



K102XX AUTOMATIC ANILINE POINT APPARATUS

OPERATION AND INSTRUCTION MANUAL

REV B

KOEHLER INSTRUMENT COMPANY, INC.

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

PETROLEUM TESTING & ANALYSIS INSTRUMENTATION • CUSTOM DESIGN & MANUFACTURING

CERTIFICATE OF CONFORMANCE

Aniline Point Apparatus K102XX

This certificate verifies that part number K102XX, Aniline Point Apparatus, was manufactured in conformance with the applicable standards set forth in this certification.

Specifications:

- ASTM D611
- IP 2
- ISO 2977
- DIN 51775
- FTM 791-3601
- NF M 07-021

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.



Jesse Kelly
Application Engineer
Koehler Instrument Company



EC Declaration of conformity

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

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.

2004/108/EC The Electromagnetic Compatibility Directive
2006/42/EC The Machinery Directive by way of the Low-Voltage directive 2006/95/EC

And hereby declare that:
Equipment : **Aniline Point Analyzer**
Model Number(s): **K10290**

Qualifications:


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

and

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 2006/95/EC
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 (1900 VAC, 60 sec.) as detailed in the product's technical documentation.
EMC	Meets the essential requirements of EMC Directive 2004/108/EC by engineering design review and by meeting the requirements of Conducted Emissions Test for Group 1 Class A as detailed in the product's technical documentation.
EN 55011:2007	



James R. Ball
Dir. Research & Development

1595 Sycamore Av.
Bohemia, NY 11716
United States of America
July 26, 2013

www.koehlerinstrument.com

631-589-3800

WEEE Directive Compliance Statement

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	10
1.1	<i>Koehler's Commitment to Our Customers</i>	10
1.2	<i>Recommended Publications</i>	10
1.3	<i>Electrical Requirements</i>	10
2	Safety Information and Warnings	11
3	Getting Started	11
3.1	<i>Packing List</i>	11
3.2	<i>Unpacking</i>	11
3.3	<i>Installation Instructions</i>	11
3.4	<i>Assembly Instructions</i>	12
4	Operation	13
4.1	<i>Cleaning the Test Cell</i>	14
5	Service Instructions	14
6	Trouble-Shooting Guide	14
7	Service	14
8	Replacement Parts	15
9	Storage	15
10	Warranty	15
11	Returned Goods Policy	15
	Assembly and Wiring Diagrams	16
	Notes	19

1 Introduction

Koehler Model K102XX Automatic Aniline Point Apparatus performs aniline point and mixed aniline point determinations automatically by means of a modified thin film technique (ASTM D611 Method E). Characterization of pure hydrocarbons and an indication of the aromatic content of hydrocarbon mixtures are determined.

This manual provides operating instructions for the K102XX Automatic Aniline Point Apparatus, and should be used in conjunction with applicable standard test methods.

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 more than 50 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
<http://www.koehlerinstrument.com>

1.2 Recommended 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

ASTM Publication:

- ASTM D611: Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents

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 2977

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 2: Petroleum Products and Hydrocarbon Solvents – Determination of Aniline and Mixed Aniline Point

4. Deutsche International Norm (DIN)

DIN Publication:

- DIN 51775

5. Federal Test Method (FTM)

FTM Publication:

- FTM 791-3601

1.3 Electrical Requirements

Model No	Voltage	Frequency
K10200	115V	60 Hz
K10290	220-240V	50/60 Hz

2 Safety Information and Warnings

Safety Considerations. 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.

Equipment Modifications 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.

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.

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>.

Aniline:



WARNING: Poison! Read the Material Safety Data Sheet before using.

- Harmful if swallowed, inhaled, or absorbed through the skin
- Use goggles, safety clothes and gloves previous to aniline
- 100 ppm dangerous to life and health
- Target organs affected: Eyes, skin, mucous membranes, respiratory and gastrointestinal tracts, central nervous

system, liver, kidneys, bone marrow, and blood

- Combustible

n-Heptane:



WARNING: Flammable. Harmful if inhaled.

- Keep away from heat, sparks, open flames and any other source of ignition
- Keep container closed
- Use with adequate ventilation
- Avoid prolonged breathing of vapor or spray mist
- Avoid contact with eyes, skin or clothing

3 Getting Started

3.1 Packing List

- K102XX Automatic Aniline Point Apparatus
- K10210 Standard Pyrex Test Cell with Drain

Accessories (purchased separately):

- 250-000-33F ASTM 33F Thermometer
Range: -36.5 to +107.5°F
- 250-000-33C ASTM 33C Thermometer
Range: -38 to +42°C
- 250-000-34F ASTM 34F Thermometer
Range: 77 to 221°F
- 250-000-34C ASTM 34C Thermometer
Range: 25 to 105°C
- 250-000-35F ASTM 35F Thermometer
Range: 194 to 338°F
- 250-000-35C ASTM 35C Thermometer
Range: 90 to +170°C

3.2 Unpacking

This unit comes packed in a special carton with foam inserts protecting the unit. Remove the unit and foam inserts (taped together) from the carton. Carefully remove the inserts from the unit and be very cautious not to damage the delicate glass cell. Place the unit on a firm, level table away from direct sunlight which may affect sensitivity of the photocell.

3.3 Installation Instructions

Ventilation: A fume hood or exhaust system is required when testing aniline.

Air Supply: Air pressure should be maintained at a minimum of 20 psi.

Connect the line cord to a properly fused and grounded receptacle with the correct voltage as stated in the Electrical Requirements section. To double check the voltage requirements, refer to the information plate on the back of the unit.

Before plugging in this unit, be sure all switches are off.

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

- No / Low Dust
- No direct sunlight
- Not near heating or AC ventilation ducts
- No Vibrations
- Clearance from other instruments
- Temperature Range: 5 to 40°C
- Elevation to 2000 meters
- Relative Humidity: < 80%

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.



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.

3.4 Assembly Instructions

1. Connect the alligator clips to the heating and cooling tube terminals on top of the unit and connect the plug into the receptacle in the top of the instrument.
2. Connect the air supply line to the fitting located at the rear of the cabinet. Air pressure is set by backing off the control valve before the air line is turned on. Pressure can then be increased to the proper amount by screwing the Air Valve Control (located above the line switch) in clockwise. When the apparatus is in

operation, the air pressure should be maintained at a minimum of 20 psi.

3. Close the stopcock on the Pyrex Test Cell.
4. Insert the platinum RTD probe into the Pyrex Test Cell, making sure the bottom of the probe is approximately 1/8" above the propeller blade of the stirrer. The probe holder is adjustable and should be firm around the RTD probe.

4 Operation

1. Mix the sample to be tested according to the instructions in any of the standard test methods mentioned in the Introduction of this manual.
2. Inject the mixture into the Pyrex Test Cell using a pipette or syringe through the projecting spout of the Pyrex Test Cell.

Warning: Do not turn the heater on without liquid in the cell.

3. Turn ON the Line Switch (located at the lower right-hand side of the control panel).
4. Turn ON the Motor Switch (located next to the Line Switch). Adjust the Motor Control Dial (located at the upper left-hand side of the control panel) to a setting between 50 and 70. This will supply sufficient agitation to completely mix the sample.
5. Turn ON the Heater Switch and the Air Valve Switch (located at the lower left-hand side of the control panel).

Note: The apparatus will operate without cooling air for samples with an aniline point above room temperature. However, the use of air will increase the speed of the cycle.

6. Turn the Heater Control Dial (located above the Heater Switch) to maximum.
7. Turn the Light Control Dial (located above the Air Valve Control) all the way clockwise.

The green light will be on. Then decrease the light intensity until the red pilot light (indicating the heater is in operation) goes on. A setting between 30 and 50 will service most oils.

8. Allow the unit to run until the red and green lights go on and off alternately, indicating that the cloud and clear points (aniline point) have been reached. When the aniline point is reached, the cycle of cooling and heating (indicated by the green and red lights) should be approximately the same. This can be adjusted by decreasing the heat until the red and green lights remain on for approximately the same length of time. Allow 30 seconds for stabilization to be reached, and read the aniline point from the digital thermometer display.
9. Once the aniline point is reached, the apparatus will accurately hold the solution at this temperature long enough for the operator to record the temperature.

For light samples, the light intensity required is not as great as required for dark samples. External cooling is not necessary for solutions that have an aniline point above room temperature.

In the relatively few instances where the aniline point is below room temperature, the air line should be run through an outside cooling agent such as liquid nitrogen.

4.1 Cleaning the Test Cell

1. Turn OFF the Heater Switch and Air Valve Switch.
2. Open the stopcock and drain the sample into a waste container while the motor is running. Close the stopcock and flush the cell one or two times with solvent into a waste container while the motor is running.
3. Turn OFF the Motor Switch and Line Switch.
4. For thorough draining of the solvent, a vacuum line may be attached to the bottom of the drain with the stopcock open to remove the last few drops of solvent. The apparatus can now be used for the next sample or stored away in a safe place for future use.

5 Service Instructions

Under normal conditions, service is not required. However, in the event that a problem should arise, please contact Koehler immediately so that we can address your problem as soon as possible.

Koehler Instrument Company, Inc.
1595 Sycamore Avenue
Bohemia, NY 11716
Phone:
Phone: (631)589-3800
Fax: (631)589-3815
email: sales@koehlerinstrument.com

6 Trouble-Shooting Guide

The Sample will not Heat:

1. Check to ensure that the HEATER switch is in the ON position.
2. Check to ensure that the HEATER CONTROL dial is turned ON.
3. Check the heater terminal connections on top of the unit.
4. Check the element in the heating-cooling tube. If the filament is missing or broken, replace the heating-cooling tube (P/N: K10220)

The Sample will not Stir:

1. Check to ensure that the MOTOR switch is in the ON position.
2. Check to ensure that the MOTOR CONTROL dial is turned up.
3. Check to ensure that the cable from the drive motor is connected to the socket.
4. Check to ensure that the flexible stirrer cable is intact.
5. Replace motor as needed.

Will not Cycle:

1. Turn the LIGHT CONTROL dial up to increase the light intensity.
2. Check to ensure that the test cell is properly aligned in the instrument. The indented sides of the cell should be even with the light source on one side and the photocell assembly on the other side.
3. If these adjustments do not correct the problem, turn the HEATER switch to the OFF position on the sample from the test cell.
4. Turn the LIGHT CONTROL all the way up.
5. Place a business card in front of the photocell assembly on the right-hand side of the test cell. Remove and replace the card. The light should cycle ON and OFF as the card is removed and replaced.
6. Replace the photocell assembly as needed. Access to the photocell is obtained by removing the back cover of the unit and the photocell assembly shroud (P/N: K102-30).

7 Service

Under normal operating conditions and with routine maintenance, the K102XX Automatic Aniline Point Apparatus 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: _____

8 Replacement Parts

Part Number	Replacement Part
K10210	Pyrex Test Cell with Threaded Ring
K10220	Heating/Cooling Tube
K102-3	Pyrex Tee
K102-6	Stirrer
283-120-001	Solenoid Valve
280-115-001	Variable Transformer
288-115-001	Stirrer Motor
K102-12	Pressure Regulator
045-000-001	Pilot Light Body Cap, Red
045-000-003	Pilot Light Body
279-115-001	Lamp
277-000-001	Fuse Holder
278-010-001	Fuse, 10 Amp
050-001-009	Switch
K102-30	Photo Cell Assembly
K102-31	Light Source
045-000-002	Green Lens Cap
250-115-002	Digital Thermometer 115/230V
265-400-004	RTD Temperature Probe (10")
240-230-001	Transformer to 115V

9 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.

10 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

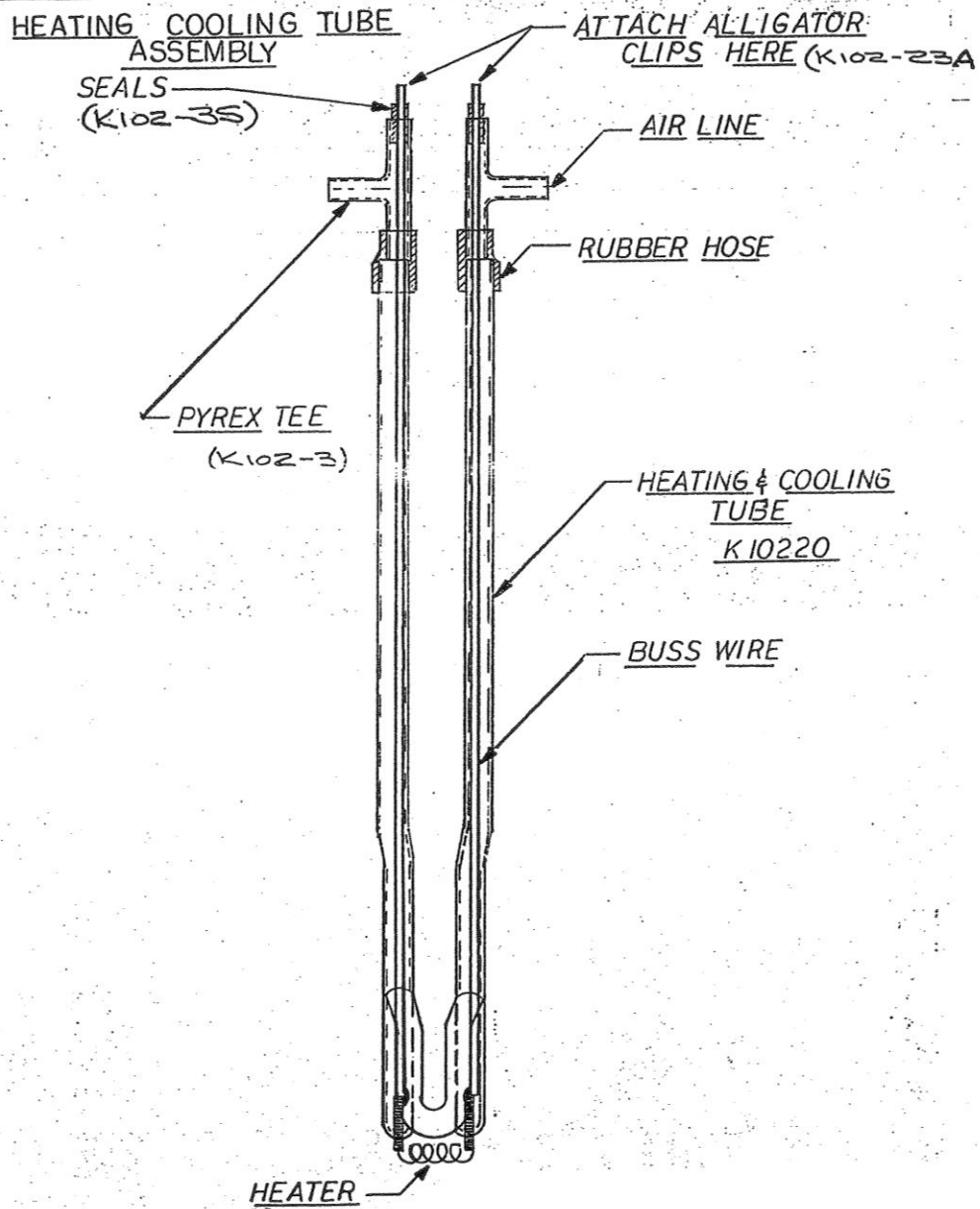
the date of receipt, but no longer than fifteen (15) months from the date of shipment, Koehler equipment fails to perform properly because of defects in materials or workmanship, Koehler Instrument Company, Inc. will repair or, at its sole discretion, replace the equipment without charge F.O.B. its plant, 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.

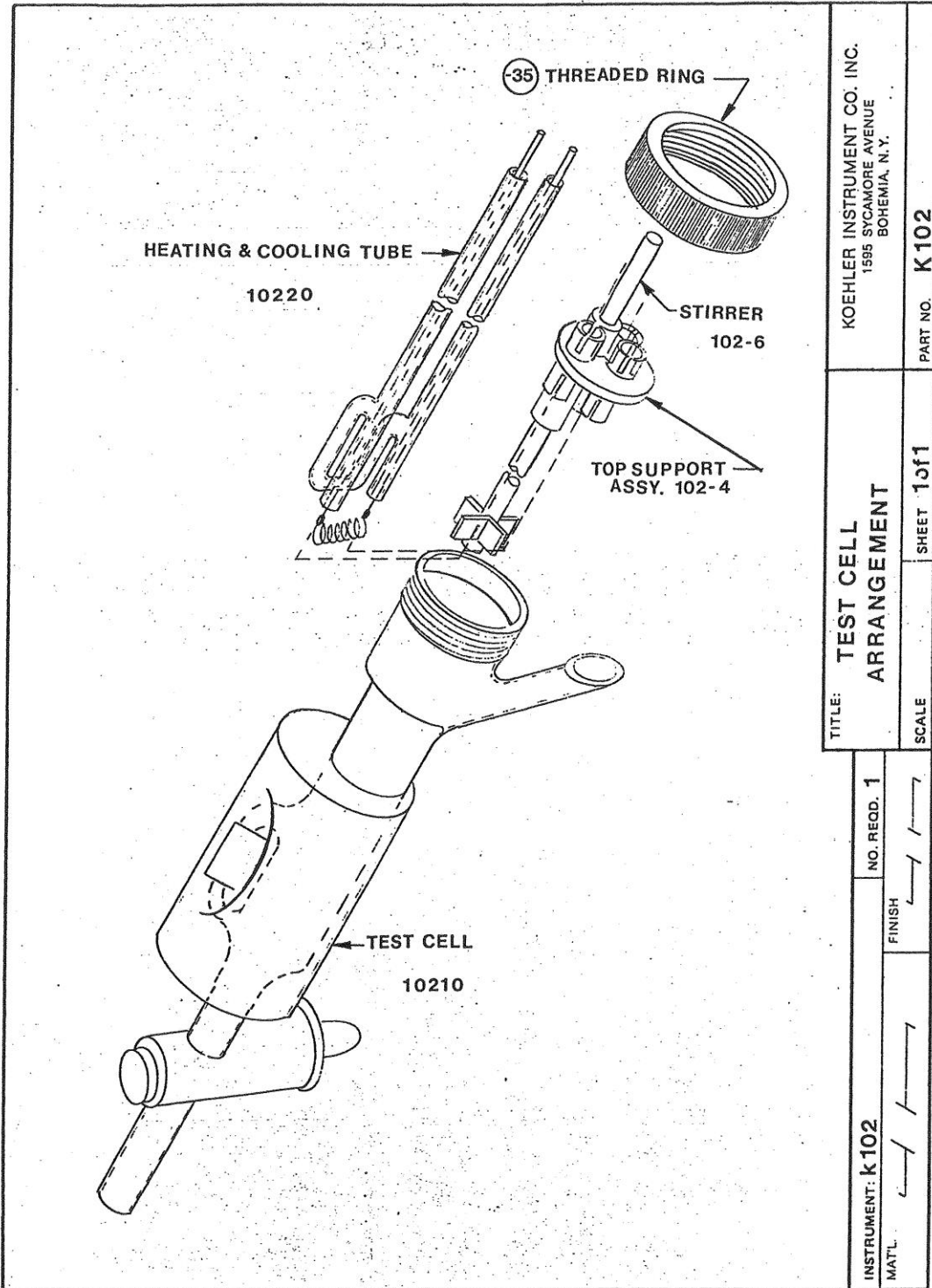
11 Returned Goods Policy

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 with 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.

Assembly and Wiring Diagrams

K10200 AUTO-ANILINE





INSTRUMENT: k 102		NO. RECD. 1	
MATL.	FINISH	SCALE	
		SHEET 1 of 1	
TITLE: TEST CELL ARRANGEMENT		PART NO. K 102	
		KOEHLER INSTRUMENT CO. INC. 1595 SYCAMORE AVENUE BOHEMIA, N.Y.	

