Physical security of transformers is increasingly important in the face of planned sabotage threats. Utilities have reported 300 intentional physical attacks on power infrastructure that resulted in power disturbances between 2011 and 2014. The CoreStrike ballistic sensor provides impact detection and assessment algorithms that can help mitigate the consequences of such incidents.

**Always on guard**
CoreStrike™ continuously monitors the transformer tank for mechanical impacts that could indicate an attack is in progress. Real time response to such attacks provides crucial time for operators to take mitigating actions and potentially save the active parts of the transformer from severe damage.

**Fast response to attacks**
When CoreStrike™ raises the alarm a contingency plan can be executed; typically:
- turn off the cooling system if coupled with CoreStrike,
- activate redundant cooling system if available,
- shut down the transformer to avoid further damage,
- maintain operations by rerouting power,
- alert the authorities to stop the attack,
- send maintenance crew to perform an assessment.

**Easy installation**
CoreStrike™ is easy to install on any transformer. It just requires four small sensors to be glued or welded to the walls. These sensors are connected to an analytics unit integrated in the transformer control cabinet or supplied with a dedicated enclosure.

**Reliable design**
CoreStrike™ features an entirely solid state design with an IP67 rated enclosure to ensure that bad weather, flooding and small earthquakes do not interrupt monitoring.

**Impact assessment algorithms**
CoreStrike™ intelligently classifies each impact in order to only raise the alarm in case of real ballistic incidents. For example normal vibrations coming from transformer operation, the cooling system or maintenance activities (like hitting the transformer with a hammer) will not trigger the alarm.

**Part of ABB Resilient transformer**
The North American Electric Reliability Corporation’s (NERC) recently-issued CIP-014-1 (Critical Infrastructure Protection) which requires transmission owners to assess the vulnerability of critical substations and development and implement security plans. ABB has developed a transformer resiliency program based on five strategic elements:
- **Assessment** – Risk is assessed for extreme weather events, intentional criminal attacks, geomagnetic disturbances (GMD) and electromagnetic pulses (EMP).
- **Hardening** – Design modifications can be made to “harden” the substation and its transformers against malevolent attack and extreme environmental elements.
- **Monitoring** – Constant monitoring using CoreStrike™ and other sensors for critical parameters and conditions.
- **Rapid Repair** – ABB can deploy rapid repair teams to quickly repair light damage to substations.
- **Rapid Replacement** – ABB can replace severely damaged transformers by supplying proven rapid replacement transformers.
### Specifications

#### Electrical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage input</td>
<td>100 to 240 VAC (50 to 60 Hz)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>70 W</td>
</tr>
</tbody>
</table>

#### Communications specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Interfaces</td>
<td>RJ45 100 base-T Ethernet ports</td>
</tr>
<tr>
<td>Protocols</td>
<td>Modbus IP over Ethernet</td>
</tr>
<tr>
<td>Analog Interfaces</td>
<td>4 dry-contact relays for alarms</td>
</tr>
</tbody>
</table>

#### Environmental specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating ambient temperature and humidity</td>
<td>–40 °C to 60 °C (–40 °F to 140 °F) with 5 to 95 % RH, non-condensing</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>–610 to 3,000 meters (-2000 to 9840 feet)</td>
</tr>
</tbody>
</table>

For more information and local contacts please visit [www.abb.com/transformerservice](http://www.abb.com/transformerservice)

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