LKV BAYERN
REGIONALE TIERBETREUUNG

FÜR BAYERNS TIERHALTER SEIT 1938

LKV-Universal-Shuttle

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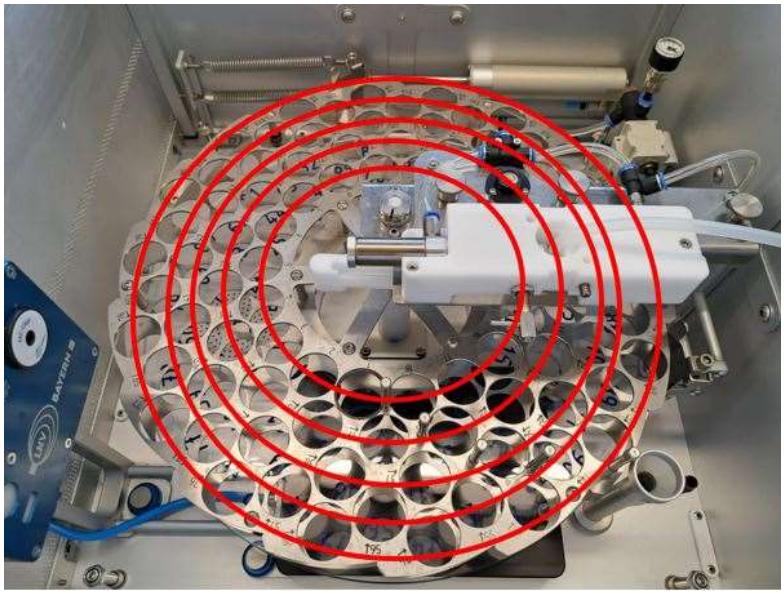
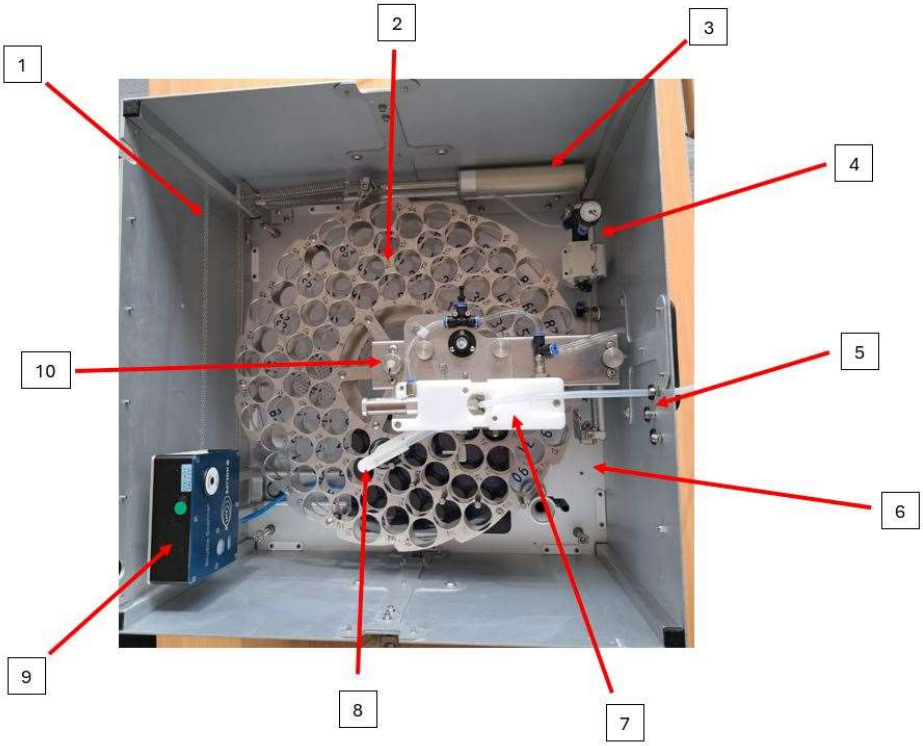
1. Description

1.1 Construction oft the LKV-Universal-Shuttle

The system is circular and divides into 5 rings



The system is controlled by compressed air → pneumatic



1	Removable frame with air holes	6	Base plate
2	Drive rim and carrier for 90 bottles with three levels	7	Filling unit
3	Drive for roundel, includes cylinder	8	Automatic bottle-scanner
4	Pressure gauge	9	Lockable break
5	Hose passage in the housing with staggered passages	10	Crossbar

1.2 Functional description

The system works in 5 stages:

1. Waiting for the milk sample
2. Transport of the milk and filling of the sample bottle (level control is robot-specific)
3. The remaining milk is drawn back from the milk tube by the milking robot
4. Pneumatic rotation of the roundel
5. Storage of sample bottles

Procedure may vary slightly depending on the robot manufacturer

1.3 Technical data

Capacity	90 bottles à 50 ml capacity, level 30/40 ml
Action	pneumatic / compressed air (Max: 6 Bar, Min: 3 Bar)
Measurements	600x570x250 mm
Weight	12 kg

2. Sample taking

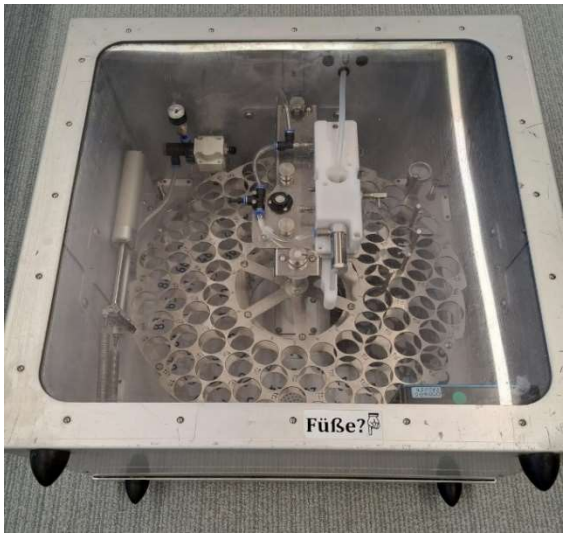
! ATTENTION: Insert the bottles before connecting the shuttle to the robot!

- The corresponding sample numbers are engraved on the roundel and are also visible on the bottom → Number bottles before filling the roundel
- Make sure all bottles contain a fresh preservative.

→ contact your LOP or PN if you have any questions. Always include the barcode of the sample bottles

2.1 Setting up and positioning the device

The device must be as close as possible to the robot in order to keep the milk hose as short as possible. The milk tube should not exceed a maximum length of 175 cm. The LKV-Universal-shuttle should be set up in such a way that there is a gradient between the robot and the shuttle. With the exception of GEA and DeLaval, the milk sample is transported by gravity into the sample milking bottles. Due to the short milk hose and the slope, carry-over is avoided.



2.1.1 Positioning oft he bottling arm

- Turn the roundel until the bottling arm is centrally positioned above position 1
- The bottling arm remains in this row until the last bottle in this row has been filled, and is then pushed into the next row using metal rods

2.1.2 Automatic bottle coding

- The automatic bottle-scanner assigns the bottles to the corresponding cow
- The automatic bottle-scanner is connected to the milking robot's software via a chip, but it has no influence on the milk sample filling process

2.1.3 Sample filling using the example of Lely

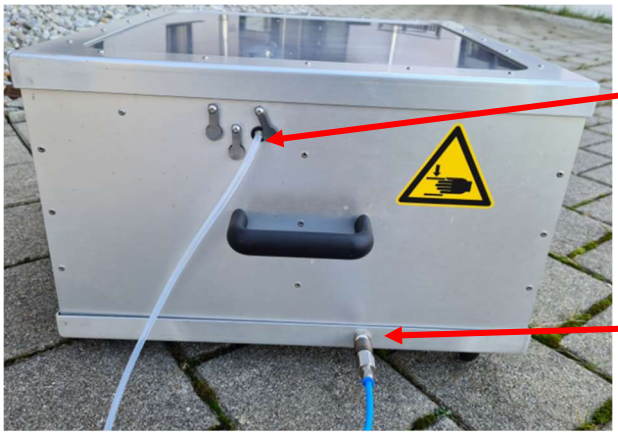
- Air pressure activates the cylinder and allows milk to flow into the sample bottle
- Filling level in the bottle is controlled by filler neck (remaining milk is pumped back by the AMS. As a result, no more milk is supplied than needed)
- Once the filling process has been completed, the locking cylinder is reactivated by another air pulse and the roundel is pushed one position further

For robot-specific descriptions, please read the connection instruction for the respective model!

2.2 Connection to the AMS

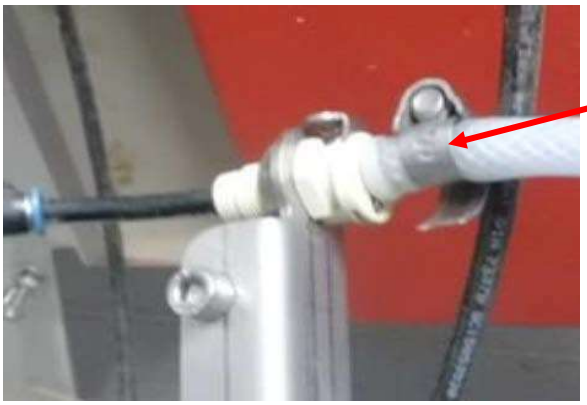
2.2.1 Pneumatic connection

Please connect the compressed air hose to the LKV-Universal Shuttle and the AMS



Milk tube

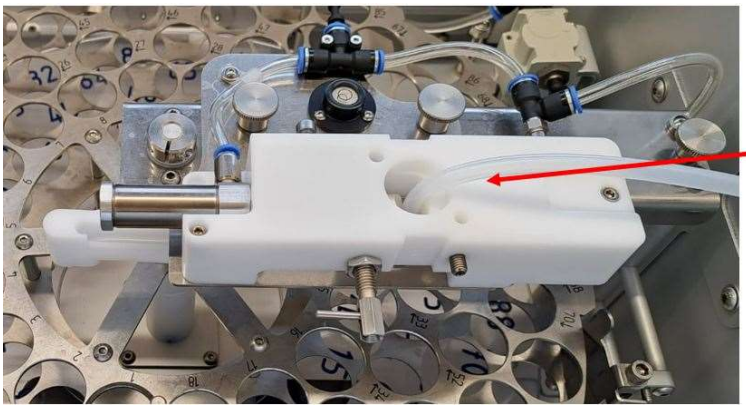
Compressed air connection at the LKV-Universal-Shuttle



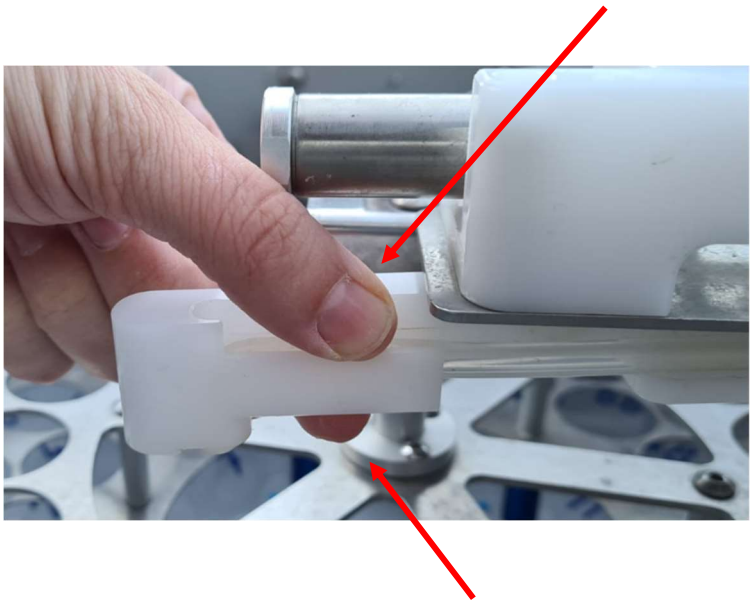
Compressed air connection tot he AMS

2.2.2 Connection to the milking system

To connect the shuttle to the AMS, please refer to the model-specific instructions.

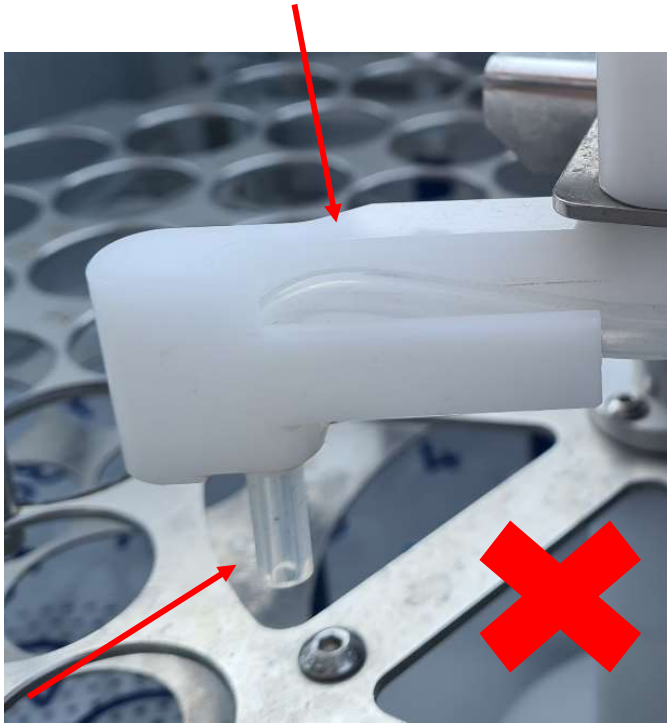


If you do not use a dosing attachment, pass the milk hose through the bottling arm



Press the milk hose with counter pressure in the bottling arm

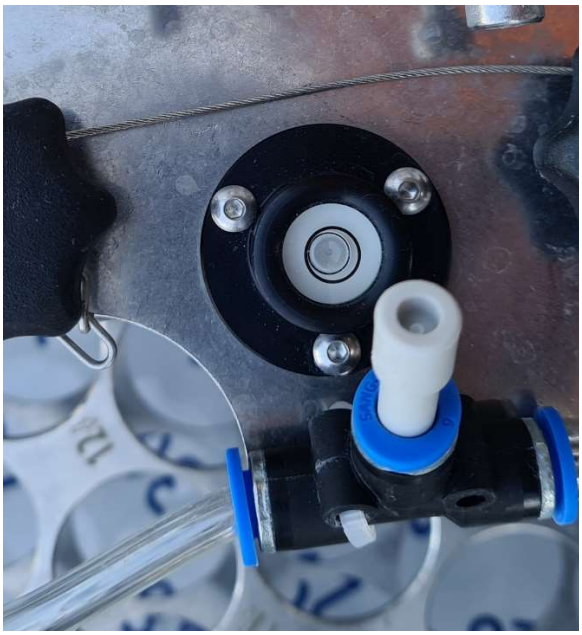
Make sure that the milk tube does not sag to avoid carry-over



The milk hose must end flush with the bottling arm.
If the milk tube protrudes, it sticks to the bottles.

2.2.3 Leveling

Leveling is done by adjustable feet to place the device parallel to the ground → control by spirit level.



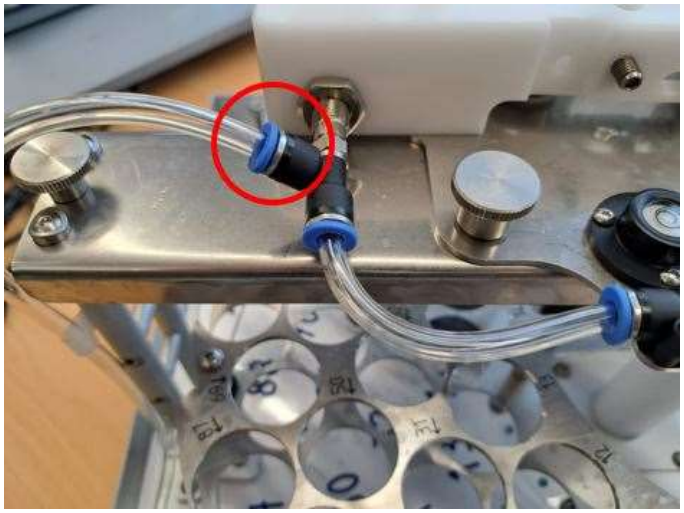
3. Cleaning of the LKV-Universal-Shuttle

3.1 Dismantling of the LKV-Universal-Shuttle

Remove the lid and frame of the shuttle

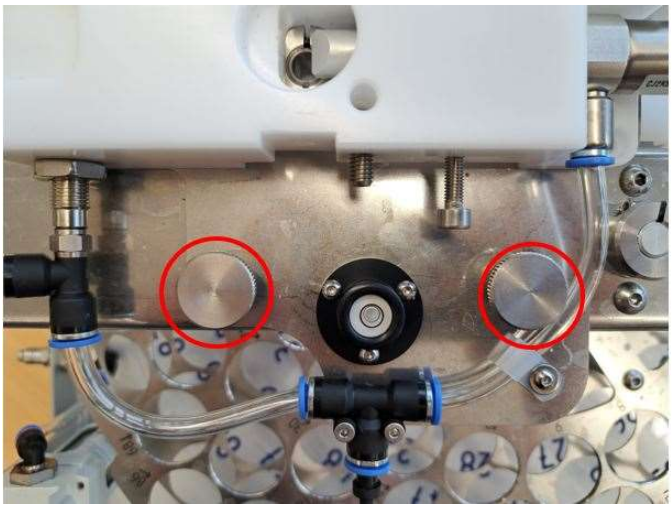
Use a screwdriver to loosen the screws between the bottom and the frame

3.2 Dismantling of the compressed air hose



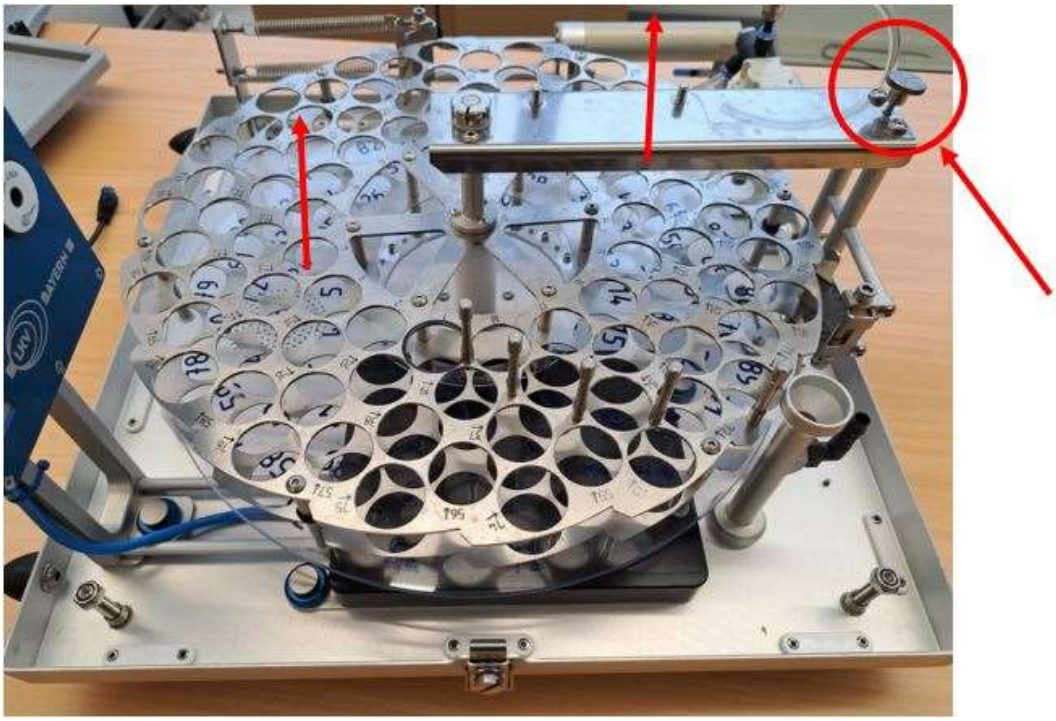
Press the blue edge of the compressed air connection towards the left adapter and pull out the hose

3.3 Dismantling oft he bottling system



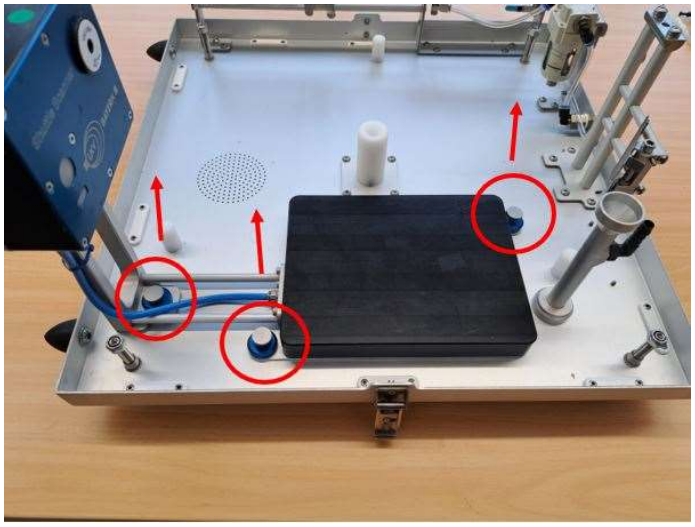
Remove the knurled screws and lift the bottling system from the roundel

3.4 Dismantling of the roundel



Remove the last knurled screw.
Then pull the roundel straight up and lift it off the base plate.

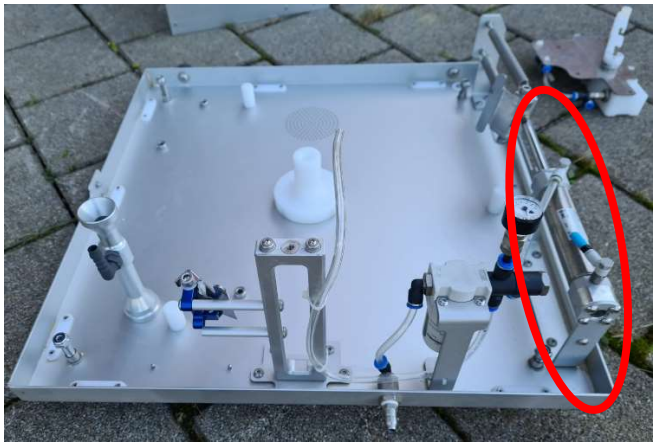
3.5 Dismantling oft he RFID bottle scanner



Remove the three knurled screws to put out the RFID bottle scanner

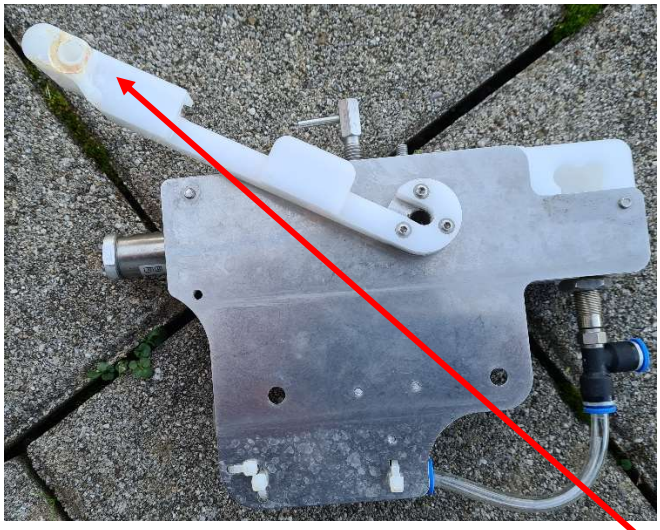
3.6 Cleaning of the LKV-Universal-Shuttles

The frame, base plate and roundel can be cleaned with running water, detergent and a brush.
Please DO NOT use acid to clean the Universal shuttle and do NOT fill the entire assembled BOX with water!



Please DO NOT clean cylinders and water separators with a direct water jet.

This shortens the service life considerably!



Clean the filling unit with a damp cloth and, if necessary, with a toothbrush.

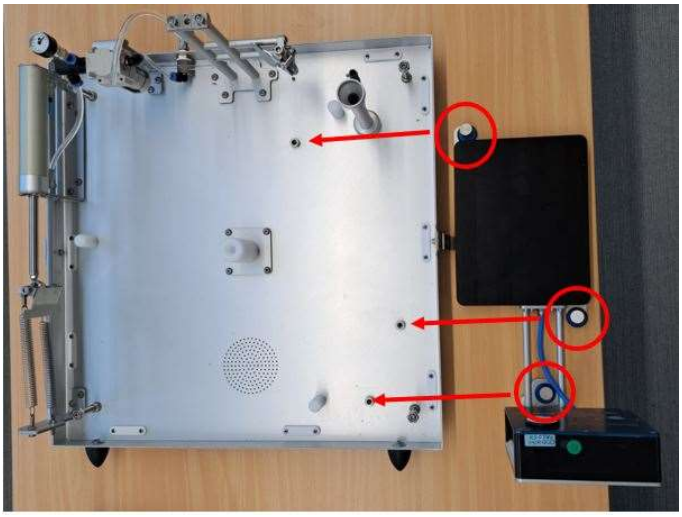
Please DO NOT hold under running water.

Especially on the underside of the bottling arm, milk deposits like to form.

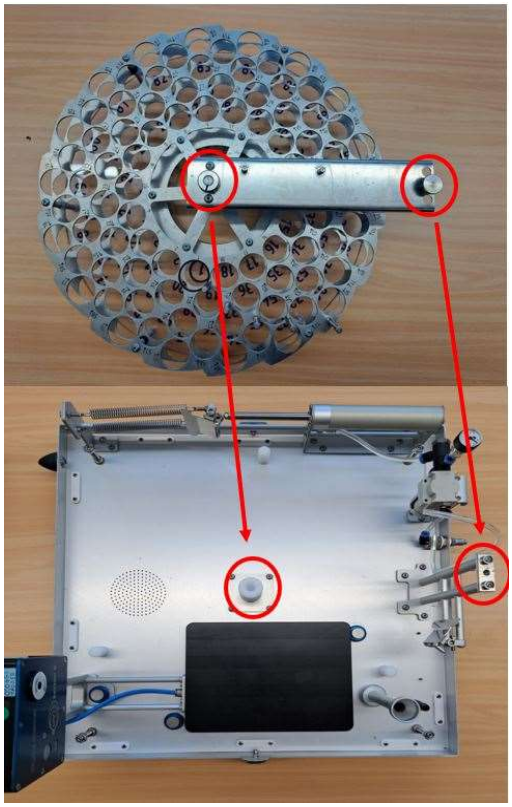
Be sure to remove these as well.

4. Assembling of the LKV-Universal Shuttle

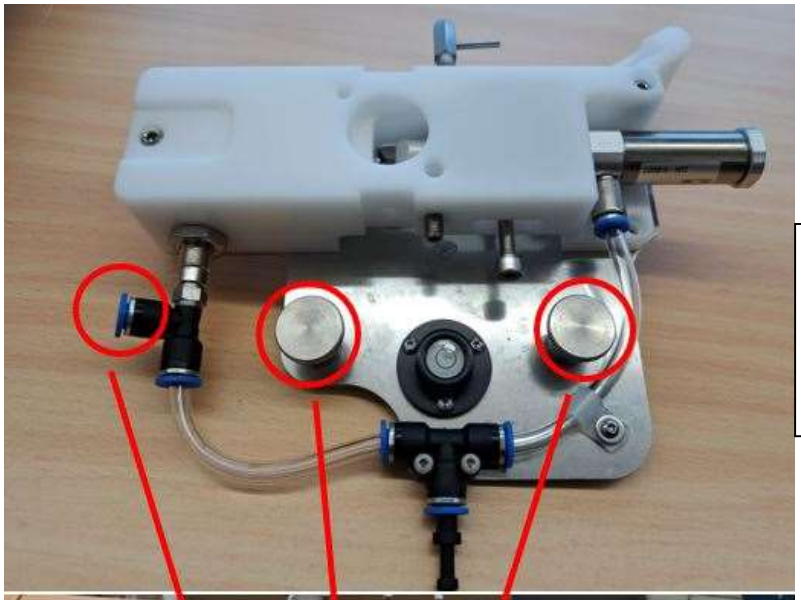
Please carry out each step with care and without firm shaking and pressing.



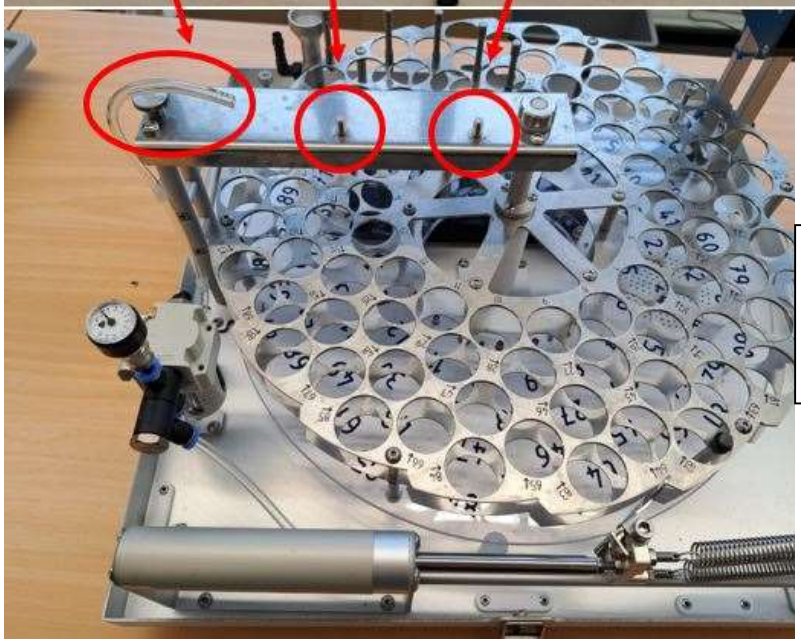
Please screw the three screws oft the scanner into the holes provided



Push the roundel onto the base plate and attach it with the knurled screw



Push the bottling unit onto the threads provided for this purpose and attach it with the knurled screws.



Then reattach the compressed air hose to the bottling unit.

Attach the frame to the base plate and retighten the screws with a screwdriver

Reattach the lid to the frame.

When putting on the lid, please pay attention to the **correct direction of the feet!**

If the lid is placed upside down, the weld can burst!

In case of loss of individual parts, please obtain spare parts only from LKV Bayern e.V. and DO NOT use any foreign parts.

5. Maintenance

The LKV-Universal Shuttle should be checked every 6 months to ensure good performance.

Servicing:
Replace the farm's own milk tube annually, if necessary more often (purchase again from LKV Bayern e.V.)

If the performance changes, cylinders must be checked by the shuttle officer and, if necessary, replaced.
ATTENTION: Cylinders work dry and do NOT need lubrication!
Lubrication affects the performance of the cylinders negatively.

6. Examples of malfunctions

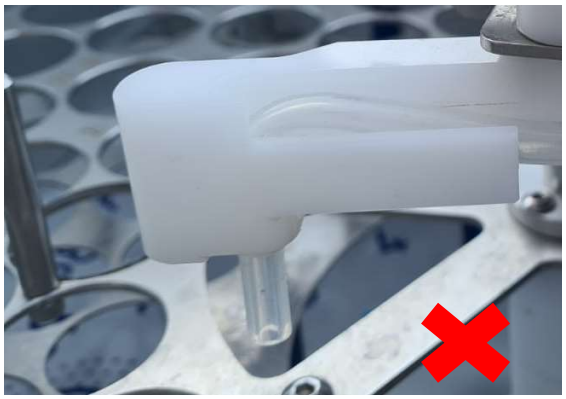
Possible faults and correction

Problem	Causes and fixes
The roundel doesn't turn any further	• Check the pressure on the pressure gauge. A pressure below 4 bar usually means a fault on the robot, pressure above 6 bar indicates a defect in the throttle valves on the robot -> please contact Universal shuttle officer. **Caution:** at a **pressure above 6 bar**, the Universal-Shuttle can **break**! • In case of audible pressure loss, please check all compressed air connections and blank plugs.
The LKV-Universal-Shuttle does not fill samples	• Check the milk tube for kinks and holes
The roundel moves on the spot	• activate the brake to prevent the roundel from turning back when the cylinder loses pressure

7. Checklist:

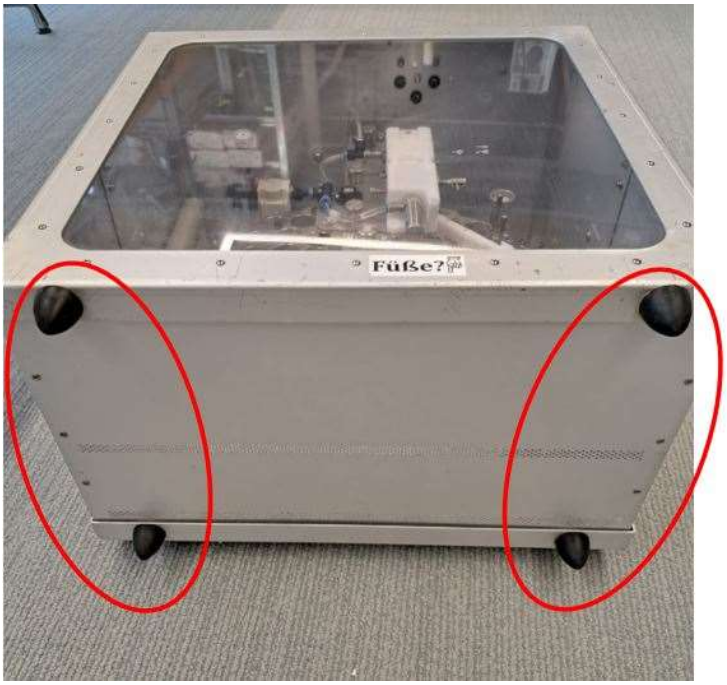
1. Is the device level? → spirit level and feet

2. The milk hose in the filling arm must not protrude → otherwise gets stuck on the sample bottles!



3. The pressure must be between 4 – 6 bar and must not exceed 6 bar

4. **Transport position:** Please place the lid on frames (stickers) in the right direction. Feet in the same direction, otherwise it will burst weld seam



8. Differents between Ori-Collector and LKV-Universal-Shuttle:

Ori-Collector	LKV-Universal-Shuttle
Removable frame without air holes	Removable frame with air holes → Better ventilation and drying of the shuttle
One drive spring on the cylinder	Two driver springs on the cylinder → more stability → back up for one broken spring
Material filling unit metal	Material filling unit polyoxymethylen → less weight → easier mobility
Colorful base plate	Colorless numbered base plate
Smaller drive cylinder	Larger drive cylinder
Two hose passages in the housing but at a height	Three hose passages in the housing with different heigths
Roundel with two levels	Roundel with three levels → more stability fort he botttles in the rondel
Non-removable case	Removable case → easier cleaning

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