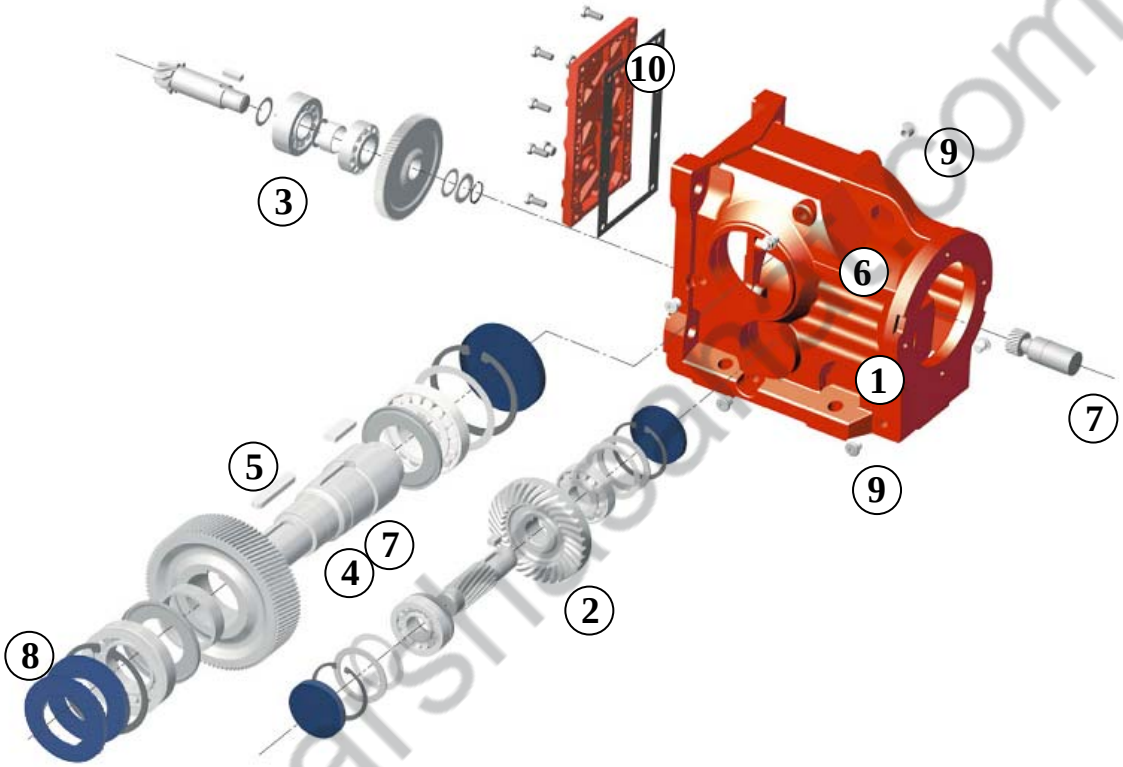
Technical Note

K-Series Gear Reducer

K-Series

Features

The SEW-Eurodrive K-series reducer contains three gearing stages: 1st stage – helical, 2nd stage – bevel, 3rd stage – helical. Efficiencies are comparable to SEW's R-series and F-series helical reducers.



1. SAE Class 30 or equivalent (GG20) gray cast iron housing and flanges. No bolt-on bearing covers.

2. Finish ground or shaved steel gears heat treated and hardened to 58-62 Rockwell C

3. ABEC-1 bearing tolerances

4. SAE 1045 steel shafts (SAE 4140 steel on solid shafts for sizes K87 through K187)

5. Captured keys on input/output shafts

6. Corrugated surface improves heat dissipation and reduces vibration

7. Input and output shafts are available in either inch or metric sizes. Solid shafts contain a center-tapped hole to ease mounting components onto the shaft.

8. Exclusive ***interlocking*** 2-piece seal design consisting of a patented bi-helix Viton® inner seal and a double-lip Nitrile (Buna N) outer seal to provide three sealing surfaces against contaminants

9. Oil level and breather plugs strategically placed according to the customer's mounting position

10. Removable inspection cover

www.arshreducer.com

Technical Note

Features:

- **Style**: Right-angle shaft orientation (output shaft at 90° to the motor shaft or to a solid input shaft)
- **Flange**: Contains O-ring to minimize oil leakage that may result from mounting to a "flat" surface that exceeds acceptable tolerances. Also contains a centering tenon (pilot) and is available with either through holes (B5) or tapped holes (B14)
- **Input Types**: Available with adapters to accommodate NEMA or IEC motor frames, solid input shafts, backstops, adjustable motor mounting platforms, and scoops. Also accepts an R-series reducer as the input (ex: KAZ67R37) to attain higher ratios and lower output speeds.
- **Output Shaft – Keyed**: Metric or inch shaft available in hollow or solid designs. Keyed hollow shaft supplied with special mounting paste and a retaining kit. Paste protects against corrosion as is available in regular or food grade. Retaining kit secures customer's solid shaft and contains bolt, washer, and protective cap.
- **Output Shaft – Keyless**: Available as a metric shrink disc, an inch tapered bushing (TorqLOC™), or a DIN 5480 spline
- **Mounting**: Available as foot, flange, or shaft mounting
- **Torque Ratings**: Based upon mechanical capacity under continuous operation
- **Torque Capacity**: Ranges from 345 lb-in to 442,500 lb-in (sizes K37 – K187)
- **Shaft Rotation**: Unrestricted - clockwise or counterclockwise
- **Efficiency**: Due to rolling friction, the efficiency is much higher than a helical-worm or single worm reducer: only 1.5% efficiency loss per gear stage (ie: K67 = 95.5% efficient).
- **Ratio Range – Single Reducer**: 5.36 to 150.41
- **Ratio Range – Compound**: 94 to 17,550
- **Fatigue Strength**: Shafts and gears designed for infinite fatigue strength
- **Shock Capacity**: Meets or exceeds AGMA 6009-A00, which states that reducer must be capable of withstanding 4 shock loads within an 8-hour period – each shock equal to 200% of the maximum rated torque for 2 seconds.

www.arshasanat.com

Housing Material

All SEW K-series reducers are manufactured from SAE 30 or equivalent (GG20) gray cast iron due to the following benefits:

- Cast iron flows well, allowing it to be used on intricate castings.
- Cast iron machines well.
- Cast iron serves as an excellent damping material to minimize vibration, contributing to longer bearing and gear life.

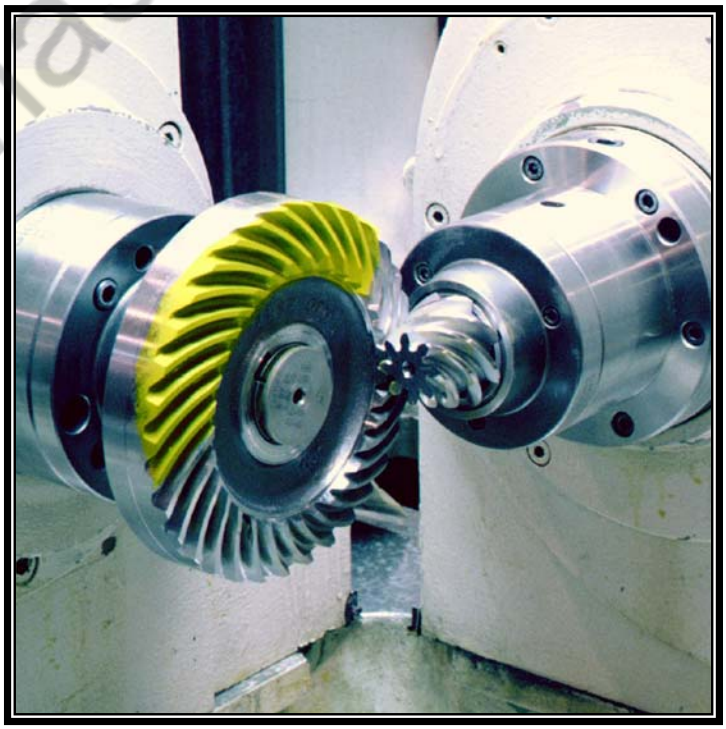
Ductile iron (or nodular iron), a type of cast iron containing magnesium, is 2 to 4 times stiffer than gray cast iron. It is often used in applications involving heavy shock loads at low temperatures – when gray iron housings lose much of their shock absorbing strength.

Ductile iron housings are not available on K-series reducers.

Matched Bevel Sets

During manufacturing, a bevel pinion is paired with a driven gear. The two gears are placed at right angles (see picture at right) and are finely polished using an abrasive liquid. This "lapping" operation meshes one gear pattern into the other, like a foot pressing a pattern into a shoe. The result is quieter, smoother operating gears.

Since these two gears are now mates, they are sold as a set only. A unique serial number is stamped onto both gears for identification.



www.arshasanat.com

Technical Note

Torque Arm/Shaft Mounting

KA67T

The preferred method of installing a hollow shaft reducer is to hang the reducer from a solid shaft and to allow the solid shaft to support the entire weight of the reducer and motor. Since this method does not require the use of feet or a flange, the reducer has a natural tendency to spin around the shaft if not restrained.

To aid in restraint, SEW can provide an optional torque arm and rubber bushing that mount to the bottom of the reducer, as shown at left. If supplied, a letter "**T**" is added to the nomenclature after the reducer size.

It is most important that the customer properly affix the torque arm. More information on torque arm installation is available within **Tech Note GM-021**.

Foot Mounting

All K-series units are available with a footed housing that contains through-holes for mounting. The reducer may be mounted from the bottom or from the side since there are two footed surfaces (J-mount). A footed housing is standard on all units with a solid shaft. It is optional on the four styles of hollow shafts listed below.

- KA (keyed hollow shaft)
- KT (TorqLOC™ keyless tapered bushing)
- KV (DIN 5480 spline)
- KH (metric shrink disc)

When a footed housing is specified on any of these four styles, the letter "**B**" is added to the nomenclature after the reducer size, as shown in the example at right.

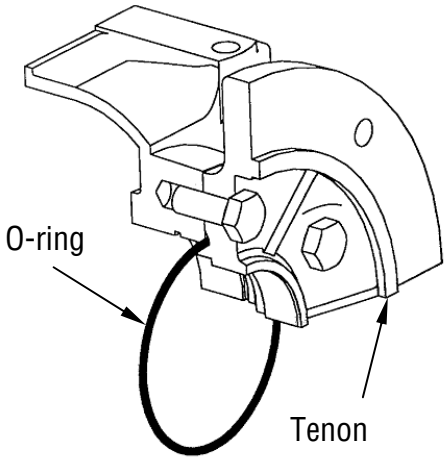
KA67B

Note: When using the footed housing with a TorqLOC™ (ex: KT67B) or with a shrink disc (e.g: KH67B), customer must shield the rotating shaft to protect against injury.

www.arshasanat.com

Technical Note

Flange Mounting



Two styles of flanges are available: **B5** and **B14**. Both flanges contain an O-ring and tenon (pilot) as shown at left.

The O-ring helps prevent oil leakage that could occur if the flange is mounted to a "flat" surface that exceeds the recommended flatness tolerance.

The tenon allows for easier installation as well as protects the reducer from shifting out of alignment if the mounting bolts were to loosen.

B5 Flange ("F")
A B5 flange bolts onto the reducer housing and contains through-holes (non-threaded) for mounting. These holes are intentionally made slightly larger than the bolts for which they are intended. The letter "**F**" is added to the nomenclature to designate this option.

KAF67

B14 Flange ("Z")
A B14 flange bolts onto either side of the reducer. It contains through holes to allow access to the tapped holes of the housing. The bolt circle and tenon diameters are smaller on the B14 than on the B5 flange of the same reducer. The letter "**Z**" is added to the nomenclature to designate this option.

KAZ67

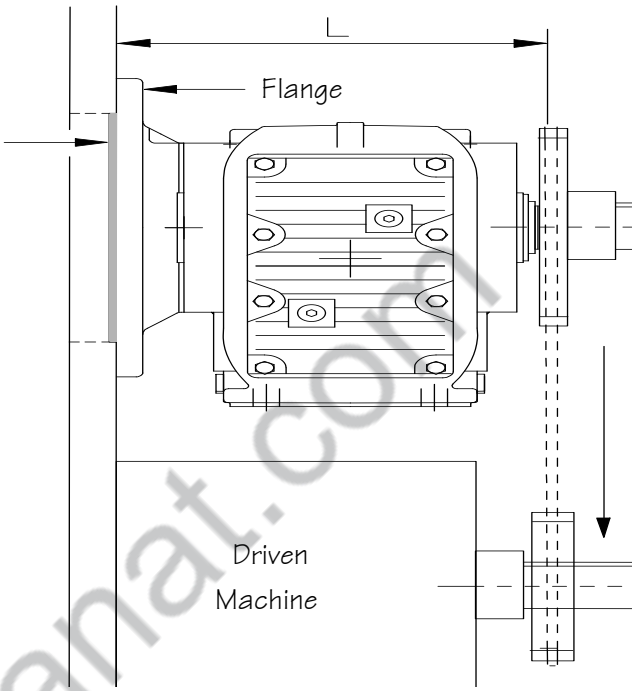
Please reference **Tech Note GM-020** for important additional information on mounting procedures for flanged units.

www.arshasanat.com

Technical Note

Flange-Opposite-Shaft Mounting

A K-series solid shaft reducer is available with a 'flange-opposite-shaft' configuration, as shown at right. The solid output shaft and mounting flange are located on opposite sides of the reducer. In this configuration, a small radial force (OHL) on the output shaft results in a large bending moment on the flange due to the long lever arm (distance L). Without additional support, the allowable overhung load (OHL) must be reduced to 25% of the published maximum OHL to avoid distorting or fracturing the flange. Contact Regional Engineering for more information.



Optional Bearings

K-series reducers are available with optional heavy-duty bearings as listed below. Heavy-duty bearings increase the overhung load capacity. For more information, contact SEW Engineering.

Unit	Output Bearings	
	Standard	Optional
KA/KAF/KAZ 67	Ball	Taper Roller
KA/KAF/KAZ 77	Ball	Taper Roller
KA/KAF/KAZ 87	Ball	Taper Roller
KA/KAF/KAZ 97	Ball	Taper Roller
KA 107	Ball	Taper Roller
KA 127	Ball	Taper Roller
K/KH 167	Taper Roller	Spherical
K/KH 187	Taper Roller	Spherical

Note: Heavy-duty bearing option is only available with a metric hollow shaft.

www.arshiasanat.com