



Guides, Brakes and Valves

Operating Instructions

ORIGA SYSTEM PLUS

Appendix to the Operating Instructions OSP-P / OSP-E

aerospace
climate control
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filtration
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User's Responsibilities

The following is assumed to be the operator's/organisation's responsibility:

- compliance with EN 89/655 and the national applications
- compliance with the applicable national regulations for safety at work
- authorized use of OSP-P with its guides and brakes
- correct applications of these operating instructions.

Commissioning of the OSP-P is forbidden until it has been established that the machine/plant in which it is to be installed complies with the requirements of the EC Machines Directives.

1 Foreword to the Operating Instructions

This Appendix to the Operating Instructions is to be used only in conjunction with the Operating Instructions „OSP-P Pneumatic Linear Drive“ and „OSP-E Belt-Driven Linear Actor“

Please observe the Safety Notes carefully.

For the repair of the basic cylinder unit please see also the Operating Instructions „OSP-P Pneumatic Linear Drive or „OSP-E Belt-Driven Linear Actor“

The service life of the OSP cylinder and of its guides and brakes has been optimized by advanced material pairing and design which has been thought through to the smallest detail. However, excessive loads and difficult environmental conditions can reduce service life, therefore occasional careful maintenance work is recommended.

For technical data, permissible loads and calculation of service life of guides and brakes please see the Catalogue:









“ORIGA SYSTEM PLUS - Modular Pneumatic Linear Drive Systems“ or

“ORIGA SYSTEM PLUS - Modular Electric Linear Drive Systems“

All personnel who have anything to do with the OSP fitted with guides, brakes or valves must read and understand this Appendix to the Operating Instructions!

Keep for future use in conjunction with the Operating Instructions of the Linear Drive!

Explanation of Symbols and Notes

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

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

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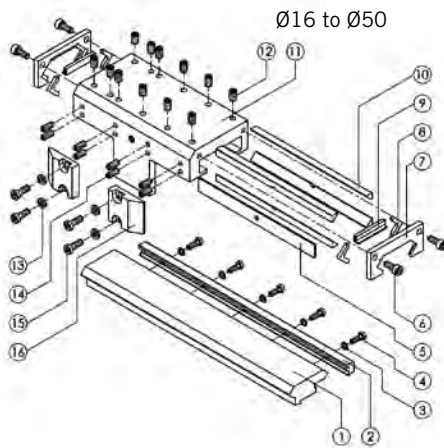
They must not be copied in full or in part, distributed or used in an unauthorized manner for competitive purposes or passed on to others. Contravention may lead to legal action.

2 Assembly Instructions

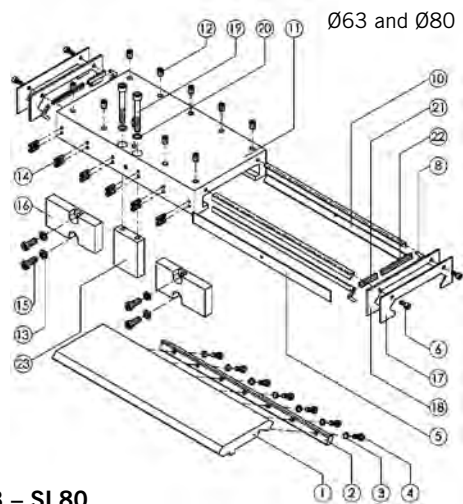
2.1 Slideline

(SL16 / SL25 / SL32 / SL40 / SL50 / SL63 / SL80)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.



SL16 – SL25 – SL32 – SL40 – SL50



SL63 – SL80

Dismantling of the Guide Carriage

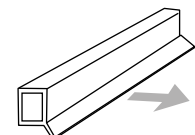
- Depressurise the cylinder and switch off all electrical power supply.
- Remove all parts mounted externally on the guide carriage (11).
- Unscrew one drive block (16) from piston of OSP, so that the guide carriage can be moved.
- For the OSP-P40, OSP-P50, OSP-E50, OSP-P63 and OSP-P80 only: unscrew one end cap from the cylinder.
- Loosen screws (6) on wiper cover (17).
- Slide the complete guide carriage off the guide rail.
- Unscrew wiper cover (7) (or 17+18 for SL63 and SL80) from both ends of the guide carriage (11).
- Inspect the parts – replace damaged or worn parts such as: wiper (9), slide profile (10) and felt (8) (service kit).

Dismantling and Reassembly of the Guide Rail

- To dismantle the guide rail (1) remove the screws (4) with their washers (3). Remove the guide rail (1) and clamping rail (2) from the cylinder profile.
- Clean all the parts.
- Centre the guide rail on the cylinder profile.
- Fit the clamping rail (2) to the guide rail (1) and screw in the screws (4) with their washers (3) (use the specified torque).

Reassembly of the Guide Carriage

- Clean all the parts.
- Grease the felts (8) with guide grease (Order No. 10550FIL).
- Lay the wipers (9) or (21+22) and felts (8) in the wiper covers. The sealing lip of the wiper must be outwards (see drawing).
- Back off the adjusting screws (14) in the guide carriage.
- Lay in the support strip (5) on the same side as the adjusting screws.
- Place 2 slide profiles (10) per side in the guide carriage. The edges of the slide profiles in which grooves are cut (to allow grease from the grease nipples to get to the guide rail) must touch each other.
- Screw on the two wiper covers (7) or (17+18) loosely with the screws (6).



Remounting the Reassembled Guide Carriage on the Guide Rail

- Push the complete guide carriage assembly carefully onto the guide rail with the side with the adjusting screws towards the piston.
- If necessary move the felt wiper carefully into its correct position with a screwdriver.

Adjustment of Play and Final Assembly

- Tighten the self-locking adjusting screws (14), individually from the middle working outwards, with the specified torque. If non-self-locking screws are used (14), use a locking medium (Loctite low-strength is recommended) and tighten the screws from the middle working outwards until the guide carriage can no longer be moved by hand.
- Tap the sides of the guide carriage (11) gently with a rubber hammer until the slide profiles (10) have settled into position and then tighten all the adjusting screws (14) again (see above).
- Loosen all the adjusting screws (14) about 1/4 to 1/2 turn individually from the middle working outwards. When correctly adjusted the guide carriage should be easily movable by hand but with no play.
- Tighten the screws (6) in the wiper cover (7) or (17+18) with the specified torque.
- Position the guide carriage centrally over the cylinder piston and secure the drive blocks (16) with the washers (13) and screws (15).

Note:

The drive blocks (16) must be fitted against the guide carriage with no play (11) !

Note the high torque required !

- Refit the end cap of the OSP if applicable.



Lubrication

All unused threaded holes in the guide carriage (11) must be plugged with set screws (12) to prevent escape of lubricant. The grease nipples on both sides of the guide carriage (11) should be filled with guide grease (Order No. 10550FIL) until a thin film of grease can be seen on the guide rail when the guide carriage is moved by hand.

Torques for Screws

Item	SL 16	SL 25	SL 32	SL 40	SL 50	SL 63	SL 80	
4	3 Nm	3 Nm	3 Nm	10 Nm	10 Nm	10 Nm	10 Nm	
6	3 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	
14	0.3-0.5 Nm	2.5-3 Nm	2.5-3 Nm	2.5-3 Nm	2.5-3 Nm	2.5-3 Nm	2.5-3 Nm	(only self-locking screws)
15	4.5 Nm	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm	35 Nm	40 Nm	
19	---	---	---	---	---	20 Nm	20 Nm	

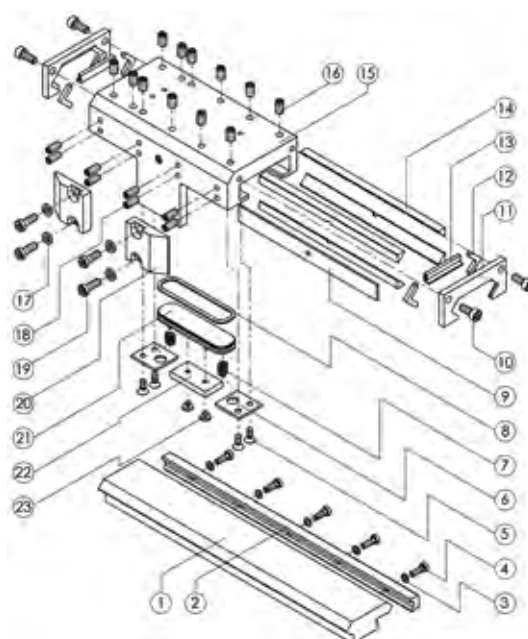
2.2 Slideline with Active Brake

(SL25 / SL32 / SL40 / SL50)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

Dismantling of the Guide Carriage

- Depressurise the cylinder and brake lines and switch off all electrical power supply.
- Remove all parts mounted externally on the guide carriage (15).
- Unscrew drive block (20) from piston of OSP-P, so that the guide carriage can be moved.
- For the OSP-P40 and OSP-P50 only: unscrew one end cap of the cylinder.
- Loosen the screws (10) on the wiper cover (11).
- Slide the complete guide carriage off the guide rail.
- Unscrew the wiper cover (11) from both ends of the guide carriage (15).
- Inspect the parts – replace damaged or worn parts such as: wiper (13), slide profile (14) and felt (12) (service kit).



Dismantling of the Brake

- Remove screws (5) and remove the plates (6) and springs (7) from the guide carriage.
- To remove the brake piston (21), apply compressed air to its air connection and blow it out (do not use sharp tools on the piston!).



Danger:

hold the brake piston while blowing it out!

- Remove screws (23) and remove the brake lining (22) from the brake piston (21) and the O-ring (8).
- Inspect the parts – replace damaged or worn parts such as: O-ring (8) and brake lining (22).

Dismantling and Reassembly of the Guide Rail

- Remove the screws (4) with their washers (3). Remove the guide rail (1) and clamping rail (2) from the cylinder profile.
- Clean all the parts.
- Centre the guide rail on the cylinder profile.
- Secure the guide rail (1) and clamping rail (2) with the screws (4) and their washers (3) (use the specified torque).

Reassembly of the Brake

- Clean all the parts, the inside of the brake piston chamber and the brake air connection.
- Fit the brake lining (22) to the brake piston (21). Apply a locking medium (Loctite low-strength is recommended) to the screws (23) and tighten them.
- Grease the walls of the brake piston chamber and the groove in the brake piston lightly with guide grease (Order No. 10550FIL).



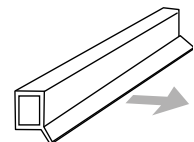
Note:

The brake lining must be grease-free.

- Locate the O-ring (8) in the brake piston (21) and grease the O-ring lightly.
- Fit the brake piston (21) into the guide carriage (15).
- Fit the springs (7) and plates (6). Apply a locking medium to the screws (5) and tighten them.

Reassembly of the Guide Carriage

- Clean all the parts.
- Grease the felts (12) with guide grease (Order No. 10550FIL).
- Lay the wipers (13) and felts (12) in the wiper covers. The sealing lip of the wiper must be outwards (see drawing).
- Back off the adjusting screws (18) in the guide carriage.
- Lay in the support strip (9) on the same side as the adjusting screws.
- Place 2 slide profiles (14) per side in the guide carriage. The edges of the slide profiles in which grooves are cut (to allow grease from the grease nipples to get to the guide rail) must touch each other.
- Screw on the two wiper covers (11) loosely with the screws (10).



Remounting the Reassembled Guide Carriage on the Guide Rail

- Push the complete guide carriage assembly carefully onto the guide rail with the side with the adjusting screws towards the piston.
- If necessary move the felt wiper carefully into its correct position with a screwdriver.

Adjustment of Play

- Tighten the self-locking adjusting screws (18), individually from the middle working outwards, with the specified torque. If non-self-locking screws are used (18), use a screw locking system (Loctite low-strength is recommended) and tighten the screws from the middle working outwards until the guide carriage can no longer be moved by hand.
- Tap the sides of the guide carriage (15) gently with a rubber hammer until the slide profiles (14) have settled into position and then tighten all the adjusting screws (18) again (see above).
- Loosen all the adjusting screws (18) about 1/4 to 1/2 turn individually from the middle working outwards. When correctly adjusted the guide carriage should be easily movable by hand but with no play.
- Tighten the screws (10) in the wiper cover (11) with the prescribed torque.

Lubrication

- All unused threaded holes in the guide carriage (15) must be plugged with set screws (16) to prevent escape of lubricant. The grease nipples on both sides of the guide carriage (15) should be filled with guide grease (Order No. 10550FIL) until a thin film of grease can be seen on the guide rail when the guide carriage is moved by hand.

Final Assembly

- Position the guide carriage centrally over the cylinder piston and secure the drive blocks (20) with the washers (17) and screws (19).

Note:



**The drive blocks (20) must be fitted against the guide carriage with no play (15)!
See the table for the correct torque !**

- Refit the end cap of the OSP-P, if applicable.

Torques for Screws

Pos.	SL 25	SL 32	SL 40	SL 50
4	3 Nm	3 Nm	10 Nm	10 Nm
5	3 Nm	3 Nm	3 Nm	3 Nm
10	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm
18	2.5 - 3 Nm	2.5 - 3 Nm	2.5 - 3 Nm	2.5 - 3 Nm
	(only self-locking screws)			
19	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
23	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm

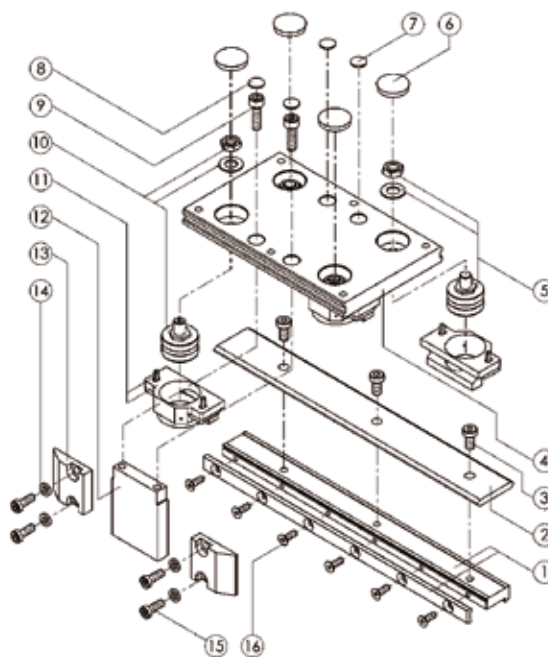
2.3 Powerslide

PS16/25 – PS25/25 – PS25/35 – PS25/44 - PS32/35 – PS32/44 – PS40/44 – PS40/60 – PS50/60 – PS50/76

All the parts of the guide system mounted on the Powerslide are factory-adjusted and checked. Further adjustment is not necessary. If adjustment is required after some operating time, please follow these instructions.

Adjustment of the Guide System

- Depressurise the cylinder air lines and switch off all electrical power supply.
- Remove all parts mounted externally on the guide carriage (4).
- Remove the drive block (13) from the piston of the OSP so that the guide carriage can be moved.
- For the OSP-P50 and OSP-E50 only : unscrew one end cap of the cylinder.
- Slide the complete guide carriage off the guide rail (2).
- Unscrew the cover (11) and slide the guide carriage back onto the guide rail.
- Remove the caps (6).
- Loosen the locknuts of the two eccentric rollers (10) with a box spanner. The eccentric roller (10), unlike the centric roller (5), has a hexagon socket in its axle.
- Turn the two eccentric rollers with an Allen key or spanner until there is no play. Only minimal force should be used. Tighten the nuts, taking care not to turn the eccentric rollers any further.



- Check the play on the guide: when the guide carriage is moved it should still be possible to hold the roller still with the fingers.
- Check the play at several points on the guide over the whole stroke as described above.
- Slide the complete guide carriage off the guide rail.
- Lubricate the cover (11)
- Fit the cover (11) with its screws and washers (do not tighten them yet).
- Slide the guide carriage back onto the guide rail. ensuring that the carrier is on the same side as the cylinder piston.
- Adjust the covers (11) so that there is light contact with the guide rail. This ensures reliable lubrication of the system in operation.

Note:



Too heavy a contact increases friction.

- Position the guide carriage centrally over the piston of the cylinder and fit the drive blocks (13) with the washers (14) and screws (15).
- Fit the caps (6).

Note:



See the table for the correct torques !

- The drive blocks (13) must be fitted against the carrier (12) with no play !
- Lubricate the cover (11) with a grease gun.

Note:



Too heavy pressure of the rollers on the guide rail should be avoided at all times. as this shortens the service life of the guide.

- Refit the end cap of the OSP. if applicable.

Torques for Screws

Item	PS 16/25	PS 25/25	PS 25/35	PS 25/44	PS 32/35	PS 32/44	PS 40/44	PS 40/60	PS 50/60	PS 50/76
3	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	20 Nm	20 Nm	20 Nm
5	13 Nm	13 Nm	13 Nm	25 Nm	13 Nm	25 Nm	25 Nm	25 Nm	25 Nm	70 Nm
9	3 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	20 Nm	20 Nm
15	4.5 Nm	9 Nm	9 Nm	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm	14.5 Nm	14.5 Nm	14.5 Nm
16	2.6 Nm	2.6 Nm	3 Nm	3 Nm	3 Nm	3 Nm	5.5 Nm	10 Nm	10 Nm	10 Nm

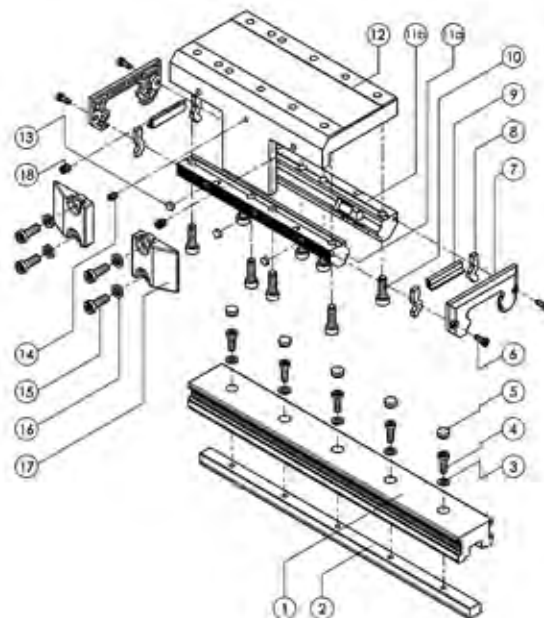
2.4 Proline

(PL16 / PL25 / PL32 / PL40 / PL50)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

Dismantling of the Guide Carriage

- Depressurise the cylinder lines and switch off all electrical power supply.
- Remove all parts mounted externally on the guide carriage (12).
- Unscrew drive block (17) from the piston of the OSP, so that the guide carriage can be moved.
- Loosen the screws (6) in the wiper cover (7).
- For the PL40 / PL50 only: remove one end cap from the OSP cylinder.
- Slide the complete guide carriage off the double rail (1).
- Remove the wiper covers (7) with the felts (8) and wipers (9) from both ends of the guide carriage (12).
- Loosen and remove the screws (10) and separate the pair of roller shoes (11) from the guide carriage (12).

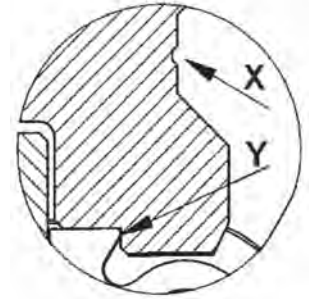


Dismantling of the Double Rail

- Remove the cap plugs (5).
- Remove the screws (4) and washers (3) and take the double rail (1) off the OSP cylinder.
- If necessary: remove the end caps of the OSP cylinder and push the clamping profile out of the slot in the cylinder profile.

Reassembly of the Double Rail

- Inspect the double rail (1) and replace it if necessary.
- Clean all the parts.
- If necessary: remove the end caps of the OSP cylinder and push the clamping profile into the slot in the cylinder profile.
- Fit the double rail (1) and clamping profile (2) to the OSP cylinder with the screws (4) and washers (3) (note the maximum torque), centring the rails on the cylinder profile. The groove (X) on the side of the double rail (1) must be on the piston side. The bearing surface (Y) of the double rail (1), which is on the same side as the groove (X), must be positioned against the dovetail profile of the OSP cylinder profile.
- Insert new cap plugs (5) flush with or slightly below the surface of the double rail (1).



Reassembly of the Guide Carriage

- Inspect the components: the pair of roller shoes (11), wiper (9) and felt (8) and replace any damaged or worn
- Clean all the parts.
- For adjustment of the roller shoes there is a fixed side and an adjustment side. The roller shoe on the fixed side (11b) is secured firmly to the underside of the guide carriage (12) with the screws (10).
- Place the three washer (13) in the roller shoe (11a) on the adjustment side and fit it against the guide carriage (12) with the screws (10). Tighten the screws (10) until the roller shoe lies fully on the guide carriage but can still be moved.
- Slide the complete guide carriage carefully onto the guide rail with the side with the adjusting screw (14) towards the piston of the OSP.
- Adjust the roller shoes (11) with the set screw (14). The roller shoes must be adjusted in the unloaded condition and there should be no play at the loosest point on the double rail (1). At the tightest point on the double rail the resistance to movement must not exceed the maximum value. The correct and maximum resistance to movement are as follows:

Size	PL 16	PL 25	PL 32	PL 40	PL 50
Correct ≤	0.5 N	1 N	1.5 N	2 N	3 N
Maximum ≤	3 N	6 N	9 N	10 N	12 N

- First tighten the screws (10) with the specified torque and afterwards tighten the both set screws(18) with the specified torque.
- Fit the wiper covers (7), felts (8) and wipers (9) with the screws (6).
- Position the guide carriage (12) centrally over the piston of the cylinder and secure the drive blocks (17) with the washers (16) and screws (15).

Note:

**The drive blocks (17) must be fitted against the guide carriage (12) with no play!
See the correct torque in the table!**

- Refit the end caps of the OSP, if applicable.



Lubrication

The Proline roller guide is lifetime-lubricated.

Torques for Screws

Item	PL 16	PL 25	PL 32	PL 40	PL 50
(OSP-P) 4	3 Nm	3 Nm	10 Nm	10 Nm	10 Nm
(OSP-E) 4	---	1 Nm	7 Nm	---	10 Nm
6	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
10	3 Nm	5.5 Nm	10 Nm	10 Nm	20 Nm
15	4.5 Nm	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
18	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm

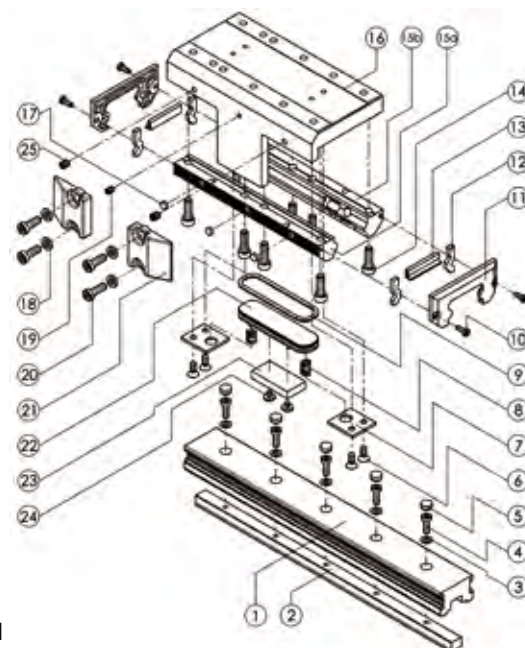
2.5 Proline with Active Brake

(PL25 / PL32 / PL40 / PL50)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

Dismantling of the Guide Carriage

- Depressurise the cylinder lines and switch off all electrical power supply.
- Remove all parts mounted externally on the guide carriage (16).
- Unscrew drive block (20) from piston of OSP-P so that the guide carriage can be moved.
- Loosen screws (10) in wiper cover (11).
- For PL40 / PL50 only: remove one end cap of the OSP.
- Slide the complete guide carriage off the double rail (1).
- Remove the wiper covers (11) with felts (12) and wipers (13) from both ends of the guide carriage (16).
- Loosen and remove the screws (14) and separate the pair of roller shoes (15) from the guide carriage (16).



Dismantling of the Brake

- Remove the screws (6) and remove the plates (7) and springs (8) from the guide carriage.
- To remove the brake piston (22), apply compressed air to its air connection and blow it out (do not use sharp tools on the piston!).



Danger:

hold the brake piston while blowing it out!

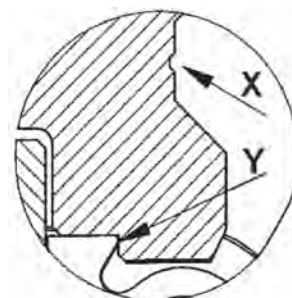
- Remove the screws (24) and remove the brake lining (23) and O-ring (9) from the brake piston (22).
- Inspect the parts – replace any damaged or worn parts, e.g. the O-ring (9) and the brake lining (23).

Dismantling of the Double Rail

- Remove the cap plugs (5).
- Remove the screws (4) and washers (3) and take the double rail (1) off the OSP cylinder.
- If necessary: remove the end caps of the OSP cylinder and take the clamping profile out of the slot in the cylinder profile.

Reassembly of the Double Rail

- Inspect the double rail (1) and replace it if necessary.
- Clean all the parts.
- If necessary: remove the end caps of the OSP cylinder and push the clamping profile into the slot in the cylinder profile.
- Fit the double rail (1) and clamping profile (2) to the OSP cylinder with the screws (4) and washers (3) (note the maximum torque), centring the rails on the cylinder profile.
The groove (X) on the side of the double rail (1) must be on the piston side. The bearing surface (Y) of the double rail (1), which is on the same side as the groove (X), must be positioned against the dovetail profile of the OSP cylinder profile.
- Insert new cap plugs (5) flush with or slightly below the surface of the double rail (1).



Reassembly of the Brake

- Clean all the parts, the inside of the brake piston chamber and the brake air connection.

Note:



The brake lining must be grease-free.

- Locate the O-ring (9) in the brake piston (22) and grease the O-ring lightly.
- Fit the brake piston (22) into the guide carriage (16).
- Fit the springs (8) and plates (7). Apply a locking medium to the screws (6) and tighten them.

Reassembly of the Guide Carriage

- Inspect the components: the pair of roller shoes (15), wiper (13) and felt (12) and replace any damaged or worn parts.
- Clean all the parts.
- For adjustment of the roller shoes there is a fixed side and an adjustment side. The roller shoe on the fixed side (15b) is secured firmly to the underside of the guide carriage (16) with the screws (14).
- Place the three washers (17) in the roller shoe (15a) on the adjustment side and fit it against the guide carriage (16) with the screws (14). Tighten the screws (14) until the roller shoe lies fully on the guide carriage but can still be moved.
- Slide the complete guide carriage carefully onto the guide rail with the side with the adjusting screw (19) towards the piston of the OSP.
- the roller shoes (15) with the set screw (19). The roller shoes must be adjusted in the unloaded condition and there should be no play at the loosest point on the double rail (1). At the tightest point on the double rail the resistance to movement must not exceed the maximum value.

The correct and maximum resistance to movement are as follows:

Size	PL 25	PL 32	PL 40	PL 50
Correct ≤	1 N	1.5 N	2 N	3 N
Maximum ≤	6 N	9 N	10 N	12 N

- First tighten the screws (14) with the specified torque and afterwards tighten the both set screws(25) with the specified torque.
- Fit the wiper covers (11), felts (12) and wipers (13) with the screws (10).
- Position the guide carriage (16) centrally over the piston of the cylinder and secure the drive blocks (21) with the washers (18) and screws (20).

Note:



**The drive blocks (21) must be fitted against the guide carriage (16) with no play!
See the correct torque in the table!**

- Refit the end caps of the OSP-P, if applicable.

Lubrication

The Proline roller guide is lifetime-lubricated.

Torques for Screws

Item	PL 25	PL 32	PL 40	PL 50
4	3 Nm	10 Nm	10 Nm	10 Nm
6	3 Nm	3 Nm	3 Nm	3 Nm
10	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
14	5.5 Nm	10 Nm	10 Nm	20 Nm
20	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
24	0.8-1 Nm	0.8-1 Nm	0.8-1 Nm	0.8-1 Nm
25	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm

2.6 Guide OSP-KF

2.6.1 Dismantling of the Guide

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

For the disassembly of the cylinder (of the drive itself) please refer to the operating instructions OSP-P.

- **Note the position of the parts on the exploded view drawing**

Preparation:

- Depressurise the cylinder air lines. Make sure that the cylinder is completely depressurised.
- Switch off all electrical power supply.
- Remove all parts mounted externally on the guide carriage plate.
- Carefully remove the guided cylinder without bending it.

Dismantling of the Guide Carriage

- Unscrew one off drive block (3) from the piston OSP-P.

Risk of jamming!

Watch out for balls falling out (may occur due to wear).

- Carefully slide off the guide carriage from the guide rail (5), **avoid jamming!**
- **Clean the components** using customary cleansing agents. Use lint-free cloths only.
- Generally check all parts for wear:
 - guide carriage (9) for damages, thread.
 - carrier (8) balls (heavy operation, check for damage).
 - guide rail (5) for grooves, chatter marks.
 - clamping profile (4) for damages, thread.
- Replace components if necessary.

Dismantling of the Carrier (8)

- To dismantle the carriers (8), loosen the screws (10).

Dismantling of the Guide Rail (5)

In the case of visible wear in the form of grooves and/or chatter marks the guide rail must be replaced. It is not possible regrind to repair the guide rail.

- To disassemble the guide rail (5) loosen screws (6) with screw-selflocking.
- Remove guide rail from the cylinder barrel.

Dismantling the Clamping Profile (4)

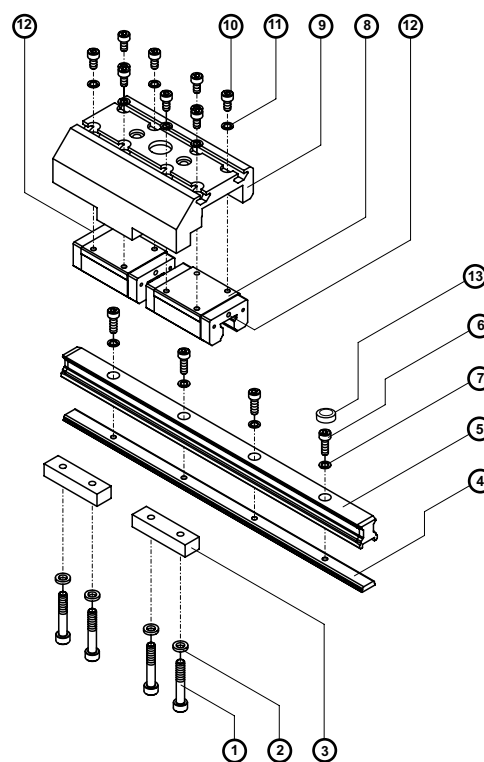
The following steps are normally only necessary if the complete guide is to be dismantled for ever, or if a full cleaning is required.

To dismantle the clamping profile (4), one of the endcap (35, 36) of the OSP cylinder must be removed. Please follow the instructions in the operating instructions OSP-P.

- Loosen the sealing bands, unscrew the endcap screws (4) off and remove endcap.
- Slide the clamping profile off the dovetail groove of the cylinder barrel.

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.



2.6.2 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, 36).

- Remove residues of screw-selflocking if necessary.
- Slide clamping profile (4) into the lateral groove of the cylinder barrel.
- Fit endcaps (35, 36) of the OSP cylinder.
For proper procedure refer to operating instructions OSP-P.

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 OSP-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 Item	OSP KF-16	OSP KF-25	OSP KF-32	OSPKF-40	OSP 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.

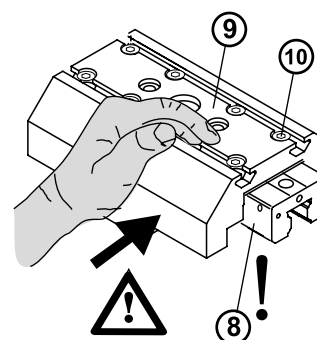
- Grease front side of the guide rail with the anti-friction bearing grease prescribed for the guide (see page 16).
- Align the carrier **with the grinded datum face pointing towards the piston yoke** of the OSP cylinder. (with OSP-KF 16 both sides are equal).
- Align both carriers using the mounting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

Mounting the Guide Carriage (9)

Depending on the cylinder washers must be used:
for **OSP-KF16 / -KF32 / -KF40 / -KF50 use washers (11)**.

The carrier at the guide carriage (9) must be positioned on the side of the piston yoke of the OSP cylinder.

- Loosely fix the guide carriage (9) with all screws (10) and washers (11) on the carriage.
- Press guide carriage (9) **against the grinded side of the carrier (8)**
- and tighten all screws (10) in accordance with the table using a torque wrench.



Note:

The datum faces of the carriers must fit close to the guide carriage!

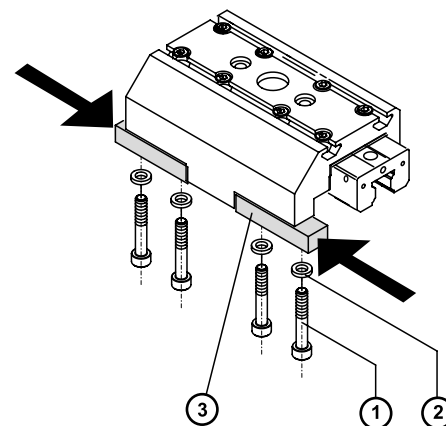
Screw Item	OSP KF-16	OSP KF-25	OSP KF-32	OSP KF-40	OSP KF-50
10	1.2 Nm	3 Nm	3 Nm	5.5 Nm	10 Nm



Important:

The driveblocks (3) must be fixed to the carrier of the guide carriage (9) without any backlash!

- Strongly press the driveblocks (3) to the piston yoke of the OSP cylinder together with the screws (1) and the washers (2) and screw down alternately.



Screw Item	OSP KF-16	OSP KF-25	OSP KF-32	OSP KF-40	OSP KF-50
1	3 Nm	5.5 Nm	10 Nm	10 Nm	10 Nm

See the correct torque in the table!



Information:

Assembly of OSP-KF into a machine or plant refers in principle to the OSP-cylinder.
For more informations please refer to the operating instructions OSP-P.

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.



In case 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.

Table amount of grease OSP-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.



2.7 OSP-Starline

2.7.1 Dismantling the complete Guide Carriage

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

- **Note the position of the parts on the exploded view drawing**

Preparation:

- Depressurise the cylinder air lines. Make sure that the cylinder is completely depressurised.
- Switch off all electrical power supply.
- Remove all parts mounted externally on the guide carriage plate.
- Carefully remove the guided cylinder without bending it.

Dismantling of the Guide Carriage (9):

- Unscrew one drive block (3) from the piston of the OSP-P.
- Carefully slide the complete guide carriage (9) from the guide rail.
- Check guide carriage (9), carrier (8), guide rail (5) and clamping profile (4) for damages and wear and replace if necessary.

Dismantling the Carrier (8)

- Remove screws (10) from the guide carriage.

Dismantling the Guide Rail (5)

- Remove screws (6) with screw self-locking from the guide carriage.
- Remove guide rail (5) from the cylinder barrel.

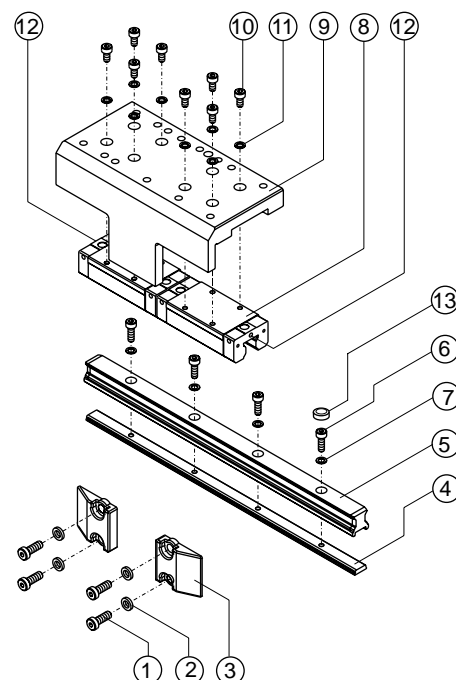
Dismantling the Clamping Profile (4)

To dismantle the clamping profile (4) remove one of the endcaps of the OSP-P cylinder.

- Refer to the operating instructions OSP-P (part 35).
- Remove residues of screw-selflocking if necessary.
- Slide the clamping profile (4) out of the groove of the cylinder barrel.

Loosening:

Due to the screw 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.



2.7.2 Mounting the complete Guide Carriage

Mounting of the Clamping Profile (4)

To mount the clamping profile (4) remove one of the endcaps of the OSP-P cylinder.

- Refer to the operating instructions OSP-P (part 35).
- Slide clamping profile (4) into the groove of the cylinder barrel.
Mind position at the cylinder barrel!
- Fix cover (35) of the OSP cylinder. For procedure see operating instructions OSP-P.

Mounting of the Guide Rail (5)

- Provide guide rail (5) with all screws (6).

Note:

Different washers due to different screw penetration:

OSP-STL16 and STL50 with washers (7), other cylinder sizes without washers.





Note:

Guide rail screws(6) must be **secured against incidental loosening.**
(Medium-tight type liquid screwlocking, e.g. Loctite ® 243, should be used.)

- Loosely fix screws, align.
- **Tighten screws (6) in accordance with the torque table:**

Item	OSP-STL16	OSP-STL25	OSP-STL32	OSP-STL40	OSP-STL50
6	1.2 Nm	4.5 Nm	4.5 Nm	9 Nm	14 Nm

Mounting of the carriers (8):

- Carefully slide both carriers (8) onto the guide rail (5).
**For new carriers use enclosed mounting aid and carefully slide onto the guide rail (5).
Refer to the enclosed instructions.**

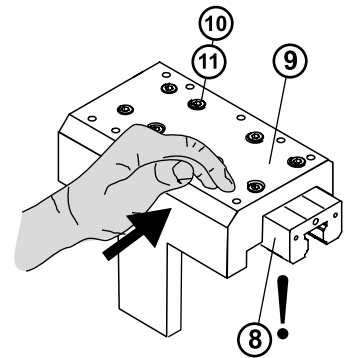


Note:

The grinded datum face of the carrier must face the piston yoke.
(see operating instructions OSP-P part 27)

Mounting of the Guide Carriage (9)

- Position guide carriage (9) onto the carriers (8),
mind alignment towards the piston.
- Loosely fix with the screws (10) and the washers (11) and then:



Note:

- **Press guide carriage (9) against the sanded surface of the carriers (8) and fix with the screws (10).**

Important!

The datum face of the carrier (8) must abut the guide carriage
Observe the prescribed torques!

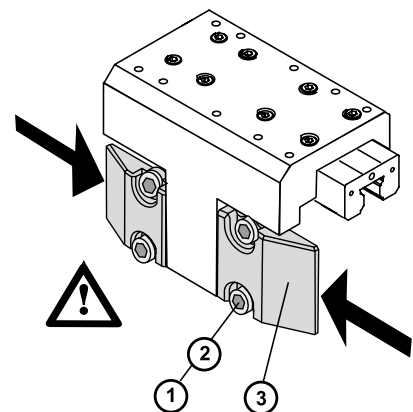
Item	OSP-STL16	OSP-STL25	OSP-STL32	OSP-STL40	OSP-STL50
10	1.2 Nm	3 Nm	3 Nm	5.5 Nm	10 Nm

Mounting of the drive block (3)

- Fix the drive block (3) with the screws (1) and the washers (2) to the piston yoke while exerting pressure on the surfaces of the carrier.

Important!

The datum face of the drive blocks must be mounted against the carrier of the guide carriage without any backlash!



Observe the prescribed torque!

Item	OSP-STL16	OSP-STL25	OSP-STL32	OSP-STL40	OSP-STL50
1	4.5 Nm	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm

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 STL16, STL25, STL32 and STL50 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.

Table amount of grease OSP-STL

Type	Subset for	cm ³
-STL16	initial lubrication	3 x 0.04
	re-lubrication	1 x 0.04
-STL25	initial lubrication	3 x 0.3
	re-lubrication	1 x 0.3
-STL32	initial lubrication	3 x 0.3
	re-lubrication	1 x 0.3
-STL40	re-lubrication	1 x 0.6
-STL50	initial lubrication	3 x 1
	re-lubrication	1 x 1



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.

2.8 Heavy Duty

(HD 25 / HD 32 / HD 40 / HD 50)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

- **Note the position of the parts on the exploded view drawing!**

Preparation:

- Depressurise the cylinder air lines. Make sure that the cylinder is completely depressurised.
- Switch off all electrical power supply.
- Remove all parts mounted externally on the guide carriage plate.

2.8.1 Installing the guide mechanism into a system

Clean the contact surfaces for the guide unit. The accuracy of the guide mechanism depends on the quality of the connecting surface. The contact surfaces should be as flat, parallel and without warping as possible.



Information:

The connecting surfaces of the guide unit may not be completely parallel to the level support structure when not fixed – that is permissible and has no effect on the guiding precision when fixed.

- Put the guide unit onto the support structure and fix with fixing screws through the holes or using T-shaped wedge nuts.
- When using **T-shaped wedge nuts**, the distance should not be more than 100 mm.



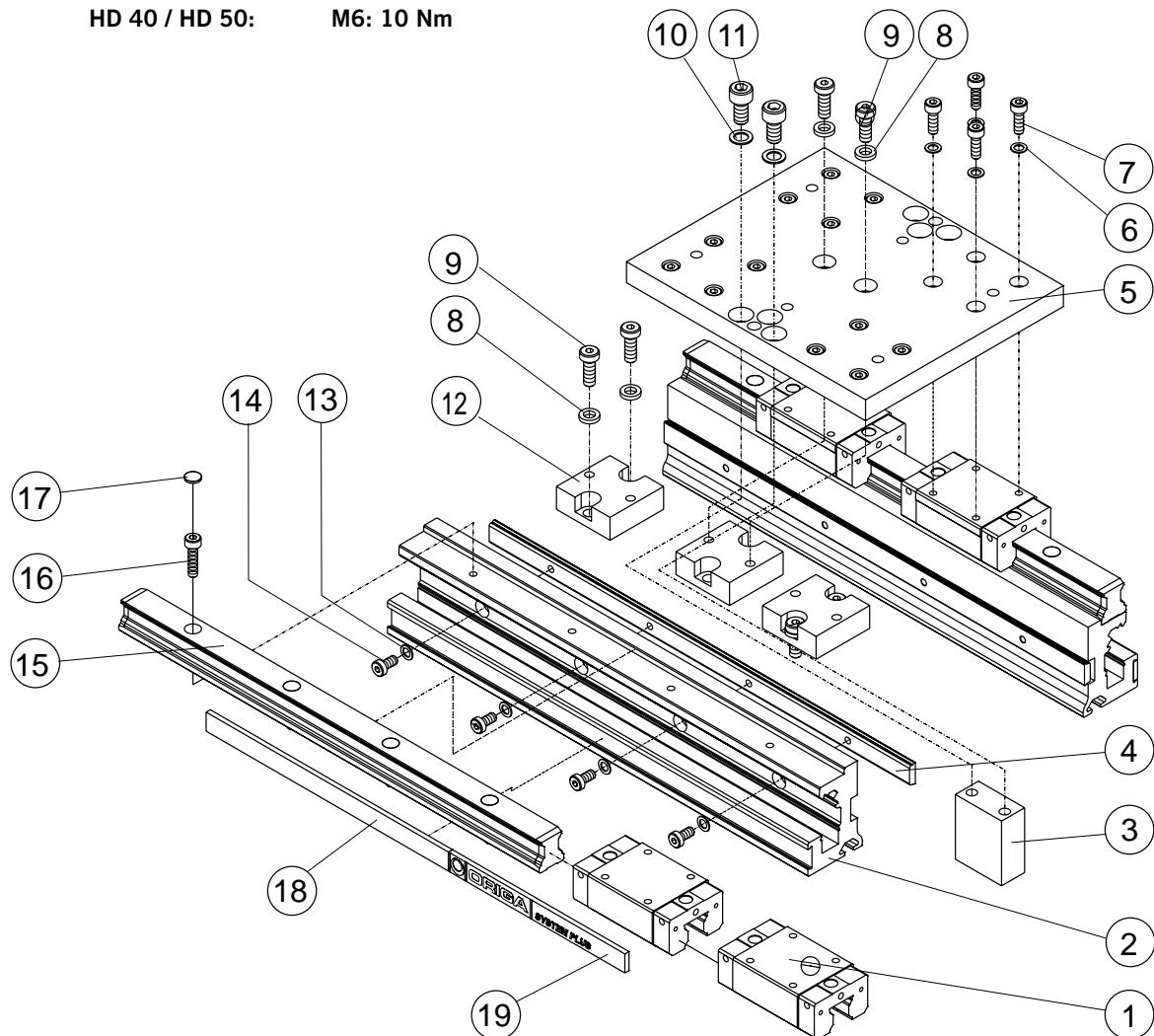
Note:

The fixing screws of the guide unit must be secured by providing self-locking (e.g. liquid screw retention, medium hard)

- Tighten screws in accordance with the torque table:

HD 25 / HD 32: M5: 5,5 Nm

HD 40 / HD 50: M6: 10 Nm



2.8.2 Maintenance

If the carriages (1) are damaged, we recommend to replace the carriages and the guide rails (15) at the same time.

Only use spare parts from Parker Origa to ensure that the permitted load values specified in the catalogue are maintained.

Step 1:

Dismantling the carriage plate (5)

- Release the pressure from the pressure lines to the cylinder and switch off the power.
- Dismantle all external parts mounted on the carriage plate (5).
- Undo and remove the screws (9) with the washers (8).
- Dismantle the magnet holder (3); to do that take out the screws (11) and washers (10).
- Undo and remove the screws (7) and washers (6) in order to separate the carriage plate (5) from the carriages (1).

Dismantling the guide rails (15) and carriages (1)

- To dismantle the guide rails (15) from the contact surfaces of the carrier rails (2) the fixing screws have to be removed.
- Take off the cover caps (17) and remove the fixing screws (16); take off the guide rails with the carriages (1).
- Slide the carriages (1) from the guide rails (5).

Dismantling the carrier rails (2)

- Take off fixing screws (14) and washers (13). Take the carrier rails (2) off the OSP.
- Remove the clamping profiles (4). To do that, dismantle an endcap of the OSP (see operating instructions OSP-P or OSP-E).

Step 2:

Mounting the carrier rails (2)

- Check the clamping profiles (4) and replace if necessary.
- Clean the carrier rails (2).
- Fit the clamping profiles (4). To do that, dismantle an endcap of the OSP (see operating instructions OSP-P or OSP-E).
- Fit the OSP endcap back into place (see operating instructions OSP-P or OSP-E).
- Place the carrier rails (2) onto the OSP.
- Slightly tighten the fixing screws (14) with washers (13).
- Align both carrier rails (2) on a level surface and then tighten the fixing screws with the required torque.

Mounting the guide rails (15) and carriages (1)

- Clean the guide rails (15), check and replace if necessary.
- Check the carriages (1); replace if necessary.
- Carefully slide two carriages (1) each onto the guide rails (15).

Be careful not to jam!

When fitting new carriages, apply the fitting aid supplied and carefully slide onto the guide rails.

Take note of the instructions supplied.

- Push one guide rail (15) against the stop edge of the carrier rail (2) and tighten with the fixing screws (16) to the required torque.
- Place the second guide rail onto the carrier rail and only lightly tighten the fixing screws.

Torques for Screws

POS.	HD 25	HD 32	HD 40	HD 50
7	3 Nm	3 Nm	5.5 Nm	10 Nm
9	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
11	10 Nm	10 Nm	10 Nm	10 Nm
(OSP-P) 14	3 Nm	3 Nm	10 Nm	10 Nm
(OSP-E) 14	1.6 - 2 Nm *	3 Nm	-	10 Nm
16	3 Nm	3 Nm	5.5 Nm	10 Nm

* use threadlocker Loctite 243



Mounting the carriage plate (5)

- Clean all parts.



Note

Never slide the fully assembled carriage unit onto the guide rail since this could lead to damage of the carriages!

- Place the carriage plate (5) onto the carriages (1) and fix with the fixing screws (7) and washers (6) to the required torque.
- In order to align the second guide rail in parallel, carry out a double pass with the sledge plate (5) and carriages (1).

Then tighten the fixing screws (16) during a pass movement to the required torque.

- **To avoid tensions:**
- Release the fixing screws of the two carriages again from the two guide rails and run two passes. Then tighten the fixing screws again with the required torque.
- Mount the cover caps.
- Slide the guide carriage centrally over the piston of the cylinder and fix the middle driver (12) with the washers (8) and screws (9).

Observe required torque!

- Tighten the magnet holder (3) with the fixing screws (11) and washers (10) on the desired side and to the required torque.



Note

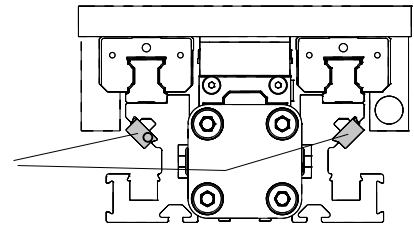
Take note of the torque according to the table (page 22)!

It is imperative that the three drivers (12) are fitted without any movement to each other!

Arrangement of magnetic switches

The magnetic switches can be fitted on both sides along the whole length.

Magnetic switch



Lubrication



Information

There are grease nipples at the front of the carriers (1) for re-lubrication.

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

Determine the lubrication intervals in accordance with your individual case of application thus 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.



In case new carriages for size HD 50 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.

Table amount of grease OSP-HD

Type	Subset for	cm ³
HD25, 32	re- lubrication	1 x 0,3
HD40	re- lubrication	1 x 0,5
HD50	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 carriers 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.

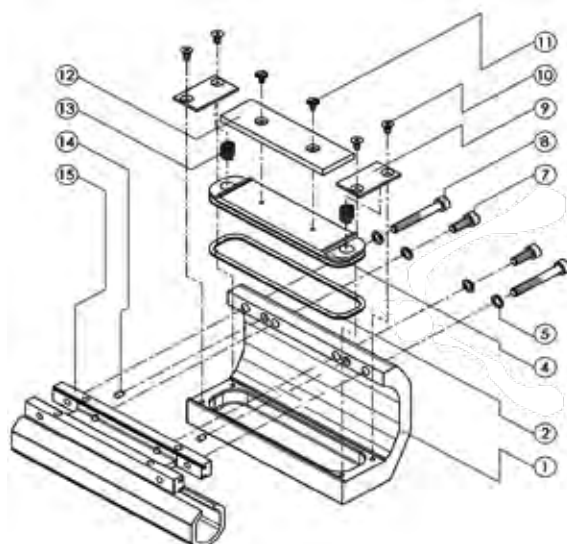
In the case of deviations from our standards or critical applications please refer to our engineering department.

2.9 Active Brake (AB25 / AB32 / AB40 / AB50 / AB63 / AB80)

Usually it is not necessary to remove the cylinder from the machine or plant.

Dismantling of the Active Brake

- Depressurise the cylinder and brake lines and switch off all electrical power supply.
- Remove the compressed air line from the brake air connection.
- Remove the screws (7 + 8) with their washers (5) and take the brake housing (1) off the cylinder piston (15).
- Unscrew the screws (10) and remove the plates (9) and springs (13) from the brake housing (1).
- To remove the brake piston (4), apply compressed air to its air connection and blow it out (do not use sharp tools on the piston!).



Danger

hold the brake piston while blowing it out!

- **For AB40 / AB50 / AB63 / AB80 only:** loosen the screws (11) and remove the brake lining (12) from the brake piston (4).
- Remove the O-ring (2) from the brake piston (4).
- Inspect the parts – replace any damaged or worn parts: O-ring (2) and brake lining (12) or brake piston with brake lining (4 + 12) on AB25 and AB32.

Reassembly of the Brake

- Clean all the parts, the inside of the brake piston chamber and the brake air connection.
- **For AB40 / AB50 / AB63 / AB80 only:**
- fit the brake lining (12) onto the brake piston (4).
- Apply a locking medium (Loctite low-strength is recommended) to the screws (11).
- Grease the walls of the brake piston chamber and the groove in the brake piston lightly with grease (Order No. 1598).



Note:

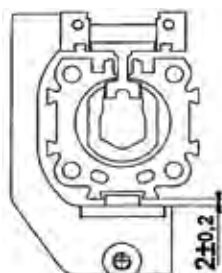
The brake lining must be grease-free.

- Place the O-ring (2) in the brake piston (4) and grease the O-ring lightly.
- Fit the brake piston (4) into the brake housing (1).
- Fit the springs (13) and plates (9). Apply a locking medium to the screws (10) and tighten them.
- Fit the brake housing (1) onto the cylinder piston (15) with the screws (7 + 8) and washers (5). Additionally for the AB40 and AB50 use locating pins(14).

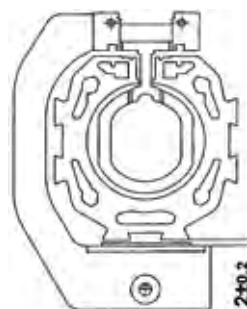


Note

When reinstalling the brake housing, adjust the clearance between the cylinder profile and the plate (9) to 2 mm ± 0.2 mm with a feeler gauge (see diagram).



AB25 / AB32



AB40 / AB50 / AB63 / AB80

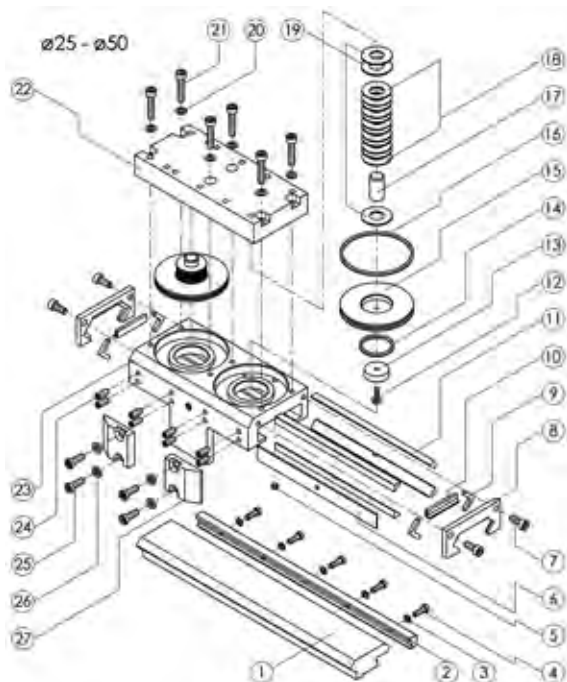
Torques for Screws

Item	AB 25	AB 32	AB 40	AB 50	AB 63	AB 80
7 + 8	5.5 Nm	9.7 Nm	9.7 Nm	9.7 Nm	23 Nm	47 Nm
10	2.9 Nm	2.9 Nm	2.9 Nm	2.9 Nm	5.5 Nm	5.5 Nm
11	---	---	0.8-1 Nm	0.8-1 Nm	0.8-1 Nm	0.8-1 Nm

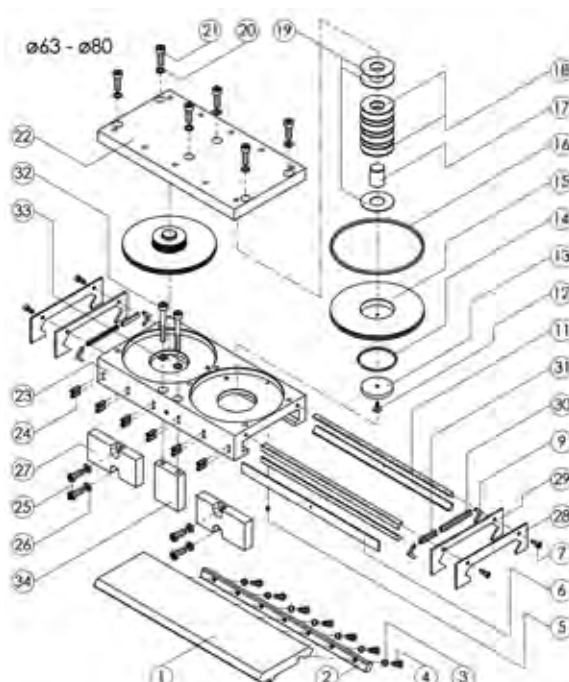
2.10 Multi-Brake - Slideline (Passive Brake)

(MB-SL25 / MB-SL32 / MB-SL40 / MB-SL50 / MB-SL63 / MB-SL80)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.



MB-SL25 / MB-SL32 / MB-SL40 / MB-SL50



MB-SL63 / MB-SL80

Dismantling of the Guide Carriage

- Depressurise the cylinder and brake lines and switch off all electrical power supply.
- Remove all parts mounted externally on the plate (22).
- Unscrew the screws (21) with their washers (20), backing off each screw a little at a time, so that the plate (22) does not tip and jam when it is removed from the guide carriage (23).
- Remove the plate (22) from the guide carriage (23).
- Unscrew one drive block (27) from the piston of the OSP-P so that the guide carriage can be moved.
- Loosen the screws (7) in the wiper cover (8 or 28 + 29).
- For the OSP-P40, OSP-P50, OSP-P63 and OSP-P80 only: remove one end cap of the cylinder.
- Slide the complete guide carriage (23) off the guide rail (1).
- Unscrew the wiper covers (8 or 28 + 29) from both ends of the guide carriage (23).
- Inspect the parts – replace damaged or worn parts such as: wiper (10 or 30 + 31), slide profile (11) and felt (9) (service kit).

Dismantling of the Brake

- Remove the saucer springs (18) and pressure plates (19) and press the brake piston (15) out of the guide carriage (23) from the brake lining side.
- Remove the screws (12) and remove the brake lining (13) and guide pin (17) from the brake piston (15), and also the O-rings (14) and (16).
- Inspect the parts – replace damaged or worn parts such as: O-rings (14) and (16) and brake lining (13).

Dismantling and Reassembly of the Guide Rail

- Unscrew the screws (4) with their washers (3). Remove the guide rail (1) and clamping rail (2) from the cylinder profile.
- Clean all the parts.
- Centre the guide rail (1) on the cylinder profile. Secure the guide rail (1) and clamping rail (2) with the screws (4) and their washers (3) (use the specified torque).

Reassembly of the Brake

- Clean all the parts, the inside of the brake piston chamber and the brake air connection.
- Centre the guide pin (17) on the brake piston with the help of the pressure plate (19) and fit the brake lining (13) on the brake piston (15), applying a locking medium (Loctite low-strength is recommended) to the screw (12) and tightening it.
- Grease the walls of the brake piston chamber and the groove in the brake piston lightly with guide grease (Order No. 10550FIL).



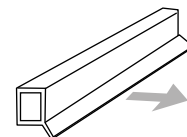
Note

The brake lining must be grease-free.

- Locate the O-rings (14) and (16) in the brake piston (15) and grease the O-rings lightly.
- Fit the brake piston (15) into the guide carriage (23).

Reassembly of the Guide Carriage

- Clean all the parts.
- Grease the felts (9) with guide grease (Order No. 10550FIL).
- Lay the wipers (10 or 30 + 31) and felts (9) in the wiper covers. The sealing lip of the wiper must be outwards (see drawing).
- Back off the adjusting screws (24) in the guide carriage.
- Lay in the support strip (6) on the same side as the adjusting screws.
- Place 2 slide profiles (11) per side in the guide carriage. The edges of the slide profiles in which grooves are cut (to allow grease from the grease nipples to get to the guide rail) must touch each other.
- Screw on the two wiper covers (8 or 28 + 29) loosely with the screws (7).



Remounting the Reassembled Guide Carriage on the Guide Rail

- Push the complete guide carriage assembly carefully onto the guide rail with the side with the adjusting screws towards the piston.
- If necessary move the felt wiper carefully into its correct position with a screwdriver.

Adjustment of Play

- Tighten the self-locking adjusting screws (24), individually from the middle working outwards, with the specified torque. If non-self-locking screws are used (24), use a locking medium (Loctite low-strength is recommended) and tighten the screws from the middle working outwards until the guide carriage can no longer be moved by hand.
- Tap the sides of the guide carriage (23) gently with a rubber hammer until the slide profiles (11) have settled into position and then tighten all the adjusting screws (24) again (see above).
- Loosen all the adjusting screws (24) about 1/4 to 1/2 turn individually from the middle working outwards. When correctly adjusted the guide carriage should be easily movable by hand but with no play.
- Tighten the screws (7) in the wiper cover (8 or 28 + 29) with the prescribed torque.

Lubrication

The grease nipples on both sides of the guide carriage (23) should be filled with guide grease (Order No. 10550FIL) until a thin film of grease can be seen on the guide rail when the guide carriage is moved by hand.

Final assembly

- Position the guide carriage centrally over the cylinder piston and secure the drive blocks (27) with the washers (26) and screws (25).



Note:

The drive blocks (27) must be fitted against the guide carriage (23) or carrier (34) with no play!
See the table for the correct torque!

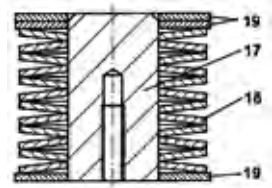
- Push the saucer springs (18) and pressure plates (19) onto the guide pin.



Note:

See the diagram for the correct arrangement of the saucer springs and pressure plates. Depending on the brake type the numbers of saucer springs (18) and pressure plates (19) are different.

- Lay the plate (22) on the pressure plates (19).
- Tighten the screws (21) with their washers (20) gradually and evenly until the plate (22) lies completely flat on the guide carriage (23).
- Refit the end cap of the OSP-P, if applicable.



Torques for screws

Item	MB-SL 25	MB-SL 32	MB-SL 40	MB-SL 50	MB-SL 63	MB-SL 80
4	3 Nm	3 Nm	10 Nm	10 Nm	10 Nm	10 Nm
7	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm	5.5 Nm
12	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm	0.8 - 1 Nm
21	5.5 Nm	10 Nm	10 Nm	10 Nm	20 Nm	20 Nm
24	2.5 - 3 Nm	2.5 - 3 Nm	2.5 - 3 Nm	2.5 - 3 Nm	2.5 - 3 Nm	2.5 - 3 Nm
	(only self-locking screws)					
25	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm	35 Nm	40 Nm
32	---	---	---	---	20 Nm	20 Nm

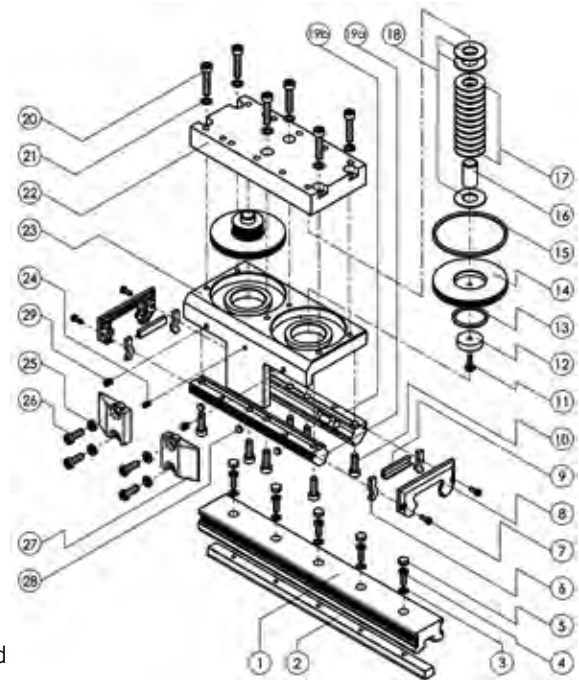
2.11 Multi-Brake - Proline (Passive Brake)

(MB-PL25 / MB-PL32 / MB-PL40 / MB-PL50)

For fitting and removal of the guide system the complete cylinder unit should be removed from the machine or plant.

Dismantling of the Guide Carriage

- Depressurise the cylinder and brake lines and switch off all electrical power supply.
- Remove all parts mounted externally on the plate (22).
- Unscrew the screws (20) with their washers (21), backing off each screw a little at a time, so that the plate (22) does not tip and jam when it is removed from the guide carriage (23).
- Remove the plate (22) from the guide carriage (23).
- Unscrew the drive block (27) from the piston of the OSP-P so that the guide carriage can be moved.
- Loosen the screws (7) in the wiper cover (8).
- For the OSP-P40, OSP-P50 only: remove one end cap of the cylinder.
- Slide the complete guide carriage off the double rail (1).
- Remove the wiper covers (8) with the felts (6) and wipers (9) from both ends of the guide carriage (23).
- Loosen and remove the screws (10) and separate the pair of roller shoes (19) from the guide carriage (23).



Dismantling of the Brake

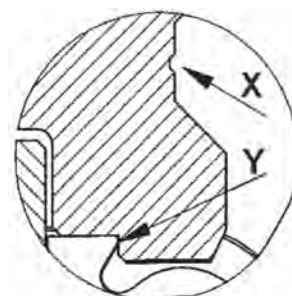
- Remove the saucer springs (17) and pressure plates (18) and press the brake piston (14) out of the guide carriage (23) from the brake lining side.
- Remove the screw (11) and remove the brake lining (12) and guide pin (16) from the brake piston (14), and also the O-rings (13) and (15).
- Inspect the parts – replace any damaged or worn parts such as the O-rings (13) and (15) and brake lining (12).

Dismantling of the Double Rail

- Remove the cap plugs (5).
- Remove the screws (4) and washers (3) and take the double rail (1) off the OSP cylinder.
- If necessary: remove the end caps of the OSP cylinder and push the clamping profile out of the slot in the cylinder profile.

Reassembly of the Double Rail

- Inspect the double rail (1) and replace it if necessary.
- Clean all the parts.
- If necessary: remove the end caps of the OSP cylinder and push the clamping profile into the slot in the cylinder profile.
- Fit the double rail (1) and clamping profile (2) onto the OSP cylinder with the screws (4) and washers (3) (note the maximum torque), centring the rails on the cylinder profile. The groove (X) on the side of the double rail (1) must be on the piston side. The bearing surface (Y) of the double rail (1), which is on the same side as the groove (X), must be positioned against the dovetail profile of the OSP cylinder profile.
- Insert new cap plugs (5) flush with or slightly below the surface of the double rail (1).



Reassembly of the Brake

- Clean all the parts, the inside of the brake piston chamber and the brake air connection.
- Centre the guide pin (16) on the brake piston with the help of the pressure plate (18) and fit the brake lining (12) onto the brake piston (14). Apply a locking medium to the screw (11) (Loctite low-strength is recommended) and tighten it.
- Grease the walls of the brake piston chamber and the groove in the brake piston lightly with guide grease (Order No. 10550FIL).

Note:

The brake lining must be grease-free.

- Locate the O-rings (13) and (15) in the brake piston (14) and grease the O-rings lightly.
- Fit the brake piston (14) into the guide carriage (23).



Reassembly of the Guide Carriage

- Inspect the parts: the pair of roller shoes (19), wiper (9) and felt (6) and replace any damaged or worn parts.
- Clean all the parts.
- For adjustment of the roller shoes there is a fixed side and an adjustment side. The roller shoe on the fixed side (19b) is secured firmly to the underside of the guide carriage (23) with the screws (10).
- Place the three washers (28) in the roller shoe (19a) on the adjustment side and fit it against the guide carriage (23) with the screws (10). Tighten the screws (10) until the roller shoe lies fully on the guide carriage but can still be moved.
- Slide the complete guide carriage carefully onto the guide rail with the side with the adjusting screw (24) towards the piston of the OSP.
- Adjust the roller shoes (19) with the set screw (24). The roller shoes must be adjusted in the unloaded condition and there should be no play at the loosest point on the double rail (1). At the tightest point on the double rail the resistance to movement must not exceed the maximum value. The correct and maximum resistance to movement are as follows:

Size	MB-PL 25	MB-PL 32	MB-PL 40	MB-PL 50
Correct ≤	1 N	1.5 N	2 N	3 N
Maximum ≤	6 N	9 N	10 N	12 N

- First tighten the screws (10) with the specified torque and afterwards tighten the both set screws(29) with the specified torque.
- Fit the wiper covers (8), felts (6) and wipers (9) with the screws (7).

Lubrication

The Proline roller guide is lifetime-lubricated.

Final Assembly

- Position the guide carriage (23) centrally over the piston of the cylinder and secure the drive blocks (27) with the washers (25) and screws (26).



Note

**The drive blocks (27) must be fitted against the guide carriage (23) with no play !!!
See the correct torque in the table !!!**

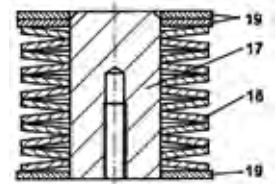
- Push the saucer springs (17) and pressure plates (18) onto the guide pin.



Note

**See the diagram for the correct arrangement of the saucer springs and pressure plates and assemble it.
According to the brake type the numbers of saucer springs (17) and pressure plates (18) are different.**

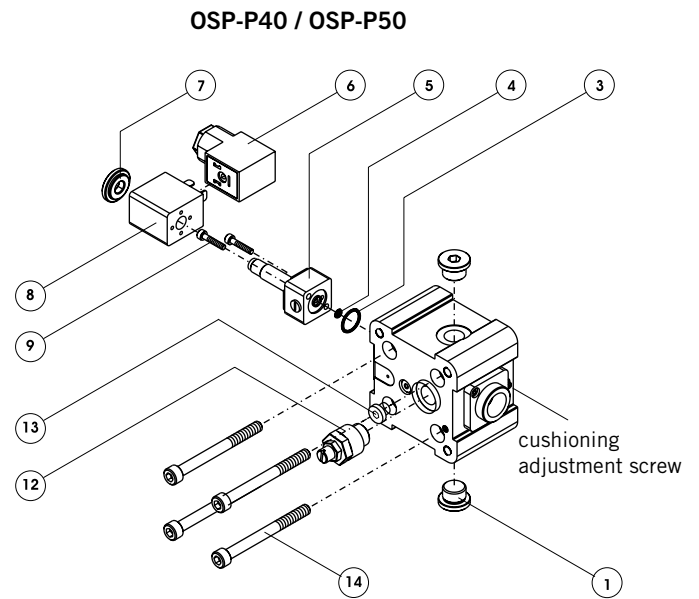
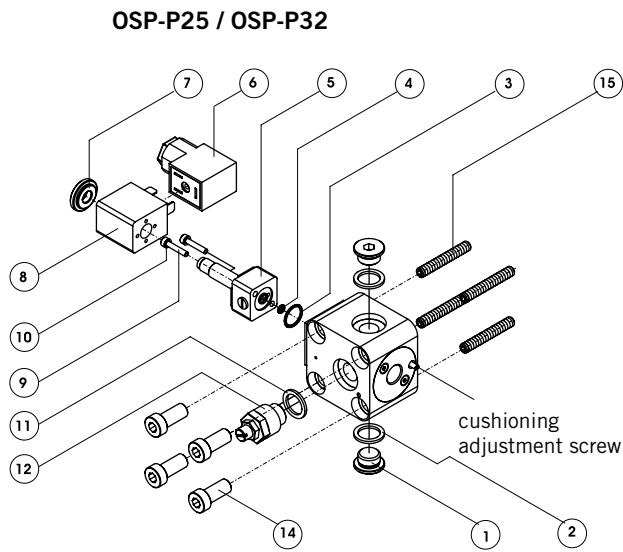
- Lay the plate (22) on the pressure plates (18).
- Tighten the screws (20) with their washers (21) gradually and evenly until the plate (22) lies flat on the guide carriage (23).
- Refit the end caps of the OSP-P, if applicable.



Torques for Screws

Item	MB-PL 25	MB-PL 32	MB-PL 40	MB-PL 50
4	3 Nm	10 Nm	10 Nm	10 Nm
7	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
10	5.5 Nm	10 Nm	10 Nm	20 Nm
11	0.8-1 Nm	0.8-1 Nm	0.8-1 Nm	0.8-1 Nm
20	5.5 Nm	10 Nm	10 Nm	10 Nm
26	9 Nm	14.5 Nm	14.5 Nm	14.5 Nm
29	0.5 Nm	0.5 Nm	0.5 Nm	0.5 Nm

2.12 Integrated 3/2 Way Valves V0E



Fault-Finding

(only with machine switched off)

If faulty valve is suspected:

- Check actuating signal and voltage at solenoid.
- Check functioning with manual override (red turn button on pilot valve). If valve works, only replace solenoid coil (28).
- If cylinder speed is reduced: unscrew throttle silencer (35) and wash it or replace it.
- Override selector should be in the zero position.

Modification and rigging notices

The design of the integrated 3/2 way VOE valves enables their subsequent modification for installation in a machine or system:

- in respect to the position of the air connection,
- in respect to the pilot valve and magnet alignment.

Compressed air can cause injury and property damage



All work performed on cylinders under pressure can be dangerous.

Make sure the cylinder is depressurized!

Rotating the Valve

The VOE valve can be rotated 4 x 90° to position the air connection as required.

- Remove end cap screws (14).
- Rotate valve housing to desired position.
- Refit end cap screws (14) and tighten to specified torque. Take care that the two O-rings between valve housing and cushioning spigot are not damaged.

Rotating the Pilot Valve and Solenoid

The pilot valve of the VOE valve can be rotated 180° to position the manual override turn button as required.

- Remove screws (9).
- Rotate pilot valve (5) to desired position.
- Refit screws (9) and tighten to specified torque. Take care that the two O-rings (3) and (4) are not damaged.
- Solenoid (8) can be rotated 4 x 90° to position connector (6) as required: to do this, remove knurled nut (7), turn solenoid (8) to desired position and retighten knurled nut.

Speed Regulation

- The throttle silencer (12) can be exchanged with either of the screw plugs (1) to improve the accessibility of the adjusting screw. The adjusting screw is used to regulate the speed of the cylinder. The plug screws (1) can if desired be replaced by a second or third throttle silencer (12) to increase exhaust air flow rate and thereby the speed of the piston.
- If the piston speed is changed, the end cushioning must be adjusted accordingly with the cushioning adjustment screw (14). See „Chapter 5 – Commissioning“ in the OSP-P Operating Instructions.

Air Connection V6

- For OSP-P40 and OSP-P50:
The air connection with screw plug (13) provides direct connection to the cylinder chamber, e.g. for an external valve or a pressure sensor.

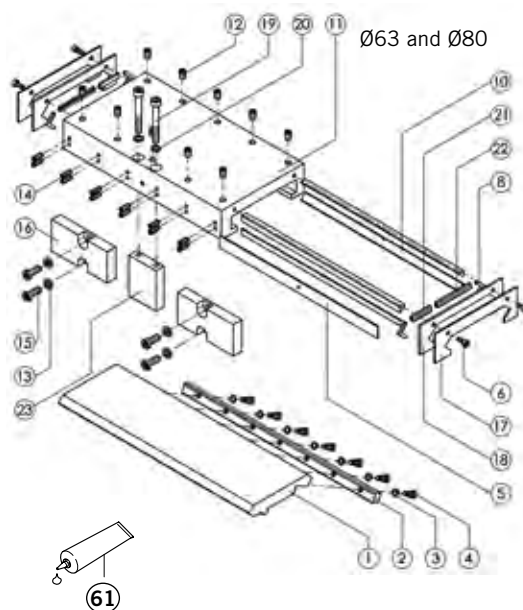
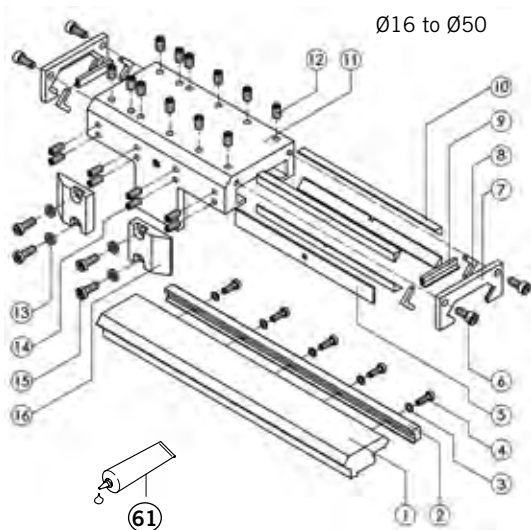
Torques for Screws

Item	OSP-P25	OSP-P32	OSP-P40	OSP-P50
9	1.2 Nm	1.2 Nm	1.2 Nm	1.2 Nm
14	8 Nm	10 Nm	10 Nm	10 Nm

3 Replacement Parts

3.1 Slideline

(SL16 / SL25 / SL32 / SL40 / SL50 / SL63 / SL80)



Delivery package

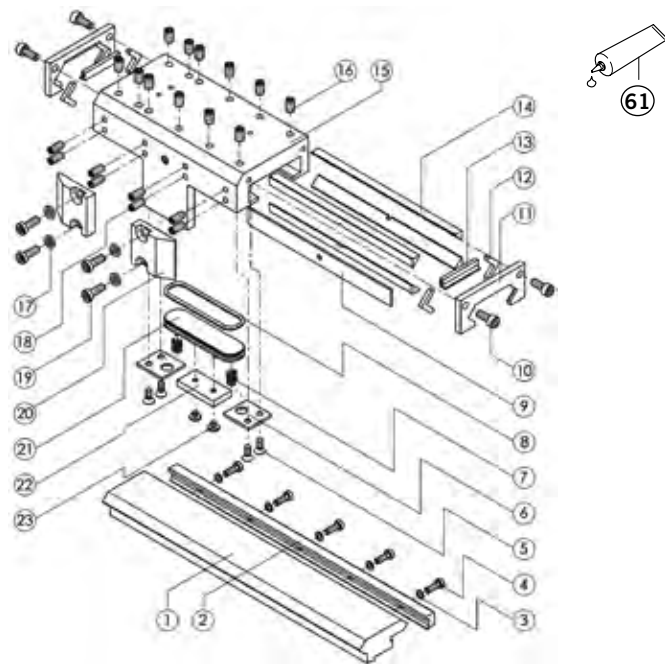
Slideline (SL)

Item (Pos. No.)	Description	Order-No. *(**)						
		SL 16	SL 25	SL 32	SL 40	SL 50	SL 63	SL 80
1-16	Slideline plain bearing guide**	20341	20342	20196	20343	20195	-	-
1-23	Slideline plain bearing guide**	-	-	-	-	-	20853	21000
1-16	Slideline plain bearing guide, stainless**	20344	20345	20346	20347	20348	-	-
1-23	Slideline plain bearing guide, stainless**	-	-	-	-	-	20854	21001
1	Guide rail**	10912	10913	10914	10915	10916	10939	10941
5,6,7,8,9,10, 11,12,14,61	Guide carriage, complete, stainless	11400	11402	11405	11408	11411	-	-
5,6,8,10,11, 12,14,17,18, 21,22,61	Guide carriage, complete, stainless	-	-	-	-	-	11889	
8,9,10,61	Service kit	11066	11067	11068	11069	11070	-	-
8,10,21,22,61	Service kit	-	-	-	-	-	11094	
13,15,16	Drive block Kit stainless	21712	21713	21714		21715	-	-
13,15,16,19, 20,23	Drive block Kit stainless	-	-	-	-	-	21716	21717
61	Guide grease 8 gr tube	10550						

* Please use this order pattern: ORDER NO. + „FIL“, example Service Kit SL25: 11067FIL

** Please use this order pattern: ORDER NO. + “stroke length in mm” (5 digits),
example Guide rail SL32 (1000 mm stroke): 10914-01000

3.2 Slideline with Active Brake (SL-AB25 / SL-AB32 / SL-AB40 / SL-AB50)



Delivery package

Slideline with Active Brake (SL-AB)

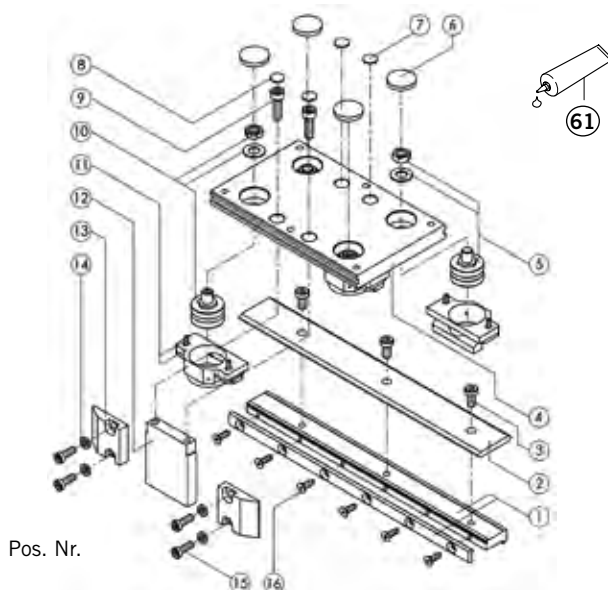
Item (Pos. No.)	Description	Order-No. *(**)			
		SL-AB 25	SL-AB 32	SL-AB 40	SL-AB 50
1-23	Slideline plain bearing guide with Active Brake**	20409	20410	20411	20412
1	Guide rail**	10913	10914	10915	10916
5-16,18,21,22,23,61	Guide carriage, complete	11403	11406	11409	11412
8,12-14,22,61	Service kit	11095	11096	11097	11098
17,19,20	Drive block Kit stainless	21713	21714		21715
61	Guide grease, 8 gr tube	10550			

* Please use this order pattern: ORDER NO + „FIL“, example Guide carriage complete SL-AB25: 11403FIL

** Please use this order pattern: ORDER NO + „stroke in mm“ (5 digits),
example Guide rail SL-AB25 (1000 mm stroke): 10913-01000

3.3 Powerslide

PS 16/25
 PS 25/25
 PS 25/35
 PS 25/44
 PS 32/35



Delivery package

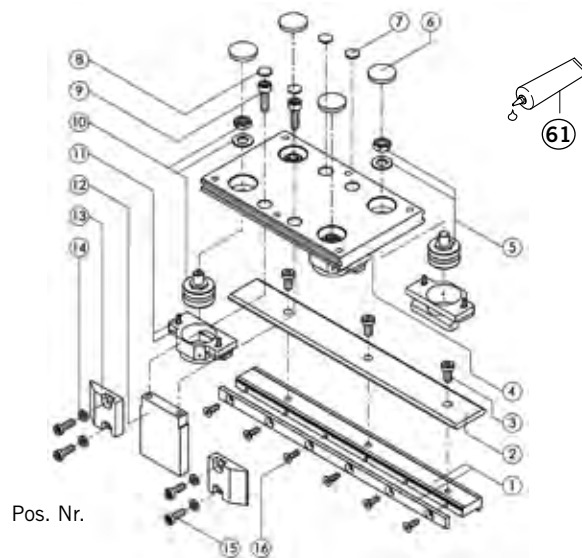
Powerslide (PS)

Item (Pos. No.)	Description	Order-No. *(**)				
		PS 16/25	PS 25/25	PS 25/35	PS 25/44	PS 32/35
1-16	Powerslide roller guide** for OSPP and OSP-E screw	20285	20015	20016	20017	20286
1-16	Powerslide roller guide** for OSP-E Belt	-	20304	20305	20306	20307
1-16	Powerslide roller guide stainless** for OSPP and OSP-E screw	20294	20295	20296	20297	20298
2	Guide rail **OSPP/OSPE-screw	11011	11012	11013	11014	11015
2	Guide rail **OSPE Belt	-	11038	11039	11040	11041
2	Guide rail stainless**OSPP/OSPE-screw	11021	11022	11023	11024	11025
4,5-8,10,11	Guide carriage complete	-	-	11415	11416	11415
4,5,6,8,10,11	Guide carriage complete	11413	11414	-	-	-
5	Roller, centric	10620		10622	10620	
5	Roller, centric stainless	14411		14413	14411	
10	Roller, eccentric	10619		10621	10619	
10	Roller, eccentric stainless	14410		14412	14410	
11	Cover for rollers with screws	4009		4017	4009	
11	Cover for rollers with screws, stainless	10625		10626	10625	
13,14,15	Drive block Kit stainless	21712	21713		21714	

* Please use this order pattern: ORDER NO. + „FIL“, example Guide carriage complete PS 25/35: 11415FIL
 ** Please use this order pattern: ORDER NO. + „stroke length in mm“ (5 digits)
 example Powerslide roller guide PS 16/25 (1000 mm stroke): 20285-01000

Guides, Brakes and Valves OSP-P / OSP-E

PS 32/44
PS 40/44
PS 40/60
PS 50/60
PS 50/76



Delivery package

Powerslide (PS)

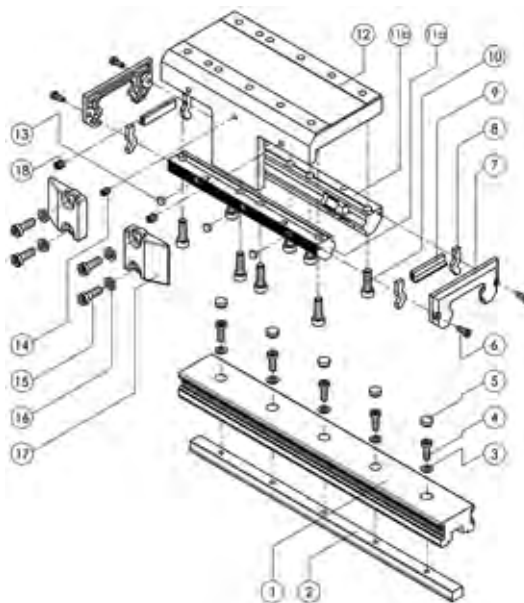
Item (Pos. No.)	Description	Order-No. (**)				
		PS 32/44	PS 40/44	PS 40/60	PS 50/60	PS 50/76
1-16	Powerslide roller guide** for OSPP and OSP-E screw	20287	20033	20034	20288	20289
1-16	Powerslide roller guide** for OSP-E Belt	20308	-	-	20309	20310
1-16	Powerslide roller guide stainless** for OSPP and OSP-E screw	20299	20300	20301	20302	20303
2	Carrying rail **OSPP/OSPE-screw	11016	11017	11018	11019	11020
2	Carrying rail **OSPE Belt	11042	-	-	11043	11044
2	Carrying rail stainless**OSPP/OSPE-screw	11026	11027	11028	11029	11030
4,5-8,10,11	Guide carriage complete	11416		11417		-
4,5,6,8,10,11	Guide carriage complete	-	-	-	-	11418
5	Roller, centric	10622				10624
5	Roller, centric stainless	14413				14415
10	Roller, eccentric	10621				10623
10	Roller, eccentric stainless	14412				14414
11	Cover for rollers with screws	4017				10627
11	Cover for rollers with screws, stainless	10626				10799
13,14,15	Drive block Kit stainless	21714			21715	

* Please use this order pattern: ORDER NO. + „FIL“, example Guide carriage complete PS 32/44: 11416FIL

** Please use this order pattern: ORDER NO. + „stroke length in mm“ (5 digits)
example Powerslide roller guide PS 40/60 (1000 mm stroke): 20034-01000

3.4 Proline

(PL16 / PL25 / PL32 / PL40 / PL50)



Delivery package

Proline (PL)

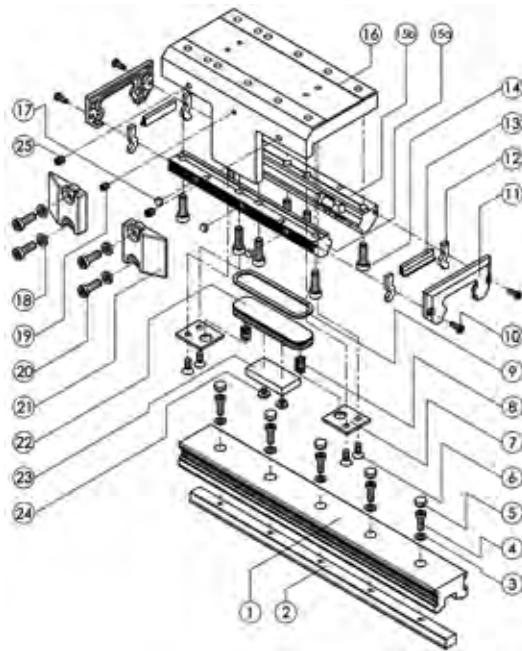
Item (Pos. No.)	Description	Order-No. *(**)				
		PL 16	PL 25	PL 32	PL 40	PL 50
1-18	Proline roller guide** for OSP-P and OSP-E Screw	20855	20856	20857	20858	20859
1-18	Proline roller guide** for OSP-E Belt	-	20874	20875	-	20876
1	Double rail for OSP-P and OSP-E Screw **	10951	10943	10944	10945	10946
1	Double rail for OSP-E Belt **	-	10868	10869	-	10870
6-14,18	Guide carriage complete	11985	11899	11900	11901	11902
15-17	Drive block Kit stainless	21712	21713	21714		21715

* Please use this order pattern: ORDER NO. + „FIL“, example Guide carriage complete PL 32: 11900FIL

** Please use this order pattern: ORDER NO. + “stroke length in mm” (5 digits),
example Double rail PL 25 (1000 mm stroke): 10943-01000

3.5 Proline with Active Brake

(PL-AB25 / PL-AB32 / PL-AB40 / PL-AB50)



Delivery package

Proline with Active Brake (PL-AB)

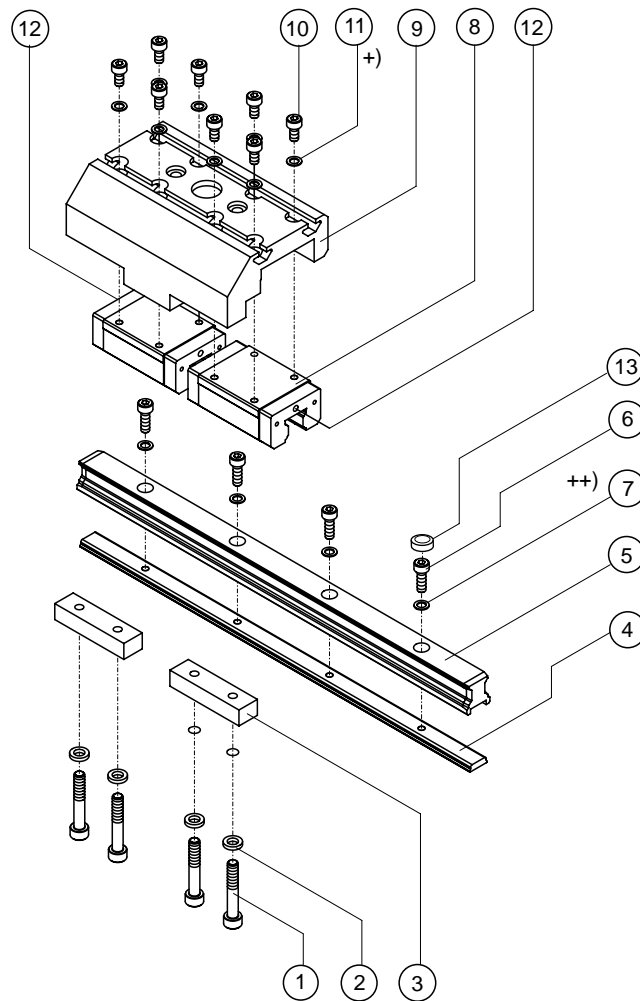
Item (Pos. No.)	Description	Order-No. *(**)			
		PL-AB 25	PL-AB 32	PL-AB 40	PL-AB 50
1-25	Proline roller guide with Active Brake**	20860	20861	20862	20863
1	Double rail **	10943	10944	10945	10946
6-17,19,22-25	Guide carriage, complete	11903	11904	11905	11906
18,20,21	Drive block Kit stainless	21713	21714		21715

* Please use this order pattern: ORDER NO. + „FIL“, example Drive block Kit PL-AB50: 21715FIL

** Please use this order pattern: ORDER NO. + “stroke length in mm” (5 digits), example Double Rail PL-AB 50 (1000 mm stroke): 10946-01000

3.6 Guide OSP-KF

(KF16 / KF25 / KF32 / KF40 / KF50)



+) only
 -KF16
 -KF32
 -KF40
 -KF50

++) only-
 KF16
 -KF40
 -KF50

Delivery package

KF

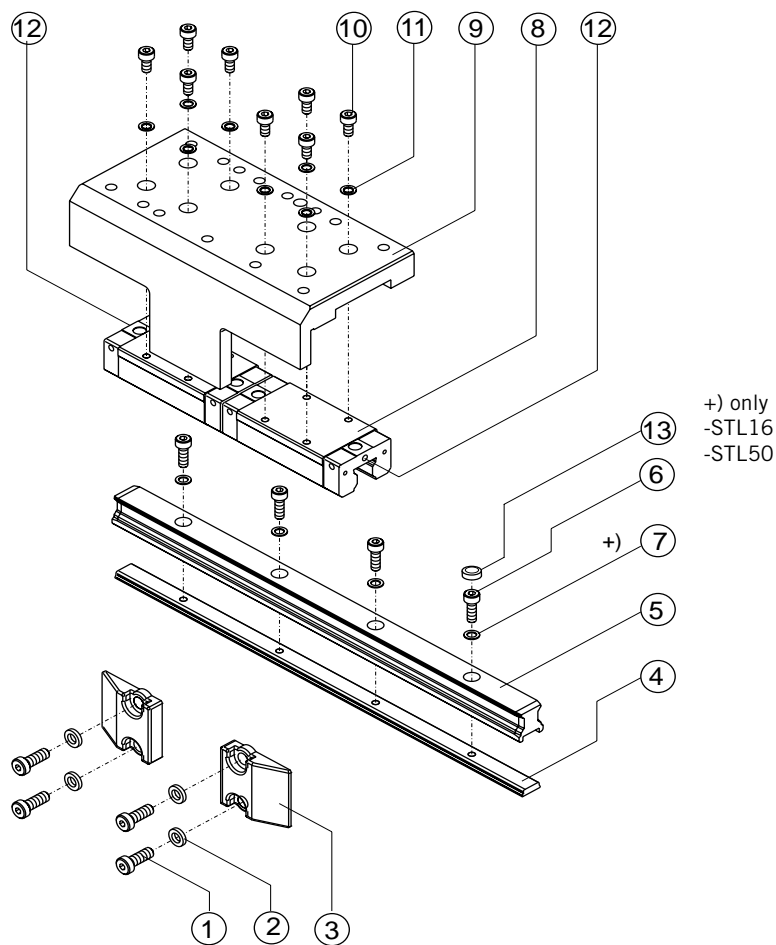
Item (Pos. No.)	Description	Order-No. **				
		KF 16	KF 25	KF 32	KF 40	KF 50
1-13	Ball bearing guide KF**	21101	21102	21103	21104	21105
5	Guide rail **	Please contact our product support specialists !***				
8	Carriage					

** Please use this order pattern: ORDER NO. + “stroke length in mm” (5 digits), example Ball bearing guide KF 25 (1000 mm stroke): 21102-01000

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3.7 OSP-Starline

(STL16 / STL25 / STL32 / STL40 / STL50)



Delivery package

Starline STL

Item (Pos. No.)	Description	Order-No. *(**)				
		STL 16	STL 25	STL 32	STL 40	STL 50
1-13	Ball bearing guide STL**	21111	21112	21113	21114	21115
5	Guide rail **	Please contact our product support specialists !***				
8	Carriage					
1,2,3	Drive block Kit stainless	21712	21713	21714	21715	21715

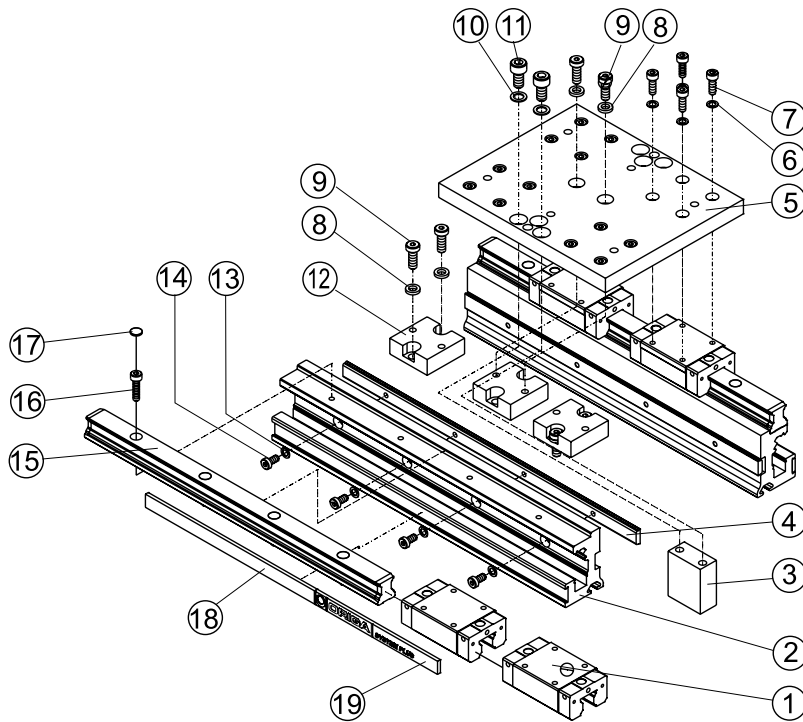
* Please use this order pattern: ORDER NO. + „FIL“, example Drive block Kit STL50: 21715FIL

** Please use this order pattern: ORDER NO. + “stroke length in mm” (5 digits), example Ball Bearing Guide STL16 (1000 mm stroke): 21111-01000

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3.8 OSP-Heavy Duty

(HD25 / HD32 / HD40 / HD50)



Delivery package

Heavy Duty (HD)

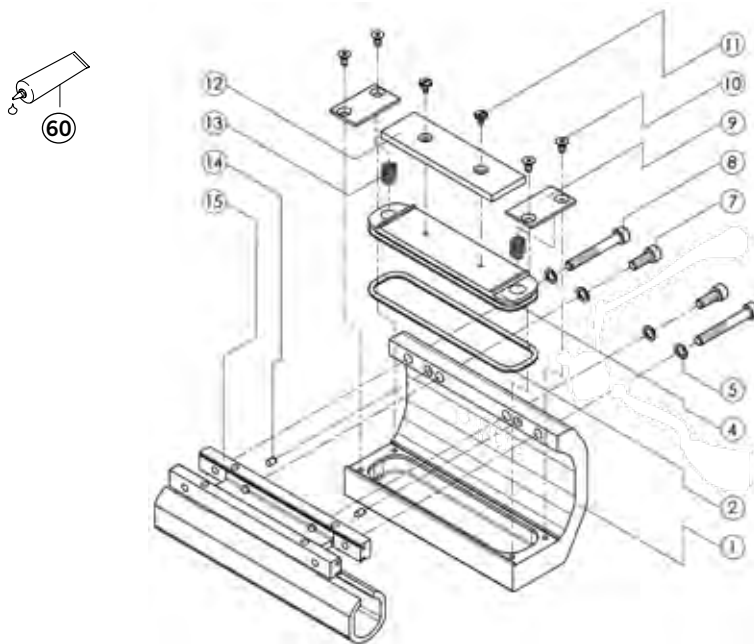
Item (Pos. No.)	Description	Order-No. **			
		HD 25	HD 32	HD 40	HD 50
1-19	Guide OSP-HD**	21246	21247	21248	21249
15	Guide rail **	Please contact our product support specialists !***			
1	Carriage				

** Please use this order pattern: ORDER NO. + “stroke length in mm” (5 digits),
example Guide OSP-HD 25 (1000 mm stroke): 21246-01000

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3.9 Active Brake

(AB25 / AB32 / AB40 / AB50 / AB63 / AB80)



Delivery package

Active Brake (AB)

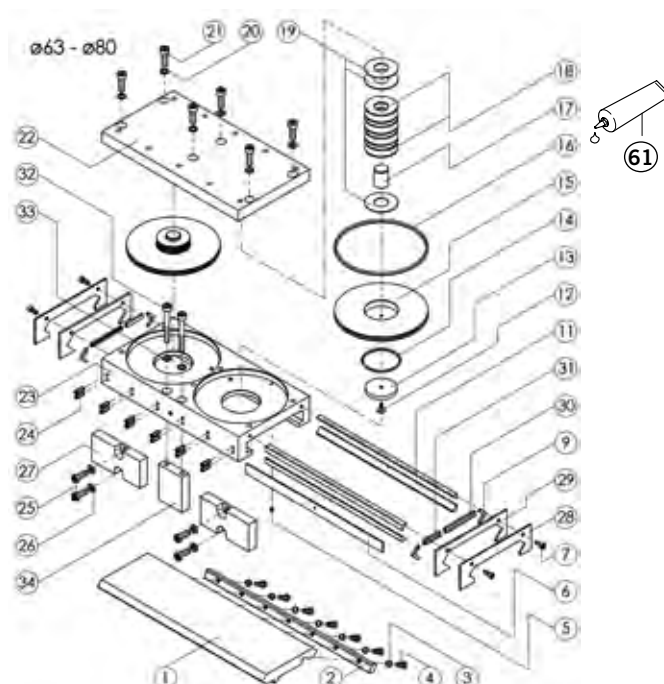
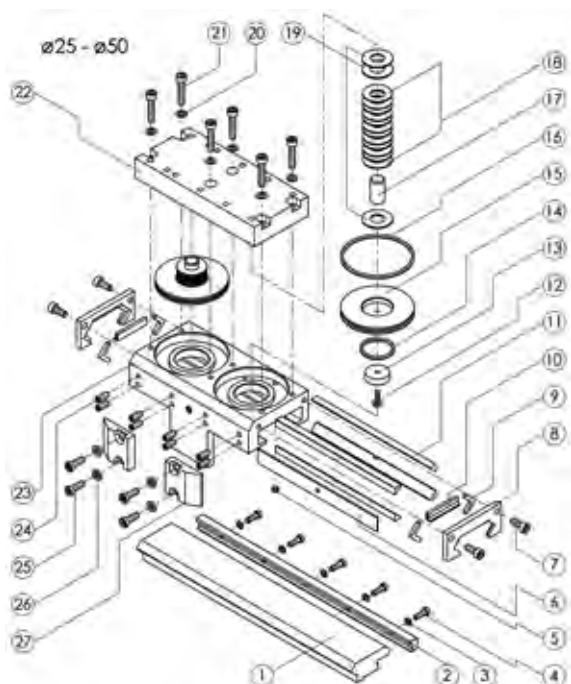
Item (Pos. No.)	Description	Order-No. *					
		AB 25	AB 32	AB 40	AB 50	AB 63	AB 80
1-15	Active brake complete	20806	20807	20808	20809	20810	20811
2,4,12,60	Service Kit incl. grease 25gr tube	11822	11823	-	-	-	-
2,12,60	Service Kit incl. grease 25gr tube	-	-	11824	11825	11826	11827
15	Piston yoke	11625	11626	11627	11628	11629	11630
60	Grease 25gr tube	1598					

* Please use this order pattern: ORDER NO. + „FIL“, example Service Kit AB 25 : 11822FIL

* Please use this order pattern: ORDER NO. + „FIL“, example Piston yoke AB 32 : 11626FIL

3.10 Multi-Brake-Slideline (Passive Brake)

(MB-SL25 / MB-SL32 / MB-SL40 / MB-SL50 / MB-SL63 / MB-SL80)



Delivery package

Multi - Brake Slideline (MB-SL)

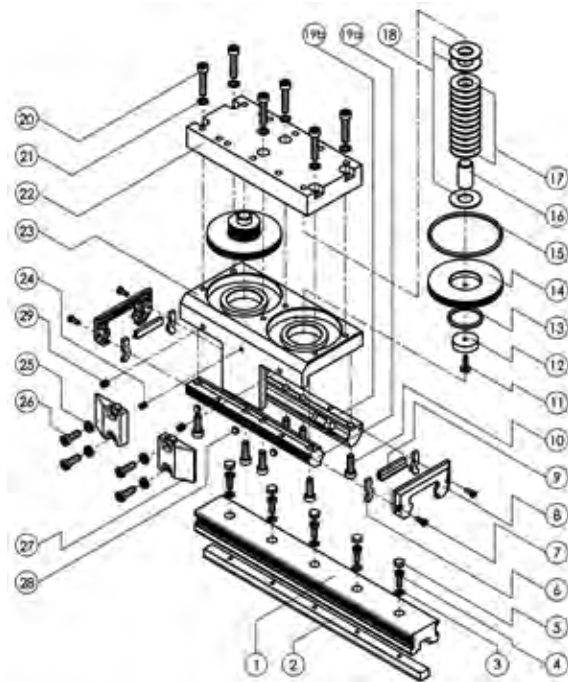
Item (Pos. No.)	Description	Order-No. (**)					
		MB-SL 25	MB-SL 32	MB-SL 40	MB-SL 50	MB-SL 63	MB-SL 80
1-27	Multi-Brake (Passive Brake) with Slideline plain bearing guide**	20796	20797	20798	20799		
1-34	Multi-Brake (Passive Brake) with Slideline plain bearing guide**	-	-	-	-	20800	20846
1	Guide rail **	10913	10914	10915	10916	10939	10941
5-24	Guide carriage complete, stainless	11684	11685	11686	11687	-	-
5-7,9,11,12-24, 28-31	Guide carriage complete, stainless	-	-	-	-	11688	
9,10,11,13,14, 16,61	Service Kit	11089	11090	11091	11092	-	-
9,11,13,14,16, 30,31,61	Service Kit	-	-	-	-	11093	
25,26,27	Drive block Kit, stainless	21713	21714		21715	-	-
25,26,27,32, 33,34	Drive block Kit, stainless	-	-	-	-	21716	21717
61	Grease for Guide 8 gr tube	10550					

* Please use this order pattern: ORDER NO. + „FIL“, example Service Kit MB-SL25: 11089FIL

** Please use this order pattern: ORDER NO. + “stroke length in mm” (5 digits),
example Multi-Brake MB-SL25 (1000 mm stroke): 20796-01000

3.11 Multi-Brake-Proline (Passive Brake)

(MB-PL25 / MB-PL32 / MB-PL40 / MB-PL50)



Delivery package

Multi - Brake Proline (MB-PL)

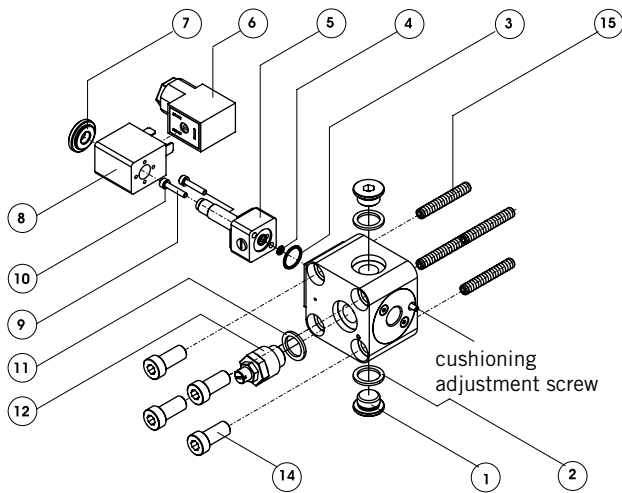
Item (Pos. No.)	Description	Order No. (**)			
		MB-PL 25	MB-PL 32	MB-PL 40	MB-PL 50
1-29	Multi-Brake with Proline roller guide**	20864	20865	20866	20867
1	Double rail **	10943	10944	10945	10946
6-17,19-24,28,29	Guide carriage complete	11907	11908	11909	11910
25,26,27	Drive block Kit stainless	21713	21714		21715

* Please use this order pattern: ORDER NR. + „FIL“, example Guide carriage complete MB-PL32: 11908FIL

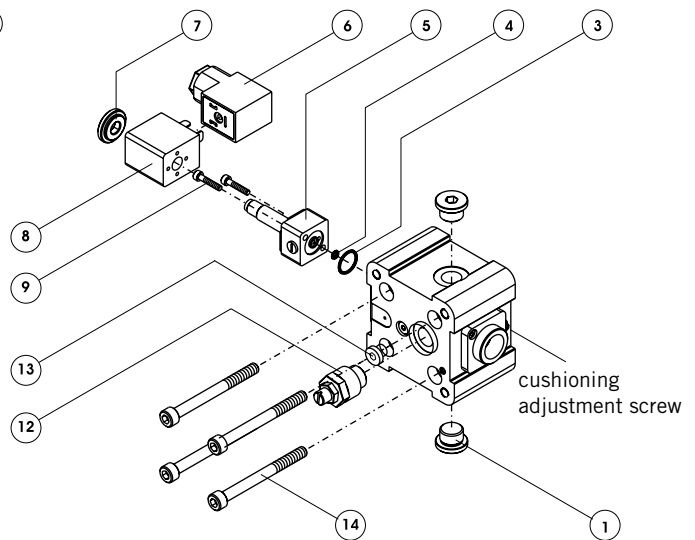
** Please use this order pattern: ORDER NR. + “stroke length in mm” (5 digits), example Multi-Brake MB-PL25 (1000 mm stroke): 20864-01000

3.12 Integrated 3/2 Way Valves VOE

OSP-P25 / OSP-P32



OSP-P40 / OSP-P50



Delivery package

Integrated 3/2 way valve VOE

Item (Pos. No.)	Description	Order No. *			
		OSPP25	OSPP32	OSPP40	OSPP50
1-15	Integrated 3/2 way valve VOE 24 V complete incl. endcap screws	20914*	20916*	20918*	20920*
1-15	Integrated 3/2 way valve VOE 230 V complete incl. endcap screws	20915*	20917*	20919*	20921*
without 6,7,8,14,15	Complete Integrated 3/2 way valve VOE without: plug, knurled nut, magnet and endcap screw	11840*	11866*	11855*	11857*
3,4,5,7,9	Pilot valve complete	21734*			
6	Plug 10-50 V	11894*			
6	Plug 70-250 V	11895*			
8	Solenoid coil for 24 V= and 60 V =~/50-60 Hz	KZ3673			
8	Solenoid coil for 110 V= and 230 V =~/50-60 Hz	KZ3672			
60	Grease 25 gr tube	1598*			

* Please use this order pattern: ORDER-NO. + „FIL“, example Integrated 3/2 way valve VOE 24V for OSPP25: 20914FIL

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