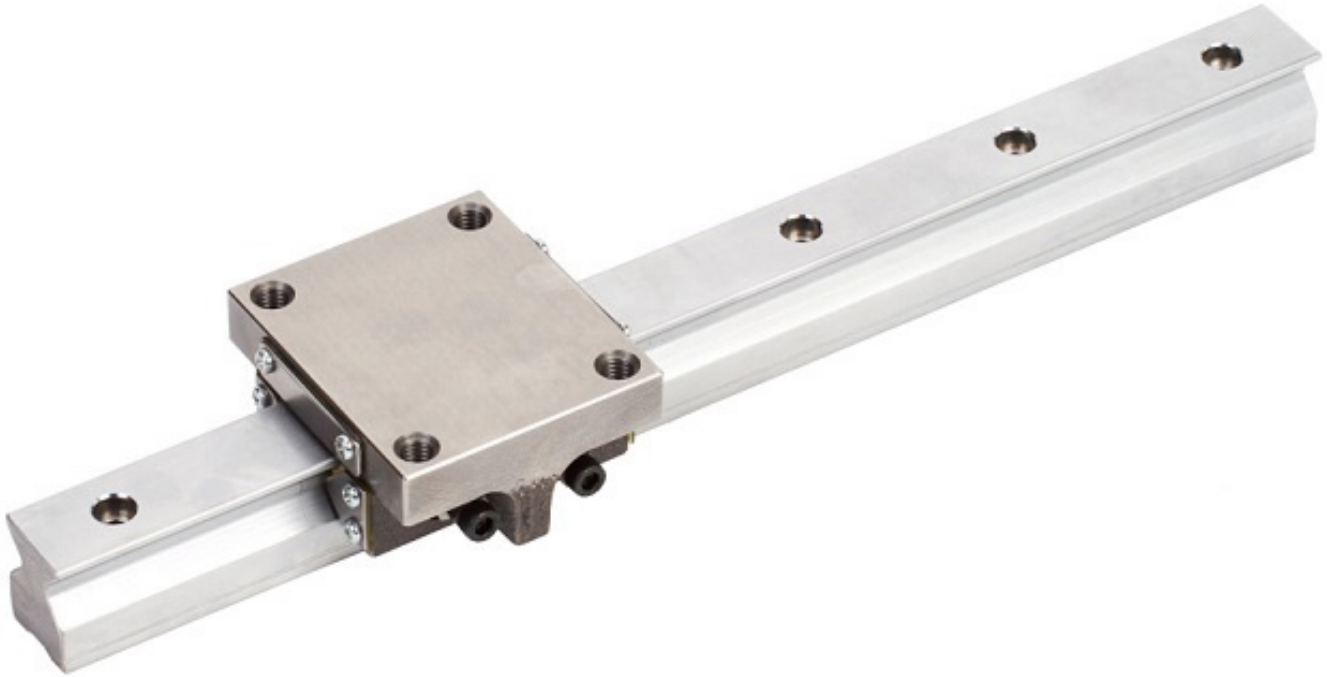
SANKYO OILLESS Industry GmbH



LG-008, LG-011 & LG-041
Linear guides

Stepping foreard together with our customers

For more than 50 years, ***SANKYO OILLESS*** has been one of the leading manufacturers of maintenance-free sliding elements. As a leading supplier and pioneer in the production of stamping and press tool components for the automotive industry, ***SANKYO OILLESS*** supplies an products for many other applications such as mold making, engineering, packaging, heavy industry, aerospace and many more.

The technologies developed by ***SANKYO OILLESS*** have reduced or eliminated friction, wear and tear. In addition, ***SANKYO OILLESS*** provides services and quality products to offer you the best possible solutions for your requirements at all times.

The benefits of slide bearings versus roller bearings

In a variety of applications, designers are increasingly replacing roller bearings with slide bearings. In addition to ease of installation and cost effectiveness, slide bearings offer a number of distinct advantages. Slide bearings require less installation space, have a larger load bearing capacity, are maintenance-free or require little maintenance, are easier to assemble and are less susceptible to noise and vibration.

The following list gives an overview of the general advantages of bearings compared to bearings.

Slide bearing

- Higher load bearing capacity and reduced footperint
- Higher resistance to vibration and increased lifetime
- Easier installation
- Lower installation costs
- Increased shaft tolerances possible
- Compensates misalignment and reduces the edge load

Roller bearing

- sensitive to shock, vibration and edge load
- high costs for bearings, housings, counterfaces and - fixing materials
- large space required
- is prone to noise development

Technologies for top performance

SANKYO products are manufactured in our own plants and distributed worldwide.

We offer high quality maintenance-free sliding elements acc. to international standards and standards for use in

- pressing tools
- injection molds
- general engineering

As an experienced specialist, we have the appropriate know-how in tribology to always offer the best solutions for your needs. We supply a large portfolio of lubrication-free sliding elements and also offer custom products acc. to customer drawing.

Quality and performance are our constant commitment!

Linear guides

Properties

SANKYO linear guides „LG“ are guiding systems with plain bearing integrated made of special copper alloy.

The inserted solid lubricants achieve best sliding properties without any maintenance. High robustness and dirt resistance mark the SANKYO linear guides

Advantages:

- no permanent lubrication required, therefore clean and environmentally friendly
- applicable in high-temperature range (300°C), resistant against splash water
- the reails are made for high loads at moderate movement thanks to their large contact surface and high-tensile material
- the sliding elements are resistant against shock and torsion load
- stable sliding guidance (X-shape for LG-011, T-shape for LG-008) provide a safety and smooth movement
- sliding elements with V-shape (LG-011) are adjustable, which enables backlash-free slide motions
- the solid lubricants guarantee a constant friction coefficient over liftetime, further lubrication is not needed
- scrapers on both sides prevent the intrusion of dirt

Variants

Undrilled guide rails available to maximize the fl exibility on the rail layout. This make it feasible to adopt hole patterns from the customer and to replace existing guiding systems.

It is also possible to string together or shorten the guide rail.

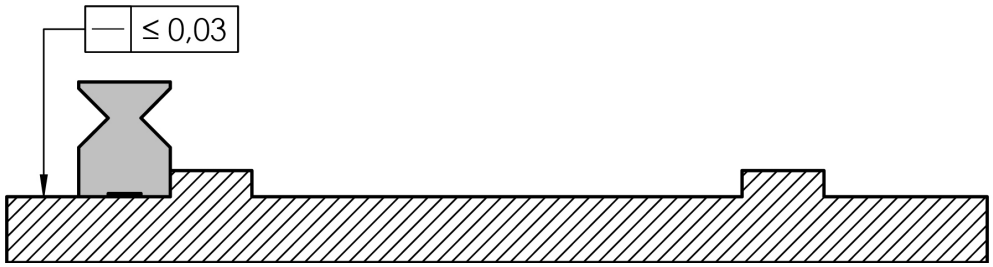
Furthermore, special lengths can also be requested.

Assembly instruction

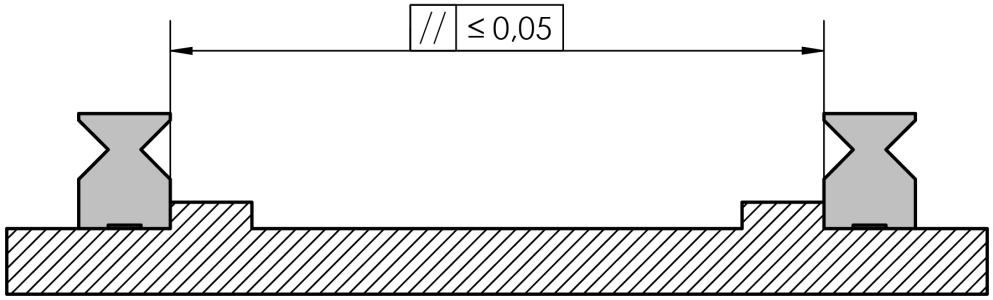
Guide rail

The guide rail is made out of nitrated steel. During assembly,

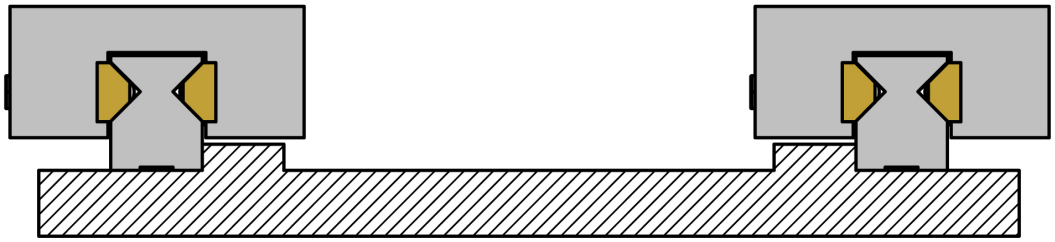
1. Fixing the guide rail, compensating for unevenness.



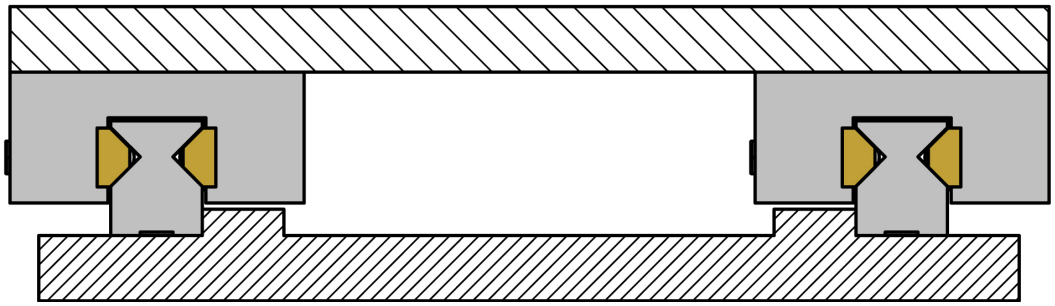
2. Fixing the second guide rail parallel.



3. The sliding head is placed on the guide rail and the movement of the sliding head should be tested.



4. Base plate to be fixed on the slide heads. After provisional assembly, check the movement and fix the screws and dowel pins in the correct place.

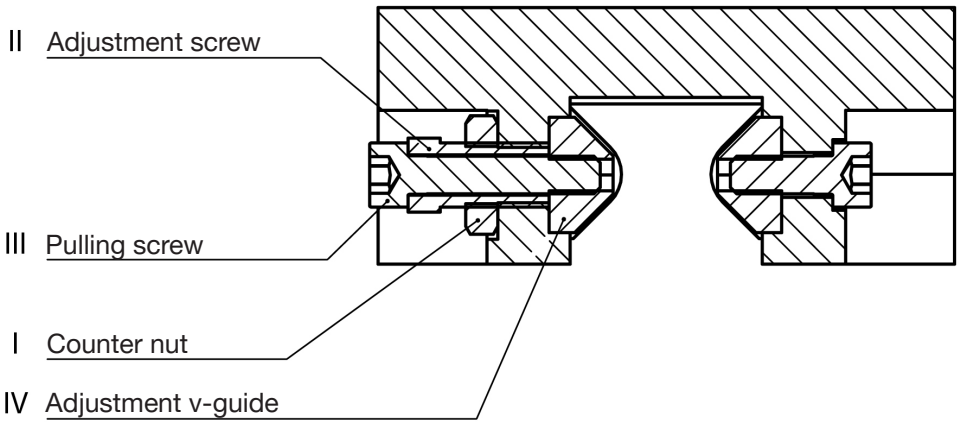


Sliding head

Normally the sliding head is positioned by dowel pins. Shouldering is possible if required (- - -).

Toleranzen

Our guide systems are individually adjustable to the guide rail.



1. Loosen the counter nut (**I**) (counterclockwise)
2. Loosen the pulling screw (**III**)
3. Loosen the adjustement screw (**II**)
4. Assemble the sliding head on to the guide rail
5. Tighten the adjustment screw (**II**) sligthly until the sliding head can no longer be moved by hand
6. Turn back the adjustment screw (**II**) max. 10° for creating the sliding clearance
7. Hold the adjustment screw (**II**) with a wrench and tighten the pulling screw (**III**)
8. Hold the adjustment screw (**II**) with a wrench and at the same time tighten the counter screw (**I**)

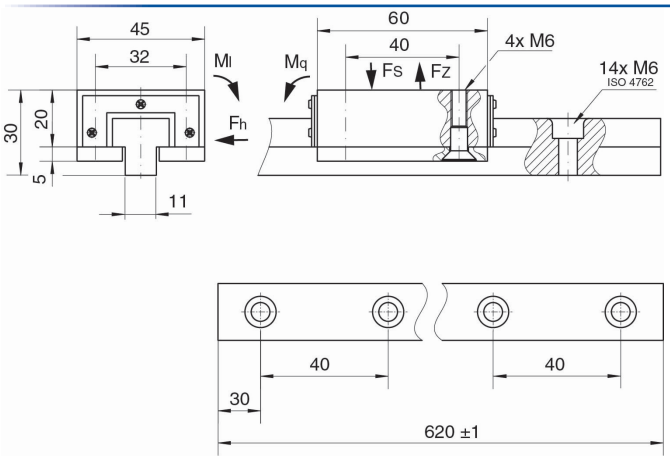
Connect several guide rails in series

The distance between the divided guide rails should be kept as small as possible (max. 2 mm).

The guide rails can be cut at any point except in the area of the fixing holes. A radius R2 should be provided on the edges, especially on the sliding surfaces (V-shape).

LG-008, LG-011 & LG-041 - Linear guides

Article informationen

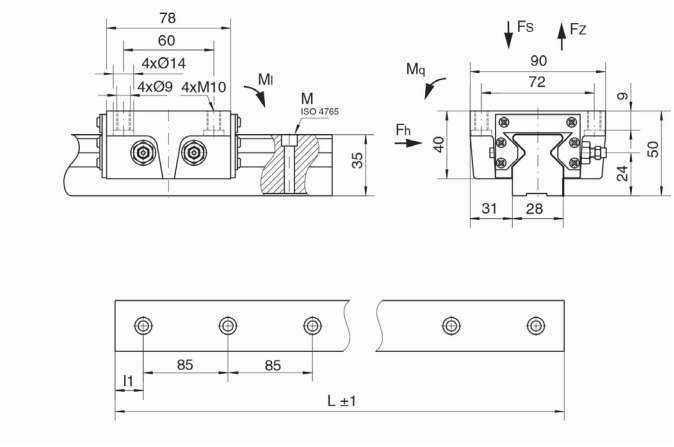


Properties:

Base material	Special brass (SO#50SP2)
Self-lubricating	Yes
Lubricant	Graphite
Max. surface pressure P	100 N/mm²
Max. sliding speed v	30 m/min
Max. P*v-Wert	200 N/mm² x m/min
Operating temperature	-50°C / +200°C (max. 300°C)
Friction coefficient	0,07

Article no.:	Article name:	Fs (kN):	Fz (kN):	Fh (kN):	Mq (Nm):	Ml (Nm):
70080000	LG-008-H	10	2	3	150	300

Article no.:	Article name:	Fs (kN):	Fz (kN):	Fh (kN):	Mq (Nm):	Ml (Nm):
70080620P	LG-008-620	10	2	3	150	300
70080620U	LG-008-620-UG	10	2	3	150	300



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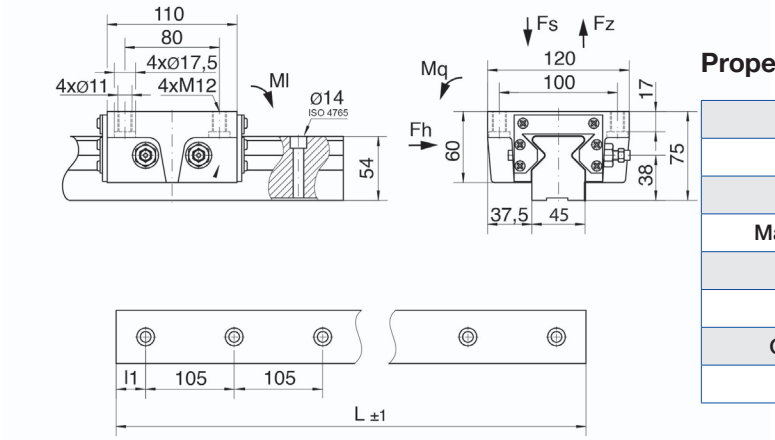
Article no.:	Article name:	Fs (kN):	Fz (kN):	Fh (kN):	Mq (Nm):	Ml (Nm):
70110010	LG-011-H	16	16	13	270	540

Article no.:	Article name:	Länge L:	l1:	Fs (kN):	Fz (kN):	Fh (kN):	Mq (Nm):	Ml (Nm):
70110600P	LG-011-600	600	45	16	16	13	270	540
70110600U	LG-011-600-UG	600	-	16	16	13	270	540
70111250P	LG-011-1250	1250	30	16	16	13	270	540
70111250U	LG-011-1250-UG	1250	-	16	16	13	270	540



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Friction coefficient	0,07

Article no.:	Article name:	Fs (kN):	Fz (kN):	Fh (kN):	Mq (Nm):	Ml (Nm):
70110010	LG-041-H	36	36	29	690	1380

Article no.:	Article name:	Länge L:	l1:	Fs (kN):	Fz (kN):	Fh (kN):	Mq (Nm):	Ml (Nm):
70110600P	LG-041-600	600	37,5	36	36	29	690	1380
70110600U	LG-041-600-UG	600	-	36	36	29	690	1380
70111250P	LG-041-1200	1200	22,5	36	36	29	690	1380
70111250U	LG-041-1200-UG	1200	-	36	36	29	690	1380

Material data

Material		SO#50SP2*	SO#50SP5	SO#50SP7	SO#50SP8	SO#50SP13	SO#50B
		Hard brass with graphite	*Alu-bronze with graphite*	*Alu-bronze with graphite*	*Hard brass with graphite*	*Bronze with graphite*	*Red brass with graphite*
Self-lubricating		Yes	Yes	Yes	Yes	Yes	Yes
Lubricant		Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
Max. surface pressure *[N/mm²]*		100	100	120	130	120	50
Max. sliding speed *[m/min]*		30	10	10	15	10	50
Max. P*v-Wert *[N/mm² * m/min]*		200	150	200	200	200	100
Temperature *[°C]*	*Standard* *Max*	-50 / +200 +300	-50 / +200 +300	-50 / +200 +300	-50 / +200 +300	-50 / +200 +300	-50 / +200 +400
Friction coefficient**	*initial* *long term*	0,15 0,07	0,15 0,07	0,15 0,07	0,15 0,07	0,2 0,15	0,15 0,07
Brinell hardeness *[HB]*		>210	>210	>260	220 ~ 260	>280	>60
Further informatio							
Elongation *[%]*		>12	>18	>2	>3	>0,5	>15
Density *[kg/dm³]*		7,9	7,7	7,8	7,8	7,2	8,7
Tensile strength *[N/mm²]*		>755	>686	>833	>700	>550	>195
Yield strength *[N/mm²]*		>412	>372	>509	-	-	>105
E-Module *[N/mm²]*		97000	108000	123600	108000	145000	96000
Thermal expansion *[10-5 * grd.-1]*		1,9	1,6	1,6	1,9	1,71	1,8

: Material used according to **SANKYO OILLESS standards*

***: against steel, hardened and grinded*

Tin bronze	Sinter-bronze	SO#50PB	CuSn8	SO#50S45C	SO#50F	Polyacetal
		Ton bronze	*acc. to DIN 17662*	*Steel with graphite*	*Grey cast iron with graphite*	*Plastic*
No	Yes	No	No	Yes	Yes	No
-	Oil	-	-	Graphite	Graphite	Graphite
80	50	80	40	30	5	25 35 (with oil)
20	300	50	120	10	10	50 200 (with oil)
-	96	100	-	80	50	100 200 (with oil)
-50 / +200 +300	-12 / +90	-50 / +200 +300	-200 / +200	-50 / +150	-50 / +150	-50 / +80
0,16	0,09	0,15 0,07	-	0,01	-	-
>80	>25	>80	-	>375	160 ~ 220	115 (HRR)
n						
>6	-	>5	-	19	-	73
8,7	6,5 ~ 7,0	8,2	8,8	7,8	7,1 ~ 7,3	1,4
>295	-	>295	-	>690	>250	69
>161	-	>161	-	-	-	-
108000	-	108000	115000	-	-	-
1,8	-	1,8	-	1,1	1	7,7

Chemical resistance

Water

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AIB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	*Red brass mit FSS*
Fresh Water	O	◎	◎	X	◎	O
Sea Water	△	O	O	X	◎	O

Acid

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AIB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	
Alcohol	◎	◎	◎	-	◎	-
Formic acid	-	-	-	-	-	X
Chlorine (dry)	◎	◎	◎	-	◎	-
Chlorine (wet)	X	△	△	-	-	-
Chromic acid	X	X	X	X	-	-
Acetic acid	X	X	◎ (20°C) △ (118°C)	X	◎	O
Hydrochloric acid	-	O	O	X	-	X
Concentrated hydrochloric acid	X	X	△	X	X	-
Lactic acid	X	X	X	X	O	X
Phenol	-	-	-	-	-	X
Phosporic acid	X	O	O	X	△	X
Nitric acid	X	X	X	X	O	-
Sulfuric acid (40-80%)	X	△	△	X	△	X* △**
Sulfuric acid (80-95%)	X	O	O	X	△	X* △**
Diluted hydrocloric acid	△	-	-	-	-	X
Hydrogen peroxide	△	O	O	X	O	-

**: High concentration*

***: Low concentration*

Explanation		
◎: Preferred	O: no problem in use	△: Affected
X: Not allowed for use	-: unknown	

Chemical resistance

Alkali

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AIB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	
Ammonia (dry)	◎	◎	◎	O	◎ (20°C) X (Gas)	X
Ammonia (wet)	X	X	X	O	◎ (20°C) X (Gas)	X
Ammonia (liquid)	X	X	X	-	◎	X
Iron chloride	X	O	O	X	△	-
Potassium hydroxide	O	O	O	-	-	-
Calcium chloride	X	O	O	△	O	-
Calcium hydroxide	O	◎	◎	O	-	O
Sodium hydroxide	O	O	O	-	◎	-
Sulfur (dry)	◎	O	O	△	-	O
Sulfur (wet)	X	X	X	△	-	O

Solvent

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AIB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	
Acetone	◎	◎	◎	O	◎	△
Benzene	-	-	-	-	-	△
Ethylene glycol	O	◎	◎	△	-	-
Carbon tetrachloride (dry)	◎	◎	◎	X	◎	-
Carbon tetrachloride (wet)	X	O	O	X	-	-
Methyl alcohol	◎	◎	◎	O	O	△
Toluene	◎	◎	◎	O	-	-

Explanation		
◎: Preferred	O: no problem in use	△: Affected
X: Not allowed for use	-: unknown	

Chemical resistance

Grease and others

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AlB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	
Gasoline	◎	◎	◎	O	◎	O
Diesel	-	-	-	-	-	O
Crude oil	△	O	O	O	O	-
Lacquer	◎	◎	◎	△	-	-
Kerosene	◎	◎	◎	O	◎	-
Vegetable oil	◎	◎	◎	△	-	-
Lubricants	◎	◎	◎	◎	◎	O
Heavy oil	O	◎	◎	O	O	-
Animal oil	◎	◎	◎	-	-	-

Explanation		
◎: Preferred	O: no problem in use	△: Affected
X: Not allowed for use	-: unknown	

Maintenance and lubrication

Before inserting the sliding elements, clear the mounting surfaces of the housing. An oil film on the back surface will make it easier to mount the bearing. Before mounting the axle, lubricate the sliding surfaces with a light greasy film to avoid wear of the inlet and to activate the solid lubricant.

The following greases should be preferred:

ELKALUB GLS 364	ELKALUB	120°C	For the food industry
ELKALUB GLS 595/N2	ELKALUB	300°C	For the food industry
ELKALUB GLS 993 H1	ELKALUB	150°C	For the food industry
GLEITMO 805	FUCHS	110°C	
ALTEMP QNB 50	KLÜBER	150°C	
Klüberalfa DH 3-350	KLÜBER	230°C	
Klüberfood NH1 CH 2-150	KLÜBER	250°C	For the food & pharmaceutical industry
Klübertemp GR AR 555	KLÜBER	250°C	
PARALIQ P 68	KLÜBER	100°C	For the food & pharmaceutical industry
Gadus S2 V100 2	SHELL	130°C	
Gadus S3 V100 2	SHELL	160°C	
Multi-purpose grease Nr.12511	PRESSOL	80°C	

The greases have to be free of Additives like MoS2 (molybdenum disulfide) and EP.

The work to be carried out is usually limited to an inspection of the wear in the period from ½ to 2 years, depending on the duration of use and load. After each disassembly, a single re-greasing should be carried out, but the sintered sliding film of solid lubricant should not be removed. Continuous introduction of lubricant is not necessary, as the parts are maintenance-free under consideration of the application criteria for sliding elements made of bronze with solid lubricant.

Transport and storage

The parts are to be stored dust-free and dry, mechanical damages during transport and storage are to be avoidded. Contact with organic and inorganic solvents must also be prevented, as this may destroy the solid lubricant.