

Maintenance of Heater Sheath

WARNING
DO NOT REPAIR OR MODIFY KEV COMPONENTS

CAUTION
DO NOT MIX OR INTERCHANGE PARTS WITH THOSE OF OTHER MANUFACTURERS.

Any disassembly and/or reassembly of this unit must be performed in accordance with IEC 60079-19, *Explosive Atmospheres - Part 19: Equipment Repair, Overhaul, and Reclamation*.

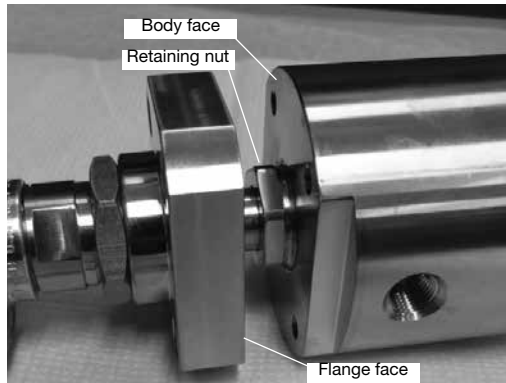
Disassembly

1. Turn off power to the regulator and disconnect.
2. Vent the system.
3. Remove the regulator from the system.
4. Remove the four cap screws from the heater flange.
5. Slide the conduit assembly back to expose the heater sheath retaining nut.

CAUTION
DO NOT PULL THE ASSEMBLY BACK FARTHER THAN THE NUT. DAMAGE TO THE HEATER WIRES CAN RESULT.

6. Loosen the heater sheath retaining nut until the heater sheath can be removed from the regulator body.

CAUTION
DO NOT SCRATCH OR DAMAGE THE BODY OR FLANGE FACES.



Inspection

1. Remove and discard the heater sheath seal.

CAUTION
BE CAREFUL NOT TO DAMAGE THE BODY SEAL RECESS SURFACES. LEAKAGE CAN RESULT.

2. Inspect and verify the maximum surface finish and maximum flatness. Do not modify, rework or use any damaged components.



Reassembly

1. Insert a new heater sheath seal (ordering number: 9R0065) into the body recess of the regulator body.
2. Insert the heater sheath back into regulator body.
3. Tighten the heater sheath retaining nut to 35.9 ft-lb (48.7 N·m, 5.0 m·kg). Pressurize the inlet of the regulator to 1.5 times to rated pressure, e.g. 1.5 × 3600 = 5400 psig (372 bar). Test for leakage around the retaining nut with Snoop® liquid leak detector. If any leakage is detected, repair or replace the seal joint.
4. Slide the conduit assembly back against the regulator body.
5. Reinsert and tighten the four DIN267 A4 Class 70 cap screws to 2.9 ft-lb (4.0 N·m, 0.4 m·kg). Use a 0.001 in. (0.04 mm) shim gauge to ensure the flange/regulator body gap is fully closed. If the gauge can be inserted anywhere around the flange, inspect and rebuild the regulator.
6. Reinstall the regulator into the system and test all connections for leaks.
7. Reset the pressure setting according to the **Operation** section.
8. Turn on the power.

KEV Series Electrically Heated Vaporizing Pressure Reducing Regulators

Swagelok®

Instructions for Use

Contents

• Scope	1
• General Safety.....	1
• General Information.....	2
• Installation.....	3
• Operation.....	5
• Maintenance	6

Scope

These instructions cover the installation and use of the Swagelok® KEV series electrically heated, vaporizing, pressure-reducing regulators.

General Safety

WARNING, HOT SURFACE
EXTERNAL SURFACES OF THIS PRODUCT MAY REACH TEMPERATURES OF OVER 248°F (120°C) DURING NORMAL OPERATION.

WARNING
CERTIFICATION AND HAZARDOUS TYPE PROTECTION MAY BE IMPAIRED IF THE KEV REGULATOR IS USED IN A MANNER NOT SPECIFIED BY SWAGelok. REFER TO THESE INSTRUCTIONS FOR CORRECT METHOD OF INSTALLATION, OPERATION, AND USE.

WARNING
DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT.

CAUTION
SWAGelok KEV SERIES REGULATORS ARE NOT "SAFETY ACCESSORIES" AS DEFINED IN THE PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU.



Base-Mounted



Side-Mounted

CAUTION
DO NOT USE THE REGULATOR AS A SHUTOFF DEVICE.

NOTICE
ONLY QUALIFIED PERSONS SHOULD INSTALL, OPERATE OR SERVICE A KEV SERIES REGULATOR.

Caution: Do not mix or interchange parts with those of other manufacturers.

General Information

Marking

All Swagelok KEV series pressure reducing regulators are marked with the company name and address and any current standards/certifications, using adhesive labels as shown.

In addition, all bodies are marked with the following information:

- Ordering number
- Maximum inlet pressure
- Outlet pressure range
- Electrical ratings
- HP—High-pressure ports (inlet)
- LP—Low-pressure ports (outlet)
- Serial number
- Year of manufacture.

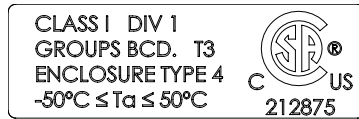
Address Label



ATEX / IECEx Label



CSA Label



Intended Areas of Use

Environment

- This equipment is in accordance with ATEX (Europe) and IECEx (International) — Group II, Category 2G, Exdb IIB+H2; T3 Gb. Temperature class is T3 (200°C, 392°F) for use at temperatures between -20°C and +60°C (-4°F and 140°F).

For explanation of above, refer to standards EN60079-0:2012 / IEC 60079-0:6th Ed., for Gas Groups and temperature classes and EN60079-01:2014 / IEC 60079-1:7th Ed., for details of explosion protection.

- This equipment is in accordance with CSA (Canada and U.S.A.) — Class I, Div 1, Groups B, C, & D; T3: CSA Encl Type 4. For use at temperatures between -50°C and +50°C (-58°F and 122°F).



WARNING

THE KEV SERIES REGULATOR IS NOT DESIGNED FOR USE IN AN ACETYLENE ENVIRONMENT.

ATEX/HAZLOC Special Condition

There is a potential for air to be trapped within the piping system, thus creating the possibility of a combustible mixture. This could occur during system startup or shutdown. In order to allow the KEV heater tube to stabilize at ambient temperature, turn off the power to the regulator during system startup and shutdown. The amount of time for the system to reach ambient conditions depends on several system parameters including (but not limited to): set point, flow rate, ambient temperature, and thermal properties of the system and the fluid.

Inlet and Outlet Pressures

The maximum inlet and outlet pressures depend on the model ordered and are marked on the side of the regulator body (HP = Inlet, LP = Outlet).

Electrical Supply

- The required supply voltage and frequency are marked on the side of the regulator body, along with the power rating of the heater.
- The installation must be connected to an electrical supply with sufficiently rated cabling and via a suitably rated contact breaker or fuse device.
- Suitable explosion-proof cable and conduit entries must also be used.
- Electrical rating options:
Supply — 120 and 240 V (ac), 50/60 Hz
Heater ratings — 50, 100, 150, and 200 W

Safe Product Selection

When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

Disassembly/Reassembly

NOTICE

CONTACT YOUR AUTHORIZED SALES AND SERVICE REPRESENTATIVE FOR ANY MAINTENANCE OR REPAIR BEYOND MAINTENANCE OF THE HEATER SHEATH. DO NOT ALTER OR DIASSEMBLE ANY OF THE FLAME-PROOF JOINTS WITHIN A KEV SERIES REGULATOR.

Installation

Mounting

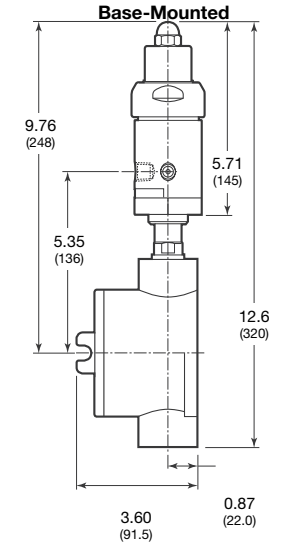
- Mount the regulator using the two 9/32 in. (7.5 mm) diameter holes provided in the electrical box.
- For side-mounted models, mount using the two 10-32 UNF (M5) mounting holes located on the base of the regulator body or the two 9/32 in. (7.5 mm) diameter holes in the electrical box.
- An auxiliary upstream filter is recommended for use in all but the cleanest of media.
- The orientation of the electrical box may be adjusted by loosening the lock nut on the connector tube and rotating the electrical box to the desired orientation before re-tightening the lock nut.



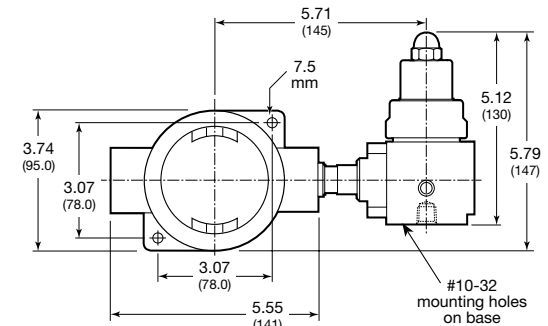
WARNING

DO NOT ROTATE THE ELECTRICAL BOX MORE THAN ONE-HALF TURN FROM ITS ORIGINAL POSITION. THIS MAY CAUSE EXCESSIVE DAMAGE TO THE HEATER CABLES.

Dimensions, inches (millimeters), are for reference only and are subject to change.



Side-Mounted



Process Connections



CAUTION

CONNECT ONLY INLET PRESSURE TO REGULATOR HP PORT (INLET), AND ONLY SYSTEM OUTLET TO REGULATOR LP PORT (OUTLET). REVERSE CONNECTING OF THE REGULATOR MAY RESULT IN PERMANENT DAMAGE TO THE PRODUCT.

- Close the regulator before pressurizing by removing the domed lock nut and turning the stem with a 9/32 in. (7 mm) wrench or socket counterclockwise until it stops.
- Check all connections for leaks.

Electrical Connections



WARNING

TURN OFF POWER TO REGULATOR BEFORE OPENING ELECTRICAL BOX LID. FAILURE TO DO SO MAY RESULT IN ELECTRIC SHOCK AND MAY ALSO PRESENT AN EXPLOSION HAZARD.



WARNING

THE SUPPLY MUST NOT EXCEED 110 % OF THE RATED VOLTAGE.



CAUTION

USE CABLE AND GLANDS RATED TO AT LEAST 221°F (105°C).

NOTICE

ALL CABLE ENTRY DEVICES AND BLANKING ELEMENTS SHALL BE CERTIFIED IN TYPE OF EXPLOSION PROTECTION FLAMEPROOF ENCLOSURE “db”, SUITABLE FOR THE CONDITIONS OF USE, AND CORRECTLY INSTALLED.

Ground connection sizes:

External ground: M4

Internal ground: 14 AWG lead (refer to Step 3)

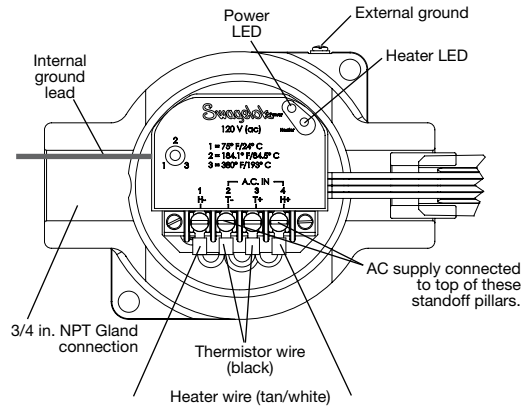
Wire for internal and external ground connections:

14 AWG lead

Follow all local wiring codes.

Minimum Cross-sectional Area of Protective Earthing (PE) Conductors

Cross-sectional Area of Phase Conductor, S mm ²	Minimum Cross-sectional Area of the Corresponding PE Conductor, S _p mm ²
S ≤ 16	S
16 < S ≤ 35	16
S > 35	0.5 × S



- Before opening the electrical box lid, a 1.5 mm hex key will be required to loosen the small locking screw located in the lid lip.
- Connect the specified AC supply to the standoff pillars labeled 2 and 4, as indicated in the drawing. Read and remove the Max Ambient Temperature warning label from the terminal screws.
- Connect to the internal ground using the loose green lead. 150 mm (6 in.) of lead is supplied and can be shortened as needed, use a suitable connector.
- Replace the electrical box lid and tighten the locking screw.

Operation

Pressure setting

- To set the pressure, first remove the anti tamper nut. Rotate the stem clockwise to raise the outlet pressure. Rotate the stem counterclockwise while venting the downstream side of the regulator to lower the outlet pressure.
- Final adjustments should be made in the direction of increasing pressure to obtain the most accurate set points.
- When fluid is flowing through the system, a small adjustment to the outlet pressure may be required.
- Once the desired pressure has been set with the unit in service, the anti tamper nut should be replaced and tightened.

Temperature setting



WARNING

TEMPERATURE SETTING SHOULD ONLY BE DONE WHEN THE UNIT IS ELECTRICALLY ISOLATED.

- Turn off power to regulator.
- Loosen the locking screw with a 1.5 mm hex key and remove the electrical box lid.
- Turn the small adjuster screw located on the control unit completely counter-clockwise for the minimum setting and completely clockwise for the maximum setting. Use the temperature markings on the label for guidance on other temperature settings. Additional adjustment to achieve the exact desired setting for your application will be required.
- Replace electrical box lid and tighten the locking screw.
- Turn on power to regulator.

Heater Operation

- The KEV heater LEDs provide an indication of the firmware version, the amount of power flowing to the heater, and the status of the over-temperature protection.
 - At power-up, both LEDs will blink simultaneously. The number of blinks corresponds to the firmware version. (ex. 3 blinks = Version 3)
 - During normal operation the “Power” LED will be on continuously and the “Heater” LED will blink to indicate the level of power being delivered to the heater.
 - Power level to the heater is 50% when the “Heater” LED on and off times are equal.
 - Power is not flowing to the heater when the “heater” LED is off.
 - After power-up, when the “Power” LED is flashing the over-temperature protection system is active.
- Power-up system checks are performed by the KEV heater each time the heater unit is powered on to ensure it is safe to apply power to the heater.
 - If the heater temperature is below 30°F (-1°C) the unit may take up to 60 minutes to start normal heating operation. The “Power” LED will flash during this time.
 - If the KEV regulator power is disrupted while the thermal switch is open, the unit may take up to 30 minutes to start normal operation after power is restored.
- A two-stage over-temperature system is used to limit the maximum KEV temperature. The first stage uses a self-resettable thermal switch. The second stage uses a non-resettable thermal fuse.
 - Stage 1 - When an over-temperature condition occurs, the thermal switch will detect it first and open. This causes the KEV heater controller to disrupt power to the heater until the temperature lowers enough for the switch to close. Once the switch closes, the KEV will resume normal operation.
 - Stage 2 - Should the KEV heater controller fail with power flowing to the heater the thermal fuse will open when needed to prevent the external temperature of the KEV from reaching 200°C (392°F). This will permanently disrupt power to the heater.
- If both the power LED and heater LED are on but no heat is detected, contact your authorized sales and service representative. Service may be required.