



User manual

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CBS™ HIGH SECURITY STRAWS FILLING AND SEALING SYSTEM PACE

**Read this manual carefully before using CBS™ HIGH SECURITY STRAWS FILLING
AND SEALING SYSTEM
PACE**

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INTRODUCTION

"CBS" straws are designed to preserve a variety of biological samples (blood, serum, sperm, cell cultures, microbiological or viral sources) in liquid nitrogen at a temperature of - 196°C.

This "High Security" guarantee can only be ensured if all the conditions recommended for the manipulation of these straws are complied with.

These manipulation conditions are summarized below.

1 **MANIPULATION AND STORAGE BEFORE USE**

Very stringent manipulation and inspection conditions are applied throughout the CBS straw manufacturing cycle.

The PACE must be stored horizontally in a closed package and at a controlled temperature □ 20°C.

In the laboratory, they must be manipulated gently and avoiding, more particularly, any mechanical trauma (torsion, pinching, etc.) and/or thermal shock.

The PACE taken from the original package and not used for testing shall be preserved dry in a rigid and closed package at a temperature □ 20°C.

2 **FILLING - WELDING**

2.1 Filling and welding machine "rs-pace"

Important :

The performance of the "RS-PACE" machine will ensure a "High Security" guarantee for CBS straws as long as the utilization conditions are complied with to the letter..

The energizing of the machine is carried out by means of a toggle switch at the back off the control box. (□ 6.2)

The heating temperature (156°C – 220 V / 50 Hz) or (158°C – 110 V / 60 Hz) is reached after 20 to 25 minutes. Thermal regulation applies with a deviation of □ 1°C. The temperature of the welding jaws is approximately 25°C less than the set point temperature.

The CBS straws must be welded at a precise temperature which must not be perturbed. To achieve this result, it is imperative to take the following instructions into consideration:

- On energizing during the heating period, the Plexiglas □ lid must be raised.

2.2 Filling jet and sample tube

The filling jet has a seal, the position of which is adjusted in the factory so that the part penetrating into the straw is set exactly to 18 mm.

It is advisable to check that the seal was not moved during transport.

The installation of the jet on the jet-holder must be carried out gently to prevent any deformation of the rigid tube, the axis which must be accurately aligned with that of the straw.

To maintain the efficiency of the siphon sequence to call back the droplet, the sample to be distributed must be placed in the "sample tube" by fractions of volumes equal to or less than 6 ml.

The filling jet has a flexible tube which makes it possible to sample directly in the "sample tube". It must not be pinched or form loops. It must be "immersed" to the very bottom of the tube.

Important :

The jets must be replaced in the drop return is insufficient and if the welding zone is soiled by traces of liquid.

2.3 Suction jet

Except in the case of a manipulation incident (suction power too great), the suction jets are never in contact with the sample to be distributed.

It is advisable to change them at the end of each period of use and before cleaning the machine (see § 4.1).

2.4 CBS straw supply hopper

Important :

After starting the machine with the green pushbutton "START", check that the eccentric (007976) making it possible to ensure the perfectly horizontal storage of the straws in the hopper, turns freely. Then press the white pushbutton "STOP" to stop the machine.

In one go, add the number of straws required for the manipulation in view into the hopper, taking care to place the intermediate straw plug on the side corresponding to the suction nozzle.

The straw counter engaged in the filling welding cycle (001639) must be set to a random value equal to the number of straws provided for, plus 6 (e.g.: for 10 straws, the value displayed on the counter shall be 16).

Before each filling-welding cycle, return the counter to its initial position by pressing the black pushbutton on the left.

Important :

Whatever the number of CBS straw (from 1 to 10) placed in the hopper, leave the filling-welding cycle run until the counter is reset to zero.

2.5 Suction pressure

The suction pressure to be used varies with the viscosity of the product to be distributed. The machine has a negative pressure adjusting knob. The negative pressure is increased in the increasing graduation directions and reduced in the other direction.

Each product is filled by means of two embossed indications that are linked together.

- A "low" embossed depression corresponding to the setting required by adjustment, by running the machine without straws.
- This value automatically corresponds to a given "High" depression value displayed during the normal filling of the straw with the product to be distributed.

The goal to be achieved at all costs is that of obtaining the required quantity and volume (included between the intermediate stopper of the straw which must reach the level of the injection base at the pump, without exceeding it).

This is a way of guaranteeing that the internal area of the weld at the end of the injection jet side is totally clean and dry after injection. This condition is essential for correct filling. In addition, it is the means of obtaining a regular volume of air between the free surface of the liquid and the weld.

Slight adaptation of the settings may be needed in both cases.

- if the high depression is insufficient, it will lead to insufficient filling (the liquid will not reach the intermediate plug);
- if the high depression is too high, there is a risk of turbulence in the injection nozzle and/or an insufficient volume.

2.6 Filling-Welding

During this operation, beware of any wrong moves and in particular:

- incorrect alignment of the straws and the filling and suction nozzles (□ 2.2),
 - excessively long welding time related to stoppage of the machine in the "welding" position because of a wrong move.
 - excessively early manipulation of the straws after welding. Filled straws gathered in the carrier at the machine outlet must be placed carefully on a flat surface and left to stand for 5 to 10 minutes.

Important :

In the event of an exceptional incident causing disorder in the straw feed movement:

- 1 - Open the Plexiglas® cover immediately. The machine will stop instantly in any position.
- 2 - Switch to the manual mode to open the welding jaws by successively pressing the white pushbutton at the rear.

3 - Remove the weighted plate holding the straws in position and clear those that have come out of their position, beginning with the ones closest to the welding jaws.

4- Close the cover and restart the cycle.

2.7 Cleaning

After each period of use:

- The Plexiglas® guards will be cleaned with a compatible product (ethyl alcohol, for instance).
- The working area of the RS-PACE machine will be cleaned while preventing any liquids from entering the bottom section of the machine containing the electrical equipment.

3 **SUCTION CIRCUIT**

The suction is ensured by an electric pump constant flow.

The variation of the power of aspiration is obtained while acting on the button graduated.

In order to forestall any risks of contamination of the suction circuit, a plastic "trap" will be placed between the suction jet and the circuit.

The various couplings, and in particular the trap cover will govern the reliability and reproducibility of the filling process.

4 **MAINTENANCE OF THE RS-PACE MACHINE**

4.1 Cleaning of machine (see also § 2.7)

To do this, remove the upper part attached with two screws on either side of the machine. Before raising the upper part, remove the hopper and uncouple the suction nozzle from the circuit.

On assembly, be sure that the two levers in the bottom part are placed in exactly the same plane and toward the front, otherwise assembly will be impossible or difficult.

Check that the two split pins are properly located in the longitudinal direction of the machine so that the jet support levers penetrate in the slots (§ 7.3).

4.2 Control unit

4.2.1 Power supply and control module

The control module can be powered with 220V-50Hz / 2 AT or 115V-60Hz / 4AT via the connector at the back of the unit.

4.2.2 Machine block connection

Connection to the machine block is by the 19-pole connector at the back of the unit. All the devices in the machine are supplied with 24 V DC or AC.

4.2.3 Failures and actions

On energizing, the machine cannot be started because it will be necessary to wait for the temperature to reach the set point value and for the red indicator lamps marked with the letters ALM or AL to go out on the two temperature regulators.

This alarm value (ALM or AL) is factory-adjusted to : 153°C

4.3 Machine block and accessories

4.3.1 Disassembly on machine

See § 4.1.

4.3.2 Cleaning and maintenance

The cleaning of the mechanical parts will be carried out (after removing the upper section - see § 4.1.) with soap and water.

The jet support shafts can be greased with a small amount of oil if the jet support has a minor friction point.

4.3.3 Change of Teflon® on welding jaws

4.3.3.1 Removal of jaw models No.1

- To do this, disassemble the upper part of the machine by detaching the two knurled screws on either side of the machine beneath the upper part.

- Then detach the 4 screws (dia. 3 mm with a 2.5 mm Allen key) holding the stainless steel casing in place and slide it to one side.

Detach the 2 screws (dia. 3 mm with a 2.5 mm Allen key) retaining the upper jaw (see □ 7.4);

- Do likewise with the lower jaw, and then detach the screw of the Teflon□ clamp without removing it.

- Remove the Teflon□ and apply a new piece of Teflon□, first pre-forming it with a corner of the Teflon□ clamp, then tighten and assemble in the opposite order to disassembly.

- After assembling the lower and upper jaws and the casing, install the upper part on the lower part (see § 4.1.). Turn on the electric unit and wait until the temperature has finished rising.

- Check the air gap between the upper and lower jaws using the adjusting shim; this check is carried out with the jaws closed. By adjusting the white pushbutton (001593) at the back of the electrical unit (see § 6.2), the jaws can be closed (the P.B. works directly on the movement motor). The adjusting shim should slide with a slight friction point between the two jaws. If not, adjust the adjusting screw located on the upper jaw (see § 7.4):

- screw it in to increase the air gap;
- screw it out to decrease the air gap

4.3.3.2 Removal of jaw models No.2

- To remove the jaws, disassemble the upper part of the machine by detaching the two knurled screws located on either side of the machine below the upper part.

- Then detach the 4 screws (dia. 3 mm with a 2.5 mm Allen key) retaining the stainless steel housing and slide it to one side.

- Detach the 2 screws (dia. 3 mm with a 2.5 mm Allen key) holding the upper jaw (see § 7.4);

- Do the same with the lower jaw, and then unscrew the screw of Teflon® flange (§ 7.7) and remove the welding jaw split pin (§ 7.6) and remove the Teflon®.

- For assembly, fold the Teflon® at 1 cm approx. from the longitudinal edge, then place the Teflon® in the die on the split pin side and insert the split pin to

retain the Teflon®. Then tension the Teflon on the die and pinch out with the Teflon® flange (§ 7.7) and tighten the flange screw. Repeat the operation on all the jaws.

- After fitting the lower and upper jaws and the housings, install the upper part on the lower part (see § 4.1.). Energize the electric unit and wait until the temperature finishes rising.

- Check the air gap between the upper and lower jaws with the adjusting shim; this check is to be made with the jaws closed. By adjusting the pushbutton located at the back of the electric unit (see § 6.2), the jaws can be closed (the P.B. works directly on the movement motor). The adjusting shim must slide with a slight friction point between the two jaws. Otherwise, adjust the adjusting screw located on the upper jaw (see § 7.4):

- screw it in to increase the air gap,
- screw it out to decrease the air gap.

4.4 Failures and actions

a) - The two regulators doesn't light up.

⇒ Power plug on unit not properly pushed in or fuse (F0) on mains plug broken: replace
(see § 6.2)

b) - No temperature rise or temperature remains at 20°C (ambient temperature).

⇒ Fuse F1 (10 A) at back of unit broken: replace.

c) - Messages on regulators (FAIL)

⇒ Probe broken or machine connector not properly plugged in (if the probe is broken, call in a C.B.S. technical agent).

d) - No machine mechanical movement

⇒ Fuse F2 (8 AT) is broken: replace it

⇒ or drive belt broken (call in a C.B.S. technical agent). This drive belt is in the lower part of the machine, and access to the belt is possible after removing the stainless steel housings.

⇒ Motor Switched Out: replace.

e) - Heating plugs:

⇒ Pay great attention not to turn the heating plugs in either direction because it could destroy the probe and the heating resistor (§ 7.1).

5 OPERATION

Press the On/Off switch at the back off the control box.

The machine operates in 2 modes:

- Automatic
- Manual

The operating mode is selected by means of the key switch (ξ 6.1).

- Automatic operation (without key)
- Manual operation (key inserted into lock of selector and turned to the right).

The movements are controlled by continuous pressure on the white button (bp) on the rear panel (ξ 6.2).

Automatic cycle:

- In the event of an operating anomaly, it is possible to stop the machine during the cycle by pressing the white "**STOP**" button (ξ 6.1);

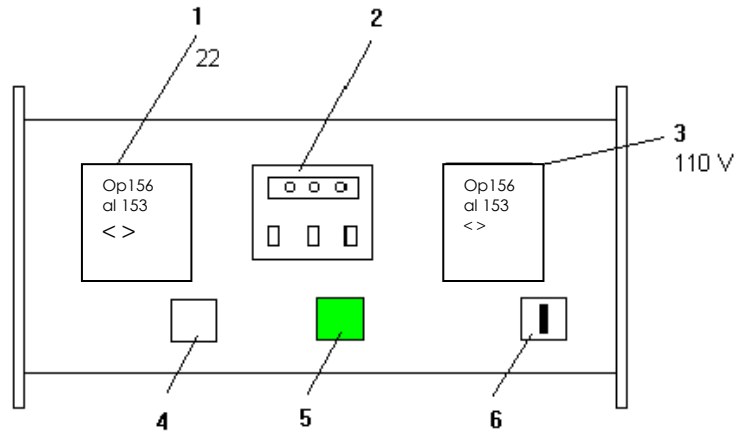
To reinitialise the cycle, it will be necessary to press the green "**START**" button again (ξ 6.1).

- During the cycle, if the operator raises the protection cover, the movements will stop.

When the cover is closed, it will be necessary to press the green button to restart the cycle.

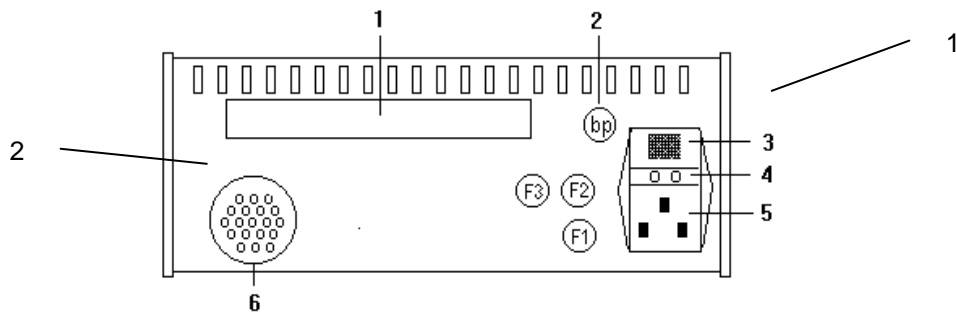
6 CONTROLE BOX

6.1 Front view



- 1 and 3 Temperature regulator
Series 91 (001236)
series 3216 (019194)
- 2 Straw counter (001639)
- 4 Off / stop (white)
- 5 On / start (Green)
- 6 Auto / Manual key selector (001579)

6.2 Rear view



- 1. Identification plate
- 2. Pushbutton
- 3. Switch
- 4. Fuses
- 5. Mains plug
- 6. Machine connector

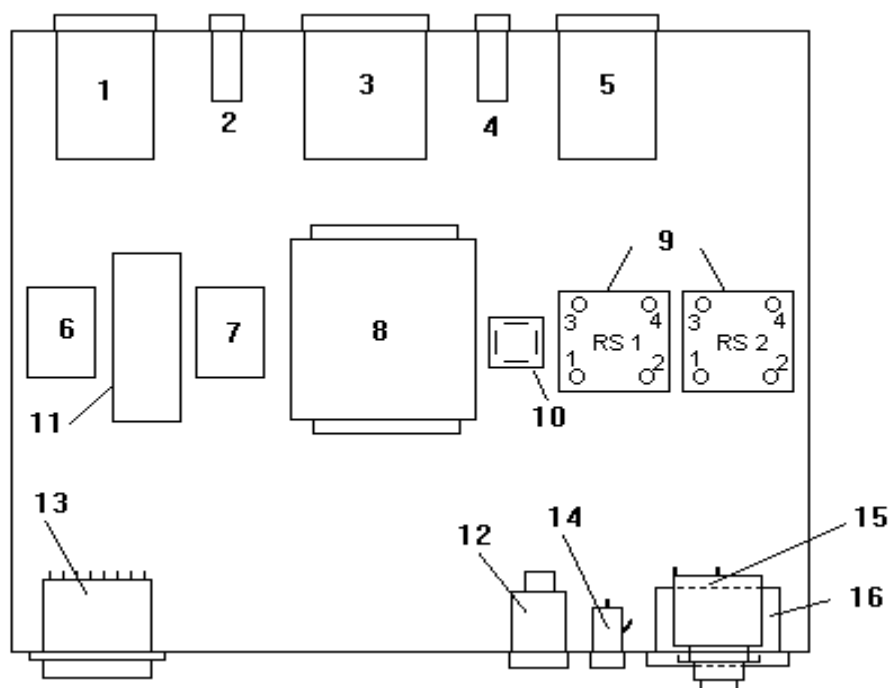
Fuses

F1 = 10 A heating
F2 = 8A delayed motor
F3 = 2A delayed circuit

Mains fuse

2A delayed at 230 V
4A delayed at 115 V

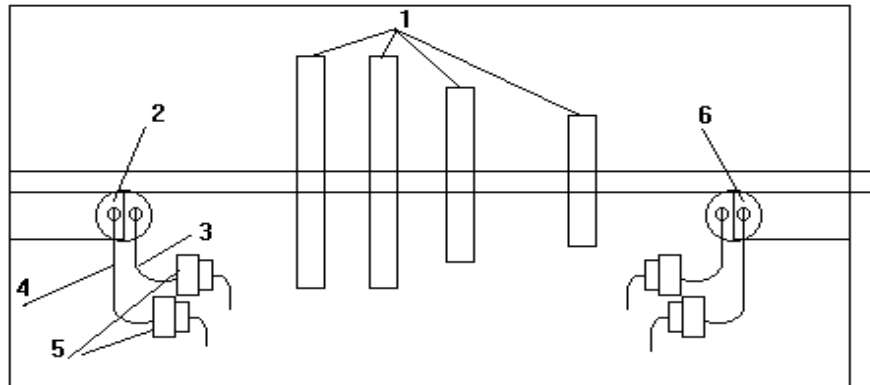
6.3 Top view



- | | |
|-----|---|
| 1. | Regulator 1 |
| 2. | On / start |
| 3. | Counter |
| 4. | Stop |
| 5. | Regulator 2 |
| 6. | Relay A |
| 7. | Relay C |
| 8. | Transformer |
| 9. | Static relay |
| 10. | Rectifier bridge |
| 11. | Time delay |
| 12. | 10 A heating fuse |
| 13. | Machine connector plug |
| 14. | 8 A delayed motor fuse |
| 15. | Weld adjustment P.B. |
| 16. | Mains plug with fuses
2 A delayed at 230V
4 A delayed at 115V |

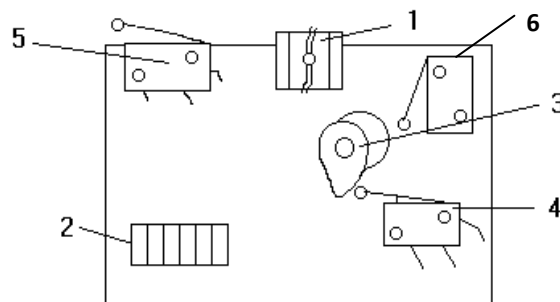
7 MACHINE BLOCK

7.1 *View of lower section from the underneath*



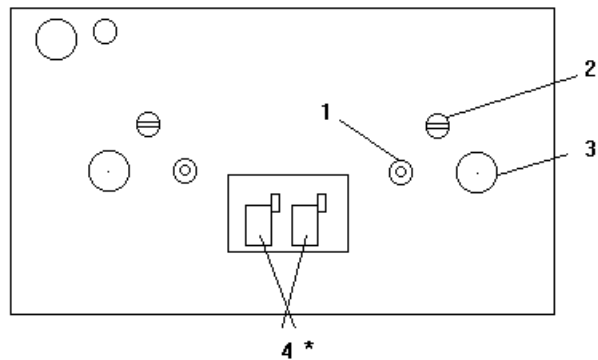
1. Cam S
2. Heating plug
3. Probe
4. Resistor wire
5. Connector
6. Heating plug

7.2 *View of lower part side*



1. Pinch solenoid (optional)
2. Connection terminal block
3. Cycle cam and cycle stop
4. Cycle micro switch and cycle stop with straw counter
5. Security micro switch
6. Solenoid switch (optional)

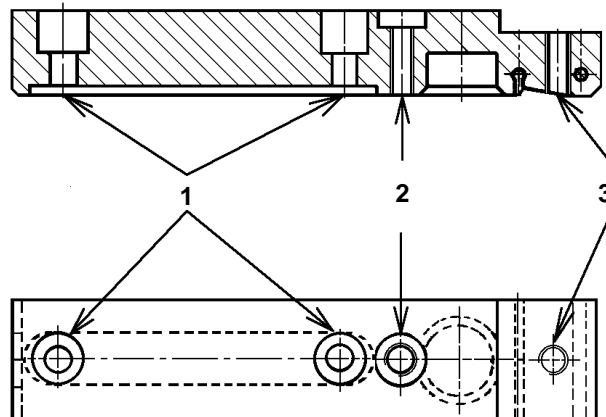
7.3 Top view of lower section



1. Dowel for jaw opening
2. Dowel for jet opening
3. Heating plug
4. Table movement lever

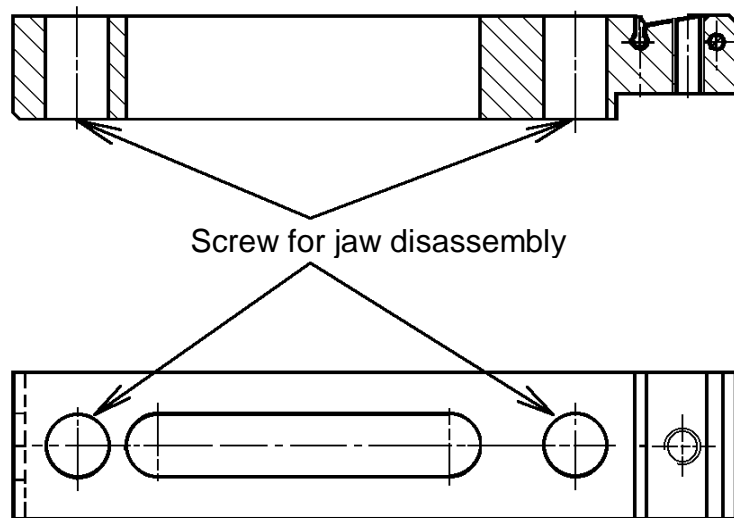
* **Caution** : Position as shown in figure

7.4 Upper jaw (009916)

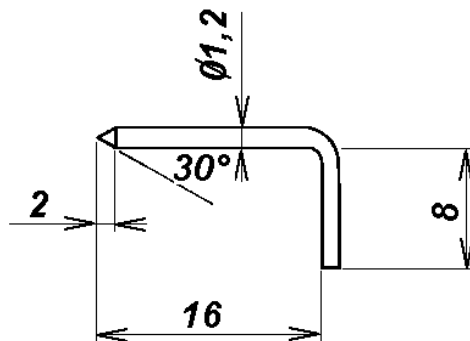


1. Screw for jaw disassembly
2. Air gap adjusting screw
3. Teflon® clamp-retaining screw

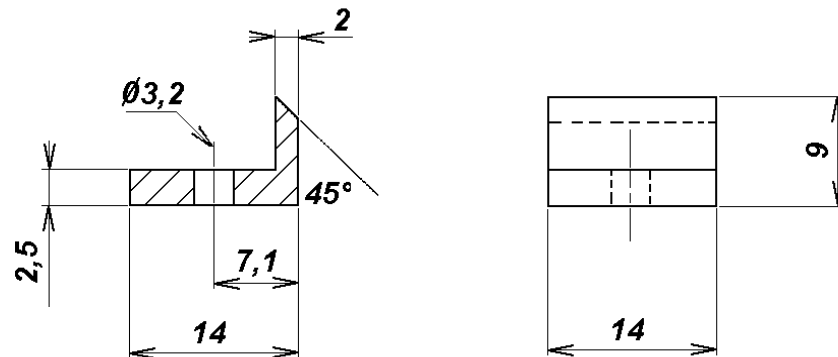
7.5 Lower jaw (009915)



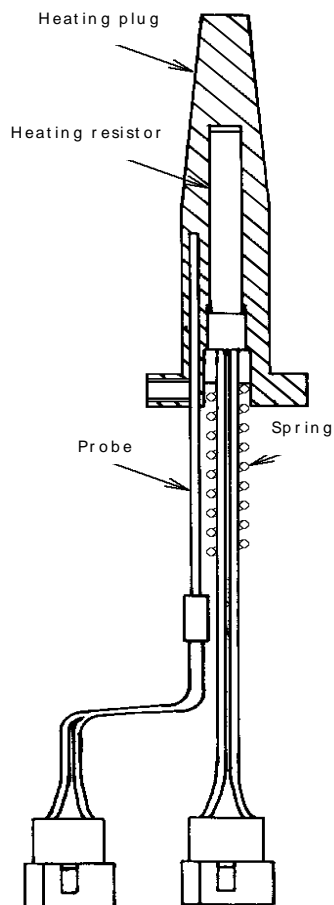
7.6 Welding jawsplit pin (009920)



7.7 Teflon clamp (009914)



7.8 Resistor assembly (008071)



8 Drawings and diagrams

See Annex 1