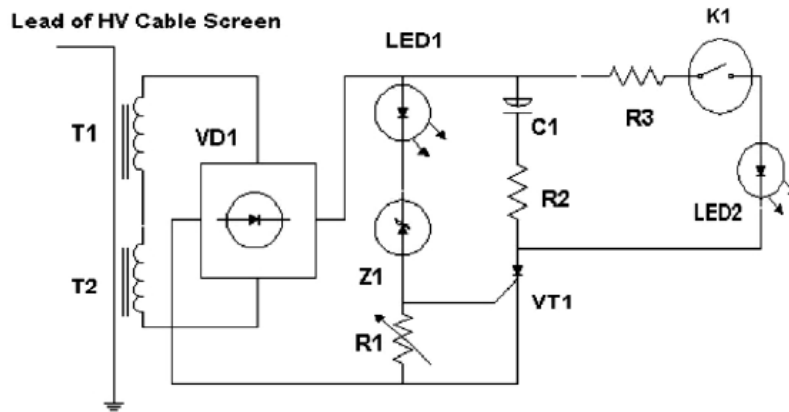


A Single-Phase Short Circuit Indicator for Internal HV Cables in Medium Voltage Substation

The breakdown of cable insulation to its external shield causes capacitive currents which can be in the level of a fraction of an ampere to several amperes that would flow through the grounding bus flexible copper wire connected to the shield. In a small substation cable lengths can be from tens to hundreds of meters. The operation of a damaged cable for prolonged periods of time is dangerous for different reasons, one of which is the known occurrences of fire outbreaks in the

cable channel due to severe heating at the junction points of the grounding wire. Even when the relay protection has caused the disconnection of a line, it is still necessary to search for the damaged section of the cable.

The author developed a simple electronic fault passage indicator (FPI) that reacts to such damage. A feature of the indicator is the absence of an external power supply on the one hand, and a low power input signal on the other. These features complicate the design of the indicator's circuit.



T1, T2 - Miniature Current Transformers on Ferrite Ring Core
 VD1 - Rectifier Bridge
 Z1 - Zener Diode
 VT1 - SCR
 LED1, LED2 - Light Emission Diodes
 K1 - Miniature Reed Switch

