**710_4_man Rev. 0 del 07.07.2021**

# INSTRUCTION MANUAL - English
# **Compact quad electrode holder - 710 series**

Thank you for purchasing multi-probe series **710**.
Before using the device, please read carefully this manual, and keep it in a safe place, for future use.

***1*** **- Safety warnings**

Safe operation of this product can only be guaranteed if it is properly installed, commissioned, operated and maintained by qualified personnel (see Section 1.11 of this document) in accordance with the operating instructions. It is also necessary to follow the general safety installation instructions, relating to the construction of pipes and systems, as well as the appropriate use of safety equipment and equipment.

This product was designed and built to withstand the stresses encountered during normal use. The use of the product for any use other than that intended, non-compliance in the installation of the product in accordance with these Installation and Maintenance Instructions may damage the product itself, invalidate the CE marking and cause injury or modal accidents to personnel.

Pay the utmost attention to local and national regulations.

**1.1 - Intended use**

With reference to the Installation and Maintenance Instructions, the appliance plate and the Technical Data Sheet, check that the product is suitable for the intended use / application. The products comply with the requirements of the European Pressure Equipment Directive 2014/68 / EU (PED) and fall into the SEP category.

Note: SEP products cannot be CE marked by law.

I) The equipment has been specifically designed for use with the intended fluid.

II) Check the suitability of the material, the pressure, the temperature and their minimum and maximum values. If the maximum operating conditions of the product are lower than those of the system in which it is to be used, or if a malfunction of the product can give rise to dangerous overpressure or overtemperature, be sure to include a safety device in the system to prevent exceeding the limits. expected.

III) Determine the correct installation position and fluid flow direction.

IV) MMT s.r.l. products they are unable to cope with external stresses that can be induced by the systems in which they are inserted. It is the installer's responsibility to take these efforts into account and take appropriate precautionary measures to minimize them. Remove the protective covers from all connections before installation on steam systems or other high temperature systems.

**1.2 - Access**

Ensure safe access and, if necessary, a safe work platform (with suitable protection) before starting to work on the product.

Provide suitable lifting equipment if necessary.

**1.3 - Lighting**

Ensure adequate lighting, particularly where detailed or complex work is required.

**1.4 - Dangerous liquids or gases present in the pipeline**

Take into account the contents of the pipeline or the fluids it may have previously contained. Pay attention to: flammable materials, substances hazardous to health, extremes of temperature.

**1.5 - Dangerous environmental situations**

Consider: areas at risk of explosion, lack of oxygen (e.g. tanks, wells), hazardous gases, temperature limits, high temperature surfaces, fire hazard (e.g. when welding), excessive noise, moving machinery .

**1.6 - The system**

Consider the possible effects of the planned work on the whole system. Evaluate whether the planned action (for example closing shut-off valves, electrical isolation) could put other parts of the system or personnel at risk.

Dangers can include interception of vents or protective devices or making controls or alarms ineffective. Make sure the shut-off valves are opened and closed gradually to avoid sudden changes to the system.

**1.7 - Systems under pressure**

Make sure that pressure is isolated and safely vented to atmospheric pressure. Consider double isolation (double block and vent) and locking or labeling of closed valves. Do not assume that a system is depressurized even if the pressure gauge indicates zero.

**1.8 - Temperature**

Wait for the temperature to normalize after isolation to avoid the danger of burns.

**1.9 - Equipment and consumables**

Before starting work, make sure you have suitable tools and / or consumables available.
Use only original MMT srl spare parts.

**1.10 - Protections (clothing)**

Take into account the possible need for protective clothing against dangers, for example, of chemicals, high / low temperatures, radiation, noise, falling objects and risks to eyes and face.

**1.11 - Work permit**

All work must be carried out or supervised by a competent person. The installation and operating personnel must be trained in the correct use of the product according to the maintenance and installation instructions.

Where a formal 'permit to work' system is in place, it will have to comply.

Where no such system exists, it is recommended that a manager be aware of the progress of the work and that, when necessary, an assistant be appointed whose primary responsibility is safety. If necessary, post the 'danger warning' sign.

**1.12 - Handling**

Manual handling of large and / or heavy products can present a risk of injury. Lifting, pushing, pulling, carrying or supporting a load with body strength can cause damage, particularly to the back. Please evaluate the risks taking into consideration the task, the individual, the load and the working environment and use the appropriate handling method according to the circumstances of the work to be performed.

**1.13 - Other risks**

During normal use, the outer surface of the product can be very hot. Many products are not self-draining. Take this into account when disassembling or removing the appliance from the system (refer to the "Maintenance" instructions below).

**1.14 - Frost**

Products that are not self-draining should be protected from frost damage in environments where they can be exposed to temperatures below the point of ice formation.

**1.15 - Safety information / product specifications for control units, alarms and level limiters in steam boilers**

Products and systems must be selected, installed, operated and tested in accordance with:
- local and national standards and regulations
- the laws on health and safety at work
- the requirements requested by the bodies responsible for the approvals
- boiler inspection bodies
- the technical specifications of the boiler manufacturer.

The boiler must be vented and depressurized to atmospheric pressure before installing the probe. Two independent low water level alarm / limitation systems must be installed on steam boilers. The level probes must be placed in separate external chambers / boiler tubes that have sufficient space between the tips and the ground.

Each probe must be connected to an independent controller. The low level alarm relays must block the operation of the boiler burner.

The high water level alarm can be part of either the level control or a separate system. If necessary for safety, an independent high-level alarm system must be fitted. In this case, the relays must simultaneously intercept the feed water and the boiler burner, in the high level alarm state. All boiler water level alarms / limiters require regular operation checks.

To ensure continuous, safe and correct operation of the control and limiting systems, adequate water treatment must always be carried out. For this purpose, it is advisable to contact the organizations mentioned above and extremely competent companies in the sector.

**1.16 - Disposal**

Unless otherwise specified in the installation and maintenance instructions, this product is recyclable. It is not believed that there is an ecological hazard arising from its disposal, provided that appropriate precautions are taken.

**1.17 - Return of products**

Customers and retailers are reminded that, according to the EC Health, Safety and Environment Law, when returning products to MMT srl, they must provide information on the dangers and precautions to be taken due to contamination residues or mechanical damage that they can present a risk to health, safety and the environment. This information must be provided in writing, including Health and Safety data sheets for any substance identified as hazardous or potentially hazardous.

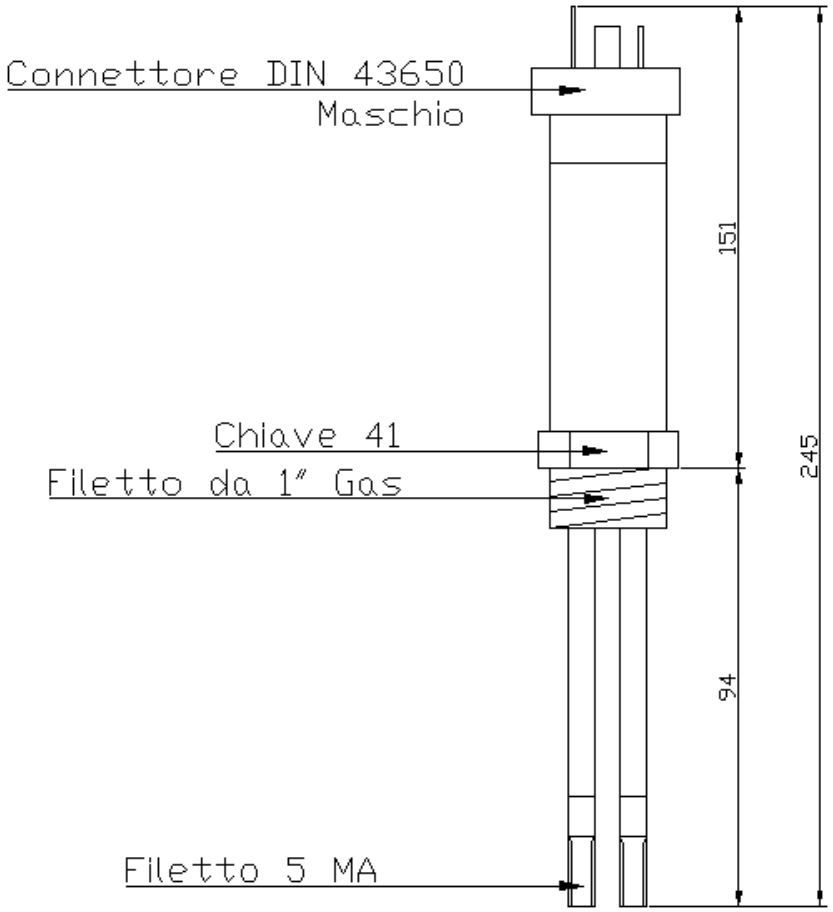
**2 - Description**

The 710 series electrode holders allow ON / OFF level detection for conductive liquids.
They are particularly suitable for use in environments with pressure and temperature.
The level regulators to be used in combination with the 710 series electrode holders are all the MMT products of the 200, 203, 201 (delayed), 204 (delayed) series.
The casing is in AISI 303 stainless steel.
The 4 electrode holders are in stainless steel, coated with Teflon; they are already electrically connected to the connector for an easy and immediate use.

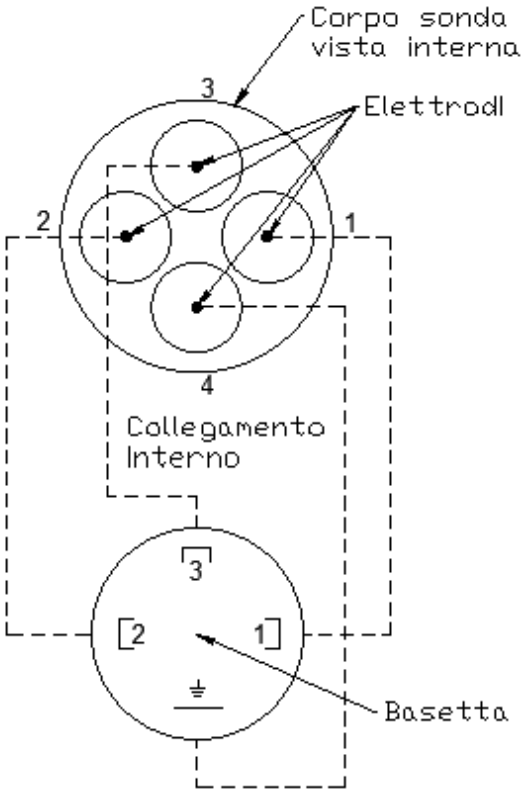
**3 - Technical characteristics**
- electrical connection: DIN 43650-A with PG9 cable gland
- threaded connection: 1 ”conical gas
- maximum temperature at the electrode: 239 °C
- maximum working pressure: 32 bar
- maximum ambient temperature: 70 ° C
- weight: 750 g

**4 - Operation**
The electrode holder is a mechanical device that allows you to detect 4 different levels of water level inside a boiler or tank in general, based on an electrical conductive principle.
A weak alternating electric current is introduced through the electrodes and the return is obtained through the threaded body.
In the case of a concrete or plastic tank, one of the 4 electrodes, the longer one, must act as a return.
The device is suitable for operation with conductive liquids other than water.
The 4 intervention levels are determined simply by cutting the 4 electrodes at the desired heights.
When the liquid level discovers an electrode, there is a signal.

***5 - Mechanical dimensions and overall dimensions***




***6 - Internal electrical connection diagram***




The above drawing indicates the top view of the electrode holder with the lid unscrewed and of the male DIN connector on the electrode holder. The electrode holder does not have a ground connection, which, in the case of a metal tank, is still secured using the threaded body of the electrode holder.

**7 - Installation and use**

7.1 - Use in metal tank

The 710 series quadruple electrode holder allows you to make a level adjustment on 4 levels of:

Maximum level alarm
ON = pump / valve connection
OFF = pump / valve disconnection
Minimum level alarm

The joint is obtained from the metallic mass of the tank.

7.2 - Use in non-metallic tank

The 710 series quadruple electrode holder allows you to make a level adjustment on 3 levels of:

Level I
Level II
Level III

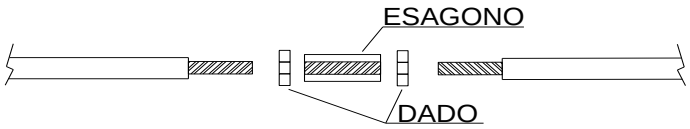
The common is obtained through the fourth electrode, which must always be the longest of the 4.

7.3 Mounting the electrodes

The electrode kit can be combined with the electrode holder cod. 999-710-01 consisting of 4 threaded rods 5 MA for the entire length of 1m, complete with the necessary joints and the spacer.

It is necessary to establish the lengths of the 4 electrodes according to the size of the tank where the electrode holder is to be mounted and according to the 4 heights at which you want to have the intervention of the regulating organ, such as pump or solenoid valve.

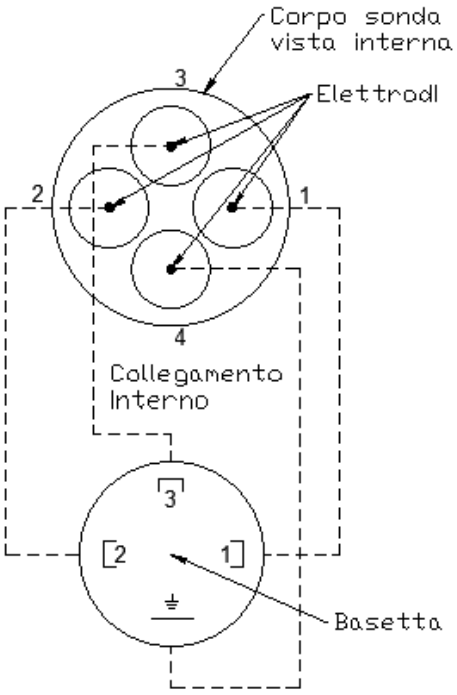
The maximum electrode is the shortest; the minimum is intermediate; the common one is the longest and always immersed in the liquid. Once the lengths of the 4 electrodes have been established, they can be cut to size if less than 1m, or connected to each other if greater than 1m. For the connections between them use the cylinder with double thread and the locknuts, while to connect the electrodes to the electrode holder, in both cases operate as in the figure below.



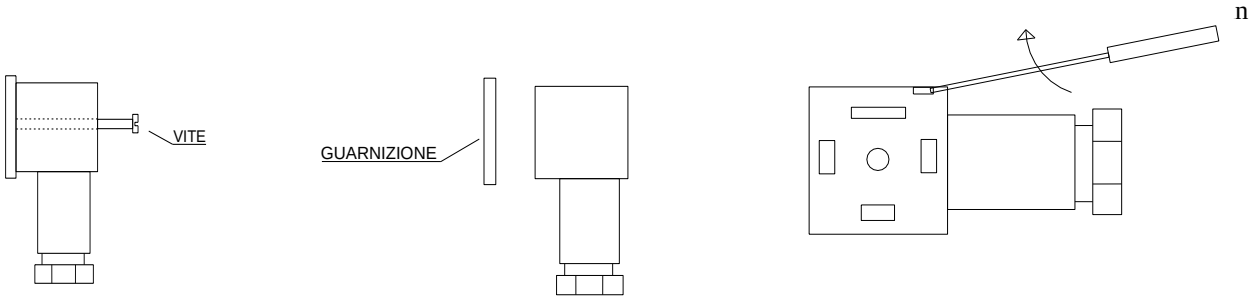

If the electrodes are long, and there is a risk of accidental contact between them, it is possible to use a Teflon spacer, supplied and included in the kit cod. 999-710-01.
This spacer is fixed by inserting the electrodes and fixing their height with two nuts, as in the adjacent figure.
This spacer has a particular constructive shape, which favors the flow of the liquid, preventing the formation of conductive bridges, which could give false level indications.

7.4 - Assembling the electrode holder in the field
Once the electrode holder has the 4 electrodes mounted of the correct length, it must be fixed on the process tank.

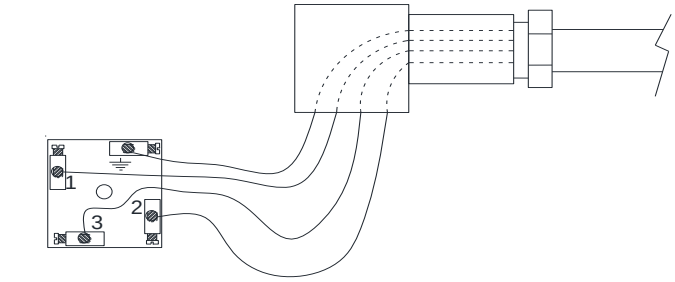
7.5- Electrical connection
Once the 4 electrodes have been fixed to the electrode holder, they are already automatically electrically connected to the male DIN connector on the electrode holder, without the need for other operations.
The internal link is visible in the figure below.



Now it is only necessary to connect the user cable to the female connector, supplied as an accessory supplied.
If the female connector is connected to the male connector, unscrew the central screw and disconnect it, keep the screw.
Then remove the square seal and keep it.




For the electrical connection, use cables, not necessarily shielded, with a section of not less than 1 sqmm.
The cables must be separated from the power cables. As for the length of the cables, this depends on the type of level regulator used.
In the case of using our level regulators, for a.c. at standard and low sensitivity, and for those d.c. at any sensitivity, the cables can be up to 200m long. For the a.c. at high sensitivity, the cables must be as short as possible; in particular for the 1 ÷ 20 μS range they must not exceed 40 m; for the range 0.3 ÷ 2 μS, they must not exceed 10 m.
Loosen the PG9 cable gland.
Connect the cables to the connector terminals marked with numbers 1,2,3 and with the earth symbol; connect the earth terminal only if necessary; refer to the figure below.




VISTA DA DIETRO

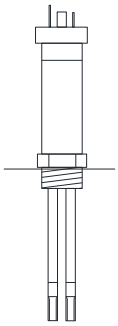
Once the screws are tightened, put the cap back on the fruit and mechanically lock it.
Tighten the PG9 cable gland on the cable to ensure tightness and IP protection.
Replace the square gasket between the wired female connector and the male connector on the electrode holder.
Engage the 2 connectors together, with a slight pressure. Retighten the central screw.

**8 - Maintenance**

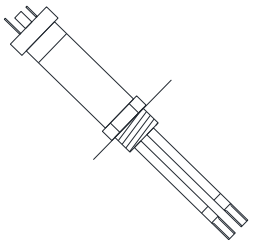
If the mechanical assembly and electrical connection have been carried out as described, the 710 series electrode holder does not require any maintenance.
To control aggressive liquids, periodically check the electrodes, if necessary clean them with a fine abrasive paper.

**9 - Warnings**

The electrodes must not touch each other. Use the spacer for this purpose.
The electrodes must not touch the walls of the tank, even if not metallic.
Avoid mounting the electrode holder in an oblique position as in fig. following:



OK



NO

Check that the liquid to be controlled is not aggressive for the stainless steel of the electrodes.