AWDS TECHNOLOGIES SRL

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USER MANUAL

PRODUCT NAME	Twister
PART NUMBER	1401.100
DECSRIPTION	Pay-out assistant for twist-free welding wires in drums
DEVICE	Mechanic
MANUFACTURER	AWDS Technologies S.R.L
ISSUE	01/2021

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THIS MANUAL MUST BE ALWAYS STAY WITH THE DEVICE

FOREWORD AND NOTES FOR THE USER

Carefully read this manual before using the device

Before starting any operation, it is mandatory to read this instruction manual.

The guarantee of the correct functioning and full performance compliance of the device is strictly dependent on the implementation of all the instructions contained in this document.

This manual contains all the necessary information in order to allow correct use of the device.

The listed routine maintenance policies can help keep your device in perfect condition.

The workers responsible for using this device must have all the necessary information and instructions and must receive adequate training on the best safety practices related to:

- the conditions of use of the equipment;
- to foreseeable abnormal situations; pursuant to art. 73 of Legislative Decree 81/08.

This manual has been prepared exclusively for use by its customers, guaranteeing the most up-to-date version at the date of edition.

AWDS Technologies S.R.L. reserves the right to make changes to the product described in this manual at any time and without notice.

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GENERAL INDEX

Summary

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1 INTRODUCTION

1.1 MANUAL ORGANIZATION

The manual is designed to describe the operation, the main components, the various configurations and ordinary maintenance of the Twister.

- Operation section: Description of startup and operation of the device.
- Components section: Description of main components.
- Configurations section: Description of the various configurations and accessories.
- Maintenance section: Troubleshooting and unit replacement.

This manual is made up of chapters so that the user can choose and read the chapters according to the operation he wishes to carry out.

1.2 GENERAL WARNINGS

The Twister must only be used by qualified and adult personnel.
The safety manager should ensure that the person assigned to use the device has read and understood the information contained in this manual.
The personnel in charge of maintenance, both ordinary and extraordinary, must have good mechanical knowledge.
While the device is turning, it is recommended not to remove its protections.
It is recommended to avoid performing any type of work, repair or intervention which is not shown on this manual.
It is advisable to store this manual with care, for a correct use of the device.

The manufacturer declines all responsibilities for any damage to people and/or things caused by incorrect use of the device.
Any modifications to the device effected by the user should be considered sole responsibility of the same, and therefore the manufacturer declines all responsibilities for any damage caused to people and/or things deriving from maintenance interventions carried out by non-professionally qualified personnel and in a manner differing from the operating procedures listed below.

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2 SPECIFICATIONS AND MAJOR COMPONENTS

2.1 GENERAL DESCRIPTION OF THE DEVICE

The TWISTER is an anti-torsional device designed to relieve the residual tension remaining sometimes on the welding wire after the twist-free winding process, for the purpose of preventing knots, jams and consequent unwanted machine stops.

The device must be installed on the upper end of the hood positioned on the bulk welding wire container, as shown in figure 1.

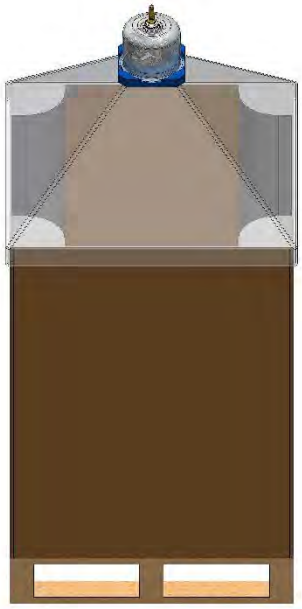

Figure 1

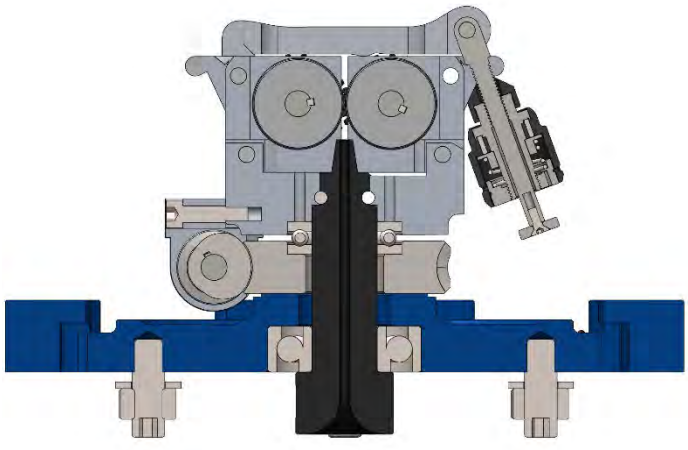

Figure 2

For the initial threading, the welding wire has to be first of all manually inserted through a plastic core, as shown in figure 2, and subsequently passed through the two contact wheels, whose "pinching" force is controlled by a special pressure knob equipped with torque limiting clutch.
The passing of the wire through the two engaging wheels, generates the rotational movement of the gear assembly, consisting of three or four spur gears (depending on the model version), a worm gear and a helical gear, which in turn imparts a rotation on the wire itself along its axis.

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2.2 COMPONENTS GENERAL OVERVIEW

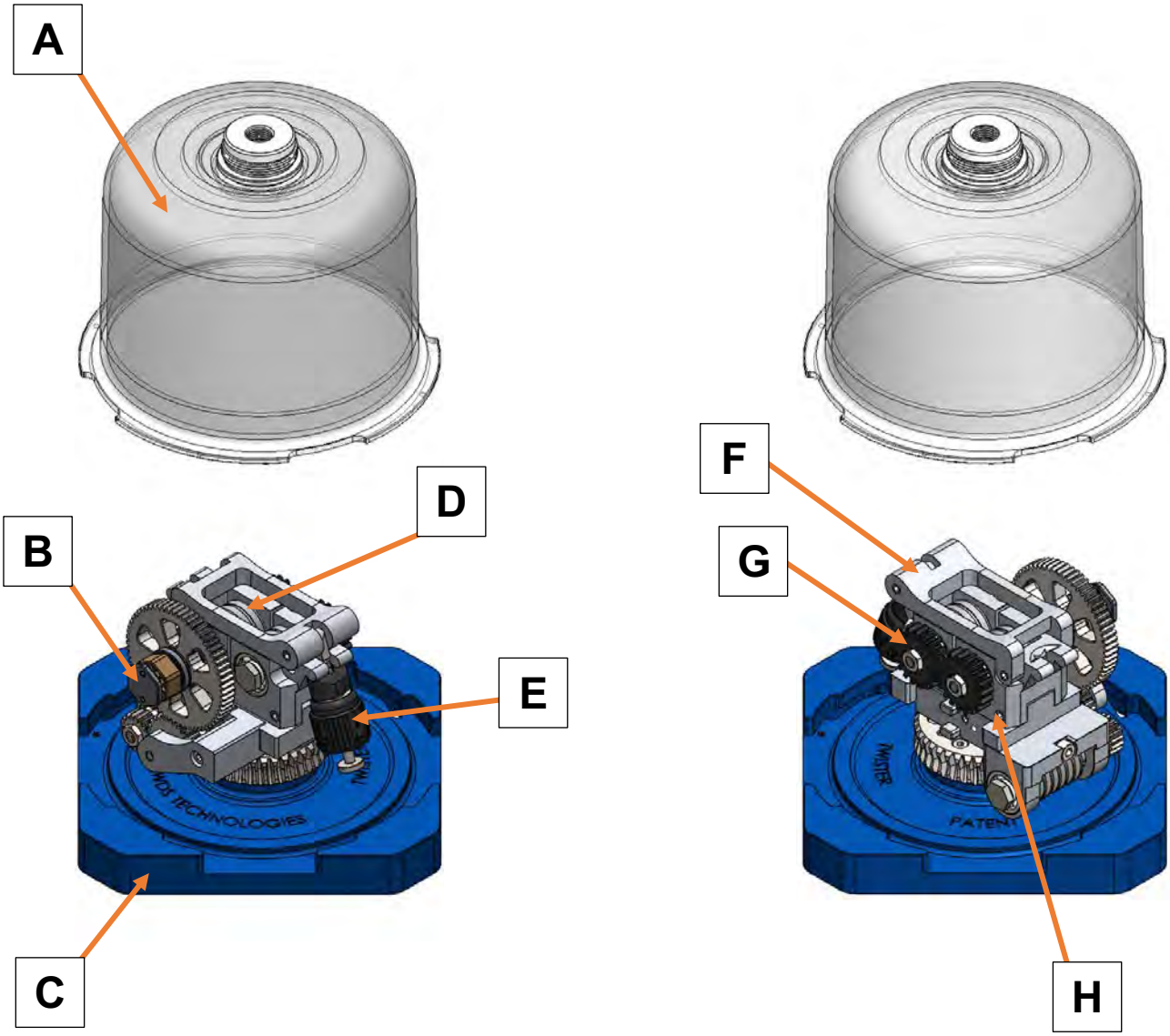

Figura 3

A	Protective cover dome
B	Torque limiter
C	fixed Base
D	wire contacting wheels
E	Torque limiter control knob
F	Closing lever
G	synchro wheels
H	wheels support body

2.3 TECHNICAL FEATURES

Mass [kg]	2,2
Width [mm]	167
Depth [mm]	167
Height from Base [mm]	140
Total height [mm]	160
Minimum wire loop diameter inside pack [mm]	500

Should you plan to feed lower wire loop diameters, contact first the manufacturer for additional clarifications and instructions.

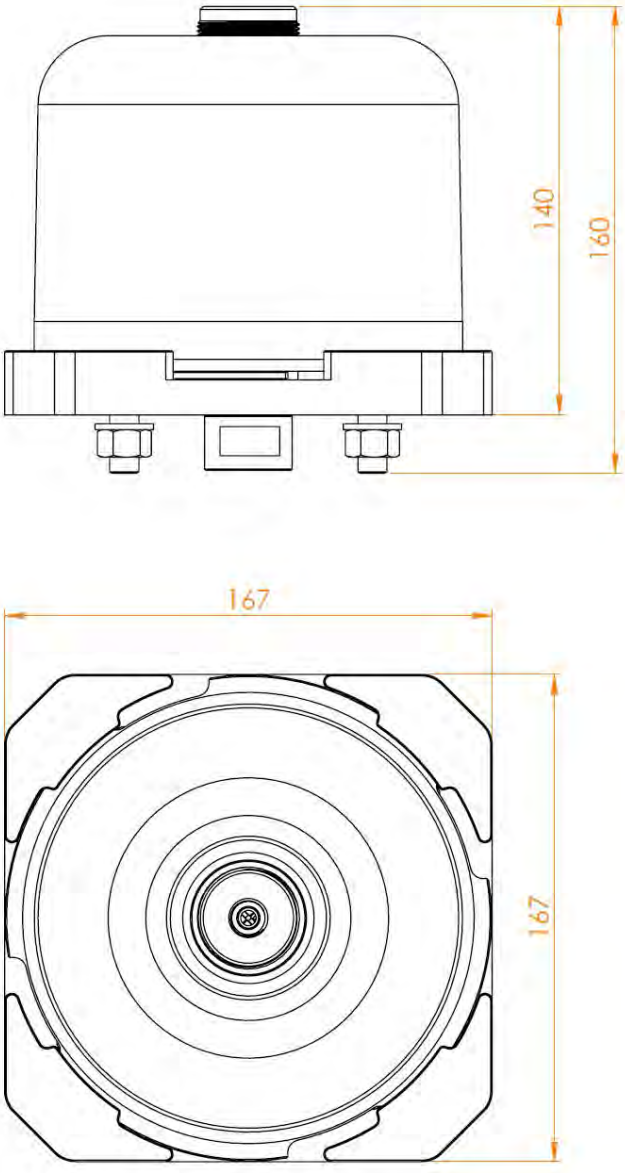

Figure 4

3 COMMISSIONING THE DEVICE

3.1 UNPACKING

The Twister is supplied fully assembled, in a cardboard box.
Before removing the packaging, verify the condition of the device, and ensure that all required accessories and the user manual or other documentation are contained in the box.

When moved around the Twister must be grabbed by the fixed base and NOT by the cover.

3.2 DRUM OR BULK PACK PREPARATION

For a correct the functioning of the device, it is necessary to remove any type of central core from the drum / pack, as this could prevent the anti-torsional action of the Twister.
Figure 5 shows a central core.

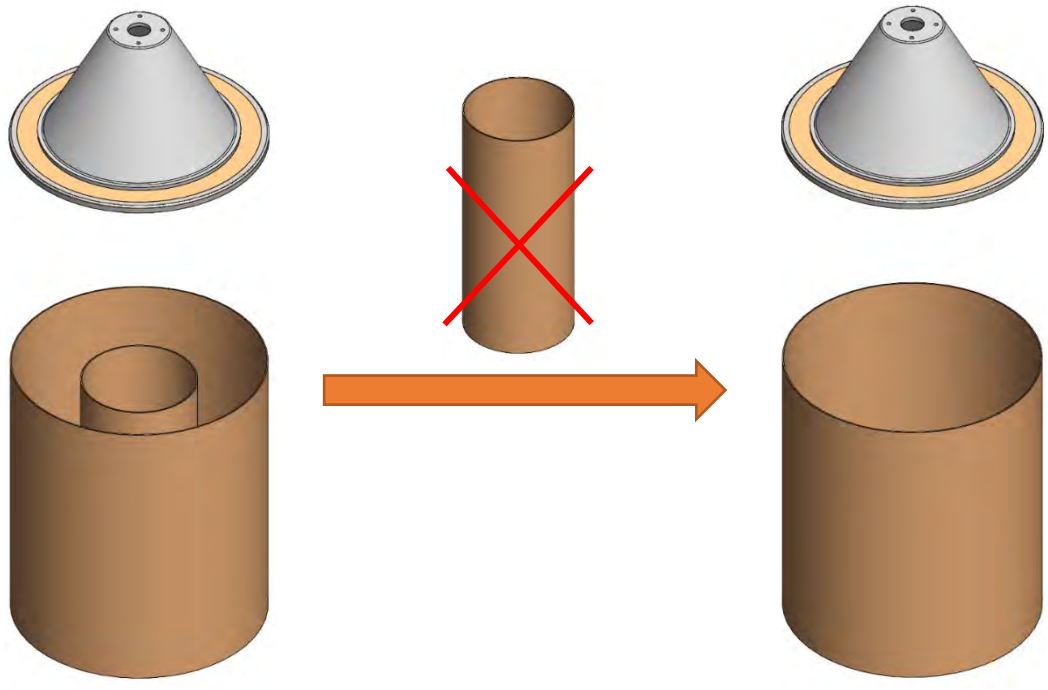

Figure 5

Depending on the model,the Twister can rotate in two different direction (clockwise or anti-clockwise) In order to function correctly, it must always rotate in the same unwinding (pay-out) rotation of the wire. When ordering your Twister, always specify the unwinding direction of the wire. See chapter 4.1.

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3.2 MOUNTING THE TWISTER ON THE DRUM / BULK PACK HOOD

The Twister is mounted and locked on the dome by fastening 4x M10 nuts.

To facilitate the drilling on the upper part of the hood, an aluminum template is supplied with the device with the exact holes which must be drilled on the plastic dome.

Tools: • Drill and bit ø11[mm].
• Open end wrench with 17[mm] hexagonal mouth

The operations to be carried out in sequence are:

1. Position the supplied template on the upper end of the dome, making sure that it is placed in a central position with respect to the hole of the hood. Figures 6 and 7;

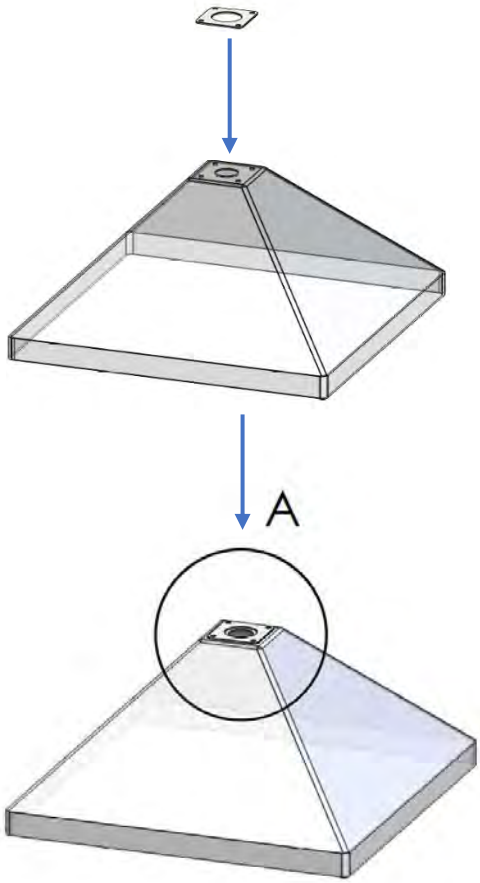

Figure 6

Figure 7

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2. Drill the dome carefully matching the diameters shown in figure 8;

The central hole no.5 (figure 8) of the hood must be drilled or cut respecting the indicated diameter (min 45 max 60 mm). Drilling a hole with a smaller diameter than the one shown below can compromise the functioning of the device, as it could prevent the free rotation of the plastic core where the wire enters the twister. Figure 11.

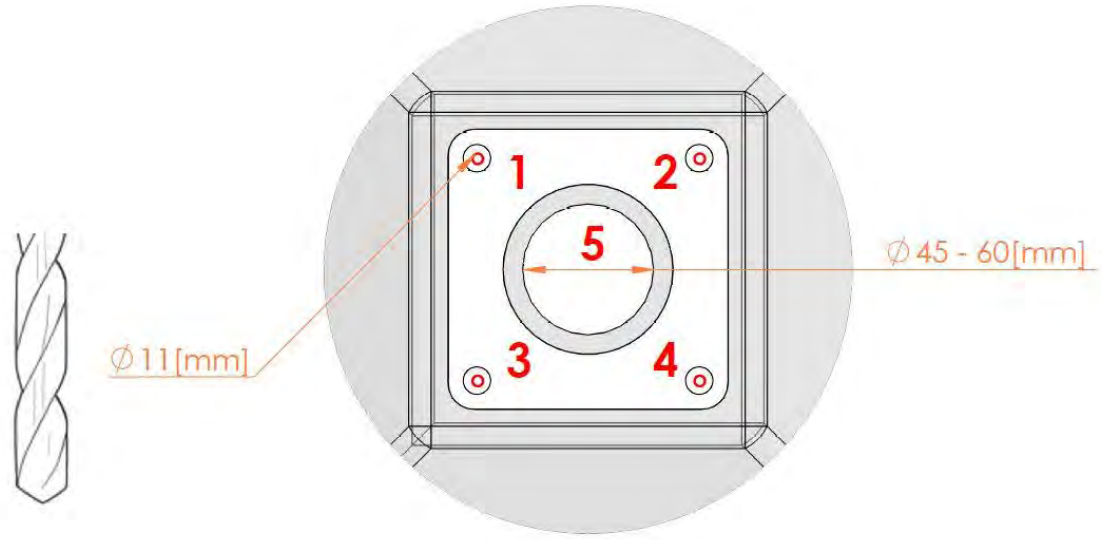

Figure 8

3. Unscrew the 4 nuts and remove the 4 washers that you will find pre-assembled on the Twister. Figure 9.

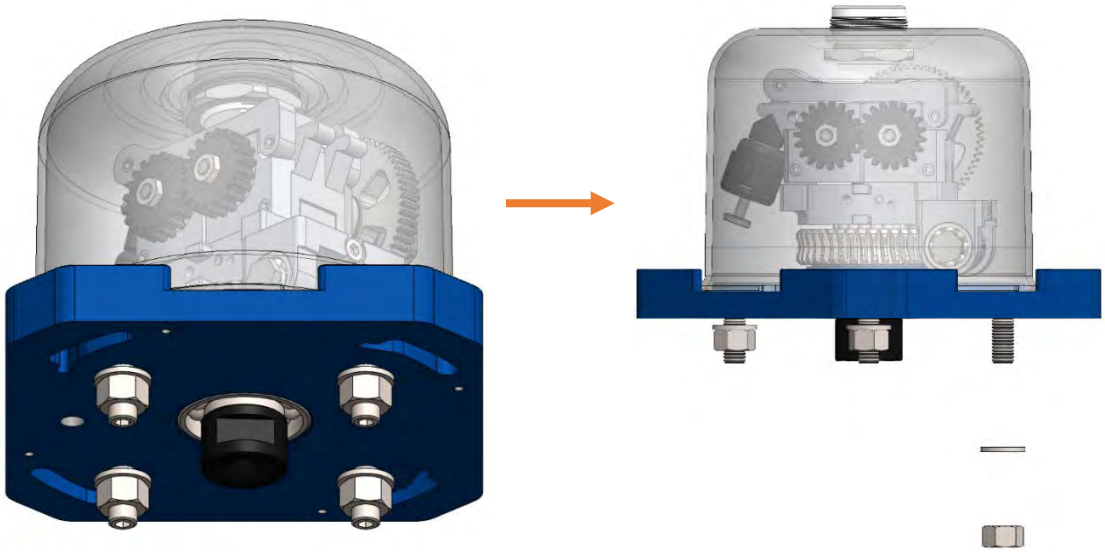

Figure 9

4. Place the Twister on the upper end of the hood making sure that the grains present on the base of the Twister are inserted into the appropriate holes. Figure 10;

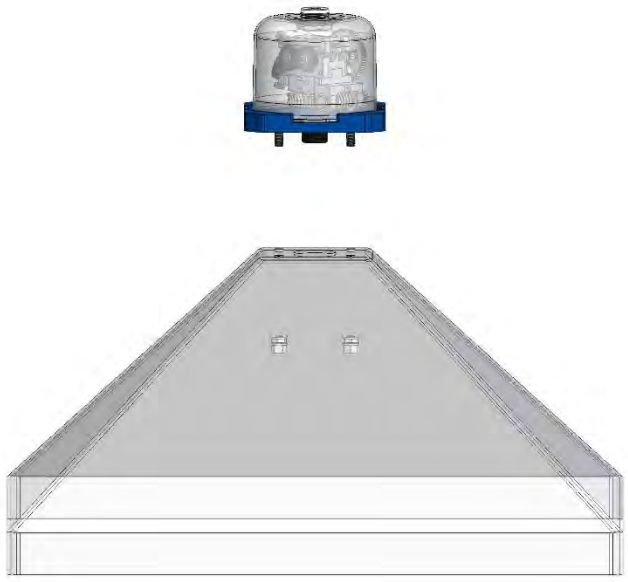

Figura 10

5. Finally, fix the Twister by tightening the nuts back and making sure that the washers are correctly positioned. Figure 11.

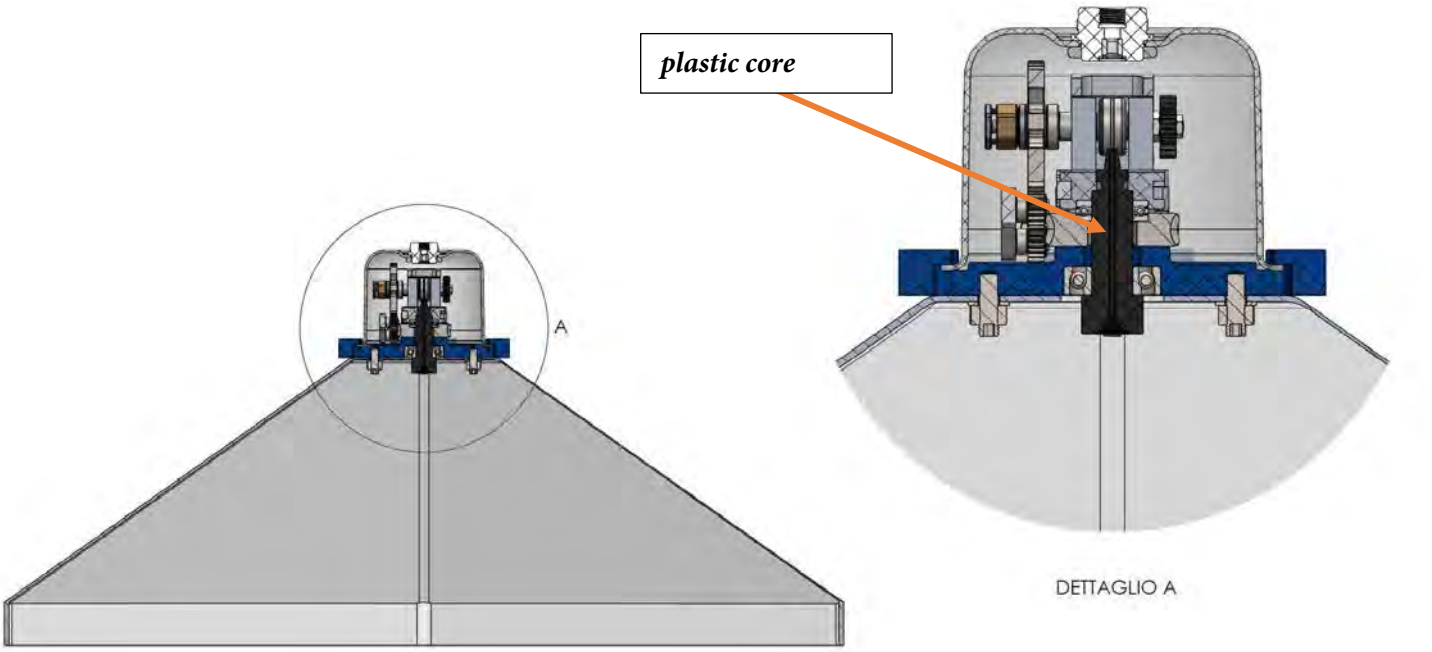

Figure 11

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3.3 REMOVING THE COVER TOP

It is absolutely forbidden to operate the Twister if the cover top is not correctly positioned.

Cover removal should be done when the Twister is completely stopped.

To remove the protection, simply:

1. Rotate the plastic cover top anticlockwise, until the stop tab disengages from the locking tooth. Figure 12 and 13

Figure 12

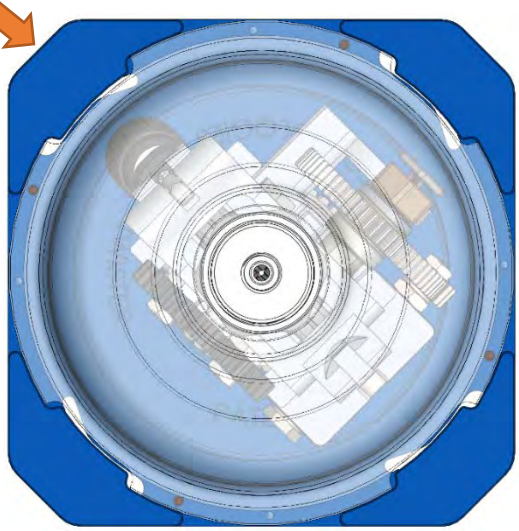

Figure 13

2. Lift the cover. Figure 14;

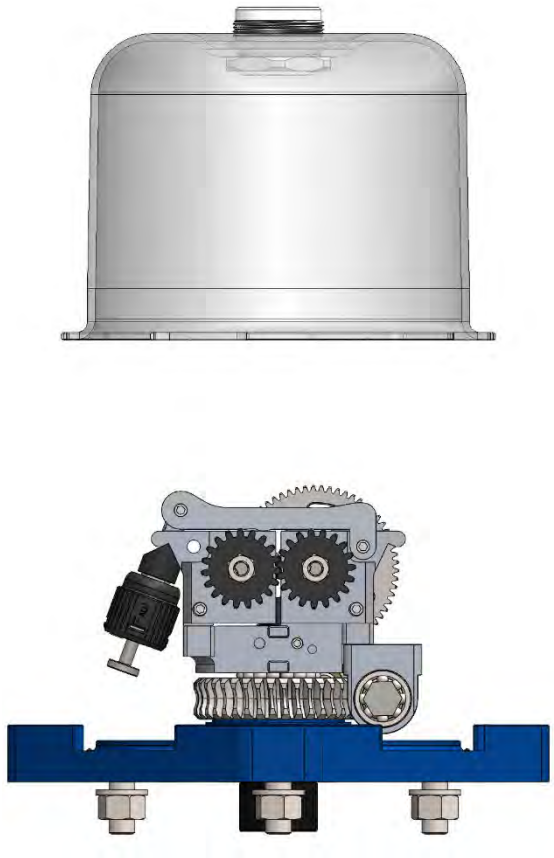

Figura 14

3. To reposition the cover, simply reverse the process: place the cover in its seat and rotate the cover clockwise until it locks.

3.4 INSERTING THE WIRE

This operation must be carried out after the Twister has been mounted on the hood of the pack containing the twist-free wound welding wire; it consists in threading the wire through the device.

1. Remove the cover as explained in the previous chapter. Figure 15;

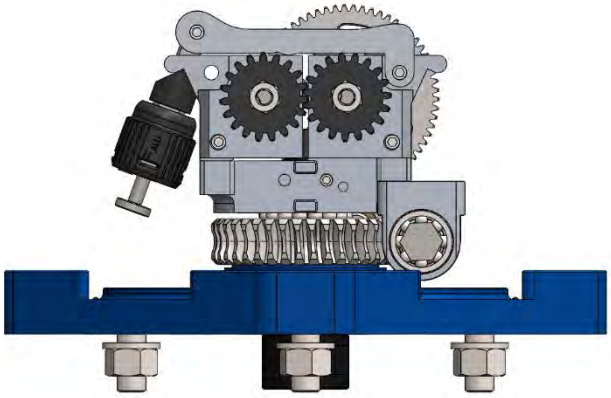

Figure 15

2. Unscrew the pressure knob located on the side of the Twister. Figure 16;

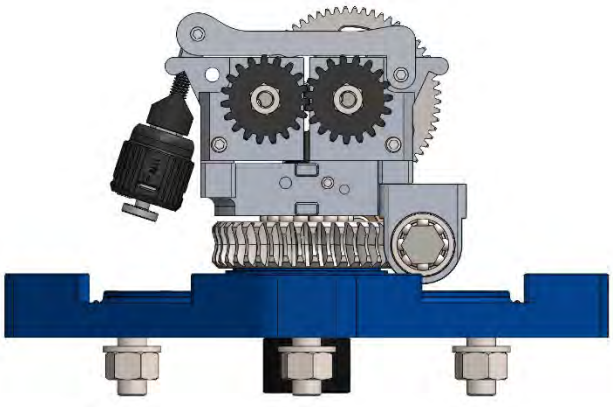

Figure 16

3. Lift the closing lever in order to open the twister wheels and rest the knob in its seat. Figure 17;

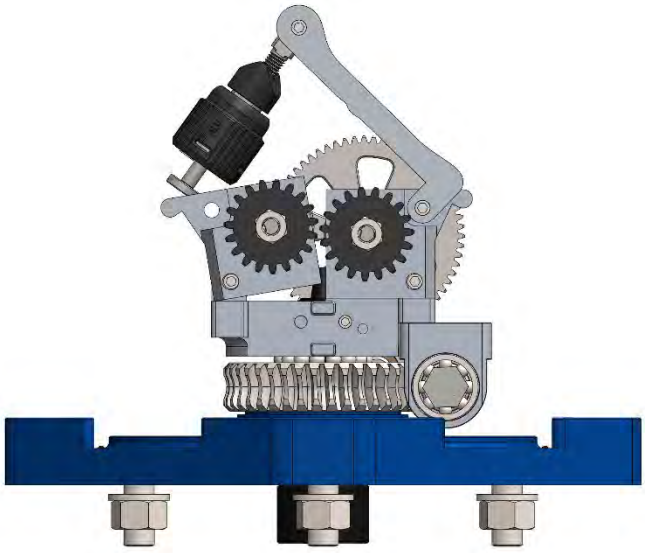

Figure 17

4. It is now possible to thread the welding wire through the Twister and feed it through the hole of the plastic core located in the lower part, until it exits on the opposite end, as shown in figures 18 and 19;

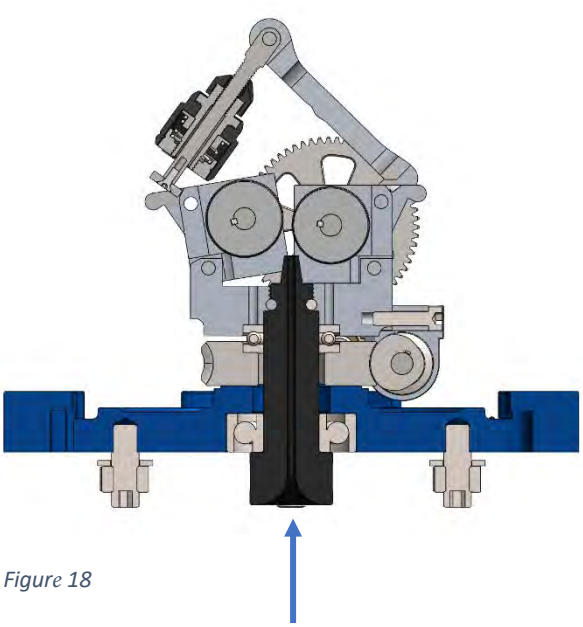

Figure 18

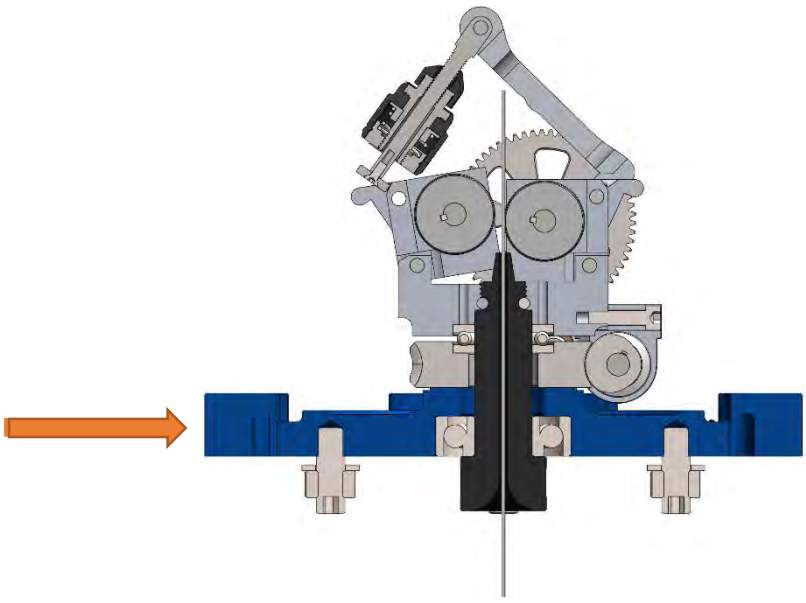

Figure 19

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5. Ensure that the wire is positioned inside the "U" shaped grooves of the contact wheels, return the knob to its original position and turn it until the torque limiting clutch is engaged as shown on Figure 20;

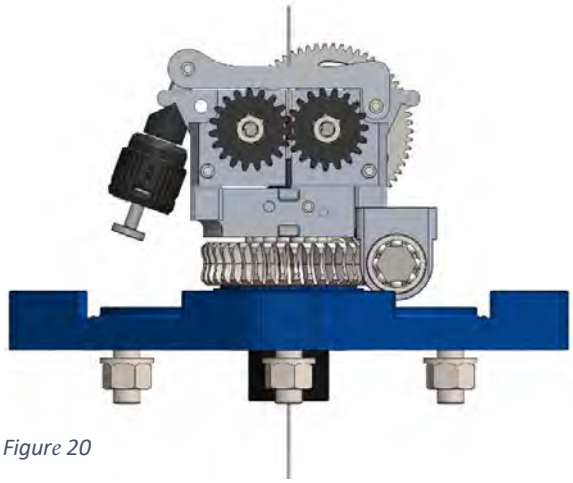

Figure 20

6. Now pull the welding wire until it exits at the top by at least 70-80[mm];

7. Position the cover as described in the previous paragraph, being careful to feed the wire through the top cover opening. Figure 21;

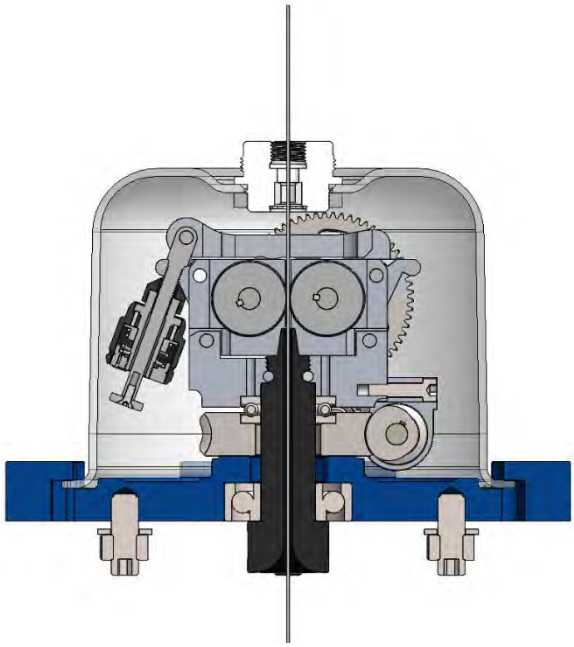

Figure 21

8. Gently pull the wire upward, to ensure that it feeds smoothly and without jerks. If this is not the case, verify and repeat the procedures making sure they are carried out as described in this manual. Should the problem persist, an excessively high pressure adjustment could be the root cause and it will become necessary to readjust the knob torque limiter. See chapter 3.5.

3.5 ADJUSTING THE WHEEL PRESSURE CONTROL KNOB

The pressure knob controls the pressure applied while pushing the two contact wheels one against another and through the built-in torque limiter it prevents, through a correct adjustment, an excessive pressure on the passing welding wire.
The torque limiter requires different adjustments depending on the type of welding wire, its diameter and its columnar strength.
To simplify this operation, the knob has 4 adjustment levels:

ALU I	Aluminum wires with diameter 1.20
ALU II	Aluminum wires with diameter 1.60
STEEL III	Carbon Steel and Flux cored wires
STEEL IIII	Inconnel or stainless steel wires

Tools required:

- TORX screwdriver.
- Compass wrench.
- Open end wrench with 9[mm] hexagonal mouth.
- Allen key, with 2[mm] hexagon.

Knob adjustment steps:

1. Remove the cover lid and loosen the knob.
2. Place the knob in a vertical position, in such a way as to prevent it from falling, and using a male hexagonal wrench, loosen the screw and remove the anti-fall lock from the knob. Figure 22;

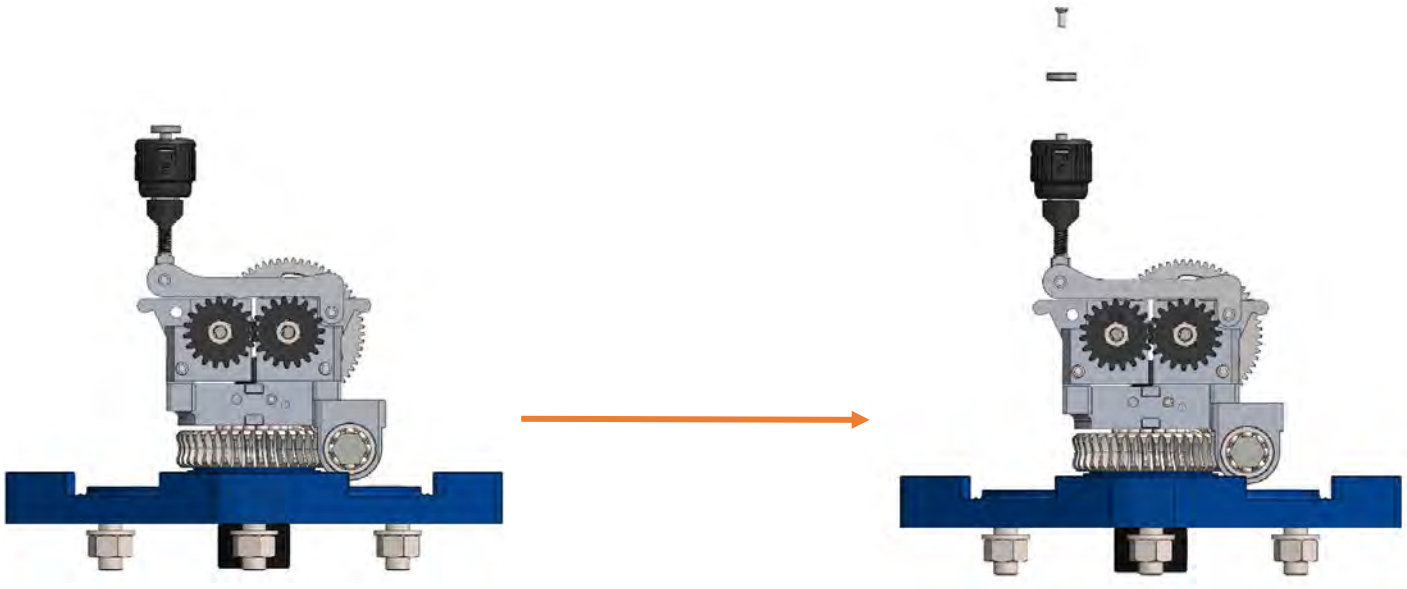

Figure 22

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3. Pull the knob off its shaft;
4. Loosen the locking screw located on the upper part of the knob, highlighted with an orange circle in figure 23, using the TORX screwdriver. (**There is no need to remove the screw**);

Figura 23

5. The cursor has a central green depression, while the knob has 4 openings arranged in a circular way at different heights, marked with the words described in the above table. The adjustment consists in positioning the green line of the cursor in the center of the opening corresponding to the desired type of wire. Figures 24 and 25;

Figure 24

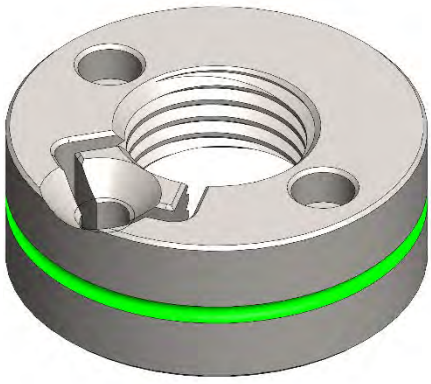

Figure 25

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6. To proceed with the adjustment it is necessary to combine the use of the compass spanner and the open spanner. Pull upward the external knob cover, insert the fork spanner and also the compass spanner in the appropriate cursor holes. While holding the fork wrench still, turn the compass wrench to adjusts the cursor at the desired height. Figure 26-27;

Figure 26

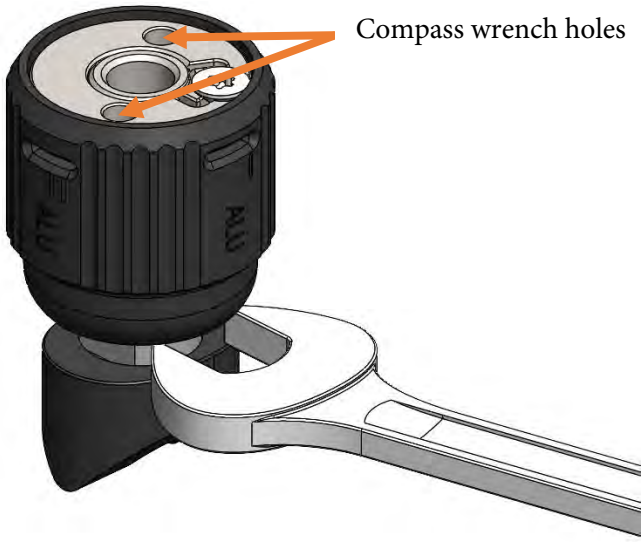

Figure 27

7. Once the cursor has been adjusted to the desired position, tighten the locking screw.

Pressure adjusting criteria:

The action of the Twister should never alter the shape of the wire, nor damage its surface.

An incorrect adjustment for the type of wire in use:

- Could negatively impact the performance of the device. With an excessively low torque adjustment, the force exerted on the wire could not be sufficient to activate the Twister wire counter-torsioning function, while on the contrary if the pressure exerted on the wire by the pushing wheels is too high, a wire dragging force is generated and it could affect the wire feeding or excessive resistance to the pulling force of the front feeder.
- If the force exerted on the wire is too high, it might damage its surface and shape.

To verify that the pressure adjustment is adequate:

1. Make sure that the wire runs through the Twister smoothly and without jerks.
2. Verify that the wire surface does have any shavings or scratches after it has passed through the Twister wheels.
3. Cut 1[m] of welding wire, pass it through the Twister wheels and compare its curvature with 1[m] of welding wire taken directly from the pack, by laying both next to one another on a flat surface. There should be no difference between the two pieces of wire.

Should one of the above situations occur, it will indicate that the pressure exerted on the wire is too high, and it is therefore necessary to set the knob on a lower notch position.

Attention: an incorrect adjustment can seriously compromise the device functions and performance

3.6 CHANGING THE DIRECTION OF ROTATION

The twister must always rotate in the same pay-out direction of the welding wire
some wires unwind from the drum in a clockwise direction, others in the anti-clockwise direction. Please verify this information before ordering a new twister.

IThe change of direction of rotation of the Twister can be done by replacing the rotation module.

- 1401.200-003 → Clockwise rotation Module. Fig.28.

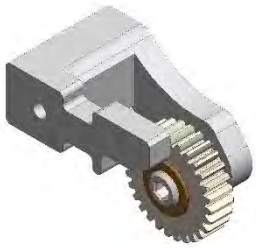

Figure 28

- 1401.200-009 → Anti-clockwise rotation Module. Fig.29.

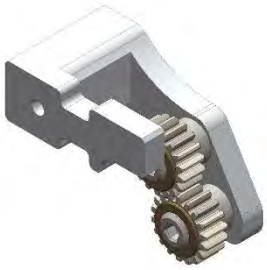

Figure 29

Tool required:

- Allen key, with 3[mm] hexagon shape

Module change steps:

1. Make sure the Twister is completely stopped and remove the plastic cover;

2. Using the hexagonal key, unfasten and extract the module locking screw, carefully avoiding to drop it. Figure 30;

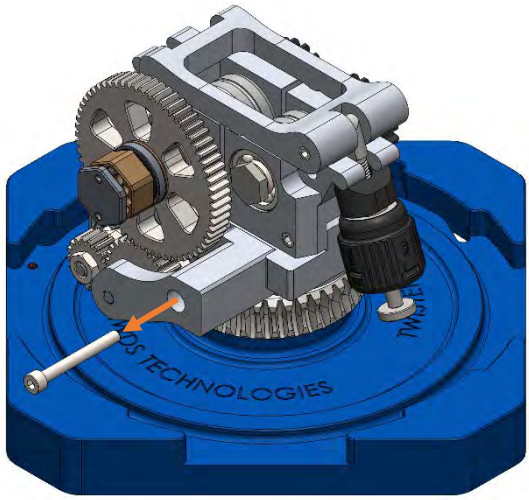

Figure 30

3. Remove the rotation module to be replaced. See figure 31;

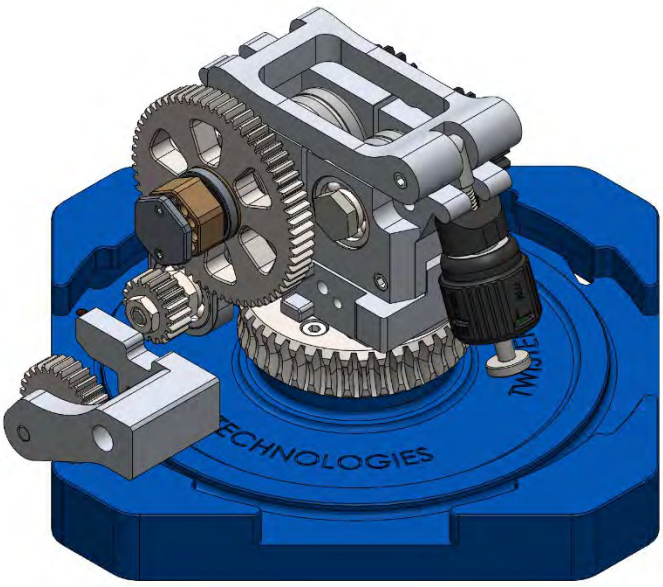

Figure 31

4. Insert the desired rotation module and fasten the module locking screw.

4 CONFIGURATIONS

4.1 POSSIBLE CONFIGURATIONS

The configurations vary according to the welding wire diameter and the rotation direction required.

- **Versions for wire diameter 1,0[mm]**

AWDS PART #	DESCRIPTION
1401.100-010	Twister for wire diameter 1.0[mm], components for clockwise rotation
1401.100-110	Twister for wire diameter 1.0[mm], components for anti-clockwise rotation

- **Versions for wire diameter 1,2[mm]**

AWDS PART #	DESCRIPTION
1401.100-012	Twister for wire diameter 1.2[mm], components for clockwise rotation
1401.100-112	Twister for wire diameter 1.2[mm], components for anti-clockwise rotation

- **Versions for wire diameter 1,6[mm]**

AWDS PART #	DESCRIPTION
1401.100-016	Twister for wire diameter 1.6[mm], components for clockwise rotation
1401.100-116	Twister for wire diameter 1.6[mm], components for anti-clockwise rotation

4.1 CHOOSING THE RIGHT TWISTER

The choice of the correct device depends on the variables below:

- the welding wire diameter;
- the unwinding direction of the wire while it is being paid out from the drum;

Welding wire diameter

The available models available currently support the following wire diameters:

- 1.00 [mm] - 0.040 [in]
- 1.20 [mm] - 0.047 [in]
- 1.60 [mm] - 0.062 [in]

Rotating direction

The Twister rotation (clockwise or anti-clockwise) must always match the unwinding direction of the wire while it is being paid out from the drum.

Unwinding wire direction during use	Twister rotation Module
clockwise	clockwise
anti-clockwise	anti-clockwise

Warning: if the two above parameters (diameter and rotating direction) are not correct, the Twister will be totally useless.

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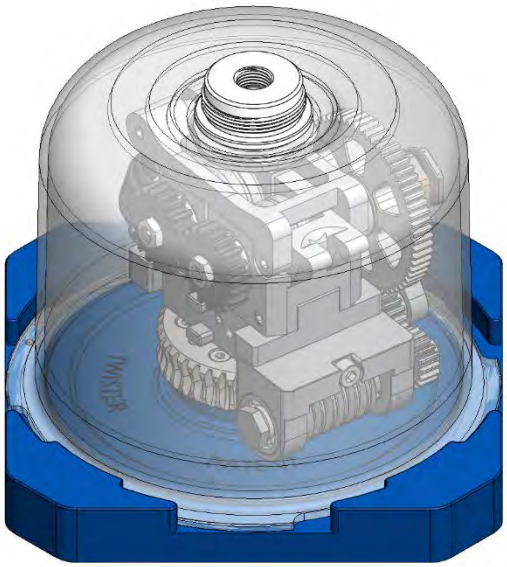
Basic Configuration



In the basic configuration the Twister plastic cover is equipped with a 1/4" male thread reduction which allows the subsequent connection of various conduit adapters. Figures 32 and 33.

Figure 32

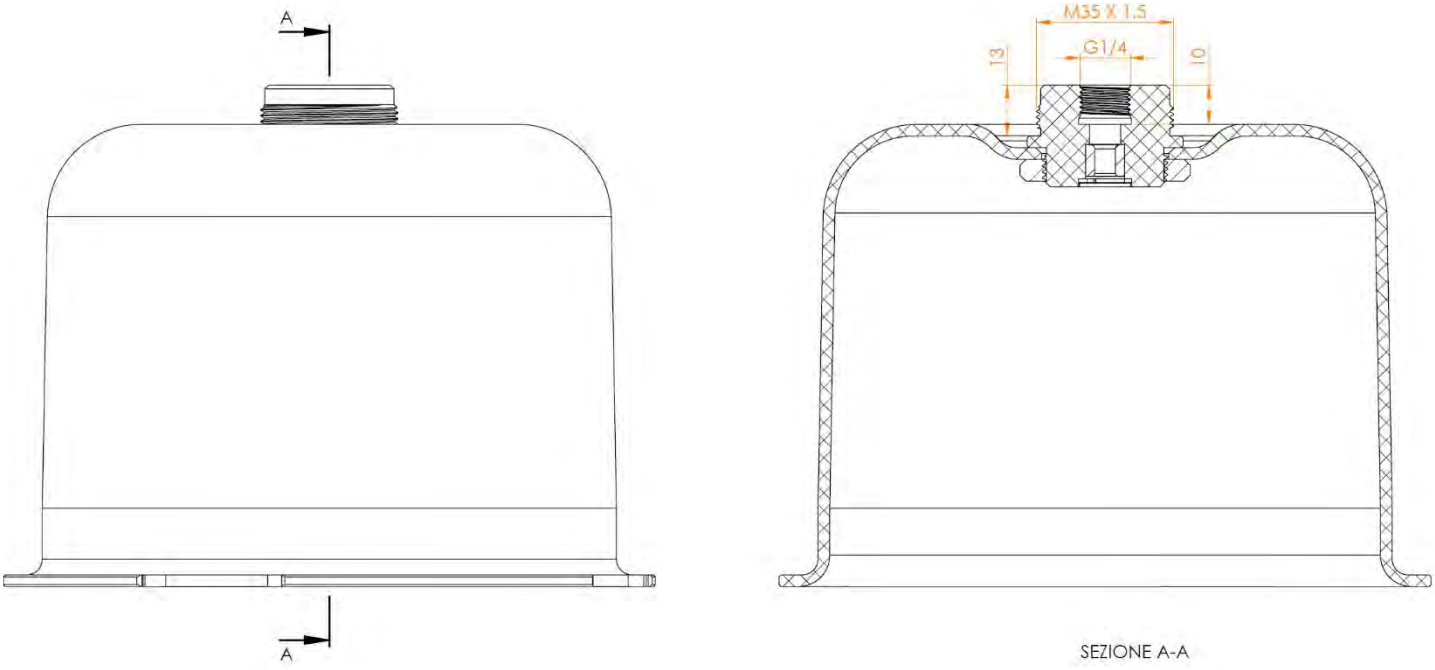


Figure 33

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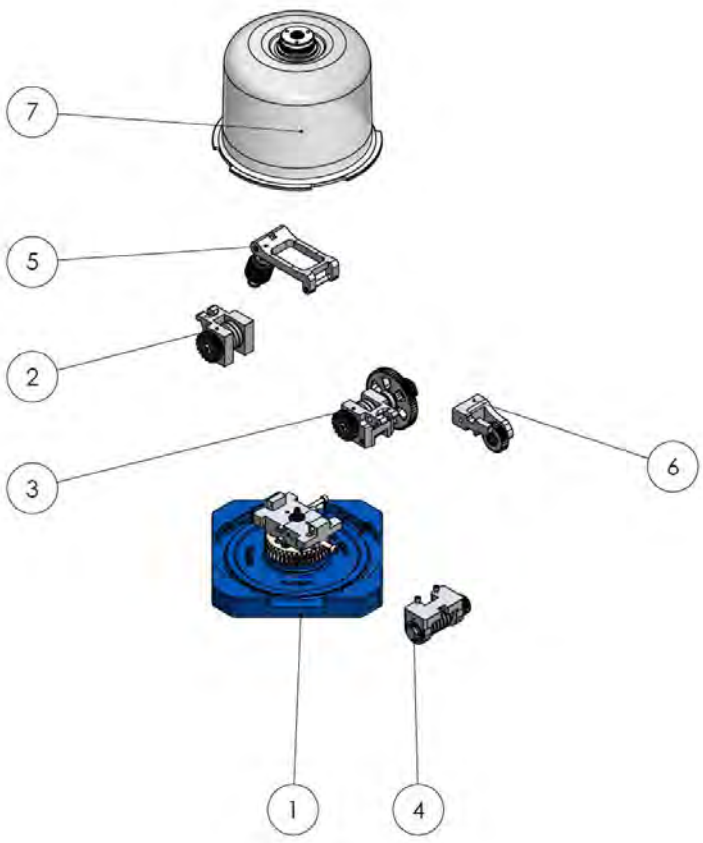
4.3 COMPONENTS CONFIGURATIONS

- 1401.100-010



ITEM NO.	PART NUMBER	DESCRIPTION	MASS[gr]	QTY.
1	1401.200-001	Base support and rotating body	1135	1
2	1401.200-005	Support for the passive wheel for wire dia. 1,00[mm]	192,4	1
3	1401.200-002	Support for active wheel for wire dia 1.00[mm]	294,2	1
4	1401.200-010	Worm screw support	128,3	1
5	1401.200-011	Closing lever with torque limiter	112,5	1
6	1401.200-008	Module for clockwise rotation	61,65	1
7	1401.200-012	Cover without fittings	283,4	1

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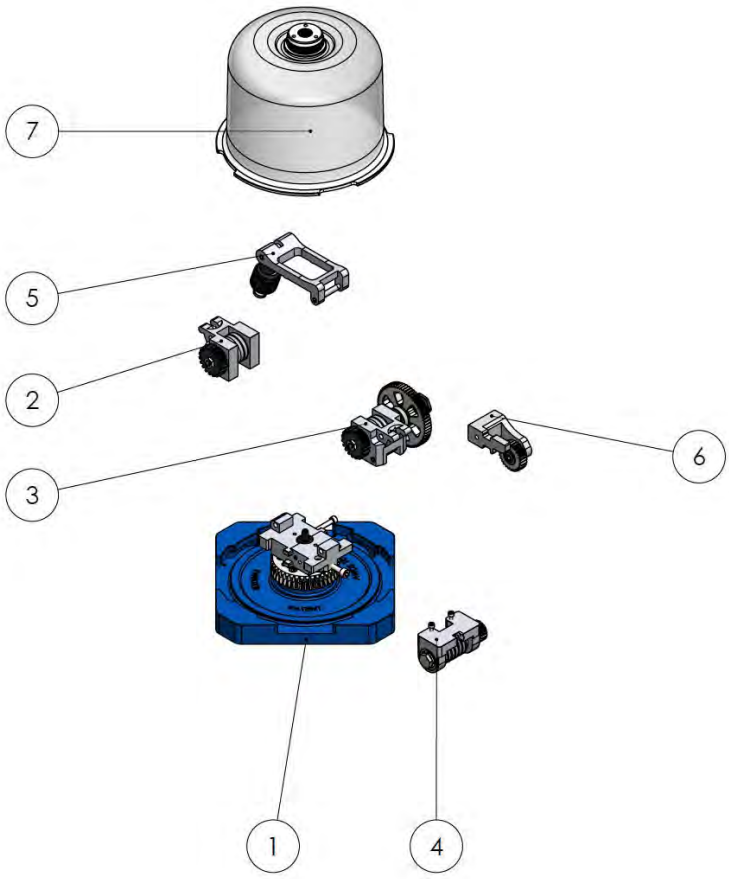
- 1401.100-012



ITEM NO.	PART NUMBER	DESCRIPTION	MASS[gr]	QTY.
1	1401.200-001	Base support and rotating body	1135	1
2	1401.200-006	Support for the passive wheel for wire dia. 1,20mm]	191,5	1
3	1401.200-003	Support for active wheel for wire dia 1.20[mm]	293,4	1
4	1401.200-010	Worm screw support	128,3	1
5	1401.200-011	Closing lever with torque limiter	112,5	1
6	1401.200-008	Module for clockwise rotation	61,65	1
7	1401.200-012	Cover without fittings	283,4	1

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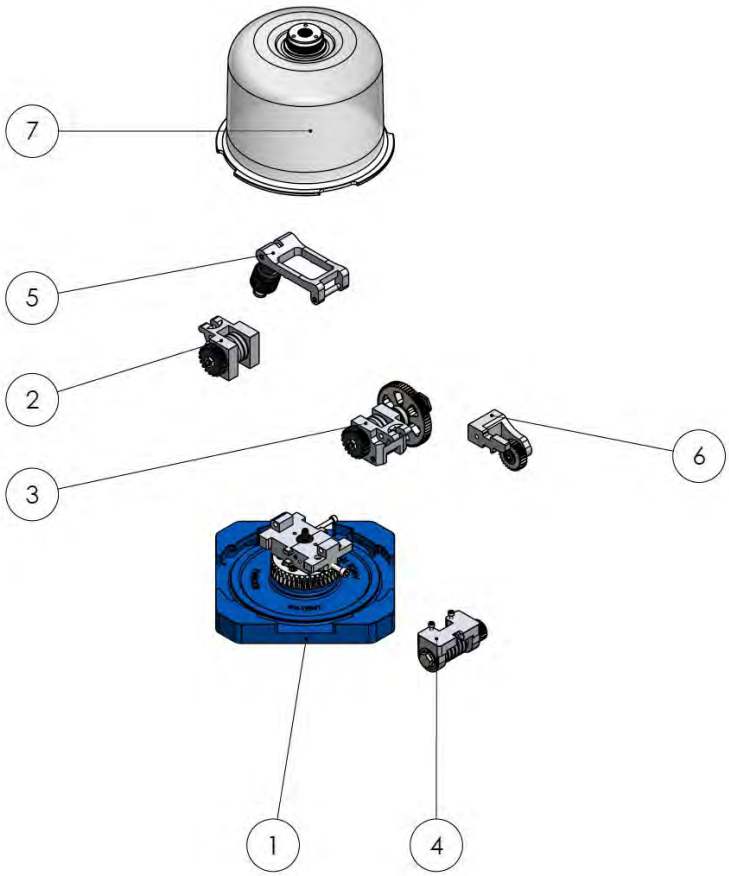
- 1401.100-016



ITEM NO.	PART NUMBER	DESCRIPTION	MASSA[gr]	QTY.
1	1401.200-001	Base support and rotating body	1135	1
2	1401.200-007	Support for the passive wheel for wire dia. 1,60[mm]	191,1	1
3	1401.200-004	Support for active wheel for wire dia 1.60[mm]	293	1
4	1401.200-010	Worm screw support	128,3	1
5	1401.200-011	Closing lever with torque limiter	112,5	1
6	1401.200-008	Module for clockwise rotation	61,65	1
7	1401.200-012	Cover without fittings	283,4	1

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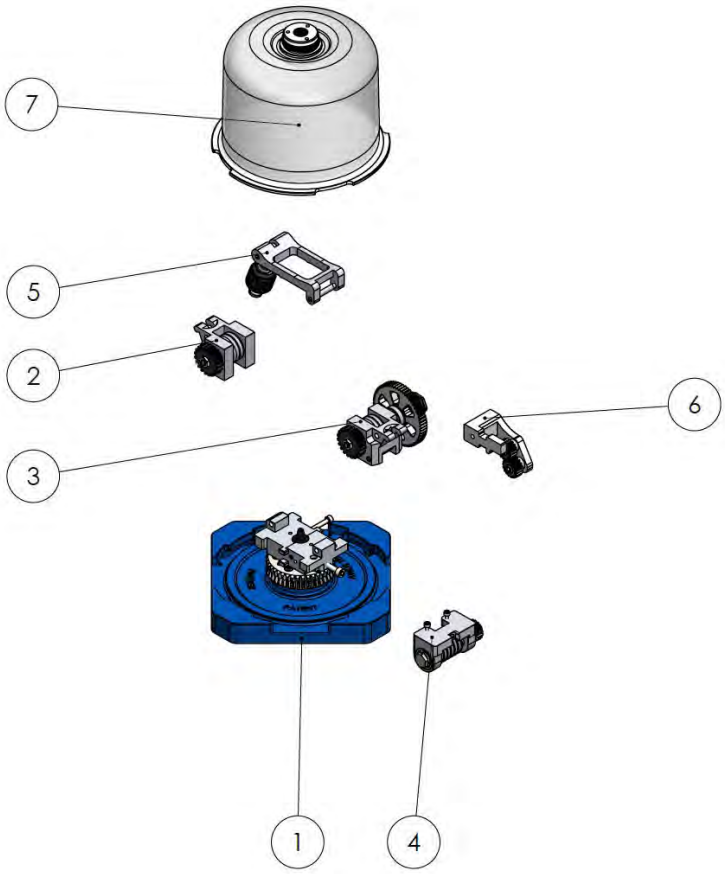
- 1401.100-110



ITEM NO.	PART NUMBER	DESCRIPTION	MASS[gr]	QTY.
1	1401.200-001	Base support and rotating body	1135	1
2	1401.200-005	Support for the passive wheel for wire dia. 1,00[mm]	192,4	1
3	1401.200-002	Support for active wheel for wire dia 1.00[mm]	294,2	1
4	1401.200-010	Worm screw support	128,3	1
5	1401.200-011	Closing lever with torque limiter	112,5	1
6	1401.200-009	Module for anti-clockwise rotation	78,5	1
7	1401.200-012	Cover without fittings	283,4	1

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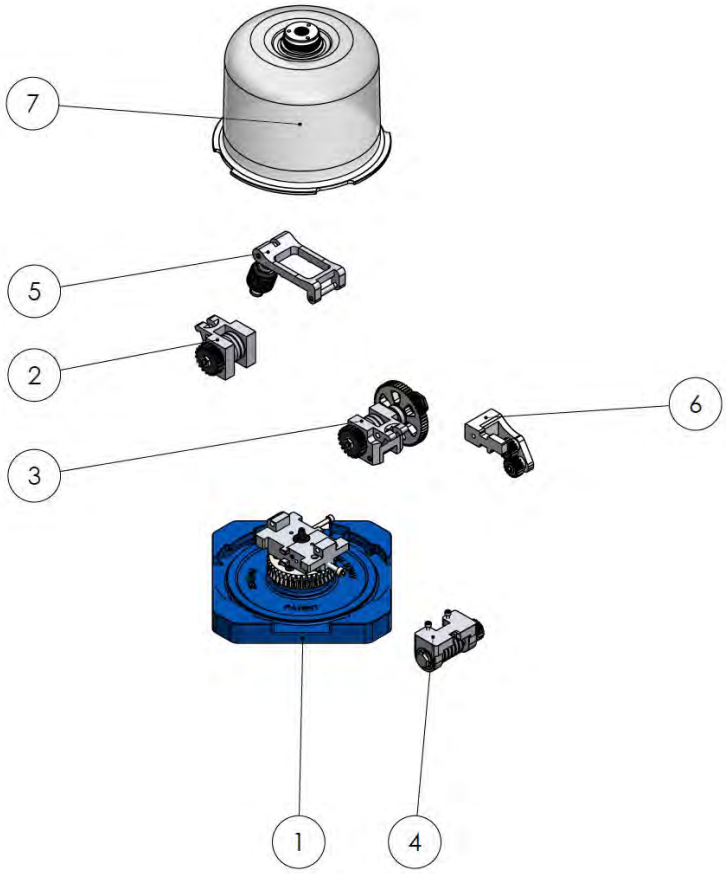
- 1401.100-112



ITEM NO.	PART NUMBER	DESCRIPTION	MASS[gr]	QTY.
1	1401.200-001	Base support and rotating body	1135	1
2	1401.200-006	Support for the passive wheel for wire dia. 1,20[mm]	191,5	1
3	1401.200-003	Support for active wheel for wire dia 1.20[mm]	293,4	1
4	1401.200-010	Worm screw support	128,3	1
5	1401.200-011	Closing lever with torque limiter	112,5	1
6	1401.200-009	Module for anti-clockwise rotation	78,5	1
7	1401.200-012	Cover without fittings	283,4	1

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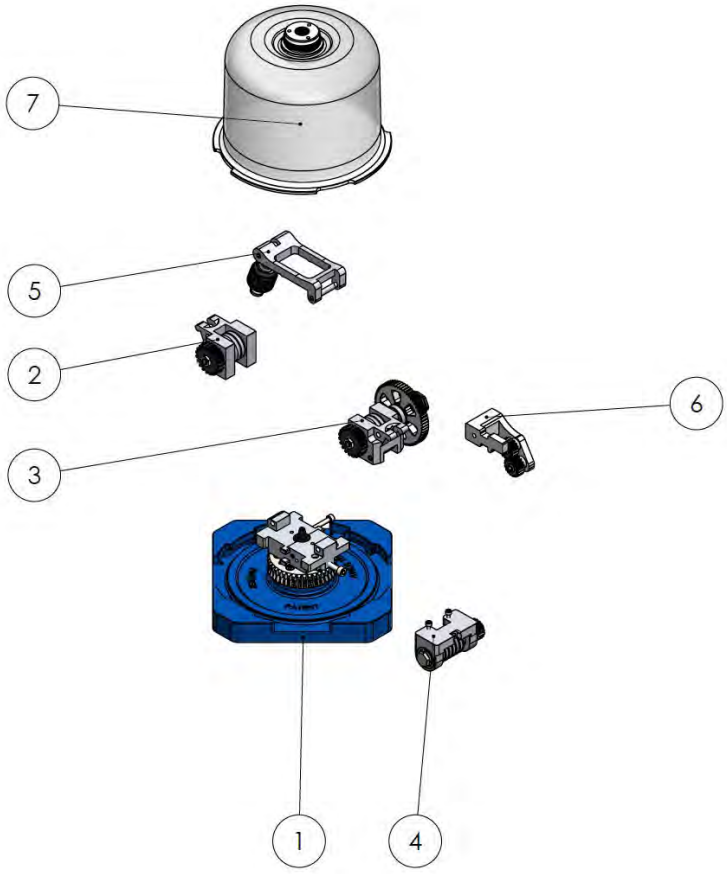
- 1401.100-116



ITEM NO.	PART NUMBER	DESCRIPTION	MASS[gr]	QTY.
1	1401.200-001	Base support and rotating body	1135	1
2	1401.200-007	Support for the passive wheel for wire dia. 1,60[mm]	191,1	1
3	1401.200-004	Support for active wheel for wire dia 1.60[mm]	293	1
4	1401.200-010	Worm screw support	128,3	1
5	1401.200-011	Closing lever with torque limiter	112,5	1
6	1401.200-009	Module for anti-clockwise rotation	78,5	1
7	1401.200-012	Cover without fittings	283,4	1

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4.4 PLASTIC COVER ACCESSORIES AND FITTINGS FOR CONNECTION TO THE WIRE FEEDING SYSTEM (CONDUIT)

Depending on the type of connection, the following accessories are available:

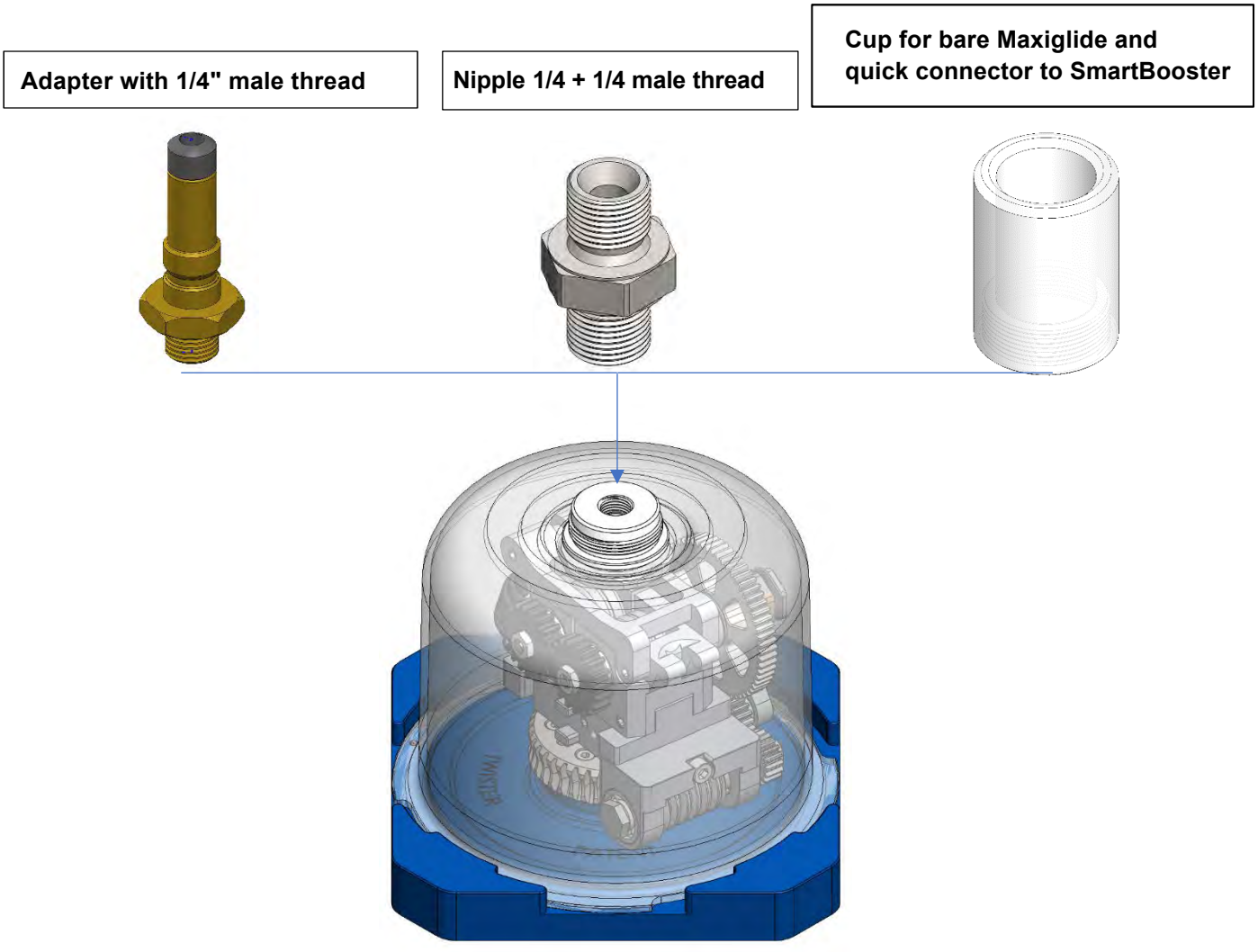

Figure 34

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Accessories' Part Numbers:

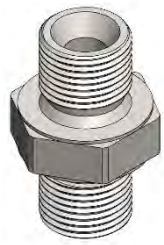

Figure 35

PART NUMBER	DESCRIPTION
1401.500-056	Nipple 1/4" + 1/4" male thread

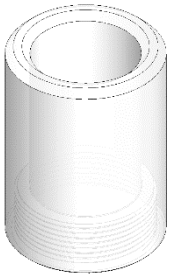

Figure 36

PART NUMBER	DESCRIPTION
1401.500-051	Cup for bare Maxiglide and quick connector to SmartBooster

Figure 37

PART NUMBER	DESCRIPTION
601.082	Fitting 1/4" male thread for Maxiglide quick connectors

4.5 EXAMPLE OF POSSIBLE APPLICATIONS FOR ACCESSORIES

Part Number 1401.500-051

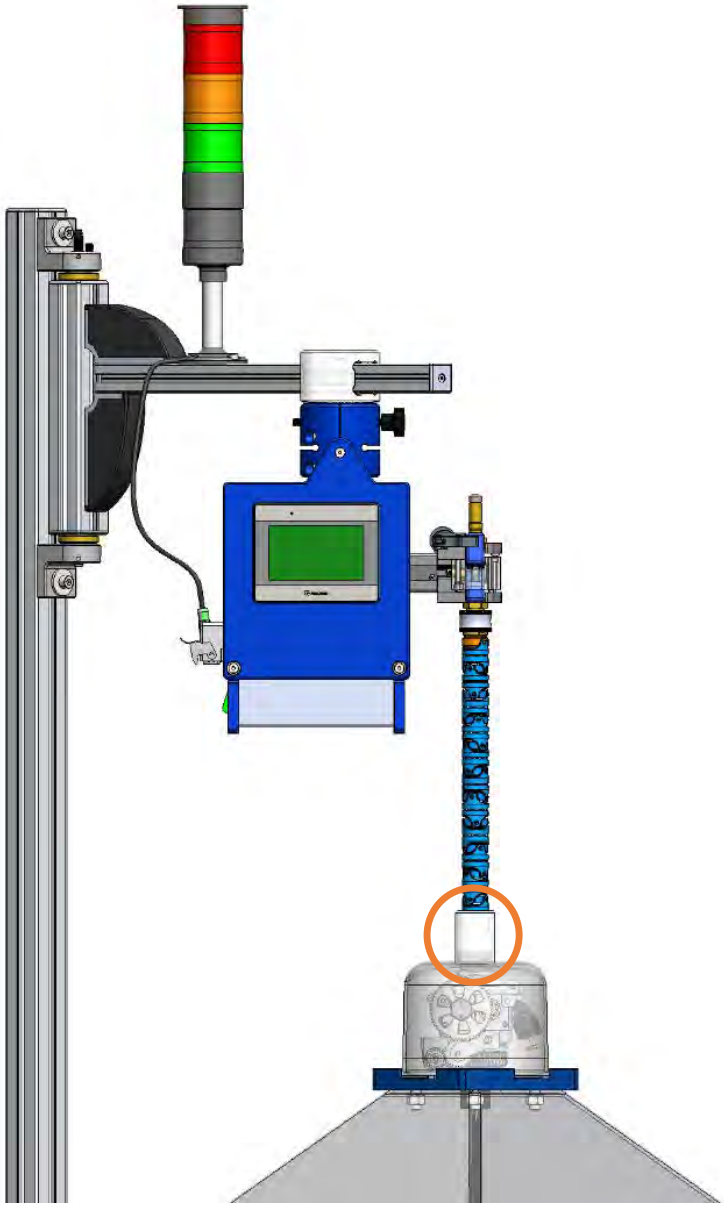

Figure 38

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4.5 EXAMPLE OF POSSIBLE APPLICATIONS FOR ACCESSORIES

Part Number 601.082

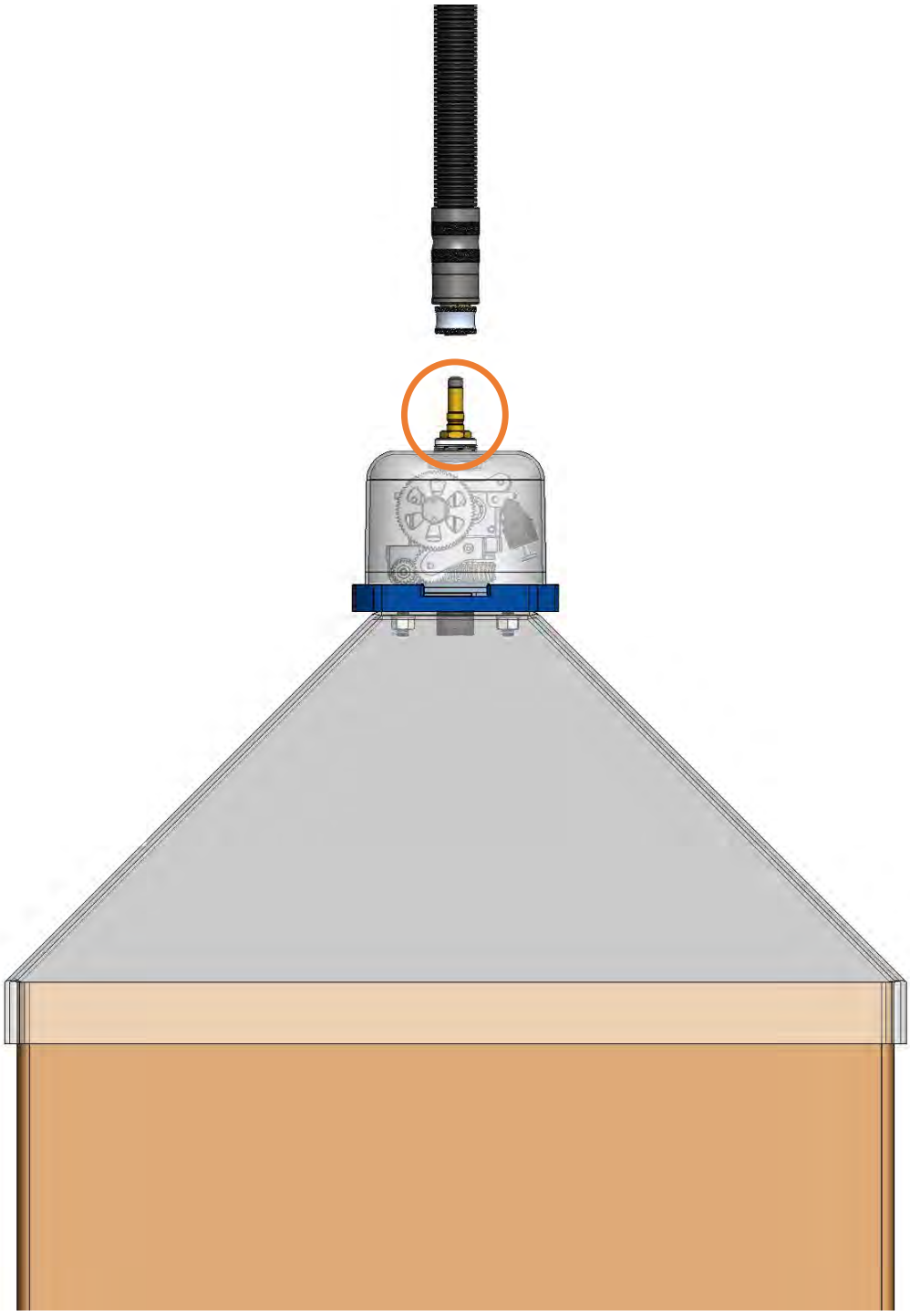

Figure 39

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4.5 EXAMPLE OF POSSIBLE APPLICATIONS FOR ACCESSORIES

Part Number 1401.500-056

Figure 40

5 MAINTENANCE

5.1 ORDINARY MAINTENANCE

This paragraph has the purpose of illustrating the main Twister control and maintenance procedures. Maintenance and repairs must be done by specialized personnel.

Type of intervention			
	Daily Frequency	Weekly Frequency	Every 2 Months
General visual check	•		
Labels readability check	•		
Cleaning		•	
Gears' wear check			•
Wheel grooves wear check			•

- **General visual inspection:** check the general condition of the device, specially look for loose screws or damaged parts.

• **Labels readability check:** check that the plate on the Twister is perfectly legible.

• **General cleaning:** blow away accumulations of dust or dirt using compressed air.

• **Gears wear check:** check the wear of the Twister gears and, if damaged, promptly contact the Manufacturer for replacement parts.

• **Contact wheel grooves wear check:** check the state of wear of the contact wheels and their "U" shaped grooves; in the event of excessive wear or damage, replace them following the instructions contained in the manual.

5.2 REPLACEMENT OF THE WIRE CONTACTING WHEELS

The wire contact wheels must be replaced for the following reasons:

- when it becomes necessary to feed a wire with a different diameter.
- in case of excessive wear of the wheels "U" shaped grooves.

Available Part numbers

PART NUMBER	DESCRIPTION	QTY.
1401.500-010	Contact wheel for wire diameter 1.00[mm]	1
1401.500-012	Contact wheel for wire diameter 1.20[mm]	1
1401.500-016	Contact wheel for wire diameter 1.60[mm]	1

NOTICE: For the spare contact wheels it is necessary to replace 2 wheels for each Part Number

Figure 41

Tools:

- A fork wrench with a 10[mm] hexagonal mouth;
- Two fork wrenches with hexagonal mouth 13[mm] thickness <6[mm]

Wheels designation:

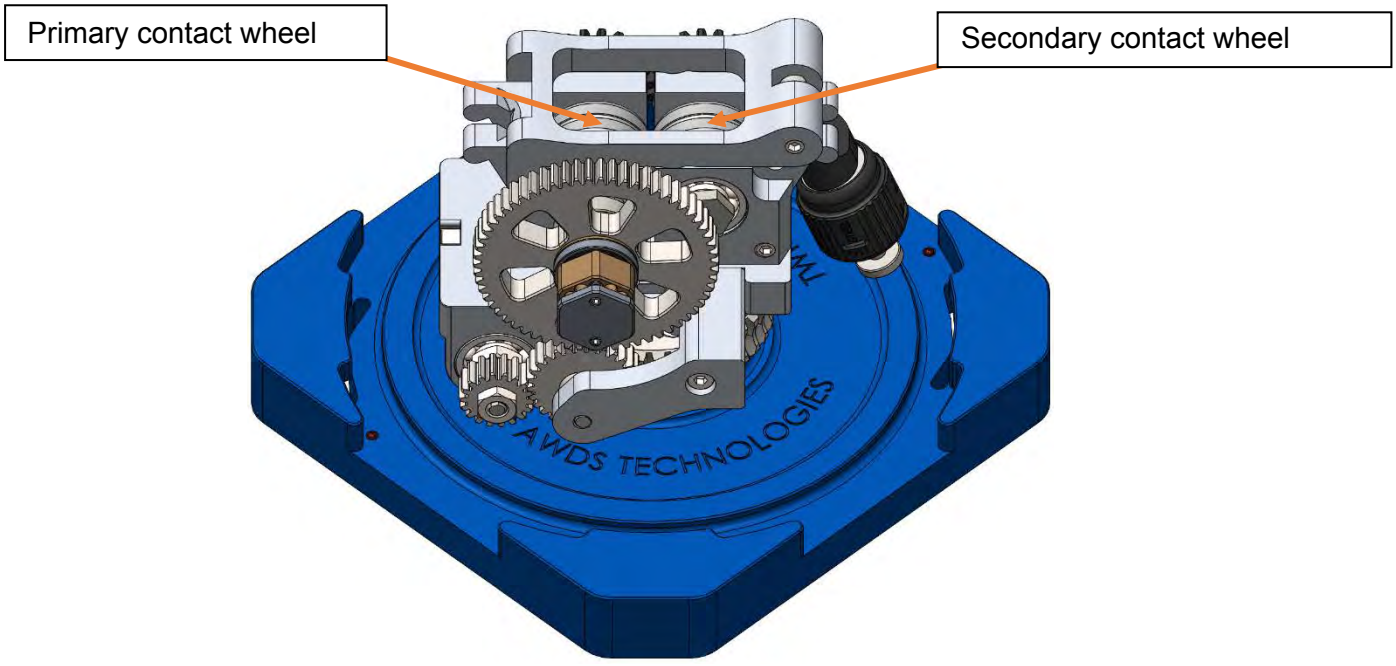

Figure 42

Procedure:

1. Remove both synchronizing wheels using the 10[mm] and 13[mm] open end hexagonal wrenches as shown in the figure.
Tip: Be careful not to lose the tabs of the two wheels during disassembly. Figures 43 and 44;

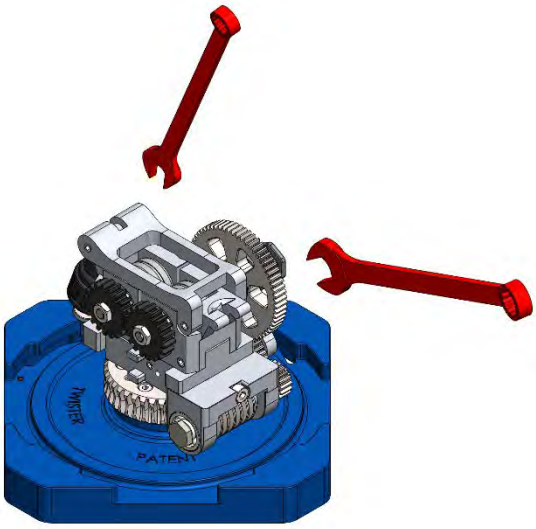

Figure 43

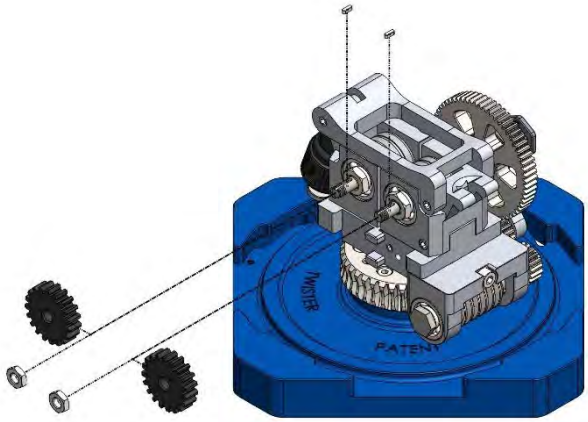

Figure 44

2. Using two 13[mm] open end wrenches, unscrew the M10 nut located on the primary contact wheel shaft as shown in the figure. Figures 45 and 46;

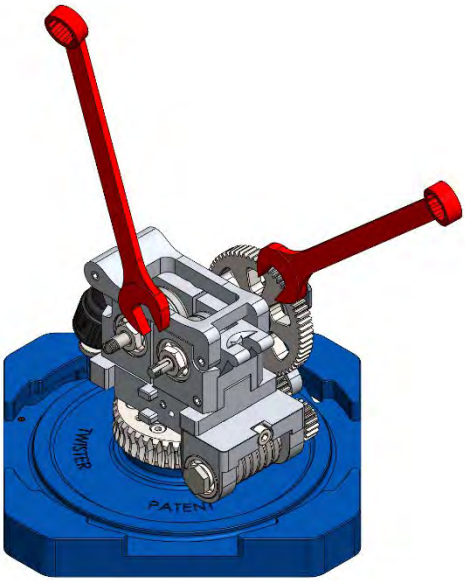

Figure 45

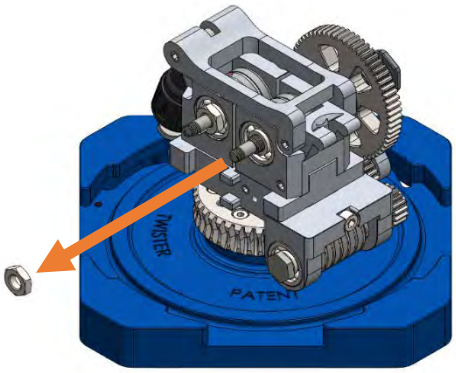

Figure 46

3. Extract the shaft longitudinally, possibly leaving the bearing, the spacer and the key in the appropriate seats. If not, reposition the elements on the shaft as shown in the figure. Once this operation has been carried out, remove the contact wheel. Figures 47 and 48;

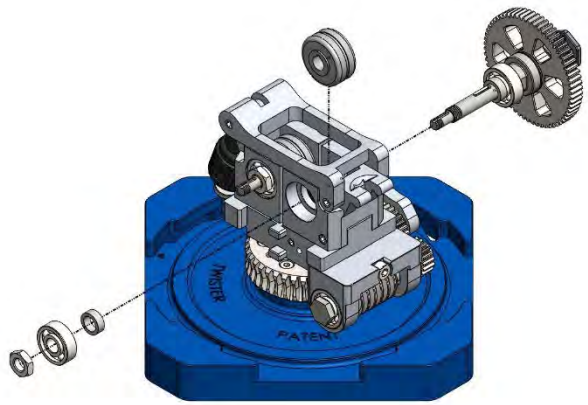

Figure 47

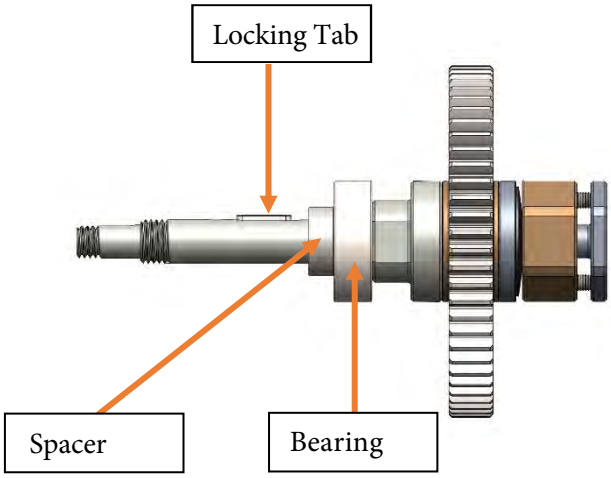

Figure 48

4. Similarly to what was done in step 2, unscrew the M10 nut located on the shaft of the secondary contact wheel as shown in the figure. Figures 49 and 50;

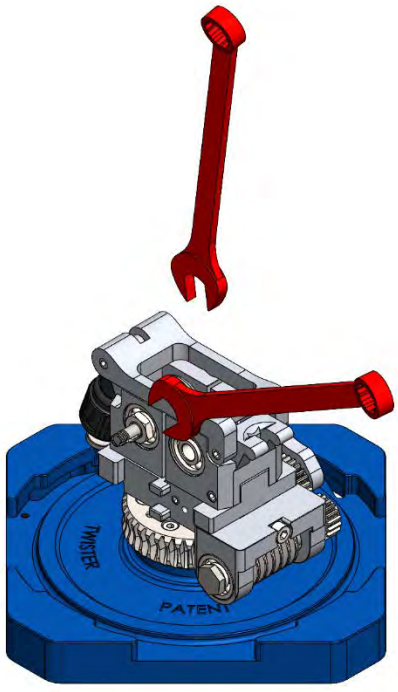

Figure 49

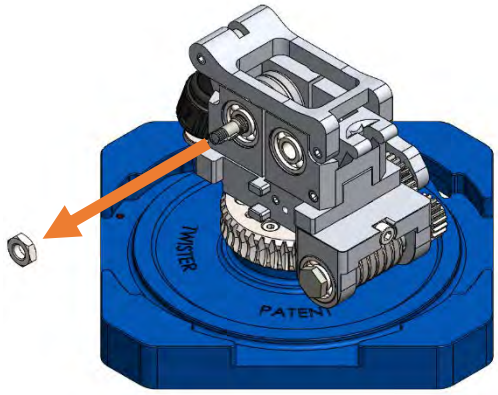

Figure 50

5. Extract the shaft longitudinally, possibly leaving the bearing, the spacer and the locking Tab in the appropriate seats. If not, reposition the elements on the shaft as shown in the figure.
Once this operation has been carried out, remove the contact wheel. Figures 51 and 52;

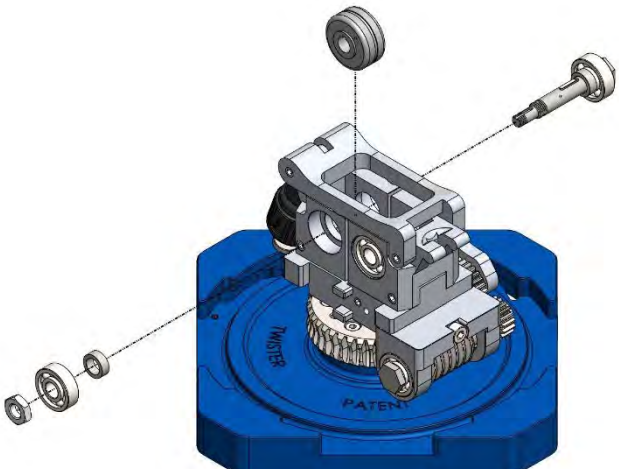

Figure 51

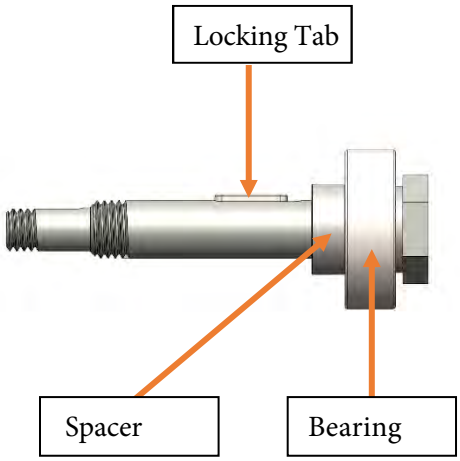

Figure 52

6. Carry out the steps previously described, you will find yourself in the situation shown in the figure below. The figure shows the set of disassembled elements with the relative assembly lines. Figure 53;

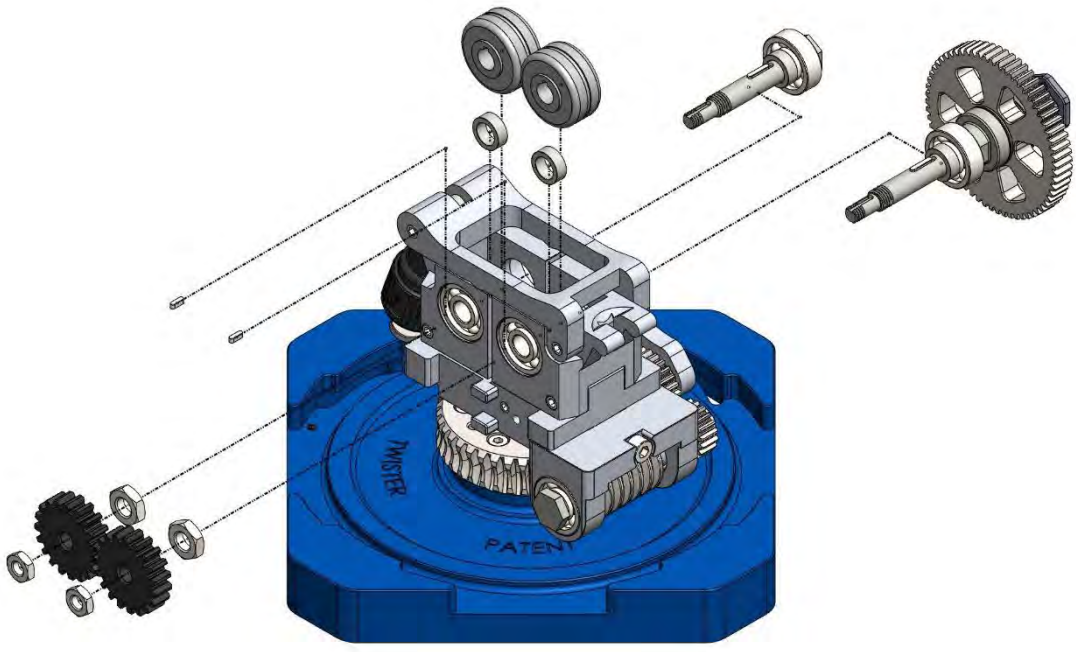

Figure 53

7. At this point it will be possible to mount the two contact wheels selected from the available models. Contact wheels have a lighter colored mark on one side. During assembly, make sure that the mark of each of the two wheels faces the drive wheel. Figures 54 and 55;

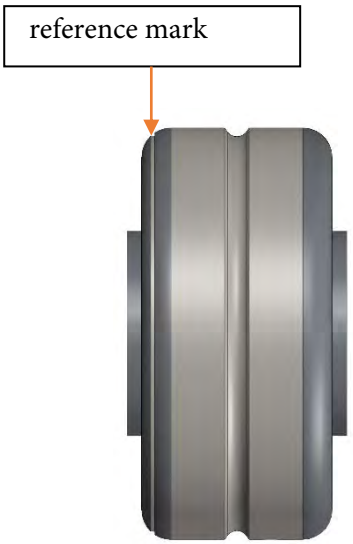

Figure 54

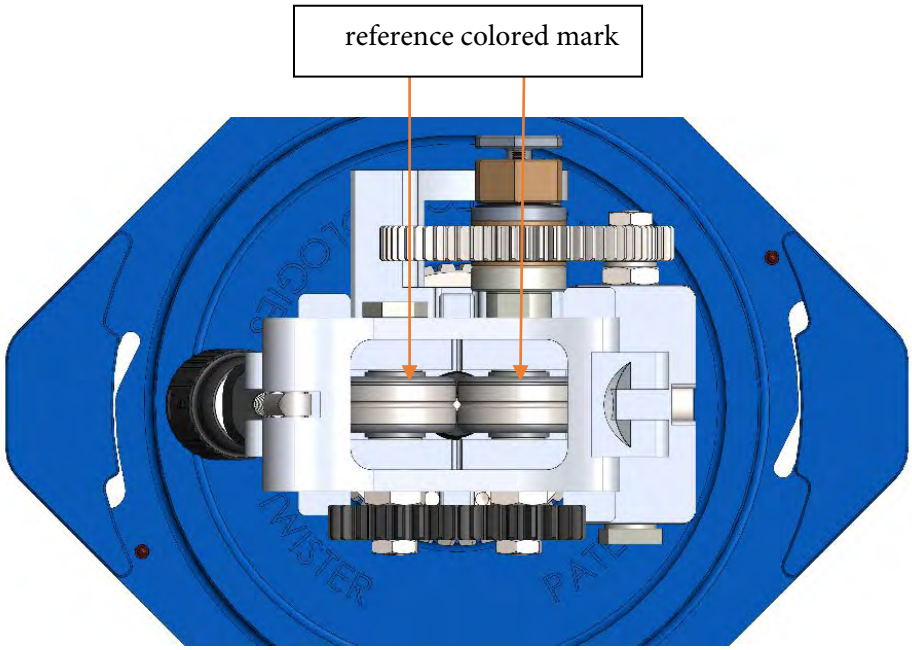

Figure 55

Attention: an incorrect assembly of the contact wheels can compromise the functioning of the device

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8. Position the spacer and the secondary contact wheel as shown in the figure, then insert the shaft taking care to keep the wheel raised, so that the shaft fits into the appropriate hole, and to position the locking tab correctly. Once the shaft has been inserted, using two 13[mm] open end wrenches, screw the M10 nut. Figures 56 and 57;

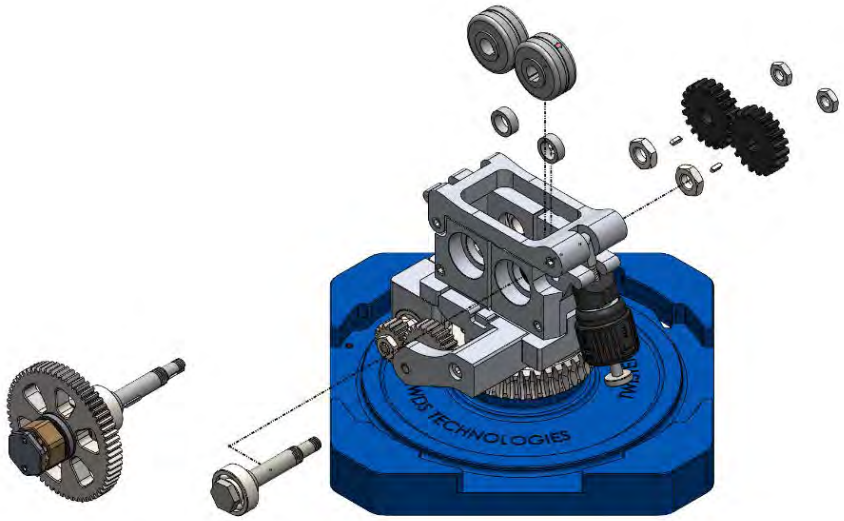

Figure 56

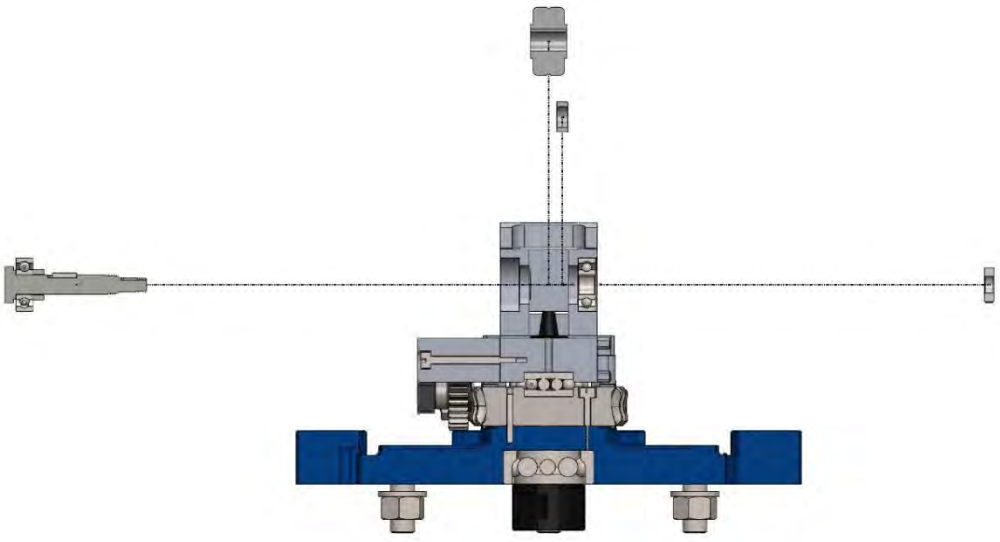

Figure 57

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9. Repeat the same procedure, described in step 8, with the primary contact wheel. Figures 58 and 59;

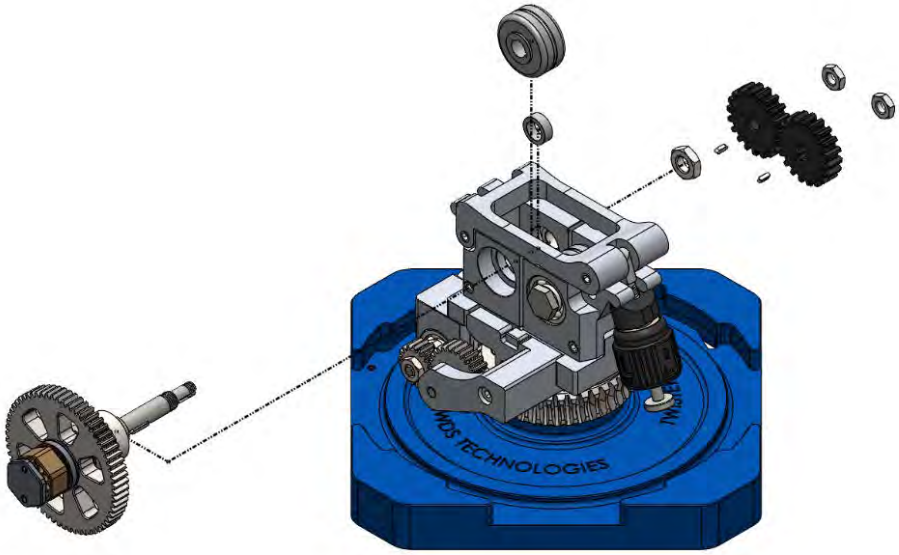

Figure 58

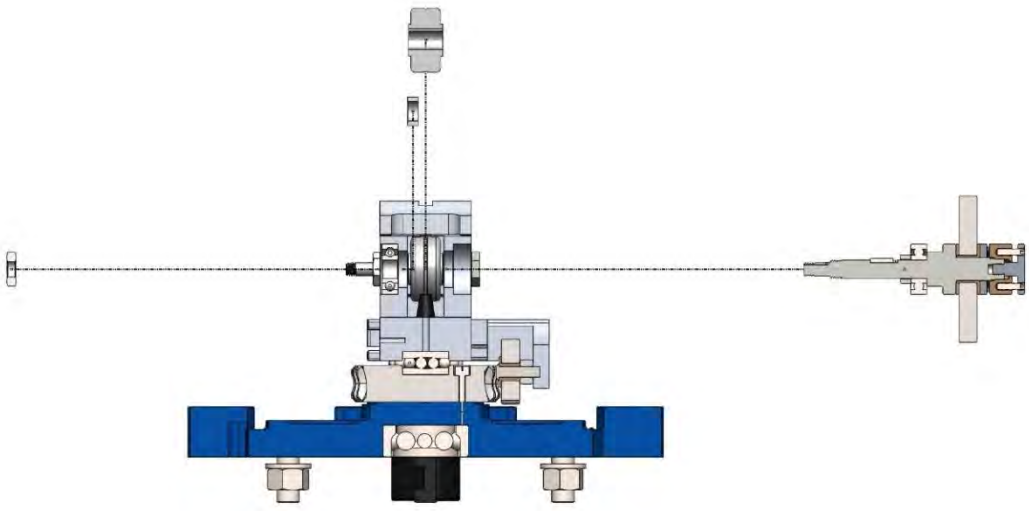

Figure 59

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10. The last operation consists in assembling the synchronization wheels by using open end wrenches with a 10[mm] and 13[mm] hexagonal mouth. Figure 60.

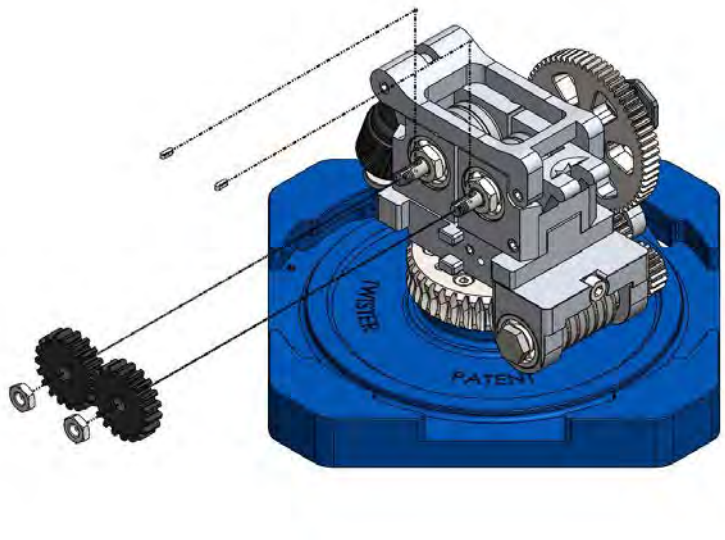

Figure 60

Caution: the phases described here are in chronological order, so it is important to strictly follow them step by step.

6 DISPOSAL

In the event that the Twister is to be scrapped, proceed with the disposal of its parts in a differentiated way.

Contact a specialized center for the collection of metallic materials.

Twister is made up of parts in aluminum, steel and parts in plastic materials.
The different materials must be separated according to their nature, and disposed of through specialized authorized companies, in compliance with the requirements of the law.