

Automatic Distillation System

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 **Koehler**
INSTRUMENT COMPANY, INC.

Features & Advantages

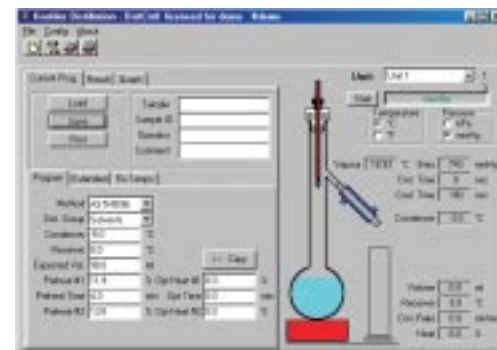
- ◀ **Standard Test Methods:** ASTM D86-04b, D850-03, D1078-03; DIN 51751; ISO 3405; IP 123; JIS K2254; NF M 07-002
- ◀ **Windows®-based software package for PC control with LIMS export capabilities**
- ◀ **Networking for up to 32 units**
- ◀ **Automatic determination of initial boiling point (IBP), final boiling point (FBP), dry point, and barometric and residue corrections**
- ◀ **Auto temperature and volume calibration**
- ◀ **Diagnostic system continuously ensures proper unit performance and user safety**
- ◀ **Programmable distillation rate (2-15mL/min)**
- ◀ **Ready for distillation groups 0 - 4**
- ◀ **Powerful CFC-free cooling & heating system**
- ◀ **Automatic dry point detection board included**
- ◀ **Receiver chamber heating system to 60°C**
- ◀ **Ultra quiet operation**
- ◀ **Rugged construction and modular design for easy routine maintenance**
- ◀ **Precision level follower system with optical meniscus detector**
- ◀ **Integrated automatic fire extinguishing system with manual operation option**

Automatic Distillation Analyzer

The Koehler Automatic Distillation Analyzer is designed to perform optimal distillation analyses of gasolines, fuels, oils, solvents, aromatics, naphthas, kerosenes, hydrocarbons, and other volatile products to ensure conformity to rigid quality control standards. The analyzers automatically perform tests, process results, and produce standard reports according to ASTM, ISO, DIN and related international test specifications. Additional product features of the distillation analyzer include:

- A powerful CFC-free heating and cooling system that allows quick changes between distillation groups.
- Heater compartment is rapidly cooled at the completion of a distillation run to reduce operator downtime.
- An easy-to-use Windows®-based PC communication software expands user capabilities for data analysis and unit control. The distillation methods and parameters can be easily created or modified.
- A high-performance, low-inertia 24V AC heater provides precise temperature control for maintaining uniform distillation rates.
- A complete series of Pt-100 RTD probes to monitor distillation flask vapor, condenser, and receiver compartment and mimic the response of mercury-in-glass thermometers with an accuracy of $\pm 0.01^\circ\text{C}$.
- A built-in fire extinguishing system with optical detection for fast response ensures user and laboratory safety.

- Rugged construction for instrument longevity with a modular design for easy routine maintenance.
- Complete data storage of results, limited only by the hard drive capacity of the PC.
- Software calculates repeatability and reproducibility as per ASTM D86-04b as well as standard and deviation against reference materials.
- K45701-TS/K45702-TS models are supplied with built-in PC, internal touch-screen LCD monitor, virtual keyboard and track-ball mouse.
- Receiver chamber heating system is ideal for samples that form waxes or other solids during distillation.



Main Software Screen for Distillation Analyzer

Easy Operation & Control

The distillation analyzer features ease-of-use operation and a Windows®-based software package that is user friendly for even the most inexperienced operators. Additional features of the analyzer include:

- A microprocessor-based control system that continuously monitors test results, unit operation, safety features, and alerts user to maintenance needs or safety problems via the software program.
- Test results are displayed in real-time and can include distillation curve and temperature with or without barometric compensation and/or evaporation correction, distillation rate, heating power curve, master curve comparison, and zoom function for high resolution of heating and temperature curves.



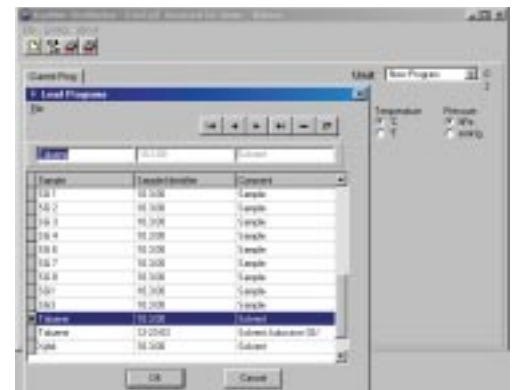
Diagnostic screen for monitoring of analyzer functions.

- Point by point comparisons of distillation results are easily performed for quality control and referencing.

Ready for Groups 0 - 4, Dry Point, and more...

Each Koehler Automatic Distillation Unit comes ready with the equipment, accessories, and features as standard to properly run distillation groups 0 to 4 per ASTM D86-04b and related test specifications. No additional accessories are required. The Windows®-based software package allows simple operator selection of the programmed settings for each distillation protocol. No complicated routines are needed to setup the unit. User-defined programs are easily created for customization of the analyzer.

Dry Point can be detected visually or by automatic detection for ASTM D850-03 and D1078-03 test methods. The unit is delivered ready with the PC board components already included as standard to perform the dry point analysis. It only requires the additional accessories of the dry point thermocouple, 200mL flask, and PTFE plug in order to perform the dry point detection analysis automatically.



Software protocols for performing distillations.

Ordering Information

K45701-TS Automatic Distillation Analyzer with built-in PC and LCD touch screen, 115V 50/60Hz

K45702-TS Automatic Distillation Analyzer with built-in PC and LCD touch screen, 230V 50/60Hz

Optional Accessories

K45654 Automatic Dry Point Detection Kit, includes:
Pt-100 thermocouple for dry point detection
200mL distillation flask
PTFE plug

Internal PC Minimum Specifications

A built-in computer with the following minimum specifications is included with the K45701-TS/K45702-TS can be used to control up to 32 distillation analyzers without an external PC: Windows® XP Pro operating system; 600 MHz operating system speed; 128 Mb RAM; 4 Gb hard drive; LCD touch screen; USB, RS-232 (serial port for printer), and RJ45 ports; virtual keyboard and track-ball mouse.

Specifications

◀ **Standard Test Methods** ASTM D86-04b, D850-03, D1078-03; DIN 51751; ISO 3405; IP 123; JIS K2254; NF M 07-002

◀ **Product Certification** Product tested to UL Standard 61010A-1:2002 R4.02 and bears the mark cTUV_{us}.



◀ **Included Accessories** The standard accessories for immediate operation include: ASTM E1405-03 distillation flask (125mL), Pt-100 temperature probe, ASTM probe centering device, calibrated graduated receiver cylinder (100mL), drip tip, Ceran plates (25, 32, 38, 50mm diameter hole), silicone condenser stopper, factory-filled CFC-free heating and cooling system, automatic dry point detection board, condenser wiper, operation manual, and PC adaptor, cable, and software.

◀ **Temperature**

Distillation Range:	0 to 450°C (±0.1°C accuracy)
Condenser:	-5 to 60°C (±0.1°C accuracy); closed loop system
Receiver Chamber:	0 to 60°C (±0.1°C accuracy) with optional heating system
Ambient:	Automatic temperature sensor

◀ **Distillation Parameters**

Distillation Rate:	2 to 15 mL/min in 0.1 mL increments, user-selectable
Receiver Volume:	0 to 100mL (±0.1mL accuracy) by photoelectric detection of meniscus by level following system utilizing a precision stepper motor and a special calibrated glass receiver; automatic calculation of evaporated loss volume and automatic multi-point volume calibration system ensures highest accuracy
Barometric Pressure:	Automatic barometric correction utility with automatic sensor, range: 550 to 900 mm Hg (±1 mm Hg accuracy)
Dry Point Detection:	Automatic dry point detection board is included with standard equipment and only requires a dry point sensor, 200mL flask, and PTFE plug for ASTM D850-03 and D1078-03 tests.

◀ **Operation**

User Interface:	Easy operational use utilizing start and stop buttons on the analyzer or via built-in PC.
Diagnostics:	Auto temperature and volume (up to 10 points each) calibration. Auto diagnostic routines for all analyzer functions to find and resolve system problems, featuring low refrigerant, moisture detection systems, error logging, and program and results feeding and recover capability, and calibration service scheduling based upon use and maintainance frequency.
Sample Heating:	Automatic real-time monitoring and adjustment of heating levels to maintain distillation as per programmed settings. Heating assembly utilizes rugged scissors-jack system for proper elevation.
Receiver Chamber:	Receiver chamber heating system provides programmable temperatures of 0 to 60°C for the distillation of waxy materials.
Safety:	Optical fire detection with built-in fire extinguishing system (requires connection to nitrogen or carbon dioxide gas source).

◀ **Physical**

Electrical Requirements:	115V 50/60Hz 20A or 230V 50/60Hz 10A
Dimensions l _w xw _h ,in.(cm):	21x21.5x27.75 (53.3x54.6x70.5)
Net Weight:	200 lbs (91kg)
Operational Conditions:	0 to 45°C (32 to 113°F)

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