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PG 600 SX

Installation and Operation Manual | **EN**
PG 600 SX Backup Power Supply

PG 600 SX

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SAFETY INFORMATION

The appliance shall be installed by a trained person. The Manual is intended for an informed person. The contents of this Manual may change over time.

THE APPLIANCE OPERATES WITH VOLTAGE DANGEROUS TO HUMAN LIFE. PLEASE STICK TO SAFETY INSTRUCTIONS GIVEN IN THIS GUIDE, PREVENTING THUS RISK OF ELECTRIC SHOCK.

IMPORTANT

Wrong wiring or handling may cause damage to the appliance itself or connected machines!

Prior to beginning with installation and start of the appliance, please read the Manual carefully and follow the instructions meticulously!

These electrical appliances shall be grounded in compliance with the valid standards. The cross-sections of the power supply cables and their current ratings shall conform to the nominal values on the label and to the specification of the appliance as required by a respective rule valid for low-voltage electric appliances. Prior to installation of this electric appliance please make sure all circuit breakers and fuses are off.

Batteries may only be handled by trained, informed and experienced persons sticking to all applicable safety measures. Before touching the battery clamps, all safety and switch-off elements at the appliance itself, batteries and their outlets shall be switched off!

Do not put any tools, instruments or other, esp. metal items on batteries!

Do not push any objects into the appliance through the ventilation or other openings!

Use a damp cloth to clean the casing. Take care not to let moisture or water into the appliance through the ventilation or other openings!

The appliance shall be installed in a sufficiently spacious and ventilated room enabling good access. It shall never be exposed to weather!

For any handling the battery and PG 600 SX, the backup power supply shall be turned off and disconnected from the mains.

The appliance is not designed to be operated with an automotive starter battery.

The backup time depends on the power drawn by the devices connected to PG 600 SX. The higher is the power consumption, the shorter is the backup time.

PLEASE RESPECT THE FOLLOWING INSTRUCTIONS

The appliance may be installed by authorized staff only!

When switching off the electric appliance fed by PG 600 SX do not forget to switch off the PG 600 SX itself as well. Otherwise the PG 600 SX's inverter continues to supply electricity from its batteries and does not switch off until the battery voltage drops below the set min. value.

Even if the appliance is turned off, the battery voltage is still present at the clamps.

No contact of the UPS outlet socket shall get connected to any lead of mains or any other electric wiring. The UPS is designed for a closed circuit. If the UPS outlet got connected with the mains, there would be a danger of destroying the connected appliances, the UPS itself, and even causing harm to health and property. The only lead that may be connected outside the TN-S network is the protective yellow-green lead.

When testing a pump backup, never unplug the PG 600 SX from el. socket. Doing so would interrupt the PE line. De-energizing shall be done by a circuit breaker or fuse.

PG 600 shall be always used with a battery connected.

Do not leave the appliance turned off for more than 6 months unless its batteries had been fully charged.

The appliance should be completely cleaned by a serviceperson at least twice a year. Cooling and heat exchange are hindered by excess dust inside and the appliance might get overheated.

Check annually that the battery terminals are properly tightened.

TAKING CARE OF YOUR BATTERIES

The appliance is equipped with maintenance-free lead acid batteries. The following rules shall be respected when using them:

Avoid any mechanical stress, especially by a hit.

Avoid any damage to the battery casing and do not attempt to open it. The acid inside is toxic, dangerous to skin and eyes! In no case shall the battery be exposed to high temperatures or flames. There is a risk of explosion!

When the battery is to be replaced and a new one installed, its number, model, wiring manner and capacity set by the manufacturer shall be maintained. Only an authorized serviceperson may do that.

In a room where the battery is placed the temperature shall be kept at $20\text{ °C} \pm 5\text{ °C}$. At temperatures above 20 °C the battery lifetime deteriorates, at temperatures below 20 °C the battery capacity deteriorates.

SAFETY INSTRUCTIONS REGARDING THE BATTERY

Never wire and charge very cold batteries (exposed to freezing temperatures).

A battery represents a serious threat to human health and the environment. It shall be disposed of in compliance with a valid legislation.

Be extremely careful when using metal items and tools near the battery.

When working with the appliance, refrain from smoking and using open flame! Do not use water to extinguish eventual fire, danger of explosion!

Gases develop in all lead acid batteries during charging. In traditional unsealed batteries these gases escape into the air. In batteries with pressure valves most of these gases recombine inside the battery and just a very small portion escapes into the air.

Always ensure good ventilation for battery cabinets or rooms (at least 1 l of air per hour). Hydrogen gas may explode and cause serious injuries and fire.

Acid lead batteries suffer from reduced capacity when used for a long time. This is quite normal. In order to be sure about its proper working, test its backup function at least once a year and verify if its backup time is sufficient.

Should the battery get very hot, start making sounds or inflating, leave the room immediately!

ACID BURN INJURY



Should the acid get in contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water, use sterile gauze bandage and special medical aids. In case of contact of acid with eyes, rinse immediately with plenty of water and call emergency and ambulance. In all emergency, life-threatening situations contact a doctor asap.

HOW TO EXTEND THE SERVICE LIFE OF YOUR BATTERY:

Never store a discharged battery. Storing a discharged battery will cause its definite destruction!

Always charge a battery prior to storing and disconnect all leads from its poles. The battery may be stored for a longer time in this manner only. At the same time, it is recommended to charge it every 3 months. Older batteries shall be checked more frequently.

Should the UPS be disconnected from the mains for a longer time, it is unconditionally necessary to disconnect also the battery from the UPS.

1. ESSENTIAL INFORMATION - USE, FEATURES, DESCRIPTION

- PG 600 line UPSis intended preferably to power supply circulation pumps in heating systems.
- The consumption of connected equipment shall not exceed the max. inverter output power.
- Use exclusively acid lead batteries purchased from Regulus intended for backup power supplies.
- The appliance is designed for indoor use. Do not expose it to adverse weather conditions (direct sunshine, rain) and increased moisture level. Protect from dust!
- The ON/OFF button on PG 600 SX does not disconnect electrically the internal circuitry. In order to de-energize the PG 600 SX, it is necessary to disconnect the power supply at the respective terminal - by pulling out the power cord and disconnecting the battery.
- Do not put anything onto PG 600 SX.
- Do not expose the appliance to high temperatures.
- Do not open the cover of PG 600 SX when any of its internal circuits are energized; this may apply even if the power supply at the input terminal is disconnected. In no case any repair on internal parts of PG 600 SX may be performed by a user.
- The front panel is designed for manual control; do not use sharp or pointed items.
- PG 600 SX is not designed for operation in explosive environment.
- PG 600 SX and the battery shall be placed in a sufficiently ventilated space. Ventilation openings shall not be covered and air intake shall not be obstructed. The min. free space around the PG 600 SX see the Fig.
- When PG 600 SX is in operation, its fan is running. Its switching is controlled (by its inner temperature).

1.1 GENERAL DESCRIPTION

When the unit is power-supplied from the grid, the electricity runs via its internal bypass directly to its outlet socket. At the same time, the battery is being charged. In case of a power failure, the inverter turns on and the load is fed from the battery.

A battery connects to PG 600 SX using cables fitted with cable lugs. Max. battery capacity for PG 600 SX is 100 Ah. During charging, the temperature of the unit may rise to circa 45°C (normal operation state).










FEATURES

- Automatic switching from grid to battery and vice versa
- High efficiency inverter
- Smart two-step battery charging with overcharge protection
- Battery overload and complete discharge protection
- Backlit LCD screen, sound signals
- Inner temperature controlled fan
- Smooth output sine wave

1.2 FRONT PANEL






There are 2 pushbuttons on the front panel. OFF and ON. Further there is a screen showing current condition of PG 600. The screen should look like the pic. (right, below).

Displej

| | |
|--|--|
| INPUT | Input |
|  | Grid power present |
|  | Input voltage from grid (approx. value) |
| OUTPUT | Output |
|  | PG 600 SX output connected to power grid |
|  | PG 600 SX output runs from battery, inverter working |
|  | Output voltage |
| BATTERY | |
|  | Battery condition in % |
|  | |
|  | PG 600 SX works within boundary values |
|  | Alarm |



PG 600 power output usage

| | | | | | |
|-----------|---|---|---|--|---|
| Displayed |  |  |  |  |  |
| Load | 0-20 % | 21-40 % | 41-60 % | 61-80 % | 81-100 % |

1.2 REAR PANEL

The rear panel involves:

1. Coiled power supply cable for PG 600 SX (INPUT)
2. two 230 V power socket (OUTPUT)
3. Fuse holder w. 10 A fuse (FUSE)
4. Battery cables (+ -)

1.3 ACOUSTIC SIGNALS

| Tone | Condition |
|------------------------------|---|
| Short, 0.5 sec. | PG 600 SX switching on. |
| Continuous, 2 sec. | Switching off by pressing OFF button, or automatic due to a discharged battery. |
| Repeating, 0.5 sec. | Alarm (overload, discharged battery). |
| Intermittent short, 0.5 sec. | The load reaches PG 600 SX overload threshold. |

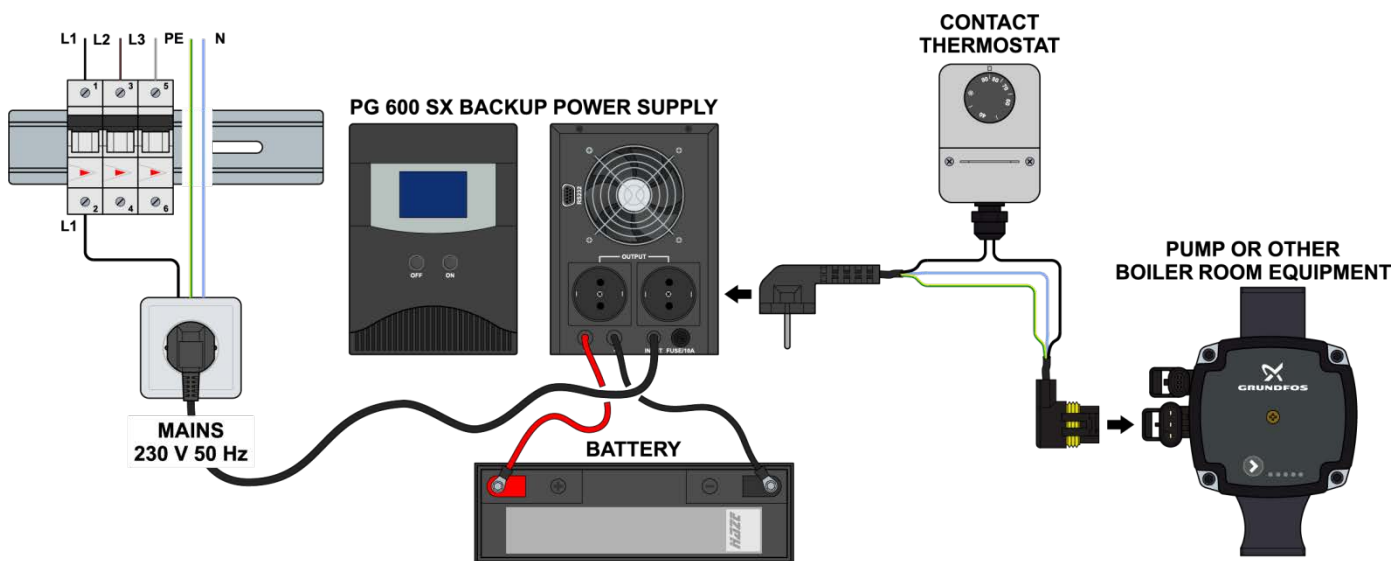


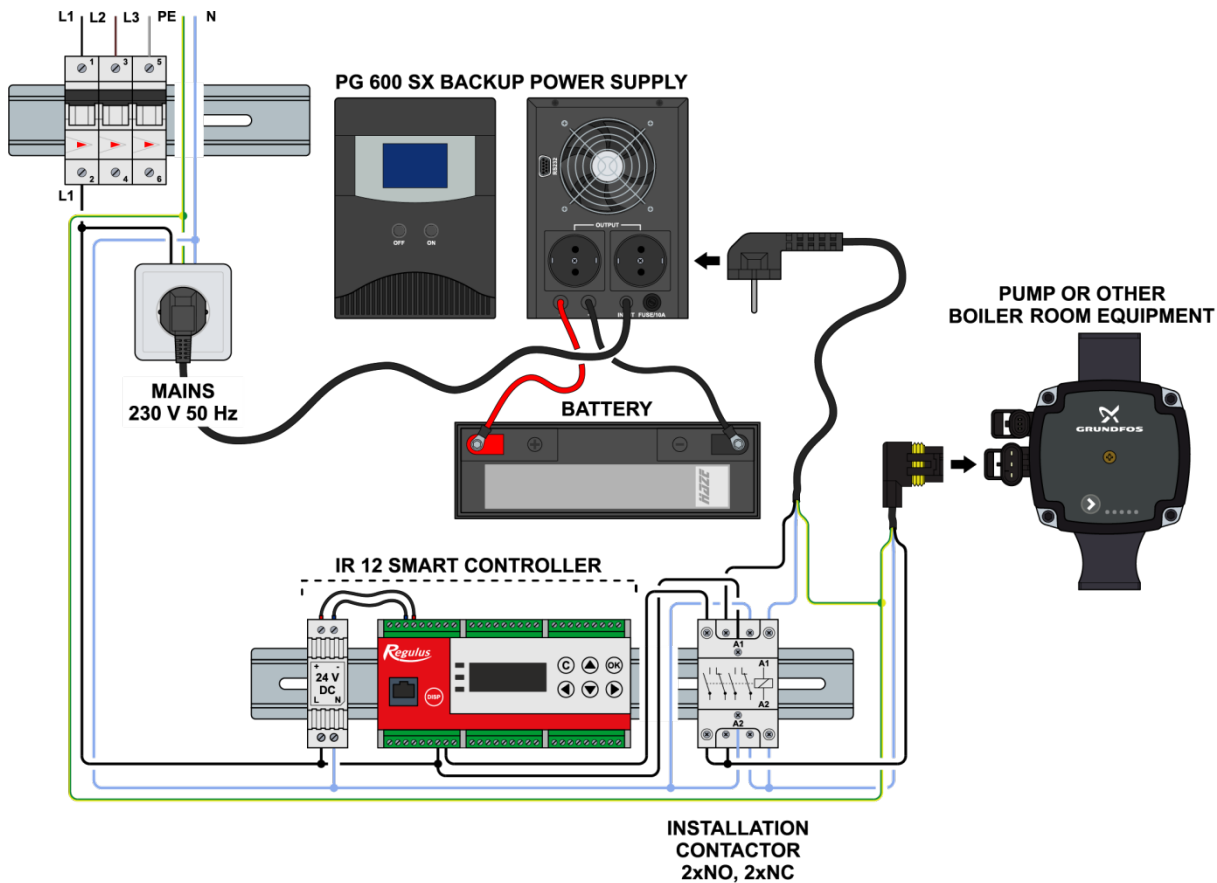
2. INSTALLATION

1. Read the entire Manual incl. safety information and how to take care of your battery.
2. Make sure the power grid voltage corresponds to the voltage PG 600 SX is designed for.
3. Connect the battery using M6 bolts (44Ah and 100Ah batteries) or M5 bolts (18Ah battery). MIND THE POLARITY, + red / - blue or black. The max. torque is shown on the batteries (usually 5-7 Nm). Fit plastic caps onto the battery terminals. Mind the right polarity!
4. Plug the power supply cord of PG 600 SX into the a wall socket. WARNING – PG 600 SX will start running and from the moment on the batteries are being charged. At the same time, the internal cooling fan also starts running.
5. Connect your pump or another load by plugging its cable into the socket of PG 600 SX. It is necessary to stick to a TN-S wiring system.
6. Press ON/OFF push button to turn PG 600 SX on. A signal will sound. The green LED will stay lit, indicating that PG 600 SX is running (standard mode, ready for backup).
7. Nyní můžete spustit čerpadlo nebo jinou zátěž a odzkoušet provoz ze sítě bez střídače. Střídač se zapne automaticky při ztrátě napětí na vstupu.

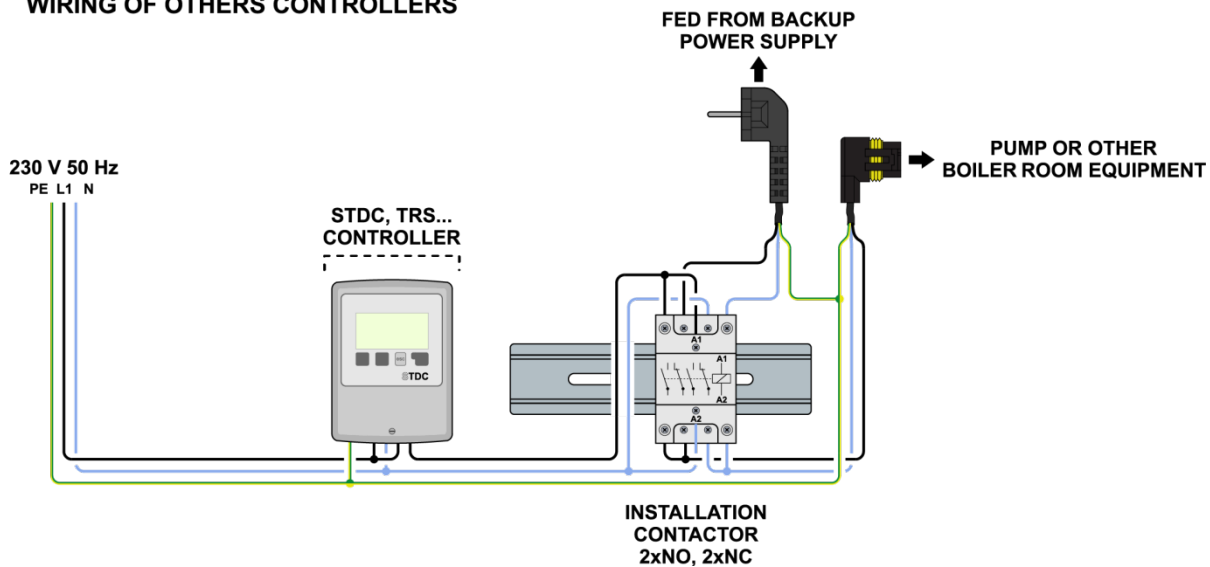
2.1 RECOMMENDED WIRING

- it is recommended to use solely an installation contactor with a 230 VAC coil, 2x NO + 2x NC.
- it must be ensured that the PE lead cannot be disconnected (e.g. by pulling out the coiled power supply cable from PG 600 SX)!
- unconditional separation of the circuit fed from PG 600 SX from the mains shall be respected





WIRING OF OTHERS CONTROLLERS



2.2 TURNING PG 600 SX ON WITH NO GRID POWER

Press the ON push button to turn PG 600 SX on. It takes the inverter about 30sec. to reach the proper voltage. The screen shows battery operation (a battery shall be connected). After the power supply from the grid is restored, mains voltage will appear on the screen and PG 600 SX will work normally, charging the battery.

2.3 TURNING PG 600 SX OFF

PG 600 SX can be turned off by pressing and holding the OFF push button for at least 3 sec. **WARNING!** The battery is not being charged any more. In case of a power failure PG 600 SX will not provide any backup but it will switch on by itself as soon as the power supply is restored. Complete turn off shall be done by disconnecting the mains.

Warning

- For safety reasons, it is strongly recommended not to modify the cables supplied.
- Make sure the power supply to PG 600 SX is safely earthed.

- A mains socket or circuit breaker shall be located close to the appliance and shall be easily accessible.
- Never disconnect the 230 V power supply to PG 600 SX when it is running - the earth protection of both PG 600 SX and the connected load would be interrupted.
- Check that when all loads are connected, the total earth leakage current does not exceed 2.7 mA (EN 62040-1-1).
- After PG 600 SX gets connected to the power grid, the battery recharging starts. At this point also the cooling fan starts. After the battery is fully charged and the inner temperature in PG 600 SX does not rise any more, the fan will not start again.
- In case of a power supply breakdown, the fan turns on, cooling the inverter if needed.
- When power supply is restored, the timer turns on and the cycle is repeated.

3. OPERATING STATES OF PG 600 SX

Power grid operation

The input voltage is shown on the screen, the battery is being recharged or is already fully charged.

Battery operation

The screen shows no power grid voltage. The symbol of battery operation is shown. PG 600 SX will provide backup until either power supply is restored or the battery completely discharged. When the threshold of 24% is reached, the battery starts making intermittent alarm sound. From the moment on, the PG 600 SX may turn off any time depending on the load level. After the power supply is restored, it takes at least 12 hours (preferably 24) to fully charge the battery.

Alarm

The alarm symbol is shown and PG 600 SX makes a sound. When overloaded, PG 600 SX will disconnect the output and make a continuous sound. Until the load is disconnected and PG 600 SX turned off and on again, it will not fulfil its backup function. The sound alarm will start when the battery level falls to 24%.

4. TROUBLESHOOTING

| Situation | Cause | Solution |
|---|---|---|
| The screen is not lit | <ul style="list-style-type: none"> • PG 600 SX is off. • No grid power, discharged battery. • Defect battery. | <ul style="list-style-type: none"> • Press and hold ON push button, switching PG 600 SX on. • Restore power supply and let the battery recharge. Eventually check the fuse. • Replace the battery. |
| The screen is lit but the connected load (pump) is not running | <ul style="list-style-type: none"> • PG 600 SX has been switched off, disconnecting the load. • Fault | <ul style="list-style-type: none"> • Check battery condition and connection • Contact service staff |
| Grid voltage is present but PG 600 SX displays zero grid voltage and works in the battery mode. | <ul style="list-style-type: none"> • PG 600 SX gets no grid power. • Electrical socket is defect | <ul style="list-style-type: none"> • Check the circuit breakers/fuses. • Check the el. Socket. |
| | <ul style="list-style-type: none"> • Faulty fuse | <ul style="list-style-type: none"> • Replace the fuse |
| PG 600 SX does not serve the expected backup time | Battery capacity may be reduced: <ul style="list-style-type: none"> • Too long storage time • Overload • Battery lifetime over • Repeated frequent power failures when the battery does not get fully charged again | <ul style="list-style-type: none"> • Let the battery charge for about 8 hours • Disconnect excess load • Replace the battery |
| Sound alarm (signal) sounds every 0.5 sec. | <ul style="list-style-type: none"> • Overload | <ul style="list-style-type: none"> • Check what is connected to PG 600 SX and disconnect excess load. |
| Sound alarm (signal) sounds continuously and then PG 600 SX turns off | <ul style="list-style-type: none"> • Discharged battery | <ul style="list-style-type: none"> • Restore power supply and let the battery recharge. |

For conditions not described in this Manual, turn off PG 600 SX, disconnect the load, pull out the power cable from the el. socket and disconnect the battery terminals. Then contact your service provider.

5. TECHNICAL SPECIFICATIONS

| Technical data | | |
|-----------------------|-----------------------------------|---|
| Backup power supply | | PG 600 SX-18, PG 600 SX-44 a PG 600 SX-100 |
| Input | nominal voltage | 230 V 50 Hz |
| | voltage range | 230 V (+25 % / 35 %) 50 Hz ± 10 % |
| Output | Max. inverter power output | 300 W |
| | Nominal voltage | 230 V |
| | Voltage range (backup mode) | 230 V (± 10 %) |
| | Frequency | 50 Hz |
| | Frequency tolerance (backup mode) | ± 0.5 Hz |
| | Waveform (backup mode) | smooth sine wave |
| Others | Dimensions (D x W x H) | 140 x 182 x 380 mm |
| | Weight | 6.3 kg without batteries |
| | Ambient working temperature | 0 - 35 °C |
| | Ambient working humidity | 0 - 90 % non-condensing |
| | Noise level | < 60 dB |

1 m long battery cables are included in the supply.