

Rectifier

PSS30

USER MANUAL



Notes to this manual

ATTENTION! Read this manual before installing and commissioning the specified module.

This manual is a part of the delivered module. Familiarity with the contents of this manual is required for installing and operating the specified module.

The function description in this manual corresponds to the stage of technology at the date of publishing. Technical changes and changes in form and content can be made at any time by the manufacturer without notice. There are no obligations to update the manual continually.

The rules for prevention of accidents for the specific country and the general safety rules in accordance with IEC 364 must be observed.

The module is manufactured in accordance with applicable DIN and VDE standards such as VDE 0106 (part 100) and VDE 0100 (part 410). The CE marking on the module confirms compliance with EU standards 73/23 EWG (low voltage) and 89/339 EWG (electromagnetic compatibility) if the installation and operation instructions are followed.

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The current revision status of this manual is the following:

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| Revision | Description of change | Writer | Date |
|----------|---|--------|------------|
| 00 | EVI layout and additional pictures inserted, minor text modifications (based on the original version "PSS30_E1_20071023.doc") | RTH | 2008-10-06 |
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Safety instructions and waste disposal rules



Warning!

Because several components of operating electrical modules are charged by dangerous voltage, the improper handling of electrical modules may be the cause of accidents involving electrocution, injury, or material damages.

- Operation and maintenance of electrical modules must be performed by qualified skilled personnel such as electricians in accordance with EN 50110-1 or IEC 60950.
- Install the module only in areas with limited access to unskilled personnel.
- Before starting work, the electrical module must be disconnected from mains. Make sure that the module is earthed.
- Do not touch connector pins as they can be charged with dangerous voltage up to 30 seconds after disconnection.
- Only spare parts approved by the manufacturer must be used.

All electric modules must be disposed of separate from domestic waste at collecting points that have been set up by the government or municipal authority.

“Separate collection is the precondition to ensure specific treatment and recycling of WEEE and is necessary to achieve the chosen level of protection of human health and the environment in the Community.”

The above statement from EU directive 2002/96/EC applies to all electric modules installed within EU countries.

In countries outside the EU, different rules may apply regarding waste disposal of electric modules.

For more information about waste disposal of your discarded equipment, contact your ELTEK VALERE INDUSTRIAL partner.

1. General

The primary switched mode rectifier type PSS30 (named PSS in the following) delivers an output power to a maximum of 3.0kW.

Typical applications are DC power supplies, uninterruptable power supplies with parallel connected batteries. Rectifiers of type PSS have good dynamic regulation properties at input voltage changes and load variations.

It works with an IV line according to DIN 41772 and is a connection unit, ready for integration in system cabinets with 19" standard frame according to DIN 41494. The operation elements, measurement instruments and input/output connectors are fitted on the front panel of the module.

Parallel operation of several modules is possible (with or without decoupling diodes at the output side). In this case the modules operate with decreased line or in current sharing mode (adjustable at factory). In the current sharing mode the variations of the output currents of the modules are $\leq \pm 5\%$ of the nominal output current.

An internal active decoupling circuit is available as option.

PSS modules also operate single side grounded or ungrounded at input and output.

2. Type range

| Type designation | Material code | Input voltage (VAC) | Output voltage (VDC) | Output current (A _{dc}) |
|----------------------|----------------|---------------------|----------------------|-----------------------------------|
| PSS30/24-80-CAN | 100-030-140.00 | 230 | 24 | 80 |
| PSS30/48-50-CAN | 100-030-150.00 | 230 | 48 | 50 |
| PSS30/60-40-CAN | 100-030-160.00 | 230 | 60 | 40 |
| PSS30/108-22,3-CAN | 100-030-170.00 | 230 | 108 | 22,3 |
| PSS30/216-11,1-CAN | 100-030-180.00 | 230 | 216 | 11,1 |
| PSS30/216-11,1-Relay | 100-030-180.01 | 230 | 216 | 11,1 |

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2.1 Available options and accessories:

| Article | Material code |
|---|-----------------|
| Connector set for input/output <40A | 880-100-STK.01 |
| Connector set for input/output >40A | 880-100-STK.02 |
| Connector set for input/output, PSS 216V | 880-100-STK.03 |
| Temperature sensor (LM335) integrated in a terminal end M5, with 4m connection wire | 880-300-TMP.01 |
| 19" sub rack, 7U | 880-MEC-BGT7.00 |



Photo: 19" sub rack, 7U, for the integration of three rectifiers PSS

3. Start up procedure

Before connecting to the input voltage, it should be checked that the voltage information on the type plate corresponds to the available voltage and also that the polarity corresponds to the connection plan of the plug. The mains connection is done via a plug at the front side. The protective conductor should be generally connected (protection class 1, leakage current $\leq 3.5\text{mA}$).

Important:

If one pole is grounded at the output side, the module has to be connected with an additional non-fused earthed conductor wire on the earth screw (left side on front panel). In this case the PE wire should not be connected to the input connector to prevent earth circuit. This is very important for paralleled modules without decoupling diodes at the output side.

The DC output and signal contacts are to be connected with a SUB-MIN-D-connector, type 21WA4. For modules with an output current $>40\text{A}$ two heavy-duty contacts are paralleled. In this case it is important that both contacts are symmetrically loaded. The current must be $\leq 40\text{A}$ per each contact. The signalling contacts for monitoring, sense links and active current sharing mode are also included in the output connector.

The rectifier has big capacitors at the output. If you connect a switched off module to a battery or other modules which operates in parallel, a high capacitor charge current will occur. This current can destroy the contacts on the output connector.

You can avoid this effect considering the following rules:

- Switch on the PSS module before connecting the output plug
- Disconnect the DC bus by switch or fuse
- Charge the capacitors with resistor (approx. $1\ \Omega/\text{V}$)
- Use decoupling diodes at the output side

After switching off, the capacitors are still fully charged. The discharge time is approx. 4s for the input and approx. 15s for the output side.

The rectifier is forced-cooled with fan. The ambient temperature has to be lower than $45\ ^\circ\text{C}$. If more than one subrack mounting level is used in one cabinet there must be a difference between two mounting levels of 3U (approx. 130mm) for an unobstructed airflow. The temperature within the cabinet should not be higher than $40\ ^\circ\text{C}$.

If there is a higher temperature the life time of the modules will be decreased.

The internal losses per module are approx. 260 up to 290W (depending on the type).

4. Operation

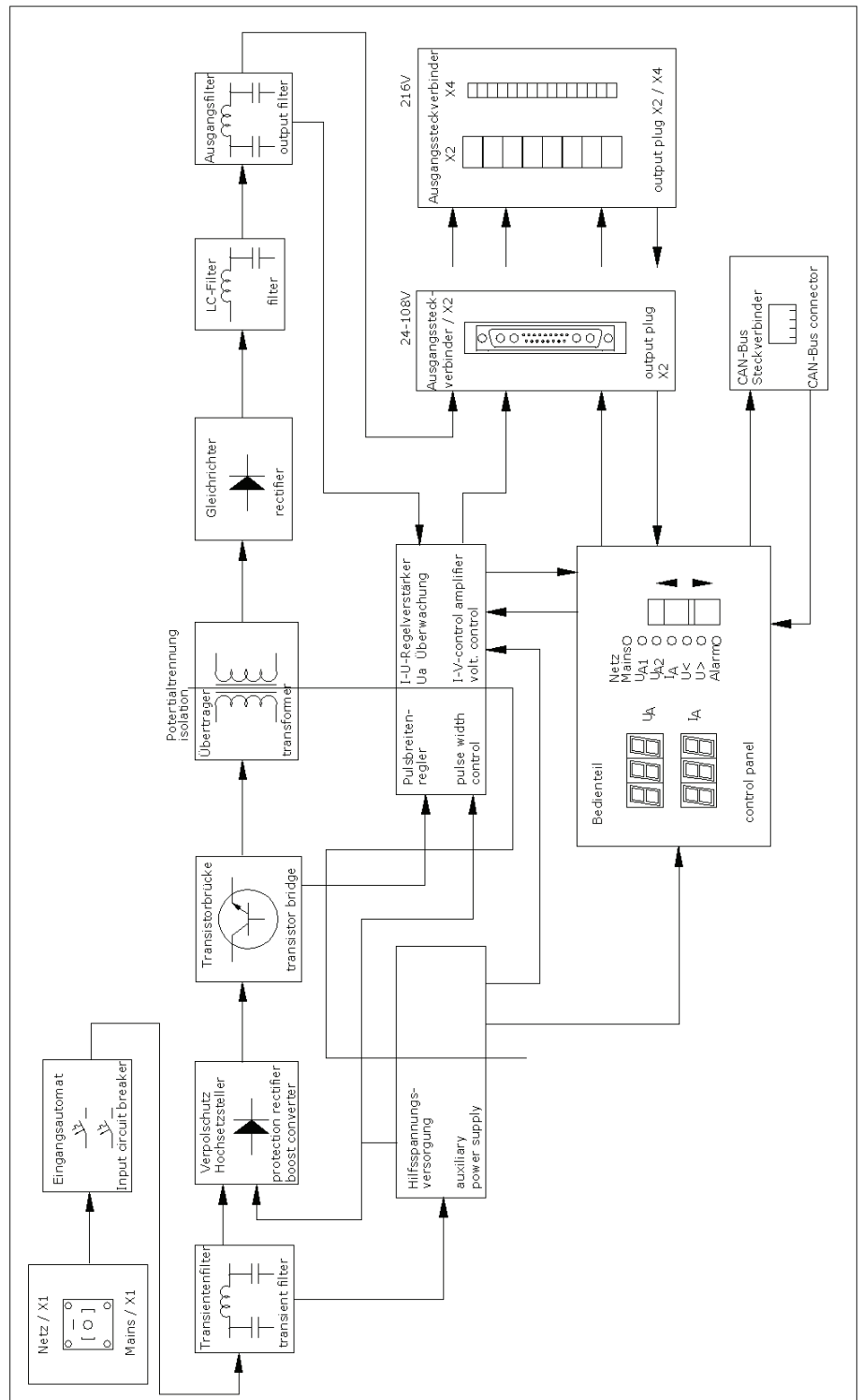
All operation elements are fitted on the front panel of the module. The function of each individual operation element is described on the following pages.

See also section 7. "Operation elements and connectors".

5. Functions

5.1. Circuit diagram

Picture:
Schematic Block
Diagram PSS30



5.2 Electrical function description

Rectifiers of type PSS consist of following main parts:

1. Line filter to reduce the high-frequency transients produced by the device as well as damping the transients and noise voltage which are superimposed on the mains.
2. Mains rectifier with switched step-up-converter (operation frequency 100 kHz) to transform the input voltage in a pre-regulated DC voltage of approx. 380V and to control the waveform of the input current (sinusoidal!) as well as to control the power factor (>0.99). An additional function is the limitation of inrush current.
3. Transistor bridge to transform the 380V_{DC} to a pulse width modulated AC voltage with a frequency of 100KHz.
4. HF transformer for the decoupling of the primary and secondary side and adaptation of the voltage level to the secondary side.
5. Rectifier diodes
6. LC filter to reduce the voltage ripple at rectifier output.
7. Output filter for RFI suppression and to reduce the noise level on DC line.
8. Internal power supply to supply the primary and secondary control units with potential separation.
9. Controlled system, opto-decoupled.
10. Adjustment panel for adjustment of output parameters, signals and measurement instruments.

5.2.1 Electrical insulation

Due to the construction principle of the module (module parts) and separated wiring of mains input and DC output, the PSS meets the following standards:

- Devices with $V_0 \leq 60V_{DC}$ protection against dangerous body currents through low voltage with safe electrical decoupling according to EN 60950 and VDE 0100.
- Devices with $V_0 > 60V_{DC}$ saved electrical decoupling to $V_0 = 220V_{DC}$ according to EN 60950 and VDE 0160.

5.2.2 Input

The input is protected with a 2-pole circuit breaker. This circuit breaker is also used as on/off-switch. The MCB is -seen from the mains input side- connected ahead of the input filter. An additional internal fuse is used to protect the controller.

The rectifier has a current limitation which limits the inrush current to the level of the nominal input current.

5.2.3 Output

The output line is an IV-line according to DIN 41772 /DIN 41773. Active current sharing mode or decreased charge line (-1% at 100% I_{nom}) is possible. Serially the decreased charge line is factory preset. The output is continuous short circuit proof (constant current controlling).

It is possible to use three different output voltages:

1. Voltage for trickle charge
2. Boost charge
3. Battery test

The output voltage for trickle charge is standard set.

For the use of "Boost charge" or "Battery test", the pins of the signal connectors are to be connected as described in section 7.3 "Electrical connectors".

5.2.4 Dynamic regulation of the output voltage

At load jumps between 10 % and 90 % I_{nom} / 90 % and 10 % I_{nom} the dynamic voltage difference is max. ± 3 % and is corrected in max. 1,5 ms to static levels.

5.2.5 RFI suppression

Modules of type PSS meet the standard VDE 0878 T1 and EN 55011/55022 class 'B'. The output ripple is (psophometrically measured according to CCITT) < 1mV (24V), < 1,8mV (48V) and < 2mV (60V).

5.2.6 CAN-Bus interface

The rectifier PSS is equipped with a serial CAN-Bus interface. Two CAN connectors (RJ11, 6-pole) are fitted at the front side of the 24V - 110V version. For the 220V version the CAN-Bus connection is integrated in the front side connector **X4**.

Several modules in a system or parallel connection can be controlled and monitored through the CAN-Bus by a central DC controller unit MU1000C.

The following parameters of a specific rectifier unit can be controlled or monitored:

- Output voltage
- Output current
- Module status

Furthermore, the rectifier unit receives all threshold values through the CAN-Bus from the DC controller unit.

REMARK: If several paralleled rectifiers are controlled by a central DC controller unit, it is important to assign an explicit CAN-Bus address to each individual rectifier (see section 5.4).

5.3 Monitoring

5.3.1 Mains voltage monitoring



Mains voltage monitoring; signalling with LED "Switch symbol", criterion: output voltage of step-up-converter ≥ 370 V, at the same time operation monitoring of step-up-converter (equivalent to main voltage of approx. ≥ 195 VAC; depends on the load).

The LED is dark if the mains voltage is low or the step-up-converter is out of order.

This signal is included in the **collective failure** signal of the rectifier. Additional there is an optocoupler signal (mains O.K.).

For high input voltages (approx. >270 Vac) there is implied an automatic switch off function.

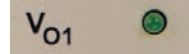
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5.3.2 Operation monitoring

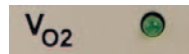


Functional monitoring; signalling with LED "V₀₁", criterion: output voltage $\geq 97\%$ of adjusted output voltage without constant current regulation; $\geq 85\%$ of adjusted output voltage with constant current regulation. The signalling threshold of this monitoring automatically follows the adjusted nominal output voltage.

This signal is included in the **collective failure** signal of the rectifier. Additionally there is an optocoupler signal (V_o O.K.) available.

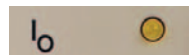
At operation with internal decoupling diodes the voltage is measured ahead of the diodes.

5.3.3 Monitoring „Boost charge“



If „boost charge“ is activated (see section 6.5), LED V₀₂ is ON, LED V₀₁ is OFF.

5.3.4 Monitoring „Constant current operation“



Constant current operation (output current limiting active) is signalled with a yellow LED I₀.

5.3.5 Output voltage low



Output voltage low monitoring; signalling with LED "V<", criterion: Output voltage is higher than adjusted level V<; this signal is included in the **collective failure** signal of the rectifier.

This signal has its own relay contact on the signalling connector. If the voltage value is O.K., pin 13 and pin 17 of X2 are closed.

5.3.6 Output voltage high



Output voltage high monitoring; signalling with LED "V>", criterion: output voltage higher than adjusted level V>;

This signal is included in the **collective failure** signal of the rectifier. If there is an error, the LED is ON and the rectifier internally switches off. You have to reset the unit by ON/OFF switch.

5.3.7 Protection against overheating/collective failure



A collective failure is signalled with the LED "Bell symbol". Furthermore overheating is signalled; criterion: Temperature of the heat sink $> 90^{\circ}\text{C}$ (the unit switches OFF). This signal is included in the **collective failure** signal. You have to reset the unit by ON/OFF switch.

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5.3.8 Signals

The following signals are available as potential-free optocoupler signals:

1. "Vo O.K.",
2. "Mains O.K."
3. Constant current mode "Iconst"

The maximum contact load is 30V/5mA.

The optocouplers switch OFF at signal 1. and 2., they switch ON at signal 3.

The collective failure signal is delayed for approx. 10s and is available (as well as the signal V>) via a potential-free relay contact. If a failure exists, the relay switches OFF.

For PSS30, 24/48/60/110V version:

The relay contacts between pin 14 and pin 15 of **X2** are open and between pin 15 and pin 16 are closed at failure.

For PSS30, 220V, only relay version:

The relay contacts between pin 12 and pin 13 of **X4** are open and between pin 13 and pin 14 are closed at failure.

The following monitoring items are included in the collective failure signal:

1. Mains voltage monitoring
2. Operation monitoring
3. Output voltage low
4. Output voltage high
5. Over temperature

5.4 Output and threshold adjustment

The adjustment of output values and monitoring thresholds are very easy. All values are to be adjusted with front keys; the actual values are indicated with the front side digital displays.

In normal operation the top display shows the output voltage (Vo1, Vo2 or Vo3 depending on the selected operation mode) and the bottom display shows the output current (Io).

In the adjustment mode, the top display shows the name of the parameter, the bottom display shows the related value.

For any adjustment please follow these instructions:

- press both keys UP/DOWN (↑↓) together for a short time; the rectifier changes to adjustment mode
- press the key UP (↑) or DOWN (↓) to change the adjustment parameter (see the following table)
- press both keys UP/DOWN (↑↓) together for a short time; the rectifier changes to value change mode
- press the key UP (↑) or DOWN (↓) to change the adjustment value (if you hold the key the value changes quicker)
- press both keys UP/DOWN (↑↓) together for a short time; the rectifier changes back to adjustment mode (at this moment the changed value will be stored)
- press both keys UP/DOWN (↑↓) for approx. 3s. to change to the operation mode

You can leave the adjustment mode at any time with pressing the keys UP/DOWN (↑↓) for approx. 3s.

Adjustable parameters in the adjustment mode:

| Displayed short term of the parameters | Parameter meaning |
|--|--|
| V01 | trickle charge voltage |
| V02 | boost charge voltage (see section 6.5) |
| V03 | voltage at discharge test (see section 6.4) |
| Io | output current |
| V< | output voltage low threshold (see section 5.3.5) |
| V> | output voltage high threshold (see section 5.3.6) |
| t | temperature coefficient for temperature compensation of the charge voltage (see section 6.2) |
| Adr | change CAN-Bus address |

The threshold values for mains/step-up-converter and over heating are not changeable. The threshold values of DC voltage low (V<) and DC voltage high (V>) can be individually set within a limited adjustment range. For more information regarding the adjustment ranges and factory preset values see section 10. "Technical data".

6. External Functions

6.1 Output voltage sensor leads

Voltage losses at wires or diodes are to be compensated with sense links for the output voltage. The maximum regulation difference is approx. 4 % of the nominal voltage. Cable break at sense links, confusing of poles or short circuit can not damage the rectifier. At cable break of the sense link, a voltage increase of max. 4% is possible.

6.2 Temperature compensation of the charging voltage

For the use of closed batteries we recommend temperature-controlled compensation of the charge voltage. Connect an external active temperature sensor (option) to the signalling connector. The standard set temperature coefficient is -4mV/K per cell (for a temperature range of $0\text{-}50\text{ }^{\circ}\text{C}$). The basic temperature is 20°C . The coefficient can be adjusted between 0 to -6mV/K per cell (see section 5.4). Connect the sensor with a 2-pole wire ($0,25\text{mm}^2$). It can be directly mounted on top of the battery or on battery poles. At great distances (approx. 2m) we recommend the use of a shielded wire with connection of the shield to rectifiers ground.

6.3 External switch ON/OFF function

The rectifier can be externally switched on/off with applying an external DC voltage over an external switch to the respective pins according to section 7.3. The output of the PSS rectifier switches OFF, if the external voltage is applied. In this case, the switch-off does not result in a collective failure signal! The input is potential free due to the use of an optocoupler and meets the supposition for safe electrical decoupling to mains and output side. The signalling voltage is $10\text{-}24\text{V}$, the internal resistance is $2,7\text{k}\Omega$. The input is protected against reversed polarity. At higher supply voltages the current in the control circuit has to be limited to approx. $5\text{-}7\text{mA}$ with a series resistor (e. g. $6,8\text{k}\Omega$ at $48/60\text{VDC}$).

6.4 Discharge test

It is possible to test the capacity of a battery which operates in parallel with the rectifier.

To select the discharge test mode you have to connect **-Vo** to pin 2 of the output connector **X2** (see section 7.3).

The discharge test voltage can be adjusted by the user (parameter V03; see section 5.4).

If the discharge test mode is active, the LED V01 is ON; LED V02 is OFF.

6.5 Boost charge mode

The rectifier module has a second charge line (boost charge line). To select this mode you have to connect **+Vo** to pin 2 of the output connector **X2** (see section 7.3). The boost charge mode is signaled by LED V02. The voltage value can be adjusted by the user (see section 5.4).

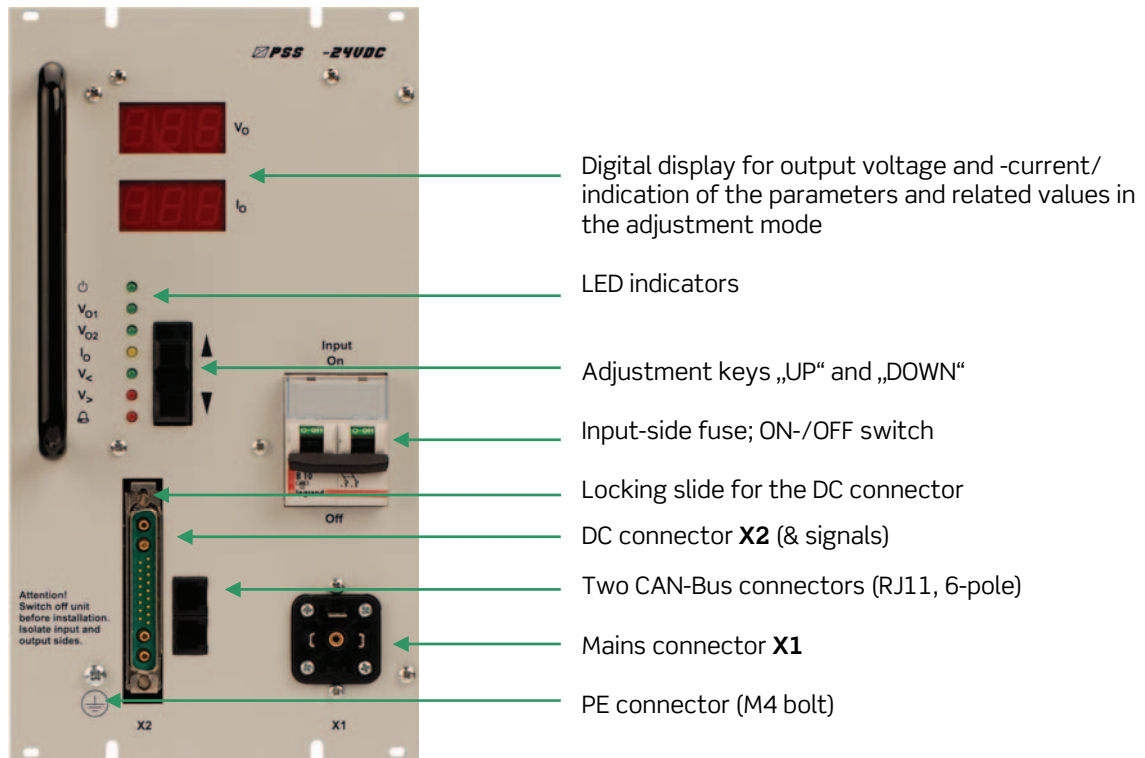
NOTE: For 60/108/216V units: For the connection to +Vo an additional series resistor is to be used (60 V: 18kOhm; 108 V: 56kOhm; 216V: 150kOhm).

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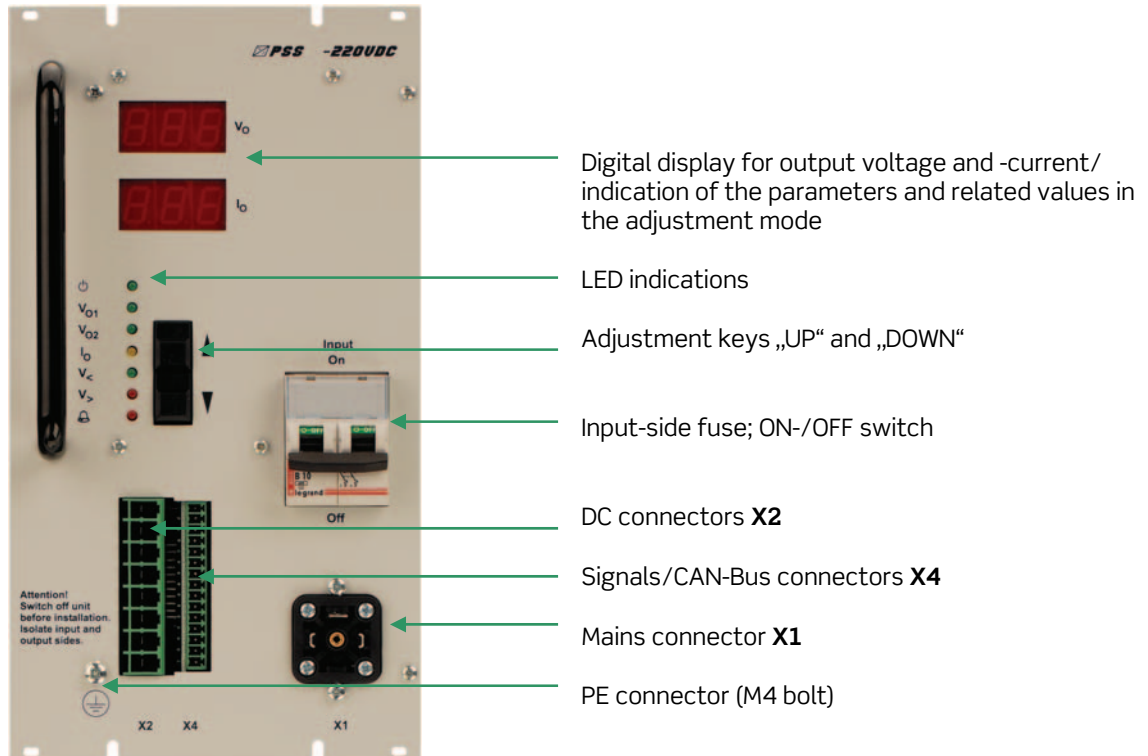
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7. Operation elements and connectors

7.1 Front view/Operation elements 24/48/60/108V version



7.2 Front view/Operation elements 216V version



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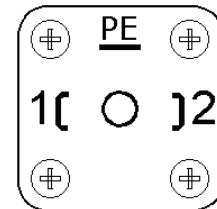
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7.3 Electrical connectors

AC-mains input (GDM-connector) for **all** PSS30 versions (connector **X1**)

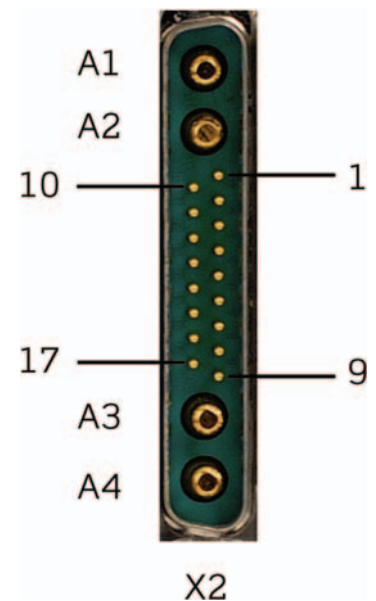
| X1, pin | Function |
|---------|------------|
| 1 | L1 - Input |
| 2 | N - Input |
| PE | PE |



X1

DC output and signalling contacts (SUB-MIN-D-connector 21WA4), for **24, 48, 60 and 108V** versions (connector **X2**):

| X2, pin | Function |
|---------|--|
| A1 | (+) - output |
| A2 | (+) - output (additional for $I_o \geq 40A$) |
| A3 | (-) - output (additional for $I_o \geq 40A$) |
| A4 | (-) - output |
| 1 | (+) - output voltage sense link |
| 2 | signal input discharge test mode / boost charge mode 1) |
| 3 | optocoupler emitter |
| 4 | optocoupler collector "Mains O.K." |
| 5 | optocoupler collector "Vo O.K." |
| 6 | optocoupler collector "Io" |
| 7 | temperature sensor (+) 2) |
| 8 | control wire for active current sharing 3) |
| 9 | (-) - output voltage sense link |
| 10 | analogue ground (for temperature sensor (-), active current sharing) |
| 11 | (+) external switch on/off 4) |
| 12 | (-) external switch on/off |
| 13 | relay contact V< , N/O 5) |
| 14 | relay contact collective failure , N/O |
| 15 | relay contact collective failure , COM |
| 16 | relay contact collective failure , N/C |
| 17 | relay contact V< , COM |



X2

REMARK: The legend of the items **1)**... **5)** follows on the next page.

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1) Tri-state-input, pin 2 at $-V_0$ = discharge test mode; pin 2 at $+V_0$ = boost charge mode

NOTE: For 60/108/216V units: For the connection to $+V_0$ an additional series resistor is to be used (60 V: 18kOhm; 108 V: 56kOhm; 216V: 150kOhm).

2) Connection of temperature sensor with 2-pole wire to pin 7(+) and pin 10 (-)

NOTE: If several modules are paralleled, pin 7 of each individual unit and pin 10 of each individual unit has to be connected.

3) At active current sharing mode of paralleled units the pin 8 of each individual module has to be connected.

4) External switch on/off with optocoupler: internal series resistor 2,7kOhm, $I_{min} < 5mA$, $I_{max} = 10mA$ (see section 6.3).

NOTE: The input is potential free with safe electrical decoupling to primary side and with 500Vdc to secondary side.

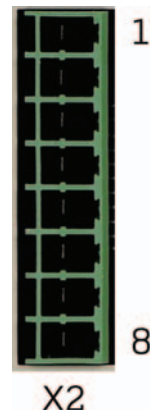
5) The relay outputs are potential free with safe electrical decoupling to primary side and with 500Vdc to secondary side.

ATTENTION! If decoupling diodes are output-side integrated in minus, the use of sense links are **not** allowed.

For the 216V version, the DC output and signal connectors are separated.

DC output (8xCOMBICON 4mm²)
for **216V** version (connector **X2**):

| X2, pin | Function |
|---------|---|
| 1 | (+) - output |
| 2 | (+) - output |
| 3 | (+) - voltage sense link |
| 4 | control wire for active current sharing 6) |
| 5 | BUS ground |
| 6 | (-) - voltage sense link |
| 7 | (-) - output |
| 8 | (-) - output |



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Signals (connector **X4** = 15 x COMBICON 1,5mm²):

Pin assignment of **X4** for PSS30/216V with **signalling relay** (without CAN-Bus)

| X4, pin | Function |
|---------|--|
| 1 | (+) external switch on/off 4) |
| 2 | (-) external switch on/off |
| 3 | optocoupler emitter |
| 4 | optocoupler collector "Mains O.K." |
| 5 | optocoupler collector "VO O.K." |
| 6 | optocoupler collector "IO" |
| 7 | BUS ground |
| 8 | signal input discharge test mode / boost charge mode 1) |
| 9 | temperature sensor (+) 2) |
| 10 | control wire for current sharing mode 3) |
| 11 | relay contact V< , NO 5) |
| 12 | relay contact collective failure , NO 5) |
| 13 | relay contact collective failure , COM |
| 14 | relay contact collective failure , NC 5) |
| 15 | relay contact V< , COM |



| X4, pin | Function |
|---------|--|
| 1 | (+) external switch on/off 4) |
| 2 | (-) external switch on/off |
| 3 | optocoupler emitter |
| 4 | optocoupler collector "Mains O.K." |
| 5 | optocoupler collector "VO O.K." |
| 6 | optocoupler collector "IO" |
| 7 | BUS - GND |
| 8 | signal input discharge test mode / boost charge mode 1) |
| 9 | temperature sensor (+) 2) |
| 10 | control wire for current sharing mode 3) |
| 11 | CVCC + |
| 12 | CAN-H |
| 13 | CAN-L |
| 14 | CVSS - |
| 15 | Not connected |

Pin assignment of **X4** for PSS30/216V with **CAN-Bus** (without signalling relay)



REMARK: The legend of the items **1)**... **6)** follows on the next page.

1) Tri-state-input, pin 8 at $-V_o$ = discharge test mode; pin 8 at $+V_o$ = boost charge mode

NOTE: For the connection to $+V_o$ an additional series resistor (150k Ω for the 216V version) is to be used.

2) Connection of a temperature sensor with 2-pole wire to pin 9 (+) and pin 7 (-)

NOTE: If several modules are paralleled, pin 9 of each individual unit and pin 7 of each individual unit has to be connected.

3) At active current sharing mode of paralleled units pin 10 of each individual module has to be connected.

4) External switch on/off with optocoupler: internal series resistor 2,7k Ω , $I_{min} < 5\text{mA}$, $I_{max} = 10\text{mA}$ (see section 6.3).

NOTE: The input is potential free with save electrical decoupling to primary side and with 500Vdc to secondary side.

5) The relay outputs are potential free with save electrical decoupling to primary side and with 500Vdc to secondary side.

6) At active current sharing mode of paralleled units pin 4 (X2) of each individual module has to be connected.

ATTENTION! You can use version 6) or version 3) for the wiring of the active current sharing mode, but not both in combination!

ATTENTION! If decoupling diodes are output-side integrated in minus, the use of sense links are **not** allowed.

8. Maintenance

In general, the PSS rectifier is maintenance-free.

A yearly inspection with following checks is recommended:

- Mechanical inspection
- Removal of dust and dirt, especially on radiator surfaces
- Check for internal dust or humidity

Attention! Dust combined with moisture or water may influence or destroy the internal electronic circuits.

Dust inside the unit can be blown out with dry compressed air.

The intervals between this checks depends on ambient conditions of the installed module.

9. Trouble shooting

Only skilled and trained technical personnel should carry out the necessary trouble shooting operations at the unit.

9.1. No output voltage

- Is the mains voltage present?
- Is the mains switch in on-position?
- Is the input plug correctly connected?
- Is the polarity correct or short circuit at the output?
- Paralleled units: incorrect polarity at external decoupling diodes?
- Monitoring of output voltage high $V_{>}$ signalize an error (lights LED $V_{>}$?); switch the unit off and on again and check the adjusted value of $V_{>}$ (see section 5.4)!

If the module still does not work even though all checks have been done, contact your sales agent or the ELTEK VALERE INDUSTRIAL service department.

9.2. Deviation of the output voltage

- Operates the module in constant current mode (overload)? >Reduce the load!
- Adjustment of output voltage value V_o wrong? >Adjust the output voltage to nominal values (see section 5.4)!
- Cable break at external sense links?
- Voltage losses at decoupling diodes on output side? >adjust the output voltage to higher level or use sense links!

If the module still does not work even though all checks have been done, contact your sales agent or the ELTEK VALERE INDUSTRIAL service department.

10. Technical data

10.1. General technical data

| | |
|--|---|
| Nominal input voltage | 230VAC -20/ +15% |
| Inrush current | 15A at 10ms |
| Recommended mains fuse | gL 16A |
| IV line | IV line acc. DIN 41 772/ DIN 41773 |
| Emission | acc. EN50081-1 |
| Conducted interference voltage | acc. EN 55011/EN55022 class "B" |
| Radiated electromagnetic field strength | acc. EN 55011/EN55022 class "B" |
| Immunity | acc. EN50082-2 |
| Cabinet | ESD-test acc. EN61000-4 part 2; 6kV contact; 8kV air discharge HF-field acc. EN61000-4 part 3; 10V/m (30Mhz - 1GHz) |
| Power wires | Burst-test acc. EN61000-4 part 4; 2kV Surge-test acc. EN61000-4 part 5; 4kV unsymmetric; 2kV symmetric |
| Signal wires | Burst-Test acc. EN61000-4 part 4; 2kV Surge-Test acc. EN61000-4 part 5; 2kV unsymmetric |
| Protection (electr.) | with safe decoupling at $V_0 \leq 60V_{DC}$ acc. VDE0100 part 41011.83 cap. 4.3.2; at $110V_{DC} \leq V_0 \leq 220V_{DC}$ acc. VDE 0160 5.88 cap. 5.6 |
| Dynamic voltage difference | $\leq 3\%$ at load changes between 10 % - 90 % - 10 % of nominal output current (regulation time ≤ 1 ms) |
| Short circuit capability | continuous short circuit proof (constant current control) |

| | |
|---|--|
| Protection / monitoring / signalling | front side 2-pole MCB (16A) |
| Mains monitoring „Mains“ | green LED |
| Operation monitoring „Vo1 “ | green LED |
| Operation monitoring „Vo2 “ | green LED |
| Output voltage low „V<“ | green LED with relay contact |
| Output voltage high „V>“ | red LED |
| Constant current mode „Io“ | yellow LED |
| Over-temperature/general fault | red LED |
| Digital instruments: | |
| Ammeter | Indication of 00,1 to 99,9Adc |
| Voltmeter | Indication of 00,1 to 999Vdc |
| External functions | |
| signal V< | via potential-free contact (contact charge: 24Vdc/1A, 120VAc/0,5A) |
| General fault alarm signal | via potential-free relay contact (10s time delay) (contact loading: 24Vdc/1A, 120VAc/0,5A) |
| Power measuring discharge test / boost charge | for active current distribution voltage values adjustable |
| Temperature compensated voltage regulation | temperature coefficient 4mV/K per cell with external temperature sensor (optional), temperature coefficient adjust- able |
| External sensor lead connection for output voltage | Signal via optocoupler „Vo O.K.“ „Mains O.K.“ |
| Constant current operation | „I _{const} “ signal via optocoupler |
| External ON/OFF | if required |
| Parallel operation | max. 50 units, consumer load sharing approx.10% |
| Design | 1/3 x 19" unit for mounting in cabinets according to DIN 41494 |
| Protection class | IP 20 |
| Cooling | Fan cooling |

| | |
|---|--|
| Ambient temperature | 0°C to 45°C for single unit operation 0°C to 40°C for cabinet assembly operation |
| Storage temperature | -30°C to + 70°C |
| Environmental conditions | IEC 721 part 3-3 Class 3K3 / 3Z1 / 3B1 / 3C2 / 3S2 / 3M2 |
| Operation altitude | up to a maximum of 1500 m |
| Mechanical strength and vibration resistance | acc. to VDE 0160 issue. 5.88 Pt. 7.2.2 |
| Finish | RAL 7035 (front plate) |
| Dimensions | see section 10.3 and 10.4 “Dimensional drawings” |
| Weight: | approx. 12,4kg |
| Electrical connectors: Input connection X1 | angular plug type GDM 2011; 3-pole |
| DC-output / signalling X2 | 24-108Vdc: SUB-Min-D-connector 21WA4 216Vdc: Front side terminals 8x4mm ² , COMBICON (DC-output); Front side terminals 15x1,5mm ² (signal contacts) |
| Protective conductor connection | bolt M4 |

10.2. Specific data (depending on the type)

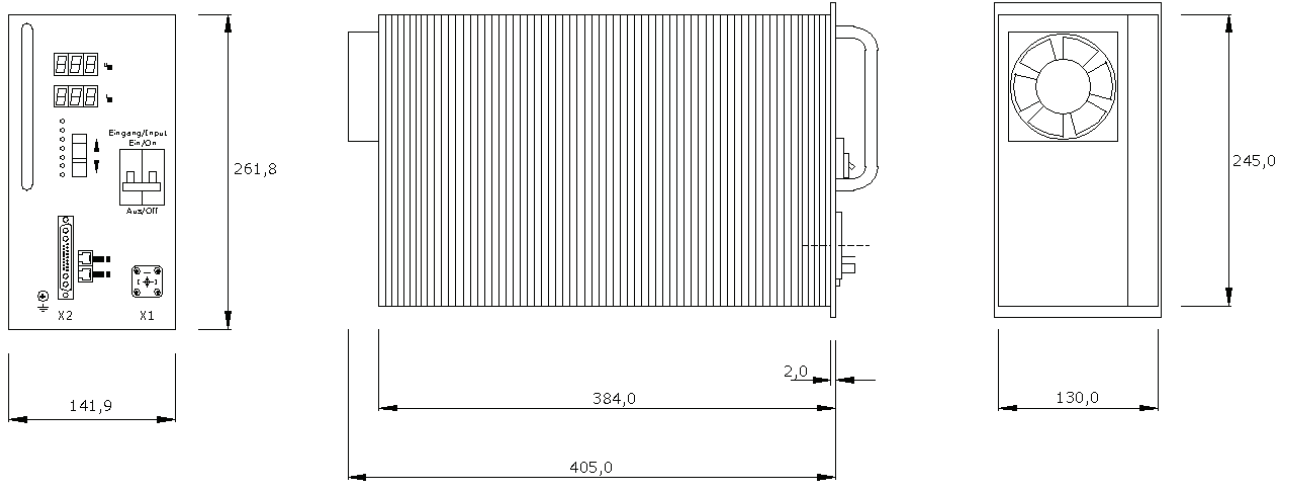
| Type | PSS30/48-50 | PSS30/60-40 | PSS30/110-22,2 | PSS30/220-11,1 |
|---|--|--|---|---|
| Input current 10,9A _{AC} | 12,9A _{AC} | 12,9A _{AC} | 12,9A _{AC} | 12,9A _{AC} |
| Output voltage V_{o1} (trickle charge) Adjusted value 27,2V _{DC} ±1% Adjustment range 23,4 to 28,8V _{DC} | 54,5V _{DC} ±1% 46,6 to 57,6V _{DC} | 68,1V _{DC} ±1% 58,5 to 72,0V _{DC} | 122,6V _{DC} ±1% 105 to 130V _{DC} | 245,2V _{DC} ±1% 211 to 260V _{DC} |
| Output voltage V_{o2} (Boost charge) Adjusted value 28,8V _{DC} ±1% Adjustment range 24 to 30V _{DC} | 57,6V _{DC} ±1% 48 to 60V _{DC} | 72,0V _{DC} ±1% 60 to 73V _{DC} | 129,6V _{DC} ±1% 108 to 135V _{DC} | 259,2V _{DC} ±1% 216 to 270V _{DC} |
| Output voltage V_{o3} (discharge test) Adjusted value 22,2V _{DC} ±1% Adjustment range 20,4 to 24V _{DC} | 44,4V _{DC} ±1% 40,8 to 48V _{DC} | 55,5V _{DC} ±1% 51 to 60V _{DC} | 99,9V _{DC} ±1% 91,8 to 108V _{DC} | 200V _{DC} ±1% 184 to 216V _{DC} |
| Output current I_o Adjusted value 80A _{DC} ±2% Adjustment range 40 to 80A _{DC} | 50A _{DC} ±2% 25 to 50A _{DC} | 40A _{DC} ±2% 20 to 40A _{DC} | 22,3A _{DC} ±2% 11 to 22,3A _{DC} | 11,1A _{DC} ±2% 5,5 to 11,1A _{DC} |
| Type of battery 12 Pb - cells | 24 Pb - cells | 30 Pb - cells | 54 Pb - cells | 108 Pb - cells |
| Efficiency 90 % | 91 % | 91 % | 91 % | 91 % |
| Voltage ripple ≤20mV _{pp} | ≤20mV _{pp} | ≤20mV _{pp} | ≤100mV _{pp} | ≤200mV _{pp} |
| Psophometric ripple according to CCITT ≤1,0mV | ≤1,8mV | ≤2,0mV | --- | --- |
| Monitoring: | | | | |
| DC under voltage V< Threshold value 20,4V _{DC} Adjustment range 19,2 to 24V _{DC} | 40,8V _{DC} 38,4 to 48V _{DC} | 51,0V _{DC} 48 to 60V _{DC} | 91,8V _{DC} 86,4 to 108V _{DC} | 184V _{DC} 173 to 216V _{DC} |
| DC over voltage V> Threshold value 30V _{DC} Adjustment range 26 to 30V _{DC} | 60V _{DC} 52 to 60V _{DC} | 75V _{DC} 66 to 75V _{DC} | 135V _{DC} 119 to 135V _{DC} | 270V _{DC} 238 to 270V _{DC} |

PSS30

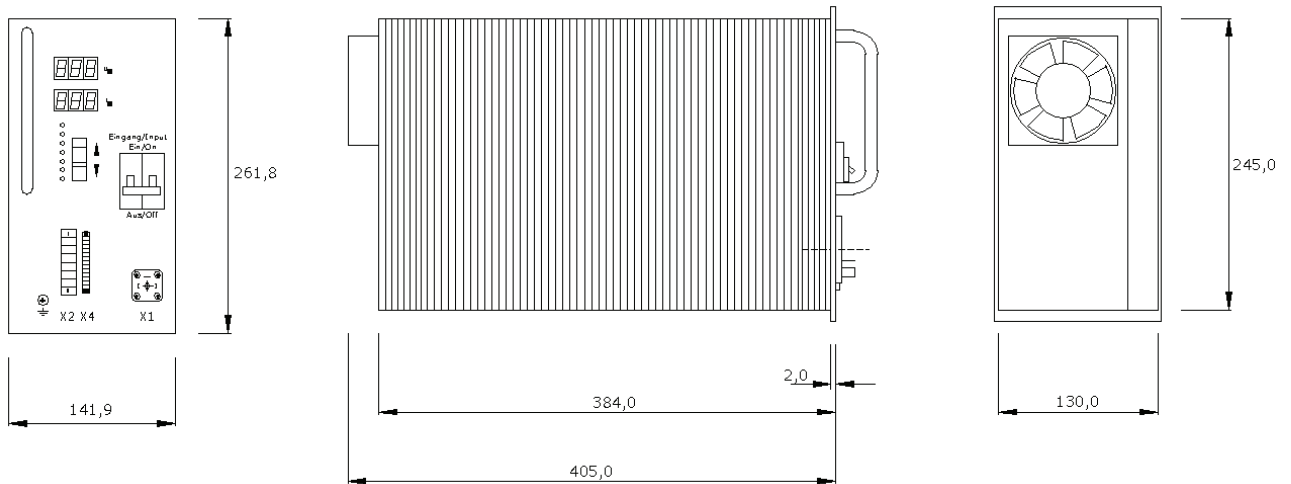
User manual

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10.3. Dimensional drawings, PSS30 (24, 48, 60 and 108V version)



10.4. Dimensional drawings, PSS30 (216V version)





Supplier:

| | |
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