Welcome to the Share section

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In this piece Elektor Netherlands editor Thijs Beckers wondered why the "polarity" of the AC line connection to a hot water boiler should be important. This generated lots of feedback for which we are grateful! Below is a selection.

Readers should be aware that 230 VAC line outlets in Holland are earthed in wet rooms, or non-earthed in dry rooms. Neither type is polarized, i.e. the connection of the Live (L) and Neutral (N) pins in the outlet is not regulated. The Protective Earth (PE) pins are connected to a local earthing pin and to central earth at the power station and/or the substation.

FEEDBACK. The Live and Neutral connections are important when a single-pole switch is used to switch equipment on and off. One example I have noticed, with fluorescent tubes. The ballast is a sort of auto-transformer wired in series with the filaments at either end of the tube. When the on/off switch is in the Neutral wire the filament is at AC mains potential even when switched off and this voltage is sometimes sufficient to cause a low-level glow discharge in the gas around the filament to the earthed fitting. With the switch in the Live wire, the filament will be at AC neutral potential which is much closer to earth and no discharge or glow is visible.

Lothar Freißmann, Germany

FEEDBACK. The problem is probably caused by electrolysis. There is always some DC component on the (AC) power line and this causes deposits to form on electrodes which can be remedied to a certain extent by grounding the device. Reversing the plug reverses this effect; but deposits will then be formed on the other electrode in the heater. I have a similar problem here in Canada, namely a buildup of lime scale in my instantaneous water heater. Running a solution of vinegar through the pipe work for a couple of hours is effective in removing the lime scale. To make the

descaling process easier I have added a bypass and pump to the pipe work so that I can flush through with vinegar for as long as necessary.

Clinton Millet, Canada

FEEDBACK. Looking through the handbook for my old gas hot water boiler 'Calenta' made by the company Remeha 'mains phase reversal detection' is an option that can be enabled in the setup menu (parameter #43). In some countries the mains plug design allows it to be inserted in one of two ways only so that the Live and Neutral connection become swapped when the plug is inserted 'upside down'. Well naturally I had to try this menu option out. The default factory setting is with this phase detection disabled. With this option enabled I swapped the Live and Neutral wires and sure enough, on switch on it produced the error code SU9 'mains plug incorrectly wired'. In the boiler combustion chamber the igniter electrode produces a spark to start the gas burning and after ignition it is fed with a high voltage producing ionizing current which is measured to check the combustion conditions are within safe limits. The handbook states that this ionization current should be less than 3 µA. Replacement electrodes are included in many of the standard service kits for the boiler. The high voltage is produced by a step-up switching regulator which could possibly generate faults if the Live and Neutral wires are swapped. Measuring such low levels of current with a worn and dirty electrode will also eventually lead to unreliable operation.

Peter van de Meerendonk, The Netherlands