SIEMENS

Operating instructions

SINAMICS

G130

dv/dt filter plus Voltage Peak Limiter

Edition 11/2017

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SINAMICS G130
dV/dt filter plus Voltage Peak Limiter

Operating Instructions

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Firmware version V5.1

11/2017

A5E00692302A

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.

Trademarks

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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.

Siemens AG
Division Process Industries and Drives
Postfach 48 48
90026 NÜRNBERG
GERMANY

A5E00692302A
℗ 03/2018 Subject to change

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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.

1.2 Handling electrostatic sensitive devices (ESD)

Electrostatic sensitive devices (ESD) are individual components, integrated circuits, modules or devices that may be damaged by either electric fields or electrostatic discharge.



NOTICE

Damage through electric fields or electrostatic discharge

Electric fields or electrostatic discharge can cause malfunctions through damaged individual components, integrated circuits, modules or devices.

- Only pack, store, transport and send electronic components, modules or devices in their original packaging or in other suitable materials, e.g. conductive foam rubber or aluminum foil.
- Only touch components, modules and devices when you are grounded by one of the following methods:
  - Wearing an ESD wrist strap
  - Wearing ESD shoes or ESD grounding straps in ESD areas with conductive flooring
- Only place electronic components, modules or devices on conductive surfaces (table with ESD surface, conductive ESD foam, ESD packaging, ESD transport container).

The necessary ESD protective measures are clearly illustrated in the following diagram:

- a = conductive floor surface
- b = ESD table
- c = ESD shoes
- d = ESD overall
- e = ESD wristband
- f = cabinet ground connection
- g = contact with conductive flooring

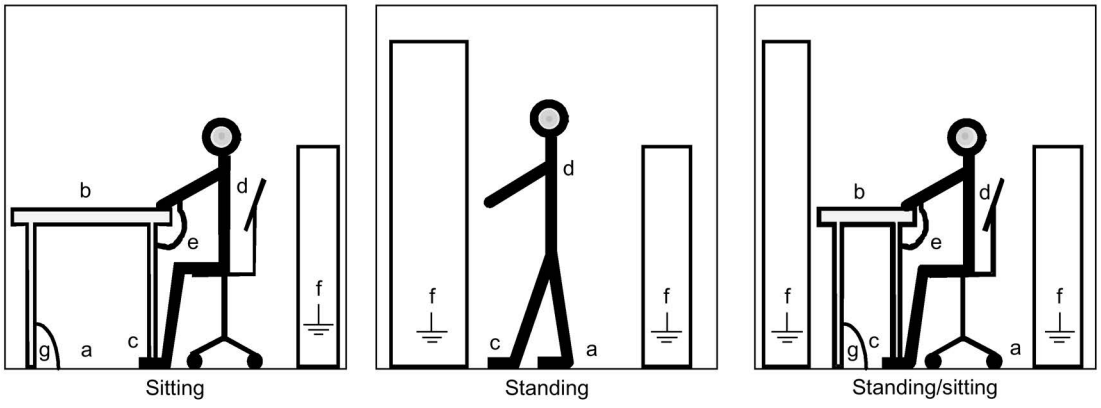


Figure 1-1 ESD protective measures

General

2

Description

The dv/dt filter plus voltage peak limiter comprises two components: the dv/dt reactor and the Voltage Peak Limiter, which cuts off the voltage peaks and returns the energy to the DC link.

The dv/dt filters plus Voltage Peak Limiter must be used for motors for which the proof voltage of the insulation system is unknown or insufficient.

dv/dt filters plus Voltage Peak Limiters limit the rate of voltage rise to values < 500 V/µs and the typical voltage peaks with rated line voltages to the values below:

< 1000 V at U_{line} < 575 V

< 1250 V at 660 V < U_{line} < 690 V.

⚠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.

⚠WARNING

Fire through overheating due to insufficient ventilation clearances

Inadequate ventilation clearances can cause overheating with a risk for personnel through smoke development and fire. Furthermore, an increased number of failures and shorter service life of the components can occur.

- Ensure 100 mm ventilation clearances above and below the component.

⚠CAUTION

Burns resulting from high surface temperature of the dv/dt reactor

The surface temperature of the dv/dt reactors may exceed 80 °C. You can get seriously burnt when touching the surface.

- Mount the dv/dt reactor so that it cannot be touched. If this is not possible, attach a clearly visible and understandable warning notice at hazardous positions.

NOTICE

Damage to the Voltage Peak Limiter due to interchanged connections

The Voltage Peak Limiter will be damaged if the input and output connections are interchanged.

- Connect the incoming cable from the DC link of the Power Module to DCPS, DCNS.
- Connect the outgoing cable for the dv/dt reactor to 1U2, 1V2, 1W2.

NOTICE

Damage to the dv/dt filter by using components that have not been released

When using components that have not been released, damage or malfunctions can occur at the devices or the system itself.

- Only use dv/dt filters that SIEMENS has released for operation with SINAMICS.

NOTICE

Damage to the dv/dt filter by exceeding the maximum output frequency

The maximum permissible output frequency when using a dv/dt filter is 150 Hz. The dv/dt filter can be damaged if the output frequency is exceeded.

- Operate the dv/dt filter with a maximum output frequency of 150 Hz.

NOTICE

Damage to the dv/dt filter by exceeding the maximum pulse frequency

The maximum permissible pulse frequency when using a dv/dt filter is 2.5 kHz or 4 kHz. The dv/dt filter can be damaged if the pulse frequency is exceeded.

- When using the dv/dt filter, operate the Power Module with a maximum pulse frequency of 2.5 kHz or 4 kHz.

NOTICE

Damage to the dv/dt filter if it is not activated during commissioning

The dv/dt filter may be damaged if it is not activated during commissioning.

- Activate the dv/dt filter during commissioning via parameter p0230 = 2.

NOTICE

Damage to the dv/dt filter if a motor is not connected

dv/dt filters which are operated without a motor being connected can be damaged or destroyed.

- Never operate a dv/dt filter connected to the Power Module without a connected motor.

Note

Cable lengths

Keep the connecting cables to the Power Module as short as possible (max. 5 m).

Assignment of dv/dt filter plus Voltage Peak Limiter and Power Module

Table 2- 1 Assignment of dv/dt filter plus Voltage Peak Limiter and Power Module

Power Module	Unit rating of the Power Module	Matching dv/dt filter plus Voltage Peak Limiter
Line voltage 3 AC 380 ... 480 V		
6SL3310-1GE32-1AA3	110 kW	**6SL3000-2DE32-6AA0**
6SL3310-1GE32-6AA3	132 kW	**6SL3000-2DE32-6AA0**
6SL3310-1GE33-1AA3	160 kW	**6SL3000-2DE35-0AA0**
6SL3310-1GE33-8AA3	200 kW	**6SL3000-2DE35-0AA0**
6SL3310-1GE35-0AA3	250 kW	**6SL3000-2DE35-0AA0**
6SL3310-1GE36-1AA3	315 kW	**6SL3000-2DE38-4AA0**
6SL3310-1GE37-5AA3	400 kW	**6SL3000-2DE38-4AA0**
6SL3310-1GE38-4AA3	450 kW	**6SL3000-2DE38-4AA0**
6SL3310-1GE41-0AA3	560 kW	**6SL3000-2DE41-4AA0**
Line voltage 3 AC 500 ... 600 V		
6SL3310-1GF31-8AA3	110 kW	**6SL3000-2DH32-2AA0**
6SL3310-1GF32-2AA3	132 kW	**6SL3000-2DH32-2AA0**
6SL3310-1GF32-6AA3	160 kW	**6SL3000-2DH33-3AA0**
6SL3310-1GF33-3AA3	200 kW	**6SL3000-2DH33-3AA0**
6SL3310-1GF34-1AA3	250 kW	**6SL3000-2DH34-1AA0**
6SL3310-1GF34-7AA3	315 kW	**6SL3000-2DH35-8AA0**
6SL3310-1GF35-8AA3	400 kW	**6SL3000-2DH35-8AA0**
6SL3310-1GF37-4AA3	500 kW	**6SL3000-2DH38-1AA0**
6SL3310-1GF38-1AA3	560 kW	**6SL3000-2DH38-1AA0**
Line voltage 3 AC 660 ... 690 V		
6SL3310-1GH28-5AA3	75 kW	**6SL3000-2DH31-0AA0**
6SL3310-1GH31-0AA3	90 kW	**6SL3000-2DH31-0AA0**
6SL3310-1GH31-2AA3	110 kW	**6SL3000-2DH31-5AA0**
6SL3310-1GH31-5AA3	132 kW	**6SL3000-2DH31-5AA0**
6SL3310-1GH31-8AA3	160 kW	**6SL3000-2DH32-2AA0**
6SL3310-1GH32-2AA3	200 kW	**6SL3000-2DH32-2AA0**
6SL3310-1GH32-6AA3	250 kW	**6SL3000-2DH33-3AA0**
6SL3310-1GH33-3AA3	315 kW	**6SL3000-2DH33-3AA0**
6SL3310-1GH34-1AA3	400 kW	**6SL3000-2DH34-1AA0**
6SL3310-1GH34-7AA3	450 kW	**6SL3000-2DH35-8AA0**
6SL3310-1GH35-8AA3	560 kW	**6SL3000-2DH35-8AA0**
6SL3310-1GH37-4AA3	710 kW	**6SL3000-2DH38-1AA0**
6SL3310-1GH38-1AA3	800 kW	**6SL3000-2DH38-1AA0**

Table 2- 2 Max. pulse frequency when a dv/dt filter is used in units with a rated pulse frequency of 2 kHz

Article no. 6SL3310-...	Power [kW]	Output current for a pulse frequency of 2 kHz [A]	Max. pulse frequency when a dv/dt filter is used
Line voltage 3 AC 380 V ... 480 V			
1GE32-1AA3	110	210	4 kHz
1GE32-6AA3	132	260	4 kHz
1GE33-1AA3	160	310	4 kHz
1GE33-8AA3	200	380	4 kHz
1GE35-0AA3	250	490	4 kHz

Table 2- 3 Max. pulse frequency when a dv/dt filter is used in units with a rated pulse frequency of 1.25 kHz

Article no. 6SL3310-...	Power [kW]	Output current for a pulse frequency of 1.25 kHz [A]	Max. pulse frequency when a dv/dt filter is used
Line voltage 3 AC 380 V ... 480 V			
1GE36-1AA3	315	605	2.5 kHz
1GE37-5AA3	400	745	2.5 kHz
1GE38-4AA3	450	840	2.5 kHz
1GE41-0AA3	560	985	2.5 kHz
Line voltage 3 AC 500 V ... 600 V			
1GF31-8AA3	110	175	2.5 kHz
1GF32-2AA3	132	215	2.5 kHz
1GF32-6AA3	160	260	2.5 kHz
1GF33-3AA3	200	330	2.5 kHz
1GF34-1AA3	250	410	2.5 kHz
1GF34-7AA3	315	465	2.5 kHz
1GF35-8AA3	400	575	2.5 kHz
1GF37-4AA3	450	735	2.5 kHz
1GF38-1AA3	560	810	2.5 kHz
Line voltage 3 AC 660 V ... 690 V			
1GH28-5AA3	75	85	2.5 kHz
1GH31-0AA3	90	100	2.5 kHz
1GH31-2AA3	110	120	2.5 kHz
1GH31-5AA3	132	150	2.5 kHz
1GH31-8AA3	160	175	2.5 kHz
1GH32-2AA3	200	215	2.5 kHz
1GH32-6AA3	250	260	2.5 kHz
1GH33-3AA3	315	330	2.5 kHz
1GH34-1AA3	400	410	2.5 kHz
1GH34-7AA3	450	465	2.5 kHz
1GH35-8AA3	560	575	2.5 kHz
1GH37-4AA3	710	735	2.5 kHz
1GH38-1AA3	800	810	2.5 kHz

Components

The article numbers of the individual components (dv/dt reactor and Voltage Peak Limiter) are listed in the following table:

Table 2- 4 dv/dt filter plus Voltage Peak Limiter, article number of the individual components

dv/dt filter plus Voltage Peak Limiter	dv/dt reactor	Voltage Peak Limiter
Line voltage 3 AC 380 V ... 480 V		
6SL3000-2DE32-6AA0	6SL3000-2DE32-6CA0	6SL3000-2DE32-6BA0
6SL3000-2DE35-0AA0	6SL3000-2DE35-0CA0	6SL3000-2DE35-0BA0
6SL3000-2DE38-4AA0	6SL3000-2DE38-4CA0	6SL3000-2DE38-4BA0
6SL3000-2DE41-4AA0	2 x 6SL3000-2DE41-4DA0	6SL3000-2DE41-4BA0
Line voltage 3 AC 500 V ... 600 V and 3 AC 660 V ... 690 V		
6SL3000-2DH31-0AA0	6SL3000-2DH31-0CA0	6SL3000-2DH31-0BA0
6SL3000-2DH31-5AA0	6SL3000-2DH31-5CA0	6SL3000-2DH31-5BA0
6SL3000-2DH32-2AA0	6SL3000-2DH32-2CA0	6SL3000-2DH32-2BA0
6SL3000-2DH33-3AA0	6SL3000-2DH33-3CA0	6SL3000-2DH33-3BA0
6SL3000-2DH34-1AA0	6SL3000-2DH34-1CA0	6SL3000-2DH34-1BA0
6SL3000-2DH35-8AA0	6SL3000-2DH35-8CA0	6SL3000-2DH35-8BA0
6SL3000-2DH38-1AA0	2 x 6SL3000-2DH38-1DA0	6SL3000-2DH38-1BA0

Limiting the rate of voltage rise and the voltage peaks by means of the motor reactor and dv/dt filter plus Voltage Peak Limiter

IGBT converter switching frequencies result in high voltage gradients (dv/dt) at the converter output. If long motor cables are used, this leads to an additional current load on the converter due to capacitive charge/discharge currents. The high voltage gradients, and the resulting transients at the motor terminals, cause the motors' electrical winding load to increase as compared with direct on-line operation.

The dv/dt filter plus Voltage Peak Limiter limits the rate of voltage rise to values < 500 V/µs and the typical voltage peaks $\hat{U}_{LL}$ to the following values (with motor cable lengths of ≤ 150 m):

- < 1000 V at U_{line} ≤ 575 V
- < 1250 V at 660 V ≤ U_{line} ≤ 690 V

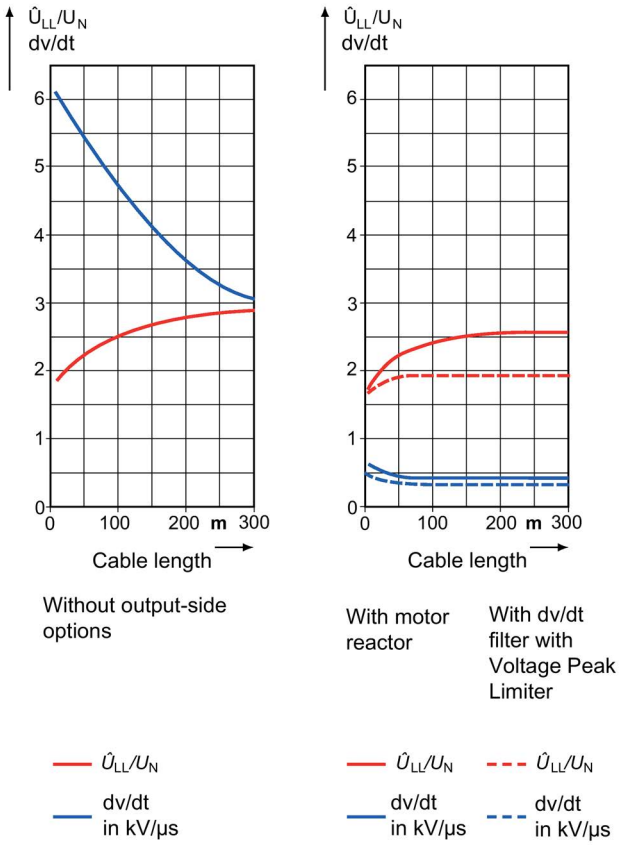


Figure 2-1 Limiting the rate of voltage rise and the voltage peaks by means of the motor reactor and dv/dt filter plus Voltage Peak Limiter

Mechanical installation

3

When the dv/dt filter plus Voltage Peak Limiter is installed in a cabinet, it must be positioned near the Power Module.

Dimension drawing

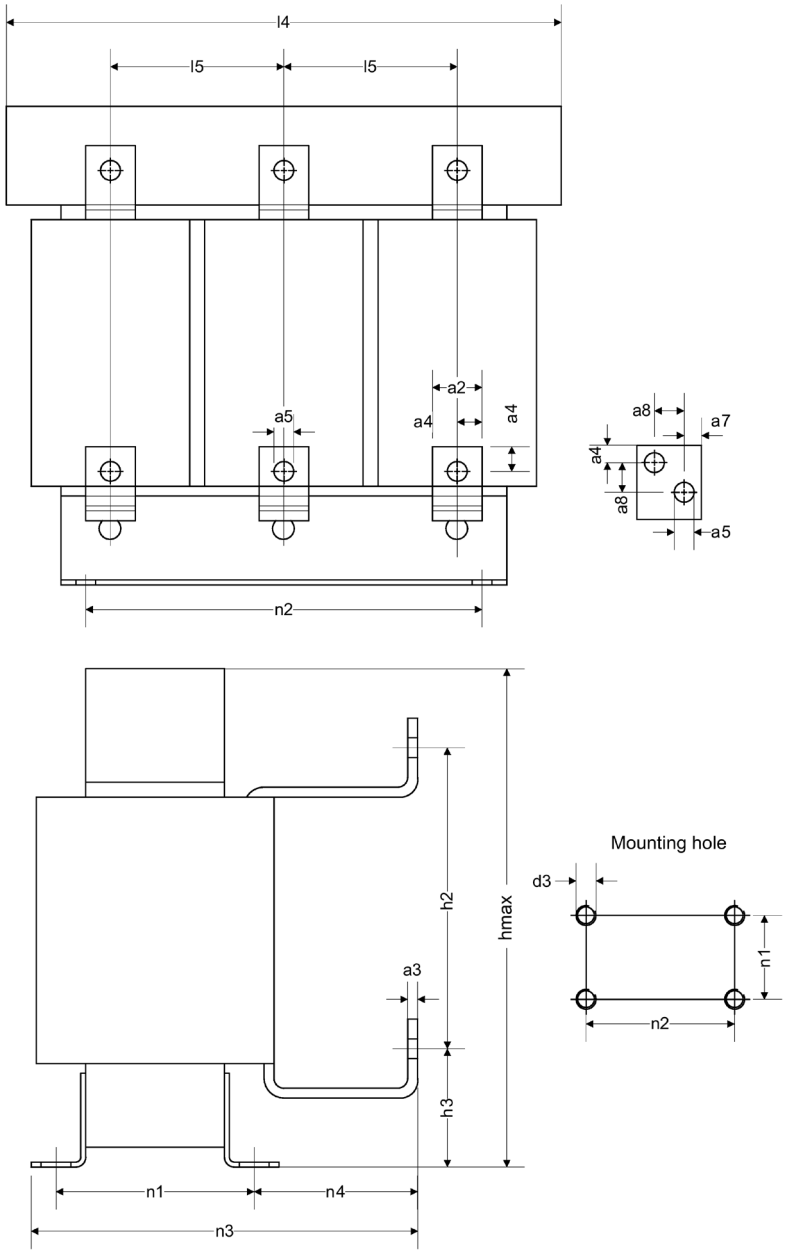


Figure 3-1 Dimension drawing, dv/dt reactor

Table 3- 1 Dimensions of du/dt reactor, line voltage 3 AC 380 V - 480 V (all values in mm)

6SL3000-	2DE32-6CA0	2DE35-0CA0	2DE38-4CA0	2DE41-4DA0
a2	25	30	40	60
a3	5	6	8	10
a4	14	17	22	19
a5	10.5 x 14	14 x 18	14 x 18	14 x 18
a6	7	9	11	11
a7	-	-	-	17
a8	-	-	-	26
l4	410	460	460	445
l5	135	152.5	152.5	145
hmax	370	370	385	385
h2	258	240	280	250
h3	76	83	78	121
n1 [1)]	141	182	212	212
n2 [1)]	316	356	356	341
n3	229	275	312	312
n4	72	71	78	78
d3	M10 (12 x 18)	M12 (15 x 22)	M12 (15 x 22)	M12 (15 x 22)
[1)] Lengths n1 and n2 correspond to the drill hole spacing				

Table 3- 2 Dimensions of dv/dt reactor, line voltage 3-phase 500 - 600 VAC and 660 - 690 VAC, Part 1 (all values in mm)

6SL3000-	2DH31-0CA0	2DH31-5CA0	2DH32-2CA0	2DH33-3CA0
a2	25	25	25	25
a3	6	6	5	5
a4	14	14	14	14
a5	10.5 x 14	10.5 x 14	10.5 x 14	10.5 x 14
a6	7	7	7	9
a7	-	-	-	-
a8	-	-	-	-
l4	350	350	460	460
l5	120	120	152.5	152.5
hmax	320	320	360	360
h2	215	215	240	240
h3	70	70	86	86
n1 [1)]	138	138	155	212
n2 [1)]	264	264	356	356
n3	227	227	275	275
n4	74	74	101	42
d3	M8	M8	M12 (15 x 22)	M12 (15 x 22)
[1)] Lengths n1 and n2 correspond to the drill hole spacing				

Table 3- 3 Dimensions of dv/dt reactor, line voltage 3-phase 500 - 600 VAC and 660 - 690 VAC, Part 2 (all values in mm)

6SL3000-	2DH34-1CA0	2DH35-8CA0	2DH38-1DA0	
a2	30	40	50	
a3	6	8	8	
a4	17	22	16	
a5	14 x 18	14 x 18	14 x 18	
a6	11	11	11	
a7	-	-	14	
a8	-	-	22	
l4	460	460	445	
l5	152.5	152.5	145	
hmax	385	385	385	
h2	280	280	255	
h3	83	78	114	
n1 [1)]	212	212	212	
n2 [1)]	356	356	341	
n3	312	312	312	
n4	78	78	78	
d3	M12 (15 x 22)	M12 (15 x 22)	M12 (15 x 22)	
[1)] Lengths n1 and n2 correspond to the drill hole spacing				

Dimension drawing of the Voltage Peak Limiter

Table 3- 4 Assigning Voltage Peak Limiters to dimension drawings

Voltage Peak Limiter	Dimension drawing type
Line voltage 3-phase 380 – 480 VAC	
6SL3000-2DE32-6BA0	Type 1
6SL3000-2DE35-0BA0	Type 2
6SL3000-2DE38-4BA0	Type 3
6SL3000-2DE41-4BA0	Type 3
Line voltage 3-phase 500 - 600 VAC and 660 - 690 VAC	
6SL3000-2DH31-0BA0	Type 1
6SL3000-2DH31-5BA0	Type 1
6SL3000-2DH32-2BA0	Type 2
6SL3000-2DH33-3BA0	Type 2
6SL3000-2DH34-1BA0	Type 3
6SL3000-2DH35-8BA0	Type 3
6SL3000-2DH38-1BA0	Type 3

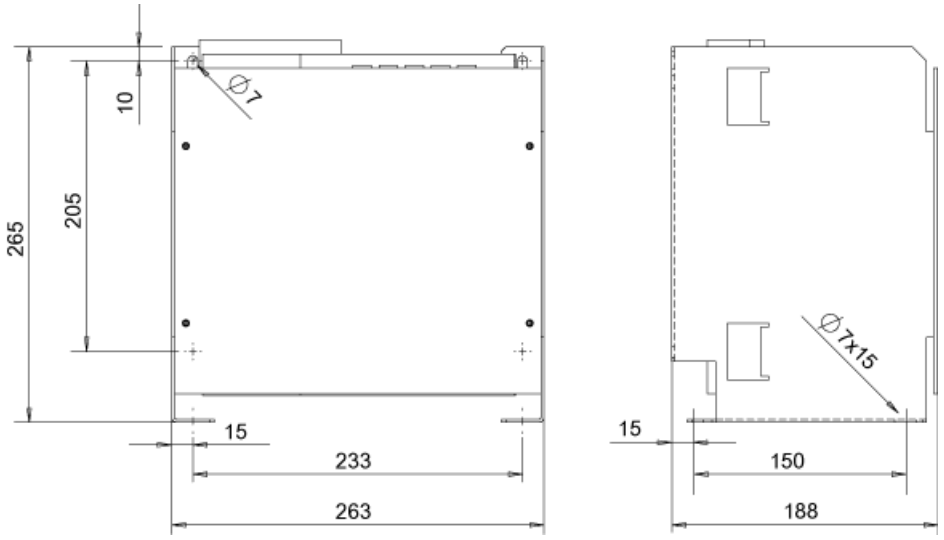


Figure 3-2 Dimension drawing of the Voltage Peak Limiter, type 1

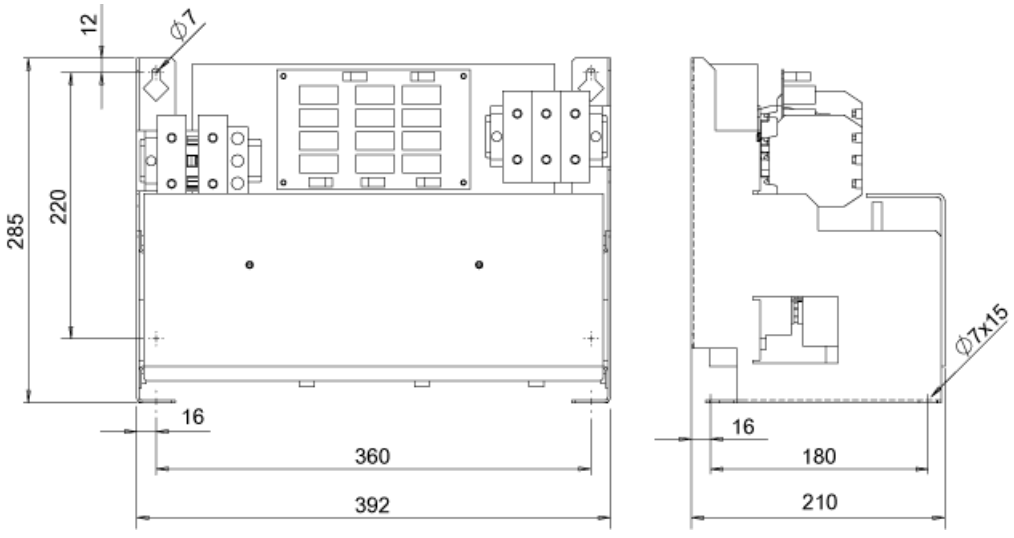


Figure 3-3 Dimension drawing of the Voltage Peak Limiter, type 2

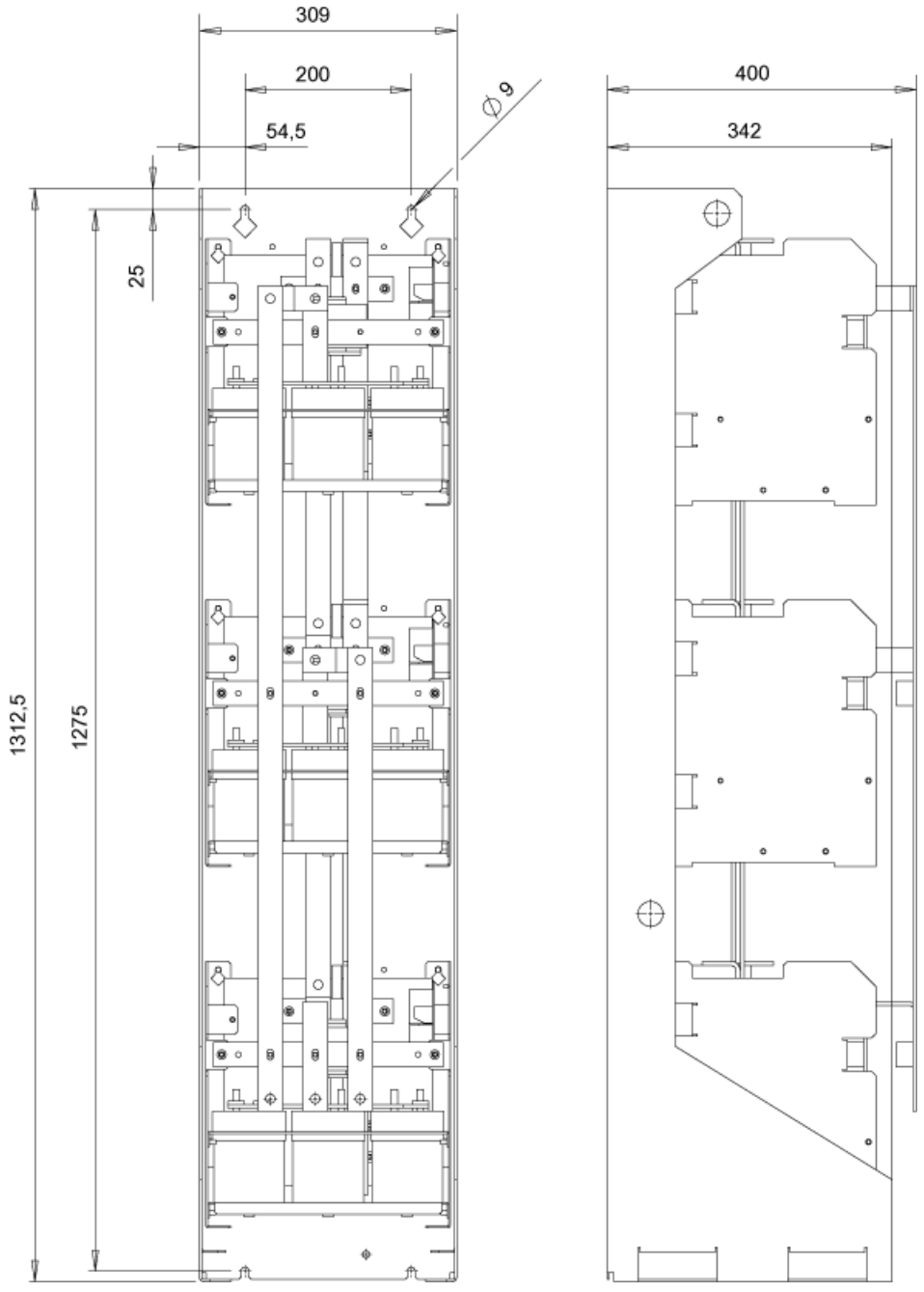


Figure 3-4 Dimension drawing of the Voltage Peak Limiter, type 3

Electrical installation

4

Interface overview

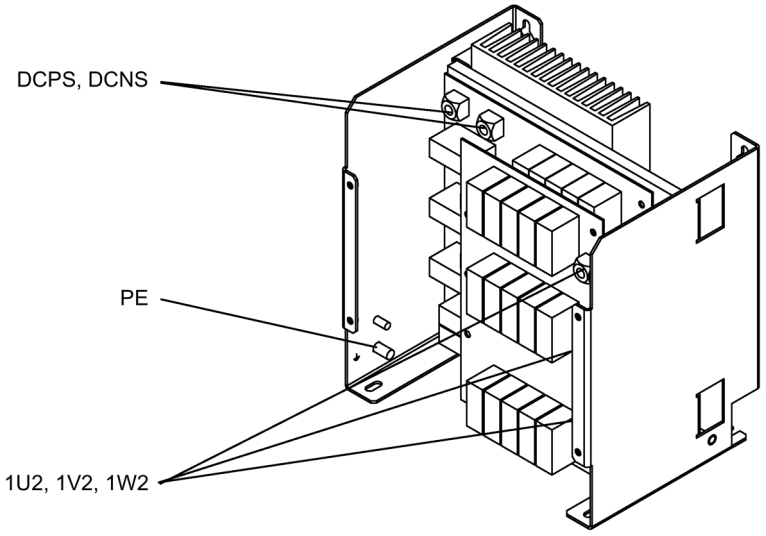


Figure 4-1 Interface overview, Voltage Peak Limiter, type 1

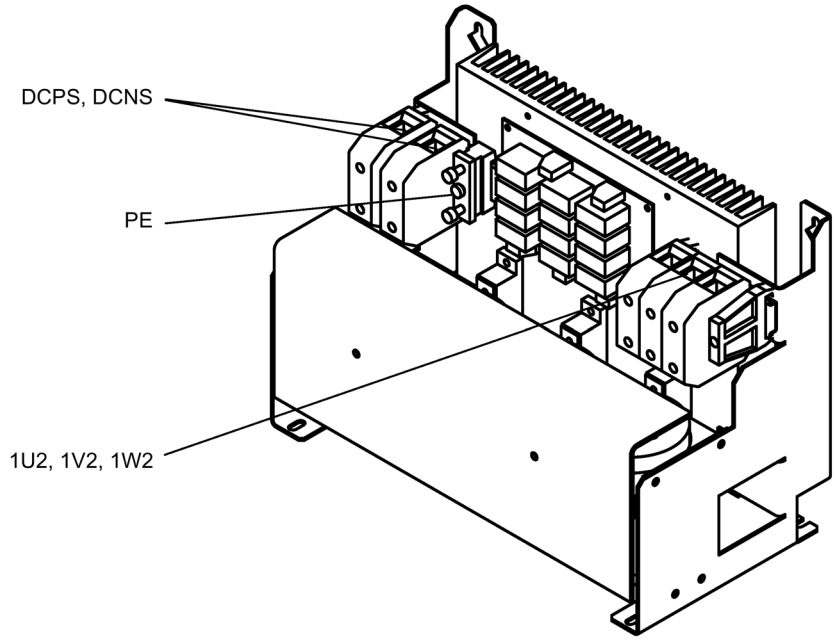


Figure 4-2 Interface overview, Voltage Peak Limiter, type 2

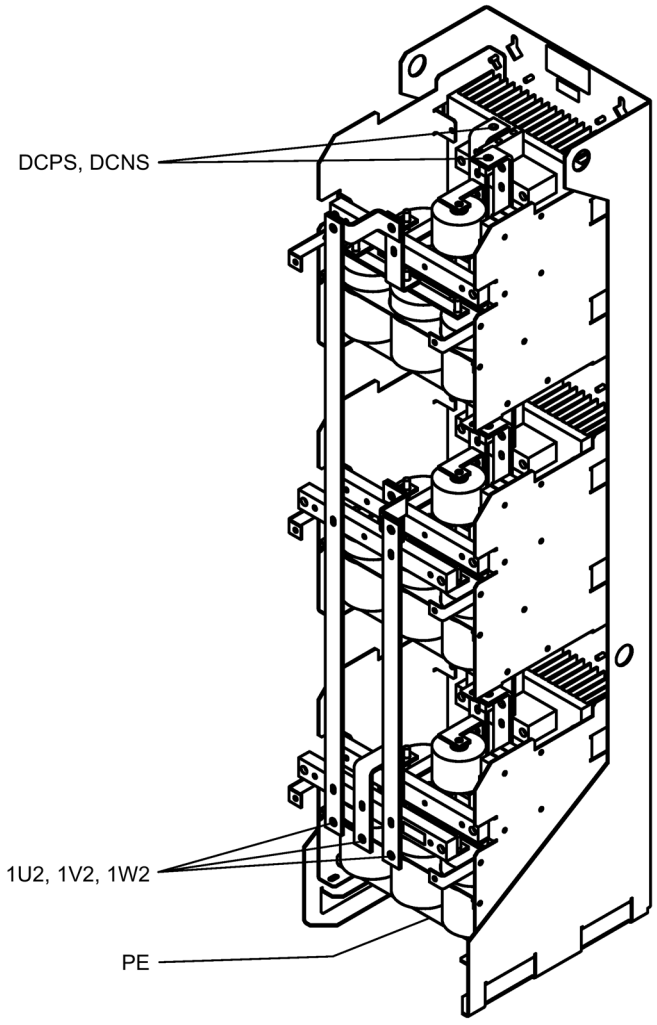


Figure 4-3 Interface overview, Voltage Peak Limiter, type 3

Connection

When connecting the dv/dt reactor and Voltage Peak Limiter, you must take into account the following conditions to ensure that it functions correctly:

- Control cables must be routed separately from power cables. Power cables are the motor cable or the connecting cables from the DC link of the Power Module (terminals DCPS/DCNS) to the Voltage Peak Limiter. 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.
- It is recommended to use shielded motor cables. If a shielded motor cable is used, its shield should be in face-to-face contact with the shield plate and motor housing.
- The ground wire for the motor must be fed directly back to the Power Module.

Connection overview

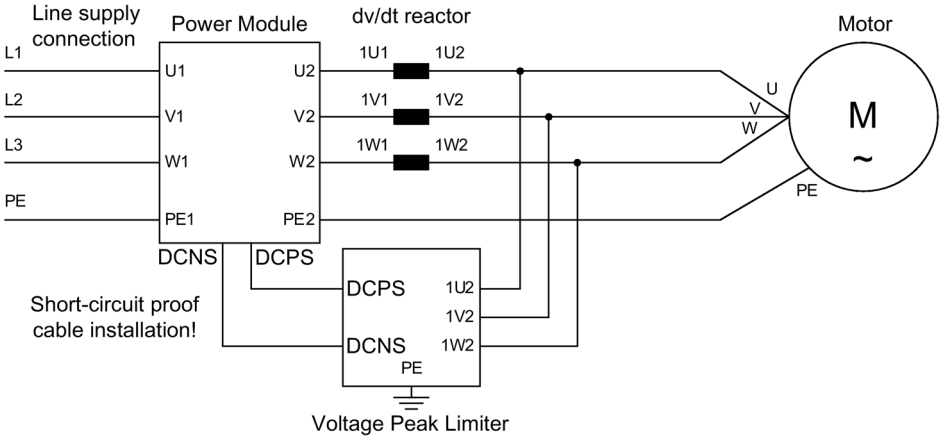


Figure 4-4 Connecting a dv/dt filter plus Voltage Peak Limiter for versions with one dv/dt reactor

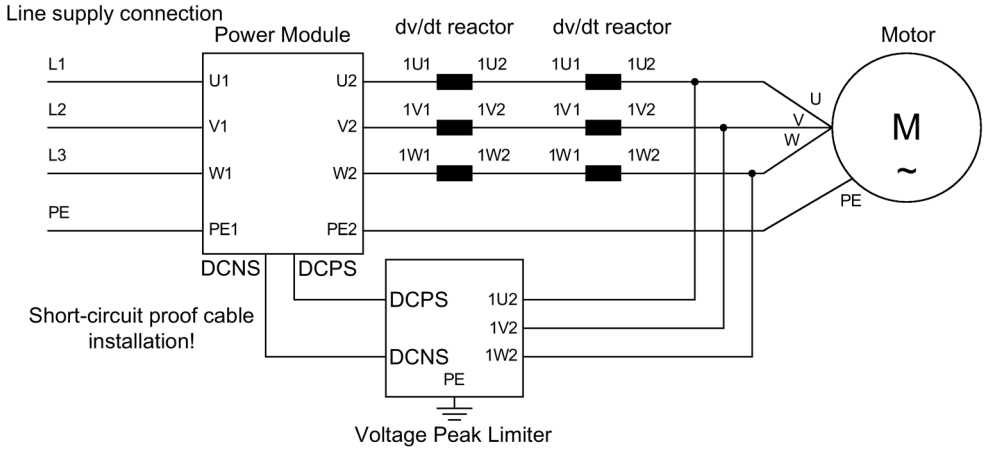


Figure 4-5 Connecting a dv/dt filter plus Voltage Peak Limiter for versions with two dv/dt reactors

Cable cross-sections

Table 4- 1 Cable cross-sections for connections between the dv/dt filter plus Voltage Peak Limiter and Power Module

dv/dt filter plus Voltage Peak Limiter	Connection to the DC link (DCPS/DCNS) [mm²]	Connection between dv/dt reactor and Voltage Peak Limiter (1U2, 1V2, 1W2) [mm²]
Line voltage 3-phase 380 – 480 VAC		
6SL3000-2DE32-6AA0	35	10
6SL3000-2DE35-0AA0	70	16
6SL3000-2DE38-4AA0	2 x 50	50
6SL3000-2DE41-4AA0	2 x 120	120
Line voltage 3-phase 500 - 600 VAC and 660 - 690 VAC		
6SL3000-2DH31-0AA0	16	6
6SL3000-2DH32-2AA0	16	6
6SL3000-2DH33-3AA0	70	16
6SL3000-2DH34-1AA0	120	35
6SL3000-2DH35-8AA0	120	35
6SL3000-2DH38-1AA0	2 x 70	70

⚠WARNING

Fire and device damage as a result of ground fault/short-circuit

Inadequate installation of the cables to the Power Module DC link can result in a ground fault/short-circuit and place persons at risk as a result of the associated smoke and fire.

- Comply with local installation regulations that enable this fault to be ruled out.
- Protect the cables from mechanical damage.
- In addition, apply one of the following measures:
  - Use cables with double insulation.
  - Maintain adequate clearance, e.g. by using spacers.
  - Lay the cables in separate cable ducts or conduits.

Note

Maximum cable lengths

The connections should be kept as short as possible.
The maximum cable length for the specified connections is 5 m in each case.

Maintenance and servicing

5

Maintenance and servicing are not carried out for the dv/dt reactor and the Voltage Peak Limiter. In the case of an error, full replacement of the dv/dt filter is necessary.

Technical specifications

6

General technical data

Table 6- 1 General technical data

Output frequency	0 ... 150 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* to 9 Hz 5 m/s² at > 9 to 200 Hz 1M2 to EN 60721-3-1	 3.5 mm at *5* to 9 Hz 10 m/s² at > 9 to 200 Hz 2M2 to EN 60721-3-2	 0.075 mm at 10 to 58 Hz 10 m/s² at >58 to 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 6- 2 Technical data for the dv/dt filter plus Voltage Peak Limiter, 3 AC 380 V ... 480 V

Article number	6SL3000-	2DE32-6AA0	2DE35-0AA0	2DE38-4AA0	2DE41-4AA0 [1]
Suitable for Power Module	6SL3310-	1GE32-1AA3 1GE32-6AA3	1GE33-1AA3 1GE33-8AA3 1GE35-0AA3	1GE36-1AA3 1GE37-5AA3 1GE38-4AA3	1GE41-0AA3
Unit rating of the Power Module	kW	110 132	160 200 250	315 400 450	560
I_{thmax}	A	260	490	840	1405
Degree of protection		IP00	IP00	IP00	IP00
dv/dt reactor					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.701 0.729 0.78	 0.874 0.904 0.963	 1.106 1.115 1.226	 1.111 1.154 1.23
Connections - to the Power Module - Load - PE		 M10 M10 M6	 M12 M12 M6	 M12 M12 M6	 2 x M12 2 x M12 M6
Max. permissible cable length between dv/dt reactor and motor	m	300 (shielded) 450 (unshielded)			
Dimensions Width Height Depth	 mm mm mm	 410 370 229	 460 370 275	 460 385 312	 445 385 312
Weight, approx.	kg	66	122	149	158
Voltage Peak Limiter					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.029 0.027 0.025	 0.042 0.039 0.036	 0.077 0.072 0.066	 0.134 0.125 0.114
Connections - to the dv/dt reactor - DC - PE		 M8 M8 M8	 Terminal 70 mm² Terminal 70 mm² Terminal 35 mm²	 M8 M8 M8	 M10 M10 M8
Dimensions Width Height Depth	 mm mm mm	 263 265 188	 392 285 210	 309 1312.5 400	 309 1312.5 400
Weight, approx.	kg	6	16	48	72

[1] Two dv/dt reactors are required for these dv/dt filters. The technical data provided applies to one dv/dt reactor.

Note

Cable lengths for versions with 2 dv/dt reactors

For versions with two dv/dt reactors, the cable lengths specified in the table do not change.

Table 6- 3 Technical data for the dv/dt filter plus Voltage Peak Limiter, 3 AC 500 V ... 600 V, part 1

Article number	**6SL3000-**	**2DH32-2AA0**	**2DH33-3AA0**	**2DH34-1AA0**	**2DH35-8AA0**
Suitable for Power Module	6SL3310-	1GF31-8AA3 1GF32-2AA3	1GF32-6AA3 1GF33-3AA3	1GF34-1AA3	1GF34-7AA3 1GF35-8AA3
Unit rating of the Power Module	kW	110 132	160 200	250	315 400
I_{thmax}	A	215	330	410	575
Degree of protection		IP00	IP00	IP00	IP00
dv/dt reactor					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.578 0.604 0.645	 0.595 0.62 0.661	 0.786 0.826 0.884	 0.862 0.902 0.964
Connections - to the Power Module - Load - PE		 M10 M10 M6	 M10 M10 M6	 M12 M12 M6	 M12 M12 M6
Max. permissible cable length between dv/dt reactor and motor	m	300 (shielded) 450 (unshielded)			
Dimensions Width Height Depth	 mm mm mm	 460 360 275	 460 360 275	 460 385 312	 460 385 312
Weight, approx.	kg	83	135	147	172
Voltage peak limiter					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.032 0.03 0.027	 0.042 0.039 0.036	 0.051 0.048 0.043	 0.063 0.059 0.054
Connections - to the dv/dt reactor - DC - PE		 Terminal 70 mm² Terminal 70 mm² Terminal 35 mm²	 Terminal 70 mm² Terminal 70 mm² Terminal 35 mm²	 M8 M8 M8	 M8 M8 M8
Dimensions Width Height Depth	 mm mm mm	 392 285 210	 392 285 210	 309 1312.5 400	 309 1312.5 400
Weight, approx.	kg	16	16	48	48

Table 6- 4 Technical data for the dv/dt filter plus Voltage Peak Limiter, 3 AC 500 V ... 600 V, part 2

Article number	**6SL3000-**	**2DH38-1AA0** [1]			
Suitable for Power Module	6SL3310-	1GF37-4AA3 1GF38-1AA3			
Unit rating of the Power Module	kW	500 560			
I_{thmax}	A	810			
Degree of protection		IP00			
dv/dt reactor					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.828 0.867 0.927			
Connections - to the Power Module - Load - PE		 2 x M12 2 x M12 M6			
Max. permissible cable length between dv/dt reactor and motor	m	300 (shielded) 450 (unshielded)			
Dimensions Width Height Depth	 mm mm mm	 445 385 312			
Weight, approx.	kg	160			
Voltage peak limiter					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.106 0.1 0.091			
Connections - to the dv/dt reactor - DC - PE		 M10 M10 M8			
Dimensions Width Height Depth	 mm mm mm	 309 1312.5 400			
Weight, approx.	kg	72			
[1] Two dv/dt reactors are required for these dv/dt filters. The technical data provided applies to one dv/dt reactor.					

Note

Cable lengths for versions with 2 dv/dt reactors

For versions with two dV/dt reactors, the cable lengths specified in the table do not change.

Table 6- 5 Technical data for the dv/dt filter plus Voltage Peak Limiter, 3 AC 660 V ... 690 V, part 1

Article number	**6SL3000-**	**2DH31-0AA0**	**2DH31-5AA0**	**2DH32-2AA0**	**2DH33-3AA0**
Suitable for Power Module	6SL3310-	1GH28-5AA3 1GH31-0AA3	1GH31-2AA3 1GH31-5AA3	1GH31-8AA3 1GH32-2AA3	1GH32-6AA3 1GH33-3AA3
Unit rating of the Power Module	kW	75 90	110 132	160 200	250 315
I_{thmax}	A	100	150	215	330
Degree of protection		IP00	IP00	IP00	IP00
dv/dt reactor					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.49 0.508 0.541	 0.389 0.408 0.436	 0.578 0.604 0.645	 0.595 0.62 0.661
Connections - to the Power Module - Load - PE		 M10 M10 M6	 M10 M10 M6	 M10 M10 M6	 M10 M10 M6
Max. permissible cable length between dv/dt reactor and motor	m	300 (shielded) 450 (unshielded)			
Dimensions Width Height Depth	 mm mm mm	 350 320 227	 350 320 227	 460 360 275	 460 360 275
Weight, approx.	kg	48	50	83	135
Voltage Peak Limiter					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.016 0.015 0.013	 0.020 0.019 0.018	 0.032 0.03 0.027	 0.042 0.039 0.036
Connections - to the dv/dt reactor - DC - PE		 M8 M8 M8	 M8 M8 M8	Terminals: 70 mm² 70 mm² 35 mm²	Terminals: 70 mm² 70 mm² 35 mm²
Dimensions Width Height Depth	 mm mm mm	 263 265 188	 263 265 188	 392 285 210	 392 285 210
Weight, approx.	kg	6	6	16	16

Table 6- 6 Technical data for the dv/dt filter plus Voltage Peak Limiter, 3 AC 660 V ... 690 V, part 2

Article number	6SL3000-	2DH34-1AA0	2DH35-8AA0	2DH38-1AA0 [1]	
Suitable for Power Module	6SL3310-	1GH34-1AA3	1GH34-7AA3 1GH35-8AA3	1GH37-4AA3 1GH38-1AA3	
Unit rating of the Power Module	kW	400	450 560	710 800	
I_{thmax}	A	410	575	810	
Degree of protection		IP00	IP00	IP00	
dv/dt reactor					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.786 0.826 0.884	 0.862 0.902 0.964	 0.828 0.867 0.927	
Connections - to the Power Module - Load - PE		 M12 M12 M6	 M12 M12 M6	 2 x M12 2 x M12 M6	
Max. permissible cable length between dv/dt reactor and motor	m	300 (shielded) 450 (unshielded)			
Dimensions Width Height Depth	 mm mm mm	 460 385 312	 460 385 312	 445 385 312	
Weight, approx.	kg	147	172	160	
Voltage peak limiter					
Power loss - at 50 Hz - at 60 Hz - at 150 Hz	 kW kW kW	 0.051 0.048 0.043	 0.063 0.059 0.054	 0.106 0.1 0.091	
Connections - to the dv/dt reactor - DC - PE		 M8 M8 M8	 M8 M8 M8	 M10 M10 M8	
Dimensions Width Height Depth	 mm mm mm	 309 1312.5 400	 309 1312.5 400	 309 1312.5 400	
Weight, approx.	kg	48	48	72	
[1] Two dv/dt reactors are required for these dv/dt filters. The technical data provided applies to one dv/dt reactor.					

Note

Cable lengths for versions with 2 dv/dt reactors

For versions with two dv/dt reactors, the cable lengths specified in the table do not change.

Additional information

Siemens:
www.siemens.com

Industry Online Support (service and support):
www.siemens.com/online-support

IndustryMall:
www.siemens.com/industrymall

Siemens AG
Process Industries and Drives
Large Drives
Postbox 4743
90025 Nuremberg
Germany

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