



Pneumatic Linear Drive OSPP-Classic / OSPP-Classic-KF

Operating Instructions

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



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This operating manual is the translation of the original German version.
Responsible: R&D dept.

1 Foreword to the Operating Instructions

These Operating Instructions should help you to become familiar with the OSPP-Classic and OSPP-Classic-KF and to benefit from its proper application.

The Operating Instructions include important notes on using the OSPP-Classic / OSPP-Classic-KF safely, properly and economically. Your compliance with them will help you to avoid dangers, to reduce repair costs and downtime and to lengthen the OSPP-Classic's / OSPP-Classic-KF's service life.

The Operating Instructions must be read and applied by all personnel who have any involvement with the OSPP-Classic or OSPP-Classic-KF, for example:

- Operation, including setting up, trouble-shooting during operation, remedying of production shortfalls, servicing, use and disposal of dangerous materials (operating and ancillary materials).
- Maintenance (servicing, inspection, overhaul).

Apart from the Operating Instructions and the safety and environmental regulations valid in the country and place of use, the recognized rules and best practice for safe, efficient working must be observed.

User's Responsibilities

The following are assumed to be responsibilities of the user:

- Compliance with EN 89/655 in its local national form.
- Compliance with applicable national regulations on safety at work.
- Correct application of the OSPP-Classic / OSPP-Classic-KF.
- Compliance with these Operating Instructions.

Before the OSPP-Classic / OSPP-Classic-KF is commissioned, it must be clearly established that the machine or plant into which it is to be installed complies with the requirements of the EC Machines Directive.

Explanation of Symbols and Notes

Notes which are highlighted by these symbols help to prevent injury to personnel. Please ensure that all users understand them.

You will also find the following symbols in the Operating Instructions.

Symbol	Explanation of Symbol	Symbol	Explanation of Symbol
	Attention: This symbol is used if failure to comply carefully with operating instructions, operating sequences, etc. can lead to personal injuries, fatal accidents or damage to the plant.		Attention: Danger of cuts to fingers etc.
	Information: Symbol for tips and notes to facilitate use of machine and to help to prevent damage.		Note: Wear safety glasses
	Attention: Falling load		Note: Wear safety gloves
	Attention: Danger of crushing		Note: Available accessory

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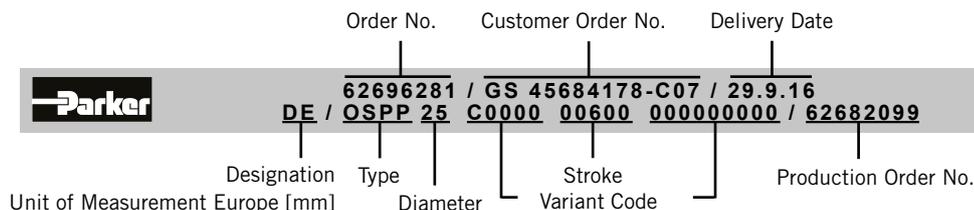
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They must not be copied in full or in part, distributed or used in an unauthorized manner for competitive purposes or passed on to others. Contravention may lead to legal action.

The Type Label

You will find the type label in the groove of the cylinder barrel.



Product Monitoring

Our goal is to supply safe, state-of-the-art products. Therefore we monitor our products constantly after delivery. Please inform us immediately of any recurring malfunctions or problems with the OSPP-Classical v. OSPP-Classical-KF.

2 Safety

Authorized Use

The operating safety of the OSPP-Classical / OSPP-Classical-KF (called „Linear Drive“) is only guaranteed if it is used in authorized applications.

Authorized applications of the Linear Drives are:

- To move loads.
- To exert force.

The Linear Drives are driven by compressed air, max. 8 bar.
(Requirements referring to compressed air see Technical Data)

The following should also be observed:

- Conditions laid down in the order confirmation.
- The Operating Instructions.

If the Linear Drive is used in any other way, this would constitute an „Unauthorized Use“.

This could result in property damage or personal injury for which we cannot be held responsible. The risk is borne by the user alone.

Personnel

The operator of the complete plant must ensure that work on the OSPP-Classical / OSPP-Classical-KF is carried out only by authorized and qualified personnel. Authorized personnel are trained engineers of the operator, the manufacturer and the service partner.

Safety-Conscious Working Practices

The contents of these Operating Instructions, especially the chapter on „Safety“, must be carefully observed. Personnel who have to work with the Linear Drive must have read and understood the Operating Instructions, especially the chapter on „Safety“, before work is begun. After work has begun it is too late. This applies especially to personnel who are involved only occasionally with the Linear Drive, e.g. for setting up, servicing, etc.

Check the safety-consciousness of the personnel and their observance of the Operating Instructions at sensible intervals.

The following are not permitted:

- Unauthorized modifications of the Linear Drive.
- Working methods which impair the safety of the OSPP-Classical / OSPP-Classical-KF.

Observe all markings on the OSPP-Classical / OSPP-Classical-KF:

- Safety instructions.
- Markings for compressed air connections.

Maintain these in fully readable condition.

Observe also the manufacturer's instructions on lubricants, solvents and cleaning materials.

Conversions and alterations

The linear drives shall not be modified in its construction and safety aspects, without the prior written approval of **Parker Hannifin GmbH**. Any such modifications carried out without approval will rule out all liability on the part of **Parker Hannifin GmbH**.

In principle, no safety and protection devices/equipment shall be dismantled or put out of operation.

When installing special attachments, the assembly regulations of **Parker Hannifin GmbH** shall be observed as required.

The following regulatory instruments must be observed as a matter of course:

- Relevant rules and regulations for accident prevention.
- Generally recognised safety regulations.
- EU Directives.
- Country-specific provisions.

Dangers after shutting down the OSPP-Classic / OSPP-Classic-KF or the whole plant

Even after venting the whole plant there can still be pressure in the cylinder. This can cause uncontrolled movements of the piston. Observe the Operating Instructions for the whole plant.

Reversal of Movement in an Emergency

See the operating instructions for the whole plant.

Replacement Parts



In the interest of safety, only original replacement parts and accessories approved by **Parker Hannifin GmbH** should be used. The use of other parts can change the characteristics of the Linear Drive.

We take no responsibility for consequences arising from this.

3 Guarantee

We reserve the right to modify these Operating Instructions and the technical details of the data and diagrams in the Operating Instructions.

The **Parker Hannifin GmbH** gives no quality or service life guarantees and no guarantees of suitability for specific purposes. These must be agreed explicitly in writing.

Statements in sales literature, advertisements or other promotional media do not constitute guarantees.

The rights of the user under guarantee are on condition that the user informs us of the problem without delay and describes it accurately in his complaint. The **Parker Hannifin GmbH** cannot be held responsible for damage to the product itself or for consequential damage caused by the product where this has been caused by improper use of the product. Insofar as the **Parker Hannifin GmbH** accepts responsibility, the **Parker Hannifin GmbH** may either repair or replace the product at its sole discretion.

Within the framework of ISO 9000, all Linear Drives bear a type label. This type label must not under any circumstances be removed or destroyed.

Any liability of **Parker Hannifin GmbH** – regardless of its basis in law – exists only if there has been intent or gross negligence, or culpable injury to life, body or health, or product defects which have been fraudulently concealed or whose absence has been explicitly guaranteed in writing. Furthermore liability can exist insofar as there is liability for personal injury and damage to privately used property under the Product Liability law.

All other claims are excluded.

Any guarantee is voided by non-compliance with these Operating Instructions, with relevant legal regulations or with other notes or instructions from the supplier.

In particular **Parker Hannifin GmbH** is not responsible for problems caused by modifications made by the customer or by a third party. In such cases normal repair costs will be charged. There will also be a charge for inspecting the product if no defect could be found in the product. This rule also applies during the guarantee period.

No rights exist in respect of continued availability of previous versions of a product or in respect of upgrading products already supplied to current technical status.

4 Transport and storage

4.1 Transport

In order to avoid damages during transport and storage the equipment shall be transported as indicated below and protected with appropriate packaging against dirt, humidity and miss handling.



Danger from falling load

Inappropriate transport and installation of the Linear Drive can lead to:

- personal injury,
- property damage.

Transport of Linear Drive

Avoid deflection of the Linear Drive!

- If necessary, long and thin cylinders should be carried by several persons.

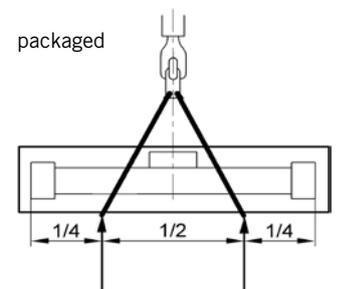
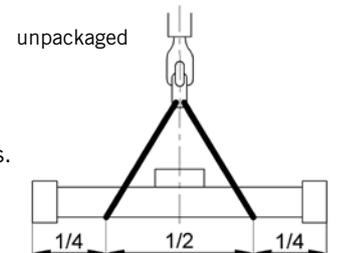
Transport of the packed Linear Drive with a crane or fork lift
(see diagram on right).

- Apply ropes of sufficient length with a load application ratio as shown or position the fork-lift truck at appropriate point.
- In the case of very long cylinders always use appropriate harness such as equalizers or fixtures in order to avoid deflection.



Information

The transport company and the manufacturer or the supplying company must be informed of any transport damage or missing parts immediately in writing.



4.2 Interim Storage

Where interim storage is involved, you must observe the following:

- Dry, dust- and vibration-free storage.
- On a **flat** surface.
- Outdoors under a suitable covering.

You must seriously avoid deflection of the Linear Drive!

5 Customer Service



Address for Replacement Parts and Customer Service

See back page.

Replacement Part List

For preventive maintenance of your cylinder we supply seal kits, service kits and replacement parts (see chapter 14 page 28 to 30).

6 Technical description OSPP-Classic

6.1 Technical Data

For further detailed information about

- Dimensions
- Space requirements
- Forces and loads
- Speeds and damping energy
- Weight

and other data, see **OSPP catalogue**.

Operating pressure range :	$p_{\max} = 8$ bar.
Speed :	> 0.005 m/s.
Compressed air requirements :	Free of water and dirt. Additional lubrication with oil mist is not necessary.
Accessory supplied :	Assembly tool.
Noise level :	The sound emission values (sound level) of the OSPP-Classic are below 70 dB(A).
Installation :	In any position.
Temperature-Range :	From -10° C to 80° C.

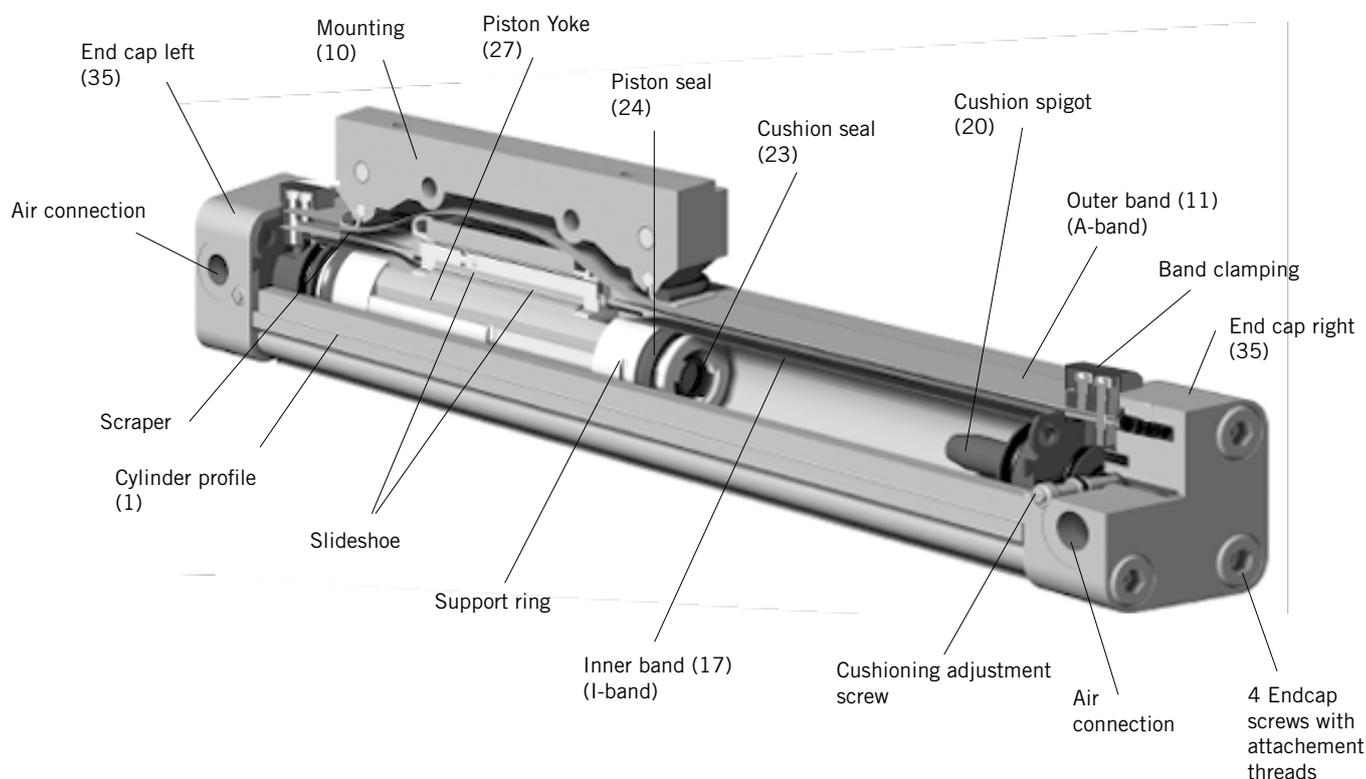
The right to introduce technical modifications is reserved.



Information:

With oil mist lubrication, the cylinder must be supplied with oil constantly while in operation.

6.2 Design and Functional Principle



NOTE:

Numbers in brackets refer to the parts list item and the exploded view drawing for the spare parts list (page 28).

6.2.1 General Design Principle

- The OSPP-Classic is a pneumatic cylinder without piston rod.
- The longitudinal slot in the cylinder is sealed and protected by stainless steel bands.
- The piston consists of piston yoke with support rings, piston seals, slideshoes and magnet set on the inside. On the outside it includes the middle section with wipers.
- The cylinder is installed with the help of the threads located at the ends or with end cap mountings.
- The air supply goes through the cushion spigot into the cylinder tube.
- The end position damping is created by a compression space around the cushion spigot between the cushion seal and endcap, at the end of each cylinder tube. With the help of a cushioning adjustment screw it can be adjusted at each cylinder end.
- The cylinder has permanent grease lubrication. With oil mist lubrication, the cylinder must be supplied with oil constantly while in operation.
- For speed ranges < 0.2 m/s we recommend our slow speed grease.

6.2.2 Functional Principle and Application

- The piston is moved by compressed air in the cylinder. In the typical operating mode, both sides of the cylinder are initially charged with compressed air and then the side towards which one wants the cylinder to move is vented.
- The piston yoke holds the seals in grooves. Force is transmitted directly to the outside.
- The unit can be fitted with the help of threads on its endcap, or end mountings can be supplied as accessories.
- For long cylinders, additional mid-section supports should be used (also available as accessories). For further details please refer to the catalogue.

7 Technical description OSPP-Classic-KF

7.1 Technical Data

For further detailed information about

- Dimensions
- Space requirements
- Forces and loads
- Speeds and damping energy
- Weight

and other data, see **OSPP-Classic-KF** catalogue.

Operating pressure range :	$p_{\max} = 8 \text{ bar.}$
Speed :	$> 0.005 \text{ m/s.}$
	OSPP-Classic-KF 25, 32, 50: 5 m/sec
	OSPP-Classic-KF 16, 40: 3 m/sec
Compressed air requirements :	free of water and dirt. Additional lubrication with oil mist is not necessary.
Accessory supplied :	assembly tool
Installation :	in any position.
Temperature-Range :	from -10° C to 80° C .

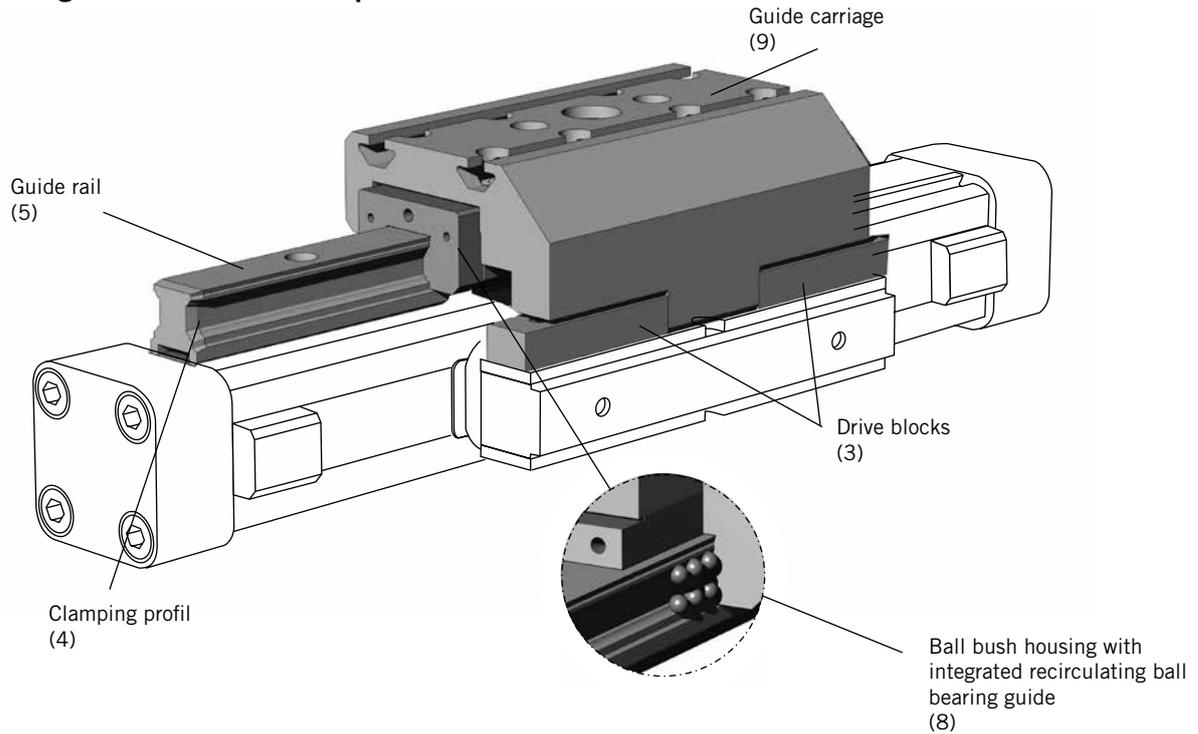
The right to introduce technical modifications is reserved.



Information:

With oil mist lubrication, the cylinder must be supplied with oil constantly while in operation.

7.2 Design and Functional Principle



Information

Numbers in brackets refer to parts list item and exploded view drawing of the spare parts list (page 30).

7.2.1 General Design Principle

- The basic cylinder is the OSPP-Classic as described previously.
- The guide (-KF) is attached to the OSPP-Classic cylinder.
- **The circulating ball bearing guide -KF consists of:**
 - a guide rail which is fixed to the cylinder using a clamping profile,
 - a guide carriage with two ball bush housings in tandem configuration.

7.2.2 Function and application

- The guide carriage bears the load.
- The guide carriage is driven by drive blocks, that are fixed to the piston yoke.

8 Commissioning of a Complete Plant

8.1 Preparations

Check before commissioning

- Remove and dispose off all packaging.
- Make two strokes of piston by hand without air pressure.

Important:



After the cylinder had been installed do not carry out any electric welding.

Electric welding may damage the sealing system which may cause considerable leakage of the cylinder.

The cylinder can produce uncontrolled movements.

Remove the cylinder or electrically isolate it.

The assembly itself must be carried out in such a way that

- The applicable rules and regulations are observed as required (e.g. DIN EN 983).
- The Linear Drive is installed without distortion or warping.
- All connections and operating parts are accessible.
- The type plate and the yellow strip with the „Attention“ note is legible on the cylinder.

Any potential hazards that may exist between ORIGA products and customer's items of equipment must be eliminated by the user as required.

8.2 Commissioning OSPP-Classic / -KF

Notes on the Application of Linear Drive

Mechanical

- In the case of extreme contamination we recommend to install the „piston / guide-carriage-down“ installation and, if necessary, the use of deflectors.
- Secure the payload only at the corresponding
OSPP-Classic: 2 threaded holes on the centre piece or use the 4 off side through holes.
OSPP-Classic-KF: T- on the guide carriage (threaded holes OSPP-Classic-KF16).
- Place the payload in such a way that the tilting moments at the piston are below the values that are stated in the catalogue OSPP-Classic / -KF.
- For long cylinders, use mid-section supports, see catalogue.
- Avoid forces exerted by loads carried on external linear guides by using the OSPP carrier with clevis mounting from our catalogue.

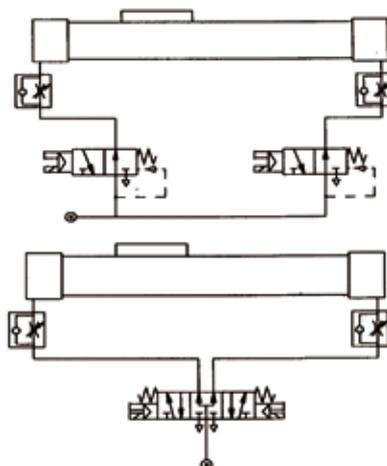
Electrical

- Sensors enable your load to be positioned accurately, see catalogue.
- Fit the sensors so that they are not close to ferritic parts or moving loads.
- Use the most favourable mounting slot on the circumference of the cylinder profile.

Pneumatic

- Actuate the cylinder via two 3/2 way valves or one 5/3 way valve, normally open, see catalogue.
- Avoid uncontrolled movements during start-up or after an unwanted stop, see catalogue.
- Use soft start valves or similar arrangements, see catalogue.
- Arrange the control system so that the piston does not travel into a completely exhausted cylinder chamber.
- Adjust the piston speed with additional throttle non-return valves screwed directly into the cylinder, see catalogue.
- Use compressed air connections of adequate size.

8.3 Typical Circuits



8.4 Accessories

Mountings and Proximity Sensors

Owing to the broad range of accessories the linear drives can be fixed regardless of the surrounding conditions.

Our magnetic switches from catalogue allow contactless position detection of the linear drives. For further information see OSPP catalogue.

9 Commissioning



Installation work and commissioning must be carried through by specialists only!

The linear drive can produce quick linear movements with high force. Failure to observe the safety-regulations can cause bodily injury as a result of trapping, or damage as a result of collision with other plant parts.



Danger of crushing

Check before commissioning:

- that the connection arrangements are correct, and
- that there is nothing in the way of the moving load.

During the first start-up, check the function of proximity and/or limit switches. First, the linear drive should be allowed to run through the entire moving zone at low speed in order to detect any possible collision areas. These must be removed immediately.

9.1 Commissioning of a single unit

- Make two strokes of piston by hand without air pressure.
- Move piston / guide carriage to the middle position.
- Fully screw in both cushioning adjustment screws for end cushioning.
- Unscrew both cushioning adjustment screws about one half turn.
- Slowly pressurise both cylinder chambers in order to prevent uncontrolled, dangerous movements (soft start valve, accessories in our catalogue),
 ➡ the piston stops after a short movement.
- Vent one side,
 ➡ the piston travels to end position.
- Start test running.
- Adjust speed with throttle non-return valve.
- Adjust end cushioning with cushioning adjustment screw.
 The floating end cushion must be adjusted to ensure a shock-free and vibration-free operation.
- Check the permissible weights and speeds in accordance with cushioning diagram in catalogue OSP-P. These values must not be exceeded !

9.2 Commissioning of a Complete Plant



Danger of crushing!

The piston yoke and the guide carriage of linear drives may cause serious injuries during their movements. Protruding edges of other subassemblies or machine components may result in dangerous crushing points.

- Observe instructions for switching on and off the plant, running up of plant, control displays in accordance with the operating instructions.
- Prior to switching on/first start-up of the plant make sure that nobody is within reach of the plant.
- Everybody must be informed that the cylinder (the plant) is about to start.
- Prior to commissioning check all protective devices, limit switches, safety earthings and other protective measures for proper function and completeness. Inspect all parts of the plant for foreign substances.
- Nobody must stay within the danger zone during commissioning.
- Make sure that the correct plant data have been entered for the first start-up.
- Make **two strokes of piston / guide carriage by hand** without air pressure.
- Move piston / guide carriage to mid position.
- Screw in both cushioning adjustment screws for end cushioning fully.
- Unscrew both cushioning adjustment screws about half a turn.
- Pressurise plant slowly in order to avoid uncontrolled, dangerous movements (soft start valve), according in our catalogue.
- Adjust speed with throttle non-return valve.
- Adjust end cushioning with cushioning adjustment screws.
Check the permissible weights and speeds in accordance with cushioning diagram in catalogue OSP-P.

9.3 Re-commissioning after long periods without operation

- Make two strokes of piston by hand without air pressure.
- Move piston to middle position.
- Continue as for individual cylinder (chapter 9.1).

10 Removal from plant



Danger of crushing and eye injuries

Take great care when removing the OSPP-Classic / OSPP-Classic-KF. Observe the Chapter 2, page 5 "Safety" and the local safety regulations.



Dangers are:

- **Residual pressure in air lines and actuators**
 - Slowly depressurise the cylinder and plant to vent residual pressure from air lines and actuators.
- **Heavy parts which can fall when disconnected**
 - Heavy parts must be secured before disconnection.
 - Make sure that no personnel are in an area where something might fall.
- **Sharp edges**
 - Safety gloves must be worn to protect against cuts from sharp edges.
- **Piston movement**
 - To avoid uncontrolled piston movements the cylinder/plant must be completely vented.
 - If installed vertically, the piston must be moved to the lower end position before venting.

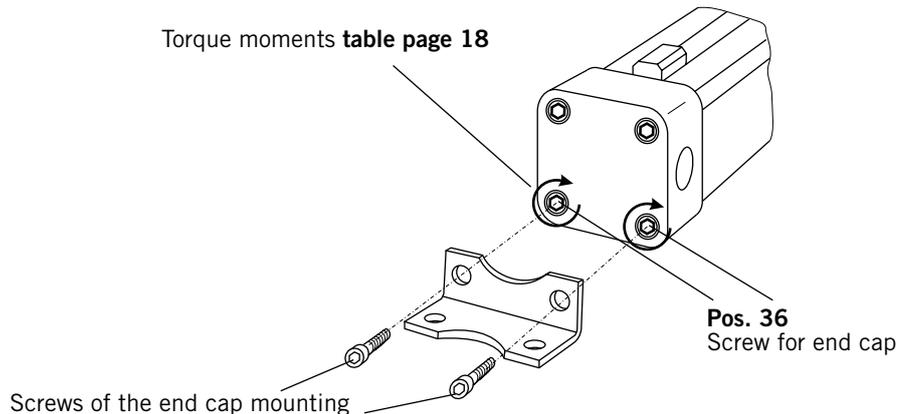


Disposal

Observe all regulations on the disposal of environmentally damaging materials.

Attention, Ø16, 25 and 32:

After loosening the screws of the end cap mounting, screws of the end cap (pos.36) must be checked upon their correct torque (see table page 18) , before pressure is applied.



11 Service / Maintenance OSPP-Classic / -KF

**Attention**

Maintenance and repair work must only be carried out by specially trained and instructed personnel! The machine or the working zone must be cordoned off for safety purposes as required!

**Danger of crushing**

Carry out maintenance work only with the machine switched off and the compressed air system depressurized.

Preparations and Things Needed

Have the following things ready:

- Seal kit or service kit.
- Screwdrivers of various sizes.
- Allan keys of various sizes.
- Dismantle the required parts in order to be able to freely move the piston / guide carriage. If necessary, completely remove the linear drive.
- Switch off the main switch and secure it against unintentional switching-on.

11.1 Maintenance intervals

Km operated	Maintenance	Instructions
From 8000	OSPP-Classic Dismantle cylinder completely if necessary, clean parts and replace worn parts	Chapter 11.3, page 16
When necessary	Clean inner sealing band.	
Depending on load and working time	OSPP-Classic-KF If required, completely dismantle and clean the guide carriage and replace wearing parts. Re-lubricate the roller carriage.	Chapter 11.4, page 21



Also observe the operating instructions of the entire plant!

11.2 Cleaning

General

For cleaning, use only material-protective media and non-fluffy cloths.

Do not use high-pressure cleaners!

11.3 Cylinder Removal, Dismantling and Cleaning



Danger of eye injuries and cuts on fingers etc.



Safety glasses must be worn!

There is danger of :

- Eye injuries from flying dirt particles and stressed springs - wear safety glasses where indicated!
- Cuts from sharp edges of inner sealing band.
- Wear protective gloves when working with inner sealing band.



Procedure:

- Depressurise cylinder/plant.
- Disconnect load.

11.3.1 Dismantling of cylinder



Information

- Please observe the position of the parts on the exploded view drawing on page 28.

Remove cover

- Remove screws (36) and end caps (35) and remove end caps (35) on both sides.

Dismantle sealing bands and piston

- **Only for Ø 16 to 50** : remove carrier clamping screws (38) and dismantle wiper O-ring (7) and carrier (10).
- **Only for Ø 63 and 80**: remove all screws (5), pull off cover (9) with wipers (8), springs (6) and O-rings (7) and dismantle.
- Pull off two clamp covers (12).
- Remove 2 screws (13) and (15) each for the outer and inner band clamping.
- Remove two clamping pieces (14) for outer sealing band.
- Remove outer sealing band (11).
- Remove two clamping pieces (16) for inner sealing band.
- Pull off two cushioning spigots (20) by inserting screwdriver carefully between cushioning spigot (20) and cylinder barrel (1).
- Push piston and inner sealing band (17) out of cylinder bore (1).
- Pull inner sealing band (17) out of piston.

Remove piston

- Remove two support rings (25) and remove spacers (29) with magnet (30).
- Remove slide shoe (28) and for **Ø 63 and 80** side wiper (31).
- Remove piston seal (24) and cushioning seal (23).

Cleaning and spare part check

- Clean all parts and replace damaged or worn parts.
Use original spare parts only. We recommend to use the spare parts listed on page 28.
- Re-assembly must be carried out on a clean surface.

11.3.2 Cylinder OSPP-Classic reassembly



Information

- Note the position of the parts as shown on the exploded view drawing on page 28.

Danger of cuts on fingers etc.

The sealing bands, especially the inner sealing band has very sharp-edges. Wear gloves!



Preparations:

- Clean and dry sealing bands and cylinder profile, inside and out.
- Look out for damage, also at the edges of the inner sealing band.

Inserting the magnet strips (see diagram)

Cylinders with a diameter exceeding 40 mm the magnet strips may slip out of the cylinder profile.

If required, insert the magnet strips again as described below. The sealing function can only be that the magnet strips are installed according to specifications.

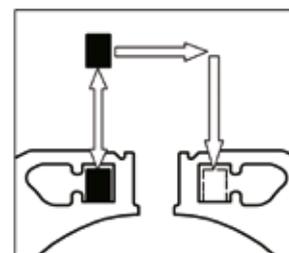
- Push one magnet strip in, leaving 5 cm sticking out (it must lie on its narrow side).
- Place the second magnet strip on its narrow side above the first magnet strip.

If the magnets repel each other:

- Push into the profile the second magnet strip without turning it over (see diagram).

If the magnets attract each other:

- Turn the second magnet strip over i.e. 180° (about its longitudinal axis) and then push it in the profile.



Installing the piston

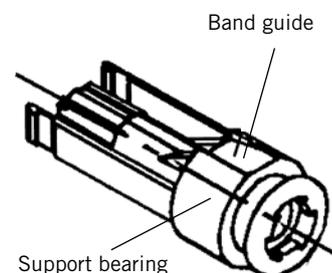
- Insert both slide shoes (28) into piston yoke (colour the same as old parts).
- Select the two support rings (25) (colour the same as old parts).
- Push two spacers (29), with magnet (30) between them, into one support ring (except on Ø 80, where magnet system is installed inside piston).
- Push the two support rings on to piston (so that flat band guides are on top - see diagram).
- Clip the two support rings together.

Check that piston moves smoothly, as follows:

- Insert piston into cylinder bore and slide it up and down.
- Replace slide shoe and/or support ring if:
 - piston is too tight, or
 - piston has too much play,
- Take piston out again.
- Insert cushioning seals (23) (so that seal lip shows on outside).

Greasing cylinder bore:

- Grease inside of cylinder bore as far as you can reach, use only the correct grease (see spare parts chapter 14.1.1 Grease).
- Grease the two support rings and piston behind support rings.
- Slide piston up and down a few times (long cylinders, however, should be greased throughout).
- Take piston out again.
- Check that cylinder bore has a complete grease film, as follows:
 - point cylinder at a light source and look through it, **no dry areas visible**,
 - repeat greasing process if required.



Fitting the piston



Information

Piston seals have a sensitive sealing lip which should only be inserted into the cylinder tube with a pulling action. For this reason the fitting sequence should be carried out as follows:

- Push on one piston seal (24) (so that groove of piston seal shows on outside).
- **Only for Cylinder Ø 63 and 80:** push in the two side wipers (31) so that wiper lip shows on outside (see diagram) and adjust their position.
- Grease piston seal and fill its groove with grease.

Risk of injury from contact with the sharp edge of the band!

Gloves must be worn!

- Place inner sealing band (17) on flat band guide of one support ring (so that „ground edge“ side lies on support ring).
- Push inner sealing band through piston without creasing it.
- Push the piston into the cylinder bore, inserting the end without the piston seal first.
- **Only for Cylinder Ø 63 and Ø 80:** place the two side wipers on to the cylinder profile and slowly move the piston further along while checking that the position of the side wipers is symmetrical.
- Put the pin into the centering hole of the inner sealing band, which is located in the cylinder barrel. Push inner sealing band into the cylinder until the other centering hole is flush with the end of the support ring.
- Do not push centering hole of the inner sealing band over the piston seal.
- Insert piston.

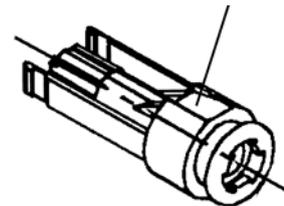
When inserting the second support ring it is imperative to push down the piston in order to avoid damaging the inner sealing band.

- Push the piston completely into the barrel and continue pushing with the sealing band until it emerges on the other side.
- Push the piston together with the inner sealing band into the cylinder bore, inserting the side without piston sealing first.
- Put the pin into the centering hole of the inner sealing band, which is located in the cylinder barrel. Push inner sealing band into the cylinder until the other centering hole is flush with the end of the support ring.
- Move the piston to the middle until one side of the inner sealing band is flush with the cylinder barrel.
- **Only for Cylinder Ø 63 and 80:** check again that position of side wipers is symmetrical
- Remove excess grease from ends of cylinder profile.

only for Ø 63 and 80



Band guide



Torque to be applied to screws

For the steps described below it is necessary to apply the torque listed in the table when turning the screws home. It is imperative to apply the correct torque in order to ensure the safe function of the cylinder during operation.

Cyl. Ø	Screw (36) for End cap (35)		Screw (38) for Mounting (10)		Screw (5) for Cover (9)		Socket set screw (15) for I-Band (17)		Socket set screw (13) for A-Band (11)	
	M	Torque	M	Torque	M	Torque	M	Torque	M	Torque
16	M4	3.25 Nm ± 0,25	M4	2.9 Nm ± 0,4	-	-	M2	0.37 Nm ± 0.02	M2	0.37 Nm ± 0.02
25	M5	6.00 Nm ± 1	M5	5.5 Nm ± 0,8	-	-	M2,5	0.7 Nm ± 0.1	M2,5	0.7 Nm ± 0.1
32	M6	10 Nm ± 1,5	-	-	-	-				
40	M6	10 Nm ± 1,5	M6	10 Nm ± 1,5	-	-	M3	1.2 Nm ± 0.2	M3	1.2 Nm ± 0.2
50	M6	10 Nm ± 1,5	-	-	-	-				
63	M8	25 Nm ± 3,8	-	-	M3	0.7 Nm ± 0,1	M3	1.2 Nm ± 0.2	M3	1.2 Nm ± 0.2
80	M10	42.5 Nm ± 2,5	-	-	M3	0.7 Nm ± 0,1				

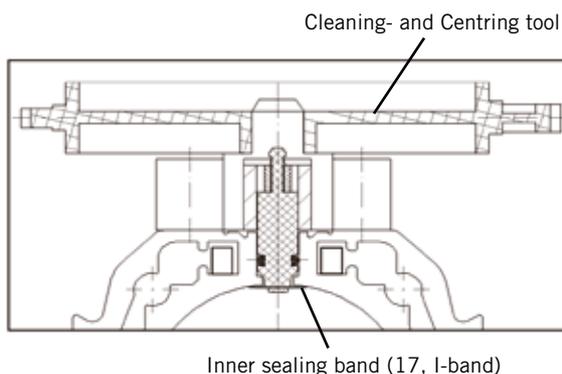
Inserting the Cushioning Spigots (20)

- Grease O-ring grooves (21), insert O-rings and grease them.
- Grease cushioning spigots.
- Place inlay nuts (26) in cushioning spigots with ridges upwards.
- Push cushioning pad (22) on to cushioning spigot (20), mind the correct installation position, bore hole at the cushion spigot must not be closed.



Risk of injury from contact with the sharp edge of the band!

- Hold inner sealing band on the side where it is flush with the cylinder profile and slide piston to about 100 mm from other end of cylinder profile.
- At that end, push centring tool (see diagram) from above through hole in inner sealing band and hold it.



- Insert one cushioning spigot, angled slightly downwards, into cylinder profile.
- Push cushioning spigot right in with gentle upward pressure and line it up with cylinder profile.
- Remove centring tool.
- Place the insert nut (26) below the bore hole of the inner sealing band.
- Fit clamping piece (16) and clamping screw (15) but do not screw it down yet.

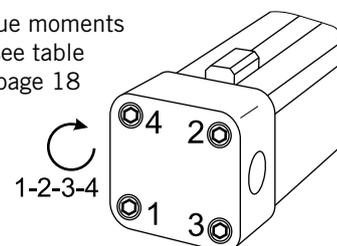
Information



See "torque moments for screws" page 18

- Slide piston to ca. 100 mm from other end of cylinder profile.
- Pull loose end of inner sealing band as far as possible to end of cylinder profile.
- Push centring tool from above through hole in inner sealing band and hold it.
- Insert second cushioning spigot, angled slightly downwards, into cylinder profile.
- Push cushioning spigot right in with gentle upward pressure and line it up with cylinder profile.
- Remove centring tool.
- Position inlay nut (26) under hole in inner sealing band.
- Fit clamping piece (16) and clamping screw (15) but do not screw it down yet.
- Slide piston to the other end of cylinder barrel.
- Grease face of cushioning spigots and insert O-rings (18, 19).
- Fit end caps with air connection on the desired side.
- Tighten screws (36) **crosswise 1 - 4 in correct order** as shown.

Torque moments
see table
page 18



- Position inner sealing band (17) the same distance from both ends of cylinder barrel and tighten clamping screw (15) at this end.
- Slide piston to the other end position.
- Adjust position of clamping piece (16) so that inner sealing band (17) lies correctly along the whole slot, without pretension or hanging loose.
- Tighten clamping screw (15) at this end too.

Checking Tension of Inner Sealing Band

Inner sealing band must be fitted:

- without pretension,
- without hanging loose.

Completing the Cylinder



Information

See “torque moments for screws“ page 18.

Only for Ø 63 and Ø 80:

- Put the two O-rings (7) on cover (9).
- Put on the two springs (6).
- Clip on wipers (8).

All cylinders:

- Lay on outer sealing band (11) and centre it.
- Push both wipers (8) into carrier (10).
- Place carrier (10) with wipers (8) in piston yoke (27).
- Fit wiper O-ring (7).
- Tighten screws (38).
- Lay on clamping pieces (14) (so that these lie on clamping pieces (16) of inner sealing band).
- Fasten clamping pieces (14) with screws (13).
- Clip on clamp caps. (12).



Observe torque moments for screws.

11.4 Cleaning, Repairing, Re-greasing the OSPP-Classic-KF Guide

Guide cylinders OSPP-Classic-KF16 / -KF25 / -KF32 / -KF40 / -KF50

11.4.1 Lubrication

There are grease nipples at the front of the carriers (8) for re-lubrication.

The re-lubrication intervals depend on the environmental influences such as dirt, vibrations, impact load etc.

Determine the lubrication intervals in accordance with your individual case of application use ensuring that there is always enough grease in the carriers. Make sure that there is always a grease film on the visible on the running surfaces of the guide rail.

For lubrication „ISOFLEX TOPAS NCA 52” grease made by Klüber is recommended.

Lubricants with solids contents (such as Grafit or MoS₂) must not be used.

Incase new carriages for sizes KF16, KF25, KF32 and KF50 are used, these must be lubricated before commissioning, as they are delivered with a rust-proofing only.

The initial lubrication is made in accordance with the below table using three times the subset:

1. grease carrier with the first subset in accordance with the table.
2. slide the carrier with 3 up and down strokes by at least three times the carrier length.
3. repeat the procedures following 1. and 2. two times.
4. check whether a grease film is visible on the guide rail.

Grease quantity table for OSPP-Classic-KF

Type	Subset for	cm ³
-KF16	initial lubrication	3 x 0.04
	re-lubrication	1 x 0.07
-KF25	initial lubrication	3 x 0.3
	re-lubrication	1 x 0.3
-KF32	initial lubrication	3 x 0.3
	re-lubrication	1 x 0.3
-KF40	re-lubrication	1 x 0.4
-KF50	initial lubrication	3 x 0.8
	re-lubrication	1 x 0.8

Note

If guides are mounted in a vertical or lateral position or with the carriage showing downwards, subsequent lubrication must be increased by 50%.

Maintenance

Dirt may collect on the exposed guide rails.

To maintain the function of the sealings in the carriers, remove such dirt deposits at regular intervals.

In the case of deviations from our standards or critical applications please refer to our engineering department.



11.4.2 Dismantling the Guide System



This work may only be carried out by trained specialist fitters. Any faults in the repair work can lead to significant risk of injury when the unit is put back into operation.

For dismantling and re-assembling the guide system, the whole guide cylinder unit should be removed from the machine or system in order to ensure appropriate accessibility.

For dismantling the OSPP-Classic cylinder (the drive itself) see section 11.3 on page 16.



Information

Please observe the position of the parts in the exploded view diagram.



Risk of injury due to unexpected movement of the drive!

For this reason:

- Release all compressed air from the cylinder/system. Make sure that the cylinder is free from compressed air.
- Switch off all electrical power connections.

Preparation:

- Dismantle all external parts fitted to the slide.
- Remove the guide cylinder correctly without bending it.



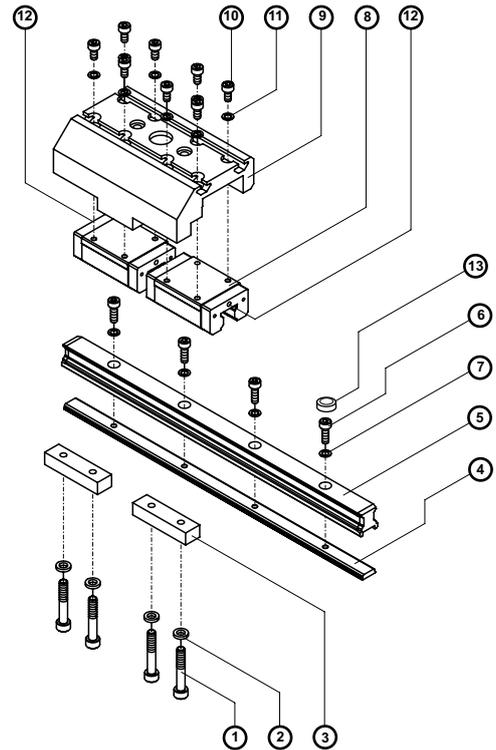
Removing the guide slide:

- Unscrew one of the drive blocks (3) from the piston yoke (27).

Risk of tilting/jamming!

Be careful not to drop any bearing balls (this may be possible where the ball retaining cage is worn).

- Carefully move the complete guide slide from the guide rail (5), taking care **not to jam/tilt it!**
- **Clean** the components with cleansing agents permitted for the application. Only use lint free cloths.
- Check all parts for wear.
 - Check the guide carriage (9) for damage and worn threads.
 - Check the carriage (8) bearing balls for stiffness, binding or damage.
 - Check the guide rail (5) for chatter marks and grooves.
 - Check the clamping profile (4) for damage, particularly to the threads.
- Replace any components as required.



Removing the carriage (8)

This should always be carried out since it makes it easier to carry out the cleaning, checking for wear and any replacement fitting.

- In order to remove the carriage (8), remove the screws (10).

Removing the guide rail (5)

If the guide rail shows wear in the form of grooves and/or chatter marks, it must be replaced. It is not possible to repair the damage by grinding or other repair methods.

- In order to remove the guide rail (5), release the screws (6). Proceed to take the guide rail from the cylinder tube.

Removing the clamping profile (4)

This job is usually only necessary when it is intended to remove the complete guide system permanently or if full hygienic cleansing needs to be carried out.

In order to remove the clamping profile (4), one of the endcaps (35) of the OSPP-Classic cylinder needs to be removed. Please refer to the instructions contained in section 11.3.1 on page 16.

- Release the sealing bands and unscrew the endcap.
- Remove the clamping profile from the dovetail groove in the cylinder tube.

Loosening:

Due to the self-locking of the screws (6) the clamping profile can be trapped. With a hammer, the clamping profile can be removed from the dove tail groove. An easy way to remove the clamping profile is to warm it up with a hot air gun.



11.4.3 Reassembly of the Guide

Prior to reassembly, the components have to be checked for wear and the required spare parts have to be provided.

Fixing of the Clamping Profile (4)

Only necessary if the guide is completely dismantled or **retrofitted**.

To fit the clamping profile (4) remove one of the endcaps (35).

- Remove residues of screw-selflocking if necessary.
- Slide clamping profile (4) into the lateral groove of the cylinder barrel.
- Fit endcaps (35) of the Linear Drive.
For proper procedure refer to operating instructions page 19.

Fitting of the Guide Rail (5)

Depending on the size of the cylinder washers (7) must be used when fixing the guide rail: **washers must be used for OSPP-Classic-KF16 / -KF40 / -KF50!**



Note:

Guide rail screws(6) must be **secured against incidental loosening**.

(Medium-tight type liquid screwlocking, e.g. Loctite[®] 243, should be used.)

- Slightly fix the guide rail (5) including all screws (6) and washers (7) where required. align.
- Tighten all screws using a torque wrench in accordance with table.

Screw Pos.	OSPP-Classic -KF-16	OSPP-Classic -KF-25	OSPP-Classic -KF-32	OSPP-Classic -KF-40	OSPP-Classic -KF-50
6	1.2 Nm	4.5 Nm	4.5 Nm	9 Nm	14 Nm

Mounting of Carrier (8)



Note:

Risk of damage due to jamming, ball loss and dirt.

The front side of the guide rail must have the required chamfer and must not show any damages, burr etc.

Do not use force. Use enclosed mounting aid for new components.

- Grease front side of the guide rail with the anti-friction bearing grease prescribed for the guide (see page 21).
- Align the carrier **with the grinded datum face pointing towards the piston yoke** of the OSPP-Classic-cylinder.
(with OSPP-Classic-KF 16 both sides are equal).
- Align both carriers using the mounting aid (if available) and carefully slide onto the rail without jamming it.

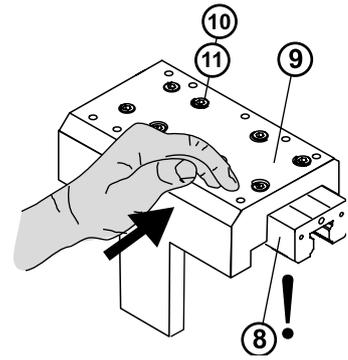
Fitting the guide carriage (9)

When fitting the carriage, it is important to use the appropriate washers, depending on the type of cylinder:

For OSPP-Classic-KF16 / -KF32 / -KF40 / -KF50 washers (11) must be used.

The tappet at the guide carriage (9) must face towards the piston yoke of the OSPP-Classic cylinder.

- First fit the guide carriage (9) to the carriage with all screws (10) and any required washers (11) loosely fitted.
- Push the guide carriage (9) against the bevelled side of the carriages (8).
- Then tighten all screws (10) with the torque spanner to the required torque according to the table.



NOTE:

The contact faces of the carriages must make contact with the guide carriage!

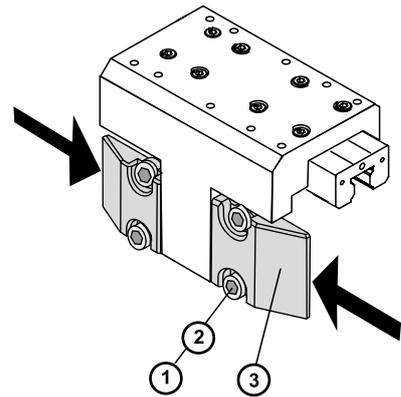
Screw Pos.	OSPP-Classic -KF-16	OSPP-Classic -KF-25	OSPP-Classic -KF-32	OSPP-Classic -KF-40	OSPP-Classic -KF-50
10	1.2 Nm	3 Nm	3 Nm	5.5 Nm	10 Nm



IMPORTANT:

It is imperative that the drive blocks (3) are fitted tight against the lug of the guide carriage (9)!

- Press the drive blocks (3) hard against the piston yoke (27 of the OSPP-Classic cylinder) and insert screws (1) and washers (2) in alternate order. Observe the required torque as listed in the table!



Screw Pos.	OSPP-Classic -KF-16	OSPP-Classic -KF-25	OSPP-Classic -KF-32	OSPP-Classic -KF-40	OSPP-Classic -KF-50
1	3 Nm	5.5 Nm	10 Nm	10 Nm	10 Nm



Information

Fitting the OSPP-Classic-KF into a machine or system is basically similar to the OSPP-Classic cylinder. For further notes please refer to section 8 on page 12.

12 Fault finding OSPP-Classic and OSPP-Classic-KF

12.1 Defect diagnosis

Defect	Cause	Correction
Cylinder leaks somewhere along inner sealing band.	Inner sealing band dirty.	Clean inner sealing band.
Cylinder leaks in piston area.	Piston seal defective.	Replace piston seal.
Cylinder leaks at end cap.	O-ring defective.	Replace O-ring.
Piston moves slowly or jerkily.	Contamination by air or abrasion.	Dismantle cylinder completely, clean and regrease. Replace war parts.
	Poor lubrication.	
	Defective piston seal.	
	Speed set too slow.	Increase speed.
	Operating pressure below 2 bar.	Check operating pressure.
	Standard grease in cylinder, with speed $v < 0.2$ m/s	Use slow speed grease, for speed $v < 0.2$ m/s.
Piston does not reach end position.	Cushioning adjustment screwed right in.	Adjust cushioning adjustment screw.
Piston impacts too hard at one or both end positions.	Wrong setting of end cushioning.	Adjust cushioning adjustment screw.
	Possibly overload.	Provide additional shock absorber.
	Cushioning seal, O-rings on end cap / cushioning spigot, piston seal or inner sealing band defective.	Check parts and replace if necessary.
Sensors do not work properly.	Ferritic parts too close to sensors.	Use parts made made of non-magnetic.
	Sensors defective.	Replace sensors.
Increasing noise produced by the guides (OSPP-Classic-KF).	Carriage defective.	Replace guide rail, replace carriage.

12.2 Cleaning the Inner Sealing Band OSPP-Classic / KF

Dirt particles can lodge between the inner sealing band and the cylinder bore and cause leakage. Cleaning is then required.



Warning!

Danger of eye injury !

Wear safety glasses where indicated!

- There is danger of eye injury from flying dirt particles.



Danger of cuts on fingers etc.

- Risk of injuries by cutting from contact with the sharp edge of the inner sealing band! Wear protective gloves when handling the inner sealing band.

The piston must be freely movable by hand, all driven parts must be removed. Depending on the local conditions it might become necessary to dismantle the complete cylinder.

Put on safety glasses

Check the position of the parts on the exploded view drawing on page 28.

- Reduce working pressure to 2 bar.

First side

- Move piston to one end position, if necessary move by hand.
- Vent cylinder on the side where the piston is.
- Remove two clamp caps (12).
- Remove two screws (13) and clamping piece (14) for outer sealing band (11).
- Pressurise the opposite side to where **the piston not is**, to a maximum pressure of 2 bar (keep other side being vented).
- Lift up one end of outer sealing band (11) without creasing it (see diagram)

NOTE:

If the groove is not completely accessible for the cleaning tool because of short strokes, you must:

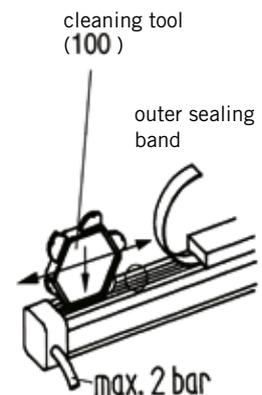
- completely remove the cover (9) with wipers (8) and
- the cover band (11).

(See chap. "Dismantling of cylinder" on page 16)

- Insert appropriate blade of cleaning tool (100) into cylinder slot up to the stop, the cylinder sizes are impressed in accordance with the diameter.
- **Carefully** draw cleaning tool along slot several times → the escaping air blows out and dirt particles.

Second side:

- Remove pressure and push piston to other end position.
- Pressurise the opposite side to where **the piston not is**, to a maximum pressure of 2 bar (vent other side).
- Repeat cleaning tool operation at other end of slot.
- Remove pressure and reassemble outer sealing band in reverse order.



13 Disposal



Observe all regulations on the disposal of environmentally damaging materials.



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SWIFT: COBADEFF480

Declaration of Incorporation

in accordance with EU-Directives Machinery 2006/42/EG

The design of the OSPP-Classic and OSPP-Classic-KF
with inner band length compensations

Types:	OSPP-Classic 16	OSPP-Classic-KF 16
	OSPP-Classic 25	OSPP-Classic-KF 25
	OSPP-Classic 32	OSPP-Classic-KF 32
	OSPP-Classic 40	OSPP-Classic-KF 40
	OSPP-Classic 50	OSPP-Classic-KF 50
	OSPP-Classic 63	
	OSPP-Classic 80	

is developed, designed and manufactured in compliance with EU-Directives Machinery 2006/42/EG and is the sole responsibility of

Company: **Parker Hannifin Manufacturing Germany GmbH & Co. KG**
Pneumatic Division Europe - Origa
Industriestraße 8 · 70794 Filderstadt (Sielmingen)

The following related standards apply:

- DIN EN ISO 12100, Safety of Machinery
- DIN EN 60204.1, Safety of Machinery, Electrical Equipment of Machines
- DIN EN 983, Safety of Machinery - Safety Requirements of Fluid Power Systems and their Components

Full technical documentation is available.

Commissioning of the OSPP Classic linear drive systems is forbidden until it has been established that the machine/plant in which it is to be installed complies with the requirements of the EU Machines Directives.

The above mentioned pneumatic linear drive systems OSPP-Classic and OSPP-Classic-KF are excluded from the area of application of the Pressure Equipment Directive.

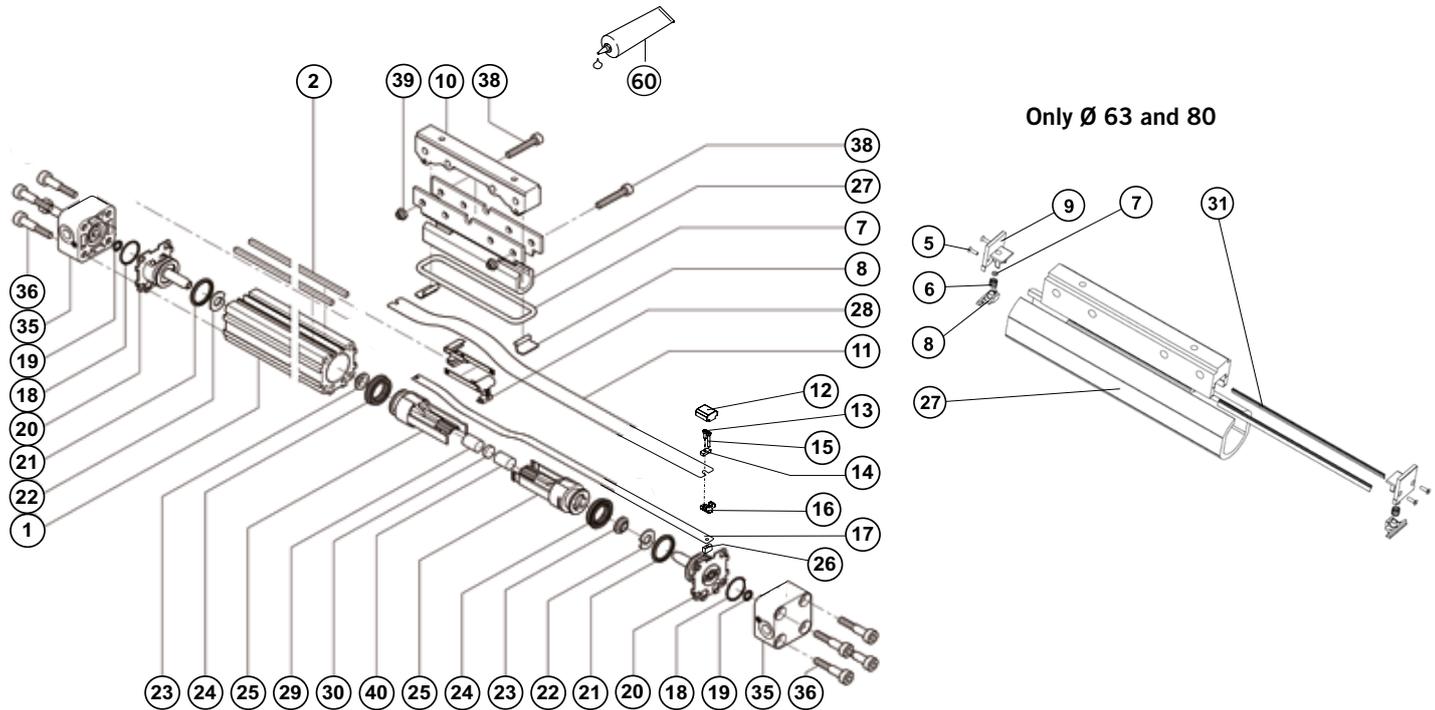
Filderstadt, June 2017

Rebecca Hammes
Business Unit nager

i.V. Dr. Axel Fröschle
Engineering Manager

14 Spare parts list

14.1 OSPP-Classic-cylinder



Seal-Kits OSPP-Classic

Item (Pos. No.)	Description	Ident - No. *						
		Ø 16	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80
7,8,18,19,21,22, 23,24,28,31,60	Seal-Kit Standard with grease, cleaning tool and centering tool.	11794	11795	11796	11797	11798	11799	11800
7,8,18,19,21,22, 23,24,28,31,61	Seal-Kit Standard , slow speed grease, with grease, cleaning tool and centering tool.	11808	11809	11810	11811	11812	11813	11814
7,8,18,19,21,22, 23,24,28,31,60	Seal-Kit Viton with grease, cleaning tool and centering tool.	11801	11802	11803	11804	11805	11806	11807
7,8,18,19,21,22, 23,24,28,31,61	Seal-Kit Viton slow speed grease, with grease, cleaning tool and centering tool.	11771	11772	11773	11774	11775	11776	11778

* Please use this order pattern: IDENT-NR. + „FIL“, example: 11795FIL Seal-Kit for OSPP-Classic 25

Service-Kits OSPP-Classic

Item (Pos. No.)	Description	Ident - No. **						
		Ø 16	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80
7,8,11,17,18,19, 21,22,23,24, 28,31,60	Service-Kit Standard with inner and outer sealing band, Seal-Kit	11741	11742	11743	11744	11745	11746	11748
7,8,11,17,18,19, 21,22,23,24, 28,31,61	Service-Kit Standard, slow speed grease, with inner and outer sealing band, Seal-Kit	11761	11762	11763	11764	11765	11766	11768
7,8,11,17,18,19, 21,22,23,24, 28,31,60	Service-Kit Viton with inner and outer sealing band, Seal-Kit	11761	11762	11763	11764	11765	11766	11768
7,8,11,17,18,19, 21,22,23,24, 28,31,61	Service-Kit Viton , slow speed grease, with inner and outer sealing band, Seal-Kit	11771	11772	11773	11774	11775	11776	11778

** All Service-Kits must be ordered following the pattern: IDENT-NR. + „stroke in mm“ (5 digits).

Example: 11741-01000 means Service-Kit Standard for OSPP-Classic 16 stroke length 1000 mm.

Replacement Parts OSPP-Classic Ø 16 - 80

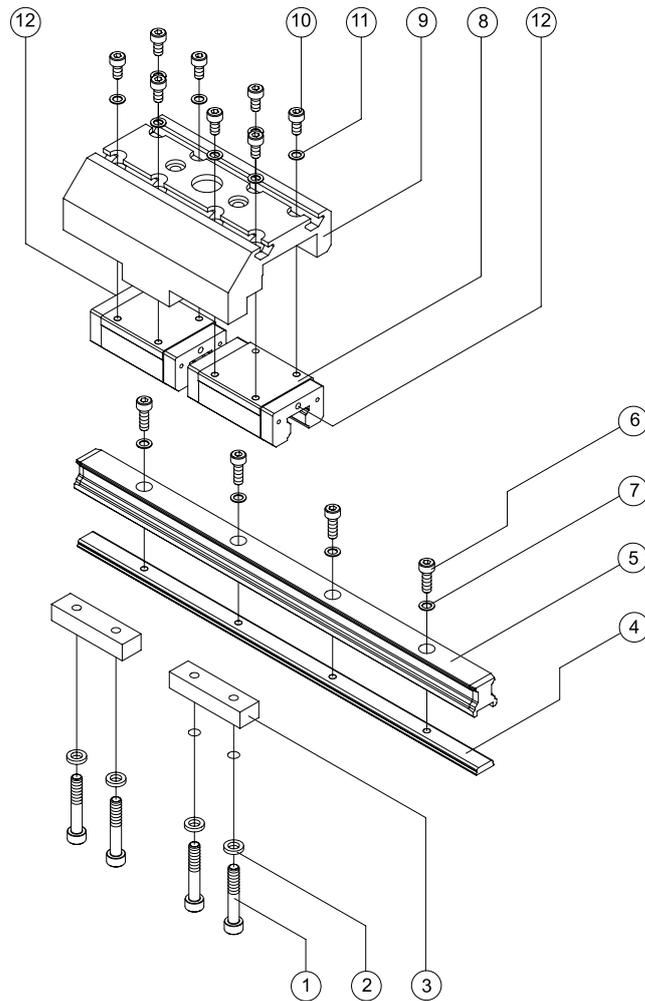
Item (Pos. No.)	Description	Ident - No. *(**)						
		Ø 16	Ø 25	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80
1,2	Cylinder barrel with magnetstrip **	10346	10002	10293	10062	10232	10381	10417
10	Mounting	11384	11350	11382	11353	2502	-	-
11	Outer sealing band cut to stroke **	10348	10004	10295	10064	10234	10367	10419
12-16,26	Clamping piece Kit stainless	21701	21702	21702	21703	21703	21703	21704
17	Inner sealing band cut to stroke **	10347	10003	10294	10063	10233	10380	10418
20	Cushioning spigot	10310	10028	10265	10086	10205	10363	10405
25	Support ring white	10303	10008	10268	10067	10211	10368	10421
25	Support ring red	10325	10009	10276	10068	10219	10369	10422
25	Support ring green	10326	10010	10277	10069	10220	10370	10423
27	Piston yoke	11378	11349	11379	11351	11380	11386	11387
35	End cap standard complete	20530	20534	20542	20550	20558	20566	20574
35	End cap standard complete Viton	20531	20535	20543	20551	20559	20567	20575
35	End cap, end air port, complete	20532	20536	20544	20552	20560	20568	20576
35	End cap, end air port, complete Viton	20533	20537	20545	20553	20561	20569	20577
35	End cap, single side left, complete	-	20538	20546	20554	20562	20570	20578
35	End cap, single side right, complete	-	20540	20548	20556	20564	20572	20580
35	End cap, single side left, compl., Viton	-	20539	20547	20555	20563	20571	20579
35	End cap, single side right, compl., Viton	-	20541	20549	20557	20565	20573	20581
36	Screw for end cap (set 8 pcs.)	21720	21721	21722	21723	21724	21725	21733
36	Screw for end cap stainless (set 8 pcs.)	21727	21728	21729	21730	21731	21732	21733
60	Grease standard, Tube 25 gr	1598						
60	Grease slow speed < 0.2m/s, tube 25 gr	3185						

Pos.	Description	Pos.	Description
1, 2	Cylinder barrel with magnetstrip	21	O-ring for cushioning spigot
5	Counter sunk screw for cover	22	Cushioning disk
6	Spring for wiper, stainless	23	Cushioning seal
7	O-Ring for scraper	24	Piston seal
8	Scraper	25	Support ring
9	Wiper cover	26	Inlay nut
10	Mounting	27	Piston yoke
11	Outer sealing band cut to stroke	28	Slide shoe
12	Clamp cap	29	Keeper plate for magnet
13	Clamping screw for outer band	30	Magnet
14	Clamping piece for outer band	31	Wiper (side)
15	Clamping screw for inner band	35	End cap
16	Clamping piece for inner band	36	Screw for end cap
17	Inner sealing band cut to stroke	38	Screw for Mounting
18	O-Ring for end cap, outer	39	Nut for Mounting
19	O-Ring for end cap, inner	40	Al-Keeper for magnet
20	Cushioning spigot	60	Grease

* Please use this order pattern: IDENT-NO. + „FIL“, example piston yoke Ø 25: 11349FIL

** Please use this order pattern: IDENT-NO. + „stroke in mm“ (5-digits),
Example: Cylinder barrel with magnetstrip Ø 16 (1000 mm stroke): 10346-01000

14.2 Guide cylinder OSPP-Classic-KF



+) only
 -KF16
 -KF32
 -KF40
 -KF50

++) only
 -KF16
 -KF40
 -KF50

Replacement Parts OSPP-Classic-KF

Item (POS. NO.)	Description	Ident - No. **				
		KF 16	KF 25	KF 32	KF 40	KF 50
1-13	Ball bearing guide KF**	21101	21102	21103	21104	21105
5	Guide rail **	Please contact our product support specialists ! ***				
8	Carriage					

** Please use this order pattern: IDENT-NR. + „stroke in mm (5-digits),
 Example Ball bearing guide KF 25 (1000 mm stroke): 21102-01000

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