Sensors   **Switches**   **Controls**

Application notes

Application Note : July 2018	
Market involved : HVAC in semiconductor industry	
Product : NRG series	
Customer : OEMs, solution providers	
Subject : Predictive maintenance of heaters used in pipe heat tracing	

CUSTOMER ISSUE :

Gases and chemicals in semiconductor manufacturing are typically transported in heat tracing pipes. Trace heating involves an electrical heating element that runs along the length of a pipe.

This heating element protects the pipes from freezing and ensures constant process temperatures for the transportation of substances that may otherwise change state depending on the ambient temperature.

The failure of such elements can be critical to production processes. Undesired stoppages in semiconductor manufacturing can have costly consequences.

A means to predict a possible heater failure will result in great cost savings.

OUR SOLUTION :

The NRG is a sub-system consisting of a number of solid state relays (SSRs) - RG..N, and a controller – NRGC, which interfaces with the main controller (PLC) through the Modbus RTU to provide real-time data.

On top of the switching function, the communication interface on the RG..Ns allows read-out of parameters such as voltage, current, frequency, energy consumption and running hours for each SSR.

The current and running hours parameters are used to have an indication of the behaviour and hence lifetime of the specific heater. Hence a predictive maintenance schedule can be set up accordingly.

In addition to this, each SSR is equipped with diagnostics and the type of failure exhibited can be easily identified for fast troubleshooting.

BENEFITS :

- Reduction of downtime by the implementation of a predictive maintenance schedule

  The expected lifetime of the heater can be compared to the recorded SSR running hours data that represents the running hours of the heater. An alert can be issued prior to the heater failing in operation.

- On-board diagnostics for fast troubleshooting

  Each RG..N is equipped with an alarm status register that identifies the type of fault exhibited. This is also physically visible on the RG..N front face.