

## SINAMICS S120 drive system

### Chassis format

#### Air-cooled Power Modules in chassis format

#### Overview



The Power Module comprises a line rectifier, a DC link and an inverter to supply the motor.

Power Modules are designed for drives that are not capable of regenerating energy to the mains supply. Regenerative energy produced while braking is converted to heat using braking resistors.

Power Modules in the chassis format can be connected to grounded TN/TT systems and non-grounded IT systems.

#### Design

The Power Modules have the following interfaces as standard:

- 1 line supply connection
- 1 motor connection
- 1 connection for the 24 V DC electronics power supply
- 1 DC link connection (DCPA, DCNA) for connecting a Braking Module
- 1 DC link connection (DCPS, DCNS) for connecting a dv/dt filter
- 3 DRIVE-CLiQ sockets
- 1 temperature sensor input for KTY84-130, Pt1000, PTC or Pt100 (Pt1000 can be used from firmware V4.7 HF17)
- 1 connection for Safe Brake Adapter
- 1 connection for Safety Integrated
- 2 PE connections

The Power Modules are controlled by the CU310-2 Control Unit that can be integrated into the Power Module.

The status of the Power Modules is indicated via three LEDs.

The scope of supply of the Power Modules includes:

- 1 DRIVE-CLiQ cable for connection to the Control Unit
- 1 24 V DC connecting cable for the power supply to the Control Unit
- 1 mounting plate for attaching the Control Unit
- 1 set of warning labels in 30 languages (BG, CN, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, JP, KR, LT, LV, MT, NL, NO, PL, PT, RO, RU, SE, SI, SK, TR)

#### Application in multi-axis systems

Power Modules in chassis format can also be connected directly via DRIVE-CLiQ to a separate CU320-2 or SIMOTION D4x5-2 Control Unit or Controller Extension CX32-2. The appropriate DRIVE-CLiQ cable for the required distance must be ordered (see section MOTION-CONNECT connection systems).

#### Selection and ordering data

Type rating at 400 V, 50 Hz (460 V, 60 Hz)	Rated output current	Power Module
kW (hp)	A	Article No.
<b>Line voltage 380 ... 480 V 3 AC</b>		
110 (150)	210	<b>6SL3310-1TE32-1AA3</b>
132 (200)	260	<b>6SL3310-1TE32-6AA3</b>
160 (250)	310	<b>6SL3310-1TE33-1AA3</b>
200 (300)	380	<b>6SL3310-1TE33-8AA3</b>
250 (400)	490	<b>6SL3310-1TE35-0AA3</b>
<b>Description</b>		<b>Article No.</b>
<i>Accessories</i>		
<b>Dust protection blanking plugs</b> (50 units) For DRIVE-CLiQ port		<b>6SL3066-4CA00-0AA0</b>

## SINAMICS S120 drive system

### Chassis format

#### Air-cooled Active Line Modules in chassis format

#### Overview



The self-commutated infeed/regenerative feedback units with IGBTs generate a regulated DC link voltage. This means that the connected Motor Modules are decoupled from the line voltage. Line voltage fluctuations within the permissible supply tolerances have no effect on the motor voltage.

If required, the Active Line Modules can also provide reactive power compensation.

Active Line Modules are designed for connection to grounded TN/TT and non-grounded IT supply systems.

Active Line Modules are always operated together with the associated Active Interface Modules. These include the necessary pre-charging circuit as well as a Clean Power Filter.

#### Design

The Active Line Modules have the following interfaces as standard:

- 1 line supply connection
- 1 connection for the 24 V DC electronics power supply
- 1 DC link connection (DCP, DCN) for supplying the connected Motor Modules
- 1 DC link connection (DCPA, DCNA) for connecting a Braking Module
- 3 DRIVE-CLiQ sockets
- 1 temperature sensor input for KTY84-130, Pt1000, PTC or Pt100 (Pt1000 can be used from firmware V4.7 HF17)
- 2 PE connections

The status of the Active Line Modules is indicated via three LEDs.

The scope of supply of the Active Line Modules includes:

- DRIVE-CLiQ cable to connect to a Control Unit
- DRIVE-CLiQ cable to connect the Control Unit to the first Motor Module
- 1 set of warning labels in 30 languages (BG, CN, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, JP, KR, LT, LV, MT, NL, NO, PL, PT, RO, RU, SE, SI, SK, TR)

#### Selection and ordering data

Rated power at 400 V, 50 Hz (460 V, 60 Hz) or 690 V, 50 Hz (575 V, 60 Hz)	Rated infeed/regenerative feedback current	Active Line Module
kW (hp)	A	Article No.
<b>Line voltage 380 ... 480 V 3 AC</b>		
132 (200)	210	<b>6SL3330-7TE32-1AA3</b>
160 (250)	260	<b>6SL3330-7TE32-6AA3</b>
235 (400)	380	<b>6SL3330-7TE33-8AA3</b>
300 (500)	490	<b>6SL3330-7TE35-0AA3</b>
380 (600)	605	<b>6SL3330-7TE36-1AA3</b>
450 (600)	745	<b>6SL3330-7TE37-5AA3</b>
500 (700)	840	<b>6SL3330-7TE38-4AA3</b>
630 (900)	985	<b>6SL3330-7TE41-0AA3</b>
800 (1000)	1260	<b>6SL3330-7TE41-2AA3</b>
900 (1250)	1405	<b>6SL3330-7TE41-4AA3</b>
<b>Line voltage 500 ... 690 V 3 AC</b>		
630 (675)	575	<b>6SL3330-7TG35-8AA3</b>
800 (900)	735	<b>6SL3330-7TG37-4AA3</b>
1100 (1250)	1025	<b>6SL3330-7TG41-0AA3</b>
1400 (1600)	1270	<b>6SL3330-7TG41-3AA3</b>
Description		Article No.
<b>Accessories</b>		
<b>Dust protection blanking plugs</b> (50 units) For DRIVE-CLiQ port		<b>6SL3066-4CA00-0AA0</b>

## SINAMICS S120 drive system

### Chassis format

#### Air-cooled Basic Line Modules in chassis format

#### Overview



Basic Line Modules are available for applications in which no energy is returned to the supply or where the energy exchange between motor and generator axes takes place in the DC link. Basic Line Modules are designed for connection to grounded TN/TT and non-grounded IT supply systems.

The Basic Line Modules are available in different frame sizes. With frame sizes FB and GB, a fully controlled thyristor bridge is used to pre-charge the Basic Line Modules and connected Motor Modules. The thyristors normally operate with a trigger delay angle of 0°.

Basic Line Modules, frame size GD for 900 kW (400 V) or 1500 kW (690 V) include a diode bridge, and the DC link is pre-charged via a separate line-side pre-charging circuit.

A Braking Module of the appropriate frame size can be integrated into a Basic Line Module in order to permit, in conjunction with an external braking resistor, regenerative operation of the drive system.

#### Design

The Basic Line Modules have the following interfaces as standard:

- 1 line supply connection
- 1 connection for the 24 V DC electronics power supply
- 1 DC link connection (DCP, DCN) for supplying the connected Motor Modules
- 1 DC link connection (DCPA, DCNA) for connecting a Braking Module
- 3 DRIVE-CLiQ sockets
- 1 temperature sensor input for KTY84-130, Pt1000 or PTC (Pt1000 can be used from firmware V4.7 HF17)
- 1 PE connection

The status of the Basic Line Modules is indicated via three LEDs.

The scope of supply of the Basic Line Modules includes:

- DRIVE-CLiQ cable to connect to a Control Unit
- DRIVE-CLiQ cable to connect the Control Unit to the first Motor Module
- 1 set of warning labels in 30 languages (BG, CN, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, JP, KR, LT, LV, MT, NL, NO, PL, PT, RO, RU, SE, SI, SK, TR)

#### Pre-charging circuit for the Basic Line Modules, frame size GD

Unlike Basic Line Modules in frame sizes FB and GB, a Basic Line Module in frame size GD requires a separate precharging circuit. The pre-charging circuit components must be ordered separately.

During startup, the pre-charging circuit ensures that the DC link capacitors of the Basic Line Module and the connected Motor Modules are pre-charged with current limiting. After pre-charging has been completed, the circuit breaker is closed and the pre-charging circuit bypassed; the Basic Line Module is then directly connected to the line supply.

The pre-charging circuit comprises a pre-charging contactor and pre-charging resistors; the circuit must be protected against overcurrent using suitable protection measures. To increase the permissible DC link capacitance, the pre-charging resistors can also be connected in parallel in each phase.

More information on the pre-charging circuit is to be found in the SINAMICS Low Voltage Engineering Manual.

#### Selection and ordering data

Rated power at 400 V, 50 Hz (460 V, 60 Hz) or 690 V, 50 Hz (575 V, 60 Hz)	Rated DC link current	Basic Line Module
kW (hp)	A	Article No.
<b>Line voltage 380 ... 480 V 3 AC</b>		
200 (305)	420	<b>6SL3330-1TE34-2AA3</b>
250 (385)	530	<b>6SL3330-1TE35-3AA3</b>
400 (615)	820	<b>6SL3330-1TE38-2AA3</b>
560 (860)	1200	<b>6SL3330-1TE41-2AA3</b>
710 (1090)	1500	<b>6SL3330-1TE41-5AA3</b>
900 (1390)	1880	<b>6SL3330-1TE41-8AA3</b>
<b>Line voltage 500 ... 690 V 3 AC</b>		
250 (250)	300	<b>6SL3330-1TG33-0AA3</b>
355 (350)	430	<b>6SL3330-1TG34-3AA3</b>
560 (600)	680	<b>6SL3330-1TG36-8AA3</b>
900 (900)	1100	<b>6SL3330-1TG41-1AA3</b>
1100 (1250)	1400	<b>6SL3330-1TG41-4AA3</b>
1500 (1500)	1880	<b>6SL3330-1TG41-8AA3</b>
Description	Article No.	
<b>Accessories</b>		
<b>Dust protection blanking plugs</b> (50 units)	<b>6SL3066-4CA00-0AA0</b>	
For DRIVE-CLiQ port		

### Overview



The Power Module comprises a line rectifier, a DC link and an inverter to supply the motor.

Power Modules are designed for drives that are not capable of regenerating energy to the mains supply. If the motor produces energy during braking, a Braking Module with braking resistors will be required.

Liquid-cooled Power Modules are especially suitable for applications where installation space is restricted and environmental conditions are harsh. Liquid cooling ensures efficient heat dissipation.

Power Modules in the chassis format can be connected to grounded TN/TT systems and non-grounded IT systems.

### Design

The liquid-cooled Power Modules have the following interfaces as standard:

- 1 line supply connection
- 1 motor connection
- 1 connection for the 24 V DC electronics power supply
- 1 DC link connection
- 3 DRIVE-CLiQ sockets
- 1 temperature sensor input for KTY84-130, Pt1000, PTC or Pt100 (Pt1000 can be used from firmware V4.7 HF17)
- 1 connection for Safe Brake Adapter
- 1 connection for Safety Integrated
- 2 PE connections
- 2 coolant connections

The CU310-2 Control Unit can be integrated into the liquid-cooled Power Modules.

The status of the Power Modules is indicated via three LEDs.

The scope of supply of the Power Modules includes:

- 1 DRIVE-CLiQ cable for connection to the Control Unit
- 2 seals for coolant connections
- 1 set of warning labels in 30 languages (BG, CN, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, JP, KR, LT, LV, MT, NL, NO, PL, PT, RO, RU, SE, SI, SK, TR)

<sup>1)</sup> Recommended components for installing a flow control as condensation protection; manufactured by Siemens Building Technologies.

### Selection and ordering data

Type rating at 400 V, 50 Hz (460 V, 60 Hz)	Rated output current	Power Module
kW (hp)	A	Article No.
<b>Line voltage 380 ... 480 V 3 AC</b>		
110 (150)	210	<b>6SL3315-1TE32-1AA3</b>
132 (200)	260	<b>6SL3315-1TE32-6AA3</b>
160 (250)	310	<b>6SL3315-1TE33-1AA3</b>
250 (400)	490	<b>6SL3315-1TE35-0AA3</b>
Description		Article No.
<b>Accessories</b>		
<b>3-way valve <sup>1)</sup></b>		<b>VXF41.../VXG41...</b>
<b>Actuator for 3-way valve <sup>1)</sup></b>		
• 230 V 1 AC		<b>SAX31...</b>
• 24 V AC/DC		<b>SAX61.../SAX81...</b>
<b>Accessories</b>		
<b>Dust protection blanking plugs (50 units)</b>		<b>6SL3066-4CA00-0AA0</b>
For DRIVE-CLiQ port		

## Overview



The self-commutated infeed/regenerative feedback units (with IGBTs in infeed and regenerative feedback directions) generate a regulated DC link voltage. This means that the connected Motor Modules are decoupled from the line voltage. Line voltage fluctuations within the permissible supply tolerances have no effect on the motor voltage.

If required, the Active Line Modules can also provide reactive power compensation.

Active Line Modules are designed for connection to grounded TN/TT and non-grounded IT supply systems.

Liquid-cooled Active Line Modules are especially suitable for applications where installation space is restricted and environmental conditions are harsh. Liquid cooling ensures efficient heat dissipation.

Active Line Modules are always operated together with the associated Active Interface Modules. These include the necessary pre-charging circuit as well as a Clean Power Filter.

## Design

The liquid-cooled Active Line Modules have the following interfaces as standard:

- 1 line supply connection
- 1 connection for the 24 V DC electronics power supply
- 1 DC link connection (DCP, DCN) for supplying the connected Motor Modules
- 3 DRIVE-CLiQ sockets
- 1 temperature sensor input for KTY84-130, Pt1000, PTC or Pt100 (Pt1000 can be used from firmware V4.7 HF17)
- 1 PE connection
- 2 coolant connections

The status of the Active Line Modules is indicated via three LEDs.

The following are included in the scope of supply of the Active Line Modules:

- 1 DRIVE-CLiQ cable for connection to the Control Unit
- 2 seals for coolant connections
- 1 set of warning labels in 30 languages (BG, CN, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, JP, KR, LT, LV, MT, NL, NO, PL, PT, RO, RU, SE, SI, SK, TR)

## Selection and ordering data

Rated power at 400 V, 50 Hz (460 V, 60 Hz) or 690 V, 50 Hz (575 V, 60 Hz)	Rated infeed/regenerative feedback current	Active Line Module
kW (hp)	A	Article No.
<b>Line voltage 380 ... 480 V 3 AC</b>		
300 (500)	490	<b>6SL3335-7TE35-0AA3</b>
380 (600)	605	<b>6SL3335-7TE36-1AA3</b>
500 (700)	840	<b>6SL3335-7TE38-4AA3</b>
630 (900)	985	<b>6SL3335-7TE41-0AA3</b>
900 (1250)	1405	<b>6SL3335-7TE41-4AA3</b>
<b>Line voltage 500 ... 690 V 3 AC</b>		
630 (675)	575	<b>6SL3335-7TG35-8AA3</b>
800 (900)	735	<b>6SL3335-7TG37-4AA3</b>
900 (975)	810	<b>6SL3335-7TG38-1AA3</b>
1100 (1250)	1020	<b>6SL3335-7TG41-0AA3</b>
1400 (1500)	1270	<b>6SL3335-7TG41-3AA3</b>
1700 (1880)	1560	<b>6SL3335-7TG41-6AA3</b>
Description		Article No.
<b>Accessories</b>		
<b>3-way valve <sup>1)</sup></b>		<b>VXF41.../VXG41...</b>
<b>Actuator for 3-way valve <sup>1)</sup></b>		
• 230 V 1 AC		<b>SAX31...</b>
• 24 V AC/DC		<b>SAX61.../SAX81...</b>
<b>Accessories</b>		
<b>Dust protection blanking plugs</b> (50 units) For DRIVE-CLiQ port		<b>6SL3066-4CA00-0AA0</b>

<sup>1)</sup> Recommended components for installing a flow control as condensation protection; manufactured by Siemens Building Technologies.

### Overview



Basic Line Modules are used for applications where energy is not fed back into the line supply or where energy is exchanged in the DC link between axes operating in the motor and generator modes. The connected Motor Modules are pre-charged via the thyristor gate control. Basic Line Modules are designed for connection to grounded TN/TT and non-grounded IT supply systems.

Liquid-cooled Basic Line Modules are especially suitable for applications where installation space is restricted and environmental conditions are harsh. Liquid cooling ensures efficient heat dissipation.

### Design

The liquid-cooled Basic Line Modules have the following interfaces as standard:

- 1 line supply connection
- 1 connection for the 24 V DC electronics power supply
- 1 DC link connection (DCP, DCN) for supplying the connected Motor Modules
- 3 DRIVE-CLiQ sockets
- 1 temperature sensor input for KTY84-130, Pt1000, PTC or Pt100 (Pt1000 can be used from firmware V4.7 HF17)
- 1 PE connection
- 2 coolant connections

The status of the Basic Line Modules is indicated via three LEDs.

The scope of supply of the Power Modules includes:

- 1 DRIVE-CLiQ cable for connection to the Control Unit
- 2 seals for coolant connections
- 1 set of warning labels in 30 languages (BG, CN, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, JP, KR, LT, LV, MT, NL, NO, PL, PT, RO, RU, SE, SI, SK, TR)

### Selection and ordering data

Rated power at 400 V, 50 Hz (460 V, 60 Hz) or 690 V, 50 Hz (575 V, 60 Hz)	Rated DC link current	Basic Line Module
kW (hp)	A	Article No.
<b>Line voltage 380 ... 480 V 3 AC</b>		
360 (555)	740	<b>6SL3335-1TE37-4AA3</b>
600 (925)	1220	<b>6SL3335-1TE41-2AA3</b>
830 (1280)	1730	<b>6SL3335-1TE41-7AA3</b>
<b>Line voltage 500 ... 690 V 3 AC</b>		
355 (395)	420	<b>6SL3335-1TG34-2AA3</b>
630 (705)	730	<b>6SL3335-1TG37-3AA3</b>
1100 (1230)	1300	<b>6SL3335-1TG41-3AA3</b>
1370 (1530)	1650	<b>6SL3335-1TG41-7AA3</b>
Description		Article No.
<b>Accessories</b>		
<b>3-way valve <sup>1)</sup></b>		<b>VXF41.../VXG41...</b>
<b>Actuator for 3-way valve <sup>1)</sup></b>		
• 230 V 1 AC		<b>SAX31...</b>
• 24 V AC/DC		<b>SAX61.../SAX81...</b>
<b>Accessories</b>		
<b>Dust protection blanking plugs</b> (50 units)		<b>6SL3066-4CA00-0AA0</b>
For DRIVE-CLiQ port		

<sup>1)</sup> Recommended components for installing a flow control as condensation protection; manufactured by Siemens Building Technologies.