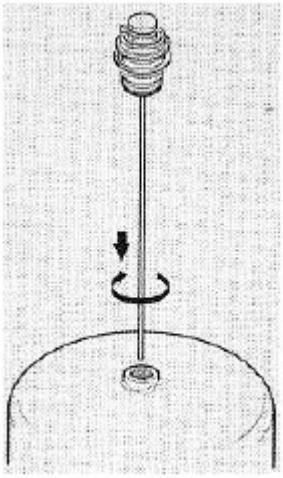
CORREX ® MP Anode with external voltage source



Installation & Operation Manual

MAGONTEC Group

MAGONTEC GmbH

Contents

These fitting and operation instructions apply to the below anode rods CORREX MP with an external voltage supply:

Fitting into a tank sleeve

a) by means of stop screw G 3/4
b) by means of stop screw G 1
c) by means of stop screw G 1 1/4

Fitting into an insulated hole

Potenciostat CORREX® MP is supplied with various anode types. Accumulation water heater producers provide information about which anode type is suitable. They also specify details regarding the necessary size of anode for a particular accumulator. This applies in particular to additional equipment of old tanks with anodes. Whilst choosing the right type, one has to consider the recommendations of the manufacturers on anode selection.

1 Safety instructions

Fitting and potential repairs of anode rods CORREX®
MP with an external voltage supply shall only be carried out by authorised experts!

Prior to the fitting of a CORREX MP device, the following has to be ensured:

- anode rod has been operated in a closed and dry room
- line voltage corresponded with the value stated on the type plate
- line voltage was connected permanently.

To ensure trouble-free function of anode rod CORREX® MP, it is absolutely necessary to follow the below safety instructions:

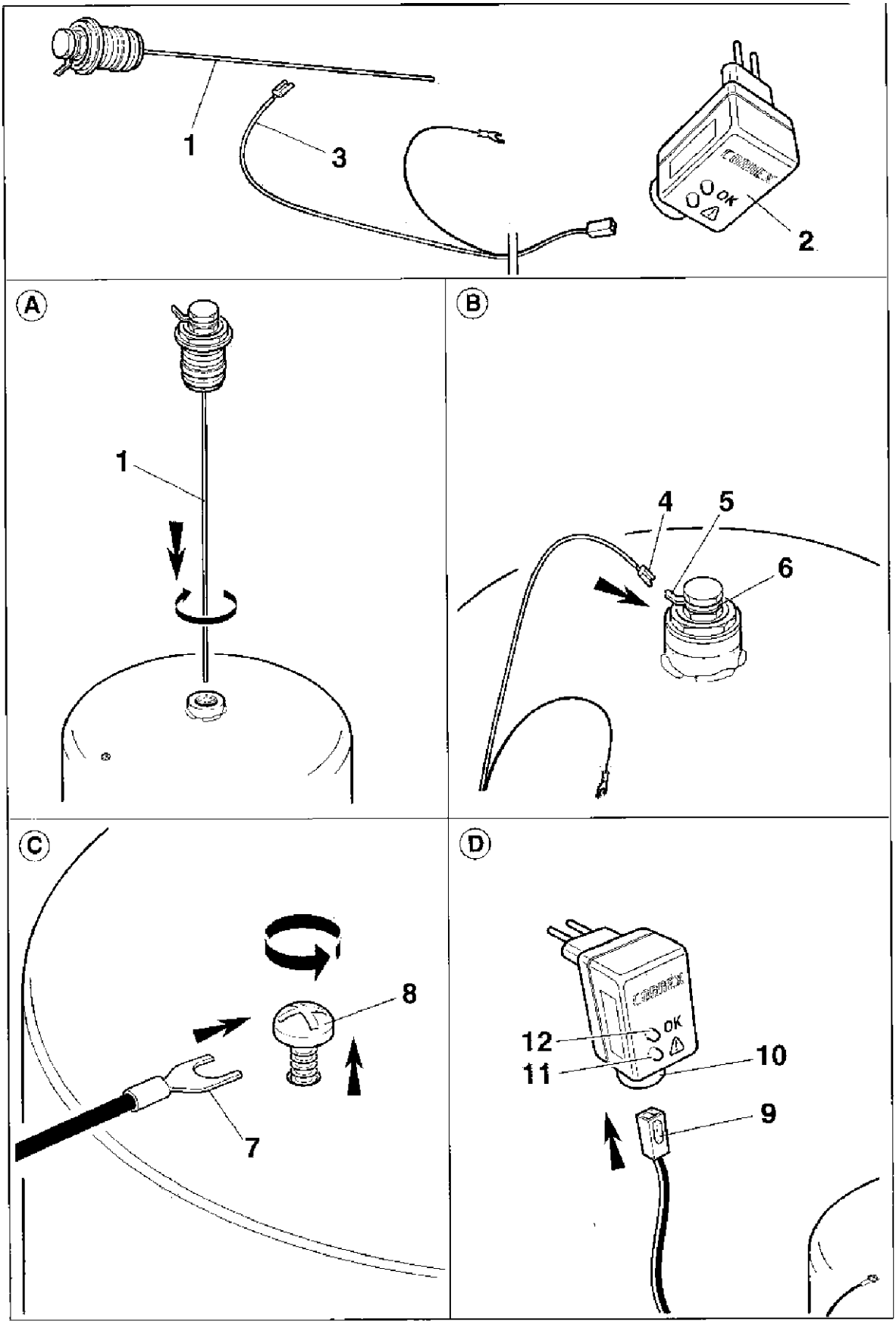
- Accumulation water heater must not be in service more than 2 months without any water withdrawal, otherwise disturbing gas concentrations may occur.
- The potentiostat device must not be pulled out of the socket if the accumulator is full. Disconnection interrupts anticorrosion protection.
- Connecting cables must not be disconnected if the accumulator is full, otherwise anticorrosion protection stops working.
- Anode rod CORREX® MP with an external voltage source must not be put out of service even in case of longer inactivity of the heater (e.g. during a holiday), since this would interrupt anticorrosion protection.

WARNING!

During operation of anode rod with an external voltage source in enamelled water heater tanks with an electric tubular heating element bear the following in mind:

In accumulation water heaters with separately mounted electric tubular heating element, bringing voltage by means of water to the metal parts of the tank we touch cannot be eliminated in case of a defect on the electric tubular heating element.
If we touch those parts, a fatal electric injury may happen under certain circumstances. Therefore, regular maintenance of the electric heating element by an expert, e.g. plumber, is required. Thus trouble-free condition of the element in terms of its outer state and function will be ensured.

In case of a defect on the electronic heating element voltage may also exist on the anode rod and the connecting cable between the anode and the potentiostat. If we touch those live parts, a fatal electric injury cannot be eliminated, either. Therefore the voltage to the tubular electronic heating element has to be disconnected before each performance of works on anode rod.


1
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11
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OK

2 Use in accordance with designated purpose

Anode rod CORREX® MP with external voltage source serves cathode anticorrosion protection of the enamelled hot water accumulators of capacity up to 300 litres, without the need of maintenance.

The appliance shall only be used for the above purpose, whilst meeting these fitting and operation instructions. We do not accept any liability for damages caused in consequence of improper use or failure to meet the said manuals!

3 Function

Anode rod CORREX® MP with external voltage source consists of mini-potentiostat and titanium electrode that are interconnected via a connecting cable.

Current from external source is generated by mini-potentiostat, protective current is supplied into the accumulator by means of titanium electrode immune from wear.

The system operates as a so-called intermittent potentiostat, i.e. protective current supply by titanium electrode is interrupted regularly in short intervals. During that interruption, the potential between the titanium electrode and the inner wall of the water accumulator is measured, and the final value is brought is the actual voltage into the mini potentiostat. There it is compared to the desired set voltage inside the appliance. The protective current supplied is then set automatically so that the potential corresponded with the value required. If the potential of the tank is U_H < -530 mV, the corrosion activity is almost zero.

4 Volume of the delivery

4.1 Fitting into a tank sleeve

Prior to the fitting, check the volume of the delivery in terms of completeness, and the parts for intactness using the below table, as well as the figure on page 3!

Item	Quantity	Description
1	1	Titanium electrode with separately mounted stop screw
2	1	Connector bushing with electronic intermitting potentiostat and indicator lamps
3	1	Connecting cable with terminals

4.2 Fitting into an insulated hole

Prior to the fitting, check the volume of the delivery in terms of completeness, and the parts for intactness using the below table, as well as the figure on page 46!

Item	Quantity	Description
1	1	Titanium electrode with screw and sealing washer
2	1	Connector bushing with electronic intermitting potentiostat and indicator lamps
3	1	Connecting cable with connecting terminals
4	1	A bag containing: 1 gasket (Viton) 1 insulation sleeve 1 zinc-plated washer 1 geared washer M8 2 hexagonal nuts M8 1 geared washer with flat contact 6.3 x 0.8 mm

5 Fitting and putting into operation

5.1 Fitting into a tank sleeve

During the fitting, do not forget to consider the following safety instructions:

- If magnesium anode rod is present, dismantle it prior to fitting the CORREX® MP anode rod (the case of additional equipment)
- Never connect CORREX® MP potentiostat to magnesium anode rod
- Titanium electrode must not have any direct contact with the parts built in the accumulator or in the wall of the accumulator Check whether the insulation is perfect, using a suitable gauge.
- The function of anode rod CORREX® MP with external voltage source is only guaranteed on condition of perfect connection of the conductive metals of all electric connections. Check whether the conductivity of the connections is perfect, using a suitable gauge.
- Use only genuine connecting cables.
- In no case extend the connecting cables.
- Prior to putting into operation check whether the cable connections are not exchanged. If so, there is a danger of corrosion.
- To ensure ideal seating of the sealing ring, the edge of the tank sleeve has to be bevelled by 60°.

☞ **In case of additional assembly of the anode rod to an external voltage source, the existing sleeves with thread or reductions can be used (zinc-plated steel).**

Fitting and putting into operation

The graphics on the folded side in the beginning of these manuals illustrates assembly of the anode to an external voltage source. The real situation depends on the heater type and its size.

☞ **Let the folded side (page 3) open during the assembly.**

What you need for the assembly:

- titanium electrode with stop screw G 3/4, G1 or G 1 1/4 **(1);**
- supply cable **(3)**
- potentiostat **(2)**

Proceed as follows during the assembly of the anode rod:

- Drain the water accumulator (if necessary)
- Dismantle the old anode rod (if necessary, e.g. in case of additional equipment)
- Screw the titanium electrode **(1)** pressure tight (up to the spigot) into the threaded sleeve of the accumulator

☞ The stop screw is provided with a PTFE sealing ring. If this sealing ring is damaged, which may occur e.g. after several screw-ins, you have to ensure the sealing function using other materials, such as cannabis or a PTFE sealing tape.

- Slip the flat sleeve 6.3 x 0.,8 **(4)** over the flat contact **(5)** of the geared anode washer **(6).**
- Fasten the flat plug**(7)** of the cable end marked as "attachment to the tank frame" to the earth bolt **(8)** of the tank.

If there is not earth bolt, an alternate reliable electric cable contact of the frame to the accumulator has to be made. Without perfect connection of the conductive metal the function of the CORREX® MP anode rod with external voltage source cannot be guaranteed.

- Insert the two-pole connector **(9)** of the connecting cable as far into the potentiostat socket **(10)** that the wedge projection snaps in.

☞ Due to using different terminals, the original connecting cable is safe against polarity reversing.

- Insert the potentiostat plug **(2)** into the 230 V power socket.
- Fill the accumulator with water and retest if it is tight.
- Check the indicator lamps on the potentiostat casing.

☞ Anode rod begins to work only if the accumulator is filled with water.

- **If the green indicator light (12) is on**, the protective current is fed.
- **If neither indicator light is on,** the power supply is probably disconnected.
- **If the red indicator light (11) is on**, a faulty function has occurred. In that case, the checks described on page 10 have to be performed.

5.2 Fitting into an insulated hole

During the fitting, do not forget to consider the following safety instructions:

- If magnesium anode rod is fitted, dismantle it prior to fitting the CORREX® MP anode rod (the case of additional equipment).
- Never connect the CORREX® MP potentiostat to magnesium anode rod.
- Titanium electrode must not have any direct contact with the parts built in the accumulator or in the wall of the accumulator Check whether the insulation is perfect, using a suitable gauge.
- The function of the CORREX® MP anode rod with external voltage source is only guaranteed on condition of perfect connection of the conductive metals of all electric connections. Check whether the conductivity of the connections is perfect, using a suitable gauge.
- Use genuine connecting cables only.
- In no case extend the connecting cables.
- Prior to putting into operation check whether the cable connections are not exchanged. If so, there is a danger of corrosion.
- Use genuine sealing material only.

☞ **In case of additional assembly of the anode rod to an external voltage source, the existing bushings after previously separately mounted anode rods can be used.**

Fitting and putting into operation

The graphics on the folded side in the beginning of these manuals uses examples to illustrate the assembly of the anode to an external voltage source. The real situation depends on the heater type and its size.

☞ **Let the folded side (page 46) open during the assembly.**

What you need for the assembly:

- titanium electrode **(1)**
- supply cable **(3)**
- potentiostat **(2)**
- 1 gasket (Viton) **(4)**
- 1 insulation sleeve **(5)**
- 1 zinc-plated washer **(6)**
- 1 geared washer M8 **(7)**
- 2 hexagonal nuts M8 **(8 & 10)**
- 1 geared washer with flat contact 6.3 x 0.8 mm **(9)**

Proceed as follows during the assembly of anode rod with an external voltage source:

- Drain the water accumulator (if necessary)
- Dismantle the old anode rod (if necessary, e.g. in case of additional equipment).
- If there is no hole, bore a hole of 10.5 mm diameter into the accumulator flange cover.
- Slip the Viton gasket **(4)** over the titanium electrode screw thread **(1)** and run the electrode from the inner side through the hole that is prepared for the assembly.
- Insert the insulation sleeve **(5)** from the outer side of the flange cover or – more precisely – wall of the tank.
- Screw in the titanium electrode with washer **(6),** geared washer **(7)** and hexagonal nut **(8).**

☞ The screwing has to be pressure-tight (the torque recommended is 6 Nm). **Use a wrench!**

- Insert the geared washer with flat contact 6.3 x 0.8 mm **(9)** and lock it with the hexagonal nut **(10).**
- Re-fix the flange with titanium electrode to the accumulator.
- Fasten the flat plug **(11)** of the cable end marked as "attachment to the tank frame" to any of the flange bolt (8) of the tank.

If there is not earth bolt, an alternate reliable electric cable contact of the frame to the accumulator has to be made. Without perfect connection of the conductive metal, the function of the CORREX® MP anode rod with external voltage source cannot be guaranteed.

- Slip the flat sleeve 6.3 x 0.,8 **(12)** over the flat contact of the geared anode washer.
- Insert the connector **(13)** of the connecting cable as far into the potentiostat socket **(14)** that the wedge projection snaps in.
  Due to using different terminals, the original connecting cable is safe against polarity reversing.

- Insert the potentiostat plug **(2)** into the 230 V power socket.
- Fill the accumulator with water and retest if it is tight.
- Check the indicator lamps on the potentiostat casing.

☞ Anode rod begins to work only if the accumulator is filled with water.

- **If the green indicator light** (**15**) **is on**, the protective current is fed.
- **If neither indicator light is on,** the power supply is probably disconnected.
- **If the red indicator light** (**16**) **is on**, a faulty function has occurred. In that case, the checks described on page 10 have to be performed.

6 Operation & Maintenance by the keeper

The CORREX® MP anode rod is immune to wear and operates without the need of maintenance. You only need to check the control lights, from time to time.

- **If the green indicator light is on**, feeding of the protective current is in process.
- **If neither indicator light is on,** call a technician or our customer service.
- **If the red indicator light is on,** call a technician or our customer service.

To ensure trouble-free function of the CORREX® MP anode rod, it is absolutely necessary to follow the below safety instructions:

- Water heater must not be in service more than 2 months without any water withdrawal. Otherwise disturbing gas concentrations may occur.
- The CORREX® MP potentiostat device must not be pulled out of the socket if the water accumulator is full. Disconnection from power supply interrupts anticorrosion protection.
- Connecting cables must not be disconnected if the water accumulator is full, otherwise anticorrosion protection stops working.
- Anode rod CORREX® MP with an external voltage source must not be put out of service even in case of longer inactivity (e.g. during a holiday), since this would interrupt anticorrosion protection.
- Only pull out the bushing with the plug or the connecting cable if the accumulator is empty.

☞ Power consumption is below 35 kWh / year.

7 Troubleshooting

The below described measures to remove failures shall only be performed by a technician or experts of our customer service!

If neither indicator light is on, the power supply is probably disconnected.

If the red indicator light is on, perform the following checks:

- **Is the water accumulator filled with water?**
  Fill water in the water accumulator!

- **Is electric clearness ensured?**
  Check all connections and contacts in terms of perfect and conductive metal contact. Remove potential defects.

- **Is there an old magnesium anode fitted inside the accumulator?**
  If so, dismantle it.
- **Is perfect insulation of the electrode or – more precisely – of the in-built accessories - from the wall guaranteed?**
  Check the insulation using a gauge with the accumulator empty and, if necessary, correct the position of the accessories and/or of the electrode.

- **In terms of electric insulation, has the assembly of other than enamelled heat exchangers of the heater been performed correctly (e.g. copper finned tubes, copper smooth tubes or chromium-nickel smooth tubes)?**
  Check the insulation using a suitable gauge and, if necessary, remove the defect.

If the above measures do not help to remove the defect of the CORREX® MP anode rod, contact the accumulator supplier.

8 Technical Data

Mini potentiostat CORREX® MP		
Function	Potentiostat with a plug for cathode anticorrosion protection of enamelled electric water heaters (intermitting potentiostat with controlled regulation of protective current potentiostat) with an integrated function indication with red/green LED control lights.	
Mains power supply	Voltage: Frequency: Power input:	230 V ± 10 % 50/60 Hz < 4 VA
Indicators	Požadovaný potenciál: Impulse frequency: Intermittence: Rated current (secondary) Supply voltage (secondary):	2,3 V ± 50 Ev 100 Hz 200 µs 100 mA max 10.6 V at 100 mA
Display	Two LEDs, 5 mm diameter	Green: followed by protective current supply Red: failure neither is on: no power supply
Operation	Temperature range (Potentiostat): IP protection:	0...40 °C II (operation in closed rooms)
Bushing	Dimensions (without Euro socket plug): Weight (without anode cable)	L x W x H = 80 x 50 x 45 mm approx. 160 g
Titanium electrode CORREX®		
Function	Supply and referential electrode with a coating of noble metal oxides; supply with protective current without wear; referential electrode to measure the actual potential in the accumulator.	
Bolt with thread	M8 x 30	
Dimensions of electrode in the part filled with water (Basic MP version)	Diameter: Délka: Coating length:	2 mm 200 mm 100 mm
Assembly options:	Fitting into a sleeve Fitting into an insulated hole	

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