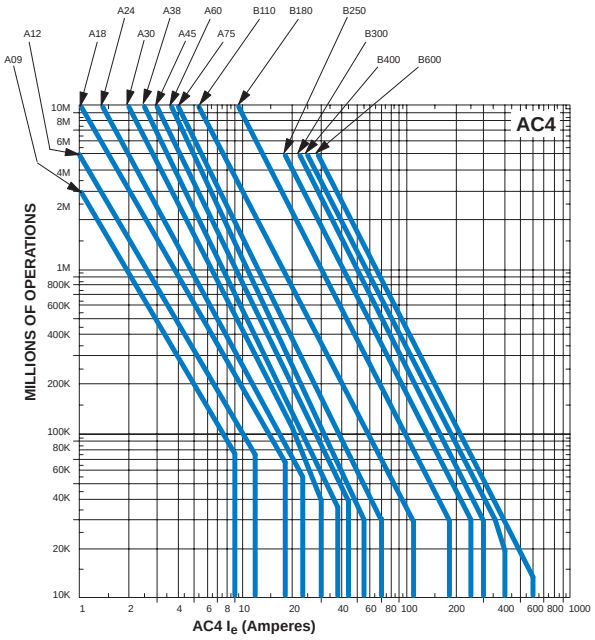
Bulletin 100 Magnetic Contactors
Contact Life for Mixed Utilization Categories AC3 and AC4

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:

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

L_{mixed} Approximate contact life for a mixed AC3/AC4 utilization category application.
L_{AC3} Approximate contact life in operations for AC3 utilization category (from AC3 life-load curves below).
L_{AC4} Approximate contact life in operations for AC4 utilization category (from AC4 life-load curves below).
P_{AC4} Percentage of AC4 operations.





Electronic Selection Disk with Automatic Life-Load Calculations.
See Section 19, **Software and Support** for details. **Cat. No. 100-SG1**.

Product Selection — Page 3-4
Accessories — Page 3-38
Approximate Dimensions — Page 3-65

IEC Specifications

Specifications, Continued

Bulletin 100 Magnetic Contactors
Electrical Ratings

Contactor Size			100-A09	100-A12	100-A18	100-A24	100-A30	100-A38
Rated thermal current I_{th} @ +40°C (+104°F)		A	22	22	35	35	45	80
Rated insulation voltage IEC (U_i)/UL		V	660/600					
Ratings: AC1 @ +40°C (+104°F)	i_e	A	22	22	35	35	45	80
Ratings: AC2, AC3, AC4 50 Hz @ +55°C	I_e	A	9	12	18	24	30	38
	220V	kW	2.2	3	4	5.5	7.5	10
	380/415V	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
Star-Delta/Wye-Delta Ratings: AC3, 50 Hz, Non-Reversing Contactors Carry Phase Current	220V	kW	4	5.5	7.5	11	11	15
	380/415V	kW	7.5	11	15	18.5	22	30
	500V	kW	11	15	18.5	22	30	37
	660V	kW	11	15	18.5	25	30	37
Ratings: AC2, AC3, AC4 60 Hz @ +55°C	I_e	A	9	12	18	24	30	38
	200V	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
Star-Delta/Wye-Delta Ratings: AC3, 60 Hz, Non-Reversing Contactors Carry Phase Current	200V	HP	5	5	7-1/2	7-1/2	10	15
	230V	HP	5	7-1/2	10	10	15	20
	460V	HP	10	15	20	25	30	40
	575V	HP	15	20	25	30	40	50
Maximum fuse size Type 2 co-ordination		A	25	25	40	40	63	80
Average impedance per pole mΩ		mΩ	2.4	2.4	2.1	2.1	2.1	1.5
AC Coil Data								
Coil consumption ±10%	50 Hz Inrush	VA	71	71	77	77	83	153
	50 Hz Sealed	VA	6.7	6.7	6.9	6.9	7.9	20
	60 Hz Inrush	VA	77	77	84	84	90	161
	60 Hz Sealed	VA	6.2	6.2	6.5	6.5	7.7	19
Power factor ±10%	50 Hz Sealed		0.25	0.25	0.26	0.26	0.24	0.22
	60 Hz Sealed		0.27	0.27	0.28	0.28	0.25	0.23
Heat dissipation		Watts	1.7	1.7	1.7	1.7	1.9	4.4
Coil operating limits			85…110% of rated voltage					
DC Coil Data								
DC Coil consumption ± 10%	Pure DC Coil	Watts	8.7	8.7	8.7	8.7	8.7	10
	Economized DC Coil	Inrush Watts	–	–	–	–	–	160
		Sealed Watts	–	–	–	–	–	1.58
Coil operating limits			80…110% of rated voltage					
Auxiliary Contacts								
Rated thermal current I_{th}			10A					
Rated insulation voltage IEC (U_i)/UL			660/600V					
Terminal size			2…4mm^2/#12 AWG					
Ratings AC15	12…120V		6A					
	220…240V		3A					
	380…480V		1.5A					
	500…660V		1.2A					
Ratings DC13	28		5.0A					
	110		1.25A					
	220		0.62A					
	440		0.27A					
	660		0.20A					

Product Selection — Page 3-17
Accessories — Page 3-38
Approximate Dimensions — Page 3-66

Bulletin 100 Magnetic Contactors
Electrical Ratings, Continued

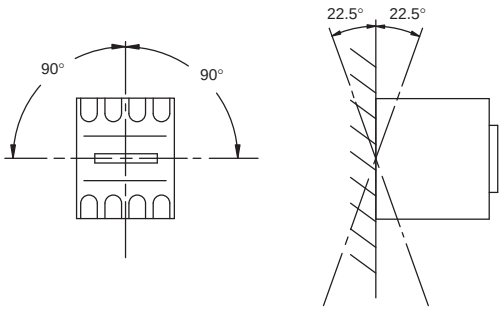
100-A45	100-A60	100-A75	100-B110	100-B180	100-B250	100-B300	100-B400	100-B600
80	100	100	160	225	400	400	600	800
660/600								
80	100	100	160	225	400	400	600	800
45	60	75	110	180	255	304	414	608
11	15	22	30	45	75	90	120	180
22	30	37	55	90	132	160	220	315
30	37	45	75	110	160	200	280	445
22	37	45	75	110	160	200	280	445
22	30	37	45	80	110	140	220	277
37	55	63	90	150	220	257	350	545
45	75	80	110	180	280	315	450	–
45	75	80	110	180	280	315	445	–
45	60	75	110	180	250	304	414	608
10	15	20	30	60	75	100	125	200
15	20	25	40	60	100	100	150	250
30	40	50	75	150	200	250	350	500
40	50	60	100	150	250	300	400	600
20	30	40	60	75	125	150	225	350
25	40	50	60	100	150	200	250	400
50	75	100	150	225	350	400	500	–
60	100	125	150	250	400	450	600	–
100	125	125	200	315	400	500	630	1000
1.5	1.2	1.2	0.5	0.4	0.3	0.3	0.3	0.1
AC Coil Data								
153	327	327	537	825	1562	1562	3300	4884
20	37	37	72	85	124	124	290	281
161	348	348	552	840	1596	1596	3312	4860
19	34	34	64	75	113	113	253	254
0.22	0.19	0.19	0.21	0.22	0.25	0.25	0.22	0.22
0.23	0.20	0.20	0.21	0.25	0.28	0.28	0.24	0.26
4.0	6.8	6.8	12.5	19.0	35.4	35.4	61.2	65.7
85…110% of rated voltage								
DC Coil Data								
10	17	17	24	–	–	–	–	–
160	309	309	383	518	–	–	–	–
1.58	2.69	2.69	3.32	3.57	–	–	–	–
80…110% of rated voltage								
Auxiliary Contacts								
10A								
660/600V								
2…4mm^2/#12 AWG								
6A 3A 1.5A 1.2A								
5.0A 1.25A 0.62A 0.27A 0.20A								

Product Selection — Page 3-17
Accessories — Page 3-38
Approximate Dimensions — Page 3-66

IEC Specifications

Specifications, Continued

Bulletin 100 Magnetic Contactors Rating

Mechanical	Contactor Size		100-A09	100-A12	100-A18	100-A24	100-A30	100-A38
Degree of protection (Open Type) IEC 529			IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Mechanical life, operations in millions			20	20	15	15	15	15
Max. number of auxiliary circuits (includes aux. contact supplied as standard with contactor)	AC Coil		5	5	5	5	5	5
	DC Coil ❶		3	3	3	3	3	5
Operating times at normal voltage at +20°C in milliseconds	Pick-up	AC	13…20	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	9	9	9	14	–
DC with suppression			44	44	30.1	30.1	40	–
Maximum operating rates all contactors (operations/hr)	AC3		600	600	600	600	600	600
	AC4		300	300	300	300	Refer to Allen-Bradley	
Construction								
Contact material: Main contacts			Silver Alloy					
Auxiliary contacts			Silver					
Terminal markings			CENELEC EN50 012 and NEMA					
Terminal sizes			M3.5 (#6-32)	M3.5 (#6-32)	M4.0 (#8-32)	M4.0 (#8-32)	M5.0 (#10-32)	M6.0 (1/4-20)
Cable size maximum (1 or 2 wires)			2-4mm^2 (2-#12 AWG)	2-4mm^2 (2-#12 AWG)	2-6mm^2 (2-#10 AWG)	2-6mm^2 (2-#10 AWG)	2-10mm^2 (2-#8 AWG)	1-25mm^2 (1-#4 AWG)
Recommended tightening torque (Power cables)			1.4 N-m (12 in-lbs)	1.4 N-m (12 in-lbs)	1.4 N-m (12 in-lbs)	1.4 N-m (12 in-lbs)	2.8 N-m (25 in-lbs)	5.1 N-m (45 in-lbs)
Environmental (Common Data)								
Temperature	Operation	(open)	–25°C…+55°C (–13°F…+131°F)					
		(enclosed)	–25°C…+40°C (–13°F…+104°F)					
	Storage		–40°C…+65°C (–40°F…+149°F)					
Altitude			2000m per IEC 947-4					
Resistance to corrosion			Steel parts zinc plated and chromated					
Operating position								

❶ For applications with 9-30A DC operated contactors, consult Allen-Bradley Sales Office.

Product Selection — Page 3-17
Accessories — Page 3-38
Approximate Dimensions — Page 3-66

Mechanical, Continued

100-A45	100-A60	100-A75	100-B110	100-B180	100-B250	100-B300	100-B400	100-B600
IP 20	IP 20	IP 20	IP 00	IP 00	IP 00	IP 00	IP00	IP00
15	15	15	10	10	5	5	5	5
5	5	5	5	5	5	5	6	6
5	5	5	5	–	–	–	–	–
12…22	14…29	14…29	16…35	20…24	18…42	18…42	16…36	25…79
–	–	–	–	–	–	–	–	–
6…11	5…14	5…14	5…14	9…20	7…17	7…17	6…18	10…22
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
600	400	400	400	300	150	150	150	150

Refer to Allen-Bradley

Construction

Silver Alloy

Silver

CENELEC EN50 012 and NEMA

M6.0 (1/4…20)	M8.0 (5/16…18)	M8.0 (5/16…18)	M8.0 (5/16…18)	M10.0 (3/8…16)	M12.0 (1/2…13)	M12.0 (1/2…13)	M12.0 (1/2…13)	M12.0 (1/2…13)
1-25mm^2 (1-#4 AWG)	1-35mm^2 (1-#2 AWG)	1-35mm^2 (1-#2 AWG)	1-50mm^2 (1-#1/0 AWG)	1-120mm^2 (1-#4/0 AWG)	1-240mm^2 (1-500 MCM AWG)	1-240mm^2 (1-500 MCM AWG)	2-185mm^2 (2-350 MCM AWG)	2-240mm^2 (2-500 MCM AWG)
5.1 N-m (45 in-lbs)	5.6 N-m (50 in-lbs)	5.6 N-m (50 in-lbs)	16.9 N-m ❶ (150 in-lbs)	31 N-m ❶ (275 in-lbs)	42 N-m ❶ (375 in-lbs)	42 N-m ❶ (375 in-lbs)	31 N-m ❶ (275 in-lbs)	31 N-m ❶ (275 in-lbs)

Environmental (Common Data)

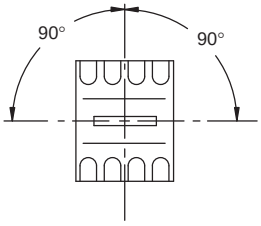
–25°C…+55°C (–13°F…+131°F)

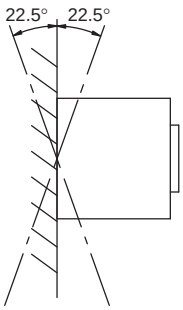
–25°C…+40°C (–13°F…+104°F)

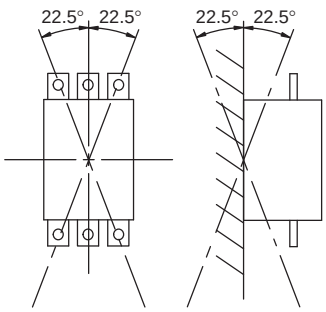
–40°C…+65°C (–40°F…+149°F)

2000m per IEC 947-4

Steel parts zinc plated and chromated







❶ Recommended torque when using proper Bulletin 199 terminal lug kit (see page 3-40).

Product Selection — Page 3-17
Accessories — Page 3-38
Approximate Dimensions — Page 3-66

Bulletin 100W Welding Contactors

Description	Cat. No. Suffix - B180	Cat. No. Suffix - B300	Cat. No. Suffix - B600
Coil Operating Limits	85…110% of Rated Voltage		
Coil Consumption ±10% 50 Hz Inrush (VA) 60 Hz Inrush (VA) 50 Hz Sealed (VA) 60 Hz Sealed (VA)	 825 840 85 75	 1562 1596 124 113	 4730 4680 216 216
Operating Times at normal voltage at +20°C in Milliseconds Pickup Dropout	 20…44 msec 9…20 msec	 18…42 msec 7…17 msec	 25…79 msec 10…22 msec
Ambient Temperature Range — Operation: Storage:	Open: –25°C…+55°C (–13°F…+131° F) Enclosed: –25°C…+40°C (–13°F…+104° F) –40°C…+65°C (–40°F…+149°F)		
Terminal Capacity (Maximum) Coil (1 or 2 Wires) Power Terminals	4mm^2/#12AWG 1-#1/0 AWG	4mm^2/#12AWG 1-240mm^2 1-500 MCM AWG	4mm^2/#12AWG 2-240mm^2 2-500 MCM AWG

Product Selection — Page 3-8
Accessories — Page 3-40
Approximate Dimensions — Page 3-72

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 Electric 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 installation. ASTA Certified combinations are certified for a maximum short circuit current of 80kA.

Contactors Only

Maximum Short Circuit Protection Device Rating/Setting in Amperes

Contactor Cat. No. Suffix	Type 2 Coordination			UL Listed Combinations	
	UL Class K1/RK1, J, CC Fuses ❶	BS88 Fuses	gL Fuses	UL Class K5/RK5/ L Fuses ❷	Circuit Breakers
-A09	15	25	25	40	15
-A12	25	25	25	60	15
-A18	25	32	35	90	50
-A24	40	32	35	90	50
-A30	50	40	40	90	90
-A38	110	80	80	110	110
-A45	110	100	100	110	110
-A60	200	125	125	200	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) ❸	500	500	601 (Class L) ❸	450
-B400	800 (Class L) ❸	630	630	800 (Class L) ❸	800
-B600	1200 (Class L) ❸	1000	1000	1200 (Class L) ❸	–

❶ In Canada, CSA Certified when using CSA fuse designation HRCI-J.
❷ In Canada, CSA Certified when using CSA fuse designation HRCII-C, HRCI-R.
❸ In Canada, CSA Certified when using CSA fuse designation HRC-L.

Note: Class CC fuses have a 60A maximum rating.

Contactors and Overload Relays Used Together (Starters)

Maximum Short Circuit Protection Device Rating/Setting in Amperes						
		UL Listed Combinations		UL Certified Type 2 Combination		ASTA ❹ Certified Type 2 Combinations
Contactor Cat. No. Suffix	Overload Relay	UL Class K5/RK5 Fuses ❶	Circuit Breakers	UL Class J Fuses (CSA HRCI-J Fuse ❷)	UL Listed Time-Delay Class CC (CSA HRCI-MISC.) Fuse ❸	Using GEC BS88 Fuses
-A09	BSA18	1	–	–	–	–
-A09	BSA26	1	–	–	–	–
-A09	BSA35	1	–	–	–	–
-A09	BSA70	1	–	–	–	–
-A09	BSA90	3	–	–	–	–
-A09	BSB12	3	–	–	–	–
-A09	BSB16	6	–	2	2.5	NIT6
-A09	BSB22	6	–	3	3	NIT6
-A09	BSB30	10	–	6	6	NIT10
-A09	BSB42	15	–	6	6	NIT16
-A09	BSB60	20	–	10	10	NIT20
-A09	BSB80	30	–	10	20	NIT20M25
-A09	BSC10	40	–	15	20	NIT20M25
-A12	BSB80	30	–	10	20	–
-A12	BSC10	40	–	15	20	–
-A12	BSC15	60	–	20	30	NIT20M32
-A18	BSA18	1	15	–	–	–
-A18	BSA26	1	15	–	–	–
-A18	BSA35	1	15	–	–	–
-A18	BSA70	1	15	–	–	–
-A18	BSA90	3	15	–	–	–
-A18	BSB12	3	15	–	–	–
-A18	BSB16	6	15	2	2.5	–
-A18	BSB22	6	15	3	3	–
-A18	BSB30	10	15	6	6	–
-A18	BSB42	15	15	6	6	–
-A18	BSB60	20	20	10	10	–
-A18	BSB80	30	25	10	20	–
-A18	BSC10	40	30	15	20	–
-A18	BSC15	60	45	20	30	TIA32M35
-A18	BSC24	90	50	30	–	TIA32M40

❶ CSA fuse designation HRCI-J must also be UL Listed as Class J fuses.
❷ In Canada, CSA Certified when using CSA fuse designation HRCI-J, HRCI-T.
❸ 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.
❹ ASTA Certification requires the use of these GEC fuses.

Note: Class CC fuses have a 60A maximum rating.

Contactors and Overload Relays Used Together (Starters)

Maximum Short Circuit Protection Device Rating/Setting in Amperes						
		UL Listed Combinations		UL Certified Type 2 Combination		ASTA ❹ Certified Type 2 Combinations
Contactor Cat. No. Suffix	Overload Relay	UL Class K5/RK5 Fuses ❶	Circuit Breakers	UL Class J Fuses (CSA HRCI-J) Fuse ❷	UL Listed Time-Delay Class CC (CSA HRCI-MISC.) Fuse ❸	Using GEC BS88 Fuses
-A24	BSC15	60	45	20	30	–
-A24	BSC24	90	50	30	–	TIA32M50
-A30	BSC24	90	50	30	–	–
-A30	BSC32	90	90	40	–	TIA32M63
-A38	CPC30	110	110	–	–	–
-A38	CPC45	110	110	50	–	TIS63M80
-A45	CPC30	110	110	–	–	–
-A45	CPC45	110	110	50	–	TIS63M80
-A60	CPC63	200	175	80	–	TIS63M100
-A75	CPC63	200	175	80	–	–
-A75	CPC75	225	200	100	–	TCP100M125
-B110	HPC66	250	250	–	–	–
-B110	HPD110	300	300	150	–	TF160
-B180	DPC88	350	350	–	–	–
-B180	DPD120	400	350	200	–	TF200
-B180	DPD200	400	400	–	–	TF200M250
-B250	EPD180	450	450	300	–	TF200M250
-B250	EPD300	450	450	–	–	TK315M355
-B300	EPD180	450 ❺❻	450 ❺	300	–	–
-B300	EPD300	450 ❺❻❼	450 ❺	–	–	TK315M355
-B400	FPD240	700 ❽ (Class L)	700	–	–	–
-B400	FPD400	800 ❽ (Class L)	800	–	–	–
-B600	GPD378	1000 ❽ (Class L)	–	–	–	TTM500
-B600	GPD630	1200 ❽ (Class L)	–	–	–	–

❶ In Canada, CSA Certified when using CSA fuse designation HRCII-C, HRCI-R.
❷ CSA fuse designation HRCI-J must be UL Listed as Class J fuses.
❸ Class CC fuses are available through 60A only. CSA HRCI-MISC fuses must also be UL Listed as Class CC fuses.
❹ ASTA Certification requires the use of these GEC fuses.
❺ 10kA maximum short circuit current available.
❻ Class K5 fuse.
❼ 18kA maximum short circuit available — Class L fuse.
❽ In Canada, CSA Certified when using CSA fuse designation HRC-L.

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 operating per hour. For applications requiring more than 10 operations per hour contact your local Allen-Bradley Sales Office for information.

Power Rating in KVAR ❶

Cat. No. 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

❶ Maximum available current of 10kA. For systems with larger available current, contact Allen-Bradley Sales Office.

Lighting Loads

Typical Electric Discharge Loads

Mercury vapor, sodium vapor, metal halogen and fluorescent 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 a 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				
Cat. No. Suffix	Circuit Closing Inrush Current (Amps Peak Including Offset)	Electric Discharge Lamp Loads <= 300V		Incandescent Lamp Loads (Amps)
		Non-Compensated (Amps)	Compensated Amps	
-A09 ❶	136	12	9	9
-A12 ❶	182	16	12	12
-A18 ❶	273	23	18	18
-A24 ❶	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

❶ When using contactor **Cat. Nos. 100-A09** through **100-A24**, all four poles can be used for switching lighting loads.

Controller Ratings for Transformer Primary - Switching kVA

Operating Conditions

Maximum Rated voltage — 660 Volts
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

Cat. No. 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	9	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

IEC Specifications

Application Data, Continued

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.

DC1 Ratings L/R ≤ 1 millisecond (3 poles in series)

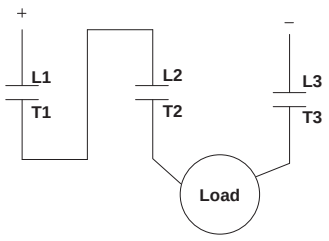
Cat. No.	Maximum Operational Current at +40°C Amperes	
	115 Volts	230 Volts
100-A09	22	10
100-A12	22	10
100-A18	35	22
100-A24	35	22
100-A30	45	25
100-A38	65	60
100-A45	65	60
100-A60	100	100
100-A75	100	100
100-B110	150	150
100-B180	200	200
100-B250	300	300
100-B300	300	300
100-B400	400	400
100-B600	630	630

DC3 & DC5 Ratings L/R ≤ 15 millisecond (3 poles in series)

Cat. No.	Maximum Operational Current at +40°C Amperes	
	115 Volts ❶	230 Volts
100-A09	9	3 ❷
100-A12	12	4 ❷
100-A18	18	5 ❷
100-A24	24	6 ❷
100-A30	30	8
100-A38	38	– ❸
100-A45	45	– ❸
100-A60	60	– ❸
100-A75	75	– ❸
100-B110	110	110 ❶
100-B180	180	180 ❶
100-B250	250	250 ❶
100-B300	300	300 ❶
100-B400	400	200 ❶
100-B600	600	300 ❶

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

Example of 3 Poles Wired in Series

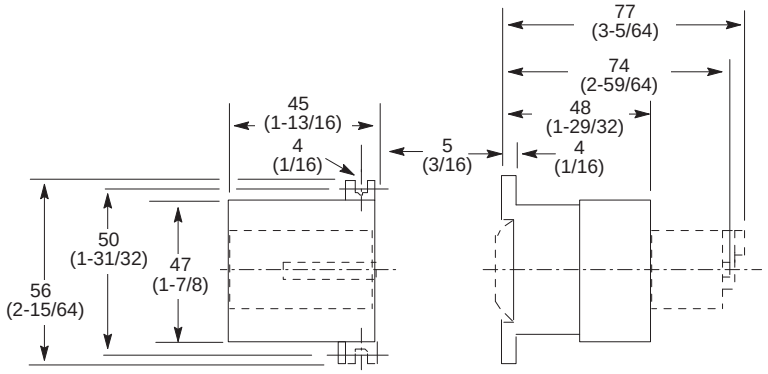


DC Utilization Categories

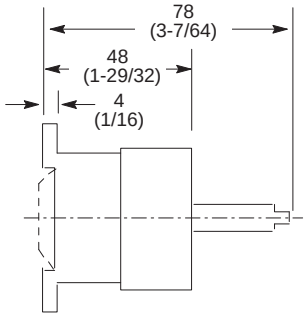
Category	Typical Applications
DC1	Non-inductive or slightly inductive loads; resistive furnaces.
DC3	Shunt motors; starting, plugging or inching; Dynamic breaking of DC motors.
DC5	Series motors; starting, plugging or inching; Dynamic breaking of DC motors.

Bulletin 100-M Miniature Contactors

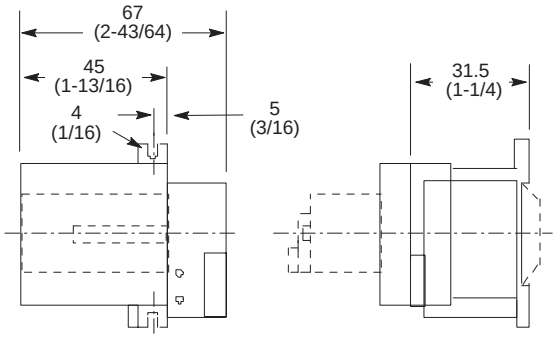
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.



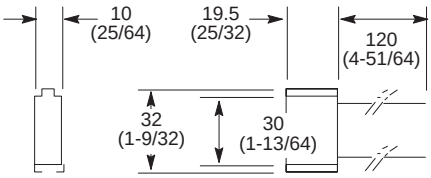
Mini-Contactor or Mini-Relay With Auxiliary Contact Adder Deck or Timer Mounted to Front.
Cat. No. 100-M** or **700-M



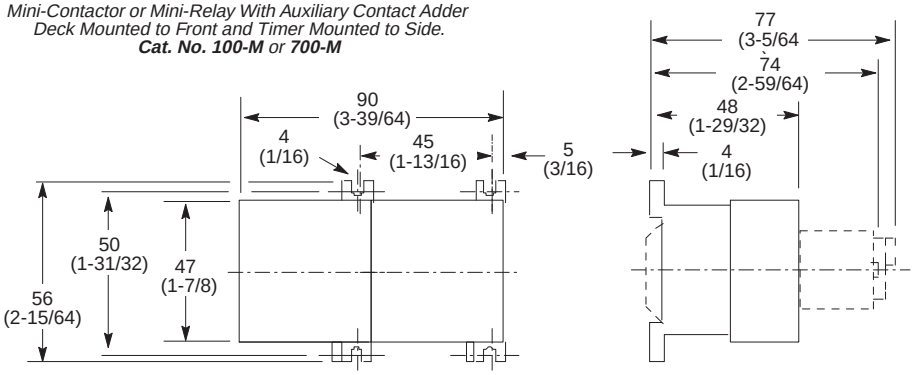
Mini-Contactor or Mini-Relay With Surge Suppressor Mounted to Front.
Cat. No. 100-M** or **700-M



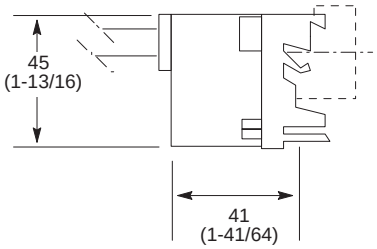
Mini-Contactor or Mini-Relay With Auxiliary Contact Adder Deck Mounted to Front and Timer Mounted to Side.
Cat. No. 100-M** or **700-M



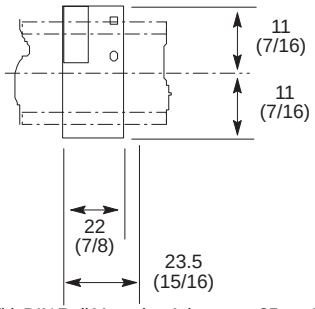
Surge Suppressor
Cat. No. 199-MSM



Reversing Mini-Contactors With Auxiliary Contact Adder Deck.
Cat. No. 104-M



Timer With DIN Rail Mounting Adapter on 35mm DIN Rail.
Cat. No. 196-MT



Timer With DIN Rail Mounting Adapter on 35mm DIN Rail.
Cat. No. 196-MT

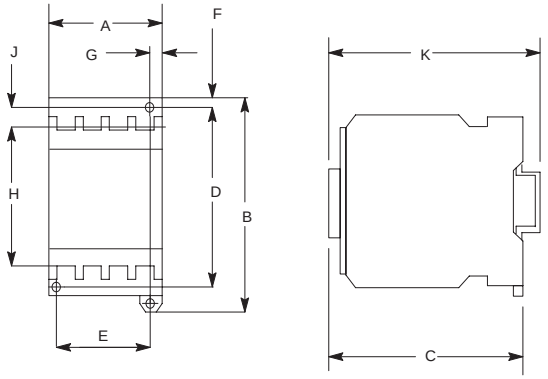
Product Selection — Page 3-6
Accessories — Page 3-38
Specifications — Page 3-48

IEC Dimensions

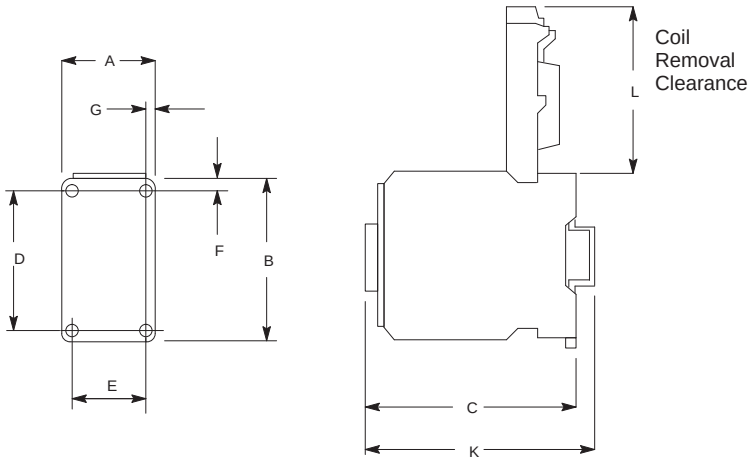
Approximate Dimensions

Bulletin 100 AC Operated Contactors

Dimensions are shown in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.



Contactor Size	A Wide	B High	C Deep	D	E	F	G	H	J	K	Mounting Screw	Approx. Ship Wt. kg (lbs.)	
												AC	DC
100-A09 and 100-A12	45 (1-13/16)	74 (2-59/64)	84 (3-5/16)	60 (2-23/64)	35 (1-3/8)	6 (15/64)	5 (3/16)	50 (1-31/32)	11 (7/16)	86 (3-3/8)	M4 (#8-32)	0.431 (.95)	0.678 (1.50)
100-A18 and 100-A24	55 (2-11/64)	83 (3-17/64)	92 (3-5/8)	75 (2-11/64)	35 (1-3/8)	4 (5/32)	10 (25/64)	60 (2-23/64)	11.5 (29/64)	94 (3-11/16)	M4 (#8-32)	0.522 (1.15)	0.817 (1.80)
100-A30	55 (2-11/64)	102 (4-1/64)	108 (4-1/4)	90 (3-35/64)	40 (1-37/64)	5 (3/16)	7.5 (19/64)	75 (2-61/64)	12.5 (1/2)	111 (4-3/8)	M4 (#8-32)	0.708 (1.56)	1.108 (2.44)

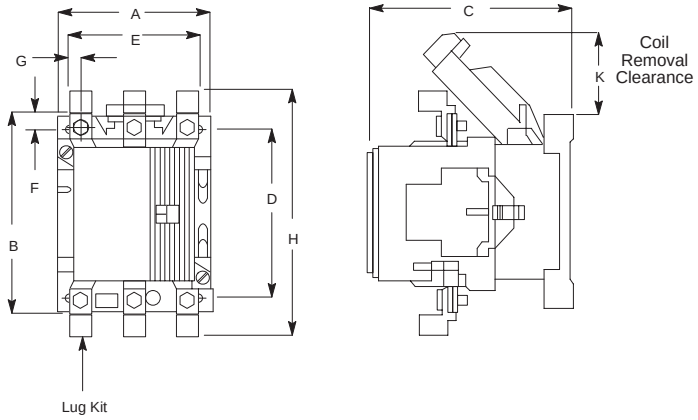


Contactor Size	A Wide	B High	C Deep	D	E	F	G	K	L	Mounting Screw	Approx Ship Wt. kg (lbs.)
100-A38 and 100-A45	75 (2-61/64)	112.4 (4-27/64)	125 (4-59/64)	100 (3-15/16)	55 (2-5/32)	5.5 (7/32)	7.5 (19/64)	128.7 (5-1/16)	63.5 (2-1/2)	M4 (#8-32)	1.25 (2.76)
100-A60 and 100-A75	93 (3-21/32)	130 (5-1/8)	143 (5-5/8)	110 (4-21/64)	80 (3-5/32)	10 (25/64)	5.5 (7/32)	–	59 (2-5/16)	M5 (#10-32)	2.09 (4.61)

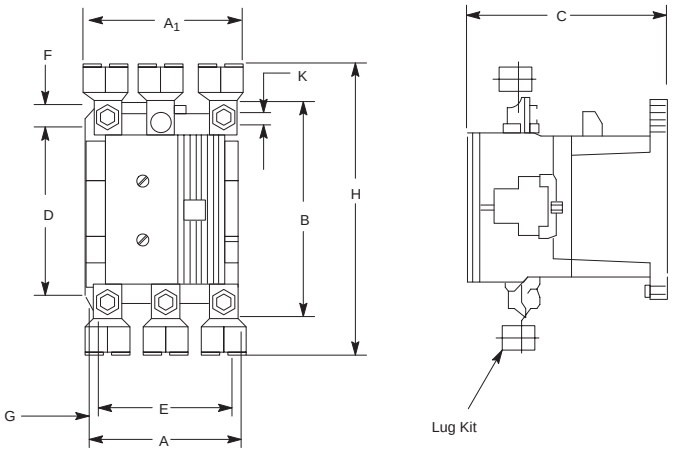
Product Selection — Page 3-6
Accessories — Page 3-38
Specifications — Page 3-48

Bulletin 100 AC Operated Contactors

Dimensions in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.



Contactor Size	A Wide	B High	C Deep	D	E	F	G	H	K	Mounting Screw	Approx. Ship Wt. kg (lbs.)
100-B110	119 (4-11/16)	154 (6-1/16)	155 (6-7/64)	130 (5-1/8)	100 (3-15/16)	12 (15/32)	9 (11/32)	187.3 (7-3/8)	62 (2-29/64)	M6 (1/4-20)	3.85 (8.49)
100-B180	134 (5-9/32)	187.8 (7-25/64)	190 (7-31/64)	160 (6-5/16)	110 (4-21/64)	13.9 (35/64)	13 (33/64)	227 (8-15/16)	90 (3-35/64)	M6 (1/4-20)	7.00 (15.43)
100-B250 and 100-B300	154 (6-5/64)	226 (8-29/32)	212 (8-11/32)	180 (7-3/32)	130 (5-1/8)	18 (45/64)	15 (19/32)	292 (11-1/2)	109 (4-19/64)	M8 (5/16-18)	8.24 (18.17)



Contactor Size	A Wide	A1 Wide	B High	C Deep	D	E	F	G	H	K	Mounting Screw	Approx. Ship Wt. kg (lbs.)
100-B400	176 (6-15/16)	189 (7-29/64)	255 (10-3/64)	230 (9-3/64)	199 (7-27/32)	154 (6-1/16)	28 (1-7/64)	11 (7/16)	344 (13-35/64)	10.5 (13/32)	M10 (3/8-16)	13.88 (30.60)
100-B600	255 (10)	–	306 (12-3/64)	267 (10-17/32)	220 (8-1/16)	226 (8-29/32)	33 (1-19/64)	145 (5-45/64)	433 (17-3/64)	10 (25/64)	M12 (1/2-13)	23.32 (51.41)

Product Selection — Page 3-6
Accessories — Page 3-38
Specifications — Page 3-48

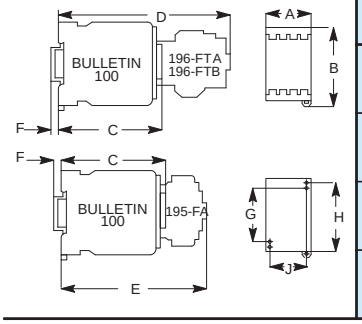
IEC Dimensions

Approximate Dimensions, Continued

Bulletin 100 DC Operated (Pure DC Coil) Contactors

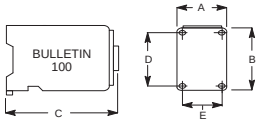
Dimensions are shown in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.

Contactor or Relay with Timer or Auxiliary Contact Adder Deck



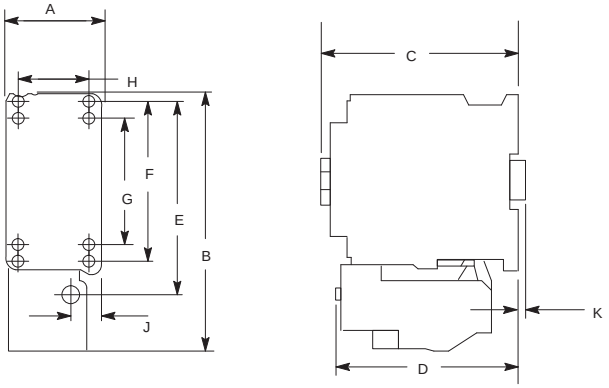
Cat. No.	A Wide	B High	C	D	E	F	G	H	J
100-A09 & 100-A12	45 (1-13/16)	74 (2-59/64)	105 (4-5/32)	165 (6-1/2)	136 (5-23/64)	2 (5/64)	50 (1-31/32)	60 (2-23/64)	35 (1-3/8)
100-A18 & 100-A24	55 (2-11/64)	83 (3-17/64)	113 (4-29/64)	173 (6-13/16)	144 (5-43/64)	2 (5/64)	60 (2-23/64)	75 (2-61/64)	35 (1-3/8)
100-A30	55 (2-11/64)	102 (4-1/64)	129 (5-3/32)	189 (7-7/16)	160 (6-19/64)	3 (1/8)	75 (2-61/64)	90 (3-35/64)	40 (1-37/64)
100-A38 & 100-A45	75 (2-61/64)	122 (4-13/64)	134 (5-17/64)	192 (7-9/16)	163 (6-27/64)	–	–	100 (3-15/16)	55 (2-11/64)

Contactor



Cat. No.	A Wide	B High	C Deep	D	E
100-A60 & 100-A75	95 (3-3/4)	130 (5-1/8)	159 (6-17/64)	110 (4-1/32)	80 (3-5/32)
100-B110	119 (4-11/16)	154 (6-1/16)	197 (7-3/4)	130 (5-1/8)	100 (3-15/16)

Contactor with Bulletin 193 Bimetallic Overload Relays



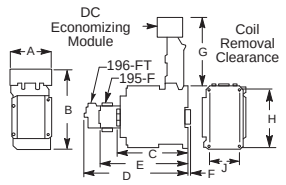
Cat. No.	A Wide	B High	C Deep	D	E	F	G	H	J	K
100-A09 & 100-A12	45 (1-25/32)	119 (4-11/16)	105 (4-5/32)	119 (4-11/16)	81 (3-11/64)	60 (2-23/64)	50 (1-31/32)	35 (1-3/8)	6 (15/64)	2 (5/64)
100-A18 & 100-A24	56 (2-13/64)	127 (5)	113 (4-29/64)	124 (4-7/8)	91 (3-37/64)	75 (2-61/64)	60 (2-23/64)	35 (1-3/8)	17 (43/64)	2 (5/64)
100-A30	54 (2-5/32)	145 (5-45/64)	129 (5-3/32)	119 (4-11/16)	109 (4-19/64)	90 (3-35/64)	75 (2-61/64)	40 (1-37/64)	14 (9/16)	2 (5/64)
100-A38 & 100-A45	75 (2-61/64)	175 (6-29/32)	133 (5-1/4)	103 (3-31/32)	129 (5-1/16)	100 (3-15/16)	–	55 (2-1/64)	21 (7/16)	–
100-A60 & 100-A75	95 (3-3/4)	187 (7-3/8)	159 (6-1/4)	124 (4-23/32)	137 (5-25/64)	110 (4-15/32)	–	80 (3-5/32)	31 (1-9/64)	–

Product Selection — Page 3-6
Accessories — Page 3-38
Specifications — Page 3-48

Bulletin DC Operated (Economized DC Coil) Contactor

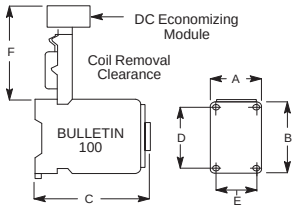
Dimensions are shown in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.

Contactor with Timer or Auxiliary Contact Adder Deck



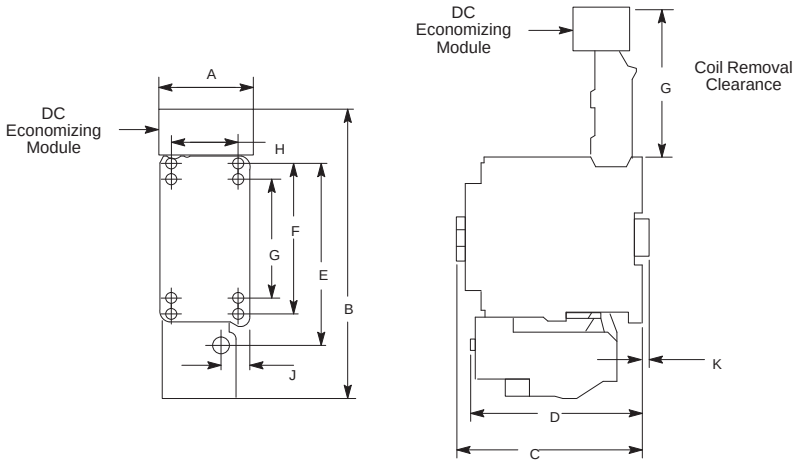
Cat. No.	A Wide	B High	C	D	E	F	G	H	J
100-A38 & 100-A45	75 (2-61/64)	144.4 (5-11/16)	125 (4-59/64)	185 (7-19/64)	156 (6-5/32)	3.7 (5/32)	92.5 (3-41/16)	100 (3-15/16)	55 (2-1/64)

Contactor



Cat. No.	A Wide	B High	C Deep	D	E	F
100-A60 & 100-A75	93 (3-21/32)	160 (6-19/64)	147 (5-51/64)	110 (4-1/32)	80 (3-5/32)	88 (3-15/32)
100-B110	119 (4-11/16)	177.4 (6-63/64)	155 (6-7/64)	130 (5-1/8)	100 (3-15/16)	89 (3-1/2)
100-B180	134 (5-9/32)	212 (8-11/32)	190 (7-31/64)	160 (6-5/16)	110 (4-21/64)	119 (4-11/16)

Contactor with Bulletin 193 Bimetallic Overload Relays

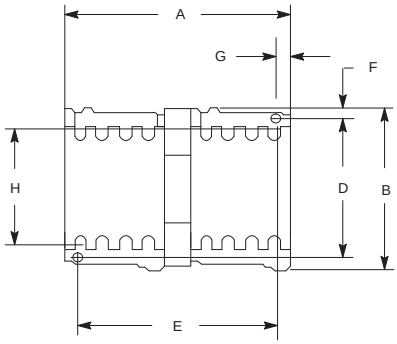


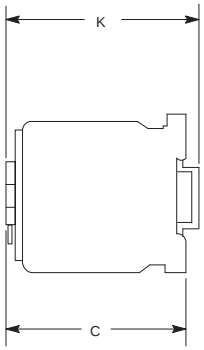
Cat. No.	A Wide	B High	C Deep	D	E	F	G	H	J	K
100-A38 & 100-A45	75 (2-61/64)	207 (8-5/32)	125 (4-59/64)	94 (3-11/16)	129 (5-1/16)	100 (3-15/16)	92.5 (3-41/64)	55 (2-1/64)	11 (7/16)	3.7 (5/32)
100-A60 & 100-A75	95 (3-3/4)	217 (8-35/64)	147 (5-51/64)	108 (4-1/4)	137 (5-25/64)	110 (4-15/32)	88 (3-15/32)	80 (3-5/32)	29 (1-9/64)	–

Product Selection — Page 3-6
Accessories — Page 3-38
Specifications — Page 3-48

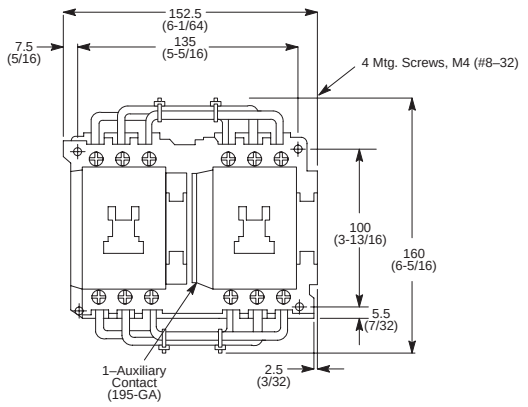
Bulletin 104 Reversing Contactors (AC Operated)

Dimensions are shown in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.

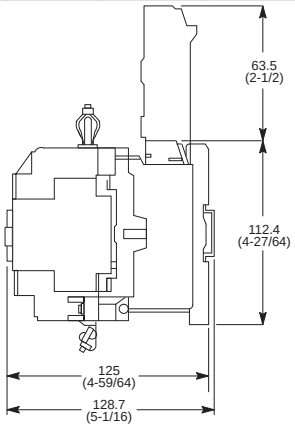




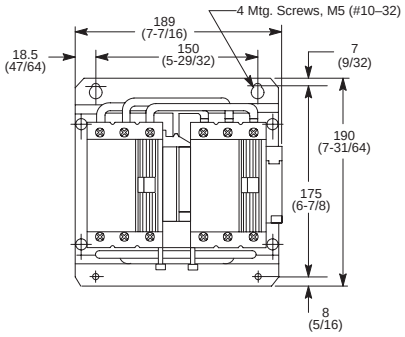
Contactor Size	A Wide	B High	C Deep	D	E	F	G	H	K	Mounting Screw	Approx. Ship Wt. kg (lbs)
104-A09 and 104-A12	102 (4-1/64)	74 (2-59/64)	84 (3-5/16)	60 (2-23/64)	92 (3-5/8)	6 (15/64)	5 (3/16)	50 (1-31/32)	86 (3-11/32)	M4 (#8-32)	0.925 (2.04)
104-A18 and 104-A24	122 (4-13/16)	83 (3-17/64)	92 (3-5/8)	75 (2-61/64)	102 (4-1/64)	4 (5/32)	10 (25/64)	60 (2-23/64)	84 (3-45/64)	M4 (#8-32)	1.084 (2.39)
104-A30	122 (4-13/16)	102 (4-1/64)	108.5 (4-17/64)	90 (3-35/64)	107 (4-7/32)	5 (3/16)	7.5 (19/64)	75 (2-61/64)	111 (4-3/8)	M4 (#8-32)	1.474 (3.25)



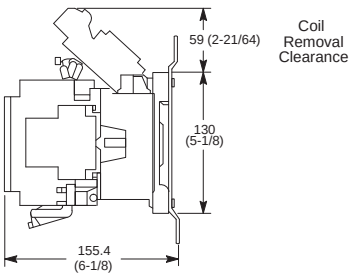
Contactor Size 104-A38 and 104-A45



Approximate Shipping Weight: 2.5kg (5.5 lbs)



Contactor Size 104-A60 and 104-A75

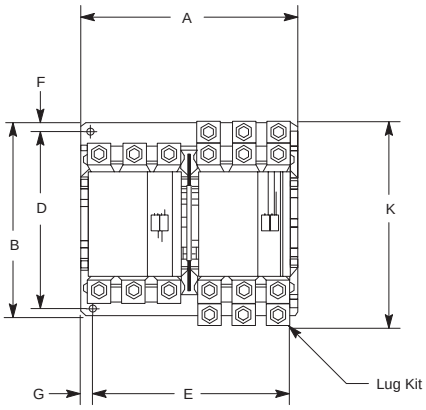


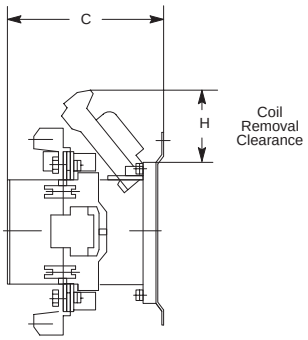
Approximate Shipping Weight: 4.8kg (10.5 lbs)

Product Selection — Page 3-6
Accessories — Page 3-38
Specifications — Page 3-48

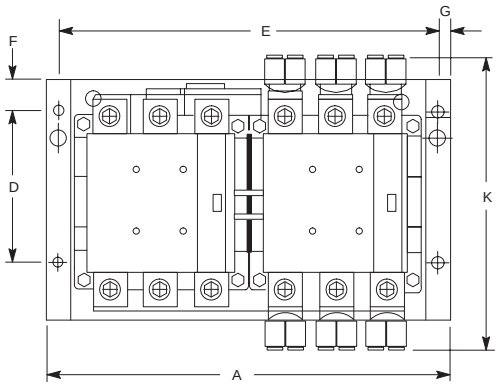
Bulletin 104 Reversing Contactors (AC Operated), Continued

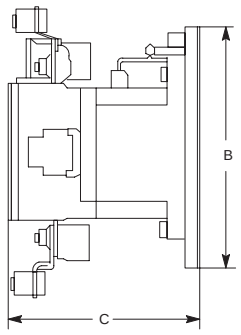
Dimensions are shown in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.





Contactor Size	A Wide	B High	C Deep	D	E	F	G	H	K	Mounting Screw	Approx. Ship Wt. kg (lbs)
104-B110	239 (9-27/64)	225 (8-33/64)	164 (6-29/64)	205 (8-1/16)	216 (8-1/2)	10 (25/64)	11.9 (15/32)	65 (2-9/16)	187.4 (7-1/2)	M6 (1/4-20)	8.2 (18.1)
104-B180	269 (10-19/32)	255 (10-3/64)	200 (7-7/8)	235 (9-1/4)	245 (9-21/32)	10 (25/64)	12 (15/32)	100 (3-15/16)	227 (9-5/64)	M6 (1/4-20)	15.1 (32.2)
104-B250 and 104-B300	311 (12-15/64)	270 (10-5/8)	221 (8-45/64)	250 (9-27/32)	280 (11-1/64)	10 (25/64)	15.5 (39/64)	108 (4-19/64)	292 (11-31/64)	M8 (5/16-18)	21.1 (46.5)





Contactor Size	A Wide	B High	C Deep	D	E	F	G	K	Mounting Screw	Approx. Ship Wt. kg (lbs)
104-B400	426 (16-49/64)	275 (10-13/16)	250 (9-27/32)	230 (9-3/64)	400 (15-3/4)	26 (1-1/64)	13 (33/64)	344 (13-35/64)	M10 (3/8-16)	33.6 (74.0)
104-B600	595 (23-13/32)	346 (13-5/8)	290 (11-7/16)	263 (10-11/32)	558 (21-31/32)	41.6 (1-41/64)	18.2 (23/32)	433 (17-3/64)	M12 (1/2-13)	59.4 (131.0)

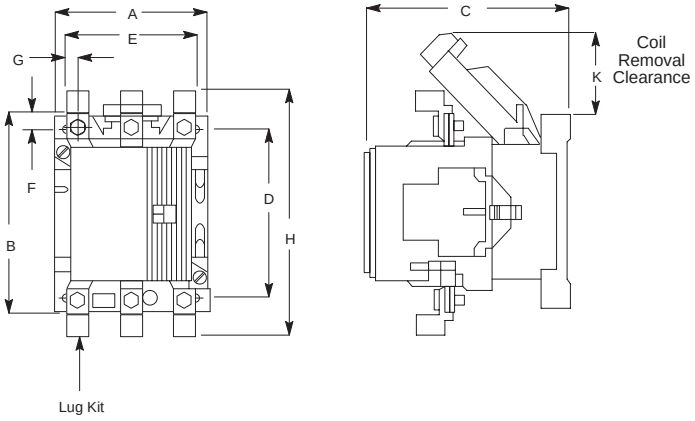
Product Selection — Page 3-6
Accessories — Page 3-38
Specifications — Page 3-48

IEC Dimensions

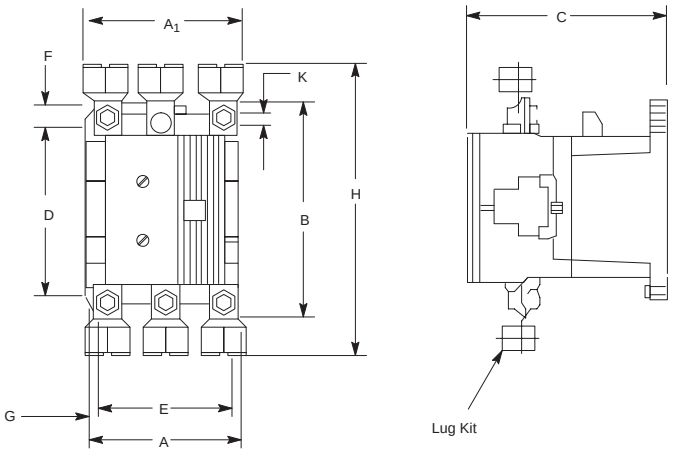
Approximate Dimensions, Continued

Bulletin 100W Welding Contactors

Dimensions in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.



Contactor Size	A Wide	B High	C Deep	D	E	F	G	H	K	Mounting Screw	Mounting Hole	Approx. Ship Wt. kg (lbs.)
100W-B180N⊗2 100W-B180N⊗3	134 (5-9/32)	188b (7-13/32)	194 (7-41/64)	160 (6-5/16)	110 (4-21/64)	13.9 (35/64)	13 (33/64)	227 (8-15/16)	90 (3-35/64)	M6 (1/4-20)	7 (9/32)	7.00 (15.4)
100W-B300N⊗2 100W-B300N⊗3	154 (6-5/64)	226 (8-29/32)	212 (8-11/32)	180 (7-3/32)	130 (5-1/8)	18 (23/32)	15 (19/32)	292 (11-1/12)	109 (4-19/64)	M8 (5/16-18)	8.7 (11/32)	8.24 (18.2)

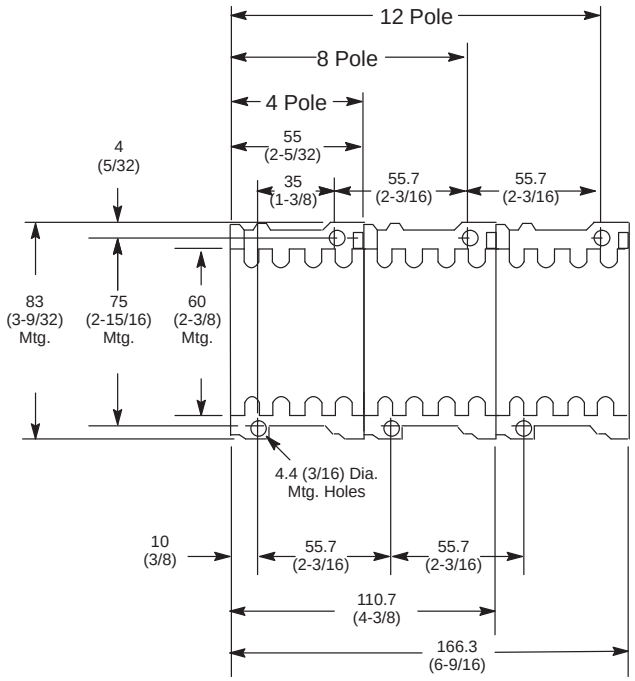


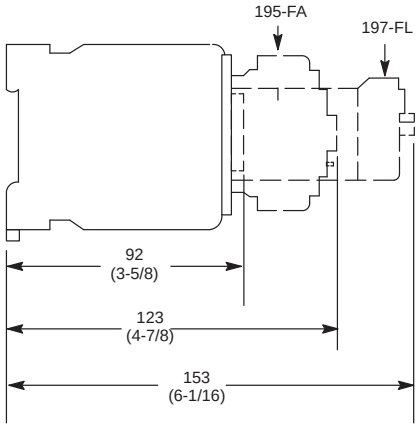
Contactor Size	A Wide	B High	C Deep	D	E	F	G	H	K	Mounting Screw	Mounting Hole	Approx.. Ship Wt. kg (lbs.)
100W-B600N⊗2 100W-B600N⊗3	255 (10-3/64)	305 (12)	284 (11-3/16)	220 (8-11/16)	226 (8-29/32)	33 (1-19/64)	14.5 (37/64)	433 (17-3/64)	10 (25/64)	M12 (1/2-13)	14 (35/64)	23.3 (51.4)

Product Selection — Page 3-8
Accessories — Page 3-40
Specifications — Page 3-58

Bulletin 100L Lighting Contactors — Open Type

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes

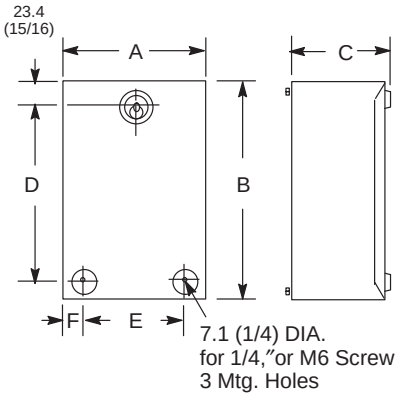




Bulletin 100L Lighting Contactors — Enclosed IP42 (Type 1)

Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Cat. No.	A Wide	B High	C Deep	D	E	F
100L-A20A⊗4	140 (5-1/2)	220 (8-21/32)	152 (5-31/32)	175 (6-7/8)	95 (3-3/4)	22.5 (7/8)
100L-A20A⊗8	235 (9-1/4)	220 (8-21/32)	152 (5-31/32)	175 (6-7/8)	190 (7-1/2)	22.5 (7/8)
100L-A20A⊗12	270 (10-5/8)	290 (11-7/16)	152 (5-31/32)	245 (9-21/32)	225 (8-7/8)	22.5 (7/8)

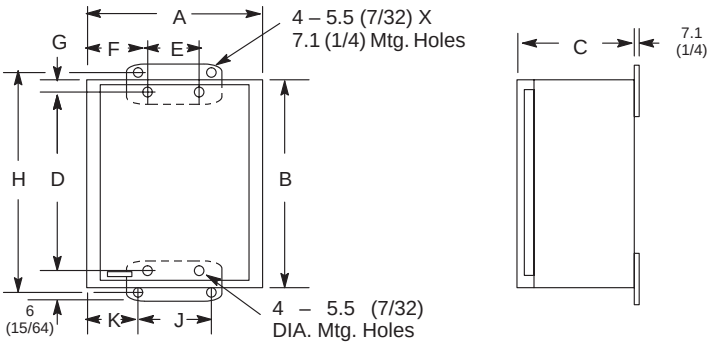


Product Selection — Page 3-11
Accessories — Page 3-38
Specifications — Page 3-11

IEC Dimensions

Approximate Dimensions

Bulletin 100L Lighting Contactors — Enclosed IP65 (Type 12) and IP66 (Type 3/4/12)

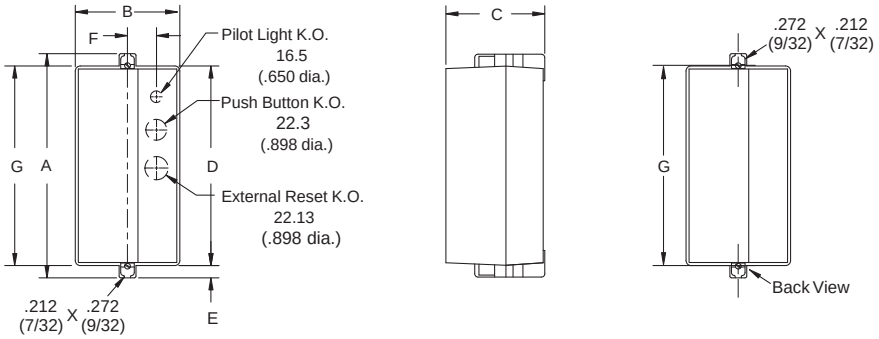


Cat. No.	A Wide	B High	C Deep	D	E	F	G	H	J	K
100L-A20F⊗4	200 (7-7/8)	300 (11-13/16)	160 (6-5/16)	236 (9-9/32)	76 (3)	62 (2-7/8)	17.5 (11/16)	313 (12-5/16)	105 (4-1/8)	47.5 (1-7/8)
100L-A20F⊗8	250 (9-27/32)	250 (9-27/32)	160 (6-5/16)	186 (7-5/16)	76 (3)	87 (3-7/16)	17.5 (11/16)	263 (10-3/8)	105 (4-1/8)	72.5 (2-7/8)
100L-A20F⊗12	300 (11-13/16)	300 (11-13/16)	160 (6-5/16)	236 (9-9/32)	178 (7)	61 (2-13/32)	17.5 (11/16)	313 (12-5/16)	206 (8-1/8)	47 (1-27/32)

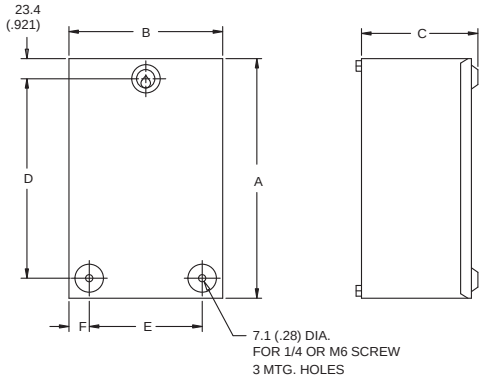
Product Selection — Page 3-11
Accessories — Page 3-38
Specifications — Page 3-11

IEC Enclosures

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



Enclosure Code		A Height	B Width	C Depth	D	E	F	G
Style	Dim.							
A	B01 K01	195 (7-11/16)	86.6 (3-13/32)	123 (4-53/64)	175 (6-57/64)	10 (25/64)	22 (55/64)	175 (6-57/64)
A	B02 K02	205 (8-5/64)	96.6 (3-47/64)	131 (5-5/32)	185 (7-9/32)	10 (25/64)	27 (1-3/64)	185 (7-9/32)



Enclosure Code		A Height	B Width	C Depth	D	E	F
Style	Dim.						
B	A02	220 (8-21/32)	140 (5-33/64)	152 (5-31/32)	175 (6-57/64)	95 (3-3/4)	22.5 (57/64)
B	A08	220 (8-21/32)	235 (9-1/4)	152 (5-31/32)	175 (6-57/64)	190 (7-31/64)	22.5 (57/64)
B	A03	290 (11-27/64)	188 (7-23/64)	152 (5-31/32)	245 (9-41/64)	140 (5-33/64)	24 (15/16)
B	A09	290 (11-7/16)	270 (10-5/8)	152 (5-31/32)	245 (9-21/32)	225 (8-55/64)	22.5 (57/64)
B	A04	315 (12-27/64)	188 (7-23/64)	203 (8)	270 (10-5/8)	140 (5-33/64)	24 (15/16)
B	A10	315 (12-27/64)	325 (12-51/64)	203 (7-63/64)	270 (10-5/8)	280 (11-1/64)	22.5 (57/64)
B	A05	585 (23-1/32)	257 (10-7/64)	203 (8)	540 (21-17/64)	210 (8-17/64)	23.5 (59/64)

Product Selection — Page 3-36

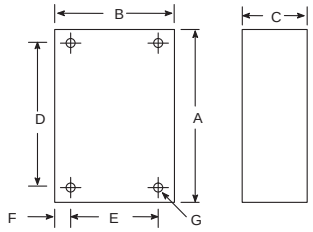
IEC Dimensions

Approximate Dimensions, Continued

IEC Enclosures

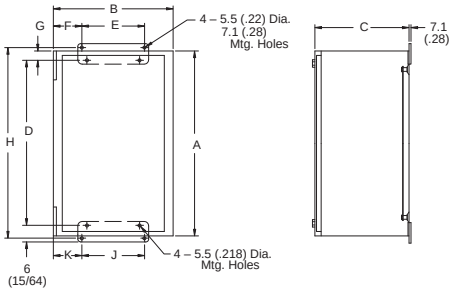
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

Style “D”
Metal Enclosures
Hinged Door Design
IP42 (Type 1)
IP66 (Type 4/4X/12)



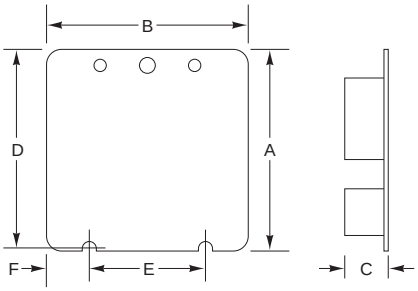
Type	Enclosure Code		A Height	B Width	C Depth	D Mtg.	E Mtg.	F	G (Dia.)
	Style	Dim.							
IP42 (Type 1)	D	A04	350 (13-25/32)	200 (7-7/8)	210 (8-9/32)	315 (12-13/32)	76 (3)	64 (2-1/2)	5.5 (7/32)
		A06	762 (30)	305 (12)	276 (10-7/8)	724 (28-1/2)	267 (10-1/2)	19 (3/4)	11 (7/16)
		A10	350 (13-25/32)	400 (15-3/4)	210 (8-9/32)	315 (12-13/32)	178 (7)	111 (4-3/8)	5.5 (7/32)
		A11	610 (24)	406 (16)	230 (9-1/16)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)
		A12	762 (30)	610 (24)	281 (11-1/16)	724 (28-1/2)	572 (22-1/2)	19 (3/4)	11 (7/16)
		A13	1,219 (48)	610 (24)	302 (11-7/8)	1,181 (46-1/2)	572 (22-1/2)	19 (3/4)	11 (7/16)
		A14	1,295 (51)	914 (36)	353 (13-7/8)	1,257 (49-1/2)	876 (34-1/2)	19 (3/4)	11 (7/16)
IP66 (Type 3/4/12)	D	F08	250 (9-13/16)	250 (9-13/16)	160 (6-5/16)	186 (7-5/16)	76 (3)	87 (3-13/32)	5.5 (7/32)
		F03	300 (11-13/16)	200 (7-7/8)	160 (6-5/16)	265 (10-7/16)	76 (3)	62 (2-7/16)	5.5 (7/32)
		F09	300 (11-13/16)	300 (11-13/16)	160 (6-5/16)	236 (9-5/16)	178 (7)	61 (2-13/32)	5.5 (7/32)
		F04	350 (13-25/32)	200 (7-7/8)	210 (8-9/32)	315 (12-13/32)	76 (3)	64 (2-1/2)	5.5 (7/32)
		F06	762 (30)	305 (12)	276 (10-7/8)	724 (28-1/2)	267 (10-1/2)	19 (3/4)	11 (7/16)
		F10	350 (13-25/32)	400 (15-3/4)	210 (8-9/32)	315 (12-13/32)	178 (7)	111 (4-3/8)	5.5 (7/32)
		F11	610 (24)	406 (16)	230 (9-1/16)	572 (22-1/2)	368 (14-1/2)	19 (3/4)	11 (7/16)
		F12	762 (30)	610 (24)	281 (11-1/16)	724 (28-1/2)	572 (22-1/2)	19 (3/4)	11 (7/16)
		F13	1,219 (48)	610 (24)	302 (11-7/8)	1,181 (46-1/2)	572 (22-1/2)	19 (3/4)	11 (7/16)
		F14	1,295 (51)	914 (36)	353 (13-7/8)	1,257 (49-1/2)	876 (34-1/2)	19 (3/4)	11 (7/16)

Style “F”
Metal Enclosures
Hinged Door Design
With Drip Hood
IP32 (Type 32)



Enclosure Code		A Height	B Width	C Depth	D	E	F	G	H	J	K
Style	Dim.										
F	F01	584 (23)	320 (12-19/32)	187 (7-5/16)	711 (28)	105 (4-1/8)	108 (4-1/4)	679 (26-3/4)	667 (26-1/4)	105 (4-1/8)	105 (4-5/32)
	F02	864 (34)	447 (17-19/32)	238 (9-5/16)	991 (39)	105 (4-1/8)	171 (6-3/4)	959 (37-3/4)	946 (37-1/4)	105 (4-1/8)	169 (6-21/32)
	F03	1067 (42)	762 (30)	305 (12)	1118 (44)	686 (27)	38 (1-1/2)	1092 (43)	1092 (43)	–	–
	F04	1219 (48)	914 (36)	305 (12)	1270 (50)	686 (27)	114 (4-1/2)	1245 (49)	1245 (49)	–	–

Bulletin 105 and 109 Open Style Starters



Starter Type	Starter Current Rating	Voltage	A Height	B Width	C Depth	D	E	F	G	H
109	9…24A	AC	202.4 (7-63/64)	69.8 (2-3/4)	98.4 (3-57/64)	190.5 (7-1/2)	5.08 (2)	9.5 (25/64)	34.9 (1-25/64)	–
	9…12A	DC	202.4 (7-63/64)	69.8 (2-3/4)	112.0 (4-27/64)	190.5 (7-1/2)	5.08 (2)	9.5 (25/64)	34.9 (1-25/64)	–
	18…24A	DC	202.4 (7-63/64)	69.8 (2-3/45)	119.8 (4-47/64)	190.5 (7-1/2)	5.08 (2)	9.5 (25/64)	34.9 (1-25/64)	–
	30A	AC	247.6 (9-3/4)	88.9 (3-1/2)	114.8 (4-17/32)	9-9/32 (235.7)	69.8 (2-3/4)	9.5 (25/64)	44.4 (1-3/4)	–
	30A	DC	247.6 (9-3/4)	88.9 (3-1/2)	135.6 (5-11/32)	235.7 (9-9/32)	69.8 (2-3/4)	9.5 (25/64)	44.4 (1-3/4)	–
	38…45A	AC	247.6 (9-3/4)	88.9 (3-1/2)	131.8 (5-13/64)	235.7 (9-9/32)	69.8 (2-3/4)	9.5 (25/64)	–	76.2 (3)
	38…45A	DC	247.6 (9-3/4)	88.9 (3-1/2)	138.9 (5-31/64)	235.7 (9-9/32)	69.8 (2-3/4)	9.5 (25/64)	44.4 (1-3/4)	–
	60A	AC	323.9 (12-3/4)	127 (5)	150.6 (5-15/16)	308.1 (12-9/64)	101.6 (4)	12.7 (1-1/2)	–	101.6 (4)
	60A	DC	323.9 (12-3/4)	127 (5)	166.6 (6-9/16)	308.1 (12-9/64)	101.6 (4)	12.7 (1-1/2)	–	101.6 (4)
	75A	AC	323.9 (12-3/4)	137.6 (5-27/64)	150.6 (5-15/16)	308.1 (12-9/64)	101.6 (4)	12.7 (1-1/2)	–	101.6 (4)
	75A	DC	323.9 (12-3/4)	137.6 (5-27/64)	166.6 (6-9/16)	308.1 (12-9/64)	101.6 (4)	12.7 (1/2)	–	101.6 (4)
	110A	AC	323.9 (12-3/4)	137.6 (5-27/64)	162.6 (6-13/32)	308.1 (12-9/64)	101.6 (4)	12.7 (1/2)	–	101.6 (4)
	110A	DC	323.9 (12-3/4)	137.6 (5-27/64)	203.9 (8-1/32)	308.1 (12-9/64)	101.6 (4)	12.7 (1/2)	–	101.6 (4)
105	9…24A	AC	202.4 (7-63/64)	4-3/4 (120.6)	98.4 (3-57/64)	190.5 (7-1/2)	101.6 (4)	9.5 (25/64)	60.4 (2-25/64)	–
	9…12A	DC	202.4 (7-63/64)	4-3/4 (120.6)	112.0 (4-27/64)	190.5 (7-1/2)	101.6 (4)	9.5 (25/64)	60.4 (2-25/64)	–
	18…24A	DC	202.4 (7-63/64)	4-3/4 (120.6)	119.8 (4-47/64)	190.5 (7-1/2)	101.6 (4)	9.5 (25/64)	60.4 (2-25/64)	–
	30A	AC	247.6 (9-3/4)	152.4 (6)	114.8 (4-11/34)	235.7 (9-9/32)	133.3 (5-1/4)	9.5 (25/64)	76.2 (3)	–
	30A	DC	247.6 (9-3/4)	152.4 (6)	135.6 (5-17/32)	235.7 (9-1/4)	133.3 (5-1/4)	9.5 (25/64)	76.2 (3)	–
	38…45A	AC	247.6 (9-3/4)	152.4 (6)	131.8 (5-13/64)	235.7 (9-9/32)	133.3 (5-1/4)	9.5 (25/64)	76.2 (3)	–
	38…45A	DC	247.6 (9-3/4)	152.4 (6)	138.9 (5-31/64)	235.7 (9-9/32)	133.3 (5-1/4)	9.5 (25/64)	76.2 (3)	–
	60A	AC	323.9 (12-3/4)	241.3 (9-1/2)	150.6 (5-15/16)	308.1 (12-9/64)	215.9 (8-1/2)	12.7 (1/2)	–	215.9 (8-1/2)
	60A	DC	323.9 (12-3/4)	241.3 (9-1/2)	166.6 (6-9/16)	308.1 (12-9/64)	215.9 (8-1/2)	12.7 (1/2)	–	215.9 (8-1/2)
	75A	AC	323.9 (12-3/4)	251.9 (9-15/16)	150.6 (5-15/16)	308.1 (12-9/64)	215.9 (8-1/2)	12.7 (1/2)	–	215.9 (8-1/2)
	75A	DC	323.9 (12-3/4)	251.9 (9-15/16)	166.6 (6-9/16)	308.1 (12-9/64)	215.9 (8-1/2)	12.7 (1/2)	–	215.9 (8-1/2)
	110A	AC	323.9 (12-3/4)	251.9 (9-15/16)	162.6 (6-13/32)	308.1 (12-9/64)	215.9 (8-1/2)	12.7 (1/2)	–	215.9 (8-1/2)
	110A	DC	323.9 (12-3/4)	251.9 (9-15/16)	203.9 (8-1/32)	308.1 (12-9/64)	215.9 (8-1/2)	12.7 (1/2)	–	215.9 (8-1/2)

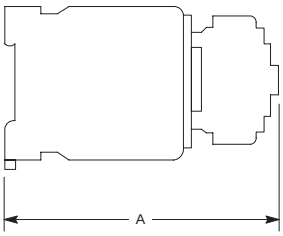
Product Selection — Page 3-15 and Page 3-23

IEC Dimensions

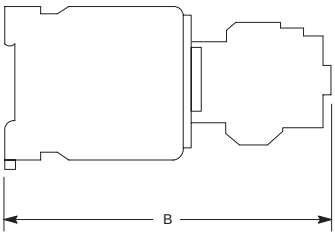
Approximate Dimensions

Bulletin 100 Line Accessories

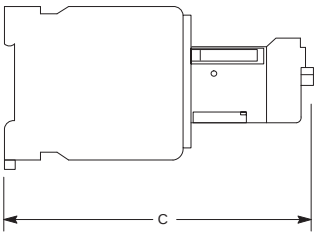
Dimensions are shown in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.



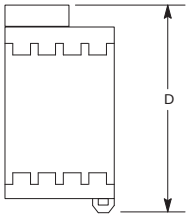
AC Operated Contactor With Front Mounted Auxiliary Contact Adder
Cat. No. 195-FA ❶



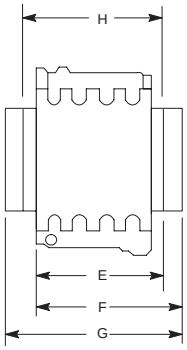
AC Operated Contactor With Pneumatic Timer
Cat. No. 196-FT ❶



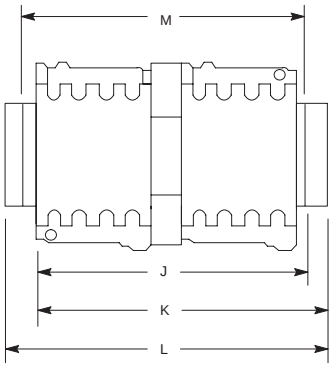
AC Operated Contactor With Latch Attachment
Cat. No. 197-FL ❶



AC Operated Contactor With Surge Suppressor
Cat. No. 199-FSMA ❶



AC Operated Contactor With Side Mounted Auxiliary Contact Adder



Reversing Contactor With Side Mounted Auxiliary Contact Adder

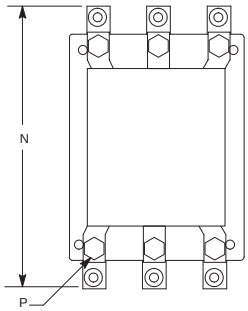
Contactor Size	Contactor with Front Mounted Accessories				Contactor with Side Mounted Accessories				Reversing Contactor with Side Mounted Accessories			
	A	B	C	D	E ❷	F ❸	G ❸	H	J ❷	K ❸	L ❸	M
A09 and A12	115 (4-17/32)	144 (5-43/64)	150 (5-59/64)	100 (3-15/16)	57 (2-1/4)	–	–	69 (2-23/32)	114 (4-1/2)	–	–	126 (4-31/32)
A18 and A24	123 (4-27/32)	152 (5-63/64)	158 (6-15/64)	108 (4-1/4)	67 (2-21/64)	–	–	79 (3-7/64)	134 (5-9/32)	–	–	146 (5-3/4)
A30	140 (5-1/2)	169 (6-21/32)	175 (6-57/64)	118 (4-41/64)	67 (2-21/64)	–	–	79 (3-7/64)	134 (5-9/32)	–	–	146 (5-3/4)
A38 and A45	156 (6-9/64)	185 (7-9/32)	191 (7-17/32)	–	72.5 (2-27/32)	84.5 (3-21/64)	99 (3-57/64)	75 (2-61/64)	152.5 (6)	165 (6-31/64)	179 (7-3/64)	155 (6-1/64)
A60 and A75	–	–	–	–	93 (3-21/32)	105 (4-1/8)	119 (4-11/16)	95 (3-3/4)	189 (7-7/16)	203 (7-63/64)	215 (8-15/32)	191 (7-33/64)
B110	–	–	–	–	119 (4-11/16)	131 (5-5/32)	143 (5-5/8)	119 (4-11/16)	239 (9-27/64)	251 (9-7/8)	263 (10-11/32)	239 (9-27/64)
B180	–	–	–	–	134 (5-9/32)	146 (5-3/4)	158 (6-7/32)	134 (5-9/32)	245 (9-21/32)	281 (11-1/16)	293 (11-35/64)	245 (9-41/64)
B250 and B300	–	–	–	–	154 (6-1/16)	166 (6-17/32)	178 (7)	154 (6-1/16)	311 (12-15/64)	322.5 (12-45/64)	334 (13-5/32)	311 (12-15/64)
B400	–	–	–	–	176 (6-15/16)	188 (7-13/32)	200 (7-7/8)	176 (6-15/16)	–	–	–	–
B600	–	–	–	–	255 (10-3/64)	265 (10-7/16)	275 (10-53/64)	255 (10-3/64)	–	–	–	–

❶ The listed Cat. Nos. are incomplete and require additional information. Refer to pages 3-38 and 3-39 listing for complete information.
❷ Overall width with standard auxiliary contacts as supplied from Allen-Bradley.
❸ Dimensions represent contactors with double stacked auxiliary contact blocks.

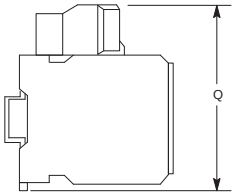
Product Selection — Page 3-39
Specifications — Page 3-54

Bulletin 100 Line Accessories

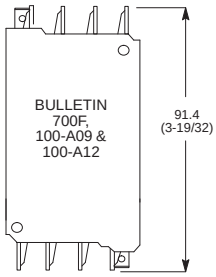
Dimensions are shown in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.



Contactor With Terminal Lugs
Cat. No. 195-L

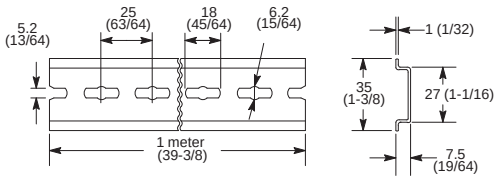


Contactor With Interface Module
Cat. No. 199-FIMZ



Contactor With Stab Connectors
Cat. No. 199-SC2

Contactor Size	N	P	Q
A09 and A12	–	–	102 (4-1/64)
A18 and A24	–	–	111 (4-3/8)
A30	–	–	130 (5-1/8)
B110	187.3 (7-3/8)	M8 (5/16-18)	–
B180	227 (8-59/64)	M10 (3/8-16)	–
B250 and B300	292 (11-31/64)	M12 (1/2-13)	–
B400	344 (13-35/64)	M12 (1/2-13)	–
B600	430 (17-3/64)	M12 (1/2-13)	–



DIN Mounting Rail
Cat. No. 199-DR1

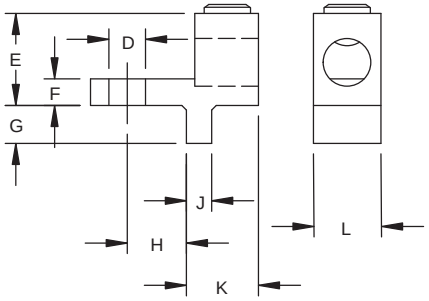
IEC Dimensions

Approximate Dimensions, Continued

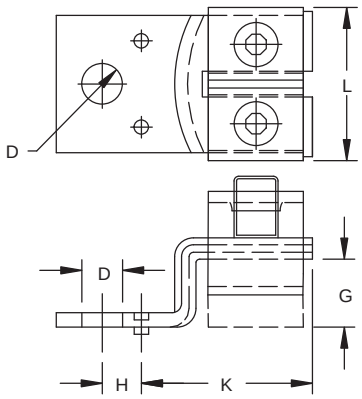
Bulletin 100 Line Accessories, Continued

Terminal Lug Kits

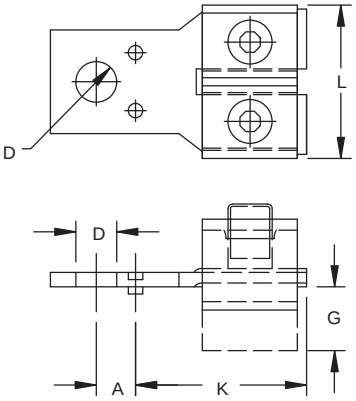
Dimensions are shown in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.



Cat. No. 199-LE1, LF1 & LG1



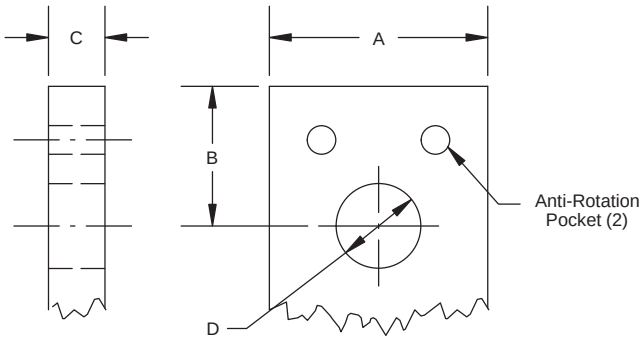
Cat. No. 199-LH1



Cat. No. 199-LJ1

Cat. No.	D	E	F	G	H	J	K	L
199-LE1	8.33 (21/64)	19.1 (3/4)	4.06 (5/32)	7.11 (9/32)	9.91 (25/64)	4.06 (5/32)	16.8 (21/32)	16 (5/8)
199-LF1	10.3 (13/32)	25.4 (1)	4.75 (3/16)	9.53 (3/8)	13.8 (35/64)	4.75 (3/16)	21.3 (27/32)	22.2 (7/8)
199-LG1	13.1 (33/64)	36.8 (1-29/64)	5.84 (15/64)	9.53 (3/8)	19.9 (25/32)	5.84 (15/64)	31.8 (1-1/4)	32.3 (1-17/64)
199-LH1	13.1 (33/64)	–	–	19.1 (3/4)	11.2 (7/16)	–	63.5 (2-1/2)	53.3 (2-7/64)
199-LJ1	13.1 (33/64)	–	–	25.4 (1)	17 (43/64)	–	90 (3-9/16)	60.5 (2-3/8)

Terminal Pads for Contactors and Current Transformer Overload Relays

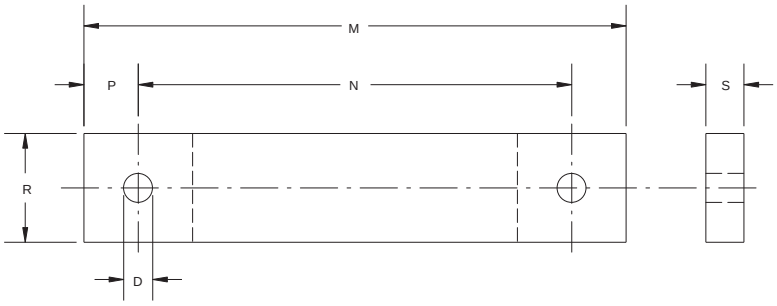


Cat. No.	A	B	C	D
100-B110 & 193-HPD	115 (19/32)	10 (25/64)	3.18 (1/8)	8.41 (21/64)
100-B180 & 193-DPD	20 (25/32)	13.8 (35/64)	4.75 (3/16)	10.4 (13/32)
100-B250 & B300 193-EPD	32 (1-17/64)	18.1 (23/32)	4.75 (3/16)	13 (33/64)
100-B400 & 193-FPD	35 (1-3/8)	19 (3/4)	5 (13/64)	13 (33/64)
100-B600 & 193-GPD	50 (1-31/32)	27 (1-1/16)	5 (13/64)	13 (33/64)

Bulletin 100 Line Accessories, Continued

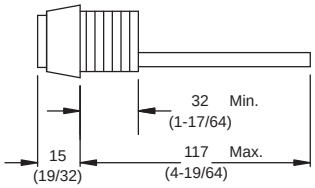
Dimensions are shown in millimeters (inches). Dimensions are not intended for manufacturing purposes.

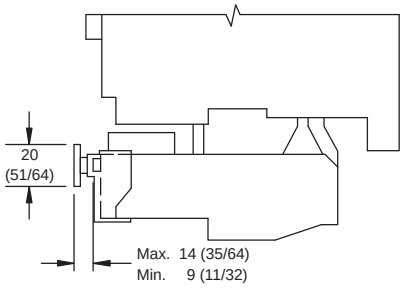
Flexible Connector Kits



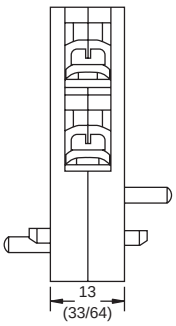
Cat. No.		D	M	N	P	R	S
199-PCE1		8.74 (11/32)	127 (5)	108 (41-1/4)	9.53 (3/8)	15.9 (5/8)	3.18 (1/8)
199-PCF1		10.3 (13/32)	153 (6-3/64)	128 (5-3/64)	12.7 (1/2)	19.1 (3/4)	3.56 (9/54)
199-PCG1		12.7 (1/2)	170 (6-11/16)	144 (5-9/16)	14.2 (9/16)	26.9 (1-1/16)	5.59 (7/32)
199-PCH1	Qty 1	12.7 (1/2)	226 (8-29/32)	191 (7-17/32)	17.5 (11/16)	34.9 (1-3/8)	4.95 (13/64)
	Qty 2	12.7 (1/2)	164 (6-15/32)	129 (5-5/64)	17.5 (11/16)	34.9 (1-3/8)	4.95 13/64)
199-PCJ1		12.7 (1/2)	284 (11-13/64)	241 (9-1/2)	21.3 (27/32)	38.1 (1-1/2)	6.6 (17/64)

External Reset and Reset Adapter

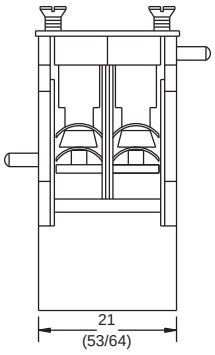




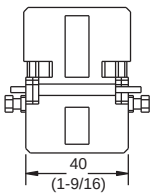
Mechanical/Electrical Interlocks



Cat. No. 199-MCA1



Cat. No. 199-MCD1



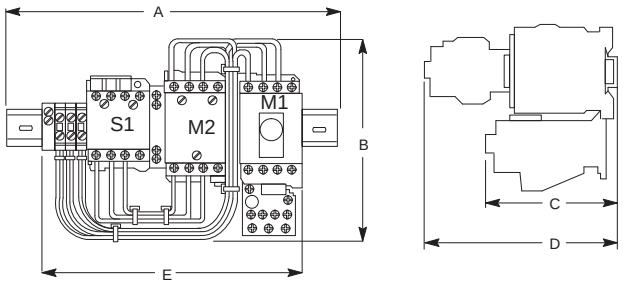
Cat. No. 199-MXH1 & MXJ1 (Mechanical Only)

IEC Dimensions

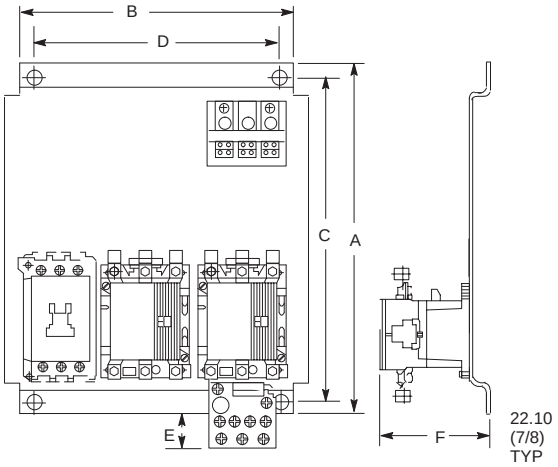
Approximate Dimensions, Continued

Bulletin 199 — Wye-Delta (Star-Delta) Starter Kits

Dimensions are shown in millimeters (inches) and shipping weights in kg (lbs).
Dimensions are not intended for manufacturing purposes.



Cat. No.	A Wide	B High	C Deep	D	E	Approx. Ship Wt.
199-YD1	250 (9-27/32)	140 (5-1/2)	99 (3-29/32)	144 (5-43/64)	194 (7-5/8)	0.454 (1)
199-YD2	250 (9-27/32)	165 (6-1/2)	104 (4-3/32)	152 (5-63/64)	219 (8-5/8)	0.454 (1)
199-YD3	300 (11-13/16)	191 (7-1/2)	100 (3-15/16)	169 (6-21/32)	229 (9)	0.908 (2)



Cat. No.	A	B	C	D	E	F	Mounting Screw	Approx. Ship. Wt.
199-YD4	280 (11-1/32)	250 (9-27/32)	268 (10-9/16)	234 (9-7/32)	44.5 (1-3/4)	136 (5-5/16)	5.51 (7/32)	2.27 (5)
199-YD5	312 (12-9/32)	284 (11-3/16)	300 (11-13/16)	268 (10-9/16)	31.8 (1-1/4)	158 (6-3/16)	5.51 (7/32)	2.724 (6)
199-YD6	550 (21-21/32)	385 (15-3/16)	530 (20-7/8)	350 (13-25/32)	–	182 (7-1/8)	7.19 (9/32)	11.34 (25)
199-YD7	723.9 (28-1/2)	421.1 (16-9/16)	700 (27-9/16)	380 (14-15/16)	–	277 (11-3/32)	10.3 (13/32)	27.69 (61)
199-YD8	876 (34-1/2)	491 (19-5/16)	850 (33-1/2)	450 (17-3/4)	–	292 (11-11/16)	12.3 (1/2)	42.68 (94)

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