

Temperature control – every degree matters

Retech technology innovations underline its expertise in filament production

Perfection in drawing fibers is Retech's simple goal. But achieving this for its customers demands sophisticated technology in temperature transmitters, monitoring devices and controllers, to allow precise heat management for high-quality products, while protecting machine investments.

Precise temperature measurement and control are basic requirements for the 'perfect' fiber – and absolutely crucial for high-performance yarns. Retech has the technology to secure the ideal temperature and control every aspect of it, even for the most demanding applications.

Every Retech development is the result of comprehensive research and practical expertise. Its trio of innovations for godet roll temperature management are typical: they are precise, reliable, easy to handle, and durable, supporting Industry 4.0 and securing the client's investment. No other godet roll manufacturer can match these sophisticated and smart temperature control solutions.

Technology for ultimate temperature accuracy

Temperature transmitters are mainly applied with multi-zone heated godet rolls. They work by contactless induction data transmission. The temperature modules transmit a rotating temperature signal to a stationary receiver. Retech temperature transmitters are proven to operate in the harshest electromagnetic environment. Pollution, high outside temperatures and aging don't influence the precision of temperature measurement.

The Retech temperature measurement with godet rolls is based on a co-rotating sensor fork (this means PT100 temperature measuring elements and temperature transmitter rotor). The sensor fork, its electronics and the control unit were recently revolutionized. Latest electronic and new materials compensate for disturbing influences which could tamper with the measuring signal. The changes mean that the measuring signal depends only on the accuracy of the PT100 element in use – and Retech applies PT100 elements of highest standard and DIN norm. During production, every sensor fork is separately calibrated to guarantee maximum precision. Single calibration offers an additional benefit compared to gauging the complete godet roll: in the rare case of a fault the affected sensor fork can be exchanged quickly without requiring a godet calibration.

A second feature ensures unadulterated temperature data. Measured values are transmitted contactlessly to the static part of the godet roll. This prevents contamination or wear and tear from influencing measuring data.

Secure way to Industry 4.0

For perfect data security, Retech offers the UTL monitoring device, which analyses the data and integrates it in the communication protocol. Benefits arise from a comprehensive view of all temperature aspects, visualizing and controlling temperature values at each zone, the bearings and the inductor via the host system. The UTL guides filament yarn producers toward Industry 4.0.

The combination of the temperature transmitter and the UTL monitoring device creates a unique safety system. It controls all relevant temperature aspects, enabling appropriate action in the event of a deviation.

In general, the transmitter measures temperatures in the godet roll at the individual heating zones. Normally, a godet has up to four heating zones. A key part of the safety system is the sensor fork for temperature measurement. Its amended electronics now have six PT100 values. Besides the heating zones, the additional two channels can be used to measure bearing temperatures (front and rear bearings), giving the possibility of more comprehensive control. In addition, the inductor temperature can be measured and monitored. This temperature is integrated into the measuring circuit via UTL. If the inductor temperature rises above a critical level – at an individually defined threshold – the heating process will immediately be interrupted, or inductor cooling activated, to protect the system. Any critical condition can be identified at an early stage and damage prevented. The lifespan of the godet rolls extends significantly.

From control to self-optimization

Self-optimization is the major advantage from combining the system with the UCR-6 temperature control unit. UCR-6 independently monitors and regulates up to six different temperature zones of a godet roll. Featuring a completely new control algorithm, the unit delivers the most efficient energy consumption, as it compensates losses at the heating zones.

UCR-6 continuously collects and analyses data from the mains frequency, so that it can correctly switch solid-state relay for resistive and inductive loads. The control unit can communicate with a PLC via Profibus or RS-485 protocol. Users appreciate the extra visualization of values and settings on the integrated controller display.

Retech's new generation of UTR temperature transmitter and UCR temperature controller represent the summit of current technological developments. They make a great leap towards self-optimization of the whole godet system, in a way that secures a long service life as well as protecting the equipment. Overall, they optimize production processes and significantly increase yarn quality.

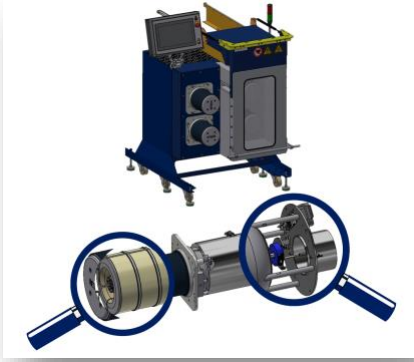
The next stage of evolution in this field will introduce more IoT options – and it's under development now at Retech, ready for launch at ITMA 2023.

Captions:



Temperature_transmission_system.jpg

Retech transmitter for heated godet rolls.



Drawing system_incl transmitter details.jpg

Heated godet drawing system, with exploded view showing inside detail of temperature measuring component (left) and transmitter unit (right).