SIEMENS

Operating instructions

SINAMICS

G130

Line reactors

Edition 11/2017

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SINAMICS

SINAMICS G130
Line reactors

Operating Instructions

Firmware version V5.1

11/2017

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠CAUTION
indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Safety information

1

1.1 General safety instructions

⚠WARNING

Electric shock and danger to life due to other energy sources

Touching live components can result in death or serious injury.

- Only work on electrical equipment if you are appropriately qualified.
- Always observe the country-specific safety rules for all work.

Generally, the following steps apply when establishing safety:

1. Prepare for disconnection. Notify all those who will be affected by the procedure.
2. Isolate the drive system from the power supply and take measures to prevent it being switched back on again.
3. Wait until the discharge time specified on the warning labels has elapsed.
4. Check that there is no voltage between any of the power connections, and between any of the power connections and the protective conductor connection.
5. Check that every auxiliary circuit is de-energized.
6. Ensure that the motors cannot move.
7. Identify all other dangerous energy sources, e.g. compressed air, hydraulic systems or water. Switch the energy sources to a safe state.
8. Check that the correct drive system is completely locked.

After you have completed the work, restore the operational readiness by following the above steps in the reverse order.

⚠WARNING

Electric shock due to connection to an unsuitable power supply

When equipment is connected to an unsuitable power supply, exposed components may carry a hazardous voltage that might result in serious injury or death.

- Only use power supplies that provide SELV (Safety Extra Low Voltage) or PELV (Protective Extra Low Voltage) output voltages for all connections and terminals of the electronics modules.

⚠WARNING

Electric shock due to equipment damage

Improper handling may cause damage to equipment. For damaged devices, hazardous voltages can be present at the enclosure or at exposed components; if touched, this can result in death or severe injury.

- Ensure compliance with the limit values specified in the technical data during transport, storage and operation.
- Do not use any damaged devices.

⚠WARNING

Electric shock due to unconnected cable shield

Hazardous touch voltages can occur through capacitive cross-coupling due to unconnected cable shields.

- Connect cable shields and unused conductors of power cables (e.g. brake conductors) at least on one side to the grounded housing potential.

⚠WARNING

Electric shock if there is no ground connection

For missing or incorrectly implemented protective conductor connection for devices with protection class I, high voltages can be present at open, exposed parts, which when touched, can result in death or severe injury.

- Ground the device in compliance with the applicable regulations.

⚠WARNING

Arcing when a plug connection is opened during operation

Opening a plug connection when a system is in operation can result in arcing that may cause serious injury or death.

- Only open plug connections when the equipment is in a voltage-free state, unless it has been explicitly stated that they can be opened in operation.

NOTICE

Property damage due to loose power connections

Insufficient tightening torques or vibration can result in loose power connections. This can result in damage due to fire, device defects or malfunctions.

- Tighten all power connections to the prescribed torque.
- Check all power connections at regular intervals, particularly after equipment has been transported.

⚠WARNING

Spread of fire from built-in devices

In the event of fire outbreak, the enclosures of built-in devices cannot prevent the escape of fire and smoke. This can result in serious personal injury or property damage.

- Install built-in units in a suitable metal cabinet in such a way that personnel are protected against fire and smoke, or take other appropriate measures to protect personnel.
- Ensure that smoke can only escape via controlled and monitored paths.

⚠WARNING

Failure of pacemakers or implant malfunctions due to electromagnetic fields

Electromagnetic fields (EMF) are generated by the operation of electrical power equipment, such as transformers, converters, or motors. People with pacemakers or implants in the immediate vicinity of this equipment are at particular risk.

- If you have a heart pacemaker or implant, maintain a minimum distance of 2 m from electrical power equipment.

⚠WARNING

Unexpected movement of machines caused by radio devices or mobile phones

When radio devices or mobile phones with a transmission power > 1 W are used in the immediate vicinity of components, they may cause the equipment to malfunction. Malfunctions may impair the functional safety of machines and can therefore put people in danger or lead to property damage.

- If you come closer than around 2 m to such components, switch off any radio devices or mobile phones.
- Use the "SIEMENS Industry Online Support App" only on equipment that has already been switched off.

⚠WARNING

Motor fire in the event of insulation overload

There is a greater load on the motor insulation as result of a ground fault in an IT system. If the insulation fails, it is possible that death or severe injury can occur as a result of smoke and fire.

- Use a monitoring device that signals an insulation fault.
- Correct the fault as quickly as possible so the motor insulation is not overloaded.

⚠WARNING

Fire due to inadequate ventilation clearances

Inadequate ventilation clearances can cause overheating of components with subsequent fire and smoke. This can cause severe injury or even death. This can also result in increased downtime and reduced service lives for devices/systems.

- Ensure compliance with the specified minimum clearance as ventilation clearance for the respective component.

⚠WARNING

Unrecognized dangers due to missing or illegible warning labels

Dangers might not be recognized if warning labels are missing or illegible. Unrecognized dangers may cause accidents resulting in serious injury or death.

- Check that the warning labels are complete based on the documentation.
- Attach any missing warning labels to the components, where necessary in the national language.
- Replace illegible warning labels.

NOTICE

Device damage caused by incorrect voltage/insulation tests

Incorrect voltage/insulation tests can damage the device.

- Before carrying out a voltage/insulation check of the system/machine, disconnect the devices as all converters and motors have been subject to a high-voltage test by the manufacturer, and therefore it is not necessary to perform an additional test within the system/machine.

⚠WARNING

Unexpected movement of machines caused by inactive safety functions

Inactive or non-adapted safety functions can trigger unexpected machine movements that may result in serious injury or death.

- Observe the information in the appropriate product documentation before commissioning.
- Carry out a safety inspection for functions relevant to safety on the entire system, including all safety-related components.
- Ensure that the safety functions used in your drives and automation tasks are adjusted and activated through appropriate parameterizing.
- Perform a function test.
- Only put your plant into live operation once you have absolutely guaranteed that the functions relevant to safety are operating correctly.

Note

Important safety instructions for Safety Integrated functions

If you want to use Safety Integrated functions, you must observe the safety instructions in the Safety Integrated manuals.

General

2

Description

Line reactors limit low-frequency line-side harmonics to permissible values.

⚠WARNING

Non-observance of the fundamental safety instructions and residual risks

The non-observance of the fundamental safety instructions and residual risks stated in Chapter 1 can result in accidents with severe injuries or death.

- Adhere to the fundamental safety instructions.
- When assessing the risk, take into account residual risks.

⚠CAUTION

Burns resulting from high surface temperature

The line reactors can become very hot. You can get seriously burnt when touching the surface.

- Mount the line reactors so that contact is not possible. If this is not possible, attach clearly visible and understandable warning notices at hazardous positions.
- To prevent adjacent components from suffering damage due to these high temperatures, maintain a clearance of 100 mm on all sides of the line reactors.

NOTICE

Damage of the system caused by the use of inappropriate and not approved line reactors

Inappropriate and not approved line reactors can damage the Line Modules.

Line harmonics that damage/disturb other loads connected to the same line supply can also occur.

- Only use line reactors listed in this manual.

Note

Malfunctions through magnetic fields

Reactors produce magnetic fields that can disturb or damage components and cables.

- Arrange the components and cables at a suitable distance (at least 200 mm) or shield the magnetic fields appropriately.

Note

Length of connection cables

The connection cables between line reactor and Line Module, as well as between line reactor and line filter, must be kept as short as possible (max. 5 m).

You must use shielded connection cables, whose cable shields are attached at both ends.

Shielding can only be omitted if the following conditions are met:

- The cables do not exceed 1 m in length.
- The cables are laid flush with the rear metal wall of the control cabinet.
- The cables are laid in a way that keeps them physically separate from signal cables.

Do not route any cables near the line reactor. If this cannot be avoided, observe a minimum distance of 200 mm.

Assignment of line reactor and Power Module

Table 2- 1 Assignment of line reactor and Power Module

Power Module	Unit rating of the Power Module	Suitable line reactor
Line voltage 3-phase 380 – 480 VAC		
6SL3310-1GE32-1AA3	110 kW	**6SL3000-0CE32-3AA0**
6SL3310-1GE32-6AA3	132 kW	**6SL3000-0CE32-8AA0**
6SL3310-1GE33-1AA3	160 kW	**6SL3000-0CE33-3AA0**
6SL3310-1GE33-8AA3	200 kW	**6SL3000-0CE35-1AA0**
6SL3310-1GE35-0AA3	250 kW	**6SL3000-0CE35-1AA0**
6SL3310-1GE36-1AA3	315 kW	**6SL3000-0CE36-3AA0**
6SL3310-1GE37-5AA3	400 kW	**6SL3000-0CE37-7AA0**
6SL3310-1GE38-4AA3	450 kW	**6SL3000-0CE38-7AA0**
6SL3310-1GE41-0AA3	560 kW	**6SL3000-0CE41-0AA0**
Line voltage 3-phase 500 – 600 VAC		
6SL3310-1GF31-8AA3	110 kW	**6SL3000-0CH32-2AA0**
6SL3310-1GF32-2AA3	132 kW	**6SL3000-0CH32-2AA0**
6SL3310-1GF32-6AA3	160 kW	**6SL3000-0CH32-7AA0**
6SL3310-1GF33-3AA3	200 kW	**6SL3000-0CH33-4AA0**
6SL3310-1GF34-1AA3	250 kW	**6SL3000-0CH34-8AA0**
6SL3310-1GF34-7AA3	315 kW	**6SL3000-0CH34-8AA0**
6SL3310-1GF35-8AA3	400 kW	**6SL3000-0CH36-0AA0**
6SL3310-1GF37-4AA3	500 kW	**6SL3000-0CH38-4AA0**
6SL3310-1GF38-1AA3	560 kW	**6SL3000-0CH38-4AA0**

Power Module	Unit rating of the Power Module	Suitable line reactor
Line voltage 3-phase 660 – 690 VAC		
6SL3310-1GH28-5AA3	85 kW	**6SL3000-0CH31-1AA0**
6SL3310-1GH31-0AA3	90 kW	**6SL3000-0CH31-1AA0**
6SL3310-1GH31-2AA3	110 kW	**6SL3000-0CH31-6AA0**
6SL3310-1GH31-5AA3	132 kW	**6SL3000-0CH31-6AA0**
6SL3310-1GH31-8AA3	160 kW	**6SL3000-0CH32-2AA0**
6SL3310-1GH32-2AA3	200 kW	**6SL3000-0CH32-2AA0**
6SL3310-1GH32-6AA3	250 kW	**6SL3000-0CH32-7AA0**
6SL3310-1GH33-3AA3	315 kW	**6SL3000-0CH33-4AA0**
6SL3310-1GH34-1AA3	400 kW	**6SL3000-0CH34-8AA0**
6SL3310-1GH34-7AA3	450 kW	**6SL3000-0CH34-8AA0**
6SL3310-1GH35-8AA3	560 kW	**6SL3000-0CH36-0AA0**
6SL3310-1GH37-4AA3	710 kW	**6SL3000-0CH38-4AA0**
6SL3310-1GH38-1AA3	800 kW	**6SL3000-0CH38-4AA0**

Mechanical installation

3

Dimension drawing

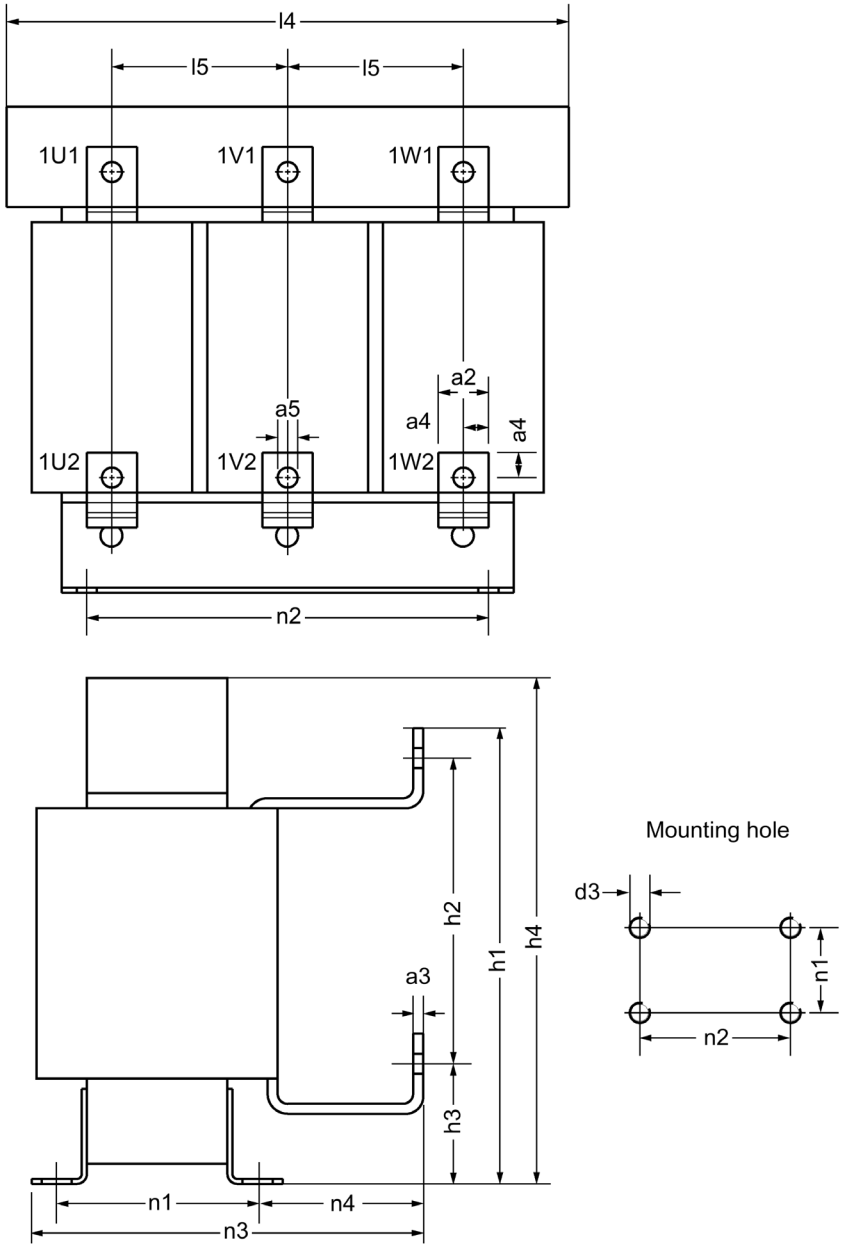

Figure 3-1 Dimension drawing of line reactor

Table 3- 1 Dimensions of line reactor, 380 V – 480 V 3 AC (all values in mm)

6SL3000-	0CE32-3AA0 0CE32-8AA0 0CE33-3AA0	0CE35-1AA0 0CE36-3AA0 0CE37-7AA0	0CE38-7AA0	0CE41-0AA0
a2	25	30	40	50
a3	5	6	8	8
a4	12.5	15	20	25
a5	11	14	14	14
l4	270	300	350	350
l5	88	100	120	120
h1	-	-	392	397
h2	150	180	252	252
h3	60	60	120	120
h4	248	269	321	321
n1 [1)]	101	118	138	138
n2 [1)]	200	224	264	264
n3	200	212.5	211.5	211.5
n4	84.5	81	60	60
d3	M8	M8	M8	M8
[1)] Lengths n1 and n2 correspond to the drill hole spacing				

Table 3- 2 Dimensions of line reactor, 500 V – 600 V 3 AC (all values in mm)

6SL3000-	0CH32-2AA0 0CH32-7AA0 0CH33-4AA0	0CH34-8AA0 0CH36-0AA0	0CH38-4AA0
a2	25	30	40
a3	5	6	8
a4	12.5	15	20
a5	11	14	14
l4	270	350	410
l5	88	120	135
h1	-	-	392
h2	150	198	252
h3	60	75	120
h4	248	321	385
n1 [1)]	101	138	141
n2 [1)]	200	264	316
n3	200	232.5	224
n4	84.5	81	56.5
d3	M8	M8	M10
[1)] Lengths n1 and n2 correspond to the drill hole spacing			

Table 3- 3 Dimensions of line reactor, 660 V – 690 V 3 AC (all values in mm)

6SL3000-	0CH31-1AA0 0CH31-6AA0 0CH32-2AA0 0CH32-7AA0 0CH33-4AA0	0CH34-8AA0 0CH36-0AA0	0CH38-4AA0
a2	25	30	40
a3	5	6	8
a4	12.5	15	20
a5	11	14	14
l4	270	350	410
l5	88	120	135
h1	-	-	392
h2	150	198	252
h3	60	75	120
h4	248	321	385
n1 [1)]	101	138	141
n2 [1)]	200	264	316
n3	200	232.5	224
n4	84.5	81	56.5
d3	M8	M8	M10
[1)] Lengths n1 and n2 correspond to the drill hole spacing			

Electrical installation

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Connection

When connecting the line filter and line reactor, you must take into account the following conditions to ensure that they function correctly:

- Use shielded control cables. The shield must be connected at both ends.
- With analog control cables, connecting the shield at both ends can result in coupled-in noise. To prevent this, the shield must only be connected at one end on the Power Module.
- Control cables must be routed separately from power cables. Power cables are motor cables or connecting cables from the DC link of the Power Module (terminals DCPA/DCNA) to other components (e.g. Braking Module). In particular, you must ensure that control cables and power cables are not routed in parallel in a joint cable raceway, even if all the cables are shielded.
- You must use shielded motor cables. The shield for the motor cable must be attached to the shield plate and motor housing.
- The ground wire for the motor must be fed directly back to the Power Module.

Connection overview

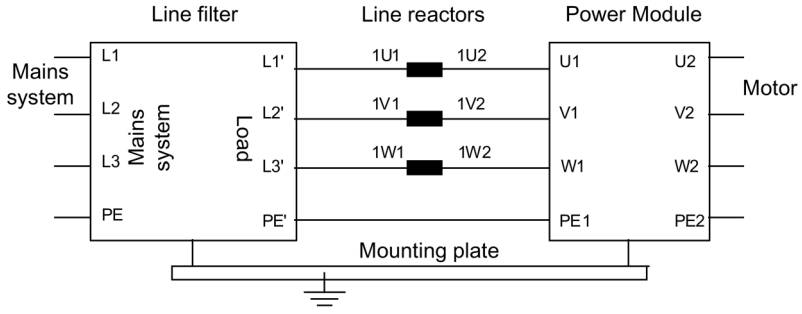

Figure 4-1 Connecting the line filter, line reactor, and Power Module

Technical specifications

5

General technical data

Table 5- 1 General technical data

Line frequency	47 … 63 Hz		
Product standard	EN 61800-5-1		
Ambient conditions	Storage	Transport	Operation
Ambient temperature	-25 ... +70 °C	-25 ... +70 °C	0 ... +50 °C
Relative air humidity [1] (condensation not permissible) corresponds to class	5 ... *95%* 1K4 according to EN 60721-3-1	5 ... 95% at 40 °C 2K3 according to EN 60721-3-2	5 ... *95%* 3K3 according to EN 60721-3-3
Mechanical strength	Storage	Transport	Operation
Vibrational load [1] - Displacement - Acceleration corresponds to class	 1.5 mm at *5* ... 9 Hz 5 m/s² at > 9 ... 200 Hz 1M2 to EN 60721-3-1	 3.5 mm at *5* ... 9 Hz 10 m/s² at > 9 ... 200 Hz 2M2 to EN 60721-3-2	 0.075 mm at 10 ... 58 Hz 10 m/s² at >58 ... 200 Hz -
Shock load [1] - Acceleration corresponds to class	 40 m/s² at 22 ms 1M2 to EN 60721-3-1	 100 m/s² at 11 ms 2M2 to EN 60721-3-2	 100 m/s² at 11 ms 3M4 to EN 60721-3-3

Deviations from the specified classes are shown in *italics*.

[1] The EN standards specified are the European editions of the international IEC standards with the same designations.

Detailed technical data

Table 5- 2 Technical data for line reactors 3 AC 380 V ... 480 V, part 1

Article number	6SL3000-	0CE32-3AA0	0CE32-8AA0	0CE33-3AA0	0CE35-1AA0
Suitable for Power Module	6SL3310-	1GE32-1AA3	1GE32-6AA3	1GE33-1AA3	1GE33-8AA3
Unit rating of the Power Module	kW	110	132	160	200
Rated voltage	V	3 AC 380 –10% to 3 AC 480 +10% (-15% < 1 min)			
I_{thmax}	A	224	278	331	508
Power loss	kW	0.274	0.247	0.267	0.365
Line/load connection 1U1, 1V1, 1W1, 1U2, 1V2, 1W2		M10 connecting lugs	M10 connecting lugs	M10 connecting lugs	M12 connecting lugs
Degree of protection		IP00	IP00	IP00	IP00
Dimensions Width Height Depth	 mm mm mm	 270 248 200	 270 248 200	 270 248 200	 300 269 212.5
Weight	kg	24.5	26.0	27.8	38.0

Table 5- 3 Technical data for line reactors 3 AC 380 V ... 480 V, part 2

Article number	6SL3000-	0CE35-1AA0	0CE36-3AA0	0CE37-7AA0	0CE38-7AA0
Suitable for Power Module	6SL3310-	1GE35-0AA3	1GE36-1AA3	1GE37-5AA3	1GE38-4AA3
Unit rating of the Power Module	kW	250	315	400	450
Rated voltage	V	3 AC 380 –10% to 3 AC 480 +10% (-15% < 1 min)			
I_{thmax}	A	508	628	773	871
Power loss	kW	0.365	0.368	0.351	0.458
Line/load connection 1U1, 1V1, 1W1, 1U2, 1V2, 1W2		M12 connecting lugs	M12 connecting lugs	M12 connecting lugs	M12 connecting lugs
Degree of protection		IP00	IP00	IP00	IP00
Dimensions Width Height Depth	 mm mm mm	 300 269 212.5	 300 269 212.5	 300 269 212.5	 350 321 211.5
Weight	kg	38.0	41.4	51.3	63.2

Table 5- 4 Technical data for line reactors 3 AC 380 V ... 480 V, part 3

Article number	**6SL3000-**	**0CE41-0AA0**			
Suitable for Power Module	6SL3310-	1GE41-0AA3			
Unit rating of the Power Module	kW	560			
Rated voltage	V	3 AC 380 –10% to 3 AC 480 +10% (-15% < 1 min)			
I_{thmax}	A	1060			
Power loss	kW	0.498			
Line/load connection 1U1, 1V1, 1W1, 1U2, 1V2, 1W2		M12 connecting lugs			
Degree of protection		IP00			
Dimensions Width Height Depth	 mm mm mm	 350 321 211.5			
Weight	kg	69.6			

Table 5- 5 Technical data for line reactors 3 AC 500 V ... 600 V, part 1

Article number	**6SL3000-**	**0CH32-2AA0**	**0CH32-7AA0**	**0CH33-4AA0**	**0CH34-8AA0**
Suitable for Power Module	6SL3310-	1GF31-8AA3 1GF32-2AA3	1GF32-6AA3	1GF33-3AA3	1GF34-1AA3 1GF34-7AA3
Unit rating of the Power Module	kW	110 132	160	200	250 315
Rated voltage	V	3 AC 500 –10% to 3 AC 600 +10% (-15% < 1 min)			
I_{thmax}	A	230	270	342	482
Power loss	kW	0.275	0.277	0.270	0.48
Line/load connection 1U1, 1V1, 1W1, 1U2, 1V2, 1W2		M10 connecting lugs	M10 connecting lugs	M10 connecting lugs	M12 connecting lugs
Degree of protection		IP00	IP00	IP00	IP00
Dimensions Width Height Depth	 mm mm mm	 270 248 200	 270 248 200	 270 248 200	 350 321 232.5
Weight	kg	31.1	27.9	38.9	55.6

Table 5- 6 Technical data for line reactors 3 AC 500 V ... 600 V, part 2

Article number	**6SL3000-**	**0CH36-0AA0**	**0CH38-4AA0**		
Suitable for Power Module	6SL3310-	1GF35-8AA3	1GF37-4AA3 1GF38-1AA3		
Unit rating of the Power Module	kW	400	500 560		
Rated voltage	V	3 AC 500 –10% to 3 AC 600 +10% (-15% < 1 min)			
I_{thmax}	A	597	840		
Power loss	kW	0.485	0.618		
Line/load connection 1U1, 1V1, 1W1, 1U2, 1V2, 1W2		M12 connecting lugs	M12 connecting lugs		
Degree of protection		IP00	IP00		
Dimensions Width Height Depth	 mm mm mm	 350 321 232.5	 410 385 224		
Weight	kg	63.8	98		

Table 5- 7 Technical data for line reactors 3 AC 660 V ... 690 V, part 1

Article number	**6SL3000-**	**0CH31-1AA0**	**0CH31-6AA0**	**0CH32-2AA0**	**0CH32-7AA0**
Suitable for Power Module	6SL3310-	1GH28-5AA3 1GH31-0AA3	1GH31-2AA3 1GH31-5AA3	1GH31-8AA3 1GH32-2AA3	1GH32-6AA3
Unit rating of the Power Module	kW	75 90	110 132	160 200	250
Rated voltage	V	3 AC 660 –10% to 3 AC 690 +10% (-15% < 1 min)			
I_{thmax}	A	107	164	230	270
Power loss	kW	0.252	0.281	0.275	0.277
Line/load connection 1U1, 1V1, 1W1, 1U2, 1V2, 1W2		M10 connecting lugs	M10 connecting lugs	M10 connecting lugs	M10 connecting lugs
Degree of protection		IP00	IP00	IP00	IP00
Dimensions Width Height Depth	 mm mm mm	 270 248 200	 270 248 200	 270 248 200	 270 248 200
Weight	kg	24.4	25.9	31.1	27.9

Table 5- 8 Technical data for line reactors 3 AC 660 V ... 690 V, part 2

Article number	**6SL3000-**	**0CH33-4AA0**	**0CH34-8AA0**	**0CH36-0AA0**	**0CH38-4AA0**
Suitable for Power Module	6SL3310-	1GH33-3AA3	1GH34-1AA3 1GH34-7AA3	1GH35-8AA3	1GH37-4AA3 1GH38-1AA3
Unit rating of the Power Module	kW	315	400 450	560	710 800
Rated voltage	V	3 AC 660 –10% to 3 AC 690 +10% (-15% < 1 min)			
I_{thmax}	A	342	482	597	840
Power loss	kW	0.270	0.478	0.485	0.618
Line/load connection 1U1, 1V1, 1W1, 1U2, 1V2, 1W2		M10 connecting lugs	M12 connecting lugs	M12 connecting lugs	M12 connecting lugs
Degree of protection		IP00	IP00	IP00	IP00
Dimensions Width Height Depth	 mm mm mm	 270 248 200	 350 321 232.5	 350 321 232.5	 410 385 224
Weight	kg	38.9	55.6	63.8	98

Additional information

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