

Connections

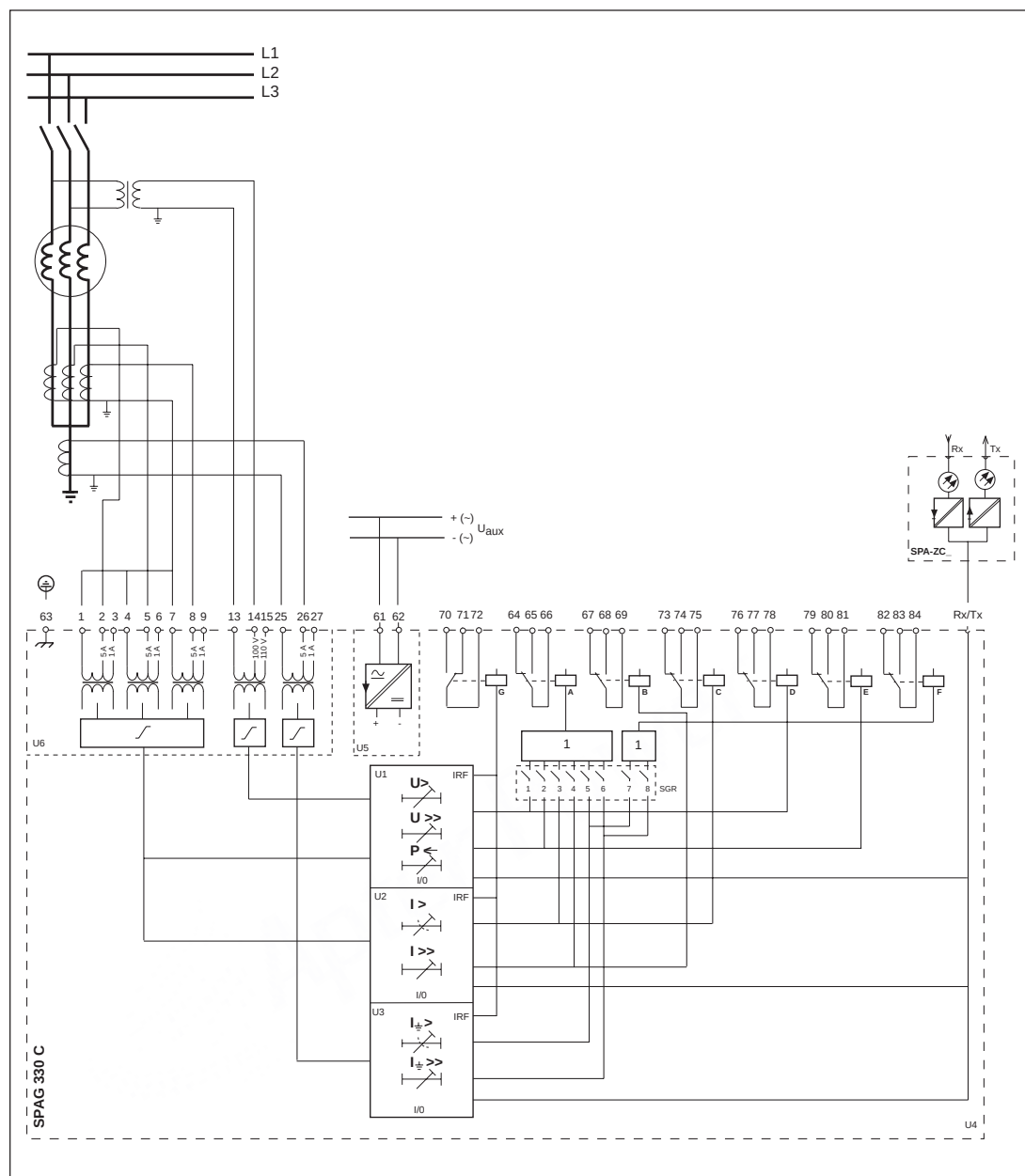


Fig. 2. Connection diagram for the generator protection SPAG 330 C.

U _{aux}	Auxiliary voltage
A, B, C, D, E, F, G	Output relays
IRF	Self-supervision
SGR	Switchgroup for tripping configuration
U1	Oversvoltage and reverse power module SPCP 3C2
U2	Three-phase overcurrent module SPCJ 3C3
U3	Non-directional earth-fault relay module SPCJ 1C8
U4	Output relay module SPTR 7B1
U5	Power supply module SPGU 240 A1 or SPGU 48 B2
U6	Input/output module SPTE 6B7
Rx/Tx	Serial port

Power supply module

To be able to operate the relay needs a secured auxiliary voltage supply. The power supply module forms the voltages required by the measuring relay modules and the auxiliary relay module. The power module is a separate plug-in module located behind the system panel together with the output relay module. The power supply module can be withdrawn after removing the system panel.

The power supply module is a transformer connected, i.e. galvanically isolated primary and secondary side, flyback-type DC/DC converter. Its

primary side is protected with a fuse F1, located on the PCB of the module. The fuse size is 1 A / 4 A (slow).

The power supply module forms the secondary voltages required by the measuring relay modules; i.e. +24 V, ± 12 V and +8 V. The output voltages ± 12 V and +24 V have been stabilized in the power supply module, while the +5 V logic voltage required by the measuring relay modules is stabilized by the built-in stabilizers of the relay modules.

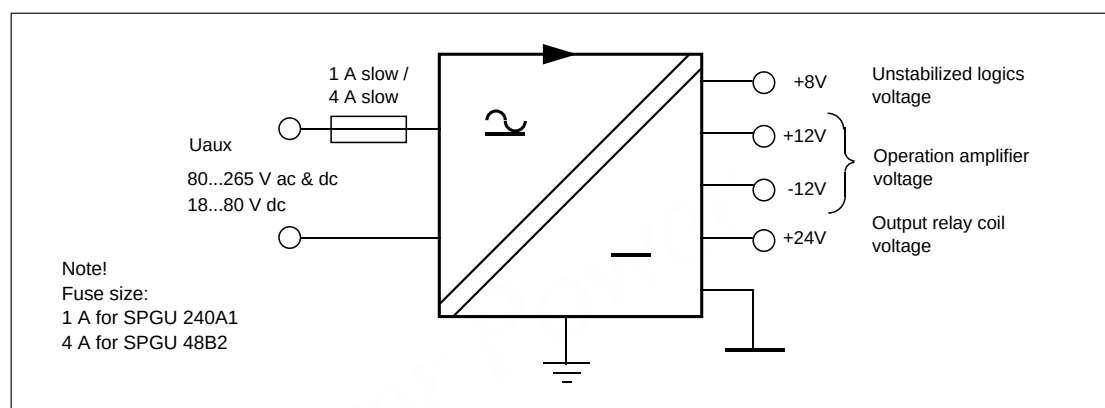


Fig. 5. Voltage levels of the power supply module.

A green LED indicator U_{aux} on the system panel is lit when the power supply module is operative. The supervision of the voltages supplying the electronics is placed in the measuring modules. If a secondary voltage deviates from its rated value by 25%, there will be a contact alarm, i.e. a self-supervision alarm. Alarm is also received when the power supply module is withdrawn from the relay case, or when the auxiliary power supply to the relay fails.

There are two versions of power supply modules available. The secondary sides are identical in both types, but the input voltage ranges differ.

Insulation test voltage between primary and secondary side and protective earth

2 kV, 50 Hz, 1 min

Rated power P_n <15 W

Voltage ranges of the power supply modules

- type SPGU 240A1 $U_{aux} = 80...265$ V dc/ac
- type SPGU 48B2 $U_{aux} = 18...80$ V dc

The SPGU 240 A1 module can be used for both ac and dc voltages. SPGU 48B2 is designed for dc voltages only. The system panel of the relay indicates the voltage range of the power supply module of the relay assembly.

Auxiliary power supply module

Type SPGU 240 A1

Type SPGU 48 B2

Burden under quiescent/operating conditions

80...265 V dc/ac

18...80 V dc

about 10 W/15 W

Maintenance and repairs

When the generator protection relay is used under the conditions specified in "Technical data", the relay requires practically no maintenance. The generator protection includes no parts or components that are sensitive to physical or electrical wear under normal operating conditions.

Should the temperature and humidity at the operating site differ from the values specified, or the atmosphere contain chemically active gases or dust, the relay should be visually inspected in association with the secondary testing of the relay. This visual inspection should focus on:

- Signs of mechanical damage to relay case and terminals
- Collection of dust inside the relay case; remove with compressed air
- Signs of corrosion on terminals, case or inside the relay

If the relay malfunctions or the operating values differ from those specified, the relay should be overhauled. Minor measures can be taken by the customer but any major repair involving the electronics has to be carried out by the manufacturer. Please contact the manufacturer or his nearest representative for further information about checking, overhaul and recalibration of the relay.

The protection relay contains circuits sensitive to electrostatic discharge. If you have to withdraw a relay module, ensure that you are at the same potential as the module, for instance, by touching the case.

Note!

Protective relays are measuring instruments and should be handled with care and protected against moisture and mechanical stress, especially during transport.

Spare parts

Overvoltage and reverse power module SPCP 3C2

Three-phase overcurrent module SPCJ 3C3

Non-directional earth-fault relay module SPCJ 1C8

Power supply module

- $U_{aux} = 80...265 \text{ V ac/dc}$

- $U_{aux} = 18...80 \text{ V dc}$

SPGU 240 A1

SPGU 48 B2

Output relay module

SPTR 7B1

Input transformer module

SPTE 6B7