



K1798X CORROSION PREVENTATIVE PROPERTIES APPARATUS

OPERATION AND INSTRUCTION MANUAL

REV A

Koehler Instrument Company, Inc.

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Petroleum Testing & Analysis Instrumentation • Custom Design & Manufacturing

CERTIFICATE OF CONFORMANCE

Corrosion Preventive Properties Apparatus K1798X

This certificate verifies that part number K1798X, Corrosion Preventive Properties Apparatus, was manufactured in conformance with the applicable standards set forth in this certification.

Specifications: ASTM D1743-73
 FTM 791-4012

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 : *Corrosion Preventative Properties Apparatus*

Model Numbers: K1798X with respective Part Numbers: K17989 (220-240VAC, 50Hz)

Qualifications:

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

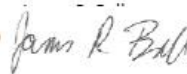
and

This product declaration is valid for unmodified equipment when installed and operated by authorized personnel following the instruction handbook.

Conforms to the following standards:

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 (1000 VAC, 60 sec.) as detailed in the product's technical documentation.
EMC	Meets the essential requirements of EMC Directive 2004/108/EC

Dir. R:



1595 Sycamore Av.
Bohemia, NY 11716
United States of America
April 24, 2012

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).

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1 Introduction

The Koehler K1798X, Corrosion Preventative Properties Apparatus is designed to determine the corrosion preventative properties of greases when distributed in a tapered roller bearing stored under wet conditions

This manual provides important information regarding safety, technical reference, installation requirements, operating condition specifications, user facility resource requirements, and operating instructions for the Pressure Viscometer. 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 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.

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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

ASTM Publication:

- ASTM D1743: Standard Test Method for Determining Corrosion Preventive Properties of Lubricating Greases
- ASTM D4950: Classification and Specification for Automotive Service Greases

1.3 Instrument Specifications

Models: K17980
K17989

Electrical Requirements: 115V 60Hz
230 V 50/60Hz

Drive Motor Speed: 1750 RPM

Dimensions (l x w x h, in. (cm)): 10x15x20
(25.4x38.1x50.8)

Net Weight: 27 lbs (12.2kg)

Shipping Dimensions: 5 Cu. ft.

Shipping Weight: 36 lbs (16.3 kg)

Altitude: Rated for use below 2000m

Environmental Conditions: As per section 1.4.1 of IEC 61010

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 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>.



WARNING: Always de-energize and unplug instrument when accessing any internal portion of the instrument. Never remove any side cover or part of the case or instrument without first de-energizing and unplugging from the mains.

Potential hazards include:

- Hair/clothing/ jewelry entanglement-rotating spindle/drill
- Eye injuries

-  **WARNING:** Safety glasses must be worn at all times in the work areas
- Rings and jewelry must not be worn
- Long and loose hair must be contained
- Close Fitting Clothing Must be Worn

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

- K1798X Corrosion Preventative Properties Apparatus, 115V 60Hz / 220-240V 50-60Hz
- K1798X-Manual Operation and Instruction Manual

Refer to Figure 1 for an illustration of the included accessories below:

- K17981 Bearing Holder Assembly (Qty 3) **(A)**
Consisting of:
 - K17981-0-1 Weight, 1kg
 - 22J-114-09S Metal Screw
 - K17981-0-2 Upper Flange
 - K17981-0-3 Lower Flange
 - K17981-0-4 Bearing Holder
 - K17984 Plastic Jar with Cover
- 289-004-002 Test Bearing Set, pk/3 **(B)**
- K17982 Mechanical Grease Packer **(C)**
Consisting of:
 - K185-0-44 Bearing Holder
 - K185-0-45 Bearing Packer Plunger
 - K185-0-47E Bearing Packer Base Assembly
- K17980-0-8 Spacer, 3mm width **(D)**
- K17984 Plastic Jar with Cover (Qty 2) **(E)**
- K17983 Pliers **(F)**

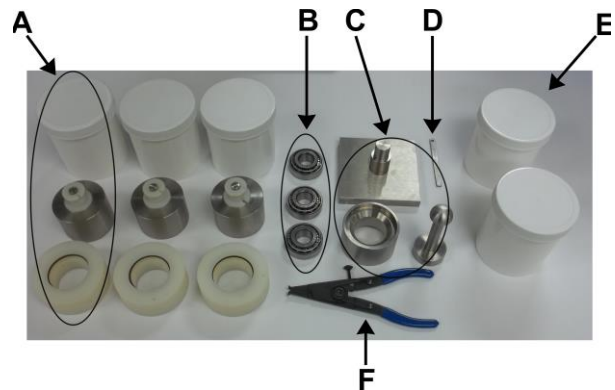


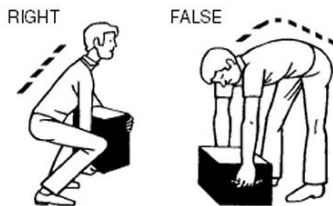
Figure 1. Packing List

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 Figure below.



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. Place the instrument on a firm, level table in an area with adequate ventilation or in a hood. This unit comes basically fully assembled, except for the assembly of the

bearing holder assemblies and mechanical grease packer.

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.

Environmental Conditions: Instrument must be set up and operated in the following environmental conditions:

- No/low dust
- No direct sunlight
- Not near heating or AC ventilation ducts
- No vibrations
- Clearance to other instruments
- Environmental temperature range given in IEC 61010: 5 degrees C to 40 degrees C
- Elevation to 2000m
- Relative humidity <80%

3.4 Pre-operational safety checks

1. Locate and ensure you are familiar with the operation of the motor ON/OFF switch and speed adjustment knob
2. Follow correct clamping procedures using the height adjustment knob on the back of the apparatus as well as the upper and lower level adjustment nuts on the side to ensure the apparatus is secure.
3. Faulty equipment must not be used. Ensure the instrument is in proper working order before use.

4 Description

4.1 Instrument Descriptions



Figure 2. Instrument Descriptions_Front

1. **Power Switch.** This switch controls the power to the motor. When the power switch is in the **ON** position, the drive motor is powered on rotates the Spindle/Thrust Loading Device (4) at the desired set speed.
2. **Motor Speed Knob.** This knob controls the speed at which the motor rotates the Spindle/Thrust Loading Device. The knob is labeled with number designations which are arbitrary and only indicate the percentage of power that is applied to the motor. The proper test speed in accordance to ASTM D1743 is 1750 ± 50 RPM.
3. **Lever.** To lower the apparatus onto the bearing holder assembly. Maximum and minimum height can be adjusted by the Upper and Lower Adjustment Nuts located on the back of the apparatus. See Figure 3.
4. **Spacer, 3mm.** Used to standardize the thrust loading device. The spacer is 3mm in width and is used in conjunction with the adjustment nuts located on the left-hand side of the apparatus. Refer to Section 5.2 for additional details on the use of this item.

5. **Spindle/Thrust Loading Device.** Spring loaded device to apply a precise load to the test bearing while capable of spinning in conjunction with the drive motor (5). Equipped with an indexing pin for alignment with the hole located on the 1kg weight.
6. **Drive Motor.** Rotates the Spindle/Thrust Loading Device at a speed of 1750 RPM in accordance to ASTM D1743.



Figure 3. Instrument Descriptions_Back

7. **Adjustment Knob.** Loosen to raise and lower apparatus to proper height that allows the Spindle / Thrust Loading Device to engage the bearing holder assembly.
- NOTE:** It is important to support the top assembly while loosening the knob as the weight of the apparatus will drop to the bottom plate easily.
8. **Lower Adjustment Nut.** Determines the lower limit of the apparatus when using the lever mechanism. Refer to section 5.2 for further details on the positioning for standardization of the spindle / thrust loading device.
 9. **Upper Adjustment Nut.** Determines the upper limit of the apparatus when using the lever mechanism. Refer to section 5.2 for further details on the positioning for standardization of the spindle / thrust loading device.

5 Operation

5.1 Preparation of Bearings

1. Only bearings that have outer races and rollers entirely free of corrosion should be tested. Bearings should not be handled without the use of tongs or rubber or plastic gloves.
2. Wash the selected bearing thoroughly in hot (52 to 66°C) mineral spirits reagent grade to remove rust preventative



WARNING: Mineral spirits is highly combustible and vapors are hazardous. The washing temperatures are considerably above the flashpoint. All washing should be carried out in a well ventilated hood with no flames or ignition source present.

3. Moisten a tissue in hot solvent and wipe the bearing cup and cone to remove remaining residue.
4. Rinse bearing again in hot mineral spirits, reagent grade.
5. Transfer bearing to the solvent rinse solution to remove the mineral spirits.



WARNING: Poison. Fatal if swallowed, harmful if inhaled. Causes burns. Vapor extremely irritating.

6. Rinse the bearing and slowly rotate in $66 \pm 5^\circ\text{C}$ solvent rinse solution.
7. Remove the bearing from the solvent rinse solution and place on filter paper to drain. Dry the bearing in an oven at $70 \pm 5^\circ\text{C}$ for 15 to 30 minutes.
8. Permit the bearing to cool to room temperature and re-examine surfaces to assure that all corrosion-free and free-turning specimens have been selected.
9. Wash and dry the bearing packer using the same technique as preparation of the bearings.

5.2 Standardization of Thrust Loading Device

1. To standardize the thrust loading device a packed bearing must be prepared and installed into a bearing holder assembly.

Refer to section 5.3 and 5.4 for a detailed procedure of this preparation.

2. Place the prepared bearing holder assembly onto the base of the motor drive spindle and center it under the indexing pin of the drive. See Figure 4 below:

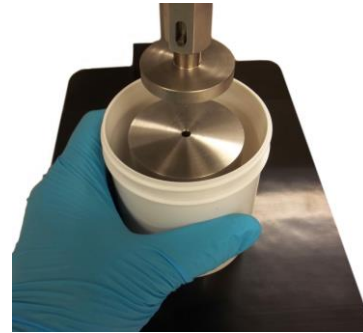


Figure 4. Bearing Holder Assembly Placement

3. Lower the drive until the O-ring just contacts the 1-kg weight. See Figure 5 below:



Figure 5. Spindle / Thrust Loading Device Placement

4. Run the lower adjustment nut (Figure 3, item 8) of the depth gage located on the back of the instrument to the metal guide.

NOTE: The metal guide runs along the depth gauge and acts as two point of contact for the upper and lower adjustment nuts to limit the movement of the apparatus when using the lever.

5. Place the 3mm spacer (Figure 2, item 4) on top of this nut and bring the upper adjustment nut (Figure 3, item 9) down to the spacer.
6. Hold the upper adjustment nut in position, then remove the spacer and run the lower adjustment nut up and tighten it against the upper adjustment nut.
7. When the O-ring located at the underside of the Spindle / Thrust Loading Device is compressed against the 1-kg weight to the point where the lower adjustment nut hits the metal stop guide, a 29 Newton (N) load will be added to the bearing assembly. This will give a total load on 39 N on the bearing.
8. Examine the O-ring periodically and replace it if it shows any cracks or other signs of deterioration.
9. The thrust loading device should be standardized before use, once per day if used daily. Standardization should be performed again if there is any reason to believe that the standardization might have changed.

5.3 Grease Packing Procedure

1. The K17982 Mechanical Grease Packer must be utilized to properly pack the test grease into the bearing. Please refer to Figure 6 and 7 below for the following steps:

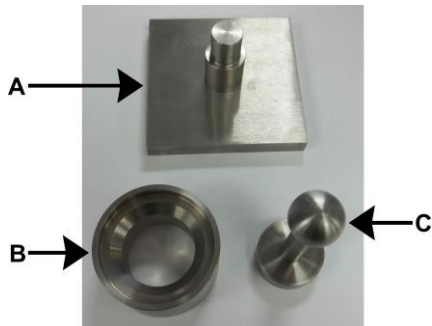


Figure 6. Mechanical Grease Packer

- A. Bearing Packer Base
- B. Grease Reservoir Cylinder
- C. Grease Packer Plunger



Figure 7. Test Bearing

D. Bearing Cup

E. Bearing Cone

2. Place the bearing cone (E) with small diameter facing up onto the bar of the grease packer base (A). Place the bearing cup (D) over the bearing cone. See Figure 8 below:

NOTE: Gloves must be worn at all times when handling bearings

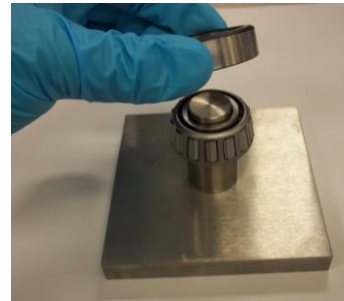


Figure 8. Mechanical Grease Packing Procedure

3. Place the grease reservoir cylinder (B) over the bearing cup.
4. Fill the cylinder with grease and use the grease packing plunger to force grease through the bearing. See Figure 9 below:



Figure 9. Mechanical Grease Packing Procedure

5. Remove the cylinder and plunger from the bearing cup. Wearing gloves, remove the bearing cup and cone together as a unit from the grease packer stand.
6. Use a spatula to remove grease that is beyond the end of the bearing rollers so approximately the same amount of grease is used each time.

5.4 Bearing Holder Assembly Procedure

1. Please refer to Figure 10 below to identify the components required while following the bearing holder assembly procedure.

NOTE: The bearing cup and cone, items D and E from Figure 7 respectively, are shown in the below figure as well.

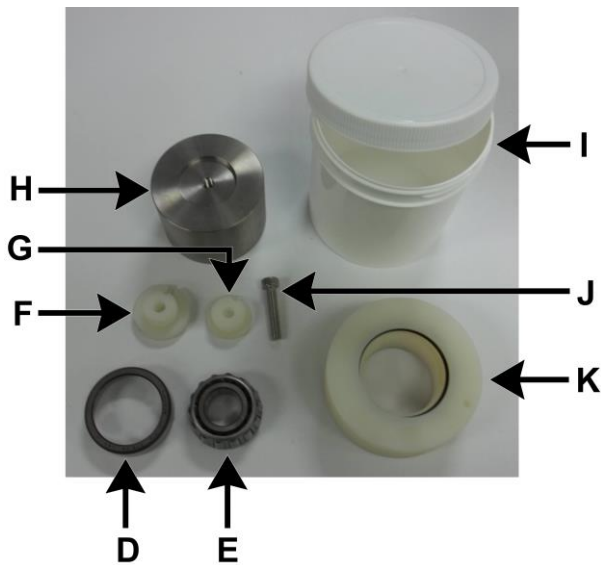


Figure 10. Bearing Holder Assembly Components

- D. Bearing Cup
- E. Bearing Cone
- F. Upper Flange
- G. Lower Flange
- H. 1 kg Weight
- I. Plastic Jar
- J. Metal Screw
- K. Bearing Holder

2. Wearing gloves, hold the packed bearing with the large inside diameter of the cup facing down and insert the small diameter plastic flange or lower flange (G) on top of the bore and the larger upper flange (F) into the bottom of the bore.
3. Slide the bearing assembly onto the 1-kg weight (H). The large diameter upper flange (F) should fit into the recess on the top of the weight.
4. Insert the metal screw (J) through the assembly and tighten into the weight with a screw driver.
5. Lower the plastic bearing holder (K) over the bearing. Press the holder down so that the bearing cup (D) fits squarely in the holder. See Figure 11 below:



Figure 11. Bearing Holder Assembly

6. Invert the plastic jar (I) over the bearing assembly. See Figure 12 below. Slide the two components over the edge of the inner bottom of the jar and invert the entire assembly. See Figure 12 below:

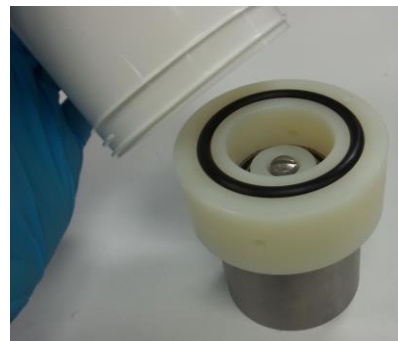


Figure 12. Bearing Holder Assembly

5.5 Test Procedure



WARNING: Always use a safe working posture (beware of hair catching). Stand erect, do not lean forward or place face near the rotating shaft. Keep hands away from rotating parts during operation.

1. Place the Bearing Holder Assembly onto the base of the apparatus and center to the indexing pin of the Spindle / Thrust Loading Device. See Figure 13 below:

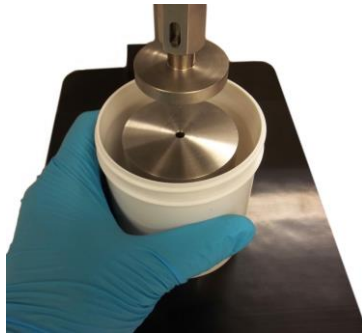


Figure 13. Bearing Holder Assembly Placement

2. Start the motor and slowly increase and decrease the motor speed RPM. Listen for any unusual movement and discontinue operation if anything unusual occurs.



WARNING: Never leave the apparatus while it is running.

3. Adjust the motor speed 1750 RPM and bring the Spindle / Thrust Loading Device down into the center of the 1-kg weight and load until the nut hits the depth start. See Figure 14 below:



Figure 14. Spindle / Thrust Loading Device Placement



WARNING: Apply pressure downwards slowly and smoothly. Do not apply pressure rapidly or in a jerky manner.

4. Run for 60 seconds then raise the drive and allow the bearings to coast to a stop.

NOTE: Do not break the contact between the races and rollers of the bearing at this point and in the following steps. At no time during or after the 60 second run should grease be redistributed or forced back into the bearing.

5. Fill a syringe with 100 ± 5 mL of distilled water. The distilled water should be freshly boiled for 10 ± 5 minutes and then cooled to 25 ± 0.5 °C.
6. With the run-in bearing in the jar start a timer and at the same time, begin adding water into the hole in the bearing holder (K). See Figure 13. Add the 100mL of water within 20 ± 3 seconds.



Figure 13. Water Treatment

7. When the timer shows 50 ± 3 seconds, start withdrawing the water.
8. When the timer shows 60 ± 3 seconds complete the withdrawal of 70 ± 5 mL of water, leaving 30 ± 5 mL of water in the jar.

NOTE: A larger needle may be required to withdrawal the water in 10 seconds.



WARNING: Make sure that water does not touch the bearing after the 70 ± 5 mL is withdrawn

9. Screw the cap on the jar and transfer to a dark oven essentially free of vibration for 48 hours at $52 \pm 1^\circ\text{C}$.
10. Prepare three bearings with each grease to be tested. Each group of three bearings is one test.



WARNING: Wait until the motor is fully spun down and the unit is powered off before attempting to set-up for a test or to disassemble the apparatus after a test.

5.6 Rating Procedure

1. Remove the bearing from the test jar and place the bearing cup in a 50 / 50 mixture of isopropyl alcohol and mineral spirits.

NOTE: The solvent solution can be heated to aid in the removal of grease

2. Agitate vigorously to remove the grease. Repeat the rinsing using fresh solvent mixture of gently wipe the bearing with a clean cloth or tissue to ensure that traces of grease are removed.
3. Transfer the bearing cup from the solvent and allow drying on clean filter paper.
4. Examine the cup raceway for evidence of corrosion without the use of magnification.
5. Rate the raceway for pass or fail. Any corrosion spot 1.0mm or larger will be considered a fail. Ignore the number of spots.

6 Maintenance



WARNING: Disconnect power to the unit before servicing to avoid exposure to high voltages and/or temperatures which may result in personal injury or death. If you have any questions about maintaining your equipment, then please do not hesitate to contact the Koehler technical service department.

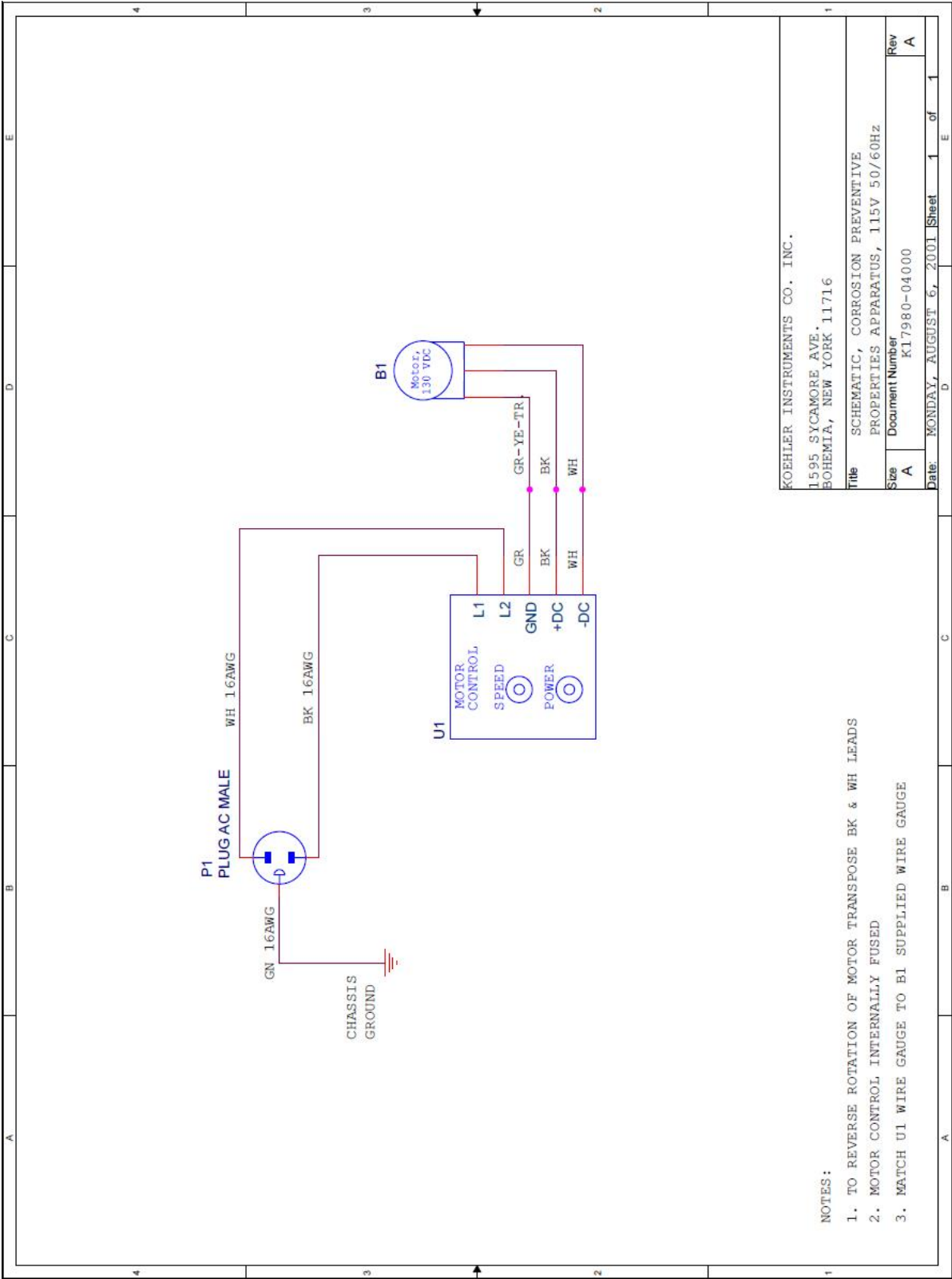
6.1 Routine Maintenance

The K1798X Corrosion Preventative Properties Apparatus requires little routine maintenance to provide many years of continuous service. However, over the course of time, some instrument parts may need to be replaced. When ordering replacement part(s), please provide the model number, serial number, and product shipment date of your equipment so that we can ensure you will receive the proper replacement part(s).

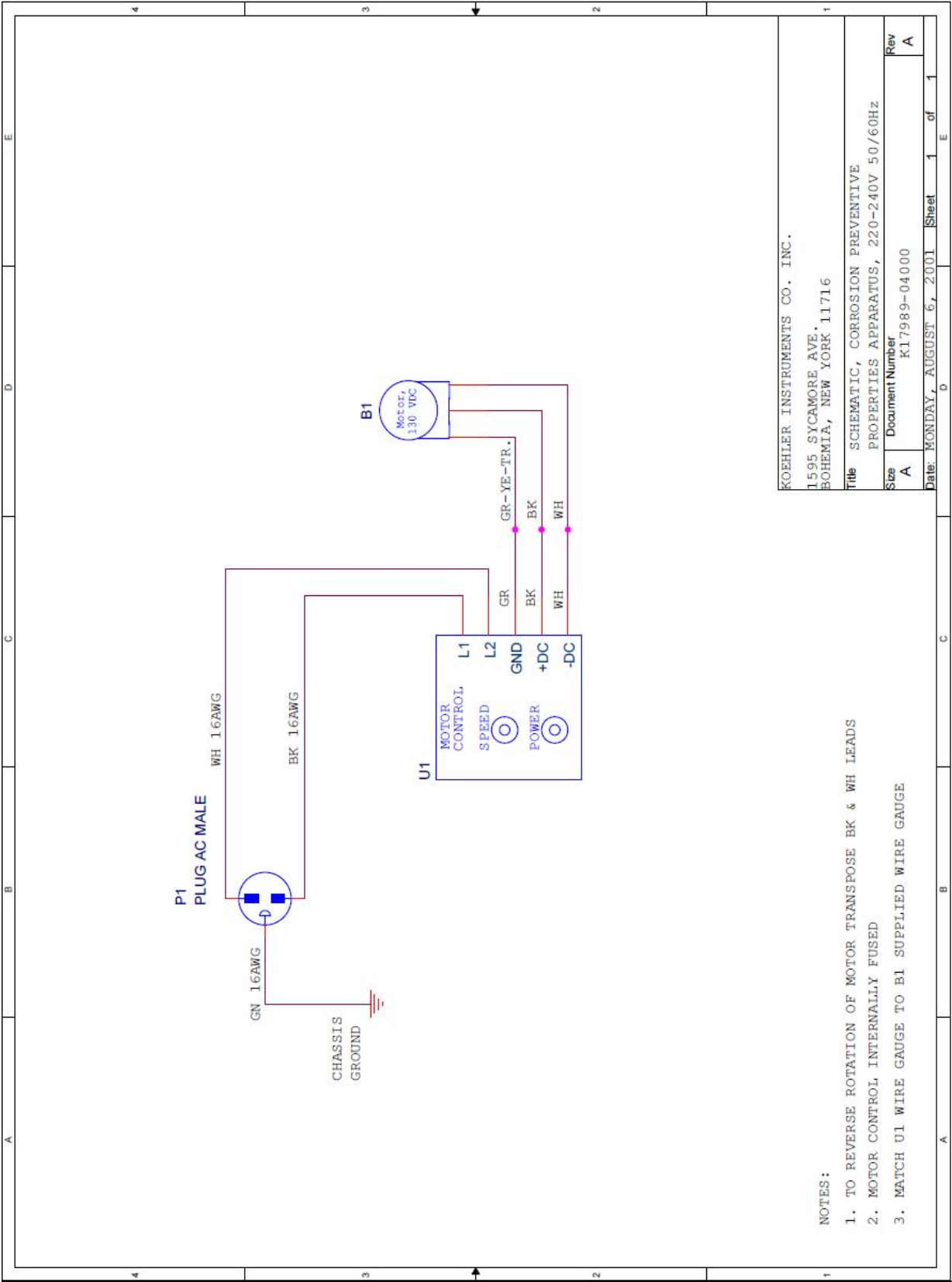
6.2 Replacement Parts

Part Number	Description
K1798X Corrosion Preventative Properties Apparatus	
K17980-0-1	Spindle Thrust Loading Device
K17980-0-8	3mm Spacer
360-115-015	Motor Speed Control, 115V/230V 50/60Hz
289-004-002	Bearing Assembly (Cup and Cone), pk/3
288-115-053	Motor, ¼ HP
K17983	Pliers
K17981 Bearing Holder Assembly	
K17981-0-1	Weight, 1 kg
K17981-0-2	Upper Flange
K17981-0-3	Lower Flange
K17981-0-4	Bearing Holder
AS568-329	Large O-ring
AS568-224	Small O-ring
22J-114-09S	Metal Screw
K17984	Plastic Jar with Cover
K17982 Mechanical Grease Packer	
K185-0-44	Grease Reservoir Cylinder
K185-0-45	Grease Packing Plunger
K185-0-47E	Bearing Packer Base

7 Wiring Diagrams
7.1 115V Unit Wiring (K17980)



7.2 220-240V Unit Wiring (K17989)



8 Service

Under normal operating conditions and with routine maintenance, the K1798X Corrosion Preventative Properties 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: _____

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 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.



Notes

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.