



# VARODRY VD65-200

## Minor Service Manual Belt Replacement

Operating Instructions 300757580\_002\_C3

### Part Numbers

111065V10 VARODRY VD 65, 50Hz  
111065V11 VARODRY VD 65, 60Hz  
111065V15 VARODRY VD 65, 50Hz, Purge  
111065V16 VARODRY VD 65, 60Hz, Purge  
111100V10 VARODRY VD 100, 50Hz  
111100V11 VARODRY VD 100, 60Hz  
111100V15 VARODRY VD 100, 50Hz, Purge  
111100V16 VARODRY VD 100, 60Hz, Purge  
111160V10 VARODRY VD 160, 50Hz  
111160V11 VARODRY VD 160, 60Hz  
111160V15 VARODRY VD 160, 50Hz, Purge  
111160V16 VARODRY VD 160, 60Hz, Purge  
111200V10 VARODRY VD 200, 50Hz  
111200V11 VARODRY VD 200, 60Hz  
111200V15 VARODRY VD 200, 50Hz, Purge  
111200V16 VARODRY VD 200, 60Hz, Purge



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Original operating instructions.

# Safety information

## Obligation to Provide Information

Before installing and commissioning the pump, carefully read these Operating Instructions and follow the information so as to ensure optimum and safe working right from the start.

The Leybold **VARODRY VD65-200** has been designed for safe and efficient operation when used properly and in accordance with these Operating Instructions. It is the responsibility of the user to carefully read and strictly observe all safety precautions described in this section and throughout the Operating Instructions. Moreover, observe the information in all additionally supplied Operating Instructions for switches or valves, for example. The pump must only be operated in the proper condition and under the conditions described in the Operating Instructions. It must be operated and maintained by trained personnel only. Consult local, state, and national agencies regarding specific requirements and regulations. Address any further safety, operation and/or maintenance questions to our nearest office.

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE is used to notify users of installation, operation, programming or maintenance information that is important, but not hazard related.

We reserve the right to alter the design or any data given in these Operating Instructions. The illustrations are not binding.

Retain the Operating Instructions for further use.

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## NOTICE



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## DANGER



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## WARNING



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## CAUTION



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## NOTICE



# Safety information

## 0 Important safety information

### 0.1 Heavy object. Risk of physical injury. Use suitable lifting equipment.

NOTICE

1 Mechanical hazards



DANGER

### 1.2 Electrical hazards

1 Do not operate the pump with any parts of the enclosures removed or damaged as there may be a risk of an electric shock.



CAUTION

### 1.3 Thermal hazards

1 Risk of burns. Do not touch the pump inlet or exhaust ports whilst the pump is running since the temperatures of these parts could be high enough to cause harm. Elevated temperatures could remain after the pump has stopped.



DANGER

### 1.4 Hazards caused by materials and substances

1 If within the system toxic substances or gases are being used, then the operator will be responsible for ensuring that the corresponding safety precautions are introduced!



2 If the pump has previously pumped hazardous gases take the appropriate safety measures before opening the intake or exhaust ports. Use gloves, a breathing mask or protective clothing to avoid skin contact with toxic or highly corrosive substances. Work under a fume hood.

3 Contaminated parts can be detrimental to health and environment. Before beginning with any work, first find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

# Belt replacement

## 1 Belt replacement

### 1.1 Tools needed to start work

Sr No.	Description	Quantity	Kit number
1	10mm spanner	1	-
2	5mm Allen key	1	-
3	8mm Allen key	1	-
4	17mm wrench	1	-
5	Torque wrench	1	-
6	Small screw driver	1	-
7	Special tool kit for belt replacement (Tool for belt tension adjustment x 1 Tool for belt tension measurement x 1 Equip. fail safe gear adjustment x 1	1	EK6530942

### 1.2 Maintenance kits

Sr No.	Description	Quantity	Kit Number
1	Toothed Belt DSTD-960-DS8M-15 CXP 50Hz	1	E6525604
2	Toothed Belt DSTD-960-DS8M-15 CXP 60Hz	1	E6525605
3	Kit Fail safe gear NR Polyamid	1	EK6530258
	Fail-safe gear NR Polyamid	1	-
	O-ring	2	-
	Bushing	2	-
	Screw,soc. HD CP-M6x20,DIN912	2	-

# Belt replacement

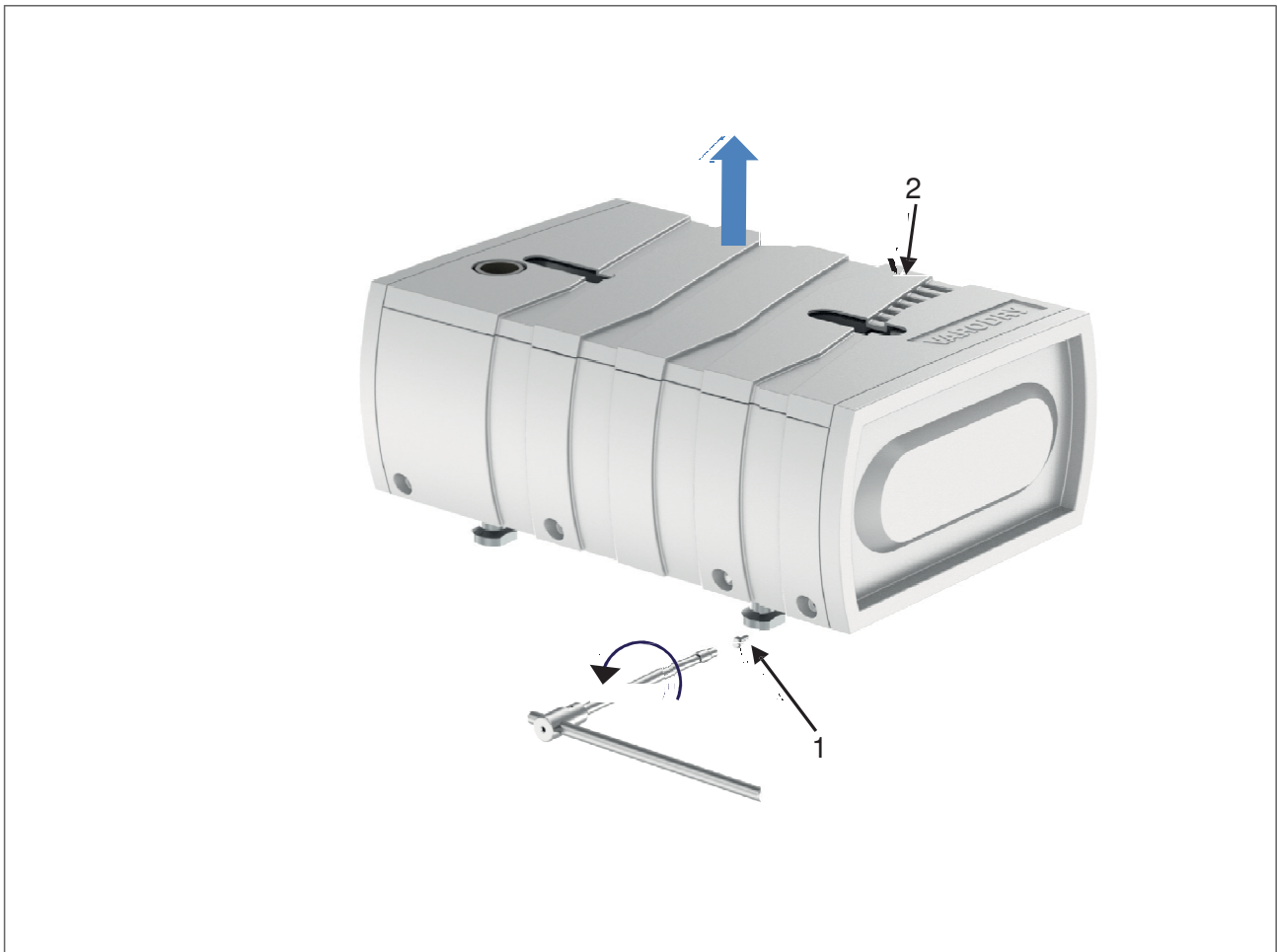


Figure 1 – Pump enclosure removal

## 1.3 Procedure

### 1.3.1 Disassemble pump enclosure

#### Items:

1. Hex screw M6X20 8.8
2. Pump enclosure

**DANGER**



#### Procedure:

1. Switch off the pump and isolate from the electrical supply (Certified electrician).
2. Using 10mm spanner to loosen the 8 screws (Figure 1, item 1) which secure pump enclosure and carefully lift the pump enclosure (Figure 1, item 2) by hand.

**CAUTION**



# Belt replacement

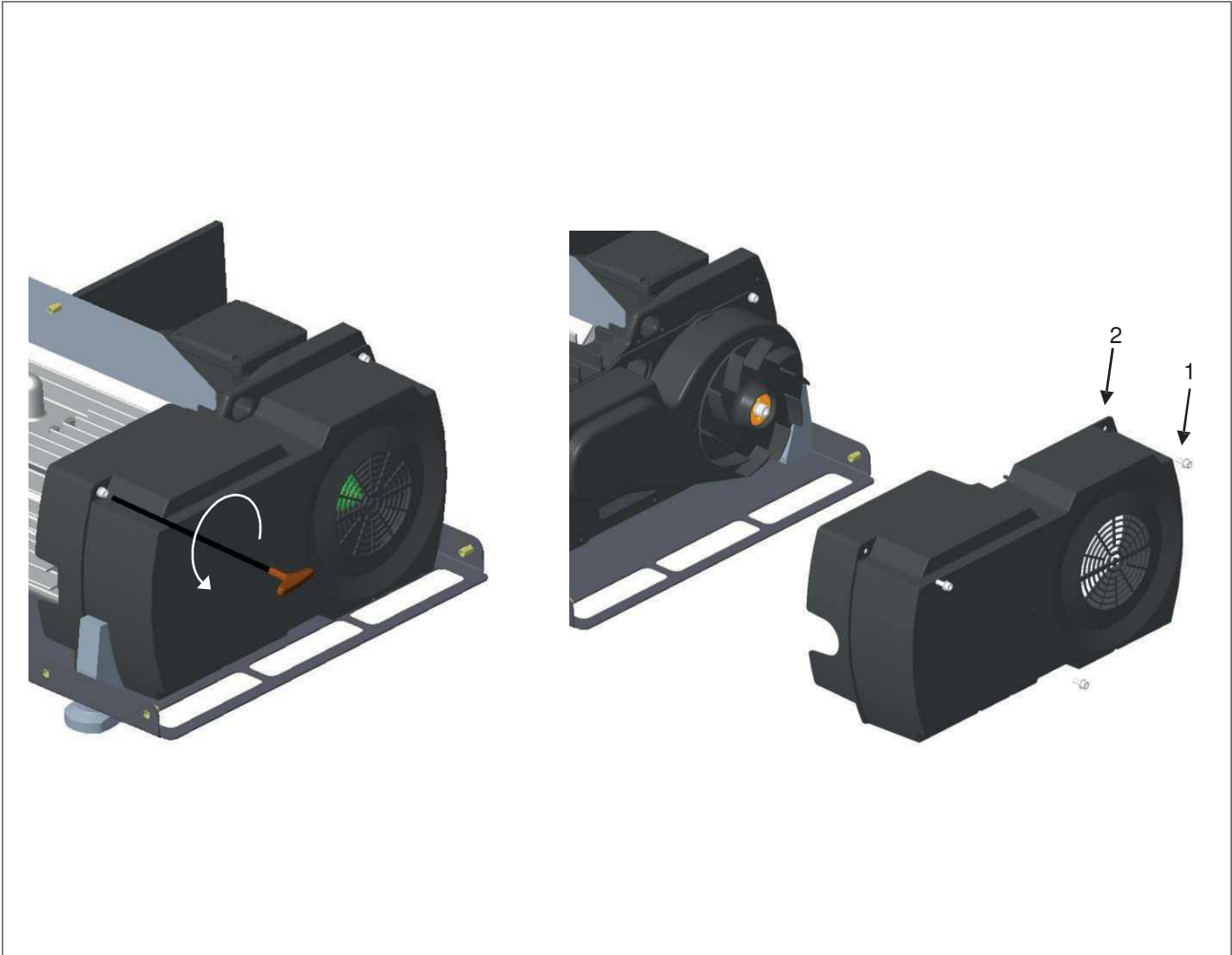


Figure 2 – Drive enclosure removal

## 1.3.2 Disassemble drive enclosure

### Items:

1. Cap screw M6X16 8.8
2. Drive enclosure

### Procedure:

1. Using 5mm Allen key, remove the 3 screws (Figure 2, item 1) which secure drive enclosure and carefully separate the drive enclosure (Figure 2, item 2) from pump.

**CAUTION**



# Belt replacement

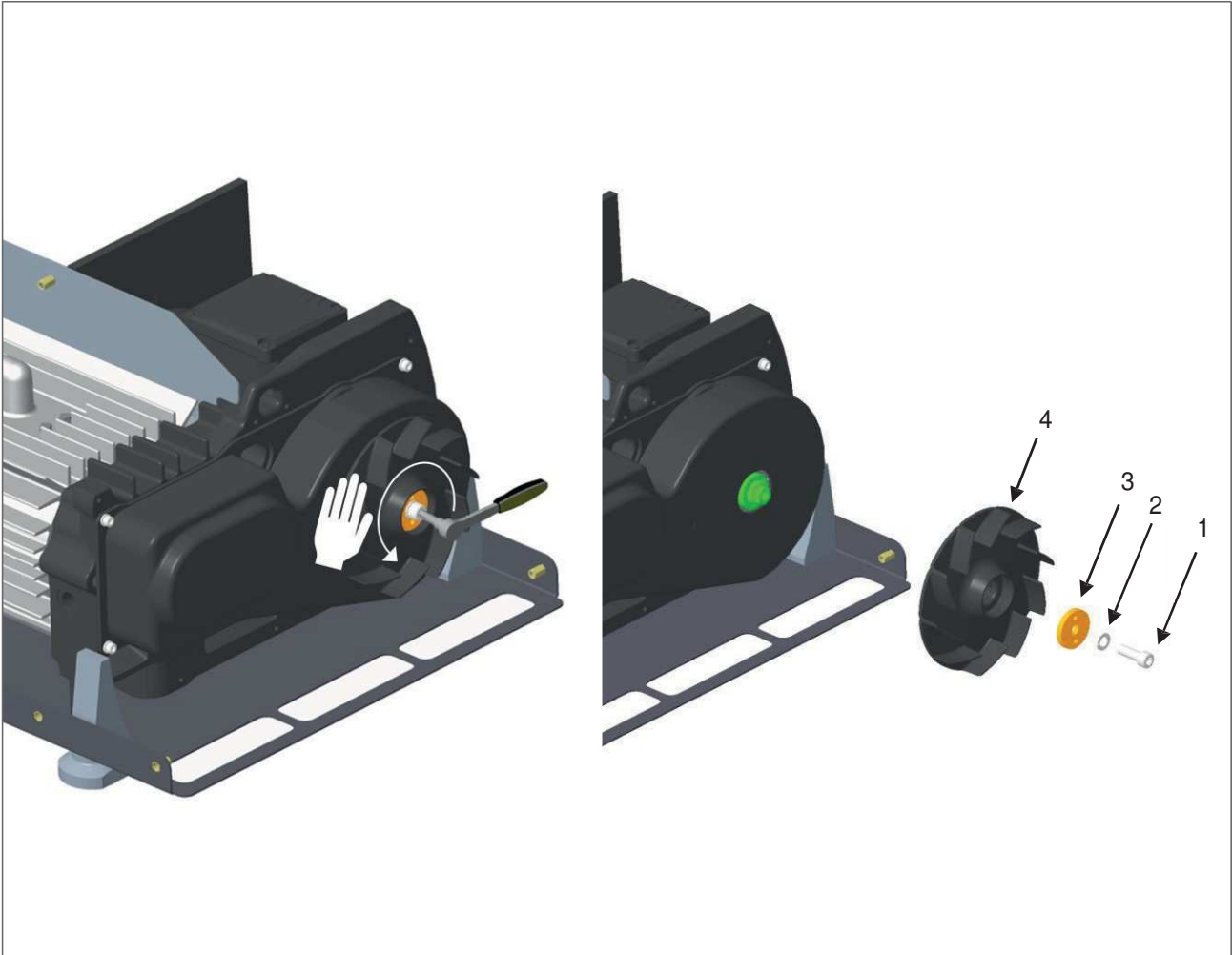


Figure 3 – Fan removal

## 1.3.3 Disassemble rotor disc, screw and fan

### Items:

1. Cap screw M10X30 8.8
2. Spring washer
3. Rotor washer
4. Fan

### Procedure:

1. Using an 8 mm Allen key, remove the screws, washer and rotor washer (Figure 3, Item 1, 2, 3) which secure the fan on belt chamber.
2. Separate fan (Figure 3, Item 4) from pump.

**CAUTION**



# Belt replacement

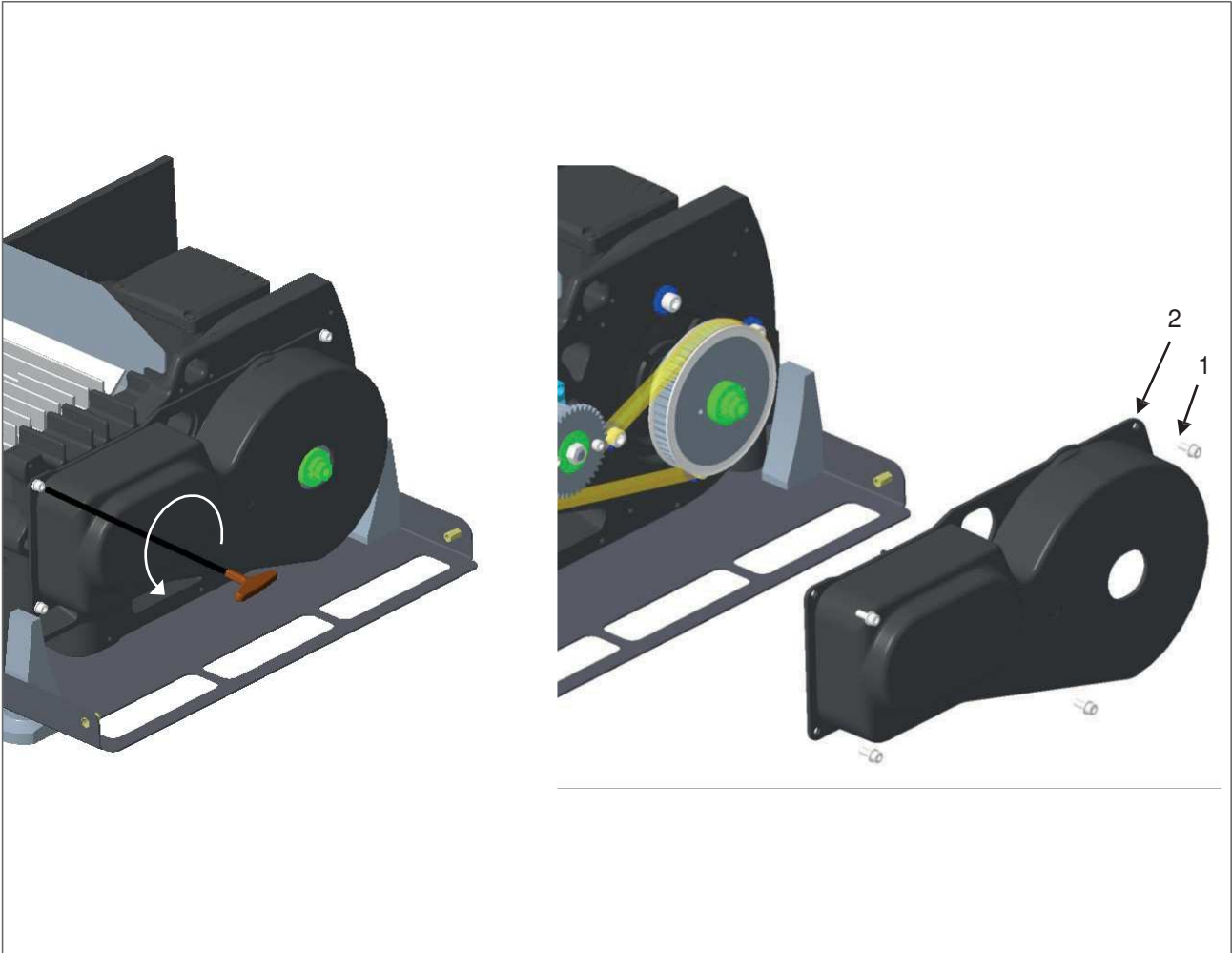


Figure 4 – Belt chamber cover removal

## 1.3.4 Disassemble belt chamber cover

### Items:

1. Cap screw M6X16 8.8
2. Belt chamber cover

### Procedure:

1. Using 5mm Allen key remove the 4 screws (Figure 4, item 1) which secure belt chamber cover (Figure 4, item 2).
2. Carefully separate belt chamber cover (Figure 4, item 2) from pump.

**CAUTION**



# Belt replacement

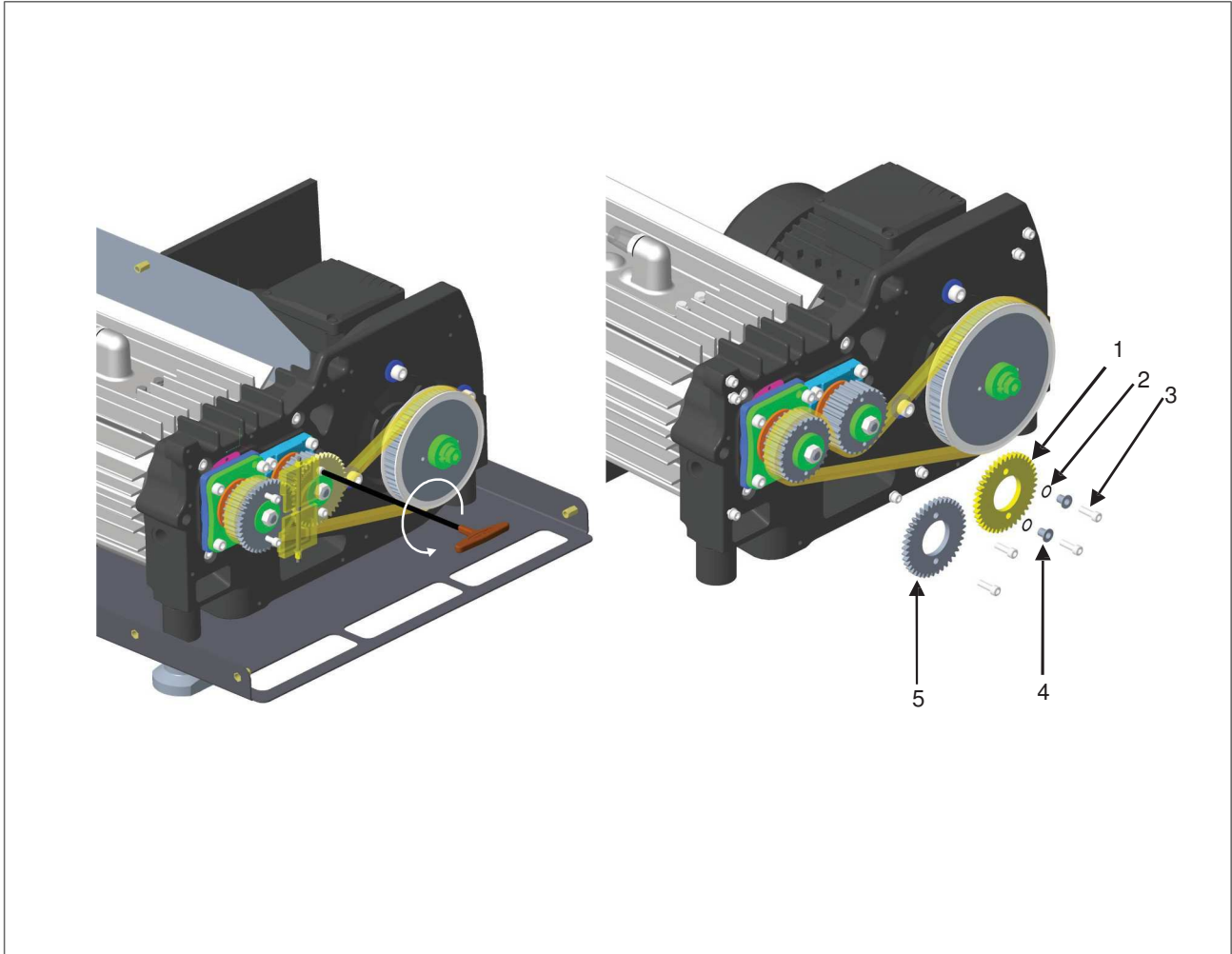


Figure 5 – Fail safe gear removal

## 1.3.5 Disassemble fail safe gear II

### Items:

1. Fail-safe gear NR Polyamid
2. O-ring
3. Cap screw M6X20 8.8
4. Bushing, fail-safe gear
5. Fail safe gear AR Metal

### Procedure:

1. Use a 17mm spanner to interlock the rotors and loosen 4x bolts (Figure 5, Item 3) by 1 rotation with 5mm Allen key and remove 4x bolts.
2. Remove the bushing (Figure 5, Item 4), o-ring (Figure 5, Item 2) and fail-safe gears (Figure 5, Item 1 & Item 5).

**CAUTION**



# Belt replacement

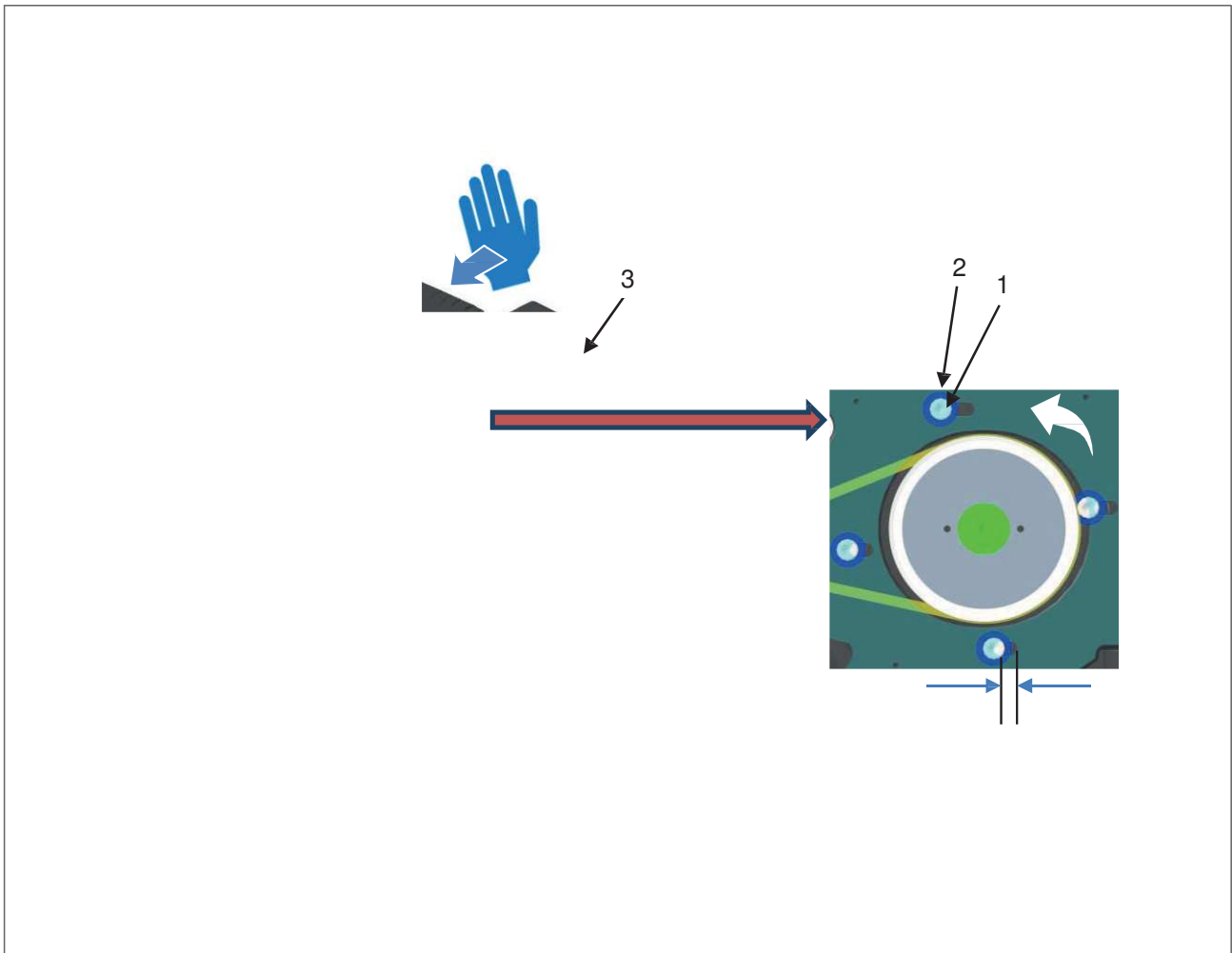


Figure 6 – Motor screw removal

## 1.3.6 Loosen the motor screws and push motor to loosen the belt

### Items:

1. Cap screw M10X30 8.8
2. Washer 10.5

### Procedure:

1. To enable belt removal, using an 8mm Allen key loosen the 4 screws (Figure 6 items 1 & 2) which secure the motor and pulley to the bearing flange (Figure 6 items 3).
2. Push motor towards pump body to loosen the belt.

**CAUTION**



# Belt replacement

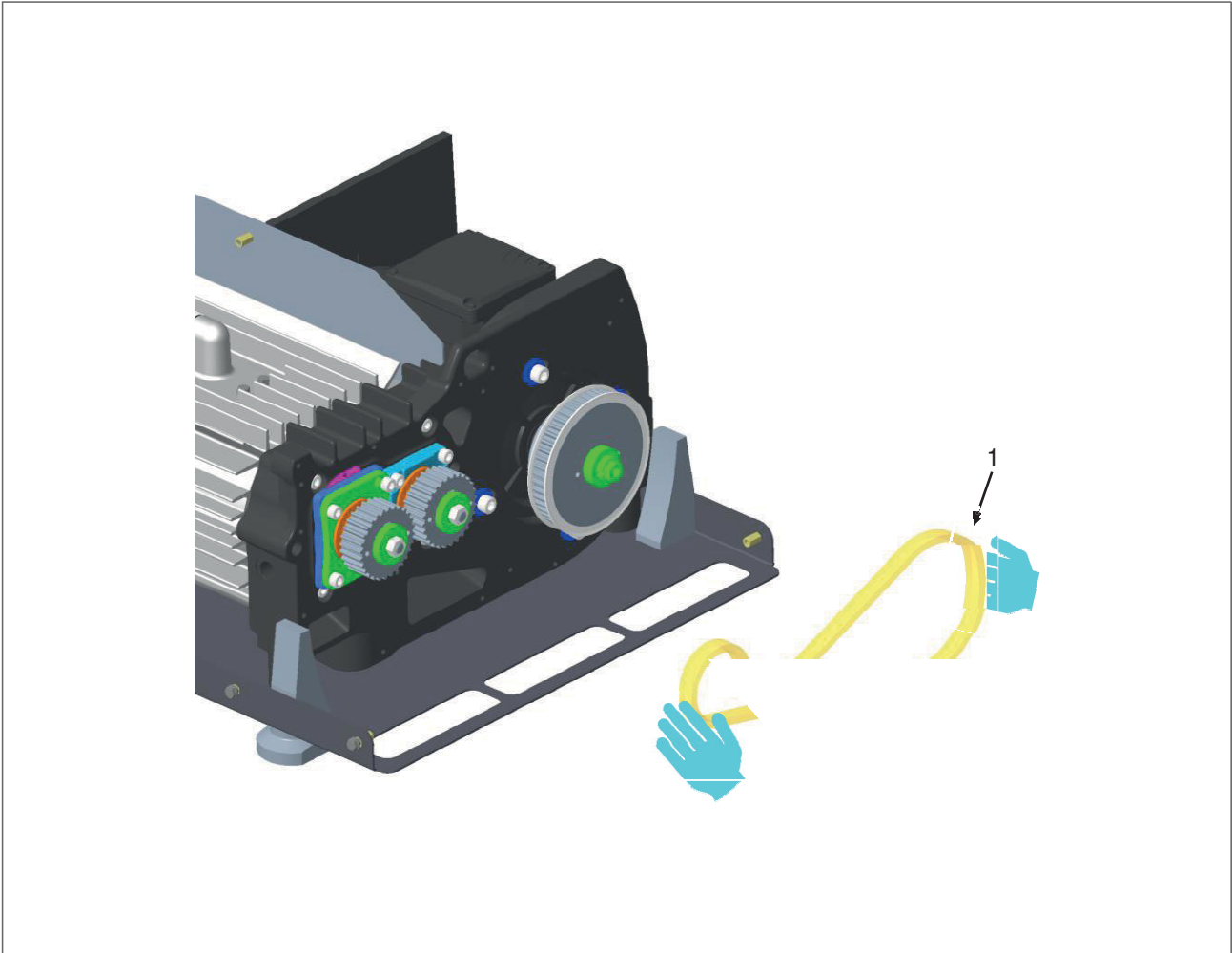


Figure 7 – Tooth belt removal

## 1.3.7 Disassemble tooth belt

### Items:

1. Tooth belt

### Procedure:

1. Take tooth belt out of gears and pulley.
2. Clean gears and pulley with recommended cleaning agent.
3. Old toothed belt to be disposed of once removed.

**CAUTION**



# Belt replacement

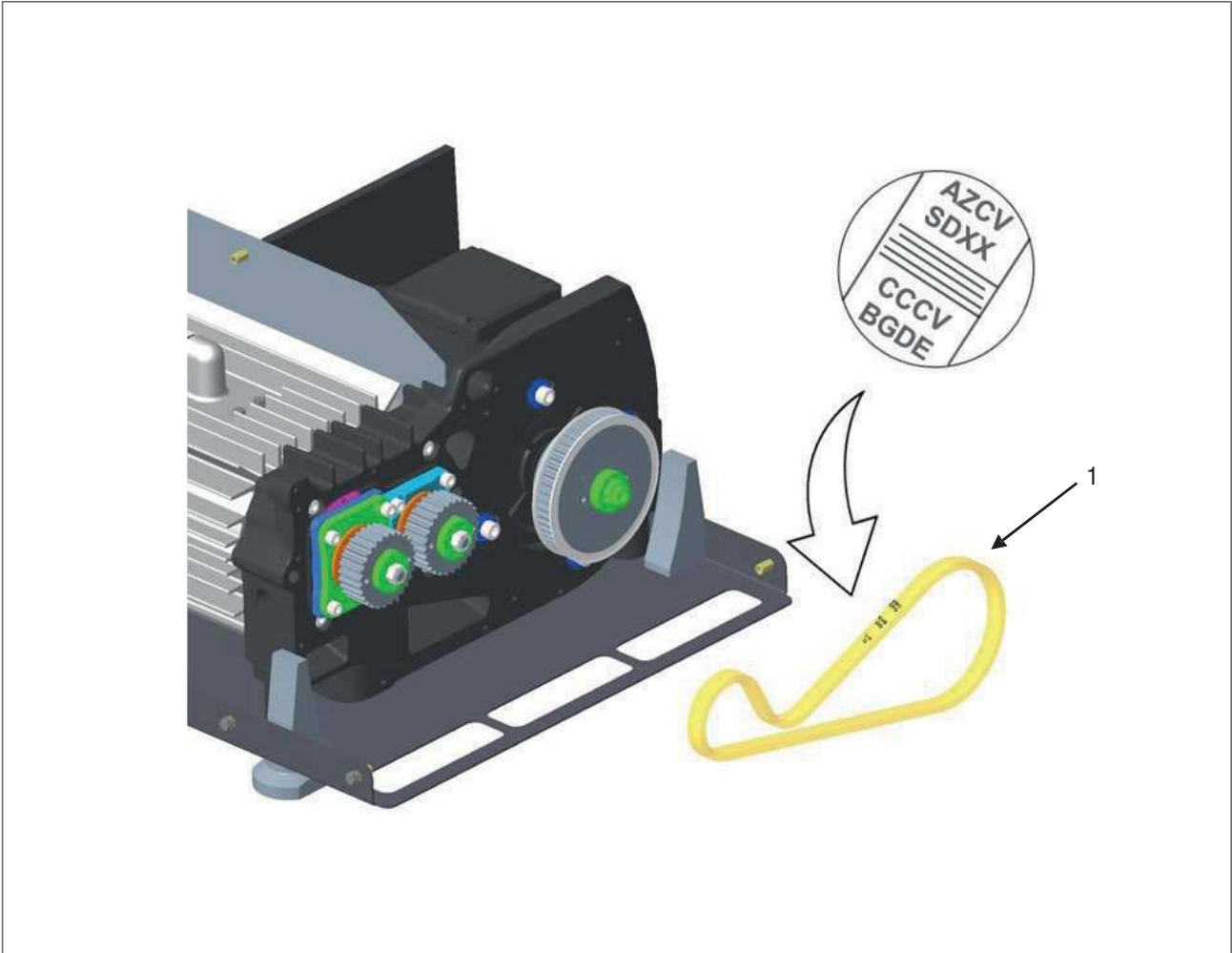


Figure 8 – Tooth belt assembly

## 1.3.8 Assemble tooth belt

### Items:

1. Tooth belt

### Procedure:

Taking a new tooth belt, fit it using following technique on both gears and pulley.

1. To install the new tooth belt on pulley, keep imprint readable in front.
2. Then move the pulleys 3 times in running direction.

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**CAUTION**



# Belt replacement

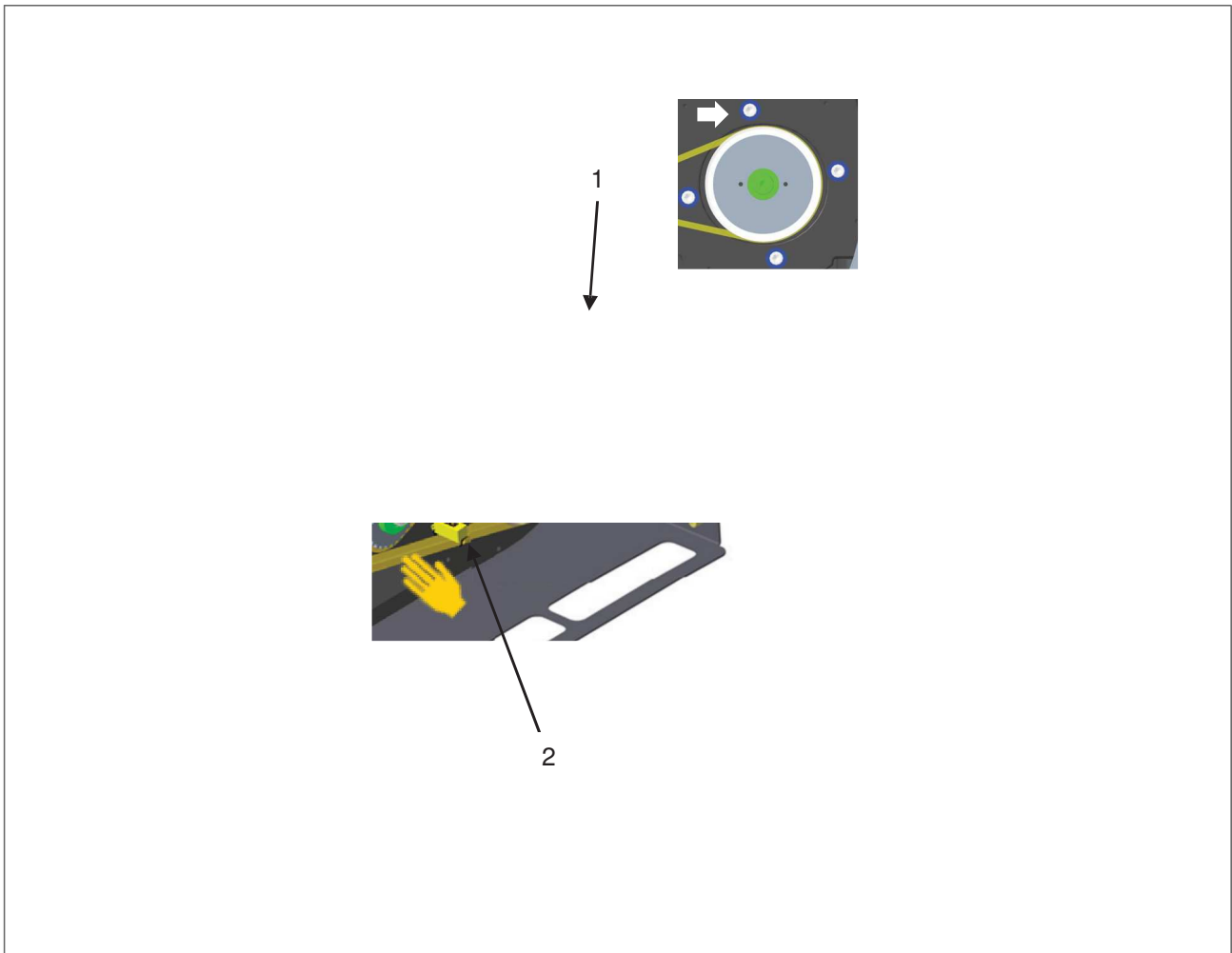


Figure 9 – Tooth belt removal

## 1.3.9 Tighten tooth belt by tool

### Items:

1. Belt tightening tool
2. VSM mini

### Procedure:

1. Install belt tighten tool (Figure 6, Item 1) and clamp VSM mini (Figure 6, Item 2) on the belt, switch it on, give a little push to the belt, measure input value (Hz).
2. Tighten the belt with wrench 19mm, Ensure the frequency by pushing the belt, Value 83+/- 5 Hz. Move pulley 5 to 8 times.

**CAUTION**



# Belt replacement

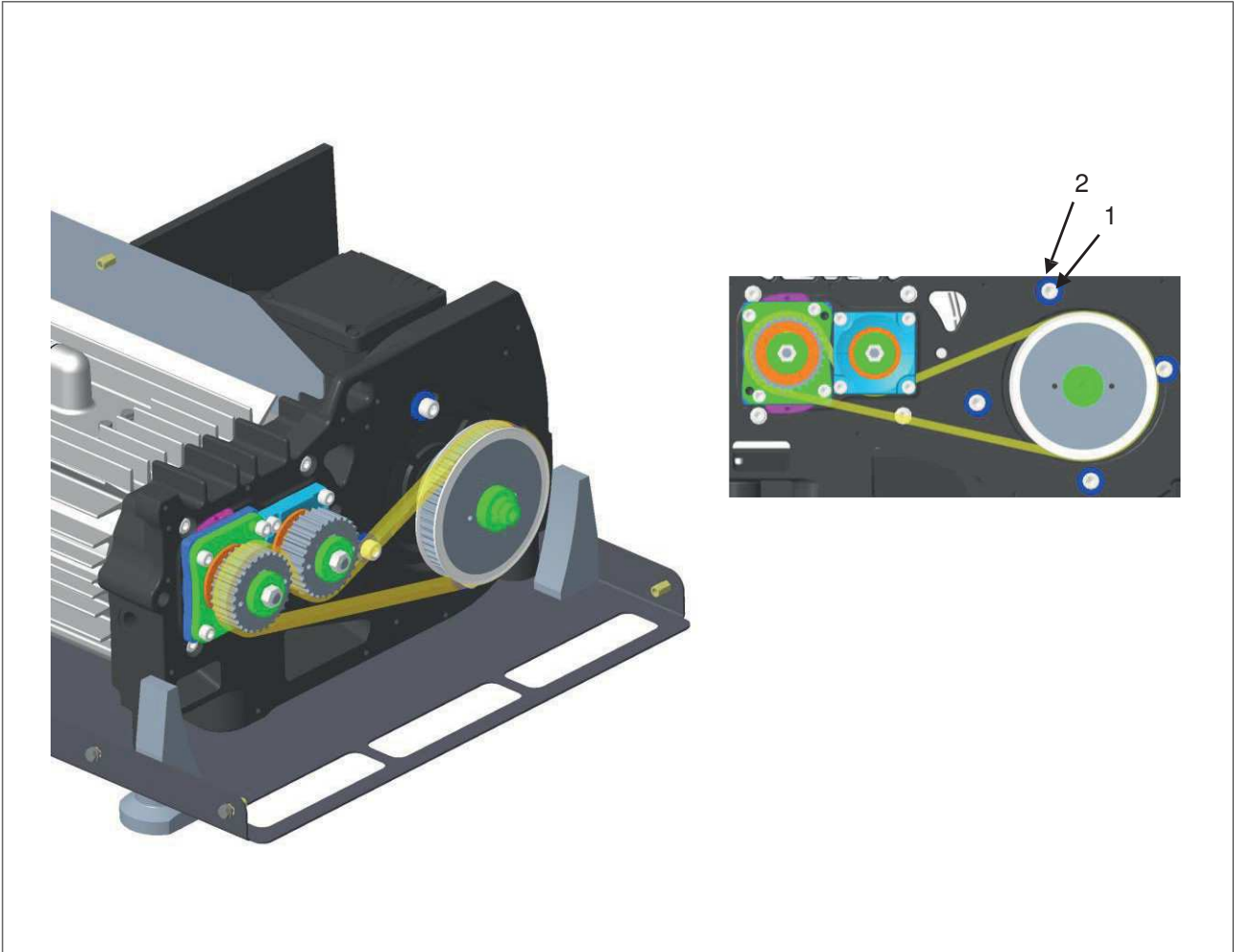


Figure 10 – Motor screw assembly

## 1.3.10 Motor screw

### Items:

1. Cap screw M10X30 8.8
2. Washer 10.5

### Procedure:

1. Tighten the motor cap screw (Figure 8, Item 1 and 2) using 8 mm Allen key by hand. Torque each screw to 40Nm.
2. Remove VSM mini and belt tightening tool.
3. Rotate Pulley by hand 5 to 8 times and make sure that the belt is tightened and running correctly.

Note: If no torque tool is available closest to the exact torque is acceptable.

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### CAUTION



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### NOTICE



# Belt replacement

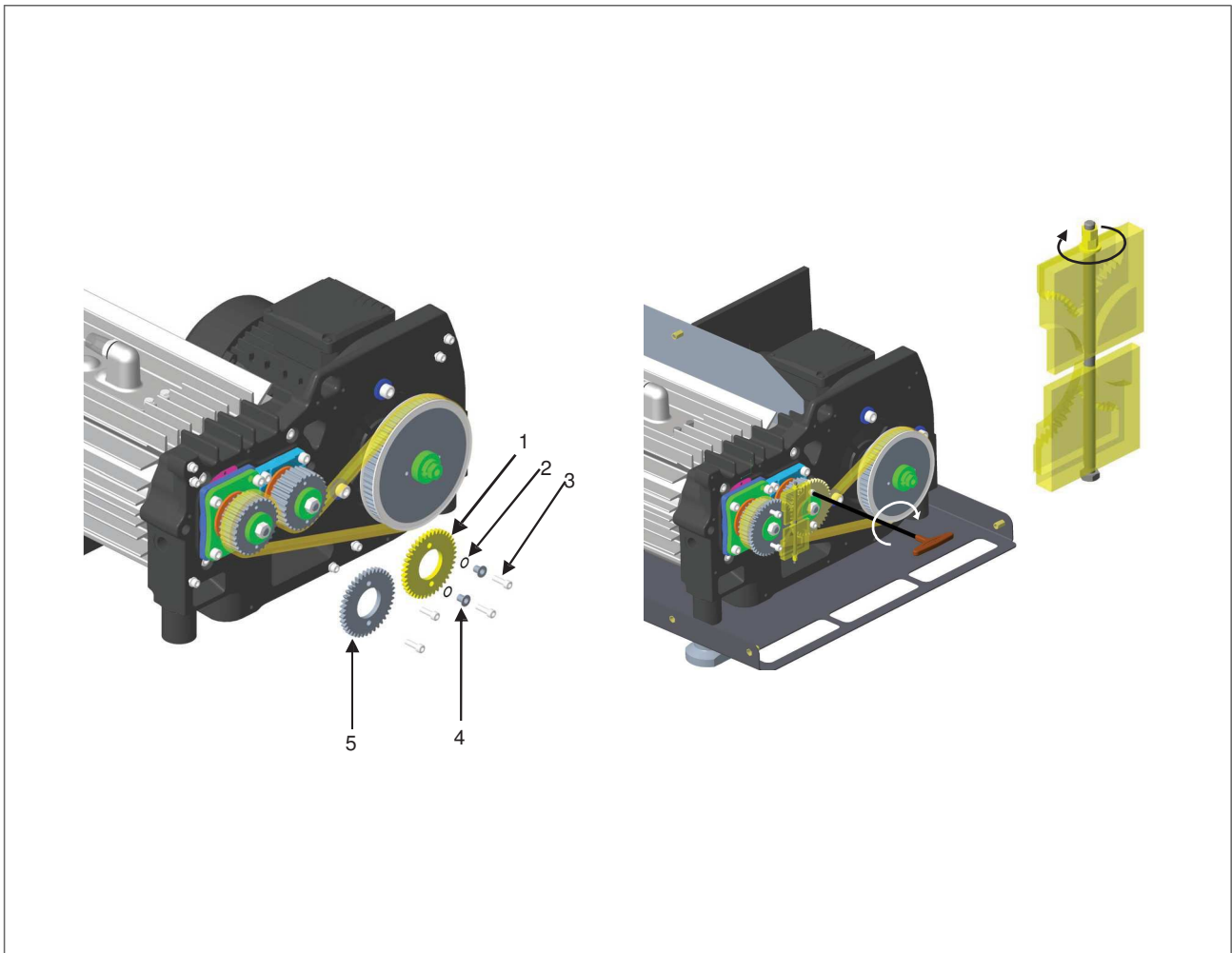


Figure 11 – Fail safe gear assembly

## 1.3.11 Fail safe gear assembly

### Items:

1. Fail-safe gear NR Polyamid
2. O-ring
3. Cap screw M6X20 8.8
4. Bushing, fail-safe gear
5. Fail safe gear AR Metal

### Procedure:

#### CAUTION



1. Assemble fail-safe gears and other all necessary parts back to original position in reverse order of disassembly, check status of fail-safe gear NR Polyamid (Figure 11, Item 1) and change it in case of necessary.
2. Place the bolts for fastening the gears.
3. Fasten plastic gear with 2 bolts (10Nm).

# Belt replacement

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**NOTICE**

5. Rotate the motor pulley by hand 5-8 revolutions counter-clockwise (do not turn clockwise, until fail-safe gears are fastened).
6. Place gear adjustment tool on gears and fasten it (avoid clockwise rotation of belt).
7. Tighten the steel gear with 2 bolts (10Nm).
8. Remove the gear adjustment tool.
9. Rotate the motor pulley counter clockwise by hand for three revolutions. Make sure that the gears do not touch.
10. If gears touch, repeat step 28-32.

Note: If no torque tool is available closest to the exact torque is acceptable.

# Belt replacement

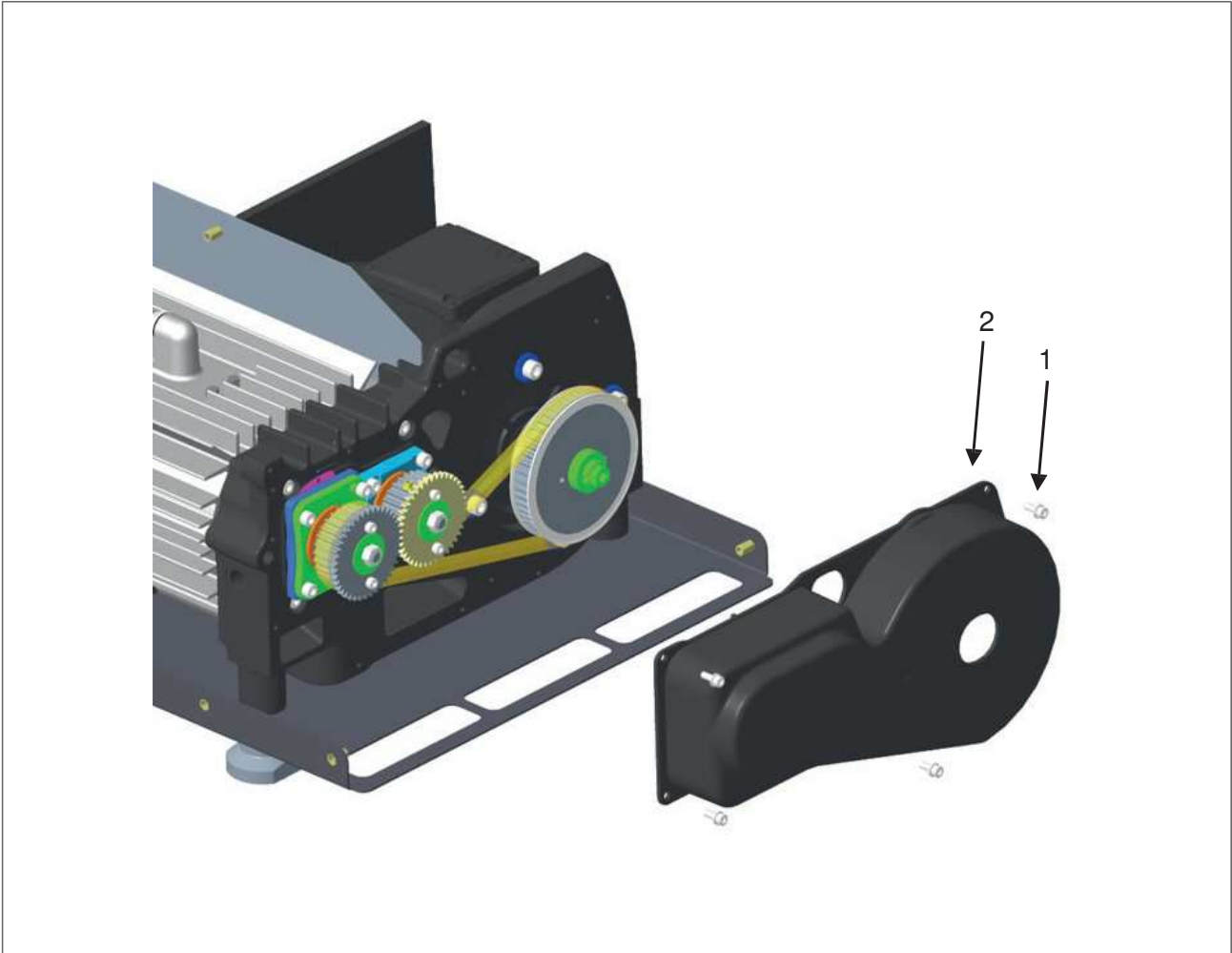


Figure 12 – Belt chamber cover assembly

## 1.3.12 Belt chamber cover assembly

### Items:

1. Cap screw M6X16 8.8
2. Belt chamber cover

### CAUTION



### Procedure:

1. Assemble Belt chamber cover (Figure 12, Item 2) onto the bearing flange with 4 cap screws (Figure 12, Item 1) using 5mm Allen key.
2. Tighten cap screws by hand and torque each screw to 2.5Nm.

### NOTICE



Note: If no torque tool is available closest to the exact torque is acceptable.

# Belt replacement

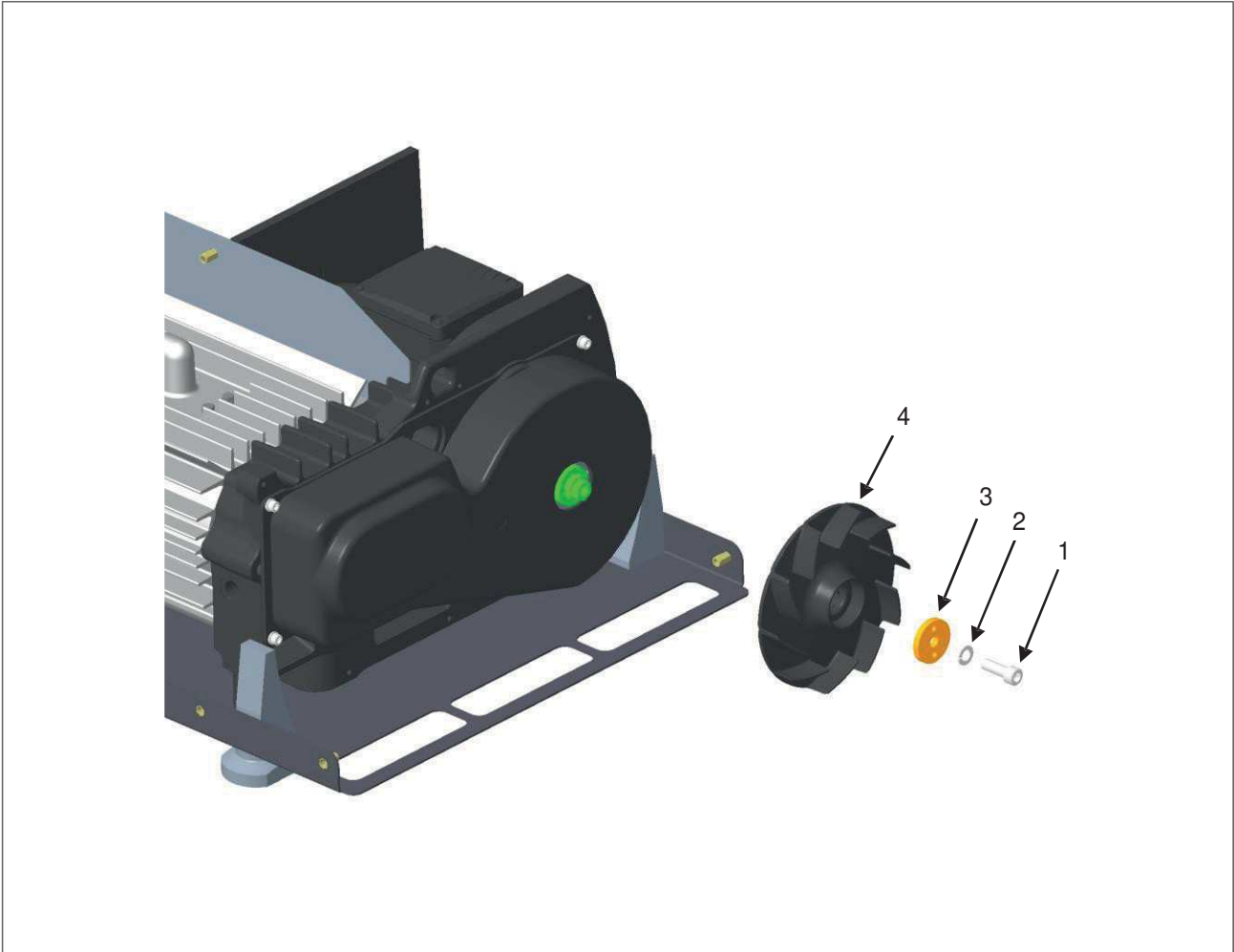


Figure 13 – Fan assembly

## 1.3.13 Fan assembly

### Items:

1. Cap screw M10X30 8.8
2. Spring washer
3. Rotor washer
4. Fan

### Procedure:

1. Assemble the fan (Figure 13, Item 4) by sequence as shown in figure i.e. (Figure 13, Item 4,3,2 and 1) using 8mm Allen key.
2. Tighten cap screw by hand and torque screw to 20Nm after locking fan by spanner.

Note: If no torque tool is available closest to the exact torque is acceptable.

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### CAUTION



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### NOTICE



# Belt replacement

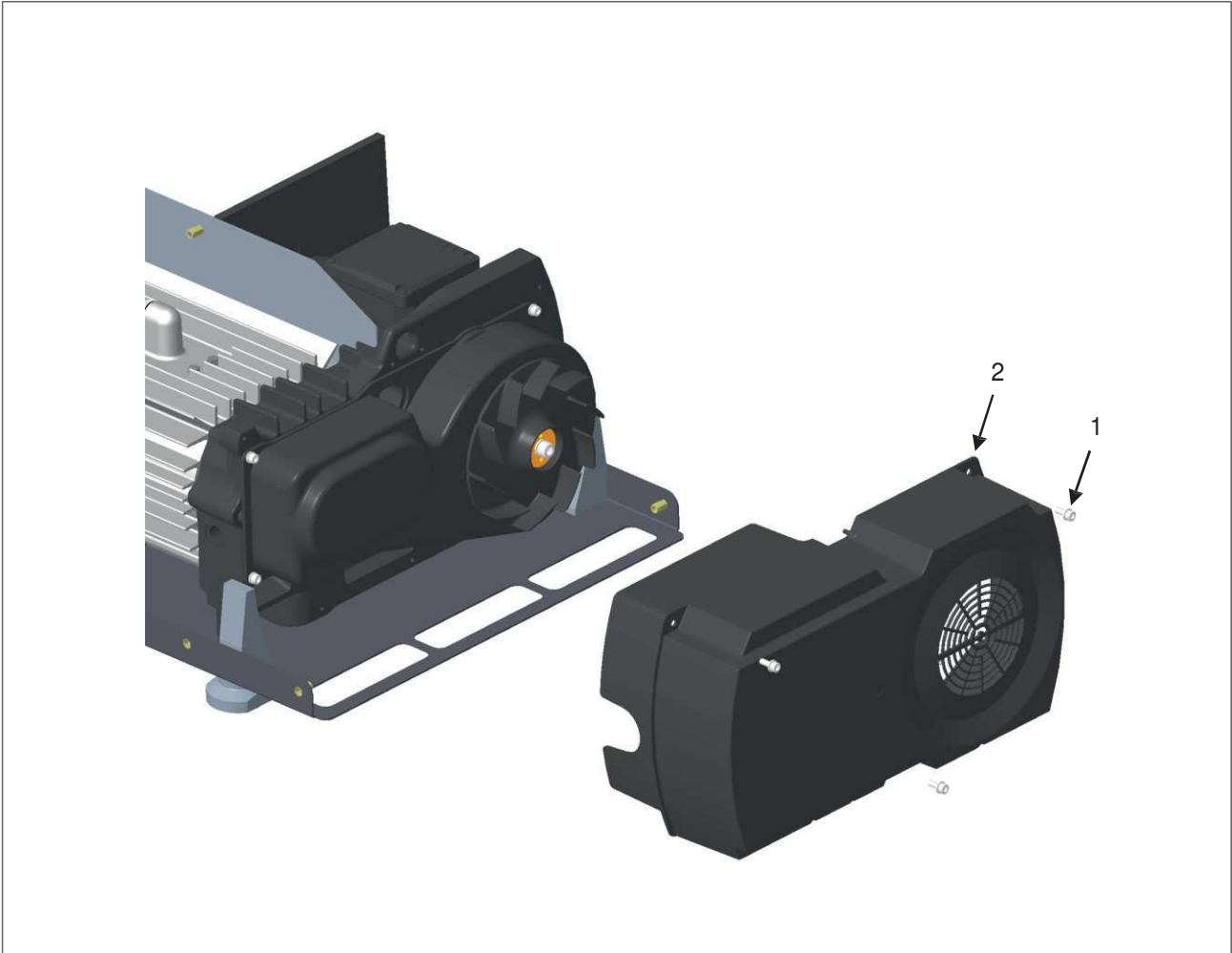


Figure 14 – Drive enclosure assembly

## 1.3.14 Drive enclosure assembly

### Items:

1. Cap screw M6X16 8.8
2. Drive enclosure

### Procedure:

#### CAUTION



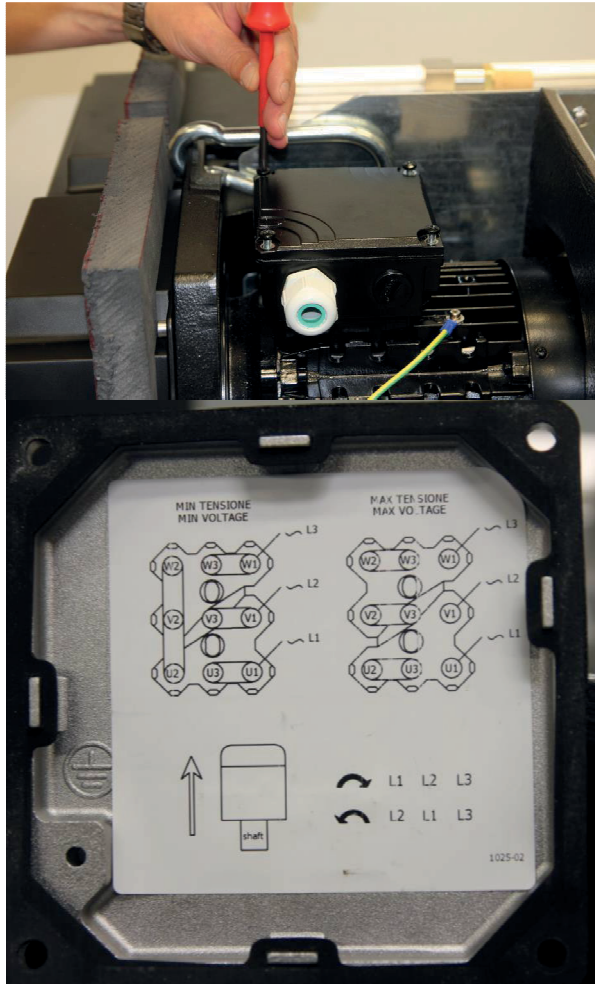
1. Assemble drive enclosure (Figure 14, Item 2) onto the bearing flange with 3 cap screws (Figure 14, Item 1) using 5mm Allen key.
2. Tighten cap screws by hand and torque each screw to 2.5Nm.

Note: If no torque tool is available closest to the exact torque is acceptable.

#### NOTICE



# Belt replacement



Open the motor terminal box

Min Voltage = Star Connection  
200 V, 50 Hz  $\pm 10\%$  ("Delta connection of motor")  
230 V, 60 Hz  $\pm 10\%$  ("Delta connection of motor")  
Max Voltage = Delta Connection  
400 V, 50 Hz  $\pm 10\%$  ("Star connection of motor")  
460 V, 60 Hz  $\pm 10\%$  ("Star connection of motor")

Figure 15 – Electrical connection view

## 1.3.15 Electric connection

### Procedure:

1. Open the motor terminal box.
2. Do the electrical connection (certified electrician) before installing the enclosure. See manual for the pump.

# Belt replacement

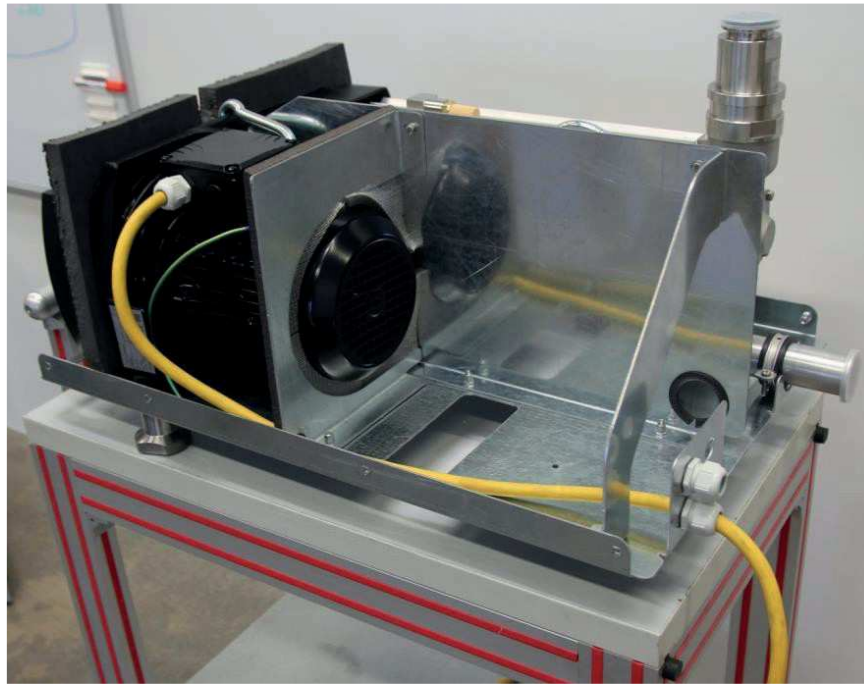


Figure 16 – Cable route view

## 1.3.16 Cable route

### Procedure:

1. Feed in the cable as shown in the picture.

# Belt replacement

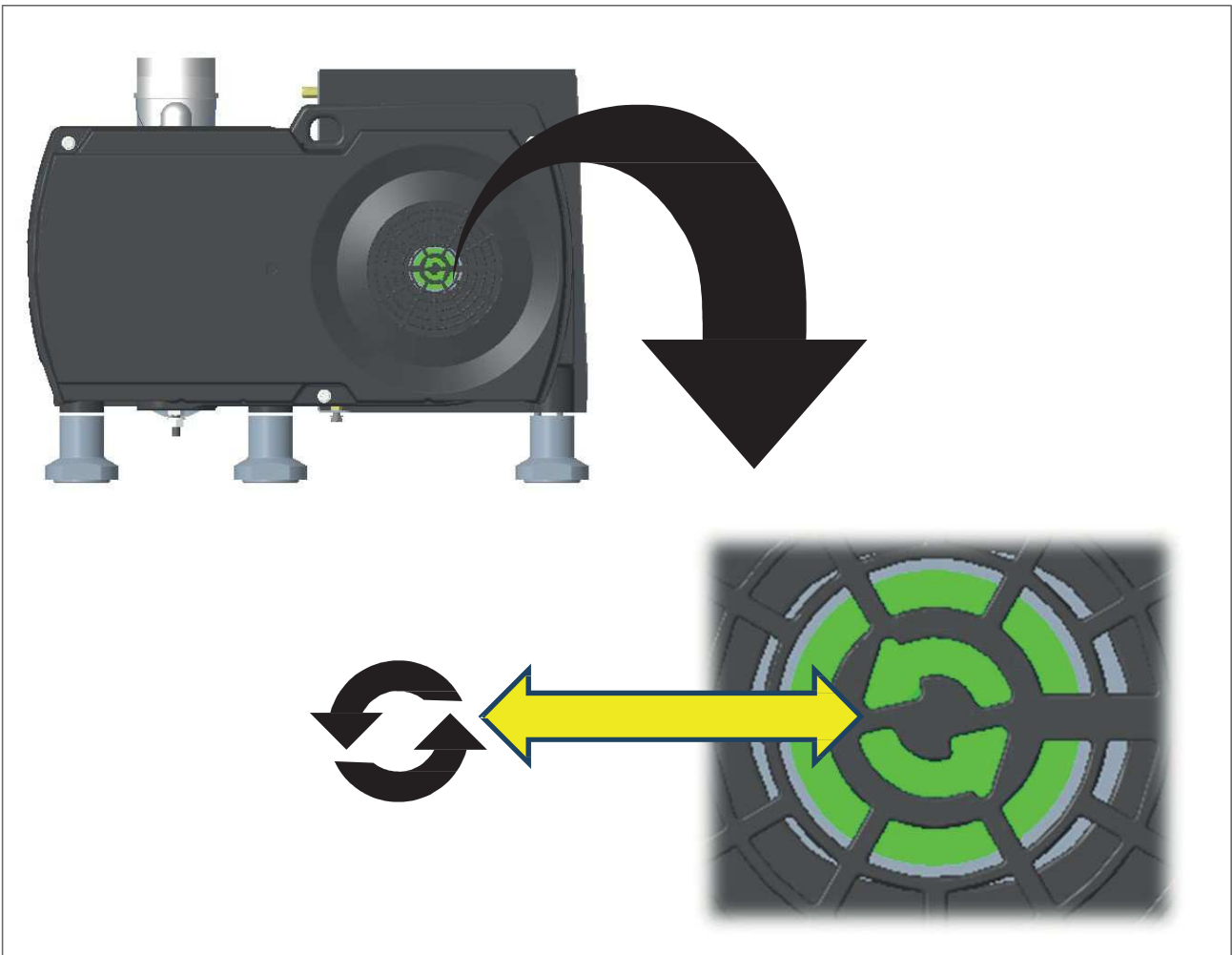


Figure 17 – Motor rotation view

## 1.3.17 Verify motor rotation

### Procedure:

Verify the correct rotating direction of the motor by a brief start of the pump.

Two alternatives:

1. Verify if the pump fan rotates in the same direction as the arrows on the fan protection grille.
2. Check if the pump creates vacuum on the inlet port. (Attention! Do not close the pump inlet with your hands or any other body part and avoid objects from being sucked inside the pump). In case of a wrong direction swap two phases at the motor clamping board.

**DANGER**



# Belt replacement

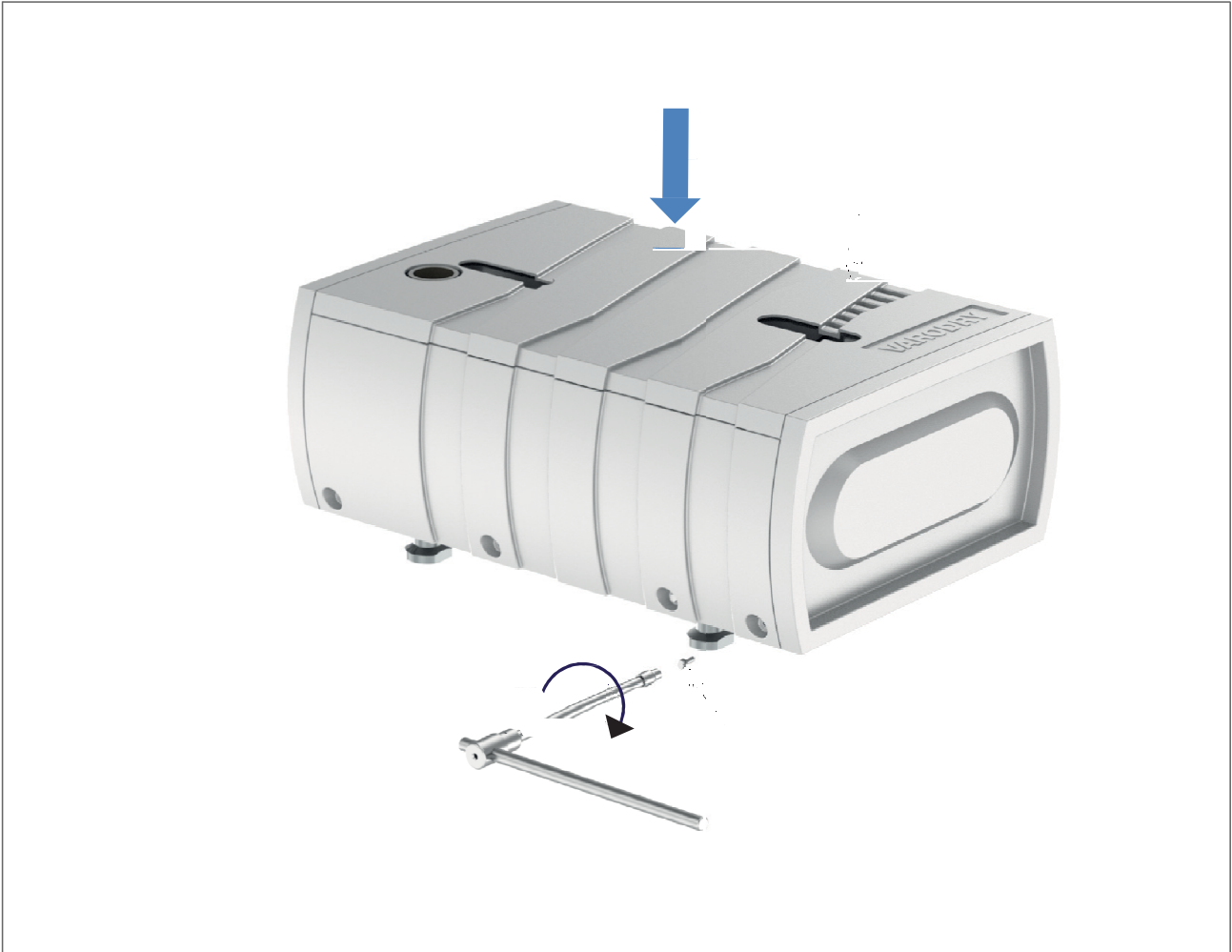


Figure 18 – Drive enclosure assembly

## 1.3.18 Install the enclosure

### Procedure:

1. Reassemble the pump enclosure shown on the picture.
2. Use 10mm spanner to tighten the 8 screws which secure pump enclosure on frame.

**CAUTION**





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