Visible-Break Window Gasket Replacement, KPA-2881-1S Kit Instructions

Powering Business Worldwide

DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY

The information, recommendations, descriptions and safety notations in this document are based on Eaton Corporation's ("Eaton") experience and judgment and may not cover all contingencies. If further information is required, an Eaton sales office should be consulted. Sale of the product shown in this literature is subject to the terms and conditions outlined in appropriate Eaton selling policies or other contractual agreement between Eaton and the purchaser.

THERE ARE NO UNDERSTANDINGS, AGREEMENTS, WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, OTHER THAN THOSE SPECIFICALLY SET OUT IN ANY EXISTING CONTRACT BETWEEN THE PARTIES. ANY SUCH CONTRACT STATES THE ENTIRE OBLIGATION OF EATON. THE CONTENTS OF THIS DOCUMENT SHALL NOT BECOME PART OF OR MODIFY ANY CONTRACT BETWEEN THE PARTIES.

In no event will Eaton be responsible to the purchaser or user in contract, in tort (including negligence), strict liability or other-wise for any special, indirect, incidental or consequential damage or loss whatsoever, including but not limited to damage or loss of use of equipment, plant or power system, cost of capital, loss of power, additional expenses in the use of existing power facilities, or claims against the purchaser or user by its customers resulting from the use of the information, recommendations and descriptions contained herein. The information contained in this manual is subject to change without notice.

Contents

Safety for life

Eaton meets or exceeds all applicable industry standards relating to product safety in its Cooper Power™ series products. We actively promote safe practices in the use and maintenance of our products through our service literature, instructional training programs, and the continuous efforts of all Eaton employees involved in product design, manufacture, marketing, and service.

We strongly urge that you always follow all locally approved safety procedures and safety instructions when working around high voltage lines and equipment, and support our "Safety For Life" mission.

Safety information

The instructions in this manual are not intended as a substitute for proper training or adequate experience in the safe operation of the equipment described. Only competent technicians who are familiar with this equipment should install, operate, and service it.

A competent technician has these qualifications:

- Is thoroughly familiar with these instructions.
- Is trained in industry-accepted high and low-voltage safe operating practices and procedures.
- Is trained and authorized to energize, de-energize, clear, and ground power distribution equipment.
- Is trained in the care and use of protective equipment such as arc flash clothing, safety glasses, face shield, hard hat, rubber gloves, clampstick, hotstick, etc.

Following is important safety information. For safe installation and operation of this equipment, be sure to read and understand all cautions and warnings.

Hazard Statement Definitions

This manual may contain four types of hazard statements:

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in equipment damage only.

Safety instructions

Following are general caution and warning statements that apply to this equipment. Additional statements, related to specific tasks and procedures, are located throughout the manual.

DANGER

Hazardous voltage. Contact with hazardous voltage will cause death or severe personal injury. Follow all locally approved safety procedures when working around high- and low-voltage lines and equipment. G103.3

WARNING

Before installing, operating, maintaining, or testing this equipment, carefully read and understand the contents of this manual. Improper operation, handling or maintenance can result in death, severe personal injury, and equipment damage. G101.0

WARNING

This equipment is not intended to protect human life. Follow all locally approved procedures and safety practices when installing or operating this equipment. Failure to comply can result in death, severe personal injury and equipment damage. G102.1

WARNING

Power distribution and transmission equipment must be properly selected for the intended application. It must be installed and serviced by competent personnel who have been trained and understand proper safety procedures. These instructions are written for such personnel and are not a substitute for adequate training and experience in safety procedures. Failure to properly select, install or maintain power distribution and transmission equipment can result in death, severe personal injury, and equipment damage. G122.3

Product information

Introduction

Service Information MN285007EN provides replacement instructions for the Visible-Break Window Gasket Replacement kit, KPA-2881-1S. Before installing or operating this kit, carefully read and understand the contents of this manual.

Read this manual first

Read and understand the contents of this manual and follow all locally approved procedures and safety practices before connecting or operating this equipment.

Additional information

These instructions cannot cover all details or variations in the equipment, procedures, or process described, nor provide directions for meeting every possible contingency during installation, operation, or maintenance. For additional information, contact Eaton's Cooper Power series product representative.

Acceptance and initial inspection

Each Visible-Break Gasket kit is completely assembled and inspected at the factory. It is in good condition when accepted by the carrier for shipment.

Upon receipt, inspect the carton for signs of damage. Unpack the kit and inspect it thoroughly for damage incurred during shipment. If damage is discovered, file a claim with the carrier immediately.

Handling and storage

Be careful during handling and storage of the kit to minimize the possibility of damage. If the kit is to be stored for any length of time prior to installation, provide a clean, dry storage area.

Quality standards

ISO 9001:2008 Certified Quality Management System

Parts and equipment

Kit components

- Service Instructions MN285007EN Visible-Break Window Gasket Replacement, KPA-2881-1S Kit Instructions
- 16 silicon bronze 3/8 hex jam nuts*
- 16 Belleville washers - 3/8 inch*
- SS window retaining ring p/n 2093898A01
- Window p/n P29 28816A 1
- Gasket p/n P05 28817A 1
- Field modification record sticker P/N P11027938A0071

*Quantity 16 are included (14 are required, plus two spares)

Required tools (not included)

- Torque wrench
- Ink or permanent marker
- Optional pneumatic gun or torque limiting nut driver (set to 50 in. lbs.), with 9/16" 6-point deep socket
- Hoses and pump
- 180 gallon dielectric fluid storage container (recommended size)
- Dielectric fluid sample bottle (optional)

Figure 1. Kit parts and tools.

Gasket replacement procedure

Step 1: De-energize

⚠ WARNING

Hazardous voltage. This equipment must be de-energized and grounded prior to conducting any maintenance, dielectric fluid sampling, or dielectric fluid filling procedures. Failure to comply can result in death or severe personal injury. T239.2

Note: During the course of this procedure, components that are connected to the bushings will be exposed.

Note: The repair should be conducted in a dry environment and the dielectric fluid temperature should be higher than the surrounding air temperature to avoid condensation.

Follow all locally approved procedures and safety practices.

Step 2: Drain dielectric fluid

⚠ CAUTION

Dielectric failure, equipment damage. Shield all rubberized connectors, cables, and other equipment from contact with dielectric fluid. If dielectric fluid comes in contact with the rubber surface of connectors, cables, and other equipment, wipe the fluid off immediately with a clean dry rag. Dielectric fluid will degrade rubberized equipment, decreasing its insulating strength, causing equipment damage and possible personal injury. T364.0

The Type VFI switchgear must be de-energized, grounded, and removed from service before conducting any maintenance, dielectric fluid sampling, or dielectric fluid filling procedures.

1. **De-energize and ground switchgear.**
2. **Reduce internal tank pressure to 0 PSIG.** The switchgear is equipped with a pressure relief valve that opens at 5 PSIG and closes at 3 PSIG. To relieve internal tank pressure, pull the ring on the pressure relief valve.
3. **Check the dielectric fluid maintenance schedule for this piece of equipment and perform any dielectric fluid maintenance that is due.** *Refer to Service Instructions MN285006EN Type VFI, Oil-Insulated, Vacuum Fault Interrupter; Installation, Operation and Maintenance Instructions.*

⚠ CAUTION

This equipment relies on dielectric fluid to provide electrical insulation between components. The dielectric strength of the fluid must be checked on a regular basis, as part of the routine maintenance inspection, to ensure that it is at or above minimum dielectric requirements. Use of this equipment with dielectric fluid that does not meet minimum requirements can result in internal flashovers that will damage the equipment and can cause personal injury. G107.3

4. **Dielectric Fluid Maintenance**

   To assure trouble-free operation of this equipment, a regular schedule of dielectric fluid testing and dielectric fluid maintenance is required. A routine dielectric fluid testing and maintenance schedule is necessary to monitor changes that occur in the dielectric fluid as a result of normal operation and to detect abnormal conditions that may occur.

   Maintaining a record of this test data will help in assessing the condition of the dielectric fluid over time.

Note: Envirotemp™ FR3™ or Envirotemp 200 dielectric fluid may be provided instead of oil, if specified at time of order. Refer to the manufacturer's instructions for specifications and ASTM-approved testing procedures.

5. **Lower the dielectric fluid level.** Lower the dielectric fluid level as needed to a level below the bottom edge of the visible-break window. (Refer to Step F for recommended method.) It is not necessary to completely drain the unit to replace the visible-break gaskets.

   Store the drained dielectric fluid according to locally approved procedures.

6. **Recommended Dielectric Fluid Draining Method**

   A. Remove fill plug.

   B. Insert hose into the fill plug port until the hose end is below the visible-break window. (Use the window to help locate the hose end.)

   C. Make sure the inlet hose is in the pad-mounted switchgear and the outlet in the dielectric fluid container.

   D. Turn pump on and drain unit until the dielectric fluid is approximately an inch below the bottom of the visible-break window.

Figure 2. Visible-break window gasket removal part identification.

Step 3: Visible-break window removal

1. Shield all rubberized connectors, cables, and other equipment from contact with dielectric fluid.
2. If dielectric fluid comes in contact with the rubber surface of connectors, cables, and other equipment, wipe the fluid off immediately with a clean dry rag.
3. Loosen all nuts.
4. Remove and discard all nuts.
5. Remove and discard all lock washers.
6. Remove and discard all flat washers.
7. Remove and discard the polycarbonate visible-break viewing window.
8. Remove and discard the visible-break window gasket.
9. Wipe off the window mounting area on the front panel with a clean dry rag.

Step 4: Visible-break window gasket installation

1. **Inspect the new window and gasket.** Visually inspect the replacement window and gasket to ensure they are clean and free of defects (voids in the molding and nicks in the gasket).
2. **Inspect front plate for non-conformance.** Inspect the front plate mating surface for conditions which could affect the gasket sealing. It should be clean and smooth.
3. **Inspect studs before installing window.** Check studs to make sure the threads are clean and were not damaged during removal of the old gasket.
4. **Mount the gasket, window, SS window ring, and hardware (Figure 3).**
   A. Seat the replacement gasket over studs onto front plate.
   B. Remove protective wrap and install replacement window over studs onto the front plate.

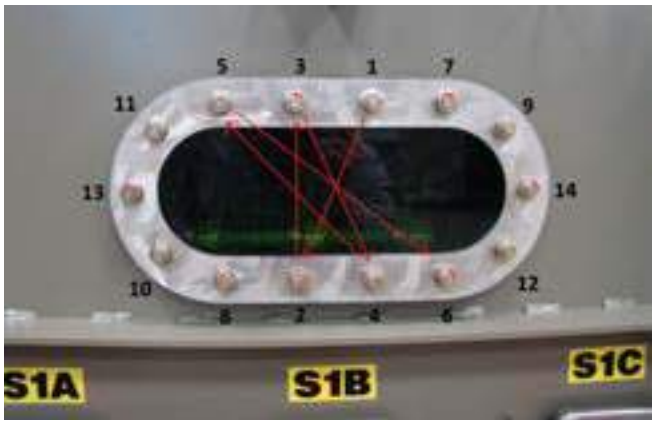

Figure 3. Mount the gasket, window, steel ring, and hardware.

   C. Install the SS window retaining ring over studs onto the front plate.
   D. Install provided Belleville washers onto each stud.
   E. Hand-thread nut on each stud three turns before using the optional air tool or manual torque wrench for tightening.
5. **Tighten hardware for visible-break window (Figure 4).** Tighten hardware for window incrementally and evenly, in a **"Diagonal"** sequence (as shown in Figure 3, starting with position 1 and continuing through to position 14), to the correct torque specifications **50 in. lbs.** using the optional air tool or manual torque wrench; it is critical that the gasket is compressed evenly by the Visible-Break window.

Figure 4. Tighten hardware for visible-break window.

6. **Tighten hardware to final torque value for visible-break window (as shown in Figure 3, starting with position 1 and continuing through to position 14).** Apply the final torque using a torque wrench set to **100 in. lbs.** on all of the nuts on the Visible-Break windows for each side of the tank to ensure the optional air tool or manual torque wrench is providing consistent torque.

Figure 5. Torque hardware for visible-break window.

7. **Write the date on the provided field modification sticker.** Apply the sticker in a convenient and visible location near the visible-break window to designate that the gasket has been replaced.

   Insert the plastic bag into the provided pre-paid UPS shipping envelope for shipment via UPS to the factory.

Step 5: Refill dielectric fluid

The Type VFI switchgear must be de-energized, grounded, and removed from service before conducting any maintenance, dielectric fluid sampling, or dielectric fluid filling procedures.

⚠ CAUTION

This equipment relies on dielectric fluid to provide electrical insulation between components. The dielectric strength of the fluid must be checked on a regular basis, as part of the routine maintenance inspection, to ensure that it is at or above minimum dielectric requirements. Use of this equipment with dielectric fluid that does not meet minimum requirements can result in internal flashovers that will damage the equipment and can cause personal injury. G107.3

1. **De-energize and ground switchgear.** (Confirm this was completed with step 2.)

⚠ WARNING

Hazardous voltage. This equipment must be de-energized and grounded prior to conducting any maintenance, dielectric fluid sampling, or dielectric fluid filling procedures. Failure to comply can result in death or severe personal injury. T239.2

2. **Refill with dielectric fluid.** Refer to the **Oil Sampling and Testing Procedures** section in *Service Instructions MN285006EN Type VFI, Oil-Insulated, Vacuum Fault Interrupter; Installation, Operation and Maintenance Instructions* and make sure that the unit is properly filled with clean, dry dielectric fluid.

Note: Refer to the **Maintenance** section of *Service Instructions MN285006EN Type VFI, Oil-Insulated, Vacuum Fault Interrupter; Installation, Operation and Maintenance Instructions* for additional information regarding dielectric fluid maintenance and testing requirements.

3. **Recommended Refilling Method**

   A. Reverse the hoses at the pump: the inlet hose goes to the tote and the outlet goes to the pad-mounted unit.

   B. Turn pump on and fill to the proper level (when the dielectric fluid sight gauge balls float).

   C. Remove hose and install fill plug. Be sure to add pipe dope to plug before installing.

   D. When filling is complete, check the dielectric fluid level gauge to verify that the dielectric fluid is filled to the correct level. Allow at least one hour for gas bubbles to dissipate prior to energizing the unit.

4. **Optional: Perform a High-Potential Withstand Test to confirm the dielectric integrity of the repaired equipment.** *Refer to Service Instructions MN285006EN Type VFI, Oil-Insulated, Vacuum Fault Interrupter; Installation, Operation and Maintenance Instructions* for High-Potential Withstand Test Procedure.

Table 1. Field High-Potential Withstand Values

Voltage Class	AC High-Potential Withstand Value (per IEEE Std C37.60™-2003 standard)	DC High-Potential Withstand Value (based on crest value of AC level)
15	26.2 kV AC	37.0 kV DC
25	30.0 kV AC	42.4 kV DC
35	37.5 kV AC	53.0 kV DC

Step 6: Re-energize

Always follow all locally approved procedures and safety practices. Refer to *Service Instructions MN285006EN Type VFI, Oil-Insulated, Vacuum Fault Interrupter; Installation, Operation and Maintenance Instructions*.

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

Eaton's Power Systems Division
2300 Badger Drive
Waukesha, WI 53188
United States
Eaton.com/cooperpowerseries

Printed in USA
Publication No. MN285007EN
June 2016
KA20480710 REV02

For Eaton's Cooper Power Series product information
call 1-877-277-4636 or visit:
www.eaton.com/cooperpowerseries.

Powering Business Worldwide