

## SITOP power supply

## SITOP expansion modules

### Equipment Manual

SITOP RED1200 redundancy module

6EP4346-7RB00-0AX0

SITOP RED1200 redundancy module

6EP4347-7RB00-0AX0

SITOP RED1200 redundancy module

6EP4348-7RB00-0AX0

SITOP PSE202U redundancy module

6EP1961-3BA21

SITOP PSE202U redundancy module

6EP1962-2BA00

SITOP PSE202U redundancy module

6EP1964-2BA00

SITOP CHO1400 chopper module

6EP4548-7XB00-3AX0

SITOP BUF1200 buffer module

6EP4231-7HB00-0AX0

SITOP PSE201U buffer module

6EP1961-3BA01

SITOP PBM1200 power boost module

6EP4240-7HB00-0AX0

Inrush current limiter Logo! ICL230

6EP4683-6LB00-0AY0

SITOP inrush current limiter

6EP1967-2AA00

SITOP RED1200 Ex redundancy module

6EP4347-7RC00-0AX0

SITOP BUF1200 Ex buffer module

6EP4231-7HC00-0AX0

### Overview

Safety instructions

1

Description, device design,  
dimension drawing

2

Mounting/removal

3

Mounting position,  
mounting clearances

4

Installation

5

Technical data

6

Safety, approvals, EMC

7

Ambient conditions

8

Applications

9

Environment

10

Service & Support

11

## Ordering data

The following device versions are available:

| Expansion modules                                                       |                    |
|-------------------------------------------------------------------------|--------------------|
| Type                                                                    | Order number       |
| Redundancy module SITOP RED1200<br>input/output 12 - 48 V DC/20 A       | 6EP4346-7RB00-0AX0 |
| Redundancy module SITOP RED1200<br>input/output 12 - 48 V DC/40 A       | 6EP4347-7RB00-0AX0 |
| Redundancy module SITOP RED1200<br>input/output 12 - 48 V DC/80 A       | 6EP4348-7RB00-0AX0 |
| Redundancy module SITOP PSE202U<br>input/output 24 V DC/40 A            | 6EP1961-3BA21      |
| Redundancy module SITOP PSE202U NEC CLASS 2<br>input/output 24 V DC/4 A | 6EP1962-2BA00      |
| Redundancy module SITOP PSE202U<br>input/output 24 V DC/10 A            | 6EP1964-2BA00      |
| Chopper module SITOP CHO1400                                            | 6EP4548-7XB00-3AX0 |
| Buffer module SITOP BUF1200                                             | 6EP4231-7HB00-0AX0 |
| Buffer module SITOP PSE201U                                             | 6EP1961-3BA01      |
| Power boost module SITOP PBM1200                                        | 6EP4240-7HB00-0AX0 |
| Inrush current limiter Logo! ICL230                                     | 6EP4683-6LB00-0AY0 |
| Inrush current limiter SITOP                                            | 6EP1967-2AA00      |

| Expansion modules Ex                                                 |                    |
|----------------------------------------------------------------------|--------------------|
| Type                                                                 | Order number       |
| Redundancy module SITOP RED1200 Ex<br>input/output 12 - 48 V DC/40 A | 6EP4347-7RC00-0AX0 |
| Buffer module SITOP BUF1200 Ex                                       | 6EP4231-7HC00-0AX0 |

| Accessories for SITOP RED1200         |                    |
|---------------------------------------|--------------------|
| Type                                  | Order number       |
| Reference labeling plate (160 plates) | 6ES7193-6LF30-0AW0 |

## 2.2 Connections and terminal designation

| Connections and terminal designations of the redundancy modules 6EP4347-7RB00-0AX0, 6EP4348-7RB00-0AX0 and 6EP4347-7RC00-0AX0 |                                 |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| ① Input 12 - 48 V supply voltage of power supplies 1 and 2 "DC IN1", "DC IN2"                                                 | one spring-loaded terminal each |
| ② Output 12 - 48 V supply voltage to the load / "DC OUT1", "DC OUT2" (6EP4348-7RB00-0AX0 only)                                | one spring-loaded terminal each |

|                                                                                   | ① + ②                         |
|-----------------------------------------------------------------------------------|-------------------------------|
|  | 0,8 x 5,5                     |
|  | 1 x 0,75 - 16 mm <sup>2</sup> |
|  | 1 x 0,75 - 25 mm <sup>2</sup> |
|  | 1 x 0,25 - 16 mm <sup>2</sup> |
| AWG                                                                               | 18 - 4                        |
|  | 18 - 20 mm                    |

Figure 2-12 Terminal data 6EP4347-7RB00-0AX0, 6EP4348-7RB00-0AX0 and 6EP4347-7RC00-0AX0

## 2.2.1.2 SITOP PSE202U

**Note**

Use suitable copper cables that are designed for operating temperatures of at least 60/75 °C. The cables must be certified for at least 90 °C for the 6EP1964-2BA00 device.

| Connections and terminal designations of redundancy module 6EP1961-3BA21                             |                                    |
|------------------------------------------------------------------------------------------------------|------------------------------------|
| ① Input 24 V supply voltage of power supplies 1 and 2 "IN 24 V-1", "IN 24 V-2"                       | One screw terminal each            |
| ② Output 24 V supply voltage to the load / "OUT 24 V"<br>0 V connection to the internal supply "GND" | One screw terminal each            |
| ③ Floating relay contact (changeover contact) "OK"                                                   | Plug-in terminal 3 screw terminals |

## 2.5 Dimensions and weight

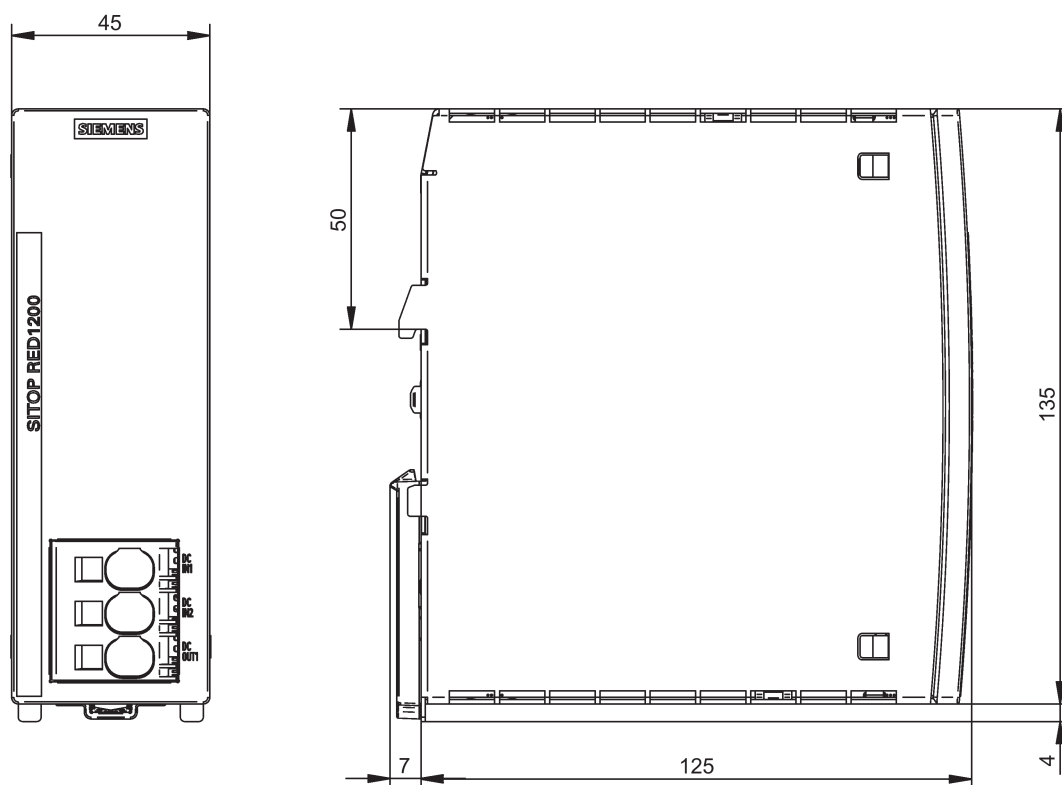


Figure 2-29 Dimension drawing 6EP4347-7RB00-0AX0 and 6EP4347-7RC00-0AX0

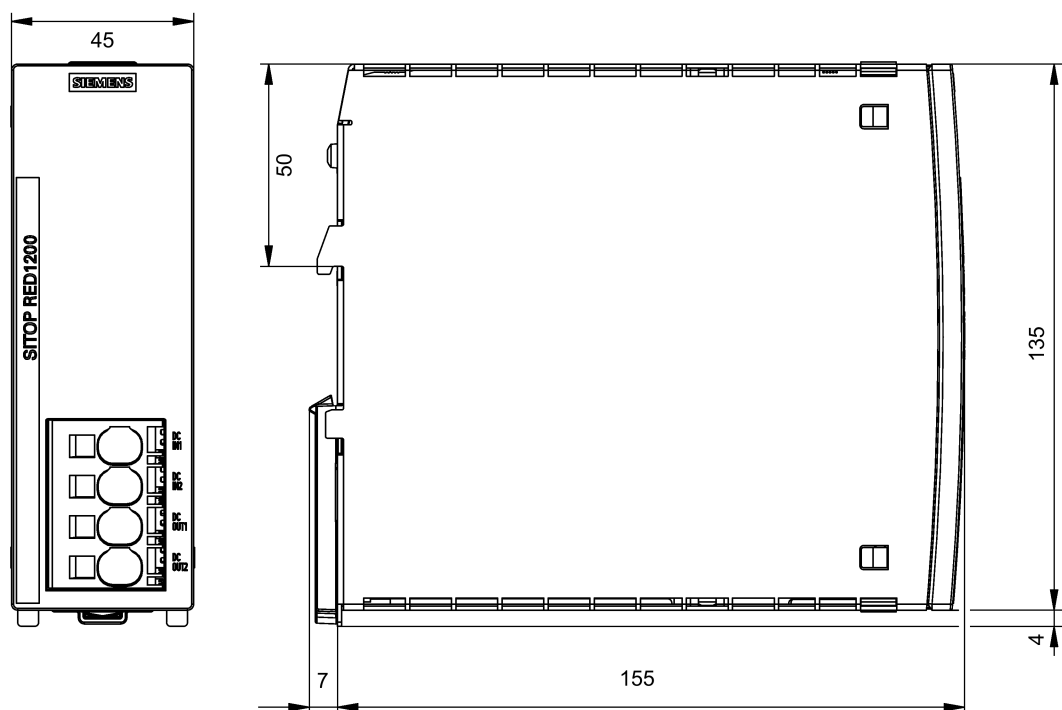


Figure 2-30 Dimension drawing 6EP4348-7RB00-0AX0

|                              | 6EP4346-7RB00-0AX0 | 6EP4347-7RB00-0AX0<br>6EP4347-7RC00-0AX0 | 6EP4348-7RB00-0AX0 |
|------------------------------|--------------------|------------------------------------------|--------------------|
| Dimensions (W × H × D) in mm | 35 × 135 × 125     | 45 × 135 × 125                           | 45 × 135 × 155     |
| Weight                       | 0.47 kg            | 0.50 kg                                  | 1.01 kg            |

### 2.5.1.2 SITOP PSE202U

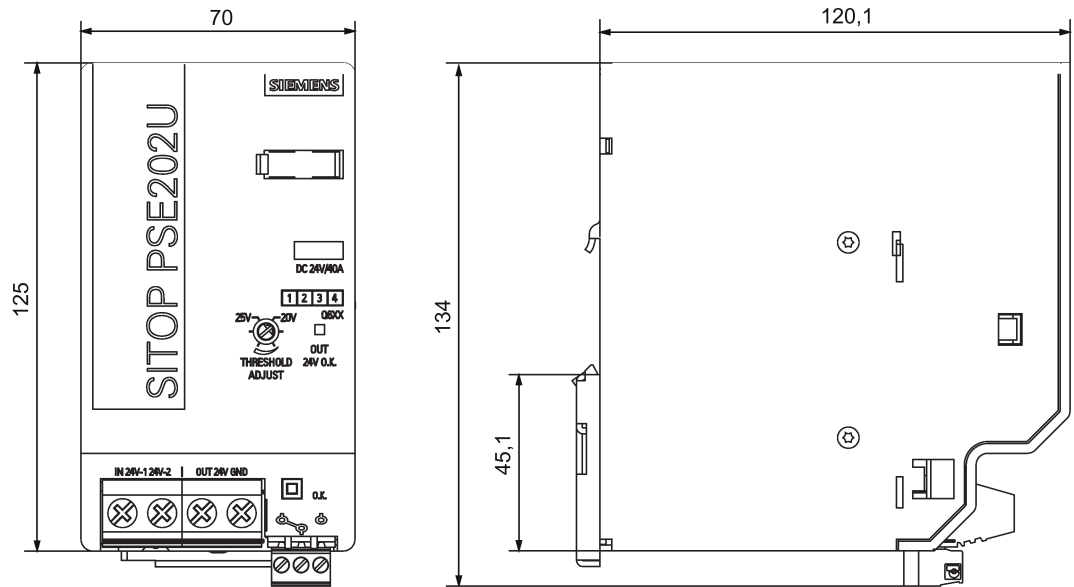


Figure 2-31 Dimension drawing 6EP1961-3BA21

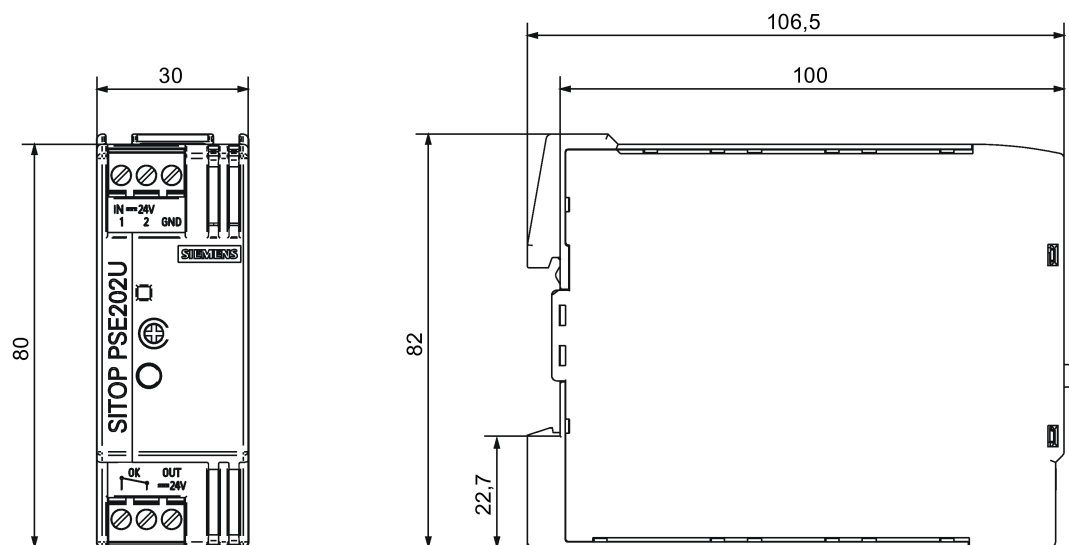


Figure 2-32 Dimension drawing 6EP1962-2BA00

## Mounting position, mounting clearances

### 4.1 Standard mounting position

The expansion modules are mounted on standard mounting rails. The certified standard mounting position of the devices is vertical, and to ensure correct cooling they must be mounted in such a way that

- for the RED1200 devices (6EP4346-7RB00-0AX0, 6EP4347-7RB00-0AX0, 6EP4347-7RC00-0AX0, 6EP4348-7RB00-0AX0) the terminals are at the bottom. A clearance of at least 45 mm must be maintained above and below the devices (max. cable channel depth, 50 mm).
- for the PSE202U 2 x 20 A (6EP1961-3BA21) the terminals are at the bottom. A clearance of at least 50 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the PSE202U NEC Class 2 (6EP1962-2BA00) and PSE202U 2 x 5 A (6EP1964-2BA00) the input terminals are at the top and the output terminals at the bottom. Clearances must be maintained above and below the device (see Figure 3-3 Clearances (Page 56)).
- for the CHO1400 (6EP4548-7XB00-3AX0) the input terminals are at the bottom and the signaling contact terminals at the top. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the BUF1200 (6EP4231-7HB00-0AX0, 6EP4231-7HC00-0AX0) the terminals are at the bottom. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the PSE201U (6EP1961-3BA01) the terminals are at the bottom. A clearance of at least 50 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the PBM1200 (6EP4240-7HB00-0AX0) the terminals are at the bottom. A clearance of at least 45 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the Logo! ICL230 (6EP4683-6LB00-0AY0) the output terminals are at the top and the input terminals at the bottom. A clearance of at least 20 mm must be maintained above and below the device (max. cable duct depth 50 mm).
- for the inrush current limiter SITOP (6EP1967-2AA00) the input terminals are at the top and the output terminals at the bottom. A clearance of at least 50 mm must be maintained above and below the device (max. cable duct depth 50 mm).

Lateral clearances do not have to be maintained.

## Output current as a function of the ambient temperature and mounting height

Buffer module 6EP4231-7HB00-0AX0: -25 ... 70 °C without derating  
 Power boost module 6EP4240-7HB00-0AX0: -40 ... 70 °C without derating  
 Buffer module 6EP1961-3BA01: -25 ... 70 °C without derating  
 Inrush current limiter 6EP1967-2AA00: -25 ... 60 °C without derating  
 Inrush current limiter 6EP4683-6LB00-0AY0: -40 ... 70 °C without derating  
 Chopper module 6EP4548-7XB00-3AX0: 3%  $I_{out rated}/K$  derating at > 60 °C

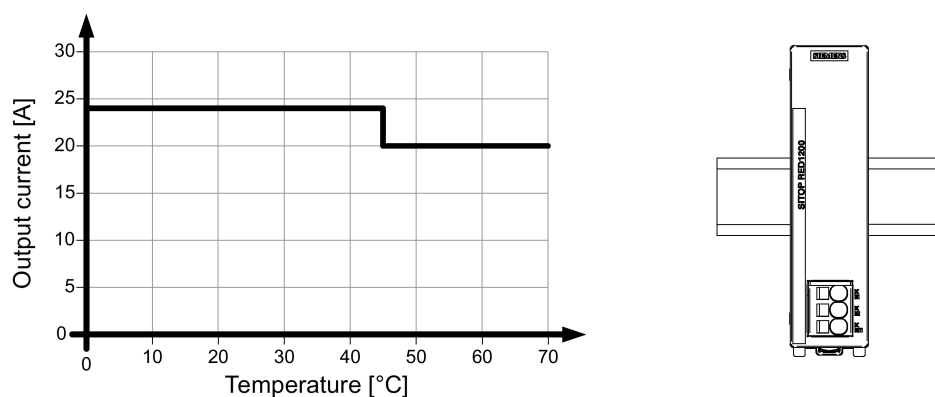


Figure 4-1 6EP4346-7RB00-0AX0: Output current in the standard mounting position

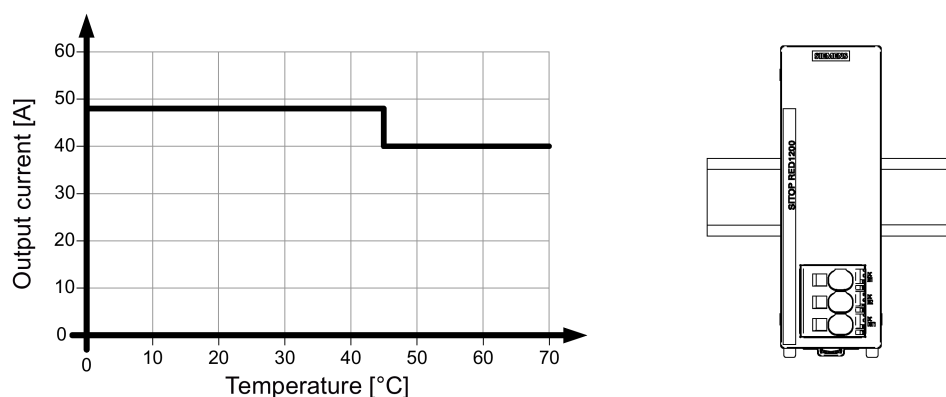


Figure 4-2 6EP4347-7RB00-0AX0 and 6EP4347-7RC00-0AX0: Output current in the standard mounting position

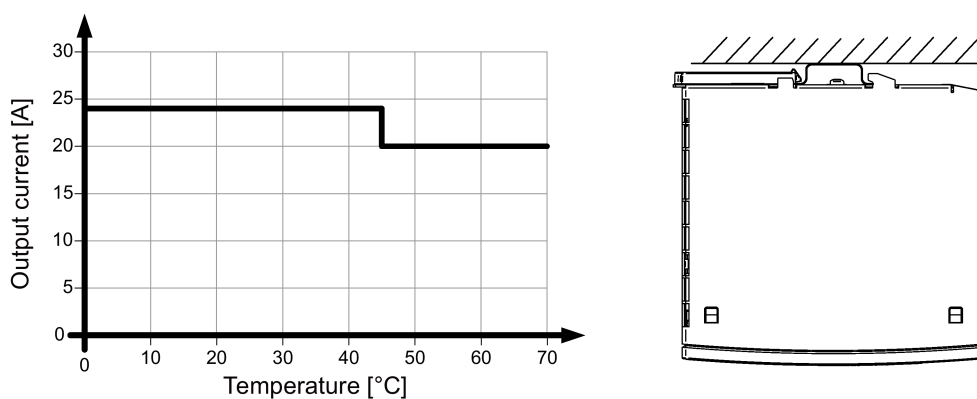


Figure 4-12 Mounting position 5

#### 4.2.1.2 6EP4347-7RB00-0AX0 and 6EP4347-7RC00-0AX0

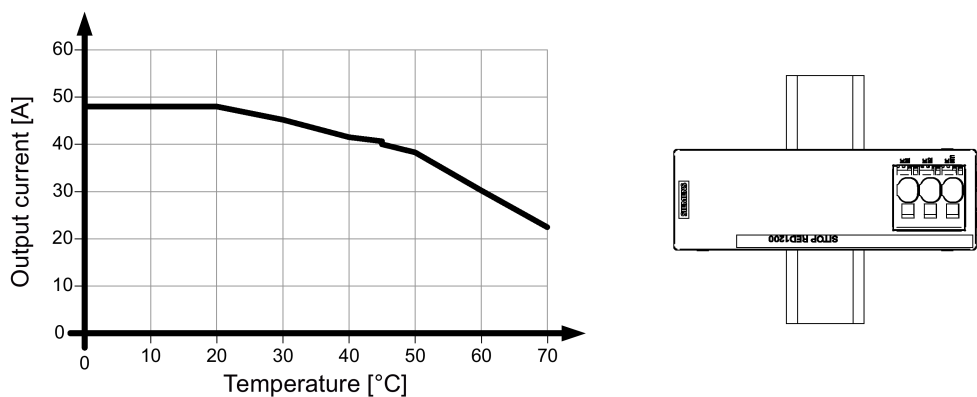


Figure 4-13 Mounting position 1

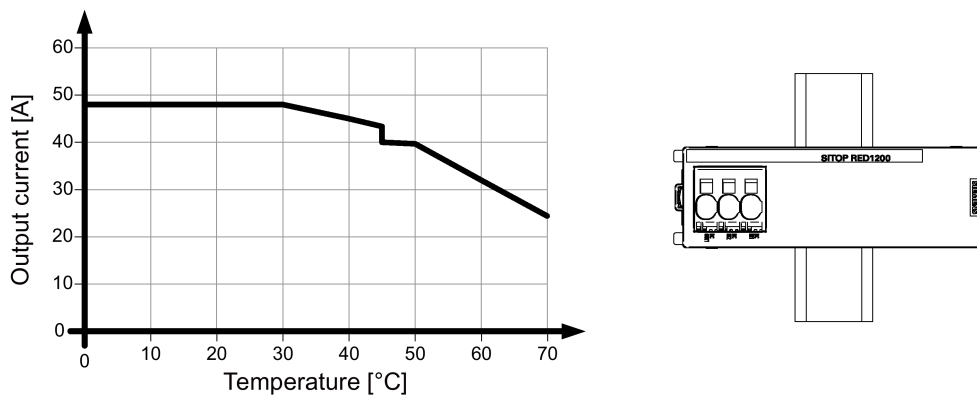


Figure 4-14 Mounting position 2

|                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>WARNING</b>                                                                                                                                                           |
| <b>Hazard due to electric shock</b>                                                                                                                                                                                                                        |
| Before installation or maintenance work can begin, the system's main switch must be switched off and measures taken to prevent it being switched on again. If this instruction is not observed, touching live parts can result in death or serious injury. |

Copper wire that as a minimum must comply with the subsequent temperature requirement must be used to wire the devices.

| Expansion modules                                 |                    |                             |
|---------------------------------------------------|--------------------|-----------------------------|
| Type                                              | Article number     | Temperature                 |
| Redundancy module SITOP RED1200 (2 × 10 A)        | 6EP4346-7RB00-0AX0 | 90 °C<br>(UL 508: 60/75 °C) |
| Redundancy module SITOP RED1200 (2 × 20 A)        | 6EP4347-7RB00-0AX0 | 90 °C<br>(UL 508: 60/75 °C) |
| Redundancy module SITOP RED1200 (2 × 40 A)        | 6EP4348-7RB00-0AX0 | 90 °C<br>(UL 508: 60/75 °C) |
| Redundancy module SITOP PSE202U (2 × 20 A)        | 6EP1961-3BA21      | 60/75 °C                    |
| Redundancy module SITOP PSE202U NEC CLASS 2 (4 A) | 6EP1962-2BA00      | 60/75 °C                    |
| Redundancy module SITOP PSE202U (2 × 5 A)         | 6EP1964-2BA00      | 90 °C                       |
| Chopper module SITOP CHO1400                      | 6EP4548-7XB00-3AX0 | 75 °C                       |
| Buffer module SITOP BUF1200                       | 6EP4231-7HB00-0AX0 | 75 °C                       |
| Buffer module SITOP PSE201U                       | 6EP1961-3BA01      | 75 °C                       |
| Power boost module SITOP PBM1200                  | 6EP4240-7HB00-0AX0 | 75 °C                       |
| Inrush current limiter Logo! ICL230               | 6EP4683-6LB00-0AY0 | 90 °C                       |
| Inrush current limiter SITOP                      | 6EP1967-2AA00      | 60/75 °C                    |

| Expansion modules Ex                          |                    |                             |
|-----------------------------------------------|--------------------|-----------------------------|
| Type                                          | Article number     | Temperature                 |
| Redundancy module SITOP RED1200 Ex (2 × 20 A) | 6EP4347-7RC00-0AX0 | 90 °C<br>(UL 508: 60/75 °C) |
| Buffer module SITOP BUF1200 Ex                | 6EP4231-7HC00-0AX0 | 75 °C                       |

## 5.1 Input connections

### NOTICE

Country-specific regulations must be observed when installing.

### 5.1.1 Redundancy modules

#### 5.1.1.1 SITOP RED1200

Inputs "DC IN1" and "DC IN2" of the redundancy module must be connected with outputs "+" of the power supplies.

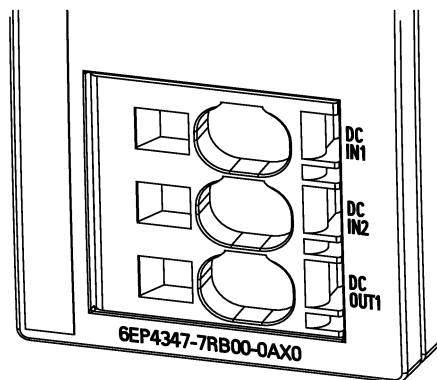


Figure 5-1 Input/output

#### 5.1.1.2 SITOP PSE202U

Inputs "IN 24 V-1" and "IN 24 V-2" of the redundancy module must be connected with outputs "+" of the power supplies and input "GND" of the redundancy module with outputs "-" of the power supplies.

### NOTICE

It is not permissible to operate the device without the GND cable being connected. It is not permissible that cables IN 24V-1 or IN 24V-2 and cable GND are interchanged.

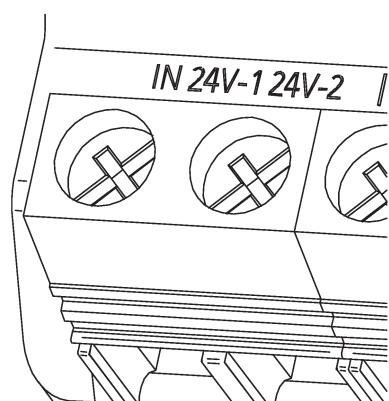


Figure 5-2 Input 6EP1961-3BA21

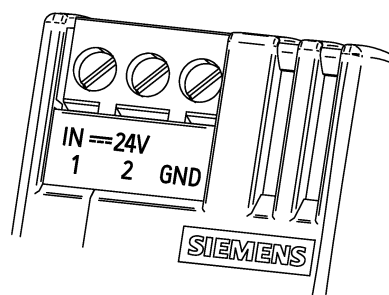


Figure 5-3 Input 6EP1962-2BA00 and 6EP1964-2BA00

### 5.1.2 Chopper module

Input "+" of the chopper module is connected with output "+" of the power supply, and input "-" of the chopper module with output "-" of the power supply.

The chopper module should be wired with the same conductor cross-section as the output cable of the power supply.

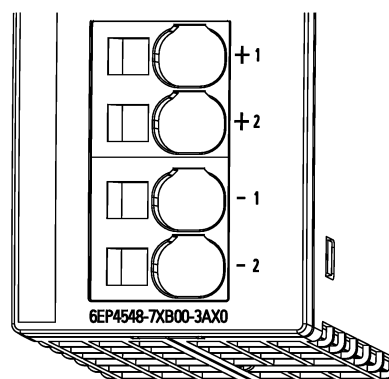


Figure 5-4 Input

### 5.1.3 Buffer modules

#### 5.1.3.1 SITOP BUF1200

The buffer module is connected in parallel with the SITOP power supply. To do this, input/output "+" of the buffer module must be connected with output "+" of the power supply, and input/output "-" of the buffer module, with output "-" of the power supply. The buffer module should be wired with the same conductor cross-section as the output cable of the power supply.

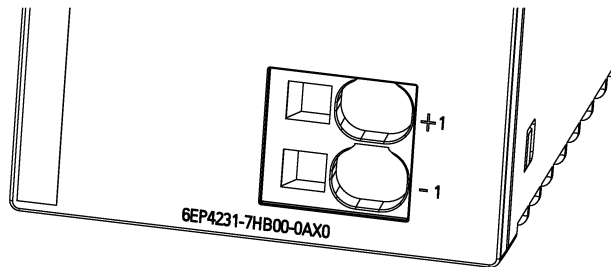


Figure 5-5 Input/output

#### 5.1.3.2 SITOP PSE201U

The buffer module is connected in parallel with the SITOP power supply. To do this, input/output "+" of the buffer module must be connected with output "+" of the power supply, and input/output "-" of the buffer module, with output "-" of the power supply. The buffer module should be wired with the same conductor cross-section as the output cable of the power supply.

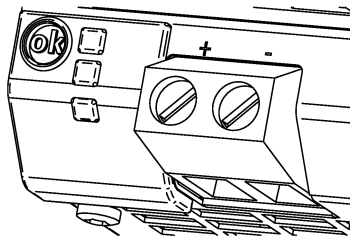


Figure 5-6 Input/output

### 5.1.4 Power boost module

The input "+1" of the power boost module is to be connected with the output "+" of the power supply and the input "-1" of the power boost module without the output "-" of the power supply. The load should be connected to the terminals "+2" and "-2" of the power boost module.

The power boost module should be wired with the same cable cross-section as the output cable of the power supply.

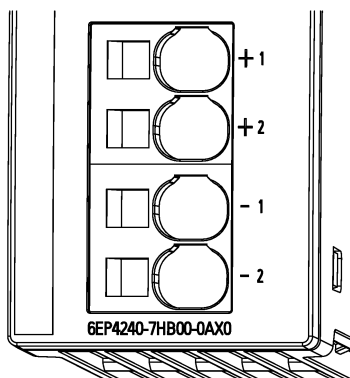


Figure 5-7 Input

### 5.1.5 Inrush current limiter

#### 5.1.5.1 Logo! ICL230

The inrush current limiter is connected between the line supply and the power supply to be supplied. It is suitable for connection to 1-phase AC line supplies with 100 V, 120 V or 230 V 50-60 Hz or to 2-phase line supplies with 208 V line voltage on the line side, upstream of transformers, power supplies or LEDs, and using the integrated fixed resistor, it limits the inrush current to approx. 10 A at 230 V. In steady-state operation, the limiting resistor is bypassed after approx. 60 ms, therefore minimizing the associated power loss.

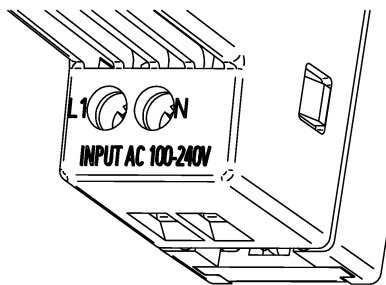


Figure 5-8 Input

### 5.1.5.2 SITOP inrush current limiter

The inrush current limiter is connected between the line supply and the power supply to be supplied. It is suitable for connection to 1-phase AC line supplies with 100 V, 120 V or 230 V 50-60 Hz or to 2-phase or 3-phase 208 - 480 V AC line supplies. The switch-on current pulse at 230 V is limited to approximately 8 A. In steady-state operation, the limiting element is bypassed.

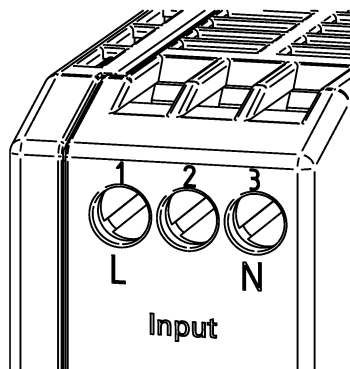


Figure 5-9 Input

Depending on the particular application, the input terminals should be connected as shown in the following wiring diagram:

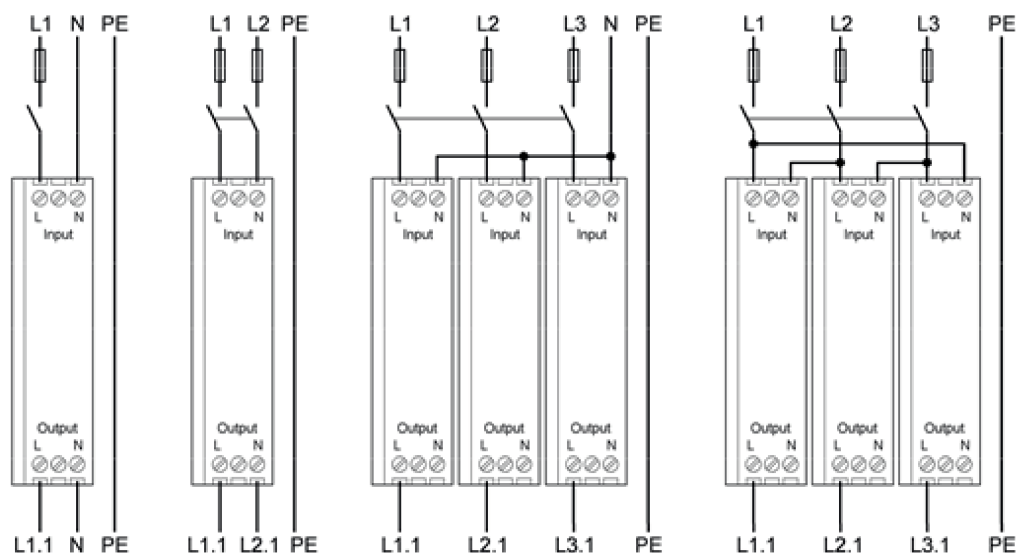


Figure 5-10 Wiring diagram

## 5.2 Output connections

### 5.2.1 Redundancy modules

#### 5.2.1.1 SITOP RED1200

Output "DC OUT1" of the redundancy module must be connected to the load.  
See Figure 5-1 Input/output (Page 86).

The subsequent wiring is recommended to guarantee safe and reliable operation of the power supplies in all operating states:

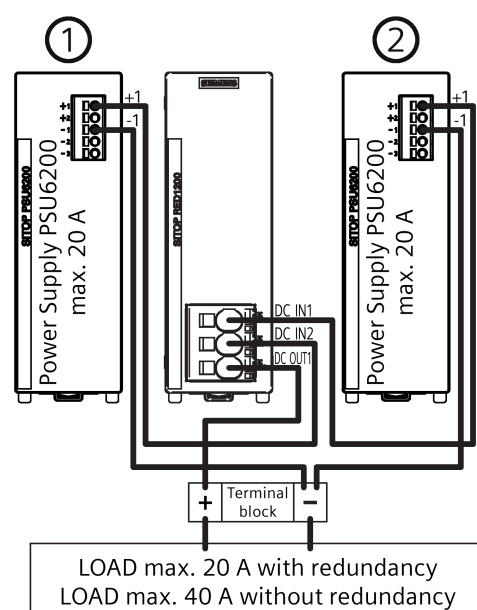


Figure 5-11 Wiring: 1 redundancy module (2 x 20 A) with 2 x 20 A power supply

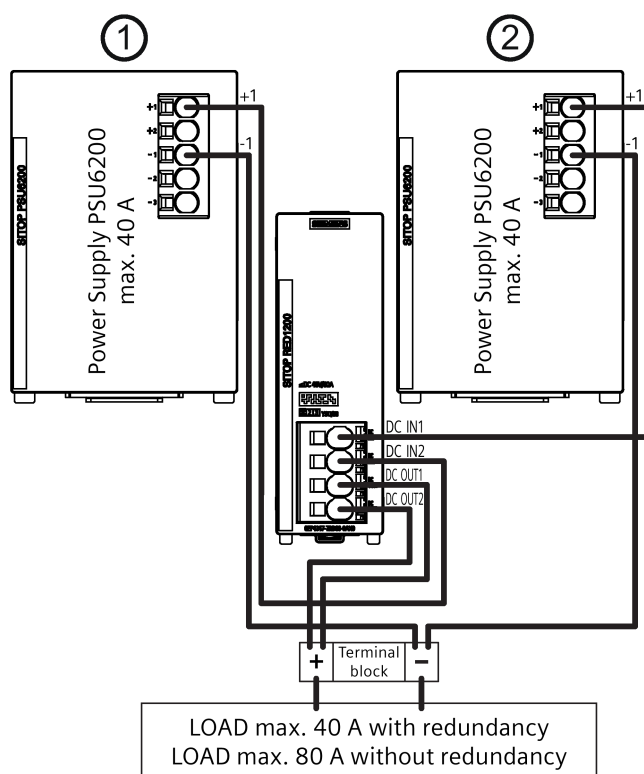


Figure 5-12 Wiring: 1 redundancy module (2 x 40 A) with 2 x 40 A power supply

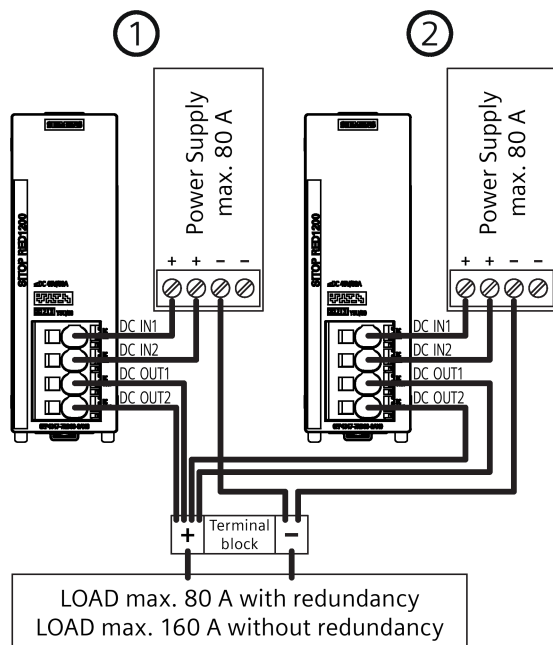


Figure 5-13 Wiring: 2 redundancy modules (2 x 40 A) with 2 x 80 A power supply

To achieve an output voltage of 24/48/96 V DC, **two 12/24/48 V SITOP power supplies of the same type** can be connected in series. Depending on the grounding point of the secondary output voltage, voltages of +24/48/96 V,  $\pm 12/24/48$  V or -24/48/96 V can be realized. To guarantee safe and reliable operation of the power supplies in all operating states, for the series connection, the subsequent wiring using two redundancy modules SITOP RED1200 is recommended.

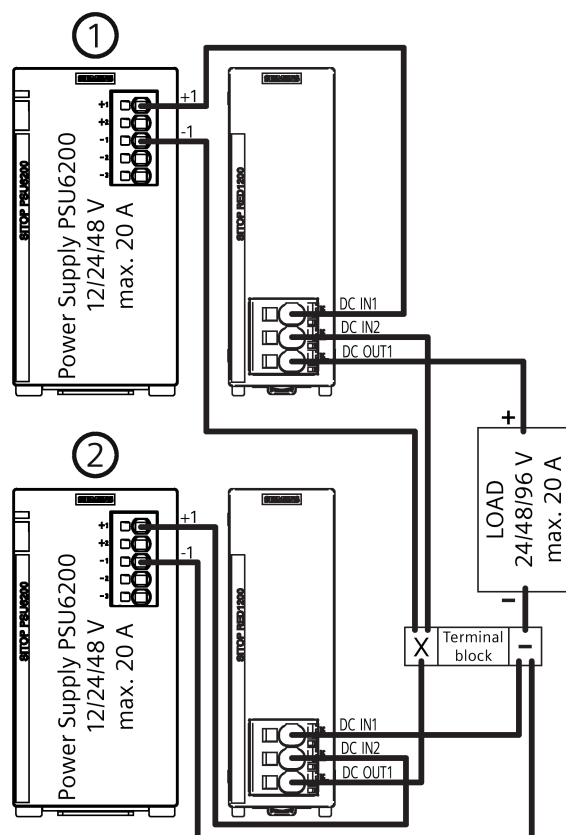


Figure 5-14 Variant 1: 2 power supplies (12/24/48 V, max. 20 A) and 2 redundancy modules 2 x 20 A

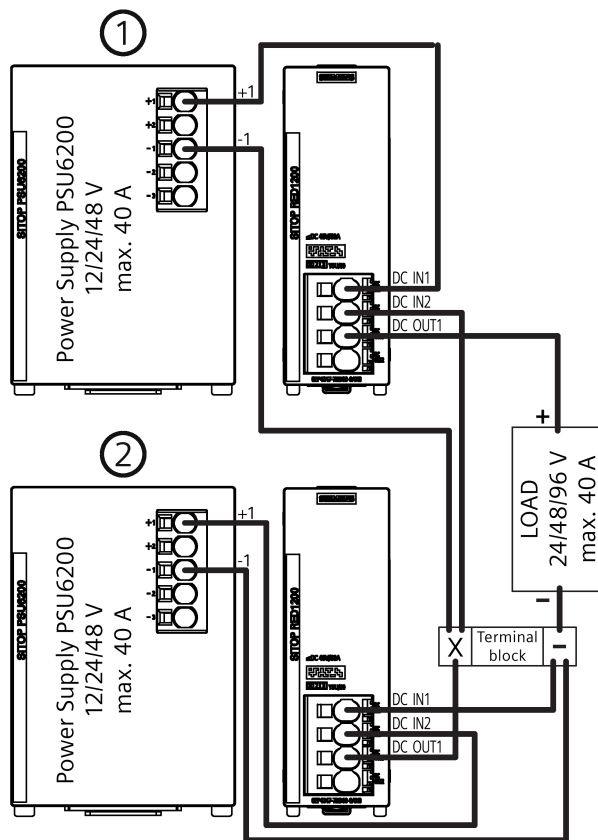


Figure 5-15 Variant 2: 2 power supplies (12/24/48 V, max. 40 A) and 2 redundancy modules 2 x 40 A

**! WARNING****SELV (ES1) cannot be guaranteed in the case of a fault**

When connecting two power supplies in series, the continuous, permissible SELV (ES1) voltage of maximum 60 V DC according to EN 61204-7 cannot be guaranteed in the case of a fault.

**! WARNING****SELV (ES1) is not given for a series connection of 48 V devices**

When connecting two 48 V power supplies in series, the continuous, permissible SELV (ES1) voltage of maximum 60 V DC according to EN 61204-7 is exceeded.

## Technical data

### Note

Technical data apply for a rated input voltage, rated load and 25 °C ambient temperature, if nothing else is specified.

## 6.1 Input

### 6.1.1 Redundancy modules

|                                            | 6EP4346-7RB00-0AX0<br>6EP4347-7RB00-0AX0<br>6EP4348-7RB00-0AX0<br>6EP4347-7RC00-0AX0 | 6EP1961-3BA21 | 6EP1962-2BA00<br>6EP1964-2BA00 |
|--------------------------------------------|--------------------------------------------------------------------------------------|---------------|--------------------------------|
| Input                                      | DC voltage                                                                           | DC voltage    | DC voltage                     |
| Rated input voltage $U_{in \text{ rated}}$ | 12 - 48 V                                                                            | 24 V          | 24 V                           |
| Voltage range                              | 10 - 58 V                                                                            | 24 - 28.8 V   | 19 - 29 V                      |

### 6.1.2 Chopper module

|                                            | 6EP4548-7XB00-3AX0                        |
|--------------------------------------------|-------------------------------------------|
| Rated input voltage $U_{in \text{ rated}}$ | 24 - 28 V DC or 48 - 56 V DC              |
| Operating voltage range                    | 20.5 - 29 V or 41 - 57 V DC               |
| Input power                                | 0 - 1000 W                                |
| Chopper time at 1000 W                     | max. 1.8 s                                |
| Derating temperature                       | at > 60 °C: 3% $I_{out \text{ rated}}$ /K |

## 6.2 Output

### 6.2.1 Redundancy modules

|                                          | <b>6EP4346-7RB00-0AX0</b>                            | <b>6EP4347-7RB00-0AX0</b><br><b>6EP4347-7RC00-0AX0</b> | <b>6EP4348-7RB00-0AX0</b>                                                                                |
|------------------------------------------|------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Output                                   | DC voltage                                           |                                                        |                                                                                                          |
| Rated output voltage<br>$U_{out\ rated}$ | 12 - 48 V                                            | 12 - 48 V                                              | 12 - 48 V                                                                                                |
| Output voltage                           | $U_{in}$ - approx. 0.6 V                             | $U_{in}$ - approx. 0.6 V                               | $U_{in}$ - approx. 0.6 V                                                                                 |
| Output current $I_{out}$                 | 0 - 20 A                                             | 0 - 40 A                                               | 0 - 80 A                                                                                                 |
| • Remark                                 | 120 % $I_{out\ rated}$ in the range<br>-40 ... 45 °C | 120 % $I_{out\ rated}$ in the range<br>-40 ... 45 °C   | 120 % $I_{out\ rated}$ in the range<br>-40 ... 45 °C<br>60 ... 70 °C derating: 3 %<br>$I_{out\ rated}/K$ |

|                                          | <b>6EP1961-3BA21</b>     | <b>6EP1962-2BA00</b>                                                                                 | <b>6EP1964-2BA00</b>     |
|------------------------------------------|--------------------------|------------------------------------------------------------------------------------------------------|--------------------------|
| Output                                   | DC voltage               |                                                                                                      |                          |
| Rated output voltage<br>$U_{out\ rated}$ | 24 V                     | 24 V                                                                                                 | 24 V                     |
| Output voltage                           | $U_{in}$ - approx. 0.5 V | $U_{in}$ - approx. 0.5 V                                                                             | $U_{in}$ - approx. 0.5 V |
| Output current $I_{out}$                 | 0 - 40 A                 | 0 - 4.3 A (at 19 V $U_{out}$ )<br>0 - 3.5 A (at 24 V $U_{out}$ )<br>0 - 2.8 A (at 28.5 V $U_{out}$ ) | 0 - 10 A                 |
| • Remark                                 |                          | Max. output power (NEC<br>Class2): 100 VA                                                            |                          |

### 6.2.2 Chopper module

See Chapter Chopper module (Page 99)

## 6.6 Dimension drawing

### 6.6.1 Redundancy modules

See chapter Redundancy modules (Page 43)

CAD data that can be downloaded from the Internet:

6EP4346-7RB00-0AX0

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_01519](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01519))

6EP4347-7RB00-0AX0

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_01522](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01522))

6EP4348-7RB00-0AX0

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_01880](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01880))

6EP4347-7RC00-0AX0

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_01877](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01877))

6EP1961-3BA21

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_00529](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00529))

6EP1962-2BA00

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_00710](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00710))

6EP1964-2BA00

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_00713](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00713))

### 6.6.2 Chopper module

See Chapter Chopper module SITOP CHO1400 (Page 47)

CAD data that can be downloaded from the Internet:

6EP4548-7XB00-3AX0

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_02067](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_02067))

### 6.6.3 Buffer modules

See chapter Buffer modules (Page 48)

CAD data that can be downloaded from the Internet:

6EP4231-7HB00-0AX0

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_01682](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01682))

6EP4231-7HC00-0AX0

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_01874](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_01874))

6EP1961-3BA01

([http://www.automation.siemens.com/bilddb/index.aspx?objKey=G\\_KT01\\_XX\\_00532](http://www.automation.siemens.com/bilddb/index.aspx?objKey=G_KT01_XX_00532))

## Safety, approvals, EMC

### 7.1 Safety

|                                 |                                                                                                                  |                                                                      |
|---------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
|                                 | <b>6EP4346-7RB00-0AX0</b><br><b>6EP4347-7RB00-0AX0</b><br><b>6EP4348-7RB00-0AX0</b><br><b>6EP4347-7RC00-0AX0</b> | <b>6EP1961-3BA21</b><br><b>6EP1962-2BA00</b><br><b>6EP1964-2BA00</b> |
| Electrical isolation            | -                                                                                                                | Yes, SELV (ES1) acc. to EN 61204-7 (relay contact)                   |
| Protection class                | Class III                                                                                                        | Class III                                                            |
| Degree of protection (EN 60529) | IP 20                                                                                                            | IP 20                                                                |
|                                 | <b>6EP4231-7HB00-0AX0</b><br><b>6EP4231-7HC00-0AX0</b><br><b>6EP1961-3BA01</b>                                   | <b>6EP4683-6LB00-0AY0</b><br><b>6EP1967-2AA00</b>                    |
| Electrical isolation            | -                                                                                                                | -                                                                    |
| Protection class                | Class III                                                                                                        | Class II                                                             |
| Degree of protection (EN 60529) | IP 20                                                                                                            | IP 20                                                                |
|                                 | <b>6EP4548-7XB00-3AX0</b><br><b>6EP4240-7HB00-0AX0</b>                                                           |                                                                      |
| Electrical isolation            | -                                                                                                                |                                                                      |
| Protection class                | Class III                                                                                                        |                                                                      |
| Degree of protection (EN 60529) | IP 20                                                                                                            |                                                                      |

## 7.2 Approvals

### 7.2.1 SITOP RED1200

|                       | <b>6EP4346-7RB00-0AX0</b><br><b>6EP4347-7RB00-0AX0</b><br><b>6EP4348-7RB00-0AX0</b> | <b>6EP4347-7RC00-0AX0</b>                     |
|-----------------------|-------------------------------------------------------------------------------------|-----------------------------------------------|
| CE marking            | Yes, (2014/30/EU and 2011/65/EU)                                                    | Yes, (2014/30/EU, 2011/65/EU and 2014/34/EU)  |
| CB certificate        | Yes                                                                                 |                                               |
| CB scheme             | IEC 62368-1                                                                         |                                               |
| UL/cUL approval       | cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259                             |                                               |
| cCSAus approval       | Yes, CSA C22.2 No. 62368-1                                                          |                                               |
| Explosion protection  | -                                                                                   | Yes                                           |
| ATEX approval         | -                                                                                   | II 3G Ex ec IIC T4 Gc (EPS 21 ATEX 1 194 X)   |
| IECEx approval        | -                                                                                   | Yes (IECEx EPS 21.0059X)                      |
| cULus HazLoc approval | -                                                                                   | cULus HazLoc Class I, Div 2, Group A,B,C,D T4 |
| CCC HazLoc approval   | -                                                                                   | Ex ec IIC T4 Gc (2023322303005007)            |
| UKCA HazLoc approval  | -                                                                                   | Yes                                           |
| Marine approvals      | DNV, ABS                                                                            |                                               |
| UKCA marking          | Yes                                                                                 |                                               |
| RCM approval          | Yes                                                                                 |                                               |
| EAC approval          | Yes                                                                                 |                                               |

### 7.2.2 SITOP PSE202U

|                  | <b>6EP1961-3BA21</b>                                    | <b>6EP1962-2BA00</b>                                                                                      | <b>6EP1964-2BA00</b>                                    |
|------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| CE marking       | Yes, (2014/30/EU and 2011/65/EU)                        |                                                                                                           |                                                         |
| UL/cUL approval  | cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259 | cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259<br>UL-R/C (UL 60950-1, NEC class 2), File E151273 | cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259 |
| Marine approvals | DNV, ABS                                                | -                                                                                                         | -                                                       |
| UKCA marking     | Yes                                                     |                                                                                                           |                                                         |
| RCM approval     | Yes                                                     |                                                                                                           |                                                         |
| EAC approval     | Yes                                                     |                                                                                                           |                                                         |

### 7.2.3 Chopper module

|                 | <b>6EP4548-7XB00-3AX0</b>                               |
|-----------------|---------------------------------------------------------|
| CE marking      | Yes, (2014/30/EU and 2011/65/EU)                        |
| CB certificate  | Yes                                                     |
| CB scheme       | IEC 62368-1                                             |
| UL/cUL approval | cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259 |
| cCSAus approval | Yes, CSA C22.2 No. 62368-1, UL 62368-1                  |
| Marine approval | Available soon                                          |
| UKCA marking    | Yes                                                     |
| RCM approval    | Yes                                                     |
| EAC approval    | Yes                                                     |

### 7.2.4 Buffer modules

|                       | <b>6EP4231-7HB00-0AX0</b>                               | <b>6EP1961-3BA01</b> | <b>6EP4231-7HC00-0AX0</b>                     |
|-----------------------|---------------------------------------------------------|----------------------|-----------------------------------------------|
| CE marking            | Yes, (2014/30/EU and 2011/65/EU)                        |                      | Yes, (2014/30/EU, 2011/65/EU and 2014/34/EU)  |
| CB certificate        | Yes                                                     |                      |                                               |
| CB scheme             | IEC 62368-1                                             |                      |                                               |
| UL/cUL approval       | cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259 |                      |                                               |
| cCSAus approval       | Yes, CSA C22.2 No. 62368-1                              |                      |                                               |
| Explosion protection  | -                                                       | -                    | Yes                                           |
| ATEX approval         | -                                                       | -                    | II 3G Ex ec IIC T4 Gc (EPS 21 ATEX 1 194 X)   |
| IECEx approval        | -                                                       | -                    | Yes (IECEx EPS 21.0059X)                      |
| cULus HazLoc approval | -                                                       | -                    | cULus HazLoc Class I, Div 2, Group A,B,C,D T4 |
| CCC HazLoc approval   | -                                                       | -                    | Ex ec IIC T4 Gc (2023322303005007)            |
| UKCA HazLoc approval  | -                                                       | -                    | Yes                                           |
| Marine approvals      | DNV, ABS                                                | DNV, ABS             | DNV, ABS                                      |
| UKCA marking          | Yes                                                     |                      |                                               |
| RCM approval          | Yes                                                     |                      |                                               |
| EAC approval          | Yes                                                     |                      |                                               |

### 7.2.5 Power boost module

|                 | <b>6EP4240-7HB00-0AX0</b>                               |
|-----------------|---------------------------------------------------------|
| CE marking      | Yes, (2014/30/EU and 2011/65/EU)                        |
| CB certificate  | Yes                                                     |
| CB scheme       | IEC 62368-1                                             |
| UL/cUL approval | cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259 |
| cCSAus approval | Yes, CSA C22.2 No. 62368-1, UL 62368-1                  |
| Marine approval | Available soon                                          |
| UKCA marking    | Yes                                                     |
| RCM approval    | Yes                                                     |
| EAC approval    | Yes                                                     |

### 7.2.6 Inrush current limiter

|                 | <b>6EP4683-6LB00-0AY0</b><br><b>6EP1967-2AA00</b>       |
|-----------------|---------------------------------------------------------|
| CE marking      | Yes, (2014/35/EU, 2014/30/EU and 2011/65/EU)            |
| UL/cUL approval | cULus-listed (UL 508, CSA 22.2 No. 107.1), File E197259 |
| UKCA marking    | Yes                                                     |
| EAC approval    | Yes                                                     |

## 7.3 EMC

### 7.3.1 SITOP RED1200

|                                                    |              | <b>6EP4346-7RB00-0AX0</b><br><b>6EP4347-7RB00-0AX0</b><br><b>6EP4348-7RB00-0AX0</b><br><b>6EP4347-7RC00-0AX0</b> |
|----------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------|
| Electrostatic discharge                            | EN 61000-4-2 | 8 kV contact, 8 kV air                                                                                           |
| High-speed transient disturbance variables (burst) | EN 61000-4-4 | 2 kV at DC input<br>2 kV at DC output                                                                            |
| Surge voltages                                     | EN 61000-4-5 | 0.5 kV asymmetrical on DC output cables                                                                          |
| Generic standards                                  | EN 61000-6-2 | Interference immunity for industrial environments (only for tests applicable for the device)                     |

### 7.3.2 PSE202U

|                                                    |              | <b>6EP1961-3BA21</b>                              | <b>6EP1962-2BA00</b><br><b>6EP1964-2BA00</b>                              |
|----------------------------------------------------|--------------|---------------------------------------------------|---------------------------------------------------------------------------|
| Electrostatic discharge                            | EN 61000-4-2 | 4 kV contact                                      | 6 kV contact, 8 kV air                                                    |
| Electromagnetic fields                             | EN 61000-4-3 | 30 - 2000 MHz 3 V/m                               | 80 - 6000 MHz 10 V/m,<br>1000 - 2700 MHz 10 V/m                           |
| High-speed transient disturbance variables (burst) | EN 61000-4-4 | 1 kV at the DC output<br>1 kV on the signal cable | 2 kV at the DC input<br>2 kV at the DC output<br>2 kV on the signal cable |
| Surge voltages                                     | EN 61000-4-5 | 1 kV at the DC output<br>1 kV on the signal cable |                                                                           |
| High-frequency fields                              | EN 61000-4-6 | 3 V; 0.15 - 80 MHz                                | 10 V; 0.15 - 80 MHz                                                       |
| Magnetic fields                                    | EN 61000-4-8 | 30 A/m; 50 Hz                                     | 30 A/m; 50 Hz                                                             |
| Emitted interference                               | EN 55032     | Class B                                           | -                                                                         |
| Generic standards                                  | EN 61000-6-2 | -                                                 | Noise immunity for industrial environments                                |
|                                                    | EN 61000-6-3 | -                                                 | Interference emission for residential areas                               |

## 7.3 EMC

## 7.3.3 SITOP CHO1400

| 6EP4548-7XB00-3AX0                                 |              |                                                 |
|----------------------------------------------------|--------------|-------------------------------------------------|
| Electrostatic discharge                            | EN 61000-4-2 | 8 kV contact, 8 kV air                          |
| Electromagnetic fields                             | EN 61000-4-3 | 80 - 6000 MHz 10 V/m,<br>1000 - 2700 MHz 10 V/m |
| High-speed transient disturbance variables (burst) | EN 61000-4-4 | 2 kV DC terminal                                |
| Surge voltages                                     | EN 61000-4-5 | 0.5 kV on DC terminal<br>1 kV on signal line    |
| High-frequency fields                              | EN 61000-4-6 | 10 V; 0.15 - 80 MHz                             |
| Generic standards                                  | EN 61000-6-2 | Immunity for industrial environments            |
|                                                    | EN 61000-6-3 | Interference emission for residential areas     |

## 7.3.4 Buffer modules

|                                                    |              | 6EP4231-7HB00-0AX0<br>6EP4231-7HC00-0AX0               | 6EP1961-3BA01                                                                                                                                                                                                      |
|----------------------------------------------------|--------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrostatic discharge                            | EN 61000-4-2 | 8 kV contact, 8 kV air                                 |                                                                                                                                                                                                                    |
| Electromagnetic fields                             | EN 61000-4-3 | 80 - 1000 MHz 10 V/m,<br>900 MHz $\pm$ 5 MHz 10 V/m    | 80 - 1000 MHz 50 V/m,<br>900 MHz $\pm$ 5 MHz 10 V/m                                                                                                                                                                |
| High-speed transient disturbance variables (burst) | EN 61000-4-4 | 2 kV at DC output                                      | Tested with power supply<br>6EP1436-3BA00:<br>4 kV at upstream power supply<br>2 kV at DC output                                                                                                                   |
| Surge voltages                                     | EN 61000-4-5 | 0.5 kV symmetrical/asymmetrical<br>on DC output cables | Tested with power supply<br>6EP1436-3BA00:<br>3 kV symmetrical at the power<br>supply input<br>3 kV asymmetrical at the power<br>supply input<br>0.5 kV symmetrical/asymmetrical<br>on DC output cables/conductors |
| High-frequency fields                              | EN 61000-4-6 | 10 V; 0.15 - 80 MHz                                    |                                                                                                                                                                                                                    |
| Generic standards                                  | EN 61000-6-2 | Noise immunity for industrial environments             |                                                                                                                                                                                                                    |

### 7.3.5 SITOP PBM1200

| 6EP4240-7HB00-0AX0                                 |              |                                                                                              |
|----------------------------------------------------|--------------|----------------------------------------------------------------------------------------------|
| Electrostatic discharge                            | EN 61000-4-2 | 8 kV contact, 8 kV air                                                                       |
| High-speed transient disturbance variables (burst) | EN 61000-4-4 | 2 kV DC terminal                                                                             |
| Surge voltages                                     | EN 61000-4-5 | 0.5 kV asymmetrical on DC output cables                                                      |
| Generic standards                                  | EN 61000-6-2 | Interference immunity for industrial environments (only for tests applicable for the device) |

### 7.3.6 Inrush current limiter

|                                                    |              | 6EP4683-6LB00-0AY0                                                                                                      | 6EP1967-2AA00                                                                                           |
|----------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Electrostatic discharge                            | EN 61000-4-2 | 8 kV contact, 8 kV air                                                                                                  |                                                                                                         |
| Electromagnetic fields                             | EN 61000-4-3 | 80 - 1000 MHz 10 V/m,<br>1400 - 2000 MHz 3 V/m,<br>2000 - 2700 MHz 1 V/m,<br>900 MHz $\pm 5$ MHz and 1.89 GHz<br>10 V/m | 80 - 1000 MHz 20 V/m,<br>1400 - 2000 MHz 3 V/m,<br>2000 - 2700 MHz 1 V/m,<br>900 MHz $\pm 5$ MHz 10 V/m |
| High-speed transient disturbance variables (burst) | EN 61000-4-4 | 2 kV at input/output                                                                                                    | 4 kV at input/output                                                                                    |
| Surge voltages                                     | EN 61000-4-5 | 1 kV symmetrical at input/output                                                                                        | 3 kV symmetrical at input/output                                                                        |
| High-frequency fields                              | EN 61000-4-6 | 10 V; 0.15 - 80 MHz                                                                                                     |                                                                                                         |
| Magnetic fields                                    | EN 61000-4-8 | -                                                                                                                       | 30 A/m; 50 Hz                                                                                           |
| Line harmonics limit                               | EN 61000-3-2 | Class A                                                                                                                 |                                                                                                         |
| Generic standards                                  | EN 61000-6-2 | Noise immunity for industrial environments                                                                              |                                                                                                         |
|                                                    | EN 61000-6-3 | Interference emission for residential areas                                                                             |                                                                                                         |



## Ambient conditions

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                        |                                                        |                                                        |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
|                                   | 6EP4346-7RB00-0AX0<br>6EP4347-7RB00-0AX0<br>6EP4348-7RB00-0AX0<br>6EP4347-7RC00-0AX0<br>6EP4231-7HB00-0AX0<br>6EP4231-7HC00-0AX0<br>6EP1961-3BA01<br>6EP4548-7XB00-3AX0<br>6EP4240-7HB00-0AX0                                                                                                                                                                                                                                                                                           | 6EP1961-3BA21<br>6EP1967-2AA00                         | 6EP4683-6LB00-0AY0                                     | 6EP1962-2BA00<br>6EP1964-2BA00                         |
| Ambient temperature               | -40 ... 70 °C for natural convection (self convection)                                                                                                                                                                                                                                                                                                                                                                                                                                  | -25 ... 60 °C for natural convection (self convection) | -40 ... 70 °C for natural convection (self convection) | -20 ... 70 °C for natural convection (self convection) |
|                                   | Tested according to: <ul style="list-style-type: none"><li>• EN 60068-2-1 Cold</li><li>• EN 60068-2-2 Dry heat</li><li>• EN 60068-2-78 Humid heat, constant</li><li>• EN 60068-2-14 Temperature change</li></ul>                                                                                                                                                                                                                                                                        |                                                        |                                                        |                                                        |
| Transport and storage temperature | -40 ... 85 °C<br>Tests (packed for shipping) according to: <ul style="list-style-type: none"><li>• EN 60068-2-1 Cold</li><li>• EN 60068-2-2 Dry heat</li><li>• EN 60068-2-30 Humid heat, cyclic</li></ul>                                                                                                                                                                                                                                                                               |                                                        |                                                        |                                                        |
| Humidity class                    | Climatic class 3K3 according to EN 60721, 5 - 95 % no condensation                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                        |                                                        |                                                        |
| Degree of pollution               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                        |                                                        |                                                        |
| Mechanical stressing in operation | <ul style="list-style-type: none"><li>• Tested according to EN 60068-2-6 vibration, test Fc:</li></ul> <div><div>3.5 mm deflection in the range 5 - 8.4 Hz<br/>2 g acceleration in the range 8.4 - 150 Hz</div><div>3.5 mm deflection in the range 5 - 8.4 Hz<br/>1.3 g acceleration in the range 8.4 - 50 Hz</div></div> <ul style="list-style-type: none"><li>• Tested according to EN 60068-2-27 shock, test Ea:<br/>acceleration 150 m/s<sup>2</sup>, test duration 11 ms</li></ul> |                                                        |                                                        |                                                        |

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                |                                                      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------|
|                      | 6EP4346-7RB00-0AX0<br>6EP4347-7RB00-0AX0<br>6EP4348-7RB00-0AX0<br>6EP4347-7RC00-0AX0<br>6EP4231-7HB00-0AX0<br>6EP4231-7HC00-0AX0<br>6EP1961-3BA01<br>6EP4548-7XB00-3AX0<br>6EP4240-7HB00-0AX0                                                                                                                                                                                                                                                                                                                                                                          | 6EP1961-3BA21<br>6EP1967-2AA00 | 6EP4683-6LB00-0AY0<br>6EP1962-2BA00<br>6EP1964-2BA00 |
| Damaging gases       | Tested according to: <ul style="list-style-type: none"> <li>• EN 60068-2-42 sulfur dioxide</li> <li>• EN 60068-2-43 hydrogen sulfide</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                        |                                |                                                      |
| Atmospheric pressure | Operation: <ul style="list-style-type: none"> <li>• 1080 - 795 hPa (<math>\leq 2000</math> m)</li> <li>• For operation at altitudes of 2000 m up to 6000 m above sea level:<br/>output must be derated by -7.5% / 1000 m or<br/>the ambient temperature must be reduced by 5 K / 1000 m<br/>see Figure 4-7 Altitude derating (Page 70)</li> <li>• Overvoltage category:<br/>II up to 2000 m (EN 61204-7)<br/>I from 2000 m up to 6000 m (EN 61204-7)</li> </ul> Storage: <ul style="list-style-type: none"> <li>• 1080 - 660 hPa (<math>\leq 3500</math> m)</li> </ul> |                                |                                                      |