SIEMENS

Compact Installation Instructions

SINAMICS G120C FSAA - FSC

Edition 09/2018

Scope of Delivery

- SINAMICS G120C converter.
- Mains supply terminal x1 (L1,L2,L3,Earth).
- Motor terminal x1 (U2,V2,W3, Earth).
- Brake resistor terminal x1 (R1,R2).
- I/O terminals.
- Screening plate.
- Cabinet information sticker (English/French).
- Multi-language warning labels.
- Accessory bag.

WARNING

Danger to life if the safety instructions and installation instructions are not observed

The compact installation instructions only contain the most important information for installing the inverter. If the safety instructions and installation instructions in the associated documentation are not observed, accidents involving severe injuries or death can occur

- Observe the safety instructions and installation instructions given in the associated documentation.
- See also https://support.industry.siemens.com/cs/ww/en/view/109744769

SINAMICS G120C Operating Instructions
https://support.industry.siemens.com/cs/ww/en/view/109744769

SINAMICS G120C Betriebsanleitung
https://support.industry.siemens.com/cs/ww/de/view/109744769

SINAMICS G120C Instructions de service
https://support.industry.siemens.com/cs/ww/fr/view/109744769

SINAMICS G120C Istruzioni operative
https://support.industry.siemens.com/cs/ww/it/view/109744769

SINAMICS G120C Instrucciones de servicio
https://support.industry.siemens.com/cs/ww/es/view/109744769

SINAMICS G120C 操作说明
https://support.industry.siemens.com/cs/cn/zh/view/109744769

Reading the OSS license terms

The inverter contains open-source software (OSS). OSS comprises open source text and satisfies special license terms. If you wish to read the license terms, you must transfer them from the inverter to a PC.

Procedure

To transfer the OSS license terms from the inverter to a PC, proceed as follows:

1. Switch off the inverter power supply.
2. Insert an empty memory card into the card slot of the inverter.
3. Switch on the inverter power supply.
4. When you have switched on the power supply, wait 30 seconds.
   During this time, the inverter writes the "Read_OSS.ZIP" file onto the memory card.
5. Switch off the inverter power supply.
6. Withdraw the memory card from the inverter.
7. Use a card reader and load the file to a PC.

You have then transferred the OSS license terms from the inverter to a PC, and you can now read the license terms.

OSS-Lizenzbedingungen lesen

Der Umrichter enthält Open Source Software (OSS). OSS besteht aus offengelegtem Quelltext und erfüllt besondere Lizenzbedingungen. Wenn Sie die Lizenzbedingungen lesen wollen, müssen Sie diese vom Umrichter auf einen PC übertragen.

Vorgehen

Um die OSS-Lizenzbedingungen vom Umrichter auf einen PC zu übertragen, gehen Sie folgendermaßen vor:

1. Schalten Sie die Stromversorgung des Umrichters aus.
2. Stecken Sie eine leere Speicherkarte in den Karten-Slot des Umrichters.
3. Schalten Sie die Stromversorgung des Umrichters ein.
4. Warten Sie 30 Sekunden nach dem Einschalten der Spannung.
   Der Umrichter schreibt in dieser Zeit die Datei "Read_OSS.ZIP" auf die Speicherkarte.
5. Schalten Sie die Stromversorgung des Umrichters aus.
6. Ziehen Sie die Speicherkarte aus dem Umrichter.
7. Laden Sie die Datei über einen Kartenleser in einen PC.

Sie haben die OSS-Lizenzbedingungen vom Umrichter auf einen PC übertragen und können die Lizenzbedingung lesen.

Lecture des conditions de licence OSS

Le variateur comporte un logiciel open source (OSS). OSS est constitué d'un code source accessible au public et remplit des conditions de licence particulières. Si vous voulez lire les conditions de licence, vous devez transférer celles-ci du variateur à un PC.

Marche à suivre

Pour transférer les conditions de licence OSS sur un PC, procédez comme suit :

1. Coupez l'alimentation du variateur.
2. Insérez une carte mémoire vide dans l'"emplacement pour carte du variateur.
3. Appliquer l'alimentation du variateur.
4. Attendre 30 secondes après mise sous tension.
   Le variateur copie pendant ce temps le fichier "Read_OSS.ZIP" sur la carte mémoire.
5. Coupez l'alimentation du variateur.
6. Retirez la carte mémoire du variateur.
7. Insérez la carte dans un lecteur de cartes du PC.

Les conditions de licence OSS ont été transférées du variateur sur un PC et peuvent à présent être lues.

Leer las condiciones de licencia del OSS

El convertidor incluye software fuente abierto (OSS). El OSS está compuesto por texto fuente de dominio público y cumple determinadas condiciones de licencia. Si desea leer dichas condiciones de licencia, deberá transferirlas del convertidor a un PC.

Procedimiento

Para transferir las condiciones de licencia del OSS del convertidor a un PC, proceda del siguiente modo:

1. Desconecte la alimentación del convertidor.
2. Inserte una tarjeta de memoria vacía en la ranura al efecto del convertidor.
3. Conecte la alimentación del convertidor.
4. Espere 30 segundos tras conectar la alimentación.
   Durante este tiempo el convertidor escribe el archivo "Read_OSS.ZIP" en la tarjeta de memoria.
5. Desconecte la alimentación del convertidor.
6. Extraiga la tarjeta de memoria del convertidor.
7. Cargue el archivo en un PC usando un lector de tarjetas.

Con ello habrá transferido las condiciones de licencia del OSS desde el convertidor a un PC y ya puede leerlas.

Lettura delle condizioni di licenza OSS

Il convertitore contiene software Open Source (OSS). L'OSS (Open Source Software) consiste di testo sorgente aperto e soddisfa particolari condizioni di licenza. Se si desidera leggere le condizioni di licenza, si devono trasferire le stesse dal convertitore a un PC.

Procedura

Procedere come segue per trasferire le condizioni di licenza OSS dal convertitore a un PC:

1. Disinserire l'alimentazione elettrica del convertitore.
2. Inserire una scheda di memoria vuota nell'apposito slot del convertitore.
3. Inserire l'alimentazione elettrica del convertitore.
4. Attendere 30 secondi dopo la messa sotto tensione.
   Durante questo tempo il convertitore registra sulla scheda di memoria il file "Read_OSS.ZIP".
5. Disinserire l'alimentazione elettrica del convertitore.
6. Estrarre la scheda di memoria dal convertitore.
7. Caricare il file in un PC tramite un lettore di schede.

Le condizioni di licenza OSS sono state trasferite dal convertitore ad un PC e sono così leggibili.

Installation in the United States and Canada (UL or CSA)

To install the inverter in compliance with UL/cUL, perform the following steps:

- The inverter must be mounted in the appropriate enclosure.
- Use the specified protection devices.
- A multi-motor drive is not permissible, i.e. simultaneously operating several motors connected to one inverter.
- The integrated semiconductor short-circuit protection in the inverter does not provide branch protection. Install branch protection in compliance with the National Electric Code and possibly relevant local regulations.
- Use copper cables, Class 1, ≥ 60° C for frame size FSAA with rated power ≤ 1.5 kW.
- Use copper cables, Class 1, 75° C for frame sizes FSAA (2.2 KW) and FSA … FSC.
- Leave parameter p0610 in its factory setting.
- The factory setting p0610 = 12 means: The inverter responds to motor overtemperature immediately with an alarm and after a certain time with a fault.
- When commissioning the drive system, set the motor overload protection to 115%, 230% or 400% of the rated motor current using parameter p0640.
- No user serviceable parts are contained within the inverter. For replacement fans, see Service and Support link.

Additional requirements for CSA compliance:

- Use the specified protection devices.
- Use a surge protection device with article no. 5SD7424-1.
- Alternative: Install the inverter with an external surge protection device with the following attributes:
  - Surge protection device with 'listed' test symbol: category checking numbers VZCA and VZCA7
  - Rated 480 V (Phase to Phase)
  - VPR maximum 2.5 kV (FSA-C), 4.0 kV (FSAA)
  - Suitable for SPD applications, type 1 or type 2.

Installation in den Vereinigten Staaten und Kanada (UL bzw. CSA)

Um den Umrichter UL/cUL-konform zu installieren, ergreifen Sie folgende Maßnahmen:

- Der Umrichter muss im geeigneten Gehäuse montiert werden.
- Verwenden Sie die angegebenen Sicherungseinrichtungen.
- Ein Mehrmotorenantrieb, das heißt der gleichzeitige Betrieb mehrerer Motoren an einem Umrichter, ist unzulässig.
- Der integrierte Halbleiter-Kurzschlussschutz im Umrichter bietet keinen Abzweigschutz. Installieren Sie den Abzweigschutz in Übereinstimmung mit dem National Electric Code und etwaigen zusätzlichen lokalen Vorschriften.
- Verwenden Sie Kupferleitungen der Klasse 1, ≥ 60° C für die Baugröße FSAA mit Bemessungsleistung ≤ 1,5 kW.
- Verwenden Sie Kupferleitungen der Klasse 1, 75° C für die Baugrößen FSAA (2,2 KW) und FSA … FSC.
- Belassen Sie den Parameter p0610 in Werkseinstellung.
- Die Werkseinstellung p0610 = 12 bedeutet: Der Umrichter reagiert auf eine Motorübertemperatur unmittelbar mit einer Warnung und nach einer bestimmten Zeit mit einer Störung.
- Stellen Sie bei der Inbetriebnahme des Antriebssystems den Motorüberlastschutz mit dem Parameter p0640 auf 115 %, 230 % oder 400 % des Motorbemessungsstromes ein.
- Im Umrichter befinden sich keine durch den Benutzer zu wartenden Teile. Für Austauschlüfter, siehe Link zu Service und Support.

Zusätzliche Anforderungen für CSA-Konformität:

- Verwenden Sie die angegebenen Sicherungseinrichtungen.
- Setzen Sie ein Überspannungsschutzgerät mit der Artikelnummer 5SD7424-1 ein.
- Alternative: installieren Sie den Umrichter mit einem externen Überspannungsschutzgerät mit folgenden Merkmalen:
  - Überspannungsschutzgerät mit Listed-Prüfzeichen: Kategoriekontrollnummer VZCA und VZCA7
  - Bemessungsspannung 480 V (Phase-Phase)
  - VPR maximal 2,5 kV (FSA-C), 4,0 kV (FSAA)
  - Geeignet für SPD-Anwendung Typ 1 oder Typ 2

Installation aux Etats-Unis et au Canada (UL ou CSA)

Pour installer le variateur conformément à UL/cUL, prendre les mesures suivantes :

- Le variateur doit être installé dans une enceinte appropriée.
- Utilisez les équipements de sécurité indiqués.
- L'entraînement à commande sectionnelle, c'est-à-dire l'exploitation de plusieurs moteurs sur un variateur, n'est pas admissible.
- La protection intégrée contre les courts-circuits à semi-conducteur dans le variateur n'offre aucune protection des dérivations. Toute protection de dérivation doit être installée en conformité avec le National Electric Code ainsi qu'avec d'éventuelles prescriptions locales complémentaires.
- Utilisez des câbles cuivre de classe 1, ≥ 60° C pour la taille FSAA avec une puissance assignée ≤ 1,5 kW.
- Utilisez des câbles cuivre de classe 1, 75° C pour les tailles FSAA (2,2 KW) et FSA … FSC.
- Ne pas modifier le réglage d'usine du paramètre p0610.
- Le réglage d'usine p0610 = 12 signifie : le variateur réagit à une surchauffe du moteur immédiatement en déclenchant une alarme et après un certain temps en déclenchant un défaut.
- Lors de la mise en service du moteur, régler à l'aide du paramètre p0640 la protection du moteur contre les surcharges sur 115 %, 230 % ou 400 % du courant nominal du moteur.
- Le variateur ne contient aucune pièce pouvant faire l'objet d'une maintenance par l'utilisateur. Pour remplacer les ventilateurs, se référer au lien relatif à la Maintenance et à l'Assistance.

Exigences supplémentaires concernant la conformité CSA :

- Utilisez les équipements de protection indiqués.
- Utiliser un appareil de protection contre les surtensions avec le numéro d'article 5SD7424 1.
- Alternative : installer le variateur avec un appareil externe de protection contre les surtensions présentant les caractéristiques suivantes :
  - Appareil de protection contre les surtensions avec la marque d'homologation UL : numéros de contrôle de catégorie VZCA et VZCA7
  - Tension assignée 480 V (triphasée)
  - Protection de tension nominale maximum VPR 2,5 kV (FSA-C), 4,0 kV (FSAA)
  - Convient pour une application SPD, type 1 ou type 2

Instalación en EE. UU. y Canadá (UL o CSA, resp.)

Para instalar el convertidor de acuerdo con las normas de UL/cUL, tome las siguientes medidas:

- El convertidor debe montarse dentro de una caja o envolvente adecuada.
- Utilice los dispositivos de protección especificados.
- No se permite un accionamiento multimotor; es decir, la alimentación simultánea de varios motores desde un solo convertidor.
- La protección de semiconductores contra cortocircuitos integrada en el convertidor no protege las derivaciones. Instale la protección de derivaciones conforme al National Electric Code y a cualquier otra normativa local aplicable.
- Utilice cables de cobre de clase 1, ≥ 60° C para el tamaño FSAA con intensidad asignada ≤ 1,5 kW.
- Utilice cables de cobre de clase 1, 75° C para los tamaños FSAA (2,2 KW) y FSA ... FSC.
- Deje el parámetro p0610 con el ajuste que viene de fábrica.
- El ajuste de fábrica p0610 = 12 significa: El convertidor reacciona a un exceso de temperatura del motor inmediatamente con una alarma y, tras un cierto tiempo, con un fallo.
- Al poner en marcha el sistema de accionamiento ajuste la protección de sobrecarga del motor al 115&, 230% o 400% de la intensidad asignada del motor usando el parámetro p0640
- Dentro del convertidor no hay piezas que requieran servicio por el usuario. Para reemplazar el ventilador, visite la web de Servicio y Soporte

Requisitos adicionales para conformidad con CSA:

- Utilice los dispositivos de protección especificados.
- Utilice un protector contra sobretensiones con referencia 5SD7424-1.
- Alternativa: instale el convertidor con un protector contra sobretensiones externo que posea las siguientes características:
  - Protector contra sobretensiones con marca de "listado": números de control de categoría VZCA y VZCA7
  - Tensión asignada de 480 V (entre fases)
  - VPR máxima 2,5 kV (FSA-C) o 4,0 kV (FSAA)
  - Apropiado para aplicaciones SPD, tipo 1 o tipo 2.

Installazione negli Stati Uniti e in Canada (UL o CSA)

- Per un'installazione del convertitore conforme a UL/cUL, adottare le seguenti misure:
- Il convertitore deve essere montato in un cabinet adatto
- Utilizzare i dispositivi di sicurezza indicati
- Un azionamento con più motori, ossia il funzionamento contemporaneo di più motori con un convertitore, non è ammesso.
- La protezione da cortocircuito a semiconduttori integrata nel convertitore non offre alcuna protezione della partenza. Installare la protezione partenza in conformità con il National Electric Code e le eventuali norme aggiuntive locali.
- Utilizzare solo cavi in rame di classe 1, ≥ 60° C per la grandezza costruttiva FSAA con potenza nominale ≤ 1,5 kW.
- Utilizzare solo cavi in rame di classe 1, 75° C per le grandezze costruttive FSAA (2,2 KW) e FSA … FSC.
- Lasciare il parametro p0610 sull'impostazione di fabbrica.
- L'impostazione di fabbrica p0610 = 12 significa: il convertitore reagisce a una sovratemperatura del motore immediatamente con un avviso e dopo un certo tempo con un'anomalia.
- Alla messa in servizio del sistema di azionamento, impostare tramite il parametro p0640 la protezione da sovraccarichi del motore al 115%, 230% o 400% della corrente nominale dello stesso.
- Il convertitore non contiene parti di cui l'utente possa effettuare la manutenzione. Per i ventilatori di ricambio, vedere il link Service and Support.

Ulteriori requisiti per la conformità CSA:

- Utilizzare i dispositivi di sicurezza indicati.
- Utilizzare un dispositivo di protezione da sovratensione con il numero di articolo 5SD7424 1.
- Alternativa: installare il convertitore con un dispositivo di protezione da sovratensione esterno che abbia le seguenti caratteristiche:
  - Dispositivo di protezione da sovratensione con marchio di collaudo Listed: numero di controllo di categoria VZCA e VZCA7
  - 480 V nominali (da fase a fase)
  - VPR max. 2,5 kV (FSA-C), 4,0 kV (FSAA)
  - Adatto per applicazione SPD, tipo 1 o tipo 2

Rating plate and technical data

Frame size	Rated output power	Rated output current	Article No.	
	Based on low overload		Without filter	With filter
FSAA	0.55 kW	1.7 A	6SL3210-1KE11-8U☐2	6SL3210-1KE11-8A☐2
	0.75 kW	2.2 A	6SL3210-1KE12-3U☐2	6SL3210-1KE12-3A☐2
	1.1 kW	3.1 A	6SL3210-1KE13-2U☐2	6SL3210-1KE13-2A☐2
	1.5 kW	4.1 A	6SL3210-1KE14-3U☐2	6SL3210-1KE14-3A☐2
	2.2 kW	5.6 A	6SL3210-1KE15-8U☐2	6SL3210-1KE15-8A☐2
FSA	0.55 kW	1.7 A	6SL3210-1KE11-8U☐1	6SL3210-1KE11-8A☐1
	0.75 kW	2.2 A	6SL3210-1KE12-3U☐1	6SL3210-1KE12-3A☐1
	1.1 kW	3.1 A	6SL3210-1KE13-2U☐1	6SL3210-1KE13-2A☐1
	1.5 kW	4.1 A	6SL3210-1KE14-3U☐1	6SL3210-1KE14-3A☐1
	2.2 kW	5.6 A	6SL3210-1KE15-8U☐1	6SL3210-1KE15-8A☐1
	3.0 kW	7.3 A	6SL3210-1KE17-5U☐1	6SL3210-1KE17-5A☐1
	4.0 kW	8.8 A	6SL3210-1KE18-8U☐1	6SL3210-1KE18-8A☐1
FSB	5.5 kW	12.5 A	6SL3210-1KE21-3U☐1	6SL3210-1KE21-3A☐1
	7.5 kW	16.5 A	6SL3210-1KE21-7U☐1	6SL3210-1KE21-7A☐1
FSC	11.0 kW	25.0 A	6SL3210-1KE22-6U☐1	6SL3210-1KE22-6A☐1
	15.0 kW	31.0 A	6SL3210-1KE23-2U☐1	6SL3210-1KE23-2A☐1
	18.5 kW	37.0 A	6SL3210-1KE23-8U☐1	6SL3210-1KE23-8A☐1
SINAMICS G120C USS/MB (USS, Modbus RTU)			B	B
SINAMICS G120C DP (PROFIBUS)			P	P
SINAMICS G120C PN (PROFINET, EtherNet/IP)			F	F

Permissible Type E combination motor controller (NKJH)

Frame size	Rated power	Inverter article number	Type E combination motor controller			SCCR [3]	Control cabinet [4]
			Article number	Imax [1]	PN [2]		
FSAA, FSA	0.55 kW 0.75 kW 1.1 kW 1.5 kW 2.2 kW	6SL3210-1KE11-8… 6SL3210-1KE12-3… 6SL3210-1KE13-2… 6SL3210-1KE14-3… 6SL3210-1KE15-8…	3RV2011-1JA.. or 3RV2021-1JA..	10 A	5 HP	65 kA, 480Y / 277 VAC	≥ 1830 in³
FSA	3.0 kW 4.0 kW	6SL3210-1KE17-5… 6SL3210-1KE18-8…	3RV2011-4AA.. or 3RV2011-4AA..	16 A	10 HP	65 kA, 480Y / 277 VAC	≥ 1830 in³
			3RV1031-4AA..	16 A	10 HP	65 kA, 480Y / 277 VAC	≥ 1830 in³
FSB	5.5 kW 7.5 kW	6SL3210-1KE21-3… 6SL3210-1KE21-7…	3RV2021-4DA..	25 A	15 HP	65 kA, 480Y / 277 VAC	≥ 3660 in³
			3RV2021-4EA..	32 A	20 HP	50 kA, 480Y / 277 VAC	≥ 3660 in³
			3RV1031-4EA.. 3RV2031-4EA..	32 A	20 HP	65 kA, 480Y / 277 VAC	≥ 3660 in³
FSC	11 kW 15 kW 18.5 kW	6SL3210-1KE22-6… 6SL3210-1KE23-2… 6SL3210-1KE23-8…	3RV1031-4HA..	50 A	40 HP	65 kA, 480Y / 277 VAC	≥ 12200 in³
			3RV1041-4JA..	63 A	50 HP	65 kA, 480Y / 277 VAC	≥ 12200 in³

1) Maximum rated current of the Type E combination motor controller. You may use NKJH-listed Type E combination motor controller of the same type - with a rated voltage ≥ 480 V AC and with a lower rated current - which match the inverter.
2) Rated power of the Type E combination motor controller at 460 V AC
3) Short-circuit current rating of the branch circuit
4) Minimum volume of a control cabinet approved according to UL in which the inverter is installed. UL does not specify any minimum value of the control cabinet for inverters FSA … FSC with fuses, Class AJT from Mersen (Ferraz Shawmut).

Permissible circuit-breakers (DIVQ)

Frame size	Rated power	Inverter article number	Circuit breaker		SCCR [2]	Control cabinet [3]
			Article number	Imax [1]		
FSAA, FSA	0.55 kW 0.75 kW 1.1 kW 1.5 kW 2.2 kW	6SL3210-1KE11-8… 6SL3210-1KE12-3… 6SL3210-1KE13-2… 6SL3210-1KE14-3… 6SL3210-1KE15-8…	3RV1742, LGG or CED6	15 A	5 kA, 480 VAC	≥ 1830 in³
			3RV2711	15 A	5 kA, 480Y / 277 VAC	≥ 1830 in³
FSA	3.0 kW 4.0 kW	6SL3210-1KE17-5… 6SL3210-1KE18-8…	3RV1742, LGG or CED6	15 A	65 kA, 480 VAC	≥ 1830 in³
			3RV2711	15 A	65 kA, 480Y / 277 VAC	≥ 1830 in³
FSB	5.5 kW 7.5 kW	6SL3210-1KE21-3… 6SL3210-1KE21-7…	NCGA	35 A	35 kA, 480 VAC	≥ 3660 in³
			3RV2721	35 A	50 kA, 480Y / 277 VAC	≥ 3660 in³
			LGG, CED6 or HCGA	35 A	65 kA, 480 VAC	≥ 3660 in³
			3RV1742	35 A	65 kA, 480Y / 277 VAC [4]	≥ 3660 in³
			3RV2711	35 A	65 kA, 480Y / 277 VAC	≥ 3660 in³
FSC	11 kW 15 kW 18.5 kW	6SL3210-1KE22-6… 6SL3210-1KE23-2… 6SL3210-1KE23-8…	NCGA	60 A	35 kA, 480 VAC	≥ 8780 in³
		6SL3210-1KE23-2…	LGG, CED6 or HCGA	60 A	65 kA, 480 VAC	≥ 8780 in³
		6SL3210-1KE23-8…	3RV1742	60 A	65 kA, 480Y / 277 VAC [4]	≥ 8780 in³

1) Maximum rated current of the circuit-breaker
2) Short-circuit current rating of the branch circuit
3) Minimum volume of a control cabinet approved according to UL in which the inverter is installed. UL does not specify any minimum value of the control cabinet for inverters FSA … FSC with fuses, Class AJT from Mersen (Ferraz Shawmut).
4) 65 kA, 480 VAC with rated current < 35 A

Permissible circuit protection with non-semiconductor fuses of Classes J, T, CC, G or CF (JDDZ)

Frame size	Rated power	Inverter article number	Imax [1]	SCCR [2]	Control cabinet [3]
FSAA, FSA	0.55 kW 0.75 kW 1.1 kW 1.5 kW 2.2 kW	6SL3210-1KE11-8… 6SL3210-1KE12-3… 6SL3210-1KE13-2… 6SL3210-1KE14-3… 6SL3210-1KE15-8…	10 A	100 kA, 480 V 3 AC	≥ 1830 in³
FSA	3.0 kW 4.0 kW	6SL3210-1KE17-5… 6SL3210-1KE18-8…	15 A	100 kA, 480 V 3 AC	≥ 1830 in³
FSB	5.5 kW 7.5 kW	6SL3210-1KE21-3… 6SL3210-1KE21-7…	35 A	100 kA, 480 V 3 AC	≥ 3660 in³
FSC	11 kW 15 kW 18.5 kW	6SL3210-1KE22-6… 6SL3210-1KE23-2… 6SL3210-1KE23-8…	60 A	100 kA, 480 V 3 AC	≥ 12200 in³

1) Maximum rated current of the fuse
2) Short-circuit current rating of the branch circuit
3) For FSA ... FSC only, providing the branch circuit protection is a class AJT fuse by Mersen (Ferraz Shawmut) no minimum volume is specified.

Branch circuit protection according to the IEC standard

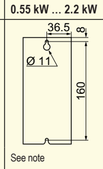
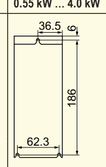
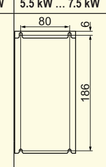
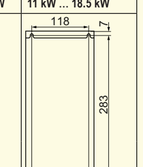
Frame size	Rated power	Inverter article number	Article number		Imax [1]	Control cabinet [2]
			Fuse	Circuit-breaker		
FSAA, FSA	0.55 kW 0.75 kW 1.1 kW 1.5 kW 2.2 kW	6SL3210-1KE11-8… 6SL3210-1KE12-3… 6SL3210-1KE13-2… 6SL3210-1KE14-3… 6SL3210-1KE15-8…	3NA3803	3RV2011-1JA.. or 3RV2021-1JA..	10 A	≥ 0.03 m³
FSA	3.0 kW 4.0 kW	6SL3210-1KE17-5… 6SL3210-1KE18-8…	3NA3805	3RV2011-4AA.. or 3RV2021-4AA..	16 A	
FSB	5.5 kW 7.5 kW	6SL3210-1KE21-3… 6SL3210-1KE21-7…	3NA3812	3RV2021-4EA..	32 A	≥ 0.06 m³
FSC	11 kW 15 kW 18.5 kW	6SL3210-1KE22-6… 6SL3210-1KE23-2… 6SL3210-1KE23-8…	3NA3822	3RV1041-4JA..	63 A	≥ 0.2 m³

1) Maximum rated current of the protection device. You may also use protective devices 3NA38.. and 3RV with a lower rated current.
2) Minimum volume of the control cabinet in which the inverter is installed. The restriction applies only for a protection with a circuit-breaker.

Branch circuit protection according to the UL standard

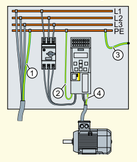
Protection device	UL category
Fuses of any manufacturer with faster tripping characteristic than class RK5, e.g. class J, T, CC, G, or CF	JDDZ
SIEMENS circuit breaker	DIVQ
Type E combination motor controller (designation according to the UL standard), is available as SIEMENS circuit breaker	NKJH

Drill Patterns

	Frame size AA 0.55 kW … 2.2 kW	Frame Size A 0.55 kW … 4.0 kW	Frame size B 5.5 kW … 7.5 kW	Frame size C 11 kW … 18.5 kW
Drilling pattern Note: Drilling pattern without shield plate When the shield plate is mounted, the drilling pattern is compatible to FSA				
Mounting parts	2 x M4 bolts 2 x M4 nuts 2 x M4 washers	3 x M4 studs, 3 x M4 nuts, 3 x M4 washers	4 x M4 studs, 4 x M4 nuts, 4 x M4 washers	4 x M5 studs, 4 x M5 nuts, 4 x M5 washers
Tightening torques	2.5 Nm	2.5 Nm	2.5 Nm	2.5 Nm

Dimensioning the protective conductor

Observe the local regulations for protective conductors subject to an increased leakage current at the site of operation.



① Protective conductor for line feeder cables
② Protective conductor for inverter line feeder cables
③ Protective conductor between PE and the electrical cabinet
④ Protective conductor for motor feeder cables

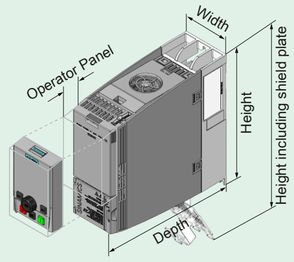
The minimum cross-section of the protective conductor ① … ④ depends on the cross- section of the line or motor feeder cable:

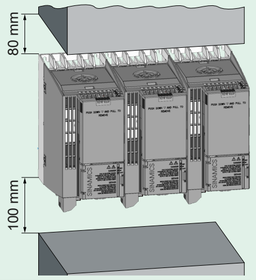
- Line or motor feeder cable ≤ 16 mm²
  - Minimum cross-section of the protective conductor = cross-section of the line or motor feeder cable 16 mm² < line or motor feeder cable ≤ 35 mm²
  - Minimum cross-section of the protective conductor = 16 mm²
- Line or motor feeder cable > 35 mm²
  - Minimum cross-section of the protective conductor = ½ cross-section of the line or motor feeder cable

Additional requirements placed on the protective conductor ①:

- For permanent connection, the protective conductor must fulfill at least one of the following conditions:
  - The protective conductor is routed so that it is protected against damage along its complete length. Cables routed inside electrical cabinets or enclosed machine housings are considered to be adequately protected against mechanical damage.
  - As a conductor of a multi-conductor cable, the protective conductor has a cross-section ≥ 2.5 mm² Cu.
  - For an individual conductor, the protective conductor has a cross-section ≥ 10 mm² Cu.
  - The protective conductor consists of two conductors with the same cross-section.
- When connecting a multi-core cable using an industrial plug connector according to EN 60309, the protective conductor must have a cross-section of ≥ 2.5 mm² Cu.

Mounting Specifications



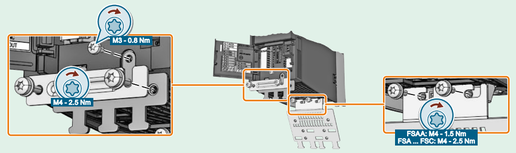


	Frame size AA 0.55 kW … 2.2 kW	Frame Size A 0.55 kW … 4.0 kW	Frame Size B 5.5 kW … 7.5 kW	Frame Size C 11 kW … 18.5 kW
Height including connectors	181 mm	196 mm	196 mm	295 mm
Height including shield plate	268 mm	276 mm	276 mm	375 mm
Width	73 mm	73 mm	100 mm	140 mm
Depth of the inverter with PROFINET interface	178 mm	226 mm	226 mm	226 mm
Depth of the inverter with USS/MB, CANopen, or PROFIBUS interface	155 mm	203 mm	203 mm	203 mm
Additional depth when the Operator Panel is attached	+ 21 mm with IOP (Intelligent Operator Panel) attached			
	+ 11 mm with BOP-2 (Basic Operator Panel) attached			
Weight (kg)	1.1	2.1	2.7	5.2
Max. surrounding air temperature	40 °C			

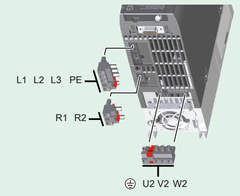
Cross-sections and tightening torques

Frame size	Rated power	Converter connection cross-section (tightening torque)	
FSAA, FSA	0.55 kW ... 4.0 kW	1.0 ... 2.5 mm² (0.5 Nm)	18 ... 14 AWG (4.5 lbf in)
FSB	5.5 kW ... 7.5 kW	4.0 ... 6.0 mm² (0.6 Nm)	12 ... 10 AWG (5.5 lbf in)
FSC	11 kW	6.0 ... 16.0 mm² (1.5 Nm)	10 ... 5 AWG (13.5 lbf in)
	15 kW ... 18.5 kW	10.0 ... 16.0 mm² (0.5 Nm)	7 ... 5 AWG (13.5 lbf in)

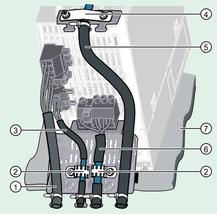
Fitting shield plates



Converter Connections

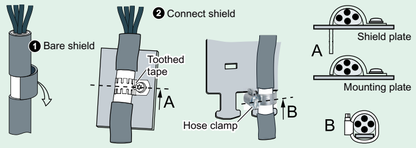


EMC compliant Connections



① Unshielded line cable
② Toothed tapes on the shield plate of the inverter
③ Shielded cable to the braking resistor
④ Shield clamp for the cable to the terminal strip on the shield plate of the inverter
⑤ Shielded cables to the terminal strip, to the fieldbus and to the motor temperature sensor
⑥ Shielded motor cable
⑦ Unlacquered, good electrically conducting mounting plate

EMC shield connection



Fieldbus interface assigment

X126 CAN (9-pin, 9 6 / 5 1)

1	---
2	CAN_L, CAN signal (dominant low)
3	CAN_GND, ground
4	---
5	CAN _SHLD, shield
6	GND, optional ground
7	CAN_H, CAN signal (dominant high)
8	---
9	---

X128 RS485 (5-pin, 1 5)

1	0 V
2	RS485P, receive and transmit (+)
3	RS485N, receive and transmit (-)
4	Shield
5	---

X126 PROFIBUS (9-pin, 6 9 / 1 5)

1	---
2	---
3	RxD/TxD-P, receive and transmit (B/B')
4	CNTR-P, control signal
5	GND, reference for data (C/C')
6	+ 5 V power supply
7	---
8	RxD/TxD-N, receive and transmit (A/A')
9	---

X150 P1 / X150 P2 PROFINET (8-pin, 8 ... 1)

1	RX+ Receive data +
2	RX- Receive data -
3	TX+ Transmit data +
4	---
5	---
6	TX- Transmit data -
7	---
8	---

Description files for fieldbuses

Generic Station Description (GSD) for PROFIBUS
http://support.automation.siemens.com/WW/view/en/23450835

GSD Markup Language (GSDML) for PROFINET
http://support.automation.siemens.com/WW/view/en/26641490

Electronic Data Sheet (EDS) for CANopen
http://support.automation.siemens.com/WW/view/en/48351511

Operator Panels and Commissioning Tools

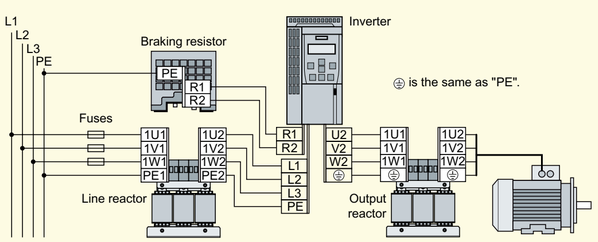
Compatible Operator Panels and Control Units
http://support.automation.siemens.com/WW/view/en/67273266

Operating Instructions for Operator Panels
http://support.automation.siemens.com/WW/view/en/30563514/133300

Startdrive commissioning software download
http://support.automation.siemens.com/WW/view/en/68034568

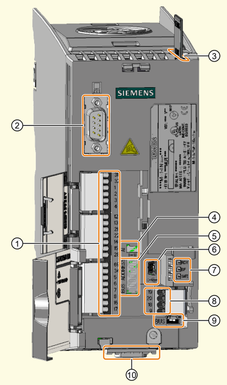
STARTER commissioning software download
http://support.automation.siemens.com/WW/view/en/26233208

Connection with options



Inverter intefaces

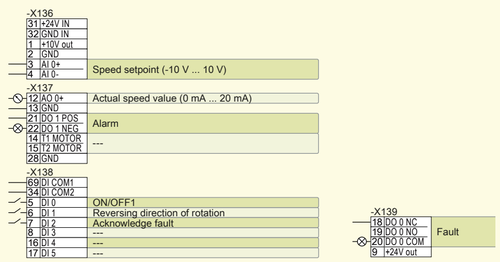
To access the interfaces at the front of the inverter, you must unplug the operator panel (if one is being used) and open the front doors.



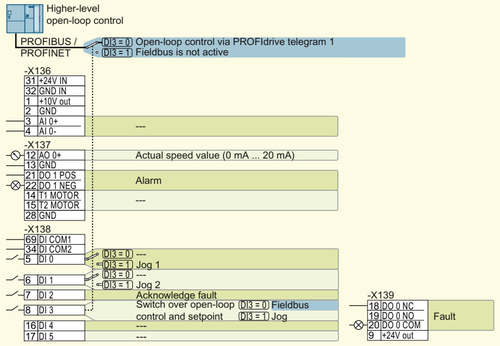
① Terminal strip
② Connection to the operator panel
③ Memory card slot
④ Switch for analog input:
I 0/4 mA … 20 mA
U -10/0 V … 10 V
AI
⑤ Selecting the fieldbus address:
• PROFIBUS
• USS
• Modbus RTU
• CanOpen
⑥ USB interface for connection to a PC
⑦ Status LED:
LNK1 LNK2 RDY BF SAFE
⑧ Terminal strip
⑨ Depending on the fieldbus:
• No function for PROFIBUS and PROFINET
• Bus termination for USS, Modbus and CANopen
⑩ Fieldbus interface

Factory settings of the interfaces

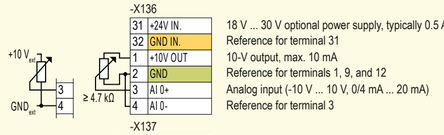
Factory default setting for G120C USS and G120C CAN



Factory default settings G120C DP and G120C PN



Layout of terminal strip



-X136

31	+24V IN.	18 V ... 30 V optional power supply, typically 0.5 A
32	GND IN.	Reference for terminal 31
1	+10V OUT	10-V output, max. 10 mA
2	GND	Reference for terminals 1, 9, and 12
3	AI 0+	Analog input (-10 V ... 10 V, 0/4 mA ... 20 mA)
4	AI 0-	Reference for terminal 3

-X137

12	AO 0+	Analog output (0 V ... 10 V, 0 mA ... 20 mA)
13	GND	Reference for terminals 1, 9, and 12
21	DO 1+	Digital output, max. 0.5 A, 30 V DC
22	DO 1-	
14	T1 MOTOR	Temperature sensor (PTC, KTY84, Pt1000, bimetal)
15	T2 MOTOR	
28	GND	Reference for terminals 1, 9, and 12

-X138

69	DI COM1	Reference for terminals 5, 7, and 16
34	DI COM2	Reference for terminals 6, 8, and 17
5	DI 0	Digital inputs, for contacts switching to P or N, low < 5 V, high > 11 V, max. 30 V
6	DI 1	
7	DI 2	
8	DI 3	
16	DI 4	
17	DI 5	

-X139

19	DO 0 NO	Digital output, max. 0.5 A, 30 V DC
20	DO 0 COM	
18	DO 0 NC	
9	+24V OUT	24-V output, max. 100 mA

Technical Support contact

Siemens Service and Support
http://www.siemens.com/automation/service&support

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+49 (0)911 895 7222

+39 (02) 24362000

+34 902 237 238

Environmentally friendly documentation

To help reduce the amount of paper being produced, all documentation is available for immediate download. Just follow the hyperlinks or scan the QR codes to be taken directly to the required document.

Download manuals from Siemens Support site

SINAMICS G120C compact operating instructions
https://support.industry.siemens.com/cs/ww/en/view/109477359

EMC installation guideline
http://support.automation.siemens.com/WW/view/en/60612658

SINAMICS G120C List Manual
https://support.industry.siemens.com/cs/ww/en/view/109477254

"Fieldbus" function manual
https://support.industry.siemens.com/cs/ww/en/view/109477369

"Safety Integrated" function manual
https://support.industry.siemens.com/cs/ww/en/view/109477367

Underwriters Laboratories
UL and CUL LISTED POWER CONVERSION EQUIPMENT for use in a pollution degree 2 environment

ISO 9001
Siemens plc operates a quality management system, which complies with the requirements of ISO 9001.

European Low Voltage Directive
Europäische Niederspannungsrichtlinie
Directive européenne basse tension
Directiva europea "Baja tension"
Direttiva europea sulla bassa tensione

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Änderungen vorbehalten

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