

Pump Load Current Sense

This application depicts a water pump control system with manual and automatic control features. The design provides user ON/OFF control via successive switch presses. Alternatively, the system senses current load and can automatically reset to the OFF state after reaching a set time delay.

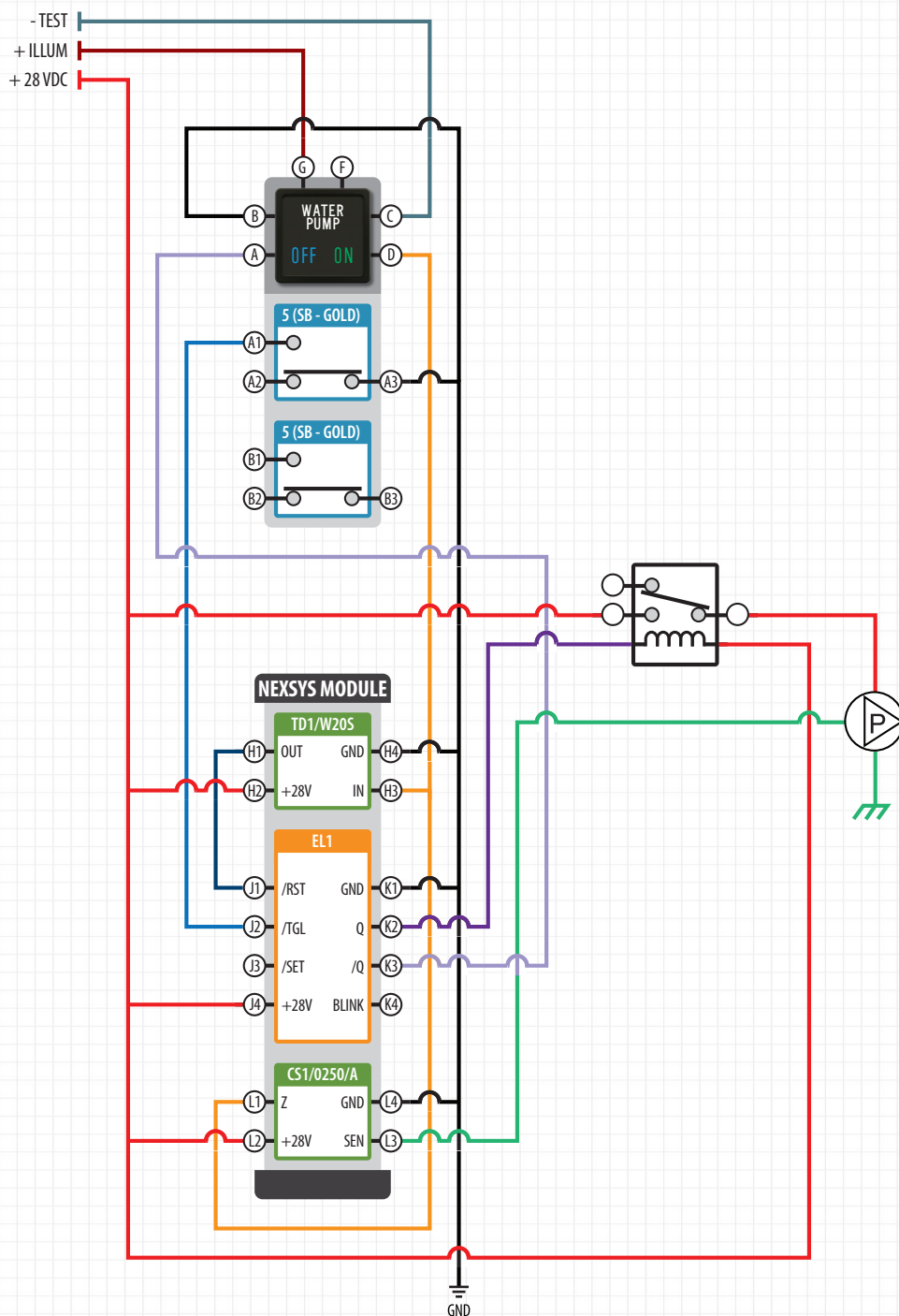
The design uses one switch with a VIVISUN High Capacity Body which houses two momentary switch poles, and a standalone NEXSYS Module which houses NEXSYS Current Sensor (CS1), Electronic Latch (EL1), and Time Delay (TD1) components. The EL1 controls the automatic and manual ON/OFF states. The CS1 senses when the water pump is actively operating, and the TD1 senses how long the water pump has been operating. The CS1 and TD1 work together to control the automatic reset feature of the circuit.

The WATER PUMP (B) indicator is always illuminated. In the default OFF state, the EL1 has outputs Q (K2) and BLINK (K4) high-z (open) and output Q low (ground). The low (ground) from output /Q illuminates the OFF (A) indicator. When the momentary switch is pressed, the normally open contact (A1) passes through a low (ground) to the /TGL input (J2) of the EL1. This causes output /Q (K2) to go high-z (open) and outputs Q (K2) and BLINK (K4) to go low (ground). The OFF (A) indicator is no longer illuminated and the low (ground) from Q (K2) energizes the mechanical relay passing power to the water pump.

When the water pump begins operating, the current draw rises above 250 milliamps (mA). The CS1 senses this current draw on the SEN input (L3) which causes output Z (L1) go low (ground) and illuminates the ON (D) indicator. The TD1 senses this low (ground) on input IN (H3) which begins the 20 second timer.

At this point, if the user presses the momentary switch again, the EL1 will be toggled again turning the water pump off. If the user does not manually turn off the water pump, the TD1 will output a low (ground) from output OUT (H1) after the 20 second delay has been reached. This low (ground) will be passed to input /RST (J1) of the EL1 causing output Q (K2) to go high-z (open) which will turn the water pump off and return the system to the OFF state.

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