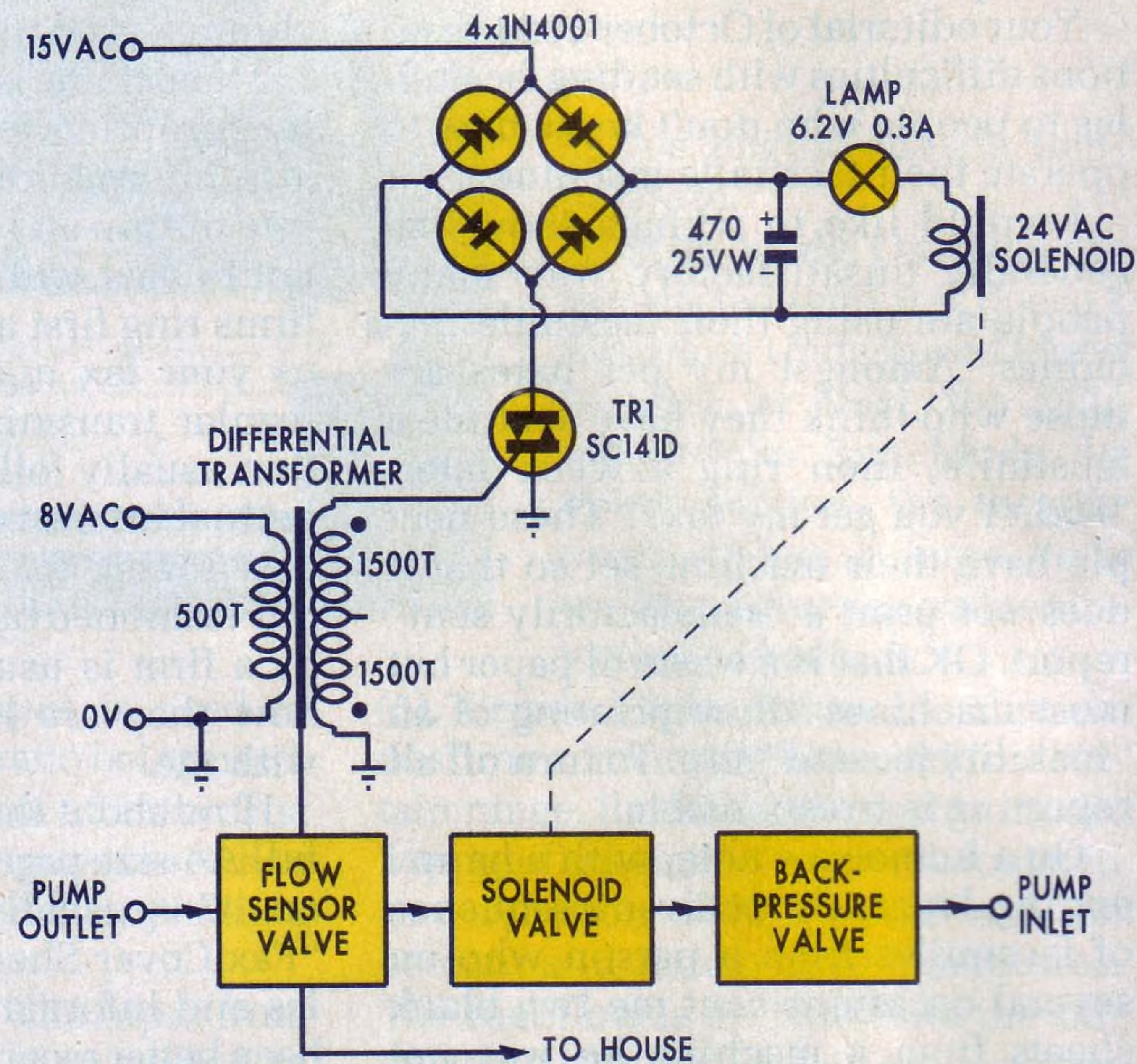


# Pump control system uses LDT

Most country households get their water supply from tanks via an automatic pump. This cycles on and off if the demand is less than the supply capacity of the pump. The resulting pressure variations can be mildly annoying when under the shower and extended periods of cycling leads to premature pump failure. This control system overcomes both problems by returning the surplus output of the pump to its inlet whenever the flow sensor detects a demand on the system.

The flow sensor uses a linear differential transformer to detect flow. This device has a central primary winding to magnetise a core and two identical secondary windings, one each side of the primary, connected in series but in opposite phase. With the core positioned equally in both secondary windings there is no output. Displacement of the core by the flow sensor valve produces a nett output from the secondaries and when this reaches 2 volts the Triac will fire on each half cycle. The Triac turns on a solenoid valve which then returns unwanted flow from the pump back to its inlet.

The solenoid valve used is the 24VAC type commonly found in garden irrigation systems and this is rated for both inrush (at switch on) and steady currents. As the interrupted current from the Triac makes the solenoid just rattle, it is rectified and smoothed by the 470 $\mu$ F 25VW capacitor. To provide the required inrush current,



a non-linear resistor in the form of a lamp is used. This has a cold resistance of 3 $\Omega$  and hot resistance of 20 $\Omega$ .

For construction details of the flow sensor and back pressure valves, send a stamped self-addressed envelope to the designer.

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