

DESCRIPTION

Alarmtech 24V series power supplies PSV 2465, PSV 2435 and PSV 2415 are highly efficient power supply units with battery backup, compliant with and provides all features required by EN 50131-6:2017, security Grade 3. These must be connected to the mains with a circuit breaker that is close by and easily accessible.

They all incorporate the unique and distinctive features of ViP mode – Voltage-in-Parallel, invented by Alarmtech. Power supply units with ViP feature can be connected in parallel, both (+) and (-) on one common power bus without a need of additional synchronization. Connected units will share load on a bus. ViP feature can be used to build distributed and redundant power systems. It can also be used to compensate voltage drops on a bus by placing power supply units along the bus sections.

Power conversion is based on high frequency SMPS regulator providing high conversion efficiency. Low internal losses preserve batteries from overheating, which increases battery life time. The processor-controlled battery charge operates during the first part of the charge with constant current and limited voltage, switching to constant voltage when the batteries are sufficiently charged. This is the most advanced and the best method to obtain the longest possible battery life.

Power unit is equipped with a built-in diagnostic system detecting and signalling all critical failures, including mains voltage & fuse together with different battery failures including end-of-life, low voltage and blown fuse.

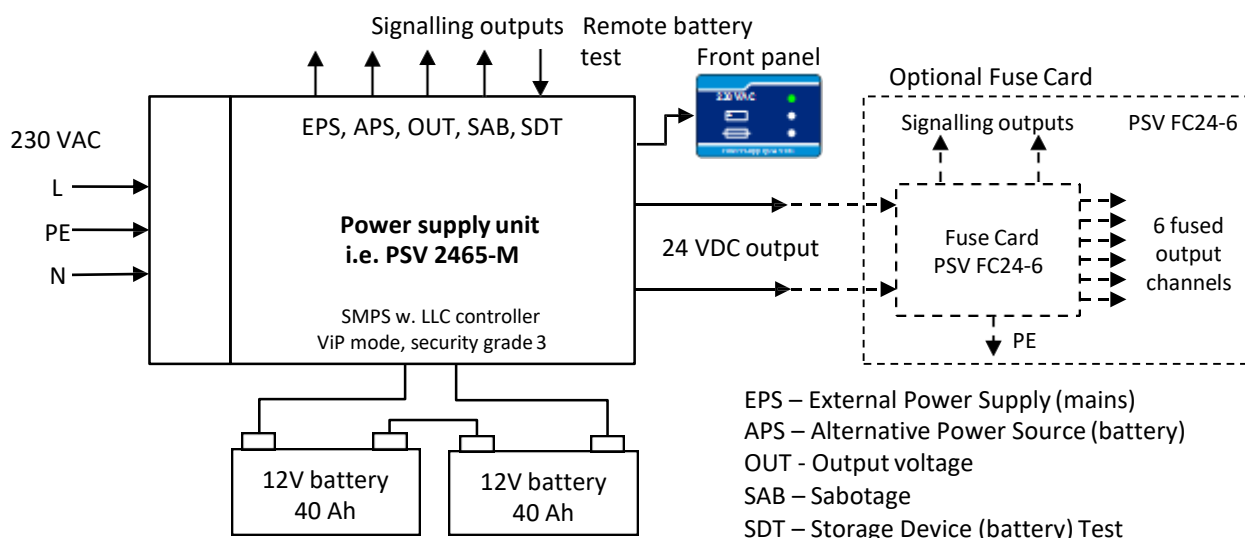
APPLICATIONS

- Power supply system for 24 VDC installations
- Distributed power supply systems with built-in redundancy
- Power supply systems for access control, fire and intruder alarm installations.

MAIN FEATURES

- Compliant with Security grade 3 (EN 50131-6:2017)
- Type A - mains connection with rechargeable batteries
- Voltage 27,6 VDC
- Max total power output 6.5A (PSV 2465)
- Maximum power to equipment 6.0A (PSV 2465)
- The ViP (Voltage-in-Parallel) function increases the security and capacity of the system. Units with ViP can be connected in parallel and share the load independent of the rated current for each connected unit.
- Space and capacity to charge up to two 12 V / 40 Ah sealed lead-acid batteries (box A1, see below).
- Short-circuit protection and overload protection
- Detection of mains voltage failure (EPS error)
- Low output voltage detection (OUT error)
- Detection of fuse fault (OUT fault)
- Detection of different types of battery faults (APS faults), eg if batteries are not connected, too low battery voltage or high internal resistance
- Deep discharge protection that disconnects the batteries when the battery voltage is too low
- Local or remote start of battery test
- Tamper security provided – case opening and pry-off switch
- Connected batteries must have minimum Flame Class V-2

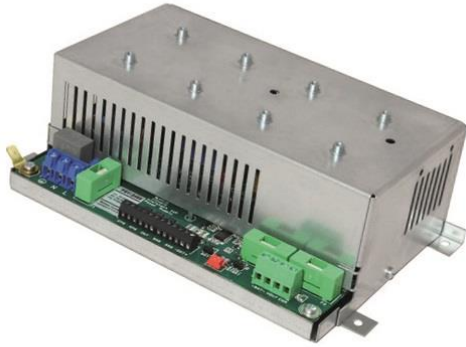
BLOCK DIAGRAM



1. Combinations, power modules and enclosures

There are a number of different combinations of power supplies (modules) and enclosures to be able to find a solution for specific needs:

24V modules



| | |
|-------------------|-----------|
| PSV 2465-M | 24V, 6.5A |
| PSV 2435-M | 24V, 3.5A |
| PSV 2415-M | 24V, 1.5A |

Wallmounted enclosures [WxHxD]



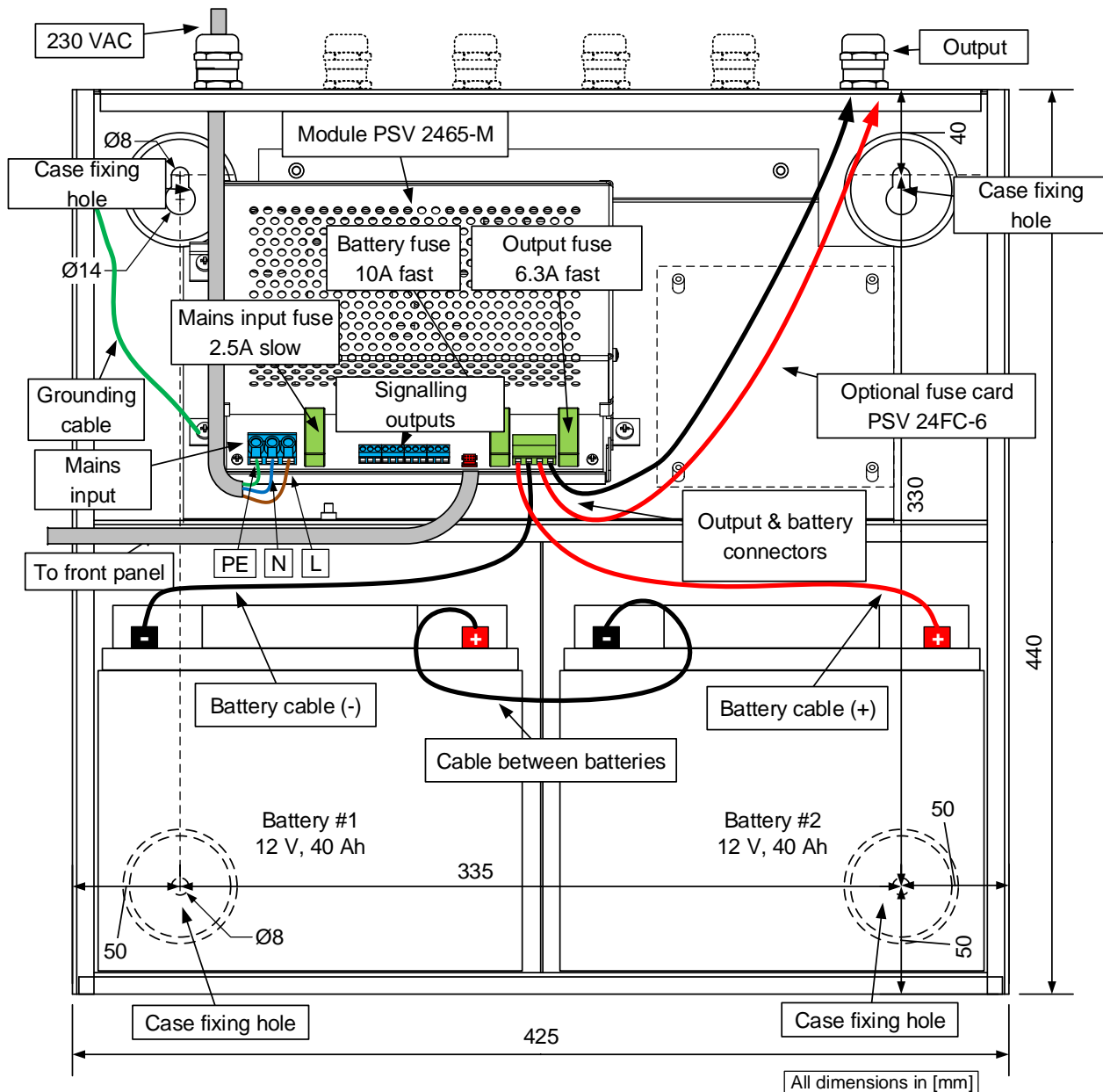
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|-----------|---|
| A1 | 425x440x200mm, 2x40Ah batteries |
| B2 | 385x385x115mm, 2x(7Ah, alt. 12Ah, alt 18Ah) |
| B3 | 385x575x115mm, 2x(7Ah, alt. 12Ah, alt 18Ah) |

Rackmounted enclosures [WxHxD]



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|-----------|--|
| R1 | 482x132x292mm, 2x(7Ah alt. 12Ah) batteries |
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2. INSTALLATION of PSV 2465-M (here enclosure A1)



PSV 2465-A1-40 Installation and Startup:

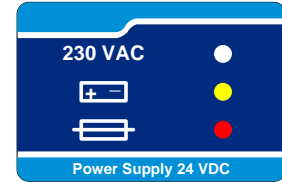
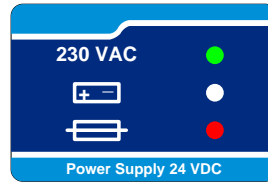
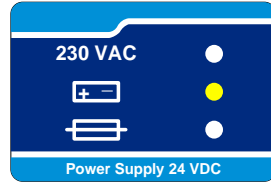
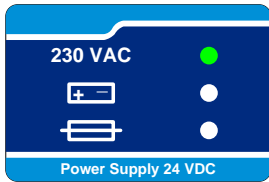
- The device must be connected to the mains with a connector that is close by and easily accessible.
- For safety reasons, make sure that the 230 VAC cable is not connected to the mains when working.
- Mount the unit using the 4 mounting holes.
- Place two batteries 12 V/40 Ah 18Ah (Flame class at least V-2 according to UL) in battery chambers
- Make internal connection in battery pack using supplied grey cable, connecting left battery (+) with right battery (-). with the help of grey cable.
- Connect the right battery (+) with the red battery cable.
- Connect the left battery (-) with the black battery cable.
- Connect the equipment to be supplied with voltage to 27.6 VDC.
- If fault outputs / control input for battery test (output EPS, APS, OUT, SAB, input –SDT *) are to be used, connect these to external equipment.
- Connect the 230 VAC cable to the 230 VAC input, ensure that grounding is done correctly.
- **NOTE!** For safety reasons, the batteries are disconnected when the mains voltage is not connected. The system can be operated with only the batteries before the mains voltage is connected, but then the kick-start must be used to open the electronic lock.
- Switch on the mains voltage. PSV 2465-40 will start automatically, supply power to the system and monitor all functions .

3. TECHNICAL DESCRIPTION

3.1 Front panel visual indications

Power supply unit is equipped with a status display panel showing the current status of the unit. Three LED's display shows:

- Green LED: mains voltage present – unit in EPS mode supplied from mains
- Yellow LED: mains voltage missing – unit in APS mode supplied from battery
- Red LED: fault detected – quick visual identification and localisation of failure is possible with help of set of diagnostic LED's in power unit.



Unit state OK

Mains voltage ok
 Battery OK
 Output OK
 No faults detected

Mains fault

(EPS output triggered)
 Supplied from battery
 No other faults

Mains OK

Battery fault detected
 Possible faults:
 APS (battery low)
 OUT (output or fuse)

Missing mains

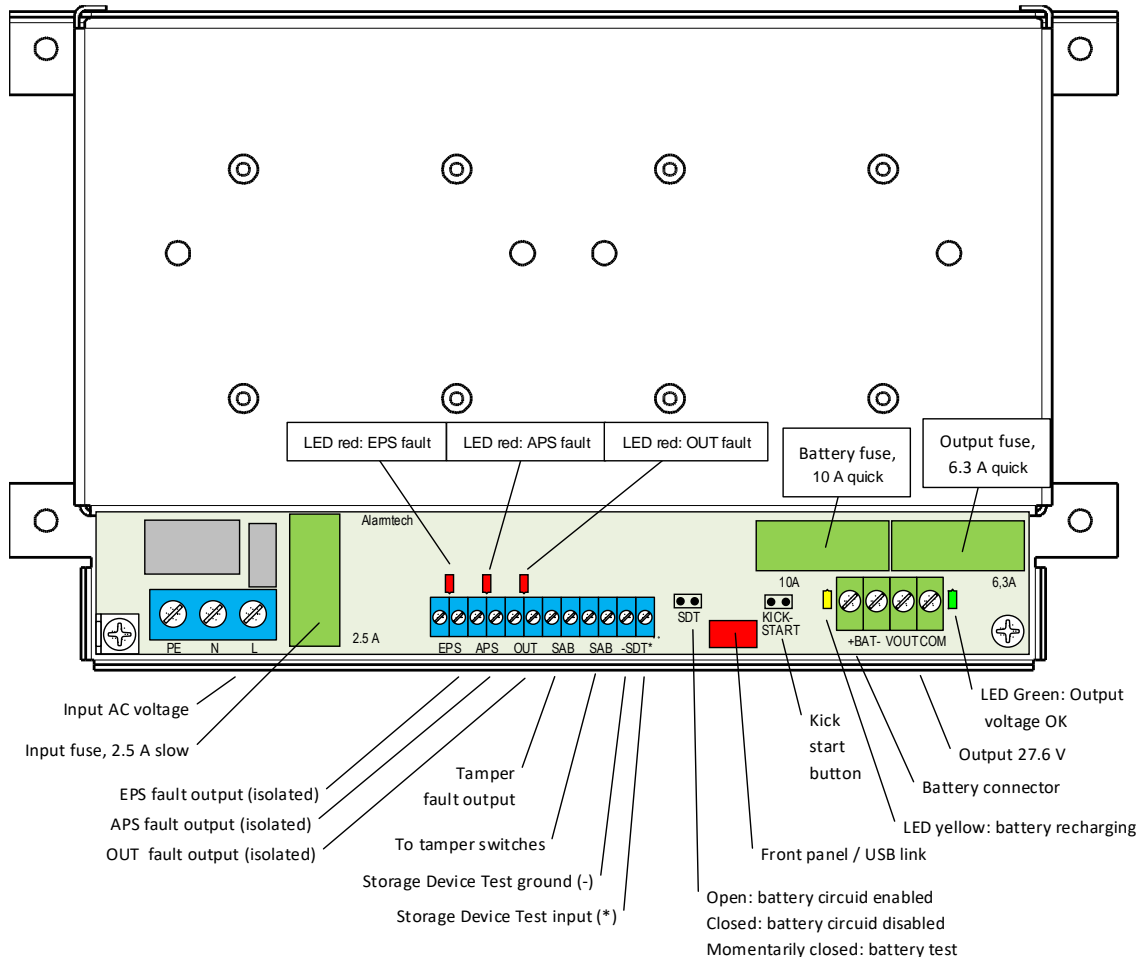
Supplied from battery
 Possible faults:
 APS (battery low)
 OUT (output or fuse)

3.2 Internal state monitoring functions and connections in power module

All monitored states of PSU are displayed with help of LED diodes for quick visual identification. The placement of monitoring LED is documented in below placed drawings. The meaning of LED colours is following:

- Green - normal state, OK
- Red - fault detected
- Yellow - informative meaning (neutral)

Fuse ratings depend on module type



3.3 Jumpers in power units

Power unit is equipped with 2 jumpers placed on PCB marked SDT and Kickstart:

SDT Storage Device Test

When triggered the computer disconnects the battery from installation if mains is ON, connects the battery to an internal load and measures the battery internal resistance. The value should be within certain limits defined by battery capacity, and if outside the limits an APS fault will be triggered. This function is triggered at startup and then automatically every 10 hours. It can be manually triggered by the jumper on the PCB or remotely if SDT terminal is connected. Default position is open and triggering is a momentary shunt to minus. If SDT is permanently shunted the battery charging is disabled.

WARNING: Do not connect a battery in this situation as it will be discharged. DDP will still work to avoid permanent battery damage

SDT (Storage Device Test) jumper - Close then open to manually test the battery, automatic test every 10 hours

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|-----------------|--|
| Momentary shunt | Battery test trigger (30s test of internal battery circuit resistance) |
| Open (default) | Battery recharging circuit enabled |
| Closed | Battery recharging circuit disabled |

Kick start

NOTICE: During installation with no mains, but battery connected, there will be no output voltage from PSV.

By momentary shunt the kick start jumper the output voltage will be enabled and installation is supplied from the battery. This function is introduced to prevent the battery to be discharged accidentally during installation.

Kick-start jumper - Close jumper then open to start the PSU without mains voltage

| | |
|-----------------|---|
| Momentary shunt | Kick-start of PS from battery (w/o mains) |
| Open (default) | Deep Discharge Protection (DDP) of battery enabled |
| Closed | Deep Discharge Protection (DDP) of battery disabled |

3.4 Input/output terminals

| Input / Output | Marking | Description |
|------------------------------|-----------|---|
| Mains input with PE | PE, N, L | 230 VAC input |
| Power output | VOUT, COM | (+) and (-) terminals for power output |
| Battery pack connection | + BAT - | (+) and (-) terminals for 1 x 12V battery pack connection |
| Mains failure signalling | EPS | Potential free NC opto-relay output signalling EPS fault |
| Battery failure signalling | APS | Potential free NC opto-relay output signalling APS fault |
| Output failure signalling | OUT | Potential free NC opto-relay output signalling OUT fault |
| Storage Device Test (remote) | -SDT* | Test triggered by momentary connect to minus (-) |
| SAB Tamper output/input | 2xSAB | Potential free NC micro-switch connection points |

4. TECHNICAL SPECIFICATIONS (PSV 2465/PSV 2435/PSV 2415)

| | |
|---|---|
| Type of Power Supply acc. to EN 50131-6:2017: | Type A |
| Nominal input voltage rating: | 230 VAC +/-15 %, 1.7 A/0.9 A/0.7 A with max load, 50 Hz |
| Output voltage: | 27,6 VDC |
| Maximum ripple: | < 50mV |
| Total maximal output: | 6.5 A/3.5 A/1.5 A |
| Total maximal output to installation: | 6.0 A/3.0 A/1.3 A |

PSV 2465

| | |
|----------------------------------|--|
| Max current in security grade 3: | 1.33 A (powered by battery 30 h. with 40 Ah battery) |
| Max current in security grade 2: | 3.33 A (powered by battery 12 h. with 40 Ah battery) |
| Max battery charge current: | 1.5 A in grade 3 charges battery in approx 24 h. 0.5 A in grade 2 charges battery in approx 72 h. |

PSV 2435

| | |
|----------------------------------|--|
| Max current in security grade 3: | 1.33 A (powered by battery 30 h. with 40 Ah battery) |
| Max current in security grade 2: | 3.33 A (powered by battery 12 h. with 40 Ah battery) |
| Max battery charge current: | 1.5 A in grade 3 charges battery in approx 24 h. 0.5 A in grade 2 charges battery in approx 72 h. |

PSV 2415

| | |
|---|--|
| Max current in security grade 3: | 0.4 A (powered by battery 30 h. with 12 Ah battery) |
| Max current in security grade 2: | 1 A (powered by battery 12 h. with 12 Ah battery) |
| Max battery charge current: | 0.5 A in grade 3 charges battery in approx 24 h. 0.2 A in grade 2 charges battery in approx 72 h. |
| Battery type: | Two 12 V/7 Ah-40 Ah sealed lead acid batteries in series. At least UL class V-2. |
| Battery recharging method: | Initially constant current, then constant voltage |
| Battery pack voltage triggering APS fault: | 22 V |
| Battery pack voltage triggering DDP circuit: | 20 V |
| Output voltage triggering OUT fault: | 25 V |
| Monitoring outputs: | EPS – loss of mains APS – battery pack low voltage, battery failure, disconnected OUT – output voltage low, power unit failure SAB – case tampering |
| Electrical characteristics of monitoring outputs: | Opto-isolated relay for EPS, APS, OUT (max 100 mA) Micro-switch for case tampering |
| Logical characteristics of monitoring signals: | Closed – monitored condition not present (OK) Open – monitored condition present (ALARM) |
| Remote battery test input: | -SDT* - shunt between terminals (-) and (*) triggers 30 s test of internal battery circuit resistance |
| Remote battery test acknowledgement: | APS output |
| Local battery test trigger: | SDT jumper, momentary shunt |
| Automatic battery diagnostics procedure: | Automatically tested every 10 hours |
| Operating temperature and humidity range: | -10° C...+40° C, RH to 90 %, no condensation |
| Environmental class according to EN 50130-5:1998: | Class II |
| Safety: | EN 62368-1:2014/AC:2015 |
| EMC: | EN 61000-6-3 |
| Certifications: | SSF1014-5 Larmklass 3, Miljöklass II EN 50131-6:2017 Grade 3 |
| Dimensions: | See page 2 |
| Weight without batteries: | A1 approx 9.5 kg B2 approx 5 kg B3 approx 7 kg R1 approx 7.5 kg |

