

SDF Digital Star/Delta Replacement Soft Starters



FAIRFORD ELECTRONICS

Installation Instructions Montageanweisung Notice d'installation Istruzioni per il montaggio Instrucciones de montaje

This device is suitable for use in industrial environments. EN 55011/22 Class A
Das Gerät ist für den industriellen Einsatz geeignet EN 55011/22 Klasse A.
L'appareil a été conçu pour l'emploi en milieu industriel EN 55011/22 classe A.
L'apparecchio è adatto per uso in ambienti industriali EN 55011/22 Classe A.
El aparato es adecuado para uso en ambiente industrial EN 55011/22 clase A.

Electric shock risk. Danger

Only skilled or instructed persons may carry out the following operations.

Lebensgefahr durch elektrischen Strom!

Nur Elektrofachkräfte und elektrotechnisch unterwiesene Personen dürfen die im Folgenden beschriebenen Arbeiten ausführen.

Tension électrique dangereuse !

Seules les personnes qualifiées et averties doivent exécuter les travaux ci-après.

Tensione elettrica: Pericolo di morte!

Solo persone abilitate e qualificate possono eseguire le operazioni di seguito riportate.

¡Corriente eléctrica! ¡Peligro de muerte!

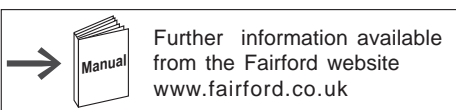
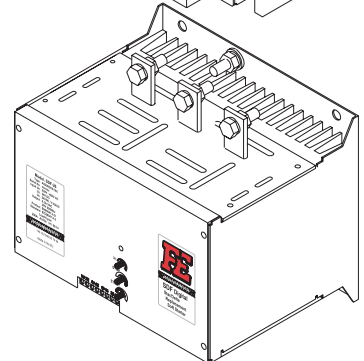
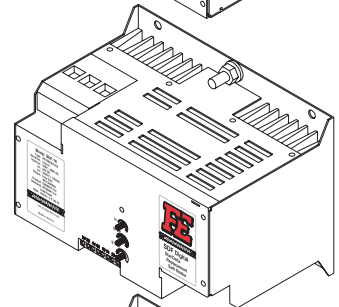
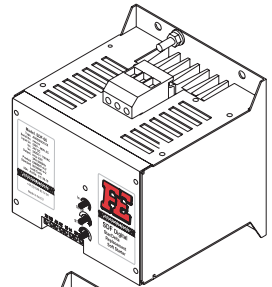
El trabajo a continuación descrito debe ser realizado por personas cualificadas y advertidas.



SDF-02	11kW @ 400V	22Amp
SDF-04	15kW @ 400V	29Amp
SDF-06	22kW @ 400V	41Amp
SDF-08	30kW @ 400V	55Amp

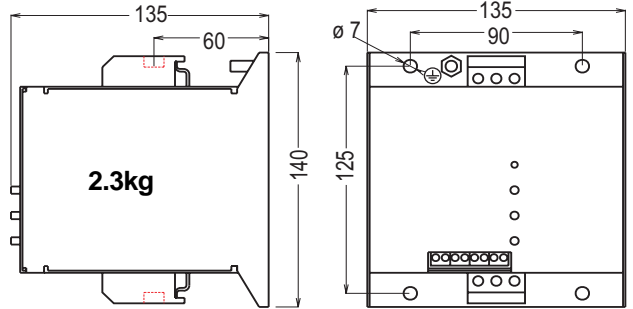
SDF-12	37kW @ 400V	66Amp
SDF-14	45kW @ 400V	80Amp
SDF-16	55kW @ 400V	97Amp

SDF-22	75kW @ 400V	132Amp
SDF-24	90kW @ 400V	160Amp
SDF-26	110kW @ 400V	195Amp



Dimensions – Abmessungen – Dimensioni – Dimensiones

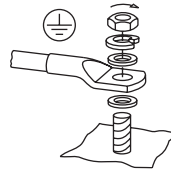
SDF-02 to SDF-08 11kW to 30kW



Power cables/Leistungsleitungen/Conducteurs de puissance/Cavi di potenza/Conductores de potencia

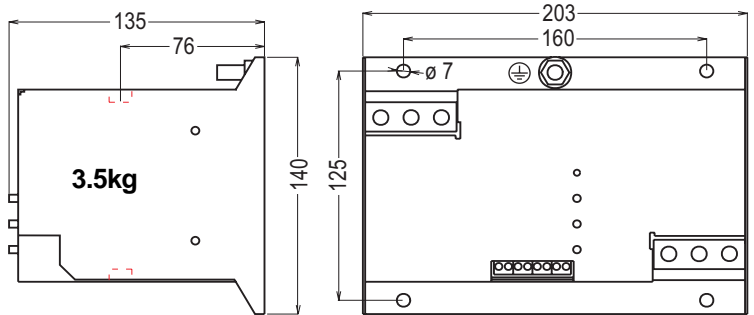
1L1, 3L2, 5L3, 2T1, 4T2, 6T3				
mm ²	AWG	mm	Nm	mm
6 - 16	10 - 4	13	1.2	0.8 x 4

Mountings suitable for M6
90mm x 125mm centres



M6 8 Nm

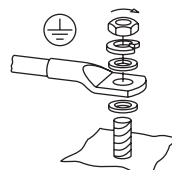
SDF-12 to SDF-16 37kW to 55kW



Power cables/Leistungsleitungen/Conducteurs de puissance/Cavi di potenza/Conductores de potencia

1L1, 3L2, 5L3, 2T1, 4T2, 6T3				
mm ²	AWG	mm	Nm	mm
16 - 35	6 - 1	17	2.5	1.2 x 6.5

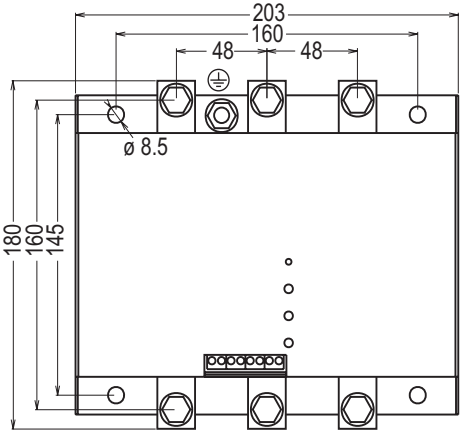
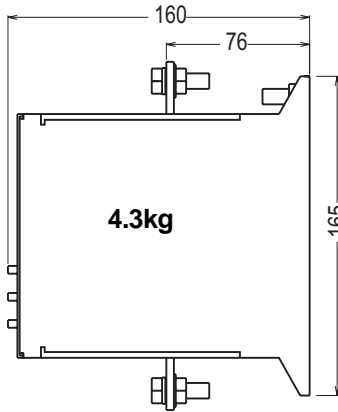
Mountings suitable for M6
160mm x 125mm centres



M8 12 Nm

Dimensions – Abmessungen – Dimensioni – Dimensiones

SDF-22 to SDF-26 75kW to 110kW

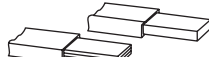


Power cables/Leistungsleitungen/Conducteurs de puissance/Cavi di potenza/Conductores de potencia

1L1, 3L2, 5L3, 2T1, 4T2, 6T3 (PE)



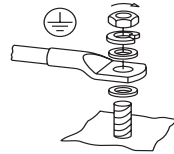
50 - 95mm²
2/0 - 4/0 AWG



20mm x 5mm

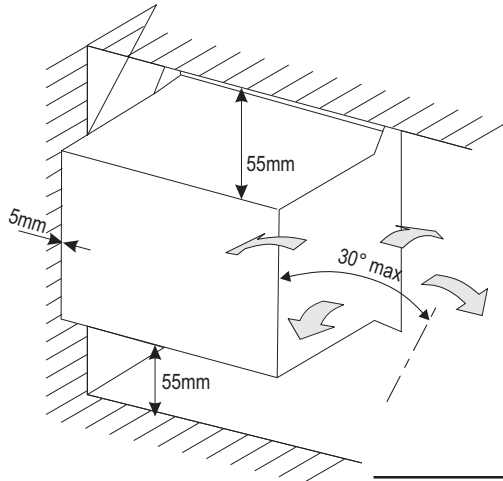


M8 - 12Nm

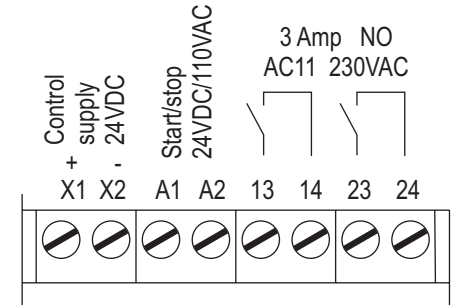


M8 12 Nm

Mountings suitable for M8.
160mm x 145mm centres

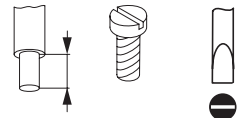


Control cables – Steuerleitungen
Conducteurs de commande –
Cavi comandi -
Conductores de mando



Mounting position -
Einbaulage - Position de
montage - Posizione di
montaggio - Posición de
montaje

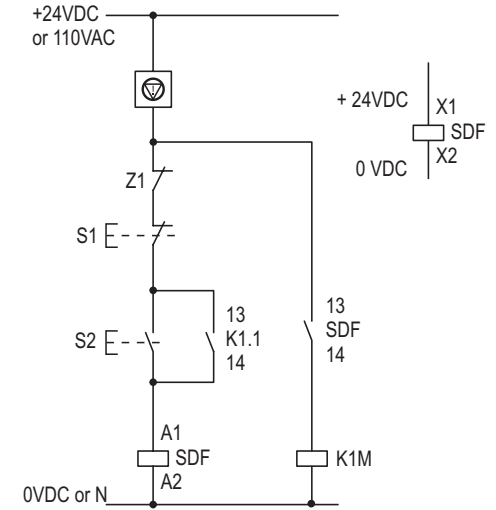
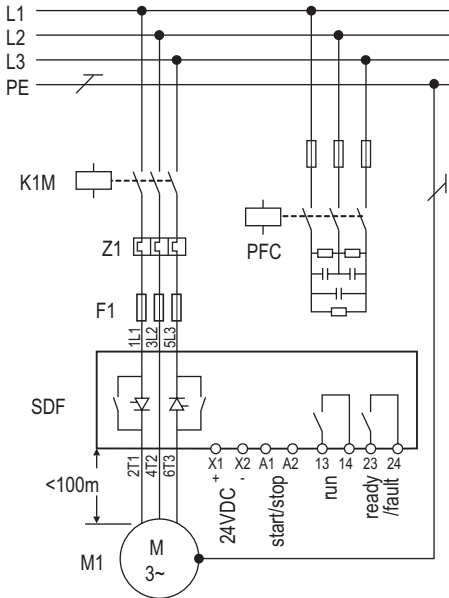
X1, X2 A1, A2
13, 14 23, 24



	mm ²	AWG	mm	Nm	mm
1 x	0.75 – 2.5	18 – 12	6	0.8	0.5 x 3.5
2 x	0.75 - 1	18 – 16	11	0.8	0.5 x 3.5

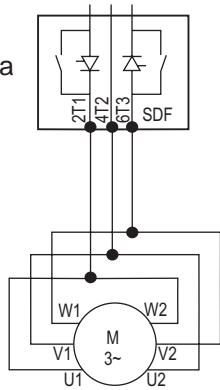
Standard connection – Standardanschluss – Raccordement standard – Collegamento standard – Conexión estándar

Soft starter with mains contactor - Softstarter mit Netzschütz – Démarreur progressif avec contacteur réseau – Softstarter con contattatore di rete – Arrancador suave con contactor red

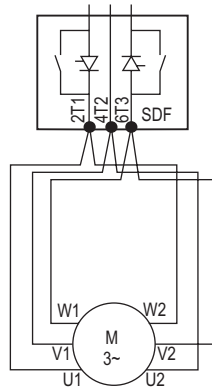


3 wire control 24 VDC/110VAC

Make the Delta at the motor



Make the Delta at the SDF



Where several conductors are to be connected, the difference between the wires/cables used must not exceed one DIN Standard size level.

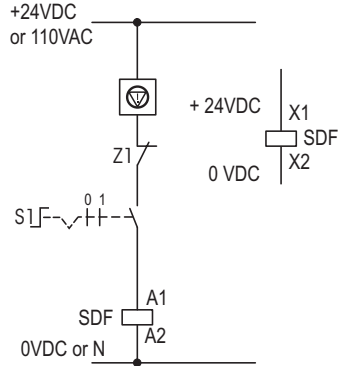
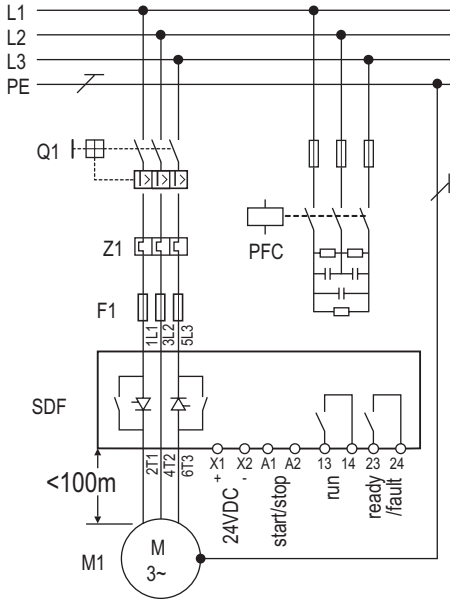
Bei Mehrleiteranschluss darf maximal ein DIN-Normgrößen-Sprung zwischen den verwendeten Leitern liegen.

En cas de raccordement de plusieurs conducteurs, il faut 1 écartement normalisé max. entre les conducteurs.

In caso di collegamento a più conduttori, è ammesso al massimo un salto di grandezza DIN standard fra i conduttori utilizzati.

En caso de conexión de múltiples conductores puede haber como máximo un salto de magnitud normalizada DIN entre los conductores utilizados.

Semiconductor contactor – Halbleiterschütz – Contacteur à semi-conducteurs –
 Contattore a semiconduttori – Contactor semiconductor



2 wire control element
 24 Volt within cabinet, 110 Volt external

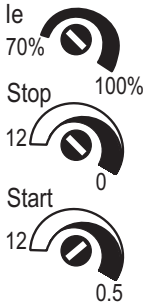
- Q1 = Cable protection - Leitungsschutz - Protezione di linea -
 Protección de cable - Protection de câbles
- K1M = Main contactor - Netzschütz - Contattore di rete - Contactor red -
 Contacteur réseau
- Z1 = Overload relay - Überlastrelais - Relè termico - Relé de sobrecarga -
 Relais thermique
- F1 = Semiconductor fuse for type 2 coordination, in addition to Q1 -
 Halbleitersicherung für Zuordnungsart 2, zusätzlich zu Q1 -
 Per avere la protezione del semiconduttore in coordinamento di tipo 2, è
 necessario un fusibile in aggiunta a Q1 -
 Fusible semiconductor para tipo de coordinación 2, adicionalmente a Q1 -
 Fusible pour semi-conducteurs pour coordination de type 2, additionnel à Q1
- SDF = Soft Starter - Halbleiterschütz - Contactor semiconductor - Contattore a
 semiconduttori - Contacteur à semi-conducteurs
- A1-A2 = Start/Stop - Start/Stopp - Start/Stop - Arranque/Parada -
 Démarrage/Arrêt
- ⊗ = EMERGENCY-STOP - NOT-AUS - ARRESTO D'EMERGENZA -
 PARADA DE EMERGENCIA - ARRET D'URGENCE

SERVICING

WARNING NEVER CARRY OUT ANY WORK ON ELECTRICAL OR MECHANICAL EQUIPMENT BEFORE ISOLATING ALL POWER SUPPLIES. THE SDF DOES NOT PROVIDE ISOLATION. LIVE OUTPUTS MAY BE PRESENT WITHOUT MOTOR ROTATION



Settings - Einstellungen - Réglages - Regolazioni - Regulaciones



Motor current:- 100% for standard rating
70% for smaller motors

Soft Stop time:- 0 = default
range 0 S to 12 S

Soft Start time:- ~5 = default
range 0.5 S to 12S

Flash Green	
1	ready
2	starting
3	run
4	stopping
Flash Red (fault)	
1	SCR / supply
2	thermal
3	Uc <24V

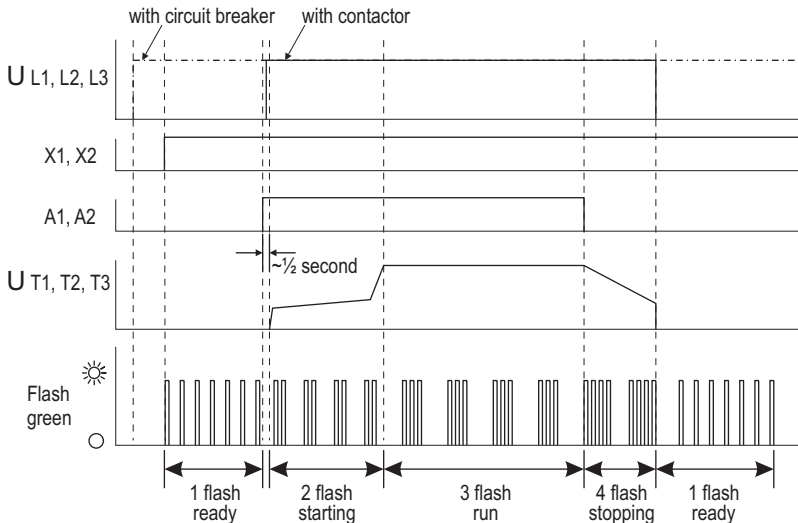
☺ LED green - LED grün – DEL vert –

LED verde - LED verde

- 1 Ready for operation – Betriebsbereit – Prêt à fonctionner – Pronto al funzionamento – En condiciones para funcionamiento
- 2 Starting – in Rampe – en rampe – in rampa – en rampa
- 3 Full volts – vollen Spannung – pleine tension – piena tensione – plena tensión
- 4 Soft-Stop – Soft stop – Arrêt progressif – Soft-Stop – Paro suave

☹ Fault LED red – Fehler LED rot – DEL erreur rouge – LED errore rosso –LED error rojo

- 1 SCR or supply
- 2 Too hot
- 3 Control supply low volts



Attention!

Within the scope of the EU Directives, the SDF soft starters and their accessories may be commissioned only provided it is established that the machine fulfils the protective requirements of Machine Directive 89/392/EWG.

Achtung!

Im Geltungsbereich der EG-Richtlinien dürfen die Softstarter der Reihe SDF und deren Zubehör nur dann in Betrieb genommen werden, wenn festgestellt wird, dass die Maschine die Schutzanforderungen der Maschinenrichtlinie 89/392/EWG erfüllt.

¡Atención!

En el campo de aplicación de la normativa CE, los arrancadores suaves de la serie SDF y sus correspondientes accesorios sólo deberán ponerse en marcha cuando se asegure que la máquina cumple con las exigencias de seguridad de la normativa de máquinas 89/392/CE.

Attention !

En application des directives européennes, les démarreurs progressifs de la gamme SDF et leurs accessoires ne doivent être mis en service que s'il a été vérifié que la machine répond bien aux exigences de la directive machines 89/392/EWG.

Attenzione!

Nel campo di validità delle direttive CEE i softstarter della serie SDF e i loro accessori possono essere messi in esercizio solamente se è verificato che la macchina soddisfa i requisiti di sicurezza delle direttive macchine 89/392/CEE.

Rated Impulse withstand Voltage (Uimp) 2.5kV

Rated Insulation Voltage (Ui) 500V

Pollution Degree 2

Rated Short Circuit Current (Iq)* 10kA

Short Circuit Co-ordination* Type 2

Ambient Temperature 0°C to 40°C.

Above 40°C de-rate linearly by 2% of unit FLC per °C to a derate of 40% at 60°C

Transport and Storage -25°C to +60°C

Altitude 1000m. Above 1000m de-rate linearly by 1% of unit FLC per 100m to a max. altitude of 2000m.

Humidity max. 85% non-condensing, not exceeding 50% at 40°C

IP Rating IP20 or IP00

Design Standards

IEC 60947-4-2;

EN60947-4-2

“AC Semiconductor Motor Controllers and Starters”

* When protected by recommended semiconductor fuse.

EMC EMISSION AND IMMUNITY LEVELS		
ESD immunity	IEC 61000-4-2	4kV contact. 8kV air discharge
R F immunity	IEC 61000-4-6	140dBuV over 0.15-80MHz
R F immunity	EC 61000-4-3	10V/m over 80 -1000MHz
Fast Transient immunity	IEC 61000-4-4	2kV/5kHz
Surge immunity	IEC 61000-4-5	2kV line to ground 1kV line to line
Conducted RF emissions	EN 55011	Class A
Radiated RF emissions	EN 55011	Class A

Operational Voltage (Ue)	230-460 VAC rms 3-Phase (-15% +10%)
Rated Frequency	50 - 60Hz +/- 2Hz
Form Designation	Form 1
Index Rating	Standard AC53a: 3-5: 99-10 Class 10A AC53a: 3-12: 99-10
Control Supply	24V DC approx 4VA supplied externally to terminals X1-X2. Power supply kit (12VA) available as part No. AMISC0005.
Start/Soft Stop Control	24V DC/110V AC galvanically isolated terminals A1-A2
Auxiliary Circuits (relays)	Run - 13/14, Ready - 23/24. 230VAC 3A, AC11.
Indication	Multi function LED on front panel
Start Time	0.5 to 12 seconds.
Stop Times	0 to 12 seconds
Start Duty	3 x FLC for 5 seconds at standard rating
Starts / Hour	10 starts per hour or 5 starts + 5 soft stops per hour Internally bypassed

Power Terminals

Input 1/L1, 3/L2 & 5/L3 output 2/T1, 4/T2 6/T3.
Up to 55kW (97Amp) IP20 Rated wire clamping terminals (unit is IP20)
75kW to 110kW (132Amp to 197Amp) External busbars (unit is IP00)

Earth Terminal External stud Up to 30kW/55Amp M6
37kW/66A to 110kW/195Amp M8

Model Name 400/460V Range	Standard Rating 3x FLC for 5 seconds 10 starts per Hr		Class 10A 3 x FLC for 12 seconds 10 starts per Hr		Ferraz Fuse for Type 2 coordination short circuit protection
	le (Arms)	Motor kW at 400V	le (Arms)	Motor kW at 400V	
SDF-02	22A	11kW	15.5A	7.5kW	6,9 URB 00 D08L 050
SDF-04	29A	15kW	22A	11kW	6,9 URB 00 D08L 100
SDF-06	41A	22kW	29A	15kW	
SDF-08	55A	30kW	41A	22kW	6,9 URB 00 D08L 125
SDF-12	66A	37kW	55A	30kW	
SDF-14	80A	45kW	66A	37kW	6,9 URD 31 D08A 200
SDF-16	97A	55kW	80A	45kW	
SDF-22	132A	75kW	97A	55kW	6,9 URD 31 D08A 0250
SDF-24	160A	90kW	132A	75kW	6,9 URD 31 D08A 0400
SDF-26	195A	110kW	160A	90kW	

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