



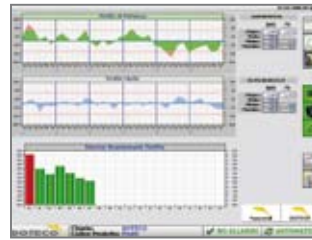
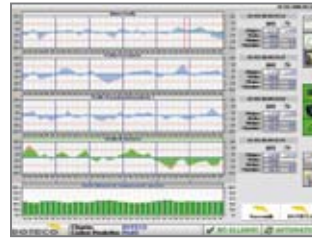
PROFIX PROTUNE

GAUGE CONTROL SYSTEMS

GAUGE CONTROL SYSTEMS

Highlights

- Retrofitable
- Outstanding gauge uniformity and cooling efficiency
- Design maximize the cooling rate and utilize maximum blower efficiency with proven gauge deviation reduction
- The operating principles assure a quick response time to any input for thickness correction
- Superb gauge uniformity while maintaining excellent output.
- Designed to match the exact characteristics of any polymer and provide excellent bubble control and gauge uniformity.
- Suitable for running low melt-strength materials at higher blow-up ratios.
- Repeatable settings of total airflow adjustments by a variable speed AC control for the blower motor.
- Do not require an additional blower or use compressed air.



PROFIX

BASED ON D10 - PRO AIR RING WITH VALVES

Based on a dual lip MACRO D10 PRO air ring with integrated auto profile control, PROFIX controls the air flow, from point to point, around the bubble.

SYSTEM COMPONENTS

- Dual lip air ring MACRO D10 PRO, fully powered by Doteco.
- Pc Based Operator Interface with 15" touch-screen colour screen, to display:
 - previous and actual profile comparison (cartesian plot)
 - actual profile (polar)
 - profile trend diagram
- Control cabinet with automatic gauge control software
- Online film thickness sensor Kündig K-300 Rotomat



OPERATING MODE AND FUNCTIONS

- Dual lip air ring MACRO D10 PRO:
 - the primary airflow (through the Primary Gap) gently starts cooling action of the extruded melt;
 - the majority of the air (between 70% and 90%) goes to the secondary airflow (through the Secondary Gap) and provides the major cooling action and also controls the stalk of the bubble and the frost line height;
 - the bottom airflow (through the Gauge Control Gap) is diverted into several radial flows (control zones) distributed all around the ring.
- Thickness control is achieved by precisely adjusting the air-flow on each control zones, by valves operated by stepper motors.
- The automatic control system gets the inputs from the thickness sensor and therefore adjusts the valves opening to compensate any deviation of the thickness profile:
 - if a thicker section is detected, the air flow into the relevant control zone is reduced, hence the melt is going to be a little under cooled enough to make the gauge thinner;
 - if a thinner section is detected, the air flow into the relevant control zone is increased, hence the melt is going to be over cooled, making the gauge thicker.
- The valves, hence the thickness profile, can be manual adjusted from the HMI. When in Automatic Mode, all adjustments are controlled automatically by the gauge control software.
- Depending on the air ring size, there might be 32, 48, or 64 control zones.

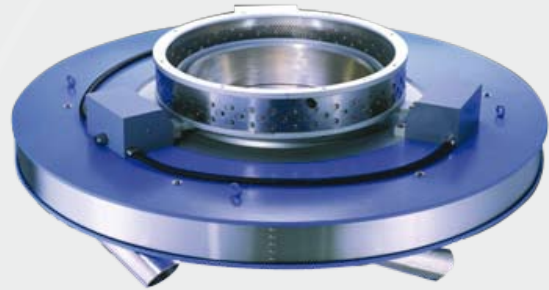
PROTUNE

BASED ON AUTOKU2 AIR RING WITH HEATERS

- Based on a dual lip AutoKu2 air ring with integrated auto profile control, PROTUNE controls the temperature of the cooling air, from point to point, around the bubble.

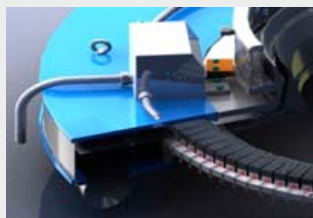
SYSTEM COMPONENTS

- Dual lip air ring AutoKu2, fully powered by Dotecco.
- Pc Based Operator Interface with 15" touch-screen colour screen, to display:
 - previous and actual profile comparison (cartesian plot)
 - actual profile (polar)
 - profile trend diagram
- Control cabinet with automatic gauge control software
- Online film thickness sensor Kündig K-300 Rotomat

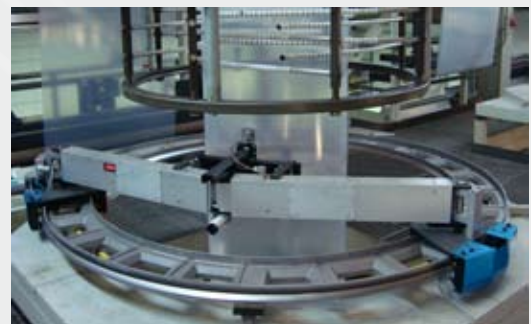


OPERATING MODE AND FUNCTIONS:

- Advanced dual lip air ring AutoKu2:
 - the Lower Lip provides initial quenching to strengthen the melt and also the venturi effect between the bubble and the cone to "set" the bubble;
 - Forming Cone: guides lower lip air and supports bubble while in the "semi-solid" state
 - the Upper Lip provides the final "blast" of cooling air "adjustment";
 - the Upper Lip is provided with a motorized lifting device, to adjust "on-the-fly" (machine running) volume and speed of the air, hence to get exactly the adjustment which is suitable for each BUR and each material processed;
 - also the Chimney is adjusted by a motorized lifting device, to further redirect the cooling air and increase the stability of the bubble.
- The air flow is diverted into several radial flows distributed all around the ring, that impinge on the melt as it exits the die. The temperature of each individual air stream is controlled by cartridge heaters (control zones).
- The automatic control system gets the inputs from the thickness sensor and therefore adjusts the temperature of the air streams into each control zone, to compensate any deviation of the thickness profile:
 - if a thicker section is detected, the air temperature into the relevant control zone is slightly increased, hence the melt is going to be a little under cooled, enough to make the gauge thinner;
 - if a thinner section is detected, the air temperature into the relevant control zone is slightly reduced, hence the melt is going to be a little over cooled, enough to make the gauge thicker.
- The temperature of control zones can be manual adjusted from the operator screen. When in Automatic Mode, all adjustments are controlled automatically by the gauge control software
- Depending on the air ring size, there might be from 78 up to 140 control zones.



ONLINE THICKNESS SENSOR KÜNDIG K-300 ROTOMAT



- The capacitive sensor, on slewing ring, goes around the bubble and measures the film thickness along the circumference, over the frost line.
- The system calculates the thickness average value and the thickness actual values on each radial position (corresponding to the control zones of the automatic air rings).
- Rotates continuously in one direction at a minimum rotation time of 36 seconds.
- Different sizes of slewing rings available for lay-flats from 255 mm up to 3900 mm.
- Sensors with different coatings available: CRS (chrome coated sensor for standard films, excellent durability with abrasive films), PVD-2 (plasma coated sensor for slightly sticky films, good durability with light abrasive films), PTFE (coated sensor for sticky films, short lifetime with abrasive films).

On demand, gauge control systems PROFIX and PROTUNE could be interfaced with other sensors available in the market.



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