User Instruction

For Industrial Use ONLY
This product is designed for industrial use only. Make sure that this product will be used by persons who:
- Have sufficient knowledge on occupational health and safety and respiratory protective equipment;
- Work under the close supervision of personnel with sufficient knowledge.

Chemical cartridge respirator (Chemical cartridge, Half facepiece)

Model R-5

Model R-5-08, Japan National Assay registration No.TN421

*Before use, make sure that approval label is attached on the respirator.

For safe and proper usage

- There are several limitations associated with the use of a chemical cartridge respirator.
- Unless following the limitations, there is a possibility of resulting in death or serious injury.
- Throughout this User Instruction, special messages of “DANGER,” “WARNING” and “CAUTION” are shown in front of sentences that are important for safety. Make sure to read the definitions of the special messages and understand the contents.

DANGER
Indicates a potentially hazardous situation. Unless following the instructions, there is a possibility of resulting in death or serious injury.

WARNING
Indicates a potentially hazardous situation. Unless following the instructions, there is a possibility of resulting in light injury or property damage accident.

CAUTION
Indicates a potentially hazardous situation. Unless following the instructions, there is a possibility of resulting in light injury.

Selection of chemical cartridges

Use the following cartridges (option)

Performance of chemical cartridge respirator varies depending on the type of chemical cartridge in use. Make sure to read the user instruction of the chemical cartridge prior to use. The following chemical cartridges can be used with Models R-5/R-5X. For protection against toxic gases that cannot be removed by these chemical cartridges, use appropriate respiratory protective equipment such as supplied air respirators. If appropriate chemical cartridges are unknown for a particular toxic gas, etc., call manufacturer of the chemical substance, etc. or KOKEN.

Type of gas

Names of cartridge

National Assay No.

Particulate filter

(category)

Halogen gas

KGC-1L for halogen gas

No. TN52

-----

KGC-1L with Mighty micron filter for halogen gas

No. TN53

Yes (S1)*

Acid gas

KGC-1L for acid gas

JIS T 9152

compatible

-----

KGC-1L with Mighty micron filter for acid gas

-----

-----

KGC-1M for organic vapor

No. TN35

-----

KGC-1L for organic vapor

No. TN36

-----

KGC-1S for organic vapor

No. TN38

-----

Organic Vapor

KGC-1L with Mighty micron filter for organic vapor

No. TN37

Yes(S1)*

KGC-1S with Mighty micron filter for organic vapor

No. TN39

Yes(S1)*

KGC-1S with Uni-Micron filter for organic vapor

No. TN182

Yes(S2)*

---

Ammonia

KGC-1L for ammonia

No. N90

-----

KGC-1L with Mighty micron filter for ammonia

No. N91

Yes(S1)*

Sulfur dioxide

KGC-1L for sulfur dioxide

No. TN54

-----

KGC-1L with Mighty micron filter for sulfur dioxide

No. TN55

Yes(S1)*

KGC-1L with Uni-Micron filter for sulfur dioxide

No. TN357

Yes(S2)*

Hydrogen Sulfide

KGC-1L for hydrogen sulfide

JIS T 9152

compatible

-----

KGC-1L with Mighty micron filter for hydrogen sulfide

-----

Yes(S1)*

* By installing on cartridge, the Mighty micron filter can be used to remove dust that exists with toxic gas or vapor. However, DO NOT use these cartridges in the environment where diocins, radioactive dusts, asbestos, metal fume and/or oil mist exist.

* The Uni-micron filter can be used to remove dust that exists with toxic gas or vapor. However, DO NOT use these cartridges in the environment where diocins, radioactive dusts, asbestos, and/or oil mist exist.

* The same test criteria as the national assay standard category S1 are used.

Part names and structure

Inhalation valve (rectangular shape type C)

Exhalation valve (Type T-7K)

Clamp ring (Ring Type A)

Headband (Type RB)

Section of parts

- Only exclusive “Ring Type A” can be used with this respirator. Rings for previous Model R-5-lcannot be used.

CAUTION

DO NOT use the chemical cartridge respirator when:
- Concentration level of oxygen is unknown or less than 18%.
- Use of respirators is very dangerous and may result in death due to lack of oxygen. Use pressure-demand SCBAs or pressure-demand airline masks with changeover alarm for emergency air supply in the oxygen-deficient environment.
- Type of toxic gas, etc. is unknown.
- When the type of toxic gas existing in the environment is unknown, chemical cartridge respirators cannot be used as an appropriate chemical cartridge cannot be selected. Use supplied air respirators appropriate for the working environment.
- Concentration level of toxic gas, etc. is unknown.
- Use pressure-demand SCBAs or pressure-demand airline masks with changeover alarm for emergency air supply in the oxygen-deficient environment.
- There is no chemical cartridge that can remove toxic gas, etc. existing in the environment.
- A chemical cartridge cannot remove the gas other than the gas that that particular chemical cartridge is designed to remove. Use supplied air respirators appropriate for the working environment.
- Mixture of gases with different characteristics exists.

Make sure to use chemical cartridge respirators when all of the following conditions are satisfied (Scope of applications):

- Concentration level of oxygen in the working environment is more than 18%.
- Working environment is under normal temperature, normal humidity and normal atmospheric pressure.
- In the working environment with high temperature or high heat, there is a possibility that respirator body or parts may be deformed.
- Toxic-removing performance of the chemical cartridge decreases.
- Type of toxic gas, etc. in the environment is known and there exist chemical cartridges listed in the table of “Selection of chemical cartridges.”
- Performance of chemical cartridge respirators varies depending on the type of chemical cartridge. Make sure to read the user instruction of the chemical cartridge prior to each use.
- When direct-connection type, compact chemical cartridges are used, the concentration level in the working environment is below 0.1%.
- When a half-facepiece chemical cartridge respirator is used, the average concentration level of the toxic gas is below 10 times of the exposure limit. (It is below 30 times of the exposure limit if the duration of work per day is less than 30 minutes.) (Standard of Japan Respirator Manufacturers Association).
- Permisible concentration levels recommended by the Japan Society for Occupational Health are applied to the exposure limit. For toxic gases without the predefined permissible concentration levels, TLV-TWA levels recommended by ACGIH are applied.

WARNING

DO NOT use respirators in the high-temperature environment where the respirator itself becomes hot or in the low-temperature environment where moisture from the exhaled breath becomes frozen.

Deforming of parts or freezing may cause exhalation valve etc. to malfunction, resulting in leakage of toxic substances into the respirator.

Make sure that the facepiece is well fit on face.

Check fitness according to “Performing fit test.” (Page 3)

DO NOT use the respirator in the following cases as sufficient fitness cannot be ensured. Make sure to follow local laws and regulations.

- When working in a confined space, be careful not to bang the respirator against the wall.
- The respirator slipped out of place may cause toxic substance to leak into the facepiece.
- Use a full-facepiece respirator in the environment with eye-stimulating gas.
- DO NOT use respirators if the wearer has a disorder in respiratory or circulatory system, or is claimed inappropriate by doctor.
- To protect against aerosols that exist with gas, use a chemical cartridge with a particulate pre-filter categorized under appropriate classification.
Service life of chemical cartridges

Chemical cartridge loses decontamination capability when it has reached its breakthrough. It is important to know the service life of a cartridge.

- Estimation of service life by breakthrough time curve

Service life of a chemical cartridge varies significantly depending on the gas concentration in the environment. Breakthrough time curve, shown in the user instruction of the chemical cartridge, represents the relationship between the gas concentration level in the environment and the estimated service life of the chemical cartridge. Replace the chemical cartridge with a new one before the total time spent reaches the estimated service life indicated in the breakthrough curve.

If a chemical cartridge is repeatedly used and used for a short period of time in each use in the environment where a certain level of gas concentration is kept constant, record the time it is used under “Amount of time” column and add that amount to the time in the “Cumulative Time” column in the user instruction of the chemical cartridge. Before the cumulative time reaches the estimated service life, replace the chemical cartridge with a new one.

- When using a chemical cartridge equipped with a particulate pre-filter

Replace the particulate pre-filter with a new one when inhalation resistance increases (i.e. when the wearer feels difficulty in breathing) regardless of decontamination capability remaining in the chemical cartridge. When using a chemical cartridge with a built-in particulate pre-filter, replace the chemical cartridge itself with a new one.

*Refer to the user instruction of a chemical cartridge for the estimated service life.

DANGER

- Chemical cartridge can NOT be used in the working environment where its temperature, humidity and/or atmospheric pressure deviate substantially from a normal condition because the expected performance of chemical cartridge may decrease significantly.
- Call KOKEN when you want to determine the service life of a chemical cartridge to be used under special conditions or for special toxic gas environment.
- Dispose of the used chemical cartridge, indicating to an industrial waste disposer that waste plastic and burnt residue are included, as industrial waste.

WARNING

- For replacement schedule and applications of chemical cartridge, read the user instruction attached to a chemical cartridge.
- Estimation of service life by using the breakthrough time curve is just for reference purpose only. Service life is also influenced by the volume of air breathed, humidity and temperature, etc. Replace the chemical cartridge with a new one well in advance.
- Breakthrough time curve shown on the user instruction of chemical cartridge is based on the test gasses specified by Japanese national assay standard and JIS. The service life of the same chemical cartridge varies depending on the type of gas. (The chemical cartridge that is used for methanol, carbon disulfide or gas of similar nature whose estimated service lives are significantly shorter than that of the test gasses should not be re-used.)
- Do not take apart the unused chemical cartridge when disposing. If it is a used chemical cartridge, put is in a sealed plastic bag. Dispose of the used filtering material in a tightly sealed plastic bag so that the toxic gas absorbed would not diffuse into the atmosphere.

How to use

1. Installation of a chemical cartridge

- Rip open the plastic bag and take out the chemical cartridge and the user instruction. (Read the user instruction carefully to understand the content.)
- Remove the clamp ring by turning it counter-clockwise.
- Place the chemical cartridge on top of the rubber gasket as shown on the illustration.
- Place the clamp ring over the chemical cartridge, align it with the cartridge holder groove and firmly tighten by turning it clockwise.
- If the thread is caught in the groove of the cartridge or the cartridge is not stable, remove the cartridge and re-install it.

DANGER

- Shelf life of chemical cartridge is 2 years from the date of manufacture.
- Do NOT use the chemical cartridge stored for more than 2 years from the date of manufacture.
- Make sure to use genuine parts supplied by KOKEN. (Refer to Page 4)

WARNING

- Do NOT rip open the plastic bag until just before use if the chemical cartridge is new. If opened, its decontamination capability may decrease due to absorption of moisture.
- Before installing a chemical cartridge onto the respirator, check if there is no distortions on the chemical cartridge or the particulate pre-filter or damages such as scratch or deterioration on rubber gasket or thread inside the cartridge holder.

Example of breakthrough time curve

For KGC-1L for organic vapor (internal standard)

Test gas: Cyclohexane Breakthrough criteria: 5ppm Flow rate: 30 liter/min.

**Measure the gas concentration level in the environment and plot it on the Y-axis on the breakthrough time curve. Draw an extension line from the point, parallel to the X-axis towards the breakthrough time curve.**

The estimated service life is the value on the X-axis where the extension line meets the curve.

*(Sample calculation for KGC-1L chemical cartridge for organic vapor) Under the condition of 20℃ and RH50% with cyclohexane concentration level of 300ppm, the estimated service life is 260 minutes.

Note, however, that the service life of a chemical cartridge can be shortened if it is used under the condition of high concentration, high temperature and/or high humidity. For example, the estimated service life is 120 minutes if it is used under the condition of 30℃ and RH170% with cyclohexane concentration level of 500ppm.

Gas concentration (ppm)

Concentration 500ppm

30℃, 70%RH

20℃, 60%RH

0 100 200 300 400 500 600 700 800 900 1000

0 120 260 300 360 400 420 480 540 600

120 260

290 Estimated service life (min.)

Inspect chemical cartridge respirator before each use following <Inspection procedures>(Page 4)
Perform installation and removal of respirator and cartridge in safe place.
Make sure to use genuine parts supplied by KOKEN. (Refer to Page 4)


Contents described in this User Instruction may differ from the requirements/specifications exercised outside Japan. In such case, make sure to follow local laws and regulations.
2. Fitting instructions

Wear or remove respirator in safe place with no toxic substance.

1. Place the plastic molded cradle harness over the top back of head so that it stabilizes on head.
2. Hold buckles (hook and D-Ring) and pull the headband straps evenly towards both sides of the respirator so that respirator approaches to face to cover mouth and nose.
3. Fasten buckle behind the neck by fitting hook in D-Ring.
4. Place facepiece over bridge of nose first, and check if it completely fits on face, then place it over chin.
5. Adjust the respirator position on face for stable position by aligning it left and right and up and down.
6. Perform a fit test after the wearer completes wearing the respirator.
7. To remove the respirator, loosen the buckle.

Adjustment of headband length

Adjust the length of headband so that there is no slight opening between facepiece and face. Make sure not to overtighten the headband to avoid oppression. Remove respirator first and adjust the length of headband.

To tighten, pull the ends of the headband on both the hook and D-Ring sides.
To loosen, release the tension of headband by lifting both tabs of the D-ring and the hook and pull the ends of headband in the direction of the arrows as shown in the illustration.

WARNING

Unless following the instructions, the respirator may not donned correctly and there is a possibility that a good fit is not obtained. Make sure to observe the following instructions.

- Do NOT wear the respirator on towel applied over face.
- Toxic substances may leak into the facepiece.
- Make sure that the left and right sides of the headband are even in length.
- There is a possibility that over-extended headband and/or longer side of the headband than the other may be caught up in a machine.
- The wearer with allergic tendency and/or fragile skin may suffer from rash, eczema, etc. by using the respirator. And the similar symptom may occur due to sweat or dirt on the facepiece. In such cases, stop using the respirator and see a doctor.
- Do NOT apply vibration or excessive force onto the chemical cartridge. Failure to do so may result in decrease in performance and/or damage to the chemical cartridge.

CAUTION

- If the length of the headband is too short or too long, make adjustment following <Adjustment of headband length>.
- Make sure that the headband is well elastic and has sufficient strength to hold the respirator.
- If the headband is over-tightened, feeling of good fit may be lost and the wearer may experience a feeling of discomfort after working for a long time.
- After adjustment, make sure to perform a fit test.

Replacement of inhalation valve/exhalation valve

Replace inhalation/exhalation valve in safe area with no toxic substances. Make sure to use genuine parts supplied by KOKEN.

1. Replacement schedule
- Replace when damage such as crack, distortion, scar, and hole, remarkable dirt and/or sticky surface is observed.

2. Replacement of inhalation valve
- Remove the used inhalation valve from the retainer pin of the valve seat located inside of the respirator.
- To place a new inhalation valve in its position, slightly widen the hole of the valve with fingers and install it on the retainer pin firmly.

3. Replacement of exhalation valve
- Exhalation valve is located inside the lower portion of the facepiece. (Fig.1)
- Unhook the hooking hole located at the bottom of the facepiece cushion, from the protruding portion of the bonnet enclosure. (Fig.2)
- Fold the facepiece cushion toward the inside.
- Take out the exhalation valve by pinching it with two fingers.
- To install a new exhalation valve, insert the valve stem into the center hole of the exhalation valve seat. When the top of the stem comes out from the inner side of the valve seat, grasp the projected point of the valve and pull it until the stem flange appears outside of the center hole of the exhalation valve seat.
- Make sure that the exhalation valve is installed correctly without eversion, etc.
- Cover the facepiece cushion over the bonnet enclosure, and hook the hooking hole at the protruding portion of the bonnet enclosure. (Make sure that the facepiece cushion thoroughly covers over the bonnet enclosure.)
Caution: Make sure not to damage the exhalation valve seat.

Performing a fit test

Perform a fit test in safe place without toxic substances.

Press down the fit checker lever completely.

How a fit checker works:
- The fit checker lever is pressed down.
- The fit checker plate is allowed to slide up to cover the inhalation air inlet.

Make sure to perform a fit test prior to each use.
- If the respirator is not properly worn, the wearer may inhale toxic substances that leak through the gap between face and facepiece into the respirator.
- Do NOT apply excessive force on the fit checker lever. Failure to do so may cause malfunctions.
Replacement of headband

Replacement schedule
Replace the headband with a new one when:
1. Remarkable dirt, damage such as distortion and crack and/or sticky surface due to deterioration of rubber is found on headband;
2. Damage is found on buckles or plastic molded cradle harness;
3. Headband is not fully elastic.

Replacement procedure
1. Remove the headband straps through the strap slit of headband holders located on the right and left sides of the respirator.
2. To install new headband, insert the straps of the new headband through the slit of the headband holder from the facepiece side toward the cartridge holder.(RB)
3. For Type RA, insert the straps of the new headband through the slit of the headband holder form the cartridge side toward the facepiece.

Inspection procedure
Perform inspection in safe place with no toxic substances.

Check points

<table>
<thead>
<tr>
<th>Facepiece</th>
<th>Criteria</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>No damages such as crack, distortion and hole, no sticky surface due to rubber deterioration, and/or remarkable dirt are found.</td>
<td>Replace the respirator with a new one. Clean the respirator if remarkable dirt is found.</td>
<td></td>
</tr>
<tr>
<td>Bonnet enclosure</td>
<td>No damages such as crack, distortion and hole, and/or no remarkable dirt are found. Chemical cartridges can be securely installed.</td>
<td></td>
</tr>
<tr>
<td>Exhalation valve seat</td>
<td>No damages such as crack, distortion and scart, and/or no remarkable dirt are found.</td>
<td>Replace the part with a new one. Clean the part if remarkable dirt and foreign object are found.</td>
</tr>
<tr>
<td>Inhalation valve/ Rubber gasket</td>
<td>No damages such as crack, distortion, scart and hole, and/or no sticky surface due to rubber deterioration are found. There is no adherence of remarkable dirt and foreign object.</td>
<td>Replace the exhalation valve with a new one. Clean the part if remarkable dirt and foreign object attached are found.</td>
</tr>
<tr>
<td>Clamp/Ring</td>
<td>No damages such as crack, distortion and scart and/or no remarkable dirt are found. Chemical cartridges can be securely installed.</td>
<td></td>
</tr>
<tr>
<td>Exhalation valve</td>
<td>No damages such as crack, distortion, scart and hole, and/or no sticky surface due to rubber deterioration are found. There is no adherence of remarkable dirt and foreign object.</td>
<td></td>
</tr>
<tr>
<td>Overall condition after all parts are assembled</td>
<td>All parts are correctly assembled. There are no missing parts.</td>
<td>Install missing parts.</td>
</tr>
<tr>
<td>Type</td>
<td>Chemical cartridge must be an appropriate one for the type of toxic gas and its concentration level in the environment</td>
<td>Use appropriate chemical cartridge.</td>
</tr>
<tr>
<td>Appearance on unopened bag</td>
<td>The shelf life of chemical cartridge must be within two years from the date of manufacture in an unopened condition. There are no holes or rip in the bag. The bag is kept sealed.</td>
<td>Replace the cartridge with a new one that is kept in an unopened condition within 2 years from the date of manufacture.</td>
</tr>
<tr>
<td>Chemical cartridges</td>
<td>No damages such as distortion and hole, and/or remarkable dirt are found. The used chemical cartridge is kept in a place that is installed from the outside air and stored under proper management. There is enough remaining service life. (Check the remaining service life before using the cartridge)</td>
<td></td>
</tr>
<tr>
<td>Smell</td>
<td>No gas smell and/or unusual odor are recognized.</td>
<td>Replace the chemical cartridge with a new one. If the filtering material cannot be replaced, replace only the filtering material.</td>
</tr>
<tr>
<td>Filtering material</td>
<td>No damages, no distortions and/or no difficulty in breathing are found.</td>
<td></td>
</tr>
</tbody>
</table>

Straps
Fully elastic and have enough strength to hold respirator.

Headband
No cracks and/or no distortions. Buckles can be securely tightened and can be removed easily.

Overall condition
All parts are correctly assembled. There are no missing parts.

Type
Chemical cartridge must be an appropriate one for the type of toxic gas and its concentration level in the environment.

Appearance on unopened bag
The shelf life of chemical cartridge must be within two years from the date of manufacture in an unopened condition. There are no holes or rip in the bag. The bag is kept sealed.

Chemical cartridges
No damages such as distortion and hole, and/or remarkable dirt are found. The used chemical cartridge is kept in a place that is installed from the outside air and stored under proper management. There is enough remaining service life. (Check the remaining service life before using the cartridge.)

Smell
No gas smell and/or unusual odor are recognized.

Filtering material
No damages, no distortions and/or no difficulty in breathing are found.

For cleaning, refer to "Cleaning after use."

Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Internal standard</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>R 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhalation resistance</td>
<td>Less than 25a</td>
<td>9Pa</td>
</tr>
<tr>
<td>Exhalation resistance</td>
<td>Less than 40Pa</td>
<td>24Pa</td>
</tr>
<tr>
<td>Increased value of carbon dioxide concentration (Deal space)</td>
<td>Less than 0.7%/Less than 280cm³</td>
<td>0.34%/136cm³</td>
</tr>
<tr>
<td>Weight</td>
<td>Less than 137g</td>
<td>117g</td>
</tr>
</tbody>
</table>

The values above represent the performance level without cartridge, optional parts, etc.

Replacement parts
Shop for the following replacement parts from our local distributor.

- Inhalation valve
- Exhalation valve
- Clamp/Ring
- Rubber gasket
- Headband

- For KGC-1L and S, Paint spray chipper type R°
- For KGC-1M, Paint spray chipper for KGC-1M
- Particular filter to be installed on the cartridge
- For KGC-1L and 1S, Lightweight micron pre-filter for KGC-1°
- For KGC-1S, Uni micron pre-filter for KGC-1°
- To install the filter onto the cartridge, filter retainer is required.
- For KGC-1L and 1S, Filter retainer type 1

Optional parts (sold separately)

- Chipper for spray painting
- For KGC-1L and S, Paint spray chipper type R°
- For KGC-1M, Paint spray chipper for KGC-1M
- Particular filter to be installed on the cartridge
- For KGC-1L and 1S, Lightweight micron pre-filter for KGC-1°
- For KGC-1S, Uni micron pre-filter for KGC-1°
- To install the filter onto the cartridge, filter retainer is required.
- For KGC-1L and 1S, Filter retainer type 1

Maintenance and storage
Make sure to perform maintenance after each use and keep the respirator clean.

1. Cleaning after use.
Perform cleaning in safe place with no toxic substances.

- **WARNING**
  - Do not modify the respirator. Do not disassemble the parts that are not replaceable.
  - Do not use parts other than genuine parts supplied by KOKEN when replacing.

- **CAUTION**
  - Make sure to perform cleaning after removing chemical cartridge from respirator.
  - Gently wipe out dust and sweat with a dry or slightly wet cloth. Be sure not to damage the respirator.
  - Wash out remarkable dirt with mild detergent diluted with warm water. Be careful not to damage the exhalation valve seat and exhalation valve in particular. Then rinse off neutral detergent completely.
  - Wipe out residual water after cleaning and dry the respirator in the shade before use.
  - Disinfect the face-contacting area and inside of the facepiece by wiping with alcohol-soaked cloth. Then wipe out the residual alcohol completely.

2. Storage
Place for storage
After cleaning, store the respirator in a dry place without heavy temperature fluctuation and/or high humidity. Do NOT pile up the cleaned respirators as the facepiece, headband, etc. could be cracked and/or distorted. Avoid direct sunlight for storage. Prepare an exclusive storage place so that storage condition can be checked without trouble.

- **WARNING**
  - Absolutely do not conduct the followings as they could cause distortion and/or damage on chemical cartridge, and decrease in toxic-removing performance, etc.
  - Cleaning chemical cartridge with a wet cloth or washing it in water.
  - Applying unnecessary force onto the chemical cartridge such as tapping it hard to remove particulates captured on filtering material.
  - Blowing particulates attached on surface of the filtering material with compressed air generated by compressor or sucking them with vacuum cleaner, etc.

- **DANGER**
  - Shell life of unopened chemical cartridge is two years from the date of manufacture.
  - Do NOT use the chemical cartridge stored for more than 2 years from the date of manufacture.
  - Dispose of the used chemical cartridge, clearly indicating to an industrial waste disposer that waste plastic and burnt residue are included, as industrial waste.
  - Do not take apart the unused cartridge when disposing and if it is the used cartridge, put it in a sealed plastic bag. Dispose of the used filtering material in a tightly sealed plastic bag so that toxic gas absorbed would not diffuse into the atmosphere.