

ITV | ICEmakers



Orbital bin assembly

Service – November 2019

Orbital bin



2000 to 19000 kg capacity

Orbital bin assembly

Previous requirements

- The bin must be located inside a cold room, with a temperature of -3°C or less. Never in a temperature above zero.
- The bin is designed to store and dispense flake ice, sub-cooled. It must be stored for a maximum of 24/48 hours. Once a week it must be emptied and cleaned.
- In the room where the bin is located, a sink for molten ice water must be placed on the floor.
- The floor where the bin goes must be as level as possible, and must be made of concrete or an element with a slab that can withstand the weight of the bin and the ice it stores.
- Three-phase electrical connection, without neutral.

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Bin assembly material

TOOLS:

- Spanners, double set, 17 and 19.
- Ratchet
- Wrench
- Jack
- Nylon hammer
- Drill
- Drill bit for stainless, 3.5, 5 and 10 mm
- Sandpaper for metal
- 41 mm crown for ice level drill (for stainless/iron)
- Radial saw for stainless
- Welding unit for stainless
- Electrical tester

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MATERIALS (electrical part):

- 4 x 2.5 mm² cable to run motors (approximately 30 meters)
- Corrugated tube (approximately 50 meters)
- 2 x 1 mm² cable for the silo door microphone (about 10 meters)
- 5 x 1 mm² cable for ice levels (about 10 meters)
- Nut to set ice level
- Stainless stud of 8 or 10, about 4 meters (to hold the covers in the central part)

RESOURCES:

- 1 forklift

PERSONNEL:

- 2 mechanics
- 1 electrician

TIME TAKEN:

- Day and a half to two days with electrical wiring

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Bin materials

BEDPLATE

- 4 bed structures, and a central structure
- 4 legs
- 4 fixing brackets
- Screws

CENTRAL STRUCTURE (STORAGE TANK)

- 4 stainless steel plates (base)
- Side plates (the bottom ones with central reinforcement)
- Side plate with door: 1
- Square plate with a circular hole (central zone)
- 1 round Teflon central ring
- 1 hopper with output auger (motor at the end of the output, opposite the hopper, if requested)
- Screws to install everything, stainless steel, nuts, bolts, washers, lock washers

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DRIVE SHAFT

- 1 central tube, with the forwarding installed at the bottom, and two side access covers (one above and one below)
- 1 output spindle
- 1 large and one small washer with M12 screw to hold the output auger
- 2 ball joints
- 2 axles for transmission forwarding, with keys on both ends
- 1 top cover with shaft output, and with a bearing on the bottom

MOTORS

- 1 structure for motor support, with anchor bolts
- 1 lower reduction motor for sweeping and one on top for erosion spindle movement
- 1 or 2 mechanical stops, 24 volts AC, for stopping the ice generators (one per machine)

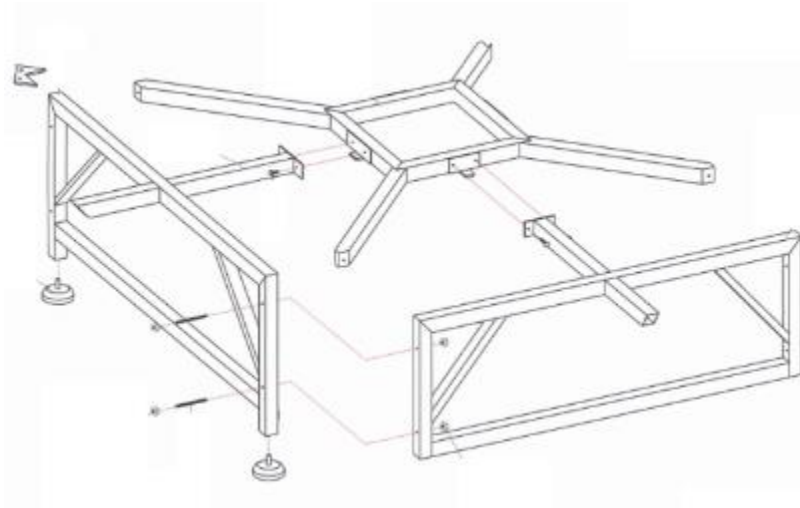
ELECTRICAL PANEL

- 1 full electrical panel, inverter and switching elements

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FRAME ASSEMBLY

- Place the side supports, one on each side, making an L, and place the through bolts with their nuts. Do not tighten much.
- Position the other sides, and the central support.
- Adjust and tighten the screws. You may need a jack to adjust a screw.
- Position the legs, and if necessary move the bench to the final location of the bin.

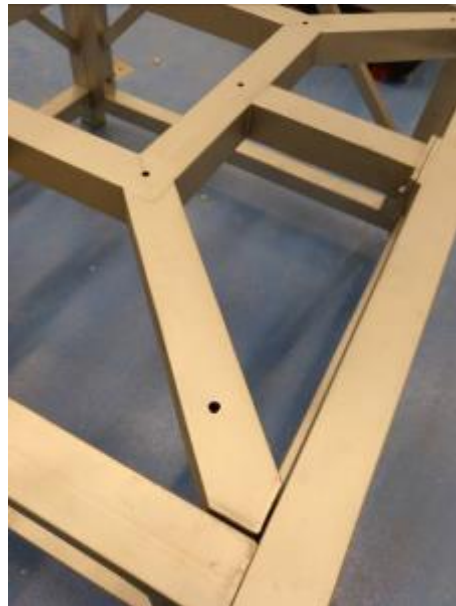


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FRAME ASSEMBLY



Bench details

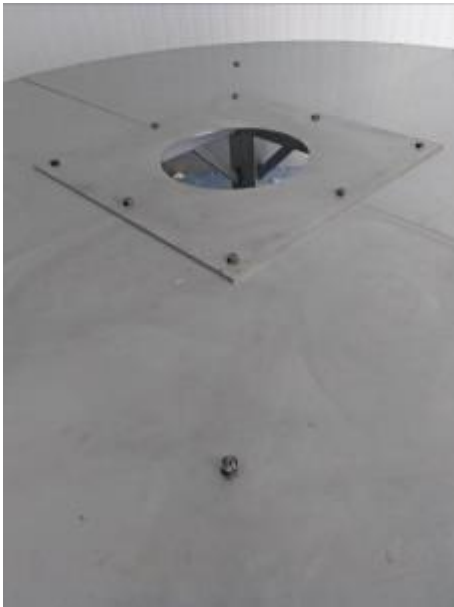


Mounted bench

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BIN BASE ASSEMBLY

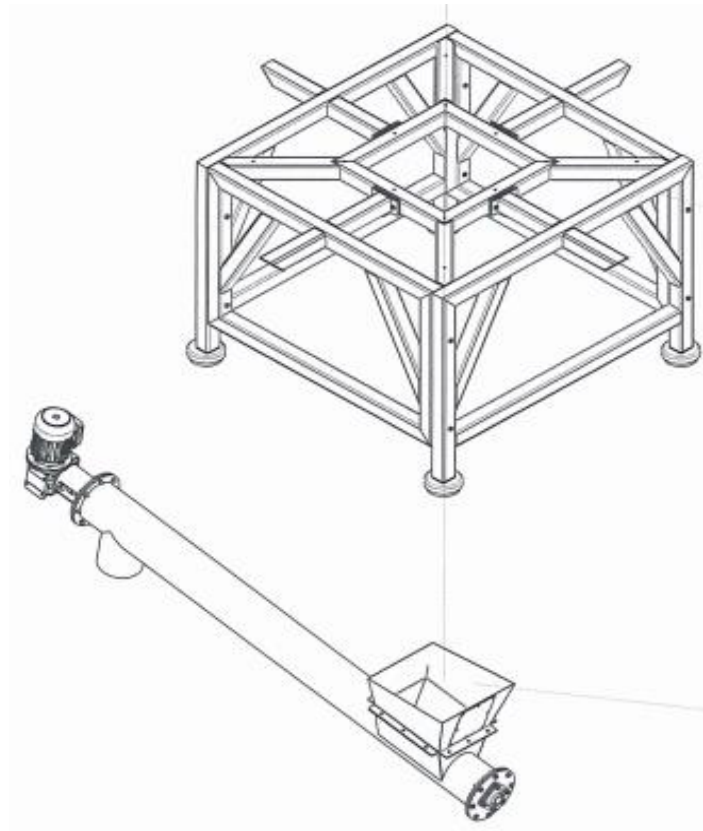
- Assemble the plates of the base of the bed.
- Screw the holes in the middle of the bench.
- Position the center plate.



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BIN BASE ASSEMBLY

- This is screwed to the ice hopper. Place the hopper in position and screw. For the output spindle, take into account the layout, if it goes through the wall of the chamber to be able to insert and position it.



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CENTER CONE ASSEMBLY

Position with a hoist in the center, before you put the Teflon gasket. It can be assembled before mounting the walls.

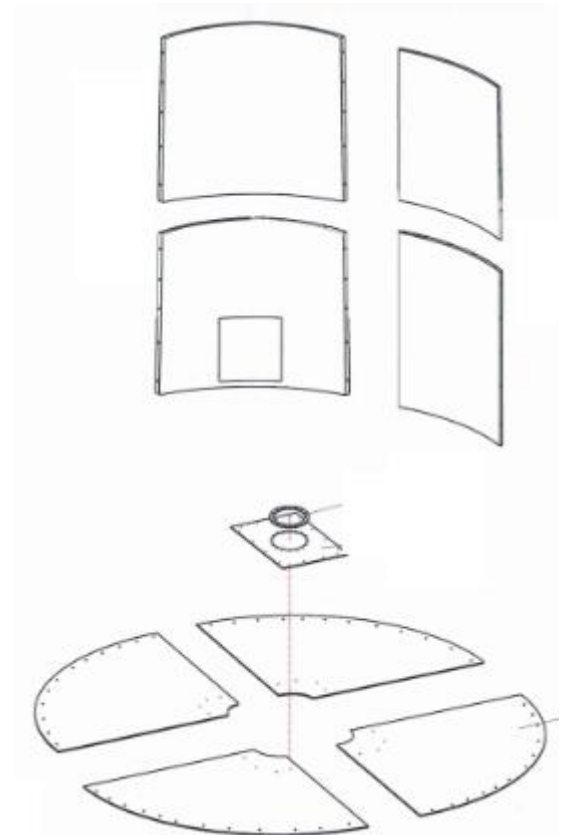


Teflon gasket

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ASSEMBLING WALLS

- Assemble side enclosures, from below, using medium reinforcement, one behind the other, starting with the door.
- The upper parts on hand are marked 1-1, 2-2, to mount side by side as appropriate.
- Take into account that you must leave a side without mounting to finish the interim cone.



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Then assemble the upper parts, with their bolts (bolt with groove and washer, and under washer and nut). On the sides, joining one piece to another, place the bolts in opposite directions.



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CENTER CONE ASSEMBLY

The central cone comes with the internal forwarding and the axles mounted on the joints, as well as the top cover for the engines.



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ASSEMBLING MOTORS

Before assembling the motors, we have to level the bin with the adjustment feet.

Assemble the support structure. There are two lateral and the central.
Assemble with through bolt and washer.



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ASSEMBLING COVERS

You have to assemble the two covers that cover the silo, they are held with bolts on the periphery. Keep in mind that in addition when ice generators are assembled, holes must be made for the ice to fall.

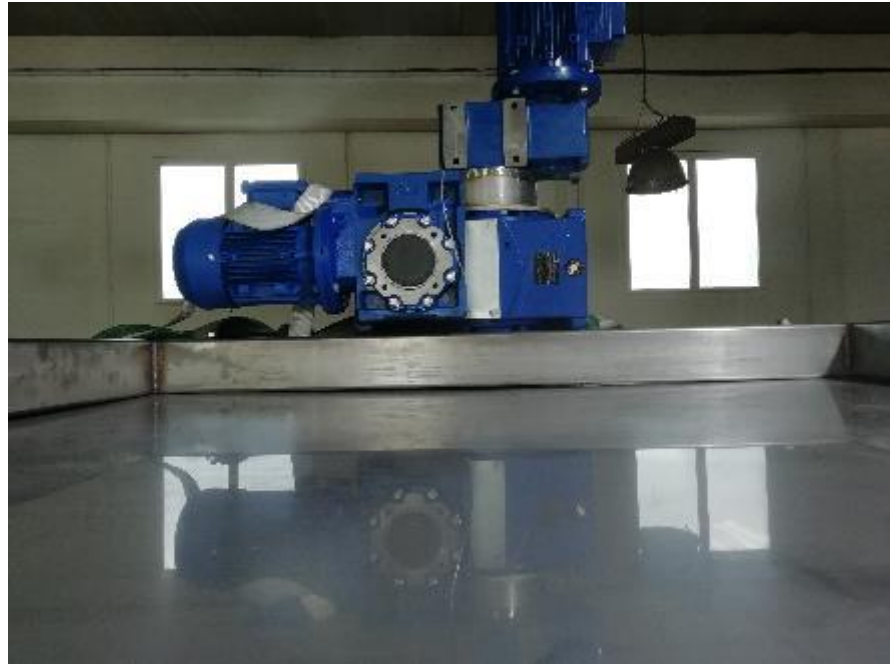
The covers with two threaded rods can be attached to the structure in the central part to give them some slope.



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ASSEMBLING MOTORS

Mount the motors on the axis of the cone, attached to the central structure. Bear in mind that the spigot shafts must match that of the motors, so that they enter. You may need to move them to get them in the proper position. And remember to put some grease on the shafts so that they enter easily.



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ASSEMBLING MOTORS

Once the motors have been positioned and the structure leveled (it has adjustable blue legs), drill through holes to secure the structure to the edge of the bin (it has an angle to attach the structure to the edge of the bin).

Take care that the structure does not prevent access to the door.



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ASSEMBLING AUGER EROSION

Mount the erosion spindle, placing the shaft by the forwarding, and by the lower access cover of the central cone, place the large metal washer, the small one and the screw, and tighten. Then close the lid. If the top one is still open, close also.



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ASSEMBLING MECHANICAL STOP

- The mechanical stop is located in the highest part of the silo, about 10 cm from the top. It is necessary to make a hole with a 41 mm crown. One stop is placed per machine, where the ice falls, one per machine.
- They are fastened with a nut, and the mobile element is placed with its bolt. The electrical box is on the outside, and the cable entry is put low down to avoid condensation and water entering it.



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Assembling ice outlet auger

The output spindle is positioned by screwing into the hopper. It has a single position. The end must be held while positioning. If it goes through the wall of the chamber, it is placed on the wall. If it goes inside the chamber, it must be fastened with a stainless steel clamp. It comes with a clamp ring to the bin bench.



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ELECTRICAL INSTALLATION

- Make the installation as clean as possible. Use the fastening screws of the enclosure to position flanges and be able to pass the wiring with its corrugated pipe. Utilizing the upper wing, drill and place the tube flanges.



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ELECTRICAL INSTALLATION

- The upper motors must be wired up to the electrical panel terminal block. Normally this board is positioned outside the chamber, and a remote stop gearbox is used to place in the chamber next to the ice outlet.
- If the ice outlet is outside the chamber, position the board right next to the outlet, so you can access the start and stop buttons.
- Wire the output motor to the panel.
- Wire mechanical stops.
- Wire safety stop opening door, and position on the door.



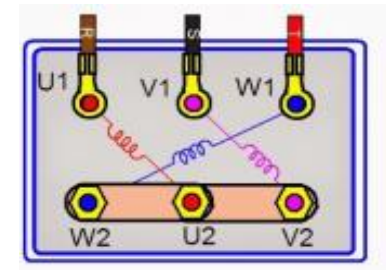
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ELECTRICAL INSTALLATION

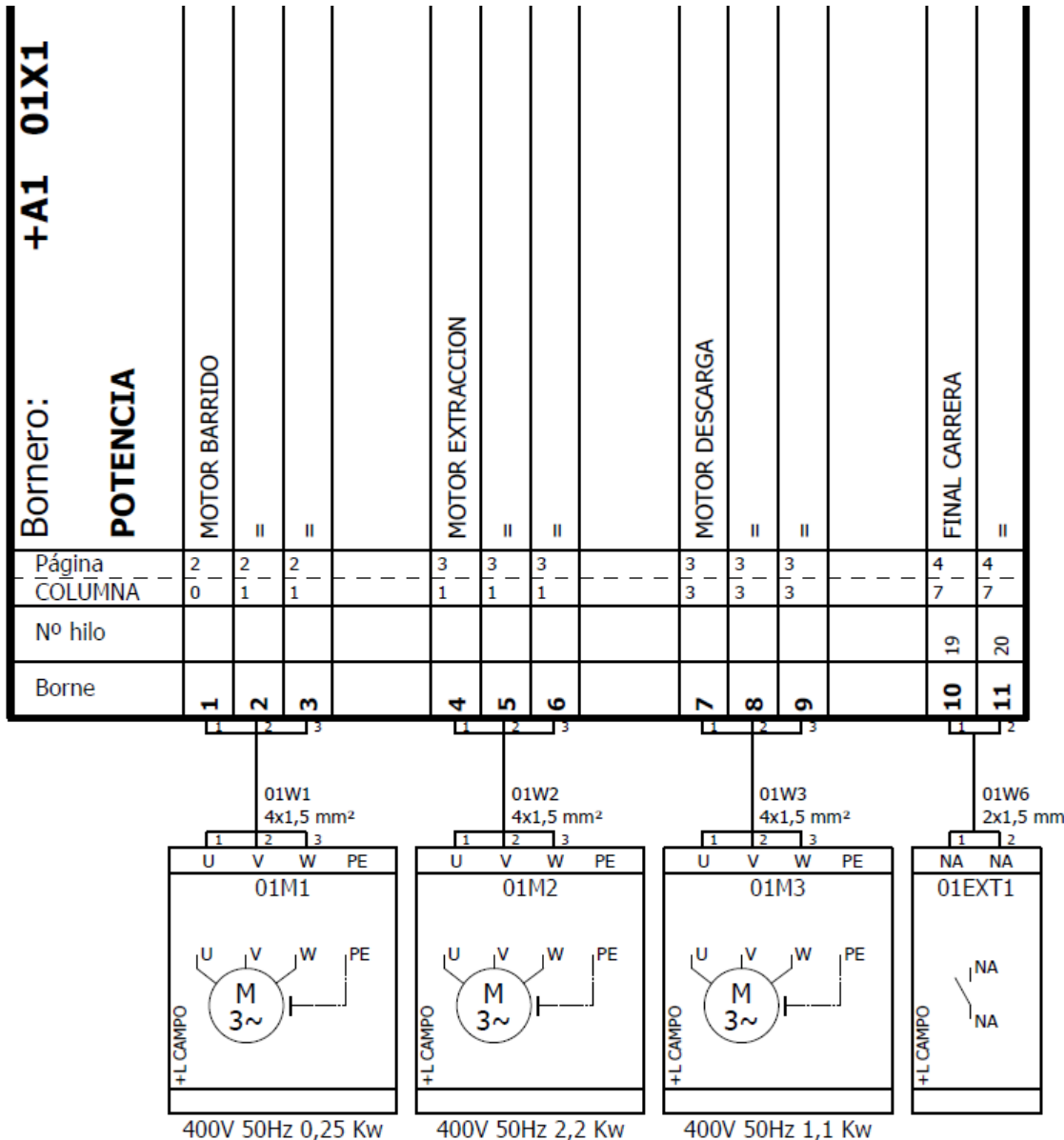
- Once everything is connected, close the door, and test the turns, powering up the panel and pressing start (all in automatic). If necessary reverse the rotation direction by changing two phases in terminal block.
- Sweep turn (translation, drive inverter), no matter the direction.
- Erosion spin (extraction): it must turn counterclockwise, inwards (spindle inside the bin).
- Turn output spindle, it must turn clockwise to take out the ice.

NOTE: All engines have the star connection.

NOTA: The silo drive moves the sweep motor (translation), it must always be between 30 and 32 Hz.



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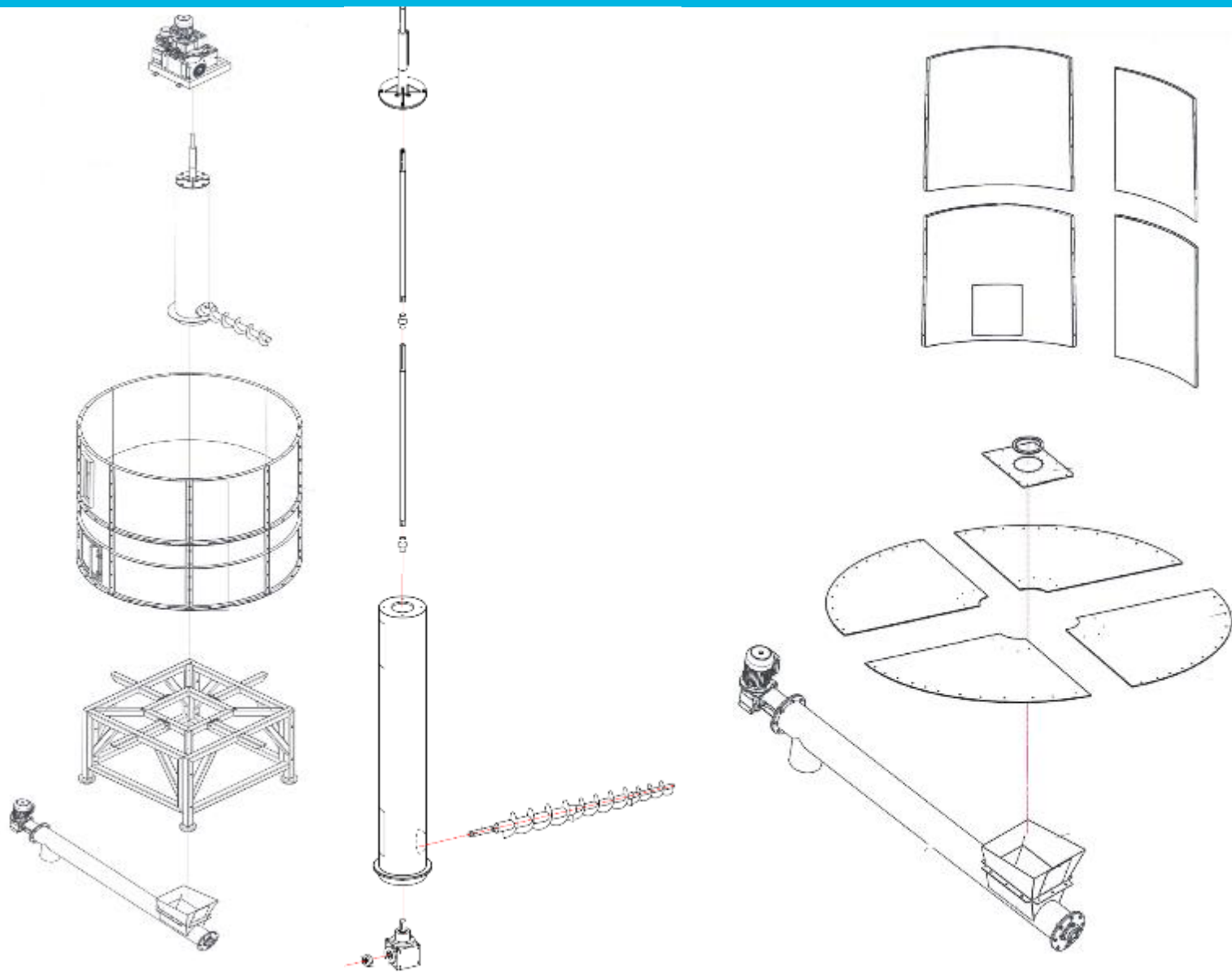
- Terminals 1, 2, 3: Sweep motor (translation, the largest of the bin, with variator)
- Terminals 4, 5, 6: Extraction motor (the top of the block on the bin)
- Terminals 7, 8, 9: Unloading motor
- Terminals 10, 11: Stop by door opening (to the door relay)

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CHECKING THE BIN

- Check the safety of the bin, mechanical stop and door opening.
- Check the bin with ice.
- Check that the output motor rotates correctly, according to the direction of rotation. If you need to, change a phase.
- Adjust if necessary.
- Check with ice, its exit, and adjust bin leveling with the legs.

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Thank you for your
attention

