Bulletin 193 E1 PLUS Overload Relay Application and Installation
Application et installation du relais de surcharge Famille 193 E1 PLUS
Überlastrelais Bulletin 193 E1 PLUS, Anwendung und Installation
Aplicación e instalación del relé de sobrecarga, Boletín 193 E1 PLUS
Boletim 193 E1 PLUS Aplicação e Instalação do Relé de Sobrecarga
Applicazione ed installazione dei relè termici Bollettino 193 E1 PLUS
ブレティン**193 E1 PLUS** 過負荷継電器の応用と取付け
Bulletin 193 E1 PLUS 过载继电器的使用与安装

(Cat 193-EE_F, -EE_G, -EE_H)

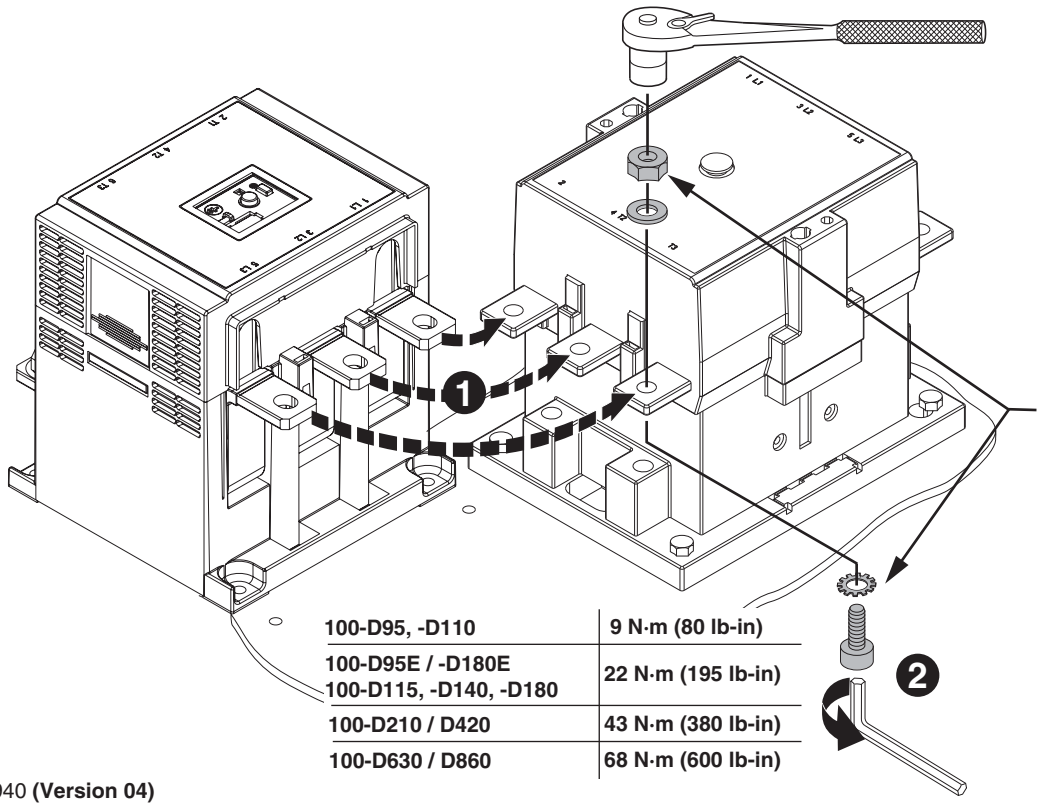
Installation
Instalación
Instalação
Installazione
取付け方法
安装

WARNING	To prevent electrical shock, disconnect from power source before installing or servicing. Install in suitable enclosure. Keep free from contaminants. (Follow NFPA70E requirements)
AVERTISSEMENT	Avant le montage et la mise en service, couper l'alimentation secteur pour éviter toute décharge. Prévoir une mise en coffret ou armoire appropriée. Protéger le produit contre les environnements agressifs. (Vous devez respecter la norme NFPA70E).
WARNUNG	Vor Installations- oder Servicearbeiten Stromversorgung zur Vermeidung von elektrischen Unfällen trennen. Die Geräte müssen in einem passenden Gehäuse eingebaut und gegen Verschmutzung geschützt werden. (Befolgen Sie die Anforderungen nach NFPA70E).
ADVERTENCIA	Desconéctese de la corriente eléctrica, antes de la instalación o del servicio, a fin de impedir sacudidas eléctricas. Instálelo en una caja apropiada. Manténgalo libre de contaminantes. (Cumpla con los requisitos NFPA70E)
ATENÇÃO	Para evitar choques, desconectar da corrente elétrica antes de fazer a instalação ou a manutenção. Instalar em caixa apropriada. Manter livre de contaminantes. (Cumpra as exigências da norma NFPA70E)
AVVERTENZA	Per prevenire infortuni, togliere tensione prima dell'installazione o manutenzione. Installare in custodia idonea. Tenere lontano
警告	感電事故防止のため、取付けまたは修理の際は電源から取り外してください。適切なケース内に取付けてください。また、汚染物質がないことを確認してください。(NFPA70Eの要件に従ってください)
警告	为了防止触电，在安装或维修之前必须先切断电源。安装在合适的设备箱内。防止接触污染物。(符合NFPA70E要求)

Supplied - Fourni - Im Lieferumfang enthalten - Incluye - Fornecido - Fornito - 已提供 - 付属部品

	M8 x 25	x 3		M10 x 30	x 3		M12 x 40	x 3
193-EE _ F	M8 Washer	x 3	**193-EE _ G**	M10 Washer	x 3	**193-EE _ H**	M12 Washer	x 3
	M8 Nut	x 3		M10 Nut	x 3		M12 Nut	x 3

1



100-D95, -D110	**9 N·m (80 lb-in)**
100-D95E / -D180E **100-D115, -D140, -D180**	**22 N·m (195 lb-in)**
100-D210 / D420	**43 N·m (380 lb-in)**
100-D630 / D860	**68 N·m (600 lb-in)**

Supplied with Contactor
Fourni avec un contacteur
Mit Schütz geliefert
Incluido con el interruptor automático
Fornecido com contato
Fornito con il contattore
随电流接触器提供
接触器に付属の部品

PN-39921
DIR 10000044940 **(Version 04)**
Printed in U.S.A.

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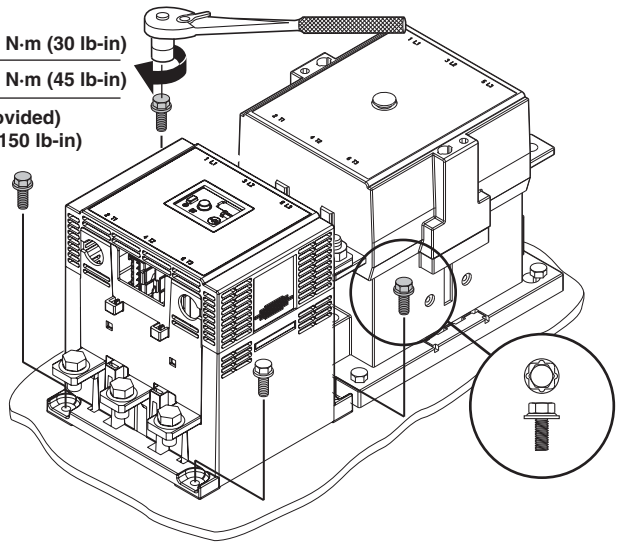
193-EE _ _ F	(M5) 3.4 N·m (30 lb-in)
193-EE _ _ G	(M6) 5.1 N·m (45 lb-in)
193-EE _ _ H	(M12 Provided) 17 N·m (150 lb-in)



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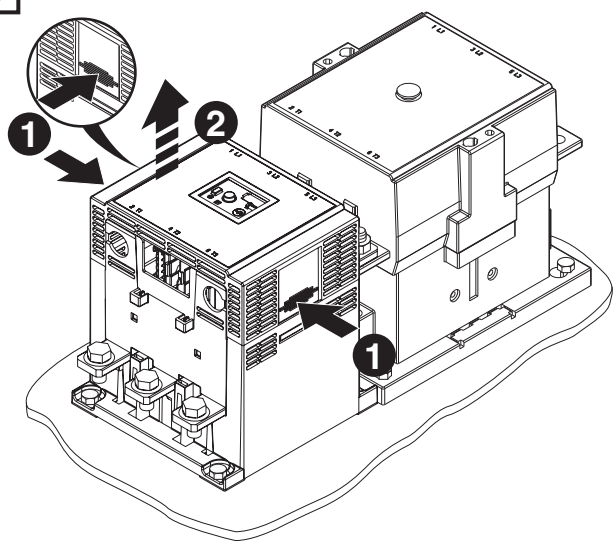
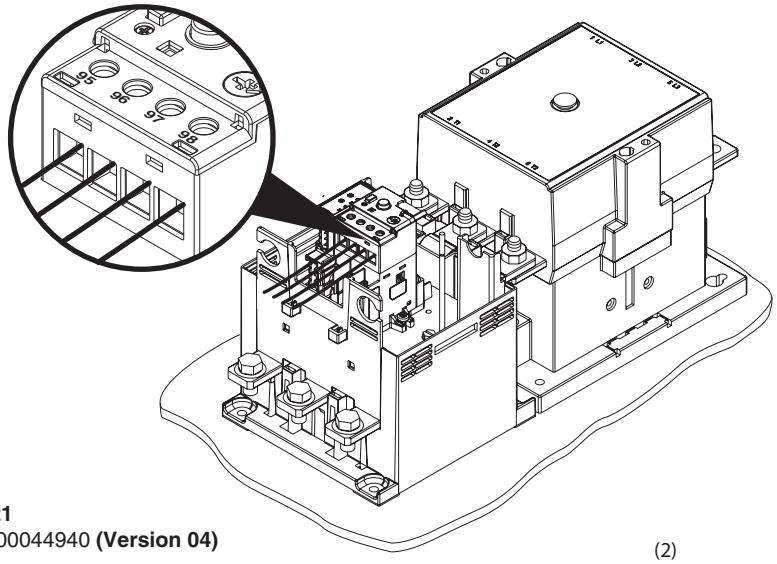


WARNING	The ratings of the E1 Plus overload relay's output and trip relays must not be exceeded. If the coil current or voltage of the contactor exceeds the relay's ratings, an interposing relay must be used.
AVERTISSEMENT	La valeur nominale de la sortie du relais de surcharge E1 Plus et des relais de déclenchement ne doit pas être dépassée. Si le courant de la bobine ou la tension du contacteur dépasse la valeur nominale du relais, un relais intercalé doit être utilisé.
WARNUNG	Die Nennleistung der Ausgangs- und Auslöserelais des Überlastrelais E1 Plus darf nicht überschritten werden. Wenn der Spulenstrom oder die Spulenspannung des Schützes die Nennleistung des Relais übersteigt, muss ein Zwischenrelais verwendet werden.
ADVERTENCIA	No deben excederse los límites de los relés de disparo y de potencia de relé de sobrecarga de E1 Plus. Si la corriente de bobina o voltaje del interruptor automático excede los límites del relé, debe usarse un relé intermedio.
ATENÇÃO	Os limites de saída do relé de sobrecarga E1 Plus e dos relés com interruptor não devem ser excedidos. Se a corrente ou a voltagem do contato excederem os limites do relé, um relé de interposição deverá ser usado.
AVVERTENZA	Non superare i valori nominali dell'uscita del relè termico E1 Plus e dei relè di intervento. Se la corrente o la tensione della bobina del contattore supera i valori nominali del relè, è necessario utilizzare un relè intermedio.
警告	必须超过 E1 Plus 过载继电器输出和切断继电器的额定电流。若线圈电流或电流接触器的电压超出继电器额定值，则必须使用插入继电器。
警告	E1 Plus 過負荷継電器の出力とトリップ継電器の定格を超えないようにしてください。 接触器のコイル電流または電圧が継電器の定格を超える場合は、中間継電器を使用する必要がります。

WARNING	Connect the internal metal shield to a solid earth ground via a low impedance connection.
AVERTISSEMENT	Connectez l'écran métallique interne à une prise de terre via une connexion à faible impédance.
WARNUNG	Schließen Sie die innere Metallabschirmung über eine niederohmige Verbindung an eine starre Erdung an.
ADVERTENCIA	Conecte la pantalla protectora metálica interna a tierra física a través de una conexión de baja impedancia.
ATENÇÃO	Conecte a proteção de metal interna a um fio-terra por meio de uma conexão de baixa impedância.
AVVERTENZA	Collegare a terra lo schermo metallico interno utilizzando un cavo a bassa impedenza.
警告	内部金属屏蔽与固定接地之间须用低阻连接。
警告	低インピーダース接続を介して内部金属シールドを接地してください。

4



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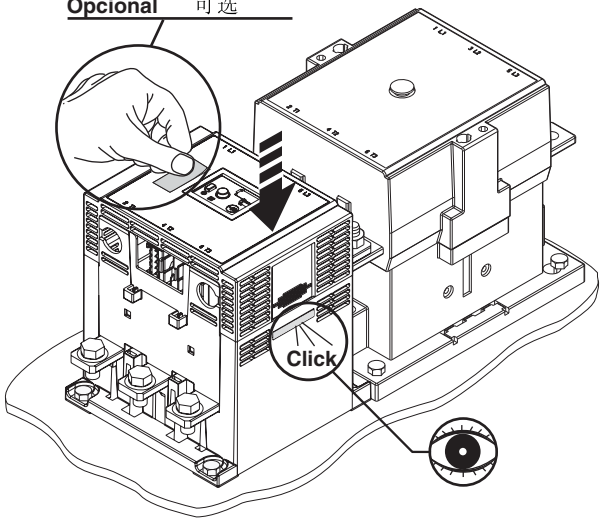
Optional **Opzionale**
En option オプション
Opcional 可选



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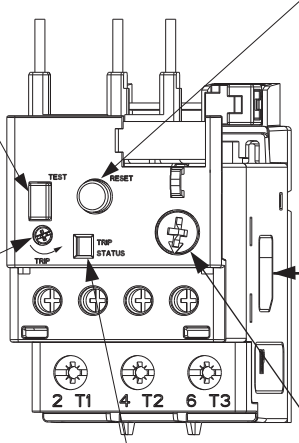
DIR 10000044940 **(Version 04)**

E1 PLUS Features
Caractéristiques du E1 PLUS
Leistungsmerkmale des E1 PLUS
Características del E1 PLUS
Características E1 PLUS
Funzioni dell'E1 PLUS
E1 PLUS の特長
E1 PLUS 继电器的特性

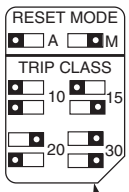


Push To Test
Enfoncer pour tester
Testschalter
Presione para probar
Pressione para testar
Spingere per provare
押してテストします。
按下键钮进行测试

Push to Reset
Enfoncer pour réinitialiser
Nullstellschalter
Presione para reiniciar
Pressione para religar
Premere per reimpostare
推进并重新设置
押してリセットします。

Rotate to Manually Trip
Faire pivoter pour déclencher manuellement
Für manuelle Auslösung drehen
Rotar para disparar manualmente
Gire para disparar manualmente
Ruotare per intervenire manualmente
旋转进行 手动设置
回転すると手動トリップします。

193*-EE



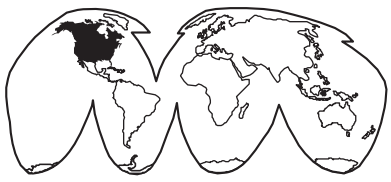
A = Automatic/Manual Reset Mode
A = Mode de réinitialisation automatique/manuel
A = Automatische/Manuelle Nullstellung
A = Modo de reinicio automático/manual
A = Modo de religação automático/manual
A = Modalità reimpostazione automatica/Manuale
自动 和手动模式
A = 自動/手動リセットモード

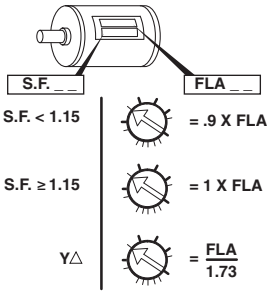
M = Manual Reset Mode
M = Mode de réinitialisation manuel
M = Manuelle Nullstellung
M = Modo de reinicio manual
M= Modo de religação manual
M = Modalità reimpostazione manuale
手动模式
M = 手動リセットモード

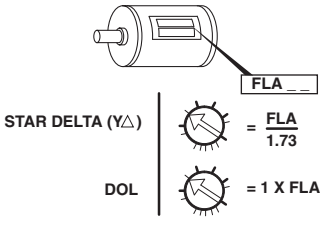
Selectable Trip Class
Classe de déclenchement sélectionnable
Wählbare Auslösestufen
Clase de disparo seleccionable
Seleção da classe de disparo
Classe di intervento selezionabile
選択可能なトリップ種類
可选用的跳闸等级

- **Trip Indicator Window**
  Yellow indicator not visible: Not Tripped.
  Yellow indicator visible: Tripped.
- **Fenêtre d'indicateur de déclenchement**
  Indicateur jaune non visible : pas de déclenchement
  Indicateur jaune visible : déclenchement
- **Auslösungsanzeigefenster**
  Gelbe Anzeige nicht sichtbar: keine Auslösung
  Gelbe Anzeige sichtbar: Auslösung
- **Ventana indicadora de disparo**
  Indicador amarillo no visible: No disparado
  Indicador amarillo visible: Disparado

- **Visor de disparo**
  Se o indicador amarelo não estiver visível: não disparado
  Se o indicador amarelo estiver visível: disparado
- **Finestra indicatrice di intervento.**
  Indicatore giallo non visibile: non scattato.
  Indicatore giallo visibile: scattato.
- トリップ表示ウィンドウ
  黄色インジケータが表示されていない場合 :トリップなし
  黄色インジケータが表示されている場合 :トリップ済み
- 跳闸指示窗
  黄色标记未显示: 没有跳闸
  黄色标记显示: 已跳闸







- **To adjust trip current, turn dial until the desired current is aligned with the ▲ pointer. Trip rating is 120% of dial setting.**
- **Pour régler l'intensité de déclenchement, tournez le cadran jusqu'à ce que le pointeur ▲ soit sur l'intensité voulue. La valeur nominale de déclenchement est de 120% du réglage cadran.**
- **Zur Einstellung des Auslösestroms drehen Sie den Schalter, bis der Zeiger ▲ auf die gewünschte Stromstärke zeigt. Der zur Auslösung erforderliche Nennstrom beträgt 120% des eingestellten Wertes.**
- **Para ajustar la corriente del disparo, gire el dial hasta que la corriente deseada esté alineada con la marca ▲. La capacidad nominal del disparo es el 120% del posicionamiento del dial.**
- **Para regular a corrente de disparo, gire o disco mostrador até que a corrente desejada esteja alinhada com o indicador ▲. A classe de disparo corresponde a 120% da marcação no mostrador.**
- **Per regolare la corrente di intervento, ruotare il regolatore fin quando la corrente desiderata non è allineata con il puntatore ▲. Il valore nominale di intervento corrisponde al 120% dell'impostazione del regolatore.**
- トリップ電流を調整するには、所定の電流の目盛りが▲印に来るまでダイヤルを回してください。トリップ定格は、ダイヤル設定値の**120%**です。
- 若欲调节跳闸电流设定，可转动刻度盘，使所需的设定值对准▲箭头。跳闸电流额定值是刻度盘显示值的**120%**。

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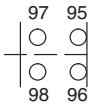
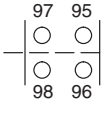
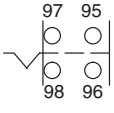
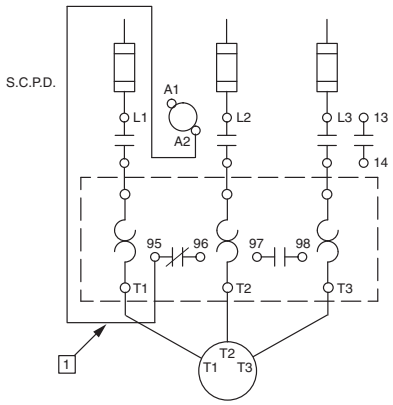
WARNING	**Do not use automatic reset mode in applications where unexpected automatic restart of the motor can cause injury to persons or damage to equipment.**
AVERTISSEMENT	**N'utilisez pas le mode Remise à zéro automatique dans les applications où un redémarrage automatique inattendu du moteur pourrait provoquer des blessures personnelles ou des dégâts matériels.**
WARNUNG	**Der automatische Rücksetzmodus darf nicht in Anwendungen verwendet werden, in denen der unerwartete Neustart des Motors zu Personen- oder Sachschäden führen kann.**
ADVERTENCIA	**No use el modo de reseteo automático en aplicaciones donde el rearranque repentino del motor pueda causar lesiones personales o daño al equipo.**
ATENÇÃO	**Não utilize o modo de reajuste automático em aplicações nas quais o reinício automático e inesperado do motor possa causar ferimentos às pessoas ou danos ao equipamento.**
AVVERTENZA	**Non usare la modalità di ripristino automatico in applicazioni dove il riavviamento automatico improvviso del motore può provocare infortuni o danni all'apparecchiatura.**
警告	モーターの予期しない自動再スタートによって負傷や機器の破損をまねく恐れのあるような応用では、自動リセット・モードを使用しないでください。
警告	在马达突然自动再起动可能导致人员伤害或设备损坏的地方，切勿采用自动复原模态。

Contact Status
Etat des contacts
Kontaktstatus
Estado del contacto

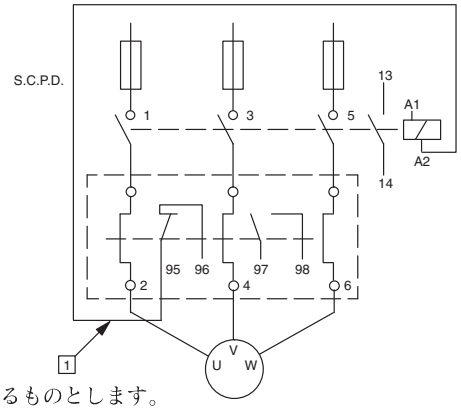
Situação de contato
Stato dei contatti
接触状態
接触状态

Normal		Test	Tripped
95 — 96	Closed	Open	Open
97 — 98	Open	Open	Closed
			

Wiring Diagram - 3 Phase Full Voltage DOL Starter
Schéma de câblage - Pleine tension triphasée Démarreur DOL (direct en ligne)
Verkabelungsschema - 3-phasiger Vollspannungs-DOL-Motoranlasser
Diagrama de cableado - Arrancador DOL (directo en línea) trifásico de voltaje pleno
Diagrama de circuito - Dispositivo de partida DOL, trifásico, de máxima tensão
Schema elettrico - Avviatore diretto trifase a tensione piena
配線図 - 3 相全電圧 DOL 始動器
配线图 — 三相全电压DOL起动器

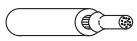
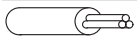
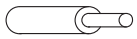
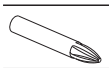


1 Connection must be fitted by user
1 Connexion à régler par l'utilisateur
1 Verbindung muß vom Benutzer hergestellt werden
1 La conexión debe ser realizada por el usuario
1 Conexão deve ser colocada pelo usuário
1 Il collegamento deve essere adattato dall'utente
1 接続部はユーザー側で取付けるものとします。
1 线路连接必须由用户完成



Control Connections
Bornes de Commande
Steueranschlüsse
Morsetti di Commando
Conexões de controle
Conexiones de Control
控制连接
制御接続

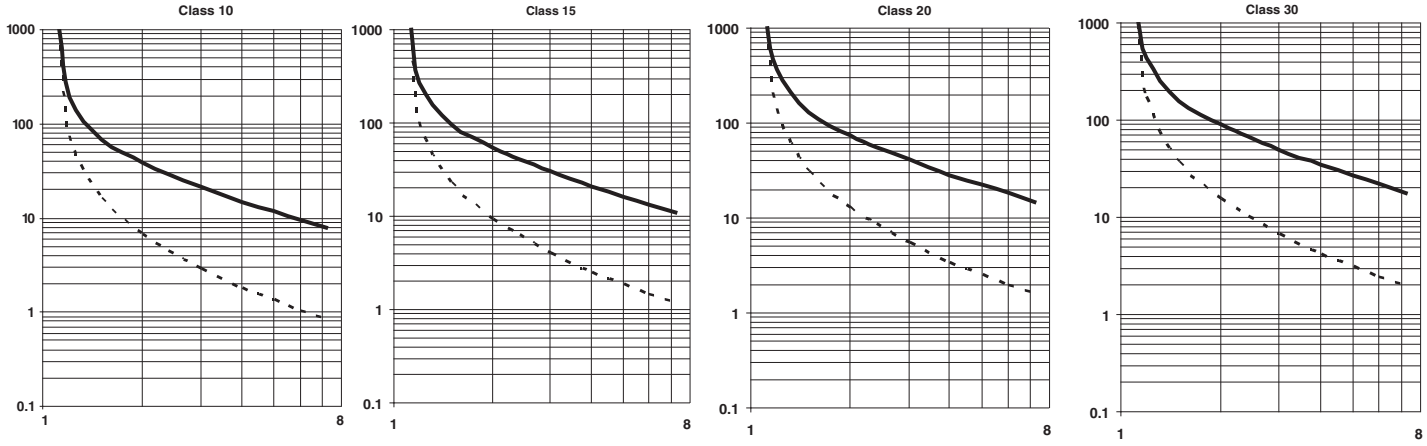
Rated Insulation Voltage (Ui): **690 VAC**
Rated Operational Voltage (Ue) IEC / UL: **690 VAC / 600 VAC**
Rated Operational Current (Ie): **B600 N.O. / N.C.**

Terminal Screw		M3
	1x	0.5 … 2.5 mm² 0.55 Nm
	2x	0.2 … 0.75 mm² 0.55 Nm
	1x	0.5 … 4 mm² 0.55 Nm
	2x	0.2 … 1.5 mm² 0.55 Nm
	1x	24 … 10 AWG 5 lb-in
	2x	22 … 16 AWG 5 lb-in
		#1
		0.6 x 3.5 mm

Trip Curve
Courbe de déclenchement
Auslösekurve
Curva del disparo
Curva de disparo
Curva di intervento
トリップ曲線
跳闸曲线

COLD START
DEMARRAGE A FROID
KALTSTART
ARRANQUE EN FRIO
PARTIDA À FRIO
AVVIAMENTO A FREDDO
冷始動
冷态起动

HOT START
DEMARRAGE A CHAUD
WARMSTART
ARRANQUE EN CALIENTE
PARTIDA À QUENTE
AVVIAMENTO A CALDO
熱始動
热态起动



Multiple of FLA
Intensités pleine charge multiples
Múltiplo de FLA
Vielfache des FLA-Wertes
Intensités pleine charge multiples
Multiplo di Max amp.
FLA 倍率
满载电流安培(FLA)的倍数

Short Circuit Ratings

Table 1 Standard Fault Short Circuit Ratings per UL508 and CSA 22.2 No.14

Cat. No.		Max. available fault current (kA)	Max. voltage (V)
193	EEHF, EEJF	10	600
	EEJG, EEKG, EELG	18	
	EEMH, EENH	42	

Table 2 High Fault Short Circuit Ratings per UL508 and CSA 22.2 No.14

Cat. No.		Contactor Cat. No.	Max. starter FL (A)	Max.available fault current (kA)	Max. voltage (V)	Max. UL Class J and CSA HRCI-J Fuse
193	EEHF	100-D95	95	100	600	200
		100-D110	110			200
		100-D115	115			200
		100-D140	140			250
	EEJF	100-D180	180			300
	EEJG	100-D210	200			400
		100-D250	200			400
		100-D300	200			500
	EEKG	100-D210	210			400
		100-D250	250			400
		100-D300	300			500
	EELG	100-D300	300			500
		100-D420	420			600

Table 3 IEC Short Circuit Ratings per EN60947-4-1

Cat. No.		Prospective S.C. current, Ir (kA)	Conditional S.C. current, Iq (kA)	Max. voltage (V)
193	EEHF, EEJF, EEJG, EEKG	10	100	600
	EELG, EEMH	18		
	EENH	30		

Type 2 Fuse Selection Table for Class gG and Class aM Fuses at Line Voltage of 400V, 50Hz

Motor		Fuse		Contactor	O/L Relay 193-EE..		S.C. Current
	Rated Operational Current I_e	Type gG Rated Current	Type aM Rated Current	Catalog Number	Catalog Number	Current Setting Range	I_q
[kW]	[A] 1)	[A]	[A]	2)		[A]	[kA]
55	97	200	125	100-D115…	193-EEHF	30 - 150	50
63	113	200	125	100-D115…	193-EEHF	30 - 150	
75	132	200	160	100-D140…	193-EEHF	30 - 150	
90	160	250	200	100-D180…	193-EEJF	40 - 200	
110	195	315	200	100-D210…	193-EEJG	40 - 200	
132	230	400	250	100-D250…	193-EEKG	60 - 300	
160	280	400	315	100-D300…	193-EEKG	60 - 300	
200	350	500	355	100-D420…	193-EELG	100 - 500	

Recommended fuse sizes based on the following starting conditions:
≤ 3 kW Starting current max. 6 x Motor rated current, Starting time max. 5 s
> 3 kW Starting current max. 7 x Motor rated current, Starting time max. 5 s

1) Typical motor currents according IEC 60947-4-1 Table G.1
2) Incomplete catalog number, add coil and auxiliary contact codes

Fuse Coordination

Table 1 IEC Type I and Type II Fuse Coordination with CA6 contactors per EN60947-4-1

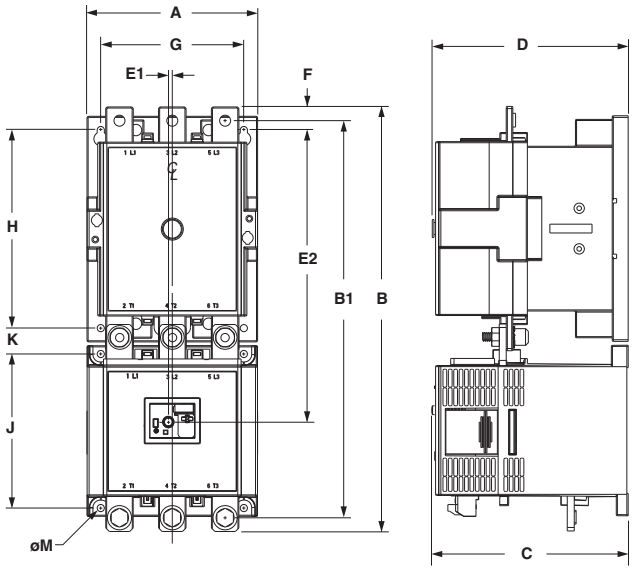
Cat. No.		Contactor Cat. No.	Max. starter FLC (A)	Prospective S.C. current, Ir (kA)	Conditional S.C. current, Iq (kA)	Max. voltage (V)	Type I with Max. Class J fuse (A)	Type II with Max. Class J fuse (A)
193	EEHF	100-D95	95	10	100	600	200	200
		100-D110	110				200	200
		100-D115	115				200	200
		100-D140	140				250	250
	EEJF	100-D180	180				300	300
	EEJG	100-D210	200				400	400
		100-D250	200				400	400
		100-D300	200				500	500
	EEKG	100-D210	210				400	400
		100-D250	250				400	400
		100-D300	300				500	500
	EELG	100-D300	300	18			500	500
		100-D420	420				600	600

Table 4 High fault short circuit ratings, using Bul. 140MG, circuit protectors, per UL508 and CSA 22.2 No.14

E1 Plus Cat. No.		Contactor Cat. No.	Max. starter FLC (A)	Max. available fault current (kA) At 480V	Max. available fault current (kA) At 600 V	Circuit Protector Cat. No.	Max. Circuit Protector Current (A)	Minimum Enclosure Size (in.)
193	EEHF	100-D140	140	65	25	140MG-J8P-D20	200	48 x 24 x 12 with two hinges and two multi-turn screw type latches
	EEJF	100-D180	180	65	25	140MG-J8P-D20	200	48 x 24 x 12 with two hinges and two multi-turn screw type latches
	EEKG	100-D210	210	65	25	140MG-K8P-D40	400	56 x 30 x 14 with three hinges and two multi-turn screw type latches
	EEKG	100-D250	250	65	30	140MG-K8P-D40	400	56 x 30 x 14 with three hinges and three multi-turn screw type latches
	EEKG	100-D300	300	65	30	140MG-K8P-D40	400	56 x 30 x 14 with three hinges and three multi-turn screw type latches
	EELG	100-D420	420	42	25	140MG-M8P-D60	600	56 x 30 x 14 with three hinges and three multi-turn screw type latches

Table 5 High fault short circuit ratings, using Bul. 140G, circuit breakers, per UL508 and CSA 22.2 No.14

E1 Plus Cat. No.		Contactor Cat. No.	Max. starter FLC (A)	Max. available fault current (kA) At 480V	Max. available fault current (kA) At 600 V	Circuit Breaker Cat. No.	Max. Circuit Breaker Current (A)
193	EEHF	100-D140	140	65	25	140G-J6F3-D20	200
	EEJF	100-D180	180	65	25	140G-J6F3-D20	200
	EEKG	100-D210	210	65	25	140G-J6F3-D25	250
	EEKG	100-D250	250	65	25	140G-K6F3-D40	400
	EEKG	100-D300	300	65	25	140G-K6F3-D40	400
	EELG	100-D420	420	65	25	140G-M6H3-D60	600



Overload Relay Cat	Contactor Cat	Width A	Height B		B1	Depth C	D	E1	E2	F	G	H	J	K	øM
			Without Terminal Covers	With Terminal Covers		(Reset)									
193-EE _ F	100-D95, -D110	120 (4.72)	336.3 (13.24)	418 (16.46)	311.8 (12.27)	152.7 (6.01)	156 (6.14)	3.6 (.14)	226.3 (8.91)	12.5 (.49)	100 (3.94)	145 (5.71)	135 (5.31)	22.3 (.88)	8 - 5.6 (8 - .22)
	100-D115, -D140, -D180	120 (4.72)	339.8 (13.38)	418 (16.46)	317.8 (12.51)	152.7 (6.01)	156 (6.14)	3.6 (.14)	226.3 (8.91)	16 (.63)	100 (3.94)	145 (5.71)	135 (5.31)	22.3 (.88)	8 - 5.6 (8 - .22)
193-EE _ G	100-D210, -D250, -D300, -D420	155 (6.10)	385.8 (15.19)	487.4 (19.19)	360.8 (14.2)	176.5 (6.95)	180 (7.09)	3.6 (.14)	265.2 (10.44)	21 (.83)	130 (5.12)	180 (7.09)	140 (5.51)	23.5 (.93)	8 - 6.5 (8 - .26)
193-EE _ H	100-D630, -D860	255 (10.04)	552 (21.73)	915 (36.02)	508 (20)	269.3 (10.6)	270.7 (10.66)	3.6 (.14)	384.1 (15.12)	52.5 (2.07)	226 (8.90)	230 (9.06)	108 (4.25)	109 (4.29)	8 - 13 (8 - .51)

Accessories	Cat	Overload Relay
Lug Kit	100-DL180 (3 per kit)	193-EE _ F
	100-DL420 (3 per kit)	193-EE _ G
	100-DL630, -DL860 (3 per kit)	193-EE _ H
3 Pole Terminal Kit	100-DTB-180	193-EE_ F
	100-DTB-420	193-EE _ G
	N/A	193-EE _ H
Finger Protection Covers	100-DTC180	193-EE _ F
	100-DTC420	193-EE _ G
	100-DTC860	193-EE _ H
Current Adjustment Shield	193-BC8	193-EE _ F 193-EE _ G 193-EE _ H

Replacement E1 Plus Module

Part Number	Current Range	Overload Relay
193-NREEHZ 193-NREEJZ	30-150 A 40-200 A	193-EE _ F
193-NREEJZ 193-NREEKZ 193-NREELZ	40-200 A 60-300 A 100-500 A	193-EE _ G
193-NREEMZ 193-NREENZ	120-600 A 160-800 A	193-EE _ H

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