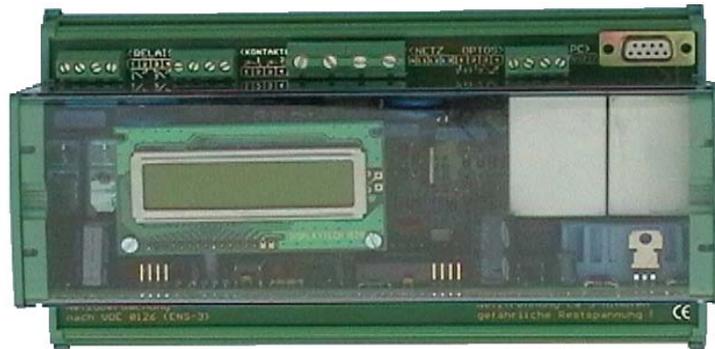


Die ENS30

A separate three-phase islanding protection device

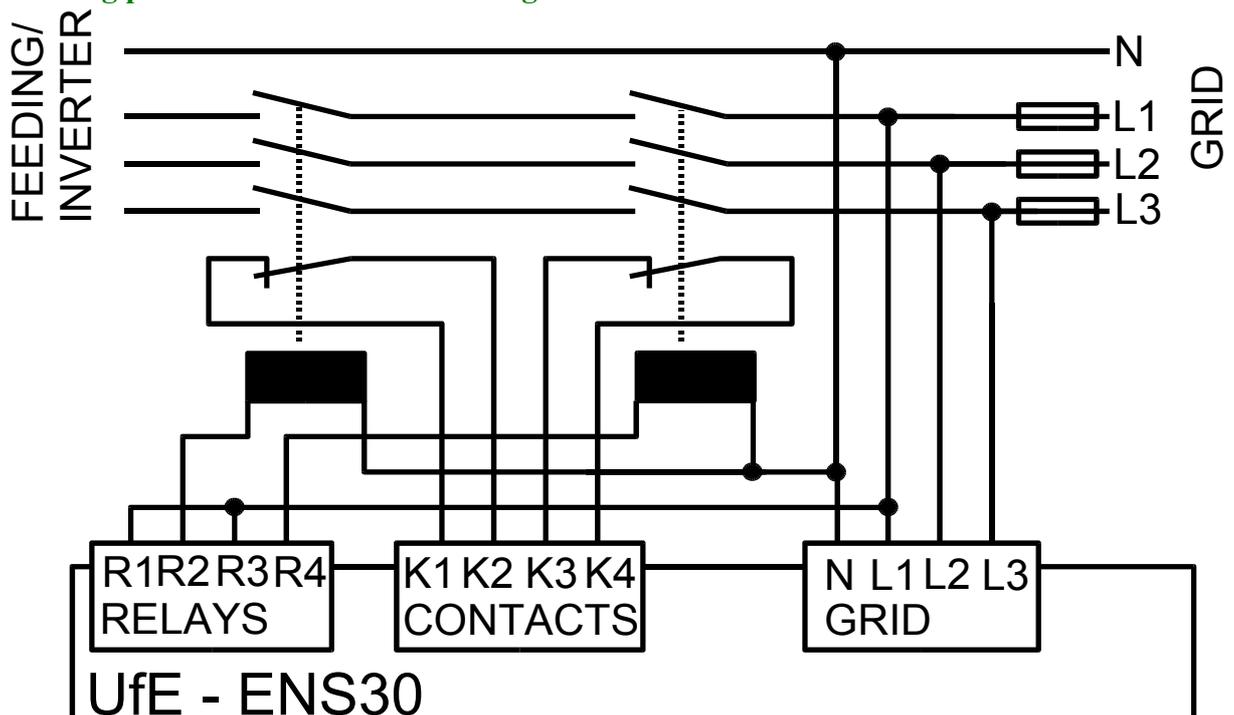


The ENS30 is an autonomous release unit according to DIN VDE0126. This way the unit replaces the always accessible release mechanism of the power supplier. The device monitors frequency, voltage and impedance of the grid. If the prescribed limit values are overranged, the device separates the grid from the inverter by two assigned contactors. What distinguishes this device is the low current consumption. The device including the measuring method is under patent law.

Advice for installation

In the tree-phase ENS the relays of the interrupt facility are not included in the device but placed externally. Therefore they are not part of the routine test and certification. The selection of the suitable relays and interconnection as prescribed and with that the function of the security concept is in the responsibility of the installer. The selection criteria and the instructions for installation have to be followed carefully. It is very significant that the self-energy generation is really only connected with the grid via the two ENS assigned contactors.

The following plan indicates the basic configuration



In the basic configuration the ENS switches on the feeding point via two contactors with forced auxiliary normally closed contacts. The contacts distance of the contactor have to be 7 mm and have to own an AC3 permission by maximum power of the generator. The ENS30 has to be fuse protected with maximum value 25 A. Anyway, the earth conductor should pass the device. It is absolutely necessary to connect the neutral conductor with the ENS30 because the device might be damaged otherwise.

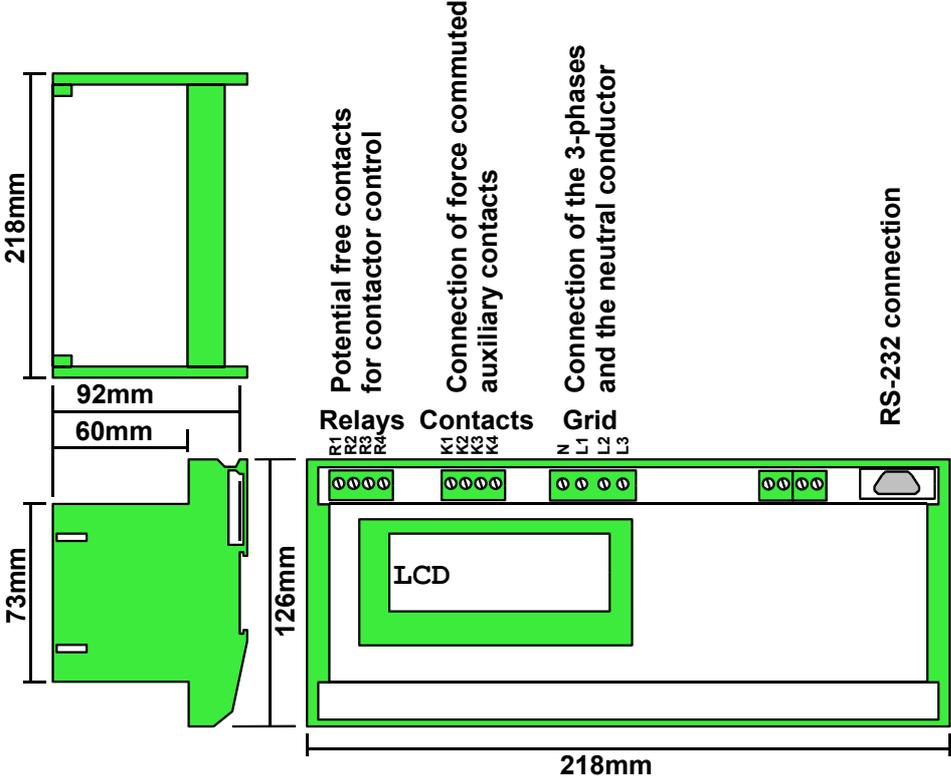
Only fuses with a value of 800 mA T at high switching capacity should be installed into the device for phase L1 to L3. An exchange is only allowed to be done by qualified personnel. Attention, the device is able to have residual voltage some minutes after switching it off!

If the ENS30 should be switched on and off by an assembly control, the “L1” contact may be switched via a relay. There will be a delay time up to 30 seconds of the contactors when switching on via “L1” contact, because the ENS30 is testing the feeding conditions newly.

Don’t pull off the device violently from the mounting bar. Use a screwdriver inserted in the supposed grooves to pull off the device by a light lever movement.

Measurements and characteristic of contacts

The ENS30 is designed for nounting bar installation. See the following plan with measurements of the box and the pin configuration.



The LCD

The ENS30 indicates its own status and decision about the grid on a 2 x 16–sign liquid-crystal display. The following table shows different examples and annotations. The first line indicates in addition to the voltage also the status of the ENS device.

LCD indication:	Annotations:
224 230 222VTST	The ENS is testing the grid after mains connection.
224 230 222V ON	No fault! The mains voltages is indicated in sequence L1, L2 und L3. The contactors assigned to the ENS are released.
v120 230 222VErr	Mains voltage on phase L1 is too low.
220 230^266VErr	Mains voltage on phase L3 is too high.

Indication of impedance:

LCD indication:	Annotation:
0,3 2,4 1,9O 02	Impedances of the tree phases in ohm. The number of released contactors after the last mains connection is shown in the right.
0,3 2,4^4,9O 02	The impedance of phase L3 is outside the measuring range.
0,3/2,4 1,9O 02	On phase L2 a positive impedance step is realized.

Frequency fault:

LCD indication:	Annotation:
50,03H 120 241°	No fault! 50,33 Hz mains frequency. Phase angle 120 and 240°.
^50,33Hv110 240°	Frequency too high. The first phase angle too low.
50,02H L2FEHLT!	No phase L2.
50,02H <-L2L3->	Phase L2 und L3 are mixed up. (false direction of rotation)

LCD indication:	Annotation:
50,03H 120 241°	No fault! 50,33 Hz mains frequency. Phase angle 120 and 240°.
^50,33Hv110 240°	Frequency too high. The first phase angle too low.
50,02H L2FEHLT!	No phase L2.
50,02H <-L2L3->	Phase L2 und L3 are mixed up. (false direction of rotation)

LCD indication:	Annotation:
HEr:Ip1?	No impedance measuring on phase 1 achieved.
HEr:Eep!	Parameters of the unit are damaged.
HEr:Cap^	Capacity seems too high.
HEr:WHu!	The second microcontroller don't shake hands.
HEr:!Temperatur!	The temperature of the ENS is inadmissibly high.
Ref^	Reference of voltage is too high.