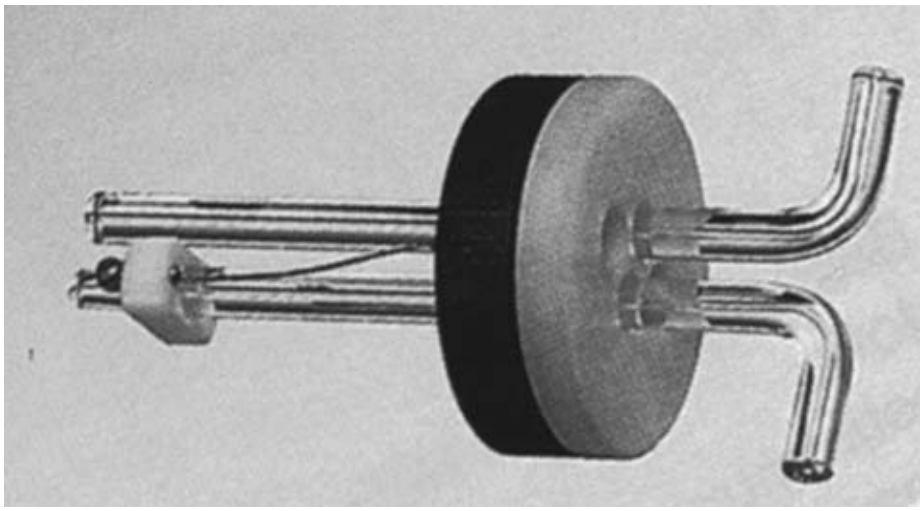
Lid for calorimeter insert

02615.02

Operating Instructions



Contents

1 PURPOSE AND CHARACTERISTIC FEATURES

The lid for the calorimeter insert allows the controlled burning of small quantities of gas when used in combination with the calorimeter insert for the glass jacket (order no.: 02615.01), and the determination of the enthalpy of the reaction together with the glass jacket (order no.: 02615.00). A screw connection enables it to be gas-tightly connected to the calorimeter insert for such usage. Two glass capillary tubes are fixed in the lid, one for the passage of the gas to be tested into the calorimeter insert, the other for the oxygen required for combustion. Two electrodes, each with a platinum wire tip, are positioned at the outlet side of the test gas tube. The tips are so angled that they are opposite to each other, with only a small distance between them, just in front of the tube opening from which the gas emerges. The lid has a 4 mm socket which enables the electrodes to be connected to a high voltage supply (e.g. the high voltage supply unit, 0-10 k, order no.: 13670.93) with high voltage connecting cord (connecting cord, 50 KV, 500 mm, order no.: 07367.00) for the generation of permanent ignition sparking. When high voltage is applied, a continuous spark gap is formed between the two electrodes, which serves to ignite the gas to be burnt.

2 ATTACHING THE LID TO THE CALORIMETER INSERT

Proceed as follows to fit the lid onto the calorimeter insert:

- Unscrew the black tightening ring, remove it from the lid and slide it onto the calorimeter insert, threaded side first
- When doing this, leave the lid sealing ring (a silicone rubber O-ring) in the lid socket
- Press the lid against the flange of the calorimeter insert and screw the tightening ring tightly onto the thread of the lid for a completely sealed attachment (see Fig. 2).

3 INSERTION OF THE CALORIMETER INSERT INTO THE GLASS JACKET

The calorimeter insert with lid attached is used as described in the operating instructions for the glass jacket (order no.: 02615.00), positioned with the tube holding the electrodes below the other tube, as otherwise the flame would be unnecessarily near to the glass wall. Further requirements (filling with water, thermometer etc.) are dependent upon the individual experimental set-up. Descriptions of experimental procedures are given in PHYWE Experimental Literature (e.g. the Glass Jacket Manual, order no.: 01196.12).

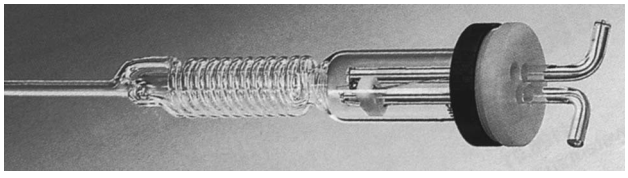


Fig. 2: Calorimeter insert with the lid screwed on

4 SAFETY PRECAUTIONS

The ignition of the combustible gas must occur immediately it enters the combustion chamber, in order to avoid a possible formation of an explosive gas mixture. The position of the electrodes in front of the gas entry tube is therefore of decisive importance (see Fig. 3). The distance of the tips of the electrodes from each other should be 4 mm 0.5 mm. The spark gap must run exactly across the front of the tube opening, at a distance of approximately 1 mm from it. The positioning of the electrodes must be carefully checked before the lid is fitted on to the calorimeter insert. When the measuring set-up is complete, apply high voltage to generate a permanent spark and again check the correct positioning of the spark gap. Before doing this, ensure that there is no combustible gas in the combustion chamber! The permanent sparking must never break off during the subsequent combustion of the gas, as there would then be a danger of the formation of an explosive gas mixture. Should sparking break off during combustion, immediately break the connection to the high voltage supply to avoid an unintentional ignition of such a mixture. The experiment can be re-started after complete removal of the gas mixture from the calorimeter system and elimination of the fault which led to an interruption of the permanent sparking.

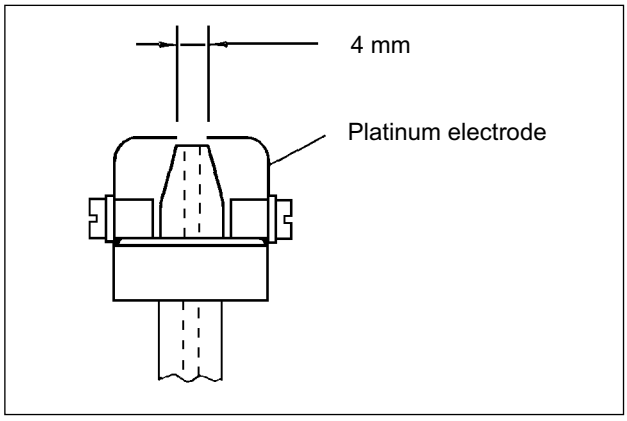


Fig. 3: Arrangement of the electrodes

5 REPLACING THE ELECTRODE TIPS

The electrode tips can be easily replaced when necessary, e.g. when they have melted because of too high a temperature (melting point of platinum: 1769°C). After undoing the small screw (see Fig. 3), draw out the platinum electrode replaced it with a new one. This can be prepared from platinum wire (d = 0.3 mm, l = 100 mm; order no.: 31739.03) by cutting off a 25 mm length and bending it as was the old tip. Insert the electrode which is so prepared in the position from which the old one was removed, and fix it by re-tightening the loosened screw.

6 NOTE ON THE GUARANTEE

We guarantee the instrument supplied by us for a period of 6 months. This guarantee does not cover natural wear nor damage resulting from improper handling.

The manufacturer can only be held responsible for the function and safety characteristics of the instrument, when maintenance, repairs and changes to the instrument are only carried out by the manufacturer or by personnel who have been explicitly authorized by him to do so.

7 RECOMMENDED ACCESSORIES

High voltage supply unit, 0-10 kV	13670.93
Connecting cord, 30 kV, l = 100 cm	07367.00
Glass Jacket Manual	01196.12