

USER INSTRUCTIONS FOR LEAK CURRENT LOCATOR

ELMA 4000

EL.NO. 80 223 40



EL.NO. 80 223 41



EL.NO. 80 223 37



Product description Elma 4000/C173:

1 pc. Generator 4HZ	el.no. 80 235 51
1 pc. Receiver	el.no. 80 235 47
1 pc. Medium current clamp C173	el.no. 80 235 54
1 pc. Power cord generator	
1 pc. Mini screw driver	
1 pc. Case for the equipment	
Measuring cable and crocodile clips	

Product description Elma 4000/D37N:

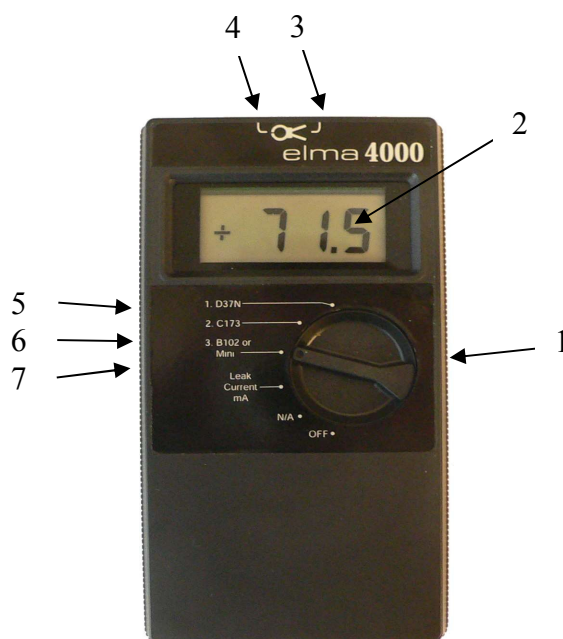
1 pc. Generator 4HZ	el.no. 80 235 51
1 pc. Receiver	el.no. 80 235 47
1 pc. Big current clamp D37N	el.no. 80 235 88
1 pc. Power cord generator	
1 pc. Mini screw driver	
1 pc. Case for the equipment	
Measuring cable and crocodile clips	

Product description Elma 4000/B102:

1 pc. Generator 4HZ	el.no. 80 235 51
1 pc. Receiver	el.no. 80 235 47
1 pc. Big current clamp B102	el.no. 80 235 10
1 pc. Power cord generator	
1 pc. Mini screw driver	
1 pc. Case for the equipment	
Measuring cable and crocodile clips	

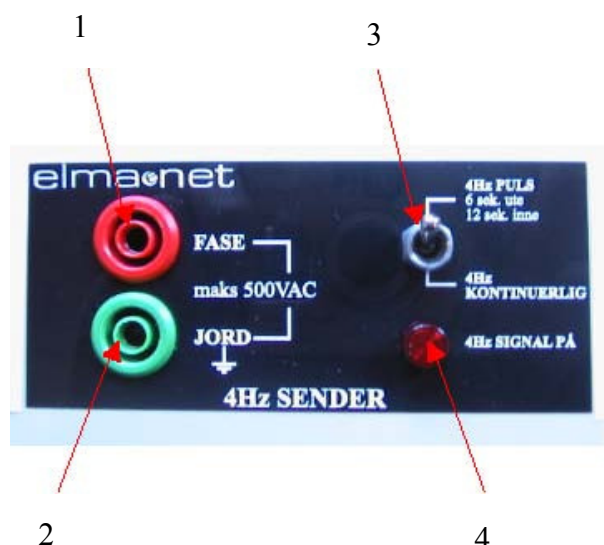
Receiver:

1. Function selector
2. Digital display
3. Common entry (COM)
4. Entry for current clamps
5. Adjustment screw for D37N
6. Adjustment screw for C173
7. Adjustment screw for B102/M1



Generator:

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



Technical specifications:

Generator:

Supply	230 VAC, +10 -20%, 45-65 Hz, 4VA
Fuse	63mA quick, 5 x 20 mm
Signal out	4Hz max. 30mA, max. 15Vrms
Impedance	Ca. 32kohm at 50Hz
4Hz signal	Optional continuous or puls (12 sec. in – 6 sec. out)

Receiver:

Supply	9V battery 6F22
Power consumption	10mA max.
Fuses	2 pcs Belling-Lee L693 250mA quick
Class	1% +-1 digit
Current entry	Less than 3V: impedance ca. 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 0-1999mV from the current clamps. Conversion to mA or AAC is dependent upon the setting of the clamp.
Class	1% +- the inaccuracy of the clamps

Calibration of the equipment at 4Hz reading before use:

Remember:

Small current clamp Mini 05 shall be set to: 10A

Medium current clamp C173 shall be set to: 1000mV/A

Large current clamp D37N shall be set to: 100mV/A

Large current clamp B102 shall be set to: 1000mV/A

The receiver may be used with all those clamps, extra clamps can be added 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 the current clamp C173 to the receiver, and set the Selector switch to the C173 position.

Surround the generator loop with the current clamps. Adjust the small pot meter (6) on the side of the receiver with the mini-screwdriver, until it shows about 100 on the display. This will then correspond to a 100% signal.

If you have other clamps, make the same adjustment:

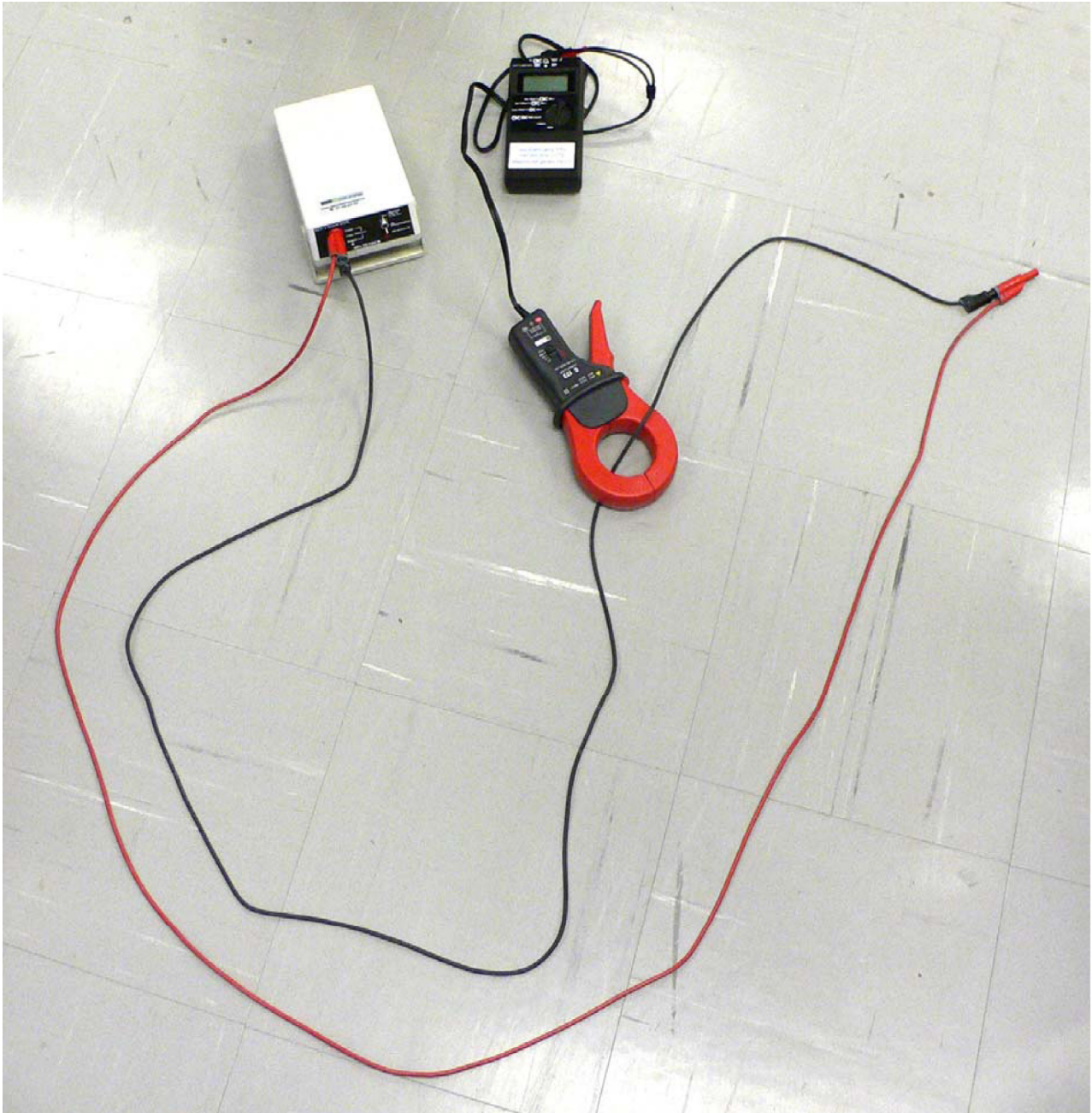
For D37N: Selector switch to D37N position, adjust pot. (5)

For B102: Selector switch to B102 position, adjust pot. (7)

Give the receiver time to stabilize. This is in particular necessary when adjusting the large clamp (D37N), because of high amplification.

The system is now ready for use. Calibration is usually not necessary each time, 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 measuring principle cannot be applied because of the zero point being grounded. The system may then be used as a standard current leakage device.

- 1. Connect the clamp you wish to use to the receiver in the clamp-symbol (blue socket) and COM (black socket).**
- 2. Set the function selector in position “Leak current/mA”**
- 3. Surround all connectors L1, L2, L3 and possibly zero-conductor with the current clamp. 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 on point 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 on point 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 can 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-net:

In IT-net, the generator and the 4Hz-method can 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 cable from the green contact on the generator to the ground in the installation, and thereafter the other cable from the red contact (FASE) to a 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 clamp to the receiver and set the selector to the area applicable for this. (Remember calibration of clamp and placing of the range selector on the clamp, as mentioned earlier.**
- 4. By surrounding the conductor, which runs out from the generator marked FASE, the total ground-leak of the transformer circuit 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 clamp, each outgoing circuit in the main distribution, by surrounding all conductors L1, L2 and L3, except for ground or screen. In case of parallel conductors, all the active conductors must be surrounded simultaneously.**
- 6. Follow the circuit, which has the highest value and measure all outgoing main risers in the belonging sub-distributions.**
- 7. Carry out this procedure until all ground-leaks in your own construction have been repaired. Surround the circuit, which runs from the generator as described on point 1 (FASE), in order to check as to whether there still is a ground-leak in the circuit. Should there still be fluctuations, but you are sure that there are no longer ground-leaks in your own installation, it may be caused by ground-faults outside of your own installation, in the same transformer circuit.**

Notice:

The use of Elma 4000 as leakage current clamp in IT-net is done in the same manner as in TN- and TT-nets.

Use of Elma 4000 in direct current net:

Elma 4000 also works in DC-net, and is then being used in the same way as in IT-net. 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.

Change of battery:

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

It is placed at the bottom in the back of the instrument, behind a cover. Remember that the receiver must be turned off and must not be connected to net, when the battery is being changed.

Chose following range

Clamp D37N
Selector: 100mV/A
El.no. 80 236 38



Clamp C173
Selector: 1000mV/A
El.no. 80 235 34



Clamp B102
Selector: 1000mV/A
El.no. 80 235 10



Clamp Mini 05
Selector: 1000mV/A
El.no. 80 236 08

