

# operation and instruction manual



## K71000 Automatic PMCC Flash Point Analyzer

service | innovation | technology

REV K-A



1595 Sycamore Avenue • Bohemia, New York 11716-1796 • USA  
Toll Free: 1-800-878-9070 (US only) • Tel: +1 631 589 3800 • Fax: +1 631 589 3815  
<http://www.koehlerinstrument.com> • e-mail: [info@koehlerinstrument.com](mailto:info@koehlerinstrument.com)  
Petroleum Testing & Analysis Instrumentation • Custom Design & Manufacturing



---

# CERTIFICATE OF CONFORMANCE

---

## Automatic PMCC Flash Point Analyzer K71000

---

This certificate verifies that part number K71000, Automatic PMCC Flash Point Analyzer, was manufactured in conformance with the applicable standards set forth in this certification.

<b>Specifications:</b>	<b>ASTM D93 ISO 2719 IP 34 DIN 51758 DIN EN 22719 FTM 791-1102 AASHTO T73-811 NF M 07-019 JIS K2265</b>
------------------------	---

This unit is tested before it leaves the factory, to ensure total functionality and compliance to the above specifications and ASTM standards. Test and inspection records are on file for verification.



**Vincent Colantuoni**  
**Product Manager**

**Koehler Instrument Company, Inc.**  
**1595 Sycamore Ave.**  
**Bohemia, NY 11716**  
**United States of America**

**Serial Number:** \_\_\_\_\_

**Date:** \_\_\_\_\_



---

**EC Declaration of conformity**

Koehler Instrument Company, Inc.  
of 1595 Sycamore Av., Bohemia, New York USA

**This declaration of conformity is issued under the sole responsibility of the manufacturer. We declare that the product listed below meets all basic requirements in accordance with the following Directive(s) by design, type, and version placed upon the market by us.**

2006/42/EC The Machinery Directive by way of the Low-Voltage directive 2014/35/EU

**And hereby declare that:**

**Equipment: Automatic PMCC Flash Point Analyzer**

**Model Number(s): K71000**

**Qualifications:**

**This product may only to be used in a professional laboratory setting by authorized personnel following the instruction handbook.**

**and**

**The object of the declaration described above is in conformity with the relevant union harmonization legislation. This product declaration is valid for unmodified equipment when installed and operated by authorized personnel following the instruction handbook.**

**Conforms to the following standards (as applicable):**

Safety	Low-Voltage directive 2014/35/EU
EN 61010-1:2010	Safety Requirements for electrical equipment for measurement, control and laboratory use; by engineering design and risk review and by meeting the requirements of Hi-Pot Test (1500 VAC, 60 sec. per table 5) as detailed in the product's technical documentation.

*VINCENT COLANTUONI*  
Vincent Colantuoni  
Product Manager

1595 Sycamore Ave.  
Bohemia, NY 11716  
United States of America  
**October 25, 2021**

www.koehlerinstrument.com

631-589-3800

## WEEE Directive

### Background

The goal of the WEEE Directive is to encourage design of environment-friendly products that increase reuse, recycling and other forms of recovery to reduce waste streams and applies to listed Electronic and Electrical Equipment (EEE) and Koehler's equipment falls broadly into Appendix 1A; Section 9 Monitoring and Control Equipment: Measuring, weighing or adjusting appliances for household or as laboratory equipment.

Any associated non-embedded equipment such as Lighting (Saybolt Color) and PCs/Printers also fall under WEEE. If provided with an order these ancillary items must be WEEE compliant. For these and other reasons (printer cartridges are regionalized) the equipment must be supplied through a third party supplier in Europe.

The WEEE Directive applies to electrical and electronic equipment falling under the categories set out in Annex IA provided that the equipment concerned is not part of another type of equipment that does not fall within the scope of this Directive. Annex IB contains a list of products which fall under the categories set out in Annex IA.

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:037:0024:0038:en:PDF>

We do not qualify for any of the 10 exemption categories.  
<http://www.dpa-system.dk/en/WEEE/Products/Exemptions>

### Professional use

For equipment defined for 'professional use' local authorities have no role to play. Producers and importers are basically responsible for collection of WEEE recyclables from the professional user and for subsequent management. A separate statement is given cataloging the items that require separation from the equipment along with basic information on subsequent processing or recycling prior to disposal of the equipment.

<http://www.dpa-system.dk/en/WEEE/Products/Private-or-professional-use>

### Responsibility for Registration and Annual Reporting:

Koehler will not sell directly to end users in the EU and so has no responsibility to register within each EU state and to make annual reports. Koehler declares that this responsibility is born by the importer who is the first level of the distribution chain and is subject to producer responsibility. We will communicate this in writing to our distributor/importers in the EU stating they are responsible to satisfy WEEE registration and reporting requirements in the EU states where they conduct sales activities.

It is illegal to market electrical and electronic equipment covered by producer responsibility without being registered.

<http://www.dpa-system.dk/en/WEEE/Producers/Whoissubjecttoproducerresponsibility>

### Product Design

Koehler's designs allow for complete disassembly to a modular level which usually allows for standard recycling. A qualified refrigeration system technician must be consulted when disassembling and de-commissioning any equipment with refrigeration systems.

Koehler's scientific testing equipment is robustly designed to function over a long service life and are typically repaired many times over the course of years rather than being replaced. We believe that re-use and refurbishment is the very best form of re-cycling.

All batteries must be readily removable not soldered in place.

### Recycling instructions

In the event that replacement becomes necessary, we will include instructions, particularized to each instrument that informs the customer of their recycling responsibilities and giving them guidance in doing this. All Koehler equipment has been placed on the market since 13th August 2005 and so Koehler is defined as a "new WEEE producer". As such we must provide information on refurbishment, treatment, and re-use.

Our instrument manual will include this compliance statement and indicate that any collection of materials will be handled by their authorized distributor. In the event that the distributor is unreachable or is no longer a distributor for Koehler Instrument, Co., other arrangements may be made including accepting the materials directly.

Recycling is free of charge. Shipping is the responsibility of the end users. Whether shipping to a distributor or to Koehler directly, safe, properly declared, and labeled packaging and shipping expenses are the sole responsibility of the end user.

### WEEE Marking



Since Koehler products are subject to the WEEE Directive we must display the WEEE symbol shown above in accordance with European Standard EN 50419 on the equipment. It must be indelible, at least 5mm in height, and clearly legible. If the equipment is too small the mark must be in the product literature, guarantee certificate, or on the packaging. Rules on marking are established in section 49 of the WEEE Order.

Koehler Instrument Company, Inc.  
c/o RECYCLING  
1595 Sycamore, Ave.  
Bohemia, NY 11716

As a minimum the following substances, preparations and components have to be removed from any separately collected WEEE:

- Mercury containing components, such as switches or backlighting lamps (compact fluorescent lamps, CFL),
- Batteries
- Printed circuit boards if the surface of the printed circuit board is greater than 10 square centimeters (about 4 sq in.),
- Toner cartridges, liquid and pasty, as well as color toner,
- Chlorofluorocarbons (CFC), hydrochlorofluorocarbons (HCFC) or hydrofluorocarbons (HFC), hydrocarbons (HC)
- Liquid crystal displays (together with their casing where appropriate) of a surface greater than 100 square centimeters and all those back-lighted with gas discharge lamps,
- External electric cables
- Components containing refractory ceramic fibers as described in Commission Directive 97/69/EC of 5 December 1997 adapting to technical progress Council Directive 67/548/EEC relating to the classification, packaging and labeling of dangerous substances (2),
- Electrolyte capacitors containing substances of concern (height > 25 mm, diameter > 25 mm or proportionately similar volume)

2. The following components of WEEE that is separately collected have to be treated as indicated:

- Equipment containing gases that are ozone depleting or have a global warming potential (GWP) above 15, such as those contained in foams and refrigeration circuits: the gases must be properly extracted and properly treated. Ozone-depleting gases must be treated in accordance with Regulation (EC) No 2037/2000 of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer (4).

## Table of Contents

1. Introduction	2
1.1. Koehler's Commitment to Our Customers	2
1.2. Recommended Resources and Publications	2
1.3. Pensky-Martens Flash Point Method Scope and Summary	3
1.4. Instrument Specifications	4
2. Safety Information and Warnings	5
2.1. Safety Considerations	5
2.2. Unit Design	5
2.3. Contaminated Samples	5
2.4. Safe Quick Test Method	6
2.5. Fire Detection / Suppression and Draft Shield / Dome System	6
2.6. Equipment Modification and Replacement Parts	6
2.7. Chemical Reagents Information	6
2.8. Additional Important Safety Information	6
2.9. Other Important Hazards	7
3. Getting Started	7
3.1. Packing List	7
3.2. Unpacking	8
3.3. Setup	8
4. Descriptions	11
4.1. Front of Instrument	11
4.2. Back of Instrument	12
4.3. Cover Assembly	14
5. Operation	15
6. Service	35
7. Storage	35
8. Warranty	35
9. Returned Goods Policy	35

## 1. Introduction

The Koehler model K71000 Automated Pensky-Martens Closed Cup Flash Point Analyzer is the latest design for performing the ASTM D93 test method and related test specifications.

The K71000 determines the flash points of distillate fuels (diesel, biodiesel blends, kerosene, heating oil, turbine fuels), new and in-use lubricating oils, residual fuel oils, cutback residua, used lubricating oils, mixtures of, petroleum liquids containing suspended solids and petroleum liquids that tend to form a surface film during testing and biodiesel (B100). It determines the flash points of a wide range of products by a closed cup method with stirring of the sample.

This manual provides important information regarding safety, technical reference, installation requirements, operating condition specifications, user facility resource requirements, and operating instructions for the K71000 Automated Pensky-Martens Closed Cup Flash Point Analyzer. This manual should also be used in conjunction with applicable published laboratory procedures. Information on these procedures is given in section 1.2.

### 1.1. Koehler's Commitment to Our Customers

Providing quality testing instrumentation and technical support services for research and testing laboratories has been our specialty for almost 100 years. At Koehler, the primary focus of our business is providing you with the full support of your laboratory testing needs. Our products are backed by our staff of technically knowledgeable, trained specialists who are experienced in both petroleum products testing and instrument service to better understand your requirements and provide you with the best solutions. You can depend on Koehler for a full range of accurate and reliable instrumentation as well as support for your laboratory testing programs. Please do not hesitate to contact us at any time with your inquiries about equipment, tests, or technical support.

**Toll Free: 1-800-878-9070 (US only)**

**Tel: +1 631 589 3800**

**Fax: +1 631 589 3815**

**Email: [info@koehlerinstrument.com](mailto:info@koehlerinstrument.com)**

**<http://www.koehlerinstrument.com>**

### 1.2. Recommended Resources and Publications

1. American Society for Testing and Materials (ASTM)  
100 Barr Harbor Drive  
West Conshohocken, Pennsylvania 19428-2959, USA  
Tel: +1 610 832 9500  
Fax: +1 610 832 9555  
<http://www.astm.org>  
email: [service@astm.org](mailto:service@astm.org)

**ASTM Publication:**

- ASTM D93: Flash Point by Pensky-Martens Flash Point Tester

2. International Organization for Standardization (ISO)  
1, rue de Varembe  
Case postale 56  
CH-1211 Geneva 20, Switzerland  
Tel: 41 22 749 01 11  
Fax: 41 22 733 34 30  
<http://www.iso.org>

**ISO Publication:**

- ISO 2719: Petroleum Products and Lubricants - Determination of Flash Point - Pensky-Martens Closed Cup Method

3. Energy Institute (IP)  
61 New Cavendish Street  
London, WIM 8AR, United Kingdom  
Tel: 44 (0)20 7467 7100

Fax: 44 (0)20 7255 1472  
<http://www.energyinstpubs.org.uk/>

**IP Publication:**

- IP 34: Determination of closed flash point – Pensky-Martens method

4. Deutsche International Norm (DIN)  
<http://www.din.de>

**DIN Publication:**

- DIN 51758: Testing of liquid petroleum products and other combustible liquids; determination of flash point by Pensky-Martens closed tester
- DIN EN 22719: Petroleum products and lubricants; determination of flash point; Pensky-Martens closed cup method (withdrawn)

5. Federal Test Method (FTM)

**FTM Publication:**

- FTM 791-1102: Flash Point by Pensky-Martens Closed Tester

6. American Association of State Highway and Transportation Officials (AASHTO)  
444 North Capitol Street N.W., Suite 249 Washington, DC 20001



Phone: +1 202 624-5800

Fax: +1 202 624-5806

E-mail: [info@ashto.org](mailto:info@ashto.org)

**AASHTO Publication:**

- AASHTO T73-811

8. Japanese Industrial Standards(JIS)

<http://www.jisc.go.jp>

**JIS Publication:**

- JIS K2265

7. Association Française de Normalisation (AFNOR)

<http://www.afnor.fr>

**AFNOR Publication:**

- NF M 07-019

## 1.3. Pensky-Martens Flash Point Method Scope and Summary

The K71000 Automatic Pensky-Martens Flash Point Analyzer determines the lowest flash point temperature of fuels, lubricating oils, and homogenous liquids (ASTM D93 A), or liquids containing suspended solids as well as liquids that tend to form a surface film during testing (ASTM D93 B), and the determination of the flash point of biodiesel in the temperature range of 60 to 190°C (ASTM D93 C).

**Method Scope:**

The scope of the method covers the analysis of products in the temperature range of 40 to 360°C but this automated apparatus extends the range from dew point + 10°C to 400°C.

Internet Link to Summary: [ASTM D93 PM Flash Standard Method Scope and Summary](#)

**Method Summary:**

Flash Point is the lowest temperature (barometrically corrected to standard atmospheric pressure of 101.3 kPa (760 Torr) at which the vapors of a combustible liquid will ignite and the flame front propagate across the head-space of the sample cup under the conditions specified by the test method.

Flash point tests are conducted by filling the test cup to the full indication mark, placing the flash cup into the test sample chamber then locking the cup cover into position.

Next, the user selects a predefined or user programmed test method, types in or accepts the expected flash point (EFP), optionally selects a product type, then hits the start button.

A Quick Test feature allows for determination of flash points of unknown materials beginning the test from ambient and proceeding with the test at an accelerated heating rate.

The unit is equipped with a differential Pt-100 RTD probe designed to duplicate the response time of a mercury-in-glass thermometer as per ASTM D93-02a and E1-03a. If a flash is not detected 30°C above the expected flash point or at 405°C, then the test is automatically aborted for safety.

Once analysis is complete the results are displayed to the screen and saved to the instrument hard disk drive. The results may be opened in a report generation program like MS Word or Excel and sent to a local or network printer. Once the results have been reviewed and accepted by the operator the results may be sent directly to a network folder for processing and direct entry into LIMS.

Once analysis is complete the instrument actuates the rapid cool-down system. The cool-down system is capable of reducing the temperature of the sample from 300 to 30°C in about 8 minutes in a laboratory with ambient conditions at 20°C. User can also manually switch to standard air cooling. Cooling the system will take a longer period of time however fan noise will be reduced.

## 1.4. Instrument Specifications

- Models:** K71000
- Electrical Requirements:** 115/230VAC 50/60Hz  
User selectable via switch located at the back of the analyzer
- Temperature Measuring Range:** Ambient to 405°C (761°F)
- Flash Detection System:** Differential Thermocouple,  
Ionization Detection
- Stirring Speed:** 0 to 300 RPM
- Heating Rate:** In accordance to ASTM D93 procedure A, B, C  
Quick Test (8°C/min - 10°C/min)
- Ignition Source:** Gas and Electric Igniter both equipped on cover assembly:  
- Software Selectable  
- User-Friendly Manual Switching
- Mechanical Lift:** Three (3) position mechanical lift system of cover / motor  
assembly, software selectable: Open – Clean – Test
- Cleaning:** Cover / Motor assembly lift features convenient cleaning  
position. At this position the user can easily remove the cover  
assembly and clean with appropriate solvent between tests.
- Ignition Test Frequency:** User selectable on per method basis (1°C/interval -  
20°C/interval)
- Cooling:** Integrated Dual Fan System: First (1) directly to cup, Second (2)  
to cool environment around test cup
- Barometric Pressure Correction:** Automatic Barometric Pressure Transducer for Flash  
Temperature Correction
- Interface Port:** RS232:1  
USB:2 (1–Front, 1–Back)  
Ethernet:1 (LIMS)
- Gas Supply / Connection:** Ignition Gas: LP Gas (Propane / Butane) or Natural Gas.  
Min. 3.45kPa (0.5psi). Max. 206.843 kPa (30.0psi)
- Display:** 8.4" LCD Touch Screen
- Temperature Sensor:** PT-100 in S/S sheath
- User Programmable Methods & Data Storage:** Capable of storing unlimited data runs and test methods
- Temperature Calibration:** Three (3) Types available:  
- 2 Point Sample Temperature (Standard)  
- Multipoint (>2) Temperature Calibration (Available as Option)  
- CRM Calibration – Built-In Software function to automatically  
correct as per CRM tested
- Security:** Three level password protection
- Key Safety Features:** - Collision / Interference Detection: Analyzer can sense user  
position around moveable parts and stop its motion  
- Fire suppression detection: Equipped with second gas line for  
connection to CO<sub>2</sub> or Nitrogen gas. Gas disbursement ring  
around test cup/cover saturated area with extinguishing gases.
- Ambient Temperature Range:** 10°C to 35°C
- Altitude:** Rated for use below 2000m

**Environmental Conditions:** As per section 1.4.1 of IEC 61010

**Dimensions:** Width: 10 7/8" (27.63cm)  
**(in.(cm))** Depth: 17.5" (44.45cm)  
Height:  
- Closed Test Position – 20" (50.8cm)  
- Fully Open Position – 26" (66.04cm)

**Net Weight:** 60 lbs (27.22 kg)

## 2. Safety Information and Warnings

### 2.1. Safety Considerations

The most important safety consideration is that people are operating this piece of equipment. The laboratory staff and management are responsible to assure that only authorized, trained and competent personnel use this equipment.

The use of this equipment may involve *hazardous* materials and operations. This manual does not purport to address all of the safety problems associated with the use of this equipment. It is the responsibility of any user of this equipment to investigate, research, and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

Test results from ASTM D93 flash point test are used along with other data to assess the flammable hazards of a material. By its very nature a flash point analysis is the performance of a hazardous activity (waving a flame above a heated flammable material in the presence of excess air) under carefully controlled conditions (limited small amount of material, ability to remove ignition source, ability to remove oxidizer). Still there are conditions that can cause operating problems during testing. Among the most well known are samples contaminated with water or light ends, and less commonly, samples which foam and cause overflow. Samples may also contain or be contaminated with acutely toxic materials or materials that when combusted pose a health hazard.

### 2.2. Unit Design

This equipment is specifically designed for use in accordance with the applicable standard test methods listed in section 1.2 of this manual. The use of this equipment in accordance with any other test procedures, or for any other purpose, is not recommended and may be extremely hazardous.



**WARNING:** The K71000 Automatic Pensky-Martens Flash Point Analyzer was designed to be the safest flash point instrument in the marketplace, however, there are safety concerns and hazards, which this instrument is not designed to address. The purchase and acceptance of this instrument signifies that the purchasing company and their agents, the end users, are responsible for establishing all safety and health practices and assumes full responsibility for safely using the K71000 Automatic PMCC Flash Point Analyzer.

### 2.3. Contaminated Samples

Samples contaminated with light ends (highly volatile petroleum products) may light and continue burning when the expected flash point is set above the fire point of the material. In addition, burning material may be ejected through the ignition aperture in the test cup cover. For this reason, the most recent updates to ASTM D93 require a first application of ignition at ambient temperature (<24°C below EFP) and every 10°C. This helps when the contaminant flashes at room temperature but does not address all contamination situations.

Samples contaminated with water can bump and eject hot and flammable material from the test cup.

At all times, refrain from leaning or bending over the test cup when the test is being carried out. An unexpected flash can cause serious injury to exposed body parts that are in close proximity to the test area. Ejected material may cause serious harm.

## 2.4. Safe Quick Test Method

The K71000 has a quick test option that begins testing at ambient then heats the sample at an accelerated pace while applying the igniter at 3°C increments. The detected flash is an estimate of the expected flash point which is then used in a subsequent run (under prescribed standard test conditions) to safely arrive at the flash point. The only disadvantage of this screening method is that it requires additional time and material to complete a safe analysis. The Maximum Quick Test Temperature is 370 °C.

**NOTE:** The user must set this prescribed end point prior to running a quick test. The set maximum run temperature is solely at the user's discretion.

**We recommend this method of screening for ALL samples.**

## 2.5. Fire Detection / Suppression and Draft Shield / Dome System

The K71000 comes standard with a fire detection and inert gas fire suppression system. This system is designed to flood the sample cup area with an inert gas, extinguishing sample based fires. The system is triggered when a high temperature event melts the thermal fuse. The open circuit condition triggers the flame suppression system. The electronics are extremely fast relying solely on electronic logic (no software). The flame suppression system also shuts off the ignition gas source, closes the cup cover by de-energizing the motor, and de-energizes the electric igniter if in use.



**WARNING:** Never operate the instrument without the draft shield making it difficult to inadvertently touch hot working surfaces.

## 2.6. Equipment Modification and Replacement Parts

Any modification or alteration of this equipment from that of factory specifications is not recommended and voids the manufacturer warranty, product safety, performance specifications, and/or certifications whether specified or implied, and may result in personal injury and/or property loss. Replacement parts must be O.E.M. exact replacement equipment.

## 2.7. Chemical Reagents Information

Chemicals and reagents used in performing the test may exhibit potential hazards. Any user must be familiarized with the possible dangers before use. We also recommend consulting the Material Data and Safety Sheet (MSDS) on each chemical reagent for additional information. MSDS information can be easily located on the internet at <http://siri.uvm.edu> or <http://www.sigma-aldrich.com>.

## 2.8. Additional Important Safety Information



**WARNING:** As an important safety precaution, **NEVER** use unregulated gas with the K71000 Pensky-Martens Closed Cup Flash Point Analyzer!

Use in an area that is adequately ventilated, preferably with an exhaust tube / pipe to remove any fumes that may be emitted during the test. Conduct tests behind a safety shield, especially if you are not sure of the flash point or the ignition temperature. Wear appropriate personal protective equipment (PPE) during testing.



**NOTE:** ASTM D93 specifically notes that a hood should not be operated during testing as excessive drafts can cause erroneous results!

Exercise caution in removing and replacing the cup in the furnace. Hot surfaces and substances may cause injury if they come in contact with the operator.

All connections should be properly made and tested for leaks prior to carrying out the tests.

The ignition gas source should be equipped with a proper safety regulator capable of delivering a maximum of 5 psi of pressure to the test flame assembly. Some propane regulators give pressure in inches of water (inH<sub>2</sub>O) at 60°F. A standard 11 inches of water (inH<sub>2</sub>O) regulator should give sufficient gas for normal use. Minimum pressure required is about 7 kPa or 1.0 psi.

The flame suppression (inert gas) source should be regulated to between 20 and 30 psi for safe use.

## 2.9. Other Important Hazards

Working surfaces on the instrument may become hot enough to produce severe burns even with momentary contact.

Open flames and electrically heated resistance elements are present. Direct momentary contact can cause severe burns.

The draft shield around the sample area also functions as a mechanical guard. The instrument should never be used if this guard is removed.



**WARNING:** Electrical hazards exist inside the instrument case. Lethal voltages and current are present. Only factory authorized or otherwise qualified personnel may repair or service this instrument. Only original parts may be used for repair. No substitution parts or alterations to this equipment are allowed; doing so may void the warranty.



### **PC Motherboard WARNINGS**

- Due to high voltages inside the instrument, under no circumstances should the instrument be opened or access covers removed while energized.
- Lethal voltages are present inside power supplies. Under no circumstances should Power Supply covers be removed. Power Supply warranties are voided once the cover is removed.
- For indoor use only. Please operate the power supply in a safe and dry environment.
- Do not insert any objects into the open ventilation or fan grill area of the power supply.
- The 24-pin main power connector has a detachable 4-pin connector. This 4-pin connector is not a P4 or ATX 12V connector. Please DO NOT force this cable in the P4 or ATX +12V socket on the motherboard.

## 3. Getting Started

The instructions for preparing the equipment assume that the user is aware of the contents of this document, which lists the warranty conditions and important precautions.

### 3.1. Packing List

- K71000 Automatic PMCC Flash Point Analyzer, 115/230V 50/60Hz
- Brass Test Cup with Handle
- Combination Gas/Electric Igniter
- Stirrer Shaft and Blade Assembly
- PT-100 Temperature Probe / Thermal Detector
- Ionization Detector
- Cover Assembly
- Draft Shield
- Test Cup Holder
- Stylus
- Temperature Calibration Cable
- Power Cords, 115V & 230V
- K71000-Manual K71000 Automatic PMCC Flash Point Analyzer Operation and Instruction Manual

#### Installed in the K71000

- Panel PC and Microprocessor Controllers
- Operating Software, Instruction Manual PDF, Recovery Software on Hard Disk Drive
- Thermocouple and Ionization Detection
- Fire Sensing and Suppression System
- Collision / Interference Detection

- Mechanical Lift System
- Dual Fan Cooling System

#### On Outside of Instrument

- Identification Plate
  - Model Number
  - Serial Number
  - Voltage / Hz / Phase / Amp
  - Company Contact Information
- COA Sticker (Microsoft Sticker is on Back Panel of Instrument)

#### Optional Accessories (purchased separately):

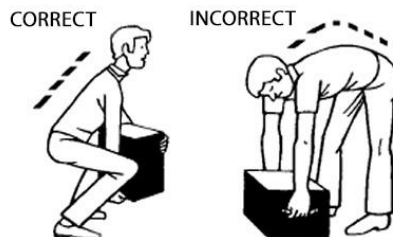
- Calibration Decade Box
- Stainless Steel Test Cup
- USB Printer
- Certified Reference Material

## 3.2. Unpacking

1. Check Shock Watch Label on Cardboard Box for indication of rough handling and possible damage.
2. Check labeling for correct orientation of instrument. (e.g. This Side Up)
3. Carefully open top of box with box cutter and remove packing foam.
4. Make two additional vertical cuts, using box cutter, along length of two sides of the box and remove packing foam.
5. Extract instrument and place on suitable cart for transportation to work area / lab bench.



**WARNING:** Be sure two or more individuals are available for extracting and lifting instrument from box to cart and from cart to bench. Individuals must lift in accordance to proper technique. See accompanying figure.



6. Lift instrument from cart and place on bench.
7. Ensure that all parts listed on the packing list are present. Inspect the unit and all accessories for damage. If any damage is found, keep all packing materials and immediately report the damage to the carrier. We will assist you with your claim, if requested. When submitting a claim for shipping damage, request that the carrier inspect the shipping container and equipment. Do not return goods to Koehler without written authorization.

## 3.3. Setup

**Equipment Placement:** Make sure the instrument is placed on a firm, level table in an area with adequate ventilation or in a hood. The unit may be leveled by making minor turning adjustments to the feet located at the base of the unit. Please note that Koehler does not supply a level with this equipment.

The instruments dimensions are:

Width: 10 7/8" (27.63cm)

Depth: 17.5" (44.45cm)

Height:

- Closed Test Position – 20" (50.8cm)

- Fully Open Position – 26" (66.04cm)

For proper operation the instrument requires adequate ventilation.

- It is recommended that approximately 15 cm (6 inches) of space be provided on either side of the instrument. This recommendation is dependent upon the lab environment and samples typically run. Samples with a higher flash point require increasing the heater temperature to high values.
- About 15 cm (6 inches) clearance is required behind the instrument for connecting gasses and utilities.
- The instrument is on feet and draws air from the bottom, exhausting to the top and sides. The bottom must not be obstructed. Dust must not be allowed to accumulate beneath the instrument.
- Do not obstruct top the top of the unit. This may damage the lift.

**Environmental Conditions:** The instrument environment must comply with the following conditions for proper setup:

- No / Low Dust



**NOTE:** Electronics lifetime may be reduced due to heat build-up resulting from dust contamination

- Distilled fuel must be wiped off of instrument work surfaces and not be allowed to collect. This is a flammability hazard and collects dust.
- Free of Corrosive Fumes
- No Direct Sunlight
- Not near heating or AC ventilation ducts
- No Vibrations
- Clearance from other instruments so as to not influence instruments ambient conditions
- Height of bench top must allow for easy viewing and use
- Temperature Range: 15 to 35°C (59 to 95°F)
- Maximum Rate of Change: 6°C (10°F) / hr
- Elevation to 2000 meters
- Relative Humidity: < 80%, non-condensing





**NOTE:** No warranty provision is made to cover instrument failure due to environmental conditions outside the above mentioned criteria. No warranty is provided that the instrument will produce acceptable results outside the above mentioned criteria.

**Ventilation.** A fume hood or exhaust system is required after performing a test. Flammable vapors and/or steam are generated during operation and must not be permitted to accumulate. A canopy-style hood may be used if the height from the top of the unit to the canopy is 5 feet or less. The exhaust blower should have a rating of 1000 C.F.M. or greater.

**Power:** Connect the line cords to properly fused and grounded receptacles with the correct voltage as indicated in section 1.3 or on the back of the unit. A switch located on the back of the unit allows the user to switch the input voltage to either 115VAC or 230VAC.



**WARNING:** Ensure the voltage type selected on the back of the unit matches the plug type used when powering the instrument.



**WARNING:** For safety, disconnect the power when performing any maintenance and/or cleaning. Do **NOT** turn the power on unless the bath is filled with the proper medium; otherwise, damage may occur to the unit and the warranty will be void.

Electrical supply circuitry, fusing, and wiring size for the K71000 Automated PM Flash Point Analyzer was selected according to pertinent. An IEC 302-C14 receptacle, is provided on the back panel of the instrument. An electrical cord with three conductors, 10 A must be used with this instrument. The cord is about 1 meter (3 feet) in length. One end is an IEC 320-C13 Plug which inserts into the IEC 320-C14 receptacle on the back panel of the instrument. The other end must be rated for a minimum of 10A and allow connection to the mains power (AC mains voltage value stated on the instrument name plate) in your country.



## 4. Descriptions

### 4.1. Front of Instrument

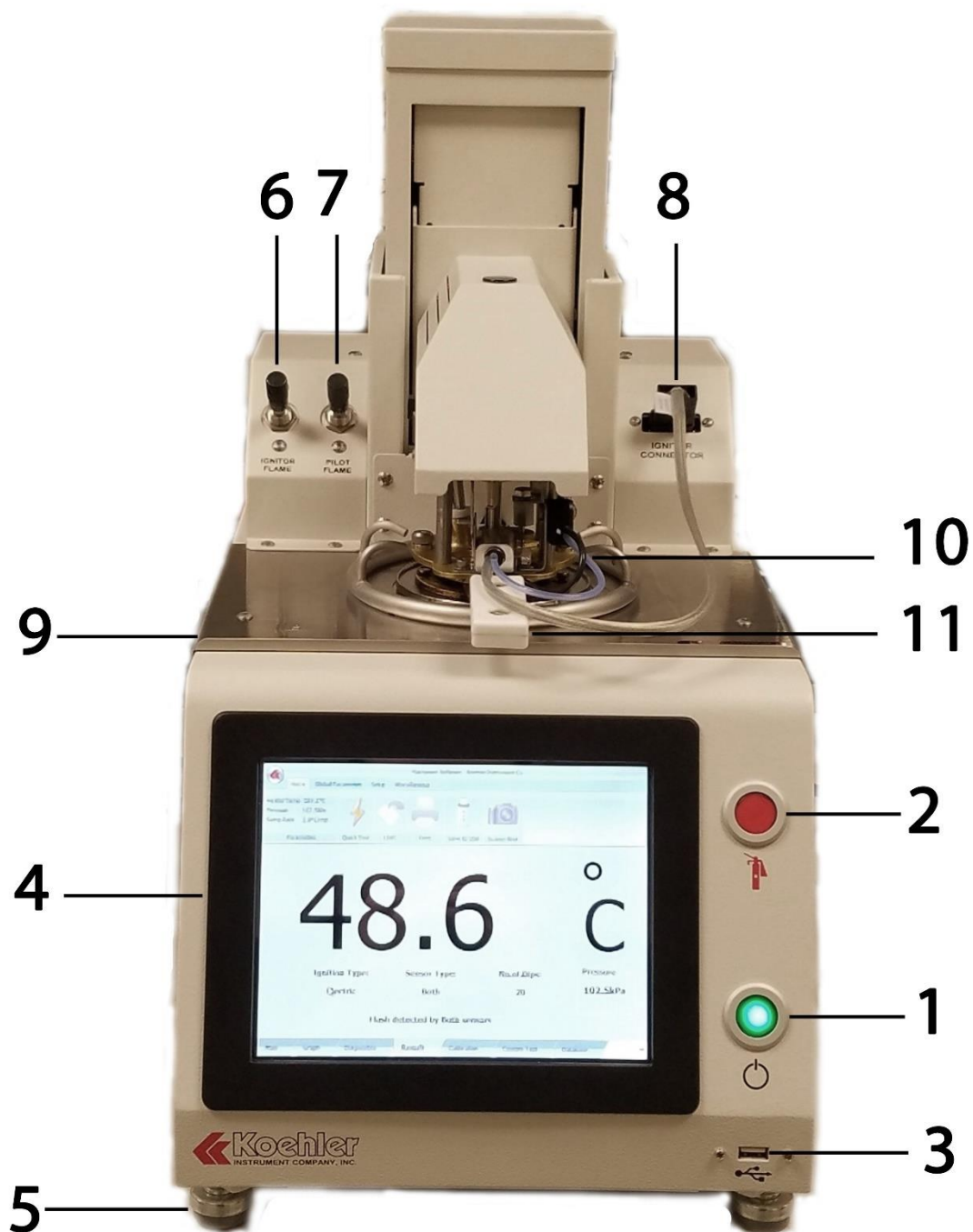


Figure 2. Instrument Descriptions (Front)

- 1. Power Button:** This button allows the user to turn the instrument on and off from the front side. The main power switch at the back of the unit (**Figure 2, Item 12**) must be switched ON prior to pressing on the power button.

2. **Emergency Fire Suppression Button:** Pressing this button initiates the integrated Fire Suppression System.



**NOTE:** Inert Gas must be connected to secondary gas port located at the back of the instrument for fire suppression system to function properly.

3. **USB Connection Port:** For connection of USB device to export test results, save software screenshots and upload factory software updates.
4. **Touch Screen Control Panel:** Main control point of instrument. Please refer to Section 5 for full operational details.
5. **Leveling Feet:** To make adjustments to instrument level for proper operation.
6. **Ignitor Flame Adjustment Knob:** Controls gas flow to ignitor flame for fine tuning flame size in accordance to test method ASTM D93.
7. **Pilot Flame Adjustment Knob:** Control gas flow to pilot flame for fine tuning pilot flame size. Pilot flame is designed to ensure ignitor flame remains lit during entire testing procedure.
8. **Ignitor Connection Port:** For connection of gas / electric ignitor assembly to instrument.
9. **Spill Guard:** To prevent sample from spilling or leaking on Touch Screen Control Panel.
10. **Draft Shield:** Provides user protection from test area. Protects test flame from external draft source.
11. **Test Cup:** Brass test cup equipped with heat resistant handle. Test cup locks in place for sample stabilization during testing.

## 4.2. Back of Instrument

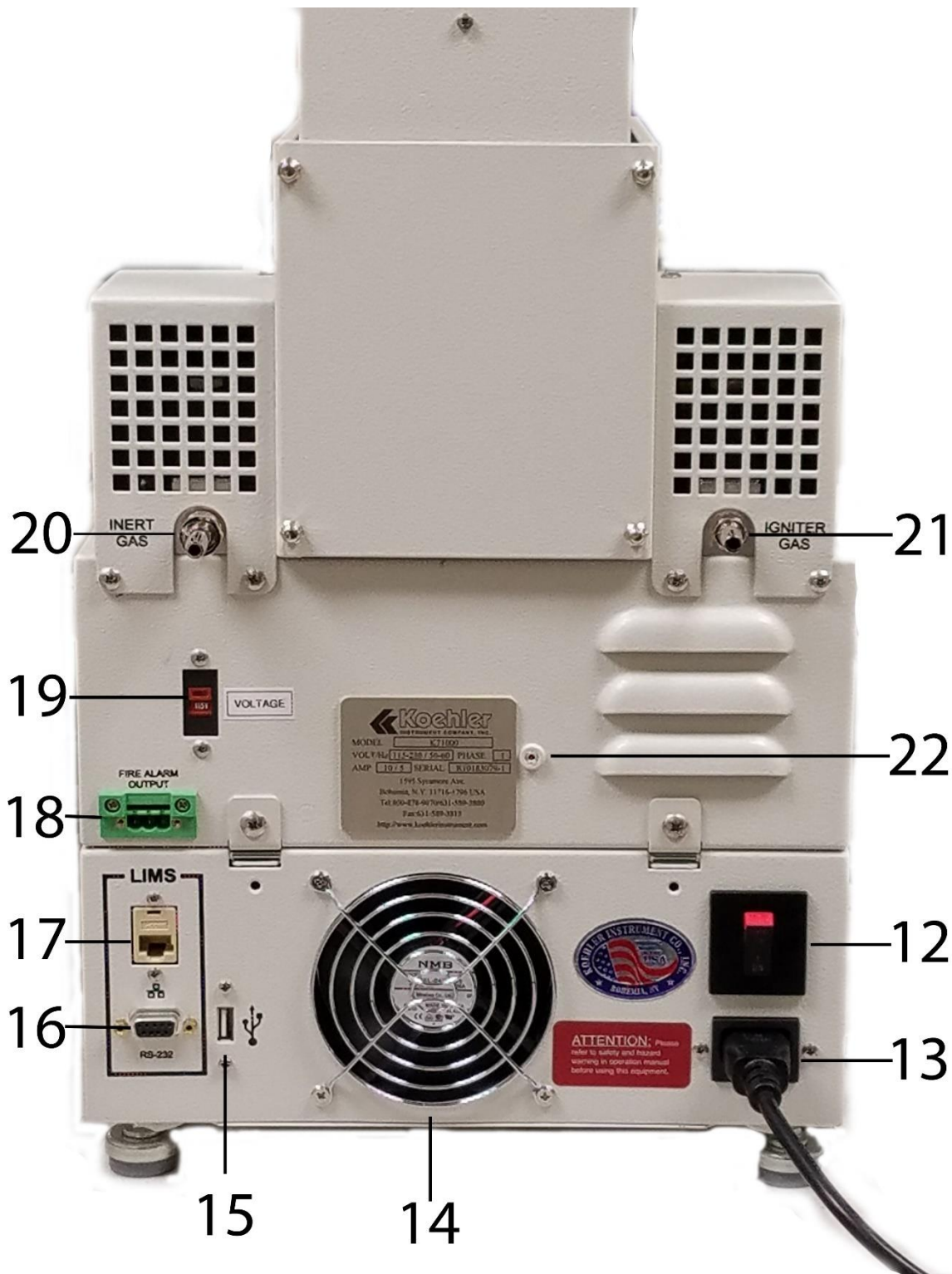


Figure 2. Instrument Descriptions (Back)

- 12. **Power Switch:** Controls power to the entire unit. To power on the instrument, first press the Power Switch to ON then press the Power Button (Figure 1, Item 1) on the front on the analyzer.
- 13. **AC Outlet:** The analyzer has been designed with an integrated C13 line socket in order to easily change plug types (115V or 230V). Internal voltage can be switch using the Voltage switch (Figure 2, Item 19).
- 14. **Cooling Fan:** Integrated cooling fans for cooling of electronics and test cup after testing.

- 15. **USB Port:** For connection to Keyboard, Mouse, Thumb Drive, or Printer.
- 16. **RS232 Port:** For connection to external PC or LIMS.
- 17. **Ethernet Port:** For connection to LIMS system or the Internet.
- 18. **Dry Contact Alarm Port**
- 19. **Voltage Switch:** The user may easily switch the internal voltage compatibility by switching up or down. The voltage type will be displayed on the switch accordingly.
- 20. **Inert Gas Inlet:** For connection of external inert gas source, typically Nitrogen. Analyzer must be connected to gas source for the integrated Fire Extinguishing System to be utilized properly.
- 21. **LPG or Natural Gas Inlet:** For connection to Natural Gas Source or Bottled Gas (LPG - Propane or Butane is typically used).
- 22. **Barometric Pressure Sensor:** Point where internal automatic barometric pressure adjustment system senses atmospheric pressure.

### 4.3. Cover Assembly

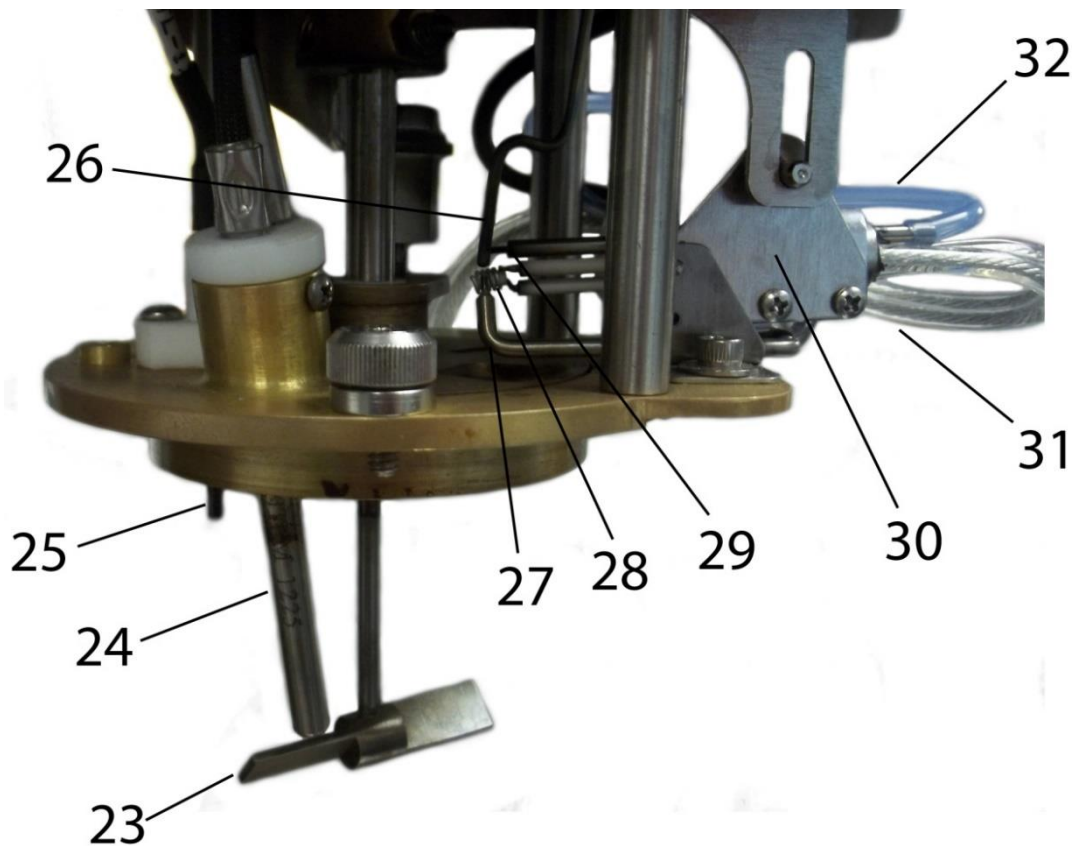


Figure 3: Instrument Descriptions (Cover Assembly)

- 23. **Stirring Propeller:** To maintain sample homogeneity throughout the duration of the test.
- 24. **Sample Temperature Probe:** Measures sample temperature during testing.
- 25. **Ionization Detector:** For automatic detection of the sample's flash point.
- 26. **Flame Detection Thermocouple:** For continuous monitoring of pilot flame during testing. In the event the test flame goes out, the Flame detection thermocouple will automatically detect this and initiate re-lighting of the flame.
- 27. **Pilot Flame:** The pilot flame ensures the test flame is lit prior to each test dip.

28. **Electric Ignitor:** Alternative means for applying heat source to initiate a flash point. The electric ignitor is also used to light the pilot flame.
29. **Gas Ignitor:** Referee means for applying heat source to initiate a flash point.
30. **Application Mechanism:** Houses gas / electric ignitor assembly. Automatically lowers ignitor into test cup at intervals in accordance to the prescribed test method.
31. **Electric Ignitor Cable:** Reinforced cable for connecting to Ignitor Connection Port (**Figure 1, Item 8**).
32. **Gas Tubing:** Provides means for gas source to reach gas ignitor.

## 5. Operation

1. **User Login** - Upon turning on the instrument the user will be prompted to select the desired user log in level. There are four levels to choose from. Factory preset pass codes for Levels 1, 2, and 3 are listed below:
  - Level 1 – 1234
  - Level 2 – 2345
  - Level 3 – 3

Levels 1, 2, and 3 can be custom configured by pressing the Set Access Priorities Key. The fourth or factory level is designed for administrative purposes only and specifically allows for access to the factory settings menu. From this screen, the user can also Change User Password, Set Access Priorities, Turn off Security and Contact Koehler.



Figure 4: User Login Screen

2. **Change User Password** - Clicking on the **Change User Password** button will bring up a screen that will allow the user to change the password of any of the four user levels. Choose the desired user level by clicking on the **Select User Level** pull down tab. Then type in the **Current Password** for that level, the **New Password**, then click **Save**.



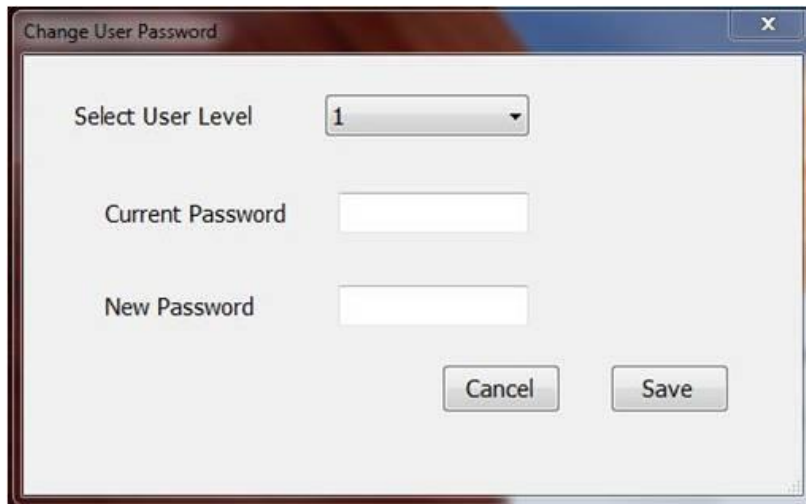


Figure 5: Change User Password Screen

3. **Set Access Priorities** - Clicking on the Set Access Priorities button will allow the user to select the which operations they want a particular user level to have access to. The user can choose to turn on or off access to the **Diagnostics, Calibration** and **Custom Test** Menus. Click **Save** when complete.

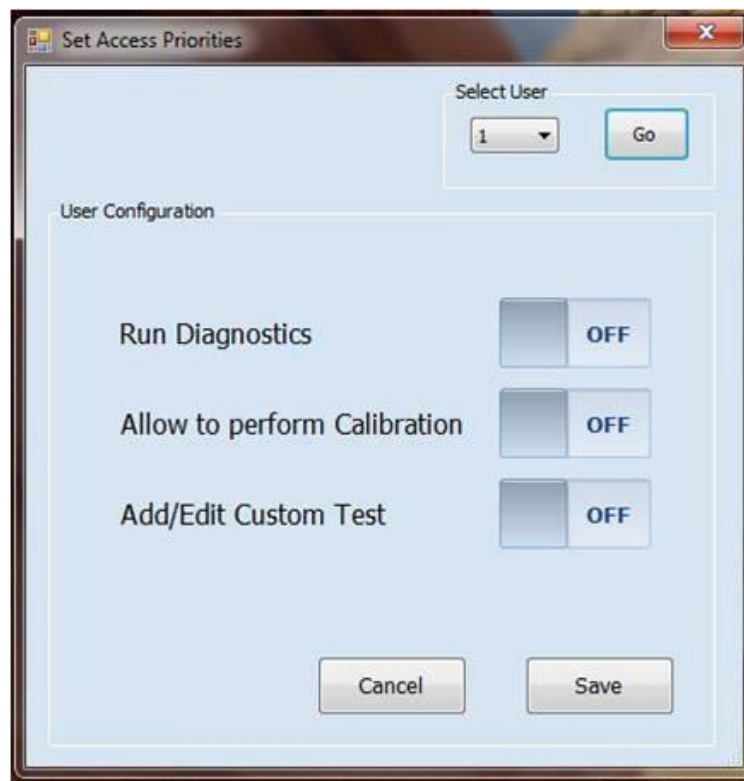


Figure 6: Set Access Priorities Screen

4. **Last Global Parameter** - Reverting back to the User Login Screen, After choosing your login preference you will be asked, "Do you want to load the last global parameter setting? Clicking **Yes** will automatically load all parameters that the user input in the global parameters menu from the previous login. Clicking **No** will automatically reset all global parameter settings back to the factory default.



Figure 7: Last Global Parameter Pop Up

5. **Main Home Screen** - After clicking **Yes** or **No** to the Last Global Parameter pop up, the user will be brought to the Main Home Screen. The Main Home Screen is comprised of four sections: An Upper Tab Section, a Lower Tab Section, a Side Bar and the Main Display section. Descriptions for each Section are given below:



Figure 8: Main Menu Screen

**Side Bar – Routine Testing/Quick Start Parameters Section:**




The **Test Parameters** section can be accessed by pressing the side bar on the far left side of the screen. In this section the user can input the **Expected Flash Point, Operator Name, Sample Name / ID.** and the Test Method. After all parameters are entered, Press the **START** button to initiate the test.



Figure 9: Main Menu with Side Bar Test Parameters

### Main Display Section:

This section displays the current temperature as measured by the stainless steel PT100 probe located in the cover assembly. Buttons for positioning the automatic lift system and checking the dip mechanism of the igniter are also found in this section.

- a. **Test Position** - Lowers lift to place cover assembly on test cup
- b. **Change Position** - Raises (or lowers) lift to middle position for ease of changing test sample cup
- c. **Clean Position** - Raises lift to highest position where it is easy to disassemble cover for cleaning
- d. **Stop Lift** - Pressing this button stops lift while in motion
- e. **Check Dip** - Pressing this button checks the operability of the dipping mechanism
- f.  **Green Check** - When this icon is displayed, the apparatus is ready for use.
- g.  **Fan Cooling** - When this icon is displayed, the apparatus is cooling down.
- h.  **Heat Icon** - When this icon is displayed, the sample is heating. See **Figure 13**.

### Upper Tab Section:

- a. **Home:** The Home tab is comprised of six (6) subsections:
  - **Parameters:** Displays current Heater Temperature, Pressure, and Heater Ramp Rate
  - **Quick Test:** Clicking the Quick test button will immediately start a test using the default quick test parameters. This mode is to aid in determining the flash point of an unknown sample. Details on this mode can be found in **Section 2.4** of this document.
  - **LIMS:** This function is only accessible when the user is in the results database screen. Data can be exported to a Laboratory LIMS system by clicking this button.
  - **Print:** This function is only accessible when the user is in the results database screen. Data can be sent to a printer by clicking this button.



- **Save to USB:** This function is only accessible when the user is in the results database screen. Data can be exported to a USB by clicking this button.
- **Screenshot:** This function is only accessible when a USB is connected to the analyzer. Clicking this button will automatically take a screen shot of the analyzer's display screen and send an image file to the USB device connected

**b. Global Parameters:** The Global Parameters tab is comprised of six (6) subsections:

- **Temp Unit:** Toggle between Temperature Units of Celsius or Fahrenheit
- **Sensor Selection:** To activate Thermocouple or Ionization Detection or Both
- **Ignition Method:** Toggle between Gas or Electric Ignition
- **Test Method:** Toggle between Standard test methods (ASTM D93 Procedure A, B and C or Custom Test Method). Available test methods will be displayed in the **Test Parameters - Side Bar** section in the **Select Test Method** pull down menu.
- **Product Type Go-No-Go:** This subsection serves as a database for any number of types of products. All product types created are stored and can be accessed in the pull down menu. To add a product type click on the **Add New** button. This brings up a pop up screen that allows for the user to input the name of the product, the unit of measure (in °C or °F), and a minimum and maximum flash point temperature limit. Clicking the **Remove** button brings up the same pop up screen and allows the user to select a product type from the pull down menu and delete it. Clicking the **Set Prd - None** button resets the product type in the pull down menu to the left.
- **Lift Sound - Turns On or Off** the audible sound alarm while the mechanical lift is descending.



Figure 10: Global Parameters Tab

**c. Setup:** The Setup tab is comprised of five (5) subsections:

- **Quick Test Setup:** Change / Save maximum Quick Test (QT) run temperature. Maximum Quick Test Temperature is 370 °C. **NOTE:** The user must set this prescribed end point prior to running a quick test. The set maximum run temperature is solely at the user's discretion.
- **LIMS Port Setup:** Change / Save the type of port, either RS232 or Ethernet, to connect to LIMS
- **LIMS Path Setup:** Change / Save path in which to export data to LIMS
- **Standard Test Parameters:** Change / Save minimum temperature in which the instrument lift can open safely and the temperature in which the cooling fan can be turned off
- **Inst ID Setup:** Change / Save Instrument ID

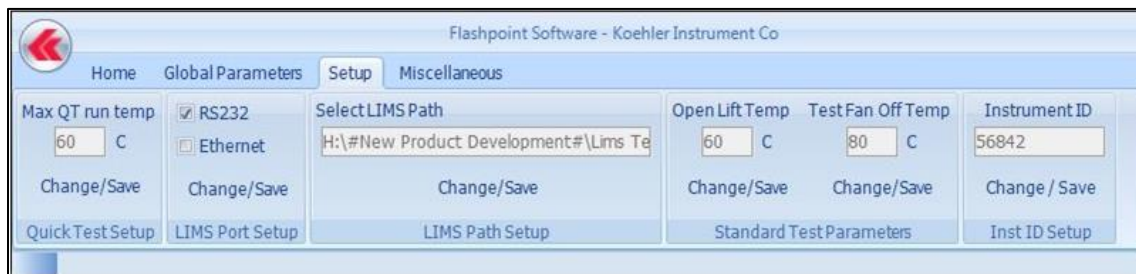


Figure 11: Setup Tab

**d. Miscellaneous:** The Miscellaneous tab is comprised of five (5) subsections:

- **Access Factory Setting:** Allows access to Factory Setting Menu. This function is only activated when logged in under Factory Login.
- **Software Update:** This function is only activated when a USB is connected to the analyzer with a software update file. Software can be updated to most current version when this function is accessed.
- **Instrument:** Under Construction.
- **Help:** Under Construction.
- **Touch Screen Calibration:** Allows the screen to be recalibrated to work more efficiently with the users fingers.

- **Version:** Displays the Model number, Firmware Version and PC Software Version.



Figure 12: Miscellaneous Tab

6. **Test Screen** - While the Flash Point test is being performed, the Test Screen will be displayed. See **Figure 13** below. The current temperature of the test is displayed at the center of the screen. The **Ignition Type** being used, the **Sensor Type** which will detect the flash point, the **Number of Test Dips** that have occurred so far and a **Heat Icon** showing that the system is heating up are also displayed on the screen. On the left side the test parameters are displayed. This includes the **Expected Flash Point**, the **Operator Name**, **Sample Name/ID.**, and **Select Test Method**. **STOP** allows the user to stop the test before it is over and **Add 10C to END Temp** allows the test to be extended. If at any point the operator wants to change the expected flash point, they can click **Change EFP**.

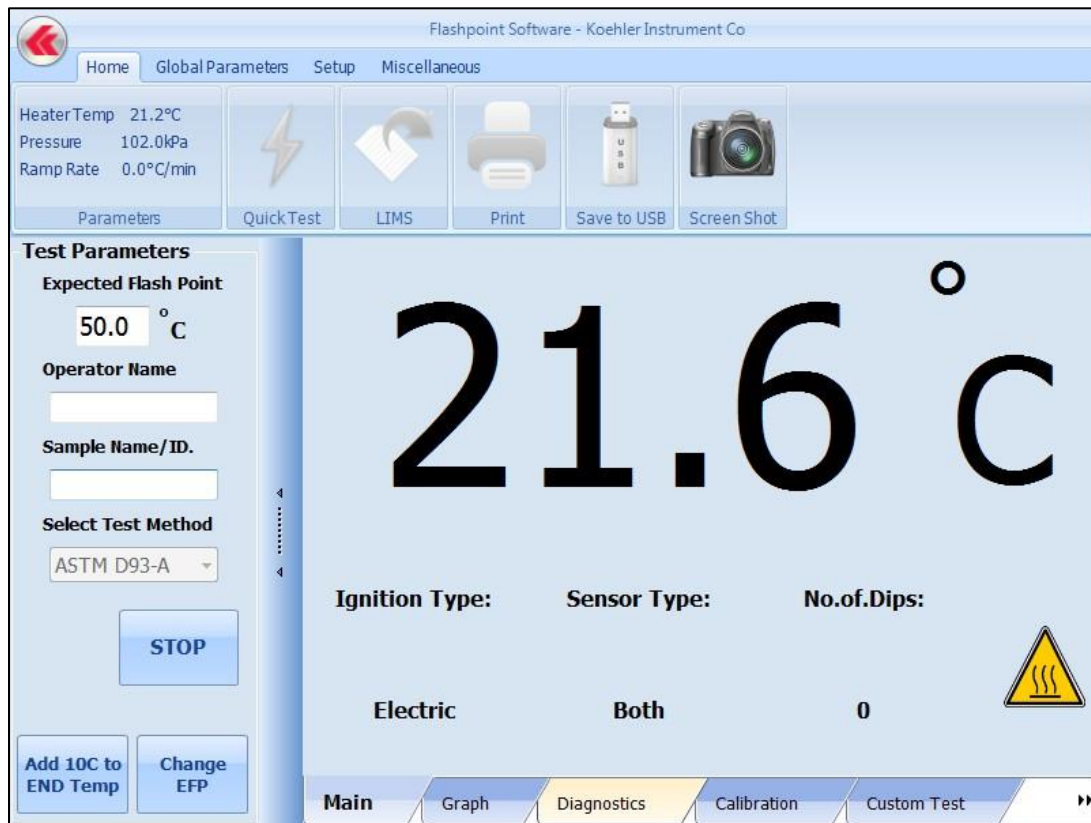


Figure 13: Test Screen

7. **Result Screen** - After a Flash Point Test is complete, the Results Screen will be displayed. See **Figure 14** below. The corrected flash point value is prominently displayed at the center of the screen. Additionally, the **Type of Ignition** used to perform the test is displayed as well as the **Sensor Type** which detected the flash, the **Number of Test Dips** that occurred throughout the duration of the test, and the **Barometric Pressure** measured during the test.

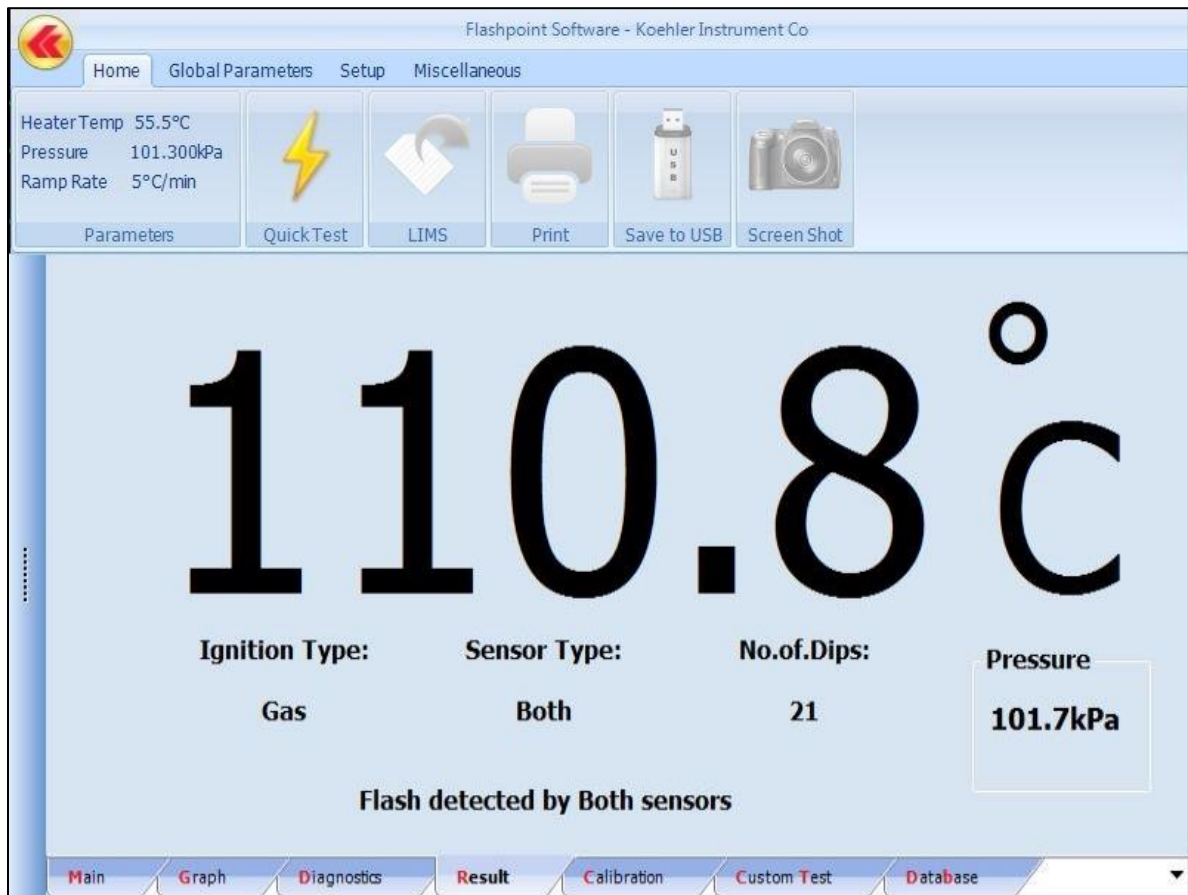


Figure 14: Result Screen

8. **Graph Screen** - Pressing on the Graph Tab in the Lower Tab Section of the Main Menu allows the user to see a graphical interpretation of the sample temperature and heating rate during a test. **Sample Temperature, Heater Temperature** and **Ramp Rate** are displayed at the right hand side of the screen. Accessing the graph screen will also add an additional tab to the Upper Tap Section titled **Graph Tools**. The Graph screen features the following functions:








- a.  **Zoom In**
- b.  **Zoom Out**
- c.  **Pan XY** - Provides cursor that can be moved along graph and display data
- d.  **Restore** - Resets X and Y Axis to default position
- e.  **Refresh** - Manual update of graph
- f.  **Clear** - Pressing this button will clear out the graph and the data will begin collecting again from the origin
- g.  **Save Graph** - Function is only activated when a USB is connected to the Analyzer. Clicking on button will upload graphical data to the connected USB as a CSV output.
- h. **Rate Graph Tab** - The Rate Graph Tab will display Heating Rate vs Time
- i. **Sample Graph Tab** - The Sample Graph Tab will display Sample Temperature vs Time



Figure 15: Graph Screen

- 9. **Diagnostic Screen** - Clicking on the Diagnostics Tab located at the Lower Tab Section of the Main Menu will bring up the K71000 Diagnostic Screen. The Diagnostics screen allows the user to check proper functioning of the following components by toggling an On/Off Switch:

- a. **Heater**
- b. **Ignitor** - Note also that there is an indicator below that displays the intensity of the ignitor in Amps
- c. **Gas Solenoid**
- d. **CO<sub>2</sub> Solenoid**
- e. **Fan** - For cooling electrical components
- f. **Fan2** - High Powered fan for cooling heating block after test
- g. **Dip**

The Diagnostics Screen also allows the user to test the functionality of the numerous mechanical functions of the analyzer. See descriptions below:

- a. **Find Dip Home** - Brings flame dip mechanism to home position
- b. **Find Lift Home** - Brings mechanical lift to Home Position (also considered test position)
- c. **Clean Position** - Brings mechanical lift to Clean Position (highest position)
- d. **Change Position** - Brings mechanical lift to Change Position (middle position)
- e. **Test Position** - Brings mechanical lift Test Position (home position)
- f. **Stirrer 105 RPM** - Rotates Stirrer Motor at 105 RPM (ASTM D93, Procedure A)
- g. **Stirrer 250 RPM** - Rotates Stirrer Motor at 250 RPM (ASTM D93, Procedure B)
- h. **Stirrer 300 RPM** - Rotates Stirrer Motor at 300 RPM (Maximum RPM)
- i. **All Motor Stop** - Stops Stirrer Motor
- j. **Move Lift** - Moves lift upwards

A Sensor Status bar can also be found on the right hand side of the Diagnostic Screen. The lights change from Red to Green when that particular sensor is activated. For example when the Collision Sensor is activated by an object coming in contact with the mechanical lift during descent, the light will briefly change from Red to Green.



Figure 16: Diagnostic Screen

**10. Calibration Screen** - Clicking on the Calibration Tab located at the Lower Tab Section of the Main Menu will bring up the Calibration Screen. The Calibration Screen is comprised of three calibration submenus: PT-100 Calibration, Pressure Calibration and Igniter Offset Calibration

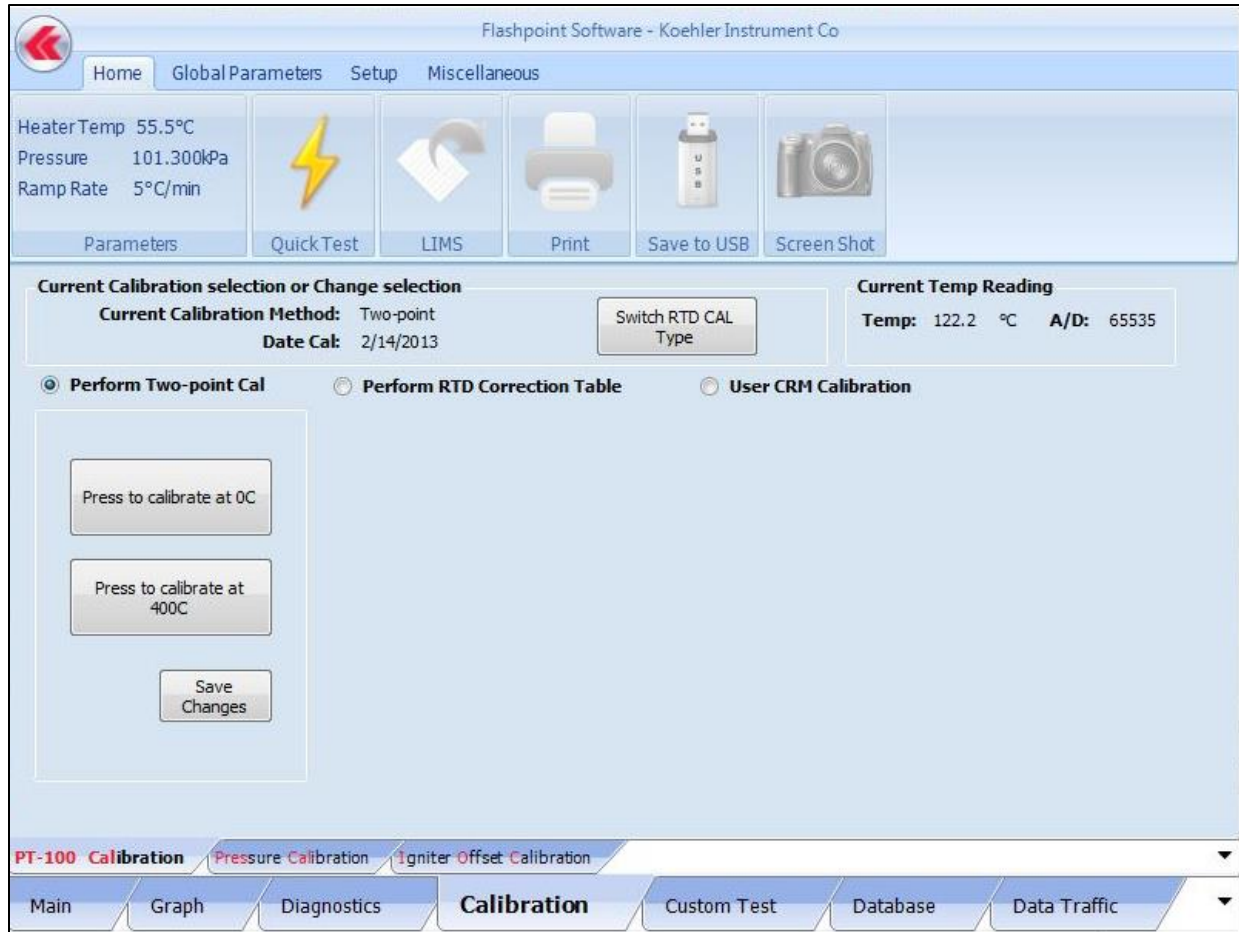
- a. **PT100 Calibration** - Three types of PT100 Calibration can be performed:
  - **Two Point Calibration**



- RTD Correction Table
- User CRM Calibration

**Two Point Calibration** as shown in **Figure 15** below is performed using an external PT100 Simulator Box (**Available as an Additional Accessory**).

1. Remove the PT100 ground plug from the side of the cover assembly
2. Insert the PT100 Simulator Box Connector
3. Set the Simulator Box to 0°C by turning the dial to the 0°C position
4. Click the **Press to Calibrate at 0°C** button
5. Set the Simulator Box to 400°C by turning the dial to the 400°C position
6. Click the **Press to Calibrate at 400°C** button
7. Click the **Save Changes** button



**Figure 17: Calibration Screen (Two Point Calibration)**

**RTD Correction Table** Calibration as shown in **Figure 18** below is performed in conjunction with external certified temperature measuring devices. This table lists 21 fields in which the user can input offset values for any of temperature values shown. This table is particularly convenient for those with Certified Digital Contact Thermometers or Certified Liquid in Glass Thermometers and are interested in offsetting the analyzer at one or more temperature values of their choice. Simply enter the offset value in the corresponding field and click **Save Changes** to implement the offset.

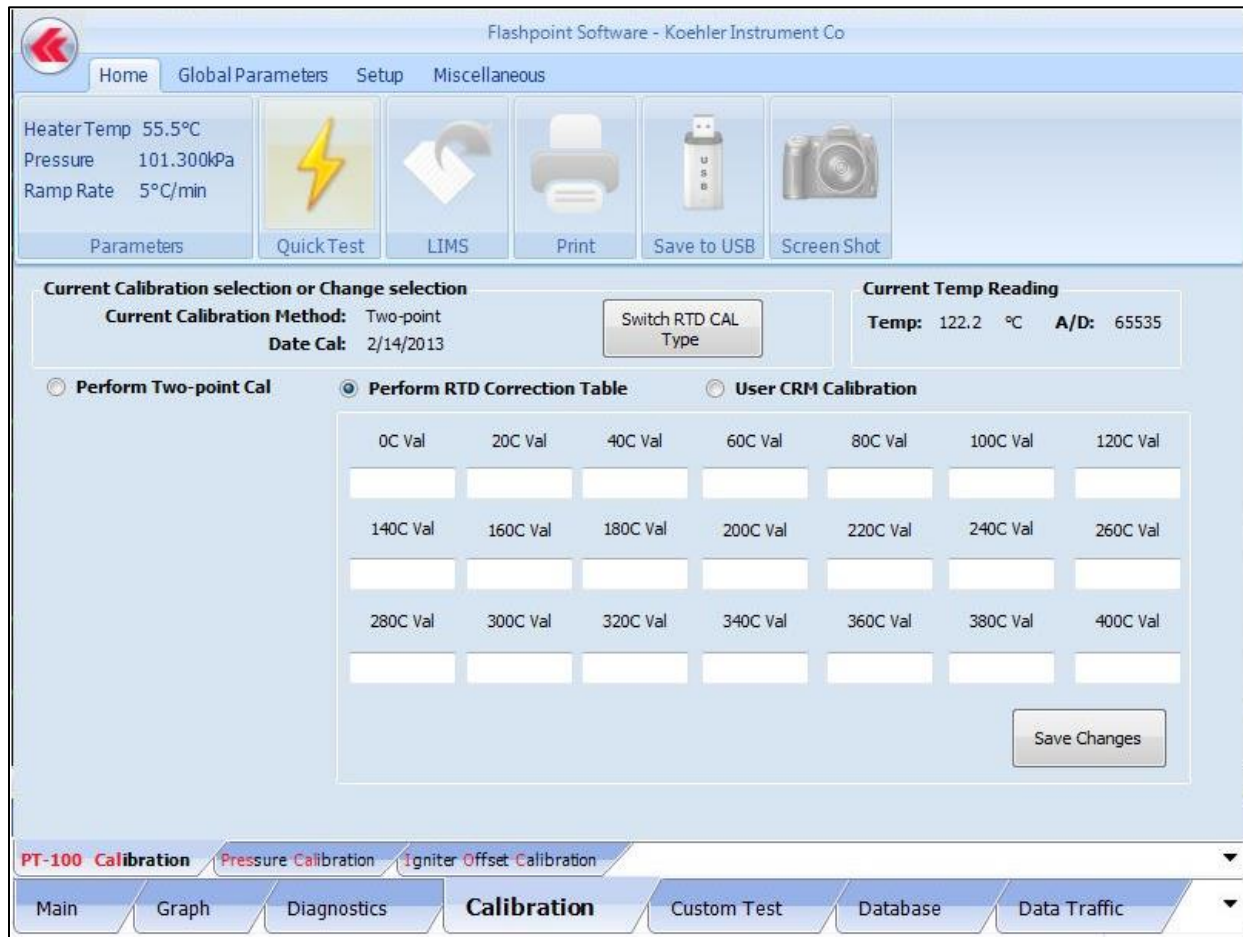


Figure 18: Calibration Screen (RTD Correction Table)

**User CRM Calibration\_Gas CRM Calibration** as shown in **Figure 19** below is a user defined table that allows for the input of flash point values of up to four (4) Certified Reference Material (CRM) samples using a Gas Ignition source.

1. Input the certified flash point value from the CRM bottle label or test certificate into the first column titled **CRM Flash Value**
2. Perform a series of four flash point tests with the analyzer using the CRM sample

3. Input the Flash Point Value as determined by the Analyzer into each **Run Column 1 - 4**
4. Click the **Save Changes** button to confirm the instrument calibration

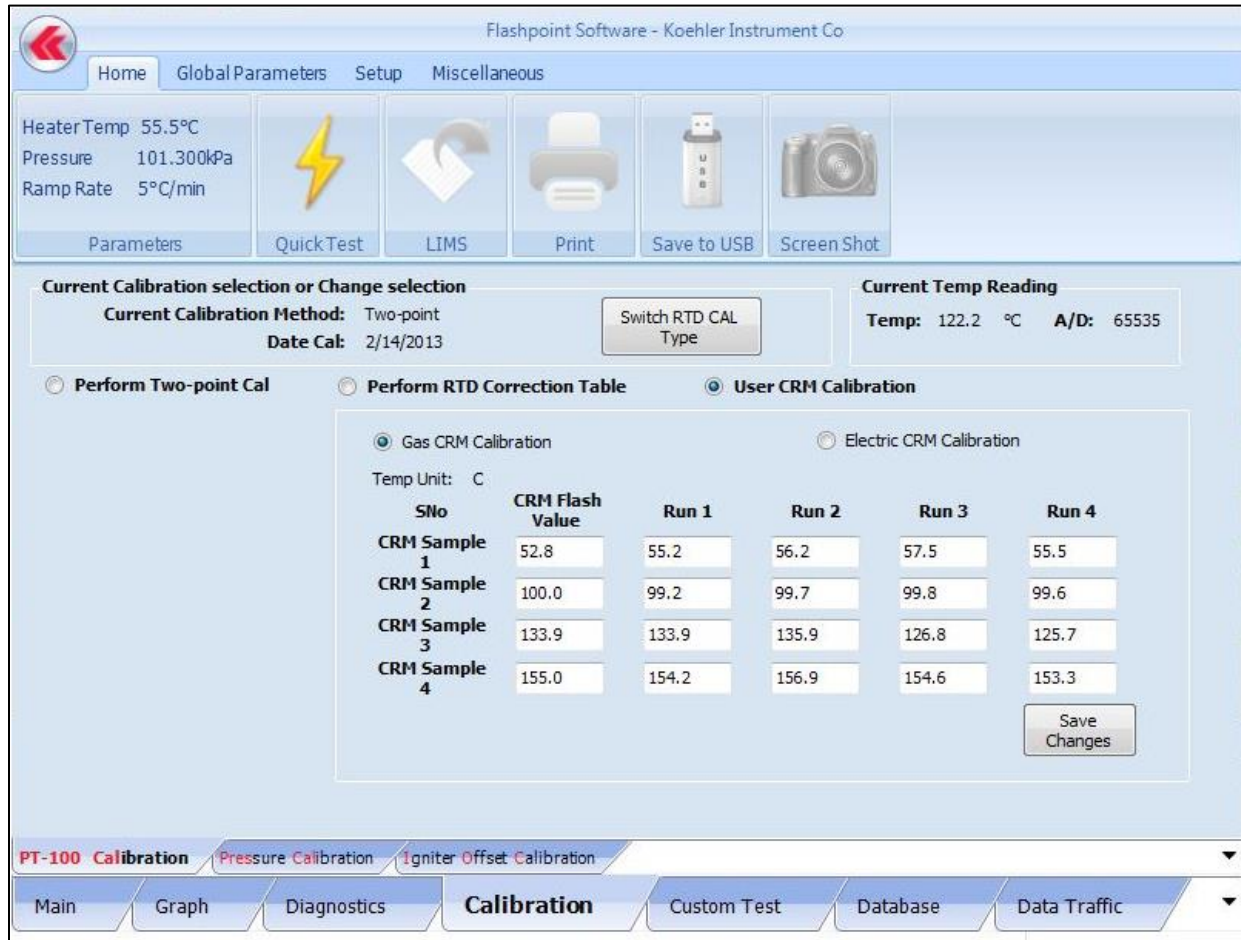


Figure 19: Calibration Screen (Gas CRM Calibration)

**User CRM Calibration\_Electric CRM Calibration** as shown in **Figure 20** below is a user defined table that allows for the input of flash point values of up to four (4) Certified Reference Material (CRM) samples using the Electrical Ignition Source.

1. Input the certified flash point value from the CRM bottle label or test certificate into the first column titled **CRM Flash Value**
2. Perform a series of four flash point tests with the analyzer using the CRM sample
3. Input the Flash Point Value as determined by the Analyzer into each **Run Column 1 - 4**



4. Click the **Save Changes** button to confirm the instrument calibration

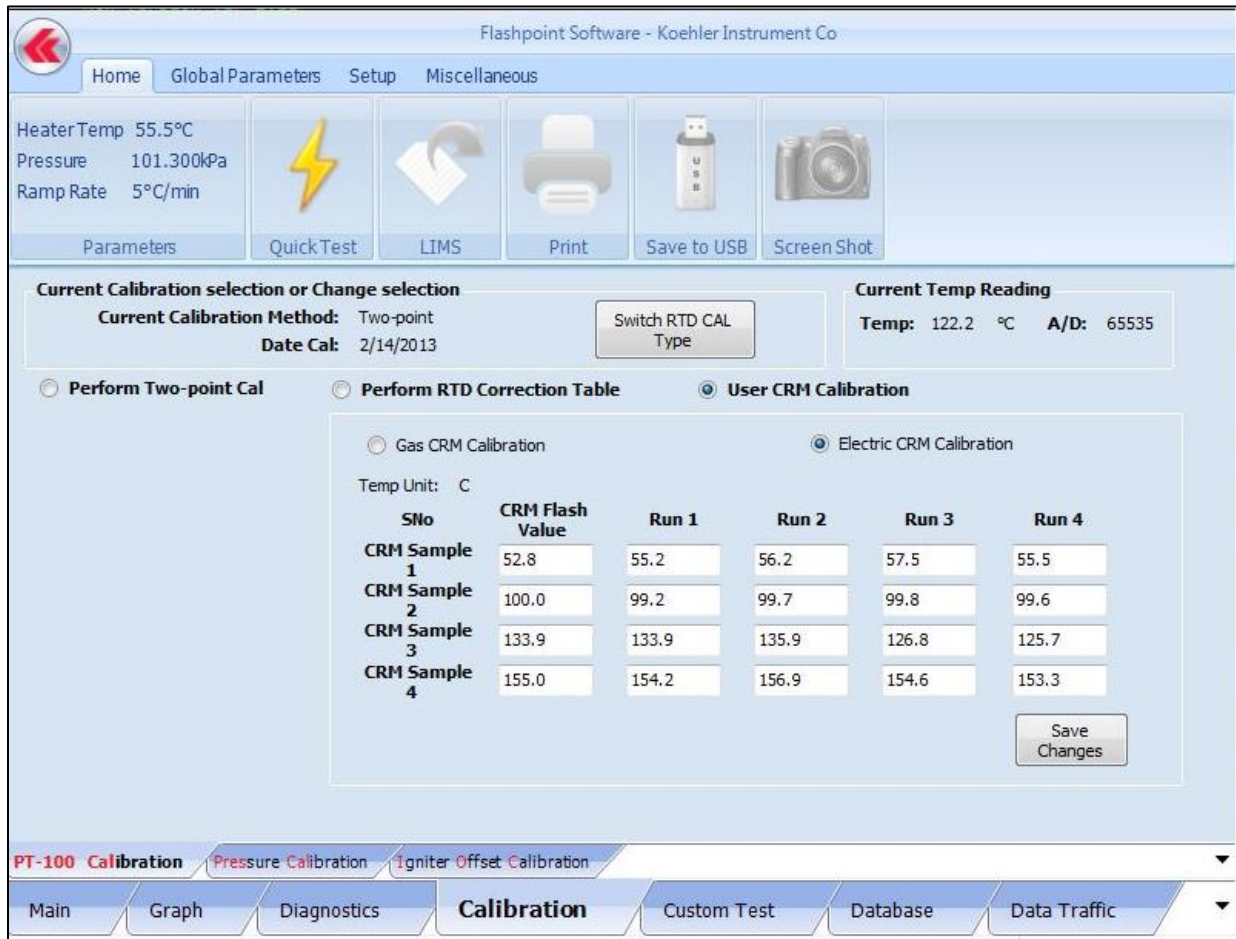


Figure 20: Calibration Screen (Electric CRM Calibration)

- b. **Pressure Calibration** - The Flash Point Analyzer is equipped with an Atmospheric Barometric Pressure Correction Feature. As pictured in **Figure 21** below the user can **Enter Atmospheric Pressure** in Kilopascals (kPa) into the empty field. The **Measured Barometric Pressure** is determined by the analyzers integrated barometer. Clicking Save Calibration Parameters will enter the Pressure Correction and update the **Date Calibrated**.

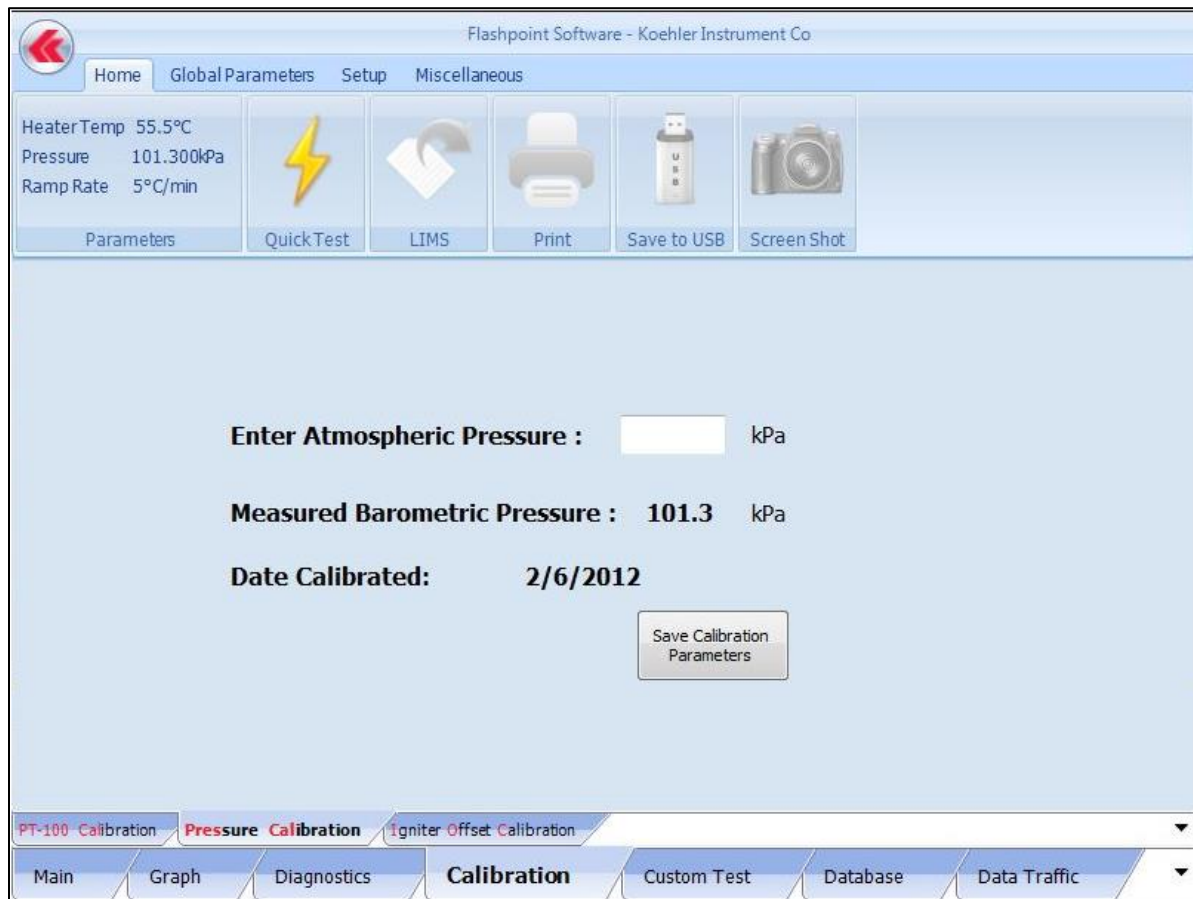


Figure 21: Calibration Screen (Pressure Calibration)

- c. **Igniter Offset Calibration** - An Electrical Igniter offset can be entered as a deg Celsius (°C) value as pictured in Figure 19 below. This method of calibration is useful when a material of known flash point is tested and the analyzer is displaying a value greater than the known value, e.g. known value is 53°C, Analyzer displays 55°C. Entering a 2°C value in the field will offset the analyzer measurement to display 53°C.

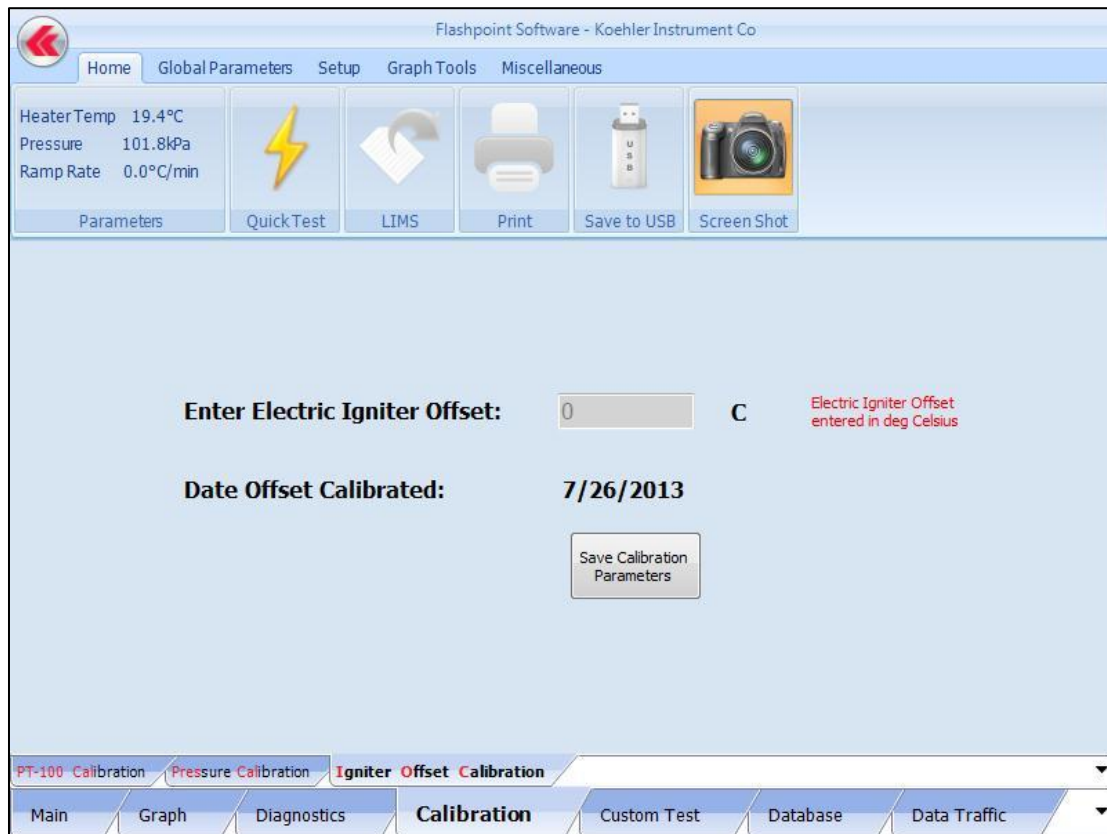


Figure 22: Calibration Screen (Igniter Offset Calibration)

**11. Custom Test Screen** - Clicking on the Custom Test Tab located at the Lower Tab Section of the Main Menu will bring up the Custom Test Method Parameters Menu as shown in **Figure 23**:

a. To set up a Custom Test Method:

1. Input **Method Name**

2. Input Test Method Parameters
  - Start Dip Temperature (Expected Flash Point (EFP) - X) (°C)
  - Dip Frequency (°C)
  - Motor Speed (RPM)
  - Heating Rate (°C/min)
  - End Test Temperature (EFP + X) (°C)
  - Fan Off Temperature (°C)
  - Pre-Heat Limit Temperature (°C)
  - Pre-Heat Ramp Rate (°C/min)
  - Open Lift Temperature (°C)
  - Soak Temperature (°C) (Typically used only for Asphalt / Bitumen Applications)
  - Soak Time (°C) (Typically used only for Asphalt / Bitumen Applications)
  - Apply Pressure Correction (YES/NO)
3. Click **Add Method** button

b. The Custom Test Method Screen can also be used to View, Clear, Edit and Delete Custom Test Methods. Select a Test Method from the **Select Program Name** pull down tab and click on the appropriate action button to the right to apply: **View, Clear, Edit, Delete**

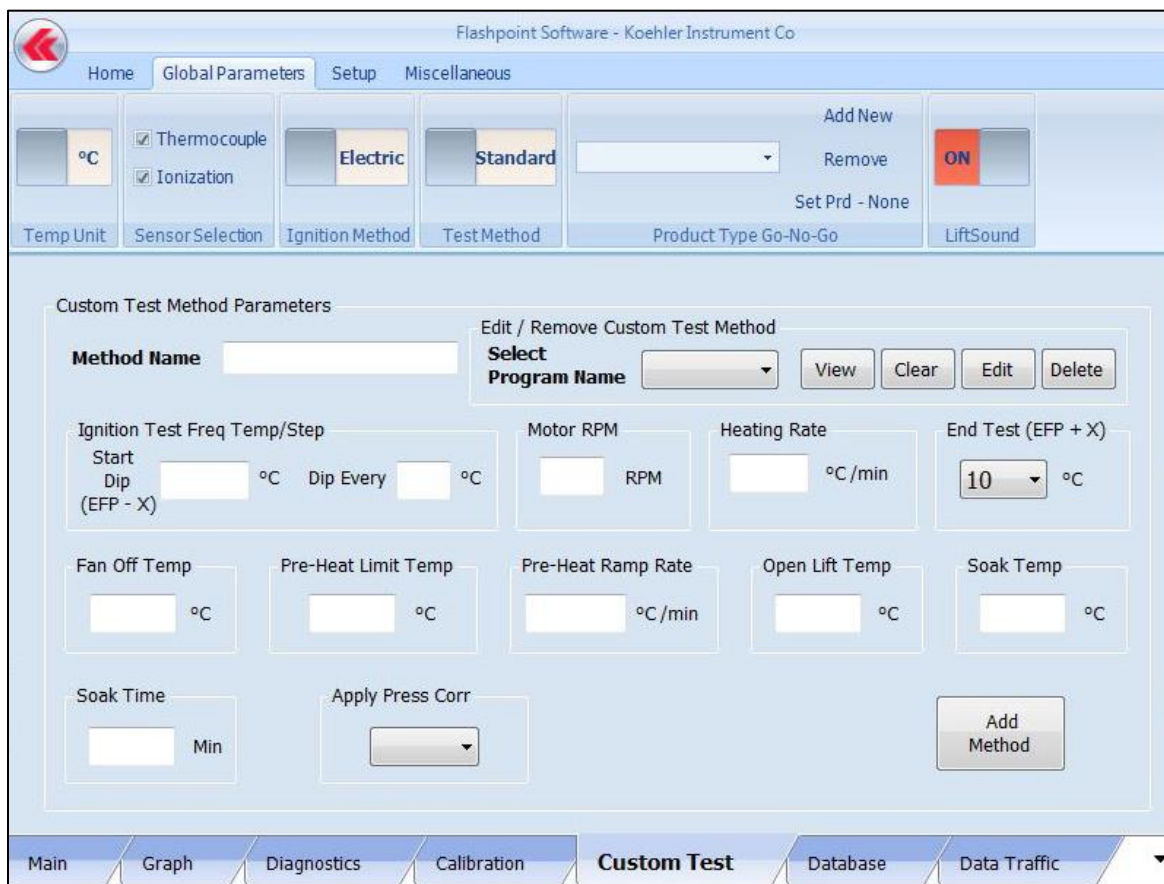


Figure 23: Custom Test Method Screen

**12. Database Screen** - Clicking on the Database tab will display the Analyzers Database as shown in **Figure 24** below. A maximum of 50 results will be accessible in this menu, the excess of which will be sent to an archive folder in the PC's hardware.

After a test is complete the result and corresponding test input and parameter data will automatically be sent to the database. Each test is listed in a single row with the information separated by column.

The user also has the option to delete or update the database list by clicking the **Delete** or **Update** buttons.

In addition, the user can also export selected data to **LIMS**, sent to **Print** or **Save to USB** from the Database Screen. Please note that each Icon will only become active (illuminate) if the respective external hardware is connected to the analyzer. E.g. the **LIMS** Icon will illuminate when the Ethernet or RS232 cable is connected to the Analyzer.

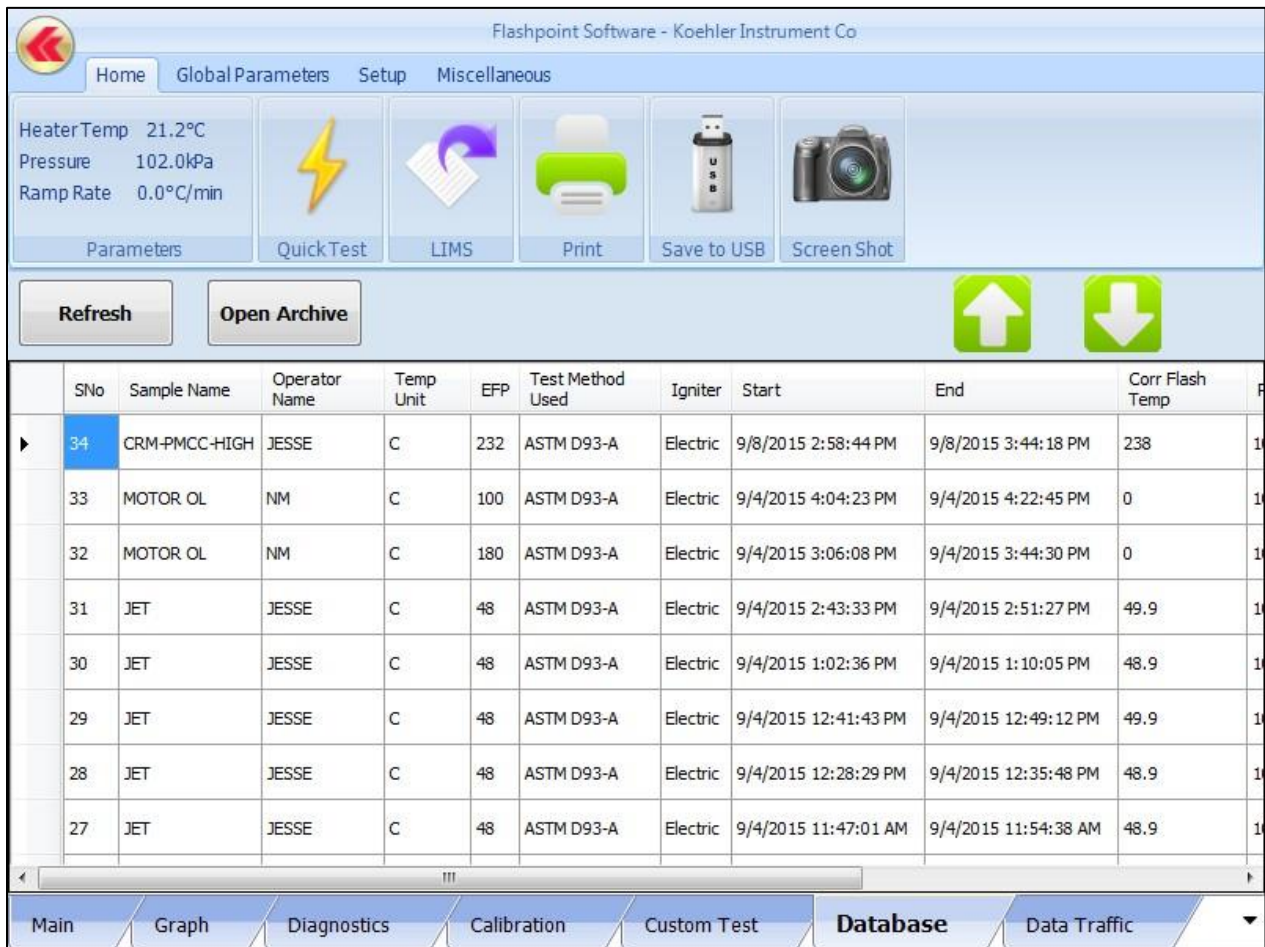


Figure 24: Database Screen

Double clicking on a data set allows for another window to popup that allows viewing the information for that specific trial to be displayed easier. **Figures 25 and 26** shows the **Flash Point, Sample Name, Operator Name, Expected Flash Point, Ignition Type, Method Used,** and **Barometric Pressure** measured during the test. The **Toggle Units** button allows for the temperature units to change from Celsius to Fahrenheit and vice versa depending on what the user needs.



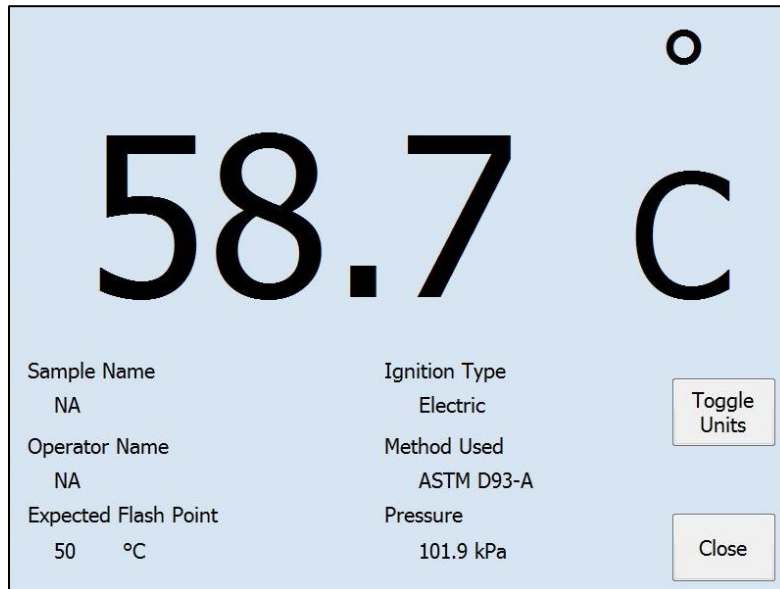


Figure 25: Database Result View Celsius

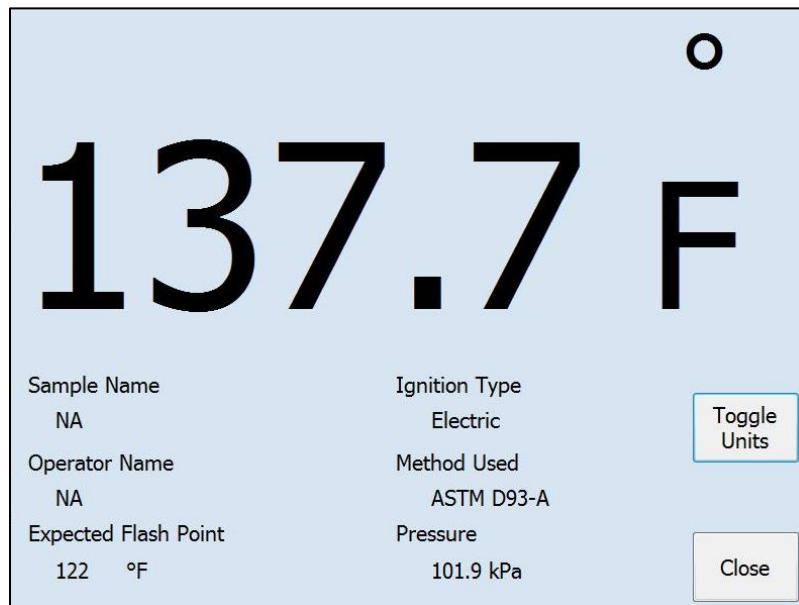


Figure 26: Database Result View Fahrenheit

Highlighting a data set and clicking on the **Print** button will cause a temporary **Print Result** Screen to appear followed by a **Printer Options** Menu. See **Figures 27** and **28** below. Once the appropriate printer is selected, click the **Print** button to send the test result to the Printer.

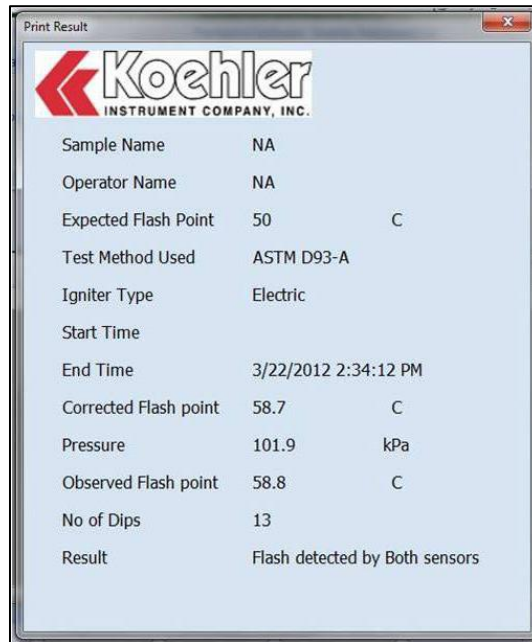


Figure 27: Print Result Screen

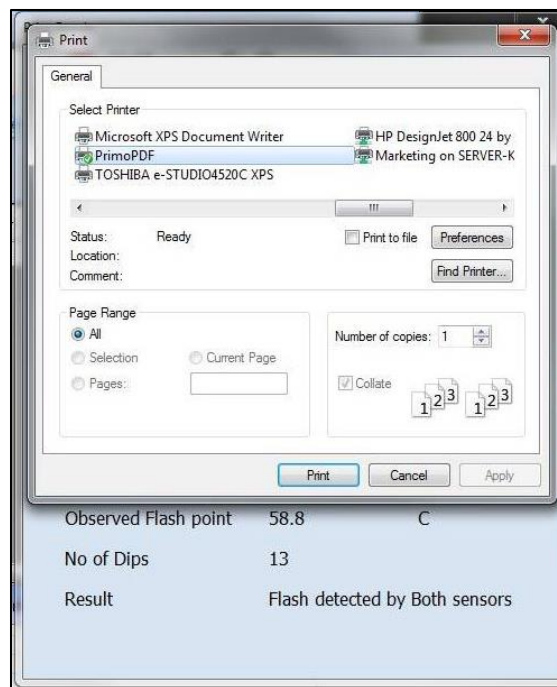


Figure 28: Printer Options Screen

**13. Data Traffic** - Clicking on the Data Traffic Tab will display the analyzers platform for showing the data traffic or communication data between the systems PC and Microprocessor as shown in **Figure 29** below. When the user first enters this menu, the display screen will be blank. Clicking on the **Monitor Traffic** box will begin displaying the data communication. At this time, a screenshot can be taken of the current data being displayed. The user can also insert a USB drive at this time and click the

**Record Traffic** box. This function is useful in a troubleshooting situation. A file containing a record of the data traffic can be useful for a Koehler Technician for diagnosing a problem.

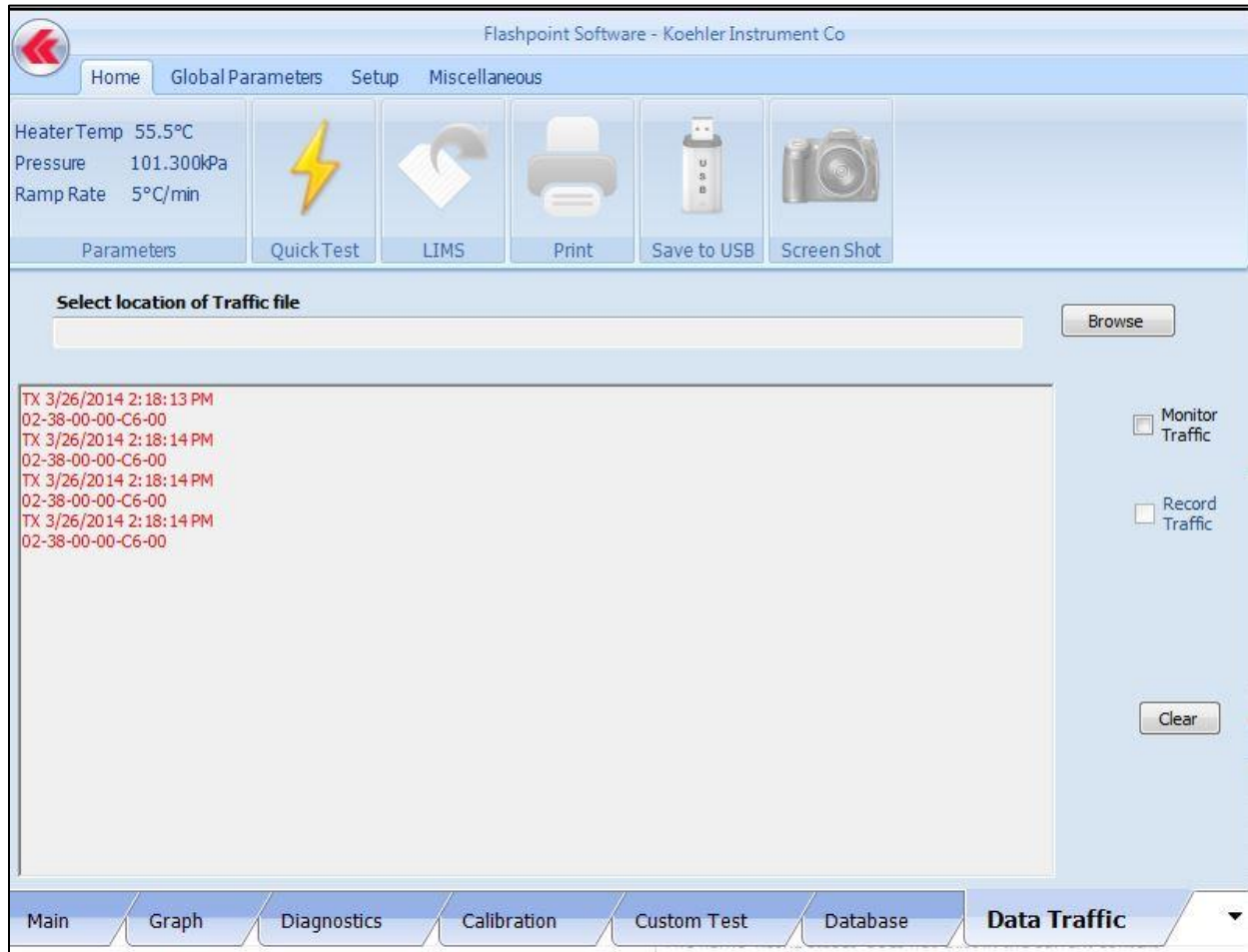


Figure 29: Data Traffic Screen



## 6. Service

Under normal operating conditions and with routine maintenance, the K33900 6-Unit Existent Gum Evaporation Bath should not require service. Any service problem can be quickly resolved by contacting Koehler's technical service department either by letter, phone, fax, or email. In order to assure the fastest possible service, please provide us with the following information.

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Date of Shipment: \_\_\_\_\_

## 7. Storage

This laboratory test instrument is equipped with electrical components. Storage facilities should be consistent with an indoor laboratory environment. This testing equipment should not be subjected to extremes of temperature and/or moisture.

This equipment was shipped from the factory in a corrugated cardboard container. If long term storage is anticipated, re-packing the instrument in a water-resistant container is recommended to ensure equipment safety and longevity.

## 8. Warranty

We, at Koehler, would like to thank you for your equipment purchase, which is protected by the following warranty. If within one (1) year from the date of receipt, but no longer than fifteen (15) months from the date of shipment, Koehler equipment fails to perform properly because of defects in materials or workmanship, Koehler Instrument Company, Inc. will repair or, at its sole discretion, replace the equipment without charge F.O.B. its plant, provided the equipment has been properly installed, operated, and maintained. Koehler Instrument Company must be advised in writing of the malfunction and authorize the return of the product to the factory. The sole responsibility of Koehler Instrument Company and the purchaser's exclusive remedy for any claim arising out of the purchase of any product is the repair or replacement of the product. In no event shall the cost of the purchaser's remedy exceed the purchase price, nor shall Koehler Instrument Company be liable for any special, indirect, incidental, consequential, or exemplary damages. KOEHLER INSTRUMENT COMPANY, INC. DISCLAIMS ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. Please save the shipping carton in the event the equipment needs to be returned to the factory for warranty repair. If the carton is discarded, it will be the purchaser's responsibility to provide an appropriate shipping carton.

## 9. Returned Goods Policy

To return products for credit or replacement, please contact Koehler Customer Service with your purchase order number, our packing list/invoice number, the item(s) to be returned and the reason for the return. You will be issued a Returned Authorization (RA) number, which must be prominently displayed on the shipping container when you return the material to our plant. Shipping containers without an RA number prominently displayed will be returned to the sender. Goods must be returned freight prepaid. Returns will be subject to a restocking charge, the application of which will depend upon the circumstances necessitating the return. Some returns cannot be authorized, including certain products purchased from outside vendors for the convenience of the customer, products manufactured on special order, products shipped from the factory past ninety (90) days, and products which have been used or modified in such a way that they cannot be returned to stock for future sale.



