



Active Line Modules in booksize format

Overview



Active Line Module in booksize format

Active Line Modules are self-commutated infeed/regenerative feedback units (with IGBTs in the infeed and regenerative feedback directions) that generate a controlled 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. Active Line Modules are designed for connection to grounded star (TN, TT) and non-grounded symmetrical (IT) supply systems.

The DC link is pre-charged via integrated precharging resistors.

In order to operate an Active Line Module, an associated Active Interface Module is required.

Design

The Active Line Modules in booksize format feature the following connections and interfaces as standard:

- 1 power connection via screw-type terminals
- 1 connection for the 24 V DC electronics power supply via the 24 V terminal adapter included in the scope of supply
- 1 DC link connection via integrated DC link busbars
- 3 DRIVE-CLiQ sockets
- 2 PE (protective earth) connections
- 1 temperature sensor input for KTY84-130, Pt1000 or PTC (Pt1000 can be used from firmware V4.7 HF17)

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

For the Active Line Module with a width of 100 mm (3.94 in), the shield of the power connection cable can be connected to the integrated shield connection plate by means of a shield connection clamp or hose clip, e.g. Weidmüller type KLBÜ CO 4. The shield connection clamp must not be used as a strain relief mechanism. Shield connection sets are available for the 150 mm (5.91 in), 200 mm (7.87 in) and 300 mm (11.81 in) wide Active Line Modules.

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

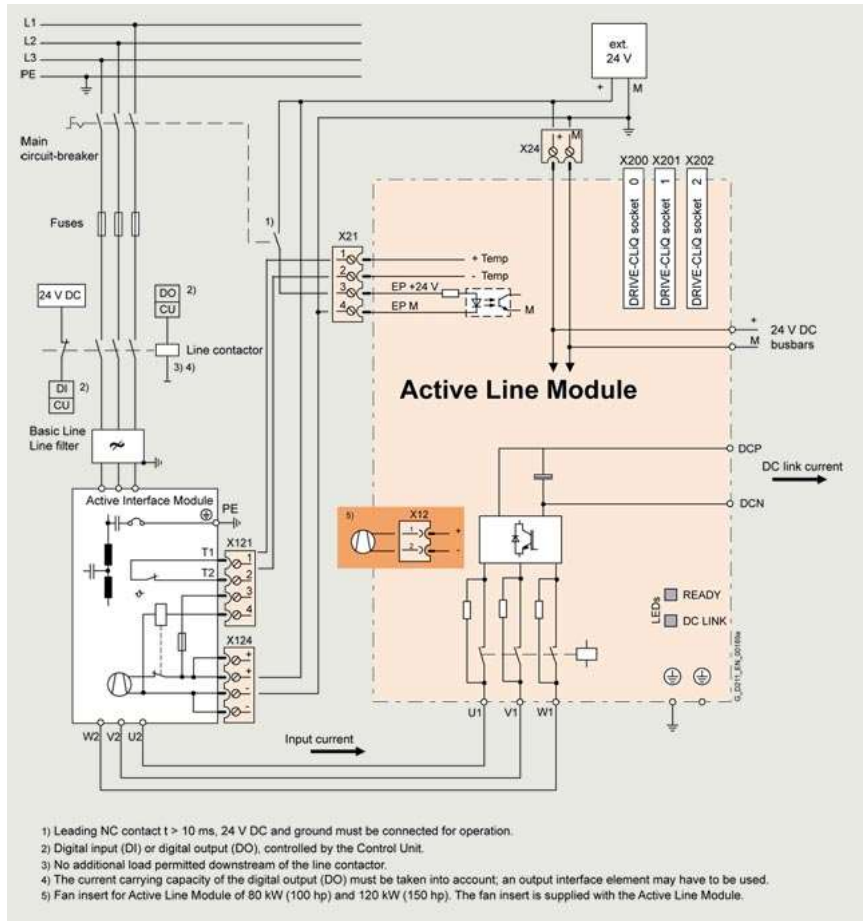
The scope of supply of the Active Line Modules includes:

- DRIVE-CLiQ cable for connection to the adjacent Control Unit on the left for drive control, length 0.11 m (4.33 in)
- DRIVE-CLiQ cable (length depends on Active Line Module width) for connection to the adjacent Motor Module, length = width of Active Line Module + 0.11 m (4.33 in)
- 2 blanking plugs for sealing unused DRIVE-CLiQ sockets
- Jumper for connecting the 24 V DC busbar to the adjacent Motor Module
- 24 V terminal adapter (X24)
- Connector X21 for digital inputs
- Fan insert for Active Line Modules of 80 kW (100 hp) and 120 kW (150 hp) (the voltage for the fan unit is supplied by the Active Line Module)
- 1 set of warning labels in 30 languages

Integration

The Active Line Module receives its control information via DRIVE-CLiQ from:

- CU320-2 Control Unit
- SINUMERIK 840D sl
- SINUMERIK ONE
- SINUMERIK MC
- SIMOTION D



Connection example of Active Line Module in booksize format

Technical specifications

	Active Line Module in booksize format 6SL3130-7TE...
Line voltage (up to 2000 m (6562 ft) above sea level)	380 ... 480 V 3 AC ± 10 % (in operation -15 % <1 min)
Line frequency	47 ... 63 Hz
SCCR (short-circuit current rating)	65 kA in conjunction with the recommended Class J fuse, or circuit breaker according to UL489 / CSA 22.2 No. 5-02 see recommended line-side components
Line power factor	
• Active mode	
- Fundamental power factor ($\cos \varphi_1$)	1 (factory setting), can be altered by inputting a reactive current setpoint
- Total (λ)	1 (factory setting)
• Smart Mode	
- Fundamental power factor	>0.96
- Overall	0.65 ... 0.9
Overvoltage category to EN 60664-1	Class III
DC link voltage V_d	In <u>Active Mode</u> , the DC link voltage is regulated and can be adjusted as a voltage decoupled from the line voltage. In <u>Smart Mode</u> , the DC link voltage is kept in proportion to the line voltage at the mean rectified line voltage value. Factory setting for DC link voltage: 380 ... 400 V 3 AC: 600 V (Active Mode) 400 ... 415 V 3 AC: 625 V (Active Mode) 416 ... 480 V 3 AC: $1.35 \times \text{line voltage}$ (Smart Mode) ¹⁾
Electronics power supply	24 V DC -15 %/+20 %
Radio interference suppression	
• Standard (Active Line Module + Active Interface Module)	Category C3 to EN 61800-3 up to 350 m (1148 ft) total cable length
• With line filter	Category C2 according to EN 61800-3 up to 350 m (1148 ft) total cable length

	Active Line Module in booksize format				
	6SL3130-7TE... Category C3 according to EN 61800-3 from 350 m to 1000 m (1148 ... 3281 ft) total cable length				
Type of cooling	Internal air cooling (power units with increased air cooling by built-in fan)				
Permissible ambient and coolant temperature (air)	0 ... 40 °C (32 ... 104 °F) without derating, > 40 ... 55 °C (104 ... 131 °F), see derating characteristics				
during operation for line-side components, Line Modules and Motor Modules					
Installation altitude	Up to 1000 m (3281 ft) above sea level without derating, > 1000 ... 4000 m (3281 ... 13124 ft) above sea level, see derating characteristics				
Declarations of conformity	CE (Low Voltage and EMC Directives)				
Certificate of suitability	cULus				

¹⁾ Active Mode can also be selected if the connected motors are suitable for > 650 V DC.

Line voltage 380 ... 480 V 3 AC		Active Line Module in booksize format				
Internal air cooling		6SL3130-7TE21-6AA4	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
Infeed/regenerative feedback power						
• Rated power P_{rated}						
• At 380 V 3 AC	kW	16	36	55	80	120
• At 460 V 3 AC ⁵⁾	(hp)	(18)	(40)	(60)	(100)	(150)
• For S6 duty P_{S6} (40 %)	kW	21	47	71	106	145
• P_{max}	kW	35	70	91 (110 ¹⁾)	131	175
DC link current						
• At 600 V DC	A	27	60	92	134	200
• For S6 duty (40 %)	A	35	79	121	176	244
• Maximum	A	59	117	152 (176 ¹⁾)	218	292
Input current						
• Rated current at 380/400/480 V 3 AC	A	26/25/21	58/55/46	88/84/70	128/122/102	192/182/152
• For S6 duty (40 %) at 400 V	A	32	71	108	161	220
• At 400 V max.	A	54	107	139 (168 ¹⁾)	200	267
Current requirement 24 V DC electronics power supply, max.	A	1.1	1.5	1.9	2	2.5
Current carrying capacity						
• 24 V DC busbars	A	20	20	20	20	20
• DC link busbars	A	100	200	200	200	200
DC link capacitance						
• Active Line Module	µF	710	1410	1880	2820	3995
• Drive line-up, max.	µF	20000	20000	20000	20000	20000
Power loss ²⁾	kW	0.28	0.67	0.95	1.38	2.24
Cooling air requirement	m ³ /s (ft ³ /s)	0.016 (0.57)	0.031 (1.09)	0.044 (0.155)	0.144 (5.09)	0.144 (5.09)
Sound pressure level L_{pA} (1 m)	dB	<60	<65	<60	<73	<73
Line connection U1, V1, W1		Screw-type terminals (X1)	M6 screw studs (X1)	M8 screw studs (X1)	M8 screw studs (X1)	M8 screw studs (X1)
• Conductor cross-section, max.	mm ²	2.5 ... 10	2.5 ... 50	2.5 ... 95, 2 × 35	2.5 ... 120, 2 × 50	2.5 ... 120, 2 × 50

Line voltage 380 ... 480 V 3 AC		Active Line Module in booksize format				
Internal air cooling		6SL3130-7TE21-6AA4	6SL3130-7TE23-6AA3	6SL3130-7TE25-5AA3	6SL3130-7TE28-0AA3	6SL3130-7TE31-2AA3
Shield connection		Integrated in the connector	See Accessories	See Accessories	See Accessories	See Accessories
PE connection		M5 screw	M6 screw	M6 screw	M8 screw	M8 screw
Cable length, max. Total of all motor cables and DC link						
• Shielded	m (ft)	630 (2067) ³⁾	630 (2067) ³⁾	1000 (3281)	1000 (3281)	1000 (3281)
• Unshielded	m (ft)	850 (2789)	850 (2789)	1500 (4922)	1500 (4922)	1500 (4922)
Degree of protection		IP20	IP20	IP20	IP20	IP20
Dimensions						
• Width	mm (in)	100 (3.94)	150 (5.91)	200 (7.87)	300 (11.81)	300 (11.81)
• Height	mm (in)	380 (14.96)	380 (14.96)	380 (14.96)	380 (14.96)	380 (14.96)
• - With fan ⁴⁾	mm (in)	—	—	—	629 (24.76)	629 (24.76)
• Depth	mm (in)	270 (10.63)	270 (10.63)	270 (10.63)	270 (10.63)	270 (10.63)
Weight, approx.		kg (lb)	7 (15.4)	10 (22.0)	16 (35.3)	23 (50.7)

¹⁾ Higher peak output is possible in combination with the Active Interface Module 6SL3100-0BE25-5AB0 (for operating cycle constraints, see SINAMICS S120 Manual).

²⁾ Power loss of Active Line Module at rated power including losses of 24 V DC electronics power supply.

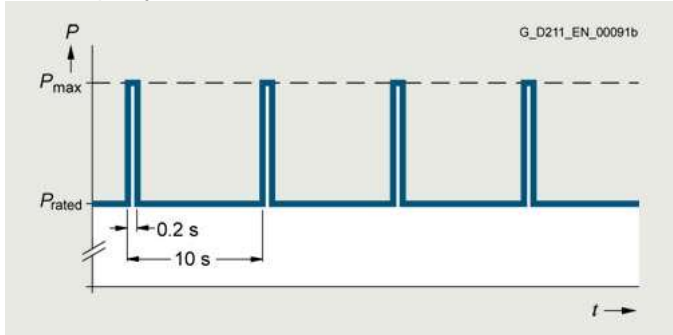
³⁾ Max. cable lengths in combination with Active Interface Module and Basic Line Filter (Category C3 according to EN 61800-3).

⁴⁾ The fan is supplied together with the Active Line Module and must be installed before the Active Line Module is commissioned.

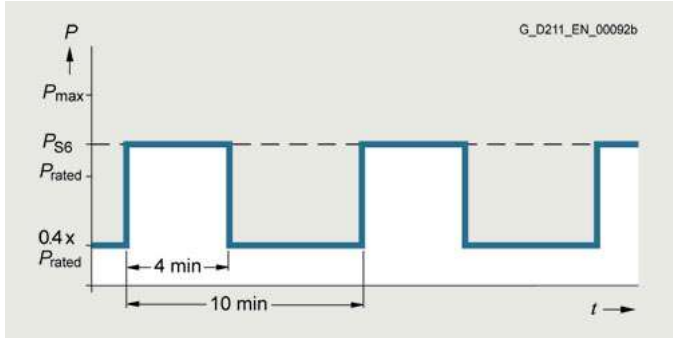
⁵⁾ Nominal hp ratings are provided for ease of assigning components only. The Line Module outputs are dependent on the Motor Module loading and are to be dimensioned accordingly.

Characteristic curves

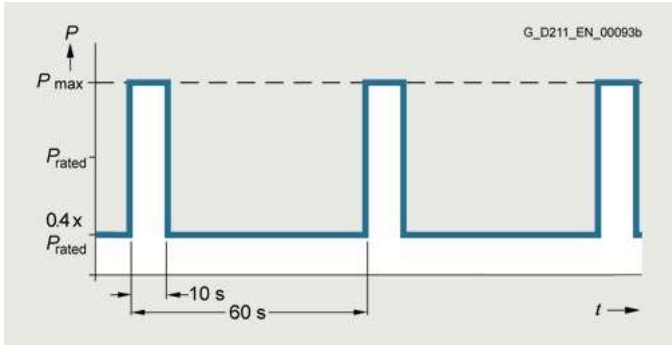
Overload capability



Duty cycle with previous load

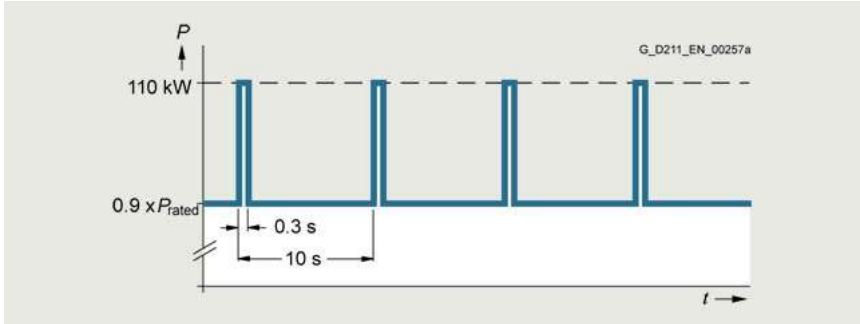


S6 duty cycle with previous load



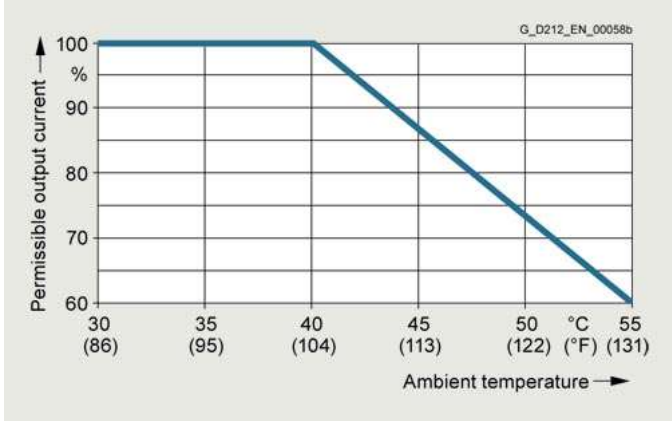
S6 duty cycle with previous load

55 kW Active Line Module only:



Peak power load duty cycle with previous load

Derating characteristics



Output power as a function of ambient temperature

Installation altitude

- >1000 ... 4000 m (3281 ... 13124 ft) above sea level
 - Reduction of the output current by 10 % per 1000 m (3281 ft), or
 - Reduction of the ambient temperature by 5 °C (9 °F) per 1000 m (3281 ft)
- >2000 ... 4000 m (6562 ... 13124 ft) above sea level
 - Operation on line supply systems with grounded neutral point, or
 - Operation with an isolating transformer with secondary grounded neutral point

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