TITLE: Instructions for the assembly of ZK and ZN Nozzles .

Index:

1.- ADVANCE:

We would like to take this opportunity to thank you for purchasing a ORYMO system.
The purpose of this manual is to assist users in the integration, operation and maintenance, please contact your representative or a ORYMO office.

Note:

The responsibility for the safety of personnel remains exclusively with the employer.It is the obligation of the employer to properly train and instruct its personnel in the safe operation of equipment including maintenance and the purpose amd proper use of all the safety devices. In addition, the employer must provide its personel with all necessary protetive clothing, including such items as a face shield and heat resistant gloves.Any instructional material provided by ORYMO for the operation and maintenance of equipment, does not in any way absolve the employer from fulfilling these obligations and Orymo disclaims liability for injury to personnel using equipment supplied.

2.- OBJETIVE:

This technical instruction is intented to define the assembly or change process of nozzles type ZK and ZN.

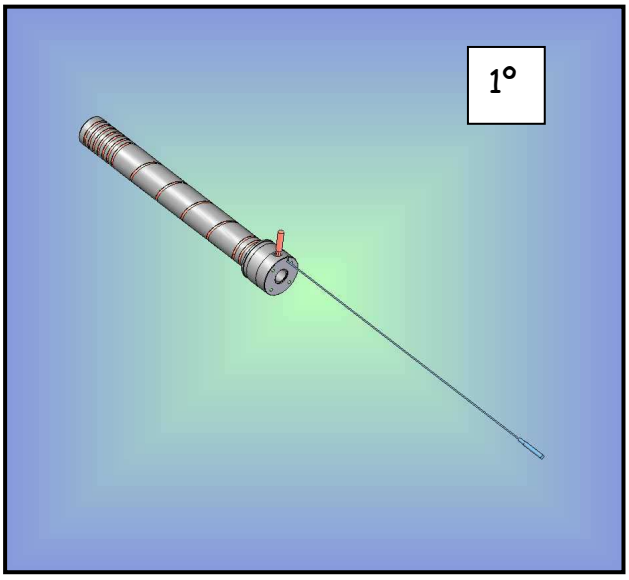
3.- Nozzles affected:

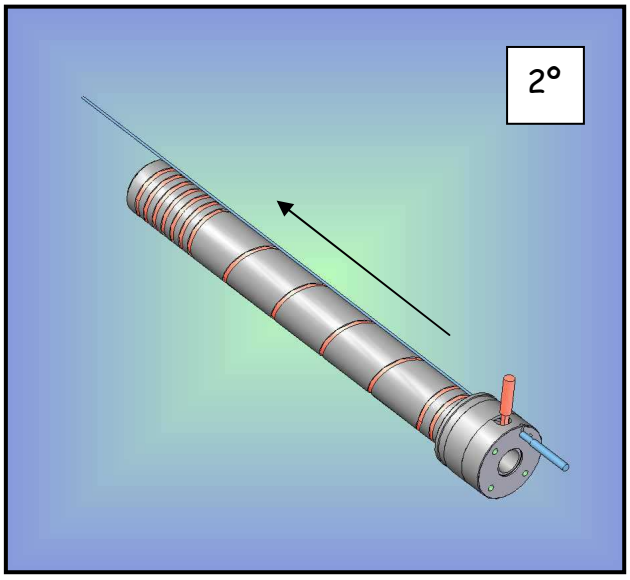
This Technical instruction can be use in all nozzles type ZK and ZN.

4.- ASSEMBLY PROCEDURE:

4.1.- Assembly/changes of thermocouples.

A.-Change the nozzle thermocouple:





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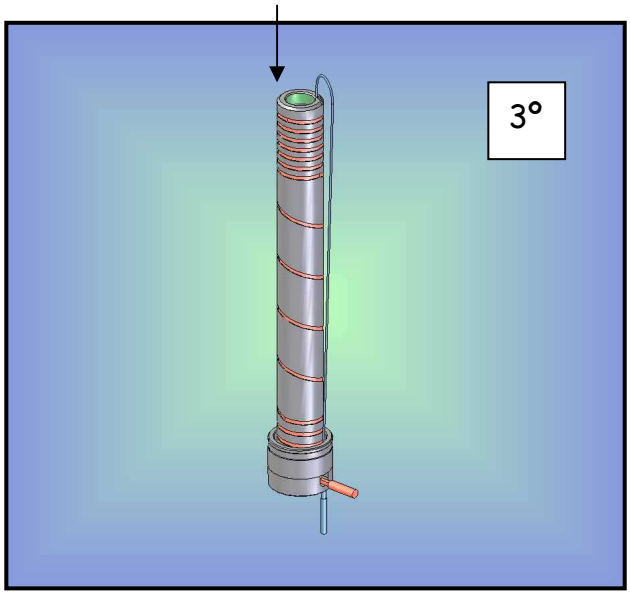
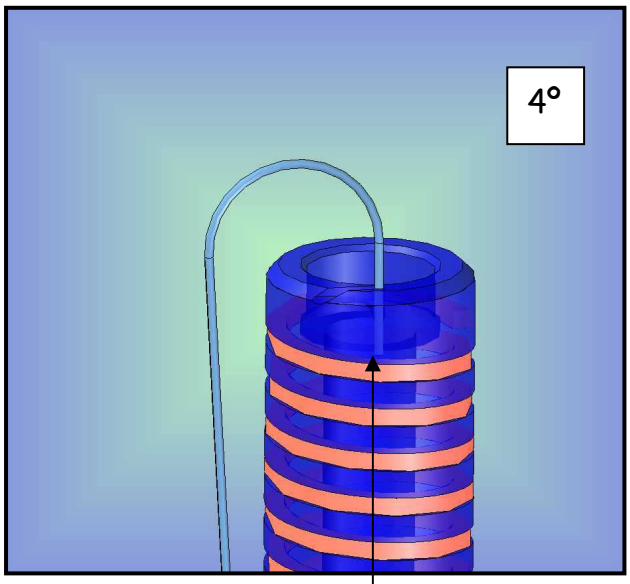
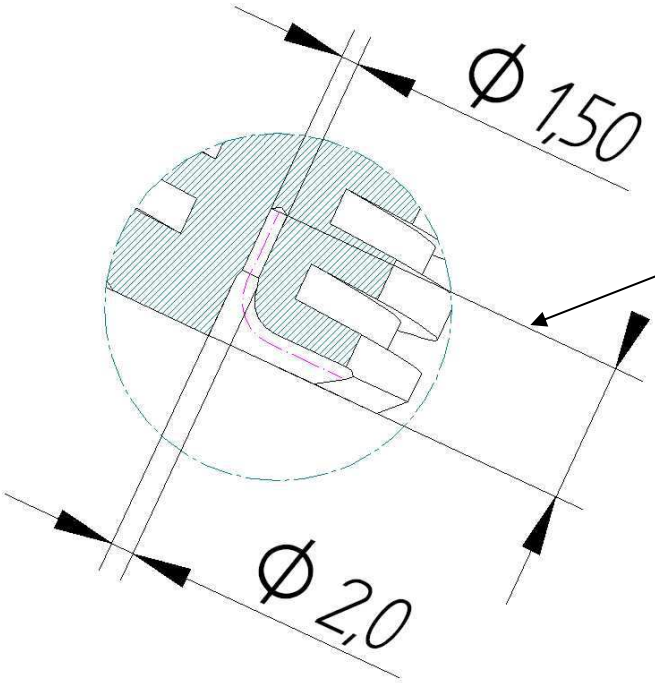
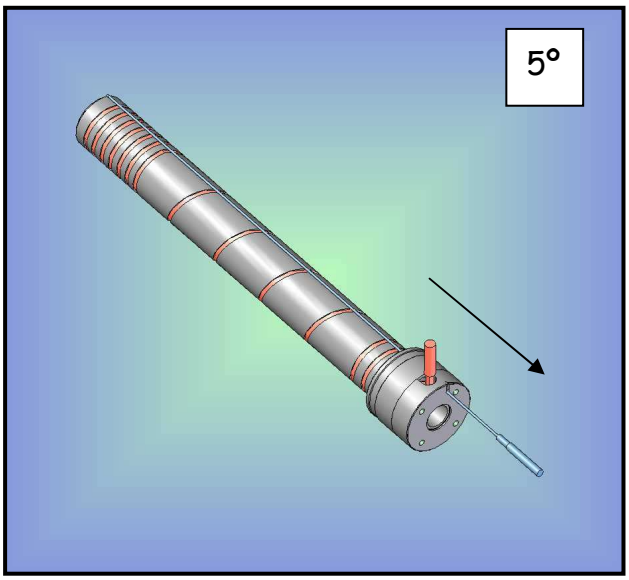
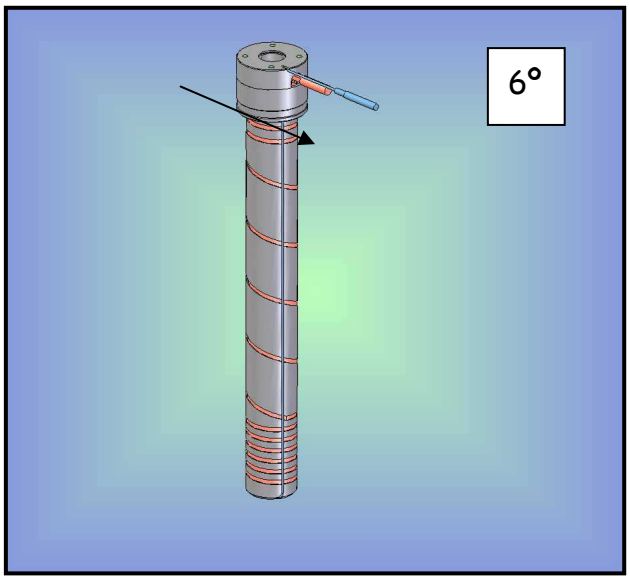






The thermocouple must be in contact with the nozzle





ZK NOZZLE	THERMOCOUPLE	POWER
ZK-100	154DLBLHN	620 W / 230V
ZK-200	TM15300	900 W / 230V
ZK-300	TM15400	900 W / 230V

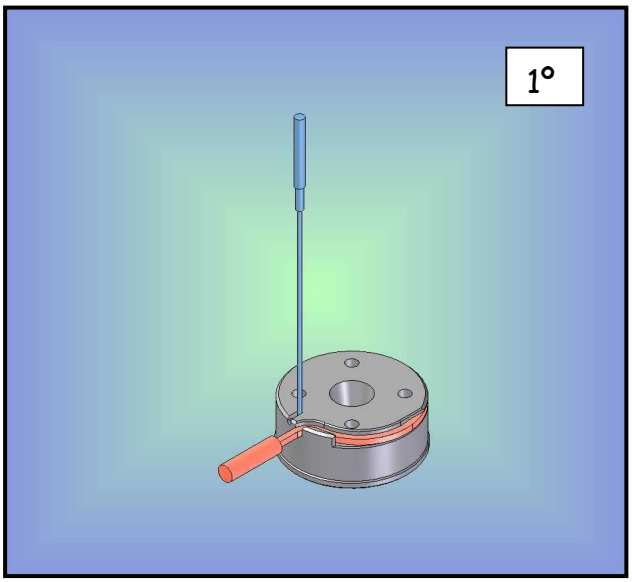
ZN NOZZLE	THERMOCOUPLE	POWER
ZN-040	154DLBLHN	270 W / 230V
ZN-060	TM15160	400 W / 230V
ZN-080	TM15160	480 W / 230V
ZN-100	154DLBLHN	480 W / 230V
ZN-120	TM15200	535 W / 230V
ZN-140	TM15250	660 W / 230V
ZN-160	TM15250	800 W / 230V
ZN-200	TM15300	800 W / 230V

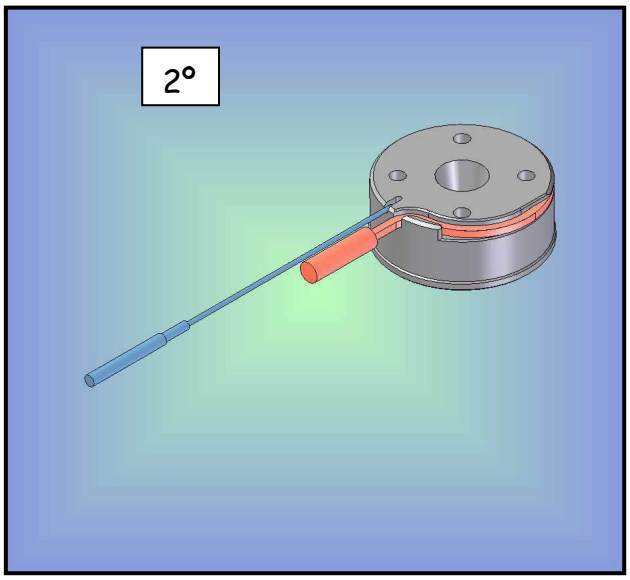
Note:
-All the thermocouples supplied by ORYMO are isolated ground.
- The thermocouples supplied by ORYMO are:

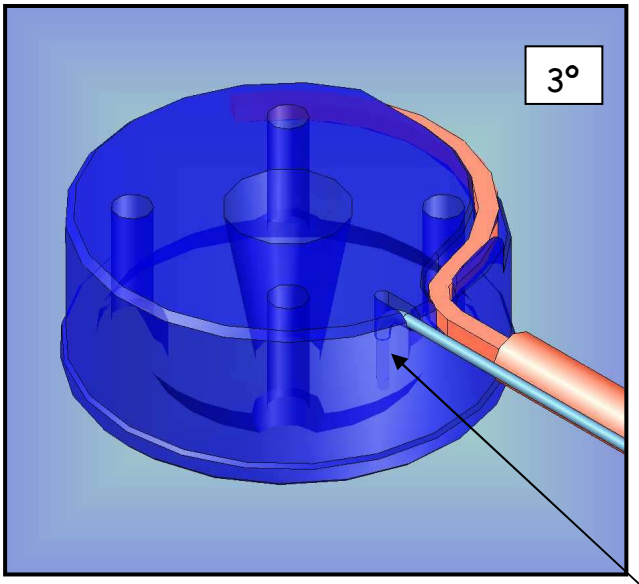
Type J.	Red + (magnetic)	Blue – (not magnetic)
	Black + (magnetic)	White – (not magnetic)

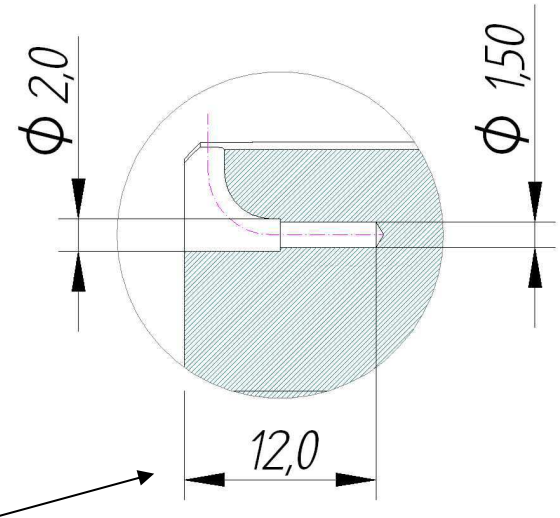
-The resistance between poles of the thermocouple must be from 3 to 20 Ω.

B.-Change the thermocouple in the back-plate:









The thermocouple must be in contact with the nozzle

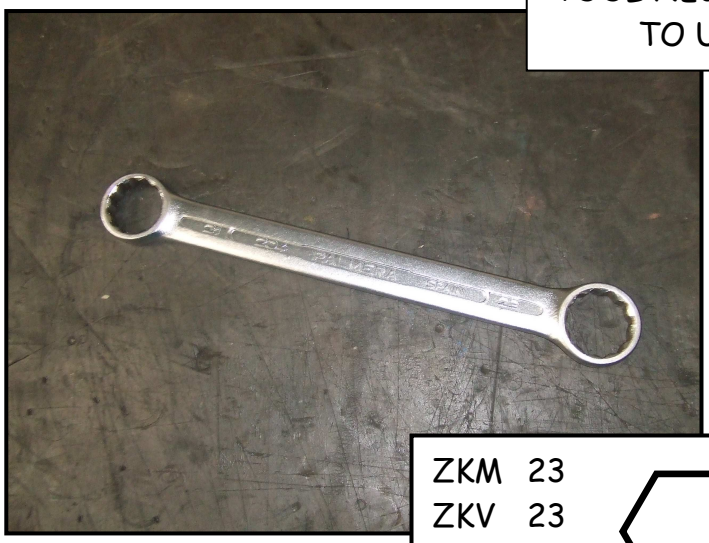
BACK PLATE	THERMOCOUPLE	POWER
ZK	154DLBLHN	500 W / 230V

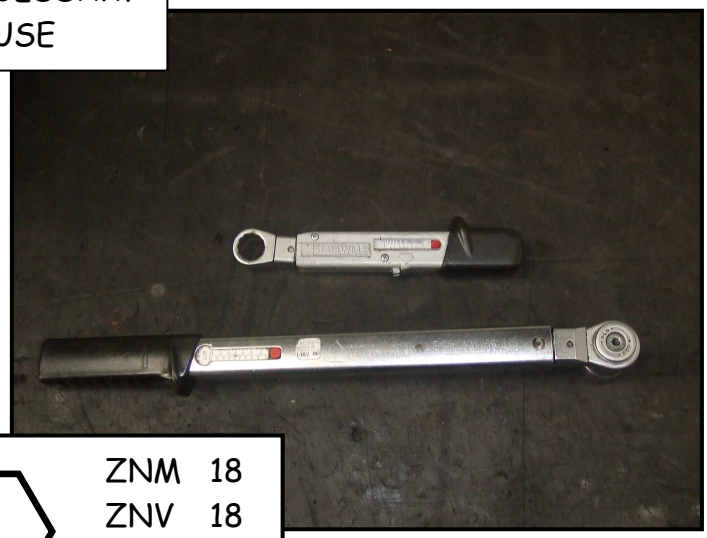
BACK PLATE	THERMOCOUPLE	POWER
ZN	154DLBLHN	430 W / 230V

4.2.- Assembly/changes of inserts.

A.- Tools.

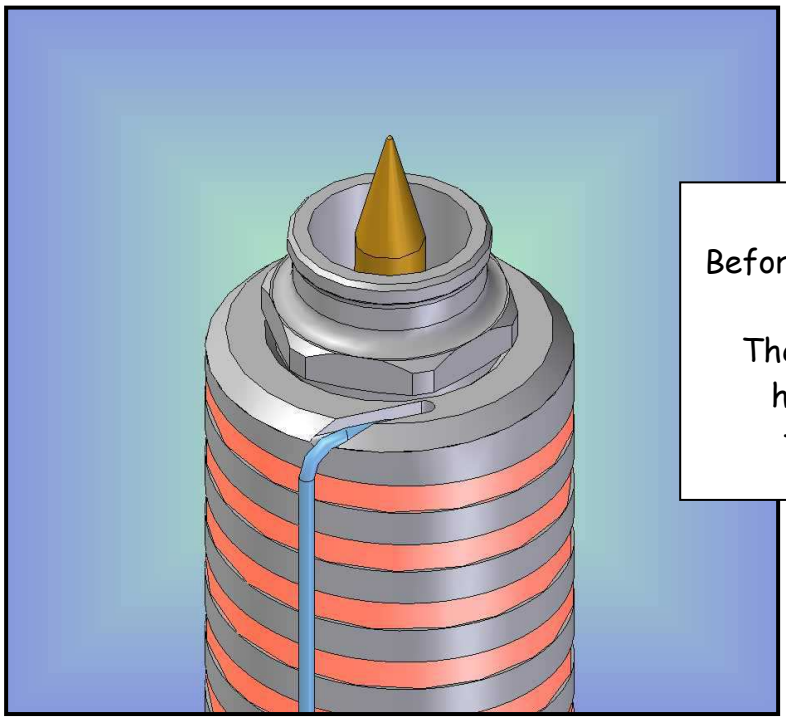
TOOL NECESSARY TO USE





ZKM	23	ZNM	18
ZKV	23	ZNV	18
ZKDF	23	ZNDF	16

B.- Before you unscrew the tip insert:

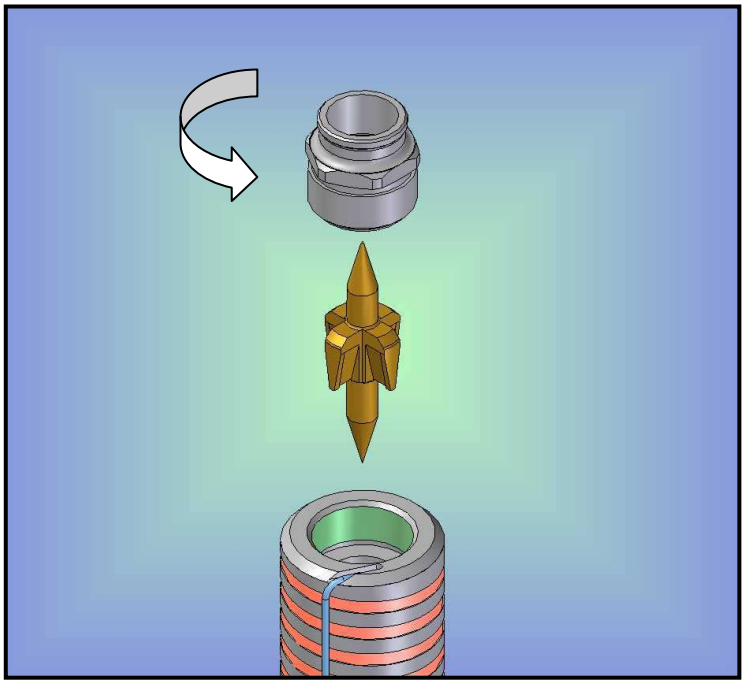


CAUTION:
Before you unscrew the tip insert.
The nozzle must be heated to melt temperature.

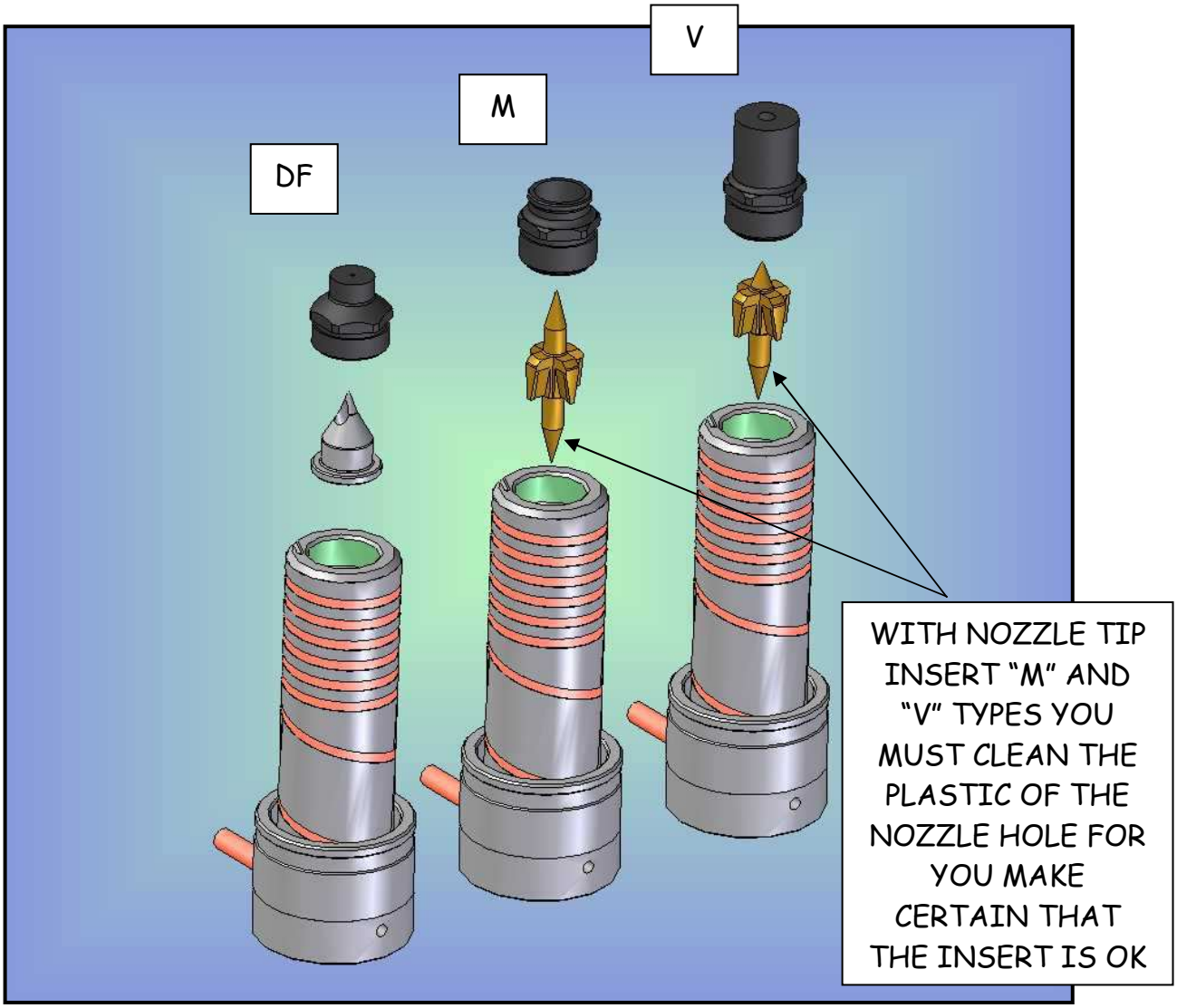
Note:
- If is possible heat the nozzle with a controller melt temperature.

-If is not possible, you can heat the nozzle with a welding torch. See the picture. Only when the heater is broken you can use a welding torch. Always you must use a temperature controllers when it was possible.

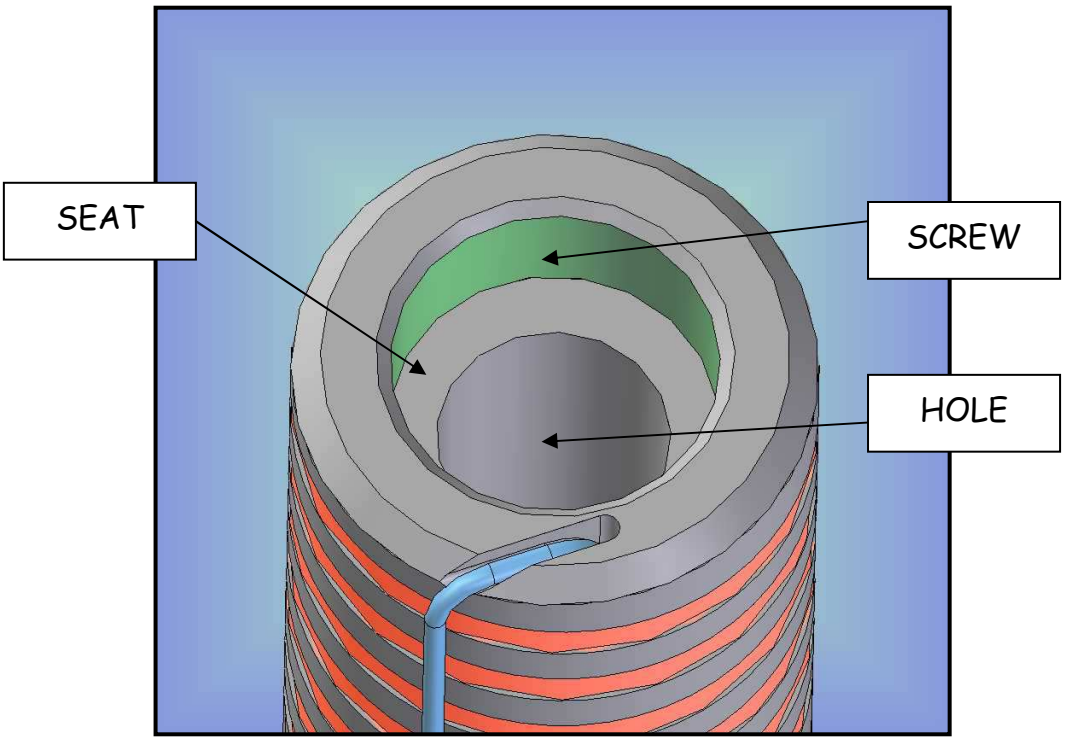
C.- Unscrew the tip insert.



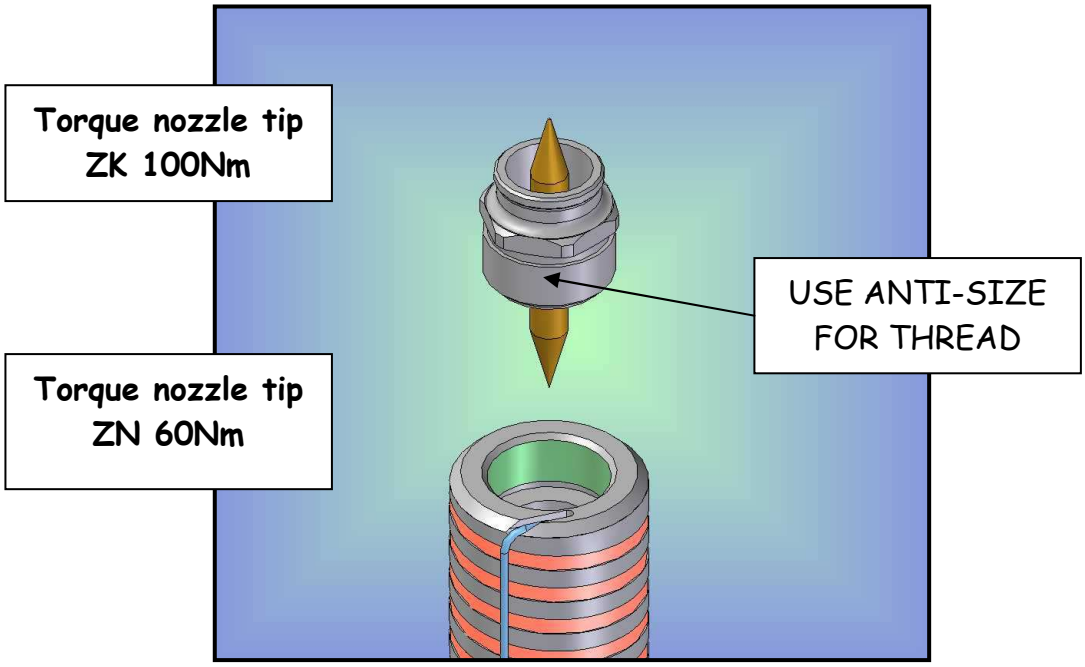
D.-You must clean very good remains of plastic if the pieces are going to be used again.



E.- Clean very good the hole, the thread and the seat for you make certain of the assembly.



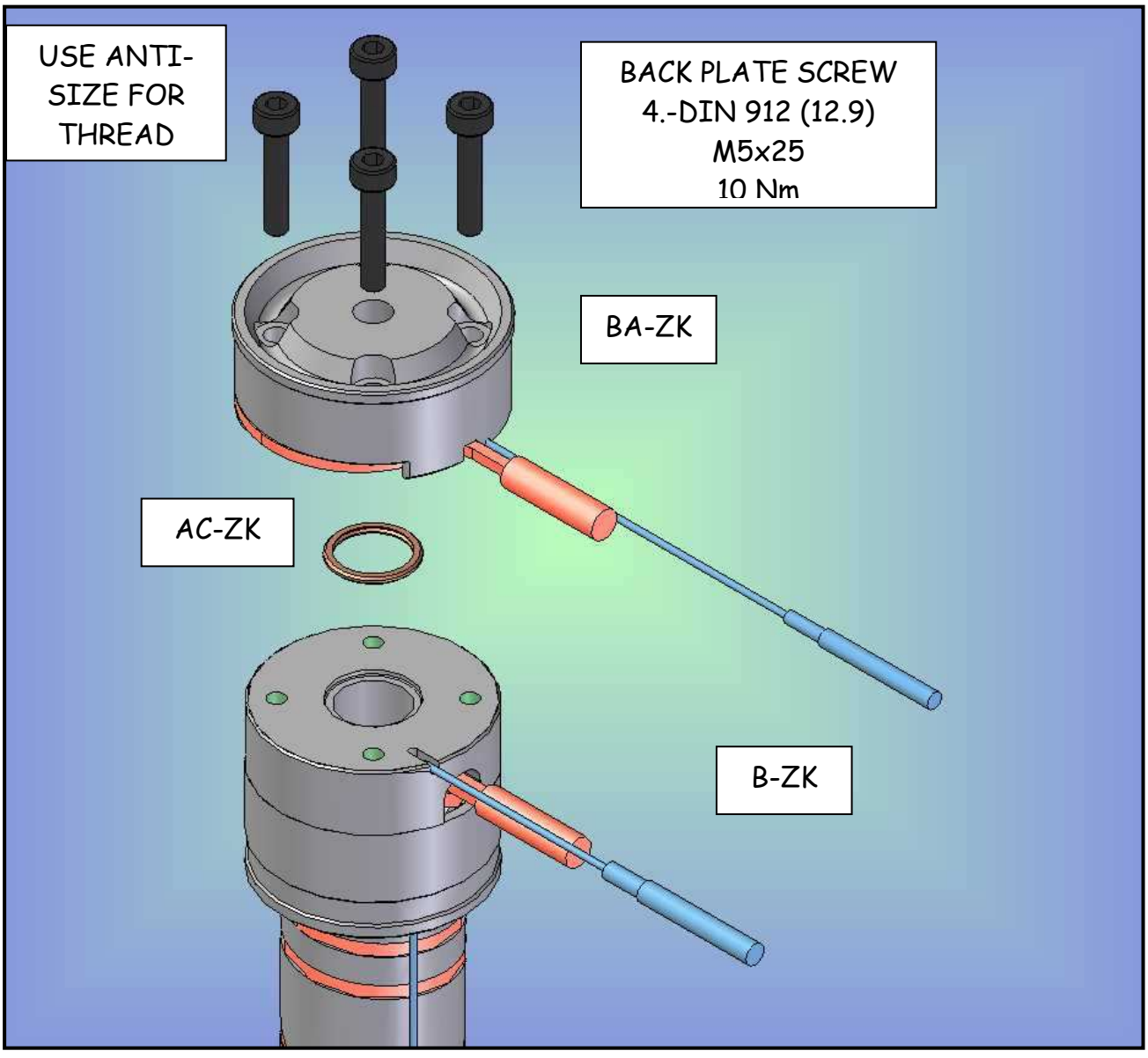
F.- Before assembly the insert tip with the insert apply high temperature oil on the threads for easy disassembly.



4.3.-Back-Plate assembly.

ZK

A.- Parts to use.

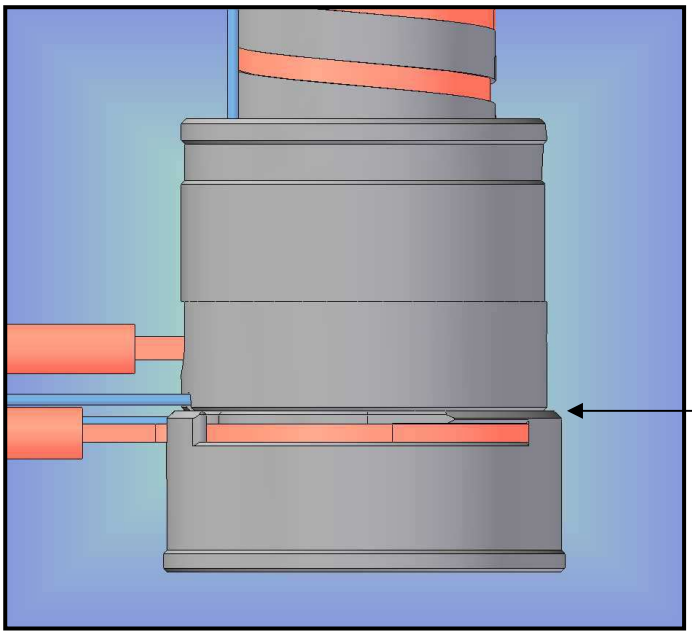


Note:

Every time that the Back-plate was disassembly you must change the o-ring and the screws.

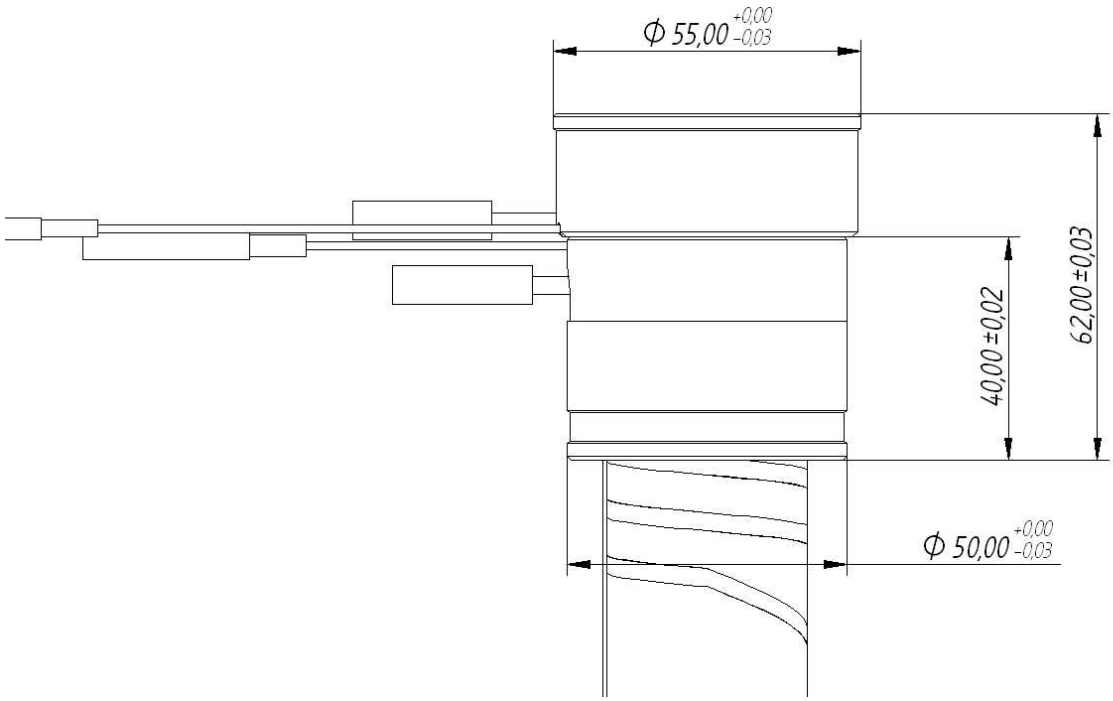
B.-Verify that NOT be light between the nozzle and the Back-Plate.

ZK



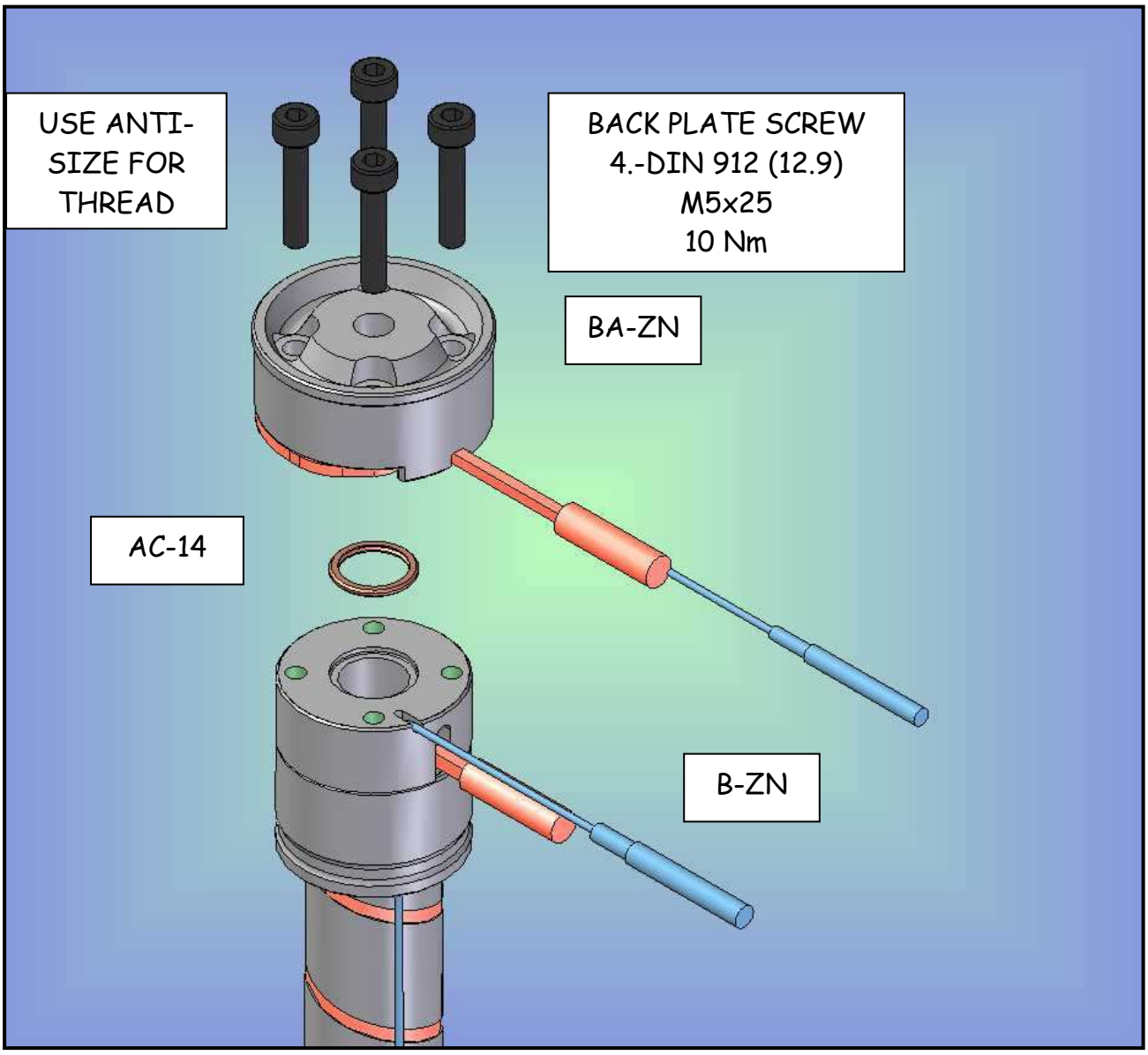
The o-ring must be adapted to the nozzle boring details. To assure this tightening the screws until **62,00**.

C.- Measures to verify for you make certain that the assembly is correct.



A.- Parts to use.

ZN

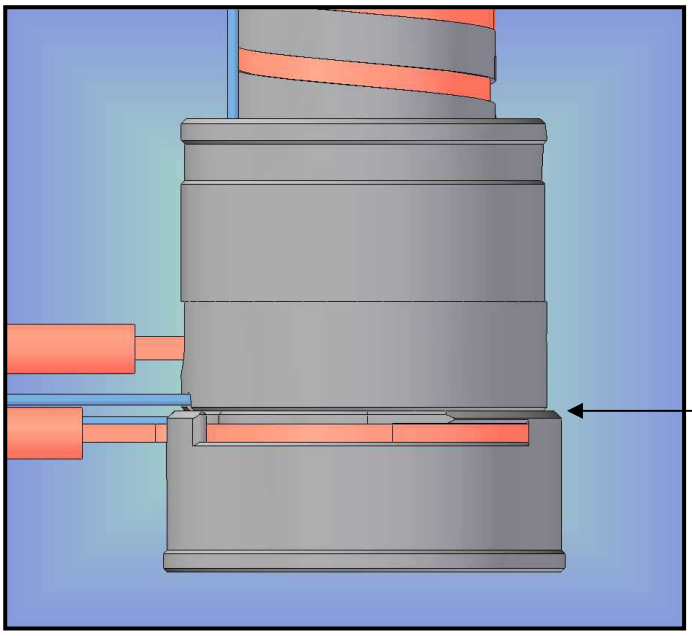


Note:

Every time that the Back-plate was disassembly you must change the o-ring and the screws.

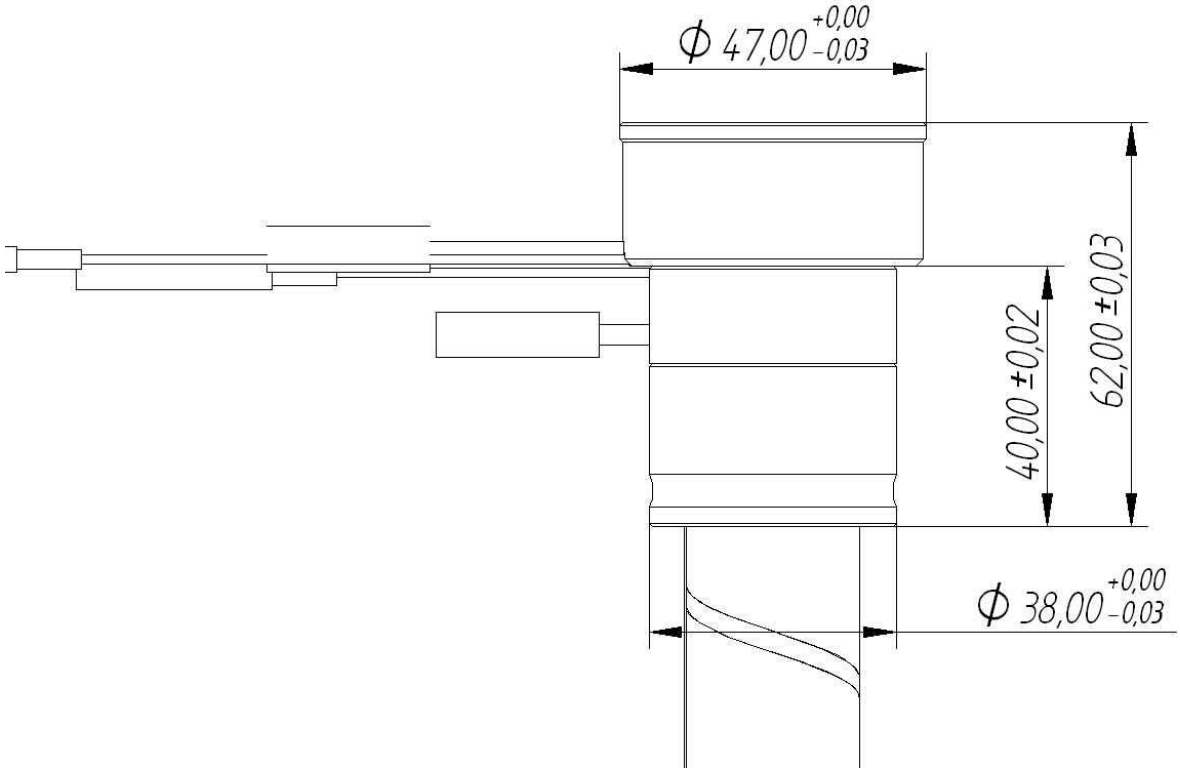
B.-Verify that NOT be light between the nozzle and the Back-Plate.

ZN



The o-ring must be adapted to the nozzle boring details. To assure this tightening the screws until **62,00**.

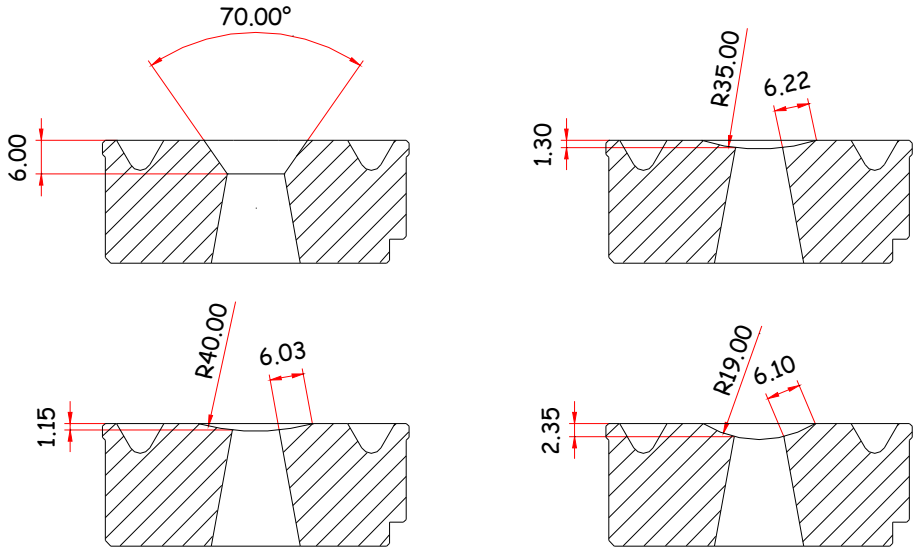
C.- Measures to verify for you make certain that the assembly is correct.



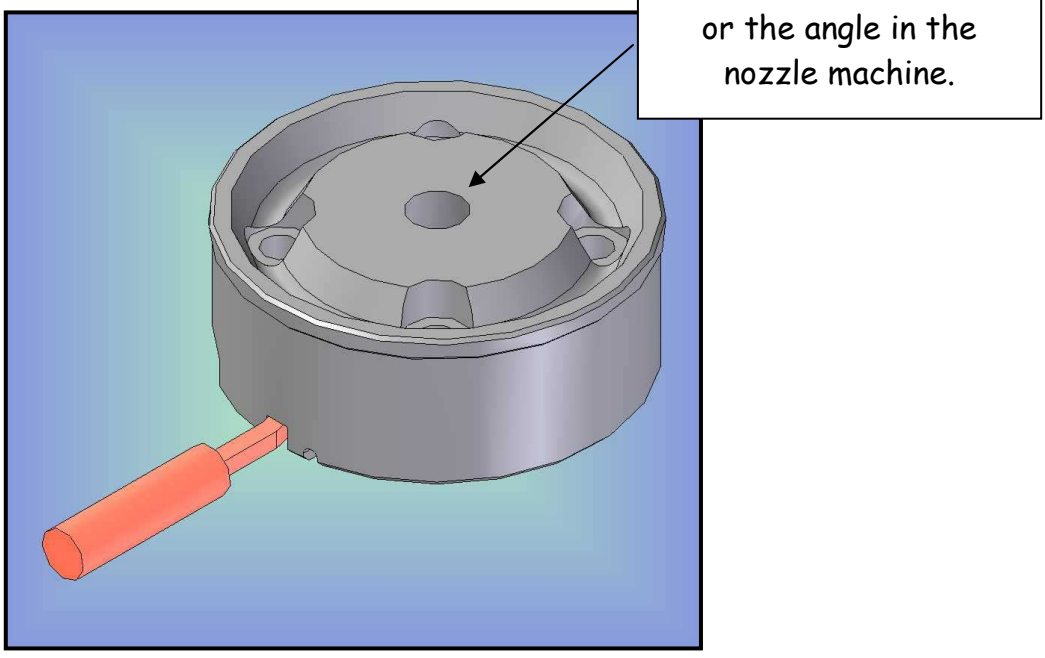
4.4.- Mechanized angle or radius.

-Contact zone with the nozzle machine aprox. 6mm.

Examples:



-When is mechanized the nozzle machine, Never you can use any liquids: oil, water,...If the heater is wet It will be broken.



4.5.- General and electrical precautions.

A.-General precautions.

Check that all coolant, hydraulic and air lines as well as electrical cables will not interfere with the moving parts of the mold, machine or robot. The lines must be of sufficient length so that they will not strain or pinch when the mould halves separate.

B.- The nozzle tip must be assembly perpendicular to the cooling bush for avoid breaks or wears.

C.- Make certain that the nozzle tip and the screws of the back-plate are tightened.

D.-Don´t pull out the leads for disassembly the nozzle of the mould

E-Electrical cautions.

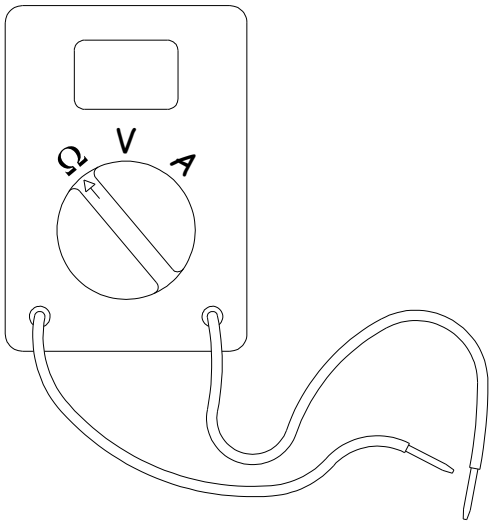
Water and /or hydraulics on the mold may be in close proximity to electrical connections and equipment. Water leakage may cause electrical short circuit. Hydraulic fluid leakage may cause a fire hazard. Always keep water and/or hydraulic hoses and fittings in good condition to avoid leaks.
Never the electrical parts can be wet.

F.-Do not mixed electrical power cables with thermocouple extension cables. They are not designed to carry the power load or list accurate temperature readings in each other´s application.

G-High voltage and amperage cables are connected to the mold. Electric power must be shut off prior to installing or removing any cables.

4.6.- System check.

A.- Using the Ohm meter to check the electrical parts..



B.- Check for continuity between the Mold Power Connector ground pin and the mold. The ohm reading should be zero.

C.- Measure the resistance between each pin of the mold power connector and ground. The reading should be infinity. Occasionally, the electric heaters accumulate moisture, which can reduce the resistance value to between 50 kΩ to 10 MΩ . The controller should be designed to remove this moisture during start-up

The use of thermo controls without soft-start function can broke the heater and cancel the guarantee of the electrical parts in case of failure. Never apply full power to a heater if the insulation resistance reading is below 50kΩ.

D.-Measure the resistance between each poles pair of thermocouples wires on the mold´s Thermocouple connector. The resistance should be between 3Ω to 20Ω.

E.- Measure the resistance between each pair of heater power wires at the mold power connector.

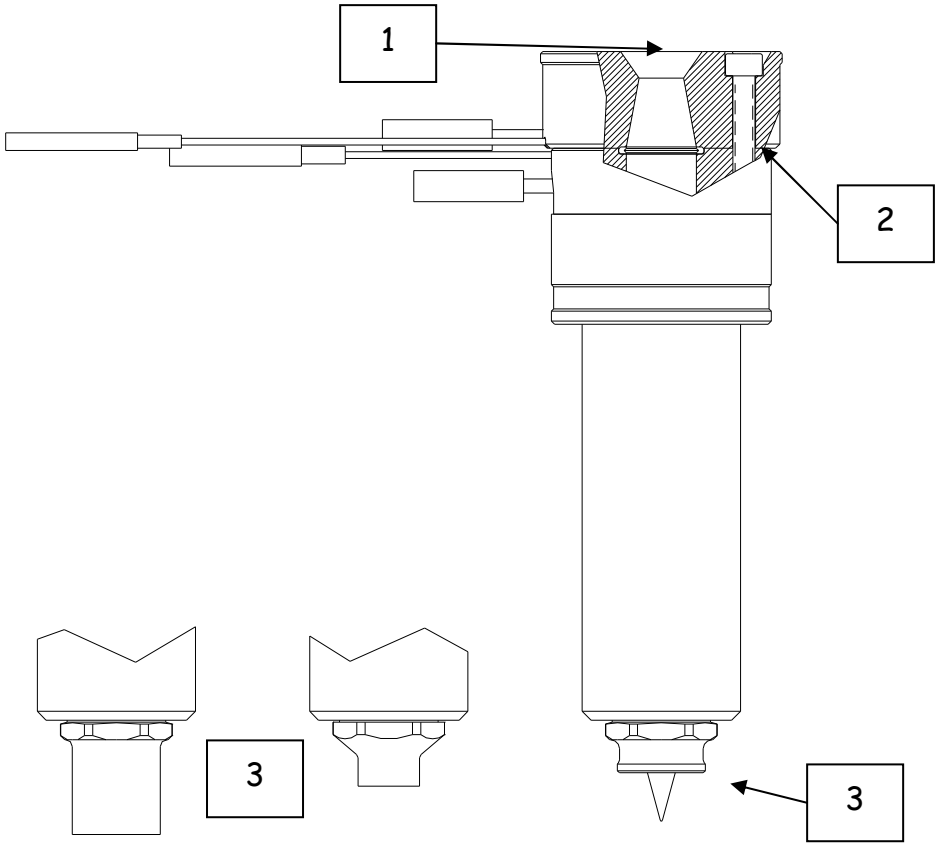
Compare your reading with your general assembly drawing

$R = V^2 / P$ Where: R = Resistance, V = Voltage
P = Power

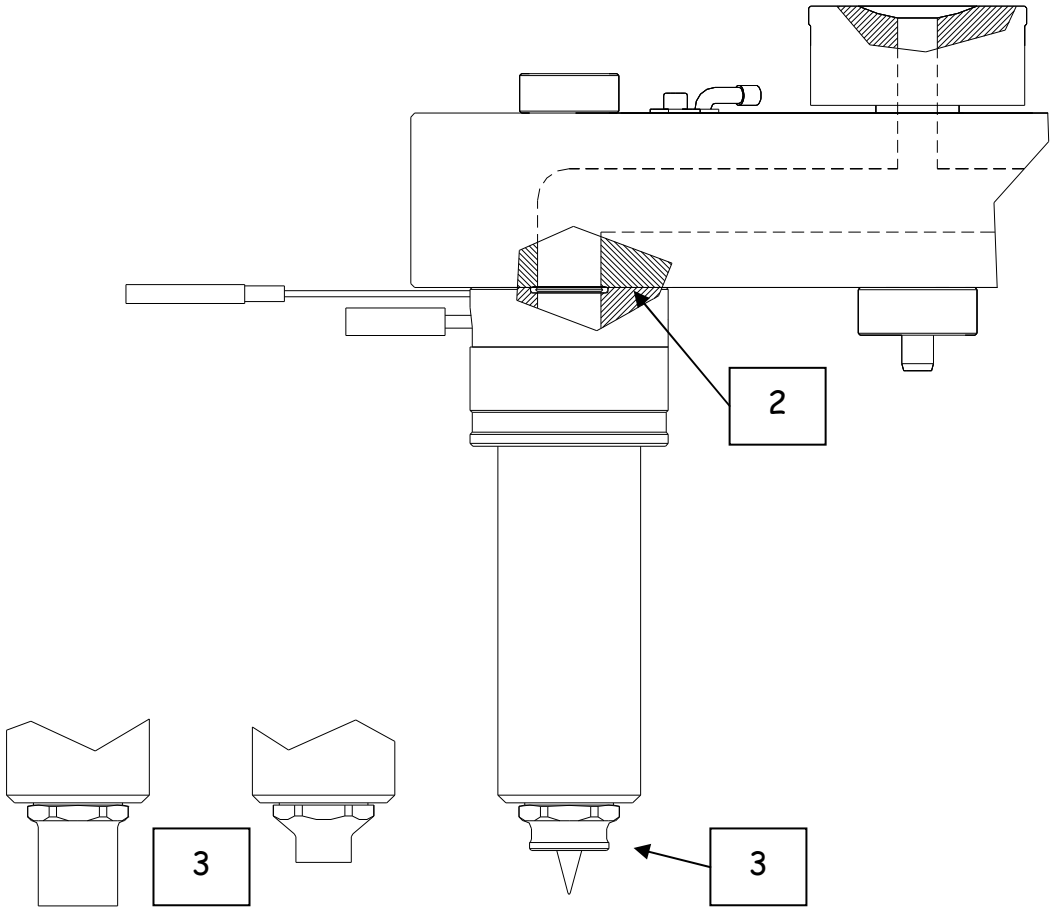
4.7.-Trouble and countermeasure.

TROUBLE	CAUSE	COUNTERMEASURE
The heater does not work.	The heater is switched off.	Check the thermocontrol.
		Check the wiring according the 4.6 point (page 18).
	The hater is broken.	Check that the thermocontrol has activated the start-function.
		In order to repair it contacts with ORYMO.
	The thermocouple is broken.	Check the wiring according the 4.6 point (page 18). To raplace it.
	The thermocouple is switched off.	Check the wiring according the 4.6 point (page 18).
	The hose of thermocontrol is broken.	Repair or change the hose.
The heater does not reach the wished temperature.	Contact area is not according the installation draws.	Verify the nozzle boring details.
The temperatura marked does not correspond with the nozzle operation.	In the connections, the thermocouples does not correspond with its heaters.	Check the connections according to the electrical scheme.
	Mistake in the polarity of thermocouples.	Check the polarity in the connectors and thermocouples.
	The thermocouple is broken.	Check the wiring according the 4.6 point (page 18). To raplace it.
	Thermocouple badly installed. It does not make good contact.	Check the assembly according the 4.1 point (page 3).
	The thermocontrol does not work.	Change the thermocontrol.

TROUBLE	CAUSE	COUNTERMEASURE
Resin Leakage	Point 1 of the sketch.	Use the appropiate radius in the machine an in good state of concentricity . Single application according to the 4.4 point (page 16).
	Point 2 of the sketch.	Check assembly. Single application according to the 4.3 point (page 12).
		Change the o-ring after unassembly (back plate or manifold).
	Point 3 of the sketch.	Check the boring details in the gate area.
		Check the torque of the gate insert.
		Check the paralelism of the nozzle assembly.



FOR MANIFOLD APPLICATIONS.



- For manifold application our system drawing is part of this instruction.
- Please pass on this manual and the system drawing to the end user.
- Guarantee claims only valid if installation and operation to our instructions.
- Inportant mold checks before first test:
    - Gate boring detail.
    - Gate diameter.
    - Gate cap contact.
    - Nozzle lenght expansion.
    - Electric connection.
- For questions please call our Applications Department.
- Our products are only part of a complete production process. Other components such as plastic, mold or machine have a sidnificant effect on the function of our products.
- Guarantee is provided only within the framework of our general conditions of sale and delivery. **Subject to alterations.**

5.- GUARANTEES:

- All products are supplied free of defectives according our quality control.
- The guarantee period of our products is as follow:

  - 10 years for manifolds and nozzles
  - 60 days for wear parts or wear zones as tips gate, valve gate pins, valve gate bushing, o-rings, heaters and thermocouples.

- Excluded from this guarantee heaters that do not show visible failure or breakdown occur, and stretching or breakage of electric wires and leads.
- Because the goods may be subject to a wide variety of use , installation , maintenance, and cleaning, the guarantee is only against such defects and not against any other failures, the misuse of the products or normal wear are not included in this guarantee.
- This guarantee only ORYMO concern the replacement of damaged components, not the damage costs caused by the concrete.
- Handling or use of non-original components use voids this guarantee.
- The guarantee period begins on the date of shipment by ORYMO.
- For the purposes of this guarantee parts must be reviewed by ORYMO.