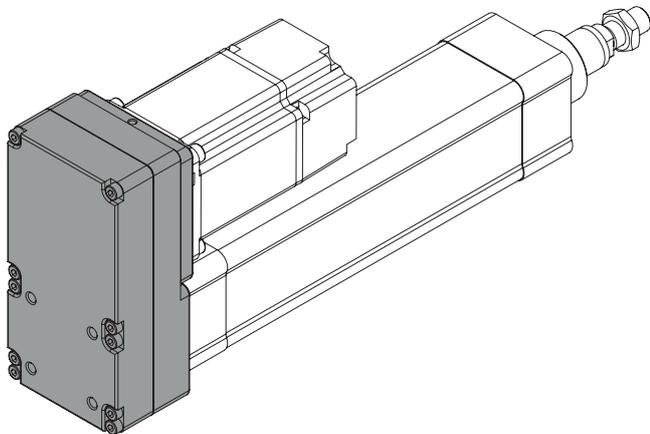


UNIMOTION

ASSEMBLY INSTRUCTIONS FOR MSD S and IP65CR version



MOUNTING

i The maximum speed and the maximum torque of the motor must not exceed the limits of the electric cylinder - PNCE and Motor side drive - MSD.
For the values of the speed and torque, please see our catalogue UNIMOTION Electric cylinder PNCE.

! The belt pretensioning frequency must not be exceeded!

! It should be noted that the excessive pretensioning of the belt may result in breaking of the PNCE drive journal or the motor shaft!

Recommended tightening torques for screws

	8.8	M2	M2,5	M3	M4	M5	M6	M8	M10	M12
M_{max} [Nm]		0,4	0,7	1,3	2,8	5,6	9,6	23	45	74

Table 1: Recommended tightening torques for screws of strength class 8.8.

Recommended tightening torques for screws of the self locking device

For the case of the self locking device with screws

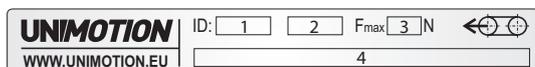
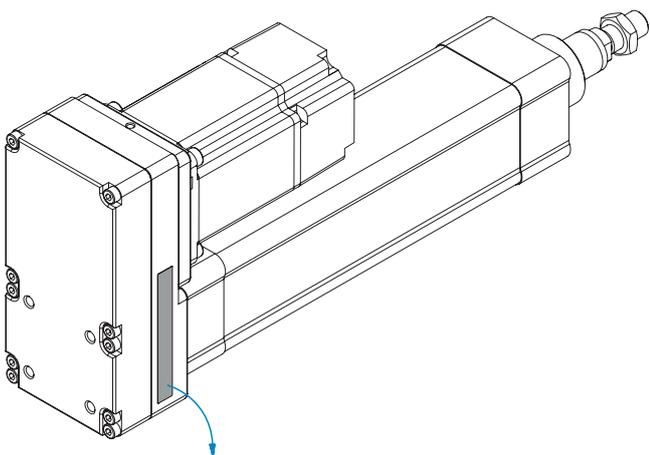
Screw size	M2,5	M3	M4	M5	M6	M8
M_{max} [Nm]	1,2	2,1	4,9	9,7	17	41

For the case of the self locking device with locking nut

Shaft diameter [mm]	4	5	6	6,35	7	8
M_{max} [Nm]	4	5	8	8	9	15

Table 2: Recommended tightening torques for screws (or locking nut) of the self locking device.

IDENTIFICATION LABEL OF THE MOTOR SIDE DRIVE



- 1 - ID number
- 2 - Manufacturing date of the motor side drive
- 3 - Maximum radial load on the shaft - pretensioning load F_{max}^*
- 4 - Type of the motor side drive (ordering code without motor dimensions)

* This is the load which is generated by the correct pretension of the belt - **using the belt pretensioning frequency**. This load, which is linearly dependent on the maximum drive torque $M_{p,MSD}$ needs to be reduced in accordance with the capabilities of the motor.

i In the case of ordering additional or replacement parts for the motor side drive all data must be given from the identification label.

i The label must be fully visible and must ensure compliance with all the instructions contained on it. Damaged or illegible labels must be replaced.

PARTS LIST

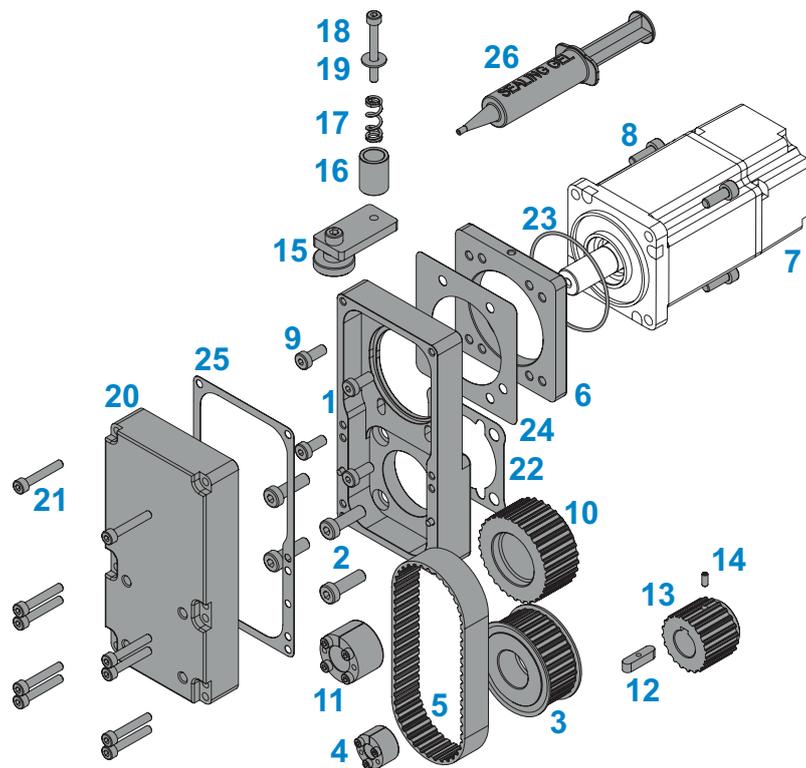


Figure 1: Parts list.

- 1 - Motor side drive housing
 - 2 - Screw of the housing
 - 3 - PNCE belt pulley
 - 4 - Self locking device
 - 5 - Toothed belt
 - 6 - Tensioning plate
 - 7 - Motor
 - 8 - The motor screw
 - 9 - The tensioning plate screw
 - 10 - Motor belt pulley
 - 11 - Self locking device
 - 12 - Keyway
 - 13 - Motor belt pulley
 - 14 - The keyway set screw
 - 15 - Clamping plate
 - 16 - Pretensioning limiter
 - 17 - Spring
 - 18 - Pretensioning screw
 - 19 - Plain washer
 - 20 - MSD cap
 - 21 - The MSD cap screw
 - 22 - The PNCE seal
 - 23 - The motor O ring seal
 - 24 - The tensioning plate seal
 - 25 - The MSD cap seal
 - 26 - Sealing gel
- | |
|---|
| with clamping set |
| with keyway |
| belt pretensioning unit
(useful only for the generation of pretensioning load) |
| seals for the IP65CR protection |

STEP 1 and 2

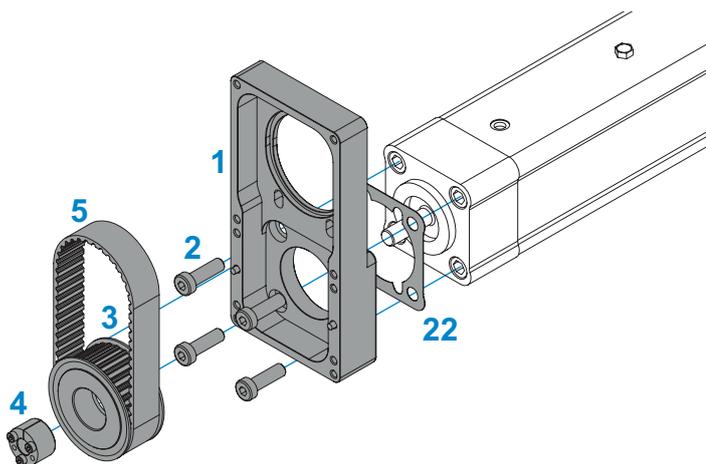


Figure 2: Step 1 and 2.

STEP 1: In the case of the IP65CR protection the seal of the PNCE **22** must be fitted on the drive cap of the PNCE.

The housing of the motor side drive **1** must be mounted and screwed (using **2**) on the drive cap of the electric cylinder - PNCE. The housing can be mounted in any way - UP, DOWN, RIGHT or LEFT.

STEP 2: After the housing **1** has been mounted on the electric cylinder, the PNCE belt pulley **3** with the self locking device **4** and the toothed belt **5** must be fitted on the drive journal of the PNCE. Adjust the clearance (pulley mounting distance L) as it is shown in Figure 3 and Table 3. The self locking device **4** must be completely inserted into the bore of the PNCE belt pulley **3**. Tension the self locking device **4**.

Clearance (pulley mounting distance L) and belt pretensioning frequency

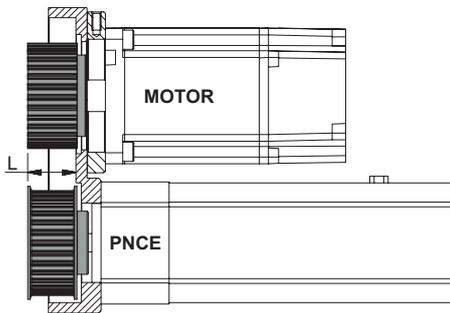


Figure 3: Clearance (pulley mounting distance L).

PNCE	32				40				50				63	
Type	T0		T1		T1		T2		T1		T2		T1	
Gear ratio	1	1,5	1	1,5	1	1,5	1	1,5	1	1,5	1	2	1	2
Distance L [mm] (± 0,2 mm)	13,0	13,0	14,5	14,5	21,0	21,0	21,0	21,0	31,5	31,5	31,0	31,0	38,0	38,0
Belt pretensioning frequency [Hz] (± 5 Hz)	320	320	215	225	235	250	185	190	215	225	155	155	215	190

PNCE	80				100	
Type	T1		T2		T1	
Gear ratio	1	2	1	2	1	2
Distance L [mm] (± 0,2 mm)	38,0	38,0	59,0	59,0	59,0	59,0
Belt pretensioning frequency [Hz] (± 5 Hz)	215	190	95	105	135	150

Table 3: Clearance (pulley mounting distance L) and belt pretensioning frequency

i Distance L is equal for both PNCE and the motor belt pulley.

i For the tightening torques for the screws please refer to Table 1 and 2.

STEP 3, 4 and 5

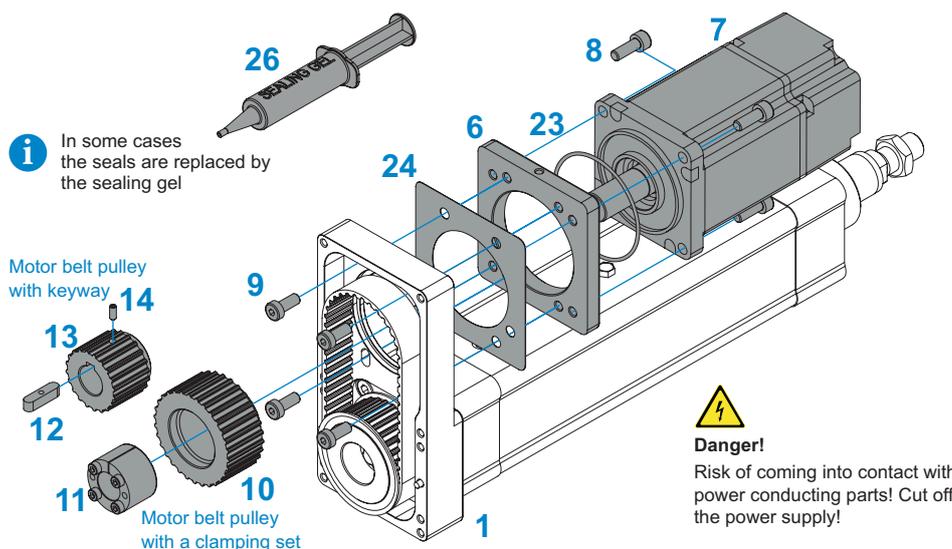


Figure 4: Step 3, 4 and 5.

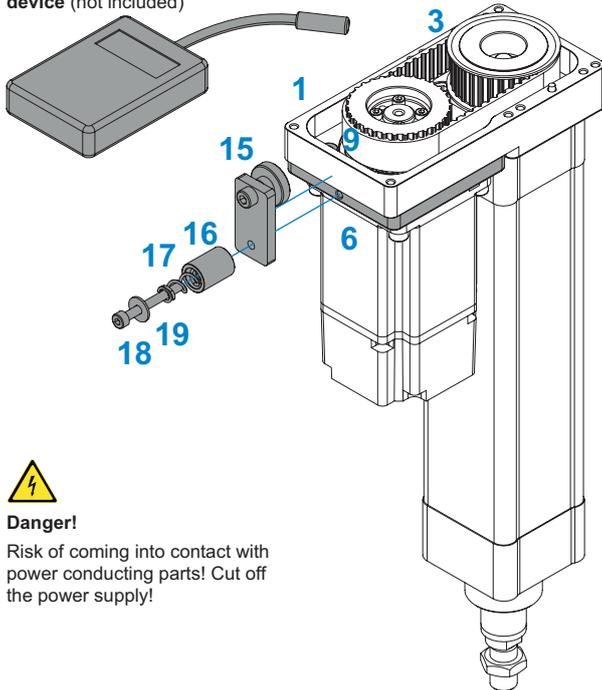
STEP 3: In the case of IP65CR protection, the O ring seal of the motor **23** must be fitted on motor **7**. In some cases the O ring seal **23** is replaced by the sealing gel **26**. To use the sealing gel properly, please refer to the section **SEALING GEL** - Sealing the connection between motor and tensioning plate. Mount the motor **7** onto the tensioning plate **6** and tighten the screws of the motor **8**.

STEP 4: Mount the tensioning plate together with the motor (and with the seal of the tensioning plate **24** in the case of the IP65CR protection - for the case of MSD PNCE 80 T2 and 100 T1 the tensioning plate seal **24** is replaced by the sealing gel **26**. To use the sealing gel properly, please refer to the section **SEALING GEL** - Sealing the connection between tensioning plate and housing of the MSD) onto the housing of the motor side drive **1** and lightly tighten the screws of the tensioning plate **9**. Make sure that the movement of the tensioning plate **6** is unrestricted.

STEP 5: When the tensioning plate is mounted onto the housing, mount the motor belt pulley **10** with the self locking device **11** onto the motor journal in the case of the motor belt pulley with a clamping set or mount the motor belt pulley **13** with the keyway **12** onto the motor journal in the case of the motor belt pulley with a keyway. Adjust the clearance (pulley mounting distance L) as is shown in Table 3. Tension the self locking device **11** (for tightening torques please refer to Table 2) in the case of the motor belt pulley with the clamping set or tighten the set screw of the keyway **14** in the case of the motor belt pulley with a keyway.

STEP 6, 7 and 8

Frequency measuring device (not included)



Danger!

Risk of coming into contact with power conducting parts! Cut off the power supply!

Figure 5: Step 6, 7 and 8.

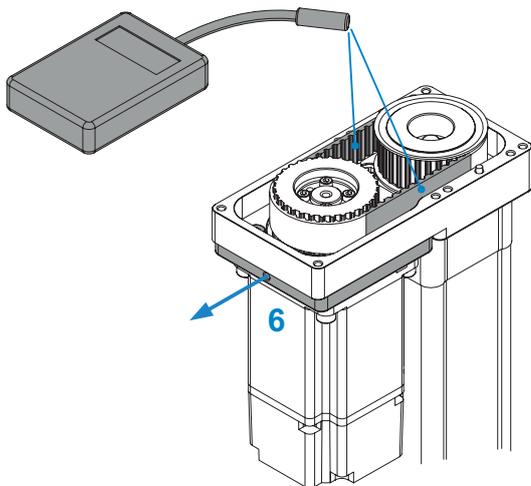


Figure 6: Belt pretensioning procedure.

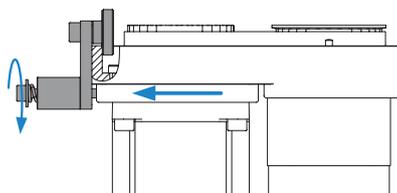


Figure 7: Mounting of the belt pretensioning unit.

STEP 6: Place the housing of the motor side drive (together with the PNCE and the motor) in a horizontal direction.

STEP 7: Belt pretensioning procedure



The belt pretensioning frequency must not be exceeded!



It should be noted that the excessive pretensioning of the belt may result in breaking of the PNCE drive journal or the motor shaft!

Pretension the belt with the belt pretensioning frequency. The belt pretensioning frequency must be adjusted using the suitable frequency measuring device and sufficiently applied pretensioning load on the tensioning plate **6** (see Table 3 and Figure 6).

To generate the pretensioning load on the tensioning plate **6**, the belt pretensioning unit can be used. In this case, mount the clamping plate **15** onto the edge of the housing of the motor side drive **1**. Screw the pretensioning screw **18** with a plain washer **19** and spring **17** through the pretensioning limiter **16** and the clamping plate **15** into the tensioning plate **6**. To generate the pretensioning load adjust the pretensioning screw **18** carefully, see Figure 7.

STEP 8: After the belt pretensioning procedure tighten the screws of the tensioning plate **9**. Check the belt frequency at 0°, 90°, 180° and 270° angles of rotation of the PNCE belt pulley **3** at both sides of the MSD housing (Figure 6). If the maximum measured belt frequency exceeds the specified one (see Table 3), the belt pretension must be adjusted (repeat STEP 7).



For the tightening torques for the screws please refer to Table 1.

STEP 9 and 10

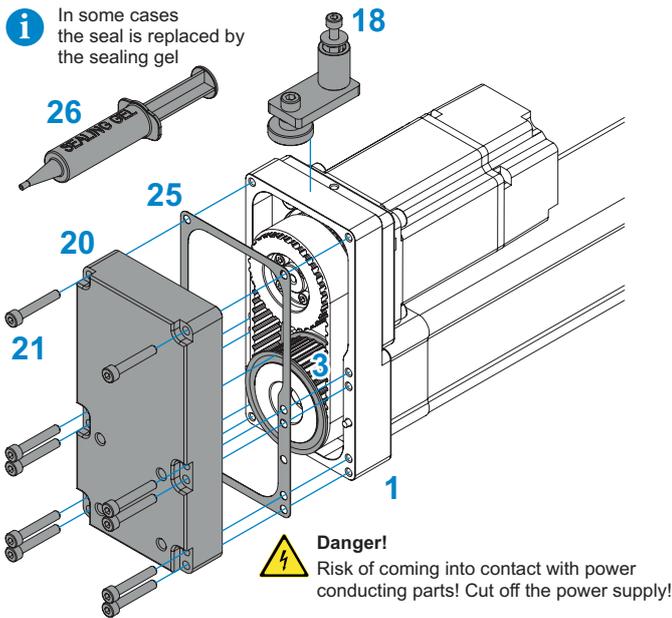


Figure 8: Step 9 and 10.

STEP 9: If the belt pretensioning unit was used, loosen the pretensioning screw **18** and remove the belt pretensioning unit. Slightly oil both flanges of the PNCE belt pulley **3** on the side where the belt is running on the pulley. Do not use the lubricant which contains any solid parts!

STEP 10: In the case of IP65CR protection, the seal of the MSD cap **25** must be fitted on the housing of the motor side drive **1** - for the case of MSD PNCE 80 T2 and 100 T1 the MSD cap seal **25** is replaced by the sealing gel **26**. To use the sealing gel properly, please refer to the section **SEALING GEL** - Sealing the connection between housing and MSD cap. Mount the MSD cap **20** on the housing of the motor side drive **1**. Tighten the screws of the MSD cap **21**.

i Before the initial start-up, check if everything is OK:

- electrical wiring
- mounted elements
- tightened screws
- correct tensioning of the belt.

STEP 11 - DISMOUNTING

i Take care when loosening the screws of the tensioning plate when the toothed belt is tensioned.

STEP 11: To dismantle the motor side drive - MSD, take precautions, such as turning off the power supply and prevent the piston rod from dropping, if it is in a vertical position. To dismantle the MSD properly, look at the mounting procedure.

SEALING GEL

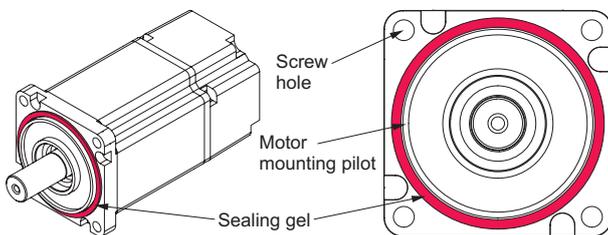


Figure 9: Sealing gel applied on the motor flange.

Sealing the connection between motor and tensioning plate:

- Apply the sealing gel **26** to the cleaned flange of the motor **7** as it is presented on the Figure 9 (the gel must be applied continuously in a closed loop around the motor mounting pilot on surface that comes into the direct contact with tensioning plate **6** (make sure that the screw hole are outside the sealing gel); it should be noted that surface shape may vary depending on the motor manufacturer, model and size).
- Apply the sealing gel **26** to the thread on the screws of the motor **8**.
- Clean the tensioning plate **6** and follow with STEP 3 in the section **STEP 3, 4 and 5**. Note: once the contact between the flange of the motor and the tensioning plate is ensured, the sealing gel is activated after 30 min.

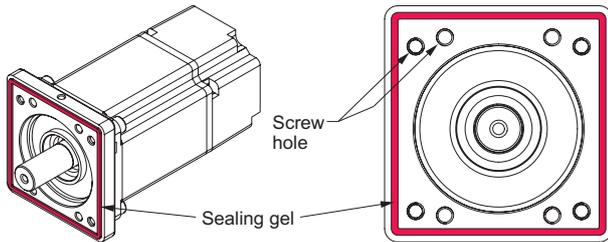


Figure 10: Sealing gel applied on the tensioning plate **6**.

Sealing the connection between tensioning plate and housing of the MSD:

- Apply the sealing gel **26** to the cleaned tensioning plate **6** as it is presented on the Figure 10 (the gel must be applied continuously in a closed loop so the screw holes are inside the applied gel; it should be noted that surface shape may vary depending on the motor side drive size and type).
- Apply the sealing gel **26** to the thread on the screws of the tensioning plate **9**.
- Clean the motor side drive housing **1** and follow with STEP 4 in the section **STEP 3, 4 and 5**.

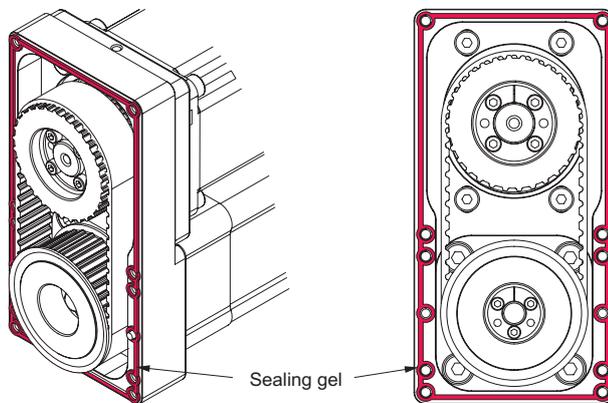


Figure 11: Sealing gel applied on the MSD housing **1**.

Sealing the connection between housing and MSD cap:

- Apply the sealing gel **26** to the cleaned housing of the motor side drive **1** as it is presented on the Figure 11 (the gel must be applied continuously in a closed loop on surface that comes into the direct contact with the MSD cap **20**. Sealing gel must be applied also around the holes of the MSD cap screws; it should be noted that surface shape may vary depending on the motor side drive size and type).
- Clean the MSD cap **20** and follow with STEP 10 in the section **STEP 9 and 10**. Note: once the contact between the housing and MSD cap is ensured, the sealing gel is activated after 30 min.