

Direct current electrode. EAC-1

Model 276



1. Description of the electrode

The electrode is a measurement probe that must be handled with extreme care. Avoid any knocks, in particular against the measurement area, which could damage the seal points.

All connections and start-up procedures must be carried out without opening the box (1). Any evidence of unauthorised tampering with the box (1) will void the guarantee.

2. Operating principle

The electronic level control device is based on the principle of capacitive level.

The rod of the capacitive electrode and the wall of the measurement recipient constitute a condenser.

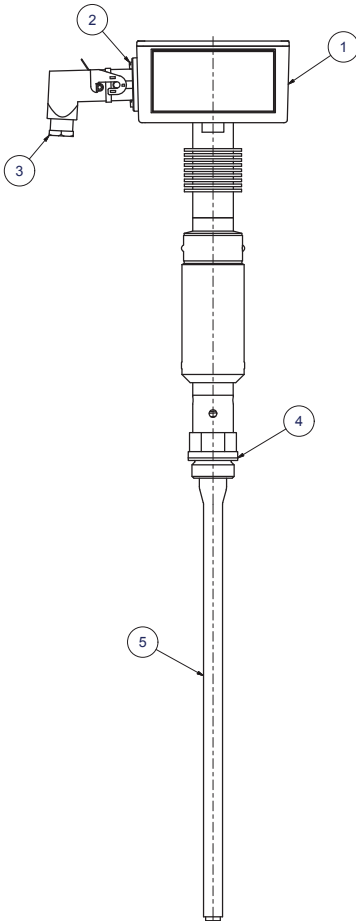
The dielectric medium is air or the corresponding product. In electrically conductive products, the condenser is comprised of the product and the electrode, the insulating covering of which acts as a dielectric. The capacity of the condenser therefore depends on the level in the electrode. This capacity is measured by applying a high frequency constant voltage to the electrodes.

The high frequency current passing through the condenser is proportional to the capacity.

This current is transformed into a signal proportional to the level and equivalent to 4÷20 mA, which later activates an electric element.

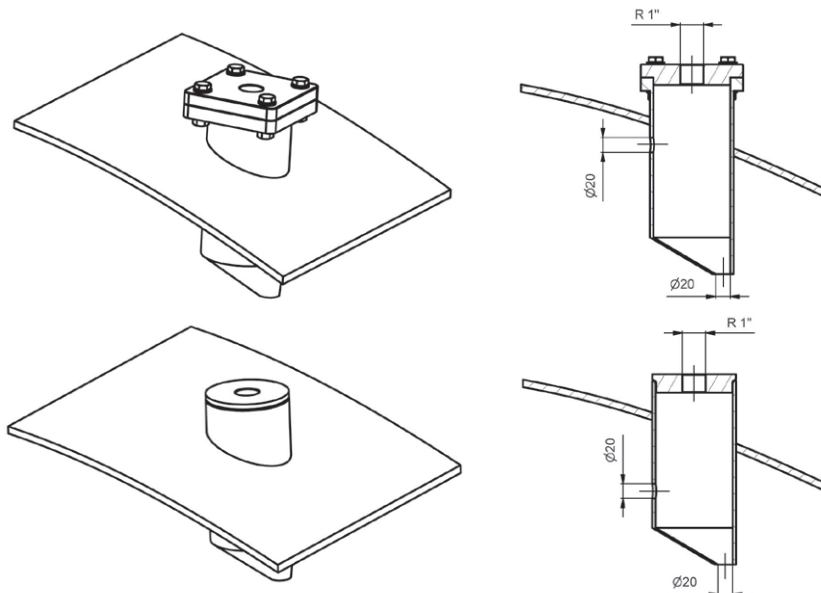
3. Technical information

R		1"
CONNECTIONS		Male cylindrical Whitworth Gas Thread ISO 228/1 (DIN-259)
OPERATING CONDITIONS	PRESSURE IN bar	32
	MAX. TEMP. IN °C	238
MAXIMUM ADMISSIBLE ROOM TEMPERATURE IN °C		70
DEGREE OF PROTECTION		IP-65 as per EN-60529
PROTECTION AGAINST OVERHEATING IN °C		102
MINIMUM REQUIRED CONDUCTIVITY IN µS/cm IN WATER AT	25° C	0,5
	238° C	20



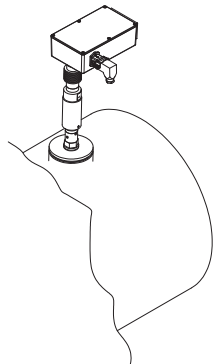
4. Installing the capacitive electrode

Examples of unions.
Interior of the boiler body.

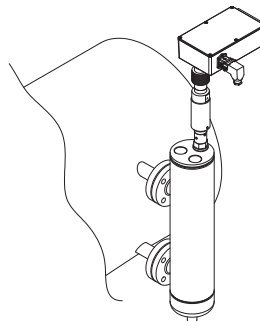


Danger: Make absolutely sure that the connection area is free of pressure and is cold before proceeding with the assembly of the capacitive electrode.

Before installing the capacitive electrode, clean the measurement coating (5) with the aid of a clean, slightly damp cloth. The measurement coating (5) must be completely free of any oil or grease. After placing the washer (4) in position, screw the capacitive electrode home manually and then tighten with a spanner to a torque of 160 Nm.



Examples of installation on the boiler body



Examples of installation on a collector

Warning: Only stainless steel washers (4) should be used

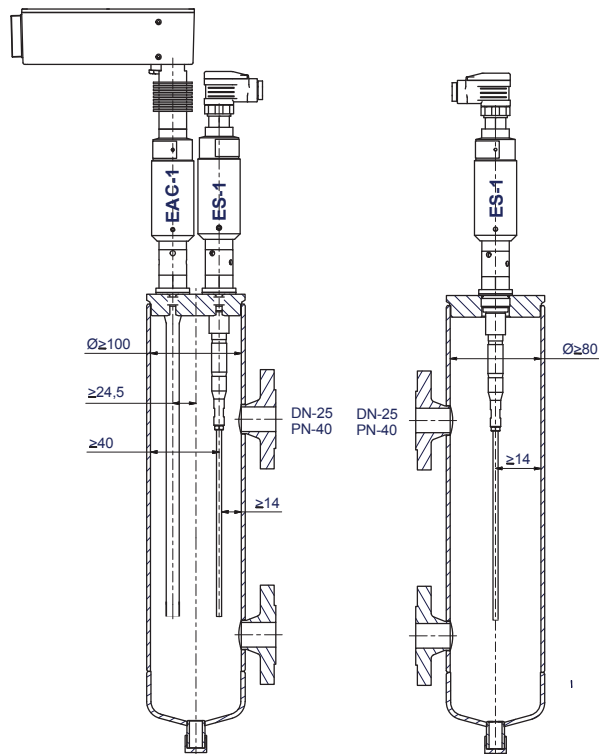
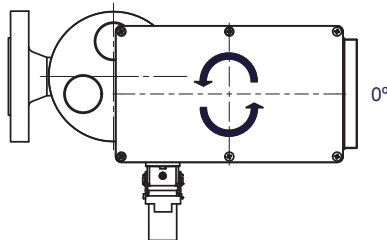
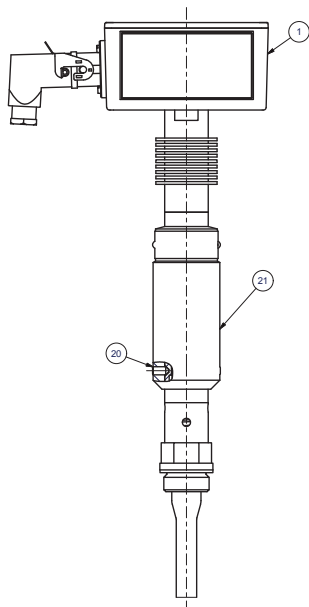
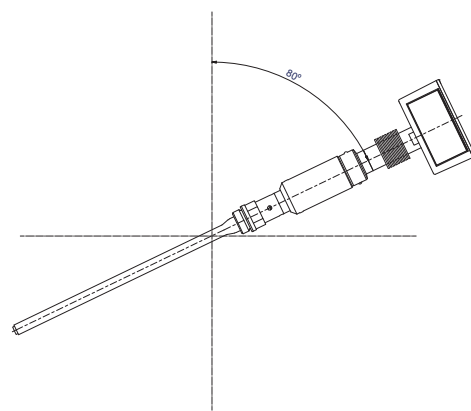
Use a new washer (4) for each assembly operation. The upper part of the hexagon must not be embedded in the boiler insulation.

The capacitive electrode may be installed either vertically or inclined, with the measurement coating (5) facing downward. The inclined position should not exceed 80° from the vertical.

The measurement coating (5) must be absolutely parallel to the metal wall of the recipient, collector, baffle or metal rod that acts as a condenser.

Collector connection for electrodes Mod. 176 is valid up to an effective measurement field of $h = 400$ mm (See catalogue Mod. 176).

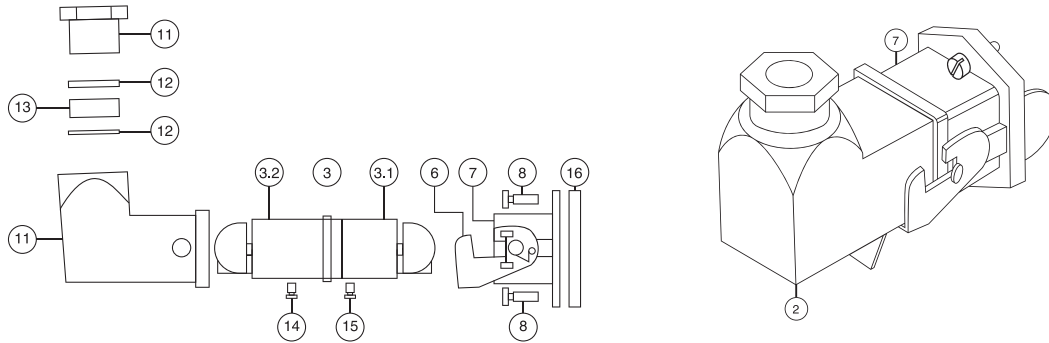
The box (1) may be turned through 360°. Loosen the bolts (20), position the box (1) as desired by turning the protective tube (21) and re-tighten the bolts (20). We recommend proceeding with extreme care in order to note any unlikely abnormality in the internal connections.



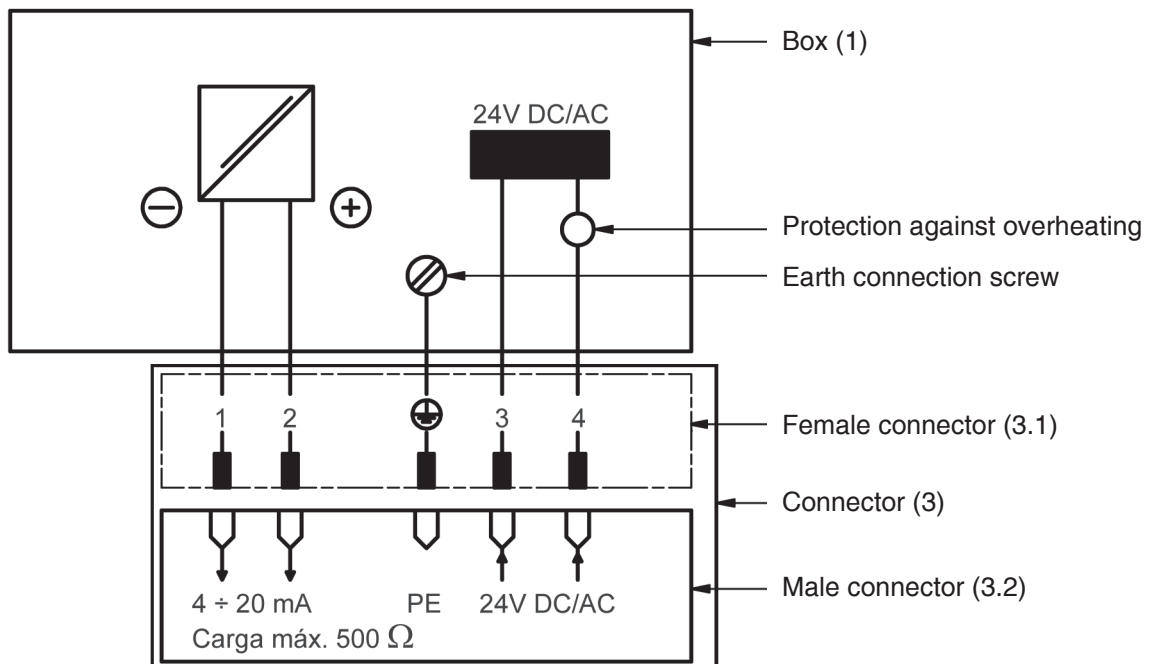
5. Connecting the electrode

The power supply to the electrode should be 24 V DC/AC via a safety power supply, in compliance with EN-61558 and EN-60950, duly protected against current surges according to EN-61010.

Electrical connection	Connection box for 5-pole electric cable, each conductor with a cross section of 0.75 mm ²
Maximum cable length	50 m.
Power supply voltage	24 V DC/AC
Power consumption	5 VA
Output	4÷20 mA in proportion to the fill level, without voltage, maximum load 500 Ω.



Turn the locking lever (6) and loosen the screw (14), take out the connector body (2). You will then have access to the interior. To simplify connection, the connector (3) may be unplugged from both male (3.2) and female (3.1) sides. Run the wire through the gland nut (11), the gland ring (12) and the seal (13). Set the ends at No. 1, 2, 3, and 4, and the fifth to earth (⊥). Tighten the gland nut (11). Select the right position for the connector body (2) and lock it onto the support (7). Fasten it using screw (14) and locking lever (6).



Warning: During the assembly process, make sure that the washers (16) and (17) remain in their original position. If not, position them correctly.

6. Start-up

It is well known that polytetrafluoroethylene (PTFE) expands at high temperatures. Check each capacitive electrode after start-up and after use. The capacitive electrodes must be checked to ensure they are in perfect working order before they can be installed in the boiler and the boiler started.

7. Adjusting the measurement range: Upper and lower point with DIP-10 A1 indicator

Before starting the unit for the first time, make absolutely sure that all electrical connections have been made as indicated in the wiring diagram and check that the power supply voltage is the same as that appearing on the identification plate.

7.1. Adjust the high measurement point (20 mA corresponds to 100%)

1. Use the feed pump to fill the steam generator or tank with liquid up to the lowest measurement point. From this point on, we refer only to a generator, but the procedure is the same for any other compatible piece of equipment.

In steam generators the lowest measurement point corresponds to a water level that shows approximately 1 cm on the glass of the level indicator. This point is below the minimum water level in the generator and so this level must be exceeded for the burner to start.

2. Set the generator to the working pressure on the manometer. As the water heats it expands and the level rises. Once the working pressure is reached, use the drain cock to adjust the water level to the lowest measurement point.

3. Disconnect the burner and use the bleed valve to reduce the water level to 1 cm on the glass of the level indicator. This point is 0% or the minimum adjustment level.

4. Calibration (lower section) (A).

- Press the ▲ and ▼ keys at the same time
- The display alternates ADJ.LO and the current value
- Use the ▲ and ▼ keys to set the value to 0%
- Press ↵ to validate
- "Good" must be displayed, which confirms the operation

7.2. Adjust the high measurement point (20 mA corresponds to 100%).

1. Start the feed pump and fill the steam generator with water up to the highest measurement point. In steam generators, the high measurement point corresponds to a water level that is 1 cm below the maximum of the level indicator glass. This point is 100% or the maximum adjustment level.

2. Calibration (upper section) (B).

- Press the ↵ and M keys at the same time
- The display alternates ADJ.HI and the current value
- Use the ▲ and ▼ keys to set the value to 100%
- Press ↵ to validate
- "Good" must be displayed, which confirms the operation



DIP-10 A1 indicator

7.3. Adjusting the measurement range: Upper and lower point with IDEAL-P indicator

Level probe VYC-EAC-1 with IDEAL-P indicator

Capacitive level with 0-100% indication corresponding to a 4/20mA galvanically isolated output.

Generic viewfinder programming:

Three keys are available to move through the menus and submenus and to modify data:

- ENTER: Desplazamiento vertical en los menús, validar datos.
- ▲ UP: Incrementa el valor del dígito activo.
- ▶ SHIFT/DOWN: Desplazamiento horizontal en los menús, cambio de dígito activo.

Numeric values are entered digit by digit by selecting the digit with ▶ and then changing its value with ▲ and validating the value by pressing ■ nnnn value only to be displayed.

0% and 100% calibration.

- Set the level at 0%

Proceed according to:

- Pro ■
- InP ▶
- dSP ■
- SCAL ▶
- tEAC ■
- InP1 (flash) ■
- nn.nn ■
- dSP1 (flash) ■
- 0000 ■
- 0000. ■
- InP2 (flash) ■
- nn.nn ■

- Set the level to 100%, the nn.nn value will increase

- dSP2 (flash)
- 0100 ■
- Stor (flash)



IDEAL-P indicator

Note: The flashing display indicates that the level is below 5% or above 105%.

8. Maintenance

We recommend a thorough cleaning of the capacitive electrode according to the working conditions. The interval between cleaning should not exceed 6 months. To disassemble the capacitive electrode, disconnect the power supply and separate the male connector (3.2) from the female connector (3.1) according to point 5.

Warning: Only dismantle the electrode if it is absolutely certain that the connection area is free of pressure and temperature.

9. Anomalies

A leak at the gasket (4) can usually be eliminated by tightening the gasket. If it does not disappear, replace the gasket (4) with a new one.

10. Transport and storage

All our products are delivered in packaging suitable for any destination and transport to ensure optimum protection. Store the devices in their original packaging. Do not expose the electronic level control devices to temperatures below -40°C or above +80°C.

Avoid shocks and vibrations.

Protect the electronic level control devices against humidity and its effects (humidity < 60%). The storage place must be clean and dust-free.

Electronic level control devices must not be subjected to temperature changes of more than 10°C per hour during storage or transport.

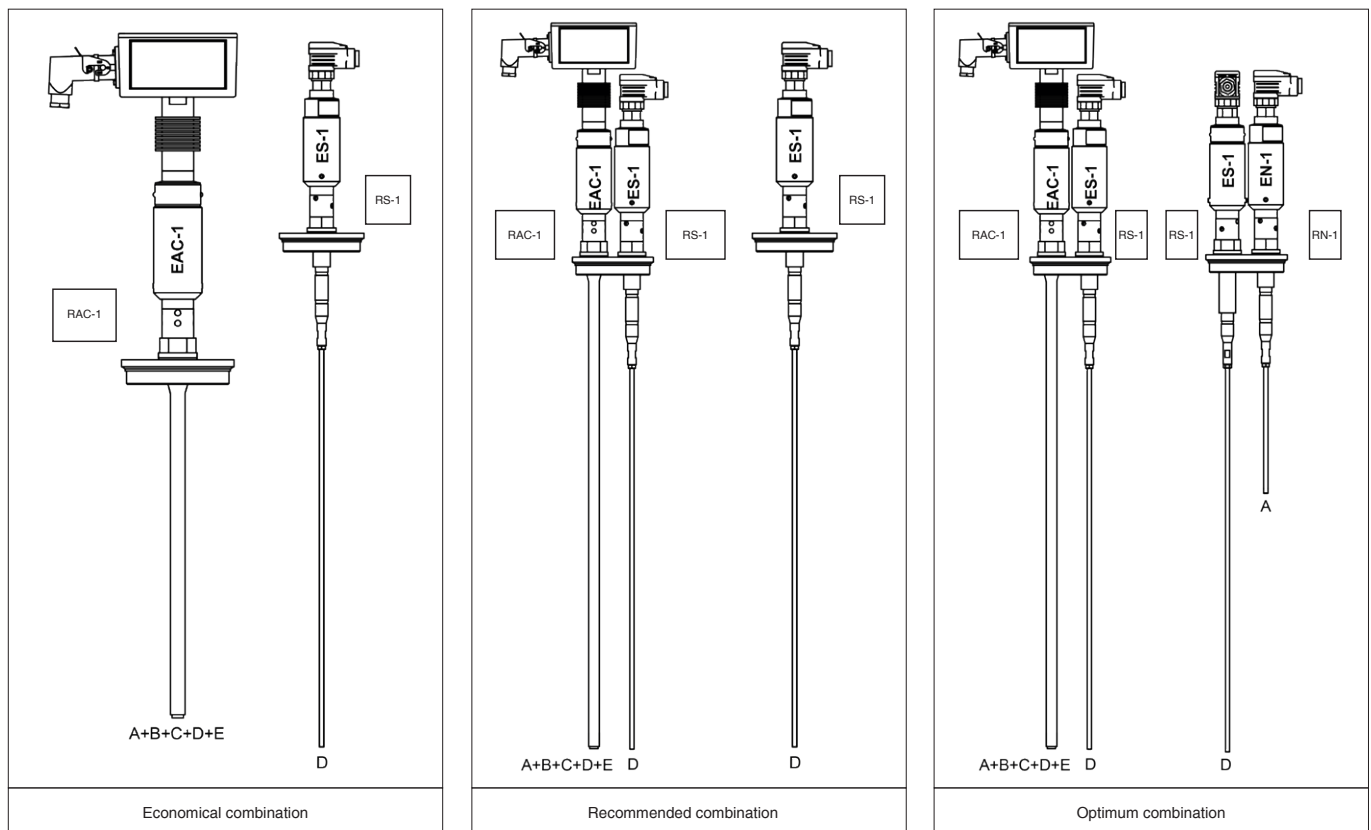
Warning: If you detect any damage to the packaging, you must notify the carrier immediately in writing and with acknowledgement of receipt.

11. Validity of the operating instructions

These operating instructions contain vital information which is supplemented by the following supplementary instructions:

- Catalogue Model 276

12. Combinations for generator level control



Funciones

A.- Maximum level safety. B.- Pump stop. C.- Pump start. D.- Minimum level safety. E.- Others.

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Mod. 276 | EAC-1
 Automatic level controller | CTI