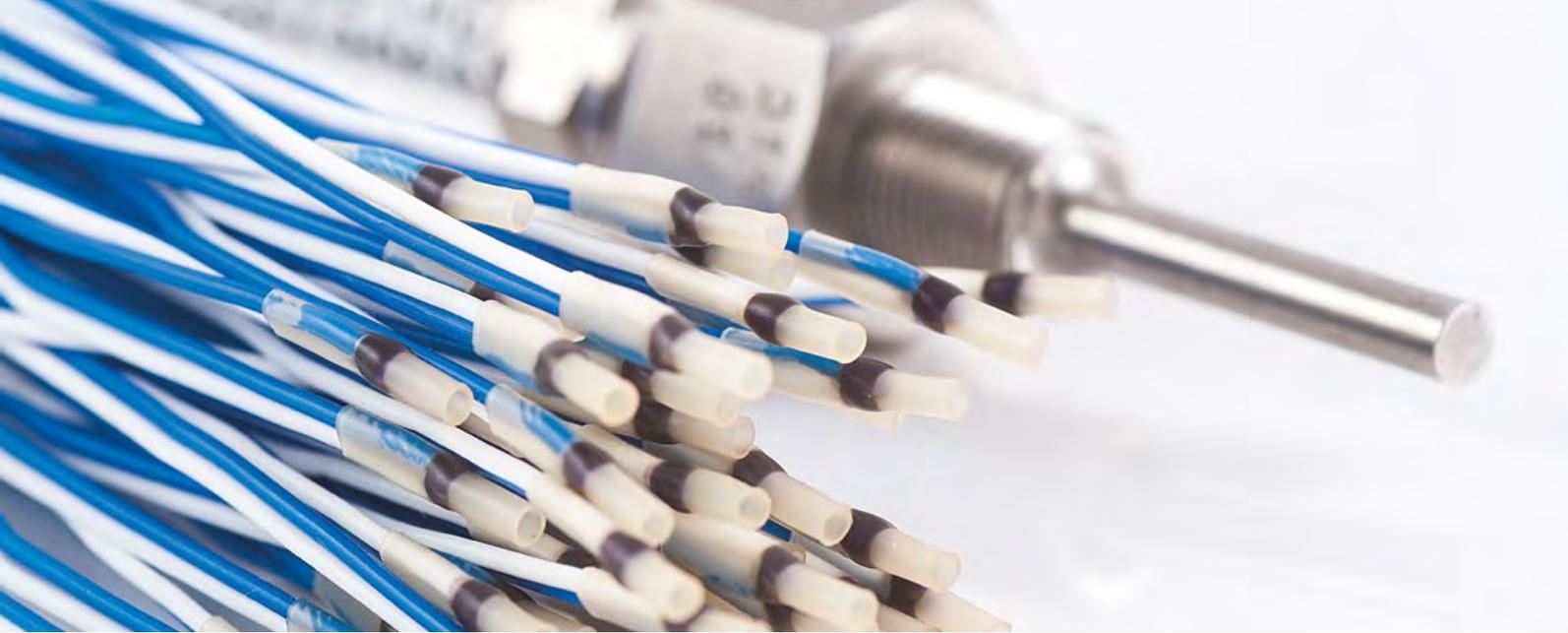
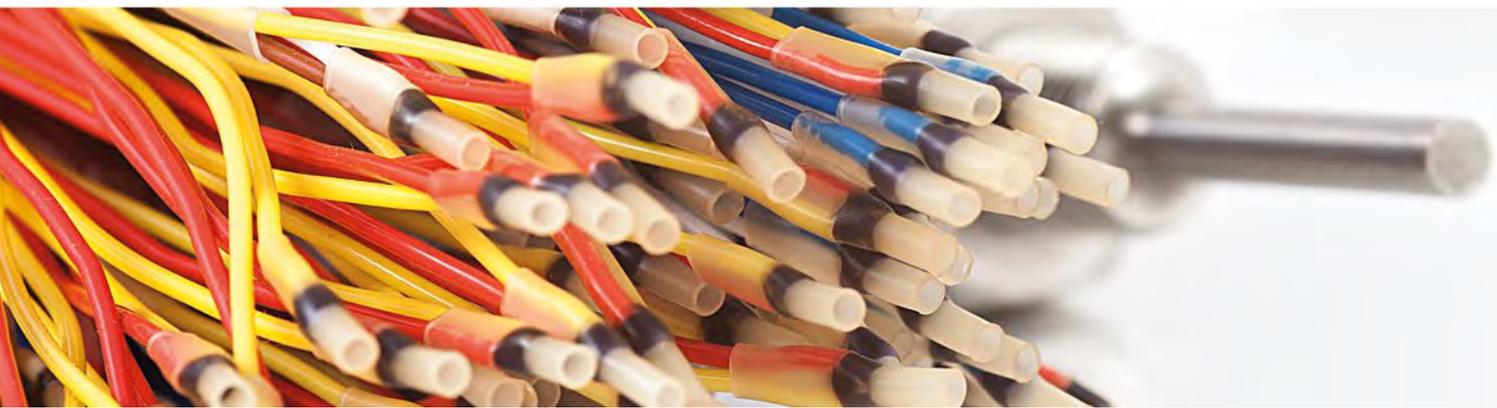


# PTC+ sensors



**KRIWAN Sensor Technology with Performance Plus  
for Protection of Machines and Systems**





## PTC sensors

### Small sensor – big effect

With its expertise, experience, and exceptional product quality, KRIWAN has been one of the leading suppliers of sensors for the thermal protection of motors, generators, and transformers for almost 50 years.

In addition to reliable overheating protection for their motors, mechanical engineers and machine operators require continuous, dynamic monitoring of critical system parameters.

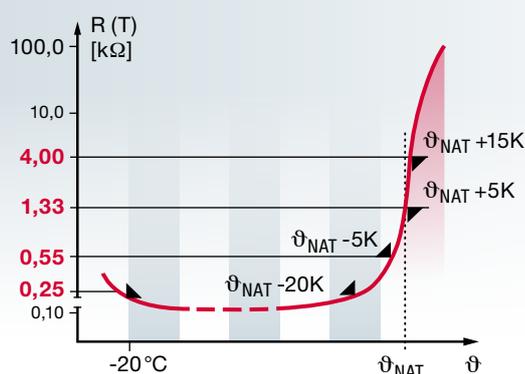
The KRIWAN PTC+ is a sensor that combines each of these objectives. In conjunction with a motor protection relay, such as KRIWAN INT69 Diagnose, an efficient and extremely reliable level of protection is provided against thermal overload and overheating.

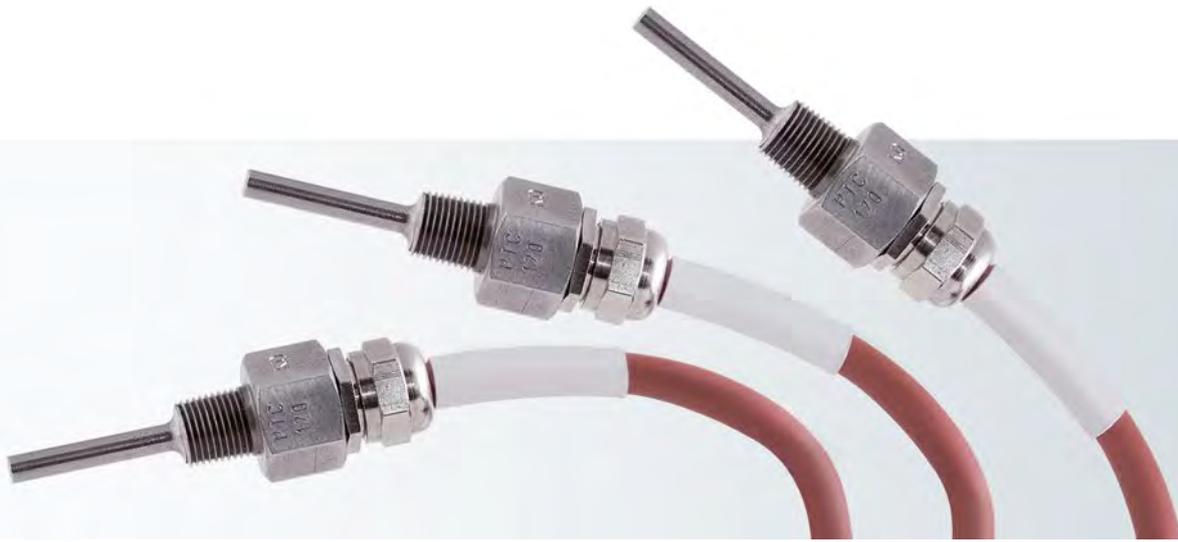
PTC sensors are temperature-dependent components with a very high positive temperature coefficient. Once the motor exceeds the maximum permitted operating temperature, the PTC sensor will suddenly become highly resistive, and the protection module will switch off the motor. After cooling down (and possibly being reset, depending on the model), the motor is re-enabled via the safety chain and can be restarted.

KRIWAN further developed PTC sensors and improved them considerably. In addition to the traditional PTC sensor, a linear temperature sensor was also integrated. This sensor combination enables continuous, precise temperature analysis of up to approx. NAT -5K. The new generation of KRIWAN PTC+ sensors offer even greater functionality and fully meet the specifications according to DIN 44081 / 44082. The typical characteristic curve was also optimized.

### PTC sensors

Characteristic curve of a PTC sensor, according to DIN 44081 / DIN 44082.





## KRIWAN PTC+ sensors: Added performance and safety

PTC+ sensors developed by KRIWAN have a different characteristic curve compared to conventional PTC sensors in the previously neglected area below the rated shut-off temperature. This enables continuous temperature measurement and further processing in downstream regulators and controls, meaning that overheating of the motor can be prevented more effectively than was previously possible. With the right electronics, there are also countermeasures or additional functions available in addition to shut-off at a specific temperature, where Pt 100/Pt 1000 sensors, for example, needed to be used prior to this point.

**For every application.** PTC+ sensors are available in the same designs as PTC sensors – with shrink tube insulation for installation in windings, or in sleeves or screw housing. PTC+ sensors are compatible with KRIWAN protection and diagnosis units and can be used as an upgrade to traditional PTC screw-in sensors.

**Specially for motor winding.** For the special requirements involved in the case of the use of electrical equipment in the motor winding, KRIWAN developed the PTC+ sensor AMS (Advanced Motor Scaling). This sensor detects dangerous rapid increases in temperature, e.g. locked rotor, significantly earlier than conventional PTC sensors (approx. 30K before shut-off temperature). This enables high temperature overruns to be considerably reduced. With a programmable control system, temperature trends can also be estimated within a temperature range.

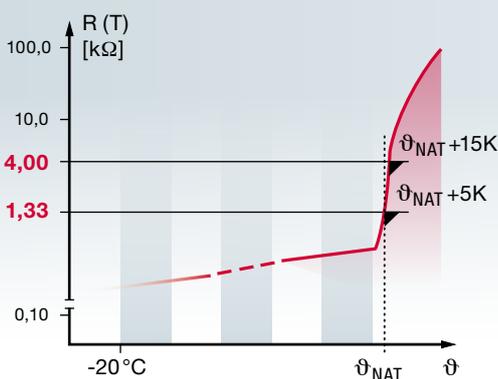
**Tamper-proof.** As with all PTC sensors, the shut-off point is firmly defined by the sensor and is therefore tamper-proof.

### PTC+ sensor installations

- Transmissions
- Transformers
- Bearings
- Windings
- Control cabinets
- Brakes
- Wheel sets of rail vehicles
- Cooling elements of power semiconductors
- Pitch / azimuth drives for monitoring wind energy systems

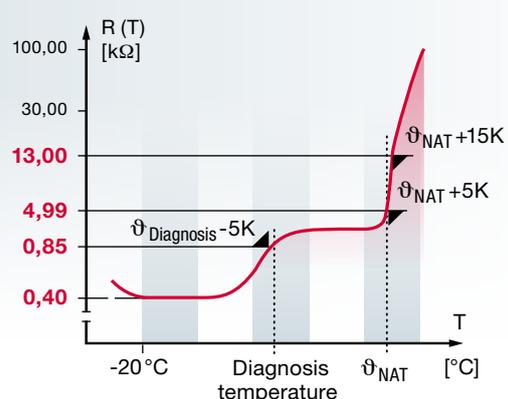
### PTC+ screw-in sensor

Characteristic curve of a PTC+ sensor with linear resistance curve as a single sensor, similar to DIN 44081.



### PTC+ AMS sensor

Graduated characteristic curve of special sensor for temperature measurement in motor winding, similar to DIN 44082.



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