MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

Reference package for procurement and maintenance review

SIEMENS

## 6SL3120-1TE15-0AA3

**BOOKSIZE SINGLE MOTOR MODULE**

Used with the applicable SINAMICS S120 Booksize configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Siemens NC61 2007/2008, SINAMICS S120 Booksize Single Motor Modules, pages 9/47 and 9/48

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## Overview

A wide range of single-axis and two-axis Motor Modules with graded current/power ratings can be supplied:

- Single Motor Modules: Single-axis variant
  Booksize format with rated output currents of 3 A to 200 A
- Double Motor Modules: Two-axis variant
  Booksize format with rated output currents of 3 A to 18 A

In principle, all Single Motor and Double Motor Modules can be operated on Smart Line Modules or Active Line Modules for the corresponding voltage range.

## Design



The Single Motor Modules in booksize format feature the following interfaces as standard:

- 2 DC link connections via integrated DC link busbars
- 1 electronics power supply connection via integrated 24 V DC busbars
- 3 DRIVE-CLiQ sockets
- 1 motor connection, plug-in (not included in scope of supply) or screw-stud depending on rated output current
- 1 safe standstill input (enable pulses)
- 1 safe motor brake control
- 1 temperature sensor input (KTY84-130 or PTC)
- 2 PE (protective earth) connections

The status of the Motor Modules is indicated via two multi-color LEDs.

The motor cable shield is inside the connector on 50 mm (1.97 in) and 100 mm (3.94 in) width modules. A shield connection kit can be supplied for 150 mm, 200 mm and 300 mm (5.91 in, 7.87 in and 11.81 in) wide modules. On these modules, the motor cable shield can be connected using a tube clip.

The signal cable shield can be connected to the Motor Module by means of a shield connection terminal, e.g. Weidmüller type KLBÜ 3-8 SC.

## Design (continued)

The scope of supply of the Motor Modules includes:

- DRIVE-CLiQ cable (length depends on module width) to connect Motor Module to adjacent module
- Jumper for connecting the 24 V DC busbar to the adjacent Motor Module
- Connector X21
- Connector X11 for the motor brake connection (for Motor Modules with a rated output current of 45 A to 200 A)
- 2 blanking plugs for sealing unused DRIVE-CLiQ sockets
- Fan insert for the 132 A and 200 A Motor Modules (the voltage for the fan insert is supplied by the Motor Module)
- 1 set of warning signs in foreign languages

## Integration

Single Motor Modules communicate with a CU320 Control Unit or SINUMERIK solution line via DRIVE-CLiQ.

## Technical specifications

*General technical specifications*

| | |
|---|---|
| **DC link voltage**<br>Up to 2000 m (6562 ft) above sea level | 510 ... 720 V DC<br>(line voltage 380 ... 480 V 3 AC) |
| **Output frequency** | |
| • Control type Servo | 0 ... 650 Hz[1)] |
| • Control type Vector | 0 ... 300 Hz[1)] |
| • Control type *V/f* | 0 ... 300 Hz[1)] |
| **Electronics power supply** | 24 V DC -15%/+20% |
| **Type of cooling** | • Internal/external air cooling, power sections with increased air cooling by means of built-in fan<br>• Cold-plate cooling on request |
| **Permissible ambient or coolant temperature (air)**<br>in operation for line-side components, Line Modules and Motor Modules | 0 ... 40 °C (32 ... 104 °F) without derating,<br>> 40 ... 55 °C (104 ... 131 °F), see derating characteristics |
| **Installation altitude** | Up to 1000 m (3281 ft) above sea level without derating,<br>> 1000 ... 4000 m (3281 ... 13124 ft) above sea level, see derating characteristics |
| **Conformity** | CE (low-voltage and EMC directives) |
| **Approvals** | cULus (File No.: E192450) |

[1)] Note correlation between max. output frequency, pulse frequency and current derating; see system description on the CD-ROM supplied with the catalog for further information.

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## Single Motor Modules in booksize format

### Technical specifications (continued)

DC link voltage 510 ... 720 V DC

| Order No. | | | | | | |
|---|---|---|---|---|---|---|
| • Internal air cooling | | 6SL3120-1TE13-0AA3 | 6SL3120-1TE15-0AA3 | 6SL3120-1TE21-0AA3 | 6SL3120-1TE21-8AA3 | 6SL3120-1TE23-0AA3 |
| • External air cooling | | 6SL3121-1TE13-0AA3 | 6SL3121-1TE15-0AA3 | 6SL3121-1TE21-0AA3 | 6SL3121-1TE21-8AA3 | 6SL3121-1TE23-0AA3 |
| **Product name** | | Single Motor Modules in booksize format | | | | |
| **Output current** | | | | | | |
| • Rated current $I_{rated}$ | A | 3 | 5 | 9 | 18 | 30 |
| • Base load current $I_H$ | A | 2.6 | 4.3 | 7.7 | 15.3 | 25.5 |
| • for S6 duty (40%) $I_{S6}$ | A | 3.5 | 6 | 10 | 24 | 40 |
| • $I_{max}$, maximum | A | 6 | 10 | 18 | 36 | 56 |
| **Power** | | | | | | |
| • with 600 V DC link voltage | kW (HP) | 1.6 (1.5) | 2.7 (3) | 4.8 (5) | 9.7 (10) | 16.0 (20) |
| • based on $I_H$ | kW (HP) | 1.4 (1) | 2.3 (2.5) | 4.1 (5) | 8.2 (10) | 13.7 (18) |
| **Rated pulse frequency** | kHz | 4 | 4 | 4 | 4 | 4 |
| **DC link current $I_d$** [1] | A | 3.6 | 6 | 11 | 22 | 36 |
| **Current capacity** | | | | | | |
| • 24 V DC busbars | A | 20 | 20 | 20 | 20 | 20 |
| | | If, due to a number of Line and Motor Modules being mounted side-by-side, the current carrying capacity exceeds 20 A, an additional 24 V DC connection using a 24 V terminal adapter is required (connection cross-section, max. 6 mm$^2$, fuse protection, max. 20 A). | | | | |
| • DC link busbars | A | 100 | 100 | 100 | 100 | 100 |
| **DC link capacitance** | µF | 110 | 110 | 110 | 220 | 710 |
| **Current requirement** with 24 V DC, max. | A | 0.85 | 0.85 | 0.85 | 0.85 | 0.9 |
| **Power loss** | | | | | | |
| • Internal air cooling | kW | 0.035 | 0.055 | 0.080 | 0.165 | 0.290 |
| • External air cooling int./ext. [2] | kW | 0.015/0.015 | 0.023/0.03 | 0.035/0.045 | 0.075/0.09 | 0.08/0.210 |
| **Cooling air requirement** | m$^3$/s (ft$^3$/s) | 0.008 (0.283) | 0.008 (0.283) | 0.008 (0.283) | 0.008 (0.283) | 0.016 (0.565) |
| **Sound pressure level** | dB (A) | < 60 | < 60 | < 60 | < 60 | < 60 |
| **Motor connection** U2, V2, W2 | | Plug-in connector (X1) [3], max. 30 A | | | | |
| **Shield connection** | | Integrated in connector (X1) | | | | |
| **PE connection** | | On housing with M5 screw | | | | |
| **Motor brake connection** | | Integrated into the plug-in motor connector (X1), 24 V DC, 2 A | | | | |
| **Motor cable length, max.** | | | | | | |
| • Shielded | m (ft) | 50 (164) | 50 (164) | 50 (164) | 70 (230) | 70 (230) |
| • Unshielded | m (ft) | 75 (246) | 75 (246) | 75 (246) | 100 (328) | 100 (328) |
| **Degree of protection** | | IP20 | IP20 | IP20 | IP20 | IP20 |
| **Dimensions** | | | | | | |
| • Width | mm (in) | 50 (1.97) | 50 (1.97) | 50 (1.97) | 50 (1.97) | 100 (3.94) |
| • Height | mm (in) | 380 (14.98) | 380 (14.98) | 380 (14.98) | 380 (14.98) | 380 (14.98) |
| • Depth | | | | | | |
| - with internal air cooling | mm (in) | 270 (10.63) | 270 (10.63) | 270 (10.63) | 270 (10.63) | 270 (10.63) |
| - with external air cooling in front of/behind mounting surface | mm (in) | 226/66.5 (8.9/2.6) | 226/66.5 (8.9/2.6) | 226/66.5 (8.9/2.6) | 226/66.5 (8.9/2.6) | 226/66.5 (8.9/2.6) |
| **Weight, approx.** | | | | | | |
| • with internal air cooling | kg (lb) | 5.0 (11) | 5.0 (11) | 5.0 (11) | 5.0 (11) | 6.9 (15) |
| • with external air cooling | kg (lb) | 5.7 (13) | 5.7 (13) | 5.7 (13) | 5.7 (13) | 8.5 (19) |

[1] Rated DC link current for dimensioning an external DC connection. For DC link current calculation for dimensioning the Line Module, see system description "Power units/Line Modules" on the CD-ROM supplied with the catalog.

[2] Power loss of Motor Module at rated power without losses of 24 V DC electronics power supply.

[3] Not included in scope of supply, see Accessories.