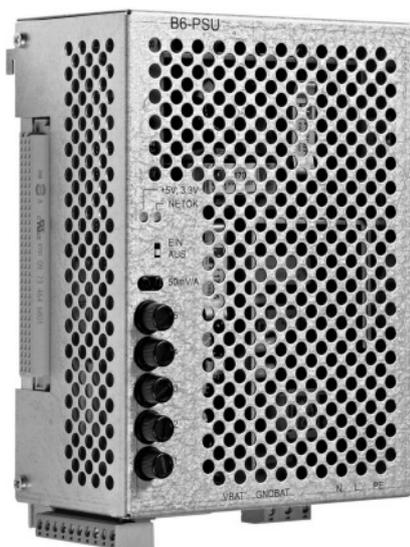


# SecuriFire

## Power Supply Unit B6-PSU

### Technical Description





## Imprint



### Notice

This document, T 811 039, is valid only for the product described in Section 1.

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German	T 811 039 de
English	T 811 039 en
French	T 811 039 fr

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<sup>1</sup> Reference document: B6-PSU, V 1.1

# Safety information

Provided the product is deployed by trained and qualified persons in accordance with technical document T 811 039 and the danger, safety and general information notices in this technical documentation are observed, there is no danger to persons or property under normal conditions and when used properly.

National and state-specific laws, regulations and guidelines must be observed and adhered to in all cases.

Below are the designations, descriptions and symbols of danger, safety and general information notices as found in this document.



### Danger

If the Danger notice is not properly observed, the product and other system parts may present a hazard for persons and property, or the product and other system parts may be damaged to the extent that malfunctioning results in danger to persons and property.

- Description of which dangers can occur
- Measures and preventative actions
- How dangers can be averted
- Other safety-relevant information



### Warning

The product may be damaged if the safety information is not heeded.

- Description of which damage can occur
- Measures and preventative actions
- How dangers can be averted
- Other safety-relevant information



### Notice

The product may malfunction if this notice is not observed.

- Description of which malfunctions can be expected
- Measures and preventative actions
- Other safety-relevant information



### Environmental protection / recycling

Neither the product nor product components present a hazard to the environment provided they are handled properly.

- Description of which parts have environmental protection issues
- Description of how devices and their parts have to be disposed of in an environmentally-friendly way
- Description of the recycling possibilities



### Batteries

It is not permitted to dispose of batteries in the domestic rubbish. As the end user you are legally obliged to return used batteries. Used batteries can be returned free of charge to the seller or brought to a designated recycling point (e.g. to a communal collection point or retailer). You may also send them back to the seller by post. The seller refunds the postage when you return your old batteries.

## Document history

First edition      Date 01 July 2011

Index „a“      Date 08.06.2012

Most important changes compared with first edition:

Section	New (n) / changed (c) / deleted (d)		What / Reason
• 7	n	Article SI-G 8A	complement



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# 1 General

## 1.1 Validity

The following documentation is valid for the SecuriFire B6-PSU Power Supply Unit with edition EG072950--.

## 1.2 General

The B6-PSU ([Power Supply Unit](#)) is fitted in the map case of every SecuriFire 1000/2000 on the right and next to the main control unit.

## 1.3 Compatibility notice



### Notice

The B6-PSU is included in the basic configuration of each SecuriFire 1000/2000 and is supported regardless of the SecuriFire software.

# 2 Design and function

The B6-PSU Power Supply Unit is an internal 4 A power supply unit, and together with the B6-BCU main control unit it forms the basis of the B6 hardware platform.

The B6-PSU supplies the required output voltage of 3.3 V, 5 V and 27 V to each SecuriFire 1000/2000. In the event of mains failure, the standards-compliant battery buffered DC voltage for the SCP and peripheral devices must be ensured. This is accomplished by connecting two (or four) batteries of a type which has been tested by VdS and approved by Securiton AG. The batteries are connected on the bottom side of the B6-PSU with a 2-pin terminal and monitored.

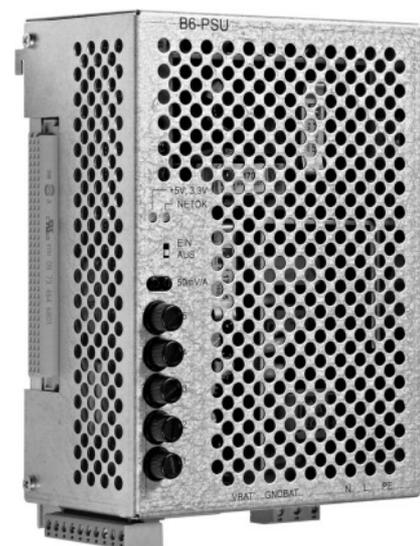


Fig. 1 B6-PSU

## 2.1 Overview

The B6-PSU has a map case made of galvanised sheet steel. It is always fitted next to the B6-BCU main control unit on the right and connected via a 64-pin male connector.

On the underside of the power supply unit is a 10-pin plug-in screw terminal to which external consumers can be connected via five separately fused outputs.

Two batteries (15...18 Ah) can be connected to the power supply unit to supply emergency power.

### 2.2 Interfaces

<b>X1</b>	Mains connection
<b>X3</b>	Connector for battery current measurement
<b>X4</b>	Output voltage for internal consumers
<b>X5</b>	Output voltage for external consumers
<b>X13</b>	VBAT battery connection
<b>X14</b>	GNDBAT battery connection
<b>S1</b>	On/Off switch (mains switch)
<b>V45</b>	LED displays
<b>A10</b>	Output fuses F1 to F5

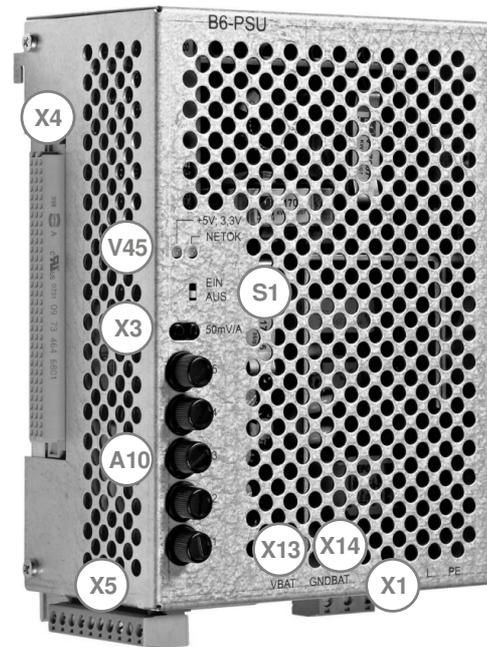


Fig. 2 B6-PSU interfaces

## 2.3 Batteries

Power can be supplied to the internal and external consumers either from the mains or internal batteries; this guarantees power supply to the system from two independent sources of energy. If there is a mains voltage or mains power supply failure, the internal batteries automatically supply the system with power.

## 2.4 Connection

One battery pair (15...18 Ah) is connected to the B6-PSU by default in a SecuriFire 1000/2000.

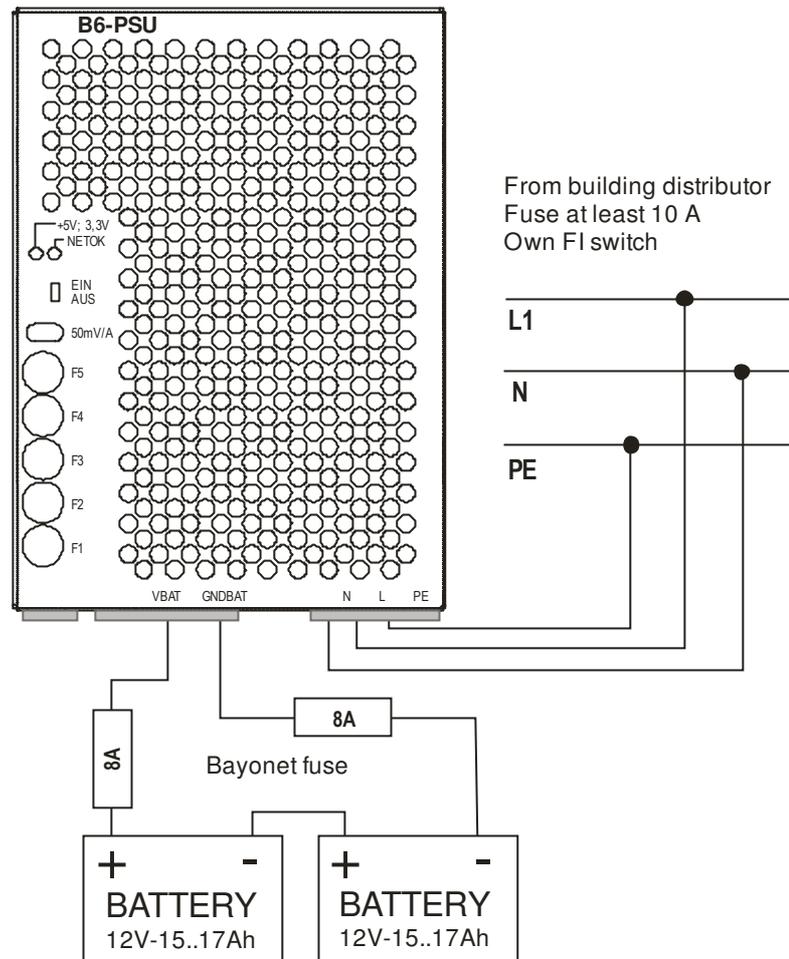


Fig. 3 B6-SCU wiring diagram

### 2.5 Battery charge

The batteries are charged by the mains supply, whereby the temperature-regulated charging voltage is between 26.3 V (at 50 °C) and 28.3 V (at 0 °C).

This guarantees a battery charge of 80% of full capacity within 24 hours.



#### Notice

The temperature sensor integrated in the B6-PSU Power Supply Unit monitors the ambient temperature of the SecuriFire SCP.

### 2.6 Battery test

The batteries are subjected to a battery test every 10 to 15 min. for 10 s.

If the batteries indicate a fault (e.g. cell short-circuit or battery short-circuit), the system voltage is automatically disconnected from the batteries by the integrated protection circuit. When this happens, only the battery charging current and not the system supply current is interrupted; this guarantees the uninterruptible power supply of the system even if the batteries are faulty.

The criterion for disablement of the charging current is a battery undervoltage of approx. 18 V. When the battery charging branch is disabled, the system voltage is regulated to the nominal 29 V.

Should the mains supply fail and thereby the associated transition to battery supply, monitoring the batteries to protect them against low charge is extremely important. For longer mains failures, the consumers are disabled when the battery voltage is typically 19.6 V.

Re-enablement is possible only when the mains supply is restored or by pressing the On/Off switch; in the latter case, the battery voltage when under load must also be > typically 23.5 V.

### 3 Power requirement



#### Notice

- In the event of a power failure, the fire alarm control panel is powered by batteries. Depending on the configuration and connected peripheral devices (units, detectors, sirens, etc.), it is important to ensure that the batteries have sufficient capacity to operate the fire alarm control panel for the specified time (e.g. according to a standard or directive).
- Moreover, the consumer current has to be dimensioned so that batteries which have become empty can be charged to 80% of their capacity within 24 hours.

#### 3.1 Typical power consumption values for B6-PSU Power Supply Unit

The power consumption of the board must also be taken into consideration when calculating the power requirement:

Type	Designation	Quiescent current	Alarm current
B6-PSU	SecuriFire unit	34 mA	34 mA

#### 3.2 Power requirement calculation

For the power requirement calculation there is a power calculation tool in which the battery types in use and the necessary bridging time (according to local standards and directives) are entered.

#### 3.3 Battery current measurement

After the system has been successfully commissioned, it is necessary to perform a battery current measurement (mains fault under full load, dropped holding magnet, display lighting off, printer at standstill, service PC cable disconnected from the SCP) in order to guarantee that the battery capacity meets the requirements.

If the results of the battery current measurement (example with a 18 Ah battery pair) is not in line with the power requirement calculation ( $\pm 5\%$ ), notify your Securiton Support point immediately.

Observe the following procedure precisely:

- During normal operation, remove the mains plug of the B6-PSUB6-PSU power supply unit of the SecuriFire 1000/2000: there must be no pending alarms or disablements; the batteries must be connected and charged.
- Mains fault is displayed (after a delay time): the batteries now supply power to the SCP without exception.
- Switch on the measuring instrument (multimeter, voltmeter) and set to the "DC" measurement range. The expected measurement value is approx. 10-2000 mV DC.
- Attach the battery power cable (art. no. FG81720) on the B6-PSU to the battery power connector and connect to the measuring instrument.
- Read and note the measurement value (= quiescent current) on the measuring instrument.
- Trigger armed alarm for all (if possible) activated fire incident controls supplied by the SCP.
- Read and note the measurement value (= alarm current) on the measuring instrument.
- Convert measurement value: measurement value [mV] / 50 = battery current [A].
- The calculation of the available minimum charging current must be performed using the formula  $C_{(\text{nominal battery capacity})} \times 0.05$ . For 2x 12 V / 18 Ah batteries, this corresponds to a charging current of 0.9 A; this results in a maximum battery current of 3.1 A (= 155 mV).
- Guaranteed from 18 Ah if the quiescent current is less than 0.23 A (= 11.5 mV).
- When using other battery capacities or bridging times, the following calculation must be performed: (quiescent current x quiescent bridging time) + (alarm current x alarm time) < effective battery capacity.

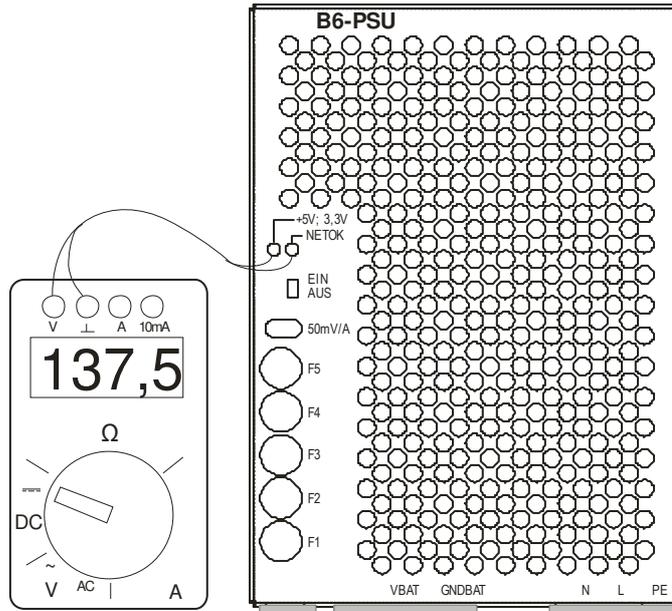


Fig. 4 Battery current measurement

## 4 Displays

### 4.1 Fault displays

The document “Module faults”, which will provide a complete description of all module faults, is in preparation.

### 4.2 LED displays

The B6-PSU Power Supply Unit has two LED displays on the front side which indicate the current state of the board.

Display for	Status	Meaning
NET OK	On	Mains voltage present
	Off	No mains voltage present / overtemperature
+5 V (3.3 V)	On	All system voltages (27 V, 5 V, 3.3 V) are present
	Off	At least one system voltage is lacking / power supply unit switched off



#### Notice

The **NET OK** display lights up as soon as there is mains voltage on the B6-PSU, regardless of whether the power supply unit is switched on or off!

## 5 Technical data

### 5.1 Mains input

#### Connection via the mains connection plug (X1)

Input effective voltage	230 V +15% / -20%
Frequency of the input voltage	47 Hz to 63 Hz
Typical efficiency	> = 80% if max. output power
Max. power consumption	160 W
Input current	acc. to EN 61000-3-2
Radio interference	acc. to EN 55022, Class B
Fuse protection	Slow-action 4.0 A (F1 on main print)
Mains failure bridging time	> = 20 ms
Switch-on current (t > 50 μs)	< 25 A

### 5.2 Direct current voltage inputs/outputs

#### 5.2.1 Battery connection

##### On the device underside (X13 VBAT, X14 GNDBAT)

Charge voltage (dependent on temperature)	U (0°C) = 28.3 V ±1% U (50°C) = 26.3 V ±1%
At X°C and X°C stored device without load or battery charging current within 1 min. after switching on	[28.42 – X*2 / 50] V ±0.2%
Temperature dependent	Linear
Load current limit	3.19 A ±7% for I = 0 A
Residual ripple without batteries	Effective residual ripple voltage < 100 mV (for full charging current)
Minimum voltage for battery test	20.2 V
Battery current measurement on X3 (measurement connector on the front of the device)	50 m V/A ±5%
Undervoltage disablement	18.3 V ±3%
Threshold for consumer disablement if mains failure (low charge protection)	19.6 V ±3%
Enablement threshold for consumer voltages when only battery operated	Typically 23.5 V
Leakage current when slide switch on On (U <sub>bat</sub> = 23 V) and device switched off (low charge protection active, without mains voltage)	< 0.5 mA

## Technical data

### 5.2.2 Output voltage for external consumers (X5)

Output voltage	+ pole	- pole	Protected by glass tube fuse FF 2.5 / 250 V/E
VEXT1	X5 PIN 9	X5 PIN 10	F1
VEXT2	X5 PIN 7	X5 PIN 8	F2
VEXT3	X5 PIN 5	X5 PIN 6	F3
VEXT4	X5 PIN 3	X5 PIN 4	F4
VEXT5	X5 PIN 1	X5 PIN 2	F5

Idle voltage (when batteries disabled)

29 V  $\pm$ 2%

Current limit when batteries not connected

4 A  $\pm$ 1% for  $U_{out} = 24$  V

(sum of all outputs, when 5 V and 3.3 V circuits not loaded)

Residual ripple without batteries

Acc. to VDE 0878, Class B

Idle voltage when batteries full

U (0°C) = 28.3 V  $\pm$ 1%

U (50°C) = 26.3 V  $\pm$ 1%

Typical output resistance static when  $I = 0.75$  A

90 m $\Omega$

(sum of all outputs with parallel connection of all outputs)

when  $T_a = 25^\circ\text{C}$



#### Notice

Each of the monitored outputs are individually protected by a screw-in glass tube fuse (2.5 A)!

### 5.2.3 Output voltage for internal consumers (X4)

#### Internal, peripheral

Fuse protection	Quick-acting 4 A (F3 on main print)
Residual ripple	< 100 mV (measurement bandwidth 20 MHz)
Minimum output voltage for battery test and I= 2 A	20.2 V
Idle voltage when batteries full	U (0 °C) = 28.3 V ±1% U (50 °C) = 26.3 V ±1%
Typical static output resistance when I <sub>a</sub> = 0.75 A when T <sub>a</sub> = 25 °C	150 mΩ

#### Internal, logic

Fuse protection	1 A (F4 on main print) using polymer fuse
Residual ripple	< 100 mV (measurement bandwidth 20 MHz)
Minimum output voltage for battery test and I= 2 A	20.2 V
Idle voltage when batteries full	U (0 °C) = 28.3 V ±1% U (50 °C) = 26.3 V ±1%
Typical static output resistance when I <sub>a</sub> = 0.5 A, when T <sub>a</sub> = 25 °C	300 mΩ



#### Notice

The F4 polymer fuse on the B6-PSU is a self-healing fuse. It resets itself after a short-circuit as soon as electrical current no longer flows through it; it can therefore be used many times.

Output voltage	5.06 V ±2.7%
Output current	0 mA – 1 A
Output ripple	< 50 mV (measurement bandwidth 20 MHz)
Current limit (latched deactivation when undervoltage is reached)	Typically 2 A (3.7 V - 4.5 V)

Output voltage	3.38 V ±2.7%
Output current	0 mA – 3 A
Output ripple	< 50 mV (measurement bandwidth 20 MHz)
Current limit (latched deactivation when undervoltage is reached)	Typically 3.4 A (2.4 V – 2.9 V)

### 5.3 Ambient conditions

Environmental class II acc. to VdS 2110

Cooling	Convection cooling
Temperature threshold for main converter OFF	Typically 95 °C

### 6 Related standards and regulations

EN 50130-4	Electromagnetic compatibility
EN 54-4	Fire detection and fire alarm systems – Power supply equipment
EN 55022 Cl. B	Information technology – Radio disturbance characteristics
EN 60950-1	Information technology – Safety
EN 61000-3-2	EMC – Limits for harmonic current emissions
EN 61000-4-4	EMC – Electrical fast transient/burst immunity test
EN 61000-4-5	EMC – Surge immunity test
EN 50082-2	Immunity for industrial environments
VDE 0800	Telecommunications – Security
VDE 0804	Telecommunications – Additional definitions
VDE 0833	Alarm systems for fire, intrusion and hold-up
VDE 0878 Cl. B	Radio interference suppression of telecommunication equipment
VdS 2110	<a href="#">Schutz gegen Umwelteinflüsse</a>
VdS 2115	<a href="#">Energieversorgungsgeräte – Anforderungen</a>
VdS 2541	<a href="#">Energieversorgungseinrichtungen</a>

### 7 Article numbers / spare parts

Short designation		Swiss art. no.	Art. no.
B6-PSU	Power supply unit		EG072950
B6 BATAKAB	Battery cable		EI29940
SI-G 8A	Replacement fuse for cable set	038.616 249	IS625040
B3 KAB PSU5	Battery power cable		FG81720
FF2.5 /250V/E (F1-F5)	Replacement fuse	238.024 600	IS625228

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