

USER INSTRUCTIONS FOR LEAK CURRENT LOCATOR

ELMA 4000

EL.NO. 80 223 40 AND EL.NO. 80 223 41



Elma Instruments AS

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Product Description Elma 4000/C173: 1 pc. Generator 4HZ,
 el.no. 80.235.51 1 pc. Receiver el.no. 80.235.47 1 pc. small current clamp M1,
 el.no. 80.236.08 1 pc medium current pliers C173, el.no. 80.235.54 1 pc power
 cord generator 1 pc. mini screw driver 1 pc. case for the equipment
 Measuring line and crocodile clips

Product Description Elma 4000/D37N:

1 pc. Generator 4HZ,
 1 pc. Receiver,
 1 pc. small current clamp M1,
 1 pc. large current clamp D37N,
 1 pc. power cord generator,
 1 pc. mini screw driver
 1 pc. case for equipment Measuring
 line and crocodile clips

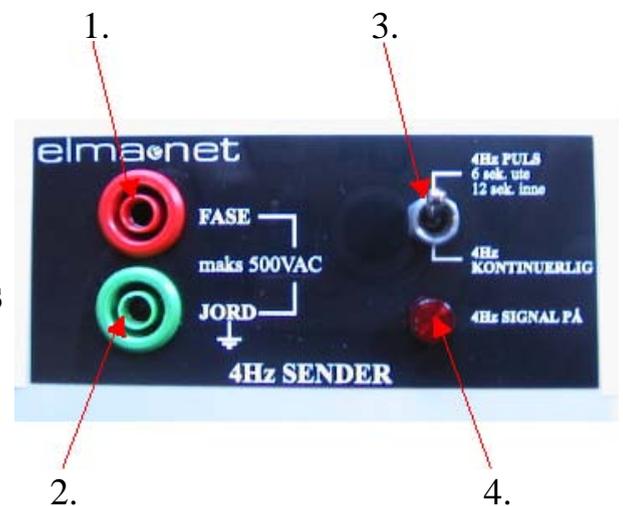
el.no. 80.235.51
 el.no. 80.235.47
 el.no. 80.236.08
 el.no. 80.235.88

Receiver: ^{6.}
 7.

1. Function selector
2. Digital display 8.
3. Entry for voltage measuring
4. Common entry (COM)
5. Entry for current clamps
6. Adjustment screw for D37N
7. Adjustment screw for C173
8. Adjustment screw for M1



1. Connection phase or + - on DC-net
2. Connection ground
3. Switch for selection of 4Hz continuous or 4Hz puls-signal.
4. Indicator-lamp 4Hz on/off
5. Net-connection



Technical specifications:

Generator:

Supply 230 VAC, +10-20%, 45-65 Hz, 4VA

Fuse 63mA quick, 5 x 20 mm.

Signal out 4Hz max. 30mA, amx. 15Vrms

Impedance Ca32kohm at 50Hz

4Hz signal Optional continuous or puls (12 sec. in – 6 sec. out)

Receiver:

Supply 9V battery 6F22

Power consumption 10mA max.

Voltage entry 2Mohm max. 500V

Fuses 2 pcs Belling-Lee L693 250mA quick

Class 1% +-1 digit

Current entry Less than 3V:impedance abt. 1Mohm Larger than 3V:

impedance min. 6kohm (2 pcs. 3kohm PTC in series)

Power-meter The display shows 0-1999, which

at 50Hz corresponds to 0-1999 in from the current clamps Conversion to mA or AAC is dependent upon the setting of the tongs.

Class 1% +- the inaccuracy of the clamps.

Calibration of the equipment at 4Hz reading before use:

Remember : Small current clamps M1 shall be set at: 10A Medium current clamps C173 shall be set at: 1000mV/A Large current clamps D37N shall be set at: 100mV/A

The receiver may be used for all those tongs, so in case one wishes, extra clamps may be bought later.

Connect the generator to the measuring lines, so that those make a loop (see fig.) The switch shall be set at “4Hz cont.

Connect change-over switch M1 to the receiver, and set the change-over switch in position “Small 1000m V/A 4Hz”.

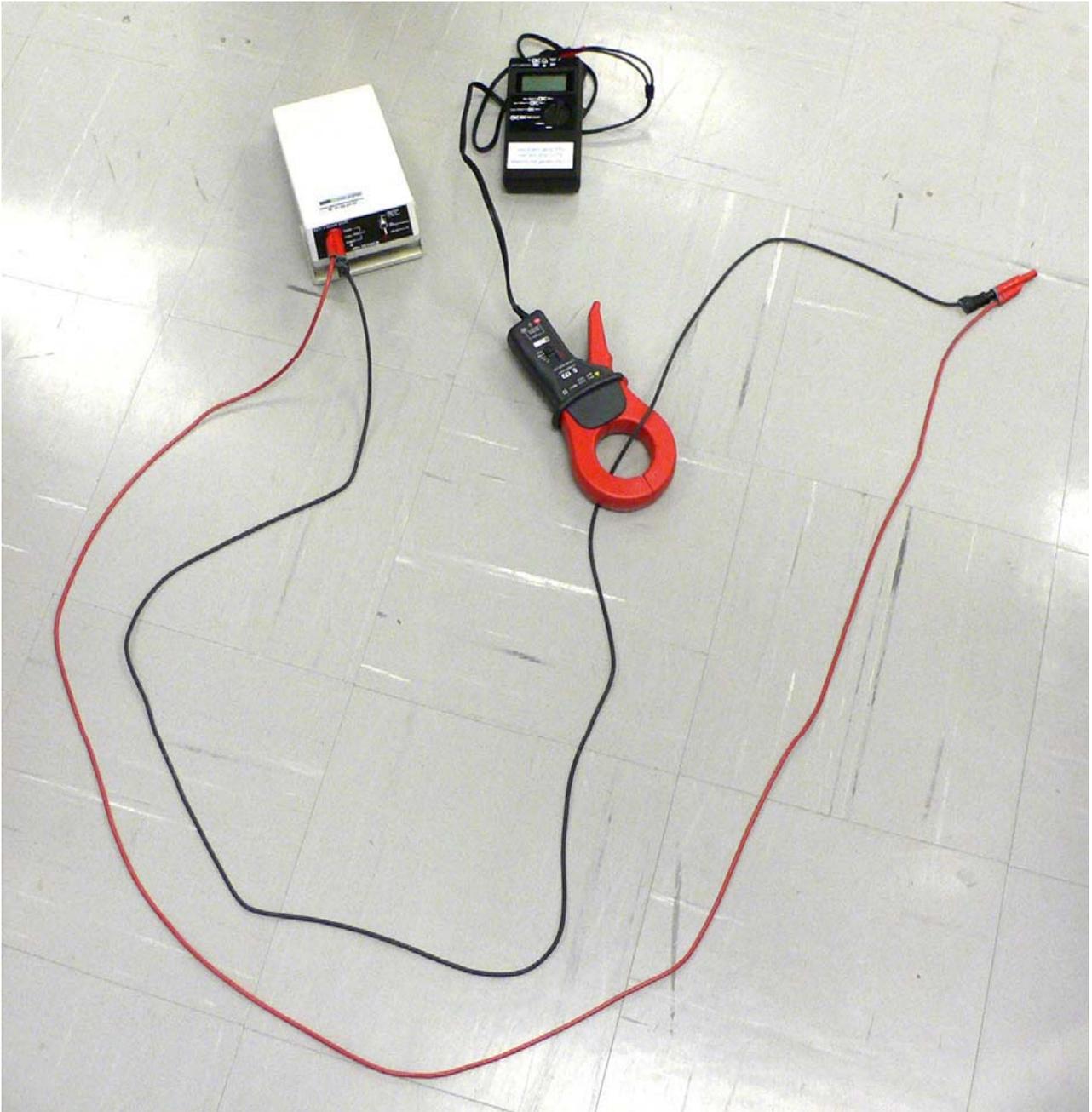
Surround the generator loop with the current clamps. Adjust the small pot meter (8) on the side of the receiver with the mini-screwdriver, till it shows about 100 on the display. This will then correspond to a 100%-signal.

Thereafter, make the same adjustment for the other clamps: For C173: Change-over switch in position “Large 1000mV/A, adjust pot. (7). For D37N: Chang-over switch in position “Large 100mV/A, adjust pot. (6).

Give the receiver time to get stabilized. This is in particular necessary when adjusting the largest tongs (D37N), because of high amplification.

The system is now ready for use. Calibration is most often not necessary for each use, but it is advisable to check after some time.

Hook-up for calibration of Elma 4000



Use of Elma 4000 in TN- and TT-net:

In TN- and TT-net, the use of 4Hz reading principles cannot be applied, because of the zero point being grounded. The system is then used as standard current leakage clamps.

- 1. Connect the tongs you wish to use to the receiver in the clamps-symbol (blue socket) and COM (black socket).**
- 2. Set the function selector in position “50Hz A/mA”**
- 3. Surround all connectors L1, L2, L3 and possibly zero-conductor with the current clamps. In case of several parallel cables, all active conductors shall be surrounded at the same time.**
- 4. Start by reading each main riser in the main distributor, as described in item 3. Make notes of the largest values.**
- 5. Thereafter, go to the sub-distribution, which has the biggest ground-fault. Prioritize the highest value and make the same readings as in item 4. If the ground-fault current has increased from out-going main riser in the main distribution to in-going riser in the sub-distribution, you may be sure, that this one has a ground-fault. The increase is due to the fact, that the capacitive return-currents are increasing.**
- 6. Fluctuations under 100mA may be caused by capacitive current leakage in the installation, if this has been much stretched out (many long cables, large heating cables, much PC-equipment). Follow the highest value until the faulty spot has been located.**

Use of Elma 4000 in IT-nets.

In IT-nets the generator and the 4Hz-method be used. The generator shall be placed as close to the inlet as possible, and connected to auxiliary voltage via the net-cable, which is included.

- 1. Connect one power line from green contact on the generator to ground in the installation, and thereafter the power line from red contact (FASE) to random phase in the construction.**
- 2. When the generator is connected, the lamp will light up as an indication , that the 4Hz-signal is on. By means of the selector on the generator, one may choose between continuous or puls-signal. Often it may be smart to choose puls-signal, because one may then observe, that the signal comes and goes. (Good to know, when there is a lot of other noise on the net). The system is now ready for use.**
- 3. Connect the suitable clamps to the receiver and set the selector at the area applicable for this. (Remember calibration of clamps and placing of the area selector on the clamps, as mentioned earlier.**
- 4. By surrounding the conductor, which runs out from the generator, marked FASE, the total ground-leak of the trafocircuit is being measured. This may be a large ground-leak or distributed over several “small faults” in the construction.**
- 5. Measure, as by using a leakage-power tongs, each out -going circuit in the main distribution, by surrounding all conductors L1, L2 and L3, except for ground or screen. In case of parallel conductors, all active conductors must be surrounded simultaneously.**
- 6. Follow the circuit, which has the highest value and measure all out-going main risers in the belonging sub-distributions.**

7. Carry out this procedure until all ground-leaks in your own construction has been repaired. Surround the circuit, which runs from the generator, as described in item 1 (FASE), in order to check as to whether there still is a ground-leaks in the taro-circuit. Should there still be fluctuations, but you are sure, that there is no longer ground-leaks in your own installation, this may be caused by ground-faults outside of your own installation, in the same trafo-circuit.

Use of Elma 4000 as leakage power-tongs.

In IT-nets this being done in the same manner as in TN- and TT-nets.

Use of Elma 4000 in direct current nets.

Elma 4000 also works in DC-nets, and is then being used in the same way as in IT-nets. Just remember, that you here must connect the generator between ground and the circuit (plus or minus), which has the ground-fault. You may well use another instrument in order to determine this.

Voltage measuring 0 – 500VAC max.

1. Place black measuring line in COM and red measuring line in Volt (Voltage) inlet of the receiver.
2. Set the function selector in ~Volt (Voltage).
3. Connect the measuring lines to the circuit, which is to be measured, and read the value.

Change of battery.

The receiver contains a 9V battery, of type 6F22.

This is placed at the bottom at the rear of the instrument, behind a cover.

Remember, that the receiver shall be turned off and must not be connected to net, when the battery is being changed.

