

Thermo Scientific HAAKE MiniLab II

A micro compounder
for small sample amounts

The Thermo Scientific HAAKE MiniLab II needs a sample amount of 5 g only. Compounding expensive or small scale materials such as nano-composites, bio-polymers or pharmaceuticals is therefore no longer a problem. Simultaneously, the rheological properties can be recorded to document structural changes. By using the optional force feeder, continuous extrusion with very small volume flows is possible.



Main features

- Co- and counter-rotating twin screws
- Integrated viscosity measurement
- Automatic bypass operation for circulation/extrusion
- Pneumatic feeding
- LCD screen for graphical data display
- Manual or computer control
- Easy to clean due to exit in split barrel
- Fits into laboratory fume hood

Concept

The Thermo Scientific HAAKE MiniLab compounds small sample amounts of 5 g or 7 cm³. This minaturized, high-tech tool is perfect for research in material science, such as testing of expensive additives and the development of new formulations. The system is based on a conical, twin-screw compounder with an integrated backflow channel. Due to the channel and a bypass valve, the residence time is well defined. Two pressure transducers are integrated in the backflow channel. They allow the measurement of (relative) melt viscosity (counter-rotating screws required). This micro compounder can be used with co- or counter-rotating screws and is equipped with an inert gas flush system.

Applications

The Thermo Scientific HAAKE MiniLab is ideal for the precisely controlled reactive extrusion of high viscous melts. By running the instrument in circulation mode, the required reaction time for the reactive mixture can be controlled easily. At the end of the test, the bypass valve can be opened and the sample is extruded as a strand. By measuring the torque of the drive motor and the pressure in the backflow channel, the reaction process can be monitored effectively.

Because of the small sample volumes required, the combination of the HAAKE MiniLab and the Thermo Scientific HAAKE Force Feeder is a powerful tool for quick analysis. Performing the same test with a standard lab extruder would take much longer.

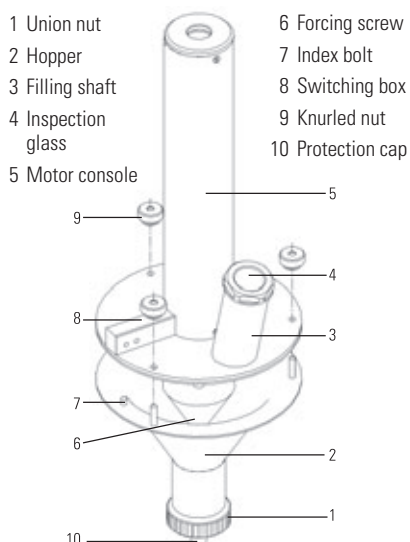
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Feeding systems

Three different feeding systems are available for the HAAKE MiniLab: a standard pneumatic feeding system, an optional manual feeder and an optional HAAKE Force Feeder. This new feeder is specially designed for the HAAKE MiniLab to enable continuous sample feeding (max. pellet size 2 mm). With an attached rod or slit die the constant production of small strands or bands is possible. The cooled feeding zone avoids the melting of material in the feeder funnel. For sensitive samples the sealed funnel can be purged with inert gas. Output rates are possible in the range of 2 g of material per minute.



Instrument control

The Thermo Scientific HAAKE MiniLab can be controlled by using the separate manual control box which includes a LCD screen for graphical data display or using the versatile application software.

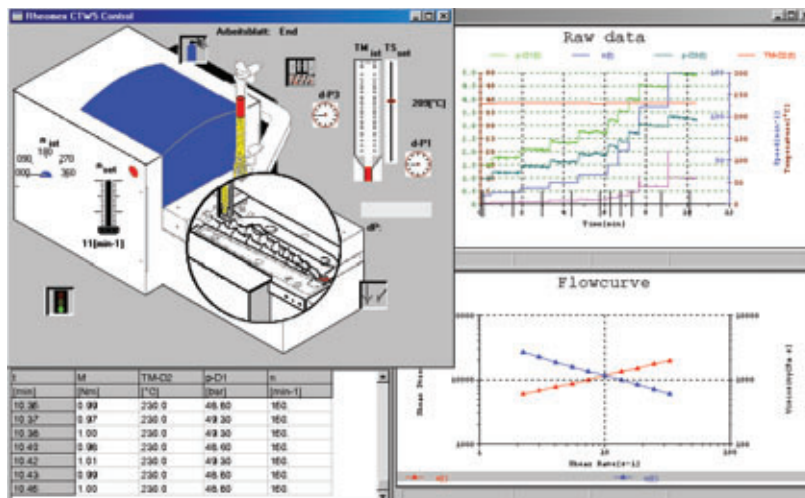
The manual control box features:

- easy handling with a clear menu structure
- numerical and graphical data monitoring
- storage of up to 10 test setups
- flexible positioning of the display

Software

The application software features:

- instrument control via standardized RS232 interface
- storage of test setup and test results in one file
- flexible data documentation
- advanced evaluation methods and documentation of rheological data (viscosity, shear stress).



Application example: Drop of the melt viscosity due to the degradation of the polymer at long residence time

Technical specifications

Drive

Motor power	400 W
Speed range	1 ... 360 min ⁻¹
Max. torque	5 Nm per screw
Power supply	230 V ± 10 %, 50/60 Hz 115 V ± 10 %, 60 Hz

HAAKE Force Feeder

Max. Speed	30 min ⁻¹
Material	stainless steel 1.4122 Cr coated
Power supply	230 V ± 10 %, 50/60 Hz 115 V ± 10 %, 60 Hz

Extruder

Design	conical co & counter rotating
Temperature	350 °C or 420 °C as option
Barrel	high performance plastic mold steel (M340); additional sensor port (optional)
Screws	stainless steel 1.4122
Cooling	air / water for 350 °C version, air for 420 °C version
Pressure	up to 200 bar
Volume	7 cm ³ (equivalent to 5 g PE)
Bypass	automatic valve
Feeding	pneumatic ram (standard) manual feeding (optional) force feeder (optional)

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