

# Assembly Instructions M8146-EN

## Spare parts Vario-5 switching and buffer valve

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## Precondition



### **WARNING!**

#### **Danger for unauthorized persons!**

Conversion work may only be carried out by specialist staff who have been trained accordingly.

Therefore:

- Keep unauthorized persons away from the work area.



### **NOTE!**

*Knowledge of the Instruction Manual is a precondition for carrying out conversion work on the unit.*

## Procedure



### **DANGER!**

#### **Danger to life caused by electric current!**

Touching conductive parts causes a direct danger to life.

Therefore:

- For all work on the electrical system, for maintenance, cleaning or repair work, disconnect from the mains or disconnect all phases of the external power supply and secure them against being switched on again. Check unit is isolated from power supply.



### **WARNING!**





#### **Danger of crushing due to rolling away or tipping**


With an uneven floor or when the castors are not locked, there is a danger that the unit tips over or rolls away causing crushing.

Therefore:

- Only install the unit on an even floor.
- Ensure that the castors are locked.

## Preparation

1. Proceed as follows to cool down the system and carry out mould evacuation:
  - Select module no. "VCn" with the  or  key.
  - Display menu page **Functions**.
  - Select the **Cooling** parameter and activate with the  key.
  - Select the parameter **Mould evacuation** and press the  key.

→ The activated function is indicated with the  symbol.
2. Proceed as follows to mount or disassemble the multiphase motors:
  - Display the menu page **Service \ Support** (Profile support)
  - Set the parameter **Positioning valve heating** to „25 %“.
  - Set the parameter **Positioning valve cooling** to „25 %“.
  - Set the parameter **Positioning valve buffer** to „0 %“.



### NOTICE!

*The user profile must be set to support in order to access the parameter (→ Operating instructions: chapter Operation).*

3. Switch off all main switches, unplug the mains plug and empty the switching unit.
4. Removing the covers of the switching unit (→ Operating instructions: chapter Maintenance).

## Sleeve and seal (O/ID T27098)

1. Carry out preparation (→ page 3).

**on the multiphase motor, the switching module (M 5,6)**

2. Proceed as follows to disassemble the multiphase motor (M 5,6):

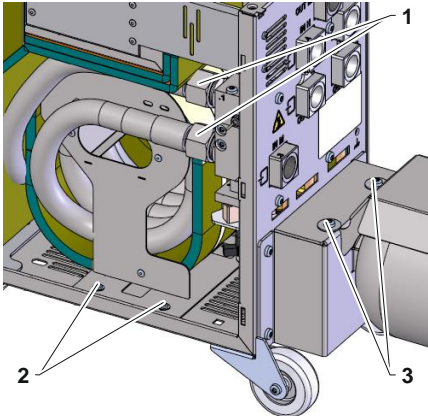


Fig. 1: Remove switching unit buffer (19)

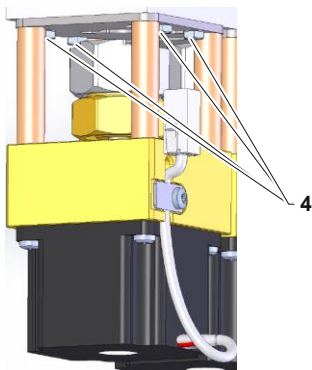


Fig. 2: Remove the multiphase motor M 5,6

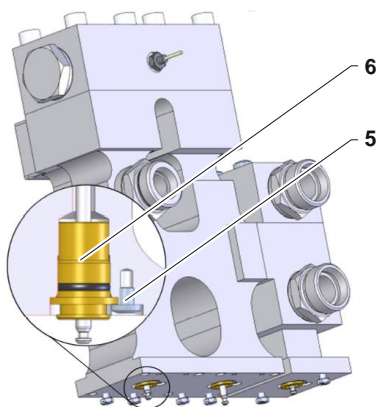


Fig. 3: Replacing the guide bush



### CAUTION! Risk of burns!

During operation, the multiphase motor (M 5,6) becomes hot. Danger of burns, if touched.

Therefore:

- Wear thermal gloves when touching or let the multiphase motor cool down.

- In order to remove the switching buffer unit (19), disassemble 2x pipe couplings (label 1) and remove 2x screws (label 2).
- Remove the switching buffer unit (19) on the side.
- To disassemble the protection cover of the accumulator (16), remove 2x screws (label 3).



### NOTICE!

Observe following when disassembling the multiphase motor:

- Positioning of the multiphase motors  
→ Preparation page 3.
- Alignment of the groove of the coupling, to allow the piston rod to extend → Fig. 5.

- Withdraw the cable connector of the multiphase motor (M 5.6).
- Loosen the 4 fixing screws (label 4) (approx. 8–10 mm).
- Slightly pull out downwards the multiphase motor (M 5,6) and move out of coupling.

3. Proceed as follows in order to replace the guide bush:

- Remove the fixing screw (label 5) holding the guide bush at the bottom of the switching (20) resp. buffer module (21).
- Remove the guide bush (label 6).



### NOTICE!

Do not remove the mounting rod to assemble the guide bush.

- Assemble the new guide bush. The mounting rod is being pressed out by the piston.
- Remove the mounting rod, it is no longer needed.
- Fix the guide bush with the fixing screw.

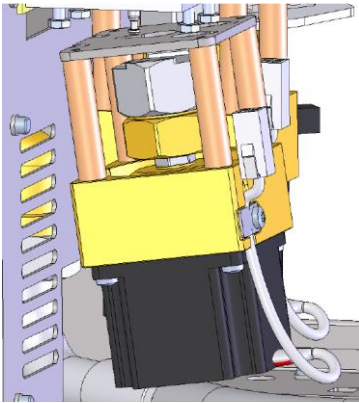


Fig. 4: Mount the multiphase motor M 5,6

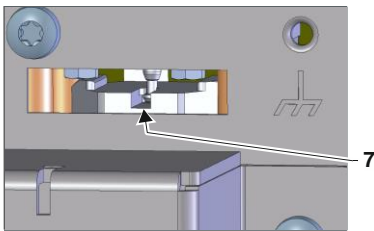


Fig. 5: Visual control of the groove alignment

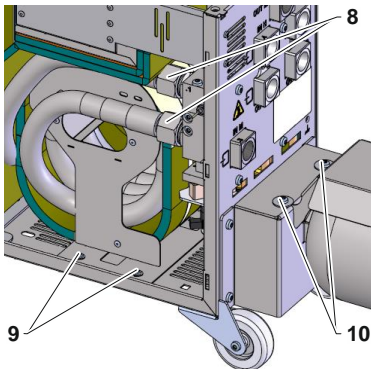


Fig. 6: Assemble the switching unit buffer (19)

#### 4. Proceed as follows to mount the multiphase motor (M 5,6):



##### **NOTICE!**

Observe following when mounting the multiphase motor:

- Loosen the 4 fixing screws enough (approx. 8-10 mm) to enable an easier installation.
- Alignment of the groove of the coupling, to allow the piston rod to retract (label 7 → Fig. 5).

- Engage the multiphase motor, turn into final position and fix with the 4 screws.



##### **WARNING!**

**Improper installation can cause material damage!**

Wrongly mounted multiphase motors can lead to dysfunction and/or material damage.

Therefore:

- Observe correct mounting, visual control to check the engagement of the piston rod in the coupling → Fig. 29.
- Connect the cable connector of the multiphase motor (M 5.6).
  - Engage the switching buffer unit (19) on the side.
  - Mount the switching buffer unit (19) with 2x pipe couplings (label 8) as well as 2x screws (label 9) on the base plate.
  - Mount the protection cover of the accumulator with two screws (label 10).

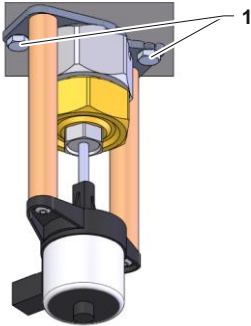


Fig. 7: Disassemble the multiphase motor M 7

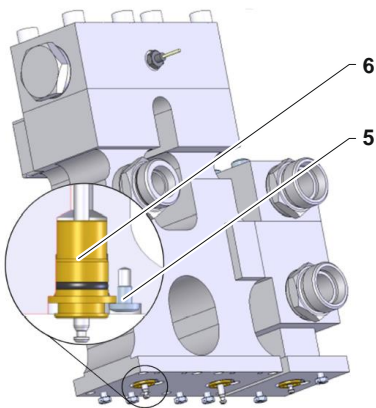


Fig. 8: Replacing the guide bush

### on the multiphase motor, the buffer module (M 7)

5. Proceed as follows to disassemble the multiphase motor (M 7):
  - Withdraw the cable connector of the multiphase motor (M 7).
  - Loosen 2x fixing screws (label 1) of the multiphase motor (M 7).
  - Turn the multiphase motor (M 7), slightly pull out downwards and move out of connection.

6. Proceed as follows in order to replace the guide bush:
  - Remove the fixing screw (label 5) holding the guide bush at the bottom of the switching (20) resp. buffer module (21).
  - Remove the guide bush (label 6).



#### **NOTICE!**

*Do not remove the mounting rod to assemble the guide bush.*

- Assemble the new guide bush. The mounting rod is being pressed out by the piston.
  - Remove the mounting rod, it is no longer needed.
  - Fix the guide bush with the fixing screw.
7. Proceed as follows to mount the multiphase motor (M 7):
    - Engage the multiphase motor, turn into final position and fix with the two screws.
    - Connect cable plug of the multiphase motor.
  8. Carry out inspection (→ page 16).

## Piston with sleeve and seal (O/ID T27099, T28434)

1. Carry out preparation (→ page 3).

### For switching module (20)

2. Proceed as follows to disassemble the multiphase motor (M 5,6):

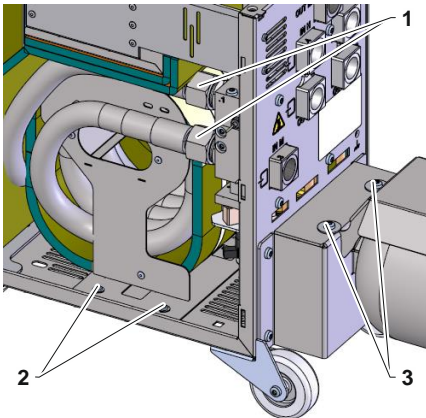


Fig. 9: Remove switching unit buffer (19)

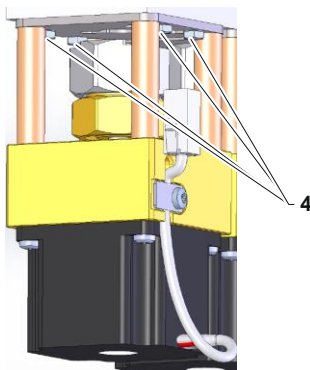


Fig. 10: Remove the multiphase motor M 5,6

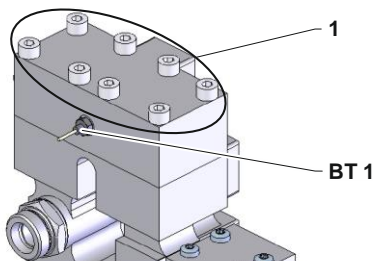


Fig. 11: Remove the cover of the switching module



### CAUTION! Risk of burns!

During operation, the multiphase motor (M 5,6) becomes hot. Danger of burns, if touched.

Therefore:

- Wear thermal gloves when touching or let the multiphase motor cool down.

- In order to remove the switching buffer unit (19), disassemble 2x pipe couplings (label 1) and remove 2x screws (label 2).
- Remove the switching buffer unit (19) on the side.
- To disassemble the protection cover of the accumulator (16), remove 2x screws (label 3).



### NOTICE!

Observe following when disassembling the multiphase motor:

- Positioning of the multiphase motors  
→ Preparation page 3.
- Alignment of the groove of the coupling, to allow the piston rod to extend → Fig. 15

- Withdraw the cable connector of the multiphase motor (M 5.6).
- Loosen the 4 fixing screws (label 4) (approx. 8–10 mm).
- Slightly pull out downwards the multiphase motor (M 5,6) and move out of coupling.

3. Proceed as follows to disassemble the cover:

- Disassemble the flexible tube of the tool circuit exit (OUT M).
- Disassemble the main line temperature sensor (BT 1).
- Disassemble 8x screws (label 1) and remove cover.

4. Carefully move out the piston rod upwards.

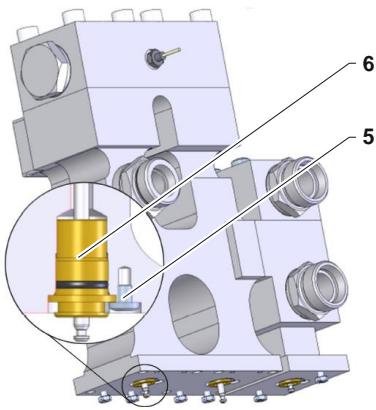


Fig. 12: Replacing the guide bush

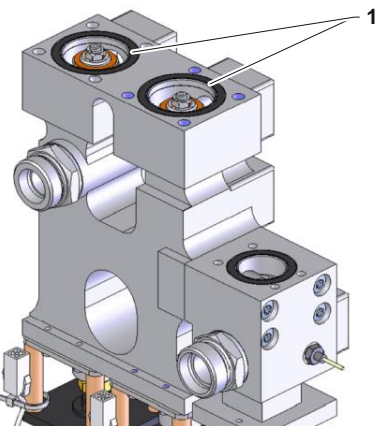
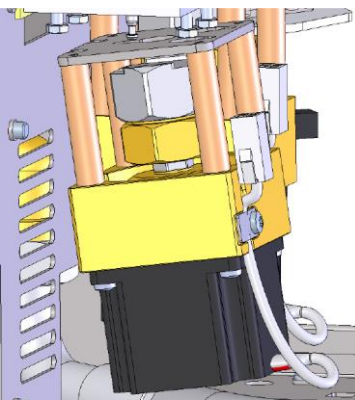


Fig. 13: Mount the cover of the switching module



5. Proceed as follows in order to replace the guide bush:
  - Remove the fixing screw (label 5) holding the guide bush at the bottom of the switching (20) resp. buffer module (21).
  - Remove the guide bush (label 6).



**NOTICE!**

*Do not remove the mounting rod to assemble the guide bush.*

- Assemble the new guide bush. The mounting rod is being pressed out by the piston.
- Remove the mounting rod, it is no longer needed.
- Fix the guide bush with the fixing screw.

6. Carefully assemble the piston rod

7. Proceed as follows to mount the cover of the switching module (20):



**WARNING!**

**Damages if leaking!**

The re-use of used seals can cause leaking.

Therefore:

- seals are to be compulsory replaced after each disassembly of the cover.



**WARNING!**

**Damages if leaking!**

Leaking if torque is wrong.

Therefore:

- Tighten cover of the switching module with 37 Nm.

- Remove the old seals, clean the sealing surface and place the new seals (label 1).
- Attach the cover and tighten the 8 screws with a torque of 37 Nm.
- Mount main line of the temperature sensor (BT 1) at the cover.
- Connect the flexible tube of the tool circuit exit (OUT M).

8. Proceed as follows to mount the multiphase motor (M 5,6):



**NOTICE!**

*Observe following when mounting the multiphase motor:*

- Loosen the 4 fixing screws enough (approx. 8-10 mm) to enable an easier installation.
- Alignment of the groove of the coupling, to allow the piston rod to retract (label 7 → Fig. 15)

- Engage the multiphase motor, turn into final position and fix with the 4 screws.



Fig. 14: Mount the multiphase motor M 5,6

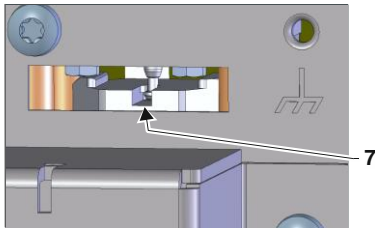


Fig. 15: Visual control of the groove alignment

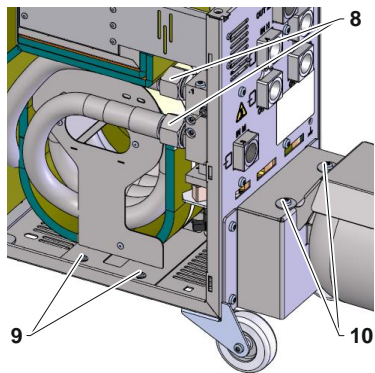


Fig. 16: Assemble the switching unit buffer (19)



**WARNING!**  
Improper installation can cause material damage!

Wrongly mounted multiphase motors can lead to dysfunction and/or material damage.

Therefore:

- Observe correct mounting, visual control to check the engagement of the piston rod in the coupling → Fig. 15

- Connect the cable connector of the multiphase motor (M 5.6).
- Engage the switching buffer unit (19) on the side.
- Mount the switching buffer unit (19) with 2x pipe couplings (label 8) as well as 2x screws (label 9) on the base plate.
- Mount the protection cover of the accumulator with two screws (label 10).

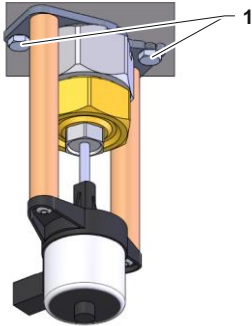


Fig. 17: Disassemble the multiphase motor M 7

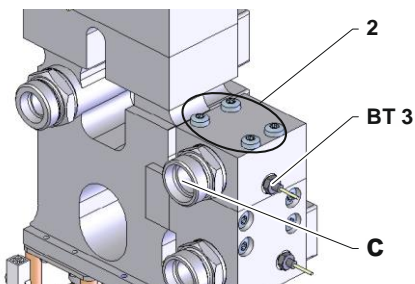


Fig. 18: Remove the cover of the buffer module

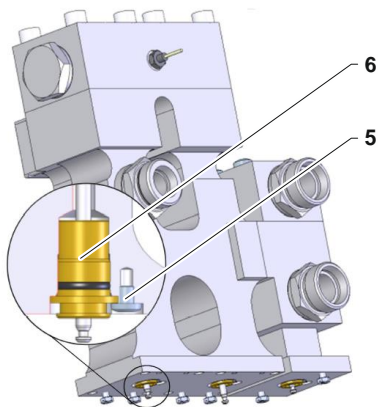


Fig. 19: Replacing the guide bush

## For buffer module (21)

9. Proceed as follows to disassemble the multiphase motor (M 7):
- Withdraw the cable connector of the multiphase motor (M 7).
  - Loosen 2x fixing screws (label 1) of the multiphase motor (M 7).
  - Turn the multiphase motor (M 7), slightly pull out downwards and move out of connection.

10. Proceed as follows to disassemble the cover:
- Disassemble flexible tube of the buffer entry (c).
  - Disassemble the temperature sensor of the buffer (BT 3).
  - Disassemble the 1 screw on the rear panel of the unit.
  - Disassemble 4x screws (label 2) and remove cover.

11. Carefully move out the piston rod upwards.

12. Proceed as follows in order to replace the guide bush:
- Remove the fixing screw (label 5) holding the guide bush at the bottom of the switching (20) resp. buffer module (21).
  - Remove the guide bush (label 6).



### NOTICE!

*Do not remove the mounting rod to assemble the guide bush.*

- Assemble the new guide bush. The mounting rod is being pressed out by the piston.
- Remove the mounting rod, it is no longer needed.
- Fix the guide bush with the fixing screw.

13. Carefully assemble the piston rod

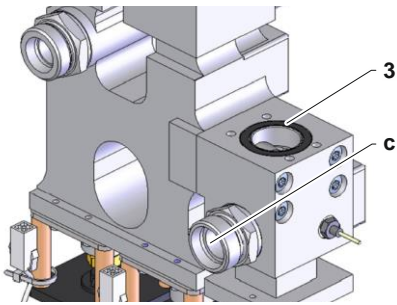


Fig. 20: Mount the cover of the buffer module

14. Proceed as follows to mount the cover of the buffer module (21):



**WARNING!**  
**Damages if leaking!**

The re-use of used seals can cause leaking.  
Therefore:

- seals are to be compulsory replaced after each disassembly of the cover.



**WARNING!**  
**Damages if leaking!**

Leaking if torque is wrong.  
Therefore:

- Tighten cover of the buffer module with 10 Nm.

- Remove the old seal, clean the sealing surface and place the new seal (label 3).
  - Fit the cover and tighten with the 4 screws.
  - Mount the 1 screw on the rear panel of the unit.
  - Mount the temperature sensor of the buffer (BT 3) at the cover.
  - Connect the flexible tube of the buffer exit (c).
15. Proceed as follows to mount the multiphase motor (M 7):
- Engage the multiphase motor, turn into final position and fix with the two screws.
  - Connect cable plug of the multiphase motor.
16. Carry out inspection (→ page 16).

## Sealing set (O/ID T27101, T27102)

1. Carry out preparation (→ page 3).

### For switching module (20)

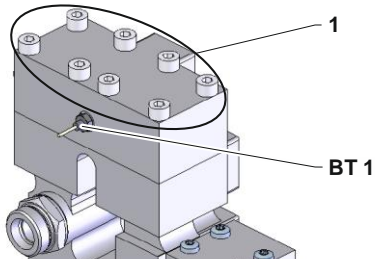


Fig. 21: Remove the cover of the switching module

2. Proceed as follows to disassemble the cover:

- Disassemble the flexible tube of the tool circuit exit (OUT M).
- Disassemble the main line temperature sensor (BT 1).
- Disassemble 8x screws (label 1) and remove cover.

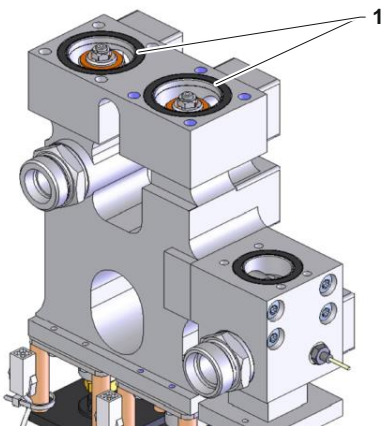


Fig. 22: Mount the cover of the switching module

3. Proceed as follows to mount the cover of the switching module (20):



### **WARNING!** **Damages if leaking!**

The re-use of used seals can cause leaking.

Therefore:

- seals are to be compulsory replaced after each disassembly of the cover.



### **WARNING!** **Damages if leaking!**

Leaking if torque is wrong.

Therefore:

- Tighten cover of the switching module with 37 Nm.

- Remove the old seals, clean the sealing surface and place the new seals (label 1).
- Attach the cover and tighten the 8 screws with a torque of 37 Nm.
- Mount main line of the temperature sensor (BT 1) at the cover.
- Connect the flexible tube of the tool circuit exit (OUT M).

### For buffer module (21)

4. Proceed as follows to disassemble the cover:

- Disassemble flexible tube of the buffer entry (c).
- Disassemble the temperature sensor of the buffer (BT 3).
- Disassemble the 1 screw on the rear panel of the unit.
- Disassemble 4x screws (label 2) and remove cover.

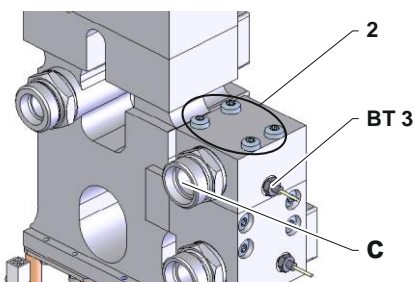


Fig. 23: Remove the cover of the buffer

module

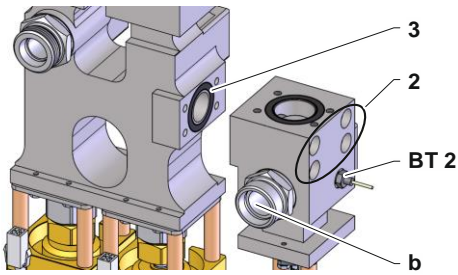


Fig. 24: Seal between switching and buffer module

5. Proceed as follows to replace the seal of the switching (20) and buffer module (21):
  - Disassemble flexible tube of the buffer entry (b).
  - Disassemble the return line of the temperature sensor (BT 2).
  - Disassemble 1 screw on the rear panel of the unit and the 4 screws (label 2).
  - Remove the old seal, clean the sealing surface and place the new seal (label 3).



**WARNING!**  
**Damages if leaking!**

Leaking if torque is wrong.

Therefore:

- Tighten buffer module (21) with 10 Nm.

- Attach buffer module and tighten the 4 screws (label 2) with a torque of 10 Nm.
- Mount the 1 screw on the rear panel of the unit.
- Mount the return line temperature sensor (BT 2) at the buffer module.
- Connect flexible tube of the buffer entry (b).

6. Proceed as follows to mount the cover of the buffer module (21):



**WARNING!**  
**Damages if leaking!**

The re-use of used seals can cause leaking.

Therefore:

- seals are to be compulsory replaced after each disassembly of the cover.

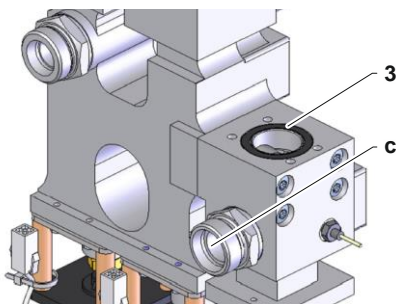


Fig. 25: Mount the cover of the buffer module



**WARNING!**  
**Damages if leaking!**

Leaking if torque is wrong.

Therefore:

- Tighten cover of the buffer module with 10 Nm.

- Remove the old seal, clean the sealing surface and place the new seal (label 3).
- Fit the cover and tighten with the 4 screws.
- Mount the 1 screw on the rear panel of the unit.
- Mount the temperature sensor of the buffer (BT 3) at the cover.
- Connect the flexible tube of the buffer exit (c).

7. Carry out inspection (→ page 16).

## Complete linear stepper motor (O/ID T27595, T28433)

1. Carry out preparation (→ page 3).

**on the multiphase motor, the switching module (M 5,6)**

2. Proceed as follows to disassemble the multiphase motor (M 5,6):

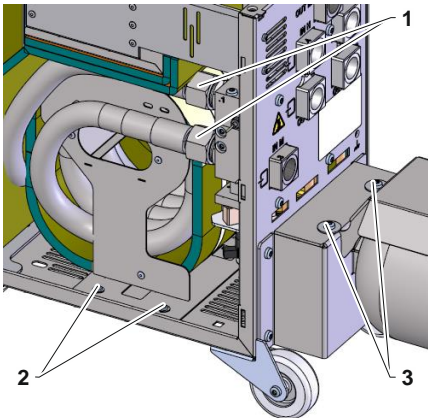


Fig. 26: Remove switching unit buffer (19)

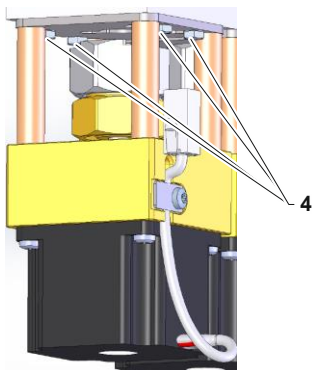


Fig. 27: Remove the multiphase motor M 5,6

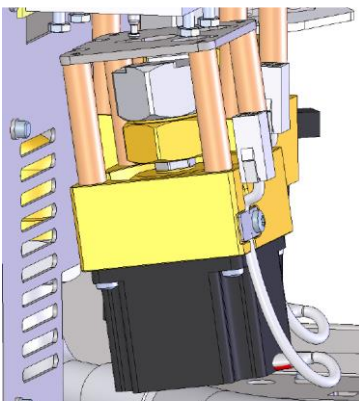


Fig. 28: Mount the multiphase motor M 5,6



### CAUTION! Risk of burns!

During operation, the multiphase motor (M 5,6) becomes hot. Danger of burns, if touched.

Therefore:

- Wear thermal gloves when touching or let the multiphase motor cool down.

- In order to remove the switching buffer unit (19), disassemble 2x pipe couplings (label 1) and remove 2x screws (label 2).
- Remove the switching buffer unit (19) on the side.
- To disassemble the protection cover of the accumulator (16), remove 2x screws (label 3).



### NOTICE!

Observe following when disassembling the multiphase motor:

- Positioning of the multiphase motors  
→ Preparation page 3.
- Alignment of the groove of the coupling, to allow the piston rod to extend → Fig. 29.

- Withdraw the cable connector of the multiphase motor (M 5,6).
- Loosen the 4 fixing screws (label 4) (approx. 8-10 mm).
- Slightly pull out downwards the multiphase motor (M 5,6) and move out of coupling.

3. Proceed as follows to mount the multiphase motor (M 5,6):



### NOTICE!

Observe following when mounting the multiphase motor:

- Loosen the 4 fixing screws enough (approx. 8-10 mm) to enable an easier installation.
- Alignment of the groove of the coupling, to allow the piston rod to retract (label 7 → Fig. 29.).

- Engage the multiphase motor, turn into final position and fix with the 4 screws.

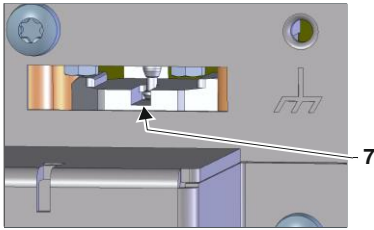


Fig. 29: Visual control of the groove alignment

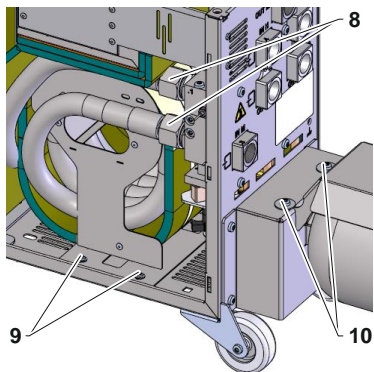


Fig. 30: Assemble the switching unit buffer (19)

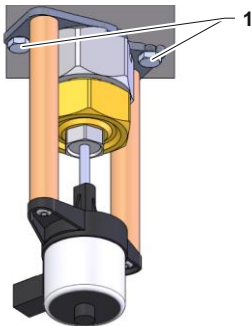


Fig. 31: Disassemble the multiphase motor M 7



### WARNING!

**Improper installation can cause material damage!**

Wrongly mounted multiphase motors can lead to dysfunction and/or material damage.

Therefore:



- Observe correct mounting, visual control to check the engagement of the piston rod in the coupling → Fig. 29.

- Connect the cable connector of the multiphase motor (M 5.6).
- Engage the switching buffer unit (19) on the side.
- Mount the switching buffer unit (19) with 2x pipe couplings (label 8) as well as 2x screws (label 9) on the base plate.
- Mount the protection cover of the accumulator with two screws (label 10).

### on the multiphase motor, the buffer module (M 7)

4. Proceed as follows to disassemble the multiphase motor (M 7):
  - Withdraw the cable connector of the multiphase motor (M 7).
  - Loosen 2x fixing screws (label 1) of the multiphase motor (M 7).
  - Turn the multiphase motor (M 7), slightly pull out downwards and move out of connection.
5. Proceed as follows to mount the multiphase motor (M 7):
  - Engage the multiphase motor, turn into final position and fix with the two screws.
  - Connect cable plug of the multiphase motor.
6. Carry out inspection (→ page 16).

## Inspection

1. Proceed as follows for inspection:
2. Plug all main plugs and switch on the main switch.
3. Switch the system on with the  key and check tightness and functioning.
4. Switch the system off with the  key.
5. Switch off all main switches.
6. Fit the covers correctly on the switching unit.

## Parts list

Pos	Description	O/ID	O/ID						
			T27098	T27099	T28434	T27101	T27102	T27595	T28433
			Pcs	Pcs	Pcs	Pcs	Pcs	Pcs	Pcs
01	Bush 18x4x33 (mounted)	T25912	1	1	1	-	-	-	-
02	Ring 11x4x2,4 (mounted)	T27139	1	1	1	-	-	-	-
03	Scraper ARLON (mounted)	T27138	1	1	1	-	-	-	-
04	Circlip DIN 427 (mounted)	N10411	1	1	1	-	-	-	-
05	Grease Barrierta L55/2 (mounted)	H1056	1	1	1	-	-	-	-
06	Cylinder pin DIN 6325-4h6x30 (mounted)	B1306553	1	1	1	-	-	-	-
07	O-Ring 10x2-FFKM75 (mounted)	T25432	1	1	1	-	-	-	-
08	Seal 4x10x4-FFKM (mounted)	T25590	1	1	1	-	-	-	-
09	Screw M4x6-TORX (mounted)	B3061615	1	1	1	-	-	-	-
10	Piston complete 25	T26658	-	1	-	-	-	-	-
11	Piston complete 22	T28042	-	-	1	-	-	-	-
12	Seal Sigraflex 39x47x1	T25808	-	2	-	2	-	-	-
13	Seal Sigraflex 29x37x1	T26758	-	-	1	-	1	-	-
14	Seal Sigraflex 24x32x1	T25838	-	-	-	-	1	-	-
15	Linear step motor type 57 with bracket	T27430	-	-	-	-	-	1	-
16	Linear step motor with bracket	T28036	-	-	-	-	-	-	1
17	Hexagon screw M4x8-A2	B3061322	-	-	-	-	-	-	2
18	Hexagon screw M4x12-A2	B1237837	-	-	-	-	-	4	-
19	Assembly instructions German	M8146-DE	1	1	1	1	1	1	1
20	Assembly instructions English	M8146-EN	1	1	1	1	1	1	1
21	Assembly instructions French	M8146-FR	1	1	1	1	1	1	1