



TDK-500

INSTA GAUGE™



Your Operators:
Making Quality Film
Without Air Ring
Anxiety



U.S. Patents US11,826,941
US11,618,200
Canada Patent 3,077,704
Europe Patent EP4,299,277
and other patents pending

D.R. Joseph
INCORPORATED

When You Need Solutions... Not Just Answers®

TDK-500 InstaGauge™ Automatic Gauge Air Ring

For new blown film operators, adjusting the air ring produces the most anxiety of any component on a blown film line. At DRJ, our three-day blown film seminar includes running a 3-layer blown film line each day. At each seminar, only a small minority (~15%) of attendees were willing to make air ring adjustments. These observations told us an auto gauge air ring with intuitive controls was needed in the marketplace.

The TDK-500 InstaGauge™ system is a result of five years of development starting in 2017 which drew from 40+ years of air ring design experience from Techflow Design of Mississauga, Canada, 30+ years of internal bubble cooling (IBC) controls design experience from D.R. Joseph Inc, and 30+ years of thickness measurement experience from Kündig Control Systems of Ruti, Switzerland. The combined experiences created innovations which focused on making a high performance auto gauge air ring easier to install, easier to operate efficiently and much easier to modify and maintain. Some features are shown below:



Flatter Film, Less Waste, Improved Processability

- Control zones range from 48 to 96 zones (depending on die size)
- Supporting dies sizes:
9 - 37"/228 - 940 mm
- BUR from 1.2:1 to 4:1

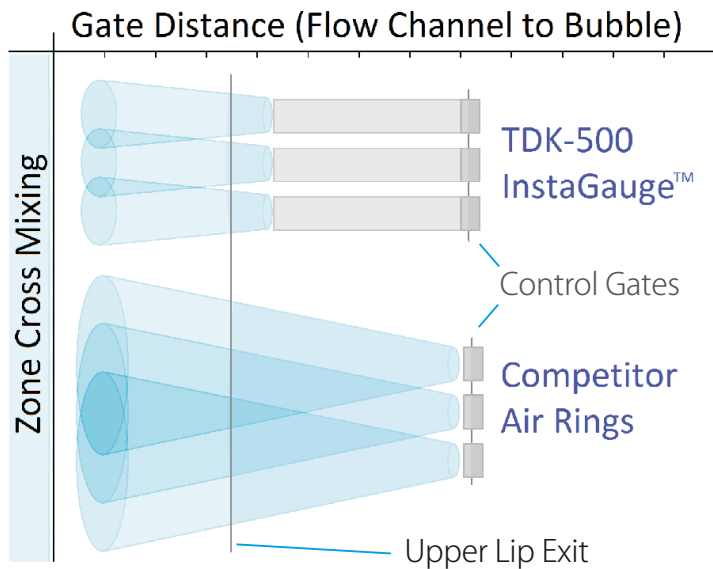
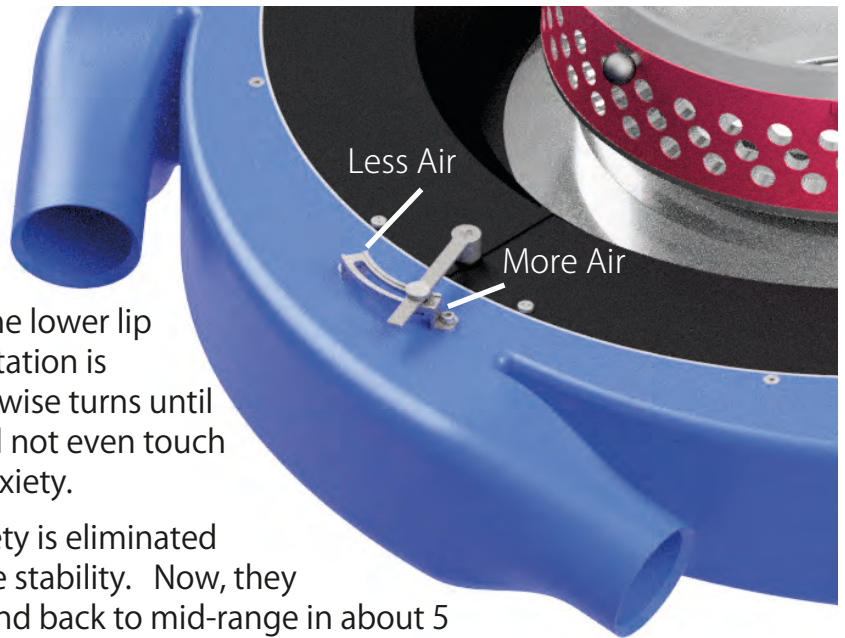
- 50% improvement in gauge variation
- InstaStart* automates scanner start-up and retraction based on bubble stability
- Quick and reliable airflow adjustment
- Overheat protection when air ring blower VFD is integrated to the InstaGauge™ system
- Native Yaskawa Drive Protocol Support
- Optional Die Drool Detect: Prevent air ring damage from molten polymer accumulation with extruder stop dry contact output

*InstaStart requires InstaConnect to a 32-bit DRJ IBC system

InstaSet Lower Lip Adjust

The Lower Lip InstaSet control intuitively indicates the current proportion of lower lip airflow. Move the control to the left for less air and to the right for more air. Conversely, on a conventional auto-gauge air ring, operators must know to either count exposed threads or rotate the lower lip adjustment multiple 360° turns clockwise until rotation is mechanically stopped - then count counter-clockwise turns until the bubble is stable. Inexperienced operators will not even touch the adjustment because of air ring adjustment anxiety.

With the lower lip InstaSet control, operator anxiety is eliminated as they can quickly correlate the setting to bubble stability. Now, they can adjust air flow from minimum to maximum and back to mid-range in about 5 seconds – without fear of losing the bubble.



Efficient Design

The air flow from each control zone is constrained in an independent channel that extends to just before the upper lip exit. This eliminates zone cross mixing and provides a more direct and effective control response to the film (pictured to the left). The result is finer resolution control of gauge irregularities.

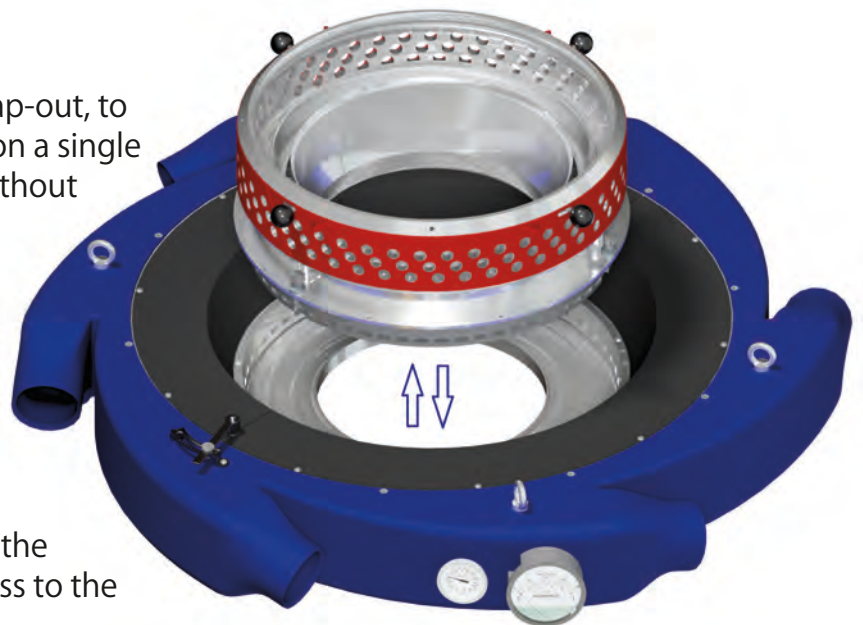
Internal components are specified to the highest degree for consistent and reliable performance, even in harsh running conditions. Safety features are built in to prevent damage and costly downtime.

Flexibility and Customization

The unit was designed for easy component swap-out, to expand the range of products that can be ran on a single air ring. The lip set can be instantly swapped without tools, and without elevating the air ring off of the die. This is a time and cost saving measure which expands the versatility of the air ring.

Optional weight reduction is available for easier lifting from a 3D printed polycarbonate cooling collar.

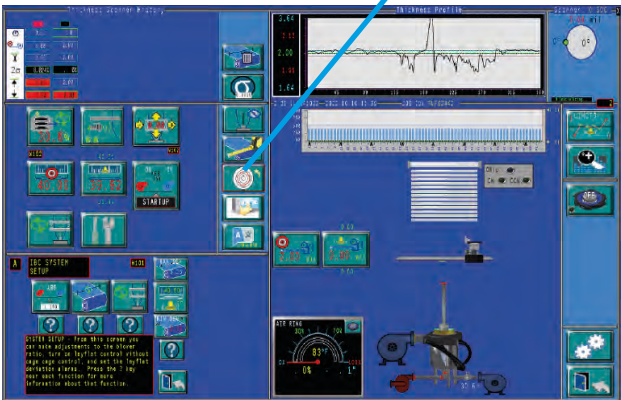
This level of modularity also drastically reduces the required effort to clean the die via toolless access to the lower lip.



TDK-500 INSTA GAUGE™

Access to air ring control via the gauge software, InstaGauge™, is carried out on a 19" color touch screen. The screen is housed in an industrial control panel, or can be optionally supplied in a loose-mount, OEM style configuration. A keyboard/mouse is included. A space for a printer (not included) is provided in the panel.

User Configurable Profile Trends & Graphs



The screenshot shows a complex software interface with multiple panels. On the left, there are 'IBC Controls' represented by a vertical list of icons. The main area features a 'Profile & Scanner Controls (Always Visible)' section at the top with a line graph, and 'Air Ring Controls' at the bottom with various status indicators and a 3D model of the gauge head. Brackets on the right side of the screenshot group these elements into their respective functional categories.



Kündig K-500 Rotomat KT Thickness Gauge

Rapid and accurate measurement of film thickness is achieved via integration between the TDK-500 and Kündig thickness gauges. For most applications, the Kündig K-500 is excellent choice for gauge measurement thanks to its accuracy and durability.

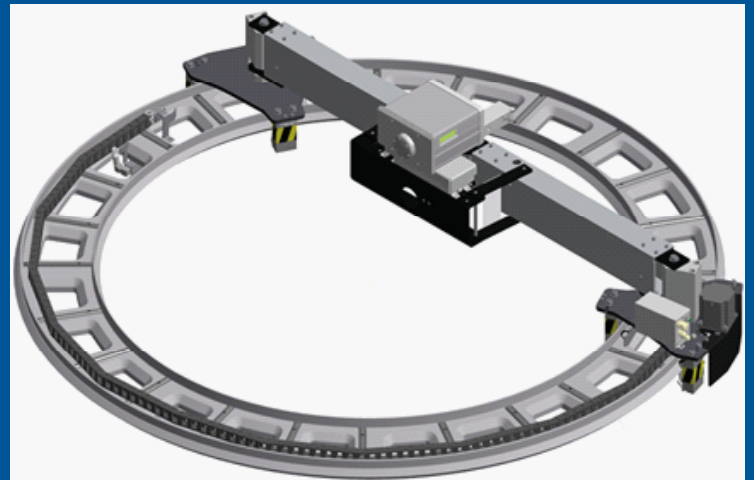
The capacitive thickness sensor of the K-500 is protected by a cover made from sintered ceramic with a very smooth surface. That allows an extremely low wear measurement of film thickness, even though the K-500 is constantly in contact with the film.

The Rotomat KT in the third generation comes with a virtual data processor (VDP) which runs on the same industrial HMI as the InstaGauge system.

Thickness Measurement

- Measuring principle capacitive thickness sensor
- Measuring frequency 1 MHz
- Measuring range 10 - 300 μm (0.4-11.8 mil)
- Measuring interval 50 ms
- Resolution 0.1 μm (0.0039 mil)

Non contact thickness gauges are also available for sticky or touch sensitive films. Additionally, Kündig offers the K-XRAY measurement head using electrically generated Xray to measure gauge for barrier films.



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